# Cisco Smart+Connected Remote Management Server Installation Guide

Release 1.1

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*Cisco Smart+Connected Remote Management Server Installation Guide*

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# Preface

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation* as an RSS feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service. Cisco currently supports RSS Version 2.0.

## Related Documentation

For more information about the Cisco Smart+Connected Residential products, see the following documents and websites:

| Subject / Document Title | Location |
|---|---|
| **General** | |
| Product Information and Home Page | www.cisco.com/go/smartconnectedresidential |
| Cisco 1-Year Limited Hardware Warranty Terms | www.cisco.com/go/smartconnectedresidential warranty |
| Regulatory Compliance and Safety Information for Cisco Smart+Connected Residential Products | www.cisco.com/go/smartconnectedresidential/docs |
| Cisco Support | www.cisco.com/cisco/web/support/ |
| **Technical Documentaion** | |

| | |
|---|---|
| **Release Notes**<br>Cisco Smart+Connected Residential Installation and Configuration Guide<br><br>**Installation and Configuration**<br>Cisco Smart+Connected Residential Installation and Configuration Guide<br><br>**Cisco RMS Installation and Administration**<br>Cisco Smart+Connected Remote Management Console Administration Guide<br>Cisco Smart+Connected Remote Management Server Installation Guide<br><br>**Reference Guides**<br>Cisco Smart+Connected Controller 200 Reference Guide<br>Cisco Smart+Connected Controller 250 Reference Guide<br>Cisco Smart+Connected Controller 800 Reference Guide<br>Cisco Smart+Connected 7” In-wall Display Reference Guide<br>Cisco Smart+Connected Portable Tablet Reference Guide<br>Cisco Smart+Connected I/O Extender Reference Guide<br>Cisco Smart+Connected Universal Remote 150 Reference Guide<br>Cisco Smart+Connected Universal Remote 250 Reference Guide<br>Cisco Smart+Connected Video Door Station Reference Guide | www.cisco.com/go/smartconnectedresidential/docs |
| Cisco Smart+Connected Residential Licensing and Registration Guide | See your Cisco representative or partner for more information. |
| Smart Device Compatibility and other information:<br>Cisco Smart+Connected Smart Device License for Real Estate Developers | www.cisco.com/go/smartconnectedresidential |
| Composer Pro User Guide | http://www.control4.com/documentation/Composer_Pro_User_Guide/index.htm |

**Note** For information about third-party hardware and software, see the manufacturer’s product documentation and/or website.

CHAPTER 1

# Overview

This document describes how to install and configure the Cisco Smart+Connected Remote Management Server. This server is a web application that performs the following functions:

- Host the Cisco RMS Web Services that are called by Cisco Controllers.
- Host the Cisco RMS Console browser-based interface used to manage commissioning and diagnostic tests and tasks.
- Host the Cisco RMS Locator web service, which directs Cisco Controllers to the correct Cisco RMS Server for your deployment. You can direct all Cisco Controllers to a single deployment, or create advanced rules to direct specific sets of Controllers to different Cisco RMS Servers, if necessary.

After the Cisco RMS Server and Cisco RMS Locator are installed, use the Cisco RMS Console to commission and monitor the Cisco Controllers in your deployment.

**Note** This document describes how to install the Cisco RMS and Cisco RMS Locator web services on the same Windows 2008 server (the server can be a physical or virtual instance). The Cisco RMS installer includes the *Jakarta Isapi* redirector that allows both the Microsoft IIS web server and the Apache Tomcat web server to operate without conflict (The Microsoft IIS web server hosts the Cisco RMS Server and Management Console, while Tomcat hosts the Locator services).

Refer to the following topics for more information:

**Contents**

# Requirements

Before you begin, verify that the following requirements are met.

**Note** The installer should be experienced in server and database installation and administration.

***Table 1-1 Requirements***

| Requirements | More Information | Requirement Complete? (✓) |
|---|---|---|
| Network Requirements:<br>• One IP addresses for the Cisco RMS Server.<br>• A DNS entry for the Cisco RMS Server.<br>• A DNS-A entry for `c4locator` that points to the Cisco RMS Server.<br>• DHCP server with domain suffix configured to match *yourdomain.com*. | Prepare the Server and Network Environment, page 2-2 | ☐ |
| Download and extract the Cisco RMS Server software | Obtaining the Cisco RMS Server Software, page 1-6 | ☐ |
| A SSL certificate signed by Thawte for the Cisco RMS Server. | Install and Configure the Cisco RMS Server, page 2-1<br>http://www.thawte.com | ☐ |
| Cisco RMS licenses:<br>• One Cisco RMS Server license<br>• One Cisco RMS Client license for each Cisco Controller in your deployment | Obtaining and Installing Licenses, page 1-6 | ☐ |
| A physical server that meets the following performance requirements can support up to 5,000 Cisco Controllers under normal operating conditions:<br>• Quad-core processor<br>• 8GB RAM<br>• Server-class disk subsystem (RAID 1 minimum)<br>• An Internet connection (required to download and install additional third-party software and Windows updates.) | See the server documentation for instructions to install the physical or virtual machine.<br>• The physical server requirements are the minimum hardware requirements for each group of 5,000 servers. A physical server with additional processor cores, RAM, and disk space can support additional Cisco RMS Server instances on the same machine.<br>• Tasks that require high levels of data transfer can cause decreased performance or unreliable operation. For example, initial configuration and commissioning of large numbers of Cisco Controllers, frequent polling and updating, or software update delivery by the Cisco RMS Server. To avoid performance or reliability issues, we recommend staggering data-intensive tasks, polling intervals and software updates. You can also add additional Cisco RMS Server instances to support less than the maximum number of Cisco Controllers. | ☐ |

*Table 1-1 Requirements*

| Requirements | More Information | Requirement Complete? (✓) |
|---|---|---|
| Operating System: Microsoft Windows Server 2008 R2 or later (64-bit) | The Windows server can host both the Cisco RMS Server and Cisco RMS Locator web applications.<br>See the following link for additional information: www.microsoft.com/windowsserver2008/ | ☐ |
| Database: Microsoft SQL Server Express | Included with the Cisco RMS Server installer.<br>The database is used by the Cisco RMS Server. See the following for more information:<br>• Install and Configure the Cisco RMS Server, page 2-1<br>• www.microsoft.com/express/database/ | ☐ |
| Microsoft Internet Information Services (IIS) web server version 7 or later. | The IIS server hosts the Cisco RMS Server web application.<br>See the "Install and Configure the Cisco RMS Server" section on page 2-1 for more information.<br>See the following link for additional information: http://www.iis.net/ | ☐ |
| Apache Tomcat and Java Development Kit (JDK) 1.6 | Included with the Cisco RMS Server installer.<br>The Tomcat server hosts the Cisco RMS Locator web applications. JDK is required to run the web application.<br>• See the "Define the Locator Lookup Rules and URLs" section on page A-1 to install and configure the software.<br>• See the following links for additional information:<br>– Tomcat: http://tomcat.apache.org (click **Tomcat 6** (http://tomcat.apache.org/download-60.cgi) Direct link: http://www.oracle.com/technetwork/java/javase/downloads/jdk6-downloads-1637591.html<br>– JDK: http://www.oracle.com/technetwork/java/javase/downloads/index.html (under **Java SE 6 Update 33**, click the **JDK Download** link) | ☐ |

*Table 1-1 Requirements*

| Requirements | More Information | Requirement Complete? (✓) |
|---|---|---|
| Microsoft .Net 4.0 | Included with the Cisco RMS Server installer.<br>Microsoft .Net 4.0 is required to support the web applications.<br>• See the "Define the Locator Lookup Rules and URLs" section on page A-1 to install and configure the software.<br>• See the following link for additional information: http://www.microsoft.com/net | ☐ |
| Microsoft ASP.NET MVC 3 Tools | Included with the Cisco RMS Server installer.<br>The MVC 3 Tools are required to support the web applications.<br>• See the "Define the Locator Lookup Rules and URLs" section on page A-1 to install and configure the software.<br>• See the following link for additional information: www.asp.net/mvc/mvc3. | ☐ |

# Summary Steps

Complete the following steps to install and configure the Cisco RMS Solution on your network.

| | Task | Related Documentation | Task Complete? (✓) |
|---|---|---|---|
| **Step 1** | Complete the requirements, including software installation downloads, SSL certificates, network requirements, IP addresses and other requirements. | Requirements, page 1-2 | ☐ |
| **Step 2** | Download and decompress the Cisco RMS Server installation files. | Obtaining the Cisco RMS Server Software, page 1-6 | ☐ |
| **Step 3** | Physically install the server on your existing IP network, or create a virtual machine (VM) for the Cisco RMS Server installation. | See your server or VM documentation for more information | ☐ |
| **Step 4** | Install the Windows Server 2008 on the physical server or VM instance. | www.microsoft.com/windowsserver2008/ | ☐ |
| **Step 5** | Revise the network and server properties. | Prepare the Server and Network Environment, page 2-2 | ☐ |
| **Step 6** | Install the Microsoft IIS Web Server. | Prepare the Server and Network Environment, page 2-2<br>http://www.iis.net/ | ☐ |
| **Step 7** | Install a nd configure the web service software, including the Cisco RMS Server and Cisco RMS Locator. | Install and Configure the Cisco RMS Web Services, page 2-3 | ☐ |
| **Step 8** | Verify the Installation. | Verify the Web Service and Access the Cisco RMS Console, page 2-16<br>Verify the Cisco RMS Web Services Installation, page 2-19 | ☐ |
| **Step 9** | (Optional) Deployments with multiple Cisco RMS Servers can create Cisco RMS Locator discovery rules for Cisco Controllers. | Appendix A, “Define the Locator Lookup Rules and URLs” | ☐ |
| **Step 10** | Deploy Cisco Controllers and related equipment using the browser-based Cisco RMS Console. | Cisco Smart+Connected Remote Management Console Administration Guide | ☐ |

# Obtaining the Cisco RMS Server Software

To obtain the latest Cisco RMS Server software for your release , see the Release Notes for the Cisco Smart+Connected Residential Solution.

# Obtaining and Installing Licenses

A valid license file with the .lic extension must be installed on each Cisco RMS Server. Each license file contains the server and client licenses you must purchase as described in the Release Notes for the Cisco Smart+Connected Residential Solution (the license file includes the number of clients supported by the server, and the license expiration date).

### Obtaining the License File

To obtain the license file, purchase one Cisco RMS Server license and the number of required Cisco RMS Client licenses, as described in the following procedure. You will then receive a single license file for installation.

See the Release Notes for the Cisco Smart+Connected Residential Solution for more information.

### Installing the License File

To install a license file, copy the file to the `rms` directory on the drive where you installed the Cisco RMS data. For example, **E:\rms\RMC.lic**.

See the Step 4 (select the data partition) and Step 18 (copy the license file to the rms directory) of the "Install and Configure the Cisco RMS Server" section for more information.

### Procedure

Complete the following procedure to purchase and obtain the Cisco RMS Server license file that includes the number of clients required by your deployment.

**Step 1** Purchase the license:

a. Determine the part numbers for the license you want to purchase (see the Release Notes for the Cisco Smart+Connected Residential Solution).

b. Purchase the licences by contacting your Cisco sales representative or Cisco reseller. For more information, visit http://www.cisco.com/en/US/ordering/index.shtml.

c. When the purchase is complete, you are issued a Product Authorization Key (PAK) in paper form, or in an email message.

**Step 2** Obtain the license file:

a. Locate the Product Authorization Key (PAK) created with the purchase of the optional feature.

b. In a Web browser, open the Cisco Product License Registration Web page.

http://www.cisco.com/go/license/

c. Follow the onscreen instructions to complete the form and enter the Product Authorization Key (PAK).

d. Wait for the a license file to be sent to your email address.

e. Transfer the file to the PC or a removable drive that can be accessed during the configuration.

