

Alibaba Cloud Express Connect Physical Connection

Issue: 20190802

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Generic conventions

Table -1: Style conventions

Style	Description	Example
	This warning information indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 Danger: Resetting will result in the loss of user configuration data.
	This warning information indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 Warning: Restarting will cause business interruption. About 10 minutes are required to restore business.
	This indicates warning information, supplementary instructions, and other content that the user must understand.	 Notice: Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user.	 Note: You can use Ctrl + A to select all files.
>	Multi-level menu cascade.	Settings > Network > Set network type
Bold	It is used for buttons, menus, page names, and other UI elements.	Click OK .
Courier font	It is used for commands.	Run the <code>cd / d C :/ windows</code> command to enter the Windows system folder.
<i>Italics</i>	It is used for parameters and variables.	<code>bae log list --instanceid <i>Instance_ID</i></code>
[] or [a b]	It indicates that it is an optional value, and only one item can be selected.	<code>ipconfig [-all -t]</code>

Style	Description	Example
<code>{}</code> or <code>{a b}</code>	It indicates that it is a required value, and only one item can be selected.	<code>swich {stand slave}</code>

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1 What is a physical connection?

You can use a leased line from your service provider to establish a physical connection from your on-premises data center to an Alibaba Cloud access point. After the physical connection is established, you can create a Virtual Border Router (VBR) to connect your on-premises data center with Alibaba Cloud to build hybrid cloud networks. As a private network connection, the physical connection does not pass through the Internet. Compared with traditional Internet connections, the physical connection is safer, faster, more reliable, and has less latency.

Features

The Express Connect physical connection interface (through which a leased line connects to an Alibaba Cloud access point) provides the following features:

- Multiple connection modes

You can use a point-to-point Ethernet connection or MPLS VPN connection. The physical connection supports RJ45 and LC optical ports (maximum distance: 10 km) with a transmission rate from 1 Mbit/s to 100 Gbit/s.

- Redundant connections

The physical connection uses Equal-Cost Multi-Path routing (ECMP) to implement redundancy with two leased lines.

- If both leased lines are connected to different access points in the same region, the leased lines are naturally redundant to each other.
- If both leased lines are connected to the same access point in the same region, you can select the first leased line as the redundant connection when applying for the second leased line.

Limits

The physical connection interface has the following limits:

- Physical connections do not support SDH G.703 or V.35 interfaces.
- Alibaba Cloud provides one or more access points in each accessible region. Different access points have different service provider restrictions. Before applying for a physical connection interface, you must open a ticket to obtain the target access point and corresponding restriction information of your service provider.

2 Renew a physical connection interface

We recommend that you renew your physical connection interfaces before they expire to avoid service disruptions.

Context

If you no longer use an interface, open a ticket to delete it.

If you do not renew your physical connection interface within 15 days after the bill becomes overdue, the interface is stopped. We recommend that you enable the auto-renewal function to ensure your interface is renewed on time.



Note:

No resource occupation fee is charged if you use a shared port of NSP partners, which means that only a VBR is created under your account and no physical connection interface is applied.

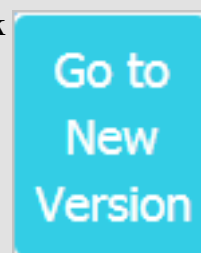
Procedure

1. Log on to the [Express Connect](#) console.
2. In the left-side navigation pane, choose Physical Connections > Physical Connection Interfaces.



Note:

If your console is different from the following figure, click



in the

lower-right corner to switch to the new version console.

3. Find the target physical connection interface and check its status. Only interfaces in the Enabled state can be renewed.

Physical Connection Interfaces [Investigation questionnaire](#) [Apply for New Interface](#)

[Apply for New Interface](#) Instance ID

Instance ID/Name	Access Point	ISP Provider	Port Spec	Billing Method	Status	Actions
pc- -	Hangzhou-Yuhang-A	China Unicom	1G and below	Subscription Expires at May 21, 2019, 00:00:00	● Enabled	Renew Auto Renew

4. Click **Renew** or **Auto Renew** (recommended) in the **Actions** column to renew the expiration date of the resource occupation fee associated to the interface.

The following steps take the recommended action as an example.

