



Cisco *live!*

January 29 – February 2, 2018 · Barcelona

Ten Cool Prime Infrastructure Tricks to Better Manage Your Network

Lewis Hickman, Customer Solutions Architect

Jennifer Valentine, Systems Engineer

~~Ten~~ Cool Prime Infrastructure Tricks to Better Manage Your Network

Lewis Hickman, Consulting Systems Engineer

Jennifer Valentine, Systems Engineer

Cisco Spark

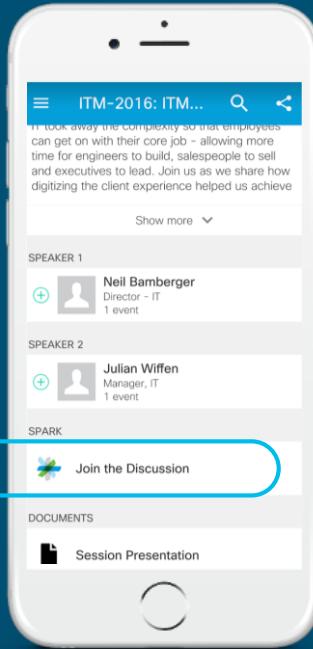


Questions?

Use Cisco Spark to communicate with the speaker after the session

How

1. Find this session in the Cisco Live Mobile App
2. Click “Join the Discussion” ——————
3. Install Spark or go directly to the space
4. Enter messages/questions in the space



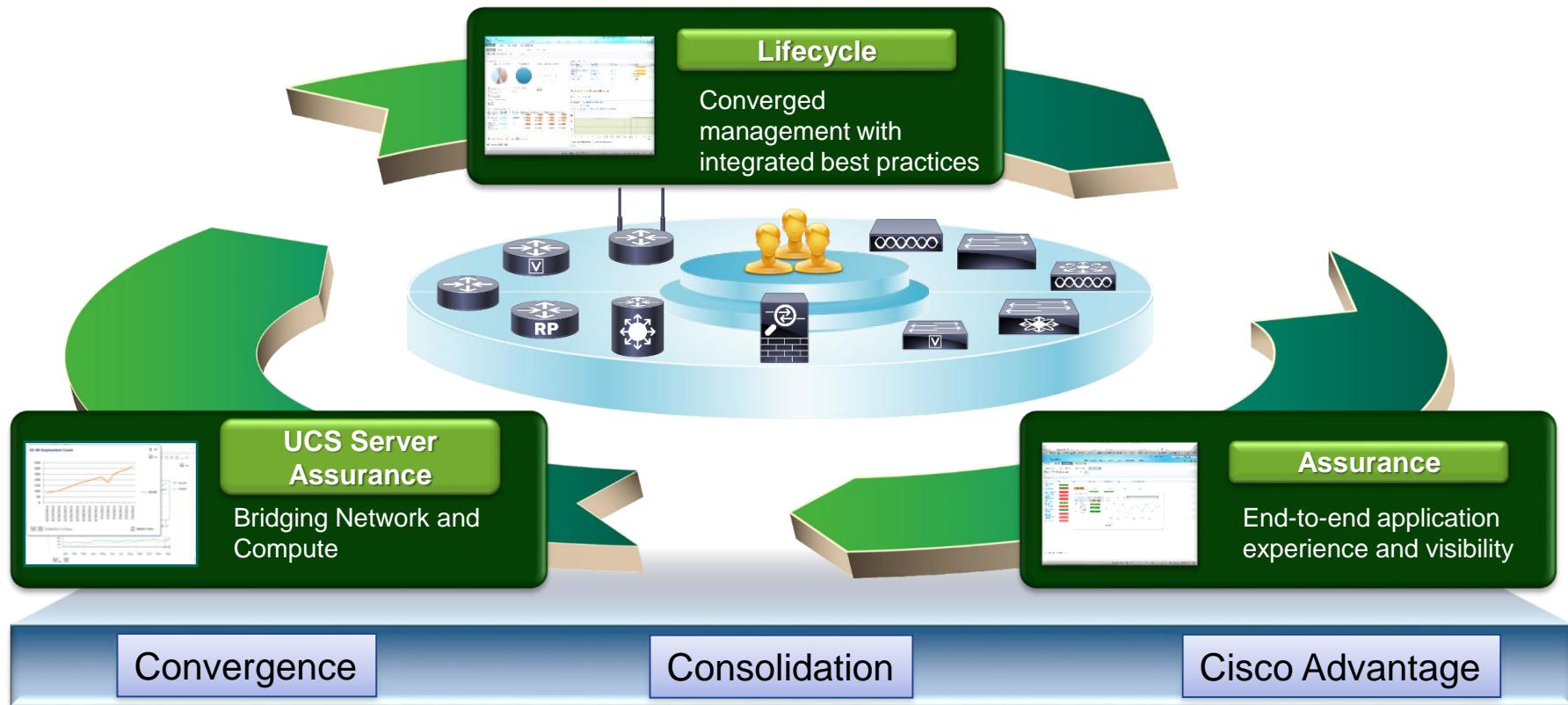
cs.co/ciscolivebot#BRKNMS-2702

Agenda

- A Brief Overview
- Tips and Tricks
 - 1. Installation and Setup
 - 2. Device Discovery/Device Groups
 - 3. Customizing Configuration templates
 - 4. Setting up and using Baseline Compliance
 - 5. Customizing Reports
 - 6. Tips for Client/Host Tracking
 - 7. Software Image Mgmt (SWIM)
 - 8. Implementing High Availability
 - 9. Troubleshooting with Prime Infrastructure
 - 10. Integration w. other systems
- And A Look Ahead

Overview

Cisco Prime Infrastructure - Overview



Operations Center

Centralized Visualization of Multiple PI Instances

Distributed

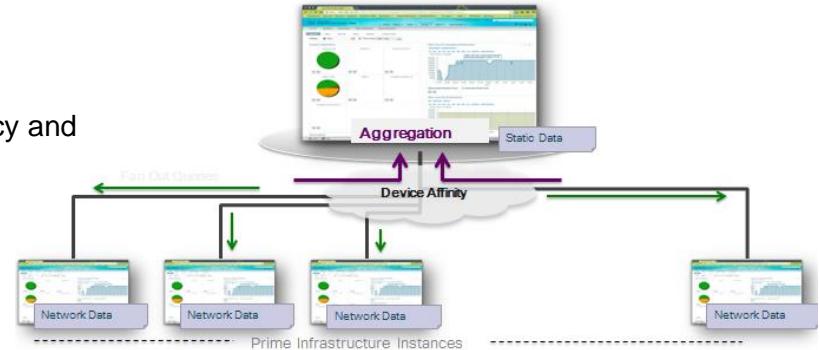
- Supports up to 10 Prime Infrastructure instances
- Addresses geographic distribution, scalability, resiliency and visibility
- Single pane of glass monitoring with click-through management

Centralized

- Central view of assets, alarms and clients
- Single sign-on
- Dashlets aggregated from PI instances

Scalable

- Consolidated view of network health
- Consolidated view of health of each PI instance
- Reports scheduling from one interface



Device Work Center							
Device Group		All Members					
Device Name	Reachability	IP Address	Device Type	Collection Status	Collection Time	Software Ver.	Source
2.2.2.2 cisco.com	Reachable	172.20.110.67	Managed with ...	12.2(50)SG	192.168.115.241		
Beta1.example...	Reachable	172.23.208.204	Managed with ...			192.168.115.241	
Branch-NAE	Reachable	172.20.122.122	Managed	Mon Jul 16 03:...	4.2.1	192.168.115.241	
IPM-1002a	Reachable	171.69.217.77	Managed	Mon Jul 16 03:...	15.2(20)I1...	192.168.115.241	
IPM-2595-2	Reachable	172.20.110.70	Managed with ...			12.1(2)IR1A13	192.168.115.241
IPM-3560-2-test	Unreachable	172.20.110.72	Managed with ...			12.2(50)IR	192.168.115.241
IPM-4500-E	Unreachable	172.20.110.73	Managed with ...			12.2(3)S1X2A	192.168.115.241
IPM_2921year...	Reachable	171.69.217.76	Managed with ...			15.0(1)M4	192.168.115.241
NAM	Reachable	172.20.104.26	Managed with ...			192.168.115.241	
SAM-9-C-WA12	Reachable	172.23.208.130	Managed	Mon Jul 16 03:...	4.3.1		172.25.119.210
SAM-9-NAM1...	Reachable	172.23.208.187	Managed	Mon Jul 16 03:...	5.1(2)patch3A		172.25.119.210
SAM-9-SJ-CR	Reachable	172.23.208.131	Managed with ...	Sun Jul 15 03:00:...	15.2(20)I1...		172.25.119.210
SAM-9-SJ-CM-a...	Reachable	172.23.208.136	Managed	Mon Jul 16 03:...	4.2.3		172.25.119.210
test.example.com	Reachable	171.69.217.78	Managed with ...			15.1(3)T	192.168.115.241
test123	Reachable	172.23.208.231	Managed with ...			15.1(2)M	192.168.115.241
test23456.exe...	Reachable	171.69.217.81	Managed with ...			15.1(2)T	192.168.115.241

Top Tips and Tricks

Installation and Setup

Finding the files you need

Download Software

Downloads Home > Products > Cloud and Systems Management > Routing and Switching Management > Network Management Solutions > Prime Infrastructure > Prime Infrastructure 3.1 > Prime Infrastructure Software-3.1.0

Prime Infrastructure 3.1

Release 3.1.0			
	File Information	Release Date	Size
▼ Latest 3.1.0 ▼ All Releases ▶ 3	Cisco Prime Infrastructure 3.1 Physical Appliance ISO image (for Gen2 Appliance only) PI-APL-3.1.0.0.132-1-K9.iso	05-NOV-2016	3583.60 MB
	Cisco Prime Infrastructure 3.1 Upgrade Installer for Physical (for Gen2 Appliance only) and Virtual Appliance PI-Upgrade-3.0.X_to_3.1.0.0.132.tar.gz	05-NOV-2016	3717.40 MB
	Cisco Prime Infrastructure 3.1 Virtual Appliance image PI-VA-3.1.0.0.132.ova	19-APR-2016	3617.25 MB
	Cisco Prime Infrastructure Plug and Play Gateway Release 2.2.0.15 - for Prime Infrastructure 3.1 - Virtual Appliance Image PNP-GATEWAY-VM-2.2.0.15.ova	19-APR-2016	522.77 MB
	Cisco Prime Infrastructure Plug and Play Gateway Release 2.2.0.15 - for Prime Infrastructure 3.1 - ISO installer	19-APR-2016	541.89 MB

Use the ISO file for Physical Appliance or HyperV deployments

Use the OVA file for an ESXi deployment

Deploying PI Virtual Appliance –Pro Tips

The screenshot shows the 'Disk Format' step of a virtual appliance deployment. On the left, a sidebar lists navigation options: Source, OVF Template Details, End User License Agreement, Name and Location, Deployment Configuration, Host / Cluster, Storage, Disk Format (which is bolded), Network Mapping, and Ready to Complete. The main area has a blue header 'Deploy OVF Template'. Below it, the 'Disk Format' section asks 'In which format do you want to store the virtual disks?'. It shows a 'Datastore' dropdown set to 'UCS-C220-Lo...' and an 'Available space (GB)' input field set to '325.2'. Three radio button options are listed: 'Thick Provision Lazy Zeroed' (selected), 'Thick Provision Eager Zeroed', and 'Thin Provision'. A large green callout box with a black arrow points from the text 'Post power-on: Be Patient!' to the 'Thin Provision' radio button. The callout box contains the following text:

Steps:

1. Use Thick Provision Lazy Zeroed for Storage
2. Do Not Change the OVA Resource Reservations

Post power-on: Be Patient!

Deploying PI Physical Appliance-Pro Tip

Cisco Integrated Management Controller

Overall Server Status: Good

Server Admin Storage

Cisco 12G SAS Modular Raid Controller (SLOT-HBA)

Controller Info Physical Drive Info Virtual Drive Info Battery Backup

Virtual Drives

Virtual Drive Number	Name	Status	Health	Size	RAID Level
0		Optimal	Good	855444 MB	RAID

Actions

- Initialize
- Set as Boot Drive
- Delete Virtual Drive
- Edit Virtual Drive

Operation Status

Operation: No operation in progress
Progress in %: 0
Elapsed Time (secs): 0

Refresh



Maximize Performance:

1. Use the CIMC web interface
2. Click Storage Tab>Controller> Virtual Drive
3. Click on Edit Virtual Drive
4. Select Write Back Good BBU

Deploying PI Physical Appliance-Pro Tip

Cisco Integrated Management Controller

Overall Server Status: Good

Server Admin Storage (Storage is selected)

Cisco 12G SAS Modular Raid Controller (SLOT-HBA)

Controller Info Physical Drive Info Virtual Drive Info Battery Backup

Virtual Drives

Virtual Drive Number	Name	Status	Health	Size	RAID Level
0		Optimal	Good	855444 MB	RAID

Actions

- Initialize
- Set as Boot Drive
- Delete Virtual Drive
- Edit Virtual Drive

Operation Status

Operation: No operation in progress
Progress in %: 0
Elapsed Time (secs): 0

Refresh



Maximize Performance:

1. Use the CIMC web interface
2. Click Storage Tab>Controller> Virtual Drive
3. Click on Edit Virtual Drive
4. Select Write Back Good BBU

Deploying PI Physical Appliance-Pro Tip

Cisco Integrated Management Controller

Overall Server Status: Good

Server Admin Storage (Storage is selected)

Cisco 12G SAS Modular Raid Controller (SLOT-HBA)

Controller Info Physical Drive Info Virtual Drive Info (Virtual Drive Info is selected)

Battery Backup

Virtual Drives

Virtual Drive Number	Name	Status	Health	Size	RAID Level
0		Optimal	Good	855444 MB	RAID

Actions

- Initialize
- Set as Boot Drive
- Delete Virtual Drive
- Edit Virtual Drive (Edit Virtual Drive is selected)

Operation Status

Operation: No operation in progress
Progress in %: 0
Elapsed Time (secs): 0

Refresh



Maximize Performance:

1. Use the CIMC web interface
2. Click Storage Tab>Controller> Virtual Drive
3. Click on Edit Virtual Drive
4. Select Write Back Good BBU

Deploying PI Physical Appliance-Pro Tip

Cisco Integrated Management Controller

Overall Server Status: Good

Server Admin Storage (Storage is selected)

Cisco 12G SAS Modular Raid Controller (SLOT-HBA)

Controller Info Physical Drive Info Virtual Drive Info (Virtual Drive Info is selected)

Battery Backup

Virtual Drives

Virtual Drive Number	Name	Status	Health	Size	RAID Level
0		Optimal	Good	855444 MB	RAID

Actions

- Initialize
- Set as Boot Drive
- Delete Virtual Drive
- Edit Virtual Drive (highlighted with a yellow arrow)

Operation Status

Operation: No operation in progress
Progress in %: 0
Elapsed Time (secs): 0

Refresh



Maximize Performance:

1. Use the CIMC web interface
2. Click Storage Tab>Controller> Virtual Drive
3. Click on Edit Virtual Drive
4. Select Write Back Good BBU

Deploying PI Physical Appliance-Pro Tip

Cisco Integrated Management Controller

Overall Server Status: Good

Server Admin Cisco 12G SAS Controller (SLOT-HBA) Cisco FlexFlash

Edit Virtual Drive

Select RAID Level to migrate: Select

Physical Drives

Physical Drive Number	Size (MB)	Status	Type
1	285148 MB	Online	SAS
2	285148 MB	Online	SAS
3	285148 MB	Online	SAS
4	285148 MB	Online	SAS

Virtual Drive Properties

Virtual Drive Name: [] Read Policy: No Read Ahead

RAID Level: RAID 10 Cache Policy: Direct IO

Strip Size: 64 KB Disk Cache Policy: Unchanged

Access Policy: Read Write Size: 855444 MB

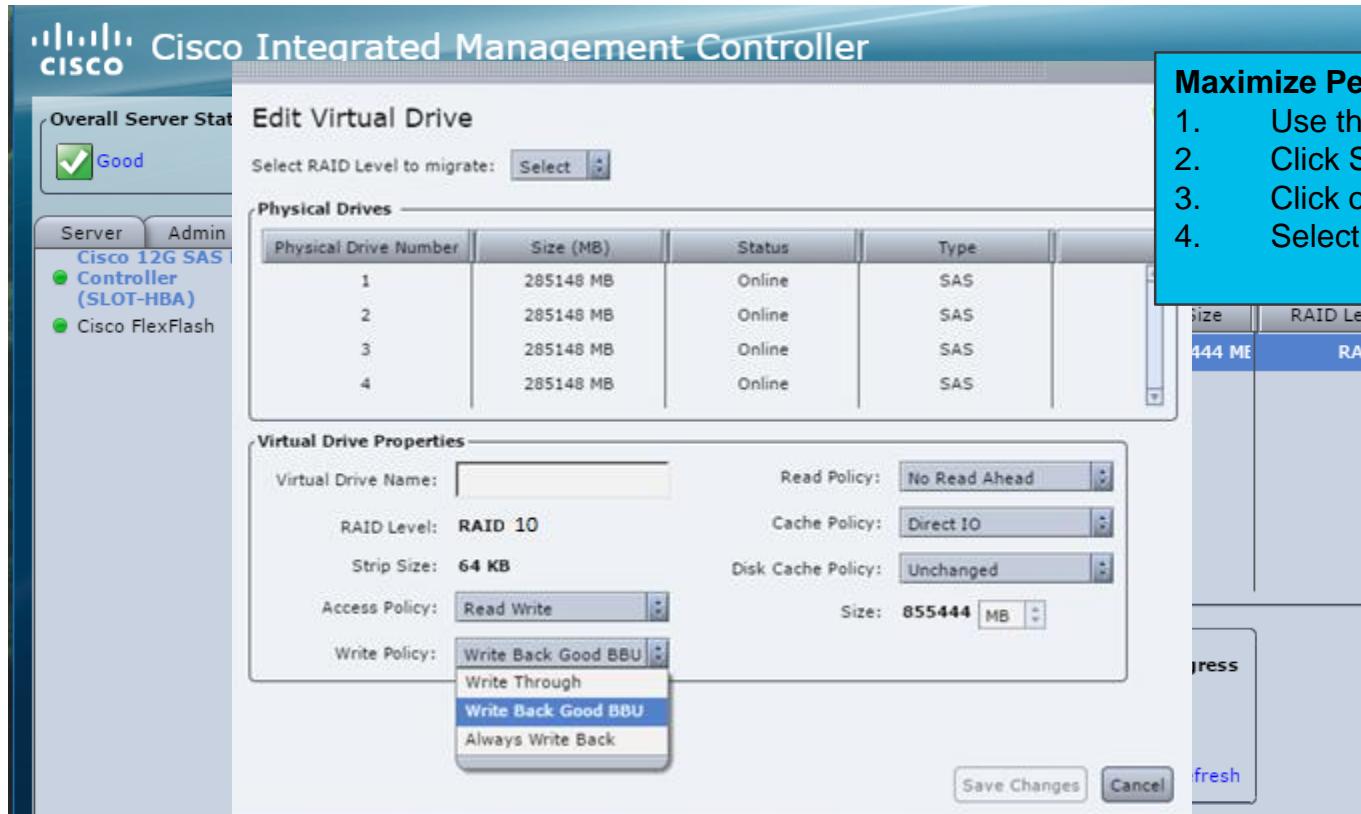
Write Policy: Write Back Good BBU

Write Through

Write Back Good BBU

Always Write Back

Save Changes Cancel Refresh



Maximize Performance:

1. Use the CIMC web interface
2. Click Storage Tab>Controller> Virtual Drive
3. Click on Edit Virtual Drive
4. Select Write Back Good BBU

Shell Access from CLI – Pro Tip

```
172.16.50.31 - PuTTY
PI31-OVA-pro/admin# shell
Shell access password is not set
Configure password for shell access

Password :
Password Again :

Shell access password is set
Run the command again to enter shell
PI31-OVA-pro/admin# shell
Enter shell access password :
Starting bash shell ...
ade #
```

Enabling Shell access:

1. Record the username and password from initial setup (default is admin)
2. Enable Shell access using the **shell** CLI command
3. Setup more usernames using CLI **username** command

```
172.16.50.65 - PuTTY
PI31-Cisco-Live/admin(config)#
PI31-Cisco-Live/admin(config)# username lewis password plain Admin1234 role admin
PI31-Cisco-Live/admin(config)#
PI31-Cisco-Live/admin(config)#
PI31-Cisco-Live/admin(config)# do show run | incl username
username admin password hash $6$KlgKZjC3$.9Uw4XsrU5MbH1kvR0o9vvyr0P4oMqnX1k7ukDHaObnKHc
x2Onx3Bg.Pn8WYG.wNQQQzTT5gkhVhCNdWfWTMq1 role admin
username lewis password hash $6$2gUaNXh5$LEXu48fgG8Eh0El2YPurO/Ff4Xdk7OtGH8IYnJrTca3jR
w8byYuwlHM5aT7rUgQjuA4L//598KcGzn92phcm/ role admin
-
no-username
PI31-Cisco-Live/admin(config)#

```

Setup Repository

```
172.16.50.65 - PuTTY
PI31-Cisco-Live/admin# conf t
Enter configuration commands, one per line. End with CNTL/Z.
PI31-Cisco-Live/admin# repository SFTPrepo
PI31-Cisco-Live/admin(config-Repository)# url sftp://172.16.50.20/PI
PI31-Cisco-Live/admin(config-Repository)# user lewis password plain lewis
PI31-Cisco-Live/admin(config-Repository)# exit
PI31-Cisco-Live/admin# exit
PI31-Cisco-Live/admin# show repo SFTPrepo
CiscoPrime-PI31-OVA-pro_ConfigArchive_2017-04-23_21-01-00.zip
PI31-Cisco-Live/admin#
```

Setup External Repository:

- Used for Prime Infra Backups
- Used for Configuration Archiving
(Formerly known as shadow directory)
- Used for Patches and upgrades

Pro Tip - Set backups to external repository

The screenshot shows the Cisco Prime Infrastructure Job Dashboard. At the top, there are five status boxes: User Job Status (0 Scheduled, 0 Failed, 0 Suspended), Poller Job Status (0 Scheduled, 0 Failed, 0 Suspended), System Job Status (11 Scheduled, 2 Failed, 11 Suspended), In Progress Jobs (0 User, 0 System, 0 Poller), and My Jobs (0 Scheduled, 0 Failed, 0 Suspended). Below these is a message "Last Updated: Thursday, April 27, 2017 at 2:26:59 PM EDT". On the left, a sidebar shows categories like User Jobs, System Jobs (selected), APIC-EM Integration, Assurance And Health Summary, Infrastructure, Inventory And Discovery Jobs, Status, Wireless Monitoring, and Poller Jobs. In the center, a table lists System Jobs: Server Backup (selected, checked), Mobility Service Backup, and Controller Configuration Backup, all categorized as Infrastructure. A blue box highlights the edit icon in the header of this table. A modal window titled "Edit Job Properties" is open over the table, showing "Backup Repository" set to "SFTPRepo" with a "Create" button, and "Max UI backups to keep" set to "2". Buttons for "Save" and "Cancel" are at the bottom of the modal.

