ORACLE

Connectivity - FastConnect

Level 200

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Oracle Cloud Infrastructure
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Safe harbor statement

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Objectives

After completing this lesson, you should be able to:

- FastConnect Use cases
- FastConnect Concepts
- Describe FastConnect Service Models

  Direct to Oracle:

    Datacenter Colocation (1a)

    Dedicated Circuits from a 3rd Party Network Carrier (1b)

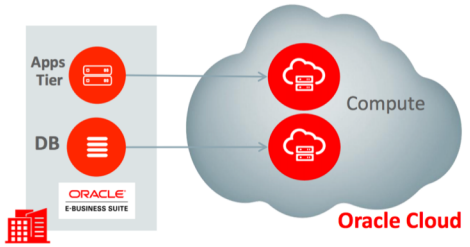
  Using an Oracle Network Provider or Exchange Partner

  - Pre-requisites: Connectivity – Level 100

Why do you need dedicated connectivity into cloud?

ORACLE Applications ORACLE E-Business Suite
ORACLE JD Edwards ORACLE PeopleSoft
ORACLE Siebel ORACLE Hyperion

HPC hadoop Altair slurm APACHE Spark



Latency sensitive enterprise applications	Big Data & High Performance Computing with data-transfer needs	Sensitive data that cannot traverse the public internet	Lift-and-shift to Cloud
Applications with relational database especially vulnerable to latency and require predictable performance including backup, replication use cases	Large data transfer (for example batch jobs or real-time queries) require high performance and low latency	Applications that contain sensitive data benefit from an extra level of privacy and isolation	Moving Web-App-DB tiers to Oracle Cloud needs dedicated network connectivity

FastConnect - Product Overview

FastConnect provides an easy, elastic, and economical way to create a dedicated and private connection with higher bandwidth options, and a more reliable and consistent networking experience when compared to internet-based connections

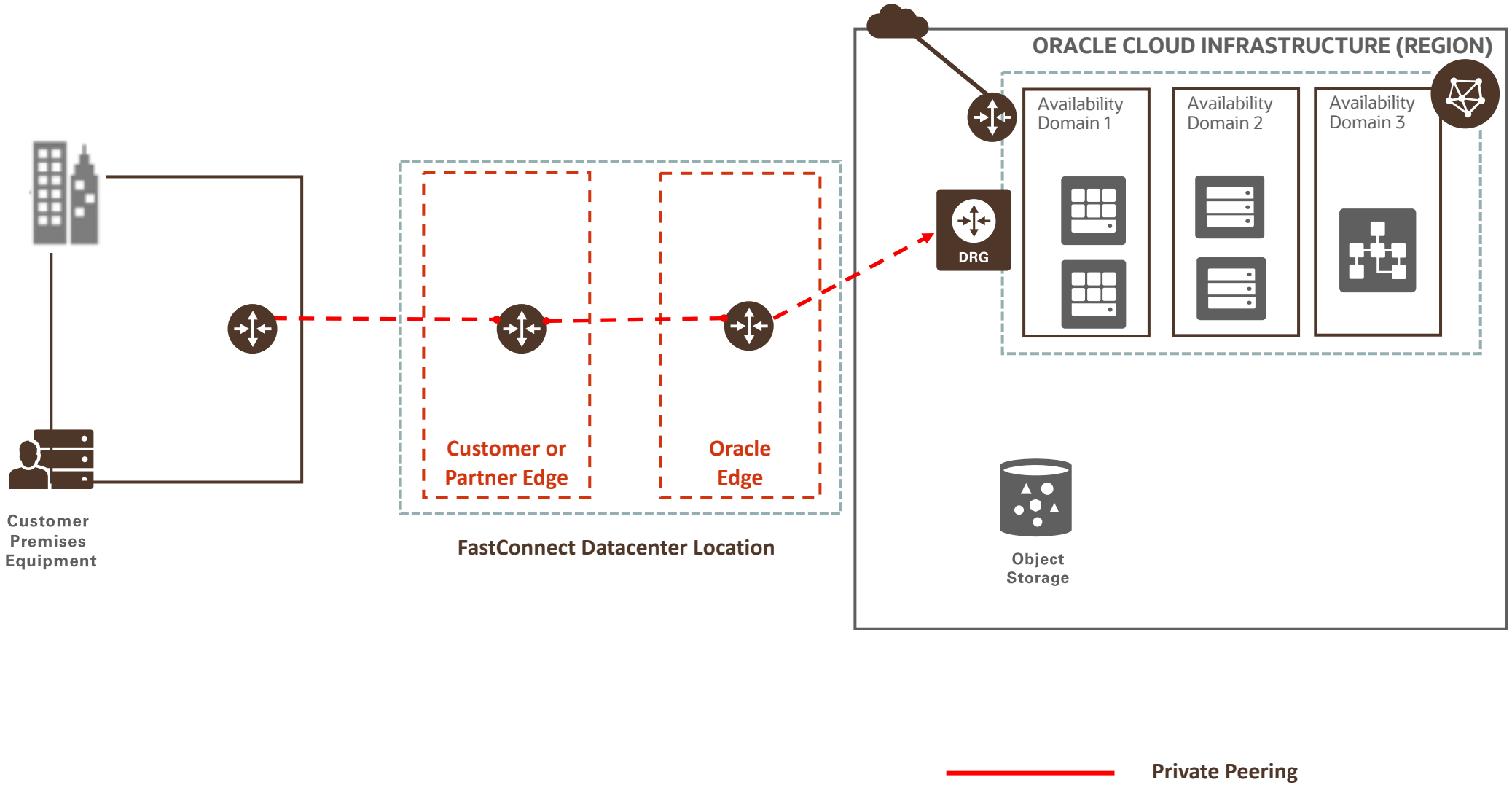
- Connect to OCI directly or via pre-integrated Network Partners
- 1Gbps and 10Gbps increments
- Extend remote datacenters into Oracle ("*Private peering*") or connect to Public resources ("*Public peering*")
- No charges for inbound/outbound data transfer
- Uses BGP protocol

FastConnect Use Cases

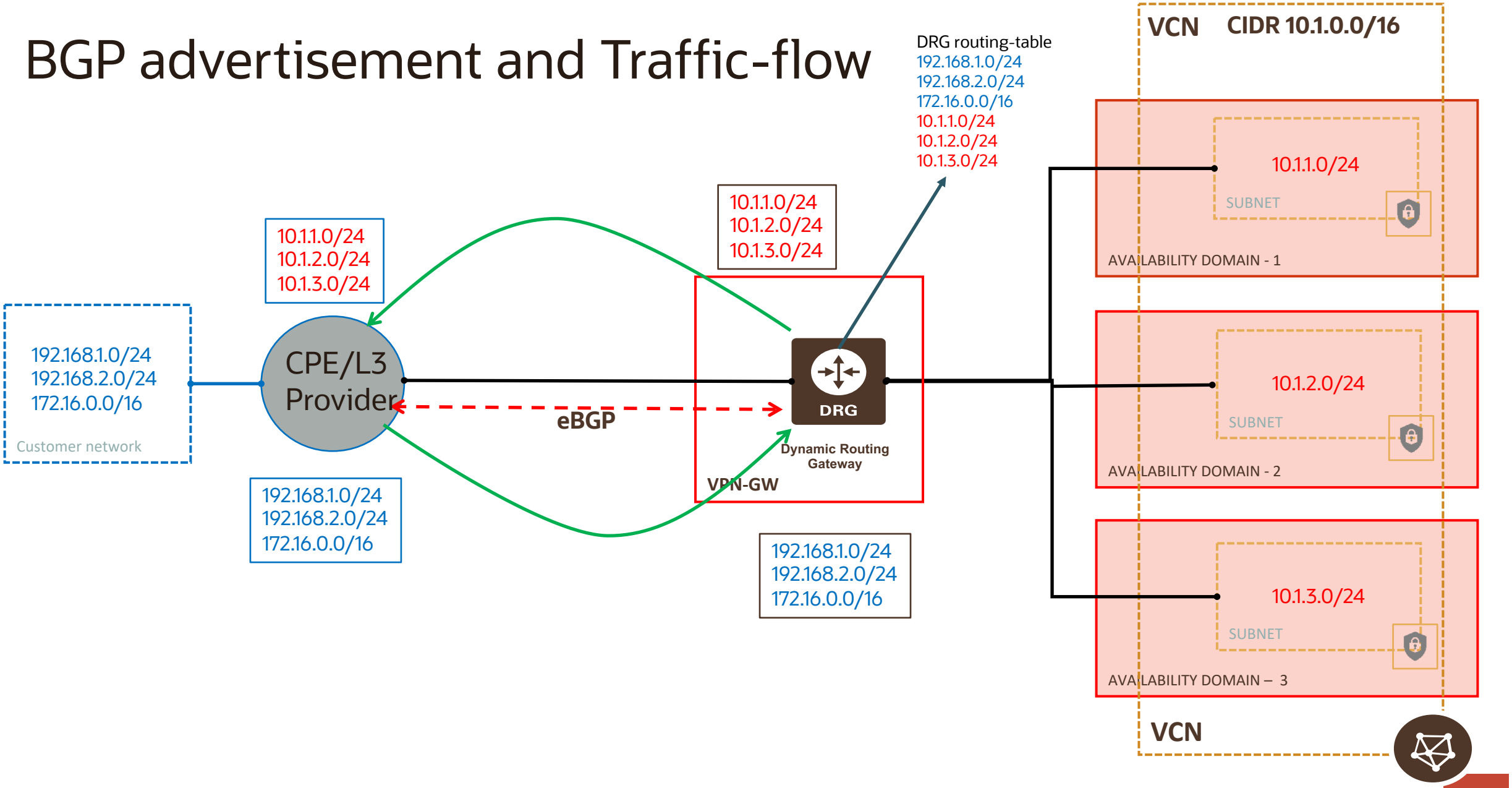
FastConnect Use Scenarios

- Private Peering
  - Extension of the on premise network to the OCI VCN
  - Communication across connection with private IP addresses
- Public Peering
  - To access public OCI services over dedicated FastConnect connection
  - Access Object storage, OCI Console or APIs
  - Communication across connection with public IP addresses

FastConnect (Private Connection)



BGP advertisement and Traffic-flow



FastConnect Use Scenarios

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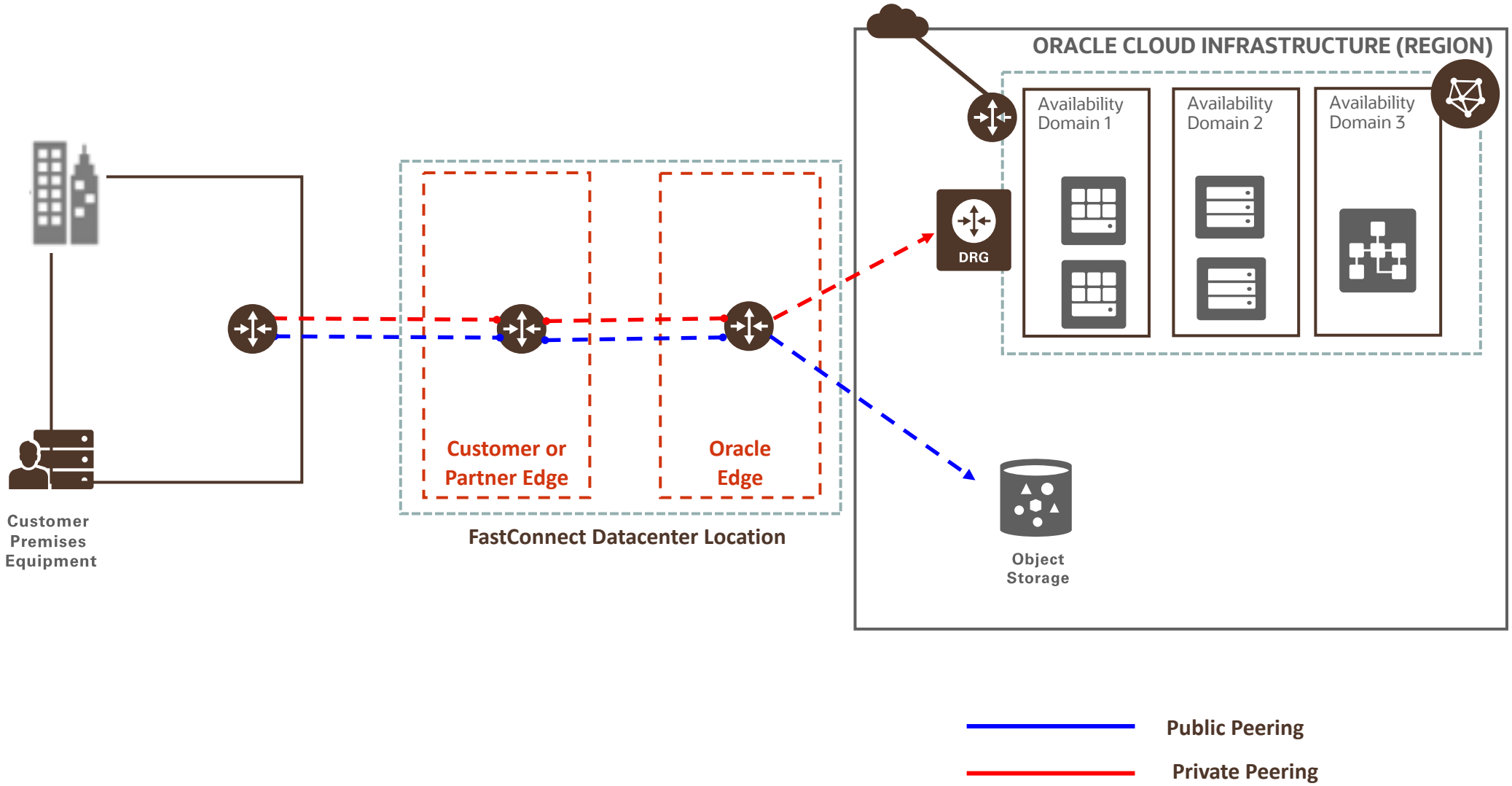
  - Access Object storage, OCI Console or APIs
  - Communication across connection with public IP addresses

