



# INTEL<sup>®</sup> PRODUCT QUICK REFERENCE MATRIX

Intel<sup>®</sup> Product Quick Reference Matrix  
Q2 2019

# TABLE OF CONTENTS

**INTEL® TECHNOLOGY PROVIDER**

**INTEL® VPRO™ TECHNOLOGY SOLUTION**

**INTEL® IOT PLATFORM**

**INTEL UNITE®**

**INTEL® AERO PLATFORM FOR UAVS**

**THUNDERBOLT™ 3**

**INTEL® GRAPHICS**

**INTEL MEMORY AND STORAGE**

**DESKTOP PRODUCTS**

Intel® Desktop Processors

Intel® Ethernet Desktop Adapters

Intel® Boxed Thermal Solutions

Intel® NUC

Intel® Compute Stick

Intel® Compute Card

**INTEL® WIRELESS PRODUCTS**

**INTEL® REALSENSE™ TECHNOLOGY**

**MOVIDIUS™ NEURAL COMPUTE STICK**

**SERVER PRODUCTS**

Intel® Server/Workstation Processors

Intel® Server Boards

Intel® Server Systems

Intel® Data Center Blocks

Intel® Server Chassis

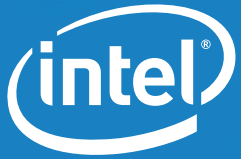
Intel® RAID

Intel® Ethernet Server Adapters

Intel® Server Management

Intel® Accelerators

Intel® Omni-Path Architecture



**YOUR SOLUTIONS.  
OUR TECHNOLOGY.  
SMARTER  
TOGETHER.**

# **INTEL® TECHNOLOGY PROVIDER**

## **INTEL® TECHNOLOGY PROVIDER**

Intel® Technology Provider provides support to keep your business running smoothly, knowledge and expertise to provide an edge and rewards to grow your business.

## **ONLINE RESOURCES**

Access a number of online resources designed to help provide the right solutions for your customers and grow your business.

## **ONLINE TRAINING**

Access a wide range of online courses that include in-depth technical, business and technology specific training. Earn credits as you learn more.

## Your Solutions. Our Technology. Smarter Together.

Whether selling to businesses or consumers, Intel® Technology Providers get the competitive advantage. Access your many benefits as you progress through the program, receiving the support, expertise, and recognition you need to succeed in a fast-moving global marketplace.

SUPPORT	EXPERTISE	RECOGNITION
Grow your bottom line with sales and marketing tools dedicated to Intel Technology Providers.	Become a trusted advisor to your customers with training, events, newsletters, and online guides.	Be recognized for the business you do with Intel. Earn points on purchases to spend on rewards and access promotions and membership materials.



## Helping You Succeed, with These Partner Benefits:



### ACCOUNT MANAGEMENT

Platinum tier members may be eligible to work with an account manager to help you drive sales and solutions, stay ahead of industry trends and alert you to the latest opportunities.



### POINTS

Greater performance brings greater rewards. All partners can earn points while Gold and Platinum partners can spend points on Intel® technology, events and more.



### TRAINING

Access to the latest online and face-to-face training courses.



### EVENTS

Invitations for Platinum and Gold tier members to annual partner-only events offering the latest product information and the opportunity to network with other top ecosystem partners as well as Intel executives.



### SALES & MARKETING TOOLS

Targeted sales and marketing solutions to boost sales and grow your business.



### PRIORITY TECHNICAL SUPPORT

Priority support for Platinum partners via chat, email, or phone, and advanced warranty service. NEW - Intel Support App. Submit support tickets from your mobile device.

For more information, visit [www.intel.com/technologyprovider](http://www.intel.com/technologyprovider)

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

# CLOUD DATA CENTER SPECIALTY BENEFITS



## Earn specialty benefits and gain exclusive, partner-only resources to help you plan, build, and deploy your cloud data center solutions.

The Cloud Data Center Specialty aims to reward Partners who have the deepest expertise in designing and deploying cloud solutions. Intel has exclusive resources available to you, through Cloud Data Center Specialty Benefits, to help you plan, implement and deliver your data center solution, opening the door to another level of engagement with Intel on cloud.



### ADDITIONAL POINTS FOR SPECIALISTS

We will offer our Cloud Specialists the opportunity to participate in offers and earn additional points for purchases of Intel Data Center Portfolio products through authorized distributors that are available only to Specialty Partners.



### CUSTOMER MATCHMAKING

As a Cloud Specialist, you'll have priority access to Intel sales teams as they help match-make between your cloud expertise and our customer base. Intel also hosts special invitation-only matchmaking events at industry conferences.



### POTENTIAL FOR MDF

Marketing development funds may be available for projects proposed by Cloud Specialists and accepted by Intel. Contact ITP-Cloud@intel.com for limitations and guidelines.



### ACCESS TO INTEL CLOUD RESOURCES

Trainings, white papers, success stories and other collateral are just a few examples of the available resources that will help you stay up to date with cloud technologies and stay ahead of the competition. Our research and world-class resources will assist you in planning and architecting cloud solutions.



### ACCELERATOR INITIATIVES

Exclusive accelerator efforts designed to support and drive transitions to the latest Intel® technologies and enable your company to have a competitive edge on the latest industry products.



### PRIORITY INVITATION TO INDUSTRY EVENTS AND TECHNICAL TRAINING

Imagine being in the same room at key events with Intel experts and learning about cutting-edge technologies. As a Cloud Specialist, you can look forward to receiving special invitations to leading industry events or Intel events such as Intel's Server Product Leader Conference.



### ACCESS TO CLOUD EXPERTS FOR PRESALES TECHNICAL SUPPORT

As a Cloud Specialist, you'll receive priority access to our Cloud Experts, who can help you confidently offer end-to-end solutions to grow your business and cement your role as a trusted advisor. Reach out to us at ITP-Cloud@intel.com, and we will get you in touch with the right person to help you achieve your business goals.



### CLOUD SPECIALIST PROMOTION & SPECIALIST DESIGNATION

Intel will promote Cloud Specialists as the experts to the market. Our "Partner with an Intel Cloud Data Center Specialist" web page will give you invaluable exposure, making it easier for potential customers to find and connect with you. Display your specialty badge to show your official affiliation with Intel and your specific expertise.



### OPPORTUNITY TO EARN STRATEGIC OEM (SOEM) STATUS

As part of the Data Center Specialty you may have the opportunity to be eligible for Strategic OEM status based on annual revenue level. As an SOEM you would be eligible for matching annual Market Development Funds and if qualified year on year bonus based on total Intel revenue growth. This initiative is invite-based and intended to accelerate technology solutions, encourage innovation, and improve long term strategic planning with our key OEM's.

For more information, visit [www.intel.com/technologyprovider/cloud](http://www.intel.com/technologyprovider/cloud)

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

# HIGH-PERFORMANCE COMPUTING (HPC) DATA CENTER SPECIALTY BENEFITS



## Earn specialty benefits and gain exclusive, partner-only resources to help you plan, implement, and deliver your data center solutions.

Intel has preferred resources available to you through HPC Data Center Specialty Benefits to help you plan, implement and deliver your data center solution. This includes access to special members-only training and events. These resources will open the door to another level of engagement with Intel on HPC.



### ACCELERATOR INITIATIVES

Exclusive accelerator efforts designed to support and drive transitions to the latest Intel® technologies and enable your company to have a competitive edge on the latest industry products.



### CUSTOMER MATCHMAKING

As an HPC Specialist, you'll have priority access to Intel sales teams as they help match-make between your HPC expertise and our customer base. Intel also hosts special invitation-only matchmaking events at industry conferences.



### POTENTIAL FOR MDF

Marketing development funds may be available for projects proposed by HPC Specialists and accepted by Intel. Contact ITPHPC@intel.com for limitations and guidelines.



### ADDITIONAL POINTS OFFERS FOR HPC SPECIALISTS

Participate in offers and earn additional points available only to Specialty partners. Use points to build your business and attract more data center customers.



### SPECIAL OMNI-PATH PRICING

HPC Specialists receive special pricing on purchase of Omni-path products.



### PRIORITY INVITATION TO INDUSTRY EVENTS AND TECHNICAL TRAININGS

Imagine being in the same room at key events with Intel experts and learning about cutting-edge technologies. As an HPC Specialist, you can look forward to receiving special invitations to leading industry events or Intel events such as Intel's Server Product Leader Conference.



### ACCESS TO HPC EXPERTS FOR PRESALES TECHNICAL SUPPORT

Closing deals can be a complicated process that requires all the help you can get. With access to our experts, we can help you confidently offer end-to-end solutions to grow your business and cement your role as a trusted advisor. Reach out to us at ITPHPC@intel.com, and we will get you in touch with the right person to help you achieve your business goals.



### HPC DATA CENTER SPECIALIST PROMOTIONS AND SPECIALTY DESIGNATION

Intel will promote the HPC Specialists as experts to the market. Our "Partner with an Intel HPC Data Center Specialist" web page will give you exposure, making it easier for potential customers to find and connect with you as an expert in HPC design and deployment. Display your specialty badge to show your official affiliation with Intel and your specific expertise in providing Intel® technology and solutions to end customers.



### OPPORTUNITY TO EARN STRATEGIC OEM (SOEM) STATUS

As part of the Data Center Specialty you may have the opportunity to be eligible for Strategic OEM status based on annual revenue level. As an SOEM you would be eligible for matching annual Market Development Funds and if qualified year on year bonus based on total Intel revenue growth. This initiative is invite-based and intended to accelerate technology solutions, encourage innovation, and improve long term strategic planning with our key OEM's.

For more information, visit [www.intel.com/technologyprovider/hpc](http://www.intel.com/technologyprovider/hpc)

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

# ARTIFICIAL INTELLIGENCE (AI) SPECIALTY BENEFITS



## Earn specialty benefits and gain exclusive, partner-only resources to help you plan, implement, and deliver your AI solutions.

Intel has preferred resources available to you through AI Specialty Benefits to help you plan, implement and deliver your data center solution. This includes access to special members-only training and events. These resources will open the door to another level of engagement with Intel and AI.



### PROMOTION OF YOUR COMPANY BY INTEL

Intel will promote AI Specialists as the experts to the market. Our "Partner with an Intel AI Specialist" web page will give you invaluable exposure, making it easier for potential customers to find and connect with you as an AI service provider they can trust.



### PUBLIC RELATIONS SUPPORT

Intel will provide quotes and other supporting comments from our recognized AI experts to support your technical, sales and marketing collateral.



### POTENTIAL FOR MDF

Marketing development funds may be available for projects proposed by AI Specialists and accepted by Intel. Contact ITP-AI@intel.com for limitations and guidelines.



### ADDITIONAL POINTS OFFERS FOR AI SPECIALISTS

Participate in offers and earn additional points available only to Specialty partners. Use points to build your business and attract more data center customers.



### PRIORITY INVITATION TO INDUSTRY EVENTS & TECHNICAL TRAININGS

Imagine being in the same room at key events with Intel experts and learning about cutting-edge technologies. As an AI Specialist, you can look forward to receiving special invitations to leading industry events or Intel events such as Intel's Server Product Leader Conference.



### ACCESS TO AI EXPERTS FOR PRESALES TECHNICAL SUPPORT

Closing deals can be a complicated process that requires all the help you can get. With access to our experts, we can help you confidently offer end-to-end solutions to grow your business and cement your role as a trusted advisor. Reach out to us at ITP-AI@intel.com, and we will get you in touch with the right person to help you achieve your business goals.



### AI SPECIALIST PROMOTIONS AND SPECIALTY DESIGNATION

Intel will promote the AI Specialists as experts to the market. Our "Partner with an Intel AI Specialist" web page will give you exposure, making it easier for potential customers to find and connect with you as an expert in AI design and deployment. Display your specialty badge to show your official affiliation with Intel and your specific expertise in providing Intel® technology and solutions to end customers.



### ACCESS TO ONLINE TRAINING AND COLLATERAL

Product trainings, white papers, success stories and other collateral are just a few examples of the available resources that will help you stay up to date with AI technologies and stay ahead of the competition. Our research and world class resources will assist you in planning and architecting AI solutions.

For more information, visit [www.intel.com/technologyprovider/AI](http://www.intel.com/technologyprovider/AI)

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

## Get Assets, Promotion and Unique Benefits to Help You Differentiate and Succeed

Enthusiast PC specialty benefits give you exclusive, partner-only resources to help you excel, differentiate and accelerate in the enthusiast market segment. Get access to valuable benefits designed and tailored for channel partners selling and promoting finished systems based on Intel® Core™ X, K, H series.



### MARKET INTELLIGENCE REPORTS

Access quarterly Intel curated enthusiast market segment intelligence reports, containing market data, insights, and forecasting at the macro and country level.



### GET WORLD CLASS GAMING, SOFTWARE PACKS

Receive entertainment packs free-of-cost with Intel® Core™ processor-based systems. Latest titles are sourced from top gaming and software partners.



### GET PROMOTED

Be included in promotional listings of qualified Enthusiast Specialists on select Intel partner directories.



### GET PASSES TO LOCAL E-SPORTS EVENTS

Receive at least 10 passes to your local E-Sports League or Intel® Extreme Masters (IEM) events, to be used as giveaways or promotions.



### EARN ADDITIONAL POINTS

Earn additional points when you participate in offers only for Enthusiast PC Specialists. Use your points for partner events, marketing resources and more.



### ACCESS ONLINE TECHNICAL WEBINARS

Join exclusive technical sessions led by Intel experts on topical and technical enthusiast and gaming topics in your geography.



### MERCHANDISE AND GIVEAWAYS

Receive select merchandise and giveaways to help in your marketing and promotion, starting with an Intel® Technology Provider-branded E-sports shirts.

For more information, visit [www.intel.com/enthusiastpc](http://www.intel.com/enthusiastpc)

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.



# ENTHUSIAST PC SPECIALTY BENEFITS FOR DEVELOPER/PUBLISHER



## Get Assets, Promotion and Unique Benefits to Help You Differentiate and Succeed

Enthusiast PC specialty benefits give you exclusive, partner-only resources to help you excel, differentiate and accelerate in the enthusiast market segment. Get access to valuable benefits designed and tailored for channel partners selling and promoting finished systems based on Intel® Core™ X, K, H series.



### MATCHMAKING CONCIERGE

Get connected to gaming hardware providers, for an opportunity to collaborate on go-to-market and innovative business opportunities.



### SPONSORSHIP PASS TO INTEL® PARTNER CONNECT

Get additional exposure through your local Intel® Partner Connect event. Receive a one-time offer of "Developer" Tier Sponsorship Pass to the next event. (Value of USD \$10K).



### MARKET INTELLIGENCE REPORTS

Access quarterly Intel curated enthusiast market segment intelligence reports.



### GET PROMOTED

Be included in promotional listings of qualified Enthusiast Specialists on select Intel partner directories.



### GET PASSES TO LOCAL E-SPORTS EVENTS

Receive at least 10 passes to your local E-Sports League OR Intel® Extreme Masters (IEM) events, to be used as giveaways or promotions.



### ACCESS ONLINE TECHNICAL WEBINARS

Join exclusive technical sessions led by Intel experts on topical and technical enthusiast and gaming topics in your geography. Coming soon.



### MERCHANDISE AND GIVEAWAYS

Receive select merchandise and giveaways to help in your marketing and promotion, starting with Intel® Technology Provider-branded E-sports shirts.

For more information, visit [www.intel.com/enthusiastpc](http://www.intel.com/enthusiastpc)

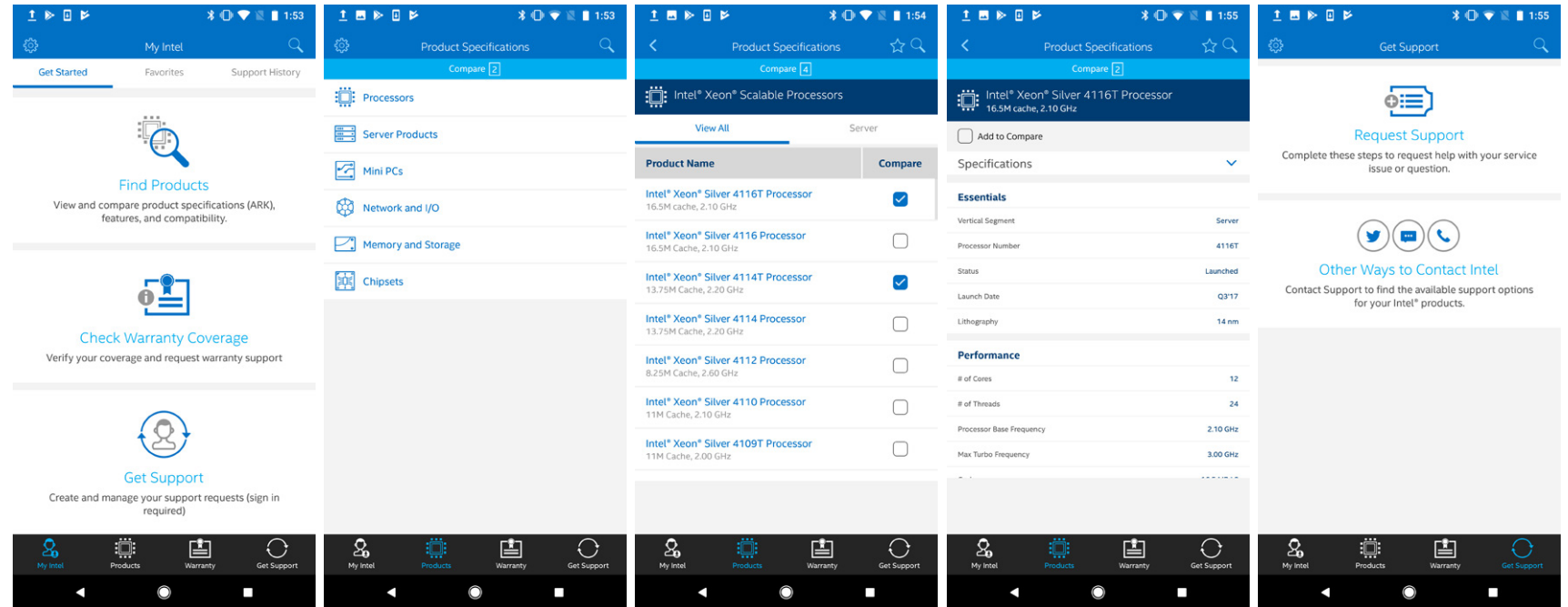
All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

## Intel® Support App

The Intel® Support smartphone app allows customers to submit support requests through their mobile device and access product specifications.

- An easy and simple smartphone application that allows customers to submit new support requests, check the status of active requests, submit warranty claims, or view their support history.
- Product specification tool replaces the former ARK mobile app.
- Gives customers a more personalized experience, and provides more control over where, when, and how they engage with Intel Customer Support.
- Future enhancements will include the bar code scanning, and chat directly with a support agent from your mobile device.
- Available on iPhone®, iPad®, and Android® mobile devices.

**AVAILABLE FOR DOWNLOAD ON THE APPLE APP STORE  
& GOOGLE PLAY**



All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. Copyright © 2019 Intel Corporation. All rights reserved. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



## THE FOUNDATION FOR BUSINESS COMPUTING

# INTEL® VPRO™ TECHNOLOGY SOLUTION

### THE INTEL® VPRO™ PLATFORM

The Intel® vPro™ platform<sup>1</sup> meets the needs of the user and the business by combining a premium computing experience with hardware-enhanced security, flexible management, and improved stability—all made possible by 8th Generation Intel® Core™ vPro™ processors.

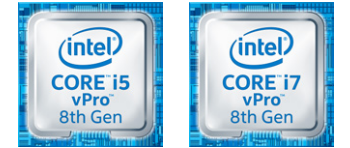
Intel® Product Quick Reference Matrix  
Q2 2019

<sup>1</sup> Intel® technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at <http://www.intel.com>.

# THE ADVANTAGES OF INTEL® VPRO PLATFORMS FOR BUSINESS OF ALL SIZES



Refresh your desktop fleet with the latest 8th Gen Intel® vPro™ processors to unlock performance and productivity, enhanced security and improved capabilities. The new 8th Gen Intel® vPro™ processors with up to 6 Cores provide exceptional performance and responsiveness leveraging Intel® Optane™ Memory technology. This is the first 6-core Intel® vPro™ processor for Mainstream computing with enhanced hardware security and advanced remote manageability. The new 8th Gen Intel® vPro™ platform is Intel's Best-In-Class business platform.



## 31%

### Up to 31% Better Productivity Performance vs 7th Gen <sup>1,2,4</sup>

Premium performance enables things like - robust content creation, analyze data using Microsoft\* Office products up to 31% faster than a 7th Gen PC



## 41%

### Up to 41% Faster Multi-Tasking vs 7th Gen <sup>2,5,6,7,8,9</sup>

Collaborate with teammates while also working on multiple Microsoft Office applications faster than a 7th Gen PC



## 10HRS

### Up to 10 Hours Battery Life <sup>3</sup>

Enjoy up to 10 hours battery life to analyze data and create content while conducting research on the web

## Sales Opportunities

Nearly half (46%) of small businesses are in a managed environment, and drive 62% of small business IT spending.\*\*

Devices powered by Intel® Core™ vPro™ processors deliver proven value with reduced repair times and improved system availability.

Intel vPro technology is supported by a broad set of ISV management consoles and a wide variety of devices.



### Processor

Intel® Core™ i7 and Intel® Core™ i5 vPro™ Processors



### Desktop Chipset

Intel® Q Series Chipset

OR

### Mobile Chipset

Intel® QM Series Chipset



### Network

Intel® LAN Controller

\*\* Source: AMI-Partners (<http://www.ami-partners.com>) 2013. For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks)

## 8th Generation Intel® Core™ vPro™ Processors

### BUSINESS-CLASS PERFORMANCE YOU CAN COUNT ON

Streamline productivity with performance for serious business compute, multitasking for maximum efficiency, and unprecedented battery life that lasts up to 10 hours.



#### Lighten your heaviest workloads

When finance crunches complex calculations, developers compile precise code, and designers manipulate sophisticated graphics, the premium performance of new 8th Intel® Core™ vPro™ processors give uptime a whole new meaning.

From Excel macros to CAD animations, Intel® Hyper-Threading Technology handles demanding applications by running multiple threads on each core to deliver cutting-edge responsiveness for serious business compute.



#### Take the task out of multitasking

Trying to do more than one thing at a time on old technology is a productivity drain, not a driver.

Keep business running smoothly with new 8th Generation Intel® Core™ vPro™ processor-based devices that have Intel® Speedshift™ Technology for steady load balancing across highly demanding workloads.

Performance automatically adjusts to focus frequencies where they're needed most, while applications running in the background reserve power.



#### Unleash real mobile productivity

From improving interactions with patients to delighting customers on the sales floor, modern business is all about mobility and long battery life is central to this transformation.

Make your workforce more productive from anywhere, anytime with the endurance of new 8th Generation Intel® Core™ vPro™ processor-based devices, which provide up to 10 hours of untethered power to last the entire work day.

For more information, visit [www.intel.com/go/vpro](http://www.intel.com/go/vpro)

#### Refresh Configurations

Intel® Core™ i5-8350U (Intel Reference Platform), 15W, 4C8T, Turbo up to 3.6GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows® 10

Intel® Core™ i5-3427U, 15W, 2C4T, Turbo up to 2.8GHz, Memory: 2x4GB DDR3-1600, Storage: 80GB SSD, Graphics: Intel(R) HD Graphics 4000, OS: Windows® 10

#### Gen-on-Gen Configurations

Intel® Core™ i7-8650U (Intel Reference Platform), 15W, 4C8T, Turbo up to 4.2GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows® 10

Intel® Core™ i7-7600U (Intel Reference Platform), 15W, 2C4T, Turbo up to 3.9GHz, Memory: 2x4GB DDR4-2400, Storage: Intel® 6000p SSD, Graphics: Intel® UHD Graphics 620, OS: Windows® 10

#### Battery Life Configuration

Intel® Core™ i7-8650U Processor (Intel Reference Platform), 15W, 4C8T, Turbo up to 4.2GHz, Memory: 2x4GB DDR4-2133, Storage: Intel 540s m.2 SSD, Graphics: Intel UHD Graphics 620, OS: Windows® 10, Battery Size: 42Whr, Screen: 25x14 12.5", Windows 10 Power Slider – Better Performance

#### Workloads

- <sup>1</sup> SYSmark® 2014 SE: SYSmark® 2014 SE is a benchmark from the BAPCo® consortium that measures the performance of Windows® platforms. SYSmark 2014 SE tests four usage scenarios: Office Productivity, Media Creation, Data/Financial Analysis, and Responsiveness. SYSmark contains real applications from Independent Software Vendors such as Microsoft® and Adobe®.
- <sup>2</sup> Office Productivity and Multitasking Workload: Slack is open in the background while a 2.28 MB, Microsoft PowerPoint .ppt presentation is exported as a 1920x1080 H.264 .mp4 video presentation. While the video presentation is being created 1) a 6.49 MB, 844 page, Microsoft Word .docx document is converted to a 7.98 MB, PDF file and 2) a 70.4 MB, .Microsoft Excel .xlsm macro-enabled worksheet that is recalculated.
- <sup>3</sup> EMBC Browsing Bench Component Average Power (projected on Intel Reference Platform using a 42Whr battery and 25x14 Panel): Disconnect all USB devices, connect to a local WiFi access point and set the screen brightness to 200 nits (disable DPST, set brightness to 200 nits on a white background and enable DPST). Wait for 10 mins for the OS to completely idle and then launch EEMBC Browsing Bench using Microsoft® Edge Browser. Set the web pages to idle for 20s in between page loads. Measure power for the duration of all page loads and report 3 run median.
- <sup>4</sup> Large numerical calculation workload: uses the Black-Scholes model to execute approximately 300,000 iterations of the Monte Carlo simulation in Microsoft® Excel® 2016. It also uses Excel lookup functions to compare the Black-Scholes model's put price with the historical market price for 50,000 rows to understand the convergence, creating a spreadsheet file larger than 70 MB.
- <sup>5,6</sup> WebXPRT® 2015 (<sup>5</sup> Stock Option Pricing Subscore, <sup>6</sup> DNA Sequencing Subscore: benchmark from Principled Technologies® that measures the performance of web applications using six usage scenarios: Photo Enhancements, Organize Album, Local Notes, Stock Option Pricing, Sales Graphs, and Explore DNA Sequencing. WebXPRT tests modern browser technologies such as HTML5 Canvas 2D, HTML5 Table, HTML5 Local Storage, as well as JavaScript®. Reported metrics: elapsed time in seconds (lower is better) for each scenario, plus an overall score (higher is better). Scaling efficiencies: CPU dominant (newer browsers are GPU accelerated), sensitive to frequency. WebXPRT is very sensitive to browser type and version. OS support: Any OS that supports an HTML5 browser.
- <sup>7</sup> Microsoft® PowerBI Data Source Change Workload: Measures the time to load, query, calculate statistics, and draw 6 charts from a different local data source containing 2.2 million sales records
- <sup>8</sup> Dataset JOIN query workload: Measures the time to perform a multi-table SQL JOIN query in Microsoft® Access 2016 on a sample dataset containing 2.2 million sales records to create a quarterly sales summary.
- <sup>9</sup> File Compression (Zipping) workload: Measures the time to compress 50 files totaling 118MB using WinZip® v22.

\* Other names and brands may be claimed as the property of others.



# INTEL<sup>®</sup> IOT PLATFORM

ENABLING A  
CONNECTED  
DIGITAL  
LIFESTYLE

## INTEL<sup>®</sup> IOT PLATFORM

The Intel<sup>®</sup> IoT Platform is a reference architecture implemented using products and technologies from Intel, along with developers and the ecosystem that seamlessly and securely connect and manage devices, deliver trusted data to the cloud, and deliver value through analytics.



# INTEL® IOT PLATFORM

Enabling a connected digital lifestyle through devices that are able to connect to the internet securely.

The Intel® IoT Platform is a reference architecture implemented using products and technologies from Intel, along with developers and the ecosystem that seamlessly and securely connect and manage devices, deliver trusted data to the cloud, and deliver value through analytics.

## INTEL® IOT PLATFORM INFOGRAPHIC

The Internet of Things (IoT) is at the heart of a powerful technology revolution. The act of connecting devices and systems to each other so that they can share data is the seed of new products, services, and experiences. Today, there are many IoT solutions based on Intel® technology in operation worldwide and the impact has been significant for businesses and consumers.

## IOT PRODUCT PORTFOLIO

Intel technology is the backbone of proven IoT solutions in smart home, industrial, and mobile applications, as well as for vertical markets, including transportation, healthcare, and retail. It is helping billions of devices talk to each other and share valuable information, protecting sensitive data, and providing critical analytics and API offerings.

## IOT SECURITY PORTFOLIO

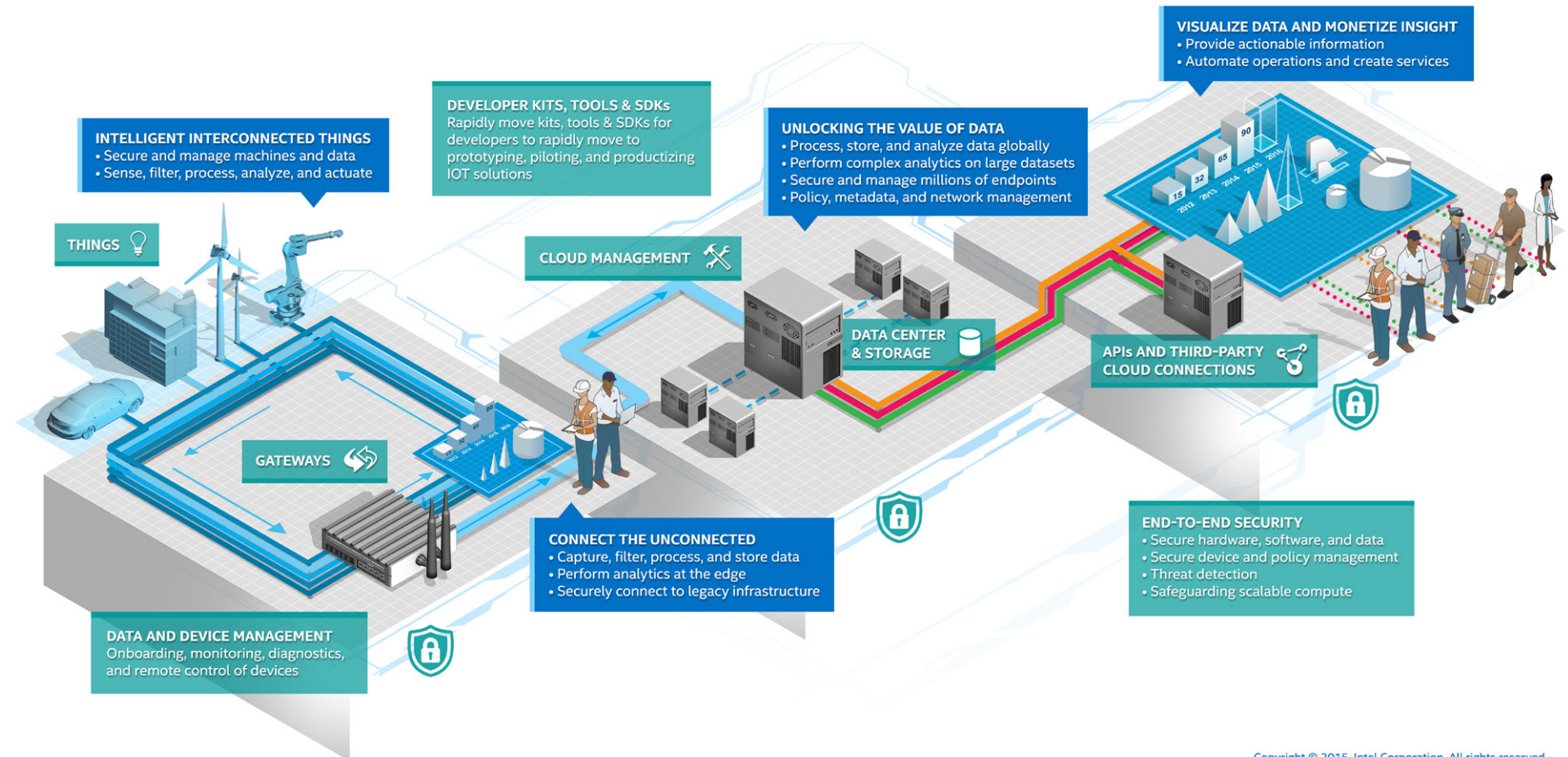
Intel supports tightly integrated hardware and software security from the edge to the cloud, along with data protection and policy management, delivering trusted data resulting in valuable insights.





## Secure. Scalable. Interoperable.

The Intel® IoT Platform is an end-to-end reference architecture and family of products from Intel, that works with third-party solutions, to provide a foundation for seamlessly and securely connecting devices, delivering trusted data to the cloud, and delivering value through analytics.



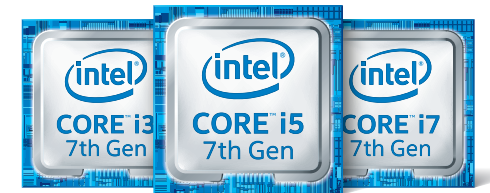
Copyright © 2015, Intel Corporation. All rights reserved.



## Hyperreal Visuals Drive Greater IOT Possibilities

Build your most innovative solutions with 7th Gen Intel® Core™ processors, featuring enhanced graphics, performance, and responsiveness.

- 14nm silicon technology
- Reduced electrical and power consumption
- Latest hardware- and software-enhanced security
- Long-term availability (up to seven years)



### BETTER PERFORMANCE

- Up to 17%<sup>1</sup> better CPU performance
- Power-optimized for mobility
- Intel® Optane™ memory ensures media responsiveness
- Intel® Speed Shift Technology optimizes task performance

### STRONGER GRAPHICS

- Up to 4K Ultra HD
- New HEVC 10-bit and VP9 decode
- Integrated HDCP 2.2
- Support for additional formats, such as AVC/H.264, MPEG-2, and VC-1

## Intel® Processors for IoT



### INTEL® QUARK™ PROCESSORS

Intel® Quark™ processors are microcontrollers for intelligent things. They provide flexible, low-power computing for a variety of small form factor applications to offer low-cost connectivity, integration, and compatibility for the IoT.



### INTEL® ATOM™ PROCESSORS

Intel® Atom™ processors pack an entire system-on-a-chip for the ultimate in power and portability. Get performance/watt leadership, security and manageability, rich graphics, and I/O integration, with stunning graphics performance for edge devices.



### 7TH GENERATION INTEL® CORE™ PROCESSORS

The 7th generation Intel® Core™ processors offer unprecedented power and responsiveness of Intel® Turbo Boost Technology.<sup>2</sup> Work with superior CPU and graphics performance, powerful security, and a range of power options to boost edge-to-cloud IoT designs.



### INTEL® XEON® PROCESSORS

The Intel® Xeon® processors power any workload and lift data center productivity. They combine multi-core performance and compute density with hardware-based manageability, security, virtualization, and power management for scalability and reliability at the edge.

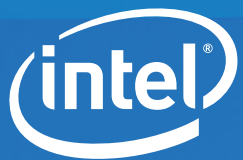
Learn more at [intel.com/iot](https://intel.com/iot)

<sup>1</sup> Measured by Intel on a system with 7th Gen Intel® Core™ processor i7-7700 versus a system with 6th Gen Intel® Core™ processor i7-6700 using SPECfp2006 (8 copy).

<sup>2</sup> Requires a system with Intel® Turbo Boost Technology. Intel® Turbo Boost Technology and Intel® Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit [intel.com/turboboost](https://intel.com/turboboost).

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. For more complete information about performance and benchmark results, visit [intel.com/benchmarks](https://intel.com/benchmarks).

Copyright © 2019, Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Atom, Intel Core, Xeon and Quark are trademarks of Intel Corporation in the U.S. and/or other countries. \*Other names and brands may be claimed as the property of others.



# INTEL® UNITE

Intel® Product Quick Reference Matrix  
Q2 2019

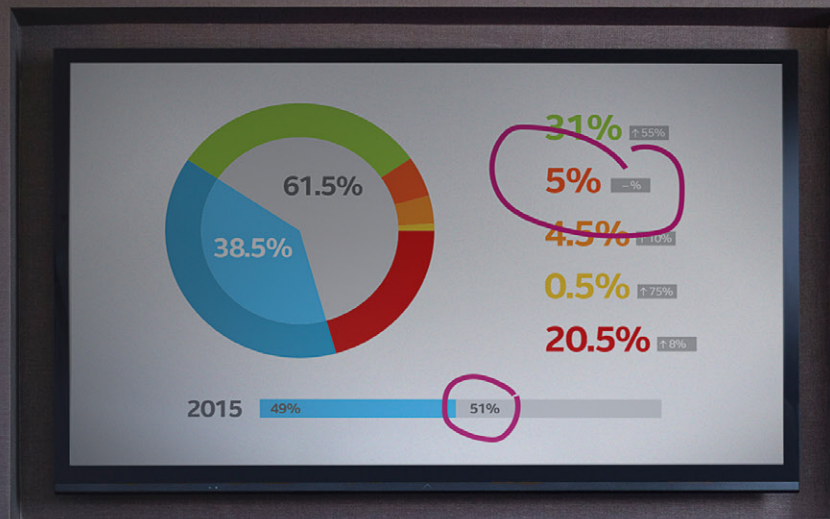
**SMARTER ROOMS.  
SMARTER  
COLLABORATION.**

## INTEL® UNITE

Start meetings fast and be more productive with easy wireless content sharing to room displays and other devices connected to the network.

# SMARTER ROOMS. SMARTER COLLABORATION.

Start meetings fast and be more productive with easy wireless content sharing to room displays and other devices connected to the network.



intel UNITE

## ENTERPRISE INSTALLATION

This easily scalable solution is ideal for enhancing collaboration in *managed* IT environments with more than a few rooms, including medium to large businesses and schools. It features a centralized administrative web portal, broad OS support, and the ability to integrate optional plugin extensions.

## SMALL BUSINESS INSTALLATION – NEW!\*

For unmanaged small business environments with only a few rooms, this easy-to-install option requires no IT expertise or server components, and enables basic collaboration capabilities for users with PCs and Macs. Connection reliability is now on par with the enterprise installation, and multiple subnets are now supported.

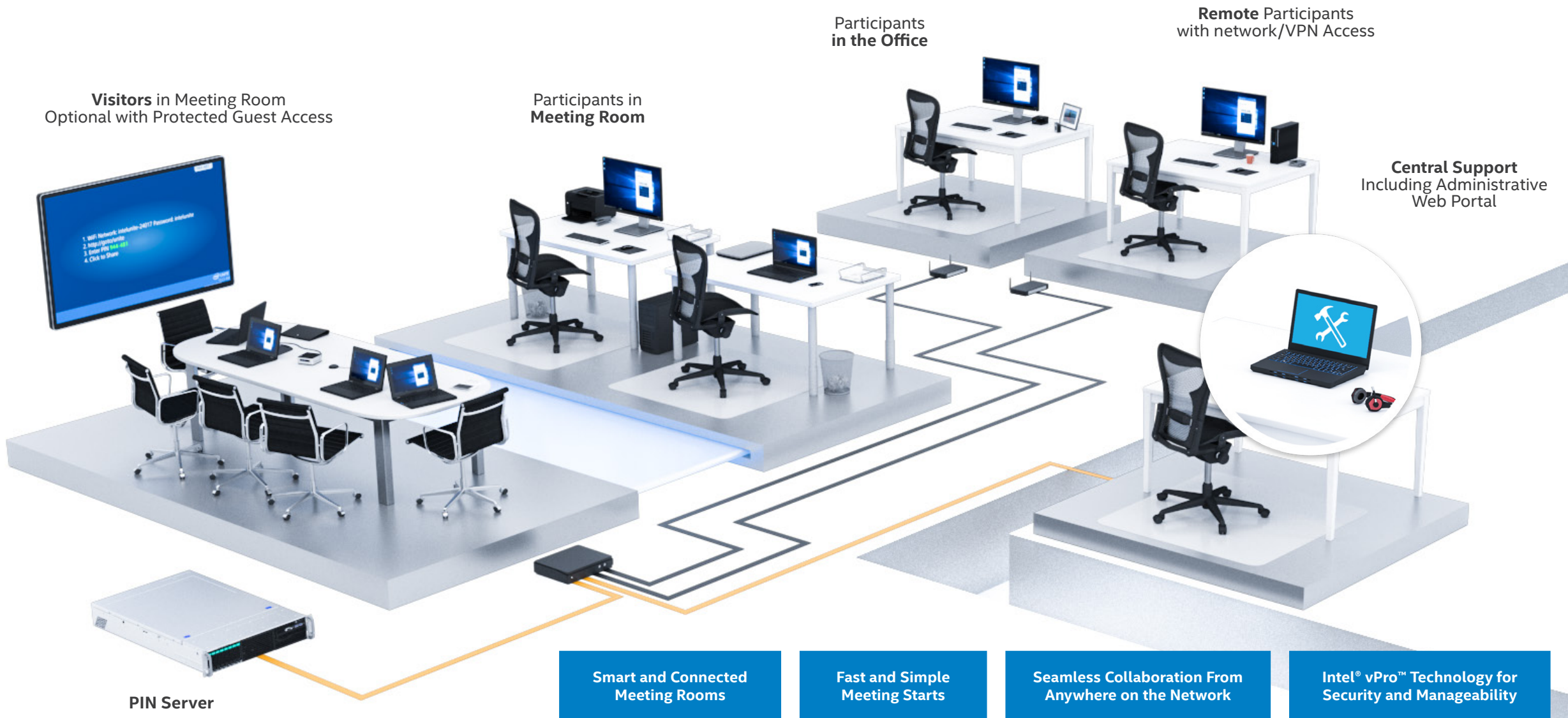
\* Now available with Intel Unite® software version 3.2

## COLLABORATION MADE EASY

Just launch the app on your device, enter the short PIN shown on the room's display, and begin wirelessly sharing or viewing content with a click.

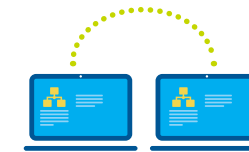
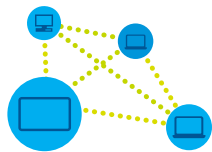


# INTEL UNITE® - ENTERPRISE SOFTWARE INSTALLATION FOR MANAGED ENVIRONMENTS



## Simplify IT Management

With Intel® vPro™ technology on every room-based PC running Windows and Intel Unite® software, you can easily integrate these PCs into your existing IT infrastructure and leverage the management tools, systems and policies you already have in place. And by simplifying the infrastructure technologies needed in your conference rooms, you can help reduce costs and improve manageability.



## Ditch the Dongle

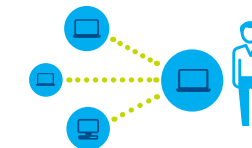
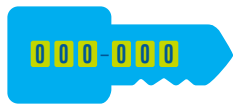
Technology connects attendees to new or existing displays, projectors, and interactive whiteboards. There's no need to waste time searching for the right adapter or dongle.

## Collaborate in Real Time

Attendees from any location can view, annotate, and share documents—in real time, every time. Share files easily using the built-in file transfer feature.

## Host From Your PC

No room monitor? An Intel® Core™ vPro™ processor-based client device with the Intel Unite® app installed can host a session, allowing workers to share screens wirelessly between their devices.<sup>1</sup>



## Safer Meetings

To improve security, attendees must enter the appropriate rotating PIN code to join the meeting. Guests outside of your network can temporarily join and participate in configured rooms using the optional software plugin<sup>3</sup> for protected guest access.

## Protected Data

Enterprise-grade security ensures that data is 256-bit Secure Sockets Layer (SSL) encrypted and stays within your corporate network. Data always stays within the virtual walls of your business and isn't dependent on any additional vendor solutions.<sup>1</sup>

## Remote Manageability

With the remote management tools of Intel® vPro™ technology, you can manage all conference room PCs from any location to complete basic tasks, apply patching, or make repairs. Use the Administrative Web Portal<sup>3</sup> to track analytics and centrally manage or configure your deployed Intel Unite® solutions.

## Reseller Conferencing Dilemma

Conferencing solutions in SMB are quickly becoming the new battle ground. Resellers have numerous solutions from several vendors to offer their customers.

**Resellers will gravitate towards solutions that:**

- Have the features their customer demand
- Are easy to deploy and manage
- Offer them incremental opportunities for margin
- Keep the lines of communications open with their customer
- Offer the best support from the OEM for the entire solution

## Reseller Opportunities with Conferencing

### Resell

- NUCs and branded systems
- Network infrastructure
- Third Party Peripherals

### Plan

- Communication workshops
- Network assessments
- System integration

### Enhance

- Customization
- Vertical LOB integration
- Vertical applications

## Advantages of adopting Intel Unite® software for the Reseller

### Added margin opportunities

### Resell

- Intel® Core™ vPro™ PC with Intel Unite® software
- Third Party Peripherals

### Plan

- Conference Consulting Services
- Network Assessment Services

### Enhance

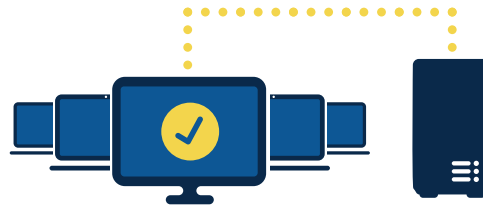
- Customization Services
- Service Level Agreements
- Configure room hubs with modular plug-ins for added functionality or integrated control of other enabled solutions (enterprise installation only)





## Deploy & Configure the Intel Unite® solution with Confidence

Follow these tips to help your customers jumpstart a more collaborative experience in every meeting, whether for a single shared space or throughout their organizations.



### Unmanaged Small Business Installation

For basic screen sharing in small, unmanaged business environments, a small business installation – formerly 'standalone' – is now available. In addition to adequate memory and storage, hubs will need Intel® vPro™ technology and Windows\* 10 with Microsoft\* .NET Framework 4 or newer. Clients require Windows\* 7 or newer or Mac OS\* X 10.9 or newer, plus the Intel Unite® app. For a cost-effective approach, configure the mini PC to work as both a collaboration solution and a personal or shared PC work station.

### Enterprise Installation

Add a new server or use a compatible existing server to manage connections for enterprise deployment. The server should have Microsoft\* IIS and Microsoft SQL Server\* 2008 or newer. Chromebook, Linux client, iPad and Android tablet support are also now available for enterprise installations via their respective app stores.

### Customize for Manageability

IT can configure rooms in enterprise installations differently with plugins and, add the organization's theme with hub customizations. Use the server's Administrative Web Portal to create and manage rooms, generate solution telemetry data reports, and control optional moderator account permissions.

For an exclusive ITP opportunity to download the Intel Unite® software today and to learn more, visit:

<https://www-ssl.intel.com/content/www/us/en/secure/technology-provider/products/software/unite-enables-real-time-collaboration.html>

<sup>1</sup> Intel technologies may require enabled hardware, specific software, or services activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com. Copyright © 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Core, the Intel Experience What's Inside logo, Intel Experience What's Inside, Intel Unite, and Intel vPro are trademarks of Intel Corporation in the U.S. and/or other countries.

<sup>2</sup> Skype\* for Business sold separately.

<sup>3</sup> Available with enterprise installation only.

\* Other names and brands may be claimed as the property of others.



## THE USB-C THAT DOES IT ALL

# THUNDERBOLT™ 3

### WHAT IS THUNDERBOLT™ 3?

At 40 Gb/s, it's the fastest port available on a computer today.

- 8x faster than USB 3.0 and 4x more video bandwidth than HDMI 1.4
- Transfer a 4K movie in less than 30 seconds
- Back up a year's worth of continuous MP3s in five minutes
- Plus, connect to any display, Thunderbolt, or USB device

# THUNDERBOLT™ 3

Thunderbolt™ 3 brings Thunderbolt to USB-C at speeds up to 40 Gigabits per second (Gbps), creating one compact port that does it all – delivering the fastest\*, most versatile connection to any dock, display, or data device.

## THE SPEED YOU NEED

Thunderbolt™ 3 technology is 8x faster than USB 3.0 and provides 4x more video bandwidth than HDMI 1.4, helping users work and play more efficiently. Incredible data transfer rates for high-powered external graphics cards - deliver exciting potential for multi-streaming HD and 4K UHD video and also allow you to enjoy the latest games as they were intended. Orchestrate desktop-level performance from a lightweight laptop, experience higher frame rates and improve visual quality with an unprecedented speed of 40Gbps.

## ALL-IN-ONE SIMPLICITY

Expand your capabilities while reducing cables with the simplicity of a single Thunderbolt™ 3 port paired with the latest 8th Generation Intel® Core™ processor. Now, just one compact port can enable lightning-fast data transfer, support two 4K UHD 60 Hz displays, and even charge a laptop. It's the most advanced, efficient, and versatile single-docking solution available.

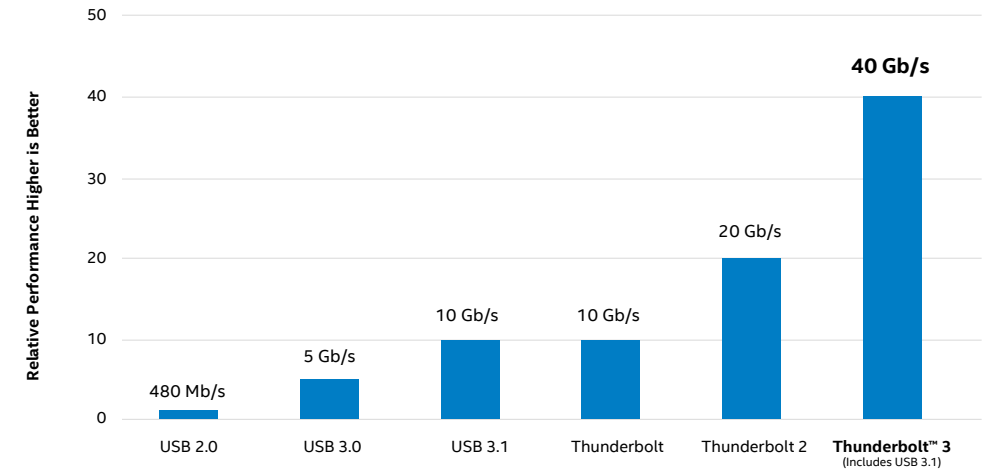
\* As compared to other PC I/O connection technologies including eSATA, USB, and IEEE 1394 Firewire. Performance will vary depending on the specific hardware and software used. Must use a Thunderbolt-enabled device.

## Thunderbolt™ 3 Brings Thunderbolt to USB-C

### THE USB-C THAT DOES IT ALL

Thunderbolt™ 3 technology offers a fast and simple level of connection and consistency for work or home, bringing the speed and versatility of Thunderbolt™ to USB-C. Increase productivity by linking multiple devices through a single, compact port or add a little more power to your gaming with lightning-fast transfers.

- 40Gb/s Thunderbolt™ 3
- Bi-directional, PCI Express and DisplayPort
- Four lanes of PCI Express Gen 3
- Eight lanes of DisplayPort 1.2
- Native USB 3.1 (10Gb/s)
- Native DisplayPort 1.2



### More Protocols

Simplify with one port to connect Thunderbolt devices, every display, and billions of USB devices.



### More Speed

Speed your creation of multi-stream HD or 4K video and archive it with superfast storage.



### More Power

Data, video, and power on the same cable. Up to 100W notebook charging, 15W to bus-powered devices.



### More Pixels

Access the fastest storage, two 4K displays and simultaneously charge with a single cable.

For more information, visit [thunderbolttechnology.net](http://thunderbolttechnology.net) or [www.intel.com/thunderbolt](http://www.intel.com/thunderbolt)

# ADAPTER/EXPANSION

thunderbolttechnology.net/products



<b>BRAND</b>	Ableconn Technologies	Ableconn Technologies	Akitio	Akitio	Akitio	Akitio
<b>PRODUCT</b>	Ableconn TBT3-DPX2 Thunderbolt 3 to Dual DisplayPort Adapter	Ableconn TBT3-HDX2 Thunderbolt 3 to Dual HDMI Adapter	AKiTiO Node Duo	AKiTiO Node Lite	AKiTiO Node Pro	AKiTiO T3-2DP



<b>BRAND</b>	Akitio	Akitio	Akitio	ALOGIC	ALOGIC	Apple
<b>PRODUCT</b>	AKiTiO T3T	AKiTiO Thunder3 10G Network Adapter	AKiTiO Thunder3 PCIe Box	Alogic Thunderbolt 3 (USB-C) to Dual DisplayPort Adapter - 4K 60 Hz	Alogic Thunderbolt 3 (USB-C) to Dual HDMI Adapter - 4K 60 Hz	Apple Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter



<b>BRAND</b>	Areca Technology	Areca Technology	Atech Flash Technology, Inc	Atech Flash Technology, Inc	ATTO Technology	ATTO Technology
<b>PRODUCT</b>	ARC-4108T3	ARC-4607T3	Blackjet TX-1S Media Reader for Sony SXS Cards	Blackjet UX-1 Cinema Dock	ATTO ThunderLink SH 3128	ATTO ThunderLink® FC 3162 (SFP+)

# ADAPTER/EXPANSION

thunderbolttechnology.net/products



<b>BRAND</b>	ATTO Technology	ATTO Technology	ATTO Technology	ATTO Technology	ATTO Technology	Cable Matters
<b>PRODUCT</b>	ATTO ThunderLink® FC 3322 (SFP+)	ATTO ThunderLink® NQ 3401 (QSFP+)	ATTO ThunderLink® NQ 3402 (QSFP+)	ThunderLink® NS 3101 (SFP+)	ThunderLink® NS 3102 (SFP+)	Cable Matters Dual DisplayPort Thunderbolt 3 Mini Dock



<b>BRAND</b>	Cable Matters	Cable Matters	Cable Matters	Cable Matters	Cambrionix	CE-LINK
<b>PRODUCT</b>	Cable Matters Thunderbolt 3 Dual HDMI 2.0 Mini Dock for Mac & Windows	Thunderbolt 3 to Dual 4K HDMI Adapter for Mac & Windows	Thunderbolt 3 to Dual 4K or Single 5K DP Adapter for Mac & Selected Windows	Thunderbolt 3 to Thunderbolt Adapter for Windows & Mac	ThunderSync3-16	Thunderbolt™ 3 to Dual DisplayPort Adapter



<b>BRAND</b>	Delock	Delock	Fullink Technology Co., Ltd.	HighPoint Technologies, Inc	IOGEAR	IOGEAR
<b>PRODUCT</b>	Delock 62709 Adapter Thunderbolt™ 3 > Thunderbolt™	Delock Adapter 62708 Thunderbolt™ 3 > 2 x Displayport 4K 60 Hz	Thunderbolt™ 3 to Dual DisplayPort Adapter	RocketStor 6661A Thunderbolt™ 3 to PCIe 3.0 x16 Expansion Chassis	Thunderbolt 3 6-Slot SD Card Reader	Thunderbolt 3 to Dual 4K DisplayPort Adapter

# ADAPTER/EXPANSION

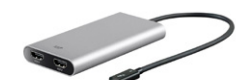
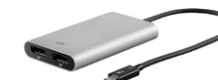
thunderbolttechnology.net/products



<b>BRAND</b>	IOGEAR	IOGEAR	IOGEAR	Linkup Technology Inc.	Linkup Technology Inc.	Lintes Technology
<b>PRODUCT</b>	Thunderbolt 3 to Dual 4K HDMI Adapter	Thunderbolt 3 to eSATA and USB Adapter	Thunderbolt 3 Travel Dock	Linkup Thunderbolt 3 Dual 4K / 5K 60Hz DisplayPort Adapter	Linkup Thunderbolt 3 Dual 4K 60Hz HDMI Adapter	LINTES Thunderbolt 3 Baby Adapter



<b>BRAND</b>	Lintes Technology	Lintes Technology	Lintes Technology	Micro Solution, Inc.	Micro Solution, Inc.	Monoprice
<b>PRODUCT</b>	LINTES Thunderbolt 3 eSATA+USB3.1 Dongle	LINTES Thunderbolt 3 Legacy Adapter	LINTES Thunderbolt 3 Travel Dock	Thunderbolt™ 3 DP Dual Display Adapter TB3DDA02-MSJ	Thunderbolt™ 3 HDMI 2.0 Dual Display Adapter TB3DHA02-MSJ	Monoprice Thunderbolt 3 6-Slot SD Card Reader



<b>BRAND</b>	Monoprice	Monoprice	Monoprice	Monoprice	Monoprice	Monoprice
<b>PRODUCT</b>	Monoprice Thunderbolt 3 Dual Display-Port Mini Dock Mac & Windows	Monoprice Thunderbolt 3 Dual HDMI 2.0 Mini Dock Mac and Windows	Monoprice Thunderbolt 3 Mobile Dual DP Output Micro Adapter, 4K@60Hz	Monoprice Thunderbolt 3 Mobile Travel Dock, Dual Video HDMI & DP, 4K@60Hz	Thunderbolt 3 Dual DisplayPort Output Adapter, 4K @ 60Hz	Thunderbolt 3 Dual HDMI 2.0 Output Adapter, 4K@60Hz

# ADAPTER/EXPANSION

thunderbolttechnology.net/products



<b>BRAND</b>	National Instruments	Nekteck, Inc.	Nekteck, Inc.	Netstor	Netstor	One Stop Systems
<b>PRODUCT</b>	PXIe-8301	Nekteck Thunderbolt 3 to Dual 4K DP Adapter Converter-Mac&Windows Syst	Nekteck Thunderbolt 3 to Dual 4K HDMI Adapter Cnvtr for Mac & Win Syst	Netstor HL23T	Netstor NA211TB3	ExpressBox 3T-V3



<b>BRAND</b>	OWC	OWC	OWC	Panasonic	Plugable Technologies	Plugable Technologies
<b>PRODUCT</b>	OWC Mercury Helios 3	OWC Thunderbolt 3 Dual DisplayPort Adapter	OWC Thunderbolt 3 Dual HDMI Adapter	Memory Card Drive "expressP2 drive" AU-XPD3	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X-83



<b>BRAND</b>	Plugable Technologies	Promise	Promise	Promise	QNAP	QNAP
<b>PRODUCT</b>	Plugable Thunderbolt 3 Dual HDMI Adapter - TBT3-HDMI2X-83	SANLink3 F2	SANLink3 N1	SANLink3 T1	QNA-T310G1S	QNA-T310G1T



# ADAPTER/EXPANSION

thunderbolttechnology.net/products



<b>BRAND</b>	QSAN	Raidon	Raidon	RaidSonic	RaidSonic	RaidSonic
<b>PRODUCT</b>	XN-TB302	AR0080-TB3	STARDOM SA2TB3	IB-SPL1025-TB3	IB-SPL1026-TB3	ICY BOX IB-DK405-TB3



<b>BRAND</b>	RaidSonic	Sabrent	Sabrent	Sabrent	Sabrent	Sapphire Technology Limited
<b>PRODUCT</b>	ICY BOX IB-DK406-TB3	DS-TH3C	Sabrent TH-3HD2	TH-3DP2	TH-W3H2	SAPHIRE GearBox Thunderbolt™ 3 eGFX Solution



<b>BRAND</b>	Sapphire Technology Limited	Sapphire Technology Limited	Shenzhen DAK Technology Co., Ltd.	Shenzhen DAK Technology Co., Ltd.	Shenzhen MMUI Co., Ltd. (IOCREST)	SIIG, Inc.
<b>PRODUCT</b>	SAPHIRE Thunderbolt™ 3 to Dual DisplayPort Dongle	SAPHIRE Thunderbolt™ 3 to Dual HDMI Dongle	CHOETECH Dual DP Adptr for Mac & Windows Thunderbolt 3 Computers	CHOETECH Thunderbolt 3 to Dual HDMI 2.0 Output Adapter	IOCREST Thunderbolt 3 to 10 Gigabit Network Adapter	Thunderbolt 3 (USB-C) to Dual Display-Port Adapter - DP, 1.2 4K@60Hz

# ADAPTER/EXPANSION

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	SIIG, Inc.	SIIG, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.
<b>PRODUCT</b>	Thunderbolt 3 to Dual HDMI Video Hub LAN Dock	USB-C Thunderbolt V3 (USB Type C, male) to Dual HDMI Adapter - HDMI 2.0	Echo™ Express III-D – Thunderbolt 3 Edition	Echo™ Express III-R – Thunderbolt 3 Edition	Sonnet Echo Express SE I - Thunderbolt 3 Edition	Sonnet Echo Express SEL - Thunderbolt 3 Edition



<b>BRAND</b>	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.
<b>PRODUCT</b>	Sonnet Echo™ 11 Thunderbolt 3 Dock	Sonnet Echo™ Express SE III	Sonnet eGFX Breakaway Box 550	Sonnet eGFX Breakaway Box 650	Sonnet eGFX Breakaway™ Box	Sonnet SF3™ Series — CFast™ 2.0 Pro Card Reader



<b>BRAND</b>	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.
<b>PRODUCT</b>	Sonnet SF3™ Series - SxS™ Pro Card Reader	Sonnet Solo10G SFP+ Thunderbolt 3 Edition	Sonnet Solo10G™ Thunderbolt 3 Edition	Sonnet Thunderbolt™ 3 to Dual Display-Port™ Adapter	Sonnet Thunderbolt™ 3 to Dual HDMI 2.0 Adapter	Sonnet Twin 10G™ SFP+ Thunderbolt 3 Edition

# ADAPTER/EXPANSION

thunderbolttechnology.net/products



<b>BRAND</b>	Sonnet Technologies, Inc.	StarTech.com	StarTech.com	StarTech.com	StarTech.com	StarTech.com
<b>PRODUCT</b>	Sonnet Twin 10G™ Thunderbolt 3 Edition	Mini Thunderbolt 3 Dock for Laptops-Mac Windows-Dual DisplayPort-4K 60Hz	StarTech.com Thunderbolt 3 to Dual DisplayPort Adapter - 4K 60 Hz	StarTech.com Thunderbolt 3 to Dual HDMI Adapter - 4K 30Hz	Thunderbolt 3 PCIe Expansion Chassis with DisplayPort - PCIe x16	Thunderbolt 3 to eSATA Adapter + USB 3.1 (10Gbps) Port - Mac / Windows



<b>BRAND</b>	StarTech.com	StarTech.com	Vantec	Vantec	Winstars Technology Ltd.	Winstars Technology Ltd.
<b>PRODUCT</b>	Thunderbolt 3 to USB 3.1 Controller Adapter - 1x USB-C, 3x USB-A	Thunderbolt™ 3 to Thunderbolt Adapter - Windows Only	Thunderbolt™ 3 to Dual DisplayPort 4K (60Hz) Adapter (CB-TB3DP122)	Thunderbolt™ 3 To Dual HDMI 2.0 4K (60Hz) Adapter (CB-TB3HD142)	Thunderbolt™ 3 Dual DisplayPort 8K Adapter	Thunderbolt™ 3 USB-C to dual 4K DisplayPort Adapter



<b>BRAND</b>	Winstars Technology Ltd.	Winstars Technology Ltd.	Xcellon (A Gradus Group Brand)	ZOTAC	ZOTAC
<b>PRODUCT</b>	Thunderbolt™ 3 USB-C to dual 4K HDMI Adapter	Thunderbolt™ 3 USB-C to NVMe SSD Adapter	Xcellon Little Brother	AMP BOX	AMP BOX MINI

# ADD-IN-CARDS

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	ASRock	ASUS	GIGABYTE	MSI	Sonnet Technologies, Inc.
<b>PRODUCT</b>	ASRock Thunderbolt 3 AIC	ASUS ThunderboltEX 3	GIGABYTE GC-ALPINE RIDGE	MSI THUNDERBOLT M3	Sonnet Thunderbolt 3 Upgrade Cards



<b>BRAND</b>	AJA Video Systems	AJA Video Systems	AVID Technology	AVID Technology	AVID Technology	BlackMagic Design
<b>PRODUCT</b>	AJA Io IP	IO-4K Plus	AVID ARTIST DNXID	Avid Artist DNxIP	Avid Artist DNxIV	Blackmagic UltraStudio 4K Extreme 3



<b>BRAND</b>	BlackMagic Design	IOGEAR	Monoprice	Monoprice	Monoprice	Monoprice
<b>PRODUCT</b>	UltraStudio HD Mini	Thunderbolt 3 to Dual 4K HDMI Adapter	Monoprice Thunderbolt 3 Dual DisplayPort Mini Dock Mac & Windows	Monoprice Thunderbolt 3 Dual HDMI 2.0 Mini Dock Mac and Windows	Monoprice Thunderbolt 3 Mobile Dual DP Output Micro Adapter, 4K@60Hz	Monoprice Thunderbolt 3 Mobile Travel Dock, Dual Video HDMI & DP, 4K@60Hz



<b>BRAND</b>	Plugable Technologies	Plugable Technologies	Plugable Technologies	Sabrent	Sabrent	Sabrent
<b>PRODUCT</b>	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X	Plugable Thunderbolt 3 Dual DisplayPort Adapter - TBT3-DP2X-83	Plugable Thunderbolt 3 Dual HDMI Adapter - TBT3-HDMI2X-83	DS-TH3C	Sabrent TH-3HD2	TH-3DP2



<b>BRAND</b>	Sonnet Technologies, Inc.	StarTech.com	StarTech.com	Vantec	Winstars Technology Ltd.	Winstars Technology Ltd.
<b>PRODUCT</b>	Sonnet Echo™ 11 Thunderbolt 3 Dock	StarTech.com Thunderbolt 3 to Dual DisplayPort Adapter - 4K 60 Hz	StarTech.com Thunderbolt 3 to Dual HDMI Adapter - 4K 30Hz	Thunderbolt™ 3 to Dual DisplayPort 4K (60Hz) Adapter (CB-TB3DP122)	Thunderbolt™ 3 USB-C to dual 4K DisplayPort Adapter	Thunderbolt™ 3 USB-C to dual 4K HDMI Adapter

# CABLE

thunderbolttechnology.net/products



<b>BRAND</b>	Accusys	Akitio	Akitio	Akitio	Apple	Apple
<b>PRODUCT</b>	Accusys Thunderbolt 3 Cable 2M 40Gb/s	AkiTiO 40Gbps Thunderbolt 3 Cable (2m)	AkiTiO 40Gbps Thunderbolt™ 3 Cable (0.5m)	AkiTiO T3T	Apple Thunderbolt 3 (USB-C) Cable (0.8m)	Apple Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter



<b>BRAND</b>	Atech Flash Technology, Inc	Belkin	Cable Matters	Cable Matters	Cable Matters	Cable Matters
<b>PRODUCT</b>	Blackjet 40Gbps Thunderbolt™ 3 Cable (0.5m)	Thunderbolt 3 Cable (40Gbps) (0.5m)	Cable Matters 20 Gbps Thunderbolt™ 3 Cable in Black 3.3 Feet / 1m	Cable Matters 20 Gbps Thunderbolt™ 3 Cable in Black 6.6 Feet / 2m	Cable Matters 40 Gbps Thunderbolt™ 3 Cable in Black 1.6 Feet / 0.5m	Cable Matters 40 Gbps Thunderbolt™ 3 Cable in Black 3.3 Feet / 1m



<b>BRAND</b>	Cable Matters	Cable Matters	CalDigit	CalDigit	CalDigit	CalDigit
<b>PRODUCT</b>	Cable Matters 40 Gbps Thunderbolt™ 3 Cable in Black 6.6 Feet / 2m	Thunderbolt 3 to Thunderbolt Adapter for Windows & Mac	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 0.5m	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 0.7m/2.3 Feet	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 3.3 Feet / 1m	CalDigit Thunderbolt™ 3 Cable, 40Gbps / 100W Charging / 5A/20V, 6.6 Feet / 2m

# CABLE

thunderbolttechnology.net/products



<b>BRAND</b>	Delock	Delock	Delock	HighPoint Technologies, Inc	HighPoint Technologies, Inc	HighPoint Technologies, Inc
<b>PRODUCT</b>	Delock 62709 Adapter Thunderbolt™ 3 > Thunderbolt™	Delock Thunderbolt™ 3 (20 Gb/s) cable 1.0M 1.5M 2.0M	Delock Thunderbolt™ 3 (40 Gb/s) cable 0.5M	TB3-040G-505	TB3-040G-510	TB3-040G-520



<b>BRAND</b>	IOGEAR	IOGEAR	IOGEAR	KaiJet Technology International Limited	KaiJet Technology International Limited	KaiJet Technology International Limited
<b>PRODUCT</b>	Thunderbolt 3 USB-C 0.5m 40Gbps Cable	Thunderbolt 3 USB-C 1m 20Gbps Cable	Thunderbolt 3 USB-C 2m 20Gbps Cable	j5create 20Gbps Thunderbolt™ 3 Cable (1m)	j5create 40Gbps Thunderbolt™ 3 Cable (0.5m)	j5create 40Gbps Thunderbolt™ 3 Cable (1m)