**Step 3** Install the license file as described in the "Install and Configure the Cisco RMS Server" section on page 2-1.

CHAPTER 2

# Install and Configure the Cisco RMS Server

The Cisco RMS Server includes a web application that performs two functions:

- Host the Web Services that are called by the Cisco Controllers.
- Host the Cisco RMS Console browser-based interface.

Complete the following procedures to install and configure Cisco RMS Server and associated web services.

**Contents**



## Overview

The Cisco RMS Server installation software includes the following software components and settings. Complete the "Install and Configure the Cisco RMS Web Services" section on page 2-3 to install the software and complete the initial configuration.

- Cisco RMS Server software (hosted by the Microsoft IIS web server on a Microsoft 2008 server)
- Microsoft SQL Server Express
- Microsoft .Net 4.0
- Microsoft ASP.NET MVC 3 Tools
- (Locator Installations only) Apache Tomcat, Java Development Kit (JDK) 1.6, and *Jakarta Isapi* redirector.
- The settings and configurations required to host the Cisco Smart+Connected Remote Management Solution.

# Prepare the Server and Network Environment

Complete the following tasks before installing the Cisco RMS Server software.

**Procedure**

**Step 1** Physically install the server on your existing IP network, or create a virtual machine (VM) for the Cisco RMS Server installation.

See the server or VM product documentation for more information.

**Step 2** (Optional) Create a user with administrator rights, and using that user to install Cisco RMS (best practice is to always create a second user with administrator rights rather than use the default administrator account).

**Step 3** Change the computer name, description and primary DNS suffix.

a. Go to **Start > Computer > Properties > Change Settings > Computer Name**

b. Click **Change**.

c. Enter a *Computer name*. For example, `RMS_Server`.

d. Add the server as a member of a domain, if necessary. For example, `cisco.com`

e. Click **More** and enter the *Primary DNS Suffix of This Computer* to define the Fully Qualified Domain Name (FQDN).
For example, `cisco.com`

**Step 4** Configure the server network properties, such as a static IP address.

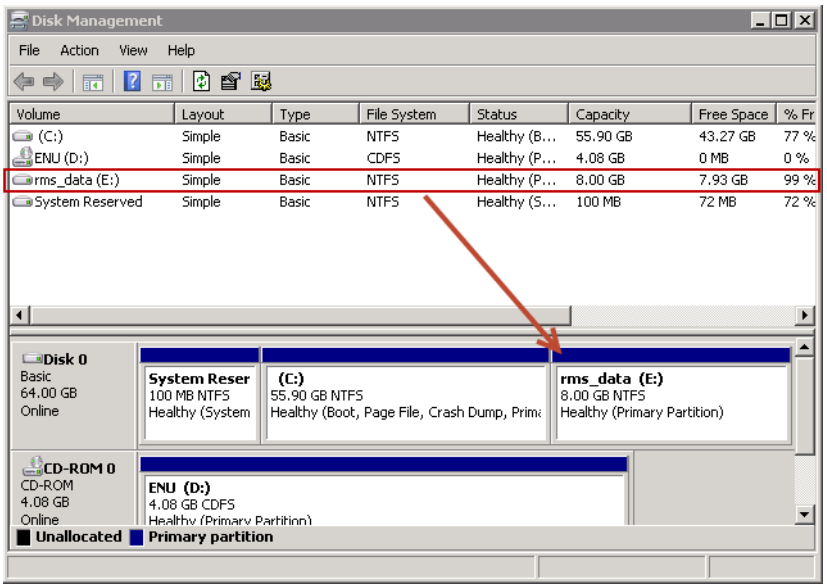
**Step 5** On the DNS server, add an entry for the Cisco RMS Server.

We recommend using the default server name **rms**. For example, `rms.<your_domain>.com`

**Step 6** (Optional but recommended) Create a data partition where the Cisco RMS web services files will be installed.

- For example, open the Disk Management utility and create a new volume (Figure 2-1).
- You may need to shrink the size of the `C:` volume to free up space for the new partition.
- Assign the volume a drive letter, such as `E:` and assign a meaningful name such as `rms_data`.
- We recommend creating an 8 GB partition in the NTFS format.

*Figure 2-1 Creating a Data Partition for the Cisco RMS Files*




# Install and Configure the Cisco RMS Web Services

**Procedure**

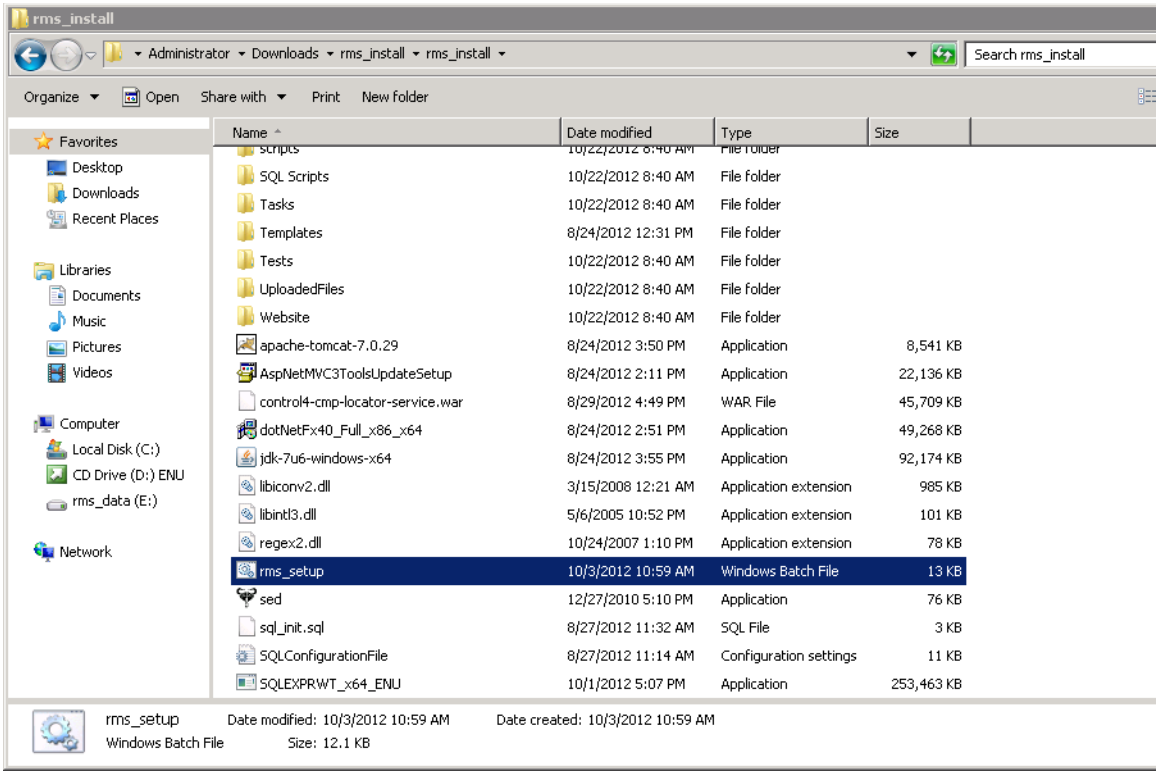
**Step 1** Complete the network, server and other requirements necessary to install and operate the Cisco Smart+Connected Remote Management Solution. See the following for more information:

- Requirements, page 1-2
- Prepare the Server and Network Environment, page 2-2

**Step 2** Download and extract the .zip rms installer package.

- See the "Obtaining the Cisco RMS Server Software" section on page 1-6 for more information.
- See the "Overview" section on page 2-1 for a summary of the software components included in the installer archive.
- The files are extracted to the `/rms_install` directory on your local drive (Figure 2-2).

*Figure 2-2 Installer Directory and .bat (Batch) File*




**Step 3** Launch the `rms_setup.bat` installer file located in the `/rms_install` directory (Figure 2-2).

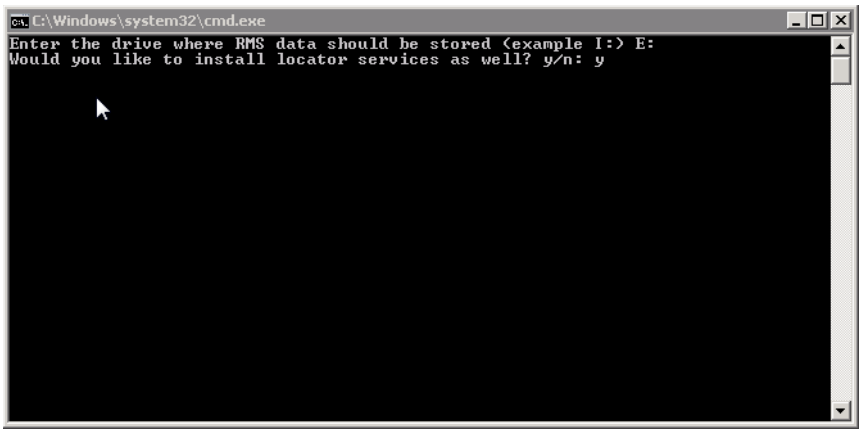
**Step 4** In the terminal window, enter the initial prompts (Figure 2-3):

**a.** Enter the drive where the installer files will be stored. For example: `E:`

**b.** Enter **Y** to install the Cisco RMS Locator service.

**Note** We recommend installing the Cisco RMS Locator service Each a Cisco RMS client (Controller) cannot access a Locator, then the Controller will attempt to access `rms.<yourdomain>.com`.

*Figure 2-3 Initial Installer Prompts*




**Step 5** Wait for the various installation tasks to complete (Figure 2-4). For example:

**a.** The directory structure is created.

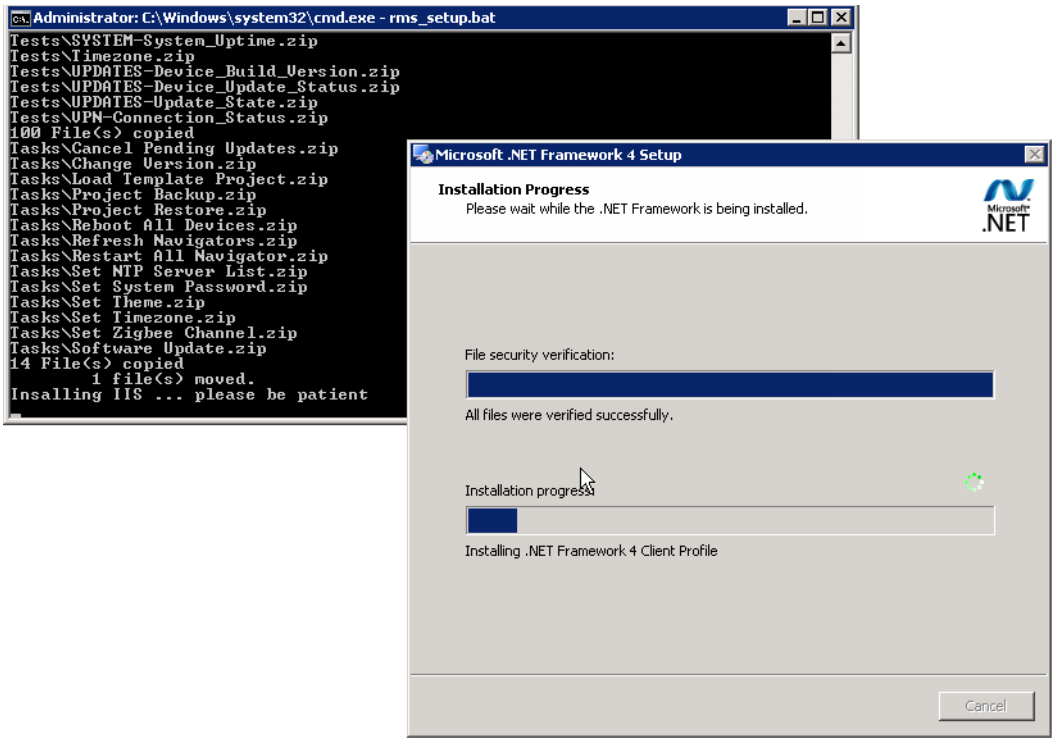
**b.** Cisco RMS resources such as tests, tasks, themes, project backup and other features are installed and configured.

