



February 20 - 24, 2017 • Berlin



Your Time Is Now

How I Learned to Stop Worrying and Love Prime Infrastructure

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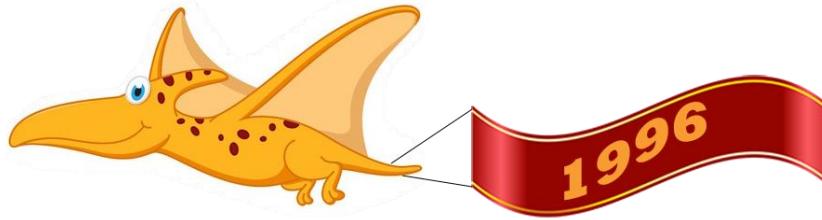
BRKNMS-2701

Agenda

- Overview
 - A History Of...
 - Why are we here?
- A Walk Through of Prime Infrastructure
 - Discovery and Inventory
 - Archiving and Configuring Devices
 - Baseline Configuration Compliance
 - Monitoring for Performance and Faults
 - Upgrading Software
 - Cool New Features
- Key Takeaways And A Look Ahead

Overview

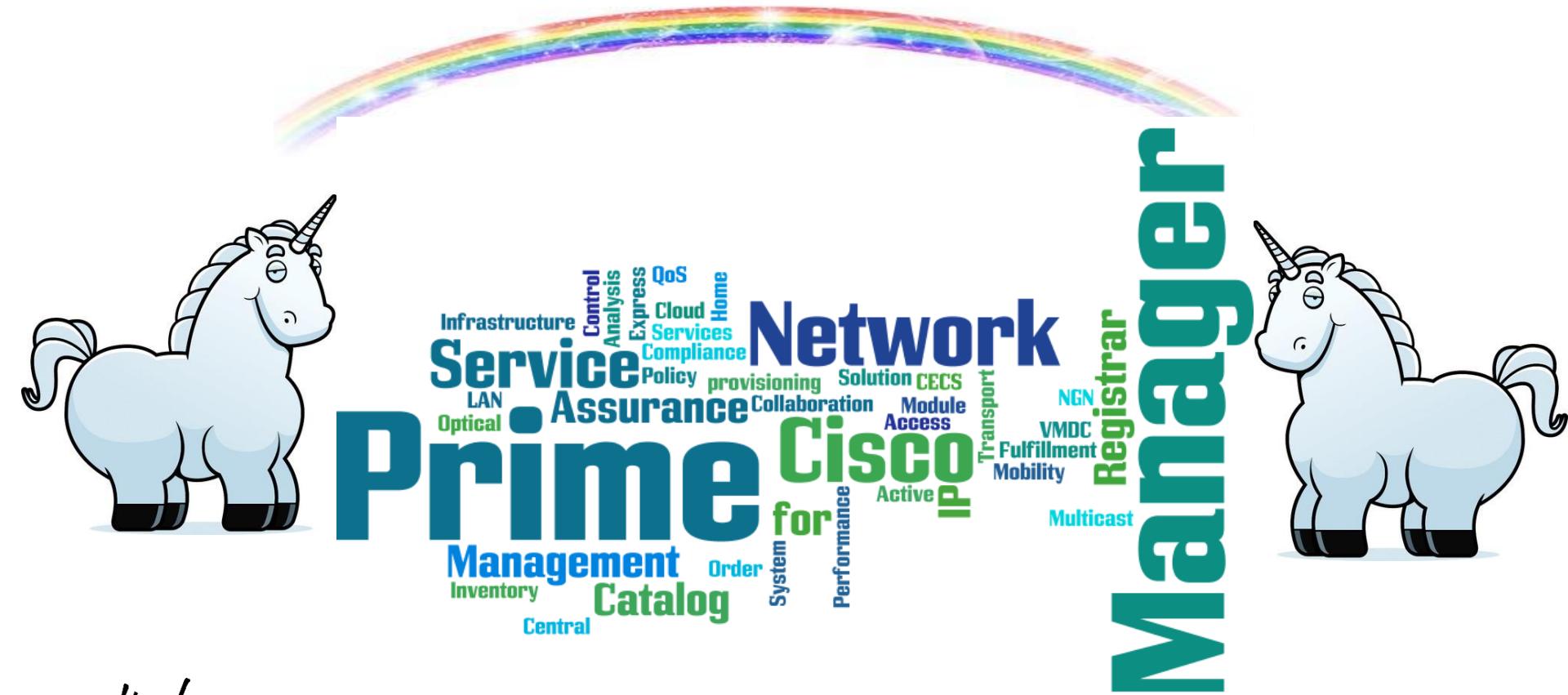
A History Of...



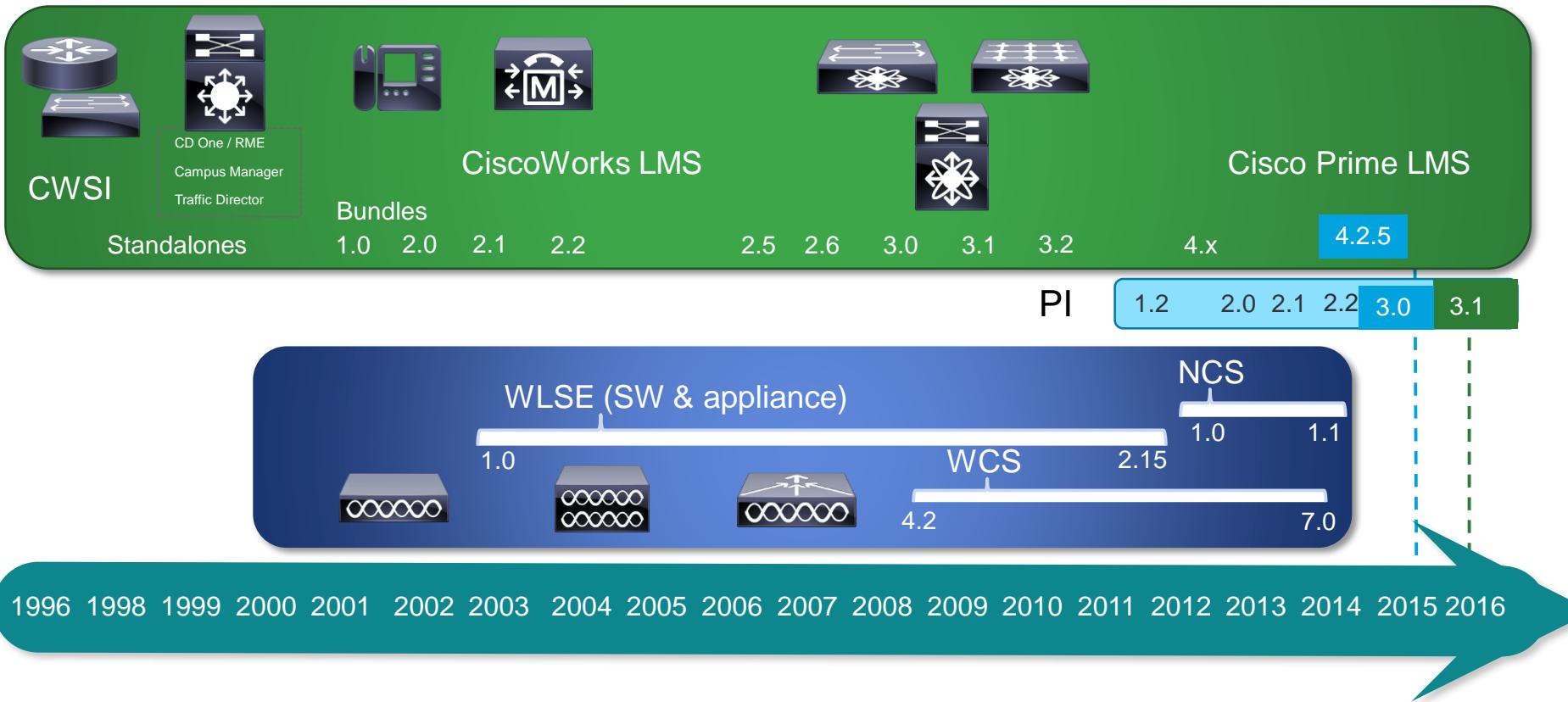
Content
CiscoWorks Monitor
CWSI VLANDirector
FlowTrafficDirector
AtmDirector **NETSYS**
CiscoView **CiscoWorksBlue**
nGenius **SwitchProbes**



And where we are now...

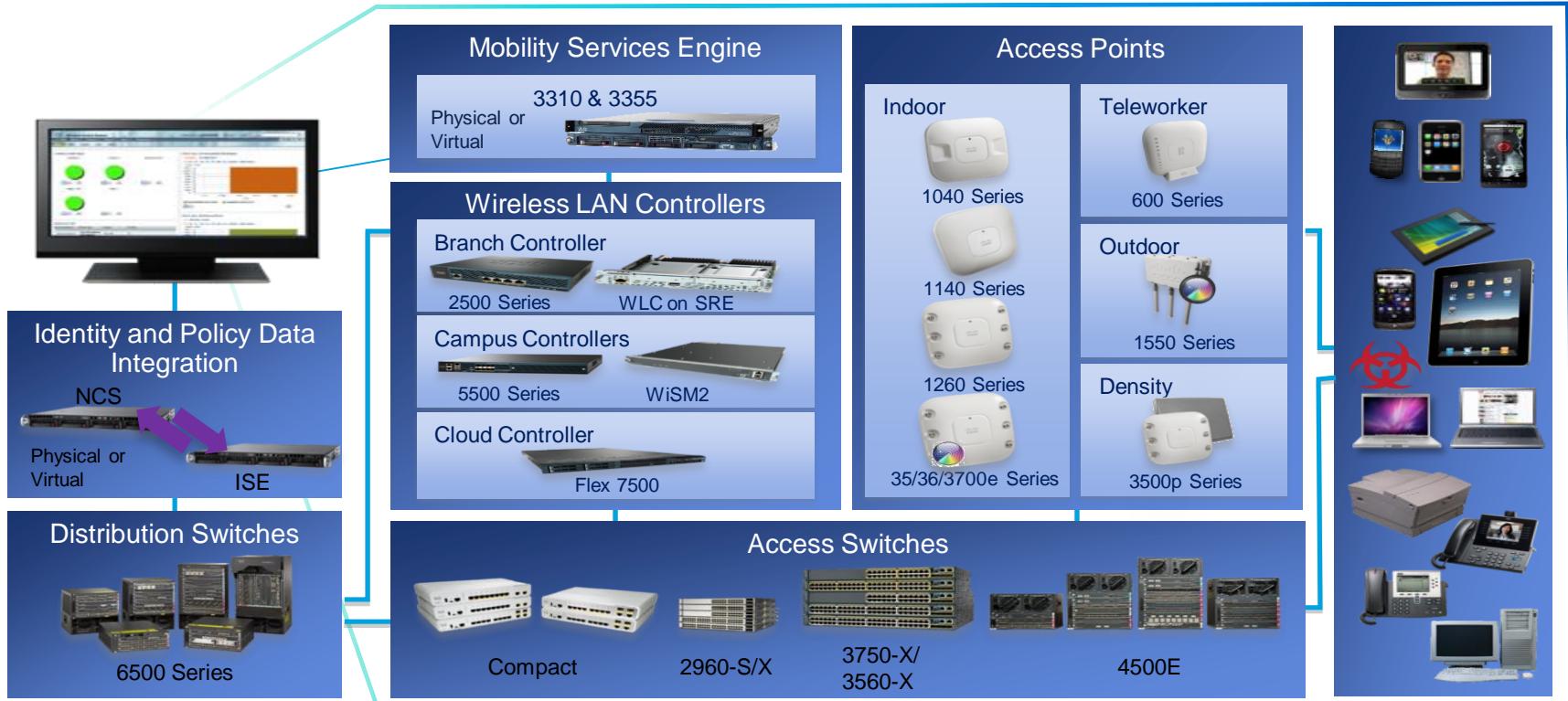


How Did We Get Here?



Cisco's One Network - Unified Access Portfolio

Control and Visibility for IT - Predictability for Users



Cisco Prime Infrastructure - Overview

Realizing the Vision of One Management



Operations Center

Centralized Visualization of Multiple PI Instances

Distributed

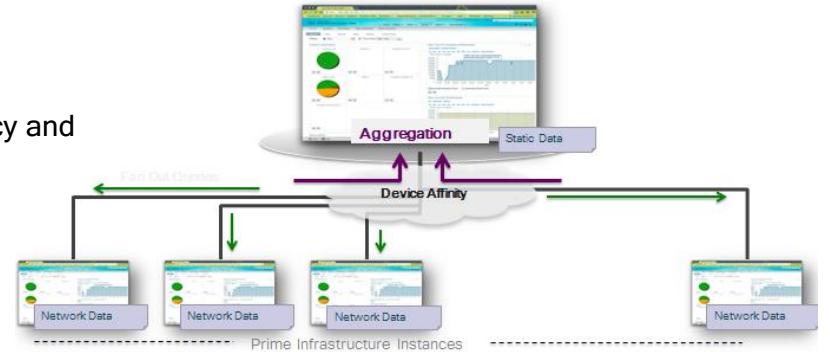
- Supports up to 10 Prime Infrastructure instances
- Addresses geographic distribution, scalability, resiliency and visibility
- Single pane of glass monitoring with click-through management

Centralized

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

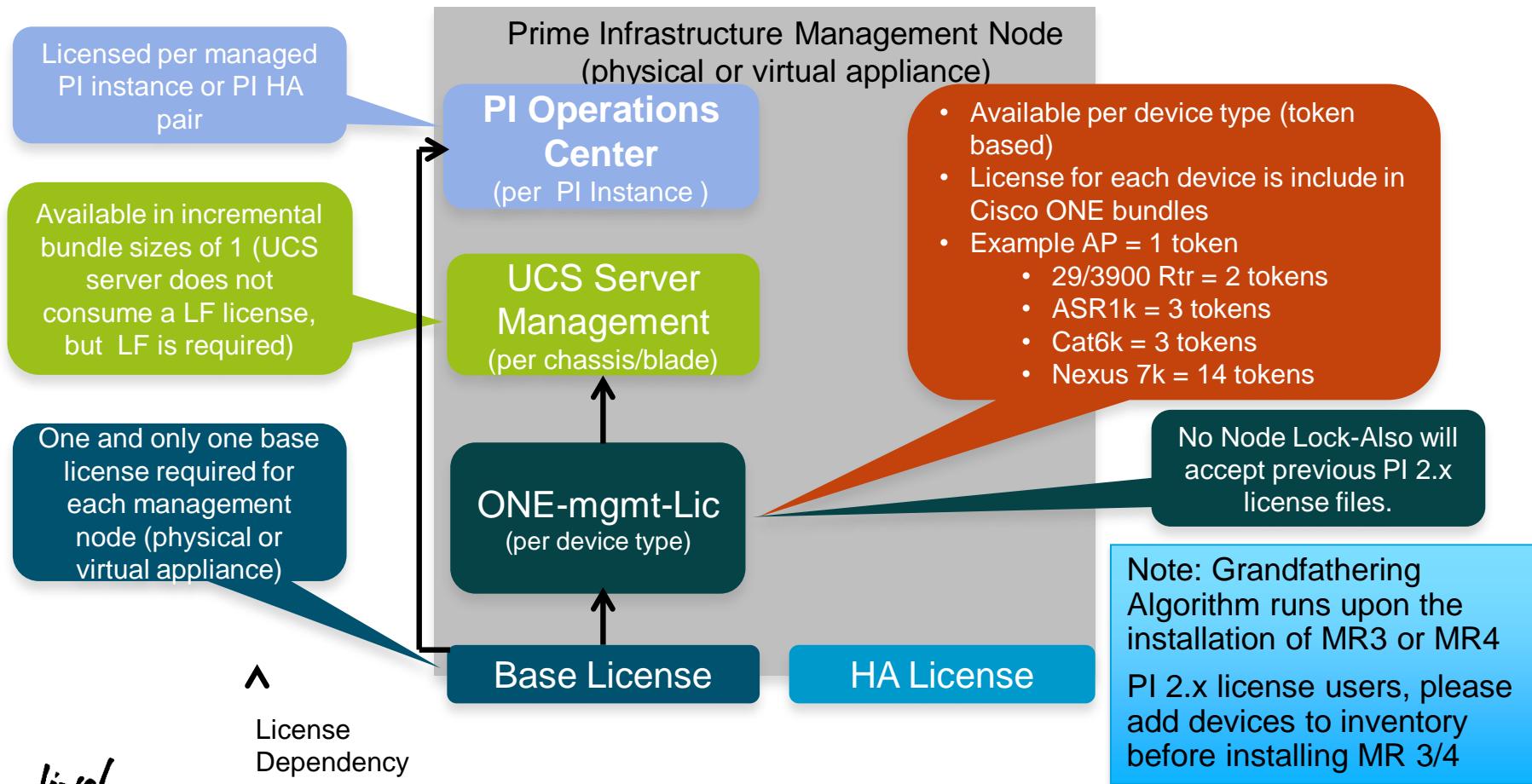
Scalable

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



Device 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	
BetaC1.example...	Reachable	172.23.208.204		Managed with ...		192.168.115.241	
Branch-WiFi	Reachable	172.20.122.122		Managed	Mon Jul 16 03:... 4.2.1	192.168.115.241	
IPM-1.002a	Reachable	171.69.217.77		Managed	Mon Jul 16 03:... 15.2(20111...)	192.168.115.241	
IPM-2500-2	Reachable	172.20.110.70		Managed with ...	12.1(2)PA1A3	192.168.115.241	
IPM-3560-2-test	Unreachable	172.20.110.72		Managed with ...	12.2(50)RE	192.168.115.241	
IPM-4500-R	Unreachable	172.20.110.73		Managed with ...	12.2(3)SN2A	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	
SAMS-9-DC-WAR2	Reachable	172.23.208.139		Managed	Mon Jul 16 03:... 4.3.1	172.25.119.210	
SAMS-NAM-1...	Reachable	172.23.208.187		Managed	Mon Jul 16 03:... 5.1(2)patch4	172.25.119.210	
SAMS-SJ-CE	Reachable	172.23.208.131		Managed with ...	Sun Jul 16 03:00:... 15.2(20111...)	172.25.119.210	
SAMS-SJ-CM.a...	Reachable	172.23.208.130		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(4)M	192.168.115.241	
test2345.exa...	Reachable	171.69.217.81		Managed with ...	15.1(2)T2	192.168.115.241	

Prime Infrastructure 3.1 License Model Overview

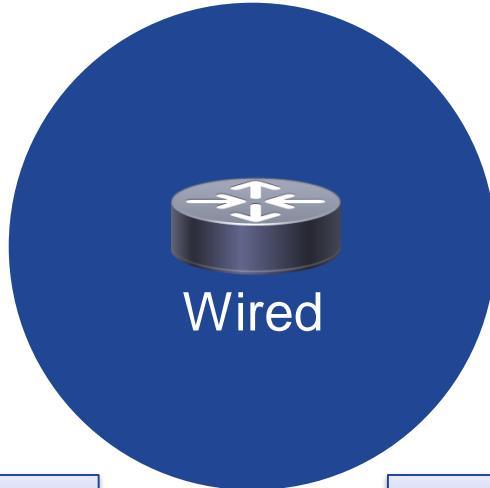


Why are we here?

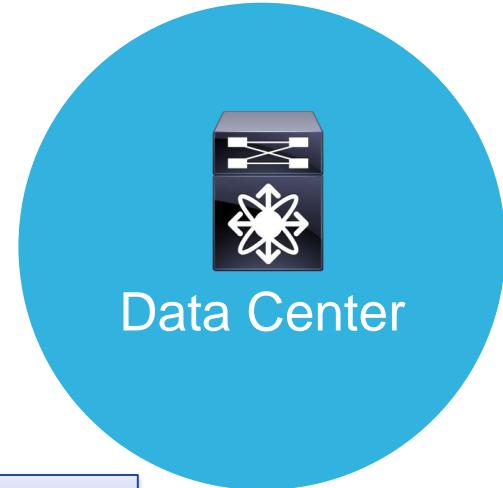
Realizing the Vision of One Management



Wireless



Wired



Data Center

Convergence

Consolidation





PI For Wired Management



Inventory



Configuration



Compliance



Monitoring and User Tracking



Software Management

The screenshot displays the Cisco Prime Infrastructure (PI) interface, specifically the Network Summary and Device Management sections.

Network Summary: Shows ICMP Reachability Status (All: 10, Reachable: 10, Unreachable: 0), Alarm Summary (69 Critical, 0 Major, 117 Minor), Unified AP Status (2 All, 1 Reachable, 1 Unreachable), Controller Status (18 All, 1 Reachable, 17 Unreachable), and System Health (0 Critical, 0 Major, 0 Minor).

Metrics: A large green circle indicates Tx: 0.20% and Rx: 0.20%.

Interface Utilization Summary: Shows utilization for Tx (0.20%) and Rx (0.20%) over various time frames.

Network Topology: A map showing network segments: Asia Pacific, Europe, North America, System Campus, and JNAC, connected via various routers and switches.

Device Groups: A list of device types including Cisco Interfaces and Modules, Cisco UCS Series, Router, Switches and Hub, Third Party Device, Unified AP, and Wireless Controller, with specific models like AMS-800-HW1-E-05, Cisco Nexus 7000, and Cisco Catalyst 3560.

Alarms & Events: Shows the latest 4000 alarms, including critical events such as "SW-TRUNK-BRN-3602-BER" and "PWR-PSU-3603-BER-1".

Device Details: A table listing device names, reachability, IP addresses, and other details for devices like "Cisco Nexus 7000 8-Port Smb" and "Cisco Catalyst 3560V2-E".

Walk Through

Finding Devices With Discovery

The screenshot shows the Cisco Prime Infrastructure interface for managing discovery jobs. On the left, under 'Discovery Jobs', there are two entries:

Name	Status	Start Time	End Time	Discovery Settings	Reachable	Filtered	Unreachable
Job_Discovery_5_19_55_136_PM_10_1_2...	RUNNING	2015-Dec-28 22:20:00		Discovery Settings			
Job_Discovery_16_38_46_657_1_10_2015	SUCCESS	2015-Oct-01 16:38:47	2015-Oct-01 17:38:47	MIMIC	2015-Oct-01 16:29:07	2015-Oct-01 16:29:07	

A modal window titled 'Discovery Settings' is open over the second job, showing a table with one row:

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

The 'Schedule' button in this modal is highlighted with a green circle.

Discovery Jobs Instances

Name
No data available

From Inventory → Discovery to go to the Discovery job page.

>>Difference from LMS<<

Multiple sets of discovery settings can be created and scheduled independently (think different schedules for work days/weekends).

Discovery Settings

Prime Infrastructure

Inventory / Device Management / Discovery

Discovery Jobs

Name
Job_Discovery_5_19_55_136_PM_10_1_2...
Job_Discovery_16_38_46_657_1_10_2015

Discovery Settings

*Name: coe_prod

Protocol Settings

PingSweep Module

Current Discovery Settings

PingSweep Module
Cisco Discovery Protocol
Credential Set

Layer 2 Protocols

Cisco Discovery Protocol
Link Layer Discovery Protocol

Advanced Protocols

Filters

IP Filter

Advanced Filters

Credential Settings

Credential Set
SNMPv2 Credential
SNMPv3 Credential
Telnet Credential
SSH Credential

Preferred Management IP

Save Run Now Cancel

This screenshot shows the 'Discovery Settings' configuration page in Cisco Prime Infrastructure. It includes sections for 'Protocol Settings' (PingSweep Module), 'Current Discovery Settings' (PingSweep Module, Cisco Discovery Protocol, Credential Set), 'Layer 2 Protocols' (Cisco Discovery Protocol, Link Layer Discovery Protocol), and 'Filters' (IP Filter). Below this is a 'Credential Settings' section listing 'Credential Set', 'SNMPv2 Credential', 'SNMPv3 Credential', 'Telnet Credential', and 'SSH Credential'. At the bottom are 'Save', 'Run Now', and 'Cancel' buttons.

Discovery settings share a number of similarities with LMS (in fact, it uses the same code). See <https://supportforums.cisco.com/document/33526/understanding-lan-management-solution-lms-discovery> for more on how discovery works.

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.

>>Difference from LMS<<

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

Credential Profiles

Prime Infrastructure Application Search 5 jevalent - ROOT-DOMAIN

Add Profile

Entering a valid value in either SNMP Read Community, or Protocol Username and Password in Telnet/SSH Parameters, or Protocol Username and Password in Http Parameter is required. *Indicates required fields

General Parameters

* Profile Name: jen1

Description:

SNMP Parameters

Version: v2c

SNMP Retries and Timeout

* Retries: 2

* Timeout: 10 (secs)

* SnmpPort: 161

* Read Community:

* Write Community:

* Confirm Read Community:

* Confirm Write Community:

Telnet/SSH Parameters

Protocol: Telnet

Telnet Timeout

* Timeout: 60 (secs)

Username:

Password:

Confirm Password:

Add, Import, Export, Oh My!

The screenshot shows the Cisco Prime Infrastructure Device Management interface. On the left, there's a sidebar with 'Device Groups' and a search bar. The main area is titled 'All Devices' and shows a table of network devices. At the top of the table are buttons for 'Delete', 'Edit', 'Sync', 'Groups & Sites', 'Add Device' (which is highlighted with a green box), 'Bulk Import', and 'Export Device'. The table columns include Device Name, Reachability, IP Address, DNS Name, Device Type, Admin Status, Last Inventory Collection Status, and Last Successful Coll. The table lists various Cisco devices like Nexus, 3750, and ASR routers. A large blue callout box on the right contains the text: 'Single-device add as well as bulk CSV import options exist.' and 'Export is a bit different from LMS. The export is compressed in a password-protected zip file.'

<input type="checkbox"/>	Device Name	Reachability	IP Address	DNS Name	Device Type	Admin Status	Last Inventory Collection Status	Last Successful Coll.
<input type="checkbox"/>	AMS-BXB-HWAE-1-95	✓	18.100.128.20	18.100.128.20	Third Party Device	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-CORE-2-47	✓	20.10.128.20	20.10.128.20	Cisco Nexus 7000 9-Slot Switch	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-DC1-N7K-3-79	✓	18.10.128.12	18.10.128.12	Cisco Nexus 7000 10-Slot Swi...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-LON-3750-SBR-31	✓	20.1.192.12	20.1.192.12	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-TSPM-SJ-P2C2R3-...	✓	15.111.128.4	15.111.128.4	Cisco 2951 Integrated Service...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-TSPM-SJ-P2C2R3-...	✓	20.200.192.4	20.200.192.4	Cisco 2951 Integrated Service...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-AMS-3650-SBR.cis...	✓	15.1.192.10	15.1.192.10	Cisco Catalyst 3650-24PD-E ...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-ASR1002-East-1-38	✓	20.10.128.2	20.10.128.2	Cisco ASR 1002-X Router	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-DEN-3650-SBR.cis...	✓	20.200.192.18	20.200.192.18				December 28, 2015
<input type="checkbox"/>	BSA-IWAN-BR-3945-86	✓	18.100.128.2	18.100.128.2				December 28, 2015
<input type="checkbox"/>	BSA-LON-4948-ABR2-22	✓	15.111.128.18	15.111.128.18				December 28, 2015
<input type="checkbox"/>	BSA-prime-asr9k-cluster...	✓	20.50.192.10	20.50.192.10				December 28, 2015
<input type="checkbox"/>	BXB-BSA-4431-RBR.cis...	✓	18.10.128.24	18.10.128.24				December 28, 2015
<input type="checkbox"/>	BXB-BXB-HP-A5120-37	✓	20.1.192.24	20.1.192.24				December 28, 2015
<input type="checkbox"/>	BXB-CORE-2-VPC-AGG...	✓	20.200.192.16	20.200.192.16				October 1, 2015 7:5
<input type="checkbox"/>	BXB-LA-4331-RBR.cisco...	✓	15.111.128.16	15.111.128.16				December 28, 2015
<input type="checkbox"/>	BXB-PAR-CT5760-1-53	✓	20.50.192.8	20.50.192.8				October 7, 2015 8:2
<input type="checkbox"/>	BXB-PAR-CTS5760-2-5	✓	15.1.192.8	15.1.192.8				October 7, 2015 8:2
<input type="checkbox"/>	CHN-ASR1002-East-1-2	✓	15.1.192.2	15.1.192.2	Cisco ASR 1002-X Router	Managed	Completed	December 28, 2015

Secure Local Export

The screenshot shows the Cisco Prime Infrastructure interface. On the left, there's a navigation tree with categories like Device Groups, All Devices, Device Type (Cisco Interfaces and Modules, Cisco UCS Series, Routers, Switches and Hubs, Third Party Device, Unified AP, Wireless Controller), Location, and User Defined. The main pane displays a list of network devices with columns for Device Name, Reachability, and IP Address. Several devices are selected, including AMS-DC1-N7K-3-79, AMS-LON-3750-SBR-31, and AMS-TSPM-SJ-P2C2R3... A context menu is open over these selected devices. In the center, a modal dialog titled "The Unarchiver" prompts for a password to open an archive named "ExportDevice.zip". Below it, another modal titled "Export Device" asks for a password to lock the export file. To the right, a table lists various devices with their status (Managed/Completed) and last updated date.

Device Name	Reachability	IP Address
AMS-BXB-HWAE-1-95	✓	18.100.128.20
AMS-CORE-2-47	✓	20.10.128.20
AMS-DC1-N7K-3-79	✓	18.10.128.12
AMS-LON-3750-SBR-31	✓	20.1.192.12
AMS-TSPM-SJ-P2C2R3...	✓	15.111.128.4
AMS-TSPM-SJ-P2C2R3...	✓	20.200.192.4
BSA-AMS-3650-SBR.cis...	✓	15.1.192.10
BSA-ASR1002-East-1-38	✓	20.10.128.2
BSA-DEN-3650-SBR.cis...	✓	20.200.192.1
BSA-IWAN-BR-3945-86	✓	18.100.128.2
BSA-LON-4948-ABR2-22	✓	15.111.128.1
BSA-prime-asr9k-cluster...	✓	20.50.192.10
BXB-BSA-4431-RBR.cis...	✓	18.10.128.24
BXB-BXB-HP-A5120-37	✓	20.1.192.24
BXB-CORE-2-VPC-AGG...	✓	20.200.192.16
BXB-LA-4431-RBR.cisco...	✓	15.111.128.16
BXB-PAR-CT5760-1-53	✓	20.50.192.8
BXB-PAR-CTS5760-2-5	✓	15.1.192.8
CHN-ASR1002-East-1-2	✓	15.1.192.2

You need to supply a password to open the archive "ExportDevice.zip".

Password encoding: Default encoding

Apply to all Stop Continue

Export Device

Enter a password to lock the exported file.

* Password: []

* Confirm Password: []

Export Close

Device Name	Status	Last Updated
Cisco 2951 Integrated Service...	Managed	Completed
Cisco 2951 Integrated Service...	Managed	Completed
Cisco Catalyst 3650-24PD-E ...	Managed	Completed
Cisco ASR 1002-X Router	Managed	Completed
Cisco Catalyst 3650-24PD-E ...	Managed	Completed
Cisco 3945E Integrated Servi...	Managed	Completed
Cisco Catalyst 4948 10 Gigabi...	Managed	Completed
Cisco ASR 9006 Router	Managed	Partial Collection Failure
Cisco 4431 Integrated Service...	Managed	Completed
Third Party Device	Managed	Completed
Cisco Nexus 7000		
Cisco 4331 Inte...		
Cisco 5760 Wireless		
Cisco 5760 Wireless		
Cisco ASR 1002-X		

Export CSV (with credentials) is exported to the client machine and must be uncompressed with a utility that understands password-protected files.

Prime Inventory

LMS – Device Credential Repository.
PI 2.1 – Device Work Center.

