ACI Host vPC with Fabric Extenders (FEX)

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Note:

All ACI Leafs are wired to all 7K VDCs (N7K1 – N7K12). Before making changes on the Leafs, verify that you are making the changes on the correct ports by referencing the ACI Wiring Diagram or the outputs of the `show lldp neighbors` , similar to the following:

```
N7K1# config t
Enter configuration commands, one per line.  End with CNTL/Z.
N7K1(config)# feature lldp
N7K1(config)# int e1/1 - 8
N7K1(config-if-range)# no shutdown
N7K1(config-if-range)# end
N7K1# show lldp neighbor | include Leaf|Port
Device ID                      Local Intf      Hold-time   Capability  Port ID
Leaf101                        Eth1/7          120         BR          Eth1/1
Leaf102                        Eth1/8          120         BR          Eth1/1
N7K1#
```

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Objective

- Configure vPC connectivity between the ACI Leafs and the UCS C Series Server through the Fabric Extenders (FEXes).

Task

Note:

All references to "X" refer to your rack number. For information connecting to the KVM see Managing UCS C-Series Server Using CIMC

- Create a vPC pair between Leaf 101 and Leaf 102 using vPC Domain ID 1.
- Configure a Switch Profile called "RackX_FEX101" that uses FEX ID 101 on Leaf 101's ports 1/44 – 47 connecting to N2K1.
- Configure a Switch Profile called "RackX_FEX102" that uses FEX ID 102 on Leaf 102's ports 1/44 – 47 connecting to N2K2.
- Create a vPC Interface Policy Group called "RackX_FEX_101_102_vPC_to_C220" with the following attributes:
  - CDP On
  - LLDP On
  - LACP Active
  - LACP Suspend Individual disabled
  - AAEP AAEP_RackX-ESXi-Rack-Servers
- Create an Access Port Selector under each of the generated FEX Profiles as follows:
  - Create Interface Selector "RackX_FEX_101_ to_C220_ifSelector" on FEX 101
  - Create Interface Selector "RackX_FEX_102_ to_C220_ifSelector" on FEX 102
  - Apply your Policy Group "RackX_FEX_101_102_vPC_to_C220" to these Interface Selectors
- Verify from the CLI of the Leaf switches that the vPC is created, and that LACP has the ports in Individual (not Suspended) state.
- Configure the AAEP for this Policy Group as follows:
  - Create and call Domain "RackX_Domain" from the AAEP
  - Create and call VLAN Pool "RackX_VLANs" from the Domain
  - Use Static VLAN 10, and Dynamic VLANs X00 – X99 in the pool
- Configure your Tenant Policies as follows:
  - Create a Tenant named "RackX_Tenant"
  - Create VRF "RackX_VRF1" inside the Tenant
  - Create Bridge Domain "RackX_BD10" inside the VRF
  - Assign the VIP 10.0.1.254/24 to this Bridge Domain
  - Create an Application Profile named "RackX_AppPro1"
  - Create an EPG named "RackX_EPG_ESXi_MGMT" inside the App Profile
  - Assign your previously created Domain to the EPG
  - Deploy the EPG to the vPC previously created towards the C220 server
  - Use VLAN 10 as the Native VLAN for this EPG
- Verify IP connectivity between the ACI Leafs and the C220 Server as follows:
  - KVM into the UCS C-Series Server, and you should see the VMWare ESXi console.
  - Login to the ESXi console with username "root" and password "Cciedc01". If login fails, you can re-install ESXi onto the server by attaching the ESXi ISO under Z:\ISO\VMware\Vmware-ESXi-6.0.0-2494585-Custom-Cisco-6.0.0.2.isoas Virtual Media, and rebooting the server. Ensure to set the root password to "Cciedc01" if you re-install.
  - Once logged into the ESXi console, go to "Network Restore Options" and "Restore Network Settings"; this will delete any previous vSwitch configurations.
  - Next, go to "Configure Management Network" then "Network Adapters"; you should see the LAN On Motherboard (LOM) ports as Disconnected, and the two VIC Adapter interfaces as Connected. Select one of the VIC Adapter interfaces as the VMKernel Management interface, and de-select all other interfaces.
  - Ensure that "VLAN" is set to "Not set", which means the management traffic is untagged.
  - Statically set the IPv4 Address to 10.0.1.204/24 with Gateway 10.0.1.1.
  - Hit Esc and apply the new network settings.
  - Select "Test Management Network", and ping the VIP of the ACI Leafs, 10.0.1.254. If everything is configured properly, you should have IP connectivity between the ACI Leafs and the C220 Server.
- Establish management connectivity from your jumpbox to the ESXi instance on the C220 server as follows:
  - Configure the NX-OS topology as follows:
    - Create VLAN 10 on your first 5K and both 7Ks, and VLAN 10 SVIs with IP addresses 10.0.1.Y/24, where Y is the device number.
    - Assign VLAN 10 as the access VLAN from your first 5K to your jumpbox.
    - Configure your jumpbox with the IP address 10.0.1.1Y/24, where Y is the server number, and gateway 10.0.1.254.
    - Trunk VLAN 10 between the 5K and 7Ks.
    - Configure trunk ports from your 7Ks to the ACI Leafs, and use VLAN 10 as the Native VLAN.
    - Verify that your 5K and 7Ks see the same STP Root Bridge for VLAN 10, that at least one trunk is in the STP forwarding state towards the ACI Leafs, and that you can ping from your jumpbox to the VLAN 10 SVIs of the 5K and 7Ks.
  - Configure the ACI fabric as follows:
    - From the APIC, run the "Configure an interface, PC, and VPC" Quick Start Wizard under Fabric > Access Policies.
    - Configure a new Switch Profile named "RackX_Leaf_101_102_Profile" which calls both Leafs 101 and 102.
    - Configure a new Interface Selector named "RackX_Leaf_101_102_to_N7KY_N7KZ", where Y and Z are your 7K device numbers, which references all interfaces connecting the ACI Leafs to your 7Ks.
    - Create a new Interface Policy Group for these links with the following attributes:
      - CDP On
      - LLDP On
      - MCP On