**c.** The .NET 4.0 Framework is installed.

**d.** The Microsoft ASP.NET MVC 3 Tools are installed.

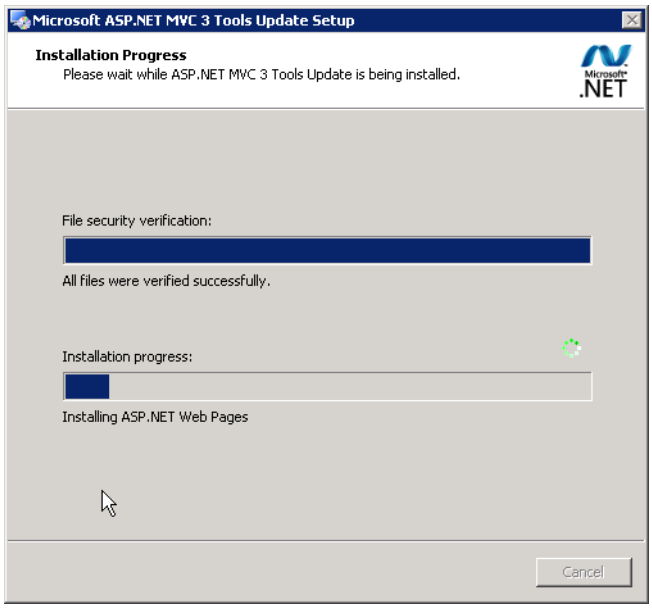
**e.** Other required software and configurations are installed and implemented.

*Figure 2-4 Installation Window Samples*



**Step 6** Wait for the ASP.Net configuration to complete (Figure 2-5).

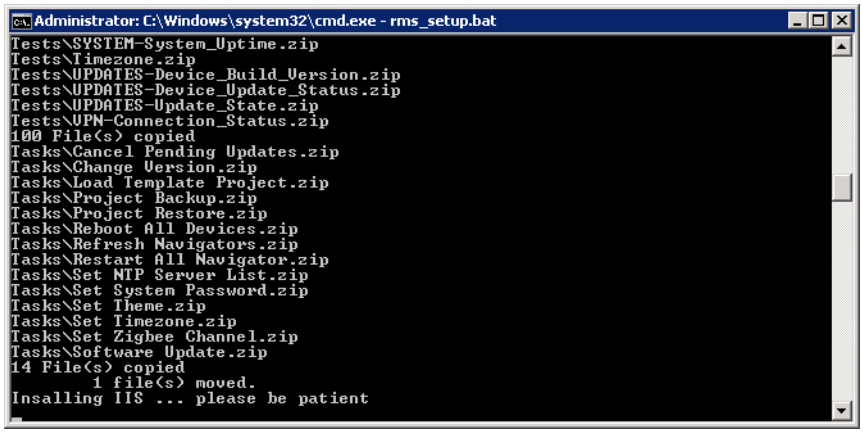
***Figure 2-5 ASP.NET Installation***




**Step 7** Wait for the additional configurations to be applied in the CLI (Figure 2-6).

- For example, the IIS *Web Server Role* is installed.
- The "Default Web Site" is also deleted and replaced by an "RMS" website (and the new RMS website is started).

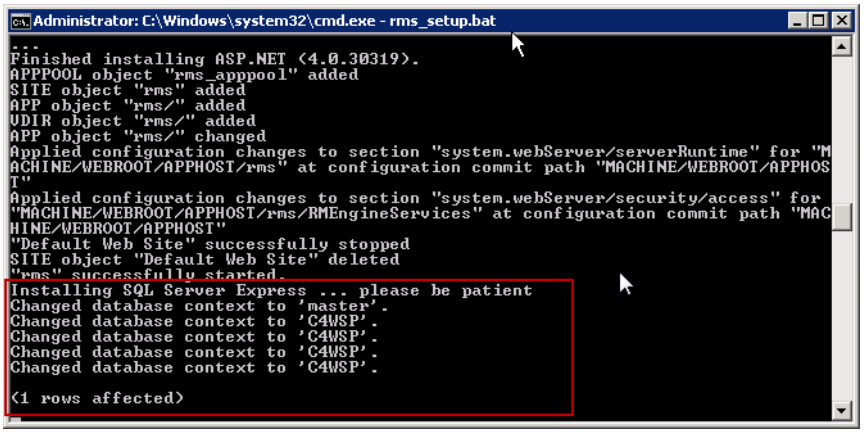
***Figure 2-6 IIS Web Server Installation***



**Step 8** Wait for the Microsoft SQL Server Express installation and configuration to complete (Figure 2-7).

- This process also configures the SQL server for use with Cisco RMS (for example, the database is created, the schema is applied, the tables and other settings are also created.

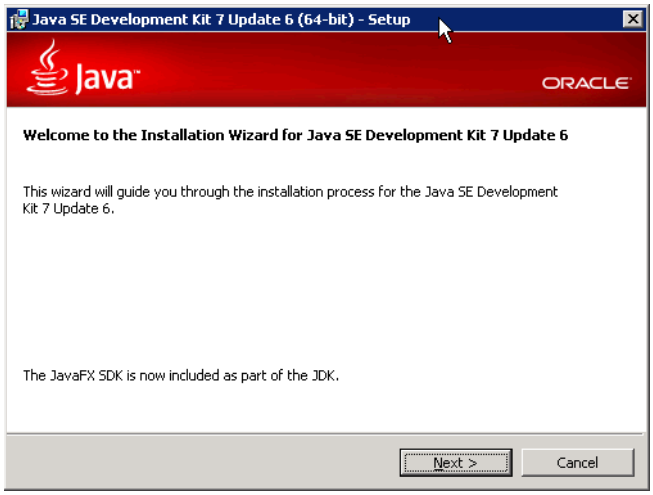
*Figure 2-7 SQL Express Installation*




**Step 9** (Locator installations only) Follow the on-screen instructions to install the Java Development Kit (JDK). (Figure 2-8).

- Click **Next** or **Close** when prompted to complete the installation.
- Close the Java registration site if it appears.

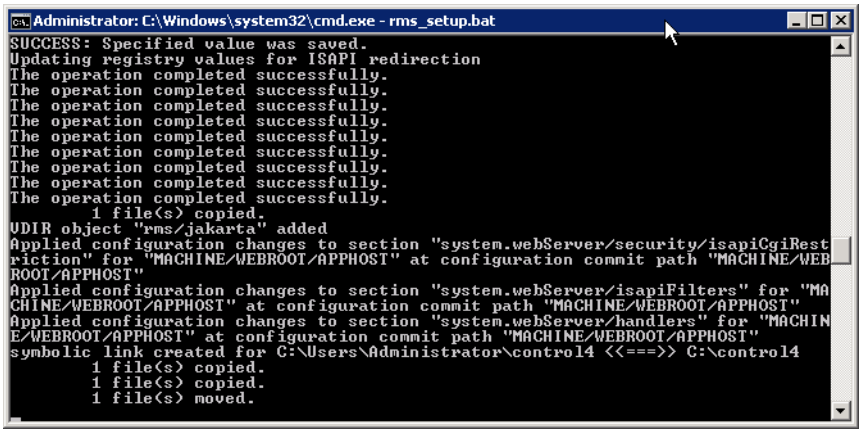
*Figure 2-8 Java (JDK) Installation*



**Step 10** Wait for the installation to complete (Figure 2-9).

- For example, the Registry values for the ISAPI redirector are created if you are installing the Cisco RMS Locator.

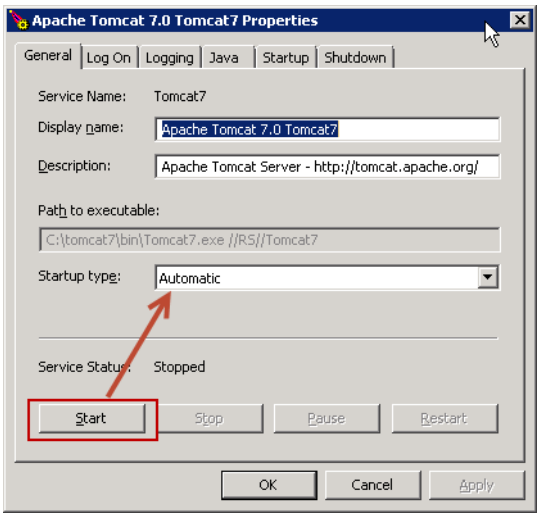
***Figure 2-9 Final Installation Settings***




**Step 11** (Locator installations only) Click **Start** in the *Apache Tomcat 7.0 Tomcat7 Properties* window (Figure 2-10) to start the Tomcat web server.

**Note** Be sure the startup type is set to **Automatic** (Figure 2-10).

***Figure 2-10 Apache Tomcat Properties***

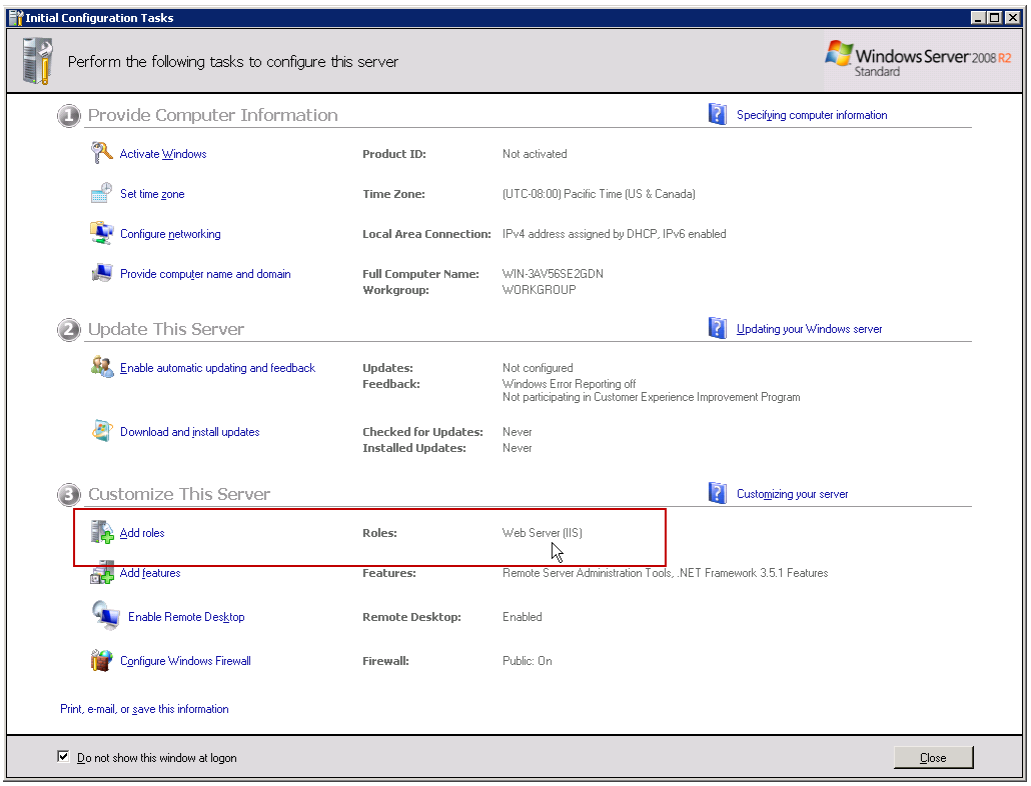



**Step 12** Restart the Windows 2008 server (**Start > Restart**) to restart the IIS and Tomcat web servers.

**Step 13** Log in to the Administrator account on the Windows 2008 server.

**Step 14** When the *Initial Configuration Tasks* window appears (Figure 2-11), verify that the *Web Server (IIS)* role appears. This indicates that the web server was successfully installed.

