

SonicWall®
Secure Mobile Access 12.1
Central Management Server with
Global High Availability

Administration Guide

SONICWALL®

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About this Guide

This guide contains installation procedures and configuration guidelines for deploying the SonicWall® Central Management Server (CMS) with Global High Availability (Global HA) for Secure Mobile Access (SMA).

This guide provides the following information:

CMS Configuration

- [Introduction to CMS](#) describes the Central Management Server with Global High Availability and its features.
- [Installing and Configuring the Central Management Server](#) includes procedures for setting up and installing the CMS, setting up VPN appliances to be managed, defining the collection of managed appliances, and monitoring appliances from the CMS Dashboard.
- [Configuring Appliances for Central Management](#) includes information about configuring appliances for central management.
- [Using the Management Console Menus](#) explains the choices available with the CMS menus for operating and controlling the CMS and Managed Appliances. This includes information about Alerts, Configuration, Monitoring, and Maintenance.
- [Central User Licensing](#) includes information about the Central User Licensing (Pooled Licensing).
- [Global High Availability](#) describes the Always Online VPN service that is enabled for users when GTO is enabled.
- [Alerts and SNMP](#) contains information about how the CMS provides a new SNMP MIB that queries the CMS and managed appliances to get health and metrics data associated with the CMS as well as generating SNMP traps for critical alerts.
- [Capture Advanced Threat Protection](#) includes information about using the Capture ATP service to analyze various types of content for malicious behavior.

GTO Configuration

- [Introduction to Global HA and GTO](#) provides overview information about CMS with Global HA,
- [Planning GTO Deployment](#) describes how to configure the GTO service with CMS and ensure a highly available and optimized VPN infrastructure.
- [Setting up GTO](#) describes how to make deploying GTO easier by planning and adhering to a few guidelines.
- [Extending GTO Deployment](#) describes how to deploy and configure additional SMA appliances.

SonicWall Support

- [SonicWall Support](#) includes Information about contacting technical support.

Guide Conventions

The following conventions are used in this guide.

Guide Conventions

Convention	Use
Bold Text	Highlights field, button, and tab names. Also highlights window, dialog box, and screen names. Also used for file names and text or values you are being instructed to type into the interface.
<i>Italic Text</i>	Indicates the name of a technical manual, emphasis on certain words in a sentence, or the first instance of a significant term or concept. Italics text also represents a variable in an expression. It should be replaced with the real item, for example, a file name.
Menu Item > Menu Item	Indicates a multiple step Management Interface menu choice. For example, System > Status means select the Status page under the System menu.

CMS Configuration

- Introduction to CMS
- Installing and Configuring the Central Management Server
- Configuring Appliances for Central Management
- Using the Management Console Menus
- Central User Licensing
- Global High Availability
- Capture Advanced Threat Protection
- Alerts and SNMP

Introduction to CMS

Topics

- [Overview](#)
- [CMS Deployment Options](#)
- [What's New in This Release](#)
- [Central Management Server](#)
- [Central Management Console](#)
- [Managed Appliances](#)
- [Licensing CMS](#)
- [Central User Licenses](#)
- [Global Traffic Optimizer](#)
- [GMS Deprecation](#)
- [FIPS and CMS](#)
- [Getting Started in Five Steps](#)

Overview

This section is an introduction to the SonicWall™ Central Management Server (CMS) with Global High Availability (Global HA) and provides important concepts associated with it. CMS is an add-on product for managing multiple Secure Mobile Access (SMA) VPN appliances. It gives customers with multiple appliances a single administrative user interface from where they can manage all their VPN appliances. CMS is a virtual machine that interacts with the managed SMA appliances. CMS reduces the total cost of operation and simplifies the management of multiple VPN appliances for organizations.

Global HA enables SMA appliances to scale performance by deploying multiple appliances under the same service name (e.g. access.example.com). Global HA eliminates a single point of failure and provides resilience whether customers deploy 2 SMA appliances in the same data center or clusters of up to 100 physical and virtual appliances across multiple data centers around the globe. A distributed data store shares user session state and licensing information across the mesh network of SMA appliances in an active-active cluster. This allows for session persistence across data centers. In the event of a fail-over, users get connected to another appliance in the service. Their experience is frictionless and productivity is not impacted. The distributed data store also allows for central user licenses to be shared across appliances and data centers.

NOTE: SMA appliances in the Global HA mesh must be able to communicate with each other via their internet-routable IP addresses in order for them to be able to share information in the distributed data store.

The VPN administrator uses the Central Management Console (CMC) of the CMS to manage all the VPN appliances regardless of location. CMS and managed appliances are closely integrated through native communications secured with TLS.

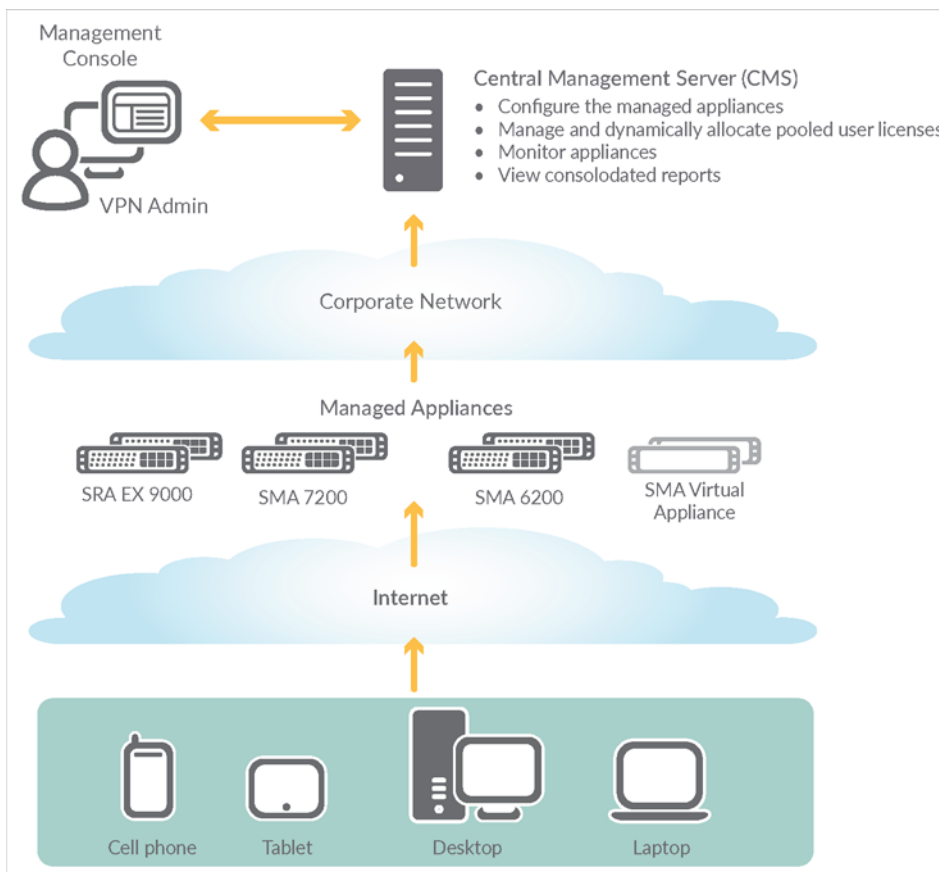
The CMS is a virtual machine, requiring no dedicated appliance or hardware, and provides the following features:

- A single dashboard for managing a distributed VPN infrastructure.
- Simplified license management with a centralized license that eliminates the need for separate appliance licenses. Licenses are shared by appliances
- Central Management Console (CMC) to configure, maintain, and monitor appliances.
- Reduced Total Cost of Operation (TCO) of the VPN infrastructure..
- Reduced operator errors associated with managing multiple appliances that may be in different data centers
- Centralized alerts via the console dashboard and SNMP traps.
- Global High Availability that is enabled with the Global Traffic Optimizer (GTO) service

This dashboard view in the CMC gives the administrator a summarized view of all managed appliances.

Administrators can apply a common configuration to managed appliances from the CMC. Consolidated monitoring and reporting gives the administrator an overview of all the appliances that are being managed.

An administrator can click on a single appliance in the CMC to launch the Appliance Management Console (AMC) for that appliance because of a single-sign on system.



CMS Deployment Options

Depending on your operational needs, CMS can be deployed in four phases:

- **Phase 1: Deploy CMS to only monitor and maintain standalone SMA appliances**
This gives you a dashboard view and a single console from which to monitor and maintain all your SMA appliances.
- **Phase 2: Enable Central User Licenses on CMS**
Central user licenses allows you to optimize user licenses across all your SMA appliances.
- **Phase 3: Use CMS to manage configurations**
A centralized policy on the CMS, that is normalized across all your SMA appliances, simplifies configuration management, and gives users a consistent experience when they get connected to any appliance in your VPN infrastructure.
- **Phase 4: Enable Global High Availability using the Global Traffic Optimization Service**
GTO provides a highly available VPN infrastructure where users connect to a single domain name (such as access.example.com) and get redirected to an available and proximate appliance. Central User Licensing and centralized policies are prerequisites for enabling GTO.

What's New in This Release

Version 12.1 of the Secure Mobile Access (SMA) Central Management Server (CMS) with Global High Availability (Global HA) includes these new features and changes:

- [Global High Availability](#)
- [Capture Advanced Threat Protection](#)

Global High Availability

[Global High Availability](#) (Global HA) facilitates global high availability with load distribution and disaster recovery capabilities across the SMA appliances in the GTO service. The high availability can be deployed in a single datacenter or across dispersed data centers.

Capture Advanced Threat Protection

[Capture Advanced Threat Protection](#) (Capture ATP) is a cloud-based service that analyzes various types of content for malicious behavior. This function is integrated with the WorkPlace File Explorer feature. When files are uploaded, the file can be sent to the Capture ATP service for analysis.

New User Licensing Options

SMA 12.1 provides new user licensing options:

- [Central Spike User Licenses](#)
- [Central Email Licenses](#)
- [Perpetual Pooled Licenses](#)

What's Deprecated in This Release

These features are no longer supported in SMA 12:

- [GMS Deprecation](#)

GMS Deprecation

SMA 12 does not support the SonicWall Global Management System (GMS). SMA 12 appliances must be managed by the Central Management Server (CMS).

Central Management Server

CMS is only available as a virtual machine. Details about the supported platforms is listed in [Supported Platforms for CMS with Global HA](#).

CMS can manage up to 100 appliances (physical and virtual appliances), but before an appliance can be managed it must be registered with CMS. CMS registration is secured with encryption using a one time password. Its purpose is to bootstrap TLS communication by exchanging public keys. Following registration all CMS/appliance communication is secured with TLS.

The CMS communicates with each managed appliance to receive:

- Data on the Control channel for configuring, licensing, maintaining appliances.
- Periodic health and status information from managed appliances.

CMS periodically communicates with MySonicWall for license validation. This ensures correct system wide timing and use of licenses.

CMS also requires access to the following two online services:

	SonicWall Licensing Server	SonicWall Geo Server
FQDN	software.sonicwall.com	geows.global.sonicwall.com
IP addresses	204.212.170.115 217.149.45.76	208.17.117.116
Ports	80 443	80 443

NOTE: CMS must also be able to communicate with the internal IP address on Port 8444 for each SMA appliance.

NOTE: Do not use more than one CMS for a single managed appliance.

Central Management Console

The Central Management Console (CMC) provides the user with a single screen (called the Dashboard) to show Active alerts, Appliance status, License status, and Geographic View of all appliances on a map of the world. The Dashboard also allows you, from a single point to:

- Configure appliances (using push configuration settings).
- Maintain appliances, that is, Upgrade/hotfix, EPC update, and Restart.
- Use a one-click (single sign-on) to the AMC of managed appliance.
- View health history and reports for all appliances.
- Configure alerts, manage alert notifications for appliances or CMS.
- Install a central user license. Central licenses are available to all appliances as user demand changes between appliances.

Managed Appliances

Managed appliances are SMA 1000 series appliances that are registered with the CMS so that they can be centrally managed.

Each managed appliance must be an SMA Version 12.1 (or later) SMA appliance. A group of managed appliances may consist of physical and/or virtual appliances.

In this document, the term SMA 1000 series appliance refers to the EX6000, EX7000, EX9000, SMA 6200, SMA 7200, and SMA 8200v appliances.

 **NOTE:** The Virtual Appliance name has been changed to the SMA 8200v virtual appliance.

Managed appliances send health and status information to the CMS. They accept policy configuration, user licenses, and maintenance commands from the CMS. Managed appliance communication with a CMS is secured with TLS.

 **NOTE:** CMS must be able to communicate with appliances on port 8444.

Licensing CMS

CMS has the ability to manage appliances licensed with different feature sets. Unlike SMA appliances, the CMS contacts the online SonicWall License Manager service to obtain its license.

 **NOTE:** SMA appliances download and import a license file from the MySonicWall portal.

To license the CMS initially, you enter the serial number and authentication code into the CMS console. The CMS then contacts the License Manager service and obtains its license. After that, the CMS periodically contacts the License Manager service to refresh its license.

A CMS Base License is available at no cost from MySonicWall. You enable a CMS Base License by entering the serial number and the authentication code. A CMS Base License allows you to manage three appliances. A CMS Base license comes with a trial for pooled licenses for a limited period of time. A CMS Base License enables you to use the CMS without pooled licensing. A CMS Base License enables you to manage and monitor licensed SMA appliances. You can upgrade from a Trial License to a Base License.

Central User Licenses (Pooled Licenses) are shared licenses that are available to CMS-managed appliances. To use pooled licensing, you must add Central User Licenses to the CMS Base License. Central User Licenses can be subscription licenses (valid for specific periods of time, such as 1 year or 3 years), or perpetual licenses (without an expiration date).

NOTE: CMS subscription licenses do not have SUPPORT SKUs. CMS subscription user licenses include support costs. CMS perpetual licenses require SUPPORT SKUs.

Central User Licenses

CMS supports an optional pooled licensing model that allows user licenses to be centralized on the CMS and available to the managed appliances. Individual VPN appliances no longer need their own license. Customers with appliances that are globally distributed can benefit from the fluctuating demands for user licenses due to time differences. Central user licenses are available to managed appliances where user demands have peaked when license demand has fallen in other regions due to off-work/night hours. For more information, refer to [Central User Licensing](#).

Global Traffic Optimizer

GTO allows customers to deploy a VPN infrastructure without the need for load balancers or global traffic management using a CMS and SMA 1000 series appliances. The SMA appliances may be located in a datacenter or globally distributed.

GTO allows customers to deploy the SonicWall GTO service. A GTO service is an online VPN service that is enabled by a cluster of SMA appliances working in concert to provide users with a highly available and optimized VPN infrastructure.

The GTO service distributes VPN connection requests from users to the appropriate SMA appliances. Load distribution is done using heuristics based on system parameters that are known and monitored by the GTO service. These parameters include appliance availability, appliance proximity to the user, user load, and appliance capacity.

NOTE: To use GTO with Connect Tunnel, Connect Tunnel must be upgraded to 11.4.0 or above.

FIPS and CMS

FIPS appliances with their own appliance-based license can be registered with a CMS.

- Central user licensing and GTO cannot be used with FIPS.
- A FIPS appliance configuration cannot be imported into the CMS.

Getting Started in Five Steps

- 1 Install and configure the CMS and apply the CMS license.
Refer to [Installing and Configuring the Central Management Server](#).
- 2 Configure GTO.
Refer to [Setting up GTO](#)
- 3 Setup the VPN appliances to be managed.
Refer to [Configuring Appliances for Central Management](#).
- 4 Define the collection of managed appliances.
Refer to [Add/Remove](#).
- 5 Monitor and manage appliances from the CMS Dashboard.
Refer to [Dashboard](#).

i | **NOTE:** When updating an SMA infrastructure that is already in place with upgrades and hotfixes, the managed SMA appliances are updated first, and then CMS is updated last.

Installing and Configuring the Central Management Server

Topics

- [Overview](#)
- [Supported Platforms for CMS with Global HA](#)
- [Hardware Resource Requirements](#)
- [Installation Files](#)
- [Setting Up a CMS](#)

Overview

The Central Management Server with Global High Availability (CMS with Global HA) is located inside a corporation's intranet. CMS requires a new type of license called a CMS License that is issued by SonicWall.

The CMS runs as a virtual machine that can be hosted on VMware ESX/ESXi or Microsoft Hyper-V. CMS is not designed to run on custom hardware such as VPN appliances.

CMS with Global HA provides the following features:

- Central Management Console (CMC) to monitor, maintain, and configure SMA appliances
- Simplified license management with a centralized license that eliminates the need for individual appliance licenses
- Centralized alerts via the console dashboard and SNMP traps
- Global Traffic Optimizer (GTO)

Supported Platforms for CMS with Global HA

CMS with Global HA runs as a virtual machine on the following hypervisor platforms:

Supported Platforms

VMWare	Microsoft
ESXi 5.5 or higher	Windows Hyper-V Server 2012 R2
	Windows Server 2016

CMS with Global HA is supported on the following SMA 1000 series appliances:

- EX6000
- EX7000
- EX9000
- SMA 6200
- SMA 7200
- SMA 8200v (ESX/Hyper-V)

Hardware Resource Requirements

The virtual instance of CMS requires the following hardware resources:

- 8 GB RAM
- 4 CPU

Installation Files

The Central Management Server should run the same firmware version as the appliances it manages.

- To install on VMware hypervisors, the Open Virtualization Archive (.OVA) file with the following file name format is available for import and deployment to your ESX/ESXi server: `ex_sra_vm_12.x.x-xxx.ova`
- To install in a Microsoft Hyper-V environment, use an International Organization for Standardization (.ISO) file such as: `12.x.x-xxx.iso`.

The 12.x.x indicates the SMA release version and xxx represent a build number.

i | **NOTE:** The same firmware is used for both the CMS and the SMA 8200v. The Central Management feature is enabled during the setup process.

For information on installing the SMA 8200v, refer to the *SMA 8200v Getting Started Guide*.

Setting Up a CMS

To setup a Centrally Managed VPN infrastructure:

- 1 Setup a virtual instance (ESX or Hyper-V) of the release firmware.
- 2 Start the virtual machine and wait for a login prompt to appear.
- 3 Login as **root** (no password is required).
- 4 Press any key to continue.
- 5 Enter the network settings for the internal interface (labeled **2** on the appliance).
 - IP Address
 - Subnet mask
 - Gateway

i | **NOTE:** If you are on the same network as the appliance, press **Enter** when prompted for the gateway.

6 Continue until instructed to access the console from a browser at <https://<Internal-IP-Address>:8443>.

This Setup Wizard guides you through a series of required and optional settings for getting the appliance up and running quickly:

Basic Settings: Set the password you'll use to administer the appliance, and the date and time.

Network Settings: Set the name of the appliance, which is used in log files, and the IP address and subnet mask for the internal and external network interfaces.

Routing: Configure the gateways for internal and external network traffic.

Name Resolution: Configure the domain name of the network to which the appliance will be connected and the internal DNS.

User Access: Create a basic security policy. You can change it later in the Appliance Management Console (AMC).

After you complete the Setup Wizard:

- You will be redirected to AMC. To log in, type "admin" in the Username box, and then enter the administrator password that you set on the Basic Settings page.
- Register your appliance on MySonicWALL (www.mysonicwall.com). Registration gives you access to essential resources, such as your license file and updates. In order to register, you need both the serial number for your appliance, and its authentication code, which is visible on the General Settings page in AMC.

7 Click **Next** to view the License Agreement.

Welcome

License Agreement

Basic Settings

Network Settings

Routing

Name Resolution

User Access

Completion

License Agreement

To continue with setup, you must accept the terms of the End User License Agreement. Please read the agreement carefully.

SonicWall End User Product Agreement

PLEASE READ THIS AGREEMENT CAREFULLY BEFORE USING THIS PRODUCT. BY DOWNLOADING, INSTALLING OR USING THIS PRODUCT, YOU ACCEPT AND AGREE TO THE TERMS AND CONDITIONS OF THIS AGREEMENT. FOR DELIVERIES OUTSIDE THE UNITED STATES OF AMERICA, PLEASE GO TO [HTTPS://WWW.SONICWALL.COM/LEGAL/EUPA.ASPX](https://www.sonicwall.com/legal/eupa.aspx) TO VIEW THE APPLICABLE VERSION OF THIS AGREEMENT FOR YOUR REGION. IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS OF THIS AGREEMENT OR THE APPLICABLE VERSION OF THIS AGREEMENT FOR YOUR REGION, DO NOT DOWNLOAD, INSTALL OR USE THIS PRODUCT.

This SonicWall End User Product Agreement (the "Agreement") is made between you, the Customer ("Customer" or "You") and the Provider, as defined below.

1. Definitions. Capitalized terms not defined in context shall have the meanings assigned to them below:

I accept the terms of the license agreement

I do not accept the terms of the license agreement

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Secure Mobile Access

8 Read the agreement and if you agree, select **I accept the terms of the license agreement**.

- 9 Click **Next** to select Basic Settings.

Basic Settings

Central Management

This appliance can manage the licensing and configuration of up to 100 appliances.

Install this appliance as the central management server for a pool of appliances

Administrator password

Specify the password you will use to access the Appliance Management Console (AMC). Your password must be at least eight characters long.

Enter password: *

Confirm password: *

Date and time

Please select a time zone below. To set the current time, click **Change**. If you wish to synchronize the time with an NTP server, it can be configured later in AMC.

Time zone:

Current time: Mon Sep 14 2015 13:30:11 GMT [Change](#)

- 10 Select **Install this appliance as the central management server for a pool of appliances**.
- 11 Under **Administrator password**, enter the password you want for the administrator and confirm it.
 - IMPORTANT:** Be sure to save or write this password down in a secure location. It is encrypted and is difficult to recover if you forget it.
- 12 Under **Date and time**, select the time zone from the **Time Zone** menu.
- 13 Click **Next**.

Network Settings

Enter a name to identify your appliance as well as the IP address and subnet mask for the internal and external network interfaces. If you are using a single gateway in your DMZ, you should select "Single Interface".

Appliance name: *

Dual interfaces Single interface

Internal Interface

IP address: *

Subnet mask: *

This is the interface connected to your private internal network.

External Interface

IP address: *

Subnet mask: *

This is the interface connected to the Internet.

- 14 Enter a descriptive name in the **Appliance name** field.

15 Select the **Single interface** option.

i | **IMPORTANT:** CMS should not be set up with a dual interface. HA Pairs are no longer supported.

16 Enter the **Internal Interface IP address** and **Subnet mask**.

17 Click **Next**.

Routing

To leverage an existing router, select the dual gateway option to reach your resources. To restrict incoming appliance traffic to only a few routes or subnets, select a single gateway option and enter the routes or subnets as static routes later in AMC.

If you plan to access AMC from a computer on a different subnet than the appliance (172.31.4.222/255.255.0.0), you must configure an internal gateway that will pass traffic to that subnet. Alternatively, you can define a static route later in AMC to the subnet from which the appliance is to be accessed.

Routing mode:

Internal gateway IP address: * This gateway is used for internal network traffic. It must be on the same subnet as the internal interface (172.31.4.222/255.255.0.0).

External gateway IP address: * This gateway is used for external network traffic. It must be on the same subnet as the external interface (10.4.124.222/255.255.248.0).

18 From the **Routing mode** menu, select **Default gateway**.

19 In the **Default gateway IP address** field, enter the gateway IP address.

20 Click **Next**.

Name Resolution

Specify the domain in which the appliance is located and the primary DNS server used for name resolution. This allows the appliance to reach resources on your internal network by name.

Default domain: * The domain in which the appliance is located (such as example.com).

DNS Server: Enter the IP address for your primary DNS server. More DNS servers can be added later in AMC.

21 Enter your domain in the **Default domain** field.

- 22 Enter the IP address of the primary DNS server into the **DNS Server** field.
- 23 Click **Next**.

Central Management

This server manages the licensing and configuration for a collection of appliances.

Locale

Country:

Location:
Example: Seattle, WA

Policy Synchronization

Enable pushing policy configuration from this server to managed appliances.

- 24 Under **Locale**, enter the **Country** and the **Location**.
- 25 Select **Enable pushing policy configuration from this server to managed appliances**.
- 26 Click **Next**.

Completion

You have successfully completed the Setup Wizard.

To apply your settings, click **Finish**. After your settings have been applied, you will be directed to AMC where you can login using the password you supplied earlier.