<b>BRAND</b>	Lintes Technology	Lintes Technology	Lintes Technology	Lintes Technology	Lintes Technology	Monoprice
<b>PRODUCT</b>	LINTES Thunderbolt 3 0.7M 40Gbps Passive Cable	LINTES Thunderbolt 3 2M 40Gbps Active Cable	LINTES Thunderbolt 3 Baby Adapter	LINTES Thunderbolt 3 Legacy Adapter	Lintes Thunderbolt™ 3 40Gbps Cable - 0.5-meter	Thunderbolt 3 (40 Gbps) USB-C Cable, 100W



# CABLE

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	Nekteck, Inc.	Nekteck, Inc.	Nekteck, Inc.	Nekteck, Inc.	OWC	OWC
<b>PRODUCT</b>	Nekteck 20 Gbps Thunderbolt™ 3 Cable in Black 3.3 Feet / 1m	Nekteck 20 Gbps Thunderbolt™ 3 Cable in Black 6.6 Feet / 2m	Nekteck 40 Gbps Thunderbolt™ 3 Cable in Black 1.6 Feet / 0.5m	Nekteck Thunderbolt 3 40Gbps Active Cable - 2M	OWC Thunderbolt 3 Cable 20Gb/s - Black - 1.0M, 2.0M	OWC Thunderbolt 3 Cables 40Gb/s - Black - .5M, 1.0M, 2.0M



<b>BRAND</b>	Plugable Technologies	Plugable Technologies	Plugable Technologies	Shenzhen DAK Technology Co., Ltd.	Shenzhen DAK Technology Co., Ltd.	Shenzhen DAK Technology Co., Ltd.
<b>PRODUCT</b>	Plugable 20Gbps Thunderbolt 3 1m Cable	Plugable 20Gbps Thunderbolt 3 2m Cable	Plugable 40Gbps Thunderbolt 3 0.5m Cable	CHOETECH Thunderbolt 3 Cable (0.5M/1.6FT)– 40Gbps/ 100W	CHOETECH Thunderbolt 3 Cable (2M/6.5FT) - 40Gbps/ 100W	CHOETECH Thunderbolt 3 Cable (2M/6.5FT)–20Gbps/ 60W



<b>BRAND</b>	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	StarTech.com	StarTech.com	StarTech.com	StarTech.com
<b>PRODUCT</b>	Sonnet 0.5m Thunderbolt 3 (40Gbps) Cable	Sonnet 1m Thunderbolt 3 (40Gbps) Cable	StarTech.com 0.5m Thunderbolt 3 Cable	StarTech.com 1m Thunderbolt 3 20Gbps Cable	StarTech.com 2m Thunderbolt 3 20Gbps Cable	Thunderbolt™ 3 to Thunderbolt Adapter - Windows Only

# CABLE

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	Sumitomo Electric Industries, Ltd.	TEKQ (Mega Grand)	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)
<b>PRODUCT</b>	Passive 0.8 meter Thunderbolt™3 40Gbps from Sumitomo	TEKQ Thunderbolt 3 Cable (0.5 m)	Xcellon Thunderbolt 3 Active Cable (40Gbps/100W) (2M)	Xcellon Thunderbolt 3 Cable (20Gbps/100W) (1M)	Xcellon Thunderbolt 3 Cable (20Gbps/100W) (2M)	Xcellon Thunderbolt 3 Cable (40Gbps/100W) (0.5M)



<b>BRAND</b>	Xcellon (A Gradus Group Brand)	Xcellon (A Gradus Group Brand)	Zikko Inc.
<b>PRODUCT</b>	Xcellon Thunderbolt 3 Cable (40Gbps/100W) (0.7M)	Xcellon Thunderbolt 3 Cable (40Gbps/100W) (1M)	Zikko Thunderbolt™ 3 Cable 0.5M 40Gbps

# DISPLAY

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	<b>ASUS</b>	<b>ASUS</b>	<b>Lenovo</b>	<b>Lenovo</b>	<b>LG Electronics</b>	<b>Samsung Electronics</b>
<b>PRODUCT</b>	ASUS ProArt PA27AC Professional Monitor	ASUS ProArt PA32UC Professional Monitor	Lenovo ThinkVision P32u-10	ThinkVision X1 (2nd Gen)	LG UltraFine 5K Display	C34J791

# DOCK

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	Action Star Technology	AkiTiO	ALOGIC	Atech Flash Technology, Inc	ATEN/IOGEAR	Belkin
<b>PRODUCT</b>	Thunderbolt 3 Travel Dock	AKiTiO Thunder3 Dock Pro	ALOGIC Thunderbolt 3 Docking Station with Dual 4K Display & Power Delivery	Blackjet UX-1 Cinema Dock	UH7230 Thunderbolt™ 3 Multiport Dock with Power Charging	Thunderbolt 3 Express Dock HD



<b>BRAND</b>	BizLink	Cable Matters	Cable Matters	CalDigit	CalDigit	CalDigit
<b>PRODUCT</b>	Bizlink Thunderbolt 3 Docking Station (Alpine Ridge)	Cable Matters Thunderbolt 3 Docking Station for Windows & Mac Computers	Thunderbolt 3 Dock w/Dual 4K Video,SD Memory Card Slot & 60W Pwr Delivery	CalDigit Thunderbolt 3 mini Dock - Dual DisplayPort	CalDigit Thunderbolt 3 mini Dock - Dual HDMI	CalDigit Thunderbolt™ Station 3



<b>BRAND</b>	CalDigit	CalDigit	CalDigit	Diamond Multimedia	Elgato	HP
<b>PRODUCT</b>	CalDigit Thunderbolt™ Station 3 Lite	CalDigit Thunderbolt™ Station 3 Plus	CalDigit Thunderbolt™ Station 3 Plus - Space Gray	TB3000DS	Elgato Thunderbolt™ 3 Dock	HP ZBook Dock with Thunderbolt 3

# DOCK

thunderbolttechnology.net/products



<b>BRAND</b>	IOGEAR	IOGEAR	IOGEAR	Kensington Computer Products Group	Kensington Computer Products Group	Kensington Computer Products Group
<b>PRODUCT</b>	Quantum Thunderbolt 3 Docking Station	Quantum Thunderbolt 3 Docking Station Pro 85	Thunderbolt 3 Travel Dock	Kensington SD5000T Thunderbolt 3 Docking Station	Kensington SD5200T Thunderbolt 3 Docking Station	LD5400T Multi-User Thunderbolt 3 Dock with K-Fob™ Smart Lock



<b>BRAND</b>	Kensington Computer Products Group	Lenovo	Linkup Technology Inc.	Mantiz Innovation Ltd.	Micro Solution, Inc.	Monoprice
<b>PRODUCT</b>	Single-User Thunderbolt 3 Universal Dual 4K Dock w/K-Fob Smart Lock	ThinkPad Thunderbolt 3 Dock	Linkup Thunderbolt 3 Docking Station	Mantiz Titan	Thunderbolt™ 3 PD Docking Station TB3DS1230-MSJ	Monoprice Thunderbolt 3 Dual Display-Port Mini Dock Mac & Windows



<b>BRAND</b>	Monoprice	Monoprice	Monoprice	Nekteck, Inc.	OWC	OWC
<b>PRODUCT</b>	Monoprice Thunderbolt 3 Dual HDMI 2.0 Mini Dock Mac and Windows	Monoprice Thunderbolt 3 Mobile Travel Dock, Dual Video HDMI & DP, 4K@60Hz	Thunderbolt 3 Docking Station, PD UpTo 60W, Dual Display UpTo 4K 60Hz	Thunderbolt 3 PD Docking Station-4K HD Display, 60W PD, 4K HDMI2.0@60Hz	OWC Thunderbolt 3 Dock	OWC Thunderbolt 3 Dock

# DOCK

thunderbolttechnology.net/products



<b>BRAND</b>	OWC	Plugable Technologies	Plugable Technologies	Promise	RaidSonic	RaidSonic
<b>PRODUCT</b>	Thunderbolt 3 Dock	Thunderbolt 3 Docking Station w/Host Charging (Supports Single HDMI or DP)	Thunderbolt 3 Docking Station-No Host Charging, Single HDMI or DP Monitor	Dock TD-300	IB-DK2501-TB3	ICY BOX IB-DK2801-TB3



<b>BRAND</b>	Shenzhen DAK Technology Co., Ltd.	SIIG, Inc.	SIIG, Inc.	Sonnet Technologies, Inc.	StarTech.com	StarTech.com
<b>PRODUCT</b>	CHOETECH Thunderbolt 3 Travel Dock-Model:HUB-M12	Thunderbolt 3 Dual 4K Video Docking Station with Power Delivery	Thunderbolt 3 to Dual HDMI Video Hub LAN Dock	Sonnet Echo™ 11 Thunderbolt 3 Dock	Dual 4K Monitor Mini Thunderbolt 3 Dock with HDMI	Mini Thunderbolt 3 Dock for Laptops - Mac and Windows - Dual DP - 4K 60Hz



<b>BRAND</b>	StarTech.com	StarTech.com	StarTech.com	StarTech.com	Targus	Toshiba
<b>PRODUCT</b>	Thunderbolt 3 Dock with SD Card Reader - Dual-4K - 85W USB Power Delivery	Thunderbolt 3 Dual-4K Docking Station for Laptops - Mac and Windows	Thunderbolt 3 Dual-4K Docking Station for Laptops - Mac and Windows - PD	Thunderbolt™ 3 Dual-4K Docking Station for Laptops - 5K Support - Windows Only	Thunderbolt™ 3 DV4K Docking Station with Power	Toshiba Thunderbolt 3 Dock

# DOCK

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	<b>TUL Corporation</b>	<b>Winstars Technology Ltd.</b>
<b>PRODUCT</b>	TUL TDX-120B	Thunderbolt 3 USB-C 4K Display Docking Station

# EXTERNAL GRAPHICS (EGFX)

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	Akitio	ASUS	ASUS	BlackMagic Design	Galaxy Microsystems Ltd.	GIGABYTE
<b>PRODUCT</b>	AKITiO Node	ASUS ROG XG Station 2	XG-STATION-PRO	Blackmagic eGPU	GALAX SNPR External Graphics Enclosure	AORUS GTX 1070 Gaming Box



<b>BRAND</b>	GIGABYTE	GIGABYTE	HP	Mantiz Innovation Ltd.	Netstor	OWC
<b>PRODUCT</b>	AORUS GTX 1080 Gaming Box	RX 580 Gaming Box	OMEN by HP Accelerator	Mantiz Venus (MZ-02)	Netstor HL23T-PRO	Mercury Helios FX 650



<b>BRAND</b>	OWC	Razer	Razer	Razer	Sapphire Technology Limited	Sonnet Technologies, Inc.
<b>PRODUCT</b>	OWC Mercury Helios FX	Razer Core	Razer Core V2	Razer Core X	SAPPHIRE GearBox Thunderbolt™ 3 eGFX Solution	Sonnet eGFX Breakaway Box 550



# EXTERNAL GRAPHICS (EGFX)

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	Sonnet Technologies, Inc.	TUL Corporation	TUL Corporation
<b>PRODUCT</b>	Sonnet eGFX Breakaway Box 650	Sonnet eGFX Breakaway™ Box	Sonnet eGFX Breakaway™ Puck Radeon™ RX 560	Sonnet eGFX Breakaway™ Puck Radeon™ RX 570	PowerColor Devil Box	POWERCOLOR GAMING STATION



<b>BRAND</b>	TUL Corporation	Visiontek	ZOTAC	ZOTAC
<b>PRODUCT</b>	TBX-550CA	Visiontek VT-TB3-eGPU100	AMP BOX	AMP BOX MINI

# MOTHERBOARDS

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	ASRock	ASUS	ASUS	ASUS	GIGABYTE	GIGABYTE
<b>PRODUCT</b>	ASRock X299 Designer+	ASUS MAXIMUS-VIII-EXTREME	ASUS X99-DELUXE II	ASUS Z170-PREMIUM	GA-H170-DESIGNARE	GA-X170-WS ECC



<b>BRAND</b>	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
<b>PRODUCT</b>	GA-X99-Designare EX	GA-Z170X-Designare	GA-Z170X-Gaming 7-EU	GA-Z170X-UD3 Ultra	GA-Z270X-Gaming 7	GA-Z270X-Gaming 8



<b>BRAND</b>	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
<b>PRODUCT</b>	GA-Z270X-Gaming 9	GA-Z270X-UD5	GIGABYTE GA-X170-EXTREME ECC	GIGABYTE GA-X99P-SLI	GIGABYTE GA-Z170X-Gaming 7	GIGABYTE GA-Z170X-Gaming G1

# MOTHERBOARDS

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	<b>GIGABYTE</b>	<b>GIGABYTE</b>	<b>GIGABYTE</b>	<b>GIGABYTE</b>
<b>PRODUCT</b>	GIGABYTE GA-Z170X-Gaming GT	GIGABYTE GA-Z170X-UD5 TH	GIGABYTE GA-Z170X-Ultra Gaming	X299 UD4 EX + GC-ALPINE RIDGE AIC

# NOTEBOOK/COMPUTER

thunderbolttechnology.net/products



<b>BRAND</b>	Acer	Acer	Acer	Acer	Acer	Acer
<b>PRODUCT</b>	Acer Aspire R 13	Acer Aspire Switch 12 S	Acer Aspire V 15 Nitro	Acer Aspire V 17 Nitro	Acer Predator 15	Acer Predator 17



<b>BRAND</b>	Acer	Apple	Apple	Apple	Apple	ASUS
<b>PRODUCT</b>	Acer Predator 17 X	Apple 13-inch MacBook Pro	Apple 13-inch MacBook Pro with Touch Bar	Apple 15-inch MacBook Pro with Touch Bar	Apple iMac Pro	ASUS ROG G501VW



<b>BRAND</b>	ASUS	ASUS	ASUS	ASUS	ASUS	ASUS
<b>PRODUCT</b>	ASUS ROG G701VO	ASUS ROG G752VL	ASUS ROG G752VT	ASUS ROG G752VY	ASUS ROG GL702VT	ASUS ROG GX700VO

# NOTEBOOK/COMPUTER

thunderbolttechnology.net/products



<b>BRAND</b>	ASUS	ASUS	ASUS	Clevo	Clevo	Clevo
<b>PRODUCT</b>	ASUS Transformer 3 Pro	ASUS ZenBook 3 Deluxe UX490UA	ASUS ZenBook Pro UX501VW	Clevo P750DM	Clevo P770DM	Clevo P870DM



<b>BRAND</b>	Clevo	Clevo	Clevo	Clevo	Clevo	Clevo
<b>PRODUCT</b>	N130WU	N130ZU	N140WU	N141ZU	N150ZU	N350TV



<b>BRAND</b>	Clevo	Clevo	DELL	DELL	DELL	DELL
<b>PRODUCT</b>	N350TW	P870TM1	Alienware 13	Alienware 15	Dell 15 inch Precision 5530 2 in 1	Dell Alienware 13

# NOTEBOOK/COMPUTER

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	DELL	DELL	DELL	DELL	DELL	DELL
<b>PRODUCT</b>	Dell Alienware 15	Dell Alienware 17	Dell Latitude 12 5290 2-in-1	Dell Latitude 12 7285 2-in-1	Dell Latitude 5480	Dell Latitude 5580



<b>BRAND</b>	DELL	DELL	DELL	DELL	DELL	DELL
<b>PRODUCT</b>	Dell Latitude 7275	Dell Latitude 7280	Dell Latitude 7290	Dell Latitude 7370	Dell Latitude 7380	Dell Latitude 7390



<b>BRAND</b>	DELL	DELL	DELL	DELL	DELL	DELL
<b>PRODUCT</b>	Dell Latitude 7390 2-in-1	Dell Latitude 7480	Dell Latitude 7490	Dell Latitude 7520	Dell Latitude 7720	Dell Latitude E5570

# NOTEBOOK/COMPUTER

thunderbolttechnology.net/products



<b>BRAND</b>	DELL	DELL	DELL	DELL	DELL	DELL
<b>PRODUCT</b>	Dell Precision 15 3000 Series (3510)	Dell Precision 15 5000 Series (5510)	Dell Precision 15 7000 Series (7510)	Dell Precision 17 7000 Series (7710)	Dell Precision 3520	DELL XPS 12



<b>BRAND</b>	DELL	DELL	DELL	DELL	DELL	DELL
<b>PRODUCT</b>	DELL XPS 13	Dell XPS 13 2-in-1	Dell XPS 13 9370	DELL XPS 15	Dell XPS 15 9575 2-in-1	Precision 5520



<b>BRAND</b>	EVGA	EVGA	Fujitsu	GIGABYTE	GIGABYTE	GIGABYTE
<b>PRODUCT</b>	EVGA SC15 Geforce GTX 1060 Gaming Laptop	EVGA SC17 Geforce GTX 1080 Gaming Laptop	FUJITSU Workstation CELSIUS H760	AORUS X5v7	AORUS X7 DT v7	AORUS X7v7

# NOTEBOOK/COMPUTER

thunderbolttechnology.net/products



<b>BRAND</b>	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
<b>PRODUCT</b>	AORUS X9	GB-BKi5HT2-7200	GB-BKi5T2-7200	GB-BKi7HT2-7500	GB-BKi7T2-7500	GB-GZ1DTi7



<b>BRAND</b>	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE	GIGABYTE
<b>PRODUCT</b>	GIGABYTE AERO14K	GIGABYTE AERO15	GIGABYTE GB-BSi5HT-6200	GIGABYTE GB-BSi5T-6200	GIGABYTE GB-BSi7HT-6500	GIGABYTE GB-BSi7T-6500



<b>BRAND</b>	GIGABYTE	HP	HP	HP	HP	HP
<b>PRODUCT</b>	GIGABYTE P56XT	EliteBook x360 1030 G2	HP Elite x2 1012 G1	HP Elite x2 1012 G2	HP Elite x2 1013 G3 Tablet	HP EliteBook 1040 G4(KBL-H)



# NOTEBOOK/COMPUTER

thunderbolttechnology.net/products



<b>BRAND</b>	HP	HP	HP	HP	HP	HP
<b>PRODUCT</b>	HP EliteBook Folio G1	HP EliteBook x360 1020 G2	HP EliteBook x360 1030 G3	HP EliteBook x360 G2	HP EliteDesk 800 G4 SFF/TWR	HP EliteOne 1000 G2 AiO



<b>BRAND</b>	HP	HP	HP	HP	HP	HP
<b>PRODUCT</b>	HP Envy 27 All-in-One PC	HP ENVY Curved 34 All-in-One PC	HP Spectre 13 Laptop PC	HP Spectre Notebook PC (13")	HP Spectre x360 Convertible PC 13	HP Spectre x360 Convertible PC 13 (2017 new model)



<b>BRAND</b>	HP	HP	HP	HP	HP	HP
<b>PRODUCT</b>	HP Spectre x360 Convertible PC 15	HP Z2 Mini G4 Workstation	HP Z4 G4 Workstation	HP Z6 G4 Workstation	HP Z8 G4 Workstation	HP ZBook 15 G4 Mobile Workstation

# NOTEBOOK/COMPUTER

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	HP	HP	HP	HP	HP	Huawei
<b>PRODUCT</b>	HP ZBook 17 G4 Mobile Workstation	HP ZBook Studio G4 Mobile Workstation	HP ZBook Studio x360 G5	Omen 15 Laptop	OMEN X Laptop 17	HUAWEI MateBook X Pro



<b>BRAND</b>	Intel	Intel	Intel	Intel	Intel	Intel
<b>PRODUCT</b>	Intel NUC Kit NUC7i5BNH	Intel NUC Kit NUC7i5BNK	Intel NUC Kit NUC7i7BNH	Intel NUC kit NUC8i7HVK	Intel NUC: NUC8i3BEH	Intel® NUC Kit NUC8i7BEH



<b>BRAND</b>	Intel	Lenovo	Lenovo	Lenovo	Lenovo	Lenovo
<b>PRODUCT</b>	Intel® NUC: NUC6i7KY	Lenovo Legion Y720 Laptop	Lenovo Miix 720	Lenovo ThinkPad P50	Lenovo ThinkPad P70	ThinkPad P51

# NOTEBOOK/COMPUTER

thunderbolttechnology.net/products



<b>BRAND</b>	Lenovo	Lenovo	Lenovo	Lenovo	Lenovo	Lenovo
<b>PRODUCT</b>	ThinkPad P51s	ThinkPad P71	ThinkPad T470	ThinkPad T470s	ThinkPad T570	ThinkPad X1 Carbon



<b>BRAND</b>	Lenovo	Lenovo	MSI	MSI	MSI	MSI
<b>PRODUCT</b>	ThinkPad X1 Yoga	ThinkPad Yoga 370	MSI GS40 Gaming Notebook	MSI GS60 Gaming Notebook	MSI GS63 Gaming Notebook	MSI GT72 Gaming Notebook



<b>BRAND</b>	MSI	MSI	MSI	MSI	Panasonic	Panasonic
<b>PRODUCT</b>	MSI GT80 Gaming Notebook	MSI Vortex G65 Gaming PC	MSI WS60 Workstation Notebook	MSI WT72 Workstation Notebook	Let's note CF-LV7	Let's note CF-SV7

# NOTEBOOK/COMPUTER

thunderbolttechnology.net/products



<b>BRAND</b>	Panasonic	Razer	Razer	Razer	Razer	Razer
<b>PRODUCT</b>	Let's note CF-SV8	Razer Blade	Razer Blade Pro	Razer Blade Stealth	Razer Blade Stealth - 13"	Razer Blade Stealth (late 2017)



<b>BRAND</b>	Samsung Electronics	Samsung Electronics	Samsung Electronics	Smartron India Pvt Ltd	Toshiba	Toshiba
<b>PRODUCT</b>	Notebook Pen S	NoteBook9 Always 2018	NoteBook9 Pro	t.book Flex	PORTEGE X20W-E	Portege® X20W Convertible Notebook Series



<b>BRAND</b>	Toshiba	Toshiba	Toshiba	Toshiba	VAIO Corporation	ZOTAC
<b>PRODUCT</b>	Portege® X30 Laptop Series	Portege® X30-E Laptop Series	Tecra® X40 Laptop Series	Tecra® X40-E Laptop Series	VAIO S11	ZBOX-CI549NANO

# NOTEBOOK/COMPUTER

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	ZOTAC	ZOTAC	ZOTAC	ZOTAC
<b>PRODUCT</b>	ZBOX-MI549NANO	ZBOX-MI552	ZBOX-MI553	ZBOX-MI572

# STORAGE

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	Accusys	Accusys	Action Star Technology	Akitio	Akitio	Akitio
<b>PRODUCT</b>	Accusys A12T3-Share	Accusys Gamma	Thunderbolt 3 6-Slot SD Card Reader	AKiTiO Node Lite with Intel Optane 905P SSD	AKiTiO Thunder3 Duo Pro	AKiTiO Thunder3 PCIe SSD



<b>BRAND</b>	Akitio	Akitio	Akitio	Akitio	Archgon International Ltd.	Areca Technology
<b>PRODUCT</b>	AKiTiO Thunder3 Quad	AKiTiO Thunder3 Quad mini	AKiTiO Thunder3 Quad X	AKiTiO Thunder3 RAID STATION	X70 Portable SSD - Thunderbolt 3	ARC-8050T3 SAN



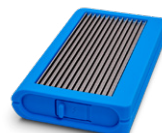
<b>BRAND</b>	Areca Technology	Areca Technology	Areca Technology	Areca Technology	Areca Technology	Areca Technology
<b>PRODUCT</b>	ARC-8050T3-12	ARC-8050T3-12R	ARC-8050T3-24R	ARC-8050T3-4	ARC-8050T3-6	ARC-8050T3-6M

# STORAGE

thunderbolttechnology.net/products



<b>BRAND</b>	Areca Technology	Atech Flash Technology, Inc	ATTO Technology	BIOS	BIOS	BIOSAP Inc
<b>PRODUCT</b>	ARC-8050T3-8	Blackjet UX-1 Cinema Dock	ATTO ThunderLink SH 3128	EP106TB3	EP112TB3	DVT12T3



<b>BRAND</b>	Cable Matters	CalDigit	CalDigit	DELL	DELL	Delock
<b>PRODUCT</b>	480GB Bus-Powered Ext Thunderbolt 3 SSD Up to 2400 MB/s Read	CalDigit T4 Thunderbolt™ 3 RAID	CalDigit Tuff X	Dell Portable Thunderbolt 3 SSD, 1TB	Dell Portable Thunderbolt 3 SSD, 500GB	Delock 54000 Thunderbolt™ 3 External Portable SSD (240GB)



<b>BRAND</b>	Delock	Drobo	G-Technology	G-Technology	G-Technology	G-Technology
<b>PRODUCT</b>	Delock 54007 Thunderbolt™ 3 External Portable SSD (480GB)	Drobo 5D3	G-DRIVE with Thunderbolt 3 / USB 3.1	G-RAID w/Thunderbolt 3, USB 3.1, HDMI - Removable Dual Drive Storage System	G-SPEED Shuttle SSD	G-SPEED Shuttle with ev Series Bay Adapters

# STORAGE

thunderbolttechnology.net/products



<b>BRAND</b>	G-Technology	G-Technology	G-Technology	G-Technology	HighPoint Technologies, Inc	HighPoint Technologies, Inc
<b>PRODUCT</b>	G-SPEED Shuttle with Thunderbolt 3	G-SPEED Shuttle XL Thunderbolt 3 (with ev Series Bay Adapters)	G-SPEED Shuttle XL with ev Series Bay Adapters (with Thunderbolt 3)	G-SPEED Shuttle XL with Thunderbolt 3	HighPoint RocketStor 6618A	RocketStor 6618T



<b>BRAND</b>	HighPoint Technologies, Inc	HighPoint Technologies, Inc	HighPoint Technologies, Inc	LaCie	LaCie	LaCie
<b>PRODUCT</b>	RocketStor 6628A	RocketStor 6628T	RocketStor 6674T	2big Dock	LaCie 12big Thunderbolt3	LaCie 6big Thunderbolt3



<b>BRAND</b>	LaCie	LaCie	MagStar	Monoprice	MyDigitalDiscount.com	Nekteck, Inc.
<b>PRODUCT</b>	LaCie Bolt3	LaCie d2 Thunderbolt3	TRB3-HL8 Desktop LTO8 12TB LTFS Tape Drive with Thunderbolt™ 3 Interface	Monoprice Thunderbolt 3 6-Slot SD Card Reader	MyDigitalSSD Pocket Vault eXpress port PCIe Gen 3 Thunderbolt 3 USB-C Ext SSD	Nekteck 480GB Thunderbolt 3 SSD NVME SSD Hard Drive



# STORAGE

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	Netstor	Netstor	Netstor	Netstor	Netstor	Netstor
<b>PRODUCT</b>	Netstor NA333TB3	Netstor NA338TB3	Netstor NA341TB3	Netstor NA381TB3	Netstor NA611TB3	Netstor NA762TB3



<b>BRAND</b>	Netstor	Noon Technology Co., Ltd.	Noon Technology Co., Ltd.	Noon Technology Co., Ltd.	Other World Computing, Inc.	OWC
<b>PRODUCT</b>	Netstor NS370TB3	TerraMaster D4 Thunderbolt 3	TerraMaster D5 Thunderbolt 3	TerraMaster D8 Thunderbolt3	OWC Envoy Pro EX	OWC Envoy Pro EX (VE) Thunderbolt 3



<b>BRAND</b>	OWC	OWC	OWC	Panasonic	Phison Electronics Corp.	Phison Electronics Corp.
<b>PRODUCT</b>	OWC ThunderBay 4 - Thunderbolt 3	OWC ThunderBay 6	OWC ThunderBlade	Memory Card Drive "expressP2 drive" AU-XP3	PHISON E12 Thunderbolt 3 Portable SSD	PHISON E8 Thunderbolt 3 Portable SSD

# STORAGE

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



<b>BRAND</b>	Plugable Technologies	Promise	QNAP	QNAP	QNAP	QNAP
<b>PRODUCT</b>	Plugable TB3-NVME480 Thunderbolt 3 480GB NVMe SSD	Pegasus3 RAID (R4/R6/R8)	TS-453BT3	TVS-1282T3	TVS-1582TU	TVS-882BRT3



<b>BRAND</b>	QNAP	QSAN	Raidon	Raidon	Raidon	Raidon
<b>PRODUCT</b>	TVS-882ST3	XN-TB302	GR3660-TB3	GR4670-TB3	GR8480-TB3	GR8670-TB3



<b>BRAND</b>	Raidon	Raidon	Raidon	Raidon	Raidon	Raidon
<b>PRODUCT</b>	GR8680-TB3	GT4670-TB3	GT8670-TB3	STARDOM DR2-TB3	STARDOM DR3-TB3	STARDOM DR8M-TB3

# STORAGE

thunderbolttechnology.net/products



<b>BRAND</b>	Raidon	Raidon	Raidon	Raidon	Raidon	Raidon
<b>PRODUCT</b>	STARDOM DR8-TB3	STARDOM PD01-TB3	STARDOM SR4-TB3	STARDOM SR8-TB3	STARDOM ST2-TB3	STARDOM ST4-TB3



<b>BRAND</b>	Raidon	Raidon	Rocstor	Rocstor	Rocstor	Sabrent
<b>PRODUCT</b>	STARDOM ST4-TL3+	STARDOM ST8-TB3	Rocpro RT38 Thunderbolt 3 RAID & JBOD 8-Bay2U Rackmount Hot-Swap DT DAS	Rocpro T34 Thunderbolt 3 RAID & JBOD 4-Bay Desktop DAS Hot-Swap Storage	Rocpro T38 Thunderbolt 3 RAID & JBOD 8-Bay Hot-Swap Desktop DAS Storage	TH-P1TB



<b>BRAND</b>	Sabrent	Sabrent	Sabrent	Samsung Electronics	Sonnet Technologies, Inc.	TEKQ (Mega Grand)
<b>PRODUCT</b>	TH-P256	TH-P2TB	TH-P512	Samsung Portable SSD X5	Sonnet Fusion Thunderbolt 3 PCIe Flash Drive	TEKQ Rapide Thunderbolt 3 SSD Drive

# STORAGE

[thunderbolttechnology.net/products](https://thunderbolttechnology.net/products)



<b>BRAND</b>	<b>Visiontek</b>	<b>Visiontek</b>	<b>Winstars Technology Ltd.</b>
<b>PRODUCT</b>	VisionTek Portable 1TB Thunderbolt 3 SSD	VisionTek Portable 512GB Thunderbolt 3 SSD	Thunderbolt™ 3 USB-C to NVMe SSD Adapter

# OTHER

[thunderbolttechnology.net/products](http://thunderbolttechnology.net/products)



BRAND	National Instruments	Panasonic
PRODUCT	PXIe-8301	Memory Card Drive "expressP2 drive" AU-XP3

Visit [ThunderboltTechnology.net](https://ThunderboltTechnology.net) for more information.

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document. Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

The products and services described may contain defects or errors which may cause deviations from published specifications. Current characterized errata are available on request.

© 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Thunderbolt, and the Thunderbolt logo are trademarks of Intel Corporation in the U.S. and other countries.

\* Other names and brands may be claimed as the property of others.




## A VISION OF EXCELLENCE

# INTEL<sup>®</sup> GRAPHICS

### INTEL<sup>®</sup> GRAPHICS TECHNOLOGY

Work and play in high resolution with Intel<sup>®</sup> UHD Graphics and Iris<sup>®</sup> Plus Graphics. Watch captivating 4K Ultra HD (UHD) video on up to three screens, edit photos and videos like a pro, and immerse yourself in vividly rendered, seamless 3D gameplay - all with the added power boost of an Intel<sup>®</sup> Core<sup>™</sup> processor. Intel<sup>®</sup> Graphics Technology brings stunning visuals to thinner and lighter portable devices, like laptops, 2 in 1s, and desktop computers.



# INTEL<sup>®</sup> GRAPHICS

Immerse yourself in rich, vivid visuals enabled by integrated Intel<sup>®</sup> UHD Graphics and Iris<sup>™</sup> Plus Graphics, delivering built-in 4K Ultra HD for new home theater, gaming, and conferencing experiences.

## INTEL<sup>®</sup> GRAPHICS

Experience visual perfection with Intel<sup>®</sup> UHD graphics and Iris<sup>™</sup> Plus graphics. Watch captivating 4k video on up to three screens, edit photos and videos like a professional, and desktop computers. Immerse yourself in vividly rendered, seamless 3D gameplay. Intel UHD graphics, and Iris<sup>™</sup> Plus graphics are built right in to the processor, bringing stunning visuals to thinner and lighter portable devices, like Notebook 2 in 1s, and portable All-in-Ones.



# 8<sup>TH</sup> AND 9<sup>TH</sup> GEN INTEL® CORE™ PROCESSOR GRAPHICS DELIVER EXCITING EXPERIENCES



## Watch

View stunning 4K UHD video and immerse yourself completely in up to three angles of the same experience with multi-screen capability.

- 4K/UHD Premium Content Playback with Netflix\* HDR
- 360 degree playback
- Multiple video streams



## Game

Enjoy the latest games delivered to you in high definition, complete with complex shading, and fast frame rates.

- HD Gaming on Intel® UHD Graphics
- Up to 1080p Gaming on Intel® Iris® Plus Graphics
- Accelerated game streaming

Visit [Gameplay.intel.com](https://www.intel.com/content/www/us/en/gaming/gameplay.html) – to discover in-game settings optimized for your Intel® Graphics Technology.



## Create

Uninhibited expression through enhanced media conversion and rendering, delivering picture perfect performance, every time. Uses fixed function hardware for fast, low-power video encode and transcode.

- 4K photo and video editing
- 360 degree stitching/VR content creation<sup>1</sup>

<sup>1</sup> May not be available on all SKUs

<sup>2</sup> Requires 7th Generation Intel® Core™ i5 Processors with Intel® UHD 620 Graphics or higher

# OPTIMIZE YOUR GAMING EXPERIENCE – VISIT GAMEPLAY.INTEL.COM



- Auto-detect / Enter Intel processor details and explore supported games
- Click on chosen games and discover optimal in-game settings per your hardware
- Optimized settings available for hundreds of games over multiple genres



Visit [gameplay.intel.com](http://gameplay.intel.com)

Settings only available for 4th Generation Intel® Core™ processor or higher.



## Intel® Core™ Processor H-Series, X-Series, S-Series 'K', and G-Series

High-End Discrete Graphics

- >1080p gaming & premium VR experiences with H-series processors optimized for discrete graphics



## Intel® Core™ Processor S-Series

Intel® UHD Graphics  
Mid-Range Discrete Graphics

- Up to Intel® UHD Graphics for HD gaming
- 5K support
- UHD resolution support



## Intel® Core™ Processor U-Series

Intel® Iris® Plus Graphics  
Intel® UHD Graphics

- Up to Intel® Iris® Plus Graphics for 1080p gaming
- UHD resolution support



## Intel® Core™ Processor Y-Series

Intel® UHD Graphics

- Up to Intel® UHD Graphics for HD gaming
- UHD resolution support

## Intel® Core™ Processor N-Series

Intel® UHD Graphics

- Up to Intel® UHD Graphics
- UHD resolution support

## 9<sup>th</sup> Generation Intel® Processor Graphics

Premium content comes to life in 4K Ultra HD, so users can enjoy amazing and vibrant multimedia experiences on compatible displays. Edit photos and videos like a pro with fast processor graphics. Expand entertainment with multiple video streams, 360° video and high resolution video chat. Challenge your skills with agile, texture-rich graphics for HD gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, minipcs and all-in-ones.

### INTEL® UHD GRAPHICS 630

Processor Family	Intel® Core™
Max Dynamic Frequency	1.2 GHz
Processor Number	i9-9900K
	i7-9700K
	i5-9600K



# 8<sup>TH</sup> GENERATION INTEL® PROCESSOR GRAPHICS



## 8<sup>th</sup> Generation Intel® Core™ Processor with Radeon™ RX Vega M Graphics

### NEXT LEVEL PERFORMANCE IN SLEEK, THIN & LIGHT COMPUTERS

The new 8th Gen Intel® Core™ mobile processor with Radeon™ RX Vega M graphics is Intel's first processor and discrete graphics bundled in a single package. This unprecedented design unlocks performance levels previously unseen in thin and light form factors with Intel processors due to its ultra-small footprint and unique power sharing capability. This new processor is for the high performing, small form factor computers like 2-in-1's, thin and light notebooks and mini-PC's.

	INTEL® CORE™ i7-8809G PROCESSOR	INTEL® CORE™ i7-8709G PROCESSOR	INTEL® CORE™ i7-8706G PROCESSOR	INTEL® CORE™ i7-8705G PROCESSOR	INTEL® CORE™ i5-8305G PROCESSOR
Discrete Graphics	Radeon™ RX Vega M GH	Radeon™ RX Vega M GH	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL
Intel HD Graphics	630	630	630	630	630
Graphics Dynamic Frequency (MHz)	Up to 1100	Up to 1100	Up to 1100	Up to 1100	Up to 1100
Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes
Discrete GPU & HBM Overclocking	Yes	No	No	No	No



## 8th Generation Intel® Processor Graphics

Starting with 8th Gen Intel® Core™ processors, Intel's integrated graphics offerings will be branded Intel® UHD Graphics. Intel® UHD graphics brand aligns the brand to the 4K platform capabilities of 8th Generation Intel® Core™ processors, including content playback, content creation, output, and display. Premium content comes to life in 4K Ultra HD, so users can enjoy amazing and vibrant multimedia experiences on compatible displays. Edit photos and videos like a pro with fast processor graphics. Expand entertainment with multiple video streams, 360° video and high resolution video chat. Challenge your skills with agile, texture-rich graphics for HD gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.



	INTEL IRIS PLUS GRAPHICS 655	INTEL UHD GRAPHICS P630	INTEL® UHD GRAPHICS 630	INTEL® UHD GRAPHICS 620	INTEL® UHD GRAPHICS 615	INTEL UHD GRAPHICS 610	INTEL UHD GRAPHICS 605	INTEL UHD GRAPHICS 600
<b>Processor Family</b>	Intel® Core™	Intel® Xeon™	Intel® Core™ / Intel® Pentium®	Intel® Core™	Intel® Core™	Intel® Pentium® / Intel® Celeron®	Intel® Pentium®	Intel® Celeron®
<b>Max Dynamic Frequency</b>	1.2 GHz	1.2 GHz	1.2 GHz	1.15 GHz	1.10 GHz	1.05 GHz	800 MHz	750 MHz
<b>eDRAM</b>	128 Mb	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Processor Number</b>	i7-8559U	E-2186G	i9-8950HK	i7-8650U	i7-8500Y	Pentium® Gold G5400	Pentium® Silver N5000	N4100
	i5-8269U	E-2176G	i7-8850H	i7-8565U	i5-8200Y	Pentium® Gold G5400T	Pentium® Silver J5005	N4000
	i5-8259U	E-2174G	i7-8750H	i5-8550U	m3-8100Y	Celeron® G4920		J4105
	i3-8109U	E-2146G	i7-8700K	i5-8350U		Celeron® G4900		J4005
		E-2144G	i7-8700	i5-8265U		Celeron® G4900T		
		E-2126G	i7-8700T	i5-8250U				
		E-2124G	i5-8600K	i3-8145U				
		E-2104G	i5-8600	i3-8130U				
		E-2186M	i5-8600T					
		E-2176M	i5-8500					
			i5-8500T					
			i5-8400					
			i5-8400H					
			i5-8400T					
			i3-8350K					
			i3-8300					
			i3-8300H					
			i3-8300T					
			i3-8100					
			i3-8100T					
			Pentium® Gold G5600					
			Pentium® Gold G5500					
			Pentium® Gold G5500T					

# 7<sup>TH</sup> GENERATION INTEL® PROCESSOR GRAPHICS



## Advanced Performance for Captivating Visuals

Intel® 7th Generation Processor Graphics delivers advanced performance for captivating visuals. With 7th Gen Intel® Core™ processors, you can watch, create, share, and game like never before. Premium content comes to life in 4K Ultra HD, so users can enjoy amazing and vibrant multimedia experiences on compatible displays. Edit photos and videos like a pro with fast processor graphics. Expand entertainment with multiple video streams, 360° video and high resolution video chat. Challenge your skills with agile, texture-rich graphics for HD gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.



		INTEL® HD GRAPHICS 620 <sup>2</sup>	INTEL® HD GRAPHICS 650 <sup>4</sup>
Productivity	SYSmark* 2014	1.0	1.11x
Video Editing	TouchXPRT* 2016	1.0	1.40x
Gaming	3DMark* 11	1.0	1.65x



## 7<sup>th</sup> Generation Intel® Processor Graphics

	INTEL® IRIS™ PLUS GRAPHICS 650	INTEL® IRIS™ PLUS GRAPHICS 640	INTEL® HD GRAPHICS 630	INTEL® HD GRAPHICS 620	INTEL® HD GRAPHICS 610	INTEL® HD GRAPHICS 615
Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ M Family
Processor Line	U-Series	U-Series	H-Series	U-Series	U-Series	Y-Series
Platform	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
Processor Number	i7-7567U	i7-7660U	i7-7920HQ	i7-7600U	4415U	m-7Y75
	i5-7287U	i7-7560U	i7-7820HQ	i7-7500U	3965U	m-7Y57
	i5-7267U	i5-7360U	i7-7820HK	i5-7300U	3865U	m-7Y54
	i3-7167U	i5-7260U	i7-7700HQ	i5-7200U		m-7Y30
			i5-7440HQ	i3-7100U		
			i5-7300HQ			
			i3-7100H			

# 6<sup>TH</sup> GENERATION INTEL® PROCESSOR GRAPHICS

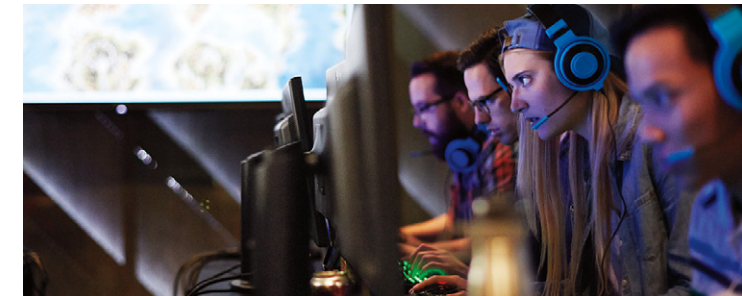


## Intel® Iris™ Graphics

Intel® Iris™ Graphics delivers advanced performance for captivating 4K visuals. Edit photos and videos like a pro with fast processor graphics. Expand entertainment to multiple screens for home entertainment and gaming. Challenge your skills with agile, texture-rich graphics for gaming. Get the high-impact visuals you want on premium Notebooks, 2 in 1s, mini-pcs and all-in-ones.



		INTEL® HD GRAPHICS 520 <sup>2</sup>	INTEL® IRIS™ GRAPHICS 540 <sup>3</sup>	INTEL® HD GRAPHICS 550 <sup>4</sup>
<b>Productivity</b>	SYSmark* 2014 Overall	1.0	1.06x	1.12x
<b>Video Editing</b>	CyberLink* MediaEspresso 7 Ultra HD Media Transcode	1.0	1.40x	1.40x
<b>Gaming</b>	3DMark* 11 Graphics Score (relative)	1.0	1.30x	1.80x



## 6<sup>th</sup> Generation Intel® Processor Graphics

	INTEL® IRIS™ GRAPHICS 580	INTEL® IRIS™ GRAPHICS 550	INTEL® IRIS™ GRAPHICS 540	INTEL® HD GRAPHICS 530	INTEL® HD GRAPHICS 520	INTEL® HD GRAPHICS 510	INTEL® HD GRAPHICS 515
<b>Processor Family</b>	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ Processor Family	Intel® Core™ M Family
<b>Processor Line</b>	H-Series	U-Series	U-Series	H-Series	U-Series	U-Series	Y-Series
<b>Platform</b>	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
<b>Processor Number</b>	i7-6970HQ	i7-6567U	i7-6650U	i7-6920HQ	i7-6600U	4405U	m-6Y75
	i7-6870HQ	i5-6287U	i7-6560U	i7-6820HQ	i7-6500U	3995U	m-6Y57
	i7-6770HQ	i5-6267U	i5-6360U	i7-6820HK	i5-6300U	3855U	m-6Y54
	i5-6350HQ	i3-6167U	i5-6260U	i7-6700HQ	i5-6200U		m-6Y30
				i5-6440HQ	i3-6100U		
				i5-6300HQ			
				i3-6100H			



# 5<sup>TH</sup> GENERATION INTEL® PROCESSOR GRAPHICS



## Intel® Iris™ Graphics

Intel® Graphics Technology gives you discrete-level graphics power and performance without the additional add-in card, integrated right into your favorite Intel processor. The results are clear: home theater, gaming, conferencing and video and photo editing are smooth, vivid and faster than ever before. It's an immersive experience for premium notebooks, Ultrabook™, mini-pcs, and all-in-ones.



		INTEL® HD GRAPHICS 5500 <sup>5</sup>	INTEL® IRIS™ GRAPHICS 6100 <sup>6</sup>	INTEL® IRIS™ PRO GRAPHICS 6200 <sup>7</sup>
<b>Productivity</b>	CPU Performance SYSmark* 2014 Overall	1x	1.10x	1.70x
<b>Video Editing</b>	Quick Sync Video Accelerated Conversion Performance HDXPRT* Video Conversion	1x	1.20x	1.95x
<b>Gaming</b>	3DMark* 11-P Graphics Subscore, 3DMark* Firestrike Graphics Subscore, 3DMark* Vantage-P Graphics Subscore	1x	1.50x	2x

## 5th Generation Intel® Processor Graphics

	INTEL® IRIS™ PRO Graphics 6200	INTEL® IRIS™ PRO Graphics 6200	INTEL® IRIS™ Graphics 6100	INTEL® IRIS™ Graphics 6000	INTEL® HD Graphics 5600	INTEL® IRIS™ Graphics 5500	INTEL® HD Graphics 5300	INTEL® HD Graphics
<b>Processor Family</b>	Intel® Core™ Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Core™ M Processor Family	Intel® Pentium® / Intel® Celeron®
<b>Processor Line</b>	S-Series	H-Series	U-Series	U-Series	H-Series	U-Series	Y-Series	U-Series
<b>Platform</b>	Desktop	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile	Mobile
<b>Processor Number</b>	i7-5775R	i7-5950HQ	i7-5557U	i7-5650U	i7-5700HQ	i7-5600U	M-5Y70	3805U
	i7-5775C	i7-5850HQ	i7-5287U	i7-5550U		i7-5500U	M-5Y71	3755U
	i5-5675R	i7-5750HQ	i7-5257U	i5-5350U		i5-5300U	M-5Y31	3205U
	i5-5675C	i5-5350H	i7-5157U	i5-5250U		i5-5200U	M-5Y10	3825U
	i5-5575R					i5-5010U	M-5Y10a	3765U
						i5-5005U	M-5Y10c	3215U

## Intel® Core™ i7-7567U Processor (e\*) up to 4 GHz, 4T/2C, 4MB w/ Iris Plus Graphics 650 vs. Intel® Core™ i7-7500U Processor (e\*) up to 3.5GHz, 4T/2C, 4MB w/ HD Graphics 620

Estimates and measurements based on (1) Productivity - SYSmark\* 2014 Overall Score, (2) Media Editing – TouchXPRT\* 2016 –Convert Videos for sharing Sub-score, (3) 3DMark\* Sky Diver\* - Graphics Score

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>

<sup>1</sup> Data based on SKUs below

<sup>2</sup> Core i7-6500U 15W w/HD Graphics 520

<sup>3</sup> Core i7-6560U 15W w/Iris Graphics 540

<sup>4</sup> Core i7-6567U 28w w/Iris Graphics 550

<sup>5</sup> System configuration for 5th Generation Intel Core Processor w/ HD Graphics 5500: Intel CRB, Intel® Core™ i7-5600U Processor, 2C4T, Turbo up to 3.2GHz, Memory: 2x2GB LPDDR3-1600, Storage: Intel SSD, Display Resolution:1920x1080.

<sup>6</sup> System configuration for 5th Generation Intel Core Processor w/ Iris Graphics 6100: Intel CRB, Intel® Core™ i7-5557U 15W/28W, 2C4T, Turbo up to 3.2GHz/3.4 GHz, Memory: 2x2GB LPDDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080. (Estimates based on measurements done with DDR3L)

<sup>7</sup> System configuration for 5th Generation Intel Core Processor w/ Iris Pro Graphics 6200: Intel CRB, Intel® Core™ i7-5950HQ PL1=47W TDP, 4C8T, Turbo up to 3.8 GHz, Memory: 2x4GB DDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080.

System configuration for Desktop LGA 5th Generation Intel Core Processor w/ Iris Pro Graphics 6200: Intel CRB, Intel® Core™ i7-5775C PL1=65W TDP, 4C8T, Turbo up to 3.7 GHz, Memory: 2x4GB DDR3-1866, Storage: Intel SSD, Display Resolution:1920x1080. System configuration for Previous Gen Desktop LGA 4th Generation Intel Core Processor: Intel CRB, Intel® Core™ i7-4790S 65W, 4C8T, Turbo up to 4.0 GHz, Memory: 2x4GB DDR3L-1600, Storage: Intel SSD, Display Resolution:1920x1080.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

\* Other names and brands may be claimed as the property of others.



# INTEL<sup>®</sup> MEMORY AND STORAGE

**FLEXIBILITY.  
STABILITY.  
EFFICIENCY.**

## MEMORY AND STORAGE

Intel provides technically-advanced products that support every level of computing—from data center workloads to enthusiast usage. Intel<sup>®</sup> Optane™ memory creates an accelerated bridge between memory and storage. Intel<sup>®</sup> Solid State Drives (Intel<sup>®</sup> SSDs) provide storage flexibility, stability, and efficiency.



# INTEL® OPTANE™ MEMORY

Affordably get high-speed performance and greater responsiveness while maintaining high capacity.

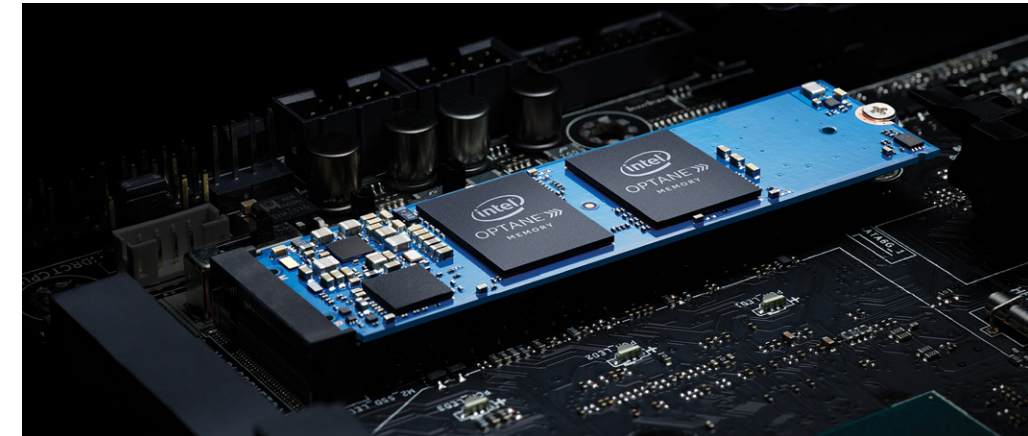
## BREAKTHROUGH SPEED. UNCOMPROMISED CAPACITY.

Increase PC responsiveness with Intel® Optane™ memory, smart and adaptable system accelerator that pairs with a 7th Gen or greater Intel® Core™ processor based PC to deliver high-performance responsiveness for almost everything—from checking email and web surfing to gaming and business.

# INTEL® OPTANE™ MEMORY OFFERS BETTER END USER VALUE



<b>USES</b>	<ul style="list-style-type: none"> <li>• System Acceleration with 7th/8th Gen Core based systems and a SATA HDD</li> <li>• Intel® Optane™ Memory Ready Motherboards</li> </ul>
<b>TARGET SEGMENTS</b>	<ul style="list-style-type: none"> <li>• Desktops, Workstations (Refer to Intel® Optane™ Memory POR document CDI 568777 for full list of supported platforms)</li> </ul>
<b>FEATURES</b>	<ul style="list-style-type: none"> <li>• High Speed &amp; 2x Responsiveness</li> <li>• Revolutionary Intel® Optane™ Technology</li> <li>• Intelligent System Acceleration</li> <li>• High performance at low queue depth</li> <li>• Intel Q&amp;R backed by 5Yr Warranty</li> <li>• Software Encryption with Bitlocker and McAfee</li> <li>• New Sell-Up Opportunity</li> <li>• Platform Confidence &amp; Intel Branded Solution</li> </ul>



## 16 GB INTEL® OPTANE™ MEMORY

<b>MARKET SEGMENT</b>	<ul style="list-style-type: none"> <li>• Mainstream / DIY Builder</li> <li>• SMB / Mainstream Corporate Users</li> </ul>
<b>IDEAL FOR USERS THAT</b>	<ul style="list-style-type: none"> <li>• Need high capacity storage and affordable performance</li> <li>• Task switch across online applications</li> <li>• Often have multiple browser tabs open</li> <li>• Utilize a smaller-footprint workload</li> <li>• Run multiple applications throughout the day</li> </ul>

## 32 GB INTEL® OPTANE™ MEMORY

<ul style="list-style-type: none"> <li>• Mainstream Enthusiast / DIY Builder</li> <li>• Enthusiast / Corporate Users</li> </ul>
<ul style="list-style-type: none"> <li>• Need high capacity storage and affordable performance</li> <li>• Work in applications with large data sets</li> <li>• Run a variety of data intensive applications</li> <li>• Play Mainstream games</li> <li>• Work in content creation applications</li> <li>• Regularly multi-task</li> </ul>

## 16 GB Intel® Optane™ memory + 1 TB HDD 4 GB DDR delivers better responsiveness than 1 TB HDD 8 GB DDR

MAINSTREAM

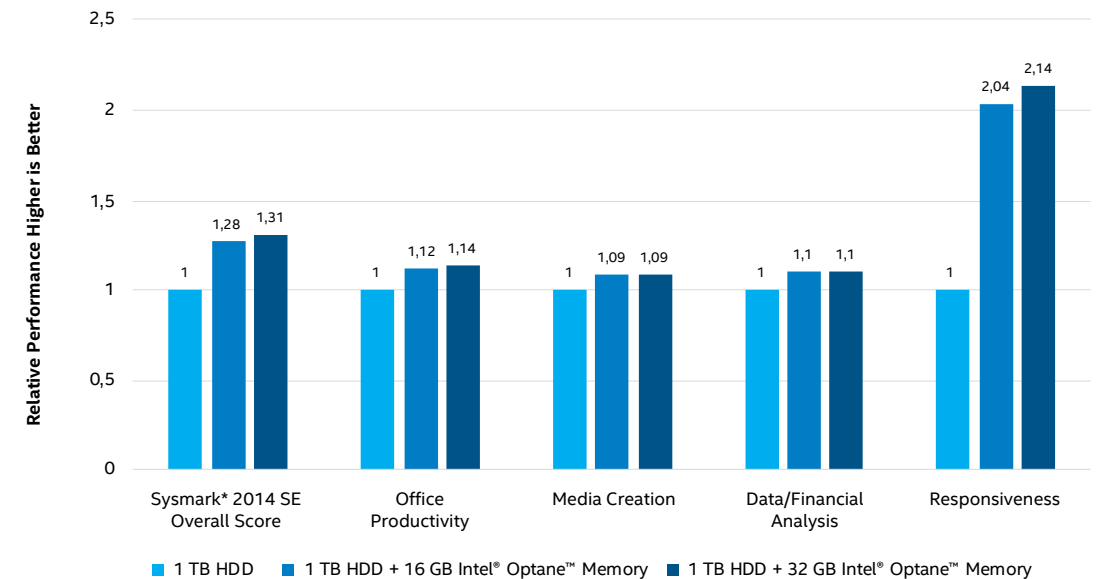
ENTHUSIAST

BUSINESS

### 16 GB Intel® Optane™ Memory + HDD

Everyday Tasks <sup>1</sup>	Up to 2x More Responsive
Storage Performance <sup>2</sup>	Up to 14x/21x Faster
Computer Boot Time <sup>3</sup>	Up to 2x Faster
Launch Web Browser <sup>4</sup>	Up to 5x Faster
Launch Game <sup>5</sup>	Up to 67% Faster
Game Level Load <sup>5</sup>	Up to 65% Faster
Open Large Media Projects <sup>6</sup>	Up to 4.1x Faster
Launch Email <sup>7</sup>	Up to 5.8x Faster
Launch Presentations <sup>8</sup>	Up to 3.8x Faster
Windows* File Search <sup>9</sup>	Up to 4x Faster

### Sysmark\* 2014 SE Comparison



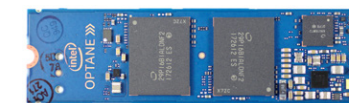
<sup>1</sup> SYSmark 2014 SE (Responsiveness Subscore) <sup>2</sup> PCMark\* Vantage (HDD Suite) <sup>3</sup> OS Load Time Workload <sup>4</sup> Browser Launch Workload <sup>5</sup> Game Launch & Level Load Workload <sup>6</sup> Media Project Load Workload <sup>7</sup> Email Launch Workload <sup>8</sup> Presentation Launch Workload <sup>9</sup> File Search Workload

\*Other names and brands may be claimed as the property of others

Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors.

Performance tests, such as SYSmark\* and MobileMark\*, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information, go to [www.intel.com/benchmarks](http://www.intel.com/benchmarks).

# INTEL® SOLID STATE DRIVE OPTANE™ FAMILY



INTEL® SSD	INTEL® OPTANE™ SSD 905P	INTEL® OPTANE™ SSD 900P	INTEL® OPTANE™ SSD 800P
<b>USES</b>	For the most demanding storage workloads and high performance desktop <ul style="list-style-type: none"> <li>• Media Content creation, high performance gaming</li> <li>• CGI, Particle Simulation, Rendering, Game Development</li> <li>• High resolution image and video</li> <li>• Engineering design and workloads</li> </ul>	Storage for high performance Desktop and Workstations <ul style="list-style-type: none"> <li>• CGI, Particle Simulation, Rendering, Game Development</li> <li>• High Resolution Image and Video</li> <li>• Engineering design and high workload</li> <li>• Media creation</li> </ul>	Ideal OS drive for fast boot and quick application launch M.2 slim form factor and low power design provide the versatility for mobile and desktop devices
<b>INTERFACE</b>	PCI Express* 3.0x 4, NVM Express*	PCI Express* 3.0x 4, NVM Express*	PCI Express* 3.0x 2, NVM Express*
<b>FORM FACTOR</b>	AIC, U.2 (15mm), M.2	AIC, U.2(15mm)	M.2 80mm
<b>CAPACITIES</b>	380GB / 480GB / 960GB / 1.5TB	280GB / 480GB	58GB / 118GB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 575k IOPS Writes: Up to 550k IOPS	Reads: Up to 550k IOPS Writes: Up to 500k IOPS	Reads: Up to 300k IOPS Writes: Up to 120k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 2.7 GB/s Writes: Up to 2.2 GB/s	Reads: Up to 2.5 GB/s Writes: Up to 2.0 GB/s	Reads: Up to 1350 MB/s Writes: Up to 500 MB/s
<b>SECURITY</b>	AES 256 bit encryption	AES 256 bit encryption	AES 256 bit encryption
<b>ENDURANCE</b>	10 DWPD	10 DWPD	10 DWPD
<b>WARRANTY</b>	5 year limited	5 year limited	5 year limited

## Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive<sup>4</sup>
- Easy to use
- Free

Download now at [www.intel.com/go/ssdinstallation](http://www.intel.com/go/ssdinstallation)

\*Other names and brands may be claimed as the property of others.

## Intel® SSD Toolbox v3.5.3

- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at [www.intel.com/go/ssdtoolbox](http://www.intel.com/go/ssdtoolbox)



INTEL® SSD	INTEL® OPTANE™ MEMORY	INTEL® OPTANE™ MEMORY M10
<b>USES</b>	System Acceleration with 7th/8th Gen Core based systems	System Acceleration with 7th/8th Gen Core based systems
<b>INTERFACE</b>	PCI Express* 3.0x 2, NVMe Express*	PCI Express* 3.0x 2, NVMe Express*
<b>FORM FACTOR</b>	M.2 80mm	M.2 80mm, M.2 42mm
<b>CAPACITIES</b>	16GB / 32 GB	80mm: 16GB / 32GB / 64GB 42mm: 16GB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 240k IOPS Writes: Up to 65k IOPS	Reads: Up to 300k IOPS Writes: Up to 120k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 1350 MB/s Writes: Up to 290 MB/s	Reads: Up to 1350 MB/s Writes: Up to 500 MB/s
<b>ENDURANCE</b>	40GB DWPD	40GB DWPD
<b>WARRANTY</b>	5 year limited	5 year limited

## Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive<sup>4</sup>
- Easy to use
- Free

Download now at [www.intel.com/go/ssdinstallation](http://www.intel.com/go/ssdinstallation)

\*Other names and brands may be claimed as the property of others.

## Intel® SSD Toolbox v3.5.3

- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

Download now at [www.intel.com/go/ssdtoolbox](http://www.intel.com/go/ssdtoolbox)





# INTEL<sup>®</sup> SOLID STATE DRIVES

Intel Corporation manufactures industry leading solid state drives targeting data center, embedded, professional, and consumer market segments.

## CONSUMER FAMILY

Impressive performance with NVMe\*/PCIe\* and SATA for enthusiasts and mainstream consumers.

## PROFESSIONAL FAMILY

Enhanced security and remote manageability with vPro™ integration for the corporate client.

## DATA CENTER FAMILY

Consistently amazing performance for NVMe\*/PCIe\* and SATA with broad industry compatibility, and robust enterprise RAS features.



INTEL® SSD	INTEL® SSD 760p SERIES	INTEL® SSD 660p SERIES
<b>USES</b>	PCs- notebooks, desktops, NUCs Everyday computing Gaming Mobile computing	PCs - Desktop & Mobile computing, NUCs Everyday Computing HDD Replacement SATA SSD Replacement Gaming
<b>INTERFACE</b>	PCI Express* 3.0x 2, NVMe Express*	PCIe* 3.0x4, NVMe Express*
<b>FORM FACTOR</b>	M.2 80mm	M.2 80mm
<b>CAPACITIES</b>	128GB / 256GB / 512GB / 1024MB (1TB) / 2048MB (2TB) (Double Sided)	512MB / 1024MB (1TB) / 2048MB (2TB)
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 350k IOPS Writes: Up to 280k IOPS	Reads: Up to 220k IOPS Writes: Up to 220k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 3200 MB/s Writes: Up to 1600 MB/s	Read: Up to 1800MB/s Write: Up to 1800MB/s
<b>SECURITY</b>	End-to-end data protection <sup>3</sup> AES 256 bit encryption	End-to-end data protection <sup>3</sup> AES 256 bit encryption
<b>ENDURANCE</b>	Up to 576 TBW	Up to 200 TBW
<b>WARRANTY</b>	5-year limited	5-year limited

## Intel® Data Migration Software

- Transfer operating system, applications, and files from an old HDD or SSD to a new Intel® Solid State Drive<sup>4</sup>
- Easy to use
- Free

Download now at [www.intel.com/go/ssdinstallation](http://www.intel.com/go/ssdinstallation)

\*Other names and brands may be claimed as the property of others.

## Intel® SSD Toolbox v3.5.3

- Update Intel® SSD firmware and Intel® drivers on host PC
- Optimize PC configuration for Intel SSDs, run drive diagnostics, and Secure Erase
- View SMART attributes, such as host writes and media wear out
- Supported in multiple languages

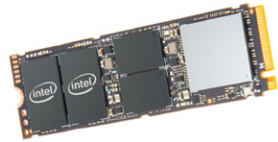
Download now at [www.intel.com/go/ssdtoolbox](http://www.intel.com/go/ssdtoolbox)



**INTEL® SSD INTEL® SSD 600p SERIES**

**INTEL® SSD 545s SERIES**

<b>USES</b>	PCs- notebooks, desktops, NUCs Everyday computing Gaming Mobile computing	PCs- notebooks, desktops, NUCs Everyday computing Gaming Mobile computing
<b>INTERFACE</b>	PCI Express*, NVM Express*	SATA 6Gb/s
<b>FORM FACTOR</b>	M.2 80mm	M.2 80mm, 2.5"(7mm)
<b>CAPACITIES</b>	128GB / 256GB / 512GB / 1TB	M.2: 128GB / 256GB / 512GB 2.5": 128GB / 256GB / 512GB / 1TB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 155k IOPS Writes: Up to 128k IOPS	Reads: Up to 90k IOPS Writes: Up to 75k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 1800 MB/s Writes: Up to 560 MB/s	Reads: Up to 560 MB/s Writes: Up to 500 MB/s
<b>SECURITY</b>	AES 256 bit Encryption	AES 256 bit encryption
<b>ENDURANCE</b>	Up to 576 TBW	Up to 72 TBW
<b>WARRANTY</b>	5 year limited	5 year limited



**INTEL® SSD** **INTEL® SSD PRO 7600p SERIES**

**INTEL® SSD PRO 6000p SERIES**

**INTEL® SSD PRO 5450s SERIES**

<b>USES</b>	Corporate IT Managed Client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-Pcs / Intel NUC	Corporate IT Managed client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-PCs / Intel NUC	Corporate IT Managed Client Workstation Thin and light form factors: Ultrabook*, business tablets, 2-in-1s Desktop and all-in-ones Managed mini-Pcs / Intel NUC
<b>INTERFACE</b>	PCI Express* 3.0, NVMe Express*	PCI Express* 3.0, NVMe Express*	SATA 6Gb/s
<b>FORM FACTOR</b>	M.2 80mm	M.2 80mm	M.2 80mm, 2.5"(7 mm)
<b>CAPACITIES</b>	128GB / 256GB / 360GB / 512GB / 1TB / 2TB	1.2 TB/ 512 GB/ 256 GB/ 128 GB	M.2 80mm: 256GB / 512GB 2.5": 256GB / 512GB / 1TB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 350k IOPS Writes: Up to 280k IOPS	Reads up to: 100k IOPS Writes up to: 90k IOPS	Reads: Up to 75k IOPS Writes Up to 90k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 3200 MB/s Writes: Up to 1600 MB/s	Reads up to: 1700 MB/s Writes up to: 600 MB/s	Reads: Up to 560 MB/s Writes: Up to 500 MB/s
<b>SECURITY</b>	AES 256b Encryption, OPAL 2.0 features, eDrive capable	AES 256b Encryption, OPAL 2.0 features, eDrive capable	AES 256b Encryption, OPAL 2.0 features, eDrive capable
<b>ENDURANCE</b>	Up to 576 TBW	72TBW (40GB DWPD)	Up to 576 TBW
<b>WARRANTY</b>	5 years limited	5 year limited	5 year limited

## Intel® SSD Data Center Family for PCIe\* - Intel® Optane™ Technology



INTEL® SSD INTEL® OPTANE™ SSD DC P4800X SERIES

<b>USES</b>	Fast storage or cache Extended memory
<b>INTERFACE</b>	PCI Express* 3.0, NVM Express*
<b>FORM FACTOR</b>	AIC, U.2(15mm)
<b>CAPACITIES (MB)</b>	AIC: 375GB / 750GB / 1.5TB U.2: 375GB / 750GB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 550k IOPS Writes: Up to 550k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 2500 MB/s Writes: Up to 2200 MB/s
<b>SECURITY</b>	AES 256b Encryption
<b>ENDURANCE</b>	375GB - 20.5PBW (30 DWPD) 750GB - 41PBW (30 DWPD) 1.5TB - 164PBW (60 DWPD)
<b>WARRANTY</b>	5 year limited

\* Other names and brands may be claimed as the property of others.

