Practice tests

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Official Cert Guide

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CCNP and CCIE Data Center Core

DCCOR 350-601

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Cisco Press

SMU types include the following:

- **Restart:** Restarts an affected process. The process is restarted in all virtual device contexts (VDCs) where running.
- **In-Service Software Upgrade (ISSU) SMU:**
  - Dual Supervisor > ISSU
  - Single Supervisor > Reload

Patching is for operationally impacting bugs without a workaround:

- You cannot patch the next release.
- For the Nexus 7000 Series, patching is done in default/admin VDC and applies to all VDCs; patching is not available per VDC.
- ISSUs work with all or a subset of patches applied.
- You don't need to apply all patches.
- Some SMUs may have only a single fix, whereas others may have multiple packages.
- SMUs are supported by the Cisco Technical Assistance Center (TAC).
- SMUs are synced to standby supervisor.
- On a Supervisor replacement, patches are synchronized.
- SMUs are not for feature implementation. An SMU cannot change the configuration.

The steps to download and apply a specific SMU are as follows:

Step 1. Download the appropriate SMU for your device from Cisco.com.

Step 2. Copy the package file from the TFTP or FTP or SFTP server to the bootflash:

```
switch# copy tftp://10.1.1.1/images/n7700-s2-dk9.7.2.0.
D1.1.CSCuo07721.bin bootflash:
```

Step 3. Display the package files that are available to be added under flash:

Step 4. Activate a package that was added to the device. The SMU packages remain inactive until activated.

```
switch# install activate n7700-s2-dk9.7.2.0.D1.1.CSCuo07721.bin
Install operation 158 completed successfully at Tue Jun 11 19:09:33 2019
```

Step 5. Commit the current set of packages so that these packages are used if the device is restarted.

```
switch# install commit n7700-s2-dk9.7.2.0.D1.1.CSCuo07721.bin
Install operation 2 completed successfully at Tue Jun 11 20:20:46 2019

switch# show install committed
Boot Images:
      Kickstart Image: bootflash:/n7700-s2-kickstart.7.2.0.D1.1.bin
      System Image: bootflash:/n7700-s2-dk9.7.2.0.D1.1.bin
```

```
Committed Packages:
      n7700-s2-dk9.7.2.0.D1.1.CSCuo07721.bin
```

Step 6. Deactivate and uninstall the package.

```
switch# install deactivate n7700-s2-dk9.7.2.0.D1.1.CSCuo07721.bin
Install operation 3 completed successfully at Tue Jun 9 01:20:36 2019

switch# show install inactive
Inactive Packages: n7700-s2-dk9.7.2.0.D1.1.CSCuo07721.bin

switch# install commit
Install operation 4 completed successfully at Tue Jun 9 01:20:46 2019

switch# install remove n7700-s2-dk9.7.2.0.D1.1.CSCuo07721.bin
Proceed with removing n7700-s2-dk9.7.2.0.D1.1.CSCuo07721.bin? (y/n)? [n] y
Install operation 5 completed successfully at Tue Jun 9 01:20:57 2019
```

Key Topic

Programmable Logical Devices Upgrade

Cisco Nexus modular switches (Nexus 7000 and 9500) contain several programmable logical devices (PLDs) that provide hardware functionalities in all modules. Cisco provides EPLD image upgrades to enhance hardware functionality or to resolve known issues for modular switches only. PLDs include EPLDs, field programmable gate arrays (FPGAs), and complex programmable logic devices (CPLDs), but they do not include application-specific integrated circuits (ASICs). In this chapter, the term *EPLD* is used for *FPGAs* and *CPLDs*.

The advantage of having EPLDs for some module functions is that when you need to upgrade those functions, you just upgrade their software images instead of replacing their hardware.

NOTE EPLD image upgrades for a line card disrupt the traffic going through the module because the module must power down briefly during the upgrade. The system performs EPLD upgrades on one module at a time, so at any one time the upgrade disrupts only the traffic going through one module.

EPLD image updates are not mandatory unless otherwise specified. The EPLD image upgrades are independent from the Cisco in-service software upgrade (ISSU) process, which upgrades the system image with no impact on the network environment.