*Figure 2-11 IIS Web Server Role*



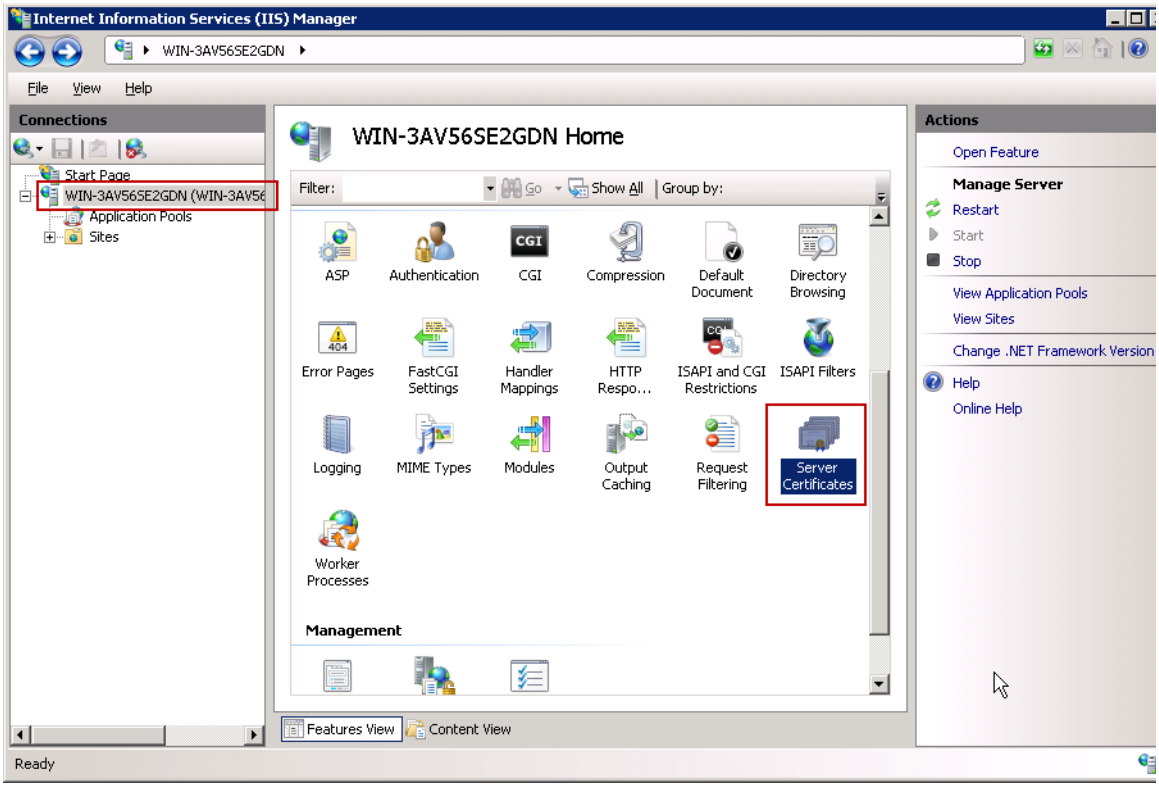

**Step 15** Create the security certificate.

**Note** Production Cisco RMS Servers communicate using a secure, encrypted HTTPS connection that is enabled by a certificate from a recognized Certificate Authority (such as Thawte). Self-signed certificates are not secure and are useful only for verifying the web site configuration. Cisco Controllers will not sync with an RMS server that is using a self-signed certificate.

a. Open the Internet Information Services (IIS) Manager (**Start > Administrative Tools > Internet Information Services (IIS) Manager**).

b. In *Connections*, select the root server (Figure 2-12).

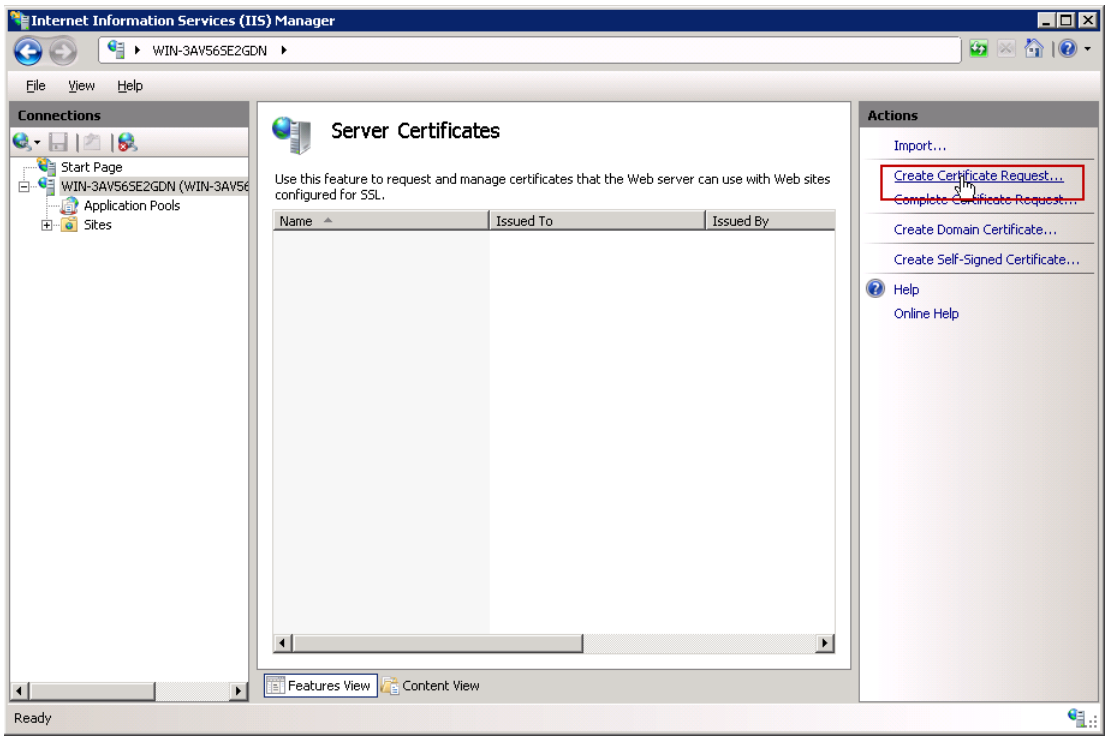
*Figure 2-12 IIS Manager Server Certificates*




c. Double-click the **Server Certificates** icon (Figure 2-12) in the middle pane to display the Server Certificates window.

d. Select **Create Certificate Request** (right pane) to request a new certificate from a recognized Certificate Authority (Figure 2-12).

*Figure 2-13 Create Certificate Request*




e. Complete the form to request a new certificate from a recognized Certificate Authority (such as Thawte).

f. Submit the certificate request code on the Certificate Authority website.

g. You will receive a certificate code from the Certificate Authority. Paste the certificate code into a file and save on your drive.

h. Click **Complete Certificate Request** to upload the certificate you receive from the Certificate Authority.

**Note** See the Microsoft and Thawte documentation for more information.

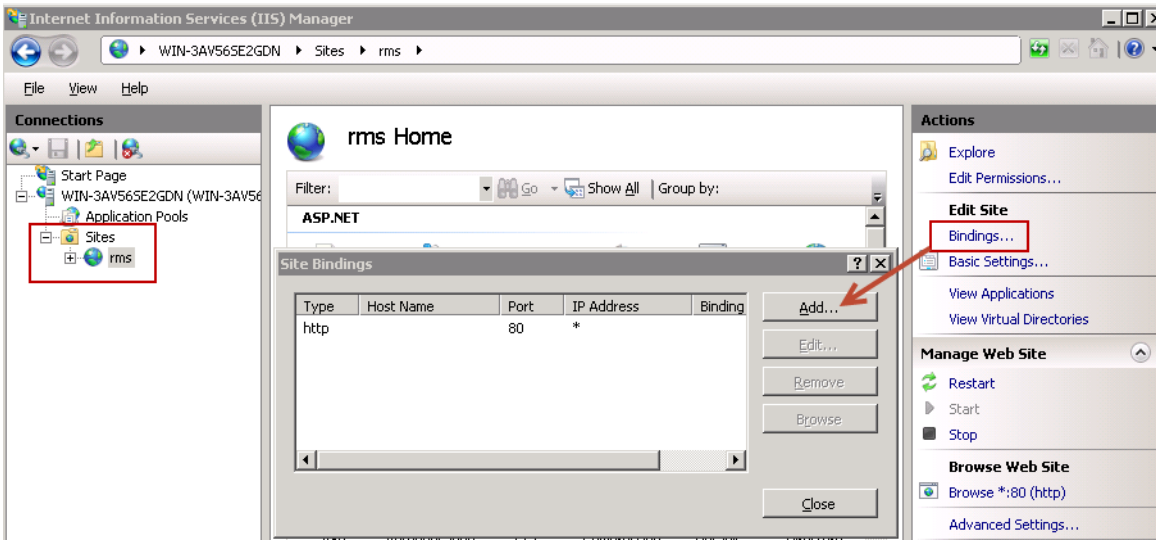
**Step 16** Add the HTTPS binding and add the certificate.

a. Select the RMS web site (for example **Sites** > **rms**) from the left pane (Figure 2-14).

b. Click **Bindings** (right pane under *Actions* tab).

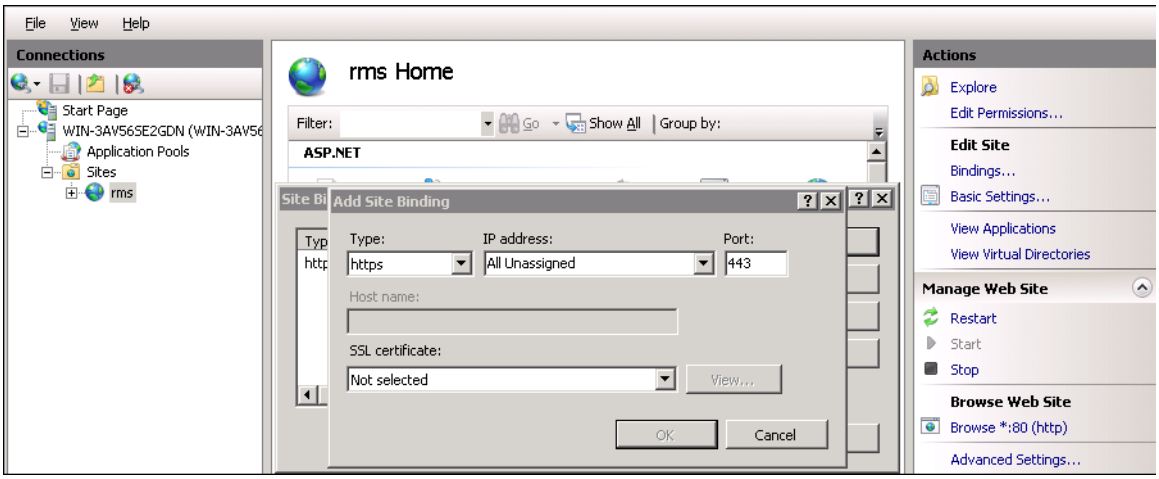
c. Click **Add** in the *Site Bindings* window.

