

TechCast



طريقك لاحتراق التقنية

CCIE Enterprise Infrastructure v1.0

SD-Access
<https://www.techcast.io>

Topology	4
1 SD-Access Network Preparation.....	6
1.1 Lab 01 – Configuring DNAC & ISE Integration	6
1.2 Lab 02 – Border Node Initial Configuration.....	9
1.3 Lab 03 – Fusion Node Initial Configuration	11
2 DNAC Design.....	14
2.1 Lab 04 – Network Hierarchy – Site & Building.....	14
2.2 Lab 05 – Servers Configuration – AAA, DHCP, DNS & NTP	17
2.3 Lab 06 – Device Credentials	19
2.4 Lab 07 – IP Address Pools – Underlay & Overlay.....	21
3 Fabric Network Infrastructure –Underlay Manual Configuration	23
3.1 Lab 08 – Configure IP Addresses	23
3.2 Lab 09 – Configure IGP Protocol - OSPF	27
3.3 Lab 10 – Device Discovery & Provisioning.....	29
4 Fabric Network Infra – LAN Automation	31
4.1 Lab 11 – DNAC Discovery - Discover Seed Device (Border).....	31
4.2 Lab 12 – DNAC Provisioning - Assign Seed Device (Border) to HQ Site	34
4.3 Lab 13 – DNAC Provisioning – Enable LAN Automation & Fabric Discovery	35
4.4 Lab 14 – DNAC Provisioning – Provision Fabric Devices to HQ Site.....	38
5 Configure Fabric Network Itself.....	39
5.1 Lab 15 – Configuring Fabric – HQ Site – Under/Overlay IP Pool Reservation.....	39
5.2 Lab 16 – Configuring Fabric – HQ Site – Create Fabric VNs.....	43
5.3 Lab 17 – Configuring Fabric–HQ Site–Create L3HANDOFF/Transit Network	44
5.4 Lab 18 – Configuring Fabric – HQ Site – Configuring Host Onboarding.....	45
5.5 Lab 19 – Configuring Fabric – HQ Site – Provision Control/Border (Roles)	48
5.6 Lab 20 – Configuring Fabric – HQ Site – Provision Fabric Edges Nodes.....	50
5.7 Lab 21 – Fusion and Border Nodes Configuration Matching.....	52
6 MACRO Segmentation	56
6.1 Lab 22 – ISE Configuration – Users & Groups Creation	56
6.2 Lab 23 – ISE Configuration – Authorization Profiles for DNAC VNs.....	58
6.3 Lab 24 – ISE Configuration – Authorization Policies for DNAC VNs.....	60
6.4 Lab 25 – Verifying MACRO Segmentation	63
7 MICRO Segmentation	69

7.1	Lab 26 – DNAC Configuration – Create SGTs	69
7.2	Lab 27 – ISE Configuration – Reconfigure Authorization Policies by SGTs	71
7.3	Lab 28 – DNAC Configuration – Block Communications between SGTs	73
7.4	Lab 29 – DNAC Configuration – Creating Customer SG ACL Contract	75
7.5	Lab 30 – DNAC Configuration – Applying & Verifying Custom SG ACL	77
7.6	Lab 31 – DNAC Configuration – L2HANDOFF	79
7.7	Lab 32 – DNAC Configuration – Templates Configurations	82

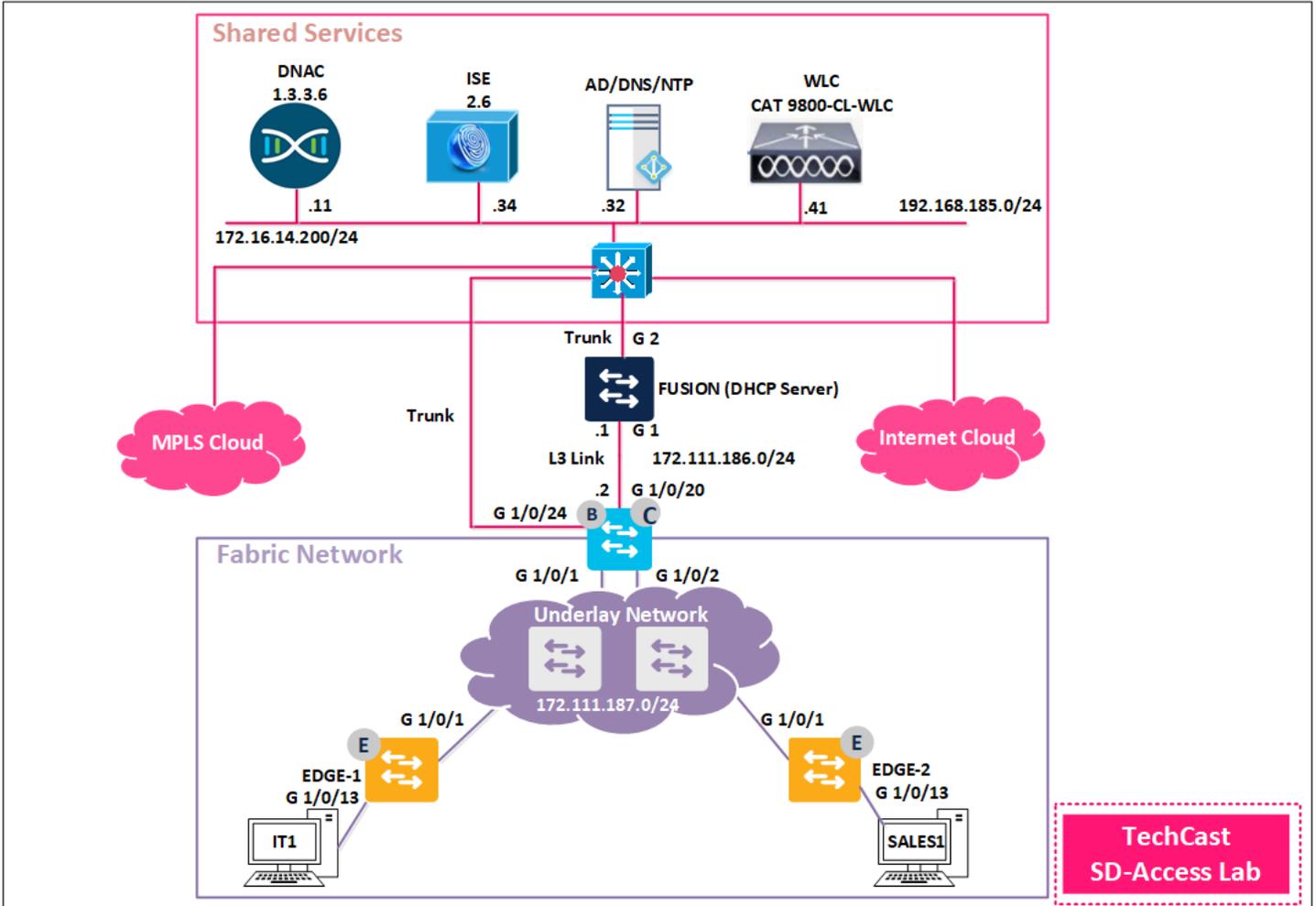
The above table of content is the exact workbook outlines!

