InControl Setup Guide for Managing FusionHub & AWS Transit Gateway Connections

December 2021

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Overview

FusionHub on AWS allows you to establish SpeedFusion connections between AWS VPC and on-premise Peplink devices. AWS Transit Gateway Connect and Peering Connection integration allows your on-premises networks in different worldwide locations to connect through AWS Cloud and be able to access other services on AWS.

This guide contains:

- Provisioning Transit Gateway / Connect / Peering Connect, VPC route table by InControl
- Provisioning AWS Global Network by InControl
- Provisioning GRE and BGP settings to Peplink FusionHub

Prerequisite

Users who would like to deploy FusionHub on AWS with AWS Transit Gateway Connect should require some basic technical knowledge/know-how in the areas listed below:

- Understand the operation of SpeedFusion/PepVPN on Balance/MAX and FusionHub;
- Understand how to use InControl 2 (https://www.peplink.com/software/network-management-solution-incontrol-2/);
- Understand the FusionHub license model. (Software license for FusionHub is free for 1 SpeedFusion/PepVPN Peer. It is necessary to purchase a license from our eStore if more than one SpeedFusion/PepVPN peer is required.);
- Understand the concept and know how to operate Amazon AWS Marketplace, EC2, VPC, and Transit Gateway;
- Understand the requirements for FusionHub on AWS and which requirements will incur changes by AWS according to the different types of instances and regions.

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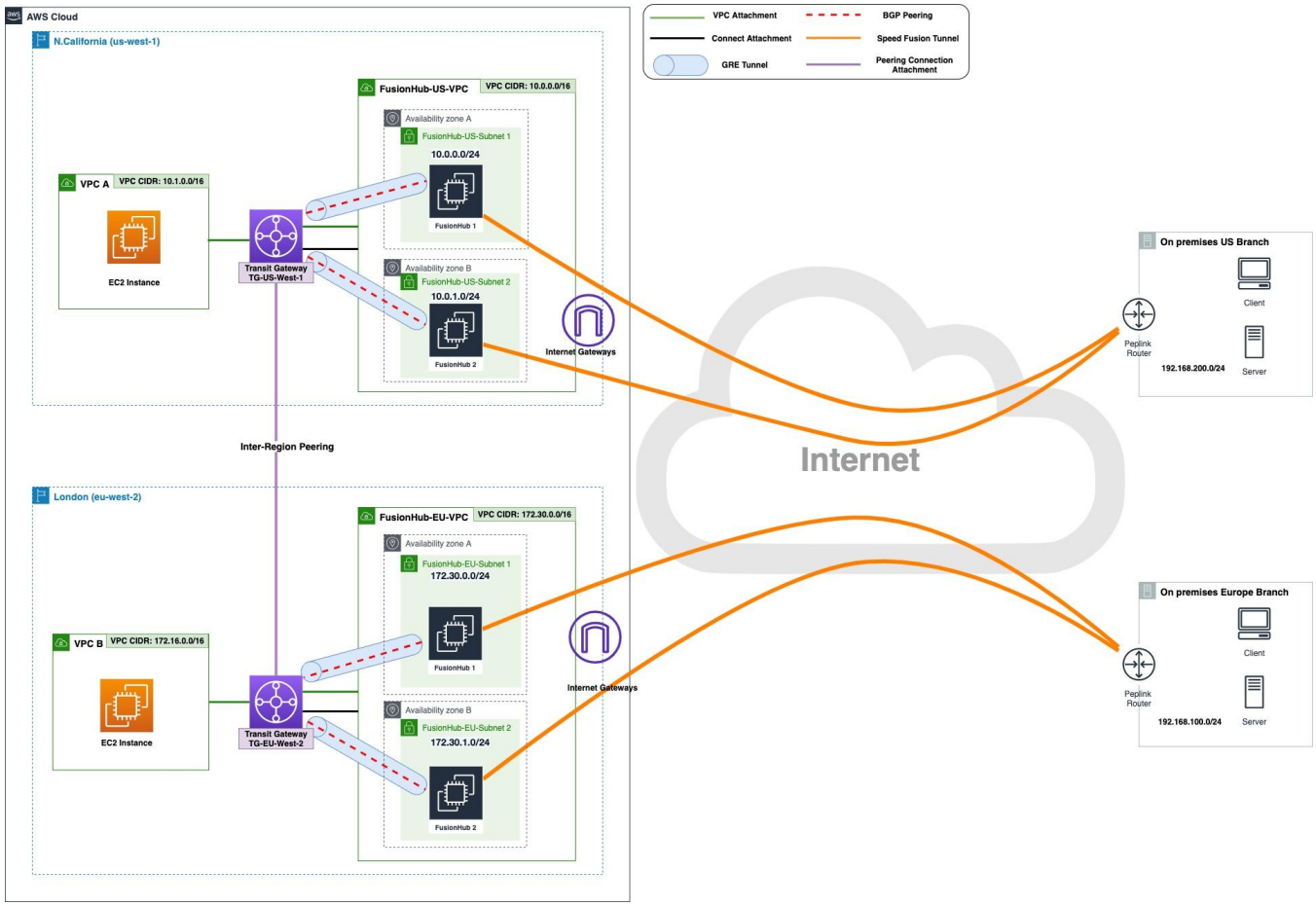
Sample Deployment Diagram

In this example, we connected the US Branch (192.168.200.0/24) and EU branch (192.168.100.0/24) with SpeedFusion through FusionHub on different AWS Regions. The edge device (Peplink router) at the branch will establish a SpeedFusion tunnel to the FusionHub devices (DC & DR) at the local AWS region. Both AWS regions are connected via AWS Transit Gateway Inter-Region Peering Connection.

As a result, the US Branch (192.168.200.0/24) and EU Branch (192.168.100.0/24) can communicate over SpeedFusion and the AWS Transit Gateway Inter-Region Peering Connection.



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Setting Up FusionHub devices on AWS

To deploy FusionHub on AWS, it is necessary to:

- Create a VPC, Subnet, and Internet Gateway on AWS;
- Deploy the FusionHub devices to the defined AWS VPC.

Create AWS VPC and Subnets

The following tables are the regions, names, CIDR, and IP addresses which will be used for creating VPC, Subnets, Internet Gateway, and FusionHub devices.

VPC

Region	VPC Name	VPC IPv4 CIDR
us-west-1 (N. California)	FusionHub-US-VPC	10.0.0.0/16
eu-west-2 (London)	FusionHub-EU-VPC	172.30.0.0/16

VPC Subnet and FusionHub IP

Subnet Name	VPC name	Region/ Availability Zone	Subnet IPv4 CIDR	FusionHub Private IP
FusionHub-US-Subnet-1	FusionHub-US-VPC	us-west-1a	10.0.0.0/24	10.0.0.10
FusionHub-US-Subnet-2	FusionHub-US-VPC	us-west-1c	10.0.1.0/24	10.0.1.10
FusionHub-EU-Subnet-1	FusionHub-EU-VPC	eu-west-2a	172.30.0.0/24	172.30.0.10
FusionHub-EU-Subnet-2	FusionHub-EU-VPC	eu-west-2b	172.30.1.0/24	172.30.1.10

