# IBM Power Virtual Server Integration with x86 Workloads

## An IBM Systems Lab Services Tutorial

IBM Systems Lab Services
Infrastructure services to help you build the foundation of a smart enterprise.

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# Table of Contents

# Chapter 1: Solution Overview

## Introduction

A key client benefit of IBM Power Virtual Server (PowerVS) is the ability to integrate it with their x86-based workloads running in IBM Cloud for a single multiplatform business solution.  For example:

- An Oracle database running in AIX in PowerVS connecting to a Linux application server in an x86 virtual server instance (VSI)
- A core banking application in IBM i connecting to a point-of-sale application in a VMware-based x86 VSI

While deployment of both PowerVS and x86 VSIs is straightforward, **additional network configuration is required** for those workloads to be able to communicate. Simply using a common IP address and subnet scheme is not enough for an application in an x86 VSI to access data in a PowerVS VSI.

This tutorial will provide step-by-step instructions for performing that extra required network configuration in three common use cases.

## Use Cases

### PowerVS and x86 VSI Integration

In this case we have an x86 VSI (or baremetal server) communicating with a PowerVS VSI.

### PowerVS and VMware Integration

Here we have x86 VSI within a VMware cluster in IBM Cloud communicating with a PowerVS VSI.  VMware VSIs require additional configuration on top of what basic x86 VSIs do in order to integrate with PowerVS.

### PowerVS and Virtual Private Cloud Integration

Lastly, we have a VSI or baremetal server in a Virtual Private Cloud (VPC) within “Gen 2” IBM Cloud communicating with a PowerVS VSI.

## Solution Components and Requirements

### Components

The following components need to be setup in the IBM Cloud UI.

1. *Open an IBM Cloud account*
2. *Create two Power PowerVS location Services and a private subnet in each PowerVS location.*
3. *Provision AIX and IBM i VSIs in each PowerVS location*
4. *Order Direct Link Connect Classic to connect each PowerVS location to IBM Cloud*
5. *Order two Vyatta Gateways one in each datacenter: Lon06 and Tor01 datacenters or your chosen datacenters to allow for PowerVS location-to-PowerVS location communication*
6. *Request a Generic Routing Encapsulation (GRE) tunnel to be provisioned at each PowerVS location.*
7. *Configure three GRE tunnels in the Vyatta Gateways. Two to connect Vyatta Gateway to the PowerVS location GRE tunnels created in Step 6 above and one across Vyatta Gateways to connect Vyatta-to-Vyatta. This will allow end-to-end PowerVS location to PowerVS location communication for the VSIs in the PowerVS locations and to the IBM Cloud VSIs and other services such as Cloud Object Storage (COS).*
8. *Configure a Reverse-proxy Centos VSI to allow access to Private Cloud Object Storage endpoint from PowerVS location*

### Requirements

### *Open an IBM Cloud account*

Login to https://cloud.ibm.com and follow the procedure to open an Internal to external account.
For internal accounts, you can use your IBM intranet ID and password. For external accounts you will need to provide a billing source such as a credit card.

### *Create PowerVS location Service and Subnet(s)*

All Power VSIs are provisioned in what is called a PowerVS location. This is a separate datacenter adjacent to IBM Cloud datacenters. In order to setup your PowerVS location, you will setup a PowerVS location service in the IBM Cloud UI. The PowerVS location service is a service within IBM Cloud which allows you to provision Power AIX and IBM I VSIs. There is a limit of one PowerVS location service per datacenter in IBM Cloud. In our scenario we have created two PowerVS locations, one is Toronto and one in London datacenters.
Prior to provisioning Power VSI in the PowerVS location, you will need to create at least one subnet. You can have as many subnets as you require in each PowerVS location service on which you can provision your Power VSIs.

### *Provision AIX and IBM i VSIs in each PowerVS location*

In each PowerVS location service you can create AIX or IBM i VSIs. The details are provided in the next section.

### *Order Direct Link Connect Classic*

You will need to order Direct Link (DL) Connect Classic to allow your Power VSIs 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 location datacenters, you will need to use a Generic Routing Encapsulation (GRE) tunnels. GRE tunnels are provisioned on Vyatta Gateways so you will need to order one Vyatta Gateway in each PowerVS location.
We ordered one Vyatta in LON06 and the other in TOR01 datacenters where our PowerVS locations exists.

### *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 subnets information in each PowerVS location in the ticket.

### *Configure three 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 three GRE tunnels

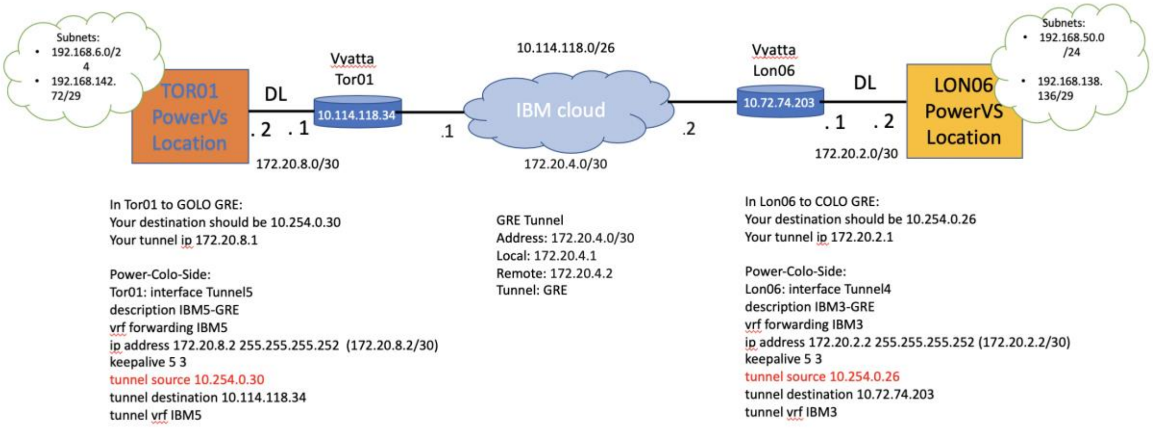
1. *GRE tunnel on Vyatta to terminate the PowerVS location GRE in LON06*
2. *GRE tunnel on Vyatta to terminate the PowerVS location GRE in TOR01*
3. *GRE tunnel across the two vyatta gateways. One on each side.*

### *Configure a Reverse-proxy Centos VSI*

In this section we will discuss the procedure to configure a reverse proxy to allow access to private COS endpoint.
All access to COS from Power VSI is via this reverse proxy.
You will access  it via https://<reverse proxy ip>.
You will need to provision a Centos or Redhat VSI in IBM cloud to configure at reverse proxy. This VSI must have public access. After configuration, the public access can be disabled.

## Diagrams

The overall architecture of our deployment is shown in Figure 1.



```
In Tor01 to GOLO GRE:
Your destination should be 10.254.0.30
Your tunnel ip 172.20.8.1

Power-Colo-Side:
Tor01: interface Tunnel5
description IBM5-GRE
vrf forwarding IBM5
ip address 172.20.8.2 255.255.255.252  (172.20.8.2/30)
keepalive 5 3
tunnel source 10.254.0.30
tunnel destination 10.114.118.34
tunnel vrf IBM5
```

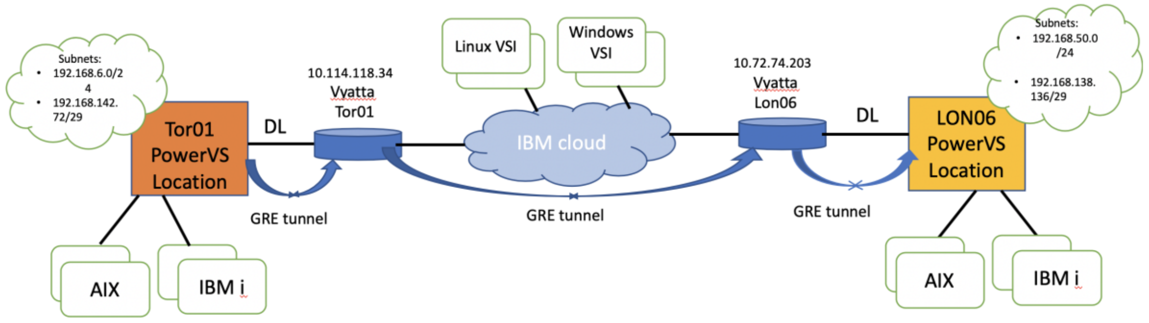
```
GRE Tunnel
Address: 172.20.4.0/30
Local: 172.20.4.1
Remote: 172.20.4.2
Tunnel: GRE
```

```
In Lon06 to COLO GRE:
Your destination should be 10.254.0.26
Your tunnel ip 172.20.2.1

Power-Colo-Side:
Lon06: interface Tunnel4
description IBM3-GRE
vrf forwarding IBM3
ip address 172.20.2.2 255.255.255.252 (172.20.2.2/30)
keepalive 5 3
tunnel source 10.254.0.26
tunnel destination 10.72.74.203
tunnel vrf IBM3
```

DL:Direct Link

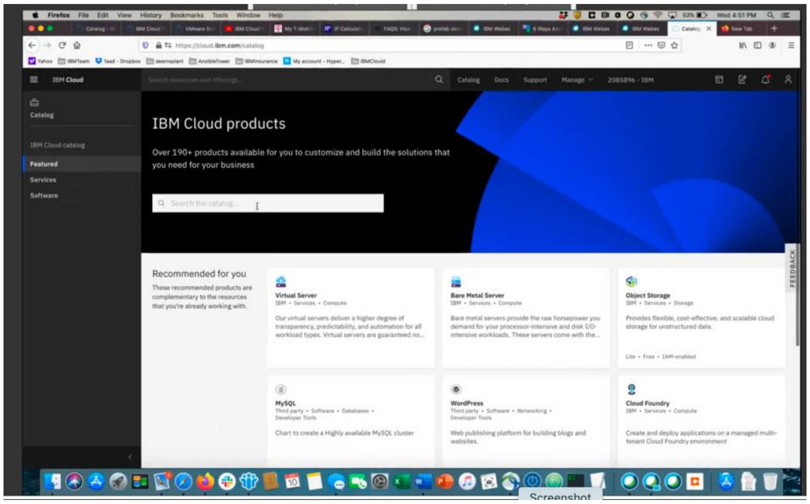
End-to-End PowerVS location  Architecture



DL:Direct Link

## *Create PowerVS location Services and Subnet(s)*

You will need an IBM Cloud account to start this process.
Go to the main IBM Cloud UI page and click on “Catalog” on upper right side of the UI.



https://cloud.ibm.com/catalog

IBM Cloud products

Over 190+ products available for you to customize and build the solutions that you need for your business

Search the catalog...

Recommended for you

These recommended products are complementary to the resources that you're already working with.

Virtual Server
IBM • Services • Compute
Our virtual servers deliver a higher degree of transparency, predictability, and automation for all workload types. Virtual servers are guaranteed no...

Bare Metal Server
IBM • Services • Compute
Bare metal servers provide the raw horsepower you demand for your processor-intensive and disk I/O-intensive workloads. These servers come with the...

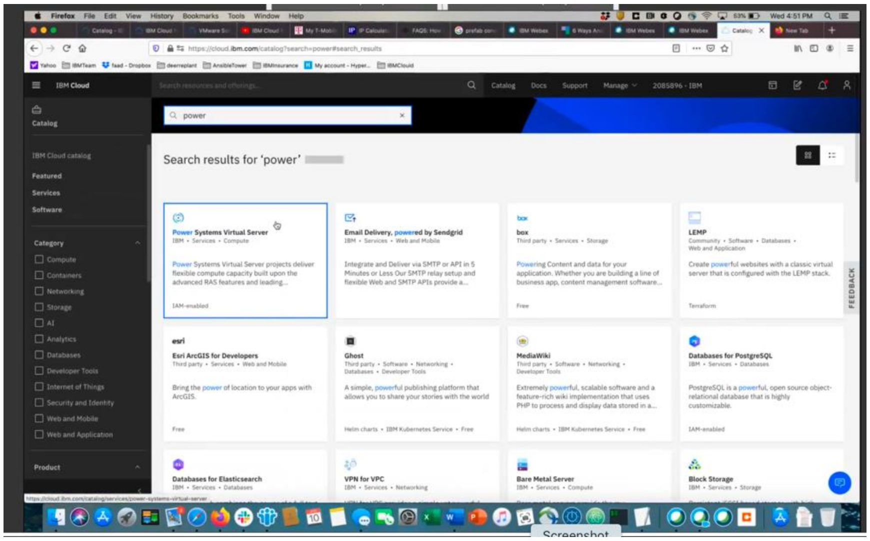
Object Storage
IBM • Services • Storage
Provides flexible, cost-effective, and scalable cloud storage for unstructured data.
Lite • Free • IAM-enabled

MySQL
Third party • Software • Databases • Developer Tools
Chart to create a Highly available MySQL cluster

WordPress
Third party • Software • Networking • Developer Tools
Web publishing platform for building blogs and websites.

Cloud Foundry
IBM • Services • Compute
Create and deploy applications on a managed multi-tenant Cloud Foundry environment

Search for "Power"



https://cloud.ibm.com/catalog?search=power#search_results

power

Search results for 'power'

Power Systems Virtual Server
IBM • Services • Compute
Power Systems Virtual Server projects deliver flexible compute capacity built upon the advanced RAS features and leading...
IAM-enabled

Email Delivery, powered by Sendgrid
IBM • Services • Web and Mobile
Integrate and Deliver via SMTP or API in 5 Minutes or Less Our SMTP relay setup and flexible Web and SMTP APIs provide a...

box
Third party • Services • Storage
Powering Content and data for your application. Whether you are building a line of business app, content management software...
Free

LEMP
Community • Software • Databases • Web and Application
Create powerful websites with a classic virtual server that is configured with the LEMP stack.
Terraform

Esri ArcGIS for Developers
Third party • Services • Web and Mobile
Bring the power of location to your apps with ArcGIS.
Free

Ghost
Third party • Software • Networking • Databases • Developer Tools
A simple, powerful publishing platform that allows you to share your stories with the world
Helm charts • IBM Kubernetes Service • Free

MediaWiki
Third party • Software • Networking • Developer Tools
Extremely powerful, scalable software and a feature-rich wiki implementation that uses PHP to process and display data stored in a...
Helm charts • IBM Kubernetes Service • Free

Databases for PostgreSQL
IBM • Services • Databases
PostgreSQL is a powerful, open source object-relational database that is highly customizable.
IAM-enabled

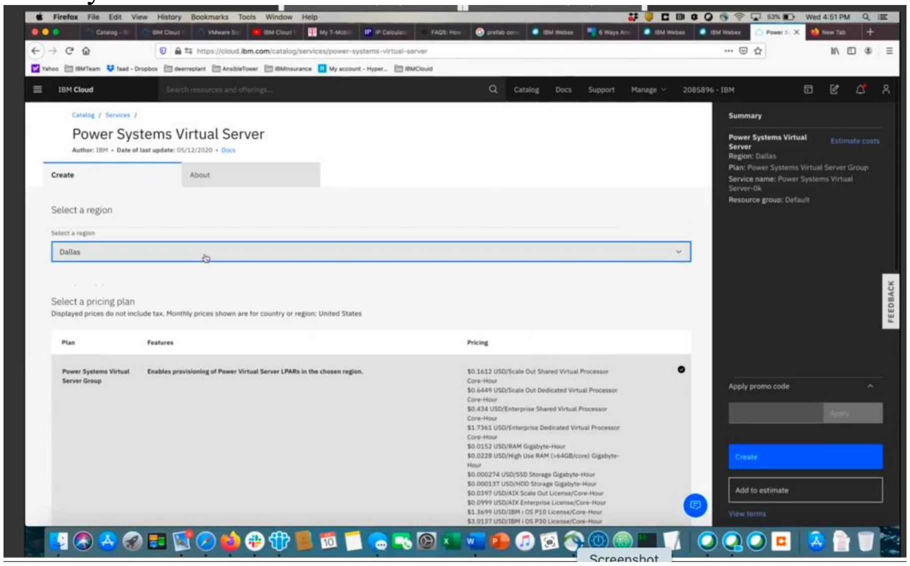
Databases for Elasticsearch
IBM • Services • Databases

VPN for VPC
IBM • Services • Networking

Bare Metal Server
IBM • Services • Compute

Block Storage
IBM • Services • Storage

Select "Power System Virtual Servers".



https://cloud.ibm.com/catalog/services/power-systems-virtual-server

Catalog / Services /

Power Systems Virtual Server

Author: IBM • Date of last update: 05/12/2020 • Docs

Create | About

Select a region

Select a region: Dallas

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or region: United States

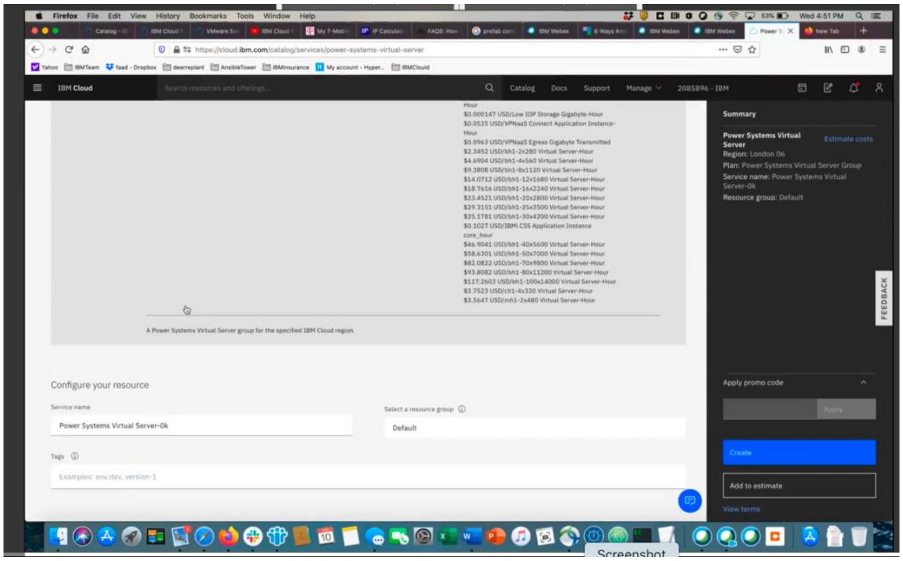
| Plan | Features | Pricing |
|---|---|---|
| Power Systems Virtual Server Group | Enables provisioning of Power Virtual Server LPARs in the chosen region. | $0.1612 USD/Scale Out Shared Virtual Processor Core-Hour<br>$0.6449 USD/Scale Out Dedicated Virtual Processor Core-Hour<br>$0.434 USD/Enterprise Shared Virtual Processor Core-Hour<br>$1.7361 USD/Enterprise Dedicated Virtual Processor Core-Hour<br>$0.0152 USD/RAM Gigabyte-Hour<br>$0.0228 USD/High Use RAM (>64GB/core) Gigabyte-Hour<br>$0.000274 USD/SSD Storage Gigabyte-Hour<br>$0.000137 USD/HDD Storage Gigabyte-Hour<br>$0.0397 USD/AIX Scale Out License/Core-Hour<br>$0.0999 USD/AIX Enterprise License/Core-Hour<br>$1.3699 USD/IBM i OS P10 License/Core-Hour<br>$3.0137 USD/IBM i OS P30 License/Core-Hour |

Summary

Power Systems Virtual Server — Estimate costs
Region: Dallas
Plan: Power Systems Virtual Server Group
Service name: Power Systems Virtual Server-0k
Resource group: Default

Apply promo code

Under Select Region, choose your region. You are limited to only one service per region.



Hour
$0.000147 USD/Low IOP Storage Gigabyte-Hour
$0.0535 USD/VPNaaS Connect Application Instance-Hour
$0.0963 USD/VPNaaS Egress Gigabyte Transmitted
$2.3452 USD/bh1-2x280 Virtual Server-Hour
$4.6904 USD/bh1-4x560 Virtual Server-Hour
$9.3808 USD/bh1-8x1120 Virtual Server-Hour
$14.0712 USD/bh1-12x1680 Virtual Server-Hour
$18.7616 USD/bh1-16x2240 Virtual Server-Hour
$23.4521 USD/bh1-20x2800 Virtual Server-Hour
$29.3151 USD/bh1-25x3500 Virtual Server-Hour
$35.1781 USD/bh1-30x4200 Virtual Server-Hour
$0.1027 USD/IBMi CSS Application Instance core_hour
$46.9041 USD/bh1-40x5600 Virtual Server-Hour
$58.6301 USD/bh1-50x7000 Virtual Server-Hour
$82.0822 USD/bh1-70x9800 Virtual Server-Hour
$93.8082 USD/bh1-80x11200 Virtual Server-Hour
$117.2603 USD/bh1-100x14000 Virtual Server-Hour
$3.7523 USD/ch1-4x320 Virtual Server-Hour
$3.5647 USD/mh1-2x480 Virtual Server-Hour

A Power Systems Virtual Server group for the specified IBM Cloud region.

Configure your resource

Service name: Power Systems Virtual Server-0k

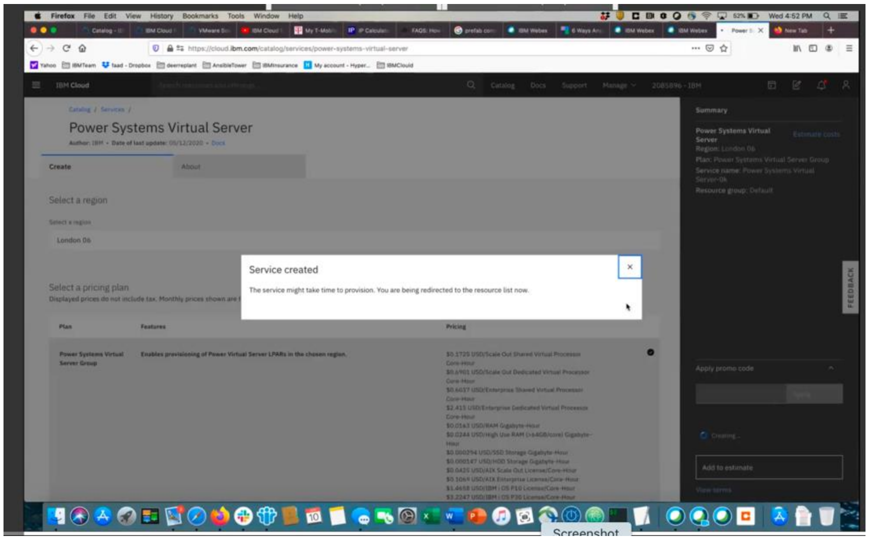
Select a resource group: Default

Tags: Examples: env:dev, version-1

Summary

Power Systems Virtual Server
Region: London 06
Plan: Power Systems Virtual Server Group
Service name: Power Systems Virtual Server-0k
Resource group: Default

Select a “Service Name” or chose default name provided.
Then press “Create”



Catalog / Services /

Power Systems Virtual Server

Author: IBM • Date of last update: 05/12/2020 • Docs

Select a region

Select a region: London 06

Service created

The service might take time to provision. You are being redirected to the resource list now.

Select a pricing plan
Displayed prices do not include tax. Monthly prices shown are

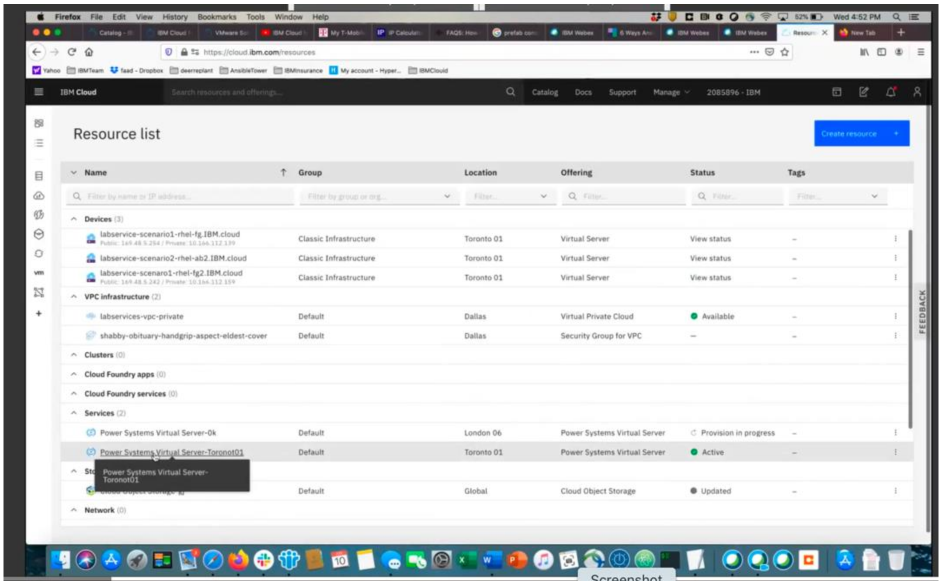
| Plan | Features | Pricing |
|---|---|---|
| Power Systems Virtual Server Group | Enables provisioning of Power Virtual Server LPARs in the chosen region. | $0.1725 USD/Scale Out Shared Virtual Processor Core-Hour<br>$0.6901 USD/Scale Out Dedicated Virtual Processor Core-Hour<br>$0.6037 USD/Enterprise Shared Virtual Processor Core-Hour<br>$2.415 USD/Enterprise Dedicated Virtual Processor Core-Hour<br>$0.0163 USD/RAM Gigabyte-Hour<br>$0.0244 USD/High Use RAM (>64GB/core) Gigabyte-Hour<br>$0.000294 USD/SSD Storage Gigabyte-Hour<br>$0.000147 USD/HDD Storage Gigabyte-Hour<br>$0.0425 USD/AIX Scale Out License/Core-Hour<br>$0.1069 USD/AIX Enterprise License/Core-Hour<br>$1.4658 USD/IBM i OS P10 License/Core-Hour<br>$3.2247 USD/IBM i OS P20 License/Core-Hour |

Summary

Power Systems Virtual Server
Region: London 06
Plan: Power Systems Virtual Server Group
Service name: Power Systems Virtual Server-0k
Resource group: Default

Your PowerVS location service will now appear under the Services tab.

You will repeat this process to create a second PowerVS location service. In our case we have two PowerVS location services, one in London and one in Toronto.

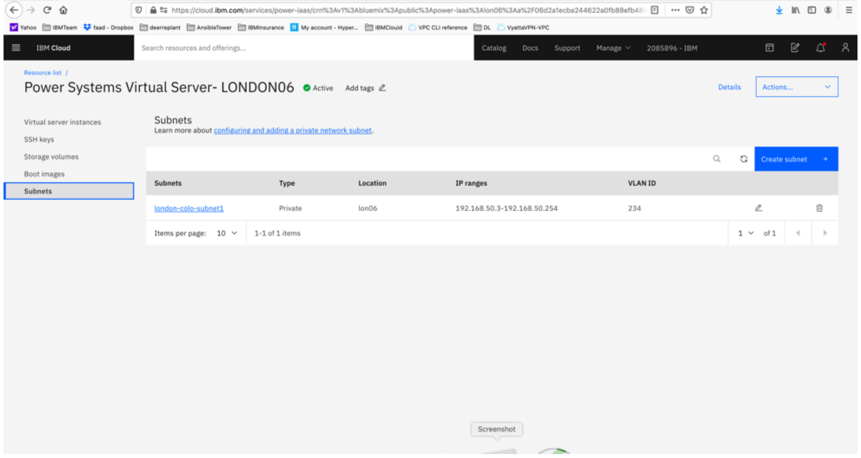


Resource list

| Name | Group | Location | Offering | Status | Tags |
|---|---|---|---|---|---|
| Devices (3) | | | | | |
| labservice-scenario1-rhel-fg.IBM.cloud<br>Public: 169.48.5.254 / Private: 10.166.112.139 | Classic Infrastructure | Toronto 01 | Virtual Server | View status | – |
| labservice-scenario2-rhel-ab2.IBM.cloud | Classic Infrastructure | Toronto 01 | Virtual Server | View status | – |
| labservice-scenaro1-rhel-fg2.IBM.cloud<br>Public: 169.48.5.242 / Private: 10.166.112.159 | Classic Infrastructure | Toronto 01 | Virtual Server | View status | – |
| VPC infrastructure (2) | | | | | |
| labservices-vpc-private | Default | Dallas | Virtual Private Cloud | ● Available | – |
| shabby-obituary-handgrip-aspect-eldest-cover | Default | Dallas | Security Group for VPC | – | – |
| Clusters (0) | | | | | |
| Cloud Foundry apps (0) | | | | | |
| Cloud Foundry services (0) | | | | | |
| Services (2) | | | | | |
| Power Systems Virtual Server-0k | Default | London 06 | Power Systems Virtual Server | Provision in progress | – |
| Power Systems Virtual Server-Toronot01 | Default | Toronto 01 | Power Systems Virtual Server | ● Active | – |
| Sto[illegible] | | | | | |
| [illegible] | Default | Global | Cloud Object Storage | ● Updated | – |
| Network (0) | | | | | |

Power Systems Virtual Server-Toronot01

Next you will need to click on the PowerVS location Service you created and provision a subnet to be used by your Power VSI servers.