هذه قائمة المحتوى الفعلي للكتاب العملي لهذه الدورة!

All below sections are sample of how our workbooks looks like!

هذا الملف يحتوي على أمثلة مقتبسة من الكتاب العملي الفعلي!

Topology

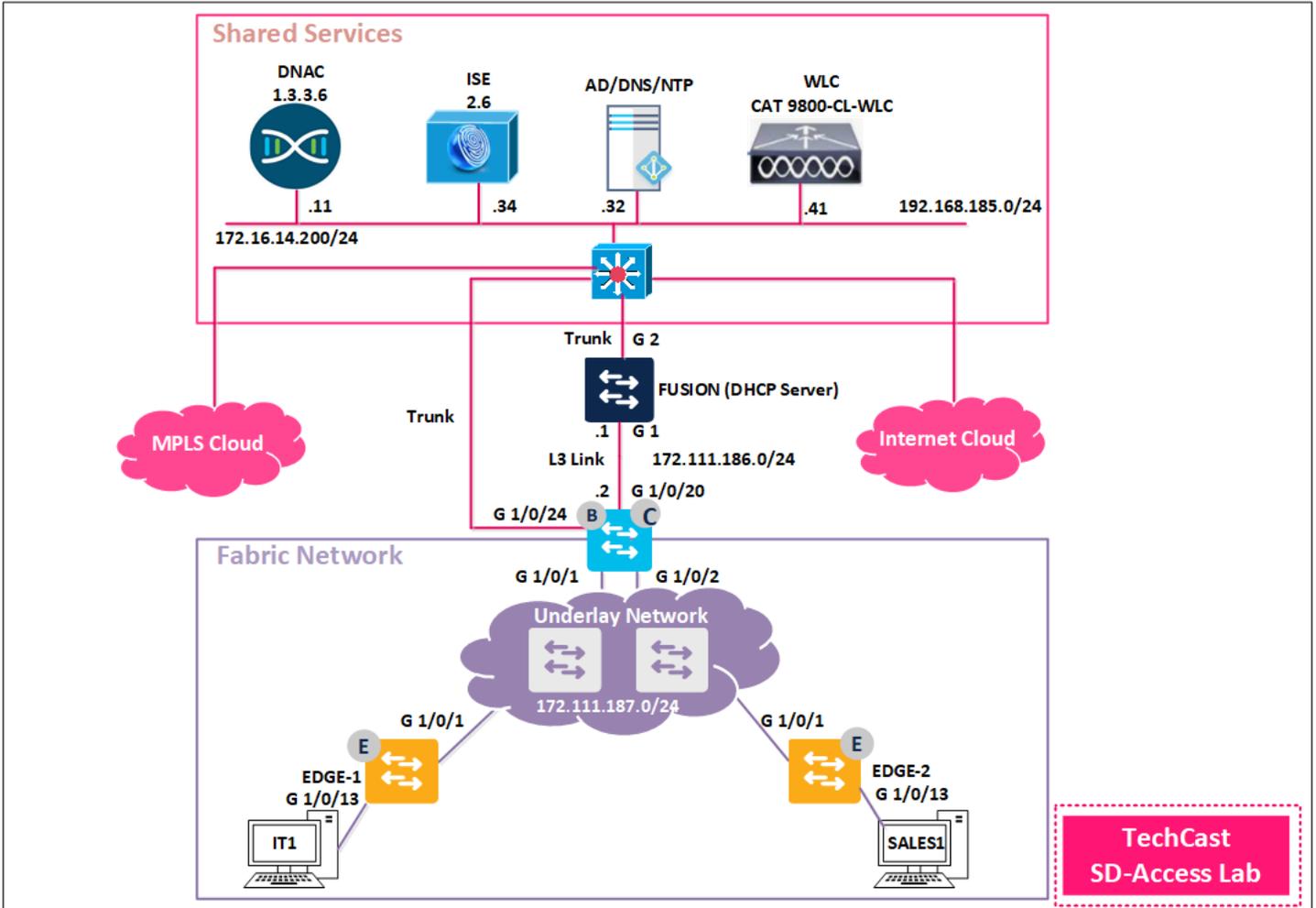


Subnets	Interface & IPv4 Address	Device	Gateway IPv4 Address
Shared Services Network	Ent. 172.16.14.200/24 192.168.185.11/24	DNAC	172.16.14.1
	G 0 192.168.185.34	ISE	192.168.185.1
	192.168.185.32	DNS/NTP/AD	192.168.185.1
Fusion Node			
Border Node	G 1/0/20 172.111.186.0/24	To Fusion Node G1	L3 Link
	G 1/0/24	To Core SW-To Fusion	Trunk (L3HANDOFF)

	G 1/0/1	To Edge-1	Edge-1's G 1/0/1
	G 1/0/2	To Edge-2	Edge-2's G 1/0/1
Fabric Edge-1	G 1/0/1	To Border	Border's G 1/0/1
	G 1/0/13	To IT1-Wired PC	-
Fabric Edge-2	G 1/0/1	To Border	Border's G 1/0/2
	G 1/0/13	To SALES1-Wired PC	-
SDA Fabric Network			

1 SD-Access Network Preparation

1.1 Lab 01 – Configuring DNAC & ISE Integration



Before we start integration between DNAC and ISE; we need to enable few services such as REST API and PxGRID services. In addition, because of the lab only we need to suppress few RADIUS services. According to that, we will configure integration between them and migrate the policies.

