



# Implementing Cisco Application Centric Infrastructure Workbook

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# Cisco ACI Fabric Discovery Lab (DCloud)

## 1. Fabric Discovery

- Click **Begin First Time Setup** to start the Let's Configure the Basics
- Fabric Membership > Click **Begin**
- Right click on switch & click **Register**.
- Assign the parameters from the table below:

Pod ID	Node ID	Switch Name
1	101	GCT-LF-101
1	102	GCT-LF-102
1	201	GCT-SP-201
1	202	GCT-SP-202

- Click **Submit**

## 2. Configure the Basic (BGP Route Reflector)

- BGP > Click **Begin**
- Enter these parameters:
  - AS Number : **65846**
  - Spine 1 : **101**
  - Spine 2 : **102**
- Click **Submit**

## 3. Configure the Basic (NTP)

- NTP > Click **Begin**
- Enter these parameters:
  - IP Address : **198.18.128.1**
  - Preferred : **Check**
- Click **Submit**

## 4. Configure the Basic (DNS)

- DNS > Click **Begin** > Click + On **DNS Server**
- Enter these parameters:
  - IP Address : **198.18.133.1**
  - Preferred : **Check**
  - Search Domain :
    - Name : **dcloud.cisco.com**
    - Default : Check
- Click **Submit**

## 5. Configure the Basic (OOB IP Management)

- Out Of Band Management > Review & Configure > Configure OOB IP's for selected nodes

Configure OOB IP's for selected nodes

Unconfigured Nodes

Select All

Select	ID	Name	Role
<input checked="" type="checkbox"/>	201	Leaf1	leaf
<input checked="" type="checkbox"/>	202	Leaf2	leaf
<input checked="" type="checkbox"/>	101	Spine 1	spine
<input checked="" type="checkbox"/>	102	Spine2	spine

- Enter these parameters :

IPv4 Starting Address	IPv4 Gateway	IPv6 Starting Address	IPv6 Gateway
<input type="text" value="198.18.133.203/18"/> <small>address/mask</small>	<input type="text" value="198.18.128.1"/>	<input type="text"/>	<input type="text"/>

Selected Nodes

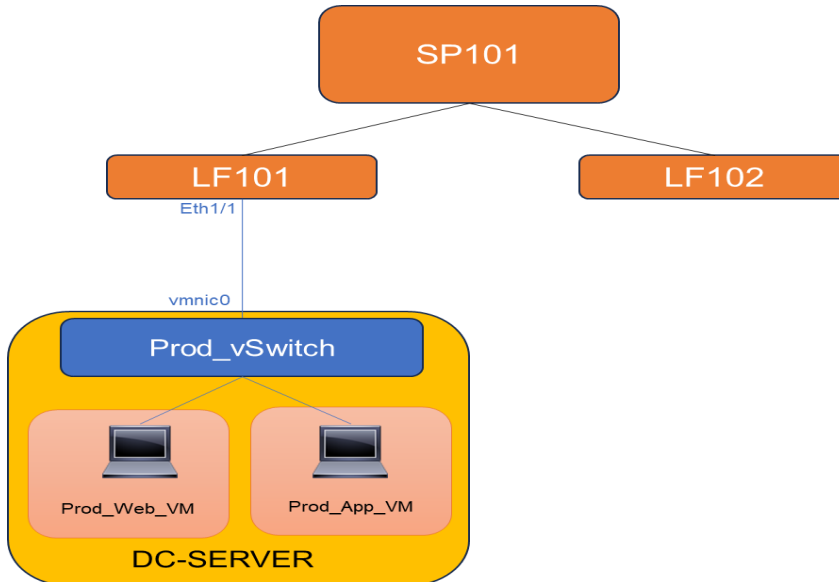
Node Id	Name	IPv4 Address	IPv4 Gateway	IPv6 Address	IPv6 Gateway
201	Leaf1	198.18.133.203/18	198.18.128.1		
202	Leaf2	198.18.133.204/18	198.18.128.1		
101	Spine1	198.18.133.205/18	198.18.128.1		
102	Spine2	198.18.133.206/18	198.18.128.1		

- Click **Submit**

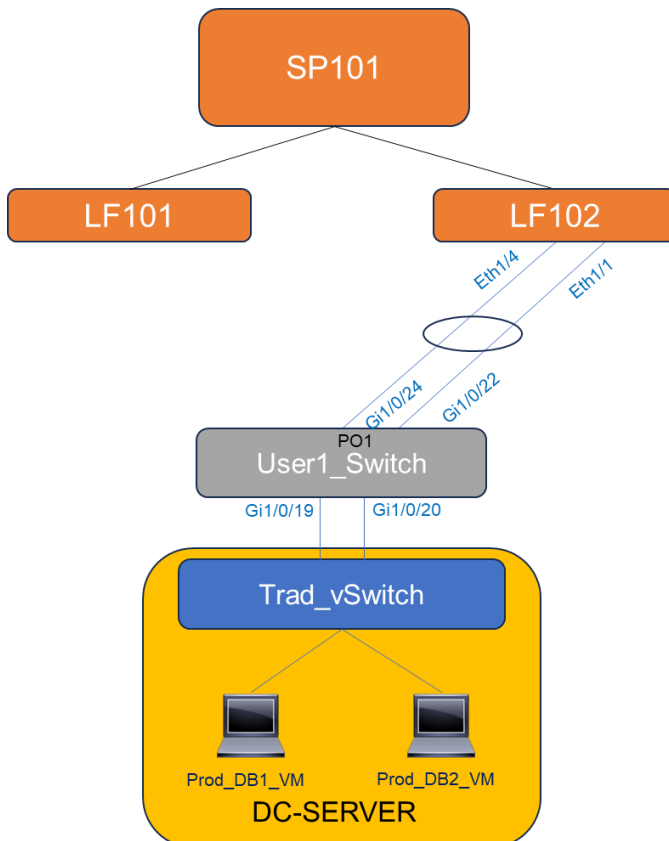
# Cisco ACI Access Policies Provisioning Lab

## 1. Lab Topology

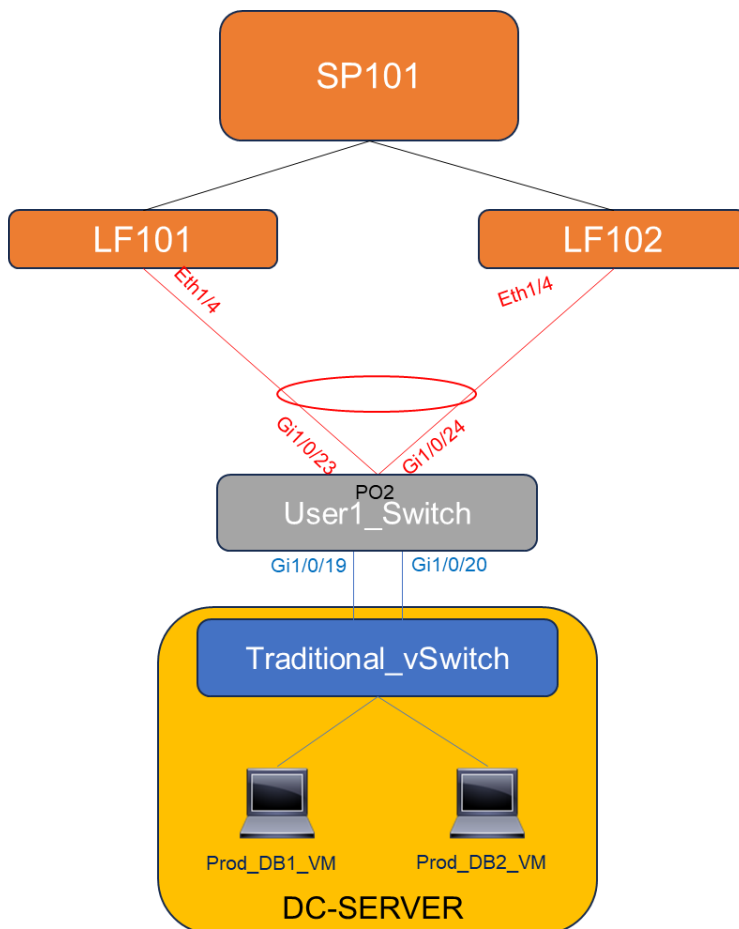
- Access Port Interface



- Port Channel Interface



- **VPC Interface**



## 2. Configure & Verify VLAN Pool

- **Fabric > Access Policies > Pools > VLANs > User-Statics-VLANs-1 >**
- Verify these parameters:
  - Name : **UserX-Static-VLANs-1**
  - Allocation Mode : **Static Allocation**
  - Encap Block (Vlan Range) : **1801-1820**
- **Fabric > Access Policies > Pools > VLANs > User-Statics-VLANs-2 >**
- Verify these parameters:
  - Name : **UserX-Static-VLANs-2**
  - Allocation Mode : **Static Allocation**
  - Encap Block (Vlan Range) : **1821-1830**

### 3. Configure Physical & Layer 3 Out Domain

- **Fabric > Access Policies > Physical & External Domain > Physical Domain > Right – click > Create Physical Domain**

- Enter these parameters:

- Name : **UserX-PhysDom1**
- VLAN Pool : **UserX-Static-VLANs-1**

- Click **Submit**
- 

- **Fabric > Access Policies > Physical & External Domain > L3 Out Domain > Right – click > Create L3 Out Domain**

- Enter these parameters:

- Name : **UserX-L3OutDom2**
- VLAN Pool : **UserX-Static-VLANs-2**

- Click **Submit**

### 4. Configure AAEP

- **Fabric > Access Policies > Policies > Global > Right – Click Attachable Access Entity Profile > Create Attachable Access Entity Profile**

- Enter these parameters:

- Name : **UserX-PhysDom-AAEP**

- Click + On Domain VMM, Physical or External to be associated to interfaces:

- Domain Profile : **UserX-PhysDom1**

- Click **Update > Next > Finish**
- 

- **Fabric > Access Policies > Policies > Global > Right – Click Attachable Access Entity Profile > Create Attachable Access Entity Profile**

- Enter these parameters:

- Name : **UserX-L3OutDom-AAEP**

- Click + On Domain VMM, Physical or External to be associated to interfaces:

- Domain Profile : **UserX-L3OutDom2**

- Click **Update > Next > Finish**

## 5. Configure Interface Policy (CDP)

- **Fabric > Access Policies > Policies > Interface > CDP Interface > Right – Click > Create CDP Interface Policy**
- Policy 1
  - Name : **UserX-CDP-ON**
  - Admin State : **Enabled**
- Click **Submit**

---

- Policy 2
  - Name : **UserX-CDP-OFF**
  - Admin State : **Disabled**
- Click **Submit**

## 6. Configure Interface Policy (LLDP)

- **Fabric > Access Policies > Policies > Interface > LLDP Interface > Right – Click > Create LLDP Interface Policy**
- Policy 1
  - Name : **UserX-LLDP-ON**
  - Transmit : **Enabled**
  - Receive : **Enabled**
- Click **Submit**