Appliance Settings

Date and time:	Mon Sep 14 2015 13:32:48 GMT
Central management server:	Yes
Clustered:	No
Appliance name:	CMS-90
Internal interface:	172.24.0.1
External interface:	Disabled
Routing:	Default gateway (172.24.0.1)
Default domain:	win2012.com
DNS server:	8.8.8.8
Full network access:	OnDemand Tunnel disabled
Access policy:	Unknown

- 27 Click **Finish**. The configuration changes are applied and a **Logon** screen appears.

Secure Mobile Access
Central Management Console

Please log in

Username:

Password:

Log in using: Management Console ▼

28 Login with username **admin** and the password that you just configured. The **Central Management Console (CMC) Dashboard** Page appears.

Management Server

Dashboard

- Alerts
- Configure
- Monitor
- Maintain

Managed Appliances

- Add/Remove
- Configure
- Monitor
- Maintain

Alerts

None

Appliances Appliance table ▼

Name	Status	Users	CPU	Mem	Mbps	Uptime
No data available in table						

Showing 0 to 0 of 0 entries

Appliance load

No appliances

Central license usage Daily ▼

Click [here](#) to enable central user licensing. The current license will support 15 concurrent user sessions across all appliances.

About

Model: SonicWall Secure Mobile Access CMS
Hypervisor platform: Microsoft HyperV
Version: 12.1.0-03524
Hotfixes: None
System times: Tue Jan 23 15:14:06 GMT 2018
Uptime: 0 days 3 hours 57 mins
License: 3 appliances, 15 Full users, 0 Email users

You can now download and install a CMS license from MySonicWall.com. Refer to [Licensing Pages](#).

SMA 12.1 Central Management Server with Global High Availability Administration Guide
Installing and Configuring the Central Management Server

21

Configuring Appliances for Central Management

Topics

- [Overview](#)
- [Firmware Compatibility with the CMS](#)
- [Enabling Central Management and Registering an SMA Appliance with the CMS](#)
- [Previously Configured Appliances](#)

Overview


This section describes how to configure SMA appliances for CMS with Global HA, so that they become Managed Appliances.

A CMS can manage up to 100 appliances. Managed Appliances can be any combination of physical and virtual appliances (for example, EX6000, EX7000, EX9000, SMA 6200, SMA 7200, and SMA 8200v).

Firmware Compatibility with the CMS

CMS can only manage appliances running compatible firmware versions. It must be at the same firmware version as the managed appliances for features like Global High Availability to work across the cluster of appliances.

CMS can be used to manage appliance that have been upgraded to a new release that is one version above the CMS version. However, newer features on the managed appliances may not work until the CMS is upgraded to the same version as all the managed appliances.

 **NOTE:** CMS cannot manage an appliance that exceeds one major version ahead of the CMS.

For more information about upgrading CMS and its managed appliances, refer to the *SMA 12.1 Upgrade Guide*.

Enabling Central Management and Registering an SMA Appliance with the CMS

Before an appliance can be registered with the CMS, it must first be enabled for Central Management. In addition, the CMS must have an unused appliance license (obtained from the CMS license) before an SMA Appliance can be registered. The administrator must enable Central Management and type the One-Time

Password into the console of the SMA appliance. In addition the administrator must register the appliance with the CMS.

The One-Time Password is used to establish a secure channel, and all subsequent communications go through the secure channel. The appliance uploads its information (model, version, serial#) to the CMS. The CMS pushes a Leased License to the appliance, and then (if configured), pushes the configuration settings to the appliance.

The managed appliance is now online and ready to accept VPN connections.

i | **NOTE:** After you have registered a SMA 8200v appliance with a CMS, you cannot re-register it to a different CMS.

To enable central management:

- 1 Go to the **System Configuration > Maintenance** page.

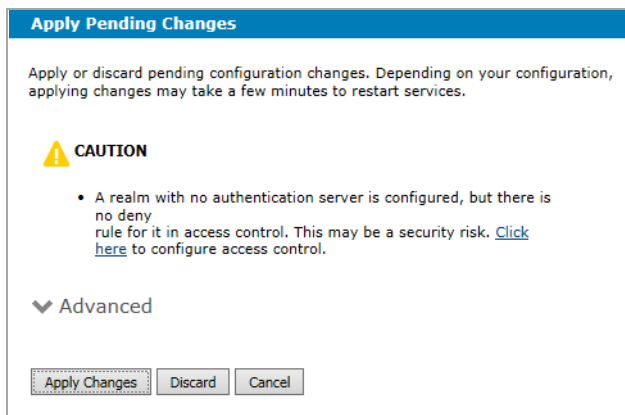
The screenshot shows the 'Maintenance' page with a 'Maintenance Tasks' tab. It displays system information for a SonicWall Secure Mobile Access 8200v appliance, including version 12.1.0-03524 + hotfixes, time since last reboot (3 Days 11 Hours 43 Minutes 34 Seconds), and number of current users (0). Below this are three buttons: 'Restart...', 'Shutdown...', and 'Reset...'. The 'System configuration' section contains 'Import or export' and 'Central Management' options. The 'System software updates' section contains 'Update' and 'Rollback' options. The 'Advanced' section contains 'Configuration extensions' and 'Apply All' options.

- 2 Click **Configure** under **Central Management** in the **System Configuration** section.

The screenshot shows the 'Configure Central Management' dialog box. It includes the breadcrumb 'Maintenance > Configure Central Management' and the text 'Include this appliance in a pool of appliances that is managed by a central management server.' There is a checked checkbox for 'Enable central management'. A blue information icon is followed by the text 'Apply pending changes to create a one time password.' At the bottom are 'Save' and 'Cancel' buttons.

- 3 Verify that **Enable central management** is selected.
- 4 Choose **Save**.

- 5 Click on the link to **Apply Pending Changes**.



Apply Pending Changes

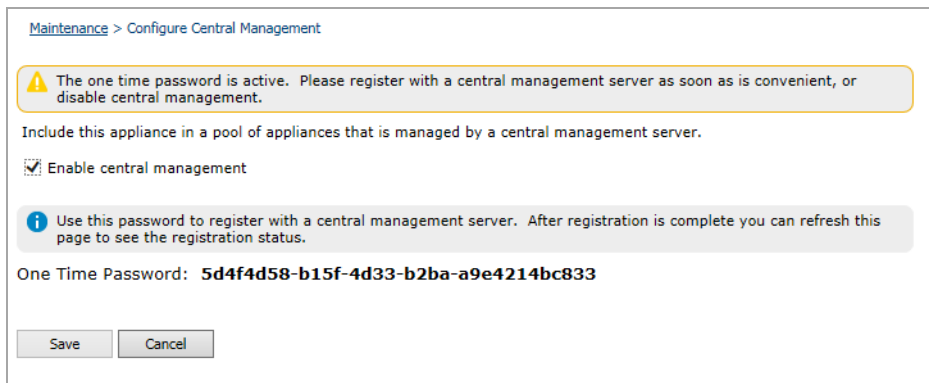
Apply or discard pending configuration changes. Depending on your configuration, applying changes may take a few minutes to restart services.

CAUTION

- A realm with no authentication server is configured, but there is no deny rule for it in access control. This may be a security risk. [Click here](#) to configure access control.

▼ Advanced

- 6 Click **Apply Changes**. The one time password is now active and the appliance is ready to be registered by the CMS.



Maintenance > Configure Central Management

! The one time password is active. Please register with a central management server as soon as is convenient, or disable central management.

Include this appliance in a pool of appliances that is managed by a central management server.

Enable central management

i Use this password to register with a central management server. After registration is complete you can refresh this page to see the registration status.

One Time Password: **5d4f4d58-b15f-4d33-b2ba-a9e4214bc833**

Previously Configured Appliances

Standalone appliances that were originally configured from their AMC can be registered with a CMS without affecting the appliance's policy settings.

For information on how to synchronize (or not) policy on an appliance from the CMS, refer to [Configure](#).

Using the Management Console Menus

Topics

- [Overview](#)
- [Management Server](#)
 - [Dashboard](#)
 - [Alerts](#)
 - [Configure](#)
 - [Monitor](#)
 - [Maintain](#)
- [Managed Appliances](#)
 - [Add/Remove](#)
 - [Configure](#)
 - [Monitor for Managed Appliances](#)
 - [Maintain for Managed Appliances](#)

Overview

The Central Management Console is the interface you use to manage all the registered VPN appliances. The menu is listed on the left and the content of the window varies depending on the option selected. When you first login to the console, the Dashboard page is the default screen that appears.

The menu has two sections: Management Server and Managed Appliance. Management Server has the commands for central management, licensing and so forth. Managed Appliances have the commands for managing the registered VPN appliances in your infrastructure.

Management Server

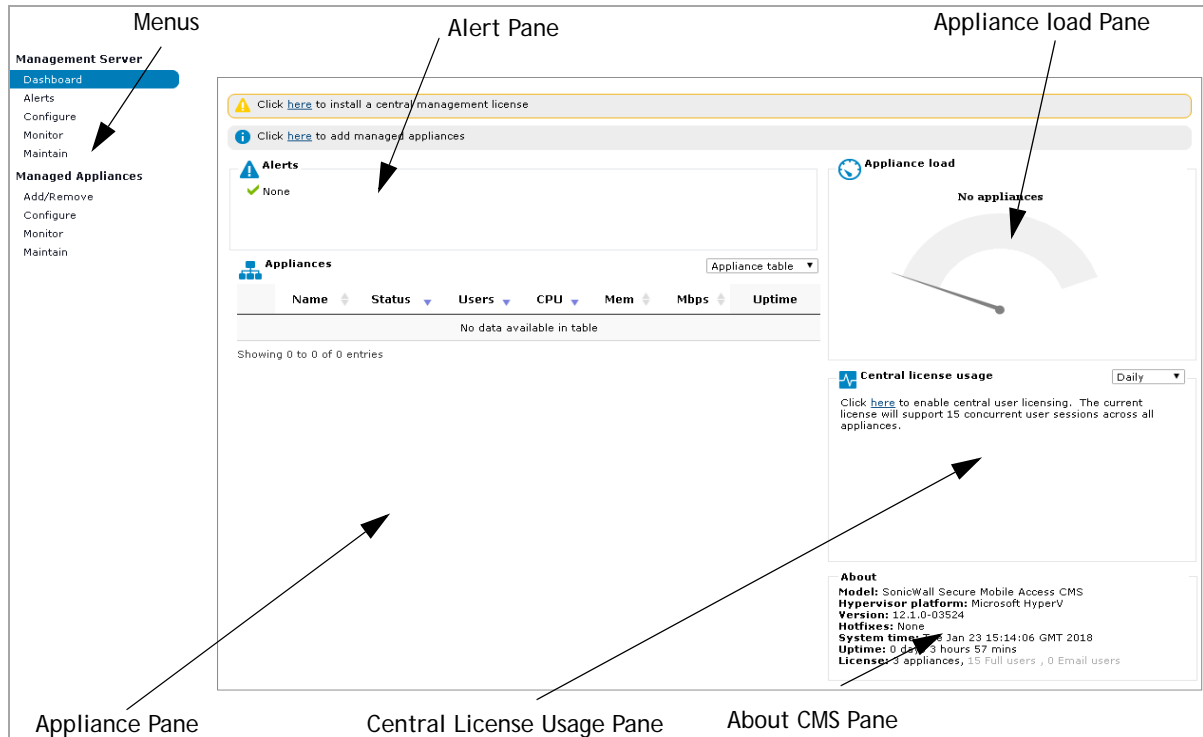
This section provides information about the Management Server commands:

- [Dashboard](#)
- [Alerts](#)
- [Configure](#)
- [Monitor](#)
- [Maintain](#)

Dashboard

The **Dashboard** page is the first screen that appears after you log in. You can also access it anytime by clicking **Management Server > Dashboard** from the menus.

The Dashboard is divided into the sections illustrated and explained below.



- **Menu** - Contains the commands for central management of your devices.
- **Alerts** - Contains a list of currently active alerts. Select an Alert to view more information.
- **Appliance load** - an estimate of the current load on an appliance based on metrics such as CPU and memory usage.
- **Appliances** - Shows all online appliances. Select a managed appliance to view information about it. Appliances are sorted starting with the appliance with the most users.
- **Central License Usage** - Displays information about license usage.
- **About** - Displays CMS Information consisting of Model, Hypervisor platform, Version, Hotfixes, System Time, Uptime, License.

Each pane is independently refreshed with updated information/status.

The Dashboard panes use the following color codes:

- Green (OKAY)
- Yellow (WARNING)
- Red (ERROR)

Alerts Pane

The **Alerts** pane on the Dashboard shows a consolidated view of all currently active alerts that have not been acknowledged by the administrator. These alerts appear when specific thresholds are met. Warnings and Errors are shown on the CMC Dashboard.



Red icons represent critical alerts and yellow icons represent warnings. Errors are listed first, followed by warnings with the most recent being listed at the top of each category.

Alerts can be acknowledged by the administrator by clicking on the X to the right of it. An acknowledged alert no longer appear in the dashboard, but it re-appears if the state changes. Alerts are automatically removed if the cause of the alert ceases. Click on an individual alert to see the details.

All alerts can be seen when you chose the **Alert** command. Refer to [Alerts](#) for more details.

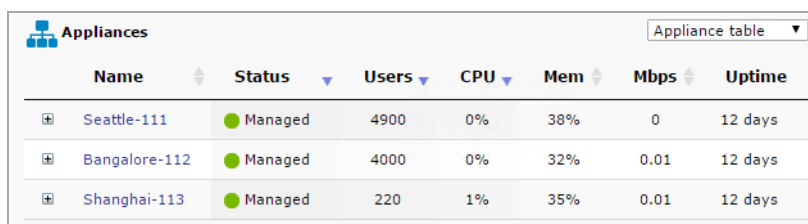
Appliances Pane

The **Appliances** pane displays a quick overview of the appliances being managed. It provide real-time data for online, managed appliances and includes:

- Name
- Status
- Users
- CPU usage
- Memory usage
- Mbps, Uptime.

The drop down menu on the top, right side provides toggling views of the appliances

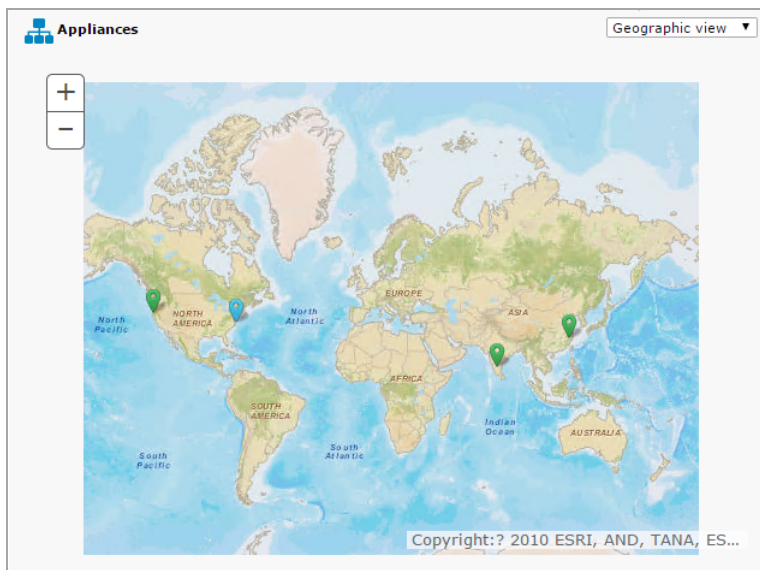
- The Appliance Table is the default view.



The screenshot shows the Appliances pane with a title bar containing a blue icon and the word "Appliances". On the right side of the title bar, there is a dropdown menu set to "Appliance table". Below the title bar, there is a table with the following columns: Name, Status, Users, CPU, Mem, Mbps, and Uptime. The table contains three rows of data:

Name	Status	Users	CPU	Mem	Mbps	Uptime
Seattle-111	Managed	4900	0%	38%	0	12 days
Bangalore-112	Managed	4000	0%	32%	0.01	12 days
Shanghai-113	Managed	220	1%	35%	0.01	12 days

- The Geographic View shows the geographic location of each appliance on a world map.



The Geographic View shows a visual location of the appliance based on its city and country obtained during configuration. You can reposition the icon for an appliance by dragging and dropping the icon to another location. You may need to do this if the icon for an appliance is not correctly positioned on the map, or if multiple appliance icons are positioned too closely to each other.

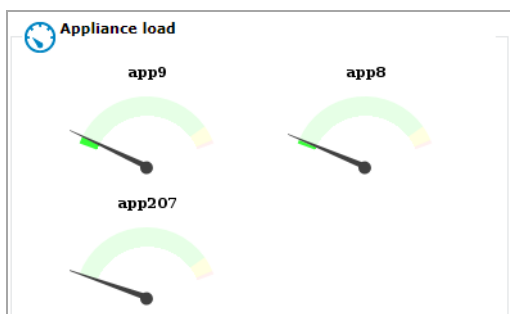
By moving your cursor across the colored icons on the map, details about that appliance appears. In addition, the color of the icon has meaning:

- A blue icon represent the CMS Server and displays Host name and address.
- A green icon represents a selected managed appliance that is online. The interface displays Host, Status, Users, CPU, Memory, Bandwidth information.
- A red icon represents an appliance that is offline.

Zoom (+) and UnZoom (-) buttons allow the map view to be changed. The last map viewed is saved.

Appliance Load Pane

The **Appliance load** pane displays an estimate of the load level of the appliance based on metrics such as CPU, memory usage, and the number of users logged into the appliance. For more information, see the [Appliances Pane](#).



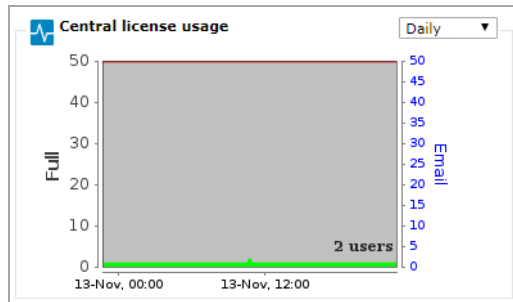
The dial for each appliance displays an estimate of how busy the appliance is:

- Green indicates that the appliance is not very busy.
- Yellow is a warning that the appliance is starting to get busy.

- Red indicates that the appliance is busy or has a 100% load; the user experience may degrade.

Central License Usage Pane

This **Central License Usage** pane displays the history of CMS user license consumption relative to the maximum license capacity. The drop-down menu allows you to change the display to different time periods, such as Now, Hourly, Daily, Weekly, Monthly, and Quarterly.



The graph displays the number of users as a function of time and colors are used to indicate the status of the licensing:

- Green indicates that the CMS license usage is running within the Central User Licensed capacity.
- Yellow indicates that the license capacity has reached 75%, the default threshold for a CMS license usage warning.
- Red indicates that the license capacity has reached 90% threshold, default threshold for the a CMS license usage alert.

About Pane

```

About
Model: SonicWall Secure Mobile Access CMS
Hypervisor platform: VMware
Version: 12.1.0-03524
Hotfixes: dt-hotfix-12.1.0-04072 pform-hotfix-12.1.0-04072
pform-hotfix-12.1.0-04087
System time: Mon Nov 13 22:16:12 GMT 2017
Uptime: 19 days 14 hours 21 mins
License: 5 appliances, 50 Full users , 50 Email users
  
```

The **About** pane displays the information about the Central Management Server:

- Model name
- Hypervisor platform and version number
- Installed hotfixes
- current system time
- current uptime statistics
- licensing summary

Alerts

CMS generates alerts that are either Warnings or Errors. Alerts are displayed prominently on the CMS dashboard and can also be accessed by selecting the **Alerts** menu option. Alerts typically originate from a condition that occurs on the CMS or on a managed appliance.

For detailed information about alerts and using alerts with SNMP, refer to [Alerts and SNMP](#).

To view and configure alerts:

- 1 Select **Management Server > Alerts**. This page has two tabs: **View Alerts** and **Configure Alerts**.

The **View Alerts** tab is the default view and shows all the alerts in table form. You can sort the table by clicking on the table headings to sort the data.

The screenshot shows the 'View Alerts' interface. At the top, there are two tabs: 'View Alerts' (selected) and 'Configure Alerts'. Below the tabs, there is a text area stating: 'View system alerts. You can also access the [Alerts](#) using the Management API to download a list of alerts in CSV format. [Click here](#) for more information on using the Management API.'

Below this, there are filter options: 'Filters (active: reset)'. The filters include:

- Description: [input field]
- Priority: [dropdown menu, currently set to 'All']
- Appliance: [dropdown menu, currently set to 'All']
- Acknowledged
- Cleared
- [Refresh button]

Below the filters, there is an 'Acknowledge' button with a close icon. The main part of the interface is a table with the following columns: Priority, State, Appliance, Description, and Time. The table contains 17 rows of alert data. The first 16 rows have a red 'X' icon in the Priority column, indicating they are cleared. The last row has a yellow warning triangle icon. The descriptions include 'License has expired', 'Unreachable for 1 day', and 'The datastore replication service is report...'. The times range from Mon Oct 23 2017 11:39:54 GMT to Thu Oct 26 2017 20:08:46 GMT.

At the bottom of the table, there is a link: '147 of 147 alerts shown (filtered) [Show all](#)'. Below the table, there is a link: 'Modify [alert notification](#) settings.'

- At the bottom of the page, click **alert notification**.

[Configure Alerts](#) > Configuration Alert Notification

Configure settings for alert notification

Notify recipients of:

- Critical alerts
- Warning alerts
- Acknowledged alerts
- Cleared alerts

Email settings

Email messages will be sent for the above events.

! Email alerts will not be sent because SMTP is not enabled. Go to the [SMTP settings](#) page to configure SMTP.

From address:

Alert notifications use the [SMTP settings](#) to send email messages.

Send email to the following recipients:

[+ New](#) [X Delete](#)

<input type="checkbox"/>	Name	Address	Enabled

[Save](#) [Cancel](#)

- Select the alerts for which you want to be notified:
 - Critical alerts
 - Warning alerts
 - Acknowledged alerts
 - Cleared alerts
- Under **Email Settings**, enter the Email address from which alert notifications is sent.
- To add an Email address to send alert notifications to, click the **New** button.
- Enter the **Name** and Email **Address** of the recipient to be notified and click **OK**. Repeat to add more recipients.

i **NOTE:** The **OK** option is location next to the email address field. You may need to expand the window to see it.
- Click **Save**.

Adding an Alert Trigger

To add an alert trigger:

- 1 Select to the **Configure Alerts** option.

The screenshot shows the 'Configure Alerts' interface. At the top, there are two tabs: 'View Alerts' and 'Configure Alerts'. Below the tabs, it says 'Configure system alerts'. There are filter options for Name, Measurement, Priority, and Enabled, all set to 'All', with a 'Refresh' button. Below the filters are buttons for '+ New', 'Delete', 'Disable', and 'Enable'. The main area is a table with columns: 'Pri', 'Name', 'Measurement', and 'Condition'. The table lists 18 alerts, including 'Unable to communicate with License Ma...', 'Temporary communication loss', 'Permanent communication loss', 'License has expired', 'License expires soon', 'High user license usage', 'High swap usage', 'High memory usage', 'High disk usage', 'High CPU usage', 'High appliance license usage', 'Critically high memory usage', 'Critically high CPU usage', 'Critically high appliance license usage', 'Certificate expired', and 'Certificate about to expire'. At the bottom, it says '18 of 18 alerts shown' and 'Modify alert notification settings.'

- 2 Click **New**.

The screenshot shows the 'Alerts > Add Alert Trigger' form. It has a 'Name:' field. Below it is a checked checkbox 'Alert trigger is enabled'. The 'Priority:' section has radio buttons for 'Critical' (selected) and 'Warning'. The 'When this measurement:' dropdown is set to 'CMS license usage'. The 'Meets this condition:' dropdown is set to 'Value is over the threshold'. Below that is a 'Threshold:' field with '0' entered and 'percent' as the unit. The 'Activate alert:' section has radio buttons for 'As soon as condition is met' (selected) and 'If condition is met for 0 minutes'. At the bottom are 'Save' and 'Cancel' buttons.

- 3 In the **Name** field, enter a name for the alert.
- 4 Select **Add trigger is enabled**.
- 5 Select the **Priority**.
- 6 Select the other conditions and options that you want.
- 7 Click **Save**.

Configure

The **Configure** option allows you to set various options for the Central Management Console. Select **Management Server > Configure** to see the options.

Central Management Settings

Configure CMS location, central user licensing, global traffic optimizer, and policy synchronization.