- a) Click **Auto Renew**.
- b) On the **Manually Renew** tab of the **Express Connect-Charge for rental (International)** page, find the target interface and click **Enable Auto-Renew** in the **Actions** column.
- c) In the displayed **Enable auto-renewal** dialog box, select a renewal period and then click **Enable Auto-Renew**.

Enable Auto-Renew ✕

1. With auto-renewal, you will be charged from 3 days before the service expires. Make sure that you have sufficient balance in your credit card or other methods of payment.

2. If you manually renew your instance before the charge date, the auto-renewal occurs based on the new expiration date.

3. If you set up auto-renewal today, it would be effective from tomorrow, and using credit is supported.

Renews these products on expiration, **Auto-Renew Cycle** 1 Month ▼

Instance ID	Expiration Date	Remaining Days
pc- r	May 2, 2019, 00:00	3 Days

Not Now Enable Auto-Renew

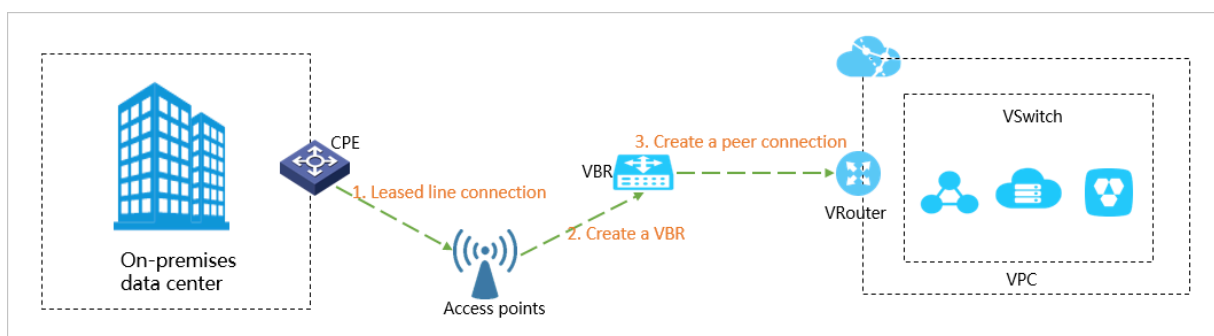
- d) After you renew the interface, you can go to the **Manually Renew** tab of the **Express Connect-Charge for rental (International)** page to verify the expiration date is updated.

3 Physical connection process

By using a leased line from your service provider, you can connect your on-premises data center to an Alibaba Cloud access point to build hybrid clouds and expand your local network.

Physical connection process

As shown in the following figure, after connecting your on-premises data center to the nearest Alibaba Cloud access point through a leased line from your service provider, you need to create a VBR for the leased line as a router between the local Customer-Premises Equipment (CPE) and the VPC. Then, you need to add the VBR to the Cloud Enterprise Network, or establish a peering connection between the VBR and the VPC so that the on-premises data center can communicate with other VPCs.



To establish a physical connection, you must first connect the leased line to an access point.

Leased line connection process

The process of connecting the leased line to an access point is shown in the following figure.

4 Apply for a physical connection interface

You need to apply for a physical connection interface to connect the leased line from your service provider to an Alibaba Cloud access point before you can establish a physical connection.

Prerequisites



Before applying for a physical connection interface, pay attention to the following restrictions:

- Access through ports such as 155M CPOS, V.35, and G.703 of the SDH protocol is not supported.
- Alibaba Cloud provides multiple access points in each available region, except the China (Qingdao) and US (Silicon Valley) regions. Different access points have different service provider restrictions. For more information, see [Select an access point](#).

Procedure

1. Log on to the [Express Connect](#) console.
2. In the left-side navigation pane, choose Physical Connections > Physical Connection Interfaces.
3. Click Apply for New Interface.
4. Configure the physical connection interface, and complete the payment for an initial installation fee.



Configuration	Description
Region	Select the region where the leased line is deployed. We recommend that you install the leased line in the region of your VPC. If you choose a different region, you need to pay an extra fee incurred by cross-region Cloud Enterprise Network (CEN) or a peering connection.
SP	Select the service provider of the leased line. Different access points are provided for different service providers.