When new EPLD images are available, the upgrades are always recommended if your network environment allows for a maintenance period in which some level of traffic disruption is acceptable. If such a disruption is not acceptable, then consider postponing the upgrade until a better time.

NOTE The EPLD upgrade operation is a disruptive operation. Execute this operation only at a programmed maintenance time. The system ISSU upgrade is a nondisruptive upgrade.

NOTE Do not perform an EPLD upgrade during an ISSU system upgrade.

To verify whether an EPLD is required, download and apply the EPLD as follows:

Step 1. Determine whether you need to upgrade an EPLD image with impact type or EPLD upgrade not required.

```
switch# show install all impact epld bootflash:n7000-s1-epld.5.1.1.img

Compatibility check:
Module  Type  Upgradable   Impact     Reason

------  ----  ----------  ----------  --------
1       LC       Yes      disruptive  Module Upgradable
2       LC       Yes      disruptive  Module Upgradable
4       LC       No       none        Module is not Online
5       SUP      Yes      disruptive  Module Upgradable
7       LC       Yes      disruptive  Module Upgradable
8       LC       Yes      disruptive  Module Upgradable
9       LC       Yes      disruptive  Module Upgradable
10      LC       Yes      disruptive  Module Upgradable
1       Xbar     Yes      disruptive  Module Upgradable
2       Xbar     Yes      disruptive  Module Upgradable
3       Xbar     Yes      disruptive  Module Upgradable
1       FAN      Yes      disruptive  Module Upgradable
2       FAN      Yes      disruptive  Module Upgradable
3       FAN      Yes      disruptive  Module Upgradable
4       FAN      Yes      disruptive  Module Upgradable

Retrieving EPLD versions... Please wait.
Images will be upgraded according to following table:

Module Type EPLD         Running-Version New-Version g-Required
------ ---- ----         --------------- ----------- -----------
1      LC Power Manager       4.008       4.008        No
1      LC IO                  1.015       1.016        Yes
1      LC Forwarding Engine   1.006       1.006        No
1      LC FE Bridge(1)        186.005     186.006      Yes
1      LC FE Bridge(2)        186.005     186.006      Yes
1      LC Linksec Engine(1)   2.006       2.006        No
1      LC Linksec Engine(2)   2.006       2.006        No
1      LC Linksec Engine(3)   2.006       2.006        No
1      LC Linksec Engine(4)   2.006       2.006        No
1      LC Linksec Engine(5)   2.006       2.006        No
1      LC Linksec Engine(6)   2.006       2.006        No
1      LC Linksec Engine(7)   2.006       2.006        No
```

Step 2. Download the EPDL image from Cisco.com.

Step 3. Verify the EPLD upgrade version.

```
switch# show version module 7 epld

EPLD Device Version
----------------------------------------
Power Manager 4.008
IO 1.016
Forwarding Engine 1.006
FE Bridge(1) 186.008 << OK!
FE Bridge(2) 186.008 << OK!
Linksec Engine(1) 2.007
Linksec Engine(2) 2.007
Linksec Engine(3) 2.007
Linksec Engine(4) 2.007
```

Step 4. Upgrade the EPLD for a specific module.

```
switch# install module 1 epld bootflash:n7000-s1-epld.5.1.1.img

Retrieving EPLD versions... Please wait.

Images will be upgraded according to following table:
Module Type EPLD        Running-Version New-Version Upg-Required
------ ---- ----        --------------- ----------- -------------
1      LC   Power Manager       4.008       4.008        No
1      LC   IO                  1.015       1.016        Yes
1      LC   Forwarding Engine   1.006       1.006        No
1      LC   FE Bridge(1)        186.005     186.006      Yes
1      LC   FE Bridge(2)        186.005     186.006      Yes
1      LC   Linksec Engine(1)   2.006       2.006        No
1      LC   Linksec Engine(2)   2.006       2.006        No
1      LC   Linksec Engine(3)   2.006       2.006        No
1      LC   Linksec Engine(4)   2.006       2.006        No
1      LC   Linksec Engine(5)   2.006       2.006        No
1      LC   Linksec Engine(6)   2.006       2.006        No
1      LC   Linksec Engine(7)   2.006       2.006        No
1      LC   Linksec Engine(8)   2.006       2.006        No
Module 1 will be powered down.
Do you want to continue? (yes/no) [n]: y
```