---

- Policy 2
  - Name : **UserX-LLDP-OFF**
  - Transmit : **Disabled**
  - Receive : **Disabled**
- Click **Submit**

## 7. Configure Interface Policy (Link Level)

- **Fabric > Access Policies > Policies > Interface > Link Level > Right – Click > Create Link Level Interface Policy**
- Policy 1
  - Name : **UserX-1G-ON**
  - Speed : **1gbps**
- Click **Submit**

---

- Policy 2
  - Name : **UserX-10G-ON**
  - Speed : **10gbps**
- Click **Submit**

## 8. Configure Interface Policy (Port Channel)

- **Fabric > Access Policies > Policies > Interface > Port Channel > Right – Click > Create Port Channel Policy**
- Policy 1
  - Name : **UserX-LACP-ACTIVE**
  - Mode : **LACP-Active**
- Click **Submit**

---

- Policy 2
  - Name : **UserX-LACP-PASSIVE**
  - Mode : **LACP-Passive**
- Click **Submit**

---

- Policy 3
  - Name : **UserX-STATIC-ON**
  - Mode : **Static Channel – Mode On**
- Click **Submit**

## 9. Configure Access Port Policy Group

[Leaf Access Port Connected to vmnic0](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Policy Group > Right Click Leaf Access Port > Create Leaf Access Port Policy Group**
- Enter these parameters:
  - Name : **UserX-1G\_AP\_PG**
  - CDP : **UserX-CDP-ON**
  - LLDP : **UserX-LLDP-ON**
  - Link Level : **UserX-1G-ON**
  - AAEP : **UserX-PhysDom-AAEP**
- Click **Submit**

## 10. Configure Port Channel Policy Group

[Port Channel Connected to UserX-Switch Interface Gi1/0/22 & Gi1/0/24](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Policy Group > PC Interface > Create Port Channel Policy Group**
- Enter these parameters:
  - Name : **UserX-Switch-Po3\_PC\_PG**
  - CDP : **UserX-CDP-ON**
  - LLDP : **UserX-LLDP-OFF**
  - Link Level : **UserX-1G-ON**
  - Port-Channel : **UserX-LACP-ACTIVE**

- AAEP : UserX-PhysDom-AAEP
  - Click **Submit**
- 

## 11. Configure Interface Profile

### Interface Profile for Leaf 101, Leaf 102 & Leaf 101-102

- **Fabric > Access Policies > Interface > Leaf Interfaces > Right Click Profiles > Create Leaf Interface Profile**
- Profile 1:
  - Name : UserX-LF101-IPF
- Click **Submit**
- Profile 2:
  - Name : UserX-LF102-IPF
- Click **Submit**
- Profile 3:
  - Name : UserX-LF101-102-IPF
- Click **Submit**

## 12. Configure Access Port Interface Selector

### Interface Selector for Access Port Interface from Leaf 101 Connected to DC1-SERVER2

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles > UserX-LF101-IPF > Click + on Interface Selector**
- Selector:
  - Name : L101\_Eth1-37
  - Description : Connected to ESXi\_vmnic0
  - Interface ID : 1/37
  - Interface Policy Group : UserX-1G\_AP\_PG
- Click **Submit**

## 13. Configure Port Channel Interface Selector

### Interface Selector for Port Channel Interface from Leaf 102 Connected to UserX-Switch Interface Gi1/0/22 & Gi1/0/24

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles > UserX-LF102-IPF > Click + on Interface Selector**
- Selector:
  - Name : UserX-Switch-Po3

- Description : **Connected to UserX Switch Po1**
- Interface ID : **1/37**
- Interface Policy Group : **UserX-Switch-Po3\_PC\_PG**

- Click **Submit**

[Add More Interface to the Port Channel Policy](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles > UserX-LF102-IPF > UserX-Switch-Po1** Click + on Port Blocks

- Interface ID : **1/40**

- Click **Submit**

## 14. Configure Switch Profile

[Switch Profile for Leaf 101](#)

- **Fabric > Access Policies > Switches > Leaf Switches > Profiles > Right-Click > Create Leaf Profile**

- Profile 1:

- Name : **UserX-LF101-SPF**

- Click + On Leaf Selector

- Leaf Name : **LF101**
- Block : **101**

- Click Next & Select Interface Selector Profiles

- Interface Selector Profiles : **UserX-LF101-IPF**

- Click **Submit**

[Switch Profile for Leaf 102](#)

- **Fabric > Access Policies > Switches > Leaf Switches > Profiles > Right-Click > Create Leaf Profile**

- Profile 1:

- Name : **UserX-LF102-SPF**

- Click + On Leaf Selector

- Leaf Name : **LF102**

- Block : **102**
- Click Next & Select Interface Selector Profiles
  - Interface Selector Profiles : **UserX-LF102-IPF**
- Click **Submit**

Switch Profile for Leaf 101 & 102

- **Fabric > Access Policies > Switches > Leaf Switches > Profiles > Right-Click > Create Leaf Profile**
- Profile 1:
  - Name : **UserX-LF101-102-SPF**
- Click + On Leaf Selector
  - Leaf Name : **LF101-102**
  - Block : **101-102**
- Click Next & Select Interface Selector Profiles
  - Interface Selector Profiles : **UserX-LF101-102-IPF**
- Click **Submit**

## 15. Verify Physical Interface Status

Verify Leaf 101 Interface Eth1/37 status on the ACI Fabric

- **Fabric > Inventory > Pod 1 > DC-LEAF101 > Interfaces > Physical Interface > Eth1/1 >**

Layer 1 Physical Interface Configuration - 101/eth1/1

Operational | Deployed EPGs | VLANs | Stats | QoS Stats | Health | Faults | History

Properties

Description is editable from the Interface Configuration Table, the Interface Selector, or the Override Policy

- Interface: eth1/1
- Description:
- Admin State: Up
- Usage: EPG
- Oper Speed: 1 Gbps
- Oper State: Up
- Oper State Reason: connected
- Backplane Mac: 54:88:DE:90:21:51
- Last Link St Change: 2024-02-05T22:30:05.268-06:00
- Oper Router Mac: 00:00:00:00:00:00
- Oper Mdiix: Auto
- Access VLAN: unknown
- Native VLAN: unknown
- Reset Counter: 18

- Make sure the Admin State & Oper State is Up.

## 16. Configure Port Channel on UserX Switch

### [Port Channel 1 Configuration Script](#)

```
interface GigabitEthernet1/0/22
  channel-group 1 mode active
interface GigabitEthernet1/0/24
  channel-group 1 mode active
```

## 17. Verify Port Channel Interface Status

### [Verify Port Channel Interface status on the ACI Fabric](#)

- **Fabric > Inventory > Pod 1 > DC-LEAF102 > Interfaces > PC Interface > PoXX-UserX-Switch-Po1\_PC\_PG**

Aggregated Interface - po21-User1-Switch-Po1\_PC\_PG

Operational | VLANs | Stats | Health | Faults | History

Properties

Description is editable from the Interface Configuration Table, the Interface Selector, or the Override Policy

Pc Id: po21  
Description:  
Last Bundle Mbr: eth1/1  
Protocol: lacp-active  
Speed: 1 Gbps  
Layer: Switched  
Mode: Trunk  
Oper State: Up ●  
Oper State Reason: connected  
Allowed VLANs:  
Oper Vlan

Show Usage

- Make sure the Oper State is Up.

### [Verify Port Channel Interface status on the UserX Switch](#)

Group	Port-channel	Protocol	Ports
1	Po1(SU)	LACP	Gi1/0/22(P) Gi1/0/24(P)

UserX-Switch#

- Make sure the Port Channel Interface is Up.

## 18. Configure VPC Policy Group

[Virtual Port Channel Connected to UserX-Switch Interface Gi1/0/23 & Gi1/0/24](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Policy Group > VPC Interface > Create VPC Interface Policy Group**
- Enter these parameters:
  - Name : **UserX-Switch-Po4-VPC\_PG**
  - CDP : **UserX-CDP-ON**
  - LLDP : **UserX-LLDP-OFF**
  - Link Level : **UserX-1G-ON**
  - Port-Channel : **UserX-LACP-ACTIVE**
  - AAEP : **UserX-L3OutDom-AAEP**
- Click **Submit**

## 19. Remove Port Channel Interface Selector

[Remove Port Channel Interface from Leaf 102 Connected to UserX-Switch Interface Gi1/0/22 & Gi1/0/24](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles> UserX-LF102-IPF > Right Click UserX-Switch-Po3 > Delete**

## 20. Configure Virtual Port Channel Interface Selector

[Interface Selector for Virtual Port Channel Interface from Leaf 101&102 Connected to UserX-Switch Interface Gi1/0/23 & Gi1/0/24](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles> UserX-LF101-102-IPF > Click + on Interface Selector**
- Selector:
  - Name : **UserX-Switch-Po4\_VPC**
  - Description : **Connected to UserX Switch Po4**
  - Interface ID : **1/40**
  - Interface Policy Group : **UserX-Switch-Po4\_VPC\_PG**
- Click **Submit**

