

## SPOTO CCIE EI Lab DOO SDN S1 Workbook

**VERSION** V1.0  
**LEVEL**  OPEN  INTER  SECRET  
**TYPE**  DISCUSS  BETA  RELEASE

Revision History				
Date.	Author	Version	Reviewer	Note.
2021-03-25	Lambert	1.0		Alpha

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**IMPLEMENTING PROOF OF CONCEPT SDX BRANCHES ..... 7**

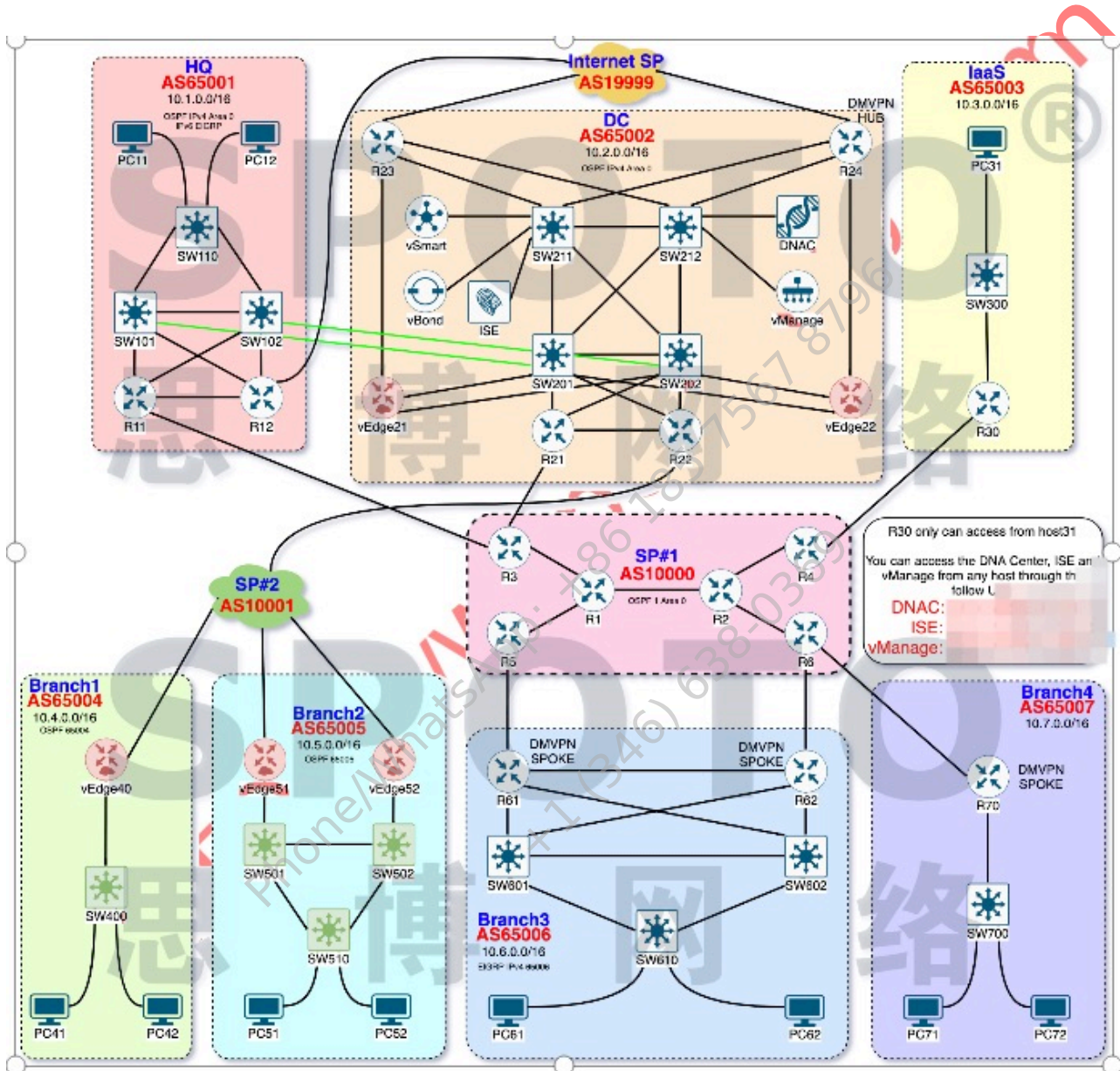
COMPLETING VN CONFIGURATION IN DNA CENTER ..... 7