Key Topic

Graceful Insertion and Removal

Starting with Cisco NX-OS Software Release 7.2, you can use Graceful Insertion and Removal (GIR) for maintenance mode, to isolate a switch from the network to perform an upgrade or downgrade the switch with little service disruption.

You can use GIR mode to simplify the maintenance process. Currently, during maintenance window for module installation, cabling, and erasable programmable logic device (EPLD) upgrades, you need to isolate the switch using a series of commands and scripts, which is a cumbersome

process. GIR mode provides an easy method for isolating a switch for maintenance window and then bringing it back into service. You can configure GIR mode for each VDC on Cisco Nexus 7000 Series platform switches, using the existing configuration profile foundation in NX-OS.

The following protocols are currently supported in GIR mode:

- Border Gateway Protocol Version 4 (BGPv4)
- BGP Version 6 (BGPv6)
- Multiprotocol BGP (MP-BGP) address families (Virtual Private Network Version 4 [VPNv4], VPNv6, and Layer 2 VPN [L2VPN] Ethernet VPN [EVPN]
- Enhanced Interior Gateway Routing Protocol (EIGRP)
- Enhanced Interior Gateway Routing Protocol Version 6 (EIGRPv6)
- Intermediate System-to-Intermediate System (IS-IS)
- Open Shortest Path First (OSPF)
- Open Shortest Path First Version 3 (OSPFv3)
- Virtual Port Channel (vPC and vPC+)
- Cisco FabricPath

GIR supports two modes:

- System autogenerated configuration profile
- Custom manual configuration profile

When you use the autoconfiguration profile in GIR mode, the system checks for supported protocols and adds them to the configuration profile. When you enter GIR (maintenance) mode, the system automatically generates a profile in which all supported protocols are shut down. In addition, the autoconfiguration profile shuts down all the interfaces on the switch. The configuration profile is generated and applied when you enter GIR mode by using the **system mode maintenance** command in the CLI.

Example 6-2 shows the **system mode maintenance** command. During the maintenance, the system shuts down the OSPF process.

Example 6-2 *Entering GIR Mode Using Autoconfiguration Profile Configuration*

```
Switch(config)# system mode maintenance

BGP is not enabled, nothing to be done

EIGRP is not enabled, nothing to be done

OSPF is up... .. will be shutdown
     OSPF TAG = 100, VRF = default
                  config terminal
                  router ospf 100
```

```
                shutdown
                end
OSPFv3 is not enabled, nothing to be done

ISIS is not enabled, nothing to be done

vPC is not enabled, nothing to be done

Interfaces will be shutdown
Do you want to continue (y/n)? [n] y

Generating maintenance-mode profile
Processing……..Done.
System mode operation completed successfully
```

When you exit GIR mode, the normal-mode configuration profile is generated, and all protocols that were shut down along with the interfaces are brought up again. You can exit GIR mode by using the **no system mode maintenance** command. Example 6-3 shows that the system will enable the OSPF process when you disable the maintenance mode and change OSPF to the up state.

Example 6-3 *Exiting GIR Mode Using Autoconfiguration Profile Configuration*

```
Switch(config)# no system mode maintenance

BGP is not enabled, nothing to be done

EIGRP is not enabled, nothing to be done

OSPF is up..... will be brought up
       OSPF TAG = 100, VRF = default
                config terminal
                router ospf 100
                no shutdown
                end

OSPFv3 is not enabled, nothing to be done

ISIS is not enabled, nothing to be done

vPC is not enabled, nothing to be done

Interfaces will be brought up
Do you want to continue (y/n)? [n] y

Generating maintenance-mode profile
Processing……..Done.
System mode operation completed successfully
```