

IBM Cloud Service Management & Operations

# Field Guide



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IBM Cloud Service Management &  
Operations Field Guide



<https://ibm.biz/csmo-field-guide>

# Cloud service management & operations

Most people who say they are doing DevOps are doing mostly dev and very little ops. Cloud service management and operations is about designing, implementing, and continuously improving the operations management processes you use in your enterprise. Cloud service management and operations is organized into personas who do the work, processes that define what work is needed and how it is performed, and tools to enable and support these activities.

## KEEP THE OPS IN DEVOPS

**Enable agile for operations.** Implement agile and continuous delivery practices for operations in the same way you do for development.

**Refine for the cloud.** Revisit the activities of plan, design, deliver, operate, and control then transform them to better fit the needs of cloud based operations.

**Realize the benefits.** Support applications in the cloud to ensure an “always on” experience for your customers.

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## What's inside?

This field guide provides a high-level overview of cloud service management and operations.

### LEARN IT

A summary of the concepts.

### GET STARTED

Considerations for moving ops into your development process.

# IBM's unique approach

After an application is pushed to production, it must be managed. Cloud service and management operations addresses the operational aspect of your application and services. Applications are monitored to ensure availability and performance according to service level agreements. As methods to develop, test, and release new functions become more agile, service management must also transform to support this paradigm shift.

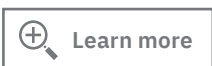
## REINVENT YOUR CLOUD OPERATIONS

**Organize your team.** Create dedicated DevOps teams with full lifecycle responsibility from design to development to operations and global Site Reliability Engineering teams, to ensure availability, stability, and growth.

**Streamline your processes.** Adapt service management processes to work in the context of DevOps automation and continuous delivery.

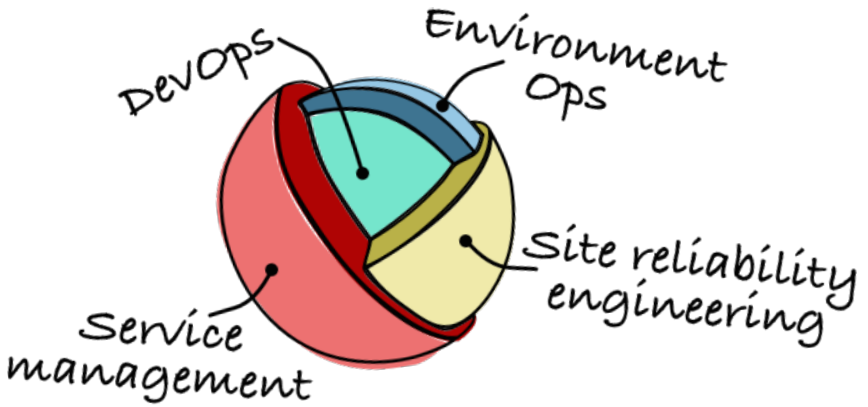
**Choose and use your tools.** Adopt tools and methodologies, such as ChatOps, to enable collaboration and rapid restoration of service.

**Build your culture.** Change your existing culture to embrace blameless post-mortems and agile operations.



Check out IBM Cloud Service Management architecture.

<https://ibm.biz/csma-guide-ibm>



Work with IBM to improve your operations practices.

# Slow is the new down

It's all about the customer's experience. Customers demand fast service along with the rapid delivery of new products and features. If your mobile app or website is slow and does not perform, your site might as well be down. Your customer will take their business elsewhere.

## TARGET 24/7/365 AVAILABILITY

**Shift left.** Use automation to test and deploy your applications as early in your development cycle as possible.

**Test your apps.** Run your automated tests as part of your DevOps pipeline - every time you deploy.

**Test APIs and health checks.** Ensure that the APIs and health checks used by your app are accurate and available.

**The 4 golden signals.** To ensure you detect an issue before it causes an outage, prioritize monitoring of the four golden signals: latency, traffic, error rate, and saturation.

**Monitor what is important.** Provide observability by instrumenting the application and services. Extend the management and monitoring functionality of containers through sidecars and a service mesh framework such as Istio. Most importantly, monitor the service as it is experienced by the end-user.