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(hh:mm..)	Next Start Time
backup	Infrastructure					
Server Backup	Infrastructure					
Mobility Service Backup	Infrastructure					
Controller Configuration Backup	Infrastructure					

Edit Job Properties

Backup Repository

SFTPRepo

Create

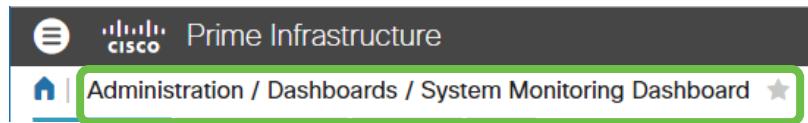
Max UI backups to keep

2

Save

Cancel

Pro Tip - Set backups to external repository



Backup Information

Zoom: 1h | 6h | 1d | 1w | 2w | 4w | 3m | 6m | 1y | From: 1/3/2018, 11:41 PM | To: 1/17/2018, 11:41 PM

Server Backup Schedule Runs every day @ 03:30:00

Start Time	Status	Duration (hh:mm:ss)
2018-01-11 23:30	✓	00:10:18
2018-01-04 23:30	✓	00:10:33

Wed Jan 17 23:41:22 EST 2018

Server Backups (Max number of auto-backups stored: 2)

Backup Name	Repository	Size (...)	Available Si...	Backups taken time	RemoteServer
PI33-OVA-std-180...	FTPRepo	NA	NA	2018-01-11 23:30	172.16.50.20
PI33-OVA-std-180...	FTPRepo	NA	NA	2018-01-04 23:30	172.16.50.20

Wed Jan 17 23:41:22 EST 2018

Alarms on Server Backup

Alarm Type	Time Stamp	Severity
No data is available		

Pro Tip – Upgrading/Licensing

- Install PI 3.1.0 OVA
- Restore DB from previous version/import inventory/run discovery
- Install PI 1.x or PI 2.x licenses
- Install Device Pack 16 (6 or higher required) –Restart required
- Install Maintenance Release 7 –Restart required

DP 16 is the last Planned Device Pack release for PI 3.1

If Staying on 3.1

- Install 3.1.7 Update 1 – Restart required

If you are upgrading to PI 3.3

- Perform the PI 3.3 upgrade – Restart required
 - Reconfigure the Controller Configuration Backup job to resume it from the suspended state.
 - Reconfigure the Server Backup job if the period was other than 1 day (Default)

Device Discovery + Device Groups

Discovery Settings

Prime Infrastructure

Inventory / Device Management / Discovery

Discovery Jobs

Name
Job_Discovery_5_19_55_136_PM
Job_Discovery_16_38_46_657_1

Discovery Settings

*Name: coe_prod

Protocol Settings

PingSweep Module: PingSweep Module

Current Discovery Settings

Cisco Discovery Protocol

Credential Set

Layer 2 Protocols

Cisco Discovery Protocol

Link Layer Discovery Protocol

Advanced Protocols

Filters

IP Filter

Credential Settings

Credential Set

SNMPv2 Credential

SNMPv3 Credential

Telnet Credential

SSH Credential

Preferred Management IP

Save Run Now Cancel

Discovery Settings

Schedule

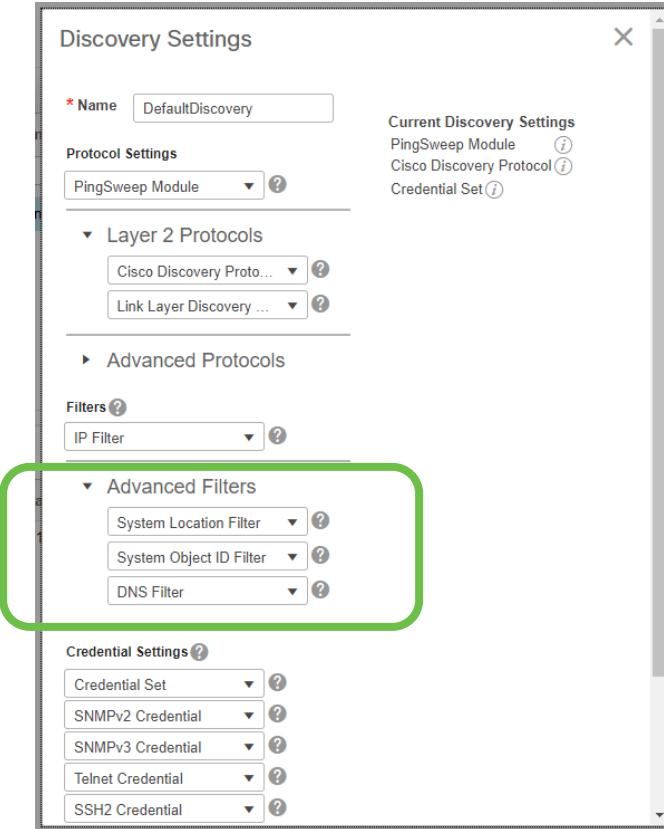
Name	Date Created	Date Modified
MIMIC	2015-Oct-01 16:29:07	2015-Oct-01 16:29:07

Pro-Tip: Ping sweep and CDP are the two most commonly used discovery modules.

Pro-Tip: Using loopback is the best way to pick a management address.

Discovery asks for CLI credentials so that full inventory can be done.

Advanced Discovery Filter



Pro Tip: Further filtering options available as of PI 3.3

Device Inventory

The screenshot shows the Cisco Prime Infrastructure Device Management interface. On the left, there's a sidebar with navigation links like 'Prime Infrastructure', 'Inventory / Device Management / Network Devices', and various device group filters. The main area displays a table of 'All Devices' with columns for Device Name, Reachability, IP Address, DNS Name, and Device Type. A green box highlights the 'Add Device', 'Bulk Import', and 'Export Device' buttons at the top right of the table. To the right, a context menu is open under 'Format' with a green box highlighting the 'MS-DOS Comma Separated (.csv)' option. A large blue callout box in the bottom right corner contains the text: 'Single-device add as well as bulk CSV import options exist.' and 'Pro Tip: Save CSV (MS-DOS) format'.

Device Name	Reachability	IP Address	DNS Name	Device Type
AMS-BXB-HWAE-1-95	✓	18.100.128.20	18.100.128.20	Third Party
AMS-CORE-2-47	✓	20.10.128.20	20.10.128.20	Cisco Network
AMS-DC1-N7K-3-79	✓	18.10.128.12	18.10.128.12	Cisco Network
AMS-LON-3750-SBR-31	✓	20.1.192.12	20.1.192.12	Cisco 3750 Series
AMS-TSPM-SJ-P2C2R3-...	✓	15.111.128.4	15.111.128.4	Cisco 2960 Series
AMS-TSPM-SJ-P2C2R3-...	✓	20.200.192.4	20.200.192.4	Cisco 2960 Series
BSA-AMS-3650-SBR.cis...	✓	15.1.192.10	15.1.192.10	Cisco Catalyst 3650
BSA-ASR1002-East-1-38	✓	20.10.128.2	20.10.128.2	Cisco ASR 1002-X Router
BSA-DEN-3650-SBR.cis...	✓	20.200.192.18	20.200.192.18	Cisco Catalyst 3650
BSA-IWAN-BR-3945-86	✓	18.100.128.2	18.100.128.2	Cisco 3945 Wireless BR
BSA-LON-4948-ABR2-22	✓	15.111.128.18	15.111.128.18	Cisco 4948-ABR2
BSA-prime-asr9k-cluster...	✓	20.50.192.10	20.50.192.10	Cisco ASR 9000 Series
BXB-BSA-4431-RBR.cis...	✓	18.10.128.24	18.10.128.24	Cisco 4431 RBR
BXB-BXB-HP-A5120-37	✓	20.1.192.24	20.1.192.24	Cisco 5120 Series
BXB-CORE-2-VPC-AGG...	✓	20.200.192.16	20.200.192.16	Cisco 5120 Series
BXB-LA-4331-RBR.cisco...	✓	15.111.128.16	15.111.128.16	Cisco 4331 RBR
BXB-PAR-CT5760-1-53	✓	20.50.192.8	20.50.192.8	Cisco 5760 Series
BXB-PAR-CTS5760-2-5	✓	15.1.192.8	15.1.192.8	Cisco 5760 Series
CHN-ASR1002-East-1-2	✓	15.1.192.2	15.1.192.2	Cisco ASR 1002-X Router

Group Rules

Prime Infrastructure

Inventory / Group Management / Network Device Groups

Device Groups

Untitled

Add Device SubGroup

Group Name: Test_Switches Parent Group: User Defined

Group Description:

Add Devices Dynamically

And Product Family equals (=) Switches and H...
And Product Series equals (=) Cisco Catalyst 3850 Series Ethernet Stackable...

Add Devices Manually

+ Add

Device Name: C2811-SpkrBus-GW, C3560V2-CBC1, C3750-HCCOE-Video, CBC-C2960X-PS24-L, COE Profile 52, COE-3750-1stFL, COE-5508, COE-Access-SW1.cisco.dod.mil, COE-Access-UCC

Selected 0 / Total 24

Show All

Save Cancel

Device Name	IP Address/DNS
C2811-SpkrBus-GW	10.137.1.20
C3560V2-CBC1	192.168.254.236
C3750-HCCOE-Video	192.168.254.244
CBC-C2960X-PS24-L	192.168.254.232
COE Profile 52	10.10.161.201
COE-3750-1stFL	192.168.254.248
COE-5508	10.10.100.12
COE-Access-SW1.cisco.dod.mil	192.168.254.253
COE-Access-UCC	10.10.100.141

Specify the rules to match devices.

Static groups contain all matching devices at the time the group is created.

Dynamic groups have their rules re-evaluated when the inventory changes.

Enhanced Location Based Grouping

Inventory / Group Management / Network Device Groups ★

Device Groups

Device Groups / Location / All Locations Untitled

Add Location SubGroup

Edit Preview

* Group Name San Jose * Parent Group West Coast

Group Description

Group type Campus

Geographical Location

Civic Location 170 W Tasman Dr, San Jose, California 95134, United States

GPS (Lat. / Long.) -121.95377 / 37.408802

▼ Add Devices Dynamically ?

And Location(sysLocation) contains San Jose

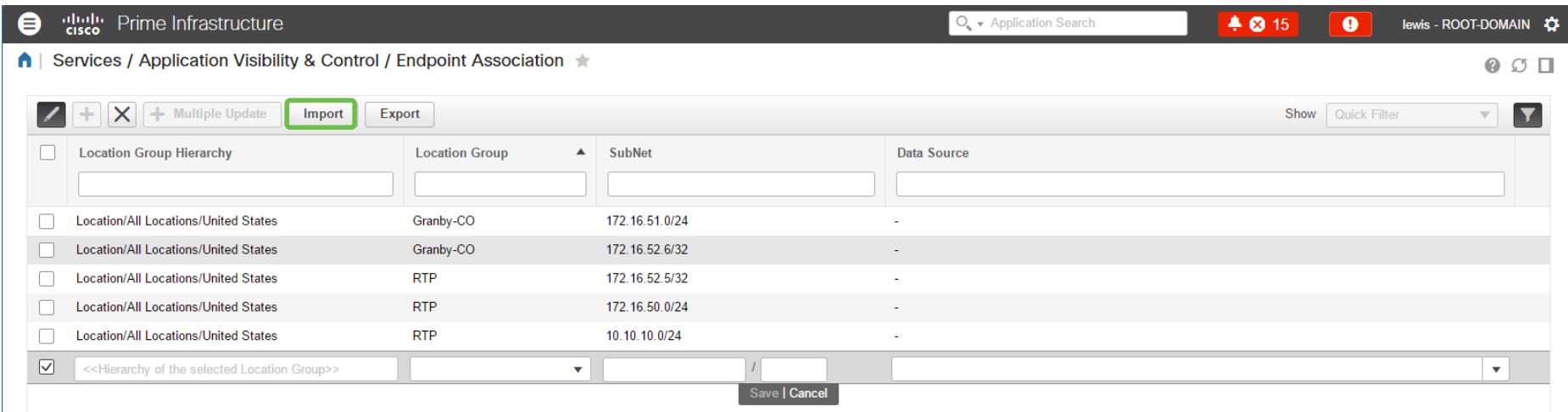
Or City contains San Jose

Or Device Name contains SJC

Save Cancel

The screenshot displays the Cisco NNM-Cloud interface for managing network device groups. A left sidebar shows a tree view of device groups categorized by type (All Devices, Device Type, Location, etc.). The main panel is titled 'Add Location SubGroup' and is set to the 'Edit' tab. It requires a 'Group Name' (San Jose) and a 'Parent Group' (West Coast). The 'Geographical Location' checkbox is checked, and the 'Civic Location' radio button is selected, with specific coordinates entered. Below this, there's a section for dynamically adding devices based on location, city, or device name. The 'Location(sysLocation)' field is highlighted with a green border.

Pro Tip-End Point Assoc. for better Site Dashboards



The screenshot shows the Cisco Prime Infrastructure interface for managing endpoint associations. The top navigation bar includes the Cisco logo, Prime Infrastructure, Application Search, notifications (15), and user information (lewis - ROOT-DOMAIN). The main page title is "Services / Application Visibility & Control / Endpoint Association". Below the title is a toolbar with icons for edit, add, delete, multiple update, import (highlighted in green), and export. A table lists endpoint associations with columns: Location Group Hierarchy, Location Group, SubNet, and Data Source. The first row is a header. The second row is highlighted in grey. The third row has a checkbox checked. The fourth row has a checkbox checked. The fifth row has a checkbox checked. The sixth row has a checkbox checked. The bottom of the table has a search bar and a "Save | Cancel" button.

Location Group Hierarchy	Location Group	SubNet	Data Source
<input type="checkbox"/> Location/All Locations/United States	Granby-CO	172.16.51.0/24	-
<input type="checkbox"/> Location/All Locations/United States	Granby-CO	172.16.52.6/32	-
<input type="checkbox"/> Location/All Locations/United States	RTP	172.16.52.5/32	-
<input type="checkbox"/> Location/All Locations/United States	RTP	172.16.50.0/24	-
<input type="checkbox"/> Location/All Locations/United States	RTP	10.10.10.0/24	-

Associate subnets with Site location groups for more accurate per site application reporting/monitoring

Customizing Configuration Templates

Preparing To Deploy Configurations

The screenshot shows the Cisco Prime Infrastructure interface. The top navigation bar includes the Cisco logo and the text "Prime Infrastructure". Below it, the breadcrumb navigation shows "Administration / Settings / System Settings". On the left, a sidebar menu lists several categories: "System Settings", "Network and Device" (which is expanded to show "CLI Session", "Controller Upgrade", "Plug & Play", and "SNMP"), "Switch Port Trace (SPT)" (expanded to show "Auto SPT", "Manual SPT", "SPT Configuration", and "Known Ethernet MAC Address L"), "Inventory" (expanded to show "Configuration" and "Configuration Archive"). The main content area is titled "Inventory Configuration". It contains several configuration options with checkboxes: "Backup Device Configuration" (checked) and "Rollback Configuration" (checked). Below these are two input fields: "Deploy CLI Thread Pool Count" set to "5" and "Deploy CLI Time Out(ms)" set to "300000". At the bottom are "Save" and "Reset" buttons.

Visit the configuration deployment settings to set desired values.

Pro-Tip: Increasing the thread count will allow PI to deploy to more devices faster. Consider 10 or 20 for larger PI servers.

Pro-Tip: Uncheck Rollback Configurations if you have dynamic routing protocols

Defining The Template

Templates / My Templates / CLI Templates (User Defined)

Change_ACL_Border_Routers

Save Save as New Template Cancel Deploy History

▼ Template Basic

* Name	Change_ACL_Border_Route	Author	lewis
Description	Changes the ACL on all Inte	Feature Category	CLI
Tags		Type	<input checked="" type="radio"/> Devices <input type="radio"/> Ports

Device Type Routers OS Version ? ?



▼ Template Detail

CLI Content Form View Add Variable Add Global Variable Global Variable

```
#if($DeviceName eq "2921-Router.amer.cisco.com")
interface gi 0/2
ip access-group $ACLNAME in
#end
#if($DeviceName eq "Condo-2811.comcast.net")
interface fa 0/0.25
ip access-group $ACLNAME in
#end
```

Specify a template description (helpful to engineers when deploying)

Add tags to group this template with other related templates (opt).

Specify device type(s) this template is applicable to –auto filters when deploying

Defining A New Template Variable

Template Detail

CLI Content Form View **Add Variable** Add Global Variable Global Variable

```
#if($DeviceName eq "2921-Router.amer.cisco.com")
interface gi 0/2
ip access-group $ACLNAME in
#end
#if($DeviceName eq "Condo-2811.comcast.net")
interface fa 0/0.25
ip access-group $ACLNAME in
#end
```

Enter the name of the Global Variable to add a Global Variable to the template

Click the “Add Variable” tab to define a new local variable for the template.

Defining A DB Variable

Pro-Tip: Name must match DB Variable name
Pro-Tip: use Validation Expression and Default Value to ensure that operator cannot change value

Template Detail

CLI Content Form View Add Variable Add Global Variable

Add To CLI

	Name	Type	Display Label	Description	Required									
<input checked="" type="radio"/>	DeviceName	DB	DB Variable-do not c...		false	<input type="button" value="Add To CLI"/>								
<table border="1"><tr><td colspan="2">Validation Expression</td><td><input type="text" value="DeviceName"/></td><td><input type="button" value="?"/></td></tr><tr><td colspan="2">Default Value</td><td><input type="text" value="DeviceName"/></td><td><input type="button" value="?"/></td></tr></table>							Validation Expression		<input type="text" value="DeviceName"/>	<input type="button" value="?"/>	Default Value		<input type="text" value="DeviceName"/>	<input type="button" value="?"/>
Validation Expression		<input type="text" value="DeviceName"/>	<input type="button" value="?"/>											
Default Value		<input type="text" value="DeviceName"/>	<input type="button" value="?"/>											
<input type="radio"/>	▶ ACLNAME	String	ACL name	Name of ACL to be a...	true	<input type="button" value="Add To CLI"/>								

Pro-Tip: Creating New Built-in Variables

The screenshot shows a software interface with two main sections. On the left, there is a code editor window displaying a series of SQL-like queries used for extracting data from a database. On the right, there is a modal dialog titled 'Managed Variables' with the following details:

Name	Type	Display Label	Description	Required
mode	Dropdown	Mode	Access,Trunk	false
encapsulation	String	Encapsulation (Enter dot1q/isl/neg...)	Encapsulation (Enter dot1q...)	false
portfast	Checkbox	Enable Portfast	Enable Portfast	false
SerialNumber	DB	Device Serial Number	Device Serial Number	✓

Below the table, there are fields for 'Validation Expression' (empty) and 'Default Value' (set to 'SerialNumber'). At the bottom of the dialog are 'Save' and 'Cancel' buttons, along with 'Add To CLI' and 'Close' buttons.

```
1 IntName=select u.name from EthernetProtocolEndpoint u where u.owningEntityId =
2 UpIntfName=select u.name from EthernetProtocolEndpointExtended u where u.adminStatus='1' and u.owningEntityId =
3 DownIntfName=select u.name from EthernetProtocolEndpointExtended u where u.adminStatus='2' and u.owningEntityId =
4 AllIntf=select u.name from EthernetProtocolEndpointExtended u where u.owningEntityId =
5 DeviceName=select u.name from NetworkResource u where u.owningEntityId =
6 ProductSeries=select u.productSeries.value from ManagedNetworkElement u where u.owningEntityId =
7 SysObjectID=select u.sysObjectId from ManagedNetworkElement u where u.owningEntityId =
8 IPAddress=select replace(u.managementAddress.paddedAddress,' ','') from ManagedNetworkElement u where u.owningEntityId =
9 SoftwareVersion=select u.softwareVersion from ManagedNetworkElement u where u.owningEntityId =
10 SerialNumber=select u.serialNumber from Equipment u where u.vendorEquipmentType like 'cevChassis%' and u.owningEntityId =
11 ModelNumber=select u.partNumber from Equipment u where u.vendorEquipmentType like 'cevChassis%' and u.owningEntityId =
12 ImageName=select u.imageName from SoftwareImageInstalled u where u.owningEntityId =
13 ImageFileName=select u.installPath from SoftwareImageInstalled u where u.owningEntityId =
14 ImageoVersion=select u.imageVersion from SoftwareImageInstalled u where u.owningEntityId =
15 v Managed Variables
16 V P Edit Add Row Delete Show All
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
```

- Additional data can be extracted from the database and used in Velocity expressions
- Reference server file
`/opt/CSColumos/conf/ifm/template/inventoryTagsInTemplate/CLITemplateDbVariablesQuery.properties`
for existing keys or to define your own using SQL
- Define variables in the feature templates using the DB type
- Variable values will be enclosed in '[' ']'; E.g.:
 - `#if ($SerialNumber == "[FDO1323Z10Q]")`

CLITemplateDBVariablesQuery.properties

```
IntfName=select u.name from EthernetProtocolEndpoint u where u.owningEntityId = --?%-- order by u.name  
UpIntfName=select u.name from EthernetProtocolEndpointExtended u where u.adminStatus='1' and u.owningEntityId = --?%-- order by u.name  
DownIntfName=select u.name from EthernetProtocolEndpointExtended u where u.adminStatus='2' and u.owningEntityId = --?%-- order by u.name  
AllIntf=select u.name from EthernetProtocolEndpointExtended u where u.owningEntityId = --?%-- order by u.name  
EveryIntf=select u.name from InterfaceProtocolEndpoint u where u.owningEntityId = --?%-- order by u.name  
DeviceName=select u.name from NetworkResource u where classname = 'ManagedNetworkElement' and u.owningEntityId =  
ProductSeries=select u.productSeries.value from ManagedNetworkElement u where u.owningEntityId =  
SysObjectID=select u.sysObjectId from ManagedNetworkElement u where u.owningEntityId =  
IPAddress=select replace(u.managementAddress.paddedAddress, ',' ,') from ManagedNetworkElement u where u.owningEntityId =  
SoftwareVersion=select u.softwareVersion from ManagedNetworkElement u where u.owningEntityId =  
SerialNumber=select u.serialNumber from Equipment u where u.vendorEquipmentType like 'cevChassis%' and u.owningEntityId =  
ModelNumber=select u.partNumber from Equipment u where u.vendorEquipmentType like 'cevChassis%' and u.owningEntityId =  
ImageName=select u.imageName from SoftwareImageInstalled u where u.owningEntityId =  
ImageFileName=select u.installPath from SoftwareImageInstalled u where u.owningEntityId =  
ImageVersion=select u.imageVersion from SoftwareImageInstalled u where u.owningEntityId =  
VlanId=select STR(u.vlanId) from VLANInterface u where u.owningEntityId =  
VlanName=select vlan.name from VLANInterface vlan where vlan.owningEntityId =  
ProductType=select u.productType.value from ManagedNetworkElement u where u.owningEntityId =
```

Previewing The Template Form

Click the *Form View* tab to preview what the template form will look like when it is deployed.

Template Detail

CLI Content **Form View** Add Variable Add Global Variable Global Variable

DB Variable-do not change this Field DeviceName

* ACL name ?

Deploying The Template

Templates / My Templates / CLI Templates (User Defined)

Change_ACL_Border_Routers

Save Save as New Template Cancel Deploy History

▼ Template Basic

* Name	Change_ACL_Border_Route	Author	lewis
Description	Changes the ACL on all Inte	Feature Category	CLI
Tags	?	Type	<input checked="" type="radio"/> Devices <input type="radio"/> Ports
* Device Type		Routers	?
OS Version			?

▼ Template Detail

CLI Content Form View Add Variable Add Global Variable Global

```
#if($DeviceName eq "2921-Router.amer.cisco.com")
interface gi 0/2
ip access-group $ACLNAME in
#end
#if($DeviceName eq "Condo-2811.comcast.net")
interface fa 0/0.25
ip access-group $ACLNAME in
#end
```

Once the template is ready, click Save, then you can click on Deploy to push the template to the Network device(s).

Deploying The Template (cont)

The screenshot shows the Cisco Prime Infrastructure interface for managing templates. On the left, a sidebar lists categories like 'Features and Technologies', 'CLI Templates', 'Composite Templates', 'Feature Templates', 'My Tags', 'My Templates' (which is expanded), and 'System Templates - CLI (User Defined)'. A green box highlights the 'My Templates' section and its sub-item 'CLI Templates (User Defined)'. The main pane displays a table titled 'Templates / My Templates' under 'CLI Templates (User Defined)'. The table has columns for Name, Feature Cate..., Folder, and Created On. A row for 'Change_ACL_Border_Routers' is selected, indicated by a blue background. The 'Deploy' button in the toolbar above the table is highlighted with a red box. A callout bubble in the bottom right corner provides instructions: 'Select the template from the list of "My Templates." Click the Deploy button to begin the workflow.'

Name	Feature Cate...	Folder	Created On
3850-AVC-cu	App Visibility <i>i</i>	My Templates/CLI Templates (User Defined)	2015-Dec-22 19:04:29 EST
Change_ACL_Border_Routers	CLI <i>i</i>	My Templates/CLI Templates (User Defined)	2017-Apr-29 12:35:13 EDT
Configure SNMPv3	CLI <i>i</i>	My Templates/CLI Templates (User Defined)/System Templates - ...	2016-Nov-05 07:02:01 EDT
Configure SNMPv3 - Orig	CLI <i>i</i>	My Templates/CLI Templates (User Defined)/System Templates - ...	2016-Nov-05 07:00:34 EDT
Configure VLAN - Custom	CLI <i>i</i>	My Templates/CLI Templates (User Defined)/System Templates - ...	2016-Jan-13 16:26:31 EST
Test-export-switches	CLI <i>i</i>	My Templates/CLI Tem...	

Fill In the Template Values

The screenshot shows the Cisco Prime Infrastructure interface. At the top, there's a navigation bar with 'Prime Infrastructure' and various status indicators. Below it, the breadcrumb path reads 'Configuration / Templates / Features & Technologies'. A horizontal flowchart indicates the process: 'Select Devices' (highlighted with a blue border), followed by 'Input Options', 'Input Values', 'Schedule Deployment', and finally 'Deployment Summary'. The main area is titled 'Devices' and contains a table with columns: Name, Description, Type, and IP Address/DNS. A large blue callout box with white text is overlaid on the table, stating: 'Choose the device or devices in which to apply this template.' The table data includes:

	Name	Description	Type	IP Address/DNS
<input type="checkbox"/>	All Devices	All Members		
<input type="checkbox"/>	Device Type	Device Type		
<input type="checkbox"/>	Location	Location based groups		
<input checked="" type="checkbox"/>	User Defined	User Defined Device Groups		
<input checked="" type="checkbox"/>	Border_Routers	All Border Routers		
<input checked="" type="checkbox"/>	2921-Router.amer.cis...	2921-Router.amer.cisco.com	Routers	172.16.50.254
<input checked="" type="checkbox"/>	Test-2921-Router.am...	Test-2921-Router.amer.cisco.com	Routers	172.16.50.239

Fill In the Template Values

Configuration / Templates / Features & Technologies ★



Input Options

CSV properties

This screen is for advanced user, which will guide you to update all the template properties for the selected devices using CSV export/import mechanism. Please follow the export option below to download the CSV template which will contain configuration template fields in rows. You need to fill in the values in the exported CSV and save it locally. Use the import CSV option to upload all the configuration properties for respective devices to the work flow.

