



Simplifying Operations and Upgrades on Nexus using Modular NXOS Software

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BRKDCN-2639



Webex App

Questions?

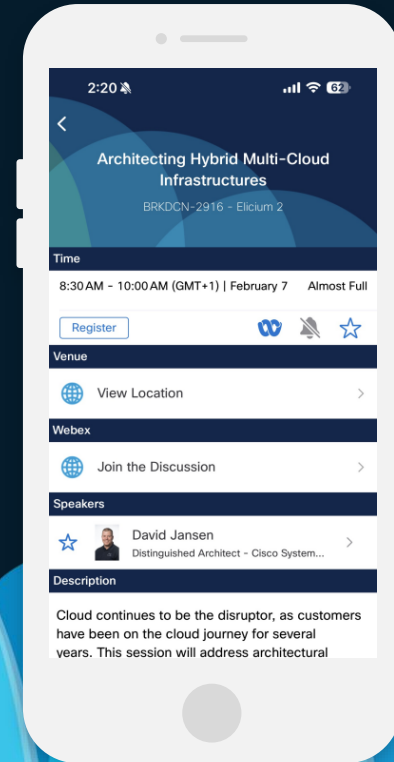
Use the Webex app to chat with the speaker after the session

How

- 1 Find this session in the Cisco Events mobile app
- 2 Click “Join the Discussion”
- 3 Install the Webex app or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

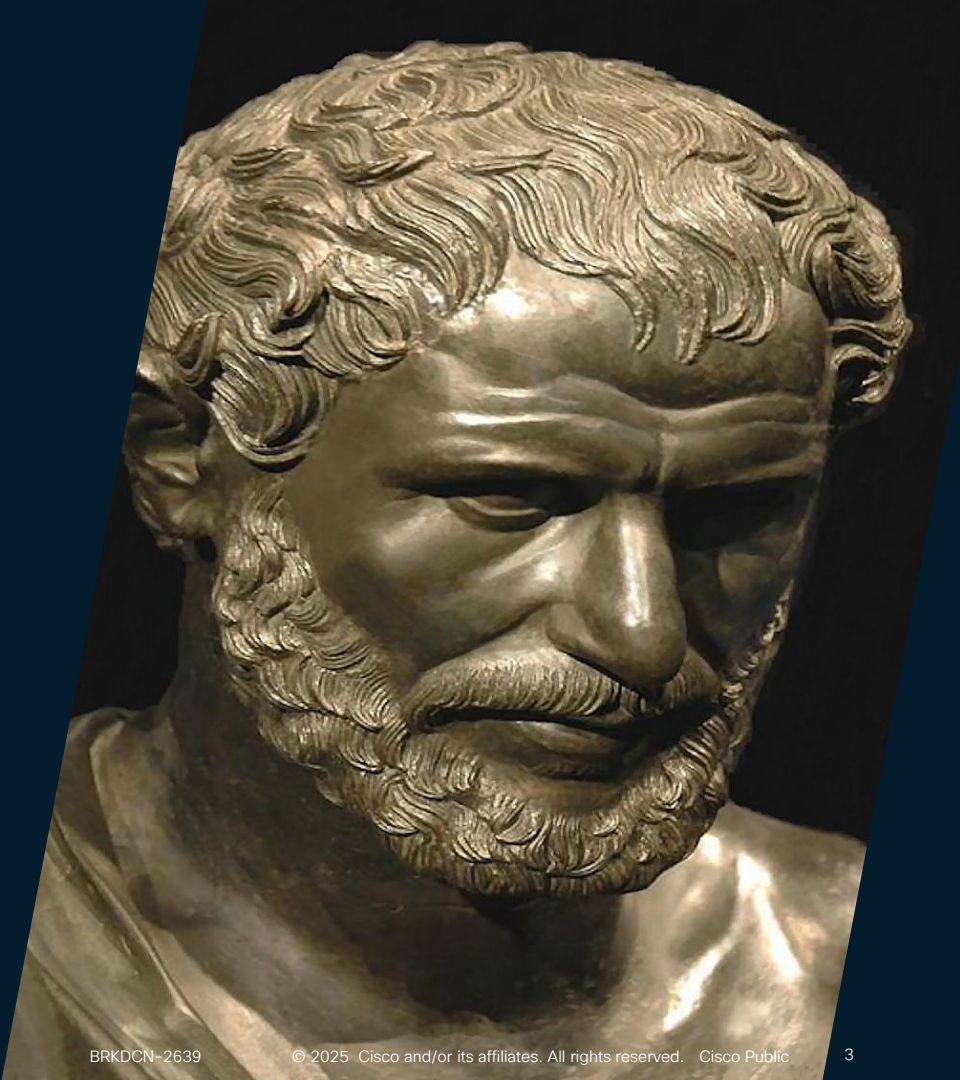
Webex spaces will be moderated by the speaker until February 28, 2025.

CISCO *Live!*



“The Only
Constant in
Life Is Change”

Heraclitus



Agenda

- NXOS SW Architecture
- Upgrades on the Nexus Switches
- Upgrades on ACI Switches
- Bonus: Modular Software Operations



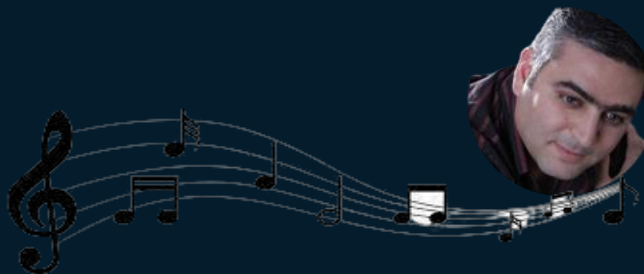
Jordan



Bullet

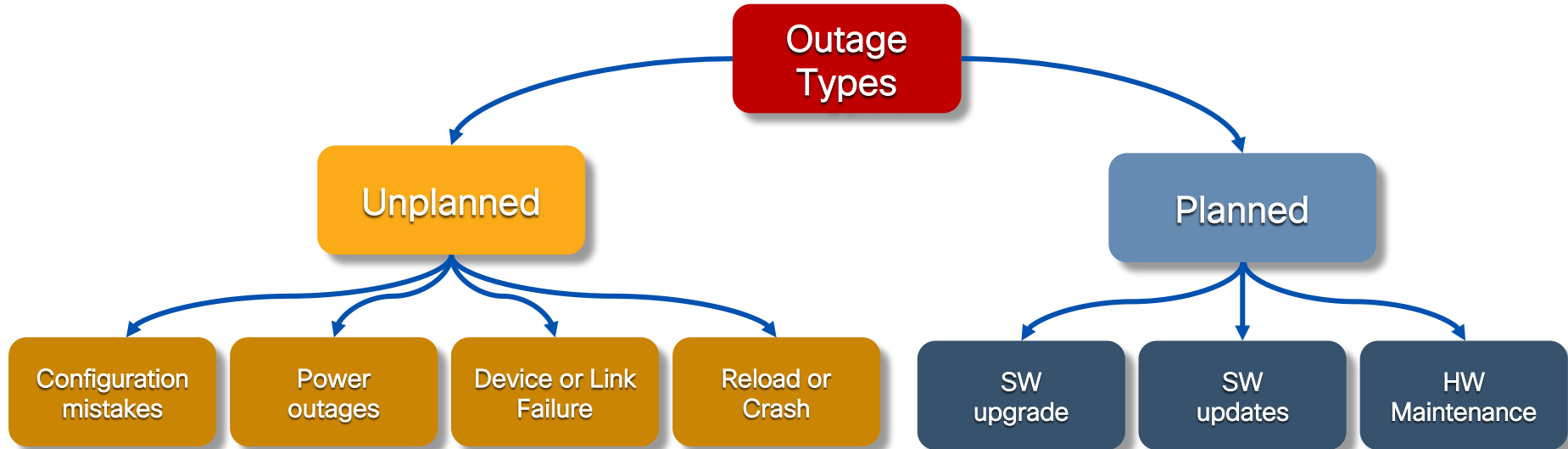


CISCO
28+



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Planned vs. Unplanned Outages



