

# AWS DIRECT CONNECT

CUSTOMER GUIDE



AXON CONNECTIVITY TECHNICAL GUIDE





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## INTRODUCTION TO AXON

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In today's hyperconnected world our data, applications, clouds, locations and people live everywhere.

To operate and compete without limitation, we must integrate our siloed worlds. We need to be connected. Our people need access to whatever they need, whenever they need it, from wherever they are with complete confidence it is secure.

Connectivity with NEXTDC allows you to connect your physical and virtual worlds uniting the people, places and clouds most critical to your organisation.

The way we help you achieve this is via AXON, an advanced high-speed connectivity platform that delivers your business a superior connectivity experience, so the digital experiences you deliver your customers are something they won't find elsewhere.

AXON's high-performance virtual connections give you fast and secure access on-demand to any number of services Australia-wide. And because your AXON connections are private, they never touch the public internet, resulting in greater control and reliability of the critical infrastructure that powers your business, and enhanced security of your data.





## AWS DIRECT CONNECT

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AWS Direct Connect is a service that enables you to create private connections between Amazon data centres and your infrastructure located on your premises, or in a colocation environment. AWS Direct Connect connections do not go over the public internet therefore offering greater reliability, faster speeds, lower latencies and greater levels of security than typical connections over the public internet.

NEXTDC offers three AWS Direct Connect products:

### LOCAL POINT OF PRESENCE (POP)

A Direct Connect Local POP is available in NEXTDC locations which have an on-site AWS Direct Connect POP and is available in 1Gbps or 10Gbps.

### MANAGED INTERCONNECT

A Direct Connect Managed Interconnect is for customers who require 1Gbps or 10Gbps access into AWS. Managed Interconnect can be delivered to any AXON POP nationally.

### HOSTED INTERCONNECT

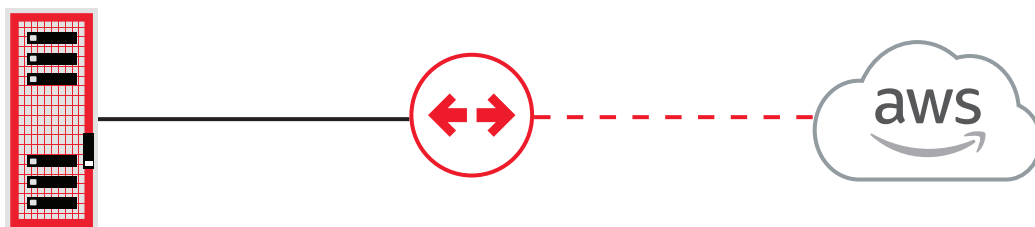
A Direct Connect Hosted Interconnect is for customers who require 50Mbps to 10Gbps access into AWS. Hosted Interconnect services are delivered within 60 seconds of ordering to your AXON Port and can be delivered to any AXON POP nationally.

## AWS DIRECT CONNECT LOCAL POP





AWS Direct Connect Local POP is available in NEXTDC locations which have an on site AWS Direct Connect POP and is available in 1Gpbs or 10Gpbs.

To order use the following procedure:

- 1 Sign up for AWS Direct Connect from Amazon and order a dedicated Direct Connect port via the AWS console. You will be directly billed by Amazon for the dedicated port in addition to your usage charges.
- 2 Wait for the AWS Letter of Authority (LOA) for your dedicated Direct Connect port on the Amazon network, this letter will contain the information you need to order your cross connect and an authority to connect from Amazon.
- 3 Login to ONEDC and order a Cross Connect to the location mentioned in the LOA documentation.
- 4 You will receive an email from NEXTDC confirming your order, reply to this email and attach the LOA as confirmation that you are authorised to connect to AWS infrastructure.
- 5 NEXTDC will email you a notice of completion, once this has arrived your AWS Direct Connect will be ready for activation on your equipment.
- 6 Your Direct Connect will be configurable via the AWS web portal.



### LEGEND

	Customer Rack		Physical Cross Connect		Direct Connect		AWS Cloud
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### AWS DIRECT CONNECT GUIDE

For further information on configuring AWS Direct Connect – Local can be found at:

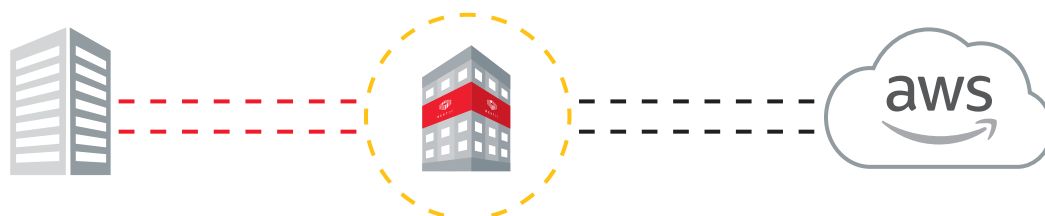
<http://docs.aws.amazon.com/directconnect/latest/UserGuide/>