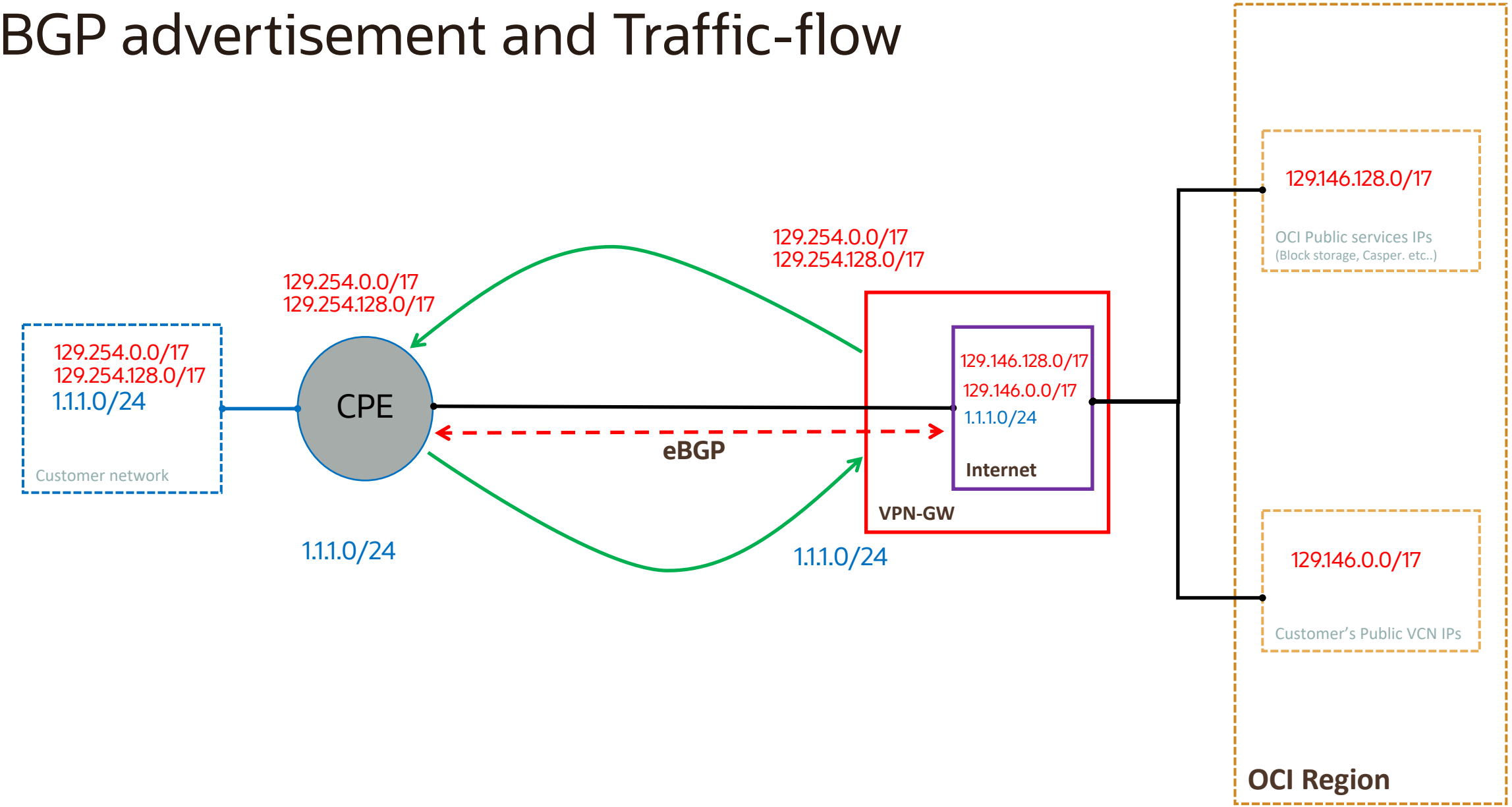
FastConnect (Public Peering Connection)



FastConnect (Public Peering Connection)

- You choose which of your organization's public IP prefixes you want to use with the virtual circuit. Each prefix must be /31 or less specific.
- Oracle verifies your organization's ownership of each prefix before sending any traffic for it across the connection.
- When configuring your edge for public peering, make sure to give higher preference to FastConnect over your ISP
- Oracle prefers the most specific route when routing traffic from Oracle Cloud Infrastructure to other destinations that means even if you have a IGW, replies to your verified public prefixes will go over the FastConnect connection.
- You can add or remove public IP prefixes at any time by editing the virtual circuit

BGP advertisement and Traffic-flow



Private and Public Peering

	FastConnect-Private	FastConnect-Public
Use case	To manage VCN resources privately	To access OCI's public service offering
Typical bandwidth	Higher bandwidth; increments of 1 Gbps, and 10 Gbps ports	Higher bandwidth; increments of 1 Gbps, and 10 Gbps ports
Protocols	BGP	BGP
Point-to-point IPs	Customer assigns IPs (/30 or /31)	Oracle assign IPs (/30 or /31)
Prefix-advertisement	OCI advertises VCN subnet routes	OCI advertises public VCN routes and public Services routes
Prefix-validation	Not needed	OCI does validation that prefixes are owed by customer or not
Prefix-limit	2000	200
BGP ASN	Any ASN	Public ASN

FastConnect Connectivity Models

Fast Connect Concepts

- FastConnect location

  A specific Oracle data center where you can connect with Oracle Cloud Infrastructure.

- Metro Area

  A geographical area (for example, Ashburn) with multiple FastConnect locations.

  All locations in a metro area connect to the same set of availability domains for resiliency in case of failure in a single location.

- Oracle provider

  A network service provider that has integrated with Oracle in a FastConnect location.

- Third-party provider

  A network service provider that is NOT on the list of Oracle providers

- Colocation

  The situation where your equipment is deployed into a FastConnect location.

Fast Connect Concepts contd..

- Cross-connect

  In a colocation or third-party provider scenario, this is the physical cable connecting your existing network to Oracle in the FastConnect location.

- Cross-connect group

  In a colocation or third-party provider scenario, this is a link aggregation group (LAG) that contains at least one cross-connect.

  You can add additional cross-connects to a cross-connect group as your bandwidth needs increase. This is applicable only for colocation.

Fast Connect Concepts contd..(2)

- Virtual Circuit
  - A virtual circuit is an isolated network path that runs over one or more physical network connections to provide a single, logical connection between the customer's edge router and their DRG
  - Each virtual circuit is made up of information shared between the customer, Oracle, and a provider
  - The customer could have multiple virtual circuits to isolate traffic from different parts of their organization (e.g. one virtual circuit for 10.0.1.0/24; another for 172.16.0.0/16), or to provide redundancy
  - FastConnect uses Border Gateway Protocol (BGP) to exchange routing information between the various autonomous systems involved in the connection
  - With FastConnect, there are two scenarios for how the virtual circuit's BGP session is established (Layer 2 or Layer 3)

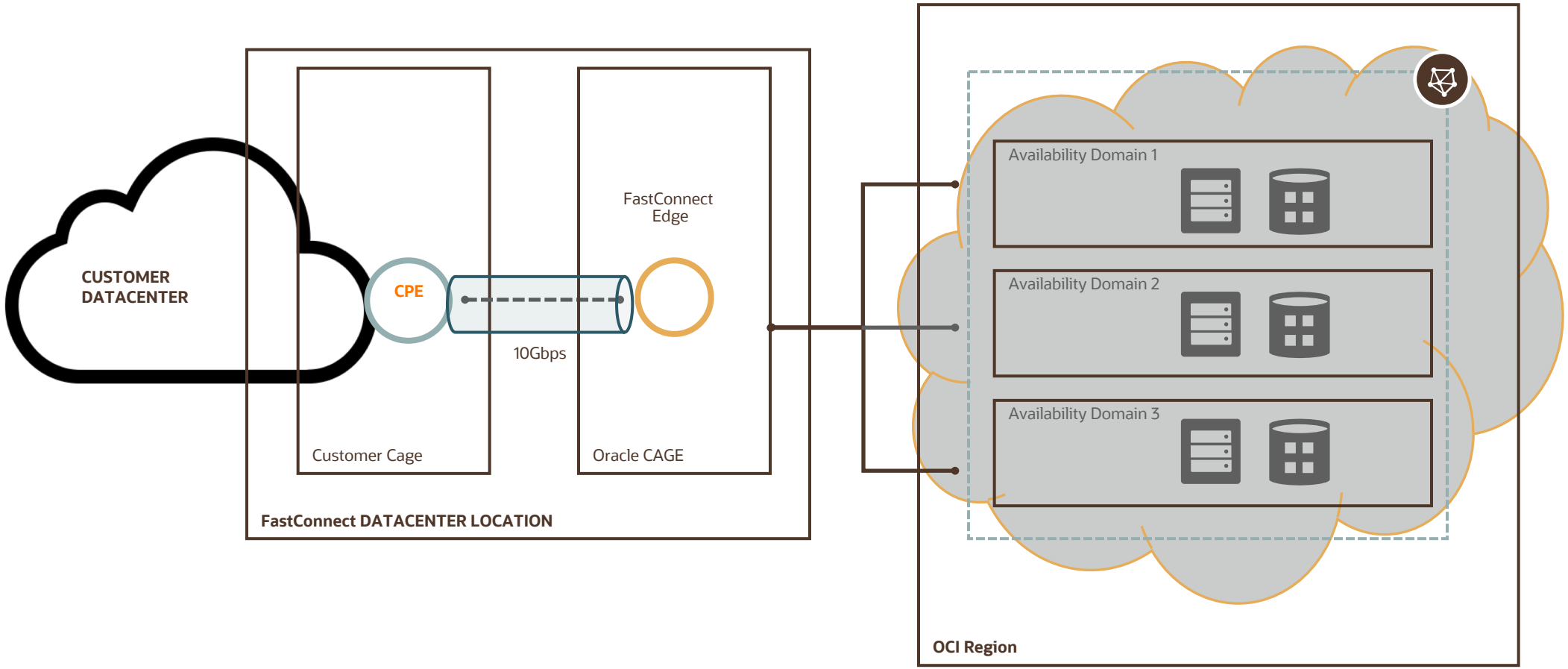
FastConnect Connectivity Options

Connectivity Models

- Direct to Oracle:
    - Datacenter Colocation (1a)
    - Dedicated Circuits from a 3rd Party Network Carrier (1b)
- Using an Oracle Network Provider or Exchange Partner