## Intel® Solid State Drive Data Center Family for PCIe\*



**INTEL® SSD DC P4500 SERIES**



**INTEL® SSD DC P4501 SERIES**

	<b>INTEL® SSD DC P4500 SERIES</b>	<b>INTEL® SSD DC P4501 SERIES</b>
<b>USES</b>	Cloud storage Scale out storage Hard drive replacement	Cloud storage Scale out storage SATA replacement
<b>INTERFACE</b>	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*
<b>FORM FACTOR</b>	U.2(15mm), AIC	U.2(7mm), M.2 (110mm)
<b>CAPACITIES (MB)</b>	U.2: 1TB / 2TB / 4TB AIC: 4TB / 8TB	U.2: 500GB / 1TB / 2TB / 4TB M.2: 1TB / 2TB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 688k IOPS Writes: Up to 65k IOPS	Reads: Up to 361k IOPS Writes: Up to 46.5k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 3200 MB/s Writes: Up to 1850 MB/s	Reads: Up to 3200 MB/s Writes: Up to 900 MB/s
<b>SECURITY</b>	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
<b>ENDURANCE</b>	<1 DWPD	<1 DWPD
<b>WARRANTY</b>	5 year limited	5 year limited

## Intel® Solid State Drive Data Center Family for PCIe\*



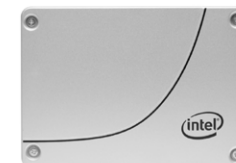
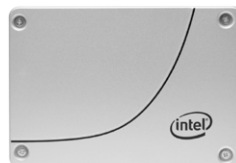
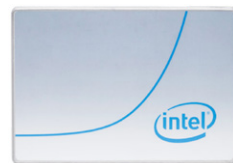
**INTEL® SSD DC P4510 SERIES**



**INTEL® SSD DC P4511 SERIES**

<b>USES</b>	Cloud storage Scale Out Storage Hard Drive replacement	Increases server agility and utilization, and accelerates applications across a wide range of cloud workloads.
<b>INTERFACE</b>	PCI Express* 3.0, NVMe Express*	PCIe* 3.1 x4, NVMe* 1.2
<b>FORM FACTOR</b>	U.2 (15mm)	M.2 (110mm x 22mm)
<b>CAPACITIES (MB)</b>	1TB / 2TB / 4TB / 8TB	1TB / 2TB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 650k IOPS Writes: Up to 135k IOPS	Read: Up to 295k IOPS Write: Up to 36k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 3200 MB/s Writes: Up to 3000 MB/s	Read: Up to 1900 MB/s Write: Up to 1430 MB/s
<b>SECURITY</b>	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
<b>ENDURANCE</b>	Up to 2.61 PBW	Up to 0.9 DWPD
<b>WARRANTY</b>	5 year limited	5 year limited

## Intel® Solid State Drive Data Center Family for PCIe\*



### INTEL® SSD

### INTEL® SSD DC P4600 SERIES

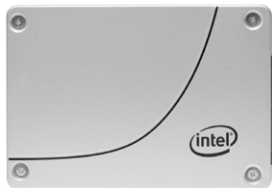
### INTEL® SSD DC P4601 SERIES

### INTEL® SSD DC P4608 SERIES

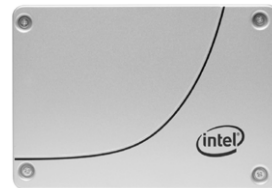
	INTEL® SSD DC P4600 SERIES	INTEL® SSD DC P4601 SERIES	INTEL® SSD DC P4608 SERIES
<b>USES</b>	Virtualization Caching Database Business Analytics	Cloud storage Scale Out Storage SATA replacement	High performance computing Database Big Data Analysis
<b>INTERFACE</b>	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*	PCI Express* 3.0, NVM Express*
<b>FORM FACTOR</b>	AIC, U.2 (15mm)	U.2 (7mm)	AIC x8
<b>CAPACITIES (MB)</b>	AIC: 2TB / 4TB U.2: 1.6TB / 2TB / 3.2TB / 6.4TB	4TB	6.4TB
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 680k IOPS Writes: 246k IOPS	Reads: Up to 325k IOPS Writes: Up to 100k IOPS	Reads: Up to 1379k IOPS Writes: Up to 428k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 3200 MB/s Writes: Up to 2000 MB/s	Reads: Up to 3200 MB/s Writes: Up to 900 MB/s	Reads: Up to 6500 MB/s Writes: Up to 3100 MB/s
<b>SECURITY</b>	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
<b>ENDURANCE</b>	3 DWPD	3 DWPD	3 DWPD
<b>WARRANTY</b>	5 year limited	5 year limited	5 year limited



## Intel® Solid State Drive Data Center Family for SATA



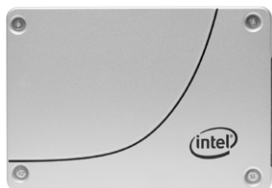
**INTEL® SSD DC S4600 SERIES**



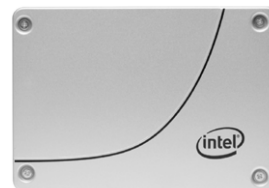
**INTEL® SSD D3-S4610 SERIES**

<b>USES</b>	Manufacturing Retail Virtualization Analytical & operational databases Machine generated data	Replace HDDs with the highly efficient Intel® SSD D3-S4510 and D3-S4610 Series to reduce storage operating cost, accelerate read-intensive workloads with power efficient performance.
<b>INTERFACE</b>	SATA 6Gb/s	SATA 6Gb/s
<b>FORM FACTOR</b>	2.5"(7mm)	2.5"(7mm)
<b>CAPACITIES (MB)</b>	240GB / 480GB / 960GB / 1.92TB	240GB, 480GB, 960GB, 2TB (1.92TB), 4TB (3.84TB), 8TB (7.68TB)
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 72k IOPS Writes: Up to 65k IOPS	Read: Up to 97K IOPS Write: Up to 51k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 500 MB/s Writes: Up to 490 MB/s	Read: Up to 560 MB/s Write: Up to 510 MB/s
<b>SECURITY</b>	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
<b>ENDURANCE</b>	3 DWPD	3 DWPD
<b>WARRANTY</b>	5 year limited	5 year limited

## Intel® Solid State Drive Data Center Family for SATA



**INTEL® SSD DC S4500 SERIES**



**INTEL® SSD D3-S4510 SERIES**

<b>USES</b>	Cloud Embedded Boot, Static Web Content Low data rate, Operational databases & Analytics Web server and SQL Logs OS Paging and Media Streaming	Replace HDDs with the highly efficient Intel® SSD D3-S4510 and D3-S4610 Series to reduce storage operating cost, accelerate read-intensive workloads with power efficient performance.
<b>INTERFACE</b>	SATA 6Gb/s	SATA 6Gb/s
<b>FORM FACTOR</b>	2.5"(7mm)	2.5"(7mm)
<b>CAPACITIES (MB)</b>	240GB / 480GB / 960GB / 1.92TB / 3.84TB	240GB, 480GB, 960GB, 2TB (1.92TB), 4TB (3.84TB), 8TB (7.68TB)
<b>MAXIMUM RANDOM PERFORMANCE</b>	Reads: Up to 72k IOPS Writes: Up to 33k IOPS	Read: Up to 97k IOPS Write: Up to 36k IOPS
<b>MAXIMUM SEQUENTIAL PERFORMANCE</b>	Reads: Up to 500 MB/s Writes: Up to 490 MB/s	Read: Up to 560 MB/s Write: Up to 510 MB/s
<b>SECURITY</b>	End-to-end data protection Power-loss data protection AES 256-bit encryption	End-to-end data protection Power-loss data protection AES 256-bit encryption
<b>ENDURANCE</b>	1 DWPD	Up to 2 DWPD
<b>WARRANTY</b>	5 year limited	5 year limited

## Consumer Family SSDs

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® Optane™ SSD 905P Series	480GB	SSDPE21D480GAX1	(480GB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single Pack	w/ Standard U.2 Cable	1
	480GB	SSDPE21D480GAM3	(480GB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single Pack	w/ M.2 Adapter Cable	1
	960GB	SSDPE21D960GAX1	(960GB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single Pack	w/ M.2 Adapter Cable	1
	960GB	SSDPE21D960GAM3	(960GB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single Pack	w/ Standard U.2 Cable	1
	1.5TB	SSDPE21D015TAX1	(1.5TB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single Pack	w/ Standard U.2 Cable	1
	1.5TB	SSDPE21D015TAM3	(1.5TB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single Pack	w/ M.2 Adapter Cable	1
Intel® Optane™ SSD 900P Series	280GB	SSDPED1D280GASX	(280GB, ½ Height PCIe 3.0 X4, 20nm 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	280GB	SSDPED1D280GAX1	(280GB, 1/2 Height PCIe x4, 3D XPoint™)	Reseller Single Pack	SSD only	1
	280GB	SSDPE21D280GAX1	(280GB, 2.5in PCIe x4, 3D XPoint™)	Reseller Single	SSD only	1
	280GB	SSDPE21D280GASM	(280GB, 2.5in PCIe x4, 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	280GB	SSDPE21D280GASX	(280GB, 2.5in PCIe x4, 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	480GB	SSDPED1D480GASX	(480GB, ½ Height PCIe 3.0 X4, 20nm 3D XPoint™)	Star Citizen Promo	SSD and Star Citizen Code	1
	480GB	SSDPED1D480GAX1	(480GB, 1/2 Height PCIe x4, 3D XPoint™)	Reseller box	SSD only	1
Intel® Optane™ SSD 800P Series	60GB	SSDPEK1W060GAXT	(60GB, M.2 80mm PCIe x4, 3D Xpoint™)	Retail Box	SSD only	10
	120GB	SSDPEK1W120GAXT	(120GB, M.2 80mm PCIe x4, 3D Xpoint™)	Retail Box	SSD only	10
	120GB	SSDPEK1W120GAX1	(120GB, M.2 80mm PCIe x4, 3D Xpoint™)	Retail Box	SSD only	1
	60GB	SSDPEK1W060GA01	(60GB, M.2 80mm PCIe x4, 3D Xpoint™)	Generic Pack	SSD only	1
	120GB	SSDPEK1W120GA01	(120GB, M.2 80mm PCIe x4, 3D Xpoint™)	Generic Pack	SSD only	1
	60GB	SSDPEK1W060GA	(60GB, M.2 80mm PCIe x4, 3D Xpoint™)	Generic Pack	SSD only	100
	120GB	SSDPEK1W120GA	(120GB, M.2 80mm PCIe x4, 3D Xpoint™)	Generic Pack	SSD only	100
Intel® SSD 760p Series	1.024TB	SSDPEKKW010T8X1	(1.024TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	1
	512GB	SSDPEKKW512G8XT	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	512GB	SSDPEKKW512G801	(512GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
	256GB	SSDPEKKW256G8XT	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	256GB	SSDPEKKW256G801	(256GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1
	128GB	SSDPEKKW128G8XT	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box	SSD only	10
	128GB	SSDPEKKW128G801	(128GB, M.2 80mm, PCIe 3.0 x4, 3D2, TLC)	Generic Single Pack	SSD only	1

Intel® SSD 660p Series	256GB	SSDPEKNW256G801	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	512GB	SSDPEKNW512G801	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	512GB	SSDPEKNW512G8X	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	1
	512GB	SSDPEKNW512G810	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	10
	512GB	SSDPEKNW512G8XT	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	10
	1.0TB	SSDPEKNW010T801	(1.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	1.0TB	SSDPEKNW010T8X1	(1.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	1
	2.0TB	SSDPEKNW020T801	(2.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Generic Pack	SSD only	1
	2.0TB	SSDPEKNW020T8X1	(2.0TB, M.2 80mm PCIe 3.0 x4, 3D2, QLC)	Retail Box	SSD only	1
Intel® SSD 600p Series	1024 GB	SSDPEKKW010T7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	512 GB	SSDPEKKW512G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	256 GB	SSDPEKKW256G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	128 GB	SSDPEKKW128G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
Intel® SSD 545s Series	1.024TB	SSDSC2KW010T8X1	(1.024TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail box	SSD only	1
	512GB	SSDSC2KW512G8	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	512GB	SSDSC2KW512G8XT	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	512GB	SSDSC2KW512G8X1	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	512GB	SSDSCKW512G8X1	(512GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	256GB	SSDSC2KW256G8	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	256GB	SSDSC2KW256G8XT	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	256GB	SSDSC2KW256G8X1	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	256GB	SSDSCKW256G8	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	256GB	SSDSCKW256G8XT	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	256GB	SSDSCKW256G8X1	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	128GB	SSDSC2KW128G8	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	128GB	SSDSC2KW128G8XT	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	10
	128GB	SSDSC2KW128G8X1	(128GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1
	128GB	SSDSCKW128G8X1	(128GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box	SSD only	1

## Consumer Family SSDs Intel® Optane™ Memory

PRODUCT NAME	DENSITY	MM#	PRODUCT DESCRIPTION	PRODUCT CODE
Intel® Optane™ Memory	16GB	957790	Intel® Optane™ Memory Series	MEMPEK1W016GAXT
	16GB	953340	Intel® Optane™ Memory Series	MEMPEK1W016GA01
	16GB	957794	Intel® Optane™ Memory Series	MEMPEK1W016GA
	32GB	953341	Intel® Optane™ Memory Series	MEMPEK1W032GA01
	32GB	957795	Intel® Optane™ Memory Series	MEMPEK1W032GA
	35GB	957793	Intel® Optane™ Memory Series	MEMPEK1W032GAXT

## Professional Family SSDs

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® SSD Pro 7600p Series	2.048TB	SSDPEKKF0202T8X1	(2.048TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	1.02TB	SSDPEKKF010T8X1	(1.024TB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	512 GB	SSDPEKKF512G8X1	(512GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256 GB	SSDPEKKF256G8X1	(256GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	128 GB	SSDPEKKF128G8X1	(128GB, M.2 80mm PCIe 3.0 x4, 3D2, TLC)	Retail Box Single Pack	SSD only	1
Intel® SSD Pro 6000p Series	1024 GB	SSDPEKKF010T7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	512 GB	SSDPEKKF512G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	360 GB	SSDPEKKF360G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	256 GB	SSDPEKKF256G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
	128 GB	SSDPEKKF128G7X1	3D1, TLC / M.2 / 80mm PCI Express 3.0	Reseller box	SSD only	1
Intel® SSD Pro 5450s Series	512GB	SSDSC2KF512G8X1	(512GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256GB	SSDSC2KF256G8X1	(256GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1
	256GB	SSDSCKKF256G8ES	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Generic Single Pack	SSD only	1
	256GB	SSDSCKKF256G8X1	(256GB, M.2 80mm SATA 6Gb/s, 3D2, TLC)	Retail Box Single Pack	SSD only	1

## Intel® Solid State Drives Data Center for PCIe\*

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® Optane™ SSD DC P4800X Series	750GB	SSDPED1K750GA01	(750GB, 1/2 Height PCIe x4, 3D XPoint™)	Generic Pack	SSD only	1
	750GB	SSDPE21K750GA01	(750GB, 2.5in PCIe x4, 3D XPoint™)	Generic Pack	SSD only	1
	375GB	SSDPED1K375GA01	(375GB, 1/2 Height PCIe x4, 3D XPoint)	Generic Pack	SSD only	1
	375GB	SSDPE21K375GA01	(375GB, 2.5in PCIe x4, 3D XPoint™)	Generic Pack	SSD only	1

Intel® SSD DC P4500 Series	8TB	SSDPERKX080T701	(8.0TB, Ruler PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPE2KX040T701	(4.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPEDKX040T701	(4.0TB, 1/2 Height PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPERKX040T701	(4.0TB, Ruler PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPE2KX020T701	(2.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	1TB	SSDPE2KX010T701	(1.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel® SSD DC P4501 Series	4TB	SSDPE7KX040T701	(4.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPE7KX020T701	(2.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	1TB	SSDPE7KX010T701	(1.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel® SSD DC P4510 Series	500GB	SSDPE7KX500G701	(500GB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPE2KX020T810	(2.0TB, 2.5in PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	10
	2TB	SSDPE2KX020T801	(2.0TB, 2.5in PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
	1TB	SSDPE2KX010T810	(1.0TB, 2.5in PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	10
Intel® SSD DC P4511 Series	1TB	SSDPELX010T801	(1.0TB, M.2 110mm PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
	2TB	SSDPELX020T801	(2.0TB, M.2 110mm PCIe 3.1 x4, 3D2, TLC)	Generic Pack	SSD only	1
Intel® SSD DC P4600 Series	6.4TB	SSDPE2KE064T701	(6.4TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPEDKE040T701	(4.0TB, 1/2 Height PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	3.2TB	SSDPE2KE032T701	(3.2TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPEDKE020T701	(2.0TB, 1/2 Height PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	2TB	SSDPE2KE020T701	(2.0TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	1.6TB	SSDPE2KE016T701	(1.6TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
Intel® SSD DC P4601 Series	4TB	SSDPE7KE040T701	(4TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	1
	4TB	SSDPE7KE040T7	(4TB, 2.5in PCIe 3.1 x4, 3D1, TLC)	Generic Pack	SSD only	50
Intel® SSD DC P4608	6.4TB	SSDPECKE064T701	(6.4TB, 1/2 Height PCIe 3.1 x8, 3D1, TLC)	Generic Pack	SSD only	1

## Intel® SSD Data Center Family for SATA

PRODUCT NAME	CAPACITY	PRODUCT CODE	PRODUCT DESCRIPTION	PACKAGE TYPE	PACKAGE CONTENTS	QUANTITY PER BOX
Intel® SSD DC S4600 Series	1.9TB	SSDSC2KG019T701	(1.9TB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	960GB	SSDSC2KG960G701	(960GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	480GB	SSDSC2KG480G701	(480GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	240GB	SSDSC2KG240G701	(240GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1

Intel® SSD D3-S4610 Series	240GB	SSDSC2KG240G8	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	240GB	SSDSC2KG240G801	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	480GB	SSDSC2KG480G8	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	480GB	SSDSC2KG480G801	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	960GB	SSDSC2KG960G8	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	960GB	SSDSC2KG960G801	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	1.92TB	SSDSC2KG019T8	(1.92TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	1.92TB	SSDSC2KG019T801	(1.92TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	3.84TB	SSDSC2KG038T8	(3.84TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	3.84TB	SSDSC2KG038T801	(3.84TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
Intel® SSD DC S4500 Series	3.8TB	<b>SSDSC2KB038T701</b>	(3.8TB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	1.9TB	<b>SSDSC2KB019T701</b>	(1.9TB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	960GB	<b>SSDSC2KB960G701</b>	(960GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	480GB	<b>SSDSC2KB480G701</b>	(480GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
	240GB	<b>SSDSC2KB240G701</b>	(240GB, 2.5in SATA 6Gb/s, 3D1, TLC)	Generic Pack	SSD only	1
Intel® SSD D3-S4510 Series	240GB	<b>SSDSC2KB240G8</b>	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	240GB	<b>SSDSC2KB240G801</b>	(240GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	480GB	<b>SSDSC2KB480G8</b>	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	480GB	<b>SSDSC2KB480G801</b>	(480GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	960GB	<b>SSDSC2KB960G8</b>	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	960GB	<b>SSDSC2KB960G801</b>	(960GB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	1.9TB	<b>SSDSC2KB019T8</b>	(1.9TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	1.9TB	<b>SSDSC2KB019T801</b>	(1.9TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1
	3.8TB	<b>SSDSC2KB038T8</b>	(3.8TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	50
	3.8TB	<b>SSDSC2KB038T801</b>	(3.8TB, 2.5in SATA 6Gb/s, 3D2, TLC)	Generic Pack	SSD only	1

For more information, visit [www.intel.com/ssd](http://www.intel.com/ssd)

<sup>1</sup> Performance varies by capacity. Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. System configurations:

1a Intel® Core™ i7-4770 CPU at 3.4 GHz, 8GB DDR3 at 1600 MHz, Intel® SSD DC P3608 Series 1.6TB

1b Intel Core i7-3770K CPU @ 3.50GHz, 8GB of system memory, Windows<sup>1</sup> Server 2012, IOMeter. Random performance is collected with 4 workers each with 32 QD. Average RMS Active write power measured at max bandwidth

1c Performance measured by Intel using Iometer 1.1.0 with queue depth 32. Measurements are performed on 8 GB of Logical Block Address (LBA) range on a full SSD. System configuration: Intel® Core i7-5960X processor, Intel® X99 chipset, PC2666 16GB DRAM.

<sup>2</sup> Random 4 KB reads. Performance specifications apply to both compressible and non-compressible data.

<sup>3</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com](http://www.intel.com)

<sup>4</sup> 1 PB = 1000 TeraBytes

<sup>5</sup> Desktop installation kit contents: SATA signal cables, screws, installation guide, and warranty documentation.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks)

Copyright © 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, and Ultrabook are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



**PREPARE TO  
BE AMAZED**

# INTEL<sup>®</sup> DESKTOP PROCESSORS

## **INTEL<sup>®</sup> DESKTOP PROCESSORS**

This new generation of processors extends all the capabilities users have come to love in our desktop platforms with advanced innovations that deliver exciting new features to immerse you in incredible experiences on a variety of form factors.





# INTEL® DESKTOP PROCESSORS

## ACCELERATE PERFORMANCE WITH 9<sup>TH</sup> GEN INTEL® CORE™ PROCESSOR FAMILY.

All-new performance. All-new experiences.  
An all-new computer.

### PERFORMANCE TO EXCITE

A desktop computer based on a 9th Generation Intel® Core™ processor is always ready for real-life productivity, creativity and entertainment.

### EXPERIENCE TO AMAZE

9th Generation Intel® Core™ processor-based desktop PCs are packed with new and enhanced features to deliver amazing experiences that a 5-year old PC can't handle. Uncompromised gaming, while you stream, chat and share with your community – stunning visuals of Ultra HD 4K premium content – or transport into a great VR experience.

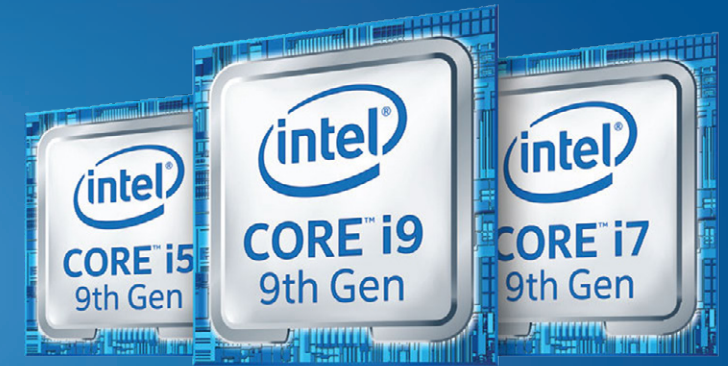
### HARDWARE-BASED FEATURES MITIGATE THREATS

9th Generation Intel® Core™ processors offer hardware-level security features that strengthen the protection of your enabled security software. Hardware-based security to help you compute with greater peace of mind.

### SCALABLE PORTFOLIO OF PROCESSORS

The 9th Generation Intel® Core™ processor family delivers significant value and is a great investment in your success. From the i9-9900K to the i3-9350KF, there is a processor to fit a wide range of budgets and needs, from the performance-hungry professionals to the first-time buyers.

# 9<sup>TH</sup> GENERATION INTEL® CORE™ DESKTOP PROCESSOR



## The Most Powerful Generation of Intel® Core™ Processors

Introducing the NEW 9th Gen Intel® Core™ desktop processors - the most powerful generation of Intel® Core™ desktop processors. Whether you are a gamer looking for a fantastic in-game experience with the performance headroom for smooth live streaming and seamless highlights recording or you are a creator that is ready to do more creating and sharing, less time waiting, this new generation of processors is ready to take you to that new level.

### Game on a Whole New Level

Game, Record, Stream without compromise on a system powered by a 9th Generation Intel® Core™ i9 processor. Utilize Intel® Quick Sync Video technology to live-stream, capture, and multitask without interruption. Power up and customize your gaming rig with up to 40 platform PCIe\* lanes giving you the outstanding flexibility. Pair it with Intel® Optane™ memory technology to accelerate the loading and launching of the games you play the most.

### Hardware Based Security<sup>1</sup>

9th Generation Intel® Core™ processors integrate hardware level technologies that help strengthen the protection of your enabled security<sup>1</sup> software. Hardware-based security helps you experience online and offline activities with added peace of mind, enabled by features that include: Intel® Software Guard Extensions (Intel® SGX)<sup>1</sup> to help applications protect your system and your data; Intel® BIOS Guard and Intel® Boot Guard to help protect your system during startup.

### Create Without Limits

Unlock your creative potential with the power you need to create, edit, and share. Let your creativity flow as the 9th Generation Intel® Core™ processor renders and encodes in the background so you don't miss a beat. Minimize the wait time between inspiration and creation with Intel® Optane™ memory accelerating the loading of your most used applications.

### Scalable Portfolio of Processors

A 9th Generation Intel® Core™ processor is a great investment in your desktop experiences — whether for gaming, creating, entertainment, or general purpose computing — wherever your life takes you. From the bar-raising performance of the 9th Generation Intel® Core™ i9-9900K processor with up to 5GHz and 16-way multitasking to great value entry-level performance options down the stack, our latest generation of desktop processors offers a range of options for your budgets and needs.

### Ultra-High Definition Entertainment

Desktop computers based on the 9th Generation Intel® Core™ processors integrate advanced media technologies that bring premium, high-quality content to your desktop, including:

- HEVC 10-bit encode/decode, VP9 10-bit decode:
  - Delivering smooth streaming of premium 4K UHD entertainment to your PC from leading online providers.
  - Providing full-size, screen-immersive viewing experiences with 4K video and 360-degree viewing.
- High Dynamic Range (HDR) and Rec. 2020 (Wide Color Gamut) for life-like luminesces to provide enhanced image and video viewing experiences.

<sup>1</sup> Intel® technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at <https://www.intel.com>.

\* Other brands and names may be claimed as the property of others

# 9<sup>TH</sup> GEN INTEL® CORE™ DESKTOP PLATFORM

## A New Level of Performance

The 9th Gen Intel® Core™ processor takes mainstream desktop PC performance to a whole new level. At the top of the stack, our mainstream flagship, the new i9-9900K. The first Intel® Core™ i9 desktop processor for the mainstream users. Best in class, the i9-9900K with 16MB of cache<sup>1</sup> and Intel® Turbo Boost 2.0 technology cranks maximum turbo frequency up to blazing 5.0 GHz. Throw in high performing 16-way multitasking support powered by 8 cores with Intel® Hyper-Threading Technology to conquer the most demanding workloads. Want to reach for even greater levels of performance? — Overclock confidently with new and enhanced features like Solder Thermal Interface Material (STIM) and improved overclocking customizations to tweak the processor performance to its unleashed potential.<sup>2</sup>

### The NEW 9th Generation Intel® Core™ processor family delivers:

- A range of processors including the first unlocked Intel® Core™ i9 mainstream desktop processor.
- Data acceleration when paired with Intel® Optane™ memory to retrieve that data you use the most for fast system responsiveness.<sup>1</sup>
- DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds.
- Intel Z390 chipset support which includes unprecedented connectivity to all of your devices with integrated USB 3.1 Gen 2, Intel® Wireless-AC and support for Gigabit Wi-Fi speed.
- Compatible with Intel® 300 series chipset.



<sup>1</sup> Intel® technologies features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at <http://www.intel.com>.

<sup>2</sup> Warning: Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of systems and components for additional details.

\* Other brands and names may be claimed as the property of others

## 9th Gen Intel® Core™ Processor SKUs (LGA)

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/Threads	Memory Type	Memory Speed Support (DDR4) <sup>2</sup>	Intel® Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked <sup>1</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	PCG	Intel Technologies					
													Intel® SiPP <sup>3</sup>	Intel® vPro™ Technology <sup>4</sup>	ISM* <sup>4</sup>	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready <sup>5</sup>
<b>Socket 1151 95W</b>																		
i9-9900K	3.6	16M	8/16	DDR4	2666	5.0	✓	Intel® UHD Graphics 630	1200	2 ch	95	2015D	✓	✓	✓	✓	✓	✓
i7-9700K	3.6	12M	8/8	DDR4	2666	4.9	✓	Intel® UHD Graphics 630	1200	2 ch	95	2015D	✓	✓	✓	✓	✓	✓
i5-9600K	3.7	9M	6/6	DDR4	2666	4.6	✓	Intel® UHD Graphics 630	1150	2 ch	95	2015D	✓	✓	✓	✓	✓	✓
<b>Socket 1151 Standard Power</b>																		
i5-9400	2.9	9M	6/6	DDR4	2666	4.1		Intel® UHD Graphics 630	1050	2 ch	65	2015C		✓		✓	✓	✓

## 9th Gen Intel® Core™ Processor SKUs (LGA) (Without Processor Graphics)

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/Threads	Memory Type	Memory Speed Support (DDR4) <sup>2</sup>	Intel® Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked <sup>1</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	PCG	Intel Technologies					
													Intel® SiPP <sup>3</sup>	Intel® vPro™ Technology <sup>4</sup>	ISM* <sup>4</sup>	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready <sup>5</sup>
<b>Socket 1151 95W</b>																		
i9-9900KF	3.6	16M	8/16	DDR4	2666	4.0	✓	N/A	N/A	2 ch	95	2015D		✓		✓	✓	✓
i7-9700KF	3.6	12M	8/8	DDR4	2666	4.9	✓	N/A	N/A	2 ch	95	2015D		✓		✓	✓	✓
i5-9600KF	3.7	9M	6/6	DDR4	2666	4.6	✓	N/A	N/A	2 ch	95	2015D		✓		✓	✓	✓
i3-9350KF	4	8M	4/4	DDR4	2400	4.6	✓	N/A	N/A	2 ch	95	2015D		✓		✓	✓	✓
<b>Socket 1151 Standard Power</b>																		
i5-9400F	2.9	9M	6/6	DDR4	2666	4.1		N/A	N/A	2 ch	65	2015C		✓		✓	✓	✓

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards).

All processors support Intel® Virtualization Technology (Intel® VT-x).

<sup>1</sup> Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details. For more information, visit <http://www.intel.com/content/www/za/en/gaming/overclocking-intel-processors.html>.

<sup>2</sup> DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs. DDR4 2DPC UDIMM 2666 is capable when same UDIMM part number are populated with in each channel.

<sup>3</sup> Eligible for Intel® SiPP starting with Coffee Lake-S Refresh Corporate Platform availability.

<sup>4</sup> When paired with the eligible Intel® 300 Series chipset SKU.

<sup>5</sup> Intel® Optane™ memory requires specific hardware and software configuration. Visit [www.intel.com/Optanememory](http://www.intel.com/Optanememory) for configuration requirements.

\* Intel® Standard Manageability

# 8<sup>TH</sup> GEN INTEL® CORE™ DESKTOP PLATFORM



## Exceptional Platform Performance

The 8th Generation Intel® Core™ processors redefine mainstream desktop PC performance with up to six cores for more processing power—that's two more cores than the previous generation Intel® Core™ processor family—Intel® Turbo Boost Technology 2.0 to increase the maximum turbo frequency up to 4.7 GHz, and up to 12 MB of cache memory.<sup>1</sup>

Intel® Hyper-Threading Technology (Intel® HT Technology)<sup>1</sup> delivers up to 12-way multitasking support in the latest generation of Intel® Core™ processors.

For the enthusiast, the unlocked 8th Generation Intel® Core™ i7-8700K processor provides you the opportunity to tweak the platform performance to its fullest potential and enjoy great gaming and VR experiences.

### The new 8th Generation Intel® Core™ processor family delivers:

- An impressive portfolio of standard and unlocked systems for a broad range of usages and performance levels
- New system acceleration when paired with Intel® Optane™ memory to deliver amazing system responsiveness<sup>1</sup>
- Intel® Turbo Boost Technology 2.0 to give you that extra burst of performance when you need it
- Intel® Hyper-Threading Technology (Intel® HT Technology), which allows each processor core to work on two tasks at the same time, improving multitasking, speeding up workflows, and accomplishing more in less time
- DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds
- The ability to set an overclocked ratio per core with unlocked processors,<sup>1</sup> when paired with select chipset SKUs, to provide you more control and more granularity for overclocking<sup>2</sup> your platform



<sup>1</sup> Intel® technologies features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at <http://www.intel.com>.

<sup>2</sup> Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details. For more information, visit <http://www.intel.com/content/www/za/en/gaming/overclocking-intel-processors.html>.

\* Other brands and names may be claimed as the property of others

## 8th Generation Intel® Core™ Processor SKUs

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/Threads	Memory Speed Support (DDR4) <sup>2</sup>	Intel® Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked <sup>1</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	Intel Technologies					
											Intel® SIPP <sup>3</sup>	Intel® vPro™ Technology <sup>4</sup>	ISM <sup>*4</sup>	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready <sup>5</sup>
Core i7-8700K	3.7	12M	6/12	2666	4.7	✓	Intel® UHD Graphics 630	1200	2 ch	95	✓	✓	✓	✓	✓	✓
Core i5-8600K	3.6	9M	6/6	2666	4.3	✓	Intel® UHD Graphics 630	1150	2 ch	95	✓	✓	✓	✓	✓	✓
Core i3-8350K	4	8M	4/4	2400	N/A	✓	Intel® UHD Graphics 630	1150	2 ch	91			✓		✓	✓
Core i7-8700	3.2	12M	6/12	2666	4.6		Intel® UHD Graphics 630	1200	2 ch	65	✓	✓	✓	✓	✓	✓
Core i5-8600	3.1	9M	6/6	2666	4.3		Intel® UHD Graphics 630	1150	2 ch	65	✓	✓	✓	✓	✓	✓
Core i5-8500	3	9M	6/6	2666	4.1		Intel® UHD Graphics 630	1100	2 ch	65	✓	✓	✓	✓	✓	✓
Core i5-8400	2.8	9M	6/6	2666	4		Intel® UHD Graphics 630	1050	2 ch	65			✓		✓	✓
Core i3-8300	3.7	8M	4/4	2400	N/A		Intel® UHD Graphics 630	1150	2 ch	62			✓		✓	✓
Core i3-8100	3.6	6M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	65			✓		✓	✓
Pentium Gold G5600	3.9	4M	2/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	54			✓		✓	
Pentium Gold G5500	3.8	4M	2/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	54			✓		✓	
Pentium Gold G5400	3.7	4M	2/4	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	54/58 <sup>6</sup>			✓		✓	
Celeron G4920	3.2	2M	2/2	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	54					✓	
Celeron G4900	3.1	2M	2/2	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	54					✓	
Core i7-8700T	2.4	12M	6/12	2666	4		Intel® UHD Graphics 630	1200	2 ch	35	✓	✓	✓	✓	✓	✓
Core i5-8600T	2.3	9M	6/6	2666	3.7		Intel® UHD Graphics 630	1150	2 ch	35	✓	✓	✓	✓	✓	✓

Continued on next page...

... continued from previous page

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/Threads	Memory Speed Support (DDR4) <sup>2</sup>	Intel® Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked <sup>1</sup>	Graphics	Dynamic Frequency (MHz)	Integrated Memory Controller	TDP (W)	Intel Technologies					
											Intel® SIPP <sup>3</sup>	Intel® vPro™ Technology <sup>4</sup>	ISM <sup>*4</sup>	Intel® TXT	Intel® Boot Guard	Intel® Optane™ Memory Ready <sup>5</sup>
Core i5-8500T	2.1	9M	6/6	2666	3.5		Intel® UHD Graphics 630	1100	2 ch	35	✓	✓	✓	✓	✓	✓
Core i5-8400T	1.7	9M	6/6	2666	3.3		Intel® UHD Graphics 630	1050	2 ch	35			✓		✓	✓
Core i3-8300T	3.2	8M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	35			✓		✓	✓
Core i3-8100T	3.1	6M	4/4	2400	N/A		Intel® UHD Graphics 630	1100	2 ch	35			✓		✓	✓
Pentium Gold G5500T	3.2	4M	2/4	2400	N/A		Intel® UHD Graphics 630	1050	2 ch	35			✓		✓	
Pentium Gold G5400T	3.1	4M	2/4	2400	N/A		Intel® UHD Graphics 610	1050	2 ch	35			✓		✓	
Celeron G4900T	2.9	2M	2/2	2400	N/A		Intel® UHD Graphics 610	1000	2 ch	35					✓	

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards)

All processors support Intel® Virtualization Technology (Intel® VT-x)

<sup>1</sup> See overclocking disclaimer above

<sup>2</sup> DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs

<sup>3</sup> Eligible for Intel® SIPP starting with Coffee Lake-S Corporate Platform availability

<sup>4</sup> When paired with the eligible Intel® 300 Series chipset SKU, availability targeted Q1 2018.

<sup>5</sup> Intel® Optane™ memory requires specific hardware and software configuration. Visit [www.intel.com/Optanememory](http://www.intel.com/Optanememory) for configuration requirements

<sup>6</sup> From 4-core die (54W) and fused 60-core die (58w)

# INTEL® CORE™ X-SERIES PROCESSOR FAMILY



## Intel® Core™ X-Series Processors and Intel® X299 Chipset

The new Intel® Core™ X-series processors deliver the power and flexibility to turn creative vision into reality. Designed for intense multi-threaded workloads, these processors are built for handling creator's most demanding tools and applications.

- Unprecedented scalability from 8 cores to 18 cores
- Fully unlocked for performance tuning<sup>1</sup>
- Featuring Solder Thermal Interface Material (STIM)
- Improved Intel® Turbo Boost Max Technology 3.0
- Intel® Turbo Boost Technology 2.0
- Rebalanced Intel® Smart Cache hierarchy
- Up to 44 PCI Express\* 3.0 lanes on all SKUs
- Support for Optane™ Memory and Intel® Optane™ SSDs



## Intel® Core™ X-Series Processor Family (Basin Falls Refresh) SKUs (LGA) — Socket 2066

Processor Number	Base Frequency (GHz)	Intel® Smart Cache	Cores/Threads	Memory Type	Memory Speed	Intel® Turbo Boost Max Technology 3.0 (GHz)	Intel® Turbo Boost Technology maximum single core turbo frequency (GHz)	Unlocked <sup>1</sup>	PCIe Lanes	Integrated Memory Controller	TDP (W)	PCG	Intel® Technologies			
													Intel® SIPP	Intel® vPro™	ISM <sup>3</sup>	Intel® TXT
i9-9980XE	3.0	24.75M	18/36	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X				✓
i9-9960X	3.1	22M	16/32	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X				✓
i9-9940X	3.3	19.25M	14/28	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X				✓
i9-9920X	3.5	19.25M	12/24	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X				✓
i9-9900X	3.5	19.25M	10/20	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X				✓
i9-9820X	3.3	16.5M	10/20	DDR4	2666	4.2	4.1	✓	44	4 Ch	165	2017X				✓
i7-9800X	3.8	16.5M	8/16	DDR4	2666	4.5	4.4	✓	44	4 Ch	165	2017X				✓

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards)

All processors support Intel® Virtualization Technology (Intel® VT-x)

<sup>1</sup> Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.

<sup>2</sup> Intel® Optane™ memory requires specific hardware and software configuration. Visit [www.intel.com/Optanememoryfor](http://www.intel.com/Optanememoryfor) configuration requirements

<sup>3</sup> Intel® Standard Manageability



# INTEL® 300 SERIES CHIPSETS

## Intel® 300 Series Chipsets

- Supports 9th and 8th Gen Intel® Core™ (Coffee Lake-S) processors
- Support for integrated Intel® Wireless-AC<sup>3</sup>
  - Wi-Fi 802.11ac (160MHz) & Bluetooth\* 5
- Integrated USB 3.1 Gen 2 (10 Gb/s)<sup>3</sup>
- Support for next generation Intel® Optane™ Memory
- Support for Intel® Smart Sound Technology with quad-core audio DSP<sup>3</sup>
- Intel® Platform Trust Technology
- Intel® Boot Guard
- Integrated Gigabit Ethernet MAC
  - Supports Intel® Ethernet Connection I219 (Jacksonville LAN PHY)

<sup>1</sup> Some features and capabilities require SSDs and/or multiple HDDs.

<sup>2</sup> Maximum lanes/port counts available may vary depending on platform implementation.

<sup>3</sup> Certain features may not be present in all system configurations.

<sup>4</sup> Intel SIPP, Intel vPro™, & Intel AMT support requires select Coffee Lake-S processors and select Intel® 300 series chipsets.

<sup>5</sup> Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.

\* Other brands and names may be claimed as the property of others.

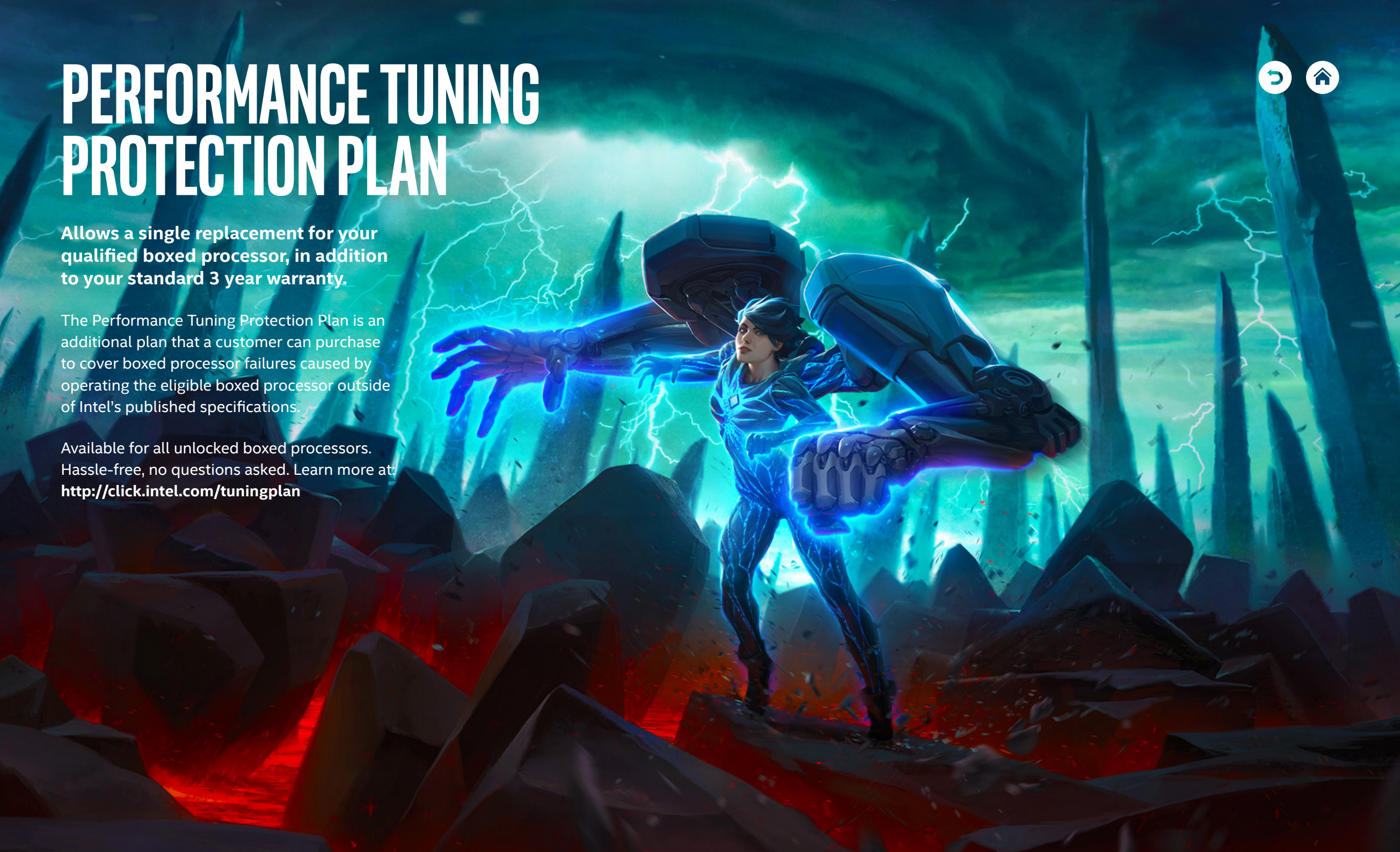
KEY FEATURE DIFFERENTIATION	Q370	Z390	Z370	H370	B365	B360	H310	H310C
Intel® ME Firmware SKU	ME 12 Corporate	ME 12 Consumer	ME 11 Consumer	ME 12 Consumer/Corporate	ME11 Consumer	ME12 Consumer/Corporate	ME 12 Consumer	ME 11 Consumer
Processor PCI Express* 3.0 Configuration Support	1x16 or 2x8 or 1x8+2x4	1x16 or 2x8 or 1x8+2x4	1x16 or 2x8 or 1x8+2x4	1x16	1x16	1x16	1x16	1x16
Independent Display Ports / Pipes Support	3/3	3/3	3/3	3/3	3/3	3/3	3/2	3/2
Memory Channels / DIMMs per Channel	2/2	2/2	2/2	2/2	2/2	2/2	2/1	2/1
Processor Overclocking <sup>5</sup>	No	Yes	Yes	No	No	No	No	No
Integrated Intel® Wireless-AC Support	Yes	Yes	No	Yes	No	Yes	Yes	No
Intel® Smart Sound Technology <sup>3</sup>	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Intel® SIPP Eligible <sup>4</sup>	Yes	No	No	No	No	No	No	No
Intel® vPro™ Technology Eligible <sup>4</sup>	Yes	No	No	No	No	No	No	No
Intel® Active Management Technology <sup>4</sup>	Yes	No	No	No	No	No	No	No
Intel® Standard Manageability	Yes	No	No	No	No	No	No	No
Intel® Optane™ Memory Support	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Integrated SDXC (SDA 3.0) Support	Yes	Yes	No	Yes	No	Yes	Yes	No
Maximum High Speed I/O Lanes	30	30	30	30	30	24	14	14
Total USB Ports (Maximum USB 3.1) <sup>2</sup>	14 (10)	14 (10)	14 (10)	14 (8)	14 (8)	12 (6)	10 (4)	10 (4)
Maximum USB 3.1 Ports: Gen 2 (10 Gb/s) / Gen 1 (5 Gb/s) <sup>2</sup>	6 / 10	6 / 10	0 / 10	4 / 8	0 / 8	4 / 6	0 / 4	0 / 4
Maximum SATA 3.0 Ports (6 Gb/s) <sup>2</sup>	6	6	6	6	6	6	4	4
Maximum PCI Express* 3.0 lanes <sup>2</sup>	24	24	24	20	20	12	6 (Gen 2.0 only)	6 (Gen 2.0 only)
Intel® Rapid Storage Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Intel® RST for PCIe Storage Ports (x2 M.2 or x4 M.2) <sup>2</sup>	3	3	3	2	2	1	0	0
Intel® RST PCIe RAID 0, 1, 5 <sup>1</sup>	Yes	Yes	Yes	Yes	Yes	No	No	No
Intel® RST SATA RAID 0, 1, 5, 10 <sup>1</sup>	Yes	Yes	Yes	Yes	Yes	No	No	No
Intel® Rapid Storage Technology for CPU-attached Intel PCIe Storage <sup>1</sup>	Yes	Yes	Yes	No	No	No	No	No

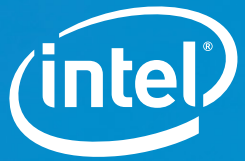
# PERFORMANCE TUNING PROTECTION PLAN

**Allows a single replacement for your qualified boxed processor, in addition to your standard 3 year warranty.**

The Performance Tuning Protection Plan is an additional plan that a customer can purchase to cover boxed processor failures caused by operating the eligible boxed processor outside of Intel's published specifications.

Available for all unlocked boxed processors. Hassle-free, no questions asked. Learn more at: <http://click.intel.com/tuningplan>






# INTEL<sup>®</sup> ETHERNET DESKTOP ADAPTERS

Intel<sup>®</sup> Product Quick Reference Matrix  
Q2 2019

# 1GB INTEL® ETHERNET FOR DESKTOP



PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	PORTS	SUPPORTED SLOT HEIGHTS	HALOGEN FREE	INTELLIGENT OFFLOADS	NETWORK VIRTUALIZATION TECHNOLOGY FOR CONNECTIVITY	STORAGE OVER ETHERNET	INTEL ETHERNET POWER MANAGEMENT <sup>1</sup>	ORDER CODES
 <p>Intel® Gigabit CT Desktop Adapter</p>	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	82574	PCI Express* v2.1 2.5 GT/s, x1 Lane	Single Port	Low Profile and Full Height	N/A	N/A	N/A	iSCSI, NFS, SMB	N/A	EXPI9301CT EXPI9301CTBLK

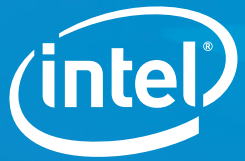
Make the Connection with Intel® Ethernet Adapters at [intel.com/ethernet](https://www.intel.com/ethernet)

<sup>1</sup> Intel Ethernet Power Management includes Energy Efficient Ethernet (EEE) and DMA Coalescing.

Intel and the Intel logo are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

© Intel Corporation



# INTEL<sup>®</sup> BOXED THERMAL SOLUTIONS

Intel<sup>®</sup> Product Quick Reference Matrix  
Q2 2019



## INTEL® THERMAL SOLUTION TS15A

The Intel® Thermal Solution TS15A (air cooling) is an efficient thermal solution for 6th Generation Intel® Core™ processors. It is designed to support a wide range of processor sockets for performance desktops.

### Features

- Supports up to 130 W processors
- Lower cost
- Shock and vibrate compliant and keep out safe
- Supports the LGA 1151/1156/1150
- 3 year limited warranty

MM# 944216  
Product code: BXTS15A

## INTEL® THERMAL SOLUTION TS13A

The Intel® Thermal Solution TS13A (air cooling) is designed for budget-focused cooling requirements. Targeted uses include business, government, and entry-level workstations.

### Features

- Supports up to 140 W processors
- Low cost
- Shock and vibrate compliant and keep out safe
- Supports the LGA2011 and LGA2011-v3 socket only
- 3 year limited warranty

MM# 937425  
Product code: BXTS13A

## INTEL® THERMAL SOLUTION HTS1155LP

The Intel® Thermal Solution HTS1155LP is a compact cooling solution for Thin Mini-ITX based All-in-One PCs, and compatible Mini PCs.

### Features

- Low-profile All-In-One / Small Form Factor thermal solution
- Supports up to 65 W processors in the LGA1155 socket
- Compatible with Thin Mini-ITX desktop boards
- Multiple options for fan placement
- Available now from authorized Intel® distributors
- 3 year limited warranty

MM# 917752  
Product code: BXHTS1155LP

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at <http://www.intel.com/support/processors/sb/CS-034910.htm> or <http://www.intel.com/support/processors/sb/CS-034340.htm>

Copyright © 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Inside, the Intel Inside logo, and Intel Core are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



# INTEL<sup>®</sup> NUC

**SMALL  
PACKAGE.  
BIG  
POTENTIAL.**

## **INTEL<sup>®</sup> NUC**

The Intel<sup>®</sup> NUC is a powerful 4x4-inch mini PC with entertainment, gaming, and productivity features, including a customizable board that is ready to accept the memory, storage, and operating systems that you want.

## **INTEL<sup>®</sup> NUC MINI PCS**

Fully configured Intel<sup>®</sup> NUC with Windows 10 pre-installed.

## **INTEL<sup>®</sup> NUC KITS**

Customizable kit, configurable features - choose memory, storage, and operating system.

## **INTEL<sup>®</sup> NUC BOARDS**

4x4-inch form factor with soldered-on processor.



# INTEL® NUC MINI PCS

**NEW! 8th generation Intel® NUCs, now with Optane!**

The Intel® NUC Mini PC has gotten faster, smaller and smarter! The latest products with 8th generation Intel® Core™ processors are available, including 3 skus with Intel® Optane memory pre-installed for an incredibly responsive PC experience. Combining an incredibly small form factor, cutting-edge technologies and the performance of Intel's latest processors, Intel® NUCs deliver an incredible user experience.

## INTEL® NUC MINI PCS

Fully configured Intel® NUC with Windows 10 pre-installed.

## INTEL® NUC KITS

The Intel® NUC kits are available from various retailers and include a highly customizable four-by-four-inch board that is ready to accept the memory, hard drive, and operating system you choose to install.

## INTEL® NUC BOARDS

The four-by-four-inch Intel® NUC board comes complete with a soldered-on processor. The board can be purchased independently of the kit, giving you the flexibility to choose the chassis that best suits your needs.



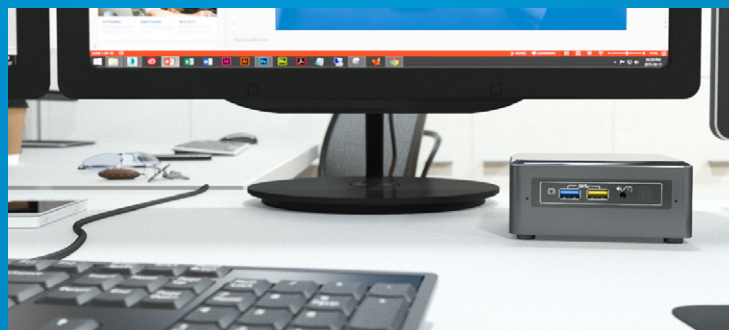
# SMALL PACKAGE, BIG POTENTIAL

The Intel® NUC is an energy-efficient, fully functioning and versatile PC.



## IMMERSIVE GAMING

With a form factor as small as a game controller, but as powerful as a dragon slayer, the Intel® NUC delivers an immersive gaming experience.



## BUSINESS PRODUCTIVITY

The Intel® NUC delivers a fully functioning PC at a fraction of the size, as well as support for VESA\* mount brackets and much more.



## HOME ENTERTAINMENT

Compact and capable, Intel® NUC gives you the performance you need to be organized, connected and enjoy a visually stunning experience.



### FULL SYSTEM

**PRODUCT FAMILY** NUC8i3CYSM

**DESCRIPTION** Intel® NUC 8 Home, a mini PC with Windows® 10

**CPU & GFX** 8th Generation Intel® Core™ i3-8121U  
2.2 GHz - 3.2 GHz Turbo, Dual Core, 4MB Cache, 15W  
AMD Radeon™\* 540 discrete graphics, 2GB GDDR5 graphics memory

**RAM** 8GB Dual-channel LPDDR4-2666

**HDD** 1TB SATA3 HDD pre-installed

**INTEL® OPTANE™ MEMORY** Yes

**OS LOAD** Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded

**DIMENSIONS** 117 x 112 x 52 mm

**CONNECTIVITY** 2x front USB 3.1 (one charging), 2x rear USB 3.1, and 2x internal USB 2.0 via header  
Front Consumer Infrared port

**VIDEO OUTPUTS** 2x HDMI 2.0b ports

**SDXC** SDXC slot with UHS-I support

**NETWORKING** Intel® i219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas

**AUDIO** Up to 7.1 multichannel digital audio via HDMI signals

**ENCLOSURE** Plastic with metal inner frame, replaceable lid, Kensington lock with base security

**POWER ADAPTER** 19V<sub>DC</sub> input range, 19V<sub>DC</sub> 90W power supply with geo-specific AC cords

**INTERNAL HEADERS** Front Panel, CEC, 2x USB2.0 internal headers

**OTHER FEATURES** Microsoft Windows® 10 logo'd, compatible with various Linux distros  
VESA mounting plate included  
Individual retail packaging  
Three-year Warranty



### FULL SYSTEM

**PRODUCT FAMILY** NUC8i3CYSN

**DESCRIPTION** Intel® NUC 8 Home, a mini PC with Windows® 10

**RAM** 4GB Dual-channel LPDDR4-2666



**FULL SYSTEM**

**FULL SYSTEM**

PRODUCT FAMILY	NUC8i7HVKVA	NUC8i7HNKQC
DESCRIPTION	Intel® NUC 8 Enthusiast, a Mini PC with Windows 10	Intel® NUC 8 Business, a Mini PC with Windows 10
CPU & GFX	8th Generation Intel® Core™ i7-8809G, 3.1 GHz - 4.2 GHz Turbo, Quad Core, 8MB Cache, 100W Radeon™ RX Vega M GH graphics, 1063 MHz – 1190 MHz, Unlocked and VR-capable	8th Generation Intel® Core™ i7-8705G, 3.1 GHz - 4.1 GHz Turbo, Quad Core, 8MB Cache, 65W Radeon™ RX Vega M GL graphics, 931 MHz – 1011 MHz
RAM	16GB DDR4-2400 pre-installed, 1.2V; Dual-channel, 32GB maximum	16GB DDR4-2400 pre-installed, 1.2V; Dual-channel, 32GB maximum
SSD	1TB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3; one additional slot free	512GB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3; one additional slot free
OS LOAD	Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded	Windows 10 Professional x64, Intel® Driver & Support Assistant pre-loaded
DIMENSIONS	221 x 142 x 39 mm (1.2 L)	
CONNECTIVITY	Front USB 3.1 Gen2 via USB-C™ and front USB type-A connectors Front charging USB 3.0, 4x rear USB 3.0, 2x internal USB 3.0 and 2x USB 2.0 via headers Front Consumer Infrared port	
VIDEO OUTPUTS	2x Mini DisplayPort 1.2 ports 2x Thunderbolt™ 3 ports Front and rear HDMI 2.0b connectors	
SDXC	SDXC slot with UHS-I support	
NETWORKING	2x Intel® 10/100/1000 Mbps (i219-LM and i210-AT) Ethernet ports Intel® Wireless-AC 8265 M.2 22x30 card, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack, 3.5mm rear speaker / TOSLINK combo jack Beam-forming, far-field, quad-mic array	
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
POWER ADAPTER	19V <sub>DC</sub> 230W power supply with geo-specific AC cords	
INTERNAL HEADERS	Front Consumer Infrared port Common I/O header with Front Panel, CEC, 2x USB 3.0, 2x USB2.0 signals	
OTHER FEATURES	Replaceable lid with customizable RGB LED illumination and front panel status RGB LEDs Microsoft Windows* 10 logo'd, compatible with Windows Server 2016 VESA mounting plate included Individual retail packaging Three-year Warranty	



**FULL SYSTEM**

**FULL SYSTEM**

**FULL SYSTEM**

PRODUCT FAMILY	NUC8i7BEHGA	NUC8i5BEHFA	NUC8i3BEHFA
<b>DESCRIPTION</b>	Intel® NUC 8 Enthusiast, a Mini PC with Windows 10	Intel® NUC 8 Home, a Mini PC with Windows 10	Intel® NUC 8 Home, a Mini PC with Windows 10
<b>CPU &amp; GFX</b>	<b>8th Generation Intel® Core™ i7+ 8559U</b> 2.7 GHz - 4.5 GHz Turbo, Quad Core, 8MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.2 GHz	<b>8th Generation Intel® Core™ i5+ 8259U</b> 2.3 GHz – 3.8 GHz Turbo, Quad Core, 6MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz	<b>8th Generation Intel® Core™ i3-8109U</b> 3.0 GHz - 3.6 GHz, Dual Core, 4MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz
<b>RAM</b>	8GB DDR4-2400 SODIMM pre-installed, 1.2V; Dual-channel, 32GB maximum	4GB DDR4-2400 SODIMM pre-installed, 1.2V; Dual-channel, 32GB maximum	
<b>HDD</b>	2TB SATA3 HDD pre-installed	1TB SATA3 HDD pre-installed	
<b>INTEL® OPTANE™ MEMORY</b>	Intel® Optane™ Memory 32GB pre-installed	Intel® Optane™ Memory 16GB pre-installed	
<b>OS LOAD</b>	Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded		
<b>DIMENSIONS</b>	117 x 112 x 51 mm		
<b>CONNECTIVITY</b>	2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header Front Consumer Infrared port		
<b>VIDEO OUTPUTS</b>	HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port		
<b>NETWORKING</b>	Intel® i219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas		
<b>AUDIO</b>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals		
<b>ENCLOSURE</b>	Plastic with metal inner frame, replaceable lid, Kensington lock with base security		
<b>POWER ADAPTER</b>	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 90W power supply with geo-specific AC cords		
<b>INTERNAL HEADERS</b>	Front Panel, CEC, 2x USB2.0 headers		
<b>OTHER FEATURES</b>	Front panel status RGB LED Microsoft Windows® 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty		



**FULL SYSTEM**

**PRODUCT FAMILY** NUC8i7BEKQA

**DESCRIPTION** Intel® NUC 8 Enthusiast, a Mini PC with Windows 10

**CPU & GFX** 8th Generation Intel® Core™ i7-8559U  
2.7 GHz - 4.5 GHz Turbo, Quad Core, 8MB Cache, 28W  
Intel® Iris™ Plus Graphics 655, 300 MHz – 1.2 GHz

**RAM** 16GB (2x 8GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32GB maximum

**SSD** 512GB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3

**INTEL® OPTANE™ MEMORY**

**OS LOAD** Windows 10 Home x64, Intel® Driver & Support Assistant pre-loaded

**DIMENSIONS** 117 x 112 x 36 mm

**CONNECTIVITY** 2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header  
Front Consumer Infrared port

**VIDEO OUTPUTS** HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port

**NETWORKING** Intel® i219-V 10/100/1000 Mbps Ethernet  
Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas

**AUDIO** Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals

**ENCLOSURE** Plastic with metal inner frame, replaceable lid, Kensington lock with base security

**POWER ADAPTER** 12 – 19V<sub>DC</sub> input range, 19V<sub>DC</sub> 90W power supply with geo-specific AC cord

**INTERNAL HEADERS** Front Panel, CEC, 2x USB2.0 headers

**OTHER FEATURES** Front panel status RGB LED  
Microsoft Windows® 10 logo'd, compatible with various Linux distros  
VESA mounting plate included  
Individual retail packaging  
Three-year Warranty



**FULL SYSTEM**

**PRODUCT FAMILY** NUC8i5BEKPA

**DESCRIPTION** Intel® NUC 8 Home, a Mini PC with Windows 10

**CPU & GFX** 8th Generation Intel® Core™ i5-8259U  
2.3 GHz – 3.8 GHz Turbo, Quad Core, 6MB Cache, 28W  
Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz

**RAM** 8GB (2x 4GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32GB maximum

**SSD** 256GB Intel® NVMe SSD pre-installed, M.2 PCIe X4 Gen3



**FULL SYSTEM**

**FULL SYSTEM**

**FULL SYSTEM**

PRODUCT FAMILY	NUC7i5DNKPC		NUC7i3DNKTC	NUC7i3DNHNC
<b>DESCRIPTION</b>	Intel® NUC 7 Business, a Mini PC with Windows® 10 Pro		Intel® NUC 7 Business, a Mini PC with Windows® 10 Pro	Intel® NUC 7 Business, a Mini PC with Windows® 10 Pro
<b>CPU &amp; GFX</b>	<b>7th Generation Intel® Core™ i5-7300U</b> 2.6 GHz to 3.5 GHz Turbo, Dual Core, 3MB Cache, 15W Intel® HD Graphics 620, 300 MHz - 1.0 GHz Intel® vPro™ Technology, Intel® AMT v11.6		<b>7th Generation Intel® Core™ i3-7100U</b> 2.4 GHz, Dual Core, 3MB Cache, 15W Intel® HD Graphics 620, 300 MHz - 1.0 GHz	
<b>RAM</b>	8GB (2x 4GB) DDR4-2133 SODIMMs pre-installed (1.2V, dual-channel, 32GB maximum)		4GB DDR4-2133 SODIMM pre-installed (1.2V, dual-channel, 32GB maximum)	
<b>HDD</b>	256GB Intel® SSD E 6100p pre-installed, M.2 NVMe		128GB Intel® SSD E 5100s pre-installed, M.2 SATA3	
<b>INTEL® OPTANE™ MEMORY</b>			1TB HDD pre-installed, 2.5" SATA3	
<b>OS LOAD</b>	M.2 22x80 slot available for SSD or Intel® Optane™ Memory			
<b>OS LOAD</b>	Windows 10 Pro* x64 with platform drivers pre-installed			
<b>DIMENSIONS</b>	115 x 111 x 36 mm			115 x 111 x 52 mm
<b>CONNECTIVITY</b>	2x front USB 3.0, 2x rear USB 3.0, 1x internal USB 3.0 header (host & device modes) 2x internal USB 2.0 headers (all USB ports w/ individual power control)			
<b>VIDEO OUTPUTS</b>	Dual HDMI 2.0a (4K 60Hz, HDR), w/HDCP2.2 and basic CEC built-in for 1 port			
<b>NETWORKING</b>	Intel Wireless-AC 8265 vPro™ M.2 22x30 card 802.11ac 2x2 + BT 4.2, internal antennas Intel® i219-LM 10/100/1000 Mbps RJ45 Ethernet		Intel Wireless-AC 8265 M.2 22x30 card 802.11ac 2x2 + BT 4.2, internal antennas Intel® i219-LM 10/100/1000 Mbps RJ45 Ethernet	
<b>AUDIO</b>	Up to 7.1 multichannel (or dual 8-channel) digital audio via HDMI			
<b>ENCLOSURE</b>	Aluminum and plastic chassis, replaceable lid, Kensington lock with base security			
<b>POWER ADAPTER</b>	12 – 24V <sub>DC</sub> input range, 19V <sub>DC</sub> 65W power supply with geo-specific AC cords			
<b>INTERNAL HEADERS</b>	1x internal USB 3.0 header (host & device modes)			Speaker and microphone 3.5mm audio jacks Additional USB 3.0 port
<b>OTHER FEATURES</b>	Microsoft Windows* 10 (logo'd), Windows 10 IOT Enterprise, Windows Server 2016 Supports Ubuntu 16.04 LTS, compatible with various Linux distros Qualified for 24x7 operation VESA mounting plate included Individual brown-box packaging Three-year Warranty			

**FULL SYSTEM**



**FULL SYSTEM**



PRODUCT FAMILY	NUC7i7BNKQ	NUC7i5BNKP
<b>CPU &amp; GFX</b>	<b>7th Generation Intel® Core™ i7-7567U</b> 3.5 GHz to 4.0 GHz Turbo, Dual Core, 4 MB cache, 28W Intel® Iris™ Plus Graphics 650, 300 MHz - 1.1 GHz	<b>7th Generation Intel® Core™ i5-7260U</b> 2.2 GHz up to 3.4 GHz Turbo, Dual Core, 4 MB cache, 15W Intel® Iris™ Plus Graphics 640, 300 MHz - 950 MHz
<b>RAM</b>	16 GB (2x 8 GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32 GB maximum	8 GB (2x 4 GB) DDR4-2400 SODIMMs pre-installed, 1.2V; Dual-channel, 32 GB maximum
<b>SSD</b>	512 GB Intel® 600p SSD pre-installed, M.2 22x80 PCIe X4 Gen3 NVMe	256 GB Intel® 600p SSD pre-installed, M.2 22x80 PCIe X4 Gen3 NVMe
<b>OS LOAD</b>	Windows 10 Home x64, Intel® Remote Keyboard, Intel® Driver & Support Assistant	
<b>DIMENSIONS</b>	115 x 111 x 35 mm	
<b>CONNECTIVITY</b>	Thunderbolt™ 3 (40 Gbps) and USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2 via USB-C™ connector 2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header Front Consumer Infrared port	
<b>VIDEO OUTPUTS</b>	HDMI 2.0a (4K 60Hz, HDR) and DisplayPort 1.2 via Thunderbolt™ 3 (USB-C™) port Both ports support HDCP 2.2	
<b>SDXC</b>	MicroSDXC slot with UHS-I support	
<b>NETWORKING</b>	Intel® I219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
<b>AUDIO</b>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	
<b>ENCLOSURE</b>	Aluminum and plastic with replaceable lid, Kensington lock with base security	
<b>POWER ADAPTER</b>	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 65W wall-wart power supply with replaceable plugs	
<b>INTERNAL HEADERS</b>	Front Panel, CEC, 2x USB2.0	
<b>OTHER FEATURES</b>	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel RGB LED ring Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty	

For more information, visit [www.intel.com/NUC](http://www.intel.com/NUC)



**FULL SYSTEM**

**FULL SYSTEM**

**FULL SYSTEM**

PRODUCT FAMILY	NUC7i7BNHXG	NUC7i5BNHXF	NUC7i3BNHXF
<b>DESCRIPTION</b>	Intel® NUC 7 Enthusiast, a Mini PC with Windows 10	Intel® NUC 7 Home, a Mini PC with Windows 10	Intel® NUC 7 Home, a Mini PC with Windows 10
<b>CPU &amp; GFX</b>	7th Generation Intel® Core™ i7-7567U 3.5 GHz to 4.0 GHz Turbo, Dual Core, 4 MB cache, 28W Intel® Iris™ Plus Graphics 650, 300 MHz - 1.1 GHz	7th Generation Intel® Core™ i5-7260U 2.2 GHz up to 3.4 GHz Turbo, Dual Core, 4 MB cache, 15W Intel® Iris™ Plus Graphics 640, 300 MHz - 950 MHz	7th Generation Intel® Core™ i3-7100U 2.4 GHz, Dual Core, 3 MB cache, 15W Intel® HD Graphics 620, 300 MHz - 1 GHz
<b>RAM</b>	8 GB DDR4-2400 SODIMM pre-installed, 1.2V Dual-channel capable, 32 GB maximum	4 GB DDR4-2400 SODIMM pre-installed Dual-channel capable, 32 GB maximum	
<b>INTEL® OPTANE™ MEMORY</b>	32 GB M.2 22x80 module pre-installed	16 GB M.2 22x80 module pre-installed	
<b>HDD</b>	2 TB SATA3 pre-installed	1 TB SATA3 pre-installed	
<b>USB-C™ PORT</b>	Thunderbolt™ 3 (40 Gbps) and USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2		USB 3.1 Gen2 (10 Gbps) and DisplayPort 1.2
<b>OS LOAD</b>	Windows 10 Home x64, Intel® Remote Keyboard		
<b>DIMENSIONS</b>	115 x 111 x 51 mm		
<b>CONNECTIVITY</b>	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port		
<b>VIDEO OUTPUTS</b>	HDMI 2.0a (4K 60Hz, HDR) and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port; Both ports support HDCP 2.2		
<b>SDXC</b>	MicroSDXC slot with UHS-I support		
<b>NETWORKING</b>	Intel® I219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas		
<b>AUDIO</b>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals; 3.5mm front headset jack		
<b>ENCLOSURE</b>	Aluminum and plastic with replaceable lid, Kensington lock with base security		
<b>POWER ADAPTER</b>	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 65W wall-wart power supply with replaceable plugs		
<b>INTERNAL HEADERS</b>	Front Panel, CEC, 2x USB2.0		
<b>OTHER FEATURES</b>	Microsoft Windows® 10 logo'd, compatible with various Linux distros Front panel RGB LED ring Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty		