GOAL: Minimize the impact of outages on clients, network and applications

Planned vs. Unplanned Outages



Outage Types

Unplanned

Configuration mistakes

Power outages

Device or Link Failure

Reload or Crash

Planned

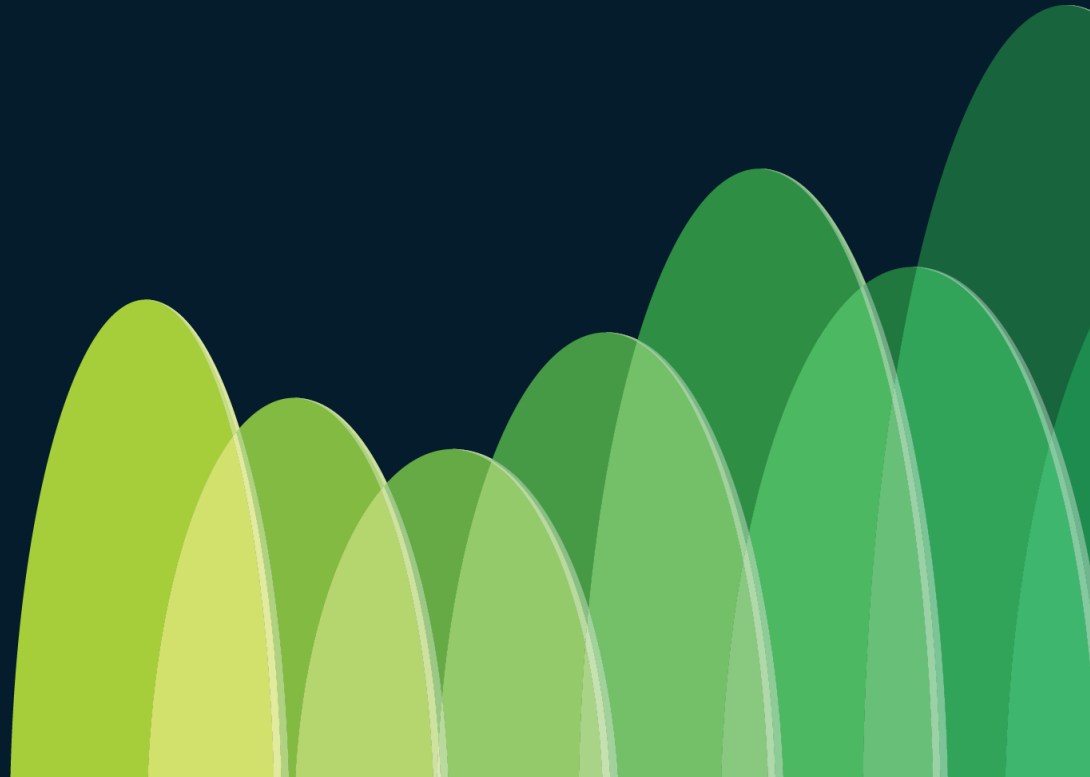
SW upgrade

SW updates

HW Maintenance

GOAL: Minimize the impact of outages on clients, network and applications

NXOS SW Architecture

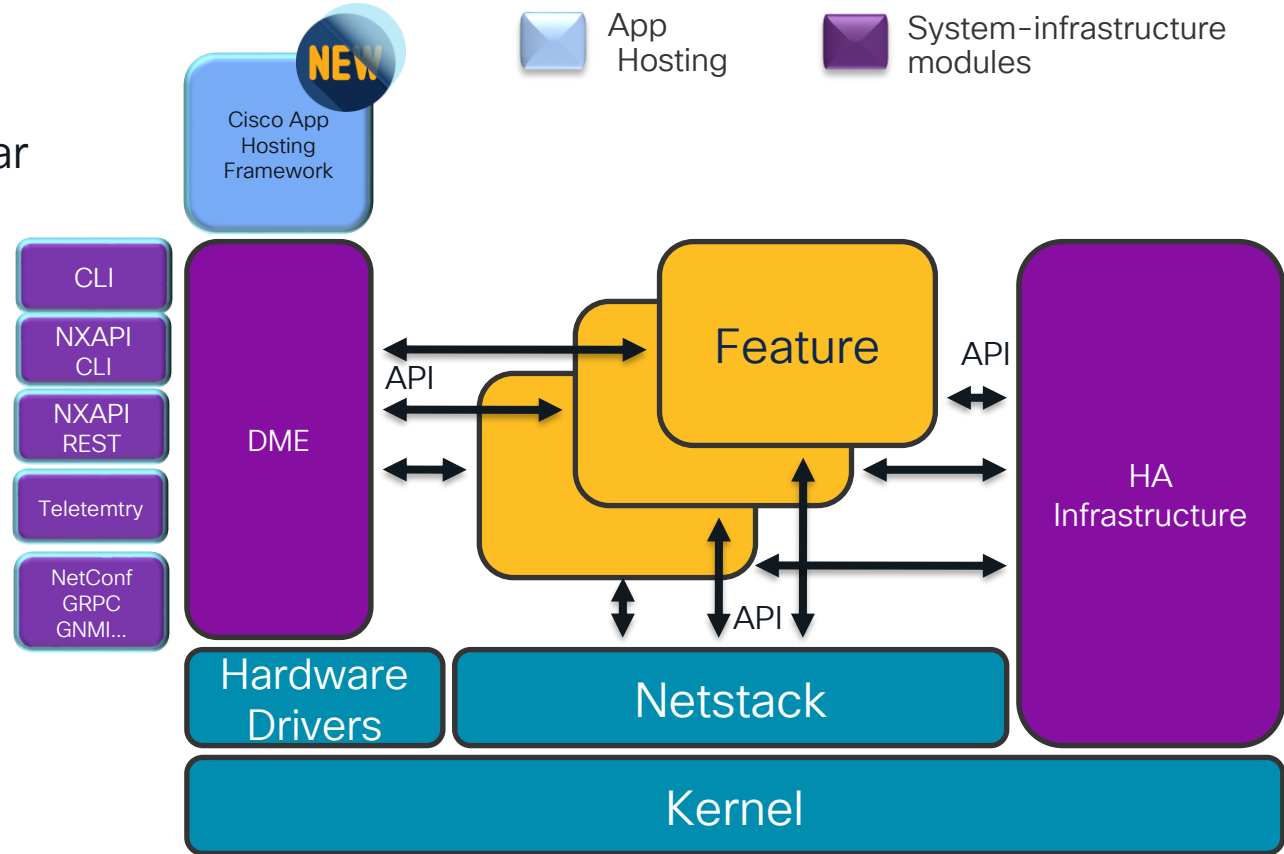


NX-OS HA Architecture

Feature modules
App Hosting

Platform-dependent hardware-related modules
System-infrastructure modules

- Fully distributed modular design
- Control-plane & data-plane separation
- Service restart-ability
- Non-disruptive SSO* & ISSU
- Open & Model Driven
- App Hosting Capability

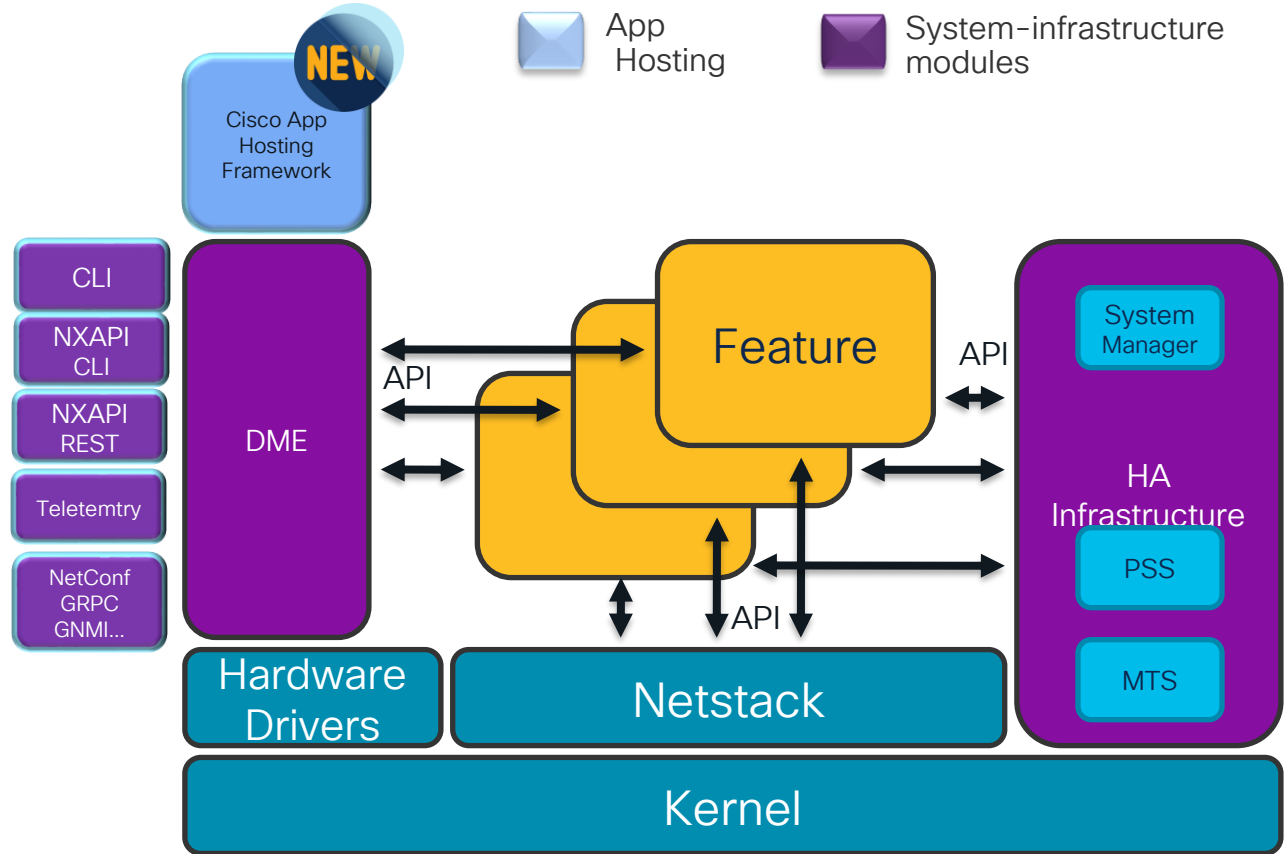


NX-OS HA Architecture

Feature modules
App Hosting

Platform-dependent hardware-related modules
System-infrastructure modules

- 3 Major components
- System Manager
- Message & Transaction Service (MTS)
- Persistent Storage Service (PSS)



ACI Architecture

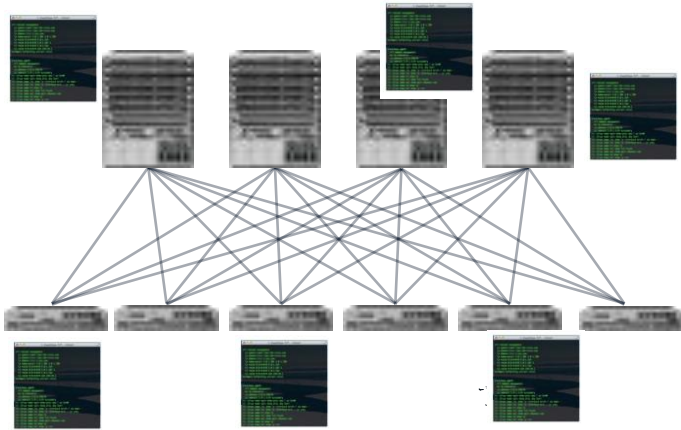
Controller Integration



Now let's imagine a network switch ... at the moment, largely configured on the CLI

ACI Architecture

Controller Integration

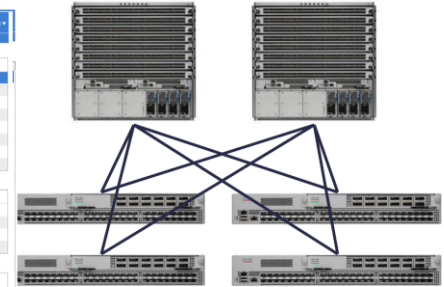
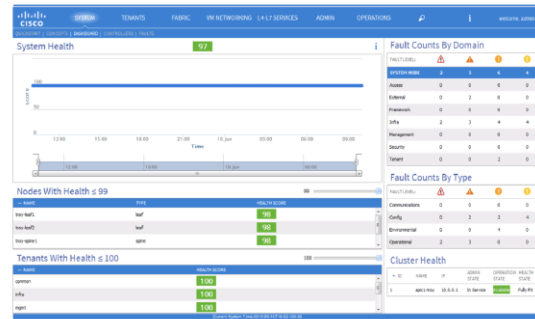


