IBM Power Virtual Server Virtual Private Network Connectivity

An IBM Systems Lab Services Tutorial

IBM Systems Lab Services

Infrastructure services to help you build the foundation of a smart enterprise.

Faad Ghoraishi Vess Natchev ibmsls@us.ibm.com

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Chapter 1: Solution Overview

Introduction

A key client requirement for <u>IBM Power Virtual Server</u> (PowerVS) is the ability to connect to cloud-based workloads from an on-premise environment. Specifically, clients need the capability for multiple users and multiple on-premise systems to connect securely to workloads in PowerVS. Configuring individual user connectivity with a Virtual Private Network (VPN) **client** is fairly easy and documented here: <u>https://cloud.ibm.com/docs/power-iaas?topic=power-iaas-configuring-power</u>. Meanwhile, we would not recommend creating PowerVS workloads with a public IP address for security reasons.

Therefore, the focus of this tutorial will be how to configure a **site-to-site VPN connection** from an on-premise environment to PowerVS. The approach detailed in this document can also be customized for cloud-to-cloud VPN connectivity, as well, with a VPN gateway on each side.

Note that this tutorial uses two separate IBM Cloud locations to simulate the site-to-site VPN connection between an on-premise client environment and IBM Cloud. Therefore, the same configuration method is used for both VPN gateways. With a client environment, the on-premise (or other cloud) VPN gateway should be configured according to its specifications, while this tutorial would be used for the VPN gateway in the IBM Cloud.

Use Cases

Site-to-site VPN Connectivity

We will demonstrate how to configure a site-to-site VPN connection to PowerVS.

Solution Components and Requirements

Components

The following components need to be setup to allow for VPN site-to-site connection. Site-to-site VPN will allow customers to connect their remote datacenter to IBM cloud Power Locations using private IP. If customers wish to use public IP access, then all they would require is internet access from their datacenter and a Direct Link inside IBM Cloud to the their PowerVS location.

In this scenario we are simulating a remote datacenter to be one of the two PowerVS locations in IBM Cloud. In this case, LON06 is simulating a remote datacenter and TOR01 is the cloud PowerVS location.

Customers who have their own routers in their datacenters, will not need to order two Vyatta routers show in step 2. Instead only need one Vyatta router in the IBM Cloud located in same geo as their PowerVS location geo location in the IBM Cloud.

All steps given shown here for site-to-site GRE and IPsec tunnel provisioning are for Vyatta OS, i.e., vyos.

- 1. Order Direct Link Connect Classic to connect each PowerVS location to IBM Cloud
- 2. Order two Vyatta Gateways one in each PowerVS location: allow for PowerVS location-to-PowerVS location communication
- 3. Request a Generic Routing Encapsulation (GRE) tunnel to be provisioned at each PowerVS location to the Vyatta Gateway in that location.
- 4. Configure GRE tunnels in each Vyatta Gateway to connect Vyatta Gateway to each PowerVS location
- 5. Configure an site-to-site IPsec tunnel between the two vyatta gateways.

Requirements

Order Direct Link Connect Classic

You will need to order Direct Link (DL) Connect Classic to allow your Power VSIs provisioned inside IBM Cloud to communication with Linux/Window VSIs in IBM Cloud and also with all other IBM Cloud services such as VMWare VMs, and Cloud Object Storage (COS). Ordering a DL may take 1-2 weeks to complete. There is no charge for this service as of June 2020.

Order Vyatta Gateways in each datacenter

In order to setup communication between the two PowerVS locations for a site-to-site VPN, you will need to use an IPsec tunnels between the two Vyatta over Public Internet, and a GRE tunnels from PowerVS location to each Vyattas over DL. You will need to order Vyatta Gateways in each PowerVS location. We ordered one Vyatta in LON06 and the other in TOR01 PowerVS locations.

Request a Generic Routing Encapsulation (GRE) tunnel

You will need to open a support ticket with Power Systems and request that a GRE tunnel be provisioned in each PowerVS location. They will provision their end of the GRE tunnel and send you the information so you can continue and provision your end on the Vyatta Gateways. You will need to provide the Power location subnets information in each PowerVS location in the ticket.

Configure two GRE tunnels in Vyatta Gateways

We used the following link to configure the GRE.

https://cloud.ibm.com/docs/power-iaas?topic=power-iaas-configuring-power

After the support team finished configuring the GRE tunnel, you will need to configure your end of the GRE tunnel on the two Vyatta Gateways. You will need two GRE tunnels

- 1. GRE tunnel on Vyatta to terminate the PowerVS location GRE in LON06
- 2. GRE tunnel on Vyatta to terminate the PowerVS location GRE in TOR01

Configure an IPsec tunnels between Vyatta Gateways

We will configure an IPsec tunnel between the two Vyattas over public interface. This will allow communication between the two Vyattas for the Power Locations.

Diagrams

The overall architecture of our deployment is shown in the diagrams below.



End-to-End PowerVS location to Remote Datacenter VPN Site-to-Site IPsec VPN

Order Direct Link Connect Classic

You will need to order Direct Link (DL) Connect Classic to allow your Power VSIs in the PowerVS location to communication with Linux/Window VSIs in IBM Cloud and also with all other IBM Cloud services such as Cloud Object Storage and VMware services. This process may take 1-2 weeks to complete. There are several steps involved in completing DL ordering:

- Order Direct link connect classic service on IBM Cloud UI see steps below
- Next a support ticket will be created, and Support will send you a word document with questionnaires to be completed concerning various DL settings.
- Complete the questionnaires and upload it to support in the ticket.
- Support will then request that you create a new support ticket with the Power System so they can complete their side of the DL provisioning. Attach information about the DL in the original ticket to this ticket.
- The DL will be provisioned, and you will be notified when complete.

• You can now test connection to any Linux/Windows VSI you may have in IBM Cloud and other IBM Cloud services.



To start the DL order process, go to IBM Cloud UI and log in. Choose "Catalog" from upper right-hand side, and search for "direct".

Select "Direct Link Connect on Classic".

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Press "Create". There are no options to select.

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Now choose "Order Direct Link Connect" from top right-hand side.

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- Choose a "name" for the DL.
- Choose a location for the DL. This should be the same location as where you created your PowerVS location Service.
- Choose "link speed" under network provider menu.
- Choose "Local Routing (free)"

Global routing will require additional charges and will allow for easier PowerVS location-to-PowerVS location communication. You will also need to order a Vyatta Gateway Router to complete your Global routing option via use of a GRE tunnel. Support can help you with this further.

In our case, we decided to use Local Routing and then order a Vyatta Gateway in each PowerVS location and provision a GRE tunnel end-to-end.

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• Check the box to accept the offer and press "Create"

A support case will be opened with the information required.



After this is complete, you will then be contacted by support and requested to complete and answer some questions in an attached document and send it back as attachment to the same ticket.

After this step is complete, support will request that you open a new IBM support ticket and address it to the Power System. Include the information in the original DL ticket. This new ticket will be sent to the PowerVS location support to configure their side of the DL connection.

This should be the last step before DL communication works. You can test your connection by pinging IBM Cloud Linux/Windows VSI from your Power VSIs and in reverse.

Order Vyatta Gateways in each PowerVS location

In our scenarios we used two Vyatta Gateways, one in each PowerVS location to provide site-to-site VPN for PowerVS location-to-PowerVS location communication using GRE tunnels between Vyatta and PowerVS location and IPsec tunnel between two Vyattas over public internet.

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Login to IBM Cloud and click on the "Catalog", then search for vyatta.

Select "Gateway Appliance" and click on it.

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Select "AT&T vRouter". This is the Vyatta Gateway. You have other choices of Gateways, but we will use Vyatta.

Provide a name for the Gateway and include the PowerVS location name in it so you can distinguish them later.

Select Location to match your PowerVS location.

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Choose the following options:

- Uncheck the High Availability option unless you wish to order one which means you will order two Vyatta Gateways in each PowerVS location. We uncheck this option.
- Select the location by pressing on the arrow key in each location to find the exact datacenter where you PowerVS location are located.
- You may need to choose the POD if there are several PODs in the selected datacenter location.
- Select the CPU single or dual processor. We chose Single Processor.
- Select the amount of RAM you wish and add ssh keys if you like to login without password. This can be done later too.
- Choose Private network interface unless you wish to use the default which is public/private interface. We chose private network interface only.

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32 GB (\$171.10) Add-ons ~ Storage disks 1 of 4 dis Here you can add, remove, and con Type Individual Add-ons ~ Network interface Interface ① Private ~	ks used figure storage disks. You can a Disks Hot V 1 0 Port redundancy Automatic (recommende	Iso configure RAID storage vol Spares Disk Media SATA HDD	Add key • turnes and disk partitions.	Disk Size 2.00 TB (\$25.38) ss - Bandwidth 0.00) V	Add new O	A - Disk controller - Non-RA Individual 2.00 TB SATA + 1 Network interface 1.00pb Redundant Private N grinks Add-ons Apply promo code Total due per month* **	dotw e tation s Vi

Now check the box to agree with service agreement on the bottom-right side and press "Create"

The vyatta gateway is now being provisioned. This may take several hours.

You will need to do this process in each of the two PowerVS locations.

After the Vyatta Gateway is provisioned, you can see it listed under "Devices" where you can find your "vyatta" and "root" user passwords.

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To log into the vyatta gateway, use a browser and access it via the link:

https://<ip address of the vyatta gateway>

user: vyatta

password: as show under "devices" in IBM Cloud UI and password tab on the left.