Work Flow

Export CSV

By clicking on the export button, it will download the CSV template to the local system. If you want to skip the optional fields while filling in the configurations please deselect the check box below. By default it is selected and will bring downloaded CSV.

Do you want Optional Parameters:

Import CSV

Please upload the updated CSV file from the local system, by clicking on the import button. You should neither tamper the header of the CSV nor the file while filling in the entries and make sure the device IP addresses are valid.

Pro-Tip: Use Import and Export to fill in values for multiple devices using a spreadsheet

Export/Import CSV

Import CSV

Cancel **Previous** **Next**

A green arrow points from the "Import CSV" button to the "Pro-Tip" box.

Fill In the Template Values

Configuration / Templates / Features & Technologies ★

• Select Devices ✓ → **Input Options ✓** → **Input Values** → **Schedule Deployment**

Name
<input checked="" type="radio"/> All Selected Devices
<input type="radio"/> 2921-Router.amer.cisco.com
<input type="radio"/> Test-2921-Router.amer.cisco.com

DB Variable-do not change this Field

* ACL name ?

Apply

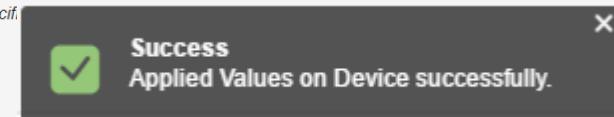
NOTE: Filling in Common properties for "All Selected Devices", updates the same value for Each device. To override this select specific values.

Cancel **Previous** **Next**

Fill in the parameters.

Common parameters can be applied to all devices with per-device overrides.

Click on Apply



Select Job Options

Configuration / Templates / Features & Technologies ★

Global Variables |



Schedule Job

Job Name Start Time Now Date (MM/dd/yyyy hh:mm AM/PM)

Recurrence
 None Hourly
 Minute Daily
 Weekly Monthly
 Yearly

Decide on a schedule (or run the job immediately), and then click OK to deploy the template to the selected device(s).

Job Option Failure Policy

Copy Running Config to Startup

Archive Config after Deploy ?

Pro Tip --save the running configuration to startup to avoid startup/running out-of-sync configurations

NOTE: Each job scheduled here goes through Job Approval if the respective function is selected to go through job approval in Administration ->Settings -> System Settings->Job Approval. Post approval the scheduled jobs will run. If there is a delay in job approval, the runs scheduled in the above times slots will not run by PI Job Manager.

[Cancel](#)

[Previous](#)

[Next](#)

Preview CLI and Finish

Configuration / Templates / Features & Technologies ★

Global Variables



Job Deployment Summary

You have reached the final step after which the template will be deployed to the network based on the schedule. The workflow has created a job Change_ACL_Border_Routers_1 for you which is going to deploy Change_ACL_Border_Routers on 2 device(s) in the scheduled time. Please click Finish to initiate the job.

Name
<input checked="" type="radio"/> 2921-Router.amer.cisco.com
<input type="radio"/> Test-2921-Router.amer.cisco.com

Change_ACL_Border_Routers
interface gi 0/2
ip access-group WeeklyACL in

Once you get to the Deployment Summary the work flow automatically displays the CLI preview of each device in the deployment

Click Finish to Deploy the template

[Cancel](#) [Previous](#) [Finish](#)

Defining Port Based Template

Templates / My Templates / CLI Templates (User Defined)
Change_ACL_Border_Rtr_Portbased

Save Save as New Template Cancel Deploy History

Template Basic

* Name	Change_ACL_Border_Rtr_P	Author	lewis	* Device Type	Routers
Description		Feature Category	CLI	OS Version	
Tags	Ports 		Type	<input type="radio"/> Devices <input checked="" type="radio"/> Ports	

Template Detail

CLI Content Form View Add Variable

```
ip access-group $ACLNAME in
```

Check the Ports Radio button to make this a
Port based configuration template

Deploying Port Based Template

Configuration / Templates / Features & Technologies ★

Select the applicable ports for each device

The screenshot shows the 'Select Ports' step of a template deployment process. The top navigation bar includes 'Select Devices' (green checkmark), 'Select Ports' (highlighted in blue), 'Input Options', 'Input Values', and 'Schedule Deployment'. A blue callout box points to the 'Select Ports' step with the text 'Select the applicable ports for each device'. The main table displays two devices: '2921-Router.amer.cisco.com' and 'Test-2921-Router.amer.cisco.com'. For the first device, its interface table is highlighted with a green circle around the 'GigabitEthernet0/2' row, where the checkbox is checked. The second device's interface table is partially visible below.

Name	Description	Type	IP Address
2921-Router.amer.cisco.com	2921-Router.amer.cisco.com	Routers	172.16.50.254

Interface	Description
<input type="checkbox"/> Backplane-GigabitEthernet0/3	Backplane-GigabitEthernet0/3
<input checked="" type="checkbox"/> GigabitEthernet0/2	GigabitEthernet0/2
<input type="checkbox"/> GigabitEthernet0/0	GigabitEthernet0/0
<input type="checkbox"/> GigabitEthernet0/1	GigabitEthernet0/1
<input type="checkbox"/> Tunnel0	Tunnel0

Test-2921-Router.amer.cisco.com	Test-2921-Router.amer.cisco.com	Routers	172.16.50.239
---------------------------------	---------------------------------	---------	---------------

Cancel Previous Next

Preview CLI and Finish

Configuration / Templates / Features & Technologies ★

Global Variables 🗑️ 🌐 ⓘ ⓘ ⓘ ⓘ



Job Deployment Summary

You have reached the final step after which the template will be deployed to the network based on the schedule. The workflow has created a job Change_ACL_Border_Rtr_Portbased_1 for you which is going to deploy Change_ACL_Border_Rtr_Portbased on 2 device(s) in the scheduled time. Please click Finish to initiate the job.

Name
<input checked="" type="radio"/> 2921-Router.amer.cisco.com
<input type="radio"/> Test-2921-Router.amer.cisco.com

Change_ACL_Border_Rtr_Portbased

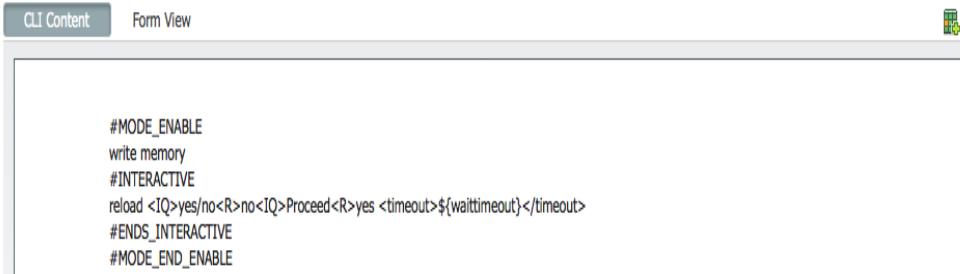
interface GigabitEthernet0/2
ip access-group WeeklyACL in
exit

Cancel Previous **Finish**

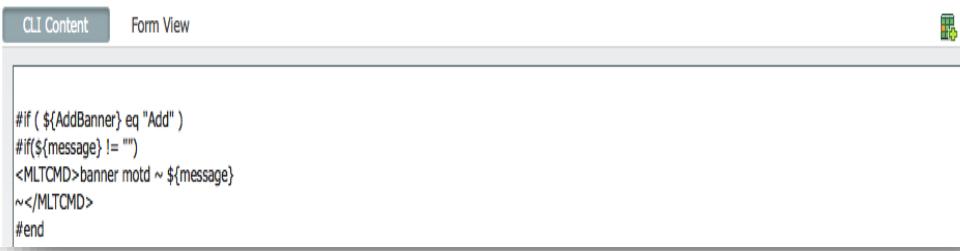
Once you get to the Deployment Summary the work flow automatically displays the CLI preview of each device in the deployment

Click Finish to Deploy the template

Pro-Tip: Interactive, Enable, and Multiline Commands



```
#MODE_ENABLE
write memory
#INTERACTIVE
reload <IQ>yes/no<R>no<IQ>Proceed<R>yes <timeout>${waittimeout}</timeout>
#ENDS_INTERACTIVE
#MODE_END_ENABLE
```



```
#if (${AddBanner} eq "Add")
#if(${message} != "")
<MLTCMD>banner motd ~ ${message}
~</MLTCMD>
#end
```

- Interactive commands can be done using the `#INTERACTIVE` command followed by `<IQ>` to denote a question and `<R>` to specify the reply
 - Use `#ENDS_INTERACTIVE` to denote the end of the interactive block
- Multi-line commands can be specified using the `<MLTCMD></MLTCMD>` tags
- Enable (i.e., EXEC) mode commands can be specified within `#MODE_ENABLE` and `#MODE_END_ENABLE` comments

Setting up and using Baseline Compliance

Getting Started with Compliance

The screenshot shows the Cisco Prime Infrastructure administration interface. The left sidebar lists various settings categories: General, Mail and Notification, Network and Device, and Switch Port Trace (SPT). The main panel is titled 'General Server' and contains sections for 'HTTP Forward', 'HTTPS', 'Global Idle Timeout', 'NTP Servers', and 'Compliance Service'. Under 'HTTP Forward', the 'Enable' radio button is selected. Under 'HTTPS', the port is set to 443. Under 'Global Idle Timeout', the 'Logout all idle users' checkbox is checked, and the 'after' dropdown is set to '15 min'. Under 'NTP Servers', the server name is 'time.nist.gov' and the time zone is 'EDT'. Under 'Compliance Service', the 'Enable' radio button is selected. At the bottom are 'Save' and 'Apply System Default Settings' buttons.

(3.x) Compliance needs to be enable

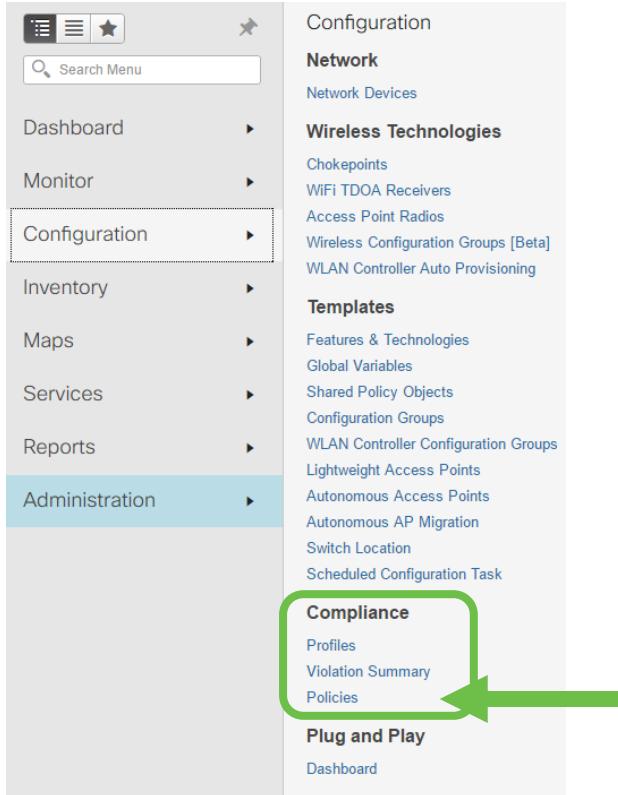
Go to Administration > Settings >System Settings > Server

Select Enable and Click Save

You must Restart the Server for changes to take effect (NCS Stop/NCS start)

Note: *Compliance requires Standard OVA (3.1.3+), Pro OVA, or Gen2 hardware appliance*

Getting Started with Compliance



Once enabled, Configuration>Compliance section will appear on the Menu

Compliance follows a 3-Level Model

Policies

Profiles

Violation Summary

To get started, we click on Policies

Define Compliance Policy (cont)

Edit Rule:Check valid trap destination

► Rule Information

▼ Platform Selection

Select all platforms for which this rule is applicable.

Available Platforms

	Value
<input type="checkbox"/>	Cisco Devices
<input checked="" type="checkbox"/>	Cisco IOS Devices
<input checked="" type="checkbox"/>	Cisco IOS-XR Devices
<input checked="" type="checkbox"/>	Cisco IOS-XE Devices
<input type="checkbox"/>	Cisco NX-OS Devices
<input type="checkbox"/>	Cisco ASA Devices

Selected 3 / Total 6 

Previous  Next Cancel

► Rule Inputs 

► Conditions And Actions 

Select the OS(es) the Policy applies to

Click Next

Define Compliance Policy (cont)

Edit Rule:Check valid trap destination

Rule Information

Platform Selection

Rule Inputs

Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions, at a minimum you need to add one condition per rule.

Selected 1 / Total 1

S.No	Scope	Match Action	Does Not Match Action
1	Configuration must contain the string sn... ⓘ	Does not Raise a Vi...	Raise a Violation

Previous Save Cancel

X

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output, Properties or Previous Blocks

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions

Condition Details Action Details

Condition Scope Details

Condition Scope Configuration
Device Property
Show Commands

Block Options

Parse as Blocks
* Block Start Expression
Block End Expression Advanced Block Options

Condition Match Criteria

Operator Contains the string
* Value snmp-server host <_Destination> version 2c <_Community_String>

Advanced Regular Expression Options Test Regular Expression

OK Cancel

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output, Properties or Previous Blocks

Previous Save Cancel

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions

Condition Details Action Details

Condition Scope Details

Condition Scope Configuration
Device Command Outputs
Device Properties
Previously Matched Blocks

Block Options

Parse as Blocks

* Block Start Expression

Block End Expression

Advanced Block Options

Condition Match Criteria

Operator Contains the string

* Value snmp-server host <_Destination> version 2c <_Community_String>

Advanced Regular Expression Options Test Regular Expression

+ New Edit Delete

S.No Scope

1 Configuration

Previous Save Cancel

OK Cancel

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output, Properties or Previous Blocks

The screenshot shows the 'Edit Rule' interface for defining a compliance policy. The main window has tabs for 'Rule Information', 'Platform Selection', 'Rule Inputs', and 'Conditions And Actions'. The 'Conditions And Actions' tab is active, showing a table with one row (S.No 1, Scope Configuration). The 'Action Details' tab is selected. A modal dialog titled 'Create the Condition and Action Rules' is open, showing the 'Condition Scope Details' section with options like 'Configuration', 'Device Command Outputs', 'Device Properties', and 'Previously Matched Blocks'. Below it, 'Block Options' and 'Condition Match Criteria' sections are visible. The 'Condition Match Criteria' section includes an operator dropdown set to 'Contains the string' and a value input field containing 'snmp-server host <_Destination> version 2c <_Community_String>'. The 'OK' button at the bottom right of the modal is highlighted.

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions

Condition Details Action Details

Condition Scope Details

Configuration
Device Command Outputs
Device Properties
Previously Matched Blocks

Block Options

Parse as Blocks

* Block Start Expression

Block End Expression

Advanced Block Options

Condition Match Criteria

Operator Contains the string

* Value snmp-server host <_Destination> version 2c <_Community_String>

Advanced Regular Expression Options Test Regular Expression

+ New Edit Delete

S.No Scope

1 Configuration

Previous Save Cancel

OK Cancel

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output, Properties or Previous Blocks

BRKNMS-2702 © 2018 Cisco and/or its affiliates. All rights reserved. Cisco Public 75

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions X

Condition Details Action Details

Select Match Action

Select Action Does Not Raise a Violation

Condition Number

Violation Severity

Violation Message Type

Violation Message Id

*Violation Message

Fix CLI

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output, Properties or Previous Blocks

+ New Edit Delete

S.No	Scope
1	Configuration

Previous Save Cancel OK Cancel

Cisco live!

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions X

Condition Details Action Details

Select Match Action

Select Does not Match Action

Condition Number

Violation Severity

Violation Message Type

Violation Message Id

*Violation Message

Fix CLI

OK Cancel

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output, Properties or Previous Blocks

Rule Information

Platform Selection

Rule Inputs

Conditions And Actions

Select the Condition that comprise this rule. Y

+ New	Edit	X Delete
S.No	Scope	
1	Configuration	

Previous Save Cancel

The screenshot illustrates the configuration of a compliance policy rule. On the left, the 'Edit Rule' window shows a table with one row (S.No 1, Scope Configuration). The 'Edit Conditions And Actions' window is open, showing the 'Action Details' tab selected. It includes fields for 'Select Action' (set to 'Raise a Violation'), 'Condition Number', 'Violation Severity' (set to 'Minor'), 'Violation Message Type' (set to 'User defined Violation Message'), 'Violation Message Id', and 'Violation Message' (containing the message 'Trap Destination is not configured. 'snmp-ser'). Below these is a 'Fix CLI' section with the command 'snmp-server host <_Destination> version 2c <_Community_String>'. A green callout box on the right highlights the 'Create the Condition and Action Rules' section and notes that 'Condition Scope can be based on config, Command Output, Properties or Previous Blocks'.

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions X

Condition Details Action Details

Select Match Action

Select Does not Match Action

Condition Number

Violation Severity

Violation Message Type

Violation Message Id

*Violation Message

Fix CLI

OK Cancel

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output, Properties or Previous Blocks

Rule Information

Platform Selection

Rule Inputs

Conditions And Actions

Select the Condition that comprise this rule. Y

+ New		Edit	X Delete
S.No	Scope		
1	Configuration		

Previous Save Cancel

Cisco live!

Compliance Example 2

Command Output

Command output Compliance Policy

Edit Rule:Check-ASA-Uptime-special

▶ Rule Information

▼ Platform Selection

Select all platforms for which this rule is applicable.

Available Platforms

Value
<input type="checkbox"/> Cisco IOS Devices
<input type="checkbox"/> Cisco IOS-XR Devices
<input type="checkbox"/> Cisco IOS-XE Devices
<input type="checkbox"/> Cisco NX-OS Devices
<input type="checkbox"/> Cisco Wireless LAN Controller(WLC) Devices
<input checked="" type="checkbox"/> Cisco ASA Devices

Previous

Next

Cancel

▶ Rule Inputs

▶ Conditions And Actions

Select the OS(es) the Policy applies to

Click Next

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special



► Rule Information ✓

► Platform Selection ✓

► Rule Inputs ✓

▼ Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions, at a minimum you need to add one condition per rule.

Selected 1 / Total 2

		New	Edit
		Delete	↓
		↑	
Show		All	▼
		Filter	
S.No	Scope	Match Action	Does Not Match Action
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="radio"/> 1	Output of show version grep Software ... <small>i</small>	Continue	Does not Raise a Violation
<input type="radio"/> 2	Output of show version grep days mus... <small>i</small>	Raise a Violation	Does not Raise a Violation

Previous Save Cancel

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special

▶ Rule Information
▶ Platform Selection
▶ Rule Inputs
▼ Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions.

Conditions	
+	New
<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
<input type="button" value="↓"/>	<input type="button" value="↑"/>

S.No	Scope
<input checked="" type="radio"/> 1	Output of show version grep Software ... (i)
<input type="radio"/> 2	Output of show version grep days mus... (i)

Previous

Save

Cancel

Edit Conditions And Actions

Condition Details Action Details

Condition Scope Details

Condition Scope

Device Property

Show Commands

Block Options

Parse as Blocks

* Block Start Expression

Block End Expression

[Advanced Block Options](#)

Condition Match Criteria

Operator

* Value

OK

Cancel

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special

▶ Rule Information

▶ Platform Selection

▶ Rule Inputs

▼ Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Con

		<input type="button" value="New"/>	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>	<input type="button" value="↓"/>	<input type="button" value="↑"/>
S.No	Scope					
<input checked="" type="radio"/> 1	Output of show version grep Software ... (i)					
<input type="radio"/> 2	Output of show version grep days mus... (i)					

Previous

Save

Cancel

Edit Conditions And Actions

Condition Details

Action Details

Condition Scope Details

Condition Scope

Device Property

Show Commands

Block Options

Parse as Blocks

* Block Start Expression

Block End Expression

[Advanced Block Options](#)

Condition Match Criteria

Operator

* Value

OK

Cancel

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special

► Rule Information

► Platform Selection

► Rule Inputs

▼ Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions.

Action Bar: + New | Edit | Delete | Down | Up

S.No	Scope
1	Output of show version grep Software ... <i>i</i>
2	Output of show version grep days mus... <i>i</i>

Buttons: Previous | Save | Cancel

Edit Conditions And Actions

Condition Details Action Details

Select Match Action

Select Action: Continue

Condition Number:

Violation Severity:

Violation Message Type:

Violation Message Id:

*Violation Message:

Fix CLI:

Select Does not Match Action

Select Action: Does Not Raise a Violation

Condition Number:

Violation Severity:

Buttons: OK | Cancel

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special

Rule Information ✓
Platform Selection ✓
Rule Inputs ✓
Conditions And Actions **Selected 1 / Total 2**

Select the Condition that comprise this rule. You can add any number of Conditions, at a minimum you need to add one condition per rule.

S.No		Scope	Match Action	Does Not Match Action
<input type="radio"/> 1	Output of show version grep Software ... <small>(i)</small>	Continue	Does not Raise a Violation	
<input checked="" type="radio"/> 2	Output of show version grep days mus... <small>(i)</small>	Raise a Violation	Does not Raise a Violation	

Previous **Save** Cancel

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special

Rule Information

Platform Selection

Rule Inputs

Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions.

S.No	Scope
1	Output of show version grep Software ...
2	Output of show version grep days must be ...

Previous Save Cancel

Edit Conditions And Actions

Condition Details Action Details

Condition Scope Details

Condition Scope: Device Command Outputs

Device Property:

Show Commands: show version | grep days

Block Options

Parse as Blocks

* Block Start Expression:

Block End Expression:

Advanced Block Options

Condition Match Criteria

Operator: Matches the expression

* Value: (20[0-9]|21[0-3])

OK Cancel

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special

Rule Information

Platform Selection

Rule Inputs

Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions.

S.No	Scope
1	Output of show version grep Software ...
2	Output of show version grep days must be ...

Block Options

Parse as Blocks

* Block Start Expression:

Block End Expression:

Condition Match Criteria

Operator: Matches the expression

* Value: (20[0-9]|21[0-3])

Previous Save Cancel

Edit Conditions And Actions

Action Details

Condition Scope Details

Condition Scope: Device Command Outputs

Device Property:

Show Commands: show version | grep days

Block Options

Parse as Blocks

* Block Start Expression:

Block End Expression:

Advanced Block Options

Condition Match Criteria

Operator: Matches the expression

* Value: (20[0-9]|21[0-3])

OK Cancel

Command output Compliance Policy (cont)

Edit Rule:Check-ASA-Uptime-special

Rule Information

Platform Selection

Rule Inputs

Conditions And Actions

Select the Condition that comprise this rule. You can add any number of Conditions.

S.No	Scope
1	Output of show version grep Software ...
2	Output of show version grep days must...

New **Edit** **Delete** **↓** **↑**

Previous Save Cancel

Edit Conditions And Actions

Condition Details Action Details

Select Match Action

Select Action **Raise a Violation**

Condition Number

Violation Severity **Critical**

Violation Message Type **User defined Violation Message**

Violation Message Id

*Violation Message **Reboot ASAP-ASA has been running for more than 200 day:**

Fix CLI

Select Does not Match Action

Select Action **Does Not Raise a Violation**

Condition Number

Violation Severity

OK

Cancel

Violation Summary

Prime Infrastructure Application Search 15 lewis - ROOT-DOMAIN

Administration / Dashboards / Job Dashboard / Job_Compliance Audit Job_1_00_31_787_AM_3_31_2017

Job Name Job_Compliance Audit Job_1_00_31_787_AM_3_31_...