MAPPING SDA VNS TO SD-WAN VPNS ..... 错误!未定义书签。

CONFIGURING SD-WAN VPN ROUTE LEAKING..... 错误!未定义书签。

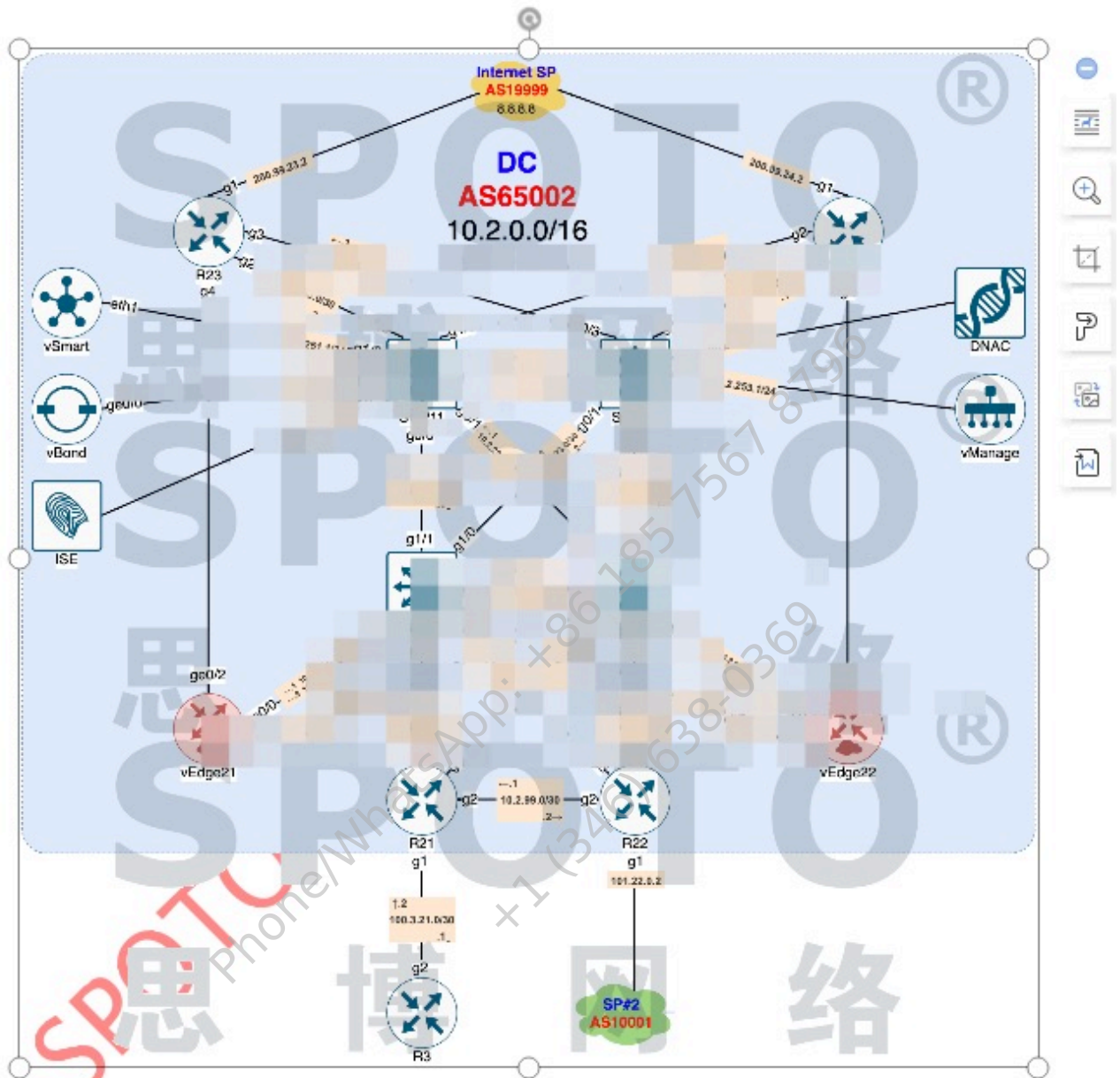
## Lab Topology

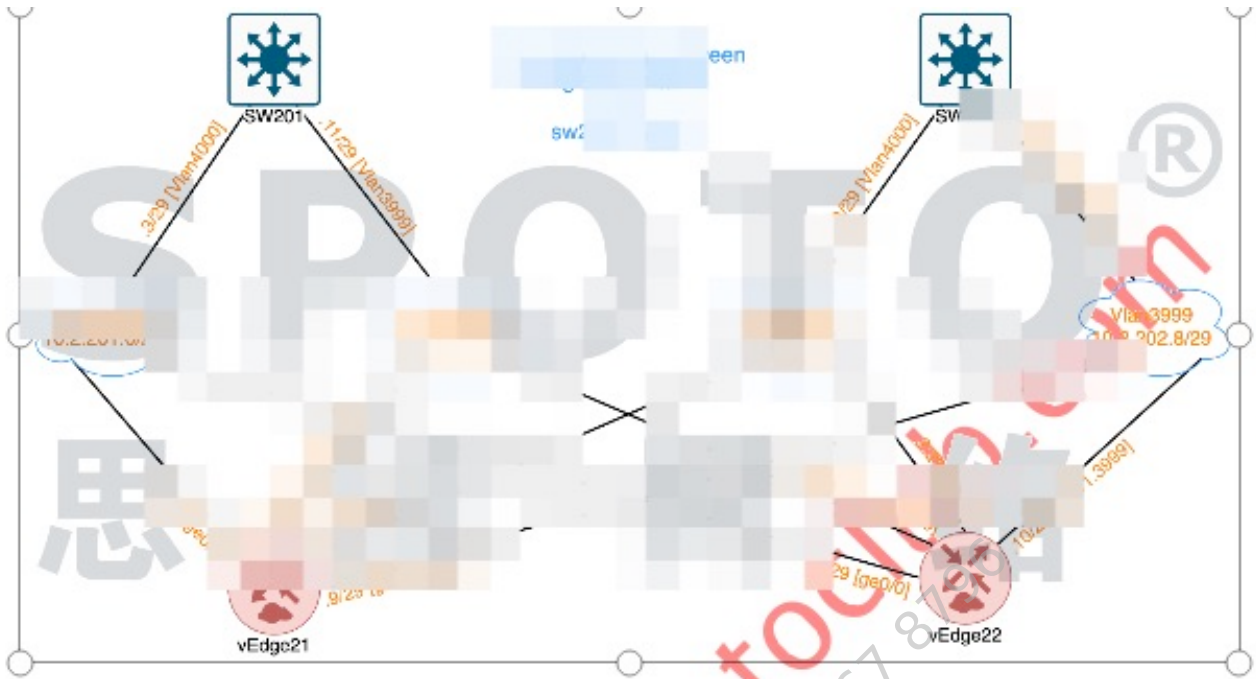
### Diagram 01: Complete Topology

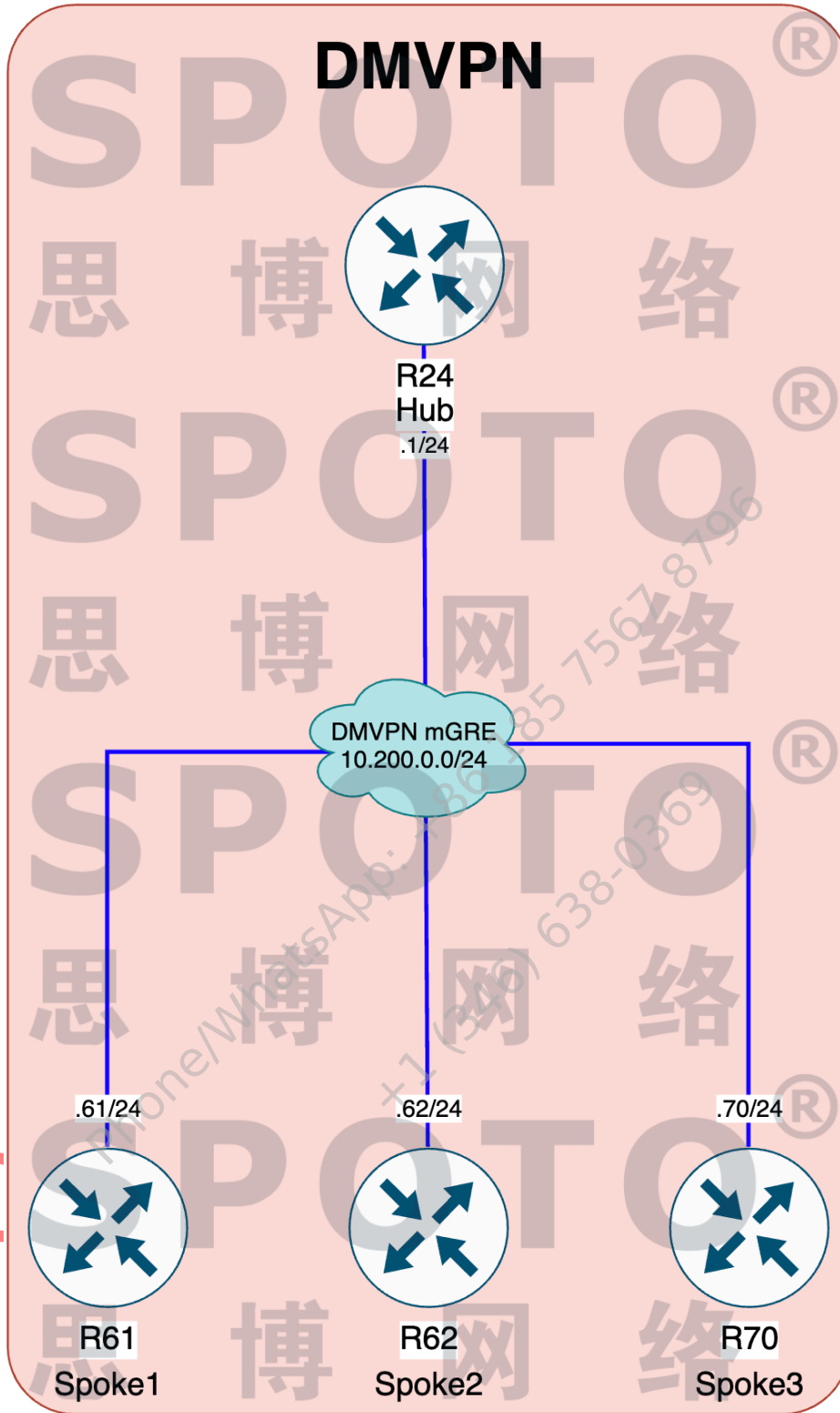


## Diagram 03: DC

Diagram 03: DC







## Implementing proof of concept SDx Branches

### Completing VN configuration in DNA Center

Using the DNA Center GUI, perform configuration tasks according to these requirements:

- Add new Virtual Network named IoT for the internet-of-things network on the Branches #1 and #2.
- Create new address pools for the IoT VN named Branch1-ForIoT and Branch2-ForIoT on the global level, and Branch1-IoT and Branch2-IoT on the branch level.
- For Branch #1 IoT VN, allocate the subnet 10.4.198.0/24 and the gateway IP address 10.4.198.1.
- For Branch #2 IoT VN, allocate the subnet 10.5.198.0/24 and the gateway IP address 10.5.198.1.
- Associate the Branch1-IoT and Branch2-IoT pools with the IoT VN on the respective branches.
