
TOMORROW starts here.
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Configuration Management and Zero Touch Deployment with Prime Infrastructure

BRKNMS-2661

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Systems Engineer

Cisco live!

Agenda

- What is Cisco Prime for IT
- Creating Configuration Templates
- Prime PnP Gateway
- Tips and Tricks

Cisco Prime for Enterprise Product Portfolio




What is Prime for IT

Achieve Operation Excellence with Cisco Prime

The Old Way

- Independent "point" products
- Untimely device and technology support
- Reliance on highly skilled staff
- Inconsistent user experience
- Difficult to install, administer, and maintain

The Cisco Prime™ Way

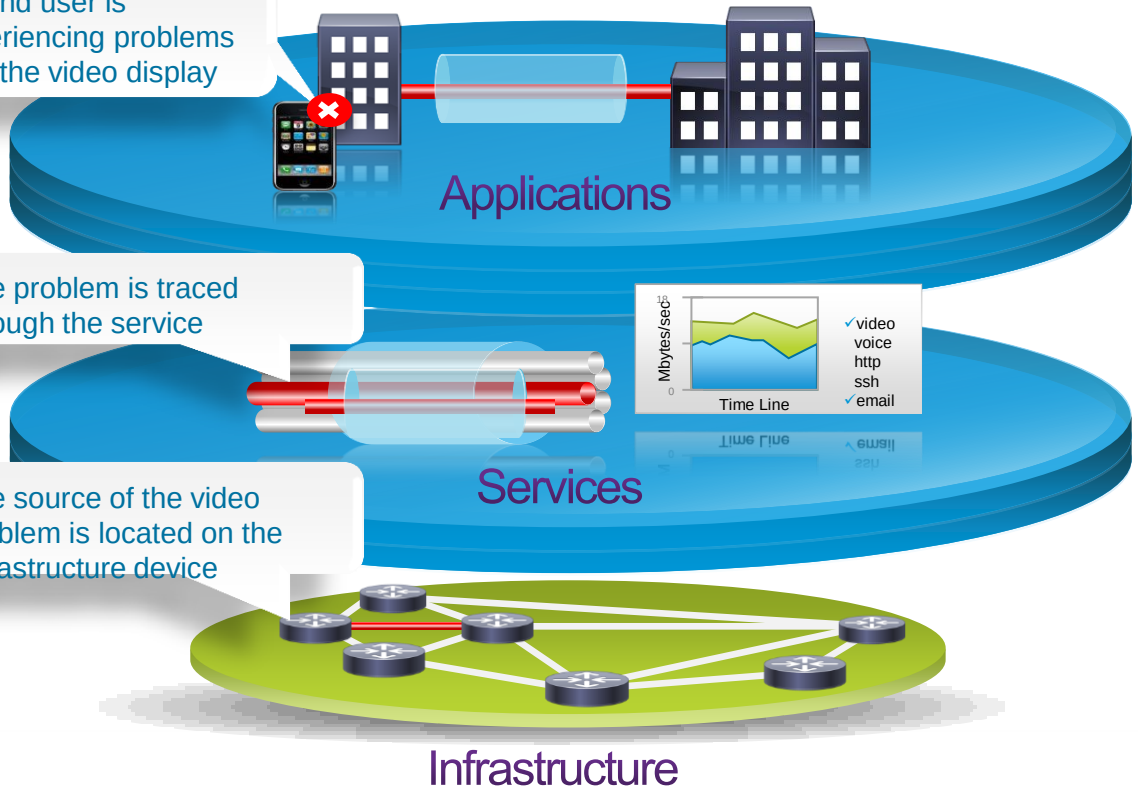
- Integrated solutions that align with major transitions
- Day-one device support for the Cisco® Advantage
- Use of Cisco best practices and knowledgebase
- Integrated workflows and user experience
- Single solution and virtual appliance

Network Services Management Foundation

An end user is experiencing problems with the video display

The problem is traced through the service

The source of the video problem is located on the infrastructure device



Users

Service or Network Operator
View across all network layers

Performance

Network

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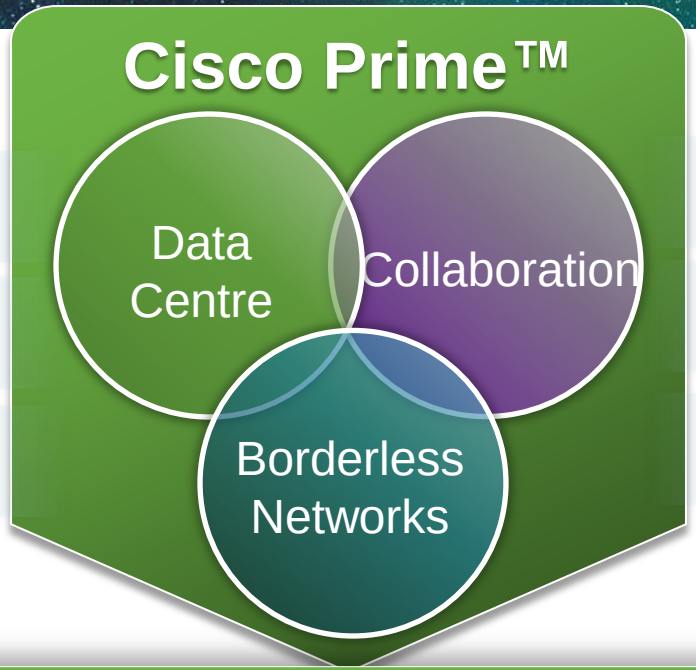
Cisco Prime for IT

Common Operational Attributes



- Optimised Operations Experience
- Integrated Cisco® Best Practices
- Complete Lifecycle Management
- Day-1 Device Support
- Smart Interactions
- Physical and Virtual Appliance

Simple and Efficient Management Across Architectures, Networks, and Services

Cisco Prime for IT

Common Attributes

Optimised Operations Experience

- Common user interface
- Intuitive user experience
- Optimised operator workflows

Integrated Cisco Best Practices

- Guided deployment of Cisco-validated best practices
- Automated trouble-shooting and diagnostics

Complete Lifecycle Management

- End-to-end lifecycle
- ITIL-aligned operations
- Northbound integration to customer back office

Day-One Device Support

- Support for new devices and technologies upon shipment
- Non-disruptive support upgrades

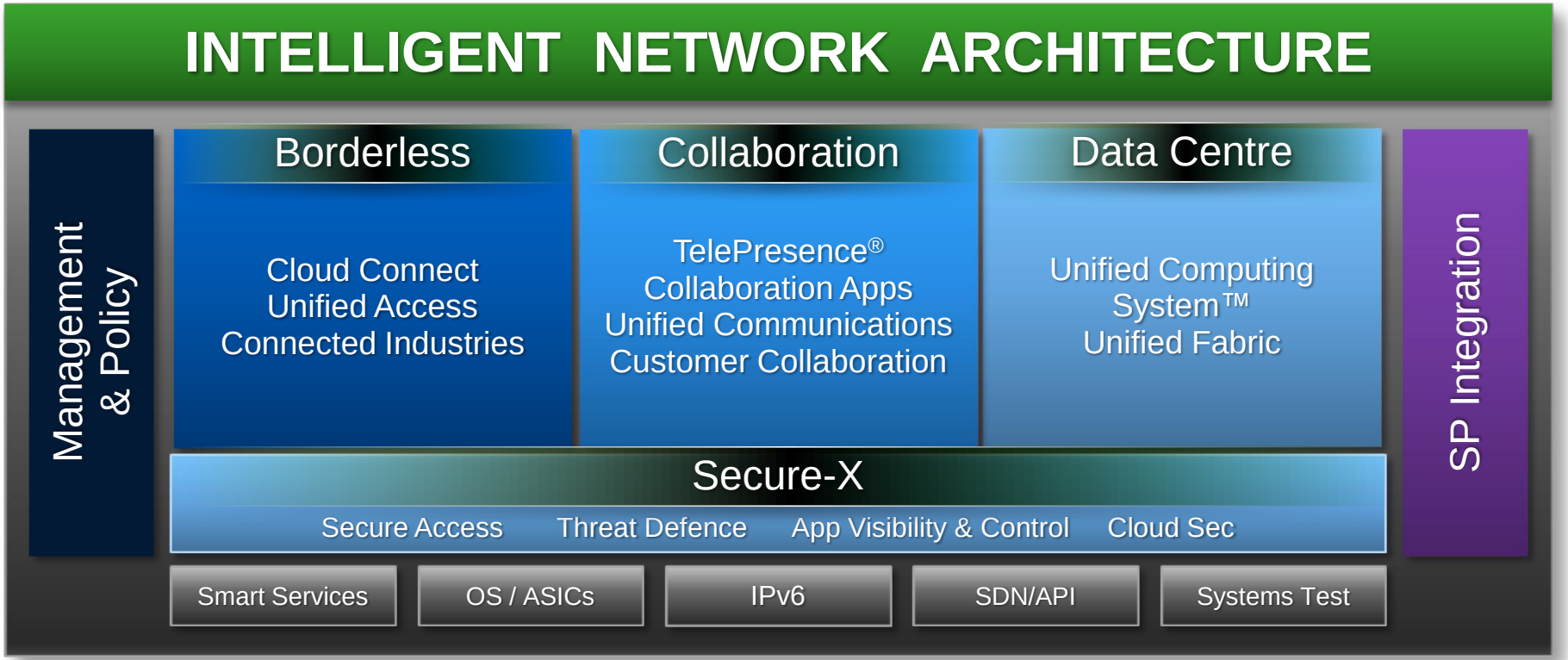
Smart Interactions

- Context-based help tool
- Real-time access to Cisco support community
- Automated Cisco TAC case creation and management

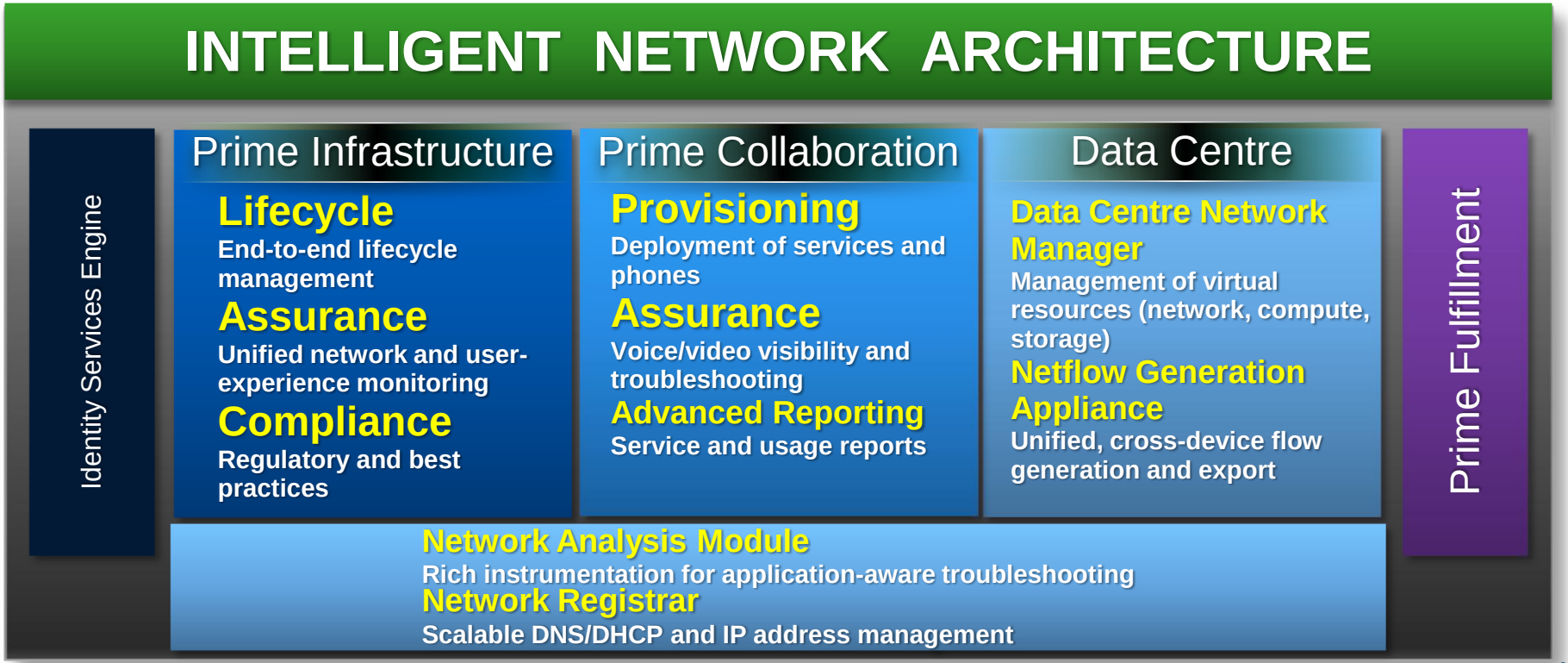
Physical and/or Virtual Appliance

- Two delivery options
- Both options fully self-contained
- Includes operating system, software application, database, and CLI

Enterprise Architecture



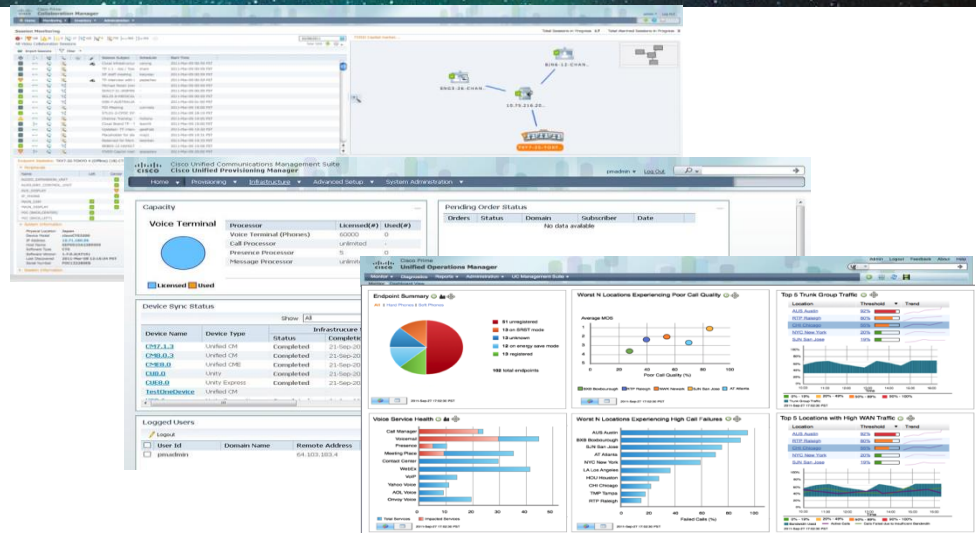
Cisco Prime for IT Portfolio



Cisco Prime Collaboration

Improves Quality of Experience with Robust Voice and Video Management

- Gain real-time access to actionable information for quick and easy troubleshooting
- Quickly isolate the root cause of service degradation
- Solve problems pro-actively prior to impacting quality of service

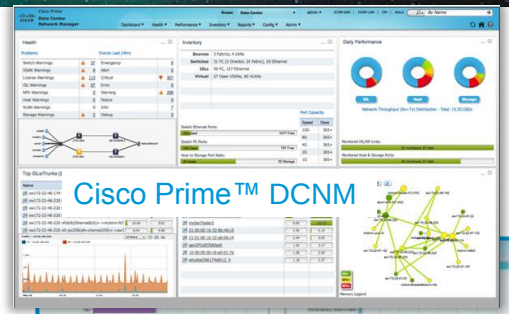


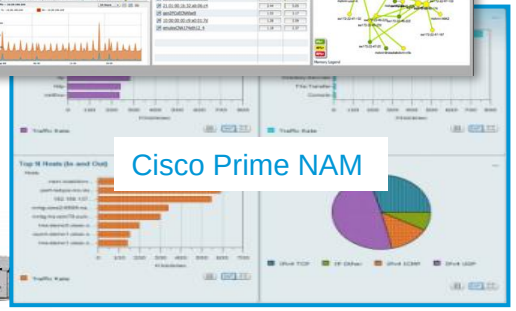
- Improve quality of experience with intuitive troubleshooting workflows
- Reduce training costs with common user experience
- Quickly isolate and fix problems, improving service availability

Data Centre

Application Visibility, Troubleshooting, and Resource Management

- NAM: Deep, application-aware network visibility and granular analytics to rapidly isolate and remediate problems and improve the user experience
- NetFlow Generation Appliance: Delivers NetFlow visibility to support performance, planning, and security monitoring requirements in high-throughput environments
- Data Centre Network Manager: Provides detailed management of data centre resources



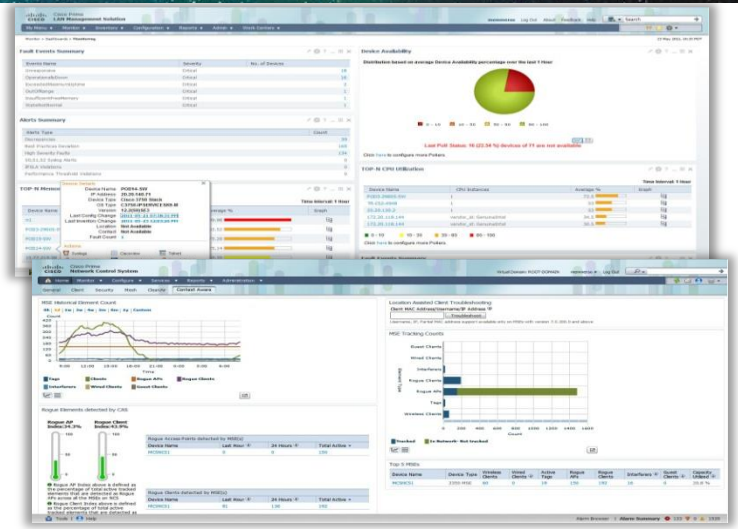


- Improve service levels with complete end-to-end network visibility
- Simplify troubleshooting with normalised data from multiple sources
- Reduce end-user and application downtime with lower TCO

Cisco Prime Infrastructure

Integrated Wired and Wireless Lifecycle and Assurance Management

- Complete wired and wireless lifecycle management
- Converged user and access management
- Configuration, change and compliance management
- Monitoring, troubleshooting and reporting



- Single pane of glass for wired and wireless management
- Lower TCO with intuitive user experience and workflows
- Speeds troubleshooting, improves network availability

Access to Cisco Knowledgebase

- Prime Infrastructure integrates with Cisco backend systems for increased visibility into impact analysis
- PSIRT (Security Advisories) reports provide an analysis on which devices are impacted based on:
  - IOS version running on the device
  - How the device is configured