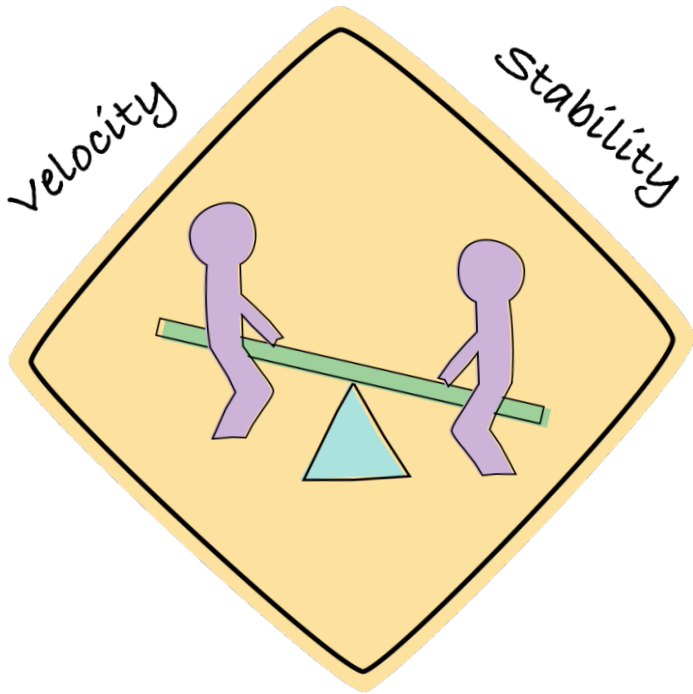


Learn more

Check out the Manage practices of the Cloud Innovate method.

<https://ibm.biz/csmo-guide-slow>

Performance is critical



Customers expect your app to perform on demand.

# Relevance of Service Management

Originally developed in the 1980's, the Information Technology Infrastructure Library (ITIL) is one of several competing standards for IT Service development and management. ITIL is comprehensive and has proven its worth in defining key processes and their relationships.

## LEARN FROM THE PAST. ADAPT FOR THE FUTURE.

**Is ITIL relevant now?** With modernization and an understanding of where to deviate, the premise and concepts of ITIL are absolutely still relevant.

**Proven practices.** Jumpstart your own agile IT operational processing using proven patterns, including process descriptions, feeds, and outputs defined in ITIL.

**Adapt to modern team structures.** Break down the silos and adapt ITIL to integrated, cross-function team structures inherent in agile DevOps teams.

**Adopt an agile approach.** Especially in a hybrid environment, traditional approaches (like ITIL) need to meet and integrate with



Check out Service management for IT and cloud services.

<https://ibm.biz/csmo-guide-til>



## Traditional IT management (ITIL)

Operations team is often working in isolation, disconnected from the development team

Performed by operations team AFTER product ship

Primarily process-driven

## Devops and Cloud management

Development team sees successful operations as part of their job

Operations goals defined and addressed throughout the DevOps lifecycle

Heavily focused on embedded and automated capabilities at all stages

# Incident management

Incident management restores your services as quickly as possible by using a first-responder team that is equipped with automation and well-defined runbooks. To maintain the best possible levels of service quality and availability, your team performs sophisticated monitoring to detect issues early, before the service is affected.

## DETECT ISSUES EARLY. QUICKLY RESTORE APP SERVICES.

**Enable monitoring with notifications.** Detect outages and performance saturations and alert your subject matter experts (SMEs) when something is going wrong.

**Analyze the incident.** Use event management to correlate events, remove noise, and show actionable alerts enriched with additional context.

