CSM Server User Guide

What is CSM Server?

CSM Server is a web based server-side automation and orchestration framework. It provides service providers the ability to simultaneously schedule and deploy IOS-XR (ASR9K, CRS, and NCS6K) SMUs & software upgrades across hundreds of routers in a scheduled manner through a simple point and click Web interface

It leverages the Accelerated Upgrade Tool (AUT) to automate and relieve our customers of having to perform tedious & manual install steps themselves

CSM Server



Requirements

- Runs on Linux machine
- Python interpreter 2.7.6 & supported libraries
- MySQL 5.6 or above
- Gunicorn web server
- Safari/Google Chrome/Firefox Browser

Installation

- Refers to the Installation guide
- This guide will provide instructions on installing CSM Server and various components on different Linux distributions as well as how to launch it.

CSM Server Modules

- CSM Server
 - Provides a Web GUI to provision hosts, jump servers, regions, and servers
 - Schedules different types of installation jobs
 - Browses database information and view system and session logs
 - Performs administrative tasks

CSM Dispatcher

- Runs scheduled download and install jobs
- Collects software inventory information from hosts
- Performs housekeeping tasks

High Level Overview

Login

Use default Admin user authentication to login

Modify User Password

Click Tools – Edit User Profile

Create CSM Server Users

Click Admin – Create User

Create Server Repositories

Define TFTP/FTP/SFTP server information

Create Regions

Create regions and link them with server repositories

Create Jump Servers

 Define jump servers if managed hosts are behind them

Create Managed Hosts

- Define connection information and assign a region to a managed host
- Once a host is defined, CSM Server will connect to the host to retrieve software inventory information

Host Dashboard

- Click the hostname under the Managed Hosts tab
- Display the host connection information, software packages, scheduled installations, and the install and software inventory history.
- Allows installation to be scheduled

Schedule Install

 From Host Dashboard, click Action - Schedule an Install

Install Dashboard

View scheduled/in-progress/failed/completed installations

Start & Stop CSM Server

Start CSM Server

- For detail information, refer to the installation guide
- Follow only if CSM Server is running inside virtualenv
 - To enter the virtual environment, from csmserver directory, type "source env/bin/activate"
 - The shell prompt will display "(env)" which indicates you are inside the virtual environment
 - Follow below instructions to start CSM Server
 - To leave the virtual environment, type "deactivate". This will return you to the regular shell prompt
- To Start CSM Server
 - From csmserver directory, type "./csmserver start"
- To Start CSM Server Securely
 - Must have ssl.key and ssl.cert files
 - From csmserver directory, type "./csmserver start secure"

Stop CSM Server

- For detail information, refer to the installation guide
- Before stopping CSM Server, precautions below help eliminate unexpected results
 - On the Admin Dashboard, disable 'Allow Scheduled Installs to Run'
 - Go to the Install Dashboard to see if there is any in-progress installation
 - If no in-progress installation, following the instructions below to stop CSM Server
 - 'Allow Scheduled Installs to Run' will need to be re-enabled when CSM Server starts again
- If CSM Server is running inside virtualenv
 - Follow instructions on previous slide to enter the virtual environment
- To Stop CSM Server
 - From csmserver directory, type "./csmserver stop"

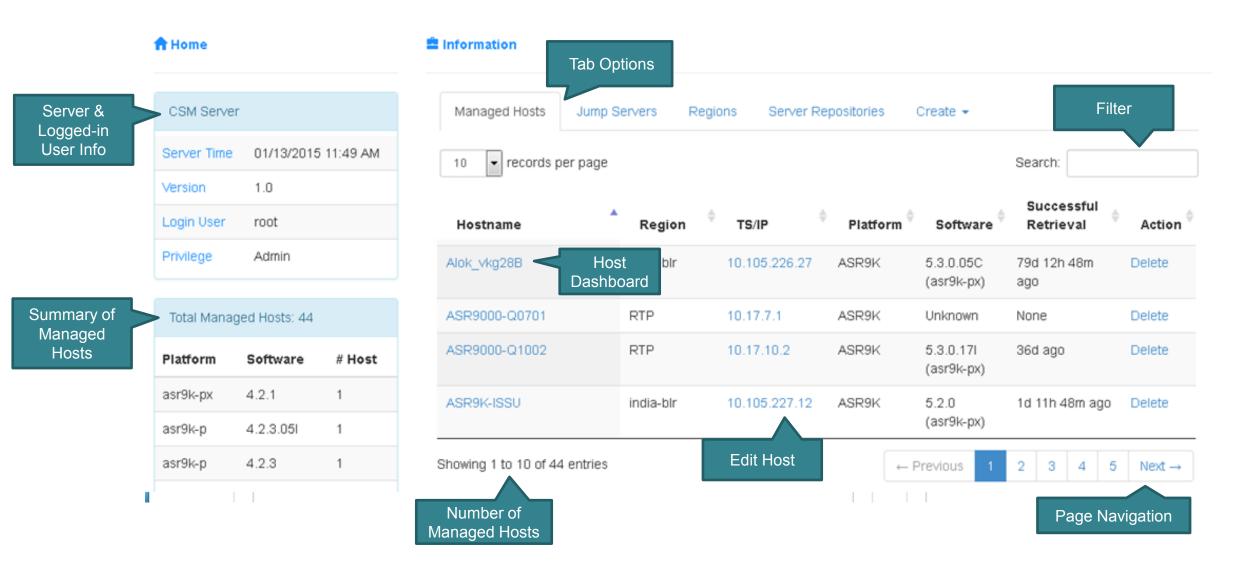
Main Menu Bar

Main Menu Bar



CSM Server Home

Home



Home Tab Options



Managed Hosts

Jump Servers

Regions

Server Repositories

Create -

Managed Hosts

- Managed host are Cisco IOS-XR devices that scheduling tasks can be performed on.
- Each row represents one Cisco device.

Jump Servers (Optional)

- The server that CSM logs into in order to then connect to the managed hosts.
- Many service provider environments often place their devices behind a jump server. CSM first logs into the jump server, then to the router.

Regions

- A region is mapped to multiple server repositories.
- All devices from the same region share the same set of TFTP, FTP, SFTP servers.

