



# Connecting Equinix Direct Connect to VMware Cloud on AWS

VMware Integrations

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## Connecting Equinix Direct Connect to VMware Cloud on AWS

### Summary

This blog will go through the steps to make a direct private connection from Equinix to a VMware Cloud on AWS SDDC. This connection can securely link infrastructure a customer has deployed in different geographical locations.

- Customers Equinix private clouds to the VMware Cloud SDDC.
- Private connections from customers on prem datacenters to VMware Cloud on AWS SDDC through Equinix.
- Edge and ROBO sites to VMware Cloud on AWS SDDC through Equinix.
- Other cloud provider VPC's, provisioned services and VMware SDDC's to VMware Cloud on AWS through Equinix.

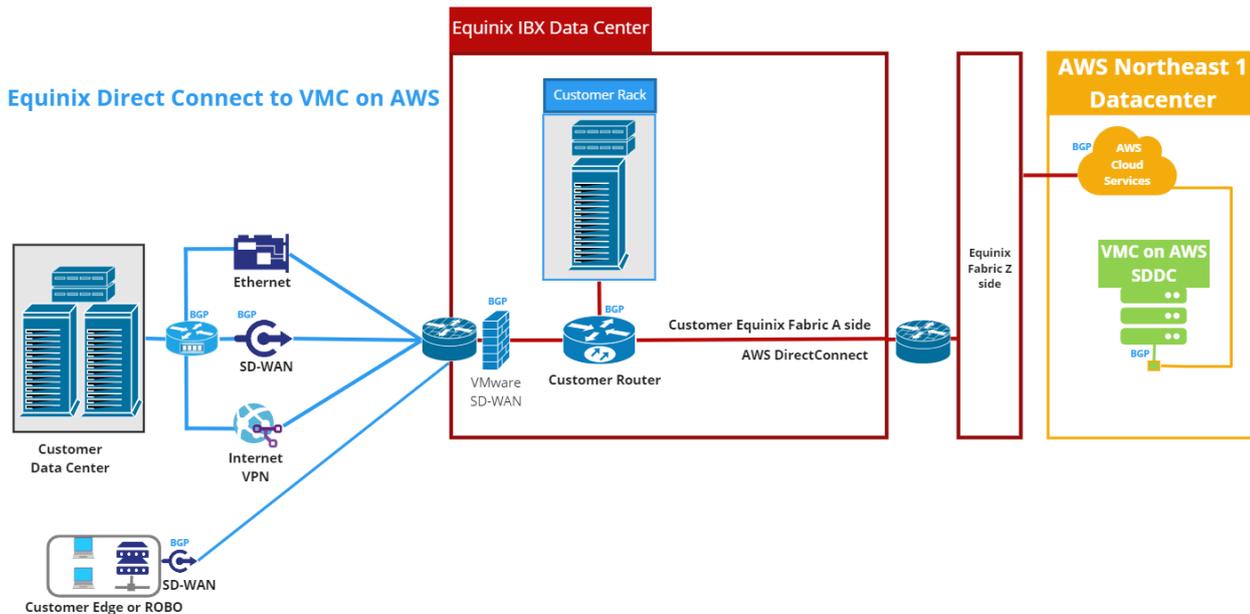
The customer can link sites to Equinix using private data lines, SD-WAN or VPN tunnels connected to customer owned physical networking infrastructure or use virtual networking devices as a service from Equinix. By using Equinix as the network point of presence or edge route to Hyperscalers like AWS, Google and AVS, a private network connection can quickly be deployed and torn down very easily on demand as this blog will show. Equinix acts as the network hub to link the customer hyperscaler networks on VMware Cloud on AWS, Google Cloud on VMware Engine, AVS as well as between the customer on prem, edge and Equinix located private clouds.

This blog assumes the customer already has a VMware Cloud on AWS SDDC deployed and functional. This blog does not cover the customer side switch and router setup as this can vary depending on the manufacture of the networking equipment. The assumption is the customer already knows how to set up a VLAN with layer 3 routing and can configure the BGP routing protocol on the customer equipment on the Equinix side of the connection. The blog will go over the steps to extend the customers connection using "Equinix Fabric" to an SDDC running in VMware Cloud on AWS.

## Architecture Overview

The following diagram represents a customer with Equinix collocated equipment and on-premises sites connected to Equinix. Equinix fabric is used to create a “Direct Connect” data link to a customer VMware Cloud on AWS SDDC providing a private direct connection for all sites to cloud services in VMware Cloud on AWS. BGP is used between all locations to advertise routes enabling seamless end to end private network environment from on-prem datacenters to edge to Equinix to VMware Cloud on AWS.

The Equinix A and Z side connections provide VLAN translation from your private network VLAN in Equinix to the AWS network VLAN assigned when the “Direct Connect” circuit is provisioned. This provides a seamless layer 2 connection between two different VLAN IDs with Equinix taking care of the translation for the customer.