2.2 → 3.x Now called Network Devices

Inventory > Device Management > Network Devices

Prime Infrastructure

Inventory / Device Management / Network Devices

Device Groups

All Devices

<input type="checkbox"/>	Device Name	Reachability	IP Address	DNS Name	Device Type	Admin Status	Last Inventory Collection Status	Last Successful Coll	
<input type="checkbox"/>	AMS-BXB-HWAE-1-95		18.100.128.20		18.100.128.20	Third Party Device	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-CORE-2-47		20.10.128.20		20.10.128.20	Cisco Nexus 7000 9-Slot Switch	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-DC1-N7K-3-79		18.10.128.12		18.10.128.12	Cisco Nexus 7000 10-Slot Swi...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-LON-3750-SBR-31		20.1.192.12		20.1.192.12	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-TSPM-SJ-P2C2R3-...		15.111.128.4		15.111.128.4	Cisco 2951 Integrated Service...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	AMS-TSPM-SJ-P2C2R3-...		20.200.192.4		20.200.192.4	Cisco 2951 Integrated Service...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-AMS-3650-SBR.cis...		15.1.192.10		15.1.192.10	Cisco Catalyst 3650-24PD-E ...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-ASR1002-East-1-38		20.10.128.2		20.10.128.2	Cisco ASR 1002-X Router	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-DEN-3650-SBR.cis...		20.200.192.18		20.200.192.18	Cisco Catalyst 3650-24PD-E ...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-IWAN-BR-3945-86		18.100.128.2		18.100.128.2	Cisco 3945E Integrated Servi...	Managed	Completed	December 28, 2015
<input type="checkbox"/>	BSA-LON-4948-ABR2-22		15.111.128.18		15.111.128.18				December 28, 2015
<input type="checkbox"/>	BSA-prime-asr9k-cluster...		20.50.192.10		20.50.192.10				December 28, 2015
<input type="checkbox"/>	BXB-BSA-4431-RBR.cis...		18.10.128.24		18.10.128.24				December 28, 2015
<input type="checkbox"/>	BXB-PAR-CTS5760-2-5		15.1.192.8		15.1.192.8				October 1, 2015 7:52
<input type="checkbox"/>	CHN-ASR1002-East-1-2		15.1.192.2		15.1.192.2	Cisco ASR 1002-X Router	Managed	Completed	December 28, 2015

Drilling Into A Device

The screenshot shows the Cisco Prime Infrastructure interface for a device named BSA-ASR1002-East-1-38. The left sidebar has a tree view under 'System' with 'Summary' selected. The main content area has tabs for 'Device Details', 'Configuration', 'Applied/Scheduled Templates', 'Configuration Archive', and 'Image'. The 'Device Details' tab is active, displaying the 'Summary' page. It includes sections for General information (IP Address/DNS Name: 20.10.128.2, Device Name: BSA-ASR1002-East-1-38, Device Type: Cisco ASR 1002-X Router, Up Time: 3 hrs 2 mins 6 secs, Reachability Status: Reachable), Location (Contact: Testing Contact), and CPU Utilization (Avg. CPU Utilization: 100%). There are also sections for Unique Device Identifier (UDI) and Inventory (Software Version: 15.4(3)S, Model No.: ASR1002-X). The bottom panel shows Port Summary (Number of Ports Up: 4, Number of Ports Down: 0) and Memory Utilization.

When a single device is checked, the bottom panel shows the device details, including health and inventory. Think of LMS Device Center.

(3.x) Because 3.x supports multi-select editing, you have to click on a device name to drill into a device.

Device Groups In PI

The screenshot shows the Cisco Prime Infrastructure interface. On the left, there's a sidebar with navigation links like 'Inventory / Device Management / Network Devices'. Below it, a 'Device Groups' section lists categories: 'All Devices', 'Device Type', 'Location', and 'User Defined'. A green line highlights the 'User Defined' section. The main content area shows a table of 'All Devices' with columns for 'Device Name', 'Reachability', and 'IP Address'. Another green line highlights the first few rows of this table. To the right, a modal window titled 'Device Groups' is open, featuring a search bar and four sections: 'All Devices', 'Device Type', 'Location', and 'User Defined'. A large blue callout box is overlaid on the bottom right of the modal, containing the text: 'Device groups work very much like they did in LMS. Both static and dynamic sets of user-defined groups can be created from Network Devices'. The background shows a list of inventory collection status entries.

Last Inventory Collection Status	Last Successful Coll
Completed	December 28, 2015
Partial Collection Failure	December 28, 2015
Completed	December 28, 2015
Completed	December 28, 2015
Wrong CLI Credentials	October 1, 2015 7:5
Completed	December 28, 2015
Completed	October 7, 2015 8:2
Completed	October 7, 2015 8:2
Completed	December 28, 2015

Creating A New Group

To add a new group, mouse-over the “i” next to User Defined and click Add SubGroup.

To add a new group, mouse over the + next to User Defined and click Add SubGroup.

The screenshot shows the Cisco Prime Infrastructure interface for managing network device groups. The left sidebar includes navigation links for Device Groups, Device Type, Location, and User Defined. Under User Defined, there is a summary table with columns for Name, Description, Type, No. of Members, and No. of SubGroups. The 'Actions' column contains a link 'Add SubGroup' which is highlighted with an orange box. The main content area displays a table of devices with columns for Device Name, IP Address/DNS, and Device Type. Each row in the table has a checkbox in the first column. The table lists various Cisco devices such as Nexus switches, Catalyst switches, and ASR routers, along with some third-party devices.

	Device Name	IP Address/DNS	Device Type
<input type="checkbox"/>	BSA-ASR1002-East-1-38	20.10.128.2	Cisco ASR 1002-X Router
<input type="checkbox"/>	BSA-DEN-3650-SBR.cisco.com-70	20.200.192.18	Cisco Catalyst 3650-24PD-E Switch
<input type="checkbox"/>	BSA-IWAN-BR-3945-86	18.100.128.2	Cisco 3945E Integrated Services Router G2
<input type="checkbox"/>	BSA-LON-4948-ABR2-22	15.111.128.18	Cisco Catalyst 4948 10 Gigabit Ethernet Switch
<input type="checkbox"/>	BSA-prime-asr9k-cluster-54	20.50.192.10	Cisco ASR 9006 Router
<input type="checkbox"/>	BXB-BSA-4431-RBR.cisco.com-85	18.10.128.24	Cisco 4431 Integrated Services Router
<input type="checkbox"/>	BXB-BXB-HP-A5120-37	20.1.192.24	Third Party Device
<input type="checkbox"/>	BXB-CORE-2-VPC-AGG-2-69	20.200.192.16	Cisco Nexus 7000 9-Slot Switch
<input type="checkbox"/>	BXB-LA-4331-RBR.cisco.com-21	15.111.128.16	Cisco 4331 Integrated Services Router
<input type="checkbox"/>	BXB-PAR-CT5760-1-53	20.50.192.8	Cisco 5760 Wireless LAN Controller
<input type="checkbox"/>	BXB-PAR-CTS5760-2-5	15.1.192.8	Cisco 5760 Wireless LAN Controller
<input type="checkbox"/>	CHN-ASR1002-East-1-2	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 (highlighted with a red arrow)

Device Name:

No data available

Add Devices

Filter by: All Devices

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	10.160.354.241

Save Cancel

Selected 0 / Total 0

Show Quick Filter

Specifying 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 S

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 shows the 'Add Location SubGroup' screen. The 'Group Name' field is set to 'San Jose' and the 'Parent Group' is 'West Coast'. The 'Geographical Location' checkbox is checked, and the 'Civic Location' radio button is selected, with the address '170 W Tasman Dr, San Jose, California 95134, United S' displayed. Below this, there's a section for 'Add Devices Dynamically' with three conditions: 'And' (Location(sysLocation) contains 'San Jose'), 'Or' (City contains 'San Jose'), and another 'Or' (Device Name contains 'SJC'). At the bottom are 'Save' and 'Cancel' buttons.

Viewing The Group Members

The screenshot shows the Cisco Prime Infrastructure Network Devices interface. On the left, a sidebar lists device groups: All Devices, Device Type (Cisco Interfaces and Modules, Cisco UCS Series, Routers, Switches and Hubs, Third Party Device, Unified AP, Wireless Controller), Location, and User Defined. A 'Test_Switches' group is selected. The main pane displays the members of this group:

Device Name	Reachability	IP Address	DNS Name	Device Type	Admin Status	Last Inventory Collection Status	Last Successful Coll
AMS-LON-3750-SBR-31	✓	20.1.192.12	20.1.192.12	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM
DAL-3750-PHY-1-46	✓	20.10.128.18	20.10.128.18	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM
IND-FL4-3750S-1-83	✓	18.10.128.20	18.10.128.20	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM
IWAN-DC-FL4-3750S-1-12	✓	15.1.192.22	15.1.192.22	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM
NYC-BXB-3750-SBR.cis...	✓	20.200.192.14	20.200.192.14	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM
NYC-LON-3750-SBR-100	✓	18.100.128.30	18.100.128.30	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM
RTP-3750-PHY-1-48	✓	20.10.128.22	20.10.128.22	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM
RTP-3750-PHY-1-96	✓	18.100.128.22	18.100.128.22	Cisco 3750 Stackable Switches	Managed	Completed	December 28, 2015 10:30 AM

A tooltip for 'Test_Switches' provides the following details:

- Name: Test_Switches
- Description:
- Type: Device
- No. of Members: 8 Direct, 0 Children
- No. of SubGroups: 0 Total (0 Direct, 0 Children)
- No. of Rules: 2

Actions available are Add SubGroup, Edit Group, Delete Group, and Duplicate Group.

Under Network Devices, select the group from the Device Group tree to display the members in Inventory window. These groups will also be available in the various PI device selectors.

Inventory Collection

The screenshot shows the 'Inventory / Device Management / Network Devices' page in Cisco Prime Infrastructure. On the left, there's a sidebar with 'Device Groups' and a search bar. The main area shows a table of network devices with columns for Device Name, Reachability, IP Address, DNS Name, Type, Status, and Last Synced. A red box highlights the 'Sync' button at the top of the table header. The table lists various devices, including Cisco Nexus and Catalyst switches, along with their respective IP addresses and sync status.

Device Name	Reachability	IP Address	DNS Name	Type	Status	Last Synced
AMS-BXB-HWAE-1-95	✓	18.100.128.20	18.100.128.20	Third Party Device	Managed	Completed
AMS-CORE-2-47	✓	20.10.128.20	20.10.128.20	Cisco Nexus 7000 9-Slot Switch	Managed	Completed
AMS-DC1-LNK-3-79	✓	18.10.128.12	18.10.128.12	Cisco Nexus 7000 10-Slot Swi...	Managed	Completed
AMS-LON-3750-SBR-31	✓	20.1.192.12	20.1.192.12	Cisco 3750 Stackable Switches	Managed	Completed
AMS-TSPM-SJ-P2C2R3-...	✓	15.111.128.4	15.111.128.4	Cisco 2951 Integrated Service...	Managed	Completed
AMS-TSPM-SJ-P2C2R3-...	✓	20.200.192.4	20.200.192.4	Cisco 2951 Integrated Service...	Managed	Completed
BSA-AMS-3650-SBR.cis...	✓	15.1.192.10	15.1.192.10	Cisco Catalyst 3650-24PD-E ...	Managed	Completed
BSA-ASR1002-East-1-38	✓	20.10.128.2	20.10.128.2	Cisco ASR 1002-X Router	Managed	Completed
BSA-DEN-3650-SBR.cis...	✓	20.200.192.18	20.200.192.18	Cisco Catalyst 3650-24PD-E ...	Managed	Completed
BSA-IWAN-BR-3945-86	✓	18.100.128.2	18.100.128.2	Cisco 3945E Integrated Servi...	Managed	Completed
BSA-LON-4948-ABR2-22	✓	15.111.128.18	15.111.128.18	Cisco Catalyst 4948 10 Gigabi...	Managed	Completed

Inventory Collection is launched using the Sync button from Network Devices. It is collected via SNMP, Telnet, and SSH.

Multiple devices can be synced at one time.

Inventory Reporting

Prime Infrastructure Application Search 5 jevalent - ROOT-DOMAIN

Reports / Reports / Report Launch Pad

Device

Autonomous AP
CleanAir
Client
Compliance
Composite
Device
Ethernet Port Utilization
AP Image Pre-download
AP Profile Status
AP Radio Downtime Summary
AP Summary
AP Utilization
Busiest APs
CPU Utilization
Classmap QOS Statistics
Detailed Hardware
Detailed Software
Device Credential Verifica...
Device Health
Dmvpn Reports
GET VPN Network Status
Identity Capability
Interface Availability
Interface Capacity
Interface Utilization
Inventory
Memory Utilization

Report Launch Pad

Autonomous AP
Autonomous AP Memory and CPU Utilization
Autonomous AP Summary
Autonomous AP Tx Power and Channel
Autonomous AP Uptime
Autonomous AP Utilization
Busiest Autonomous APs

CleanAir
Air Quality vs Time
Security Risk Interferers
Worst Air Quality APs
Worst Interferers

Client
Busiest Clients
CCX Client Statistics
Client Count
Client Sessions
Client Summary
Client Traffic
Client Traffic Stream Metrics
Dormant Clients
Mobility Client Summary
Posture Status Count
Throughput
Unique Clients
Unique Clients and Users Summary

Compliance
Change Audit
Network Discrepancy
PCI DSS Detailed

Guest
Guest Accounts Status
Guest Association
Guest Count
Guest User Sessions
PI Guest Operations

Identity Service Engine (open in a new window)
Endpoint Authentication Summary
Endpoint Profiler Summary
Posture Detail Assessment
Top N Endpoint Authorizations
Top N User Authorizations
User Authentication Summary

Mesh
Alternate Parent
Link Stats
Nodes
Packet Stats
Stranded APs
Worst Node Hops

Network Summary
802.11n Summary
Preferred Calls
Wireless Network Executive Summary

Performance
802.11 Counters
AP RF Quality
AP RF Quality History
Application Summary

PI unifies all reports under The Report Launch Pad. For inventory reports, expand the Device section.

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 Interfac
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)M5, 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			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(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 Cisco IOS Software, 2800			FTX1017A1KY	cevChassis2811	122.24	110
Cisco 2800 Series Integrated Services Routers	COE-RMS1.cisco.dod.mil	2015-Apr-01, 22:00:30 EST				FTX1105A1TG	cevChassis2811		

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



TIP: The Wired Detailed Device Inventory report will feel very familiar.

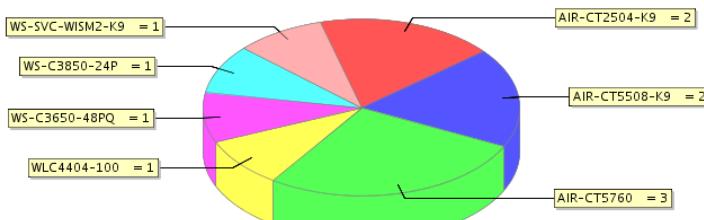
Asset Management with Prime Infrastructure

Device Inventory Reports

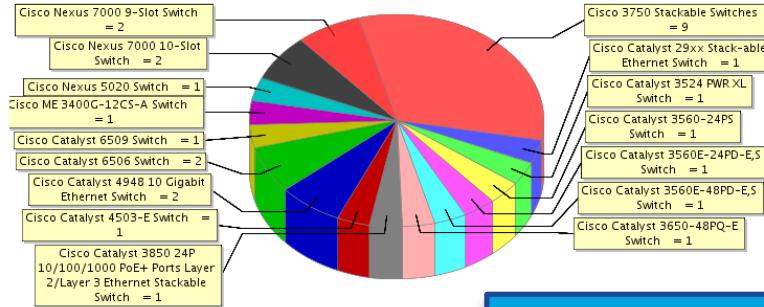
Count of Controllers by Model

Model Name	Number of Controllers
AIR-CT2504-K9	2
AIR-CT5508-K9	2
AIR-CT5760	3
WLC4404-100	1
WS-C3650-48PQ	1
WS-C3850-24P	1
WS-SVC-WISM2-K9	1

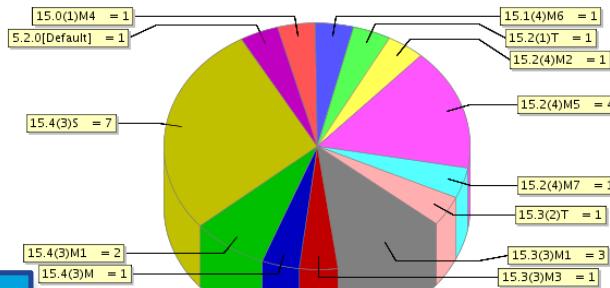
Controllers by Model



Count of Routers by Version



Count of Switches by Model



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 4331 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

Composite Reports

Ability to combine multiple reports into a single report

The screenshot shows the 'Settings' page for creating composite reports. On the left, under 'Available Reports', several options like AP Summary, AP Ethernet Port UtilizationAP, and AP Radio Downtime Summary are listed. Under 'Report By', criteria for AP Summary and AP Ethernet Port UtilizationAP are defined. In the center, a red box highlights the 'Selected Reports' section containing 'AP Summary' and 'AP Ethernet Port UtilizationAP'. To the right, the 'Schedule' section is shown, allowing for export format (CSV) and destination (File or Email), along with a start date/time (05/07/2015 12:00) and recurrence options.

Settings

Report Title

Report Category

Available Reports

- AP Ethernet Port UtilizationAP
- AP Image Pre-download
- AP Radio Downtime Summary
- AP Summary
- Alternate Parent
- Autonomous AP Summary
- Autonomous AP Uptime
- Detailed Hardware

Report By

AP Summary Report By

AP Summary Report Criteria

AP Ethernet Port UtilizationAP Report By

AP Ethernet Port UtilizationAP Report Criteria

Selected Reports

- AP Summary
- AP Ethernet Port UtilizationAP

Schedule

Scheduling

Export Format

Destination

Start Date/Time

Recurrence

Exporting Reports

Report Run Result

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 Interfac
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)M5, 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			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			FTX1017A1KY	c...		



Scheduled reports can be automatically exported to CSV or PDF, while reports viewed in the browser can be displayed in Printer Friendly mode and printed or saved.

TrustSec Readiness Assessment

Services / TrustSec / Readiness Assessment ★

TrustSec Overview TrustSec Readiness

Enforcement Enforce traffic policy based on the SGT via a Secure Group ACL (SGACL on switches, routers) or Security group firewall (SGFW)
44 %
12 devices of 27 are capable of doing Enforcement.

Classification Classify and propagate Security Group Tag. Dynamic classification is based on identity/context with 802.1X, MAB, or Web Auth; Static is mapped to IP, subnet, VLAN, or interface. Propagation is through SGT tagging in the packet or SGT Exchange Protocol (SXP).
56 %
15 devices of 27 are capable of doing Classification.

TrustSec Incapable No classification, propagation, or enforcement capabilities exist for these devices based on TrustSec Release 5.3 validated product software versions.
44 %
12 devices out of 27 are not capable of TrustSec. Hardware and Software upgrade may be required.

Total 27

Device Name	Categories	IP Address	▲	Feature	SGT Classification...	SXP Support	SGT Tagging	SGT Enforcement	Current Running Version
TEST-RTR4331	Cisco 4331...	10.0.8.2		TrustSec Incapable					15.4(3)S1
3560-DC-1	Cisco Catal...	10.0.252.4		TrustSec Incapable					12.2(52)SE
VSS-CAT6800-dist	Cisco Catal...	10.0.255.41		Classification & Enf...	Dynamic, IP to SGT...	Speaker, Listener V...	SGT over Ethernet; ...	SGACL (IPv4, IPv6)	15.1(2)SY3
ASR1K-CORE1	Cisco ASR ...	10.0.255.42		Classification & Enf...	IP to SGT, Subnet t...	Speaker, Listener V4	SGT over Ethernet, ...	SG Firewall PBR	03.16.02.S
ASR1K-CORE2	Cisco ASR ...	10.0.255.52		Classification & Enf...	IP to SGT, Subnet t...	Speaker, Listener V4	SGT over Ethernet, ...	SG Firewall PBR	03.16.02.S
LA-3650	Cisco Catal...	10.2.1.2		TrustSec Incapable					03.03.04SE
LA-RTR4331-IWAN	Cisco 4331...	10.2.255.1		TrustSec Incapable					15.5(3)S2
TEST-SW3650	Cisco Catal...	10.8.1.2		TrustSec Incapable					03.03.04SE
AMS-ASR1K-MPLS	Cisco ASR ...	10.11.1.1		Classification & Enf...	IP to SGT, Subnet t...	Speaker, Listener V4	SGT over Ethernet, ...	SG Firewall	03.16.02.S
AMS-WLC5508	Cisco 5508...	10.11.200.1		Classification	Dynamic	Speaker V2			8.1.131.0

Configuration Management

- PI offers configuration archive services
 - Multiple revisions
 - Compare between revisions and devices
 - Spot out of sync running and startup
- Wizard-based configuration forms to help enable and customize certain features
- Flexible templates to design your own configuration tasks
- Separation between network architect and engineer roles

Preparing The Configuration Archive

The screenshot shows the Cisco Prime Infrastructure interface. On the left, a sidebar lists 'System Settings', 'Inventory' (with 'Configuration Archive' highlighted), and 'Alarms and Events'. The main panel is titled 'Inventory Configuration Archive' and contains tabs for 'Basic' and 'Advanced'. Under 'Basic', there are several configuration options:

- Timeout(ms): 360000
- Summary refresh hold-off time(min): 30
- Thread pool count: 10
- Archive Configuration out-of-box?
- Archive Configuration after Inventory Sync?
- Archive Configuration on receiving configuration change events?
- Hold Off Timer(min): 10
- Mask security content while exposing configuration
- Max. configuration archives: 5
- Max. days retained: 7

At the bottom are 'Save' and 'Reset' buttons.

Callouts provide instructions:

- A blue callout points to the 'Archive Configuration out-of-box?' checkbox with the text: "Archive the config as soon as the device is added."
- A blue callout points to the 'Max. configuration archives' and 'Max. days retained' fields with the text: "Listen for config change syslog messages."
- A blue callout points to the 'Hold Off Timer(min)' field with the text: "NEW!! Set a hold-off timer to prevent config fetch loops on certain platforms"

Viewing The Configuration Archive

The screenshot shows the Cisco Prime Infrastructure interface. At the top, there's a navigation bar with 'Prime Infrastructure' and a search bar. Below it, a breadcrumb trail shows the path: ... / Network Devices / Device Groups / All Devices / 3750E-switch.amer.cisco.com. A blue callout box on the right contains the text: "Click the Configuration Archive tab in Device Group>Device Details page to see archived configurations for the selected device." The main content area has tabs: Device Details, Configuration, Applied/Scheduled Templates, Configuration Archive (which is highlighted in blue), and Image. Below the tabs, a message says "Startup/Running Mismatch: No". A toolbar above the table includes buttons for Schedule Rollback, Schedule Overwrite, Edit Tag, Schedule Archive (which is highlighted in blue), and Schedule Deploy. To the right of the table, there are buttons for Show, Quick Filter, and a search icon. The table itself has columns: Date, Created By, Tag, Description, and Out of band. The data rows are:

	Date	Created By	Tag	Description	Out of band
<input type="radio"/>	► October 3, 2015 10:10:18 PM EDT	Syslog		Archived by syslog	Yes
<input type="radio"/>	► September 28, 2015 10:10:48 PM EDT	Syslog		Archived by syslog	Yes
<input type="radio"/>	► September 21, 2015 10:10:58 PM EDT	Syslog		Archived by syslog	Yes
<input type="radio"/>	► August 11, 2015 2:41:05 PM EDT	Syslog		Archived by syslog	Yes
<input type="radio"/>	► July 6, 2015 9:57:24 AM EDT	Inventory		Initial version	

Configuration List

Each of the archived configurations are listed individually. Click on the configuration name to view it in both processed and raw formats.

Prime Infrastructure

... / Network Devices / Device Groups / All Devices / 3750E-switch.amer.cisco.com

Device Details Configuration Applied/Scheduled Templates Configuration Archive Image

Startup/Running Mismatch: No

Archive Details

Schedule Rollback Schedule Overwrite Edit Tag Schedule Archive Schedule Deploy Show Quick Filter

Date	Software Version	Created By	Tag	Description	Out of band
January 18, 2017 10:10:06 PM EST	12.2(58)SE2	Syslog		Archived by syslog. There a...	Yes
Running Configuration		Startup Configuration		Admin Configuration	
Configurations	Details	Startup and running Config are same		There is no Admin configuration available for this Device	Vlan Configuration
Compare	Previous Other Version Other Device			Configurations	Details
Compare				Compare	Binary file comparison is not supported
January 16, 2017 10:10:06 PM EST	12.2(58)SE2	Syslog	Archived by syslog. There a...	Yes	
January 12, 2017 10:10:05 PM EST	12.2(58)SE2	Syslog	Archived by syslog. There a...	Yes	
October 11, 2016 12:32:35 PM EDT	12.2(58)SE2	Syslog	Archived by syslog	Yes	
October 10, 2016 10:10:07 PM EDT	12.2(58)SE2	Syslog	Archived by syslog. There a...	Yes	

Running Configuration



Configuration Details: 3750E-switch.amer.cisco.com / Running Configuration / October 3, 2015 10:10:18 PM EDT

Processed Configuration

Raw Configuration

Configlets



All

Global

IP

IP Global

EnergyWise

Crypto

Spanning Tree

Vlan

Vlan Global

Interface

IP Global

```
ip routing
ip domain-name amer.cisco.com
ip http server
ip http secure-server
ip route 0.0.0.0 0.0.0.0 172.16.50.254
ip route 172.16.50.245 255.255.255.255 172.16.50.254
```

Export

Close

Scheduling Configuration Archive

The archive can be updated on a per-device basis.

Device Details Configuration Applied/Scheduled Templates Configuration Archive Image

Startup/Running Mismatch: No

Archive Details

Schedule Rollback Schedule Overwrite Edit Tag **Schedule Archive** Schedule Deploy

	Date	Software Version	Created By	Tag	Description	Out of band
<input type="radio"/>	January 18, 2017 10:10:06 PM EST	12.2(58)SE2	Syslog		Archived by syslog. There a...	Yes
Running Configuration			Startup Configuration		Admin Configuration	
Configurations Details			Startup and running Config are same		There is no Admin configuration available for this Device	
Compare Previous Other Version Other Device					Vlan Configuration	
					Configurations Details	
					Compare Binary file comparison is not supported	
<input type="radio"/>	▶ January 16, 2017 10:10:06 PM EST	12.2(58)SE2	Syslog		Archived by syslog. There a...	Yes
<input type="radio"/>	▶ January 12, 2017 10:10:05 PM EST	12.2(58)SE2	Syslog		Archived by syslog. There a...	Yes
<input type="radio"/>	▶ October 11, 2016 12:32:35 PM EDT	12.2(58)SE2	Syslog		Archived by syslog	Yes
<input type="radio"/>	▶ October 10, 2016 10:10:07 PM EDT	12.2(58)SE2	Syslog		Archived by syslog. There a...	Yes

Scheduling Configuration Archive (cont.)

The screenshot shows the Cisco Prime Infrastructure interface for managing network devices. The top navigation bar includes 'Prime Infrastructure', 'Application Search', notification icons (28), and 'root - ROOT-DOMAIN'. The current page is 'Network Devices / Device Groups / All Devices / 3750E-switch.amer.cisco.com'. The 'Configuration Archive' tab is selected in the top menu. A message 'Startup/Running Mismatch: No' is displayed. On the left, there's a sidebar for 'Running Configuration' with options like 'Configurations', 'Details', 'Compare', and 'Previous | Other V...'. Below it is a list of configuration snapshots. A central modal dialog titled 'Schedule Configuration Archive' is open, containing fields for 'Job Name' (set to 'Job_Config-Archive_4_13_41_795_PM_1_11_2016'), 'Start Time' (set to 'Now' at '01/11/2016 04:13 PM'), and 'Recurrence' (set to 'None'). A note at the bottom of the dialog says 'Comparison is not supported'.

Note: just like in LMS, the configuration will not actually be archived unless an interesting change is detected.

Comparing Configs

The screenshot shows the Cisco Prime Infrastructure Configuration Archive interface. On the left, there's a sidebar titled "Available Devices" with a search bar and filters for "Groups", "All Devices", "Device Type", "Location", and "User Defined". The main area displays a table of devices with columns: Name, IP Address, Date, and Created By. Three devices are listed:

Name	IP Address	Date	Created By
4948-Switch.amer.cis...	172.16.50.253	July 19, 2015 1:07:37 PM EDT	Syslog
3750E-switch.amer.ci...	172.16.50.248	August 11, 2015 2:41:05 PM EDT	Syslog

A blue callout box on the right says: "Configurations can be compared between versions and between other devices." Another blue callout box below it says: "Select another device and its configuration revision and type from the device selector." At the bottom right are "Compare" and "Close" buttons.

Configuration Diffs

Configuration Comparison

Processed Configuration Raw Configuration

Configlets

- ▼ Configlets
 - Difference Only
- ▼ All
 - Global
 - Vrf
 - Flow
 - IP
 - EnergyWise
 - Spanning Tree
 - Vlan
 - Interface

4503E-switch.amer.cisco.com / Running
Configuration / July 19, 2015 1:14:02 PM EDT

Global

```
version 15.1
service timestamps debug datetime localtime show-l
service timestamps log datetime localtime show-time
service compress-config
hostname 4503E-switch
boot system flash bootflash:cat4500e-universalk9.SF
boot system flash bootflash:cat4500e-universalk9.SF
address-family ipv4
exit-address-family

address-family ipv6

exit-address-family
logging buffered informational
enable secret 5 *****
```

3750E-switch.amer.cisco.com / Running
Configuration / August 11, 2015 2:41:05 PM EDT

Global

```
version 12.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime sl
hostname 3750E-switch

aaa authentication enable default group tacacs+ er
aaa authorization commands 1 default group tacac
aaa authorization commands 15 default group taca

enable secret 5 *****
switch 1 provision ws-c3750e-48pd
system mtu routing 1500
```

■ Added/Deleted ■ Updated ■ No Change

Export Close

Configuration diffs are shown side-by-side highlighting those lines that have been either added, removed or changed.

Viewing The Full Archive

The screenshot shows the Cisco Prime Infrastructure interface for Device Management. The top navigation bar includes 'Prime Infrastructure' and 'Inventory / Device Management / Configuration Archive'. A green box highlights the 'Configuration Archive' link. On the left, a sidebar shows 'Groups' (All Devices selected), 'Device Type', 'Location', and 'User Defined'. The main area displays a table of configuration archives for various devices. The table has columns for Name, IP Address, Latest Archive, Out Of Band, Startup/Running..., and Archive Status. An 'Export Latest Config' dropdown menu is open, showing options 'Sanitized' and 'Unsanitized'. A blue box on the right contains the text: 'Inventory > Device Management > Configuration Archive from main menu will launch the global configuration archive for all devices.'

Name	IP Address	Latest Archive	Out Of Band	Startup/Running...	Archive Status
2921-Router.amer.cisco.com	172.16.50.254	January 18, 2017 10:10:03 PM EST	Yes		Yes
2960-Condo-Switch.comcast.net	172.16.51.251	December 3, 2016 10:10:06 PM EST	Yes		Yes
3560-Condo-Switch.comcast.net	172.16.51.252	December 3, 2016 10:10:08 PM EST	Yes		Yes
3560c-switch.amer.cisco.com	172.16.50.251	October 11, 2015 4:09:32 PM EDT	Yes		Yes
3750E-switch.amer.cisco.com	172.16.50.248	January 18, 2017 10:10:06 PM EST	Yes		Yes
3850-switch.amer.cisco.com	172.16.50.252	January 18, 2017 10:10:11 PM EST	Yes		Yes
4503E-switch.amer.cisco.com	172.16.50.249	January 18, 2017 10:10:02 PM EST	Yes	Yes	Yes
4948-Switch.amer.cisco.com	172.16.50.253	January 18, 2017 10:10:05 PM EST	Yes	Yes	Yes

Viewing The Full Archive / Out-of-Sync

From here, one can view the archive information for each device in tabular format as well as view how many devices have a mismatched running/startup configuration.