Now let's imagine a network switch ... at the moment, largely configured on the CLI

APIC becomes single point of management for the entire fabric ... with a policy-based model

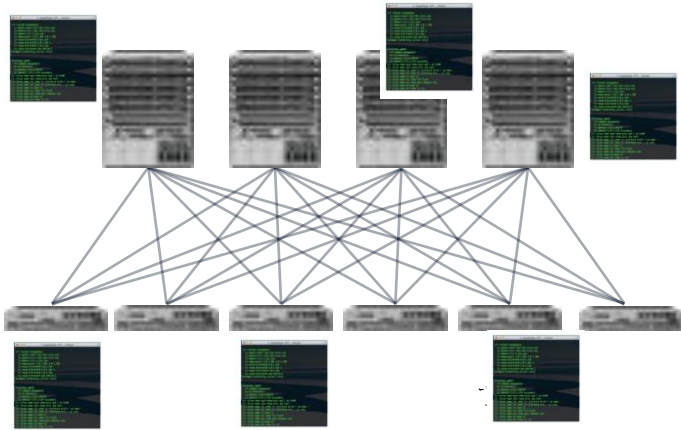


Interfaces, protocols, TCAM, etc ... all represented in an object model, and ALL accessible through an XML/JSON API and CLI



ACI Architecture

Controller Integration

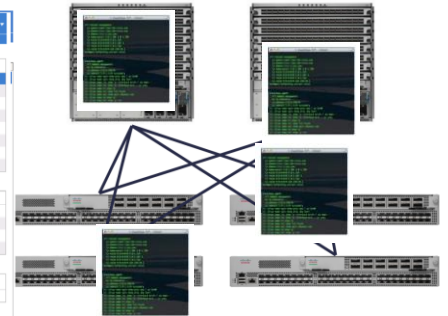
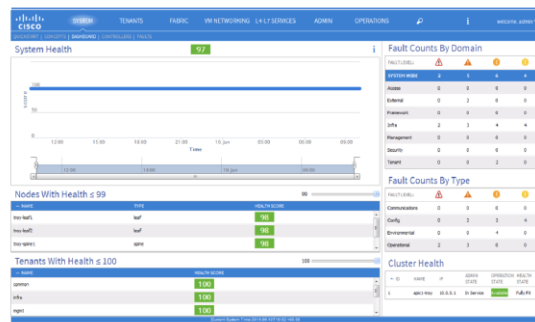


Now let's imagine a network switch ... at the moment, largely configured on the CLI

APIC becomes single point of management for the entire fabric ... with a policy-based model



Interfaces, protocols, TCAM, etc ... all represented in an object model, and ALL accessible through an XML/JSON API and CLI



Agenda

- NXOS SW Architecture
- Upgrades on the Nexus Switches
 - Install command
 - Enhanced mode
 - GIR
 - Upgrades from NDFC
 - Best Practices
- Upgrades on ACI Switches
- Bonus: Modular Software Operations

Planned

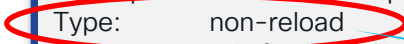
Patching & ISSU

Validating SMU Impact

Each SMU comes with a README file

SMU Types	Impact
Non-Reload (Hot)	Process Restart
Reload (Cold)	Box Reload

```
#####  
#  
# Readme for SMU nxos64.CSCvz98895-n9k_ALL-1.0.0-10.3.1.167.lib32_64_n9000  
#  
# Copyright (c) 2021 by Cisco Systems, Inc.  
# All rights reserved.  
#  
#####  
Name:      nxos64.CSCvz98895-n9k_ALL  
Version:   10.3.1.167  
Compressed size:89146  
DDTS:     CSCvz98895  
Description: Kr2f-122: nxpython3 core while collecting show-tech-detail > icam script is failing  
Type:     non-reload  
MD5:      a84fa50587d045828421860b840cc366
```



SMU Impact

Nexus SMU install commands

Adding SMU

```
switch# install add nxos`.CSCxy68793-n9k_ALL-1.0.0-10.3.1.132.lib32_n9000.rpm  
[#####] 100%  
Install operation 26 completed successfully at Sat May 4 00:27:02 2021
```

Activating SMU

```
switch# install activate nxos.CSCxy68793-n9k_ALL-1.0.0-10.3.1.132.lib32_n9000.rpm  
Activating the patch (/nxos.CSCxy68793-n9k_ALL-1.0.0-10.3.1.132.lib32_n9000.rpm)  
[#####] 100%  
Install operation 27 completed successfully at Sat May 4 00:27:11 2021
```

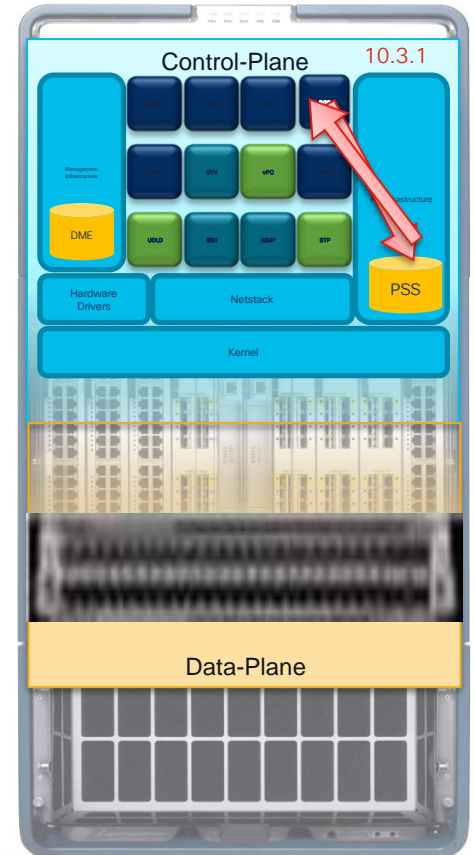
Committing SMU

```
switch# install commit  
[#####] 100%  
Install operation 28 completed successfully at Sat May 4 00:29:15 2024
```

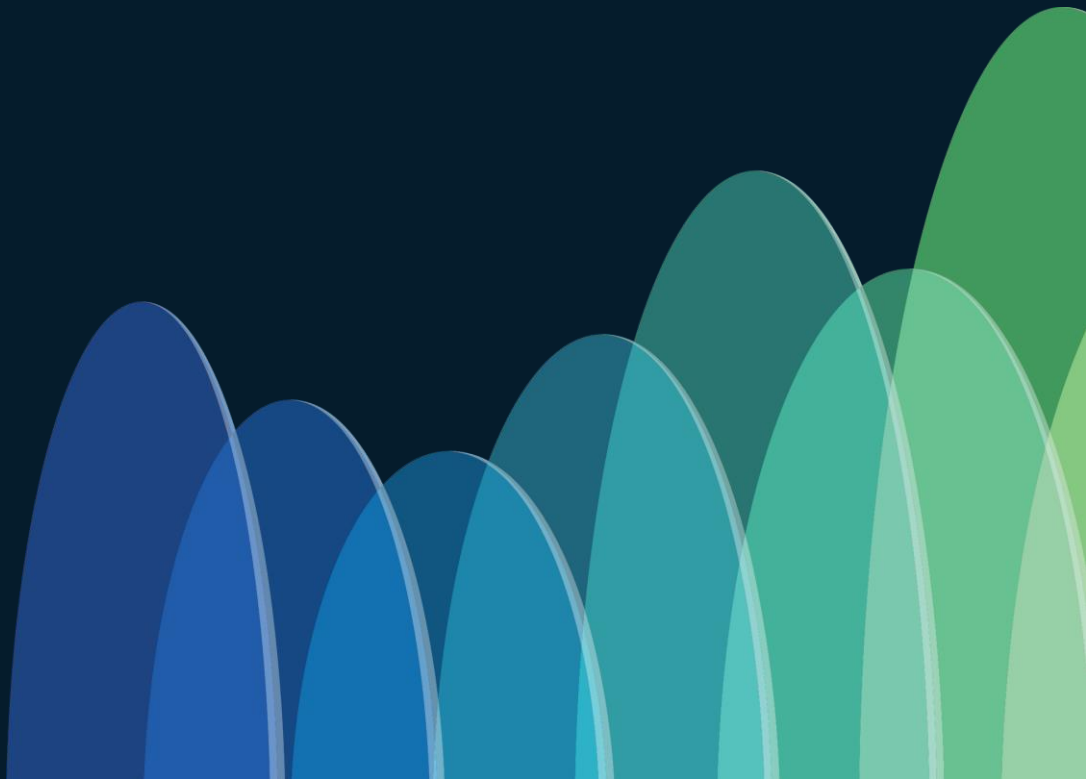
Any failures/reloads between activate and commit result in a rollback

Non-reload(HOT) SMU update on Nexus 9000

- Services Checkpoints their state in PSS
- Installer asks SysMgr to stop the process
- Installer updates File System with files from SMU
- Installer asks SysMgr to restart the process
- No impact on data plane
- State is recovered, operation resumes
- Total Recovery Time ~10ms



NXOS ISSU



Running Manual Switch Checks (Upgrades)

- First step is downloading the image to switch

New Image Version

```
#show install all impact nxos...
```

```
switch# show install all impact nxos bootflash:nxos64.10.3.1.F.bin
Installer will perform impact only check. Please wait.

Verifying image bootflash:/nxos64.10.3.1.F.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

Verifying image type.
[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos64.10.3.1.F.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos64.10.3.1.F.bin.
[#####] 100% -- SUCCESS

Notifying services about system upgrade.
[#####] 100% -- SUCCESS
```

Running Manual Switch Checks (Upgrades)

#show install all impact nxos...

```
switch# show install all impact nxos bootflash:nxos64.10.3.1.F.bin
Installer will perform impact only check. Please wait.
```

```
Verifying image bootflash:/nxos64.10.3.1.F
[#####] 100% -- SUCCESS
```

Verifying Compatibility check is done:

Module	bootable	Impact	Install-type	Reason
1	yes	disruptive	reset	default upgrade is not hitless
27	yes	disruptive	none	default upgrade is not hitless

Preparation

[#####]

Images will be upgraded according to following table:

Module	Image	Running-Version (pri:alt)	New-Version	Upg-Required
1	lcn9k	10.2 (2)	10.2 (2)	no
27	nxos	10.2 (2)	10.2 (2)	no
27	bios	v05.45 (07/05/2021) :v05.39 (08/30/2019)	v05.45 (07/05/2021)	no

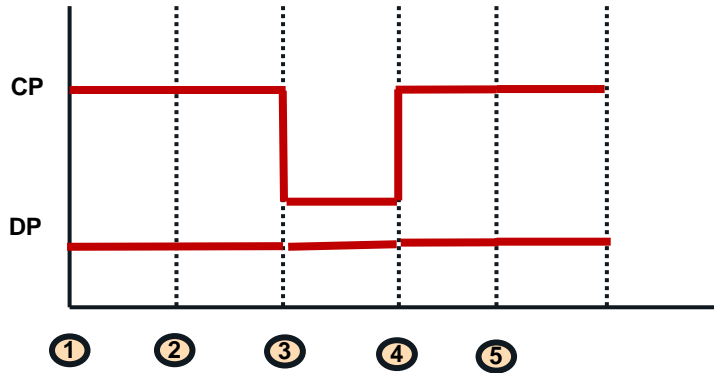
New Image Version

The impact

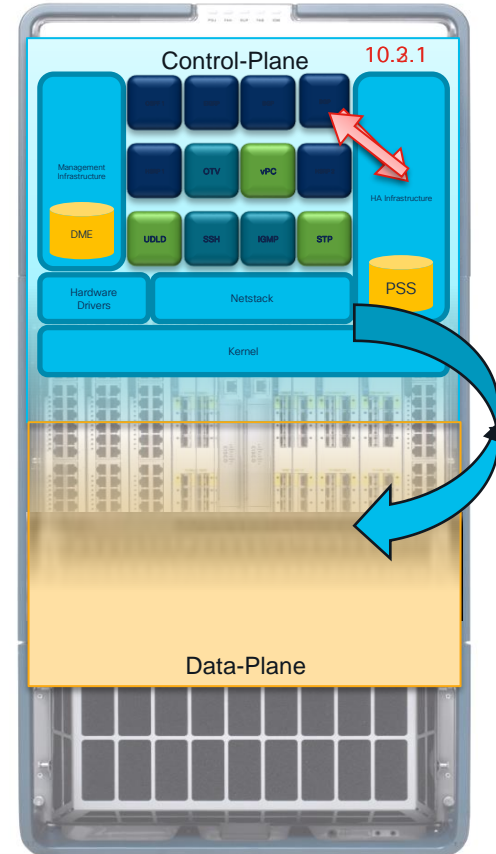
Reason

Hitless ISSU on the Nexus TOR N9K

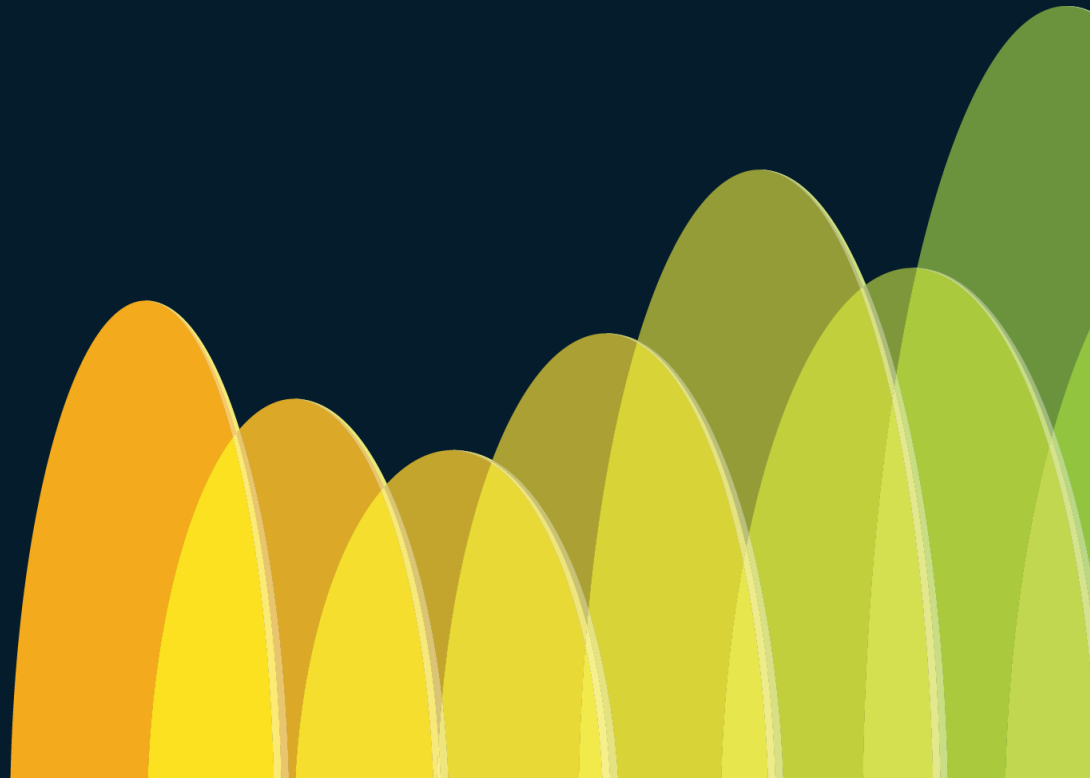
- Single supervisor
- Hitless Upgrade
 - Control plane is inactive during reload while Data plane is forwarding



1. Pre Upgrade Check
 - Config Locked
 - Stable Network
2. Save State
3. kexec to new Image
4. Restore control plane from saved State
5. Reconcile with Data Plane



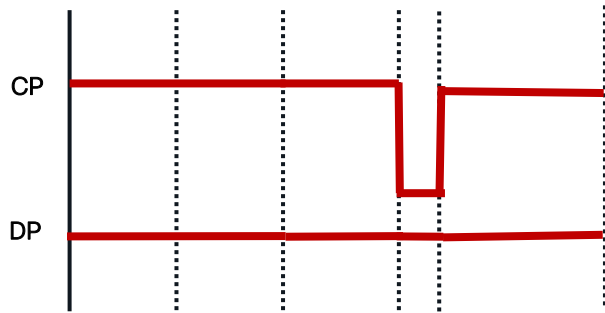
Enhanced ISSU



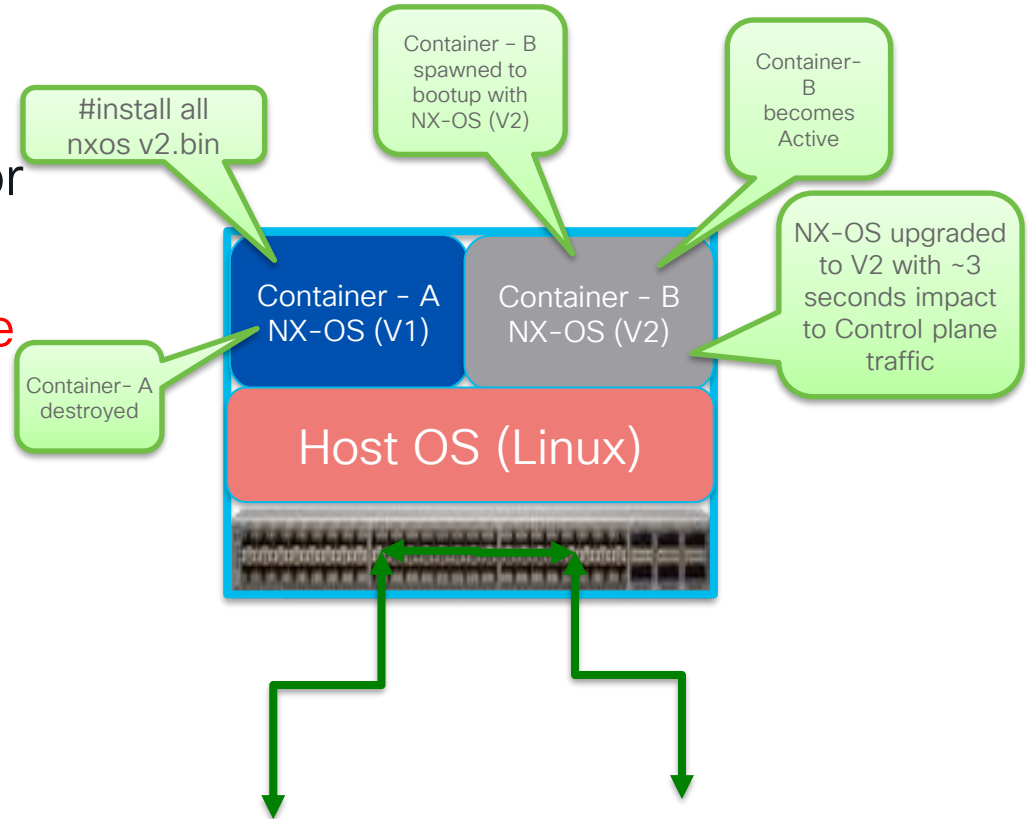
Enhanced ISSU on the Nexus TOR N9K

- Dual Container
- Control plane is only down for ~3 sec during switchover

If Kernel uprev is detected, we auto-revert to normal ISSU



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GIR

CISCO *Live!*



Graceful Insertion and Removal for NXOS

Planned Outage - Isolation & reintroduction of Switch



Change window begins.



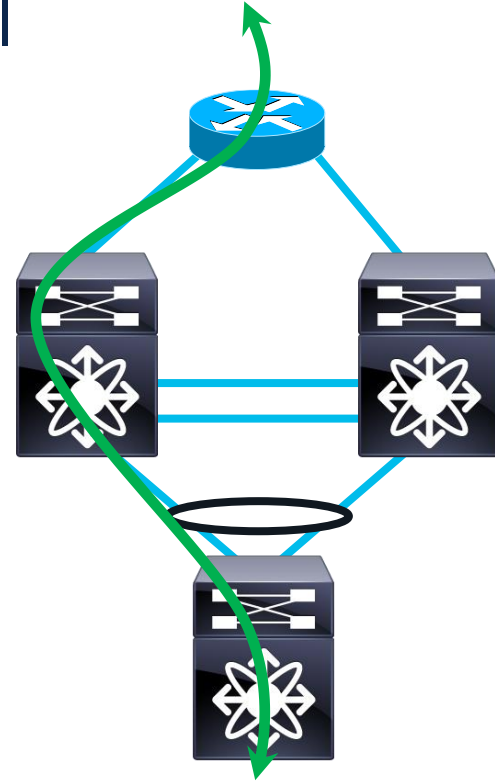
One command!