Licensing

License holder:	"SonicWall"
Maximum users:	15
Maximum appliances:	3
Appliance serial number:	004010277D29
Authentication code:	7P7MWAT2

General options

Client security:	720 minutes credential lifetime
Date and time	
Current time:	Wed Apr 26 2017 04:49:46 IST
Time zone:	GMT+05:30 India Standard Time (Asia/Kolkata)

Administration

Define administrators and authentication servers for managing the central management server.

Network Settings

Modify server IP address, routing, and name resolution.

Network Services

Modify settings for server services NTP, SSH, SNMP, and SMTP.

SSL Settings

Modify the management console certificate and SSL settings.

Topics:

- [Central Management Settings](#)
- [Licensing Pages](#)
- [General Options](#)
- [Administration](#)
- [Network Settings](#)
- [Network Services](#)
- [SSL Settings](#)

Central Management Settings

Use the **Central Management Settings** option to configure CMS location, central user licensing, Global Traffic Optimizer, and policy synchronization.

To configure the Central Management Settings:

- 1 Select **Management Server > Configure > Central Management Settings**.

Configure Server > CMS Settings

This central management server manages the licensing and configuration for a collection of appliances.

Locale

Country: Geographic server can't be accessed now. You can only change central management server's location by dragging it on [dashboard](#).

Location:
Example: Seattle, WA

Central User Licensing

Enable managing appliance user licensing with one central license. The current license will support 15 concurrent user sessions across all appliances.

Global Traffic Optimizer Service

i Central User Licensing must be enabled to activate the Global Traffic Optimizer Service

Users connect to this global high availability service from anywhere in the world and are routed to a nearby appliance.

Policy Synchronization

Enable pushing policy configuration from this server to managed appliances.

By default, configuration data on the destination nodes will be overwritten. To preserve certain settings on the destination, specify exclusions here.

Authentication servers

Nodes in the collection share centralized authentication servers
Overwrites the authentication server settings on the destination nodes.

Each node has its own authentication server
Retains authentication settings on the destination nodes, except in the case of a PKI server: trusted CA certificates cannot be retained.

- 2 Under **Locale**, enter your **Country** and **Location**.
- 3 Under **Central User Licensing**, select **Enable managing appliance user licensing with one central license**.
- 4 Under **Global Traffic Optimizer Service**, select **Users connect to this global high availability service from anywhere in the world and are routed to a nearby appliance**.

i | **NOTE:** Central User Licensing must be enabled to activate the Global Traffic Optimizer service.

- 5 Under **Policy Synchronization**, select **Enable pushing policy configuration from this server to managed appliances**.
- 6 Under **Authentication servers**, select one of the following:
 - **Nodes in the collection share centralized authentication servers**
 - **Each node has its own authentication server**
- 7 Click **Save**.

Licensing Pages

Use the Licensing option to review and manage the software licenses for CMS.

To manage the licenses:

- 1 Go to the **Management Server > Configure > Licensing** page. The default view is the Manage Licenses view.

[Configure Server](#) > Manage Licenses

Review and manage the software licenses for the CMS.

Product: SonicWall Secure Mobile Access CMS (Unlocked)
License holder: SonicWall Engineering
Maximum concurrent users: Full: 500 Email: 50
Maximum appliances: 500
Appliance serial number: 004010277D29
Authentication code: 7P7MWAT2
Licensing mode: Online, synchronized 7 hours, 25 minutes, 43 seconds ago

Component	License Type
Managed appliances: 500	Evaluation - Expires Wed Nov 22 2017
Central email licenses: 50	Evaluation - Expires Wed Nov 22 2017
Central user licenses: 500	Evaluation - Expires Wed Nov 22 2017

Online licensing

This appliance is registered with MySonicWall. Choose **Manage** to activate, upgrade or renew services. Choose **Synchronize** to synchronize this appliance with the licensed services on MySonicWall.

▼ Advanced

- 2 Review your license information.
- 3 Under **Online licensing**:
 - Choose **Manage** to activate, upgrade or renew services.
 - Expand the **Advanced** section to manage spike licensing.

[Configure Server](#) > [Manage Licenses](#)

Review and manage the software licenses for the CMS.

MySonicWall License Manager

mySonicWall.com Login

mySonicWall.com is a one-stop resource for registering all your SonicWall Internet Security Appliances and managing all your SonicWall security service upgrades and changes. mySonicWall provides you with an easy to use interface to manage services and upgrades for multiple SonicWall appliances. For more information on mySonicWall, please visit the [FAQ](#). If you do not have a mySonicWall account, please click [here](#) to create one.

Please enter your existing mySonicWall.com username (or email address) and password below:

MySonicWall username/email:

Password:

[Forgot your Username or Password?](#)

i **NOTE:** If you choose **Synchronize**, this appliance synchronizes with the licensed services on MySonicWall.

- 4 Login to MySonicWall with your MySonicWall credentials.
- 5 Follow the prompts to manage or create a license.

General Options

Use the **General Options** to control security settings for users and set the date and time.

To configure the General Options:

- 1 Select **Management Server > Configure > General Options**.

Client security settings

Control security settings for users. You can also enhance security using [End Point Control \(EPC\)](#).

Credential lifetime: * minutes

If the length of a session exceeds the time specified, the user is prompted to reauthenticate.

Date/time

To set the management server time click **Change** next to the current time, or [click here](#) to configure the management server to synchronize with one or more NTP servers. To set the time zone referenced on the management server and in the system logs, click **Change** next to the time zone.

⚠ Apply or discard pending changes before modifying the date, time, or time zone.

Current system time: Wed Apr 26 2017 05:49:32 IST

Time zone: GMT+05:30 India Standard Time (Asia/Kolkata)

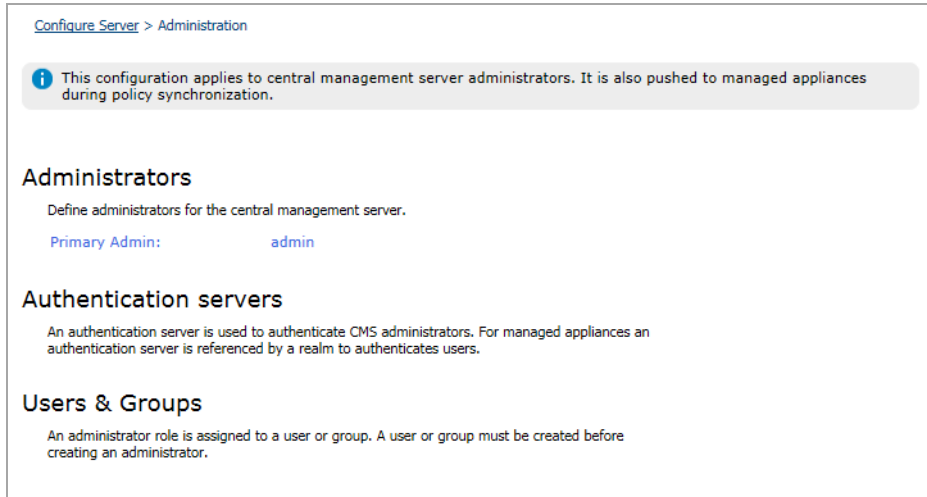
- 2 Set the credential lifetime in minutes. This refers to the length of a user session. If it exceeds the time specified the user is asked to re-authenticate.
- 3 Set the date and time, if needed.
- 4 Click **Save**.

Administration

Use the **Administration** option to define who the administrators are and what authentication server are used for managing the Central Management Server.

To configure the Administration settings:

- 1 Select **Management Server > Configure > Administration**.



The screenshot shows the 'Administration' configuration page. At the top, there is a breadcrumb trail 'Configure Server > Administration'. Below it is a grey information box with a blue 'i' icon and the text: 'This configuration applies to central management server administrators. It is also pushed to managed appliances during policy synchronization.' The page is divided into three main sections: 'Administrators', 'Authentication servers', and 'Users & Groups'. Under 'Administrators', there is a sub-section 'Primary Admin:' with the value 'admin'. Under 'Authentication servers', there is a descriptive paragraph. Under 'Users & Groups', there is another descriptive paragraph.

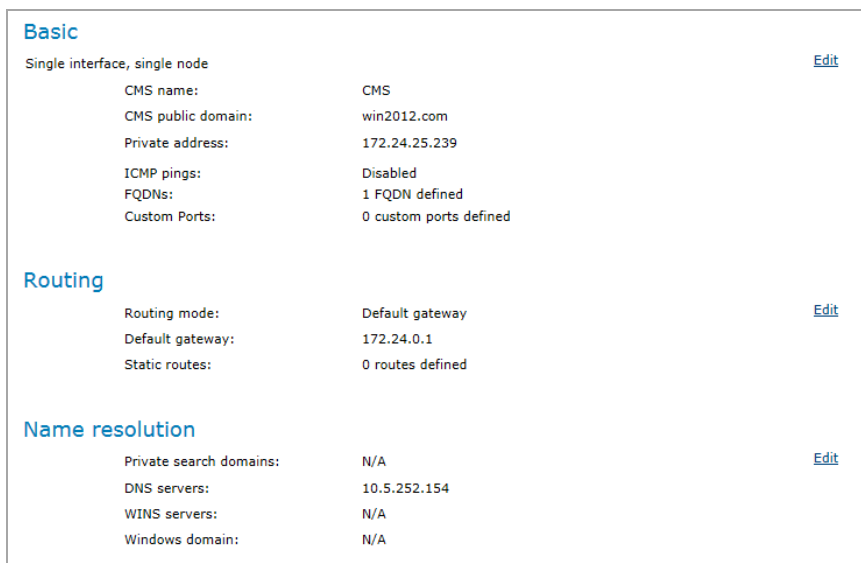
- 2 Select any of the three items: **Administrators**, **Authentication servers**, and **Users & Groups**.
- 3 Make the changes you want.
- 4 When finished, click **Save**.

Network Settings

Use Network Settings to modify server IP address, routing and name resolution.

To configure the network settings:

- 1 Select **Management Server > Configure > Network Settings**.



The screenshot shows the 'Network Settings' configuration page. It is divided into three sections: 'Basic', 'Routing', and 'Name resolution'. Each section has an 'Edit' link. The 'Basic' section shows: 'Single interface, single node', 'CMS name: CMS', 'CMS public domain: win2012.com', 'Private address: 172.24.25.239', 'ICMP pings: Disabled', 'FQDNs: 1 FQDN defined', and 'Custom Ports: 0 custom ports defined'. The 'Routing' section shows: 'Routing mode: Default gateway', 'Default gateway: 172.24.0.1', and 'Static routes: 0 routes defined'. The 'Name resolution' section shows: 'Private search domains: N/A', 'DNS servers: 10.5.252.154', 'WINS servers: N/A', and 'Windows domain: N/A'.

- 2 Click **Edit** to configure any of the **Basic**, **Routing**, or **Name resolution** settings.
- 3 When finished, click **Save**.

Network Services

Use the **Network Services** option to modify the settings for server services like NTP, SSH, SNMP and SMTP.

To configure Network Services:

- 1 Select **Management Server > Configure > Network Services**.
The **Network Services** page appears.

<p>NTP Synchronize the system clock with an external Network Time Protocol (NTP) server.</p> <p>Configure</p>	Status: Disabled
<p>SSH Use Secure Shell (SSH) to safely access the CMS command line from another host.</p> <p>Configure</p>	Status: Disabled
<p>SNMP Monitor the CMS from a Simple Network Management Protocol (SNMP) management tool.</p> <p>Configure</p>	Status: Disabled
<p>SMTP Allow the CMS to send email using a Simple Mail Transfer Protocol (SMTP) mail server.</p> <p>Configure</p>	Status: Disabled

- 2 Click **Configure** for the item you want to configure: **NTP**, **SSH**, **SNMP**, or **SMTP**.
- 3 Make the desired changes.
- 4 When finished, click **Save**.

SSL Settings

Use the **SSL Settings** option to modify the management console certificate and SSL settings.

To configure SSL settings:

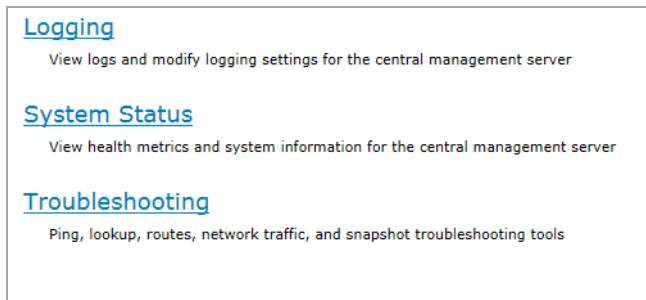
- 1 Select **Management Server > Configure > SSL Settings**.

SSL certificates	
<p>Management console certificate (CMC)</p> <p>192.168.0.10 (self-signed) Valid through: 10 Apr 2022</p>	Edit
<p>Virtual hosting certificates for WorkPlace sites and URL resources</p> <p>172.24.25.239, 192.168.0.10</p>	
SSL encryption	
<p>Protocols: TLS v1.2 or v1.1</p>	Edit
<p>Ciphers:</p> <p>ECDHE/ECDSA AES: 128 bit GCM with SHA-256 , 256 bit GCM with SHA-384 RSA AES CBC: 256 or 128 bit with SHA-256 , 256 or 128 bit with SHA-1 RSA DES: none RSA RC4: none Compression: disabled</p>	

- 2 Click **Edit** for the item you want to edit: **SSL certificates** or **SSL encryption**.
- 3 Make the desired changes.
- 4 When finished, click **Save** and **Apply Pending Changes**.

Monitor

The Monitor option allows you to set various options for monitoring. Select **Managed Server > Monitor** to see the options.



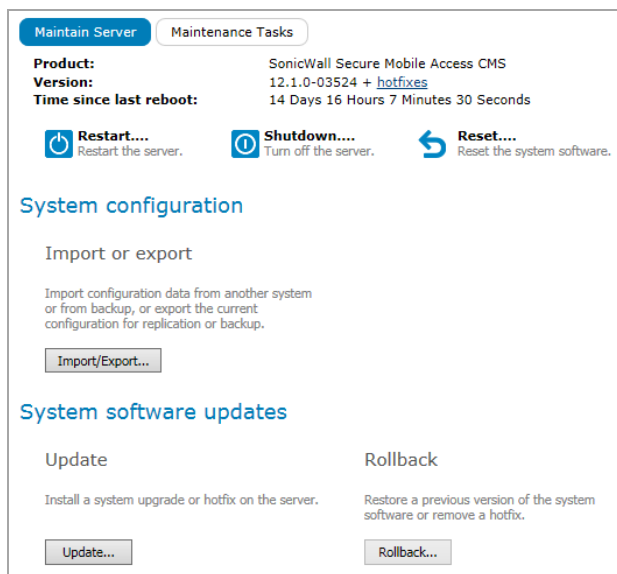
- To view or edit logging settings for the CMS, click **Logging**. Make the changes and click **Save**.
- To view health metrics and system information for the CMS, click **System Status**. Make the changes and click **Save**.
- To ping, lookup, view network traffic or use snapshot troubleshooting tools, click **Troubleshooting**. Make the changes and click **Save**.

Maintain

The Maintain option allows you to set various options for monitoring. Select **Managed Server > Maintain** to see the options. The default view is Maintain Server.

To maintain the CMS:

- 1 Select **Management Server > Maintain**.



- 2 Do any of the following:
 - To restart the CMS, click **Restart**.
 - To shutdown the CMS, click **Shutdown**.
 - To reset the CMS, click **Reset**.
- 3 To import or export a system configuration file, click **Import/Export**. Provide additional information on the next window.
- 4 To update the system software to a newer version, click the **Update** button.
- 5 To rollback the system software to a previous version, click the **Rollback** button.
- 6 Click the **Maintenance Tasks** button. In the **Task log** panel, you can view the tasks that are scheduled.

Maintain Server **Maintenance Tasks**

View, reschedule or delete maintenance tasks. All times are in the [server time zone GMT](#).

Task log

Filters (reset)

Start Date: 11/13/2017 End Date: 11/14/2017 Refresh

Time	Task	Run at	Status	Message
11/14/2017 07:27:41	Synchronize policy with app8, app9, app207	11/14/2017 07:21 GMT	✓ Succeeded	
11/14/2017 07:16:18	Synchronize policy with app8, app9, app207	11/14/2017 07:07 GMT	✓ Succeeded	
11/14/2017 07:15:09	Restart app207	11/14/2017 07:10 GMT	✓ Succeeded	
11/14/2017 05:40:36	Synchronize policy with app8, app9, app207	11/14/2017 05:33 GMT	✓ Succeeded	

Scheduled Tasks

Run at	Scheduled by	Task

*This task will restart the server after running.

Delete Run now Reschedule

- 7 Filter the **Task log** table by setting a **Start Date** and **End Date** and clicking **Refresh**.

NOTE: If the **Start Date** and **End Date** fields aren't visible, click on the plus sign (+) by **Filters**.
- 8 In the **Scheduled Tasks** panel, you can select a task and **Delete**, **Run now**, or **Reschedule**.

Managed Appliances

This section provides information about the Managed Appliances commands:

- [Add/Remove](#)
- [Configure](#)
- [Monitor for Managed Appliances](#)
- [Maintain for Managed Appliances](#)

- 5 Click **OK**. This registers the appliance with the CMS and adds it to the CMS list. The dialog changes with more options.

i **NOTE:** The client certificate warning, **DNS name** field, and **Public IP** field are only visible when CMS is enabled for GTO.

Finalize Appliance Settings

i 33 has been registered for central management. Please complete the following settings

Name*	<input type="text" value="app103"/>	The display name for this appliance
Internal IP or host*	<input type="text" value="176.14.25.212"/>	The internal IP address or host name for this appliance
Public IP*	<input type="text" value="12.8.122.5"/>	The appliance address that is routable from the Internet. Normally this should be the appliance external address
Public IPv6	<input type="text"/>	The appliance IPv6 address that is routable from the Internet. Normally this should be the appliance external IPv6 address
Country	<input type="text" value="▼"/>	The country where this appliance is located
Location	<input type="text"/>	The city, state or province where this appliance is located
<input checked="" type="checkbox"/> Enable Global Traffic Optimizer Service		Participate in the global high availability service qa.gto.com
DNS name	<input type="text" value="app103.access.example.com"/>	A unique DNS name for this appliance
<input type="checkbox"/> DNS authoritative server		This appliance will serve as a DNS authoritative server for qa.gto.com
<input type="checkbox"/> Send user connections to this appliance		Users connecting to qa.gto.com may be routed to this appliance

- 6 From the **Country** menu, select the country where the appliance is located.
- 7 In the **Location** field, enter the city, state, or province where the appliance is located.
- 8 Select the checkbox for **Enable Global Traffic Optimizer Service**.
- 9 In the **DNS name** field, enter a unique DNS-legal name for this appliance, for example **seattle01**.
- 10 In the **Public IP** field, enter the internet-visible, public IP address for this appliance.

i **NOTE:** The **Public IP** should be the address by which remote users will access this appliance. The default IP address is the external IP address of the appliance. The public IP address may be different from its external IP address if the public WAN addresses are using NAT at the DMZ.
- 11 Check the box for **DNS authoritative server** if this appliance will be delegated in public DNS as an authoritative server.
- 12 Check the box for **Send user connections to this appliance**, so that users connecting to access.example.com may be routed to this appliance.
- 13 Click **Save**.

To delete a managed appliance:

- 1 Select the appliance you want to delete.
- 2 Click the **Delete** button.
- 3 Click **OK**.

Configure

Topics:

- [Overview](#)
- [Configuring the Managed Appliances](#)

Overview

An administrator can import policies from an existing appliance and define configurations. Policies can be applied to all appliances or just a subset. An existing managed appliance configuration may be partially imported into the CMS to startup the CMS global configuration.

Services do not need to be restarted after this configuration.

The first time the CMS synchronizes a policy with an appliance, it overwrites the policy on the appliance. This is equivalent to the appliance partially importing the CMS configuration. After the initial policy synchronization, further policy synchronizations replicate the CMS configuration onto the appliance.

Also, after the initial policy synchronization, the administrator can manually modify the address pools of the appliance and the authentication servers. The administrator changes are not overwritten during subsequent CMS policy synchronizations.

The policy settings that are replicated during synchronization are:

- Security policy, including access control rules and EPC configuration
- Network resources
- Users and groups
- Realms
- Authentication servers (the authentication server names should match those on the sending node, even if the IP addresses do not).

i **NOTE:** When you define a collection of appliances, you have the option of either overwriting authentication server settings (which would be typical in a deployment where there is a shared, central server), or excluding server settings from being overwritten during replication.

- WorkPlace shortcuts
- CA certificates
- Certificate revocation lists downloaded from a remote CDP (CRL distribution point)
- Agent configuration, including graphical terminal agents (Citrix and Windows Terminal Server) and Web browser profiles
- Local user accounts
- Single sign-on profiles

The policy settings that are not replicated during synchronization are:

- Network settings, including IP addresses, routing information, name resolution settings (DNS and WINS), and the settings for the network services (NTP, SSH and SNMP)
- The unique list of fallback servers configured for your Connect Tunnel users
- License files
- SSL certificates

- WorkPlace configuration data (customized templates)
- Administrator user accounts and role definitions

i **NOTE:** You can optionally exclude authentication server settings from being overwritten during replication, which is typical for a deployment where each appliance has its own authentication server.

Configuring the Managed Appliances

Select **Managed Appliances > Configure** to see the configuration options.

Management Server	
Dashboard	
Alerts	Define Policy Define the central policy for managed appliances.
Configure	
Monitor	Synchronize Policy Synchronize appliance policies with the central policy.
Maintain	
Managed Appliances	
Add/Remove	
Configure	
Monitor	
Maintain	

- The **Define Policy** option provides access to the **Security Administration**, **User Access**, and **System Configuration** policy pages.
- The **Synchronize Policy** option allows you to view and schedule policy synchronization events.

Define Policies

To define policies:

- 1 Go to **Managed Appliances > Configure > Define Policy**.

<p>Security Administration</p> <p>Access Control Review and manage your access control rules.</p> <p>Resources Manage web, network, and file system resources. Manage resource groups and variables.</p> <p>Users & Groups Manage users and groups</p> <p>User Access</p> <p>Realms A realm references an authentication server and determines which access agents are provisioned to your users and what end point control restrictions are imposed.</p> <p>Network Tunnel Service Manages TCP/IP connections from the network tunnel clients (Connect Tunnel and OnDemand Tunnel).</p> <p>Web Proxy Service Manages HTTP and TCP/IP connections from web browsers, OnDemand, and Connect Tunnel.</p> <p>WorkPlace Manage workplace shortcuts, shortcut groups, sites, appearance, and settings.</p> <p>Agent Configuration Manage access agents and other agents.</p> <p>End Point Control Manage end point control settings.</p>
--

- 2 Under **Security Administration**, define
 - **Access Control**
 - **Resources** (web, file, group and variables)
 - **Users & Groups**
- 3 Under **User Access**, define:
 - Realms
 - Network Tunnel Service
 - Web Proxy Service
 - WorkPlace
 - Agent Configuration
 - End Point Control
 - Capture Advanced Threat Protection
- 4 Under **System Configuration**, define:
 - Administrators
 - Authentication Servers
 - CA certificates
 - OSCP (Online Certificate Status Protocol)
- 5 When you are finished defining a policy, click **Save** or **OK**.

Synchronize Policy

To synchronize a policy:

- 1 Go to **Managed Appliances > Configure > Synchronize Policy**.

Configure Appliances > Synchronize policy

Push policy data to the selected appliance(s).

<input type="checkbox"/>	Name	Status
<input checked="" type="checkbox"/>	app8	Last synchronization: ✔ Tue Nov 14 2017 07:10:36 GMT
<input checked="" type="checkbox"/>	app9	Last synchronization: ✔ Tue Nov 14 2017 07:12:47 GMT
<input checked="" type="checkbox"/>	app207	Last synchronization: ✔ Tue Nov 14 2017 07:16:01 GMT
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		

Advanced

Force selected appliances to import the CMS policy

Synchronize configuration:

Now

At : GMT on

- 2 Click **Advanced** to open the **Advanced** panel.

- 3 Select the **Force selected appliance to import the CMS policy** checkbox. This triggers the next synchronization (or scheduled sync) to overwrite the policies of the selected appliances with the CMS policy (just as the initial policy synchronization would). This is a way to reset appliance policy to the baseline CMS policy.
- 4 Select **Now** if you want to synchronize immediately, or select **At** and choose the time and date from the drop-down menus to schedule the synchronization.
- 5 Click **Synchronize**.