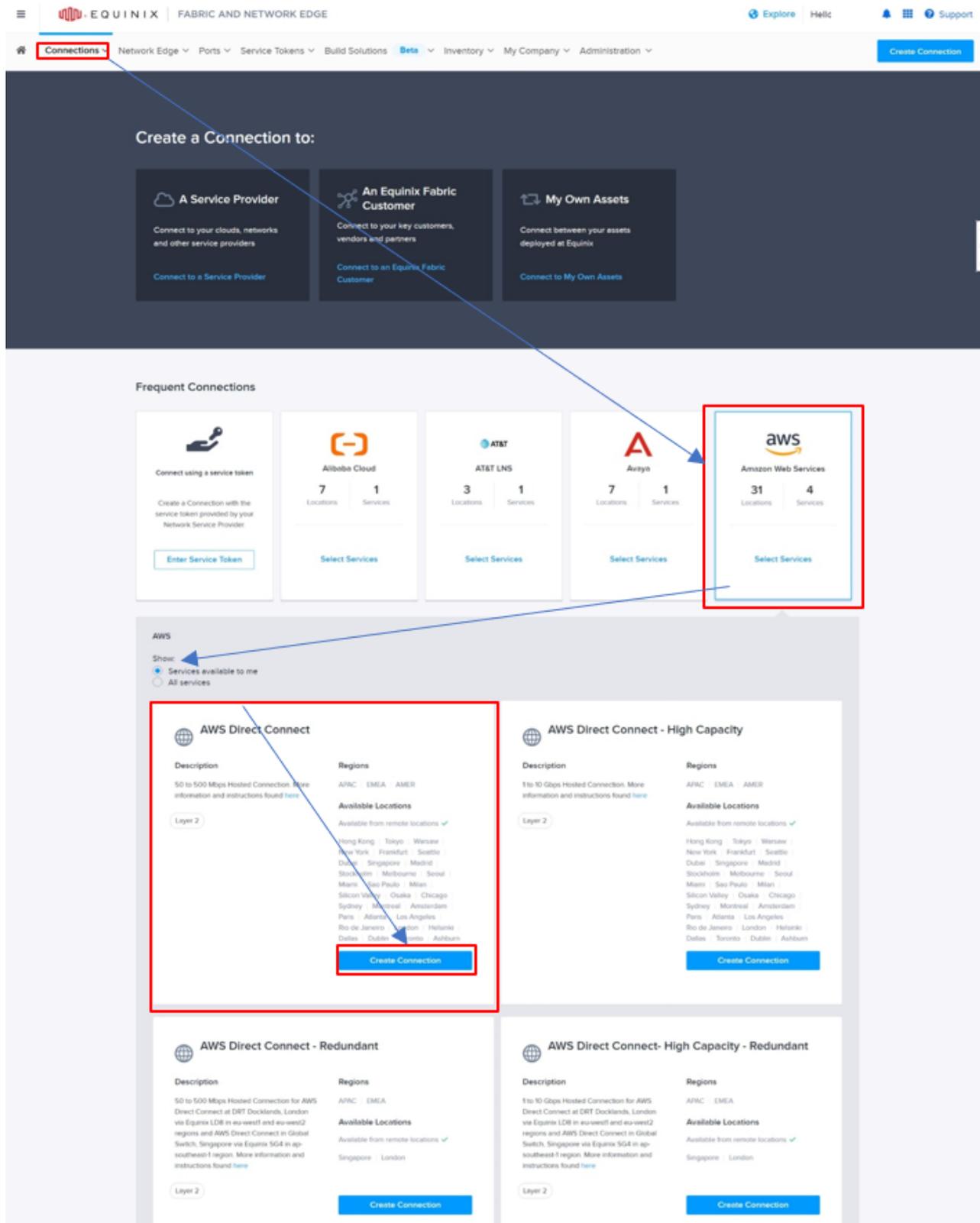
## Prerequisites

- New VLAN tagged on customer router on Equinix side fabric connection
- New BGP ASN for use on VMware Cloud on AWS side of connection
- Collect BGP ASN used on customer Equinix side router
- Private /30 IP subnets to use for connection between customer router and VMware Cloud on AWS

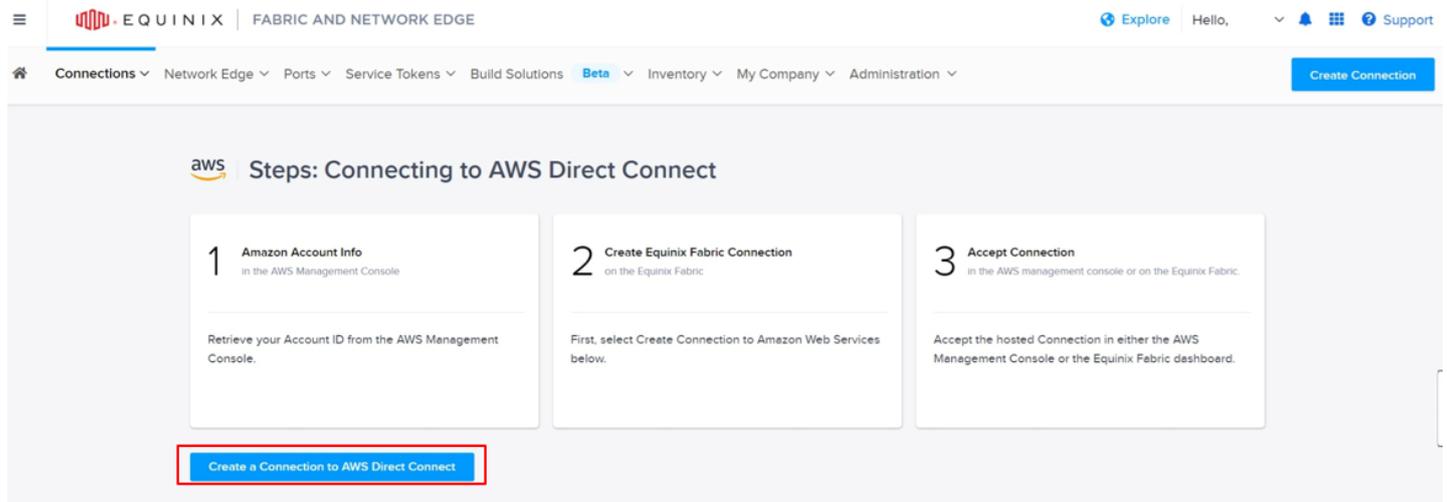
## Workflow

### Equinix Fabric Connection

The first step to make a direct connection from Equinix to AWS is to login to the Equinix Fabric and Network Edge web portal. Once in the web portal, select "Connections," "AWS" for the connection, then under "Show" select "Services available to me." "AWS Direct Connect" click "Create Connection".