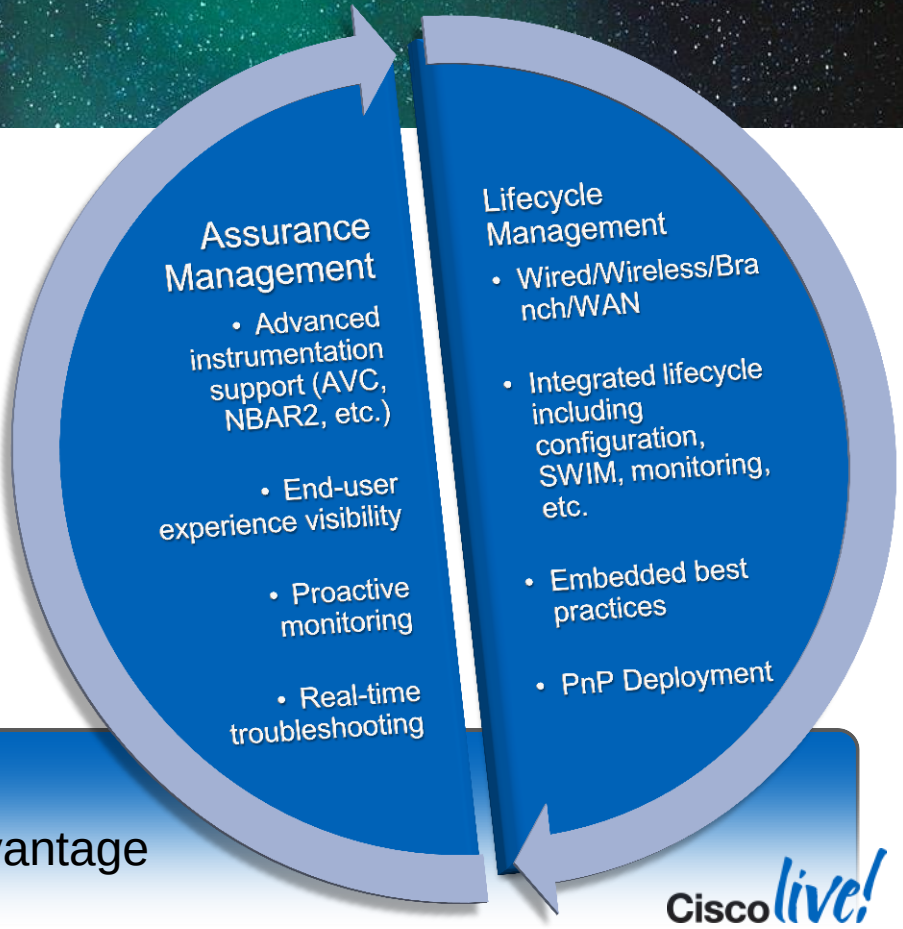
Software Version	Incident Description	Based on Version	Based on Configuration
12.2(52)SE	Hard-Coded SNMP Community Names in Cisco Industrial Ethernet 3000 Series Switches Vulnerability-111895(http://www.cisco.com/en/US/products/products_security_advisory09186a0080b3f12f.shtml)	Failed	Failed
12.2(25)SEE2	IOS Software NAT H.323 Vulnerability - 112253(http://tools.cisco.com/security/center/content/CiscoSecurityAdvisory/cisco-sa-20110928-nat)	Failed	Passed
12.2(25)SEE2	IOS Software NAT LDAP Vulnerability - 112253(http://tools.cisco.com/security/center/content/CiscoSecurityAdvisory/cisco-sa-20110928-nat)	Failed	Passed
12.2(25)SEE2	IOS Software NAT SIP Vulnerability - 112253(http://tools.cisco.com/security/center/content/CiscoSecurityAdvisory/cisco-sa-20110928-nat)	Failed	Passed
12.2(25)SEE2	Authentication Proxy Vulnerability - 110478(http://www.cisco.com/en/US/products/products_security_advisory09186a0080af8132.shtml)	Failed	Passed
12.2(25)SEE2	TCP State Manipulation DoS Vulnerability -		

- EoX reports provide a lifecycle management analysis on the devices
  - Shows devices that are or will be ‘End-of-Sales’ or ‘End-of-Support’
  - Allows customers to budget for upcoming refresh
- One-Click access to related posts and discussions on Cisco Forums
- One-Click creation of TAC Case
  - Device and SmartNet Contract # automatically populated
  - Common supporting documents automatically forwarded to TAC

Cisco Prime Infrastructure

One Management for Unified Access

- A single integrated solution that offers comprehensive lifecycle management of wired and wireless access, campus, and branch networks
- Utilises rich performance data for end-to-end network visibility to assure application delivery and optimal end-user experience

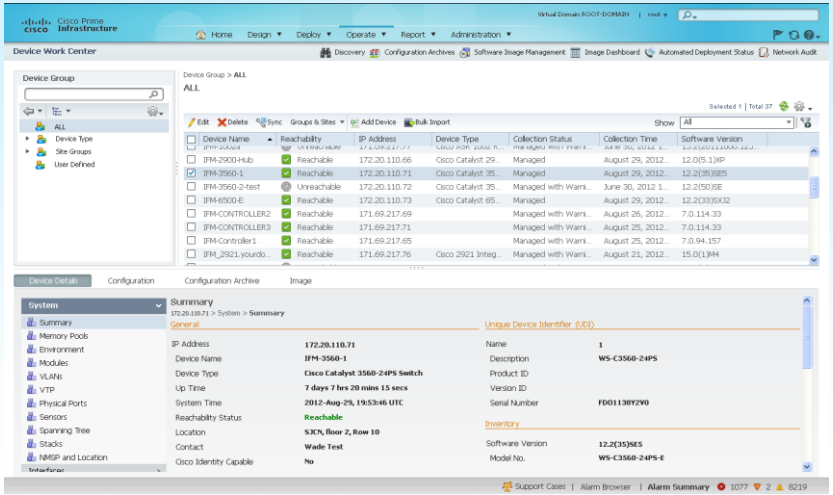


- Single Pane of Glass
- Consolidation, convergence, Cisco® Advantage

Lifecycle Management

End-to-End Lifecycle Management

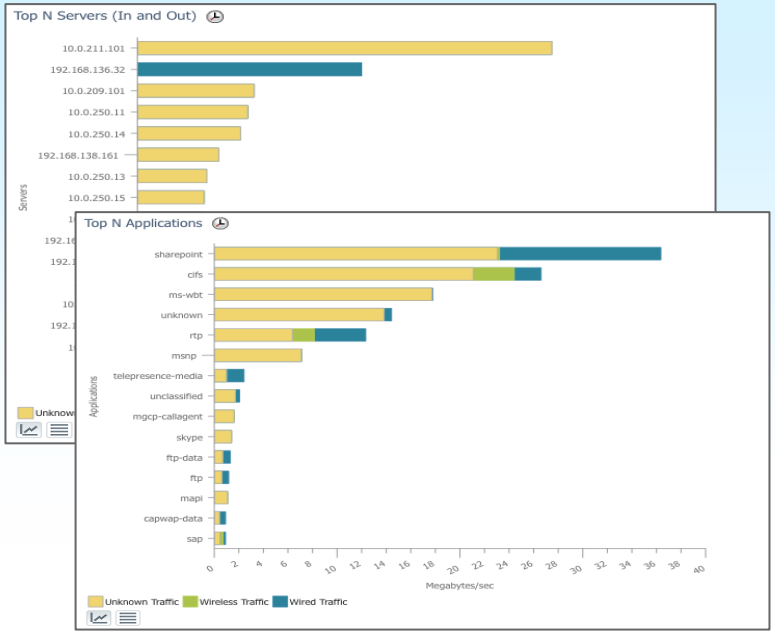
- Centralised Discovery, Inventory, Configuration Management, SWIM, and Proactive/Reactive Monitoring
- Accelerated Troubleshooting of Wired/Wireless Infrastructure Issues
- Greater device coverage: 3850/5760 (including templates and guided workflows), ASAs, IOS-XR and IDU
- Customisable out-of-the-box Cisco best practices and validated design configuration templates for wired/wireless devices
- Unified Access Management and Client Tracking
- Infrastructure lifecycle reports
- Plug & Play for Automated Deployment
- 3rd party device support



Assurance Management

Application Visibility and End User Experience

- End-to-End Visibility for Service-Aware Networking
  - By applications, services and end-users
- Out-of-the-Box Support for Cisco Advanced Instrumentation
  - Netflow, Flexible Netflow, AVC, NBAR, PA, Medianet, etc.
- Simplified End-to-End Visibility for Faster Troubleshooting
  - Normalises, correlates and aggregates data sources
- Automated Baselining with Dynamic Thresholds
- NBAR2 Custom Application Support
- Multi-NAM Management
- Service Health Dashboard



So Why Network Management

- Improved Operational Efficiency
- Simplify Technology Deployment
- Troubleshooting and Visibility (Single View)
- Automate Lifecycle Processes
- Be Proactive and Delegate
- Speed up Problem Resolution
- AND if you Don’t

When Control Systems Fail

When Control Systems Fail

Prime Plug and Play Gateway

What is Automation?

- Automation is the use of **control systems** and **information technologies** to reduce the need for human work in the production of goods and services

Why Automation?

- Efficient use of resources
- Reduction in errors
- Faster deployment
- Consistency
- Security

Why Zero-touch Provisioning?

- Estimation that 80% of network downtime can be attributed to human error
- Networks are getting more complex
- Manual configuration is slow
- People are expensive
- Travel is expensive

When to Zero-touch?

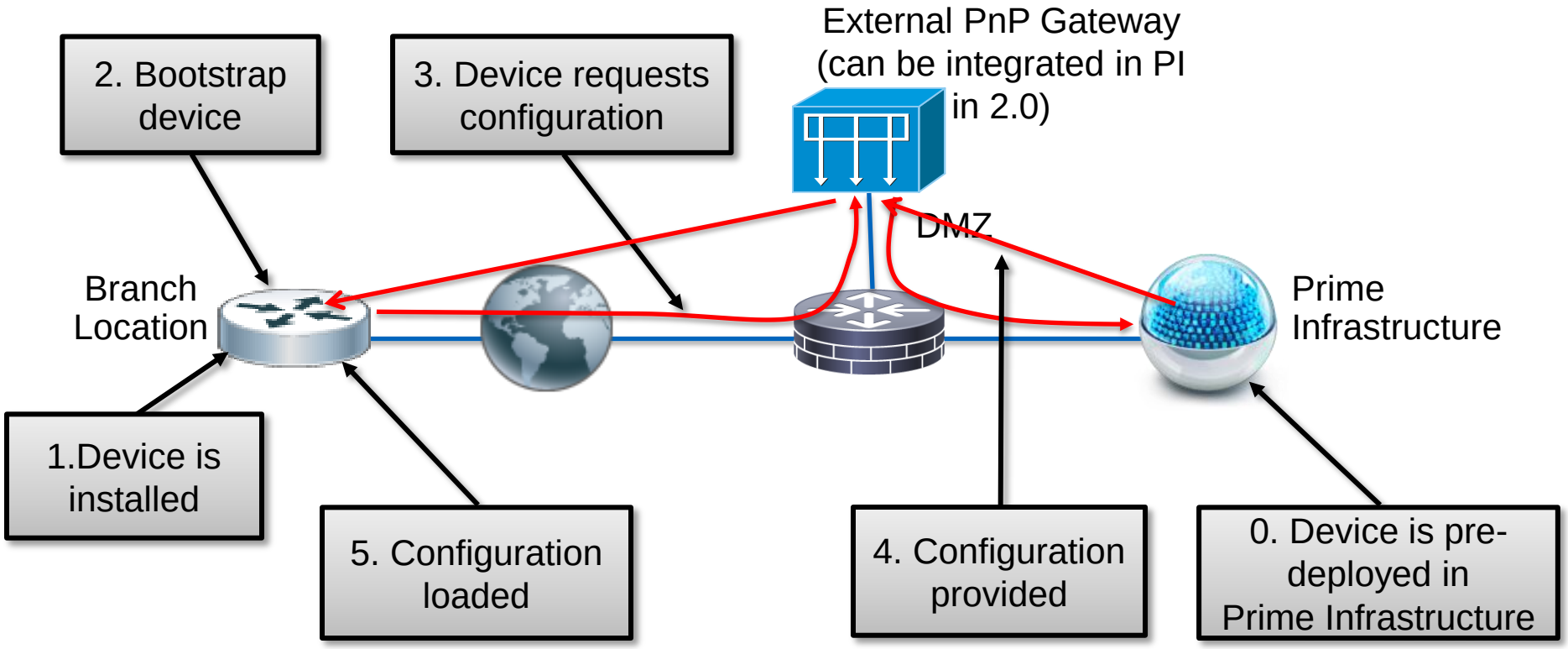
- Reduce Onsite Skilled Support
- Consistent Configuration
- Reduce Deployment Time
- Reduce Deployment Cost
- To Keep Your Job
- Allow for Innovation

What are the Options?

For Zero or Single Touch Deployments

- DHCP/TFTP Boot (Switches Only)
- Auto Smart Install
- Cisco Configuration Engine
- Cisco or Partner Customisation Services
- Plug and Play Gateway

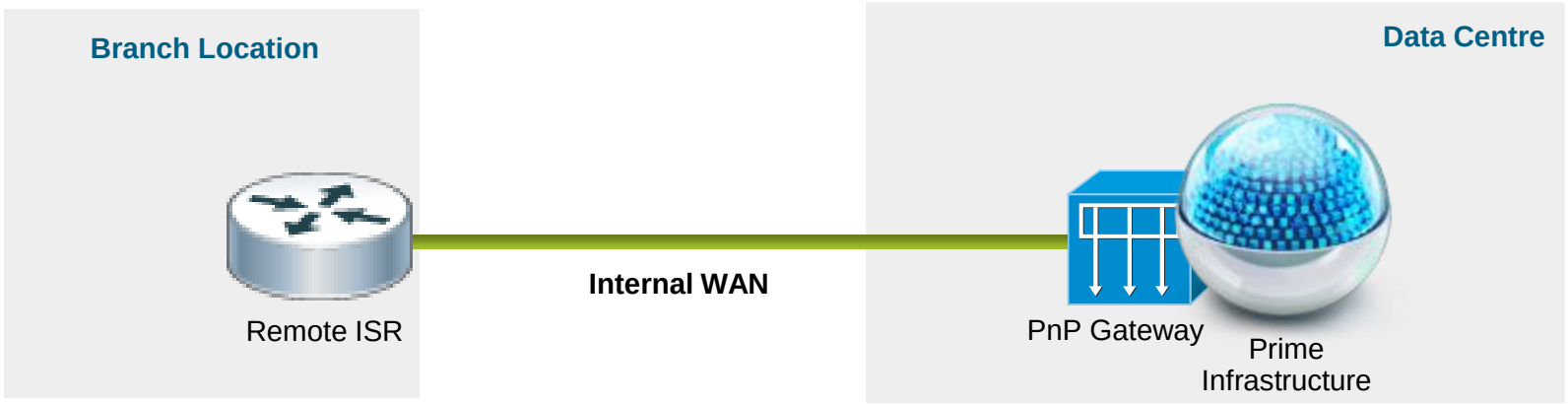
Plug and Play Overview



PnP Gateway for Internal Deployments

PnP Gateway in Prime Infrastructure

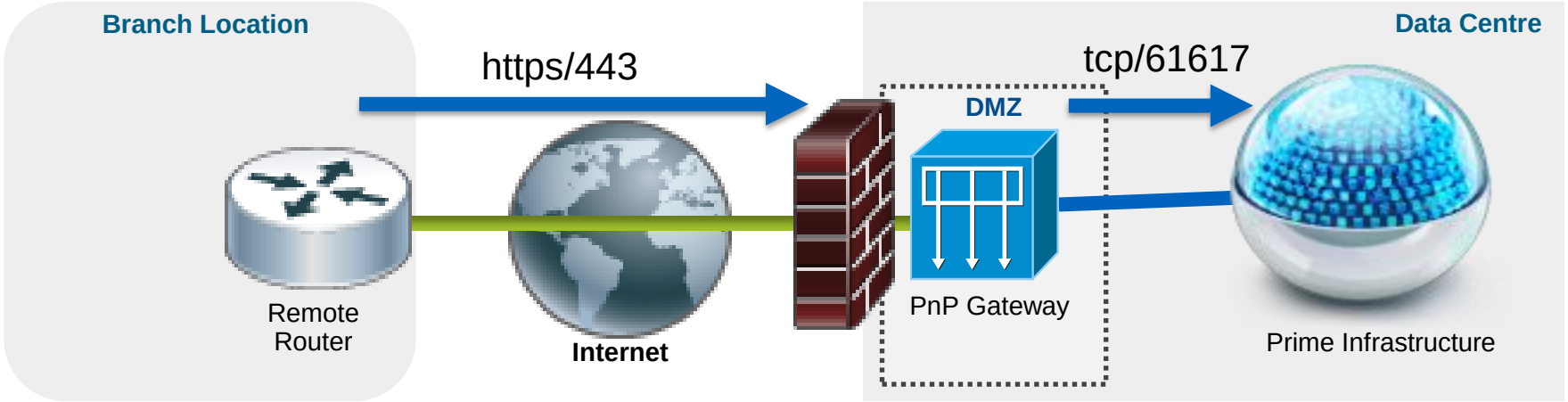
- PnP Gateway integrated into Prime Infrastructure 2.x onwards



PnP Gateway for Internet Deployments

PnP Gateway in a DMZ

- PnP Gateway in a DMZ for Prime Infrastructure 1.3 onwards
- A separate PnP gateway Server can be deployed on DMZ
- This allows Prime Infrastructure to now be exposed to the Internet



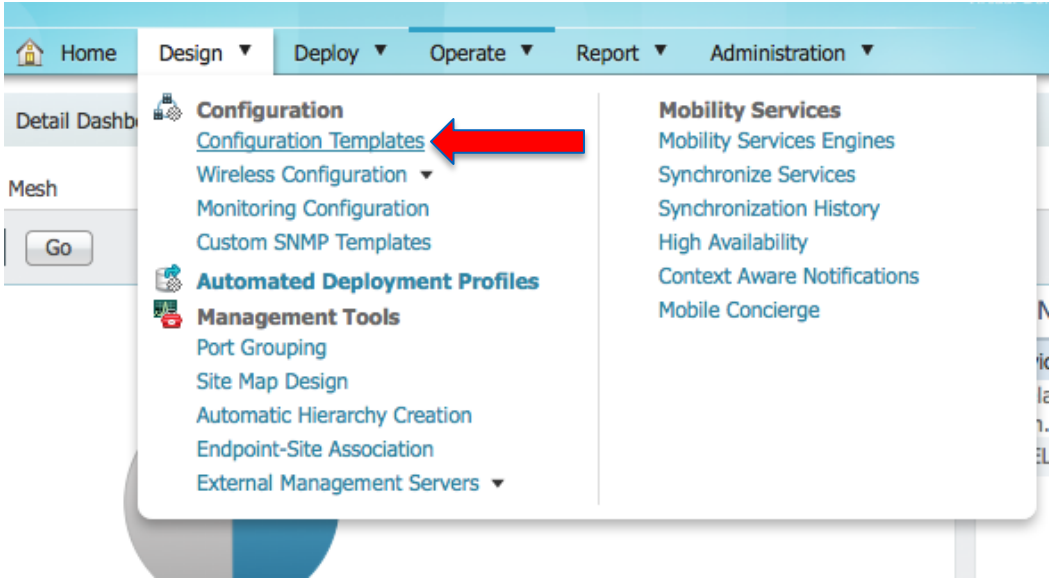
Steps to Get This Working

- Design
  - Create Bootstrap Configuration Template
  - Create Device Configuration Template
  - Create Automated Deployment Profile
  - Publish Automated Deployment Profile
- Deploy
  - Deploy Automated Deployment Profile
- Operate
  - Monitoring the Deployment Status
  - Confirming the Device is being Managed