Server Repositories

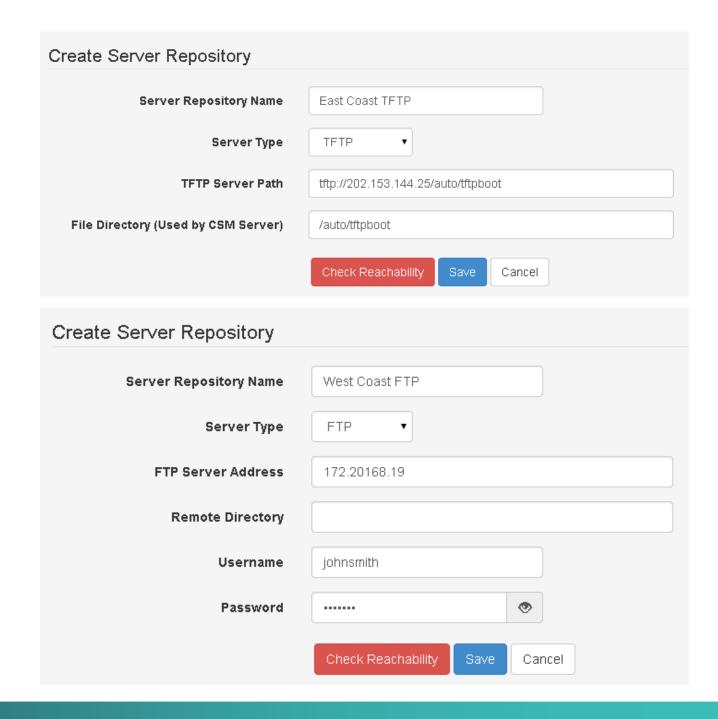
 Where you define the TFTP, FTP, and SFTP server repositories.

Create

 Where you go to create managed hosts, jump servers, regions and server repositories.

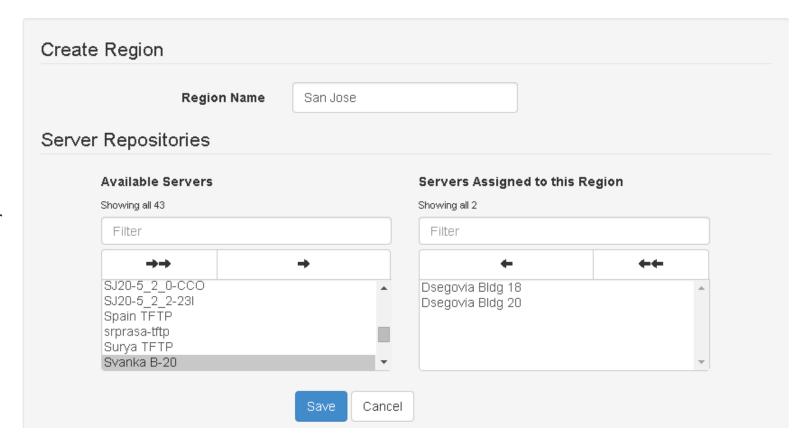
Create Server Repository

- Specify an unique server repository name
- Select a server type for the server repository where the software packages reside.
- For TFTP server, specify the TFTP server path (e.g. tftp://202.153.144.25/auto/tftpboot). A TFTP server path usually has a corresponding Unix file directory (e.g. /auto/tftpboot). Specify that in File Directory so that CSM Server can browse the software packages
- For FTP/SFTP server, specify the FTP/SFTP server address (e.g. ftp.easycgi.com or an IP address). If applicable, specify the remote directory. The remote directory is optional and should be relative to the default directory where FTP/SFTP client first connects to.
- When scheduling an install, CSM Server uses this server repository information to provide file and directory browsing function.



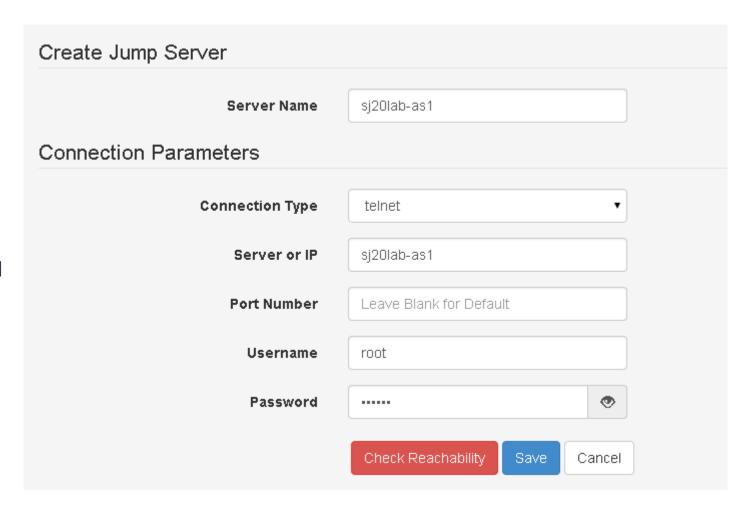
Create Region

- Specify an unique region name.
- Assign server repositories to the region.
- When creating a new host, a region is attached to the host.
- When scheduling an install, CSM Server uses the host's region to lookup server repositories and provides file and directory browsing function.



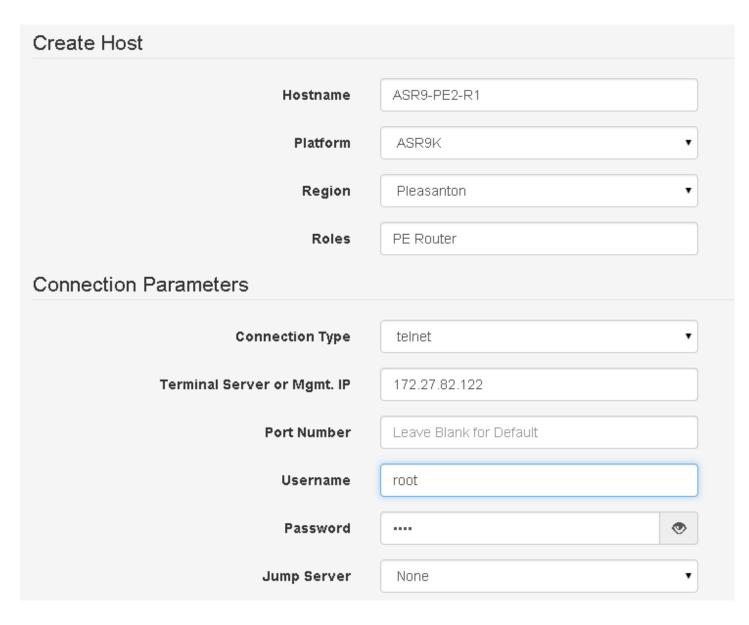
Create Jump Server

- Specify an unique jump server name
- Specify a connection type
- Specify a sever name or an IP address of the server
- Specify a telnet or ssh port number.
- A jump server may be assigned to a managed host if the managed host is behind the jump server.