- Complete the configuration of the address pools for the Guest VN in the DNA Center so that Branch #1 and Branch #2 can accommodate guest connections. If a new address pool needs to be created and an address range allocated to it, follow the established addressing plan.
- Correct the addressing information currently defined for the Branch2-ForEmployees and Branch2-Employees address pool.
- For all address pools, use the DHCP server 10.2.255.211 to allocate addresses to clients.

On sw211, complete the DHCP server configuration according to these requirements:

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- Create four new DHCP pools for the IoT and Employees VNs on respective branches
  - Pool named br1\_iot for Branch #1 IoT VN
  - Pool named br1\_emp for Branch #1 Employees VN
  - Pool named br2\_iot for Branch #2 IoT VN
  - Pool named br2\_emp for Branch #2 Employees VN
- In each subnet, assign addresses from .101 up to .254 inclusively, and the appropriate gateway to clients.

## Solution

### Open the rack

### The account is :

---

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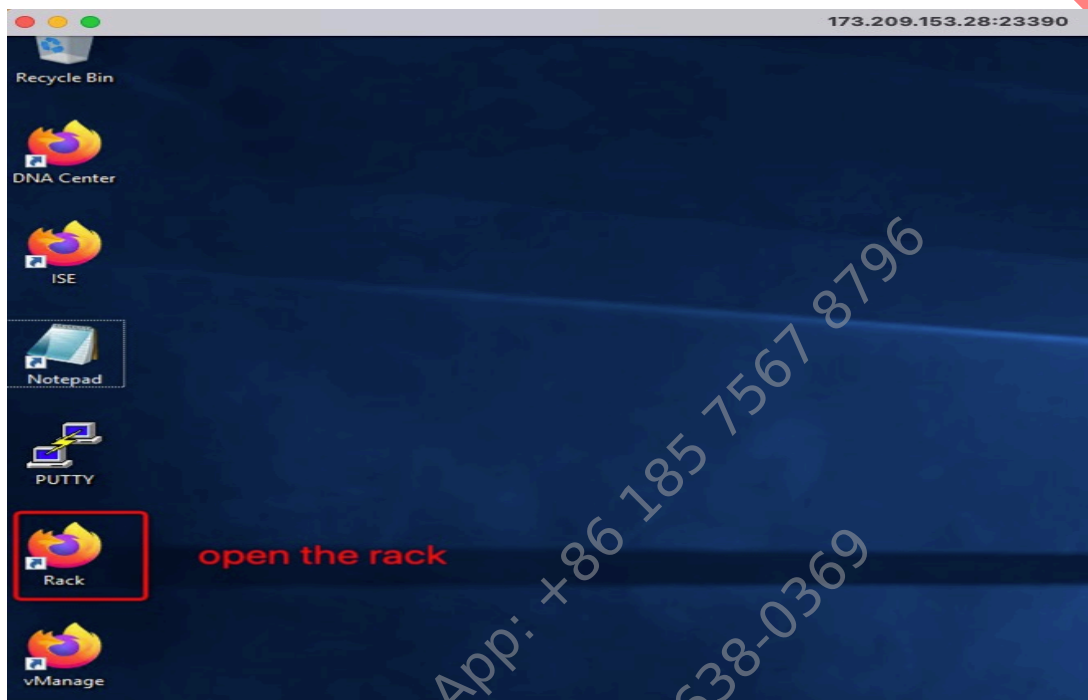
Learning to change destiny, we create the future together.