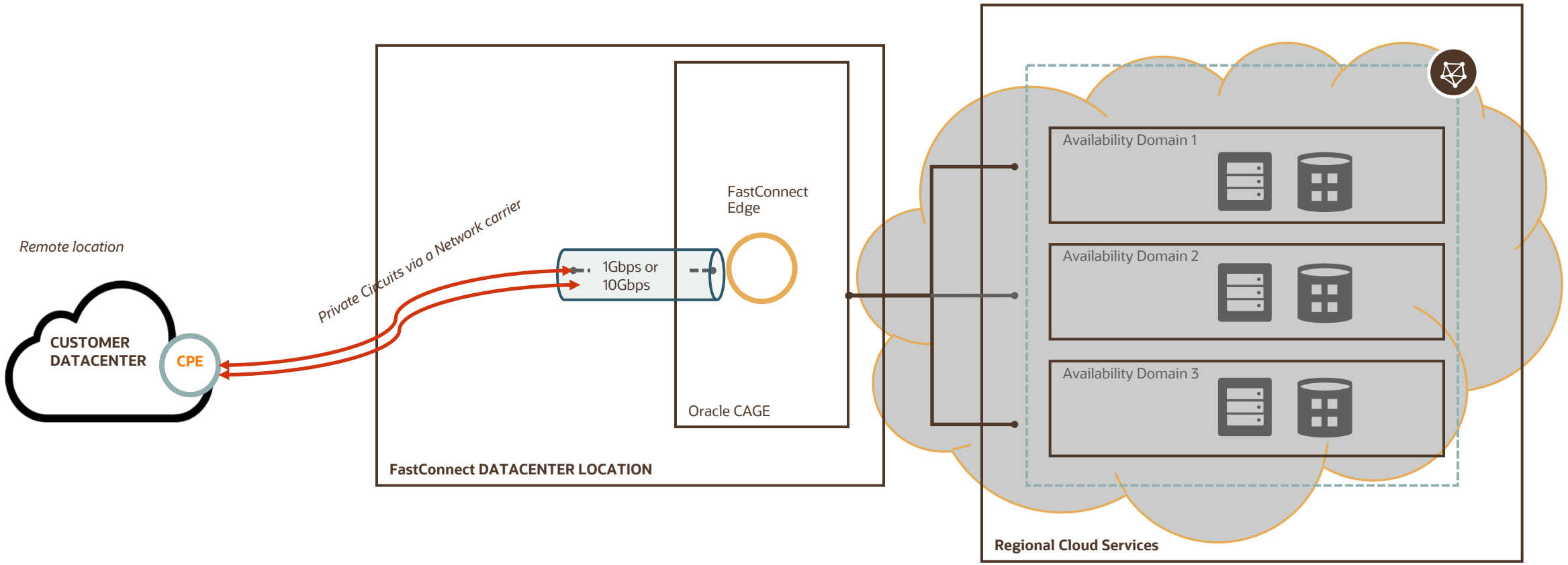
Direct to Oracle: Datacenter Colocation (1a)

Physical Connection:



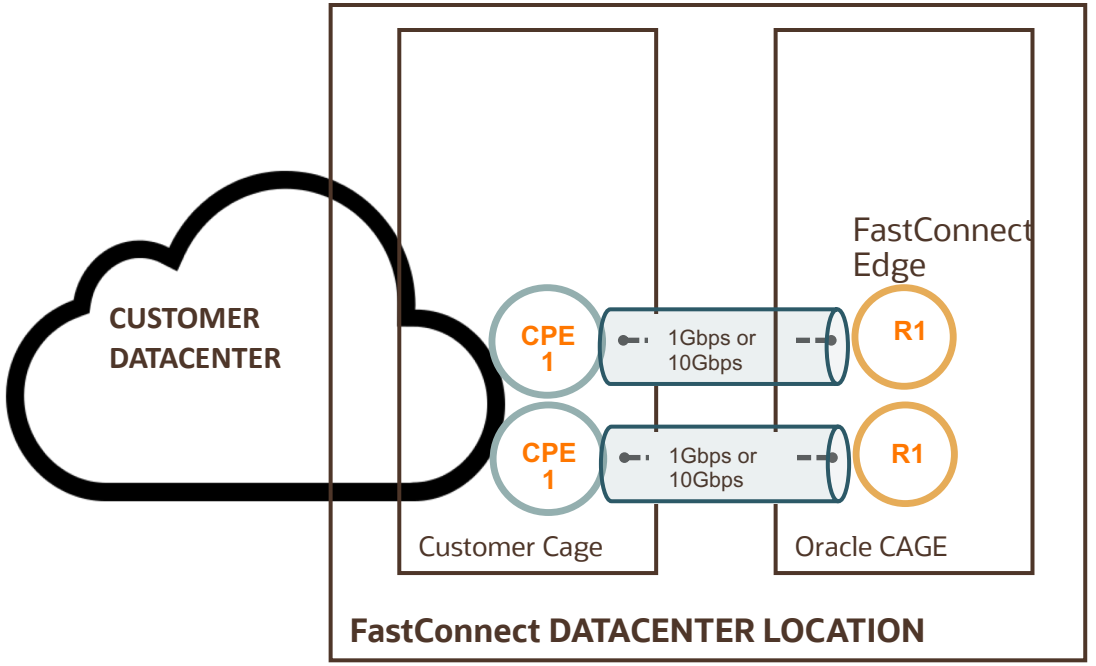
Direct to Oracle: Dedicated Circuits using a Network Service Provider (1b)

Physical Connection

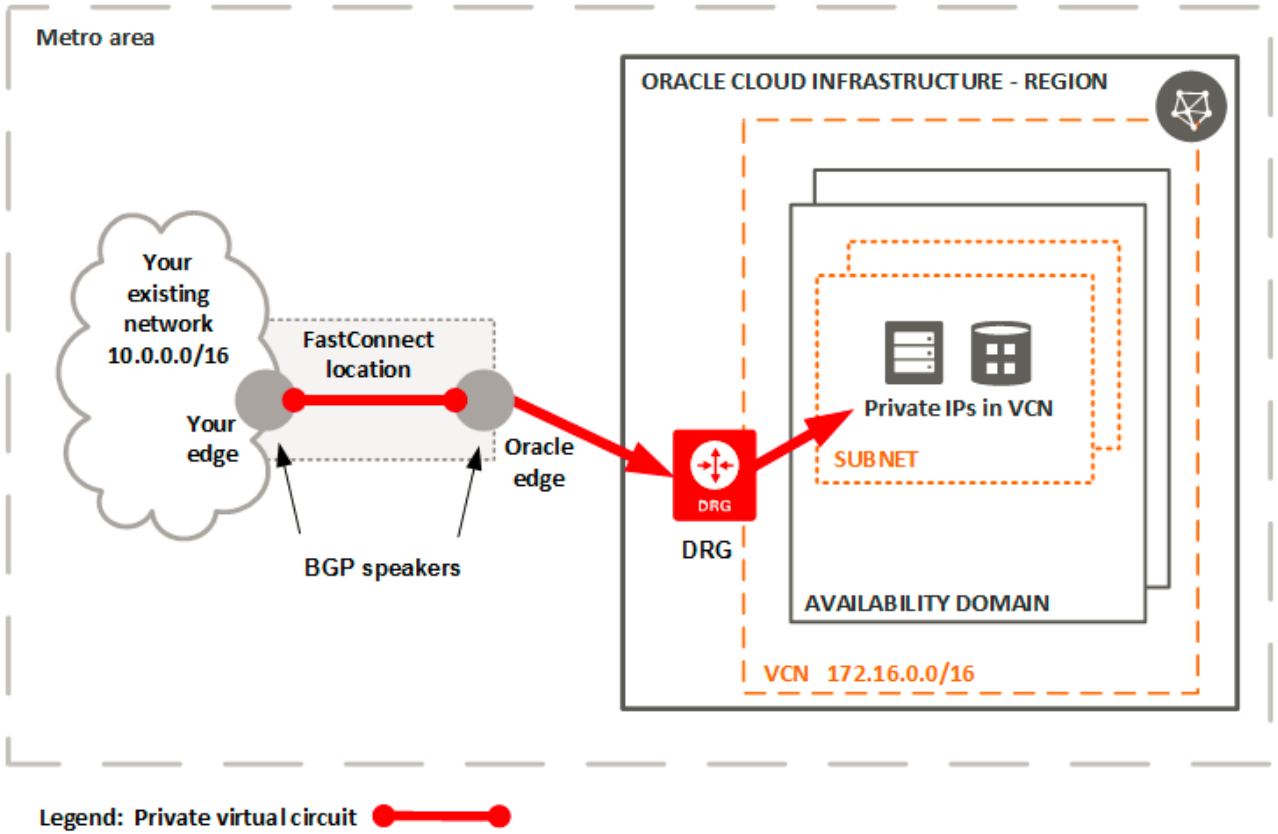


Cross Connects in Models 1a and 1b - Physical Connection

- In colocation model 1a and 1b
  - You can add additional cross-connects to a cross-connect group as your bandwidth needs increase such as 2x10G ports into a LAG.
  - When you create a Cross-Connect Group, the Cross-Connects are grouped together to form a Link Aggregation Group (LAG).
  - Can group up to 8 cross-connects in a cross-connect group. (8x10G if required)
  - In a cross-connect group, all ports are on the same router



Direct to Oracle
Logical Connection - virtual circuit:



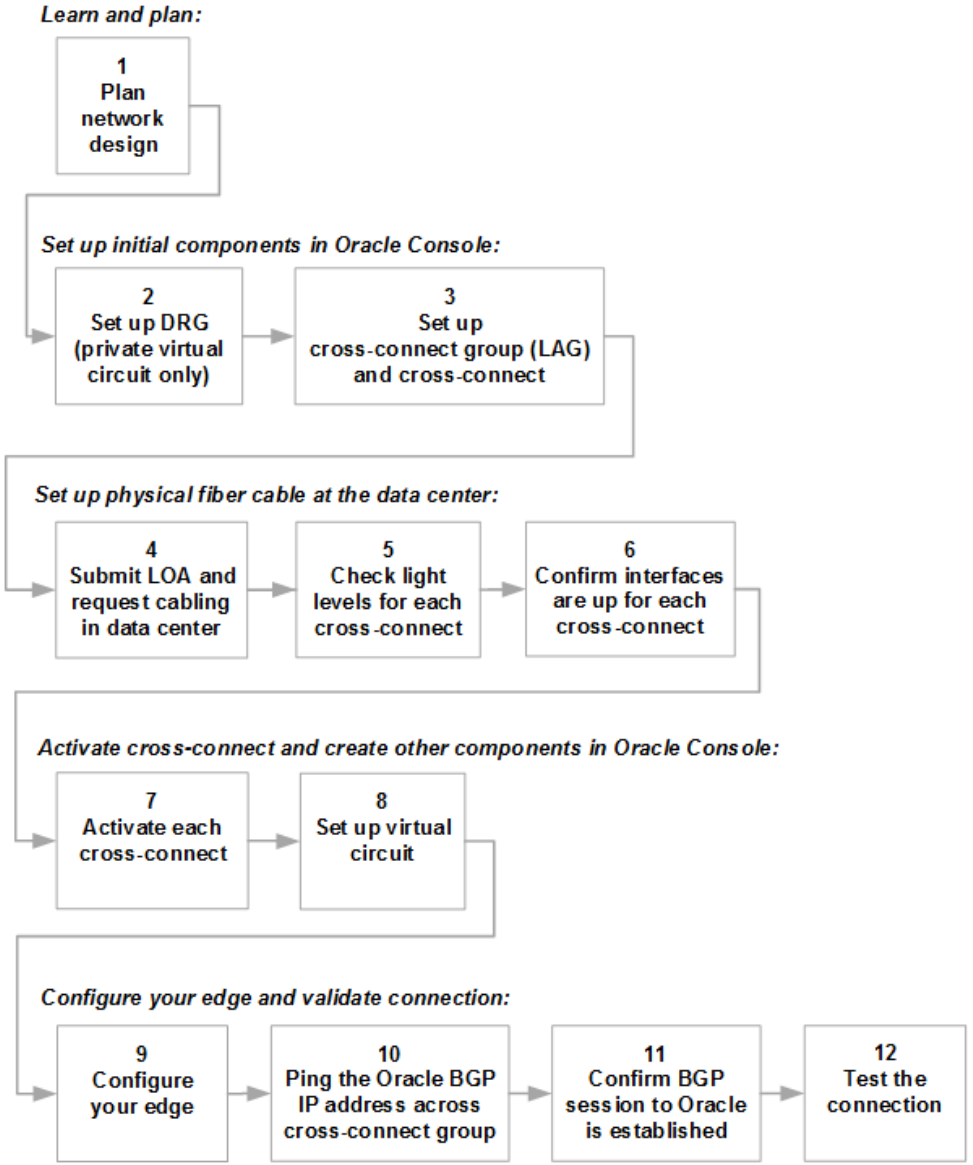
- A single, logical connection (virtual circuit) between your edge and Oracle Cloud Infrastructure by way of your Dynamic Routing Gateway. Traffic is destined for private IP addresses in your VCN.

How to setup a FastConnect Virtual Circuit in Colocation Model?