Power Systems Virtual Server- LONDON06 ● Active Add tags

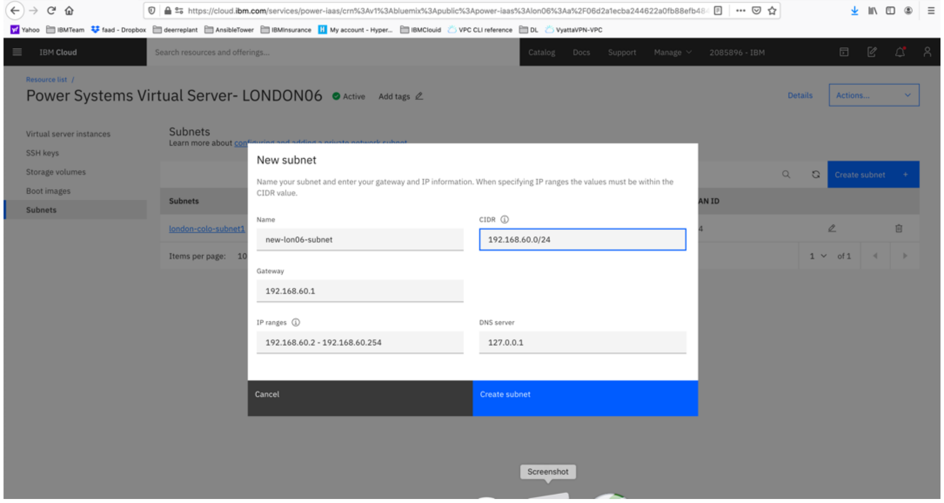
Subnets

Learn more about configuring and adding a private network subnet.

| Subnets | Type | Location | IP ranges | VLAN ID |
|---|---|---|---|---|
| london-colo-subnet1 | Private | lon06 | 192.168.50.3-192.168.50.254 | 234 |

Items per page: 10 1-1 of 1 items 1 of 1

Choose “Subnets” from the menu on the left.



New subnet

Name your subnet and enter your gateway and IP information. When specifying IP ranges the values must be within the CIDR value.

Name: new-lon06-subnet

CIDR: 192.168.60.0/24

Gateway: 192.168.60.1

IP ranges: 192.168.60.2 - 192.168.60.254

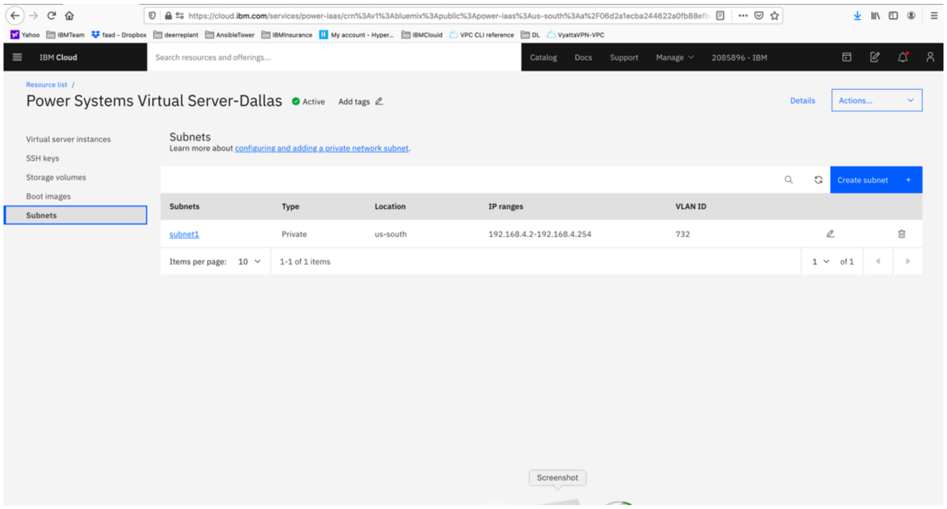
DNS server: 127.0.0.1

Provide the following information:

1. *name for your subnet*

2. *CIDR range. This can be any private IP subnet ranges. For example, 192.168.5.0/24. You may choose /21 to /30 based on how many IPs you will require. You may use your own private CIDR if you wish.*
3. *The rest of the fields will be automatically populated based on the CIDR you provided.*

Press “Create Subnet”



Power Systems Virtual Server-Dallas

Subnets

Learn more about configuring and adding a private network subnet.

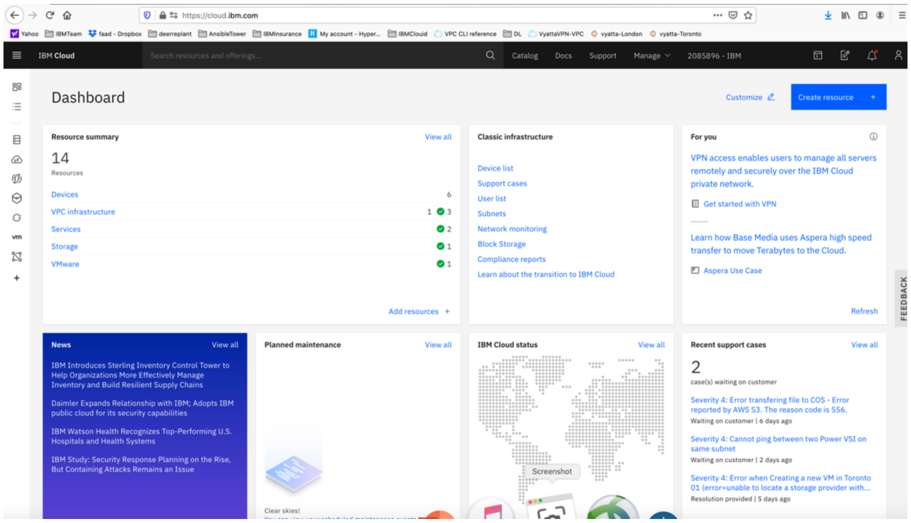
| Subnets | Type | Location | IP ranges | VLAN ID |
|---|---|---|---|---|
| subnet1 | Private | us-south | 192.168.4.2-192.168.4.254 | 732 |

Items per page: 10 1-1 of 1 items 1 of 1

There should be a VLAN ID associated with the subnet.
At this point, you will need to open a Support Ticket with Power System to request that the subnet be configured to allow local communication between any Power VSI you create in this PowerVS location service. Provide your PowerVS location service location, and your subnet in the ticket.
Without this step, the Power VSI you create will not be able to ping between each other even if they are on same subnet in the same PowerVS location.

## *Provision AIX and IBM i VSIs in each PowerVS location*

The procedure is similar for both AIX and IBM i VSI provisioning. Here is a procedure to create an AIX 7.2 VSI. The cost shown are monthly costs, but you are being charged hourly.
Go to the IBM Cloud Catalog and press the “IBM Cloud” on top left side of the UI.



Dashboard

Resource summary

14
Resources

| | |
|---|---|
| Devices | 6 |
| VPC infrastructure | 1 ✓ 3 |
| Services | ✓ 2 |
| Storage | ✓ 1 |
| VMware | ✓ 1 |

Classic infrastructure

Device list
Support cases
User list
Subnets
Network monitoring
Block Storage
Compliance reports
Learn about the transition to IBM Cloud

For you

VPN access enables users to manage all servers remotely and securely over the IBM Cloud private network.

Get started with VPN

Learn how Base Media uses Aspera high speed transfer to move Terabytes to the Cloud.

Aspera Use Case

News

IBM Introduces Sterling Inventory Control Tower to Help Organizations More Effectively Manage Inventory and Build Resilient Supply Chains

Daimler Expands Relationship with IBM; Adopts IBM public cloud for its security capabilities

IBM Watson Health Recognizes Top-Performing U.S. Hospitals and Health Systems

IBM Study: Security Response Planning on the Rise, But Containing Attacks Remains an Issue

Planned maintenance

Clear skies!

IBM Cloud status

Recent support cases

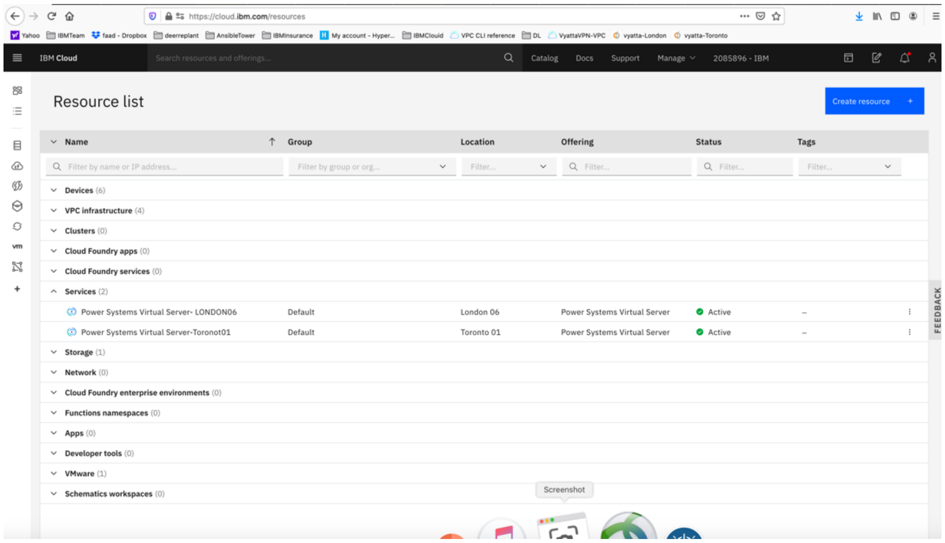
2
case(s) waiting on customer

Severity 4: Error transfering file to COS - Error reported by AWS S3. The reason code is 556.
Waiting on customer | 6 days ago

Severity 4: Cannot ping between two Power VSI on same subnet
Waiting on customer | 2 days ago

Severity 4: Error when Creating a new VM in Toronto 01 (error=unable to locate a storage provider with...
Resolution provided | 5 days ago

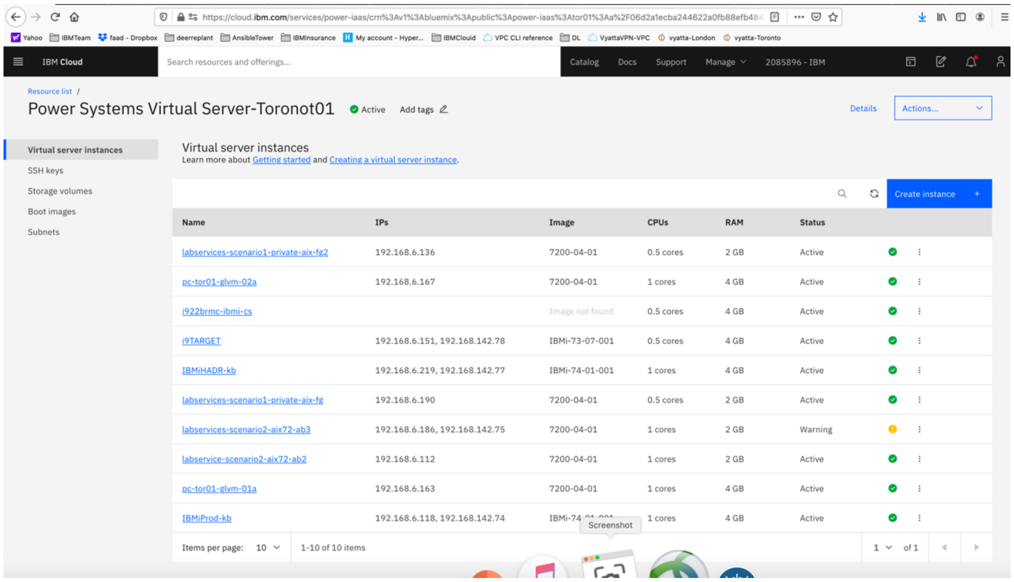
Choose "Services" from the list shown.



Resource list

| Name | Group | Location | Offering | Status | Tags |
|---|---|---|---|---|---|
| Filter by name or IP address... | Filter by group or org... | Filter... | Filter... | Filter... | Filter... |
| Devices (6) | | | | | |
| VPC infrastructure (4) | | | | | |
| Clusters (0) | | | | | |
| Cloud Foundry apps (0) | | | | | |
| Cloud Foundry services (0) | | | | | |
| Services (2) | | | | | |
| Power Systems Virtual Server- LONDON06 | Default | London 06 | Power Systems Virtual Server | ✓ Active | – |
| Power Systems Virtual Server-Toronot01 | Default | Toronto 01 | Power Systems Virtual Server | ✓ Active | – |
| Storage (1) | | | | | |
| Network (0) | | | | | |
| Cloud Foundry enterprise environments (0) | | | | | |
| Functions namespaces (0) | | | | | |
| Apps (0) | | | | | |
| Developer tools (0) | | | | | |
| VMware (1) | | | | | |
| Schematics workspaces (0) | | | | | |

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



Resource list /

Power Systems Virtual Server-Toronot01 ● Active Add tags

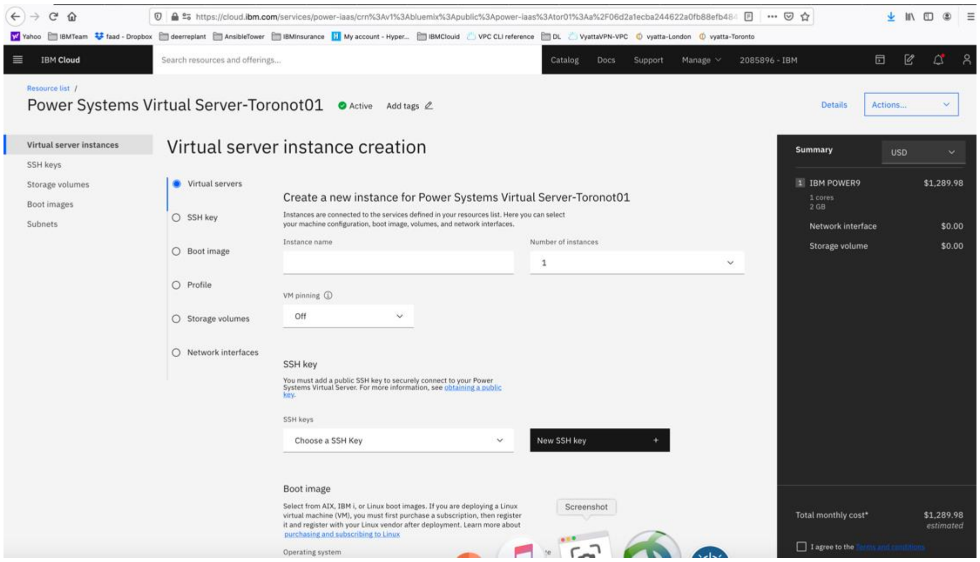
Virtual server instances

Learn more about Getting started and Creating a virtual server instance.

| Name | IPs | Image | CPUs | RAM | Status |
|---|---|---|---|---|---|
| labservices-scenario1-private-aix-fg2 | 192.168.6.136 | 7200-04-01 | 0.5 cores | 2 GB | Active |
| pc-tor01-glvm-02a | 192.168.6.167 | 7200-04-01 | 1 cores | 4 GB | Active |
| i922brmc-ibmi-cs | | Image not found | 0.5 cores | 4 GB | Active |
| i9TARGET | 192.168.6.151, 192.168.142.78 | IBMi-73-07-001 | 0.5 cores | 4 GB | Active |
| IBMiHADR-kb | 192.168.6.219, 192.168.142.77 | IBMi-74-01-001 | 1 cores | 4 GB | Active |
| labservices-scenario1-private-aix-fg | 192.168.6.190 | 7200-04-01 | 0.5 cores | 2 GB | Active |
| 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 |
| pc-tor01-glvm-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 | 1 cores | 4 GB | Active |

Items per page: 10 1-10 of 10 items 1 of 1

Since we have already provisioned several VSIs, 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.



Resource list /

Power Systems Virtual Server-Toronot01 ● Active Add tags

Virtual server instance creation

Create a new instance for Power Systems Virtual Server-Toronot01

Instances are connected to the services defined in your resources list. Here you can select your machine configuration, boot image, volumes, and network interfaces.

Instance name:

Number of instances: 1

VM pinning: Off

SSH key

You must add a public SSH key to securely connect to your Power Systems Virtual Server. For more information, see obtaining a public key.

SSH keys: Choose a SSH Key

Boot image

Select from AIX, IBM i, or Linux boot images. If you are deploying a Linux virtual machine (VM), you must first purchase a subscription, then register it and register with your Linux vendor after deployment. Learn more about purchasing and subscribing to Linux

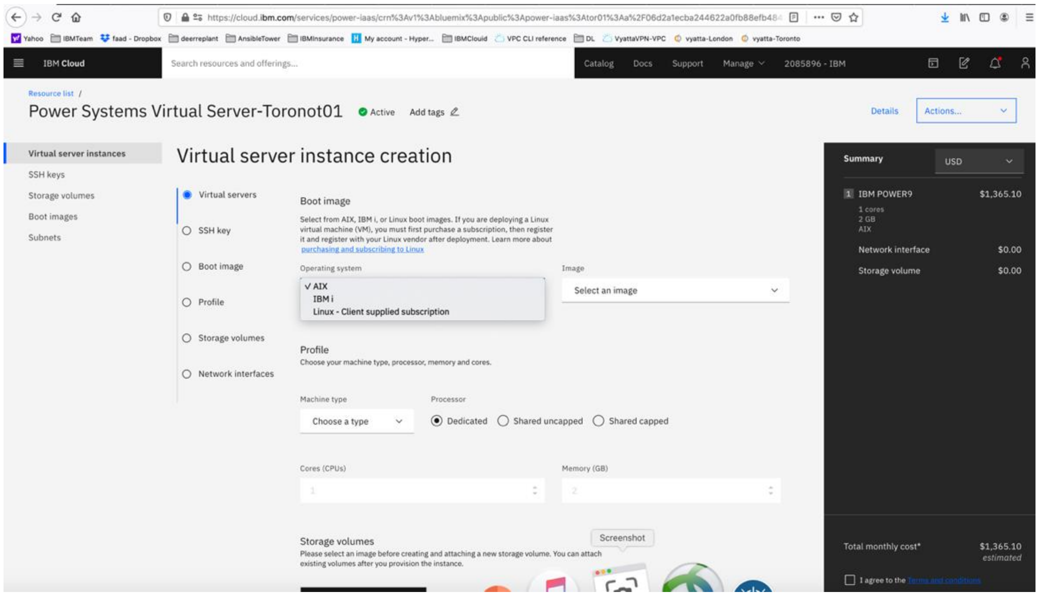
Operating system

| Summary | USD |
|---|---|
| 1 IBM POWER9<br>1 cores<br>2 GB | $1,289.98 |
| Network interface | $0.00 |
| Storage volume | $0.00 |
| Total monthly cost* | $1,289.98<br>estimated |

□ I agree to the Terms and conditions

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. You will need to create a password via the OS command.

Scroll down to choose other options.



Power Systems Virtual Server-Toronot01 Active Add tags

Virtual server instance creation

Boot image

Select from AIX, IBM i, or Linux boot images. If you are deploying a Linux virtual machine (VM), you must first purchase a subscription, then register it and register with your Linux vendor after deployment. Learn more about purchasing and subscribing to Linux

Operating system: √ AIX / IBM i / Linux - Client supplied subscription

Image: Select an image

Profile

Choose your machine type, processor, memory and cores.

Machine type: Choose a type

Processor: ● Dedicated ○ Shared uncapped ○ Shared capped

Cores (CPUs): 1

Memory (GB): 2

Storage volumes

Please select an image before creating and attaching a new storage volume. You can attach existing volumes after you provision the instance.

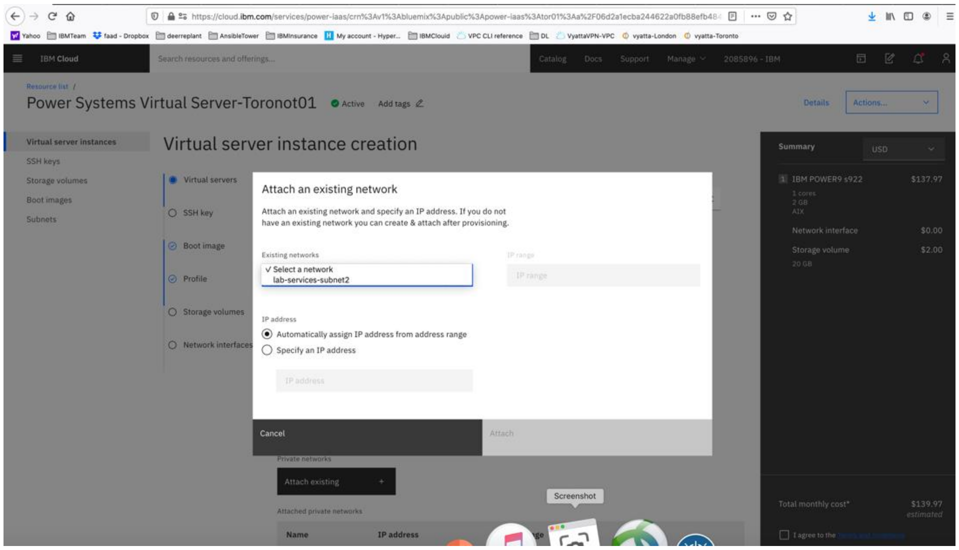
| Summary | USD |
|---|---|
| 1 IBM POWER9<br>1 cores<br>2 GB<br>AIX | $1,365.10 |
| Network interface | $0.00 |
| Storage volume | $0.00 |
| Total monthly cost* | $1,365.10<br>estimated |

□ I agree to the Terms and conditions

Here you will choose the following options:

- *Operating System – AIX or IBM i or any other image you may have imported via the "Boot Image" menu on the left.*
- *Image type: AIX 7.1 or 7.2, etc.*
- *Disk types: Type 1 or 3. Type 3 is a less expensive option which we selected.*
- *Machine type: S922 or E980. S922 is the cheater of the two which we selected.*
- *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" under networks.



Power Systems Virtual Server-Toronot01

Virtual server instance creation

Attach an existing network

Attach an existing network and specify an IP address. If you do not have an existing network you can create & attach after provisioning.

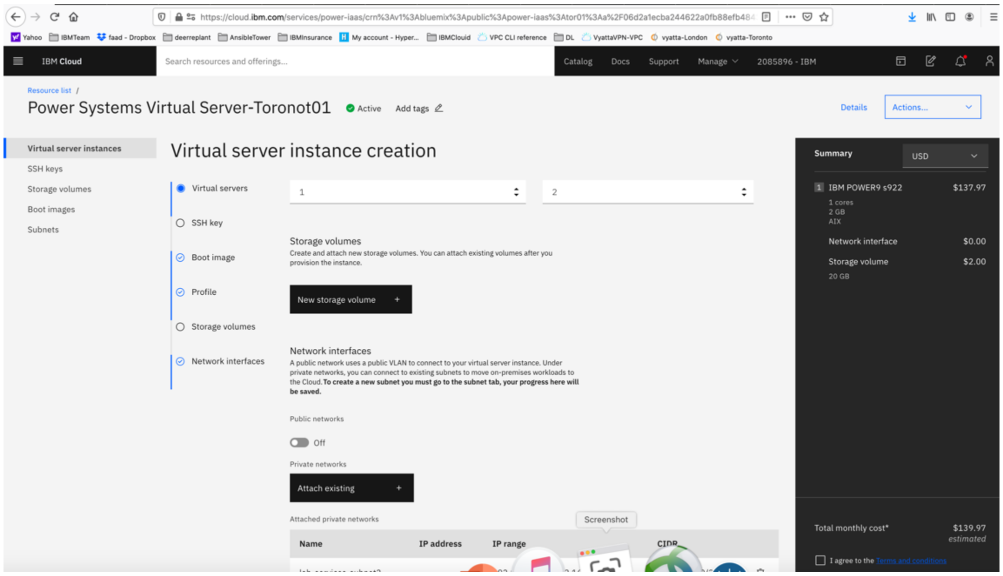
Existing networks: √ Select a network / lab-services-subnet2

IP address

● Automatically assign IP address from address range

○ Specify an IP address

Choose the subnet you wish to attach, and the press “Attach”



Power Systems Virtual Server-Toronot01

Virtual server instance creation

Storage volumes

Create and attach new storage volumes. You can attach existing volumes after you provision the instance.

Network interfaces

A public network uses a public VLAN to connect to your virtual server instance. Under private networks, you can connect to existing subnets to move on-premises workloads to the Cloud. **To create a new subnet you must go to the subnet tab, your progress here will be saved.**

Public networks: Off

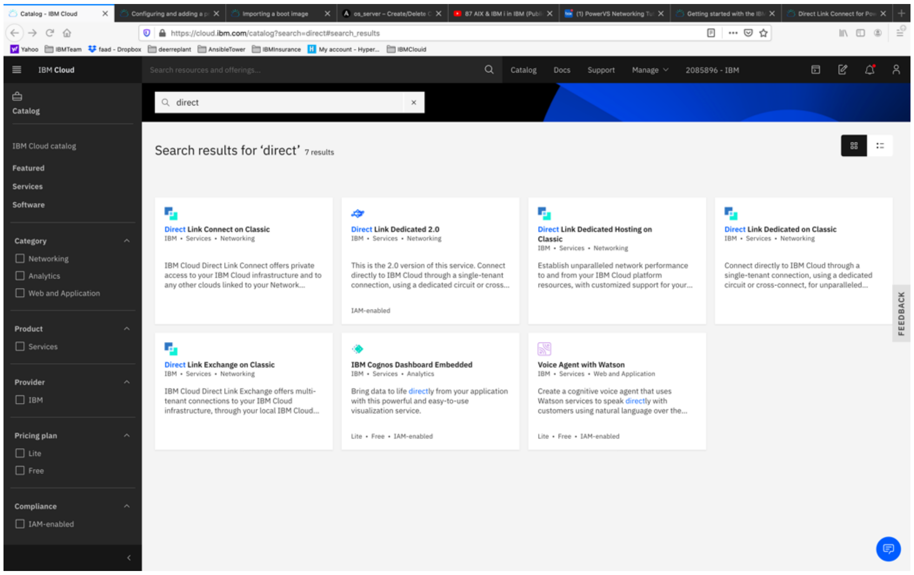
Now check the box “I agree to the ….” And press “create Instance” in lower right-hand side.
Your VSI is now being provisioned.

### *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".



direct

Search results for 'direct' 7 results

**Direct Link Connect on Classic**
IBM • Services • Networking
IBM Cloud Direct Link Connect offers private access to your IBM Cloud infrastructure and to any other clouds linked to your Network...

**Direct Link Dedicated 2.0**
IBM • Services • Networking
This is the 2.0 version of this service. Connect directly to IBM Cloud through a single-tenant connection, using a dedicated circuit or cross...
IAM-enabled

**Direct Link Dedicated Hosting on Classic**
IBM • Services • Networking
Establish unparalleled network performance to and from your IBM Cloud platform resources, with customized support for your...

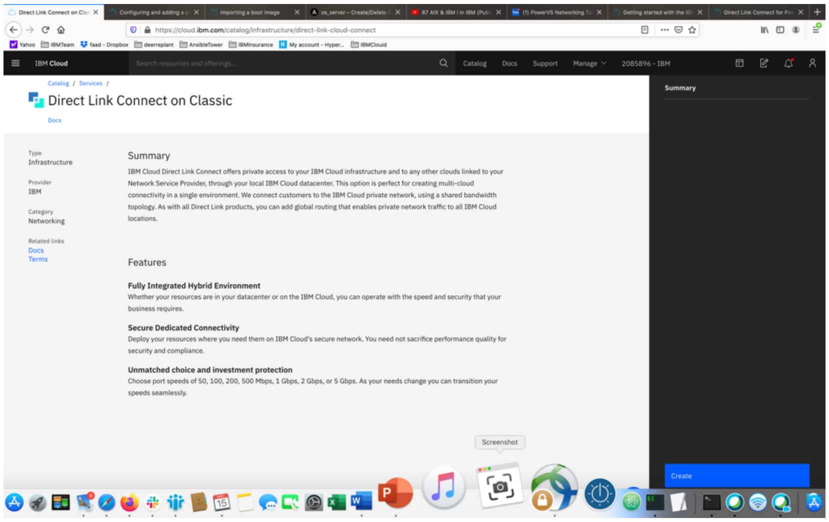
**Direct Link Dedicated on Classic**
IBM • Services • Networking
Connect directly to IBM Cloud through a single-tenant connection, using a dedicated circuit or cross-connect, for unparalleled...

**Direct Link Exchange on Classic**
IBM • Services • Networking
IBM Cloud Direct Link Exchange offers multi-tenant connections to your IBM Cloud infrastructure, through your local IBM Cloud...

**IBM Cognos Dashboard Embedded**
IBM • Services • Analytics
Bring data to life directly from your application with this powerful and easy-to-use visualization service.
Lite • Free • IAM-enabled

**Voice Agent with Watson**
IBM • Services • Web and Application
Create a cognitive voice agent that uses Watson services to speak directly with customers using natural language over the...
Lite • Free • IAM-enabled

Select "Direct Link Connect on Classic".



https://cloud.ibm.com/catalog/infrastructure/direct-link-cloud-connect
IBM Cloud
Search resources and offerings...
Catalog
Docs
Support
Manage
2085896 - IBM
Catalog / Services /
Summary
Screenshot
Create

Direct Link Connect on Classic

Docs

Type
Infrastructure

Provider
IBM

Category
Networking

Related links
Docs
Terms

Summary

IBM Cloud Direct Link Connect offers private access to your IBM Cloud infrastructure and to any other clouds linked to your Network Service Provider, through your local IBM Cloud datacenter. This option is perfect for creating multi-cloud connectivity in a single environment. We connect customers to the IBM Cloud private network, using a shared bandwidth topology. As with all Direct Link products, you can add global routing that enables private network traffic to all IBM Cloud locations.