Next click “Create a Connection to AWS Direct Connect”



Now choose “Port” for the type of connection, “Select Location,” where the port will be provisioned, pick the circuit from the available circuit ports in the location and the “Destination” from the available destinations provided by Equinix. Once all information is selected click “Next”

The screenshot shows the 'Select Locations' page in the Equinix Fabric and Network Edge interface. The page is divided into three tabs: 'Select Locations', 'Connection Details', and 'Review'. The 'Select Locations' tab is active and contains a 'Preview' section showing a connection between 'Ashburn' and 'Amazon Web Services Ashburn' with a 'Speed Latency (RTT) < 1 ms'. Below the preview are two main sections: 'Origin' and 'Destination'. The 'Origin' section shows 'Connect Using' options (Port, Service Token, Virtual Device) and a 'Select Location' dropdown set to 'Ashburn'. Below this are 'Ports in Ashburn' with four options: 'Secondary | DOT1Q | 10 Gbps' (I1, I2) and 'Primary | DOT1Q | 10 Gbps' (I2, I1). The 'Destination' section shows 'Suggested' locations (Ashburn) and a grid of 'Remote' locations with their respective latencies. A blue arrow points from the bottom of the page to a 'Next' button.

Remote Location	Region	Latency (RTT)
Ashburn	us-east-1	< 1 ms
New York	us-east-1	6 ms
Seattle	us-west-2	57 ms
Miami	us-east-1	30 ms
Sao Paulo	sa-east-1	117 ms
Silicon Valley	us-west-1	60 ms
Chicago	us-east-2	15 ms
Montreal	ca-central-1	16 ms
Atlanta	us-east-1	18 ms
Los Angeles	us-west-1	58 ms
Rio de Janeiro	sa-east-1	127 ms
Dallas	us-east-1	33 ms
Toronto	ca-central-1	18 ms

On the connection details page provide a "Virtual Circuit Name," the "A side VLAN," the "AWS Account ID" for the link to connect and the "Connection Speed" desired for the circuit. Once all sections are completed click "Next."

The screenshot displays the Equinix Fabric and Network Edge console. The top navigation bar includes the Equinix logo, 'FABRIC AND NETWORK EDGE', and user options like 'Explore', 'Hello', and 'Support'. A secondary navigation bar lists 'Connections', 'Network Edge', 'Ports', 'Service Tokens', 'Build Solutions', 'Beta', 'Inventory', 'My Company', and 'Administration', with a 'Create Connection' button on the right. The main content area shows a progress bar with 'Select Locations' (completed) and 'Connection Details' (active). The 'Connection Details' section features a 'Preview' diagram of a connection between '110 Ashburn' and 'AWS Amazon Web Services Ashburn', with performance metrics: Speed 50 Mbps, Latency (RTT) < 1ms. Below the preview are three form sections: 'Connection Information' with fields for 'Virtual Circuit Name' (EQ-Line3) and 'VLAN ID' (81); 'Purchase Order Number' (Optional) with an example 'P054855'; and 'AWS ACCOUNT ID' (123456789). A 'Connection Speed' section presents a grid of options: 50 Mbps (75.00 USD), 100 Mbps (100.00 USD), 200 Mbps (100.00 USD), 300 Mbps (150.00 USD), 400 Mbps (150.00 USD), and 500 Mbps (150.00 USD). A 'Pricing Overview' box indicates a 'Connection Monthly Charge' of 75.00 USD and includes a 'Design Summary' button. At the bottom, 'Previous' and 'Next' buttons are visible, with the 'Next' button highlighted in a red box.

Now review the connection details. If you need to add another email account to get notified about this connection deployment you can add that in the “Notifications.”

If everything is correct after review click “Submit Order.”

The screenshot shows the Equinix Fabric and Network Edge console. At the top, there is a navigation bar with the Equinix logo and 'FABRIC AND NETWORK EDGE'. On the right, there are links for 'Explore', 'Hello', and 'Support'. Below the navigation bar, there are several dropdown menus: 'Connections', 'Network Edge', 'Ports', 'Service Tokens', 'Build Solutions', 'Beta', 'Inventory', 'My Company', and 'Administration'. A 'Create Connection' button is visible on the right.

The main content area shows a progress bar with three steps: 'Select Locations' (completed), 'Connection Details' (completed), and 'Review' (active). Below the progress bar, the 'Review' section is displayed. It includes a diagram showing a connection between 'Ashburn' and 'Amazon Web Services Ashburn' with a speed of 50 Mbps and latency of < 1 ms. Below the diagram, there are three panels: 'Connection Summary', 'Pricing Overview', and 'Notifications'.

**Connection Summary**

Connection Name	EQ-Line3
Buyer Port	Ri-01
Buyer VLAN ID	80
Speed	50 Mbps
Billing Tier	Up to 50 Mbps
Purchase Order Number	-
AWS ACCOUNT ID	123456789
Average last month latency	< 1 ms
Billed to	Acme Inc.