## 21. Configure Port Channel on UserX Switch

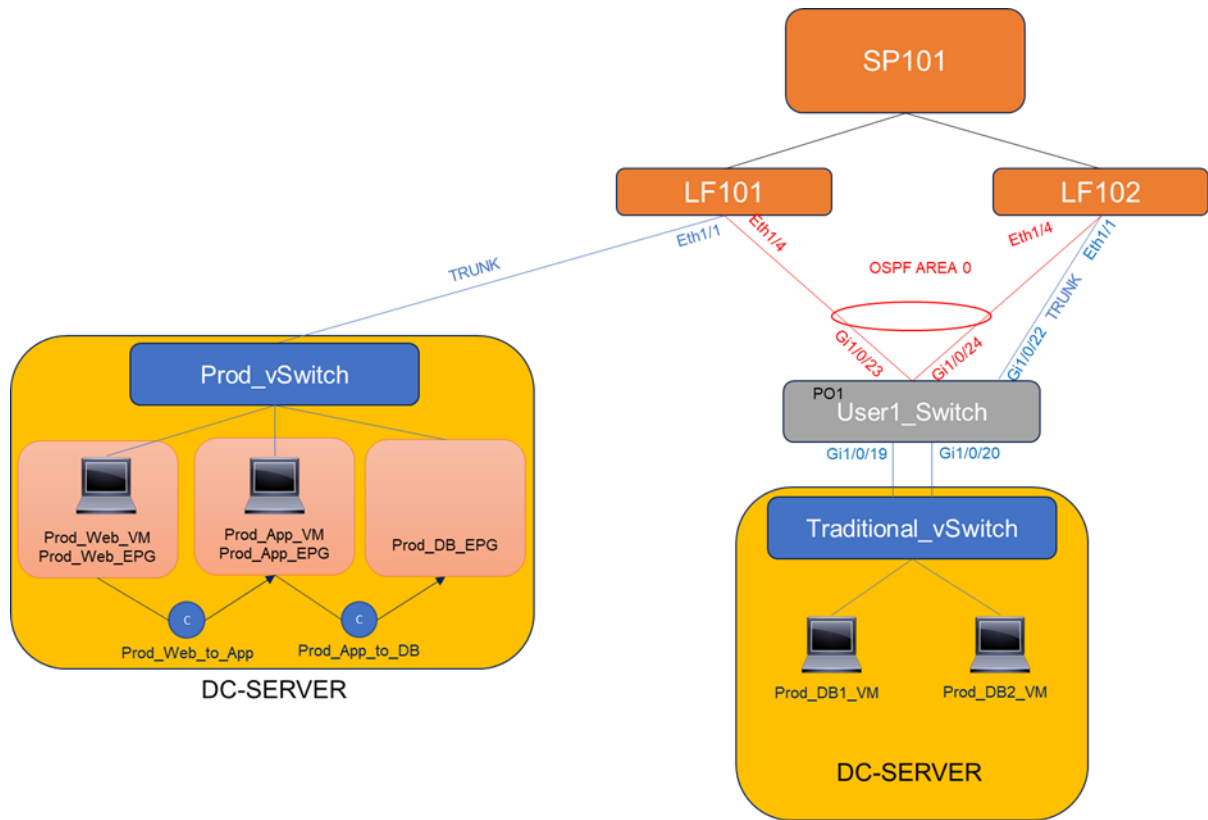
[Port Channel 2 Configuration Script](#)

```
interface GigabitEthernet1/0/23
  channel-group 2 mode active
interface GigabitEthernet1/0/24
  channel-group 2 mode active
```

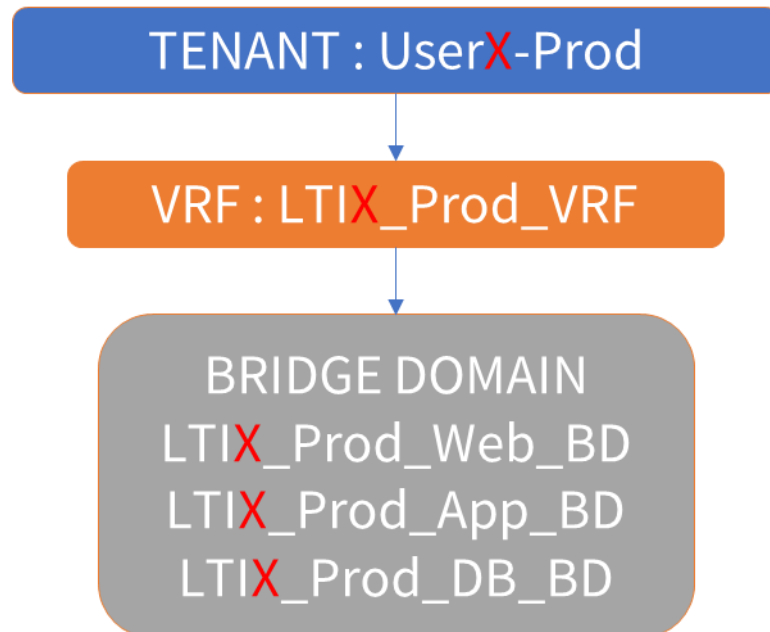


# Cisco ACI Tenant Policies Provisioning Lab

## 1. Lab Topology



## 2. Tenant & Networking Design



### 3. IP Address & VLAN Design

Present Number (X)	Bridge Domain Name	Bridge Domain Gateway (Y)	VM Name	VM IP Address	VLAN
1	GCT1_Prod_Web_BD	10.10.3.1/24	GCT1_Web_VM	10.10.3.10	1803
	GCT1_Prod_App_BD	10.10.4.1/24	GCT1_App_VM	10.10.4.10	1804
	GCT1_Prod_DB_BD	10.10.5.1/24	GCT1_DB1_VM GCT1_DB2_VM	10.10.5.10 10.10.5.11	1805
2	GCT2_Prod_Web_BD	10.10.6.1/24	GCT2_Web_VM	10.10.6.10	1806
	GCT2_Prod_App_BD	10.10.7.1/24	GCT2_App_VM	10.10.7.10	1807
	GCT2_Prod_DB_BD	10.10.8.1/24	GCT2_DB1_VM GCT2_DB2_VM	10.10.8.10 10.10.8.11	1808
3	GCT3_Prod_Web_BD	10.10.9.1/24	GCT3_Web_VM	10.10.9.10	1809
	GCT3_Prod_App_BD	10.10.10.1/24	GCT3_App_VM	10.10.10.10	1810
	GCT3_Prod_DB_BD	10.10.11.1/24	GCT3_DB1_VM GCT3_DB2_VM	10.10.11.10 10.10.11.11	1811
4	GCT4_Prod_Web_BD	10.10.12.1/24	GCT4_Web_VM	10.10.12.10	1812
	GCT4_Prod_App_BD	10.10.13.1/24	GCT4_App_VM	10.10.13.10	1813
	GCT4_Prod_DB_BD	10.10.14.1/24	GCT4_DB1_VM GCT4_DB2_VM	10.10.14.10 10.10.14.11	1814
5	GCT5_Prod_Web_BD	10.10.15.1/24	GCT5_Web_VM	10.10.15.10	1815
	GCT5_Prod_App_BD	10.10.16.1/24	GCT5_App_VM	10.10.16.10	1816
	GCT5_Prod_DB_BD	10.10.17.1/24	GCT5_DB1_VM GCT5_DB2_VM	10.10.17.10 10.10.17.11	1817
6	GCT6_Prod_Web_BD	10.10.18.1/24	GCT6_Web_VM	10.10.18.10	1818
	GCT6_Prod_App_BD	10.10.19.1/24	GCT6_App_VM	10.10.19.10	1819
	GCT6_Prod_DB_BD	10.10.20.1/24	GCT6_DB1_VM GCT6_DB2_VM	10.10.20.10 10.10.20.11	1820

### 4. Configure VRF

[Configure VRF Based on Participant Present Number \(X is Participant Present Number\)](#)

- **Tenant > UserX-Prod > Networking > Right-Click VRFs > Create VRF**
- Enter these parameters:
  - Name : **GCTX\_Prod\_VRF**
  - Create a Bridge Domain : **Uncheck**
- Click **Submit**

### 5. Configure Bridge Domain

[Configure L3 Bridge Domain Based on Provided Design](#)

- **Tenant > UserX-Prod > Networking > Right-Click Bridge Domain > Create Bridge Domain**
- Bridge Domain 1:

- Name : **GCTX\_Prod\_Web\_BD**
- VRF : **GCTX\_Prod\_VRF**
- Subnets/GW : **10.X.Y.1/24**

- Click **Submit**
- 

- Bridge Domain 2:
  - Name : **GCTX\_Prod\_App\_BD**
  - VRF : **GCTX\_Prod\_VRF**
  - Subnets/GW : **10.X.Y.1/24**

- Click **Submit**
- 

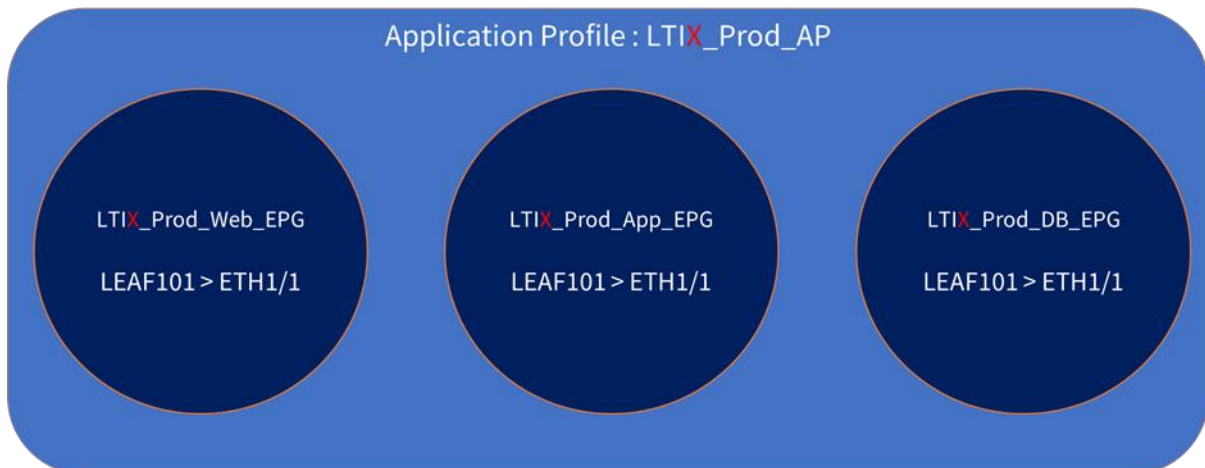
Configure L2 Bridge Domain Based on Provided Design

- **Tenant > UserX-Prod > Networking > Right-Click Bridge Domain > Create Bridge Domain**

- Bridge Domain 3:
  - Name : **GCTX\_Prod\_DB\_BD**
  - VRF : **GCTX\_Prod\_VRF**
  - L2 Unknown Unicast : **Flood**
  - Arp Flooding : **Check**
  - Unicast Routing : **Uncheck**

- Click **Submit**

## 6. Application Profile & EPG Design



## 7. Configure Application Profile & EPG

### Configure Application Profile Based on Provided Design

- **Tenant > UserX-Prod > Networking > Right-Click Application Profile > Create Application Profile**
  - Enter the parameter:
    - Name : **GCTX\_Prod\_AP**
  - Click **Submit**
- 

### Configure Endpoint Group Based on Provided Design

- **Tenant > UserX-Prod > Application Profiles > GCTX\_Prod\_AP > Application EPGs > Right-Click > Create Application EPG**
  - Endpoint Group 1:
    - Name : **GCTX\_Prod\_Web\_EPG**
    - Bridge Domain : **GCTX\_Prod\_Web\_BD**
  - Click **Submit**
- 

- Endpoint Group 2:
    - Name : **GCTX\_Prod\_App\_EPG**
    - Bridge Domain : **GCTX\_Prod\_App\_BD**
  - Click **Submit**
- 

- Endpoint Group 3:
  - Name : **GCTX\_Prod\_DB\_EPG**
  - Bridge Domain : **GCTX\_Prod\_DB\_BD**
- Click **Submit**

## 8. Configure Physical Domain On EPG

### Configure Domain on EPGs to Connect Tenant & Fabric Policies

- **Tenant > UserX-Prod > Application Profiles > GCTX\_Prod\_AP > Application EPGs > <EPG Name> Domain > Right-Click > click Add Physical Domain Association**
  - Endpoint Group 1:
    - Application EPG : **GCTX\_Prod\_Web\_EPG**
    - Domain : **UserX-PhysDom1**
  - Click **Submit**
- 