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UNEX: 1% of 1.66 TB	dp0bond1 *		•	0 kbps	0 kbps	
System Information *	* 0:0qb		1G FD	1.33 kbps	28.23 kbps	
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MSDP * Peers: 0, Groups: 0, Mesh groups: 0	39	Firewall * Stat	e-Policy: none, Rule-sets: 0/1	in use	30	
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Typically, you will use a command line to ssh to the vyatta for further configuration. You will use the "vyatta" user id to do the configurations.

Request a Generic Routing Encapsulation (GRE) tunnel

You will need to open a support ticket to Power Systems and request that a GRE tunnel be provisioned in each PowerVS location. You will need to provide information on the subnets you created in the PowerVS location. They will provision their end of the GRE tunnel and send you the information you will need so you can continue and provision your end of the GRE tunnel on the Vyatta Gateways.

Power Support team will send you the following information for your GRE tunnels after they complete their end of the GRE tunnel:

TOR01:

TOR: ASR End: Tunnel IP -- 172.20.8.2/30 Tunnel Source -- 10.254.0.30 Tunnel Destination-- 10.114.118.18

Vyatta End: Tunnel IP -- 172.20.8.1/30 Tunnel Source -- 10.114.118.18 Tunnel Destination -- 10.254.0.30 (edited)

LON06:

LON: ASR END: Tunnel IP -- 172.20.2.2/30 Tunnel Source -- 10.254.0.26 Tunnel Destination -- 10.72.74.212

Vyatta End: Tunnel IP -- 172.20.2.1/30 Tunnel Source -- 10.72.74.212 Tunnel Destination -- 10.254.0.26

Setup PowerVS location GRE tunnels in Vyatta Gateways

The following references may help in configuring GRE tunnels:

https://cloud.ibm.com/docs/virtual-router-appliance?topic=solution-tutorials-configuring-IPSEC-VPN

https://docs.huihoo.com/vyatta/6.5/Vyatta-Tunnels_6.5R1_v01.pdf

https://cloud.ibm.com/docs/power-iaas?topic=power-iaas-configuring-power

Open a command window on your Mac/Window.

Note: Prior to login to a 10.x.x.x private IPs in IBM Cloud you will need to start your MotionPro Plus VPN access.

Setup GRE PowerVS location Tunnel in LON06:

userID: vyatta Password: as show in the GUI ssh <u>vyatta@10.72.74.212</u> ssh to LON06 Vyatta Gateway.

We are using the information provided by support for LON06 GRE

LON06:

LON: ASR END: Tunnel IP -- 172.20.2.2/30 Tunnel Source -- 10.254.0.26 Tunnel Destination -- 10.72.74.212 Vyatta End:

Tunnel IP -- 172.20.2.1/30 Tunnel Source -- 10.72.74.212 Tunnel Destination -- 10.254.0.26 Run the following commands: We have chosen to call our tunnel "tun0" on the Vyatta Gateway.

```
configure
set interfaces tunnel tun0 address
172.20.2.1/30
set interfaces tunnel tun0 local-ip
10.72.74.212
set interfaces tunnel tun0 remote-ip
10.254.0.26
set interfaces tunnel tun0 encapsulation gre
set interfaces tunnel tun0 mtu 1300
commit
exit
```

```
vyatta@vyatta-ipsec-2-lod06:~$ configure
[edit]
vyatta@vyatta-ipsec-2-lod06# set interfaces tunnel tun0 address 172.20.2.1/30
[edit]
vyatta@vyatta-ipsec-2-lod06# set interfaces tunnel tun0 local-ip 10.72.74.212
[edit]
vyatta@vyatta-ipsec-2-lod06# set interfaces tunnel tun0 remote-ip 10.254.0.26
[edit]
vyatta@vyatta-ipsec-2-lod06# set interfaces tunnel tun0 encapsulation gre
[edit]
vyatta@vyatta-ipsec-2-lod06# set interfaces tunnel tun0 mtu 1300
[edit]
vyatta@vyatta-ipsec-2-lod06# commit
[edit]
vyatta@vyatta-ipsec-2-lod06# exit
logout
vyatta@vyatta-ipsec-2-lod06:~$ show interfaces tunnel
Codes: S - State, L - Link, u - Up, D - Down, A - Admin Down
Interface IP Address
                                                   S/L Description
   _____
                                                   ___
                                                   u/u
tun0
               172.20.2.1/30
```

You can verify that your GRE tunnel is setup by running the following commands:

show interfaces tunnel
Or to get more info:
Show interface tunnel tun0
exit



Setup GRE PowerVS location Tunnel in TOR01:

userID: vyatta Password: as show in the GUI ssh <u>vyatta@</u>10.114.118.18

ssh to Tor01 Vyatta Gateway. TOR01:

> TOR: ASR End: Tunnel IP -- 172.20.8.2/30 Tunnel Source -- 10.254.0.30 Tunnel Destination-- 10.114.118.18 Vyatta End:

Tunnel IP -- 172.20.8.1/30 Tunnel Source -- 10.114.118.18 Tunnel Destination -- 10.254.0.30 (edited)

Run the following commands:

We have chosen to call our tunnel "tun0" in the Vyatta Gateway same as the other Vyatta Gateway.

```
O configure
```

- o set interfaces tunnel tun0 address
 172.20.8.1/30
- O set interfaces tunnel tun0 local-ip 10.114.118.18
- o set interfaces tunnel tun0 remote-ip
 10.254.0.30
- O set interfaces tunnel tun0 encapsulation gre
- O set interfaces tunnel tun0 mtu 1300
- 0 commit
- o exit

vyatta@vyatta-ipsec-2-tor01:~\$ configure

[edit]

vyatta@vyatta-ipsec-2-tor01# set interfaces tunnel tun0 address 172.20.8.1/30 [edit] vyatta@vyatta-ipsec-2-tor01# set interfaces tunnel tun0 local-ip 10.114.118.18 [edit] vyatta@vyatta-ipsec-2-tor01# set interfaces tunnel tun0 remote-ip 10.254.0.30 [edit] vyatta@vyatta-ipsec-2-tor01# set interfaces tunnel tun0 encapsulation gre [edit] vyatta@vyatta-ipsec-2-tor01# set interfaces tunnel tun0 mtu 1300 [edit] vyatta@vyatta-ipsec-2-tor01# commit [edit] vyatta@vyatta-ipsec-2-tor01# exit logout vyatta@vyatta-ipsec-2-tor01:~\$ show interfaces tunnel Codes: S - State, L - Link, u - Up, D - Down, A - Admin Down Interface IP Address S/L Description _____ tun0 172.20.8.1/30 u/u

To show the status:

o show interfaces tunnel
o Or to get more info:
o Show interface tunnel tun0
o exit



Finally, you need to set static route in each Vyatta to point the traffic to the GRE tunnels.



- > configure
- > set protocols static route 192.168.50.0/24 next-hop 172.20.2.2
- ➤ commit
- ≻ exit

Setup site-to-site IPsec tunnel between Two Vyatta Gateways

In this section you will setup a site-to-site IPsec tunnel between the two vyatta gateways to allow for cross Vyatta connection over the public interface. All commands are for Vyatta vyos OS type. Other router/gateway types will have different commands to perform these actions.

In this scenario we are simulating a remote customer datacenter to be one of the two PowerVS locations in IBM Cloud. In this case, LON06 is simulating a remote customer datacenter and TOR01 is the cloud PowerVS location.

Customers who have their own routers in their datacenters, will not need to order two Vyatta routers. Instead only need one Vyatta router in the IBM Cloud located in same geo as their PowerVS location geo location in the IBM Cloud.

TOR01 Vyatta IPsec Configuration:

Local Public IP: 158.85.94.90 Peer Public IP: 158.176.145.42 Remote Subnet Prefix: 192.168.50.0/24 Local Subnet Prefix: 192.168.6.0/24

Need to replace items in color below with you own values on run these commands on the Vyatta gateway in TOR01.

```
o configure
o set security vpn ipsec esp-group ESP01 pfs 'enable'
o set security vpn ipsec esp-group ESP01 proposal 1 encryption
   'aes256'
o set security vpn ipsec esp-group ESP01 proposal 1 hash
   'sha2 512'
o set security vpn ipsec esp-group ESP01 mode 'tunnel'
o set security vpn ipsec esp-group ESP01 pfs 'dh-group5'
o set security vpn ipsec ike-group IKE01 proposal 1 dh-group '5'
   set security vpn ipsec ike-group IKE01 proposal 1 encryption
0
   'aes256'
o set security vpn ipsec ike-group IKE01 proposal 1 hash
   'sha2 512'
o set security vpn ipsec site-to-site peer 158.176.145.42
   authentication pre-shared-secret 'iamsecret2'
o set security vpn ipsec site-to-site peer 158.176.145.42
   default-esp-group 'ESP01'
o set security vpn ipsec site-to-site peer 158.176.145.42 ike-
   group 'IKE01'
o set security vpn ipsec site-to-site peer 158.176.145.42 tunnel
   1 esp-group 'ESP01'
o set security vpn ipsec site-to-site peer 158.176.145.42 local-
   address '158.85.94.90'
o set security vpn ipsec site-to-site peer 158.176.145.42 tunnel
   1 local prefix '192.168.6.0/24'
o set security vpn ipsec site-to-site peer 158.176.145.42 tunnel
   1 remote prefix '192.168.50.0/24'
o commit
o exit
```

Below shows the output of all the commands ran. The value of pre-shared-secret is encrypted in this output and shown as "******".