1.1.1 Step 1 – Disable RADIUS services on ISE (Not in Production Network)

Radius



- Uncheck the following services.
 - *“Reject RADIUS requests from clients with repeated failures”*
 - *“Suppress repeated failed clients”*
 - *“Suppress repeated successful authentications”*
- Click **“Save”**

1.1.2 Step 2 – Enable REST API and PxGRID Services on ISE

ERS



- Check *“Enable for ERS for Read/Write”*
- Click **“Save”**

PxGrid



- Check *“Enable for PxGrid”*
- Click **“Save”**

1.1.3 Step 3 – Configure ISE’s parameters in DNAC to establish communication.



- Click **“Add”**
 - Server IP Address: 192.168.185.34
 - Shared Secret: Cisco@123
 - Cisco ISE Server: Slide to Enable
 - Username: admin
 - Password: 1234QWer
 - FQDN: ISE.sda.local (**copy it from ISE**).
 - Subscriber Name: DNAC-TechCast (**this name will appear for DNAC in ISE**).

- Click **“Apply”**

1.1.4 Step 4 – Verify and Approve the Integration on ISE



- Click **“Approve All”**
- You should see this green color message on the left bottom corner **“Connected via XMPP ISE.sda.local”**

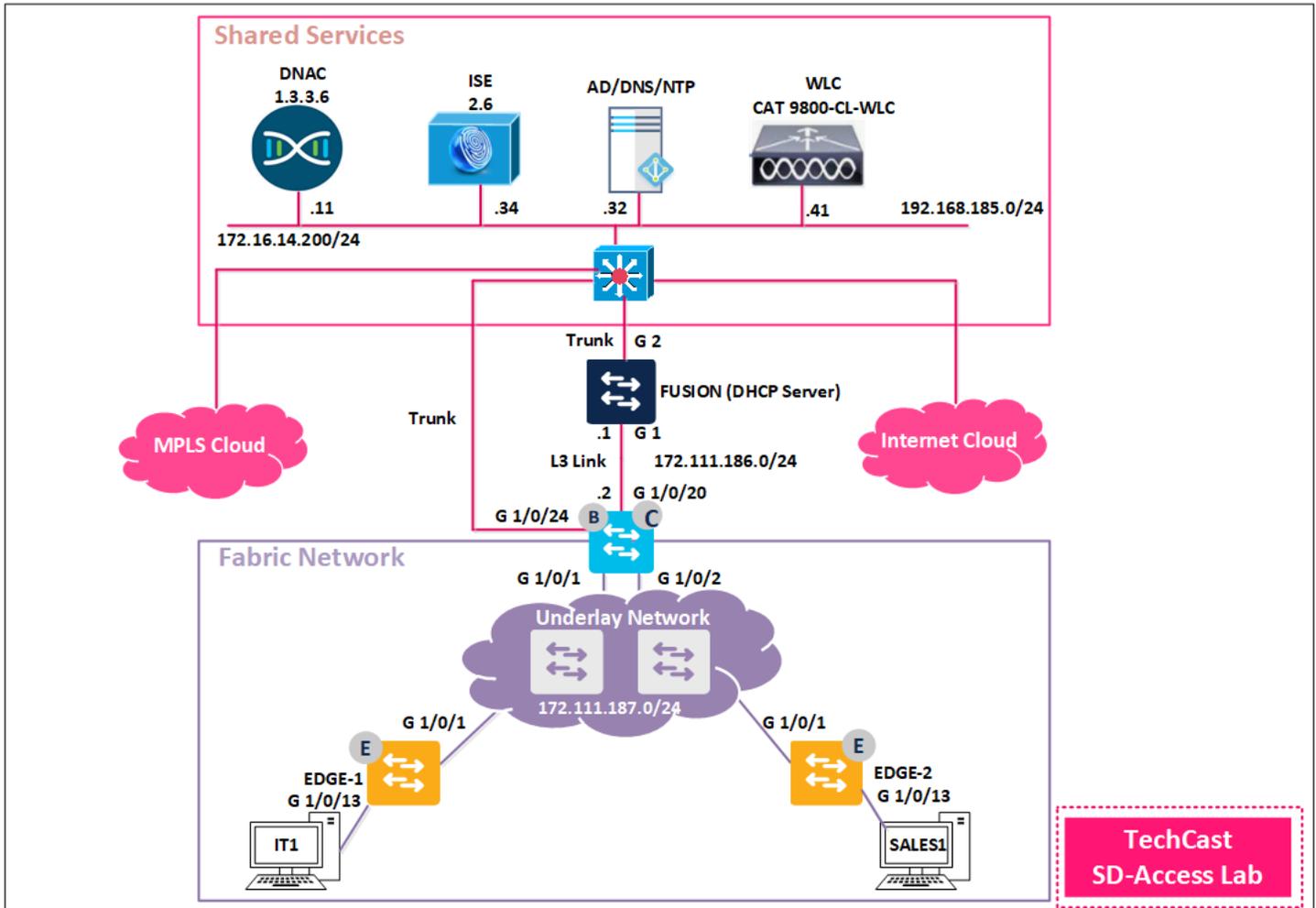
1.1.5 Step 5 – Migrate Policy from ISE to DNAC