Service Models

- Direct to Oracle:
    - Datacenter Colocation – 1a
    - Dedicated Circuits from a 3rd Party Network Carrier – 1b

How to setup a FastConnect Virtual Circuit in Colocation Model?



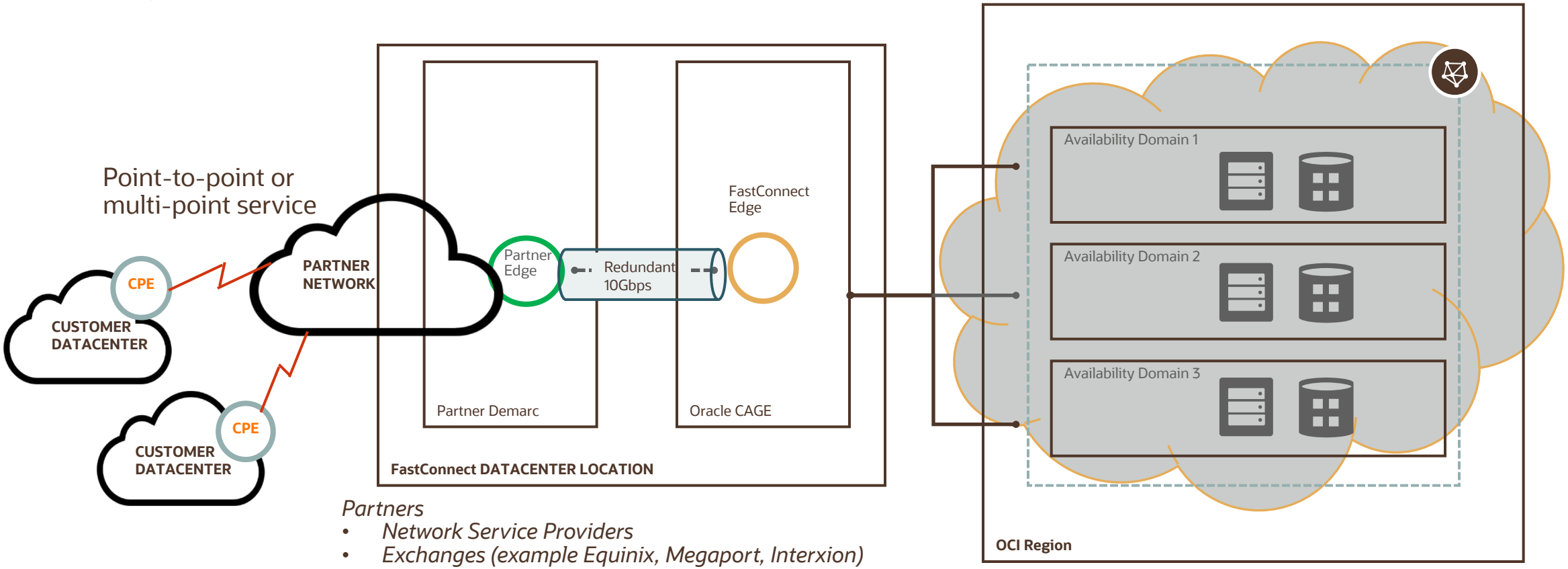
FastConnect Connectivity Options

Service Models

- Direct to Oracle:
    - Datacenter Colocation
    - Dedicated Circuits from a 3rd Party Network Carrier
- Using an Oracle Network Provider or Exchange Partner (Layer 2 or Layer 3)

Using an Oracle Network Provider or Exchange Partner

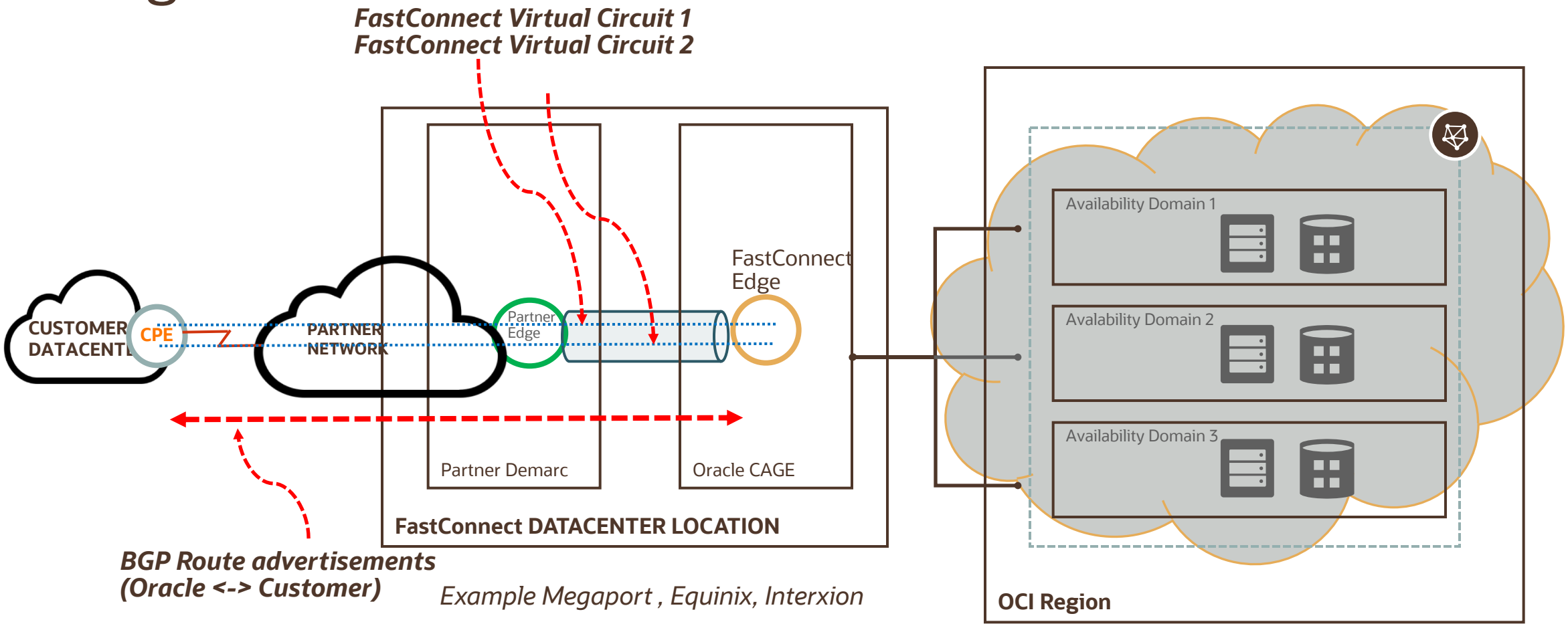
Physical Connection:



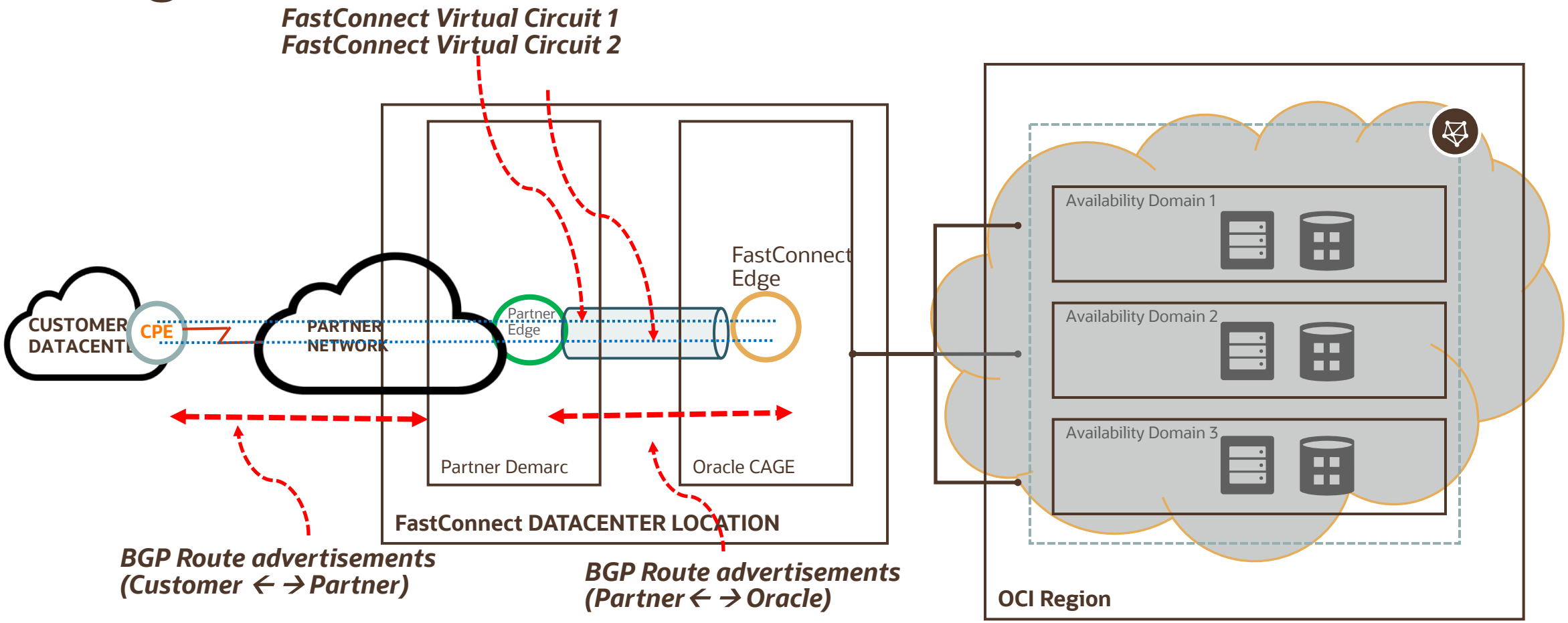
Partners

- *Network Service Providers*
- *Exchanges (example Equinix, Megaport, Interxion)*

Using an Oracle Network Provider or Exchange Partner– Layer 2
Logical Connection:



Using an Oracle Network Provider or Exchange Partner– Layer 3 Logical Connection:



FastConnect Connectivity Partners

North America Network Provider and Exchange Partners

FastConnect Partners	Oracle Cloud Location Phoenix, AZ, USA	Oracle Cloud Location Ashburn, VA, USA	Oracle Cloud Location Toronto, ON, Canada
Aryaka	✗	✓	✗
AT&T NetBond® for Cloud	✓	✓	✗
BT Cloud Connect	✗	✓	✗
C3ntro	✓	✓	✗
CenturyLink® Cloud Connect	✓	✓	✓
Cologix Hyperscale Connect	✗	✓	✓
Coresite Open Cloud Exchange	✗	✓	✗
Digital Realty Service Exchange	✓	✓	✗
EdgeConneX	✓	✗	✗
Epsilon	✗	✓	✗

https://www.oracle.com/cloud/networking/fastconnect-providers.html

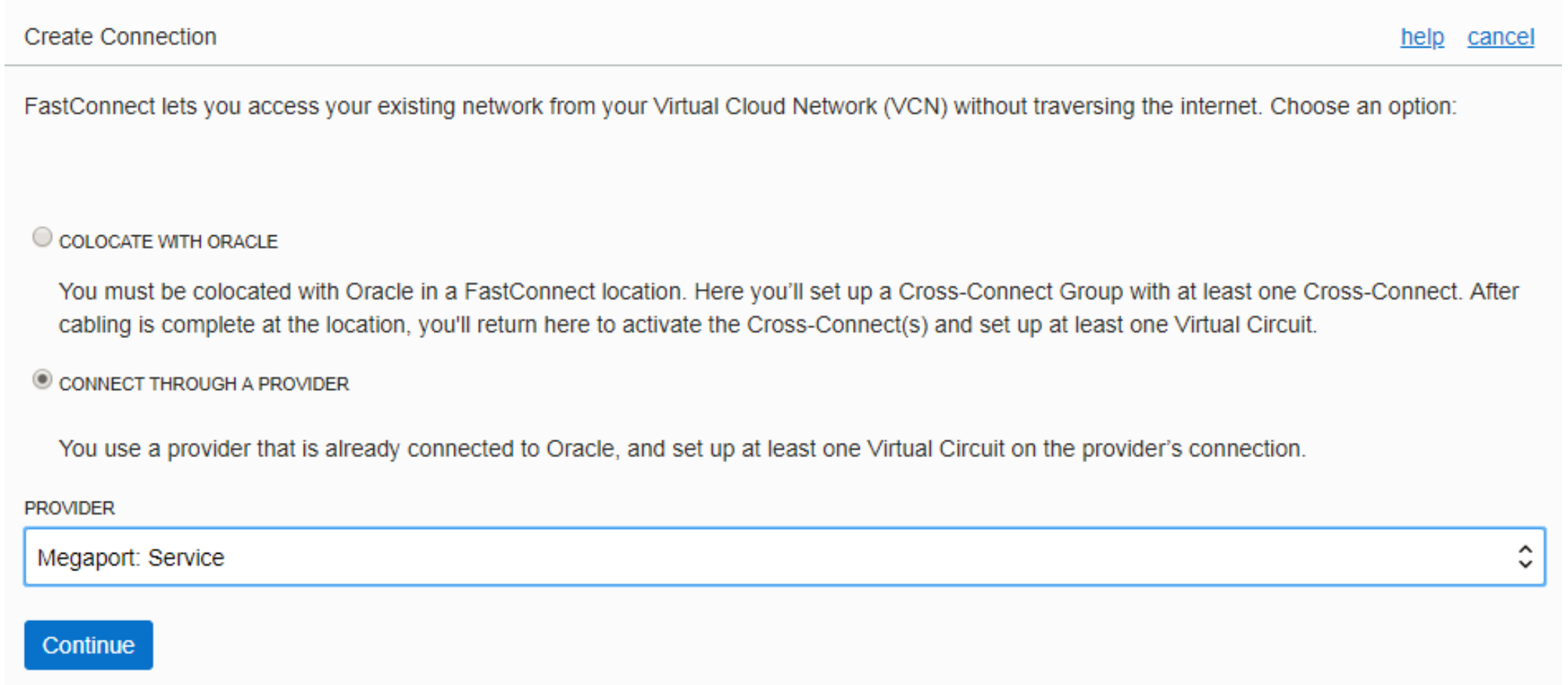
How to Setup a FastConnect virtual circuit with Partner: Demo example - Megaport Layer3 Partner