The screenshot shows the Cisco Prime Infrastructure interface for managing device configurations. The top navigation bar includes 'Prime Infrastructure' and the current location 'Inventory / Device Management / Configuration Archive'. On the left, there's a sidebar with 'Groups' (All Devices selected), 'Device Type', 'Location', and 'User Defined'. The main content area is titled 'All Devices' and has tabs for 'Devices' (selected) and 'Archives'. Below these are buttons for 'Schedule Archive' and 'Overwrite'. A table lists 29 devices, each with a checkbox, name, device type, IP address, latest archive date, and two status columns: 'Out Of Band' and 'Startup/Running ...'. The 'Out Of Band' column for the last device ('4948-Switch.amer.cisco.com') is highlighted with a green box around the 'Yes' value.

	Name	Device Type	IP Address	Latest Archive	Out Of Band	Startup/Running ...
<input type="checkbox"/>	2960-Condo-Switch.comcast.net	Cisco Catalyst 2960PD-8T-L Compact Switch	172.16.51.251	July 6, 2015 9:59:48 AM EDT		
<input type="checkbox"/>	3560-Condo-Switch.comcast.net	Cisco Catalyst 3560G-24PS Switch	172.16.51.252	October 19, 2015 1:12:21 PM EDT	Yes	Yes
<input type="checkbox"/>	3560c-switch.amer.cisco.com	Cisco Catalyst 3560CG-8PC-S Compact Switch	172.16.50.251	October 11, 2015 4:09:32 PM EDT	Yes	
<input type="checkbox"/>	3750-switch.amer.cisco.com	Cisco 3750 Stackable Switches	172.16.50.252	October 11, 2015 10:10:14 PM EDT	Yes	
<input type="checkbox"/>	3750E-switch.amer.cisco.com	Cisco 3750 Stackable Switches	172.16.50.248	October 3, 2015 10:10:18 PM EDT	Yes	
<input type="checkbox"/>	4503E-switch.amer.cisco.com	Cisco Catalyst 4503-E Switch	172.16.50.249	July 19, 2015 1:14:02 PM EDT	Yes	
<input type="checkbox"/>	4948-Switch.amer.cisco.com	Cisco Catalyst 4948 Switch	172.16.50.253	September 21, 2015 10:10:59 PM EDT	Yes	Yes

Viewing The Full Archive / Out-of-Sync

The screenshot shows the Cisco Prime Infrastructure Configuration Archive interface. The left sidebar includes navigation links for Groups, All Devices (selected), Device Type, Location, and User Defined. The main area displays a table of devices under the 'All Devices' tab. The table columns are Name, Device Type, IP Address, Last Archive Date, and two status indicators. A green box highlights the 'Name' column header and the row for '4503E-switch.amer.cisco.com'. A green circle highlights the 'Yes' status in the last column of that row.

<input type="checkbox"/>	Name	Device Type	IP Address	Last Archive Date	Status 1	Status 2
<input type="checkbox"/>	2960-Condo-Switch.comcast.net	Cisco Catalyst 2960PD-8T-L Compact Switch	172.16.51.251	July 6, 2015 9:55:49 AM EDT	Yes	Yes
<input type="checkbox"/>	3560-Condo-Switch.comcast.net	Cisco Catalyst 3560G-24PS Switch	172.16.51.252	October 19, 2015 1:12:21 PM EDT	Yes	Yes
<input type="checkbox"/>	3560c-switch.amer.cisco.com	Cisco Catalyst 3560CG-8PC-S Compact Switch	172.16.50.251	October 11, 2015 4:09:32 PM EDT	Yes	
<input type="checkbox"/>	3750-switch.amer.cisco.com	Cisco 3750 Stackable Switches	172.16.50.252	October 11, 2015 10:10:14 PM EDT	Yes	
<input type="checkbox"/>	3750E-switch.amer.cisco.com	Cisco 3750 Stackable Switches	172.16.50.248	October 3, 2015 10:10:18 PM EDT	Yes	
<input type="checkbox"/>	4503E-switch.amer.cisco.com	Cisco Catalyst 4503-E Switch	172.16.50.249	July 19, 2015 1:14:02 PM EDT	Yes	Yes
<input type="checkbox"/>	4948-Switch.amer.cisco.com	Cisco Catalyst 4948 Switch	172.16.50.253	September 21, 2015 10:10:59 PM EDT	Yes	

From here, one can view the archive information for each device in tabular format as well as view how many devices have a mismatched running/startup configuration.

From the list of out-of-sync devices, click the Device name link for Archive details. for Startup/Running out-of-sync to view the differences between running and startup.

Viewing The Full Archive / Out-of-Sync

The screenshot shows the Cisco Prime Infrastructure interface for managing device configurations. At the top, the navigation path is: Inventory / Device Management / Configuration Archive / 4503E-switch.amer.cisco.com. A blue callout box on the right states: "From here, one can view the archive information for each device in tabular format as well as view how many devices have a mismatched running/startup configuration."

In the main area, there's a section titled "Archive Details" with buttons for Schedule Rollback, Schedule Overwrite, Edit Tag, Schedule Archive, and Schedule Deploy. Below this, a table lists an archive entry for July 19, 2015, at 1:14:02 PM EDT, archived by Syslog.

Under "Archive Details", there are two sections: "Running Configuration" and "Startup Configuration", each with "Configurations" and "Details" links, and "Compare", "Previous", "Startup", "Other Version", and "Other Device" buttons.

A large blue callout box on the right side of the page states: "From the list of out-of-sync devices, click the Device name link for Archive details. for Startup/Running out-of-sync to view the differences between running and startup." This callout points to a table on the right side of the screen, which lists several entries with a "Yes" checkbox in the last column, with the last one circled in green.

Date	Created By	Tag	Description	Archived by	Y	Y	Y	
July 19, 2015 1:14:02 PM EDT	Syslog			Archived by syslog	Yes	1 PM EDT	Yes	Yes
					Yes	2 PM EDT	Yes	
					Yes	14 PM EDT	Yes	
					Yes	8 PM EDT	Yes	
					Yes	M EDT	Yes	
					Yes	10:59 PM EDT	Yes	

Viewing The Full Archive / Out-of-Sync

The screenshot shows the Cisco Prime Infrastructure Configuration Archive interface for a device named 4503E-switch.amer.cisco.com. The 'Startup/Running Mismatch' status is set to 'Yes'. The 'Archive Details' section includes fields for Date (July 19, 2015), Created By, Tag, Description, and Archiving method (Archived by syslog). Below this, there are two sections: 'Running Configuration' and 'Startup Configuration', each with 'Configurations' and 'Details' links, and 'Compare', 'Previous', and 'Startup' buttons. A green box highlights the 'Startup' button under Running Configuration.

From here, one can view the archive information for each device in tabular format as well as view how many devices have a mismatched running/startup configuration.

From the list of out-of-sync devices, click the Device name link for Archive details. for Startup/Running out-of-sync to view the differences between running and startup.

Click on the Compare Startup link or Startup/Running Yes link to view the differences between running and startup.

Startup/Running Out Of Sync (cont.)

Configuration Comparison

Processed Configuration Raw Configuration

Configlets

4503E-switch.amer.cisco.com / Startup Configuration / July 19, 2015 1:14:02 PM EDT

Interface GigabitEthernet2/3
description test interface
switchport access vlan 11

Interface GigabitEthernet2/5

Interface GigabitEthernet2/7

4503E-switch.amer.cisco.com / Running Configuration / July 19, 2015 1:14:02 PM EDT

Interface GigabitEthernet2/3
description ESXi51-3 UCS-C250
switchport access vlan 2

Interface GigabitEthernet2/5
description ESXi51-3 UCS-C250
switchport access vlan 7
spanning-tree portfast

Interface GigabitEthernet2/7
description UCS-C250 CIMC
switchport access vlan 2
spanning-tree portfast

Legend: Added/Deleted (blue square) Updated (red square) No Change (black square)

Export Close

Differences show up the same way as when comparing between versions or across devices.

(3.x) Synchronizing can be done, but from Archive Details screen using the Schedule Overwrite button.

Startup/Running Out Of Sync (cont.)

Configuration Comparison

The screenshot shows the Cisco Prime Infrastructure Configuration Archive interface. At the top, it displays 'Inventory / Device Management / Configuration Archive / 4503E-switch.amer.cisco.com'. A message 'Startup/Running Mismatch: Yes' is present. Below this, the 'Archive Details' section includes buttons for 'Schedule Rollback', 'Schedule Overwrite', 'Edit Tag', 'Schedule Archive', and 'Schedule Deploy'. A table lists archive details: Date (July 19, 2015 1:14:02 PM EDT), Created By (Syslog), Tag (empty), Description (empty), and Archived by syslog (Yes). The 'Running Configuration' and 'Startup Configuration' sections show tabs for 'Configurations' and 'Details', with 'Compare' and 'Previous | Startup | Other Version | Other Device' links. At the bottom, another row shows a date (July 6, 2015 9:55:48 AM EDT), 'Inventory', and 'Initial version'.

Differences show up the same way as when comparing between versions or across devices.

(3.x) Synchronizing can be done, but from Archive Details screen using the Schedule Overwrite button.

Startup/Running Out Of Sync (cont.)

Configuration Comparison

The screenshot shows the Cisco Prime Infrastructure Configuration Archive interface for the device 4503E-switch.amer.cisco.com. The left sidebar lists 'Startup/Running Mismatch' and 'Archive Details'. The main content area is titled 'Schedule Overwrite' with a warning message: 'WARNING: It copies the running configuration to the startup configuration.' It includes sections for 'Overwrite Options' (checkbox for 'Archive after overwrite') and 'Scheduling Options' (Job Name: 'Job_Configuration-Overwrite_12_52_52_575_PM_1_12_2016', Start Time: 'Now'). Buttons at the bottom are 'Submit' and 'Cancel'. A red box highlights the 'Schedule Overwrite' button in the sidebar.

Differences show up the same way as when comparing between versions or across devices.

(3.x) Synchronizing can be done, but from Archive Details screen using the Schedule Overwrite button.

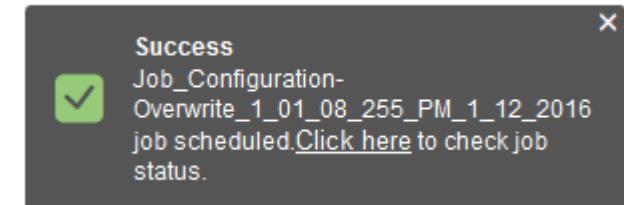
Startup/Running Out Of Sync (cont.)

Configuration Comparison

The screenshot shows the 'Schedule Overwrite' section of the Configuration Archive screen. A warning message states: "WARNING: It copies the running configuration to the startup configuration." Below this, there are two sections: "Overwrite Options" and "Scheduling Options". In the "Overwrite Options" section, there is a checked checkbox for "Archive after overwrite". In the "Scheduling Options" section, the "Job Name" is set to "Job_Configuration-Overwrite_12_52_52_575_PM_1_12_2016", the "Start Time" is set to "Now", and the date is "01/12/2016 12:52 PM". A red box highlights the "Schedule Overwrite" button at the top right of the section.

Differences show up the same way as when comparing between versions or across devices.

(3.x) Synchronizing can be done, but from Archive Details screen using the Schedule Overwrite button.



The PI Approach To Configuration

Prime Infrastructure

Configuration / Templates / Features & Technologies

Templates

CLI Templates

CLI is a set of re-usable device configuration commands with the ability to parameterize select elements of the configuration as well as add control logic statements. This template is used to generate a device deployable configuration by replacing the parameterized elements (variables) with actual values and evaluating the control logic statements.

To view the list of CLI templates, choose Configuration > Templates > CLI Templates > System Templates - CLI. You cannot delete a System Template, but you can modify and save it as a new template. In this page, you can import or export any template. You cannot import a template under the system defined folder. The Undeploy button is disabled in this page since the CLI templates do not have an option to undeploy them.

Design

Network administrators can schedule these templates for future deploy or can deploy immediately post design and approval. Deploying network level configuration requires user to select the templates and devices where this configuration need to be applied. Also, it helps in scheduling this as a JOB so that it can be triggered as a single or recurrent job at a time and if opted, it can also go through job approval where a Sr. administrator approves the job before it gets deployed in the network.

Approve

Templates are used for designing network configurations on the devices in a branch or site. PI bundles customizable OOB templates based on CVD to build a generic configuration that can be applied to one or more devices in the network. Altering configurations across a large number of devices on a big network can be tedious and time-consuming and templates save a lot of time by applying the necessary configurations and ensuring consistency across the network.

Deploy

Templates are used for designing network configurations on the devices in a branch or site. PI bundles customizable OOB templates based on CVD to build a generic configuration that can be applied to one or more devices in the network. Altering configurations across a large number of devices on a big network can be tedious and time-consuming and templates save a lot of time by applying the necessary configurations and ensuring consistency across the network.

Template Detail

CLI Content Form View

```
#if($version != 1)
  #if($isPreferred != "" && $isPreferred != "No")
    ntp server $server_ip key $peer_key version $version prefer
  #else
    ntp server $server_ip key $peer_key version $version
  #end
#else
  #if($isPreferred != "" && $isPreferred != "No")
    ntp server $server_ip key $peer_key prefer
  #else
    ntp server $server_ip key $peer_key
  #end
#end
#else
```

Save Save as New Template Cancel Deploy

- Configuration tasks are distinctly split into two phases
 - Design
 - Deploy
- These phases mirror certain organizational roles
 - Architect
 - Engineer
- Once a design is finalized, it can be made available for deployment across the network

CLI Templates: The New NetConfig

The screenshot shows the Cisco Prime Infrastructure interface for managing CLI templates. On the left, a sidebar lists various configuration categories like Security, WAN Optimization, and CLI Templates. The main area displays a template configuration window for 'Configure NTP'. The window includes sections for 'Template Basic' (Name: Configure NTP, Description: Configure NTP, Tags), 'Features and Technologies' (App Visibility & Control, Controller, Interfaces, Network Analysis Module, Security, WAN Optimization), 'Validation Criteria' (Device Type: Multi-Platform), and 'CLI Templates' (System Templates - CLI). A large orange box highlights the 'CLI Content' tab, which contains the following configuration script:

```
#{$server_conf=="Server"}  
#{($peer_key!="")}  
#{($version!="")}  
#{($isPreferred!="") &  
#    $ntp_server $server_ip}  
#else  
#    $ntp_server $server_ip  
#end  
#else  
#{($isPreferred!="") &  
#    $ntp_server $server_ip}  
#else  
#    $ntp_server $server_ip  
#end
```

At the bottom of the template window are 'Save' and 'Save as New Template' buttons. The background shows a list of other system templates.

PI ships with a number of built-in configuration templates (many taken from LMS NetConfig).

Designing A Custom Template

The screenshot shows the 'Templates' section of the Cisco Network Management System (NMS) interface. On the left, a sidebar lists various features and templates. Under 'CLI Templates', the 'CLI' template is selected. The main panel displays the 'Template Detail' for the 'CLI' template. The 'Actions' section contains a 'New' button, which is highlighted with a green rectangle. The 'CLI Content' tab is selected, showing the following configuration script:

```
#if ($option=="Create")
# if ($vlanid!="")
    vlan $vlanid
    #if ($vlanName!="")
        name $vlanName
    #end
    #if ($mtu!="")
        mtu $mtu
    #end
    exit
# if ($interfaceName!="")
    interface $interfaceName
    #if ($mode == "Access")

```

At the bottom of the dialog, there are 'Save' and 'Save as New Template' buttons, with 'Save as New Template' also highlighted with a green rectangle. There are also 'Cancel' and 'Deploy' buttons.

- Create a new CLI template from scratch
- Copy an existing template, tweak it, and save it as a new CLI template

Defining The Template

Templates / My Templates / CLI Templates (User Defined) / System Templates - CLI (User Defined)
Configure VLAN - Custom

Save Save as New Template Cancel Deploy History

Template Basic

* Name: Configure VLAN - Custom
Author: root
Description:
Tags: ?
Feature Category: CLI
Type: Devices Ports
* Device Type: Multiple selections
OS Version: ?

Template Detail

CLI Content Form View Add Variable Add Global Variable

```
#if ($option=="Create")
#if ($vlanid!="")
    vlan $vlanid
#if ($vlanName!="")
    name $vlanName
#end
#if ($mtu!="")
    mtu $mtu
#end
exit
#if ($InterfaceName!="")
    interface $InterfaceName
#if(${mode} == "Access")
```

Specify a template description (helpful for engineers when deploying it) and any tags to group this template with other related templates .

Defining The Template (cont.)

Validation Criteria

* Device Type

Multiple selections

Template Detail

CLI Content

Form View

Operation

* VlanId

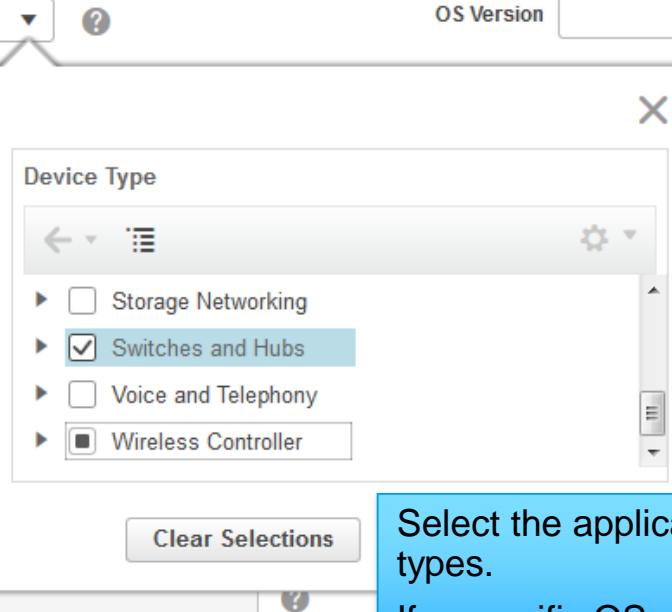
Vlan Name(Vlan name should be a single word)

MTU size [576-18190]

Interface Name

Mode

Encapsulation (Enter dot1q/isl/negotiate)



OS Version

?



Select the applicable device type or types.

If a specific OS version is required, specify that as well.

Scripting The Template Logic

Template Detail

CLI Content Form View +

```
visor wrlan0
#If ($vlanName != "")
    name $vlanName
#end
#If ($mtu != "")
    mtu $mtu
#end
exit
#If ($interfaceName != "")
    interface $interfaceName
#If ${mode} == "Access"
    switchport mode access
    switchport access vlan $vlanId
#end
#end
```

Programmatic Velocity logic

Straight CLI

Templates can be as simple as straight CLI, or marked up with programmatic logic using the Apache Velocity Template Language (see <http://velocity.apache.org/engine-devel/vtl-reference-guide.html> for the reference).

Defining A New Template Variable

Template Detail

CLI Content Form View Add Variable

Add Global Variable

Global Variable

```
#if ($option=="Create")
    #if ($vlanid !="")
        vlan $vlanid
    #if ($vlanName !="")
        name $vlanName
    #end
    #if ($mtu !="")
        mtu $mtu
    #end
    exit
#if ($interfaceName !="")
    interface $interfaceName
```



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 New Template Variable

Template Detail

CLI Content Form View Add Variable Add Global Variable

Add To CLI

Show Quick Filter ▾

	Name	Type	Display Label	Description	Required
<input type="radio"/>	vlanid	Integer	VlanId	VlanId	true
<input type="radio"/>	vlanName	String	Vlan Name(Vlan name should b...	VlanName	false
<input type="radio"/>	mtu	Integer	MTU size [576-18190]	MTU size [576-18190]	false
<input type="radio"/>	interfaceName	String	Interface Name	Interface Name	false
<input type="radio"/>	mode	Dropdown	Mode	Access Mode	false

Specify:

Variable name : the string that will appear after the '\$' in your template

Type : type of form field

Display Label : What to show in the GUI

Description : Help text

Required : Whether or not the field is required

Variable Validation

Template Detail

The screenshot shows a software interface for managing variable templates. At the top, there are tabs for 'CLI Content' and 'Form View', with 'Add Variable' being the active tab. To the right of these tabs are buttons for 'Add Global Variable' and a search bar labeled 'Global Variable'. Below the tabs is a toolbar with icons for edit, add, and delete, along with a 'Show' dropdown set to 'All' and a filter icon. The main area is a table with columns: Name, Type, Display Label, Description, and Required. A row is selected for 'encapsulation', which is of type 'String'. The 'Display Label' and 'Description' fields both contain 'Encapsulation (Enter)'. The 'Required' field has an unchecked checkbox. A tooltip box is overlaid on the interface, containing the following text:

Each variable type can have its value checked to make sure it falls within an allowed range.

For example, strings can be checked against a regular expression.

	Name	Type	Display Label	Description	Required
●	encapsulation	String	Encapsulation (Enter)	Encapsulation (Enter)	<input type="checkbox"/>

Validation Expression: (dot1q|isl|negotiate)

Default Value: dot1q

Buttons: Save, Cancel

Pro-Tip: Creating New Built-in Variables

The screenshot shows a database query editor with a large list of built-in variables at the top and a 'Managed Variables' dialog box at the bottom.

Built-in Variables (Listed in Query Editor):

```
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
17 V
18 P Edit Add Row Delete
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
```

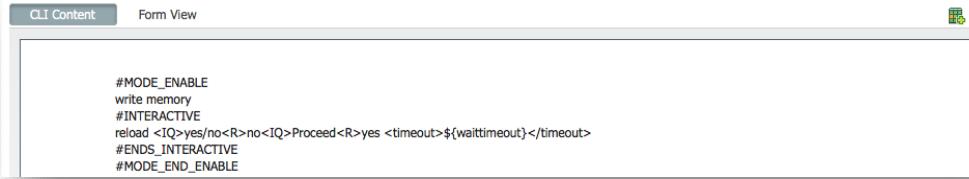
Managed Variables Dialog Box:

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	✓

Validation Expression: ?
Default Value: ?
Save Cancel Add To CLI Close

- 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]")`

Pro-Tip: Interactive, Enable, and Multiline Commands



CLI Content Form View

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

- 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



CLI Content Form View

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

Previewing The Template Form

Template Detail

▼

CLI Content Form View Add Variable

Operation: Create ?

* VlanId: ?

Vlan Name(Vlan name should be a single word): ?

MTU size [576-18190]: ?

Interface Name: ?

Mode: Access ?

Encapsulation (Enter dot1q/isl/negotiate): dot1q ?



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

Deploying The Template

The screenshot shows the Cisco Prime Infrastructure interface. In the top navigation bar, there is a search bar labeled "Application Search", a notification icon with "14" notifications, and a user account "root - ROOT-DOMAIN". The main content area shows a breadcrumb path: "Configuration / Templates / Features & Technologies". On the left, a sidebar lists various template categories like Controller, Interfaces, Network Analysis Module, Security, WAN Optimization, and several types of CLI templates. The "My Templates" section is expanded, showing "CLI Templates (User Defined)" and "System Templates - CLI (User Defined)". Under "System Templates - CLI (User Defined)", the "Configure VLAN - Custom" template is selected. The main panel displays the "Template Detail" page for this template. It includes tabs for "CLI Content" (which is selected), "Form View", and "Add Variable". Below the tabs is a code editor containing the following CLI script:

```
#if ($option=="Create")
    #if ($vlanid!="")
        vlan $vlanid
        #if ($vlanName!="")
            name $vlanName
        #end
        #if ($mtu!="")
            mtu $mtu
        #end
        exit
    #if ($interfaceName!="")
        interface $interfaceName
        #if($mode == "Access")

```

At the top of the main panel, there are buttons for "Save", "Save as New Template", "Cancel", "Deploy" (which is highlighted with a green box), and "History". To the right of the code editor, there is a "Global Variable" section with a "Add Global Variable" button and a search bar.

Once the template is ready, click Deploy to push the template to the Network device(s).

Note: PI no longer has a Publishing menu, the template is automatically published, once it is saved.

Deploying The Template

The screenshot shows the Cisco Prime Infrastructure web interface. At the top, there's a navigation bar with the Cisco logo, the text "Prime Infrastructure", a search bar labeled "Application Search", a notification icon with "14" notifications, and a user account "root - ROOT-DOMAIN". Below the navigation bar, the main content area has a breadcrumb trail: "Configuration / Templates / Features & Technologies". The main panel title is "Templates / My Templates / CLI Templates (User Defined) / System Templates - CLI (User Defined)". A sub-section title "Configure VLAN - Custom" is visible. There are several buttons at the top of this section: "Save", "Save as New Template", "Cancel", "Deploy", and "History", with "History" being highlighted with a green border. Below these buttons, under "Template Detail", there are three tabs: "CLI Content" (which is selected), "Form View", and "Add Variable". The "CLI Content" tab displays the following CLI script:

```
#if ($option=="Create")
    #if ($vlanid!="")
        vlan $vlanid
        #if ($vlanName!="")
            name $vlanName
        #end
        #if ($mtu!="")
            mtu $mtu
        #end
    exit
    #if ($interfaceName!="")
        interface $interfaceName
        #if($mode == "Access")

```

A large blue callout box on the right side of the screen contains the text: "Before deploying the template you may want to see the history of this template's deployment. To do so click on the History button".

Deploying The Template

Cisco Prime Infrastructure

Application Search 14 root - ROOT-DOMAIN

Configuration / Templates / Features & Technologies

Templates / My Templates / CLI Templates (User Defined) / System Templates - CLI (User Defined)

Configure VLAN - Custom

Save Save as New Template Cancel Deploy History

Template Detail

History

*Few jobs may not be listed here if they have been purged as part of regular job clean up task (happening every 7 days)

Selected 0 / Total 2 Show Quick Filter

Name	Job Type	Status	Last Run Status	Last Start Time	Duratio...	Next Start Time	Owner
Configure VLAN - Custom_1_R...	Config Deploy - Dep...	Comp... <i>i</i>	Success	2016-01-13 ...	00:00:13		root
Configure VLAN - Custom_1	Config Deploy - Dep...	Comp... <i>i</i>	Failure	2016-01-13 ...	00:00:55		root

Close

Before deploying the template you may want to see the history of this templates deployment. To do so click on the History button

Preparing To Deploy Configurations



Administration / Settings / System Settings

System Settings

Search All

Network and Device

- CLI Session
- Controller Upgrade
- Plug & Play
- SNMP

Switch Port Trace (SPT)

- Auto SPT
- Manual SPT
- SPT Configuration
- Known Ethernet MAC Address L

Inventory

- Configuration
- Configuration Archive

Inventory Configuration

Backup Device Configuration ?

Rollback Configuration ?

Deploy CLI Thread Pool Count

Deploy CLI Time Out(ms)

Save

Reset

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.

Deploying The Template (cont)

The screenshot shows the Cisco Prime Infrastructure interface. On the left, there's a navigation sidebar with sections like 'Features and Technologies' and 'My Templates'. Under 'My Templates', 'CLI Templates (User Defined)' is selected and highlighted with a green border. In the main content area, the 'CLI Templates (User Defined)' page is displayed. At the top, there are buttons for 'Delete', 'Import', 'Export', 'Deploy' (which is highlighted with a red box), 'Undeploy', and 'History'. Below these buttons is a table with columns: 'Name', 'Type', 'Folder', and 'Created On'. There are five rows in the table:

Name	Type	Folder	Created On
3850-AVC-cu	App Visibility	My Templates/CLI Templates (User Defined)	2015-Dec-22 19:04:29 EST
Configure VLAN - Custom	CLI	My Templates/CLI Templates (User Defined)/System Templates - ...	2016-Jan-13 16:26:31 EST
Test-export-switches	CLI	My Templates/CLI Templates (User Defined)	2015-Dec-22 12:34:29 EST
add-pi30-cleanup	CLI	My Templates/CLI Templates (User Defined)	2016-Jan-11 15:35:57 EST

A blue callout box with white text is positioned on the right side of the table, containing the following instructions:

Select the template from the list of "My Templates." Click the Deploy button to begin the workflow.

Fill In the Template Values

Configuration / Templates / Features & Technologies ★

Global Variables

```
graph LR; A["* Select Devices"] --> B["Input Options"]; B --> C["* Input Values"]; C --> D["* Schedule Deployment"]; D --> E["Deployment Summary"]
```

Name	Description	Type	IP Address/DNS	Vendor
All Devices	All Members			
<input checked="" type="checkbox"/> 3750E-switch.amer.cisc...	3750E-switch.amer.cisco.com	Switches and Hubs	172.16.50.248	Cisco
<input type="checkbox"/> 3850-switch.amer.cisc...	3850-switch.amer.cisco.com	Switches and Hubs	172.16.50.252	Cisco
<input type="checkbox"/> 4948-Switch.amer.cisc...	4948-Switch.amer.cisco.com	Switches and Hubs	172.16.50.253	Cisco
<input type="checkbox"/> Device Type	Device Type			
<input type="checkbox"/> Location	Location based groups			
<input type="checkbox"/> User Defined	User Defined Device Groups			

Choose the device or devices in which to apply this template.

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.

Export/Import CSV

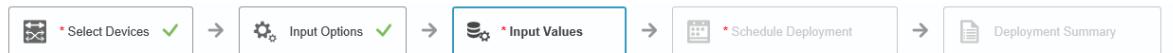
Pro-Tip: Use Import and Export to fill in values for multiple devices using a spreadsheet

Cancel **Previous** **Next**

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

Fill In the Template Values

Configuration / Templates / Features & Technologies ★



Name

All Selected Devices

3750E-switch.amer.cisco.com

Operation Create

* VlanId 333

Vlan Name(Vlan name should be a single word) Doomsday_Device

MTU size [576-18190]

Interface Name

Mode Access

Encapsulation (Enter dot1q/isl/negotiate)

Apply

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

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 ★



Schedule Job

Job Name: Configure VLAN - Custom_2

Start Time: Now (06/22/2016 10:26 PM)

Recurrence: None

(MM/dd/yyyy hh:mm AM/PM)

Hourly
Minute
Weekly
Daily
Monthly
Yearly

Job Option

Failure Policy: Ignore failure and co... ▾

Copy Running Config to Startup:

Archive Config after Deploy: ?

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 in the above times slots will not run by PI Job Manager.

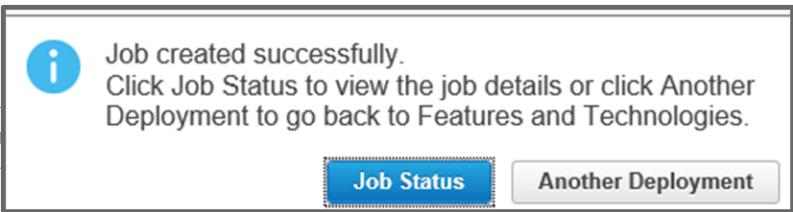
Cancel Previous Next

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

(3.x) You can now save the running configuration to startup and change failure options as part of the job setup.