*Figure 2-14 Add Site Bindings*




**d.** Select the following in the *Add Site Bindings* window (Figure 2-15):

*Figure 2-15 Add Site Bindings*




- Type—**https**
- IP Address—**All Unassigned**
- Port—**443**
- SSL certificate—Select the SSL certificate you created in Step 15.

**Step 17** Import the certificate file that allows Cisco Controllers to connect to the RMS server.

To do this, import the installation file **clientca.pem** to the server's *Trusted Root Certification Authorities*. The **clientca.pem** is in the `Resources` directory of the extracted Cisco RMS installation files.

**a.** Select **Start > Run > mmc** to launch the MCC.

**b.** Select **File > Add/Remove Snap-in...**

**c.** Double-click **Certificates** (under *Available Snap-ins*) and click **OK**.

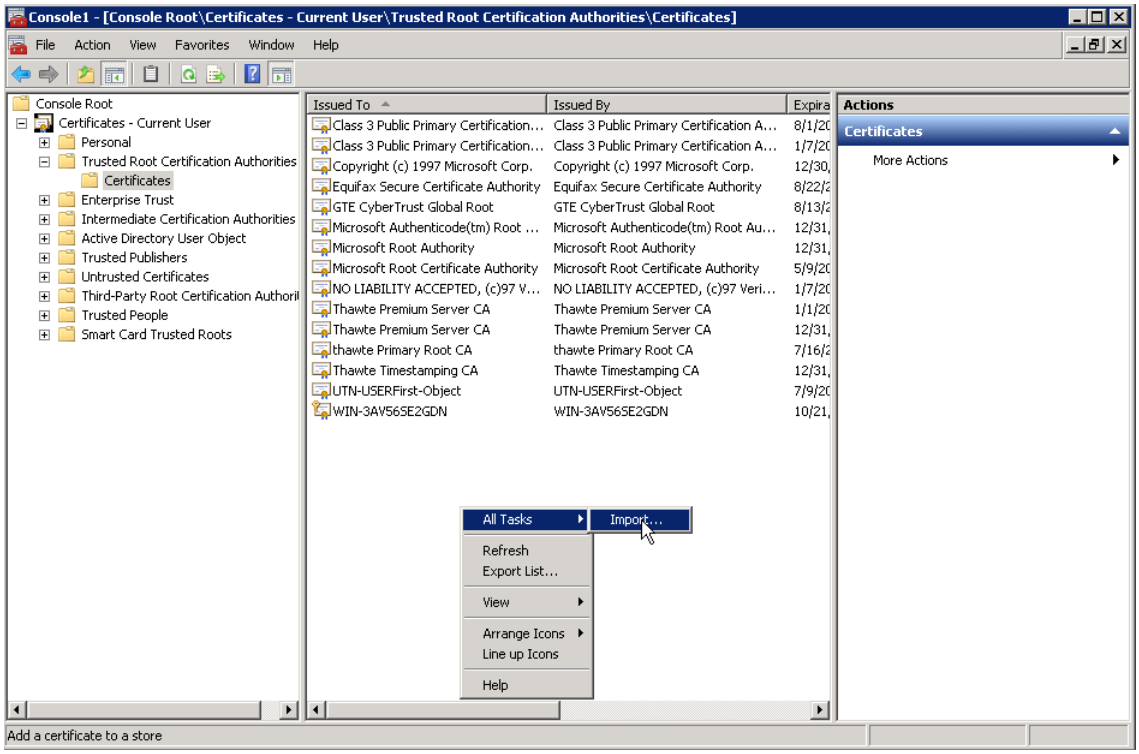
You can also select **Certificates** and click **Add**.

d. Select **My user account** (In the dialog *This snap in will always manage certificates for*) and click **Finish**.

e. Expand **CERTIFICATES > TRUSTED ROOT CERTIFICATION AUTHORITIES** and select the **Certificates** folder (Figure 2-16).

The current list of certificate authorities on the server is displayed (Figure 2-16).

***Figure 2-16 Trusted Root Certification Authorities***



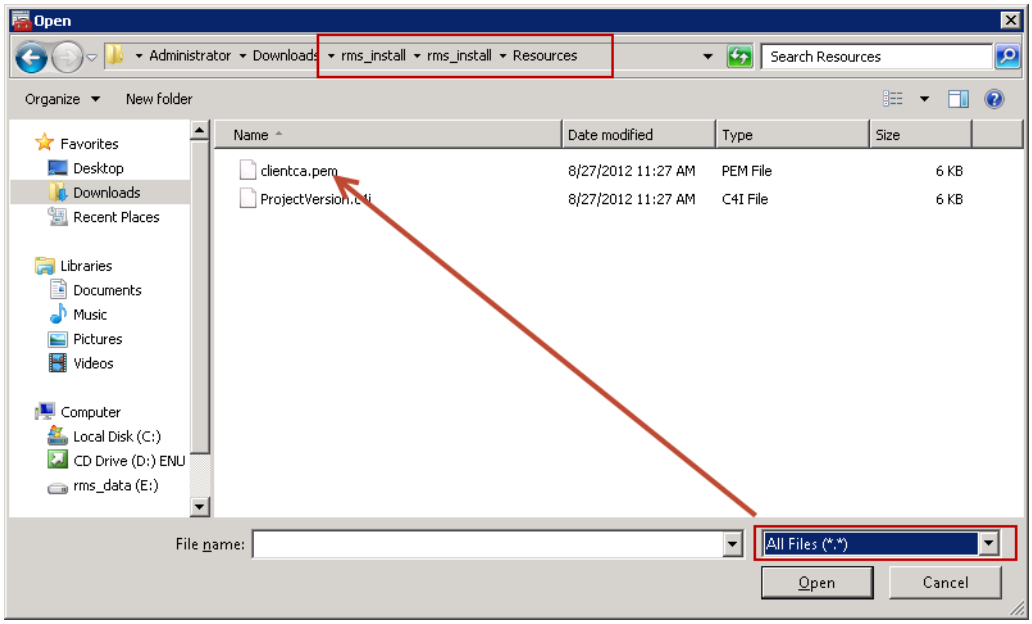

f. Right-click the center pane and select **All Tasks > Import**.

g. A wizard will appear.

h. Using the *Certificate Import Wizard*, click **Next** and **Browse** to select the **clientca.pem** file (located in the `\Resources` directory of the extracted Cisco RMS installation files). See Figure 2-17.

**Tip** Select the **All Files (*.*)** file type to display the .pem file (Figure 2-17).

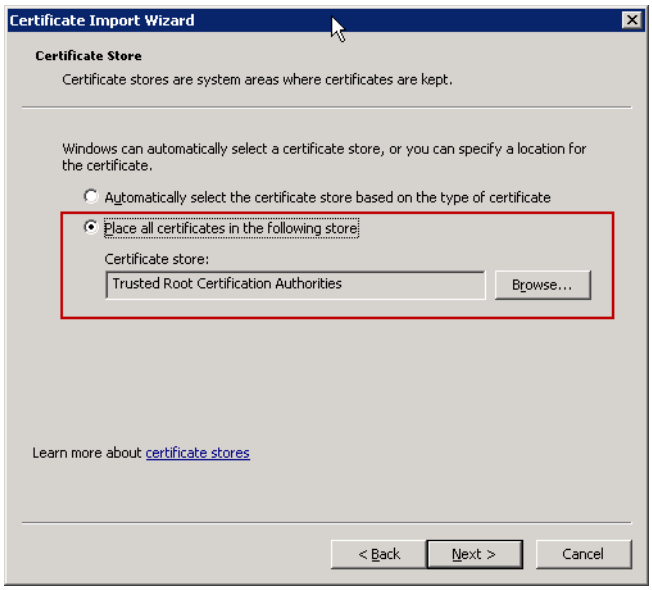
*Figure 2-17 Select the .PEM File*




i. Click **Open** and then **Next**.

j. Select **Place all certificates in the following store** and verify that **Trusted Root Certification Authorities** appears in *certificate store* (Figure 2-18).

*Figure 2-18 Certificate Store*




k. Click **Next**.

l. Click **Finish** to complete the certificate import wizard.

m. Click **Yes** to accept any security warnings and install the certificate.

n. Click **OK** when the import process is successful.

o. Exit the console and click **No** when asked to save the Console settings.

**Step 18** Install the `.lic` Cisco RMS license file.

The license file enables a single Cisco RMS Server and the number of clients purchased as client licenses. See the "Obtaining and Installing Licenses" section on page 1-6 for more information.

a. Navigate to the location where the `.lic` license file is stored. For example, a USB flash drive. See the Step 2 (extract the installation files) for more information.

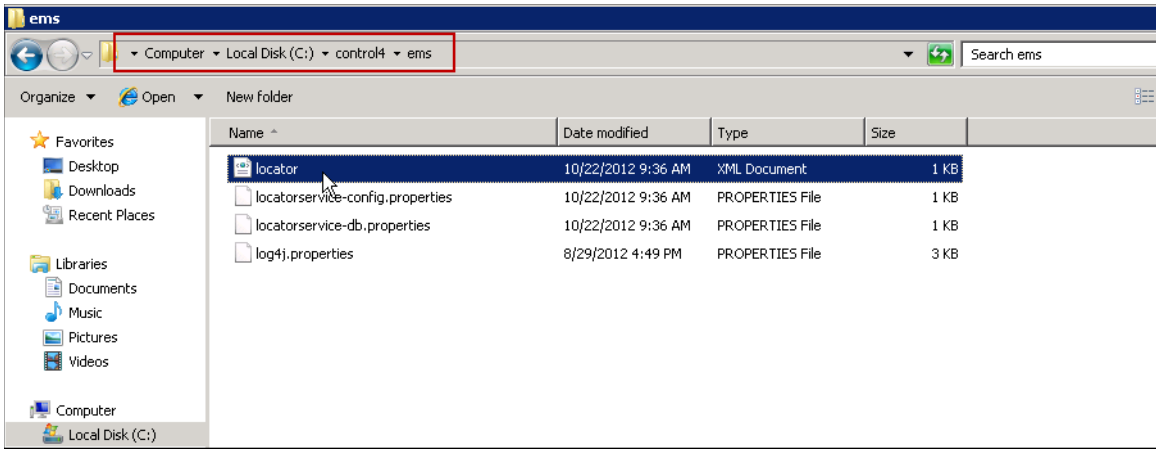
b. Copy the `RMC.lic` file to the `rms` directory on the drive where you installed the Cisco RMS data. For example `E:\rms\`. See the Step 4 (select the data partition) for more information.

**Step 19** (Locator installations only) Define the default Cisco RMS Server that Cisco Controllers will use by default.

Cisco Controllers will be redirected to the specified Cisco RMS Server by the Cisco RMS Locator service. To create advanced rules for deployments that include multiple Cisco RMS Servers, see Appendix A, "Define the Locator Lookup Rules and URLs."

a. Navigate to the `C:\control4\ems` directory (Figure 2-19).

***Figure 2-19 Cisco RMS Locator.xml Configuration File***




b. Open the `locator.xml` file using a text or XML editor such as Notepad++ (Figure 2-20).

c. Replace the default IP address or hostname with the IP address or hostname for your Cisco RMS Server:

The Cisco RMS hostname is the computer name defined in Step 3 of the "Prepare the Server and Network Environment" section on page 2-2.