Configuration	Description
Access Point	<p>Select an access point that is closest to your on-premises data center.</p> <p>Access points are the on-premises data centers of Alibaba Cloud that are located in multiple regions. Each region has one or more access points. Different access points correspond to different access locations and have different access capabilities. You can open a ticket to obtain detailed information about the location of access points.</p>
Port Specification	<p>Port specifications include 1G and below, 10G, 40G, and 100G. If you select 40G or 100G, you need to enable a whitelist.</p> <div data-bbox="563 887 1442 1048" style="background-color: #f0f0f0; padding: 5px;">  Note: Different specifications incur different resource occupation fees. </div>
Port Type	<p>Select the access port type.</p> <p>Available port types vary according to the selected access point. The console displays available port types.</p> <div data-bbox="563 1256 1442 1496" style="background-color: #f0f0f0; padding: 5px;">  Note: Available port types vary according to the selected access points and service providers. We recommend that you consult the service provider before applying for a port. </div>
Redundant Connection ID	<p>Select a requested physical connection to provide an Equal-Cost Multi-Path routing (ECMP) redundant link for this physical connection. Two physical connections accessing the same region can be used as redundant physical connections.</p> <ul style="list-style-type: none"> · When accessing different access points, both physical connections naturally provide redundancy to each other. · When both physical connections access the same access point, you need to specify one as the redundancy of the other. Redundant physical connections are allocated to different physical access devices.

- Return to the Physical Connection Interfaces page to check the physical connection interface you have applied for.

The physical connection interface is in the To Apply for LOA state.

- Click Apply for LOA in the Actions column.
- On the Apply for LOA page, enter the leased line connection information, and click Add Field Engineer to add the information of a data center cable installation technician or representative. Multiple technicians can be added.

Configuration	Description
Company Name	Enter the company name that you set when you registered your account or the name of the account owner.
Construction Company	Enter the name of your designated data center cable installation company, which is usually your service provider of the leased line or the on-premises data center.
Construction Type	Select the required leased line type: <ul style="list-style-type: none"> · MSTP · MPLSVPN · FIBRE · Others <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;">  Note: SDH is not supported. </div>
Scheduled Construction Time	Set the date and time when the data center cable installation technician or representative from the installation company will go to complete the leased line connection at the site of the Alibaba Cloud data center.
Location	Optional. Enter the location of your on-premises data center.
Bandwidth	Optional. Enter the bandwidth of the leased line. <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;">  Note: The bandwidth value you enter does not affect the fees charged to your account or your usage of the leased line. </div>

- Click OK. Your application is then sent to Alibaba Cloud personnel for review.

The physical connection interface enters the In Application state.

9. After the application is approved, download the LOA in the console.

The physical connection interface enters the Approved LOA state. Click View LOA in the Actions column to view the installation information, such as the data center location of Alibaba Cloud, cabinet location, and port information.



Letter of Authorization

hereby authorizes or its agent to arrange 1-pair of cross-connection in tbc, details as below.

Room: **4**

Rack: **F08**

Patch Panel:

Fiber Connector Type:

Port: **10GE1/0/38**

Remark:

* Final terminating equipment and port number: **ad-cn-hangzhou**, **100Base-T**

* Circuit ID: **pc-bp**

shall bear no cost related to this order. CU may deal directly with or its agent for all matters relating to this order. This authorization will remain in effect for 30 days only.

Yours sincerely,

Name:

Email: **1**

Date: **2019-02-27T16:05:46.000Z**

10. At this stage, we recommend that you instruct your installation company to start installation. After installation is complete, click Delivery Report on the Physical Connection Interfaces page, enter the leased line code and the label numbers of the cables at the site of the Alibaba Cloud data center, and click OK.

The physical connection interface enters the Waiting state.

11. Alibaba Cloud will connect the cables to the corresponding CSW ports according to the information you provided. Alibaba Cloud should complete this step within two working days of you clicking OK in the preceding step.

The physical connection interface enters the Waiting state.

12. After you confirm that the physical connection interface has been deployed, pay the resource fee and enable the port.

13. After payment, the physical connection interface changes to the Enabled state, indicating that the leased line connection is completed.



Note:

The estimated time frame of completing the LOA application, installation, and on-site assistance from Alibaba Cloud is subject to local laws and authorities.

5 Delete a physical connection

When you no longer need a physical connection, you can delete it.

To delete a physical connection, follow these steps:



Note:

To delete a physical connection, you must use the following sequence:

1. Delete the route entries configured in the VBR and the VRouter of the VPC.
2. Delete related BGP peers and BGP groups if BGP routing is configured.
3. Delete the peering connection between the VPC and the VBR.
4. Delete all associated VBRs.
5. Delete the physical connection interface.