Preview CLI and Finish

Configuration / Templates / Features & Technologies ★



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 **Configure VLAN - Custom_2** for you which is going to deploy **Configure VLAN - Custom** on 1 device(s) in the scheduled time. Please cl

Name
3750E-switch.amer.cisco.com

Configure VLAN - Custom

```
vlan 333  
name Doomsday_Device  
exit  
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

Verifying The Job's Status

Administration / Dashboards / Job Dashboard / Configure VLAN - Custom 3 ★

Recurrence None
Description N/A

Showing latest 5 Job instances [Show All](#)

Run ID	Status	Duration (hh:mm:ss)	Start Time	Completion
▼ 55802275	✓ Success	00:00:39	2016-06-22 22:48	2016-06-22

Job summary Successful deployment on 1 device(s).

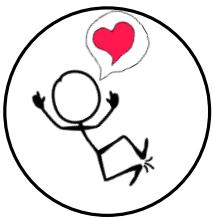
Job Results for Configure VLAN - Custom

Device	Status	Transcript
172.16.50.252	 ⓘ Success	configlet: vlan 333 name Doomsday_Device exit exit response:terminal width 0 config t vlan 333 name Doomsday_Device exit exit 3850-switch#config t Enter configuration commands, one per line. End with CNTL/Z. 3850-switch(config)#vlan 333 3850-switch(config-vlan)#name Doomsday_Device 3850-switch(config-vlan)#exit 3850-switch(config)#exit 3850-switch#> Copying running to startup : Successful