**Pricing Overview**

Connection Monthly Charge **75.00 USD**

Additional taxes and/or fees may apply, depending on the Metro. Billing will begin when the Connection is provisioned.

[Design Summary](#)

**Notifications** 1 Recipient(s)

Enter email address(es) that will receive notifications about this Connection:

[Add Another Email](#)

At the bottom of the page, there is a 'Previous' button on the left and a 'Submit Order' button on the right, which is highlighted with a red border.

Next you will get confirmation that the order has been submitted. You will also receive an email confirmation of the order. Once the line is provisioned you will get an email update to let you know the line is now provisioned and ready.

The screenshot shows the Equinix Fabric portal interface. At the top, the navigation bar includes the Equinix logo, 'FABRIC AND NETWORK EDGE', and user options like 'Explore', 'Hello', and 'Support'. Below the navigation bar, there are tabs for 'Connections', 'Network Edge', 'Ports', 'Service Tokens', 'Build Solutions', 'Beta', 'Inventory', 'My Company', and 'Administration'. A 'Create Connection' button is visible in the top right.

The main content area displays a green checkmark and the heading 'Your Order was Submitted'. Below this, a message states: 'We've sent a confirmation email to the email address(es) you have provided.'

There are three main sections:

- Next Steps:** A green box containing three bullet points:
  - Once the Connection is provisioned by AWS, it will display on the Dashboard.
  - Accept the Hosted Connection on the Amazon Web Services management console or the Cloud Exchange Dashboard with your AWS Access ID and Secret Key.
  - If you need a redundant Connection, follow these steps again and ensure you have chosen a different port.Two buttons are present: 'Go To My Dashboard' and 'Accept the hosted Connection on AWS'.
- Additional Information About this Connection:** A grey box showing the 'Unique ID' as 'bs' followed by a redacted field. Below this, text explains: 'This is the unique ID for your Connection. You can use it for troubleshooting with Equinix, if needed. Connection details, including this unique ID, are also displayed in the Connection details in your Inventory.'
- Look for order details in your email:** A grey box with the text 'Once your order is provisioned, we will send another email.' and an icon of an open envelope.
- See this Connection in your inventory:** A grey box with the text 'See your Connection details and status at any time in your Inventory.' and a 'Go to My Inventory' button. Below this is a preview of the connection in the inventory, showing 'pse-AWS-2' with a green checkmark, a '1K P8 Ashburn' icon, and a 'Destination Ashburn' icon.

Once the line is provisioned you will need to login to the Equinix Fabric portal and retrieve the Z side VLAN to use when creating the "Virtual Interface" in AWS.

Equinix translates the VLAN from the A side which is your equipment in Equinix where you can use any VLAN you choose to the Z side of the connection where Equinix designates the VLAN to use with AWS services.

# Connecting Equinix Direct Connect to VMware Cloud on AWS

The screenshot shows the Equinix Fabric and Network Edge console. At the top, there's a navigation bar with 'Connections' selected. Below it, a diagram shows a connection between an Equinix location (11 Ashburn) and an AWS Direct Connect location (Ashburn). The connection speed is 50 Mbps and latency is < 1 ms. Below the diagram, there's a table with tabs for 'Overview', 'Origin', 'Destination', and 'Connection Utilization'. The 'Overview' tab is active, showing details for connection 'EQ-Line3'. The 'Origin VLAN Tagging' is 80 and 'Destination VLAN Tagging' is 327. Callouts point to these values: 'A side VLAN' for 80 and 'Z side VLAN' for 327. Other details include: Unique ID (4), Equinix Status (Provisioned), Provider Status (Provisioned), Type (Outgoing), Origin Location (Ashburn), Destination Location (Ashburn), Bandwidth (50 Mbps), Latency (RTT) (< 1 ms), Seller-side Region (us-east-1), Billed Account Name, and Billed Account Number.