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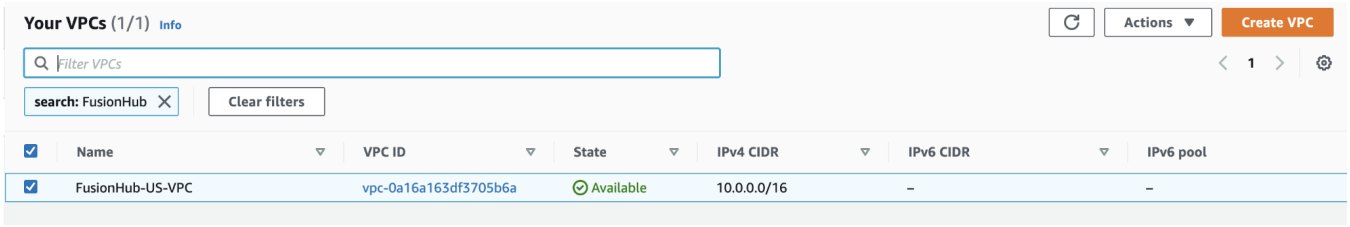
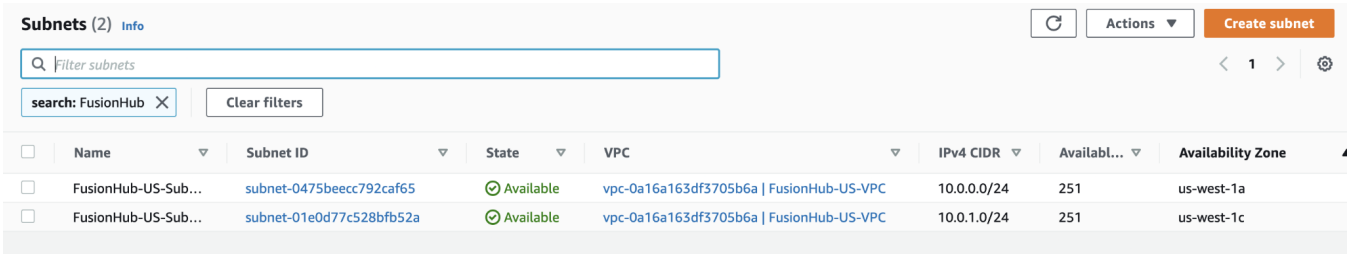
Region: us-east-1 (N. California)

Create the VPC
VPC Name: FusionHub-US-VPC
IPv4 CIDR: 10.0.0.0/16

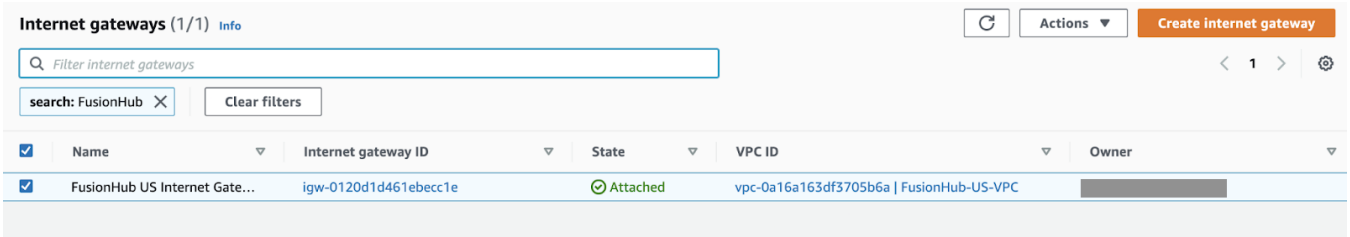


Create two Subnets
Subnet name: FusionHub-US-Subnet-1
Availability Zone: us-west-1a
IPv4 CIDR: 10.0.0.0/24

Subnet name: FusionHub-US-Subnet-2
Availability Zone: us-west-1c
IPv4 CIDR: 10.0.1.0/24



Create the Internet Gateways
Create an Internet Gateway and attach them to FusionHub-US-VPC.



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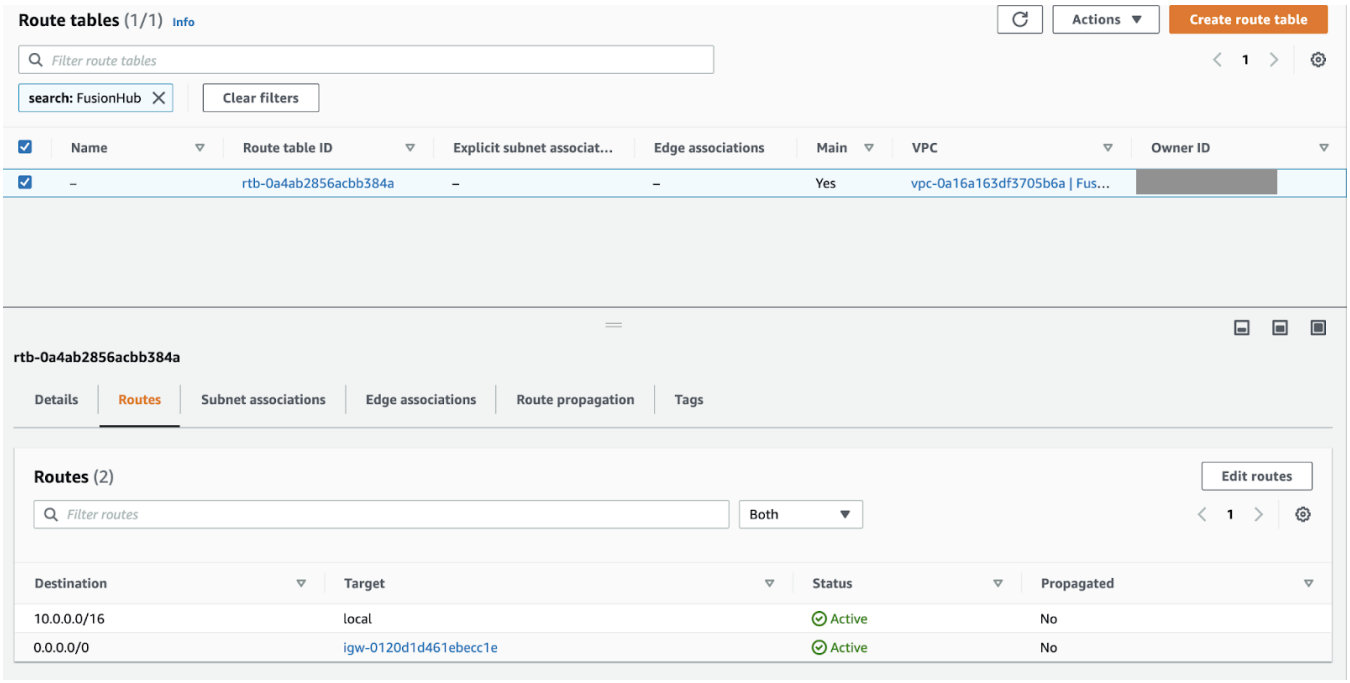
Configure the Route Table

Define the default route (0.0.0.0/0) in the Route Table of FusionHub-US-VPC to route all Internet traffic to the defined Internet Gateway.