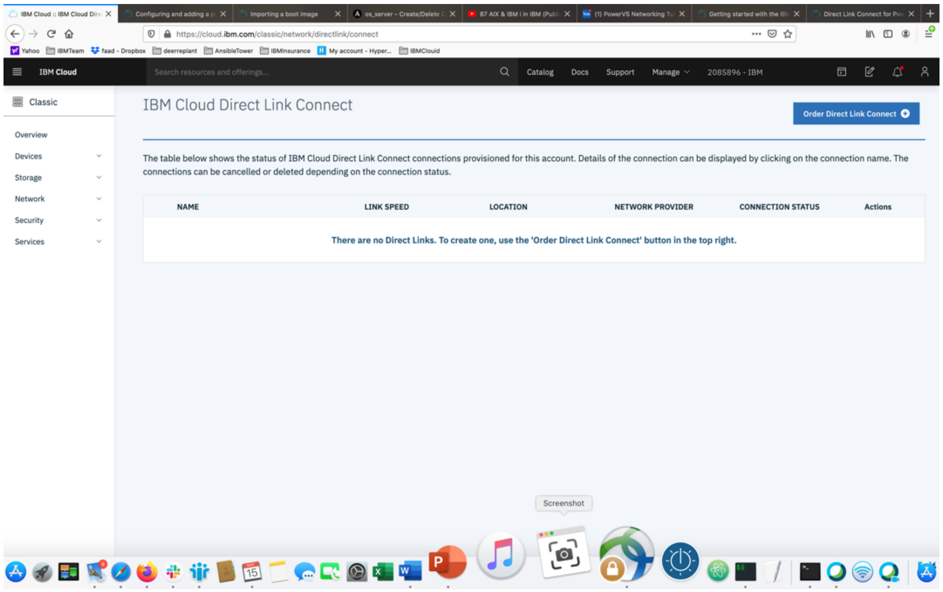
Features

**Fully Integrated Hybrid Environment**
Whether your resources are in your datacenter or on the IBM Cloud, you can operate with the speed and security that your business requires.

**Secure Dedicated Connectivity**
Deploy your resources where you need them on IBM Cloud's secure network. You need not sacrifice performance quality for security and compliance.

**Unmatched choice and investment protection**
Choose port speeds of 50, 100, 200, 500 Mbps, 1 Gbps, 2 Gbps, or 5 Gbps. As your needs change you can transition your speeds seamlessly.

Press “Create”. There are no options to select.



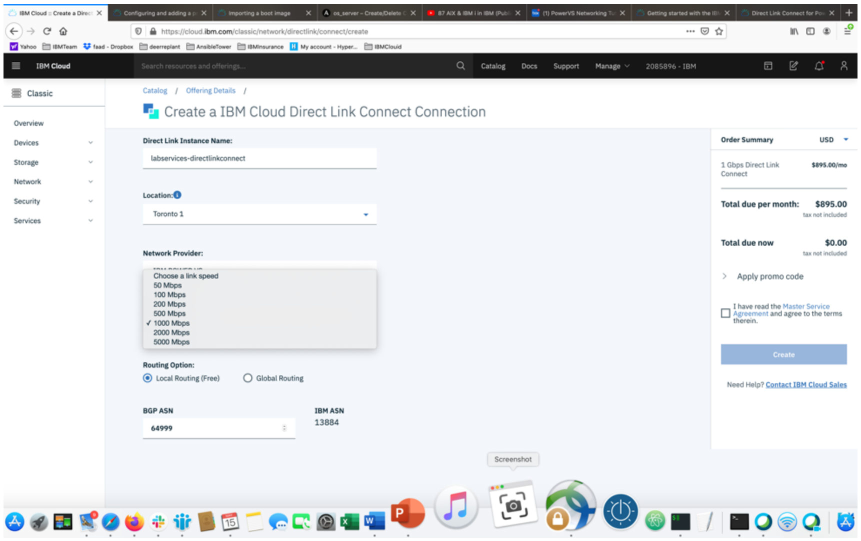
https://cloud.ibm.com/classic/network/directlink/connect
IBM Cloud
Search resources and offerings...
Catalog
Docs
Support
Manage
2085896 - IBM
Classic
Overview
Devices
Storage
Network
Security
Services
Order Direct Link Connect
Screenshot

IBM Cloud Direct Link Connect

The table below shows the status of IBM Cloud Direct Link Connect connections provisioned for this account. Details of the connection can be displayed by clicking on the connection name. The connections can be cancelled or deleted depending on the connection status.

| NAME | LINK SPEED | LOCATION | NETWORK PROVIDER | CONNECTION STATUS | Actions |
|---|---|---|---|---|---|
| There are no Direct Links. To create one, use the 'Order Direct Link Connect' button in the top right. | | | | | |

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



Create a IBM Cloud Direct Link Connect Connection

Direct Link Instance Name: labservices-directlinkconnect

Location: Toronto 1

Network Provider:

- Choose a link speed
- 50 Mbps
- 100 Mbps
- 200 Mbps
- 500 Mbps
- ✓ 1000 Mbps
- 2000 Mbps
- 5000 Mbps

Routing Option: ● Local Routing (Free) ○ Global Routing

BGP ASN: 64999

IBM ASN: 13884

| Order Summary | USD |
|---|---|
| 1 Gbps Direct Link Connect | $895.00/mo |
| Total due per month: | $895.00<br>tax not included |
| Total due now | $0.00<br>tax not included |

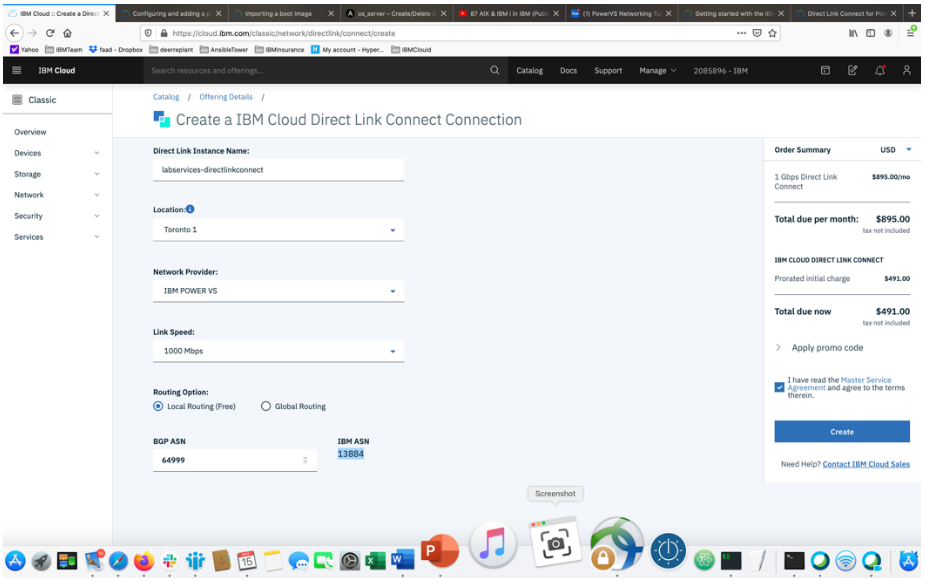
□ I have read the Master Service Agreement and agree to the terms therein.

https://cloud.ibm.com/classic/network/directlink/connect/create
IBM Cloud
Search resources and offerings...
Catalog
Docs
Support
Manage
2085896 - IBM
Classic
Overview
Devices
Storage
Network
Security
Services
Catalog / Offering Details /
Apply promo code
Create
Need Help? Contact IBM Cloud Sales
Screenshot

- *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 Vaytta Gateway in each PowerVS location and provision a GRE tunnel end-to-end.



Create a IBM Cloud Direct Link Connect Connection

Direct Link Instance Name: labservices-directlinkconnect

Location: Toronto 1

Network Provider: IBM POWER VS

Link Speed: 1000 Mbps

Routing Option: ● Local Routing (Free) ○ Global Routing

BGP ASN: 64999

IBM ASN: 13884

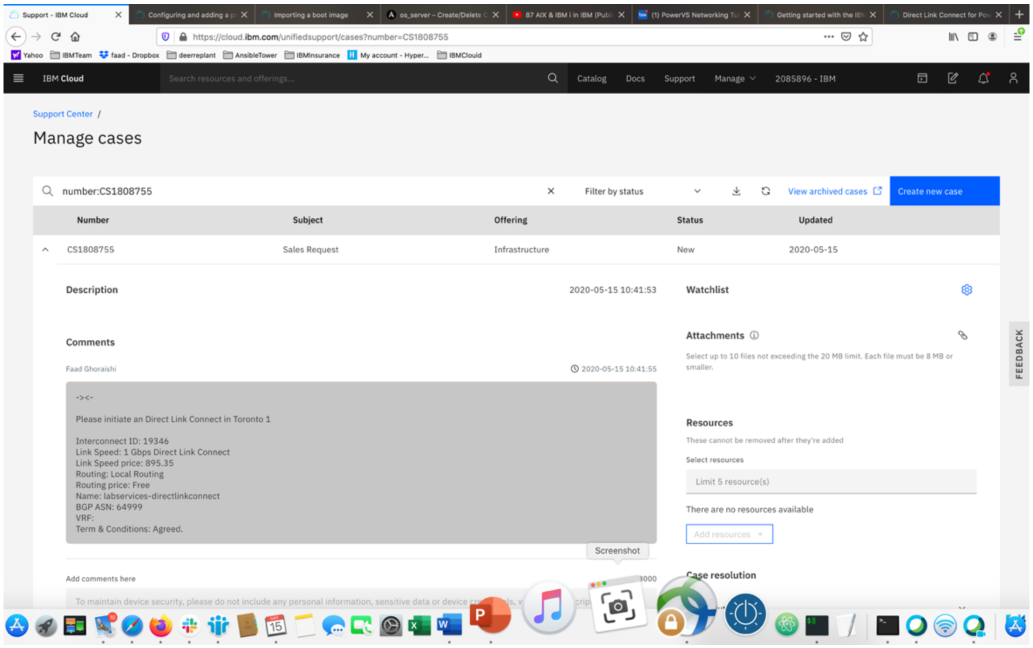
Order Summary USD

| | |
|---|---|
| 1 Gbps Direct Link Connect | $895.00/mo |
| Total due per month: | $895.00 |
| IBM CLOUD DIRECT LINK CONNECT | |
| Prorated initial charge | $491.00 |
| Total due now | $491.00 |

☑ I have read the Master Service Agreement and agree to the terms therein.

- *Check the box to accept the offer and press "Create"*

*A support case will be opened with the information required.*



Manage cases

| Number | Subject | Offering | Status | Updated |
|---|---|---|---|---|
| CS1808755 | Sales Request | Infrastructure | New | 2020-05-15 |

Description 2020-05-15 10:41:53

Comments

Faad Ghoraishi 2020-05-15 10:41:55

```
-><-

Please initiate an Direct Link Connect in Toronto 1

Interconnect ID: 19346
Link Speed: 1 Gbps Direct Link Connect
Link Speed price: 895.35
Routing: Local Routing
Routing price: Free
Name: labservices-directlinkconnect
BGP ASN: 64999
VRF:
Term & Conditions: Agreed.
```

*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.*

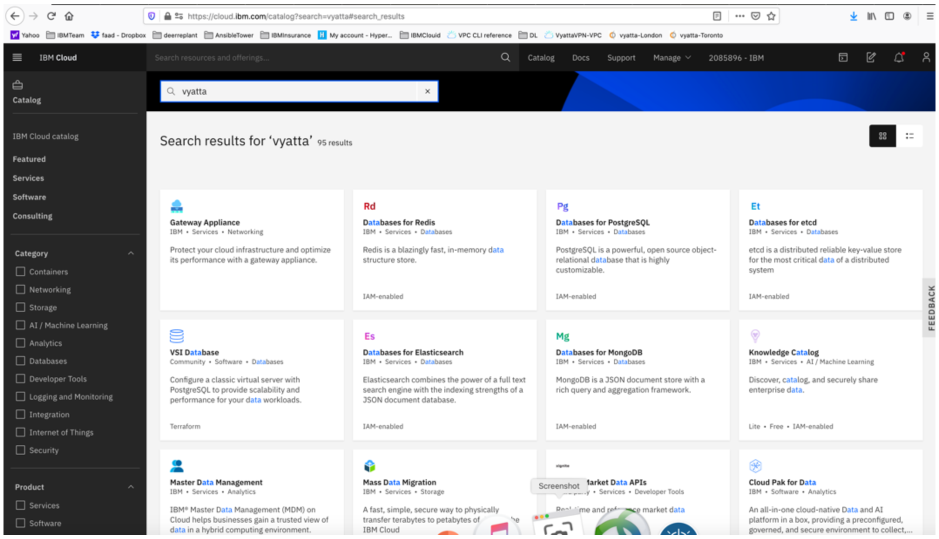
*After this step is complete, support will request that you open a new IBM support ticket and address it to the Power System. Include the information in the original DL ticket. This new ticket will be sent to the PowerVS location support to configure their side of the DL connection.*

*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 datacenter*

In our scenarios we used two Vyatta Gateways, one in each PowerVS location to provide end-to-end PowerVS location-to-PowerVS location communication using GRE tunnels.

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



Search results for 'vyatta' 95 results

**Gateway Appliance**
IBM • Services • Networking
Protect your cloud infrastructure and optimize its performance with a gateway appliance.

**Databases for Redis**
IBM • Services • Databases
Redis is a blazingly fast, in-memory data structure store.
IAM-enabled

**Databases for PostgreSQL**
IBM • Services • Databases
PostgreSQL is a powerful, open source object-relational database that is highly customizable.
IAM-enabled

**Databases for etcd**
IBM • Services • Databases
etcd is a distributed reliable key-value store for the most critical data of a distributed system
IAM-enabled

**VSI Database**
Community • Software • Databases
Configure a classic virtual server with PostgreSQL to provide scalability and performance for your data workloads.
Terraform

**Databases for Elasticsearch**
IBM • Services • Databases
Elasticsearch combines the power of a full text search engine with the indexing strengths of a JSON document database.
IAM-enabled

**Databases for MongoDB**
IBM • Services • Databases
MongoDB is a JSON document store with a rich query and aggregation framework.
IAM-enabled

**Knowledge Catalog**
IBM • Services • AI / Machine Learning
Discover, catalog, and securely share enterprise data.
Lite • Free • IAM-enabled

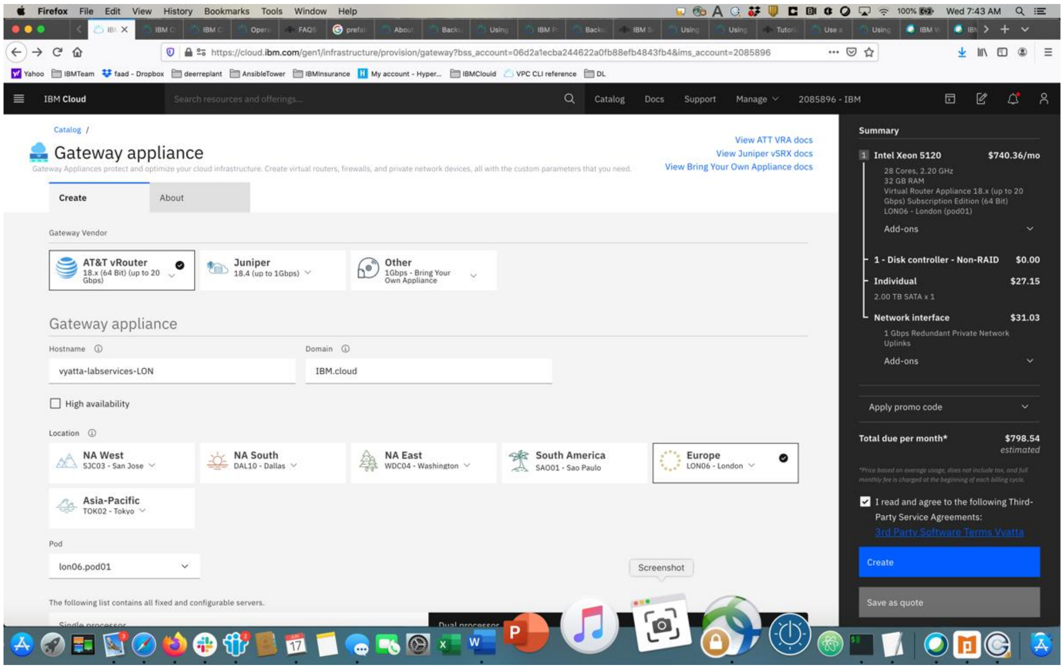
**Master Data Management**
IBM • Services • Analytics
IBM® Master Data Management (MDM) on Cloud helps businesses gain a trusted view of data in a hybrid computing environment.

**Mass Data Migration**
IBM • Services • Storage
A fast, simple, secure way to physically transfer terabytes to petabytes of the IBM Cloud

**Market Data APIs**
Services • Developer Tools
Real-time and reference market data

**Cloud Pak for Data**
IBM • Software • Analytics
An all-in-one cloud-native Data and AI platform in a box, providing a preconfigured, governed, and secure environment to collect,...

Select "Gateway Appliance" and click on it.



Catalog /

Gateway appliance

Gateway Appliances protect and optimize your cloud infrastructure. Create virtual routers, firewalls, and private network devices, all with the custom parameters that you need.

View ATT VRA docs
View Juniper vSRX docs
View Bring Your Own Appliance docs

Create | About

Gateway Vendor

- ● AT&T vRouter — 18.x (64 Bit) (up to 20 Gbps)
- Juniper — 18.4 (up to 1Gbps)
- Other — 1Gbps - Bring Your Own Appliance

Gateway appliance

Hostname: vyatta-labservices-LON
Domain: IBM.cloud

□ High availability

Location

- NA West — SJC03 - San Jose
- NA South — DAL10 - Dallas
- NA East — WDC04 - Washington
- South America — SAO01 - Sao Paulo
- ● Europe — LON06 - London
- Asia-Pacific — TOK02 - Tokyo

Pod: lon06.pod01

The following list contains all fixed and configurable servers.

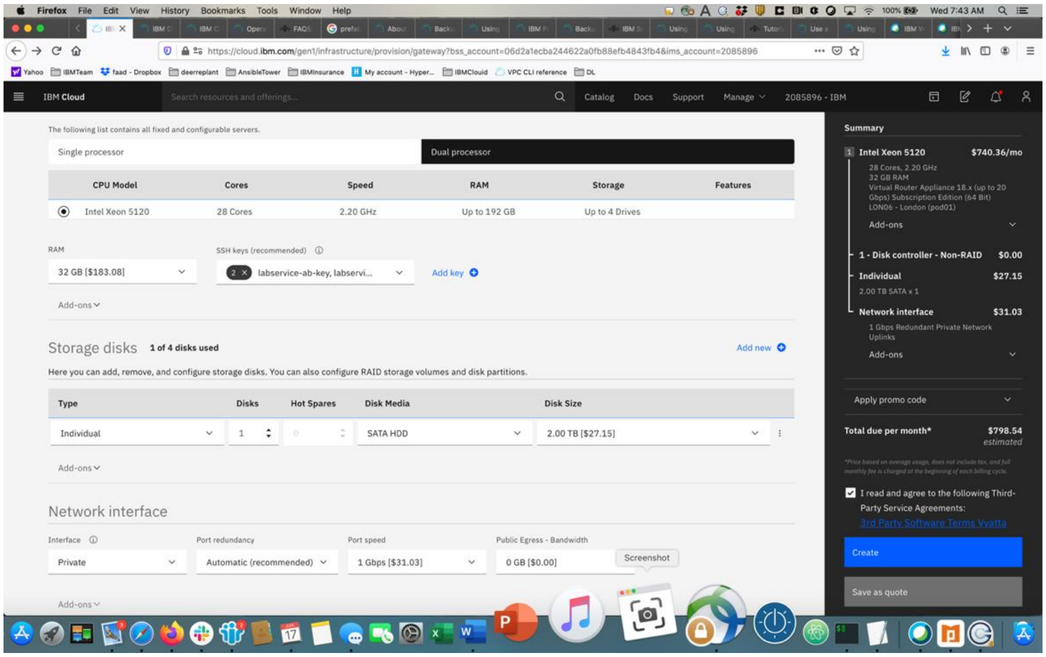
Summary

| | |
|---|---|
| 1 Intel Xeon 5120 | $740.36/mo |
| 28 Cores, 2.20 GHz<br>32 GB RAM<br>Virtual Router Appliance 18.x (up to 20 Gbps) Subscription Edition (64 Bit)<br>LON06 - London (pod01) | |
| 1 - Disk controller - Non-RAID | $0.00 |
| Individual<br>2.00 TB SATA x 1 | $27.15 |
| Network interface<br>1 Gbps Redundant Private Network Uplinks | $31.03 |
| Total due per month* | $798.54 estimated |

*Price based on average usage, does not include tax, and full monthly fee is charged at the beginning of each billing cycle.

☑ I read and agree to the following Third-Party Service Agreements: 3rd Party Software Terms Vyatta

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.



The following list contains all fixed and configurable servers.

Single processor | Dual processor

| | CPU Model | Cores | Speed | RAM | Storage | Features |
|---|---|---|---|---|---|---|
| ● | Intel Xeon 5120 | 28 Cores | 2.20 GHz | Up to 192 GB | Up to 4 Drives | |

RAM: 32 GB [$183.08]
SSH keys (recommended): 2 × labservice-ab-key, labservi...

Storage disks 1 of 4 disks used

Here you can add, remove, and configure storage disks. You can also configure RAID storage volumes and disk partitions.

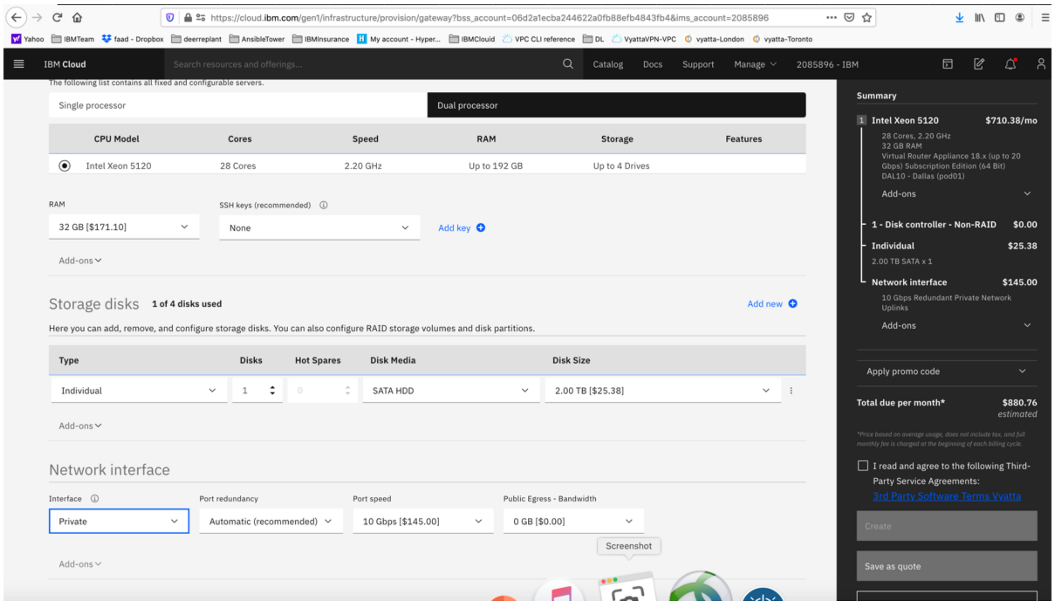
| Type | Disks | Hot Spares | Disk Media | Disk Size |
|---|---|---|---|---|
| Individual | 1 | 0 | SATA HDD | 2.00 TB [$27.15] |

Network interface

Interface: Private
Port redundancy: Automatic (recommended)
Port speed: 1 Gbps [$31.03]
Public Egress - Bandwidth: 0 GB [$0.00]

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.*



The following list contains all fixed and configurable servers.

Single processor | Dual processor

| | CPU Model | Cores | Speed | RAM | Storage | Features |
|---|---|---|---|---|---|---|
| ● | Intel Xeon 5120 | 28 Cores | 2.20 GHz | Up to 192 GB | Up to 4 Drives | |

RAM: 32 GB [$171.10]

SSH keys (recommended): None

Add key

Add-ons

Storage disks 1 of 4 disks used

Add new

Here you can add, remove, and configure storage disks. You can also configure RAID storage volumes and disk partitions.

| Type | Disks | Hot Spares | Disk Media | Disk Size |
|---|---|---|---|---|
| Individual | 1 | 0 | SATA HDD | 2.00 TB [$25.38] |

Add-ons

Network interface

Interface: Private

Port redundancy: Automatic (recommended)

Port speed: 10 Gbps [$145.00]

Public Egress - Bandwidth: 0 GB [$0.00]

Add-ons

Summary

| | |
|---|---|
| 1 Intel Xeon 5120 | $710.38/mo |
| 28 Cores, 2.20 GHz<br>32 GB RAM<br>Virtual Router Appliance 18.x (up to 20 Gbps) Subscription Edition (64 Bit)<br>DAL10 - Dallas (pod01) | |
| Add-ons | |
| 1 - Disk controller - Non-RAID | $0.00 |
| Individual<br>2.00 TB SATA x 1 | $25.38 |
| Network interface<br>10 Gbps Redundant Private Network Uplinks | $145.00 |
| Add-ons | |

Apply promo code

Total due per month* $880.76 *estimated*

**Price based on average usage, does not include tax, and full monthly fee is charged at the beginning of each billing cycle.*

□ I read and agree to the following Third-Party Service Agreements:
3rd Party Software Terms Vyatta

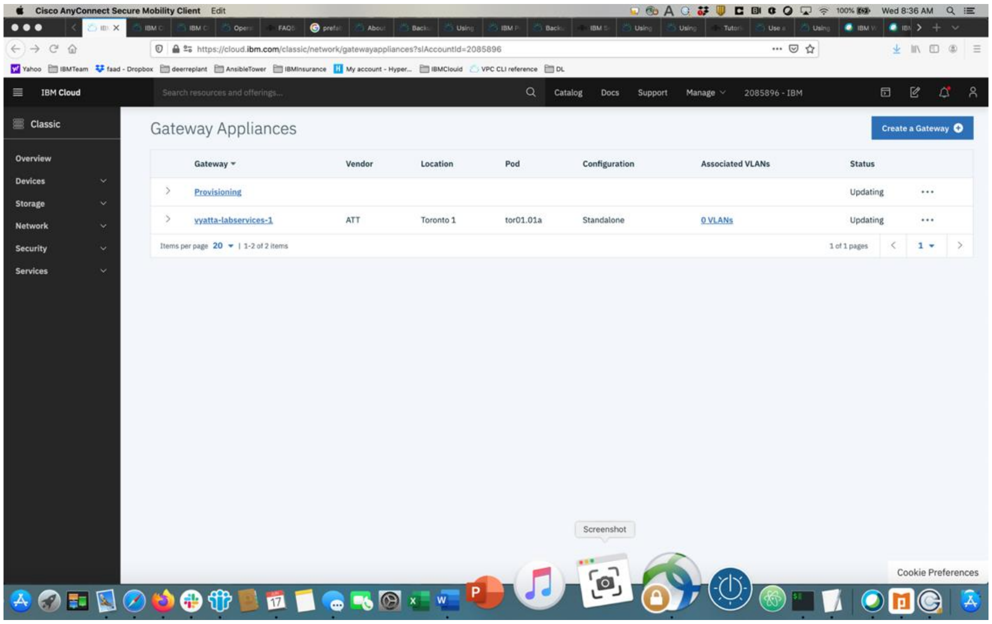
Create

Save as quote

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.



https://cloud.ibm.com/classic/network/gatewayappliances?slAccountId=2085896

Gateway Appliances

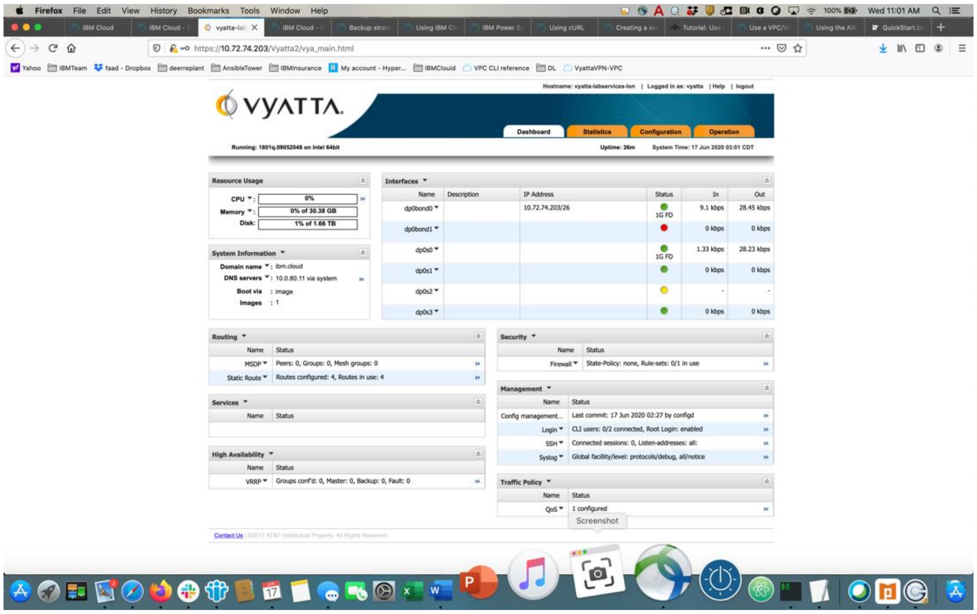
| Gateway | Vendor | Location | Pod | Configuration | Associated VLANs | Status |
|---|---|---|---|---|---|---|
| Provisioning | | | | | | Updating |
| vyatta-labservices-1 | ATT | Toronto 1 | tor01.01a | Standalone | 0 VLANs | Updating |

