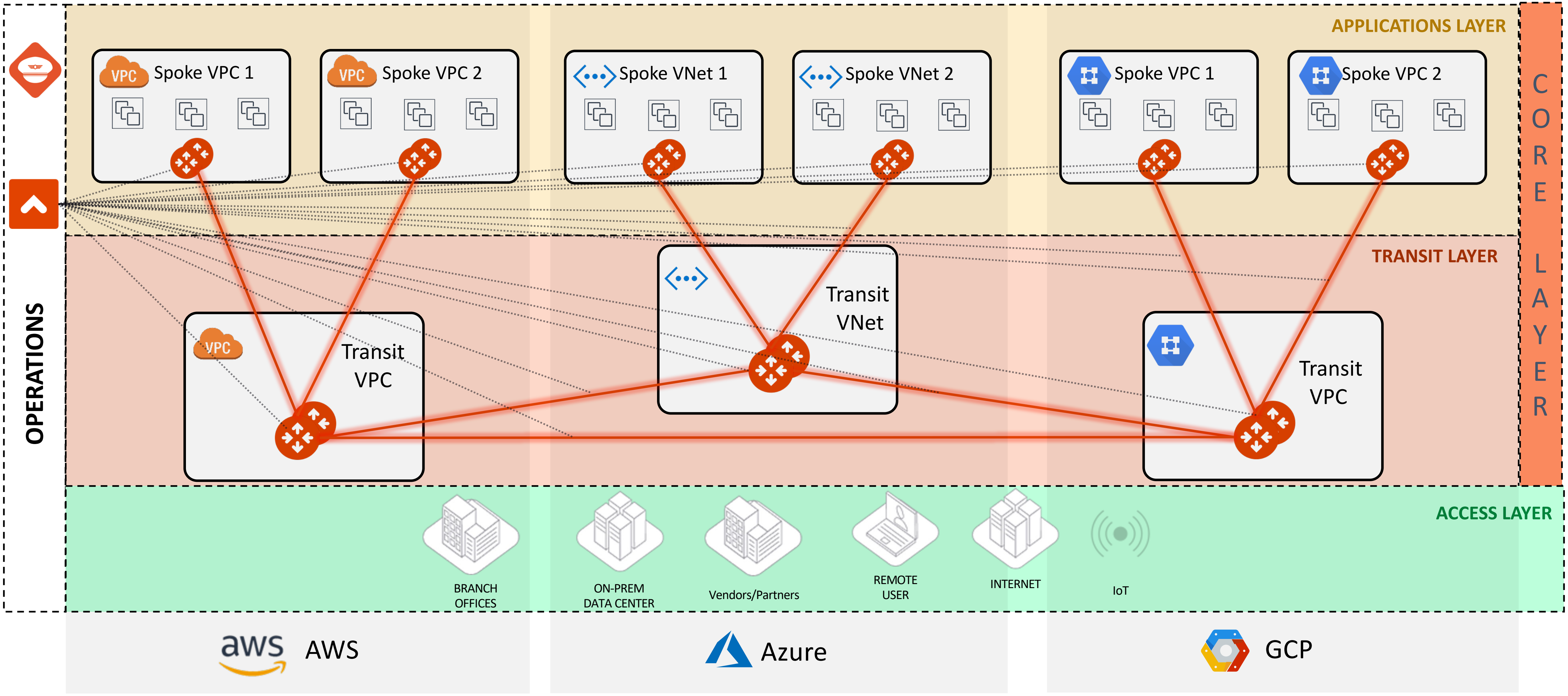
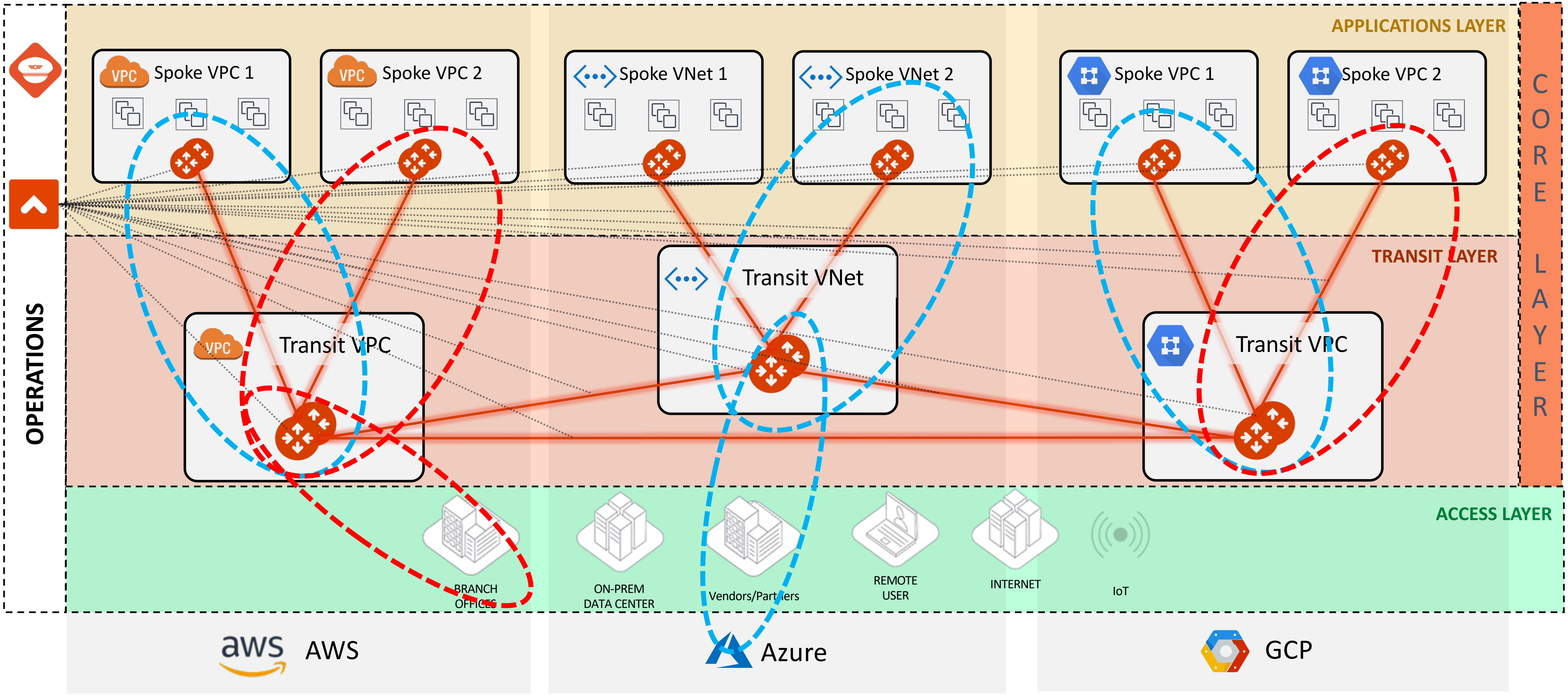
Network Segmentation