```
configlet:  
vlan 333  
name Doomsday_Device  
exit  
exit  
response:  
terminal width 0  
config t  
vlan 333  
name Doomsday_Device  
exit  
exit  
3850-switch#config t  
Enter configuration commands, one per line. End with CNTL/Z.  
3850-switch(config)#vlan 333  
3850-switch(config-vlan)#name Doomsday_Device  
3850-switch(config-vlan)#exit  
3850-switch(config)#exit  
3850-switch#>  
Copying running to startup : Successful
```

The job's results will be displayed under *Administration > Dashboard > Job Dashboard*

(3.x) Mouse-over the *i* to view the details pop-up



Baseline Configuration Compliance

- Define configuration baseline policies
- Perform compliance audits
- View compliance audit violations
- Option to fix violations
- Support for IOS, IOS-XE, IOS-XR, NX-OS, AirOS and ASA devices

Getting Started with Compliance

The screenshot shows the Cisco Prime Infrastructure administration interface. The left sidebar has a tree view with nodes like General, Mail and Notification, Network and Device, and Switch Port Trace (SPT). The main panel is titled 'Administration / Settings / System Settings'. It contains several sections: 'General' (with 'Server' selected), 'HTTP Forward' (radio button set to 'Enable'), 'HTTPS' (Port 443), 'Global Idle Timeout' (checkbox checked, dropdown set to '15 min'), 'NTP Servers' (Server Name: time.nist.gov, Time Zone: EDT), and 'Compliance Service' (radio button set to 'Enable'). At the bottom are 'Save' and 'Apply System Default Settings' buttons.

(3.x) Compliance needs to be enable

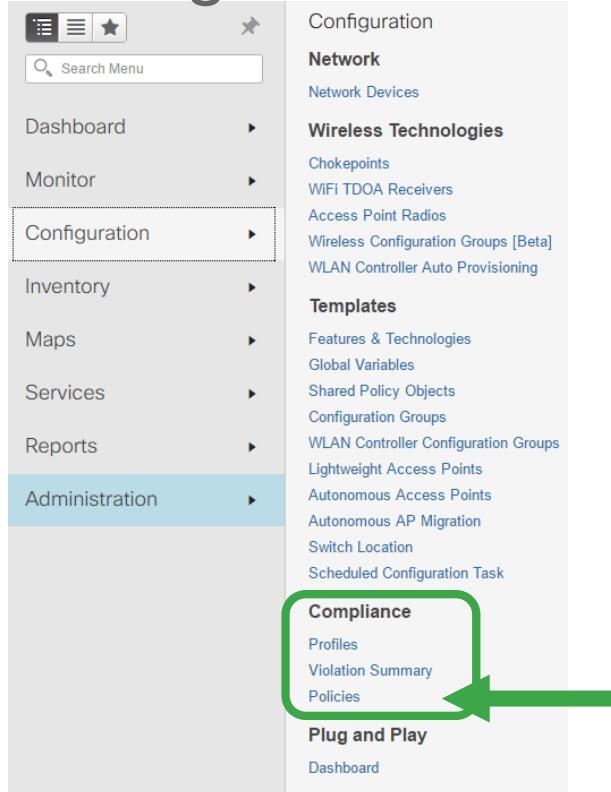
Go to Administration > Settings >System Settings > Server

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

The screenshot shows the Cisco Prime Infrastructure web interface for defining compliance policies. The top navigation bar includes the Cisco logo, 'Prime Infrastructure', and a search bar. Below the navigation, the breadcrumb path 'Configuration / Compliance / Policies' is visible. On the left, a sidebar lists various examples of compliance rules. A green callout box highlights the '+ New' button in the toolbar, which is used to create a new policy. The main content area displays a table titled 'Example - Trap Destination : Rules' with columns for Title and Description. One rule, 'Check valid trap destination', is listed with its checkbox selected.

Compliance Policies

+ New Edit Duplicate Delete

Search All

Example - All interfaces should restri...
Example - Block incoming telnets usi...
Example - Check DNS Servers are c...
Example - NTP Server redundancy
Example - OSPF MD5 Check
Example - SMU verification on ASR
Example - SNMP prohibit well know...
Example - Trap Destination

Example - Trap Destination : Rules

	Title	Description
<input checked="" type="radio"/>	Check valid trap destination	

There are multiple compliance examples provided

You can create a new policy by clicking the “+”

Define Compliance Policy (cont)

Edit Rule:Check valid trap destination

▼ Rule Information

Enter the rule details. These include giving a name to the rule, providing description, impact and suggested fix.

* Rule Title 

Description

Impact

Suggested Fix

► Platform Selection 

► Rule Inputs 

► Conditions And Actions 

Once you Name the Policy you add a rule

Give the Rule a title

Click Next

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

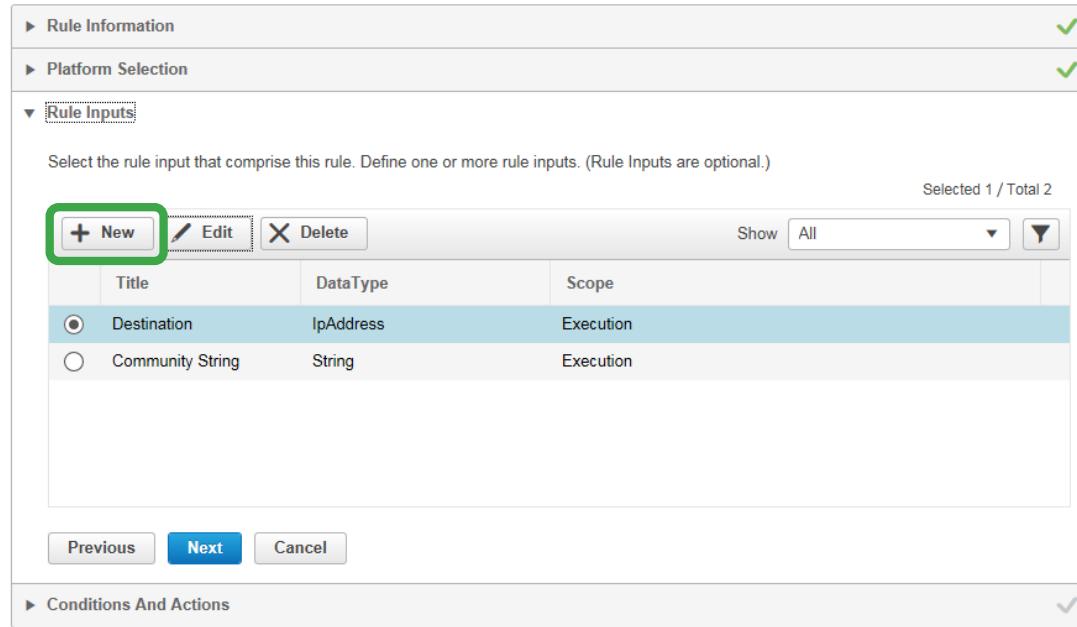
Rule Information ✓
Platform Selection ✓
Rule Inputs ▾

Select the rule input that comprise this rule. Define one or more rule inputs. (Rule Inputs are optional.)
Selected 1 / Total 2

+ New	Edit	X Delete	Show All	Filter
Title	DataType	Scope		
<input checked="" type="radio"/> Destination	IpAddress	Execution		
<input type="radio"/> Community String	String	Execution		

Previous Next Cancel

Conditions And Actions ✓



Create new input Variables that are needed for the conditions and Actions Section

Define Compliance Policy (cont)

Edit Rule:Check valid trap destination

► Rule Information

► Platform Selection

▼ Rule Inputs

Select the rule input that comprise this rule

+ New	Edit	X Delete
Title	Destination	IpAd
<input checked="" type="radio"/> Destination	IpAd	
<input type="radio"/> Community String	String	

Previous Next Cancel

► Conditions And Actions

Edit Rule Input

* Title Destination

* Identifier _Destination ?

Description

Scope Execution ?

Data Type IP Address ?

Input Required

Accept Multiple Values ?

Default Value ?

Preview OK Cancel

Create new input Variables that are needed for the conditions and Actions Section

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

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 >>LMS Netshow replacement<<, Properties or Previous Blocks

Define Compliance Policy (cont)

Edit Rule:Check valid trap destit

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

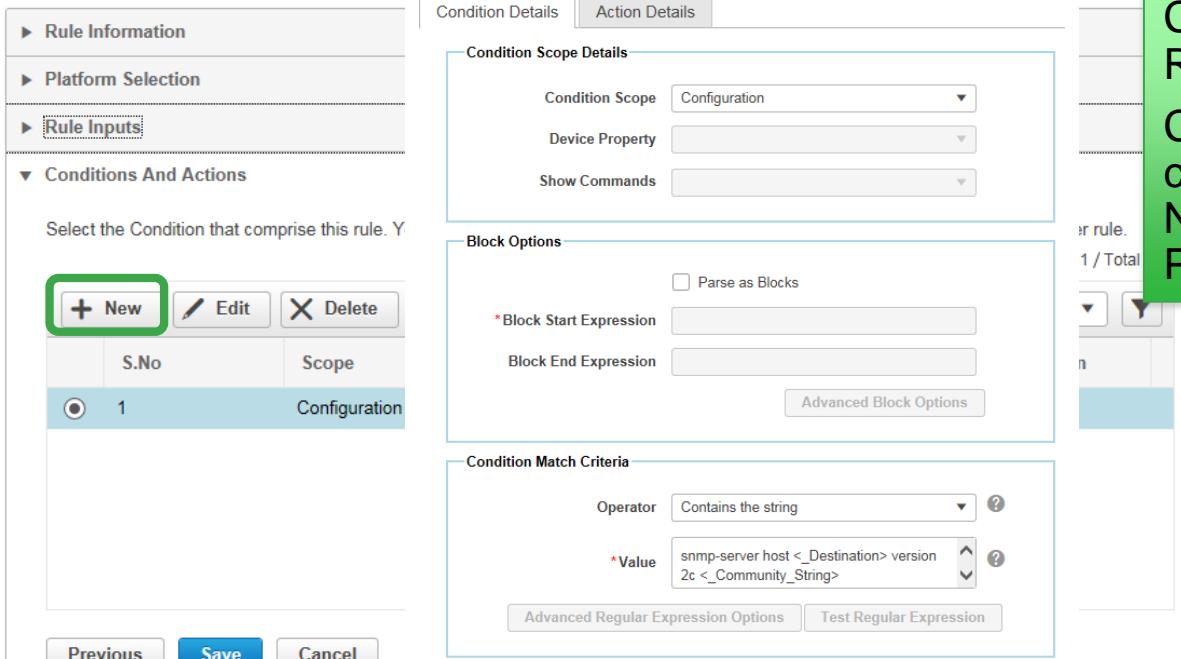
Operator: Contains the string
* Value: snmp-server host <_Destination> version 2c <_Community_String>

Advanced Regular Expression Options Test Regular Expression

+ 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 >>LMS Netshow replacement<<, Properties or Previous Blocks

Define Compliance Policy (cont)

Edit Rule:Check valid trap destit

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 >>LMS Netshow replacement<<, Properties or Previous Blocks

Define Compliance Policy (cont)

Edit Rule:Check valid trap desti

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>

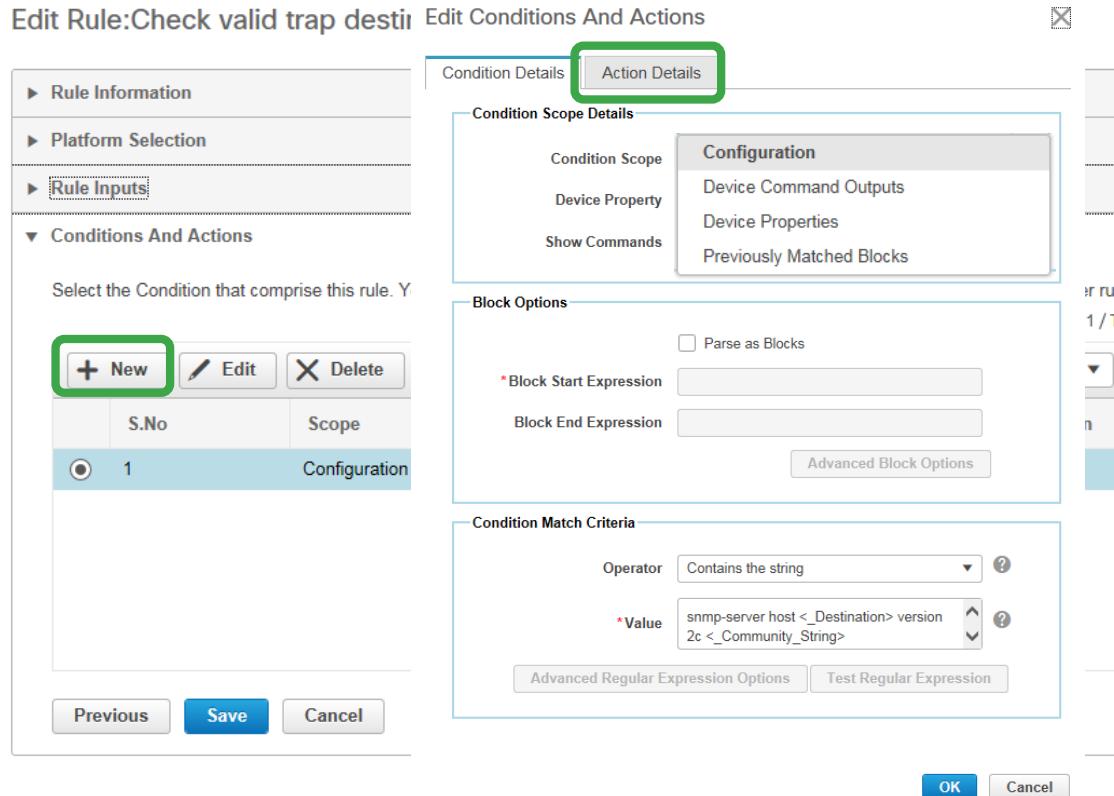
Advanced Regular Expression Options Test Regular Expression

+ 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 >>LMS Netshow replacement<<, Properties or Previous Blocks

>>Block Options are similar to LMS Conditional Block (Global and Submode)<<

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions

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

Edit Conditions And Actions

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

OK Cancel

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output >>LMS Netshow replacement<<, Properties or Previous Blocks

>>Block Options are similar to LMS Conditional Block (Global and Submode)<<

Define Compliance Policy (cont)

Edit Rule:Check valid trap destir Edit Conditions And Actions

Rule Information

Platform Selection

Rule Inputs

Conditions And Actions

Select the Condition that comprise this rule. Y

S.No	Scope
1	Configuration

+ New Edit Delete

Previous Save Cancel

Edit Conditions And Actions

Condition Details Action Details

Select Match Action

Select Does not Match Action

Select Action: Raise a Violation

Condition Number:

Violation Severity: Minor

Violation Message Type: User defined Violation Message

Violation Message Id:

*Violation Message: Trap Destination is not configured. 'snmp-ser'

Fix CLI:
snmp-server host <_Destination> version
2c <_Community_String>

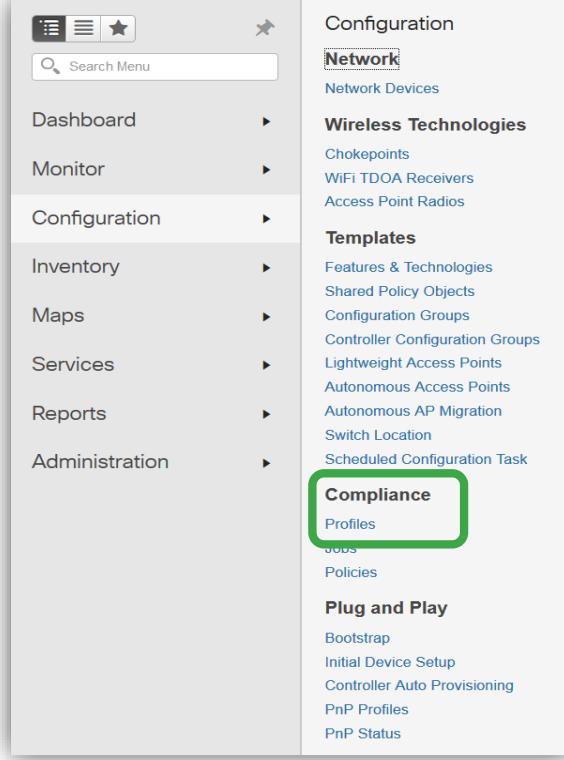
OK Cancel

Create the Condition and Action Rules

Condition Scope can be based on config, Command Output >>LMS Netshow replacement<<, Properties or Previous Blocks

>>Block Options are similar to LMS Conditional Block (Global and Submode)<<

Define Compliance Profile



Once the Policy is created, a Profile needs to be created
Configuration > Compliance > Profiles

Define Compliance Profile

The screenshot shows the Cisco Network Management System (NMS) interface. On the left is a navigation sidebar with icons for Home, Dashboard, Monitor, Configuration, Inventory, Maps, Services, Reports, and Administration. Below the sidebar is a search bar labeled "Search Menu". The main content area is titled "Compliance Profiles". At the top of this area are several icons: a plus sign for creating new profiles, a checkmark, a lightning bolt, a delete symbol, and a refresh symbol. Below these icons is a search bar labeled "Search All". A blue header bar contains the text "Router-Trap-Destination" followed by an information icon. The main body of the page is currently empty, showing a list of compliance profiles.

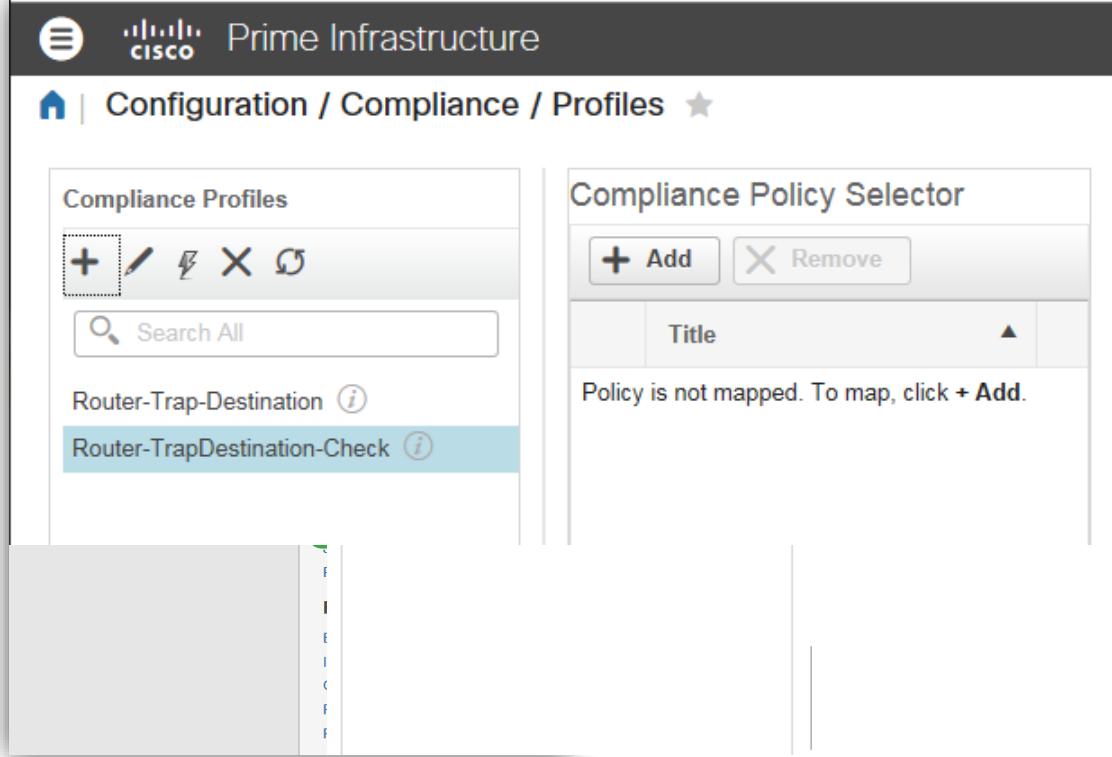
Once the Policy is created, a Profile needs to be created
Configuration > Compliance > Profiles

Define Compliance Profile

The screenshot shows a network management interface with a sidebar menu on the left and a main content area. The sidebar includes options like Dashboard, Monitor, Configuration, Inventory, Maps, Services, Reports, and Administration. The main area displays a modal dialog titled 'Create Policy Profile'. The dialog has fields for 'Title' (containing 'Router-Trap Destination-Check') and 'Description' (empty). It includes 'Create' and 'Cancel' buttons. A green curved arrow points from the 'Create' button towards the text 'Once the Policy is created, a Profile needs to be created'.

Once the Policy is created, a Profile needs to be created
Configuration > Compliance > Profiles

Define Compliance Profile



The screenshot shows the Cisco Prime Infrastructure web interface for defining compliance profiles. The top navigation bar includes the Cisco logo and the text "Prime Infrastructure". Below it, the breadcrumb navigation shows "Configuration / Compliance / Profiles".

Compliance Profiles section:

- Buttons for **Add**, **Edit**, **Remove**, and **Search All**.
- List of profiles:
 - Router-Trap-Destination (Info icon)
 - Router-TrapDestination-Check (Info icon, highlighted in blue)

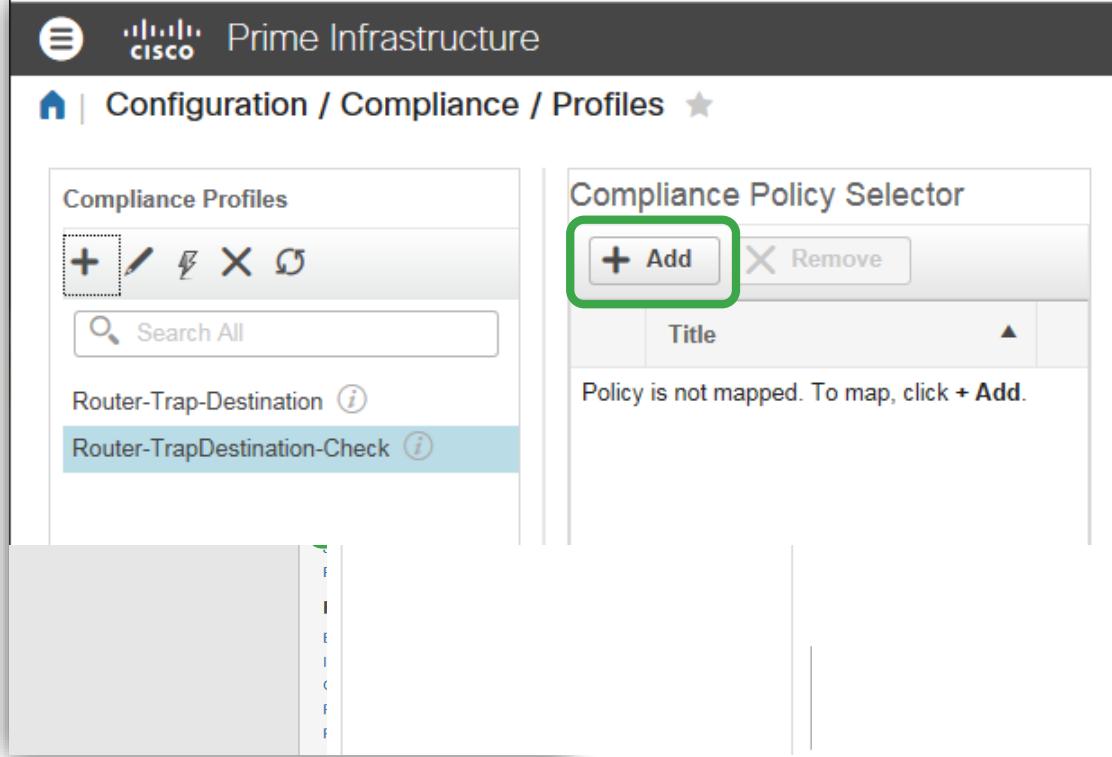
Compliance Policy Selector section:

- Buttons for **Add** and **Remove**.
- Table header: **Title**.
- Text: "Policy is not mapped. To map, click + Add."

Once the Policy is created, a Profile needs to be created

Configuration > Compliance > Profiles

Define Compliance Profile



The screenshot shows the Cisco Prime Infrastructure web interface for defining compliance profiles. The top navigation bar includes the Cisco logo and the text "Prime Infrastructure". Below it, the breadcrumb navigation shows "Configuration / Compliance / Profiles". On the left, a sidebar titled "Compliance Profiles" contains icons for Create (+), Edit (pencil), Delete (X), and Refresh (refresh), and a search bar labeled "Search All". It lists two items: "Router-Trap-Destination" and "Router-TrapDestination-Check", with the latter being the currently selected item, indicated by a blue background. The main content area is titled "Compliance Policy Selector". It features a button labeled "+ Add" which is highlighted with a green rectangular box. Below this button is a "Remove" button. A table header row contains the column "Title". A message at the bottom of the selector states: "Policy is not mapped. To map, click + Add."

Once the Policy is created, a Profile needs to be created

Configuration > Compliance > Profiles

Define Compliance Profile

The screenshot shows the Cisco Prime Configuration interface. On the left, there's a sidebar with 'Compliance Profiles' selected. Below it are icons for creating (+), editing (pencil), deleting (X), and viewing (eye) profiles. A search bar labeled 'Search All' is also present. The main area displays a list of compliance policies under 'Compliance Policies'. A search bar labeled 'Search All' is at the top. The list includes: Audit and Management, Global Configuration, Network Access Services, Network Protocols, Others, Routing Protocols, Security, Switching, and User Defined. The 'User Defined' option is currently selected, indicated by a checked checkbox. At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

Once the Policy is created, a Profile needs to be created
Configuration > Compliance > Profiles

Define Compliance Profile

The screenshot shows the Cisco Prime Configuration interface. On the left, there's a sidebar with 'Compliance Profiles' selected. The main area has a search bar and a list of compliance profiles, with 'Router-Trap-Destination' highlighted. A central modal window titled 'Add Compliance Policies' is open, showing a list of 'Compliance Policies'. Under the 'User Defined' section, several examples are listed, each with a checkbox. One example, 'Example - Trap Destination', has a checked checkbox. At the bottom of the modal are 'OK' and 'Cancel' buttons.

Add Compliance Policies

Compliance Policies

Search All

User Defined

- Example - All interfaces should restrict traffic
- Example - Block incoming telnets using un-authorized
- Example - Check DNS Servers are configured
- Example - NTP Server redundancy
- Example - OSPF MD5 Check
- Example - SMU verification on ASR
- Example - SNMP prohibit well known community string
- Example - Trap Destination

OK Cancel

Once the Policy is created, a Profile needs to be created
Configuration > Compliance > Profiles

Define Compliance Profile

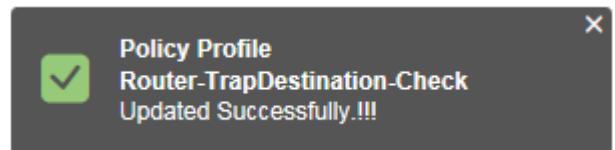
The screenshot shows the Cisco Prime Infrastructure web interface for defining compliance profiles. On the left, there's a sidebar with a search bar and two items: "Router-Trap-Destination" and "Router-TrapDestination-Check". The main area has a title "Compliance Profiles" with a toolbar for creating new profiles. Below it is a "Compliance Policy Selector" section with "Add" and "Remove" buttons, currently showing one item: "Example - Trap Destination". To the right, a detailed configuration window is open for "Example - Trap Destination". It has a header "Select Rules and Inputs for the Policy: Example - Trap Destination" and a single rule: "Check valid trap destination [IOS,IOSXE,IOSXR]". This rule has fields for "Destination" (172.16.50.52) and "Community String" (denro). At the bottom of this window are "Save" and "Cancel" buttons.

Once the Policy is created, a Profile needs to be created
Configuration > Compliance > Profiles

Define Compliance Profile

The screenshot shows the Cisco Prime Infrastructure interface. On the left, there's a sidebar with 'Compliance Profiles' and two items: 'Router-Trap-Destination' and 'Router-TrapDestination-Check'. The second item is highlighted with a blue background. In the center, under 'Compliance Policy Selector', there's a table with one row named 'Example - Trap Destination'. A green arrow points from the text in the green box to the 'Title' column of this row. Below the table, there's a form titled 'Select Rule and Inputs for the Policy: Example - Trap Destination'. It contains a checked checkbox 'Check valid trap destination [IOS,IOSXE,IOSXR]' with a tooltip, and two input fields: 'Destination' (172.16.50.52) and 'Community String' (denro). At the bottom of the form is a 'Save' button, which is also circled in green.

Once the Policy is created, a Profile needs to be created
Configuration > Compliance > Profiles



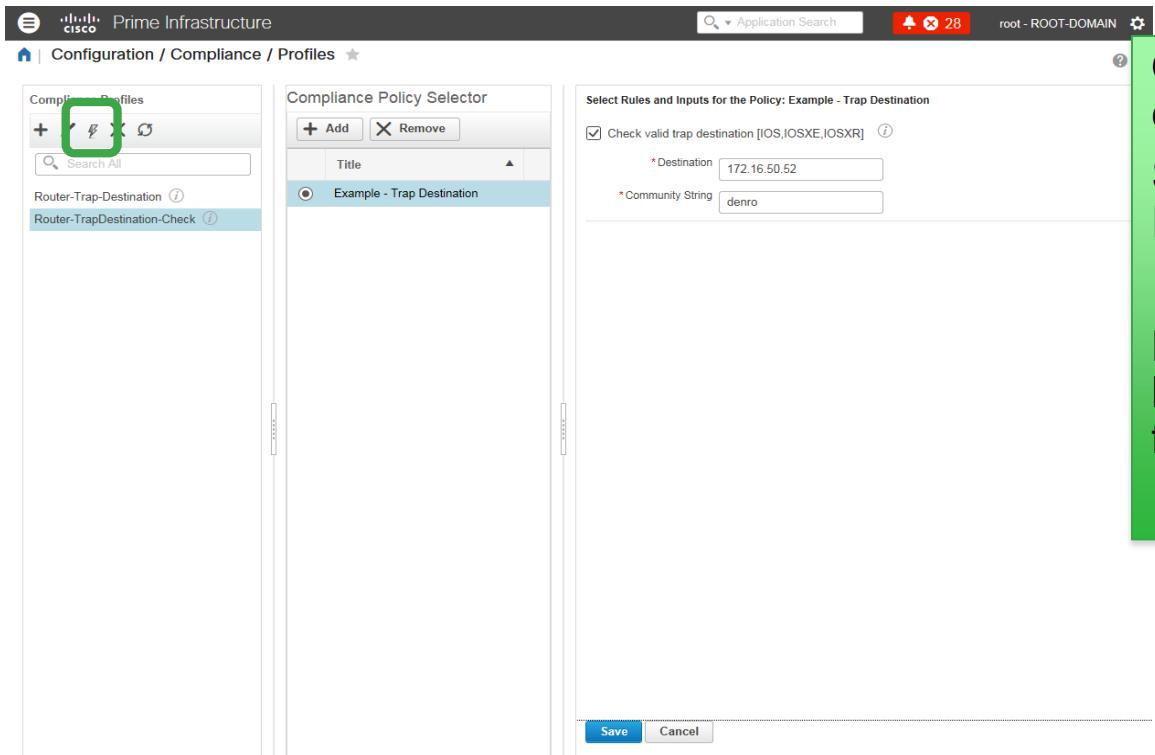
Run the Compliance Job

The screenshot shows the Cisco Prime Infrastructure web interface for managing compliance profiles. On the left, a sidebar lists 'Compliance Profiles' with items like 'Router-Trap-Destination' and 'Router-TrapDestination-Check'. The main area is titled 'Compliance Policy Selector' and shows a table with one row: 'Example - Trap Destination'. To the right, a detailed configuration window is open for 'Example - Trap Destination'. It contains a section titled 'Select Rules and Inputs for the Policy: Example - Trap Destination' with a checked checkbox for 'Check valid trap destination [IOS,IOSXE,IOSXR]'. Below this are fields for 'Destination' (set to '172.16.50.52') and 'Community String' (set to 'denro'). At the bottom of the configuration window are 'Save' and 'Cancel' buttons.

Once the Profile is created, You click on the “Lightening Bolt” Select the devices to run the Profile against

Note: you can choose between latest archive or real-time config fetch

Run the Compliance Job



The screenshot shows the Cisco Prime Infrastructure Compliance Profiles interface. On the left, there's a sidebar with a green box highlighting the 'Add' button (represented by a plus sign inside a lightning bolt). The main panel shows a 'Compliance Policy Selector' with a table containing one row: 'Example - Trap Destination'. To the right, a detailed configuration window titled 'Select Rules and Inputs for the Policy: Example - Trap Destination' is open. It contains a checkbox for 'Check valid trap destination [IOS,IOSXE,IOSXR]' which is checked, and two input fields: 'Destination' (172.16.50.52) and 'Community String' (denro).

Once the Profile is created, You click on the “Lightening Bolt” Select the devices to run the Profile against

Note: you can choose between latest archive or real-time config fetch

Run the Compliance Job

Compliance Audit: Router-TrapDestination-Check

▼ Devices and Configuration

Device Selection

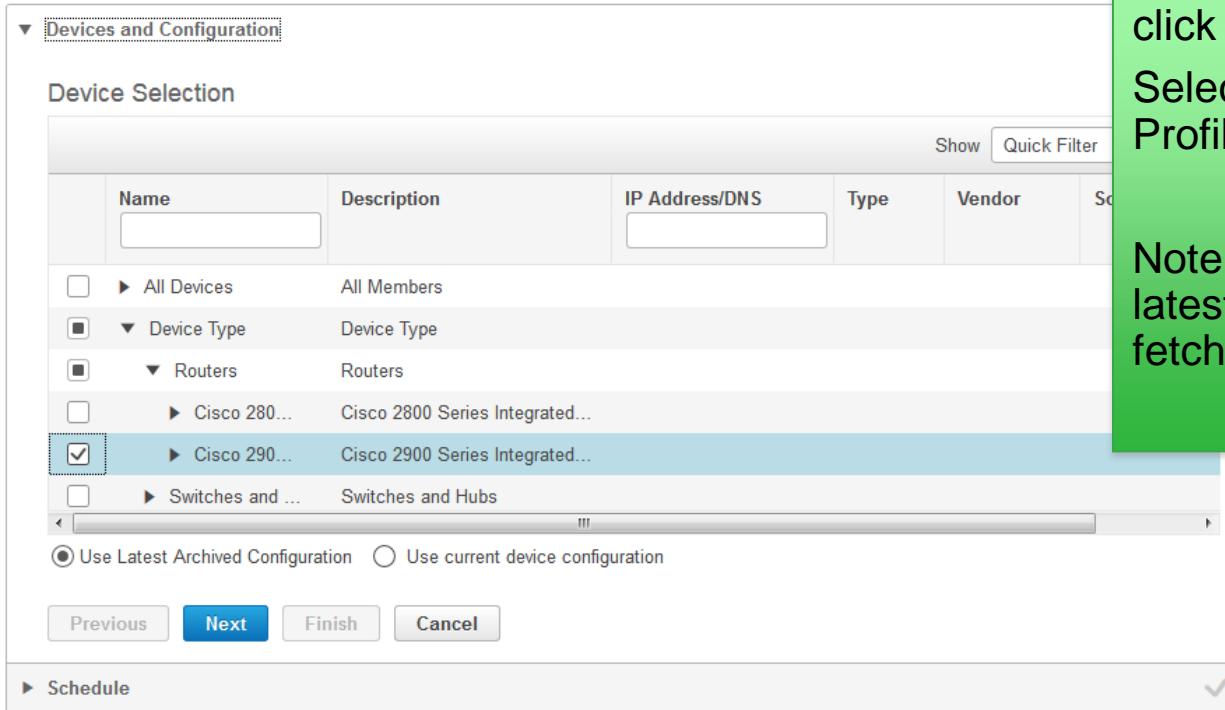
Name	Description	IP Address/DNS	Type	Vendor	Scope
<input type="checkbox"/>	All Devices	All Members			
<input checked="" type="checkbox"/>	Device Type	Device Type			
<input checked="" type="checkbox"/>	Routers	Routers			
<input type="checkbox"/>	▶ Cisco 280...	Cisco 2800 Series Integrated...			
<input checked="" type="checkbox"/>	▶ Cisco 290...	Cisco 2900 Series Integrated...			
<input type="checkbox"/>	▶ Switches and ...	Switches and Hubs			

Show Quick Filter

Use Latest Archived Configuration Use current device configuration

Next **Finish** **Cancel**

► Schedule ✓



Once the Profile is created, You click on the “Lightening Bolt”
Select the devices to run the Profile against

Note: you can choose between latest archive or real-time config fetch

Run the Compliance Job

Compliance Audit: Router-TrapDestination-Check

▼ Devices and Configuration

Device Selection

Name	Description	IP Address/DNS	Type	Vendor	Scope
<input type="checkbox"/>	All Devices	All Members			
<input checked="" type="checkbox"/>	Device Type	Device Type			
<input checked="" type="checkbox"/>	Routers	Routers			
<input type="checkbox"/>	Cisco 280...	Cisco 2800 Series Integrated...			
<input checked="" type="checkbox"/>	Cisco 290...	Cisco 2900 Series Integrated...			
<input type="checkbox"/>	Switches and ...	Switches and Hubs			

 Cisco 290... Cisco 2900 Series Integrated...

Use Latest Archived Configuration Use current device configuration

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

► Schedule 

Once the Profile is created, You click on the “Lightening Bolt”
Select the devices to run the Profile against

Note: you can choose between latest archive or real-time config fetch

Run the Compliance Job

Compliance Audit: Router-TrapDestination-Check

► Devices and Configuration

▼ Schedule

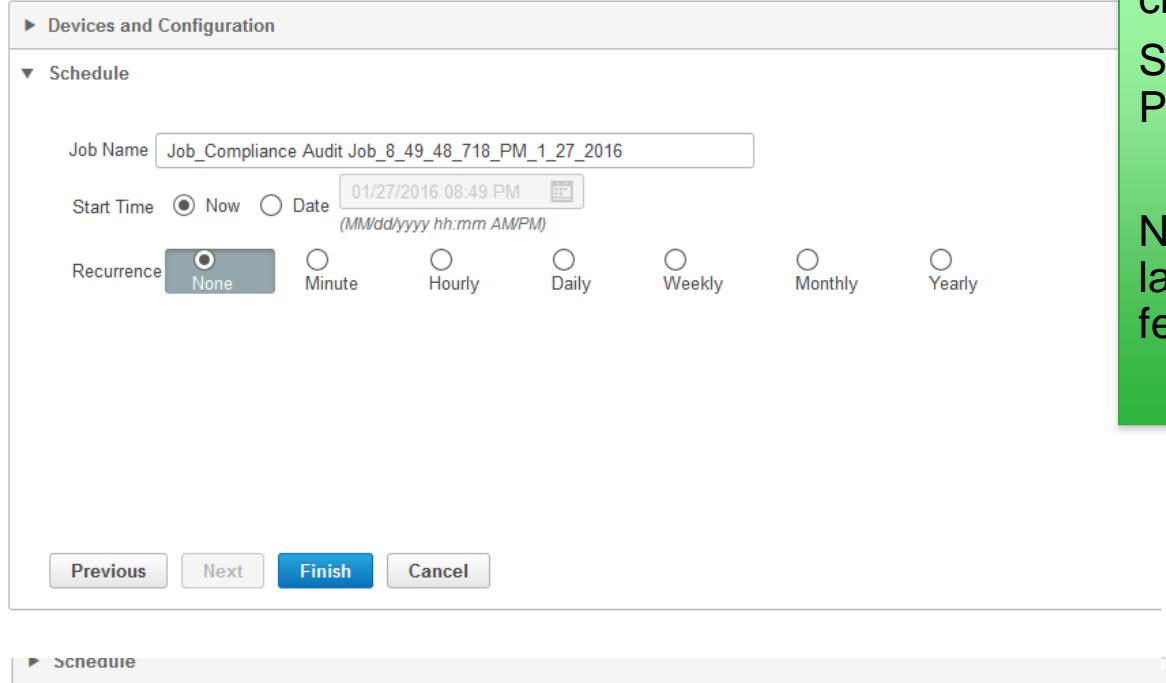
Job Name: Job_Compliance Audit Job_8_49_48_718_PM_1_27_2016

Start Time: Now Date 01/27/2016 08:49 PM
(MM/dd/yyyy hh:mm AM/PM)

Recurrence: None Minute Hourly Daily Weekly Monthly Yearly

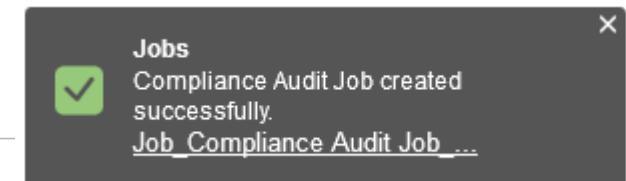
Previous Next **Finish** Cancel

► Schedule



Once the Profile is created, You click on the “Lightening Bolt” Select the devices to run the Profile against

Note: you can choose between latest archive or real-time config fetch



View Audit Job Results/Violation Summary

Screenshot of the Cisco Prime Infrastructure interface showing the Violation Summary page.

The page title is "Configuration / Compliance / Violation Summary".

Table columns include: Device Name, Profile Name, Audit Job Id, Policy Name, Rule Name, Rule Severity, Fixable?, and Fixed?.

A green arrow points to the "Audit Job Id" column.

Device Name	Profile Name	Audit Job Id	Policy Name	Rule Name	Rule Severity	Fixable?	Fixed?
CME-2811-router... (i)	Router-Trap-...	37331070	Example - Trap Des...	Check valid trap ... (i)	⚠ Minor	Yes	No
2921-Router.ame... (i)	Router-Trap-...	37331070	Example - Trap Des...	Check valid trap ... (i)	⚠ Minor	No	117051765
Condo-2811.com... (i)	Router-Trap-...	37331070	Example - Trap Des...	Check valid trap ... (i)	⚠ Minor	Yes	No

Text on the right side:

- Go to Configuration >Compliance >Violation Summary to view the results
- Click on the Audit Job Id link to see the details and potentially schedule a Fix Job

>>Difference from LMS<<
Audit Job results cannot yet be e-mailed.

Generate Fix Jobs

The screenshot shows the Cisco Prime Infrastructure Job Dashboard for a compliance audit job. On the left, the 'Violation Summary' table highlights 3 fixable violations for the 'All Policies...' policy. A large green arrow points from this summary to the 'Violation Details' table on the right, which lists three violations for the 'Trap Destination is n...' rule. The first two violations are marked as 'Fixable', while the third is marked as 'Fixed'. The 'Violation Details' table includes columns for Severity, Fixable status, Policy, Rule, Violation Message, Device Name, Device Type, and Device Location.

Policies/...	Severity	Fixable	Policy	Rule	Violation Message	Device Name	Device Type	Device Loc...
All Policies...	⚠️	Fixable	Example - ...	Trap Destination is n...	Trap Destination is n...	CME-2811-router.a...	Cisco 2811VE Integr...	
Exa...	⚠️	Fixable	Example - ...	Trap Destination is n...	Trap Destination is n...	Condo-2811.comc...	Cisco 2811VE Integr...	
	⚠️	Fixed	Example - ...	Trap Destination is n...	Trap Destination is n...	2921-Router.amer...	Cisco 2921 Integrat...	

Select/Fix per-device Violations
See Fixed Devices

Generate Fix Jobs

Prime Infrastructure Application Search... 18 Lewis - ROOT-DOMAIN

Administration / Dashboards / Job Dashboard / Job_Compliance Audit Job_2_47_21_371_PM_1_19_2016 ★

Job Name Job_Compliance Audit Job_2_47_21_371_PM_1_19_... ⓘ Policy Profile Router-Trap-Destination ⓘ Devices (Audited/Non-Audited) 3/1 ⓘ

Fix Input

1 Violation → 2 Fix Input → 3 Schedule

Total 1 Show All

Policy	Rule	Violation Message
Example - Trap Destination	Check valid trap destination	Trap Destination is not configured. 'snmp-server host 172.16.50.52 version 2c denro'

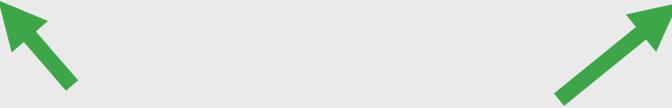
Device Level Fix Inputs

Selected 0 / Total 1 Show All

Enter Fix Input	Device Name	Device Location	Fix Input	CLI command
	<input type="checkbox"/> CME-2811-router.amer.cisco.com	N/A	Fix input not available	snmp-server host 172.16.50.52 version 2c denro

See per-device Fixes
Preview Fix Commands

Cancel Previous Next



Generate Fix Jobs

Administration / Dashboards / Job Dashboard / Job_Compliance Audit Job_2_47_21_371_PM_1_19_2016 ★

Job Name Job_Compliance Audit Job_2_47_21_371_PM_1_19_2016 ⓘ

Policy Profile Router-Trap-Destination ⓘ

Devices (Audited/Non-Audited) 3/1 ⓘ

Violation Summary

Selected 1 / Total Top Level Rows 2 ⏪ ⏴ ⚙

	Show All				
Policies/...	0	0	3	0	0
All Polic...	0	0	3	0	0
Exa...	0	0	3	0	0

1 Violation → 2 Fix Input → 3 Schedule

Job Name Job_Compliance Fix Job_3_06_07_120 PM_2_7_2017

Start Time Now Date 02/07/2017 03:06 PM ⏳ (MM/dd/yyyy hh:mm AM/PM)

Schedule the Fix Job

Cancel Previous Schedule Fix Job



PI Fault Monitoring

- PI does fault collection and monitoring out of the box
 - Device-level faults
 - Server faults
- Alarms and events can be sent as email notifications
- Alert severity can be customized for specific organizational needs
- Alerts can be acknowledged, cleared and annotated to help identify and prioritize operational work

Configuring Alarm Options

Prime Infrastructure

Application Search 89 jevalent - ROOT-DOMAIN

Administration / Settings / System Settings

System Settings

Alarms and Events

The product allows an administrator to configure or modify the network and system wide settings. You will want to customize many of these settings when you are first setting up the product, but once in production, you modify them only rarely.

Search All

General
Mail and Notification
Network and Device
Inventory
Alarms and Events
Alarms and Events
Notification Receivers
Alarm Severity and Auto Clear
System Event Configuration
Client and User
Client
Upload OUI
User Defined OUI
Services
Service Container Management

Applications

Users

Performance

Services

Network

Infrastructure

1 General
Configure system wide settings like cisco.com credentials, Database, Jobs, Server Tuning, Software updates and TAC support.
2 Mail and Notifications
Configure the mail server and notification receivers.
3 Network and Devices
Configure the network and Device level settings like CLI session, SNMP, Controller Upgrade, Plug & Play.
4 Inventory
Configure inventory functions like configuration, configuration Archives, Image Managements, Group Management, Discovery settings.
5 Alarms and Events
Configure Fault functions like Alarm settings, Severity configurations, System Events, notification receivers.
6 Clients and Users
Configure Clients and Users settings like client trouble shooting, Database settings, Client discovery, OUI.
7 Services
Configure Service functions like Container Management.

Go through the alarm and event options to make sure you get the most out of on-screen and in email alerts.

Changing Alarm Severities

The screenshot shows the Cisco Prime Infrastructure interface under the 'Administration / Settings / System Settings' menu. The 'System Settings' sidebar is open, showing various configuration options like General, Mail and Notification, Network and Device, Inventory, Alarms and Events, Client and User, and Services. The 'Alarms and Events' section is expanded, and 'Alarm Severity and Auto Clear' is selected. In the main content area, the 'Alarms and Events' tab is selected, and the 'Alarm Severity and Auto Clear' sub-tab is active. A green box highlights the 'Severity Configuration' button. Below it is a table listing various event types and their current severity levels. A tooltip box with a blue border and white text appears in the bottom right corner, stating: 'Each alarm has a pre-set severity, but these can be tweaked to make alerts more relevant to your organization.' The tooltip box contains a 'Severity Configuration Page' dialog window with 'OK' and 'Cancel' buttons.

Event Types	Severity	Auto Clear Duration (hours)
Generic	Warning	1
Wired	Major	1
Compute Servers	Information	1
Switch	Minor	1
A fan tray removed	Warning	1
A high watermark of percentage of capacity for transparent requests redir...	Major	1
An exception is detected on the managed device	Information	1
Authentication failed	Minor	1
CEFC FRU Removed	Warning	1
CEFC Module status change	Minor	1
CEFC Power Status Change	Major	1
Configuration digest error occurred. The device received a VTP advertise...	Information	1
Configuration management event has been recorded in ccmHistoryEvent...	Information	1
Configuration revision number error has occurred	Information	1
Conflict between the ring number and the VTP-obtained ring number	Information	1
Connection to a target has either failed on establishment	Information	1
Current VMPS has changed since last system re-initialization	Information	1

PI Alarms And Events

The screenshot shows the Cisco Prime Infrastructure Alarms and Events interface. The left sidebar contains navigation links for Device Groups, Compute Resources, Device Type, Location, and User Defined. The main area displays a table titled "Showing Latest 4000 Alarms" with columns: Severity, Message, Status, Failure Source, and Timestamp. The table lists 20 entries, all of which are Critical severity level. Most entries show "Not Ackno..." under Status and "Switch down" under Failure Source. The timestamp for all entries is December 31, 2015 10:5... . The interface includes tabs for Alarms, Events, and Syslogs, and buttons for Change Status, Change State, Assign, Annotation, Delete, and Email Notifications.

	Severity	Message	Status	Failure Source	Timestamp
1	Critical	Device 'SIN-NY-3650-SBR....	Not Ackno...	SIN-NY-3650-SBR.cisco...	December 31, 2015 10:5...
2	Critical	Device 'IND-BSA-3650-SB...	Not Ackno...	IND-BSA-3650-SBR.cis...	December 31, 2015 10:5...
3	Critical	Device 'BSA-prime-asr9k-c...	Not Ackno...	BSA-prime-asr9k-cluste...	December 31, 2015 10:5...
4	Critical	Device 'PAR-SIN-3845-RB...	Not Ackno...	PAR-SIN-3845-RBR-26	December 31, 2015 10:5...
5	Critical	Device 'SF-AMS-4331-RB...	Not Ackno...	SF-AMS-4331-RBR-71	December 31, 2015 10:5...
6	Critical	Device 'NYC-SF-4331-RB...	Not Ackno...	NYC-SF-4331-RBR.cisc...	December 31, 2015 10:5...
7	Critical	Device 'DAL-SF-3650-SBR...	Not Ackno...	DAL-SF-3650-SBR-30	December 31, 2015 10:5...
8	Critical	Device 'PAR-ASR1002-Ea...	Not Ackno...	PAR-ASR1002-East-1-74	December 31, 2015 10:5...
9	Critical	Device 'AMS-TSPM-SJ-P2...	Not Ackno...	AMS-TSPM-SJ-P2C2R...	December 31, 2015 10:5...
10	Critical	Device 'BSA-ASR1002-East...	Not Ackno...	BSA-ASR1002-East-1-38	December 31, 2015 10:5...
11	Critical	Device 'IWAN-DC-ASR1K-...	Not Ackno...	IWAN-DC-ASR1K-COR...	December 31, 2015 10:5...
12	Critical	Device 'RTP-BSA-4431-R...	Not Ackno...	RTP-BSA-4431-RBR.cis...	December 31, 2015 10:5...
13	Critical	Device 'DEN-DEN-4431-R...	Not Ackno...	DEN-DEN-4431-RBR.cis...	December 31, 2015 10:5...
14	Critical	Device 'PAR-ASR1K-CORE2...	Not Ackno...	PAR-ASR1K-CORE2-58	December 31, 2015 10:5...
15	Critical	Device 'BXB-BSA-4431-R...	Not Ackno...	BXB-BSA-4431-RBR.cis...	December 31, 2015 10:5...
16	Critical	Device 'IWAN-BR-kit-2785...	Not Ackno...	IWAN-BR-kit-2785-61	December 31, 2015 10:5...

PI Alarm Viewer is found under *Monitor Alarms & Events*

An **alarm** is the result of one or more events detected by PI.

An **event** is an atomic condition that occurs in the network at a specific point in time.

Filtering Alarms

The screenshot shows the Cisco Prime Infrastructure interface for monitoring tools, specifically the Alarms and Events section. The left sidebar contains a tree view of device groups, including Compute Resources (Data Centers, Clusters, Hosts, Virtual Machines), Device Type (Cisco Interfaces and Modules, Cisco UCS Series, Routers, Switches and Hubs, Third Party Device, Unified AP, Wireless Controller), Location, and User Defined. The main pane displays a table titled "Showing Latest 4000 Alarms" with a "Show All" link. The table has columns: Severity, Message, Status, Failure Source, Timestamp, Owner, Category, and Condition. The first three rows of the table are shown, all of which are Critical level. A green callout box with the text "Click the Filter button to expand the per-column filters. This makes it easy to locate specific alarms." points to the "Quick Filter" button at the bottom right of the table header. A green arrow also points to the same button.

Severity	Message	Status	Failure Source	Timestamp	Owner	Category	Condition
Critical	Device 'SIN-NY-3650-SBR....'	Not Ackno...	SIN-NY-3650-SBR.cisco...	December 31, 2015 10:5...	Switches a...	Switch down	
Critical	Device 'IND-BSA-3650-SB...	Not Ackno...	IND-BSA-3650-SBR.cis...	December 31, 2015 10:5...	Switches a...	Switch down	
Critical	Device 'BSA-prime-asr9k-c...	Not Ackno...	BSA-prime-asr9k-cluste...	December 31, 2015 10:5...	Routers	Switch down	