- Endpoint Group 2:

- Name : **GCTX\_Prod\_App\_EPG**
- Domain : **UserX-PhysDom1**
- Click **Submit**

- Endpoint Group 3:
  - Name : **GCTX\_Prod\_DB\_EPG**
  - Domain : **UserX-PhysDom1**
- Click **Submit**

## 9. Configure Static Ports On EPG

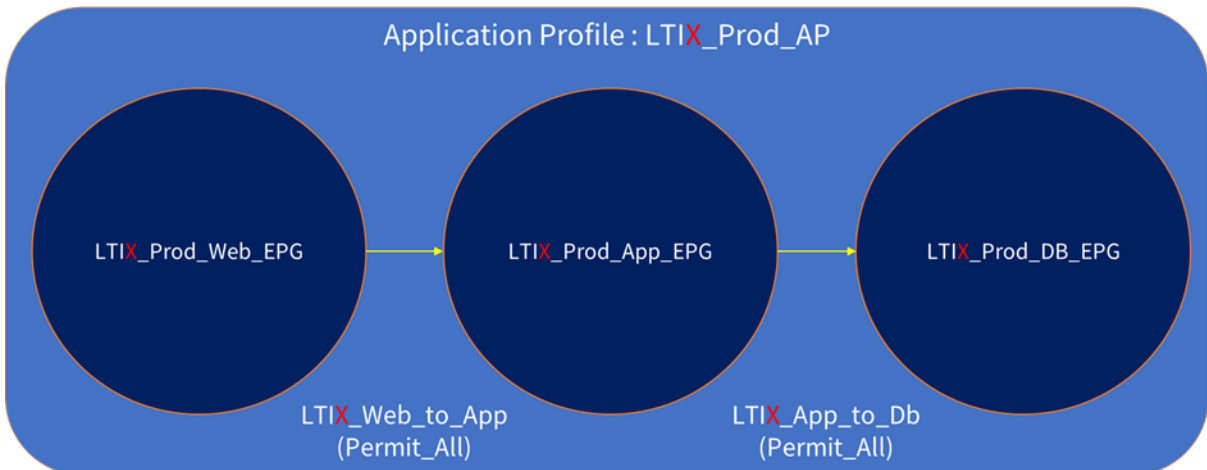
[Configure Static Ports on EPGs to Allow VLAN on Leaf Interfaces](#)

- **Tenant > UserX-Prod > Application Profiles GCTX\_Prod\_AP > Application EPGs > <EPG Name> Static Ports > Right-Click > Deploy Static EPG on PC, VPC, or Interface**

EPG	Port Type	Node/Interface	VLAN	Mode
GCTX_Prod_Web_EPG	Access	101/Eth1/37	Y	Trunk
GCTX_Prod_App_EPG	Access	101/Eth1/37	Y	Trunk

- Click **Submit**

## 10. Contract Design



## 11. Configure Contract

[Configure Contract to allow communication from GCTX\\_Prod\\_Web\\_EPG to GCTX\\_Prod\\_App\\_EPG & GCTX\\_Prod\\_App\\_EPG to GCTX\\_Prod\\_DB\\_EPG](#)

- **Tenant > UserX-Prod > Contracts > Standard > Right-Click > Create Contract**
- Contract 1:

- Contract Name : **GCTX\_Web\_to\_App**
  - Subject Name : **GCTX\_Web\_to\_App**
  - Filter:
    - Name : **GCTX-Permit-All**
    - Ether type : **unspecified**
    - Source Port/Range : **unspecified/unspecified**
    - Destination Port/Range : **unspecified/unspecified**
  - Click **Submit**
- 
- Contract 2:
    - Contract Name : **GCTX\_App\_to\_DB**
    - Subject Name : **GCTX\_App\_to\_DB**
    - Filter:
      - Name : **GCTX-Permit-All**
      - Ether type : **unspecified**
      - Source Port/Range : **unspecified/unspecified**
      - Destination Port/Range : **unspecified/unspecified**
  - Click **Submit**

## 12. Associate Contract to EPGs

[Associate Contract to EPGs to allow communication from GCTX Prod Web EPG to GCTX Prod App EPG](#)

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_Web\_EPG > Contract > Right-Click > Add Consumed Contract**
  - Select these parameters:
    - Contract Name : **GCTX\_Web\_to\_App**
  - Click **Submit**
- 
- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_App\_EPG > Contract > Right-Click > Add Provided Contract**
  - Select these parameters:
    - Contract Name : **GCTX\_Web\_to\_App**
  - Click **Submit**

[Associate Contract to EPGs to allow communication from GCTX Prod App EPG to GCTX Prod DB EPG](#)

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_App\_EPG > Contract > Right-Click > Add Consumed Contract**
- Select these parameters:
  - Contract Name : **GCTX\_App\_to\_DB**
- Click **Submit**

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_DB\_EPG > Contract > Right-Click > Add Consumed Contract**
- Select these parameters:
  - Contract Name : **GCTX\_App\_to\_DB**
- Click **Submit**

### 13. Verify Connectivity Between Endpoints

[Verify connectivity from the VMs to the Gateway](#)

- **On ESXi > Virtual Machine > (VM Names) > Console > Open Browser Console > CTRL+ALT+T > ping 10.X.Y.1**
  - **GCTX\_Prod\_Web**

The screenshot shows a terminal window titled "LTI1\_Prod\_Web" with the following content:

```

student@student-virtual-machine: ~
student@student-virtual-machine:~$
student@student-virtual-machine:~$ ping 10.1.3.1
PING 10.1.3.1 (10.1.3.1) 56(84) bytes of data:
64 bytes from 10.1.3.1: icmp_seq=1 ttl=64 time=0.337 ms
64 bytes from 10.1.3.1: icmp_seq=2 ttl=64 time=0.558 ms
64 bytes from 10.1.3.1: icmp_seq=3 ttl=64 time=0.559 ms
64 bytes from 10.1.3.1: icmp_seq=4 ttl=64 time=0.463 ms
64 bytes from 10.1.3.1: icmp_seq=5 ttl=64 time=0.458 ms
64 bytes from 10.1.3.1: icmp_seq=6 ttl=64 time=0.382 ms
64 bytes from 10.1.3.1: icmp_seq=7 ttl=64 time=0.476 ms
64 bytes from 10.1.3.1: icmp_seq=8 ttl=64 time=0.519 ms
64 bytes from 10.1.3.1: icmp_seq=9 ttl=64 time=0.496 ms
64 bytes from 10.1.3.1: icmp_seq=10 ttl=64 time=0.529 ms
64 bytes from 10.1.3.1: icmp_seq=11 ttl=64 time=0.528 ms
64 bytes from 10.1.3.1: icmp_seq=12 ttl=64 time=0.550 ms
64 bytes from 10.1.3.1: icmp_seq=13 ttl=64 time=0.525 ms
64 bytes from 10.1.3.1: icmp_seq=14 ttl=64 time=0.601 ms
  
```

- **GCTX\_Prod\_App**

```

student@student-virtual-machine: ~
PING 10.1.4.1 (10.1.4.1) 56(84) bytes of data:
64 bytes from 10.1.4.1: icmp_seq=1 ttl=64 time=0.442 ms
64 bytes from 10.1.4.1: icmp_seq=2 ttl=64 time=0.423 ms
64 bytes from 10.1.4.1: icmp_seq=3 ttl=64 time=0.465 ms
64 bytes from 10.1.4.1: icmp_seq=4 ttl=64 time=0.344 ms
64 bytes from 10.1.4.1: icmp_seq=5 ttl=64 time=0.434 ms
64 bytes from 10.1.4.1: icmp_seq=6 ttl=64 time=0.400 ms
64 bytes from 10.1.4.1: icmp_seq=7 ttl=64 time=0.524 ms
64 bytes from 10.1.4.1: icmp_seq=8 ttl=64 time=0.528 ms
64 bytes from 10.1.4.1: icmp_seq=9 ttl=64 time=0.482 ms
^C
--- 10.1.4.1 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8193ms
rtt min/avg/max/mdev = 0.344/0.449/0.528/0.056 ms
student@student-virtual-machine: ~$

```

Verify that endpoint ip addresses are learned on endpoint table of cisco ACI fabric.

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_Web\_EPG > Operational**

MAC/IP	Endpoint Name	Learning Source	Hosting Server	Reporting Interface Controller Name	Encap	ESG	Policy Tags
00:50:56:9E:20:50 10.1.3.10		learned		Pod-1/Node-101/...	vlan-3		

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_App\_EPG > Operational**

MAC/IP	Endpoint Name	Learning Source	Hosting Server	Reporting Interface Controller Name	Encap	ESG	Policy Tags
00:50:56:9E:14:E1 10.1.4.10		learned		Pod-1/Node-101/...	vlan-4		

Verify connectivity between VM Web to App

- **On ESXi > Virtual Machine > (VM Names) > Console > Open Browser Console > CTRL+ALT+T > ping 10.X.Y.10**