# AWS DIRECT CONNECT MANAGED INTERCONNECT







## DIRECT CONNECT FROM AXON (FULL PORT CONNECTION)

To order use the following procedure:

- 1 Sign up for AXON - your sales person will send you a link.
- 2 Sign up for AWS Direct Connect from Amazon and order a dedicated Direct Connect port via the AWS console. You will be directly billed by Amazon for the dedicated port in addition to your usage charges.
- 3 Wait for the AWS Letter of Authority (LOA) for your dedicated Direct Connect port on the Amazon network.
- 4 Order 1 x AXON port per AWS Direct Connect service you wish to activate via the AXON portal. You will receive an email with Point of Interconnect (POI) information.
- 5 Pass the LOA onto NEXTDC. At this point, NEXTDC will arrange the physical connectivity with Amazon.
- 6 Order 1 x Single Mode Fibre (SMF) Cross Connects per AWS Direct Connect service you wish to activate to the AXON POI from your data centre provider.
- 7 Activate your AXON Port(s) by plugging the Cross Connects in and activating the port on your network equipment.
- 8 Order Direct Connect from your AWS Direct Connect account.
- 9 Order Elastic Cross Connects (EXCs) via the AXON portal.
- 10 Supply AWS account ID.
- 11 Bandwidth – Available options (1Gbps or greater).
- 12 Select VLAN ID(s) for AXON to deliver AWS Direct Connect on your AXON Port.
- 13 AXON will provision and activate your AWS Direct Connect.
- 14 Configure Layer 3 routing via your AWS account.



LEGEND

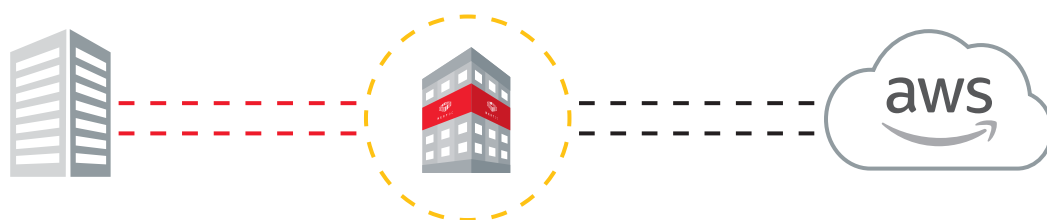
 Customer	 Patch Cable	 AWS Direct Connect
 NEXTDC Data Centre	 Elastic Cross Connect	 AWS Cloud

# AWS DIRECT CONNECT HOSTED INTERCONNECT







## DIRECT CONNECT FROM AXON

To order use the following procedure:

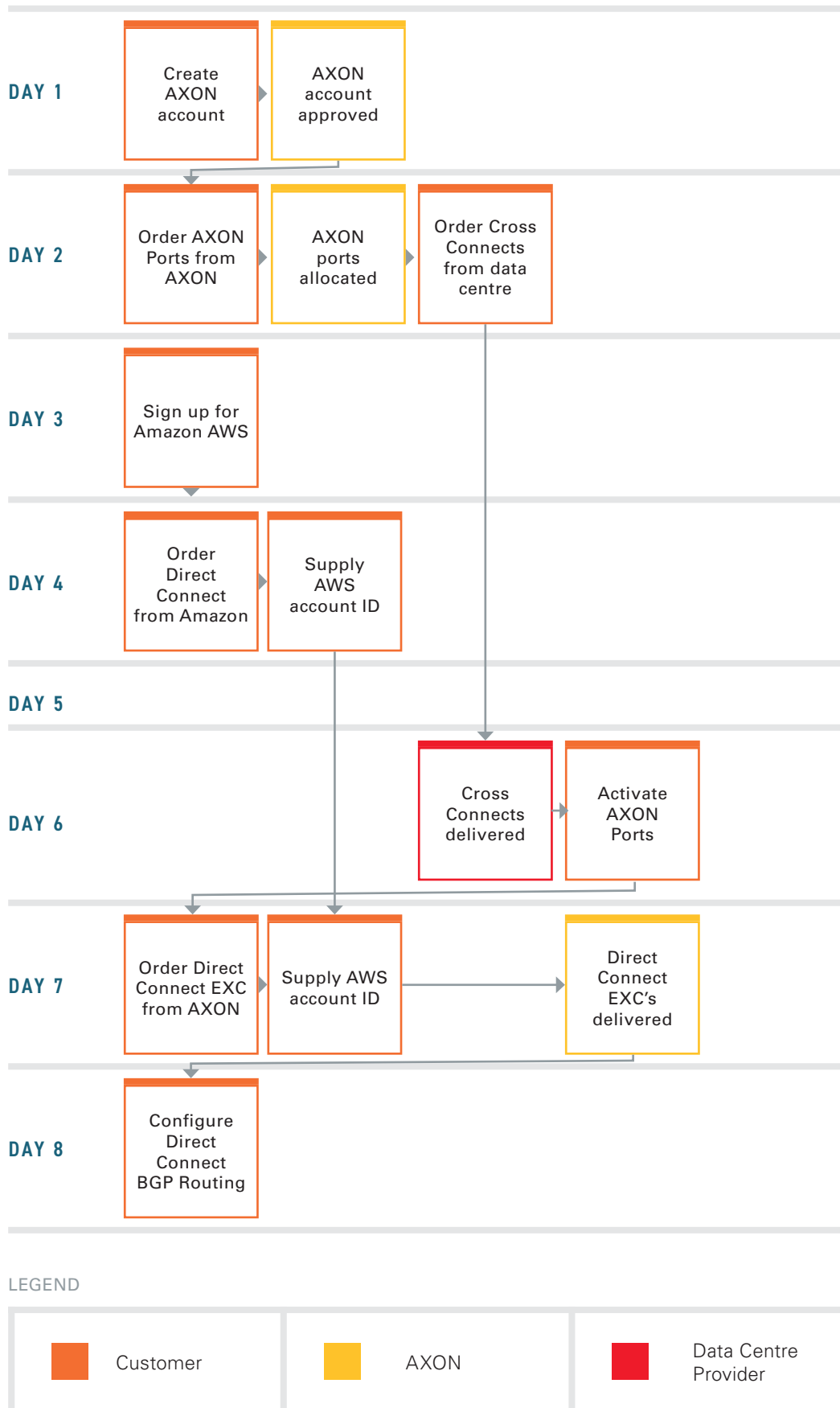
- 1 Sign up for AXON - your sales person will send you a link.
- 2 Order 1 x AXON port per AWS Direct Connect service you wish to activate via the AXON portal. You will receive an email with Point of Interconnect (POI) information.
- 3 Order 1 x Single Mode Fibre (SMF) Cross Connects per AWS Direct Connect service you wish to activate to the AXON POI from your data centre provider.
- 4 Sign up for AWS Direct Connect from Amazon.
- 5 Activate your AXON ports by plugging the cross connects in and activating the port on your network equipment.
- 6 Order Direct Connect from your AWS Direct Connect account
- 7 Order Elastic Cross Connects (EXCs) from AXON.
- 8 Supply AWS account ID.
- 9 Bandwidth – Available options (50Mbps, 100Mbps, 200Mbps, 300Mbps, 400Mbps, 500Mbps, 1Gbps, 2Gbps, 5Gbps and 10Gbps).
- 10 Select VLAN ID(s) for AXON to deliver AWS Direct Connect on your AXON Port.
- 11 AXON will provision and activate your AWS Direct Connect.
- 12 Configure Layer 3 routing via your AWS account.



LEGEND

	Customer		Patch Cable		AWS Direct Connect
	NEXTDC Data Centre		Elastic Cross Connect		AWS Cloud

## ONBOARDING PROCESS





## TECHNICAL REQUIREMENTS

Following are the minimum requirements to connect to Amazon Direct Connect via AXON:

Item	Qty	Comment
Single Mode Fibre (SMF) Cross Connect	1	1 x dual core SMF Cross Connect is required to interconnect with AXON for connection to Direct Connect.
10 Gbps Network Switch or Router	1	You can connect to AXON using either a router or a switch. If you choose to use a switch, you will need to pass Direct Connect traffic to a BGP capable router via appropriately dimensioned connectivity.
10 Gbps Network Optics	1	10 Gbps optic options are: <ul style="list-style-type: none"> <li>■ 10G-LRL (1KM)</li> <li>■ 10G-LR (10KM)</li> </ul> If your vendor only supplies LR optics and you are in the same data centre as the AXON POI, please order 1km (LRL) optics from AXON as they are compatible with 10km (LR) vendor optics.
BGP Router	1	A BGP capable router is required to connect to Direct Connect.
Autonomous System Number (ASN)	1	You will require a BGP ASN to connect to Direct Connect.
Amazon AWS Account ID	1	To sign up for Direct Connect you will require a working AWS account ID with active virtual networking resources in it.