Synchronizing a policy does not usually terminate existing user sessions. If a synchronization does terminate any user sessions, a warning message is displayed for that appliance on the **Sync Policy** page.

Monitor for Managed Appliances

The Monitor option for Managed appliances provides detailed information on **User Sessions, Reports** and **Health**. Select **Managed Appliances > Monitor** to see the options.

[User Sessions](#)
View current and past user sessions and terminate current sessions.

[Reports](#)
View reports on appliance user activity.

[Health](#)
Monitor appliances CPU, memory and disk usage.

User Sessions

On the **User Sessions** page, you can view current and past user sessions and terminate current sessions.

If you select a session and then select the **Terminate session-restrict logins** option, it temporarily disables the user's access for up to 10 minutes.

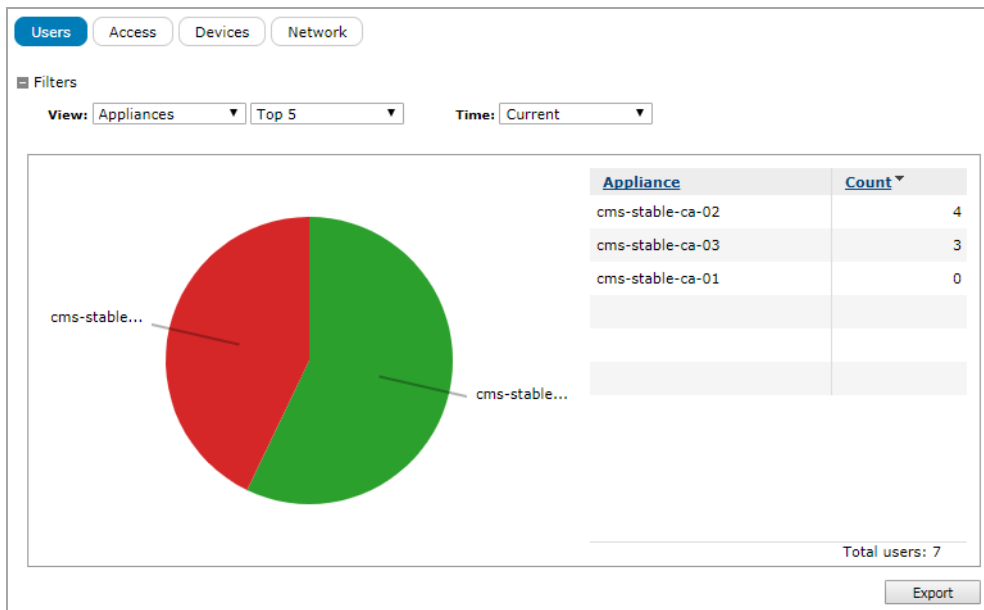
To monitor user sessions:

- 1 Go to the **Managed Appliances > Monitor > User Sessions**.

- 2 Define the how the data appears in the table:
 - a In the **View** field, select the number of users to show per page.
 - b In the **sessions** field select the type of session to view: **Licensed**, **All open**, or **All**.
 - c From the drop-down menus under **Filters**, select the items you want to view or manage.
- 3 If you want to filter the data further, select options from the drop down lists under **Appliance**, **Login status**, **Realm**, **Community**, **Zone**, **Agent**, and **Platform**.

Reports

On the **Reports** page, you can view reports about Users, Access, Devices, and the Network.



- **User** — View reports that show the number of user sessions on appliances or realms, for example, the number of user sessions currently on selected appliances, or the count for each of the top five realms of licensed users for the last day.
- **Access** — View reports that show the policy rules matched and destinations accessed by users on managed appliances, for example, the top five permit rules and how many times they have been enforced over the last hour, or the count for each of the top five most accessed destinations over the last day.
- **Devices** — View reports that show the platforms and zones in use by users, for example, a user's platform distribution for the last week, or a user's zone placement count for the last month.
- **Network** — View reports on the bandwidth consumption of appliances and the data transferred to users. For example, the top five users who transferred the most data and how much they transferred over the last hour or over the last three months, or view the top five appliances that consume the most bandwidth and how much they are currently consuming.

To view the reports:

- 1 Select the category: **Users**, **Access**, **Devices**, or the **Network**.
 - 2 From the drop down lists, select the options for **View**.
- NOTE:** The option for the View fields vary according to the type of report selected.

- 3 Select an option from the **Time** drop down list.

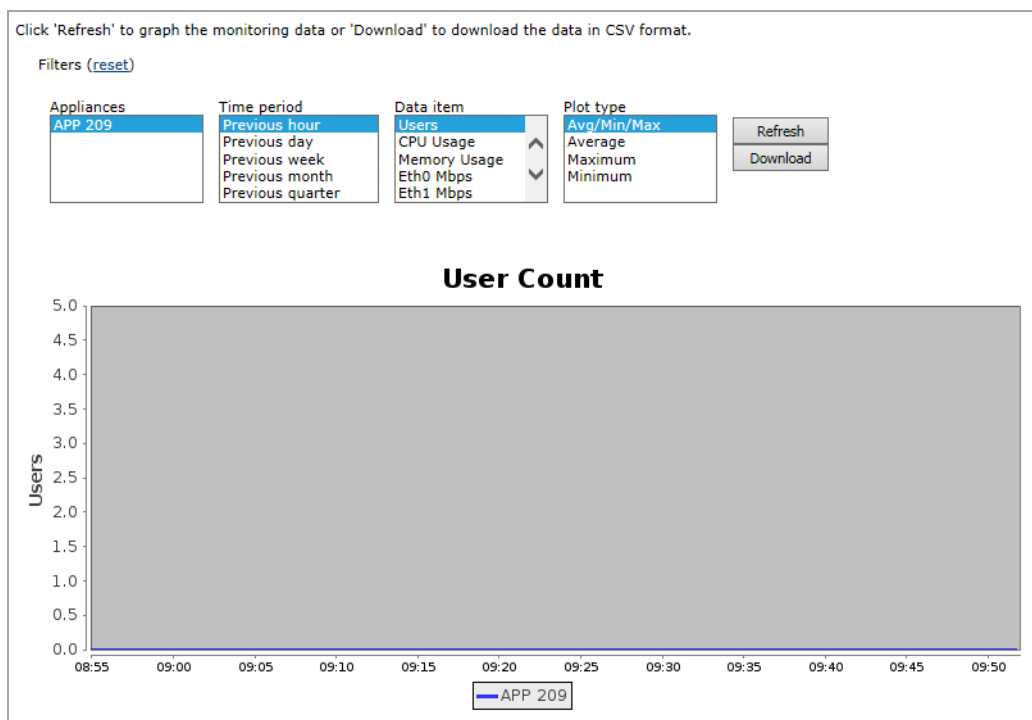
The display adjusts according to the selections made. Select **Refresh** to refresh the data in the report. Select **Export** to export the data to a CSV file.

Health

On the **Health** page, you can set up and monitor various health metrics on a graph that charts users against time. The data is downloadable to a CSV file.

To monitor health metrics:

- 1 Go to the **Managed Appliances > Monitor > Health**.



- 2 From the **Appliances** menu, select the appliance you want to graph.
- 3 From the **Time period** menu, select the time period you want the graph to display.
- 4 From the **Data item** menu, select the data you want the graph to display.
- 5 From the **Plot type** menu, select the type of graph you want to plot.
- 6 Select **Refresh** to refresh the data or select **Download** to download the data to a CSV file.

Maintain for Managed Appliances

To maintain a managed appliance:

- 1 Go to the **Managed Appliances > Maintain** page. This page has two options: **Maintain Appliances** and **Maintenance Tasks**.

<input type="checkbox"/>	Name ^	Host	Platform	Version	Hotfixes	EPC version	Pending Changes
<input type="checkbox"/>	SMA 8200v	172.24.25.209	SonicWall Secure Mobile Access 8200v	12.1.0-035	None	17.03.22.11	No

- 2 Under the **Maintain Appliances** tab, check the box for an appliance and use the buttons across the top to perform any of the following tasks: **Restart**, **EPC Update**, **Upgrade/Hotfix**.
- 3 Select the **Maintenance Tasks** tab.

View, reschedule or delete maintenance tasks. All times are in the [server time zone IDT](#).

Task log

Filters (reset)

Start Date: 04/25/2017 End Date: 04/26/2017 Refresh

Time	Task	Run at	Status	Message
------	------	--------	--------	---------

Scheduled Tasks

Run at	Scheduled by	Task
--------	--------------	------

*This task will restart the server after running.

Delete Run now Reschedule

- 4 In the **Task log** panel, you can view the tasks that are scheduled.
- 5 In the **Scheduled Tasks** panel, you can select a task and **Delete**, **Run now**, or **Reschedule** that task.

Central User Licensing

Topics

- [Overview](#)
- [How Central User Licenses Work](#)
- [Enabling Central User Licensing](#)
- [Getting Started with Central User Licensing](#)

Overview

Central User Licensing is an optional feature that allows a CMS to share a pool of user licenses among managed appliances. Managed appliances do not have their own user licenses and share the common pool of licenses. Customers with appliances that are globally distributed can use their licenses more efficiently with central user licenses where user demands peak in one geographic area while it falls in a different geographic area due to off-work/night hours. Appliances that are in a datacenter can share licenses instead of having individual licenses for each appliance. When new or replacement appliances (physical or virtual) are added under CMS management, they get to share the pool of central user licenses.

Central user licensing must be enabled to use Global High Availability.

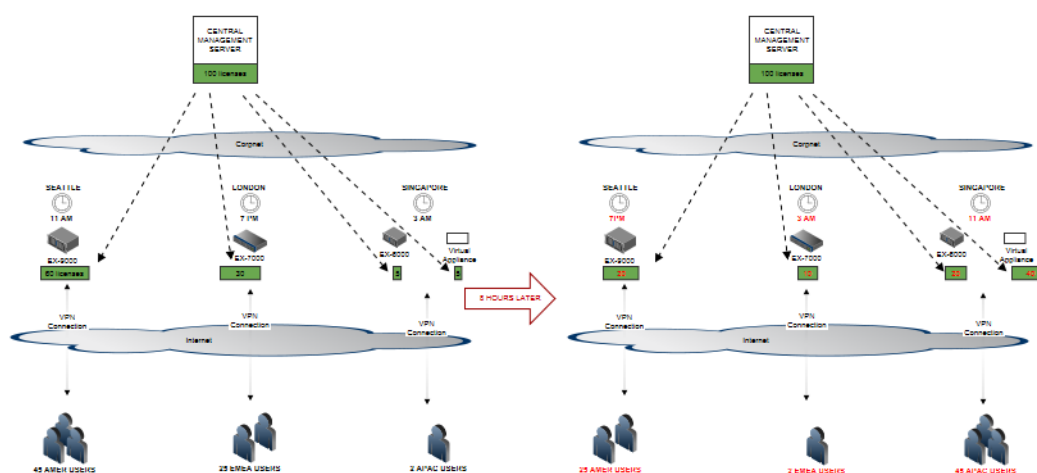
- i** | **NOTE:** If CMS is used to manage appliances that have their own license, the administrator is responsible for ensuring that licenses across all managed appliances have the same features. CMS cannot manage configurations on appliances with a heterogeneous set of licensed features.

How Central User Licenses Work

User licenses do not have to be applied to individual VPN appliances. The pooled licensing model allows central user licenses to be shared among the managed appliances. Central user licensing makes use of a distributed data store to keep track of license usage. The distributed data store has storage nodes on multiple appliances so that central user licensing is resilient to the failure of (or communication loss with) the CMS or any one appliance.

- i** | **NOTE:** Managed appliances must be able to communicate with each other via their *internet-routable IP addresses* in order for them to be able to share information in the distributed data store.

The following drawing illustrates centrally managed licenses for globally located VPN appliances.



NOTE: Beginning with the SMA 12.1 release, CMS no longer uses "leased licenses". Instead, a distributed data store is used to track user license consumption for each appliance and to regulate the total number of pooled user licenses being used.

In the event of a **CMS failure (or loss of communication)**:

- Managed appliances will continue to access the distributed data store and share central user licenses
- All central user licenses will expire in 30 days if the CMS does not recover and re-establish communication

In the event **an appliance is orphaned (unable to communicate with the CMS or other appliances)**:

- An orphaned appliance will have access to the all the central user licenses (and spike licenses) for 7 days or until communications are re-established.

In the event of a **communications loss between the CMS and MySonicWall**:

- The central user licenses continue to be valid for 30 days.

Topics:

- [Central Spike User Licenses](#)
- [Central Email Licenses](#)
- [Perpetual Pooled Licenses](#)

Central Spike User Licenses

Spike licensing allows temporary increases in the number of available licenses to meet sudden increases in demand for licenses due to inclement weather or disaster. Spike licenses can be applied to a CMS using either a subscription user license or perpetual user license. Spike user licenses are "full" user licenses and allow any type of connection (e.g., tunnel, web, ActiveSync). A spike license is automatically activated for a day if the user session count exceeds the CMS user license count.

When a spike is active, it allows the appliances to service up to sum of:

- the CMS base license max user count
- the spike license max user count

The CMS Dashboard and Licensing page will indicate that a spike is in effect, along with its Start and Stop times.

A central spike license allows any of these user licenses to spike:

- Subscription full-user license
- Subscription tiered-user license
- Perpetual full-user license

i **NOTE:** When a spike license is installed on a CMS with a subscription user license, and the subscription license expires, the spike will remain enabled.
When SMA is licensed with a standalone license, and that license expires, the spike license also expires.

The CMS administrator can control whether or not to use automatic spike licensing.

Central Email Licenses

Different terms for central email licensing are available:

Full license	permits a connection of any of these connection types: - VPN tunnel, web, ActiveSync, or Outlook Anywhere
Tiered license	permits a connection of a specific connection type: VPN tunnel, web, ActiveSync, or Outlook Anywhere
Email license	a tiered license that permits an ActiveSync or Outlook Anywhere connection

Depending on which licensing terms are available for the appliance, licensing for email connections will be applied in this way:

- During operation, if an ActiveSync connection request is made and Email licenses are available, then an Email license will be used.
- If all Email licenses are consumed and an ActiveSync connection request is made (and full licenses are available), then a full license will be used.
- The license that is issued when a connection begins will remain with the connection until it ends.

Perpetual Pooled Licenses

Perpetual pooled licenses are CMS-based user licenses that do not expire in the way that subscription-based licenses do:

- Perpetual licenses are full user licenses and allow any type of connection (e.g., tunnel, web, ActiveSync).
- Perpetual CMS licenses are stackable. Licenses remains perpetual after being stacked.

i **NOTE:** Perpetual CMS user licenses cannot be stacked with a subscription CMS user license.

These licenses and components can be used with a perpetual pooled license:

- subscription email license
- subscription Capture CMS license
- time-limited subscription components

Enabling Central User Licensing

To enable Central User Licensing on the CMS:

- 1 Go to the **Management Server > Configure > Central Management Settings** page.

The screenshot shows the 'Configure Server > CMS Settings' page. It includes a breadcrumb trail, a description of the central management server, and several configuration sections: 'Locale' with dropdowns for 'Country' (India) and 'Location' (Bangalore), a note about geographic server access, 'Central User Licensing' with an unchecked checkbox, 'Global Traffic Optimizer Service' with an information message and an unchecked checkbox, 'Policy Synchronization' with a checked checkbox, and 'Authentication servers' with two radio button options. At the bottom are 'Save' and 'Cancel' buttons.

- 2 Under **Central User Licensing**, select **Enable managing appliance user licensing with one central license**.
- 3 Click **Save**.

Getting Started with Central User Licensing

This section describes how to migrate from a standalone appliance to CMS with Global HA and Central User Licenses.

Topics

- [Setting Up CMS to Use Central User Licenses](#)
- [Setting up CMS for Centralized Appliance Configuration and Management](#)

Setting Up CMS to Use Central User Licenses

Once you have SMA appliances registered with CMS, you can transition to Central User Licensing.

NOTE: If you have an HA Pair, you need to engage with SonicWall Sales to exchange your HA pair licenses for CMS-based Central User Licenses.

To transition standalone SMA appliances to use the Central User License model:

- 1 Log into the Central Management Console.
- 2 Navigate to **Management Server > Configure > Licensing**.

[Configure Server](#) > Manage Licenses

Manage Licenses License Distribution

Review and manage the software licenses for the CMS.

Product: SonicWall Secure Mobile Access CMS
License holder: Default license
Maximum concurrent users: 15
Maximum appliances: 3
Appliance serial number: N/A
Authentication code: N/A
Licensing mode: Default

Component	License Type
Central user licenses: 15	Default - Expires Sat Apr 29 2017
Managed appliances: 3	Default - Expires Sat Apr 29 2017

Online licensing

This appliance is not registered with MySonicWall. Choose **Register** to register this appliance with your MySonicWall account.

3 Select **Register**.

The screenshot shows the 'MySonicWall License Manager' interface. At the top, there is a breadcrumb trail 'Configure Server > Manage Licenses' and two tabs: 'Manage Licenses' (active) and 'License Distribution'. Below the tabs, a heading reads 'Review and manage the software licenses for the CMS.' The main content area is titled 'MySonicWall License Manager' and contains a section for 'mySonicWall.com Login'. This section includes a paragraph explaining the service, followed by the instruction: 'Please enter your existing mySonicWall.com username (or email address) and password below:'. There are two input fields: 'MySonicWall username/email:' and 'Password:'. A 'Submit' button is located below the password field. A link 'Forgot your Username or Password?' is positioned below the input fields. At the bottom left of the main content area, there is a 'Return' button.

4 Enter the MySonicWall credentials of the MySonicWall account who owns the licenses for the Central Management Server.

The screenshot shows the 'MySonicWall License Manager' interface for registration. It features the same breadcrumb trail and tabs as the previous screenshot. The heading 'Review and manage the software licenses for the CMS.' is present. The main content area is titled 'MySonicWall License Manager' and contains the instruction: 'Enter your 12 character Software Serial Number and Authentication Code'. There are three input fields: 'Serial Number:', 'Authentication Code:', and 'Friendly Name:'. A 'Submit' button is located below the 'Friendly Name' field. A link 'What is this?' is positioned to the right of the 'Authentication Code' field. At the bottom left of the main content area, there is a 'Return' button.

5 Enter the serial number and authentication code that match the license in MySonicWall.

6 Enter a friendly name to identify this CMS in your MySonicWall account.

- 7 Select **Submit**. You see the MySonicWall view of your license. You can get back to this at any time after are registered by choosing **Manage Licenses > Manage** and re-entering your MySonicWall credentials.

[Configure Server](#) > Manage Licenses

Manage Licenses License Distribution

Review and manage the software licenses for the CMS.

MySonicWall License Manager

Security Service	Status	Free Trial	Manage Service	Count	Expiration
Analyzer	Not Licensed	Try	Activate		
Central User Licenses	Licensed		Upgrade Renew	15	26 May 2017
Managed Appliances	Licensed		Upgrade	3 Max: 100	

Support Service	Status	Manage Service	Expiration
Dynamic Support 24x7	Licensed		26 May 2017

[Return](#)

- 8 Select **Return**. This is the normal view of a registered CMS license. It shows the licensing mode as online and how long since it was last synchronized. It should never be more than 24 hours since was last synchronized.

[Configure Server](#) > Manage Licenses

Manage Licenses License Distribution

Review and manage the software licenses for the CMS.

Product: SonicWall Secure Mobile Access CMS

License holder: "SonicWALL"

Maximum concurrent users: 15

Maximum appliances: 3

Appliance serial number: [REDACTED]

Authentication code: [REDACTED]

Licensing mode: Online, synchronized 24 seconds ago

Component	License Type
Central user licenses: 15	Online - Expires Fri May 26 2017
Managed appliances: 3	Online
Dynamic Support 24x7	Online - Expires Fri May 26 2017

Online licensing

This appliance is registered with MySonicWall. Choose **Manage** to activate, upgrade or renew services. Choose **Synchronize** to synchronize this appliance with the licensed services on MySonicWall.

[Manage](#) [Synchronize](#)

[Cancel](#)

NOTE: You can also select Synchronize to force an immediate synchronization with the backend.

Setting up CMS for Centralized Appliance Configuration and Management

Once you have a cluster of SMA appliances that share a central license pool and you can monitor and maintain them from a single console.

If your appliances have very different configurations, you should normalize the differences so that you can take full advantage of CMS, GTO, and Global HA.

To use CMS to centralize appliance configuration management:

- 1 Normalize the appliance configurations.
- 2 Export the configuration from your SMA appliance.
- 3 Import the configuration to CMS.
- 4 Synchronize the CMS policy with the managed appliances.
- 5 Configure the CMS as described in [Configure](#).

Resetting a CMS License

The license state on a Central Management Server can be reset or undone.

- 1 Navigate to the **Licensing** page.
- 2 Add `?troubleshoot=1`.
- 3 Select **Reset**.

This reboots the CMS with no license and it can be registered again with MySonicWall.

Global High Availability

Global High Availability (Global HA) facilitates global high availability with load distribution and disaster recovery capabilities across the SMA appliances in the GTO service. The high availability can be deployed in a single datacenter or across dispersed data centers.

Topics:

- [High Availability of the VPN Service](#)
- [High Availability of the CMS](#)
- [Disaster Recovery for the VPN Service](#)
- [Global High Availability Versus HA Pair](#)

NOTE: Global High Availability replaces the HA Pair model. Secure Mobile Access version 11.4 is the last version of SMA that supports HA Pairs. See the [Comparison of HA Pair and GTO with Global HA](#) table for a comparison of the two models.

High Availability of the VPN Service

Global High Availability (Global HA) is configured from the CMS console by first enabling the Global Traffic Optimizer (GTO) service. Users access the VPN using the service name (e.g. access.example.com) in the VPN tunnel clients (Connect Tunnel or Mobile Connect) or the web client. The GTO service directs user connections to an appliance that is available.

Global HA enables SMA appliances to scale performance by deploying multiple appliances under a service name. Global HA eliminates a single point of failure and provides a highly available global VPN service. Customers can deploy 2 SMA appliances in the same data center or deploy clusters of up to 100 physical and virtual appliances across multiple data centers around the globe.

A distributed data store shares user session state as well as licensing information across the mesh network of SMA appliances. This allows for session persistence across appliances. In the event of a failover, users are connected to another appliance in the service. The distributed data store also allows for central user licenses to be shared across appliances and data centers.

All of the SMA appliances that are configured for the GTO service participate in the highly available VPN service. If an appliance that is part of the service fails due to hardware, power, or network issues:

- New connection requests (by tunnel or web clients) will get directed to other available appliances.
- Existing connections (that were connected to the appliance that failed) are automatically reconnected to another available appliance. Users typically do not need to re-enter their credentials.

High Availability of the CMS

Customers can setup their CMS in a virtual infrastructure (ESXi or Hyper-V) that supports high availability. The following HA models can be used to enable a fault tolerant CMS.

CMS High Availability and Disaster Recovery Features

CMS Global HA and Disaster Recovery Scenarios	VMware ESXi	Microsoft Hyper-V	Comments
HA Clustering	Yes	Yes	Seamless transition of CMS in a HA cluster from host 1 to host 2, when host 1 is rebooted or shutdown
Cloning of CMS	Yes	Yes	CMS can be successfully cloned followed by resumption of communication with managed appliances and the License Manager service.
Export/Import	Yes	Yes	CMS could be successfully exported from host 1 and imported to host 2 followed by resumption of communication with managed appliances and the License Manager service.
Snapshot/Checkpoint	Yes	Yes	Successful preservation and transition

Disaster Recovery for the VPN Service

Customers can setup Disaster Recovery (DR) for VPN by locating appliances that are in a Global Traffic Optimizer (GTO) service at different data centers.

Disaster recovery of the VPN service enables the continuation of remote access capabilities when a disaster or failure occurs to a major location. Users use the same GTO service name (such as access.example.com) and SMA appliances that are located at other locations that are part of the global VPN service accepts the connection requests.

Planning the Disaster Recovery (DR) for the VPN service is done in conjunction with DR planning of other essential IT services. SMA appliances (that are part of the GTO service) must be located at alternate data centers along with other key infrastructure components.

If a disaster destroys a data center that has SMA appliances, the remaining appliances continue to provide service.

Global High Availability Versus HA Pair

Global Traffic Optimizer (GTO) with Global High Availability (Global HA) is a new solution for SMA 12.1 and later that facilitates high availability and disaster recovery for SMA products.