Create Host

- Specify an unique host name
- Select a platform and region for the managed host. Optional, you may specify the role of the device. This will enable further filtering when creating batch schedule installs.
- If the device is attached to a terminal server, specify the terminal server IP.
- If the device is on the management network, specify the management IP.
- Multiple management IPs (i.e. RSP0 and RSP1) can be entered in the Terminal Server or Mgmt. IP field. Use comma as the delimiter.
- Multiple terminal server ports can be entered in the Port Number field. Use comma as the delimiter.



Connection via Host Console Port

When a host console port is used for connection, the syslog logging on the console should be disabled. Otherwise, it will interfere with the installation.

- To disable logging
 - RP/0/RSP0/CPU0:GW# config
 - RP/0/RSP0/CPU0:GW(config)# logging console disable
 - RP/0/RSP0/CPU0:GW(config)# commit

Host Dashboard

Host Dashboard

Overview

 The Host Dashboard is a dynamic view. It refreshes every 10 seconds to display up-to-date information.

Invocation

- Invoked by clicking the hostname under the Managed Hosts tab on the Home page.
- Invoked by using the "Search a host" search bar on the main menu bar.

General

Display the host connection information.

Software Packages

Display the software packages of the host.

Scheduled Installations

 Display all the scheduled installations. When an installation is executing, a runner icon is displayed next to the scheduled installation.

Install/Software Inventory History

- Display both the install and software inventory history.
- By default, only the last 10 records are displayed.
 To change the default, select a different number from the selector.

Action

- Schedule an Install
- Delete All Scheduled Installs
- Delete All Failed Installs
- Retrieve the Latest Software
- Edit Host

Host Dashboard

al Host: ASR9K-PE1-R0

Region Cisco Telecom
West Coast

Platform ASR9K

Software 5.1.3

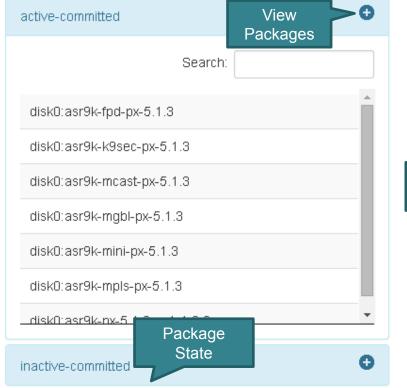
Host or IP 172.28.98.2

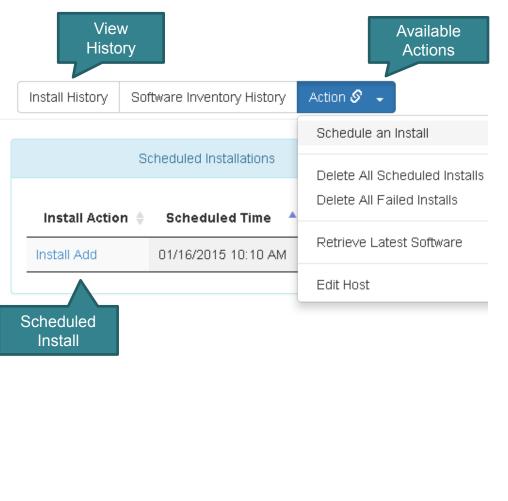
Username cisco

Connection telnet

Created By root

Last Successful Retrieval: 12h 13m 56s ago





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Install History

Install History



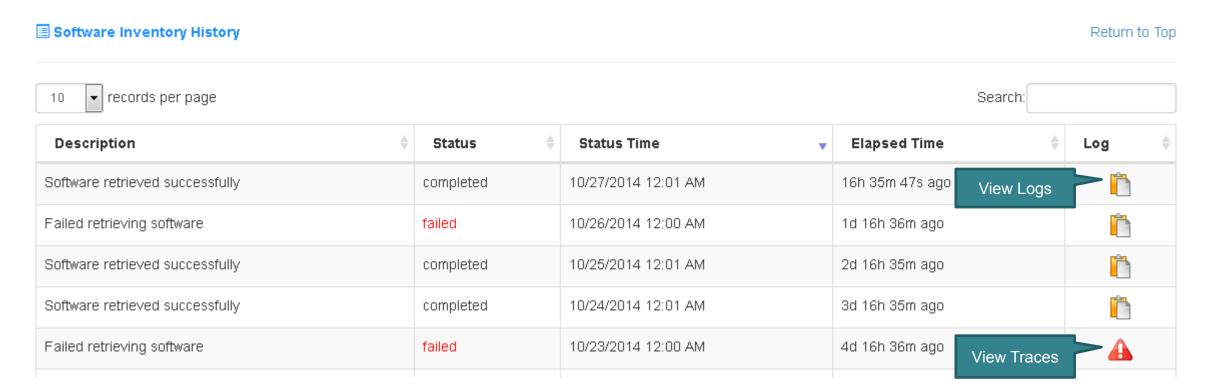
Return to Top

21

Number of Records to Retrieve Last 10 Records: 10 Retrieve from the Database records per page Search: Install Action **Scheduled Time** Start Time **Packages** Status **Status Time** Created By Log Install Add 10/05/2014 11:38 PM 10/05/2014 11:38 PM failed 10/05/2014 11:39 PM root View Logs Install Add 10/05/2014 11:19 PM 10/05/2014 11:19 PM completed 10/05/2014 11:19 PM Install Add 10/05/2014 11:09 PM 10/05/2014 11:09 PM 10/05/2014 11:09 PM completed root Install Add 10/01/2014 09:18 PM 10/01/2014 09:18 PM 0/01/2014 09:18 PM root View Packages

Software Inventory History





Schedule an Install

Available Install Actions

Pre-Upgrade

- Establishes initial device connection.
- Records running software version.
- Records the running configuration and store it in a file.
- Checks the state of all nodes on the system.
- Verifies server repository reachability.
- Records inactive, active, committed package list.

Optional Plugins:

- Records OSPF and ISIS neighbors.
- Sets ISIS set-overload-bit if ISIS is running.
- Records total number of BGP neighbors.
- Records total number of MPLS LDP neighbors.
- Records total number of PIM neighbors.
- Records total number of HSRP neighbors and states.
- Records total number of VRRP neighbors and states.