- Click **“Yes”** to accept.
- Waite for the integration to complete which might takes few minutes.

2 DNAC Design

2.1 Lab 04 – Network Hierarchy – Site & Building



2.1.1 Step 1 – Add an Area under Global



- Add the following parameters;
 - AREA NAME: TORONTO
 - PARENT: GLOBAL
- Click “Add”

2.1.2 Step 2 – Add a Building under Toronto

Design

Network Hierarchy

Add Site

Add Building

- Add the following parameters;
 - BUILDING NAME: TECHCAST-HQ
 - PARENT: TORONTO
 - ADDRESS: 3400-181 BAY ST, TORONTO ON M5J 2T3
- Click “Save”.

The screenshot shows the Cisco DNA Center interface. The top navigation bar includes 'Cisco DNA Center' and tabs for 'DESIGN', 'POLICY', 'PROVISION', 'ASSURANCE', and 'PLATFORM'. Below this, there are sub-tabs for 'Network Hierarchy', 'Network Settings', 'Image Repository', 'Network Profiles', and 'Authentication Template'. The main area is a map of Toronto with a red pin marking the location of 'TechCast-HQ' at 3400-181 Bay St. The left sidebar shows a hierarchy: 'Global' > 'Toronto' > 'TechCast-HQ'. The top of the map area has buttons for 'Add Site' and 'Import'. The bottom of the map area has a search bar for buildings.