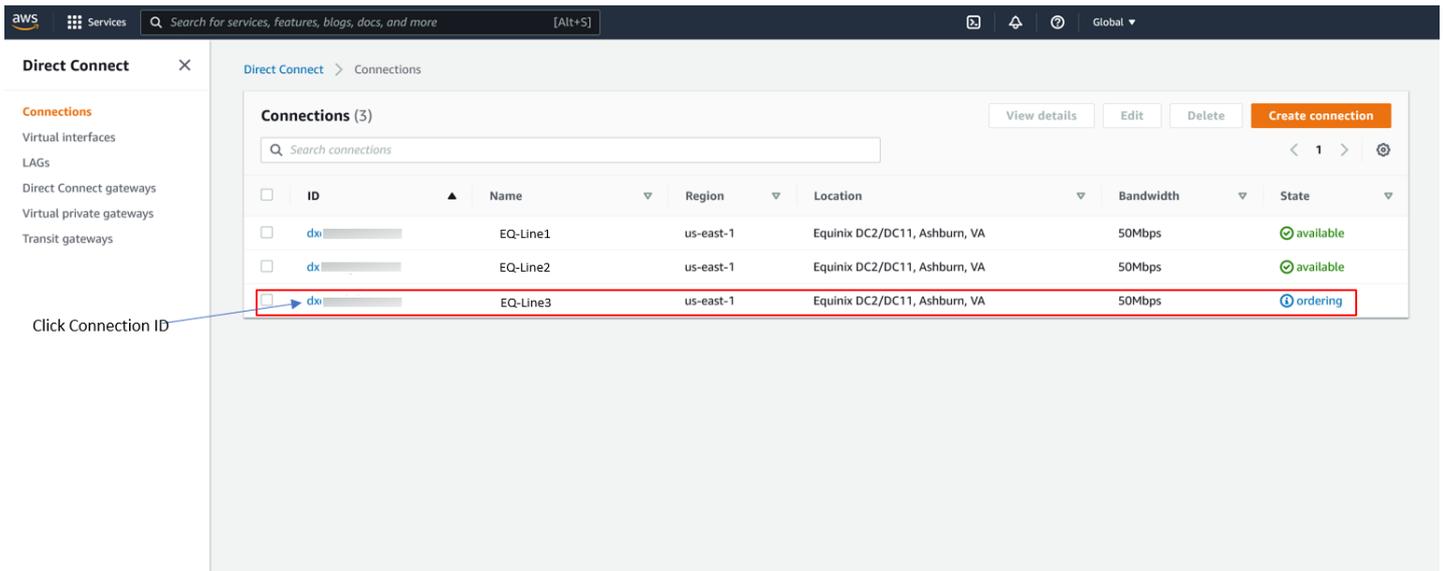
Field	Value
Connection Name	EQ-Line3
Unique ID (UUID)	4
Equinix Status	Provisioned
Provider Status	Provisioned
Type	Outgoing
Origin Location	Ashburn
Destination Location	Ashburn
Bandwidth	50 Mbps
Origin VLAN Tagging	80
Destination VLAN Tagging	327
Latency (RTT)	< 1 ms
Seller-side Region	us-east-1
Billed Account Name	
Billed Account Number	

## AWS Virtual Interface to VMware Cloud

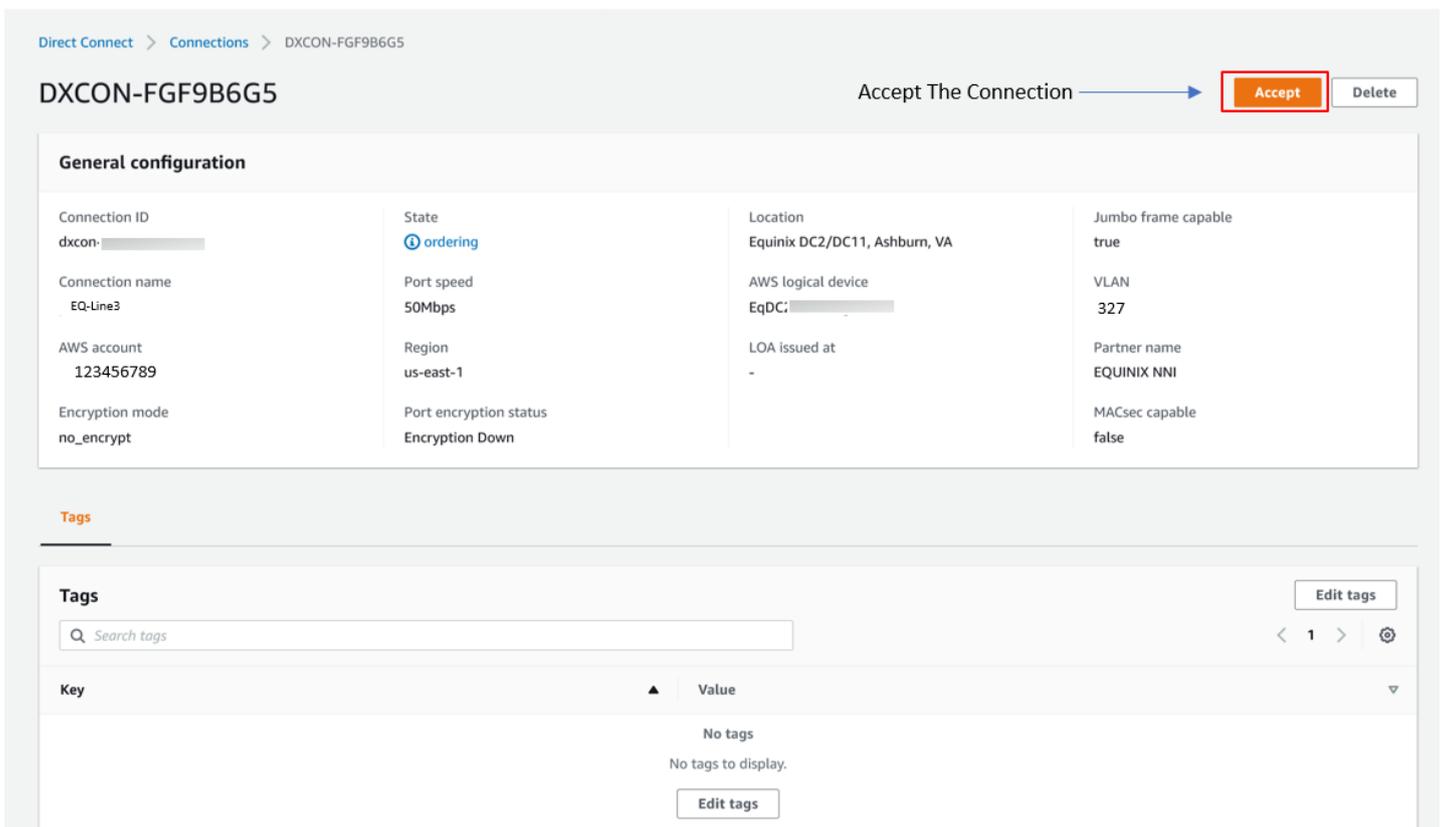
In the AWS console go to the "Direct Connect" console and click on "Connections"

The screenshot shows the AWS Direct Connect console. The left sidebar has 'Direct Connect' selected, and 'Connections' is highlighted. The main content area shows 'Networking & Content Delivery' and 'AWS Direct Connect' with the text 'Lets you establish a dedicated network connection to AWS'. There's a 'Get started' section with a 'Create a connection' button. Below that, it says 'Connect directly to an AWS device from your router at an AWS Direct Connect location.' and 'AWS Direct Connect makes it easy to establish a dedicated network connection from your premises to AWS. Using AWS Direct Connect, you can establish private connectivity between AWS and your datacenter, office, or colocation environment.'