The High Availability (HA) Pair product is not supported after SMA version 11.4.

The [Comparison of HA Pair and GTO with Global HA](#) table compares the features of an HA Pair with the features of GTO with Global HA.

Comparison of HA Pair and GTO with Global HA

	HA Pair	GTO with Global HA
High availability model	Active-Standby	All appliances in the cluster are active.
Number of appliances in HA cluster	Always 2	2 to 100
Licensing model	Two separate appliance-based license files	CMS-based pooled user license obtained from the License Manager Service
Location of appliances	Appliances must be in a single data center less than 3 feet apart.	Globally distributed locations
SMA appliances supported	All physical appliances. Virtual appliances are not supported.	All SMA physical and virtual appliances are supported.
Virtual infrastructure	Not needed	Required. CMS is a virtual machine and must be hosted on virtual infrastructure (VMWare ESX/i or Microsoft Hyper-V)
Mix of appliances	Both appliances in the HA Pair must be identical (for example two SMA EX-7200s)	The cluster can have any combination of physical and virtual SMA appliances.
Release versions supported	SMA 10.7.2 and 11.4.0 Not supported after 11.4.0 support expires	SMA 12.1 and higher No plans to back port to 11.4
End of Life	April 2019 (3 years after release of 11.4)	This is the next generation of SMA HA
Disaster Recovery	Not Supported. Appliances in an HA Pair must be in the same data center.	Supported. Appliances in the cluster can be globally distributed.
Redirection model	Uses a VIP	DNS-based redirection Requires customers to configure DNS for Global Traffic Optimizer.
Session restoration	Session is automatically restored on the paired appliance.	VPN reconnection and session restoration is supported with Global HA in SMA 12.1.

Comparison of HA Pair and GTO with Global HA

Data persistence	Personal Bookmarks, Local User accounts, Device Registration. Per-app VPN data persists across a failover. User lock out persists across a failover.	Personal bookmarks, Local User accounts, Device Registratio, per-app VPN data, and user lockouts are supported with Global HA in SMA 12.1.
Single Points of Failure	HA Pair is installed in one datacenter which is susceptible to power, network or other disasters	CMS server failure. A CMS outage for a few minutes has little or no adverse affect on HA. CMS is a virtual appliance and relies on the HA model of the IT department for it virtual infrastructure. CMS has a relatively low MTTR if a full clone is instantiated or the HA Cluster model is used. License Manager Service. CMS queries the License Manager every 24 hours and continues to operate for 30 days without access to the License Manager.

Alerts and SNMP

It consists of the following topics:

- [Overview](#)
- [Pre-Configured Alerts](#)
- [Configuring SNMP](#)

Overview

This section contains detailed information about alerts and the use of SNMP in the CMS.

The CMS generates alerts that are either Warnings or Errors. Alerts are displayed prominently on the CMS dashboard. Alerts can originate from a condition that occurs on the CMS, or from a managed appliance.

Alerts can be configured to generate SNMP traps that are monitored by any IT infrastructure Network Management System (NMS).

Pre-Configured Alerts

The Table of Pre-Configured Alerts below has a fixed set of conditions that can trigger alerts.

 **NOTE:** The Priority symbols represent a Warning  or an Error .

Table of Pre-Configured Alerts

























Priority	Name	Measurement	Condition
	Unable to communicate with License Manager	CMS connection to MySonicWall	Connection is lost for 10080 minutes
	Unable to communicate with License Manager	CMS connection to MySonicWall	Connection is lost for 10080 minutes
	Temporary communication loss	Managed appliance connection to CMS	Connection is temporarily lost
	Permanent communication loss	Managed appliance connection to CMS	Connection is permanently lost
	Managed appliances intercommunication failure	Managed appliances intercommunication	Connection is lost
	License has expired	CMS license expiration date	Expiration date is past
	License expires soon	CMS license expiration date	Expiration date is a certain number of days away
	High user license usage	CMS license usage	Value is over 95 percent
	High user license usage	CMS license usage	Value is over 75 percent

Table of Pre-Configured Alerts

Priority	Name	Measurement	Condition
	High swap usage	Swap usage	Value is over 5 percent
	High memory usage	Memory usage	Value is over 85 percent for 5 minutes
	High email user license usage	CMS Email license usage	Value is over 95 percent
	High email user license usage	CMS Email license usage	Value is over 75 percent
	High disk usage	Disk usage	Value is over 95 percent
	High CPU usage	CPU usage	Value is over 85 percent for 5 minutes
	High appliance license usage	Appliance license usage	Value is over 89 percent
	Critically high memory usage	Memory usage	Value is over 95 percent for 5 minutes
	Critically high CPU usage	CPU usage	Value is over 95 percent for 5 minutes
	Critically high appliance license usage	Appliance license usage	Value is over 98 percent
	CMS Spike license is active	CMS Spike license usage	Spike license is active
	CMS Spike license days left is low	CMS Spike license days left	Value is under 5 days
	CMS Spike license days left is critically low	CMS Spike license days left	Value is under 2days
	Certificate expired	Time until certificate expires	Value is under 0 days
	Certificate about to expire	Time until certificate expires	Value is under 30 days

The administrator can edit the pre-configured alerts as follows:

- Modify or customize these pre-configured default alerts.
- Disable them
- Make changes to the threshold, duration and message.
- Configure additional alerts. The Table of Alerts lists all the conditions that can be used to configure Alerts.
- Configure the priority of an alert to either Critical or Warning. SNMP traps are generated for all Critical alerts.

For these activities, use the following guidelines:

- When an appliance-related alert is configured, it applies to all the managed appliance, that is, alerts cannot be individually configured/tailored for a specific appliance.
- The maximum number of alerts that can be configured by the administrator on a CMS is 100.

Alerts shown on the dashboard can be dismissed by the administrator. Dismissed alerts will no longer be displayed in the dashboard view, but can be seen in the Alerts page. If the alert condition toggles (ON->OFF->ON), a new alert for the same condition will be raised in the dashboard.

All alerts are stored in the Alerts Database. A rolling history of 90 days worth of alerts are retained in the Alerts Database. An Alerts View allows the administrator to see all Alerts in the past Day, Week, Month or Quarter.

Configuring SNMP

To enable SNMP:

- 1 Click **Management Server > Configure > Network Services**.
- 2 Under SNMP, click **Configure**.

The screenshot shows the 'Configure SNMP' page in the Management Server interface. The left sidebar contains navigation options for 'Management Server' (Dashboard, Alerts, Configure, Monitor, Maintain) and 'Managed Appliances' (Add/Remove, Configure, Monitor, Maintain). The main content area is titled 'Services > Configure SNMP' and includes a 'Download MIB' button. Below the title is a description: 'Configure Simple Network Management Protocol (SNMP). SNMP can be used to manage the CMS and managed appliances.' There are three radio buttons: 'Disable SNMP' (selected), 'Enable SNMPv2', and 'Enable SNMPv3'. An 'Interface selection' dropdown is set to 'Internal'. The page is divided into sections for 'Agent properties', 'SNMPv2 Agent properties', 'SNMPv3 Agent properties', 'SNMP hosts', and 'Trap receivers'. The 'SNMPv2 Agent properties' section shows 'System name' as 'CMS-10' and 'Community string' as 'public'. The 'SNMPv3 Agent properties' section shows 'Engine ID' as '0x80001f8801ac181b0a' and a 'Username' field. There are checkboxes for 'Enable authentication (SHA-1)' and 'Enable privacy (AES)', along with 'Password' and 'Confirm password' fields. The 'SNMP hosts' section has a table with columns 'IP address' and 'Netmask'. The 'Trap receivers' section has an 'Enable support for SNMP traps' checkbox.

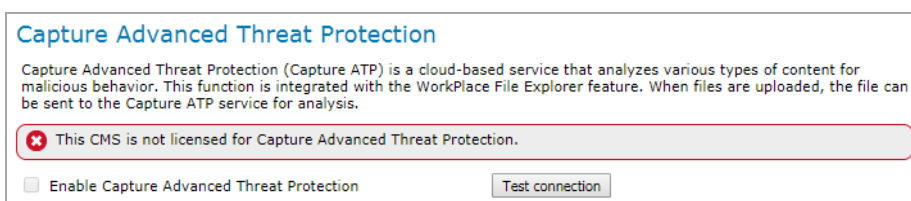
- 3 Enter the information you want in the appropriate fields.
- 4 Click **Save** and **Apply Pending Changes**.

Capture Advanced Threat Protection

Capture Advanced Threat Protection (Capture ATP) is a cloud-based service that analyzes various types of content for malicious behavior. This function is integrated with the WorkPlace File Explorer feature. When files are uploaded, the file can be sent to the Capture ATP service for analysis.

IMPORTANT: Capture Advanced Threat Protection (Capture ATP) is an add-on security service to the firewall that helps a firewall identify whether a file is malicious.

Before you can enable Capture ATP you must first get a license. If the Capture ATP license has not been activated, an error message displays:



After Capture ATP is licensed, you can view Capture ATP status in your MySonicWall account as well as configure and receive alerts and notifications.

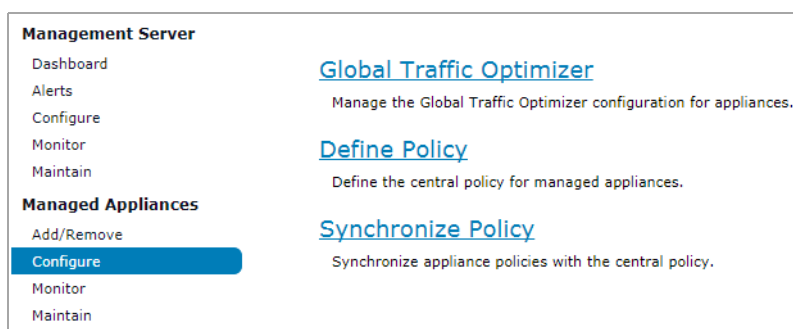
For further information about Capture ATP, licensing it, and using your MySonicWall account to configure and receive alerts and notifications, see the [SonicOS 6.5 Capture Advanced Threat Protection Feature Guide](#).

Enabling Capture ATP

After being successfully licensed, Capture ATP must be enabled before it will begin analyzing files for malicious behavior.

To enable Capture ATP:

- 1 Select **Managed Appliances > Configure > Define Policy**.



- 2 Under **User Access**, select **Capture Advanced Threat Protection**.

User Access

Realms
A realm references an authentication server and determines which access agents are provisioned to your users and what end point control restrictions are imposed.

Network Tunnel Service
Manages TCP/IP connections from the network tunnel clients (Connect Tunnel and OnDemand Tunnel).

Web Proxy Service
Manages HTTP and TCP/IP connections from web browsers, OnDemand, and Connect Tunnel.

WorkPlace
Manage workplace shortcuts, shortcut groups, sites, appearance, and settings.

Agent Configuration
Manage access agents and other agents.

End Point Control
Manage end point control settings.

Capture Advanced Threat Protection
Manage Capture Advanced Threat Protection settings.

- 3 Under **Capture Advanced Threat Protection**, select **Enable Capture Advanced Threat Protection**.

Capture Advanced Threat Protection

Capture Advanced Threat Protection (Capture ATP) is a cloud-based service that analyzes various types of content for malicious behavior. This function is integrated with the WorkPlace File Explorer feature. When files are uploaded, the file can be sent to the Capture ATP service for analysis.

Enable Capture Advanced Threat Protection

- 4 To verify the connection to the Capture ATP service, click the **Test connection** button.

File Options

The **File Options** settings allow you to specify which file types will be sent to the Capture ATP service for analysis and the maximum size of those files.

File Options

Specify the file types that will be sent to the Capture ATP service for analysis.

Executables (PE, Mach-O, and DMG)

PDF

Office 97-2003 (.doc, .xls, ...)

Office (.docx, .xlsx, ...)

Archives (.jar, .apk, .rar, .gz, and .zip)

Specify the maximum file size that will be sent to the Capture ATP service.

Use the default value (10MB)

Restrict to MB

Topics:

- [Setting the File Types](#)
- [Setting the Maximum File Size](#)

Setting the File Types

You can select the types of files to be submitted to Capture ATP for inspection.

Specify the file types that will be sent to the Capture ATP service for analysis.

- Executables (PE, Mach-O, and DMG)
- PDF
- Office 97-2003 (.doc, .xls, ...)
- Office (.docx, .xlsx, ...)
- Archives (.jar, .apk, .rar, .gz, and .zip)

To set which file types are analyzed:

- 1 Select **Managed Appliances > Configure > Define Policy**.
- 2 Under **User Access**, select **Capture Advanced Threat Protection**.
- 3 Select the file types you want analyzed by the Capture ATP service. By default, only the **Executables (PE, Mach-O, and DMG)** file type is enabled.
- 4 Click the **Save** button.

Setting the Maximum File Size

You can select the maximum size of files to be submitted to Capture ATP for inspection.

Specify the maximum file size that will be sent to the Capture ATP service.

- Use the default value (10MB)
- Restrict to MB

To set the maximum file size:

- 1 Select **Managed Appliances > Configure > Define Policy**.
- 2 Under **User Access**, select **Capture Advanced Threat Protection**.
- 3 Choose one of the options.
 - Select **Use the default value (10MB)** to use the default file size of 10MB.
 - **Restrict to ___ MB** to specify your own maximum file size.
- 4 Click the **Save** button.

Advanced Settings

The **Advanced** settings allows you to choose to block or allow uploaded files that are not evaluated by Capture ATP.

Advanced

Choose to block or allow uploaded files that are not evaluated by Capture ATP

- Block uploads when the file size exceeds the above limit
- Block uploads when there is a failure communicating with the Capture ATP service

- Select **Block uploads when the file size exceeds the above limit** to . (This is selected by default.)
- Select **Block uploads when there is a failure communicating with the Capture ATP service** to .(This is selected by default.)

Global High Availability

- Introduction to Global HA and GTO
- Planning GTO Deployment
- Setting up GTO
- Extending GTO Deployment

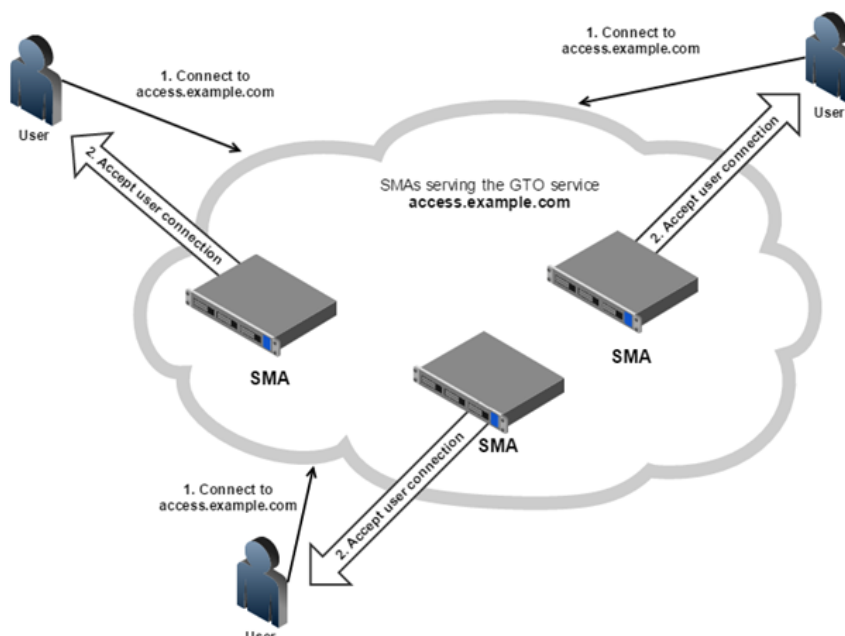
Introduction to Global HA and GTO

Topics

- [Overview](#)
- [CMS with GTO](#)
- [Exchange ActiveSync and Outlook Anywhere](#)
- [Custom FQDN for Mapped Resources](#)
- [Viewing GTO Status from the CMS Console](#)
- [GTO and IPv6](#)
- [Deployment Notes](#)

Overview

Global High Availability (Global HA) is a set of SMA features that come together to deliver a highly available VPN service. Global HA presents a collection of SMA appliances to end users through a single service name (for example `access.example.com`). Global Traffic Optimizer (GTO) is the underlying service that is enabled from the CMS console.



Previously, the benefits provided by GTO could only be achieved by deploying and coordinating an array of separate third-party appliances and services, such as content-distribution-network DNS redirectors, local traffic managers, and load balancers often under separate administrative control. GTO replaces this scenario with a single external DNS delegation, which manages all aspects of user traffic distribution automatically, including license provisioning and leveling.

NOTE: Remember to keep the DNS port open on the firewall. Refer to [Additional Deployment Notes](#) for more details.

Users have one consistent sign-on procedure with one GTO service name that connects them with the appropriate SMA appliance for their current location and circumstances, and gives them a similar experience every time they use the system anywhere in the world.

GTO makes intelligent routing decisions based on real-time data such as appliance availability, health, load, Internet and Intranet conditions. GTO redirects user connection requests to an available appliance.

This guide provides instructions on how to deploy CMS with GTO, including DNS configuration and certificate requirements.

CMS with GTO

CMS with GTO supports the following services and features:

- Exchange ActiveSync and Outlook Anywhere
- Custom FQDN for access to resources and Workplace sites
- Administration visibility into GTO status from the CMS console
- IPv6

GTO is a superior model over the fallback server model, and fallback is not supported with GTO. When an appliance is in GTO mode, it does not send fallback information to the clients.

When a client interacts with a GTO service, it does not receive fallback information. Consequently, GTO does not attempt to do fallback.

NOTE: An SMA appliance must be dual homed to participate in GTO.

Exchange ActiveSync and Outlook Anywhere

From the CMS console, you can configure Exchange ActiveSync and Outlook Anywhere across all appliances in the GTO service. For example, if the GTO service name is **access.example.com** the custom FQDN could be **mail.example.com**.

Mail clients using Exchange ActiveSync or Outlook Anywhere protocol can connect to the GTO service, using a custom FQDN, and experience global traffic Optimizer, such connection to a proximate appliance, improved availability, and load distribution.

NOTE: Public DNS must be configured for the ActiveSync and Outlook Anywhere FQDN, and the names must similar to the GTO service names.

CMS with GTO supports roaming as follows:

- When an Exchange ActiveSync client connects to a GTO service it may get directed to a different appliance from the last time it connected.
- Exchange ActiveSync clients send credentials with each request and after they get authenticated, they can access the ActiveSync server.
- A new pooled license is issued for each connection.
- The license is released after the ActiveSync connection is terminated.

Custom FQDN for Mapped Resources

You can configure custom FQDNs to backend resources across all appliances in a GTO service, and you can access those resources through the appliances that are part of the GTO service.

Users connecting to custom FQDNs can experience the benefits of GTO:

- GTO connection to a proximate appliance
- Improved availability
- Load distribution

Resources should be accessed with the FQDN name rather than with the IP address.

The public DNS must be configured appropriately for each custom FQDN, in that each custom FQDN name must be similar to the GTO service name. For example, if the GTO service name is **access.example.com**, the custom FQDN name for Email should be **mail.example.com**.

In Workplace, all links must point to the same appliance.

The maximum number of custom FQDNs that can be configured for all appliances is the same as that of a standalone SMA appliance. If you are already authenticated to a GTO service, you will need to re-authenticate if you enter a Vanity FQDN into a Web browser.

You can deploy configurations with the following types custom FQDNs to appliances that are configured for GTO:

- Vanity FQDNs that are currently supported on a single appliance.
- Custom FQDN Mapped Resource Access where the backend resource or server is mapped to an external fully qualified domain name (host and domain).
- Workplace site with a domain name that is different from the GTO service domain name.

Viewing GTO Status from the CMS Console

You can view and monitor the following capabilities on the CMC dashboard:

- Appliances successfully enabled for GTO
- Appliances not functioning correctly with GTO
- Appliances that have the recommended certificate SANs for the primary GTO service
- Appliances that do not have the recommended certificate SANs for the primary GTO service
- DNS status of appliances delegated as authoritative servers

GTO and IPv6

- End users on IPv6-only networks can reach SMA appliances with IPv6 addresses through GTO.
- SMA appliances serving as authoritative DNS servers include IPv6 AAAA records in their responses where appropriate.
- IPv6 is not supported on the internal interfaces of SMA appliances.

Deployment Notes

- You should configure a minimum of two SMA appliances and delegate them in DNS as authoritative servers. This minimizes the likelihood that your users ever lose DNS resolution of the GTO service.
- You must enable UDP 53 on your firewall for all traffic that is sent to CMS-managed appliances that are configured as authoritative servers.

Planning GTO Deployment

This section describes how to make deploying GTO easier by planning and adhering to a few guidelines as described below:

Topics

- [Choosing a Deployment Model](#)
- [Minimizing Configuration Differences](#)
- [GTO Service Names and DNS Delegations](#)
- [Provisioning Certificates](#)

Choosing a Deployment Model

Before you set up your equipment, you need to choose a deployment model that meets your organization's needs. There are several ways you can set up the network hierarchy of your GTO deployment:

- [SMA Appliances Located in One Data Center](#)
- [SMA Appliances Geo-Distributed across Multiple Data Centers](#)
- [Mixed Mode](#)

SMA Appliances Located in One Data Center

This model is typically employed by mid-sized organizations with major operations in a single location. All their SMA appliances are located in the organization's primary data center. Users have a single GTO service name (such as `access.example.com`) to access the network.

GTO eliminates the need for a load balancer in the data center for VPN traffic. User connections are automatically directed to an available appliance in the data center. The CMS and SMA appliances are all located in the data center. If any one of the appliances fails, the CMS detects the failure, and GTO automatically redirects the VPN connections to another appliance.

SMA Appliances Geo-Distributed across Multiple Data Centers

This model is typically employed by mid-sized organizations with operations in more than one geographic location, and their SMA appliances are located in different geographic locations. For example, an organization deploys two SMA appliances, one located in their New York City data center and the second appliance located in their London branch office. The employees in the Americas connect to the appliance in New York City, while the employees in Europe connect to the appliance in London.

The CMS and one of their SMA appliances is located in New York City. The other SMA appliance is located in London and is also managed by the CMS. All the employees in the Americas and in Europe use a single service name: `access.example.com`, which directs all connections to an available and proximate appliance.

Mixed Mode

This model is typically employed by larger sized organizations with a global workforce. Their SMA appliances are located in multiple geographic locations, and they may have more than one SMA appliance in the data center. For example, an organization has six SMA appliances: three in New York City, two in London, and one in Tokyo. Employees globally use the same service name: `access.example.com`.

GTO automatically directs connections from employees in the Americas to the SMA appliances in New York City, connections from employees in Europe to the SMA appliances in London, and connections from employees in Asia to the SMA appliance in Tokyo. GTO eliminates the need for a global traffic manager or load balancer in the data center.

Minimizing Configuration Differences

In a GTO service, users can get directed to different SMA appliances frequently, and users expect the same experience, regardless. You can minimize configuration differences between SMA appliances in a GTO service by observing the following guidelines:

- Maintain the same resource set and access rules on each SMA appliance in the GTO service. The best way to do this is to define one central policy on the CMS and synchronize it with all the managed SMA appliances.
- Use only DHCP tunnel address pools at each SMA deployment site. Other types of address pools can be used, but managing SMA appliances with different configurations is difficult. However, this can be done and is described in [Varying Tunnel Address Pools](#).
- Use a single authentication server configuration for all SMA appliances. If necessary, use transparently-distributed authentication services. CMS policy replication does include support for varying the authentication server configurations at each SMA appliance. You can do this by configuring locally-replicated authentication servers at the SMA appliance console. See [Using Distributed Authentication Servers](#).
- Use wildcard certificates for user access. GTO makes all of its SMA appliances available under a variety of names, each of which must match the certificate. It is possible to identify all such names each time the configuration changes and generate certificates without wildcards. It is recommended that you use wildcard certificates instead.

GTO Service Names and DNS Delegations

To establish a GTO service, you must choose a GTO service name and establish DNS delegations.

Topics

- [Choosing a GTO Service Name](#)
- [Establishing the GTO Service Name Delegations in DNS](#)

Choosing a GTO Service Name

The GTO service name is a delegated DNS zone, which means you must control the parent zone and make a delegation from it to one or more SMA appliances under the GTO service.

If your organization controls the example.com DNS zone, the access.example.com or vpn.example.com could be appropriate GTO service names.