<pre>vyatta@vyatta-ipsec-2-tor01:~\$ show configuration commands grep ipsec</pre>								
set security vpn ipsec esp-group ESP01 mode 'tunnel'								
set security vpn ipsec esp-group ESP01 pfs 'dh-group5'								
set security vpn ipsec esp-group ESP01 proposal 1 encryption 'aes256'								
set security vpn ipsec esp-group ESP01 proposal 1 hash 'sha2_512'								
set security vpn ipsec ike-group IKE01 proposal 1 dh-group '5'								
set security vpn ipsec ike-group IKE01 proposal 1 encryption 'aes256'								
set security vpn ipsec ike-group IKE01 proposal 1 hash 'sha2_512'								
set security vpn ipsec site-to-site peer 158.176.145.42 authentication pre-shared-secret '*******'								
set security vpn ipsec site-to-site peer 158.176.145.42 connection-type 'initiate'								
set security vpn ipsec site-to-site peer 158.176.145.42 default-esp-group 'ESP01'								
set security vpn ipsec site-to-site peer 158.176.145.42 ike-group 'IKE01'								
set security vpn ipsec site-to-site peer 158.176.145.42 local-address '158.85.94.90'								
set security vpn ipsec site-to-site peer 158.176.145.42 tunnel 1 esp-group 'ESP01'								
set security vpn ipsec site-to-site peer 158.176.145.42 tunnel 1 local prefix '192.168.6.0/24'								
set security vpn ipsec site-to-site peer 158.176.145.42 tunnel 1 remote prefix '192.168.50.0/24'								

LON06 IPsec Configuration:

Local Public IP: 158.176.145.42 Peer Public IP: 158.85.94.90 Local Subnet Prefix: 192.168.50.0/24 Remote Subnet Prefix: 192.168.6.0/24

Need to run these commands on the Vyatta gateway in LON06.

```
o configure
o set security vpn ipsec esp-group ESP01 pfs 'enable'
  set security vpn ipsec esp-group ESP01 proposal 1 encryption 'aes256'
0
o set security vpn ipsec esp-group ESP01 proposal 1 hash 'sha2 512'
o set security vpn ipsec esp-group ESP01 pfs 'dh-group5'
o set security vpn ipsec ike-group IKE01 proposal 1 dh-group '5'
   set security vpn ipsec ike-group IKE01 proposal 1 encryption 'aes256'
0
o set security vpn ipsec ike-group IKE01 proposal 1 hash 'sha2 512'
o set security vpn ipsec site-to-site peer 158.85.94.90 authentication pre-
   shared-secret 'iamsecret2'
0
   set security vpn ipsec site-to-site peer 158.85.94.90 default-esp-group
   'ESP01'
o set security vpn ipsec site-to-site peer 158.85.94.90 ike-group 'IKE01'
o set security vpn ipsec site-to-site peer 158.85.94.90 local-address
   '158.176.145.42'
  set security vpn ipsec site-to-site peer 158.85.94.90 tunnel 1 esp-group
0
   'ESP01'
o set security vpn ipsec site-to-site peer 158.85.94.90 tunnel 1 local prefix
   '192.168.50.0/24'
  set security vpn ipsec site-to-site peer 158.85.94.90 tunnel 1 remote prefix
0
   '192.168.6.0/24'
 commit
0
o exit
```

Below shows the output of all the commands ran. The value of pre-shared-secret is encrypted in this output and shown as "******".

vyatta@vyatta-ipsec-2-lod06:~\$ show configuration commands grep ipsec								
set security vpn ipsec esp-group ESP01 mode 'tunnel'								
set security vpn ipsec esp-group ESP01 pfs 'dh-group5'								
set security vpn ipsec esp-group ESP01 proposal 1 encryption 'aes256'								
set security vpn ipsec esp-group ESP01 proposal 1 hash 'sha2_512'								
set security vpn ipsec ike-group IKE01 proposal 1 dh-group '5'								
set security vpn ipsec ike-group IKE01 proposal 1 encryption 'aes256'								
set security vpn ipsec ike-group IKE01 proposal 1 hash 'sha2_512'								
set security vpn ipsec site-to-site peer 158.85.94.90 authentication pre-shared-secret '*******'								
set security vpn ipsec site-to-site peer 158.85.94.90 connection-type 'initiate'								
set security vpn ipsec site-to-site peer 158.85.94.90 default-esp-group 'ESP01'								
set security vpn ipsec site-to-site peer 158.85.94.90 ike-group 'IKE01'								
set security vpn ipsec site-to-site peer 158.85.94.90 local-address '158.176.145.42'								
set security vpn ipsec site-to-site peer 158.85.94.90 tunnel 1 esp-group 'ESP01'								
set security vpn ipsec site-to-site peer 158.85.94.90 tunnel 1 local prefix '192.168.50.0/24'								
set security vpn ipsec site-to-site peer 158.85.94.90 tunnel 1 remote prefix '192.168.6.0/24'								

Check the status of the IPsec tunnel by running this command on each vyatta gateway:

• show vpn ipsec status



Check the setting of the IPsec tunnel by running this command:

• show vpn ipsec sa

vyatta@vyatta-ipsec-2-lod06:~\$ show vpn ipsec sa Peer ID / IP Local ID / IP									
158.85.94.90		138.1	.70.145.42						
Tunnel Id	State	Bytes Out/In	Encrypt	Hash	DH A-Time	L-Time			
1 1	up	0.0/0.0	aes256	sha2_512	2 18898	3600			
vvatta@vvatta-ipsec-2-lod06:~\$									

<pre>vyatta@vyatta-ipsec-2-tor01:~\$ show vpn ipsec sa Peer ID / IP Local ID / IP</pre>										
	-									
158.176.145	.42		158.8	5.94.90						
Tunnel	Id	State	Bytes Out/In	Encrypt	Hash	DH	A-Time	L-Time		
1	1	up	0.0/0.0	aes256	sha2_512	2	18889	3600		

At this point you should have end-to-end connectivity between PowerVS locations and be able to ping between your Power VSIs AIX/IBM i VSIs in each PowerVS location and also from the Power AIX/IBM i VSIs to IBM Cloud services such as Linux/Windows VSI and Object storage.

Chapter 2: Implementation

After setting up site-to-site VPN connection, we will verify ping and ssh connectivity between each PowerVS VSIs and from PowerVS VSI to IBM Cloud VSI (Linux VSI).

PowerVS and x86 VSI Integration

Provision a PowerVS in the PowerVS location

The procedure is similar for both AIX and IBM i VSI provisioning, except for the OS types. Here is a procedure to create an AIX 7.2 VSI. The cost shown are monthly cost, but you are being charged hourly.

Go to the IBM Cloud Catalog and press the "IBM Cloud" on top left side of the UI.

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Choose "Services" from the list shown.

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Click on the service for each datacenter in which you have created a PowerVS location power service. In this case we will choose Toronot01 service.

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	pc-tor01-glvm-02a	192.168.6.167	7200-04-01	1 cores	4 GB	Active	o :				
	i922brmc-ibmi-cs			0.5 cores	4 GB	Active	e :				
	ISTARGET	192.168.6.151, 192.168.142.78	IBMi-73-07-001	0.5 cores	4 GB	Active	O :				
	IBMiHADR-kb	192.168.6.219, 192.168.142.77	IBMi-74-01-001	1 cores	4 GB	Active	Ø :				
	labservices-scenario1-private-aix-	g 192.168.6.190	7200-04-01	0.5 cores	2 GB	Active	• i				
	labservices-scenario2-aix72-ab3	192.168.6.186, 192.168.142.75	7200-04-01	1 cores	2 GB	Warning	• :				
	labservice-scenario2-aix72-ab2	192.168.6.112	7200-04-01	1 cores	2 GB	Active	o :				
	pc-tor01-givm-01a	192.168.6.163	7200-04-01	1 cores	4 GB	Active	•				
	IBMiProd-kb	192.168.6.118, 192.168.142.74	IBMi-74 Screensho	1 cores	4 GB	Active	• :				
	Items per page: 10 $ \sim $ 1-10) of 10 items					1 ∨ of1 4 >				

Since we have already provisioned several VSI, we see the list show above. If you are creating VSIs for the first time, your list will be empty. Press "Create Instance" on upper right-hand side.

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SSH keys						
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Subnets	SSH key	Instances are connected to the services defined in your resources list. Here your machine configuration, boot image, volumes, and network interfaces.	you can select		Network interface	\$0.00
	O Boot image	Instance name	Number of instances		Storage volume	\$0.00
	O Profile	VM pinning ①				
	 Storage volumes 	Off ~				
	O Network interfaces	SSH key You must add a public SSH key to securely connect to your Power Systems Virtual Server. For more information, see <u>dataming a public</u> http:				
		SSH kevs				
		Choose a SSH Key 🗸	New SSH key +			
		Boot image				
		Select from ADX, IBM i, or Linux boot images. If you are deploying a Linux virtual machine (VH), you must first purchase a subscription, then register it and register with your Linux vendor after deployment. Learn more about purchasing and subscripting to Linux	Screenshot		Total monthly cost*	\$1,289.98 estimated
		Operating system	· []		I agree to the Series and co	

This is where you provision AIX or IBM i VSIs.

Choose a name for your VSI, i.e., AIX-72-Tor01 and select how many VSIs you need to configure. The names of the VSI will be appended with a "-1", "-2" etc. if you select more than one VSI.

You may leave VM pruning and SSH key as is since the VSIs will have no passwords when you create them for the first time.

Scroll down to choose other options.