Service Models

- Direct to Oracle:
  - Datacenter Colocation – 1a
  - Dedicated Circuits from a 3rd Party Network Carrier – 1b
- Using an Oracle Network Provider or Exchange Partner (Layer 2 or Layer 3)

1. Setup OCI Components

a. DRG (Private Peering Only)
b. Setup a Virtual Circuit with Provider



1. Setup OCI Components

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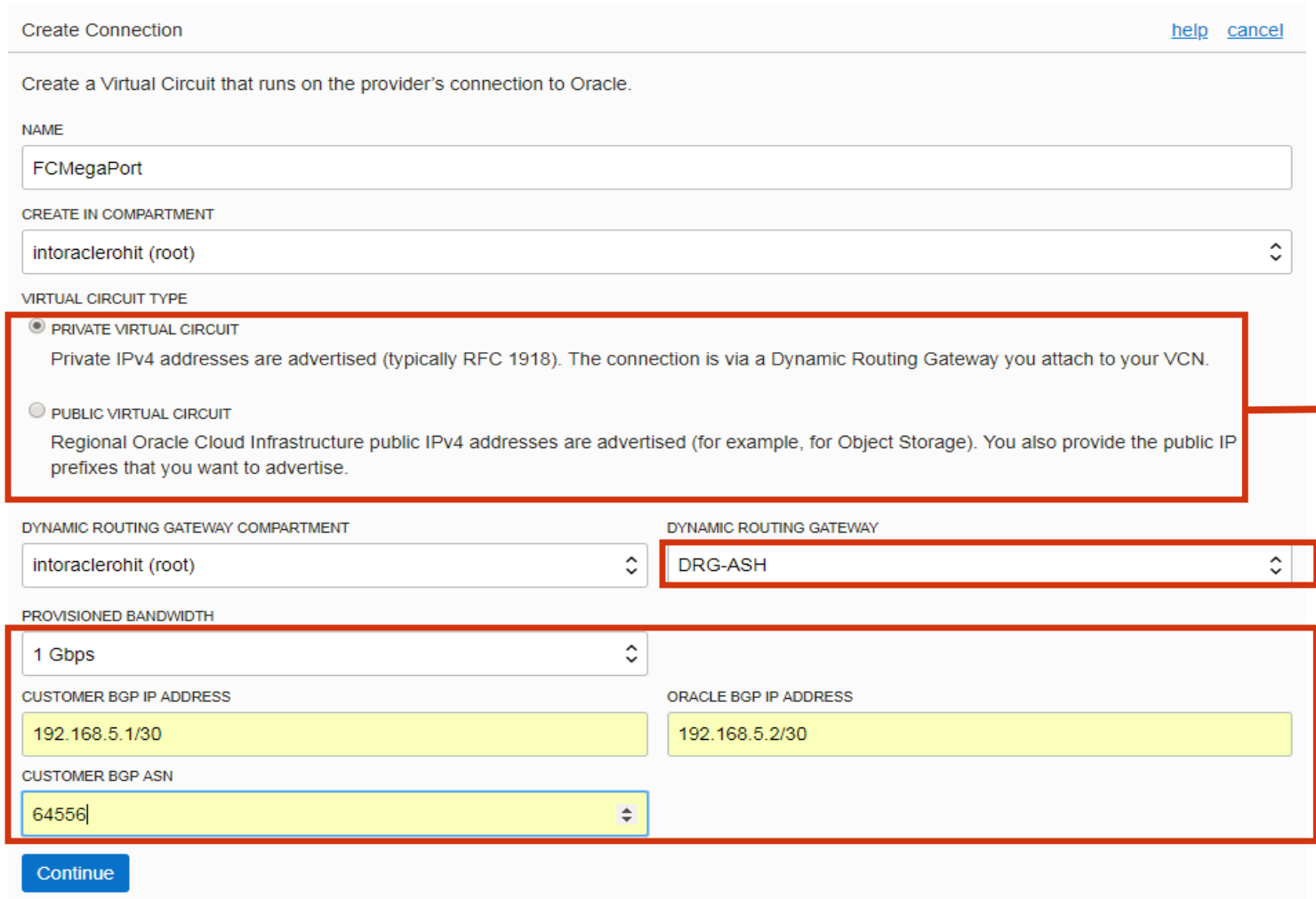
b. Setup a Virtual Circuit with Provider