Establishing the GTO Service Name Delegations in DNS

A GTO service name delegation is a DNS subzone delegation. It requires NS records that identify the authoritative server names for the subzone, and corresponding glue-A record that provides IP addresses for those authoritative server names.

DNS delegations must be created for the following components on each of the managed appliances:

- Primary GTO service
- Custom FQDN
- Custom Workplace Sites
- Outlook Anywhere
- Active Sync

The authoritative servers themselves are SMA appliances that are part of the GTO service and are identified by their public IP addresses and the NS record names in the following format:

`<DNSname>.ns.<GTOserviceName>`

For example, the following two DNS records in the zone configuration of example.com could establish a delegation for the GTO service and SMA appliance described above:

```
access.example.com. 86400 IN NS node1.ns.access.example.com.
```

```
node1.ns.access.example.com. 86400 IN A 123.231.55.77
```

In a typical GTO deployment with multiple SMA appliances, it is important to establish at least two such delegations. This ensures that the GTO service remains available if any one the SMA appliances is brought down for maintenance (or a network outage).

At least one authoritative server (SMA appliance) must be running at any given moment. Otherwise, users are not be able to connect.

Additional authoritative servers can provide redundancy and improved performance for some users. You should limit GTO service delegations to about three. Ideally, they should be geographically distributed.

Provisioning Certificates

You must provision certificates on the GTO-enabled SMA appliances to facilitate the GTO service. Provisioning certificates must be created for the following components on each of the managed appliances:

- Primary GTO service
- Custom FQDN
- Custom Workplace Sites
- Outlook Anywhere
- Active Sync

Certificates, which give connecting users proof of SMA authenticity before they submit credentials, must be configured on each individual SMA appliance. A single wildcard certificate naming both the GTO service name and all names underneath it (such as `access.example.com` and `*.access.example.com`) can be copied onto every SMA appliance.

The CMS console Dashboard provides convenient links to the management consoles of each SMA appliance, where certificates are uploaded under SSL Settings.

You can generate a CSR for a certificate that is appropriate for all the SMA appliances in the GTO service.

To generate a CSR for a certificate that is appropriate for all the SMA appliances in the GTO service:

- 1 Go to the **Certificate Signing Requests** page.
- 2 In the **Fully Qualified Domain Name** field, enter the GTO service name.
- 3 In the **Alternate Names** field, enter the corresponding wildcard name (such as `*.access.example.com`).

Setting up GTO

This section describes how to configure a basic GTO deployment, consisting of a CMS that manages at least one SMA appliance.

Topics

- [Setting up the CMS and SMA appliances](#)
- [Setting up a Basic GTO Service](#)
- [Registering an SMA Appliance with the CMS](#)
- [Monitoring and Configuring GTO](#)
- [Defining the Central Policy](#)

Setting up the CMS and SMA appliances

Before you can configure the GTO, you must first set up a CMS and at least one SMA appliance. GTO uses a distributed data store to share session state and licensing information across the SMA appliances.

NOTE: Managed appliances must be able to communicate with each other via their *internet-routable IP addresses* in order for them to be able to share information in the distributed data store.

Set up a CMS by following the instructions in [Installing and Configuring the Central Management Server](#) for establishing a CMS virtual machine to control the GTO service and manage the configuration of its component SMA appliances.

Set up at least one SMA appliance by following the instructions in [Configuring Appliances for Central Management](#). Follow the initial Setup Wizard configuration steps for cabling, administrator password, internal and external interface addresses, routing mode, and gateways, etc.

NOTE: GTO deployments do not support single-homed appliances.

Setting up a Basic GTO Service

After you set up the Central Management Server (CMS) and at least one SMA appliance, you can set up a basic GTO deployment.

To set up a basic GTO deployment:

- 1 On the CMS, navigate to the **Management Server > Configure**.

Management Server	
Dashboard	Central Management Settings
Alerts	Configure CMS location, central user licensing, global traffic optimizer, and policy synchronization.
Configure	
Monitor	Licensing
Maintain	
Managed Appliances	
Add/Remove	License holder: "SonicWall"
Configure	Maximum users: 15
	Maximum appliances: 3
	Appliance serial number: 004010277D29
	Authentication code: 7P7MWAT2

- 2 Select the **Central Management Settings** option.
The **Central Management Settings** dialog appears.

This central management server manages the licensing and configuration for a collection of appliances.

Locale

Country:

Location:
Example: Seattle, WA

Central User Licensing

Enable managing appliance user licensing with one central license. The current license will support 5265 concurrent user sessions across all appliances.

Global Traffic Optimizer Service

Users connect to this global high availability service from anywhere in the world and are routed to a nearby appliance.

i Each service name must be [delegated in public DNS](#)

i Custom GTO services can be created [using central policy resources](#)

Service name:
Example: access.example.com

Policy Synchronization

Enable pushing policy configuration from this server to managed appliances.
By default, configuration data on the destination nodes will be overwritten. To preserve certain settings on the destination, specify exclusions here.

Authentication servers

Nodes in the collection share centralized authentication servers
Overwrites the authentication server settings on the destination nodes.

Each node has its own authentication server
Retains authentication settings on the destination nodes, except in the case of a PKI server: trusted CA certificates cannot be retained.

- 3 Under **Central User Licensing**, check box for **Enable managing appliance user licensing with one central license. The current license will support 500 concurrent user sessions across all appliances.**
- 4 Under **Global Traffic Optimizer Service**, check the box for **Users connect to a service from anywhere in the world and are routed to the nearest managed appliance.**

i **NOTE:** The **Global Traffic Optimizer Service** check box is grayed out if **Central User Licensing** is not enabled. You must enable **Central User Licensing** before you can enable the **Global Traffic Optimizer Service**.

After you enable the **Global Traffic Optimizer Service**, the following message is displayed:

The service name must be delegated in public DNS, see the admin guide for details.

- 5 In the **Service name** field, enter the name of your service. For example, **access.example.com**.
- 6 Under **Policy Synchronization**, check the box for **Enable pushing policy configuration from this server to managed appliances**. This feature is recommended so that users will have a consistent experience on all GTO-enabled appliances.
- 7 Under **Authentication servers**, select **Nodes in the collection share centralized authentication servers**.

Registering an SMA Appliance with the CMS

After you configure GTO on the CMS, you must register the SMA appliance with the CMS.

To register the SMA appliance with the CMS:

- 1 On the CMS, go to **Managed Appliances > Add/Remove**.

	Name	Internal IP or host	Public IP	Country	Location
<input type="radio"/>	app8	172.24.27.8	10.5.107.8	United States	
<input type="radio"/>	app9	172.24.27.9	10.5.107.9	United States	
<input type="radio"/>	app207	172.24.25.207	10.5.111.207	United States	

- 2 Click the **New** button.

- 3 In the **Name** field, enter a name for the new appliance. For example, **Seattle-01**.
- 4 In the **Internal IP or host** field, enter the IP address for the new appliance.
- 5 In the **One Time Password** field, enter the one time password obtained from the **Maintenance > Central Management** page of the SMA appliance.

- 6 Click **OK**. This registers the appliance with the CMS and adds it to the CMS list. The dialog changes with more options.

i **NOTE:** The client certificate warning, **DNS name** field, and **Public IP** field are only visible when CMS is enabled for GTO.

Finalize Appliance Settings

i 33 has been registered for central management. Please complete the following settings

Name*	<input type="text" value="app103"/>	The display name for this appliance
Internal IP or host*	<input type="text" value="176.14.25.212"/>	The internal IP address or host name for this appliance
Public IP*	<input type="text" value="12.8.122.5"/>	The appliance address that is routable from the Internet. Normally this should be the appliance external address
Public IPv6	<input type="text"/>	The appliance IPv6 address that is routable from the Internet. Normally this should be the appliance external IPv6 address
Country	<input type="text" value="▼"/>	The country where this appliance is located
Location	<input type="text"/>	The city, state or province where this appliance is located
<input checked="" type="checkbox"/> Enable Global Traffic Optimizer Service		Participate in the global high availability service qa.gto.com
DNS name	<input type="text" value="app103.access.example.com"/>	A unique DNS name for this appliance
<input type="checkbox"/> DNS authoritative server		This appliance will serve as a DNS authoritative server for qa.gto.com
<input type="checkbox"/> Send user connections to this appliance		Users connecting to qa.gto.com may be routed to this appliance

- 7 From the **Country** menu, select the country where the appliance is located.
- 8 In the **Location** field, enter the city, state, or province where the appliance is located.
- 9 Select the checkbox for **Enable Global Traffic Optimizer Service**.
- 10 In the **DNS name** field, enter a unique DNS-legal name for this appliance, for example **seattle01**.
- 11 In the **Public IP** field, enter the internet-visible, public IP address for this appliance.

i **NOTE:** The **Public IP** should be the address by which remote users will access this appliance. The default IP address is the external IP address of the appliance. The public IP address may be different from its external IP address if the public WAN addresses are using NAT at the DMZ.
- 12 Check the box for **DNS authoritative server** if this appliance will be delegated in public DNS as an authoritative server.
- 13 Check the box for **Send user connections to this appliance**, so that users connecting to access.example.com may be routed to this appliance.
- 14 Click **Save**.

Monitoring and Configuring GTO

The CMC dashboard shows which appliances are participating in GTO. A GTO participant appliance's nominal status is **GTO** with a green globe icon. A non-participant appliance's nominal status is **Managed**. The top of the dashboard displays GTO service warnings and errors, if any.

Some appliance certificates are [not configured correctly for GTO](#). Users may see certificate warnings.

Alerts
 None

Appliances

Name	Status	Users	CPU	Mem	Mbps	Uptime
33	GTO	0	6%	14%	0.35	20 days
24	GTO	0	6%	39%	0.31	20 days
55	Managed	0	4%	14%	0.59	18 days
23	GTO	0	3%	37%	0.12	20 days
32	GTO	0	1%	13%	0.12	20 days

Showing 1 to 5 of 5 entries

Appliance load
 23, 24, 32, 33

Central license usage
 Daily
 500 Full, 0 users

About
 Model: SonicWall Secure Mobile Access CMS
 Hypervisor platform: Microsoft HyperV
 Version: 12.1.0-03524
 Hotfixes: dt-hotfix-12.1.0-04087 pform-hotfix-12.1.0-04087
 System time: Wed Nov 15 04:01:51 GMT 2017
 Uptime: 20 days 10 hours 31 mins
 License: 500 appliances, 500 Full users, 50 Email users

GTO services can be managed on the **Managed Appliances > Configure > Global Traffic Optimizer** page.

Management Server

- Dashboard
- Alerts
- Configure
- Monitor
- Maintain

Managed Appliances

- Add/Remove
- Configure**
- Monitor
- Maintain

Global Traffic Optimizer
 Manage the Global Traffic Optimizer configuration for appliances.

Define Policy
 Define the central policy for managed appliances.

Synchronize Policy
 Synchronize appliance policies with the central policy.

From this page, you can manage the following items:

- Global Traffic Optimizer (GTO)
- Central policies for managed appliances
- Synchronize appliance policies with the central policy

The **DNS Delegations** page describes the additional steps an administrator must take to configure the public DNS system for GTO, and provides a helper tool to generate DNS records in BIND format.

[Configure Appliances](#) > [DNS Delegations](#)

GTO Services | **Appliance Certificates** | **DNS Delegations**

i Each GTO service name must be delegated in public DNS

This page helps you generate the DNS delegation text that you can use to configure public DNS for the GTO services identified in the table below. Each GTO service name identified in the table must be delegated in public DNS as a subzone delegation.

You must also select SMA appliances that will serve as the DNS authoritative servers for the GTO service names. We recommend that you select at least two SMA appliances from the table below. This ensures that the GTO service remains available if any one of the SMA appliances serving as an authoritative server is brought down for maintenance (or a network outage).

The SMA appliances serving as authoritative servers are identified by their public IP addresses and by NS record names of a specific format:

DNSname.ns.GTOservicename

Each GTO service requires two DNS delegation records for each authoritative server:

- NS record that identifies the authoritative server name for the subzone
- Corresponding "glue-A" record giving the IP address for the authoritative server name

For example, these two DNS records in the zone configuration of **access.example.com** could establish a delegation for GTO service and the SMA appliance **Seattle-01**, which has a DNS Name of **seattle01** and a public IP of **172.16.100.10**:


```
access.example.com. 259200 IN NS seattle01.ns.access.example.com.
seattle01.ns.access.example.com. 259200 IN A 172.16.100.10
```

GTO Services

<input type="checkbox"/>	Service Name	Type
<input checked="" type="checkbox"/>	192.168.1.100.wall.com	Primary Service
<input checked="" type="checkbox"/>	192.168.1.100.sonicwall.com	Mapped URL
<input type="checkbox"/>	192.168.1.100.icwall.com	Mapped URL
<input type="checkbox"/>	192.168.1.100.sonicwall.com	Mapped URL

Appliances

<input type="checkbox"/>	Appliance Name	DNS Name	Public IPv4 Address	Public IPv6 Address
<input checked="" type="checkbox"/>	192.168.1.100	192.168.1.100	172.16.100.10	
<input checked="" type="checkbox"/>	192.168.1.100	192.168.1.100	172.16.100.10	
<input type="checkbox"/>	192.168.1.100	192.168.1.100	172.16.100.10	
<input type="checkbox"/>	192.168.1.100	192.168.1.100	172.16.100.10	

 **Generate Dns Delegation Text**

```
192.168.1.100.wall.com. 259200 IN NS 192.168.1.100.ns.192.168.1.100.wall.com.
192.168.1.100.sonicwall.com. 259200 IN A 172.16.100.10


192.168.1.100.icwall.com. 259200 IN NS 192.168.1.100.ns.192.168.1.100.icwall.com.
192.168.1.100.sonicwall.com. 259200 IN A 172.16.100.10

192.168.1.100.sonicwall.com. 259200 IN NS 192.168.1.100.ns.192.168.1.100.sonicwall.com.
192.168.1.100.sonicwall.com. 259200 IN A 172.16.100.10

192.168.1.100.sonicwall.com. 259200 IN NS 192.168.1.100.ns.192.168.1.100.sonicwall.com.
```

Defining the Central Policy

From the Central Management Console (CMS), you can define the central policy for a single-appliance SMA deployment. You can define the policies for your authentication servers and realms, resources and access rules, web and tunnel access methods, end-point control, and so on.

 **NOTE:** The steps in this section are optional.

To define the central policy:

- 1 On the CMS, go to the **Managed Appliances > Configure > Define policy** page.

Security Administration

Access Control
Review and manage your access control rules.

Resources
Manage web, network, and file system resources. Manage resource groups and variables.

Users & Groups
Manage users and groups

User Access

Realms
A realm references an authentication server and determines which access agents are provisioned to your users and what end point control restrictions are imposed.

Network Tunnel Service
Manages TCP/IP connections from the network tunnel clients (Connect Tunnel and OnDemand Tunnel).

Web Proxy Service
Manages HTTP and TCP/IP connections from web browsers, OnDemand, and Connect Tunnel.

WorkPlace
Manage workplace shortcuts, shortcut groups, sites, appearance, and settings.

Agent Configuration
Manage access agents and other agents.

End Point Control
Manage end point control settings.

Capture Advanced Threat Protection
Manage Capture Advanced Threat Protection settings.

System Configuration

Administrators
Manage AMC administrator accounts. Accounts are mapped to administrator roles.

Authentication Servers
Authentication servers are referenced by a realm to authenticate users.

CA certificates
CA certificates are used to establish a trust relationship with an Active Directory or LDAP connection that is secured with SSL, a connection to a back-end HTTPS Web server, or to validate a connection from an end user who is authenticating with a client certificate.

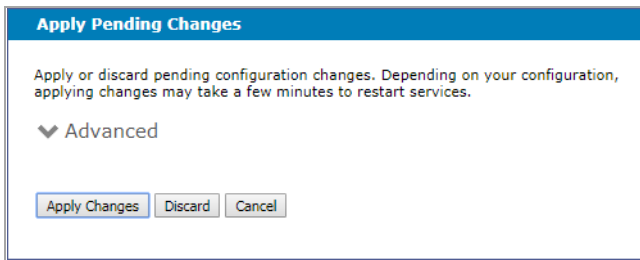
OCSP
The Online Certificate Status Protocol (OCSP) can be used to verify the status of client certificates.

- 2 Define the policies you want.

See the following sections for instructions on defining server certificates, authentication servers, and tunnel address pools:

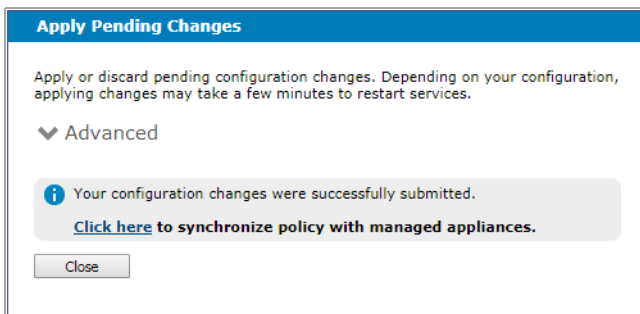
- [Enabling Cached Credentials](#)
- [Using Distributed Authentication Servers](#)
- [Varying Tunnel Address Pools](#)

- When you have finished defining your policy, click **Pending Changes**. The **Apply Pending Changes** dialog displays.

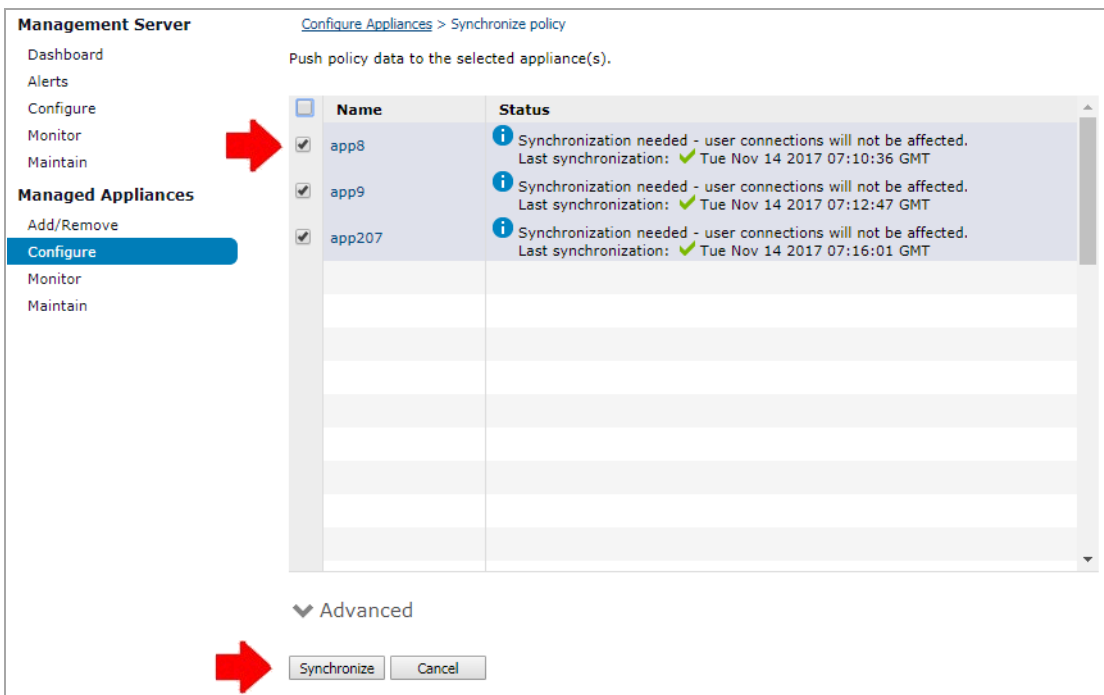


Expand the **Advanced** section if you want to schedule when you want the pending changes will be applied.

- Click **Apply Changes**.
- Select the link in **Click here to synchronize policy with managed appliances** to synchronize the policy across all of the appliances managed by the CMS.



- On the **Synchronize policy** page, select the checkbox for the SMA appliance you want to synchronize.



Expand the **Advanced** section if you want to schedule when you want the pending changes will be applied.

- Click **Synchronize**.

The message, “Synchronizing data, please wait...” appears as the policy is overwritten by the central policy.

Management Server | Maintain Appliances | **Maintenance Tasks**

Dashboard
Alerts
Configure
Monitor
Maintain

Managed Appliances
Add/Remove
Configure
Monitor
Maintain

Maintenance is in progress

View, reschedule or delete maintenance tasks. All times are in the [server time zone GMT](#)

Current task
Synchronize policy with app9

Name	Status
app9	Policy sync in progress...

8 When policy synchronization has completed, the screen displays the **Status** as **Synchronization finished**.

Management Server | Maintain Appliances | **Maintenance Tasks**

Dashboard
Alerts
Configure
Monitor
Maintain

Managed Appliances
Add/Remove
Configure
Monitor
Maintain

View, reschedule or delete maintenance tasks. All times are in the [server time zone GMT](#).

Task log

Filters (reset)

Start Date: 11/14/2017 | End Date: 11/15/2017 | Refresh

Time	Task	Run at	Status	Message
11/15/2017 16:59:35	New! Synchronize policy with app9	11/15/2017 16:51 GMT	✓ Succeeded	
11/15/2017 16:57:13	Synchronize policy with app9	11/15/2017 16:51 GMT	✓ Succeeded	
11/15/2017 16:54:29	Synchronize policy with app9	11/15/2017 16:51 GMT	✓ Succeeded	
11/14/2017 07:27:41	Synchronize policy with app8, app9, app207	11/14/2017 07:21 GMT	✓ Succeeded	
11/14/2017 07:16:18	Synchronize policy with app8, app9, app207	11/14/2017 07:07 GMT	✓ Succeeded	
11/14/2017 07:15:09	Restart app207	11/14/2017 07:10 GMT	✓ Succeeded	
11/14/2017 05:40:36	Synchronize policy with app8, app9, app207	11/14/2017 05:33 GMT	✓ Succeeded	

You can now type the GTO service name into the address bar of any standard Internet Web browser, anywhere in the world, and sign in to securely access the configured resources.

Extending GTO Deployment

Topics

- [Adding Additional SMA Appliances](#)
- [Enabling Cached Credentials](#)
- [Using Distributed Authentication Servers](#)
- [Varying Tunnel Address Pools](#)
- [Additional Deployment Notes](#)

Adding Additional SMA Appliances

Additional SMA appliances can be added to the basic GTO configuration by following the steps in [Setting up GTO](#). Each SMA appliance that is added automatically begins serving new requests for GTO user connections.

When a new SMA appliance is added to a different location than the existing appliances, it becomes available to GTO. When GTO evaluates a new user relative to the available SMA appliances, it includes the new appliance at the different location, and directs the new connection to the appropriate SMA appliance. This evaluation is repeated each time a user connects. GTO may connect users to different SMA appliances in different circumstances.

Enabling Cached Credentials

If your security settings allow cached credentials on end-user devices, you can assign nearly-seamless failover and high-availability capabilities to Connect Tunnel clients and Mobile Connect SSL VPN Tunnel clients. You can do this even if the SMA appliances are in different locations (and therefore do not share an internal network).

To enable cached credentials:

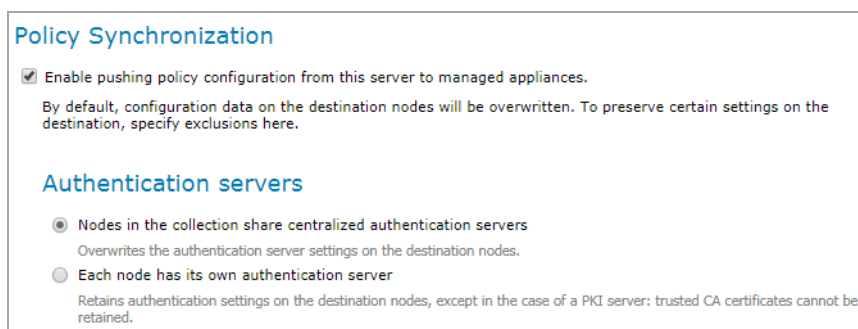
- 1 Go to the **Managed Appliances > Configure** page.
- 2 Go to **Realms > Community > Access Methods > Tunnel**.
- 3 Click the **Configure** button.

Using Distributed Authentication Servers

The latency and reliability of authentication services can be improved in some situations by replicating authentication servers in widely-distributed locations, and configuring specific SMA appliances to use a nearby replicated authentication server instead of the central instance, which might be on another continent.