MCNA Deployment: the Foundations



Global Segmentation with Network Domains



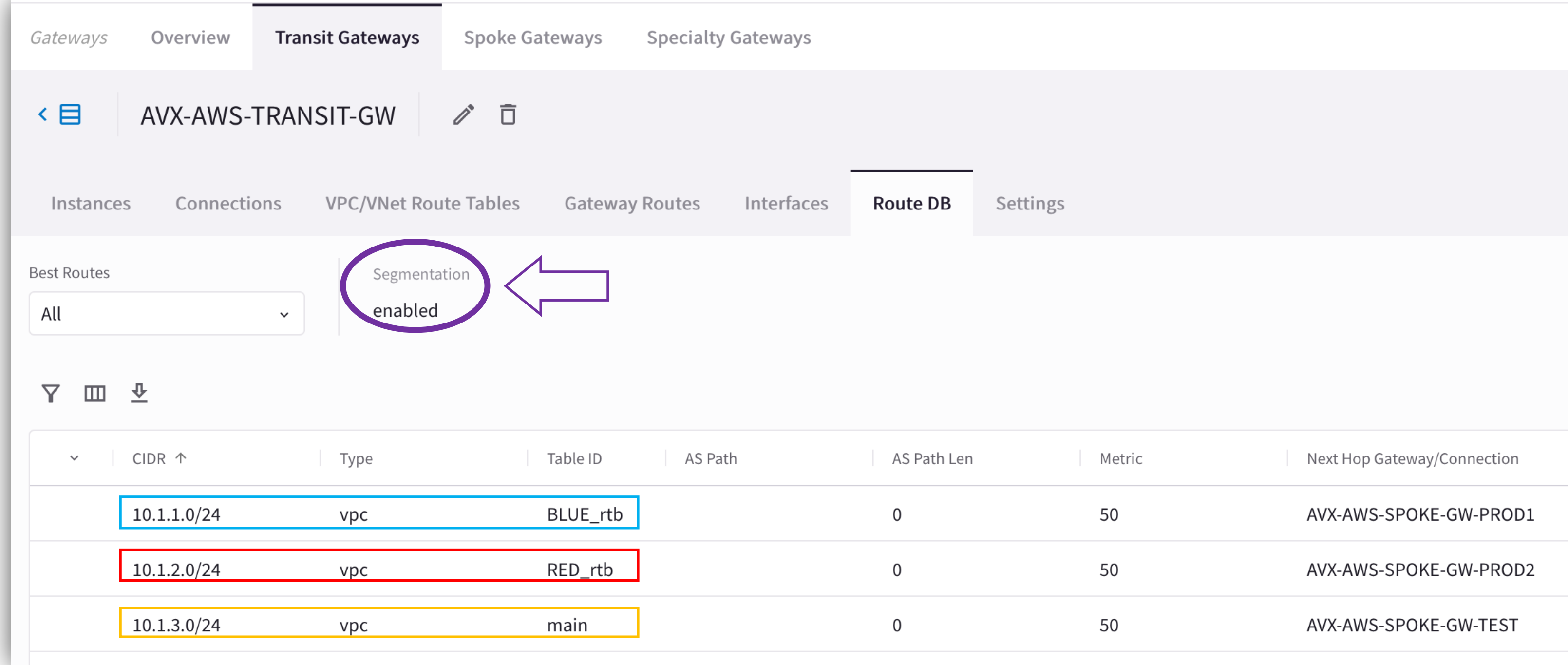
Order of Operations for activating the Network Segmentation