Step 1: Delete route entries

To delete the custom route entries in the VPC and VBR, follow these steps:

1. Log on to the [Express Connect](#) console.
2. In the left-side navigation pane, choose VPC Peering Connections > VBR-to-VPC.
3. Select the region to which the target VBR-to-VPC connection belongs and find the connection.
4. Click the ID of the acceptor VPC. On the VPC Details page, click the VPC ID again.
5. In the Network Resources section, click the route table link. On the displayed Route Tables page, click the route table ID.
6. Find the custom route entry destined for the on-premises data center and then click Delete.
7. In the displayed dialog box, click OK.
8. In the left-side navigation pane, choose Physical Connections > Virtual Border Routers (VBRs).
9. Select the region of the target VBR and then click the instance ID of the target VBR.
10. Click the Routes tab.
11. Delete the route entries added in the VBR.




Step 2: Delete BGP peers and BGP groups

If you have configured BGP, follow these steps to delete the BGP configurations associated with the VBR:

1. Log on to the [Express Connect](#) console.
2. In the left-side navigation pane, choose Physical Connections > Virtual Border Routers (VBRs).
3. Select the region of the target VBR and then click the ID of the target VBR instance.
4. Click the BGP Peers tab and then delete the created BGP peers.
5. Click the BGP Groups tab and then delete the created BGP groups.
6. Click the Advertised BGP Subnets tab and then delete the added BGP CIDR blocks.

Step 3: Delete the peering connection

To delete the peering connection between the VBR and the VPC, follow these steps:

1. Log on to the [Express Connect](#) console.
2. In the left-side navigation pane, choose VPC Peering Connections > VBR-to-VPC.
3. Select the region to which your VBR-to-VPC connection belongs and find the connection.
4. Click  > Suspend Initiator. In the displayed dialog box, click Confirm.
5. Click  > Suspend Acceptor. In the displayed dialog box, click Confirm.
6. Click  > Delete. In the displayed dialog box, click Confirm.

Step 4: Delete the VBR

To delete the VBR, follow these steps:

1. Log on to the [Express Connect](#) console.
2. In the left-side navigation pane, choose Physical Connections > Virtual Border Routers (VBRs).
3. Select the region of the target VBR.
4. Find the target VBR and click Delete.
5. In the displayed dialog box, click Confirm.

Delete the physical connection

Open a ticket to delete the physical connection interface and settle the resource occupation fee.

6 Create redundant connections

You can use two physical connections to connect an on-premises data center to Alibaba Cloud. In this way, a high-quality and highly reliable intranet communication can be established between the on-premises data center and Alibaba Cloud.

Example

This topic takes the following scenario as an example to describe how to connect an on-premises data center to Alibaba Cloud through redundant physical connections.

A company has an on-premises data center (CIDR block: 172.16.0.0/12) in Qingdao , and has an Alibaba Cloud VPC (CIDR block: 192.168.0.0/16) in the China (Qingdao) region. To solve the issue of SPOFs, the company plans to apply for two physical connections that are provided by two different service providers to connect the on-premises data center to Alibaba Cloud.

Step 1: Apply for a physical connection interface

Set the name of this first physical connection interface to leasedline1. This topic provides only general configuration information. For detailed configuration information, see [Apply for a physical connection interface](#).

1. Apply for a physical connection interface and pay the initial installation fee.
 - **Region:** Select the region where the leased line is deployed.
 - **SP:** Select the service provider of the leased line. In this example, select China Unicom.
 - **Access Point:** Select an access point that is closest in geographical proximity to your on-premises data center. In this example, select Qingdao-Laoshan-A-CU.
 - **Port specification:** Select the required port specification. Note that different specifications incur different resource occupation fees.
 - **Port Type:** Select the access port of the physical connection. In this example, select 1000Base-LX.
 - **Redundant Connection ID:** Select None.
2. Click Apply for LOA in the Actions column. On the Apply for LOA page, enter your company name, the name of the data center cable installation company, the scheduled installation date and time, and the contact information of data center cable installation technician or representative, and select a construction type.

3. After your application is approved, download the LOA to view installation information in the console, such as the location of the installation site (the Alibaba Cloud data center site), cabinet location, and port information.