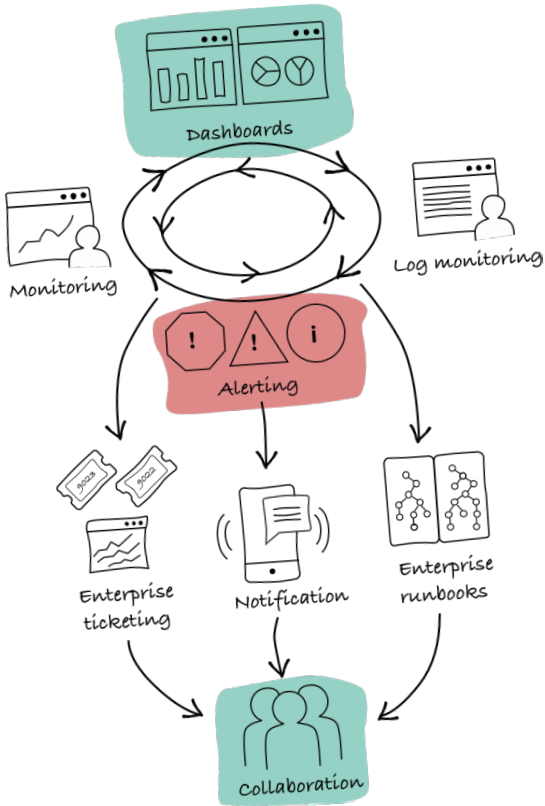
**Plan and collaborate.** Use ChatOps to enable SMEs across multiple domains to collaborate, isolate the incident, and identify an effective response.

**Resolve the incident.** Respond by fixing the problem and informing stakeholders of progress and resolution.



Check out the Incident Management subdomain.  
<https://ibm.biz/csmo-guide-incident>

Resolve incidents fast!



Quickly find and fix your problems to minimize customer impact.

# ChatOps

ChatOps integrates development tools, operations tools, and processes into a collaboration platform so that teams can efficiently communicate and easily manage the flow of their work. The solution maintains a time line of team communication that provides a record and keeps everyone up to date, avoiding information overload.

## EXTEND THE POWER AT YOUR FINGERTIPS

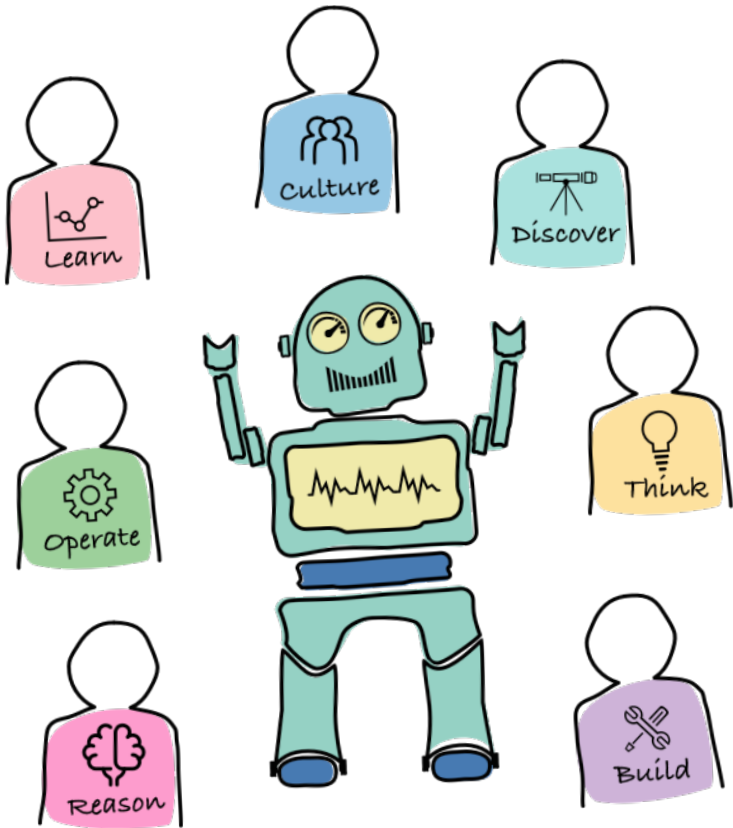
**Simplify your processes.** Streamline collaboration and increase visibility to other's actions by pushing information to problem solvers, instead of ping-ponging issues and working hard to find information.

**Integrate your tools.** Integrate Service Management and DevOps tools into the chat platform so the team can concentrate on solving problems without disruptive context switches and lengthy hand-offs.

**Automate everything.** Increase velocity with bots that answer questions and remotely execute commands, resulting in fewer meetings, less repetition, less manual work and more teamwork and reuse.