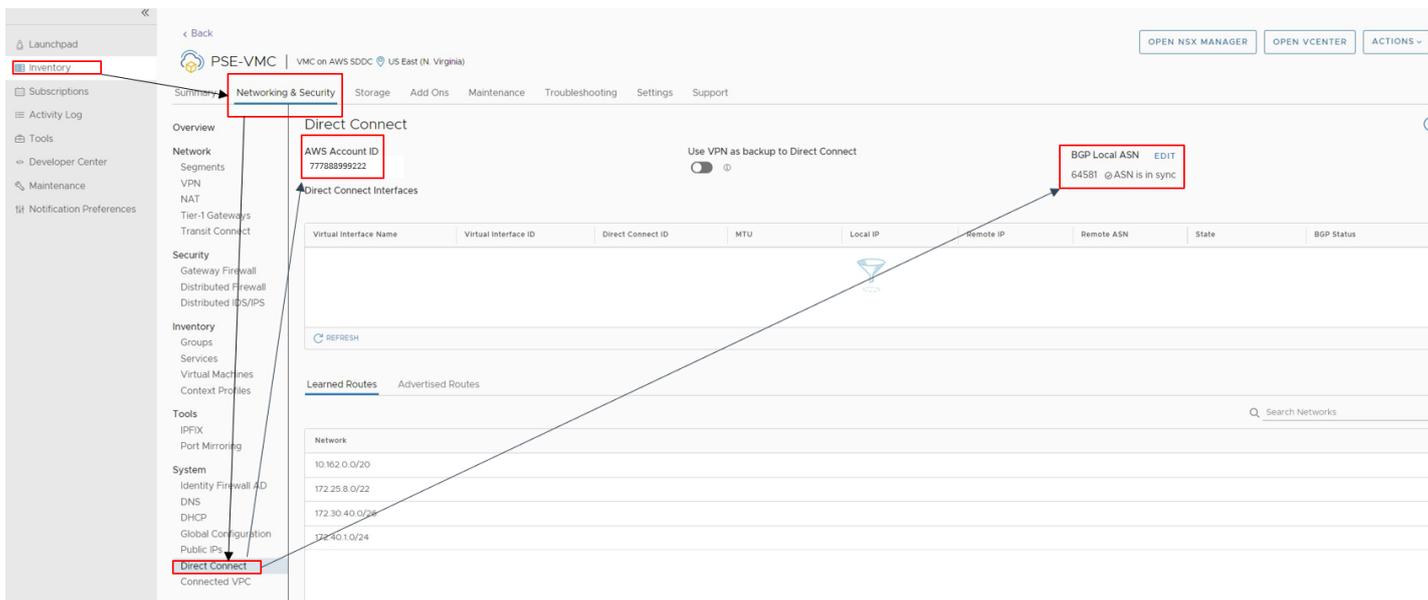
In "Connections" the new circuit will show up as ordering. This connection needs to be accepted before it will be available to use. Click on the connection ID which will open the properties of this connection.



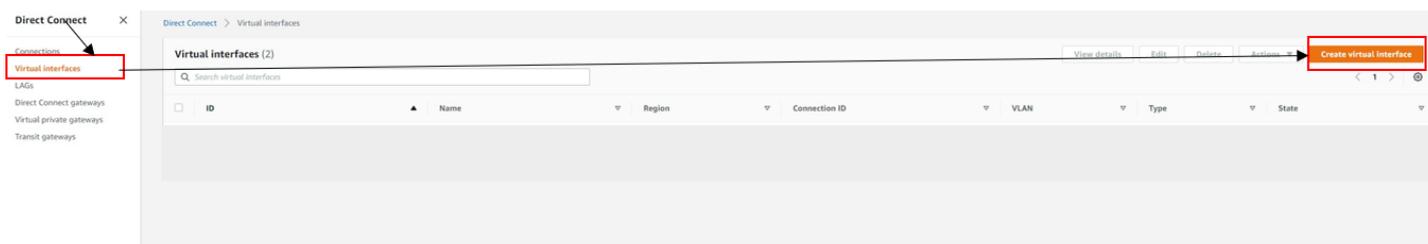
In the connection properties “Accept” the connection



Before creating a “Virtual Interface” in AWS for the direct connection to VMware Cloud log into the VMware Cloud console and navigate to the SDDC you will be connecting. Under “Inventory,” “Networking & Security,” “Direct Connect” find the “AWS Account ID” and “BGP ASN.” Take note of the “AWS Account ID” to use during the “Virtual Interface” creation. This account ID will link the “Virtual Interface” created in AWS to the VMware Cloud “Direct Connect” interface. Make sure the “BGP ASN” is set to the desired ASN needed for setup on your network. You can only change the ASN when there is no “Virtual Interfaces” attached. Making sure this is correct before attaching the “Virtual interface” will save you from needing to delete and recreate this interface to correct a misconfiguration of the “BGP Local ASN”.