At this stage, we recommend that you instruct your installation company to start installation. After the installation is complete, click **Delivery Report** on the **Physical Connection Interfaces** page, enter the leased line code and the label numbers of cables at the installation site, and click **OK**. The physical connection interface enters the **Waiting** state.

4. Alibaba Cloud will connect the cables to the corresponding CSW ports according to the information you provided. After you confirm that the physical connection interface has been deployed, pay the resource fee. When the physical connection interface changes to the **Enabled** state, the leased line connection is completed.

Step 2: Apply for a second physical connection interface

Set the name of the second physical connection interface to `leasedline2`. This topic provides only general configuration information. For detailed configuration information, see [Apply for a physical connection interface](#).

1. Apply for a physical connection interface and pay the initial installation fee.
 - **Region:** Select the region where the leased line is deployed.
 - **Access Point:** Select an access point that is closest in geographical proximity to your on-premises data center. In this example, select `Qingdao-Laoshan-A-CU`.
 - **SP:** Select the service provider of your leased line. In this example, select `China Unicom`.
 - **Port Specification:** Select the required port specification. Note that different specifications incur different resource fees.
 - **Port Type:** Select the port type of the physical connection. In this example, select `1000Base-LX`.
 - **Redundant Connection ID:** Select the first physical connection interface you have applied for. Make sure that you have paid the initial installation fee.



Note:

- If the access point of the second physical connection interface is the same as that of the first physical connection interface, select the ID of the first

physical connection interface. Make sure that you have paid the initial installation fee for the first physical connection interface.

- If the access point of the second physical connection interface is different from that of the first physical connection interface, the two connections create a redundant connection by default, so you do not need to select a physical connection ID.

2. Click Apply for LOA in the Actions column. On the Apply for LOA page, enter your company name, the name of the data center cable installation company, the scheduled installation date and time, and the contact information of data center cable installation technician and representative, and select a construction type.
3. After your application is approved, download the LOA to view installation information in the console, such as the location of the installation site (the Alibaba Cloud data center site), cabinet location, and port information.

At this stage, we recommend that you instruct your installation company to start installation. After the installation is complete, click Delivery Report on the Physical Connection Interfaces page, enter the leased line code and the label numbers of cables at the installation site, and click OK. The physical connection interface enters the Waiting state.

4. Alibaba Cloud will connect the cables to the corresponding CSW ports according to the information you provided. After you confirm that the physical connection interface has been deployed, pay the resource fee. When the physical connection interface changes to the Enabled state, the leased line connection is completed.

Step 3: Create a VBR

To create a VBR, follow these steps:

1. On the Virtual Border Routers (VBRs) page, click Create VBR.
2. Configure the VBR. The VBR configurations in this example are as follows:
 - Account: Select Current account.
 - Name: Enter vbr1.
 - Physical Connection Interface: Select the first physical connection interface.
 - VLANID: Enter 2333.
 - Gateway IP Address on Alibaba Cloud Side: Enter 10.0.0.1.
 - Gateway IP Address on Customer Side: Enter 10.0.0.2.
 - Subnet Mask: Enter 255.255.255.252.

3. Repeat the preceding steps to create a VBR named vbr2 for the second physical connection interface.

Step 4: Establish a peering connection

To establish a peering connection between your VBR and your VPC, follow these steps:

1. On the VBR-to-VPC page, click **Create Peering Connection**.
2. Configure the peering connection. The configurations in this example are as follows:
 - **Connection Type:** Select **VBR-to-VPC**.
 - **Routers to Create:** Select **Initiator and Acceptor**.
 - **Local Region:** Select the region of the VBR. In this example, select **China (Qingdao)**.
 - **Local VBR ID:** Select the created VBR.
 - **Peer Region:** Select the region to which the VPC belongs. In this example, select **China (Qingdao)**.
 - **Peer VPC ID:** Select the VPC to be connected.
 - **Bandwidth:** In this example, select **100Mb**.
3. Go back to the VBR-to-VPC page to view the status of the peering connection. The connection is established if the status of both the acceptor and the initiator is **Activated**.
4. Repeat the preceding steps to establish a peering connection between the other VBR and the VPC.

Step 5: Configure routes

After establishing the peering connections, you must configure a route that points to the on-premises data center in the VPC, and configure two routes pointing to the VPC and the on-premises data center respectively in the two VBRs. Lastly, you must add a route pointing to the VPC in the access device of the on-premises data center.