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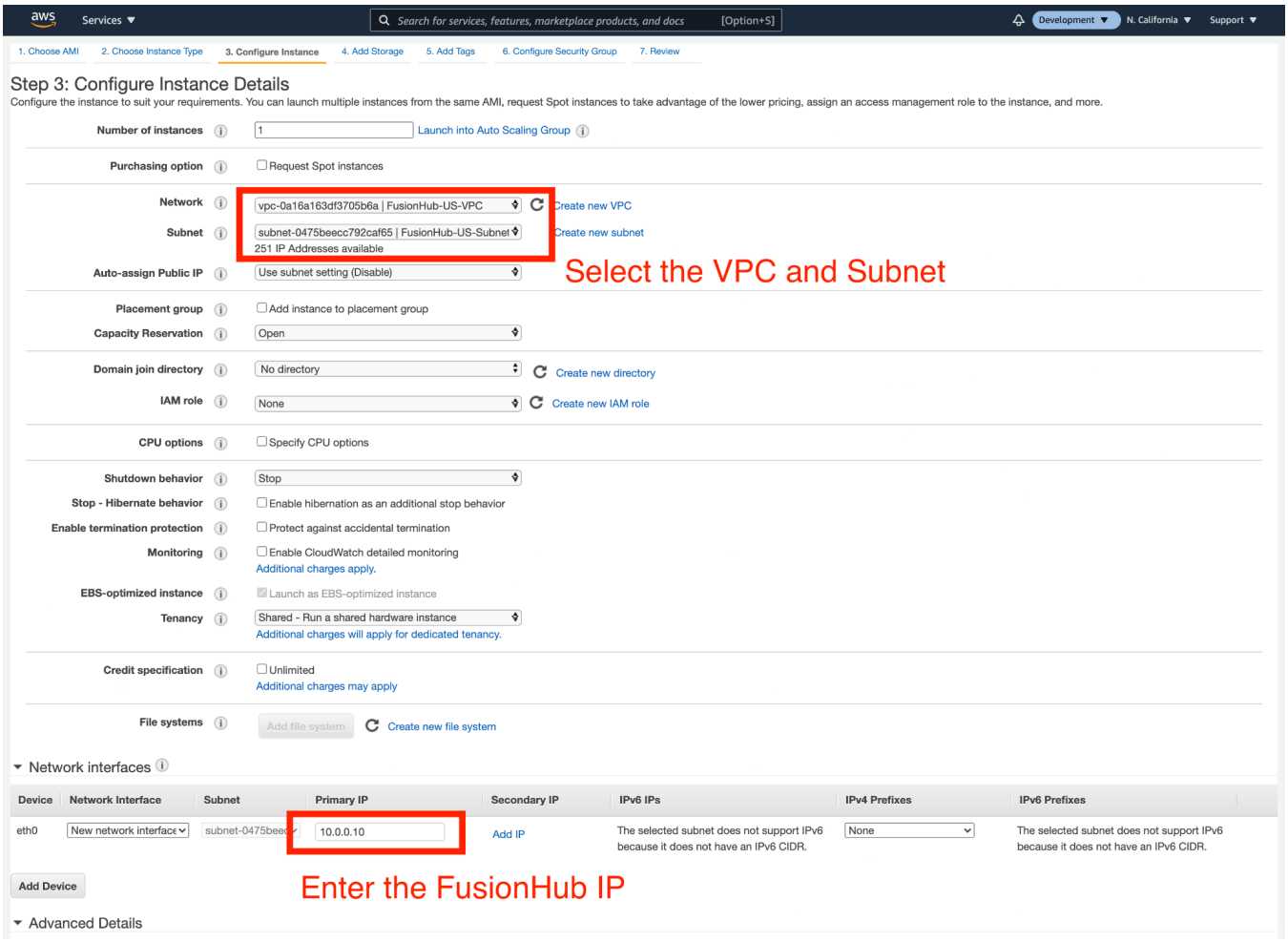
Create FusionHub on AWS VPC

This step is to create two separate FusionHub IPs on VPC Subnet **FusionHub-US-Subnet-1** and **FusionHub-US-Subnet-2** respectively, and to specify the Primary IP instead of using Auto-assign. For the detailed steps, please refer to (https://forum.peplink.com/t/deploying-peplink-fusionhub-at-aws-marketplace).

1st FusionHub IP is 10.0.0.10, on FusionHub-US-Subnet-1.
2nd FusionHub IP is 10.0.1.10, on FusionHub-US-Subnet-2.



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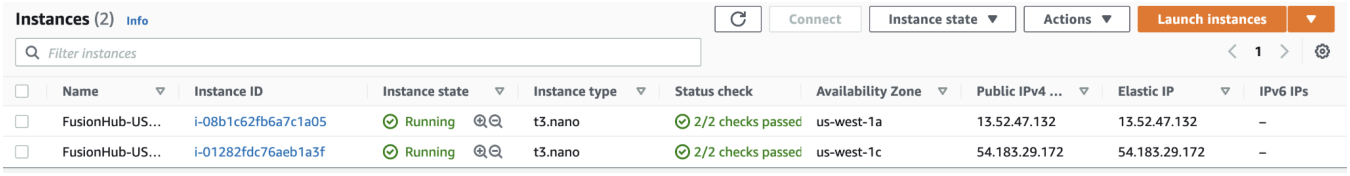
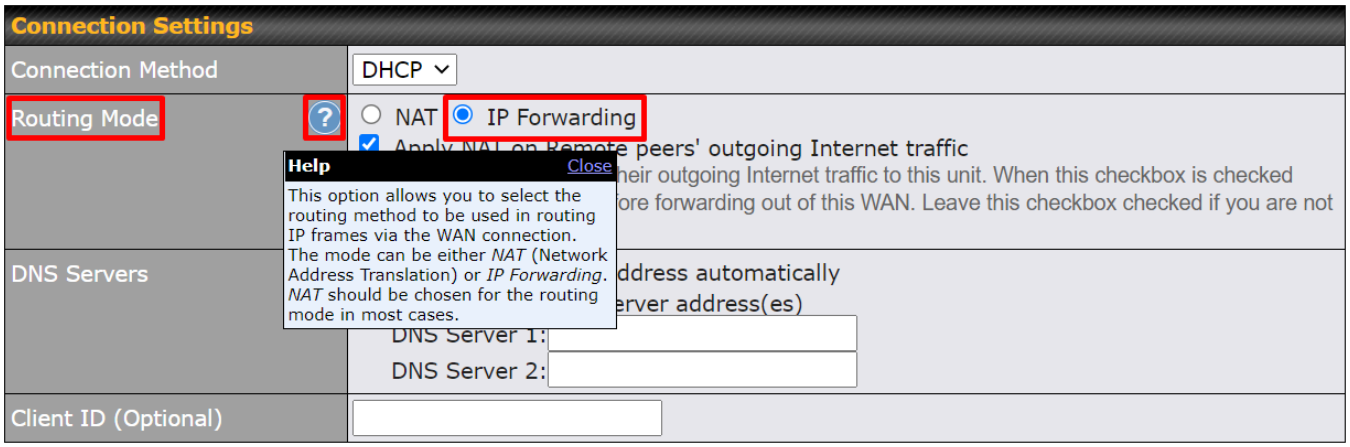
Next, associate the Elastic IPs to the FusionHub devices.



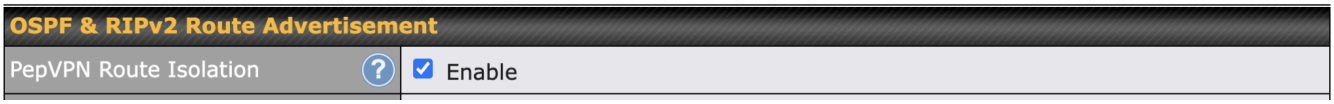
Enter the License Key for the FusionHub by accessing the FusionHub via https://<eliastic IP>/ .

Configure the IP Forwarding mode



Configure Route Isolation on Devices

Enable the PepVPN Route Isolation on the branch Peplink devices (Balance/MAX).



Setting up AWS VPC and FusionHub in another Region

Repeat the steps above to set up FusionHub in another region (eu-west-2, London in this example).

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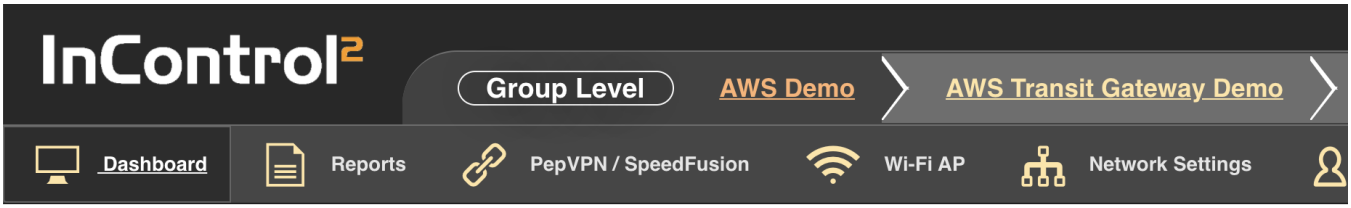
Configure SpeedFusion via InControl

To set up SpeedFusion for the FusionHub and MAX devices, place the devices into the same InControl organization.