2.1.3 Step 2 – Add Floor under TechCast-HQ

Design

Network Hierarchy

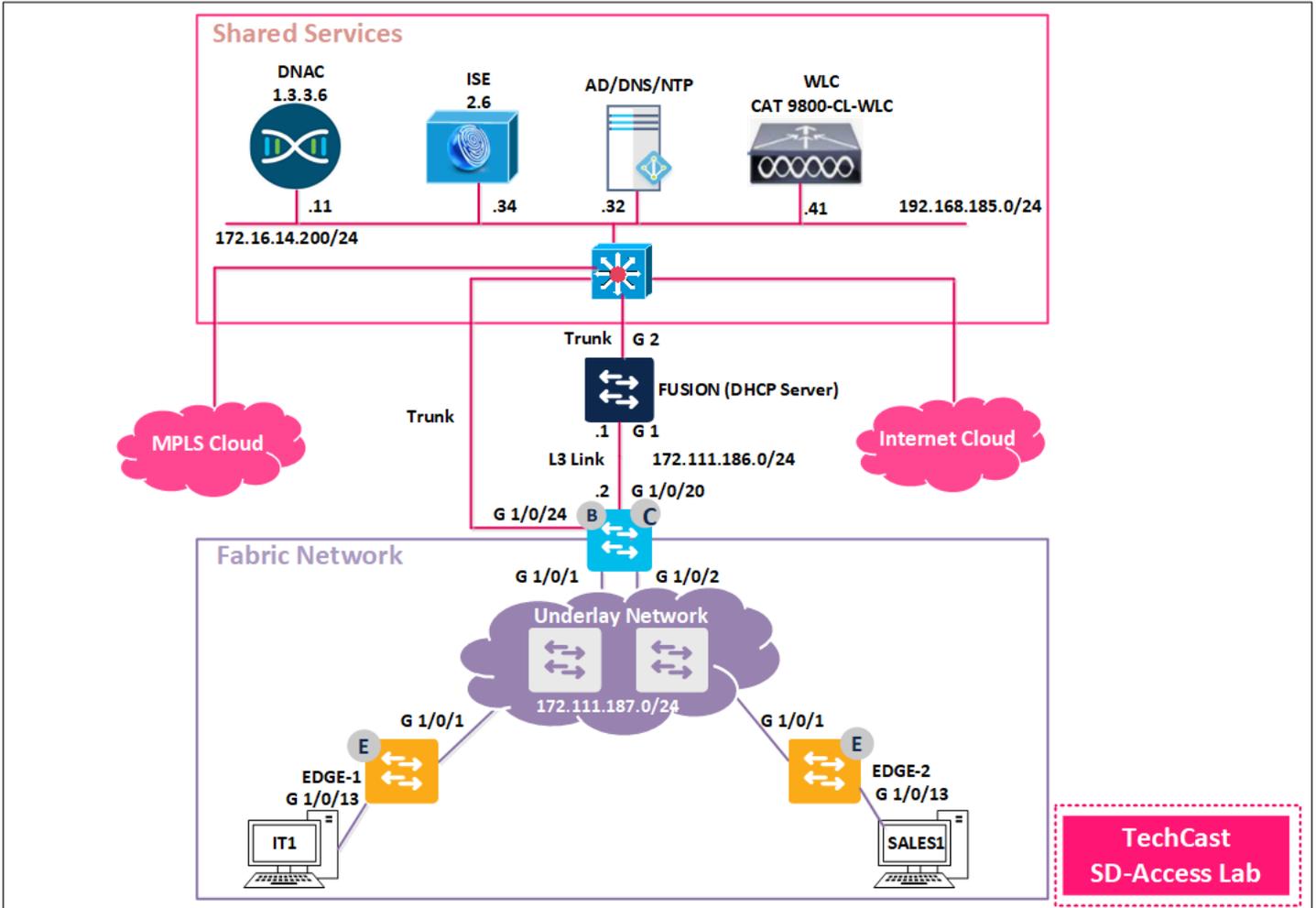
Add Site

Add Floor

- Add the following parameters;

3 Fabric Network Infrastructure –Underlay Manual Configuration

3.1 Lab 10 – Device Discovery & Provisioning



3.1.1 Step 1 – Discover the Underlay



- In Global level; click “Add” to add the following;
 - DISCOVERY NAME: **TECHCAST-FABRIC-UNDERLAY**

Note: tools button on the top left corner.

IP Address/Range

- DISCOVERY TYPE: IP ADDRESS/RANGE
- IP ADDRESS SPACE: 172.111.111.1 – 172.111.111.3

Credentials

- CLI: TECHCAST/TECHCAST-DNAC
 - SNMPV2C READ: RO
 - SNMPV2C WRITE: RW
 - UNCHECK **SNMPv3**
- Click **“Discover”** to start discovery.
 - Wait for the fabric devices to be discovered which might take few minutes.

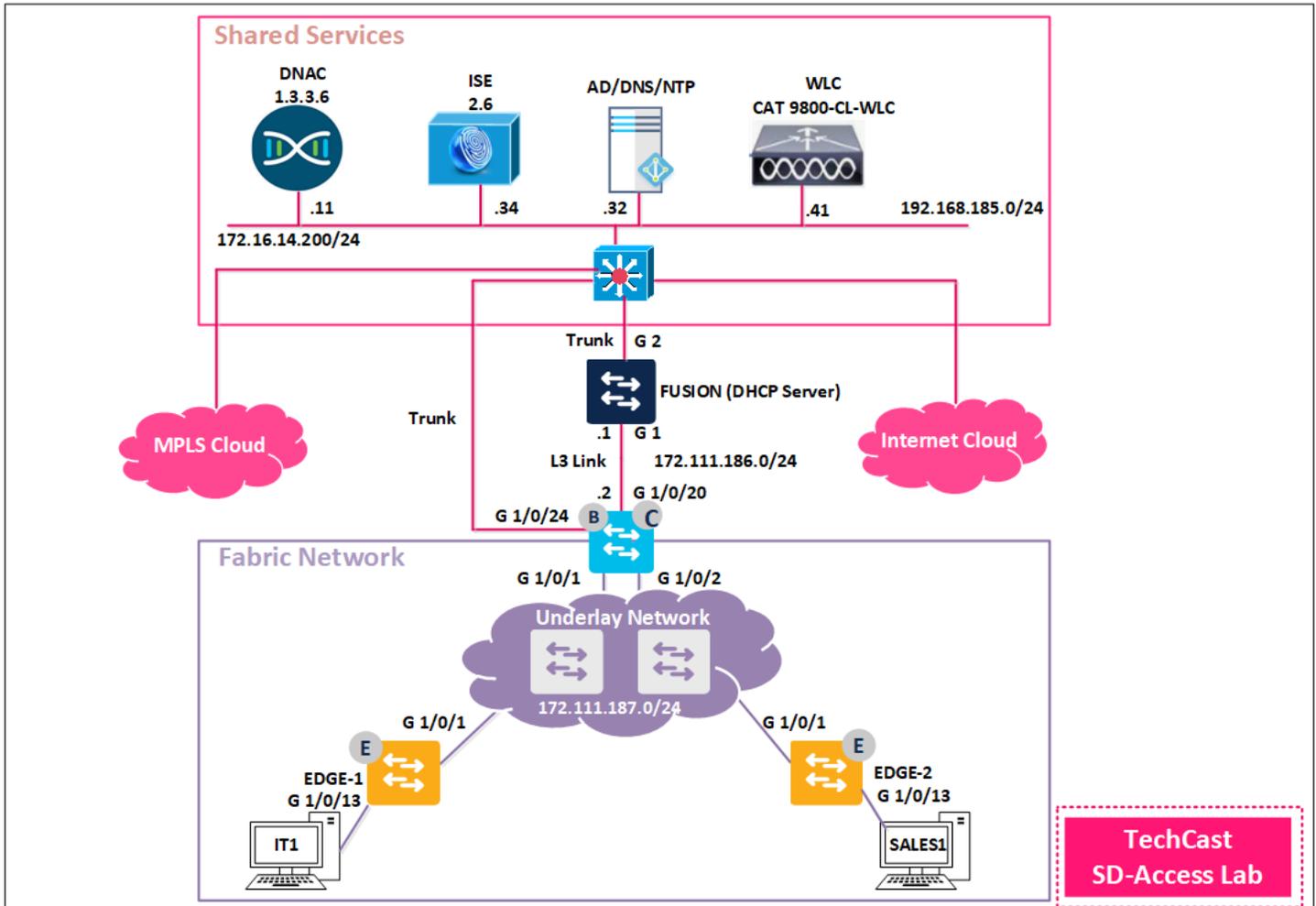
3.1.2 Step 2 – Assign Underlay Devices to the Site



- Select the following devices **“TechCast-9300CB”**, **“TechCast-9300E1”** and **“TechCast-9300E2”**.
- Click **“Action”** >> **“Provision”** >> **“Assign Devices to Site”**
- Select **“Global”** >> **“Toronto”** >> **“HQ”**
- Click **“Assign”**. You will notice that all switches moved under HQ.