1) Enable Network Segmentation on the relevant Transit Gateway(s)

2) Create Network Domains (aka Segments)

3) Associate Spoke Gateways and/or Site2Cloud connections to the Network Domains

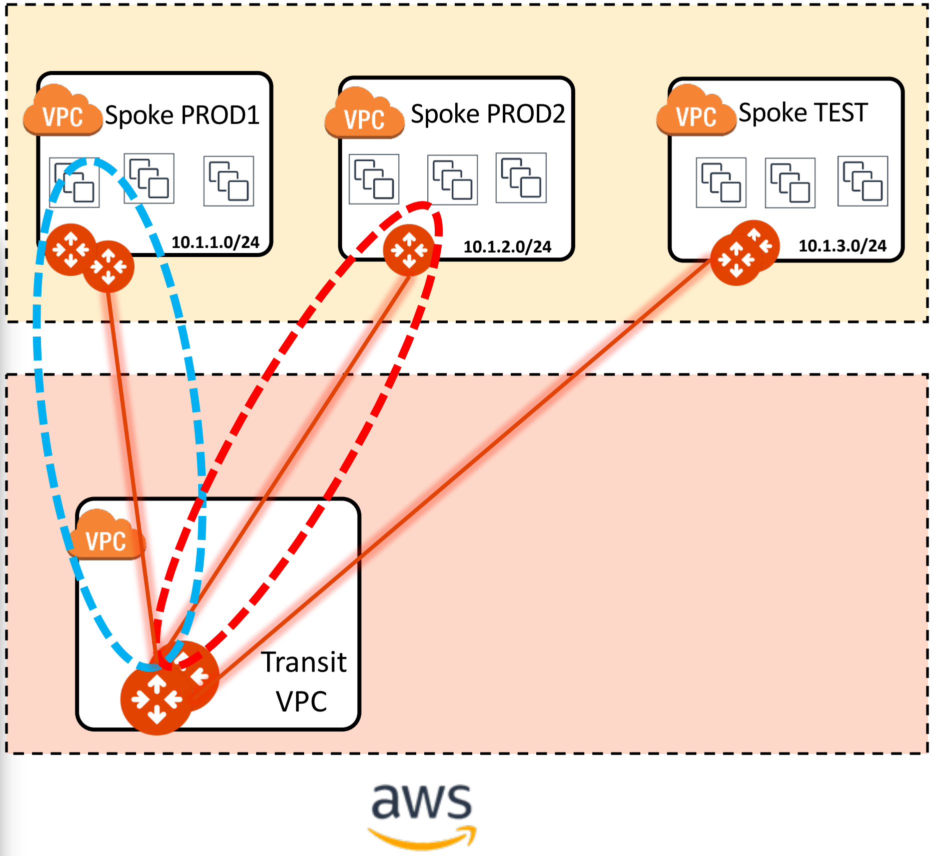
4) Apply the Connection Policy (*optional*)