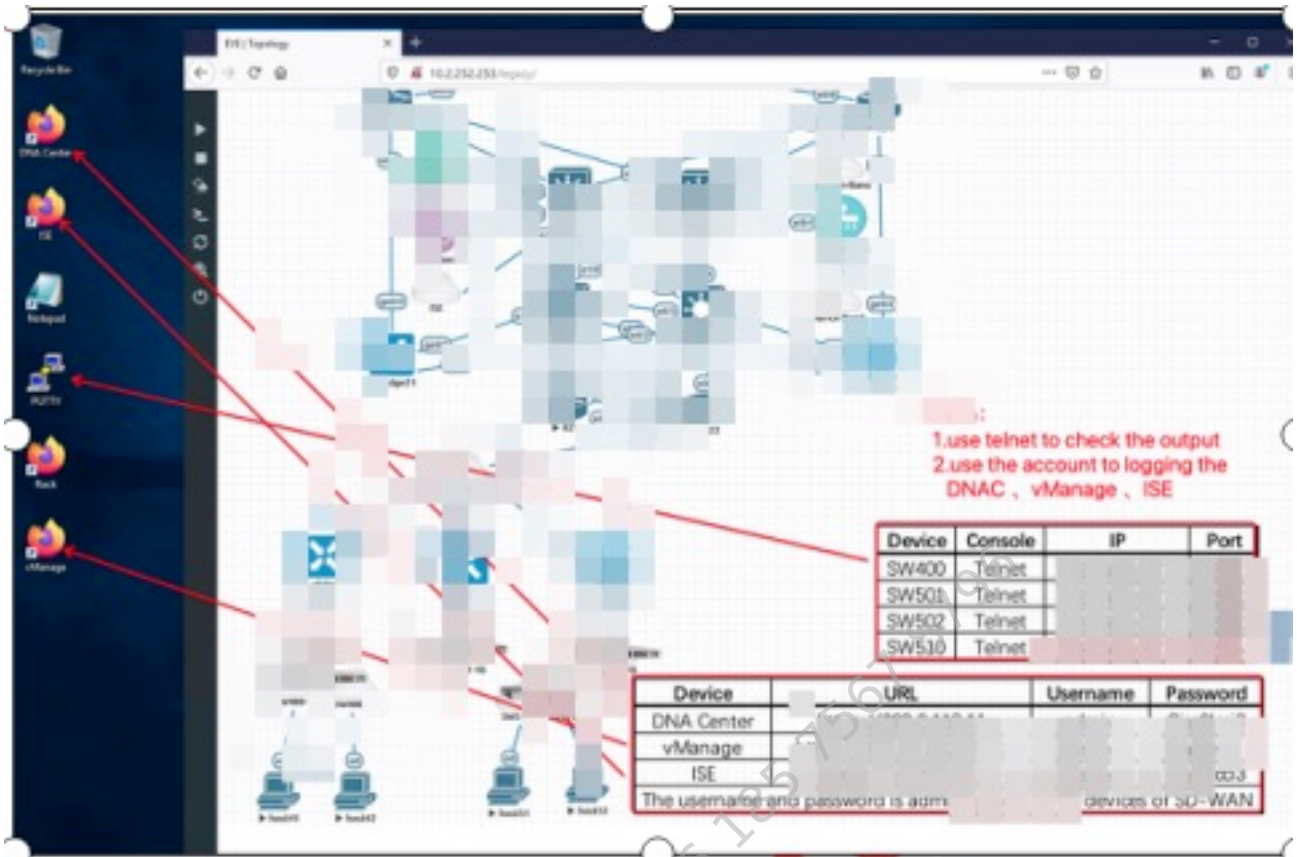
© 2020 SPOTO ALL RIGHTS RESERVED.

Username:admin

Password:eve

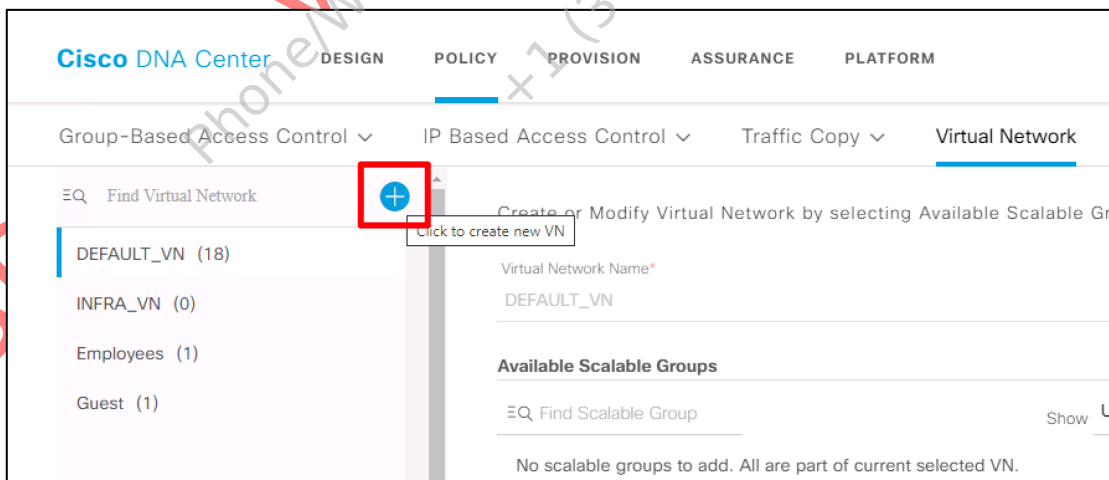
Start all the device





**DNAC ( OPEN THE DNA Center )**

**POLICY -> Virtual Network**



Create or Modify Virtual Network by selecting Available Scalable Groups.

Virtual Network Name\* **IoT** Reset **Save**

Guest Virtual Network

Available Scalable Groups

EQ Find Scalable Group Show Unselected

AU	BY	CO	DE	DS	EM	EX
Auditors	BYOD	Contractors	Developers	Development_S...	Employees	Extranet
GU	IN	NS	PC	PO	PS	PU
Guests	Intranet	Network_Servic...	PCI_Servers	Point_of_Sale_S...	Producti on_Serv...	Producti on_User...
QS	TS	TS	UN			
Quarantined_Sy...	Test_Servers	TrustSe c_Devic...	Unknown			

Groups in the Virtual Network

EQ Find Scalable Group

Drag groups here to add to the Virtual Network

## Cisco DNA Center

DESIGN **POLICY**

Group-Based Access Control  IP Based A

Policies

**Scalable Groups**

Access Contracts

Cisco DNA Center DESIGN POLICY PROVISION ASSURANCE PLATFORM

Migration is complete. Cisco DNA Center will be the policy administration point, and screens of Scalable Groups, Access Contracts and Policies in Cisco DNA Center will be read-only. You can review the policy migration log, and/or change the administration mode in GBAC Configurations

Group-Based Access Control IP Based Access Control Traffic Copy Virtual Network

Scalable Groups (18) Last updated: 12:58 PM Refresh **Create Scalable Group**

### Create Scalable Group ✕

Name\*  
**IoT**

Tag Value (decimal)\*  
**18**

Description (optional)  
**internet-of-things**

Virtual Networks\*  
DEFAULT\_VN ✕ **IoT ✕** ⊞ ▾

Propagate to ACI

Cancel **Save**

DESIGN -> Network Settings -> IP Address Pools

Assurance services have been temporarily disrupted. The system is working to restore this functionality. [More info](#)

Cisco DNA Center DESIGN POLICY PROVISION ASSURANCE PLATFORM

Network Hierarchy **Network Settings** Image Repository Network Profiles Authentication Template

EQ Find Hierarchy

- Global
- Branch1
- Branch2

Network Settings dropdown menu:

- Network
- Device Credentials
- IP Address Pools**
- SP Profiles
- Wireless

Address Pools (5)

Filter Add Actions SUBNET TYPE All IPv4 IPv6

Name	Type	IPv4 Subnet	IP
Branch1-ForEmployees	Generic	10.4.200.0/24 0% IPs available	-
Branch1-ForExternalHandoffs	Generic	10.4.254.0/24 0% IPs available	-
Branch1-ForGuest	Generic	10.4.199.0/24 0% IPs available	-
Branch2-ForEmployees	Generic	100.5.200.0/24 0% IPs available	-

Cisco DNA Center DESIGN POLICY PROVISION ASSURANCE PLATFORM

Network Hierarchy **Network Settings** Image Repository Network Profiles Authentication Template

EQ Find Hierarchy

- Global**
- Branch1
- Branch2

Network Settings dropdown menu:

- Network
- Device Credentials
- IP Address Pools**
- QoS
- Wireless

IP Address Pools (5)

Filter Add Actions SUBNET TYPE All IPv4 IPv6

Name	Type
Branch1-ForEmployees	Generic
Branch1-ForExternalHandoffs	Generic

### Add IP Pool ✕

IP Pool Name \*  
**Branch1-ForIoT**

Type\*  
**Generic** Options

IP Address Space  
 IPv4  IPv6  
Tunnel Type is supported for IPv4 pools only. If IPv6 is selected, all the below fields will have to be IPv6 format.