Steps to Get This Working

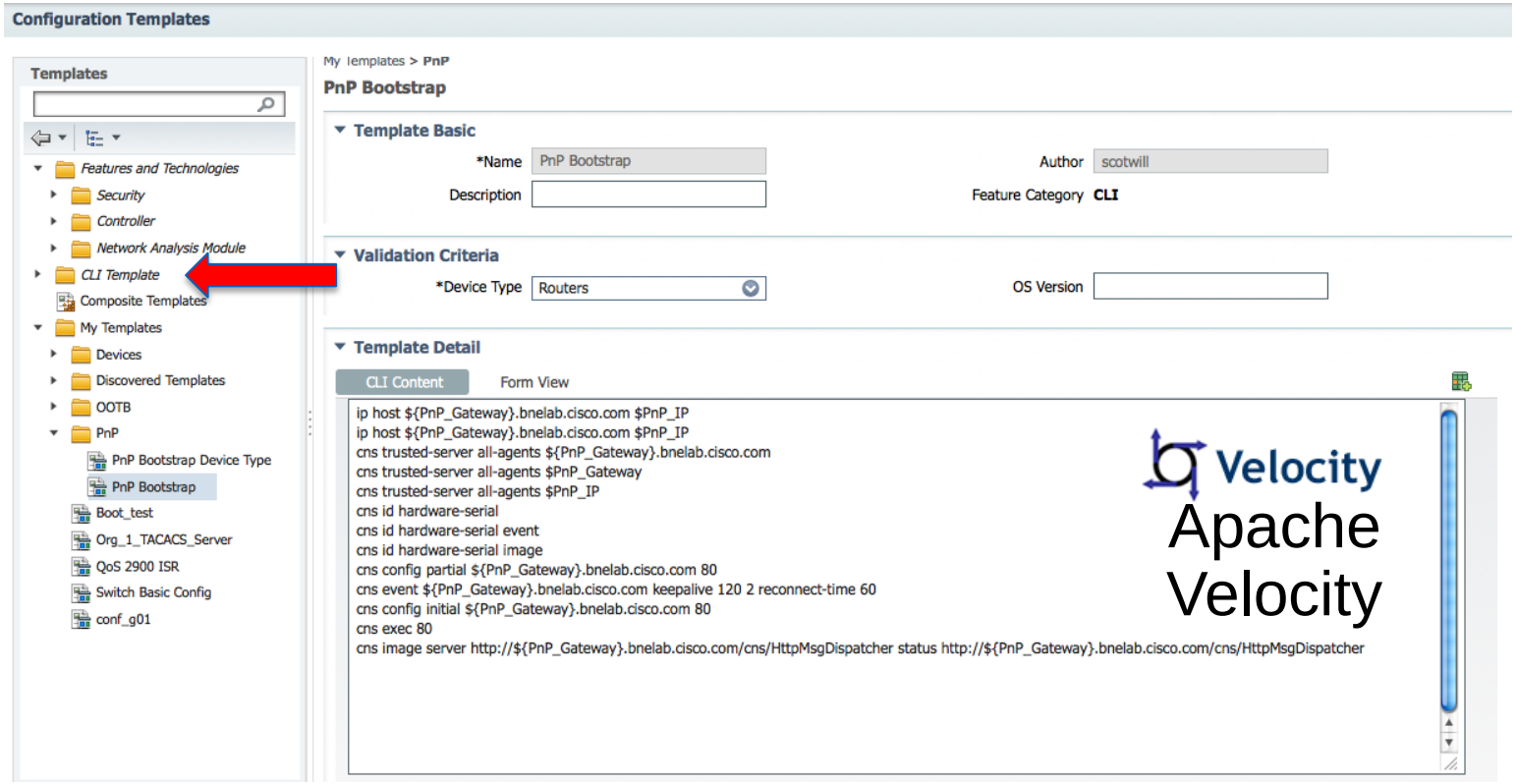
Create Configuration and Bootstrap Templates

- Create Templates
  - Bootstrap
  - Configuration



Bootstrap Template

Design – Create Bootstrap Configuration Template



Bootstrap Template

Design – The Commands to Create Bootstrap Configuration

- CNS “call-home” configuration that is required for PnP
  - Device ID is per device based on serial number
  - Device TYPE is per device type unique identifier

```
ip host <PnP Gateway server fully qualified host name> <IP address>
ip host <PnP Gateway server short hostname> <PnP Gateway IP address>
cns trusted-server all-agents <PnP Gateway server fully qualified host name>
cns trusted-server all-agents <PnP Gateway server short host name>
cns trusted-server all-agents <PnP Gateway IP address>
<The Device ID or Device Type commands go here>
cns config partial <PnP Gateway server fully qualified host name> 80
cns event <PnP Gateway server fully qualified host name> keepalive 120 2 reconnect-time 60
cns config initial <PnP Gateway server fully qualified host name> 80
cns exec 80
cns image server http://<PnP Gateway server fully qualified host name>/cns/HttpMsgDispatcher
status http://<PnP Gateway server fully qualified host name>/cns/HttpMsgDispatcher
```

Device ID-based commands

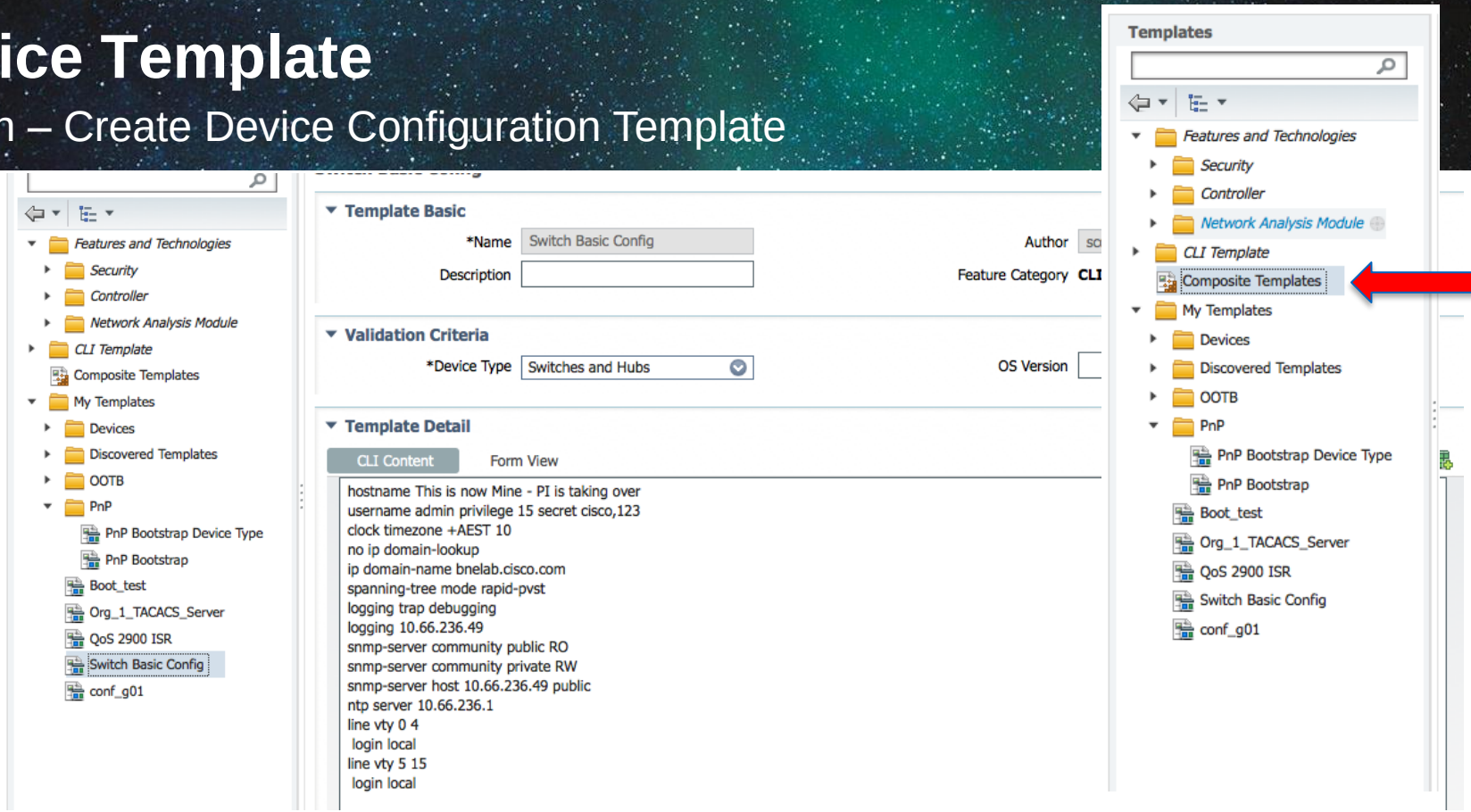
```
cns id hardware-serial
cns id hardware-serial event
cns id hardware-serial image
```

Device Type-based commands

```
cns id udi
cns id udi event
cns id udi image
```

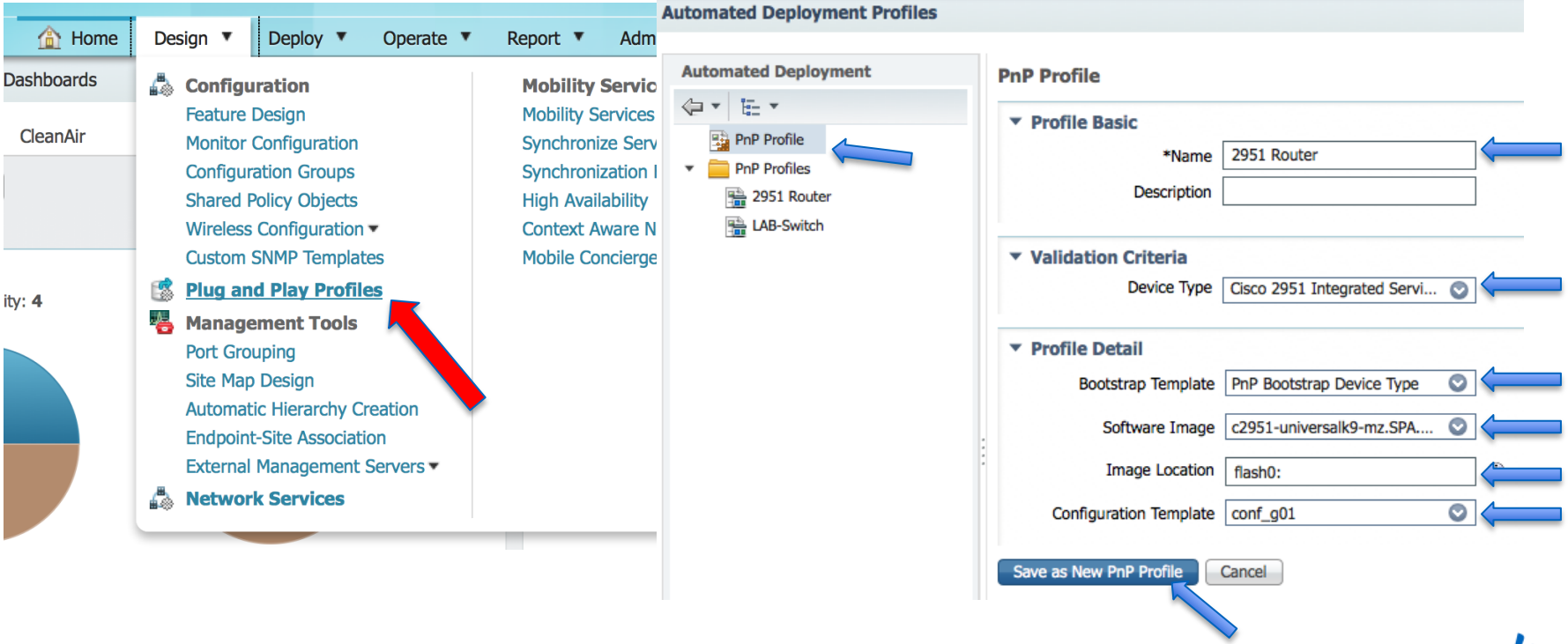
Device Template

Design – Create Device Configuration Template



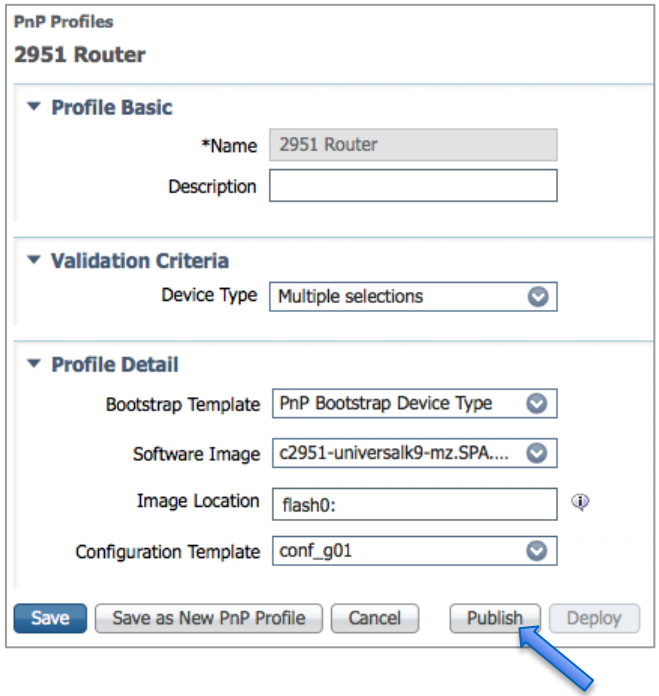
Plug and Play Profile

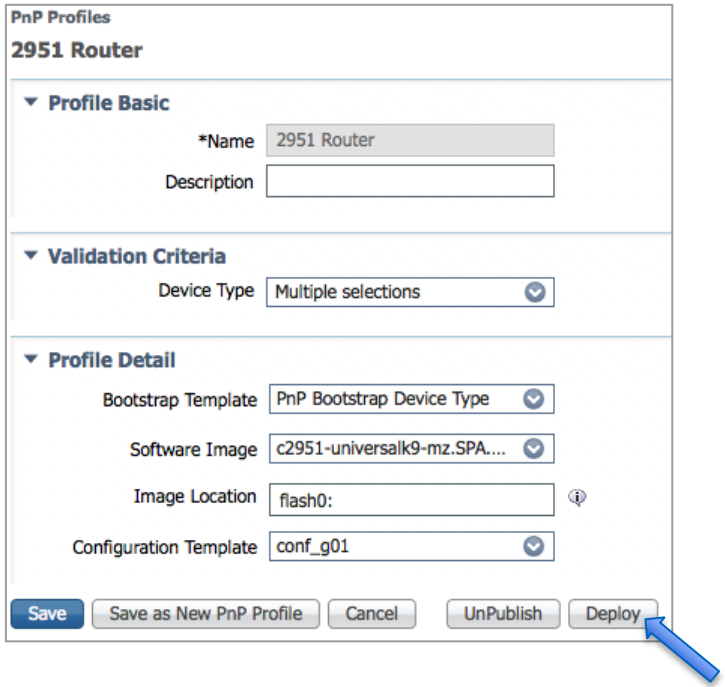
Design – Create Plug and Play Profile



Plug and Play Profile

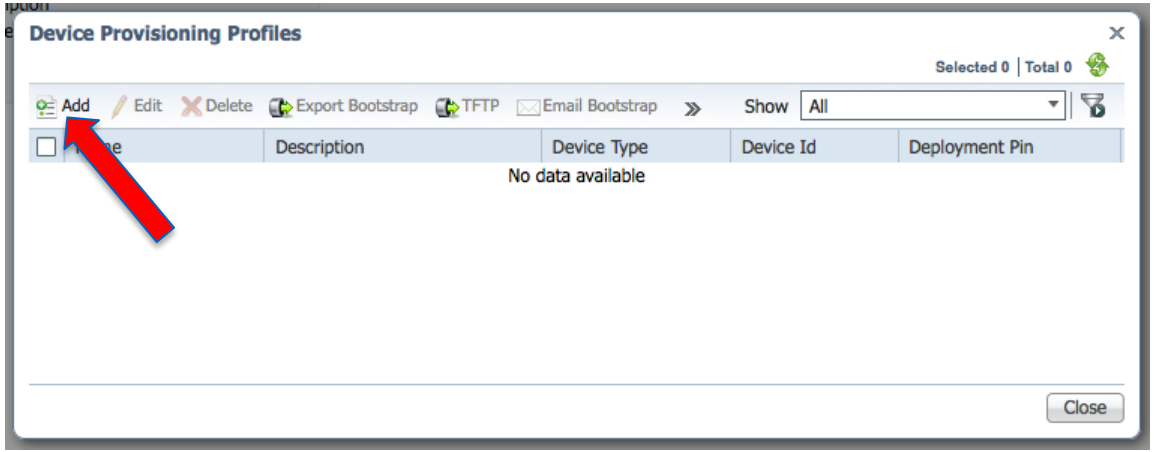
Design – Publish and Deploy the Automated Deployment Profile