For example, change

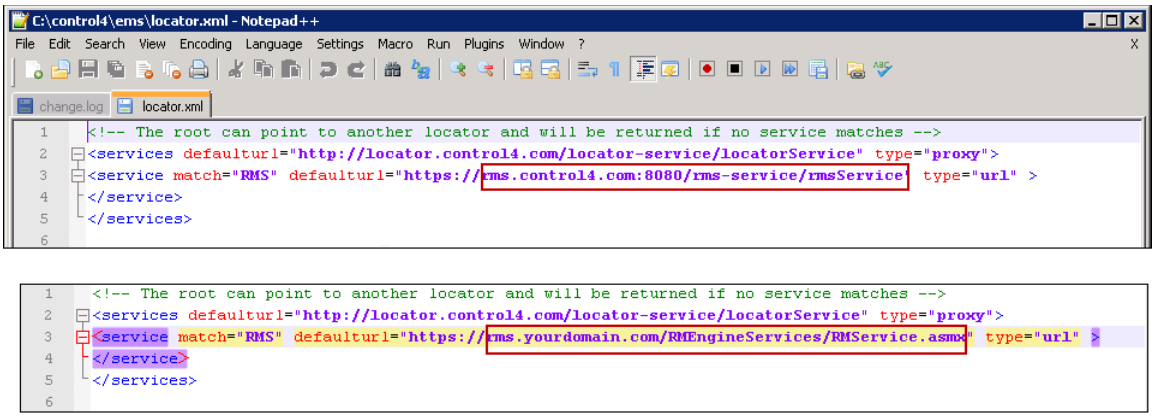
`rms.control4.com:8080/rms-service/rmsService`

to

**`rmstest.`*`yourdomain`*`.com/RMEngineServices/RMService.asmx`**

See Figure 2-20.

*Figure 2-20 Cisco RMS Locator Configuration Files*




**Step 20** Verify the installation as described in the following topics:

- Verify the Web Service and Access the Cisco RMS Console, page 2-16
- Verify the Cisco RMS Web Services Installation, page 2-19

# Verify the Web Service and Access the Cisco RMS Console

Complete the following procedure to verify that the web services are accessible and that you can log on to the Cisco RMS Console.

**Tip** If you are unable to access the we services or management console, refer to the "Verify the Cisco RMS Web Services Installation" section on page 2-19 to verify that the web server files and settings were installed correctly.

**Procedure**

**Step 1** Enter **localhost** (or the Cisco RMS Server IP address) to verify web server connectivity (Figure 2-21).

**Note** You may experience a delay the first time you connect while Cisco RMS tests and tasks (and other files) are added to the system.

For example, enter one of the following URLs in a web browser to verify connectivity:

- If connecting from the local machine, enter **localhost** and wait for the web page to redirect to the https site:
  **https://localhost/locator-service**
- If connecting from a different machine:
  **https://<*IP Address*>/locator-service**

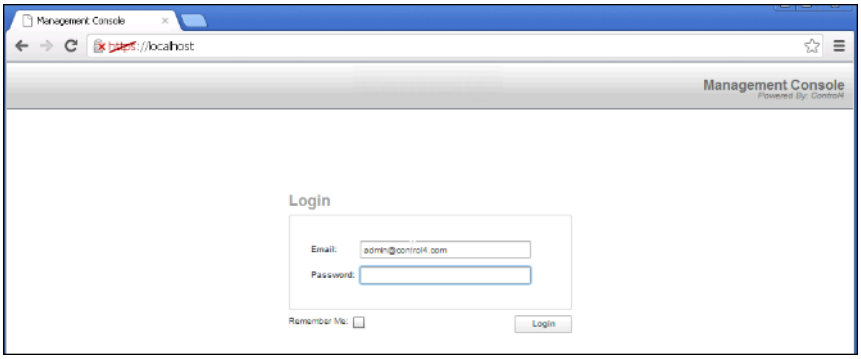
**Note** The page will redirect to the secure `https` site if you enter the non-secure "`http`".

**Step 2** Log in to the Cisco RMS Console (Figure 2-21):

The default credentials are:

- Username—**admin@control4.com**
- Password—**p@ssw0rd**

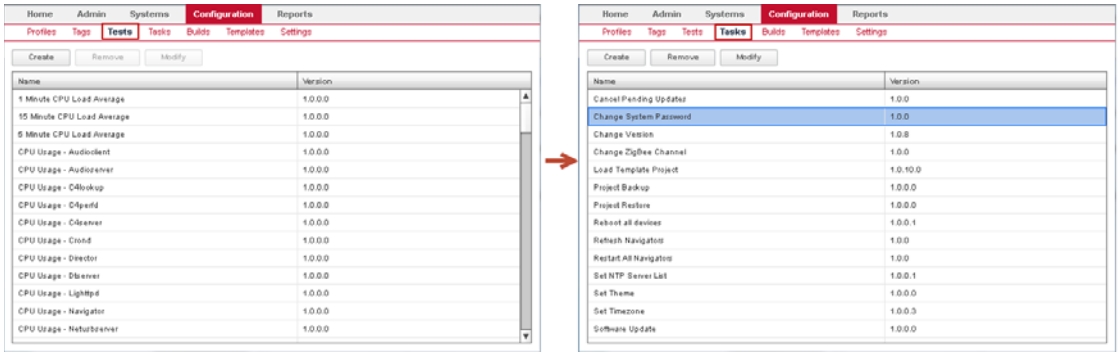
***Figure 2-21 Cisco RMS Console Login Page***




**Note** The "https" will be displayed in red with a line through it if you installed a self signed certificate for testing. Self signed certificates are not secure and do not support Controller connections.

**Step 3** Select **Configuration > Tests** and **Configuration > Tasks** to verify that the default set of tests and tasks were successfully created (Figure 2-22).

***Figure 2-22 Cisco RMS Console Tests and Tasks***



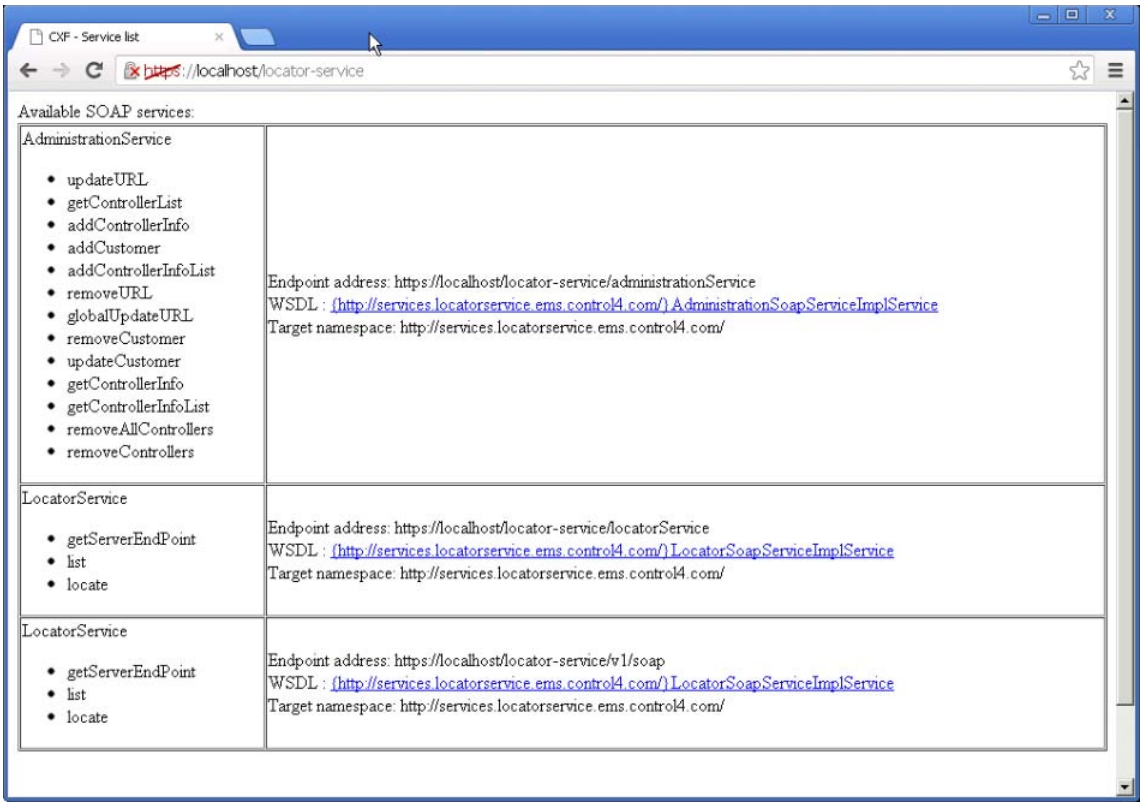

**Step 4** Verify that the Cisco RMS Locator service is available (Figure 2-23).

**a.** Enter the Cisco RMS Server URL:

**https://localhost/locator-service**

**b.** Verify that the *AdministrationService* and *LocatorService* appears in the *Available SOAP services* web page.

*Figure 2-23 Cisco RMS Locator Service*




**Step 5** Verify that the Cisco RMS engine services are available (Figure 2-24).

**a.** Enter the Cisco RMS Server URL:

**https://localhost/RMEngineServices**

**b.** Verify that the `RMService.asmx` file is present.

*Figure 2-24 Cisco RMS Engine Service*

# Verify the Cisco RMS Web Services Installation

If you are unable to access the web services or management console, complete the following procedure to verify that the web server files and configurations were successfully installed.

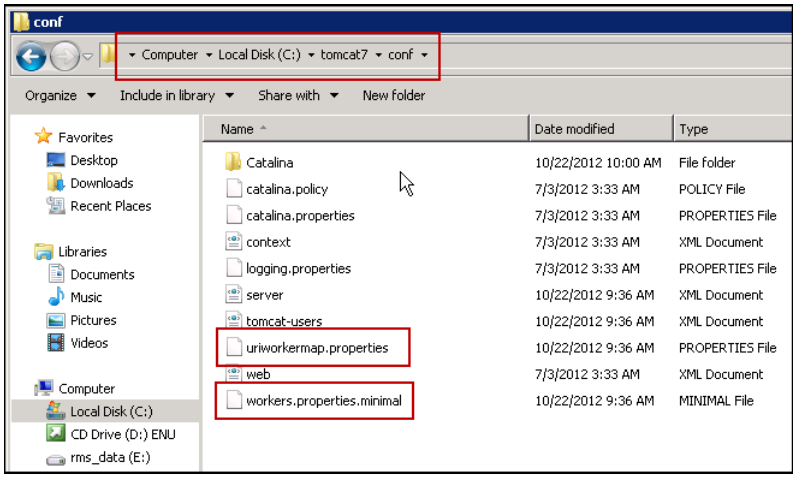
### Procedure

**Step 1** Verify that the Tomcat files are installed correctly.

**a.** Open the Windows file explorer and navigate to the `C:\tomcat7\cong` directory.

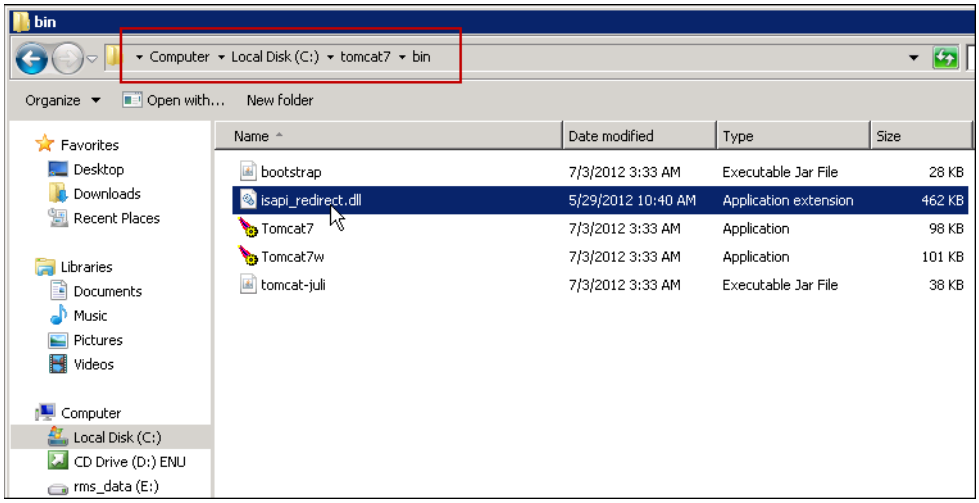
**b.** Verify that the `uriworkermap.properties` and `workers.properties.minimal` are present (Figure 2-25).

