HOW DO YOU PERFORM A FIRMWARE UPGRADE ON SPINE SWITCHES WITHOUT AN APIC?

USE CASE SCENARIO:

A customer is in the process of configuring and setting up a Multipod configuration in their ACI Fabric. They are using a "QSA adapter" to the IPN Gateway. The ACI Spines that the customer received were shipped with older ACI firmware that does not support the "QSA adapters". As a result the switches cannot be connected and discovered by the APIC cluster in the second datacenter.

The customer needs to upgrade the spine switches locally. They have searched for documentation on the upgrade steps but have been unsuccessful. How do you perform an ACI firmware upgraded on spine switches without an APIC Controller.

The switch hardware is Cisco Nexus 9504 with N9K-X9732C-EX spine card.

ASSESSMENT & STEPS TO UPGRADE THE SPINE SWITCHES:

According to the "Cisco 40-Gigabit Ethernet Transceiver Modules Compatibility Matrix", the required ACI firmware for support of **N9K-X9732C** & **QSA (CVR-QSFP-SFP10G)** is ACI-N9KDK9-12.1(1h) or later.

- Download "*Cisco Nexus 9000 Series ACI Mode Switch Software Release 12.1(1h)*" for NX-OS System Software-ACI from software.cisco.com.

https://software.cisco.com/download/type.html?mdfid=286195223&flowid=49962

```
Description:       Cisco Nexus 9000 Series ACI Mode Switch Software Release 12.1(1h)
Release:           12.1(1h)
Release Date:      02/Oct/2016
File Name:         aci-n9000-dk9.12.1.1h.bin
Size:              1020.31 MB (1069875494 bytes)
MD5 Checksum:      cf61dd3d189e4fcaf4fb42f42144c8a7
```

- Make sure you have "console" access to all switches that will be upgraded.

- Copy the ACI firmware image "aci-n9000-dk9.12.1.1h.bin" to the switches that need to be upgraded. There are a couple of methods that you can perform to copy the image to the target switch:
    a. *Copy the firmware image (using scp or sftp) to /tmp directory on the switch. Then copy the firmware image into /bootflash directory. Verify that the firmware image copied into /bootflash directory.*
    b. *Put the firmware image on an USB stick drive and insert in the switch. Copy the firmware image from the USB drive into /bootflash directory.   Verify that the firmware image copied into /bootflash directory.*

- Verify the size and MD5 Checksum of the firmware image before proceeding.

For example:

```
aci-spine1# pwd
/bootflash

aci-spine1# ls -al
-rw-rw-rw-  1 root root  1069875494 Oct  2 01:12 aci-n9000-dk9.12.1.1h.bin

aci-spine1# md5sum aci-n9000-dk9.12.1.1h.bin
cf61dd3d189e4fcaf4fb42f42144c8a7  aci-n9000-dk9.12.1.1h.bin
```

- Once you have verified the correct size & MD5 checksum, you can proceed with configuring the switch for the upgrade. Use the following commands to SET and VERIFY the boot variables for the switch.
    - clear-bootvars.sh
    - setup-clean-config.sh aci-n9000-dk9.12.1.1h.bin
    - setup-bootvars.sh aci-n9000-dk9.12.1.1h.bin
    - cat /mnt/cfg/0/boot/grub/menu.lst.local
    - cat /mnt/cfg/1/boot/grub/menu.lst.local

- Use "/usr/sbin/chassis-power-cycle.sh" to power cycle the switch. The switch should power off and then restart and boot up running the new firmware image.

- Since you are performing a "manual forced" upgrade, the FPGA\EPLDs and BIOS firmware versions will not be upgraded (if needed). So you can also perform a "manual forced" upgrade of the FPGA\EPLDs and BIOS firmware versions at this time (if needed).
    - Use "/bin/check-fpga.sh FpGaDoWnGrAdE" to perform a "manual forced" upgrade of the FPGA\EPLDs and BIOS firmware versions.

- Once the "/bin/check-fpga.sh FpGaDoWnGrAdE" has completed, you will need to run "/usr/sbin/chassis-power-cycle.sh" to power cycle the switch. The switch should power off and then restart and program the BIOS & FPGA\EPLDs with the new firmware versions.

Note: The "/usr/sbin/chassis-power-cycle.sh" resets power (like removing Power cables) where a reload is simply a software restart. When upgrading FPGA or BIOS, power needs to be removed sometimes to reprogram the firmware on the cards themselves. A "reload" will not do this. In the past, we would have ask customers to remove power cables for at least 30 seconds. As a you may understand this may be difficult for remote Data Centers so we have added "/usr/sbin/chassis-power-cycle.sh". There are some times that "/usr/sbin/chassis-power-cycle.sh" is not available to use or does not work. In this case, **you will need to remove power cables for at least 30 seconds and then re-attach to restore power**. If this does not work and you still see "BIOS or FPGA version mismatch" faults, please open a Cisco TAC Service Request with the ACI Solutions Delivery Team.

Once the switches have joined the fabric, future upgrades will be performed via upgrade policies. The upgrade policies will upgrade the FPGA\EPLDs and BIOS firmware versions during the upgrade process.

Since this is a Modular 9500 Series spine switch, there is a possibility that you may have 2 supervisors installed for the spine switch. The procedure mentioned above ONLY upgrades the ACTIVE supervisor. If you have a Secondary supervisor, you will also need to perform the same steps for the Secondary supervisor.

- Remove Power from the switch.
- Pull out ACTIVE - Primary supervisor.
- Restore Power to the switch.
- Repeat the above steps to perform a "manual forced" upgrade for the ACI firmware, FPGA\EPLD, and BIOS versions.
- Remove Power from the switch.
- Re-insert ACTIVE - Primary supervisor.
- Restore Power to the switch.

RESOURCES:

Download Software - Nexus 9504 Switch
https://software.cisco.com/download/type.html?mdfid=286195223&flowid=49962

Release Notes for 12.1(1h)
http://www.cisco.com/c/en/us/td/docs/switches/datacenter/aci/apic/sw/1-x/release/notes/aci_nxos_rn_1211.html

Cisco 40-Gigabit Ethernet Transceiver Modules Compatibility Matrix
http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/40GE_Tx_Matrix.html

Cisco Nexus 9000 Series (Fixed 9300) ACI Mode
http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/40GE_Tx_Matrix.html#_Toc466988073

TAGS: TOTD ACI UPGRADE N9K