Plug and Play Profile

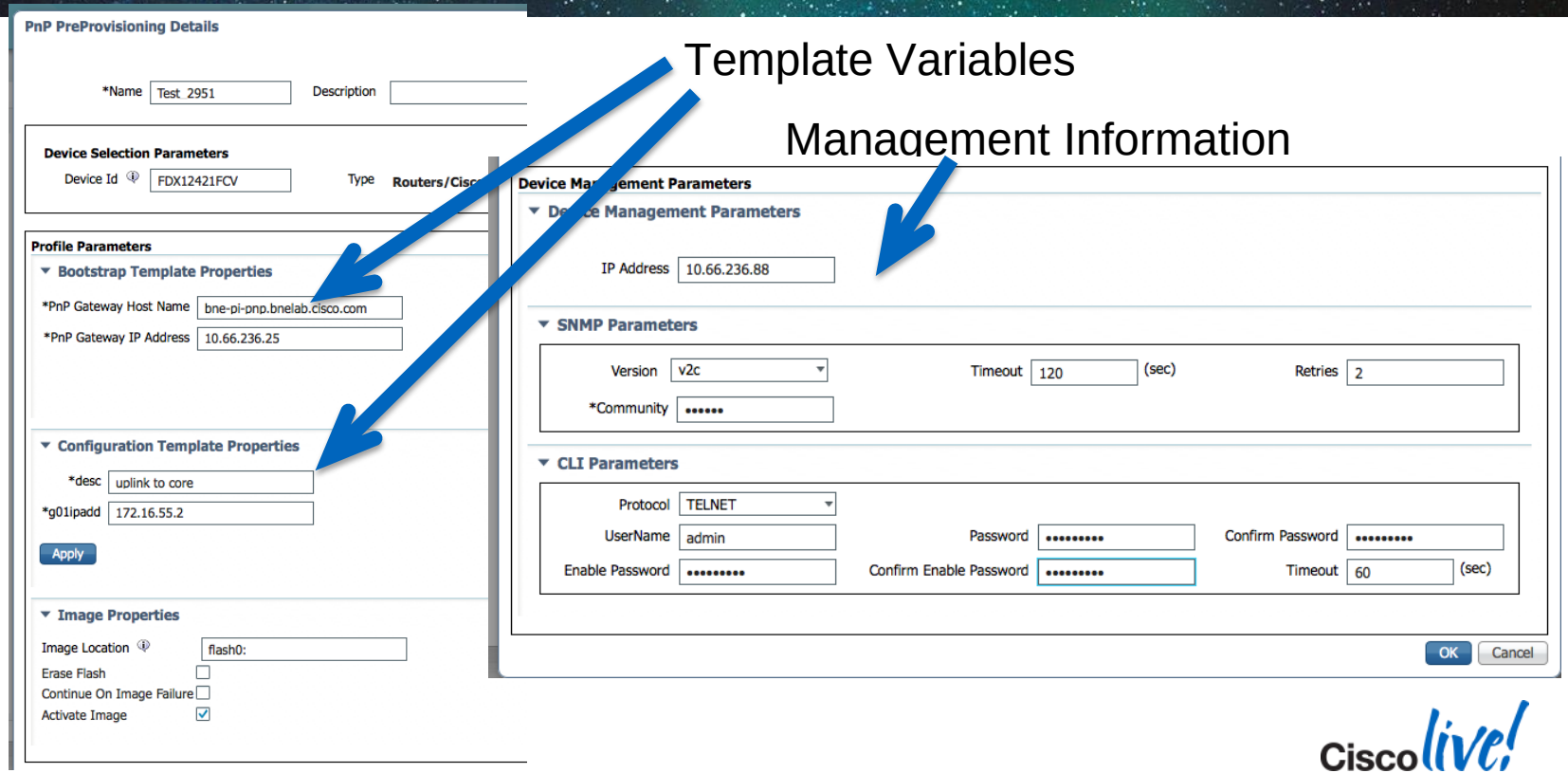
Deploy – Create Device Provisioning Profiles



- Add a new device to be provisioned

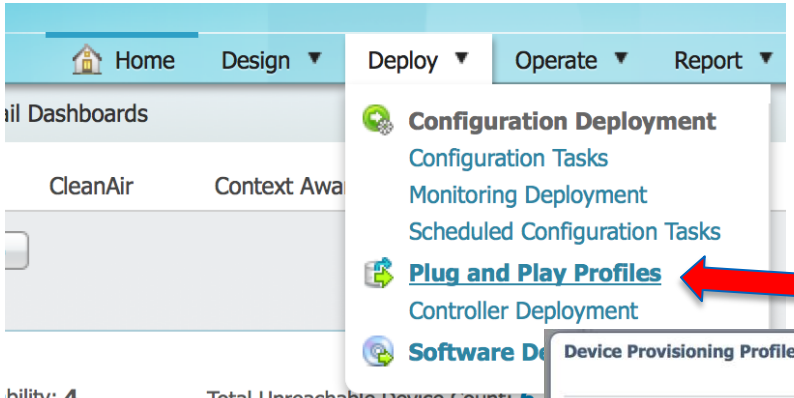
Plug and Play Profile

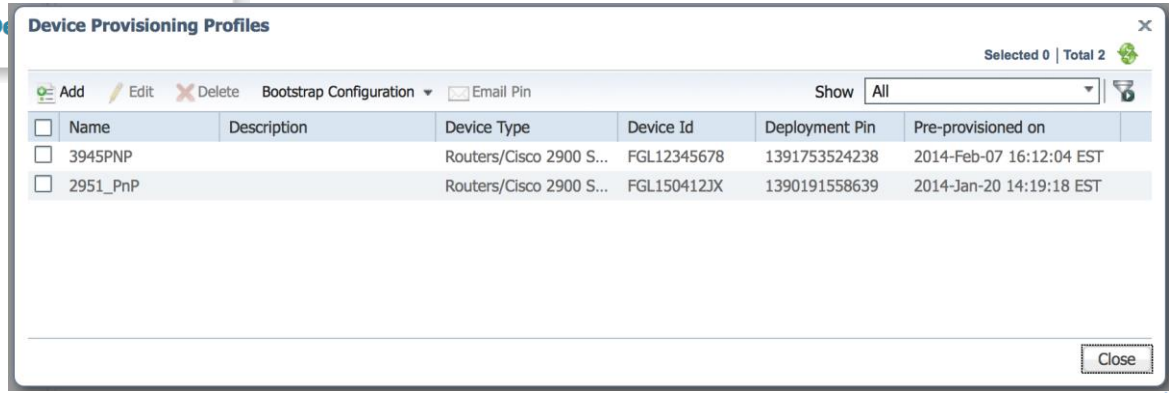
Deploy – Create Device Provisioning Profiles



Plug and Play Profile

Deploy – Plug and Play Profiles

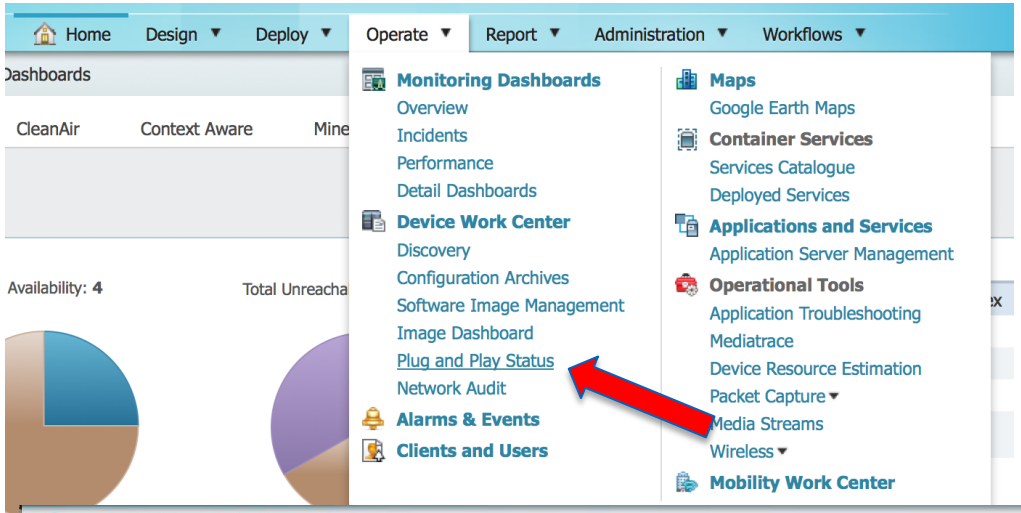


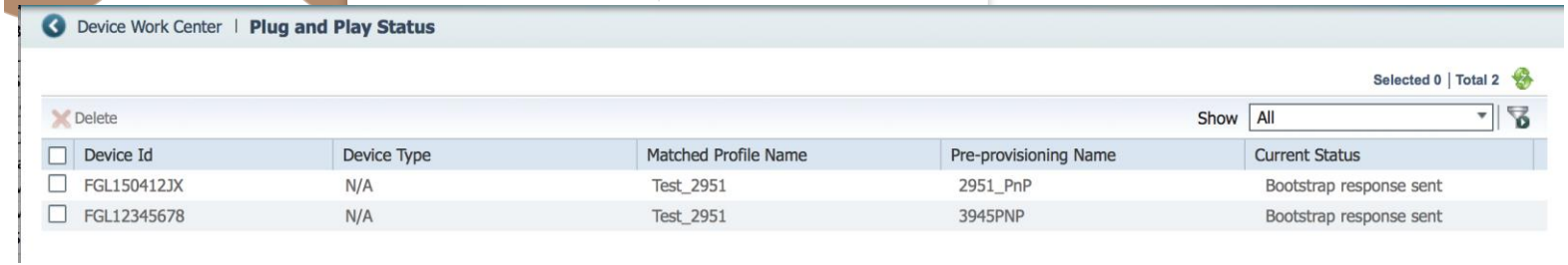


- Export Bootstrap
- TFTP Bootstrap
- Email Bootstrap
- Email PIN

Monitoring the Deployment

Operate – Monitoring the Status of Devices being Deployed

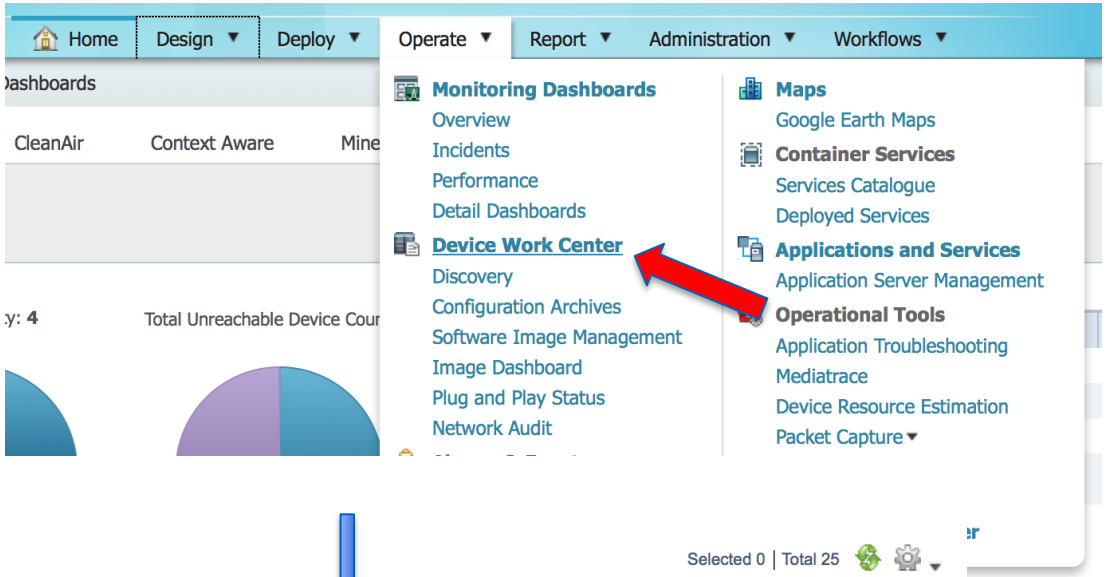




Monitoring the Deployment

Operate – Confirming the Device is being Managed

- Device added to Work Centre
- Collection Status



Device Group > **ALL**

ALL

Selected 0 | Total 25

Edit | Delete | Sync | Groups & Sites | Add Device | Bulk Import | Export Device | Show All

Device Name	Reachability	IP Address/DNS	Device Type	Admin Status	Inventory Collection Status	Last Successful Col...	Software Version
2951-Branch	✓	10.66.236.243	Cisco 2951 Integrated ...	Managed	Synchronizing	February 6, 2014 1...	15.3(2)T
2951-HQ	✓	10.66.236.242	Cisco 2951 Integrated ...	Managed	Completed	February 6, 2014 1...	15.3(2)T

Plug-n-Play Options with Prime

No CLI skills are needed for these options

PnP 1 Cisco Integrated Customised Services (CICS) which loads a custom factory config in the ISR and is available for all ISRs

PnP 2 USB stick to bootstrap the ISR

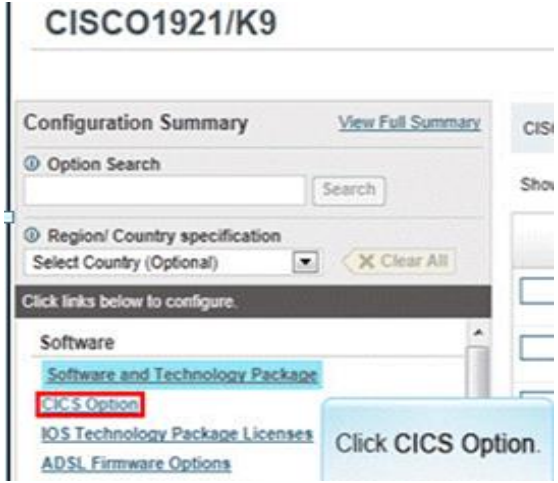
PnP 3 Cisco Prime PnP Application (*PC and for iPhone/iPad)*

PnP 4 CCP Express (GUI that optionally comes with the ISR)

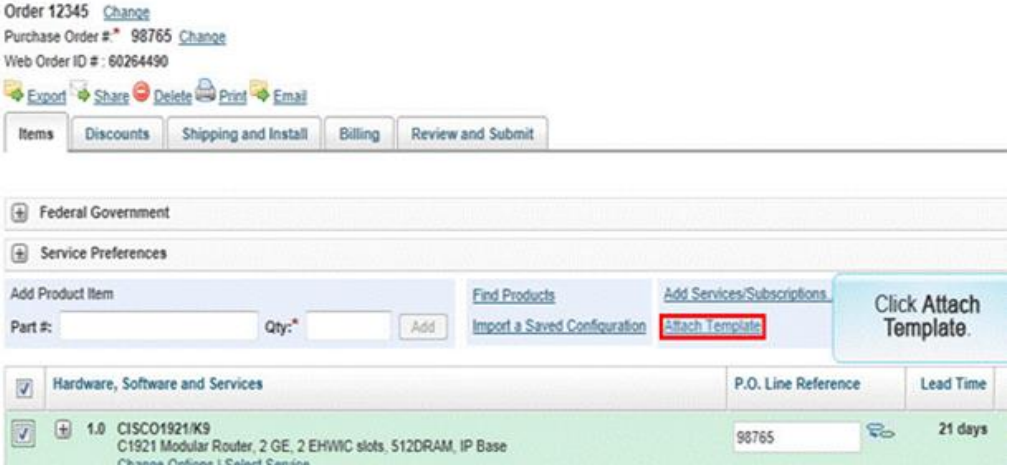
Plug-n-Play with CICS

Cisco Integrated Customisation Services

PnP 1



1 When ordering with CCW, select the CICS options



2 Attach a template to this ISR (or to multiples ISRs) This template would include the CNS commands, for example:

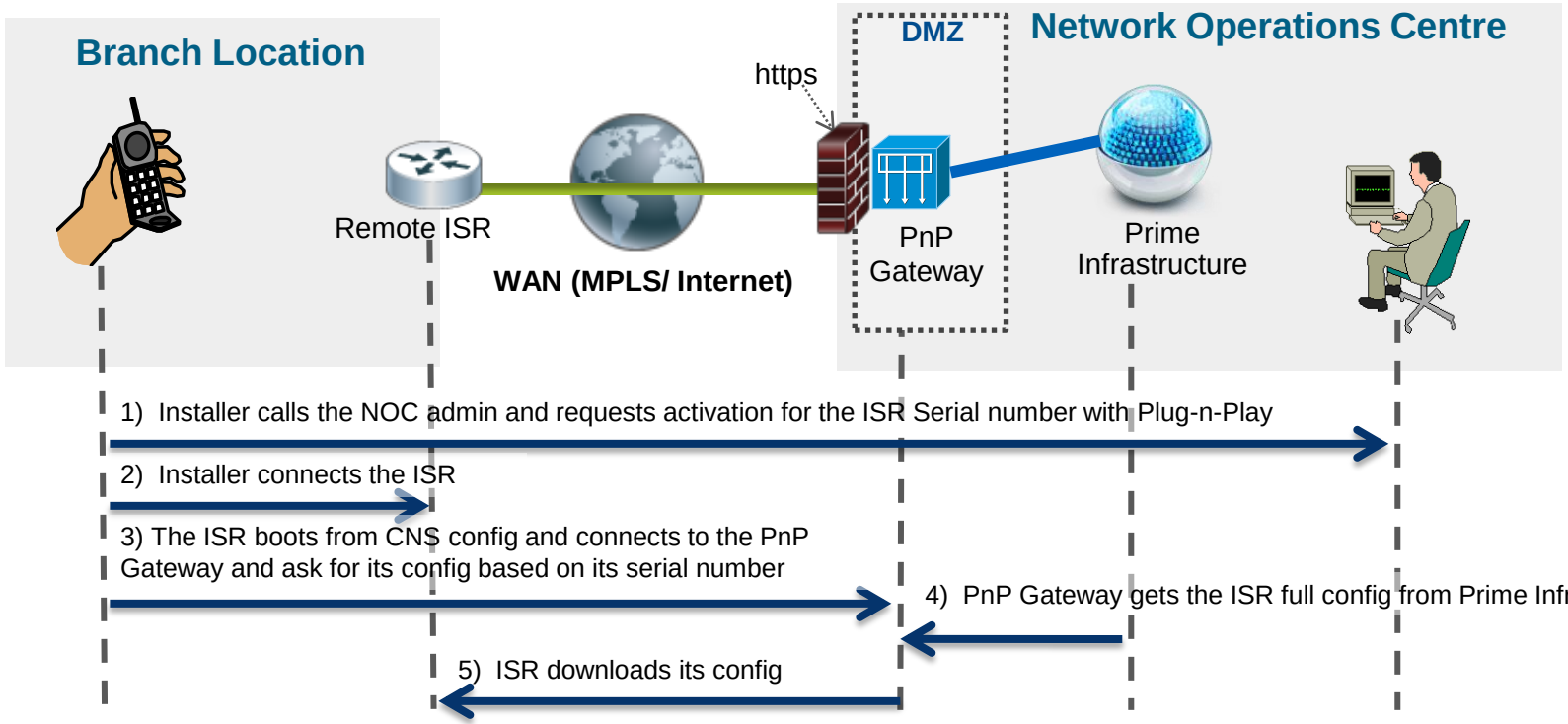
```
Router # ip host PnP 10.1.3.99
Router # cns config initial 10.1.3.99 443
Router # cns config partial 10.1.3.99 443
Router # cns id hardware-serial
Router # cns id hardware-serial event
Router # cns id hardware-serial image
Router # cns event PnP keepalive 60 3
Router # cns exec 80
```

CICS Based Plug-n-Play

Available for all ISRs

PnP 1

Zero-touch configuration for the installer (Cisco Integrated Customisation Services)