See how the effective teams uses Slack for team communications.  
<https://ibm.biz/csmo-guide-chatops>



Through collaboration tools, teams can get to know each other a little better, work together more efficiently and even have more fun at work!

# Problem management

People expect cloud services to always be available and to improve continuously. It's the driver to eliminate repeated issues. You must fix the right issue the first time, as repeated problems lead to a loss of faith in your application. Problem management means getting to the root cause of a system degradation or unavailability. Apply the 5 Whys technique to quickly discover the root cause of a problem.

## BLAMELESS POST INCIDENT REVIEW

**Know when to dig deeper.** Perform root cause analysis when issues occur more than once, when an outage could affect many users, or when the system is not working as designed.

**Apply the 5 Whys.** State the issue and discuss why it happened. Agree on the answer and again ask why? Repeat until you get to the root cause of the problem and take action to address the root cause. Remember, in complex landscapes there may be more than one root cause.

**Set response standards.** Deliver the initial root cause response in 24 hours and the final findings within 5 days. Standards create a sense of urgency and ensure the correct focus on the problem.



Check out Root-cause analysis using the 5 Whys technique.  
<https://ibm.biz/csmo-guide-problem>

Don't assign blame.

Why did our system go down?

Because the database became locked

Why did the DB become locked?

Because there were too many db writes

Why were there too many database writes?

Because this was not foreseen and it wasn't load tested

Why wasn't that change load tested?

Because we don't have a development process for when we should load test changes

Why don't we have a development process for when to load test?

We've never done much load testing and we're hitting a new level of scale

Use the 5 Whys iteratively until you find the root cause of the problem.

# Operational readiness

When apps fail and it takes excessive time to determine the root cause and restore service, customers get frustrated. You want to ensure your customers are delighted. An assessment of your organization's operational readiness answers three questions: what needs to change? how significant is the change? and what are the expected benefits? You can then use these answers to identify the gaps you need to close.

## REVIEW. ANALYZE. IMPROVE. REPEAT.

**Assess where you are.** Engage in an operational readiness review to examine all key operational processes and determine the as-is versus the to-be state.

**Determine where you need to be.** There are cost and risk tradeoffs inherent in all processes. Assess each process to determine where you need to be.

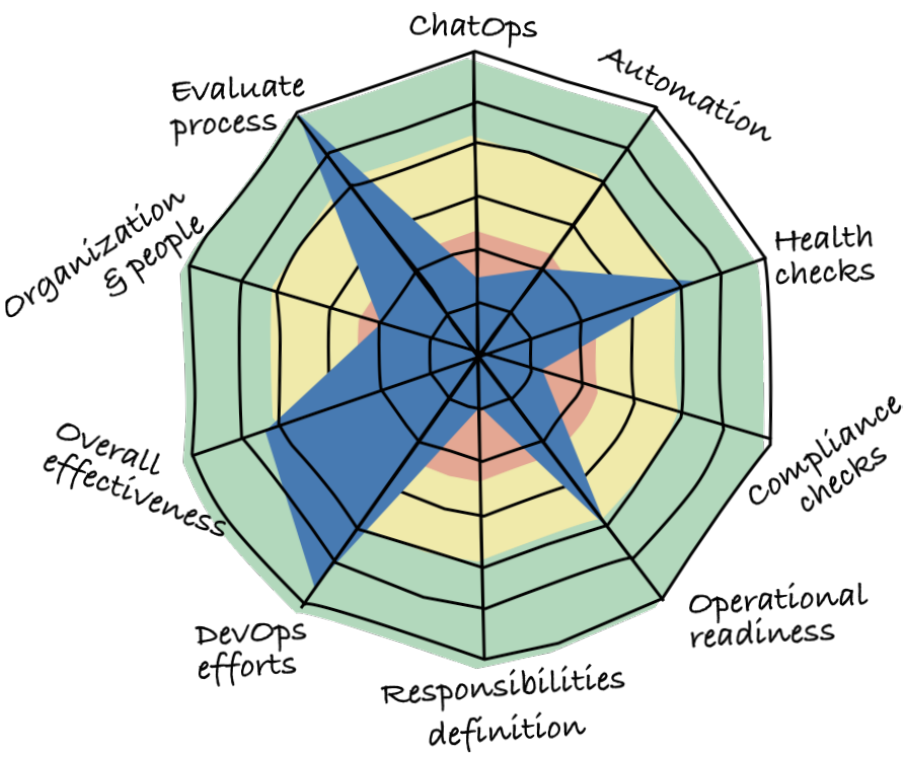
**Improve and assess continuously.** Identify gaps, where processes don't meet minimum requirements and put plans in place to address them. As you mature and needs change over time, repeat the whole process regularly.