***Figure 2-25 Tomcat Configuration Files***




**c.** Navigate to the `C:\tomcat7\bin` directory and verify that the `isapiredirect.dll` file is present. (Figure 2-26).

***Figure 2-26 Tomcat bin Files***

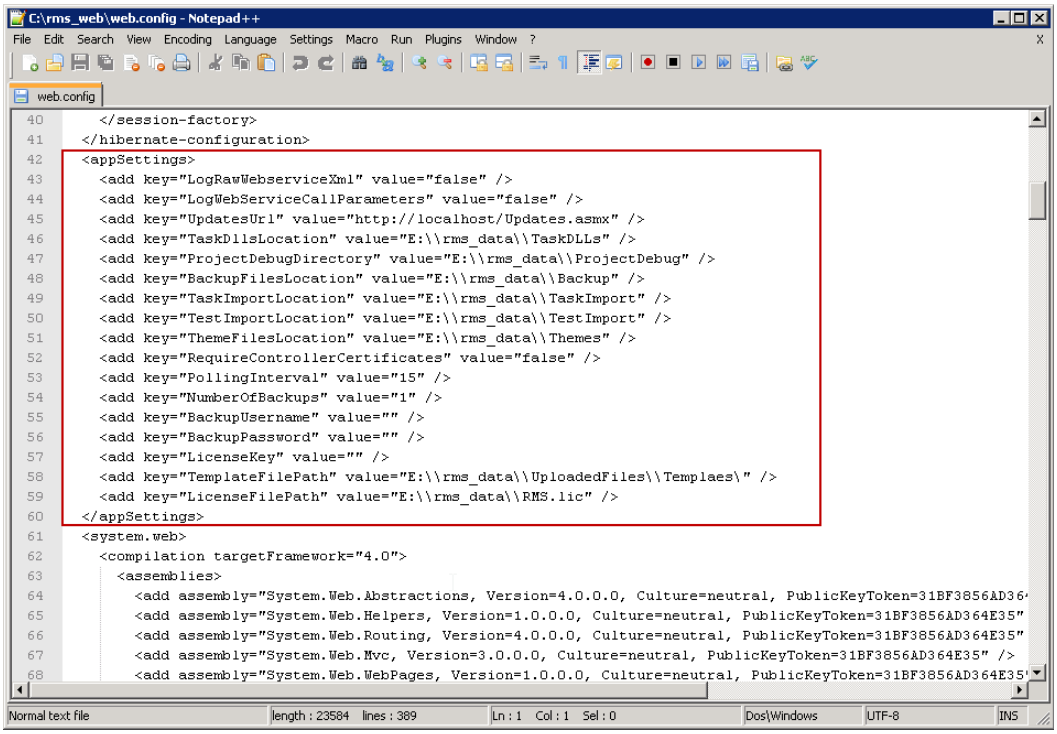


**Step 2** Verify that the RMS web configuration file is properly installed.

**a.** Open the `C:\rms_web\web.config` file in a text editor such as Notepad++.

**b.** Scroll down to the `<appSettings>` section and verify that no entries include the "%" placeholder symbol (Figure 2-27).

***Figure 2-27 Website Configuration File***

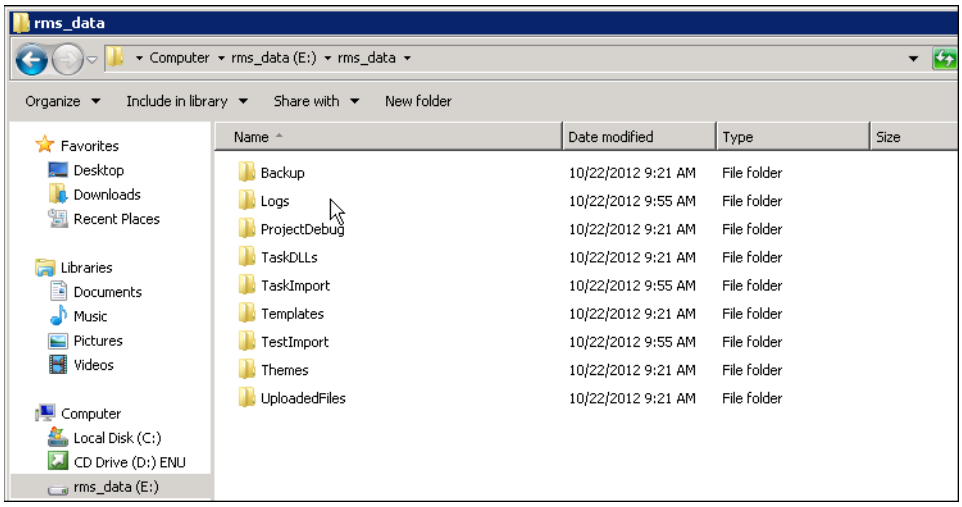


**Step 3** Verify that the Web Site directories and files are properly installed in the hard disk data partition you created in Step 6.

**a.** For example, navigate to `E:\rms-data`.

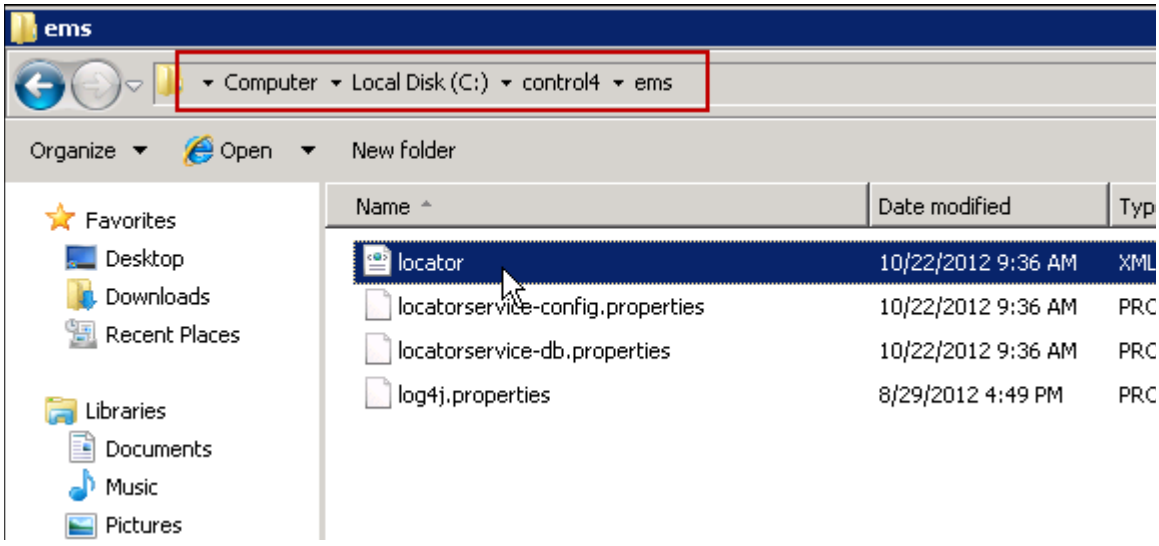
**b.** Verify that it includes the data directories similar to those displayed in Figure 2-28.

***Figure 2-28 RMS Data Directories***




**Step 4** Verify that the Cisco RMS Locator files are installed at C:\control4\ems (Figure 2-29).

***Figure 2-29 Cisco RMS Locator Configuration Files***




**Note** A link to the `C:\control4` directory is also added to the administrator account home directory. This link ensures proper operation of the Locator web service in the IIS web server environment.

**Step 5** Verify that the Jakarta Isapi redirector was successfully installed.

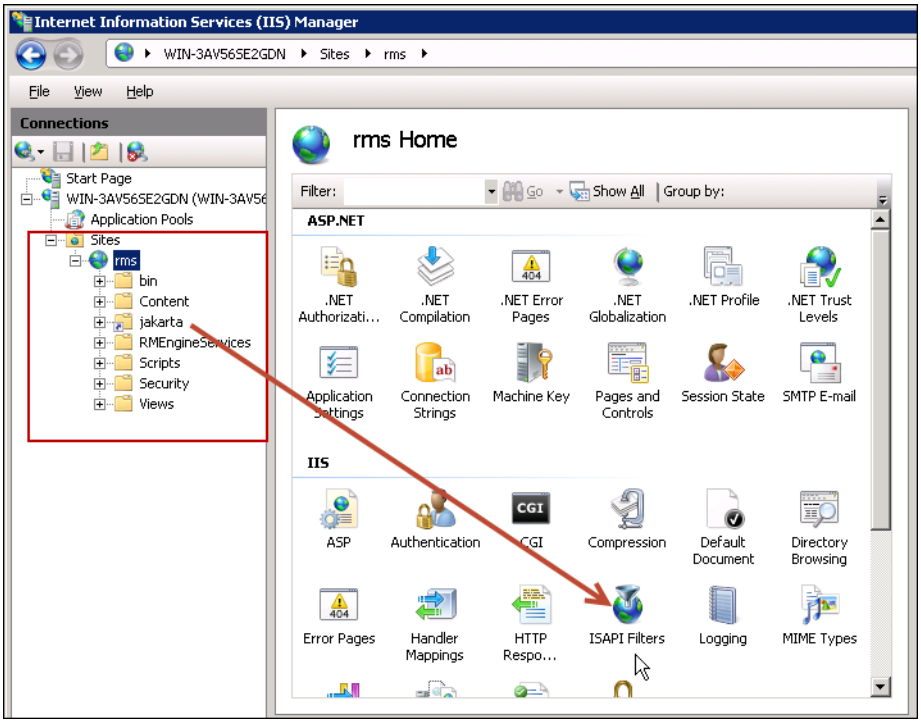
a. Launch Internet Information Services (IIS) Manager (**Start > Administrative Tools > Internet Information Services (IIS) Manager**).

b. In the *Connections* page, select the **rms** site.

c. Verify that the **jakarta** virtual directory is present.

d. In the middle pane, verify that the **ISAPIFilters** icon is present. (Figure 2-30).