Best Routes: All

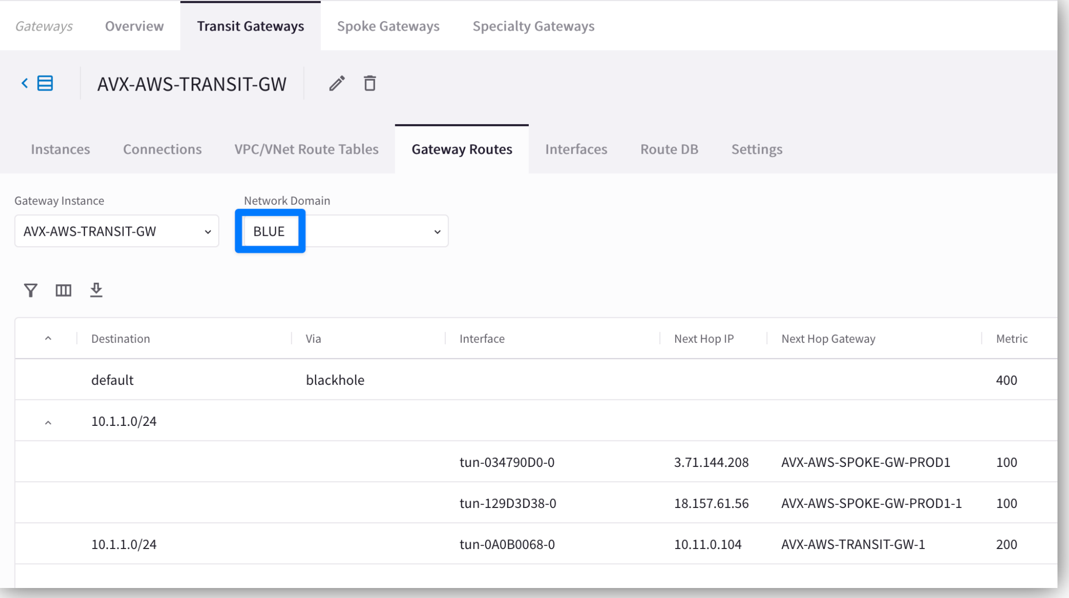
Segmentation: enabled

CIDR ↑	Type	Table ID	AS Path	AS Path Len	Metric	Next Hop Gateway/Connection
10.1.1.0/24	vpc	BLUE_rtb		0	50	AVX-AWS-SPOKE-GW-PROD1
10.1.2.0/24	vpc	RED_rtb		0	50	AVX-AWS-SPOKE-GW-PROD2
10.1.3.0/24	vpc	main		0	50	AVX-AWS-SPOKE-GW-TEST



PATH: COPILOT > Cloud Fabric > Gateways > Transit Gateways > select the relevant GW > **Route DB** (equivalent of RIB)

Multiple Routing Domains on the Transit GW



Gateways Overview **Transit Gateways** Spoke Gateways Specialty Gateways

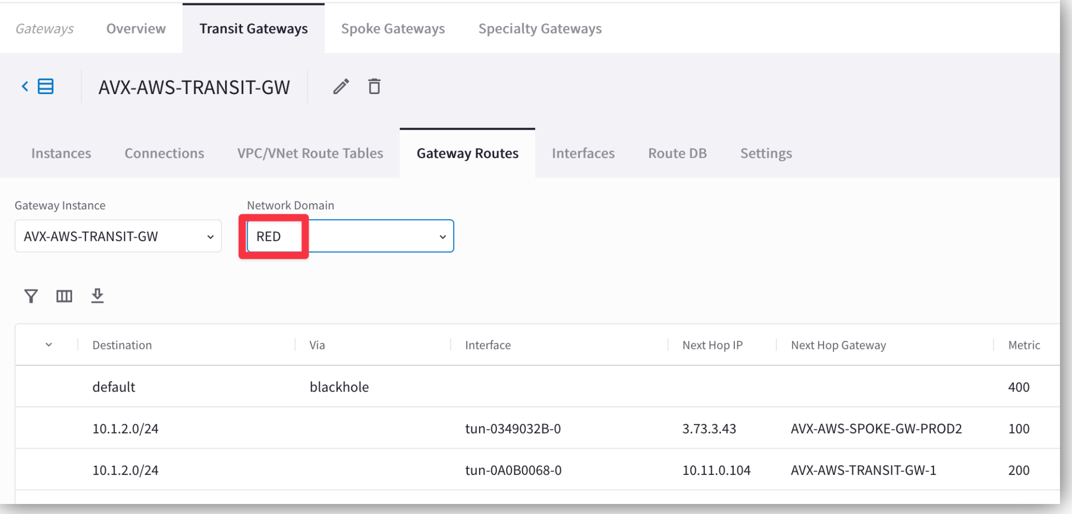
AVX-AWS-TRANSIT-GW

Instances Connections VPC/VNet Route Tables **Gateway Routes** Interfaces Route DB Settings

Gateway Instance: AVX-AWS-TRANSIT-GW

Network Domain: BLUE

Destination	Via	Interface	Next Hop IP	Next Hop Gateway	Metric
default	blackhole				400
10.1.1.0/24					
		tun-034790D0-0	3.71.144.208	AVX-AWS-SPOKE-GW-PROD1	100
		tun-129D3D38-0	18.157.61.56	AVX-AWS-SPOKE-GW-PROD1-1	100
10.1.1.0/24		tun-0A0B0068-0	10.11.0.104	AVX-AWS-TRANSIT-GW-1	200