To configure the routes, follow these steps:

1. To configure routes for a VBR:

a. On the VBR details page, click the Routes tab, and then click Add Route.

b. Add a route directing to the VPC:

- **Destination Subnet:** Enter the CIDR block of the VPC. In this example, enter 192.168.0.0/16.
- **Next Hop Type:** Select VPC.
- **Next Hop:** Select the VPC.

c. Add a route pointing to the physical connection:

- **Destination Subnet:** Enter the CIDR block of the on-premises data center. In this example, enter 172.16.0.0/12.
- **Next Hop Type:** Select Physical Connection Interface.
- **Next Hop:** Select the physical connection interface.

d. Repeat the preceding steps to configure routes for the other VBR.

2. To configure a route for the VPC:

- a. On the VBR-to-VPC page, find the created peering connection, and click the VPC ID of the acceptor to open the VPC details page. Here, you can view the ID of the route table.
- b. On the [Route Tables](#) page, click the target route table ID, and then click Add Route Entry.
- c. Configure the Destination CIDR Block by entering the CIDR block of the on-premises data center. In this topic, enter 172.16.0.0/12.
- d. Configure a route for the on-premises data center.

You can configure a static route or BGP dynamic routing to forward data between the on-premises data center and VBR:

- Static route

Example:

```
ip route 192 . 168 . 0 . 0 / 16 10 . 100 . 0 . 1
```

- Dynamic routing

You can also use BGP to forward data between the on-premises data center and the VBR. For more information, see [Configure BGP](#).



Note:

The advertised CIDR block must be the CIDR block of the VPC that will be used to communicate with the on-premises data center. In this example, enter 192.168.0.0/16.

Step 6: Configure health checks

You must configure the health check function for redundant physical connections. Alibaba Cloud sends a ping packet once every two seconds from each health check IP address to the customer-side IP address of the on-premises data center. If eight ping packets on one physical connection are sent in succession, and all packets fail to respond, the traffic is switched to the other physical connection.

To configure the health check function, follow these steps:

1. On the VBR-to-VPC page, find the created peering connection, and then choose 

> Health Check.

2. Click Configure, complete the following configurations and then click OK.

- Source IP: Enter an idle IP of the VSwitch in the connected VPC.
- Destination IP: Enter the interface IP address of the network device of the on-premises data center.

3. Repeat the preceding steps to configure the health check function for the other peering connection.

7 NSP partners

If your local infrastructure is not within the reach of Alibaba Cloud Express Connect, or if your data does not require a large bandwidth connection, you can use Alibaba Cloud's growing NSP partners to help you build a physical connection to connect your on-premises data center to Alibaba Cloud.

The following table lists the NSP partners of Alibaba Cloud. They can help you establish a network connection between Alibaba Cloud access points and your on-premises data center to build a hybrid cloud.



Notice:

You must sign contracts with and obtain services from third-party network service providers when using NSP partners to access Alibaba Cloud. Furthermore, the NSP partners that you sign agreements with are deemed responsible for service guarantees as defined in the SLA, in addition to being responsible for providing one or more solutions to any service issues that result from use of NSP partner networks. Alibaba Cloud holds no responsibility for actions resulting from use of NSP partner networks.

Partner	Mainland China	Hong Kong	Tokyo	Singapore	Sydney	Frankfurt	San Jose	Ashburn	Dubai
China Unicom	#	—	—	—	—	—	—	—	—
China Telecom Global	—	#	—	—	—	#	—	—	—
China Unicom Global	—	#	—	—	—	—	—	—	—
Epsilon	—	—	—	#	—	—	—	#	#
GTT	—	—	—	#	—	—	—	—	—
TATA	—	#	—	#	—	—	—	—	—
Megaport	—	#	—	#	#	—	#	#	—
PCCW	—	#	—	#	—	—	—	—	—

Partner	Mainland China	Hong Kong	Tokyo	Singapore	Sydney	Frankfurt	San Jose	Ashburn	Dubai
Reliance	—	—	—	#	—	—	—	—	—
SingTel	—	—	—	#	—	—	—	—	—
Vodafone	—	—	—	—	—	#	—	—	—
SoftBank	—	—	#	—	—	—	—	—	—
Intercloud	—	—	—	—	—	#	—	—	—
Equinix	—	#	—	#	#	#	#	#	—
HGC	—	#	—	—	—	—	—	—	—
NextDC	—	—	—	—	#	—	—	—	—