AWS Transit Gateway Demo ☆

Online	Offline
6 device(s)	0 device(s)

Device List

Search devices... 6 device(s)

Status	Device Name	Tags	Wi-Fi Config	Product
	☆ FusionHub-EU-01		-	FusionHub
	☆ FusionHub-EU-02		-	FusionHub
	☆ FusionHub-US-01		-	FusionHub
	☆ FusionHub-US-02		-	FusionHub
	☆ MAX_TST_EU		Device managed	MAX Transit LTEA
	☆ MBX_US		Device managed	MAX HD4 MBX

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Configure the SpeedFusion Profiles via PepVPN/SpeedFusion Configuration at the **Organization level** as shown below:

Enabled	Name	Topology	NAT	Description
☑	SpeedFusion-EU	Star	No	Hub: FusionHub-EU-01 End Points: MAX_TST_EU
☑	SpeedFusion-EU-DR	Star	No	Hub: FusionHub-EU-02 End Points: MAX_TST_EU
☑	SpeedFusion-US	Star	No	Hub: FusionHub-US-01 End Points: MBX_US
☑	SpeedFusion-US-DR	Star	No	Hub: FusionHub-US-02 End Points: MBX_US

SpeedFusion Profiles for DR purposes are required to set the path cost to 20 or higher.

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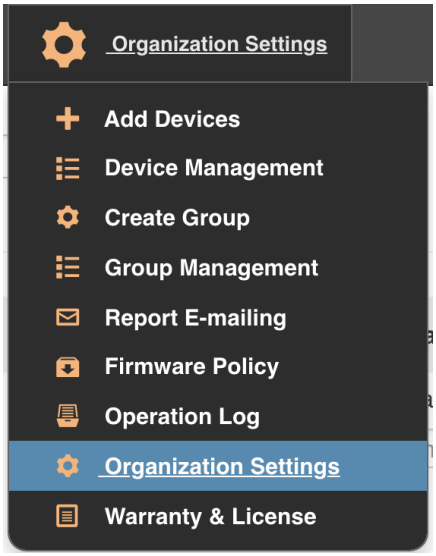
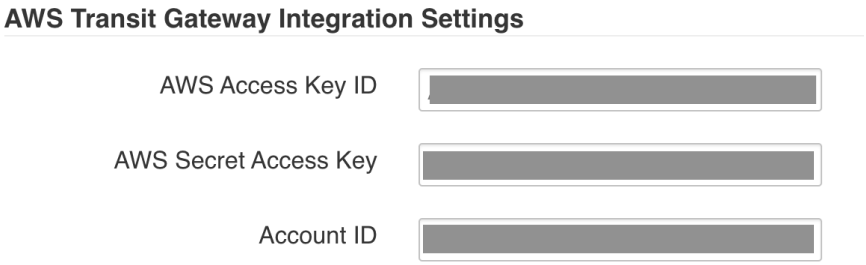
Set Up Transit Gateway Connections via InControl

Adding AWS Access Key and Secret Access Key

In InControl, go to Organization Settings and add the AWS Access Key ID, Secret Access Key, and Account ID. With these credentials, InControl will be able to set up the Transit Gateway and related configurations on the specific AWS Account ID.