Items per page 20 | 1-2 of 2 items — 1 of 1 pages

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.



https://10.72.74.203/Vyatta2/vya_main.html

Hostname: vyatta-labservices-lon | Logged in as: vyatta | Help | logout

Running: 1801q.09052048 on Intel 64bit    Uptime: 26m    System Time: 17 Jun 2020 03:01 CDT

Resource Usage
CPU: 0%
Memory: 0% of 30.38 GB
Disk: 1% of 1.66 TB

System Information
Domain name: ibm.cloud
DNS servers: 10.0.80.11 via system
Boot via: image
Images: 1

Interfaces

| Name | Description | IP Address | Status | In | Out |
|---|---|---|---|---|---|
| dp0bond0 | | 10.72.74.203/26 | ● 1G FD | 9.1 kbps | 28.45 kbps |
| dp0bond1 | | | ● | 0 kbps | 0 kbps |
| dp0s0 | | | ● 1G FD | 1.33 kbps | 28.23 kbps |
| dp0s1 | | | ● | 0 kbps | 0 kbps |
| dp0s2 | | | ● | - | - |
| dp0s3 | | | ● | 0 kbps | 0 kbps |

Routing

| Name | Status |
|---|---|
| MSDP | Peers: 0, Groups: 0, Mesh groups: 0 |
| Static Route | Routes configured: 4, Routes in use: 4 |

Services

| Name | Status |
|---|---|

High Availability

| Name | Status |
|---|---|
| VRRP | Groups conf'd: 0, Master: 0, Backup: 0, Fault: 0 |

Security

| Name | Status |
|---|---|
| Firewall | State-Policy: none, Rule-sets: 0/1 in use |

Management

| Name | Status |
|---|---|
| Config management... | Last commit: 17 Jun 2020 02:27 by configd |
| Login | CLI users: 0/2 connected, Root Login: enabled |
| SSH | Connected sessions: 0, Listen-addresses: all: |
| Syslog | Global facility/level: protocols/debug, all/notice |

Traffic Policy

| Name | Status |
|---|---|
| QoS | 1 configured |

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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:

```
In Tor01 to POWERVS LOCATION GRE:
Your destination should be 10.254.0.30
Your tunnel ip 172.20.8.1
Power-PowerVS location-Side:
Tor01: interface Tunnel5
description IBM5-GRE
vrf forwarding IBM5
ip address 172.20.8.2 255.255.255.252
keepalive 5 3
tunnel source 10.254.0.30
tunnel destination 10.114.118.34
tunnel vrf IBM5
```

LON06:

```
In Lon06 to POWERVS LOCATION GRE:
Your destination should be 10.254.0.26
Your tunnel ip 172.20.2.1
Power-PowerVS location-Side:
Lon06: interface Tunnel4
description IBM3-GRE
vrf forwarding IBM3
ip address 172.20.2.2 255.255.255.252
keepalive 5 3
tunnel source 10.254.0.26
tunnel destination 10.72.74.203
tunnel vrf IBM3
```

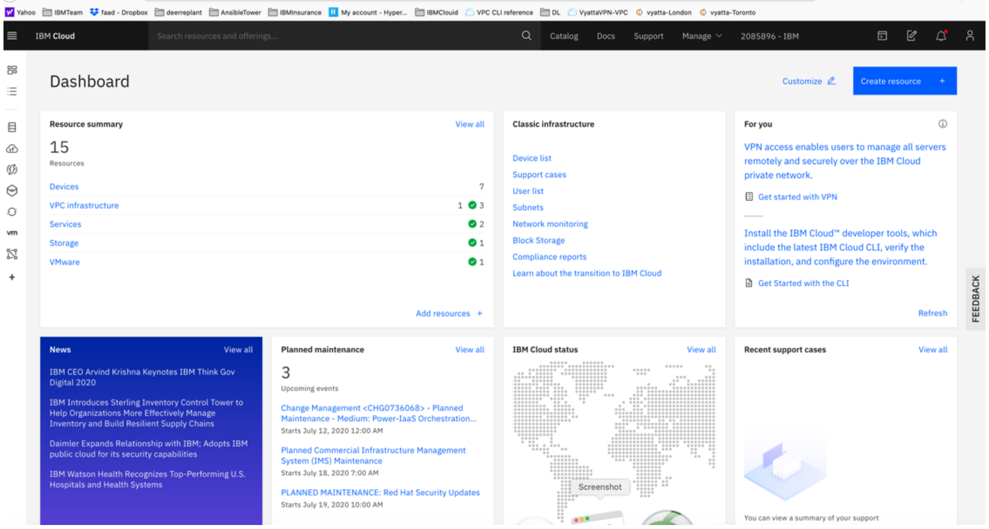
The items shown in Red is what you will need to configure your end of the GRE tunnel in each Vyatta Gateways.

- *Note that your tunnel IP address is 172.20.2.1/30 where 255.255.255.252 translate to /30*
- *Your tunnel destination IP is their tunnel source IP.*
- *Your tunnel source IP is the IP address of the vyatta gateway*

Verify your Vyatta Gateway access.

The Vyatta Gateway address can be find in the IBM Cloud UI under Devices.

Login to IBM Cloud UI and press "IBM Cloud" on top left-hand side.



Dashboard

**Resource summary** View all

15
Resources

| | |
|---|---|
| Devices | 7 |
| VPC infrastructure | 1 ✓ 3 |
| Services | ✓ 2 |
| Storage | ✓ 1 |
| VMware | ✓ 1 |

Add resources +

**Classic infrastructure**

Device list
Support cases
User list
Subnets
Network monitoring
Block Storage
Compliance reports
Learn about the transition to IBM Cloud

**For you**

VPN access enables users to manage all servers remotely and securely over the IBM Cloud private network.

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Get Started with the CLI

Refresh

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**Planned maintenance** View all

3
Upcoming events

Change Management <CHG0736068> - Planned Maintenance - Medium: Power-IaaS Orchestration...
Starts July 12, 2020 12:00 AM

Planned Commercial Infrastructure Management System (IMS) Maintenance
Starts July 18, 2020 7:00 AM

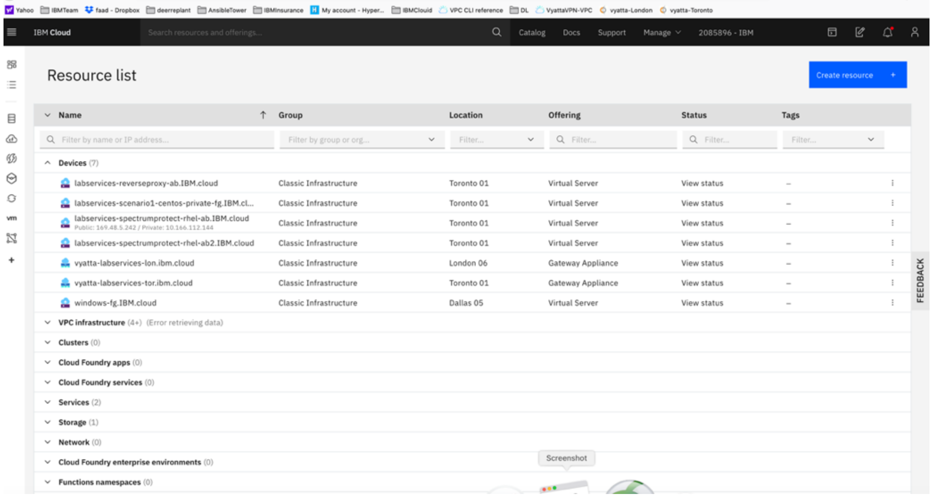
PLANNED MAINTENANCE: Red Hat Security Updates
Starts July 19, 2020 10:00 AM

**IBM Cloud status** View all

**Recent support cases** View all

You can view a summary of your support

Click on "Devices"



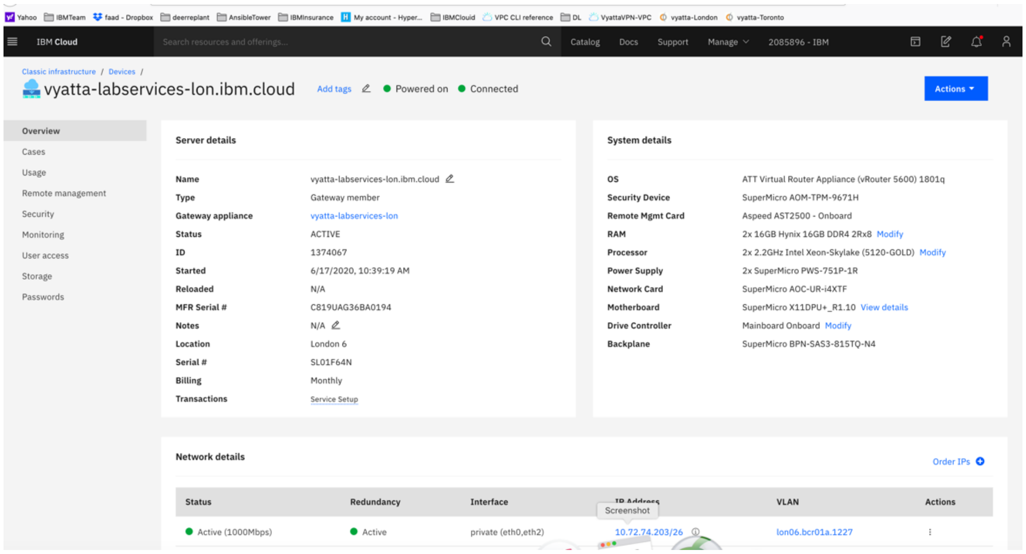
Resource list

| Name | Group | Location | Offering | Status | Tags |
|---|---|---|---|---|---|
| Filter by name or IP address... | Filter by group or org... | Filter... | Filter... | Filter... | Filter... |
| **Devices** (7) | | | | | |
| labservices-reverseproxy-ab.IBM.cloud | Classic Infrastructure | Toronto 01 | Virtual Server | View status | – |
| labservices-scenario1-centos-private-fg.IBM.cl... | Classic Infrastructure | Toronto 01 | Virtual Server | View status | – |
| labservices-spectrumprotect-rhel-ab.IBM.cloud<br>Public: 169.48.5.242 / Private: 10.166.112.144 | Classic Infrastructure | Toronto 01 | Virtual Server | View status | – |
| labservices-spectrumprotect-rhel-ab2.IBM.cloud | Classic Infrastructure | Toronto 01 | Virtual Server | View status | – |
| vyatta-labservices-lon.ibm.cloud | Classic Infrastructure | London 06 | Gateway Appliance | View status | – |
| vyatta-labservices-tor.ibm.cloud | Classic Infrastructure | Toronto 01 | Gateway Appliance | View status | – |
| windows-fg.IBM.cloud | Classic Infrastructure | Dallas 05 | Virtual Server | View status | – |
| **VPC infrastructure** (4+) (Error retrieving data) | | | | | |
| **Clusters** (0) | | | | | |
| **Cloud Foundry apps** (0) | | | | | |
| **Cloud Foundry services** (0) | | | | | |
| **Services** (2) | | | | | |
| **Storage** (1) | | | | | |
| **Network** (0) | | | | | |
| **Cloud Foundry enterprise environments** (0) | | | | | |
| **Functions namespaces** (0) | | | | | |

Choose the Vyatta system you like to configure:

- vyatta-labservices-lon.ibm.cloud
- vyatta-labservices-tor.ibm.cloud

LON06:
Click on the London vyatta: vyatta-labservices-lon.ibm.cloud



vyatta-labservices-lon.ibm.cloud ● Powered on ● Connected

**Server details**

| | |
|---|---|
| Name | vyatta-labservices-lon.ibm.cloud |
| Type | Gateway member |
| Gateway appliance | vyatta-labservices-lon |
| Status | ACTIVE |
| ID | 1374067 |
| Started | 6/17/2020, 10:39:19 AM |
| Reloaded | N/A |
| MFR Serial # | C819UAG36BA0194 |
| Notes | N/A |
| Location | London 6 |
| Serial # | SL01F64N |
| Billing | Monthly |
| Transactions | Service Setup |

**System details**

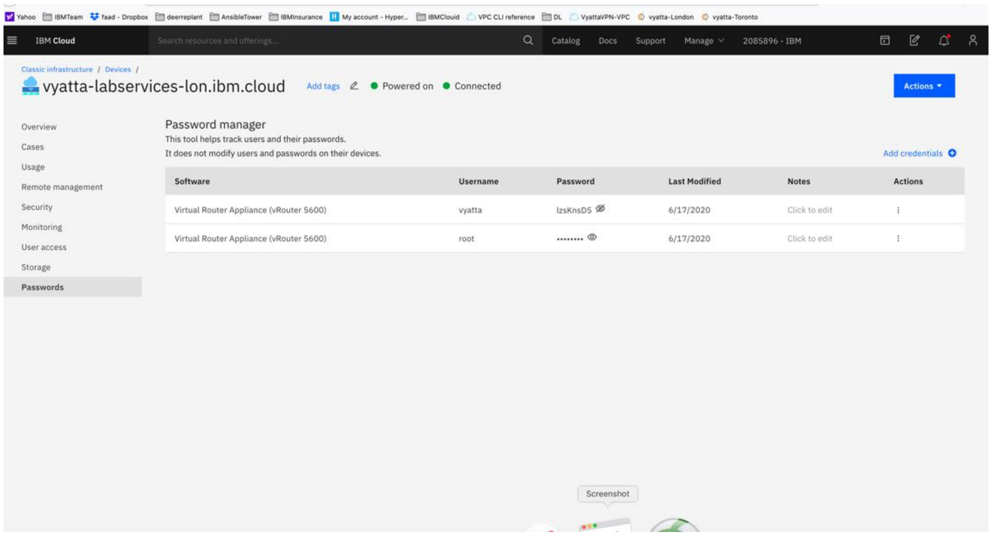
| | |
|---|---|
| OS | ATT Virtual Router Appliance (vRouter 5600) 1801q |
| Security Device | SuperMicro AOM-TPM-9671H |
| Remote Mgmt Card | Aspeed AST2500 - Onboard |
| RAM | 2x 16GB Hynix 16GB DDR4 2Rx8 Modify |
| Processor | 2x 2.2GHz Intel Xeon-Skylake (5120-GOLD) Modify |
| Power Supply | 2x SuperMicro PWS-751P-1R |
| Network Card | SuperMicro AOC-UR-i4XTF |
| Motherboard | SuperMicro X11DPU+_R1.10 View details |
| Drive Controller | Mainboard Onboard Modify |
| Backplane | SuperMicro BPN-SAS3-815TQ-N4 |

**Network details**

| Status | Redundancy | Interface | IP Address | VLAN | Actions |
|---|---|---|---|---|---|
| ● Active (1000Mbps) | ● Active | private (eth0,eth2) | 10.72.74.203/26 | lon06.bcr01a.1227 | ⋮ |

Under the “Network Details” you will see your Vyatta Gateway IP address:

Your credentials are under the “password” menu on the left-hand side. Click on the icon next to the password to see it unencrypted.



vyatta-labservices-lon.ibm.cloud ● Powered on ● Connected

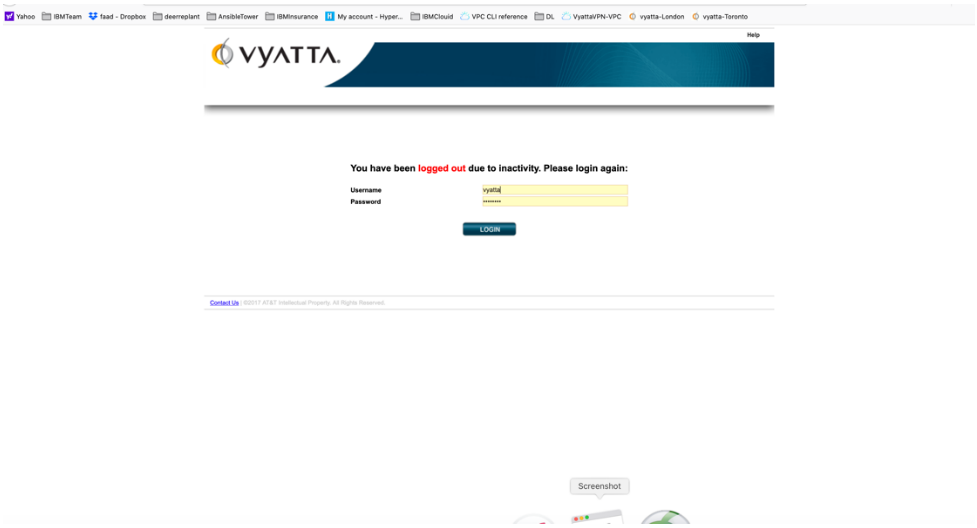
Password manager
This tool helps track users and their passwords.
It does not modify users and passwords on their devices.

| Software | Username | Password | Last Modified | Notes | Actions |
|---|---|---|---|---|---|
| Virtual Router Appliance (vRouter 5600) | vyatta | lzsKnsD5 | 6/17/2020 | Click to edit | ⋮ |
| Virtual Router Appliance (vRouter 5600) | root | •••••••• | 6/17/2020 | Click to edit | ⋮ |

Open a browser and login to the Vyatta Gateway using:

userID: vyatta
Password: as show in the GUI
https://10.72.74.203
ssh vyatta@10.72.74.203

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. This will give you access to IBM Cloud private IPs.



You have been logged out due to inactivity. Please login again:

Username: vyatta
Password: ••••••••

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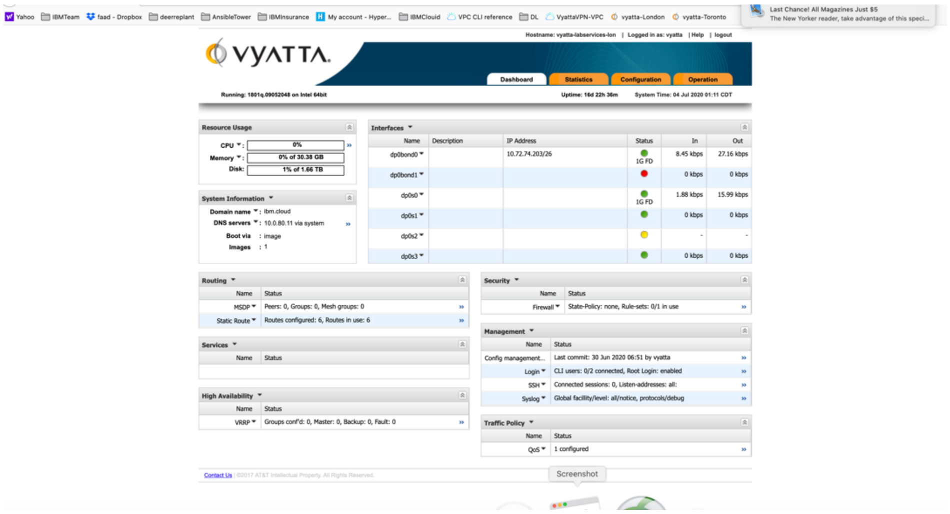
Login with the userID and password.



Hostname: vyatta-labservices-lon | Logged in as: vyatta | Help | logout

Running: 1801q.09052048 on Intel 64bit

Uptime: 16d 22h 36m    System Time: 04 Jul 2020 01:11 CDT

Resource Usage

CPU: 0%
Memory: 0% of 30.38 GB
Disk: 1% of 1.66 TB

System Information

Domain name: ibm.cloud
DNS servers: 10.0.80.11 via system
Boot via: image
Images: 1

Interfaces

| Name | Description | IP Address | Status | In | Out |
|---|---|---|---|---|---|
| dp0bond0 | | 10.72.74.203/26 | 🟢 1G FD | 8.45 kbps | 27.16 kbps |
| dp0bond1 | | | 🔴 | 0 kbps | 0 kbps |
| dp0s0 | | | 🟢 1G FD | 1.88 kbps | 15.99 kbps |
| dp0s1 | | | 🟢 | 0 kbps | 0 kbps |
| dp0s2 | | | 🟡 | - | - |
| dp0s3 | | | 🟢 | 0 kbps | 0 kbps |

Routing

| Name | Status |
|---|---|
| MSDP | Peers: 0, Groups: 0, Mesh groups: 0 |
| Static Route | Routes configured: 6, Routes in use: 6 |

Services

| Name | Status |
|---|---|

High Availability

| Name | Status |
|---|---|
| VRRP | Groups conf'd: 0, Master: 0, Backup: 0, Fault: 0 |

Security

| Name | Status |
|---|---|
| Firewall | State-Policy: none, Rule-sets: 0/1 in use |

Management

| Name | Status |
|---|---|
| Config management... | Last commit: 30 Jun 2020 06:51 by vyatta |
| Login | CLI users: 0/2 connected, Root Login: enabled |
| SSH | Connected sessions: 0, Listen-addresses: all: |
| Syslog | Global facility/level: all/notice, protocols/debug |

Traffic Policy

| Name | Status |
|---|---|
| QoS | 1 configured |

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Now that you have verified you access to the Vyatta Gateways, you will need to now access it via ssh to continue your GRE tunnel provisioning.

## *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

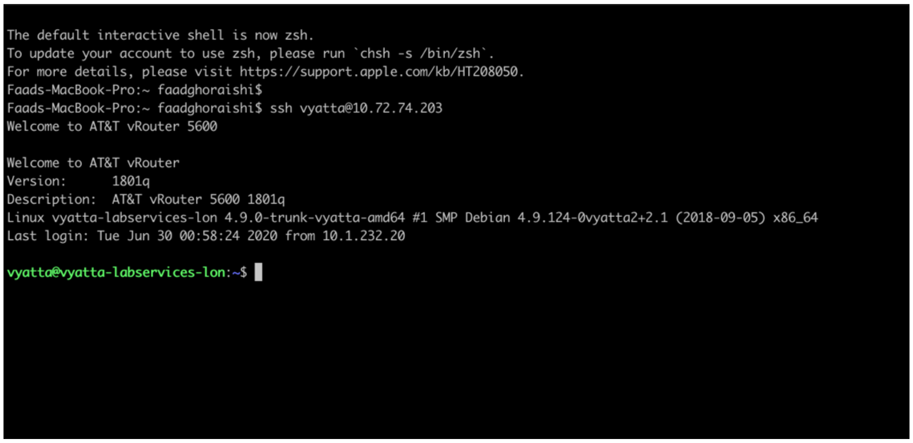
https://cloud.ibm.com/docs/power-iaas?topic=power-iaas-configuring-power

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 vyatta@10.72.74.203
ssh to LON06 Vyatta Gateway.



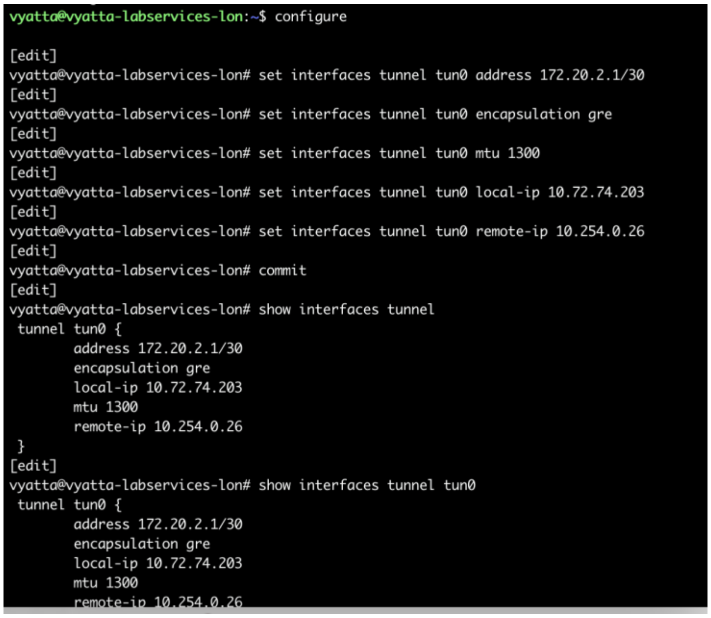
```
The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Faads-MacBook-Pro:~ faadghoraishi$
Faads-MacBook-Pro:~ faadghoraishi$ ssh vyatta@10.72.74.203
Welcome to AT&T vRouter 5600

Welcome to AT&T vRouter
Version:      1801q
Description:  AT&T vRouter 5600 1801q
Linux vyatta-labservices-lon 4.9.0-trunk-vyatta-amd64 #1 SMP Debian 4.9.124-0vyatta2+2.1 (2018-09-05) x86_64
Last login: Tue Jun 30 00:58:24 2020 from 10.1.232.20

vyatta@vyatta-labservices-lon:~$ 
```

We are using the information provided by support for LON06 GRE.