**FULL SYSTEM**

**PRODUCT FAMILY** NUC7CJYSAL

**DESCRIPTION** Intel® NUC 7 Enthusiast, a Mini PC with Windows 10

**CPU & GFX** Intel® Celeron® J4005  
Intel® HD Graphics 600, 700 MHz

**RAM** 4 GB DDR4-2400 SODIMM pre-installed, 1.2V  
Dual-channel capable, 8 GB maximum

**OS LOAD** Windows 10 Home x64, Intel® Remote Keyboard, Intel® Driver & Support Assistant

**FLASH STORAGE** 32 GB eMMC v5.1

**2.5" SATA3** 9.5mm bay and port

**DIMENSIONS** 115 x 111 x 49 mm

**CONNECTIVITY** 2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port

**VIDEO OUTPUTS** 2x HDMI 2.0a (4K 60Hz, HDR); Both ports support HDCP 2.2

**SDXC** SDXC slot with UHS-I support

**NETWORKING** Intel® I218-V 10/100/1000 Mbps Ethernet ; Intel® Wireless-AC 9462 soldered-down, IEEE 802.11ac 1x1 + Bluetooth v5, internal antennas

**AUDIO** Up to 7.1 multichannel digital audio via HDMI  
3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack

**ENCLOSURE** Plastic with metal inner frame, replaceable lid, Kensington lock with base security

**POWER ADAPTER** 12 – 19V<sub>DC</sub> input range, 19V<sub>DC</sub> 65W power supply with replaceable AC cords

**INTERNAL HEADERS** Front Panel, CEC, RGB LED, 2x USB2.0

**OTHER FEATURES** Microsoft Windows® 10 logo'd, compatible with various Linux distros  
Front panel status RGB LED  
Built-in dual-array microphones  
VESA mounting plate included  
Individual retail packaging  
Three-Year Warranty



**FULL SYSTEM**

**PRODUCT FAMILY** NUC6CAYS

**DESCRIPTION** Intel® NUC Mini PC

**CPU & GFX** Intel® Celeron® J3455  
Intel® HD graphics 500

**RAM** 2Gb DDR3L-1600 module preinstalled, 1.3V  
Dual-channel DDR3L-1866 SODIMMs, 8GB maximum

**OS LOAD**

**2.5" SATA3** Supported

**DIMENSIONS**

**CONNECTIVITY** Two front USB 3.0 (one charging), two rear USB 3.0, 2 internal USB 2.0 via header

**VIDEO OUTPUTS** HDMI; VGA

**SDXC** SDXC slot with UHS-I support on the side

**NETWORKING** Intel® Wireless-AC 3168  
10/100/1000 Mbps Ethernet

**AUDIO** Up to 7.1 multichannel digital audio via HDMI  
3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack

**ENCLOSURE** Replaceable lid

**POWER ADAPTER** Multi-country plugs (IEC types A/C/G/I)

**INTERNAL HEADERS**

**OTHER FEATURES** Consumer Infrared sensor on front panel  
Windows 10 Home pre-installed with latest Intel® drivers  
3-year Advanced Warranty Replacement

# INTEL® NUC MINI PC SUMMARY



INTEL® NUC	PROCESSOR <sup>5</sup>	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCI Express®	AUDIO	USB 3 EXT+ INT	USB 2 EXT+ INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC8i3CYSM	Intel® Core™ i3-8121U	LPDDR4	2	Yes	2x HDMI 2.0b	1 M.2	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	AMD Radeon™* 540 discrete graphics
NUC8i3CYSN	Intel® Core™ i3-8121U	LPDDR4	1	Yes	2x HDMI 2.0b	1 M.2	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	AMD Radeon™* 540 discrete graphics
NUC8i7HKVA	Intel® Core™ i7-8809G	DDR4	2	Yes	2x HDMI 2.0b 2x Mini DisplayPort 1.2	1 M.2	7.1 digital (HDMI or DP)	5 + 2	0 + 2	GbE + WiFi*	No	Thunderbolt™ 3
NUC8i7HNKQC	Intel® Core™ i7-8705G	DDR4	2	Yes	2x HDMI 2.0b 2x Mini DisplayPort 1.2	1 M.2	7.1 digital (HDMI or DP)	5 + 2	0 + 2	GbE + WiFi*	No	Thunderbolt™ 3
NUC8i7BEHGA	Intel® Core™ i7+ 8559U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Intel® Optane™ Memory; Thunderbolt™ 3
NUC8i5BEHFA	Intel® Core™ i5+ 8259U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Intel® Optane™ Memory; Thunderbolt™ 3
NUC8i3BEHFA	Intel® Core™ i3-8109U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Intel® Optane™ Memory; Thunderbolt™ 3
NUC8i7BEKQA	Intel® Core™ i7-8559U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Thunderbolt™ 3
NUC8i5BEKPA	Intel® Core™ i5-8259U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics; Thunderbolt™ 3
NUC7i5DNKPC	Intel® Core™ i5-7300U	DDR4	2	Yes	Dual HDMI 2.0a; w/HDCP2.2	1 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	No	Intel® HD graphics; Intel® vPro™ Technology
NUC7i3DNKTC	Intel® Core™ i3-7100U	DDR4	1	Yes	Dual HDMI 2.0a; w/HDCP2.2	1 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i3DNHNC	Intel® Core™ i3-7100U	DDR4	1	Yes	Dual HDMI 2.0a; w/HDCP2.2	1 M.2	7.1 digital (HDMI)	5 + 1	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i7BNKQ	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNKP	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i7BNHXG	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNHXF	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i3BNHXF	Intel® Core™ i3-7100U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7CJYSAL	Intel® Celeron® J4005	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC6CAYS	Intel® Celeron™ J3455	DDR3L	2	Yes	HDMI* + VGA	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics



PRODUCT FAMILY	NUC7i7BNH	NUC7i5BNH	NUC7i5BNK
KIT / BOARD	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A	N/A
PROCESSOR	Intel® Core™ i7-7567U	Intel® Core™ i5-7260U	Intel® Core™ i5-7260U
CHIPSET	N/A	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® Iris™ Plus graphics 650	Intel® Iris™ Plus graphics 640	Intel® Iris™ Plus graphics 640
DISPLAY OUTPUTS	HDMI DisplayPort	HDMI DisplayPort	HDMI DisplayPort
MEMORY SUPPORT <sup>4</sup>	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 2 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	Yes	Yes
EXPANSION CONNECTORS	M.2 Support	M.2 Support	M.2 Support
AUDIO <sup>3</sup>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet; Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included
TRUSTED PLATFORM MODULE	N/A	N/A	N/A
LEAD-FREE	Yes	Yes	Yes
BIOS	Intel® Visual BIOS Intel® Express BIOS update support	Intel® Visual BIOS Intel® Express BIOS update support	Intel® Visual BIOS Intel® Express BIOS update support
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support



PRODUCT FAMILY	NUC7i7DNKE	NUC7i7DNHE
DESCRIPTION	Intel® NUC 7 Business Mini PC Kit	
CPU & GFX	8th Generation Intel® Core™ i7-8650U 1.90 GHz to 4.20 GHz Turbo, Quad Core, 8MB Cache, 15W TDP Intel® UHD Graphics 620, 300 MHz – 1.15 GHz Intel® vPro™ Technology, Intel® AMT v11.6	
RAM	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum	
HDD	SATA3 data and power connectors	SATA3 data, power, 9.5mm bay
INTEL® OPTANE™ MEMORY	Intel® Optane™ Memory ready	
OS LOAD	Microsoft Windows* 10 Pro (logo'd), supports Windows 10 IOT Enterprise, Windows Server 2016	
DIMENSIONS	115 x 111 x 36 mm	115 x 111 x 52 mm
CONNECTIVITY	2x front USB 3.0, 2x rear USB 3.0, 1x internal USB 3.0 header (host & device modes)	
VIDEO OUTPUTS	Dual HDMI 2.0a with basic CEC built-in for 1 port	
NETWORKING	Intel® i219-LM 10/100/1000 Mbps Ethernet	
AUDIO	Up to 7.1 multichannel (or dual 8-channel) digital audio via HDMI	
ENCLOSURE	Aluminum and plastic chassis, replaceable lid, Kensington lock with base security; Back panel opening w/DB9 bracket (DNHE)	
POWER ADAPTER	12 – 24V <sub>DC</sub> rear jack, internal 2x2 connector; 19V <sub>DC</sub> 65W power supply with geo-specific AC cords	
INTERNAL HEADERS	2x internal USB 2.0 headers (all USB ports with individual USB power control) Internal 4-lane eDP 1.4 connector	
OTHER FEATURES	Aluminum and plastic, replaceable lid, Kensington lock with base security Certified with Ubuntu* 16.04 LTS; compatible with various Linux distros Qualified for 24x7 operation VESA mounting plate included Individual brown-box packaging Three-year Warranty	



PRODUCT FAMILY	NUC8i7HVK	NUC8i7HNK
CPU & GFX	<b>8th Generation Intel® Core™ i7-8809G</b> 3.1 GHz - 4.2 GHz Turbo, Quad Core, 8MB Cache, 100W Radeon™ RX Vega M GH graphics, 1063 MHz – 1190 MHz Unlocked and VR-capable	<b>8th Generation Intel® Core™ i7-8705G</b> 3.1 GHz - 4.1 GHz Turbo, Quad Core, 8MB Cache, 65W Radeon™ RX Vega M GL graphics, 931 MHz – 1011 MHz
RAM	Dual channel DDR4-2400+ SODIMMs, 1.2V, 32GB maximum	
SSD	2x M.2 22x42/80 key M slots for PCIe x4 Gen3 NVMe / AHCI or SATA3 SSD, RAID-0 and RAID-1 capable	
DIMENSIONS	221 x 142 x 39 mm (1.2 L)	
CONNECTIVITY	Front USB 3.1 Gen2 via USB-C™ and front USB type-A connectors Front charging USB 3.0, 4x rear USB 3.0, 2x internal USB 3.0 and 2x USB 2.0 via headers Front Consumer Infrared port	
VIDEO OUTPUTS	Front and rear HDMI 2.0b connectors 2x Mini DisplayPort 1.2 ports 2x Thunderbolt™ 3 ports	
SDXC	SDXC slot with UHS-I support	
NETWORKING	2x Intel® 10/100/1000 Mbps (i219-LM and i210-AT) Ethernet ports Intel® Wireless-AC 8265 M.2 22x30 card, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
AUDIO	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack, 3.5mm rear speaker / TOSLINK combo jack Beam-forming, far-field, quad-mic array	
ENCLOSURE	Replaceable lid with customizable RGB LED illumination and front panel status RGB LEDs Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
POWER ADAPTER	19V <sub>DC</sub> 230W power supply with geo-specific AC cords	
INTERNAL HEADERS	Common I/O header with Front Panel, CEC, 2x USB 3.0, 2x USB2.0 signals	
OTHER FEATURES	Microsoft Windows® 10 logo'd, compatible with Windows Server 2016 VESA mounting plate included Individual retail packaging Three-year Warranty	



PRODUCT FAMILY	NUC8i7BEH	NUC8i5BEH	NUC8i5BEK
<b>CPU &amp; GFX</b>	<b>8th Generation Intel® Core™ i7-8559U</b> 2.7 GHz - 4.5 GHz Turbo, Quad Core, 8MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.2 GHz	<b>8th Generation Intel® Core™ i5-8259U</b> 2.3 GHz – 3.8 GHz Turbo, Quad Core, 6MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz	
<b>RAM</b>	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum		
<b>INTEL® OPTANE™ MEMORY</b>	Intel® Optane™ Memory supported		-
<b>HDD</b>	2.5" 9.5mm SATA3 bay and port		SATA3 port only
<b>USB-C™ PORT</b>	Yes		
<b>DIMENSIONS</b>	117 x 112 x 51 mm		117 x 112 x 36 mm
<b>CONNECTIVITY</b>	2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header Front Consumer Infrared port		
<b>VIDEO OUTPUTS</b>	HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port Thunderbolt™ 3 port		
<b>SDXC</b>	MicroSDXC slot with UHS-I support		
<b>NETWORKING</b>	Intel® i219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas		
<b>AUDIO</b>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack Beam-forming, far-field, dual-mic array		
<b>ENCLOSURE</b>	Plastic with metal inner frame, replaceable lid, Kensington lock with base security		
<b>POWER ADAPTER</b>	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 90W power supply with geo-specific AC cords		
<b>INTERNAL HEADERS</b>	Front Panel, CEC, RGB LED, 2x USB2.0 headers; Front panel status RGB LED		
<b>OTHER FEATURES</b>	Microsoft Windows® 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty		



PRODUCT FAMILY	NUC8i3BEH	NUC8i3BEK
<b>CPU &amp; GFX</b>	<b>8th Generation Intel® Core™ i3-8109U</b> 3.0 GHz - 3.6 GHz, Dual Core, 4MB Cache, 28W Intel® Iris™ Plus Graphics 655, 300 MHz – 1.05 GHz	
<b>RAM</b>	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum	
<b>INTEL® OPTANE™ MEMORY</b>	Intel® Optane™ Memory supported	-
<b>HDD</b>	2.5" 9.5mm SATA3 bay and port	SATA3 port only
<b>USB-C™ PORT</b>	Yes	
<b>DIMENSIONS</b>	117 x 112 x 51 mm	117 x 112 x 36 mm
<b>CONNECTIVITY</b>	2x front USB 3.1 Gen2 (one charging), 2x rear USB 3.1 Gen2, and 2x internal USB 2.0 via header Front Consumer Infrared port	
<b>VIDEO OUTPUTS</b>	HDMI 2.0a and DisplayPort 1.2 via Thunderbolt™ 3 / USB-C™ port Thunderbolt™ 3 port	
<b>SDXC</b>	MicroSDXC slot with UHS-I support	
<b>NETWORKING</b>	Intel® i219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 9560 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v5, internal antennas	
<b>AUDIO</b>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack Beam-forming, far-field, dual-mic array	
<b>ENCLOSURE</b>	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	
<b>POWER ADAPTER</b>	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 90W power supply with geo-specific AC cords	
<b>INTERNAL HEADERS</b>	Front Panel, CEC, RGB LED, 2x USB2.0 headers; Front panel status RGB LED	
<b>OTHER FEATURES</b>	Microsoft Windows® 10 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty	



PRODUCT FAMILY	NUC7i3BNH	NUC7i3BNK
KIT / BOARD	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	Intel® Core i3-7100U	Intel® Core i3-7100U
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	HDMI DisplayPort	HDMI DisplayPort
MEMORY SUPPORT <sup>4</sup>	Dual-channel DDR4 SODIMMs 1.2V, 2133 MHz, 32GB maximum	Dual-channel DDR4 SODIMMs 1.2V, 2133 MHz, 32GB maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	M.2 Support	M.2 Support
AUDIO <sup>3</sup>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
USB PORTS	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
ONBOARD LAN	Intel® 219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® 219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265
POWER CORD OPTION	Multi-country plugs (IEC types A/C/G/I)	Multi-country plugs (IEC types A/C/G/I)
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS Intel® Express BIOS update support	Intel® Visual BIOS Intel® Express BIOS update support
WARRANTY	3-year Advanced Warranty Replacement	3-year Advanced Warranty Replacement
OTHER	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support





PRODUCT FAMILY	NUC7PJYH	NUC7CJYH
DESCRIPTION	-	-
CPU & GFX	Intel® Pentium® J5005 Intel® HD Graphics 605, 800 MHz	Intel® Celeron® J4005 Intel® HD Graphics 600, 700 MHz
RAM	Dual channel DDR4-2400 SODIMMs, 1.2V, 8 GB maximum	Dual channel DDR4-2400 SODIMMs, 1.2V, 8 GB maximum
OS LOAD	-	-
FLASH STORAGE	-	-
2.5" SATA3	9.5mm bay and port	9.5mm bay and port
DIMENSIONS	115 x 111 x 49 mm	115 x 111 x 49 mm
CONNECTIVITY	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header; Front Consumer Infrared port
VIDEO OUTPUTS	2x HDMI 2.0a (4K 60Hz, HDR); Both ports support HDCP 2.2	2x HDMI 2.0a (4K 60Hz, HDR); Both ports support HDCP 2.2
SDXC	SDXC slot with UHS-I support	SDXC slot with UHS-I support
NETWORKING	Intel® I218-V 10/100/1000 Mbps Ethernet ; Intel® Wireless-AC 9462 soldered-down, IEEE 802.11ac 1x1 + Bluetooth v5, internal antennas	Intel® I218-V 10/100/1000 Mbps Ethernet ; Intel® Wireless-AC 9462 soldered-down, IEEE 802.11ac 1x1 + Bluetooth v5, internal antennas
AUDIO	Up to 7.1 multichannel digital audio via HDMI; 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack	Up to 7.1 multichannel digital audio via HDMI; 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack
ENCLOSURE	Plastic with metal inner frame, replaceable lid, Kensington lock with base security	Plastic with metal inner frame, replaceable lid, Kensington lock with base security
POWER ADAPTER	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 65W power supply with replaceable AC cords	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 65W power supply with replaceable AC cords
INTERNAL HEADERS	Front Panel, CEC, RGB LED, 2x USB2.0	Front Panel, CEC, RGB LED, 2x USB2.0
OTHER FEATURES	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel status RGB LED Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty	Microsoft Windows* 10 logo'd, compatible with various Linux distros Front panel status RGB LED Built-in dual-array microphones VESA mounting plate included Individual retail packaging Three-Year Warranty



PRODUCT FAMILY	NUC7i5DNHE	NUC7i5DNKE
KIT / BOARD	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	BLKNUC7i5DNHE	BLKNUC7i5DNKE
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology	Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 620	Intel® HD graphics 620
DISPLAY OUTPUTS	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port
MEMORY SUPPORT <sup>4</sup>	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	No
EXPANSION CONNECTORS	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header
AUDIO <sup>3</sup>	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports
USB PORTS	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers
ONBOARD LAN	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265
POWER DELIVERY	19V 65W AC power adapter	19V 65W AC power adapter
TRUSTED PLATFORM MODULE	Yes (TPM v2.0); Worldwide and China-specific options	Yes (TPM v2.0); Worldwide and China-specific options
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS	Intel® Visual BIOS
WARRANTY	3 year limited warranty	3 year limited warranty
OTHER	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Backpanel opening w/DB9 bracket; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; Intel® Optane™ Memory support; VESA mounting plate included	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; VESA mounting plate included



	NUC7i3DNHE	NUC7i3DNKE
<b>PRODUCT FAMILY</b>	NUC7i3DNHE	NUC7i3DNKE
<b>KIT / BOARD</b>	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
<b>5-PACK OUTERCASE</b>	BLKNUC7i3DNHE	BLKNUC7i3DNKE
<b>10-PACK PRODUCT CODE</b>	N/A	N/A
<b>PROCESSOR</b>	Intel® Core™ i3-7100U	Intel® Core™ i3-7100U
<b>CHIPSET</b>	N/A	N/A
<b>INTEGRATED GRAPHICS CORE<sup>2</sup></b>	Intel® HD graphics 620	Intel® HD graphics 620
<b>DISPLAY OUTPUTS</b>	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port
<b>MEMORY SUPPORT<sup>4</sup></b>	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum
<b>2.5" HDD SUPPORT</b>	Yes	No
<b>EXPANSION CONNECTORS</b>	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card Serial port header HDMI CEC header
<b>AUDIO<sup>3</sup></b>	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports
<b>USB PORTS</b>	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header Two internal USB 2.0 port headers
<b>ONBOARD LAN</b>	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection Intel® Wireless-AC 8265
<b>POWER DELIVERY</b>	19V 65W AC power adapter	19V 65W AC power adapter
<b>TRUSTED PLATFORM MODULE</b>	N/A	N/A
<b>LEAD-FREE</b>	Yes	Yes
<b>BIOS</b>	Intel® Visual BIOS	Intel® Visual BIOS
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty
<b>OTHER</b>	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Backpanel opening w/DB9 bracket; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; Intel® Optane™ Memory support; VESA mounting plate included	Replaceable lid; 3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header; Kensington lock with base security; VESA mounting plate included



PRODUCT FAMILY	NUC6CAYH	NUC5CPYH
KIT / BOARD	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
5-PACK OUTERCASE	N/A	N/A
10-PACK PRODUCT CODE	N/A	N/A
PROCESSOR	Intel® Celeron® J3455	Intel® Celeron® J3060
CHIPSET	N/A	N/A
INTEGRATED GRAPHICS CORE <sup>2</sup>	Intel® HD graphics 500	Intel® HD Graphics
DISPLAY OUTPUTS	HDMI VGA	HDMI VGA
MEMORY SUPPORT <sup>4</sup>	Dual-channel DDR3L-1866 SODIMMs 1.35V, 8GB maximum	Single Channel DDR3L SODIMM 1.35V, 1333/1600 MHz, 8GB <sup>4</sup> maximum
2.5" HDD SUPPORT	Yes	Yes
EXPANSION CONNECTORS	SDXC slot with UHS-I support on the side	M.2 support; SDXC slot with UHS-I support on the side
AUDIO <sup>3</sup>	Up to 7.1 multichannel digital audio via HDMI 3.5mm front headset jack, 3.5mm rear speaker / TOSLINK combo jack	Eight-Channel (7.1) digital audio via Mini HDMI 1.4a output, two-channel via headphone jack
USB PORTS	Two front USB 3.0 (one charging), two rear USB 3.0, 2 internal USB 2.0 via header	Four USB 3.0 ports (two front panel with one being charging capable, two back panel) and two USB 2.0 ports (via internal header)
ONBOARD LAN	Intel® Wireless-AC 3168 10/100/1000 Mbps Ethernet	Intel® 10/100/1000 Network Connection Intel® Wireless-AC 3165
POWER CORD OPTION	Multi-country plugs (IEC types A/C/G/I)	Multi-country plugs (IEC types A/C/G/I)
TRUSTED PLATFORM MODULE	N/A	N/A
LEAD-FREE	Yes	Yes
BIOS	Intel® Visual BIOS Intel® Express BIOS update support	Intel® Visual BIOS BIOS Vault Technology Fast Boot
WARRANTY	3-year Advanced Warranty Replacement	3-year Advanced Warranty Replacement
OTHER	Replaceable lid Consumer Infrared sensor on front panel	Replaceable lid Consumer Infrared sensor on front panel



PRODUCT FAMILY	NUC5i3RYHS	NUC5i3RYHSN
<b>CPU &amp; GFX</b>	<b>5th Generation Intel® Core™ i3-5005U</b> 2.0 GHz, Dual Core, 3MB Cache, 15W Intel® HD Graphics 5500, 300 MHz – 850 MHz	<b>5th Generation Intel® Core™ i3-5005U</b> 2.0 GHz, Dual Core, 3MB Cache, 15W Intel® HD Graphics 5500, 300 MHz – 850 MHz
<b>RAM</b>	DDR3L-1600 SODIMMs, 1.35V; Dual-channel, 16GB maximum	4GB (2x 2GB) DDR3L-1600 SODIMMs pre-installed, 1.35V; Dual-channel, 16GB maximum
<b>2.5" HDD SUPPORT</b>	2.5" 9.5mm SATA3 bay and port	1TB SATA3 HDD pre-installed
<b>STORAGE</b>	M.2 22x42/60/80 key M slot for PCIe x4 Gen2 NVMe / AHCI SSD	
<b>DIMENSIONS</b>	115 x 111 x 49 mm	
<b>CONNECTIVITY</b>	2x front USB 3.0 (one charging), 2x rear USB 3.0, and 2x internal USB 2.0 via header Front Consumer Infrared port	
<b>VIDEO OUTPUTS</b>	Mini HDMI 1.4a and Mini DisplayPort 1.2	
<b>NETWORKING</b>	Intel® i218-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 7265 soldered-down, IEEE 802.11ac 2x2 + Bluetooth v4.2, internal antennas	
<b>AUDIO</b>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front stereo headset jack	
<b>ENCLOSURE</b>	Aluminum chassis, replaceable lid, Kensington lock	
<b>POWER ADAPTER</b>	12 – 19V <sub>DC</sub> input range, 19V <sub>DC</sub> 65W wall-wart power supply with replaceable plugs	
<b>INTERNAL HEADERS</b>	AUX_PWR, 2x USB2.0 headers	
<b>OTHER FEATURES</b>	Microsoft Windows* 10, 8.1, 7 logo'd, compatible with various Linux distros VESA mounting plate included Individual retail packaging Three-year Warranty	

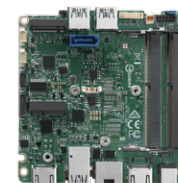
# INTEL® NUC KITS<sup>1</sup>, WITH INTEL OPTANE MEMORY



	<b>NUC7i7BNHX</b>	<b>NUC7i5BNHX</b>	<b>NUC7i3BNHX</b>
<b>PRODUCT FAMILY</b>	<b>NUC7i7BNHX</b>	<b>NUC7i5BNHX</b>	<b>NUC7i3BNHX</b>
<b>KIT / BOARD</b>	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>	Intel® NUC Kit <sup>1</sup>
<b>5-PACK OUTERCASE</b>	N/A	N/A	N/A
<b>10-PACK PRODUCT CODE</b>	N/A	N/A	N/A
<b>PROCESSOR</b>	Intel® Core™ i7-7567U	Intel® Core™ i5-7260U	Intel® Core™ i3-7100U
<b>CHIPSET</b>	N/A	N/A	N/A
<b>INTEGRATED GRAPHICS CORE<sup>2</sup></b>	Intel® Iris™ Plus graphics 650	Intel® Iris™ Plus graphics 640	Intel® HD graphics 620
<b>DISPLAY OUTPUTS</b>	HDMI; DisplayPort	HDMI; DisplayPort	HDMI; DisplayPort
<b>MEMORY SUPPORT<sup>4</sup></b>	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel DDR4-2133 SODIMM, 1.2V, 32 GB <sup>4</sup> maximum
<b>2.5" HDD SUPPORT</b>	Yes	Yes	Yes
<b>EXPANSION CONNECTORS</b>	M.2 Populated with 16GB Intel® Optane™ memory module	M.2 Populated with 16GB Intel® Optane™ memory module	M.2 Populated with 16GB Intel® Optane™ memory module
<b>AUDIO<sup>3</sup></b>	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack	Up to 7.1 multichannel digital audio via HDMI or DisplayPort signals 3.5mm front headset jack
<b>USB PORTS</b>	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header	Two front USB 3.0 (one for charging), two rear USB 3.0, two internal USB 2.0 via header
<b>ONBOARD LAN</b>	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265	Intel® (219-V 10/100/1000 Mbps Ethernet Intel® Wireless-AC 8265
<b>POWER CORD OPTION</b>	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included	Multi-country plug (Types A/C/G/I) included
<b>TRUSTED PLATFORM MODULE</b>	N/A	N/A	N/A
<b>LEAD-FREE</b>	Yes	Yes	Yes
<b>BIOS</b>	Intel® Visual BIOS Intel® Express BIOS update support	Intel® Visual BIOS Intel® Express BIOS update support	Intel® Visual BIOS Intel® Express BIOS update support
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty	3 year limited warranty
<b>OTHER</b>	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support	Replaceable lid Consumer Infrared sensor on front panel Micro SDXC slot with UHS-I support

## Intel® NUC Kit<sup>1</sup> Summary

INTEL® NUC	PROCESSOR <sup>5</sup>	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCI Express®	AUDIO	USB 3 EXT+ INT	USB 2 EXT+ INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC7i7BNH	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i5BNH	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i5BNK	Intel® Core™ i5-7260U	DDR4	2	No	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i7DNKE	Intel® Core™ i7-8650U	DDR4	2	No	Dual HDMI 2.0a	2 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	Intel® UHD Graphics 620; Intel® vPro™ Technology
NUC7i7DNHE	Intel® Core™ i7-8650U	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	Intel® UHD Graphics 620; Intel® vPro™ Technology
NUC8i7HVK	Intel® Core™ i7-8809G	DDR4	2	Yes	HDMI 2.0b + DP1.2	2 M.2	7.1 digital (HDMI or DP)	4 + 2	0 + 2	GbE + WiFi*	No	Radeon™ RX Vega M GH graphics
NUC8i7HNK	Intel® Core™ i7-8705G	DDR4	2	Yes	HDMI 2.0b + DP1.2	2 M.2	7.1 digital (HDMI or DP)	4 + 2	0 + 2	GbE + WiFi*	No	Radeon™ RX Vega M GL graphics
NUC8i7BEH	Intel® Core™ i7-8559U	DDR4	2	Yes	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Optane™ Memory supported; Intel® Iris™ Plus Graphics 655
NUC8i5BEH	Intel® Core™ i5-8259U	DDR4	2	Yes	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Optane™ Memory supported; Intel® Iris™ Plus Graphics 655
NUC8i5BEK	Intel® Core™ i5-8259U	DDR4	2	No	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics 655
NUC8i3BEH	Intel® Core™ i3-8109U	DDR4	2	Yes	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Optane™ Memory supported; Intel® Iris™ Plus Graphics 655
NUC8i3BEK	Intel® Core™ i3-8109U	DDR4	2	No	HDMI 2.0b + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus Graphics 655
NUC7i3BNH	Intel® Core™ i3-7100U	DDR4	2	Yes	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7i3BNK	Intel® Core™ i3-7100U	DDR4	2	No	HDMI* + DP1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC7PJYH	Intel® Pentium® J5005	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7CJYH	Intel® Celeron® J4005	DDR4	2	Yes	HDMI*	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR
NUC7i5DNHE	Intel® Core™ i5-7300U	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, vPro, TPM, Serial, Int Exp.
NUC7i5DNKE	Intel® Core™ i5-7300U	DDR4	2	No	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, vPro, TPM, Serial
NUC7i3DNHE	Intel® Core™ i3-7100U	DDR4	2	Yes	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, Serial, Int Exp.
NUC7i3DNKE	Intel® Core™ i3-7100U	DDR4	2	No	Dual HDMI 2.0a	2 M.2	Dual 7.1 digital (HDMI)	4 + 1	0 + 2	GbE + WiFi*	Yes	24x7, Serial
NUC6CAYH	Intel® Celeron® J3455	DDR3L	2	Yes	HDMI* + VGA	0	7.1 digital (HDMI)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics
NUC5CPYH	Intel® Celeron® N3050	DDR3L	1	Yes	mHDMI* + VGA	1 M.2	8-ch + 2-ch	4 + 0	0 + 2	GbE + WiFi*	No	CIR
NUC5i3RYHS	Intel® Core™ i3-5005U	DDR3L	2	Yes	Mini HDMI 1.4a + Mini DP 1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD Graphics 5500; CIR
NUC5i3RYHSN	Intel® Core™ i3-5005U	DDR3L	2	Yes	Mini HDMI 1.4a + Mini DP 1.2	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD Graphics 5500; CIR
NUC7i7BNHXG	Intel® Core™ i7-7567U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i5BNHXF	Intel® Core™ i5-7260U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® Iris™ Plus graphics; Thunderbolt 3; CIR
NUC7i3BNHXF	Intel® Core™ i3-7100U	DDR4	2	Yes	HDMI 2.0a; USB-C (DP1.2)	1 M.2	7.1 digital (HDMI or DP)	4 + 0	0 + 2	GbE + WiFi*	No	Intel® HD graphics; CIR



PRODUCT FAMILY	NUC7i5DNBE	NUC7i3DNBE	DE3815TYBE
<b>KIT / BOARD</b>	Intel® NUC Board	Intel® NUC Board	Intel® NUC Board
<b>5-PACK OUTERCASE</b>	BLKNUC7i5DNKE	BLKNUC7i5DNKE	N/A
<b>10-PACK PRODUCT CODE</b>	N/A	N/A	BLKDE3815TYBE
<b>PROCESSOR</b>	Intel® Core™ i5-7300U Processor with Intel® vPro™ Technology	Intel® Core™ i3-7100U Processor	Intel® Atom™ E3815
<b>CHIPSET</b>	N/A	N/A	N/A
<b>INTEGRATED GRAPHICS CORE<sup>2</sup></b>	Intel® HD graphics 620	Intel® HD graphics 620	Intel® HD graphics
<b>DISPLAY OUTPUTS</b>	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector	HDMI*; VGA; eDP*
<b>MEMORY SUPPORT<sup>4</sup></b>	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum	Dual-Channel SODIMM DDR4 2133 / 1.2V, 32 GB <sup>4</sup> maximum	Single-Channel SODIMM DDR3L 1333 / 1600 MHz, 1.35V, 8 GB <sup>4</sup> maximum
<b>2.5" HDD SUPPORT</b>	Yes	Yes	Yes
<b>EXPANSION CONNECTORS</b>	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card; Serial port header; HDMI CEC header	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card; Serial port header; HDMI CEC header	One half-size PCI Express* Mini Card
<b>AUDIO<sup>3</sup></b>	Dual Eight-Channel (7.1) digital audio via HDMI ports	Dual Eight-Channel (7.1) digital audio via HDMI ports	Eight-Channel (7.1) digital audio via HDMI 1.4a output, two-channel via headphone jack
<b>USB PORTS</b>	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header; Two internal USB 2.0 port headers	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header; Two internal USB 2.0 port headers	One USB 3.0 port (front panel), five USB 2.0 ports (two external ports and three additional ports via internal headers)
<b>ONBOARD LAN</b>	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265	Intel® PRO 10/100/1000 Network Connection
<b>POWER CORD OPTION</b>	19V 65W AC power adapter	19V 65W AC power adapter	N/A
<b>TRUSTED PLATFORM MODULE</b>	Yes (TPM v2.0); Worldwide and China-specific options	N/A	N/A
<b>LEAD-FREE</b>	Yes	Yes	Yes
<b>BIOS</b>	Intel® Visual BIOS	Intel® Visual BIOS	Intel® Visual BIOS; BIOS Vault Technology; Fast Boot
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty	3 year limited warranty
<b>OTHER</b>	3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header	3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header	4 GB eMMC storage device soldered down, Custom Solutions header, watchdog timer, fanless design





<b>PRODUCT FAMILY</b>	<b>NUC7i7DNBE</b>
<b>KIT / BOARD</b>	<b>Intel® NUC Board</b>
<b>5-PACK OUTERCASE</b>	BLKNUC7i5DNKE
<b>10-PACK PRODUCT CODE</b>	N/A
<b>PROCESSOR</b>	<b>Intel® Core™ i7-8650U Processor with Intel® vPro™ Technology</b>
<b>CHIPSET</b>	N/A
<b>INTEGRATED GRAPHICS CORE<sup>2</sup></b>	Intel® UHD graphics 620
<b>DISPLAY OUTPUTS</b>	Dual HDMI 2.0a (4k @ 60Hz) w/HDCP 2.2 and basic CEC built in for 1 port Internal 4-lane eDP 1.4 connector
<b>MEMORY SUPPORT<sup>4</sup></b>	Dual channel DDR4-2400 SODIMMs, 1.2V, 32GB maximum
<b>2.5" HDD SUPPORT</b>	Yes
<b>EXPANSION CONNECTORS</b>	One M.2 22x80 (type M) for SATA & NVMe SSDs / One M.2 22x30 (type E) for wireless card; Serial port header; HDMI CEC header
<b>AUDIO<sup>3</sup></b>	Dual Eight-Channel (7.1) digital audio via HDMI ports
<b>USB PORTS</b>	Four USB 3.0 ports (two front panel, two back panel) One internal USB 3.0 port header; Two internal USB 2.0 port headers
<b>ONBOARD LAN</b>	Intel® i219 - LM 10/100/1000 Network Connection; Intel® Wireless-AC 8265
<b>POWER CORD OPTION</b>	19V 65W AC power adapter
<b>TRUSTED PLATFORM MODULE</b>	Yes (TPM v2.0); Worldwide and China-specific options
<b>LEAD-FREE</b>	Yes
<b>BIOS</b>	Intel® Visual BIOS
<b>WARRANTY</b>	3 year limited warranty
<b>OTHER</b>	3 year product availability; Qualified for 24x7 operation; Internal power connector (12V – 24V DC); Vcc5/1A, 5Vsby/2A, 3.3Vsby/1A internal power sources via header

# INTEL® NUC BOARD SUMMARY



INTEL® NUC	PROCESSOR <sup>5</sup>	SODIMM MEMORY	DIMMS	SUPPORT FOR 2.5" DRIVE	DISPLAY OUTPUT	MINI PCIe*	AUDIO	USB 3 EXT+INT	USB 2 EXT+INT	LAN	3 YEAR PRODUCT LIFE	OTHER
NUC7i5DNBE	Intel® Core™ i5-7300U	DDR4	2	Yes	Dual HDMI	2 M.2	8-ch + 2-ch	4 + 1	0 + 2	GbE	Yes	Intel® vPro™, TPM v2.0
NUC7i3DNBE	Intel® Core™ i3-7100U	DDR4	2	Yes	Dual HDMI	2 M.2	8-ch + 2-ch	4 + 1	0 + 2	GbE	Yes	
DE3815TYBE	Intel® Atom™ processor E3815	DDR3L	1	Yes	HDMI + VGA + eDP*	1	Dual HDMI	1 + 0	2 + 3	GbE	Yes	Fanless + 4 GB on-board memory
NUC7i7DNBE	Intel® Core™ i7-8650U	DDR4	2	Yes	Dual HDMI	2 M.2	Dual HDMI	4 + 1	0 + 2	GbE	Yes	Intel® vPro™, TPM v2.0

For more information, visit [www.intel.com/NUC](http://www.intel.com/NUC)

For more information, visit [www.intel.com/NUC](http://www.intel.com/NUC)

<sup>1</sup> Intel® NUC Kit: Each kit contains motherboard, chassis, and power supply.

<sup>2</sup> Requires a processor with Intel® HD graphics.

<sup>3</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at [www.intel.com/design/chipsets/hdaudio.htm](http://www.intel.com/design/chipsets/hdaudio.htm)

<sup>4</sup> System resources and hardware (such as PCI and PCI Express\*) require physical memory address locations that can reduce available addressable system memory. This could result in a reduction of as much as 1 GB or more of physical addressable memory being available to the operating system and applications, depending on the system configuration and operating system.

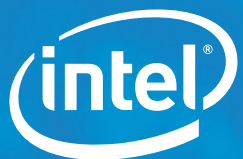
<sup>5</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: [http://www.intel.com/products/processor\\_number/](http://www.intel.com/products/processor_number/)

Intel® NUC Mini PCs, Kits and Boards may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata are available on request. All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks)

Copyright © 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Inside, the Intel Inside logo, Intel Core, Intel Atom, and Celeron are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



# INTEL<sup>®</sup> COMPUTE STICK

**BUILT FOR  
PERFORMANCE.  
SIZED FOR  
CONVENIENCE.**

## **INTEL<sup>®</sup> COMPUTE STICK**

Intel<sup>®</sup> Compute Stick is a device the size of a pack of gum that turns any HDMI display into a fully functional computer: same operating system, same high quality graphics, and same wireless connectivity.

All this in a PC on a stick that measures 4.5 inches from end to end, and is ready to compute right out of the box.



# INTEL<sup>®</sup> COMPUTE STICK

Connect. Compute.  
It's that simple.

## QUAD-CORE INTEL<sup>®</sup> ATOM<sup>™</sup> PROCESSOR

This innovative processor delivers great performance while consuming low energy—making the Intel<sup>®</sup> Compute Stick both space and energy efficient.

## INTEL<sup>®</sup> HD GRAPHICS

Exceptional clarity makes for an exceptional visual experience. The Intel<sup>®</sup> Compute Stick delivers HD wow, whether you're viewing videos, games, or photos.

## INTEL<sup>®</sup> HD AUDIO

Get a high quality, multichannel sound experience, without an audio card. It's truly an immersive media experience that will have your ears seeing stars.

# THE INTEL<sup>®</sup> COMPUTE STICK

Connect. Compute.  
It's that simple.



## INTERACTIVE DISPLAY

Transform a display into a fully functional interactive display solution.



## CONFERENCE PRESENTATION

Connect to your presentation device and stream videos or display visual content with ease.



## ENTERTAINMENT

Turn your HDMI\* television or monitor into a home entertainment computer.



Product Code	STK2m3W64CC	STK2mv64CC
Processor	6th generation Intel® Core™ Y-Series m3, 1.6GHz, 3MB L3 cache (M3-6Y30 SoC)	6th generation Intel® Core™ Y-Series m5, 1.6GHz, 3MB L3 cache (M3-6Y30 SoC), Intel® vPro™ Technology
Memory	Integrated in SoC Dual-channel LPDDR3; 1.2V, 1866 MHz, 2GB per channel (4GB total memory)	Integrated in SoC Dual-channel LPDDR3; 1.2V, 1866 MHz, 2GB per channel (4GB total memory)
Graphics	Intel® HD graphics; 1x HDMI 1.4b male plug	Intel® HD graphics; 1x HDMI 1.4b male plug
Audio	Multi-channel digital audio via HDMI interface	Multi-channel digital audio via HDMI interface
Peripheral Connectivity	1x USB 3.0 Type-A host port on side	1x USB 3.0 Type-A host port on side
Storage	64GB eMMC storage device soldered down; Micro SDXC v3.0 slot with UHS I-Support (on side)	64GB eMMC storage device soldered down; Micro SDXC v3.0 slot with UHS I-Support (on side)
Networking	IEEE 802.11 g/n/ac dual band and Bluetooth 4.1 Wireless module soldered down w/ dual band antennas	IEEE 802.11 g/n/ac dual band and Bluetooth 4.1 Wireless module soldered down w/ dual band antennas
Enclosure	Dimensions: Approx. 114mm x 38mm x 11mm; Black Chassis; Security Loop (Size TBD)	Dimensions: Approx. 114mm x 38mm x 11mm; Black Chassis; Security Loop (Size TBD)
Power Delivery	MicroUSB* Type-C power connector & cable 5V/2A Wall-wart style with US (includes Japan), AUS, UK, India, and EU interchangeable plugs	MicroUSB* Type-C power connector & cable 5V/2A Wall-wart style with US (includes Japan), AUS, UK, India, and EU interchangeable plugs
Additional Featured	Pre-installed OS: Windows* 10, 64-bit HDMI* Extender Cable Power LED, Power Button Three Year Warranty	HDMI* Extender Cable Power LED, Power Button Three Year Warranty

For more information, visit [www.intel.com/computestick](http://www.intel.com/computestick)

Actual Intel® Compute Stick may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/computestick](http://www.intel.com/computestick)

\* Other names and brands may be claimed as the property of others.

# INTEL® COMPUTE STICK “STERLING CITY”



Product Code	STK1AW32SC	STK1A32SC
<b>Processor</b>	Intel® Atom Quad-Core Processor x5-Z8300 Type 3 BGA	Intel® Atom Quad-Core Processor x5-Z8300 Type 3 BGA
<b>Memory</b>	Soldered down Single-channel DDR3L; 1.35V, 1600 MHz, 2GB	Soldered down Single-channel DDR3L; 1.35V, 1600 MHz, 2GB
<b>Graphics</b>	Intel® HD graphics (Gen 8 LP); 1x HDMI 1.4b (1080p) male plug	Intel® HD graphics (Gen 8 LP); 1x HDMI 1.4b (1080p) male plug
<b>Audio</b>	Multi-channel digital audio via HDMI interface	Multi-channel digital audio via HDMI interface
<b>Peripheral Connectivity</b>	1x USB 3.0 Type-A host port on side; 1x USB 2.0 Type-A host port on side	1x USB 3.0 Type-A host port on side; 1x USB 2.0 Type-A host port on side
<b>Storage</b>	32GB eMMC storage device soldered down Micro SDXC v3.0 slot with UHS I-Support (on side)	32GB eMMC storage device soldered down Micro SDXC v3.0 slot with UHS I-Support (on side)
<b>Networking</b>	Intel® Dual Band Wireless AC 7265 with Bluetooth 4.0	Intel® Dual Band Wireless AC 7265 with Bluetooth 4.0
<b>Enclosure</b>	Black chassis with Intel Inside logo, plastic enclosure Dimensions: Approx. 113 mm x 38 mm x 12 mm	Black chassis with Intel Inside logo, plastic enclosure Dimensions: Approx. 113 mm x 38 mm x 12 mm
<b>Power Delivery</b>	MicroUSB power connector 5V/3A wall-mount AC-DC power adapter w/ support for US, EU, UK, AUS (SKU 1) and IND, BRA, ARG, CHN, KOR (SKU 2) outlets	MicroUSB power connector 5V/3A wall-mount AC-DC power adapter w/ support for US, EU, UK, AUS (SKU 1) and IND, BRA, ARG, CHN, KOR (SKU 2) outlets
<b>Additional Featured</b>	Pre-installed OS: Windows* 10, 32-bit (64-bit capable) Intel BIOS Hot Plug video detect Power LED, power button One Year Warranty	Intel BIOS Hot Plug video detect Power LED, power button One Year Warranty

For more information, visit [www.intel.com/computestick](http://www.intel.com/computestick)

Actual Intel® Compute Stick may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/computestick](http://www.intel.com/computestick)

\* Other names and brands may be claimed as the property of others.



For more information, visit [www.intel.com/computestick](http://www.intel.com/computestick)

Intel products are not intended for use in medical, life-saving, or life-sustaining applications. Intel may make changes to specifications and product descriptions at any time, without notice.

Actual Intel® Compute Stick may differ from the image shown.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/computestick](http://www.intel.com/computestick)  
All rights reserved. Intel, the Intel logo, Intel Inside, the Intel Inside logo, and Intel Atom are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation



**THE FUTURE  
IS SMART**

# INTEL<sup>®</sup> COMPUTE CARD

## INTEL<sup>®</sup> COMPUTE CARD — SMALL IN SIZE, NOT IN CAPABILITIES

Intel<sup>®</sup> Compute Card is just slightly longer than a credit card, but it's ready to power anything from entry-level to full featured devices.

The modularity and flexibility of this computer on a card allows compute integration via card slot into devices like digital signage, kiosks, Smart TVs, appliances and more.

# THE FUTURE IS SMART

The Intel® Compute Card is pushing the boundaries of where and how technology enriches life.



## DRIVING INNOVATION

Now any device with a Compute Card slot is a smart device, unlocking potential everywhere compute is possible.

## DELIVERING VALUE

Revolutionary in size, form, and function, the Intel® Compute Card brings tremendous value to designers, OEMs, manufacturers, distributors, channel partners, and ultimately, their customers.

## DELIVERED COMPLETE

With Intel® brand processors and everything your customers need—including RAM, storage, and wireless connectivity—already built-in.



# COMPUTE ANYWHERE



## IN THE HOME

Smart appliances and devices for a more connected home.



## IN BUSINESS

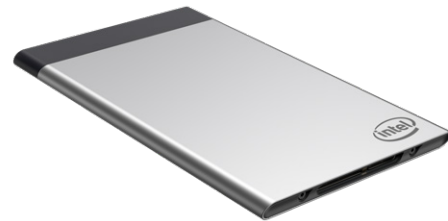
Digital signage, point of sale, intelligent vending, and smart security solutions to bring business into the future.



## IN THE FACTORY

Automation, inventory management, fleet tracking and mobile workstations to reinvent the factory floor.

# INTEL® COMPUTE CARD - MARBLE CREEK



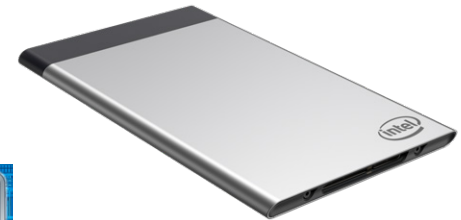
<b>Product Code</b>	<b>CD1i5128MK</b>	<b>CD1M3128MK</b>
<b>Processor</b>	7th Generation Intel® Core™ i5-7Y57 Processor	7th Generation Intel® Core™ m3-7Y30 Processor
<b>Memory</b>	8GB dual channel LPDDR3-1866	4GB dual channel LPDDR3-1866
<b>Graphics</b>	Intel® HD Graphics 630, 300 MHz up to 950 MHz	Intel® HD Graphics 615, 300 MHz up to 900 MHz
<b>Storage</b>	128GB PCIe x2 SSD	128GB PCIe x2 SSD
<b>Networking</b>	Intel® Wireless-AC 8265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas	Intel® Wireless-AC 8265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas
<b>Enclosure</b>	Metal with a plastic cap	Metal with a plastic cap
<b>Additional Features</b>	No moving components Three year warranty	No moving components Three year warranty

For more information, visit [www.intel.com/computecard](http://www.intel.com/computecard)

Actual Intel® Compute Card may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/computecard](http://www.intel.com/computecard)

\* Other names and brands may be claimed as the property of others.

# INTEL® COMPUTE CARD - GRANITE CREEK



Product Code	CD1P64GK	CD1C64GK	CD1C32GK
Processor	Intel® Pentium® Processor N4200	Intel® Celeron® N3450 Processor	Intel® Celeron® N3350 Processor
Memory	4GB dual channel LPDDR3-1866	4GB dual channel LPDDR3-1866	2GB dual channel LPDDR3-1866
Graphics	Intel® HD Graphics 505, 200 MHz up to 750 MHz	Intel® HD Graphics 500, 200 MHz up to 700 MHz	Intel® HD Graphics 500, 200 MHz – 700MHz
Storage	64GB eMMC 5.0, HS400	64GB eMMC 5.0, HS400	32GB eMMC 5.0, HS400
Networking	Intel® Wireless-AC 7265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas	Intel® Wireless-AC 7265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas	Intel® Wireless-AC 7265 802.11ac 2x2; + Bluetooth 4.2, dual internal antennas
Enclosure	Metal with a plastic cap	Metal with a plastic cap	Metal with a plastic cap
Additional Features	No moving components Three year warranty	No moving components Three year warranty	No moving components Three year warranty

For more information, visit [www.intel.com/computecard](http://www.intel.com/computecard)

Actual Intel® Compute Card may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/computecard](http://www.intel.com/computecard)

\* Other names and brands may be claimed as the property of others.

# INTEL® COMPUTE CARD DOCK - PORT JEFFERSON



<b>Product Code</b>	<b>DK132EPJ</b>
<b>Supported Cards</b>	CD1V128MK Intel® Core™ i5 vPro* CD1M3128MK Intel® Core™ m3 CD1P64GK Intel® Pentium® CD1C64GK Intel® Celeron®
<b>Security</b>	Mechanical security latch, Compute Card ejection lock, Kensington lock
<b>Networking</b>	Intel® Ethernet Controller I211-AT, IEEE 802.3/u/ab, RJ45 with dual LEDs, 10/00/1000 Mbps
<b>Enclosure</b>	Metal with plastic
<b>Additional Features</b>	Electronic ejection Active cooling One year warranty



For more information, visit [www.intel.com/computecard](http://www.intel.com/computecard)

Actual Intel® Compute Card may differ from the image shown. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/computecard](http://www.intel.com/computecard)

\* Other names and brands may be claimed as the property of others.

For more information, visit [www.intel.com/computecard](http://www.intel.com/computecard)

Intel products are not intended for use in medical, life-saving, or life-sustaining applications. Intel may make changes to specifications and product descriptions at any time, without notice.

Actual Intel® Compute Card may differ from the image shown.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/computecard](http://www.intel.com/computecard)  
All rights reserved. Intel, the Intel logo, Intel Inside, Experience What's Inside logo, Intel vPro, Intel Core, Pentium, Celeron and the Intel Inside logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation





# INTEL® WIRELESS PRODUCTS

**INTEL®  
WIRELESS-AC  
WI-FI FOR YOUR  
CONNECTED LIFE**

## **GIGABIT WI-FI POWERED BY INTEL**

With the right solution from Intel, your Wi-Fi performs just as remarkably as you do—easily keeping pace with your entertainment, business, and super-connected lifestyle.

## Intel® Wi-Fi delivers Gigabit speeds

Less time waiting, more time enjoying with Intel Gigabit-class Wi-Fi.

2x2 802.11ax (160MHz)		2402 Mbps
2x2 802.11ac (160MHz)		1733 Mbps
2x2 802.11ac (80MHz)		867 Mbps
1x1 802.11ac		433 Mbps

## Progression of Wi-Fi Standards & Technologies

YEAR	WI-FI TYPE	SHORT NAME	MAX SPEED	STREAMS	CHANNEL WIDTH	CHANNEL DENSITY
2019	2x2 802.11ax	Wi-Fi 6	2402Mbps	2	160MHz	Heavy
2016	2x2 802.11ac	2x2AC	1733Mbps	2	160MHz	Heavy
2013	2x2 802.11ac	2x2AC	867Mbps	2	80MHz	Heavy
2013	1x1 802.11ac	1x1AC	433Mbps	1	80MHz	Heavy

Note: Wider channels, heavier channel densities, and higher number of streams each contribute to higher maximum speeds

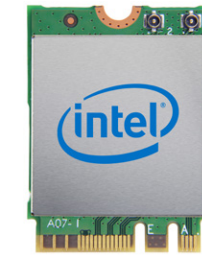
- PC (client) and AP/Router must support same technology to get highest speeds.
- Intel has important additional unique features:
  - Wireless Intel® Active Management Technology (Intel® vPro™ Technology)<sup>1</sup>
  - Worldwide Regulatory Support with Intel® Dynamic Regulatory Solution<sup>2</sup>

## Wi-Fi 6 is a Game Changer in 2019

Wi-Fi 6 brings better performance in dense environments like your home, improves network efficiency, delivers up to 75% reduction in latency<sup>6</sup> and is 3X faster than baseline 802.11ac 2x2 80MHz (867Mbps)<sup>7</sup>.

## Module Form Factors

M.2 2230 Socketed



M.2 1216 Soldered Down





## Wireless Products (802.11ac Wi-Fi and Bluetooth®)

Wi-Fi is not just for laptops. Experience the flexibility and performance offered by Intel® Wireless-AC in the desktop.

PRODUCT	INTEL® WI-FI 6 AX200	INTEL® WIRELESS-AC 9560	INTEL® WIRELESS-AC 9260	INTEL® WIRELESS-AC 9461/9462	INTEL® DUAL BAND WIRELESS-AC 8265	INTEL® DUAL BAND WIRELESS-AC 8260	INTEL® DUAL BAND WIRELESS-AC 7265	INTEL® DUAL BAND WIRELESS-AC 3168
<b>FORM FACTOR</b>	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230, 1216 (Solder Down)	M.2 2230
<b>SPEED SPATIAL STREAMS (TX AND RX)</b>	Gig+ - 2402 Mb/s (2x2)	Gigabit - 1733Mb/s (2x2)	Gigabit - 1733Mb/s (2x2)	433Mb/s (1x1) Single Antenna-9461; Diversity Antenna-9462	867Mb/s (2x2)	867 Mb/s (2x2)	867 Mb/s (2x2)	433 Mb/s (1x1)
<b>ENTERPRISE / SMB FEATURES</b>	OFDMA, MU-MIMO Rx, 1024QAM, WPA3 Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROset/wireless software, MU-MIMO Rx, Intel® Authenticate Solution	Intel® PROSet/Wireless Software, MU-MIMO, Intel® Authenticate Solution	Intel® PROSet / Wireless Software, Intel® Authenticate Solution	Intel® PROSet / Wireless Software, Intel® Authenticate Solution	Intel® PROSet / Wireless Software, Intel® Authenticate Solution
<b>BANDS</b>	Dual Band – 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band - 2.4GHz and 5GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz	Dual Band – 2.4 GHz and 5 GHz
<b>INTEL® vPRO™ TECHNOLOGY<sup>1</sup></b>	✓	✓	✓		✓	✓	✓	
<b>BLUETOOTH®</b>	Bluetooth® 5	Bluetooth® 5	Bluetooth® 5	Bluetooth® 5	Bluetooth® 4.2	Bluetooth® 4.2	Bluetooth® 4.2	Bluetooth® 4.2
<b>Wi-Fi* CERTIFICATION (802.11)</b>	WiFi certified 802.11 ax/ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n	WiFi certified 802.11 ac/a/b/g/n
<b>OPTIMIZED FOR</b>	9th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel Celeron® processors	8th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel® Celeron® processors with platforms designed to support connectivity integration	8th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel® Celeron® processors	8th generation Intel® Core™ processors and Intel® Pentium® Silver and Intel® Celeron® processors with platforms designed to support connectivity integration	7th generation Intel® Core™ processors	6th generation Intel® Core™ processors	5th & 6th generation Intel® Core™ processors	6th & 7th generation Intel® Core™ processors



## Intel® Dual Band Wireless-AC 8265 Desktop Kit

Intel® wireless networking solutions for desktop platforms enable network connectivity without wires. This solution requires a motherboard with an M.2 key E connector for wireless and includes 2 antennas, 2 RF cables with connectors and 2 mounting brackets (long/short). Integrate wireless in the desktop vs. an external USB dongle for uncompromising performance, enhanced security, and scalability for fast, flexible connectivity at work and home.



SEGMENT	BUSINESS, EDUCATION, PERFORMANCE CONSUMER
PRODUCT	INTEL® DUAL BAND WIRELESS-AC 8265 DESKTOP KIT
FORM FACTOR	M.2 (key E)
ANTENNA	Included
SPEED SPATIAL STREAMS (TX AND RX)	867 Mb/s (2x2) <sup>4</sup>
BANDS	Dual Band – 2.4 GHz and 5 GHz
ENTERPRISE / SMB FEATURES	Intel® PROSet / Wireless Software, MU-MIMO
BLUETOOTH® 4	Bluetooth® 4.2
WI-FI® CERTIFICATION (802.11)	802.11ac, 802.11n
AVAILABILITY	Shipping



## Intel offers a full portfolio of advanced technologies to optimise every wireless experience

PRODUCT CODE	MM#	DESCRIPTION	PACKING	PRODUCT CONSIDERATIONS
<b>CYCLONE PEAK - AX200</b>				
AX200.NGWG	985857	Discrete, Wi-Fi 6, Gig+, 2x2, + Bluetooth 5 – M.2	100 pack	Recommended wireless solution for 9th generation Intel® Core™, Intel® Pentium® Silver and Intel® Celeron® Processors. Supports Intel® vPro™ technology on 9th generation Intel® Core™ processors.
<b>JEFFERSON PEAK 1 &amp; 2 - 9461, 9462 &amp; 9560</b>				
9560.NGWG	957714	CNVi, Gigabit (160MHz), 2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth® 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentium® Silver and Intel® Celeron® Processors with platforms designed for connectivity integration. Supports Intel® vPro™ Technology on 8th generation Intel® Core™ processors.
9461.NGWG.NV	958885	CNVi, Single Antenna 1x1 MU-MIMO, 802.11ac/a/b/g/n + Bluetooth 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentium® Silver and Intel® Celeron® Processors with platforms designed for connectivity integration.
9462.NGWG.NV	958856	CNVi, Diversity Antenna 1x1 MU-MIMO, 802.11ac/a/b/g/n + Bluetooth 5 M.2	100 pack	
<b>THUNDER PEAK 2 - 9260</b>				
9260.NGWG	957712	Gigabit (160MHz), 2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth 5 - M.2	100 pack	Recommended wireless solution for 8th generation Intel® Core™, Intel® Pentium® Silver and Intel® Celeron® Processors. Supports Intel® vPro™ Technology on 8th generation Intel® Core™ processors.
<b>WINDSTORM PEAK - 8265</b>				
8265.NGWMG	946658	2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth® 4.2 - m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 7th generation Intel® Core™ processors.
8265.NGWMG.DTX1	958156	2x2 MU-MIMO 802.11ac/a/b/g/n + Bluetooth 4.2 – m.2 desktop kit	1 Retail Box	
<b>SNOWFIELD PEAK - 8260</b>				
8260.NGWMG	942165	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.2 - m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 6th generation Intel® Core™ processors.
<b>SANDY PEAK - 3168</b>				
3168.NGWG	944884	1x1 802.11ac/a/b/g/n + Bluetooth 4.2 - m.2	100 Packs	Nearly 3x faster than 802.11 bgn/agn based products. <sup>5</sup>
<b>STONE PEAK 1 &amp; 2 – 3165 &amp; 7265</b>				
7265.NGWWG.W	939155	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.1 - rev.2, m.2	100 Packs	Recommended overall wireless solution for M.2 form-factor on 5th generation Intel® Core™ processor-based systems. Supports Intel® vPro™ Technology on 5th generation Intel® Core™ processors. <sup>1</sup>
7265.NGWWB.W	945063	2x2 MIMO 802.11ac/a/b/g/n + Bluetooth 4.1 - rev.2, m.2, 10pk	10 Packs	Lower quantity pack to support smaller product orders.
3165.NGWG	940106	1x1 802.11ac/a/b/g/n + Bluetooth 4.1 - m.2	100 Packs	Nearly 3x faster than 802.11 bgn/agn based products. <sup>5</sup>

For more information, visit [www.intel.com/wireless](http://www.intel.com/wireless)

For more information, visit [www.intel.com/wireless](http://www.intel.com/wireless)

<sup>1</sup> Intel® vPro™ technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software, and IT environment. To learn more visit: [www.intel.com/content/www/us/en/architecture-and-technology/vpro/intel-vpro-technology-developer.html](http://www.intel.com/content/www/us/en/architecture-and-technology/vpro/intel-vpro-technology-developer.html)

<sup>2</sup> For a list of country approvals, please contact your local Intel representative.

<sup>3</sup> Based on actual product benchmark performance. Theoretical maximum bandwidth enabled by 2x2 802.11ac (80MHz) and 2x2 802.11ac (160MHz) implementations are 867 Mbps and 1733Mbps PHY rates respectively.

<sup>4</sup> Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit <http://www.intel.com/performance>.

<sup>5</sup> "Nearly 3x/6x/12x faster" Intel® Wireless-AC claims are based on the comparison of maximum theoretical data rates for single (433 Mbps), dual (867 Mbps) spatial stream 802.11ac (80MHz) and dual (1733Mbps) spatial stream 802.11ac (160MHz) vs. single spatial stream (150 Mbps) 802.11n Wi-Fi solutions as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ac wireless network routers or better.

<sup>6</sup> "Up to 4X lower latency" is based on Intel simulation data of 802.11ax with and without OFDMA using 9 clients. Average latency without OFDM is 36ms, with OFDMA average latency is reduced to 7.6ms. Latency improvement requires that the AP and all clients support OFDMA

<sup>7</sup> 802.11ax 2x2 160MHz enables 2402Mbps maximum theoretical data rate, ~3X faster than standard 802.11ac 2x2 80MHz (867Mbps) and nearly 6x faster than baseline 1x1ac (433Mbps) Wi-Fi as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ax wireless network routers

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document. Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Intel Corporation is under license

Intel, the Intel logo, Celeron, Pentium, and vPro are trademarks of Intel Corporation in the U.S. and/or other countries.

Copyright © Intel Corporation. All rights reserved.

\* Other names, brands, and logos may be claimed as the property of others.



# INTEL<sup>®</sup> REALSENSE<sup>™</sup> TECHNOLOGY

Intel<sup>®</sup> Product Quick Reference Matrix  
Q2 2019



# PERCEIVE THE WORLD IN 3D

Intel® RealSense™ technology is shaping the future by giving devices and machines the ability to perceive their surroundings.

## INTEL® REALSENSE™ TRACKING CAMERA T265

With its small form factor and low power consumption, the Intel® RealSense™ Tracking Camera T265 has been designed to give you the tracking performance you want straight off-the-shelf. Cross-platform, developer friendly simultaneous localization and mapping for all your robotics, drone and augmented reality rapid prototyping needs.

## INTEL® REALSENSE™ DEPTH CAMERAS

Designed for easy setup and portability, Intel® RealSense™ depth cameras feature long-range capabilities and high depth resolution and include active infrared (IR) stereo with standard or wide field of view. For value-conscious applications, choose rolling shutter. Fast-moving and outdoor applications benefit from global shutter.



# INTEL® REALSENSE™ TRACKING CAMERA T265 — AVAILABLE FOR PRE-ORDER



## Tracking Redefined

Introducing a new class of stand-alone simultaneous localization and mapping device, the Intel® RealSense™ Tracking Camera T265 for use in robotics, drones and more. With its small form factor and low power consumption, the Intel® RealSense™ Tracking Camera T265 has been designed to give you the tracking performance you want straight off-the-shelf. Cross-platform, developer friendly simultaneous localization and mapping for all your robotics, drone and augmented reality rapid prototyping needs.

### LOW POWER

Featuring highly optimized proprietary V-SLAM algorithms running directly on the device, it operates at an incredible 1.5W.

### PRECISION TRACKING

Extensively tested and validated for performance, providing under 1%<sup>1</sup> closed loop drift under intended use conditions.

### SMALL AND LIGHT

At 108 x 25 x 13 mm in size and weighing only 55 g, this device won't weigh your prototype down.



## Technical Specifications

### V-SLAM, PART OF INTEL® REALSENSE™ TECHNOLOGY

High precision Visual Inertial Odometry Simultaneous Localization and Mapping algorithms.

### INTEL® MOVIDIUS™ MYRIAD™ 2.0 VPU

Visual Processing Unit optimized to run V-SLAM at low power.

### TWO FISHEYE LENSES WITH COMBINED 163±5° FOV

The camera includes two OV9282 imagers with fisheye lenses for a combined, close to hemispherical 163±5° field of view for robust tracking even with fast motion.

### BMI055 IMU

The Inertial Measurement Unit, allows for accurate measurement of rotation and acceleration of the device, to feed into the V-SLAM algorithms.

### USB 3.1 GEN 1 MICRO B

USB 2.0 and USB 3.1 supported for either pure pose data or a combination of pose and images.

### 2 X M3 0.5MM PITCH MOUNTING SOCKETS

Securely attach the camera to your device with these standard mounting points on the rear of the camera.

1. Under 1% drift observed in repeated testing in multiple use cases and environments. AR/VR use cases were tested with the T265 mounted on the head in indoor living and office areas with typical indoor lighting including sunlight entering the room. Wheeled robot use cases tested with wheel odometer data integrated, again in indoor office and home environments.

## Make Perception Your Advantage

Stereo image sensing technologies use two cameras to calculate depth and enable devices to see, understand, interact with, and learn from their environment — powering intuitive, natural interaction and immersion. Stereo depth works both indoors and outdoors in a wide variety of lighting conditions and can also be used in multiple camera configurations without the need for custom calibration. The onboard Intel® RealSense™ Vision Processor D4 performs all the depth calculations on the camera, allowing for low power, platform agnostic devices. Start developing immediately with the Intel® RealSense™ SDK an open source and Cross-Platform enabling multiple computing languages, wrappers, sample code and tools.



INTEL® REALSENSE™ DEPTH CAMERA D435i



INTEL® REALSENSE™ DEPTH CAMERA D435



INTEL® REALSENSE™ DEPTH CAMERA D415

Connectors	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*	USB-C* 3.1 Gen 1*
Depth FOV (Horizontal x Vertical for HD 16:9)	85.2° x 58°	85.2° x 58°	63.4° x 40.4°
Depth Frame Rate	Up to 90 fps	Up to 90 fps	Up to 90 fps
Depth Resolution	Up to 1280 x 720	Up to 1280 x 720	Up to 1280 x 720
Depth Technology	Active IR Stereo	Active IR Stereo	Active IR Stereo
Dimensions (Length x Depth x Height)	90 mm x 25 mm x 25 mm	90 mm x 25 mm x 25 mm	99 mm x 20 mm x 23 mm
Image Sensor Technology	Global Shutter, 3µm x 3µm pixel size	Global Shutter, 3µm x 3µm pixel size	Rolling Shutter, 1.4µm x 1.4µm pixel size
Inertial Measurement Unit	Yes	No	No
Main components	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ module D430	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ module D430	Intel® RealSense™ Vision Processor D4 Intel® RealSense™ module D415
Minimum Depth Distance (Min-Z):	0.11 m	0.11 m	0.16 m
Mounting Mechanism	One 1/4-20 UNC thread mounting point Two M3 thread mounting points	One 1/4-20 UNC thread mounting point Two M3 thread mounting points	One 1/4-20 UNC thread mounting point Two M3 thread mounting points
RGB Frame Rate and Resolution	1920 x 1080 at 30 fps	1920 x 1080 at 30 fps	1920 x 1080 at 30 fps
RGB Sensor FOV (Horizontal x Vertical)	69.4° x 42.5° (+/- 3°)	69.4° x 42.5° (+/- 3°)	69.4° x 42.5° (+/- 3°)
Use environment	Indoor / Outdoor	Indoor / Outdoor	Indoor / Outdoor

## INTEL® REALSENSE™ SOFTWARE DEVELOPER KIT 2.0

Open Source, Cross Platform

### Featuring:

- Tools: Intel® RealSense™ Viewer
- Utilities for Debug
- Code Samples
- RealSense™ SDK an open source and Cross-Platform enabling multiple computing languages, wrappers, sample code and tools.