### MORE INFORMATION

For more see the redundancy section of this web page:

[Direct Connect technical overview](#)

<http://docs.aws.amazon.com/directconnect/latest/UserGuide/getstarted.html>

## REDUNDANT DESIGN REQUIREMENTS

Following are the minimum requirements to connect to Amazon Direct Connect via AXON:

Item	Qty	Comment
Single Mode Fibre (SMF) Cross Connect (Pair)	2	2 x dual core SMF Cross Connects are required for port and switch redundancy connection to AXON. You may also consider requesting cable path diversity from your carrier and/or data centre provider.
10Gbps Network Switches or Routers	2	You can connect to AXON using either routers or switches. If you choose to use switches, you will need to pass Direct Connect traffic to BGP capable routers via appropriately dimensioned connectivity.
10Gbps Network Optics	2	10Gbps optics options are: <ul style="list-style-type: none"> <li>■ 10G-LRL (1KM)</li> <li>■ 10G-LR (10KM)</li> </ul> If your vendor only supplies LR optics and you are in the same data centre as the AXON POI, please order 1km (LRL) optics from AXON as they are compatible with 10km (LR) vendor optics.
BGP Routers	2	Two BGP capable routers to connect to Direct Connect.
Autonomous System Number (ASN)	1	You will require a BGP ASN to connect to Direct Connect.
Amazon AWS Account ID	1	To sign up for Direct Connect you will require a working AWS account ID with active virtual networking resources in it.

### MORE INFORMATION

For more see the redundancy section of this web page:

[Direct Connect technical overview](#)

(<http://docs.aws.amazon.com/directconnect/latest/UserGuide/getstarted.html>)

# AWS DIRECT CONNECT PEERING

## STEP 1

### Connecting to AWS via AXON.

Once AXON completes the provisioning of the AWS Direct Connect, you will see Hosted Connection in "pending acceptance" state under "Direct Connect" menu of the AWS Console.

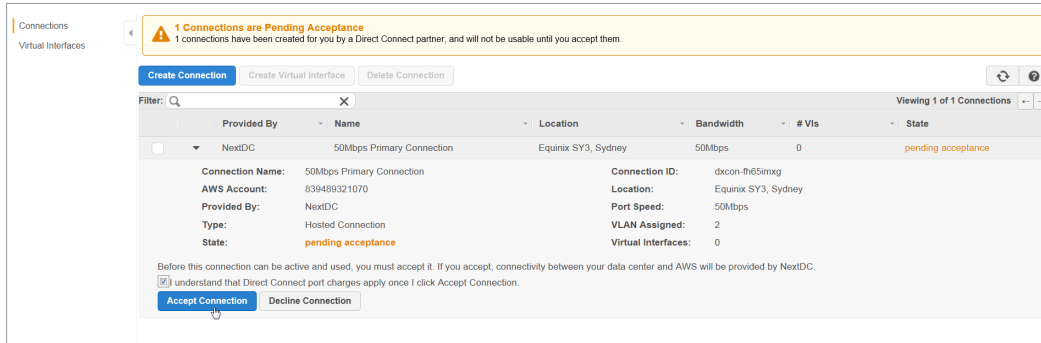


Image 1: AWS Hosted Connection in Pending Acceptance State

During completion of this phase you will receive AWS Direct Connect provisioning completion email by NEXTDC.



## STEP 2

### Accept the Hosted Connection.

Accept the connection Provided by NEXTD C. Once the connection has been accepted the connection will appear as below in “pending” state.

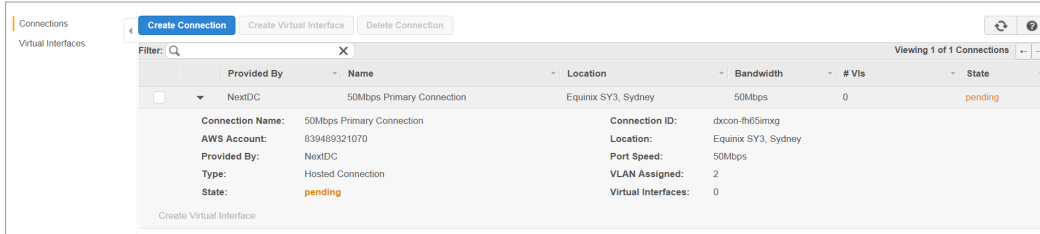


Image 2: AWS Hosted Connection in Pending State

After a few minutes Hosted Connection goes to “available”. This time can vary depending on the current load within AWS.

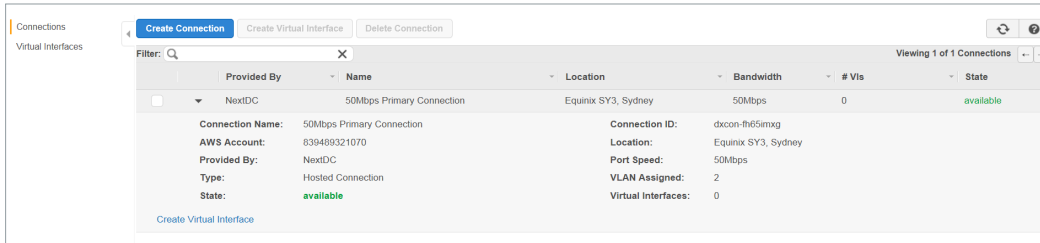


Image 3: AWS Hosted Connection “available”

### STEP 3

#### Create AWS Virtual Private Gateway.

Create virtual interface in order to setup the peering between your AXON connected equipment and AWS VPC (Virtual Private Cloud).