Check out the IBM Cloud Service Management offering.  
<https://ibm.biz/csmo-guide-readiness>



Learn where your gaps are



Assess where you are and determine where you need to be.

# Build to Manage

The Build to Manage principles mandate that the developers use a set of standards and solutions to make the application manageable and ensure that the application will meet service level objectives.

## BUILD MANAGEABLE APPS FROM THE START

**Standards for manageability.** Expose manageable features using Build to Manage principles so you can scale the management of loosely coupled applications developed in different ways by different teams.

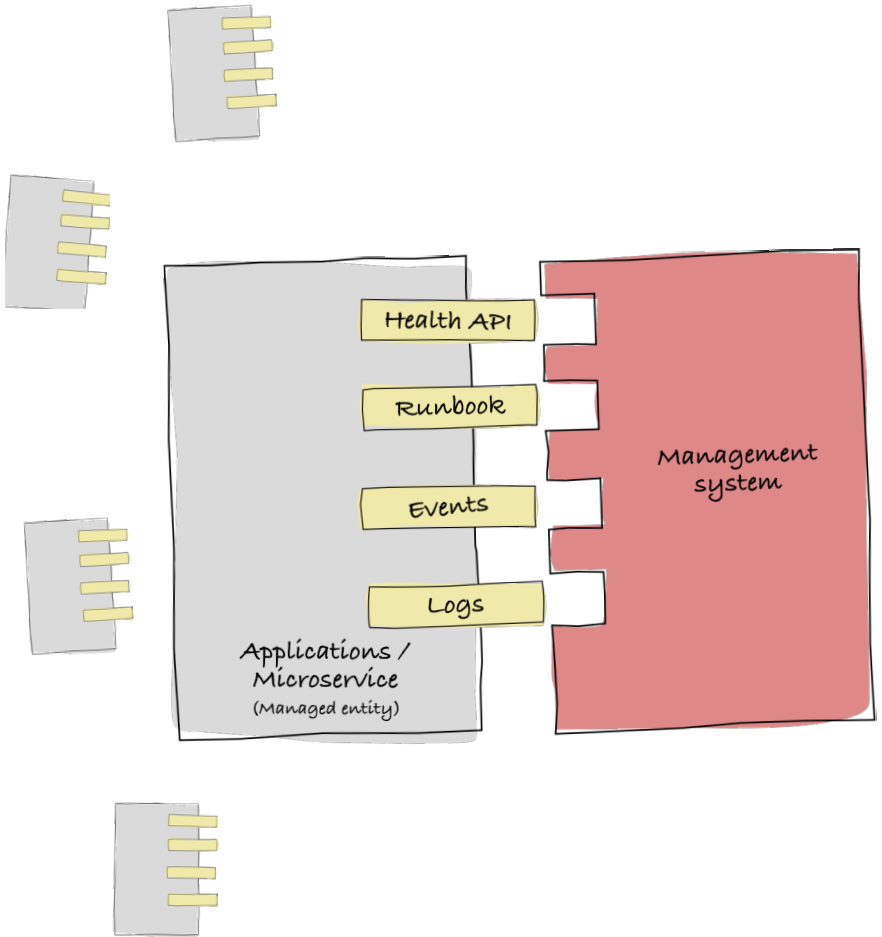
**Shift left.** More than ever before, application developers have a larger responsibility to develop application management capabilities into their application. They are the ones who know how to create runbooks, analyze logs and traces to identify and solve issues.

**Observability.** Develop applications with APIs that can report health, metrics and other application status to your management platform.