4 Fabric Network Infra – LAN Automation

4.1 Lab 14 – DNAC Provisioning – Provision Fabric Devices to HQ Site



4.1.1 Step 1 – Provision Fabric devices as HQ devices.

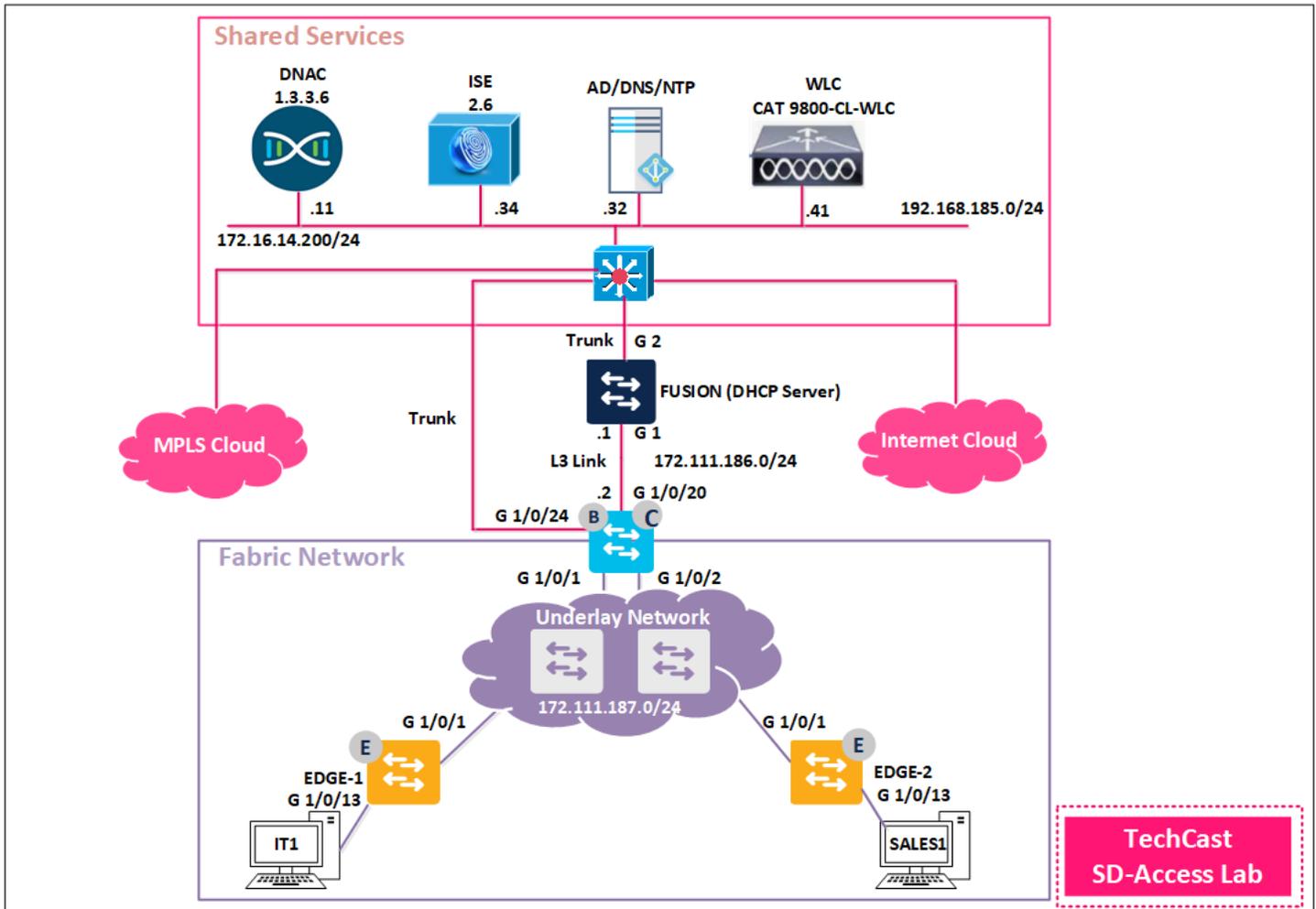


- Select “All the devices”
- Click **Action** >> **Provision** >> **Provision Device**
- Select **Global** >> **Toronto** >> **TechCast-HQ**
- Check the box “Apply to All”
- Click **Next**
- Click **Next**

- Review summary information and click **Deploy**
- When “**Now**” then click **Apply**
- At this stage, the TechCast-HQ fabric devices are ready now for Device Role Assignment.