Create Virtual Private Gateway under "AWS -> Networking -> VPC".

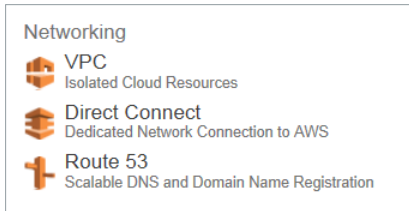


Image 4: AWS Console Networking Menu

After selecting VPC select "Virtual Private Gateway" as follows.

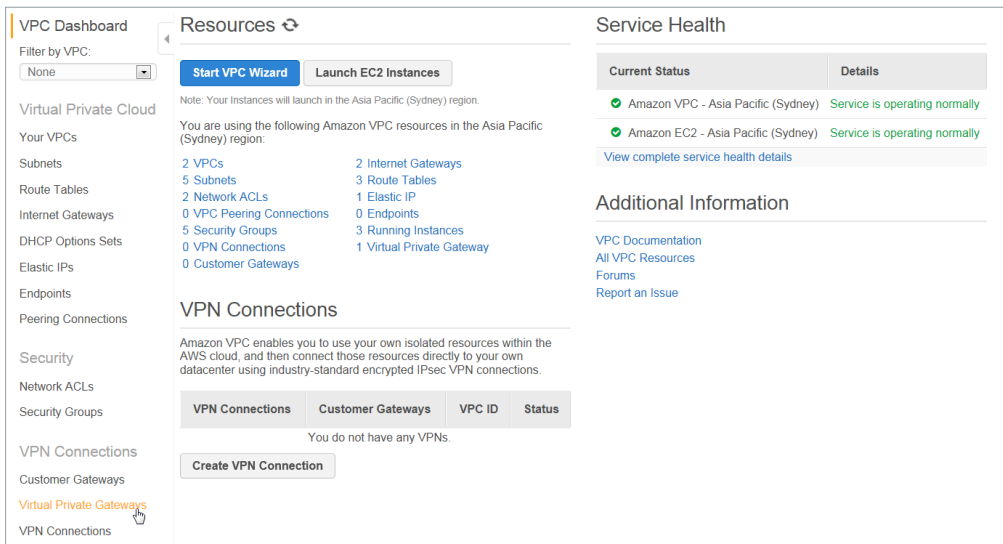


Image 5: AWS VPC Dashboard

Then Create "Virtual Private Gateway" as follows.

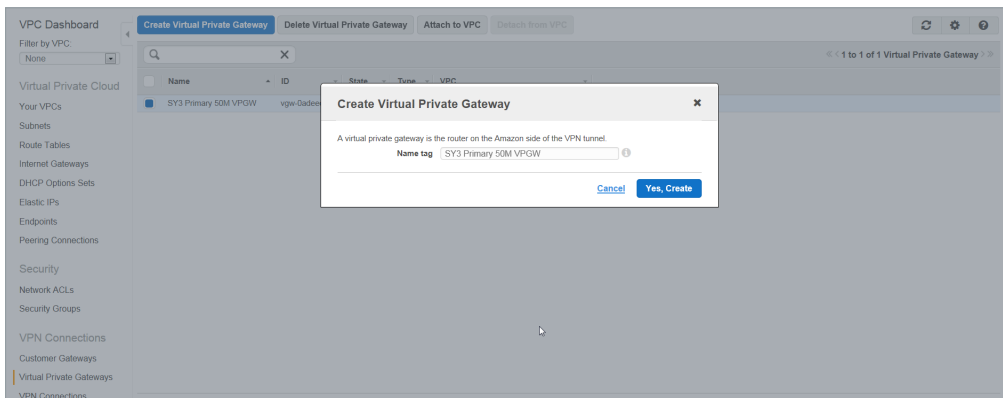


Image 6: Creating Virtual Private Gateway in AWS

## STEP 4

### Attach Virtual Private Gateway to the VPC.

After selecting the newly created Virtual Private Gateway, attach it to the VPC as follows.