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We recommend using the following AWS IAM Policy for the AWS Access Key:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "ec2:Describe*",
                "ec2:DeleteTags",
                "networkmanager:*",
                "ec2:CreateRoute",
                "ec2:CreateTags",
                "sts:GetAccessKeyInfo",
                "ec2:Get*",
                "ec2:*TransitGateway*"
            ],
            "Resource": "*"
        },
        {
            "Sid": "VisualEditor1",
            "Effect": "Deny",
            "Action": [
                "ec2:DeleteTransitGatewayRouteTable",
                "ec2:DeleteTransitGatewayPeeringAttachment",
                "ec2:DeleteTransitGatewayPrefixListReference",
                "ec2:DeleteTransitGatewayVpcAttachment",
                "ec2:DeleteTransitGatewayConnect",
                "ec2:DeleteTransitGateway",
                "ec2:DeleteTransitGatewayMulticastDomain"
            ],
            "Resource": "*"
        }
    ]
}
```

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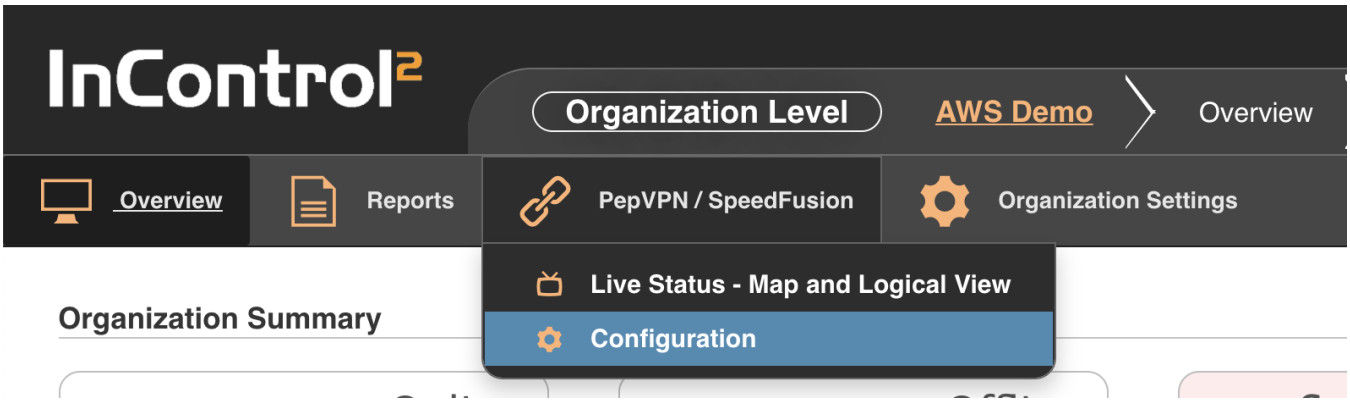
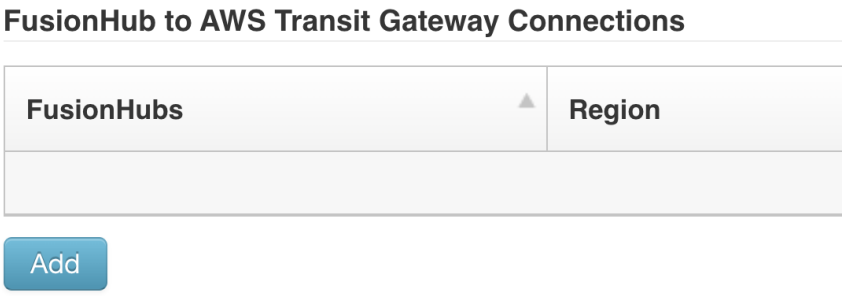
FusionHub to AWS Transit Gateway Connections

Under Organization Level, go to PepVPN / SpeedFusion, Configuration.



Click “Add” to create an AWS Transit Gateway and add the Peer Connections from FusionHub to the Transit Gateway.



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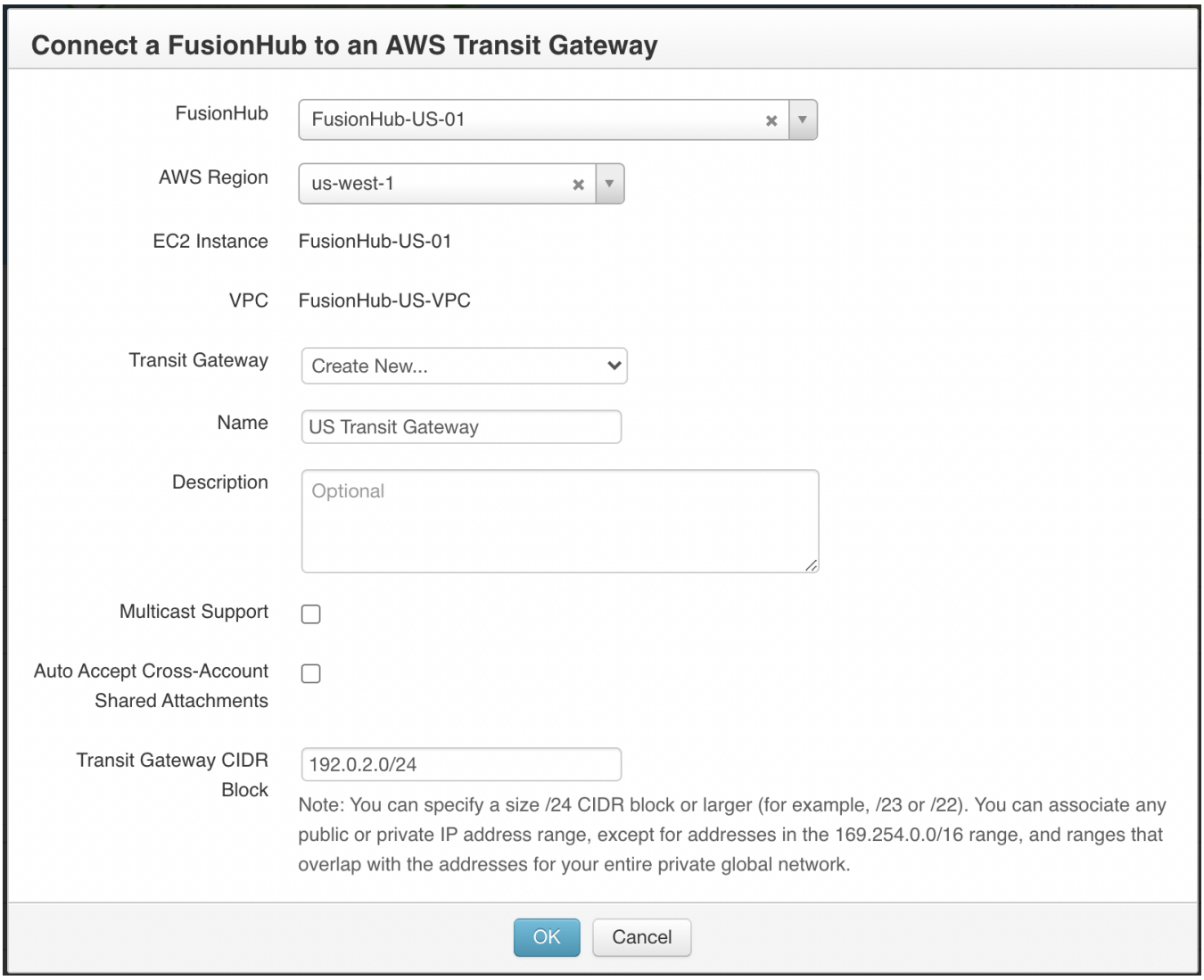
Create a new Transit Gateway (named US Transit Gateway) and add Connect Peer from FusionHub-US-01 to Transit Gateway.



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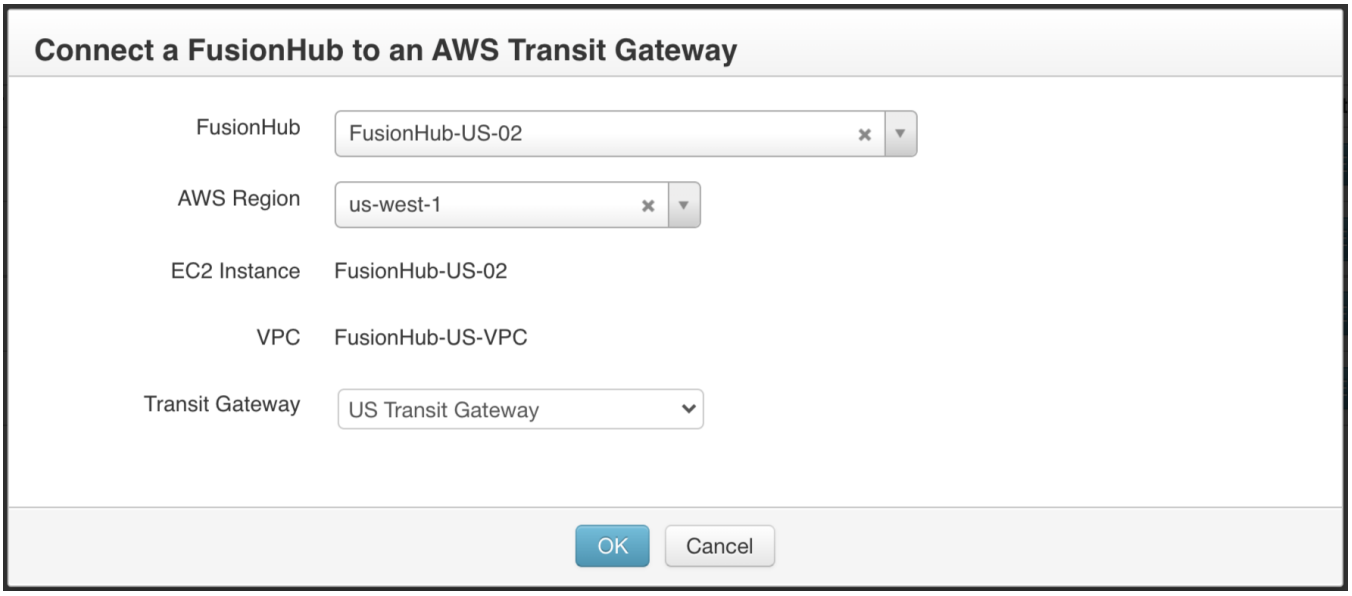
Add Connect Peer from FusionHub-US-02 to the same Transit Gateway (US Transit Gateway) in the us-west-01 region that was created in the previous step.