To accomplish this:

- 1 Establish the authentication server settings in the central policy and then synchronize the central policy with all the managed SMA appliances. See [Setting up a Basic GTO Service](#).
- 2 On the **Management Server > Configure > Central Management Settings** page, change the **Policy synchronization** settings so that the **Each node has its own authentication server** option is selected.



- 3 Click **Save**.
- 4 Click **Pending changes**. The **Apply Pending Changes** dialog box displays.
- 5 Click **Apply Pending Changes**.

Now the central authentication server settings will only be pushed to appliances during policy synchronization if an authentication server of the same name does not already exist at the SMA managed appliance. Stated another way, if an SMA appliance already has an authentication server setting whose name matches a name configured at the CMS, that setting will not be touched during policy synchronization.

For each SMA appliance that needs local modifications to authentication server settings, log onto the management console at that appliance and adjust the configuration of the existing authentication server(s).

As long as each central policy authentication server has a corresponding SMA policy authentication server with the same name, your local changes will be preserved. Don't create or delete authentication servers from the SMA policy as you cannot modify other parts of the local configuration that reference these servers. Those changes will be overwritten the next time CMS synchronizes the central policy with this SMA.

Varying Tunnel Address Pools

The preferred tunnel address pool policy for GTO deployments is a single DHCP pool replicated to all SMA appliances, with no specific DHCP server mentioned in the policy. This is done using the **Routed address pool - dynamic** setting after clicking **New** in the **IP address pools** section on the **Managed Appliances > Configure > Define Policy > User Access > Network Tunnel Service** page and not specifying a DHCP server (as shown below), so that appliances send broadcast requests to locate DHCP servers that can allocate addresses. This requires DHCP services to be available on the internal network that the appliances are on. Other policies are possible, but CMS does not help maintain them.

Management Server [Services > Configure Network Tunnel Service > Configure IP Address Pool](#)

Dashboard
Alerts
Configure
Monitor
Maintain

Managed Appliances
Add/Remove
Configure
Monitor
Maintain

Create or modify an IP address pool used by the network tunnel clients.

Name:* Description:

Translated address pool (Source NAT)

IP address: Application protocols (such as VoIP or FTP) or other protocols that transmit IP addresses may not function properly with NAT address pools, which behave like a NAT device.

Routed address pool - dynamic

DHCP server: To dynamically allocate IP addresses from a DHCP server, enter its IP address. If none is specified, the appliance sends broadcast requests to locate DHCP servers that can allocate addresses.

User-mapped address pool Use this to assign an address issued during RADIUS authentication or configured for a local user.

A tunnel address pool in the SMA policy will not be overwritten during policy synchronization if there is a corresponding tunnel address pool in the central policy with the same name. Be aware though, that the CMS will not synchronize with an SMA appliance at all if a tunnel address pool exists at the SMA appliance, but not in the CMS configuration. So the trick here is to create a tunnel address pool at the CMS, synchronize the central policy to all SMA appliances (to create the pool there), then adjust the configuration of that pool at each individual SMA appliance.

NOTE: You can adjust the parameters of pools (such as the address ranges in static pools or the NAT-from address in a NAT pool), but you cannot change the pool's type.

Additional Deployment Notes

Topics:

- [Notes on SMA Appliances](#)
- [Web Limitations if an Appliance Fails](#)

Notes on SMA Appliances

It is recommended that you configure a minimum of two SMA appliances, and that you delegate them in DNS as authoritative servers to minimize the likelihood that your users ever lose DNS resolution of the GTO service.

You must enable UDP 53 on your firewall for all traffic that is sent to CMS-managed appliances that are configured as authoritative servers.

Web Limitations if an Appliance Fails

Web users may face some limitations with GTO if an appliance fails. GTO services should DNS-resolve to more than one MA node, and web browsers given a multi-address DNS response should connect to the first address that works. When CMS finds an MA unresponsive for a minute, it instructs the DNS authoritative server nodes to reconfigure around the broken MA, but during that reconfiguration time, the broken MA node can still appear in DNS responses. If this situation occurs and the user's Workplace session fails, the user sees what looks like a typical failure of a website. The user needs to reconnect by retyping the GTO service name. They are redirected through a different node and can access that web site again.

Warranty and Licensing

- [Limited Hardware Warranty](#)
- [End User License Agreement](#)
- [Third-Party Components and Licenses](#)
- [GNU General Public License \(GPL\) Source Code](#)
- [Open Source Licenses](#)

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(f) Use by Third Parties. Customer may allow its services vendors and contractors (each, a “**Third Party User**”) to access and use the Products and Documentation provided to Customer hereunder solely for purposes of providing services to Customer, provided that Customer ensures that (i) the Third Party User’s access to or use of the Products and Documentation is subject to the restrictions and limitations contained in this Agreement, including, but not limited to those in the Export Section, (ii) the Third Party User cooperates with Provider during any compliance review that may be conducted by Provider or its designated agent, and (iii) the Third

Party Users promptly removes any Software installed on its computer equipment upon the completion of the Third Party's need to access or use the Products as permitted by this Section. Customer agrees that it shall be liable to Provider for those acts and omissions of its Third Party Users which, if done or not done by Customer, would be a breach of this Agreement.

3. Restrictions. Customer may not reverse engineer, decompile, disassemble, or attempt to discover or modify in any way the underlying source code of the Software, or any part thereof unless and to the extent (a) such restrictions are prohibited by applicable law and (b) Customer has requested interoperability information in writing from Provider and Provider has not provided such information in a timely manner. In addition, Customer may not (i) modify, translate, localize, adapt, rent, lease, loan, create or prepare derivative works of, or create a patent based on the Products, Documentation or any part thereof, (ii) resell, sublicense or distribute the Products or Documentation, (iii) provide, make available to, or permit use of the Products, in whole or in part, by any third party (except as expressly set forth herein), (iv) use the Products or Documentation to create or enhance a competitive offering or for any other purpose which is competitive to Provider, (v) remove Software that was delivered on an Appliance from the Appliance on which it was delivered and load such Software onto a different appliance without Provider's prior written consent, or (vi) perform or fail to perform any other act which would result in a misappropriation or infringement of Provider's intellectual property rights in the Products or Documentation. Each permitted copy of the Software and Documentation made by Customer hereunder must contain all titles, trademarks, copyrights and restricted rights notices as in the original. Customer understands and agrees that the Products may work in conjunction with third party products and Customer agrees to be responsible for ensuring that it is properly licensed to use such third party products. Notwithstanding anything otherwise set forth in this Agreement, the terms and restrictions set forth herein shall not prevent or restrict Customer from exercising additional or different rights to any open source software that may be contained in or provided with the Products in accordance with the applicable open source software licenses which shall be either included with the Products or made available to Customer upon request. Customer may not use any license keys or other license access devices not provided by Provider, including but not limited to "pirate keys", to install or access the Software.

4. Proprietary Rights. Customer understands and agrees that (i) the Products are protected by copyright and other intellectual property laws and treaties, (ii) Provider, its Affiliates and/or its licensors own the copyright, and other intellectual property rights in the Products, (iii) the Software is licensed, and not sold, (iv) this Agreement does not grant Customer any rights to Provider's trademarks or service marks, and (v) Provider reserves any and all rights, implied or otherwise, which are not expressly granted to Customer in this Agreement.

5. Title. Provider, its Affiliates and/or its licensors own the title to all Software.

6. Payment. Customer agrees to pay to Provider (or, if applicable, the Partner) the fees specified in each order, including any applicable shipping fees. Customer will be invoiced promptly following delivery of the Products or prior to the commencement of any Renewal Maintenance Period and Customer shall make all payments due to Provider in full within thirty (30) days from the date of each invoice or such other period (if any) stated in an order. Provider reserves the right to charge Customer a late penalty of 1.5% per month (or the maximum rate permitted by law, whichever is the lesser) for any amounts payable to Provider by Customer that are not subject to a good faith dispute and that remain unpaid after the due date until such amount is paid.

7. Taxes. The fees stated in an order from Provider or a Partner may not include taxes. If Provider is required to pay sales, use, property, value-added or other taxes based on the Products or Maintenance Services provided under this Agreement or on Customer's use of Products or Maintenance Services, then such taxes shall be billed to and paid by Customer. This Section does not apply to taxes based on Provider's or a Partner's income.

8. Termination.

(a) This Agreement or the Licenses granted hereunder may be terminated (i) by mutual written agreement of Provider and Customer or (ii) by either party for a breach of this Agreement by the other party (or a Third Party User) that the breaching party fails to cure to the non-breaching party's reasonable satisfaction within thirty (30) days following its receipt of notice of the breach. Notwithstanding the foregoing, in the case of MSP Licenses, if Customer or its Client breaches this Agreement two (2) times in any twelve (12) consecutive month period, the breaching party shall not have a cure period for such breach and Provider may terminate this Agreement immediately upon providing written notice to the breaching party.

(b) Upon termination of this Agreement or expiration or termination of a License for any reason, all rights granted to Customer for the applicable Software shall immediately cease and Customer shall immediately: (i) cease using the applicable Software and Documentation, (ii) remove all copies, installations, and instances of the applicable Software from all Appliances, Customer computers and any other devices on which the Software was installed, and ensure that all applicable Third Party Users and Clients do the same, (iii) return the applicable Software to Provider together with all Documentation and other materials associated with the Software and all copies of any of the foregoing, or destroy such items, (iv) cease using the Maintenance Services associated with the applicable Software, (v) pay Provider or the applicable Partner all amounts due and payable up to the date of termination, and (vi) give Provider a written certification, within ten (10) days, that Customer, Third Party Users, and Clients, as applicable, have complied with all of the foregoing obligations.

(c) Any provision of this Agreement that requires or contemplates execution after (i) termination of this Agreement, (ii) a termination or expiration of a License, or (iii) the expiration of a SaaS Term, is enforceable against the other party and their respective successors and assignees notwithstanding such termination or expiration, including, without limitation, the Restrictions, Payment, Taxes, Termination, Survival, Warranty Disclaimer, Infringement Indemnity, Limitation of Liability, Confidential Information, Compliance Verification, and General Sections of this Agreement. Termination of this Agreement or a License shall be without prejudice to any other remedies that the terminating party or a Partner may have under law, subject to the limitations and exclusions set forth in this Agreement.

9. Export. Customer acknowledges that the Products and Maintenance Services are subject to the export control laws, rules, regulations, restrictions and national security controls of the United States and other applicable foreign agencies (the "**Export Controls**") and agrees to abide by the Export Controls. Customer hereby agrees to use the Products and Maintenance Services in accordance with the Export Controls, and shall not export, re-export, sell, lease or otherwise transfer the Products or any copy, portion or direct product of the foregoing in violation of the Export Controls. Customer is solely responsible for obtaining all necessary licenses or authorizations relating to the export, re-export, sale, lease or transfer of the Products and for ensuring compliance with the requirements of such licenses or authorizations. Customer hereby (i) represents that Customer, and if Customer is providing services under the MSP License herein each of its Clients, is not an entity or person to which shipment of Products, or provision of Maintenance Services, is prohibited by the Export Controls; and (ii) agrees that it shall not export, re-export or otherwise transfer the Products to (a) any country subject to a United States trade embargo, (b) a national or resident of any country subject to a United States trade embargo, (c) any person or entity to which shipment of Products is prohibited by the Export Controls, or (d) anyone who is engaged in activities related to the design, development, production, or use of nuclear materials, nuclear facilities, nuclear weapons, missiles or chemical or biological weapons. Customer shall, at its expense, defend Provider and its Affiliates from any third party claim or action arising out of any inaccurate representation made by Customer regarding the existence of an export license, Customer's failure to provide information to Provider to obtain an export license, or any allegation made against Provider due to Customer's violation or alleged violation of the Export Controls (an "**Export Claim**") and shall pay any judgments or settlements reached in connection with the Export Claim as well as Provider's costs of responding to the Export Claim.

10. Maintenance Services.

(a) **Description.** During any Maintenance Period, Provider shall:

(i) Make available to Customer new versions and releases of the Software, if and when Provider makes them generally available without charge as part of Maintenance Services.

(ii) Respond to communications from Customer that report Software failures not previously reported to Provider by Customer. Nothing in the foregoing shall operate to limit or restrict follow up communication by Customer regarding Software failures.

(iii) Respond to requests from Customer's technical coordinators for assistance with the operational/technical aspects of the Software unrelated to a Software failure. Provider shall have the right to limit such responses if Provider reasonably determines that the volume of such non-error related requests for assistance is excessive or overly repetitive in nature.

(iv) Provide access to Provider's software support web site at <https://support.sonicwall.com> (the "**Support Site**").

(v) For Customers that have purchased Maintenance Services continuously since the purchase of such License, provide the repair and return program described on the Support Site for the Appliance on which the Software is delivered.

Maintenance Services are available during regional business support hours (“**Business Hours**”) as indicated on the Support Site, unless Customer has purchased 24x7 Support. The list of Software for which 24x7 Support is available and/or required is listed in the Global Support Guide on the Support Site.

The Maintenance Services for Software that Provider has obtained through an acquisition or merger may, for a period of time following the effective date of the acquisition or merger, be governed by terms other than those in this Section. The applicable different terms, if any, shall be stated on the Support Site.

(b) Maintenance Period. The first period for which Customer is entitled to receive Maintenance Services begins on the date of the registration of the Product at Provider’s registration portal (the “**Registration**”) and ends twelve (12) months thereafter (the “**Initial Maintenance Period**”). Following the Initial Maintenance Period, Maintenance Services for the Product(s) may then be renewed for additional terms of twelve (12) or more months (each, a “**Renewal Maintenance Period**”) For purposes of this Agreement, the Initial Maintenance Period and each Renewal Maintenance Period shall be considered a “**Maintenance Period.**” For the avoidance of doubt, this Agreement shall apply to each Renewal Maintenance Period. Cancellation of Maintenance Services will not terminate Customer’s rights to continue to otherwise use the Products. Maintenance fees shall be due in advance of each Renewal Maintenance Period and shall be subject to the payment requirements set forth in this Agreement. The procedure for reinstating Maintenance Services for the Products after it has lapsed is posted at <https://support.sonicwall.com/essentials/support-guide>. Maintenance Services are optional and only provided if purchased separately.

For SaaS Software, the Maintenance Period is equal to the duration of the applicable SaaS Term. For non-perpetual Licenses or for non-perpetual MSP Licenses, the Maintenance Period is equal to the duration of the License.

11. Warranties and Remedies.

(a) **Software Warranties.** Provider warrants that, during the applicable Warranty Period (as defined in subsection (c) below),

(i) the operation of the Software, as provided by Provider, will substantially conform to its Documentation (the “**Operational Warranty**”);

(ii) the Software, as provided by Provider, will not contain any viruses, worms, Trojan Horses, or other malicious or destructive code designed by Provider to allow unauthorized intrusion upon, disabling of, or erasure of the Software, except that the Software may contain a key limiting its use to the scope of the License granted, and license keys issued by Provider for temporary use are time-sensitive (the “**Virus Warranty**”);

(iii) it will make commercially reasonable efforts to make the SaaS Software available twenty-four hours a day, seven days a week except for scheduled maintenance, the installation of updates, those factors that are beyond the reasonable control of Provider, Customer’s failure to meet any minimum system requirements communicated to Customer by Provider, and any breach of this Agreement by Customer that impacts the availability of the SaaS Software (the “**SaaS Availability Warranty**”).

(b) **Appliance Warranties.** Provider warrants that, during the applicable Warranty Period, the Appliance will operate in a manner which allows the SNWL Software, respectively, to be used in substantial conformance with the Documentation (the “**Appliance Warranty**”).

(c) **Warranty Periods.** The “**Warranty Period**” for each of the above warranties (except for E-class appliances which do not include a Software warranty, shall be as follows: (i) for the Operational Warranty as it applies to Software and the Virus Warranty, ninety (90) days following the initial Registration of the Software; (ii) for the Operational Warranty as it applies to SaaS Software and the SaaS Availability Warranty, the duration of the SaaS Term; and (iv) for the Appliance Warranty, one (1) year following the date the Appliance is registered with Provider.

(d) **Remedies.** Any breach of the foregoing warranties must be reported by Customer to Provider during the applicable Warranty Period. Customer’s sole and exclusive remedy and Provider’s sole obligation for any such breach shall be as follows:

(i) For a breach of the *Operational Warranty* that impacts the use of Software, Provider shall correct or provide a workaround for reproducible errors in the Software that caused the breach within a reasonable time considering the severity of the error and its effect on Customer or, at Provider's option, refund the license fees paid for the nonconforming Software upon return of such Software to Provider and termination of the related License(s) hereunder.

(ii) For a breach of the *Operational Warranty* that impacts the use of SaaS Software, Provider shall correct or provide a workaround for reproducible errors in the Software that caused the breach and provide a credit or refund of the fees allocable to the period during which the Software was not operating in substantial conformance with the applicable Documentation.

(iii) For a breach of the *Virus Warranty*, Provider shall replace the Software with a copy that is in conformance with the *Virus Warranty*.

(v) For a breach of the *SaaS Availability Warranty*, Provider shall provide a credit or refund of the fees allocable to the period during which the SaaS Software was not available for use.

(e) **Warranty Exclusions.** The warranties set forth in this Section shall not apply to any non-conformance (i) that Provider cannot recreate after exercising commercially reasonable efforts to attempt to do so; (ii) caused by misuse of the applicable Product or by using the Product in a manner that is inconsistent with this Agreement or the Documentation; or (iii) arising from the modification of the Product by anyone other than Provider.

(f) **Third Party Products.** Certain Software may contain features designed to interoperate with third-party products. If the third-party product is no longer made available by the applicable provider, Provider may discontinue the related product feature. Provider shall notify Customer of any such discontinuation, however Customer will not be entitled to any refund, credit or other compensation as a result of the discontinuation.

(g) **Warranty Disclaimer.** THE EXPRESS WARRANTIES AND REMEDIES SET FORTH IN THIS SECTION ARE THE ONLY WARRANTIES AND REMEDIES PROVIDED BY PROVIDER HEREUNDER. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, ALL OTHER WARRANTIES OR REMEDIES ARE EXCLUDED, WHETHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, NON-INFRINGEMENT, SATISFACTORY QUALITY, AND ANY WARRANTIES ARISING FROM USAGE OF TRADE OR COURSE OF DEALING OR PERFORMANCE. PROVIDER DOES NOT WARRANT UNINTERRUPTED OR ERROR-FREE OPERATION OF THE PRODUCTS.

(h) **High-Risk Disclaimer.** CUSTOMER UNDERSTANDS AND AGREES THAT THE PRODUCTS ARE NOT FAULT-TOLERANT AND ARE NOT DESIGNED OR INTENDED FOR USE IN ANY HIGH-RISK OR HAZARDOUS ENVIRONMENT, INCLUDING WITHOUT LIMITATION, THE OPERATION OF NUCLEAR FACILITIES, AIRCRAFT NAVIGATION, AIR TRAFFIC CONTROL, LIFE SUPPORT MACHINES, WEAPONS SYSTEMS, OR ANY OTHER APPLICATION WHERE THE FAILURE OR MALFUNCTION OF ANY PRODUCT CAN REASONABLY BE EXPECTED TO RESULT IN DEATH, PERSONAL INJURY, SEVERE PROPERTY DAMAGE OR SEVERE ENVIRONMENTAL HARM (A "**HIGH RISK ENVIRONMENT**"). ACCORDINGLY, (I) CUSTOMER SHOULD NOT USE THE PRODUCTS IN A HIGH RISK ENVIRONMENT, (II) ANY USE OF THE PRODUCTS BY CUSTOMER IN A HIGH RISK ENVIRONMENT IS AT CUSTOMER'S OWN RISK, (III) PROVIDER, ITS AFFILIATES AND SUPPLIERS SHALL NOT BE LIABLE TO CUSTOMER IN ANY WAY FOR USE OF THE PRODUCTS IN A HIGH RISK ENVIRONMENT, AND (IV) PROVIDER MAKES NO WARRANTIES OR ASSURANCES, EXPRESS OR IMPLIED, REGARDING USE OF THE PRODUCTS IN A HIGH RISK ENVIRONMENT.

12. Infringement Indemnity. Provider shall indemnify Customer from and against any claim, suit, action, or proceeding brought against Customer by a third party to the extent it is based on an allegation that the Software directly infringes any patent, copyright, trademark, or other proprietary right enforceable in the country in which Provider has authorized Customer to use the Software, including, but not limited to the country to which the Software is delivered to Customer, or misappropriates a trade secret in such country (a "**Claim**"). Indemnification for a Claim shall consist of the following: Provider shall (a) defend or settle the Claim at its own expense, (b) pay any judgments finally awarded against Customer under a Claim or any amounts assessed against Customer in any settlements of a Claim, and (c) reimburse Customer for the reasonable administrative costs or expenses, including without limitation reasonable attorneys' fees, it necessarily incurs in responding to the Claim. Provider's obligations under this Infringement Indemnity Section are conditioned upon Customer (i) giving prompt written notice of the Claim to Provider, (ii) permitting Provider to retain sole control of the investigation, defense or settlement of the Claim, and (iii) providing Provider with cooperation and assistance as

Provider may reasonably request in connection with the Claim. Provider shall have no obligation hereunder to defend Customer against any Claim (a) resulting from use of the Software other than as authorized by this Agreement, (b) resulting from a modification of the Software other than by Provider, (c) based on Customer's use of any release of the Software after Provider recommends discontinuation because of possible or actual infringement and has provided a non-infringing version at no charge, or (d) to the extent the Claim arises from or is based on the use of the Software with other products, services, or data not supplied by Provider if the infringement would not have occurred but for such use. If, as a result of a Claim or an injunction, Customer must stop using any Software ("**Infringing Software**"), Provider shall at its expense and option either (1) obtain for Customer the right to continue using the Infringing Software, (2) replace the Infringing Software with a functionally equivalent non-infringing product, (3) modify the Infringing Software so that it is non-infringing, or (4) terminate the License for the Infringing Software and (A) for non-SaaS Software, accept the return of the Infringing Software and refund the license fee paid for the Infringing Software, pro-rated over a sixty (60) month period from the date of initial delivery of such Software, or (B) for SaaS Software, discontinue Customer's right to access and use the Infringing Software and refund the unused pro-rated portion of any license fees pre-paid by Customer for such Software. This Section states Provider's entire liability and its sole and exclusive indemnification obligations with respect to a Claim and Infringing Software.

13. Limitation of Liability. EXCEPT FOR (A) ANY BREACH OF THE *RESTRICTIONS* OR *CONFIDENTIAL INFORMATION* SECTIONS OF THIS AGREEMENT, (B) AMOUNTS CONTAINED IN JUDGMENTS OR SETTLEMENTS WHICH PROVIDER OR CUSTOMER IS LIABLE TO PAY TO A THIRD PARTY UNDER THE *INFRINGEMENT INDEMNITY* SECTION OF THIS AGREEMENT AND CUSTOMER IS LIABLE TO PAY ON BEHALF OF OR TO PROVIDER UNDER THE *CONDUCT, EXPORT, MSP LICENSE, AND USE BY THIRD PARTIES* SECTIONS OF THIS AGREEMENT, OR (C) ANY LIABILITY TO THE EXTENT LIABILITY MAY NOT BE EXCLUDED OR LIMITED AS A MATTER OF APPLICABLE LAW, IN NO EVENT SHALL CUSTOMER OR ITS AFFILIATES, OR PROVIDER, ITS AFFILIATES OR SUPPLIERS BE LIABLE FOR (X) ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND OR (Y) LOSS OF REVENUE, LOSS OF ACTUAL OR ANTICIPATED PROFITS, LOSS OF BUSINESS, LOSS OF CONTRACTS, LOSS OF GOODWILL OR REPUTATION, LOSS OF ANTICIPATED SAVINGS, LOSS OF, DAMAGE TO OR CORRUPTION OF DATA, HOWSOEVER ARISING, WHETHER SUCH LOSS OR DAMAGE WAS FORESEEABLE OR IN THE CONTEMPLATION OF THE PARTIES AND WHETHER ARISING IN OR FOR BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), BREACH OF STATUTORY DUTY, OR OTHERWISE.