Viewing Alarm Details

The screenshot shows a network management interface for viewing alarm details. At the top, there is a table with columns: Severity, Message, Status, Failure Source, and Timestamp. A green arrow points to the Severity column for the first row, which is labeled "Critical". A blue callout box with white text says: "Click the triangle next to the alarm to get more details about both it and the related device." Below the table, there are several sections:

- General Information:** Includes fields for Source (15.1.192.20), Acknowledged (No), Category (Switches and Hubs), Alarm Found At (December 31, 2015 10:50:18 PM UTC), Alarm Last Updated At (December 31, 2015 10:50:18 PM UTC), Alarm Detected Through (NMS), Severity (Critical, indicated by a red cross icon), and Previous Severity (Cleared, indicated by a green checkmark icon).
- Device Details:** Lists IP Address (15.1.192.20), Device Name (SIN-NY-3650-SBR.cisco.com-11), Device Type (Cisco Catalyst 3650 Series Switches), Up Time (85 days 4 hrs 19 mins 11 secs), Reachability Status (Unreachable, indicated by a red cross icon), Collection Status (Managed), Software Version (03.03.04SE), Serial Number (FDO1852E264), Location, and Contact.
- Messages:** Displays the message: "Device 'SIN-NY-3650-SBR.cisco.com-11' is unreachable."
- Annotations:** A table with columns: Message, Posted By, and Timestamp. It shows "No data available".
- Device Events:** A table showing a single event: Severity (Critical, indicated by a red cross icon), Description (Device 'SIN-NY-3650-SBR.cisco.com-11' is unreachable), Source (15.1.192.20), and Timestamp (December 31, 2015 10:50:18 PM UTC). The Time Frame is set to "Past 1 Hour".

Alarm Actions

The figure consists of three vertically stacked screenshots of a network management application's alarm interface.

- Screenshot 1:** Shows a toolbar with "Change Status", "Change State", "Assign", "Annotation", "Delete", "Email Notification", "Troubleshoot", "Show", and "Quick Filter". A context menu is open over an unacknowledged alarm for device 'BSA-AMS-3650-S...', listing options: Acknowledge, Unacknowledge, Clear, and Clear all of this condition. The status bar shows "Not Ackno..." and "January 3, 2016 5:48:54 ...".
- Screenshot 2:** Shows the same toolbar. A context menu is open over the same alarm, with the "Assign" option selected. Sub-options include "Assign to me", "Select Owner", and "Unassign". The status bar shows "Not Ackno..." and "January 3, 2016 5:48:54 ...".
- Screenshot 3:** Shows the same toolbar. An annotation dialog box is open, containing a text area with "Notes: Time to make a phone call... :)" and buttons for "Post" and "Close". The status bar shows "Not Ackno..." and "January 3, 2016 5:48:54 ...".

Each alarm can be acknowledged or cleared, assigned to a particular user, annotated, and/or deleted.

Troubleshooting Alarms

The screenshot shows a network management interface with a toolbar at the top containing buttons for 'Change Status', 'Change State', 'Assign', 'Annotation', 'Delete', and 'Email Notification'. Below the toolbar is a table with columns: Severity, Message, Status, Failure Source, and Timestamp. An alarm for 'Device 'BSA-AMS-3650-S...'' is selected, indicated by a checked checkbox and a red 'Critical' status icon. The alarm details show 'Not Ackno...', 'BSA-AMS-3650-SBR.ci...', and 'January 3, 201'. A context menu is open over the alarm row, titled 'Troubleshoot', listing options: Ping, Traceroute, Run Show Commands, Packet Capture, Support Forum, and Support Case. To the right of the table, there are filters for 'Category' and 'Condition', and a search bar.

Troubleshooting and support workflows can be launched, within context, directly from an alarm.

E.g., if a switch is down, run a quick ping to make sure it wasn't a transient issue.

Alarms From The “Toaster”

The screenshot shows the 'Alarm Summary' page in Cisco Prime Infrastructure. At the top right, there is a red notification bar with a bell icon and the number '89'. Below it is a search bar labeled 'Application Search'. The main table has three columns: 'Category', 'Critical' (with a red circle icon), 'Major' (with an orange triangle icon), and 'Minor' (with a yellow triangle icon). The table rows include: 'Alarm Summary' (89, 0, 117), 'Adhoc Rogue' (0, 0, 0), 'AP' (0, 0, 1), 'Application Performance' (0, 0, 0), 'Autonomous AP' (0, 0, 0), 'Carrier Ethernet' (0, 0, 0), 'Cisco Interfaces and Modules' (0, 0, 0), 'Cisco UCS Series' (0, 0, 0), 'Clients' (0, 0, 0), 'Compute Servers' (0, 0, 0), 'Context Aware Notifications' (0, 0, 0), 'Controller' (5, 0, 0), 'Coverage Hole' (0, 0, 0), and 'Mesh Links' (0, 0, 0). A message at the bottom left says 'Last Updated: Sunday, January 03 2016, 01:08 PM'. A blue button at the bottom right says 'View Details'.

Category	Critical	Major	Minor
Alarm Summary	89	0	117
Adhoc Rogue	0	0	0
AP	0	0	1
Application Performance	0	0	0
Autonomous AP	0	0	0
Carrier Ethernet	0	0	0
Cisco Interfaces and Modules	0	0	0
Cisco UCS Series	0	0	0
Clients	0	0	0
Compute Servers	0	0	0
Context Aware Notifications	0	0	0
Controller	5	0	0
Coverage Hole	0	0	0
Mesh Links	0	0	0

Active alarms are also visible throughout PI from the “toaster” popup at the bottom of all PI windows.

Event Viewer

Alarms and Events

The screenshot shows the 'Events' tab selected in the 'Alarms and Events' header. It displays a list of the latest 4000 events, with a total of 92 events. A specific event is highlighted:

Description	Failure Source	Timestamp	Severity	Category	Condition	Correlated
Device 'SIN-NY-3650-SBR.cisco.com-11' i...	SIN-NY-3650-SBR.cisco... <i>i</i>	January 3, 2016 5:48:54 ...	X Critical	Switches a...	Switch down	✓

General Information

- Event Type: Switch down
- Event Source: 15.1.192.20
- Event Category: Switches and Hubs
- Change Last Detected: January 3, 2016 5:48:54 PM UTC
- Device IP Address: 15.1.192.20
- Severity: X Critical

Messages

Device 'SIN-NY-3650-SBR.cisco.com-11' is unreachable.

Correlated Events

Se...	Description	Source	Time
No correlated events found.			

Event viewer looks similar to the Alarm viewer. In addition to filtering and obtaining details, you can also perform some of the same troubleshooting steps.

Viewing Syslog Messages

Prime Infrastructure

Monitor / Monitoring Tools / Syslog Viewer

Live Historic

De-duplicate

Troubleshooting Type Client

Description

Severity IP Address Device Name

Timestamp Facility Mnemonics

Selected 0 / Total 937

Export CSV PDF Export Cancel

Reports are exported via CSV or PDF

Severity	IP Address	Device Name	Description	Timestamp	Facility	Mnemonics
Warning	172.20.114.20	API-Auto-ISR-153.cisco.com	RADIUS server 10.0.2.20:1812,1813 is not responding	October 14, 2015 01:37:40 PM ...	RADIUS	RADIUS_DEAD
Critical	172.20.114.20	API-Auto-ISR-153.cisco.com	Conversation above rising threshold: source host = 10.64.92.202, de...	October 14, 2015 01:37:40 PM ...	NAM	ALCONVRISE
Emergency	172.20.99.43	sjRouter.cisco.com	Line protocol on Interface FastEthernet0/0 is down (Administratively down)	October 14, 2015 01:37:40 PM ...	LINEPROTO	UPDOWN
Critical	172.20.99.43	sjRouter.cisco.com	Card inserted in slot 4, interfaces are now present	October 14, 2015 01:37:40 PM ...	OIR-SP	INSCARD
Error	172.20.114.20	API-Auto-ISR-153.cisco.com	duplex mismatch discovered on FastEthernet0/0	October 14, 2015 01:37:40 PM ...	CDP	DUPLEX_MIS...
Debug	172.20.114.20	API-Auto-ISR-153.cisco.com	Authorization succeeded for client (001e.09bf.a387) on interface Fa1/8	October 14, 2015 01:37:40 PM ...	AUTHMGR	SUCCESS
Debug	172.20.114.20	API-Auto-ISR-153.cisco.com	Authorization succeeded for client (001b.09bf.a387) on interface Fa1/8	October 14, 2015 01:37:40 PM ...	AUTHMGR	SUCCESS
Notice	172.20.114.20	API-Auto-ISR-153.cisco.com	Starting dot1x for client (001f.09bf.a387) on interface Fa1/8	October 14, 2015 01:37:40 PM ...	AUTHMGR	SUCCESS
Informational	172.20.99.43	sjRouter.cisco.com	Authentication failed for client (001f.09bf.a387) on Interface Fa1/8	October 14, 2015 01:37:40 PM ...	DOT1X	FAIL
Notice	172.20.114.20	API-Auto-ISR-153.cisco.com	Starting dot1x for client (011b.09bf.a387) on Interface Fa1/8 AuditSe...	October 14, 2015 01:37:40 PM ...	AUTHMGR	SUCCESS
Informational	172.20.99.43	sjRouter.cisco.com	Authentication failed for client (011b.09bf.a387) on Interface Fa1/8	October 14, 2015 01:37:40 PM ...	DOT1X	FAIL
Notice	172.20.114.20	API-Auto-ISR-153.cisco.com	Starting dot1x for client (021e.09bg.a387) on Interface Fa1/8 AuditSe...	October 14, 2015 01:37:40 PM ...	AUTHMGR	SUCCESS
Alert	172.20.99.43	sjRouter.cisco.com	Authentication failed for client (021e.09bg.a387) on Interface Fa1/8	October 14, 2015 01:37:40 PM ...	DOT1X	FAIL
Notice	172.20.114.20	API-Auto-ISR-153.cisco.com	Starting dot1x for client (003c.09bf.a387) on Interface Fa1/8 AuditSe...	October 14, 2015 01:37:40 PM ...	AUTHMGR	SUCCESS
Notice	172.20.114.20	API-Auto-ISR-153.cisco.com	Starting dot1x for client (001e.09bf.a387) on Interface Fa1/8 AuditSe...	October 14, 2015 01:37:40 PM ...	AUTHMGR	SUCCESS
Warning	172.20.114.20	API-Auto-ISR-153.cisco.com	RADIUS server 10.0.2.20:1812,1813 is not responding	October 14, 2015 01:37:40 PM ...	RADIUS	RADIUS_DEAD
Critical	172.20.114.20	API-Auto-ISR-153.cisco.com	Conversation above rising threshold: source host = 10.64.92.202, de...	October 14, 2015 01:37:40 PM ...	NAM	ALCONVRISE

Link/Port Auto-Monitoring

- Access and Trunk Ports are automatically monitored for Interface and QOS Statistics
- Monitoring frequency is 15 mins by default and is configurable

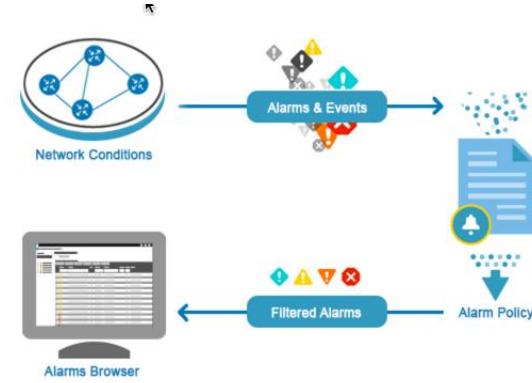
The screenshot shows the 'Monitor / Monitoring Tools / Monitoring Policies' section. Under 'Policies', 'Automonitoring' is selected. The main table displays monitoring configurations for 'Device Health' and 'Interface Parameter'. The 'Interface Parameter' section, which includes 'Link and Trunk Ports', is highlighted with an orange border. The table columns are 'Parameter', 'Polling Frequency', and 'Threshold'. For 'Link and Trunk Ports', the 'Polling Frequency' is set to '15 min'. The 'Interface Statistics' row is also highlighted with an orange border.

Parameter	Polling Frequency	Threshold
CPU Utilization	15 min	90 Percent(%)
Memory Pool Utilization	15 min	90 Percent(%)
Environment Temperature	15 min	80 Degree Celsius
Device Availability	1 min	Threshold N/A

Parameter	Polling Frequency	Threshold
Link and Trunk Ports		
Interface Statistics	15 min	
Interface Inbound Errors	10 Percent(%)	
Interface Outbound Errors	10 Percent(%)	
Interface Inbound Discards	5 Percent(%)	
Interface Outbound Discards	5 Percent(%)	
Input Utilization	90 Percent(%)	
Output Utilization	90 Percent(%)	

Simplify Alarm Noise Reduction

- Flexibility to choose events to be alarmed
- Allows filtering alarms on
 - Device Groups / Location Groups
 - Port Groups
- Suppress alarms, out of the box, for Access Switch Ports
- Advance suppression for wireless alarms based on
 - Percentage down on Location Group / Floors

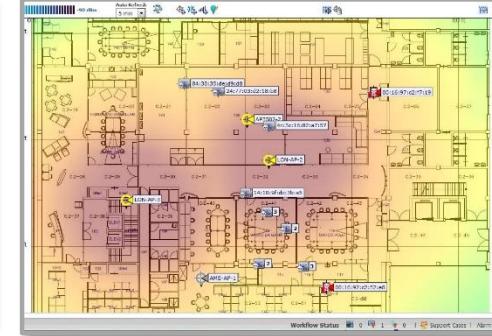
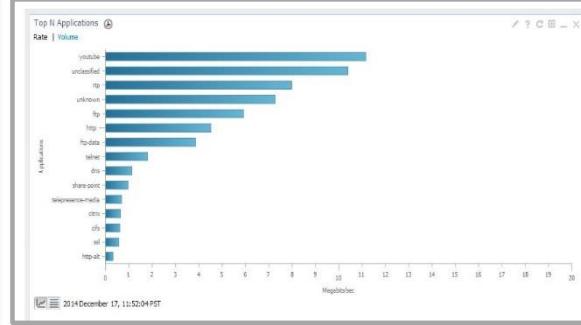
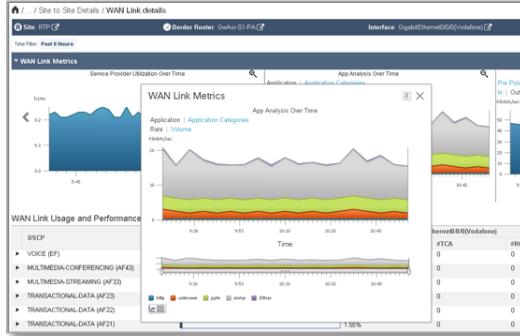


Raise critical alarms that
needs action
Reduce time to clean up
alarms

Client Tracking

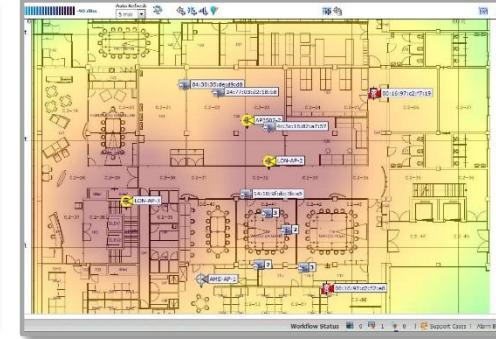
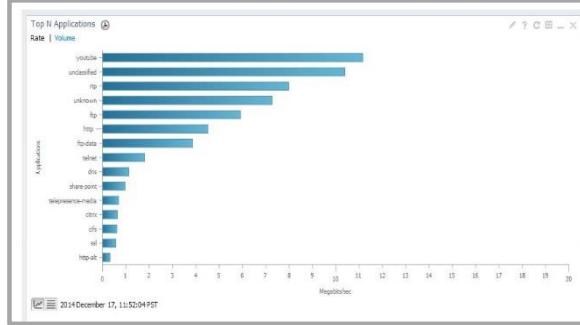
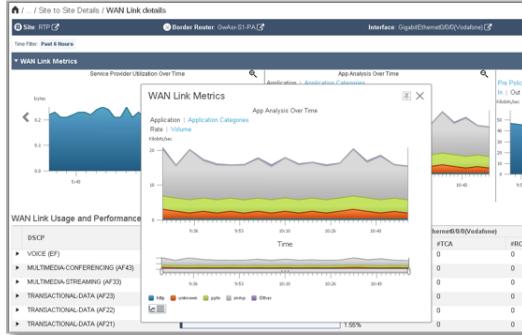
- User (or Client) Tracking in PI shows converged wired and wireless clients
- Clients on autonomous APs, lightweight APs, and switches are supported
 - 802.1x authentication can be detected
 - Non-authenticated also supported
- Like LMS, live tracking of clients can be done by enabling MAC address notification traps on switches

Cisco Live Milan 2015: The Bit-Torrent Incident



- On Friday before the show, staff is looking at network health with Prime Infrastructure
- They notice a large volume of traffic, taking up a lot of WAN bandwidth
- Easily able to see that the traffic is all from one user, and is all **Bit-Torrent !!??!?!?**
- Immediately able to see the exact end-point (IP & MAC address)
- NAM shows hostname is “Matt’s MacBook”
- Integration with MSE lets wireless maps show the exact location of “Matt”

Cisco Live Milan 2015: The Bit-Torrent Incident



- Staff walks down and has a chat with “Matt”
- He shuts off Bit-Torrent
- ACL added to WAN interface
- **Problem solved in less than 15 minutes** - including the time to walk downstairs to find Matt!

Silo tools cannot do this!

Setting Up For Client Tracking

The screenshot shows the Cisco Prime Infrastructure administration interface. The left sidebar has a tree view with categories like System Settings, Inventory, Alarms and Events, and Client and User. Under Client and User, 'Client' is selected. The main content area is titled 'Client and User Client'. It includes sections for 'Process Diagnostic Trap', 'Host Name Lookup', 'Data Retention', and 'Client Discovery'. The 'Data Retention' section is highlighted with a blue box and contains fields for 'Cache host name' (7 days), 'Disassociated clients' (7 days), 'Client session history' (32 days), and 'Number of Rows To Keep' (8000000). A warning message below states: 'Warning: Changing this value can result in increased disk space usage and could impact your system performance.' The 'Client Discovery' section at the bottom has a checkbox for 'Poll clients when client traps/syslogs received' with options for 'Wireless' and 'Wired'.

Before collecting clients on the network, adjust the settings for hostname resolution (a useful thing), data retention, and ...

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...

Advanced Filter

Match All Any

Status equals (=) Associated

Reset Clear Apply 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									
20:7d:74:2e:1...	172.16.5...	Dual-S...	Lewis...	Apple									
44:a7:cfc:5f:2f:7a	172.16.51.17	IPv4	Ther...	Murata									
00:22:1b:00:b...	172.16.50.106	IPv4	Unkn...	Morega									
00:50:56:b6:0...	172.16.50.53	IPv4	Unkn...	Vmware									
00:50:56:b6:0...	172.16.50.30	IPv4	Unkn...	Vmware									
d4:a0:2a:88:b...	10.10.10.2	IPv4	Unkn...	Cisco									
bc:16:65:88:1...	10.27.49.177	IPv4	Unkn...	Cisco	Unknown	3750-switch.amer.c...	Gi1/0/9	7	802.3	Associated	26-Jan-2016,00:38:01 ...		
00:1e:f7:28:9...	10.27.49.184	IPv4	Unkn...	Cisco	Unknown	3750-switch.amer.c...	Gi1/0/11	7	802.3	Associated	25-Jan-2016,12:37:38 ...		
bc:16:65:88:1...	172.16.50.100	IPv4	Unkn...										
00:50:56:b6:0...	172.16.50.51	IPv4	Unkn...										
00:50:56:b6:0...	172.16.50.76	IPv4	Unkn...										
00:1f:ca:05:0...	172.16.50.254	IPv4	Unkn...										
00:07:7d:42:f...	172.16.51.64	IPv4	Unkn...										
00:1a:4b:35:3...	172.16.50.28	IPv4	Unkn...										
6c:41:6a:5b:5...	10.99.86.113	IPv4	Unkn...										
40:70:09:b1:c...		Not De...	Unkn...										
00:22:64:03:5...	172.16.50.27	IPv4	Unkn...										
00:50:56:b6:0...	172.16.50.80	IPv4	Unkn...										

Total 68

Show Associated Clients

Quick Filter

Advanced Filter

All

Manage Preset Filters

2.4GHz Clients

5GHz Clients

All Lightweight Clients

All Autonomous Clients

All Wired Clients

Associated Clients

Clients known by ISE

Clients detected by MSE

Clients detected in the last 24 hours

Clients with Problems

Excluded Clients

FlexConnect Locally Authenticated

New clients detected in last 24 hours

On Network Clients

WGB Clients

All IPv4 Address Clients

All IPv6 Address Clients

All Dual-Stack Clients

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

Viewing Client Details - Troubleshooting

The screenshot shows the Cisco Prime Infrastructure web interface. At the top, there's a navigation bar with icons for Prime Infrastructure, Application Search, Notifications (28), and User information (root - ROOT-DOMAIN). Below the navigation bar, the URL is Monitor / Monitoring Tools / Clients and Users / 20:7d:74:2e:17:03. A red box highlights the "Troubleshoot and Debug" tab in the top navigation bar.

The main content area has several tabs: Overview, Location, ISE, Troubleshoot and Debug (highlighted), Clean Air, Events, RTTS, and More. Under the "Properties" section, there are three main columns: General, Session, and Security. The General column includes fields like User Name (Lewis-ipad4), IP Address (172.16.50.108), MAC Address (20:7d:74:2e:17:03), Vendor (Apple), Endpoint Type (Unknown), Client Type (Regular), and Media Type (Lightweight). The Session column shows Controller Name (Hickman-vWLC), Controller IP Address/DNS Name (172.16.50.230), AP Name (Home-AP-02), AP IP Address (172.16.50.112), AP Type (Cisco AP), AP Base Radio MAC (88:0f:77:ad:31:f0), and 802.11 State (Associated). The Security column lists Security Policy Type (WPA2), EAP Type (Unknown), On Network (Yes), 802.11 Authentication (Open System), Encryption Cipher (CCMP (AES)), SNMP NAC State (Access), and Radius NAC State (RUN).

In the Troubleshoot section, there are four green checkmark icons: 802.11 Association, 802.1X Authentication, IP Address Assignment, and Successful Association. Below this, the Problem section states "No issues found with client connectivity". The Recommendation section lists "No recommended actions" and provides troubleshooting steps:

- Troubleshoot RADIUS Authentications on Identity Services Engine
- Troubleshoot Posture on Identity Services Engine
- Search Cisco Support Community
- Open or Update a service request

The Debug and Analysis section contains a message: "Click Start to begin capturing log messages from the controller. (It may be necessary to ask the client to restart the connection process by rebooting their laptop to ensure that relevant log events are generated.) When a sufficient number of messages have been collected, click Stop". It includes buttons for Start, Stop, Clear, and Export. A Status Message section is present, and a Select LogMessages dropdown menu lists various message types: 802.11 Initialization (0), 802.1x Authentication (0), PEM Messages(0), DHCP Messages (0), AAA Messages(0), Voice QoS Messages(0), Mobility Messages(0), and All (0).

A callout box highlights the "Troubleshoot and Debug" tab with the text: "The troubleshooting tab gives further details about the client, security info, and debug information."

Annotating Client Information

The screenshot shows the Cisco Prime Infrastructure interface for monitoring clients and users. A specific client entry is selected, showing its path from a user device to an AP and then to a controller. Below this, detailed client attributes are listed, including general information like user name, IP address, MAC address, vendor, endpoint type, client type, and media type, as well as session details such as controller name, AP name, AP IP address, AP type, and various NAC states. An orange box highlights a note-taking feature where a note can be edited and saved. A blue callout box at the bottom left of the interface area contains the text: "Just like in LMS, notes can be added per-client to better describe the client's purpose."

Prime Infrastructure

Monitor / Monitoring Tools / Clients and Users / 20:7d:74:2e:17:03

Overview Location ISE Troubleshoot and Debug Clean Air Events RTTS More

Client Attributes Summary

Client Attributes

General

User Name	Lewis-ipad4
IP Address	172.16.50.108
MAC Address	20:7d:74:2e:17:03
Vendor	Apple
Endpoint Type	Unknown
Client Type	Regular
Media Type	Lightweight

Session

Controller Name	Hickman-vWLC
Controller IP Address/DNS Name	172.16.50.230
AP Name	Home-AP-02
AP IP Address	172.16.50.112
AP Type	Cisco AP
AP Base Radio MAC	88:f0:77:ad:31:f0
802.11 State	Associated
SNMP NAC State	Access
Radius NAC State	RUN

Association History

Zoom: 1h | 6h | 1d | 1w | 2w | 4w

AP

Home-AP-02

Just like in LMS, notes can be added per-client to better describe the client's purpose.

Refresh from Device (Refreshed : 26-Jan-2016,04:58:24 EST)

Edited by root Characters remaining 255

Save Note Clear Note

Tracking Clients

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.

The screenshot shows the Cisco Prime Infrastructure interface under the 'Monitor / Monitoring Tools / Clients and Users' section. A modal window titled 'Track Clients' is open, overlaid on the main client list table. The modal contains fields for adding new entries, importing from a file, and editing existing ones. It also includes sections for 'Expiration' and 'Notification Settings' with options for purging expired entries, notification frequency, method, and email address. Buttons for 'Save' and 'Cancel' are at the bottom right of the modal. The main table lists various client details such as MAC Address, IP Address, Vendor, and Device Name. A blue callout box highlights the 'Track Clients' button in the top navigation bar and the 'Track Clients' modal window.

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.c...	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:cf:5f:2f: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...	Hewlet...	Unknown	4948-Switch.amer....							
00:50:56:b6:0...	172.16.50.80	IPv4	Unkn...	Vmware	Unknown	4948-Switch.amer....							
00:15:99:ec:c...	172.16.50.4	IPv4	Unkn...	Samsung	Unknown	3750-switch.amer.c...							
6c:f0:49:0a:7...	172.16.50.20	IPv4	Unkn...	Giga b...	Unknown	3750-switch.amer.c...	Gi1/0/22	2	802.3	Associated	25-Jan-2016,12:37:38 ...	hickman-fc.amer.cisco.com	

Network Monitoring

- PI has a number of monitoring features
 - Device health
 - Interface utilization
 - Performance and application
- Performance and application monitoring requires the Assurance License
- Many of PI's monitoring features are enabled out-of-the-box
- Dashlets make it easy to quickly spot problems in the network

Enabling Monitoring Templates

The screenshot shows the Cisco Prime Infrastructure interface. In the top navigation bar, it says "Prime Infrastructure" and "jevalent - ROOT-DOMAIN". The main area is titled "Monitor / Monitoring Tools / Monitoring Policies". On the left sidebar, under "My Policies", there are two entries: "InterfaceHealth-AVC" (selected) and "InterfaceHealth-UCS". The main panel displays the details for "InterfaceHealth-AVC":

- Name:** InterfaceHealth-AVC
- Description:** Interface Health For AVC Configured Interfaces
- Author:** root
- Contact:** [empty field]
- Status:** Active

Below this, the "Parameters and Thresholds" section is shown, containing a table and a list of metrics:

Parameter	Polling Frequency
Interface_Statistics	5 min

Metrics listed under "Interface_Statistics":

- Interface Inbound Errors
- Interface Outbound Errors
- Interface Inbound Discards
- Interface Outbound Discards
- Input Utilization
- Output Utilization
- Input Packet Broadcast Percent

At the bottom of the panel are "Save and Activate" and "Cancel" buttons.

Templates for enabling various monitoring tasks can be found under *Design > Monitoring Configuration*.

Of the built-in *Metrics* templates, only *Interface Health* is not deployed to devices by default.

(3.x) Now done under Monitoring > Monitoring Policies > Automonitoring and Monitoring > Monitoring Policies > My Policies.

Dashboards and Dashlets

Screenshot of the Cisco Prime Infrastructure Network Summary dashboard:

Metrics

- ICMP Reachability Status**: 10 All, 10 Reachable, 0 Unreachable
- Alarm Summary**: 89 Critical, 0 Major, 117 Minor
- Unified AP Status**: 2 All, 100% Reachable, 0% Unreachable
- Controller Status**: 18 All, 1 Reachable, 17 Unreachable
- System Health**: 0 Critical, 0 Major, 0 Minor

Last Updated: Sunday, January 3, 2016 at 1:29:18 PM EST

Interface Utilization Summary

Zoom: 1h | 6h | 1d | 1w | 2w | 4w | 3m | 6m | 1y | From: 12/20/2015, 1:30 PM To: 1/3/2016, 1:30 PM

Rx: 0-25% (2)
Tx: 0-25% (2)

Network Topology

The PI dashboards provide a “quilt” for plugging in dashlets that visualize the health and performance of the network and individual devices.

Dashboards and Dashlets

The screenshot shows the Cisco Prime Infrastructure dashboard interface. At the top, there's a navigation bar with the Cisco logo, 'Prime Infrastructure', 'Application Search', a notification icon (89), and a user account ('jevalent - ROOT-DOMAIN'). A green arrow points to the 'Settings' gear icon in the top right corner, which is expanded to show a context menu.

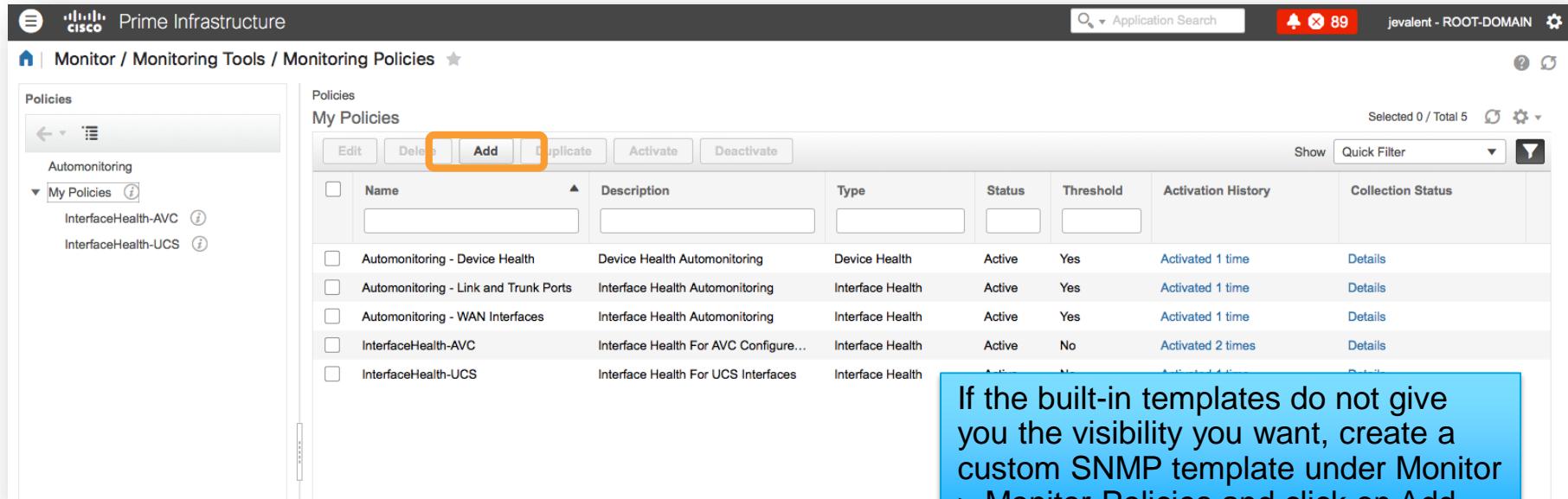
The main dashboard area contains several dashlets:

- Metrics**: ICMP Reachability Status (10 All, 10 Reachable, 0 Unreachable) and Alarm Summary (89 Critical, 0 Major).
- Interface Utilization Summary**: A chart showing utilization over the past 2 weeks.
- Top N WAN Interfaces by Utilization**: A table listing interfaces across different branches with their maximum and current utilization.
- Network Topology**: A map showing connections between Europe, North America, and Unassigned regions.
- Top N Interface Utilization**: A chart showing utilization for specific interfaces.

A blue callout box highlights the 'Metrics' and 'Interface Utilization Summary' dashlets with the text: "Each of the main dashboard tabs (Overview, Incidents, Performance, and Detail Dashboard) offer their own set of dashlets."

Another blue callout box highlights the 'Top N WAN Interfaces by Utilization' dashlet with the text: "When adding a new dashlet, its preview will show up when you mouse-over the reticule." A red circle with a minus sign is overlaid on the 'Top N WAN Interfaces by Utilization' chart area.

Custom SNMP Templates



The screenshot shows the Cisco Prime Infrastructure interface. In the top navigation bar, there are icons for Home, Cisco, and Prime Infrastructure, followed by Application Search, Notifications (89), and the user 'jevalent - ROOT-DOMAIN'. On the left, a sidebar lists 'Policies' under 'Monitor / Monitoring Tools / Monitoring Policies'. It includes sections for 'Automonitoring' and 'My Policies' (which is expanded to show 'InterfaceHealth-AVC' and 'InterfaceHealth-UCS'). The main content area is titled 'My Policies' and contains a table with columns: Name, Description, Type, Status, Threshold, Activation History, and Collection Status. The table lists five existing policies. An orange box highlights the 'Add' button in the top toolbar of the table header.

<input type="checkbox"/>	Name	Description	Type	Status	Threshold	Activation History	Collection Status
<input type="checkbox"/>	Automonitoring - Device Health	Device Health Automonitoring	Device Health	Active	Yes	Activated 1 time	Details
<input type="checkbox"/>	Automonitoring - Link and Trunk Ports	Interface Health Automonitoring	Interface Health	Active	Yes	Activated 1 time	Details
<input type="checkbox"/>	Automonitoring - WAN Interfaces	Interface Health Automonitoring	Interface Health	Active	Yes	Activated 1 time	Details
<input type="checkbox"/>	InterfaceHealth-AVC	Interface Health For AVC Configure...	Interface Health	Active	No	Activated 2 times	Details
<input type="checkbox"/>	InterfaceHealth-UCS	Interface Health For UCS Interfaces	Interface Health				

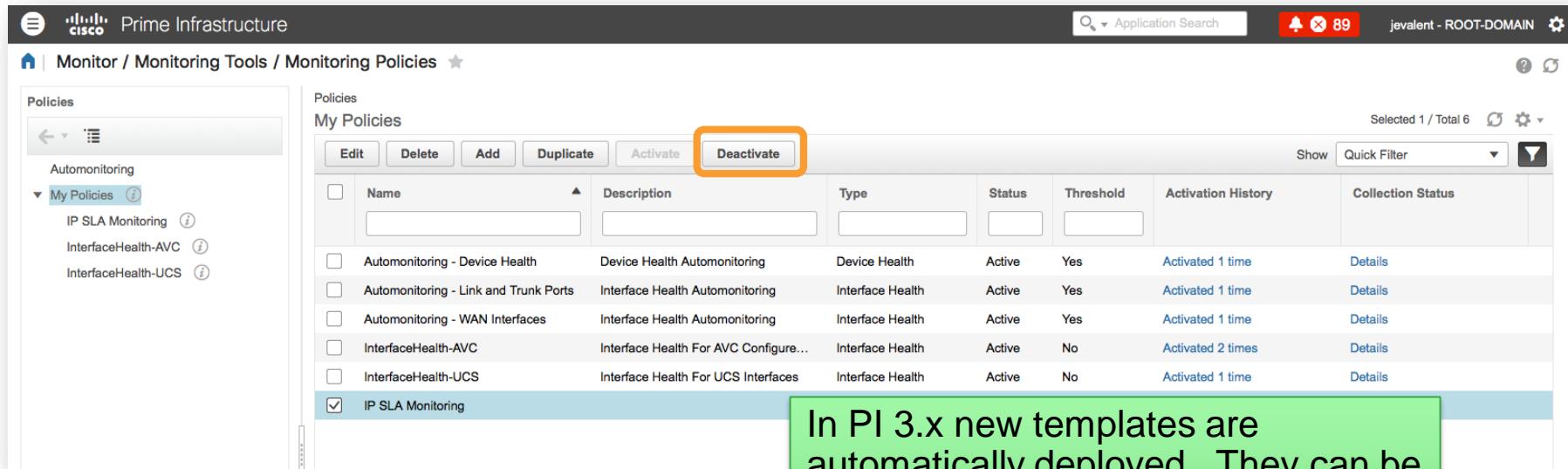
If the built-in templates do not give you the visibility you want, create a custom SNMP template under Monitor > Monitor Policies and click on Add.

Custom SNMP Templates

The screenshot shows the 'Monitor / Monitoring Tools / Monitoring Policies' section. On the left, a sidebar lists various policy types: Traffic Analysis, Application Response Time, Voice Video Data, Interface Health, Device Health, GETVPN Poller, Wireless Controller, DMVPN, WirelessAP, and two entries highlighted with orange boxes: 'Custom MIB Polling' and 'NAM Health'. The main area is titled 'Custom MIB Polling' under 'Policy Types'. It includes fields for 'Name' (set to 'IP SLA Monitoring'), 'Author' (set to 'jevalent'), 'Description' (empty), and 'Contact' (empty). The 'Feature Category' is set to 'Custom MIB Polling'. Below this, there are tabs for 'MIB Selection' (selected) and 'Test'. A large section titled 'MIBs and Polling Frequency' contains dropdowns for 'Polling Frequency' (set to '5 min') and 'MIB's' (set to 'CISCO-RTTMON-MIB'). An 'Upload MIB' button is also present. A list of MIB objects follows, each with a checkbox. Several checkboxes are checked, including one for 'rttMonLatestJitterOp...' and another for 'rttMonLatestJitterOp...'. A blue callout box on the right side of the page contains the text: 'Use Custom MIB Polling and choose from the list provided, or upload the MIB needed for the new template.'

Use Custom MIB Polling and choose from the list provided, or upload the MIB needed for the new template.

Custom SNMP Templates



The screenshot shows the Cisco Prime Infrastructure interface. In the top navigation bar, the title is "Prime Infrastructure". Below it, the path is "Monitor / Monitoring Tools / Monitoring Policies". On the left sidebar, under "Policies", there is a section for "My Policies" which includes "IP SLA Monitoring", "InterfaceHealth-AVC", and "InterfaceHealth-UCS". The main content area is titled "My Policies" and contains a table with columns: Name, Description, Type, Status, Threshold, Activation History, and Collection Status. The "Deactivate" button in the toolbar above the table is highlighted with an orange box. The table lists several policies, with "IP SLA Monitoring" being the selected row, indicated by a blue highlight.

Name	Description	Type	Status	Threshold	Activation History	Collection Status
Automonitoring - Device Health	Device Health Automonitoring	Device Health	Active	Yes	Activated 1 time	Details
Automonitoring - Link and Trunk Ports	Interface Health Automonitoring	Interface Health	Active	Yes	Activated 1 time	Details
Automonitoring - WAN Interfaces	Interface Health Automonitoring	Interface Health	Active	Yes	Activated 1 time	Details
InterfaceHealth-AVC	Interface Health For AVC Configure...	Interface Health	Active	No	Activated 2 times	Details
InterfaceHealth-UCS	Interface Health For UCS Interfaces	Interface Health	Active	No	Activated 1 time	Details
<input checked="" type="checkbox"/> IP SLA Monitoring						

In PI 3.x new templates are automatically deployed. They can be deactivated by going to Monitor>Monitoring Policies>My Policies, and selecting the new policy.

Monitoring The New Template

The screenshot shows the Cisco Prime Infrastructure interface. In the top navigation bar, the user is in the 'Dashboard / Performance' section. The main area displays a 'Generic Dashlet' titled 'IP SLA Monitoring Graph'. The 'Policy Name' dropdown is set to 'IP SLA Monitoring'. A modal window titled 'Generic Dashlet Reachability Status' is open, showing a table of data. The right side of the screen features a sidebar with various dashboard and performance monitoring options, including 'Add New Dashboard', 'Add Dashlet(s)', and 'Device Port Summary'. A callout box highlights the 'Generic Dashlet' option in the sidebar.