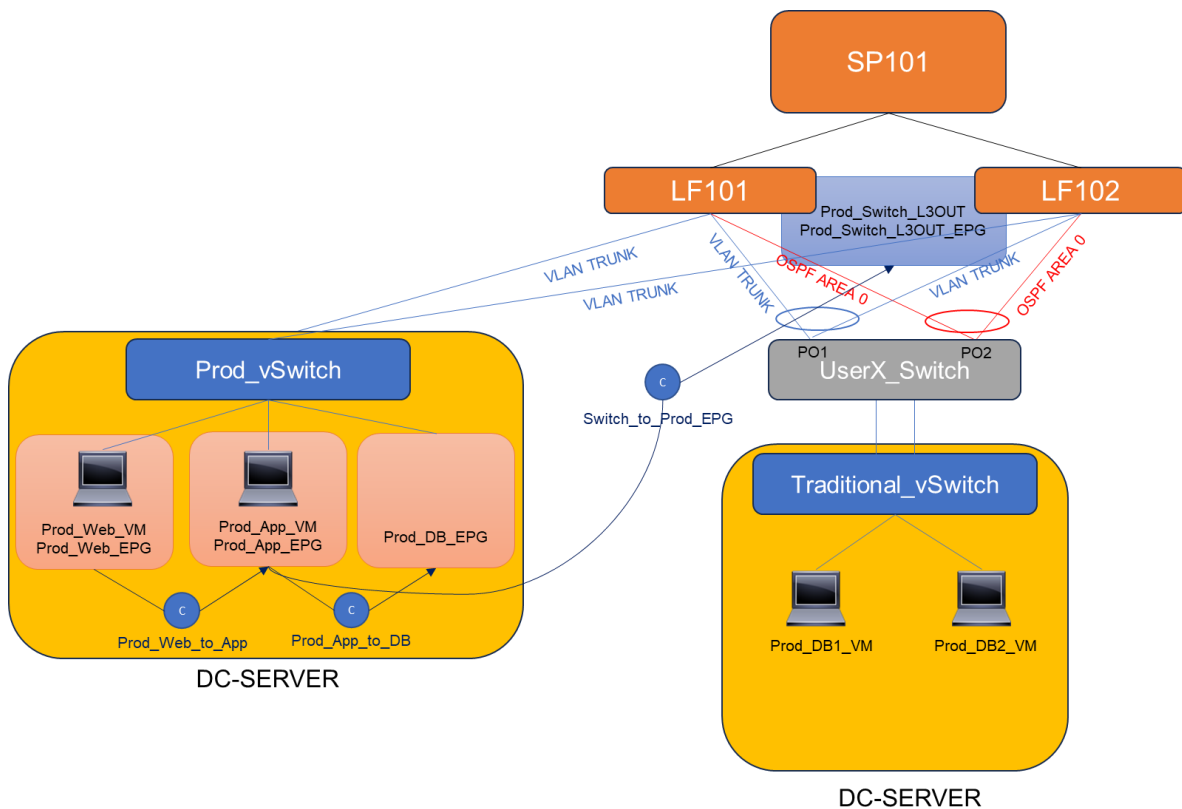
```

LTI1_Prod_Web
Activities Terminal Kam 11:36
student@student-virtual-machine: ~
student@student-virtual-machine:~$
student@student-virtual-machine:~$ ping 10.1.4.10
PING 10.1.4.10 (10.1.4.10) 56(84) bytes of data:
64 bytes from 10.1.4.10: icmp_seq=1 ttl=63 time=0.505 ms
64 bytes from 10.1.4.10: icmp_seq=2 ttl=63 time=0.661 ms
64 bytes from 10.1.4.10: icmp_seq=3 ttl=63 time=0.590 ms
64 bytes from 10.1.4.10: icmp_seq=4 ttl=63 time=0.864 ms
64 bytes from 10.1.4.10: icmp_seq=5 ttl=63 time=0.651 ms
64 bytes from 10.1.4.10: icmp_seq=6 ttl=63 time=0.796 ms
64 bytes from 10.1.4.10: icmp_seq=7 ttl=63 time=0.773 ms
64 bytes from 10.1.4.10: icmp_seq=8 ttl=63 time=0.822 ms
64 bytes from 10.1.4.10: icmp_seq=9 ttl=63 time=0.524 ms
64 bytes from 10.1.4.10: icmp_seq=10 ttl=63 time=0.466 ms
64 bytes from 10.1.4.10: icmp_seq=11 ttl=63 time=0.582 ms
64 bytes from 10.1.4.10: icmp_seq=12 ttl=63 time=0.599 ms
64 bytes from 10.1.4.10: icmp_seq=13 ttl=63 time=0.676 ms
64 bytes from 10.1.4.10: icmp_seq=14 ttl=63 time=0.840 ms

```

# Cisco ACI External Connectivity - Layer 3 Out Lab

## 1. Lab Topology



## 2. Configure OSPF Layer 3 Out Over VPC

### Configure OSPF L3Out on UserX-Prod Tenant on your created VRF to Allow Communication to UserX-Switch

- **Tenant > UserX-Prod > Networking > Right Click L3Outs > Create L3Out**
- Enter these parameters.:
  - Name : **GCTX\_Trad\_Switch\_L3OUT**
  - VRF : **GCTX\_Prod\_VRF**
  - L3 Domain : **UserX-L3OutDom2**
  - OSPF : **Checked**
  - Area ID : **0**
  - Area Type : **Regular Area**
- Click **Next to Continue**

---

### Configure Nodes & Interfaces Profile for selected node that will running the L3 Out

- Enter these parameters for Nodes and Interfaces Profile:
  - Layer 3 Interface : **SVI**
  - Layer 2 Interface : **Virtual Port Channel**
  - Address Type : **IPv4**
  - Path : **UserX-Switch\_Po4\_VPC\_PG**
  - Encap VLAN : **182X**
  - MTU : **1500**
  - Node 101 Router ID : **192.168.2X.253**
  - IP Address Primary : **192.168.2X.1/29**
  - IP Address Secondary : **192.168.2X.3/29**
  - Node 102 Router ID : **192.168.2X.254**
  - IP Address Primary : **192.168.2X.2/29**
  - IP Address Secondary : **192.168.2X.3/29**
- Click **Next to Continue**

---

### Configure OSPF Interface Policy to Change OSPF Interface Mode to Broadcast

- Select Drop Down on Policy & Create OSPF Interface Policy
- Enter these parameters:
  - Name : **GCTX\_OSPF\_Broadcast**
  - Network Type : **Broadcast**
- Click **Next to Continue**

---

### Configure L3 Out External EPG to Classify Incoming Subnet as an External EPG

- Enter these parameters for External EPG:

- Name : **GCTX\_Trad\_Switch\_L3OUT\_EPG**
- Default EPG for all External Network : **Uncheck**
- Click + On Subnet & Enter these parameters:
  - IP Address : **0.0.0.0/1**
  - External EPG Classification : **External Subnet for External EPG**
  - IP Address : **128.0.0.0/1**
  - External EPG Classification : **External Subnet for External EPG**
- Click **OK & Finish to Continue**

### 3. Configure Contract

[Configure Contract to allow communication from GCT-Prod Switch L3Out to GCTX Prod App EPG](#)

- **Tenant > UserX-Prod > Contracts > Standard > Right-Click > Create Contract**
- Contract 1:
  - Contract Name : **GCTX\_Trad\_Switch\_to\_Prod\_EPG**
  - Subject Name : **GCTX\_Trad\_Switch\_to\_Prod\_EPG**
  - Filter:
    - Name : **Permit-All**
- Click **Submit**

### 4. Associate Contract to EPG

[Associate Contract to allow communication from GCT-Prod Switch L3Out to GCTX Prod App EPG](#)

- **Tenant > UserX-Prod > Networking > L3Outs > GCTX\_Trad\_Switch\_L3Out > External EPGs > GCTX\_Trad\_Switch\_L3Out\_EPG > Contract > Add Consumed Contract**
  - Select these parameters:
    - Contract Name : **GCTX\_Switch\_to\_Prod\_EPG**
  - Click **Submit**
- 
- **Tenant > UserX-Prod > Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_App\_EPG > Contract > Right-Click > Add Provided Contract**
  - Select these parameters:
    - Contract Name : **GCTX\_Switch\_to\_Prod\_EPG**

- Click **Submit**

## 5. Advertise Bridge Domain Subnet to L3Out

[Configure Bridge Domain to advertise subnet to GCTX Trad Switch L3OUT](#)

- **Tenant > UserX-Prod > Networking > Bridge Domain > <BD Name> Policy > L3 Configuration > Click on Subnet**

- **GCTX\_Prod\_Web\_BD:**
  - Scope : **Advertise Externally**
  - Associated L3 Out : **GCTX\_Trad\_Switch\_L3OUT**

- Click **Submit**

- 
- **GCTX\_Prod\_App\_BD:**
    - Scope : **Advertise Externally**
    - Associated L3 Out : **GCTX\_Trad\_Switch\_L3OUT**

- Click **Submit**

## 6. Verify L3Out Configuration

[Verify OSPF Neighborhood On UserX-Switch](#)

- **On UserX-Switch > show ip ospf neighbor**

```
User1-Switch#show ip ospf neighbor
Neighbor ID      Pri   State           Dead Time   Address        Interface
10.1.23.253      1    FULL/BDR        00:00:35   10.1.23.1     Vlan23
10.1.23.254      1    FULL/DR         00:00:32   10.1.23.2     Vlan23
10.1.22.253      1    FULL/BDR        00:00:35   10.1.22.1     Vlan22
10.1.22.254      1    FULL/DR         00:00:34   10.1.22.2     Vlan22
10.1.21.253      1    FULL/BDR        00:00:36   10.1.21.1     Vlan21
10.1.21.254      1    FULL/DR         00:00:38   10.1.21.2     Vlan21
User1-Switch#
```

[Verify routes advertised to UserX-Switch](#)

- **On UserX-Switch > show ip route vrf GCTX**

```

User1-Switch#show ip route vrf LTI2

Routing Table: LTI2
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is not set

    10.0.0.0/8 is variably subnetted, 6 subnets, 4 masks
S       10.1.0.0/16 [1/0] via 192.168.32.1
O E2    10.1.7.0/24 [110/20] via 10.1.22.2, 00:03:38, Vlan22
         [110/20] via 10.1.22.1, 00:03:38, Vlan22

```

### Verify connectivity between VM App to DB

- **On ESXi > Virtual Machine > (VM Names) > Console > Open Browser Console > CTRL+ALT+T > ping 10.X.Y.10 & 10.X.Y.11**

The screenshot shows a terminal window titled "LTI2\_Prod\_App" with a terminal icon. The terminal output shows the following commands and results:

```

student@student-virtual-machine: ~
ping: 10.1.8.10: name or service not known
student@student-virtual-machine:~$ ping 10.1.8.10
PING 10.1.8.10 (10.1.8.10) 56(84) bytes of data:
64 bytes from 10.1.8.10: icmp_seq=1 ttl=63 time=0.541 ms
64 bytes from 10.1.8.10: icmp_seq=2 ttl=63 time=0.761 ms
^C
--- 10.1.8.10 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1030ms
rtt min/avg/max/mdev = 0.541/0.651/0.761/0.110 ms
student@student-virtual-machine:~$ ping 10.1.8.11
PING 10.1.8.11 (10.1.8.11) 56(84) bytes of data:
64 bytes from 10.1.8.11: icmp_seq=1 ttl=60 time=0.801 ms
64 bytes from 10.1.8.11: icmp_seq=2 ttl=60 time=0.842 ms
64 bytes from 10.1.8.11: icmp_seq=3 ttl=60 time=0.836 ms
64 bytes from 10.1.8.11: icmp_seq=4 ttl=60 time=0.744 ms
64 bytes from 10.1.8.11: icmp_seq=5 ttl=60 time=0.782 ms

```





## 2. Configure Layer 2 Out Domain

- **Fabric > Access Policies > Physical & External Domain > External Bridged Domain > Right – click > Create External Bridged Domain**
- Enter these parameters:
  - Name : **UserX-L2OutDom1**
  - VLAN Pool : **UserX-Static-VLANs-1**
- Click **Submit**

## 3. Configure AAEP

- **Fabric > Access Policies > Policies > Global > Right – Click Attachable Access Entity Profile > Create Attachable Access Entity Profile**
- Enter these parameters:
  - Name : **UserX-L2OutDom-AAEP**
- Click + On Domain VMM, Physical or External to be associated to interfaces:
  - Domain Profile : **UserX-L2OutDom1**
- Click **Update > Next > Finish**