Policy Profile ASA-uptime-Check Devices (Audited/Non-Audited) 1/0

Violation Summary Selected 1 / Total Top Level Rows 2

Show All

Policies/Rules (Failed)	Severity	Fixable	Policy	Rule	Violation Message	Device Name	Device Type	Device Loca...
All Policies	1	0	0	0				
ASA-Uptime-Che...	1	0	0	0				

Violation Details Selected 1 / Total 1

Export as

Severity	Fixable	Policy	Rule	Violation Message	Device Name	Device Type	Device Loca...
Not Fixable	ASA-Uptime-Check	Check-ASA-Uptime-special	Reboot ASAP-ASA has been running for more than 200 days, please reboot before 213 day Hang Threshold	ASAv-Home	Cisco Adaptive Security Virtual Appliance (ASAv)	Comm Closet	

Violations Summary

Severity	Fixable	Policy	Rule	Violation Message	Device Name	Device Type	Device Location	IP Address
Critical	Not Fixable	ASA-Uptime-Check-special-simple	Check-ASA-Uptime-special	Reboot ASAP-ASA has been running for more than 200 days, please reboot before 213 day Hang Threshold	ASAv-Home	Cisco Adaptive Security Virtual Appliance (ASAv)	Comm Closet	172.16.50.240

Export the violations results

ProTip: use Online Regex tester like <https://regex101.com/>

The screenshot shows the regex101.com interface. In the 'REGULAR EXPRESSION' field, the pattern `/ntp server ((?:[0-9]{1,3}\.){3}[0-9]{1,3}$)/` is entered. The 'TEST STRING' field contains `ntp server 10.1.1.1`. The 'EXPLANATION' section provides a detailed breakdown of the regex components:

- `/ntp server ((?:[0-9]{1,3}\.){3}[0-9]{1,3}$)/`: matches the characters `ntp server` literally (case sensitive)
- 1st Capturing group** (`((?:[0-9]{1,3}\.){3}[0-9]{1,3}$)`):
 - (?:[0-9]{1,3}\.){3}**: Non-capturing group
 - [0-9]{1,3}**: match a single character present in the list below
 - Quantifier: {1,3}: Between 1 and 3 times, as many times as possible, giving back as needed. **Greedy**
 - `0-9`: a single character in the range between 0 and 9
 - `\.`: matches the character `.` literally
 - [0-9]{1,3}**: match a single character present in the list below
 - Quantifier: {1,3}: Between 1 and 3 times, as many times as possible, giving back as needed. **Greedy**

The 'MATCH INFORMATION' section shows a single match:

- MATCH 1**:
 - `1.`: [11-19] `10.1.1.1`

Pro Tip: You can also use the built-in Test Regular Expression button

ProTip: use Online Regex tester like <https://regex101.com/>

The screenshot shows the regex101.com interface. In the 'REGULAR EXPRESSION' field, the pattern `/ntp server ((?:[0-9]{1,3}\.){3}[0-9]{1,3}$)/` is entered. The 'TEST STRING' field contains `ntp server 10.1.1.1`. The 'EXPLANATION' pane provides a detailed breakdown of the regex:

- `((?:[0-9]{1,3}\.){3}[0-9]{1,3}$)` matches the characters `ntp server` literally(case insensitive).
- `(?:[0-9]{1,3}\.){3}` matches the characters `ntp server` literally(case insensitive).
- `[0-9]{1,3}` Non-capturing group {3} Exactly 3 times
- match a single character present in the list below {1,3} Between 1 and 3 times, as many times as needed.
- greedy
- character in the range between 0 and 9
- character `.` literally
- match a single character present in the list below {1,3} Between 1 and 3 times, as many times as needed.
- greedy

The 'Edit Conditions And Actions' section includes tabs for 'Condition Details' and 'Action Details'. Under 'Condition Scope Details', the 'Condition Scope' is set to 'Device Command Outputs'. Under 'Block Options', there are fields for 'Block Start Expression' and 'Block End Expression', both currently empty. Under 'Condition Match Criteria', the operator is 'Matches the expression' and the value is `^securityk9 \s*(..[yes|no]) \s*(..[yes|no]) \s*(..[yes|no]) \s*(yes)`. Buttons for 'Advanced Regular Expression Options' and 'Test Regular Expression' are also present.

Pro Tip: You can also use the built-in Test Regular Expression button

ProTip: use Online Regex tester like <https://regex101.com/>

The screenshot shows the regex101.com interface. In the 'REGULAR EXPRESSION' field, the pattern `/ntp server ((?:[0-9]{1,3}\.){3}[0-9]{1,3}$)/` is entered. The 'TEST STRING' field contains `ntp server 10.1.1.1`. The 'EXPLANATION' pane provides a detailed breakdown of the regex: it matches the characters `ntp server` literally (case-insensitive), followed by a non-capturing group `((?:[0-9]{1,3}\.){3}[0-9]{1,3}$)` which matches three groups of one to three digits separated by dots, ending with a digit group. Below the explanation are sections for 'Condition Scope Details', 'Block Options', and 'Condition Match Criteria'. A green box highlights the 'Test Regular Expression' button. On the left sidebar, under 'FLAVOR', 'pcre (php)' is selected.

Pro Tip: You can also use the built-in Test Regular Expression button

ProTip: use Online Regex tester like <https://regex101.com/>

Screenshot of the regex101.com website showing a regular expression test.

The URL in the browser bar is <https://regex101.com/>.

The page title is "regular expressions 101" and the sub-section is "regex tester".

REGULAR EXPRESSION: /ntp server ((?:[0-9]{1,3}\.){3}[0-9]{1,3}\$)/

EXPLANATION: /ntp server ((?:[0-9]{1,3}\.){3}[0-9]{1,3}\$) / matches the characters ntp server literally(case)

TEST STRING: ntp server 10.1.1.1

Edit Conditions And Actions

Condition Scope Details: Condition Scope: Device Command Outputs; Device Property: ; Show Commands: show license feature

Block Options: Parse as Blocks (unchecked); Block Start Expression: ; Block End Expression: ; Advanced Block Options

Condition Match Criteria: Operator: Matches the expression; Value: ^securityk9 \s*(..[yes|no]) \s*(..[yes|no]) \s*(..[yes|no]) \s*(..[yes|no])

Matching Parameters: yes yes yes no

Regular Expression Tester:

Click on Test Regular Expression button to execute the Regular Expression on Test Data and get the matching parameters.

*** Regular Expression:** ^securityk9 \s*(..[yes|no]) \s*(..[yes|no]) \s*(..[yes|no])

*** Test Data:** securityk9 yes yes no

4 items found: yes yes no yes

Buttons: Advanced Regular Expression Options, Test Regular Expression, Update, Cancel, OK, Cancel

Page Footer: © 2018 Cisco and/or its affiliates. All rights reserved. Cisco Public 99

Pro Tip: You can also use the built-in Test Regular Expression button

Customizing Reports

PSIRT/EOX Reports

Reports / Reports / PSIRT and EOX ★

Schedule Job View Job Details Last Run Time: Wed Jul 22 12:41:38 PDT 2015

Device PSIRT Device Hardware EOX Device Software EOX Field Notice Total 57 ⚙️⚙️

Device PSIRT PDF Go Show All ⚙️⚙️

Device Name	Device Type	IP Address	OS Type	OS Version	PSIRT Title	Based On Version	Based On Config
AMS-4331-RBR	Cisco 4431 Integrated Services Router	192.168.152.2	IOS-XE	15.4(3)S2	No	Not Vulnerable	Not Vulnerable
			IOS	15.0(2)SE2	Multiple Vulnerabilities in OpenS...	Vulnerable	Not Vulnerable
ASR1K-CORE2	Cisco ASR 1004 Router	10.0.255.52	IOS-XE	15.4(3)S	No	Not Vulnerable	Not Vulnerable
PAR-ASR1K-RBR	Cisco ASR 1002-X Router	10.0.112.2	IOS-XE	15.4(3)S	No	Not Vulnerable	Not Vulnerable
					No	Not Vulnerable	Not Vulnerable
TSPM-SJ-P2C2R3	Cisco 2951 Integrated Services Router ...	172.21.34.78	IOS	15.0(1)M4	No	Not Vulnerable	Not Vulnerable
BXB-2921-RBR.yourdomain...	Cisco 2921 Integrated Services Router ...	10.0.255.72	IOS	15.3(3)M1	Cisco IOS Software Session Initi...	Vulnerable	Vulnerable
			NXOS	6.1(3)	GNU Bash Environment Variable...	Vulnerable	Not Vulnerable
					No	Not Vulnerable	Not Vulnerable
					No	Not Vulnerable	Not Vulnerable
			IOS	15.1(4)M6	Cisco IOS Software DHCP Denia...	Vulnerable	Vulnerable
			IOS	15.1(4)M6	Multiple Vulnerabilities in OpenS...	Vulnerable	Not Vulnerable
LON-4948-ABR2	Cisco Catalyst 4948 10 Gigabit Ethern...	10.11.10.2	IOS	12.2(31)SG	TCP State Manipulation Denial o...	Vulnerable	Not Vulnerable
LON-4948-ABR2	Cisco Catalyst 4948 10 Gigabit Ethern...	10.11.10.2	IOS	12.2(31)SG	Cisco VLAN Trunking Protocol V...	Vulnerable	Vulnerable

The Detailed Hardware Report

COE Hardware

Generated: 2015-Apr-02, 16:19:50 EST

Show: Up to 50 records

Category: Cisco Interfaces and Modules

None.

Cisco Prime Infrastructure

Category: Routers

Product Series	Device Name	Updated At	System Description	Location	Contact	Serial Number	Chassis Vendor Type	Total Flash Device Size (MB)	Number of Interfa
Cisco 2800 Series Integrated Services Routers	C2811-SpkrBus-GW	2015-Apr-01, 22:00:22 EST	Cisco IOS Software, 2800 Software (C2800NM-ADVENTERPRISEK9-M), Version 15.1(4)MS, RELEASE SOFTWARE (fc1) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2012 by Cisco Systems, Inc. Compiled Tue 04-Sep-12 15:56 by prod_rel_team Cisco IOS Software, 2800 Software (C2800NM-ADVENTERPRISEK9-M), Version 12.4(24)T8, RELEASE SOFTWARE (fc1) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2012 by Cisco Systems, Inc. Compiled Sun 09-Sep-12 04:01 by prod_rel_team Cisco IOS Software, 2800 Software (C2800NM-ADVENTERPRISEK9-M), Version 12.4(6)T3, RELEASE SOFTWARE (fc2) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2006 by Cisco Systems, Inc. Compiled Fri 21-Jul-06 16:16 by kellythw	FTX1005C2FV	cevChassis2811	122.77	18		
Cisco 2800 Series Integrated Services Routers	COE-GW-DID.cisco.dod.mil	2015-Apr-01, 22:00:21 EST	Cisco IOS Software, 2800 Software (C2800NM-ADVENTERPRISEK9-M), Version 12.4(24)T8, RELEASE SOFTWARE (fc1) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2012 by Cisco Systems, Inc. Compiled Sun 09-Sep-12 04:01 by prod_rel_team Cisco IOS Software, 2800 Software (C2800NM-ADVENTERPRISEK9-M), Version 12.4(6)T3, RELEASE SOFTWARE (fc2) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2006 by Cisco Systems, Inc. Compiled Fri 21-Jul-06 16:16 by kellythw	FTX1017A1KY	cevChassis2811	122.24	110		
Cisco 2800 Series Integrated Services Routers	COE-RMS1.cisco.dod.mil	2015-Apr-01, 22:00:30 EST	Cisco IOS Software, 2800 Software (C2800NM-ADVENTERPRISEK9-M), Version 12.4(6)T3, RELEASE SOFTWARE (fc2) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2006 by Cisco Systems, Inc. Compiled Fri 21-Jul-06 16:16 by kellythw	FTX1105A1TG	cevChassis2811	122.24	110		

The serial number as well as other hardware attributes can be found in the Detailed Hardware Report



TIP: The Wired Detailed Device Inventory has all the details of wired devices

Customizing Wired Detailed Device Inventory Report

Prime Infrastructure Application Search 20 lewis - ROOT-DOMAIN

... / Report Launch Pad / Device / Wired Detailed Device Inventory / Wired Detailed Device Inventory Report Details

Run Save Run and Save Save and Export Save and Email Cancel Delete

Settings

Report Title: Customized-Wired-Detail-Device-inv

Report By: Groups

Report Criteria: Cisco Catalyst 4500 Series Switches > All Devices
Cisco Catalyst 4900 Series Switches > All Devices
Cisco Catalyst 3750 Series Switches > All Devices
Cisco 2900 Series Integrated Services Routers G2 > All Devices

Customize Report **Customize** Customize the data for this report

Schedule

Scheduling: Enable

Export Format: CSV

Destination: File: /localdisk/ftp/reports/WiredDetailedDeviceInventory/Customized-Wired-Detail-Device-inv.xls

Start Date/Time: 08/10/2016 12:00 AM (GMT-5.0) US/Eastern

Current Server Time: 18-May-2017,16:25:29 EDT

Recurrence: No Recurrence Hourly Daily Weekly Monthly

Run Save Run and Save Save and Export Save and Email Cancel Delete

Pro-Tip:
Customize the report to make it more accurate for your needs.
If you need more than 5 devices either schedule the report or use the save and export feature

Cisco live!

BRKNMS-2702 © 2018 Cisco and/or its affiliates. All rights reserved. Cisco Public 105

The screenshot shows the 'Wired Detailed Device Inventory Report Details' page in Cisco Prime Infrastructure. On the left, there's a 'Customize Report' section with a 'Customize' button highlighted by a green box. On the right, there's a 'Schedule' section with a 'Scheduling' checkbox and an 'Enable' button. Two green arrows point to the 'Save and Export' button in the top right and the 'Enable' checkbox in the 'Scheduling' section.

Customizing Wired Detailed Device Inventory Report

Create Custom Report

Custom Report Name: System Information  Do not include

Available data fields

Sys Up Time	<input type="button" value="Add >"/>
	<input type="button" value="< Remove"/>

Data fields to include

Name	<input type="button" value="Move Up"/>
Description	<input type="button" value="Move Down"/>
IP Address/DNS Name	
Location	

* Blue fields are mandatory in this subreport.

Data field sorting

Sort by: None Ascending Descending

Then by: None Ascending Descending

Then by: None Ascending Descending

Then by: None Ascending Descending

* Only reports in tabular format can be sorted.
* Only fields that can be sorted appear in the selection menus.

After clicking Apply, click Save on the Report Details page to save the custom report settings.

Pro-Tip:

To fully customize the report choose the different sections of the report from the dropdown

Select the Fields to include/exclude
Exclude the entire selection

Customizing Wired Detailed Device Inventory Report

Create Custom Report

Custom Report Name: Equipment Information

Do not include

Available data fields:

- Sys Up Time

Data field sorting:

Sort by: None

Then by: None

Then by: None

Then by: None

Then by: None

Ascend^{ing} Descend^{ing}

* Only reports in tabular format can be sorted.
* Only fields that can be sorted appear in the selection menus.

After clicking Apply, click Save on the Report Details page to save the custom report settings.

Apply Reset Cancel



Pro-Tip:

To fully customize the report choose the different sections of the report from the dropdown

Select the Fields to include/exclude
Exclude the entire selection

Customizing Wired Detailed Device Inventory Report

Create Custom Report

Custom Report Name: Equipment Information

Do not include

Available data fields:

- Sys Up Time

Data field sorting:

Sort by: None

Then by: None

Then by: None

Then by: None

Then by: None

Ascend^{ing} Descend^{ing}

* Only reports in tabular format can be sorted.
* Only fields that can be sorted appear in the selection menus.

After clicking Apply, click Save on the Report Details page to save the custom report settings.

Apply Reset Cancel



Pro-Tip:

To fully customize the report choose the different sections of the report from the dropdown

Select the Fields to include/exclude
Exclude the entire selection

Customizing Wired Detailed Device Inventory Report

Create Custom Report

Custom Report Name: Equipment Information

Available data fields:

- Sys Up Time
- Equipment Information
- System Information
- Chassis Information
- Module Information
- Physical Interface
- VLAN Interface
- Software Image Information
- Memory Pool Information
- IP Interfaces
- Flash Device
- Flash Partition
- Flash File
- User Defined Field (UDF) Information

Data field sorting:

Sort by: None

Then by: None

Then by: None

Then by: None

Sort order: Ascending

* Only reports in tabular format can be sorted.
* Only fields that can be sorted appear in the selection menus.

After clicking Apply, click Save on the Report Details page to save the custom report settings.

Do not include

ds to include

Move Up

Move Down

X

Pro-Tip:

To fully customize the report choose the different sections of the report from the dropdown

Select the Fields to include/exclude
Exclude the entire selection

Customizing Wired Detailed Device Inventory Report

Chassis Information # Test-2921-Router.amer.cisco.com					
Name	Description	Serial Number	Vendor Type	IP Address/DNS Name	UDI
CISCO2921/K9	CISCO2921/K9 chassis	FTX1511AHC9	cevChassisC2921	172.16.50.239	CISCO2921/K9 chassisFTX1511AHC9
Module Information # Test-2921-Router.amer.cisco.com					
Serial Number	Name	Type	Part Number	Operational Status	IP Address/DNS Name
OC15063ZU9	C2921 Mother board 3GE, integrated VPN and 4W on Slot 0	Module			172.16.50.239
Chassis Information # 3750E-switch.amer.cisco.com					
Name	Description	Serial Number	Vendor Type	IP Address/DNS Name	UDI
VS-C3750E-48PD-EF	WS-C3750E-48PD	FDO1408R0LC	cevChassisCat3750E48PD	172.16.50.248	WS-C3750E-48PD FDO1408R0LC
Module Information # 3750E-switch.amer.cisco.com					
Serial Number	Name	Type	Part Number	Operational Status	IP Address/DNS Name
DO140704UM	Switch 1 - Slot 2 - TwinGig Converter Module	Module	800-27645-02	ok	172.16.50.248
Chassis Information # 4503E-switch.amer.cisco.com					
Name	Description	Serial Number	Vendor Type	IP Address/DNS Name	UDI
VS-C4503-E	Cisco Systems, Inc. WS-C4503-E 3 slot switch	SPE172900QJ	cevChassisCat4503e	172.16.50.249	Cisco Systems, Inc. WS-C4503-E 3 slot switch SPE172900QJ
Module Information # 4503E-switch.amer.cisco.com					
Serial Number	Name	Type	Part Number	Operational Status	IP Address/DNS Name
TAT1628L1F6	Supervisor(slot 1)	Module	WS-X45-SUP7I-F	ok	172.16.50.249

Customized Reports in PI 3.2/3.3

The screenshot shows the 'Create New Report' screen in Cisco Prime Infrastructure. On the left, there's a sidebar with categories like Device, Client, and Security. A green arrow points from the 'Selected Options' list to the 'Device' category. The main area is titled 'Customize : Device / Wired Detailed Device Inventory'. It has two tabs: 'Step 1 : Select Filters' (selected) and 'Step 2 : Edit Sub Reports'. Under 'Report By', it says 'Groups'. Under 'Report Criteria', it says 'All Locations > All Devices'. At the bottom right, there's a blue box with the text 'Pro-Tip: Drag and Drop the reports with the fields you want included in your Report' and 'Select Devices'.

Create New Report Schedule Report

Report Title: PI32-Custom-Serial-No-Rep

Create reports in current and each sub Virtual Domains

[View sub Virtual Domains](#)

Selected Options

- Device / Wired Detailed Device Inventory

Device

- Top AP by client count
- Interface Utilization
- Device Health
- Busiest APs
- AP Utilization

Client

Security

Reporting Period: Last 1 Day

OR

Select Date: From Date [] To Date []

View Type: Summary View Detailed View

Customize : Device / Wired Detailed Device Inventory

Step 1 : Select Filters Step 2 : Edit Sub Reports

Report By: Groups

Report Criteria: All Locations > All Devices

Pro-Tip:
Drag and Drop the reports with the fields you want included in your Report
Select Devices

Customized Reports in PI 3.2

The screenshot shows the Cisco Prime Infrastructure interface for creating reports. On the left, under 'Create New Report', there's a 'Report Title' field containing 'PI32-Custom-Serial-No-Rep'. Below it is a checkbox for 'Create reports in current and each sub Virtual Domains'. A green arrow points from the 'Selected Options' section to the 'Step 1 : Select Filters' tab in the customization pane. The 'Selected Options' section lists 'Device' and 'Security' categories, with 'Device' expanded to show 'Top AP by client count', 'Interface Utilization', 'Device Health', 'Busiest APs', and 'AP Utilization'. The 'Attributes' section in the customization pane includes fields for Name, Description, IP Address/DNS, Location, Contact, and Sys Up Time. A blue callout box labeled 'Pro-Tip:' suggests selecting sub reports to include/exclude.

Prime Infrastructure

Reports / Reports / Custom Reports

Create New Report

Schedule Report

Report Title: PI32-Custom-Serial-No-Rep

Create reports in current and each sub Virtual Domains

[View sub Virtual Domains](#)

Device

- Top AP by client count
- Interface Utilization
- Device Health
- Busiest APs
- AP Utilization

Client

Security

Reporting Period: Last 1 Day

OR

Select Date: From Date [] To Date []

View Type: Summary View Detailed View

Customize : Device / Wired Detailed Device Inventory

Step 1 : Select Filters Step 2 : Edit Sub Reports

Select Sub Report: System Information

Attributes

Name	Description ***	IP Address/DNS ***
Location	Contact	Sys Up Time ***

Fixed Columns Optional Columns

Data Field Sorting

Sort By: None

Then By: None

Then By: None

Pro-Tip:
Select Sub Reports to include/exclude

Customized Reports in PI 3.2/3.3

The screenshot shows the 'Create New Report' section of the Cisco Prime Infrastructure interface. On the left, under 'Available Options', are categories: Device, Client, Security, and Performance. Under 'Selected Options', 'Device / Wired Detailed Device Inventory' is listed. A green arrow points from the 'Selected Options' list to the 'Customize' panel on the right. The 'Customize : Device / Wired Detailed D' panel includes 'Step 1 : Select Filters' (Select Sub Report: Module Information), 'Attributes' (IP Address/DNS, Name, Serial Number, Type, Part Number, Operational Sta), and 'Data Field Sorting' (Sort By: Serial Number, Asc, Desc; Then By: None, Asc, Desc). A second green arrow points from the 'Then By' dropdowns to the sorting buttons.

Pro-Tip:

Check Fields from Sub Reports to include

Drag and drop the order in which you want the fields to appear in the report

Select the Field to be sorted on (none will default to the first field).