5 Configure Fabric Network Itself

5.1 Lab 20 – Configuring Fabric – HQ Site – Provision Fabric Edges Nodes



5.1.1 Step 1 – Provision TechCast-HQ Fabric Edge Device (Edge1)



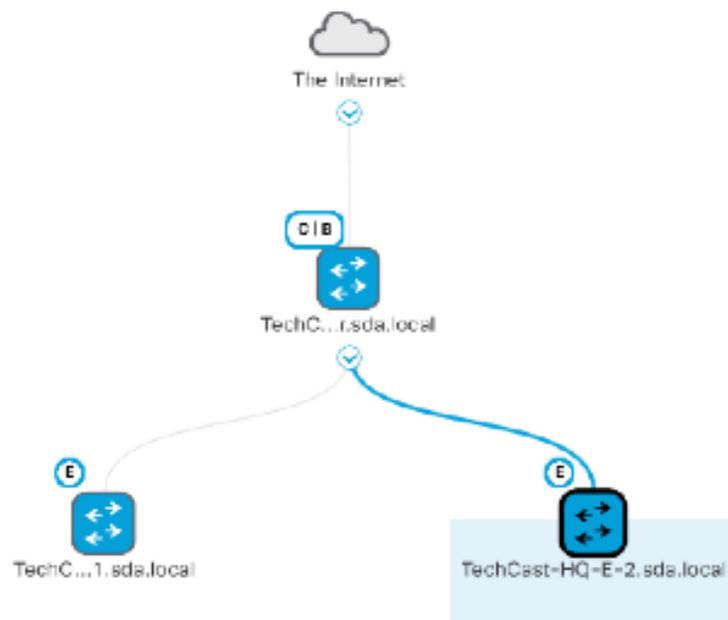
- Select **TechCast-HQ-E-1**
- Slide to select the role **Edge**
- Click **Add**
- Click **Save** and click "Now" **Apply**

5.1.2 Step 2 – Provision TechCast-HQ Fabric Edge Device (Edge2)

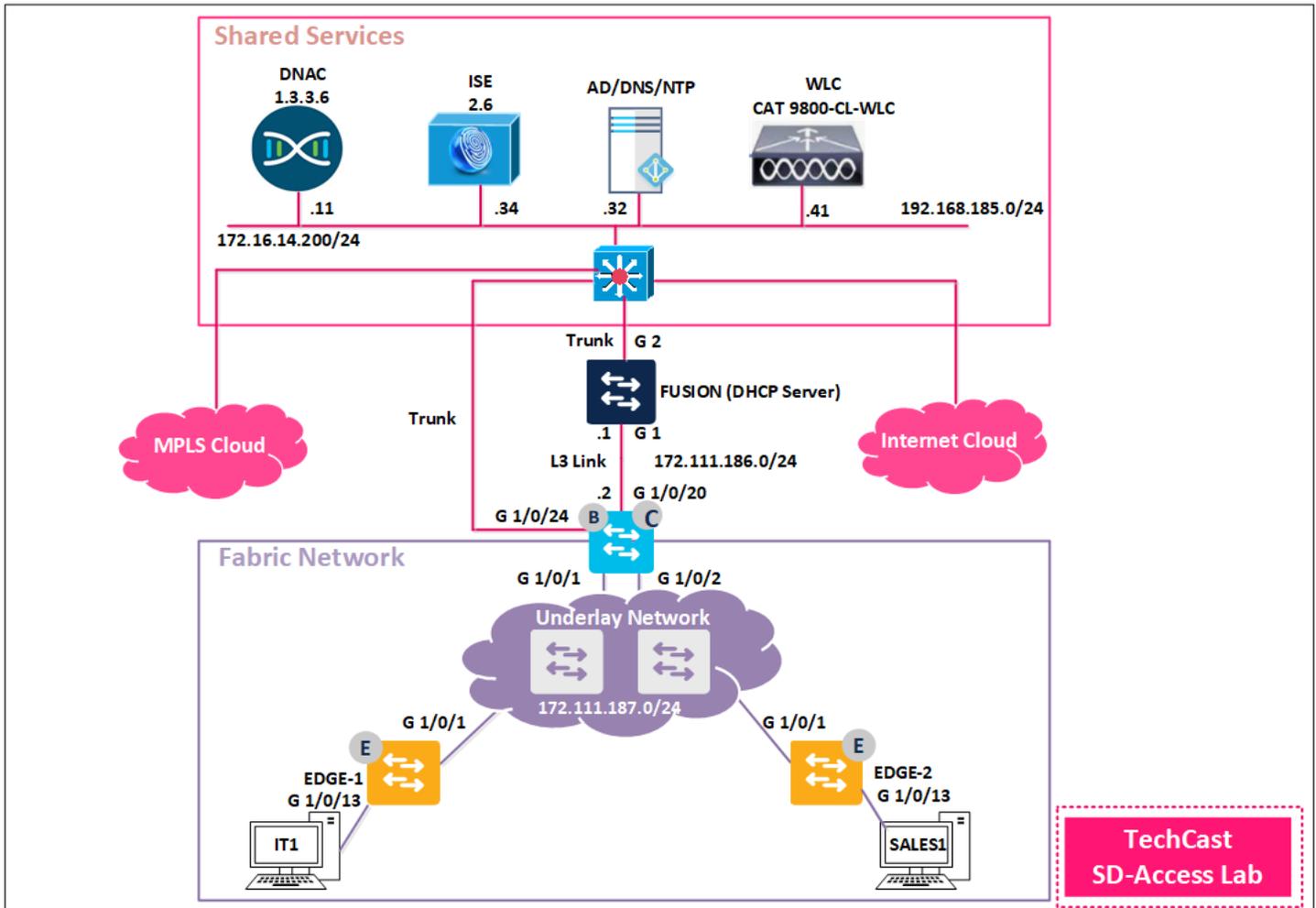


- Select **TechCast-HQ-E-1**
- Slide to select the role **Edge**
- Click **Add**
- Click **Save** and click “Now” **Apply**

Now the **TechCast-HQ-E-1 & TechCast-HQ-E-1** Fabric Edge devices should be turn with blue color which gives us indication these devices are added to Fabric and provisioned with its role.