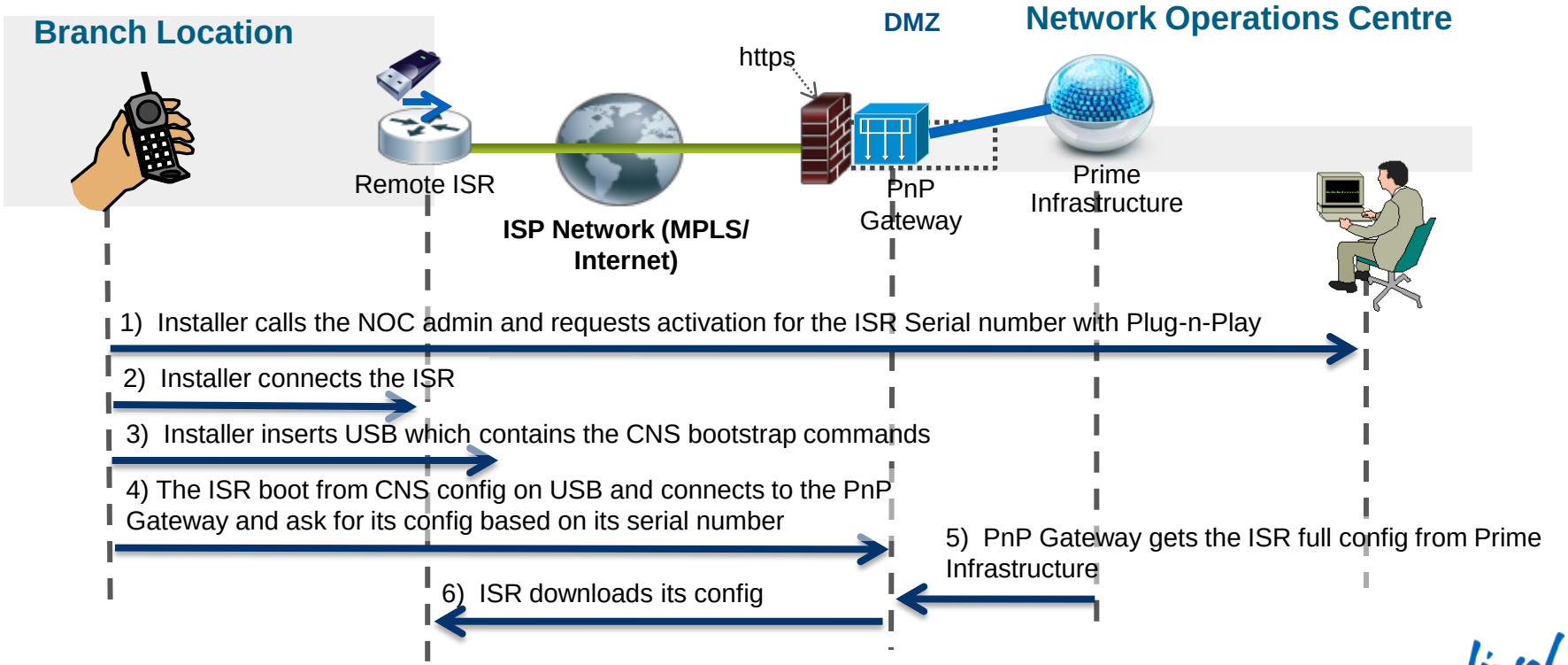


USB Based Plug-n-Play

Available for all ISRs with CVO (most 800/1900) and ZTD (2900)

PnP 2

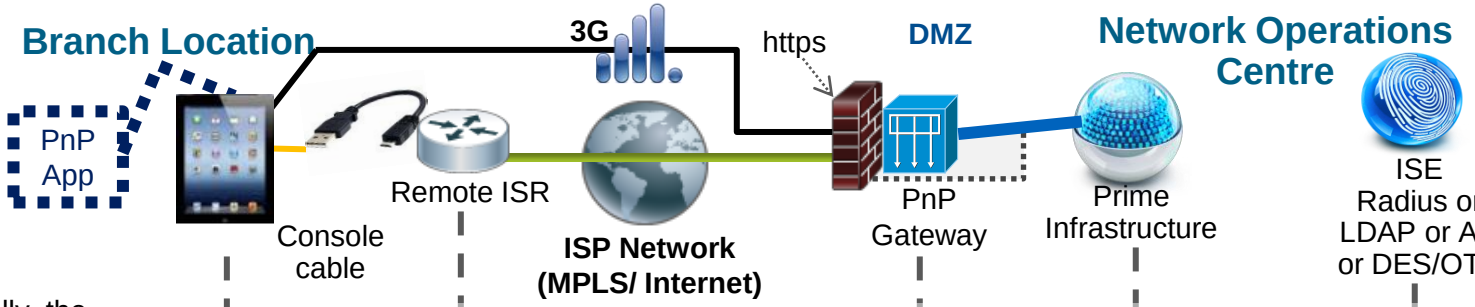
This option requires the CVO or ZTD factory configuration when ordering.



Console Application Based Plug-n-Play

Available for all ISRs and Switches.
Windows PC and iPhone/iPad

PnP 3



Optionally, the installer could have downloaded the configuration prior to getting on site, therefor not requiring 3G live connection to the PnP Gateway

1,2) Installer connects the console cable ISR to PnP App (PC), Installer enter PIN and clicks “install”

3) PnP App reads serial number or the ISR through the console

4) PnP App requests the bootstrap config for that router through the 3G connection

5) PnP Gateway validates the credentials of the installer

6) PnP Gateway registers the Serial number of that device and gets the ISR bootstrap config from Prime Infrastructure

7)PnP App receives the boot config (WAN + CNS) from PnP Server an puts it in the ISR through the console

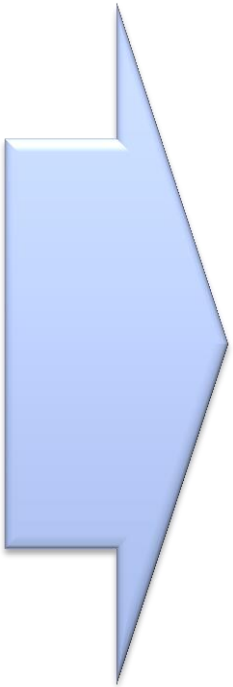
9) ISR connects to PnP Gateway using CNS and request its full config

Plug-N-Play Workflow Summary

PnP 3

Pre-Provisioning

- Network administrator creates the device PNP automated deployment template in Prime Infrastructure
- Administrator specifies the name of the device, desired configuration and image, and optionally the device serial number and a bootstrap configuration
- A deployment PIN number is generated and emailed to the installer



Installation

- Installer connects the device in its final location
- Installer starts the provisioning by entering the device PIN. PnP App will register the device serial number using the deployment PIN with PnP Gateway
- PnP App bootstraps the device
- Installer monitors the deployment status

Deployment Applications

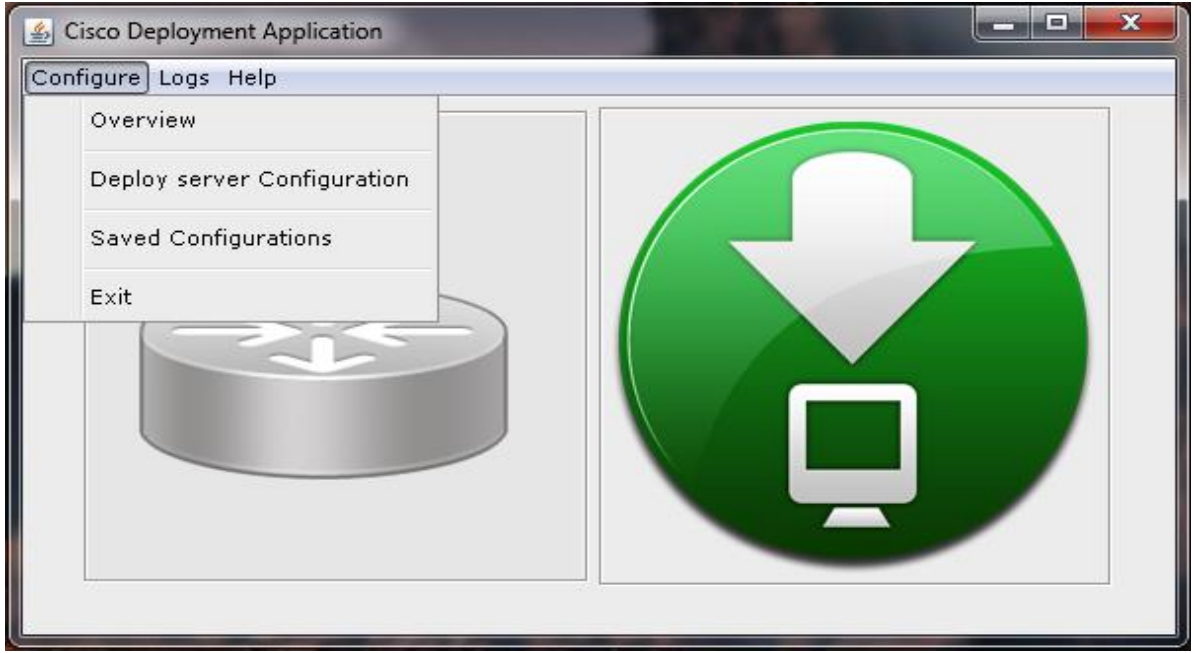
Windows PC, iPad or iPhone. Android (future)

PnP 3

- PC Application
  - Works with micro USB console port or a regular console port with a serial-to-USB adaptor.
  - Works with any IOS device with a console port
- iPad and iPhone Application
  - Requires a special cable (http://www.redpark.com/c2rj45.html)
  - Works with any IOS device with a console port

Deployment Application - Windows

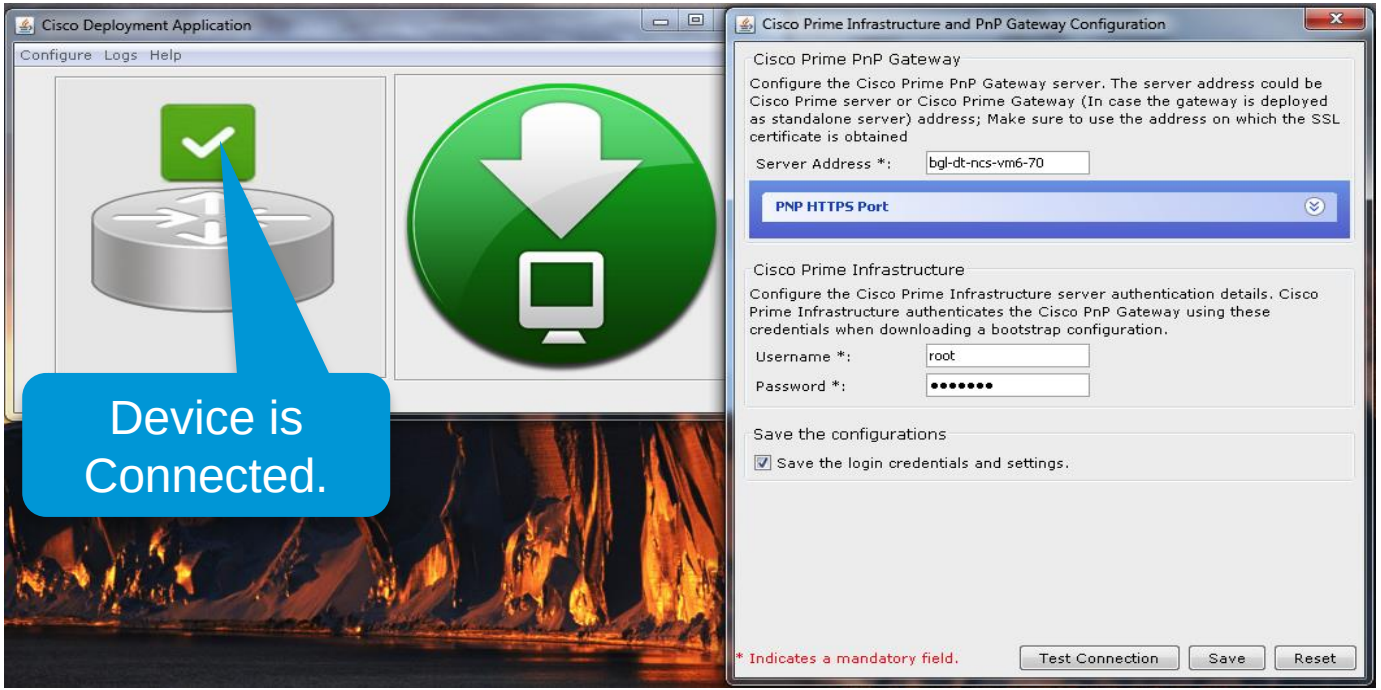
- The PnP Deployment application screen shot showing the different configuration option.



Deployment Application - PI Configuration

PnP 3

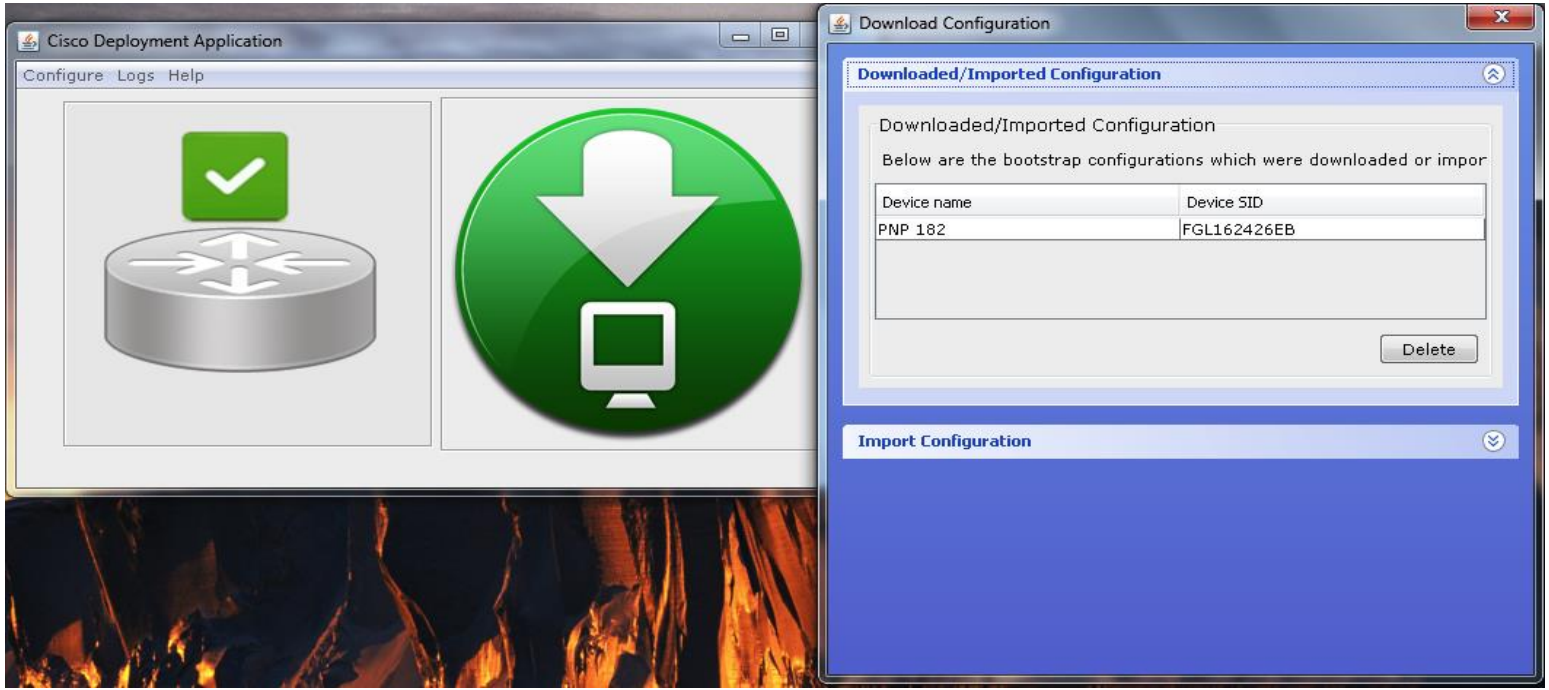
- The Configure→"Deploy Server Configuration" is used to configure the PnP Gateway Server (Standalone or PI Integrated) and PI User credentials



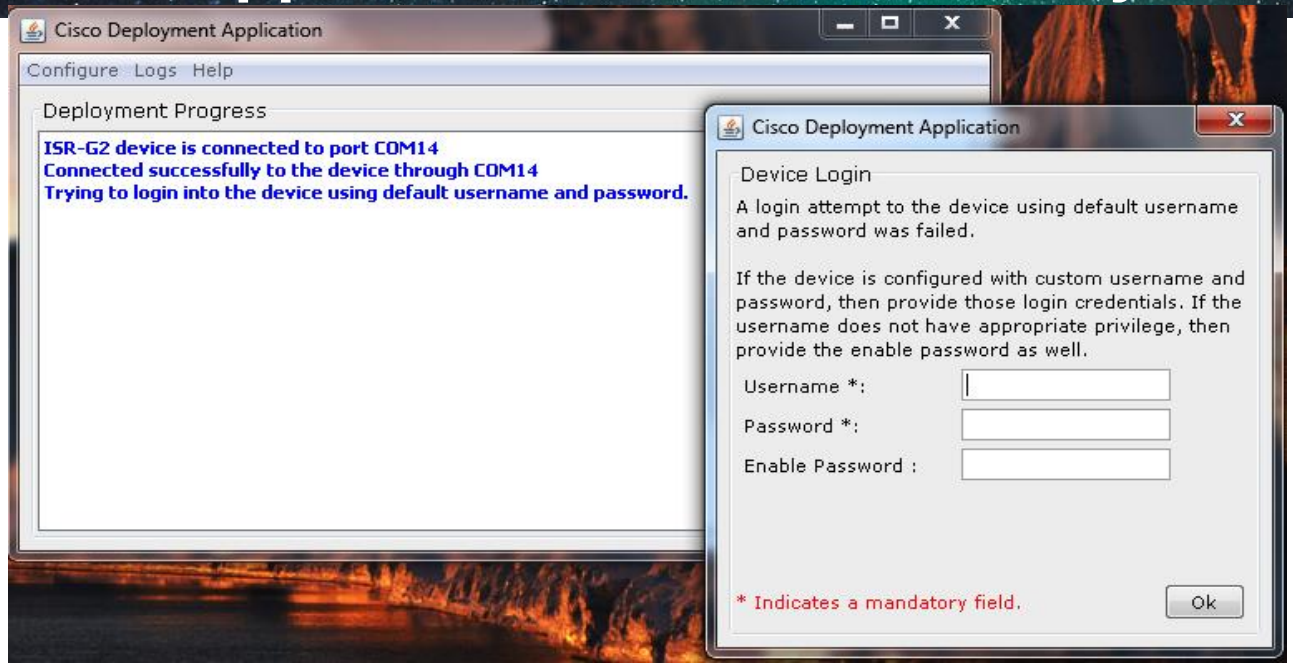
Deployment Application - Saved Configuration

PnP 3

- The Configure→"Saved Configuration" is used to view all the downloaded bootstrap configuration in the Deployment Application.