Click on Apply

Customized Reports in PI 3.2/3.3

Module Information					
IP Address/DNS Name	Part Number	Serial Number	Name	Type	Op Status
172.16.50.249	WS-X4748-RJ45V+E	CAT1525L1GR	Linecard(slot 2)	Module	ok
172.16.50.249	WS-X45-SUP7L-E	CAT1628L1F6	Supervisor(slot 1)	Module	ok
172.16.50.248	800-27645-02	FDO140704UM	Switch 1 - Slot 2 - TwinGig Converter Module	Module	ok
172.16.50.254	null	FOC15030T8D	C2921 Mother board 3GE, integrated VPN and 4W on Slot 0	Module	null
172.16.50.254	PVDM3-32	FOC150421LM	PVDM3 DSP DIMM with 32 Channels on Slot 0 SubSlot 4	Module	ok

Pro-Tip:

PI 3.2/3.3 does not have the 5 device limit

New Custom reports are saved in Reports / Reports / Composite Report / Custom Reports

Select the Field to be sorted on.
Click on Apply

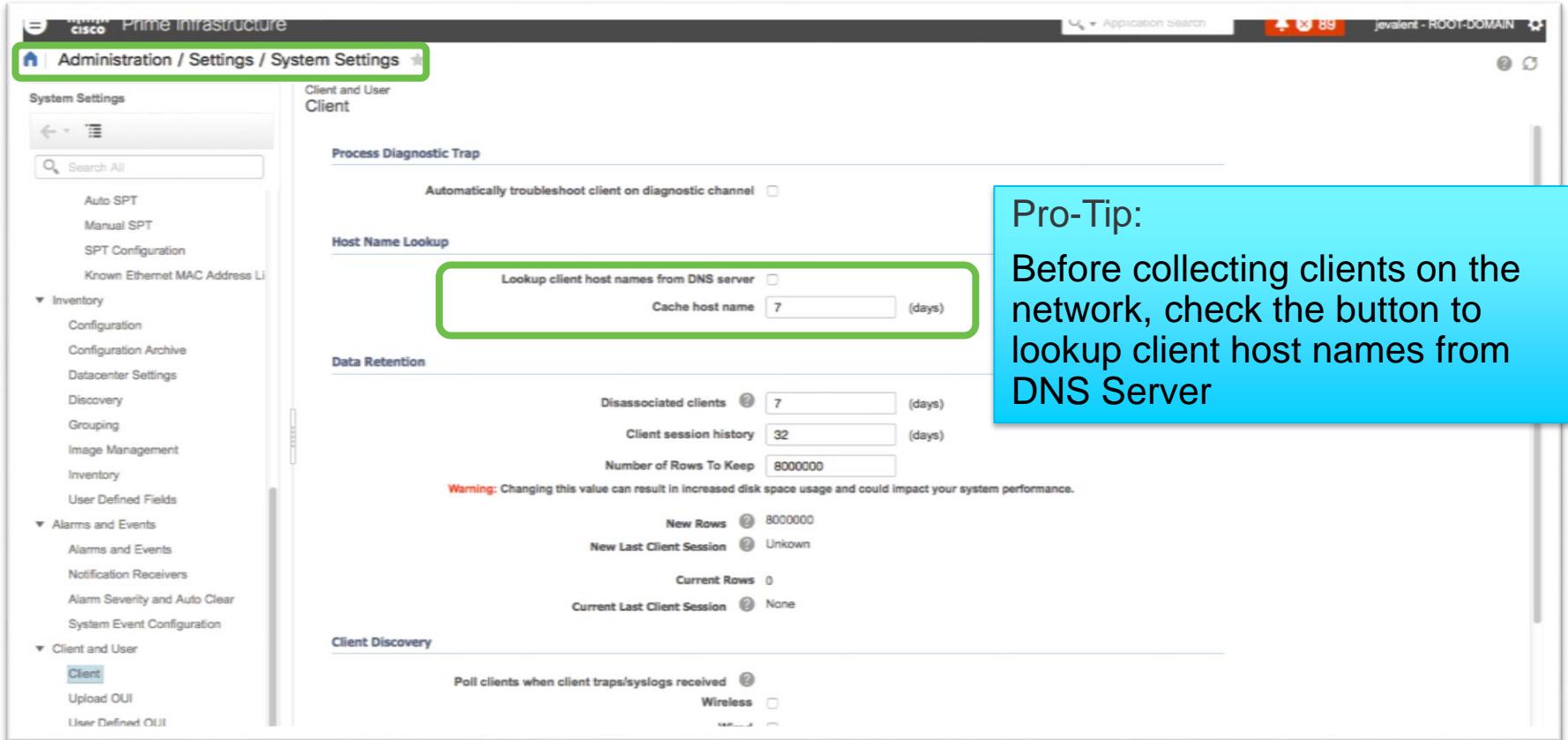
Customized Reports in PI 3.2/3.3-PDF export

Module Information

IP Address/DNS Name	Part Number	Serial Number	Name	Type	Operational Status
172.16.50.249	WS-X4748-RJ45V+E	CAT1525L1GR	Linecard(slot 2)	Module	ok
172.16.50.249	WS-X45-SUP7L-E	CAT1628L1F6	Supervisor(slot 1)	Module	ok
172.16.50.248	800-27645-02	FDO140704UM	Switch 1 - Slot 2 - TwinGig Converter Module	Module	ok
172.16.50.254		FOC15030T8D	C2921 Mother board 3GE, integrated VPN and 4W on Slot 0	Module	
172.16.50.254	PVDM3-32	FOC150421LM	PVDM3 DSP DIMM with 32 Channels on Slot 0 SubSlot 4	Module	ok
172.16.50.239	PVDM3-32	FOC150542QR	PVDM3 DSP DIMM with 32 Channels on Slot 0 SubSlot 4	Module	ok
172.16.50.239		FOC15063ZU9	C2921 Mother board 3GE, integrated VPN and 4W on Slot 0	Module	
172.16.50.252	C3850-NM-2-10G	FOC20087VRX	Switch 1 FRU Uplink Module 1	Module	
172.16.50.253	WS-C4948	FOX1233GCFW	Linecard(slot 1)	Module	ok

Tips for Client/Host Tracking

Setting Up For Client Tracking



The screenshot shows the Cisco Prime Infrastructure web interface. The left sidebar navigation includes: System Settings, Client and User Client, Auto SPT, Manual SPT, SPT Configuration, Known Ethernet MAC Address Li, Inventory (Configuration, Configuration Archive, Datacenter Settings, Discovery, Grouping, Image Management), User Defined Fields, Alarms and Events (Alarms and Events, Notification Receivers, Alarm Severity and Auto Clear, System Event Configuration), and Client and User (Client, Upload OUI, User Defined OUI). The main content area is titled 'Administration / Settings / System Settings'. It contains sections for 'Process Diagnostic Trap' (checkbox for 'Automatically troubleshoot client on diagnostic channel'), 'Host Name Lookup' (checkbox for 'Lookup client host names from DNS server' and input field 'Cache host name 7 (days)'), 'Data Retention' (checkboxes for 'Disassociated clients 7 (days)', 'Client session history 32 (days)', and 'Number of Rows To Keep 8000000', with a warning message: 'Warning: Changing this value can result in increased disk space usage and could impact your system performance.'), and 'Client Discovery' (checkbox for 'Poll clients when client traps/syslogs received' and 'Wireless' checkbox). The top right corner shows application search, notifications (89), and user 'jealent - ROOT-DOMAIN'.

Pro-Tip:

Before collecting clients on the network, check the button to lookup client host names from DNS Server

Viewing/Filtering The Clients

The client viewer can be found under *Monitor > Monitoring Tools > Clients and Users*.

The client list can be filtered using basic per-column values with the Quick Filter “Show” option...

MAC Address	IP Address	IP Type	User ...	Type	Vendor	Location	Device Name	Interface	VL	Protocol	Status	Association Time	Client Host Name
50:46:5d:89:f...	172.16.50.117	IPv4	AME...			Asustek							cisco.com
20:7d:74:2e:1...	172.16.5...		Dual-S...	Lewis...		Apple							cisco.com
44:a7:cf:5f:2f:7a	172.16.51.17	IPv4	Ther...			Murata							cisco.com
00:22:1b:00:b...	172.16.50.106	IPv4	Unkn...			Morega							cisco.com
00:50:56:b6:0...	172.16.50.53	IPv4	Unkn...			Vmware							cisco.com
00:50:56:b6:0...	172.16.50.30	IPv4	Unkn...			Vmware							cisco.com
d4:a0:2a:88:b...	10.10.10.2	IPv4	Unkn...			Cisco							cisco.com
bc:16:65:88:1...	10.27.49.177	IPv4	Unkn...			Cisco	Unknown	3750-switch.amer.c...	G1/0/9	7	802.3	Associated	26-Jan-2016,00:38:01 ...
00:1e:7f:28:9...	10.27.49.184	IPv4	Unkn...			Cisco	Unknown	3750-switch.amer.c...	G1/0/11	7	802.3	Associated	25-Jan-2016,12:37:38 ...
bc:16:65:88:1...	172.16.50.100	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...
00:50:56:b6:0...	172.16.50.51	IPv4	Unkn...									Associated	26-Jan-2016,12:38:24 ...
00:50:56:b6:0...	172.16.50.76	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...
00:1f:ca:05:0...	172.16.50.254	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...
00:07:7d:42:f...	172.16.51.64	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...
00:1a:4b:35:3...	172.16.50.28	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...
6c:41:9a:5b:5...	10.99.86.113	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...
40:70:9b:1c:...		Not De...	Unkn...									Associated	25-Jan-2016,12:37:38 ...
00:22:64:03:5...	172.16.50.27	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...
00:50:56:b6:0...	172.16.50.80	IPv4	Unkn...									Associated	25-Jan-2016,12:37:38 ...

BRKNMS-2702 © 2018 Cisco and/or its affiliates. All rights reserved. Cisco Public 118

Viewing Client Details

Clicking the hyperlink of the MAC address of the client opens the client details pane.

[Home](#) / Monitor / Monitoring Tools / Clients and Users / 14:10:9f:e6:2d:b9 ★

Test ▾ Disable | Remove | More ▾

Overview Location ISE Troubleshoot and Debug Clean Air Events RTTS More

Client Attributes Summary

Client connection status visualization



14:10:9f:e6:2d:b9 ————— SJC14-42B-AP4 ————— sjc14-wl-wlc1

Client Attributes

Ability to refresh the client info

Refresh from Device (Refreshed : 29-May-2015,09:08:00 PDT) Note: None ▾

General	Session	Security
User Name syhoe ⓘ	Controller Name sjc14-wl-wlc1	Security Policy Type WPA2
IP Address 171.70.246.234	Controller IP Address 171.71.128.75	EAP Type EAP-FAST
MAC Address 14:10:9f:e6:2d:b9	AP Name SJC14-42B-AP4	On Network Yes
Vendor Apple	AP IP Address 171.71.133.48	802.11 Authentication Open System
Endpoint Type Apple-Device ⓘ	AP Type Cisco AP	Encryption Cipher CCMP (AES)
Client Type Regular	AP Base Radio MAC 08:cc:68:cc:9a:10	SNMP NAC State Access
Media Type Lightweight	802.11 State Associated	Radius NAC State RUN
Show More ..		

Basic client information

Tracking Clients

The screenshot shows the Cisco Prime Infrastructure interface under the 'Monitor / Monitoring Tools / Clients and Users' section. A green box highlights the 'Track Clients' button in the top navigation bar. A modal window titled 'Track Clients' is open, containing settings for tracking specific MAC addresses. The main table lists network clients with columns for MAC Address, IP Address, IP Type, User Type, Vendor, Location, Device Name, Interface, VL, Protocol, Status, Association Time, and Client Host Name.

Track Clients

Get notified when specific MAC addresses are detected on the network. [?](#)

+ Add Import Edit Remove Show All

MAC Address	Expiration	Detected
		No data available

▼ Notification Settings

Purge Expired Entries: Never
Notification Frequency: On First Detection
Notification Method: Alarm
Email Address:
Save Cancel

MAC Address	IP Address	IP Type	User Type	Vendor	Location	Device Name	Interface	VL	Protocol	Status	Association Time	Client Host Name
50:46:5d:89:f...	172.16.50.117	IPv4	AME... ?	Asustek	Unknown	3750-switch.amer...	Gi1/0/23	2	802.3	Associated	25-Jan-2016,12:37:38 ...	main-win7.amer.cisco.com
20:7d:74:2e:1...	172.16.5... ?	Dual-S...	Lewis... ?	Apple	Colorado Spring...	Hickman-vWLC						
44:a7:c5:f2:7a	172.16.51.17	IPv4	Ther... ?	Murata	Root Area	WLC-Granby						
00:22:1b:00:b...	172.16.50.106	IPv4	Unkn... ?	Morega	Unknown	4948-Switch.amer...						
00:50:56:b6:0...	172.16.50.53	IPv4	Unkn... ?	Vmware	Unknown	4948-Switch.amer...						
00:50:56:b6:0...	172.16.50.30	IPv4	Unkn... ?	Vmware	Unknown	4948-Switch.amer...						
d4:a0:2a:88:b...	10.10.10.2	IPv4	Unkn... ?	Cisco	Unknown	3750-switch.amer.c...						
bc:16:65:88:1...	10.27.49.177	IPv4	Unkn... ?	Cisco	Unknown	3750-switch.amer.c...						
00:1e:f7:28:9...	10.27.49.184	IPv4	Unkn... ?	Cisco	Unknown	3750-switch.amer.c...						
40:70:09:b1:c...		Not De...	Unkn... ?	ARRIS	Unknown	3750E-switch.amer...						
00:22:64:03:5...	172.16.50.27	IPv4	Unkn... ?	Hewlett...	Unknown	4948-Switch.amer...						
00:50:56:b6:0...	172.16.50.80	IPv4	Unkn... ?	Vmware	Unknown	4948-Switch.amer...						
00:15:99:ecc...	172.16.50.4	IPv4	Unkn... ?	Samsung	Unknown	3750-switch.amer.c...						
6c:ff:10:0a:7	172.16.50.20	IPv4	Unkn... ?	Gigabit	Unknown	3750-switch.amer.c...	Gi1/0/22	2	802.3	Associated	25-Jan-2016,12:37:38 ...	hickman-fe.amer.cisco.com

Pro-Tip: The appearance of clients can trigger emails or PI alarms. Combine this with trap processing, to know immediately when a *specific* host joins the network.

Software Image Mgmt (SWIM)

Effective Software Image Management (SWIM)



Settings
Image Management Settings | [Edit](#)

Current Protocol Order | [Edit](#)
SCP ➤ SFTP ➤ FTP ➤ TFTP

Useful Links

- [Software Image Repository](#) | [Link](#)
- [Upgrade Analysis](#) | [Link](#)
- [Sync Device Inventory](#) | [Link](#)
- [Archive Device Configuration](#) | [Link](#)

- Ability to add images to software repository
 - Archive from current devices
 - Manual upload
- Ability to handle parallelism and sequencing

- Enhance Image meta-data with DRAM/Flash requirements for pre-qual checks
- Ability to push image using different transport protocols

Pro-Tip Backup all Currently deployed Images



Next Task: Backup all currently deployed images

Go to Inventory > Device Management > Software Images

Click 'Import'

Source: Device

Collection Options: All Devices

Schedule:

Pro-Tip Backup all Currently deployed Images



Next Task: Backup all currently deployed images

Go to Inventory > Device Management > Software Images

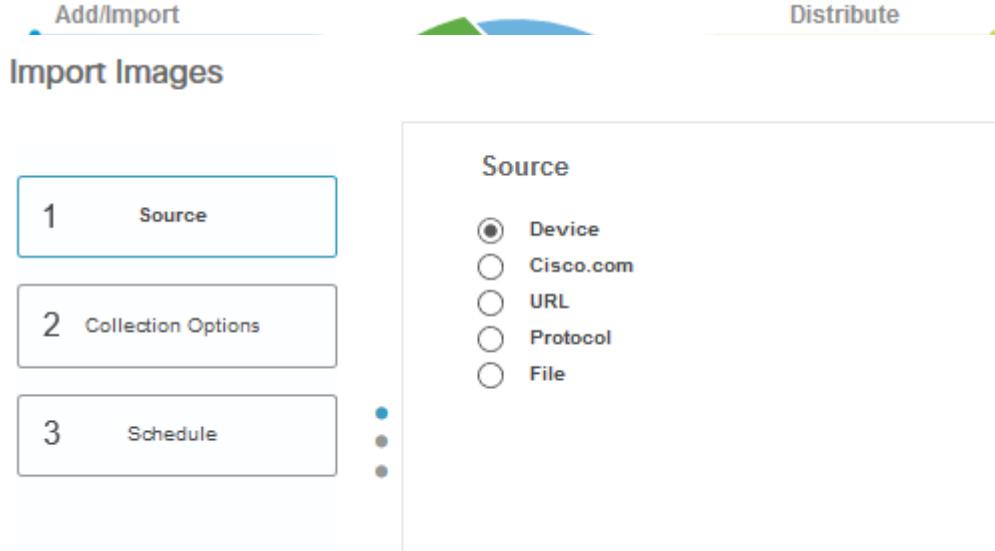
Click 'Import'

Source: Device

Collection Options: All Devices

Schedule:

Pro-Tip Backup all Currently deployed Images



Next Task: Backup all currently deployed images

Go to Inventory > Device Management > Software Images

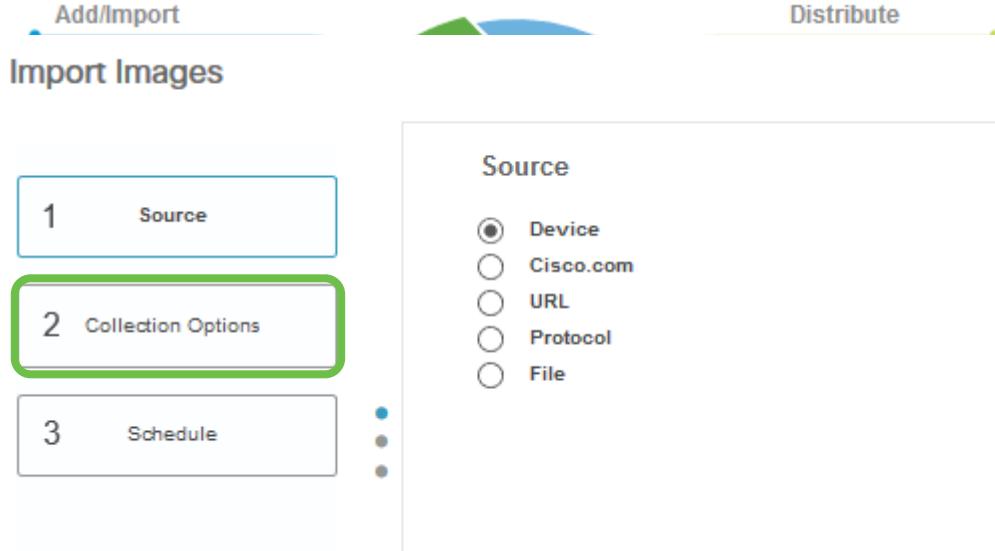
Click 'Import'

Source: Device

Collection Options: All Devices

Schedule:

Pro-Tip Backup all Currently deployed Images



Next Task: Backup all currently deployed images

Go to Inventory > Device Management > Software Images

Click 'Import'

Source: Device

Collection Options: All Devices

Schedule:

Pro-Tip Backup all Currently deployed Images

The screenshot shows the 'Device Selection' dialog box from a Cisco Network Management System (NMS) interface. The dialog is titled 'Distribute' and has a 'Device Selection' header. On the left, there's a sidebar with three numbered steps: 1. Source, 2. Collection Options (which is currently selected), and 3. Schedule. The main area of the dialog is titled 'Device Selection' and contains a table with columns for Name, Description, IP Address/DNS, Type, and Vendor. A checkbox labeled 'All Devices' is checked and highlighted in blue, with the sub-option 'All Members' listed next to it. Below this, there are other options: 'Device Type', 'Location', and 'User Defined'. At the bottom right of the dialog are 'Submit' and 'Cancel' buttons.

Next Task: Backup all currently deployed images
Go to Inventory > Device Management > Software Images
Click 'Import'
Source: Device
Collection Options: All Devices
Schedule:

Pro-Tip Backup all Currently deployed Images

The screenshot shows the 'Import Images' process in the Cisco NMS software. The left sidebar has tabs: 'Add/Import' (selected), 'Import Images', '1 Source', '2 Collection Options', and '3 Schedule'. The main area is titled 'Distribute' with a 'Schedule' sub-section. The 'Job Name' is set to 'Job_Device_Image_Collection_7_58_25_683_PM_6_26_2016'. The 'Start Time' is set to 'Now'. The 'Recurrence' is set to 'Weekly', with 'Every 1 week(s)' and 'Sunday' checked. The 'End Time' is set to 'No End Date/Time'. At the bottom are 'Submit' and 'Cancel' buttons.

Next Task: Backup all currently deployed images

Go to Inventory > Device Management > Software Images

Click 'Import'

Source: Device

Collection Options: All Devices

Schedule:

Pro-Tip Backup all Currently deployed Images

The screenshot shows the 'Import Images' process in the Cisco NMS interface. The steps are numbered 1, 2, and 3. Step 1 is 'Source', Step 2 is 'Collection Options', and Step 3 is 'Schedule'. The 'Schedule' step is currently active, indicated by a blue border around its tab. The 'Job Name' is set to 'Job_Device_Image_Collection_7_58_25_683_PM_6_26_2016'. The 'Start Time' is set to 'Now'. The 'Recurrence' is set to 'Weekly', with 'Every 1 week(s)' selected. Under 'Settings', 'Sunday' is checked, while 'Wednesday', 'Saturday', 'Monday', 'Thursday', 'Tuesday', and 'Friday' are unchecked. The 'End Time' section shows 'No End Date/Time' selected. At the bottom right of the 'Schedule' panel are 'Submit' and 'Cancel' buttons.

Next Task: Backup all currently deployed images

Go to Inventory > Device Management > Software Images

Click 'Import'

Source: Device

Collection Options: All Devices

Schedule:

Pro-Tip Backup all Currently deployed Images

The screenshot shows the 'Import Images' process in the Cisco NMS interface. The steps are numbered 1, 2, and 3. Step 1 is 'Source', Step 2 is 'Collection Options', and Step 3 is 'Schedule'. The 'Schedule' step is currently active, indicated by a blue border around its tab. The 'Distribute' button is visible at the top right. The 'Job Name' is set to 'Job_Device_Image_Collection_7_58_25_683_PM_6_26_2016'. The 'Start Time' is set to 'Now'. The 'Recurrence' is set to 'Weekly', with 'Every 1 week(s)' selected. Under 'Settings', 'Sunday' is checked, while 'Wednesday', 'Saturday', 'Monday', 'Thursday', 'Tuesday', and 'Friday' are unchecked. The 'End Time' section shows 'No End Date/Time' selected. A tooltip for 'End at' indicates a date and time of '06/26/2016 07:58 PM'. At the bottom right of the 'Schedule' step, there are 'Submit' and 'Cancel' buttons.

Next Task: Backup all currently deployed images

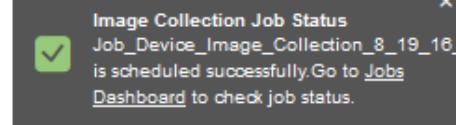
Go to Inventory > Device Management > Software Images

Click 'Import'

Source: Device

Collection Options: All Devices

Schedule:



Pro-Tip: Import Image into PI Software Repository

Import Images

- 1 Source
- 2 Device Selection
- 3 Image Selection
- 4 Schedule

Source

Device

Cisco.com (Prime server requires internet connection)

URL

Protocol

File

Log in to Cisco.com

Username*

Password*

Remember Password

Please accept the below agreements ? and login to continue

I accept End User License Agreement View

I accept Strong Encryption Eligibility Agreement View

Prior to PI 3.1.5 Cisco.com Import was disabled. It is now fixed!!

Next Task: Add Image(s) to Software Repository from File source

Go to
Inventory> Software Images,
Click 'Import'

Select 'Cisco.com' Source, enter CCO credentials, accept License agreements and Click Login

Submit

Cancel

PI Software Repository Image Import from cisco.com

Cisco 2900 Series Integrated Services Routers G2						
Device Type	SYSOIDS	S/W Version	Software	Cisco.com Image Support(Y/N)	Image Import from Device (FTP, TFTP, SFTP, SCP)	Image Distribution Server (FTP, TFT
Cisco 2951 Integrated Services Router G2	OID:1.3.6.1.4.1.9.1.1043	>=15.0(1)M, >=15.2(4)M2	IOS	Y	TFTP, SCP	FTP, TFT, SCP
Cisco 2911 Integrated Services Router G2	OID:1.3.6.1.4.1.9.1.1045	>=15.0(1)M, >=15.2(4)M2	IOS	Y	TFTP, SCP	FTP, TFT, SCP
Cisco 2921 Integrated Services Router G2	OID:1.3.6.1.4.1.9.1.1044	>=15.0(1)M, >=15.2(4)M2	IOS	Y	TFTP, SCP	FTP, TFT, SCP
Cisco 2901 Integrated Services Router G2	OID:1.3.6.1.4.1.9.1.1046	>=15.0(1)M, >=15.2(4)M2	IOS	N	TFTP, SCP	FTP, TFT, SCP
Cisco 2911-T Integrated Services Router	OID:1.3.6.1.4.1.9.1.2138	>=15.0(1)M, >=15.2(4)M2	IOS	N	TFTP, SCP	FTP, TFT, SCP

Check Device Support Matrix on CCO for supported Devices

Image Import (cont)

Prime Infrastructure

Application Search 28 root - ROOT-DOMAIN

Inventory / Device Management / Software Images

Software Images ALL Selected 0 / Total 11

<input type="checkbox"/>	File Name	Image Family	Image Type	Version	Size	Updated On
<input type="checkbox"/>	c2800nm-advpervicesk9-mz.124-24.T8.bin	C2800NM	SYSTEM_SW	12.4(24)T8	55.10 MB (57777596 bytes)	January 14, 2016 4:07:12 PM EST
<input type="checkbox"/>	c2800nm-spsservicesk9-mz.151-4.M7.bin	C2800NM	SYSTEM_SW	15.1(4)M7	56.42 MB (59161128 bytes)	January 14, 2016 3:40:37 PM EST
<input type="checkbox"/>	c2900-universalk9-mz.SPA.150-1.M1.bin	C2900	SYSTEM_SW	15.0(1)M1	59.66 MB (62558836 bytes)	January 15, 2016 3:15:57 PM EST
<input type="checkbox"/>	c2900-universalk9-mz.SPA.154-3.M4.bin	C2900	SYSTEM_SW	15.4(3)M4	99.42 MB (104247932 bytes)	January 15, 2016 3:27:07 PM EST
<input type="checkbox"/>	c2960-lanbasek9-mz.122-58.SE2.bin	C2960	SYSTEM_SW	12.2(58)SE2	11.12 MB (11660773 bytes)	January 15, 2016 11:49:49 AM EST
<input type="checkbox"/>	c3560-ipbasek9-mz.122-58.SE2.bin	C3560	SYSTEM_SW	12.2(58)SE2	14.37 MB (15072310 bytes)	January 14, 2016 3:48:54 PM EST
<input type="checkbox"/>	c3560c405ex-universalk9-mz.152-2.E.bin	C3560C405EX	SYSTEM_SW	15.2(2)E	20.15 MB (21125120 bytes)	January 14, 2016 3:36:38 PM EST
<input type="checkbox"/>	c3750-ipservicesk9-mz.122-58.SE2.bin	C3750	SYSTEM_SW	12.2(58)SE2	15.71 MB (16470273 bytes)	January 14, 2016 3:36:06 PM EST
<input type="checkbox"/>	c3750e-universalk9-mz.122-58.SE2.bin	C3750E	SYSTEM_SW	12.2(58)SE2	17.04 MB (17868957 bytes)	January 14, 2016 3:36:29 PM EST
<input type="checkbox"/>	cat4500-entservicesk9-mz.150-2.SG8.bin	CAT4500	SYSTEM_SW	15.0(2)SG8	18.57 MB (19473188 bytes)	January 14, 2016 3:37:36 PM EST
<input type="checkbox"/>	cat4500e-universalk9.SPA.03.06.03.E.152-2.E3....	CAT4500E	SYSTEM_SW	15.2.2	170.0 MB (178257396 bytes)	January 15, 2016 2:12:16 PM EST