Install Add

Copy software packages to the device

Activate

Activate packages on the device

Post-Upgrade

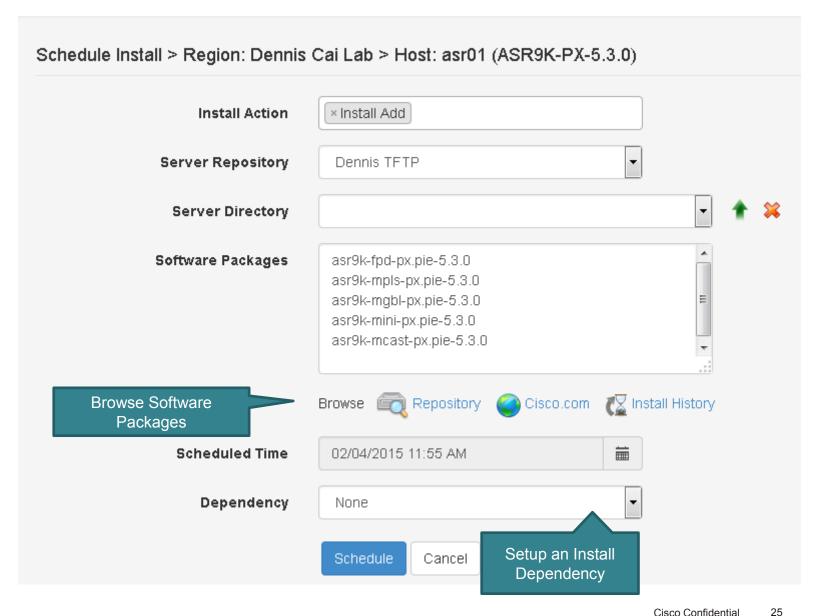
- Checks node status, standby role status, configuration failure, software package states, and etc.
- Verifies error/tracebacks/core files

ALL

• All of the above. CSM Server will create Pre-Upgrade, Install Add, Activate, and Post-Upgrade installation with the successor depends on the predecessor. Until the predecessor is executed successful, the successor will not run.

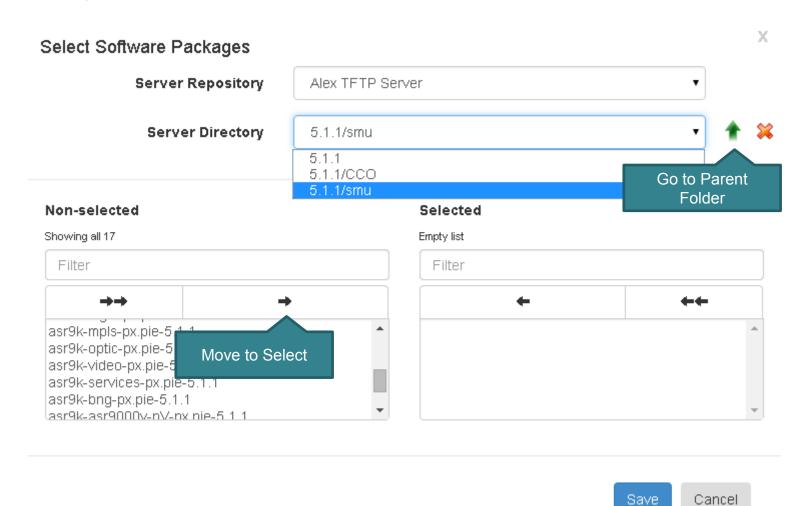
Schedule Install

- Invoked from the Host Dashboard's Action menu.
- Select an install action. Multiple install actions may be selected.
- Select a server repository. Once selected, CSM Server populates the Server Directory selector with subdirectories.
- The selected server directory will be used for software packages browsing or storage. If no server directory is selected, the base directory is used.
- Use the Browse Repository, Cisco.com, or Install History icon to select software packages.
- If a dependency is selected, the scheduled install will not proceed until the dependency is completed successfully.



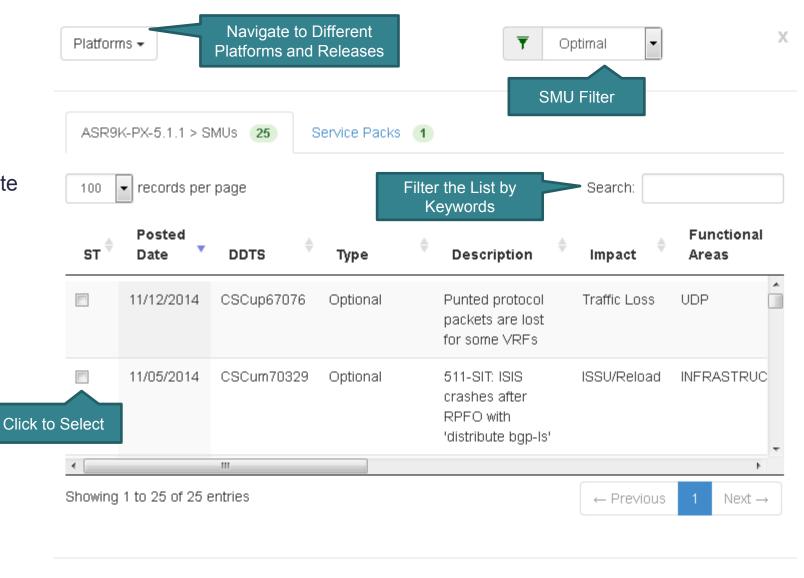
Browse Server Repository

- Invoked by clicking the Browse Repository icon on the Schedule Install dialog.
- Use the Server Directory selector to navigate to the desirable directory on the server repository. The software packages in the selected directory will be displayed in the dual list box.
- Select the software packages by clicking either the double (i.e. select all) or single arrow icon.



Browse Cisco

- Invoked by clicking the Browse Cisco icon on the Schedule Install dialog.
- Use the Platforms button to navigate to the desirable platform and release.
- Select the SMUs or Service Packs of interest.

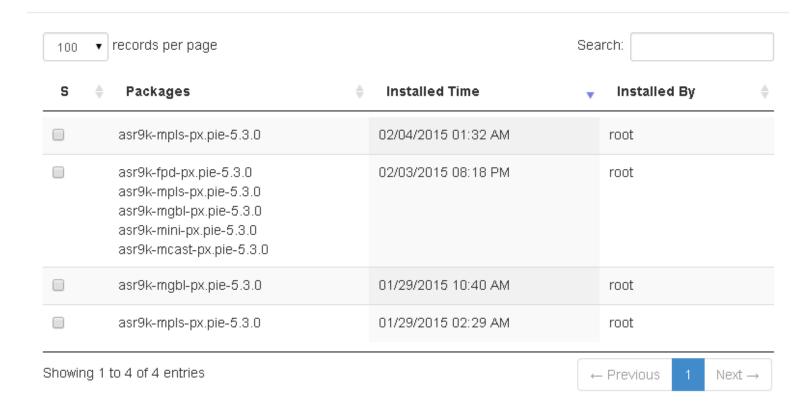


Save Cancel

Browse Install History

- Invoked by clicking the Browse Install History icon on the Schedule Install dialog.
- Select the packages from one of the successful Install Add operations. This browsing function is useful especially when an Activate install action is created individually.
- When creating an Activate install action, the package names provided to CSM Server must be an external names as on Cisco.com (not the internal names on the router).