Generic Dashlet

Dashlet Title: IP SLA Monitoring Graph

Refresh Dashlet:

Refresh Interval: 5 minutes

Override Dashboard Time Filter:

Time Frame: Past 1 Hour

Type: Table

Policy Name: IP SLA Monitoring

Reset Save Save And Close Close

Policy not selected.

Generic Dashlet Reachability Status

Event...	Owning...	Index...	iDcar...	iPhyAd...	ifHoclets...	...
2013 Jan...	171.69.2...	16	Loopback1	0		
2013 Jan...	171.69.2...	17	Loopback2	0		
2013 Jan...	171.69.2...	5	Bridged...	64.00.01...		
2013 Jan...	172.20.1...	4	BridgeInt...	26.54.26...	0	
2013 Jan...	172.23.2...	6	BridgeInt...	00.07.7d...	36054994	
2013 Jan...	175.69.2...	6	FastEthernet...	00.1d.70...	67566518	
2013 Jan...	175.69.2...	15	FastEthernet...	00.1d.70...	67566518	
2013 Jan...	171.69.2...	15	Cellular...	0		
2013 Jan...	171.69.2...	18	Vlan30	64.00.01...	2596015	
2013 Jan...	171.69.2...	12	Nat0	0		
2013 Jan...	171.69.2...	13	Vlan1	64.00.01...	0	

Description: This dashlet provides the snmp mib attributes polled by custom snmp template.

DataSources: SNMP Polling - Custom Snmp

Applicable Filters: Global Filters - None. Dashlet specific Filters override the global filter which are available in the edit settings - Time, Template (Line & Table view)

Add New Dashboard Add Dashlet(s) Device Port Summary Add Generic Dashlet Add Top N Interfaces by ... Add Application Dashlets Interface Dashlets QoS Class Map Statist... Add Top QoS Class Map St... Add DSCP Classification Add Add/Remove Filter(s) Layout Template Manage Dashboards

Add a new Generic Dashlet (Dashboard>Performance, not Overview!) to one of the Detail Dashboards and fill in the desired parameters for your custom template.

Monitoring Application Performance

Prime Infrastructure

Application Search: 89
jevalent - ROOT-DOMAIN

Dashboard / Overview

General Incidents Client Network Devices Network Interface Service Assurance

Filters Time Frame: Past 1 Hour Go

Top N Applications (Rate | Volume)

Application	Kilobits/sec
http	~63
pandora	~25
espn-browsing	~15
google-services	~2
snmp	~1
ftp	~1
netbios-ssn	~1
ssh	~1
netbios-ns	~1
active-directory	~1
ntp	~1
radius	~1

Sunday, January 03 2016 at 18:52 PM UTC

Top N Servers (Rate | Volume)

Server IP	Kilobits/sec
208.85.40.50	~50
198.19.1.10	~45

Top N Resources by Netflow (By Device | By Site)

Resource	Traffic
csr1.dcloud.cisco.com	~20

Datasource

Traffic

Sunday, January 03 2016 at 18:52 PM UTC

With the Assurance license, PI can receive NetFlow sent to UDP/9991. The Overview > Service Assurance and Service Health dashboards will show per-device, per-interface, and per-application performance and utilization.

Performance Graphs

Monitor / Monitoring Tools / Performance Graphs

Devices Interfaces Templates

Top N CPU Top N Memory X Top N Interfaces (Tx) X Top N Interfaces (Rx) X +

Settings

Top CPU Usage

Top Memory Usage

Top Interface Discards

Top Interface Errors

Top Interface Utilization (Tx)

Top Interface Utilization (Rx)

CLive-ISR4K.cisco.com (172.25.220.226)

Percent

Feb 5 Feb 6 Feb 7 Feb 8 Feb 9 Feb 10 Feb 11 Feb 12

CLive-ISR4K.cisco.com / CPU / cpu R0/0

PAR-3850-1 (10.12.0.2)

Percent

Feb 5 Feb 6 Feb 7 Feb 8 Feb 9 Feb 10 Feb 11 Feb 12

PAR-3850-1 / CPU / CPU 1
PAR-3850-1 / CPU / CPU 0
PAR-3850-1 / CPU / CPU 3
PAR-3850-1 / CPU / CPU 2

LON-3945-RBR (10.11.1.1)

Percent

Feb 5 Feb 6 Feb 7 Feb 8 Feb 9 Feb 10 Feb 11 Feb 12

LON-3945-RBR / CPU / CPU 1

Metrics

- CLive-ISR4K.cisco.com (172.25.220.226)
- PAR-3850-1 (10.12.0.2)
- LON-3945-RBR (10.11.1.1)
- AMS-3650-SBR.cisco.com (192.168.152.10)
- NY-3650-SBR.cisco.com (10.4.10.1)

Network Topology

- **Network Topology Page**
 - Maps> Network Topology
 - Main landing page for viewing network topology
- **Topology Dashlets**
 - Topology Dashlets available for Overview level dashboards
 - Multiple Topology dashlets supported
 - Any topology map can be viewed in a dashlet
- **Device 360 “N-Hop” contextual topology view**
 - Device 360 adds new action icon to see device context topology

Topology Maps

Cisco Prime Infrastructure

Maps / Topology Maps / Network Topology

Device Groups

Locations

- All Locations
 - Asia Pacific
 - Europe
 - JTAC
 - Management Apps
- North America
 - US
 - Central
 - East Coast
 - San Jose Data Center
- Custom

All Locations

Alarm Summary (125)

- Critical (8)
- Major (0)
- Minor (117)
- Warning (0)
- Informational (0)

Show Alarms Table

Links

Application Search

8

jvalent - ROOT-DOMAIN

?

Device Icons

- Asia Pacific
- System Campus
- North America
- Europe
- JTAC
- Management Apps
- Unassigned
- dCloud Branch

Diagram Description: A network topology map showing hierarchical locations. 'All Locations' is expanded to show 'Asia Pacific', 'Europe', 'JTAC', 'Management Apps', 'North America' (expanded to 'US' with 'Central' and 'East Coast'), and 'San Jose Data Center'. 'Custom' is also listed. An 'All Locations' summary shows 125 alarms: Critical (8), Minor (117), and Informational (0). A callout bubble points to the 'Asia Pacific' location icon, which has a red alarm badge with a white 'X' indicating the highest alarm state for items within its container.

Alarm Badge indicates highest alarm state of items inside the Container

Location Group Topology

Prime Infrastructure

Maps / Topology Maps / Network Topology

Device Groups

Locations

- JTAC
- Management Apps
- North America
 - US
 - Central
 - East Coast
 - West Coast
 - Los Angeles Branch
 - San Francisco Branch
 - San Jose Campus
- Custom

All.../West Coast/San Jose C...

Alarm Summary (168)

- Critical (0)
- Major (0)
- Minor (86)
- Warning (0)
- Informational (82)

Show Alarms Table

Device 360° Views

VSS-CAT6800-dist

10.0.255.41 Cisco Catalyst 68xx Virtual Switch
All Locations, San Jose Campus, San Jose Data Center, North America, US, West Coast
Up for 64 days 18 hrs 53 mins 21 secs

OS Type: IOS
OS Version: 15.1(2)S3
Last Config Change: May 14, 2015 2:07:41 PM PDT
Last Inventory Collection: January 19, 2016 10:03:09 PM PST

CPU Utilization (1 hour): 5.50% (▲ +0.17%)
Memory Utilization (1 hour): 49.00% (0.09%)

Alarms Modules Interfaces Neighbors

Status	Timestamp	Message
Not Acknowledged	11/26/15, 22:21:10	Device VSS-CAT6800-dist/Processor: value of Mem...
Not Acknowledged	11/26/15, 22:21:10	Device VSS-CAT6800-dist/I/O: value of Memory Poo...
Not Acknowledged	11/26/15, 22:23:22	Device VSS-CAT6800-dist/Chassis 1 CPU of Routing...
Not Acknowledged	11/26/15, 22:23:22	Device VSS-CAT6800-dist/Chassis 1 CPU of Module...
Not Acknowledged	11/26/15, 22:23:22	Device VSS-CAT6800-dist/Chassis 2 CPU of Module...
Not Acknowledged	11/26/15, 22:23:22	Device VSS-CAT6800-dist/Chassis 2 CPU of Module...

View Details Actions

Show Create

VSS-CAT6800-dist

10.0.255.41 Cisco Catalyst 68xx Virtual Switch

0 Critical 0 Major 0 Minor 7 Warning 0 Informational 0

Add to Group View 360

FL4-3750S-1

SS-CAT6800-dist

MGCP_Gwy

SJ-WISM2-1

CUPS.cisco.com

<UnmanagedNetwork>

Building-O

NAM

Click on the device to get Device Summary

Launch the Device 360 View

Manually Create Elements - Network / Device / Link

The screenshot shows the Cisco Prime Infrastructure interface for creating network elements. A green box highlights the 'Create' dropdown menu, which includes options for 'Create Device', 'Create Link', and 'Create Network'. A blue box labeled 'Edit Interface Assignment' points to a section where interface details are being edited for a selected link.

Create

- Create Device
- Create Link
- Create Network

Interface Details

Device	Interface
Device 1	sjc20-rbb-gw1.cisco.com
Interface 1	Unavailable
Device 2	sjcmr1-cd1-sbb-gw1.cisco.com
Interface 2	TenGigabitEthernet1/13
Link type	Manual link
Link Status	CLEARED
Source Connector	Unavailable
Target Connector	CLEARED

Edit Interface Assignment

Device 1: sjc20-rbb-gw1.cisco.com
Interface 1: Unavailable
Device 2: sjcmr1-cd1-sbb-gw1.cisco.com
Interface 2: TenGigabitEthernet1/13
Link type: Manual link
Link Status: CLEARED
Source Connector: Unavailable
Target Connector: Cleared

Critical Links View

Maps / Topology Maps / Network Topology

Device Groups

Locations

- All Locations (7)
- Beaverton
- Bellevue
- Boise
- Gold River
- Honolulu
- Lake Oswego

Custom

All Locations

Alarm Summary (786)

Links

The network topology diagram illustrates a central "San Jose Campus" node connected to multiple other locations: Beaverton, Bellevue, Boise, Gold River, Honolulu, Lake Oswego, Rancho Cordova, Seattle, and Spokane. Each location is represented by a building icon.

View the Critical Link Status, Type, Alarms on either ends of the link etc based on the location

Severity	Link Name	Type	A Side Severity	A Side	Z Side Severity	Z Side
<input type="radio"/>	bvw01-lab-gw1.cisco.com_GigabitEthernet0/...	PHYSICAL	<input checked="" type="checkbox"/> Cleared	GigabitEthernet0/1	<input checked="" type="checkbox"/> Cleared	GigabitEthernet2...
<input type="radio"/>	bvw01-lab-gw1.cisco.com_GigabitEthernet0/...	PHYSICAL	<input checked="" type="checkbox"/> Cleared	GigabitEthernet0/0	<input checked="" type="checkbox"/> Cleared	GigabitEthernet1...
<input type="radio"/>	bvw01-cs1.cisco.com_GigabitEthernet0/0:bv...	PHYSICAL	<input checked="" type="checkbox"/> Cleared	GigabitEthernet1...	<input checked="" type="checkbox"/> Cleared	GigabitEthernet0/0
<input type="radio"/>	bvw01-sw1.cisco.com_GigabitEthernet1/0/1:...	PHYSICAL	<input checked="" type="checkbox"/> Cleared	GigabitEthernet1...	<input checked="" type="checkbox"/> Cleared	GigabitEthernet0/0
<input type="radio"/>	bvw01-wan-gw1.cisco.com_GigabitEthernet...	PHYSICAL	<input checked="" type="checkbox"/> Cleared	GigabitEthernet0/1	<input checked="" type="checkbox"/> Cleared	GigabitEthernet0/1
<input type="radio"/>	bvw01-sw1.cisco.com_GigabitEthernet2/0/1:...	PHYSICAL	<input checked="" type="checkbox"/> Cleared	GigabitEthernet2...	<input checked="" type="checkbox"/> Cleared	GigabitEthernet0/0

Datacenter Topology

Prime Infrastructure Application Search 16 prime - ROOT-DOMAIN

Maps / Topology Maps / Datacenter Topology

Device Groups Locations

All Locations / TME-LAB / SJ-HQ

360° View: CORE-1-VPC-AGG-1

CORE-1-VPC-AGG-1 10.0.255.33 All Locations SJ-HQ,TME-LAB Cisco Nexus 7000 10-Slot Switch

OS Type NX-OS OS Version 6.1(3) Last Config Change April 13, 2014, 12:58:21 AM PDT Last Inventory Collection September 24, 2014, 10:08:00 PM PDT

CPU Utilization(1 Hour) 14.00% Memory Utilization (1 hour) 76.00%

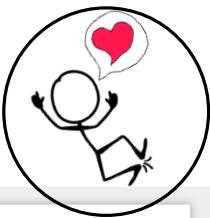
Interfaces Neighbors Civic Location VDC Details Recent Changes

Op. Status	Admin Status	Interface	Top 3 Applications
Green	Green	mgmt0	N/A
Red	Green	Ethernet1/9	N/A
Red	Green	Ethernet1/20	N/A
Green	Green	Ethernet1/11	N/A
Green	Green	Ethernet1/13	N/A

CORE-1-VPC-AGG-1 10.0.255.33 Cisco Nexus 7000 10-Slot Switch Reachable 0 0 3 0 0 0

View 360

The screenshot displays a network topology visualization for a datacenter. On the left, a sidebar lists device groups and locations, with 'SJ-HQ' selected. The main area shows three core switches (CORE-1, CORE-2, CORE-3) interconnected. External connections include MPLS and Internet clouds. A detailed callout for 'CORE-1-VPC-AGG-1' provides performance metrics (CPU: 14.00%, Memory: 76.00%) and interface status. A green box highlights the 'VDC Details' tab in the callout.



Effective Software Image Management (SWIM)



The screenshot shows the "Image Management Settings" page with the following sections:

- Settings**: Includes a link to "Image Management Settings | Edit".
- Current Protocol Order**: Shows the sequence: SCP → SFTP → FTP → TFTP.
- Useful Links**: Includes links to:
 - 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

Image Management Settings

Prime Infrastructure

Inventory / Device Management / Software Images / System Settings

System Settings

- Network and Device
 - CLI Session
 - Controller Upgrade
 - Plug & Play
 - SNMP
- Switch Port Trace (SPT)
 - Auto SPT
 - Manual SPT
 - SPT Configuration
 - Known Ethernet MAC Address L
- Inventory
 - Configuration
 - Configuration Archive
 - Datacenter Settings
 - Discovery
 - Grouping
 - Image Management**
 - Inventory
 - User Defined Fields

Inventory
Image Management

Click here to modify stored cisco.com credentials.

- Continue distribution on failure
- Collect images along with inventory collection
- TFTP fallback
- Backup current image
- Insert boot command
- Recommend latest maintenance version of each major release
- Recommend Same Image Feature
- Recommend versions higher than current version
- Include CCO for recommendation
- Remove the option to activate software during distribution jobs.

Available Options Selected Options

Image transfer protocol order

Available Options	Selected Options
	SCP
	SFTP
	FTP
	TFTP

Cisco live!

Start by visiting
Administration > System Settings
> Inventory > Image Management
to set your desired defaults

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

Add/Import

Import Images

1 Source

2 Collection Options

3 Schedule



Distribute

Source

- Device
- Cisco.com
- URL
- Protocol
- File



Next Task: Backup all currently deployed images

Go to Inventory > Device Management > Software Images

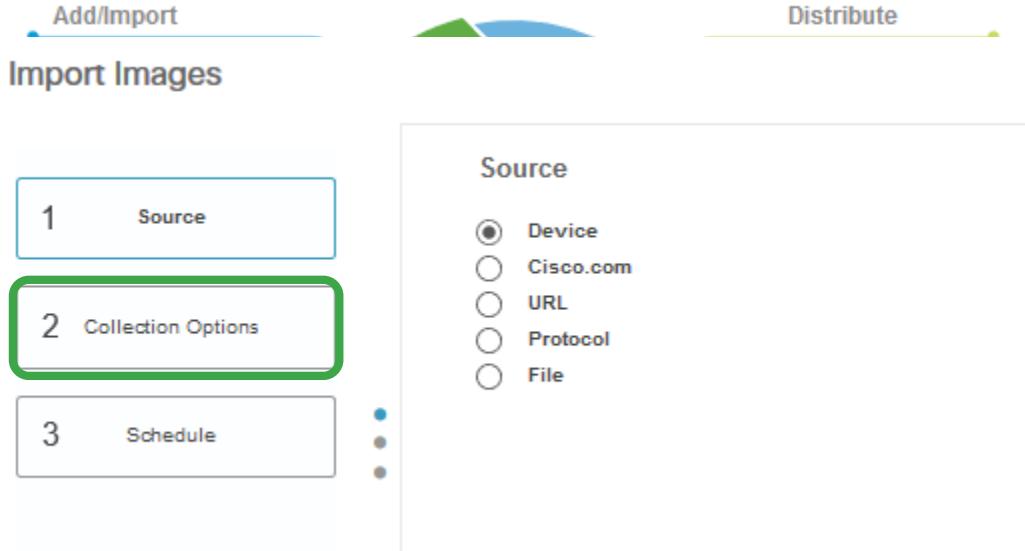
Click 'Import'

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 a software interface for managing device collections. On the left, there's a vertical navigation bar with three steps: 1. Source, 2. Collection Options (which is selected), and 3. Schedule. The main area is titled 'Distribute' and contains a 'Device Selection' table. The table has columns for Name, Description, IP Address/DNS, Type, and Vendor. A row for 'All Devices' is highlighted with a blue background and has a checked checkbox next to it. Below this table, there are four other options: Device Type, Location, and User Defined, each with an unchecked checkbox. At the bottom right of the dialog are 'Submit' and 'Cancel' buttons.

Name	Description	IP Address/DNS	Type	Vendor
<input checked="" type="checkbox"/> All Devices	All Members			
<input type="checkbox"/> Device Type	Device Type			
<input type="checkbox"/> Location	Location based groups			
<input type="checkbox"/> User Defined	User Defined Device Groups			

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' workflow in the Cisco NMS software. 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 box. At the top, there's a 'Distribute' button. The 'Schedule' section contains the following fields:

- Job Name:** Job_Device_Image_Collection_7_58_25_683_PM_6_26_2016
- Start Time:** Now Date 06/26/2016 07:58 PM (MM/dd/yyyy hh:mm AM/PM)
- Recurrence:** None Minute Hourly Daily Weekly
- Settings:** Every 1 week(s). Sunday Wednesday Saturday Monday Thursday Tuesday Friday
- End Time:** No End Date/Time Every 1 Times End at 06/26/2016 07:58 PM (MM/dd/yyyy hh:mm AM/PM)

At the bottom right of the 'Schedule' box 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

Add/Import

Import Images

1 Source

2 Collection Options

3 Schedule

Schedule

Job Name Job_Device_Image_Collection_7_58_25_683_PM_6_26_2016

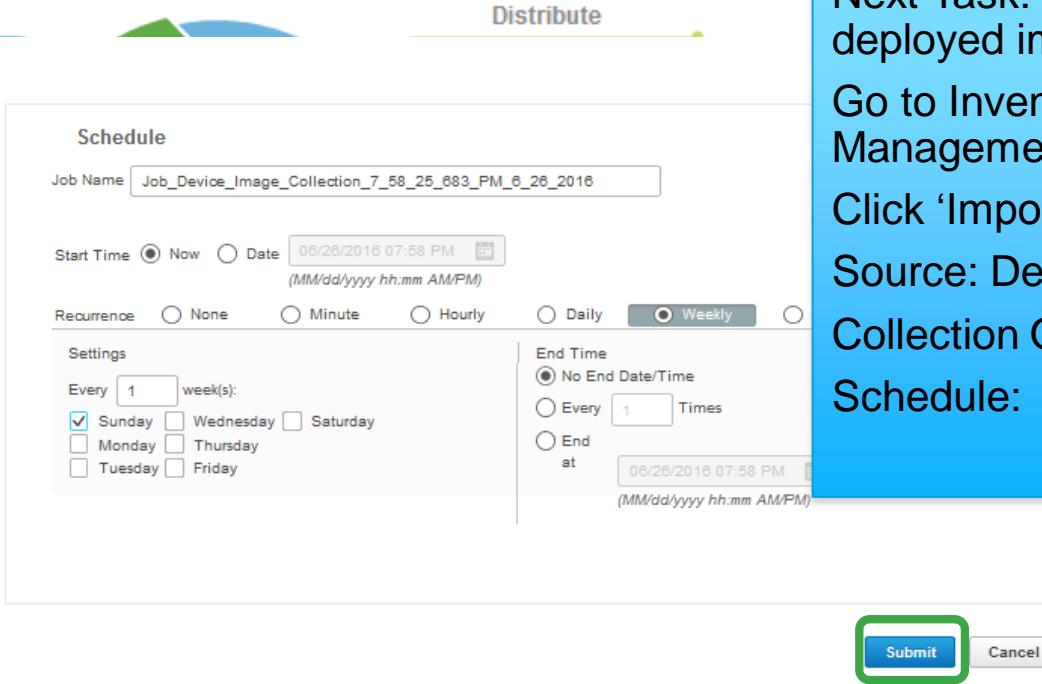
Start Time Now Date 06/26/2016 07:58 PM
(MM/dd/yyyy hh:mm AM/PM)

Recurrence None Minute Hourly Daily Weekly

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

End Time
 No End Date/Time
 Every 1 Times
 End at 06/26/2016 07:58 PM
(MM/dd/yyyy hh:mm AM/PM)

Submit **Cancel**



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

Add/Import

Import Images

1 Source

2 Collection Options

3 Schedule

Distribute

Schedule

Job Name: Job_Device_Image_Collection_7_58_25_683_PM_6_26_2016

Start Time: Now Date: 06/26/2016 07:58 PM
(MM/dd/yyyy hh:mm AM/PM)

Recurrence: None Minute Hourly Daily Weekly

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

End Time:
 No End Date/Time
 Every 1 Times
 End at: 06/26/2016 07:58 PM
(MM/dd/yyyy hh:mm AM/PM)

Submit

Cancel

Image Collection Job Status
Job_Device_Image_Collection_8_19_16
is scheduled successfully. Go to [Jobs Dashboard](#) to check job status.

Image Backup

Prime Infrastructure Application Search 11 notifications root - ROOT-DOMAIN Settings

Administration / Dashboards / Job Dashboard / Job_Device_Image_Collection_8_25_01_173_PM_6_26_2016 ★

Recurrence None
Description Collecting the image from DEVICE
Log file Download

Finally the downloads will complete

Showing latest 5 Job instances [Show All](#) Total 1

Run ID	Status	Duration (hh:mm:ss)	Start Time	Completion Time
50525922	✓ Success	00:00:02	2016-06-26 20:25	2016-06-26 20:25

Image Management Job Results | [Detach](#) Total 5

Device IP	Device Name	Image Name	Status
172.16.50.254	(i) 2821-Router.amer.cisco.com	c2900-universalk9-mz.SPA.154-3.M4.bin	✓ Success (i)
172.16.51.252	(i) 3560-Condo-Switch.comcast.net	c3560-ipbasek9-mz.122-58.SE2.bin	✓ Success (i)
172.16.51.251	(i) 2960-Condo-Switch.comcast.net	c2960-lanbasek9-mz.122-58.SE2.bin	✓ Success (i)
172.16.50.248	(i) 3750E-switch.amer.cisco.com	c3750e-universalk9-mz.122-58.SE2.bin	✓ Success (i)
172.16.50.253	(i) 4948-Switch.amer.cisco.com	cat4500-entservices-mz.122-46.SG.bin	✓ Success (i)

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

Import Image into PI Software Repository

Import Images

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

Device Selection

Name	Description	IP Address/DNS	Type	Ver
All Devices	All Members			
<input checked="" type="checkbox"/> 2921-Router....	2921-Router.amer.cisco.com	172.16.50.254	Routers	Cisco 03.07.04E
<input type="checkbox"/> 3560c-switch...	3560c-switch.amer.cisco.com	172.16.50.251	Switch...	Cisco 03.05.01.E
<input type="checkbox"/> 3750E-switc...	3750E-switch.amer.cisco.c...	172.16.50.248	Switch...	Cisco 03.05.01.E
<input type="checkbox"/> 3850-switch....	3850-switch.amer.cisco.com	172.16.50.252	Switch...	Cisco 03.05.01.E
<input type="checkbox"/> 4503E-switc...	4503E-switch.amer.cisco.c...	172.16.50.249	Switch...	Cisco 03.05.01.E

Device Type Location User Defined

Device Type Location based groups User Defined Device Groups

Select 2 Device Selection and pick you device(s)

Select 3 for Image Selection
(based on Settings previous defined)

Select 4 and Schedule the import job and click on Submit

Import Image into PI Software Repository

Import Images

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

Image Selection

Note: The table below shows only the images that are not already present in repository and downloadable images having

Name	Device ...	Version	Size	Features	MD5 C...
<input checked="" type="checkbox"/> c2900-universalk9.mz.SPA...	Cisco ... <i>i</i>	15.6.3M1	104.3 M...	UNIVER...	792e76...
<input type="checkbox"/> c2900-universalk9_npe-mz...	Cisco ... <i>i</i>	15.6.3M1	100.7 M...	UNIVER...	ba5537...
...					
...					
...					
...					

Select 2 Device Selection and pick you device(s)

Select 3 for Image Selection (based on Settings previous defined)

Select 4 and Schedule the import job and click on Submit

Submit

Cancel

Import Image into PI Software Repository

Import Images

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

Schedule

Job Name: Job_CCO_Image_Collection_7_02_44_879_PM_2_6_2017

Start Time: Now Date 02/06/2017 07:02 PM

(MM/dd/yyyy hh:mm AM/PM)

...

Submit Cancel

Select 2 Device Selection and pick you device(s)

Select 3 for Image Selection (based on Settings previous defined)

Select 4 and Schedule the import job and click on Submit

Import Image into PI Software Repository

Import Images

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

Schedule

Job Name: Job_CCO_Image_Collection_7_02_44_879_PM_2_6_2017

Start Time: Now Date 02/06/2017 07:02 PM

(MM/dd/yyyy hh:mm AM/PM)

Select 2 Device Selection and pick you device(s)

Select 3 for Image Selection (based on Settings previous defined)

Select 4 and Schedule the import job and click on Submit

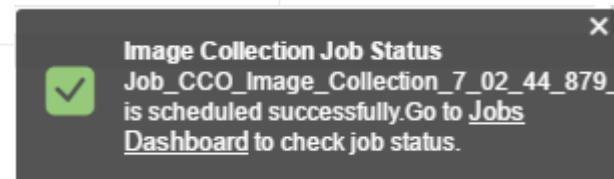


Image Import (cont)

The screenshot shows two views of the Cisco Prime Infrastructure Software Images interface. The left view is a list of software images, and the right view is a detailed view of a selected image.

Left View (Software Images List):

- Header: Software Images
- Buttons: Delete, Distribute, Import, Upgrade Analysis
- Table:
 - File Name: c2800nm-advpervicesk9-mz.124-24.T8.bin (C2800NM)
 - File Name: c2800nm-spservicesk9-mz.151-4.M7.bin (C2800NM)
 - File Name: c2900-universalk9-mz.SPA.150-1.M1.bin (C2900)
 - File Name: **c2900-universalk9-mz.SPA.154-3.M4.bin** (C2900) - This row is highlighted with a green border.
 - File Name: c2960-lanbasek9-mz.122-58.SE2.bin (C2960)
 - File Name: c3560-ipbasek9-mz.122-58.SE2.bin (C3560)
 - File Name: c3560c405ex-universalk9-mz.152-2.E.bin (C3560C405)

Right View (Image Details):

- Header: Software Images
- Header: All
- Section: Image Information
 - Section: Image Details
 - 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: 9f652984b1dbb1146af25dd5f6f5020
 - 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
 - Selected image is not running on any managed device.

>>Difference from LMS<<

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

Import Image (cont)



Download Software

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

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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 large section titled "Download Software" is visible, showing a breadcrumb trail: Downloads Home > Products > Routers > Branch Routers > 2900 Series Integrated Services Routers > 2921 Integrated Service IOS Software-15.4.3M4(ED). On the left, there's a sidebar with search, expand/collapse all buttons, and links for Suggested, Latest, All Releases, and Deferred Releases. The main content area displays two entries for the 2921 Integrated Services Router:

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

Release 15.4.3M4 ED			
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 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 is titled "2921 Integrated Services Router". On the left, there's a sidebar with search, expand/collapse all, and release filters (Suggested, Latest, All Releases, Deferred Releases) for versions 15.3.3M6(MD) and 15.4.3M4(ED). The main pane displays two entries under "Release 15.4.3M4 ED": "UNIVERSAL" (c2900-universalk9-mz.SPA.154-3.M4.bin) and "UNIVERSAL - NO PAYLOAD ENCRYPTION" (c2900-universalk9_npe-mz.SPA.154-3.M4.bin).

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

Distribute Image from Repository using External Server

The screenshot shows the Cisco Prime Infrastructure interface for managing software images. The top navigation bar includes 'Prime Infrastructure' and 'Inventory / Device Management / Software Images'. Below this, another 'Prime Infrastructure' header is shown with the same navigation path. The main content area is titled 'Software Image Management Server(s)' and lists one server: 'hickman-fs' with IP address '172.16.50.20'. A green box highlights the '+' button in the toolbar above the table. A black arrow points from this button to the 'Manage Protocols' link in the table header. Another black arrow points from the 'Manage Protocols' link to the detailed view below. The detailed view is titled 'Software Image Management Server Protocols for "hickman-fs"' and shows three protocols: FTP, SCP, and SFTP. The SFTP row is selected, indicated by a blue background. The table has columns for Protocol, Username, Password, Protocol Home Directory, and Status.

Protocol	Username	Password	Protocol Home Directory	Status
FTP	lewis	/Cisco	Success
SCP	lewis	/Cisco	Yet to verify
SFTP	lewis	/Cisco	Success

Next Task: Add Server to Software Image Management Servers

From the SWIM dashboard select Add Server

Enter Server information (IP address, Location)

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
► C2960	1
► C3560	1
► C2800NM	2
► C3750	1
► C2900	4

The diagram illustrates the software distribution process in three main steps:

- 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.

The central icon is labeled "Add Server".

Distribute Image (cont)

Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Next

1 Select software image to distribute

Image Selection

<input type="checkbox"/>	File Name	▲	Image Family	Image Type	Version	Size
<input type="checkbox"/>	c3750-ipservicesk9-mz.122-58.S...	C3750	SYSTEM_SW	12.2(58)SE2	15.71 MB (16470273 bytes)	
<input type="checkbox"/>	c3750e-universalk9-mz.122-58.S...	C3750E	SYSTEM_SW	12.2(58)SE2	17.04 MB (17868957 bytes)	
<input checked="" type="checkbox"/>	cat3k_caa-universalk9.SPA.03.0...	CAT3K_CAA	SYSTEM_SW	03.07.04E	313.0 MB (328157104 bytes)	
<input type="checkbox"/>	cat4500-entservices-mz.122-46....	CAT4500	SYSTEM_SW	12.2(46)SG	15.42 MB (16173580 bytes)	
<input type="checkbox"/>	cat4500-entservicesk9-mz.150-2...	CAT4500	SYSTEM_SW	15.0(2)SG8	18.57 MB (19473188 bytes)	
<input type="checkbox"/>	cat4500e-universalk9.SPA.03.06...	CAT4500E	SYSTEM_SW	15.2.2	170.0 MB (178257396 bytes)	
<input type="checkbox"/>	cat4500e-universalk9.SPA.03.06...	CAT4500E	SYSTEM_SW	15.2.2	170.0 MB (178288484 bytes)	

Submit

Cancel

Distribute Image (cont)

Distribute Images

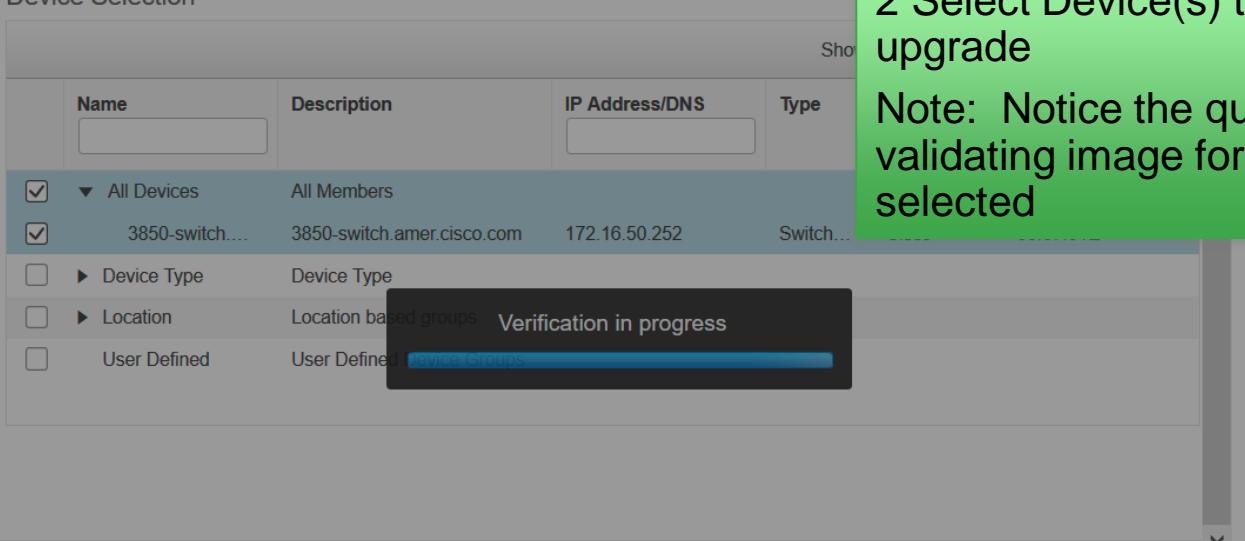
- 1 Image Selection
- 2 Device Selection**
- 3 Distribute Image
- 4 Image Deployment
- 5 Schedule Distribution

Device Selection

Name	Description	IP Address/DNS	Type
<input checked="" type="checkbox"/> All Devices	All Members		
<input checked="" type="checkbox"/> 3850-switch....	3850-switch amer.cisco.com	172.16.50.252	Switch...
<input type="checkbox"/> Device Type	Device Type		
<input type="checkbox"/> Location	Location based groups		
<input type="checkbox"/> User Defined	User Defined		

Verification in progress

Submit Cancel



Next

2 Select Device(s) to software upgrade

Note: Notice the quick pop-up validating image for the device(s) selected

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

The screenshot shows the "Distribute Image and Location Selection" screen. On the left, a vertical list of steps is shown: 1. Image Selection, 2. Device Selection, 3. Distribute Image (highlighted with a blue border), 4. Image Deployment, and 5. Warning:Flash Free space Is Not Enough to Distribute Selected Image Need to Erase Flash. A large blue callout box at the top right contains the text: "The system advises if there are DRAM/Flash issues to handle". Below the table, a message box displays the warning: "Warning:Flash Free space Is Not Enough to Distribute Selected Image Need to Erase Flash". At the bottom right are "Submit" and "Cancel" buttons.

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...

Warning:Flash Free space Is Not Enough to Distribute Selected Image Need to Erase Flash

Submit Cancel

Upgrading Devices

Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Image Deployment Options

Distribution Options

Backup Current Image Insert boot command

TFTP Fall Back Activate **OFF**

Erase Flash Before Distribution Device Upgrade Mode **Cur...**

Activate Options

Continue on failure

Advanced Options

**4+5 Image Deployment/
Schedule**

**Distribution and Scheduling
Options can be specified
Once submitted a job is created**

Submit

Cancel

Upgrading Devices

Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Schedule Distribution

Job Name Job_Swim_Distribution_8_32_23_396_PM_6_27_2016

Start Time Now Date 06/27/2016 08:32 PM 

(MM/dd/yyyy hh:mm AM/PM)

Recurrence None Minute Hourly Daily Weekly Monthly Yearly

4+5 Image Deployment/
Schedule

Distribution and Scheduling
Options can be specified
Once submitted a job is created

Submit

Cancel

Upgrading Devices

Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Schedule Distribution

Job Name Job_Swim_Distribution_8_32_23_396_PM_6_27_2016

Start Time Now Date 06/27/2016 08:32 PM 

(MM/dd/yyyy hh:mm AM/PM)

Recurrence None Minute Hourly Daily Weekly Monthly Yearly

4+5 Image Deployment/
Schedule

Distribution and Scheduling
Options can be specified
Once submitted a job is created

Image Distribution Job Status
 Job_Swim_Distribution_8_32_23_396_PM_6_2
is scheduled successfully. Please go to
[Click here](#) to check job status.

Upgrading Devices (cont)

The screenshot shows the Cisco Prime Infrastructure Job Dashboard. At the top, there's a navigation bar with 'Administration / Dashboards / Job Dashboard' and a job identifier 'Job_Swim_Distribution_8_32_23_396_PM_6_27_2016'. A blue callout box on the right says 'Status can be observed and refreshed until complete'. Below the navigation, there are sections for 'Recurrence' (None), 'Description' (Distribute the Image to the Device), and a 'Log file Download' link. A table titled 'Showing latest 5 Job instances' lists one job instance: Run ID 56711474, Status Success, Duration 00:26:11, Start Time 2016-06-27 20:53, and Completion Time 2016-06-27 21:19. Below this is a table titled 'Image Management Job Results' with one entry: Device IP 172.16.50.252, Device Name 3850-switch.amer.cisco.com, Image Name cat3k_caa-universalk9.SPA.03.07.04.E.152-3.E4.bin, Status Success, and a note '(i)'.

Run ID	Status	Duration (hh:mm:ss)	Start Time	Completion Time
56711474	Success	00:26:11	2016-06-27 20:53	2016-06-27 21:19

Device IP	Device Name	Image Name	Status	(i)
172.16.50.252	3850-switch.amer.cisco.com	cat3k_caa-universalk9.SPA.03.07.04.E.152-3.E4.bin	Success	(i)

Upgrading Devices (cont)

Prime Infrastructure

Administration / Dashboards / Job Dashboard / Job_Swim_Distribution_8_32_23_396_PM_6_27_2016 ★

Recurrence None

Description Distribute the Image to the Device

Log file Download

Showing latest 5 Job instances Show All

Run ID	Status
56711474	Success

Image Management Job Results

Operation	Status	Message
Copying image [cat3k_caa-universalk9.SPA.03.07.04....	Success	-
Distributing image [cat3k_caa-universalk9.SPA.03.07....	Success	-

Device IP Device

172.16.50.252	(i) 3850-sv
---------------	-------------

Status can be observed and refreshed until complete

The screenshot shows the Cisco Prime Infrastructure Job Dashboard. It displays a list of job instances, a summary of image management job results, and a table of device information. A blue callout box highlights the status message 'Status can be observed and refreshed until complete' with a pointer to the refresh icon in the bottom right corner of the dashboard area.

Operation	Status	Message
Copying image [cat3k_caa-universalk9.SPA.03.07.04....	Success	-
Distributing image [cat3k_caa-universalk9.SPA.03.07....	Success	-

Total 2

Total 1

(i)

Upgrading Devices (cont)

The screenshot shows a Cisco Prime Infrastructure interface with a PuTTY terminal window displaying file listing results. The terminal output shows several Cisco IOS XE software packages (cat3k_*) and configuration files (nvram_config) on the flash:/ directory. The file listing is identical to the one shown in the previous slide.