## 4. Configure Access Port Policy Group

[Leaf Access Port Connected to UserX-Switch Gi1/0/22](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Policy Group > Right Click Leaf Access Port > Create Leaf Access Port Policy Group**
- Enter these parameters:
  - Name : **UserX- L2OUT\_AP\_PG**
  - CDP : **UserX-CDP-ON**
  - LLDP : **UserX-LLDP-ON**
  - Link Level : **UserX-1G-ON**
  - AAEP : **UserX-L2OutDom-AAEP**
- Click **Submit**

## 5. Configure Interface Policy Group on Existing Access Port Interface Selector

[Interface Selector for Access Port Interface from Leaf 102 Connected to UserX-Switch Interface Gi1/0/22](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles > UserX-LF102-IPF > L102\_Eth1-37 > Interface Policy Group**

- Selector: **L102\_Eth1-37**
  - Interface Policy Group : **UserX-L2OUT\_AP\_PG**
- Click **Submit**

## 6. Configure Layer 2 Out

- **Tenant > UserX-Prod > Networking > Right Click on L2Outs > Create L2Outs >**
- Enter these parameters:
  - Name : **GCTX\_Trad\_Switch\_VLAN\_Y\_L2OUT**
  - External Bridged Domain : **UserX-L2OutDom1**
  - Bridged Domain : **GCTX\_Prod\_DB\_BD**
  - Encap VLAN : **Y**
  - Path Type : **Port**
  - Node : **DC1-LEAF-102**
  - Path : **Eth1/37**
- Click **Add > Next > Click + On External EPG Networks**
- Enter these parameters:
  - Name : **GCTX\_Trad\_Switch\_VLAN\_Y\_L2OUT\_EPG**
- Click **OK**

## 7. Configure Contract

[Configure Contract to allow communication from GCTX\\_Prod\\_DB\\_EPG to : GCTX\\_Trad\\_Switch\\_VLAN\\_Y\\_L2OUT\\_EPG](#)

- **Tenant > UserX-Prod > Contracts > Standard > Right-Click > Create Contract**
- Contract 1:
  - Contract Name : **GCTX\_Prod\_DB\_to\_Trad\_DB**
  - Subject Name : **GCTX\_Prod\_DB\_to\_Trad\_DB**
  - Filter:
    - Name : **GCTX-Permit-All**
    - Ethertype : **unspecified**
    - Source Port/Range : **unspecified/unspecified**
    - Destination Port/Range : **unspecified/unspecified**
- Click **Submit**

## 8. Associate Contract to EPGs

Configure Contract to allow communication from GCTX\_Prod\_DB\_EPG to :  
GCTX\_Trad\_Switch\_VLAN\_Y\_L2OUT\_EPG

- **Tenant > UserX-Prod > Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_DB\_EPG > Contract > Right-Click > Add Consumed Contract**
- Select these parameters:
  - Contract Name : **GCTX\_Prod\_DB\_to\_Trading\_DB**
- Click **Submit**

- 
- **Tenant > UserX-Prod > Networking > L2Outs > GCTX\_Trad\_Switch\_L2OUT > External EPGs > GCTX\_Trad\_Switch\_L2OUT\_EPG > Contracts > Click + On Provided Contracts**
  - Select these parameters:
    - Contract Name : **GCTX\_Prod\_DB\_to\_Trading\_DB**
  - Click **Update**

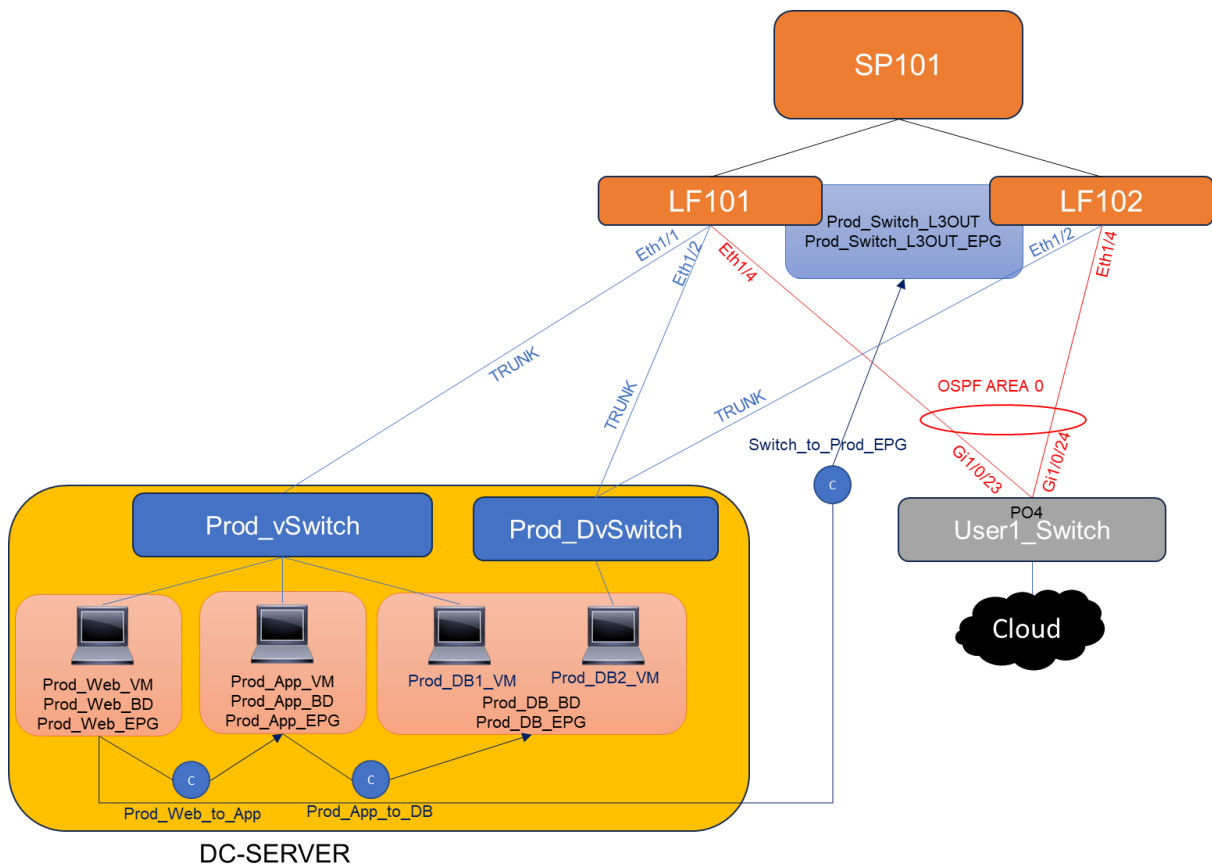
## 9. Configure Subnet on Bridge Domain

Configure Subnet On GCTX\_Prod\_DB\_BD to Move VM Gateway to Cisco ACI Leaves

- **Tenant > UserX-Prod > Networking > Bridge Domain > GCTX\_Prod\_DB\_BD Policy > L3 Configuration > Click on Subnet**
- Modify these parameters:
  - Forwarding : **Optimize**
  - Unicast Routing : **Check**
  - Subnets/GW : **10.X.Y.1/24**
- Click **Submit**

# Cisco ACI VMM Integration Lab

## 1. Lab Topology



## 2. Configure & Verify VLAN Pool

- **Fabric > Access Policies > Pools > VLANs > User-Statics-VLANs-1 >**
- Verify these parameters:
  - Name : **UserX-VMM-VLANs-1**
  - Allocation Mode : **Dynamic Allocation**
  - Encap Block (Vlan Range) : **1901-2000**

## 3. Configure VMM Domain

- **Virtual Networking > VMware > Right Click on VMware > Create vCenter Domain**
- Enter these parameters:
  - Name : **UserX-VMM1**
  - Virtual Switch : **VMware vSphere Distributed Switch**
  - VLAN Pool : **UserX-VMM-VLANs-1**

#### 4. Configure AAEP

- Click **Dropdown on AAEP > Create Attachable Access Entity Profile**
- Enter these parameters:

- Name : **UserX-VMMDom-AAEP**

- Click **Next > Finish**

#### 5. Configure vCenter Credential

- Click **+ On vCenter Credential**
- Enter these parameters:

- Name : **UserX-vCenter-Credential**
- Username : **[administrator@UserX.local](#)**
- Password : **\*\*\*\*\***
- Confirm Password : **\*\*\*\*\***

- Click **OK**

#### 6. Configure vCenter

- Click **+ On vCenter**
- Enter these parameters:

- Name : **UserX-vCenter**
- Hostname : **192.168.X.170**
- Data Center : **DC1**
- Associated Credential : **UserX-vCenter-Credential**

- Click **OK**

#### 7. Configure vSwitch

- Enter these parameters:

- Number Of Uplink : **2**
- Port Channel Policy : **MAC-Pinning +**
- vSwitch Policy : **CDP**

- Click **Submit**

## 8. Configure Access Port Policy Group

[Leaf Access Port Connected to DC1-SERVER ESXi vmnic4 & vmnic5](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Policy Group > Right Click Leaf Access Port > Create Leaf Access Port Policy Group**
- Enter these parameters:
  - Name : **UserX- VMM\_AP\_PG**
  - CDP : **UserX-CDP-ON**
  - LLDP : **UserX-LLDP-ON**
  - Link Level : **UserX-1G-ON**
  - AAEP : **UserX-VMMDom-AAEP**
- Click **Submit**

## 9. Configure Access Port Interface Selector

[Interface Selector for Access Port Interface from Leaf 101 Connected to DC1-SERVER ESXi vmnic4](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles > UserX-LF101-IPF > Click + on Interface Selector**
- Selector:
  - Name : **L101\_Eth1-38**
  - Description : **Connected to DC1-SERVER vmnic4**
  - Interface ID : **1/38**
  - Interface Policy Group : **UserX-VMM\_AP\_PG**
- Click **Submit**

-----  
[Interface Selector for Access Port Interface from Leaf 102 Connected to DC1-SERVER ESXi vmnic5](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles > UserX-LF102-IPF > Click + on Interface Selector**
- Selector:
  - Name : **L102\_Eth1-38**
  - Description : **Connected to DC1-SERVER vmnic5**
  - Interface ID : **1/38**
  - Interface Policy Group : **UserX-VMM\_AP\_PG**
- Click **Submit**

## 10. Configure VMM Domain On EPG

### Configure VMM Domain On EPGs to Push Port Group to vCenter

- **Tenant > UserX-Prod > Application Profiles > GCTX\_Prod\_AP > Application EPGs > <EPG Name> Domain > Right-Click > click Add VMM Domain Association**
- Endpoint Group 1:
  - Application EPG : **GCTX\_Prod\_Web\_EPG**
  - Domain : **UserX-VMMDom1**
- Click **Submit**