EXCEPT FOR (A) ANY BREACH OF THE *SOFTWARE LICENSE, RESTRICTIONS, OR CONFIDENTIAL INFORMATION* SECTIONS OF THIS AGREEMENT, OR ANY OTHER VIOLATION OF THE OTHER PARTY'S INTELLECTUAL PROPERTY RIGHTS; (B) PROVIDER'S EXPRESS OBLIGATIONS UNDER THE *INFRINGEMENT INDEMNITY* SECTION OF THIS AGREEMENT AND CUSTOMER'S EXPRESS OBLIGATIONS UNDER THE *CONDUCT, EXPORT, MSP LICENSE, AND USE BY THIRD PARTIES* SECTIONS OF THIS AGREEMENT, (C) PROVIDER'S COSTS OF COLLECTING DELINQUENT AMOUNTS WHICH ARE NOT THE SUBJECT OF A GOOD FAITH DISPUTE; (D) A PREVAILING PARTY'S LEGAL FEES PURSUANT TO THE *LEGAL FEES* SECTION OF THIS AGREEMENT; OR (E) ANY LIABILITY TO THE EXTENT LIABILITY MAY NOT BE EXCLUDED OR LIMITED AS A MATTER OF APPLICABLE LAW, THE MAXIMUM AGGREGATE AND CUMULATIVE LIABILITY OF CUSTOMER AND ITS AFFILIATES, AND PROVIDER, ITS AFFILIATES AND SUPPLIERS, FOR DAMAGES UNDER THIS AGREEMENT, WHETHER ARISING IN OR FOR BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), BREACH OF STATUTORY DUTY, OR OTHERWISE, SHALL BE AN AMOUNT EQUAL TO (Y) THE GREATER OF THE FEES PAID AND/OR OWED (AS APPLICABLE) BY CUSTOMER OR ITS AFFILIATES FOR THE PRODUCTS THAT ARE THE SUBJECT OF THE BREACH OR FIVE HUNDRED DOLLARS (\$500.00), EXCEPT FOR (Z) MAINTENANCE SERVICES OR A PRODUCT SUBJECT TO RECURRING FEES, FOR WHICH THE MAXIMUM AGGREGATE AND CUMULATIVE LIABILITY SHALL BE THE GREATER OF THE AMOUNT PAID AND/OR OWED (AS APPLICABLE) FOR SUCH MAINTENANCE SERVICE OR PRODUCT DURING THE TWELVE (12) MONTHS PRECEDING THE BREACH OR FIVE HUNDRED DOLLARS (\$500.00). THE PARTIES AGREE THAT THESE LIMITATIONS OF LIABILITY ARE AGREED ALLOCATIONS OF RISK CONSTITUTING IN PART THE CONSIDERATION FOR PROVIDER PROVIDING PRODUCTS AND SERVICES TO CUSTOMER, AND SUCH LIMITATIONS WILL APPLY NOTWITHSTANDING THE FAILURE OF THE ESSENTIAL PURPOSE OF ANY LIMITED REMEDY AND EVEN IF A PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH LIABILITIES OR FAILURES.

Provider's Affiliates and suppliers and Customer's Affiliates shall be beneficiaries of this *Limitation of Liability* Section and Customer's Clients and Third Party Users are entitled to the rights granted under the *MSP License* and *Use by Third Parties* Sections of this Agreement; otherwise, no third party beneficiaries exist under this

Agreement. Provider expressly excludes any and all liability to Third Party Users, Clients and to any other third party.

14. Confidential Information.

(a) **Definition.** “*Confidential Information*” means information or materials disclosed by one party (the “*Disclosing Party*”) to the other party (the “*Receiving Party*”) that are not generally available to the public and which, due to their character and nature, a reasonable person under like circumstances would treat as confidential, including, without limitation, financial, marketing, and pricing information, trade secrets, know-how, proprietary tools, knowledge and methodologies, the Software (in source code and/or object code form), information or benchmark test results regarding the functionality and performance of the Software, any Software license keys provided to Customer, and the terms and conditions of this Agreement.

Confidential Information shall not include information or materials that (i) are generally known to the public, other than as a result of an unpermitted disclosure by the Receiving Party after the date that Customer accepts the Agreement (the “*Effective Date*”); (ii) were known to the Receiving Party without an obligation of confidentiality prior to receipt from the Disclosing Party; (iii) the Receiving Party lawfully received from a third party without that third party’s breach of agreement or obligation of trust; (iv) are protected by Provider in accordance with its obligations under the *Protected Data* Section below, or (v) are or were independently developed by the Receiving Party without access to or use of the Disclosing Party’s Confidential Information.

(b) **Obligations.** The Receiving Party shall (i) not disclose the Disclosing Party’s Confidential Information to any third party, except as permitted in subsection (c) below and (ii) protect the Disclosing Party’s Confidential Information from unauthorized use or disclosure by exercising at least the same degree of care it uses to protect its own similar information, but in no event less than a reasonable degree of care. The Receiving Party shall promptly notify the Disclosing Party of any known unauthorized use or disclosure of the Disclosing Party’s Confidential Information and will cooperate with the Disclosing Party in any litigation brought by the Disclosing Party against third parties to protect its proprietary rights. For the avoidance of doubt, this Section shall apply to all disclosures of the parties’ Confidential Information as of the Effective Date, whether or not specifically arising from a party’s performance under this Agreement.

(c) **Permitted Disclosures.** Notwithstanding the foregoing, the Receiving Party may disclose the Disclosing Party’s Confidential Information without the Disclosing Party’s prior written consent to any of its Affiliates, directors, officers, employees, consultants, contractors or representatives (collectively, the “*Representatives*”), but only to those Representatives that (i) have a “need to know” in order to carry out the purposes of this Agreement or to provide professional advice in connection with this Agreement, (ii) are legally bound to the Receiving Party to protect information such as the Confidential Information under terms at least as restrictive as those provided herein, and (iii) have been informed by the Receiving Party of the confidential nature of the Confidential Information and the requirements regarding restrictions on disclosure and use as set forth in this Section. The Receiving Party shall be liable to the Disclosing Party for the acts or omissions of any Representatives to which it discloses Confidential Information which, if done by the Receiving Party, would be a breach of this Agreement.

Additionally, it shall not be a breach of this Section for the Receiving Party to disclose the Disclosing Party’s Confidential Information as may be required by operation of law or legal process, provided that the Receiving Party provides prior notice of such disclosure to the Disclosing Party unless expressly prohibited from doing so by a court, arbitration panel or other legal authority of competent jurisdiction.

15. Protected Data. For purposes of this Section, “*Protected Data*” means any information or data that is provided by Customer to Provider during this Agreement that alone or together with any other information relates to an identified or identifiable natural person or data considered to be personal data as defined under Privacy Laws, and “*Privacy Laws*” means any applicable law, statute, directive or regulation regarding privacy, data protection, information security obligations and/or the processing of Protected Data.

Except as permitted herein or to the extent required by Privacy Laws or legal process, Provider shall implement reasonable technical and organizational measures to prevent unauthorized disclosure of or access to Protected Data by third parties, and shall only store and process Protected Data as may be required to fulfill its obligations under this Agreement. If Provider complies with Customer’s written instructions with respect to the Protected Data, Provider shall have no liability to Customer for any breach of this Section resulting from such compliance. Provider shall promptly notify Customer of any disclosure of or access to the Protected Data by a third party in

breach of this Section and shall cooperate with Customer to reasonably remediate the effects of such disclosure or access. Provider further affirms to Customer that it has adequate agreements in place incorporating the EU standard contractual clauses for the transfer of Protected Data from the European Union (“EU”) to a country outside the EU.

Customer hereby (i) represents that it has the right to send the Protected Data to Provider, (ii) consents for Provider to store and use the Protected Data worldwide for the sole purpose of performing its obligations under this Agreement, (iii) agrees that the Protected Data may be accessed and used by Provider and its Representatives worldwide as may be needed to support Provider’s standard business operations, and (iv) agrees that Protected Data consisting of Customer contact information (e.g., email addresses, names) provided as part of Maintenance Services may be sent to Provider’s third party service providers as part of Provider’s services improvement processes.

16. Compliance Verification. Customer agrees to maintain and use systems and procedures to accurately track, document, and report its installations, acquisitions and usage of the Software. Such systems and procedures shall be sufficient to determine if Customer’s deployment of the Software or, if applicable, use of the SaaS Software is within the quantities, terms, and maintenance releases to which it is entitled. Provider or its designated auditing agent shall have the right to audit Customer’s deployment of the Software or, if applicable, use of the SaaS Software for compliance with the terms and conditions of this Agreement. Any such audits shall be scheduled at least ten (10) days in advance and shall be conducted during normal business hours at Customer’s facilities. Customer shall provide its full cooperation and assistance with such audit and provide access to the applicable records and computers. Without limiting the generality of the foregoing, as part of the audit, Provider may request, and Customer agrees to provide, a written report, signed by an authorized representative, listing Customer’s then current deployment of the Software and/or the number of individuals that have accessed and used SaaS Software. If Customer’s deployment of the Software or, if applicable, use of the SaaS Software is found to be greater than its purchased entitlement to such Software, Customer will be invoiced for the over-deployed quantities at Provider’s then current list price plus the applicable Maintenance Services and applicable over-deployment fees. All such amounts shall be payable in accordance with this Agreement. Additionally, if the unpaid fees exceed five percent (5%) of the fees paid for the applicable Software, then

Customer shall also pay Provider’s reasonable costs of conducting the audit. The requirements of this Section shall survive for two (2) years following the termination of the last License governed by this Agreement.

17. SaaS Provisions.

(a) **Data.** Customer may store data on the systems to which it is provided access in connection with its use of the SaaS Software (the “*SaaS Environment*”). Provider may periodically make back-up copies of Customer data, however, such back-ups are not intended to replace Customer’s obligation to maintain regular data backups or redundant data archives. Customer is solely responsible for collecting, inputting and updating all Customer data stored in the SaaS Environment, and for ensuring that it does not (i) knowingly create and store data that actually or potentially infringes or misappropriates the copyright, trade secret, trademark or other intellectual property right of any third party, or (ii) use the SaaS Environment for purposes that would reasonably be seen as obscene, defamatory, harassing, offensive or malicious.. Provider shall have the right to delete all Customer data stored in connection with the use of the SaaS Software thirty (30) days following any termination of this Agreement or any License to SaaS Software granted hereunder.

Customer represents and warrants that it has obtained all rights, permissions and consents necessary to use and transfer all Customer and/or third party data within and outside of the country in which Customer or the applicable Customer Affiliate is located (including providing adequate disclosures and obtaining legally sufficient consents from Customer’s employees, customers, agents, and contractors). If Customer transmits data to a third-party website or other provider that is linked to or made accessible by the SaaS Software, Customer will be deemed to have given its consent to Provider enabling such transmission and Provider shall have no liability to Customer in connection with any claims by a third party in connection with such transmission.

(b) **Conduct.** In connection with the use of SaaS Software, Customer may not (i) attempt to use or gain unauthorized access to Provider’s or to any third-party’s networks or equipment; (ii) permit other individuals or entities to copy the SaaS Software; (iii) provide unauthorized access to or use of any SaaS Software or the associated access credentials; (iv) attempt to probe, scan or test the vulnerability of the SaaS Software, the SaaS

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(c) **Suspension.** Provider may suspend Customer's use of SaaS Software (a) if so required by law enforcement or legal process, (b) in the event of an imminent security risk to Provider or its customers, or (c) if continued use would subject Provider to material liability. Provider shall make commercially reasonable efforts under the circumstances to provide prior notice to Customer of any such suspension.

18. General.

(a) **Governing Law and Venue.** This Agreement shall be governed by and construed in accordance with the laws of the State of California, without giving effect to any conflict of laws principles that would require the application of laws of a different state. Any action seeking enforcement of this Agreement or any provision hereof shall be brought exclusively in the state or federal courts located in the Santa Clara County, California. Each party hereby agrees to submit to the jurisdiction of such courts. The parties agree that neither the United Nations Convention on Contracts for the International Sale of Goods, nor the Uniform Computer Information Transaction Act (UCITA) shall apply to this Agreement, regardless of the states in which the parties do business or are incorporated.

(b) **Assignment.** Except as otherwise set forth herein, Customer shall not, in whole or part, assign or transfer any part of this Agreement, the Licenses granted under this Agreement or any other rights, interest or obligations hereunder, whether voluntarily, by contract, by operation of law or by merger (whether that party is the surviving or disappearing entity), stock or asset sale, consolidation, dissolution, through government action or order, or otherwise without the prior written consent of Provider. Any attempted transfer or assignment by Customer that is not permitted by this Agreement shall be null and void.

(c) **Severability.** If any provision of this Agreement shall be held by a court of competent jurisdiction to be contrary to law, such provision will be enforced to the maximum extent permissible by law to effect the intent of the parties and the remaining provisions of this Agreement will remain in full force and effect. Notwithstanding the foregoing, the terms of this Agreement that limit, disclaim, or exclude warranties, remedies or damages are intended by the parties to be independent and remain in effect despite the failure or unenforceability of an agreed remedy. The parties have relied on the limitations and exclusions set forth in this Agreement in determining whether to enter into it.

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(e) **Notices.** All notices provided hereunder shall be in writing and may be delivered by email, in the case of Provider to legal@sonicwall.com and in the case of Customer to the email address Provider has on file for Customer. All notices, requests, demands or communications shall be deemed effective upon delivery in accordance with this paragraph.

(f) **Disclosure of Customer Status.** Provider may include Customer in its listing of customers and, upon written consent by Customer, announce Customer's selection of Provider in its marketing communications.

(g) **Waiver.** Performance of any obligation required by a party hereunder may be waived only by a written waiver signed by an authorized representative of the other party, which waiver shall be effective only with respect to the specific obligation described therein. Any waiver or failure to enforce any provision of this Agreement on one occasion will not be deemed a waiver of any other provision or of such provision on any other occasion.

(h) **Injunctive Relief.** Each party acknowledges and agrees that in the event of a material breach of this Agreement, including but not limited to a breach of the *Software License, Restrictions or Confidential Information* Sections of this Agreement, the non-breaching party shall be entitled to seek immediate injunctive relief, without limiting its other rights and remedies.

(i) **Force Majeure.** Each party will be excused from performance for any period during which, and to the extent that, it is prevented from performing any obligation or service as a result of causes beyond its reasonable control, and without its fault or negligence, including without limitation, acts of God, strikes, lockouts, riots, acts of war, epidemics, communication line failures, and power failures. For added certainty, this Section shall not operate to change, delete, or modify any of the parties' obligations under this Agreement (e.g., payment), but rather only to excuse a delay in the performance of such obligations.

(j) **Equal Opportunity.** Provider is a federal contractor and Affirmative Action employer (M/F/D/V) as required by the Equal Opportunity clause C.F.R. § 60-741.5(a).

(k) **Headings.** Headings in this Agreement are for convenience only and do not affect the meaning or interpretation of this Agreement. This Agreement will not be construed either in favor of or against one party or the other, but rather in accordance with its fair meaning. When the term "including" is used in this Agreement it will be construed in each case to mean "including, but not limited to."

(l) **Legal Fees.** If any legal action is brought to enforce any rights or obligations under this Agreement, the prevailing party shall be entitled to recover its reasonable attorneys' fees, court costs and other collection expenses, in addition to any other relief it may be awarded.

(m) **Entire Agreement.** This Agreement is intended by the parties as a final expression of their agreement with respect to the subject matter thereof and may not be contradicted by evidence of any prior or contemporaneous agreement unless such agreement is signed by both parties. In the absence of such an agreement, this Agreement shall constitute the complete and exclusive statement of the terms and conditions and no extrinsic evidence whatsoever may be introduced in any proceeding that may involve the Agreement. Each party acknowledges that in entering into the Agreement it has not relied on, and shall have no right or remedy in respect of, any statement, representation, assurance or warranty (whether made negligently or innocently) other than as expressly set out in the Agreement. In those jurisdictions where an original (non-faxed, non-electronic, or non-scanned) copy of an agreement or an original (non-electronic) signature on agreements such as this Agreement is required by law or regulation, the parties hereby agree that, notwithstanding any such law or regulation, a faxed, electronic, or scanned copy of and a certified electronic signature on this Agreement shall be sufficient to create an enforceable and valid agreement. This Agreement, may only be modified or amended by a writing executed by a duly authorized representative of each party. No other act, document, usage or custom shall be deemed to amend or modify this Agreement.

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libgd graphics library	https://github.com/libgd/libgd/blob/4751b606fa38edc456d627140898a7ec679fcc24/docs/naturaldocs/license.txt
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ActiveMQ	http://activemq.apache.org/
Apache Axis2	http://axis.apache.org/axis2/java/core/
Apache Rampart	http://axis.apache.org/axis2/java/rampart/
Grub2 Bootloader	http://www.gnu.org/software/grub/
JFreeChart	http://www.jfree.org/jfreechart/
Spin.js	http://fgnass.github.io/spin.js/
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PyMySQL

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django-mysql-pymysql

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html5lib

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Flask

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Flask-RESTful

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aniso8601

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itsdangerous

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pytz

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UWSGI

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haveged

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=====

DHCP client - dhcpcd

=====

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=====

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Regular expression library - pcre
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THE BASIC LIBRARY FUNCTIONS

Written by: Philip Hazel
Email local part: ph10
Email domain: cam.ac.uk

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dropbear - Tiny SSH daemon for recovery

=====

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*

* curve25519-donna: Curve25519 elliptic curve, public key function

*

* <http://code.google.com/p/curve25519-donna/>

*

* Adam Langley <agl@imperialviolet.org>

*

* Derived from public domain C code by Daniel J. Bernstein <djb@cr.yp.to>

*

* More information about curve25519 can be found here

* <http://cr.yp.to/ecdh.html>


```
*
* djb's sample implementation of curve25519 is written in a special assembly
* language called qhasm and uses the floating point registers.
*
* This is, almost, a clean room reimplementation from the curve25519 paper. It
* uses many of the tricks described therein. Only the crecip function is taken
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*/
```

=====

curl - URL retrieval library

=====

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slf4j - Java logging library

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libxml2 - XML/XSLT parsing library

=====

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iniparser - INI parsing library

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jsoup - Java HTML Parser

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radvd - IPv6 routing daemon

=====

/*

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4. [4]Viraj Bais <vbais@mailman1.intel.com> and [5]Clayton Kirkwood <kirkwood@striderm.intel.com> port to WindowsNT 3.5
5. [6]Michael Barone <michael,barone@lmco.com> GPSVME fixes
6. [7]Karl Berry <karl@owl.HQ.leaf.com> syslog to file option
7. [8]Greg Brackley <greg.brackley@bigfoot.com> Major rework of WINNT

- port. Clean up rcvbuf and iosignal code into separate modules.
8. [9]Marc Brett <Marc.Brett@westgeo.com> Magnavox GPS clock driver
 9. [10]Piete Brooks <Piete.Brooks@cl.cam.ac.uk> MSF clock driver, Trimble PARSE support
 10. [11]Nelson B Bolyard <nelson@bolyard.me> update and complete broadcast and crypto features in snpt
 11. [12]Jean-Francois Boudreault <Jean-Francois.Boudreault@viagenie.qc.ca> IPv6 support
 12. [13]Reg Clemens <reg@dwf.com> Oncore driver (Current maintainer)
 13. [14]Steve Clift <clift@ml.csiro.au> OMEGA clock driver
 14. [15]Casey Crellin <casey@csc.co.za> vxWorks (Tornado) port and help with target configuration
 15. [16]Sven Dietrich <sven_dietrich@trimble.com> Palisade reference clock driver, NT adj. residuals, integrated Greg's Winnt port.
 16. [17]John A. Dundas III <dundas@salt.jpl.nasa.gov> Apple A/UX port
 17. [18]Torsten Duwe <duwe@immd4.informatik.uni-erlangen.de> Linux port
 18. [19]Dennis Ferguson <dennis@mrbill.canet.ca> foundation code for NTP Version 2 as specified in RFC-1119
 19. [20]John Hay <jhay@icomtek.csir.co.za> IPv6 support and testing
 20. [21]Dave Hart <davehart@davehart.com> General maintenance, Windows port interpolation rewrite
 21. [22]Claas Hilbrecht <neoclock4x@linum.com> NeoClock4X clock driver
 22. [23]Glenn Hollinger <glenn@herald.usask.ca> GOES clock driver
 23. [24]Mike Iglesias <iglesias@uci.edu> DEC Alpha port
 24. [25]Jim Jagielski <jim@jagubox.gsfc.nasa.gov> A/UX port
 25. [26]Jeff Johnson <jbj@chatham.usdesign.com> massive prototyping overhaul
 26. [27]Hans Lambermont <Hans.Lambermont@nl.origin-it.com> or [28]<H.Lambermont@chello.nl> ntpswEEP
 27. [29]Poul-Henning Kamp <phk@FreeBSD.ORG> Oncore driver (Original author)
 28. [30]Frank Kardel [31]<kardel (at) ntp (dot) org> PARSE <GENERIC> (driver 14 reference clocks), STREAMS modules for PARSE, support scripts, syslog cleanup, dynamic interface handling
 29. [32]Johannes Maximilian Kuehn <kuehn@ntp.org> Rewrote snpt to comply with NTPv4 specification, ntpq saveconfig
 30. [33]William L. Jones <jones@hermes.chpc.utexas.edu> RS/6000 AIX modifications, HP/UX modifications
 31. [34]Dave Katz <dkatz@cisco.com> RS/6000 AIX port
 32. [35]Craig Leres <leres@ee.lbl.gov> 4.4BSD port, ppsclock, Magnavox GPS clock driver
 33. [36]George Lindholm <lindholm@ucs.ubc.ca> SunOS 5.1 port
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 36. [39]Danny Mayer <mayer@ntp.org>Network I/O, Windows Port, Code Maintenance
 37. [40]David L. Mills <mills@udel.edu> Version 4 foundation, precision kernel; clock drivers: 1, 3, 4, 6, 7, 11, 13, 18, 19, 22, 36
 38. [41]Wolfgang Moeller <moeller@gwdgv1.dnet.gwdg.de> VMS port
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 42. [45]Derek Mulcahy <derek@toybox.demon.co.uk> and [46]Damon Hart-Davis <d@hd.org> ARCRON MSF clock driver
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net-snmp - SNMP libraries & daemon

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xerces - xml parser

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axis2 - Web Service Container

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rampart - WS-Sec implementation for Axis2

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grub2 - Bootloader

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The following authors assigned copyright on their work to the Free Software Foundation:

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Marco Gerards added ext2fs support, grub-emu, a new command-line engine, and fixed many bugs.

Omniflux added terminfo and serial support.

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Hollis Blanchard implemented many parts of PowerPC support.

Tomas Ebenlendr added the command chainloader into the normal mode, fixed some bugs.

Guillem Jover merged architecture-independent ELF support code.

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detect-element-resize.js

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libmnl

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To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the library's name and a brief idea of what it does.>  
Copyright (C) <year> <name of author>
```

```
This library is free software; you can redistribute it and/or  
modify it under the terms of the GNU Lesser General Public  
License as published by the Free Software Foundation; either  
version 2.1 of the License, or (at your option) any later version.
```

```
This library is distributed in the hope that it will be useful,  
but WITHOUT ANY WARRANTY; without even the implied warranty of  
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU  
Lesser General Public License for more details.
```

```
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License along with this library; if not, write to the Free Software  
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA
```

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You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the  
library 'Frob' (a library for tweaking knobs) written by James Random Hacker.
```

```
<signature of Ty Coon>, 1 April 1990  
Ty Coon, President of Vice
```

That's all there is to it!

```
=====  
libnftnl  
=====
```

```
Copyright (c) 2013-2015 Pablo Neira Ayuso <pablo@netfilter.org>
```

```
GNU GENERAL PUBLIC LICENSE  
Version 2, June 1991
```

```
Copyright (C) 1989, 1991 Free Software Foundation, Inc.  
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA  
Everyone is permitted to copy and distribute verbatim copies  
of this license document, but changing it is not allowed.
```

Preamble

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c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>  
Copyright (C) 19yy <name of author>
```

```
This program is free software; you can redistribute it and/or modify  
it under the terms of the GNU General Public License as published by  
the Free Software Foundation; either version 2 of the License, or  
(at your option) any later version.
```

```
This program is distributed in the hope that it will be useful,  
but WITHOUT ANY WARRANTY; without even the implied warranty of  
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the  
GNU General Public License for more details.
```

```
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along with this program; if not, write to the Free Software  
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA
```

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If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

```
Gnomovision version 69, Copyright (C) 19yy name of author  
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.  
This is free software, and you are welcome to redistribute it  
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program  
'Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989  
Ty Coon, President of Vice
```

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=====

readline

=====

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Version 3, 29 June 2007

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The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

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You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

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- b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no

more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

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The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for

the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

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