**Test like it runs.** Every step in the application lifecycle must be accompanied by an equivalent automated test.



Check out Build to Manage principles.  
<https://ibm.biz/csmo-guide-b2m>



**Build manageability into your app from the start.**

# Site reliability engineering (SRE)

SREs are engineers who specialize in reliability with the right mix of knowledge and skills in software and systems, responsible to analyze business needs, problem determination, advise & design, build, test, deploy, changes and maintenance of a well engineered information system. SREs often work hand-in-hand with development scrum team members.

## EMBRACE RISK IN A CONTROLLED FASHION

**Strengthen the infrastructure.** Engage in an operational readiness review to examine all key operational processes and determine the as-is versus the to-be state.

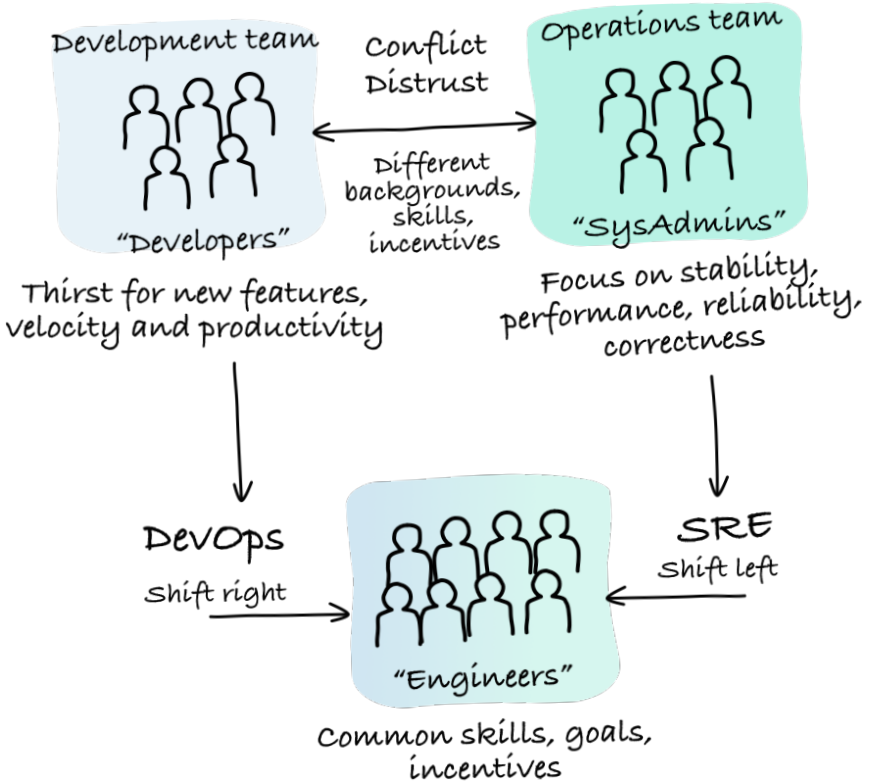
**Automate everything.** SREs use automation to provide reliability resiliency, and availability aspects to an application. SREs don't stop at automation, they engineer the problem away.

**Manage risk using an error budget.** The SRE team defines the quality of a service and manages the velocity and frequency of changes allowed based on this service level objective (SLO).

**Get to the root of the problem.** SREs ensure outages do not recur by conducting blameless post mortems to get to the root cause of problems and identify a balanced action plan so that technical debt doesn't grow disproportionately.



Check out the IBM Cloud Service Management architecture.  
<https://ibm.biz/csmo-guide-sre>



An engineering-oriented approach to operations, driven by data.

# Culture changes

Historically, organizational models encouraged domain specific processes that limited visibility, shared responsibility, and placed boundaries around teams. Emerging models include new roles and responsibilities that demand cultural changes. As with any significant change, the senior leadership must understand, support and help drive the organizational changes and find ways to make the change successful.

## CULTURAL CHANGE STARTS AT THE TOP

**Blame free environment.** Encourage understanding without blame so others can learn from mistakes without fear of consequences.

**Remove organizational silos.** The team owns the deliverables through the entire lifecycle.

**Iterate.** Create minimally viable products (MVP) and experiment to gather feedback and provide a delightful user experience.