IP Subnet \*  
**10.4.198.0** For Example - 1.2.2.3

CIDR Prefix  
**/24 (255.255.255.0)**

Gateway IP Address  
**10.4.198.1**

DHCP Server(s)  
**10.2.255.211** ✕

DNS Server(s)

Cancel **Save**

### Add IP Pool ✕

IP Pool Name \*  
**Branch2-ForIoT**

Type\*  
**Generic** Options

IP Address Space  
 IPv4  IPv6  
Tunnel Type is supported for IPv4 pools only. If IPv6 is selected, all the below fields will have to be IPv6 format.

IP Subnet \*  
**10.5.198.0** For Example - 1.2.2.3

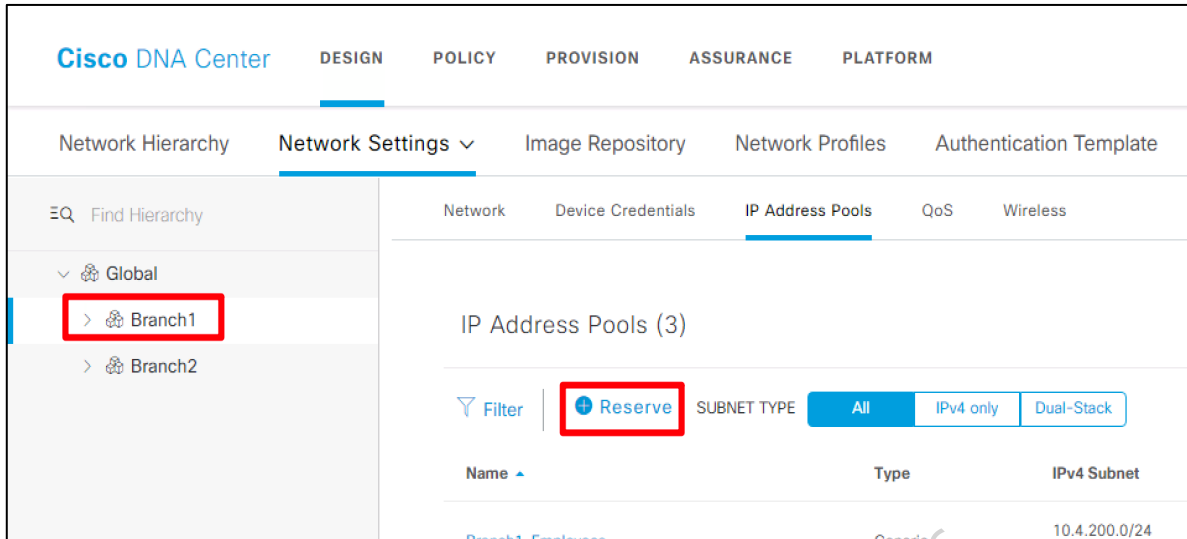
CIDR Prefix  
**/24 (255.255.255.0)**

Gateway IP Address  
**10.5.198.1**

DHCP Server(s)  
**10.2.255.211** ✕

DNS Server(s)

Cancel **Save**



### Reserve IP Pool

IP Address Pool Name\*  
**Branch1-IoT**

Type\*  
**Generic** Options

IP Address Space  
 IPv4 (Default)  IPv6  
Check both IPv4 and IPv6 to create a dual-stack pool. If the pool is used for infra VN, or if the fabric contains devices that don't support IPv6, check only IPv4.

IPv4  
Global Pool\*  
**Branch1-ForIoT (10.4.198.0/24)** Tunnel pools are not available for reserving for Site(s).

CIDR Prefix / Number of IP Addresses  
 CIDR Prefix  Number of IP Addresses

CIDR Prefix\*  
**/24 (255.255.255.0)**

IPv4 Subnet  
**10.4.198.0** For Example - 1.2.2.3

Gateway  
**10.4.198.1**

DHCP Server(s)  
**10.2.255.211** ✕ ✉ ∨

DNS Server(s)

Cancel **Reserve**

Cisco DNA Center DESIGN POLICY PROVISION ASSURANCE PLATFORM

Network Hierarchy Network Settings Image Repository Network Profiles Authentication Template

Find Hierarchy

- Global
  - Branch1
  - Branch2**

IP Address Pools (2)

Filter **Reserve** SUBNET TYPE All IPv4 only Dual-Stack

Name	Type	IPv4 Subnet
------	------	-------------

### Reserve IP Pool

IP Address Pool Name\* **Branch2-IoT**

Type\* **Generic** Options

IP Address Space

IPv4 (Default)  IPv6

Check both IPv4 and IPv6 to create a dual-stack pool. If the pool is used for infra VN, or if the fabric contains devices that don't support IPv6, check only IPv4.

IPv4 Global Pool\* **Branch2-ForIoT (10.5.198.0/24)**

Tunnel pools are not available for reserving for Site(s).