Repeat the steps above to create the Transit Gateway Connections for the eu-west-2 region. The table should match the example below.

FusionHub to AWS Transit Gateway Connections

FusionHubs	Region	VPC	Transit Gateway
FusionHub-EU-01	eu-west-2	FusionHub-EU-VPC	TGW EU
FusionHub-EU-02	eu-west-2	FusionHub-EU-VPC	TGW EU
FusionHub-US-01	us-west-1	FusionHub-US-VPC	TGW US
FusionHub-US-02	us-west-1	FusionHub-US-VPC	TGW US

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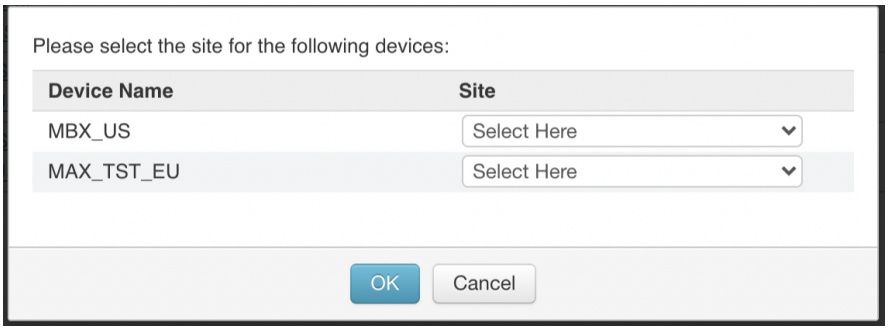
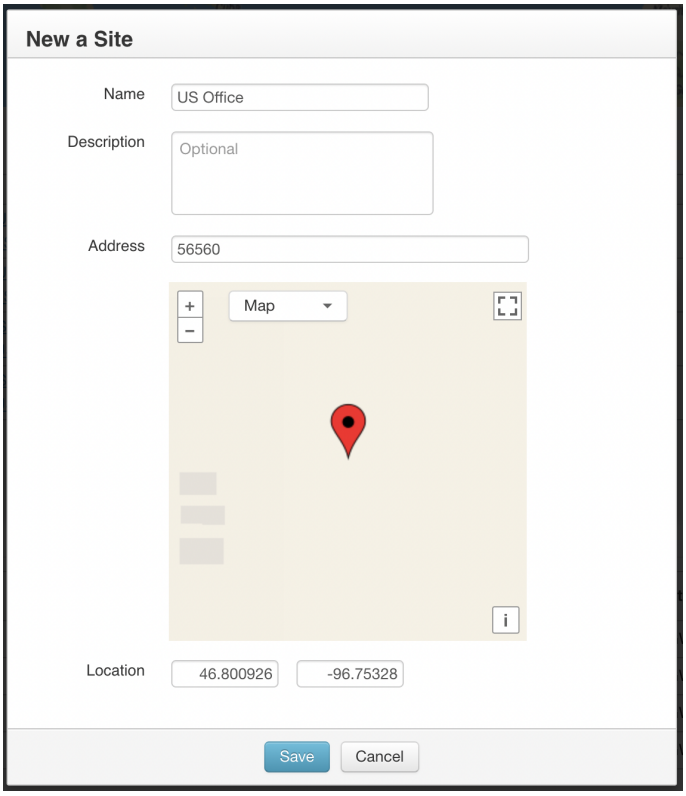
Define Devices' Sites





Associate the newly defined site with the MAX/Balance (branch Peplink device).

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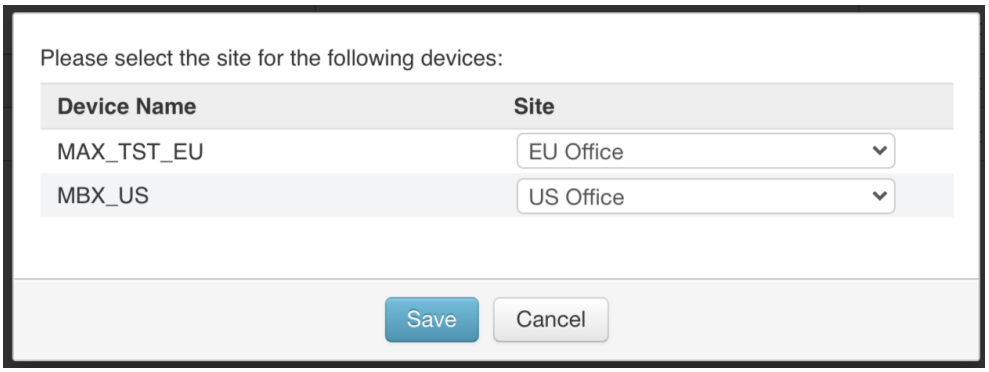

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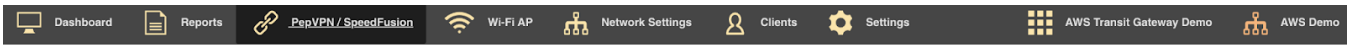
Verify the Configuration

InControl

Under the InControl Organization (AWS Demo), at the Group (AWS Transit Gateway Demo) level, select the PepVPN / SpeedFusion Live Status - Tabular View of InControl. The US Branch Peplink devices have obtained the route of the EU Branch's 192.168.100.0/24 subnet while the EU Branch devices have also successfully obtained the route of the US Branch's 192.168.200.0/24 subnet.



PepVPN / SpeedFusion Live Status - Tabular View

		Device A			Device B		
		Name	WAN	IP / Subnet Address(es)	Name	WAN	IP / Subnet Address(es)
		FusionHub-US-02 > Primary Tunnel (1167-[redacted])		Active: 192.168.200.0/24	MBX_US > Primary Tunnel (2936-[redacted])	1	Active: 10.0.1.0/24 Inactive: 10.0.0.0/16, 172.30.0.0/16, 192.168.100.0/24
		FusionHub-US-01 > Primary Tunnel (1181-[redacted])		Active: 192.168.200.0/24	MBX_US > Primary Tunnel (2936-[redacted])	1	Active: 10.0.0.0/24, 10.0.0.0/16, 172.30.0.0/16, 192.168.100.0/24