For more information, visit [intelrealsense.com/stereo-depth/](https://intelrealsense.com/stereo-depth/)

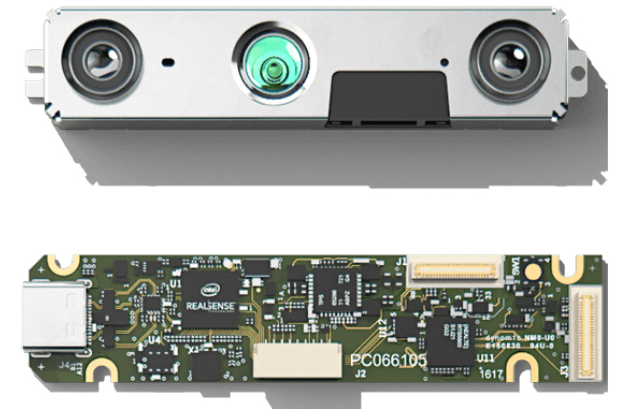
## Depth Modules

### MORE CONTROL, TIGHTER INTEGRATION

For customers who are looking for closer integration and a more flexible form factor, as well as lower cost, we offer our custom camera modules. With the addition of the Intel® RealSense™ Vision Processor D4 and ASIC card, modules allow greater design flexibility, without the need to spend engineering resources on camera placement and calibration.

If you are planning to integrate Intel RealSense technology into higher volume products, our depth modules can offer the best compromise between price and flexibility. We offer multiple different configurations to better suit your needs, fully calibrated and validated for ease of integration.

Designed for easy system integration, our complete line of modules feature a calibrated imaging sub-system with stereo sensors. When paired with an Intel® RealSense™ Vision Processor, depth data can be output via USB to any platform.



	D410	D415	D420	D430
Depth Technology	Active IR Stereo	Active IR Stereo	Passive IR Stereo	Active IR Stereo
Image Sensor Technology	Rolling Shutter	Rolling Shutter	Global Shutter	Global Shutter
Depth FOV (Horizontal x Vertical for HD 16:9)	63.4° x 40.4°	63.4° x 40.4°	85.2° x 58°	85.2° x 58°
RGB Frame Rate and Resolution	-	1920 x 1080 at 30 fps	-	-
Depth Resolution	Up to 1280 x 720	Up to 1280 x 720	Up to 1280 x 720	Up to 1280 x 720
Depth Frame Rate	Up to 90 fps	Up to 90 fps	Up to 90 fps	Up to 90 fps
Range	.16-10m+	.16-10m+	.11-10m+	.11-10m+

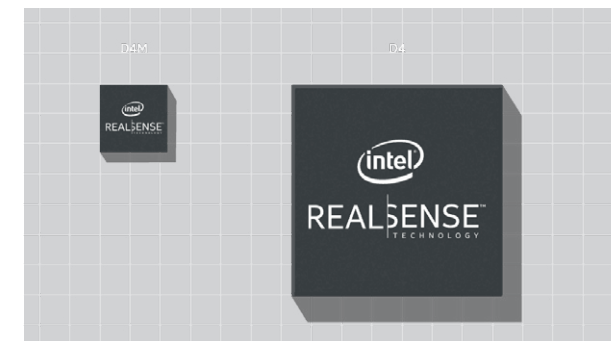
## Depth Processors

### ACCELERATE REAL-TIME PROCESSING

We offer our standalone Intel® RealSense™ Vision Processor D4 which gives you the ability to create quality stereo depth devices with your choice of sensors in any physical configuration.

Achieve superior stereo depth and computer vision with the Intel® RealSense™ Vision Processor D4. This application specific integrated circuit provides dedicated real-time processing up to 36.6\* million pixels per second in a small footprint, while offering support for flexible camera customization. Contact your Intel RealSense sales representative for more information.

<b>Depth Processor: Stereo</b>	Depth Max Throughput: up to 36.6* MP/sec (848 x 480 @ 90fps)	IR Projector Controls: Yes
<b>Form Factor and Package: ASIC BGA</b>	Depth Stream Output Resolution: Up to 1280 x 720	Host Interface: USB 3.0
<b>Process Technology: 28nm</b>	Depth Stream Output Frame Rate: Up to 90bps	Multi-Camera Support: Yes, up to 5
<b>Package Size: 6.4 mm x 6.4 mm x 1 mm</b>	RGB Sensor Max Resolution & Max Frame Rate: 1920 x 1080, Up to 60 fps	I/O: 5x MIPI CSI-2, 5x I2C, 1xSPI, GPIO, Timer



Visit [www.intelrealsense.com](http://www.intelrealsense.com) for more information.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

Intel, Intel Inside and Intel RealSense are trademarks of Intel Corporation in the U.S. and other countries.

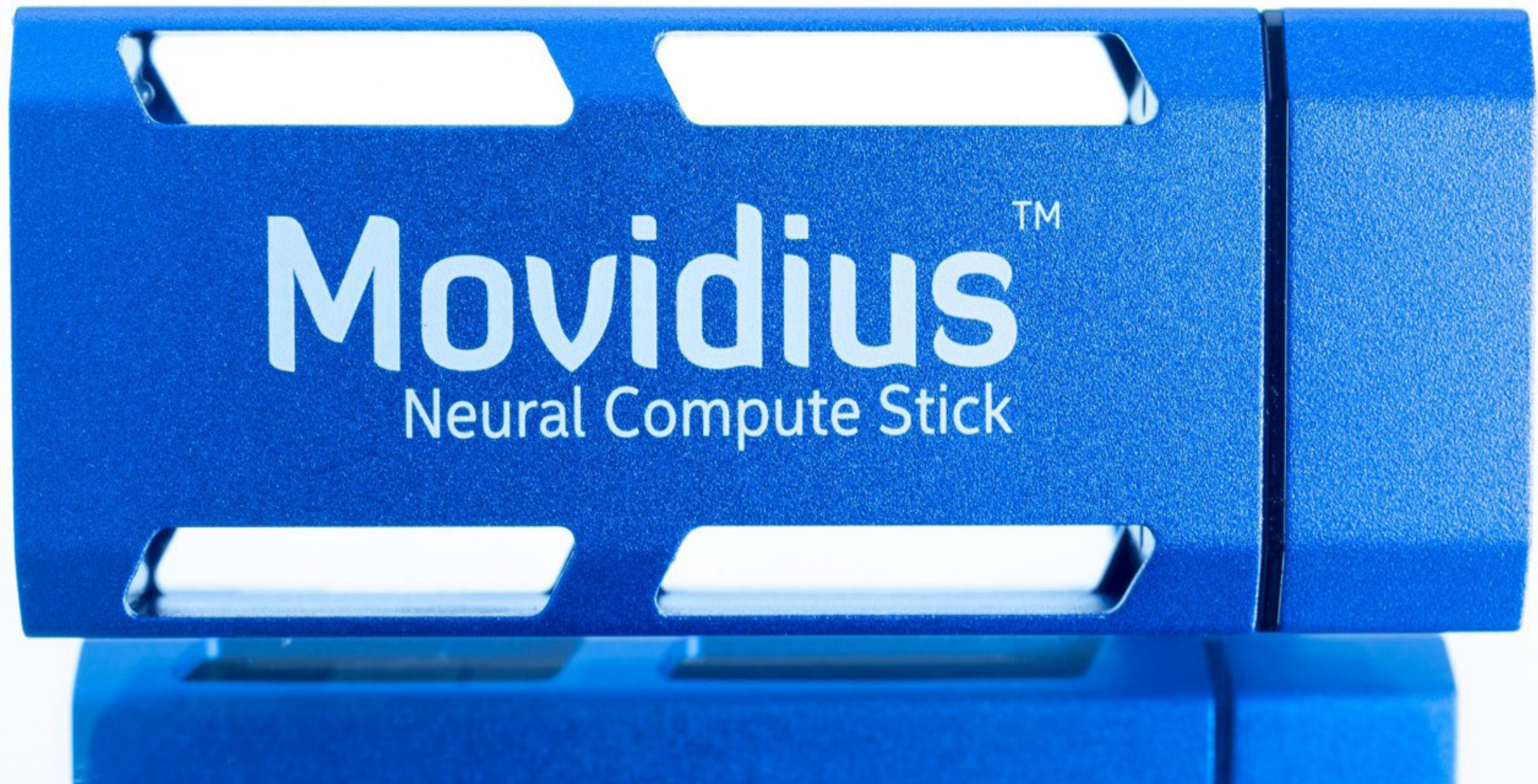
Other names and brands may be claimed as the property of others.

Copyright © 2019, Intel Corporation. All rights reserved.

# MOVIDIUS™ NEURAL COMPUTE STICK

## ACCELERATE DEEP LEARNING DEVELOPMENT AT THE EDGE

The Movidius™ Neural Compute Stick is a miniature deep learning hardware development platform that you can use to prototype and tune, validate, and your AI programs, specifically Deep Neural Networks. It features the same Movidius vision processing unit (VPU) used to bring machine intelligence to drones, surveillance cameras, and VR or AR headsets. Now, in a USB stick form factor.





## Product Insights

Powered by the Movidius™ Vision Processing Unit, capable of running high performance Floating-point CNNs at ultra-low power, packaged in a convenient USB stick form factor for real time deep learning inferences with best in class power efficiency.



**Movidius**  
an Intel company  
**NEURAL COMPUTE STICK**

**Deep neural networks  
- on a stick -  
no Cloud required**

## Deep Learning Insights

Profile, Validate, and Run your Deep Neural Network (DNN) to get real-world embedded results for deep learning research and development insights into performance and power.

## Immediate Productivity

Supports the popular Caffe DNN framework to get up and running easily. Out-of-the-box examples for x86 and Raspberry Pi\* platforms help you easily integrate DNN inferences into any application.

## Prototyping Versatility

USB stick form factor enables deep learning R&D and prototyping on a Linux laptop, x86 based host device, Raspberry Pi\* and others to come. Run multiple devices on the same platform to scale performance.

\* Other names and brands may be claimed as the property of others.

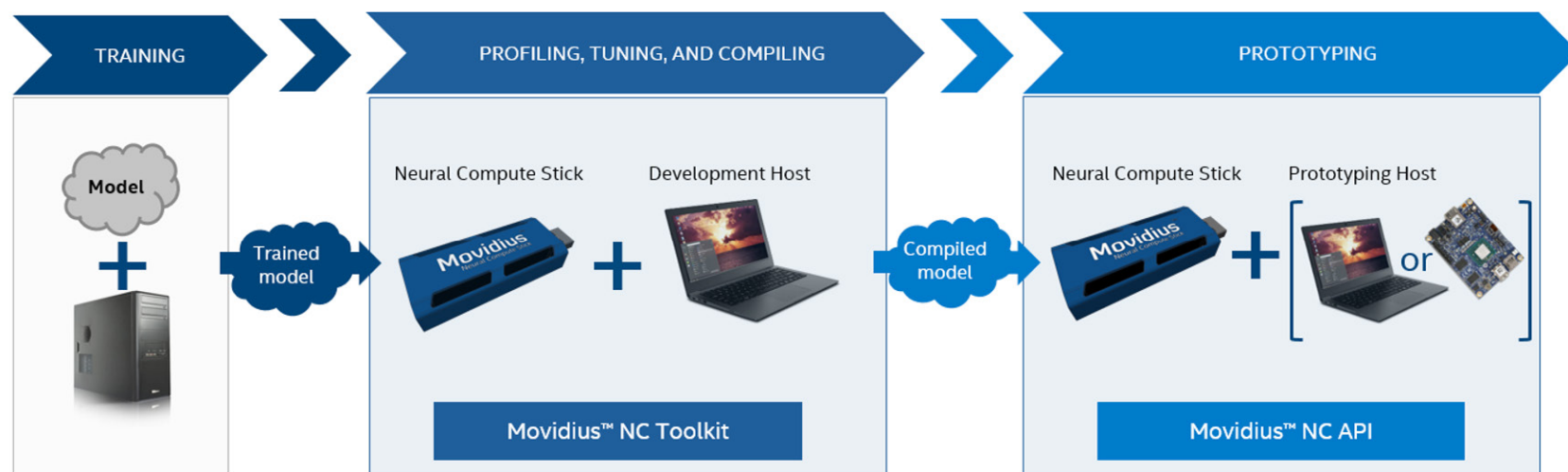
## Compile, Tune and Accelerate

A Software Development Kit (SDK) containing a Toolkit and API allows deep learning developers to profile, tune, compile and deploy deep neural network (DNN) applications on the Movidius™ Neural Compute Stick.

**Compile the Deep Neural Network:** Automatically convert a trained Caffe-based convolutional neural network (CNN) into an embedded neural network optimized to run on the onboard Movidius Myriad 2 vision processing unit (VPU).

**Tune the Network:** Layer-by-layer performance metrics for both industry standard examples provided and custom-designed neural networks enable effective tuning for optimal real-world performance at ultra-low power. Validation scripts allow developers to compare the accuracy of the optimized model on the device to the original PC-based model.

**Accelerate the Network on the Neural Compute Stick:** Unique to Movidius Neural Compute Stick, the device can behave as a discrete neural network accelerator by adding dedicated deep learning inference capabilities to existing computing platforms for improved performance and power efficiency.



For more information, visit [developer.movidius.com](http://developer.movidius.com)



Visit [developer.movidius.com](http://developer.movidius.com) for more information.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

A "Mission Critical Application" is any application in which failure of the Intel Product could result, directly or indirectly, in personal injury or death. SHOULD YOU PURCHASE OR USE INTEL'S PRODUCTS FOR ANY SUCH MISSION CRITICAL APPLICATION, YOU SHALL INDEMNIFY AND HOLD INTEL AND ITS SUBSIDIARIES, SUBCONTRACTORS AND AFFILIATES, AND THE DIRECTORS, OFFICERS, AND EMPLOYEES OF EACH, HARMLESS AGAINST ALL CLAIMS COSTS, DAMAGES, AND EXPENSES AND REASONABLE ATTORNEYS' FEES ARISING OUT OF, DIRECTLY OR INDIRECTLY, ANY CLAIM OF PRODUCT LIABILITY, PERSONAL INJURY, OR DEATH ARISING IN ANY WAY OUT OF SUCH MISSION CRITICAL APPLICATION, WHETHER OR NOT INTEL OR ITS SUBCONTRACTOR WAS NEGLIGENT IN THE DESIGN, MANUFACTURE, OR WARNING OF THE INTEL PRODUCT OR ANY OF ITS PARTS.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information. The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or go to: <http://www.intel.com/design/literature.htm>

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

All products, computer systems, dates and figures specified are preliminary based on current expectations, and are subject to change without notice.

All products, platforms, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice. All dates specified are target dates, are provided for planning purposes only and are subject to change.

This document contains information on products in the design phase of development. Do not finalize a design with this information. Revised information will be published when the product is available. Verify with your local sales office that you have the latest datasheet before finalizing a design.

Code names featured are used internally within Intel to identify products that are in development and not yet publicly announced for release. Customers, licensees and other third parties are not authorized by Intel to use code names in advertising, promotion or marketing of any product or services and any such use of Intel's internal code names is at the sole risk of the user.

Intel, Intel Inside and Movidius are trademarks of Intel Corporation in the U.S. and other countries.

Other names and brands may be claimed as the property of others.

Copyright © 2019, Intel Corporation. All rights reserved.




# INTEL® SERVER / WORKSTATION PROCESSORS

**INNOVATION  
YOU WANT.  
VERSATILITY  
YOU NEED.**

## **ENABLING BETTER DESIGNS AND FASTER TIME TO MARKET**

The demand for faster time to market, design optimization, and cost reduction is driving the rapid adoption of workstation products in many industries. Not long ago, workstations were relegated to high-end design tasks such as complex mechanical assemblies, buildings, and aerospace design. Today, workstations are used in every major industry for tasks ranging from financial modeling, to designing complex buildings and vehicles. Workstations have become standard equipment for engineers, content creators, analysts, and others who need the highest levels of performance, visualization, and data integrity.



# INTEL® SERVER / WORKSTATION PROCESSORS

Innovation You Want. Versatility You Need.

[Intel® Xeon PHI™ Product Family](#)

[2nd Generation Intel® Xeon® Scalable Processors](#)

[Intel® Xeon® Scalable Processors](#)

[Intel® Xeon® Processor E7-8800/4800 v4 Family](#)

[Intel® Xeon® Processor E7-8800/4800 v3 Family](#)

[Intel® Xeon® Processor E7-8800/4800/2800 v2 Family](#)

[Intel® Xeon® Processor E5-4600 v4 Family](#)

[Intel® Xeon® Processor E5-4600 v3 Family](#)

[Intel® Xeon® Processor E5-2600/1600 v4 Family](#)

[Intel® Xeon® Processor E5-2600/1600 v3 Family](#)

[Intel® Xeon® Processor E5-4600/2600/2400/1600 v2 Family](#)

[Intel® Xeon® W Processors](#)

[Intel® Xeon® Processor E3-1500 v5 Family](#)

[Intel® Xeon® Processor E3-1200 v6 Family](#)

[Intel® Xeon® Processor E3-1200 v5 Family](#)

[Intel® Xeon® Processor E3-1200 v4 Family](#)

[Intel® Xeon® Processor E3-1200 v3 Family](#)

[Intel® Xeon® Processor D-1500 Product Family](#)

## The Intel® Xeon Phi™ Processor – Your Path to Deeper Insight

Eliminate node bottlenecks, simplify your code modernization, and build on a power-efficient architecture with the Intel® Xeon Phi™ processor, a foundational element of Intel® Scalable System Framework. The bootable host processor offers an integrated architecture for powerful, highly parallel performance that will pave your path to deeper insight, innovation, and impact for today's most-demanding High Performance Computing applications, including Machine Learning. Supported by a comprehensive technology roadmap and robust ecosystem, the Intel® Xeon Phi™ processor is a future-ready solution that maximizes your return on investment by using open standards code that are flexible, portable, and reusable.

## Product Specifications

PROCESSOR NAME	# OF CORES/ # OF THREADS	CLOCK SPEED	MAX TDP/POWER	MEMORY TYPES	FABRIC	L2 CACHE
Intel® Xeon™ Phi Processor 7250 (16GB, 1.40 GHz, 68 core)	68/272	1.4 GHz	215 W	DDR4-2400	No	34 MB
Intel® Xeon™ Phi Processor 7230 (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	215 W	DDR4-2400	No	32 MB
Intel® Xeon™ Phi Processor 7210 (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	215 W	DDR4-2133	No	32 MB
Intel® Xeon™ Phi Processor 7290 (16GB, 1.50 GHz, 72 core)	72/288	1.5 GHz	245 W	DDR4-2400	No	36 MB
Intel® Xeon™ Phi Processor 7290F (16GB, 1.50 GHz, 72 core)	72/288	1.5 GHz	260 W	DDR4-2400	Yes	36 MB
Intel® Xeon™ Phi Processor 7250F (16GB, 1.40 GHz, 68 core)	68/272	1.4 GHz	230 W	DDR4-2400	Yes	34 MB
Intel® Xeon™ Phi Processor 7230F (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	230 W	DDR4-2400	Yes	32 MB
Intel® Xeon™ Phi Processor 7210F (16GB, 1.30 GHz, 64 core)	64/256	1.3 GHz	230 W	DDR4-2133	Yes	32 MB

## Intel® Xeon Phi™ Coprocessors

Power breakthrough innovations with the highly parallel processing of the Intel® Xeon Phi™ coprocessor. Languages, tools, and applications run smoothly across the full spectrum of Intel® Xeon® processor family-based platforms. Intel Xeon Phi coprocessors provides 68 cores, 272 threads, and 2.828 double-precision teraFLOPS of performance,<sup>4,5,6</sup> and they come in a variety of configurations to address diverse hardware, software, workload, performance, and efficiency requirements.

### Intel® Xeon Phi™ Coprocessor Product Family for Server Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	NO. OF CORES	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	THERMAL	UPC CODE
Intel® Xeon Phi™ Coprocessor 7240P	SC7240P	1.3 GHz	34 MB	68	✓	205W	Passive Thermal	7 35858 33734 2
Intel® Xeon Phi™ Coprocessor 7220A	SC7220A	1.2 GHz	34 MB	68	✓	205W	Active Thermal	7 35858 33731 1
Intel® Xeon Phi™ Coprocessor 7220P	SC7220P	1.2 GHz	34 MB	68	✓	205W	Passive Thermal	7 35858 33732 8
Intel® Xeon Phi™ Coprocessor 7220AEB (HS)	SC7220AEB	1.2 GHz	34 MB	68	✓	205W	Active Thermal	7 35858 33730 4

# 2<sup>ND</sup> GENERATION INTEL® XEON® SCALABLE PROCESSORS



## NEW 2<sup>ND</sup> Generation Intel® Xeon® Scalable Processors

The 2<sup>nd</sup> Generation Intel® Xeon® Scalable processors are the new foundation for secure, agile, multi-cloud data centers. With uncompromising security and exceptional processing performance for trusted data service delivery, these processors deliver monumental leaps in I/O, memory, storage and network technology to harness actionable insights from our increasingly data-fueled smart and connected world.



## 2<sup>ND</sup> Generation Intel® Xeon® Scalable Processors for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® UPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Platinum Processor 8280	CD8069504228001 (tray)	2.7	10.40GT/sec	38.5M	DDR4-2933	28/56	✓	2	205W	N/A
Intel® Xeon® Platinum Processor 8276	CD8069504195501 (tray)	2.2	10.40GT/sec	38.5M	DDR4-2933	28/56	✓	2	165W	N/A
Intel® Xeon® Platinum Processor 8270	CD8069504195201 (tray)	2.7	10.40GT/sec	35.75M	DDR4-2933	26/52	✓	2	205W	N/A
Intel® Xeon® Platinum Processor 8268	CD8069504195101 (tray)	2.9	10.40GT/sec	35.75M	DDR4-2933	24/48	✓	2	205W	N/A
Intel® Xeon® Platinum Processor 8260	CD8069504201101 (tray)	2.4	10.40GT/sec	35.75M	DDR4-2933	24/48	✓	2	165W	N/A
Intel® Xeon® Platinum Processor 8256	CD8069504194701 (tray) BX806958256 (box)	3.8	10.40GT/sec	16.5M	DDR4-2933	4/8	✓	2	105W	N/A
Intel® Xeon® Platinum Processor 8253	CD8069504194601 (tray)	2.2	10.40GT/sec	22M	DDR4-2933	16/32	✓	2	125W	N/A
Intel® Xeon® Gold Processor 6254	CD8069504194501 (tray)	3.1	10.40GT/sec	24.75M	DDR4-2933	18/36	✓	2	200W	N/A
Intel® Xeon® Gold Processor 6252	CD8069504194401 (tray) BX806956252 (box)	2.1	10.40GT/sec	35.75M	DDR4-2933	24/48	✓	2	150W	N/A
Intel® Xeon® Gold Processor 6248	CD8069504194301 (tray) BX806956248 (box)	2.5	10.40GT/sec	27.5M	DDR4-2933	20/40	✓	2	150W	tbd
Intel® Xeon® Gold Processor 6244	CD8069504194202 (tray)	3.6	10.40GT/sec	24.75M	DDR4-2933	8/16	✓	2	150W	N/A
Intel® Xeon® Gold Processor 6242	CD8069504194101 (tray) BX806956242 (box)	2.8	10.40GT/sec	22M	DDR4-2933	16/32	✓	2	150W	N/A

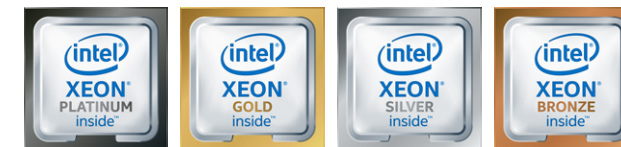
Continued on next page

Continued from previous page

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® UPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Gold Processor 6240	CD8069504194001 (tray) BX806956240 (box)	2.6	10.40GT/sec	24.75M	DDR4-2933	18/36	✓	2	150W	N/A
Intel® Xeon® Gold Processor 6230	CD8069504193701 (tray) BX806956230 (box)	2.1	10.40GT/sec	27.5M	DDR4-2933	20/40	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5222	CD8069504193501 (tray)	3.8	10.40GT/sec	16.5M	DDR4-2666	4/8	✓	2	105W	N/A
Intel® Xeon® Gold Processor 5220	CD8069504214601 (tray) BX806955220 (box)	2.2	10.40GT/sec	24.75M	DDR4-2666	18/36	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5218	CD8069504193301 (tray) BX806955218 (box)	2.3	10.40GT/sec	22M	DDR4-2666	16/32	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5217	CD8069504214302 (tray)	3	10.40GT/sec	11M	DDR4-2666	8/16	✓	2	125W	N/A
Intel® Xeon® Gold Processor 5215	CD8069504214002 (tray)	2.5	10.40GT/sec	13.75M	DDR4-2666	10/20	✓	2	85W	N/A
Intel® Xeon® Silver Processor 4216	CD8069504213901 (tray) BX806954216 (box)	2.1	10.40GT/sec	22M	DDR4-2400	16/32	✓	2	100W	N/A
Intel® Xeon® Silver Processor 4215	CD8069504212701 (tray)	2.5	10.40GT/sec	11M	DDR4-2400	8/16	✓	2	85W	N/A
Intel® Xeon® Silver Processor 4214	CD8069504212601 (tray) BX806954214 (box)	2.2	10.40GT/sec	16.5M	DDR4-2400	12/24	✓	2	85W	N/A

## Intel® Xeon® Scalable Processors

The Intel® Xeon® Scalable processors are the new foundation for secure, agile, multi-cloud data centers. With uncompromising security and exceptional processing performance for trusted data service delivery, these processors deliver monumental leaps in I/O, memory, storage and network technology to harness actionable insights from our increasingly data-fueled smart and connected world.



## Intel® Xeon® Scalable Processors for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® UPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Platinum Processor 8180	CD8067303314400 (tray) WX806738180 (box)	2.50 GHz	10.4 GT/s	38.5M	DDR4-2666 MHz	28/56	✓	2.0	205W	TBD
Intel® Xeon® Platinum Processor 8176	CD8067303314700 (tray) WX806738176 (box)	2.10 GHz	10.4 GT/s	38.5M	DDR4-2666 MHz	28/56	✓	2.0	165W	TBD
Intel® Xeon® Platinum Processor 8170	CD8067303327601 (tray) WX806738170 (box)	2.10 GHz	10.4 GT/s	35.75M	DDR4-2666 MHz	26/52	✓	2.0	165W	N/A
Intel® Xeon® Platinum Processor 8164	CD8067303408800 (tray) WX806738164 (box)	2.00 GHz	10.4 GT/s	35.75M	DDR4-2666 MHz	26/52	✓	2.0	150W	N/A
Intel® Xeon® Platinum Processor 8168	CD8067303327701 (tray)	2.70 GHz	10.4 GT/s	33M	DDR4-2666 MHz	24/48	✓	2.0	205W	N/A
Intel® Xeon® Platinum Processor 8160	CD8067303405600 (tray) WX806738160 (box)	2.10 GHz	10.4 GT/s	33M	DDR4-2666 MHz	24/48	✓	2.0	150W	TBD
Intel® Xeon® Platinum Processor 8158	CD8067303406500 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	12/24	✓	2.0	150W	N/A
Intel® Xeon® Platinum Processor 8156	CD8067303368800 (tray)	3.60 GHz	10.4 GT/s	16.5M	DDR4-2666 MHz	4/8	✓	2.0	105W	N/A
Intel® Xeon® Platinum Processor 8153	CD8067303408900 (tray)	2.00 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	✓	2.0	125W	N/A
Intel® Xeon® Gold Processor 6154	CD8067303592700 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	✓	2.0	200W	N/A
Intel® Xeon® Gold Processor 6152	CD8067303406000 (tray) WX806736152 (box)	2.10 GHz	10.4 GT/s	30.25M	DDR4-2666 MHz	22/44	✓	2.0	140W	TBD
Intel® Xeon® Gold Processor 6150	CD8067303328000 (tray)	2.70 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	✓	2.0	165W	TBD

Continued on next page



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® UPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Gold Processor 6148	CD8067303406200 (tray) WX806736148 (box)	2.40 GHz	10.4 GT/s	27.5M	DDR4-2666 MHz	20/40	✓	2.0	150W	TBD
Intel® Xeon® Gold Processor 6142	CD8067303405400 (tray) WX806736142 (box)	2.60 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	✓	2.0	150W	TBD
Intel® Xeon® Gold Processor 6140	CD8067303405200 (tray) WX806736140 (box)	2.30 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	18/36	✓	2.0	140W	TBD
Intel® Xeon® Gold Processor 6138	CD8067303406100 (tray) WX806736138 (box)	2.00 GHz	10.4 GT/s	27.5M	DDR4-2666 MHz	20/40	✓	2.0	125W	TBD
Intel® Xeon® Gold Processor 6132	CD8067303592500 (tray)	2.60 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	14/28	✓	2.0	133W	N/A
Intel® Xeon® Gold Processor 6136	CD8067303405800 (tray)	3.00 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	12/24	✓	2.0	148W	N/A
Intel® Xeon® Gold Processor 6134	CD8067303330302 (tray) WX806736134 (box)	3.20 GHz	10.4 GT/s	24.75M	DDR4-2666 MHz	8/16	✓	2.0	130W	N/A
Intel® Xeon® Gold Processor 6130	CD8067303409000 (tray) WX806736130 (box)	2.10 GHz	10.4 GT/s	22M	DDR4-2666 MHz	16/32	✓	2.0	125W	TBD
Intel® Xeon® Gold Processor 6128	CD8067303592600 (tray) WX806736128 (box)	3.40 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	6/12	✓	2.0	115W	N/A
Intel® Xeon® Gold Processor 6126	CD8067303405900 (tray)	2.60 GHz	10.4 GT/s	19.25M	DDR4-2666 MHz	12/24	✓	2.0	125W	N/A
Intel® Xeon® Gold Processor 5122	CD8067303330702 (tray) WX806735122 (box)	3.60 GHz	10.4 GT/s	16.5M	DDR4-2400 MHz	4/8	✓	2.0	105W	N/A
Intel® Xeon® Gold Processor 5120	CD8067303535900 (tray) WX806735120 (box)	2.20 GHz	10.4 GT/s	19.25M	DDR4-2400 MHz	14/28	✓	2.0	105W	TBD
Intel® Xeon® Gold Processor 5118	CD8067303536100 (tray)	2.30 GHz	10.4 GT/s	16.5M	DDR4-2400 MHz	12/24	✓	2.0	105W	N/A
Intel® Xeon® Gold Processor 5115	CD8067303535601 (tray)	2.40 GHz	10.4 GT/s	13.75M	DDR4-2400 MHz	10/20	✓	2.0	85W	N/A
Intel® Xeon® Sliver Processor 4116	CD8067303567200 (tray) WX806734116 (box)	2.10 GHz	9.6 GT/s	16.5M	DDR4-2400 MHz	12/24	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4114	CD8067303561800 (tray) WX806734114 (box)	2.20 GHz	9.6 GT/s	13.75M	DDR4-2400 MHz	10/20	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4112	CD8067303562100 (tray) WX806734112 (box)	2.60 GHz	9.6 GT/s	8.25M	DDR4-2400 MHz	4/8	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4110	CD8067303561400 (tray) WX806734110 (box)	2.10 GHz	9.6 GT/s	11M	DDR4-2400 MHz	8/16	✓	2.0	85W	TBD
Intel® Xeon® Sliver Processor 4108	CD8067303561500 (tray) WX806734108 (box)	1.80 GHz	9.6 GT/s	11M	DDR4-2400 MHz	8/16	✓	2.0	85W	TBD
Intel® Xeon® Bronze Processor 3106	CD8067303561900 (tray) WX806733106 (box)	1.70 GHz	9.6 GT/s	11M	DDR4-2133 MHz	8/16	No	No	85W	TBD
Intel® Xeon® Bronze Processor 3104	CD8067303562000 (tray) WX806733104 (box)	1.70 GHz	9.6 GT/s	8.25M	DDR4-2133 MHz	6/12	No	No	85W	TBD

# INTEL® XEON® PROCESSOR E7-8800 / 4800 V4 FAMILY



## Introducing the New Intel Xeon Processor E7-8800/ 4800 v4 Product Family

Unleash exceptional performance for your most demanding data workloads. Fast track your business for real-time analytics and in-memory computing with the secure, reliable, performance workhorse that is the Intel® Xeon® processor E7-8800/4800 v4 product families. Designed for the most mission-critical workloads and the always-on enterprise, the processor combines large memory capacities with leading performance, reliability, and virtualization capabilities to keep your data center supplying business advantage without interruption.



## Intel® Xeon® Processor E7-8800 v4 Product Family for Server / Workstation Systems Featuring Up to Eight LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-8893 v4	CM8066902065502	3.20 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	4/8	✓	✓	140 W
Intel® Xeon® processor E7-8891 v4	CM8066902027903	2.80 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	10/20	✓	✓	165 W
Intel® Xeon® processor E7-8867 v4	CM8066902028403	2.40 GHz	9.6 GT/s	45M	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	165 W
Intel® Xeon® processor E7-8890 v4	CM8066902885200	2.20 GHz	9.6 GT/s	60M	1866 MHz (DDR4) 1600 MHz (DDR3)	24/48	✓	✓	165 W
Intel® Xeon® processor E7-8880 v4	CM8066902325500	2.20 GHz	9.6 GT/s	55M	1866 MHz (DDR4) 1600 MHz (DDR3)	22/44	✓	✓	150 W
Intel® Xeon® processor E7-8870 v4	CM8066902025802	2.10 GHz	9.6 GT/s	50M	1866 MHz (DDR4) 1600 MHz (DDR3)	20/40	✓	✓	140 W
Intel® Xeon® processor E7-8860 v4	CM8066902325800	2.20 GHz	9.6 GT/s	45M	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	140 W

## Intel® Xeon® Processor E7-4800 v4 Product Family for Server / Workstation Systems Featuring Up to Four LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-4850 v4	CM8066902026904	2.10 GHz	8.0 GT/s	40M	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	115 W
Intel® Xeon® processor E7-4830 v4	CM8066902027102	2.00 GHz	8.0 GT/s	35M	1866 MHz (DDR4) 1600 MHz (DDR3)	14/28	✓	✓	115 W
Intel® Xeon® processor E7-4820 v4	CM8066902027500	2.00 GHz	6.4 GT/s	25M	1866 MHz (DDR4) 1333 MHz (DDR3)	10/20	✓		115 W
Intel® Xeon® processor E7-4809 v4	CM8066902027604	2.10 GHz	6.4 GT/s	20M	1866 MHz (DDR4) 1333 MHz (DDR3)	8/16	✓		115 W

# INTEL® XEON® PROCESSOR E7-8800 / 4800 V3 FAMILY



## Introducing the New Intel Xeon Processor E7-8800/ 4800 v3 Product Family

In Q2 2015, Intel will launch the next-generation processor family in the Mission Critical and Expandable Segment for server platforms with 2, 4, and 8+ sockets. The Intel® Xeon® Processor E7-8800/4800 v3 family will offer top-of-the-line performance, scalability, and reliability for enterprise and mission critical workloads, including advanced analytics, databases, virtualization, and scale-up HPC. Based on Haswell<sup>1</sup> microarchitecture on the 22nm process technology, the Intel Xeon Processor E7-8800/4800 v3 family will introduce performance improvements, new RAS capabilities, and new power and thermal management capabilities, as well as support for DDR4 memory.



## Intel® Xeon® Processor E7-8800 v3 Product Family for Server / Workstation Systems Featuring Up to Eight LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-8893 v3	CM8064501753602	3.20 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	4/8	✓	✓	140 W
Intel® Xeon® processor E7-8891 v3	CM8064501552202	2.80 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	10/20	✓	✓	165 W
Intel® Xeon® processor E7-8890 v3	CM8064501549928	2.50 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	165 W
Intel® Xeon® processor E7-8880 v3	CM8064501550002	2.30 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	150 W
Intel® Xeon® processor E7-8880L v3	CM8064501552522	2.00 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	115 W
Intel® Xeon® processor E7-8870 v3	CM8064501550107	2.10 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/36	✓	✓	140 W
Intel® Xeon® processor E7-8867 v3	CM8064502025001	2.50 GHz	9.60 GT/s	45 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	165 W
Intel® Xeon® processor E7-8860 v3	CM8064502017900	2.20 GHz	9.60 GT/s	40 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	16/32	✓	✓	140 W

## Intel® Xeon® Processor E7-4800 v3 Product Family for Server / Workstation Systems Featuring Up to Four LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E7-4850 v3	CM8064501551702	2.20 GHz	8 GT/s	35 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	18/28	✓	✓	115 W
Intel® Xeon® processor E7-4830 v3	CM8064502020101	2.10 GHz	8 GT/s	30 MB	1866 MHz (DDR4) 1600 MHz (DDR3)	12/24	✓	✓	115 W
Intel® Xeon® processor E7-4820 v3	CM8064502020200	1.90 GHz	6.40 GT/s	25 MB	1866 MHz (DDR4) 1333 MHz (DDR3)	10/20	✓		115 W
Intel® Xeon® processor E7-4809 v3	CM8064501551526	2.00 GHz	6.40 GT/s	20 MB	1866 MHz (DDR4) 1333 MHz (DDR3)	8/16	✓		115 W

# INTEL® XEON® PROCESSOR E7-8800 / 4800 / 2800 V2 FAMILY



## Intel® Xeon® Processor E7-8800 / 4800 / 2800 v2 Product Families

Rapidly process and analyze large amounts of data in near real time with the Intel® Xeon® processor E7-8800 / 4800 / 2800 v2 product families.

Keep data local with up to 1.5 TB of memory per socket to manage data-demanding, transaction-intensive workloads. Intel® Run Sure Technology<sup>2</sup> helps increase system uptime and data integrity for business-critical solutions. Hardware-embedded security features help better protect data and provide a safer environment.



## Intel® Xeon® Processor E7-8800 v2 Product Family for Server / Workstation Systems Featuring Eight LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E7-8893 v2	CM8063601454907	3.40 GHz	8 GT/s	37.5 MB	1600 MHz	6/12	✓	✓	155 W	N/A
Intel® Xeon® processor E7-8891 v2	CM8063601377422	3.20 GHz	8 GT/s	37.5 MB	1600 MHz	10/20	✓	✓	155 W	N/A
Intel® Xeon® processor E7-8890 v2	CM8063601213513	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	155 W	N/A
Intel® Xeon® processor E7-8880 v2	CM8063601271810	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-8880L v2	CM8063601275812	2.20 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	105 W	N/A
Intel® Xeon® processor E7-8870 v2	CM8063601272006	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-8857 v2	CM8063601275912	3.00 GHz	8 GT/s	30 MB	1600 MHz	12/12		✓	130 W	N/A
Intel® Xeon® processor E7-8850 v2	CM8063601272306	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	✓	✓	105 W	N/A

## Intel® Xeon® Processor E7-4800 v2 Product Family for Server / Workstation Systems Featuring Four LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E7-4890 v2	CM8063601272412	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	155 W	N/A
Intel® Xeon® processor E7-4880 v2	CM8063601272512	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-4870 v2	CM8063601272606	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-4860 v2	CM8063601453406	2.60 GHz	8 GT/s	30 MB	1600 MHz	12/24	✓	✓	130 W	N/A
Intel® Xeon® processor E7-4850 v2	CM8063601272906	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	✓	✓	105 W	N/A
Intel® Xeon® processor E7-4830 v2	CM8063601374506	2.20 GHz	7.20 GT/s	20 MB	1333 MHz	10/20	✓	✓	105 W	N/A
Intel® Xeon® processor E7-4820 v2	CM8063601521707	2.00 GHz	7.20 GT/s	16 MB	1333 MHz	8/16	✓	✓	105 W	N/A
Intel® Xeon® processor E7-4809 v2	CM8063601537106	1.90 GHz	6.40 GT/s	12 MB	1066 MHz	6/12	✓		105 W	N/A

## Intel® Xeon® Processor E7-2800 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011-1 Sockets

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E7-2890 v2	CM8063601375306	2.80 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	155 W	N/A
Intel® Xeon® processor E7-2880 v2	CM8063601273306	2.50 GHz	8 GT/s	37.5 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-2870 v2	CM8063601273406	2.30 GHz	8 GT/s	30 MB	1600 MHz	15/30	✓	✓	130 W	N/A
Intel® Xeon® processor E7-2850 v2	CM8063601275706	2.30 GHz	7.20 GT/s	24 MB	1333 MHz	12/24	✓	✓	105 W	N/A

# INTEL® XEON® PROCESSOR E5-4600 V4 FAMILY



## Introducing the New Intel® Xeon® Processor E5-4600 v4 Product Family

Four-socket servers based on the Intel® Xeon® processor E5-4600 v4 product family provide high-density, cost-optimized, energy-efficient compute resources to support larger workloads and high virtual machine densities for the data center or cloud.



## Intel® Xeon® Processor E5-4600 v4 Product Family for Server / Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E5-4660 v4	CM8066002062605	2.20 GHz	9.6 GT/s	40 MB	DDR4-2400 MHz	16/32	✓	✓	120 W
Intel® Xeon® processor E5-4650 v4	CM8066002028621	2.20 GHz	9.6 GT/s	35 MB	DDR4-2400 MHz	14/28	✓	✓	105 W
Intel® Xeon® processor E5-4640 v4	CM8066002061701	2.10 GHz	8.0 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	105 W
Intel® Xeon® processor E5-4620 v4	CM8066002883900	2.10 GHz	8.0 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W
Intel® Xeon® processor E5-4610 v4	CM8066002062800	1.80 GHz	6.4 GT/s	25 MB	DDR4-1866 MHz	10/20	✓		105 W
Intel® Xeon® processor E5-4669 v4	CM8066002064800	2.20 GHz	9.6 GT/s	55 MB	DDR4-2400 MHz	22/44	✓	✓	135 W
Intel® Xeon® processor E5-4667 v4	CM8066002064600	2.20 GHz	9.6 GT/s	45 MB	DDR4-2400 MHz	18 /36	✓	✓	135 W
Intel® Xeon® processor E5-4655 v4	CM8066002065000	2.50 GHz	9.6 GT/s	30 MB	DDR4-2400 MHz	8/16	✓	✓	135 W
Intel® Xeon® processor E5-4627 v4	CM8066002330800	2.60 GHz	9.6 GT/s	25 MB	DDR4-2400 MHz	10/10		✓	135 W



# INTEL® XEON® PROCESSOR E5-4600 V3 FAMILY



## Introducing the New Intel® Xeon® Processor E5-4600 v3 Product Family

Available Q2 2015, the Intel® Xeon® processor E5-4600 v3 product family is a 4-socket server platform that supports DDR4 memory technology. Target applications and usage models include large memory databases that need a highly scalable number of cores and memory bandwidth per server, and large-scale online transaction processing workloads where high-speed and large capacity memory configurations are required.



## Intel® Xeon® Processor E5-4600 v3 Product Family for Server / Workstation Systems

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE (TRAY ONLY)	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER
Intel® Xeon® processor E5-4660 v3	CM8064402018700	2.10 GHz	9.60 GT/s	35 MB	2133 MHz	14/28	✓	✓	120 W
Intel® Xeon® processor E5-4650 v3	CM8064401441008	2.10 GHz	9.60 GT/s	30 MB	2133 MHz	12/24	✓	✓	105 W
Intel® Xeon® processor E5-4640 v3	CM8064401442601	1.90 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	105 W
Intel® Xeon® processor E5-4620 v3	CM8064401442401	2.00 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	105 W
Intel® Xeon® processor E5-4610 v3	CM8064402018800	1.70 GHz	6.40 GT/s	25 MB	1600 MHz	10/20	✓		105 W
Intel® Xeon® processor E5-4669 v3	CM8064401864100	2.10 GHz	9.60 GT/s	45 MB	2133 MHz	18/36	✓	✓	135 W
Intel® Xeon® processor E5-4667 v3	CM8064401864200	2.00 GHz	9.60 GT/s	40 MB	2133 MHz	16/32	✓	✓	135 W
Intel® Xeon® processor E5-4655 v3	CM8064402018600	2.90 GHz	9.60 GT/s	30 MB	2133 MHz	6/12	✓	✓	135 W
Intel® Xeon® processor E5-4627 v3	CM8064401544203	2.60 GHz	8 GT/s	25 MB	2133 MHz	10/10		✓	135 W

# INTEL® XEON® PROCESSOR E5-2600 / 1600 V4 FAMILY



## Intel® Xeon® Processor E5-2600 v4 Product Family

The powerful new Intel® Xeon® processor E5-2600 v4 product family offers versatility across diverse workloads. These processors are designed for architecting next-generation data centers running on, software defined infrastructure supercharged for efficiency, performance, and agile services delivery across cloud-native and traditional applications. They support workloads for cloud, high-performance computing, networking, and storage.



## Intel® Xeon® Processor E5-2600 v4 Product Family for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
<b>SERVER SKUS</b>										
Intel® Xeon® Processor E5-2699 v4	CM8066002022506 (tray)	2.20 GHz	9.6 GT/s	55M	DDR4-2400 MHz	22/44	✓	2.0	145	N/A
Intel® Xeon® Processor E5-2698 v4	CM8066002024000 (tray)	2.20 GHz	9.6 GT/s	50M	DDR4-2400 MHz	20/40	✓	2.0	135	N/A
Intel® Xeon® Processor E5-2697 v4	CM8066002023907 (tray) BX80660E52697V4 (box)	2.30 GHz	9.6 GT/s	45M	DDR4-2400 MHz	18/36	✓	2.0	145	735858310574
Intel® Xeon® Processor E5-2697A v4	CM8066002645900 (tray)	2.60 GHz	9.6 GT/s	40M	DDR4-2400 MHz	16/32	✓	2.0	145	N/A
Intel® Xeon® Processor E5-2695 v4	CM8066002023801 (tray) BX80660E52695V4 (box)	2.10 GHz	9.6 GT/s	45M	DDR4-2400 MHz	18/36	✓	2.0	120W	735858310628
Intel® Xeon® Processor E5-2690 v4	CM8066002030908 (tray) BX80660E52690V4 (box)	2.60 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	135W	735858310857
Intel® Xeon® Processor E5-2683 v4	CM8066002023604 (tray) BX80660E52683V4 (box)	2.10 GHz	9.6 GT/s	40M	DDR4-2400 MHz	16/32	✓	2.0	120W	735858310529
Intel® Xeon® Processor E5-2680 v4	CM8066002031501 (tray) BX80660E52680V4 (box)	2.40 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	120W	735858310802
Intel® Xeon® Processor E5-2660 v4	CM8066002030908 (tray) BX80660E52660V4 (box)	2.00 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	105W	735858310758
Intel® Xeon® Processor E5-2650 v4	CM8066002031103 (tray) BX80660E52650V4 (box)	2.20 GHz	9.6 GT/s	30M	DDR4-2400 MHz	12/24	✓	2.0	105W	735858310703

Continued on next page

## Intel® Xeon® Processor E5-2600 v4 Product Family for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
<b>SERVER SKUS</b>										
Intel® Xeon® Processor E5-2640 v4	CM8066002032701 (tray) BX80660E52640V4 (box)	2.40 GHz	9.6 GT/s	25M	DDR4-2133 MHz	10/20	✓	2.0	90W	735858314220
Intel® Xeon® Processor E5-2630v4	CM8066002032301 (tray) BX80660E52630V4 (box)	2.20 GHz	8 GT/s	25M	DDR4-2133 MHz	10/20	✓	2.0	85W	735858314121
Intel® Xeon® Processor E5-2620v4	CM8066002032201 (tray) BX80660E52620V4 (box)	2.10 GHz	8 GT/s	20M	DDR4-2133 MHz	8/16	✓	2.0	85W	735858314077
Intel® Xeon® Processor E5-2609v4	CM8066002032901 (tray) BX80660E52609V4 (box)	1.70 GHz	8 GT/s	20M	DDR4-1866 MHz	8/8	✓	2.0	85W	735858314022
Intel® Xeon® Processor E5-2603v4	CM8066002032805 (tray) BX80660E52603V4 (box)	1.70 GHz	6.4 GT/s	15M	DDR4-1866 MHz	6	✓	2.0	85W	735858313971
Intel® Xeon® Processor E5-2650L v4	CM8066002033006 (tray)	1.70 GHz	9.6 GT/s	35M	DDR4-2400 MHz	14/28	✓	2.0	65W	N/A
Intel® Xeon® Processor E5-2630L v4	CM8066002033202 (tray)	1.80 GHz	8 GT/s	20M	DDR4-2133 MHz	10/20	✓	2.0	55W	N/A
Intel® Xeon® Processor E5-2667 v4	CM8066002041900 (tray)	3.20 GHz	9.6 GT/s	25M	DDR4-2400 MHz	8/16	✓	2.0	135W	N/A
Intel® Xeon® Processor E5-2643 v4	CM8066002041500 (tray)	3.40 GHz	9.6 GT/s	20M	DDR4-2400 MHz	6/12	✓	2.0	135W	N/A
Intel® Xeon® Processor E5-2637 v4	CM8066002041100 (tray)	3.50 GHz	9.6 GT/s	15M	DDR4-2400 MHz	4/8	✓	2.0	135W	N/A
Intel® Xeon® Processor E5-2623 v4	CM8066002402400 (tray)	2.60 GHz	8 GT/s	10M	DDR4-2133 MHz	4/8	✓	2.0	85W	N/A
<b>WORKSTATION SKU</b>										
Intel® Xeon® Processor E5-2687W v4	CM8066002042802 (tray) BX80660E52687V4 (box)	3.0GHz	9.6 GT/s	30M	DDR4-2400 MHz	12/24	✓	2.0	160W	735858310901

## Intel® Xeon® Processor E5-1600 v4 Product Family for Server and Workstation Systems

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
<b>SERVER SKUS</b>										
Intel® Xeon® Processor E5-1680 v4	CM8066002044401 (tray)	3.40 GHz	0 GT/s QPI	20M	DDR4-2400 MHz	8/16	✓	2.0	140W	N/A
Intel® Xeon® Processor E5-1660 v4	CM8066002646401 (tray)	3.20 GHz	0 GT/s QPI	20M	DDR4-2400 MHz	8/16	✓	2.0	140W	N/A
Intel® Xeon® Processor E5-1650 v4	CM8066002044306 (tray) BX80660E51650V4 (box)	3.60 GHz	0 GT/s QPI	15M	DDR4-2400 MHz	3/12	✓	2.0	140W	735858318952
Intel® Xeon® Processor E5-1630 v4	CM8066002395300 (tray)	3.70 GHz	0 GT/s QPI	10M	DDR4-2400 MHz	4/8	✓	2.0	140W	N/A
Intel® Xeon® Processor E5-1620 v4	CM8066002044103 (tray) BX80660E51620V4 (box)	3.50 GHz	0 GT/s QPI	10M	DDR4-2400 MHz	4/8	✓	2.0	140W	735858314176
<b>WORKSTATION SKU</b>										
Intel® Xeon® Processor E5-1650 v4	BX80660E51650V4 (box)	3.60 GHz	0 GT/s QPI	15M	DDR4-2400 MHz	3/12	✓	2.0	140W	

# INTEL® XEON® PROCESSOR E5-2600 / 1600 V3 FAMILY



## Intel® Xeon® Processor E5-2600 / 1600 v3 Product Family

Intel® Xeon® processor E5-2600 / 1600 v3 product families are at the heart of an agile, efficient data center and help meet your needs for compute, storage, and network. These energy-efficient marvels are designed to help deliver a combination of performance, built-in capabilities, and cost-effectiveness. Whether addressing technical computing challenges, enabling cloud deployments, delivering intelligent storage, or powering design automation and data analytics, enjoy better-than-ever performance. Help better safeguard your data and infrastructure with technology foundational for greater security. Break challenging data management performance bottlenecks with 40 gigabit Intel® Ethernet, DDR4 support, and innovative storage features. Built-in capabilities that measure and monitor make Intel-powered platforms the smart choice for a software-defined world. With the flexibility and versatility of the Intel Xeon processor E5-2600 / 1600 v3 families, you only have to remember one thing: It's what's inside that counts.



## Intel® Xeon® Processor E5-2600 v3 Product Family for Server and Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
<b>ADVANCED SKUS</b>										
Intel® Xeon® processor E5-2690 v3	BX80644E52690V3 (box) CM8064401439416 (tray)	2.60 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	135 W	7 35858 28363 2
Intel® Xeon® processor E5-2680 v3	BX80644E52680V3 (box) CM8064401439612 (tray)	2.50 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	120 W	7 35858 28358 8
Intel® Xeon® processor E5-2670 v3	BX80644E52670V3 (box) CM8064401544801 (tray)	2.30 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	120 W	7 35858 28368 7
Intel® Xeon® processor E5-2660 v3	BX80644E52660V3 (box) CM8064401446117 (tray)	2.60 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W	7 35858 28353 3
Intel® Xeon® processor E5-2650 v3	BX80644E52650V3 (box) CM8064401723701 (tray)	2.30 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	105 W	7 35858 28378 6
<b>STANDARD SKUS</b>										
Intel® Xeon® processor E5-2640 v3	BX80644E52640V3 (box) CM8064401830901 (tray)	2.60 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	90 W	7 35858 28522 3
Intel® Xeon® processor E5-2630 v3	BX80644E52630V3 (box) CM8064401831000 (tray)	2.40 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	85 W	7 35858 28533 9
Intel® Xeon® processor E5-2620 v3	BX80644E52620V3 (box) CM8064401831400 (tray)	2.40 GHz	8 GT/s	15 MB	DDR4-1866 MHz	8/16	✓	✓	85 W	7 35858 28538 4
<b>BASIC SKUS</b>										
Intel® Xeon® processor E5-2609 v3	BX80644E52609V3 (box) CM8064401850800 (tray)	1.90 GHz	6.40 GT/s	15 MB	DDR4-1600 MHz	6/6			85 W	7 35858 28373 1
Intel® Xeon® processor E5-2603 v3	BX80644E52603V3 (box) CM8064401844200 (tray)	1.60 GHz	6.40 GT/s	15 MB	DDR4-1600 MHz	6/6			85 W	7 35858 28517 9

Continued on next page

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QP <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
<b>SEGMENT-OPTIMIZED SKUS</b>										
Intel® Xeon® processor E5-2699 v3	CM8064401739300 (tray only)	2.30 GHz	9.60 GT/s	45 MB	DDR4-2133 MHz	18 / 36	✓	✓	145 W	N/A
Intel® Xeon® processor E5-2698 v3	CM8064401609800 (tray only)	2.30 GHz	9.60 GT/s	40 MB	DDR4-2133 MHz	16 / 26	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2697 v3	BX80644E52697V3 (box) CM8064401807100 (tray)	2.60 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14 / 28	✓	✓	145 W	7 35858 28264 2
Intel® Xeon® processor E5-2695 v3	BX80644E52695V3 (box) CM8064401438110 (tray)	2.30 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14 / 28	✓	✓	120 W	7 35858 28269 7
Intel® Xeon® processor E5-2683 v3	CM8064401609728 (tray only)	2 GHz	9.60 GT/s	35 MB	DDR4-2133 MHz	14 / 28	✓	✓	120 W	N/A
<b>WORKSTATION SKUS</b>										
Intel® Xeon® processor E5-2687W v3	BX80644E52687V3 (box) CM8064401613502 (tray)	3.10 GHz	9.60 GT/s	25 MB	DDR4-2133 MHz	10/20	✓	✓	160 W	7 35858 28348 9
<b>FREQUENCY-OPTIMISED SKUS</b>										
Intel® Xeon® processor E5-2667 v3	CM8064401724301 (tray only)	3.20 GHz	9.60 GT/s	20 MB	DDR4-2133 MHz	8/16	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2643 v3	CM8064401724501 (tray only)	3.40 GHz	9.60 GT/s	20 MB	DDR4-2133 MHz	6/12	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2637 v3	CM8064401724101 (tray only)	3.50 GHz	9.60 GT/s	15 MB	DDR4-2133 MHz	4/8	✓	✓	135 W	N/A
Intel® Xeon® processor E5-2623 v3	CM8064401832000 (tray only)	3 GHz	8 GT/s	10 MB	DDR4-1866 MHz	4/8	✓	✓	105 W	N/A
<b>LOW-POWER SKUS</b>										
Intel® Xeon® processor E5-2650L v3	CM8064401575702 (tray only)	1.80 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	65 W	N/A
Intel® Xeon® processor E5-2630L v3	CM8064401832100 (tray only)	1.80 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	55 W	N/A
<b>EMBEDDED SKUS</b>										
Intel® Xeon® processor E5-2658 v3	CM8064401545904 (tray only)	2.20 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	105 W	N/A
Intel® Xeon® processor E5-2648L v3	CM8064401546007 (tray only)	1.80 GHz	9.60 GT/s	30 MB	DDR4-2133 MHz	12/24	✓	✓	75 W	N/A
Intel® Xeon® processor E5-2628L v3	CM8064401547200 (tray only)	2 GHz	8 GT/s	25 MB	DDR4-1866 MHz	10/20	✓	✓	75 W	N/A
Intel® Xeon® processor E5-2622 v3	CM8064401576904 (tray only)	2.40 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	85 W	N/A
Intel® Xeon® processor E5-2618L v3	CM8064401610301 (tray only)	2.30 GHz	8 GT/s	20 MB	DDR4-1866 MHz	8/16	✓	✓	75 W	N/A
Intel® Xeon® processor E5-2608L v3	CM8064401909500 (tray only)	2 GHz	6.40 GT/s	15 MB	DDR4-1866 MHz	6/12	✓		52 W	N/A

## Intel® Xeon® Processor E5-1600 v3 Product Family for Workstation Systems Featuring One LGA2011 Socket

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
<b>ADVANCED SKUS</b>									
Intel® Xeon® processor E5-1680 v3	CM8064401547809 (tray only)	3.20 GHz	20 MB	DDR4-2133 MHz	8/16	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1660 v3	CM8064401909200 (tray only)	3 GHz	20 MB	DDR4-2133 MHz	8/16	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1650 v3	CM8064401548111 (tray only)	3.50 GHz	15 MB	DDR4-2133 MHz	6/12	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1630 v3	CM8064401614501 (tray only)	3.70 GHz	10 MB	DDR4-2133 MHz	4/8	✓	✓	140 W	N/A
Intel® Xeon® processor E5-1620 v3	CM8064401973600 (tray only)	3.50 GHz	10 MB	DDR4-2133 MHz	4/8	✓	✓	140 W	N/A

# INTEL® XEON® PROCESSOR E5-4600 / 2600 / 2400 / 1600 V2 FAMILY



## Intel® Xeon® Processor E5-4600 / 2600 / 2400 / 1600 v2 Product Families

The Intel® Xeon® processor E5-2600 / 1600 v2, E5-2400 v2, and E5-4600 v2 product families are at the heart of an agile, efficient data center. Deploy a more trusted private cloud with the technology foundational for greater security. Put the “instantaneous” into data analysis with the performance to quickly process big data. These new Intel Xeon processor families enable greater energy efficiency and power management for a range of enterprise applications.



## Intel® Xeon® Processor E5-4600 v2 Product Family for Server Systems Featuring Four LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	SHARED L3 CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-4657L v2	CM8063501285605 (tray only)	2.40 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	115 W	N/A
Intel® Xeon® processor E5-4650 v2	CM8063501541700 (tray only)	2.40 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4640 v2	CM8063501285713 (tray only)	2.20 GHz	8 GT/s	20 MB	1866 MHz	10/20	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4627 v2	CM8063501454002 (tray only)	3.30 GHz	7.20 GT/s	16 MB	1866 MHz	8/8		✓	130 W	N/A
Intel® Xeon® processor E5-4624L v2	CM8063501293407 (tray only)	1.90 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	70 W	N/A
Intel® Xeon® processor E5-4620 v2	CM8063501393202 (tray only)	2.60 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4610 v2	CM8063501521600 (tray only)	2.30 GHz	7.20 GT/s	16 MB	1600 MHz	8/16	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4607 v2	CM8063501377604 (tray only)	2.60 GHz	6.40 GT/s	12 MB	1333 MHz	6/12	✓	✓	95 W	N/A
Intel® Xeon® processor E5-4603 v2	CM8063501453800 (tray only)	2.20 GHz	6.40 GT/s	10 MB	1333 MHz	4/8	✓	✓	95 W	N/A



## Intel® Xeon® Processor E5-2600 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-2697 v2	BX80635E52697V2 (box) CM8063501288843 (tray)	2.70 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	130 W	7 35858 26666 6
Intel® Xeon® processor E5-2695 v2	BX80635E52695V2 (box) CM8063501288706 (tray)	2.40 GHz	8 GT/s	30 MB	1866 MHz	12/24	✓	✓	115 W	7 35858 26671 0
Intel® Xeon® processor E5-2690 v2	BX80635E52690V2 (box) CM8063501374802 (tray)	3 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	130 W	7 35858 26832 5
Intel® Xeon® processor E5-2687W v2	BX80635E52687V2 (box) CM8063501287203 (tray)	3.10 GHz	8 GT/s	20 MB	1866 MHz	8/16	✓	✓	150 W	7 35858 26922 3
Intel® Xeon® processor E5-2680 v2	BX80635E52680V2 (box) CM8063501374901 (tray)	2.80 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	130 W	7 35858 26837 0
Intel® Xeon® processor E5-2670 v2	BX80635E52670V2 (box) CM8063501375000 (tray)	2.50 GHz	8 GT/s	20 MB	1866 MHz	10/20	✓	✓	115 W	7 35858 26842 4
Intel® Xeon® processor E5-2667 v2	CM8063501287304 (tray only)	3.30 GHz	8 GT/s	25 MB	1866 MHz	8/16	✓	✓	130 W	N/A
Intel® Xeon® processor E5-2660 v2	BX80635E52660V2 (box) CM8063501452503 (tray)	2.20 GHz	8 GT/s	25 MB	1866 MHz	10/20	✓	✓	95 W	7 35858 26847 9
Intel® Xeon® processor E5-2650 v2	BX80635E52650V2 (box) CM8063501375101 (tray)	2.60 GHz	8 GT/s	20 MB	1866 MHz	8/16	✓	✓	95 W	7 35858 26852 3
Intel® Xeon® processor E5-2650L v2	CM8063501287602 (tray only)	1.70 GHz	7.20 GT/s	25 MB	1600 MHz	10/20	✓	✓	70 W	N/A
Intel® Xeon® processor E5-2643 v2	CM8063501287403 (tray only)	3.50 GHz	8 GT/s	25 MB	1866 MHz	6/12	✓	✓	130 W	N/A
Intel® Xeon® processor E5-2640 v2	BX80635E52640V2 (box) CM8063501288202 (tray)	2 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	7 35858 26857 8
Intel® Xeon® processor E5-2637 v2	CM8063501520800 (tray only)	3.50 GHz	8 GT/s	15 MB	1866 MHz	4/8	✓	✓	130 W	N/A
Intel® Xeon® processor E5-2630 v2	BX80635E52630V2 (box) CM8063501288100 (tray)	2.60 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	7 35858 26884 4
Intel® Xeon® processor E5-2630L v2	CM8063501376200 (tray only)	2.40 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	N/A
Intel® Xeon® processor E5-2620 v2	BX80635E52620V2 (box) CM8063501288301 (tray)	2.10 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	735858 26889 9
Intel® Xeon® processor E5-2609 v2	BX80635E52609V2 (box) CM8063501375800 (tray)	2.50 GHz	6.40 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 26894 3
Intel® Xeon® processor E5-2603 v2	BX80635E52603V2 (box) CM8063501375902 (tray)	1.80 GHz	6.40 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 26899 8

## Intel® Xeon® Processor E5-2400 v2 Product Family for Server / Workstation Systems Featuring Two LGA2011 Sockets

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	INTEL® QPI <sup>3</sup> SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-2470 v2	BX80634E52470V2 (box) CM8063401286102 (tray)	2.40 GHz	8 GT/s	25 MB	1600 MHz	10/20	✓	✓	95 W	7 35858 27206 3
Intel® Xeon® processor E5-2450 v2	BX80634E52450V2 (box) CM8063401376400 (tray)	2.50 GHz	8 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	7 35858 27211 7
Intel® Xeon® processor E5-2450L v2	CM8063401287001 (tray only)	1.70 GHz	8 GT/s	20 MB	1600 MHz	8/16	✓	✓	70 W	N/A
Intel® Xeon® processor E5-2440 v2	BX80634E52440V2 (box) CM8062000862604 (tray)	1.90 GHz	7.20 GT/s	20 MB	1600 MHz	8/16	✓	✓	95 W	7 35858 27201 8
Intel® Xeon® processor E5-2430 v2	BX80634E52430V2 (box) CM8063401286400 (tray)	2.50 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	7 35858 27196 7
Intel® Xeon® processor E5-2430L v2	CM8063401376704 (tray only)	2.40 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	60 W	N/A
Intel® Xeon® processor E5-2420 v2	BX80634E52420V2 (box) CM8063401286503 (tray)	2.20 GHz	7.20 GT/s	15 MB	1600 MHz	6/12	✓	✓	80 W	7 35858 27191 2
Intel® Xeon® processor E5-2407 v2	BX80634E52407V2 (box) CM8063401286600 (tray)	2.40 GHz	7.20 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 27186 8
Intel® Xeon® processor E5-2403 v2	BX80634E52403V2 (box) CM8063401286702 (tray)	1.80 GHz	7.20 GT/s	10 MB	1333 MHz	4/4			80 W	7 35858 27181 3

## Intel® Xeon® Processor E5-1600 v2 Product Family for Workstation Systems Featuring One LGA2011 Socket

(Thermal Solution Sold Separately)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E5-1660 v2	BX80635E51660V2 (box) CM8063501291808 (tray)	3.70 GHz	15 MB	1866 MHz	6/12	✓	✓	130 W	7 35858 26927 8
Intel® Xeon® processor E5-1650 v2	CM8063501292204 (tray only)	3.50 GHz	12 MB	1600 MHz	6/12	✓	✓	130 W	N/A
Intel® Xeon® processor E5-1620 v2	CM8063501292405 (tray only)	3.70 GHz	10 MB	1600 MHz	4/8	✓	✓	130 W	N/A

## Intel® Xeon® W Processors for Workstation Systems

Intel® Xeon® W processors deliver optimized performance for the needs of mainstream workstation professionals. Hardware-enhanced workload performance, security, and reliability for the increasing demands of professional workstations and ready for professional quality VR design.



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® W-2123 Processor	CD8067303533002	BX80673W2123	3.60 GHz	8.25 MB	2400 MHz	4/8	✓	✓	120W	735858351737
Intel® Xeon® W-2125 Processor	CD8067303533303	N/A	4.00 GHz	8.25 MB	2400 MHz	4/8	✓	✓	120W	N/A
Intel® Xeon® W-2133 Processor	CD8067303533204	N/A	3.60 GHz	8.25 MB	2400 MHz	6/12	✓	✓	140W	N/A
Intel® Xeon® W-2135 Processor	CD8067303533403	BX80673W2135	3.70 GHz	8.25 MB	2400 MHz	6/12	✓	✓	140W	735858355131
Intel® Xeon® W-2145 Processor	CD8067303533601	N/A	3.70 GHz	11 MB	2400 MHz	8/16	✓	✓	140W	N/A
Intel® Xeon® W-2155 Processor	CD8067303533703	N/A	3.30 GHz	13.75 MB	2400 MHz	10/20	✓	✓	140W	N/A
Intel® Xeon® W-2195 Processor	CD8067303805901	N/A	2.30 GHz	24.75 MB	2400 MHz	18/36	✓	✓	140W	N/A

# INTEL® XEON® PROCESSOR E3-1500 V5 FAMILY



## Introducing the Intel® Xeon® Processor E3-1500 v5 product family—the data center graphics powerhouse

Create visually stunning user experiences at low total cost of ownership with the new Intel® Xeon® processor E3-1500 v5 product family featuring Intel® Iris™ Pro graphics P580.



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Processor E3-1585 v5	JQ8066201935710	3.50 GHz	8 MB	2133 MHz	4/8	✓	✓	65W	N/A
Intel® Xeon® Processor E3-1585L v5	JQ8066201935627	3.00 GHz	8 MB	2133 MHz	4/8	✓	✓	45W	N/A
Intel® Xeon® Processor E3-1565L v5	JQ8066201935626	2.50 GHz	8 MB	2133 MHz	4/8	✓	✓	35W	N/A

# INTEL® XEON® PROCESSOR E3-1200 V6 FAMILY



## Intel® Xeon® Processor E3-1200 v6 Product Family for Server and Workstation Systems

The latest Intel® Xeon® processor E3-1200 v6 product family-based platforms are a smart investment for a wide range of business needs and sizes. In addition to gains in CPU performance, CPU performance per watt, Intel Xeon processor E3-1200 v6 product family-based platforms offer fast access to data, protect the data's integrity, and have proven reliability for a range of business needs.