CIDR Prefix / Number of IP Addresses

CIDR Prefix  Number of IP Addresses

CIDR Prefix\* **/24 (255.255.255.0)**

IPv4 Subnet **10.5.198.0** For Example - 1.2.2.3

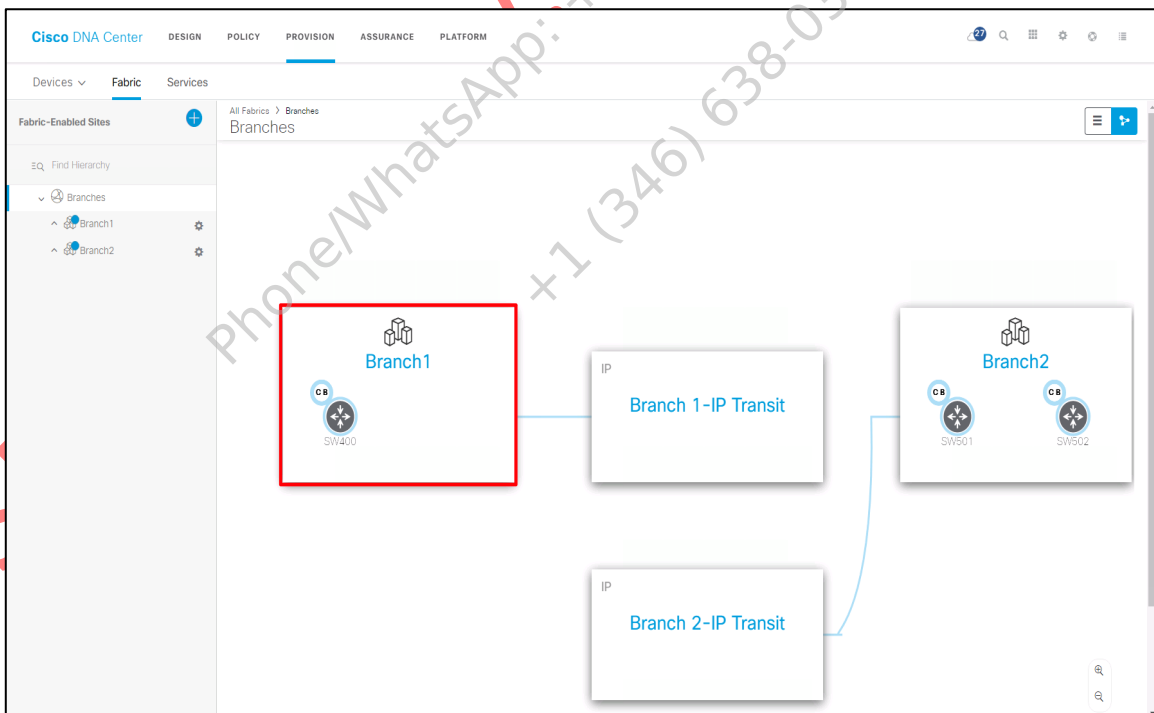
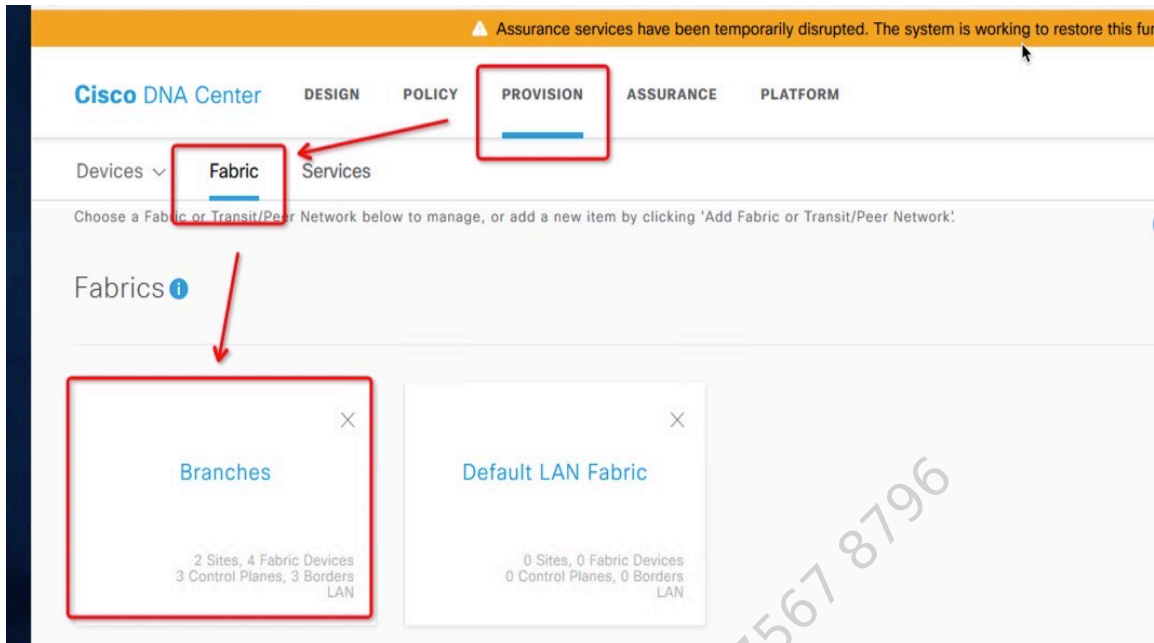
Gateway **10.5.198.1**

DHCP Server(s) **10.2.255.211**

DNS Server(s)

Cancel **Reserve**

## PROVISION -> Fabric



The screenshot shows the Cisco DNA Center interface. At the top, there are navigation tabs: DESIGN, POLICY, PROVISION, ASSURANCE, and PLATFORM. Below these are sub-tabs: Devices, Fabric, and Services. The 'Fabric' sub-tab is active. On the left, there is a 'Fabric-Enabled Sites' sidebar with a search bar 'Find Hierarchy' and a tree view showing 'Branches' > 'Branch1' and 'Branch2'. The main content area shows 'All Fabrics > Branch1' and 'Branches'. Under 'Branches', there are two options: 'Fabric Infrastructure' and 'Host Onboarding'. The 'Host Onboarding' option is highlighted with a red box. Below this, there is a 'Branch1' entry with a gear icon.

The screenshot shows the configuration page for 'Host Onboarding'. At the top, it says 'All Fabrics > Branch1' and 'Branches'. There are two radio buttons: 'Fabric Infrastructure' and 'Host Onboarding', with 'Host Onboarding' selected. Below this is a 'Select Authentication template' section with four radio buttons: 'Closed Authentication', 'Open Authentication', 'Easy Connect', and 'No Authentication'. The 'No Authentication' option is selected. To the right of this section is a 'Show Task Status' link and a 'Save' button. Below the authentication section is a 'Virtual Networks' section with a radio button for 'Critical Pool: Not Selected'. To the right of this section is a red box containing a '+ Add Virtual Network' button. At the bottom, there are four tabs: 'DEFAULT\_VN', 'Employees', 'Guests', and 'INFRA\_VN'. The 'Employees' and 'Guests' tabs are highlighted in blue.

**Add Virtual Network**

Select virtual network(s) will be used in the Fabric.