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Here you will choose the following options:

- Operating System AIX or IBM i or any other image you may have imported.
- Image type: AIX 7.1 or 7.2, etc.
- Disk types: Type 1 or 3. Type 3 is cheaper option which we selected.
- Machine type: S922 or E980
- Processor: Dedicated or Shared or Shared Capped. We choose "shared" as its less expensive.
- Choose the number of cores and RAM you will need. The minimum core is "0.25".
- You can also attach additional volume to the VSI is you wish. We did not do that here and only used the root volume which is included.

Next you will scroll down to choose your subnet on which these VSIs will be provisioned. It is assumed you have already created one or more subnets prior to this step.

Click on the "Attached Existing ".

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		Name IP address				

Choose the subnet you wish to attach, and the press "Attach"

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	 Storage volumes 		
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		Name IP address IP range CIDP.	estimated
			I agree to the Terms and conditions

Now check the box "I agree to the" And press "create Instance" in lower right-hand side.

Your VSI is now being provisioned.

Provision a Linux VSI in IBM cloud

Login to IBM Cloud UI and choose "catalog"

Search for "vsi"

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Services				
Software Consulting	VSI Database Community - Software - Databases	Virtual Server IBM - Services - Compute	Virtual Server for VPC IBM - Services - Compute	© FusionAuth Third party - Services - Security
Category ^	Configure a classic virtual server with PostgreSQL to provide scalability and performance for your data workloads.	Our virtual servers deliver a higher degree of transparency, predictability, and automation for all workload types. Virtual servers are	Our all-new x86 virtual machines with faster provisioning, higher performance, and enhanced isolation.	Modern Identity and User Management
Containers	Terraform		IAM-enabled	Free B
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Analytics	Precision Location Third party • Services • Internet of Things	Transit Gateway IBM • Services • Networking	Watson Assistant IBM • Services • AI / Machine Learning	Kubernetes Service IBM • Services • Containers
Blockchain Databases	Skyhook Precision Location	Creates secure connectivity between your networks within IBM Cloud.	Watson Assistant lets you build conversational interfaces into any application, device, or channel.	Deploy secure, highly available apps in a native Kubernetes experience. IBM Cloud Kubernetes Service (IKS) creates a cluster of compute
Developer Tools Logging and Monitoring	Free	IAM-enabled	Lite - Free - IAM-enabled	Free • IAM-enabled • Service Endpoint Supported
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Select "virtual server"

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Choose "public" and give the server a Hostname

Select Location. In this case we selected Tor01.

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- > Select a profile for your RAM and CPU.
- > Choose your OS type.
- Choose a ssh key if you want to access this VSI via ssh and without a password. You can create an ssh key by clicking on "add key" and enter a name for your profile and your private ssh key which you already may have on your laptop or follow steps to generate an ssh key and then paste it here.

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Choose your network connections under "Network Interface". We only choose Private network in our scenarios.

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Accept the agreement on the lower right-hand side and press "Create"

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After the VSI is provisioned you can now be able to ping between the Power VSI in the PowerVS location and the VSI in IBM cloud.

If you chose a Public/Private IP for your Linux VSI, then the connection may fail from the PowerVS location VSI. This is due to the fact that the default gateway is now set to a public gateway in your Linux VSI and there is no route back to the PowerVS location VSI.

To correct this, you will need to add a static route to the Linux VSI to tell it how to connect back to the Power VSI PowerVS location.

Run the following command on your Linux VSI: 192.168.6.0/24: is the subnet in your PowerVS location

10.166.112.129: is the private gateway IP of your subnet in PowerVS location which you can find by running "netstat -nr" on you power VSI.

ip route add 192.168.6.0/24 via 10.166.112.129

In order to make this route permanent, you will need to add it to your network setting.

Edit this file:

vi /etc/sysconfig/network-scripts/route-eth0

Add last 3 lines:

[root@labservice-scenaro1-rhel-fg2 network-scripts]# cat route-eth0 # Created by cloud-init on instance boot automatically, do not edit. # ADDRESS0=10.0.0.0 GATEWAY0=10.166.112.129 NETMASK0=255.0.0.0 ADDRESS1=161.26.0.0 GATEWAY1=10.166.112.129 NETMASK1=255.255.0.0 ADDRESS2=166.8.0.0 GATEWAY2=10.166.112.129 NETMASK2=255.252.0.0 # added to support pinging to PowerVS location for VSI with public IP ADDRESS3=192.168.6.0 GATEWAY3=10.166.112.129 NETMASK3=255.255.255.0

PowerVS and VMware Integration

Create a VMWare Shared

In this section we will first create a VMWare shared and then provision a VM inside the VMWare and test its connectivity to PowerVS.

Login to IBM Cloud and choose "catalog" on upper-right hand side

Search for "VMware"



Select "VMware Solutions"



Select "VMware Solution Shared". This is the less expensive VMware solution.

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Pricing plan (j)		Summary US
On-Demand 🛛	Reserved	Bill to: IBM
Resources are allocated as needed. Pricing is hourly based on the resource usage.	Resources are preallocated and guaranteed. Pricing is monthly based on the allocation size.	1 Base HA Edge Conteney, 5 public IP \$20.00/n addresis
firtual data center name		Optional consumption-based charges These charges are addeed and actual consumption after providening.
vdc-ke esource group (j)		
Default	~	Inaveread and agreed to the third-party service agreements listed below:
Data center location	Frankfurt Frankfurt 04	Mananah taran Red Hat taran
		Total due per month Usage base
Virtual data center cap	acity	Considering a ×
CPU limit		purchase?
AM limit	• 512 512 VCPU	Chat now with an IBM Sales Representative who can assist Screenshot you in finding the right
1		products and services to meet

Select:

- > Virtual data center name
- > Data center location
- > Virtual data center capacity. We choose 20 vCPU and 50 GB RAM

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Resource group () Default Data center location $\underbrace{\begin{array}{c} \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	Prashfurt Preshfurt 04		Summary USD Bill to: IBM Image for the second sec
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1 •	512 20	VCPU	 I have read and agreed to the third-party service agreements listed below: Microsoft terms Red Hat terms
1.	10240 50	G8	
Recommended see These services are pre-installed a incurred only if you choose to use Business Continuity	Prvices Ind ready for consumption. Charges are the service.		Total due per month Usage based
Veeam Avaitability Suite Veeam enables you to make secure backups of IBM Cloud for VMware Solutions	VEEAM Veeam Cloud Connect Replication Extend your on-premise Veeam environment to IBM	Screenshot	

Check the agreement check box and press "create" on lower right-hand side. You will be provided with a Admin userID and password to allow you to access the configuration website. Store that information on your laptop.

Then under "resources" you should see your VMware Solution Shared name.

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m VMware Solutions	Q Filter by name, loca	ation, or status					
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	Caveonix RiskForesig	ght licenses (0/0)					Provision new 🕀
	Name		Creation time		Status		
	On-premises HCX lic	enses (0/0)					Provision new 🕀
	Name	Activation	cey	Creatie Scree	nshot	Status	

Configure VMware Solution Shared

Click on the name of you VMware Solution Shared below.

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m VMware Solutions	Q Filter by name, loca	ation, or status					
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	Name	Activation key		Creatie Screens	hot	Status	

This will show are you VMware settings. There are 5 IPs which are provided by default to be used to assign to your VMs inside the VMware to allow outside network access.



Configure VMware Solution Shared Network

To configure your VMware Solution Shared, press on the "vCloud Director Console" on upper right-hand side.

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								Δ	
VMware Solutions / Resources VMWare-dallas	/ • Ready to use				vCloud Director console	C	Actions		
Properties		Resource Res	servation 🖉						
Name	vmware-dallas	vCPU limit	10 vCPU						
Type	On-demand	RAM limit	20 GB						
Region	Dallas Reset Organization Admin Password								
Location	dallO								
ID	2e7c4c60-70dd-48d4-9498-b9a6aa5858b8								
Creation time	May 20, 2020 9:39 AM								
Public IP	52.117.181.90 52.117.181.92 52.117.181.92 52.117.181.93 52.117.181.93 52.117.181.94								
Red Hat activation key	ic4v_shared_ee2603bb+c2e5+4399+a791-96186f3b86657								
Private network e	ndpoint								
Ye Al	ou haven't created a private endpoint yet. Iow other accounts private access to your virtual data center and enable Direct Link. <u>Les</u>	im more	Screenshot						

A browser session will open where you would enter your admin ID and password provided to you when you created the VMware Solution Shared.



Login to the console using admin and password provided.

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< All datacenters				dallas 🛞 06	d2a1ecba244622a01	b88efb4843fb4	i, 🕲 30f86b5	ib-5380-4552-9553-fd	3f675bb615			
III Compute	~	Virtual Machin	es II VMs ~	A tt G								88 =
vApps		Name	т т	Status	OS T	Memory T	CPUs	т vApp Name т	Storage Policy T	Snapshot	IP Address	Networks
Virtual Machines		: vm-centos-fg2		Powered on	CentOS 7 (6	8192 MB	2	vm-centos-fg2	4 IOPS/GB	-	192.168.20.6	vmware-net
© Networking	~	: vm-centos-fg		Powered on	CentOS 7 (6	8192 MB	2	vm-centos-fg	4 IOPS/GB		192.168.20.5	vmware-net
Networks												1 - 2 of 2 vms
Edges												
Security												
Storage	~											
Independent Disks												
Storage Policies												
Settings	Ý											
General												
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								outenandt				

At this point you need to configure your VMware network before you can provision any VMs. The screen shot above shows that we have already done so and have then provisioned VMs.