Image Import (cont)

Prime Infrastructure

Application Search 28 root - ROOT-DOMAIN

Inventory / Device Management / Software Images

Software Images ALL Selected 0 / Total 11

Delete Distribute Import Upgrade Analysis Commit Show Quick Filter

<input type="checkbox"/>	File Name	Image Family	Image Type	Version	Size	Updated On
<input type="checkbox"/>	c2800nm-advpervicesk9-mz.124-24.T8.bin	C2800NM	SYSTEM_SW	12.4(24)T8	55.10 MB (57777596 bytes)	January 14, 2016 4:07:12 PM EST
<input type="checkbox"/>	c2800nm-spsservicesk9-mz.151-4.M7.bin	C2800NM	SYSTEM_SW	15.1(4)M7	56.42 MB (59161128 bytes)	January 14, 2016 3:40:37 PM EST
<input type="checkbox"/>	c2900-universalk9-mz.SPA.150-1.M1.bin	C2900	SYSTEM_SW	15.0(1)M1	59.66 MB (62558836 bytes)	January 15, 2016 3:15:57 PM EST
<input type="checkbox"/>	c2900-universalk9-mz.SPA.154-3.M4.bin	C2900	SYSTEM_SW	15.4(3)M4	99.42 MB (104247932 bytes)	January 15, 2016 3:27:07 PM EST
<input type="checkbox"/>	c2960-lanbasek9-mz.122-58.SE2.bin	C2960	SYSTEM_SW	12.2(58)SE2	11.12 MB (11660773 bytes)	January 15, 2016 11:49:49 AM EST
<input type="checkbox"/>	c3560-ipbasek9-mz.122-58.SE2.bin	C3560	SYSTEM_SW	12.2(58)SE2	14.37 MB (15072310 bytes)	January 14, 2016 3:48:54 PM EST
<input type="checkbox"/>	c3560c405ex-universalk9-mz.152-2.E.bin	C3560C405EX	SYSTEM_SW	15.2(2)E	20.15 MB (21125120 bytes)	January 14, 2016 3:36:38 PM EST
<input type="checkbox"/>		SYSTEM_SW	12.2(58)SE2	15.71 MB (16470273 bytes)	January 14, 2016 3:36:06 PM EST	
<input type="checkbox"/>		SYSTEM_SW	12.2(58)SE2	17.04 MB (17868957 bytes)	January 14, 2016 3:36:29 PM EST	
<input type="checkbox"/>		SYSTEM_SW	15.0(2)SG8	18.57 MB (19473188 bytes)	January 14, 2016 3:37:36 PM EST	
<input type="checkbox"/>		SYSTEM_SW	15.2.2	170.0 MB (178257396 bytes)	January 15, 2016 2:12:16 PM EST	

PI does not automatically pick up the image meta-data used for pre-qual checks

Image Import (cont)

Prime Infrastructure

Application Search 28 root - ROOT-DOMAIN

Inventory / Device Management / Software Images

Software Images ALL Selected 0 / Total 11

Delete Distribute Import Upgrade Analysis Commit Show Quick Filter

<input type="checkbox"/>	File Name	Image Family	Image Type	Version	Size	Updated On
<input type="checkbox"/>	c2800nm-advpervicesk9-mz.124-24.T8.bin	C2800NM	SYSTEM_SW	12.4(24)T8	55.10 MB (57777596 bytes)	January 14, 2016 4:07:12 PM EST
<input type="checkbox"/>	c2800nm-pservicesk9-mz.151-4.M7.bin	C2800NM	SYSTEM_SW	15.1(4)M7	56.42 MB (59161128 bytes)	January 14, 2016 3:40:37 PM EST
<input type="checkbox"/>	c2900-universalk9-mz.SPA.150-1.M1.bin	C2900	SYSTEM_SW	15.0(1)M1	59.66 MB (62558836 bytes)	January 15, 2016 3:15:57 PM EST
<input type="checkbox"/>	c2900-universalk9-mz.SPA.154-3.M4.bin	C2900	SYSTEM_SW	15.4(3)M4	99.42 MB (104247932 bytes)	January 15, 2016 3:27:07 PM EST
<input type="checkbox"/>	c2960-lanbasek9-mz.122-58.SE2.bin	C2960	SYSTEM_SW	12.2(58)SE2	11.12 MB (11660773 bytes)	January 15, 2016 11:49:49 AM EST
<input type="checkbox"/>	c3560-ipbasek9-mz.122-58.SE2.bin	C3560	SYSTEM_SW	12.2(58)SE2	14.37 MB (15072310 bytes)	January 14, 2016 3:48:54 PM EST
<input type="checkbox"/>	c3560c405ex-universalk9-mz.152-2.E.bin	C3560C405EX	SYSTEM_SW	15.2(2)E	20.15 MB (21125120 bytes)	January 14, 2016 3:36:38 PM EST
		SYSTEM_SW	12.2(58)SE2	15.71 MB (16470273 bytes)	January 14, 2016 3:36:06 PM EST	
		SYSTEM_SW	12.2(58)SE2	17.04 MB (17868957 bytes)	January 14, 2016 3:36:29 PM EST	
		SYSTEM_SW	15.0(2)SG8	18.57 MB (19473188 bytes)	January 14, 2016 3:37:36 PM EST	
		SYSTEM_SW	15.2.2	170.0 MB (178257396 bytes)	January 15, 2016 2:12:16 PM EST	

PI does not automatically pick up the image meta-data used for pre-qual checks

Image Import (cont)

The screenshot shows two views of the Cisco Prime Infrastructure Software Images interface.

Left View (Search Results):

- Header: Prime Infrastructure
- Breadcrumbs: Inventory / Device Management / Software Images
- Search Bar: Search All
- Filter: All
- Table:
 - Column Headers: Delete, Distribute, Import, Upgrade Analysis
 - Rows:
 - c2800nm-advpervicesk9-mz.124-24.T8.bin (C2800NM)
 - c2800nm-spsservicesk9-mz.151-4.M7.bin (C2800NM)
 - c2900-universalk9-mz.SPA.150-1.M1.bin (C2900)
 - c2900-universalk9-mz.SPA.154-3.M4.bin (C2900)** (highlighted with a green border)
 - c2960-lanbasek9-mz.122-58.SE2.bin (C2960)
 - c3560-ipbasek9-mz.122-58.SE2.bin (C3560)
 - c3560c405ex-universalk9-mz.152-2.E.bin (C3560C405I)

PI does not automatically pick up the image meta-data used for pre-qual checks

Right View (Detailed View):

- Header: Prime Infrastructure
- Breadcrumbs: Inventory / Device Management / Software Images
- Section: All
- Section: Image Information
- Section: Image Details
- Image Details Fields:
 - File Name: c2900-universalk9-mz.SPA.154-3.M4.bin
 - Image Name: C2900-UNIVERSALK9-M
 - Image Family: C2900
 - Image Version: 15.4(3)M4
 - File Size: 99.42 MB (104247932 bytes)
 - CheckSum: 9f652984b1dbb1146af25dcdf5f6f5020
 - Features: IP|SLA|IPv6|IS-IS|FIREWALL|PLUS|QoS|HA|NAT|MPLS|VPN|LEGACY PROTOCOLS|3DES|SSH|APPN|IPSEC
 - Minimum RAM (MB): [Input Field]
 - Minimum FLASH (MB): [Input Field]
 - Minimum Boot ROM Version: [Input Field]
- Buttons: Save, Reset
- Section: Device Details
- Text: Selected image is not running on any managed device.

Import Image (cont)



Download Software

 Download Cart (0 items) [\(-\) Feedback](#) [Help](#)

[Downloads Home](#) > [Products](#) > [Routers](#) > [Branch Routers](#) > [2900 Series Integrated Services Routers](#) > [2921 Integrated Services Router](#) > [Software on Chassis](#) > [IOS Software-15.4.3M4\(ED\)](#)

2921 Integrated Services Router

Release 15.4.3M4 ED		Release Notes for 15.4(3)M4	 Add Device  Add Notification
File Information	Release Date	DRAM/Flash	
UNIVERSAL c2900-universalk9-mz.SPA.154-3.M4.bin	30-SEP-2015	512 / 256	 Download  Add to cart  Publish
UNIVERSAL - NO PAYLOAD ENCRYPTION c2900-universalk9_npe-mz.SPA.154-3.M4.bin	30-SEP-2015	512 / 256	 Download  Add to cart  Publish

Import Image (cont)



The screenshot shows the Cisco Download Software page. At the top, there's a navigation bar with links for Products & Services, Support, How to Buy, Training & Events, and Partners. The user is logged in as Lewis Hickman. Below the navigation, a breadcrumb trail shows the path: Downloads Home > Products > Routers > Branch Routers > 2900 Series Integrated Services Routers > 2921 Integrated Service IOS Software-15.4.3M4(ED). The main content area is titled "2921 Integrated Services Router" and displays two software release entries:

File Information	Release Date	DRAM/Flash	Action
UNIVERSAL c2900-universalk9-mz.SPA.154-3.M4.bin	30-SEP-2015	512 / 256	Download Add to cart Publish
UNIVERSAL - NO PAYLOAD ENCRYPTION c2900-universalk9_npe-mz.SPA.154-3.M4.bin	30-SEP-2015	512 / 256	Download Add to cart Publish

Hit the Download Center to find your image and its RAM/Flash requirements

Pro-Tip – Use entries 10% smaller because exact number may not match – math rounding

Import Image (cont)

The screenshot shows the Cisco Download Software interface. At the top, there's a navigation bar with links for Worldwide [change], Welcome, Lewis Hickman, Products & Services, Support, How to Buy, Training & Events, and Partners. Below the navigation bar, the main content area is titled "Download Software". A breadcrumb trail shows Downloads Home > Products > Routers > Branch Routers > 2900 Series Integrated IOS Software-15.4.3M4(ED). The main content area displays "2921 Integrated Services Router" and "Release 15.4.3M4 ED". Under "File Information", it lists "UNIVERSAL" and "c2900-universalk9-mz.SPA.154-3.M4.bin". Below that, under "UNIVERSAL - NO PAYLOAD ENCRYPTION", it lists "c2900-universalk9_npe-mz.SPA.154-3.M4.bin". On the left sidebar, there are sections for Suggested releases (15.3.3M6(MD), 15.4.3M4(ED)), Latest releases, All Releases, and Deferred Releases.

Hit the Download Center to find your image and its RAM/Flash requirements

Pro-Tip – Use entries 10% smaller because exact number may not match – math rounding

The screenshot shows the Cisco Prime Infrastructure Device Management interface. The title bar says "Prime Infrastructure" and "Inventory / Device Management / All Image Information". Under "Image Details", it shows the following information for the C2900-UNIVERSALK9-M image:

File Name	c2900-universalk9-mz.SPA.154-3.M4.bin
Image Name	C2900-UNIVERSALK9-M
Image Family	C2900
Image Version	15.4(3)M4
File Size	99.42 MB (104247932 bytes)
CheckSum	9f652984b1dbb1146af25dcd5f6f5020
Features	IP SLA IPv6 IS-IS FIREWALL PLUS QoS HA NAT MPLS VPN LEGACY PROTOCOLS 3DES SSH APPN IPSEC
Minimum RAM (MB)	460
Minimum FLASH (MB)	230
Minimum Boot ROM Version	[Empty]

At the bottom, there are "Save" and "Reset" buttons.

Distribute Image from Repository using External Server

Prime Infrastructure

Inventory / Device Management / Software Images

Software Image Summary

Image	Count
C3580C405EX	1
CAT4500	2
C2960	1
C3500	1
C2800NM	2
C3750	1
C2900	4

Add/Import

Add software images to the repository from various sources, such as devices, Cisco URLs, protocols, or files.

Distribute

Perform Distribution and activation of software image to devices.

Commit

Activate

Perform activation of software image already available in device.

Add Server to Software Image Management Servers

- From the SWIM dashboard select Add Server
- Enter Server information (IP address, Description)
- Select Site Location(s) serviced by this server

Settings
Image Management Settings | Edit

Current Protocol Order | Edit
SCP ➔ SFTP ➔ FTP ➔ TFTP

Useful Links
Software Image Repository | Link
Upgrade Analysis | Link
Sync Device Inventory | Link
Archive Device Configuration | Link

BRKNMS-2702 © 2018 Cisco and/or its affiliates. All rights reserved. Cisco Public 144

Distribute Image from Repository using External Server

Prime Infrastructure

Inventory / Device Management / Software Images

Software Image Summary

Image	Count
C3580C405EX	1
CAT4500	2
C2960	1
C3500	1
C2800NM	2
C3750	1
C2900	4

Add/Import: Add software images to the repository from various sources, such as devices, Cisco URLs, protocols, or files.

Distribute: Perform Distribution and activation of software image to devices.

Commit: Commit changes made to the repository.

Activate: Perform activation of software image already available in device.

Add Server

Add Server to Software Image Management Servers

- From the SWIM dashboard select Add Server
- Enter Server information (IP address, Description)
- Select Site Location(s) serviced by this server

Settings: Image Management Settings | Edit

Current Protocol Order: SCP > SFTP > FTP > TFTP

Useful Links:

- Software Image Repository | Link
- Upgrade Analysis | Link
- Sync Device Inventory | Link
- Archive Device Configuration | Link

BRKNMS-2702 © 2018 Cisco and/or its affiliates. All rights reserved. Cisco Public 145

Distribute Image from Repository using External Server

Prime Infrastructure

Inventory / Device Management / Software Images / Software Image Management Servers

Software Image Management Server(s)

	<input type="checkbox"/>	Server Name	IP Address	Active Protocols	Sites Served	Description
1	<input type="checkbox"/>	hickman-fs	172.16.50.20	FTP,SCP,SFTP	All Locations	Lab FTP server

C2900 4

Add Server to Software Image Management Servers

1. From the SWIM dashboard select Add Server
2. Enter Server information (IP address, Description)
3. Select Site Location(s) serviced by this server

software image already available in device.

Sync Device Inventory | [Link](#)
Archive Device Configuration | [Link](#)

Distribute Image from Repository using External Server

The screenshot shows the Cisco Prime Infrastructure Software Image Management Servers dashboard. At the top, there's a navigation bar with icons for Home, Inventory, Device Management, Software Images, and Software Image Management Servers. Below the navigation is a title 'Software Image Management Server(s)'. A toolbar contains icons for Edit, Delete, Add (+), and Manage Protocols. The main table lists one server: 'hickman-fs' with IP '172.16.50.20', active protocols 'FTP,SCP,SFTP', sites served 'All Locations', and description 'Lab FTP server'. A green callout box highlights the 'Add +' button in the toolbar. Inside the callout box, the text reads: 'Add Server to Software Image Management Servers' followed by a three-step list: 1. From the SWIM dashboard select Add Server; 2. Enter Server information (IP address, Description); 3. Select Site Location(s) serviced by this server. To the right of the table, a note says 'software image already available in device.' and links for Sync Device Inventory and Archive Device Configuration.

	<input type="checkbox"/> Server Name	IP Address	Active Protocols	Sites Served	Description
1	<input type="checkbox"/> hickman-fs	172.16.50.20	FTP,SCP,SFTP	All Locations	Lab FTP server

Add Server to Software Image Management Servers

1. From the SWIM dashboard select Add Server
2. Enter Server information (IP address, Description)
3. Select Site Location(s) serviced by this server

software image already available in device.

[Sync Device Inventory](#) | [Link](#)
[Archive Device Configuration](#) | [Link](#)

Distribute Image from Repository using External Server

Prime Infrastructure Application Search

Inventory / Device Management / Software Images / Software Image Management Servers

Software Image Management Server(s)

	<input type="checkbox"/> Server Name	IP Address	Active Protocols	Sites Served	Description
1	<input type="checkbox"/> hickman-fs	172.16.50.20	FTP,SCP,SFTP	All Locations	Lab FTP server
2	<input checked="" type="checkbox"/> hickman-fs2	172.16.50.81			

Save | Cancel

Add Server to Software Image Management Servers

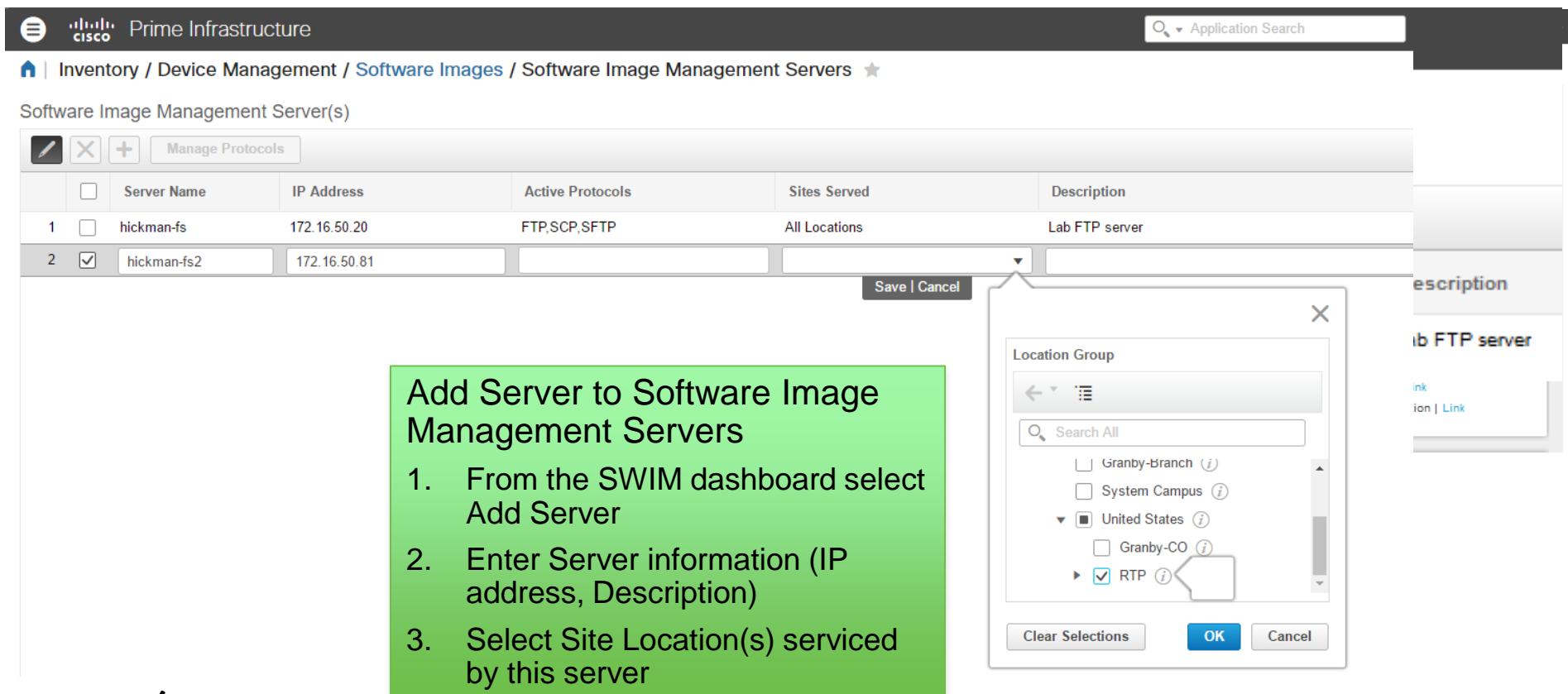
1. From the SWIM dashboard select Add Server
2. Enter Server information (IP address, Description)
3. Select Site Location(s) serviced by this server

Location Group

Search All

- Granby-Branch
- System Campus
- United States
 - Granby-CO
 - RTP

Clear Selections OK Cancel



Distribute Image from Repository using External Server

The screenshot shows the Cisco Prime Infrastructure interface. In the top navigation bar, the path is: Inventory / Device Management / Software Images / Software Image Management Servers. A green box highlights the "Manage Protocols" button in the toolbar above the table. A callout arrow points from this button to the "Manage Protocols" section below. The table lists two servers:

	<input type="checkbox"/> Server Name	IP Address	Active Protocols	Sites Served	Description
1	<input type="checkbox"/> hickman-fs	172.16.50.20	FTP,SCP,SFTP	All Locations	Lab FTP server
2	<input checked="" type="checkbox"/> hickman-fs2	172.16.50.81	RTP	X	

Below the table, a modal window titled "Software Image Management Server Protocols for 'hickman-fs'" shows the configuration for the selected server. It includes a "Verify Credentials" button and a table with three rows:

<input type="checkbox"/>	Protocol	Username	Password	Protocol Home Directory	Status
<input type="checkbox"/>	FTP	lewis	/Cisco	Success <small>(i)</small>
<input type="checkbox"/>	SCP	lewis	/Cisco	Yet to verify <small>(i)</small>
<input checked="" type="checkbox"/>	SFTP	lewis	/Cisco	<small>(i)</small>

Once Server is defined
Click on Manage Protocols to
configure protocol information for
the server

Distribute Image (cont)

Prime Infrastructure

Inventory / Device Management / Software Images

Next Task: Distribute/deploy an Image
From the SWIM dashboard click Distribute icon

► CAT4500	2
► C2980	1
► C3560	1
► C2800NM	2
► C3750	1
► C2900	4

The diagram illustrates the SWIM dashboard interface. On the left, a green box contains the text "Next Task: Distribute/deploy an Image" and "From the SWIM dashboard click Distribute icon". Below this is a table showing device counts. To the right is a central panel with a circular "Add Server" button in the center, surrounded by four segments: "Add/Import" (green), "Distribute" (blue), "Commit" (purple), and "Activate" (teal). A callout points to the "Distribute" icon, which is highlighted with a green box.

Add/Import
Add software images to the repository from various sources, such as devices, Cisco, URLs, protocols, or files.

Distribute
Perform Distribution and activation of software image to devices.

Commit
Applicable only for IOS-XR Image type

Activate
Perform activation of software image already available in device.

Distribute Image (cont)

Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Distribute Image and Location Selection

Device Name	IP Address	Distribute Image Name	Distr...	E
3850-switch.amer...	172.16.50.252	cat3k_caa-universalk9.SPA.03.07.04.E...	flash	hickman-fs(172.... <input checked="" type="checkbox"/>

Success

Submit Cancel

Next

3 Distribute image:

The system advises if there are DRAM/Flash/Protocol issues to handle

It also allows you to select a different file destination or SWIM server using the Pencil Icon

Upgrading Devices

Distribute Images

- 1 Image Selection
- 2 Device Selection
- 3 Distribute Image
- 4 Image Deployment
- 5 Sc Dis Warning:Flash Free space Is Not Enough to Distribute Selected Image Need to Erase Flash

Distribute Image and Location Selection

Device Name	IP Address	Distribute Image Name	Distr...	Extern...	S...	Verification Stat...
2921-Router.ame...	172.16.50.254	c2900-universalk9-mz.SPA.156-1.T0a.bin	flash0:1	Local Fil...		Warning:Flash Fr...

The system advises if there are DRAM/Flash issues to handle

Warning:Flash Free space Is Flash

SYNC DEVICE INVENTORY | LINK

Submit Cancel

Implementing High Availability

Key Points for Enabling HA on PI 3.x

- Primary and Secondary need to be at the same MR and DP level
- Email server needs to be configured on PI before enabling HA
- Latency <= 220 milliseconds
- Minimum of 86 Mbps net throughput
- TCP/UDP ports
 - 8082 Used by Health Monitor
 - 1522 Used by Oracle to synch data
- PI Administrator Guide (High Availability)
http://www.cisco.com/c/en/us/td/docs/net_mgmt/prime/infrastructure/3-1/administrator/guide/PIAdminBook/config_HA.htm

Enabling HA

```
*****
* High Availability (HA) Role Selection *
*****
HA refers to a system that is continuously operating during failure.
To configure HA, go to the primary server's user interface.
Choose Administration > High Availability > HA Configuration.
For more information, click the context-sensitive online help.

Will this server be used as a Secondary for HA? (yes/no :yes,
```

```
*****
* High Availability Authentication Key *
*****
Enter Authentication Key:
Enter Authentication Key again:

*****
* Summary *
*****
Server will be a Secondary.
Authentication Key is set.
Apply these settings? (y/n)y_
```

Pro TIP:

Authentication Key must be between 8 and 80 characters and contain at least 3 of the following lowercase letters, uppercase letters, digits and special characters

Securely record the Authentication key, you will need this for future maintenance and troubleshooting

Enabling HA



Cisco Prime Infrastructure Health Monitor

Version: 3.1

Login to the Secondary Health Monitor

(https://secondary_IP:8082)

Enter the Authentication Key to Login

© 2017 Cisco Systems, Inc., Cisco, Cisco Systems, and Cisco Systems logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries. All other trademarks belong to their respective owners. View third-party licenses and notices.