- Speed 10GigE
- Reference the same Domain as previously created for the C220 Server.
- Apply your previously created EPG named "RackX_EPG_ESXi_MGMT" to all links from the Leafs towards your 7Ks.
- Once complete, you should be able to ping from your jumpbox to the VIP of the ACI Leafs, 10.0.1.254, and also the C220 ESXi management IP of 10.0.1.204.

Configuration Click to *collapse*

```
apic# show run
<snip>
  vlan-domain Rack1_Domain type phys
    vlan-pool Rack1_VLANs
    vlan 100-199
    exit
  template policy-group Rack1_Trunk_Port_Policy
    cdp enable
    vlan-domain member Rack1_Domain type phys
    speed 10G
    exit
  tenant Rack1_Tenant
    vrf context Rack1_VRF1
      exit
    bridge-domain Rack1_BD110
      vrf member Rack1_VRF1
      exit
    bridge-domain Rack1_BD120
      vrf member Rack1_VRF1
      exit
    application Rack1_AppPro1
      epg Rack1_EPG110
        bridge-domain member Rack1_BD110
        exit
      epg Rack1_EPG120
        bridge-domain member Rack1_BD120
        exit
      exit
    interface bridge-domain Rack1_BD110
      ip address 10.1.10.254/24 secondary
      exit
    interface bridge-domain Rack1_BD120
      ip address 10.1.20.254/24 secondary
      exit
    exit
  leaf-interface-profile Rack1_Leaf101_to_N7K1_IntProfile
    leaf-interface-group Rack1_Leaf101_to_N7K1_IntSelector
      interface ethernet 1/1
      policy-group Rack1_Trunk_Port_Policy
      exit
    exit
  leaf-interface-profile Rack1_Leaf102_to_N7K2_IntProfile
    leaf-interface-group Rack1_Leaf102_to_N7K2_IntSelector
      interface ethernet 1/2
      policy-group Rack1_Trunk_Port_Policy
      exit
    exit
  leaf-profile Rack1_Leaf101_Profile
    leaf-group Rack1_Leaf101
      leaf 101
      exit
    leaf-interface-profile Rack1_Leaf101_to_N7K1_IntProfile
    exit
  leaf-profile Rack1_Leaf102_Profile
    leaf-group Rack1_Leaf102
      leaf 102
      exit
    leaf-interface-profile Rack1_Leaf102_to_N7K2_IntProfile
    exit
```

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