---

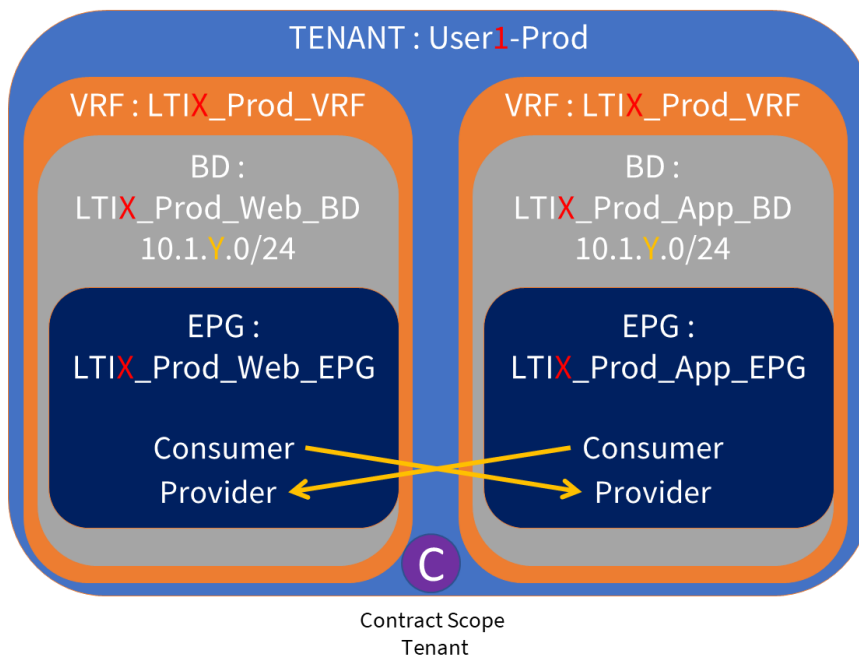
- Endpoint Group 2:
  - Name : **GCTX\_Prod\_App\_EPG**
  - Domain : **UserX-VMMDom1**
- Click **Submit**

---

- Endpoint Group 3:
  - Name : **GCTX\_Prod\_DB\_EPG**
  - Domain : **UserX-VMMDom1**
- Click **Submit**

## Cisco ACI VRF Route Leaking Lab

### 1. Lab Topology



## 2. Leaking Scenario

From EPG	From VRF	To EPG	To VRF	Contract Name
GCT1_Prod_Web_EPG	GCT1_Prod_VRF	GCT2_Prod_App_EPG	GCT2_Prod_VRF	GCT12_Web_to_App_Inter_VRF
GCT2_Prod_Web_EPG	GCT2_Prod_VRF	GCT1_Prod_App_EPG	GCT1_Prod_VRF	GCT21_Web_to_App_Inter_VRF
GCT3_Prod_Web_EPG	GCT3_Prod_VRF	GCT4_Prod_App_EPG	GCT4_Prod_VRF	GCT34_Web_to_App_Inter_VRF
GCT4_Prod_Web_EPG	GCT4_Prod_VRF	GCT3_Prod_App_EPG	GCT3_Prod_VRF	GCT43_Web_to_App_Inter_VRF
GCT5_Prod_Web_EPG	GCT5_Prod_VRF	GCT1_Prod_App_EPG	GCT1_Prod_VRF	GCT51_Web_to_App_Inter_VRF
GCT1_Prod_Web_EPG	GCT1_Prod_VRF	GCT5_Prod_App_EPG	GCT5_Prod_VRF	GCT15_Web_to_App_Inter_VRF

## 3. Modify Bridge Domain Configuration

[Configure Bridge Domain to leak subnets between VRFs \(GCT1 <> GCT2, GCT3 <> GCT4, GCT5 <> GCT6\)](#)

- **Tenant > UserX-Prod > Networking > Bridge Domain > <BD Name> Policy > L3 Configuration > Click on Subnet**
- **GCTX\_Prod\_Web\_BD:**
  - Scope : **Shared Between VRF**
- Click **Submit**
- 
- **GCTX\_Prod\_App\_BD:**
  - Scope : **Shared Between VRF**
- Click **Submit**

## 4. Configure Contract

[Configure Contract to allow communication from GCTX\\_Prod\\_Web\\_EPG to GCTX\\_Prod\\_App\\_EPG on different VRFs](#)

- **Tenant > UserX-Prod > Contracts > Standard > Right-Click > Create Contract**
- Contract 1:
  - Contract Name : **GCTXX\_Web\_to\_App\_Inter\_VRF**
  - Scope : **Tenant**
  - Subject Name : **GCTXX\_Web\_to\_App\_Inter\_VRF**
  - Filter:
    - Name : **GCTXX-Permit-All**
    - Ethertype : **unspecified**
    - Source Port/Range : **unspecified/unspecified**
    - Destination Port/Range : **unspecified/unspecified**
- Click **Submit**

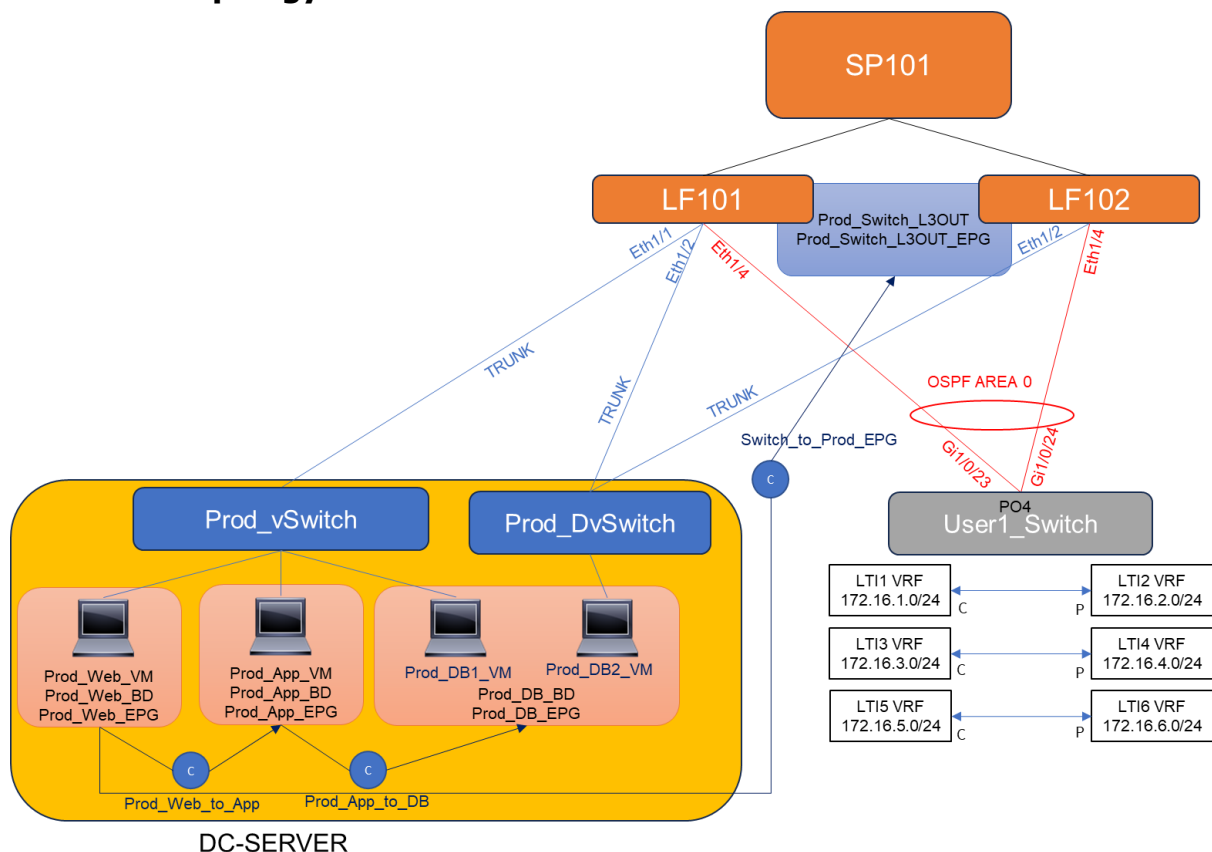
## 5. Associate Contract to EPGs

[Associate Contract to EPGs to allow communication from GCTX\\_Prod\\_Web\\_EPG to GCTX\\_Prod\\_App\\_EPG on different VRFs](#)

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_Web\_EPG > Contract > Right-Click > Add Consumed Contract**
  - Select these parameters:
    - Contract Name : **GCTXX\_Web\_to\_App\_Inter\_VRF**
  - Click **Submit**
- 
- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_App\_EPG > Contract > Right-Click > Add Provided Contract**
  - Select these parameters:
    - Contract Name : **GCTXX\_Web\_to\_App\_Inter\_VRF**
  - Click **Submit**

## Cisco ACI Transit Routing VRF Route Leaking Lab

### 1. Lab Topology



## 2. Configure L3Out External EPG

[Configure L3Out External EPG to import subnet from UserX-Switch prefix on different VRF](#)

- **Tenant > UserX-Prod > Networking > L3Outs > GCTX-Prod\_Switch\_L3Out > External EPGs > GCTX-Prod\_Switch\_L3Out\_EPG > Click + On Subnet**
- Enter these parameters:
  - IP Address : **172.16.Y.0/24**
  - Shared Route Control Subnet : **Checked**
  - Shared Security Import Subnet : **Checked**
  - External Subnet For External EPG : **Checked**
- Click **Submit**

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[Configure L3Out External EPG to export subnet into UserX-Switch prefix on different VRF](#)

- **Tenant > UserX-Prod > Networking > L3Outs > GCTX-Prod\_Switch\_L3Out > External EPGs > GCTX-Prod\_Switch\_L3Out\_EPG > Click + On Subnet**
- Enter these parameters:
  - IP Address : **172.16.Y.0/24**
  - Export Route Control Subnet : **Checked**
- Click **Submit**

## 3. Configure Contract

[Configure Contract to allow communication from GCTX Trad Switch L3OUT to GCTX Trad Switch L3OUT on different VRFs](#)

- **Tenant > UserX-Prod > Contracts > Standard > Right-Click > Create Contract**
- Contract 1:
  - Contract Name : **GCTXX\_L3OUT\_to\_L3OUT\_Inter\_VRF**
  - Scope : **Tenant**
  - Subject Name : **GCTXX\_L3OUT\_to\_L3OUT\_Inter\_VRF**
  - Filter:
    - Name : **GCTXX-Permit-All**
    - Ethertype : **unspecified**
    - Source Port/Range : **unspecified/unspecified**
    - Destination Port/Range : **unspecified/unspecified**
- Click **Submit**

## 4. Associate Contract to L3Out External EPG

[Associate Contract to allow communication from GCTX Trad Switch L3OUT to GCTX Trad Switch L3OUT on different VRFs](#)