Gateways Overview **Transit Gateways** Spoke Gateways Specialty Gateways

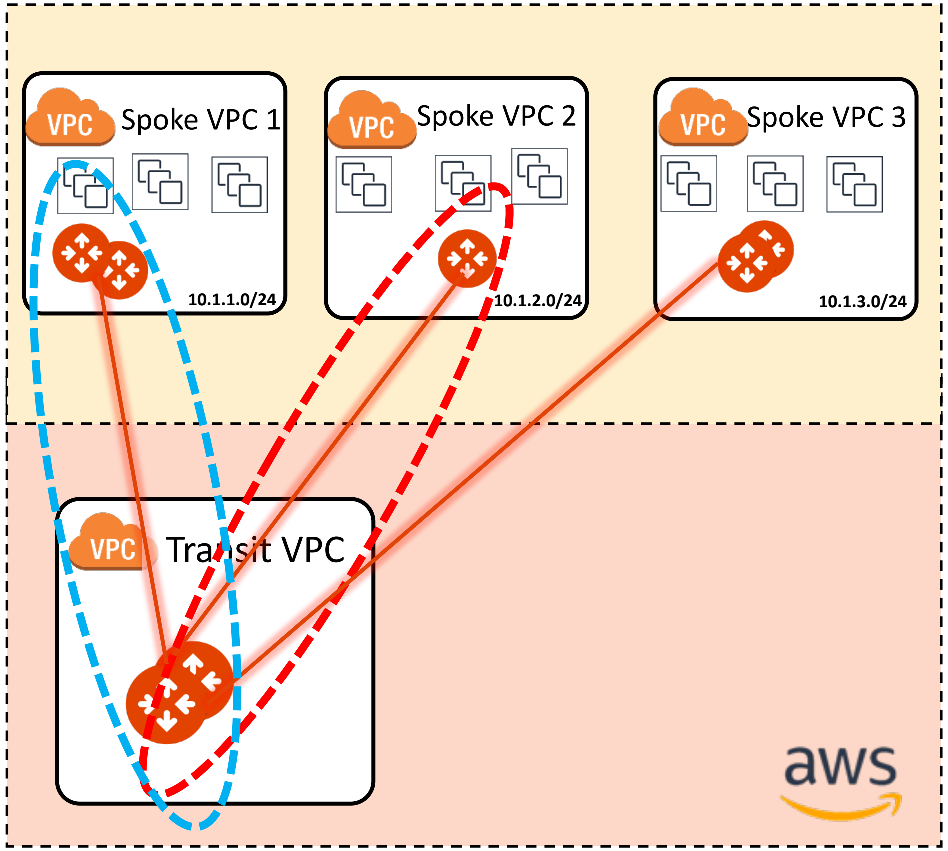
AVX-AWS-TRANSIT-GW

Instances Connections VPC/VNet Route Tables **Gateway Routes** Interfaces Route DB Settings

Gateway Instance: AVX-AWS-TRANSIT-GW

Network Domain: RED

Destination	Via	Interface	Next Hop IP	Next Hop Gateway	Metric
default	blackhole				400
10.1.2.0/24		tun-0349032B-0	3.73.3.43	AVX-AWS-SPOKE-GW-PROD2	100
10.1.2.0/24		tun-0A0B0068-0	10.11.0.104	AVX-AWS-TRANSIT-GW-1	200



- A single Spoke gateway or a Cluster of Spoke Gateways can be associated to a unique domain!
- **PATH:** COPILOT > Cloud Fabric > Gateways > Transit Gateways > select the relevant GW > **Gateway Routes** and then filter based on the network domain (i.e. VRF)

CAVEAT: The specific Network Domain view (aka vrf) is only available on the Transit GW. The Spoke GW has only the main routing table (aka grt).

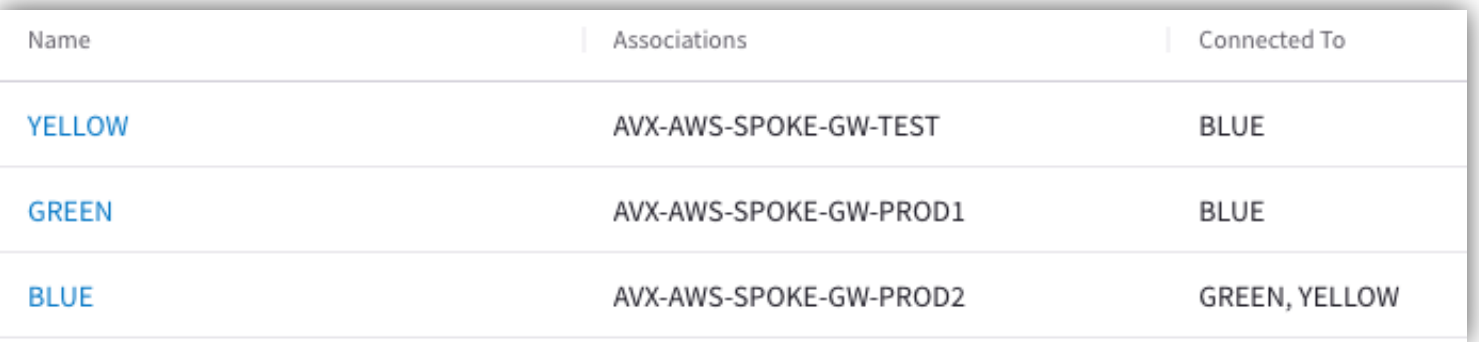
Connection Policy

- The Connection policy allows the **inter-domain** communication or **inter-segment** communication (is akin to the *vrf leaking* from the MPLS technology).