Here is a reference site with many training resources on IBM Cloud for VMware Solutions Shared.

https://www.vmware.com/ca/products/cloud-director.html https://www.ibm.com/demos/collection/VMware-Solutions-on-IBM-Cloud/

To configure the network including Edge Gateway and NAT and Firewalls, use this video site.

IBM Cloud for VMware Solutions Shared - Setup the Network

https://www.youtube.com/watch?v=gG0jp3TEtt0

Click on the "network" menu item on the left-hand side.

We will now create a network.



Select "ADD" and then choose "Routed" and press Next

				admin Organization Administrator
C All datacenters				
III Compute	New Organization VDC Network	Network Type Select the type of network that you are about to create		
Vinual Machines	1 Network Type	◯ Isolated	ionsumed.	
Affinity Rules	2 General	This type of network provides a fully isolated environment where only the VMs in this VDC can connect to.		
Q Networking	3 Edge Connection	 Routed This type of network provides controlled access to machines and networks outside of the VDC via an edge gateway 		
Networks Edges	4 Static IP Pools			
Security	5 DNS			
Storage Independent Disks Storage Policies	6 Ready to Complete	*		
🚭 Settings General	1947 - C. 1947 -			
⁴ Metadata		CANCEL NEXT		

- > Choose a name for your network, i.e. web-network
- > Select a CIDR range, i.e., 192.168.100.1/24
- Choose "Shared" option
- > Press Next

VM IBM Cloud for	VMware Solu	itiqns Datacenters			୍ ଡ~	admin Organization Administrator
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III Compute	≪ ~ N€	New Organization VDC Network	General			
vApps		1 Maturali Tuna	Name *	Web-Network	on up ad	
Virtual Machines		T Network Type	Gateway CIDR	192.168.100.1/24		
Affinity Rules		2 General				
O Networking	~	3 Edge Connection	Description			
Networks		4 Static IP Pools				
Edges		4 Static IF POOIS				
Security		5 DNS				
Storage	~	6 Ready to Complete	Shared	①		
Independent Disks						
Storage Policies						
Settings	~					
General						
Metadata						
				CANCEL PREVIOUS NECT		

Next select the Edge Gateway name and choose "Distributed" and press NEXT.

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# Compute	~ Ne	New Organization VDC Network	Edge Connectio	n				
vApps		Y	Name 🕇 T	External Networks	Org VDC Networks	Available Networks		
Virtual Machines		1 Network Type	edge-dal10-02t	2	1	7	onsumed	
Affinity Rules		2 General						
O Networking	~	3 Edge Connection						
Networks								
Edges		4 Static IP Pools						
Security		5 DNS						
Storage	~	6 Ready to Complete				1.1offeetuad/e)		
Independent Disks						1 - 1 of 1 network(s)		
Storage Policies			Interface Type	Distrib	uted ~ (ì		
Settings	~		Guest VI AN Allowed		•			
General			Guest VLAN Allowed					
Metadata								
				с	ANCEL PRE	EVIOUS NEXT		

Enter the IP pool range you wish to use. In this case we use a similar range as the CIDR by entering 192.168.100.5 - 192.168.100.254 and then press ADD an then NEXT

			Q 0) Organization Administrator
≪ ∼	New Organization VDC Network	Static IP Pools		
1	L salarante Trans	Gateway CIDR 192.168.100.1/24		
-	T Network Type	Static IP Pools		
	2 General	Enter an IP range (format: 192.168.1.2 - 192.168.1.100)		
1	3 Edge Connection	192.168.100.5 - 192.168.100.254		
	4 Chatle ID Deals			
	4 Static IP Pools	MODIFY		
	5 DNS	REMOVE		
~	6 Ready to Complete			
		Total IP addresses: 0		
2				
			FXT	
		CRITCEL PREVIOUS		

Now enter DNS addresses for external access.

We use 9.9.9.9 and 1.1.1.1 as the two public DNS Primary and Secondary respectively. Press NEXT

VM IBM Cloud for						admin Organization Administrator
< All datacenters						
iii Compute	≪ ────N€ ~	New Organization VDC Network	DNS			
vApps		1 Network Type	Primary DNS	9.9.9.9	onsumed	
Affinity Rules		2 General	Secondary DNS	1.1.1.1	-	
Networking	~	3 Edge Connection	DNS suffix		-	
Edges		4 Static IP Pools				
Security		5 DNS				
Storage	×	6 Ready to Complete				
Settings	~					
General						
weraudta				CANCEL PREVIOUS NEX		

Now you will see the final screen showing your settings. Press FINISH

≪ Ne	New Organization VDC Network	Ready to Con	pplete		
× × × Y	1 Network Type 2 General 3 Edge Connection 4 Static IP Pools 5 DNS 6 Ready to Complete	You are about to creat Review the settings a beeringtion dateway CDR Network Type Connection Type Connection Type Connection Type Connection Type Connection Type Connection Type Connection Type Connection Type Connection	te an Org VDC Network with these specifications. d click Finah. 192.168.100.124 Routed edge-datto-O2b246c6 Distributed No 9.9.9.9 11.11 - 192.168.100.5 - 192.168.100.254		
			CANCEL PREVIOUS FINIS	ж н	

Your network is now provisioned successfully.

VIII IBM Cloud for V	VMwar	9 Solutions Datacenters	Q ⑦ ´ admin Organization Administrator Č
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	«	Networks	
III Compute	~	ADD	
vApps Virtual Machines		Name † v S Configuring v Network Type Connected To	IP Pool Consumed Shared T
Affinity Rules		Web-Network 192.168.100.1/24 Routed edge-da10-02	b24 0% 🗸
Networking	~		
Networks			
Edges			
Security			
Storage	~		
Independent Disks			
Storage Policies			
Settings	~		
General			
Metadata			
			1 - 1 of 1 network(s)

Now we need to create Firewall and Source NAT for Public and Private access to our VMware.

Public Netowrk Access Firewall and Source NAT Configuration

Click on the Edges menu and select the Edge network which was included when you provisioned VMware Shared. The Edge network allows for external access. You will need to create a Firewall rule and Source NAT (SNAT) to allow access to the external network. For internal access you will need to create a Firewall rule and a Destination NAT (DNAT) rule.

Same procedure will be used later to provide access to the Private network.

Press "Configure Services"

VM IBM Cloud for	VMwar	e Solutions Dat	acenters					Q 0	Organiz	admin tation Administrator
All datacenters		🛆 tra	nsend-od	ce40efaef00de49ea9e	507, © 30f86b5b-5380-45	52-9553-	fd8f675bb615			
	«	Edges								
I Compute	~		ES CONVERT TO ADVANCED	REDEPLOY						
vApps		Status Nam	te ↑ ⊤	Used NICs	External Networks	т	Org VDC Networks	Ψ	HA Status	Ψ
Virtual Machines		⊘ edg	e-dal10-02b246c6	3	2		1		Up	
Affinity Rules										
Networking	~									1 - 1 of 1 items
Networks										
Edges										
Security		Edge Gatewa	ay Settings							
Storage	~	General								
Independent Disks		Name	edge-dal10-02b246c	6	Edge Gateway	,	Large			
Storage Policies		Description			Configuration					
Settings	\sim				High Availabili	ty	Yes			
General										
Metadata		IP Addresses			Default Gate	way				
					External Netw	orks	dal10-w02-te	nant-external		
		External Networks	Subnets	IP Addresses	Default Gatew	ay	52.117.143.1			
		dal10-w02-tenant-e	external 52.117.143.0/24	52.117.143.7						

Choose Firewall menu on top.

Choose "+"

A new firewall setting "2" will appear in the list. We will now need to configure this firewall.

Firewall	DHCP NAT Rou	uting Loa	d Balancer VPN Certificate	s Grouping Objects Statistic	Edge Settings		
Firewall	Rules						
Enabled							
+	×	4					
Show only	user-defined rules	Time	Courses	Destination	Condeo	Action	Enchle logging
1.	firewall	Internal Hig	vse	Any	Any	Accept	
2~	highAvailability	Internal Hig	169.254.1.81/30 169.254.1.82/30	169.254.1.81/30 169.254.1.82/30 234.0.0.81	Any	Accept	
3~	dns	Internal Hig	internal	10.255.255.249	udp:53:any tcp:53:any	Accept	
4~	default rule for ingress	Default Pol	Any	Any	Any	Deny 👻	

Provide a name for the firewall, i.e. web-network.