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Processor E3-1280 v6	CM8067702870647	N/A	3.9 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	N/A
Intel® Xeon® Processor E3-1275 v6	CM8067702870931	BX80677E31275v6	3.8 GHz	8 MB	2400 MHz	4/8	✓	✓	73 W	00735858328364
Intel® Xeon® Processor E3-1270 v6	CM8067702870648	BX80677E31270v6	3.8 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	00735858328487
Intel® Xeon® Processor E3-1245 v6	CM8067702870932	BX80677E31245v6	3.7 GHz	8 MB	2400 MHz	4/8	✓	✓	73 W	00735858328128
Intel® Xeon® Processor E3-1240 v6	CM8067702870649	BX80677E31240v6	3.7 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	00735858328180
Intel® Xeon® Processor E3-1230 v6	CM8067702870650	BX80677E31230v6	3.5 GHz	8 MB	2400 MHz	4/8	✓	✓	72 W	00735858328425
Intel® Xeon® Processor E3-1225 v6	CM8067702871024	BX80677E31225v6	3.3 GHz	8 MB	2400 MHz	4/4	✓	✓	73 W	00735858328241
Intel® Xeon® Processor E3-1220 v6	CM8067702870812	BX80677E31220v6	3.0 GHz	8 MB	2400 MHz	4/4		✓	72 W	00735858328302

# INTEL® XEON® PROCESSOR E3-1200 V5 FAMILY



## Intel® Xeon® Processor E3-1200 v5 Product Family for Server and Workstation Systems

The latest Intel® Xeon® processor E3-1200 v5 product family-based platforms are a smart investment for a wide range of business needs and sizes. In addition to gains in CPU performance, CPU performance per watt, and graphics performance, Intel Xeon processor E3-1200 v5 product family-based platforms offer fast access to data, protect the data's integrity, and have proven reliability for a range of business needs.



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE TRAY	PRODUCT CODE BOX	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® Processor E3-1280 v5	CM806620192160		3.7 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	N/A
Intel® Xeon® Processor E3-1270 v5	CM8066201921712	BX80662E31270V5	3.6 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	735858301732
Intel® Xeon® Processor E3-1260L v5	CM8066201921903		2.9 GHz	8 MB	2133 MHz	4/8	✓	✓	45 W	N/A
Intel® Xeon® Processor E3-1240L v5	CM8066201935808		2.1 GHz	8 MB	2133 MHz	4/8	✓	✓	25 W	N/A
Intel® Xeon® Processor E3-1240 v5	CM8066201921715	BX80662E31240V5	3.5 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	735858301855
Intel® Xeon® Processor E3-1230 v5	CM8066201921713	BX80662E31230V5	3.4 GHz	8 MB	2133 MHz	4/8	✓	✓	80 W	735858301916
Intel® Xeon® Processor E3-1220 v5	CM8066201921804	BX80662E31220V5	3 GHz	8 MB	2133 MHz	4/4	✓	✓	80 W	735858302036
Intel® Xeon® Processor E3-1275 v5	CM8066201934909	BX80662E31275V5	3.6 GHz	8 MB	2133 MHz	4/8		✓	80 W	735858301671
Intel® Xeon® Processor E3-1245 v5	CM8066201934913	BX80662E31245V5	3.5 GHz	8 MB	2133 MHz	4/8		✓	80 W	735858301794
Intel® Xeon® Processor E3-1235L v5	CM8066201935807		2 GHz	8 MB	2133 MHz	4/4		✓	25 W	N/A
Intel® Xeon® Processor E3-1225 v5	CM8066201922605	BX80662E31225V5	3.3 GHz	8 MB	2133 MHz	4/4		✓	80 W	735858301978

# INTEL® XEON® PROCESSOR E3-1200 V4 FAMILY



## Intel® Xeon® Processor E3-1200 v4 Product Family for Server and Workstation Systems

The Intel® Xeon® Processor E3-1200 v4 product family supports up to 1.8x the overall graphics performance of the previous-generation<sup>2</sup>, and delivers high-quality visual experiences with up to 1.4x more video transcoding performance per node<sup>4</sup> and up to 4,300 simultaneous HD video streams per rack than the previous generation Intel® Xeon® processor E3-1200 v3 product family.<sup>3</sup>



PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E3-1285 v4 <sup>5</sup>	CM8065802482701	3.50 GHz	6 MB	1866 MHz	4/8	✓	✓	95 W	N/A
Intel® Xeon® processor E3-1285L v4 <sup>5</sup>	CM8065802482901	3.40 GHz	6 MB	1866 MHz	4/8	✓	✓	65 W	N/A
Intel® Xeon® processor E3-1265L v4 <sup>5</sup>	CM8066201937901	2.30 GHz	6 MB	1866 MHz	4/8	✓	✓	35 W	N/A
Intel® Xeon® processor E3-1278L v4 <sup>6</sup>	FH8065802420303	2.0 GHz	6 MB	1600 MHz	4/8	✓	✓	47 W	N/A
Intel® Xeon® processor E3-1258L v4 <sup>6,7</sup>	FH8065802420602	1.8 GHz	6 MB	1600 MHz	4/8	✓	✓	47 W	N/A

For more information, visit [www.intel.com/xeone3](http://www.intel.com/xeone3)

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: [http://www.intel.com/products/processor\\_number/](http://www.intel.com/products/processor_number/)

<sup>2</sup> Up to 1.8x better performance on 3DMark® 11. Baseline configuration: Intel® Hermosa Beach 2 CRB platform with Intel® Xeon® processor E3-1286v3, 32GB memory (4x 8GB DDR3-1333 UDIMM), 64GB SATA SSD, Intel® Turbo Boost enabled, HT enabled, Red Hat Enterprise Linux® 6.3, Oracle® Java® Hotspot Java 1.7.0\_17. 3DMark® Score 1524, Source: Internal Intel measurements as of April 2014.

Intel® Xeon® processor workstation platform (Intel® Server Board 51200RP) with one Intel® Xeon® processor E3-1285 v4 (quad-core, 3.5GHz, 6M cache) BIOS 51200RP.8

68.03.01.0002.041520151123, Intel® Hyper-Threading Technology best configuration, 32GB memory (4x8GB DDR3-1600 ECC UDIMM), Intel® Iris™ Pro graphics P6300 with driver 10.18.10.3980, Intel SSDSC2BB300G4, Microsoft Windows 8.1\* 3DMark® Score 2881, Source: Intel internal testing as of June 2015.

<sup>3</sup> Up to 4300 streams per rack, or 1.4x vs previous generation. Rack density based on the Supermicro® SuperServer 5038ML-H24TRF 3U chassis with 12 sleds. Each sled containing 2 Intel® Xeon® E3-1200 v3 or v4 processors for a total of 24 E3-1200 v3 or v4 processors per 3U chassis. Assuming 2U for top of rack switches, 13 3U chassis could fit in each rack, giving 24\*13=312 sockets in a 42u rack. 312\*10=3120 streams E3-1286L v3; 312\*14=4368 streams on E3-1285L v4

<sup>4</sup> Up to 1.4x transcoding performance with Intel® Xeon® E3-1285L v4 when compared with Intel® Xeon® E3-1286L v3 on Intel Media Server Studio 2015 R3 Essentials Edition. Number of real time threads transcoded simultaneously: 10 on E3-1286L v3, 14 on E3-1285L v4, using 1080p30 20Mbps streams. Baseline configuration: Intel Rainbow Pass SR1200V3RP platform with Intel(R) Xeon® E3-1285L v4 (65W, 4C, 3.4GHz, Intel® Iris Pro Graphics P6300) or Intel® Xeon® Processor E3-1286L v3 (65W, 4C, 3.2GHz, Intel® HD Graphics P4700), 32 GB (4x8GB DDR3-1600MHz UDIMM), 160GB 7200 SATA HOD, Turbo Boost Enabled, HT Enabled, Windows Server 2012 R2, Intel Media Server Studio 2015 R3 Essentials Edition, Multi Transcoding Sample Version 6.0.0.36, Intel graphics driver pGFX 10.18.14.4172, BIOS S1200RP.86B.03.01.002. Source: Intel internal measurements as of May 2015

<sup>5</sup> Intel® Iris™ Pro Graphics P6300 requires the latest-version Intel® Graphics Driver, Intel C226 chipset, and Intel® Xeon® processor E3-1285 v4, Intel® Xeon® processor E3-1278L v4, or Intel® Xeon® processor E3-1265 v4 to enable data centre graphics application optimizations. To learn more about Intel Xeon processors for data center graphics, visit [intel.com/datacentregraphics](http://intel.com/datacentregraphics).

<sup>6</sup> BGA package

<sup>7</sup> HD P5700 graphics

# INTEL® XEON® PROCESSOR E3-1200 V3 FAMILY



## Intel® Xeon® Processor E3-1200 v3 Product Family

The Intel® Xeon® Processor E3-1200 v3 product family supports a range of business needs. Platforms based on the Intel Xeon processor E3-1200 v3 product family can be used as an entry server for small business applications or as an entry workstation for CAD and financial services. Low-power SKUs are uniquely suited to support scale-out workloads in Microserver platforms, and graphics-enabled SKUs support remote / virtual graphics capabilities and media transcode usages in the data center.



## Intel® Xeon® Processor E3-1200 v3 Product Family for Server and Workstation Systems Featuring One LGA1150 Socket

(Thermal Solution Included with Box SKUs)

PROCESSOR NAME <sup>1</sup>	PRODUCT CODE	CLOCK SPEED	SINGLECORE TURBO MAX. SPEED	INTEL® SMART CACHE	MAX. MEMORY SPEED	NO. OF CORES / THREADS	INTEL® GRAPHICS ENGINE	INTEL® HYPER-THREADING TECHNOLOGY <sup>2</sup>	INTEL® TURBO BOOST TECHNOLOGY <sup>2</sup>	POWER	UPC CODE
Intel® Xeon® processor E3-1281 v3	CM8064601575329 (tray only)	3.70 GHz	4.10 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	N/A
Intel® Xeon® processor E3-1276 v3	BX80646E31276V3 (box) CM8064601575216 (tray)	3.60 GHz	4 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	✓	✓	84 W	7 35858 27876 8
Intel® Xeon® processor E3-1271 v3	BX80646E31271V3 (box) CM8064601575330 (tray)	3.60 GHz	4 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	7 35858 27900 0
Intel® Xeon® processor E3-1246 v3	BX80646E31246V3 (box) CM8064601575205 (tray)	3.50 GHz	3.90 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	✓	✓	84 W	7 35858 27882 9
Intel® Xeon® processor E3-1245 v3	BX80646E31245V3 (box) CM8064601466509 (tray)	3.40 GHz	3.80 GHz	8 MB	1600 MHz	4/8	Intel HD graphics P4600	✓	✓	84 W	7 35858 25940 8
Intel® Xeon® processor E3-1241 v3	BX80646E31241V3 (box) CM8064601575331 (tray)	3.50 GHz	3.90 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	7 35858 27906 2
Intel® Xeon® processor E3-1231 v3	BX80646E31231V3 (box) CM8064601575332 (tray)	3.40 GHz	3.80 GHz	8 MB	1600 MHz	4/8		✓	✓	80 W	7 35858 27912 3
Intel® Xeon® processor E3-1230L v3	CM8064601467601 (tray only)	1.80 GHz	2.80 GHz	8 MB	1600 MHz	2/4		✓	✓	25 W	N/A
Intel® Xeon® processor E3-1226 v3	BX80646E31226V3 (box) CM8064601575206 (tray)	3.30 GHz	3.70 GHz	8 MB	1600 MHz	4/4	Intel HD graphics P4600		✓	84 W	7 35858 27894 2
Intel® Xeon® processor E3-1225 v3	BX80646E31225V3 (box) CM8064601466507 (tray)	3.20 GHz	3.60 GHz	8 MB	1600 MHz	4/4	Intel HD graphics P4600		✓	84 W	7 35858 25946 0
Intel® Xeon® processor E3-1220 v3	BX80646E31220V3 (box) CM8064601467204 (tray)	3.10 GHz	3.50 GHz	8 MB	1600 MHz	4/4			✓	80 W	7 35858 25976 7
Intel® Xeon® Processor E3-1220L v3	CM8064601481914 (tray only)	1.10 GHz	1.50 GHz	4 MB	1600 MHz	2/4		✓	✓	13 W	N/A

For more information, visit [www.intel.com/xeon](http://www.intel.com/xeon)



For more information, visit [www.intel.com/xeon](http://www.intel.com/xeon)

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: [http://www.intel.com/products/processor\\_number/](http://www.intel.com/products/processor_number/)

<sup>2</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at [www.intel.com](http://www.intel.com)

<sup>3</sup> Intel® QPI–Intel® QuickPath Interconnect; GT/s–Gigatransfers per second.

<sup>4</sup> Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information, go to [www.intel.com/performance](http://www.intel.com/performance)

<sup>5</sup> Claim based on calculated theoretical peak double precision performance capability for a single coprocessor. 16 DP FLOPS/clock/core \* 61 cores \* 1.238 GHz = 1.208 TeraFLOPS.

<sup>6</sup> Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

<sup>7</sup> Intel® Xeon® Processor E5-2600 v4 product family (22C, 55M Cache) compared to Intel® Xeon® Processor E5-2600 v3 product family (18C, 45M Cache).

<sup>8</sup> E5 v4 up to 47% vs. previous-generation E5 v3 performance based on binomialcpu v3.0\_AVX2 financial services workload results as of 16 March 2016) comparing 1-Node, 2 x Intel® Xeon® Processor E5-2699 v3 on Grantley-EP (Wellsburg) with 128 GB Total Memory on Red Hat Enterprise Linux\* 6.4 kernel 2.6.32-358, Options per second Score: 106025 vs. 2 x Intel® Xeon® Processor E5-2699 v4 on Grantley-EP (Wellsburg) with 128 GB Total Memory on Red Hat Enterprise Linux\* 6.4 kernel 2.6.32-358, Options per second Score: 156141 Higher is better. Data Source: Request Number: 1871 E5 v4 up to 27% vs. previous-generation E5 v3 average performance based on key industry-standard benchmarks calculations submitted by OEMs as of 16 March 2016) comparing 2-socket Intel® Xeon® processor E5 v3 to v4 family. Key industry benchmarks include: SPECint\*\_rate\_base2006, SPECint\*\_base 2006 (Speed), SPECfp\*\_rate\_base 2006, SPECfp\*\_base2006 (Speed), SPECmpi\*\_base2007, SPECmpiM\*\_base2007, SPECCompG\*\_base2012, SPECvirt\_sc\*2013, VMmark\* 2.5 performance (matched pairs), TPC-E\*, SPECjEnterprise\*2010, Two-tier SAP SD\* Windows\*/Linux, 1-Node TPC-H\* 1TB, TPCx-BB\* and SPECjbb\*2015 MultiJVM. See <http://www.intel.com/performance/datacenter> for full configuration details.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks)

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/xeon](http://www.intel.com/xeon)

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Xeon, and Xeon Phi are trademarks of Intel Corporation in the U.S. and / or other countries.

\* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation

# INTEL® XEON PROCESSOR D-1500 PRODUCT FAMILY



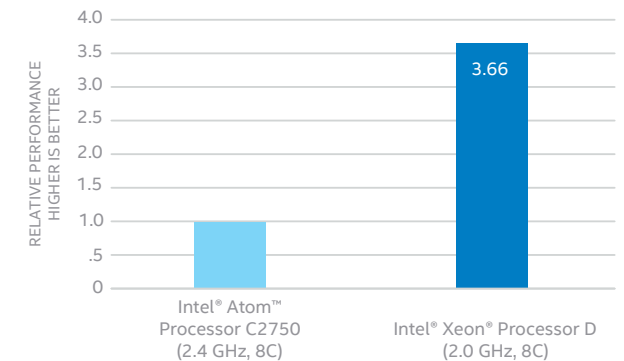
The Intel® Xeon® processor D family offers new options for infrastructure optimization, by bringing the performance and advanced intelligence of Intel® Xeon® processors into a dense, lower-power system-on-a-chip. The Intel Xeon processor D product family is Intel's 3rd generation 64-bit SoC and the first based on Intel Xeon processor technology. It can be deployed for a variety of workloads including dynamic web serving, dedicated web hosting, warm storage, network routing, and more.



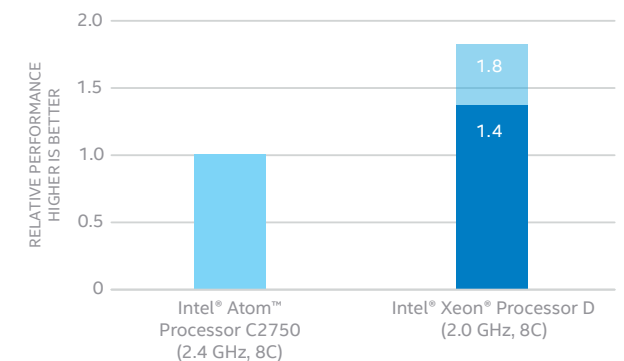
## Intel® Xeon® Processor D-1500 Product Family

	INTEL® XEON® PROCESSOR D-1541	INTEL® XEON® PROCESSOR D-1521
<b>Thermal Design Point</b>	45W	45W
<b>Frequency</b>	2.1 GHz	2.4 GHz
<b>Max Turbo Frequency</b>	2.7 GHz	2.7 GHz
<b>Cores</b>	8	4
<b>Threads</b>	16	8
<b>Memory Channels</b>	2	2
<b>DIMMS per Channel</b>	2	2
<b>DRAM Interface</b>	ECC (DDR4), DDR3	ECC (DDR4), DDR3
<b>Max. Memory Speed</b>	2133 MT/s	2133 MT/s
<b>Max. DRAM Capacity</b>	128 GB	128 GB
<b>Integrated I/O</b>	24 PCIe 3.0* 8 PCIe 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3	24 PCIe 3.0* 8 PCIe 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3
<b>Network Interface</b>	2 x 1/2.5/10 GbE Intel Ethernet	2 x 1/2.5/10 GbE Intel Ethernet
<b>Built-In Intel® Virtualization Technology</b>	VT-x, VT-d, and Cache QoS	VT-x, VT-d, and Cache QoS
<b>Cache Hierarchy</b>	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)

### Performance Dynamic Web Serving



### Performance per Watt Dynamic Web Serving



## Intel® Xeon® Processor D-1500 Product Family

<b>Intel® Xeon® Processor Intelligence in a Low-Power SoC</b>	Up to 3.6x higher performance per node <sup>1,3</sup> versus Intel® Atom™ processor C2750-based solutions. Includes up to 8 cores, two integrated ports of 10 Gigabit Intel® Ethernet, plus support for up to 128 GB of memory. Also includes Intel® 64-bit software support <sup>4</sup> , L1 cache (32K data, 32K instructions per core), L2 cache (256K per core), LLC cache (1.5 MB per core), Intel® Turbo Boost Technology <sup>4</sup> , and Intel® Hyper-Threading Technology. <sup>4</sup>
<b>Industry-Leading 14 nm Process Technology</b>	Enables dense, low power system designs with thermal design points of ~20W to 45W and system level performance per watt of up to 1.8x that of Intel Atom processor C2750-based solutions <sup>2,3</sup> .
<b>Server-Class Reliability, Availability, and Serviceability (RAS)</b>	Provides high system reliability and data integrity with support for error correction code (ECC) memory, single device data correction (SDDC), memory demand and patrol scrubbing, and much more.
<b>Built-In Intel® Virtualization Technology</b>	Delivers near-native compute and I/O performance in virtualized data centers, network infrastructure, and cloud computing, with advanced monitoring of cache and memory bandwidth for better service level and infrastructure management.
<b>Hardware-Enhanced Security and Compliance</b>	Intel Advanced Encryption Standard New Instructions (Intel AES-NI) provide integrated support for fast, low-overhead encryption and Intel® Trusted Execution Technology (Intel® TXT) provides platform verification (through authenticated boot) to enable strong security with reduced performance impact <sup>5</sup> .
<b>Server-Class Manageability</b>	Includes Intel® Node Manager Base for adaptive power management.
<b>Intel® Platform Storage Extensions</b>	Enables fast data movement and high availability through integrated support for non-transparent bridging (NTB), asynchronous DRAM self-refresh (ADR), and Intel® QuickData technology, which provides a direct memory access (DMA) engine within the SoC <sup>6</sup> .

For more information, visit [www.intel.com/xeon](http://www.intel.com/xeon)

<sup>1</sup> Up to 3.6x better performance on Dynamic Web Serving Intel® Xeon Processor D-based reference platform with one Xeon Processor D (8C, 2.0GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBase-T X552, 3x S3700 SATA SSD, Fedora\* 20 (3.17.8-200.fc20.x86\_64, Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=43844 Supermicro SuperServer\* 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBase-T X520, 2x S3700 SATA SSD, Ubuntu\* 14.10(3.16.0-23 generic), Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=12896.

<sup>2</sup> Up to 1.8x (estimated) better performance per watt on Dynamic Web Serving Intel® Xeon Processor D-based reference platform with one Xeon Processor D (8C, 2.0GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBase-T X552, 3x S3700 SATA SSD, Fedora\* 20 (3.17.8-200.fc20.x86\_64, Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=43844, Estimated wall power based on microserver chassis, power=90W, Perf/W=487.15 users/W Supermicro SuperServer\* 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBase-T X520, 2x S3700 SATA SSD, Ubuntu\* 14.10 (3.16.0-23 generic), Nginx\* 1.4.4, Php-fpm\* 15.4.14, memcached\* 1.4.14, Simultaneous users=12896. Maximum wall power =46W, Perf/W=280.3 users/W

<sup>3</sup> Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

<sup>4</sup> Intel technologies may require enabled hardware, specific software, or services activation. Check with your system manufacturer or retailer.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked “reserved” or “undefined.” Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information. The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request. Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order. Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or by visiting Intel's Web site at [www.intel.com](http://www.intel.com).

<sup>5</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com](http://www.intel.com)

<sup>6</sup> Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

For more information go to <http://www.intel.com/performance>

Intel, the Intel logo, Intel Xeon, and Intel Atom are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



# INTEL<sup>®</sup> SERVER BOARDS

THE QUALITY  
YOU WANT. THE  
CONFIDENCE  
YOU NEED.

## INTEL<sup>®</sup> SERVER BOARDS

High quality, unbranded server building blocks featuring Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.

# INTEL® SERVER BOARDS

High quality, unbranded server building blocks featuring Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.



## THE QUALITY YOU WANT WITH THE CONFIDENCE YOU NEED

Intel designs and builds to a high specification, delivering server products with maximum processing power, great flexibility, excellent manageability, and high reliability. Stringent design and manufacturing practices, rigorous validation and testing, and excellent warranty and technical support ensure you receive value that is difficult to find anywhere else.

### Platform connected boards featuring Intel® Xeon® processor Scalable family

#### Intel® Server Board S2600WF family:

Power and performance at peak efficiency supporting a 1U and 2U rack mount server form factor.

#### Intel® Server Board S2600BP family:

Density optimized board enabling highest processing and memory performance.

#### Intel® Server Board S2600ST family:

Flexible general purpose boards in an SSI EEB form factor.

### Single-socket board featuring bootable Intel® Xeon Phi™ processor family

#### Intel® Server Board S7200AP family:

A High Performing Compute Node Featuring a bootable Intel® Xeon Phi™ Processor. This board family is designed to support the demands of parallel processing while delivering performance, high availability, and serviceability.

### Single-socket board featuring Intel® Xeon® processor E3 v6 family

#### Refreshed Intel® Server Board S1200SP family:

Reliable, cost effective, easy to manage board in a microATX form factor.

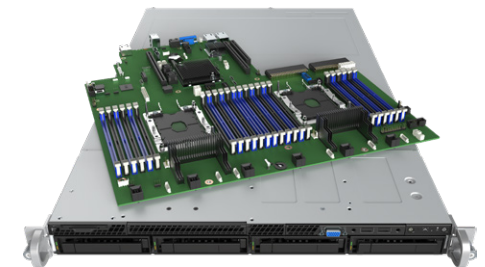
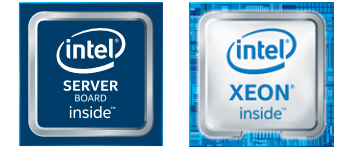
### Delivering high performance and increased memory bandwidth

The Intel® Xeon® processor families deliver versatility across diverse workloads in the data center or cloud.

## Intel® Server Board S2600WF Product Family Featuring 2<sup>nd</sup> Generation Intel® Xeon® Scalable Processors

### FEATURE RICH HYPER-CONVERGED INFRASTRUCTURE (HCI) SERVER WITH MAXIMUM FLEXIBILITY

The Intel® Server Board S2600WF product family delivers power and performance at peak efficiency designed for use in either in a 1U and 2U rack mount form factor server that features the energy-efficient dual 2<sup>nd</sup> Generation Intel® Xeon® processor Scalable Family. High memory capacity, networking, storage and I/O flexibility combine with innovative design to provide an exceptional and reliable server board for business IT, appliance, data center, cloud and high performance computing applications.

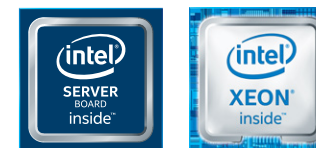


<b>DESCRIPTION</b>	Full-featured Server Board family with maximum flexibility for expansion; available as a 1U or 2U rack-mount form factor featuring the energy efficient 2 <sup>nd</sup> Generation Intel® Xeon® processor Scalable Family.		
<b>TARGET MARKETS</b>	Storage, Cloud, Networking		
<b>ORDER CODE</b>	S2600WF0R	S2600WFTR	S2600WFQR
<b>INTEL® QUICKASSIST TECHNOLOGY</b>	No	No	Yes
<b>FORM FACTOR</b>	Custom (16.7" x 17")		
<b>INTEL® SERVER CHASSIS</b>	Intel® Server Chassis R1000WF family; Intel® Server Chassis R2000WF family; Intel® Server System R1000WF family; Intel® Server System R2000WF family		
<b>PROCESSOR SUPPORT<sup>1</sup></b>	2 <sup>nd</sup> Generation Intel® Xeon® Scalable processor: up to 140W TDP (on all System SKUs), 165W TDP (Select System SKUs), 205W TDP (Board only)		
<b>CHIPSET</b>	Intel® C624 Chipset	Intel® C624 Chipset	Intel® C628 Chipset
<b>TOTAL PCI SLOTS</b>	Up to 8 PCIe slots via 3 Risers, One x8 PCIe Gen 3 SAS Mezz Module		
<b>M.2</b>	Up to 2-M.2 SATA/PCIe (x2, x4) storage device 80 mm		
<b>DIRECT ATTACH PCIe* 2.5" SSD</b>	4 OCuLink connectors	4 OCuLink connectors	2 OCuLink connectors
<b>MEMORY CAPACITY</b>	24 DDR4 RDIMM/LRDIMMs, 2 SPC, 12x channels/system		
<b>ONBOARD PCIe* NVME</b>	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)
<b>SATA PORTS</b>	8x via MiniSAS HD 2x 7pin Connector	8x via MiniSAS HD 2x 7pin Connector	2x 7pin Connector
<b>SAS OPTIONS</b>	6 Gb/s or 12 Gb/s SAS via optional SAS module		
<b>INTEGRATED LAN</b>	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)		
<b>MANAGEMENT SUPPORT</b>	Integrated baseboard management controller (IPMI 2.0 compliant), Support for Intel® Server Management software, dedicated onboard RJ45 management port, Advanced server management via Intel® RMM4 Lite (accessory option)		
<b>INTEL® RAID SUPPORT</b>	Embedded SATA Software RAID: Intel® RSTe 5.0, Intel® Embedded Server RAID Technology 1 1.60 with optional RAID 5 key support		
<b>MODULE UPGRADES</b>	Intel® OCP Mezzanine Expansion Module; Intel Remote Management Module 4; Trusted Platform Module 2.0; Integrated SAS RAID module, QSFP+ Modules		
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Intel® Trusted Platform Module 2.0 (Accessory Option)		
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available		

## Intel® Server Board S2600BP Product Family featuring 2<sup>nd</sup> Generation Intel® Xeon® Scalable processors

### DENSITY OPTIMIZED SYSTEM ENABLING HIGH PERFORMANCE

The Intel® Server Board S2600BP product family is a purpose built, density-optimized server board ideal for use in hyper-converged, data analytics, storage, cloud and high performance computing applications. Designed to support 16 DDR4 DIMM slots per server board at 2 DIMMs per channel, Intel® Optane™ DC Persistent Memory and the 2<sup>nd</sup> Generation Intel® Xeon® processor Scalable Family, the S2600BP family maximizes memory and processor bandwidth to meet demanding compute use requirements.

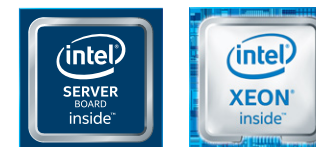


<b>DESCRIPTION</b>	This density-optimized board family enables high processing and memory performance, making this a compelling offering for compute-intensive workloads.		
<b>TARGET MARKETS</b>	Storage, Cloud, HPC		
<b>ORDER CODE</b>	S2600BPBR	S2600BPSR	S2600BPQR
<b>INTEL® QUICKASSIST TECHNOLOGY</b>	No	No	Yes
<b>FORM FACTOR</b>	6.8" x 19.1"		
<b>INTEL® SERVER CHASSIS</b>	Intel® Server Chassis H2000P Product Family		
<b>PROCESSOR SUPPORT</b>	2 <sup>nd</sup> Generation Intel® Xeon® Scalable processor: up to 165W TDP (on Intel® Server Chassis H2204XXLRE or HNS2600BPBLC only), 140W TDP on all other SKUs		
<b>CHIPSET</b>	Intel® C621 Chipset	Intel® C622 Chipset	Intel® C628 Chipset
<b>PCIe* SLOT TYPES</b>	Two x16 PCIe* lanes on two risers, and two x24 PCIe* lanes on two risers	Two x16 PCIe* lanes on two risers, and two x24 PCIe* lanes on two risers	One riser with x16 PCIe* lanes, and two x24 PCIe* lanes on two risers
<b>M.2</b>	One (1) 42mm M.2 SATA/PCIe* x4		
<b>MEMORY CAPACITY</b>	16 DIMM Slots (8 per CPU) – DDR4 RDIMM/LRDIMM, and up to 2TB of Intel® Optane™ DC Persistent Memory		
<b>ONBOARD PCIe* NVME</b>	None		
<b>SATA PORTS</b>	Four (4) SATA 6Gbps ports via Mini-SAS HD (SFF-8643) connector (from PCH)	Four (4) SATA 6Gbps ports via Mini-SAS HD (SFF-8643) connector (from PCH)	None
<b>SAS OPTIONS</b>	6 Gb/s or 12 Gb/s SAS via bridgeboard (specific SKUs only)		
<b>NETWORKING</b>	Dual 10GBase-T ports	Dual 10GbE SFP+ ports Support	Dual 10GBase-T ports
<b>MANAGEMENT SUPPORT</b>	Integrated baseboard management controller (IPMI 2.0 compliant), Support for Intel® Server Management software, dedicated onboard RJ45 management port, Advanced server management via Intel® RMM4 Lite (accessory option)		
<b>INTEL® RAID SUPPORT</b>	Embedded SATA Software RAID: Intel® RSTe 5.0, Intel® Embedded Server RAID Technology 1 1.60 with optional RAID 5 key support		
<b>MODULE UPGRADES</b>	Intel® OCP Mezzanine Expansion Module; Intel Remote Management Module 4; Trusted Platform Module 2.0; Integrated SAS RAID module, QSFP+ Modules		
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Intel® Trusted Platform Module 2.0 (Accessory Option)		
<b>WARRANTY</b>	3 year limited warranty, 5 year extended warranty available		

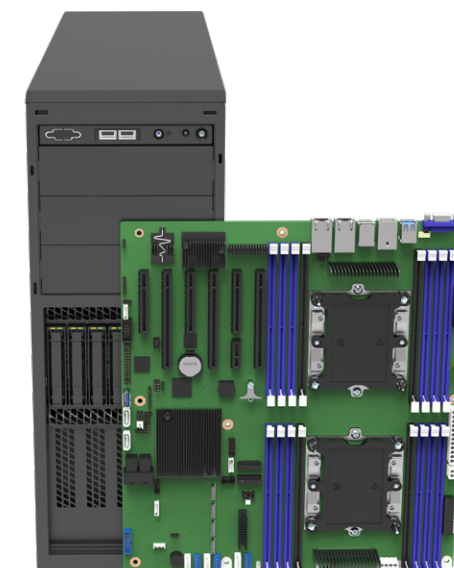
## Intel® Server Board S2600ST Product Family featuring 2<sup>nd</sup> Generation Intel® Xeon® Scalable processors

### FLEXIBLE, GENERAL PURPOSE SERVER BOARD IN A STANDARD FORM FACTOR

The Intel® Server Board S2600ST product family delivers robust features and powerful performance in a standard 12" x 13" EEB form factor for flexibility and ease of adoption. Featuring 2<sup>nd</sup> Generation Intel® Xeon® Scalable processors, high PCIe\* lane availability and SAS/SATA/NVMe\* flexibility, it provides a cost-effective option for pedestal, rack mount, or custom systems. The S2600ST is ideal for use in small and medium business, storage, networking, web hosting, and security appliances where feature capacity and price-performance balance is key.



<b>DESCRIPTION</b>	A family of flexible general purpose server boards supporting two 2 <sup>nd</sup> Generation Intel® Xeon® Scalable processors up to 205W and 16 DIMMs in a standard SSI EEB form factor board.	
<b>TARGET MARKET</b>	Small- and medium-sized businesses, Networking, Embedded deployments	
<b>ORDER CODE</b>	S2600STBR	S2600STQR
<b>INTEL® QUICKASSIST TECHNOLOGY</b>	No	Yes
<b>FORM FACTOR</b>	SSI EEB 12" W x 13" L	
<b>INTEL® SERVER CHASSIS</b>	Intel® Server Chassis P4000G Family	
<b>PROCESSOR SUPPORT<sup>1</sup></b>	2 <sup>nd</sup> Generation Intel® Xeon® Scalable processors: up to 205W TDP	
<b>CHIPSET</b>	Intel® C624 Chipset	Intel® C628 Chipset
<b>TOTAL PCIe* SLOTS</b>	CPU0: 1 x8 Gen3, 1 x16 Gen3 CPU1: 2 x8 Gen3, 2 x16 Gen3	
<b>M.2</b>	Dual M.2 SATA/PCIe (x2, x4) 80 mm connectors	
<b>DIRECT ATTACH PCIe* 2.5" SSD</b>	4 OCuLink connectors	Up to 2 OCuLink connectors
<b>MEMORY CAPACITY</b>	16 DDR4 RDIMMs or LRDIMMs, 2-1-1 Slot Config	
<b>ONBOARD PCIe* NVME</b>	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)	4 OCuLink connectors, Intel® VMD Support, Intel® RST e/Intel® VROC Support (accessory option)
<b>SATA PORTS</b>	8x via MiniSAS HD 2x 7-pin Connector	2x 7pin Connector
<b>SAS OPTIONS</b>	Via PCIe adapters	
<b>INTEGRATED LAN</b>	Dual 10GBase-T down or Dual 10GbE SFP+ via custom AIC	
<b>MANAGEMENT SUPPORT</b>	Integrated baseboard management controller (IPMI 2.0 compliant), Support for Intel® Server Management software, dedicated onboard RJ45 management port, Advanced server management via Intel® RMM4 Lite (accessory option)	
<b>INTEL® RAID SUPPORT</b>	Embedded SATA Software RAID: Intel® RSTe 5.0, Intel® Embedded Server RAID Technology 1 1.60 with optional RAID 5 key support	
<b>MODULE UPGRADES</b>	Intel Remote Management Module 4; Trusted Platform Module 2.0; Integrated SAS RAID module, QSFP+ Modules	
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Intel® Trusted Platform Module 2.0 (Accessory Option)	
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available	

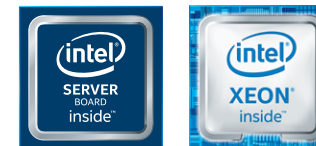




## Intel® Server Boards Supporting the Intel® Xeon® Processor E5-2600 v4 Family

### RELIABLE SOLUTIONS MADE EASY

Get Intel® Server Products built on a foundation of high-quality technology with the Intel® Xeon® processor E5-2600 v4 family of server solutions. These products are designed to span multiple use-cases and customization requirements while offering performance, power, and cost flexibility to meet customers' requirements and growth needs now and in the future. To address customer security concerns and guard against counterfeiting and malware, select product families feature the Intel® Transparent Supply Chain which enables the ability to verify the authenticity of board components and firmware. Intel® Server Products products ordered with the new Refresh order codes include the BIOS installed for the Intel® Xeon® Processor E5-2600 v4<sup>1</sup>. Previous generation products will require an Intel® Xeon® processor E5-2600 v3 (Haswell) in order to update to an Intel® Xeon® processor E5-2600 v4 (Broadwell) production BIOS.



PRODUCT NAME	INTEL® SERVER BOARD S2600KP FAMILY	INTEL® SERVER BOARD S2600TP FAMILY
<b>DESCRIPTION</b>	A hot-pluggable, high-density compute module integrated with an Intel® Server Board S2600KP model (available with or without integrated FDR InfiniBand*), maximum memory bandwidth, and flexible configuration options for the Intel® Server Chassis H2000G family.	A hot-pluggable, high-density compute module integrated with an Intel® Server Board S2600TP model (available with or without integrated FDR InfiniBand*) for higher memory capability and flexible configuration options for the Intel® Server Chassis H2000G family.
<b>TARGET MARKET</b>	High performance computing (HPC) / big data	Hyper-converged infrastructure/ High performance computing (HPC) / big data / storage / cloud
<b>ORDER CODE</b>	HNS2600KPR: 1U node with S2600KPR HNS2600KPRF: 1U node with S2600KPRF, onboard FDR InfiniBand* (1 rear InfiniBand 56 Gb/s port) BBS2600KPR: Board BBS2600KPRF: Board with FDR InfiniBand (56 Gb/s) BBS2600KPRTR: Board with TPM 1.2	HNS2600TPR: 1U node with S2600TPR HNS2600TPRPF: 1U node with S2600TPRPF, onboard FDR InfiniBand (1 rear InfiniBand 56 Gb/s port) HNS2600TP24R: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT, dual 10G BaseT HNS2600TP24SR: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT, dual 10G (SFP+) HNS2600TP24STR: 1U node for 24 x 2.5" drive chassis; dual 1G BaseT with TPM2.0 BBS2600TPR: Board BBS2600TPRPF: Board with FDR InfiniBand (56 Gb/s)
<b>FORM FACTOR</b>	Custom (6.4" x 17.7")	Custom (6.8" x 18.9")
<b>INTEL® SERVER CHASSIS OR SYSTEM</b>	Intel® Server Chassis H2000G family	Intel® Server Chassis H2000G family
<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	2 Intel® Xeon® processors E5-2600 v4 or v3 product family Boards only: 160 W Compute Modules: 145 W	2 Intel® Xeon® processors E5-2600 v4 or v3 product family Boards only: 160 W Compute Modules: 145 W
<b>CHIPSET</b>	Intel® C612 Chipset	Intel® C612 Chipset
<b>TOTAL PCIe* SLOTS</b>	3 Riser slots	4 Riser slots
<b>PCIe* SLOT TYPES</b>	1 PCI Express* 3.0 x16, 2 PCI Express 3.0 x24 super slots or 2 PCI Express 3.0 x16, 1 PCI Express 3.0 x24 super slot	2 PCI Express* 3.0 x16, 2 PCI Express 3.0 x24 super slots or 3 PCI Express 3.0 x16, 1 PCI Express 3.0 x24 super slot
<b>MEMORY CAPACITY</b>	8 LR / R/ DIMMs 1333 / 1600 / 1866 / 2133 / 2400 MHz ECC DDR42 NVDIMMs 2133MHz <sup>3</sup> 1024 GB max per system	16 LR / R/ DIMMs 1333 / 1600 / 1866 / 2133 / 2400 MHz ECC DDR42 NVDIMMs 2133MHz <sup>3</sup> 2048 GB max per system
<b>SATA PORTS</b>	10-port SATA (6 Gb/s)	HNS2600TP24R/HNS2600TP24SR: 6-port 6 Gb/s SATA; 10-port SATA (6 Gb/s)
<b>SAS OPTIONS</b>	12 Gb/s SAS via optional 12 GB SAS bridge board and Intel® RAID module / adapter	12 Gb/s SAS via optional 12 GB SAS bridge board and Intel® RAID module / adapter HNS2600TP24R/HNS2600TP24SR: 12 Gb/s SAS via integrated 12 GB SAS bridge board
<b>INTEGRATED LAN</b>	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE); 1 dedicated integrated management port	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE); 1 dedicated integrated management port
<b>MANAGEMENT SUPPORT</b>	Intel® Server Management Software Integrated BMC with IPMI 2.0	Intel® Server Management Software Integrated BMC with IPMI 2.0
<b>INTEL® RAID SUPPORT</b>	Intel® Rapid Storage Technology 4.0 (0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Up to SW Raid 5 with optional upgrade key	Intel® Rapid Storage Technology 4.0 (0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Up to SW Raid 5 with optional upgrade key
<b>MODULE UPGRADES</b>	Intel® I/O Expansion Module Intel® Remote Management Module 4 Single port 100Gb/s Intel® Omni-Path Fabric	Intel® I/O Expansion Module Intel® Remote Management Module 4 Single port 100Gb/s Intel® Omni-Path Fabric
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Statement of Conformance; Platform Certificate	Statement of Conformance
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available	3 year limited warranty, optional 2 year extended warranty available

<sup>1</sup> Intel always recommends updating the BIOS/BM/FRUSDR prior to server deployment <sup>2</sup> Maximum memory speed supported depends on the processor used. <sup>3</sup> NVDIMM support refer to Intel® Server Configurator Tool (<https://serverconfigurator.intel.com>).



**PRODUCT NAME** INTEL® SERVER BOARD S2600CW FAMILY

**PRODUCT NAME** INTEL® SERVER BOARD S2600WT FAMILY

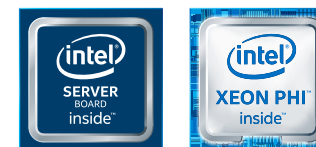
<b>DESCRIPTION</b>	A family of flexible general purpose server boards supporting two Intel® Xeon® processor E5-2600 v4 family up to 145 W and 16 DIMMs in a standard SSI EEB form factor. Board variations available for two 1 Gb or 10 Gb Ethernet ports, as well as options for an 8-port SAS controller.	<b>DESCRIPTION</b>	A rack-optimized server board supporting two Intel® Xeon® processor E5-2600 v4 family up to 145 W, 24 DIMMs, and two 1 Gb or 10 Gb Ethernet port options available.
<b>TARGET MARKET</b>	Embedded / small- and medium-sized businesses / storage / cloud	<b>TARGET MARKET</b>	Enterprise and medium business IT / big data / storage / cloud
<b>ORDER CODE</b>	DBS2600CW2R: Dual 1 Gb Ethernet ports DBS2600CWTR: Dual 10 Gb Ethernet ports DBS2600CW2SR: Dual 1 Gb Ethernet ports, 8-port LSI* 3008 SAS controller DBS2600CWTSR: Dual 10 Gb Ethernet ports, 8-port LSI 3008 SAS controller	<b>ORDER CODE</b>	S2600WT2R: 1 Gb Ethernet ports S2600WTTR: 10 Gb Ethernet ports S2600WTT5R: 10 Gb Ethernet ports with TPM2.0
<b>FORM FACTOR</b>	SSI EEB (12" x 13")	<b>FORM FACTOR</b>	Custom (16.7" x 17")
<b>INTEL® SERVER CHASSIS OR SYSTEM</b>	Intel® Server Chassis P4000G family	<b>INTEL® SERVER CHASSIS OR SYSTEM</b>	Intel® Server Chassis R1000WT family Intel® Server Chassis R2000WT family Intel® Server System R1000WT family Intel® Server System R2000WT family
<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	2 Intel Xeon processors E5-2600 v4 or v3 product family; 145 W Max	<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	2 Intel Xeon processors E5-2600 v4 or v3 product family; 145 W Max
<b>CHIPSET</b>	Intel® C612 Chipset	<b>CHIPSET</b>	Intel® C612 Chipset
<b>TOTAL PCIe* SLOTS</b>	6	<b>TOTAL PCIe* SLOTS</b>	3 Riser slots; 1 Intel® I/O Expansion Module Connector; 1 Intel® RAID Module Connector
<b>PCIe* SLOT TYPES</b>	1 PCI Express* 3.0 x8, 4 PCI Express 3.0 x16, 1 PCI Express 2.0 x4 2 PCI Express 3.0 x8, 3 PCI Express 3.0 x16, 1 PCI Express 2.0 x4 (models with LSI* 3008)	<b>PCIe* SLOT TYPES</b>	2 PCI Express* 3.0 x24 riser super socket (supporting x8, x16, and PCI-X riser card slot options) 1 PCI Express 3.0 mixed x8, x4 slot riser socket (supporting x4, and x8 riser card slot options) 1 PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 PCI Express 3.0 x8 Intel® RAID Module
<b>MEMORY CAPACITY</b>	16 R / LR DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4 <sup>2</sup> NVDIMMs 2133MHz <sup>3</sup> 1 TB max using 64 GB DIMMs 2 TB max using 128 GB DIMMs	<b>MEMORY CAPACITY</b>	24 R / LR DIMMs 1333/ 1600 / 1866 / 2133 / 2400 MHz ECC DDR4 <sup>2</sup> NVDIMMs 2133MHz <sup>3</sup> 1.50 TB max using 64 GB DIMMs
<b>SATA PORTS</b>	10-port SATA (6.0 Gb/s)	<b>SATA PORTS</b>	10-port SATA (6.0 Gb/s)
<b>SAS OPTIONS</b>	Models with LSI* 3008: 8 Integrated SAS ports, 12G SAS with battery-less hardware RAID	<b>SAS OPTIONS</b>	6 Gb/s or 12 Gb/s SAS via optional SAS module
<b>INTEGRATED LAN</b>	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)	<b>INTEGRATED LAN</b>	2 integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) or 2 integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
<b>MANAGEMENT SUPPORT</b>	Intel® Server Management Software; Integrated BMC with IPMI 2.0	<b>MANAGEMENT SUPPORT</b>	Intel® Server Management Software; Integrated BMC with IPMI 2.0
<b>INTEL® RAID SUPPORT</b>	PCH SATA 6G with Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 optional RAID 5 supported through the ESRT2 RAID 5 upgrade key Integrated RAID levels 0, 1, 1E, and 10; optional RAID level 5 upgrade available	<b>INTEL® RAID SUPPORT</b>	Intel® Rapid Storage Technology <sup>2</sup> 4.0 (SW RAID levels 0, 1, 5, and 10) Intel® Embedded Server RAID Technology 2 (SW RAID levels 0, 1, and 10; optional RAID level 5 upgrade available)
<b>MODULE UPGRADES</b>	Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module	<b>MODULE UPGRADES</b>	Intel® I/O Expansion Module Intel Integrated RAID Module (ROC or IOC) Intel Remote Management Module 4 Lite Trusted Platform Module
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	N/A	<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Statement of Conformance; Platform Certificate
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available	<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available

<sup>2</sup> Maximum memory speed supported depends on the processor used. <sup>3</sup> NVDIMM support refer to Intel® Server Configurator Tool (<https://serverconfigurator.intel.com>).

## Intel® Server Board S7200AP family supporting the Intel® Xeon Phi™ Processor (Knights Landing and Knights Mill)

### RELIABLE SOLUTIONS MADE EASY

Get Intel® Server Products built on a foundation of high-quality technology with the Intel® Xeon® Phi™ processor family of server solutions for customers. The latest server products are designed to span multiple use-cases and customization requirements while offering performance, power, and cost flexibility to meet customers' requirements and growth needs now and in the future.



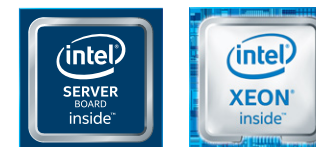
<b>PRODUCT NAME</b>	<b>INTEL® SERVER BOARD S7200AP FAMILY</b>	
<b>DESCRIPTION</b>	A hot-pluggable, efficient, high-density compute module integrated with the Intel® Server Board S7200AP and optimized memory performance. Customizable as a 2U, four node system with serviceability and high availability, hot-swappable compute modules, 2.5" or 3.5" drive bays and redundant power supplies.	
<b>TARGET MARKET</b>	High performance computing (HPC)	
<b>ORDER CODE</b>	<b>S7200APR</b> <b>HNS7200APR</b> <b>HNS7200APRL</b>	<b>S7200AP</b> <b>HNS7200AP</b> <b>HNS7200APL</b>
<b>FORM FACTOR</b>	Custom (6.8" x 14.2")	
<b>INTEL® SERVER CHASSIS</b>	Intel® Server Chassis H2204XXLR2	Intel® Server Chassis H2216XXLR2 Intel® Server Chassis H2312XXLR2
<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	Intel® Xeon Phi™ Processor, up to 320W	Intel® Xeon Phi™ Processor, up to 230W
<b>CHIPSET</b>	Intel® C612 Chipset	
<b>PCIe* SLOT TYPES</b>	Riser 1: PCIe Gen3 x 16 Riser 2: PCIe Gen3 x 20 (x16 or x4)	
<b>MEMORY CAPACITY</b>	6 x DDR4 DIMMs, 1SPC, 6 x native channels/system	
<b>SATA PORTS</b>	Integrated 9-port SATA: 4 ports to bridge board, 1 port to mSATA, 4 ports to MiniSAS HD connector	
<b>SAS OPTIONS</b>	12 Gb/s SAS via optional PCIe* card	
<b>ETHERNET</b>	2x Intel® i210 (1GbE) Controllers	
<b>MANAGEMENT SUPPORT</b>	Pilot 3 BMC with optional advanced features via RMM4-lite module	
<b>INTEL® RAID SUPPORT</b>	Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10	
<b>MODULE UPGRADES</b>	Intel® Remote Management Module 4Lite Intel® Omni-Path Port Upgrade Kit (Two Port) Intel® Omni-Path low provide PCIe* adapter	
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Statement of Conformance Platform Certificate	
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available	



## Intel® Server Boards Supporting the Intel® Xeon® Processor E3-1200 v6 Family

### RELIABLE SOLUTIONS MADE EASY

Get Intel® Server Products built on a foundation of high-quality technology in the sixth generation Intel® Xeon® processor E3-1200 v6 family of server solutions. The latest server products are designed to span multiple use-cases and customization requirements while offering performance, reliability, security, and cost flexibility to meet customers' requirements and growth needs now and in the future.



<b>DESCRIPTION</b>	A flexible and feature-rich entry-level server board family in a uATX form factor is available as a rack-mount system or easily integrated into a general purpose Intel® Server Chassis or 3rd party chassis.		
<b>TARGET MARKET</b>	Entry level server for small and medium businesses (SMBs), embedded, and storage and security appliance applications		
<b>ORDER CODE</b>	<b>DBS1200SPLR</b>	<b>DBS1200SPSR</b>	<b>DBS1200SPOR</b>
<b>FORM FACTOR</b>	microATX (9.6" x 9.6")		
<b>INTEL® SERVER CHASSIS</b>	Intel® Server Chassis P40000SFDR, P4304XXSFCN, P4304XXSHCN Intel® Server System R1000SPO family		
<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	Intel® Xeon® processor E3-1200 v5/v6 and Intel® Core® processor i3 series up to 80W TDP	Intel® Xeon® processor E3-1200 v5/v6 without HD Graphic up to 80W TDP	Intel® Xeon® processor E3-1200 v5/v6 without HD Graphic up to 80W TDP
<b>CHIPSET</b>	Intel® C236 Chipset	Intel® C232 Chipset	Intel® C236 Chipset
<b>TOTAL PCI SLOTS</b>	3 Riser Slots	1 Riser Slot	3 Riser Slots
<b>PCIe* SLOT TYPES</b>	1-PCIe 3.0 x8 elec, x16 mech 1-PCIe 3.0 x4 elec, x8 mech 1-PCIe 3.0 x8 elec, x8 mech	1-PCIe 3.0 x8 elec, x16 mech 1-PCIe 3.0 x4 elec, x8 mech 1-PCIe 3.0 x8 elec, x8 mech	1-PCIe 3.0 x8 elec, x16 mech with Riser Card suport
<b>MEMORY CAPACITY</b>	4 UDIMMs up to 2400 MHz ECC DDR4 64 GB max		
<b>SATA PORTS</b>	8-port 6Gb/s	6-port 6Gb/s	8-port 6Gb/s
<b>SAS OPTIONS</b>	With Intel® Integrated RAID module (optional)	No	With Intel® Integrated RAID module (optional)
<b>INTEGRATED LAN</b>	Dual port integrated Intel® Ethernet Controller i210 (1 GbE)		
<b>MANAGEMENT SUPPORT</b>	Intel® Server Management Software Integrated BMC with IPMI 2.0		
<b>INTEL® RAID SUPPORT</b>	Intel® Embedded Server RAID Technology 2 (ESRT2) RAID levels 0, 1, and 10 Intel® Rapid Storage Technology2 4.0 (0, 1, 5, and 10)		
<b>MODULE UPGRADES</b>	Intel® Integrated RAID Module, 22x42mm M.2 module, Intel® Remote Management Module 4 Lite2, Trusted Platform Module 1.2	-	Intel® I/O Expansion Module, Intel® Integrated RAID module, 22x42mm M.2 Module, Intel® Remote Management Module 4 Lite2, Trusted Platform Module 1.2
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available		

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.

Visit [servermarketinglibrary.intel.com](http://servermarketinglibrary.intel.com)

For more information, visit [www.intel.com/go/serverboards](http://www.intel.com/go/serverboards) or [ark.intel.com](http://ark.intel.com)

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See [www.intel.com/products/processor\\_number](http://www.intel.com/products/processor_number) for details. Refer to <http://support.intel.com/support/motherboards/server> for up-to-date details on processors supported by each server board.

<sup>2</sup> Requires a 4th generation Intel® Core™ processor, enabled chipset, and Intel® Rapid Storage Technology (Intel® RST) software.

<sup>3</sup> On interposer (need accessory kit AXXRMM4IOM or AXXRMM4IOMW).

<sup>4</sup> The Intel® Server Chassis H2204XXLRE is offered as part of the Intel® Data Center Blocks for HPC only. This product can not be ordered separately.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com](http://www.intel.com).

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more information go to <http://www.intel.com/performance>.

Intel, the Intel logo, Intel Inside, the Intel Inside logo, and Xeon are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



# INTEL<sup>®</sup> SERVER SYSTEMS

**PERFORMANCE.  
RELIABILITY.  
SECURITY.**

## **INTEL<sup>®</sup> SERVER SYSTEMS**

Based on Intel's most innovative technologies with Intel world-class validation, compatibility, certification, warranty and support. Reliable solutions made easy.

## **FEATURE-RICH INTEL<sup>®</sup> SERVER SYSTEMS FOR PERFORMANCE, RELIABILITY AND SECURITY**

Customers want data center products designed for outstanding performance and reliability that will address their unique needs. With Intel<sup>®</sup> Server Systems featuring the latest Intel<sup>®</sup> Xeon<sup>®</sup> processor families you can count on trusted performance, quality and reliability to help solve the most complex business challenges.

## Intel® Server System S9200WK Data Center Block for HPC

### INTEL® SERVER SYSTEM S9200WK: NEXT GENERATION INTEL DATA CENTER BLOCK FOR HPC

The Intel® Server System S9200WK product family is a purpose built, performance-optimized data center block ideal for use in High Performance Computing and Artificial Intelligence applications. Designed for the Intel® Xeon® Platinum 9200 Processors with up to 24 DDR4 DIMM slots per compute module, the Intel® Server System S9200WK product family maximizes processor and memory bandwidth to provide leadership performance for the most demanding compute use.



<b>DESCRIPTION</b>	Designed for the Intel® Xeon® Platinum 9200 Processors with up to 24 DDR4 DIMM slots per compute module, the Intel® Server System S9200WK product family maximizes processor and memory bandwidth to provide leadership performance for the most demanding compute use requirements.
<b>TARGET MARKET</b>	High Performance Computing
<b>KEY FEATURES</b>	<p><b>Maximum Intel® Xeon® Platinum 9200 Processors Performance</b></p> <ul style="list-style-type: none"> <li>• Leadership CPU performance per socket with Intel's highest core count, Intel® Xeon® Platinum 9200 Processors</li> <li>• Double the memory bandwidth for memory-intensive workloads with 12 memory channels per CPU, 24 memory channels per compute module</li> <li>• New Intel® DL Boost Instructions for data analytics greatly accelerates inference performance</li> <li>• Multi-Chip packaging optimized for density and performance</li> </ul> <p><b>Density Optimized 2U Rack Server with Air-Cooled and Liquid-Cooled Options</b></p> <ul style="list-style-type: none"> <li>• Up to four compute modules per 2U chassis which can support multiple compute module types in a single chassis</li> <li>• 2 CPU compute module design with advanced cooling technology for high flow rate air cooled or liquid cooling for CPUs, VRs, DIMMs, and memory VRs for high heat capture ratio</li> <li>• Up to 350W processor TDP for high performance workloads in a 2U air cooled chassis, up to 400W processor TDP with liquid-cooled versions</li> <li>• Up to 2 x16 PCIe slots in 1U compute modules, up to 4 x16 PCIe slots in 2U compute modules for network expansion options</li> <li>• Support for 2x M.2 SATA/NVMe storage devices per 1U compute module, up to 2x M.2 SATA/NVMe and 2x U.2 NVMe storage devices per 2U compute module</li> <li>• Hot-swappable compute modules, storage<sup>1</sup>, fans, and power supplies</li> </ul>
<b>FORM FACTOR</b>	2U rack enclosure; Up to 4 independent warm-swap compute modules
<b>CPU</b>	Intel® Xeon® Platinum 9200 Processors up to 56 cores
<b>MEMORY</b>	DDR4 2933 MT/s DIMMS, up to 96x DIMMs per DCB (24 DIMMs per compute module) @ 1DPC Supports 8GB to 128GB DIMM options, number and capacity configurable
<b>STORAGE</b>	Up to 8x M.2 SSDs per DCB (2x per compute module with 1U compute module Up to 4x M.2 SSDs & 4x hot-swap U.2 NVMe SSDs with 2U Compute Modules). M.2 and U.2 number and capacity configurable
<b>POWER SUPPLY</b>	3x hot-swap CRPS 2100W (Platinum) or 1600W (Titanium) PSUs
<b>ETHERNET</b>	Integrated 1Gbase-T RJ45 (two ports per compute module) Optional shared 1Gbase-T RJ45 management port chassis card



## Intel® Server System S9200WK Data Center Block for HPC

<b>COOLING</b>	Available with high flow rate air-cooling or integrated liquid-cooling options
<b>I/O</b>	2 x16 Gen3 PCIe slots per 1U compute module; 4 x16 Gen3 PCIe slots per 2U compute module for high-speed networking support
<b>MANAGEABILITY</b>	Dedicated, consolidated Management Module
<b>SECURITY &amp; SERVICEABILITY</b>	TPM 2.0 (optional); Hot-swap/redundant fans, and PSUs; light path diagnostic LEDs

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at [www.intel.com/support](http://www.intel.com/support)



## Intel® Server Systems Supporting the Intel® Xeon® Processor Scalable Family

### INTEL® SERVER SYSTEMS S2600BP BASED ON THE INTEL® SERVER BOARD S2600BP FAMILY — DENSITY OPTIMIZED SYSTEM ENABLING NEXT-GEN PERFORMANCE

The Intel® Server Board S2600BP product family is a purpose built, rack-optimized server board ideal for use in hyper-converged, data analytics, storage, cloud and high performance computing applications. Designed to support the 2nd generation Intel® Xeon® processor Scalable family and up to 16 DDR4 DIMM slots per server board (eight DIMMs per processor), the S2600BP family maximizes memory and processor bandwidth to meet demanding compute use requirements.



<b>DESCRIPTION</b>	Purpose Built for Outstanding Compute Density Purpose built for breakthrough performance, compute density, high-speed networking and I/O with stability and increased uptime
<b>TARGET MARKET</b>	High Performance Computing (HPC), Hyper Converged Infrastructure (HCI), Cloud, Storage
<b>SERVER BOARD INCLUDED</b>	S2600BPBR S2600BPSR S2600BPQR
<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	Up to two 2nd Gen Intel® Xeon® processor Scalable family Support for 2nd generation Intel® Xeon® processor family with Intel® Omni-Path Architecture integrated fabric connectors—One 100 Gb/s port per processor 165 W – board 140 W/165 W† – chassis
<b>PCI CONFIGURATION OPTIONS</b>	Riser Slot 1 (CPU1): x16 PCIe* 3.0 lanes (Riser slot 1 not available on S2600BPQR) <ul style="list-style-type: none"> <li>HNS2600BPBR/HNS2600BPB24R: Default: Video adapter; Optional: One PCIe* Slot x16 elec/x16 mech low-profile cards only</li> <li>HNS2600BPBLCR/HNS2600BPBLC24R: Not Available with AXBPLCKIT installed (required accessory)</li> <li>HNS2600BPSR/HNS2600BPS24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support</li> <li>HNS2600BPQR/HNS2600BPQ24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support</li> </ul> Riser Slot 2 (CPU1): x24 PCIe 3.0 lanes; One PCIe* slot x16 elec/x16 mech low-profile cards only Riser Slot 3 (CPU2) not available with Bridge Board installed; x24 PCIe 3.0 lanes Riser Slot 4 (CPU2) not available with Bridge Board installed; x16 PCIe 3.0 lanes
<b>MEMORY CAPACITY</b>	16 DIMM slots (eight per CPU) – DDR4 RDIMM/LRDIMM, Up to 29331 MT/s, 1.2V and Intel® Optane™ DC Persistent Memory
<b>MODULE UPGRADES</b>	Up to four
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Supported
<b>WARRANTY</b>	3-year limited warranty or optional 5-year extended warranty



† Note: 165 W TDP supported in enhanced air cooled Intel® Server Chassis H2204XXLRE only.

## Intel® Server Systems Supporting the Intel® Xeon® Processor Scalable Family

### INTEL® COMPUTE MODULE HNS2600BP FAMILY

<b>Dimensions</b>	716 x 269 x 158 mm
<b>System Cooling</b>	HNS2600BPBLCR / HNS2600BPBLC24R: Liquid Cooling Compatible¥
<b>Power Supply</b>	Two x 2130 W AC common redundant power supply (CRPS); 80 PLUS* Platinum
<b>Thermal Solution</b>	HNS2600BPBLCR / HNS2600BPBLC24R: Liquid Cooling Compatible¥
<b>PCI Riser Slots</b>	<p>Riser Slot 1 (CPU1): x16 PCIe* 3.0 lanes (Riser slot 1 not available on S2600BPQR)</p> <ul style="list-style-type: none"> <li>HNS2600BPBR/HNS2600BPB24R: Default: Video adapter; Optional: One PCIe* Slot x16 elec/x16 mech low-profile cards only</li> <li>HNS2600BPBLCR/HNS2600BPBLC24R: Not Available with AXXBPLCKIT installed (required accessory)</li> <li>HNS2600BPSR/HNS2600BPS24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support</li> <li>HNS2600BPQR/HNS2600BPQ24R: Default: Video adapter; Optional: Support for Intel® Omni-Path fabric through carrier card option only— no PCIe* slot support</li> </ul> <p>Riser Slot 2 (CPU1): x24 PCIe 3.0 lanes; One PCIe* slot x16 elec/x16 mech low-profile cards only</p> <p>Riser Slot 3 (CPU2) not available with Bridge Board installed; x24 PCIe 3.0 lanes</p> <p>Riser Slot 4 (CPU2) not available with Bridge Board installed; x16 PCIe 3.0 lanes</p>
<b>Additional Expansion</b>	<p>Bridge Board Slot</p> <p>Server Management:</p> <ul style="list-style-type: none"> <li>Integrated Baseboard Management Controller, IPMI 2.0 compliant, Redfish support</li> <li>One Dedicated RJ45 Management Port</li> <li>One 2x4 pin header for optional Intel® Remote Management Module 4 Lite (Intel® RMM4 Lite 2) with support for Remote KVM and</li> <li>Onboard LEDs: system status, system ID, POST code diagnostic, BMC error code</li> </ul> <p>Three 40x56 mm dual rotor system fans</p>
<b>Warranty</b>	3-year limited warranty or optional 5-year extended warranty

### SPECIFIC SKUs

<b>HNS2600BPBR</b>	Module integrated with an Intel® Server Board S2600BPBR Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
<b>HNS2600BPSR</b>	Module integrated with an Intel® Server Board S2600BPSR Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
<b>HNS2600BPQR</b>	Module integrated with an Intel® Server Board S2600BPQR Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
<b>HNS2600BPB24R</b>	Module integrated with an Intel® Server Board S2600BPBR Compatible with Intel® Server Chassis H2224XXLR3

### SPECIFIC SKUs

<b>HNS2600BPQ24R</b>	Module integrated with an Intel® Server Board S2600BPQR Compatible with Intel® Server Chassis H2224XXLR3
<b>HNS2600BPBLCR</b>	Module integrated with an Intel® Server Board S2600BPBR with Asetek D2C* liquid-cooling (AXXBPLCKIT accessory required¥) Compatible with Intel® Server Chassis H2312XXLR3 and H2204XXLRE
<b>HNS2600BPBLC24R</b>	Module integrated with an Intel® Server Board S2600BPBR with Asetek D2C* liquid-cooling (AXXBPLCKIT accessory required¥) Compatible with Intel® Server Chassis H2224XXLR3

¥ Liquid-cooling compute modules require Asetek\* DQC-05F connection with Asetek\* PGW-236 Coolant for compatibility.

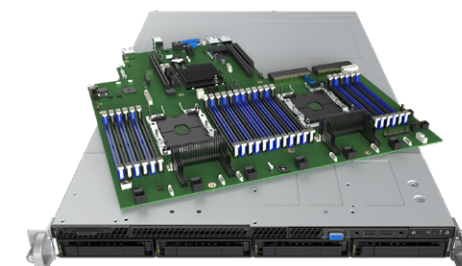
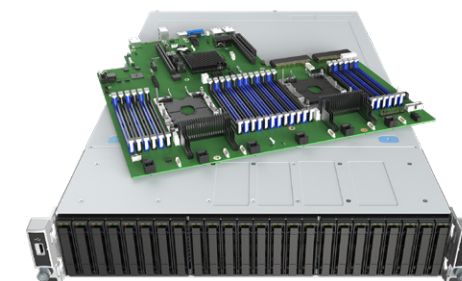
## Intel® Server Systems Supporting the Intel® Xeon® Processor Scalable Family

### INTEL® SERVER SYSTEMS R1000WF AND R2000WF BASED ON THE INTEL® SERVER BOARD S2600WF FAMILY — RELIABLE SOLUTIONS MADE EASY

Intel® Server S2600WF Product family delivers power and performance at peak efficiency in a 1U and 2U rack mount server form factor that features the energy-efficient dual 2<sup>nd</sup> Generation Intel® Xeon® processor Scalable Family. High memory capacity, networking, storage and I/O flexibility combine with innovative design to provide an exceptional and reliable server for business IT, appliance, data center, cloud and high performance computing applications.