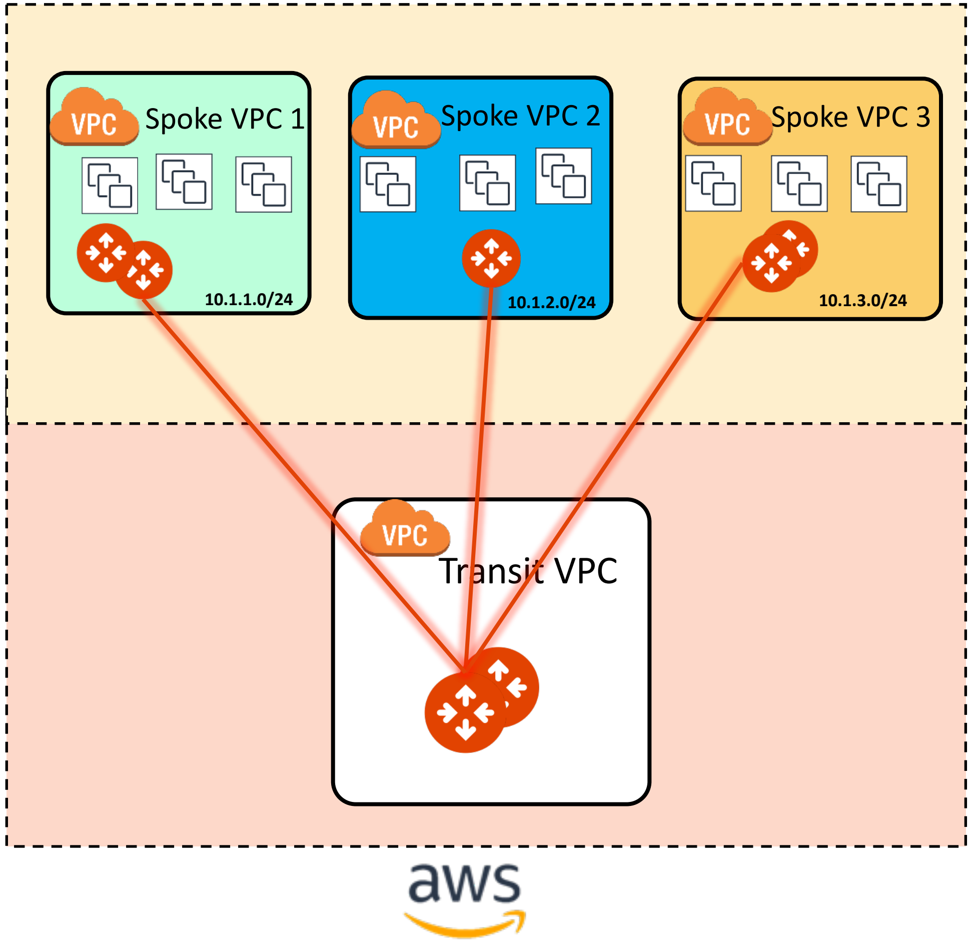
- The connection policy establishes a **bidirectional** connectivity (merging the network domains' RTBs).

- In the example on the right, there are three domains:
  - ❑ Green
  - ❑ Blue
  - ❑ Yellow

- If the Blue domain acts as the Shared Services Domain, **It will be connected to both the GREEN domain and the YELLOW domain.**



Name	Associations	Connected To
YELLOW	AVX-AWS-SPOKE-GW-TEST	BLUE
GREEN	AVX-AWS-SPOKE-GW-PROD1	BLUE
BLUE	AVX-AWS-SPOKE-GW-PROD2	GREEN, YELLOW



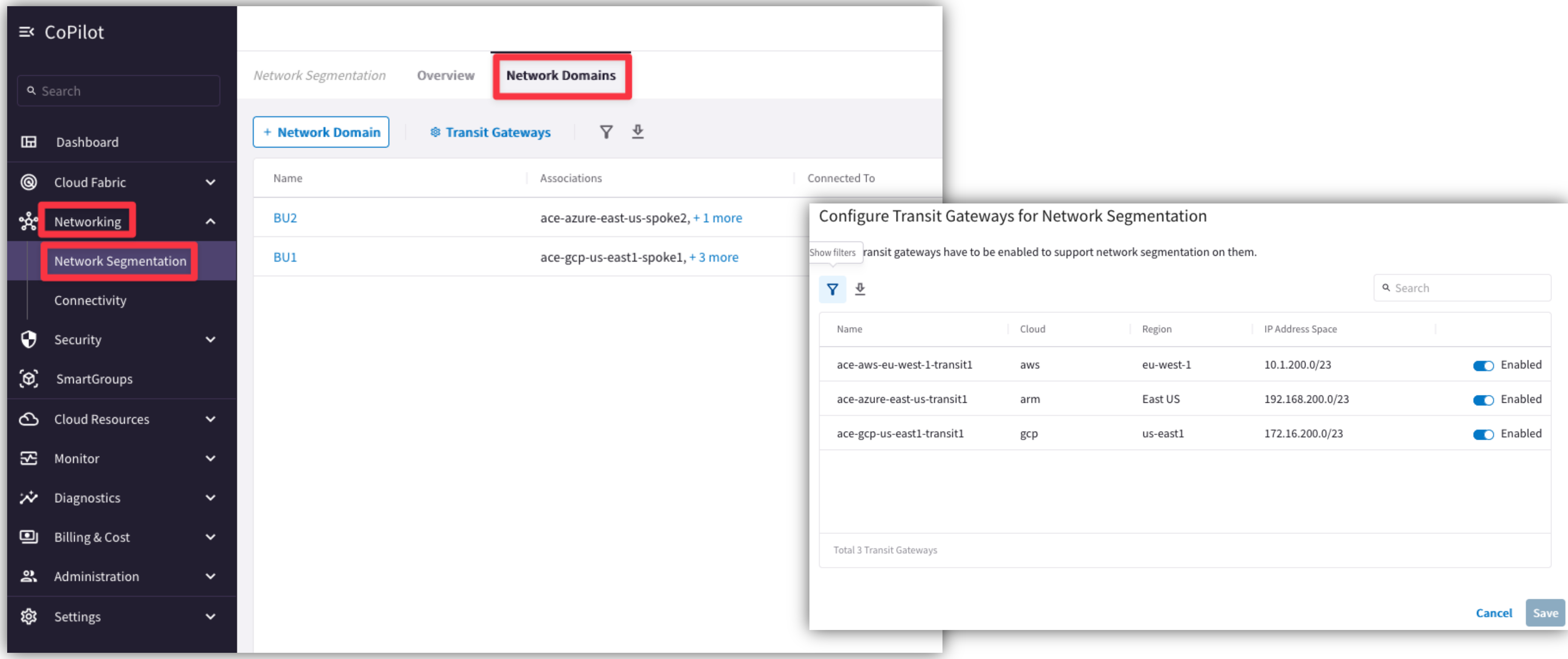
- **CAVEAT**: a connection policy can't be applied on the main RTB (aka Global Routing Table).