Pre-change System Snapshot

Graceful Insertion and Removal

Isolation of Switch from network

- Isolate a switch from the network in order to perform debugging or an upgrade.
- Shutdown Vs. Isolate Mode
 - Shutdown: All protocols are gracefully brought down and all physical ports are shut down. (7.2.1)
 - Isolate: All protocols are gracefully brought down but is not shutdown. (7.3.0)



NDFC Switch Image Upgrades

NDFC Package Upgrade Pre-requisites

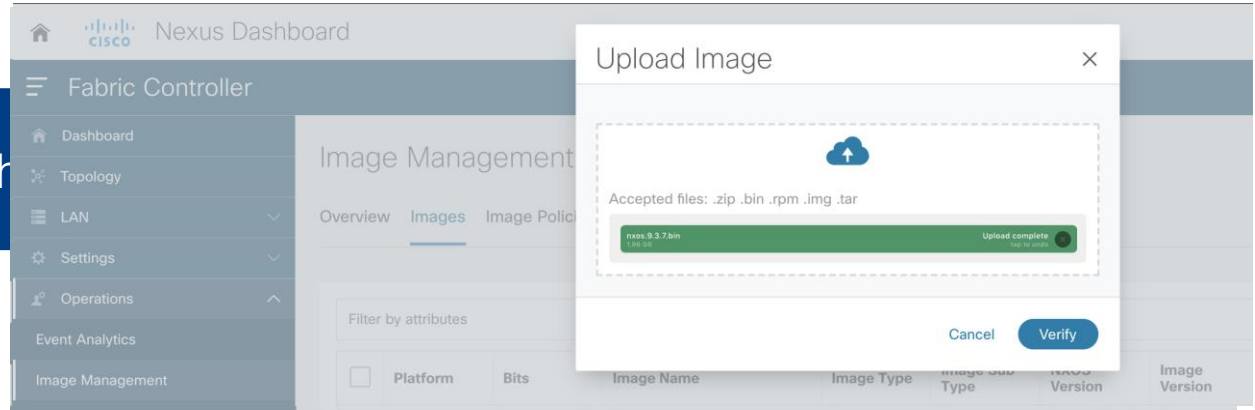


Uploading the Image to controller



Creating an Image policy

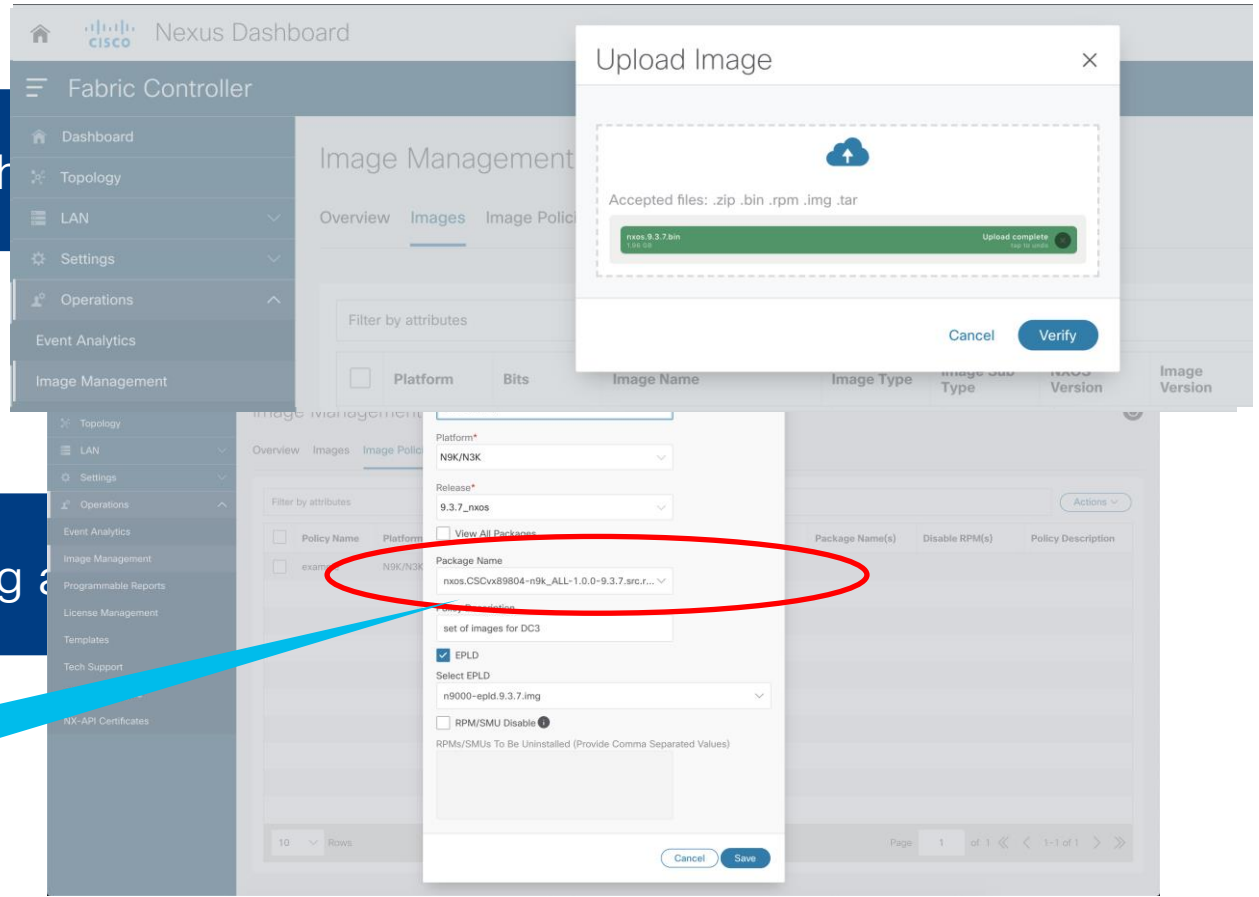
NDFC Package Upgrade Pre-requisites



NDFC Package Upgrade Pre-requisites



This is where you put the image name or SMU



Nexus Dashboard

Fabric Controller

Image Management

Accepted files: .zip .bin .rpm .img .tar

n9000-9.3.7.img 1 MB 100% Upload complete

Cancel Verify

Platform* NSK/NSK

Release* 9.3.7_nxos

Package Name n9000-epld.9.3.7.img

Policy Description set of images for DC3

EPLD

Select EPLD n9000-epld.9.3.7.img

RPM/SMU Disable

RPMs/SMUs To Be Uninstalled (Provide Comma Separated Values)

Cancel Save

Policy Name	Platform	Bits	Image Name	Image Type	Image SMU Type	NDFC Version
example	NSK/NSK					

Staging and Validation

Recommended: Outside of the install window

Nexus Dashboard

Fabric Controller

Image Management

Overview Images Image Policies History

Filter by attributes

Device Name	IP Address	Fabric	Current Version	Policy	Status	Model	Reason	Image Staged	Validate	Actions
<input checked="" type="checkbox"/> N9K-93180YC-FX-84	172.22.31.84	jason-classic	7.0(3)IA7(2)	example	Out-C	N9K-C93180YC-FX	Validate	●	●	Stage Image Validate Upgrade Change Mode Apply Policy Recalculate Compliance Run Reports
<input checked="" type="checkbox"/> 93240YC-FX2-91	172.22.31.91	jason-classic	9.2(3)	example	Out-C	N9K-C93240YC-FX2	Validate	●	●	
<input type="checkbox"/> SPINE-2	172.22.31.37	lanfab	9.2(1)	example	Out-C	N9K-C93180YC-FX	Validate	●	●	Normal
<input type="checkbox"/> LEAF-3	172.22.31.31	lanfab	9.2(1)	example	Out-C	N9K-C93108TC-FX	Compliance	●	●	Normal
<input type="checkbox"/> N7K-CORE-1	172.25.20.84	External1	8.2(5)	None	None	N7K-C7009	None	●	●	Migration
<input type="checkbox"/> N7K-CORE-2	172.25.20.85	External1	8.2(5)	None	None	N7K-C7009	None	●	●	Migration

Load Image onto switches

Non-disruptive Upgrade ?

Installing the Packages on Switch

Within the maintenance window

Nexus Dashboard

Fabric Controller

Image Management

Overview Images Image Policies History

Filter by attributes

	Device Name	IP Address	Fabric	Current Version	Policy	Status	Model	Reason	Image Staged	Validated	
<input checked="" type="checkbox"/>	N9K-93180YC-FX-84	172.22.31.84	jason-classic	7.0(3)I(A7(2)	example	Out-C	N9K-C93180YC-FX	Validate	●	●	Stage Image Validate Upgrade Change Mode Apply Policy Recalculate Compliance Run Reports
<input checked="" type="checkbox"/>	93240YC-FX2-91	172.22.31.91	jason-classic	9.2(3)	example	Out-C	N9K-C93240YC-FX2	Validate	●	●	
<input type="checkbox"/>	SPINE-2	172.22.31.37	lanfab	9.2(1)	example	Out-C	N9K-C93180YC-FX	Validate	●	●	Normal
<input type="checkbox"/>	LEAF-3	172.22.31.31	lanfab	9.2(1)	example	Out-C	N9K-C93108TC-FX	Compliance	●	●	Normal
<input type="checkbox"/>	N7K-CORE-1	172.25.20.84	External1	8.2(5)	None	None	N7K-C7009	None	●	●	Migration
<input type="checkbox"/>	N7K-CORE-2	172.25.20.85	External1	8.2(5)	None	None	N7K-C7009	None	●	●	Migration

Install image or images?

You may have to do this multiple times*

*10.2.1/9.3.8 support image and EPLD upgrade at the same time

cisco Live!