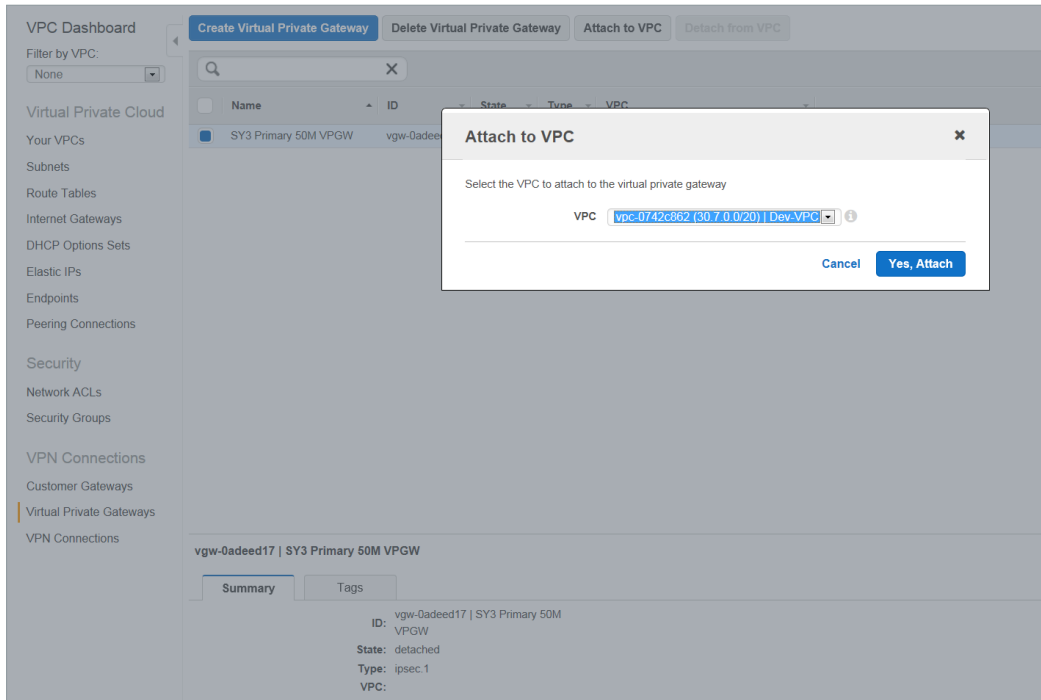


Image 7: Attaching Virtual Private Gateway in AWS



## STEP 5

### Create AWS Virtual Interface with BGP Peering.

Once VPC configuration has been completed, create a Virtual Interface under “Connections”.

Click on “Create Virtual Interface” as follows.

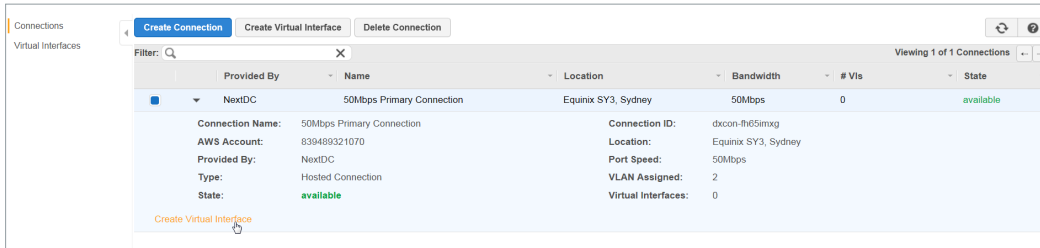


Image 8: Create Virtual Interface in AWS

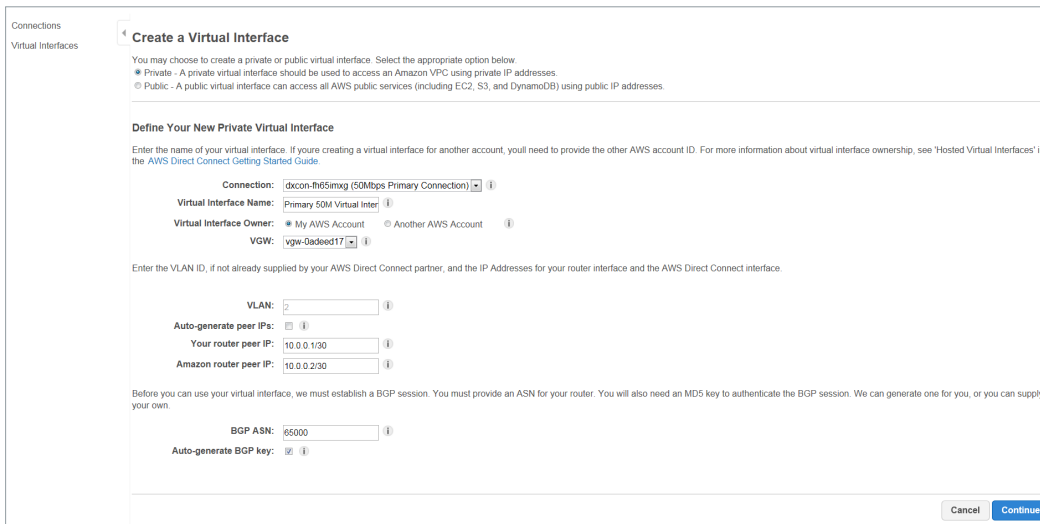


Image 9: Virtual Interface Configuration in AWS

Once the Virtual Interface is created it will show the state as “pending” initially and then change to “down”.