***Figure 2-30 Jakarta ISAPI Filters***



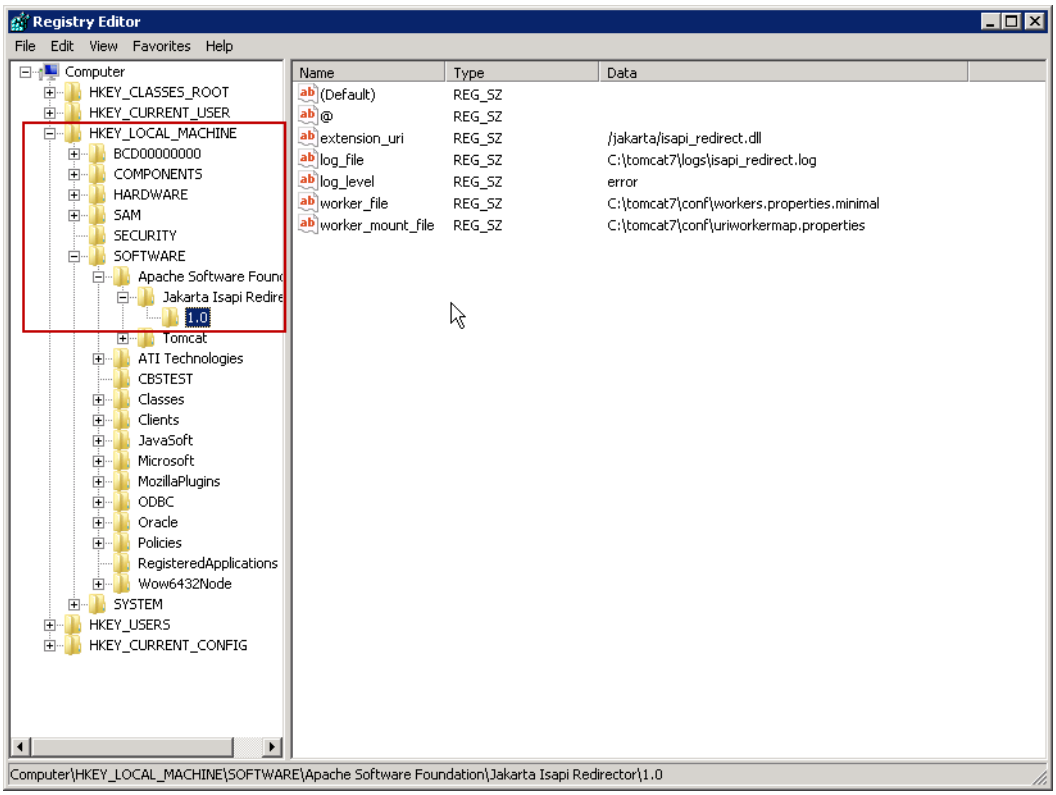

**Step 6** Verify that the Jakarta Isapi redirector was successfully added to the Windows registry.

a. Select **Start > Run** and enter **regedit** to verify that the Isapi redirector registration entries were added.

b. Verify that the following directory is present (Figure 2-31):

HKEY_LOCAL_MACHINE\SOFTWARE\Apache Software Foundation\Jakarta Isapi Redirector\1.0

*Figure 2-31 Jakarta Isapi Redirector Registry Entries*



APPENDIX A

# Define the Locator Lookup Rules and URLs

The purpose of the Locator service is to automatically redirect Cisco Controllers to a Cisco RMS Server based on the Controller properties and a set of Locator lookup rules. This section defines the Locator lookup rules that can be entered in the **locator.xml** file.

Refer to the following topics for more information:



## Locating the Locator

The Locator is discovered by the Cisco Controllers using a manually entered DNS-A record. See the "Requirements" section on page 1-2.

## Configure the Location of the locator.xml File

After installation there should be a configuration file in:

```
<user home>/control4/ems/locatorservice-config.properties
```

In this file there is a property `locator.rules.path` that should be set to the path of the `locator.xml` file that includes the lookup rules. For example:

Unix example:

```
locator.rules.path=/Users/rms/control4/ems/locator.xml
```

Windows example:

```
locator.rules.path=C:\\rms\\control4\\ems\\locator.xml
```

If the location of the rules, or the rules themselves have changed the Locator service needs to be restarted.

# Rule Based Lookup

The primary lookup mechanism is a list of rules that determines what location should be returned.

The input to the Locator is a set of optional parameters where each has a name and a value. A few examples are *Service name*, *Device IP address*, *Common Name* and *Domain*.

The output from the Locator contains a URL.

The first lookup criteria is what service is requested. If the Service Name is for example RMS the device is looking for the RMS service.

Once the requested service is determined a list of rules for this service are applied in order to find a match for the submitted parameters. The first successful match will be used and the resulting URL is assembled.

Here is a simple high level example of rules:

Service: RMS

1. IP address range: 10.10.X.X => http://rms1.mydomain.com/rms-service

2. IP address range: 10.20.X.X => http://rms2.mydomain.com/rms-service

Default => http://defaultrms.control4.com/rms-service

No services match => http://defaultlocator.control4.com/locator-service (PROXY)

If a device requests the RMS service and has the IP address 10.10.0.1 it will match the first rule and the Locator will return the URL http://rms1.mydomain.com/rms-service. If the device instead had the IP address 10.20.250.200 it would match the second rule and get the URL http://rms2.mydomain.com/rms-service back. The default http://defaultrms.control4.com/rms-service is returned if there was no other rule match for the requested RMS service. If the ACCOUNT service was requested it would return http://defaultlocator.control4.com/locator-service, and in this case it is another Locator, a proxy.

# XML Syntax

The rules are expressed in XML and the example above could have the following syntax:

```
<services defaulturl="http://defaultlocator.control4.com/locator-service" type="proxy" >
        <service match="RMS" defaulturl="http://defaultrms.control4.com/rms-service"
type="url">
            <rule name="RMS1" host="rms1.mydomain.com" path="/rms-service">
                <ip match="10.10.0.0/16" />
            </rule>
            <rule name="RMS2" host="rms2.mydomain.com"  path="/rms-service">
                <ip match="10.20.0.0/16" />
            </rule>
        </service>
</services>
```

The `/16` in the IP address match means that the rule will try to match the first 16 bits in the IP address.

The URL components are inherited from higher up in the tree, so another way to express the same rules are as follows:

```
<services defaulturl="http://defaultlocator.control4.com/locator-service" type="proxy" >
        <service match="RMS" defaulturl="http://defaultrms.control4.com/rms-service"
type="url">
            <rule name="RMS1" host="rms1.mydomain.com" >
                <ip match="10.10.0.0/16" />
            </rule>
            <rule name="RMS2" host="rms2.mydomain.com" >
                <ip match="10.20.0.0/16" />
            </rule>
        </service>
</services>
```

| Input Parameters | | |
|---|---|---|
| **Service** | **IP address** | **Locator response** |
| RMS | 10.10.40.50 | http://rms1.mydomain.com/rms-service |
| RMS | 10.20.40.50 | http://rms2.mydomain.com/rms-service |
| RMS | 99.01.40.50 | http://defaultrms.control4.com/rms-service |

# Proxy

The result URL returned from the lookup has a type associated with it. The type can be URL or PROXY. PROXY typically means that it points to another Locator.

```
<services defaulturl="http://defaultlocator.control4.com/locator-service" type="proxy" >
        <service match="RMS" defaulturl="http://defaultrms.mydomain.com/rms-service"
type="url">
            <rule name="RMS1" >
                <ip match="10.10.0.0/16" />
            </rule>
            <rule name="RMS2" host="rms.mydomain.com" >
                <ip match="10.20.0.0/16" />
            </rule>
        </service>
</services>
```

| Input Parameters | | |
|---|---|---|
| **Service** | **IP address** | **Locator response** |
| ACCT | 30.10.40.50 | http://defaultlocator.control4.com/locator-service (PROXY) |
| RMS | 30.10.40.50 | http://defaultrms.mydomain.com/rms-service (URL) |
| RMS | 10.20.40.50 | http://rms.mydomain.com/rms-service (URL) |

# Logical Operators

Logical “and” and “or” can be used in the rules for more flexibility. They can be nested in the tree. For example here is a set of rules that uses both to match two separate IP ranges and a portion of the common name:

```
<services defaulturl="http://defaultlocator.control4.com/locator-service" type="proxy" >
        <service match="RMS" defaulturl="http://rms1.mydomain.com/rms-service" type="url">
            <rule name="RMS1" >
                <and>
<or>
                        <ip match="10.10.0.0/16" />
<ip match="10.20.40.0/24" />
</or>
<commonName match="MyCommonName[0-9]+" >
</and>
            </rule>
            <rule name="RMS2" host="rms2.mydomain.com" >
                <ip match="10.20.0.0/16" />
            </rule>
        </service>
</services>
```

The `commonName` match is using a regular expression to match common names that starts with “MyCommonName” followed by one or more numbers.

| Input Parameters | | | Locator response |
|---|---|---|---|
| **Service** | **IP address** | **Common Name** | |
| RMS | 10.10.40.50 | MyCommonName123123 | http://rms1.mydomain.com/rms-service |
| RMS | 10.20.40.50 | MyCommonName123123 | http://rms1.mydomain.com/rms-service |
| RMS | 10.20.40.50 | MyOtherName123123 | http://rms2.mydomain.com/rms-service |

# URLs

The services node and the service nodes have a mandatory `defaulturl` and type.

```
defaulturl=https://rms1.mydomain.com/rms-service  type="url"
```

The `services defaulturl` is used when there is no service matching the given service name.

The `service defaulturl` is used when none of the rules for that service are matching.

Each rule may define any URL components protocol, host, port, path or type which will override what is in the `defaulturl`. If they are not overridden the defaults will be inherited and used.

For example:

```
<services defaulturl="http://defaultlocator.control4.com/locator-service" type="proxy" >
        <service match="RMS" defaulturl="https://rms1.mydomain.com/rms-service"
type="url">
            <rule name="RMS1" port="8888" >
                <and>
<or>
                        <ip match="10.10.0.0/16" />
<ip match="10.30.40.0/24" />
</or>
```

```
<commonName match="MyCommonName[0-9]+" >
</and>
            </rule>
            <rule name="RMS2" port="9999" host="rms2.mydomain.com" >
                <ip match="10.20.0.0/16" />
            </rule>
        </service>
</services>
```

Note that URL components are inherited so they don't have to be specified for each rule. In the example the first rule specifies port 8888. If this rule would match, the port would be 8888 and the other URL components would come from the `defaulturl`: https://rms1.mydomain.com:8888/rms-service

| Input Parameters | | | |
|---|---|---|---|
| **Service** | **IP address** | **Common Name** | **Locator response** |
| RMS | 10.30.40.50 | MyCommonName123123 | https://rms1.mydomain.com:8888/rms-service |
| RMS | 10.20.40.50 | MyCommonName123123 | https://rms2.mydomain.com:9999/rms-service |

# No Match

If there is no match for even the service name the services `defaulturl` will be used. This services default typically should point to another Locator.

If the service name matches but there is no match for any rules in that service, the service `defaulturl` will be used.

```
 <services defaulturl="http://defaultlocator.control4.com/locator-service" type="proxy" >
       <service match="RMS" defaulturl="https://defaultrms.mydomain.com/rms-service"
type="url">
            <rule name="RMS1" port="8888" >
                <and>
<or>
                        <ip match="10.10.0.0/16" />
<ip match="10.30.40.0/24" />
</or>
<commonName match="MyCommonName[0-9]+" >
</and>
            </rule>
            <rule name="RMS2" port="9999" host="rms2.mydomain.com" >
                <ip match="10.20.0.0/16" />
            </rule>
        </service>
</services>
```

| Input Parameters | | |
|---|---|---|
| **Service** | **IP address** | **Locator response** |
| RMS | 11.30.40.50 | https://defaultrms.mydomain.com/rms-service |
| Other | 10.20.40.50 | http://defaultlocator.control4.com/locator-service (PROXY) |

# Device Specific DB Lookup

If common name and service name is submitted from the device a database lookup will be attempted before trying to match any rule. If the particular device common name is in the database for that service, the particular service URL mapped to that common name will be returned. This feature requires that the Locator database is pre populated with common name to service URL mappings.

# XML Rule Criteria

The currently supported set of XML rule criteria are shown in the following table:

| XML criteria name | Description | Match type |
|---|---|---|
| commonName | Common name | Regular expression |
| macAddress | Device mac address | Regular expression |
| primaryDns | Primary DNS IP address | IP address match using CIDR bit mask |
| defaultGateway | Default Gateway | IP address match using CIDR bit mask |
| ip | Device IP address | IP address match using CIDR bit mask |
| domain | Domain | Regular expression |
| dhcpMacAddress | DHCP server MAC address | Regular expression |
| secondaryDns | Secondary DNS IP address | IP address match using CIDR bit mask |
| userAgent | User-Agent HTTP Header | Regular expression |