NDFC Fabric Image Upgrades



Fabric Overview – List of Fabrics

Nexus Dashboard | Fabric Controller

Manage > Fabric Software

Fabric Software

Learn More

Overview | Images | Image Policies | Devices | History

Refresh

Images

7 Images

- NX-OS Images
- Kickstart Images
- System Images
- IOS XE Images

Policies

8 Policies

8 Platforms

- CAT9K
- NGK/N3K

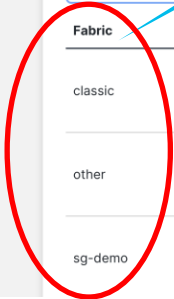
8 Release Versions

- 10.3.1_nxos64-...
- 10.4.2_nxos64-...
- 9.3.12_nxos
- 10.4.1_nxos64-...
- 17.06.05_cat9k...

Filter by attributes

Fabric	Current Version(s)	Policy	Status	Fabric Type	Switches	
classic	10.2(1) and 6 more	9312	Out-Of-Sync Prepare Update	Classic LAN	17	...
other	17.11.1 and 2 more	nxos64-cs.10.3.1.F.bin	Out-Of-Sync Prepare Update	External Connectivity Network	4	...
sg-demo	10.4(2)	nxos64-cs.10.4.1.F.bin	Out-Of-Sync Prepare Update	Data Center VXLAN EVPN	5	...

List of Fabrics in NDFC



Prepare Fabric

Policy Selection

Prepare - other

Platform(s)
CAT9K,N77,N9K

Detach Policy Attach Policy

Policy
nxos64-cs.10.3.1.F.bin

Stage Now

Stage later allows you to upgrade a subset of the devices that match the policy.

Cancel Attach

Fabric	Current Version(s)	Policy	Status	Fabric Type	Switches
classic	10.2(1) and 6 more	9312	Recalculating...	Classic LAN	17
other	17.1.1 and 2 more	nxos64-cs.10.3.1.F.bin	Out-Of-Sync Prepare Update	External Connectivity Network	4

Update Software

The screenshot displays the 'Software Update Plan' interface in the Cisco Nexus Dashboard Fabric Controller. The browser address bar shows the URL: `https://172.22.31.222/appcenter/cisco/ndfc/ui/manage/image-mgmt/overview`. The page title is 'Software Update Plan'. A blue callout box labeled 'Fabric Name' points to the 'classic' fabric name in the 'Software Summary' section. Another blue callout box labeled 'Node Types' points to the 'classic_N77_leaf', 'classic_N9K_leaf', and 'classic_N9K_spine' node types. The 'classic_N9K_spine' node type is shown with a 'Stage-Success' status, while the others are 'Yet To Start'.

Node Type	Update Plan Status	Update Groups	Devices to be updated	Policy
classic	Yet To Start	3	11 out of 17	9312
classic_N77_leaf	Yet To Start (1 Warning)	1		
classic_N9K_leaf	Yet To Start (14 Warnings)	14		
classic_N9K_spine	Yet To Start (3 Warnings)	2		

Update Software

Software Update Plan

Software Summary

Fabric classic Update Plan Status **Yet To Start**

classic_N97_leaf No Estimate

Yet To Start 1 Warnings Switch(es) 1 Update Status None Install Start Time Install End Time

Switches in Group - classic_N97_leaf

classic_N9K_leaf About 18 Mins.

Yet To Start 14 Warnings Switch(es) 14 Update Status None Install Start Time Install End Time

Switches in Group - classic_N9K_leaf

classic_N9K_spine About 38 Mins.

Yet To Start 3 Warnings Switch(es) 2 Update Status Stage-Success Install Start Time Install End Time

Auto-Assign Groups Role Based Even Odd

Actions Stage/Distribute Install Update

Default is Role Based

Install image or images?

Load Image onto switches

Software Update Plan

Install Update

classic_N9K_leaf About 18 Mins

Yet To Start 14 Warnings

Switches in Group - classic_N9K_

classic_N9K_spine About 38 Mi

Yet To Start 3 Warnings

Switches in Group - classic_N9K_

Filter by attributes

<input type="checkbox"/> Switch	IP Ad									
<input type="checkbox"/> mini-spine2	172.2									
<input type="checkbox"/> mini-spine1	172.22.31.113	N9K-C9236C	Spine	9.3(11)	Yet To Start	Stage-Success	View Logs	Normal		

Install update in group **classic_N9K_spine** estimate about 38 mins. for 2 switch(es)

Show Advanced Options

Execution Paradigm: Serial
Failure Contingency: Continue
Snapshot: Snapshot

Maintenance Mode Force Disruptive

Cancel **Install Update**

Final step to start the Installation

Simplifying Upgrade Process



NEW

Non-Disruptive NXOS upgrade

Defaulting all ND ISSU to enhanced ISSU on GX2A and GX2B platforms

10.3.3
GX,FX3

Reducing Number of reloads required during upgrade

Combining NXOS and EPLD upgrade avoids additional reload in case of EPLD – 9.3(8) and 10.1(2)

Apply SMU with NXOS and EPLD upgrades – 10.2(1)

Prevent downtime for Kernel Patch

Providing the ability to perform Kernel patch without reload 10.2(2)

Best Practices for Nexus Upgrades



Check Upgrade Path

<https://www.cisco.com/c/dam/en/us/td/docs/Website/datacenter/ISSUmatrix/index.html>



Download Upgrade/Patch Images
prior to maintenance window



Do not make Configuration Changes
during upgrades



Run Pre-Upgrade Validation Checks

Agenda

- NXOS SW Architecture
- Upgrades on the Nexus Switches
- Upgrades on ACI Switches
 - Upgrade from APIC
 - Best Practices
- Bonus: Modular Software Operations

Upgrades on ACI Switches

ACI Firmware Upgrade Types



Regular Upgrade




Software Maintenance
Upgrade (SMU)




EPLD/FPGA Upgrade
(Only Switches)

ACI Firmware Upgrade Types (Regular)

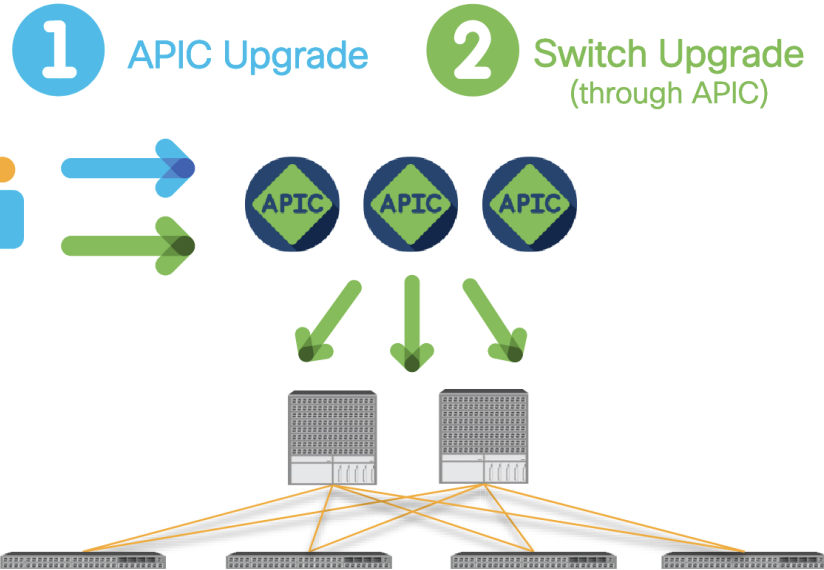
 Regular Upgrade

 Software Maintenance Upgrade (SMU)


 EPLD/FPGA Upgrade (Only Switches)

Base OS firmware upgrade


In principle, all APICs and switches should be on the same version



ACI Firmware Upgrade Types (SMU)

 Regular Upgrade

 Software Maintenance Upgrade (SMU)

 EPLD/FPGA Upgrade (Only Switches)

A patch for a specific defect

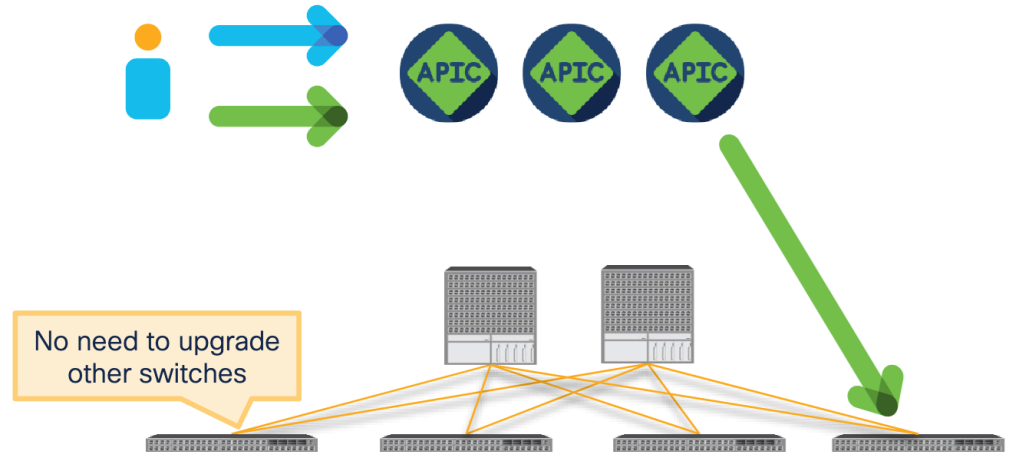
No need to upgrade the entire fabric. You can apply it only to APICs or affected switch nodes

1


SMU for all APICs


2


SMU for specific switches (through APIC)



ACI Firmware Upgrade Types (EPLD/FPGA)

 Regular Upgrade

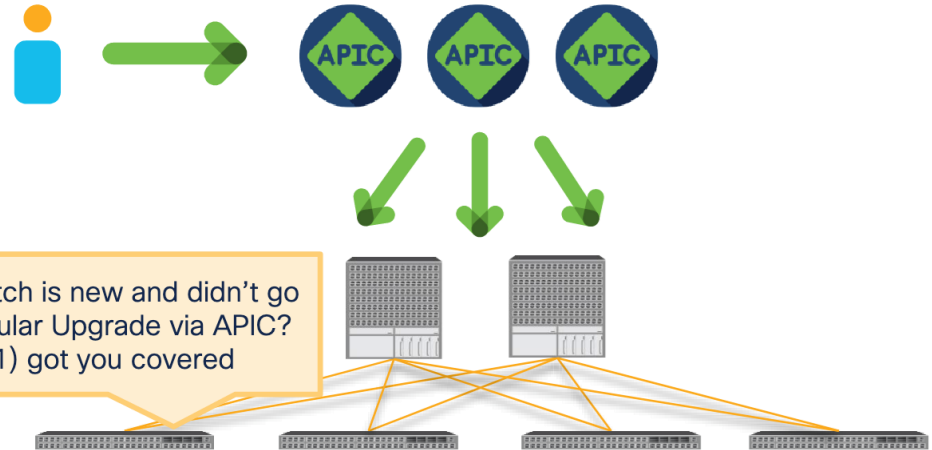
 Software Maintenance Upgrade (SMU)

 EPLD/FPGA Upgrade (Only Switches)

Hardware related firmware

Each ACI switch version has the desired EPLD/FPGA version. Automatically upgraded via Regular Upgrade through APIC.