Tools for Operating your Network Segmentation

Network Segmentation Visibility

- CoPilot: verify the Network Domains

PATH: COPILOT > Networking > Network Segmentation > Network Domains



Name	Associations	Connected To
BU2	ace-azure-east-us-spoke2, + 1 more	
BU1	ace-gcp-us-east1-spoke1, + 3 more	

Configure Transit Gateways for Network Segmentation

ransit gateways have to be enabled to support network segmentation on them.

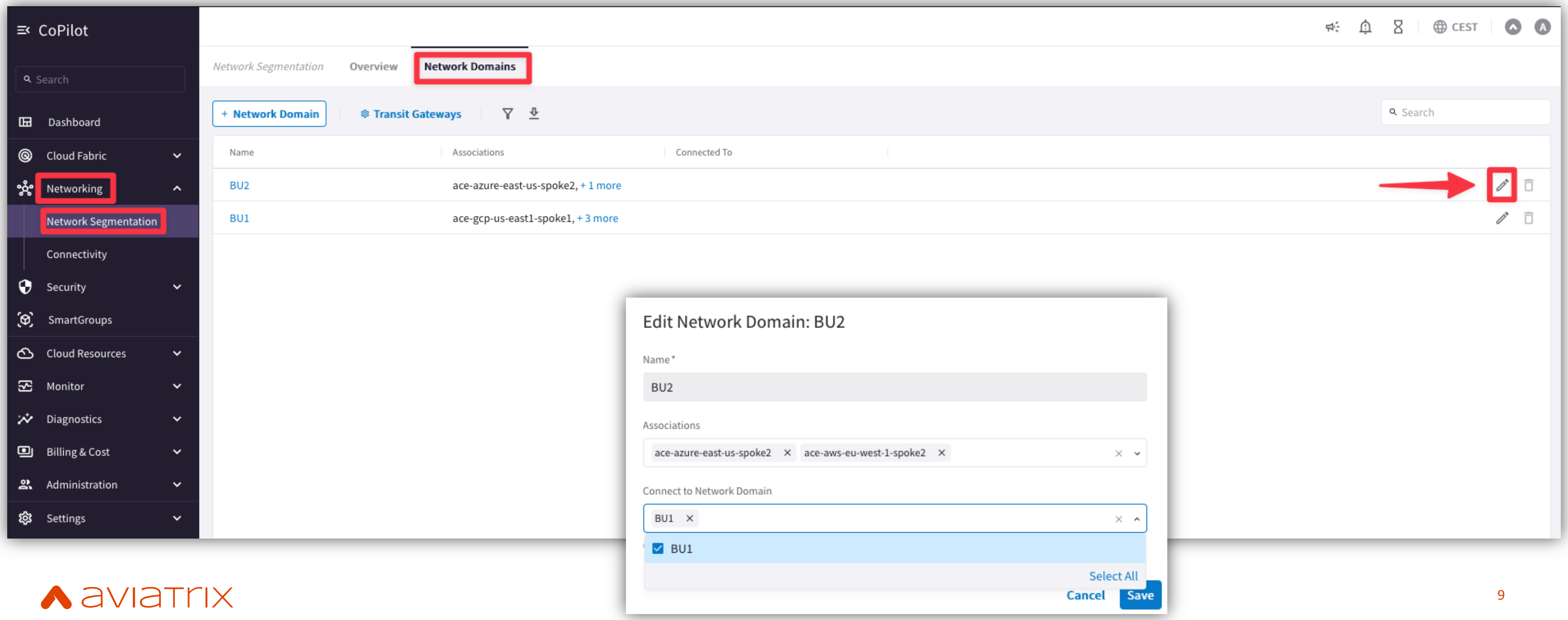
Name	Cloud	Region	IP Address Space	
ace-aws-eu-west-1-transit1	aws	eu-west-1	10.1.200.0/23	Enabled
ace-azure-east-us-transit1	arm	East US	192.168.200.0/23	Enabled
ace-gcp-us-east1-transit1	gcp	us-east1	172.16.200.0/23	Enabled