IoT X

1 Selected Find

Virtual Network

IoT

Showing 1 of 1

Cancel Update

All Fabrics > Branch1

Branches

Fabric Infrastructure Host Onboarding Show Task Status

Select Authentication template

Closed Authentication Open Authentication Easy Connect No Authentication Save

Virtual Networks Critical Pool: Not Selected

DEFAULT\_VN Employees Guest INFRA\_VN IoT

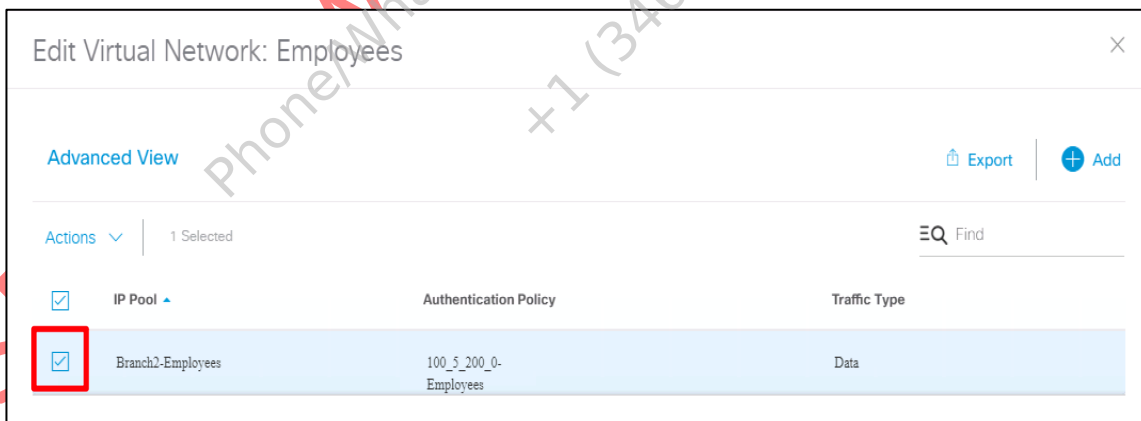
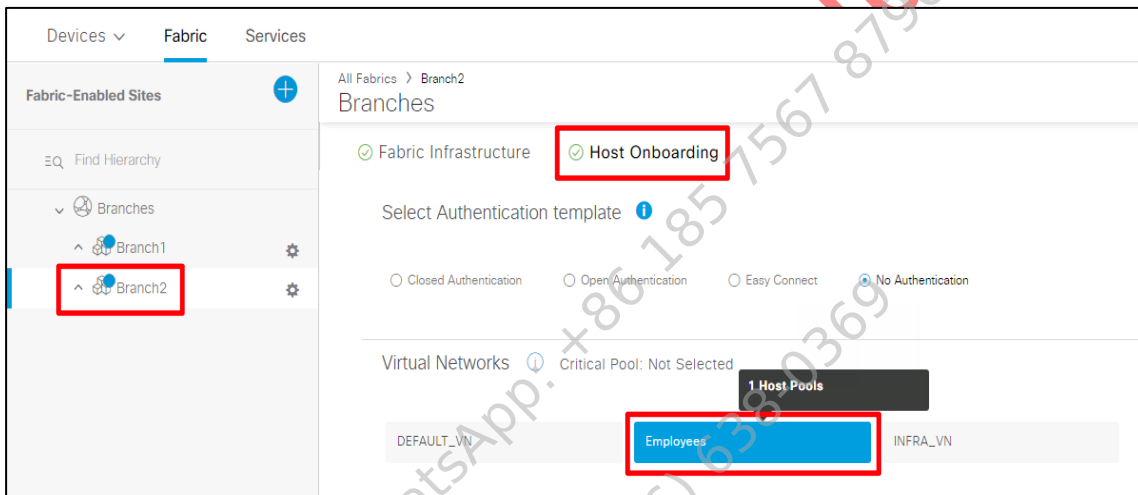
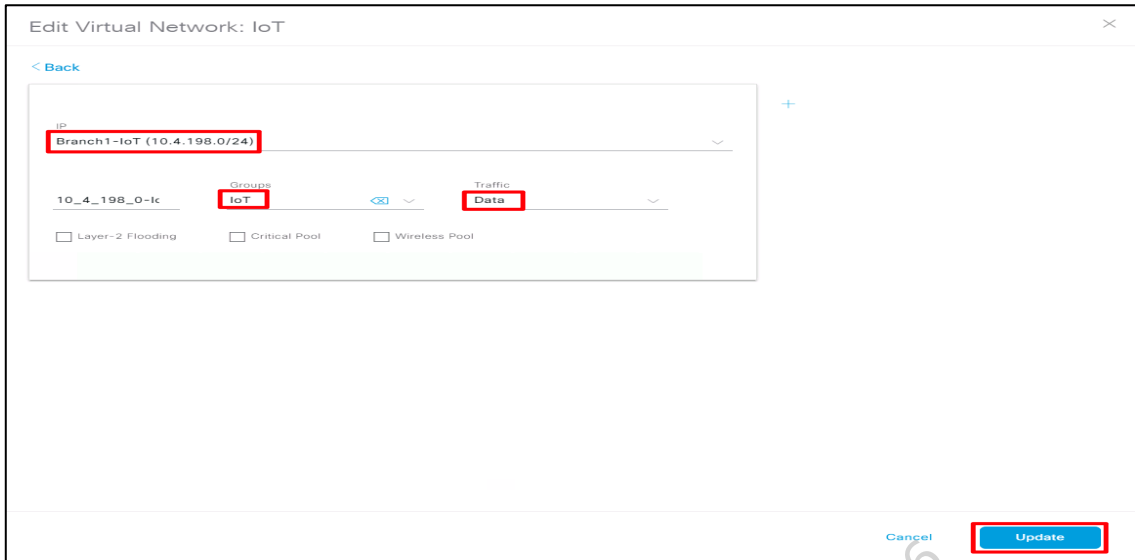
No associated pools to this VN