Eage	Gateway - edge	-dal10-0	02b246c6					
Firewall	DHCP NAT Ro	uting Lo	ad Balancer VPN Certificate	es Grouping Objects Statist	tics Edge Settings			
Firew	all Rules							
A Th	is rule set has unsaved chang	es. Save to s	tart deploying.			s	Save changes D	iscard chang
Enabled								
+	× +	4						
Show on	ly user-defined rules							
No.	Name	Туре	Source	Destination	Service	Action	Enabl	e logging
No.	Name	Type Internal Hig	Source vse	Destination Any	Service Any	Action Accept	Enabl	e logging
No.	Name firewall	Type Internal Hiç	Source vse	Destination Any	Service Any	Action Accept	Enabl	e logging
No. 1• 2•	Name firewall Web-Network	Type Internal Hiç User	Source vse Any 🕑 🎨	Destination Any Any	Service Any Any	Action Accept Accept	Enabl	e logging
No. 1✓ 2✓	Name firewall Web-Network	Type Internal Hig User	Source Vse Any 🕑 🍖	Destination Any Any	Service Any Any	Action Accept Accept	Enabl	e logging
No. 1~ 2~ 3~	Name firewall Web-Network highAvailability	Type Internal Hiç User Internal Hiç	Source vse Any (2) (*) 169.2541.81/30	Destination Any Any 169.254.181/30	Service Any Any Any	Action Accept Accept Accept	Enabl	e logging
No. 1✓ 2✓	Name firewall Web-Network highAvailability	Type Internal Hiç User Internal Hiç	Source vse Any P (*) 169.2541.81/30 169.2541.82/30	Destination Any Any 169.254.1.81/30 169.254.1.82/30	Service Any Any Any	Accept Accept Accept Accept	Enabl	e logging
No. 1√ 2√ 3√ 4√	Name firewall Web-Network highAvailability dns	Type Internal Hig User Internal Hig Internal Hig	Source vse Any P (P) (S) 169.2541.81/30 169.2541.82/30 internal	Destination Any Any 169-254.181/30 169-254.182/30 12/4.0.09 12/55.258.249	Service Any Any Any udp:53:any	Action Accept Accept Accept Accept Accept Accept	Enabl	e logging
No. 1✓ 2✓ 3✓ 4✓	Name firewall Web-Network highAvailability dns	Type Internal Hig User Internal Hig Internal Hig	Source vse Any P (P) (S) 169.2541.81/30 Internal	Destination Any Any 169-254.181/30 169-254.182/30 7/4 0.0 et 10-255.255.249	Service Any Any Any Log-53:any tcp:53:any	Action Accept Accept Accept Accept	Ŧ	e logging

Then choose Source and click on the "+" icon to add a source network.

Choose the network you created before from the list of external networks and press the "+" to add it to the right side.

Then press NEXT

vm								admin Organization Administ	trator
	DeCP PLAT	Select objects Browse objects of type: CATEWX INTERFACES + Filter. © dati0-w02-service01 © dati0-w02-service01 © dati0-w02-service01 © Usitubuted Router Transit © Web-Network	✓ Gateway Interfaces Virtual Machines Org Vod Pwtwcsta Ip Sets Security Groups	¢	Filter		×		
	Web Network	양 Internal 양 External 양 ALL							
0	default rule for in	Current page: 1				DISCARD KEEP	1		

vin	IBM Clo	ud for VMware S	olutions Datacenters					् ट	Organization Administrator
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		DHCP NAT	Select objects Browse objects of type:	Org Vdc Networks				×	
9		user-defined rules	Filter		*	Filter			
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Euge	Gateway - edge	-dal10-0)2b246c6					
Firewall	DHCP NAT Ro	uting Loa	ad Balancer VPN Ci	ertificates Grouping Objects	Statistics Edge Settings			
Firew	all Rules							
(1) Ple	ase walt 🗘							
	ly user-defined rules							
	ly user-defined rules							
No.	Name	Туре	Source	Destination	Service	Action		Enable logging
No.	Name	Type Internal Hiç	Source vse	Destination Any	Service Any	Action Accept	v	Enable logging
No. 1- 2-	Name firewall Web-Network	Type Internal Hiç User	Source vse Web-Network	Destination Any Any	Service Any Any	Action Accept Accept	T.	Enable logging
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No. 1 2 2 4	Name firewall Web-Network high/vailability dins	Type Internal Hiç User Internal Hiç Internal Hiç	Source vse Web Network 169-2541.81/30 169-2541.82/30 internal	Destination Any Any 169.2541.81/30 169.2541.82/30 334.0.93 10.255.255.249	Service Any Any Any Any udp:53:any tcp:53:any	Action Accept Accept Accept Accept	*	Enable logging

Next, lets capture some IP settings under the Edges tab. You will need these for the next steps. Save them in a Notepad for future access.



	Bie SolutionsDatacenters					
All datacenters)efaef00de49ea9e507, 30f8	86b5b-5380-4552-9553-fd8f	675bb615		
«						
Compute vApps vAtual Machines Affinity Rules Metworking Redges Security Storage Independent Disks Storage Policies General Metadata	Edge Gateway Settings General Name edge-datio-020246c6 Description IP Addresses External Networks Subnats in datio-w02-tenant-external 52.117.143.0/24 datio datio-w02-service01 52.117.132.0/24 datio Sub-allocated IP Addresses External Network Sub-allocated IP Proof datio-w02-tenant-external 52.117.143.2024 - 522 datio-w02-tenant-external 52.117.143.2084 - 522 datio-w02-service01	IP Addresses 52.117.143.7 52.117.132.75	Edge Gateway Configuration High Availability Default Gateway External Networks Default Gateway Rate Limits Enabled External Net No dal10-w02 No dal10-w02	Large Yes dafl0-w02-ten 52.117.143.1 works tenant-external service01	ant-external Incoming Rate Limit	Outgoing Rate Limit

The -external addresses are for external access and the -service01 addresses are for internal access. The last part, sub-allocated IP addresses are 5 IP addresses to be used to assign to your VMs to allow external access. You may request additional IPs if you have more than 5 VMs. You will need to open a ticket with IBM support to get more IPs.

Transend-VMWare Shared		
Save Enable Rich-Text Editor		
dal10-w02-tenant-external		
52.117.143.0/24		
52.117.143.7		
dal10-w02-service01		
52.117.132.0/24		
52.117.132.75		
dal10-w02-tenant-external		
52.117.143.208 - 52.117.143.212		
Save V Make Public (Register for private notes)		

Next go to the Edges menu and press "configure services". Now we will configure a Source NAT.

VM IBM Cloud for V	√Mwar	e Solutions Datacenters						Q 0		admin zation Administrator
< All datacenters			@ 2ff11aa08fc	e40efaef00de49ea9e507	, © 30f86b5b-5380-4552-	9553-1	d8f675bb615			
	«	Edges								
333 Compute	~	CONFIGURE SERVICES CON	VERT TO ADVANCED	REDEPLOY						
vApps		Status Name	↑ ▼	Used NICs	External Networks	Ŧ	Org VDC Networks	т	HA Status	Ŧ
Virtual Machines		edge-dal10-02	b246c6	3	2		1		Up	
Affinity Rules										
O Networking	~									1 - 1 of 1 items
Networks										
Edges										
Security		Edge Gateway Sett	ings							
Storage	~	General								
Independent Disks		Name e	dge-dal10-02b246c6		Edge Gateway		Large			
Storage Policies		Description			Configuration					
Settings	~				High Availability		Yes			
General										
Metadata		IP Addresses			Default Gateway	<i>.</i>				
					External Network	s	dal10-w02-ten	ant-external		
		External Networks	Subnets	IP Addresses	Default Gateway		52.117.143.1			
		dal10-w02-tenant-external	52.117.143.0/24	52.117.143.7						

Choose "NAT" from the top menu and let's create a Source NAT (SNAT) Press "Add Rule" for the NAT44 Rule SNAT Rule

	⑦ ~ admin Organization Adminis
	×
Logging De	escription
otion	

- > Select the external network option
- > Enter the CIDR for your network
- Select an IP from the list of 5 IPs for external access. We selected the first one 52.117.143.208
- > Add a description if you wish

vn	1BM Cloud for VMware Solutions Detector	ă.			୍ ଡ-	admin Organization Administrator
- 4						
	Prevent DHCP NAT Routing Load Bills NAT44 Rules + DHAT AULE / F SHAT BULE / F ID Type Action Applied on No NAT subs defined	Add SNAT Rule Original Source IP/Range * Translated Source IP/Range * Description	× 192.168.1001/24 52.117343.208	ogeine		
0 0	NAT64 Rules + sarea ruux	Enabled Enable logging		1		

- > Press Next
- Press "save changes"

A You have	unsaved changes.							Save changes Discard chang
NAT44 RL + DNAT RULE Show only use	ILES	x	÷					•
ID Тур	e Action Applied o	n Original	Translated		Protocol	Enabl	Logging	Description
Use	r-defined SNAT dal10-w0	IP Address Port 2-tenant-€ 192.168.100.1/24	IP Address 52.117.143.20	Port 8		~	×	Web-Network Outbound
NAT64 RL	e 🖉 🗶	• •						
ID	Match Ipv6 Destination Prefix	Translated Ipv4 Source Prefix	Enabled	Logging		Descrip	tion	
No NAT64 rule	s defined.							

Private Netowrk Access Firewall and Source NAT Configuration

Click on the Edges menu and select the Edge network which was included when you provisioned VMware Shared.