```
172.16.50.252 - PuTTY
23240 -rw- 46349632 Jun 27 2016 21:17:55 -04:00 cat3k_caa-iosd-universalk9.SPA.152-3.E4.pkg
23241 -rw- 28904332 Jun 27 2016 21:17:55 -04:00 cat3k_caa-platform.SPA.03.07.04E.pkg
23242 -rw- 128582464 Jun 27 2016 21:17:58 -04:00 cat3k_caa-wcm.SPA.10.3.141.0.pkg

1621966848 bytes total (648671232 bytes free)
3850-switch#dir
Directory of flash:/

77442 -rw- 2097152 Jun 27 2016 21:19:18 -04:00 nvram_config
77443 -rw- 82247268 Jul 16 2015 07:06:16 -04:00 cat3k_caa-base.SPA.03.07.01E.pkg
77444 -rw- 5548732 Jul 16 2015 07:06:17 -04:00 cat3k_caa-drivers.SPA.03.07.01E.pkg
77445 -rw- 36918280 Jul 16 2015 07:06:16 -04:00 cat3k_caa-infra.SPA.03.07.01E.pkg
77446 -rw- 46124352 Jul 16 2015 07:06:16 -04:00 cat3k_caa-iosd-universalk9.SPA.152-3.E1.pkg
77447 -rw- 28816268 Jul 16 2015 07:06:16 -04:00 cat3k_caa-platform.SPA.03.07.01E.pkg
77448 -rw- 111500096 Jul 16 2015 07:06:17 -04:00 cat3k_caa-wcm.SPA.10.3.110.0.pkg
77453 -rw- 1236 Jun 27 2016 21:18:01 -04:00 packages.conf
30977 drwx 4096 Jul 16 2015 07:10:56 -04:00 virtual-instance
30979 drwx 4096 Jul 16 2015 07:13:18 -04:00 dc_profile_dir
30979 drwx 4096 Jul 16 2015 07:13:59 -04:00 wnc_web_store
77450 -rw- 916 Jun 22 2016 22:48:33 -04:00 wlan.dat
77451 -rw- 328157104 Jun 27 2016 21:16:39 -04:00 cat3k_caa-universalk9.SPA.03.07.04.E.152-3.E4.bin
77452 -rw- 1236 Jul 16 2015 07:06:26 -04:00 packages.conf.00-
23237 -rw- 81992100 Jun 27 2016 21:17:55 -04:00 cat3k_caa-base.SPA.03.07.04E.pkg
23238 -rw- 5667516 Jun 27 2016 21:17:55 -04:00 cat3k_caa-drivers.SPA.03.07.04E.pkg
23239 -rw- 36656136 Jun 27 2016 21:17:55 -04:00 cat3k_caa-infra.SPA.03.07.04E.pkg
23240 -rw- 46349632 Jun 27 2016 21:17:55 -04:00 cat3k_caa-iosd-universalk9.SPA.152-3.E4.pkg
23241 -rw- 28904332 Jun 27 2016 21:17:55 -04:00 cat3k_caa-platform.SPA.03.07.04E.pkg
23242 -rw- 128582464 Jun 27 2016 21:17:58 -04:00 cat3k_caa-wcm.SPA.10.3.141.0.pkg

1621966848 bytes total (648671232 bytes free)
3850-switch#
```

Activate Image

Inventory / Device Management / Software Images ★

Software Image Summary

Image	Count
C3560C405EX	1
CAT4500	2
C2960	1
C3560	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
Applicable only for IOS-XR Image type

Activate
Perform activation of software image already available in device.

Next Task: Active the image that we just deployed

Activate Image (cont)

Activate Images

X

1 Activation Source

2 Job Selection

3 Activate Preview

4 Activate Job Options

5 Schedule Activation

Activate from Library

Activate from Completed Distribution Jobs

Select From Completed Distribution Job

Submit Cancel

The screenshot shows the 'Activate Images' wizard interface. Step 1, 'Activation Source', is selected and highlighted with a blue border. It contains two radio button options: 'Activate from Library' (unselected) and 'Activate from Completed Distribution Jobs' (selected). To the left of the main steps, there is a vertical list of steps numbered 1 through 5: 1 Activation Source, 2 Job Selection, 3 Activate Preview, 4 Activate Job Options, and 5 Schedule Activation. Step 2 is currently active, indicated by a blue dot. To the right of the main steps is a large green callout box containing the text 'Select From Completed Distribution Job'. At the bottom right are 'Submit' and 'Cancel' buttons.

Activate Image (cont)

Activate Images

The screenshot shows a 'Job Selection' interface with the following details:

Run ID	Job Name	Job Type	Status	Last Run St...	Last ...	Dura...
56711474	Job_Swim_Distribution_8...	SWIM Distribution	Comp...	Success	2016-06-...	00:26
37082997	Job_Image_Distribution_1...	SWIM Distribution	Comp...	Success	2016-01-...	00:16

A green callout box with the text "Select The Job that contains the image and devices you want to activate" is overlaid on the right side of the interface.

On the left, a vertical navigation bar lists five steps:

- 1 Activation Source
- 2 Job Selection
- 3 Activate Preview
- 4 Activate Job Options
- 5 Schedule Activation

Below the navigation bar, there are four small circular icons: a blue one at the top and three grey ones below it.

At the bottom right are 'Submit' and 'Cancel' buttons.

Activate Image (cont)

Activate Images

1 Activation Source

2 Job Selection

3 Activate Preview

4 Activate Job Options

5 Schedule Activation

Device Selection

Show All

<input checked="" type="checkbox"/>	Device Name	Ip Address	Image Name	Flash	
<input checked="" type="checkbox"/>	3850-switch.amer.cisco.com	172.16.50.252	cat3k_caa-unive...	flash	

Select the device(s) you want to reload with the new image

Submit

Cancel

Activate Image (cont)

Activate Images



1 Activation Source

2 Job Selection

3 Activate Preview

4 Activate Job Options

5 Schedule Activation

Activate Job Options

Insert boot command Continue on failure

Activate Options: Sequential  

Device Upgrade Mode: Sequential

Parallel

•
•
•
•

Select the Job options
Note: the Upgrade Order is selected here

Submit

Cancel

Activate Image (cont)

Activate Images



- 1 Activation Source
- 2 Job Selection
- 3 Activate Preview
- 4 Activate Job Options
- 5 Schedule Activation

Schedule Activation

Job Name

Start Time Now Date

(MM/dd/yyyy hh:mm AM/PM)

Recurrence None Minute Hourly Daily Weekly Monthly Yearly

Schedule the job to activate the image

Image Activation Job Status

Job_Swim_Activation_10_04_22_873_PM_6_2
is scheduled successfully. Please go to [Click here](#) to check job status.

Submit

Cancel



PI 3.1 What's New/Cool

- Enhanced troubleshooting with new 360 view features
- Elastic Global Search
- External Device Config Backup (Shadow Directory)

Inventory / Device Management / Network Devices

Device Groups

- All Devices**
- Device Type**
 - Cisco Interfaces and Modules
 - Cisco UCS Series
 - Routers
 - Switches and Hubs
 - Third Party Device
 - Unified AP
 - Unsupported Cisco Device
 - Wireless Controller
- Location**
- User Defined**

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

Actions  



3750E-switch.amer.cisco.com  

Performance Graphs

172.16.50.248
United States,RTP,All Locations

Cisco 3750 Stackable Switches

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%

Minimum	Average	Maximum
10.00%	16.25%	33.00%

Memory Utilization (1 hour)
76.00%  0.00%

Minimum	Average	Maximum
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

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 the device 4503E-switch.amer.cisco.com. The top navigation bar includes 'View Details' and an 'Actions' dropdown menu. The 'Actions' menu 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 navigation, device details are listed: IP address 172.16.50.249, location All Locations, RTP, United States, up time 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, and Last Inventory Collection January 10, 2016 10:00:14 PM EST. Performance metrics for CPU Utilization (1 hour) and Memory Utilization (1 hour) are displayed with values 3.00% and 31.00% respectively. A table of alarms is shown at the bottom.

Status	Timestamp	Message	Category
✗	07/20/15, 09:27:33	Port 'GigabitEthernet2/3' is down on devi...	Switches and...
✗	07/20/15, 09:27:33	Port 'GigabitEthernet2/5' is down on devi...	Switches and...
✗	07/20/15, 09:27:32	Port 'GigabitEthernet2/7' is down on devi...	Switches and...
⚠	07/19/15, 13:03:30	Device '172.16.50.249'. A port transitions...	Switches and...
⚠	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 Cisco Prime Infrastructure Device 360° Views interface. On the left, there's a summary card for the device 4503E-switch.amer.cisco.com, including its IP address (172.16.50.249), location (All Locations, RTP, United States), uptime (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), and last inventory collection (January 10, 2016 10:00:14 PM EST). Below this are two performance charts: CPU Utilization (1 hour) at 3.00% and Memory Utilization (1 hour) at 31.00%. At the bottom, tabs for Alarms, Modules, Interfaces, Neighbors, Wireless Interfaces, and WLAN are visible.

Actions menu (SSH highlighted):

- View Details
- Actions ▾
- Telnet
- SSH** (highlighted)
- HTTP
- HTTPS

Terminal Window:

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

Alarms Table:

	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
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%

Actions ▾

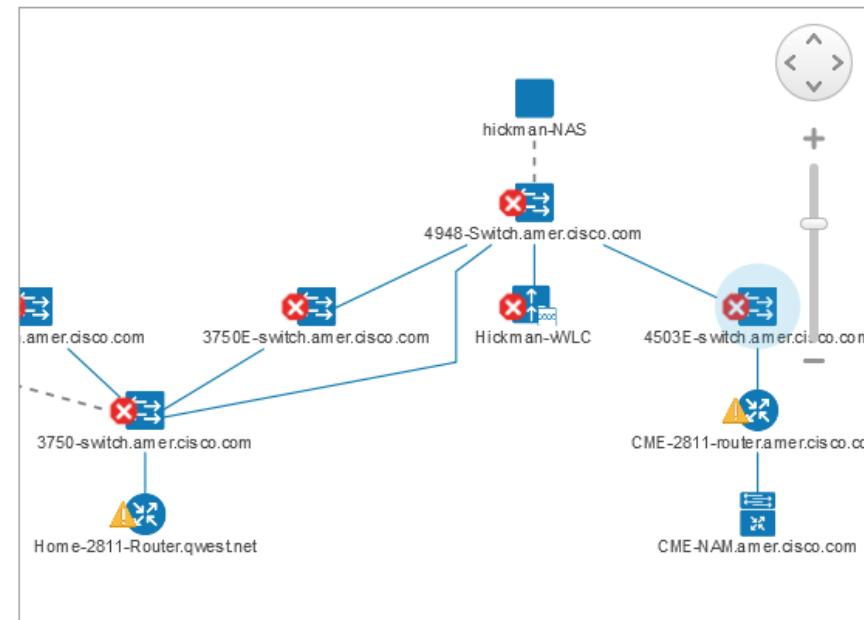
- View Details
- Telnet
- SSH**
- HTTP
- HTTPS

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



PI 3.1 Simplifies Search for Keywords within Configuration Archives and take action on them

The image displays two search interface screenshots from a Cisco device management application.

Left Search Result (aaa):

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

Buttons: Advanced Search, View All

Right Search Result (lewis):

- Clients (1):** Lewis-ipad4
- 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 ...

Buttons: Advanced Search, View All

A red oval highlights the "View All" button for the "Config Archives (40)" section, indicating it is the primary focus of the feature being demonstrated.

PI 3.1 Simplifies Search for Keywords within Configuration Archives and take action on them

The screenshot shows the Cisco Prime Infrastructure Device Management Configuration Archive interface. On the left, there's a navigation bar with 'Groups' (All Devices selected), 'Device Type' (Switches and Hubs), 'Location' (User Defined), and 'User Defined'. In the center, under 'Groups' (All Devices), there are tabs for 'Devices' and 'Archives', with 'Archives' highlighted and a red box around it. Below the tabs, a search bar displays 'Search Results for 'aaa''. There are buttons for 'Rollback', 'Edit Tag', 'Create Group', and 'Deploy Config'. A table lists two devices: 'Dist-3' and 'Dist-4'. The table columns include Device Name, IP Address, Date, Created By, Tag, Config Snippet, Description, and Out Of Band. Both devices have their 'Created By' listed as 'Inventory'.

<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

External Device Configuration Backup (Shadow Directory)

Prime Infrastructure

Application Search Job Approval Settings

lewis - ROOT-DOMAIN

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

System Jobs

Selected 1 / Total 2

Show Quick Filter

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: device

Job Type:

Status:

Last Run Status:

Last Start Time:

Duration(hh:mm):

Next Start Time:

Device Config Backup-External

Infrastructure: Scheduled 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

Run

Pause Series Resume Series

Edit Schedule

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

Recurrence: Minute Hourly Daily Weekly Monthly Yearly

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

Cisco live!

Key Takeaways and Looking Ahead

Key Takeaways/Conclusion



We hope you see the usability and highly customizable interface that PI brings to the table



There are many good features in Prime Infrastructure
- many are better than LMS



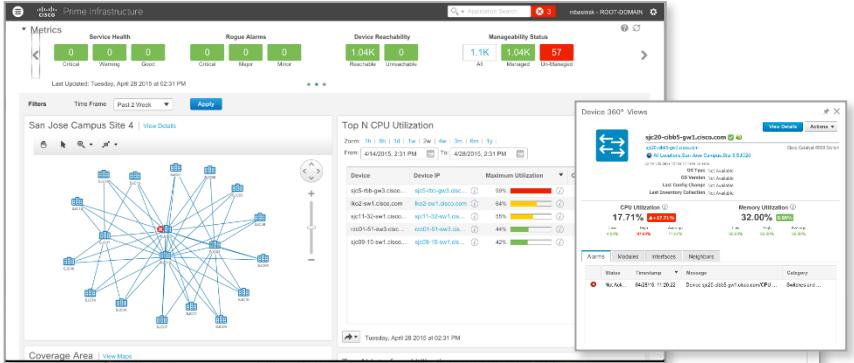
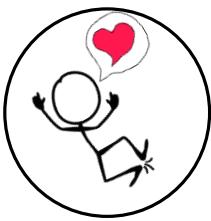
Feature Parity with LMS has made great strides
- The Time is NOW



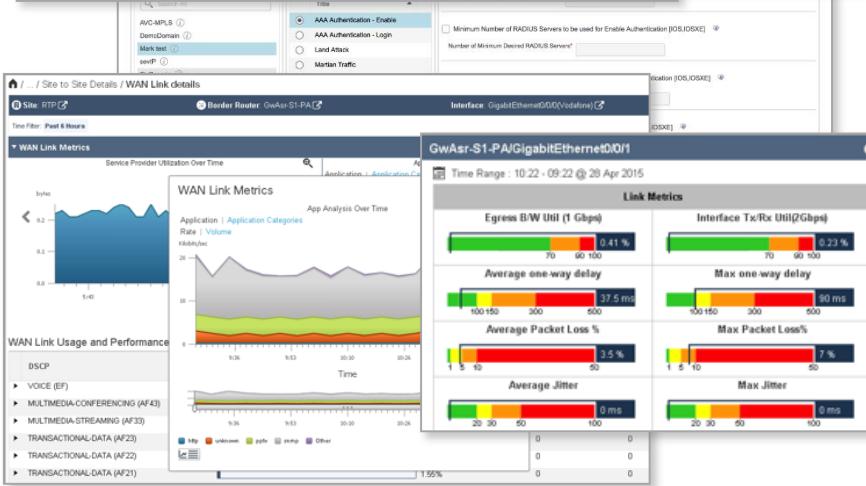
PI 3.2 and APIC-EM will continue the progression

Prime Infrastructure 3.2 Highlights

Available End of April 2017



Hyper-V hypervisor Support (2012 + 2016)



New Custom Reporting Framework

Granular Customization of Alarms and Notifications

DMVPN Monitoring

Useful Information

- [Cisco Prime LMS 4.2 and Cisco Prime Infrastructure 3.x Functional Comparison](#)
- [Cisco Prime Infrastructure Deployment Guide](#)
- [Cisco Prime Infrastructure Video Series](#)
- [Cisco Prime Infrastructure Job Aids](#) (detailed guides on how to specifically deploy/implement many of the PI 3.x features)

Cisco Prime LMS 4.2 and Cisco Prime Infrastructure 3.0 Functional Comparison

October 2015

This document outlines the high-level Cisco Prime™ Infrastructure plans to support Cisco Prime LAN Management Solution (LMS) functionality. This document provides Cisco Prime LMS customers guidance and recommendations to help ensure a smooth transition to Cisco Prime Infrastructure.

The objective of Cisco Prime Infrastructure is to advance today's IT operational and productivity capabilities. In view of this, each Cisco Prime LMS feature was reevaluated for usefulness, usability, and practical value. Table 1 will help customers quickly assess which LMS features will transition into Cisco Prime Infrastructure.

Cisco advises customers to reach out to their authorized Cisco® channel partner or Cisco account team if there are questions, concerns, or requests regarding the status or implementation plans of specific Cisco Prime LMS features or if migration assistance is needed.

Note that some of the features described in Table 1 remain in varying stages of development and will be offered on a when-and-if-available basis. Roadmap information provided in this document is subject to change at the sole discretion of Cisco, and Cisco will have no liability for delay in the delivery or failure to deliver any of the products or features set forth herein.

Table 1. High-Level Cisco Prime LMS Functional Comparison to Cisco Prime Infrastructure

Legend				
●	Equivalent support			
○	Partial support			
-	Pending support			
X	Not supported			
Green	Supported today or is intended to be supported in Cisco Prime Infrastructure only			

Functional Capability	LMS 4.2	CPI 3.0	Cisco Prime Infrastructure Future Plan	Additional Notes
Scope		Wired Converged	Converged	
System				
Virtual machine (VM) soft appliance server	●	●	●	
Physical appliance server	○	●	●	
Maximum scalability	5000	15,000	100,000+	With Cisco Prime Infrastructure Operations Center
High availability	○	●	●	
Cisco Technical Assistance Center (TAC)	●	●	●	



Cisco Spark

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Cisco Spark

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1. Go to the Cisco Live Berlin 2017 Mobile app
2. Find this session
3. Click the Spark button under Speakers in the session description
4. Enter the room, room name = **2701**
5. Join the conversation!

The Spark Room will be open for 2 weeks after Cisco Live

Cisco live!

The screenshot shows a mobile application interface for Cisco Spark. At the top, there's a header bar with icons for signal strength, battery level (59%), and the time (10:39 p.m.). Below the header, the session title "BRKINI-4003: What's new with C..." is visible. The main content area contains text about the session, a "SHOW MORE ▾" button, speaker profiles for "Manish Agarwal" and "ANIKET PATANKAR", a "SPARK" section with a "Join the Discussion" button, and a "NOTES" section for taking personal notes.

• 3G Cellcom 10:39 p.m. 59 %

BRKINI-4003: What's new with C...

Please join us to learn about all the new features & functionalities with Cisco HyperFlex Systems release 2.0. We will cover HX Data Platform 2.0 features, namely all-flash replication, encryption and the new generation of snapshot technology that results in performance and efficiency gains. The session discusses the user experience for common management workflows, such as Maintenance Mode, and goes into the technical details of handling

SHOW MORE ▾

SPEAKER 1

+ Manish Agarwal
Director of Product Management >

SPEAKER 2

+ ANIKET PATANKAR
UCS Product Manager >

SPARK

+ Join the Discussion >

NOTES

Enter your personal notes here

Email Notes

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 - Whisper Suites: Get in touch with your Cisco Account/Partner team to schedule 1-on-1 meetings with Product Teams at SDN and Network Transformation Whisper Suites
- Visit the NOC to see a Prime Infrastructure managing the CL network live!
- Prime Infrastructure related labs and sessions
 - BRKNMS-2036 - Configuration Compliance Management with Prime Infrastructure 3
 - BRKNMS-1040 - IWAN and AVC Management using Cisco Prime Infrastructure and APIC-EM
 - BRKNMS-2658 - Securely Managing Your Networks with SNMPv3
 - BRKEWN-2011 Managing an Enterprise WLAN with Cisco Prime Infrastructure
 - BRKNMS-2848 - How to Manage Wired Networks With Cisco Prime Infrastructure
 - BRKNMS-2847 - Wireless Troubleshooting with Cisco Prime Infrastructure
 - LTRNMS-2007 - PnP Deep Dive Hands-on with APIC-EM and Prime Infrastructure

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- 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 CiscoLive.com/Online

Thank You



February 20 - 24, 2017 • Berlin



Your Time Is Now

New Troubleshooting tools in PI 3.x Extra

The screenshot shows the 'Device 360° Views' interface for a Cisco Catalyst 4503-E Switch. At the top, it displays the device name '4503E-switch.amer.cisco.com', IP address '172.16.50.249', location 'Colorado Springs', and uptime 'up for 197 days 9 hrs 29 mins 9 secs'. Below this, it shows OS Type 'IOS-XE' and OS Version '03.04.04.SG', with the last config change on April 21, 2015, at 2:11:54 PM MDT, and the last inventory collection on April 22, 2015, at 10:00:53 PM MDT.

Performance metrics include CPU Utilization at 2.00% (▲+2.00%) and Memory Utilization at 27.00% (0.00%). The Alarms section lists three entries:

	Status	Timestamp	Message	Category
1	Not Ackno...	April 22, 2015 3:52:44 PM ...	Device 4503E-switch.a...	Switches a...
2	Not Ackno...	April 21, 2015 10:42:19 A...	Device '172.16.50.249'...	Switches a...
3	Not Ackno...	November 6, 2014 1:50:29...	CEFC module state cha...	Switches a...

For Windows 7/8, 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' '%!'.TrimStart('ssh://').TrimEnd('/')'"

New Troubleshooting tools in PI 3.x Extra

The screenshot shows the 'Device 360° Views' interface for a Cisco Catalyst 4503-E Switch. At the top, it displays the device name (4503E-switch.amer.cisco.com), IP address (172.16.50.249), location (Colorado Springs), and uptime (197 days 9 hrs 29 mins 9 secs). Below this, it shows OS Type (IOS-XE), OS Version (03.04.04.SG), Last Config Change (April 21, 2015 2:11:54 PM MDT), and Last Inventory Collection (April 22, 2015 10:00:53 PM MDT). The interface includes two charts: 'CPU Utilization' (2.00% ▲+2.00%) and 'Memory Utilization' (27.00% 0.00%). The 'Alarms' tab is selected, showing three entries:

	Status	Timestamp	Message	Category
!	Not Ackno...	April 22, 2015 3:52:44 PM ...	Device 4503E-switch.a...	Switches a...
!	Not Ackno...	April 21, 2015 10:42:19 A...	Device '172.16.50.249'...	Switches a...
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New Troubleshooting tools in PI 3.x Extra

The screenshot shows the 'Device 360° Views' interface for a Cisco 4503E switch. Key details include:

- Device Information:** 4503E-switch.amer.cisco.com, IP 172.16.50.249, Location Colorado Springs, Home.
- OS Details:** IOS-XE, Version 03.04.04.SG.
- Performance Metrics:** CPU Utilization (2.00% ▲+2.00%), Memory Utilization (27.00% 0.00%).
- Alarms:** A table lists three alarms: Not Ackno..., Not Ackno..., and Not Ackno... (all from November 6, 2014).

For Windows 7/8, 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):

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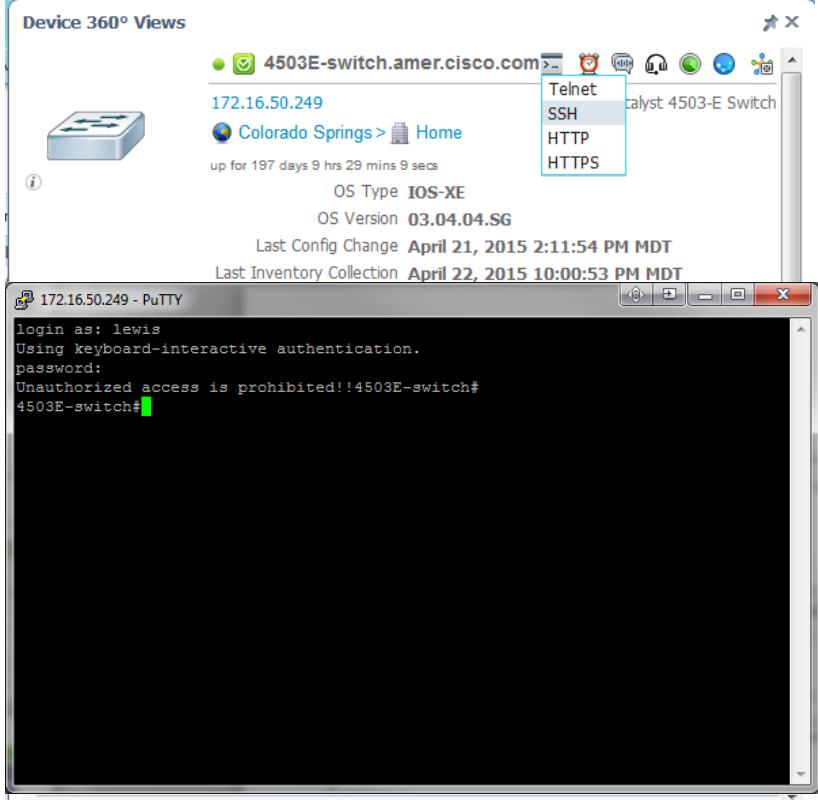
[HKEY_CLASSES_ROOT\ssh\shell]

[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' '%!'.TrimStart('ssh://').TrimEnd('/)''"

New Troubleshooting tools in PI 3.x Extra



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```

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[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' '%!'.TrimStart('ssh://').TrimEnd('/)'""
```

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 = 
```