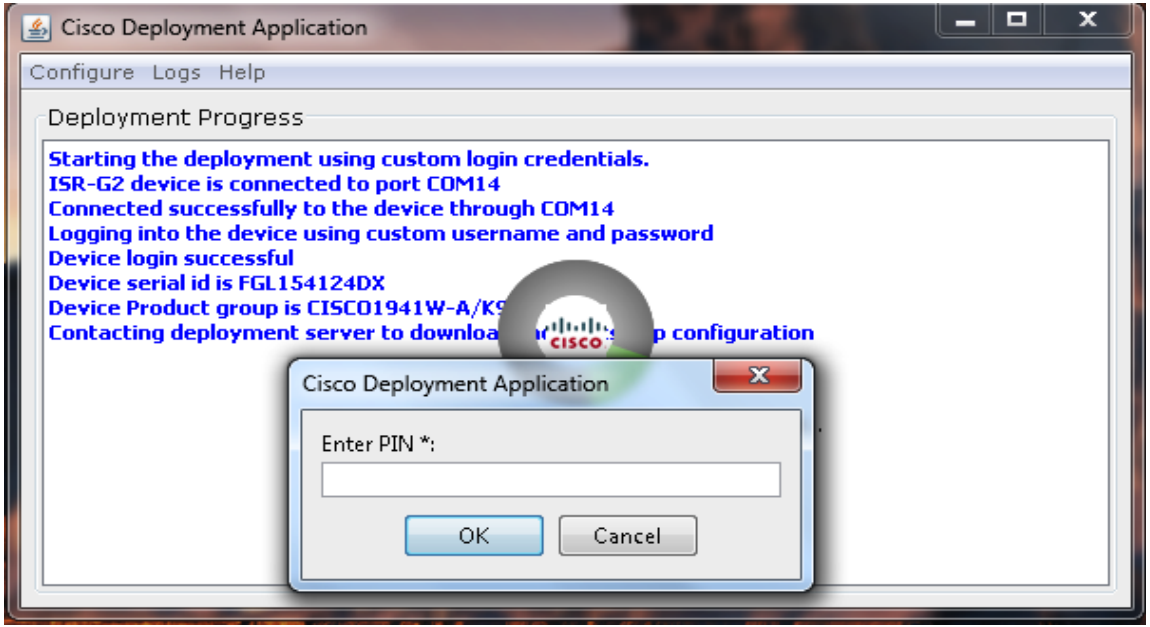


Deployment Application - Password Entry



- The Deployment App tries to login with default user and password for factory default devices
- If defaults denied then it prompts the user to these details

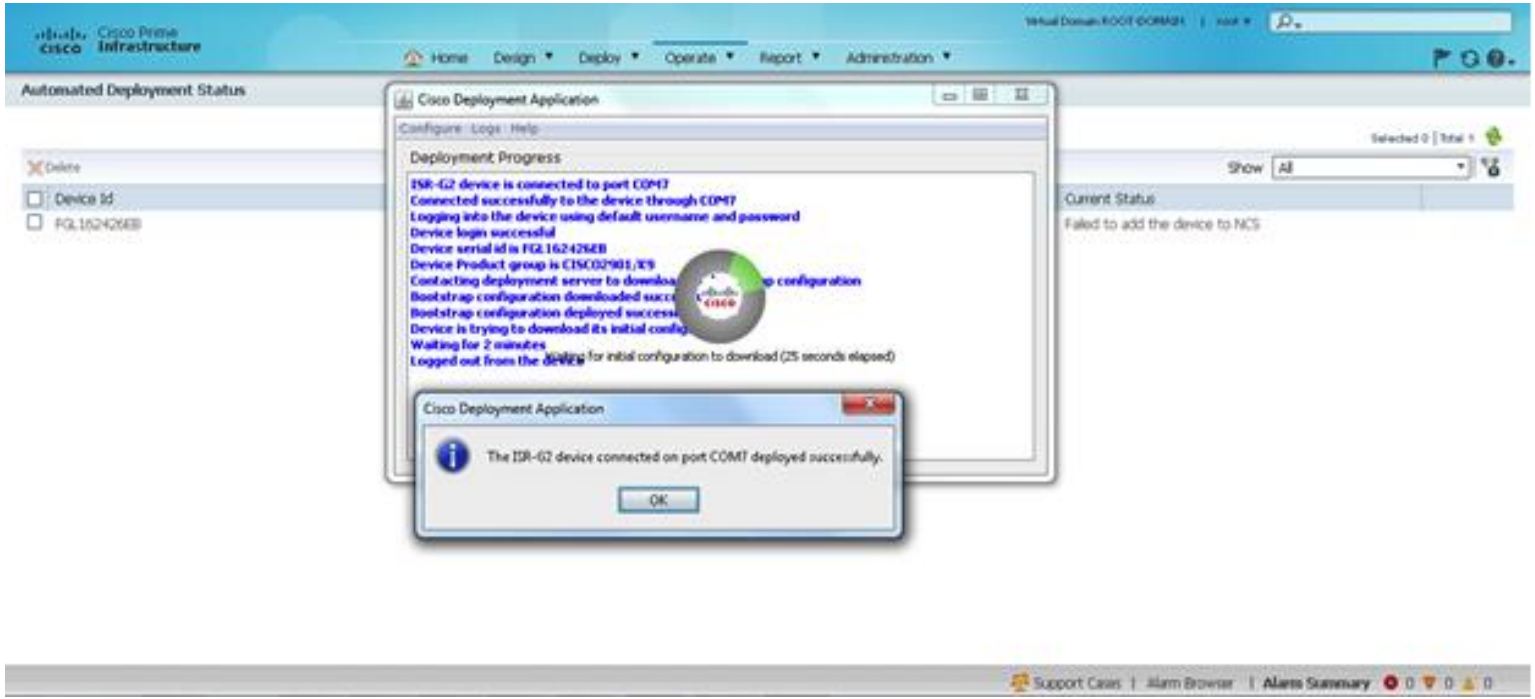
Deployment Application - PIN Entry



- The Screen shows the screen shot for entering the PIN for deployment.

Deployment Application - Device Deployment

PnP 3

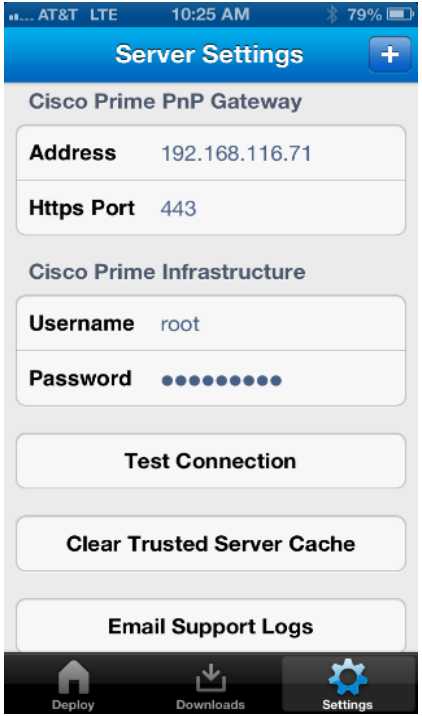


- The Screen shot shows the device deployment successfully completed

Deployment Application – iPhone

PnP 3

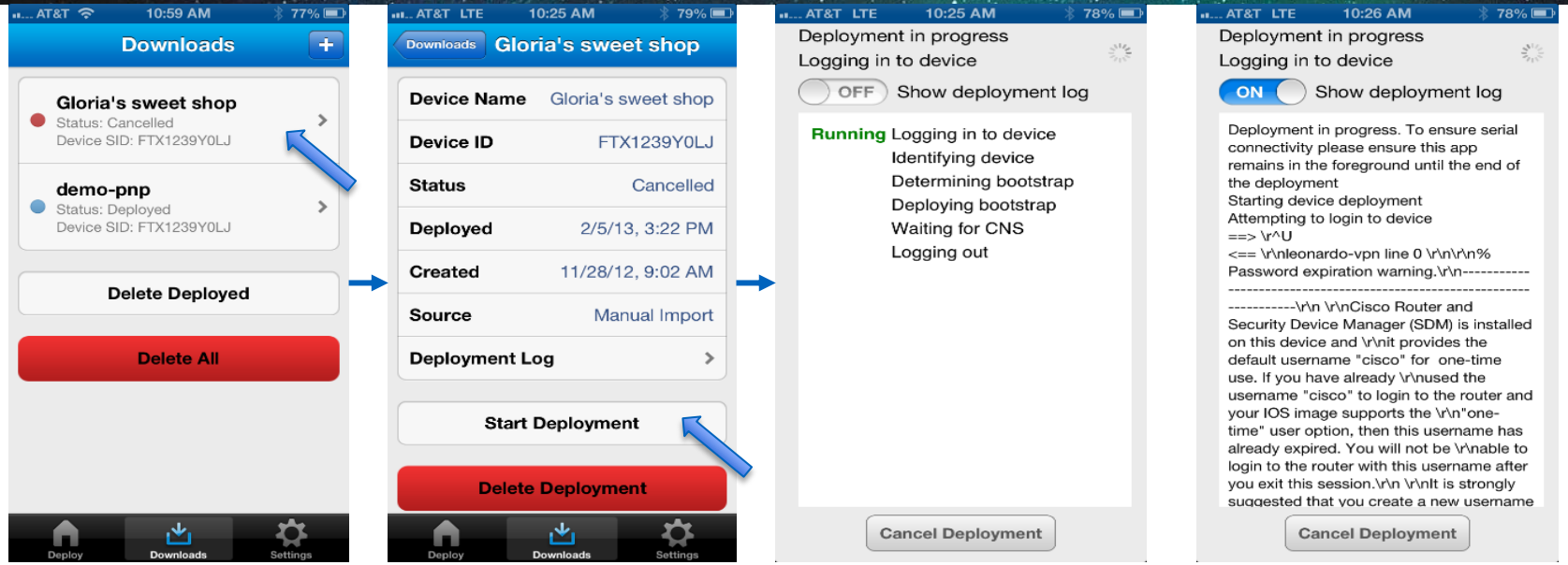
- Configuration
- Two Deployment Options
  1. Pre-specified
  2. PIN onsite



Deployment Application – iPhone

Option 1 – Device Pre-specified in PI

PnP 3

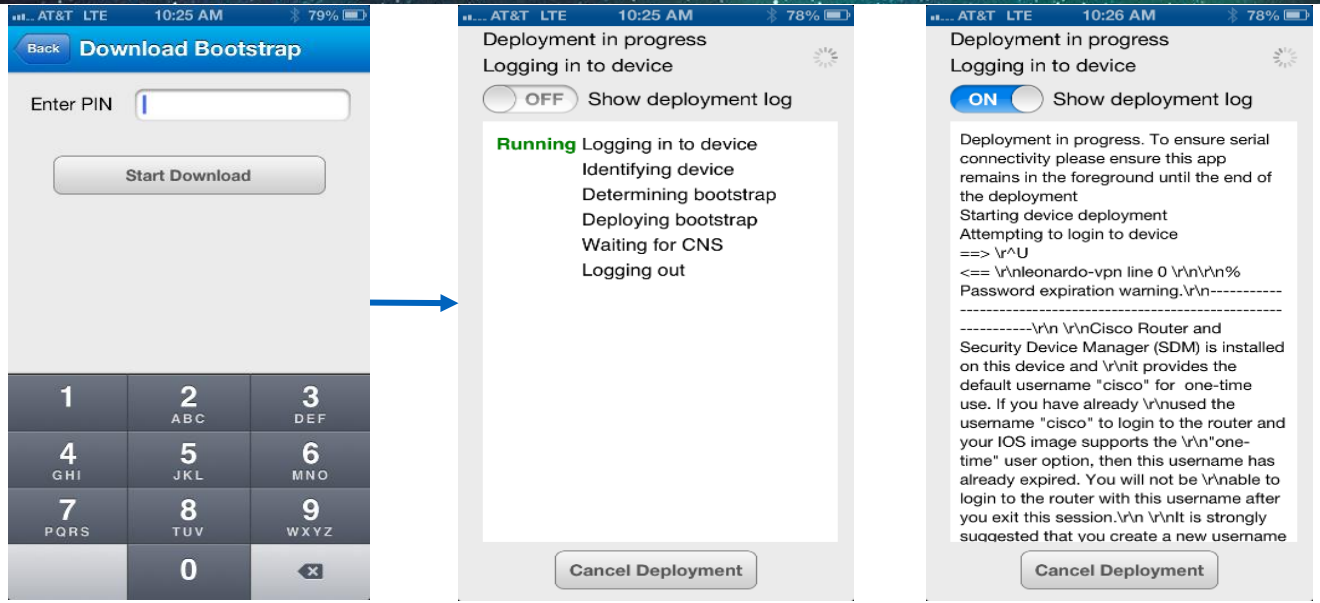


1. Device Serial Number pre-specified in Prime Infrastructure
2. Bootstrap Configuration downloaded to iPhone application

Deployment Application – iPhone

Option 2 – Deploy via PIN onsite

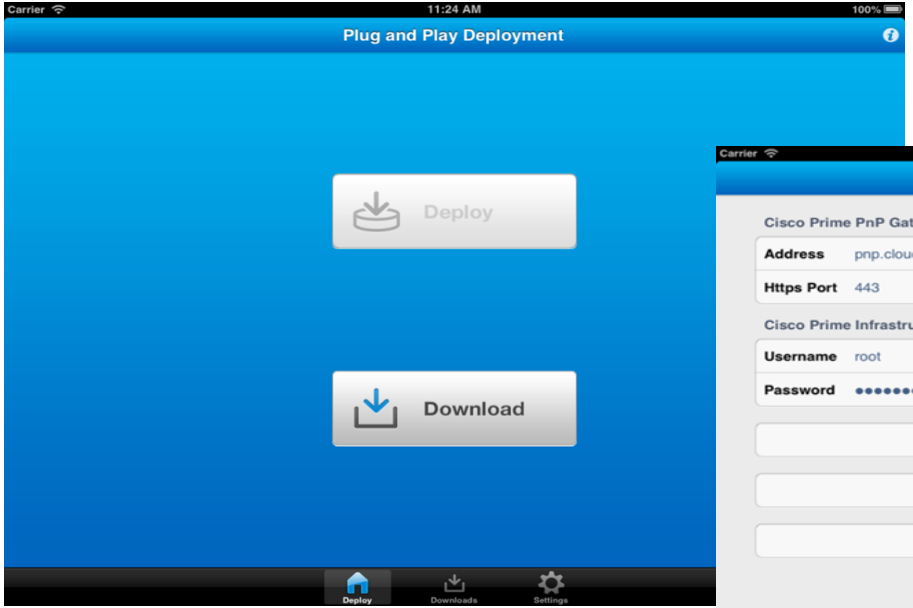
PnP 3



1. User is prompted for PIN for that location/device site
2. PnP App reads the Device Serial Number through the console cable and registers it in Prime Infrastructure via 3G, VPN or other