Choose "Firewall" and press the "+"

Firewall	DHCP NAT Ro	uting Lo	ad Balancer VPN Certifica	ites Grouping Objects Statist	ics Edge Settings		
	- Datas						
Firew	all Rules						
Enabled							
6	×		b-				
Show on	ly user-defined rules) T	6	Destilation	Com day	A	Fachla la sala a
NO.	freuzell	Type	Source	Destination	Service	Action	Enable logging
	inewaii	internal Hig	2 V30	Alty	Any	Ассерг	
2¥	highAvailability	Internal Hig	g 169.254.1.81/30	169.254.1.81/30	Any	Accept	
			169.254.1.82/30	169.254.1.82/30			
3~	dns	Internal Hig	ç internal	10.255.255.249	udp:53:any	Accept	
					(op. oo. o.)		
4~	Web-Network	User	Web-Network	Any	Any	Accept	×
		Defeuilt De	Δm/	Anv	Any	Deny	~ 0

Add a name for the newly created firewall, i.e., web-network-private Then select the Source and press "+"

Edge	Gateway - edge	e-dal10-0	02b246c6				
Firewall	DHCP NAT Ro	uting Loa	ad Balancer VPN C	Certificates Grouping Objects	Statistics Edge Settings		
Firew	all Rules						
🛆 Thi	s rule set has unsaved chang	jes. Save to s	tart deploying.			Se	ave changes Discard chan
Enabled							
+	× +		•				
	ly user-defined rules						
Show on	, u						
Show or. No.	Name	Туре	Source	Destination	Service	Action	Enable logging
No.	Name firewall	Type Internal Hig	Source vse	Destination Any	Service Any	Action Accept	Enable logging
No.	Name firewall	Type Internal Hiç	Source vse	Destination Any	Service Any	Action Accept	Enable logging
Show or No. 1 2	Name firewall Web-Network-Private	Type Internal Hiç User	Source vse Any	Destination Any Any	Service Any Any	Action Accept Accept	Enable logging
Show or No. 1 2 2 3	Name firewall Web-Network-Private highAvailability	Type Internal Hig User Internal Hig	Source vse Any 169.2541.81/30	Destination Any Any 169.2541.81/30	Service Any Any Any	Action Accept Accept Accept Accept	Enable logging
Show or No. 1√ 2√ 3√	Name firewall Web-Network-Private highAvailability	Type Internal Hig User Internal Hig	Source vse Any 169.2541.81/30 169.2541.82/30	Destination Any Any 169.2541.81/30 169.254.1.81/30 234.0.61	Service Any Any Any Any	Action Accept Accept Accept Accept	Enable logging
Show or No. 1 2 2 3 4 4	Name firewall Web-Network-Private highAvailability dns	Type Internal Hig User Internal Hig Internal Hig	Source vse Any 169.2541.81/30 169.2541.82/30 internal	Destination Any Any 169.2541.81/30 169.2541.82/30 234.0.0 et 10.255.255.249	Service Any Any Any Any udp:53:any tcp:53:any	Action Accept Accept Accept Accept Accept	Enable logging

Select the web-network.

vit									admin Organization Administrator
. s									
		wali Rules	Select objects Browse objects of type:	Org Vdc Networks	v			×	
8		a :	org vDc Networks > Filter		*	Filter	_	ļ	
		Native firewall							
		Web-Network-Pri-							
		dra	Current page: 1				DISCARD		
	188	Web-Network							

This time we will be targeting the services network in the destination. Under Destination, press the "+".

Edge	Gateway - edge	e-dal10-0)2b246c6					
Firewall	DHCP NAT Ro	uting Lo	ad Balancer VPN Certific	ates Grouping Objects Statistic	cs Edge Settings			
Firew	all Rules							
A Thi	s rule set has unsaved chang	ges. Save to s	tart deploying.				Save chan	ges Discard change
+								
+								
Show on	ly user-defined rules	0						
Show on No.	Name	Туре	Source	Destination	Service	Action		Enable logging
Show on No.	Name firewall	Type Internal Hiç	Source vse	Destination Any	Service Any	Action Accept	v	Enable logging
No.	Ily user-defined rules Name firewall Web-Network-Private	Type Internal Hig User	Source vse Web-Network	Destination Any Any (P) (+)	Service Any Any	Action Accept Accept		Enable logging
Show on No. 1✓ 2✓	Name firewall Web-Network-Private highAvailability	Type Internal Hig User Internal Hig	Source Vise Web-Network 169.2541.81/30 169.2541.82/30	Destination Any Any (P) (•) 159.254.18/30 159.254.18/30 159.254.18/30 159.254.18/30	Service Any Any Any Any	Action Accept Accept Accept	*	Enable logging
Show on No. 1 ✓ 2 ✓ 3 ✓ 4 ✓	Name Name Kerken Ke	Type Internal Hig User Internal Hig Internal Hig	Source vse Web. Network 169.254.181/30 169.254.182/30 Internal	Destination Any Image: Constraint of the state of th	Service Any Any Any udp:53:any tcp:53:any	Action Accept Accept Accept Accept		Enable logging

Select the -service01 network and then the "->" to move it the right. Press Next.

vm								admin Organization Admin	istrator ~
<									
111	DHCP NAT	Select objects	e., 10 - 11				×		
0	rule set has unsaved a	Browse objects of type: GATEWAY INTERFACES > Filter dati0-w02-tenant-external dati0-w02-service01 @ Distributed Provider Transit	Gateway Interface:	5 <u>~</u>	Filter Calto-w02-service01				
	Name firewall Web-Network-Priv	© Web-Network © Internal © External © ALL							
٩	highAvailability	Current page: 1							
	Web-Network					DISCARD			

Then press the NAT and select Source NAT.

NAT44 Rules							
Show only user-defined			*				
ID Type	Action Applied on	Original	Translated	Protocol	Enabl	Logging	Description
		IP Address Port	IP Address Port				
NAT64 Rules	× *	+ nslated Ipv4 Source Prefix	Enabled Logging		Descriptio	n	
	L.						

Select the -service01 network

Add the CIDR for your network

Add an IP from the services IPs, i.e., 52.117.32.75 which you had saved before in notepad.

Press NEXT.

VI	${\mathfrak n}$ IBM Cloud for VMware Solutions Datacent	ers		○ ② ~ admin Organization Administrator ~
<				×
	Firewall DHCP NAT Routing Load Balan NAT44 Rules	Add SNAT Rule	datt0-w02-service01 <u>~</u>	
0	ID Type Action Applied on TSIGLOD User-defined SNAT dail0 w02-tenar	Original Source IP/Range * Translated Source IP/Range * Description	192368300.1/24 5217782.75	Description Web-Network Outbound
	NAT64 Rules MAT64 Rules MAT64 Rules ID Match lpv6 Destination Prefix No NAT64 rules defined.			
0		Enabled	Discard KEEP	
				5

AT44 Rules		× • •						
ID Type	Action Applied on	Original	Translated		Protocol	Enabl	Logging	Description
		IP Address Port	IP Address	Port				
96609 User-defined S	SNAT dal10-w02-tenant	-€ 192.168.100.1/24 Any	52.117.143.208	Any	Any	~	×	Web-Network Outbound
User-defined S	SNAT dal10-w02-service	192.168.100.1/24	52.117.132.75			~	×	
AT64 Rules	× + Pestination Prefix Trans	wilated Ipv4 Source Prefix	Enabled Li	ogging		Descriptio	n	

Now you should show two Source NATs, one for external and one for internal network. The internal network will allow you to access IBM Cloud services such as Object Storage Service and Redhat repositories.

At this point, you can start to provision a VM in your VMware Shared service and be able to access external and internal network.

Provision a VM inside VMware Shared Service

This training video will demo how to provision a VM.

https://www.youtube.com/watch?v=5yl-_60gUUw

To provision a new VM in your VMware Solution Shared, press on the "vCloud Director Console" on upper right-hand side of your VMware Solution Shared UI in the IBM Cloud.



A browser session will open where you would enter your admin ID and password provided to you when you created the VMware Solution Shared.



Login to the console using admin and password provided.

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	Virtual Machines
iii Compute	NEW VM Lookin All VMs ··· Y 11 C 88 =
vApps	Name T Y Status OS Y Memory Y CPUs Y VADO Name Y Storage Pulicy Y Snapshot IP Address Networks
Virtual Machines	i vm-centos-fg2 Powered on CentOS 7 (6 8192 MB 2 vm-centos-fg2 4 IOPS/GB - 192.168.20.6 vmware-net
Networking	: vm-centos-lg Powered on CentOS 7 (6 8192 MB 2 vm-centos-lg 4 iOPS/GB - 192.168.20.5 vmware-net
Networks	1-2 of 2 vms
Edges	
Security	
🗐 Storage 🗸 🗸	
Independent Disks	
Storage Policies	
Settings	
General	
Metadata	
Recent Tasks	*
Task	T Status Y Type Y Construction T Start Time 🚽 Completion Time Service Namespace Y
	Scierano

At this point you need to configure you have completed the network configuration. Choose "Virtual Machines"

Choose New VM.

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	«	Virtual Machines													
::: Compute	Ý	NEW VM Look in All VMs	Y	, ît G										8	8 =
Virtual Machines		Name	†т S	tatus	05 T	Memory Y	CPUs	τ vA	pp Name y	Storage Policy	Y Sna	pshot	IP Address	Networks	
Affinity Rules		i vm-centos-fg2	P	owered on	CentOS 7 (6	8192 MB	2	VIT	n-centos-fg2	4 IOPS/GB			192.168.20.6	vmware-r	iet
Networking	~	vm-centos-fg	P	owered on	CentOS 7 (6	8192 MB	2	vm	n-centos-fg	4 IOPS/GB			192.168.20.5	vmware-r	et
Networks														1 - 2 of 2	vms
Edges															
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Storage	~														
Independent Disks															
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Settings	~														
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Recent Tasks															×
Task					Y Status	τ Τ3	pe 1	Screens	hot	Start Time	• <	completion Tim	5	rvice Namespace	Ψ

- Choose a Name which is same as Computer name by default or you can select different names.
- ➢ Choose "new"
- > Select the OS Family, Linux in this case
- > Select Operating system, centos in this case.
- > Compute Policy select "System Default"
- > Select a size, we chose small
- > All other options are kept as default.