Select the type of circuit

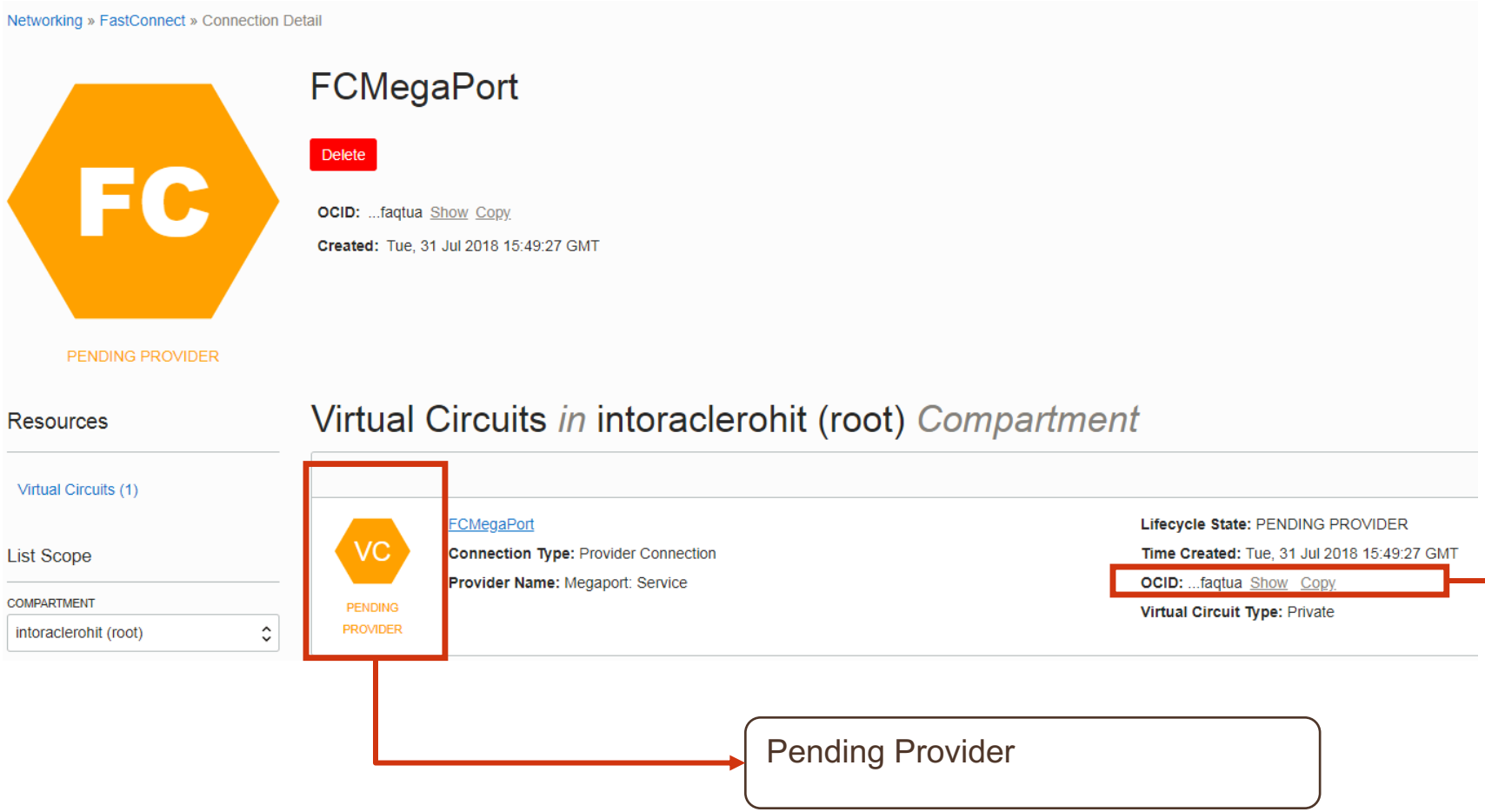
Select the DRG

Private Peering: Provide customer and oracle BGP IP address and ASN

Public Peering: Customer Public BGP ASN and public Prefixes

1. Setup OCI Components

c. Provide details of Virtual Circuit to provider

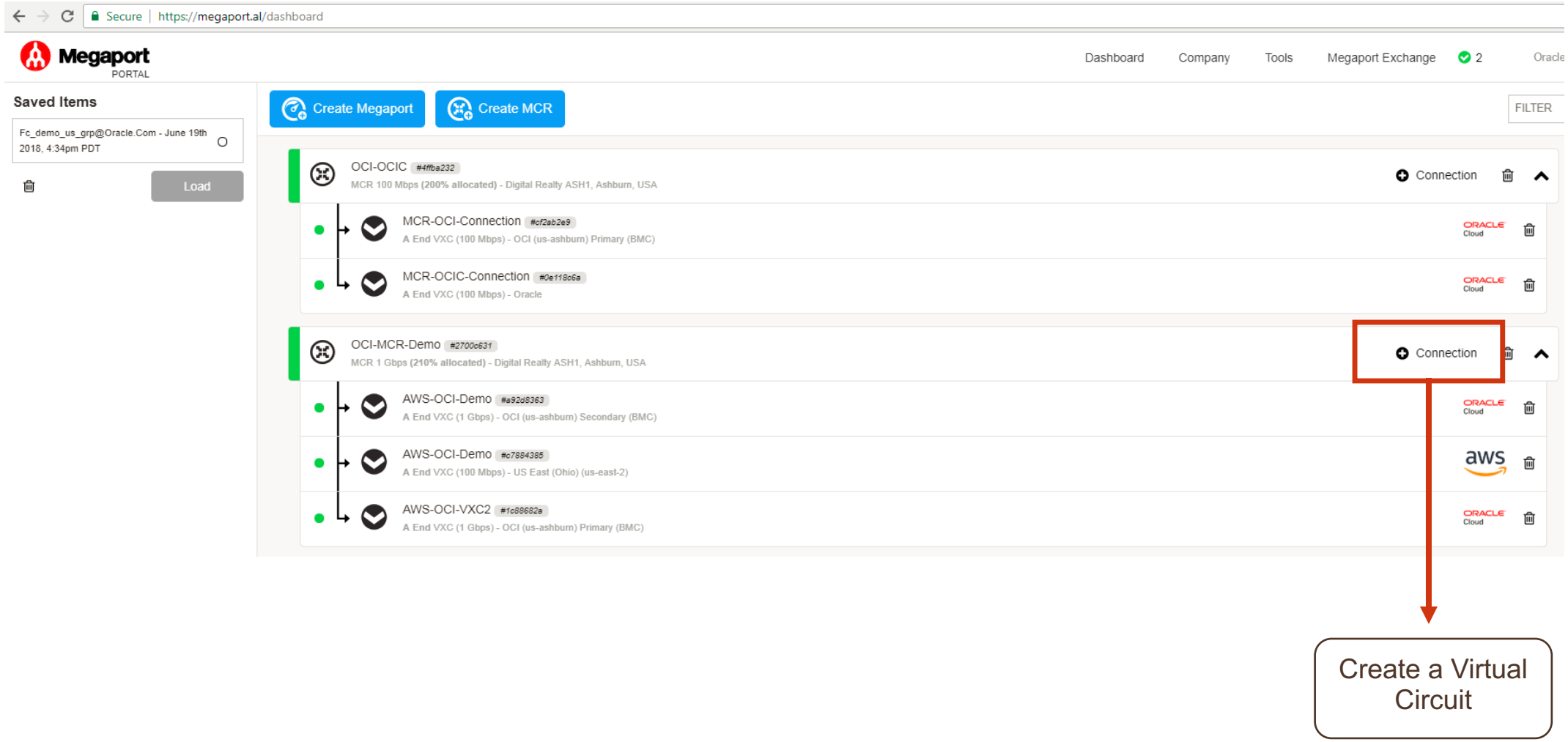


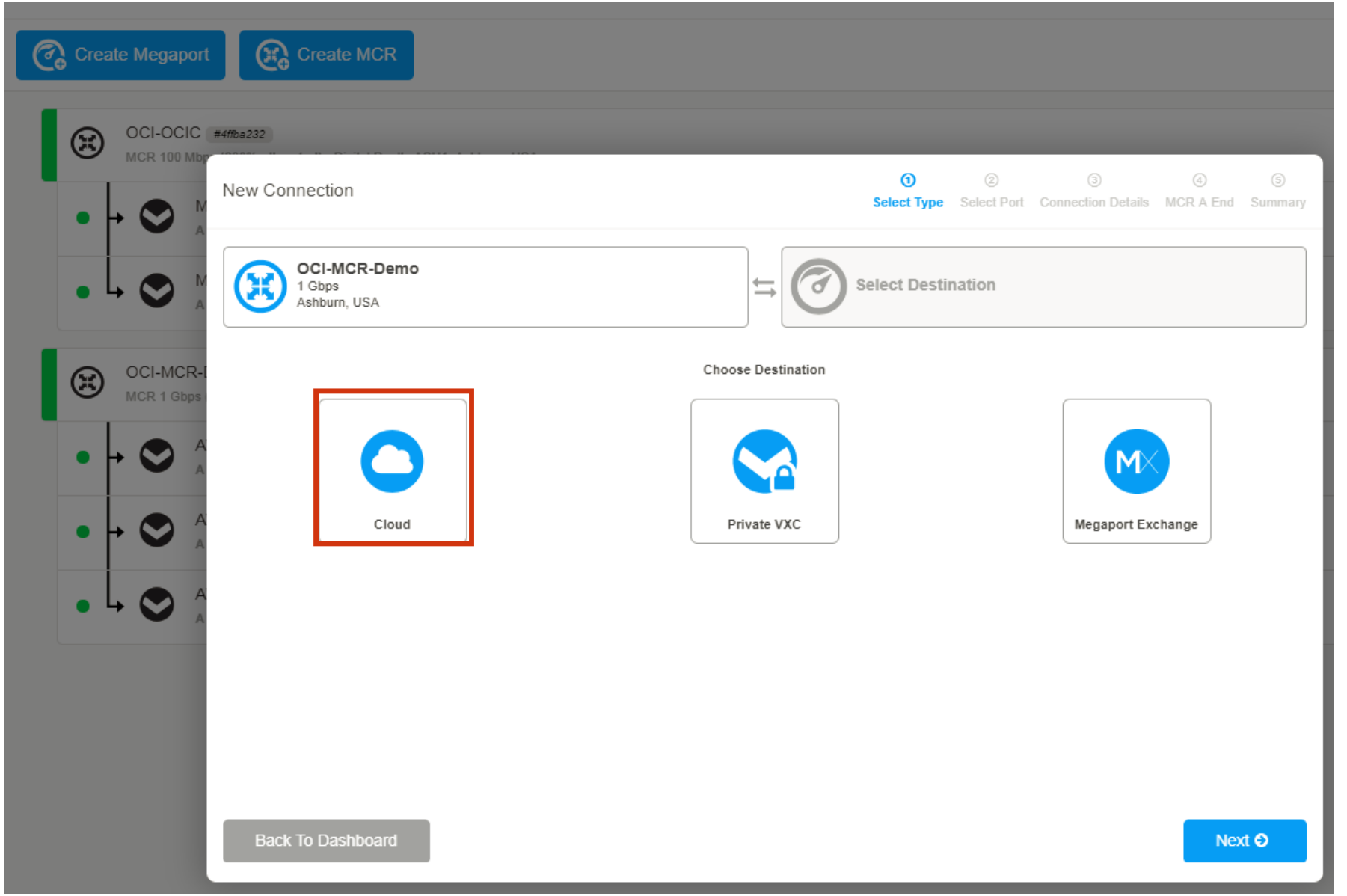
OCID of the Virtual Circuit

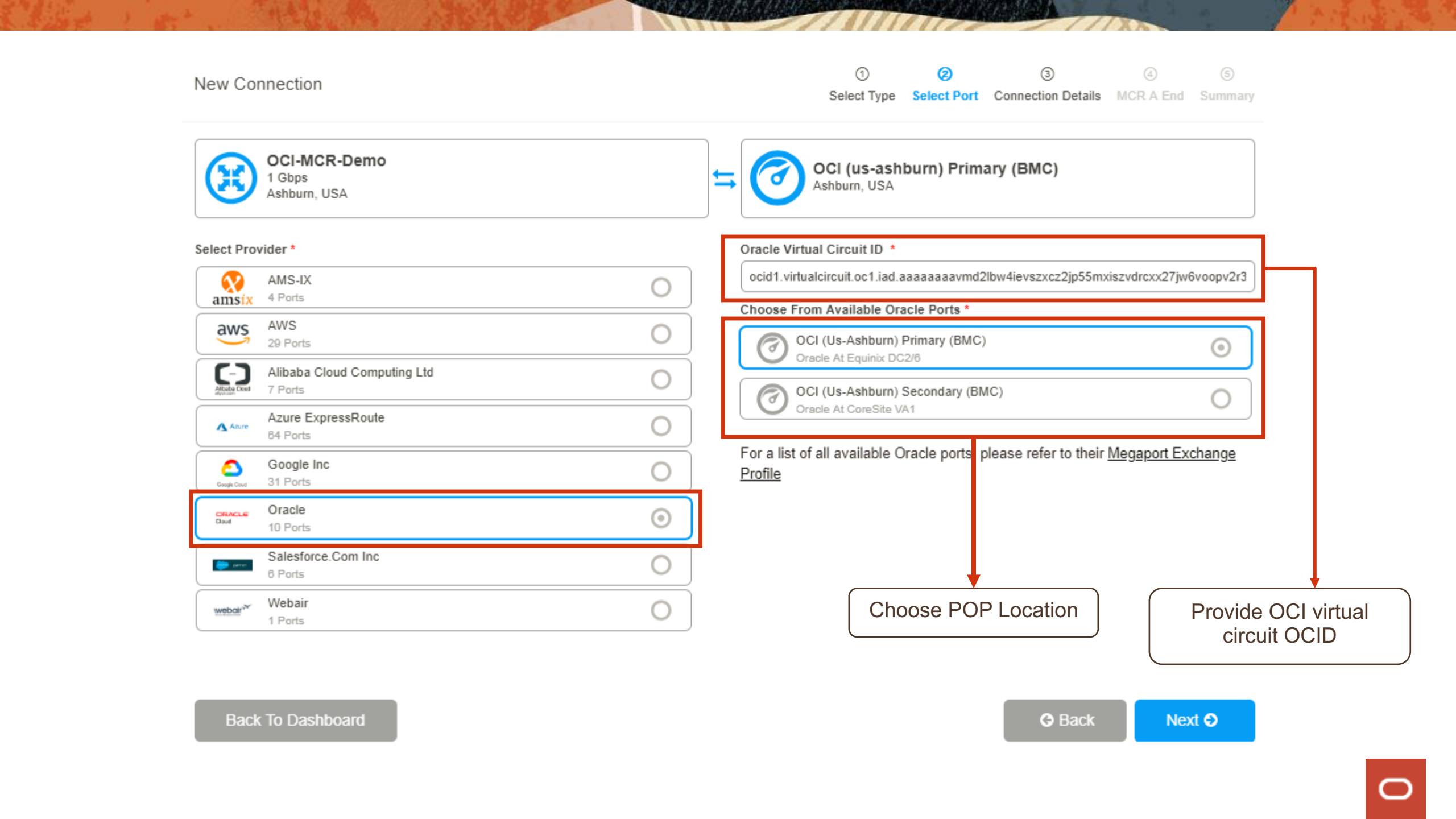
Pending Provider

2. Setup Megaport Connection

a. Use OCID of the Virtual Circuit in Megaport




Create Megaport
Create MCR
OCI-OCIC
New Connection
Select Type
Select Port
Connection Details
MCR A End
Summary
OCI-MCR-Demo
1 Gbps
Ashburn, USA
Select Destination
Choose Destination
Cloud
Private VXC
Megaport Exchange
Back To Dashboard
Next


New Connection
1 Select Type
2 Select Port
3 Connection Details
4 MCR A End
5 Summary
OCI-MCR-Demo
1 Gbps
Ashburn, USA
OCI (us-ashburn) Primary (BMC)
Ashburn, USA
Select Provider *
AMS-IX
4 Ports
AWS
29 Ports
Alibaba Cloud Computing Ltd
7 Ports
Azure ExpressRoute
64 Ports
Google Inc
31 Ports
Oracle
10 Ports
Salesforce.Com Inc
6 Ports
Webair
1 Ports
Oracle Virtual Circuit ID *
ocid1.virtualcircuit.oc1.iad.aaaaaaaavmd2lbw4ievszxcz2jp55mxiszvdrcxx27jw6voopv2r3
Choose From Available Oracle Ports *
OCI (Us-Ashburn) Primary (BMC)
Oracle At Equinix DC2/6
OCI (Us-Ashburn) Secondary (BMC)
Oracle At CoreSite VA1
For a list of all available Oracle ports please refer to their Megaport Exchange Profile
Choose POP Location
Provide OCI virtual circuit OCID
Back To Dashboard
Back
Next