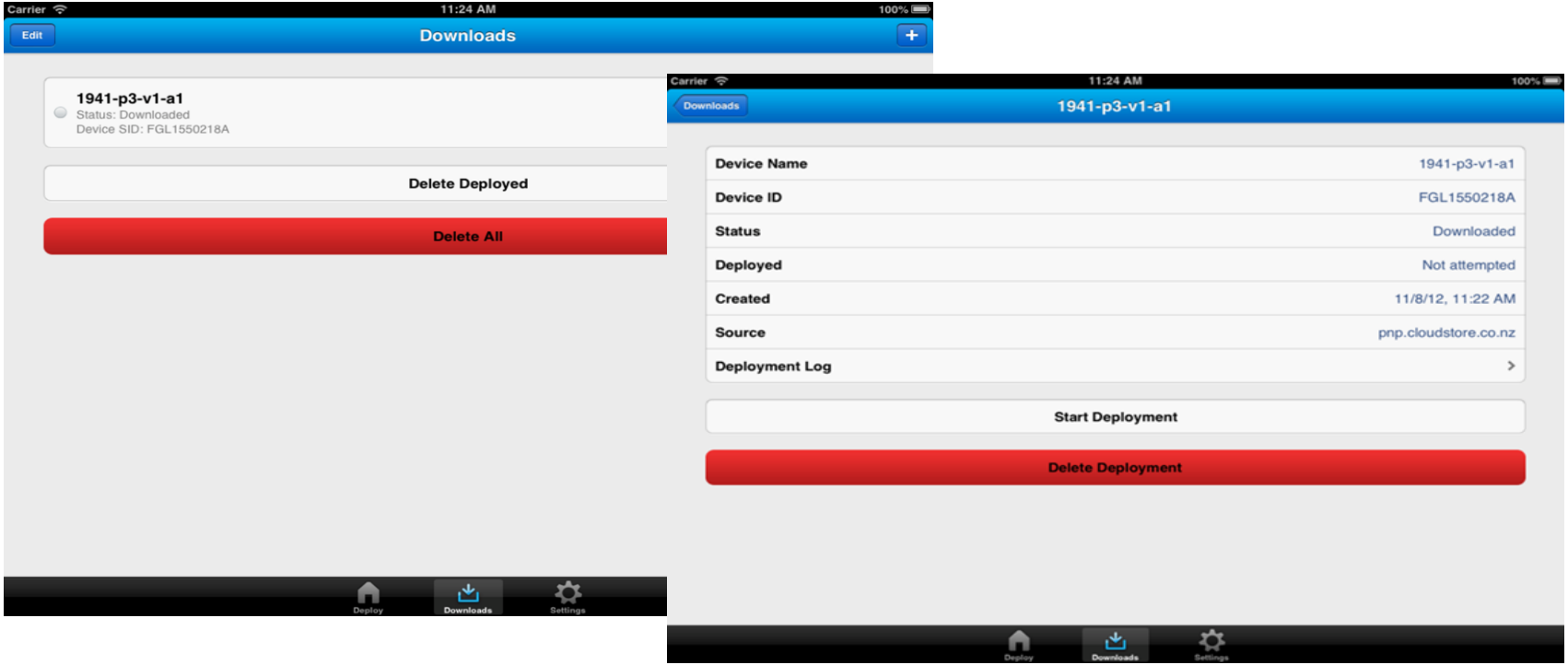
Deployment Application – iPad

PnP 3



Deployment Application – iPad

PnP 3

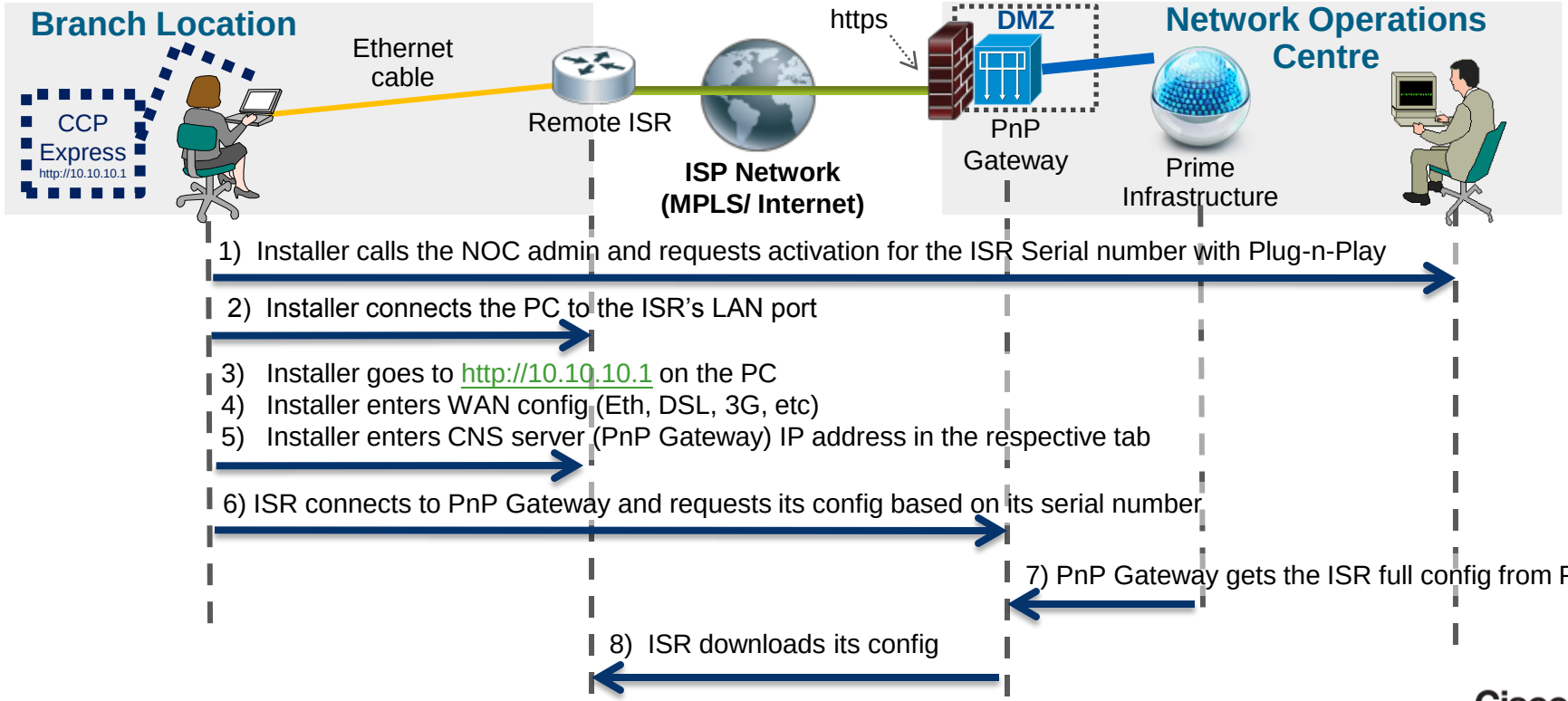


Plug-n-Play with CCP Express

GUI that optionally comes with the ISR

Available for all ISRs

PnP 4

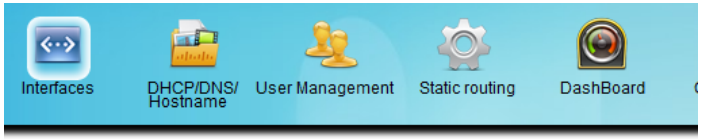


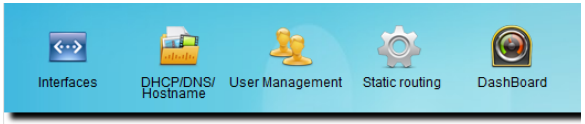
Plug-n-Play with CCP Express

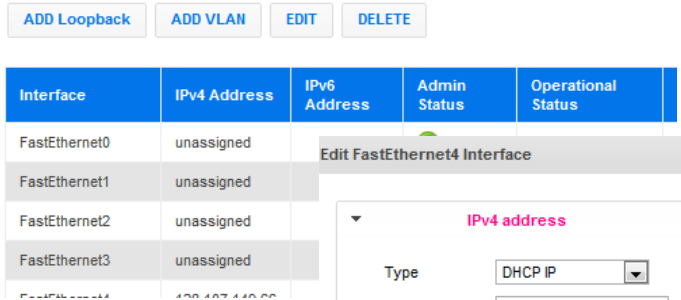
GUI that optionally comes with the ISR

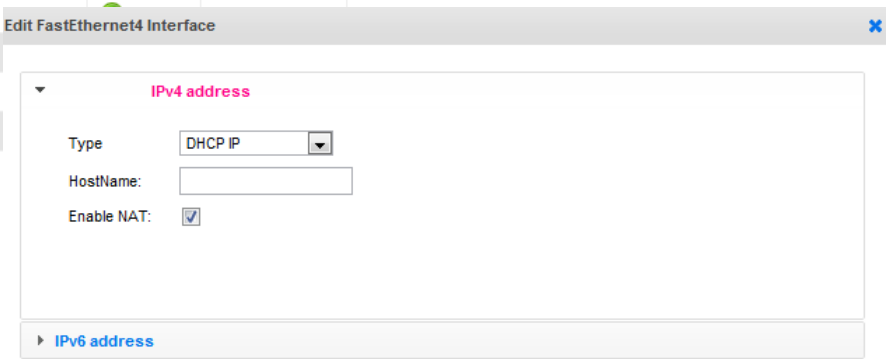
PnP 4

- Configure Interface
- Configure CNS









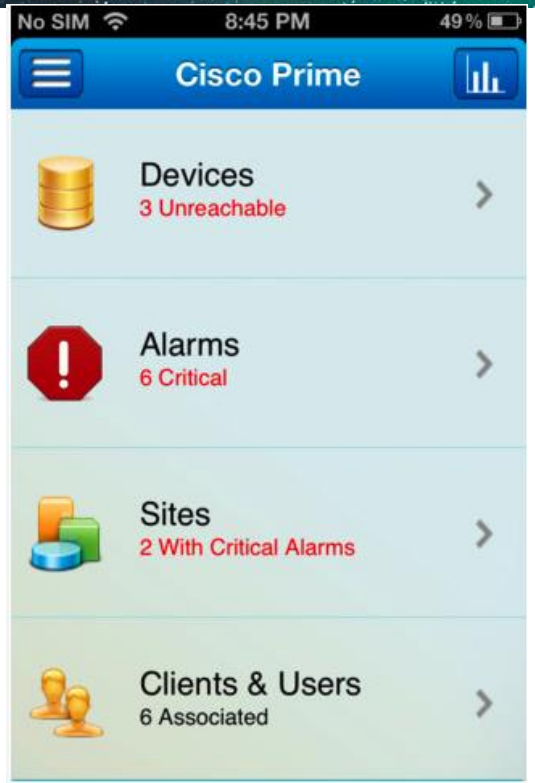
Summary

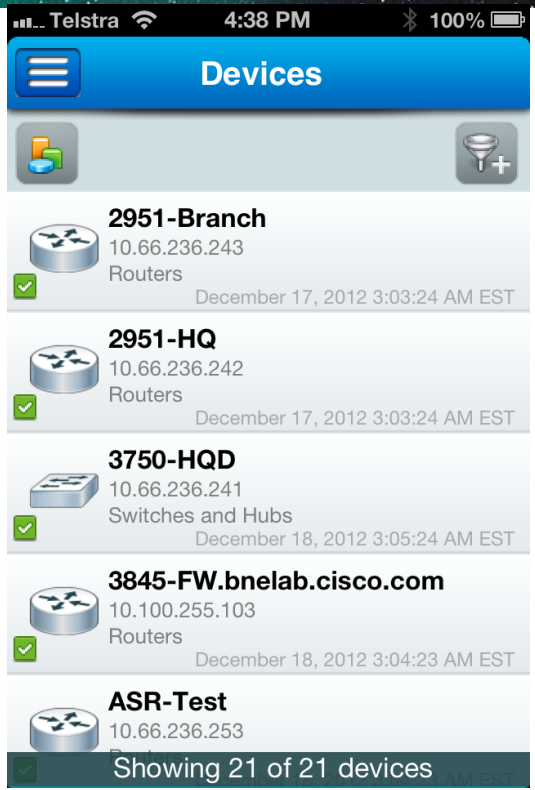
- PnP Gateway server embedded in PI server (2.x and above)
- Standalone PnP Gateway server available (1.2.x and above)
- A Windows based application for Bootstrap/Config
- A iPhone/iPad application for Bootstrap

Tip 1 – iPhone App and Toolbar

Prime Infrastructure iPhone App

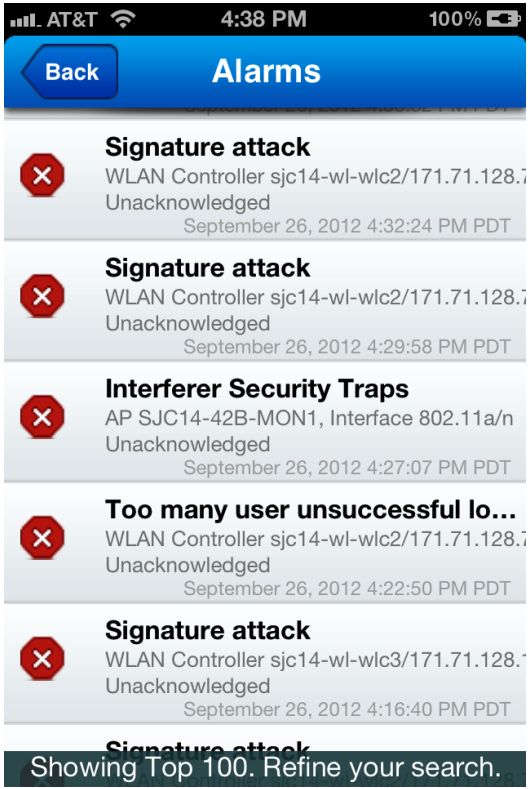
- Free application on Apple iTunes
- Provides network management summary
- Home screen displays top-level view including alarms
- List view of device inventory
- Device list filtering capability

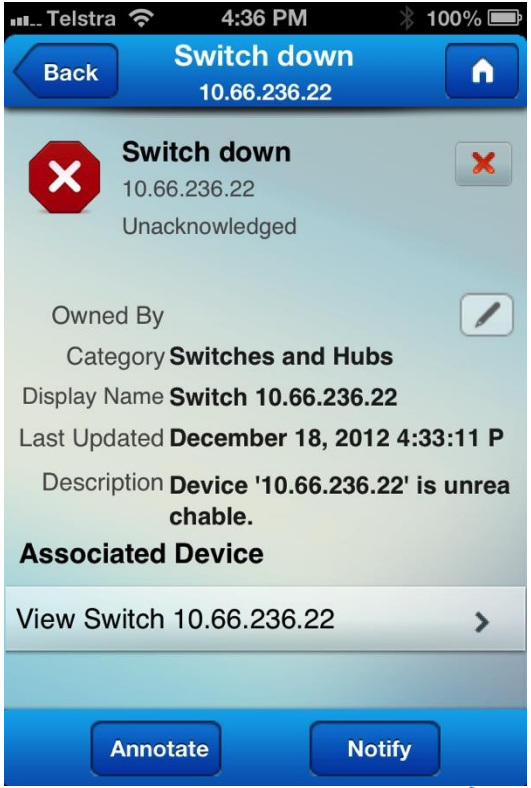




Prime Infrastructure iPhone App

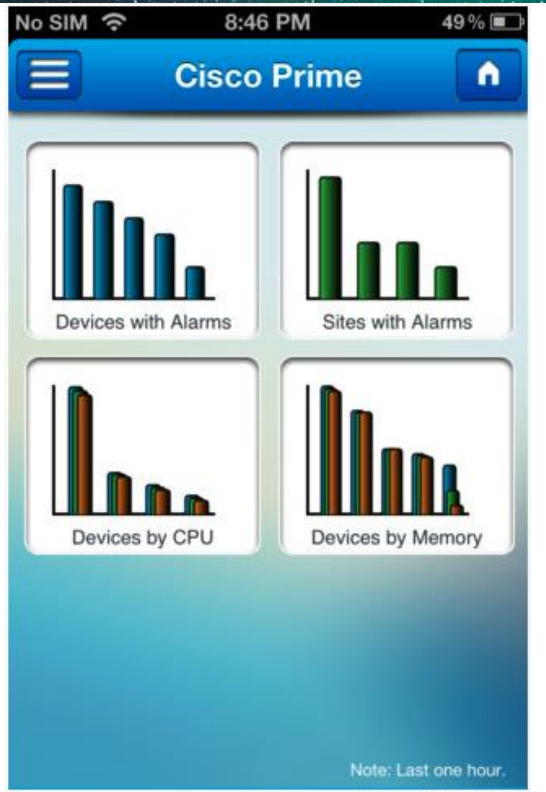
- Alarm browser
- Annotate Alarms
- Acknowledge Alarms
- Assign Alarm Owner
- Notify others of Alarm

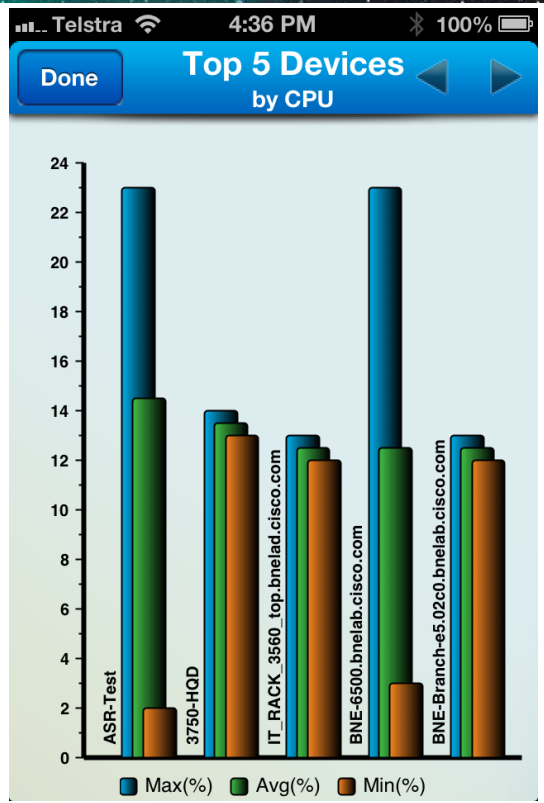




Prime Infrastructure iPhone App

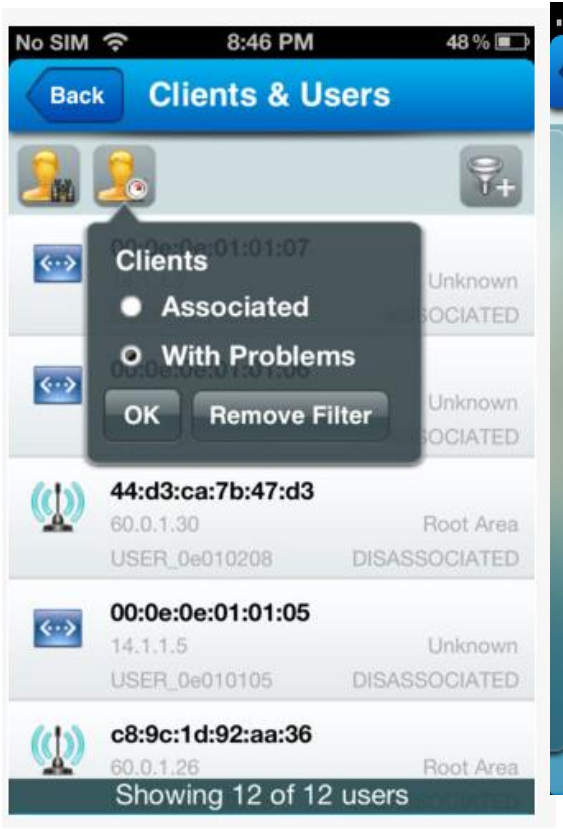
- Limited Reporting
- Alarm Report
- Alarms by Site
- CPU Utilisation
- Memory Utilisation

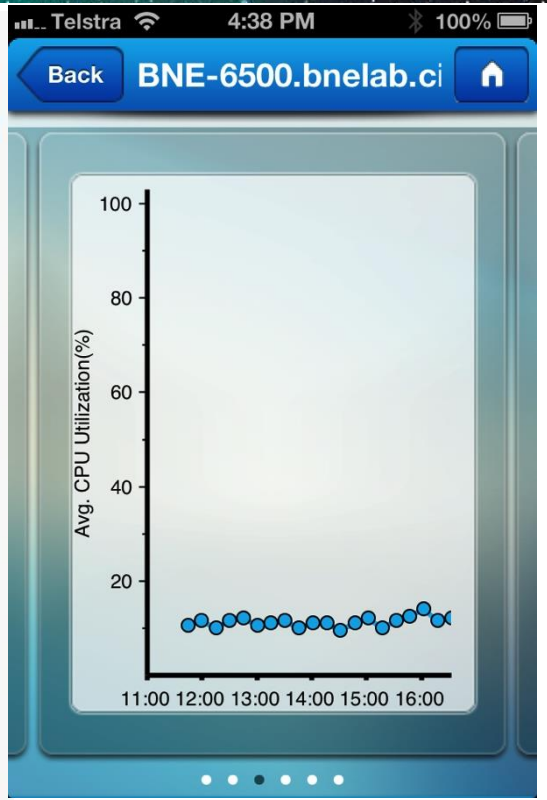




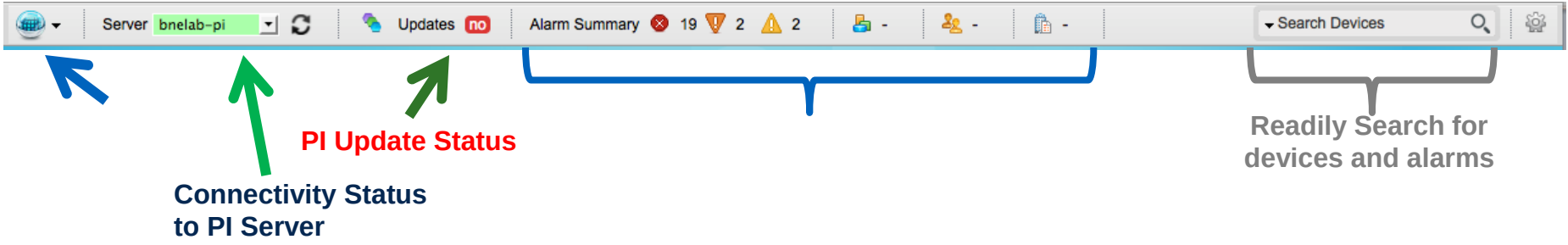
Prime Infrastructure iPhone App

- Can view list of clients on the network
- Client list filtering capability
- Filter based on user-defined criteria
- Device specific reports





Prime Infrastructure Toolbar



- At-a-glance, exception-based status – Devices unreachable, clients and sites with issues, active alarms
- Instant search for devices or alarms
- Contextual quick launch directly into Prime Infrastructure
- Live software update notifications – new device support, configuration templates, compliance rules, upgrades, etc.

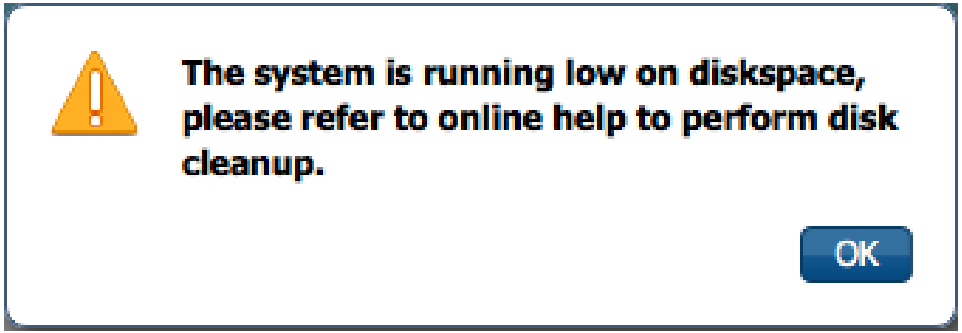
Tip 2 – Performing Disk Cleanup

Performing Disk Cleanup

Error Message

The system is running low on diskspace, please refer to online help to perform disk cleanup.