Enabling HA

Prime Infrastructure Health Monitor

Secondary Software Update Refresh Logout

Health Monitor Details
Version: 3.1 (3.1.0.0.132)

Settings

Status	Primary IP Address	State	Failover Type	Action
	None	HA not Configured		

Logging

Message Level: Information ▾ Save

Download Health Monitor Log Files [Download](#)

Events

Time	State	Description
May 23, 2017 10:18:09 PM	HA not Configured	Secondary Prime Infrastructure Server started successfully as standby
May 23, 2017 09:53:07 PM	Health Monitor Available	Health Monitor Started

Upgrade the Secondary to same version as Primary

Enabling HA after the fact

- admin# shell
- Enter shell access password :
- Starting bash shell ...
- ade # sudo -i bash
- bash-4.1# cd /opt/CSColumnos/bin
- bash-4.1# ./hamode.sh secondary

Pro Tip!

Enabling HA on Primary



HA Configuration

Configuration

Configuration Mode HA Not Configured

General

* Secondary Server	<input type="text" value="172.16.50.66"/>	?
* Authentication Key	<input type="text" value="....."/>	?
Enable Virtual IP	<input checked="" type="checkbox"/>	?
Email Address	<input type="text" value="lhickman@cisco.com"/>	?
Failover Type	<input type="text" value="Manual"/>	?

[Save](#)

Note: If HA Registration is already in progress then, attempt to Save will fail.

Login to the Primary Server
Enter Secondary information
Enter Authentication Key
Choose whether to use VIP
Choose Failover Type

Patching PI in HA Pair

- Manual Failover: Patch Primary First. No Failover is required during Primary restart (Patch time ~ 30 minutes, Downtime is ~ 20 minutes for Primary restart)
- Automatic Failover: Verify **Primary Active, Secondary Syncing** states, Patch Primary First, restart will cause Failover, Patch Secondary, restart will be about ~20 minutes downtime, Manually Failback to Primary
- Catch all –
 - Remove HA Pairing
 - Patch Primary and Secondary individually
 - Restore HA Pairing (**Need Authentication Key**)

```
admin# ncs ha remove
```

Administration / Settings / High Availability ★

HA Status

HA Configuration

Configuration

Configuration Mode HA Enabled

General

* Secondary Server 172.16.50.66

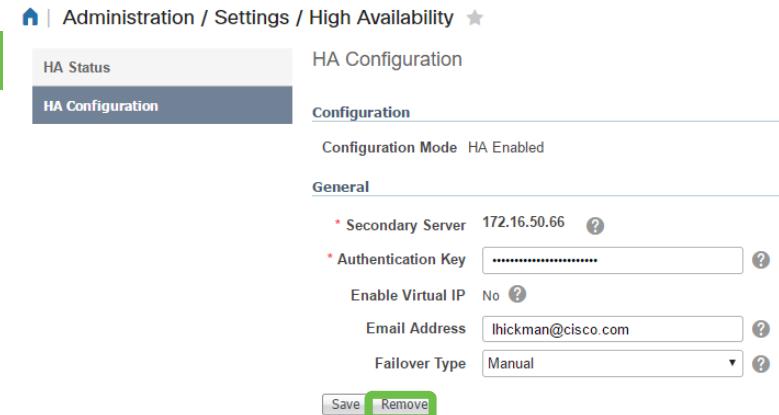
* Authentication Key

Enable Virtual IP No

Email Address lhickman@cisco.com

Failover Type Manual

Save Remove



Things to be aware of with HA

- Average DB size is 125 GB
- 1 Gbps links, 1 ms Latency, complete DB copy is < 1 hr
- 255 Mbps, 70 ms Latency, complete DB copy is ~ 2 hrs
- 86 Mbps, 220 ms Latency, complete DB copy is ~ 4.5 hrs
- HA Registration States
- CLI for resetting HA authkey
 - **NCS HA authkey authkey**
- High Available Reference Information
http://www.cisco.com/c/en/us/td/docs/net_mgmt/prime/infrastructure/3-1/administrator/guide/PIAdminBook/config_HA.html#30402

Primary HA State Transitions...	Secondary HA State Transitions...
From: HA Not Configured	From: HA Not Configured
To: HA Initializing	To: HA Initializing
To: Primary Active	To: Secondary Syncing

Troubleshooting with Prime Infrastructure

Efficient Use of Information

Prime Infrastructure

Inventory / Device Management / Network Devices

Device Groups

All Devices

Reachability	Admin Status	Device Name	IP Address
<input type="checkbox"/>	Managed	2921-Router.amer...	172.16.50.254
<input type="checkbox"/>	Managed	hickman-NAS	172.16.50.21
<input type="checkbox"/>	Managed	UCS-C220-1	172.16.50.220
<input checked="" type="checkbox"/>	Managed	2960-Condo-Swic...	172.16.51.251
<input type="checkbox"/>	Managed	3750E-switch.amer...	172.16.50.248
<input type="checkbox"/>	Managed	condo-nam.amer.ci...	172.16.51.245
<input type="checkbox"/>	Managed	WLC-Granby	172.16.51.230
<input type="checkbox"/>	Managed	3560-Condo-Swic...	172.16.51.252
<input type="checkbox"/>	Managed	Hickman-vWLC	172.16.50.230
<input type="checkbox"/>	Managed	4948-Switch.amer...	172.16.50.253
<input type="checkbox"/>	Managed	3850-switch.amer...	172.16.50.252
<input type="checkbox"/>	Managed	CME-2811-router.a...	172.16.50.247
<input type="checkbox"/>	Managed	NME-NAM.amer.ci...	172.16.50.245

360° View:3750E-switch.amer.cisco.com

View Details Actions

3750E-switch.amer.cisco.com

172.16.50.248

United States,RTP,All Locations

up for 22 days 5 hrs 50 mins 44 secs

OS Type IOS

OS Version 12.2(58)SE2

Last Config Change June 22, 2016, 10:44:30 PM EDT

Last Inventory Collection June 27, 2016, 10:01:41 PM EDT

CPU Utilization(1 Hour)

12.00% ▼-21.00%

Memory Utilization (1 hour)

76.00% 0.00%

Minimum	Average	Maximum	Minimum	Average	Maximum
10.00%	16.25%	33.00%	76.00%	76.00%	76.00%

Alarms Modules Interfaces Neighbors Civic Location Recent Changes

Time	User...	Category	Description
06/06/16, 22:01:51	SYST...	INVENT...	Logical File 'config.text' added.
06/06/16, 22:01:51	SYST...	INVENT...	Logical File 'config.text' deleted.
12/06/16, 22:01:51	SYST...	INVENT...	Logical File 'c3750e-universalk9-mz.122-58.SE2/html/i...
13/06/16, 22:01:50	SYST...	INVENT...	Logical File 'c3750e-universalk9-mz.122-58.SE2/html/i...
18/06/16, 22:05:07	SYST...	INVENT...	Logical File 'config.text' added.

New Troubleshooting tools in PI 3.1

Device 360° Views



4503E-switch.amer.cisco.com

172.16.50.249

Cisco Catalyst 4503-E Switch

All Locations, RTP, United States

up for 50 days 20 hrs 49 mins 31 secs

OS Type IOS-XE

OS Version 03.05.01.E

Last Config Change July 19, 2015 1:14:02 PM EDT

Last Inventory Collection January 10, 2016 10:00:14 PM EST

CPU Utilization (1 hour)

3.00% 0.00%

Minimum 3.00% Average 3.00% Maximum 3.00%

Memory Utilization (1 hour)

31.00% 0.00%

Minimum 31.00% Average 31.00% Maximum 31.00%

Alarms

Modules

Interfaces

Neighbors

Wireless Interfaces

WLAN

	Status	Timestamp	Message	Category
	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
	Not Ack...	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
	Not Ack...	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
	Not Ack...	07/18/15, 11:51:11	Device '172.16.50.249'. Authentication fa...	Switches and...

New Troubleshooting tools in PI 3.1

Device 360° Views



4503E-switch.amer.cisco.com

172.16.50.249

View Details

Actions ▾

Cisco Catalyst 4503-E Switch

All Locations, RTP, United States

up for 50 days 20 hrs 49 mins 31 secs

OS Type IOS-XE

OS Version 03.05.01.E

Last Config Change July 19, 2015 1:14:02 PM EDT

Last Inventory Collection January 10, 2016 10:00:14 PM EST

CPU Utilization (1 hour)

3.00% 0.00%

Minimum 3.00% Average 3.00% Maximum 3.00%

Memory Utilization (1 hour)

31.00% 0.00%

Minimum 31.00% Average 31.00% Maximum 31.00%

Alarms

Modules

Interfaces

Neighbors

Wireless Interfaces

WLAN

	Status	Timestamp	Message	Category
	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
	Not Ack...	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
	Not Ack...	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
	Not Ack...	07/18/15, 11:51:11	Device '172.16.50.249'. Authentication fa...	Switches and...

New Troubleshooting tools in PI 3.1

Device 360° Views

The screenshot shows the Device 360° Views page for a Cisco 4503E switch. At the top, there's a blue icon with two arrows pointing left and right. Below it, the device name is listed as "4503E-switch.amer.cisco.com" with a green checkmark and a lock icon. The IP address is "172.16.50.249". The location is "All Locations, RTP, United States". The device has been up for 50 days 20 hrs 49 mins 31 secs. The OS Type is "IOS-XE" and the OS Version is "03.05.01.E". The last config change was on July 19, 2015 at 1:14:02 PM EDT. The last inventory collection was on January 10, 2016 at 10:00:14 PM EST.

On the right, a dropdown menu titled "Actions" is open, showing options like Telnet, SSH, HTTP, HTTPS, Alarm Browser, Connect to Device, Device Details, Support Community, Support Request, Ping, Traceroute, and N-Hop Topology.

Below the device info, there are two performance charts: "CPU Utilization (1 hour)" and "Memory Utilization (1 hour)". The CPU utilization is 3.00% (minimum 3.00%, average 3.00%, maximum 3.00%). The Memory utilization is 31.00% (minimum 31.00%, average 31.00%, maximum 31.00%).

The screenshot shows the Alarms tab of the Device 360° Views interface. It displays a table of recent alarms:

	Status	Timestamp	Message	Category
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
⚠	Not Ack...	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
⚠	Not Ack...	07/18/15, 11:51:11	Device '172.16.50.249'. Authentication fa...	Switches and...

New Troubleshooting tools in PI 3.1

Device 360° Views

The screenshot shows the 'Device 360° Views' interface for the device **4503E-switch.amer.cisco.com**. The device is located at **172.16.50.249** and has been up for **50 days 20 hrs 49 mins 31 secs**. It is running **IOS-XE** OS version **03.05.01.E**. The last config change was on **July 19, 2015 1:14:02 PM EDT**, and the last inventory collection was on **January 10, 2016 10:00:14 PM EST**.

Performance metrics shown:

- CPU Utilization (1 hour):** 3.00% (Minimum: 3.00%, Average: 3.00%, Maximum: 3.00%)
- Memory Utilization (1 hour):** 31.00% (Minimum: 31.00%, Average: 31.00%, Maximum: 31.00%)

The 'Actions' menu is open, showing options like **SSH** (highlighted with a green box), **HTTP**, and **HTTPS**.

Below the main view, there is a table of alarms:

	Status	Timestamp	Message	Category
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
⚠	Not Ack...	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
⚠	Not Ack...	07/18/15, 11:51:11	Device '172.16.50.249'. Authentication fa...	Switches and...

New Troubleshooting tools in PI 3.1

Device 360° Views

The screenshot shows the Device 360° Views page for a 4503E-switch. At the top, there's a summary card with the device name, IP address (172.16.50.249), location (All Locations, RTP, United States), and uptime (up for 50 days 20 hrs 49 mins 31 secs). Below this, it shows OS Type (IOS-XE) and OS Version (03.05.01.E), with the last config change on July 19, 2015, at 1:14:02 PM EDT, and the last inventory collection on January 10, 2016, at 10:00:14 PM EST.

Key performance metrics are displayed: CPU Utilization (1 hour) at 3.00% (green) and Memory Utilization (1 hour) at 31.00% (red). Below these are detailed tables for CPU and Memory utilization.

A navigation menu on the right includes View Details, Actions (with SSH highlighted in green), Alarm Browser, Connect to Device, Device Details, Support Community, Support Request, Ping, and Traceroute.

Below the main summary are tabs for Alarms, Modules, Interfaces, Neighbors, Wireless Interfaces, and WLAN. The Alarms tab is selected, showing a list of recent events:

	Status	Timestamp	Message	Category
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
⚠	Not Ack...	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
⚠	Not Ack...	07/18/15, 11:51:11	Device '172.16.50.249'. Authentication fa...	Switches and...

The screenshot shows a PuTTY terminal window connected to the device at 172.16.50.249. The session title is "172.16.50.249 - PuTTY". The user has logged in as "lewis" and attempted to use keyboard-interactive authentication. The password was rejected with the message "Unauthorized access is prohibited!!". The command prompt "4503E-switch#" is visible at the bottom.

New Troubleshooting tools in PI 3.1

Device 360° Views

The screenshot shows the Device 360° Views page for a 4503E-switch. At the top, there's a summary card with the device name, IP address (172.16.50.249), location (All Locations, RTP, United States), and uptime (up for 50 days 20 hrs 49 mins 31 secs). Below this, it shows OS Type (IOS-XE) and OS Version (03.05.01.E), with the last config change on July 19, 2015, at 1:14:02 PM EDT, and the last inventory collection on January 10, 2016, at 10:00:14 PM EST.

Key performance metrics are displayed: CPU Utilization (1 hour) at 3.00% (green), Memory Utilization (1 hour) at 31.00% (red), and N-Hop Topology (highlighted with a green box).

The interface includes tabs for Alarms, Modules, Interfaces, Neighbors, Wireless Interfaces, and WLAN. A detailed table of alarms is shown below:

	Status	Timestamp	Message	Category
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
⚠	Not Ack...	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
⚠	Not Ack...	07/18/15, 11:51:11	Device '172.16.50.249'. Authentication fa...	Switches and...

The screenshot shows a PuTTY terminal window connected to the device. The session ID is 172.16.50.249 - PuTTY. The user has logged in as lewis and attempted to use keyboard-interactive authentication. The password was rejected with the message "Unauthorized access is prohibited!!".

```
login as: lewis
Using keyboard-interactive authentication.
password:
Unauthorized access is prohibited!!
4503E-switch#
```

New Troubleshooting tools in PI 3.1

Device 360° Views

4503E-switch.amer.cisco.com  

172.16.50.249
All Locations, RTP, United States
up for 50 days 20 hrs 49 mins 31 secs
OS Type IOS-XE
OS Version 03.05.01.E
Last Config Change July 19, 2015 1:14:02 PM EDT
Last Inventory Collection January 10, 2016 10:00:14 PM EST

Actions ▾

- SSH (selected)
- HTTP
- HTTPS

CPU Utilization (1 hour) 3.00% 0.00%

Minimum	Average	Maximum
3.00%	3.00%	3.00%

Memory Utilization (1 hour) 31.00% 0.00%

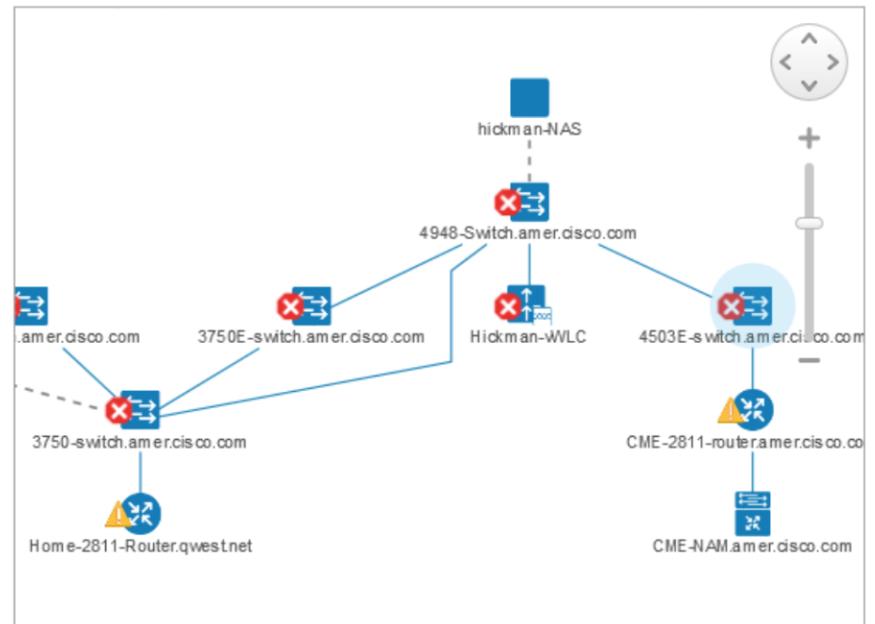
Minimum	Average	Maximum
31.00%	31.00%	31.00%

N-Hop Topology

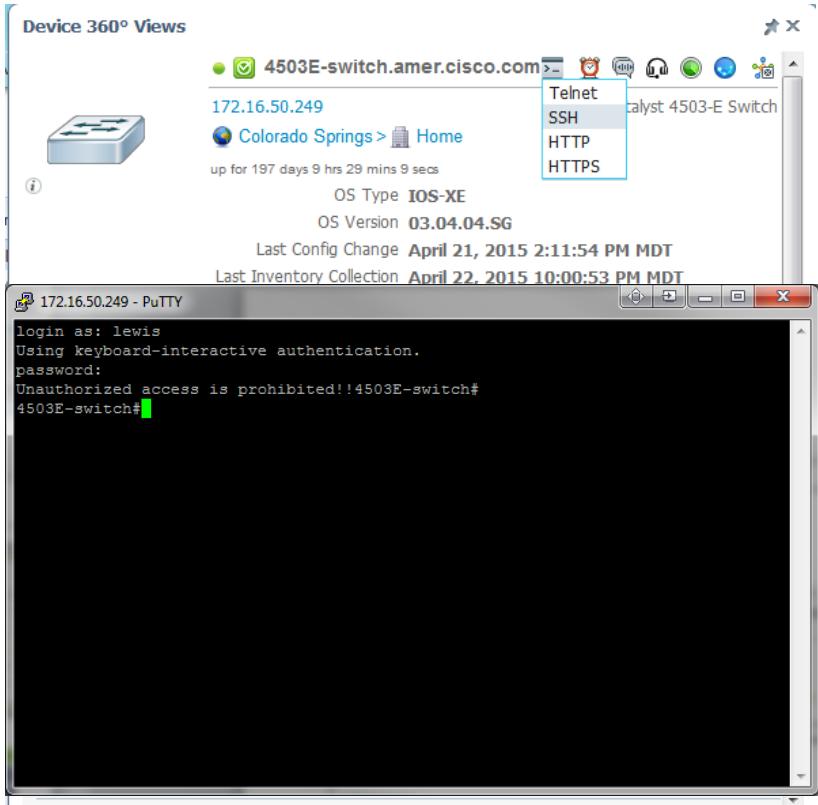
Alarms Modules Interfaces Neighbors Wireless Interfaces WLAN

	Status	Timestamp	Message	Category
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
✗	Not Ack...	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
⚠	Not Ack...	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
⚠	Not Ack...	07/18/15, 11:51:11	Device '172.16.50.249'. Authentication fa...	Switches and...

Topology: 3 Hops, Hierarchical Layout



New Troubleshooting Tools in PI 3.x



Pro-Tip:

For Windows 7/8/10, we need to teach Windows about the SSH protocol. Create file called ssh.reg with this content (This calls powershell and strips the unneeded characters off of the putty call so that putty opens with the correct ip address/device name):

REGEDIT4

```
[HKEY_CLASSES_ROOT\ssh]
@="URL:ssh Protocol"
"URL Protocol"=""

[HKEY_CLASSES_ROOT\ssh\shell]
[HKEY_CLASSES_ROOT\ssh\shell\open]
[HKEY_CLASSES_ROOT\ssh\shell\open\command]

@="C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe -Command '& 'C:\Program Files (x86)\PuTTY\putty.exe' '%l'.TrimStart('ssh://').TrimEnd('/')'"
```

Simplified Lookups with Elastic Search

The screenshot displays two search results windows from a Cisco Network Management System (NMS) interface, illustrating the use of Elasticsearch for simplified lookups.

Search Results for "aaa":

- Config Archives (2):** no aaa new-model, no aaa new-model
- Menus (3):** ACS View Servers (highlighted with a blue dotted border), ISE Servers, Users, Roles & AAA

Advanced Search and **View All** buttons are present at the bottom.

Search Results for "lewis":

- Change Audit (6):** lewis, lewis, lewis, lewis, lewis, lewis (highlighted with a blue rounded rectangle)
- Config Archives (40):** ! Last configuration change at 22:59:19 U..., ! Last configuration change at 20:30:58 U..., ! Last configuration change at 22:59:19 U..., ! Last configuration change at 21:42:19 E..., ! Last configuration change at 14:30:10 ...

Advanced Search and **View All** buttons are present at the bottom.

Search for Keywords within Configuration Archives

Inventory / Device Management / Configuration Archive ★

Groups
All Devices

Devices Archives

Search Results for 'aaa'

Selected 0 / Total 2

<input type="checkbox"/> Device Name	▲ IP Address	Date	Created By	Tag	Config Snippet	Description	Out Of Band
<input type="checkbox"/> Dist-3	172.26.150.140	(i) December 7, 2015 9:22:05 PM PST	Inventory	!	Initial version		false
<input type="checkbox"/> Dist-4	172.26.150.141	(i) December 7, 2015 9:23:55 PM PST	Inventory	!	Initial version		false

Show Search Results

Rollback Edit Tag Create Group Deploy Config

External Device Configuration Backup (Shadow Directory)

Prime Infrastructure

Administration / Dashboards / Job Dashboard

Metrics

User Job Status	Poller Job Status	System Job Status	In Progress Jobs	My Jobs	User Job Approval
Scheduled: 0 Failed: 20 Suspended: 0	Scheduled: 0 Failed: 0 Suspended: 0	Scheduled: 11 Failed: 2 Suspended: 12	User: 0 System: 0 Poller: 1	Scheduled: 0 Failed: 9 Suspended: 0	Total: 0 Pending: 0 Expired: 0

Last Updated: Thursday, January 19, 2017 at 2:53:41 PM EST

Jobs

User Jobs

- Config Deploy - Deploy View
- Configuration Archive
- Configuration Overwrite
- Discovery
- MapTile Generation
- Reports Status
- SWIM Activation
- SWIM Collection
- SWIM Distribution
- pnpBulkImport

System Jobs

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(hh:mm:...)	Next Start Time
device						
Device Config Backup-External	Infrastructure	Scheduled	Success	2016-08-18 13:52	00:00:02	2017-01-19 15:09
Device Data Collector	Wireless System	Suspended	Scheduled			

External Device Configuration Backup (Shadow Directory)

Prime Infrastructure

Administration / Dashboards / Job Dashboard

Metrics

User Job Status	Poller Job Status	System Job Status	In Progress Jobs	My Jobs	User Job Approval
Scheduled: 0 Failed: 20 Suspended: 0	Scheduled: 0 Failed: 0 Suspended: 0	Scheduled: 11 Failed: 2 Suspended: 12	User: 0 System: 0 Poller: 1	Scheduled: 0 Failed: 9 Suspended: 0	Total: 0 Pending: 0 Expired: 0

Last Updated: Thursday, January 19, 2017 at 2:53:41 PM EST

Jobs

User Jobs

- Config Deploy - Deploy View
- Configuration Archive
- Configuration Overwrite
- Discovery
- MapTile Generation
- Reports Status
- SWIM Activation
- SWIM Collection
- SWIM Distribution
- pnpBulkImport

System Jobs

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(hh:mm:...)	Next Start Time
device						
<input checked="" type="checkbox"/> Device Config Backup-External	Infrastructure	Scheduled	Success	2016-08-18 13:52	00:00:02	2017-01-19 15:09
<input type="checkbox"/> Device Data Collector	Wireless System	Suspended	Scheduled			

Application Search

21

lewis - ROOT-DOMAIN

Job Approval | Settings | ?

Metrics

User Job Status

Poller Job Status

System Job Status

In Progress Jobs

My Jobs

User Job Approval

Jobs

User Jobs

System Jobs

Edit Schedule

Run

Pause Series

Resume Series

Show

Quick Filter

Selected 1 / Total 2

Duration(hh:mm:...)