In Lon06 to POWERVS LOCATION GRE:
Your destination should be 10.254.0.26
Your tunnel ip 172.20.2.1
Power-PowerVS location-Side:
Lon06: interface Tunnel4
description IBM3-GRE
vrf forwarding IBM3
ip address 172.20.2.2 255.255.255.252 (172.20.2.2/30)
keepalive 5 3
tunnel source 10.254.0.26
tunnel destination 10.72.74.203
tunnel vrf IBM3

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 10.72.74.203
➢ set interfaces tunnel tun0 remote-ip 10.254.0.26
➢ set interfaces tunnel tun0 encapsulation gre
➢ set interfaces tunnel tun0 mtu 1300
➢ commit
➢ exit
```



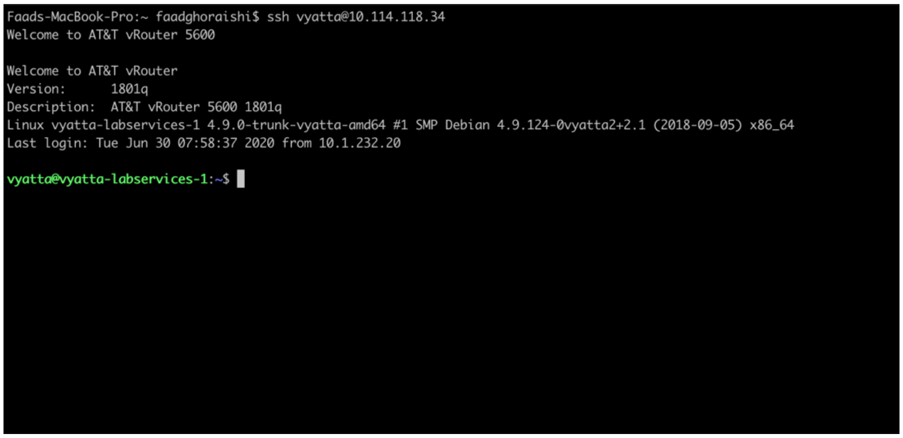
```
vyatta@vyatta-labservices-lon:~$ configure

[edit]
vyatta@vyatta-labservices-lon# set interfaces tunnel tun0 address 172.20.2.1/30
[edit]
vyatta@vyatta-labservices-lon# set interfaces tunnel tun0 encapsulation gre
[edit]
vyatta@vyatta-labservices-lon# set interfaces tunnel tun0 mtu 1300
[edit]
vyatta@vyatta-labservices-lon# set interfaces tunnel tun0 local-ip 10.72.74.203
[edit]
vyatta@vyatta-labservices-lon# set interfaces tunnel tun0 remote-ip 10.254.0.26
[edit]
vyatta@vyatta-labservices-lon# commit
[edit]
vyatta@vyatta-labservices-lon# show interfaces tunnel
 tunnel tun0 {
        address 172.20.2.1/30
        encapsulation gre
        local-ip 10.72.74.203
        mtu 1300
        remote-ip 10.254.0.26
 }
[edit]
vyatta@vyatta-labservices-lon# show interfaces tunnel tun0
 tunnel tun0 {
        address 172.20.2.1/30
        encapsulation gre
        local-ip 10.72.74.203
        mtu 1300
        remote-ip 10.254.0.26
```

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

- *configure*
- *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 vyatta@10.114.118.34
ssh to Tor01 Vyatta Gateway.

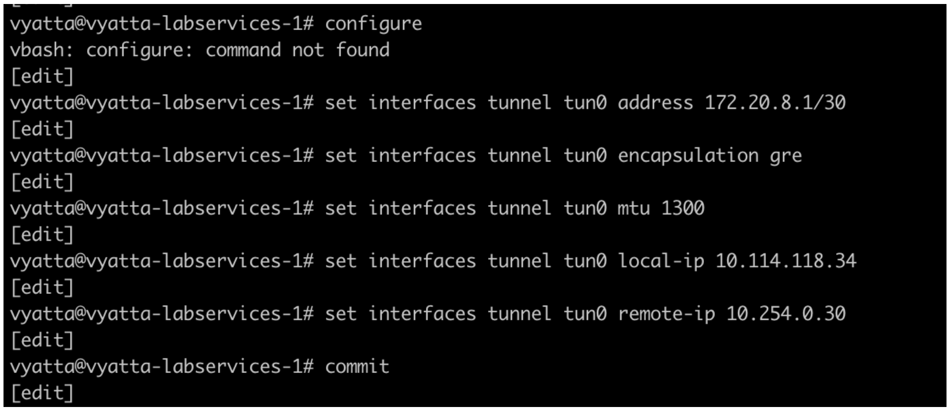


```
Faads-MacBook-Pro:~ faadghoraishi$ ssh vyatta@10.114.118.34
Welcome to AT&T vRouter 5600

Welcome to AT&T vRouter
Version:      1801q
Description:  AT&T vRouter 5600 1801q
Linux vyatta-labservices-1 4.9.0-trunk-vyatta-amd64 #1 SMP Debian 4.9.124-0vyatta2+2.1 (2018-09-05) x86_64
Last login: Tue Jun 30 07:58:37 2020 from 10.1.232.20

vyatta@vyatta-labservices-1:~$
```

In Tor01 to POWERVS LOCATION GRE:
Your destination should be 10.254.0.30
Your tunnel ip 172.20.8.1
Power-PowerVS location-Side:
Tor01: interface Tunnel5
description IBM5-GRE
vrf forwarding IBM5
ip address 172.20.8.2 255.255.255.252
keepalive 5 3
tunnel source 10.254.0.30
tunnel destination 10.114.118.34
tunnel vrf IBM5

Run the following commands:
We have chosen to call our tunnel “tun0” in the Vyatta Gateway same as the other Vyatta Gateway.

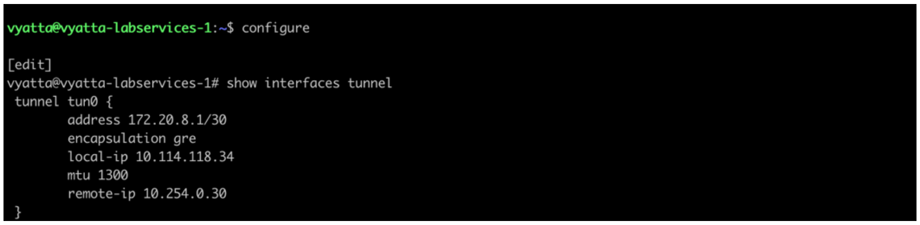
```
➢ configure
➢ set interfaces tunnel tun0 address 172.20.8.1/30
➢ set interfaces tunnel tun0 local-ip 10.114.118.34
➢ set interfaces tunnel tun0 remote-ip 10.254.0.30
➢ set interfaces tunnel tun0 encapsulation gre
➢ set interfaces tunnel tun0 mtu 1300
➢ commit
➢ exit
```



```
vyatta@vyatta-labservices-1# configure
vbash: configure: command not found
[edit]
vyatta@vyatta-labservices-1# set interfaces tunnel tun0 address 172.20.8.1/30
[edit]
vyatta@vyatta-labservices-1# set interfaces tunnel tun0 encapsulation gre
[edit]
vyatta@vyatta-labservices-1# set interfaces tunnel tun0 mtu 1300
[edit]
vyatta@vyatta-labservices-1# set interfaces tunnel tun0 local-ip 10.114.118.34
[edit]
vyatta@vyatta-labservices-1# set interfaces tunnel tun0 remote-ip 10.254.0.30
[edit]
vyatta@vyatta-labservices-1# commit
[edit]
```

To show the status:

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



```
vyatta@vyatta-labservices-1:~$ configure

[edit]
vyatta@vyatta-labservices-1# show interfaces tunnel
 tunnel tun0 {
        address 172.20.8.1/30
        encapsulation gre
        local-ip 10.114.118.34
        mtu 1300
        remote-ip 10.254.0.30
 }
```

### *Setup GRE tunnel between Two Vyatta Gateways*

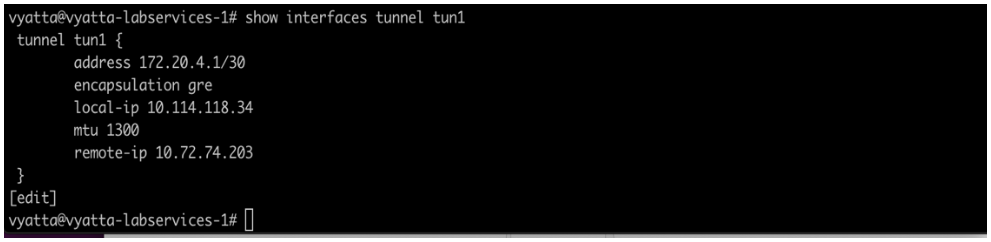
In this section you will setup a new tunnel in each of the two vyatta gateways to allow for cross Vyatta connection via a GRE tunnel.

In this case we choose the tunnel address and tunnel source and destination IPs. The tunnel address can be any IP subnet you choose. We named our tunnel “tun1” in both Vyatta Gateways. We have selected a similar IP as the ones used in the PowerVS location GRE tunnels. We choose a CIDR of /30 since we only need two IP address, one in Tor01 and one in Lon06.

- *In Lon06 Vyatta the GRE Vyatta-to-Vyatta tunnel address is 172.20.4.1/30*
- *In Tor01 Vyatta the GRE Vyatta-to-Vyatta tunnel address is 172.20.4.2/30*
- *Your tunnel destination IP is the IP address of the vyatta gateway in each location*
- *Your tunnel source IP is the IP address of the vyatta gateway in each location*
- *We call the tunnels tun1 in both locations*

TOR01 GRE Configuration:

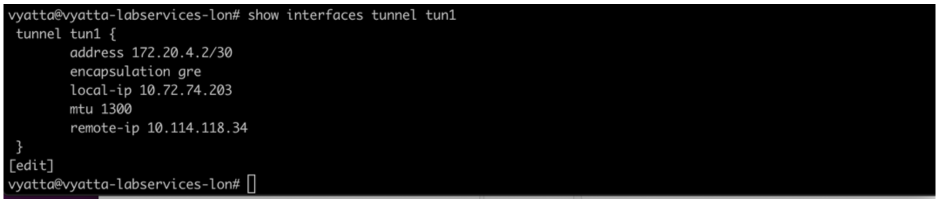
```
configure
set interfaces tunnel tun1 address 172.20.4.1/30
set interfaces tunnel tun1 local-ip 10.114.118.34
set interfaces tunnel tun1 remote-ip 10.72.74.203
set interfaces tunnel tun1 encapsulation gre
set interfaces tunnel tun1 mtu 1300
commit
exit
```



```
vyatta@vyatta-labservices-1# show interfaces tunnel tun1
 tunnel tun1 {
        address 172.20.4.1/30
        encapsulation gre
        local-ip 10.114.118.34
        mtu 1300
        remote-ip 10.72.74.203
 }
[edit]
vyatta@vyatta-labservices-1#
```

LON06 GRE Configuration:

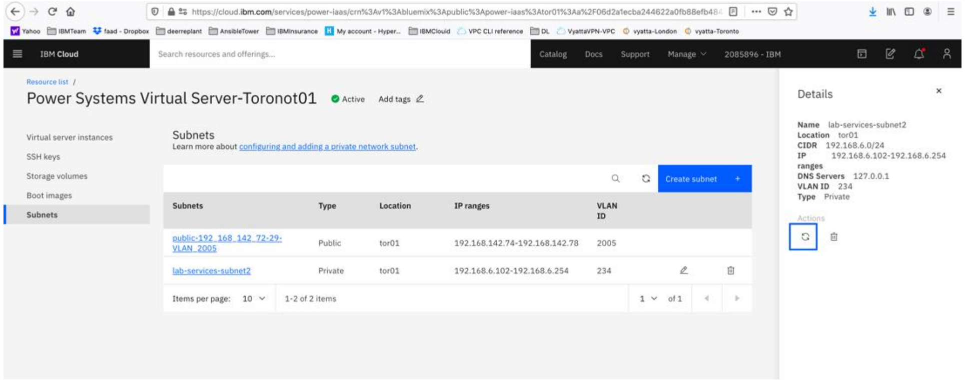
```
configure
set interfaces tunnel tun1 address 172.20.4.2/30
set interfaces tunnel tun1 remote-ip 10.114.118.34
set interfaces tunnel tun1 local-ip 10.72.74.203
set interfaces tunnel tun1 encapsulation gre
set interfaces tunnel tun1 mtu 1300
commit
exit
```



```
vyatta@vyatta-labservices-lon# show interfaces tunnel tun1
 tunnel tun1 {
        address 172.20.4.2/30
        encapsulation gre
        local-ip 10.72.74.203
        mtu 1300
        remote-ip 10.114.118.34
 }
[edit]
vyatta@vyatta-labservices-lon# 
```

The final steps needed is to setup static routes in each Vyatta to point the subnets for our PowerVS location to the right tunnels.

Find the subnets you created in each PowerVS location in TOR01 and LON06 by accessing the services in the IBM Cloud UI for each PowerVS location.



Power Systems Virtual Server-Toronot01 Active Add tags

Subnets

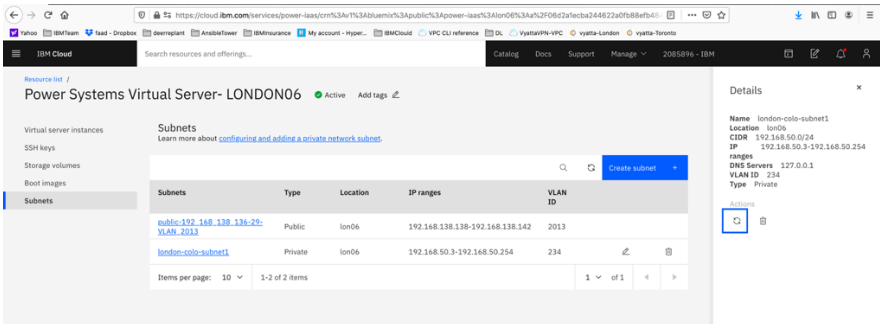
Learn more about configuring and adding a private network subnet.

| Subnets | Type | Location | IP ranges | VLAN ID |
|---|---|---|---|---|
| public-192_168_142_72-29-VLAN_2005 | Public | tor01 | 192.168.142.74-192.168.142.78 | 2005 |
| lab-services-subnet2 | Private | tor01 | 192.168.6.102-192.168.6.254 | 234 |

Items per page: 10 1-2 of 2 items 1 of 1

Details

**Name** lab-services-subnet2
**Location** tor01
**CIDR** 192.168.6.0/24
**IP ranges** 192.168.6.102-192.168.6.254
**DNS Servers** 127.0.0.1
**VLAN ID** 234
**Type** Private



Power Systems Virtual Server- LONDON06 Active Add tags

Subnets

Learn more about configuring and adding a private network subnet.

| Subnets | Type | Location | IP ranges | VLAN ID |
|---|---|---|---|---|
| public-192_168_138_136-29-VLAN_2013 | Public | lon06 | 192.168.138.138-192.168.138.142 | 2013 |
| london-colo-subnet1 | Private | lon06 | 192.168.50.3-192.168.50.254 | 234 |

Items per page: 10 1-2 of 2 items 1 of 1

Details

**Name** london-colo-subnet1
**Location** lon06
**CIDR** 192.168.50.0/24
**IP ranges** 192.168.50.3-192.168.50.254
**DNS Servers** 127.0.0.1
**VLAN ID** 234
**Type** Private

The static routes in LON06 will need to point to the subnets in TOR01 and vis versa.

We will configure both GREs to the PowerVS location and between Vyattas.
Run the following commands in each Vyatta Gateway after login in via ssh using the vyatta userID:

in TOR01 Vyatta:

```
➢ configure
➢ set protocols static route 192.168.6.0/24 next-hop 172.20.8.2
➢ set protocols static route 192.168.50.0/24 next-hop 172.20.4.2
➢ commit
➢ exit
```

in LON06 Vyatta:

```
➢ configure
➢ set protocols static route 192.168.50.0/24 next-hop 172.20.2.2
➢ set protocols static route 192.168.6.0/24 next-hop 172.20.4.1
➢ commit
➢ exit
```

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

If you cannot ping the IBM Cloud VSIs from the PowerVS location VSIs, you will need to open a ticket to address this issue. Support needs to address this from their Cisco Router side.

### *Configure a Reverse-proxy Centos VSI*

We used the official IBM cloud procedure to configure the reverse-proxy server. https://cloud.ibm.com/docs/direct-link?topic=direct-link-using-ibm-cloud-direct-link-to-connect-to-ibm-cloud-object-storage

- *You will need to first provision a Centos VSI in IBM cloud with both public and private interface.*
- *Login to the VSI.*
- *Upgrade your operating system OS (`yum update`).*

- *Install the EPEL repository (yum install epel-release).*
- *Install NginX (yum install nginx).*
- *Start nginx (systemctl start nginx or just nginx)*
- *To allow service to run after reboot:  systemctl enable nginx*

Now Test your nginx deployment:
Open a browser and put in the following URI.

http://<IP address of the Centos VSI>

Now we will customize this nginx deployment to allow COS access.

- *Make a backup of nginx.conf*

- *Replace the nginx.conf with nginx.conf file shown below. Keep the same name: nginx.conf*

https://cloud.ibm.com/docs/direct-link?topic=direct-link-using-ibm-cloud-direct-link-to-connect-to-ibm-cloud-object-storage

- *Generate ssl self-signed keys:*

Login to the Centos vs
cd to root

provide unique value for items in RED.
openssl genrsa -des3 -passout pass:test123abc -out acstest.key 2048

This command will generate a file called acstest.key in your present directory.

Next:
Item in blue  is from the previous command output file name.
Items in red you will need to provide with your own information.

openssl req -new -newkey rsa:2048 -nodes -keyout acstest.key -out acstest.csr

[root@centos-reverseproxy-tor01-fg ~]# openssl req -new -newkey rsa:2048 -nodes -keyout acstest.key -out acstest.csr

```
Generating a 2048 bit RSA private key
...+++
...........................................................................................+++
writing new private key to acstest.key'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields, but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [XX]:us
State or Province Name (full name) []:pa
Locality Name (e.g., city) [Default City]:Philadelphia
Organization Name (e.g., company) [Default Company Ltd]:IBM
Organizational Unit Name (e.g., section) []:labser
Common Name (e.g., your name or your server's hostname) []:centos-
reverseproxy-tor01-fg
Email Address []:faad.ghoraishi@ibm.com

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:test123
An optional company name []:
[root@centos-reverseproxy-tor01-fg ~]#
```

Next:
Items in blue are two files generated from previous command.
Now this command will generate the .crt file which you need.

```
openssl x509 -req -sha256 -days 365 -in acstest.csr -signkey acstest.key -out
acstest.crt
```

```
[root@centos-reverseproxy-tor01-fg ~]# openssl x509 -req -sha256 -days 365 -in
labser.csr -signkey labser.key -out labser.crt
Signature ok
subject=/C=us/ST=pa/L=philadelphia/O=ibm/OU=labser/CN=centos-
reverseproxy-tor01-fg/emailAddress=faad.ghoraishi@ibm.com
          Getting Private key
```

copy these files to location shown in the above link.

- *cp acstest.key /etc/pki/tls*
- *cp acstest.crt /etc/pki/tls*

- *Edit nginx.conf file and add the new acstest.key and acstest.crt file to the path in the file.*
- *Proxy_Path: use the private endpoint of COS at IBM cloud.*
    - *https://s3.private.us-east.cloud-object-storage.appdomain.cloud;*
- *Save the file*

The final nginx.conf looks like this. This file looks different than what is in the above IBM link. We had to add additional fields to make it work for IBM i COS interface via this reverse-proxy. Items shown in Red are the ones which may need to be updated. This also now works for AIX, so we will use this nginx.conf file.

```
user nginx;
worker_processes auto;
error_log /var/log/nginx/error.log;
pid /run/nginx.pid;

events {
   worker_connections 1024;
}

http {
   log_format  main  '$remote_addr - $remote_user [$time_local] "$request" '
                     '$status $body_bytes_sent "$http_referer" '
                     '"$http_user_agent" "$http_x_forwarded_for"';

   access_log  /var/log/nginx/access.log  main;


 sendfile            on;
   tcp_nopush          on;
   tcp_nodelay         on;
   keepalive_timeout   300;
   types_hash_max_size 2048;

   include             /etc/nginx/mime.types;
   default_type        application/octet-stream;
   ssl_session_cache shared:SSL:1m;
   ssl_session_timeout  10m;
   ssl_ciphers HIGH:!aNULL:!MD5;
   ssl_prefer_server_ciphers on;
   proxy_http_version 1.1;
   proxy_buffering off;
   proxy_intercept_errors on;

   # IBM COS Endpoints
   # https://cloud.ibm.com/docs/services/cloud-object-storage/basics?topic=cloud-object-storage-endpoints#select-regions-and-endpoints
   # FRA
   server {
      listen       443 ssl http2;
      server_name  _;
      proxy_buffering off;
      client_body_buffer_size 1100M;
      client_max_body_size 1300M;
       ssl_certificate "/etc/pki/tls/acstest.crt";
      ssl_certificate_key "/etc/pki/tls/acstest.key";
      location / {
      autoindex on;
      autoindex_exact_size off;
      proxy_pass https://s3.private.us-east.cloud-object-storage.appdomain.cloud;
      proxy_set_header Host $host;
      proxy_set_header X-Forwarded-For $remote_addr;
      proxy_http_version 1.1;
      proxy_set_header Connection "";
      }

   }
 }
```

Restart nginx.

- *nginx -t*

  output:
  nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
  nginx: configuration file /etc/nginx/nginx.conf test is successful

```
nginx -s quit; sleep 3; nginx
```

Your Power VSI client can now submit COS requests to the IP or URLs of the NginX (proxy).

You will need to now install aws command line interface on your Power VSI server.

If you Power VSI has public interface then follow this procedure:

https://computingforgeeks.com/how-to-install-and-use-aws-cli-on-linux-ubuntu-debian-centos/

Install AWS CLI on Power VSI using pip:
CentOS 8:

```
sudo dnf install -y python3 python3-pip
sudo pip3 install awscli
```

If your Power VSI does not have public interface then you can follow this procedure to download the awscli zip file.

https://github.com/aws/aws-cli/issues/2543

The steps are:

1. Download the AWS CLI Bundled Installer. Browser to curl can be used.
   $ curl "https://s3.amazonaws.com/aws-cli/awscli-bundle.zip" -o "awscli-bundle.zip"
2. Unzip the package.
   $ unzip awscli-bundle.zip
   Note
   If you don't have unzip, use your Linux distribution's built in package manager to install it.
3. Run the install executable.
   $ sudo ./awscli-bundle/install -i /usr/local/aws -b /usr/local/bin/aws

If you do not have “unzip” installed on your power VSI, then unzip the awscli.zip file first on your Linux or laptop server and use “scp -r” to copy the directory on unzipped awscli to the Power VSI.

```
scp -r <aws dir> root@powerIP:/
```

Follow the installation as shown in the above link.

Now you can issue a S3 commands using the aws cli:

Your COS endpoint is now the reverse-proxy URI;

- *https://<IP address of the Centos VSI>*

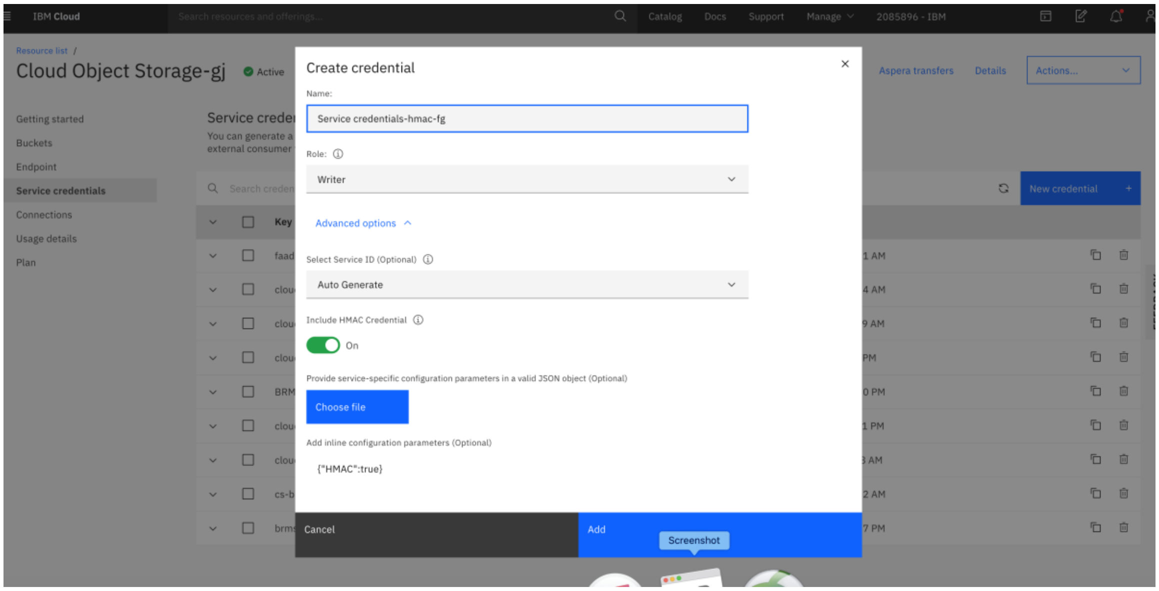
You will also need to setup you aws credential and keys using:

- *aws configure*

You will need to generate a HMAC credential.

https://cloud.ibm.com/docs/cloud-object-storage?topic=cloud-object-storage-uhc-hmac-credentials-main

Enter your credentials from the COS HMAC. Make sure when u create a new credential under Service Credential in COS GUI, you choose Advanced Option and check Include HMAC Credential check box.



Create credential

Name: Service credentials-hmac-fg

Role: Writer

Select Service ID (Optional): Auto Generate

Include HMAC Credential: On

Provide service-specific configuration parameters in a valid JSON object (Optional)

Add inline configuration parameters (Optional)

{"HMAC":true}

The new credential will now show aws credential too which you used above.

```
{
  "apikey": "2x7rTtJuYFuivMKR3C7iP3Mnausq81t6A42GZoNt6FVb",
  "cos_hmac_keys": {
    "access_key_id": "e111daebd3……",
    "secret_access_key": "58f6de7f965ef528edc2e9…21036c8d623de"
  },
  "endpoints": "https://control.cloud-object-
storage.cloud.ibm.com/v2/endpoints",
  "iam_apikey_description": "Auto-generated for key e111daeb-d379-42ff-
aa1e-2c8b6994c71……….
```

}

Our aws was installed in /opt/freeware/bin/. To see a list of Buckets from your Power VSI:

```
/opt/freeware/bin/aws --no-verify-ssl --endpoint-url https://<IP address of the Centos VSI> s3 ls
```

If you get an SSL error, then issue this command instead. Our private interface reverse-proxy ip = 10.166.112.144

```
/opt/freeware/bin/aws --no-verify-ssl --endpoint-url https://10.166.112.144 s3 ls
```

Output

```
/opt/freeware/lib/python2.7/site-packages/urllib3/connectionpool.py:986: InsecureRequestWarning: Unverified HTTPS request is being made to host '169.48.5.242'. Adding certificate verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  InsecureRequestWarning,
2020-05-14 11:30:55 brms-bucket-backupvol
2020-05-19 08:55:33 cloud-object-storage-gj-cos-standard-f1e
2020-06-10 16:00:20 cloud-object-storage-gj-cos-standard-ui4
2020-06-30 02:00:04 cloud-object-storage-gj-cos-standard-xiy-aixos7225
2020-07-02 13:12:05 cloud-object-storage-spectrumprotect-ab3
2020-05-21 10:27:00 cs-brms-02
2020-05-13 09:19:30 faad-bucket-osimages
2020-05-21 09:42:14 os-backups-ab
```

There are many other S3 commands you can issue.