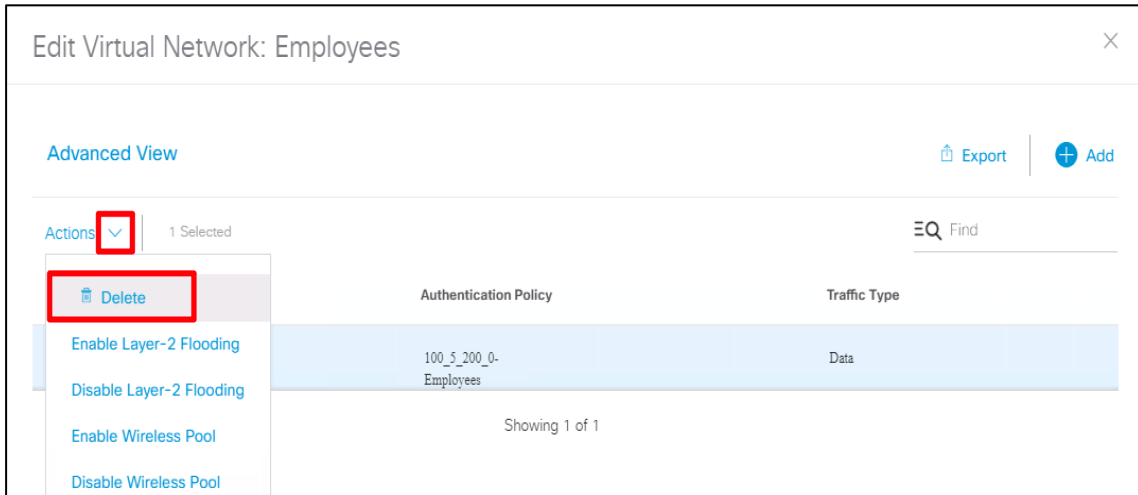
**Edit Virtual Network: IoT**

Advanced View Export Add

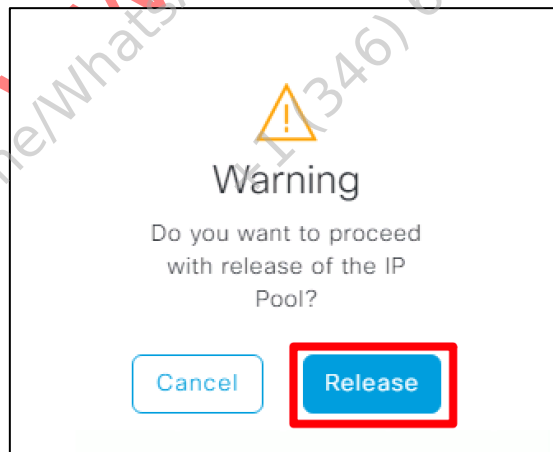
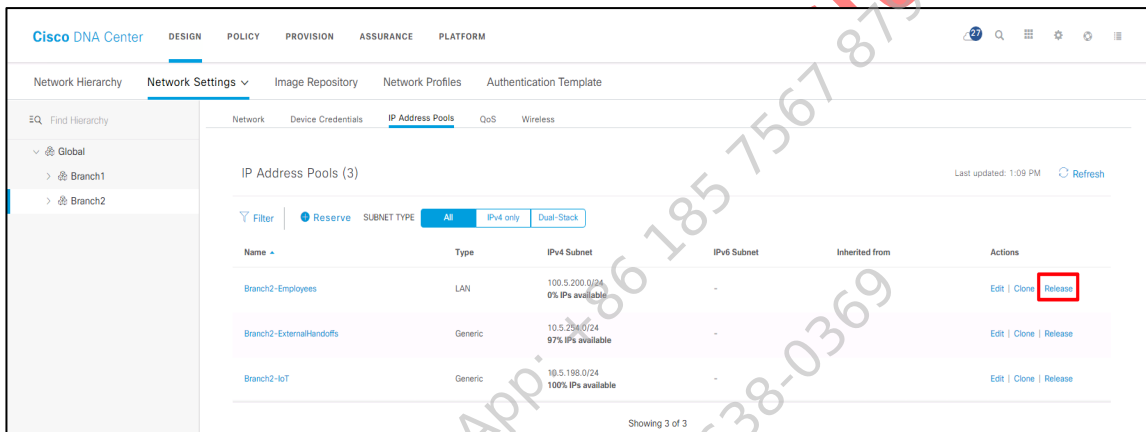
Actions Find

IP Pool Authentication Policy Traffic Type





**DESIGN -> Network Settings -> IP Address Pools -> Branch2**



Network Settings > IP Address Pools

IP Address Pools (7) Last updated: 1:18 PM Refresh

Name	Type	IPv4 Subnet	IPv6 Subnet	Actions
Branch1-ForEmployees	Generic	10.4.200.0/24 0% IPs available	-	Edit   Delete
Branch1-ForExternalHandoffs	Generic	10.4.254.0/24 0% IPs available	-	Edit   Delete
Branch1-ForGuest	Generic	10.4.199.0/24 0% IPs available	-	Edit   Delete
Branch1-ForIoT	Generic	10.4.198.0/24 0% IPs available	-	Edit   Delete
Branch2-ForEmployees	Generic	100.5.200.0/24 100% IPs available	-	Edit   <b>Delete</b>
Branch2-ForExternalHandoffs	Generic	10.5.254.0/24 0% IPs available	-	Edit   Delete
Branch2-ForIoT	Generic	10.5.198.0/24 0% IPs available	-	Edit   Delete

Showing 7 of 7

**Warning**

Are you sure you want to delete this pool?

Cancel Delete

Network Settings > IP Address Pools

IP Address Pools (6)

Filter Add Actions SUBNET TYPE All IPv4 IPv6

### Add IP Pool ✕

IP Pool Name \*  
**Branch2-ForEmployees**

Type\*  
Generic Options

IP Address Space  
 IPv4  IPv6  
Tunnel Type is supported for IPv4 pools only. If IPv6 is selected, all the below fields will have to be IPv6 format.

IP Subnet \*  
**10.5.200.0** For Example - 1.2.2.3

CIDR Prefix  
**/24 (255.255.255.0)**

Gateway IP Address  
**10.5.200.1**

DHCP Server(s)  
**10.2.255.211** ✕ ✉ ∨

DNS Server(s) ∨

Cancel **Save**

Network    Device Credentials    **IP Address Pools**    QoS    Wireless

IP Address Pools (7)

Filter | **+ Add** | Actions ▾ | SUBNET TYPE: All | IPv4

Name ▾

### Add IP Pool ✕

IP Pool Name \*  
**Branch2-ForGuest**

Type\*  
**Generic** Options

IP Address Space  
 IPv4  IPv6  
Tunnel Type is supported for IPv4 pools only. If IPv6 is selected, all the below fields will have to be IPv6 format.

IP Subnet \*  
**10.5.199.0** For Example - 1.2.2.3

CIDR Prefix  
**/24 (255.255.255.0)**

Gateway IP Address  
**10.5.199.1**

DHCP Server(s)  
**10.2.255.211** ✕ ✉ ∨

DNS Server(s) ∨

Cancel **Save**

The screenshot shows the Cisco DNA Center interface. The left-hand navigation pane is expanded to show a hierarchy: Global > Branch1 > Branch2 (highlighted with a red box). Under Branch2, there is a sub-item 'Branch2-Bldg1'. The main content area is titled 'IP Address Pools (2)'. It features a filter section with a 'Reserve' button (highlighted with a red box) and 'SUBNET TYPE' buttons for 'All', 'IPv4 only', and 'Dual-Stack'. Below the filter is a table of IP address pools.

Name	Type	IPv4 Subnet
Branch2-ExternalHandoffs	Generic	10.5.254.0/24 97% IPs available

### Reserve IP Pool

IP Address Pool Name\*  
**Branch2-Guest**

Type\*  
**Generic** Options

IP Address Space  
 IPv4 (Default)  IPv6  
Check both IPv4 and IPv6 to create a dual-stack pool. If the pool is used for infra VN, or if the fabric contains devices that don't support IPv6, check only IPv4.

IPv4  
Global Pool\*  
**Branch2-ForGuest (10.5.199.0/24)** Tunnel pools are not available for reserving for Site(s).

CIDR Prefix / Number of IP Addresses  
 CIDR Prefix  Number of IP Addresses

CIDR Prefix\*  
**/24 (255.255.255.0)**

IPv4 Subnet  
**10.5.199.0** For Example - 1.2.2.3

Gateway  
**10.5.199.1**

DHCP Server(s)  
**10.2.255.211** ✕ Options

DNS Server(s)

Cancel **Reserve**