Select Software Packages from Past Install Add





Schedule Install, Continue

- After clicking the Schedule button, CSM Server performs the following functions.
- It checks for missing pre-requisites on selected software packages.
- It determines if selected software packages are on the server repository.
 If not found, CSM Server prompts the user to download them.
- The scheduled install will not proceed at their scheduled time until the software packages are successfully downloaded and copied to the server repository.

Following pre-requisite(s) were not selected, but should be included.

asr9k-px-4.2.3.CSCue19326.pie asr9k-px-4.2.3.CSCum69972.pie asr9k-px-4.2.3.CSCug38659.pie asr9k-px-4.2.3.CSCui33805.pie

Include Pre-requisites Ignore Cancel

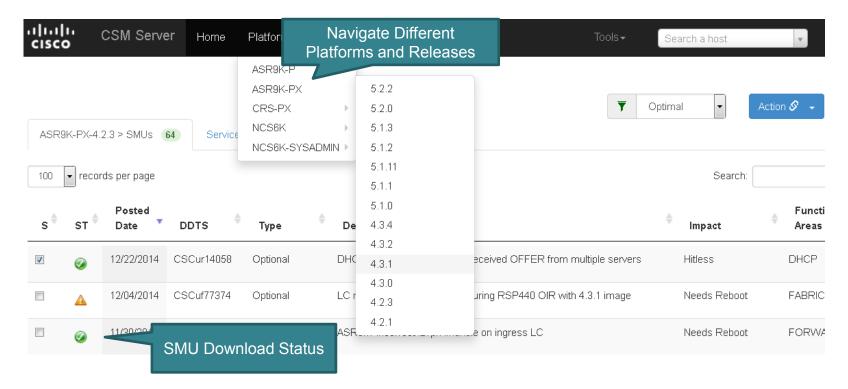
Following files are missing on the server repository. If you choose to download them, the *scheduled installation will not proceed until the files are successfully downloaded and copied to the server repository.

asr9k-px-4.2.3.CSCug38659.pie (needs asr9k-px-4.2.3.CSCug38659.tar) asr9k-px-4.2.3.CSCur14058.pie (needs asr9k-px-4.2.3.CSCur14058.tar) asr9k-px-4.2.3.CSCum69972.pie (needs asr9k-px-4.2.3.CSCum69972.tar) asr9k-px-4.2.3.CSCuh03659.pie (needs asr9k-px-4.2.3.CSCuh03659.tar) asr9k-px-4.2.3.CSCue19326.pie (needs asr9k-px-4.2.3.CSCue19326.tar) asr9k-px-4.2.3.CSCui33805.pie (needs asr9k-px-4.2.3.CSCui33805.tar)

Platforms Menu

Platforms Menu

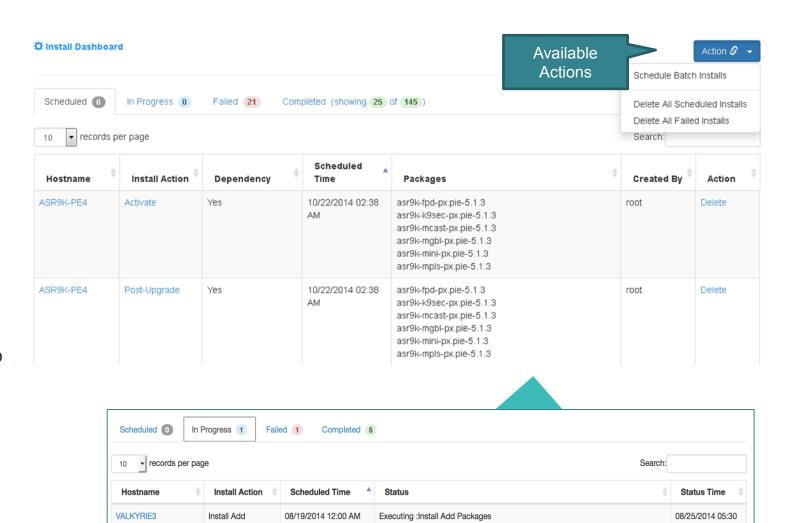
- From the Platforms menu, users can query SMUs and Service Packs information on various IOS-XR platforms and releases.
- Go to Tools User Preferences to exclude certain platforms and releases from displaying under the Platforms menu.
- If a SMU has already been downloaded to the "downloads" directory, a green check icon is displayed.
- Select to download a SMU by checking the checkbox and select Action – Download SMU/Service Pack. Then, select the server repository to store the download image.



Install Dashboard

Install Dashboard

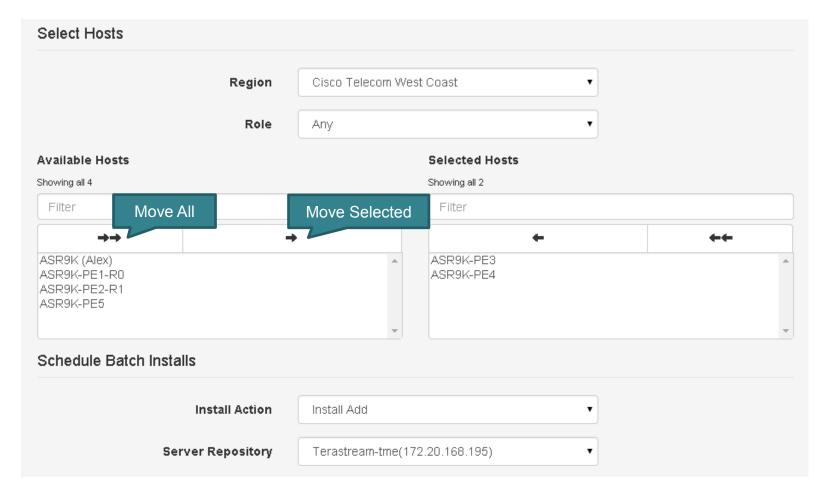
- Action
 - Schedule Batch Installs
 - Delete All Scheduled Installs
 - Delete All Failed Installs
- Install Dashboard Tabs
 - Scheduled
 - Lists any pending scheduled tasks
 - In Progress
 - Lists currently executing tasks
 - Failed
 - Lists any task that failed & provide links to appropriate logs
 - Completed
 - List of completed task plus install logs