```
/opt/freeware/bin/aws s3 help
```

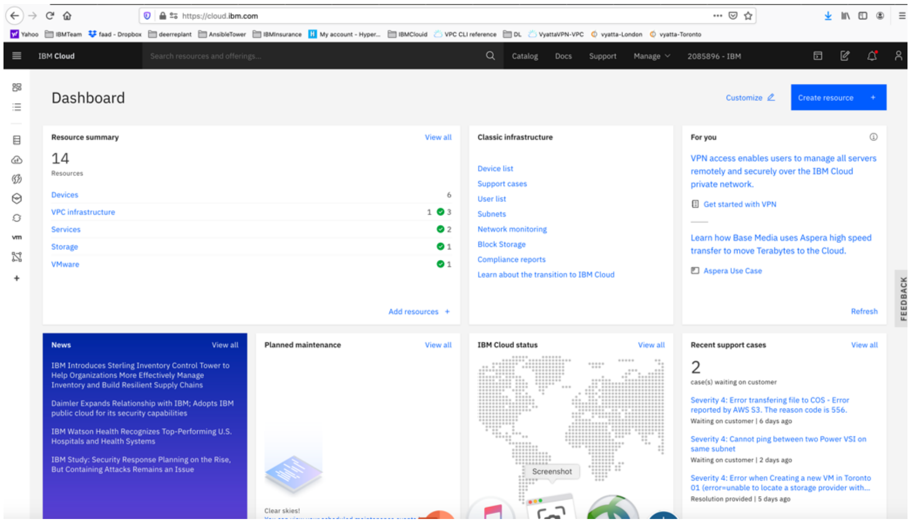
- *https://docs.aws.amazon.com/cli/latest/reference/s3/*

# Chapter 2: Implementation

## 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.



Dashboard

Resource summary — View all

14
Resources

| | |
|---|---|
| Devices | 6 |
| VPC infrastructure | 1 ✓ 3 |
| Services | ✓ 2 |
| Storage | ✓ 1 |
| VMware | ✓ 1 |

Add resources +

Classic infrastructure

Device list
Support cases
User list
Subnets
Network monitoring
Block Storage
Compliance reports
Learn about the transition to IBM Cloud

For you

VPN access enables users to manage all servers remotely and securely over the IBM Cloud private network.

Get started with VPN

Learn how Base Media uses Aspera high speed transfer to move Terabytes to the Cloud.

Aspera Use Case

Refresh

News — View all

IBM Introduces Sterling Inventory Control Tower to Help Organizations More Effectively Manage Inventory and Build Resilient Supply Chains

Daimler Expands Relationship with IBM; Adopts IBM public cloud for its security capabilities

IBM Watson Health Recognizes Top-Performing U.S. Hospitals and Health Systems

IBM Study: Security Response Planning on the Rise, But Containing Attacks Remains an Issue

Planned maintenance — View all

Clear skies!

IBM Cloud status — View all

Recent support cases — View all

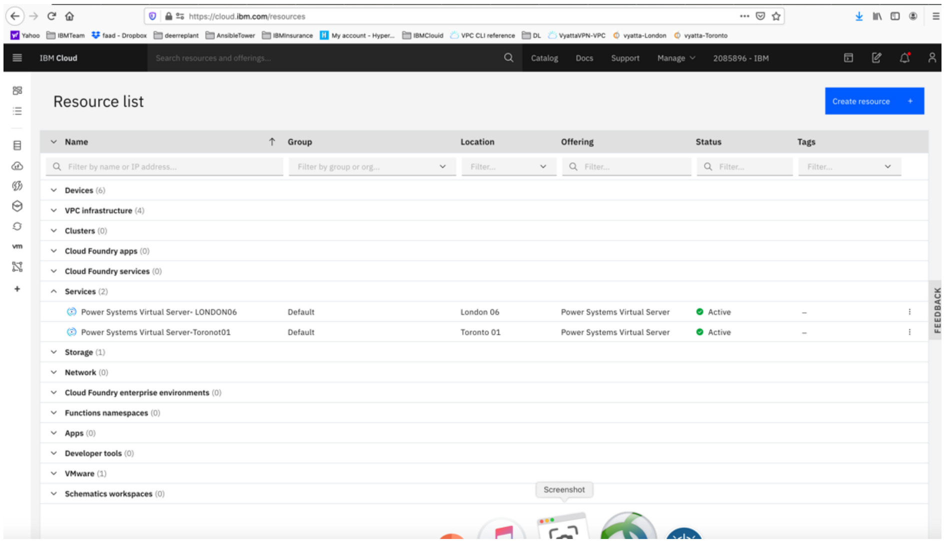
2
case(s) waiting on customer

Severity 4: Error transfering file to COS - Error reported by AWS S3. The reason code is 556.
Waiting on customer | 6 days ago

Severity 4: Cannot ping between two Power VSI on same subnet
Waiting on customer | 2 days ago

Severity 4: Error when Creating a new VM in Toronto 01 (error=unable to locate a storage provider with...
Resolution provided | 5 days ago

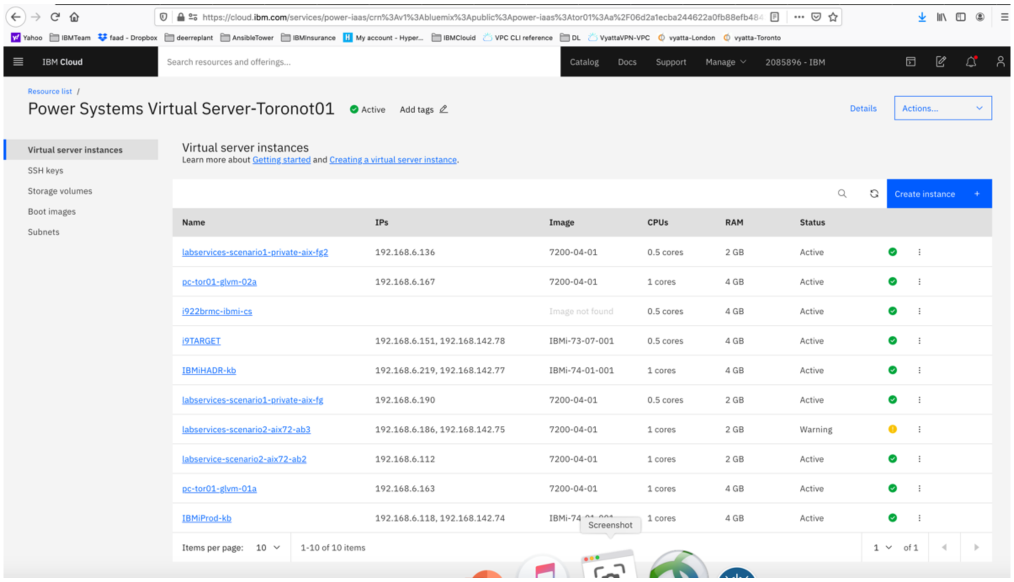
Choose “Services” from the list shown.



Resource list

| Name | Group | Location | Offering | Status | Tags |
|---|---|---|---|---|---|
| Filter by name or IP address... | Filter by group or org... | Filter... | Filter... | Filter... | Filter... |
| Devices (6) | | | | | |
| VPC infrastructure (4) | | | | | |
| Clusters (0) | | | | | |
| Cloud Foundry apps (0) | | | | | |
| Cloud Foundry services (0) | | | | | |
| Services (2) | | | | | |
| Power Systems Virtual Server- LONDON06 | Default | London 06 | Power Systems Virtual Server | ● Active | – |
| Power Systems Virtual Server-Toronot01 | Default | Toronto 01 | Power Systems Virtual Server | ● Active | – |
| Storage (1) | | | | | |
| Network (0) | | | | | |
| Cloud Foundry enterprise environments (0) | | | | | |
| Functions namespaces (0) | | | | | |
| Apps (0) | | | | | |
| Developer tools (0) | | | | | |
| VMware (1) | | | | | |
| Schematics workspaces (0) | | | | | |

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.



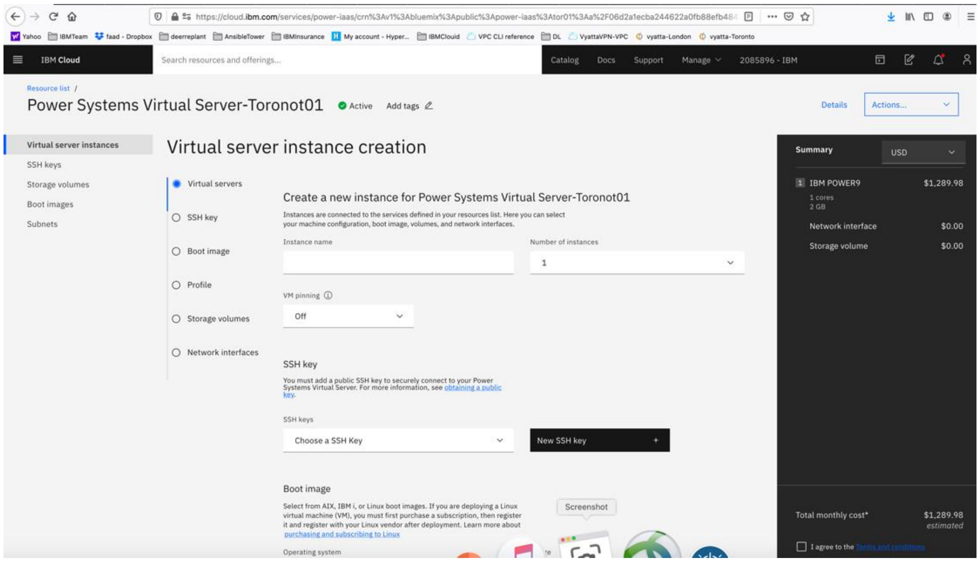
Power Systems Virtual Server-Toronot01 ● Active Add tags

Virtual server instances
Learn more about Getting started and Creating a virtual server instance.

| Name | IPs | Image | CPUs | RAM | Status |  |
|---|---|---|---|---|---|---|
| labservices-scenario1-private-aix-fg2 | 192.168.6.136 | 7200-04-01 | 0.5 cores | 2 GB | Active | ● |
| pc-tor01-glvm-02a | 192.168.6.167 | 7200-04-01 | 1 cores | 4 GB | Active | ● |
| i922brmc-ibmi-cs |  | Image not found | 0.5 cores | 4 GB | Active | ● |
| i9TARGET | 192.168.6.151, 192.168.142.78 | IBMi-73-07-001 | 0.5 cores | 4 GB | Active | ● |
| IBMiHADR-kb | 192.168.6.219, 192.168.142.77 | IBMi-74-01-001 | 1 cores | 4 GB | Active | ● |
| labservices-scenario1-private-aix-fg | 192.168.6.190 | 7200-04-01 | 0.5 cores | 2 GB | Active | ● |
| 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 | ● |
| pc-tor01-glvm-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 [illegible] | 1 cores | 4 GB | Active | ● |

Items per page: 10 1-10 of 10 items 1 of 1

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.



Power Systems Virtual Server-Toronot01 ● Active Add tags

Virtual server instance creation

Create a new instance for Power Systems Virtual Server-Toronot01

Instances are connected to the services defined in your resources list. Here you can select your machine configuration, boot image, volumes, and network interfaces.

Instance name:

Number of instances: 1

VM pinning: Off

SSH key

You must add a public SSH key to securely connect to your Power Systems Virtual Server. For more information, see obtaining a public key.

SSH keys: Choose a SSH Key

Boot image

Select from AIX, IBM i, or Linux boot images. If you are deploying a Linux virtual machine (VM), you must first purchase a subscription, then register it and register with your Linux vendor after deployment. Learn more about purchasing and subscribing to Linux

Operating system

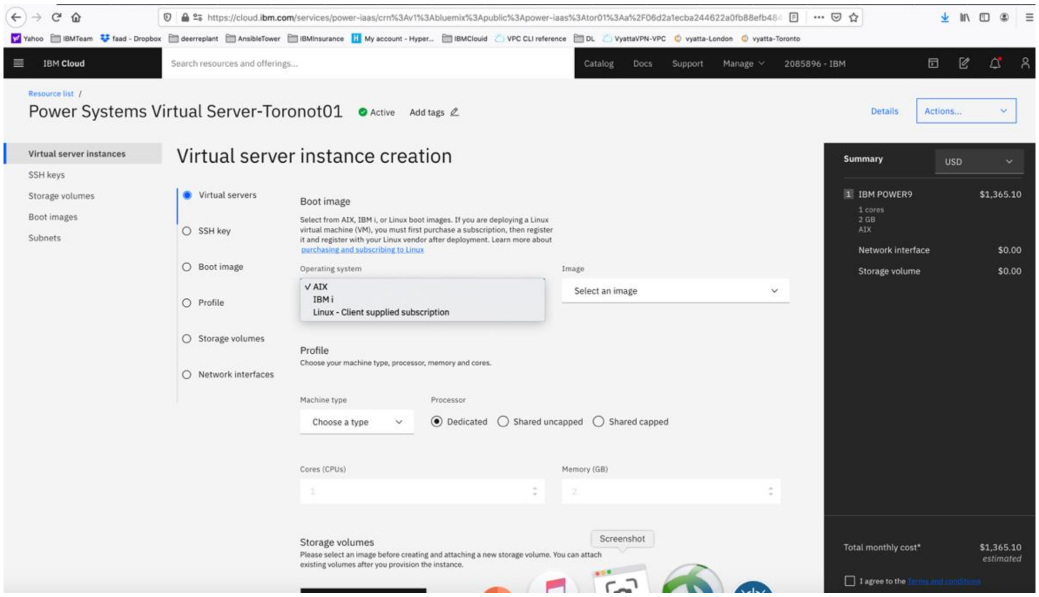
Summary USD

| | |
|---|---|
| 1 IBM POWER9<br>1 cores<br>2 GB | $1,289.98 |
| Network interface | $0.00 |
| Storage volume | $0.00 |
| Total monthly cost* | $1,289.98<br>*estimated* |

□ I agree to the Terms and conditions

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.



Power Systems Virtual Server-Toronot01 Active Add tags

Virtual server instance creation

Boot image

Select from AIX, IBM i, or Linux boot images. If you are deploying a Linux virtual machine (VM), you must first purchase a subscription, then register it and register with your Linux vendor after deployment. Learn more about purchasing and subscribing to Linux

Operating system: ✓ AIX / IBM i / Linux - Client supplied subscription

Image: Select an image

Profile

Choose your machine type, processor, memory and cores.

Machine type: Choose a type

Processor: ● Dedicated ○ Shared uncapped ○ Shared capped

Cores (CPUs): 1

Memory (GB): 2

Storage volumes

Please select an image before creating and attaching a new storage volume. You can attach existing volumes after you provision the instance.

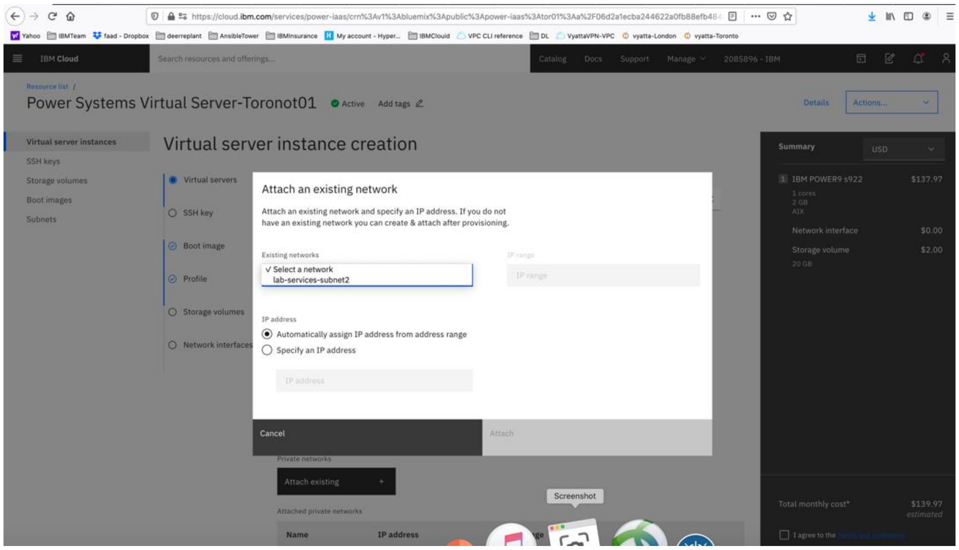
| Summary | USD |
|---|---|
| 1 IBM POWER9<br>1 cores<br>2 GB<br>AIX | $1,365.10 |
| Network interface | $0.00 |
| Storage volume | $0.00 |
| Total monthly cost* | $1,365.10<br>estimated |

□ I agree to the Terms and conditions

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 ".



Power Systems Virtual Server-Toronot01

Virtual server instance creation

Attach an existing network

Attach an existing network and specify an IP address. If you do not have an existing network you can create & attach after provisioning.

Existing networks: ✓ Select a network / lab-services-subnet2

IP address

● Automatically assign IP address from address range

○ Specify an IP address

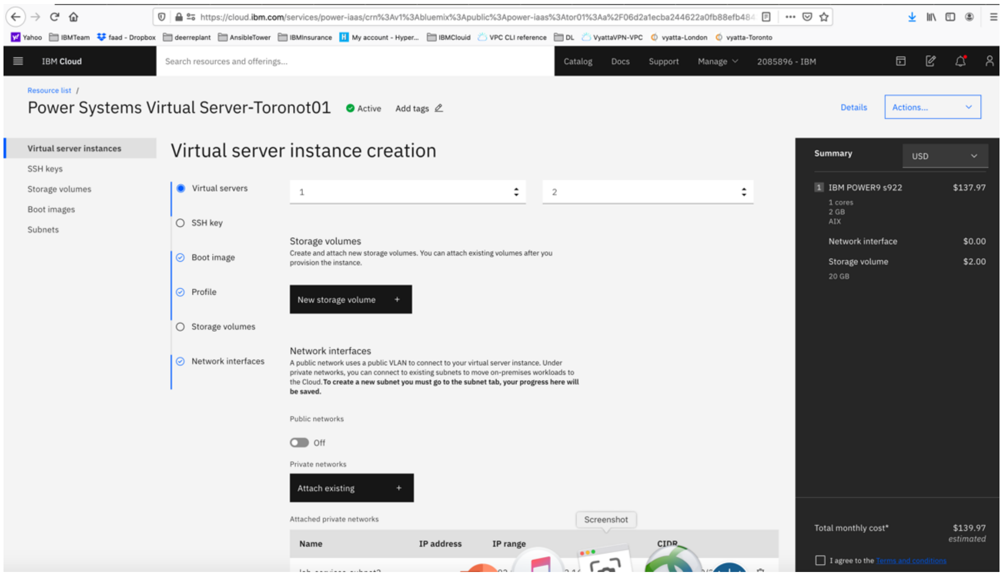
Cancel | Attach

Summary (USD)

| | |
|---|---|
| IBM POWER9 s922<br>1 cores<br>2 GB<br>AIX | $137.97 |
| Network interface | $0.00 |
| Storage volume<br>20 GB | $2.00 |
| Total monthly cost* | $139.97<br>estimated |

□ I agree to the Terms and conditions

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



Power Systems Virtual Server-Toronot01

Virtual server instance creation

Storage volumes

Create and attach new storage volumes. You can attach existing volumes after you provision the instance.

Network interfaces

A public network uses a public VLAN to connect to your virtual server instance. Under private networks, you can connect to existing subnets to move on-premises workloads to the Cloud. **To create a new subnet you must go to the subnet tab, your progress here will be saved.**

Public networks: Off

Summary (USD)

| | |
|---|---|
| IBM POWER9 s922<br>1 cores<br>2 GB<br>AIX | $137.97 |
| Network interface | $0.00 |
| Storage volume<br>20 GB | $2.00 |
| Total monthly cost* | $139.97<br>estimated |

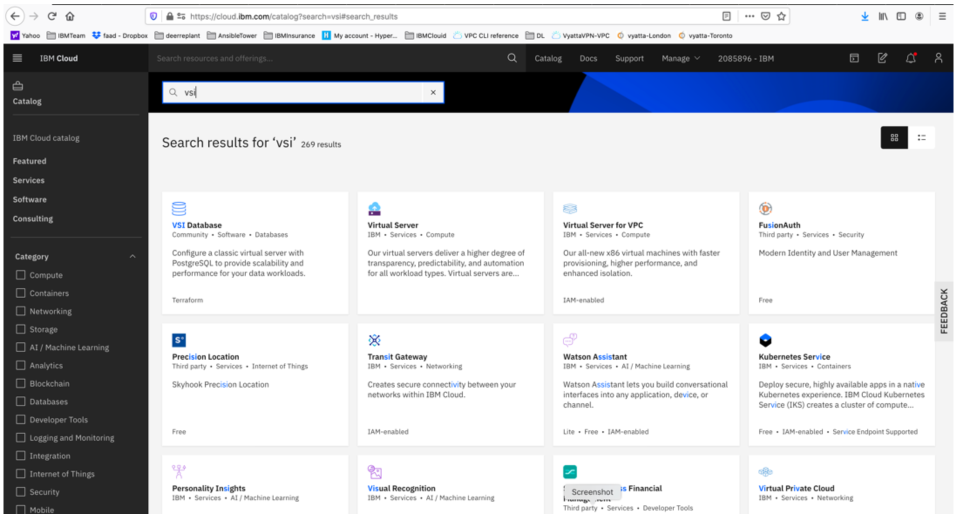
□ I agree to the Terms and conditions

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"



https://cloud.ibm.com/catalog?search=vsi#search_results

Search: vsi

Search results for 'vsi' 269 results

**VSI Database** — Community • Software • Databases
Configure a classic virtual server with PostgreSQL to provide scalability and performance for your data workloads.
Terraform

**Virtual Server** — IBM • Services • Compute
Our virtual servers deliver a higher degree of transparency, predictability, and automation for all workload types. Virtual servers are...

**Virtual Server for VPC** — IBM • Services • Compute
Our all-new x86 virtual machines with faster provisioning, higher performance, and enhanced isolation.
IAM-enabled

**FusionAuth** — Third party • Services • Security
Modern Identity and User Management
Free

**Precision Location** — Third party • Services • Internet of Things
Skyhook Precision Location
Free

**Transit Gateway** — IBM • Services • Networking
Creates secure connectivity between your networks within IBM Cloud.
IAM-enabled

**Watson Assistant** — IBM • Services • AI / Machine Learning
Watson Assistant lets you build conversational interfaces into any application, device, or channel.
Lite • Free • IAM-enabled

**Kubernetes Service** — IBM • Services • Containers
Deploy secure, highly available apps in a native Kubernetes experience. IBM Cloud Kubernetes Service (IKS) creates a cluster of compute...
Free • IAM-enabled • Service Endpoint Supported

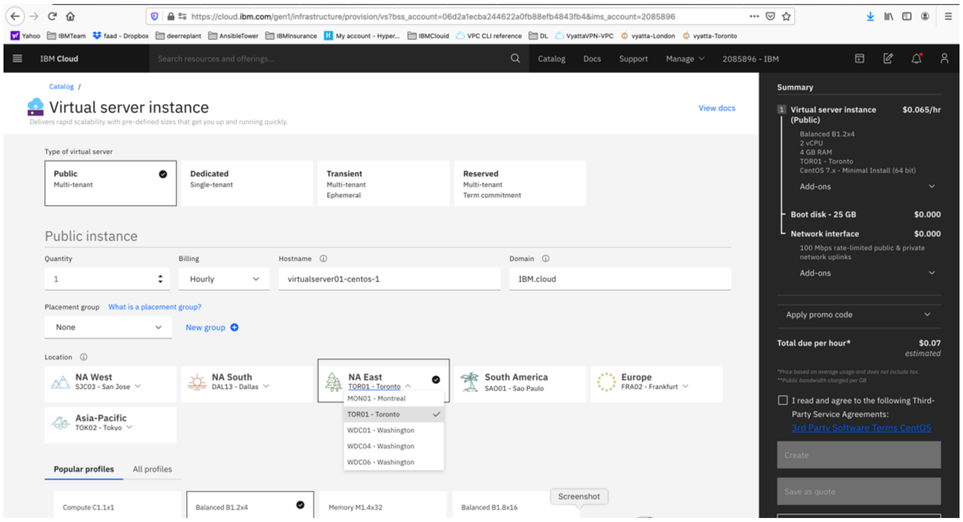
**Personality Insights** — IBM • Services • AI / Machine Learning

**Visual Recognition** — IBM • Services • AI / Machine Learning

**Financial** — Third party • Services • Developer Tools

**Virtual Private Cloud** — IBM • Services • Networking

Select "virtual server"



https://cloud.ibm.com/gen1/infrastructure/provision/vs?bss_account=06d2a1ecba244622a0fb88efb4843fb4&ims_account=2085896

Catalog /

Virtual server instance

Delivers rapid scalability with pre-defined sizes that get you up and running quickly.

Type of virtual server: Public (Multi-tenant) ● | Dedicated (Single-tenant) | Transient (Multi-tenant, Ephemeral) | Reserved (Multi-tenant, Term commitment)

Public instance

Quantity: 1
Billing: Hourly
Hostname: virtualserver01-centos-1
Domain: IBM.cloud
Placement group: None

Location: NA West (SJC03 - San Jose) | NA South (DAL13 - Dallas) | NA East (TOR01 - Toronto) ● | South America (SAO01 - Sao Paulo) | Europe (FRA02 - Frankfurt) | Asia-Pacific (TOK02 - Tokyo)

MON01 - Montreal
TOR01 - Toronto ✓
WDC01 - Washington
WDC04 - Washington
WDC06 - Washington

Popular profiles: Compute C1.1x1 | Balanced B1.2x4 ● | Memory M1.4x32 | Balanced B1.8x16

Summary

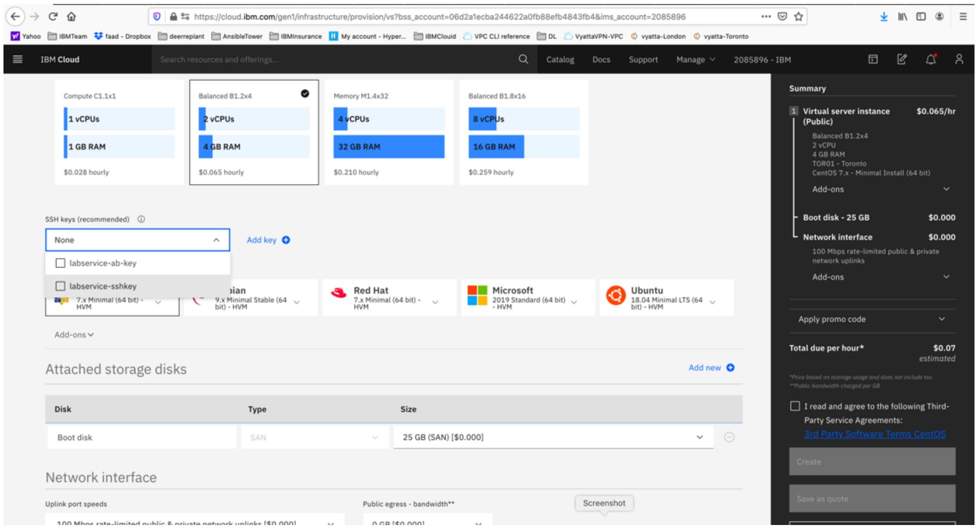
| | |
|---|---|
| Virtual server instance (Public) | $0.065/hr |
| Balanced B1.2x4<br>2 vCPU<br>4 GB RAM<br>TOR01 - Toronto<br>CentOS 7.x - Minimal Install (64 bit) | |
| Boot disk - 25 GB | $0.000 |
| Network interface | $0.000 |
| 100 Mbps rate-limited public & private network uplinks | |
| Total due per hour* | $0.07 estimated |

*Price based on average usage and does not include tax.
**Public bandwidth charged per GB

□ I read and agree to the following Third-Party Service Agreements: 3rd Party Software Terms CentOS

Choose "public" and give the server a Hostname

Select Location. In this case we selected Tor01.



| Compute C1.1x1 | Balanced B1.2x4 | Memory M1.4x32 | Balanced B1.8x16 |
|---|---|---|---|
| 1 vCPUs | 2 vCPUs | 4 vCPUs | 8 vCPUs |
| 1 GB RAM | 4 GB RAM | 32 GB RAM | 16 GB RAM |
| $0.028 hourly | $0.065 hourly | $0.210 hourly | $0.259 hourly |

SSH keys (recommended)

None

□ labservice-ab-key

□ labservice-sshkey

7.x Minimal (64 bit) - HVM | ...bian 9.x Minimal Stable (64 bit) - HVM | Red Hat 7.x Minimal (64 bit) - HVM | Microsoft 2019 Standard (64 bit) - HVM | Ubuntu 18.04 Minimal LTS (64 bit) - HVM

Attached storage disks

| Disk | Type | Size |
|---|---|---|
| Boot disk | SAN | 25 GB (SAN) [$0.000] |

Network interface

Uplink port speeds: 100 Mbps rate-limited public & private network uplinks [$0.000]

Public egress - bandwidth**: 0 GB [$0.000]

Summary

1 Virtual server instance (Public) $0.065/hr
Balanced B1.2x4
2 vCPU
4 GB RAM
TOR01 - Toronto
CentOS 7.x - Minimal Install (64 bit)

Boot disk - 25 GB $0.000

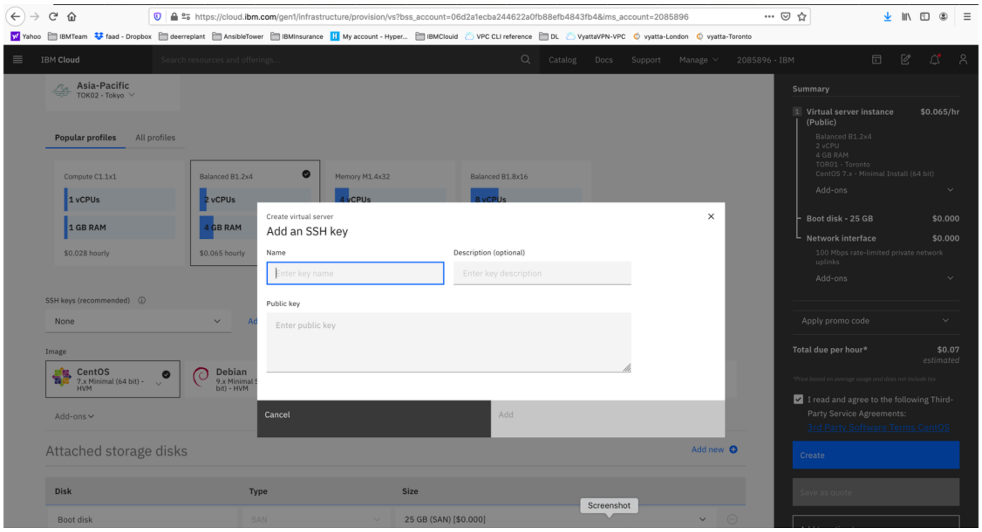
Network interface $0.000
100 Mbps rate-limited public & private network uplinks

Total due per hour* $0.07 *estimated*

*Price based on average usage and does not include tax.
**Public bandwidth charged per GB

□ I read and agree to the following Third-Party Service Agreements:
3rd Party Software Terms CentOS

- ➢ *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.*



Asia-Pacific
TOK02 - Tokyo

Create virtual server
Add an SSH key

Name: Enter key name
Description (optional): Enter key description
Public key: Enter public key

SSH keys (recommended): None

Image: CentOS 7.x Minimal (64 bit) - HVM | Debian 9.x Minimal ... bit) - HVM

Summary

1 Virtual server instance (Public) $0.065/hr
Balanced B1.2x4
2 vCPU
4 GB RAM
TOR01 - Toronto
CentOS 7.x - Minimal Install (64 bit)

Boot disk - 25 GB $0.000

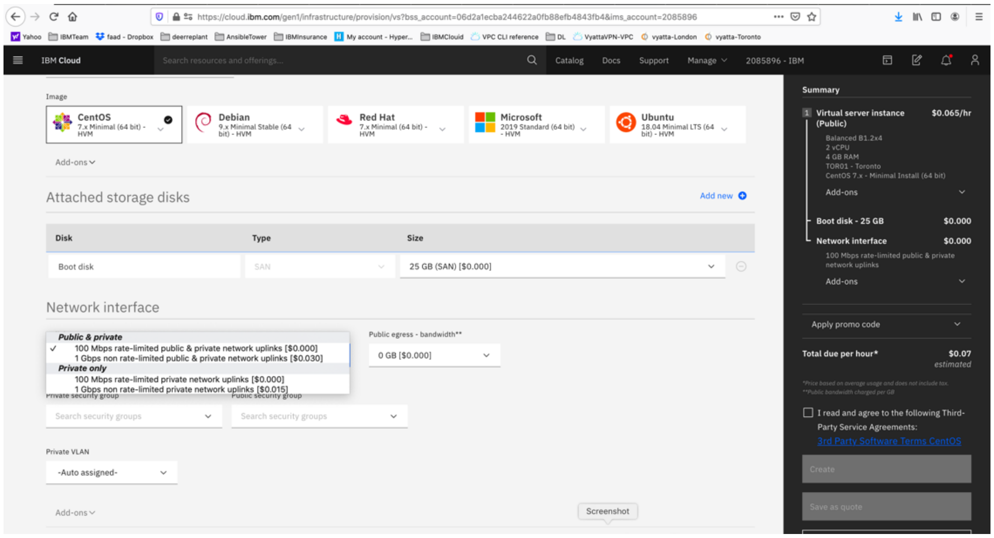
Network interface $0.000
100 Mbps rate-limited private network uplinks

Total due per hour* $0.07 *estimated*

☑ I read and agree to the following Third-Party Service Agreements:
3rd Party Software Terms CentOS

| Disk | Type | Size |
|---|---|---|
| Boot disk | SAN | 25 GB (SAN) [$0.000] |

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



https://cloud.ibm.com/gen1/infrastructure/provision/vs?bss_account=06d2a1ecba244622a0fb88efb4843fb4&ims_account=2085896

Image: CentOS 7.x Minimal (64 bit) - HVM ✓ | Debian 9.x Minimal Stable (64 bit) - HVM | Red Hat 7.x Minimal (64 bit) - HVM | Microsoft 2019 Standard (64 bit) - HVM | Ubuntu 18.04 Minimal LTS (64 bit) - HVM

Attached storage disks

| Disk | Type | Size |
|---|---|---|
| Boot disk | SAN | 25 GB (SAN) [$0.000] |

Network interface

*Public & private*
✓ 100 Mbps rate-limited public & private network uplinks [$0.000]
1 Gbps non rate-limited public & private network uplinks [$0.030]
*Private only*
100 Mbps rate-limited private network uplinks [$0.000]
1 Gbps non rate-limited private network uplinks [$0.015]

Public egress - bandwidth**: 0 GB [$0.000]

Private security group: Search security groups
Public security group: Search security groups

Private VLAN: -Auto assigned-

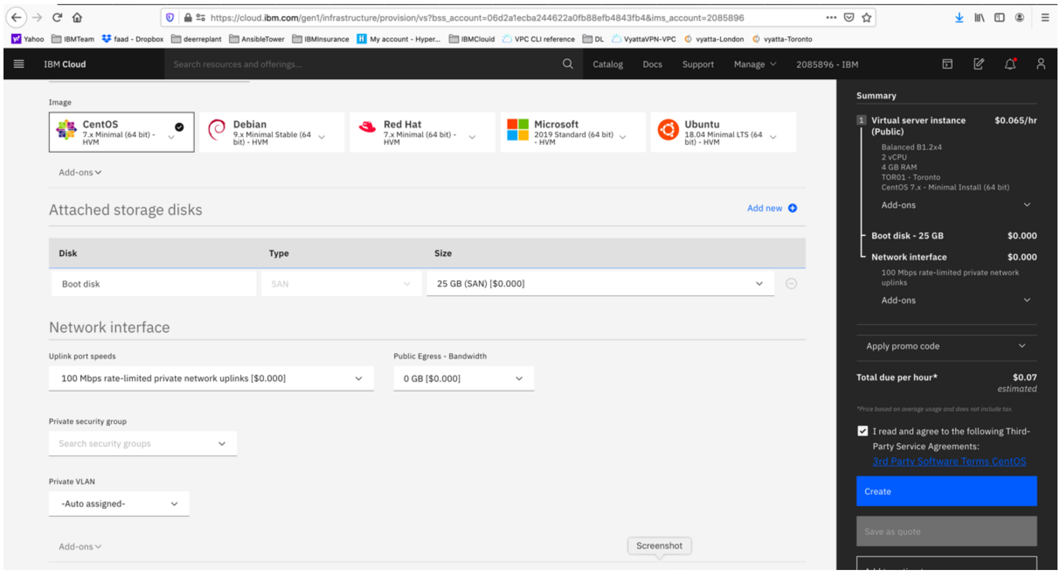
Summary

| | |
|---|---|
| 1 Virtual server instance (Public)<br>Balanced B1.2x4<br>2 vCPU<br>4 GB RAM<br>TOR01 - Toronto<br>CentOS 7.x - Minimal Install (64 bit) | $0.065/hr |
| Boot disk - 25 GB | $0.000 |
| Network interface<br>100 Mbps rate-limited public & private network uplinks | $0.000 |
| Total due per hour* | $0.07<br>*estimated* |

*Price based on average usage and does not include tax.
**Public bandwidth charged per GB

□ I read and agree to the following Third-Party Service Agreements:
3rd Party Software Terms CentOS

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



https://cloud.ibm.com/gen1/infrastructure/provision/vs?bss_account=06d2a1ecba244622a0fb88efb4843fb4&ims_account=2085896

Image: CentOS 7.x Minimal (64 bit) - HVM ✓ | Debian 9.x Minimal Stable (64 bit) - HVM | Red Hat 7.x Minimal (64 bit) - HVM | Microsoft 2019 Standard (64 bit) - HVM | Ubuntu 18.04 Minimal LTS (64 bit) - HVM

Attached storage disks

| Disk | Type | Size |
|---|---|---|
| Boot disk | SAN | 25 GB (SAN) [$0.000] |

Network interface

Uplink port speeds: 100 Mbps rate-limited private network uplinks [$0.000]
Public Egress - Bandwidth: 0 GB [$0.000]

Private security group: Search security groups

Private VLAN: -Auto assigned-

Summary

| | |
|---|---|
| 1 Virtual server instance (Public)<br>Balanced B1.2x4<br>2 vCPU<br>4 GB RAM<br>TOR01 - Toronto<br>CentOS 7.x - Minimal Install (64 bit) | $0.065/hr |
| Boot disk - 25 GB | $0.000 |
| Network interface<br>100 Mbps rate-limited private network uplinks | $0.000 |
| Total due per hour* | $0.07<br>*estimated* |

*Price based on average usage and does not include tax.

☑ I read and agree to the following Third-Party Service Agreements:
3rd Party Software Terms CentOS

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
```