		FusionHub-EU-02 > Primary Tunnel (1133-[redacted])		Active: 192.168.100.0/24	MAX_TST_EU > Primary Tunnel (2938-[redacted])		Active: 172.30.1.0/24 Inactive: 172.30.0.0/16, 10.0.0.0/16, 192.168.200.0/24
		FusionHub-EU-01 > Primary Tunnel (1177-[redacted])		Active: 192.168.100.0/24	MAX_TST_EU > Primary Tunnel (2938-[redacted])		Active: 172.30.0.0/24, 172.30.0.0/16, 10.0.0.0/16, 192.168.200.0/24

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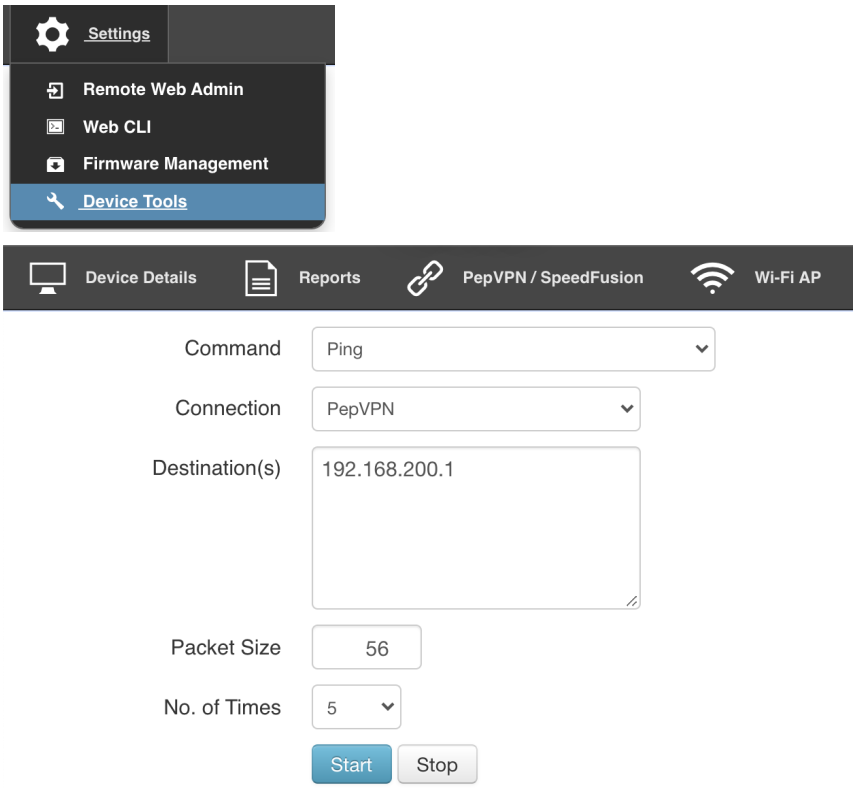
Verify the connectivity by using the Ping command. The command can ping from the EU Branch to the US Branch's device.



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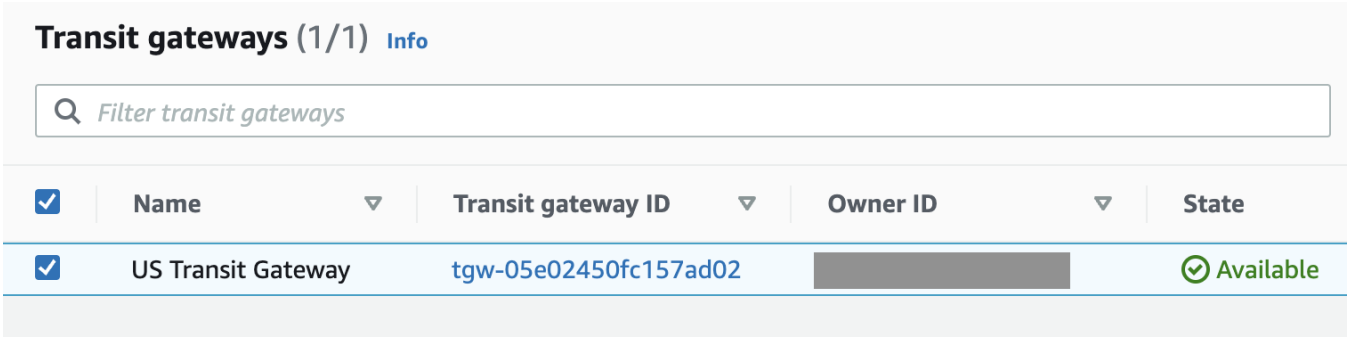
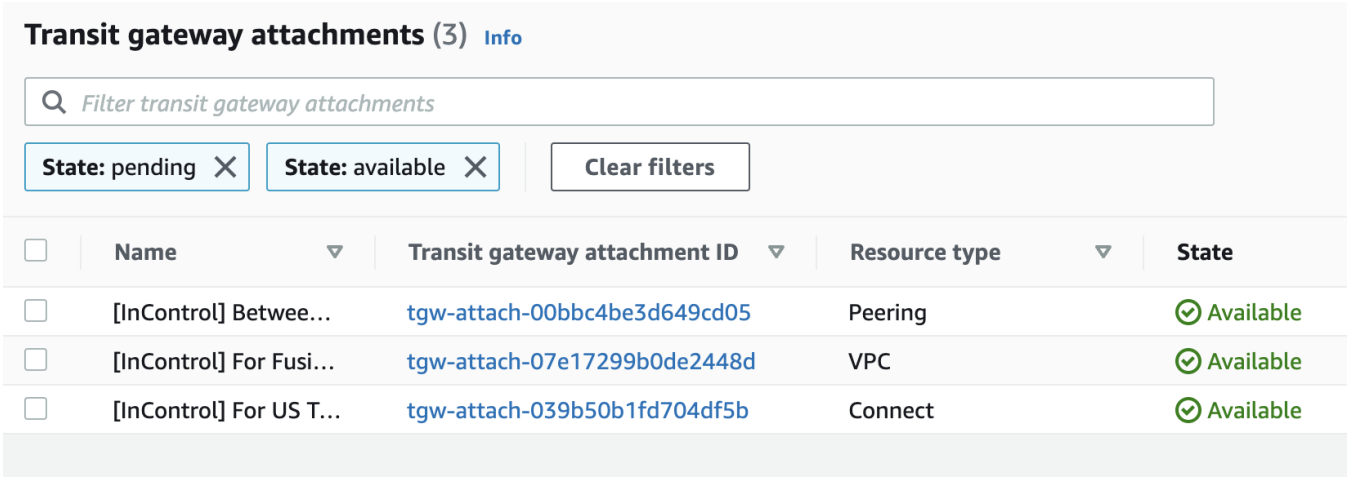
AWS Console

Once InControl has added the Transit Gateway, Attachments, Connect Peers, and the BGP Route table, they can also be verified via AWS Web Console.

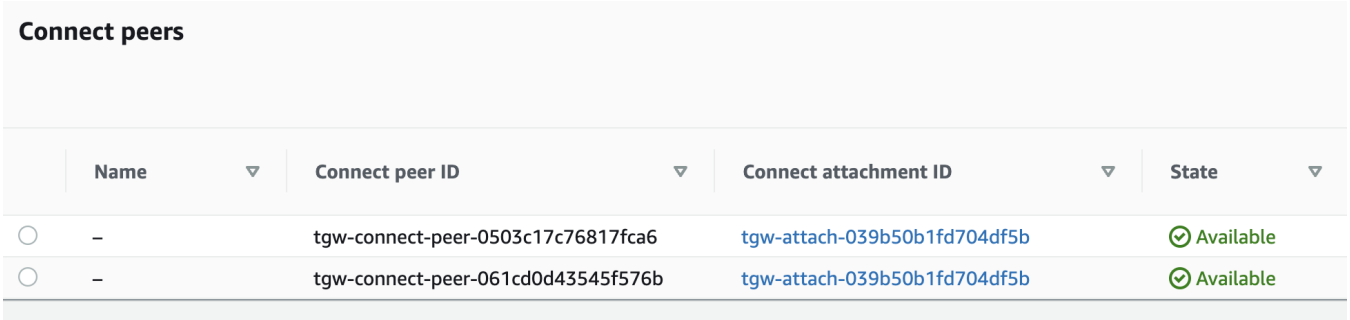
US Transit Gateway



US Transit Gateway Attachments



US Transit Gateway Connect Peers / BGP Status



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Transit gateway BGP 1 Status	Transit gateway BGP 2 address	Transit gateway BGP 2 Status
Up	169.254.30.251	Up
Up	169.254.30.235	Up

US Transit Gateway Route Table

Routes (4)

Actions | Create s

Filter routes

CIDR	Attachment ID	Resource ID	Resource type	Route type	Route state
10.0.0.0/16	tgw-attach-07e17299b0de2448d	vpc-0a16a163df3705b6a	VPC	Propagated	Active
172.30.0.0/16	tgw-attach-00bbc4be3d649cd05	tgw-0110207895b64d3d3	Peering	Static	Active
192.168.100.0/24	tgw-attach-00bbc4be3d649cd05	tgw-0110207895b64d3d3	Peering	Static	Active
192.168.200.0/24	tgw-attach-039b50b1fd704df5b	tgw-connect-peer-061cd0d…	Connect	Propagated	Active

EU Transit Gateway