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Schedule Batch Installs

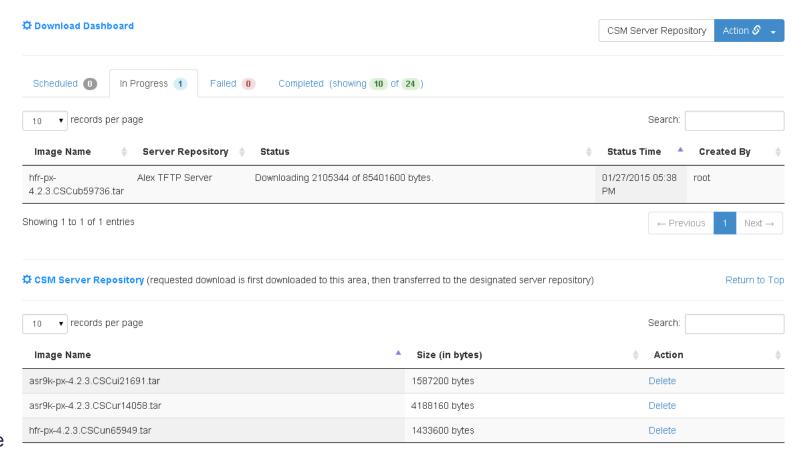
- Select a region of interest
- Select a role to further filter the hosts.
- All managed hosts belong to the selected region and role will be displayed.
- Use the dual list box to select multiple hosts for the same scheduled installation.
- By default, the scheduled time is now. The installation will be executed immediately. Click the calendar icon next to the Scheduled Time to select a different date and time.



Download Dashboard

SMU/SP Download Dashboard

- Action
 - Delete All Scheduled Downloads
 - Delete All Failed Downloads
- Download Dashboard Tabs
 - Scheduled
 - Lists any pending downloads
 - In Progress
 - Lists downloads that are in progress
 - Failed
 - Lists all failed downloads
 - Completed
 - Lists completed downloads
- CSM Server Repository
 - Lists SMU tar files that have been downloaded. All requested downloads are first saved in this repository before being transferred to the designated server repository.



Tools Menu

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Tools Menu

List Hosts

 Display all managed hosts with their connection information. To make changes, click the host name of interest.

List Jump Servers

 Display all jump servers with their connection information. To make changes, click the server name of interest.

Optimize List

 Given a SMU list, produces an optimize list which includes missing pre-requites.

Edit My Profile

Modifies the current user authentication and other information.

User Preferences

- Defines Cisco authentication .
- Excludes platforms from the Platforms menu.

About CSM Server

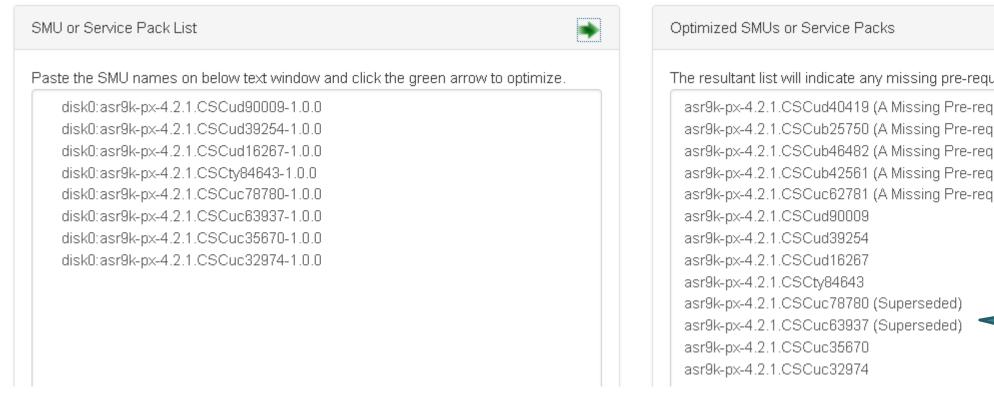
Display the About page.

Logout

Logout from the system.

Optimize List

- Given a SMU list, CSM Server identifies any missing pre-requisites as well as superseded SMUs and returns an optimal list.
- The SMU names in the list can be in different formats so long as the platform and release are identifiable.



Switch to Different Display The resultant list will indicate any missing pre-requisites or superseded SMUs. asr9k-px-4.2.1.CSCud40419 (A Missing Pre-requisite) asr9k-px-4.2.1.CSCub25750 (A Missing Pre-requisite) Identify any asr9k-px-4.2.1.CSCub46482 (A Missing Pre-requisite) Missing Preasr9k-px-4.2.1.CSCub42561 (A Missing Pre-requisite) requisites asr9k-px-4.2.1.CSCuc62781 (A Missing Pre-requisite) Identify any Superseded **SMUs**

Admin Menu

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Admin Menu – Requires Admin Privilege

Admin Dashboard

Allows the administrator to configure CSM Server.

Import Hosts

Import hosts via comma delimited texts.

Create User

Creates new users on the system.

List All Users

 Displays all the users defined in the system. To make changes, click the user name of interest

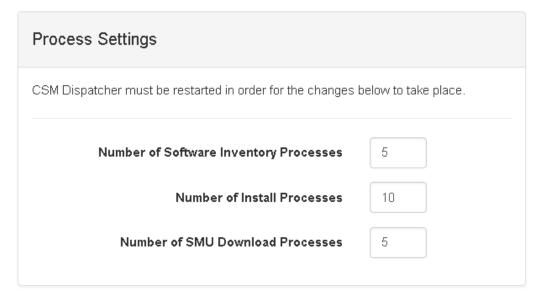
Hosts that Failed Software Inventory

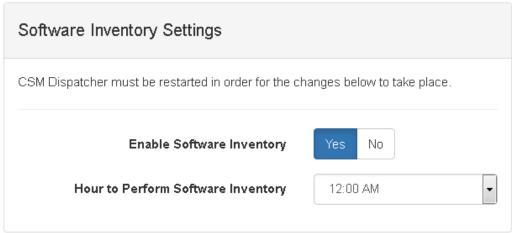
 When CSM Server is unable to retrieve software inventory from a host during the scheduled time, the host will be included on this report.