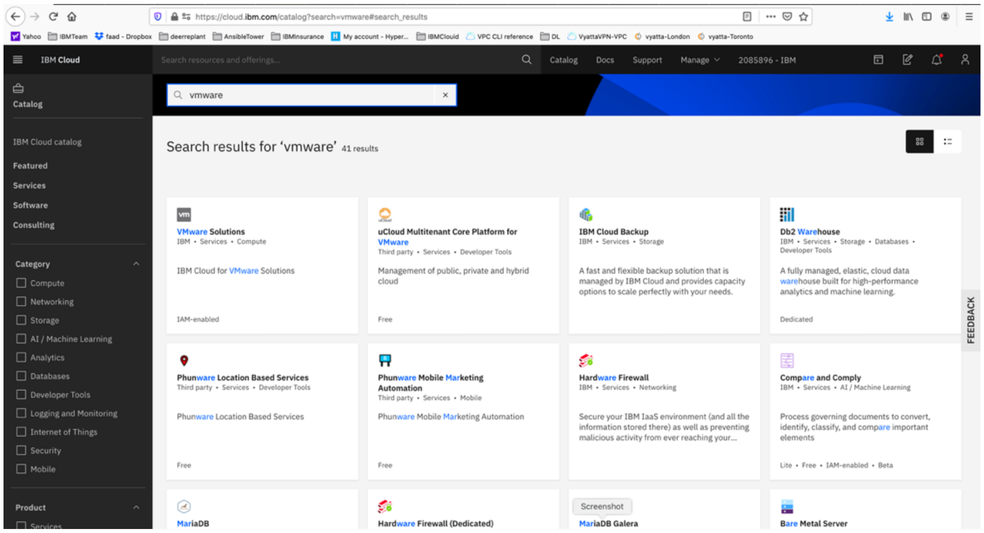
## PowerVS and VMware Integration

### 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”



Search results for ‘vmware’ 41 results

**VMware Solutions**
IBM • Services • Compute
IBM Cloud for VMware Solutions
IAM-enabled

**uCloud Multitenant Core Platform for VMware**
Third party • Services • Developer Tools
Management of public, private and hybrid cloud
Free

**IBM Cloud Backup**
IBM • Services • Storage
A fast and flexible backup solution that is managed by IBM Cloud and provides capacity options to scale perfectly with your needs.

**Db2 Warehouse**
IBM • Services • Storage • Databases • Developer Tools
A fully managed, elastic, cloud data warehouse built for high-performance analytics and machine learning.
Dedicated

**Phunware Location Based Services**
Third party • Services • Developer Tools
Phunware Location Based Services
Free

**Phunware Mobile Marketing Automation**
Third party • Services • Mobile
Phunware Mobile Marketing Automation
Free

**Hardware Firewall**
IBM • Services • Networking
Secure your IBM IaaS environment (and all the information stored there) as well as preventing malicious activity from ever reaching your...

**Compare and Comply**
IBM • Services • AI / Machine Learning
Process governing documents to convert, identify, classify, and compare important elements
Lite • Free • IAM-enabled • Beta

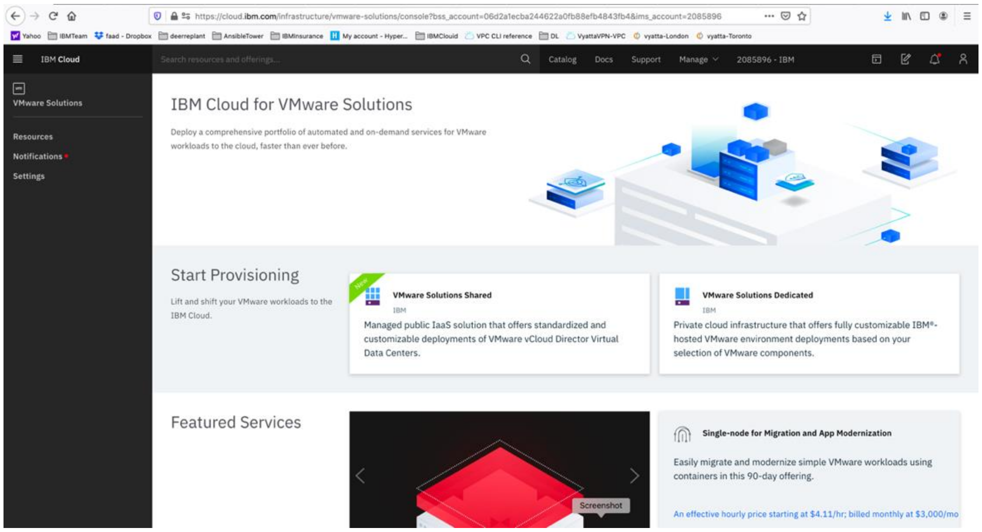
**MariaDB**

**Hardware Firewall (Dedicated)**

**MariaDB Galera**

**Bare Metal Server**

Select “VMware Solutions”



IBM Cloud for VMware Solutions

Deploy a comprehensive portfolio of automated and on-demand services for VMware workloads to the cloud, faster than ever before.

Start Provisioning

Lift and shift your VMware workloads to the IBM Cloud.

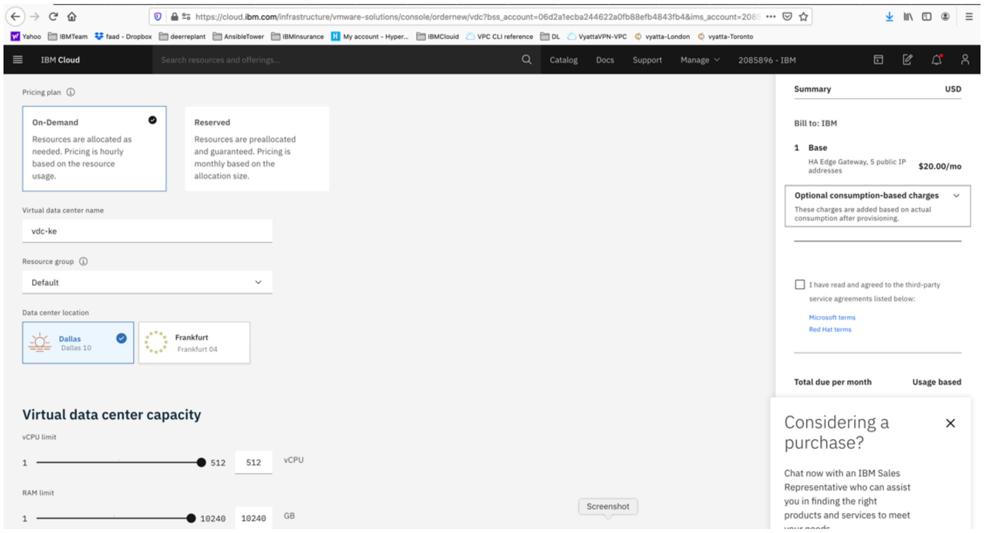
**VMware Solutions Shared**
IBM
Managed public IaaS solution that offers standardized and customizable deployments of VMware vCloud Director Virtual Data Centers.

**VMware Solutions Dedicated**
IBM
Private cloud infrastructure that offers fully customizable IBM®-hosted VMware environment deployments based on your selection of VMware components.

Featured Services

**Single-node for Migration and App Modernization**
Easily migrate and modernize simple VMware workloads using containers in this 90-day offering.
An effective hourly price starting at $4.11/hr; billed monthly at $3,000/mo

Select “VMware Solution Shared”. This is the less expensive VMware solution.



Pricing plan

On-Demand ●
Resources are allocated as needed. Pricing is hourly based on the resource usage.

Reserved
Resources are preallocated and guaranteed. Pricing is monthly based on the allocation size.

Virtual data center name: vdc-ke

Resource group: Default

Data center location: Dallas (Dallas 10) ✓ | Frankfurt (Frankfurt 04)

Virtual data center capacity

vCPU limit: 1 — 512 | 512 vCPU

RAM limit: 1 — 10240 | 10240 GB

Summary USD

Bill to: IBM

1 Base — HA Edge Gateway, 5 public IP addresses $20.00/mo

Optional consumption-based charges
These charges are added based on actual consumption after provisioning.

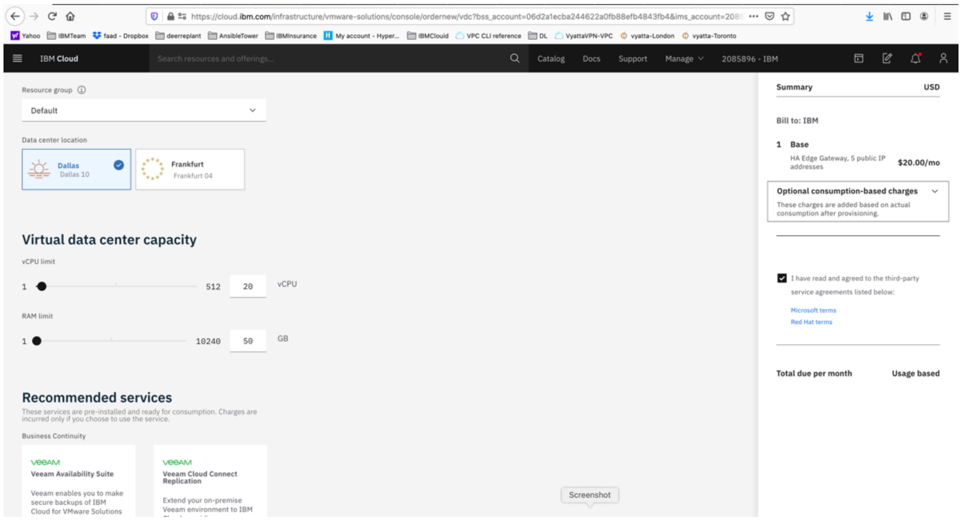
□ I have read and agreed to the third-party service agreements listed below:
Microsoft terms
Red Hat terms

Total due per month Usage based

Considering a purchase? ✕
Chat now with an IBM Sales Representative who can assist you in finding the right 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*



Resource group: Default

Data center location: Dallas (Dallas 10) ✓ | Frankfurt (Frankfurt 04)

Virtual data center capacity

vCPU limit: 1 — 512 | 20 vCPU

RAM limit: 1 — 10240 | 50 GB

Recommended services
These services are pre-installed and ready for consumption. Charges are incurred only if you choose to use the service.

Business Continuity

Veeam Availability Suite
Veeam enables you to make secure backups of IBM Cloud for VMware Solutions

Veeam Cloud Connect Replication
Extend your on-premise Veeam environment to IBM

Summary USD

Bill to: IBM

1 Base — HA Edge Gateway, 5 public IP addresses $20.00/mo

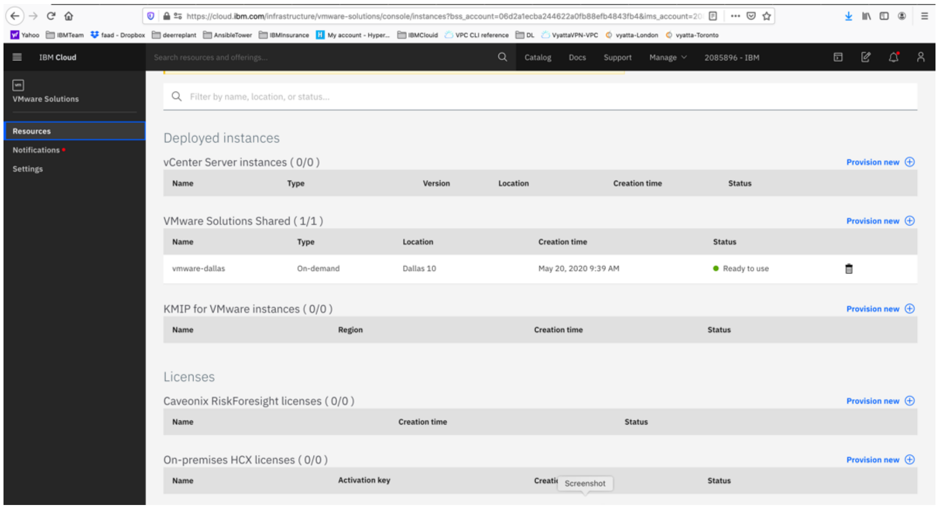
Optional consumption-based charges
These charges are added based on actual consumption after provisioning.

☑ I have read and agreed to the third-party service agreements listed below:
Microsoft terms
Red Hat terms

Total due per month Usage based

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.



https://cloud.ibm.com/infrastructure/vmware-solutions/console/instances?bss_account=06d2a1ecba244622a0fb88efb4843fb4&ims_account=20

Deployed instances

vCenter Server instances ( 0/0 )

| Name | Type | Version | Location | Creation time | Status |
|---|---|---|---|---|---|

VMware Solutions Shared ( 1/1 )

| Name | Type | Location | Creation time | Status |
|---|---|---|---|---|
| vmware-dallas | On-demand | Dallas 10 | May 20, 2020 9:39 AM | ● Ready to use |

KMIP for VMware instances ( 0/0 )

| Name | Region | Creation time | Status |
|---|---|---|---|

Licenses

Caveonix RiskForesight licenses ( 0/0 )

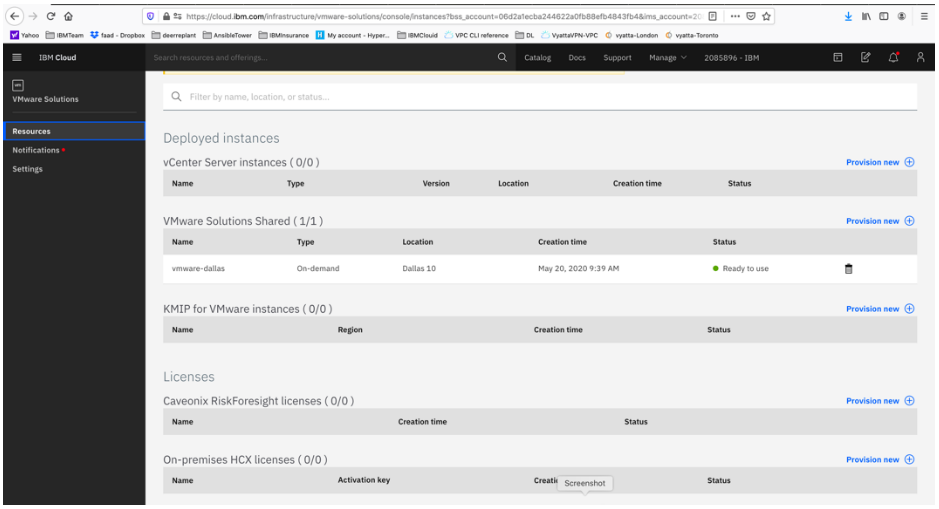
| Name | Creation time | Status |
|---|---|---|

On-premises HCX licenses ( 0/0 )

| Name | Activation key | Creati Screenshot | Status |
|---|---|---|---|

## Configure VMware Solution Shared

Click on the name of you VMware Solution Shared below.



https://cloud.ibm.com/infrastructure/vmware-solutions/console/instances?bss_account=06d2a1ecba244622a0fb88efb4843fb4&ims_account=20

Deployed instances

vCenter Server instances ( 0/0 )

| Name | Type | Version | Location | Creation time | Status |
|---|---|---|---|---|---|

VMware Solutions Shared ( 1/1 )

| Name | Type | Location | Creation time | Status |
|---|---|---|---|---|
| vmware-dallas | On-demand | Dallas 10 | May 20, 2020 9:39 AM | ● Ready to use |

KMIP for VMware instances ( 0/0 )

| Name | Region | Creation time | Status |
|---|---|---|---|

Licenses

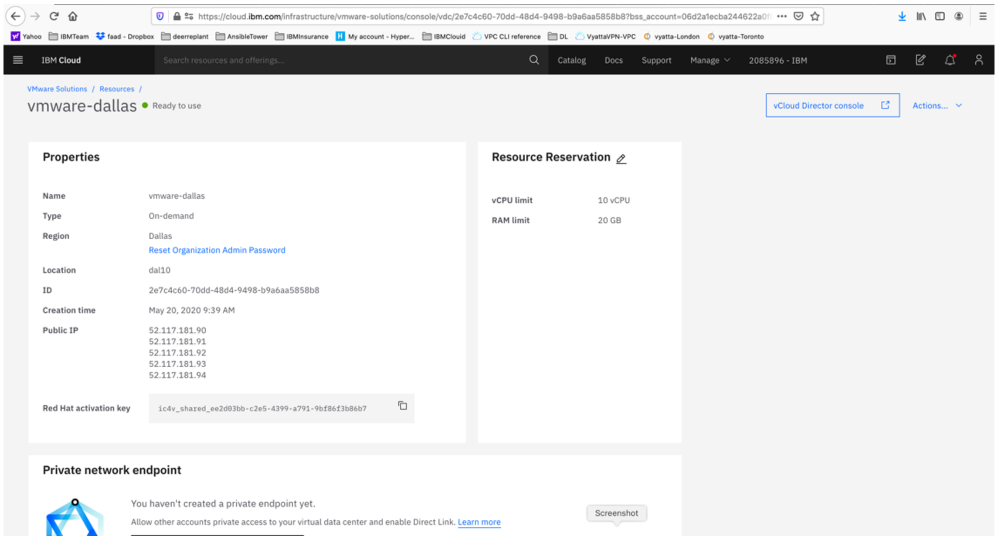
Caveonix RiskForesight licenses ( 0/0 )

| Name | Creation time | Status |
|---|---|---|

On-premises HCX licenses ( 0/0 )

| Name | Activation key | Creati Screenshot | 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.



vmware-dallas ● Ready to use

**Properties**

| | |
|---|---|
| Name | vmware-dallas |
| Type | On-demand |
| Region | Dallas<br>Reset Organization Admin Password |
| Location | dal10 |
| ID | 2e7c4c60-70dd-48d4-9498-b9a6aa5858b8 |
| Creation time | May 20, 2020 9:39 AM |
| Public IP | 52.117.181.90<br>52.117.181.91<br>52.117.181.92<br>52.117.181.93<br>52.117.181.94 |
| Red Hat activation key | ic4v_shared_ee2d03bb-c2e5-4399-a791-9bf86f3b86b7 |

**Resource Reservation**

| | |
|---|---|
| vCPU limit | 10 vCPU |
| RAM limit | 20 GB |

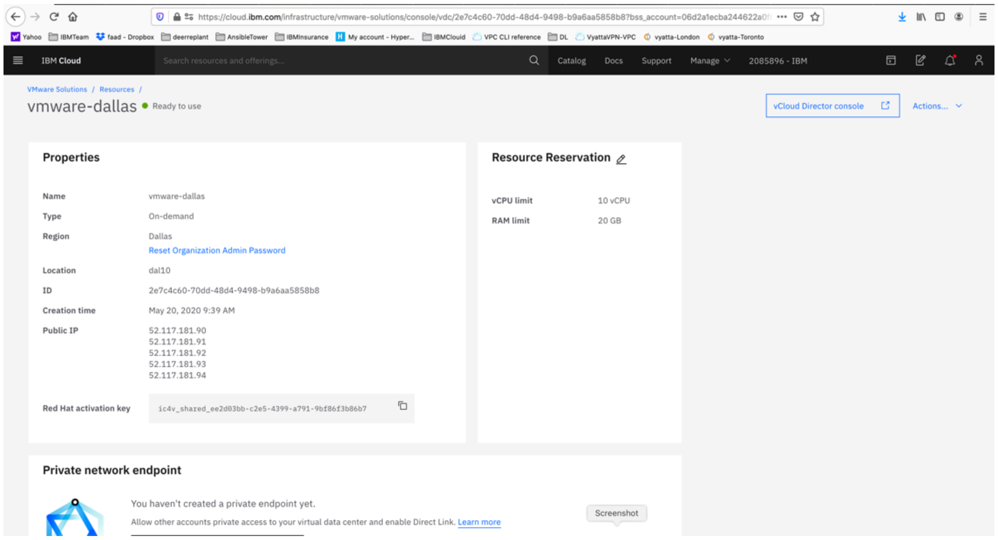
**Private network endpoint**

You haven't created a private endpoint yet.

Allow other accounts private access to your virtual data center and enable Direct Link. Learn more

## Configure VMware Solution Shared Network

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


https://cloud.ibm.com/infrastructure/vmware-solutions/console/vdc/2e7c4c60-70dd-48d4-9498-b9a6aa5858b8?bss_account=06d2a1ecba244622a0

vmware-dallas ● Ready to use

Properties

Name vmware-dallas
Type On-demand
Region Dallas
Reset Organization Admin Password
Location dal10
ID 2e7c4c60-70dd-48d4-9498-b9a6aa5858b8
Creation time May 20, 2020 9:39 AM
Public IP 52.117.181.90
52.117.181.91
52.117.181.92
52.117.181.93
52.117.181.94
Red Hat activation key ic4v_shared_ee2d03bb-c2e5-4399-a791-9bf86f3b86b7

Resource Reservation

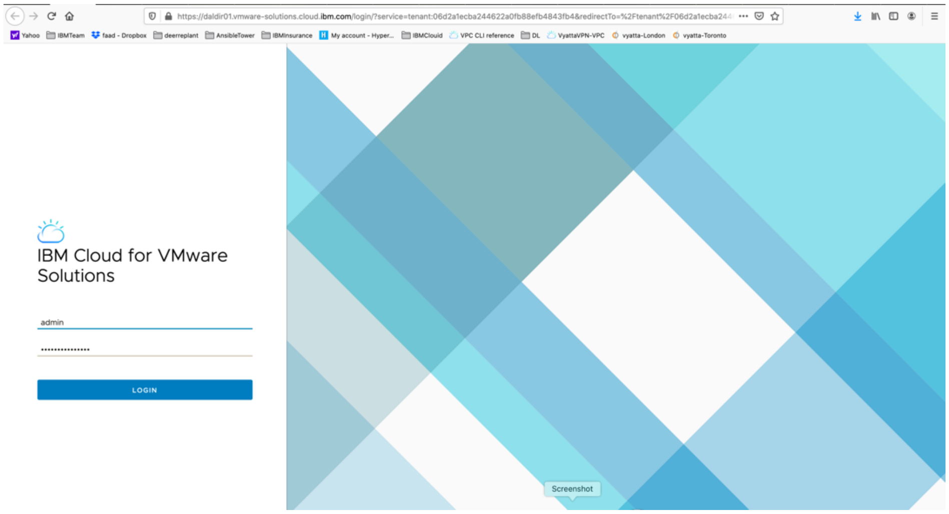
vCPU limit 10 vCPU
RAM limit 20 GB

Private network endpoint

You haven't created a private endpoint yet.

Allow other accounts private access to your virtual data center and enable Direct Link. Learn more

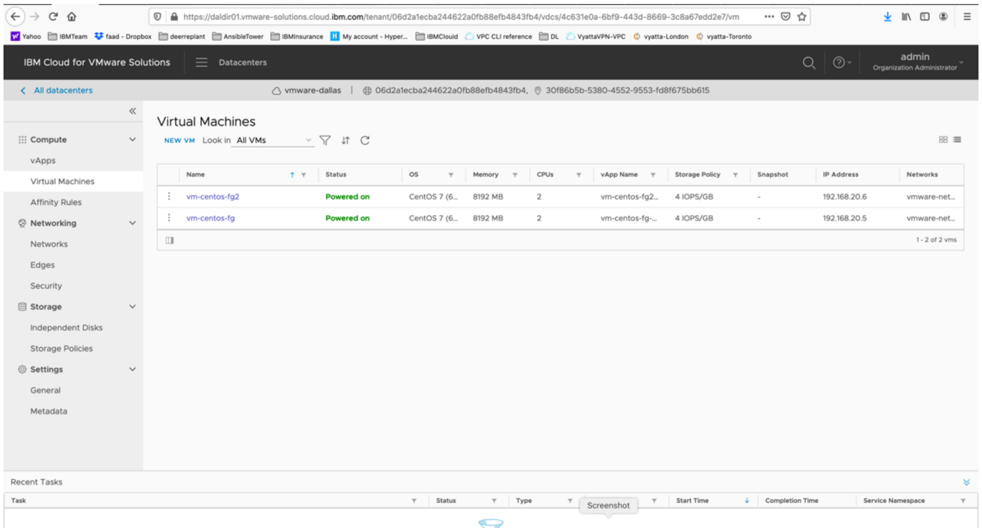
A browser session will open where you would enter your admin ID and password provided to you when you created the VMware Solution Shared.



IBM Cloud for VMware Solutions

admin

Login to the console using admin and password provided.



Virtual Machines

| Name | Status | OS | Memory | CPUs | vApp Name | Storage Policy | Snapshot | IP Address | Networks |
|---|---|---|---|---|---|---|---|---|---|
| vm-centos-fg2 | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg2... | 4 IOPS/GB | - | 192.168.20.6 | vmware-net... |
| vm-centos-fg | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg-... | 4 IOPS/GB | - | 192.168.20.5 | vmware-net... |

1 - 2 of 2 vms

Recent Tasks

| Task | Status | Type | Start Time | Completion Time | Service Namespace |
|---|---|---|---|---|---|

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.

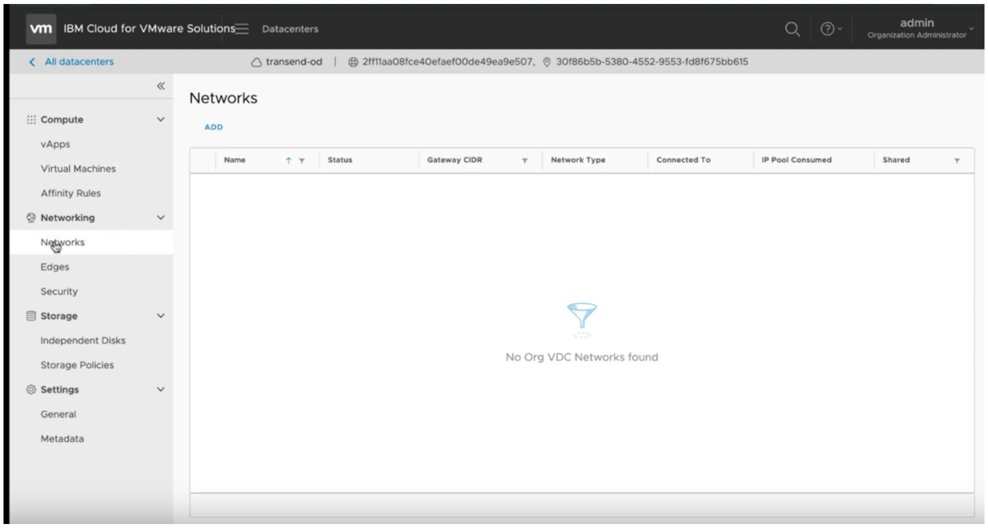
https://www.vmware.com/ca/products/cloud-director.html
https://www.ibm.com/demos/collection/VMware-Solutions-on-IBM-Cloud/

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.