- **Tenant > UserX-Prod > Networking > L3Outs > GCTX-Prod\_Switch\_L3Out > External EPGs > GCTX-Prod\_Switch\_L3Out\_EPG > Contract > Add Consumed Contract**
- Select these parameters:
  - Contract Name : **GCTX\_L3OUT\_to\_L3OUT\_Inter\_VRF**
- Click **Submit**

---

- **Tenant > UserX-Prod > Networking > L3Outs > GCTX-Prod\_Switch\_L3Out > External EPGs > GCTX-Prod\_Switch\_L3Out\_EPG > Contract > Add Provided Contract**
- Select these parameters:
  - Contract Name : **GCTX\_L3OUT\_to\_L3OUT\_Inter\_VRF**
- Click **Submit**

## Cisco ACI vzAny Contract Lab

### 1. Configure Contract

[Configure new contract for vzany](#)

- **Tenant > UserX-Prod > Contracts > Standard > Right-Click > Create Contract**
- Contract 1:
  - Contract Name : **GCTX\_VZANY**
  - Subject Name : **GCTX\_VZANY**
  - Filter:
    - Name : **GCTX-Permit-All**
    - Ethertype : **unspecified**
    - Source Port/Range : **unspecified/unspecified**
    - Destination Port/Range : **unspecified/unspecified**
- Click **Submit**

## 2. Remove Associated Contract from EPGs

Remove Associated Contract from EPGs and we will use vzany for contract relation

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_Web\_EPG > Contract > Right-Click GCTX\_Web\_to\_App**
- Click **Delete**

---

- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_App\_EPG > Contract > Right-Click GCTX\_Web\_to\_App**
- Click **Delete**

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- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_App\_EPG > Contract > Right-Click GCTX\_App\_to\_DB**
- Click **Delete**

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- **Tenant > UserX-Prod> Application Profiles > GCTX\_Prod\_AP > Application EPGs > GCTX\_Prod\_DB\_EPG > Contract > Right-Click GCTX\_App\_to\_DB**
- Click **Delete**

## 3. Configure vzAny Contract Relation

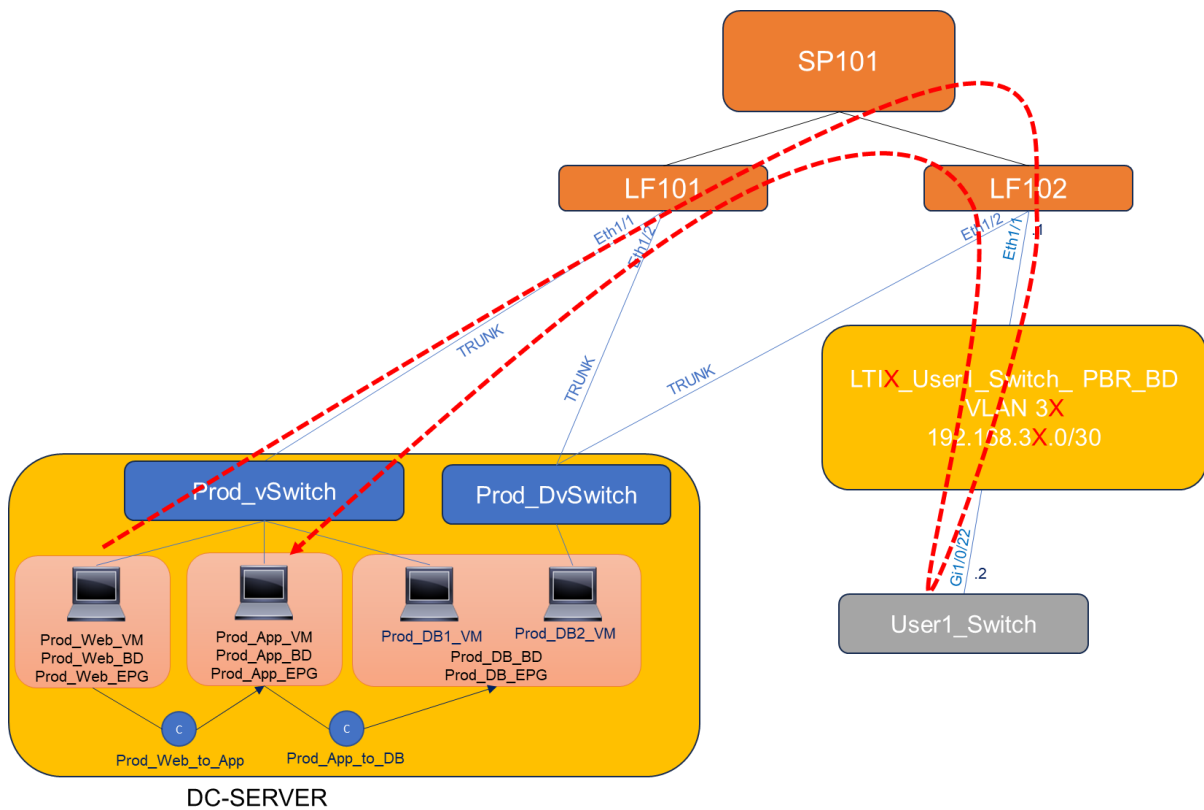
- **Tenant > UserX-Prod> Networking > VRFs > GCTX\_VRF > EPG Collection for VRF > Click + On Provided Contract**
- Select the Contract:
  - Contract Name : **GCTX\_VZANY**
- Click **Update**

---

- **Tenant > UserX-Prod> Networking > VRFs > GCTX\_VRF > EPG Collection for VRF > Click + On Consumed Contract**
- Select the Contract :
  - Contract Name : **GCTX\_VZANY**
- Click **Update**

# Cisco ACI Service Graph PBR One Arm Mode Lab

## 1. Lab Topology



## 2. Configure & Verify VLAN Pool

- **Fabric > Access Policies > Pools > VLANs > User-Statics-VLANs-3 >**
- Verify these parameters:
  - Name : **UserX-Static-VLANs-3**
  - Allocation Mode : **Static Allocation**
  - Encap Block (Vlan Range) : **31-40**

## 3. Configure Physical Domain

- **Fabric > Access Policies > Physical & External Domain > Physical Domain > Right – click > Create Physical Domain**
- Enter these parameters:
  - Name : **UserX-PhysDom3**
  - VLAN Pool : **UserX-Static-VLANs-3**
- Click **Submit**

#### 4. Configure Domain on Existing AAEP

- **Fabric > Access Policies > Policies > Global > Attachable Access Entity Profile > UserX-PhysDom-AAEP**
- Click + On Domain VMM, Physical or External to be associated to interfaces:
  - Domain Profile : **UserX-Physdom3**
- Click **Update**

#### 5. Modify Existing Access Port Interface Selector

[Interface Selector for Access Port Interface from Leaf 102 Connected to UserX-Switch Interface Gi1/0/22](#)

- **Fabric > Access Policies > Interface > Leaf Interfaces > Profiles > UserX-LF102-IPF > L102\_Eth1-1**
- Selector:
  - Interface Policy Group : **UserX-1G\_AP\_PG**
- Click **Submit**

#### 6. Configure Bridge Domain For PBR

[Configure L3 Bridge Domain For P2P Connection Between UserX-Switch & Leaves](#)

- **Tenant > UserX-Prod > Networking > Right-Click Bridge Domain > Create Bridge Domain**
- Bridge Domain:
  - Name : **GCTX\_PBR\_UserX-SW\_BD**
  - VRF : **GCTX\_Prod\_VRF**
  - Subnets/GW : **192.168.3X.1/30**
- Click **Submit**

#### 7. Configure L4-L7 Redirect Policy

- **Tenant > UserX-Prod > Policies > Protocol > Right Click L4-L7 Policy Based Redirect > Create L4-L7 Policy Based Redirect**
- Enter these parameters:
  - Name : **GCTX\_PBR\_UserX-SW\_Policy**
- Click + On L3 Destination:
  - IP : **192.168.3X.2**
  - MAC : **UserX-Switch Interface VLAN 3X Mac Address**
- Click **Submit**

## 8. Configure L4-L7 Devices

- **Tenant > UserX-Prod > Services > L4-L7 > Right Click Devices > Create L4-L7 Devices**
- Enter these parameters:
  - Name : **GCTX\_PBR\_UserX-SW**
  - Service Type : **Other**
  - Device Type : **Physical**
  - Physical Domain : **UserX-PhysDom3**
  - Function Type : **GoTo**
- Concrete Device:
  - Device Name : **GCTX\_PBR\_UserX-SW**
  - Interface Name : **GCTX\_PBR\_UserX-SW\_INTF**
  - Path : **102/Eth1-1**
- Cluster Interface:
  - Name : **GCTX\_prod\_pbr**
  - Concrete Interface : **102/Eth1-1**
  - Name : **GCTX\_prod\_pbr**
  - Vlan : **vlan-3X**
- Click **Submit**

## 9. Configure L4-L7 Service Graph Template

- **Tenant > UserX-Prod > Services > L4-L7 > Right Click Service Graph Template > Create L4-L7 Service Graph Template**
- Enter these parameters:
  - Service Graph Name : **GCTX\_PBR\_UserX-SW\_SG**
  - Device : **GCTX\_PBR\_UserX-SW**
  - Function Node Name : **GCTX\_PBR**
  - Route Redirect : **True/Checked**
- Click **Submit**

## 10. Configure L4-L7 Device Selection Policy

- **Tenant > UserX-Prod > Services > L4-L7 > Right Click Devices Selection Policies > Create Logical Device Context**
- Enter/Select these parameters:
  - Contract Name : **GCTX\_VZANY**
  - Graph Name : **GCTX\_PBR\_UserX-SW\_SG**
  - Node Name : **GCTX\_PBR\_UserX-SW**
  - Device : **GCTX\_PBR\_UserX-SW**

- Click + On Cluster Interface Context & Enter these parameters:
  - Connector Name : consumer
  - Cluster Interface : **GCTX\_prod\_pbr**
  - Associated Bridge Domain : **GCTX\_PBR\_UserX-SW\_BD**
  - L4-L7 Policy Based Redirect : **GCTX\_PBR\_UserX-SW\_Policy**

- Click **OK**

- 
- Click + On Cluster Interface Context & Enter these parameters:
    - Connector Name : provider
    - Cluster Interface : **GCTX\_prod\_pbr**
    - Associated Bridge Domain : **GCTX\_PBR\_UserX-SW\_BD**
    - L4-L7 Policy Based Redirect : **GCTX\_PBR\_UserX-SW\_Policy**

- Click **OK** & Click **Submit**

## **11. Associate Service Graph Policy to Contract Subject**

- **Tenant > UserX-Prod > Contract > Standard > GCTX\_VZANY > Subject > GCTX\_VZANY > Click on L4-L7 Service Graph**

- Select parameters:
  - Service Graph Name : **GCTX\_PBR\_UserX-SW\_SG**

- Click **Submit**