- No user configurations



What if a switch is new and didn't go through Regular Upgrade via APIC?
➤ 5.2(1) got you covered

ACI Package Upgrade Pre-requisites



loading the package(s) to APIC controller

Add Firmware to download a new firmware image

The screenshot displays the Cisco APIC Admin console interface. The top navigation bar includes tabs for System, Tenants, Fabric, Virtual Networking, L4-L7 Services, Admin, Operations, Apps, and Integrations. The 'Admin' tab is active, and the 'Firmware' sub-tab is selected. The left sidebar contains a menu with items: Dashboard, Controllers, Nodes, and Images (highlighted with a green box). The main content area is titled 'Images' and features a table with the following data:

File Name	Type	Version	Download Date	Download Status
<input type="checkbox"/> aci-apic-dk9.4.2.5k	Controller	apic-4.2(5k)	2020-08-24 07:01:46	Downloaded
<input type="checkbox"/> aci-apic-dk9.5.1.1g	Controller	apic-5.1(1g)	2020-10-22 12:52:15	Downloaded
<input type="checkbox"/> aci-9000-switch-11.0.1-5k	Switch	9000-11.0(1-5k)	2020-08-25 06:10:14	Downloaded

An 'Add Firmware Image' modal window is open, showing a form with the following fields and options:

- Location: Secure copy, HTTP, Local (selected)
- URL: http://semanava-bks2.insieme.local/semanava/
- Buttons: Cancel, Submit

The modal also includes a message: 'Newly added images may not be immediately available. Please refresh the Images table after some time to view them.'

Creating an ACI update group

The screenshot shows the Cisco ACI Admin console interface. The top navigation bar includes tabs for System, Tenants, Fabric, Virtual Networking, Admin (selected), Operations, Apps, and Integrations. Below this, a secondary navigation bar lists AAA, Schedulers, Firmware (selected), External Data Collectors, Config Rollbacks, and Import/Export. The main content area is titled 'Nodes' and contains sub-sections for Firmware Updates, SMU Updates, and Event Analytics. A search bar labeled 'Filter by attributes' is present. Below the search bar is a table with the following columns: Update Name, Type, Target Version, and Nodes. A dropdown menu is open over the 'Nodes' column, showing two options: 'Create Update Group' (highlighted with a green box) and 'Delete Update Group'. The 'Actions' button is also visible in the top right of the table area.

<input type="checkbox"/>	Update Name	Type	Target Version	Nodes

Node Selection

Node Firmware Upgrade - leaf4

1 Node Selection | 2 Version Selection | 3 Validation | 4 Confirmation

Update Name: leaf4

Select Nodes To Update

Filter by attributes Add Nodes

Pod	ID	Name	Role	Model	Version	Last Update	SMU Version	Action
1	104	f2-leaf4	leaf	N9K-C93240YC-FX2	n9000-15.2(0.168)	2021-05-10 18:24:06-07:00	-	

Cancel Next

Version Selection for either image/SMU

Node Firmware Upgrade - leaf4



Node Selection **Version Selection** Validation Confirmation

Select install of an image

Update Type



Regular Upgrade

Upgrading the entire ACI switch firmware for selected nodes. The most comprehensive and complete upgrade. All nodes in the fabric are expected to operate with the same firmware at the end.



Select install of an SMU patch.



Software Maintenance Upgrade (Install)

Installing and activating a patch image (SMU image) to resolve a particular defect or issue without upgrading the entire ACI switch firmware.



Software Maintenance Upgrade (Uninstall)

Deactivating and uninstalling a patch image (SMU image) that was already installed.



Select Firmware

Select the version



CSCbadpfm

Base Version: 15.2.0.168, Patch Version: S1.1.1, This is a patch for CSCbadpfmThe build type is final.



CSCpatch1

Base Version: 15.2.0.168, Patch Version: S1.1.1, This is a patch for CSCpatch1ETH=/var/sysmgr/tmp/patches/CSCpatch1/isan/bin/routing-sw/bgpThe build type is...



More ▾



CSCpatch2

Base Version: 15.2.0.168, Patch Version: S1.1.1, This is a patch for CSCpatch2ETH=/var/sysmgr/tmp/patches/CSCpatch2/isan/bin/routing-...



Advanced Settings

Cancel

Previous

Next

PRE Upgrade validation

Node Firmware Upgrade - leaf4



Validation

Hardware
Compatibility



Hardware compatibility passed.

Software
Compatibility



Software Compatibility passed.

Spine
redundancy
check



This validation checks if all spines in a pod are part of same maintenance group.

Cancel

Previous

Next

Staging of the packages

Node Firmware Upgrade - leaf4

Node Selection Version Selection Validation **Confirmation**

Update Settings
Name: leaf4
Target Version: n9000-patch-CSCpatch1-15.2.0.168-S1.1.1.x86_64

Selected Nodes To Update: 1 (Leaves (1))

Selected Nodes To Update

Filter by attributes

Pod	ID	Name	Role	Model	Version	Last Update
1	104	f2-leaf4	leaf			

Cancel Previous **Begin Download**

Version that is being downloaded

A SMU is typically small. The download should complete immediately. Images will take a bit longer

Installing of Package(s)

Node Firmware Update - leaf4

When installing image/Single SMU you chose
“Install and Reload”

When installing multiple patches, do install and skip
first. Then, perform “Install and Reload” for the last patch.

Update Details

Target Version
n9000-patch-CSCpatch1-
15.2.0.168-S1.1.1.x86_64

Nodes by Role

Leafs 1

Update Status

Overall Status

Ready to Install

Status Breakdown

1

- Failed (0)
- Decommissioned (0)
- Unreachable (0)
- Processing (0)
- Downloading (0)
- Ready to Install(1)
- In Queue (0)
- Installing (0)
- Completed (0)

Install and Reload

Install and Skip Reload

Nodes

Filter by attributes

Pod	Node ID	Name	Role	Model	Last Update	Current Version	SMU Version	Status	Action
1	104	f2-leaf4	leaf	N9K-C93240YC-FX2	2021-05-10 18:24:06-07:00	n9000- 15.2(0.168)	-	Ready to Install	

Once the download is completed,
the status becomes “Ready to
Install”

Best Practices for ACI switch upgrades



Confirm Supported Upgrade Path

[ACI Upgrade/Downgrade Support Matrix](#)



Clear All Faults



Check APIC Cluster is Fully Fit



Run Pre-Upgrade Validation Checks

Compare state
Before and After
Upgrades



Using
NAE

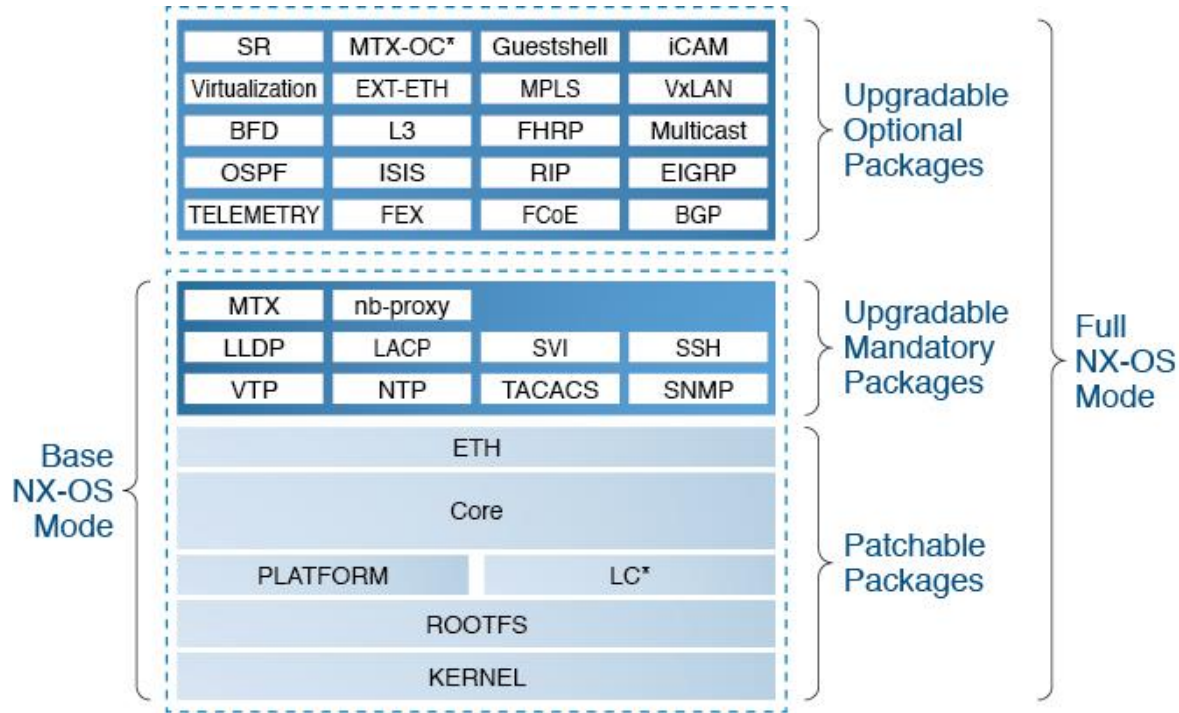


3rd party
Apps

Agenda

- Introduction
- Upgrades on the Nexus Switches
- Upgrades on ACI Switches
- **Bonus: Modular Software Operations**
 - RPM Architecture
 - Switch Boot modes