**Rigid engineering.** Fail forward and continue to work on the next version.

**Transparency.** Share your data, share your knowledge, and give people a voice.



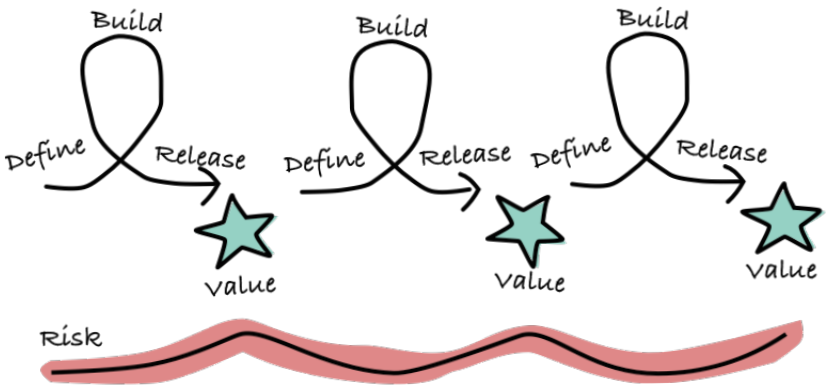
Check out the Cloud Innovate method Culture practices.

<https://ibm.biz/csmo-guide-culture>

## Before



## After



Manage risk by removing organizational silos and delivering value at increased speed.

# New roles for operations in the cloud

When you move to the cloud, the resulting culture change requires modifications to the structure and roles of your project teams. Some team members can play multiple roles and groups might be merged to create a cohesive, diverse squad. When forming the ops side of your DevOps team, consider the addition of several new roles.

## BUILD YOUR OPS TEAM TO FIX PROBLEMS FAST

**First responder.** Evaluates problems and assigns priority and urgency. This team member is empowered and skilled to solve problems, collaborating with others when needed.

**Incident commander.** Manages the investigation, communication, and resolution of major incidents.

**Subject matter expert.** Applies the deep technical skills required to resolve new and unique application issues.

**Site reliability engineer.** Takes operational responsibility to support applications running on the cloud.



Check out the Roles in a squad practice.

<https://ibm.biz/csmo-guide-roles>





First responder



Incident commander



Subject matter expert  
(SME)



Site reliability engineer  
(SRE)

Ensure the solution does not incur technical debt.

# The Ops in DevOps

DevOps is a set of practices that automate the processes between development and IT operations teams. The concept is founded on building a culture of collaboration between development and operations teams that historically functioned in relative silos. The promised benefits include increased trust, faster software releases, ability to quickly solve critical issues, and better manage unplanned work.

## DEV+OPS = TRUST, QUALITY, FASTER VELOCITY

**Configuration management & infrastructure as code.** Create code to automate operational tasks, and operating system and host configurations. Using code makes configuration changes repeatable.

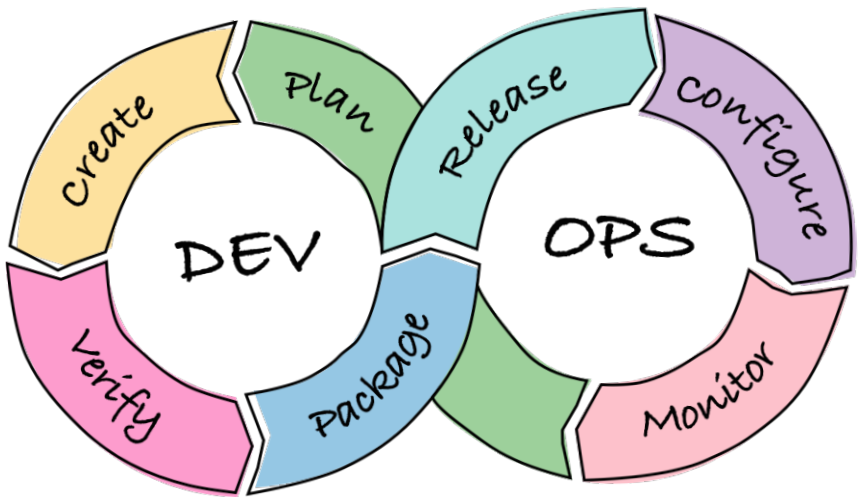
**Monitoring & logging.** Monitor metrics and logs to see how issues impact the user experience. Be proactive and fix things before users are aware an issue exists.