<b>DESCRIPTION</b>	Manage highly demanding application workloads with 1U and 2U rack systems based on the premier Intel® Server Board W2600WF family featuring power-efficient spread core design, incredible 24 DDR4 DIMMS, and support for dual 2 <sup>nd</sup> Gen Intel® Xeon® processors Scalable Family.
<b>TARGET MARKET</b>	Enterprise and medium business IT / big data / storage / cloud
<b>SERVER BOARD INCLUDED</b>	S2600WFT: Onboard 10 GbE S2600WF0: No LOM S2600WFQ: Intel® QAT support
<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	2 x 1 <sup>st</sup> or 2 <sup>nd</sup> Generation Intel Xeon processors Scalable Family NOTE: Max CPU TDP supported up to 205 W with configuration limitations, see Technical Product Specifications
<b>TOTAL PCI SLOTS</b>	3 Riser slots 1 Intel® RAID Module Connector
<b>PCI SLOT TYPES</b>	1U: 2 x PCI Express* 3.0 x16 (FHHL), 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module 2U: 3 Riser Options: Total of up to 7 PCI Express 3.0 x8 or 2 PCI Express 3.0 x16, 3 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel Integrated RAID Module Riser 1 and 2 Options: 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Riser 1 and 2 Options: 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Riser 3: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 3.0 x4 LP via 3rd riser
<b>MEMORY CAPACITY</b>	24 ECC DDR4 <sup>2</sup> LR/RDIMMs with speeds up to 2933 MT/s; NVDIMMs <sup>3</sup> 2666 MT/s Intel® Optane™ DC Persistent Memory Module support
<b>MODULE UPGRADES</b>	Intel® OCP Mezzanine Expansion Module Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Statement of Conformance Platform Certificate
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available



## Intel® Server Systems R1000WF Based on the Intel® Server Board S2600WF Family

### 1U RACK SYSTEMS

<b>Dimensions (H x W x D)</b>	1.72" x 17.25" x 28"
<b>System Cooling</b>	Redundant cooling fans
<b>Power Supply</b>	1100 W AC Redundant PSU (Platinum Efficiency) Optional 1300 W AC Redundant PSU (Titanium Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
<b>Thermal Solution</b>	Included
<b>PCI Riser Slots</b>	2 x PCI Express* 3.0 x16 (FHHL) 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module
<b>Additional Expansion</b>	1x OCP Mezzanine Expansion Module
<b>Other Components</b>	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
<b>Warranty</b>	3 year limited warranty, optional 2 year extended warranty available



### SPECIFIC SKUs

<b>R1208WFTYS/R1208WFTYSR</b>	Intel® Server Board S2600WFT/S2600WFTR Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Dual 10 GbE ports Support for 8x 2.5" hot-swap drives 24 DDR4 DIMMs
<b>R1208WFQYSR</b>	Intel® Server Board S2600WFQR Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Intel® QAT support Support for 8x 2.5" hot-swap drives 24 DDR4 DIMMs

### SPECIFIC SKUs

<b>R1304WF0YS/R1304WF0YSR</b>	Intel® Server Board S2600WF0/S2600WF0R Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Support for 4x 3.5" hot-swap drives 24 DDR4 DIMMs No LOM
<b>R1304WFTYS/R1304WFTYSR</b>	Intel® Server Board S2600WFT/S2600WFTR Supports up to 165W TDP processors Single 1100W AC 80 PLUS Platinum PSU Dual 10 GbE ports Support for 4x 3.5" hot-swap drives 24 DDR4 DIMMs

# Intel® Server Systems R2000WF Based on the Intel® Server Board S2600WF Family

## 2U RACK SYSTEMS

<b>Dimensions (H x W x D)</b>	3.44" x 17.25" x 28"
<b>System Cooling</b>	Redundant and hot-swap cooling fans
<b>Power Supply</b>	1300 W AC redundant-capable PSU (Titanium Efficiency) Optional 1100 W AC redundant-capable PSU (Platinum Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
<b>Thermal Solution</b>	Included
<b>PCI Riser Slots</b>	3 Riser Options: Total of up to 6 PCI Express* 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 3.0 x4 LP via 3rd riser
<b>Additional Expansion</b>	1x Intel® OCP Mezzanine Expansion Module
<b>Other Components</b>	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
<b>Warranty</b>	3 year limited warranty, optional 2 year extended warranty available



## SPECIFIC SKUs

<b>R2208WFTZS/R2208WFTZSR</b>	Intel® Server Board S2600WFT/S2600WFTR Supports up to 205W TDP processors Integrated Dual 10GbE ports Single 1300W AC 80 PLUS Titanium PSU Support for 8x 2.5" SAS/SATA/NVMe hot-swap drives 24 DDR4 DIMMs
<b>R2208WFOZS/R2208WFOZSR</b>	Intel® Server Board S2600WF0/S2600WF0R Supports up to 205W TDP processors Single 1300W AC 80 PLUS Titanium PSU Support for 8x 2.5" SAS/SATA/NVMe hot-swap drives 24 DDR4 DIMMs No LOM
<b>R2208WFQZS/R2208WFQZSR</b>	Intel® Server Board S2600WFQ/S2600WFQR Supports up to 205W TDP processors Single 1300W AC 80 PLUS Platinum PSU Intel® QAT support Support for 8x 2.5" hot-swap SAS/SATA/NVMe drives 24 DDR4 DIMMs

## SPECIFIC SKUs

<b>R2224WFTZS/R2224WFTZSR</b>	Intel® Server Board S2600WFT/S2600WFTR Supports up to 150W/165W TDP processors Single 1300W AC 80 PLUS Titanium PSU Support for 24 x 2.5" hot-swap SAS/SATA/NVMe drives Integrated Dual 10GbE ports
<b>R2224WFQZS</b>	Intel® Server Board S2600WFQ Supports up to 150W TDP processors Single 1300W AC 80 PLUS Platinum PSU Intel® QAT support Support for 24x 2.5" hot-swap SAS/SATA/NVMe drives 24 DDR4 DIMMs

# Intel® Server Systems R2000WF Based on the Intel® Server Board S2600WF Family

## 2U RACK SYSTEMS

### SPECIFIC SKUs

<b>R2308WFTZS/R2308WFTZSR</b>	Intel® Server Board S2600WFT/S2600WFTR Supports up to 165W TDP processors Single 1300W AC 80 PLUS Titanium PSU Dual 10 GbE ports Support for 8x 3.5" hot-swap drives 24 DDR4 DIMMs
<b>R2312WFTZS/R2312WFTZSR</b>	Intel® Server Board S2600WFT/S2600WFTR Supports up to 140W TDP processors Single 1300W AC 80 PLUS Titanium PSU Dual 10 GbE ports Support for 12x 3.5" hot-swap drives 24 DDR4 DIMMs

### SPECIFIC SKUs

<b>R2312WFONP/R2312WFONPR</b>	Intel® Server Board S2600WF0/S2600WF0R Supports up to 140W TDP processors Support for 12x 3.5" hot-swap drives 24 DDR4 DIMMs No LOM No PSU
<b>R2312WFQZS</b>	Intel® Server Board S2600WFQ Supports up to 140W TDP processors Single 1300W AC 80 PLUS Titanium PSU Intel® QAT support Support for 12x 3.5" hot-swap drives 24 DDR4 DIMMs



Product does not include memory, processors, or hard drives.

For compatibility information please refer to the configuration guide at [www.intel.com/support](http://www.intel.com/support)

For more information, visit [www.intel.com/go/serversystems](http://www.intel.com/go/serversystems)

In 2019, Intel released the 2nd Generation Intel® Xeon® processor Scalable family. To enable support for the new processor family, Intel created an updated system software stack which includes the System BIOS and other system firmware. In support of the 2nd Gen Intel® Xeon® processor Scalable family, Intel began pre-loading the supporting system software stack onto all server boards and systems that define the Intel® Server S2600WF product family. All server board and systems with a pre-loaded system software stack compatible with the 2nd Gen Intel® Xeon® processor Scalable family can be identified by a product order code ending in an 'R'. Existing server boards and systems that define the Intel® Server S2600WF product family with product codes that do NOT end in an 'R' can be made to support the 2nd Gen Intel® Xeon® processor Scalable family by updating the system software stack to one that supports this processor family. A System Update Package (SUP) with the latest system software stack can be downloaded from the following Intel website: <https://downloadcenter.intel.com>

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See [www.intel.com/products/processor\\_number](http://www.intel.com/products/processor_number) for details.

<sup>2</sup> Overall memory size depends on the processor used.

<sup>3</sup> NVDIMM support refer to Intel® Server Configurator Tool (<https://serverconfigurator.intel.com>).

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary. For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks).

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/go/serversystems](http://www.intel.com/go/serversystems).

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Intel Core, and Xeon are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

## Intel® Server Systems Supporting the Intel® Xeon® Processor E5-2600 v4 Family

### INTEL® SERVER SYSTEMS R1000WT AND R2000WT BASED ON THE INTEL® SERVER BOARD S2600WT FAMILY — RELIABLE SOLUTIONS MADE EASY

Supporting 1U and 2U rack systems for expansion flexibility and maximum compute, memory, and I/O capacity to address customer security concerns and guard against counterfeiting and malware, select product families feature the Intel® Transparent Supply Chain which enables the ability to verify the authenticity of board components and firmware. Get the latest Intel® Server Products built on a foundation of high-quality technology in the next-generation Intel® Xeon® processor E5-2600 v4 family of server solutions. The latest Intel Server Products are designed to span multiple use-cases and customization requirements while offering performance, reliability, and security to meet customers' requirements and growth needs now and in the future.



<b>DESCRIPTION</b>	Manage highly demanding application workloads with 1U and 2U rack systems based on the premier Intel® Server Board W2600WT family featuring power-efficient spread core design, incredible 24 DDR4 DIMMS, and support for dual Intel® Xeon® processors E5-2600 v4.
<b>TARGET MARKET</b>	Enterprise and medium business IT / big data / storage / cloud
<b>SERVER BOARD INCLUDED</b>	S2600WT2R: 1 Gb Ethernet S2600WTTR: 10 GbE
<b>PROCESSOR SUPPORT,<sup>1</sup> MAX TDP</b>	2 x Intel Xeon processors E5-2600 v4 product family NOTE: Max CPU TDP supported 145 W with configuration limitations, see Technical Product Specifications
<b>TOTAL PCI SLOTS</b>	3 Riser slots 1 Intel® I/O Module Connector 1 Intel® RAID Module Connector
<b>PCI SLOT TYPES</b>	1U: 2 x PCI Express* 3.0 x16 (FHHL), 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module 2U: 3 Riser Options: Total of up to 6 PCI Express 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel Integrated RAID Module Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Option 3) 2 PCI-X 133 MHz FHFL, 1 x PCI Express 3.0 x8 FHHL Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 2.0 x4 LP via 3rd riser
<b>MEMORY CAPACITY</b>	24 LR / R / DIMMs 1333 / 1600 / 1866 / 2133 / 2400 MHz ECC DDR4 <sup>1</sup> NVDIMMs 2133MHz <sup>2</sup> 1.50 TB max using 64 GB DIMMS
<b>MODULE UPGRADES</b>	Intel® I/O Expansion Module Intel® Integrated RAID Module (ROC or IOC) Intel® Remote Management Module 4 Lite Trusted Platform Module
<b>INTEL® TRANSPARENT SUPPLY CHAIN</b>	Statement of Conformance Platform Certificate
<b>WARRANTY</b>	3 year limited warranty, optional 2 year extended warranty available

For the latest product SKUs and specifications, visit [ark.intel.com](http://ark.intel.com)

<sup>1</sup> Maximum memory speed supported depends on the processor used.

<sup>2</sup> NVDIMM support refer to Intel® Server Configurator Tool (<https://serverconfigurator.intel.com>).

Continued on next page

## Intel® Server Systems R1000WT Based on the Intel® Server Board S2600WT Family

### 1U RACK SYSTEMS

<b>Dimensions (H x W x D)</b>	1.72" x 17.25" x 28"
<b>System Cooling</b>	Redundant cooling fans
<b>Power Supply</b>	750 W AC Redundant PSU (Platinum Efficiency) Optional 750 W DC 48 V Redundant PSU (Gold Efficiency) NOTE: Second power supply sold separately
<b>Thermal Solution</b>	Included
<b>PCI Riser Slots</b>	2 x PCI Express* 3.0 x16 (FHHL) 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module
<b>Other Components</b>	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
<b>Warranty</b>	3 year limited warranty, optional 2 year extended warranty available



### SPECIFIC SKUs

<b>R1208WT2GSR</b>	Intel® Server Board S2600WT2R 8 x 2.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller I350 (1 GbE)
<b>R1208WTTGSR</b>	Intel® Server Board S2600WTTR 8 x 2.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
<b>R1304WT2GSR</b>	Intel® Server Board S2600WT2R 4 x 3.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller I350 (1 GbE)

### SPECIFIC SKUs

<b>R1304WTTGSR</b>	Intel® Server Board S2600WTTR 4 x 3.5" hot-swap HDD, optional support for 1 x 2.5" fixed internal drive 750 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE)
--------------------	---



# Intel® Server Systems R2000WT Based on the Intel® Server Board S2600WT Family

## 2U RACK SYSTEMS

<b>Dimensions (H x W x D)</b>	3.44" x 17.25" x 28"
<b>System Cooling</b>	Redundant and hot-swap cooling fans
<b>Power Supply</b>	750 W AC redundant-capable PSU (Platinum Efficiency) 750 W DC -48V redundant-capable power supply (Gold Efficiency) 1100 W AC redundant-capable PSU (Platinum Efficiency) NOTE: Second power supply sold separately
<b>Thermal Solution</b>	Included
<b>PCI Riser Slots</b>	3 Riser Options: Total of up to 6 PCI Express* 3.0 x8 or 2 PCI Express 3.0 x16, 2 PCI Express 3.0 x8, 1 x PCI Express 3.0 x8 Intel® I/O Expansion Module, 1 x PCI Express 3.0 x8 Intel® Integrated RAID Module Option 1) 3 x PCI Express 3.0 x8 (2 FHFL, 1 FHHL) Option 2) 1 x PCI Express 3.0 x16 FHFL, 1 x PCI Express 3.0 x8 FHHL Option 3) 2 PCI-X 133 MHz FHFL, 1 x PCI Express 3.0 x8 FHHL Additional: 1 x PCI Express 3.0 x8 LP, 1 x PCI Express 2.0 x4 LP via 3rd riser
<b>Other Components</b>	Intel® System Management Software Integrated BMC with IPMI 2.0 Optional optical disk drive
<b>Warranty</b>	3 year limited warranty, optional 2 year extended warranty available



## SPECIFIC SKUs

<b>R2208WT2YSR</b>	Intel® Server Board S2600WT2R 8 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller I350 (1 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL), 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
<b>R2208WTTYC1R</b>	Intel® Server Board S2600WTTR 8 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 2 x 1100 W AC redundant-capable PSU Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 2 PCI Express* 3.0 x16, 2 PCI Express 3.0 x8, 1 PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP

## SPECIFIC SKUs

<b>R2208WTTYSR</b>	Intel® Server Board S2600WTTR 8 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL), 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
<b>R2224WTTYSR</b>	Intel® Server Board S2600WTTR 24 x 2.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL)

# Intel® Server Systems R2000WT Based on the Intel® Server Board S2600WT Family

## SPECIFIC SKUs

<b>R2308WTTYSR</b>	Intel® Server Board S2600WTTR 8 x 3.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL) 1 riser PCI Express 3.0 x8 LP, PCIe 2.0 x4 LP
<b>R2312WTTYSR</b>	Intel® Server Board S2600WTTR 12 x 3.5" hot-swap HDD, optional 2 x 2.5" SATA rear hot-swap drives, 2 x 2.5" fixed internal drives 1100 W AC redundant-capable PSU; second PSU sold separately Integrated Dual Port Intel® Ethernet Controller X540 (10 GbE) 6 PCI Express* 3.0 x8 (4 FHFL, 2 FHHL)

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at [www.intel.com/support](http://www.intel.com/support)

<sup>1</sup> Maximum memory speed supported depends on the processor used.

## Intel® Server Boards S1200SP–Based Systems Supporting the Intel® Xeon® Processor E3-1200 v6 Family

### RELIABLE, COST EFFECTIVE AND EASY TO MANAGE

Get Intel® Server Products built on a foundation of high-quality technology in the sixth generation Intel® Xeon® processor E3-1200 v6 family-based server system. The Intel® Server System R1000SP Family has the processing power to deliver reliability, durability and performance along with server management features and options for increased storage, functionality or faster networking speed. Intel® Server Products are backed by Intel's design excellence and manufacturing expertise to deliver processing power with high levels of flexibility, manageability and reliability.



<b>DESCRIPTION</b>	Robust and cost effective server s that can scale as customers grow. The Intel Server System R1000SP Family offers systems that scale via SATA and PCIe* expansion options, server management and storage flexibility at budget friendly prices.
<b>TARGET MARKET</b>	Small and medium businesses, embedded, storage or security appliances and web hosting rack installations
<b>SERVER BOARD INCLUDED</b>	S1200SPOR: Rack optimized to support Intel® I/O Expansion Module and storage modules
<b>PROCESSOR SUPPORT<sup>1</sup></b>	1 x Intel® Xeon® processor E3-1200 v6 product family
<b>TOTAL PCI SLOTS</b>	1
<b>PCI SLOT TYPES</b>	1 PCIe* Gen3 x8 with x16 connection
<b>MEMORY CAPACITY</b>	4 x DDR4 UDIMMs up to 2400 MHz ECC 64 GB max
<b>MODULE UPGRADES</b>	Intel® I/O Expansion Module Intel® Integrated RAID Module Intel® Remote Management Module 4 LITE2 Trusted Platform Module 1.2

### 1U RACK SYSTEMS

<b>Dimensions (H x W x D)</b>	1.7" x 17.26" x 23.84"
<b>System Cooling</b>	Fixed cooling fans
<b>Power Supply</b>	450 W Redundant (Gold Efficiency)
<b>Thermal Solution</b>	Sold separately
<b>Other Components</b>	Optional optical disk drive
<b>Warranty</b>	3 year limited warranty

### SPECIFIC SKUs

<b>R1208SPOSHORR</b>	8 x 2.5" hot-swap HDD Intel® Server Board S1200SPOR 2 x 450 W hot-swap Redundant PSU
<b>R1304SPOSHBNR</b>	4 x 3.5" hot-swap HDD Intel® Server Board S1200SPOR 1 x 350 W fixed PSU
<b>R1304SPOSHORR</b>	4 x 3.5" hot-swap HDD Intel® Server Board S1200SPOR 2 x 450 W hot-swap Redundant PSU

Product does not include memory, processors, or hard drives. For compatibility information please refer to the configuration guide at [www.intel.com/support](http://www.intel.com/support)

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.

Visit [servermarketinglibrary.intel.com](https://servermarketinglibrary.intel.com)

For more information, visit [www.intel.com/go/serversystems](https://www.intel.com/go/serversystems)

<sup>1</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See [www.intel.com/products/processor\\_number](https://www.intel.com/products/processor_number) for details.

<sup>2</sup> High efficiency power supply.

<sup>3</sup> On interposer (need accessory kit AXXRMM4IOM or AXXRMM4IOMW).

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](https://www.intel.com/benchmarks)

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/go/serversystems](https://www.intel.com/go/serversystems).

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Intel Core, and Xeon are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



## ACCELERATING DATA CENTER TRANSFORMATION

# INTEL® DATA CENTER BLOCKS (INTEL® DCB)

### REDUCE COMPLEXITY AND DRIVE INNOVATION

Customer data centers today require unique server solutions that run complex, business-critical workloads. Increasingly, it takes more of your resources to develop those solutions. Intel® Data Center Blocks make it easier for you to adopt, qualify, and sell the latest Intel® technology, helping you address the demands of today's data centers.

A woman with short dark hair, wearing a blue sweater, stands in a server room. She is looking at a tablet computer. The room is filled with rows of black server racks. The lighting is bright, and the perspective is from the side, showing the depth of the aisle.

# INTEL® DATA CENTER BLOCKS

Reduce complexity and speed time to market with unbranded, fully-validated data center blocks that feature Intel's latest technologies.

## HIGHER INTEGRATION AND VALIDATION FOR FASTER TIME-TO-MARKET

The world of computing is getting more complex. In order to help partners keep up with the rapid pace of technological demands, Intel is making it easier to adopt, qualify and sell the latest Intel technology with purpose-built Data Center Blocks. These fully-validated server building blocks feature the required Intel technology to deliver customized solutions that meet complex customer needs. Because these Data Center Blocks come with a higher level of integration and validation, partners can reallocate R&D resources to higher value activities and accelerate time to market with innovative solutions.

### Cloud and Software-Defined Infrastructure

Gain increased access to the private cloud and SDI market with fully-validated, server systems featuring the latest Intel® technologies and ISV software certifications.

### High Performance Computing (HPC)

Accelerate your growth in the HPC market with unbranded, semi-integrated 1 and 2U rack system options built-to-order for intensive workloads.

### Transform Business with Enterprise Performance

Grow and transform your business with pre-configured, fully validated server systems designed for the needs of business IT.

## Making the path to reliable HPC Solutions Easier

The process of configuring and validating the foundational components of an HPC solution that is tuned to meet specific customer requirements is a complex and resource intensive process. To help address these challenges, Intel provides high-quality, fully validated Intel Data Center Blocks for HPC that can reduce complexity for resellers. These Data Center Blocks for HPC incorporate Intel's latest data center technologies - already optimized to work better together - allowing partners to accelerate time to market with reliable HPC solutions.



## HPC Compute Blocks

### CONFIGURE TO ORDER

Intel Data Center Blocks for HPC capture the innovations taking place in compute, fabric, storage and memory in a building block optimized for HPC environments. This means partners can order based on the specific needs of their customer. By taking advantage of Intel's latest technologies, as well as world-class engineering and validation expertise, partners can build innovative solutions faster and with a lower total cost of ownership.

### MIX AND MATCH: BUILD YOUR OWN RACK

1U and 2U Rack form factors:

R1208WFTYS
R1304WF0YS, R1304WFTYS
R2208WFTZS, R2208WF0ZS, R2208WFQZS, R2224WFTZS, R2224WFQZS
R2308WFTZS, R2312WFTZS, R2312WF0NP, R2312WFQZS
HNS2600BPBR, HNS2600BPB24R, HNS2600BPSR, HNS2600BPS24R, HNS2600BPQR, HNS2600BPQ24R
HNS2600KPR, HNS2600KPRF
HNS2600TPR, HNS2600TP24R, HNS2600TP24SR, HNS2600TPFR
R1304WT2GSR, R1304WTTGSR
R1208WT2GSR, R1208WTTGSR
R2208WT2YSR, R2208WTTYC1R, R2208WTTYSR, R2224WTTYSR
R2308WTTYSR, R2312WTTYSR
HNS7200AP

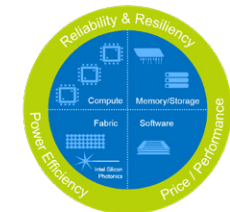
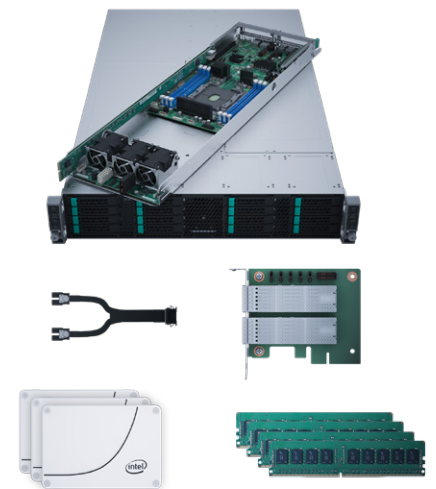
2<sup>nd</sup> Generation Intel® Xeon® Scalable Processors Family

Intel® Xeon Phi™ processor family

Intel® Omni-Path Fabric

Intel Ethernet and RAID adapters

Intel® Server Products hardware and accessories from supported families

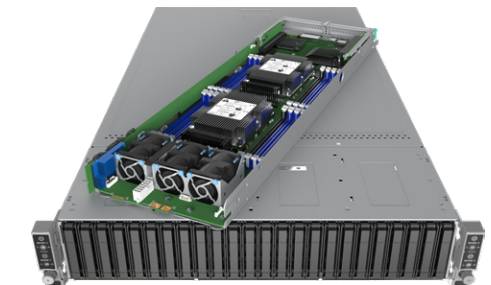
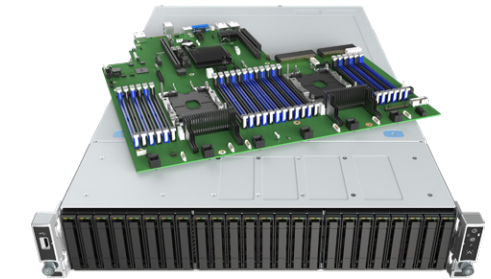


## Intel® Data Center Blocks for Nutanix\* Enterprise Cloud

Intel® Data Center Blocks (Intel® DCB) for Nutanix Enterprise Cloud are configure to order, non-branded server systems that are orderable with multiple options to allow your customer flexibility. When combined with Nutanix Enterprise Cloud\* OS, Intel® DCB afford the agility and simplicity of the public cloud, with the security and control you need in a private cloud. Achieve operational agility with compute, storage and virtualization all in one box, while retaining your ability to choose your hardware configurations to meet your customers' requirements.

### SUGGESTED CONFIGURATIONS

TYPE	INTEL® SERVER BOARD (NODE)	INTEL® XEON® SCALABLE PROCESSOR	INTEL® DC S4610 SSD 960GB	INTEL® DC S4610 SSD 1.92TB	INTEL® DC S4610 SSD 3.84TB	INTEL® DC P4610 SSD 3.2TB	SEAGATE 2TB HDD ST2000NX0433
<b>VISUALIZED SERVERS WITHIN PRIVATE CLOUDS</b>							
Good	S2600BP	2 x Silver 4116	2	-	-	-	4
Better	S2600BP	2 x Gold 5120	-	6	-	-	-
Best	S2600BP	2 x Gold 6152	-	-	4	2	-
<b>BUSINESS-CRITICAL DATABASE &amp; ANALYTICS</b>							
Good	S2600WF	2 x Silver 4116	4	-	-	-	8
Better	S2600WF	2 x Gold 6130	-	16	-	-	-
Best	S2600WF	2 x Platinum 8164	-	-	20	2	-



Visit [www.intel.com/nutanix](http://www.intel.com/nutanix) for additional information on Intel® DCB for Nutanix Enterprise Cloud.

Utilize the CTO tool at [orderconfigurator.intel.com](http://orderconfigurator.intel.com) to configure the right solution for your customer today.



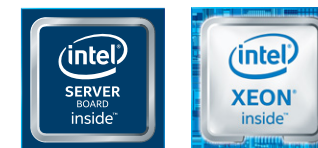
## Intel® Data Center Blocks for Cloud - Microsoft Windows Server\*

Designing, testing and validating a Microsoft Windows Server solutions for private cloud or Software Defined Storage (SDS) can be complex and resource-intensive. Cloud blocks for Microsoft are fully-validated, preconfigured server systems built with certified Windows Server ingredients. Designed to address the challenges of modern IT, this offering help resellers reduce complexity and speed to market.

### CLOUD BLOCKS FROM INTEL

<b>PRODUCT</b>	Intel® Data Center Blocks for Cloud – Microsoft Windows Server*
<b>DESCRIPTION</b>	Cloud Blocks for Microsoft Windows Server are fully-validated, pre-configured server systems featuring the latest Intel® technology, including Intel® Server Boards and Chassis, Intel® Xeon® processors and Intel® Solid State Drives (SSDs). Built with certified Windows Server ingredients and optimized for Microsoft Storage Spaces Direct (SDS), these blocks are available in multiple All-Flash (AF) or Hybrid (HY) configurations.
<b>TARGET MARKET</b>	Software-Defined Storage and Private Cloud. Recommended customer use cases include: Business-Critical Applications, Virtual Desktop Infrastructure, Disaster Recovery, Test and Development scenarios, and Enterprise Production Workloads.

ORDER CODES	INTEL® SERVER SYSTEM	FEATURES*
<b>ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)</b>		
MCB2208WFAF10R <sup>3</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 32 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 6230 processor</li> <li>• 512 GB memory</li> </ul>
MCB2208WFAF9R <sup>3</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 24 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 6230 processor</li> <li>• 768 GB memory</li> </ul>
MCB2208WFAF8R <sup>3</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 16 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 6230 processor</li> <li>• 512 GB memory</li> </ul>
MCB2208WFAF7R <sup>3</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 12 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 384 GB memory</li> </ul>
MCB2208WFAF6R <sup>3</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 16 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 384 GB memory</li> </ul>
MCB2208WFAF5R <sup>3</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 30.7 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 384 GB memory</li> </ul>
MCB2208WFAF4R <sup>3</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 11.5 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 384 GB memory</li> </ul>
MCB2208WFAF6 <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WFO	<ul style="list-style-type: none"> <li>• 24 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 6152 processor</li> <li>• 768 GB memory</li> </ul>
MCB2208WFAF5 <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WFO	<ul style="list-style-type: none"> <li>• 12 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5120 processor</li> <li>• 384 GB memory</li> </ul>



## Intel® Data Center Blocks for Cloud - Microsoft Windows Server\* — Continued

ORDER CODES	INTEL® SERVER SYSTEM	FEATURES*
<b>ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)</b>		
MCB2208WFAF4 <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	<ul style="list-style-type: none"> <li>• 11.5 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5118 processor</li> <li>• 384 GB memory</li> </ul>
MCB2224BPAF3R <sup>3</sup>	2U 4 node Intel® Server Chassis H2224XXLR3	<ul style="list-style-type: none"> <li>• 11.5 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 256 GB memory</li> </ul>
MCB2224BPAF3 <sup>3</sup>	2U 4 node Intel® Server Chassis H2224XXLR3 and Intel® Server Board S2600BPS	<ul style="list-style-type: none"> <li>• 7.7 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5118 processor</li> <li>• 256 GB memory</li> </ul>
<b>HYBRID CONFIGURATIONS (Hard drives for capacity, SSDs for cache)</b>		
MCB2208WFHY2R <sup>2</sup>	2U 1 node Intel® Server System and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 15.8 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 128 GB memory</li> </ul>
MCB2208WFHY2 <sup>2</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WF0	<ul style="list-style-type: none"> <li>• 12 TB raw storage capacity</li> <li>• Intel® Xeon® Gold 5118 processor</li> <li>• 128 GB memory</li> </ul>
MCB2224BPHY1R <sup>2</sup>	2U 4 node Intel® Server Chassis	<ul style="list-style-type: none"> <li>• 8 TB raw storage capacity per node</li> <li>• Intel® Xeon® Silver 4215 processor</li> <li>• 128 GB memory</li> </ul>
MCB2224BPHY1 <sup>2</sup>	2U 4 node Intel® Server Chassis H2224XXLR3 and Intel® Server Board S2600BPS	<ul style="list-style-type: none"> <li>• 8 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5115 processor</li> <li>• 128 GB memory</li> </ul>

Visit [ark.intel.com](https://ark.intel.com) to view product specific support status for Windows Server 2016 and Windows Server 2019 versions

<sup>2</sup> 3rd party SW stack and HDD NOT included

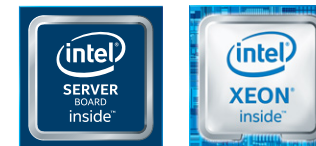
<sup>3</sup> 3rd party SW stack NOT included

\* Other names and brands may be claimed as the property of others

## Intel® Data Center Blocks for Cloud – VMware\* (vSAN ReadyNode\*)

### ACCELERATING THE PATH TO PRIVATE CLOUD WITH SOFTWARE DEFINED STORAGE (SDS) AND VMWARE\* (VSAN READYNODE) FROM INTEL® DATA CENTER BLOCKS

The new 2<sup>nd</sup> generation Intel® Xeon® processor Scalable family, including Intel® Optane™ technology, empowers modern hybrid cloud deployments with the ability to place large data sets closer to the processors for reduced latency, high density, and non-volatility. As a result, today's enterprises gain the ability to move, store, and process data more quickly in demanding workflow scenarios, and extract greater value from data sets. Intel® Data Center Blocks for Cloud (Intel® DCB for Cloud) - VMware\* vSAN ReadyNode offer a validated and supported solution tailored for high performance computing, hyper-converged architecture, and storage scenarios requiring outstanding performance. Available in All-Flash and Hybrid configurations, these systems offer partners the flexibility to build innovative, cost-effective, software-defined storage solutions quickly and efficiently.



#### INTEL® DATA CENTER BLOCKS FOR CLOUD - VMWARE (VSAN READYNODE)

<b>PRODUCT</b>	Intel® Data Center Blocks for Clouds - VMware (vSAN ReadyNode)
<b>DESCRIPTION</b>	Intel Cloud Blocks for VMware are fully-validated, pre-configured server systems featuring the latest Intel technology, including Intel® Server Boards and Chassis, 2 <sup>nd</sup> Generation Intel® Xeon® processors, and Intel® Solid State Drives (SSDs), as well as third-party memory and VMware vSAN certifications in configurations optimized for SDS solutions. These vSAN ReadyNodes from Intel are available in multiple All-Flash (AF) or Hybrid (HY) system configurations, each designed for specific workloads and use cases.
<b>TARGET MARKET</b>	Software-Defined Storage and Private Cloud. Recommended customer use cases include: Business-Critical Applications, Virtual Desktop Infrastructure, Disaster Recovery, Test and Development scenarios, and Enterprise Production Workloads.

ORDER CODES	VMWARE* VSAN PROFILE	INTEL® SERVER SYSTEM	FEATURES*
<b>ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)</b>			
VRN2208WFAF83R	All Flash (AF-8) <sup>3</sup>	2U 1 node Intel® Server System R2208WFOZSR and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 24 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 6230 processor</li> <li>• 512 GB memory</li> </ul>
VRN2208WFAF82R	All Flash (AF-8) <sup>3</sup>	2U 1 node Intel® Server System R2208WFOZSR and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 12 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 384 GB memory</li> </ul>
VRN2208WFAF81R	All Flash (AF-8) <sup>3</sup>	2U 1 node Intel® Server System R2208WFOZSR and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 11.5 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 384 GB memory</li> </ul>
VRN2208WFAF61R	All Flash (AF-6) <sup>3</sup>	2U 1 node Intel® Server System R2208WFOZSR and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 7.68 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5218 processor</li> <li>• 256 GB memory</li> </ul>
VRN1208WFAF41R	All Flash (AF-4) <sup>3</sup>	1U 1 node Intel® Server System R2208WFOZSR and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 3.84 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5215 processor</li> <li>• 128 GB memory</li> </ul>



Continued on next page

## Intel® Data Center Blocks for Cloud – VMware\* (VSAN Ready Node) — Continued

Continued from previous page

ORDER CODES	VMWARE* VSAN PROFILE	INTEL® SERVER SYSTEM	FEATURES*
<b>ALL-FLASH CONFIGURATIONS (SATA SSDs for capacity, NVMe* SSDs for cache)</b>			
VRN2208WFAF83	All Flash (AF-8) <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WFO	<ul style="list-style-type: none"> <li>• Up to 120 VMs and 80K IOPs per node</li> <li>• 24 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 6152 processor</li> <li>• 768GB memory</li> </ul>
VRN2208WFAF82	All Flash (AF-8) <sup>3</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WFO	<ul style="list-style-type: none"> <li>• Up to 120 VMs and 80K IOPs per node</li> <li>• 12 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5120 processor</li> <li>• 384 GB memory</li> </ul>
VRN2208WFAF81	All Flash (AF-8) <sup>3</sup>	2U 1 node Intel® Server Chassis R2208WF0ZS and Intel® Server Board S2600WFO	<ul style="list-style-type: none"> <li>• Up to 120 VMs and 80K IOPs per node</li> <li>• 11.5 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5118 processor</li> <li>• 384 GB memory</li> </ul>
VRN2224BPAF6	All Flash (AF-6) <sup>3</sup>	2U 4 node Intel® Server Chassis H2224XXLR3 with Intel® Server Board S2600BPS	<ul style="list-style-type: none"> <li>• Up to 60 VMs and 50K IOPs per node</li> <li>• 9.6 TB raw storage capacity per node</li> <li>• Intel® Xeon® Xeon Gold 5118 processor</li> <li>• 256 GB memory</li> </ul>
<b>HYBRID CONFIGURATIONS (Hard for capacity, SSDs for cache)</b>			
VRN2208WFHY6R	Hybrid (HY-6) <sup>2</sup>	2U 1 node Intel® Server System R2208WF0ZSR and Intel® Server Board S2600WFOR	<ul style="list-style-type: none"> <li>• 12 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5215 processor</li> <li>• 256 GB memory</li> </ul>
VRN2208WFHY6	Hybrid (HY-6) <sup>2</sup>	2U 1 node Intel® Server System R2208WF0ZS and Intel® Server Board S2600WFO	<ul style="list-style-type: none"> <li>• Up to 50 VMs and 20K IOPs per node</li> <li>• 12 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5115 processor</li> <li>• 256 GB memory</li> </ul>
VRN2224BPHY6R	Hybrid (HY-6) <sup>2</sup>	2U 1 node Intel® Server Chassis H2224XXLR3	<ul style="list-style-type: none"> <li>• 8 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5215 processor</li> <li>• 256 GB memory</li> </ul>
VRN2224BPHY6	Hybrid (HY-6) <sup>2</sup>	2U 4 node Intel® Server Chassis VRN2224BPHY6 and Intel® Server Board S2600BPS	<ul style="list-style-type: none"> <li>• Up to 50 VMs and 20K IOPs per node</li> <li>• 8 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5115 processor</li> <li>• 256 GB memory</li> </ul>
VRN2224BPHY4R	Hybrid (HY-4) <sup>2</sup>	2U 4 node Intel® Server Chassis H2224XXLR3	<ul style="list-style-type: none"> <li>• 4 TB raw storage capacity per node</li> <li>• Intel® Xeon® Gold 5215 processor</li> <li>• 128 GB memory</li> </ul>

<sup>2</sup> 3rd party SW stack and HDD NOT included

<sup>3</sup> 3rd party SW stack NOT included

\* Other names and brands may be claimed as the property of others

## Intel® Data Center Blocks for Networking – NFVI Server System

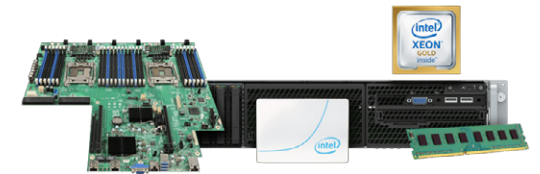
### SIMPLIFYING AND ACCELERATING NETWORK FUNCTIONS VIRTUALIZATION INFRASTRUCTURE (NFVI) DEPLOYMENT

With the global network functions virtualization (NFV) market projected to grow at a compound annual growth rate (CAGR) of 42%, reaching \$15.5 billion by 2020, a massive market opportunity exists. However, many system builders do not have deep experience in designing for the unique requirements of multi-function systems and are looking for a way to address the complexity they face in selecting and validating optimal configurations. The NFVI Server System designed and tested by Intel to deliver exceptional performance for NFVI workloads. Rather than procuring hardware as components and building the system from scratch, the NFVI Server System comes as a pre-configured system to help partners accelerate time to market with workload optimized solutions.

#### KEY BENEFITS

- Optimized for the unique needs of network functions virtualization infrastructure (NFVI) workloads to deliver exceptional performance
- Fully validated, pre-configured NFVI Server System saves time and money<sup>1</sup> freeing up resources to focus on value-add and competitive differentiation
- Single order code simplifies procurement and reduces complexity associated with system design and validation
- Intel quality and reliability with world-class integration, validation, certification, and support
- Standard Intel three-year warranty ensures customer satisfaction

#### NFVI ENABLEMENT OPTIONS FROM INTEL



NFVI Server Block	Intel® Select Solution for NFVI Reference Architecture	Intel® Select Fast Track Kit for NFVI
<p>Pre-configured, fully-validated Intel Xeon® Scalable processor-based system with balanced Intel® QuickAssist Technology (Intel® QAT), Networking, and NVMe* Storage are designed to accelerate time to market.</p> <p>Ensures efficient data flows, with consistent, repeatable performance.</p> <p>Designed to meet the Intel® Select Solution for NFVI hardware specification.</p>	<p>Reference Architecture that includes a hardened configuration of hardware, firmware, and software optimized for essential NFV workloads.</p> <p>Delivered as a branded Intel® Select Solution systems through Intel partners.</p> <p>The NFVI Server System hardware is used for reference architecture validation.</p>	<p>Combines the NFVI Server System with pre-installed Intel® Select Solution for NFVI software (Ubuntu or RedHat).</p> <p>Provides faster access to a fully functional NFVI optimized development platform.</p>

Continued on next page

## Intel® Data Center Blocks for Networking – NFVI Server System (Continued)

Continued from previous page

### PRODUCT SPECIFICATIONS

<b>ORDER CODE</b>	NB2208WFQNFVI
<b>PROCESSOR</b>	2x Intel® Xeon® Gold 6152 processor, 22 Cores, 2.1 GHz, Base non-AVX Core frequency, 30.25 LLC (MB), 140 W TDP
<b>BOARD + CHASSIS</b>	Intel® Server System R2208WFQZS (including Intel® Server Board S2600WFQ with symmetric Intel® QAT and 2U Intel® Server Chassis with 8 x 2.5" backplane)
<b>DIMENSIONS</b>	16.93" x 27.95" x 3.44"
<b>POWER SUPPLY</b>	2x Redundant 1300 W CRPS - AC, Titanium
<b>MEMORY</b>	24x RDIMM 16 GB – DDR4 288-pin, 2666 MHz (384 GB total)
<b>STORAGE-CAPACITY</b>	4x Intel® SSD DC P4500 (1.0 TB)
<b>BOOT DRIVES (R1)</b>	2x Intel® SSD DC S4500 (240 GB)
<b>NVME* SWITCH</b>	1x 4 Port Switch adapter (CPU1 riser)
<b>CABLES - STORAGE</b>	4x OcuLink* Cables for 4 drives -- AXXCBL470CVCR (1), AXXCBL530CVCR (1), AXXCBL800CVCR (2)
<b>CONNECTIVITY - NICS</b>	4x Intel® Ethernet Network Adapter XXV710-DA2 (25 GbE, 2 adapters per riser)
<b>MANAGEMENT NIC</b>	1x Intel® Ethernet Network Connection OCP I357-T4
<b>REAR HOT SWAP BACKPLANE (HSBP)</b>	Rear Hot-swap Dual Drive Cage Upgrade Kit

<sup>1</sup> Cost reduction scenarios described are intended as examples of how a given Intel®-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

## Intel® Data Center Block with Firmware Resilience

### Making It Easier to Deliver Competitive and Secure<sup>1</sup> Servers for Critical Infrastructure, Government, and Financial Institutions.

As security threats continue to evolve and increase, security IT officers are driving for a holistic and expanded view to protect their critical infrastructure. This includes protecting the server all the way down to the firmware at the lowest layers of the platform, where threats are most difficult to detect. While technologies exist to protect the higher layers of the infrastructure stack, system IT users need assurance that the underlying platform launching these security technologies can be trusted.

As hackers seek new ways to infiltrate servers, the lower layers of the platform, where threats are most difficult to detect become a more common target. To address this, Intel has developed the Intel® Data Center Block with Firmware Resilience. Featuring Intel® Platform Firmware Resilience technology, this preconfigured, validated server system enables platform security starting in the factory through power-on, system boot, OS load, and beyond<sup>1</sup>. With this offering, customers can protect firmware from being intercepted, detect firmware corruption, and automatically restore a system if malware is detected. The ability to correct firmware corruptions is a new and innovative capability, and an ideal solution for security-sensitive industries including government, financial institutions, and critical infrastructure.

Intel is simplifying adoption of this technology through fully-validated, configure-to-order systems featuring security-optimized Intel® Xeon® processor, Intel® Server Boards, Intel® Server Chassis, and multiple upgrade options to provide a solution that customers can deploy quickly and with confidence.

### Configure a system designed for your needs. Choose from three security-optimized processors and a variety of upgrade options.



Intel® Platform Firmware Resilience technology protects, detects critical firmware during boot and runtime attacks

9 pre-configured system SKUs with Order Codes: LFRB2208WFTF801, LFRB2208WFTF601, LFRB2208WFTF401, LFRB2312WFTF801, LFRB2312WFTF601, LFRB2312WFTF401, LFRB1208WFTF801, LFRB1208WFTF601, LFRB1208WFTF401

Intel® Server Board S2600WFTF

Intel® Server Chassis R2000WFTF and R1000WFTF families; 2U & 1U chassis with 1300WAC Power Supplies.

3x Security Optimized Processor Options (Intel® Xeon® Scalable processor, Platinum, Gold & Silver)

Includes two memory modules: 16GB, RDIMM, DDR4, 2666 MT/s

RFID Antenna for Protect-In-Transit

Intel Fabric, Ethernet and RAID adapters (Optional)

Support for 8x2.5" or 12x3.5" (only 2U) drives

Intel® Server Products hardware and accessories from supported families

<sup>1</sup> Intel® technologies features and benefits depend on system configuration and may require enabled hardware, software, or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer to learn more at intel.com.

## Software Guard Extensions Server Block

### CONTENT DELIVERY NETWORKS, CLOUD SERVICE PROVIDERS, COMMUNICATIONS NETWORKS, AND FINANCIAL INSTITUTIONS

The Software Guard Extensions Server Block is optimized for information security, featuring Intel's industry-leading cryptographic isolation technology - Intel® Software Guard Extensions (Intel® SGX). Intel® SGX provides CPU-hardened enclaves, or protected areas of execution in memory, that increase security for selected code and data on compromised platforms. The Software Guard Extensions Server Block is an unbranded server system designed to be a cost-effective cryptographic security solution that delivers enterprise-grade performance, reliability and security in an easy-to-manage system.

<b>PRODUCT</b>	Software Guard Extensions Server Block
<b>DESCRIPTION</b>	Pre-configured, fully validated 1U rack system, featuring Intel® Software Guard Extensions (Intel® SGX) for cryptographic security; includes the Intel® Server Board S1200SPOR, as well as other Intel components and 3rd party memory that can scale as customers grow via SATA and PCIe* expansion options for increased storage functionality or faster networking speed.
<b>ORDER CODE</b>	LR1304SPCFSGX1
<b>TARGET MARKET</b>	Security optimized server for customers with high data protection needs
<b>SERVER BOARD</b>	Intel® Server Board S1200SPOR
<b>FORM FACTOR</b>	1U; microATX 9.6" x 9.6"
<b>PROCESSOR SUPPORT</b>	Single Intel® Xeon® processor E3-1270 v6, up to 72W TDP
<b>CHIPSET</b>	Intel® C236 chipset
<b>MEMORY</b>	64GB (4 x 16GB), 2133MHZ, DDR4, UDIMM
<b>SATA PORTS</b>	One DH-10 Serial Port 'A' connector
<b>INTEGRATED LAN</b>	Dual 1GbE – Intel® i210
<b>MANAGEMENT SUPPORT</b>	Intel® Remote Management Module 4 Lite 2 (AXRMM4LITE2)
<b>CHASSIS</b>	Intel 1U chassis with hot-swappable 4 x 3.5" (2.5" SSD ready) drive trays, dual 450W redundant PSUs (R1304SPOSHOR)
<b>CHASSIS DIMENSIONS</b>	1.7 in (43.18 mm) x 17.26 in (438.5mm) x 21.06 in (548.9 mm) (Height x Width x Depth)
<b>SECURITY</b>	TPM 2.0 Module
<b>FANS</b>	Three managed 40mm single rotor system fans One fan for each installed power supply module
<b>STORAGE</b>	4 x 3.5" (2.5" SSD Ready) hot-swap drive bays 1 x optical drive bay
<b>UPGRADE OPTIONS</b>	Two Intel® SSD DC S3520 Series (1.2 TB, 2.5in. SATA 6Gb/s, 16nm, MLC) Intel® Integrated RAID Module options Intel® I/O Expansion Module options
<b>WARRANTY</b>	3 year limited warranty with options to expand to 5 years





## Intel® Data Center Blocks for Business - Entry Server Block

### ENTERPRISE PERFORMANCE FOR ENTRY NEEDS

In a highly competitive market, small enterprise and cloud service providers (CSPs) need a cost-effective server that delivers enterprise-grade performance, reliability and security in an easy-to-manage system. They also need solutions that are able to scale and be more agile, while also being competitively priced. To help address this demand, Intel is providing pre-configured, fully-validated Entry Server Blocks that will help accelerate time to market with server solutions optimized for the needs of small enterprises and CSPs. This 1U rack system includes Intel® components and 3rd party memory, in an unbranded offering that will help reduce the complexity and costs associated with designing, configuring and validating server solutions.

### ENTRY SERVER BLOCK FROM INTEL

<b>PRODUCT</b>	Intel® Data Center Blocks for Business - Entry Server Block
<b>DESCRIPTION</b>	Pre-configured, fully validated 1U rack system, featuring the Intel® Server Board S1200SPOR as well as other Intel components and 3rd party memory that can scale as customers grow via SATA and PCIe* expansion options for increased storage functionality or faster networking speed.
<b>ORDER CODE</b>	LR1304SPCFG1R
<b>TARGET MARKET</b>	Entry level server for small and medium businesses (SMBs), optimized for web hosting, enterprise applications and storage
<b>SERVER BOARD</b>	Intel® Server Board S1200SPOR
<b>FORM FACTOR</b>	1U; microATX 9.6" x 9.6"
<b>PROCESSOR SUPPORT</b>	Single Intel® Xeon® processor E3-1230 v6, up to 72W TDP
<b>CHIPSET</b>	Intel® C236 chipset
<b>MEMORY</b>	16GB (1 x16GB), 2133MHZ, DDR4, UDIMM
<b>SATA PORTS</b>	One DH-10 Serial Port 'A' connector
<b>INTEGRATED LAN</b>	Dual 1GbE – Intel® i210
<b>MANAGEMENT SUPPORT</b>	Intel® Remote Management Module 4 Lite 2 (AXXRMM4LITE2)
<b>CHASSIS</b>	Intel 1U chassis with hot-swappable 4 x 3.5" (2.5" SSD ready) drive trays, dual 450W redundant PSUs (R1304SPOSHOR)
<b>CHASSIS DIMENSIONS</b>	1.7 in (43.18 mm) x 17.26 in (438.5mm) x 21.06 in (548.9 mm) (Height x Width x Depth)
<b>FANS</b>	Three managed 40mm single rotor system fans One fan for each installed power supply module
<b>STORAGE</b>	4 x 3.5" (2.5" SSD Ready) hot-swap drive bay, drives not included 1 x optical drive bay
<b>UPGRADE OPTIONS</b>	Up to 4x 2.5" SSD drives; Intel® Integrated RAID Module options; Intel® I/O Expansion Module options
<b>WARRANTY</b>	3 year limited warranty with options to expand to 5 years



The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.  
Visit [servermarketinglibrary.intel.com](https://servermarketinglibrary.intel.com)

For more information, visit [www.intel.com/dcb](https://www.intel.com/dcb) or [ark.intel.com](https://ark.intel.com)

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](https://www.intel.com/benchmarks)

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/products/server/chassis](https://www.intel.com/products/server/chassis) or [ark.intel.com](https://ark.intel.com).

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation



# INTEL<sup>®</sup> SERVER CHASSIS

**DESIGNED FOR  
QUALITY,  
RELIABILITY,  
AND SECURITY.**

## **1U/2U RACK**

New flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments support custom form factor server boards. Find high-density, 2U rackable chassis supporting up to 4 hot-pluggable Intel<sup>®</sup> Compute Modules up to 24 2.5 inch hot-swap drives or up to 12 3.5 inch hot-swap drives.

## **TOWER CHASSIS**

Pedestal chassis ideal for small and medium business environments and purpose-built appliances.

# INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® SCALABLE PROCESSOR



INTEL® SERVER CHASSIS H2000G FAMILY<sup>3</sup>

<b>CHASSIS</b>	2U rack chassis supporting up to 4 hot-pluggable Intel® Compute Module HNS2600BPB24, HNS2600BPQ24 or HNS2600BPS24, 24 2.5" hot-swap drives, and 2 2130 W AC Platinum efficiency common redundant power supplies	2U rack chassis supporting up to 4 hot-pluggable Intel® Compute Module HNS2600BPB, HNS2600BPQ, or HNS2600BPS, up to 4 2.5" hot-swap drives and 2 2130 W AC Platinum efficiency common redundant power supplies	High-density, 2U rackable chassis supporting up to 4 hot-pluggable Intel® Compute Module HNS2600BPB, HNS2600BPQ, HNS2600BPS up to 12 3.5" hot-swap drives and two 2130 W AC Platinum efficiency common redundant power supplies
<b>TARGET MARKET</b>	Hyper-converged infrastructure, Cloud, Datacenter		
<b>MODEL</b>	24 2.5" hot-swap drives	4 2.5" hot-swap drives	3.5" Hot-swap drive model
<b>COMPUTE MODULE SUPPORT<sup>1</sup></b>	HNS2600BP24	HNS2600BPB	
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>H2224XXLR3</b>	<b>H2204XXLRE:</b> Available only as part of the HPC Data Center Block offering	<b>H2312XXLR3</b>
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	<b>AHWBPBGB24:</b> 6-Port IT Bridge Board with LSI* 3008 IOC, 6G SATA / 12G SAS, 2 NVMe* drives (pass-through), no RAID <b>AHWBPBGB24R:</b> 6-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID, 2 NVMe drives (pass-through), RAID 0/1/10 <b>AHWBPBGB24P:</b> 6-Port Add-In-Card (AIC) pass-through Bridge Board; Must be used in combination with an add-in RAID card to be functional	<b>AHWBPBGB:</b> 4-Port SATA SW RAID Bridge Board, 6G SATA only, no RAID <b>AHWBP12GBGB:</b> 4-Port Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/10 <b>AHWBP12GBGBR5:</b> 4-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/5/10	<b>AHWBPBGB:</b> 4-Port SATA SW RAID Bridge Board, 6G SATA Only, no RAID <b>AHWBP12GBGB:</b> 4-Port Bridge Board with LSI* 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/10 <b>AHWBP12GBGBR5:</b> 4-Port iMR Bridge Board with LSI 3008 IOC, 6G SATA / 12G SAS, RAID 0/1/5/10
<b>FORM FACTOR</b>	2U Rack		
<b>DRIVE BAYS</b>	Supports up to 24 2.5" hot-swap SAS / SATA drives	Supports up to four 2.5" hot-swap SAS / SATA drives	Up to 12 2.5" or 3.5" hot-swap SAS / SATA drives
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	Included		
<b>NVMe*</b>	Support up to 8 2.5" PCIe* SFF devices	None	N/A
<b>SYSTEM COOLING</b>	3 x 40mm x 56mm dual rotor fans per module		
<b>POWER SUPPLIES</b>	2 Common redundant 2130 W AC (Platinum Efficiency)		
<b>TOOL-LESS FEATURES</b>	PSU, Compute module, HDD bays are all hot-swap		
<b>DIMENSIONS (H x W x D)</b>	3.46" x 17.24" x 28.86"	3.46" x 17.24" x 30.35"	
<b>BEZEL FEATURES</b>	Black, independent front panel controls for each individual module		
<b>FRONT CONNECTORS</b>	N/A		
<b>SYSTEM SECURITY</b>	Protection for chassis drives with a lock to the chassis		

# INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® PROCESSOR E5-V4



## INTEL® SERVER CHASSIS H2000G FAMILY<sup>3</sup>

<b>CHASSIS</b>	2U rack chassis supporting up to four hot-pluggable Intel® Compute Module HNS2600TP24R, HNS2600TP24SR or HNS2600TP24STR up to 24 2.5" hot-swap drives and two 1600W common redundant power supplies.	2U rack chassis supporting up to four hot-pluggable Intel® Compute Module NS2600TP24R, HNS2600TP24SR or HNS2600TP24STR up to 24 2.5" hot-swap drives and two 2130 W common redundant power supplies.
<b>TARGET MARKET</b>	Hyper-converged infrastructure/Cloud/Datacenter	
<b>MODEL</b>	4 2.5" hot-swap drives, including support for up to eight 2.5" PCIe* small form factor (SFF) devices	
<b>INTEL® SERVER BOARD SUPPORT<sup>1</sup></b>	HNS2600TP24R, HNS2600TP24SR	
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>H2224XXKR2</b>	<b>H2224XXLR2</b>
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	24 x 2.5" Backplane: FHW24X25HS12G Power interposer board: FXXCRPSPIB Power docking board: FH2000NPB24 Bridge board: FHWKTPBGB24	24 x 2.5" Backplane: FHW24X25HS12G Bridge board: FHWKTPBGB24 Front control panel kit: FH2000FPANEL2 Power distribution board: FXXCRPSPDB2 Power board: FH2000NPB24 Power in backplane bridge board module: FXXCRPSPIB
<b>FORM FACTOR</b>	2U Rack	
<b>DRIVE BAYS</b>	Supports up to twenty-four 2.5" hot-swap SAS drives	
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	Included	
<b>NVMe*</b>	Support up to eight 2.5" PCIe* SFF devices	
<b>SYSTEM COOLING</b>	3 x 40mm x 56mm dual rotor fans per module	
<b>POWER SUPPLIES</b>	(2) Common Redundant 1600 W (Platinum Efficiency)	
<b>I/O SLOTS</b>	Up to 2	
<b>BACKPLANE</b>	Included combination backplane with PCIe* SFF device support	
<b>TOOL-LESS FEATURES</b>	PSU, Compute module, HDD bays are all hot-swap	
<b>DIMENSIONS (H x W x D)</b>	3.46" x 17.24" x 28.86"	
<b>BEZEL FEATURES</b>	Black, independent front panel controls for each individual module	
<b>FRONT CONNECTORS</b>	N/A	
<b>SYSTEM SECURITY</b>	Protection for chassis drives with a lock to the chassis	

# INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON® PROCESSOR E5-V4



## INTEL® SERVER CHASSIS H2000G FAMILY<sup>3</sup>

<b>CHASSIS</b>	High-density, 2U rackable chassis supporting up to four half-width Intel® Compute Modules.	
<b>MODEL</b>	3.5" drive model	2.5" drive model
<b>INTEL® SERVER BOARD SUPPORT<sup>1</sup></b>	HNS2600KPR, HNS2600KPFR HNS2600TPR, HNS2600TPFR	
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>H2312XXKR2</b>	<b>H2216XXKR2</b>
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	12 x 3.5" Backplane: FHW12X35HS12G 1600 W PSU Spare: FXX1600PCRPS Bridge Board: FHWKPTPBGB Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spares: FXXCRPSPDB2	16 x 2.5" Backplane: FHW16X25HS12G 1600 W PSU Spare: FXX1600PCRPS Bridge Board: FHWKPTPBGB Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spares: FXXCRPSPDB2
<b>FORM FACTOR</b>	2U Rack	
<b>DRIVE BAYS</b>	Up to twelve 2.5" or 3.5" hot-swap SAS / SATA drives	Up to sixteen 2.5" hot-swap SAS / SATA drives
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	FXX35HSCAR	FXX25HSCAR
<b>NVMe*</b>	N/A	
<b>SYSTEM COOLING</b>	3 x 40mm x 56mm dual rotor fans per module	
<b>POWER SUPPLIES</b>	(2) Common Redundant 1600 W (Platinum Efficiency)	
<b>I/O SLOTS</b>	Up to 2	
<b>BACKPLANE</b>	Included	
<b>TOOL-LESS FEATURES</b>	PSU, Compute module, HDD bays are all hot-swap	
<b>DIMENSIONS (H x W x D)</b>	3.42" x 17.24" x 30.35" (87mm x 438mm x 771mm)	3.42" x 17.24" x 28.86" (87mm x 438mm x 771mm)
<b>BEZEL FEATURES</b>	Black, independent front panel controls for each individual module	
<b>FRONT CONNECTORS</b>	N/A	
<b>SYSTEM SECURITY</b>	Protection for chassis drives with a lock to the chassis	

# INTEL® SERVER CHASSIS H2000G FAMILY FOR THE INTEL® XEON PHI™ PROCESSOR



## INTEL® SERVER CHASSIS H2000G FAMILY<sup>3</sup>

<b>CHASSIS</b>	High-density, 2U rackable chassis supporting up to four half-width Intel® Compute Modules.	
<b>MODEL</b>	3.5" drive model	2.5" drive model
<b>INTEL® SERVER BOARD SUPPORT<sup>1</sup></b>	HNS7200AP; HNS7200APL; HNS2600KPR, HNS2600KPRF; HNS2600TPR, HNS2600TPFR	
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>H2312XXLR2</b>	<b>H2216XXLR2</b>
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	12 x 3.5" Backplane: FHW12X35HS12G 2130 W PSU Spare: FXX2130PCRPS Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spare: FXXCRPSPDB2 Passive Heat-Sink: AXXAPHS Intel® Omni-Path Port Upgrade Kit (2 Port): AXX2PFABKIT 1U Spare PCIe Riser (Slot 2): FHW1U20APRISER 1U PCI Express x16 riser card for Slot 1: FHW1U16APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x4 riser card for Slot 2: FHW1U4APRISER Bridge Board Spare: FHWAPBGB	16 x 2.5" Backplane: FHW16X25HS12G 2130 W PSU Spare: FXX2130PCRPS Control Panel Spare: FH2000FPANEL2 Node Power Board: FH2000NPB2 Power Distribution Board Spare: FXXCRPSPDB2 Passive Heat-Sink: AXXAPHS Intel® Omni-Path Port Upgrade Kit (2 Port): AXX2PFABKIT 1U Spare PCIe Riser (Slot 2): FHW1U20APRISER 1U PCI Express x16 riser card for Slot 1: FHW1U16APRISER 1U PCI Express x16 riser card for Slot 2: FHW1U20APRISER 1U PCI Express x4 riser card for Slot 2: FHW1U4APRISER Bridge Board Spare: FHWAPBGB
<b>FORM FACTOR</b>	2U Rack	
<b>DRIVE BAYS</b>	Up to twelve 2.5" or 3.5" hot-swap SAS / SATA drives	Up to sixteen 2.5" hot-swap SAS / SATA drives
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	FXX35HSCAR	FXX25HSCAR
<b>NVMe*</b>	N/A	
<b>SYSTEM COOLING</b>	3 x 40mm x 56mm dual rotor fans per module	
<b>POWER SUPPLIES</b>	(2) Common Redundant 2130 W (Platinum Efficiency)	
<b>I/O SLOTS</b>	Up to 2	
<b>BACKPLANE</b>	Included	
<b>TOOL-LESS FEATURES</b>	PSU, Compute module, HDD bays are all hot-swap	
<b>DIMENSIONS (H x W x D)</b>	3.42" x 17.24" x 30.35" (87mm x 438mm x 771mm)	3.42" x 17.24" x 28.86" (87mm x 438mm x 771mm)
<b>BEZEL FEATURES</b>	Black, independent front panel controls for each individual module	
<b>FRONT CONNECTORS</b>	N/A	
<b>SYSTEM SECURITY</b>	Protection for chassis drives with a lock to the chassis	

# INTEL® SERVER CHASSIS R1000WF AND INTEL® SERVER CHASSIS R1000WT FAMILIES



The Intel® Server Chassis R1000WF and Intel® Server Chassis R1000WT families support the Intel® Server Board S2600WF family and Intel® Server Board S2600WT family, respectively. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers.



## INTEL® SERVER CHASSIS R1000WF FAMILY

## INTEL® SERVER CHASSIS R1000WT FAMILY

<b>CHASSIS</b>	Flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments supporting custom form factor server boards.	
<b>MODEL</b>	Hot-swap drive models	
<b>INTEL® SERVER BOARD SUPPORT<sup>1</sup></b>	S2600WFT, S2600WFO, S2600WFQ <sup>†</sup>	S2600WT2R, S2600WTTR
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>R1304WFXXX</b>	<b>R1208WTXXX</b> <b>R1304WTXXX</b>
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	1U riser for PCI Express* 3.0 x16 FHHL: F1UL16RISER3 SAS cables depend on usage model, reference Configuration Guide	
<b>FORM FACTOR</b>	1U Rack	
<b>DRIVE BAYS</b>	<b>R1304WTXXX:</b> Up to four 2.5" or 3.5" hot-swap SAS / SATA drives <b>Optional:</b> Fixed-mount SSD in optical drive bay (requires AXXSSDODDKIT accessory)	<b>R1208WTXXX:</b> Up to eight 2.5" hot-swap SAS / SATA drives, up to 4 PCI Express SSD with optional accessory (A1U44X25NVMEDK) <b>R1304WTXXX:</b> Up to four 2.5" or 3.5" hot-swap SAS / SATA drives <b>Optional:</b> Fixed-mount SSD in optical drive bay (requires AXXSSDODDKIT accessory)
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	Included	
<b>SYSTEM COOLING</b>	6 x 40mm internal redundant chassis fans	
<b>POWER SUPPLIES</b>	(2) Common Redundant 1100 W AC (Platinum Efficiency) (2) Common Redundant 750 W DC -48V (Gold Efficiency) NOTE: Power supply sold separately	
<b>I/O SLOTS</b>	Up to 2 PCI Express 3.0 x8 (HLFH) with purchase of risers F1UL16RISER2, Intel® I/O Expansion module, SAS module	
<b>BACKPLANE</b>	Included	
<b>TOOL-LESS FEATURES</b>	Front bezel, PCI card retainer, peripheral bays, PSU installation, and fixed drive carriers	
<b>DIMENSIONS (H x W x D)</b>	Rack: 17.25" x 1.72" x 28" (438mm x 44mm x 711mm)	
<b>BEZEL FEATURES</b>	Black, control panel, two USB ports	
<b>FRONT CONNECTORS</b>	2 x USB	
<b>SYSTEM SECURITY</b>	Locking bezel and chassis intrusion	

<sup>†</sup>Q SKU launches Q4'17

For more information, visit [www.intel.com/products/server/chassis](http://www.intel.com/products/server/chassis) or [ark.intel.com](http://ark.intel.com)



# INTEL® SERVER CHASSIS R2000WF AND INTEL® SERVER CHASSIS R2000WT FAMILIES



The Intel® Server Chassis R2000WF and Intel® Server Chassis R2000WT families support the Intel® Server Board S2600WF family and Intel® Server Board S2600WT family, respectively. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers.



## INTEL® SERVER CHASSIS R2000WF FAMILY

## INTEL® SERVER CHASSIS R2000WT FAMILY

<b>CHASSIS</b>	Flexible and highly serviceable 1U and 2U rack chassis targeted for cloud and datacenter environments supporting custom form factor server boards.	
<b>MODEL</b>	Hot-swap drive models	
<b>INTEL® SERVER BOARD SUPPORT<sup>1</sup></b>	S2600WFT, S2600WFO	S2600WT2R, S2600WTTR
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>R2000WFXXX</b>	<b>R2000WTXXX; R2312WTXXX</b>
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	Accessory 2U Hot-swap Drive Cage Upgrade Kit with 4x NVMe SSD support: A2U44X25NVMEDK 2U 3 slot riser for PCI Express* 3.0 x8: A2UL8RISER2 2U short riser PCI Express 3.0 x8, PCI Express x4: A2UX8X4RISER Accessory 2U 2 slot riser for PCI Express 3.0 x16: A2UL16RISER2 Rear 2-drive cage accessory: A2UREARHSDK SAS cables depend on usage model, reference Configuration Guide, See Configuration Guide for detailed list of Spares and Accessories	
<b>FORM FACTOR</b>	2U Rack	
<b>DRIVE BAYS</b>	<b>R2000FTXXX:</b> Requires accessory bays to support hot-swap drives, support for 2.5" SSDs, optional 2 x 2.5" rear hot-swap drives available with accessory (A2UREARHSDK) <b>Optional:</b> 4 x 2.5" NVM Express* (PCI Express SSDs) available with accessory (A2U44X25NVMEDK)	<b>R2312WTXXX:</b> Up to 12 x 3.5" hot-swap SAS / SATA drives, support for 2.5" SSDs, optional 2 x 2.5" rear hot-swap drives available with accessory (A2UREARHSDK) <b>R2000WTXXX:</b> Requires accessory bays to support hot-swap drives, support for 2.5" SSDs, optional 2 x 2.5" rear hot-swap drives available with accessory (A2UREARHSDK)
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	A2U8X35S3PHSDK1: 8 x 2.5" drives (Single port) A2U8X35S3PHSDK1(x3): Storage rack handle A2UHANDLKIT2 for 24 x 2.5" drives (Single port) A2U8X25S3DPDK2: Dual port drive cage kit supports dual port SAS drives up to 24 drives	A2U8X25S3HSDK: 8 x 2.5" drives (Single port) A2U8X25S3HSDK (x3), Storage rack handle A2UHANDLKIT for 24 x 2.5" drives (Single port) A2U8X35S3HSDK: 8 x 3.5" drives A2U44X25NVMEDK: Upgrade kit supporting up to 4 x 2.5" NVMe* drives, optional 8 x 2.5" HDD backplane A2U8X25S3DPDK: Dual port drive cage kit supports dual port SAS drives up to 24 drives
<b>SYSTEM COOLING</b>	See Configuration Guide for detailed list of cables needed 6 x 80mm internal redundant and hot-swap chassis fans	
<b>POWER SUPPLIES</b>	(2) Common Redundant 1300 W AC (Titanium Efficiency)	(2) Common Redundant 750 W AC (Platinum Efficiency)
<b>I/O SLOTS</b>	(2) Common Redundant 750 W DC -48V (Gold Efficiency); (2) Common Redundant 1100 W AC (Platinum Efficiency); NOTE: Power supply sold separately Up to 8 x PCI Express 3.0 with purchase of risers: 2 x A2UL8RISER2 and 1 x A2UX8X4RISER	
<b>BACKPLANE</b>	R2000WFXXX: See 'Drive Bays'	R2312WTXXX: Included; R2000WTXXX: See 'Drive Bays'
<b>TOOL-LESS FEATURES</b>	Front bezel, top cover, PCI card retainer, fans, hot-swap drive carriers, hot-swap drive bays, peripheral bays, and PSU installation	
<b>DIMENSIONS (H x W x D)</b>	Rack: 17.25" x 3.44" x 28" (438mm x 87mm x 711mm)	
<b>BEZEL FEATURES</b>	Black, control panel, security lock, two USB ports	
<b>FRONT CONNECTORS</b>	2 x USB	
<b>SYSTEM SECURITY</b>	Locking bezel and chassis intrusion	

# INTEL® SERVER CHASSIS P4000M FAMILY FOR THE INTEL® XEON® SCALABLE PROCESSOR AND INTEL® XEON® PROCESSOR E5-V4



Intel® Server Chassis P4000 series requires the separate purchase of a thermal solution kit and air duct specific to the Intel® Server Board selected. See the Accessories and Spares section of the chosen Intel Server Board configuration guide for recommended part numbers. Other boxed Intel® Thermal Solutions are mechanically compatible with the processor socket but are not thermally validated in Intel Server Chassis.