- Run “ncs cleanup”




```
ssh admin@10.66.236.49
admin@10.66.236.49's password:
Last login: Thu Dec 20 07:37:04 2012 from mycomputer
bnelab-pi/admin# ncs cleanup
```

Performing Disk Cleanup

```
********************************************************************************
!!!!!!!                      WARNING                         !!!!!!!
********************************************************************************
The clean up can remove all files located in the backup staging directory.
Older log files will be removed and other types of older debug information
will be removed
********************************************************************************
Do you wish to continue? ([NO]/yes) yes
********************************************************************************
!!!!!!!              DATABASE CLEANUP WARNING                  !!!!!!!
********************************************************************************
Cleaning up database will stop the server while the cleanup is performed.
The operation can take several minutes to complete
********************************************************************************
Do you wish to cleanup database? ([NO]/yes) yes
********************************************************************************
!!!!!!!              USER LOCAL DISK WARNING                   !!!!!!!
********************************************************************************
Cleaning user local disk will remove all locally saved reports, locally
backed up device configurations. All files in the local FTP and TFTP
directories will be removed.
********************************************************************************
Do you wish to cleanup user local disk? ([NO]/yes) yes
================================================
Starting Cleanup: Thu Dec 20 12:18:06 EST 2012
================================================
{Thu Dec 20 12:20:31 EST 2012} Removing all files in backup staging directory
{Thu Dec 20 12:20:31 EST 2012} Removing all Matlab core related files
{Thu Dec 20 12:20:31 EST 2012} Removing all older log files
{Thu Dec 20 12:20:40 EST 2012} Cleaning older archive logs
{Thu Dec 20 12:20:43 EST 2012} Cleaning database backup and all archive logs
{Thu Dec 20 12:20:43 EST 2012} Removing all user local disk files
{Thu Dec 20 12:21:26 EST 2012} Cleaning database
{Thu Dec 20 12:21:56 EST 2012} Stopping server
{Thu Dec 20 12:24:50 EST 2012} Not all server processes stop. Attempting to stop remaining
{Thu Dec 20 12:24:50 EST 2012} Stopping database
{Thu Dec 20 12:24:53 EST 2012} Starting database
{Thu Dec 20 12:25:21 EST 2012} Starting database clean
{Thu Dec 20 12:42:00 EST 2012} Completed database clean
{Thu Dec 20 12:42:00 EST 2012} Stopping database
{Thu Dec 20 12:43:00 EST 2012} Starting server

================================================
Completed Cleanup
Start Time: Thu Dec 20 12:18:06 EST 2012
Completed Time: Thu Dec 20 12:57:10 EST 2012
```

- Warning
- Selective Cleanup
  - Database only
  - User Local only
  - Both

Tip 3 – Troubleshooting PnP Gateway

PNP Gateway Troubleshooting Tips

Integrated PnP Gateway

- PNP Gateway Start, Stop and Status are automatically done as part of the “ncs start”, “ncs stop” or “ncs status” from the admin user
- PNP Enable and Disable used for enabling and disabling of PnP on PI Server is available in “ncs pnp-gateway enable” and “ncs pnp-gateway disable”. By default PnP is enabled on PI Integrated server. Enabling and disabling of PnP would require a restart of PI Server for the changes to take effect.
- PnP Image properties can be obtained by using the “ncs pnp-gateway property image” from the Admin user.
- Modification of image properties can done using the “ncs pnp-gateway modify image <timeout_type> <timeout value>” command.
- The PnP Log level can be modified from “Administration > Logging > General Logging Options” and modify the level for “pnpgateway”.
- The PnP logs will be generated in /opt/CSCOlumos/logs directory (shell)
  - pnp_gateway_cns.log :- CNS Gateway logs
  - pnp_gateway_image.log :- Image update logs
  - pnp_gateway.log :- Config, Resource and common logs.

PNP Gateway General Troubleshooting Tips

Check the PnP Gateway is Working

- Check that PnP Gateway is functioning from Web Browser:
  - Using the Url https://<PNP IP>/cns/ResourceInit?name=port
  - Eg https://10.66.236.26/cns/ResourceInit?name=port
  - The URL shows The list of ports that are up(plain text and SSL ports) and Number of devices connected to each ports with device id PNP and Device Connection status

```
-------- cnsGateway Resource --------
Total plain-text connection : 2

Port number : 11013 Total connection : 0 Connected Device list :

Port number : 11015 Total connection : 2 Connected Device list :
CAT0943R27H,FGL150412JU,

Port number : 11017 Total connection : 0 Connected Device list :
```

PNP Gateway General Troubleshooting Tips

Check the Device is Working

- Execute “show cns event connections” on Device in exec mode.

```
Router#show cns event connections
The currently configured primary event gateway:
    hostname is bne-pi-pnp.bnelab.cisco.com.
    port number is 11015.
    encryption is disabled.
Event-Id is FGL150412JU
Keepalive setting:
    keepalive timeout is 120.
    keepalive retry count is 2.
Connection status:
    Connection Established.
The currently configured backup event gateway:
    none.

The currently connected event gateway:
    hostname is bne-pi-pnp.bnelab.cisco.com.
    port number is 11015.
    encryption is disabled.
```

PNP Gateway General Troubleshooting Tips

Check the Device is Working

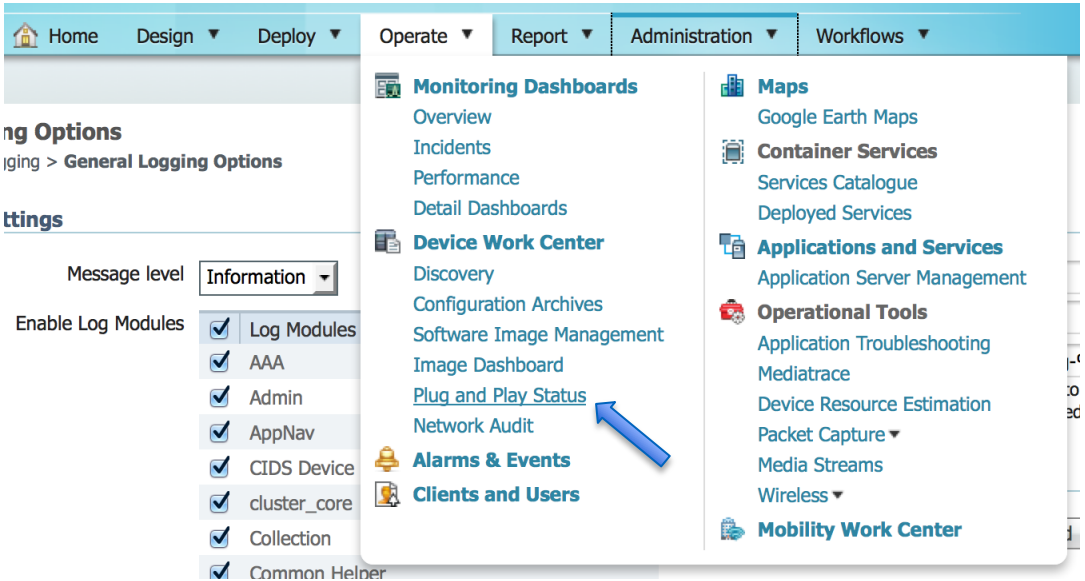
- To debug further on device enable the cns debug logs

```
Router# debug cns all
```

```
Router# sh log
*Mar  6 18:59:17.526: CNS-Trans: _ctwr.ok=2881A14
*Mar  6 18:59:17.526: CNS Event Connection: msg=0x0 17 bytes from gateway
*Mar  6 18:59:17.526: CNS Event Connection: total_len=17 nbytes=17
02912150:                          00000011                 ....
02912160: 000B0006 00020008 00020001 00          .............
*Mar  6 19:00:34.197: CNS Config Initial: connection timer event
*Mar  6 19:00:34.197: CNS http 1.0: http request-URI length=0x36, http request-
URI=/cns/config.asp?DeviceID=FGL150412JU&cnsPassword=
*Mar  6 19:00:34.197: CNS http 1.0: Attempting http connection to bne-pi-
pnp.bnelab.cisco.com, encrypt = 0
*Mar  6 19:00:34.197: CNS-Trans: _ctop.184.host=bne-pi-pnp.bnelab.cisco.com
*Mar  6 19:00:34.197: CNS-Trans: _ctop.184.v4.fd=0
*Mar  6 19:00:34.197: CNS-Trans: _ctop.184.ok=144CFD5C
*Mar  6 19:00:34.197: CNS-Trans: _ctco.ok=144CFD5C
*Mar  6 19:00:34.197: CNS message: Curdata not at end of blk
*Mar  6 19:00:34.197: CNS-Trans: _ctwr.ok=144CFD5C
*Mar  6 19:00:34.197: CNS-Trans: _ctre.ok=144CFD5C
*Mar  6 19:01:24.237: CNS I/O: socket 0 EOF
*Mar  6 19:01:24.237: CNS Agent Framework: cns_agent_msg_queue_drain function called
*Mar  6 19:01:24.237: CNS Agent Framework: cns_agent_msg_process_internal called
```

PNP Gateway General Troubleshooting Tips

- To check if the matching profile triggered status on the Prime Infrastructure server: go to Operate→Plug and Play Status
  - This will show the complete details regarding the triggered profile
  - If you want to trigger the same profile again. You need to remove the existing entry from call Home deployment status.



PNP Gateway Troubleshooting Tips

External PnP - Certificate issue

- The get the external PnP gateway communicating with the Prime Infrastructure server certificates are required

  On a linux host or the Prime Server generate the required certificates:

  1. Generate private pnp key ‘openssl genrsa -out pnpprivkey.pem 2048’
  2. Generate selfsigned pnp key ‘openssl req -new -x509 -key pnpprivkey.pem -out pnpcert.pem -days 1095’
  3. Get the CPI certificate ‘openssl s_client -showcerts -connect [cpi_hostname]:443 > cpicert.pem’
  4. I then copy all 3 files to the PnP Gateway server
  5. Run the ‘pnp setup’ command and ener the correct path to these certificates

PNP Gateway Troubleshooting Tips

External PnP - Managing the External PnP Gateway

- Ensure PnP Gateway is started after Prime Infrastructure server
- To restart PnP Gateway software
  - SSH to PnP Gateway
  - pnp stop
  - pnp start
  - pnp status

```
bne-pi-pnp/admin# pnp status

SERVICE                 | MODE                | STATUS        | ADDITIONAL INFO
-------------------------------------------------------------------------------------
System                  |                     | UP            |
-------------------------------------------------------------------------------------
Event Messaging Bus     | PLAIN TEXT          | UP            | pid: 4179
CNS Gateway Dispatcher  | PLAIN TEXT          | UP            | pid: 4839, port: 11011
CNS Gateway             | PLAIN TEXT          | UP            | pid: 4865, port: 11013
CNS Gateway             | PLAIN TEXT          | UP            | pid: 4897, port: 11015
CNS Gateway             | PLAIN TEXT          | UP            | pid: 4936, port: 11017
CNS Gateway             | PLAIN TEXT          | UP            | pid: 4975, port: 11019
CNS Gateway             | PLAIN TEXT          | UP            | pid: 5004, port: 11021
CNS Gateway Dispatcher  | SSL                 | UP            | pid: 5039, port: 11012
CNS Gateway             | SSL                 | UP            | pid: 5076, port: 11014
CNS Gateway             | SSL                 | UP            | pid: 5124, port: 11016
CNS Gateway             | SSL                 | UP            | pid: 5236, port: 11018
CNS Gateway             | SSL                 | UP            | pid: 5438, port: 11020
CNS Gateway             | SSL                 | UP            | pid: 5548, port: 11022
HTTPD                   |                     | UP            |
Image Web Service       | SSL                 | UP            |
Config Web Service      | SSL                 | UP            |
Resource Web Service    | SSL                 | UP            |
Image Web Service       | PLAIN TEXT          | UP            |
Config Web Service      | PLAIN TEXT          | UP            |
Resource Web Service    | PLAIN TEXT          | UP            |
```

PNP Gateway Troubleshooting Tips

Ensure the External PnP Gateway is communicating with the Prime Server

- Check PnP Gateway communication with Prime Infrastructure Server
  - and look for the ESTABLISHED connection to the CPI host

```
sh tech-support | inc 61617

tcp  0  0 bne-pi-pnp:41741  bnelab-pi.bnelab.cisco.com:61617 ESTABLISHED
```

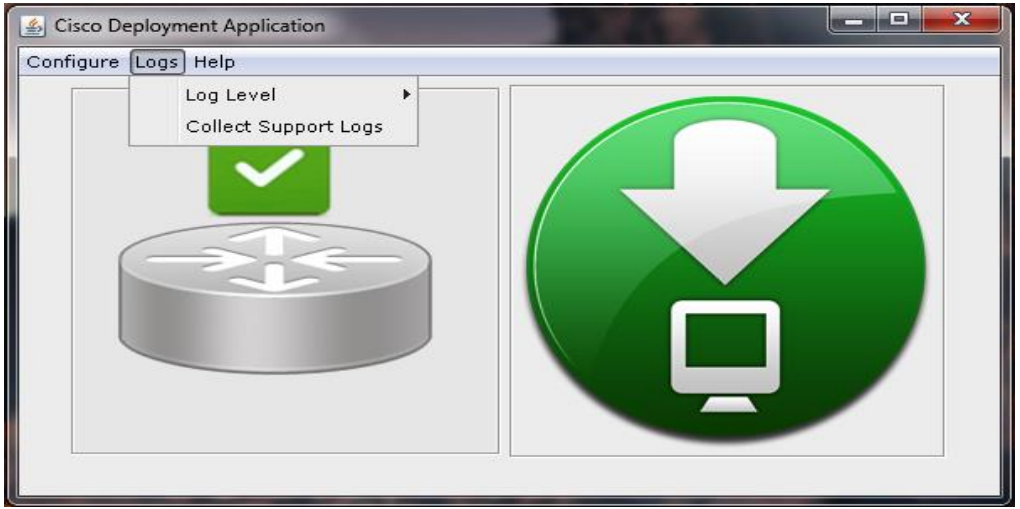
- On the Prime Infrastructure server in the linux shell check the reverse connection

```
ade # netstat -a | grep 61617

tcp  0  0 bnelab-pi:61617  ::ffff:10.66.200.38:41741   ESTABLISHED
```

Deployment Application - Troubleshooting Tips

- In case of any issues the logs are available through the ”Logs→Collect Support Logs”.
- To change the log level for debugging use the “Logs→Log Level” option



Useful Documentation

- Cisco Prime Infrastructure Site
  http://www.cisco.com/go/primeinfrastructure

- Deploying Plug and Play
  http://www.cisco.com/en/US/docs/net_mgmt/prime/infrastructure/2.0/user/guide/Cisco_Plug-n-Play-Solution-Guide.pdf

- Support Forums
  https://supportforums.cisco.com/community/netpro/network-infrastructure/network-management

Prime Demo Series

Open to Customers, Partners and Cisco People

Americas Edition

Every Week*	Prime Demo Series Topic	Same Time	Same Place
Every Tuesday	Cisco Prime Collaboration Assurance & Provisioning	11:00 AM PST San Jose Time (90 Min)	www.tinyurl.com/primedemo No Registration Required
Every Wednesday	Cisco Prime NAM & NGA		
Every Thursday	Cisco Prime Infrastructure		

*** Exceptions: US Public Holidays and Cisco Shutdown**

APJC Edition

Every Week*	Prime Demo Series Topic	Same Time	Same Place
Every Thursday	Cisco Prime Infrastructure	12:00 PM Singapore Time (90 Min)	www.tinyurl.com/prime-APJC No Registration Required
Every Tuesday	Cisco Prime Collaboration		

*** Exceptions: Indian Public Holidays and Cisco Shutdown**

EMEAR Edition

Day	Prime Demo Series Topic	Same Time	Same Place
Every Thursday	Cisco Prime Infrastructure	9:30 AM GMT (90 Min)	www.tinyurl.com/prime-emear Registration Required
Every Tuesday	Cisco Prime Collaboration		

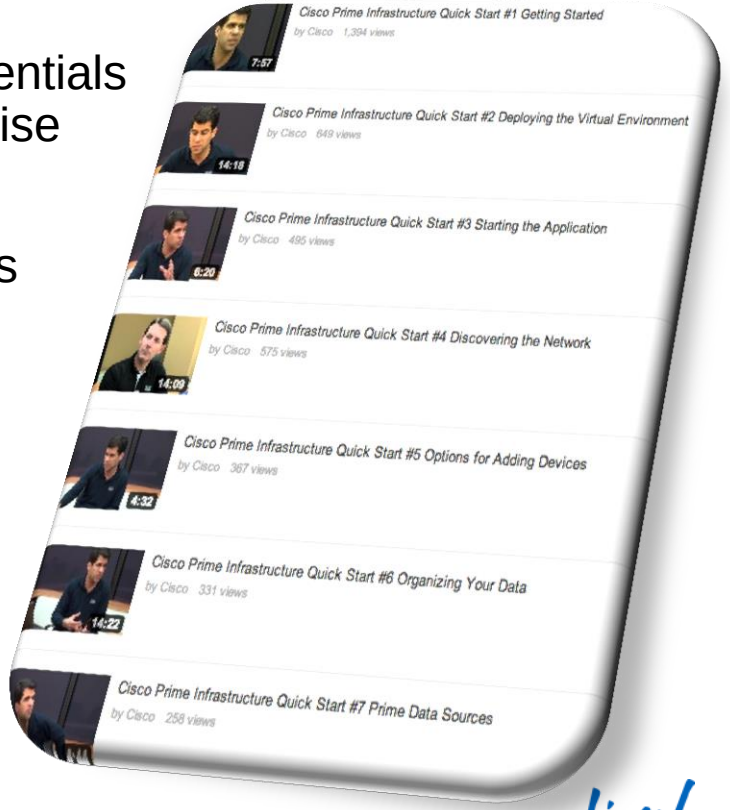
Free Trial Software

www.cisco.com/go/nmsevals

Latest Prime Demo Series agenda will always be posted at www.cisco.com/go/prime-demo

Prime Infrastructure Quick Start VoD Series

- Detailed, 18-segment Quick Start VoDs cover essentials of how to download, deploy, configure and customise Prime Infrastructure.
- Available on Cisco's YouTube Channel VoD Series available here:
  - http://www.youtube.com/playlist?list=PL7406F0EF2BC7DED8



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Summary

- Monitor Everything
- Automate repetitive boring tasks
- If it squeaks you should know about it




Q & A

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