5.2 Lab 25 – Verifying MACRO Segmentation



In this lab, we would like to verify the communication within and between VNs. So, we will use 2 Windows PCs which represents 2 end-users (IT1 and SALES1 then we will replace SALES1 to GUEST1 to test MACRO Segmentation between the previous two created VNs.

5.2.1 Step 1 – Devices within same VN should be able to communicate with each other.

- Wired-Employee-IT1 PC and login using IT1 credentials (IT1/Cisco@123)
- Wired-Employee-SALES1 PC and login using SALES1 credentials (SALES1/Cisco@123)

Note; IT1 and SALES1 should be in two different subnets but they should be able to communicate to each other.

Verification

- In **TechCast-HQ-E-1** fabric edge, use **“SHOW VLAN”** to see created VLANs by DNAC;

TechCast-HQ-E-1#SHOW VLAN

```

1002 fddi-default          act/unsup
1003 token-ring-default   act/unsup
1004 fddinet-default      act/unsup
1005 trnet-default        act/unsup
1021 SALES_DATA1         active    Tu1:8188,
1022 IT_VOICE            active    Tu1:8189,
1024 IT_DATA1            active    Tu1:8191, Gil/0/13
1025 IT_DATA2            active    Tu1:8192,
1026 SALES_VOICE         active    Tu1:8193,
1027 GUEST_DATA1        active    Tu1:8194,
2045 AP_VLAN            active
2046 VOICE_VLAN         active    Gil/0/2, Gil/0/3, Gil/0/4
VLAN Name                Status    Ports
-----
                               Gil/0/5, Gil/0/6, Gil/0/7
                               Gil/0/8, Gil/0/9, Gil/0/10

```

- In **TechCast-HQ-E-1** fabric edge, use **“SHOW RUN INTERFACE G1/0/13”** to see configuration under this physical interface.

TechCast-HQ-E-1#SHOW RUN INTERFACE G1/0/13

```

interface GigabitEthernet1/0/13
 switchport mode access
 device-tracking attach-policy IPDT_MAX_10
 dot1x timeout tx-period 7
 dot1x max-reauth-req 3
 source template DefaultWiredDot1xClosedAuth
 spanning-tree portfast
end

```

- In **TechCast-HQ-E-1** fabric edge, use **“SHOW RUN INTERFACE VLAN 1024”** to see configuration under this assigned VLAN interface by DNAC.

TechCast-HQ-E-1#SH RUN INTER VLAN 1024

BUILDING CONFIGURATION...

CURRENT CONFIGURATION : 386 BYTES

!

INTERFACE VLAN1024

DESCRIPTION CONFIGURED FROM CISCO DNA-CENTER

MAC-ADDRESS 0000.0c9f.f45f

VRF FORWARDING EMP_VN

IP ADDRESS 172.111.190.1 255.255.255.0

IP HELPER-ADDRESS 99.111.111.111

NO IP REDIRECTS

IP ROUTE-CACHE SAME-INTERFACE

NO LISP MOBILITY LIVENESS TEST

LISP MOBILITY IT_DATA1-IPV4

Go to Anything

```
script.php script.php
Open Files: 2
root > script.php
1 declare(strict_types=1);
2 namespace PhpParser;
3 class Node_Expr
4 class Node_Stmt
5 class CodeParsingTest extends CodeTestAbstract
6
7
8
9
10 * MetaProvider: provideTest(Parse)
11
12 public function testParse($name, $code, $expected, $modeline) {
13     if (null !== $modeline) {
14         $modes = array_fill_keys(explode(' ', $modeline), true);
15     } else {
16         $modes = [];
17     }
18     list($parser5, $parser7) = $this->createParsers($modes);
19     list($stmts5, $output5) = $this->getParseOutput($parser5, $code, $modes);
20     list($stmts7, $output7) = $this->getParseOutput($parser7, $code, $modes);
21     if (isset($modes['php5'])) {
22         $this->assertSame($expected, $output5, $name);
23         $this->assertNotSame($expected, $output7, $name);
24     } elseif (isset($modes['php7'])) {
25         $this->assertNotSame($expected, $output5, $name);
26         $this->assertSame($expected, $output7, $name);
27     } else {
28         $this->assertSame($expected, $output5, $name);
29         $this->assertSame($expected, $output7, $name);
30     }
31     $this->checkAttributes($stmts5);
32     $this->checkAttributes($stmts7);
33 }
34
35 public function createParsers(array $modes) {
36     $lexer = new Lexer_Emulative(['usedAttributes' => [
37         'startLine', 'endLine',
38         'startFilePos', 'endFilePos',
39         'startTokenPos', 'endTokenPos',
40         'comments'
41     ]]);
42     // MUST: ...
43     // MUST: ...
44     // MUST: ...
45     public function ...
46     $dumpPositions = isset($modes['positions']) ? ...
47     $errors = new ErrorHandler_Collecting;
48     $stmts = $parser->parse($code, $errors);
49     // MUST: ...
```

TechCast



CCIE Enterprise Infrastructure Workbook