## INTEL® SERVER CHASSIS P4000 FAMILY

<b>CHASSIS</b>	A sleek and flexible mid-length tower chassis targeted at small- to medium-sized businesses supporting custom form factor server boards.	
<b>MODEL</b>	Fixed drive models (upgradeable to hot-swap drive support)	
<b>INTEL® SERVER BOARD SUPPORT<sup>1</sup></b>	S2600STB, S2600STS, S2600CW2R, S2600CWTR, S2600CW2SR, S2600CWTSR	
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>P4304XXMFEN2, P4304XXMUXX</b>	
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	120mm Fixed Fan PCI area: FUPMNHFANPCI 120mm Fixed Fan for CPU area: FUPNHFANCPU 1600 W Common Redundant Power Supply: FXX1600PCRPS Accessory kit enables support for 2.5" FF PCI Express* 3.0 SSDs (NVMe): FUP8X25S3NVDK Bezel Spare for P4000 Chassis Supporting Fixed HDD: FUPCRPSCAGE Bracket and Extension Kit for P4000M Chassis Family: AUPMCOPROBR Front bezel with door: FUPBEZELHSD2	High Current P4000 Family Chassis Power Distribution Board Spare: FUPPDBHC2 hot-swap Drive Cage: FXX25SHCAR Redundant Power Supply Cage for Intel® Server Chassis P4000 Family: FUPCRPSCAGE SRC-B tower passive heat sink 92mm x 100mm: AUPCWPBTP Spare 3.5" Fixed HDD Carriers: FUP4X35NHDK Spare hot-swap Fan Kit for Intel® Server Chassis P4000M: FUPMLHSFAN
<b>FORM FACTOR</b>	4U Tower (rackable)	
<b>DRIVE BAYS</b>	Up to 4 x 3.5" fixed drives, optional 4 or 8 x 3.5" or 8 or 16 x 2.5" hot-swap drive bay (2.5" configurations also support up to 4x PCIe 3.0 SSD's)	
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	Upgrade: Convert up to 8 SAS / SATA hot-swap drive bays using the upgrade kit: (FUP8X25HSDK) Upgrade: Convert up to 8 hot-swap PCI Express* drive cages to support 2.5" FF PCIe SSDs (NVMe*): FUP8X25S3NVDK	
<b>SYSTEM COOLING</b>	P4304XXMFEN2: 2 x 120mm Internal fixed chassis fans; P4304XXMUXX : 5 x 80mm Redundant hot-swap internal chassis fans	
<b>POWER SUPPLIES</b>	P4308XXMFEN2: (1) Fixed Non-redundant 550 W (Silver Efficiency); P4304XXMUXX: (2) Common Redundant 750 W (Platinum Efficiency) or (2) Common Redundant 1600 W (Platinum Efficiency) sold separately	
<b>I/O SLOTS</b>	Up to 6	
<b>BACKPLANE</b>	None included	
<b>TOOL-LESS FEATURES</b>	Front bezel, EMI cover, side cover, PCI card retainer, peripheral bays, PSU installation, and fixed drive carriers	
<b>DIMENSIONS (H x W x D)</b>	Tower: 17.24" x 6.81" x 24.9" (438mm x 173mm x 632mm)	
<b>BEZEL FEATURES</b>	Black, control panel, two USB ports	
<b>FRONT CONNECTORS</b>	2 x USB	
<b>SYSTEM SECURITY</b>	Locking bezel and chassis intrusion	



### INTEL® SERVER CHASSIS P4000S FAMILY

<b>CHASSIS</b>	A general purpose 4U tower chassis supporting the Intel® Server Board S1200SP family with up to four 3.5" fixed drives, two 460W common redundant power supplies optimized for thermal and acoustic performance.	A general purpose tower chassis optimized for thermal and acoustic performance.	
<b>MODEL</b>	4 x 3.5" Fixed drives	Fixed drive models	Hot-swap drive models
<b>INTEL® SERVER BOARD SUPPORT<sup>1</sup></b>	S1200SPLR, S1200SPSR		
<b>CHASSIS ORDER CODE<sup>1</sup></b>	<b>P4000XXSFDR</b>	<b>P4304XXSFCN</b>	<b>P4304XXSHCN</b>
<b>SPARES KIT ORDER CODE<sup>2</sup></b>	Front Panel board: FXXFPANELR Power Distribution Board: AP4000E3V5PDB 4 x 3.5" 6Gb/s hard drive hot-swap backplane: FUP4X35HSBP 8 x 3.5" 6Gb/s hard drive hot-swap backplane: FUP8X35HSBP 4 x 3.5" 12Gb/s hard drive hot-swap backplane: FUP4X35S3HSBP 460W Cold redundant power supply: FXX460GCRPS	Mechanical Spares Kit: FUPSMSK Electrical Spares Kit: FUPSESK Air ducts sold separately based on board purchased	
<b>FORM FACTOR</b>	4U Tower		
<b>DRIVE BAYS</b>	Up to four 3.5" fixed drives	Up to four 3.5" fixed SAS / SATA drives	Up to four 3.5" hot-swap SAS / SATA drives
<b>HOT-SWAP DISK DRIVE BAY (ORDER CODE)</b>	Hot-swap 6Gbps SATA drives: FUP4X35HSDK Hot-swap 6Gbps SATA drives: FUP8X35HSDK Hot-swap 12Gbps SAS drives: FUP4X35S3HSDK Hot-swap 12Gbps SAS drives: 2x FUP4X35S3HSDK	Upgrade: convert to four slot hot-swap drive bays using the following Drive Bay upgrade kit: (FUP4X35HSDK), supports four SAS / SATA hot-swap drives	Share the same hot-swap drive bay kit (FUP4X35HSDK), use as a spare
<b>SYSTEM COOLING</b>	(2) 92mm fixed fans (one PCIe* zone and one rear system fan)	2 x 92mm internal chassis fan (single fan in P4304XXSFCN)	2 x 92mm internal chassis fan (single fan in P4304XXSHCN)
<b>POWER SUPPLIES</b>	(2) Common Redundant 460 W (Gold Efficiency)	P4304XXSFCN: (1) Fixed 365 W (Silver Efficiency)	P4304XXSHCN: (1) Fixed 365 W (Silver Efficiency) P4304XXSHDR: (2) Common Redundant 460 W (Gold Efficiency)
<b>I/O SLOTS</b>	Up to 3	Up to 6	
<b>BACKPLANE</b>	None included		
<b>TOOL-LESS FEATURES</b>	Front bezel, EMI cover, PCI card retainer, peripheral bays, power supply unit installation, and fixed drive carriers	Front bezel, EMI cover, side cover, PCI card retainer, peripheral bays, PSU installation, and fixed drive carriers	Front bezel, side cover, PCI card retainer, hot-swap drive carriers, hot-swap drive bay, peripheral bays, and PSU installation
<b>DIMENSIONS (H x W x D)</b>	Tower: 17.24" x 6.81" x 22.05" (438mm x 173mm x 560mm)	Tower: 17.24" x 6.81" x 21.5" (438mm x 173mm x 546mm)	
<b>BEZEL FEATURES</b>	Black, control panel, three 5.25" peripheral drive bays, four internal drive bays	Black, control panel, three 5.25" peripheral drive bays, four internal drive bays, two USB ports	Black, control panel, three 5.25" peripheral drive bays, four hot-swap drive bays and carriers (behind door), security lock, two USB ports
<b>FRONT CONNECTORS</b>	Two USB 3.0 ports	2 x USB	
<b>SYSTEM SECURITY</b>	Protection for chassis drives with a lock to the chassis	Side cover: A padlock loop slot available at the rear of the system access cover to prevent access to the processors, memory, and add-in devices Side cover: Intrusion switch Back panel: Kensington* cable lock mounting hole	Front door: Security lock (available on hot-swap drive SKUs only) Side cover: A padlock loop slot available at the rear of the system access cover to prevent access to the processors, memory, and add-in devices Side cover: Intrusion switch Back panel: Kensington* cable lock mounting hole

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools. Visit [servermarketinglibrary.intel.com](https://servermarketinglibrary.intel.com)

For more information, visit [www.intel.com/products/server/chassis](https://www.intel.com/products/server/chassis) or [ark.intel.com](https://ark.intel.com)

<sup>1</sup> Refer to <http://support.intel.com/support/motherboards/server> for up-to-date details on server boards supported by each chassis.

<sup>2</sup> For complete spare and accessory list, please download the latest configuration guide from Spare Parts list and Configuration Guide at <http://support.intel.com/support/motherboards/server>

<sup>3</sup> Intel® Server Chassis H2000 series requires the separate purchase of Intel® Compute Modules. See the Accessories and Spare Parts section of the chosen Intel® Server Board configuration guide for recommended part numbers.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](https://www.intel.com/benchmarks)

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/products/server/chassis](https://www.intel.com/products/server/chassis) or [ark.intel.com](https://ark.intel.com).

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation



# INTEL<sup>®</sup> RAID

**EXCEPTIONAL  
DATA PROTECTION.  
FASTER  
PERFORMANCE.  
EASE OF USE.**

## **INTEL<sup>®</sup> TRI-MODE GENERATION RAID PRODUCTS**

The Intel<sup>®</sup> Tri-Mode RAID controllers, featuring LSI\* SAS3500/SAS3400 series RAID-on-Chip (ROC) processors, offer significant performance enhancements for solutions architected with SAS, SATA, and PCIe\* 3.0 NVMe\* drives.

## **INTEL<sup>®</sup> RAID EXPANDER BOARDS**

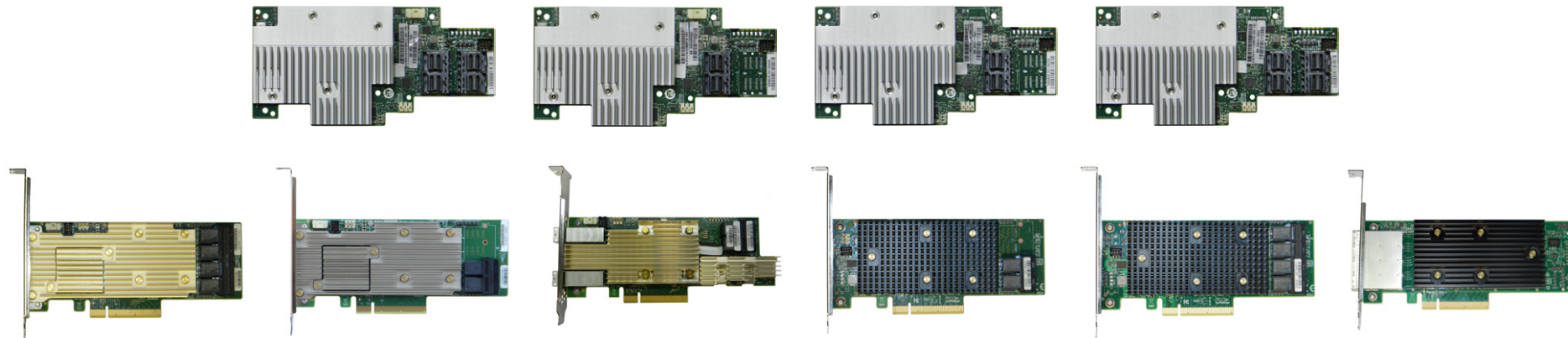
For high drive count solutions, Intel offers 12Gb/s SAS expander boards (available in midplane and add-in card form factors) and PCIe 3.0 switches and retimers.

## **INTEL<sup>®</sup> RAID PREMIUM FEATURES**

Get more performance and data protection with Premium Features for Intel<sup>®</sup> RAID solutions. When combined with Intel<sup>®</sup> RAID controllers, you can further enhance storage applications and deliver higher ROI for your server boards and systems.

## Tailor a Solution to Match Your Storage Needs

Intel offers multiple categories of RAID products to protect data, increase performance, scale storage, and enhance server availability. A brief description of each category is listed below.



### Controller Cards and Modules

- Intel® RAID Modules are designed for select 2U Intel® Xeon® Processor-based server solutions, affording up to 16 ports of PCIe\*/SAS/SATA connectivity without taking up a standard add-in card PCIe\* slot, for a highly integrated configuration.
- Intel® RAID Adapters come in a low-profile MD2 standard PCIe\* form-factor, and are PCIe\* compliant for flexibility of configuration and use in any system by any vendor.

### RAID Cache Backup

- Maintenance Free Backup Units (MFBUs) are available for Full-Featured RAID products with embedded cache. The backup options are listed in the “Backup Option” row of the product tables.

### Expander Boards

- Intel® RAID Expander Cards are intended for any system with more than 8 drives. As an example of use, 8 RAID ports can be expanded to 24 ports.

### Premium Feature Keys

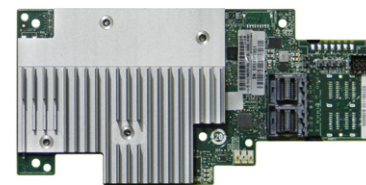
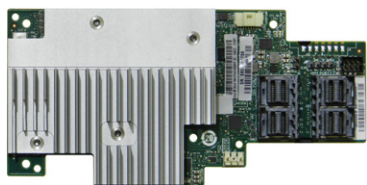
- Several upgrade features can be added to enhance the performance and data protection of Intel’s intelligent RAID cards and modules.

### Cable Kits and Converter Boards

- Newer-generation RAID products do not ship with cables, as multiple options exist depending on the system in which the RAID products are installed. Therefore, Intel offers a variety of cables. A converter board that allows for two internal 8087 connectors to be converted to two external 8088 connectors is also available.

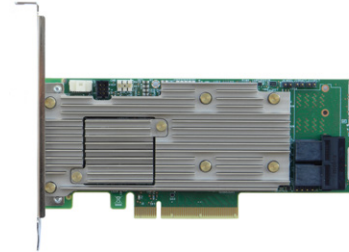
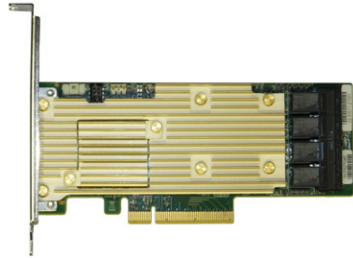
For the latest product SKUs and specifications, visit <http://ark.intel.com>

## Intel® Integrated RAID Modules (Tri-Mode)



CONTROLLER	INTEL® INTEGRATED RAID MODULE RMSP3AD160F	INTEL® INTEGRATED RAID MODULE RMSP3CD080F	INTEL® INTEGRATED RAID MODULE RMSP3HD080E	INTEL® INTEGRATED RAID MODULE RMSP3JD160J
<b>DESCRIPTION</b>	Tri-Mode SAS/SATA/PCIe* full-featured RAID mezzanine module with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe full-featured RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe JBOD mezzanine module with 16 internal ports using four Mini-SAS-HD connectors
<b>MARKET SEGMENT</b>	Full-featured RAID	Full-featured RAID	Entry-level RAID	JBOD
<b>ORDER CODE</b>	<b>RMSP3AD160F</b>	<b>RMSP3CD080F</b>	<b>RMSP3HD080E</b>	<b>RMSP3JD160J</b>
<b>PROCESSOR</b>	<b>LSI 3516</b>	<b>LSI 3508</b>	<b>LSI 3408</b>	<b>LSI 3416</b>
<b>ONBOARD CACHE MEMORY</b>	4GB DDR4	4GB DDR4	N/A	N/A
<b>PCI E* INTERFACE</b>	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
<b>PORTS</b>	16 Internal ports	8 Internal ports	8 Internal ports	16 Internal ports
<b>CHASSIS COMPATIBILITY</b>	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
<b>RAID LEVELS</b>	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode	JBOD mode only
<b>CACHE BACKUP OPTIONS</b>	AXXRMFBU7	AXXRMFBU7	N/A	N/A
<b>CABLES</b>	Purchased separately	Purchased separately	Purchased separately	Purchased separately
<b>INTEL® SERVER BOARD SUPPORT</b>	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
<b>AVAILABILITY</b>	Q2 2017	Q2 2017	Q2 2017	Q2 2017
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel® RAID Controllers (Tri-Mode) - Full-Featured



**CONTROLLER** INTEL® INTEGRATED RAID MODULE RMSP3AD160F

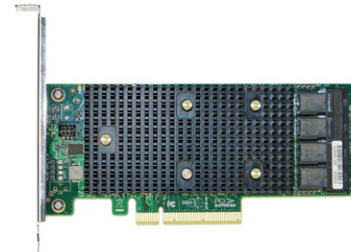
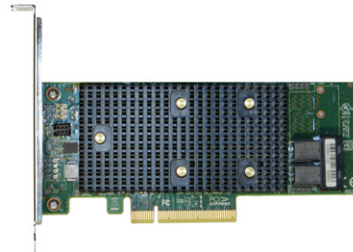
**INTEL® INTEGRATED RAID MODULE RMSP3CD080F**

**INTEL® INTEGRATED RAID MODULE RMSP3HD080E**

<b>DESCRIPTION</b>	Tri-Mode SAS/SATA/PCIe* full-featured RAID mezzanine module with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe full-featured RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level RAID mezzanine module with eight internal ports using two Mini-SAS-HD connectors
<b>MARKET SEGMENT</b>	Full-featured RAID	Full-featured RAID	Entry-level RAID
<b>ORDER CODE</b>	<b>RMSP3AD160F</b>	<b>RMSP3CD080F</b>	<b>RMSP3HD080E</b>
<b>PROCESSOR</b>	<b>LSI 3516</b>	<b>LSI 3508</b>	<b>LSI 3408</b>
<b>ONBOARD CACHE MEMORY</b>	4GB DDR4	4GB DDR4	N/A
<b>PCI E* INTERFACE</b>	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
<b>PORTS</b>	16 Internal ports	8 Internal ports	8 Internal ports
<b>CHASSIS COMPATIBILITY</b>	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
<b>RAID LEVELS</b>	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode
<b>CACHE BACKUP OPTIONS</b>	AXXRMFBU7	AXXRMFBU7	N/A
<b>CABLES</b>	Purchased separately	Purchased separately	Purchased separately
<b>INTEL® SERVER BOARD SUPPORT</b>	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
<b>AVAILABILITY</b>	Q2 2017	Q2 2017	Q2 2017
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty	3 year limited warranty



## Intel® RAID Controllers (Tri-Mode) - Entry-Level and JBOD



**CONTROLLER** INTEL® RAID CONTROLLER RSP3WD080E

**INTEL® INTEGRATED RAID MODULE** RSP3QD160J

**INTEL® INTEGRATED RAID MODULE** RSP3GD016J

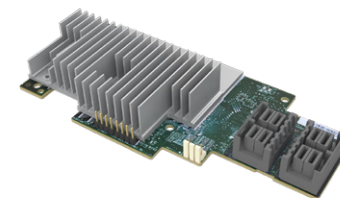
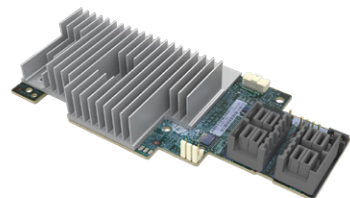
	INTEL® RAID CONTROLLER RSP3WD080E	INTEL® INTEGRATED RAID MODULE RSP3QD160J	INTEL® INTEGRATED RAID MODULE RSP3GD016J
<b>DESCRIPTION</b>	Tri-Mode SAS/SATA/PCIe* entry-level RAID adapter with eight internal ports using two Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level JBOD adapter with 16 internal ports using four Mini-SAS-HD connectors	Tri-Mode SAS/SATA/PCIe entry-level JBOD adapter with 16 external ports using four external Mini-SAS-HD connectors
<b>MARKET SEGMENT</b>	Entry-level RAID	JBOD	JBOD
<b>ORDER CODE</b>	<b>RSP3WD080E</b>	<b>RSP3QD160J</b>	<b>RSP3GD016J</b>
<b>PROCESSOR</b>	<b>LSI* 3408</b>	<b>LSI 3416</b>	<b>LSI 3416</b>
<b>ONBOARD CACHE MEMORY</b>	N/A	N/A	N/A
<b>PCI E* INTERFACE</b>	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
<b>PORTS</b>	8 Internal ports	16 Internal ports	8 External ports
<b>CHASSIS COMPATIBILITY</b>	MD2 compliant PCIe x8	MD2 compliant PCIe x8	MD2 compliant PCIe x8
<b>RAID LEVELS</b>	0, 1, 10, 5, 50 and JBOD mode	JBOD only mode	JBOD only mode
<b>CACHE BACKUP OPTIONS</b>	N/A	N/A	N/A
<b>CABLES</b>	Purchased separately	Purchased separately	Purchased separately
<b>INTEL® SERVER BOARD SUPPORT</b>	Intel® Server boards + third party boards	Intel® Server boards + third party boards	Intel® Server boards + third party boards
<b>AVAILABILITY</b>	Q2 2017	Q2 2017	Q2 2017
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel® Integrated RAID Modules (12Gb/s SAS 3.0)



CONTROLLER	INTEL® INTEGRATED RAID MODULE RMS3CC080	INTEL® INTEGRATED RAID MODULE RMS3CC040	INTEL® INTEGRATED RAID MODULE RMS3HC080	INTEL® INTEGRATED RAID MODULE RMS3JC080
<b>DESCRIPTION</b>	12 Gb/s SAS/SATA full-featured RAID mezzanine module with eight internal connectors and a storage I/O connector	12 Gb/s SAS/SATA full-featured RAID mezzanine module with four internal connectors and a storage I/O connector	12 Gb/s SAS/SATA entry-level RAID mezzanine module with eight internal ports and a storage I/O connector	12 Gb/s SAS/SATA entry-level RAID mezzanine module with eight internal ports and a storage I/O connector
<b>MARKET SEGMENT</b>	Full-featured RAID	Full-featured RAID	Entry-level RAID	Entry-level RAID
<b>ORDER CODE</b>	<b>RMS3CC080</b>	<b>RMS3CC040</b>	<b>RMS3HC080</b>	<b>RMS3JC080</b>
<b>PROCESSOR</b>	<b>LSI* 3108 ROC</b>	<b>LSI* 3108 ROC</b>	<b>LSI* 3008 IOC</b>	<b>LSI* 3008 IOC</b>
<b>ONBOARD CACHE MEMORY</b>	1 GB DDR3	1 GB DDR3	N/A	N/A
<b>PCI E* INTERFACE</b>	PCI Express* 3.0 x8	PCI Express* 3.0 x8	PCI Express* 3.0 x8	PCI Express* 3.0 x8
<b>PORTS</b>	8 Internal ports	4 Internal ports	8 Internal ports	8 Internal ports
<b>CHASSIS COMPATIBILITY</b>	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
<b>RAID LEVELS</b>	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50 and JBOD mode	0, 1, 1E, 10 and JBOD mode
<b>CACHE BACKUP OPTIONS</b>	AXXRMFBU5	AXXRMFBU5	N/A	N/A
<b>CABLES</b>	Purchased separately	Purchased separately	Purchased separately	Purchased separately
<b>INTEL® SERVER BOARD SUPPORT</b>	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel® Integrated RAID Modules (12Gb/s SAS 3.0) - High Port Count



	<b>INTEL® INTEGRATED RAID MODULE RMS3AC160</b>	<b>INTEL® INTEGRATED RAID MODULE RMS3VC160</b>
<b>CONTROLLER</b>	<b>INTEL® INTEGRATED RAID MODULE RMS3AC160</b>	<b>INTEL® INTEGRATED RAID MODULE RMS3VC160</b>
<b>DESCRIPTION</b>	A 12 Gb/s SAS/SATA full-featured RAID mezzanine module with 16 internal ports and dual core RAID-On-Chip (ROC)	A 12 Gb/s SAS/SATA JBOD mezzanine module with sixteen internal ports and dual core RAID-On-Chip (ROC)
<b>MARKET SEGMENT</b>	Full-featured RAID	Full-featured RAID
<b>ORDER CODE</b>	<b>RMS3AC160</b>	<b>RMS3VC160</b>
<b>PROCESSOR</b>	<b>LSI* 3316 ROC</b>	<b>LSI* 3216 ROC</b>
<b>ONBOARD CACHE MEMORY</b>	2 GB DDR3	NA
<b>PCI E* INTERFACE</b>	PCI Express 3.0 x8	PCI Express 3.0 x8
<b>PORTS</b>	16 internal ports	16 internal ports
<b>CHASSIS COMPATIBILITY</b>	Mezzanine-capable motherboard in 2U (or greater) chassis	Mezzanine-capable motherboard in 1U (or greater) chassis
<b>RAID LEVELS</b>	0, 1, 10, 5, 50, 6, 60	N/A (JBOD mode only)
<b>CACHE BACKUP OPTIONS</b>	AXXRMFBU6	NA
<b>CABLES</b>	Purchased separately	Purchased separately
<b>INTEL® SERVER BOARD SUPPORT</b>	Select Intel® Xeon® server boards with a storage I/O module connector	Select Intel® Xeon® server boards with a storage I/O module connector
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty

## Intel® RAID Controllers (12Gb/s SAS 3.0) - Full-Featured



CONTROLLER	INTEL® RAID CONTROLLER RS3DC080	INTEL® RAID CONTROLLER RS3DC040	INTEL® RAID CONTROLLER RS3SC008
DESCRIPTION	A 12 Gb/s SAS/SATA full-featured RAID adapter (PCIe* AIC) with 8 internal ports	A 12 Gb/s SAS/SATA full-featured RAID adapter (PCIe* AIC) with 4 internal ports	A 12 Gb/s SAS/SATA full-featured RAID adapter (PCIe AIC) with 8 external ports
MARKET SEGMENT	Full-featured RAID	Full-featured RAID	Full-featured RAID
ORDER CODE	RS3DC080	RS3DC040	RS3SC008
PROCESSOR	LSI* SAS3108 ROC	LSI* SAS3108 ROC	LSI* SAS3108 ROC
ONBOARD CACHE MEMORY	1GB DDR3	1GB DDR3	1GB DDR3
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	4 Internal ports	8 External ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60	0, 1, 10, 5, 50, 6, 60
CACHE BACKUP OPTIONS	AXXRMFBU4	AXXRMFBU4	AXXRMFBU4
CABLES	Purchased separately	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty	3 year limited warranty

## Intel® RAID Controllers (12Gb/s SAS 3.0) – Entry Level



CONTROLLER	INTEL® RAID CONTROLLER RS3WC080	INTEL® RAID CONTROLLER RS3UC080
DESCRIPTION	A 12 Gb/s SAS/SATA entry-level RAID adapter (PCIe AIC) with 8 internal ports	A 12 Gb/s SAS/SATA entry-level RAID Adapter (PCIe AIC) with 8 internal ports
MARKET SEGMENT	Entry-level	Entry-level
ORDER CODE	RS3WC080	RS3UC080
PROCESSOR	LSI* SAS3008 IOC	LSI* SAS3008 IOC
ONBOARD CACHE MEMORY	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8
PORTS	8 Internal ports	8 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	0, 1, 10, 5, 50 and JBOD mode	0, 1, 1E, 10 and JBOD mode
CACHE BACKUP OPTIONS	N/A	N/A
CABLES	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty

## Intel® Storage Controllers (12Gb/s SAS 3.0) - JBOD Only



CONTROLLER	INTEL® RAID CONTROLLER RS3GC008	INTEL® RAID CONTROLLER RS3UC080J
DESCRIPTION	A 12 Gb/s SAS/SATA JBOD Adapter (PCIe AIC) with 8 external ports	A 12 Gb/s SAS/SATA JBOD Adapter (PCIe AIC) with 8 internal ports
MARKET SEGMENT	JBOD	JBOD
ORDER CODE	RS3GC008	RS3UC080J
PROCESSOR	LSI* SAS3008	LSI* SAS3008
ONBOARD CACHE MEMORY	N/A	N/A
PCI E* INTERFACE	PCI Express* 3.0 x8	PCI Express 3.0 x8
PORTS	8 External ports	8 Internal ports
CHASSIS COMPATIBILITY	MD2 compliant PCIe x8	MD2 compliant PCIe x8
RAID LEVELS	JBOD mode (SAS Connectivity)	JBOD mode (SAS Connectivity)
CACHE BACKUP OPTIONS	N/A	N/A
CABLES	Purchased separately	Purchased separately
WARRANTY	3 year limited warranty	3 year limited warranty

## Intel® VROC – Virtual RAID on CPU

Intel® VROC is available on Intel® Server Board S2600WF, S2600BP, and S2600ST family boards. It enables RAID levels 0, 1, 10 (Standard) and 5 (Premium) with no RAID write hole. Intel® VROC boasts high IOPS and low latency.



ACTIVATION KEY	PRODUCT NAME	SKU STORAGE FUNCTIONALITY
<b>VROCSTANMOD</b>	Intel® Virtual RAID on CPU (Standard)	Activation key to support 3rd party NVMe SSDs and enable RAID (0, 1, 10) functionality
<b>VROCPREMOD</b>	Intel® Virtual RAID on CPU (Premium)	Activation key to support 3rd party NVMe SSDs and enable Intel® VROC Premium, RAID 0,1,5,10 with RAID Write Hole Closure
<b>VROCISSDMOD</b>	Intel® Virtual RAID on CPU (Premium)	Activation key to support 3rd party NVMe SSDs and enable Intel® VROC Premium, RAID 0,1,5,10 with RAID Write Hole Closure (for use with Intel® SSD's only)

## Intel® RAID Expanders (12 Gb/s SAS 3.0)



EXPANDER BOARD	INTEL® RAID EXPANDER RES3FV288	INTEL® RAID EXPANDER RES3TV360
<b>DESCRIPTION</b>	12 Gb/s SAS/SATA expander adapter (PCIe AIC) with 28 internal ports and 8 external ports	12 Gb/s SAS/SATA Expander Midplane Board with 36-ports
<b>ORDER CODE</b>	<b>RES3FV288</b>	<b>RES3TV360</b>
<b>PCI E* INTERFACE</b>	PCIe x4 (for Power Only)	N/A
<b>PORTS</b>	28 Internal ports / 8 External ports	36 Internal ports
<b>CHASSIS COMPATIBILITY</b>	MD2 compliant PCIe* x4 or chassis mount	2U (or greater) system; requires chassis mount
<b>POWER OPTIONS FOR EXPANDERS</b>	PCIe x4 or 4-pin Molex	4-pin Molex
<b>MANAGEMENT</b>	SGPIO	SGPIO
<b>FAULT LED HEADERS</b>	Includes 2 pin headers to support each SAS port	Includes 2 pin headers to support each SAS port
<b>WARRANTY</b>	3 year limited warranty	3 year limited warranty



## Intel® RAID Premium Features

These features are available as an upgrade for all LSI\* SAS2208 and SAS3108 processor-based Intel® RAID products. To identify products with these processors, please refer to the Processor row of the preceding feature tables. The Premium Feature Keys are described below.

PREMIUM FEATURE	SSD CACHE 2 – 12G SAS only	DRIVE ENCRYPTION MANAGEMENT – 12G SAS and Tri-Mode
<b>Key Benefits</b>	SSD Cache allows Solid State Drives (SSD) to be utilized as additional cache for the RAID controller. Frequently accessed information is stored in the cache, allowing rapid access.	Drive encryption management enables authentication key management, auto-lock, and instant erase of self-encrypting drives (SED).
	SSD Cache capacity of up to 2 TB possible for SAS3108-based products.	All drives eventually leave the data center and the use of SEDs helps reduce risk of data breaches.
	SSD partitioning so that a portion of the drive is available to the operating system and the remainder for cache.	Instant-erase significantly reduces the cost and time of repurposing or retiring drives.
<b>Order Code</b>	AXXRPFKSSD2	AXXRPFKDE2

## Mounting Brackets

MOUNTING BRACKET	ORDER CODE	DESCRIPTION	INTERNAL CONNECTORS	EXTERNAL CONNECTORS
Intel® RAID Battery Remote Mounting Bracket	AXXBUBRKTP	A mounting bracket that fits in a low-profile PCI Express* slot and holds two RAID batteries or Maintenance Free Backup Units.	None	None



## Cable Kits and Converter Boards

The following cables are available for connecting Intel® RAID cards and modules to storage devices and drive bays. Intel® cables are designed to a high-quality specification and include the ability to bend at a very small radii. These cables allow low-profile Intel RAID products with vertical 8087 connectors to be used in 2U rack chassis while installed in a standard PCI Express\* slot. Intel offers many other cable kits that help optimize the integration of RAID products into specific Intel® Server Systems. For a list of these cables, refer to the Server Board and System Configuration Guide available on the support web site for each given Intel Server System.

CABLE KIT ORDER CODE	NUMBER OF CABLES INCLUDED IN KIT	INITIATOR CONNECTOR	TARGET CONNECTOR	LENGTH
AXXCBL650HDMS	2	HD mini-SAS straight <sup>1</sup>	8087 mini-SAS straight <sup>1</sup>	650mm
AXXCBL730HDMS	2	HD mini-SAS straight <sup>1</sup>	8087 mini-SAS straight <sup>1</sup>	730mm
AXXCBL750MS7P	2	8087 mini-SAS straight <sup>1</sup>	Four x 7-pin SATA style	750mm
AXXCBL650MSMS	2	8087 mini-SAS straight <sup>1</sup>	8087 mini-SAS straight <sup>1</sup>	650mm



<sup>1</sup> Cable is reversible so that either connector can be on the target or initiator side. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.

Visit [servermarketinglibrary.intel.com](http://servermarketinglibrary.intel.com)

For the latest product SKUs and specifications, visit <http://ark.intel.com>

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com](http://www.intel.com). Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.

© 2019 Intel Corporation.



**INTEL<sup>®</sup>  
ETHERNET.  
IT JUST  
WORKS.**

# **INTEL<sup>®</sup> ETHERNET SERVER ADAPTERS**

## **WHY INTEL<sup>®</sup> ETHERNET?**

Driving continuous innovation for more than 35 years, Intel<sup>®</sup> Ethernet products deliver a reliable out-of-the-box experience, and proven interoperability for your current and future networking infrastructure.

# INTEL® ETHERNET SERVER ADAPTERS

Intel® Ethernet. It Just Works.



## WHY INTEL® ETHERNET?

Driving continuous innovation for more than 35 years, Intel® Ethernet products deliver a reliable out-of-the-box experience, and proven interoperability for your current and future networking infrastructure.

### High Compatibility and Broad Interoperability

- Fully tested network adapters and accessories (optics and cables)
- Hardware and software is thoroughly validated across server and networking ecosystem
- Supports a broad selection of operating systems

### Ease of Use

- Works out of the box
- Automatic and highly optimized configuration setups
- Delivers the right traffic to the right VM with 128 perfect match filters

### Performance Assurance

- Optimized for Intel® architecture and broad OSV ecosystem
- Scales with CPU technology, leverages intelligent hardware offloads, network virtualization, and fast packet processing via Data Plane Development Kit (DPDK)

### Worldwide product support

- World-class pre- and post-sales support provide convenient accessibility to customers
- Adheres to global regulatory, environmental, and market requirements
- Long product lifecycle support

### Broad Product Selection and Accessories

- Supports all speeds (1/10/25/40GbE) and media types (BASE-T, Fiber, SFP+, QSFP+, SFP28, QSFP28, KR, XAUI, CAUI)
- Available in many different form factors: discrete controller, Intel® SoCs, and add-in cards (PCIe\*, OCP, and custom form factors)

# INTEL® ETHERNET 700 SERIES NETWORK ADAPTERS



Accelerate the delivery of new services and capabilities by increasing the speed and efficiency of your network infrastructure. The Intel® Ethernet 700 Series is the foundation for server connectivity, providing broad interoperability, critical performance optimizations, and increased agility for Telecommunications, Cloud, and the Data Center.

- **Interoperability** - Multiple speeds and media types for broad compatibility backed by extensive testing and validation.
- **Optimization** - Intelligent offloads and accelerators to unlock network performance in servers with Intel® Xeon® processors.
- **Agility** - Both kernel and Data Plane Development Kit (DPDK) drivers for scalable packet processing.

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	BUS SPEED & BUS WIDTH CONNECTION SPEED	PORTS	SUPPORTED SLOT HEIGHTS	ADVANCED FEATURES	STORAGE OVER ETHERNET	ORDER CODES
 XXV710-DA1 XXV710-DA2	SFP28 Direct Attach Copper Twinaxial SFP28 LC Fiber Optic Module	Direct Attach Passive Twinaxial 25GbE: up to 5m with RS-FEC, up to 3m with no FEC Direct Attach Passive Twinaxial 10 GbE: up to 15m Multimode Fiber: up to 70m (OM3), up to 100m (OM4) Single-mode Fiber: up to 10km	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE / 25 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, NFS, SMB	XXV710DA1, XXV710DA1BLK, XXV710DA2, XXV710DA2BLK
 X710-DA2 X710-DA4FHBLK	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m Multimode Fiber: up to 300m (OM3), up to 400m (OM4) Single-mode Fiber: up to 10km	X710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual and Quad Port	Low Profile (DA2 only) and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, NFS, SMB	X710DA2, X710DA2BLK, X710DA4FH, X710DA4FHBLK
 XL710-QDA1 XL710-QDA2	QSFP+ Direct Attach Copper Twinaxial QSFP+ Fiber Optic Module	Direct Attach Passive Twinaxial: up to 7m Multimode Fiber: up to 100m (OM3), up to 150m (OM4) Single-mode Fiber: up to 10km	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	10 GbE / 40 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, NFS, SMB	XL710QDA1, XL710QDA1BLK, XL710QDA2, XL710QDA2BLK
 X710-T4	RJ45 Copper Twisted-pair	Category 6: up to 55m Category 6A or better: up to 100m	XL710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	100 Mb / 1 GbE / 10 GbE	Quad Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, NFS, SMB	X710T4, X710T4BLK
 X722-DA2 X722-DA4	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m Multimode Fiber: up to 300m (OM3), up to 400m (OM4) Single-mode Fiber: up to 10km	X710	PCI Express* v 3.0 8.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual and Quad Port	Low Profile (DA2 only) and Full Height	iWARP/RDMA Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, NFS, SMB	X722DA2, X722DA4FH

<sup>1</sup> Learn more about DPDK at [intel.com/dpdk](http://intel.com/dpdk)

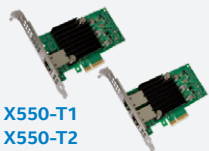




All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG\* SR-IOV capable.

# INTEL® ETHERNET 500 SERIES NETWORK ADAPTERS



The best choice for 10GBASE-T, the Intel® Ethernet 500 Series is a backward compatible with existing 1000BASE-T networks, simplifying the transition to 10GbE when more bandwidth is needed.

- Supports 100Mb, and 1/2.5/5/10GBASE-T
- Low cost, low power
- Optimized for network virtualization overlays

PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	BUS SPEED & BUS WIDTH CONNECTION SPEED	PORTS	SUPPORTED SLOT HEIGHTS	NETWORK VIRTUALIZATION ACCELERATION	STORAGE OVER ETHERNET	ORDER CODES
 <p><b>X550-T1</b> <b>X550-T2</b></p>	RJ45 Copper Twisted-pair	Category 6: up to 55m (10 GbE); Category 6A or better: up to 100m (10 GbE); Category 5 or better: up to 100m (1 GbE / 2.5 GbE / 5 GbE)	X550	PCI Express* v3.0 8.0 GT/s, x4 Lanes Operable in x8 and x16 slots	100 Mb / 1 GbE / 2.5 GbE / 5 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	Multi-Queue and Stateless Offloads for NVO, such as VXLAN, NVGRE, and GENEVE Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, FCoE, <sup>2</sup> NFS, SMB	X550T1, X550T1BLK; X550T2, X550T2BLK
 <p><b>X540-T1</b> <b>X540-T2</b></p>	RJ45 Copper Twisted-pair	Category 6: up to 55m (10 GbE); Category 6A or better: up to 100m (10 GbE); Category 5 or better: up to 100m (1 GbE)	X540	PCI Express* v2.1 5.0 GT/s, x8 Lanes	100 Mb / 1 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, FCoE, <sup>2</sup> NFS, SMB	X540T1, X540T1BLK; X540T2, X540T2BLK
 <p><b>X520-DA2</b></p>	SFP+ Direct Attach Copper Twinaxial SFP+ LC Fiber Optic Module	Direct Attach Passive Twinaxial: up to 15m; Multimode Fiber: up to 300m (OM3), up to 400m (OM4); Single-mode Fiber: up to 10km	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, FCoE, <sup>2</sup> NFS, SMB	E10G42BTDA, E10G42BTDABLK
 <p><b>X520-SR1</b> <b>X520-SR2</b></p>	LC Fiber Optic <i>Customer may remove optics as needed.</i>	Multimode Fiber: up to 300m (OM3), up to 400m (OM4)	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Single and Dual Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, FCoE, <sup>2</sup> NFS, SMB	E10G41BFSR, E10G41BFSRBLK; E10G42BFSR, E10G42BFSRBLK
 <p><b>X520-LR1</b></p>	LC Fiber Optic <i>Customer may remove optics as needed.</i>	Single-mode Fiber: up to 10km	82599ES	PCI Express* v2.0 5.0 GT/s, x8 Lanes	1 GbE / 10 GbE	Single Port	Low Profile and Full Height	RSS for UDP for VXLAN Enhanced DPDK packet-processing support <sup>1</sup>	iSCSI, FCoE, <sup>2</sup> NFS, SMB	E10G41BFLLR, E10G41BFLLRBLK

<sup>1</sup> Learn more about DPDK at [intel.com/dpdk](http://intel.com/dpdk)

<sup>2</sup> Support for new operating systems will not be added to FCoE. The last operating system versions supporting FCoE are: Microsoft Windows Server\* 2012 R2, Red Hat Enterprise Linux\* 7.2 & 6.7, SUSE Linux Enterprise Server 11 SP4, 12 SP1; VMware ESX\* 6.0

All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG\* SR-IOV capable.

# INTEL® ETHERNET OPTICS AND CABLES FOR INTEL® ETHERNET 700 SERIES AND 500 SERIES NETWORK ADAPTERS






Combine these accessories with Intel Ethernet 700 Series and 500 Series Network Adapters, for dependable interoperability and consistent performance across the network.

INTEL® ETHERNET SFP+ OPTICS	INTEL® ETHERNET SFP+ TWINAXIAL CABLES	INTEL® ETHERNET QSFP+ OPTICS	INTEL® ETHERNET QSFP+ TWINAXIAL CABLES	INTEL® ETHERNET QSFP+ TWINAXIAL BREAKOUT CABLES
E10GSFSPSR = SFP+ SR Optic E10GSFSPSRX = SFP+ SR Optic (Extended Temp) E10GSFPLR = SFP+ LR Optic E10GSFPLRX = SFP+ LR Optic (Extended Temp)	SFP+ to SPF+ copper direct attach cable XDACBL1M = 1 Meter XDACBL3M = 3 Meter XDACBL5M = 5 Meter	E40GQSFPSPSR = QSFP+ SR Optic E40GQSFPPLR = QSFP+ LR Optic	QSFP+ to QSFP+ copper direct attach cable XLDACBL1M = 1 Meter XLDACBL3M = 3 Meter XLDACBL5M = 5 Meter	QSFP+ to (4) SFP+ copper direct attach breakout cable X4DACBL1 = 1 Meter X4DACBL3 = 3 Meter X4DACBL5 = 5 Meter
INTEL® ETHERNET SFP28 OPTICS	INTEL® ETHERNET SFP28 TWINAXIAL CABLES	INTEL® ETHERNET QSFP28 TO SFP28 TWINAXIAL BREAKOUT CABLES	INTEL® ETHERNET ACTIVE OPTICAL CABLE SFP28	INTEL® ETHERNET ACTIVE OPTICAL CABLE QSFP28 TO SFP28 BREAKOUT
E25GSFP28SR = SFP28 SR Optic E25GSFP28SRX = SFP28 SR Optic (extended temp)	SFP28 to SFP28 copper direct attach cable XXVDACBL1M = 1 Meter XXVDACBL2M = 2 Meter XXVDACBL3M = 3 Meter	QSFP28 to (4) SFP+ copper direct attach breakout cable XXV4DACBL1M = 1 Meter XXV4DACBL2M = 2 Meter XXV4DACBL3M = 3 Meter	XXVAOC5M = 5 Meter XXVAOC10M = 10 Meter XXVAOC15M = 15 Meter XXVAOC20M = 20 Meter	XXV4AOC5M = 5 Meter XXV4AOC10M = 10 Meter XXV4AOC15M = 15 Meter XXV4AOC20M = 20 Meter

# 1GB INTEL® ETHERNET NETWORK ADAPTERS



PRODUCT	CONNECTOR & CABLE MEDIUM	CABLING TYPE	INTEL® ETHERNET CONTROLLER	SLOT TYPE, MAXIMUM BUS SPEED & BUS WIDTH	PORTS	SUPPORTED SLOT HEIGHTS	HALOGEN FREE	INTELLIGENT OFFLOADS	NETWORK VIRTUALIZATION TECHNOLOGY FOR CONNECTIVITY	STORAGE OVER ETHERNET	INTEL ETHERNET POWER MANAGEMENT <sup>1</sup>	ORDER CODES
 <b>I210-T1</b>	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	I210	PCI Express* v2.1 2.5 GT/s, x1 Lane	Single Port	Low Profile and Full Height	Yes	Yes	Includes Audio-Video Bridging (AVB) support 802.1Qav)	iSCSI, NFS, SMB	Yes	I210T1 I210T1BLK
 <b>I350-T4</b>	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Low Profile and Full Height	Yes	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350T4V2
 <b>I350-T2</b>	RJ45 Copper Twisted-pair	Category 5 or better: up to 100m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Dual Port	Low Profile and Full Height	Yes	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350T2V2
 <b>I350-F2</b>	LC Fiber Optic	Multimode Fiber OM1 (62.5 μm): up to 275m Multimode Fiber OM2 or better (50 μm): up to 550m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Dual Port	Low Profile and Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350F2 I350F2BLK
 <b>I350-F4</b>	LC Fiber Optic	Multimode Fiber OM1 (62.5 μm): up to 275m Multimode Fiber OM2 or better (50 μm): up to 550m	I350	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV capable	iSCSI, NFS, SMB	Yes	I350F4 I350F4BLK
 <b>I340-F4</b>	LC Fiber Optic	Multimode Fiber OM1 (62.5 μm): up to 275m Multimode Fiber OM2 or better (50 μm): up to 550m	82580	PCI Express* v2.1 5 GT/s, x4 Lanes	Quad Port	Full Height	N/A	Yes	On-chip QoS and traffic management, Flexible Port Partitioning (FPP), Virtual Machine Device Queues (VMDq)	iSCSI, NFS, SMB	N/A	E1G44HF

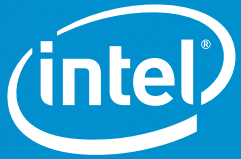
<sup>1</sup> Learn more about DPDK at [intel.com/dpdk](http://intel.com/dpdk)

All Intel® Ethernet 700 Series and 500 Series Network Adapters include intelligent offloads, are optimized for Data Plane Development Kit (DPDK) and Intel® Ethernet Flow Director, and include these server virtualization attributes: on-chip QoS and traffic management, Flexible Port Partitioning, Virtual Machine Device Queues (VMDq), PCI-SIG\* SR-IOV capable.



[www.intel.com/ethernet](http://www.intel.com/ethernet)

Intel and the Intel logo are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries. \*Other names and brands may be claimed as the property of others. © Intel Corporation



# INTEL® SERVER MANAGEMENT

**BUILD.  
DEPLOY.  
MANAGE.**

## **SOFTWARE TO BUILD, DEPLOY AND MANAGE SERVERS WITH EASE**

Intel® Server Products come with a set of software utilities that help you manage hardware and firmware across your data center network.

## **REMOTE SERVER MANAGEMENT – MADE EASY**

While Agent based utilities help you configure the system settings (BIOS & BMC) and update the firmware (BIOS/ BMC/ME/SDR), Agent-less utilities are added recently into the suite that help you do the same from a remote management console.

## **INTEGRATED BASEBOARD MANAGEMENT CONTROLLER**

Embedded systems management enables monitoring, debug, configuration and update via a variety of out-of-band protocols (Redfish, IPMI) as well as via the embedded web console.



# INTEL® SERVER MANAGEMENT

Software to build, deploy and manage servers with ease.

## GET YOUR SERVERS UP AND RUNNING FAST— AND KEEP THEM RUNNING

Intel® Server Management Software is a set of software utilities that help you manage the entire lifecycle of building, deployment and further debug & maintenance of the servers with Intel® Server boards in the data centers.

For more information, visit [www.intel.com/go/servermanagement](http://www.intel.com/go/servermanagement)

## SERVER MANAGEMENT - MADE EASY

Intel® Server Utilities can be broadly classified into two categories - Agent-based and Agent-less utilities. Agent-based utilities are run on the server which needs configuration and manageability. They are either run on the Server OS or EFI Shell to make the necessary system configuration changes and/or update the firmware. Agent-less utilities are run on a management console which can connect remotely through a secure network to rest of the servers in the data center and the system configuration and/or firmware upgrades can be executed remotely from the management console.

The Integrated Baseboard Management Controller enables secure access to the server via a variety of protocols to assist with the debug, monitoring, configuration and provisioning of the server.

## Intel® Server Management Software

Intel® Server Management Software comes in two different modes of operation. Agent-based and Agent-less applications

### AGENT-BASED APPLICATIONS

Agent-based applications are run on the server which needs to be configured and/or updated to a new firmware released by Intel. These are essentially single server utilities which are comprised of:

- **SYSCFG** – Helps to configure BIOS & BMC Settings and supported on Linux\*/Windows\*/UEFI mode. These are command line based and scriptable.
- **SYSINFO** – Retrieves the system info on system inventory, FRU, BIOS, BMC and other platform firmware. Supported on Linux\*/Windows\*/UEFI mode.
- **SELViewer** – Displays System Event Logs (SEL) recorded by BMC in a human readable format. Clear the SEL in BMC or Save it locally. Supported on Linux\*/Windows\*/UEFI mode.
- **Flash Utilities** – Helps to reprogram flash memory with new versions of BIOS. BIOS/BMC/SDR/ME can be updated with this utility which can be scriptable and available on Linux\*/Windows\*/UEFI.
- **Intel® Multi-Server Manager (Intel® MSM)** – While all the above are single server utilities, Intel® MSM is a multi-server utility which can be connected to other servers in the same in-band network. It helps to remotely manage a number of servers and the features include monitoring health and performance, system info retrieval, BMC configuration and System FW Update for a single or a group of servers that are within the group.

### AGENT-LESS APPLICATIONS

Agent-less applications take advantage of the Out-of-Band (OOB) network and connect remotely to one or a group of servers which can be reached through the Management NIC. The connections are completely secure and independent of the host network. These include:

- **VMCLI** – This tool is a command line interface for virtual media. It can be used to boot virtual media on any remote server and perform a firmware update for example.
- **Intel® MSM** – Has the same set of features as the Agent-based version except that the management server connects to the remote servers (managed nodes) through the OOB network and can perform the same operations such as monitor health & performance, system info retrieval, BMC configuration and system FW update a single or a group of servers that are within the group. The FW update can be scheduled for a particular date and time.
- **Intel® Server Debug & Provisioning Tool (Intel® SDPTool)** – This is an OOB utility for agent-less debugging and support. The tool helps to connect to a remote server(managed node) through the OOB network on the fly without any provisioning and do a bunch of system configuration settings. The features supported are platform firmware update (BIOS/BMC/ME/SDR) or a custom firmware update of any other component on the board, change the system settings supported by the SYSCFG utility (above), change the network settings, download debug logs and display the system info like CPU, Memory, FRU. The greatest advantage of this tool is it is so lightweight and can be scripted to be scaled to any number of servers without any provisioning overhead.
- **Intel® Data Center Manager (Intel® DCM)** – This is a real time power and thermal monitoring software which can be deployed across heterogeneous systems in the data center. Helps with Health Monitoring and Rack Density Optimization as well. Firmware for Intel Server Boards can be updated through the GUI of Intel® Data Center Manager (New!!!!) too but please be aware that it is distributed through a license.

## Intel® System Management Software

Intel® System Management Software is a set of management applications that let you view, debug, configure and provision servers across your network.

FEATURES	INTEL® SDPTOOL	INTEL® MSM	AGENT-BASED UTILITIES
Install Requirements	Application: Requires install on top of operating system on the management server but no installation required on remote managed servers	Application: Requires install on top of operating system on the management server but can operate in both agent-based and agent-less modes on the managed nodes	Application: Requires agent install on top of operating system
User Interface	Command Line Interface Tool - Scriptable	Command Line Interface Tool - Scriptable	Command Line Interface Tools - Scriptable
Multiple Remote server management	Single server only but can be scripted to add many servers without provisioning	Yes	No
Operating System Support	Host - Linux*. Managed nodes can be any OS	Host - Linux*. Managed nodes can be any OS	Windows*/Linux*/UEFI
Network Configuration	OOB Network	OOB Network	Uses existing operating system network
View System Info (Platform, Memory, CPU, FRU)	Yes	Yes	Yes – Use SYSINFO
Hardware Predictive Failure Analysis	Yes	Yes	Yes
Sensor Readings	Yes	Yes	Yes
Remote Firmware Update	Yes	Yes	No – (Local FW update only)
Configure Network Settings	Yes	No	No
Health Monitoring	Yes	Yes	No
BMC Configuration	Yes	Yes – many BMCs at the same time	Yes – Use SYSCFG
Power Management	Yes	Yes	No
Remote debug with Event Logs	Yes	Yes	No
Remote Power On/Off/Reboot	Yes	Yes	No
Serial Over LAN (Console Redirection)	No	Yes	No
Download Debug Logs	Yes	No	Yes

## Integrated Baseboard Management Controller (BMC)

Embedded Intel System Management Software is available in two varieties—an Integrated BMC, which has Redfish and IPMI 2.0 stack available for comprehensive remote (out-of-band) or local (in-band) management, or an Integrated BMC web console available without the requirements for any agents and is always accessible, regardless of the state of the operating system.

FEATURES	INTEL® SERVER BOARD S1200SP FAMILY	INTEL® SERVER SYSTEMS SUPPORTING INTEL® XEON® PROCESSORS E5-2600 V3 & V4 PRODUCT FAMILY AND INTEL® SERVER SYSTEMS SUPPORTING INTEL® XEON PHI™ PRODUCT FAMILY	INTEL® SERVER SYSTEMS SUPPORTING THE INTEL® XEON® PROCESSOR SCALABLE FAMILY
IPMI 2.0	Yes	Yes	Yes
Power Control	Yes	Yes	Yes
VLAN	Yes	Yes	Yes
Redfish & RSD Support			Yes
Java based Virtual Media and KVM	Yes	Yes	Yes
HTML5 Virtual Media and KVM			Yes
Remote Debug	Autonomous Debug Log	Autonomous Debug Log	Autonomous Debug Log & Remote Debug over PECI
Remote BMC/BIOS Update			Yes
Remote BIOS Configuration			Yes
SSH	SMASH CLP	SMASH CLP	SOL Only
Remote SMBIOS Retrieval	Yes	Yes	Yes
NVMeE Management			Yes
Open LDAP	Yes	Yes	Yes
Security Logs			Yes
POST Code Retrieval			Yes
Node Manager	Yes	Yes	Yes
Alerting	SNMP Traps & SMTP	SNMP Traps & SMTP	SNMP Traps & SMTP

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.

Visit [servermarketinglibrary.intel.com](http://servermarketinglibrary.intel.com)

For more information, visit [www.intel.com/go/servermanagement](http://www.intel.com/go/servermanagement)

<sup>1</sup> For the latest Intel® Server Board support, visit <http://support.intel.com/support/motherboards/server>

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks)

Features and functions of the Intel® Management Packs are dependent on the features and functions available on the server and client hardware and the loaded software and operating systems.

Not all features and functions are available on all products and may require Intel® AMT or IPMI technologies for additional functionality.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/go/servermanagement](http://www.intel.com/go/servermanagement)

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



**OPTIMIZE  
VIDEO  
DELIVERY**

# **INTEL<sup>®</sup> ACCELERATORS**

## **SUPERCHARGE YOUR MEDIA AND GRAPHICS WORKLOADS.**

The Intel<sup>®</sup> Visual Compute Accelerator is designed to optimize video delivery (transcoding and encoding). This new product is the ideal media and graphics solution bringing together the power of Intel<sup>®</sup> Xeon<sup>®</sup> Processor E5 with the graphics performance of Intel<sup>®</sup> Xeon<sup>®</sup> Processor E3 within one system along with flexible software architecture enabling software vendors to write applications quicker for many different graphics workloads.



## Intel® Visual Compute Accelerator 2

### SUPERCHARGE YOUR MEDIA AND GRAPHICS WORKLOADS

The Intel® Visual Compute Accelerator 2 is the second generation PCI Express\* card containing three Intel® Xeon® Processors E3 v5 designed to deliver cutting edge rendering performance per watt for graphics intensive workloads.<sup>1</sup> For OTT content providers and telecommunications service providers, Intel® VCA 2 takes the next step in transcode density, adding HEVC encode into the Quick Sync Video portfolio of accelerated codecs.

In the enterprise domain, security concerns and worker mobility are driving the need for cloud-based remote workstations, while at same time, applications such as AutoCad\* are consuming ever more graphics processing cycles.

The accelerator card provides customers:

- Best-in-class media transcode channel density for Intel® Xeon® processor E5-based systems in communications service provider deployments
- High performance remote graphics for Intel® Xeon® processor E5-based systems in purpose-built clouds and IT datacenters



<b>PRODUCT NAME</b>	<b>INTEL® VISUAL COMPUTE ACCELERATOR</b>
<b>ORDER CODE</b>	VCA1585LMV
<b>TARGET MARKET</b>	Comms SPs, Video Cloud Builders (Private Cloud), Enterprise Datacenter
<b>PROCESSORS</b>	Three Intel® Xeon® Processor E3-1585L v5 <ul style="list-style-type: none"><li>• 4 Cores at 3.0 GHz</li><li>• 45W TDP</li><li>• Intel® Iris™ Pro graphics P580 (GT4e), 128MB eDRAM</li></ul>
<b>FORM FACTOR</b>	Full-length, full-height, double-width PCIe* card
<b>PCI</b>	PCIe* 3.0, x16, 8 lanes per processor
<b>POWER</b>	235W
<b>MEMORY</b>	DDR4 2133MHz (1.2V), ECC SODIMMs, 2 channels per processor, up to 64GB per processor
<b>SSD's</b>	Not included
<b>OPERATING SYSTEM ON CARD</b>	CentOS* 7.2, Windows* 10 and Windows Server* 2016 Xen* and KVM hypervisors

The Intel® Server Product Marketing Library is designed as a one-stop-shop for all Intel® Server Product marketing assets and sales tools.

Visit [servermarketinglibrary.intel.com](http://servermarketinglibrary.intel.com)

For more information, visit [www.intel.com/xeon](http://www.intel.com/xeon) and [ark.intel.com](http://ark.intel.com)

<sup>1</sup> Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at [www.intel.com](http://www.intel.com).

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks)

Intel, the Intel logo, Intel Inside, the Intel Inside logo, Xeon, and Iris are trademarks of Intel Corporation in the U.S. and/or other countries.

\* Other names and brands may be claimed as the property of others.



# INTEL® OMNI-PATH ARCHITECTURE

THE HIGH  
PERFORMANCE,  
LOW COST  
FABRIC FOR HPC

## INTEL® OMNI-PATH ARCHITECTURE

Intel® Omni-Path Architecture (Intel® OPA), an element of Intel® Scalable System Framework, delivers the performance for tomorrow's high performance computing (HPC) workloads and the ability to scale to tens of thousands of nodes—and eventually more—at a price competitive with today's fabrics.



## Intel® Omni-Path Architecture

**THE HIGH PERFORMANCE, LOW COST FABRIC FOR HPC. INTEL® OMNI-PATH ARCHITECTURE.**

Imagine you could achieve supercomputing-class performance for your HPC fabric, while reducing your infrastructure requirements by as much as 50 percent.<sup>1</sup>

You could use the money you saved to expand your cluster, potentially delivering up to 24 percent more compute power to your scientists and engineers.<sup>2</sup>

That's the transformative power of Intel® Omni-Path Architecture, a foundational component of the Intel® Scalable System Framework. This end-to-end fabric solution provides 100 Gbps port bandwidth with low latency that stays low even at extreme scale.

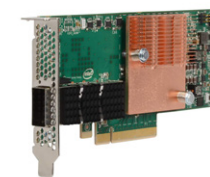
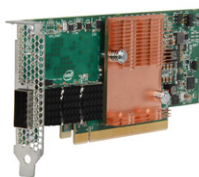
With cost-effective scaling from desk-side clusters to exascale supercomputers, Intel Omni-Path Architecture offers world-class fabric solutions for every level of HPC.

For more information, visit [www.intel.com/omnipath](http://www.intel.com/omnipath)



## 100GB Host Interfaces

Designed specifically for HPC, the Intel® Omni-Path Host Fabric Interface (Intel® OP HFI) uses an advanced connectionless design that delivers performance that scales with high node and core counts, making it the ideal choice for the most demanding application environments. Intel OP HFI supports 100 Gbps per port, which means each Intel OP HFI port can deliver up to 25 GBps per port of bidirectional bandwidth. The same ASIC utilized in the Intel OP HFI will also be integrated into future Intel® Xeon® processors and used in third-party products.



### 100GB HOST INTERFACES

INTEL PART #	100HFA018LS 100HFA018FS	100HFA016LS 100HFA016FS
DESCRIPTION	Single-port PCIe x8 Adapter, Low Profile and Std Height	Single-port PCIe x16 Adapter, Low Profile and Std Height
SPEED	58 Gbps	100 Gbps
PORTS, MEDIA	Single port, QSFP28	Single port, QSFP28
FORM FACTOR	Low profile PCIe Std Height PCIe	Low profile PCIe Std Height PCIe
FEATURES	Passive thermal – QSFP heatsink, supports up to Class 4 max optical transceivers	Passive thermal – QSFP heatsink, supports up to Class 4 max optical transceivers
SANDY BRIDGE	None	None
IVY BRIDGE	None	None
INTEL® XEON® PROCESSOR E5-2600 V3 (HASWELL-EP)	✓	✓
INTEL® XEON® PROCESSOR E5-2600 V4 (BROADWELL-EP)	✓	✓

## Edge Switches

The next generation of high performance computing (HPC) fabrics use Intel® Omni-Path Architecture to create fabrics that meet the needs of the most demanding set of applications.

The Intel® Omni-Path Edge Switch consists of two models supporting 100 Gb/s for all ports, an entry-level 24-port switch for small clusters and a 48-port switch. The larger switch, in addition to enabling a 48-port fabric in 1U, can be combined with other edge switches and directors to build much larger multitier fabrics.

These Intel Omni-Path Edge Switches are members of the Intel® Omni-Path Fabric 100 series of switches, host adapters, and software delivering an exceptional set of high-speed networking features and functions.



## 100GB Host Interfaces

INTEL PART #	100SWE48UF2 / R2 (2 Power Supplies) 100SWE48QF2 / R2 (2 Power Supplies) 100SWE48UF1 / R1 (1 Power Supply) 100SWE48QF1 / R1 (1 Power Supply)	100SWE24UF2 / R2(2 Power Supplies) 100SWE24QF2 / R2 (2 Power Supplies) 100SWE24UF1 / R1 (1 Power Supply) 100SWE24QF1 / R1 (1 Power Supply)	100SWE48QFH 100SWE48UFH
DESCRIPTION	48 Port Edge Switch ("Q" = mgmt card)	24 Port Edge Switch ("Q" = mgmt card)	Hot Swap Power Supply/Fans 48 Port Edge Switch ("Q" = mgmt card)
SPEED	100 Gbps	100 Gbps	100 Gbps
MAX EXTERNAL PORTS	48	24	48
MEDIA	QSFP28	QSFP28	QSFP28
FORM FACTOR	1U	1U	1U
FEATURES	Forward / reverse airflow and mgmt card options, up to 2 PSU	Forward / reverse airflow and mgmt card options, up to 2 PSU	Forward airflow and mgmt card options, up to 2 PSU

## Hot Swap Modules

INTEL PART #	100SWEHSFTF	100SWEHSPSF
DESCRIPTION	Hot Swap Fan Module	Hot Swap Power Supply Module

## Director Switches

The Intel® Omni-Path Director Class Switch (Intel® OP Director Class Switch), based on Intel's next generation 48-radix switch silicon, has many innovative features that provide optimum performance for both small and large fabrics. Both switch models are dense form factor designs capable of supporting up to 768 100 Gb/s ports in a low 20U footprint. Designed to be modular alongside edge switches, host adapters, and software, the Intel OP Director Class Switch 100 series enables customers to tailor their system configuration to meet present and future needs.



### DIRECTOR SWITCHES

INTEL PART #	100SWD24B1N 100SWD24B1D 100SWD24B1A	100SWD06B1N 100SWD06B1D 100SWD06B1A	100SWDLF32Q	100SWDSPINE	100SWDMGTSH
DESCRIPTION	24-slot Director Class Switch, Base Config	6-slot Director Class Switch, Base Config	Director Class Switch Leaf Module	Director Class Switch Spine Module	Director Class Switch Management Module
SPEED	100 Gbps	100 Gbps	100 Gbps	100 Gbps	100 Gbps
MAX EXTERNAL PORTS	768	192	32	N/A	N/A
MEDIA	10/100/1000 Base-T USB Gen2	10/100/1000 Base-T USB Gen2	QSFP28	Internal high speed connections	10/100/1000 Base-T USB Gen2
FORM FACTOR	20U	7U	Half-width module 2 modules per leaf	Full width module, 2 boards/module	Half-width module
FEATURES	Up to 2 mgmt modules, up to 12 PSUs, AC and DC options	Up to 2 mgmt modules, up to 6 PSUs, AC and DC options	Hot swappable	96 internal mid-plane connections, hot swappable	N+1 redundancy, hot swappable

## Intel® Omni-Path Cables

Intel® Omni-Path Fabric solutions support a broad array of 3rd party cable types and lengths from the industry's leading providers. These cables, together with the Intel® OPA Packet Integrity Protection feature, provide highly reliable communication links with superior bit error rate (BER) performance.

### PASSIVE COPPER CABLES

CABLE LENGTH	INTEL® ONMI-PATH PASSIVE COPPER CABLES
0.5M	100CQQF3005; 100CQQH3005 (30 AWG)
1.0M	100CQQF3010; 100CQQH3010 (30 AWG)
1.5M	100CQQH2615 (26 AWG); 100CQQF3015 (30 AWG)
2.0M	100CQQH2620 (26AWG); 100CQQF3202 (30 AWG)
3.0M	100CQQH2630 (26AWG); 100CQQF3030 (30 AWG); 100CQQF2630 (26 AWG)
3.5M*	100CQQH3035 (30 AWG)
4.0M*	100CQQH2640 (26 AWG); 100CQQF3040 (30 AWG); 100CQQF2640 (26 AWG)
5.0M*	100CQQH2650 (26 AWG); 100CQQF2650 (26 AWG)
5.5M*	100CQQH2655 (26 AWG)
6.0M*	100CQQF2660 (26 AWG)

\* Please consult Intel for configuration details. 100CQQx x=Vendor

### ACTIVE OPTICAL CABLES

CABLE LENGTH	INTEL® OMNI-PATH ACTIVE FIBRE CABLES
3.0M	100FRRF0030; 100FRRL0030; 100FRRA0030
5.0M	100FRRF0050; 100FRRL0050; 100FRRA0050
10M	100FRRF0100; 100FRRA0050; 100FRRA0100
15M	100FRRF0150; 100FRRL0150; 100FRRA0150
20M	100FRRF0200; 100FRRL0200; 100FRRA0200
30M	100FRRF0300; 100FRRL0300; 100FRRA0300
40M	100FRRF0300; 100FRRL0300; 100FRRA0300
50M	100FRRF0500; 100FRRL0500; 100FRRA0500
60M	100FRRF0600; 100FRRL0600; 100FRRA0600
100M	100FRRF1000; 100FRRL1000; 100FRRA1000

\* 100FRRx x=Vendor



For more information, visit [www.intel.com/omnipath](http://www.intel.com/omnipath)

#### FOOTNOTES

<sup>1</sup> Reduction of infrastructure requirements claim based on a 1024-node full bisectional bandwidth (FBB) Fat-Tree configuration, using a 48-port switch for Intel Omni-Path cluster and 36-port switch ASIC for either Mellanox or Intel® True Scale clusters.

<sup>2</sup> Configuration assumes a 750-node cluster, and number of switch chips required is based on a full bisectional bandwidth (FBB) Fat-Tree configuration. Intel® OPA uses one fully-populated 768-port director switch, and Mellanox EDR solution uses a combination of 648-port director switches and 36-port edge switches. Intel and Mellanox component pricing from [www.kernelsoftware.com](http://www.kernelsoftware.com), with prices as of October 20, 2016. Assumes \$6,200 for a 2-socket Intel® Xeon® processor based compute node.

Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark\* and MobileMark,\* are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can provide absolute security.

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

© 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, and Intel Xeon are trademarks of Intel Corporation in the U.S. and other countries.

\* Other names and brands may be claimed as the property of others.