Transit gateways (1) Info

Filter transit gateways

Name	Transit gateway ID	Owner ID	State
EU Transit Gateway	tgw-0110207895b64d3d3	780995285927	Available

EU Transit Gateway Attachments

Transit gateway attachments (3) Info

Actions

Filter transit gateway attachments

State: pending | State: available | Clear filters

Name	Transit gateway attachment ID	Transit gateway ID	Resource type	State
–	tgw-attach-00bbc4be3d649cd05	tgw-0110207895b64d3d3	Peering	Available
[InControl] For Fusi…	tgw-attach-09e75e5d47e3ccdb2	tgw-0110207895b64d3d3	VPC	Available
[InControl] For EU T…	tgw-attach-0b0d226480361ba3b	tgw-0110207895b64d3d3	Connect	Available

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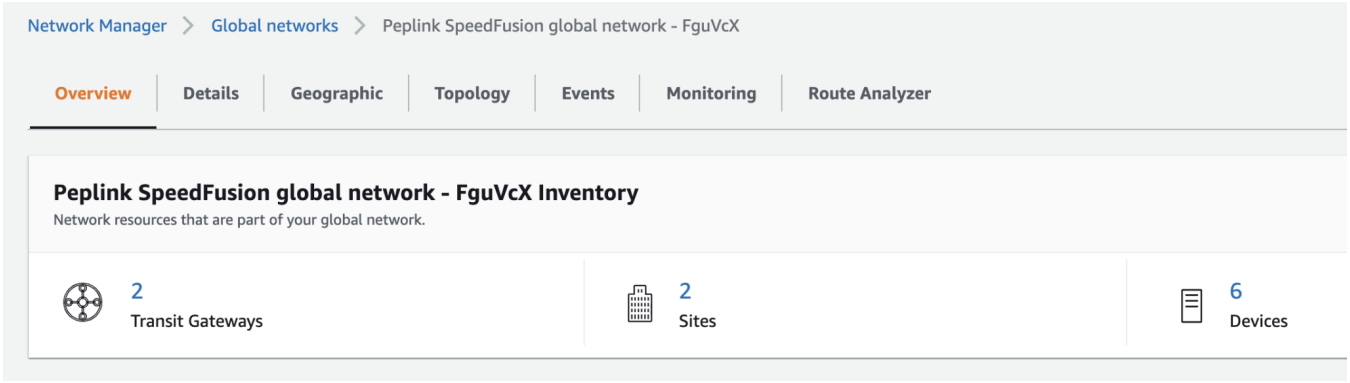
EU Transit Gateway Connect Peers / BGP Status

Connect peers

	Name	Connect peer ID	Connect attachment ID	State
○	–	tgw-connect-peer-0b3aaf3e05f8b6e30	tgw-attach-0b0d226480361ba3b	Available
○	–	tgw-connect-peer-0d67f821169a7cc9d	tgw-attach-0b0d226480361ba3b	Available

Transit gateway BGP 1 Status	Transit gateway BGP 2 address	Transit gateway BGP 2 Status
Up	169.254.30.203	Up
Up	169.254.30.211	Up

Global Networks - Overview



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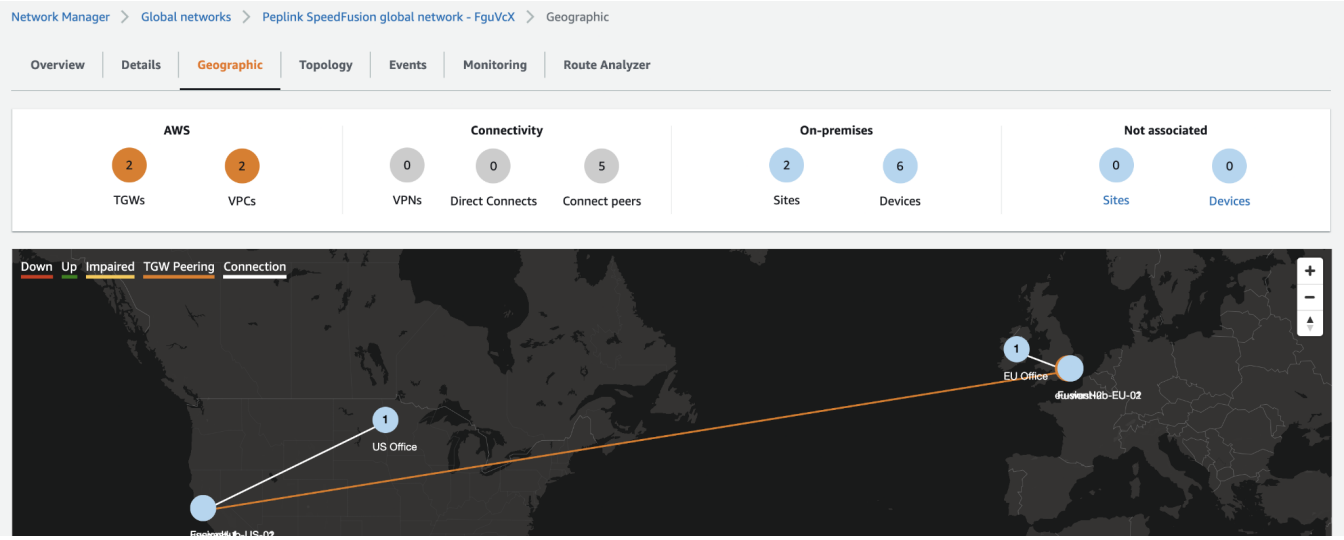
Global Networks - Geographic

This tab shows that the on-premises sites and devices are connected through the local AWS Region via SpeedFusion, and that the two AWS Regions are connected by Transit Gateway Inter-Region Peering Connection.



Global Networks - Topology

This displays the logical relationship of the network between the US and Europe, along with the on-premises networks with Peplink devices.

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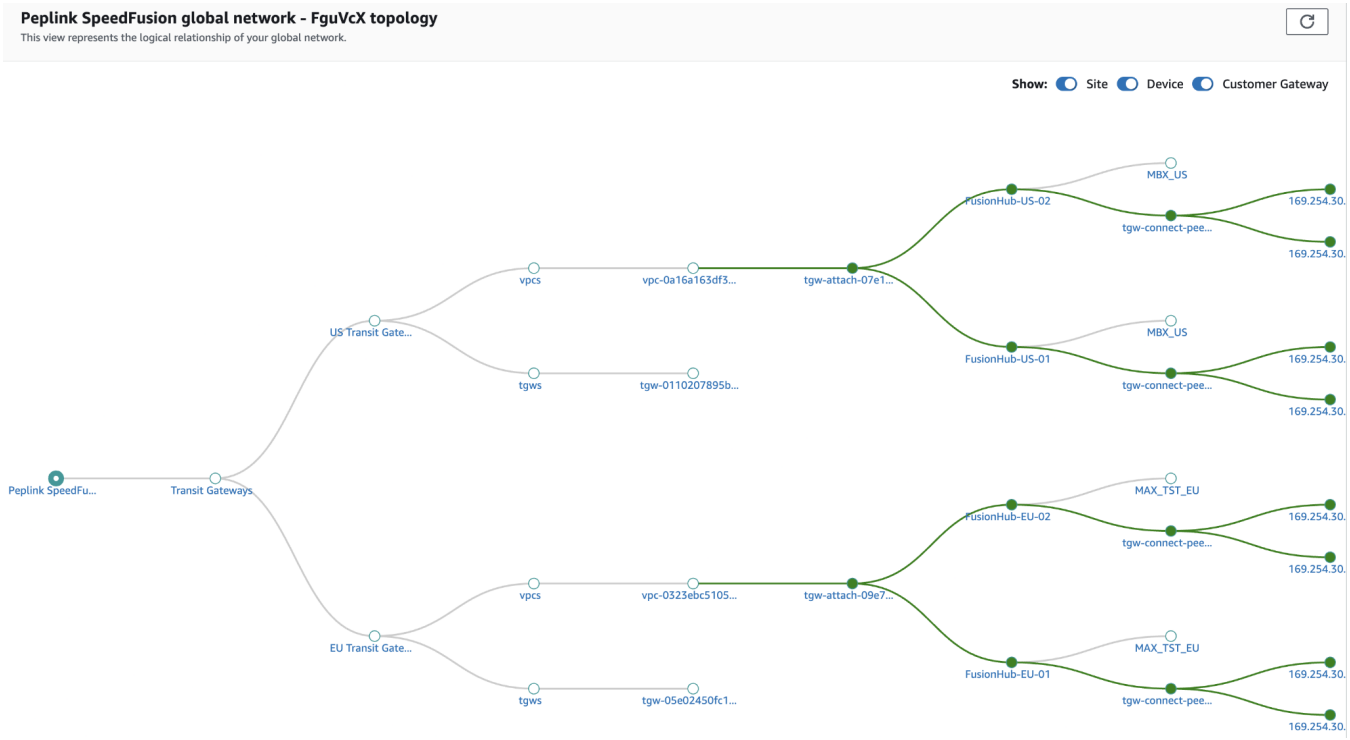

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