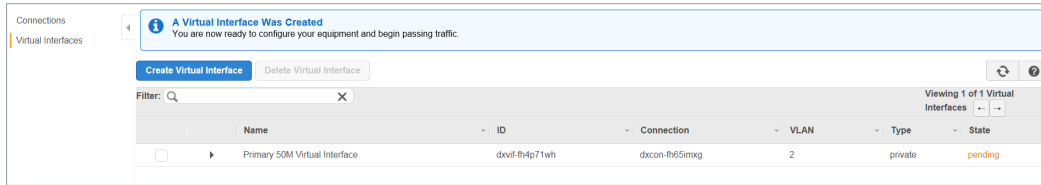


Image 10: Virtual Interface in pending state

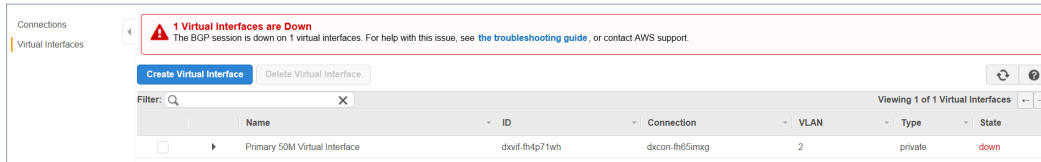


Image 11: Virtual Interface in down state

Then configure the local site according to the specified BGP information.

Once BGP peering establishes the state of the virtual interface will change to “available”.

## STEP 6

### Setup BGP Peering

The final step is to setup the BGP peering according to the information specified in the Virtual Interface.

Two options were given by AWS for the BGP peering setup:

- **Active/Active (BGP Multipath)**  
Network traffic will get load balanced across connections.  
This is the AWS recommended method and AWS end default configuration
- **Active/Passive (Failover)**  
One BGP peering is active and other one is standby

If active connection becomes unavailable, all traffic routed via passive path.

**Routing of AWS Direct Connect**  
Depending on the setup traffic flow will get demanded.

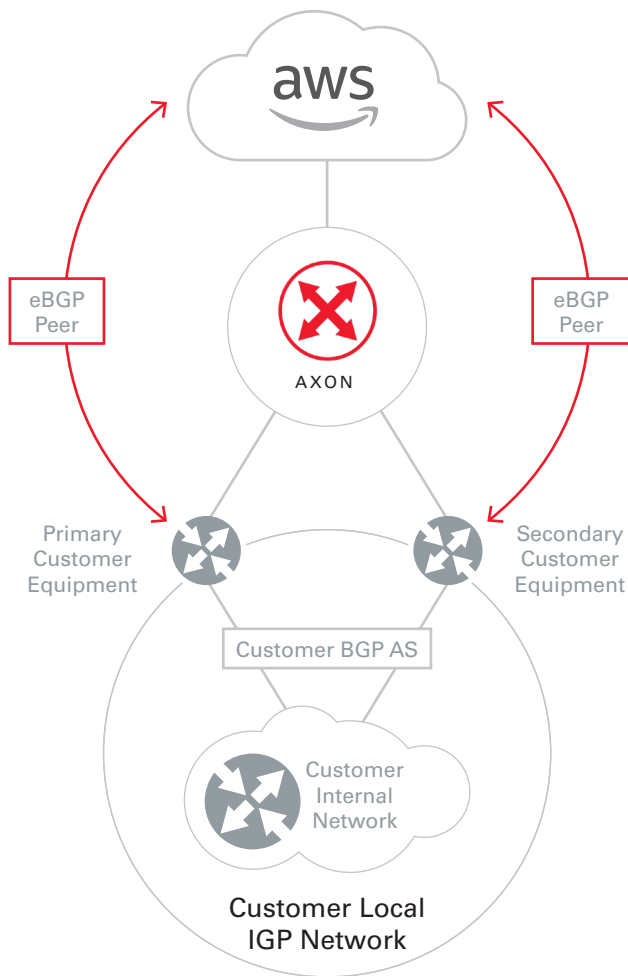


Image 12: BGP peering setup for AWS

**REFER TO AWS USER GUIDES FOR FURTHER INFORMATION.**



## HANDOFF OPTIONS

When ordering Direct Connect via AXON you will need to use the following handoff options:

- VLAN Trunk Mode (802.1q)

### HANDOFF - VLAN Trunk Mode (802.1q)

Item	QTY	Comment
Direct Connect VLAN IDs	1 or 2	You will need to provide the local VLAN IDs for each of your Direct Connect peering sessions.

## AXON PORT SPECIFICATIONS

### INTERFACE OPTIONS

Following are the standard interface options to connect to AXON.

If you have a specific requirement that is not covered by these options, please contact your account manager.

Speed (Gbps)	Distance	Optic Type
1Gbps	10 KM	1G-LX
10Gbps	1 KM	10G-LRL
10Gbps	10 KM	10G-LR
40Gbps	1 KM	40G-LRL
40Gbps	10 KM	40G-LR

\* LRL optics are compatible with LR optics, if your vendor only supplies LR optics and you are interconnecting with us over fibre that is shorter than 1km you should select LRL and use appropriate attenuators.