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IBM Cloud for VMware Soluti								admin Organization Administrator
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III Compute 🗸	Name *	vm3						88 =
VApps	Computer Name	vm3					P Address	Networks
Virtual Machines	Description						92.168.20.0	5 vmware-net
Annaty Rules	Туре *	New O From Templa	ate				92.168.20.5	5 vmware-net
Vietworking V	Power on	~						1 - 2 of 2 vms
Networks								
Edges	Operating System							
Security	OS family	Linux V						
🗄 Storage 🗸 🗸	Operating System	CentOS 8 (64-bit)	~					
Independent Disks	Boot image	Select					ř.	
Storage Policies	Compute							
Settings	Compute Policy *	System Default					×	
General	Select a Size							
Metadata	Pre-defined Sizing Options	Custom Sizing Options						
		CPU	Cores	Memory (MB)		Storage (GB)		
	 Small 	1	1	512		16		
Recent Tasks	Medium	2	2	1024		32		*
Task	C Large	4	4	2048	Screenshot	64		Service Namespace 🛛 🔻

Change the Network from DHCP to IP Pool so the VM will get assigned an IP address from you network.

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① Virtual machine "vm4" is	s being creat								~			
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vApps		Select a Size										
Virtual Machines		 Pre-defined Sizin 	g Options 🔘 Custor	n Sizing Options						P Address		
Affinity Rules				CPU	Cores	Memory (MB)		Storage (GB)		92.168.20.7		
O Networking	~	 Small 		1	1	512		16		92.168.20.6		
Networks		O Medium		2	2	1024		32		92.168.20.5		
Edges		🔿 Large		4	4	2048		64		онср		
Security		Storage ADD										
Storage	×	Disk		Storage Policy		Size (GB)				l i		
Storage Policies		1		VM default pe	blicy	~ 16	~	Û				
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General		Use custom storage	policy									
Metadata		Networking < UNI	DO CHANGES AND GO	BACK ADD								
		NIC	Network	Netw	ork Adapter Type	IP Mode	IP Address	Primary NIC				
Recent Tasks		1	vmware-network	~ VM	XNET3	✓ OHCP	Auto-assigned	0	÷			
Task Composed Virtual Application	on vm4-80cf					IP Pool Manual IP	Screenshot	-		1.014		
composed andal Applicate	on min source											

Press OK Now your VM is being provisioned.

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Virtual machine "vm4" is	being cre	ated											\times
III Compute	« ~	Virtual Machines	_~ \									88	=
Virtual Machines		Name 1	⊤ Status	OS T	Memory T	CPUs	τ vi	App Name 🛛 🖓	Storage Policy T	Snapshot	IP Address	Networks	
Affinity Rules		i vm-centos-fg2	Powered on	CentOS 7 (6	8192 MB	2	vr	n-centos-fg2	4 IOPS/GB		192.168.20.6	vmware-net.	
Networking	~	E vm-centos-fg	Powered on	CentOS 7 (6	8192 MB	2	vr	n-centos-fg	4 IOPS/GB		192.168.20.5	vmware-net.	
Networks		÷ vm3	Powered on	CentOS 8 (6	512 MB	1	vr	m3-d757dbe	4 IOPS/GB		192.168.20.7	vmware-net.	
Edges												1 - 3 of 3 vm	15
Security													
E Storage	~												
Independent Disks													
Storage Policies													
Settings	~												
General													
Metadata													
Recent Tasks													*
Task			т	Status	т Туре	- τ I	screens	hot Start Time	4	Completion Time		Service Namespace	Ψ
Updated Virtual Machine vm	3(de0380	85-2273-4a68-a51f-696e9dd7bfca)		Succeeded	vm		8 admin	07/05/20	20, 11:11:49 AM	07/05/2020, 11:12	2:04 AM	com.vmware.vcloud	

To access the VM, press on the name of the VM you just created.

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① Virtual machine "vm4" is being created and the second	ated						1	×
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III Compute V	vm3							
vApps	~ General							
Virtual Machines								
Affinity Rules	Name	vm3		Virtual Data Center	r vmware-dalla	5		
Networking ~	Computer Name	vm3		VMware Tools	Not Installed			
Networks	Description			Matural Manadarana A	HW 14			
Edges				virtual Hardware v	rension			
Security	Operating System Family	V		Enter BIOS Setup				
🖹 Storage 🗸 🗸	Operating System	CentOS 8 (64-bit)	~					
Independent Disks	Boot Delay	0						
Storage Policies	Storage Policy	4 IOPS/GB V						
⊗ Settings ∨								
General	> Hardware							
Metadata	> Guest OS Customization							
	> Advanced							
Recent Tasks							3	×
Task		⊤ Status	т Туре т	nitiat Screenshot	art Time 🗸	Completion Time	Service Namespace T	٣
Updated Virtual Machine vm3(de0380)	85-2273-4a68-a511-696e9dd7bfca)	Succee	aded vm	8 admin 07	7/05/2020, 11:11:49 AM	07/05/2020, 11:12:0	4 AM com.vmware.vcloud	

To see more details, expand the Hardware tab.

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Virtual machine "vm4" is t	eing creat	ed									×
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Compute vApps	~	Compute Policy *	System Default								÷
Virtual Machines Affinity Rules S Networking	~	CPU Number of virtual CPUs Cores per socket	<u>1 v</u> <u>1 v</u>				Virtual CPU hot add	1			
Networks Edges Security		Expose hardware-assisted CPU virtualization to guest OS Memory	512				Removable Med	ia Disconnect Disconnect	ed		
Storage Independent Disks Storage Policies	~	Memory hot add	MB				порру опле				
Settings General Metadata	~	Hard Disks ADD Name Size	P	olicy		Bus Type		Bus Number	Unit Number		
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Updated Virtual Machine vm3	(de038085	-2273-4a68-a51f-696e9dd7bfca)		Suce	ceeded vm		온 admin 07/	05/2020, 11:11:49 AM	07/05/2020, 11:12:04 AM	com.vmware.vclor	bu

To set a password to access this VM via ssh, expand on the 'Guess OS customization' and choose:

- > Enable Guess Customization
- > Allow Local Administrator Password
- > Specify a password or click on Auto Generate Password.
- > Press Save
- > Then reboot the VM to get the changes.
- > Power it on using "Power on and force recustomization" option

	«	ADD										
Compute vApps	~	Primary NIC	NIC	Connected	Network Adapter Type	Network	IP Mode	IP Address	MAC Address			
Virtual Machines Affinity Rules		•	0		VMXNET3	Web-Netwc \vee	Static - Mani \vee	192.168.100.10	00:50:56:01:0	Ū		
Networking Networks Edges Security	~	 Guest OS Custo General 	omization				Join Domain					
Storage Independent Disks	~	Enable gues	st customizati	on			Enable this VM to join a domain Use organization's domain					
Storage Policies Settings	~	Password Re	eset administrator	password			Override organization's domain Domain Name I fername					
General Metadata		Auto genera Specify pas	ministrator to ate password sw@d	change password	a on first login dC6X	_	Password Account organizati	onal unit				
		Number of t automatical	times to log oi ly	n O Value admir	of 0 will disable auto	matic log on as	Script Script file					

To access the VM, you can use ssh or the provided GUI access via Launch Web Console.

All datacenters			Defaef00de49ea9e507, 👳 30f86b5b-5380-4552-9553-fd8f675bb615
	~	ACTIONS PETALES	
iii Compute	~	Suspend	
		Shut Down Guest OS	
vApps		Power Off	
Virtual Machines		Power On	
Affinity Rules		Power On and Force Recustomization	
Networking	~	Reset	
blaburalus		Discard suspended state	
Networks		Upgrade Virtual Hardware Version	
Edges		Install VMware Tools	
Security		Insert Media	
Storage	\sim	Eject Media	
Independent Disks		Move to	
Storage Policies		Copy to	
Settings	~	Delete	
, occurgo		Create Snapshot	
General		Revert to Snapshot	
Metadata		Remove Snapshot	
		Laun a Web Console	
		Launch VM Remote Console	
		Download VMRC	
		Renew Lease	

User the root and password you created before to login.



To delete a VM, you will need to power it off first using the list on the vertical "…" icon next to the VM name and then delete it using same menu.

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PowerVS and Virtual Private Cloud Integration

Provision a Gen 2 VPC

To test the PowerVS connection to a VSI inside a Gen 2 VPC, we first need to create a Gen 2 VPC and then add one or more VPC VSIs to it.

Login to IBM Cloud. On Top left-hand side, click on the triple line icon and choose "VPC Infrastructure" and then "overview"

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Here you can provision your Gen 2 VPC. Press "Create VPC Gen 2"





Choose "Enable" to allow your VPC to communicate.

- > Choose a name for your VPC.
- > Choose the VPC location
- > Choose a name for your VPC subnet

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You can keep the IP CIDR it recommends. At this point, you can choose a Public Gateway to be provisioned to allow access to the internet. We have chosen not to enable Public Gateway and keep the VPC private.

Choose "Create Virtual Private Cloud" on the right-hand side.

Your VPC is now being provisioned.

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Provision a VPC VSI inside the Gen 2 VPC

Now choose the VPC Gen 2 which you just created.

We will now add some VPC VSI into this VPC.

On Top left-hand side, click on the triple line icon and choose "VPC Infrastructure" and then "virtual server instances"

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Choose a "new instance"

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- > Provide a name for the instance.
- > Your Virtual private cloud will be automatically chosen.
- Check the box under "Classic Access" to "Enable access to classic resources" – this is very critical since all your PowerVSI are under the classic infrastructure and so without this option checked you cannot ping the PowerVSIs.
- > Select your Operating System and Profile
- > Your subnet will also be automatically populated.

Press "Create Virtual Server Instance" on right-hand side.



Your VPC VSI is not active after a few minutes.

Now you can ping the VPC VSI from the Power VSI and vis versa using private IPs.

End of tutorial