New Connection

① Select Type ② Select Port ③ Connection Details ④ MCR A End ⑤ Summary

OCI-MCR-Demo
1 Gbps
Ashburn, USA

OCI (us-ashburn) Primary (BMC)
Ashburn, USA

Name Your Connection *
Test_FC

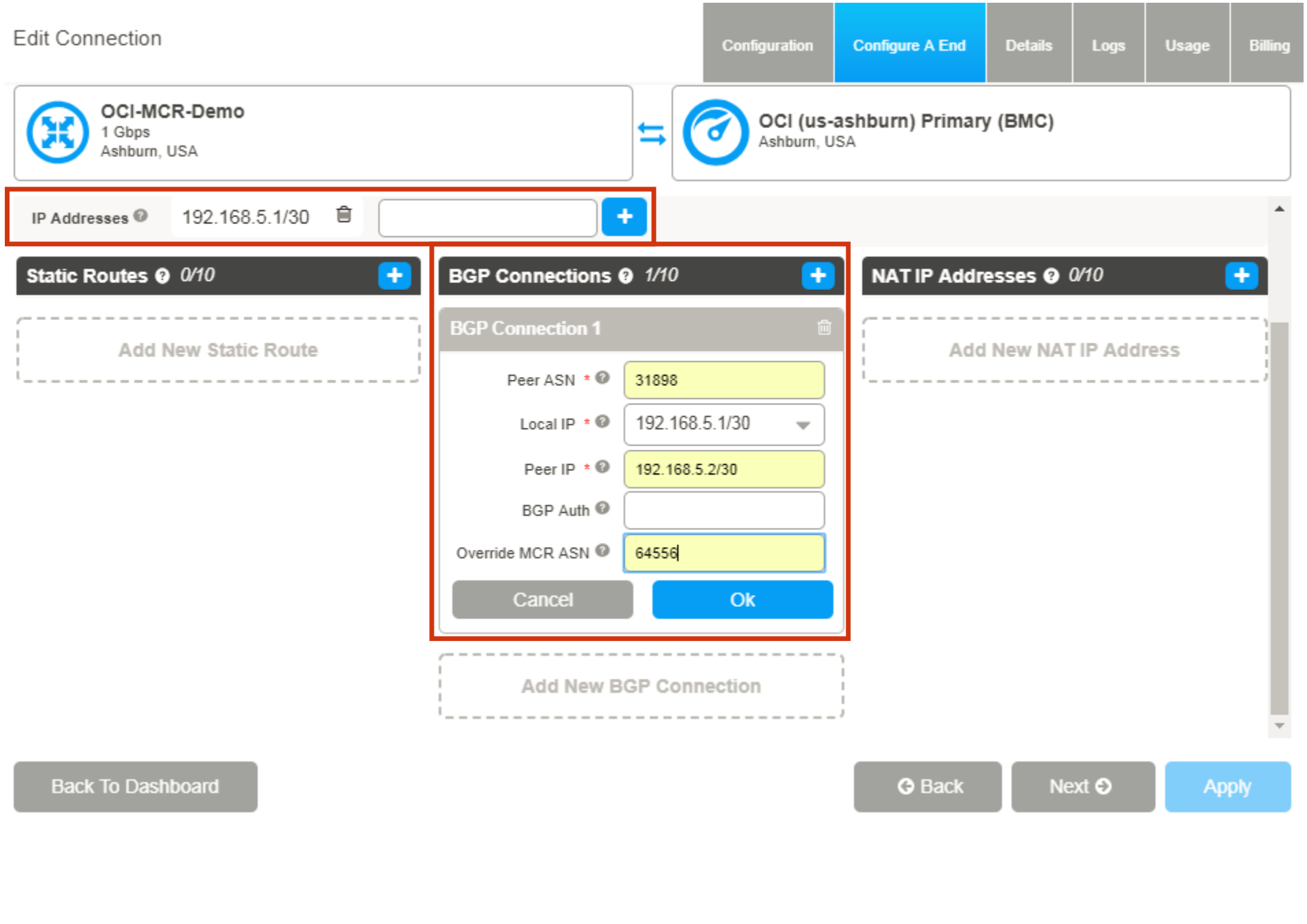
Invoice Reference

Rate Limit * MAX: 1000 Mbps
1000

Back To Dashboard

Back Next

Monthly rate: 0.00 USD (Price Excludes Tax)


Edit Connection
Configuration
Configure A End
Details
Logs
Usage
Billing
OCI-MCR-Demo
1 Gbps
Ashburn, USA
OCI (us-ashburn) Primary (BMC)
Ashburn, USA
IP Addresses
192.168.5.1/30
Static Routes 0/10
Add New Static Route
BGP Connections 1/10
BGP Connection 1
Peer ASN *
31898
Local IP *
192.168.5.1/30
Peer IP *
192.168.5.2/30
BGP Auth
Override MCR ASN
64556
Cancel
Ok
Add New BGP Connection
NAT IP Addresses 0/10
Add New NAT IP Address
Back To Dashboard
Back
Next
Apply

New Connection

① Select Type ② Select Port ③ Connection Details ④ MCR A End ⑤ Summary

OCI-MCR-Demo
1 Gbps
Ashburn, USA

⇆

OCI (us-ashburn) Primary (BMC)
Ashburn, USA

Connection Name	Test_FC
Rate Limit	1 Gbps

MCR A End Details ⌄

Cloud Details *(ORACLE)* ⌄

Monthly Rate **0.00 USD** Price excludes TAX

Back To Dashboard

Back

Add To Cart

Megaport
PORTAL

Test_FC
OCI-MCR-Demo => Oracle OCI (Us-Ashburn) Primary (BMC)

$0.00 USD

Monthly charge excluding taxes

Save Cart | Check-Out

Create Megaport | Create MCR

- OCI-OCIC #4ffba232
  MCR 100 Mbps **(200% allocated)** - Digital Realty ASH1, Ashburn, USA
  - MCR-OCI-Connection #cf2ab2e9
    A End VXC (100 Mbps) - OCI (us-ashburn) Primary (BMC)
  - MCR-OCIC-Connection #0e118c6a
    A End VXC (100 Mbps) - Oracle
- OCI-MCR-Demo #2700c631
  MCR 1 Gbps **(310% allocated)** - Digital Realty ASH1, Ashburn, USA
  - AWS-OCI-Demo #a92d8363
    A End VXC (1 Gbps) - OCI (us-ashburn) Secondary (BMC)
  - AWS-OCI-Demo #c7884385
    A End VXC (100 Mbps) - US East (Ohio) (us-east-2)
  - AWS-OCI-VXC2 #1c88682a
    A End VXC (1 Gbps) - OCI (us-ashburn) Primary (BMC)
  - Test_FC
    A End VXC (1 Gbps) - OCI (us-ashburn) Primary (BMC)

Checkout

Monthly Rate

Test_FC
No Term

$0.00 USD

+ Promo Code

Price excludes taxes

Important Information
This Order constitutes a binding offer to acquire the Services described above and which, if accepted by Megaport, creates a separate agreement incorporating the terms set out in (a) this Order; and (b) where an agreement signed by Customer or its Affiliate relating to this Service exists, that agreement or, otherwise, the Global Services Agreement.

Back To Dashboard

Deploy Now

MENU | ORACLE Cloud Infrastructure | TENANCY intoraclerohit | REGION us-ashburn-1

Networking » FastConnect » Connection Detail

FC

UP

FCMegaPort

Delete

OCID: ...ypblfq Show Copy

Created: Tue, 31 Jul 2018 18:30:12 GMT

Resources

Virtual Circuits (1)

List Scope

COMPARTMENT

intoraclerohit (root)

Virtual Circuits *in* intoraclerohit (root) *Compartment*

VC

UP

FCMegaPort

Connection Type: Provider Connection

Provider Name: Megaport: Service

Lifecycle State: PROVISIONED

Time Created: Tue, 31 Jul 2018

OCID: ...ypblfq Show Copy

Virtual Circuit Type: Private

FastConnect Connectivity Resiliency

FastConnect Redundancy

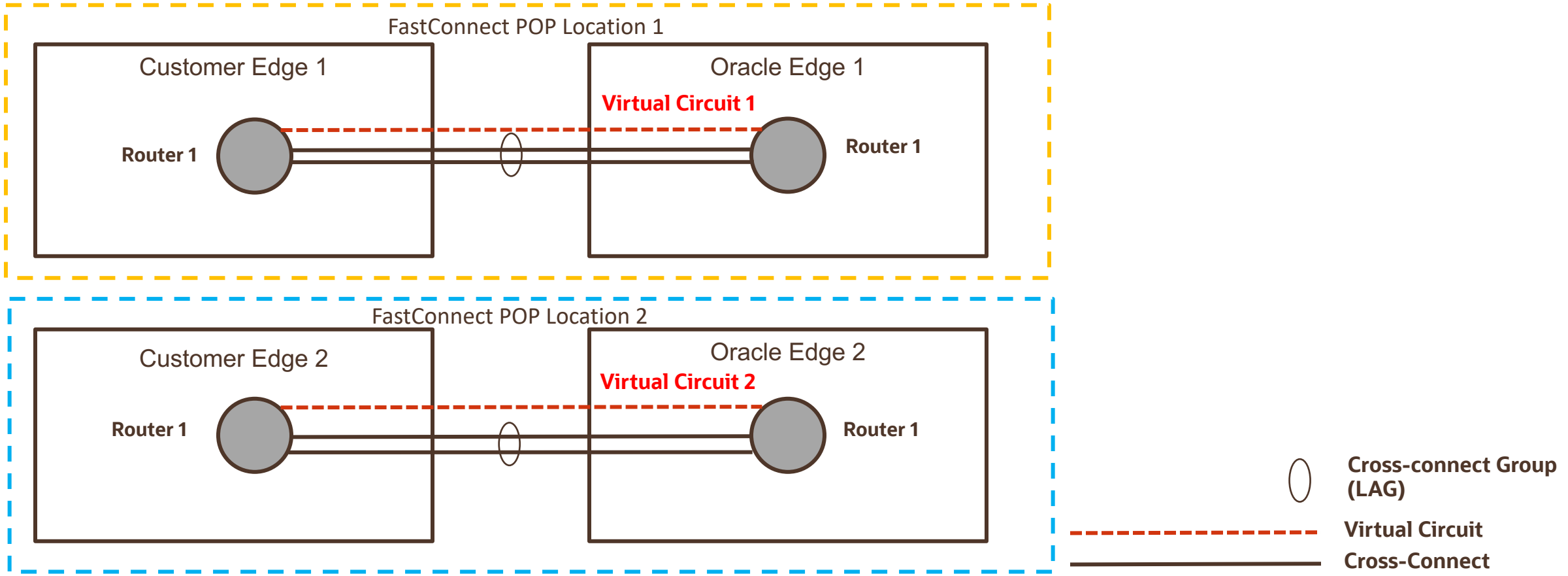
- Have multiple redundant connections into OCI and avoid having single points of failure in your design.
- For IPSec VPN - OCI recommends using multiple connections from redundant physical devices at the customer premises. High availability connections require redundant hardware, even when connecting from the same physical location
- OCI FastConnect provides multiple redundancy options, and its recommended to use multiple vendors if financially feasible to ensure you have redundant network connections
- Plan for sufficient network capacity with your FastConnect virtual circuits to ensure individual circuits are not overwhelmed in case of failures on redundant circuits
- Have a service level redundancy by creating a IPsec VPN service alongside FC. Oracle always prioritizes FC over VPN connection.

FastConnect Redundancy

- With FastConnect there are multiple types of redundancy
  - Transit POP redundancy
  - Router redundancy with-in a single Transit POP
  - Partner redundancy
  - Service redundancy
- Oracle provides:
- 2 Oracle FastConnect (POPs), for location redundancy in following regions. Each is connected to all of Oracle's Availability Domains in the region.
  - Ashburn, Phoenix, London, Frankfurt
- **Per Oracle POP:** 2 routers, for router redundancy
- Multiple physical connections between each Oracle provider and Oracle (for a given region)

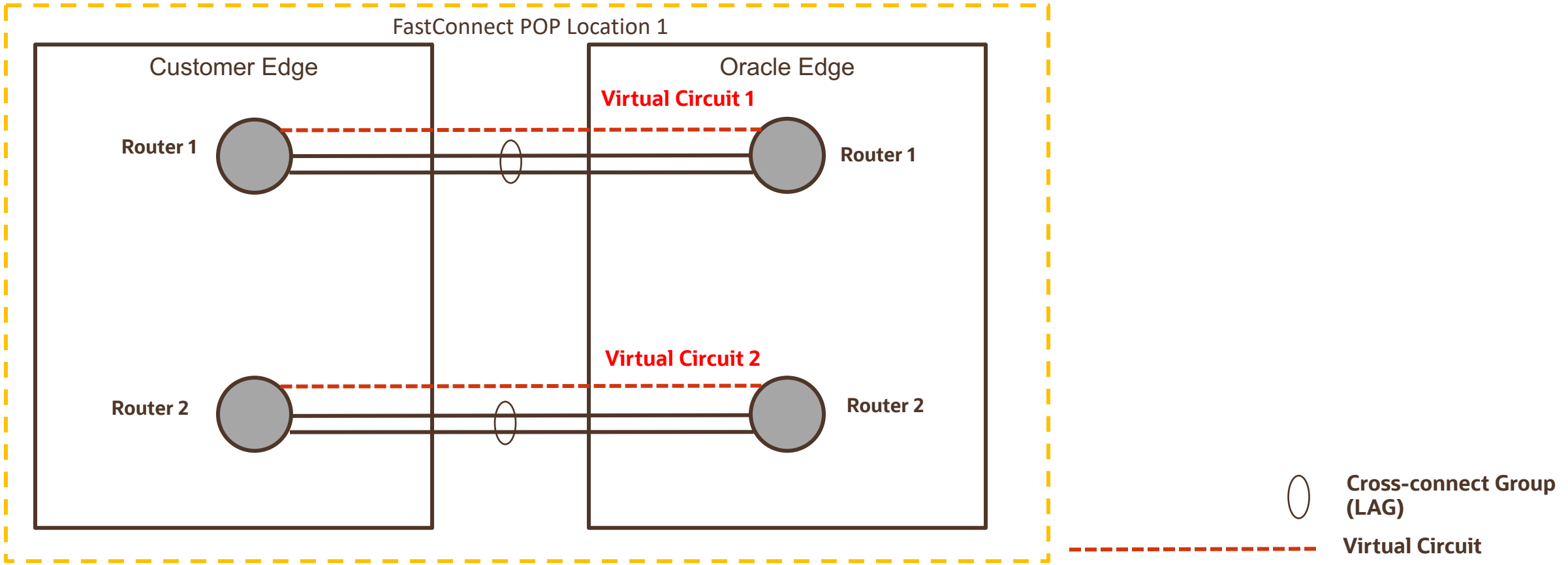
Redundancy: Connectivity Model
Colocation or colocation via third party Network Provider