**Communication & collaboration.** Use tools and automation, including chat applications, issue or project tracking systems, and wikis to keep everyone informed.



Check out Building a DevOps culture and team.  
<https://ibm.biz/csmo-guide-devops>

Teamwork is critical for success!



Remove the silos. Work as a unified DevOps team.

# IBM Cloud Garage for cloud management

Your ideas plus IBM's proven expertise equal great solutions on a global scale. IBM service management subject matter experts have extensive experience with managing applications running on the cloud – private, hybrid and public. Cloud service management and operations reduces the cost of delivering cloud services and helps support and justify your investments.

## WHEN YOU DON'T KNOW, ASK THE EXPERTS.

**Start with an MVP.** Understand how to manage and operate on the cloud. Build your service management minimum viable product (MVP) and roadmap.

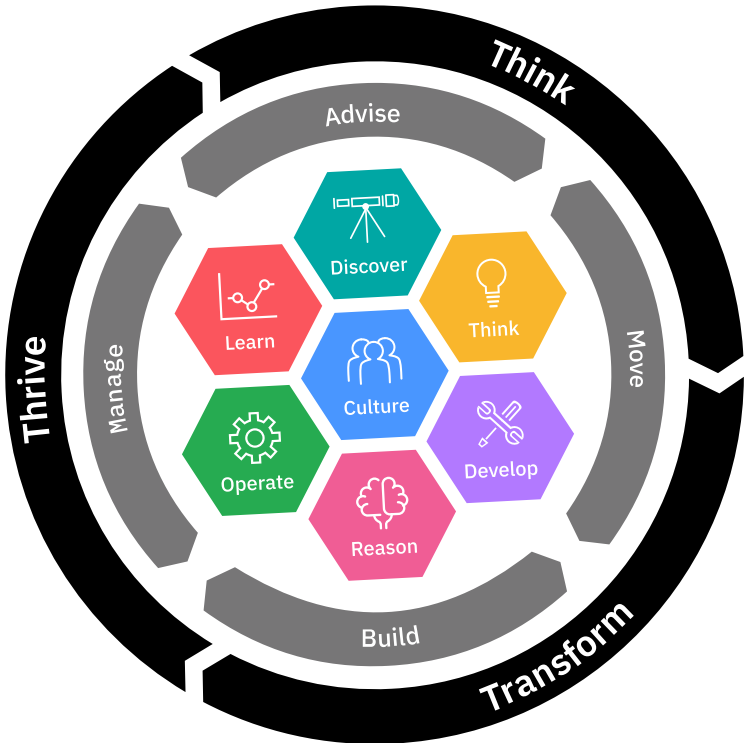
**Work with IBM SMEs.** Leverage the expertise of IBM SMEs who have extensive experience defining the processes and using the tools needed to operate and manage your applications and cloud environment.

**Implement and repeat.** Implement your MVP to demonstrate success quickly. Choose the next MVP on your roadmap and continue your operations transformation journey.



Check out the Garage Offering for Cloud Management.

<https://ibm.biz/csmo-guide-garage>



Apply the Cloud Innovate method to cloud service management & operations.

## Notes:

Reinvent your cloud operations

[https://ibm.com/cloud/garage/services/  
manage-offering](https://ibm.com/cloud/garage/services/manage-offering)



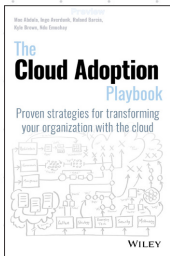
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## Explore the IBM Cloud Service Management Architecture

<https://www.ibm.com/cloud/garage/architectures/servicemanagementarchitecture>

\* Get the Book:



"The Cloud Adoption Playbook", available on [amazon.com](https://www.amazon.com)

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# IBM CLOUD SERVICE MANAGEMENT & OPERATIONS