Next Start Time

Last Run Status

Last Start Time

Status

Job Type

Name

Device Config Backup-External

Infrastructure

Scheduled

Success

2016-08-18 13:52

00:00:02

2017-01-19 15:09

Device Data Collector

Wireless System

Suspended

Scheduled

External Device Configuration Backup (Shadow Directory)

Prime Infrastructure

Administration / Dashboards / Job Dashboard

Metrics

User Job Status	Poller Job Status	System Job Status	In Progress Jobs	My Jobs	User Job Approval
Scheduled: 0 Failed: 20 Suspended: 0	Scheduled: 0 Failed: 0 Suspended: 0	Scheduled: 11 Failed: 2 Suspended: 12	User: 0 System: 0 Poller: 1	Scheduled: 0 Failed: 9 Suspended: 0	Total: 0 Pending: 0 Expired: 0

Last Updated: Thursday, January 19, 2017 at 2:53:41 PM EST

Jobs

User Jobs

- Config Deploy - Deploy View
- Configuration Archive
- Configuration Overwrite
- Discovery
- MapTile Generation
- Reports Status
- SWIM Activation
- SWIM Collection
- SWIM Distribution
- pnpBulkImport

System Jobs

Device Config Backup-External

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(hh:mm:...)	Next Start Time
device			Success	2016-08-18 13:52	00:00:02	2017-01-19 15:09

Edit Job Properties

Backup Repository: FTPRepo (ftp://172.16.50.20/CiscoPI31)

Export only latest configurations:

Encrypt exported files using GnuPG:

Encrypt Password:

Last Run Job status: 2016-08-18 13:52

32 files transferred to FTPRepo
Running Configuration: 15
Startup Configuration: 10
VLAN Configuration: 7

Note: Last backup time for this repository: 2016-08-18 13:52:40.582

Save Cancel

External Device Configuration Backup (Shadow Directory)

Prime Infrastructure

Administration / Dashboards / Job Dashboard

Metrics

User Job Status	Poller Job Status	System Job Status	In Progress Jobs	My Jobs	User Job Approval
Scheduled: 0 Failed: 20 Suspended: 0	Scheduled: 0 Failed: 0 Suspended: 0	Scheduled: 11 Failed: 2 Suspended: 12	User: 0 System: 0 Poller: 1	Scheduled: 0 Failed: 9 Suspended: 0	Total: 0 Pending: 0 Expired: 0

Last Updated: Thursday, January 19, 2017 at 2:53:41 PM EST

Jobs

User Jobs

- Config Deploy - Deploy View
- Configuration Archive
- Configuration Overwrite
- Discovery
- MapTile Generation
- Reports Status
- SWIM Activation
- SWIM Collection
- SWIM Distribution
- pnpBulkImport

System Jobs

Edit Schedule

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(hh:mm:...)	Next Start Time
device			Success	2016-08-18 13:52	00:00:02	2017-01-19 15:09

Edit Job Properties

Backup Repository: FTPRepo (ftp://172.16.50.20/CiscoPI31)

Export only latest configurations

Encrypt exported files using GnuPG

Encrypt Password:

Last Run Job status: 2016-08-18 13:52
32 files transferred to FTPRepo
Running Configuration: 15
Startup Configuration: 10
VLAN Configuration: 7

Note: Last backup time for this repository: 2016-08-18 13:52:40.582

Save Cancel

External Device Configuration Backup (Shadow Directory)

Prime Infrastructure

Administration / Dashboards / Job Dashboard

Metrics

User Job Status	Poller Job Status	System Job Status	In Progress Jobs	My Jobs	User Job Approval
Scheduled: 0 Failed: 20 Suspended: 0	Scheduled: 0 Failed: 0 Suspended: 0	Scheduled: 11 Failed: 2 Suspended: 12	User: 0 System: 0 Poller: 1	Scheduled: 0 Failed: 9 Suspended: 0	Total: 0 Pending: 0 Expired: 0

Last Updated: Thursday, January 19, 2017 at 2:53:41 PM EST

Jobs

User Jobs

- Config Deploy - Deploy View
- Configuration Archive
- Configuration Overwrite
- Discovery
- MapTile Generation
- Reports Status
- SWIM Activation
- SWIM Collection
- SWIM Distribution
- pnpBulkImport

System Jobs

Edit Schedule

Name	Job Type	Status	Last Run Status	Last Start Time	Duration(h:mm:...)	Next Start Time
device			Success	2016-08-18 13:52	00:00:02	2017-01-19 15:09

Device Config Backup-External

Edit Job Properties

Backup Repository: FTPRepo (ftp://172.16.50.20/Cisco/PI31)

Export only latest configurations:

Encrypt exported files using GnuPG:

Encrypt Password:

Last Run Job status: 2016-08-18 13:52
32 files transferred to FTPRepo
Running Configuration: 15
Startup Configuration: 10
VLAN Configuration: 7

Note: Last backup time for this repository: 2016-08-18 13:52:40.582

Save Cancel

Schedule

Start Time: Now Date: 01/19/2017 08:00 PM

Recurrence: Weekly

Settings: Every 1 week(s)
Sunday: Wednesday: Saturday:
Monday: Thursday:
Tuesday: Friday:

End Time: No End Date/Time

Every 1 Times

End at: 01/19/2017 03:02 PM

Submit Cancel

External Device Configuration Backup (Shadow Directory)

Prime Infrastructure

Administration / Dashboards / Job Dashboard

Metrics

User Job Status	Poller Job Status	System Job Status	In Progress Jobs	My Jobs	User Job Approval
Scheduled: 0 Failed: 20 Suspended: 0	Scheduled: 0 Failed: 0 Suspended: 0	Scheduled: 11 Failed: 2 Suspended: 12	User: 0 System: 0 Poller: 1	Scheduled: 0 Failed: 9 Suspended: 0	Total: 0 Pending: 0 Expired: 0

Last Updated: Thursday, January 19, 2017 at 2:53:41 PM EST

Jobs

User Jobs

- Config Deploy - Deploy View
- Configuration Archive
- Configuration Overwrite
- Discovery
- MapTile Generation
- Reports Status
- SWIM Activation
- SWIM Collection
- SWIM Distribution
- pnpBulkImport

System Jobs

Device Config Backup-External

Edit Schedule

Run (button highlighted with red box)

Pause Series

Resume Series

Show Quick Filter

Selected 1 / Total 2

Edit Job Properties

Backup Repository: FTPRepo (ftp://172.16.50.20/Cisco/PI31)

Export only latest configurations:

Encrypt exported files using GnuPG:

Encrypt Password:

Last Run Job status: 2016-08-18 13:52

32 files transferred to FTPRepo
Running Configuration: 15
Startup Configuration: 10
VLAN Configuration: 7

Note: Last backup time for this repository: 2016-08-18 13:52:40.582

Save Cancel

Schedule

Start Time: Now Date: 01/19/2017 08:00 PM (MM/dd/yyyy hh:mm AM/PM)

Recurrence: Minute Hourly Daily Weekly Monthly Yearly

Settings: Every 1 week(s):
Sunday: Wednesday:
Monday: Thursday:
Tuesday: Friday:

End Time: No End Date/Time
Every 1 Times
End at: 01/19/2017 03:02 PM (MM/dd/yyyy hh:mm AM/PM)

Submit Cancel

The screenshot shows the Cisco Prime Infrastructure Job Dashboard. It displays various job status metrics and a list of system jobs. A specific job, "Device Config Backup-External", is selected and its properties are being edited. The "Edit Schedule" tab is active, and a modal window is open for scheduling the job. The schedule is set to run weekly at 08:00 PM on January 19, 2017. The modal also shows settings for running every 1 week(s) and an end date/time of 03:02 PM on January 19, 2017.

Integration with other Systems

Integrating PI w. ISE

The screenshot shows the Cisco Prime Infrastructure web interface. The top navigation bar includes the Cisco logo and the text "Prime Infrastructure". Below the navigation, the breadcrumb trail reads "Administration / Servers / ISE Servers / Add ISE Server". The main form is titled "Add ISE Server" and contains the following fields:

Server Address	<input type="text" value="172.16.50.75"/>
Port	<input type="text" value="443"/>
Username	<input type="text" value="lewis"/>
Password	<input type="password" value="....."/>
Confirm Password	<input type="password" value="....."/>
HTTP Connection Timeout	<input type="text" value="30"/> (Max:300 secs)

At the bottom of the form are two buttons: "Save" (in blue) and "Cancel".

Pro Tips:

- 1.) For larger Multi-node ISE deployments, PI only needs to integrate with the MNT node
- 2.) Username for integration should be superuser credentials local to ISE
- 3.) PI 3.2+ will support ISE 2.2+ integration—use PxGRID, so it will require ISE Plus license or higher

Integrating PI w. MSE

Prime Infrastructure

Add MSE Configuration

Licensing

Select Service

Tracking

Assign Maps

Mobile App Enablement

Add Mobility Services Engine

* Device Name lab-mse-8-0

* IP Address 172.16.50.85

Contact Name

* Username admin

* Password ****

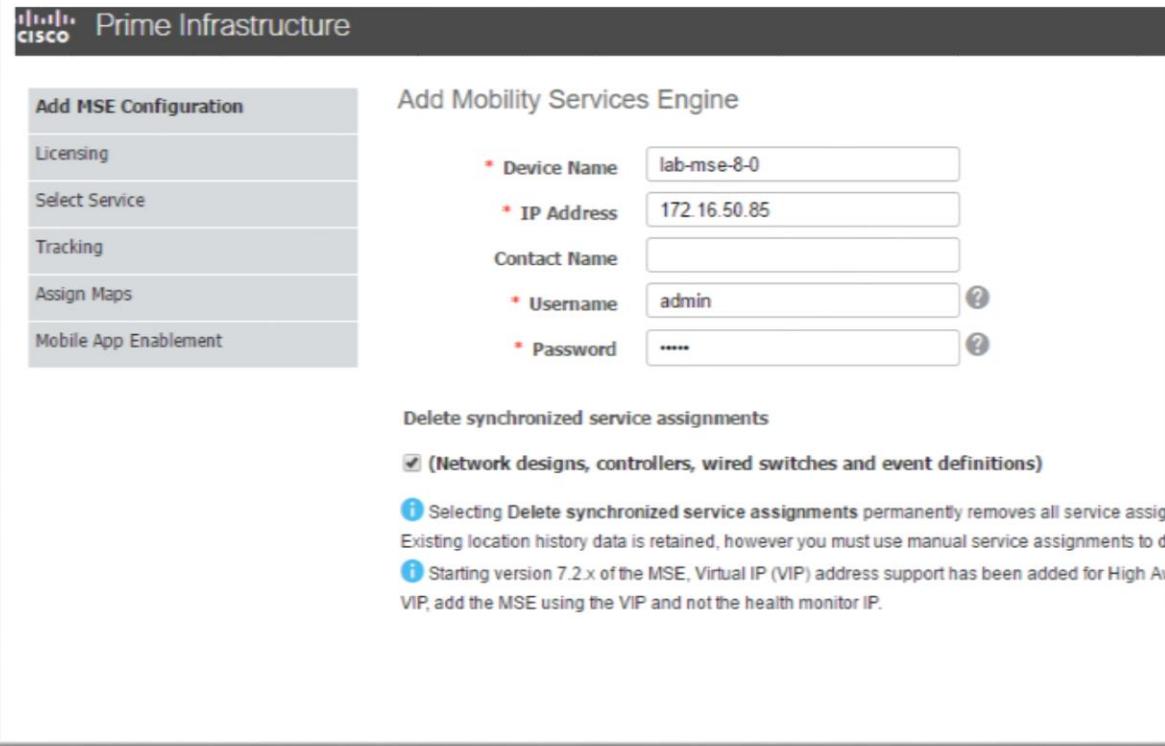
Delete synchronized service assignments

(Network designs, controllers, wired switches and event definitions)

ⓘ Selecting Delete synchronized service assignments permanently removes all service assignments. Existing location history data is retained, however you must use manual service assignments to do so.

ⓘ Starting version 7.2.x of the MSE, Virtual IP (VIP) address support has been added for High Availability. Add the MSE using the VIP and not the health monitor IP.

Next



Pro Tips:

- 1.) Username/Password for this integration was defined as part of the MSE automatic Installation script
- 2.) The Device Name helps you distinguish between devices if you have multiple Prime Infrastructures with multiple mobility services engines, but it is not considered when validating an MSE.

Integrating PI w. CMX

Services / Mobility Services / Connected Mobile Experiences ★ Selected 1 / Total 1

Edit Delete Add Import Map Show Quick Filter

<input checked="" type="checkbox"/>	Device Name	IP Address	Software Version	Owner	Reachability Status
<input checked="" type="checkbox"/>	CMX-196	192.168.114.196	10.2.3-34	Prabar	<input checked="" type="checkbox"/> Reachable

Manage CMX Servers in Prime (along with health of CMX servers)

PI Location data integration with CMX
Clients
Interferers

Integrating PI w. CMX Map Import/Export

The screenshot shows a software interface titled "Import Map to CMX". On the left, there's a sidebar with "Software" and "10.2.3-3". The main window has a title bar "Import Map to CMX" with a close button. Below it is a table with columns: "File Name", "Creation Time", and "Action". The table lists five entries:

	File Name	Creation Time	Action
<input type="radio"/>	ImportExport_9bef5be13d610ad8.tar.gz	03/28/2017 03:29:33	
<input type="radio"/>	ImportExport_4c3c1c27e0d37f0e.tar.gz	03/28/2017 01:35:23	
<input type="radio"/>	ImportExport_3d969875b1fb1b51.tar.gz	03/27/2017 15:27:27	
<input type="radio"/>	ImportExport_47ba8319e411b4c1.tar.gz	03/27/2017 15:22:46	
<input type="radio"/>	ImportExport_bf60242e0b052d7c.tar.gz	03/27/2017 15:11:15	

Below the table are two checkboxes:

- Delete & replace existing maps & analytics data.
- Delete & replace existing zones & analytics data.

At the bottom are two buttons: "Import to CMX" (blue) and "Export from PI" (gray).

- Selectively import only specific maps (Building/Floors)
- Delete and Replace or Add maps to CMX

Integrating PI w. APIC-EM (For PnP)

The screenshot shows the 'Add APIC - Controller' dialog box within the Cisco Prime Infrastructure interface. The dialog box contains the following fields:

Setting	Value
Server	192.168.139.183
Port	443
User Name	admin
Password
Confirm Password
Polling Interval(mins)	5
Protocol	HTTPS

At the bottom right of the dialog box are two buttons: 'OK' and 'Cancel'.

Pro Tips:

- 1.) Username used here must have ROLE_ADMIN role in APIC-EM
- 2.) **Global PnP/ZTD Settings** is automatically set to APIC-EM when you add a valid APIC-EM controller into Prime Infrastructure.

Integrating PI w. APIC-EM (For PnP)

The screenshot shows the Cisco Prime Infrastructure (PI) interface. At the top, there's a navigation bar with the Cisco logo and the text "Prime Infrastructure". Below it, the path "Administration / Servers / APIC-EM Controller" is shown. A star icon is also present.

The main area displays a modal dialog titled "Add APIC - Controller". It contains fields for "Server" (192.168.139.183), "Port" (443), "User Name" (admin), "Password" (redacted), "Confirm Password" (redacted), and "Polling Interval(mins)" (5). Each field has a question mark icon for help.

At the bottom of the dialog, there are two tabs: "APIC-EM Controller" and "Global PnP/ZTD Settings". The "Global PnP/ZTD Settings" tab is selected and shows the "APIC-EM" option selected for "Global PnP/ZTD Settings". It also includes a note: "Please Click here to create Plug and Play Profiles".

On the right side of the interface, there's a green box containing "Pro Tips" with the following content:

Pro Tips:

- 1.) Username used here must have ROLE_ADMIN role in APIC-EM
- 2.) **Global PnP/ZTD Settings** is automatically set to APIC-EM when you add a valid APIC-EM controller into Prime Infrastructure.

Integrating PI w. APIC-EM (For PnP)

The screenshot shows the Cisco Prime Infrastructure Job Dashboard. At the top, there are five status boxes: User Job Status (0 Scheduled, 52 Failed, 0 Suspended), Poller Job Status (0 Scheduled, 0 Failed, 0 Suspended), System Job Status (11 Scheduled, 2 Failed, 11 Suspended), In Progress Jobs (0 User, 1 System, 1 Poller), and My Jobs (0 Scheduled, 38 Failed, 0 Suspended). Below these is a message "Last Updated: Monday, May 22, 2017 at 5:01:34 PM EDT". A navigation bar includes links for Administration, Dashboards, Job Dashboard, Job Approval, Settings, and Help.

Metrics

User Job Status	Poller Job Status	System Job Status	In Progress Jobs	My Jobs
Scheduled: 0	Scheduled: 0	Scheduled: 11	User: 0	Scheduled: 0
Failed: 52	Failed: 0	Failed: 2	System: 1	Failed: 38
Suspended: 0	Suspended: 0	Suspended: 11	Poller: 1	Suspended: 0

Last Updated: Monday, May 22, 2017 at 5:01:34 PM EDT

Jobs

APIC-EM Integration

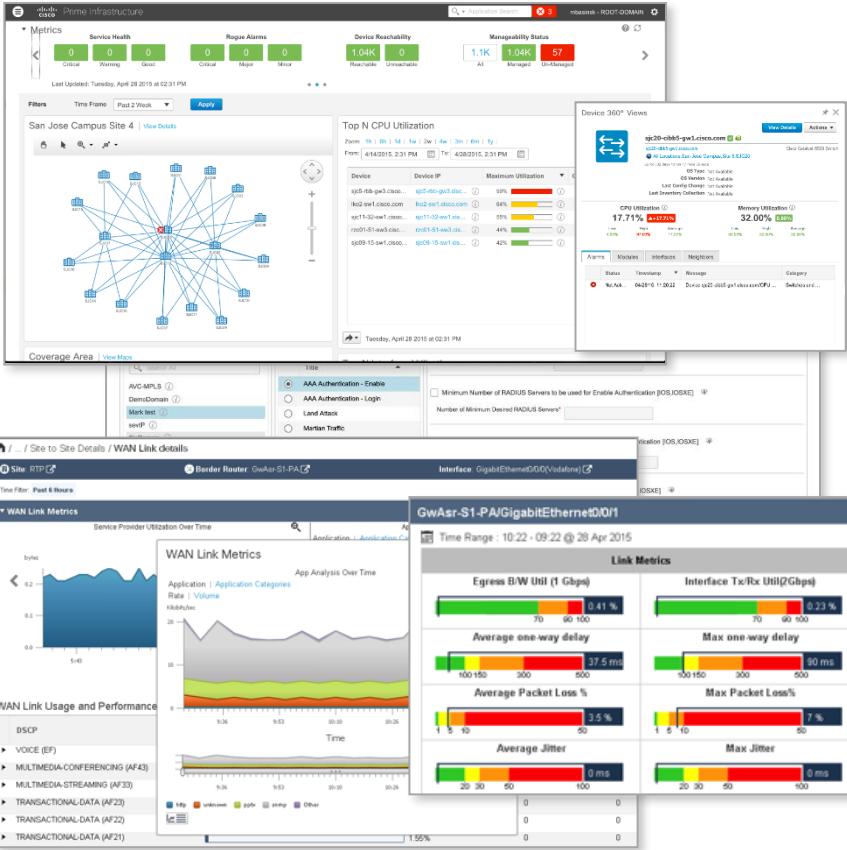
<input type="checkbox"/>	Name	Job Type	Status	Last Run Status	Last Start Time	Duration(hh:mm...)	Next Start Time
<input type="checkbox"/>	PnP Status Polling	APIC-EM PnP Status	Scheduled	Success	2017-05-22 16:58	00:00:01	2017-05-22 17:03
<input type="checkbox"/>	APIC-EM Site Sync <small>(i)</small>	APIC-EM Site Sync	Scheduled	Failure	2017-05-22 13:44	00:00:01	2017-05-22 19:44
<input type="checkbox"/>	APICSERVERSTATUS_PERODIC	APICSERVER_JOB	Completed	Failure	2017-03-07 10:00	00:00:01	

Pro Tips:

- 1.) Inventory is shared between APIC-EM and PI all devices from APIC-EM are added to the ROOT-DOMAIN
- 2.) If you don't want inventory synchronized, you can disable the job.

Looking Ahead

Future Prime Infrastructure Highlights



3.4 –Full Support for Mobility Express

3.4 – Notification email Customization

3.4 – New Port Group Attributes

3.4 – Global Dashboard Time filter

Cisco Spark

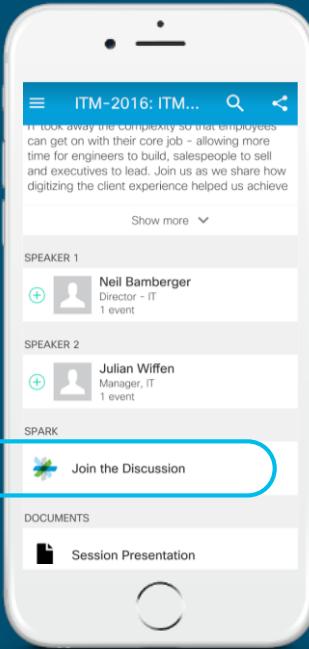


Questions?

Use Cisco Spark to communicate with the speaker after the session

How

1. Find this session in the Cisco Live Mobile App
2. Click “Join the Discussion” ——————
3. Install Spark or go directly to the space
4. Enter messages/questions in the space



cs.co/ciscolivebot#BRKNMS-2702

- Please complete your Online Session Evaluations after each session
- Complete 4 Session Evaluations & the Overall Conference Evaluation (available from Thursday) to receive your Cisco Live T-shirt
- All surveys can be completed via the Cisco Live Mobile App or the Communication Stations

Don't forget: Cisco Live sessions will be available for viewing on-demand after the event at www.ciscolive.com/global/on-demand-library/.



Complete Your Online Session Evaluation



Continue Your Education

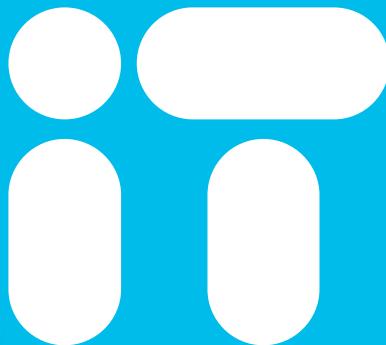
- Demos in the Cisco campus
- Walk-in Self-Paced Labs
- Tech Circle
- Meet the Engineer 1:1 meetings
- Related sessions



Thank you

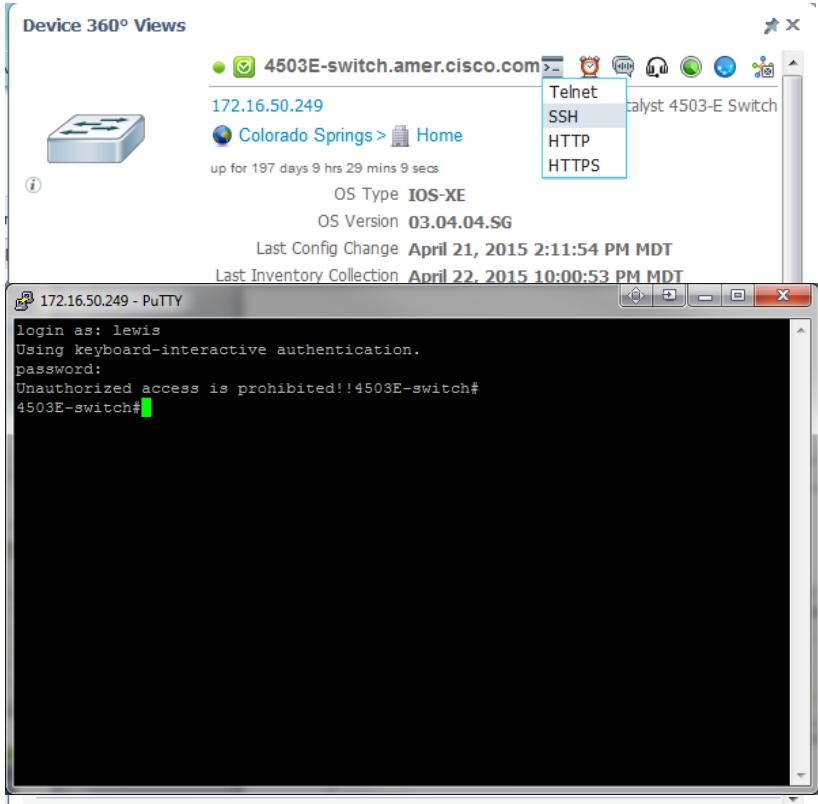


You're



Cisco *live!*

New Troubleshooting Tools in PI 3.x-SecureCRT



Pro-Tip:

For Windows 7/8/10, we need to teach Windows about the SSH protocol. Create file called ssh.reg with this content (This calls powershell and strips the unneeded characters off of the putty call so that putty opens with the correct ip address/device name):

REGEDIT4

```
[HKEY_CLASSES_ROOT\ssh]
@="URL:ssh Protocol"
"URL Protocol"=""

[HKEY_CLASSES_ROOT\ssh\shell]
[HKEY_CLASSES_ROOT\ssh\shell\open]
[HKEY_CLASSES_ROOT\ssh\shell\open\command]
@="C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe -Command '& 'C:\Program Files\VanDyke Software\SecureCRT\SecureCRT.EXE' %'"
```