Total 3 Transit Gateways

Network Segmentation Visibility

- CoPilot: create/modify the Network Domains

PATH: COPILOT > Networking> Network Segmentation > Network Domains > pencil icon (edit)



Name	Associations	Connected To
BU2	ace-azure-east-us-spoke2, + 1 more	
BU1	ace-gcp-us-east1-spoke1, + 3 more	

Edit Network Domain: BU2

Name *

BU2

Associations

ace-azure-east-us-spoke2 ✕ ace-aws-eu-west-1-spoke2 ✕

Connect to Network Domain

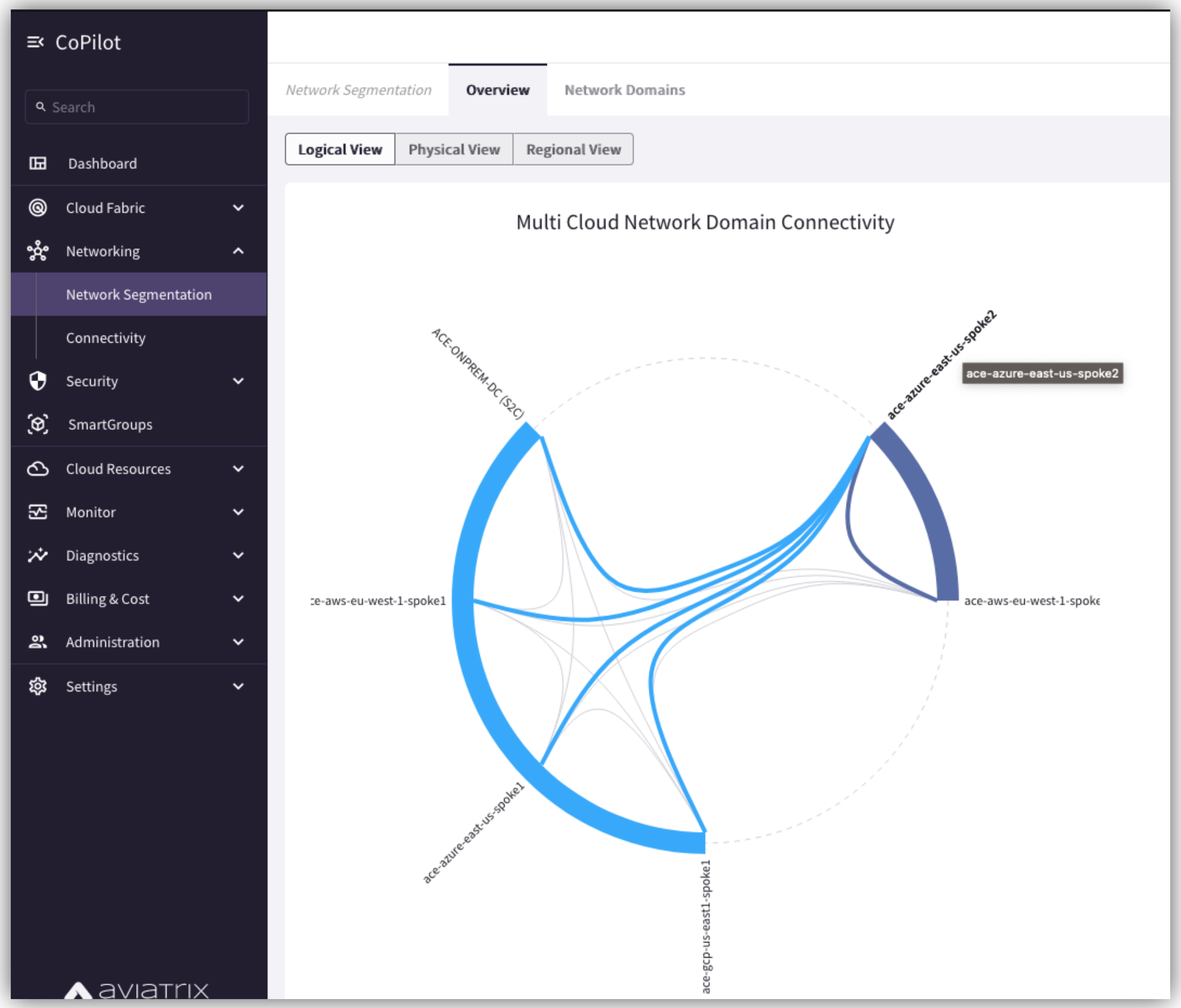
BU1 ✕

☑ BU1

Network Segmentation Visibility

- CoPilot: verify the Network Relationships

PATH: COPILOT > Networking > Network Segmentation > Overview > Logical View



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Next:

Lab 1 Network Domains & Connection Policy