### SERVICE ATTRIBUTES

Service Attributes	Parameter
MAC Layer	802.3-2002
MTU	9100
Port Mode	802.1q Trunk
VLAN Ethertype	0x8100

\* MTU of 9100 is valid for AXON network components. Please check the capabilities of the party you are connecting to.

## NEXTDC SUPPORT CONTACTS

### AXON HELP DESK

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The AXON Helpdesk can be contacted using the information below:



#### Phone (Australia)

1300 698 677



#### Phone (International)

+61 7 3177 4799



#### Technical support

[nxtops@nextdc.com](mailto:nxtops@nextdc.com)



#### Service provisioning

[nxtops@nextdc.com](mailto:nxtops@nextdc.com)

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Hours of operation:



#### Monday – Friday

09:00 - 18:00

#### Sunday & Saturday

Closed



#### Service faults

24 hours

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#### TERMS AND CONDITIONS AND SLA

A copy of our Terms and Conditions and Service Level Agreement can be found here:

[https://www.nextdc.com/storage/app/media/NEXTDC\\_AXONVX\\_Terms\\_and\\_Conditions\\_Final-20170520.pdf](https://www.nextdc.com/storage/app/media/NEXTDC_AXONVX_Terms_and_Conditions_Final-20170520.pdf)



## GLOSSARY

### AXON NETWORK

Term	Explanation
<b>AXON Enabled data centre (DC)</b>	A data centre containing an AXON point of interconnect (POI).
<b>Campus</b>	A cluster of AXON DC's which are close to each other and are treated as if they are one data centre.
<b>Cross Connect</b>	A pair of single mode fibre (SMF) cables connecting the customer to an AXON point of interconnect (POI). One Cross Connect is required for every AXON port.
<b>Cross Connect - Local</b>	A Physical Cross Connect for which both the A-END and B-END reside in the same AXON DC.
<b>Cross Connect - Carrier</b>	A Physical Cross Connect in which the B-END is external to the AXON DC it is connecting to. eg. A cross town dark fibre, Ethernet or wavelength service.
<b>Edge Switch</b>	AXON System's customer facing network equipment.
<b>Fabric</b>	A network region usually defined by city, state/territory or international borders. AXON is built as a series of fabrics (Sydney, Melbourne, Brisbane etc.) or network islands which are interconnected by partner carriers.
<b>Interconnect</b>	A Cross Connect and an AXON Port used to physically connect customers to the AXON fabric.
<b>Point of Interconnect (POI)</b>	The fibre patch panel that customers order Cross Connects to. Generally located in the carrier interconnect room of an AXON DC.
<b>Single Mode Fibre (SMF)</b>	Optical fibre cable which complies with or exceeds ITUT Recommendations G.652 or G.652D.

## AXON PRODUCTS

Term	Explanation
AXON Port	The physical switch port on an AXON edge switch that is allocated to an AXON customer.  This is the point of demarcation between AXON and its customers.
Elastic Cross Connect (EXC)	A layer 2 interconnect between two or more AXON Ports.
Direct Connect Local Point of Presence (POP)	An AWS Direct Connect service delivered directly to the customer over a fibre Cross Connect. Direct Connect Local POP is available in NEXTDC locations which have an on site AWS Direct Connect POP and is available in 1Gbps or 10Gbps.
Direct Connect Managed Interconnect	Managed Interconnect is for customers who require 1Gbps or 10Gbps access into AWS. Managed Interconnect is delivered over AXON and can be delivered to any AXON POP nationally.
Direct Connect Hosted Interconnect	Hosted Interconnect is for customers who require 50Mbps to 10Gbps access into AWS. Hosted Interconnect is delivered over AXON and can be delivered to any AXON POP nationally.

## AXON CONNECTED ENTITIES

Term	Explanation
Customer	A business or organisation that has signed up for an AXON account with a view to consuming AXON delivered services.
Integration Partner	An IT/network service organisation that has signed up for an AXON account with a view to using AXON to deliver value added products and services to their customers.
Carrier	A licensed carrier who owns significant physical network assets, has signed a carrier agreement and has interconnected with AXON with a view to consuming AXON delivered services.
Partner Carrier	A licensed carrier who owns significant physical network assets, has signed a partner carrier agreement and has interconnected with AXON with a view to consuming and also selling AXON delivered services which can be rapidly provisioned, modified and torn down ideally via API offering on demand elastic purchasing options in line with the overall ethos of the AXON product set.
Cloud Provider	A business or organisation which delivers high value cloud based services targeted at the SMB/enterprise and government markets. Cloud providers must own unique infrastructure or intellectual property which operates at scale, can be rapidly provisioned via API and offers on demand elastic purchasing options in line with the overall ethos of the AXON product set.