System Logs

 Displays all the system logs captured by CSM Server. These logs help determine anomalies that have occurred on CSM Server.

Admin Dashboard





Process Settings

- The number of processes to use to retrieve software inventory information.
- The number of processes to use to perform scheduled installation.
- The number of processes to use to download SMU or Service Pack.

Software Inventory Settings

- Enabled by default
- Specify the hour of the day to perform the software inventory function (i.e. retrieving software package information from managed hosts).
- After the software inventory function is performed, CSM Server will perform other housekeeping tasks (see Housekeeping Settings).

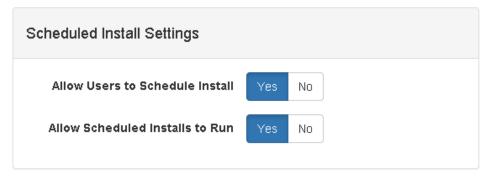
Admin Dashboard

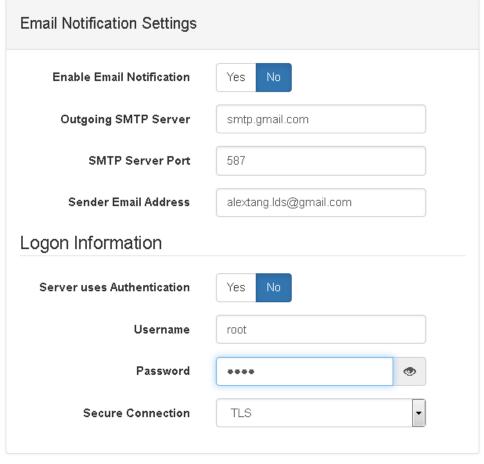
Scheduled Install Settings

- By default, CSM Server enables users to schedule installations on managed hosts.
- By Default, CSM Server enables scheduled installations to run.

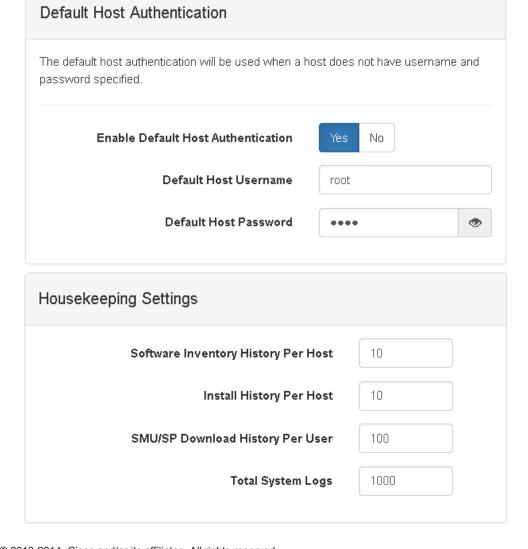
Email Notification Settings

- Email notification is disabled by default. Click Yes to enable it.
- Define the SMTP server information. Some SMTP server may require user authentication. If that is the case, click Yes and define the user authentication information
- CSM Server uses the SMTP settings to email users about scheduled install status





Admin Dashboard



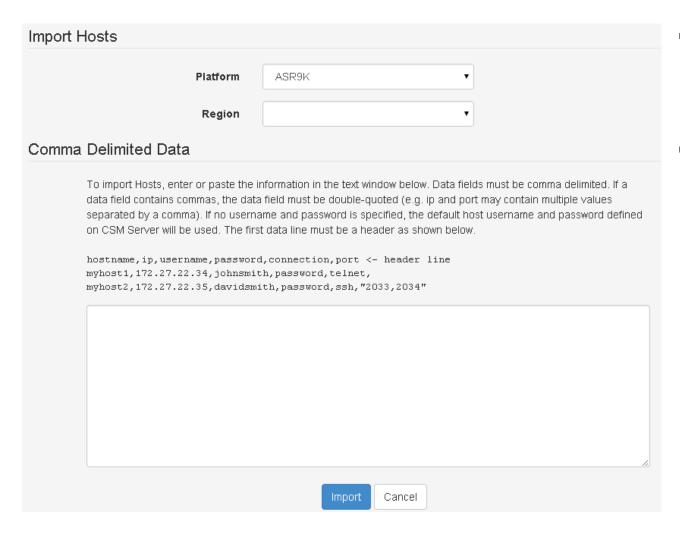
Default Host Authentication

- Disabled by default.
- The default host authentication will be used when a host does not have username and password specified.

Housekeeping Settings

- Specify the number of software inventory history records to keep per host.
- Specify the number of install history records to keep per host.
- Specify the number of SMU/SP download history records to keep per user.
- Specify the number of system log records to keep on the system.
- CSM Server will purge the history records based on the numbers specified on a daily basis (see Software Inventory Settings).

Import Hosts



Import Hosts

- Select a platform type for the hosts to be imported.
- Select a region for the hosts to be imported.

Comma Delimited Data

- Paste the comma delimited data in the text window.
 The first line must be a header line followed by each host data fields to be imported.
- The username and password fields are not mandatory. If no hostname and password is specified, CSM Server will use the default host authentication defined on the Admin Dashboard if it is enabled.
- The ip and port data fields support comma delimited values. In this case, double quotes must be used to quote the values.

Additional Topics

Password Encryption
Security Privileges
System & Session Logs
Navigate Between Hosts
Software Inventory
Installation Dependency
Dynamic Views

Password Encryption

User Password

 All user passwords are stored encrypted with a one-way hash algorithm. It is impossible to decrypt the password. If a user forgets the password, the administrator will have to reset it.

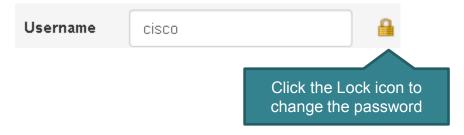
Other Passwords

- Passwords for hosts, jump servers, server repositories, and SMTP mail server are stored encrypted as well.
- When a password is first defined, it will be masked by dots. To see the password unencrypted, click the eye icon.

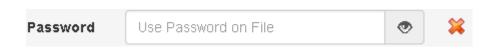


Saved Passwords

 Once the password is saved, it will not be viewable anymore. Instead, the password field shows 'Use Password on File'. To modify the password, click the lock icon next to the Username field. Then, enter the new password.



 To remove the password (i.e. no password), click the red cross icon.