Under “Direct Connect” choose “Virtual Interfaces” and then click “Create virtual interface”



In the “Create virtual Interface” setup. Select “Virtual interface Type” as “Private,” give the “Virtual Interface” a name, choose the “Connection” from the drop down. (This will be the connection previously approved from Equinix”). Select the AWS account that will be used for billing. This will be the “AWS Account ID” previously noted from the VMware Cloud console “Direct Connect”

Next add the “VLAN,” this will be the Equinix VLAN assigned to the Z side of the connection. Set the BGP ASN for the router in Equinix (This will be your A side routers ASN), set the peer router IP (Equinix Router). Now add the AWS router IP address and add the BGP password for your Equinix side router (Note: This is an optional step, but I have not been able to get my routers to peer with VMware Cloud on AWS without authentication. This could be due to my specific setup so this may or may not be required in your environment.) Now click “Create virtual interface”

Direct Connect > Virtual interfaces > Create

## Create virtual interface

You can create a private virtual interface to connect to your VPC. Or, you can create a public virtual interface to connect to AWS services that aren't in a VPC, such as Amazon S3 and Glacier. For private virtual interfaces, you need one private virtual interface for each VPC to connect to from the AWS Direct Connect connection, or you can use a AWS Direct Connect gateway. [Learn more](#)

### Virtual interface type

Type

**Private**  
A private virtual interface should be used to access an Amazon VPC using private IP addresses.

**Public**  
A public virtual interface can access all AWS public services using public IP addresses.

**Transit**  
A transit virtual interface is a VLAN that transports traffic from a Direct Connect gateway to one or more transit gateways.

### Private virtual interface settings

Virtual interface name  
A name to help you identify the new virtual interface.  
EQ-Line3-virtual

Connection  
The physical connection on which the new virtual interface will be provisioned.  
EQ-Line3

Virtual interface owner  
The account that will own the virtual interface.  
 My AWS account  
 Another AWS account

Virtual interface owner  
The account that will own the virtual interface.  
77788899222

Virtual Local Area Network (VLAN)  
The Virtual Local Area Network number for the new virtual interface.  
327

BGP ASN  
The Border Gateway Protocol (BGP) Autonomous System Number (ASN) of your on-premises router for the new virtual interface.  
64580

Additional settings

Address family - optional  
Determines whether the virtual interface is created with an IPv4 or IPv6 peering.  
 IPv4  
 IPv6

Your router peer ip - optional  
The BGP peer IP configured on your endpoint.  
192.168.200.1/30

Amazon router peer IP - optional  
The BGP peer IP configured on the AWS endpoint.  
192.168.200.2/30

BGP authentication key - optional  
The password that will be used to authenticate the BGP session.  
password-for-BGP

Jumbo MTU (MTU size 9001) - optional  
Allow MTU size of 9001 on virtual interface.  
 Enabled

Enable SiteLink - optional  
Enable direct connectivity between Direct Connect points of presence. Subject to additional charges. [Click here to learn more.](#)  
 Enabled

Tags  
Specified tags help identify a AWS Direct Connect resource.  
No tags associated with the resource

Once the “Virtual Interface” is created it will go into a state of “pending.”

Direct Connect > Virtual interfaces

Virtual interfaces (2)

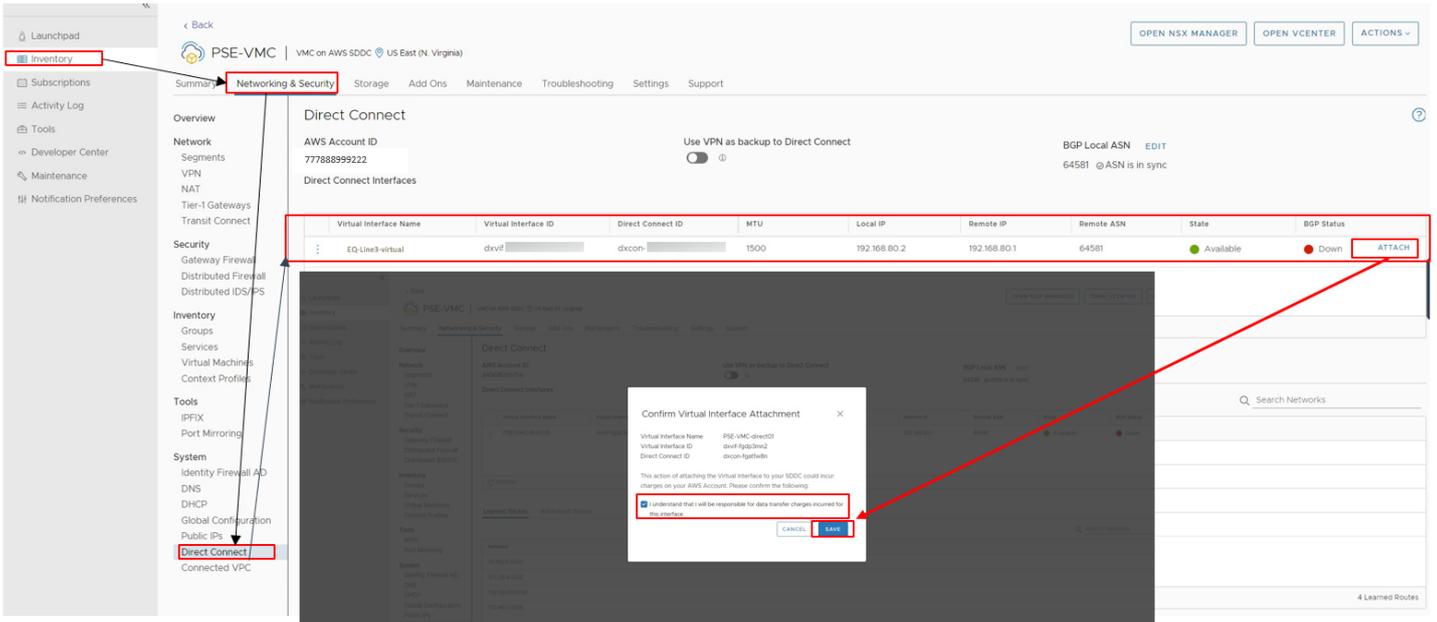
View details Edit Delete Actions Create virtual interface