Nexus RPM Architecture



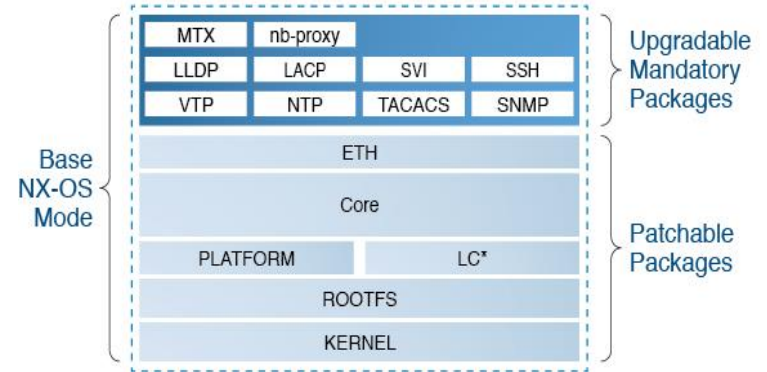
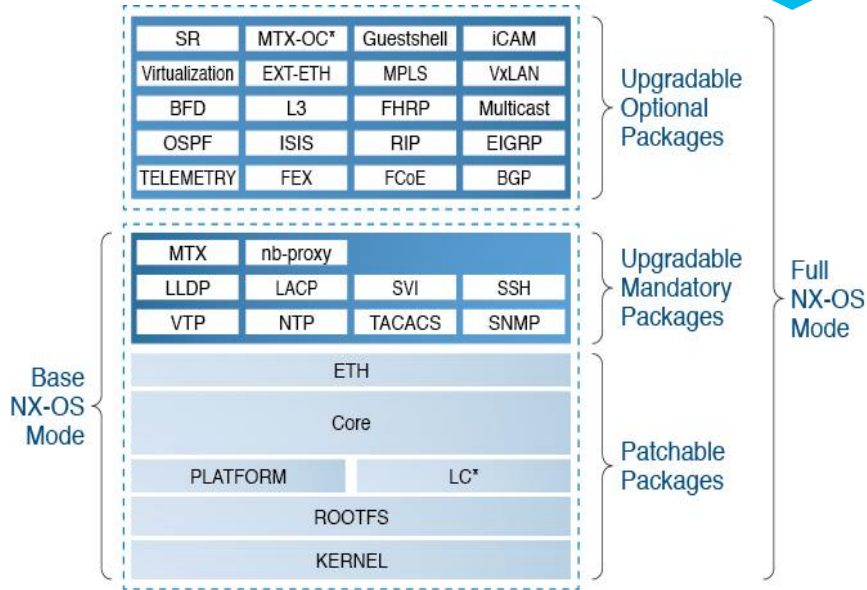
Nexus Boot Modes

Nexus Supports two Boot Modes

`#install reset nxos full`

Default

`#install reset nxos base`



Benefits of Modularity

Memory Usage Reduction



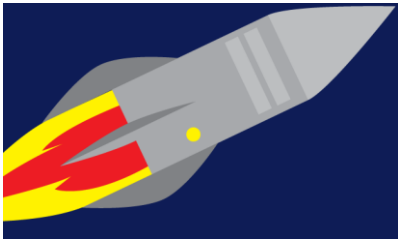
Security Vulnerability Impact



Qualification Cycle Time Reduction



Faster Boot up time



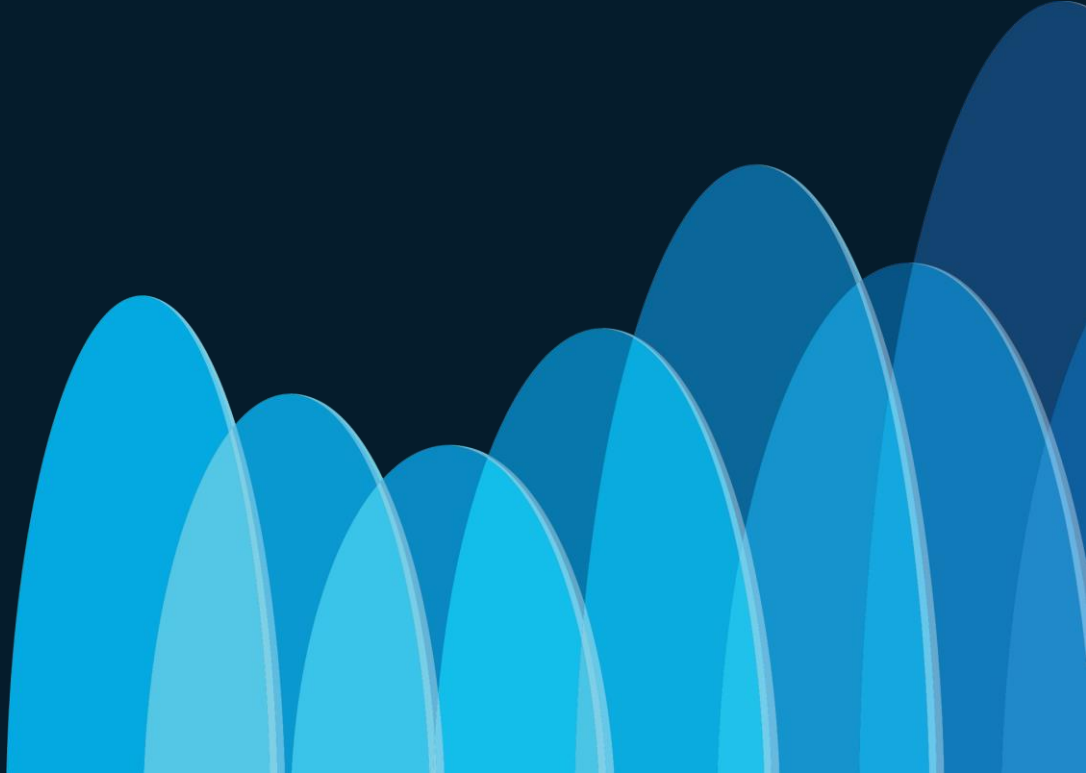
Using Open Source Tool for Managing Upgrades/Patches



Learning Maps

<https://www.ciscolive.com/emea/learn/learning-maps.html>

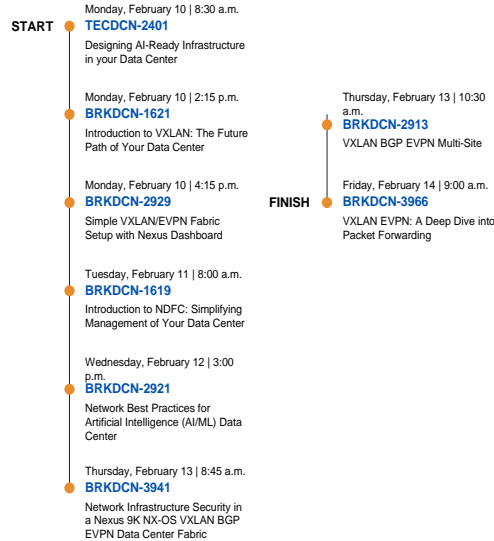
CISCO *Live!*



Data Center

NXOS Technologies

This map provides the curated list of sessions for NXOS technology architecture at Cisco Live.



CISCO Live!

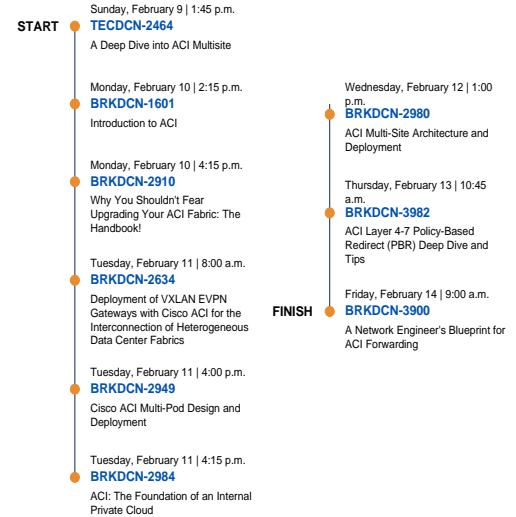
Amsterdam | February 9-14, 2025

If you are unable to attend a live session, you can watch it in the On-Demand Library after the event.

Data Center

ACI Technologies

This map provides the curated list of sessions for ACI technology architecture at Cisco Live.



CISCO Live!

Amsterdam | February 9-14, 2025

If you are unable to attend a live session, you can watch it in the On-Demand Library after the event.

CISCO Live!

Webex App

Questions?

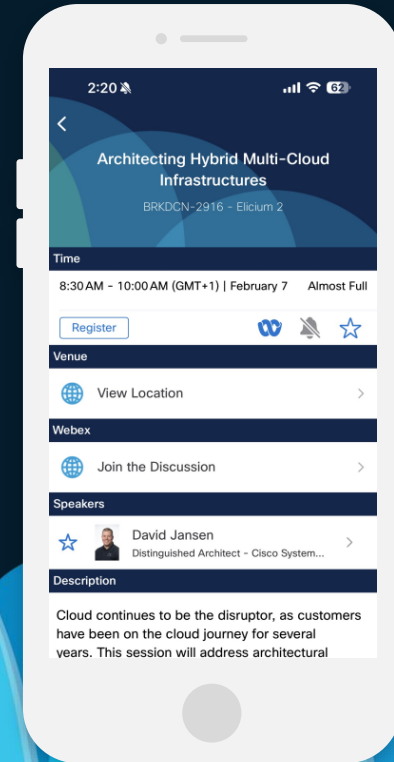
Use the Webex app to chat with the speaker after the session

How

- 1 Find this session in the Cisco Events mobile app
- 2 Click “Join the Discussion”
- 3 Install the Webex app or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until February 28, 2025.

CISCO *Live!*



Fill Out Your Session Surveys



Participants who fill out a minimum of 4 session surveys and the overall event survey will get a unique Cisco Live t-shirt.

(from 11:30 on Thursday, while supplies last)



All surveys can be taken in the Cisco Events mobile app or by logging in to the Session Catalog and clicking the 'Participant Dashboard'



Content Catalog

Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at ciscolive.com/on-demand. Sessions from this event will be available from March 3.



Thank you

CISCO *Live!*

CISCO *Live!*

GO BEYOND

A series of overlapping, rounded, teardrop-shaped abstract forms in various shades of blue, ranging from light to dark, positioned on the right side of the image.