- Transit POP redundancy



Redundancy: Connectivity Model
Colocation or colocation via third party Network Provider

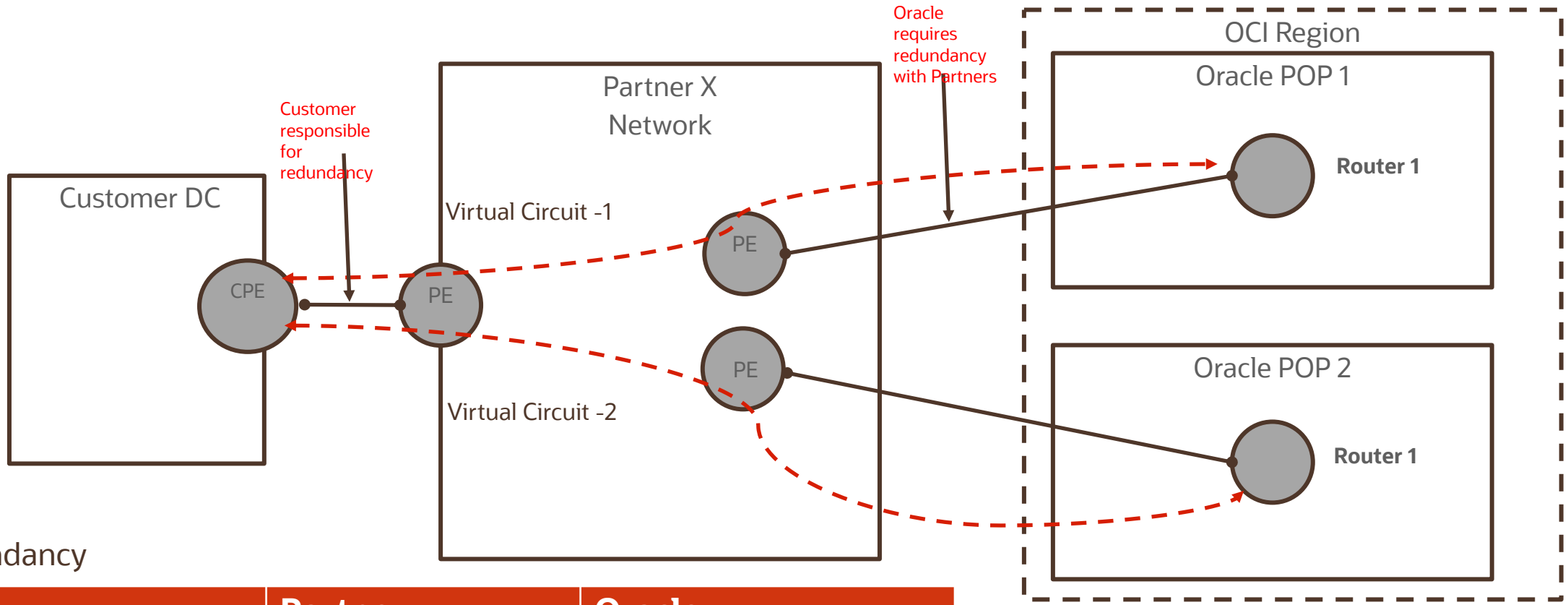
Router redundancy with-in a single Transit POP



Redundancy: Connectivity Model
Oracle Partner (Layer 2)

- For a Layer 2 partner, a given virtual circuit can run on only a single port group (formerly known as Cross-Connect) (LAG), or single cross-connect (an individual cable, no LAG).
- Redundancy can be achieved by provisioning 2nd virtual circuit.
- Partner will make sure that 2nd virtual circuit will land on redundant cross-connect LAG between them and Oracle.
- Redundant cross-connect LAG could land in same POP or different POP depending upon connectivity between partner and oracle.
- Active/Active or Active/Passive setup is possible with “LP” and “AS_PATH” BGP attributes influencing egress traffic from customer and OCI respectively

Layer 2 Partners : Megaport, Equinix, CenturyLink



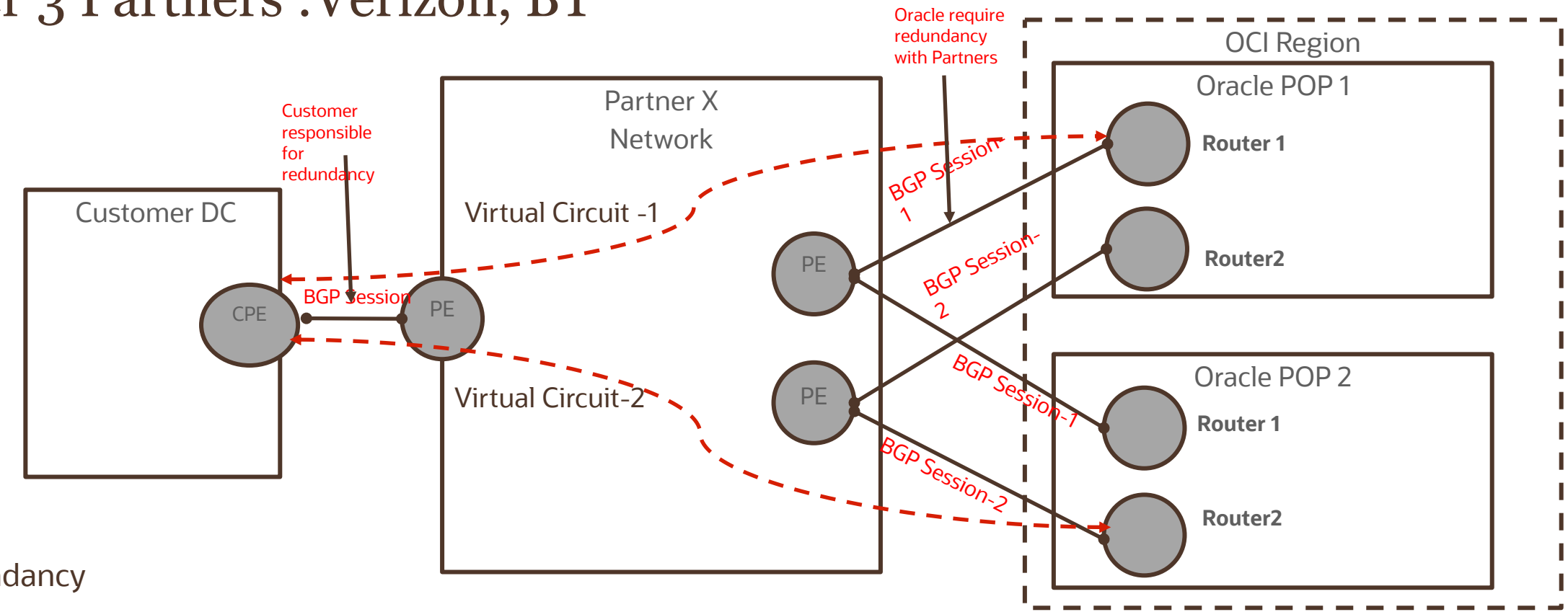
For Redundancy

Customer	Partner	Oracle
• Order 2X VC with Oracle • Order 2X cross-connects to partner	• Min 2X Circuits to Oracle. • Provisions 2nd VC on redundant cross-connect	• Min 2X Circuits to Partner • Agreement with partner to Provision 2nd VC on redundant cross-connect

Redundancy: Connectivity Model Oracle Partner (Layer 3)

- For a **Layer 3** partner, a given virtual circuit can run on multiple cross-connect groups (LAGs) or multiple cross-connects (a cross-connect is an individual cable, no LAG), which provides router redundancy for the virtual circuit.
- Customer would get 2 BGP sessions tied to single virtual circuit by default running over redundant cross-connect group or cross-connects.
- Partner and Oracle will make sure that 2nd BGP session will land on redundant cross-connect LAG between partner and Oracle.
- Customer can still provision 2nd virtual circuit with additional cost should they need redundancy with virtual circuits

Layer 3 Partners :Verizon, BT

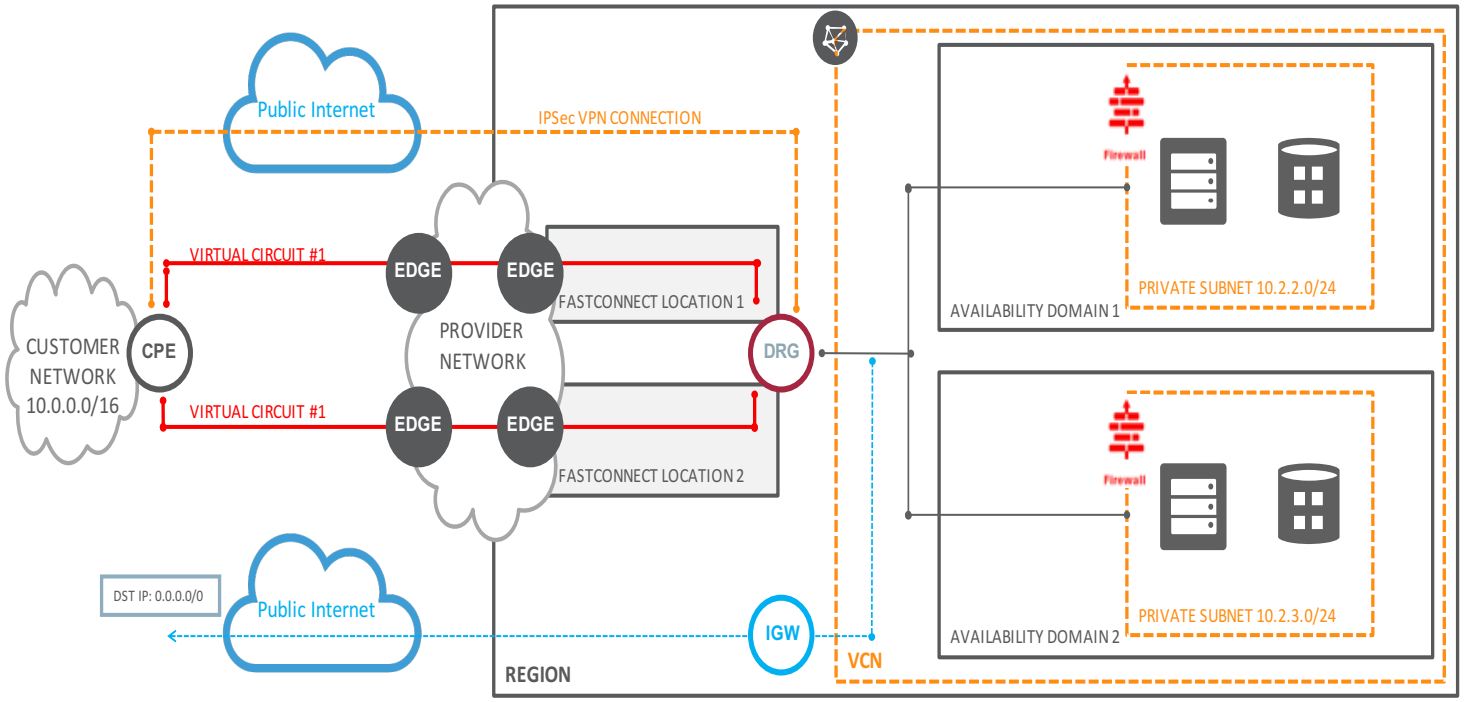


For Redundancy

Customer	Partner	Oracle
• Order 2X VC with Oracle • Order 2X cross-connects to partner	• Min 2X Circuits to Oracle • Runs 2BGP sessions with Oracle	• Min 2X Circuits to Partner • Runs 2 BGP sessions with Partner.

Service Redundancy

- Customer can provision IPsec along with FastConnect.
- IPsec can be treated as back up incase if FastConnect fails
- Egress traffic from OCI will prefer FastConnect.*
- Bandwidth, latency concerns over IPsec
- Highly recommended if customer has single FastConnect to OCI



Summary

After completing this lesson, you should have learned:

- FastConnect Use cases
- FastConnect Concepts
- Describe FastConnect Service Models
- FastConnect resiliency options

ORACLE

Oracle Cloud always free tier:
oracle.com/cloud/free/

OCI training and certification:
oracle.com/cloud/iaas/training
oracle.com/cloud/iaas/training/certification
education.oracle.com/oracle-certification-path

OCI hands-on labs:
ocitraining.qloudable.com/provider/oracle

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