Search virtual interfaces

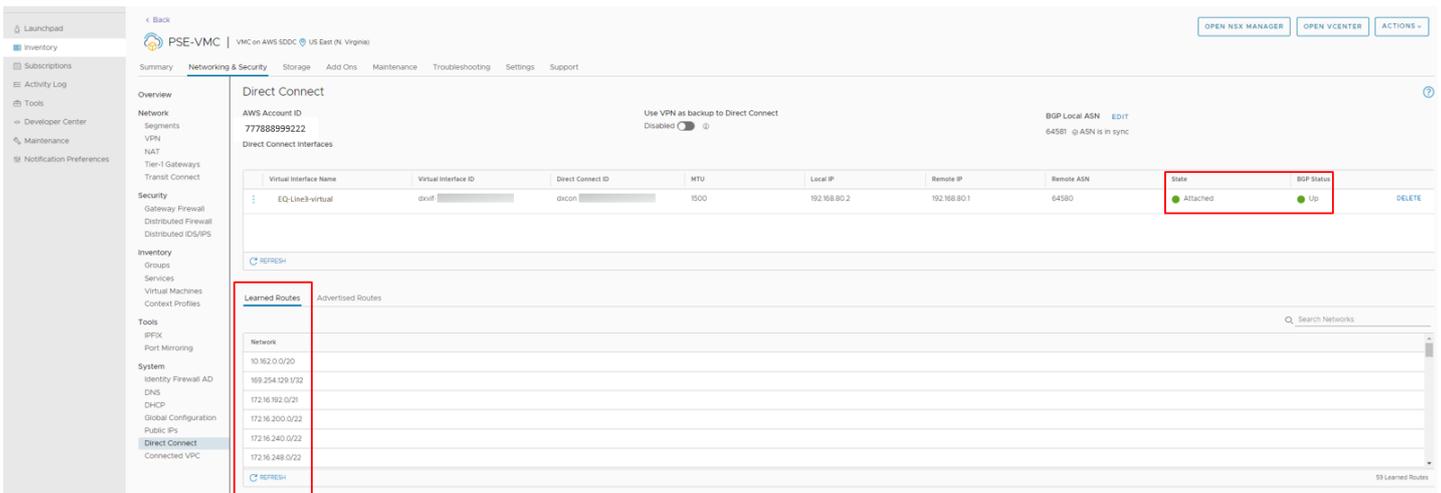
ID	Name	Region	Connection ID	VLAN	Type	State
dxvif	EQ-Line3-virtual	us-east-1	dxcon	327	private	<span style="border: 1px solid red; padding: 2px;">pending</span>

Go back to the VMware Cloud SDDC console under “Inventory,” “Direct Connect” and there will be a new connection available under “Virtual Interfaces.” Click on “ATTACH” on the new interface and a confirmation window will pop up. In the confirmation window you will be informed that charges may be incurred for the connection and need to agree to any data transfer charges incurred by checking the box, then click the “SAVE” button.

# Connecting Equinix Direct Connect to VMware Cloud on AWS



The state of the virtual interface will change to “Attached” and the BGP status should show as “Up.” Learned routes will also populate with routes from your private network.



## Troubleshooting

If BGP does not go to an up-state check that the BGP settings are correct on both sides of the connections. You can also test the layer 2 circuit is connected by pinging the “local IP” listed for the “Virtual Interface” from the remote router in Equinix. You should get a ping reply from the “Virtual Interface” at your Equinix side router even if BGP is in a down state. If you cannot ping, then there is a configuration or a circuit issue to resolve. If you get a reply when you ping across and BGP is not up, then check for issues with the BGP configuration on both sides of the connection.

Other Common Issue Resolutions:

- **Connection provisions but not able to communicate over the circuit:** Make sure you have provisioned the correct circuit ID that terminates to the correct equipment in your Equinix rack.
- **If the “Virtual Interface” does not show up in the VMware Cloud SDDC “Direct Connect”:** Make sure you used the correct account when creating the “Virtual Interface”.
- **No learned BGP routes:** Make sure all the routes intended to be advertised on your Equinix side equipment in the BGP settings are set correctly.

If after troubleshooting the connection, there is still not link, create a support ticket with the appropriate service provider as there may be a service outage causing the issue that needs to be resolved.

## Author

Jerry Haskins is a Solutions Architect responsible for collaboration of products on the VMware Partner Solutions Engineering Team in VMware's Office of the CTO. With 20 years+ of experience in the IT Industry he has spent his career in innovative roles managing enterprise networks and datacenters, working with virtualization technologies, micro services, CI/CD workflows and multi-cloud solutions.