Security Privileges

Three levels of security privileges

Admin

- Users with this privilege have no limitation
- Only admin users can create hosts, jump servers, regions, and server repositories
- Only admin users can access the Admin menu
- Only admin users can view and modify other users

Operator

- Users with this privilege can only schedule/modify/delete installations
- They cannot create hosts, jump servers, regions, and server repositories

Viewer

Users with this privilege can only view information

System & Session Logs

System Logs

- Click Admin System Logs from the main menu bar
- These logs are created when exceptions are encountered. They can be used for system debugging. These exceptions may or may not affect system stability and performance.

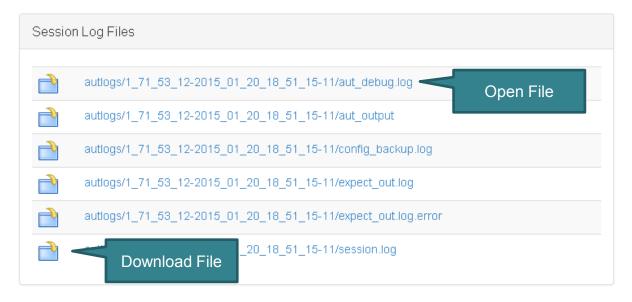
Session Logs

- Session logs are created during software inventory or installation operation.
- CSM Server uses the Accelerated Upgrade Tool (AUT) to perform software inventory and installation. These logs provide valuable insights on what have taken place on the router.
- If an error condition happens, a file called "expect_out.log.error" will be created. This file provides information on error encountered.

System Logs

	Search:		
	Create Time	Trace 💠	
ventory job = 642	10/31/2014 12:00 AM	View	
ventory job = 641	10/31/2014 12:00 AM	View	

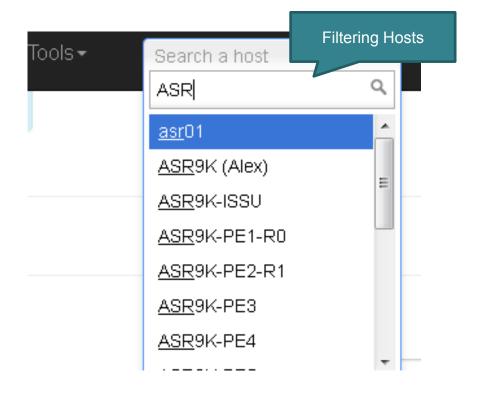
Session Logs: ConPE_dmahisek_PE8



Navigate Between Hosts

Search a host

- The Search a host bar provides a quick way to navigate in real-time between managed hosts.
 When a host is selected, the Host Dashboard is displayed.
- Further filtering can be done by typing the string matching part of the hostname.



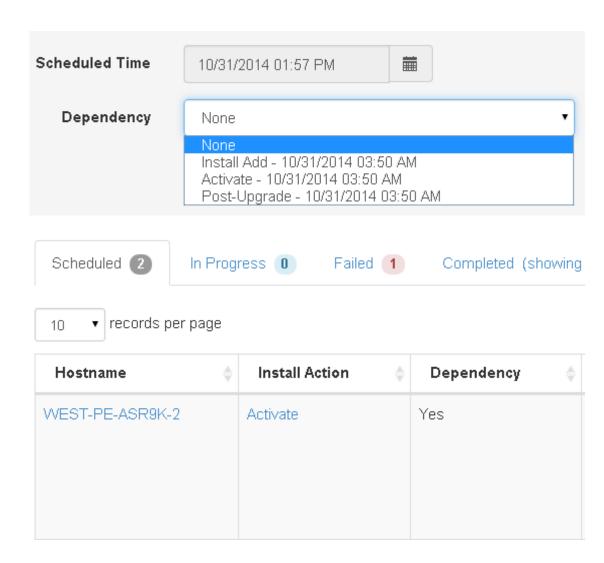
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Software Inventory

- Through the Admin Dashboard, the administrator can enable software inventory and specify the hour of the day to perform this operation.
- When the hour is reached, CSM Dispatcher will connect to the managed hosts and collect software inventory information.
- To see which managed hosts failed the software inventory, click Admin Hosts that Failed Software Inventory from the main menu bar.
- Software Inventory history can be viewed on the Host Dashboard. The Last Successful Retrieval label provides information on the last successful software inventory time.
- To retrieve the latest software, click Action Retrieve Latest Software from the Host Dashboard.

Installation Dependency

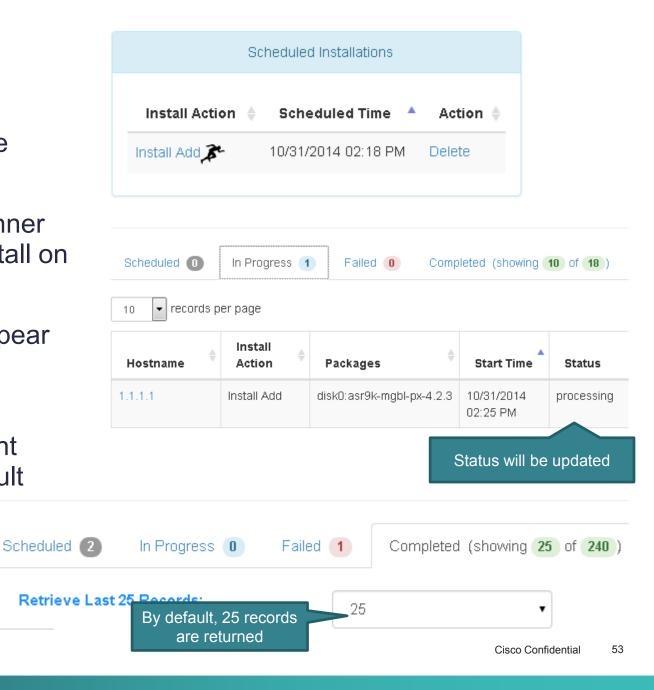
- A dependency can be specified when creating a scheduled install. For example, Install Activate should not be performed unless Install Add is successful.
- If an installation failed, the other scheduled install that has the failed installation as its dependency will not execute.
- When Install Action 'ALL' is selected, CSM Server will create the dependency automatically.
- Deleting a scheduled install will also delete all its dependencies.



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Dynamic Views

- The Host, Install, and SMU Download Dashboards are dynamic views. They are updated in every 10 seconds.
- When a scheduled install is running, a runner icon will appear next to the scheduled install on the Host Dashboard.
- The running scheduled install will also appear under the In Progress tab on the Install Dashboard.
- In order to reduce the number records sent between client and CSM Server, the default number of records to return is 25.



Thank you.