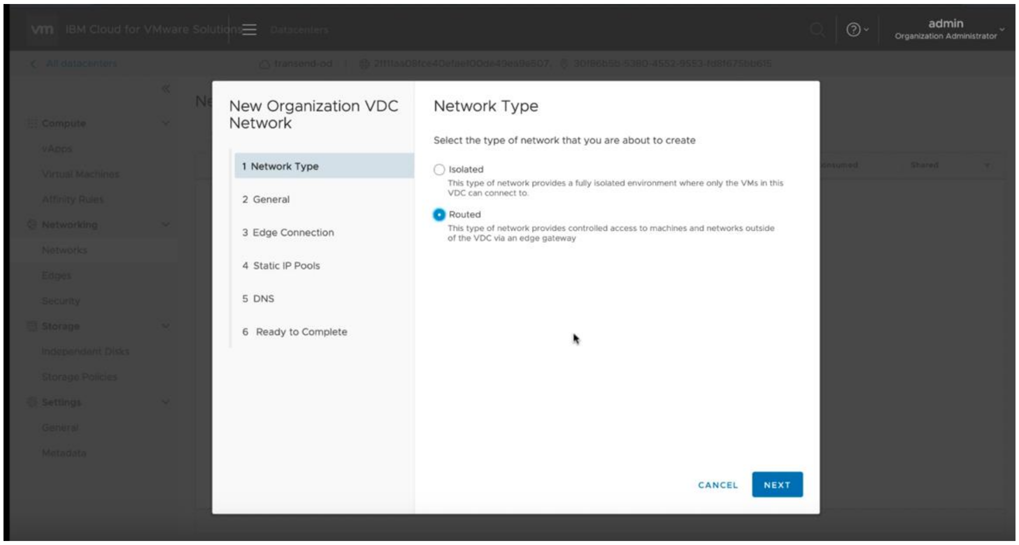


Networks

| Name | Status | Gateway CIDR | Network Type | Connected To | IP Pool Consumed | Shared |
|---|---|---|---|---|---|---|

No Org VDC Networks found

Select “ADD” and then choose “Routed” and press Next



New Organization VDC Network

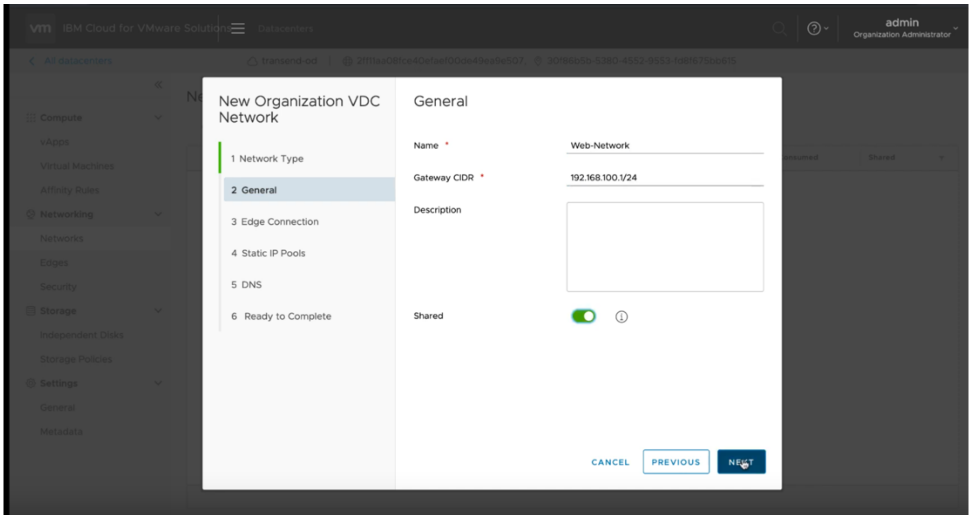
Network Type

Select the type of network that you are about to create

○ Isolated
This type of network provides a fully isolated environment where only the VMs in this VDC can connect to.

● Routed
This type of network provides controlled access to machines and networks outside of the VDC via an edge gateway

- *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*



General

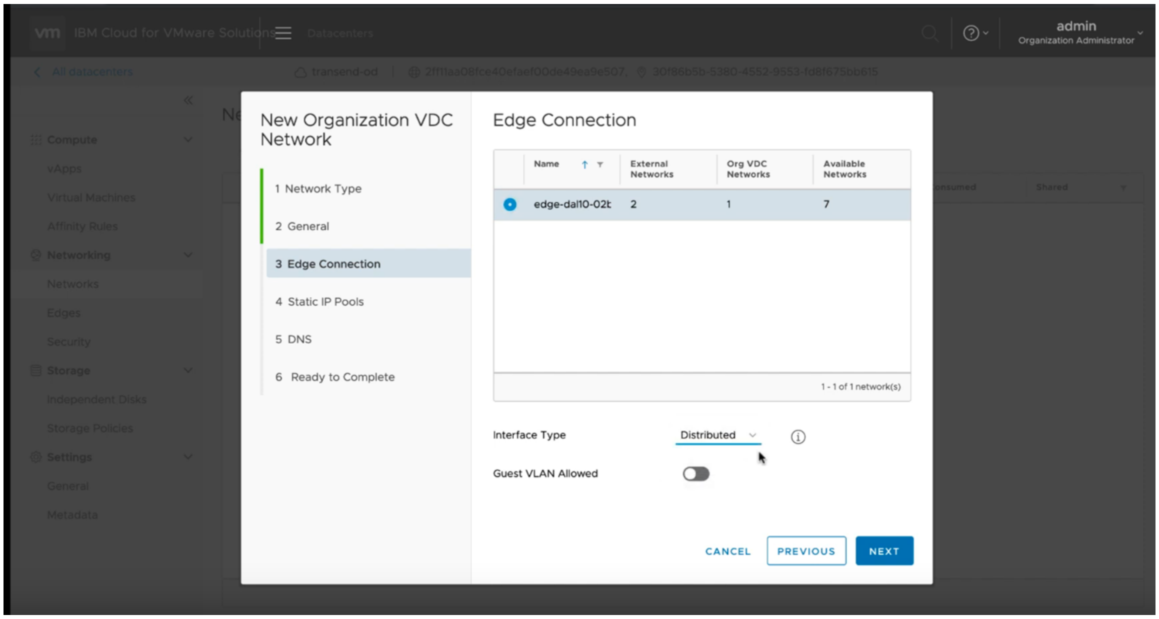
Name * Web-Network

Gateway CIDR * 192.168.100.1/24

Description

Shared: on

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



Edge Connection

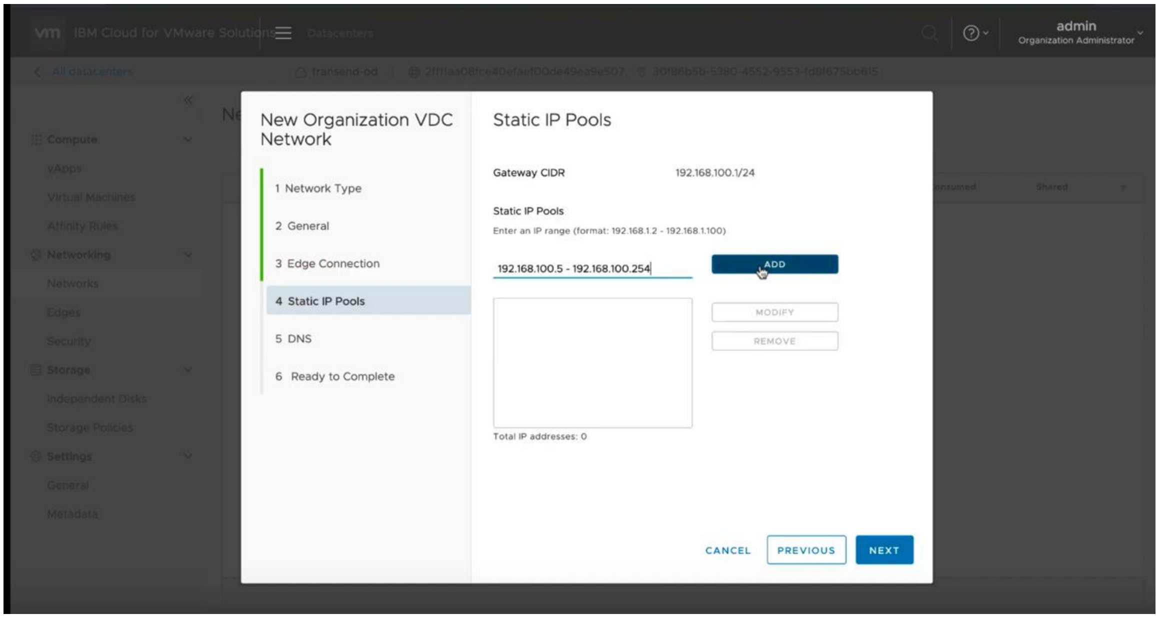
|  | Name | External Networks | Org VDC Networks | Available Networks |
|---|---|---|---|---|
| ● | edge-dal10-02t | 2 | 1 | 7 |

1 - 1 of 1 network(s)

Interface Type: Distributed

Guest VLAN Allowed: off

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



New Organization VDC Network

Static IP Pools

Gateway CIDR 192.168.100.1/24

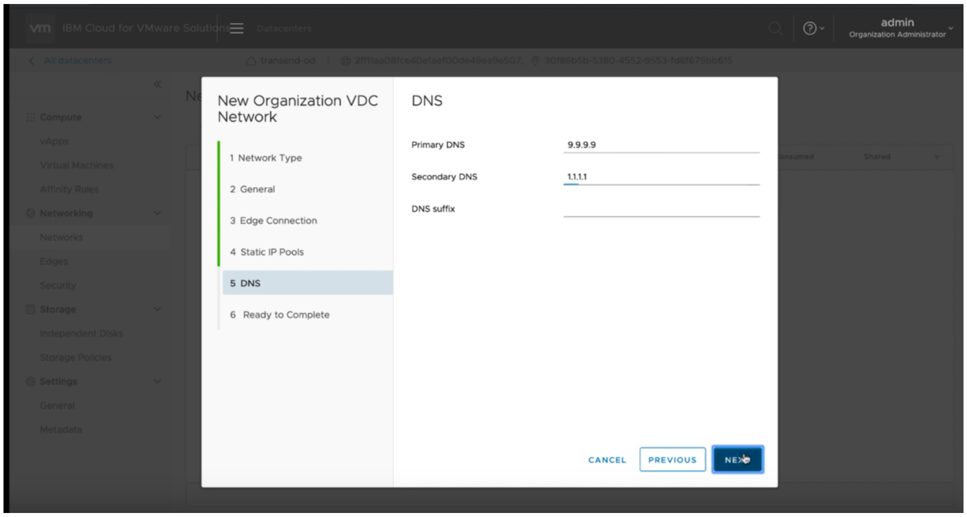
Static IP Pools

Enter an IP range (format: 192.168.1.2 - 192.168.1.100)

192.168.100.5 - 192.168.100.254

Total IP addresses: 0

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



New Organization VDC Network

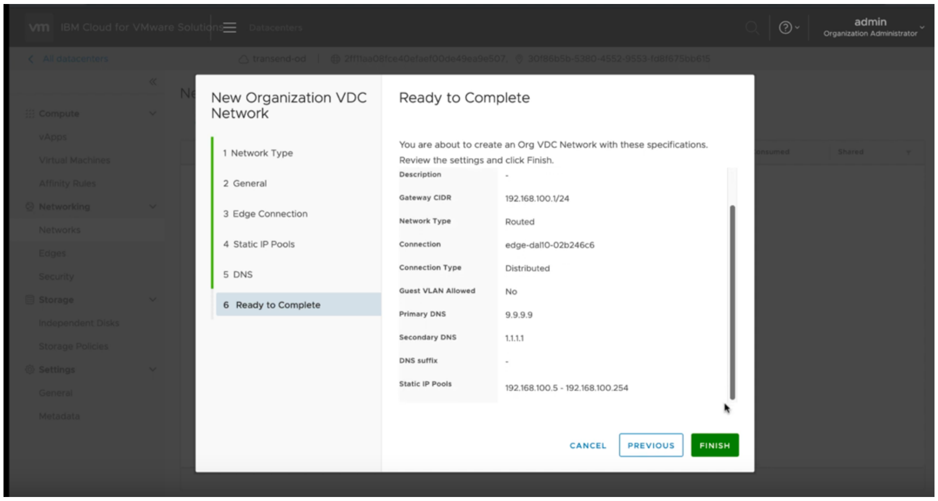
DNS

Primary DNS 9.9.9.9

Secondary DNS 1.1.1.1

DNS suffix

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



New Organization VDC Network

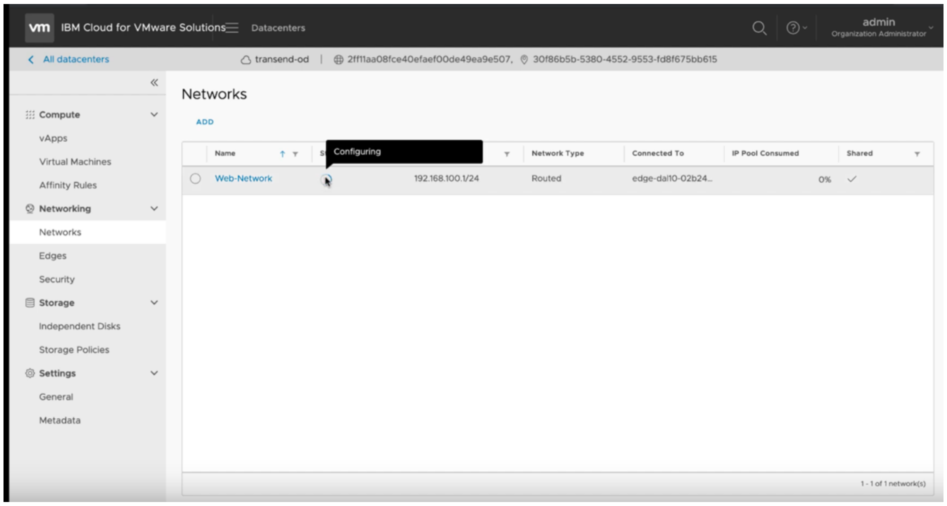
1 Network Type
2 General
3 Edge Connection
4 Static IP Pools
5 DNS
6 Ready to Complete

Ready to Complete

You are about to create an Org VDC Network with these specifications. Review the settings and click Finish.

| | |
|---|---|
| Description | - |
| Gateway CIDR | 192.168.100.1/24 |
| Network Type | Routed |
| Connection | edge-dal10-02b246c6 |
| Connection Type | Distributed |
| Guest VLAN Allowed | No |
| Primary DNS | 9.9.9.9 |
| Secondary DNS | 1.1.1.1 |
| DNS suffix | - |
| Static IP Pools | 192.168.100.5 - 192.168.100.254 |

Your network is now provisioned successfully.



transend-od | 2ff11aa08fce40efaef00de49ea9e507, 30f86b5b-5380-4552-9553-fd8f675bb615

Networks

| | Name | S | | Network Type | Connected To | IP Pool Consumed | Shared |
|---|---|---|---|---|---|---|---|
| ○ | Web-Network | | 192.168.100.1/24 | Routed | edge-dal10-02b24... | 0% | ✓ |

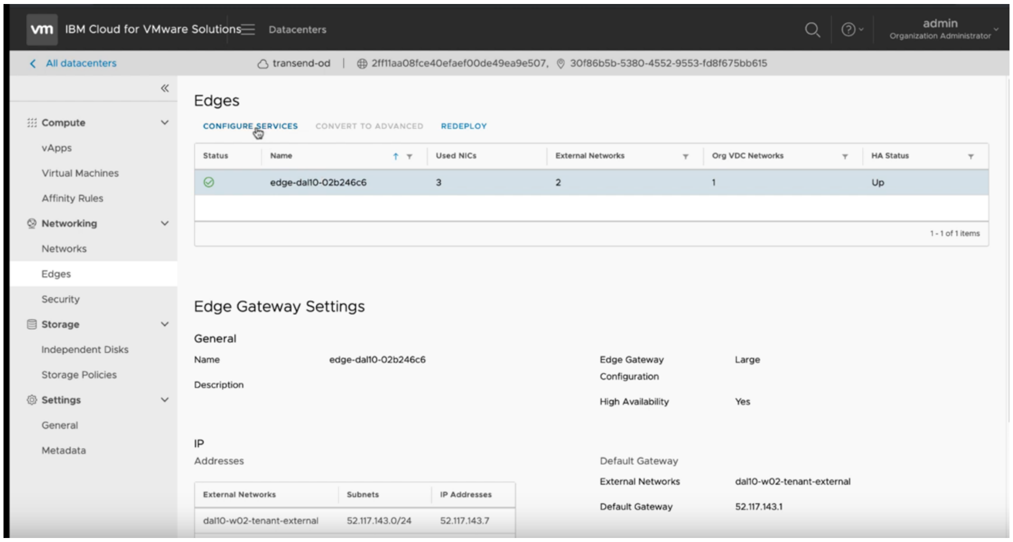
1 - 1 of 1 network(s)

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”



transend-od | 2ff11aa08fce40efaef00de49ea9e507, 30f86b5b-5380-4552-9553-fd8f675bb615

Edges

| Status | Name | Used NICs | External Networks | Org VDC Networks | HA Status |
|---|---|---|---|---|---|
| ✓ | edge-dal10-02b246c6 | 3 | 2 | 1 | Up |

1 - 1 of 1 items

Edge Gateway Settings

General

Name edge-dal10-02b246c6

Description

Edge Gateway Configuration Large

High Availability Yes

IP Addresses

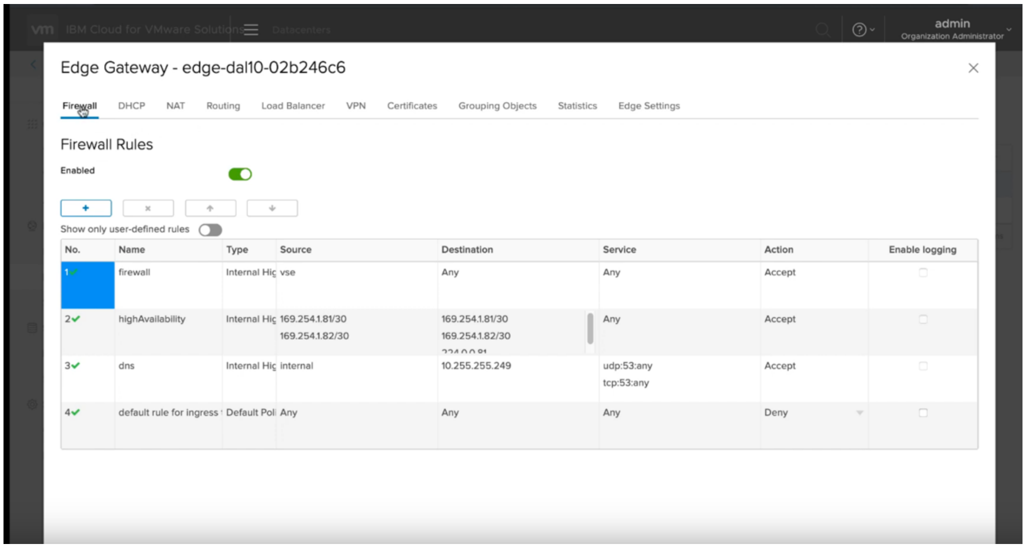
Default Gateway

External Networks dal10-w02-tenant-external

Default Gateway 52.117.143.1

| External Networks | Subnets | IP Addresses |
|---|---|---|
| dal10-w02-tenant-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.



Edge Gateway - edge-dal10-02b246c6

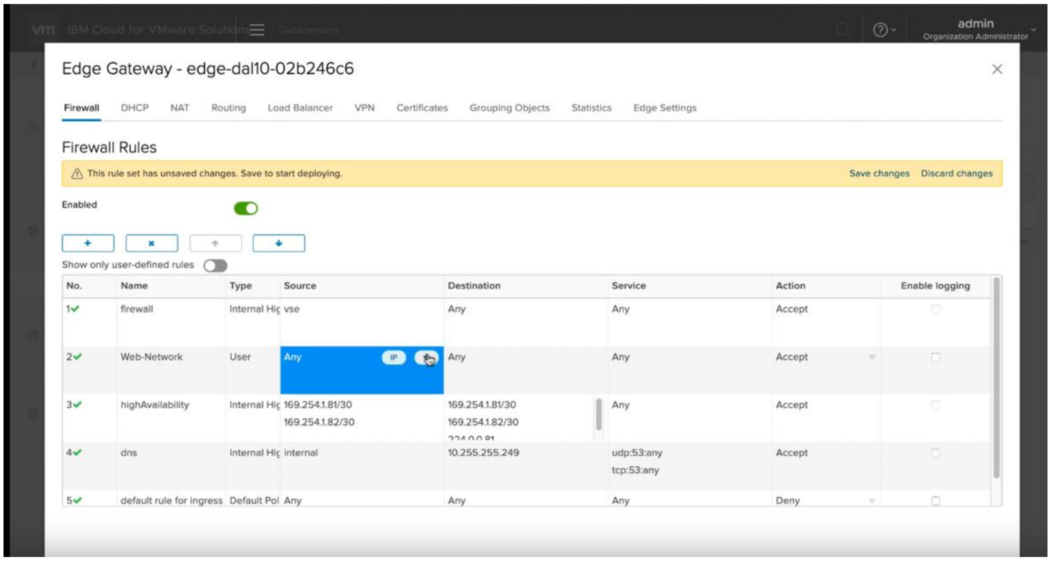
Firewall Rules

Enabled

Show only user-defined rules

| No. | Name | Type | Source | Destination | Service | Action | Enable logging |
|---|---|---|---|---|---|---|---|
| 1✓ | firewall | Internal Hic | vse | Any | Any | Accept | □ |
| 2✓ | highAvailability | Internal Hic | 169.254.1.81/30<br>169.254.1.82/30 | 169.254.1.81/30<br>169.254.1.82/30<br>224.0.0.81 | Any | Accept | □ |
| 3✓ | dns | Internal Hic | internal | 10.255.255.249 | udp:53:any<br>tcp:53:any | Accept | □ |
| 4✓ | default rule for ingress | Default Poli | Any | Any | Any | Deny | □ |

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



Edge Gateway - edge-dal10-02b246c6

Firewall Rules

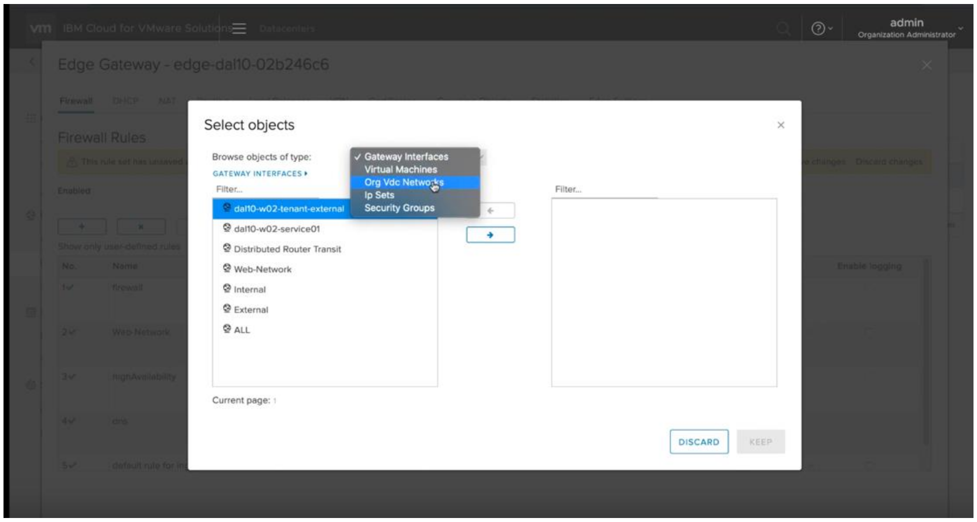
This rule set has unsaved changes. Save to start deploying.

Enabled

Show only user-defined rules

| No. | Name | Type | Source | Destination | Service | Action | Enable logging |
|---|---|---|---|---|---|---|---|
| 1✓ | firewall | Internal Hiç | vse | Any | Any | Accept | □ |
| 2✓ | Web-Network | User | Any | Any | Any | Accept | □ |
| 3✓ | highAvailability | Internal Hiç | 169.254.1.81/30<br>169.254.1.82/30 | 169.254.1.81/30<br>169.254.1.82/30<br>224.0.0.81 | Any | Accept | □ |
| 4✓ | dns | Internal Hiç | internal | 10.255.255.249 | udp:53:any<br>tcp:53:any | Accept | □ |
| 5✓ | default rule for ingress | Default Pol | Any | Any | Any | Deny | □ |

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

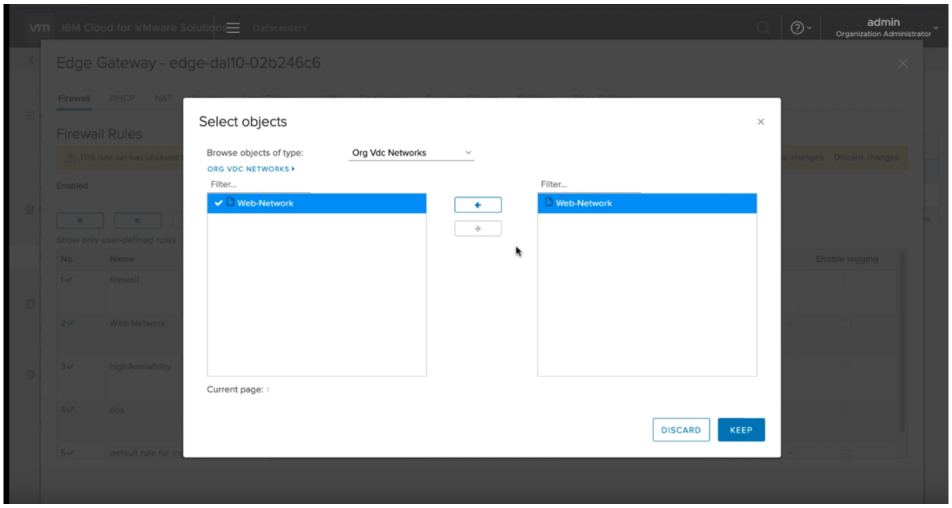


Select objects

Browse objects of type:

dal10-w02-tenant-external
dal10-w02-service01
Distributed Router Transit
Web-Network
Internal
External
ALL

Current page: 1



Select objects

Browse objects of type: Org Vdc Networks

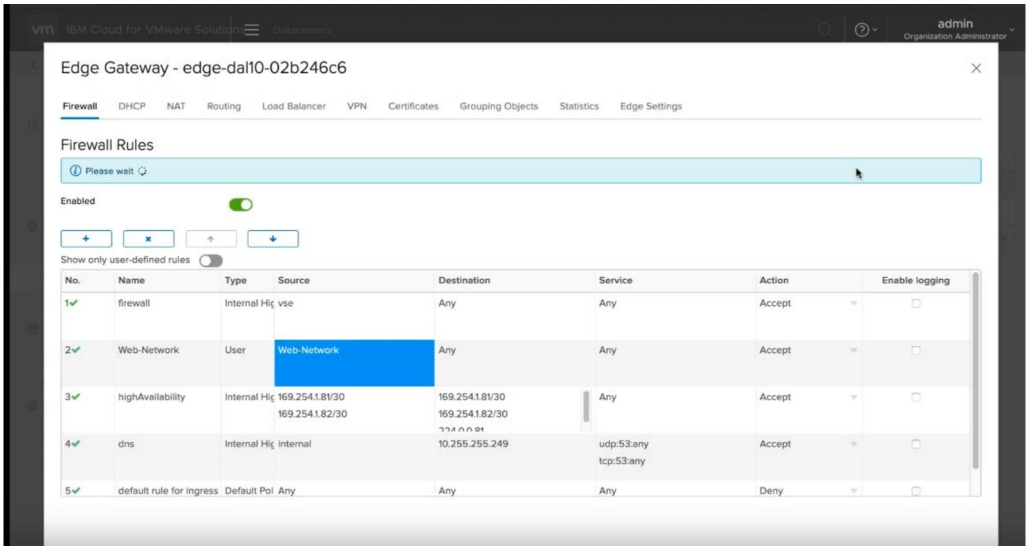
ORG VDC NETWORKS ▸

Filter... ✓ Web-Network

Filter... Web-Network

Current page: 1

DISCARD KEEP



Edge Gateway - edge-dal10-02b246c6

Firewall | DHCP | NAT | Routing | Load Balancer | VPN | Certificates | Grouping Objects | Statistics | Edge Settings

Firewall Rules

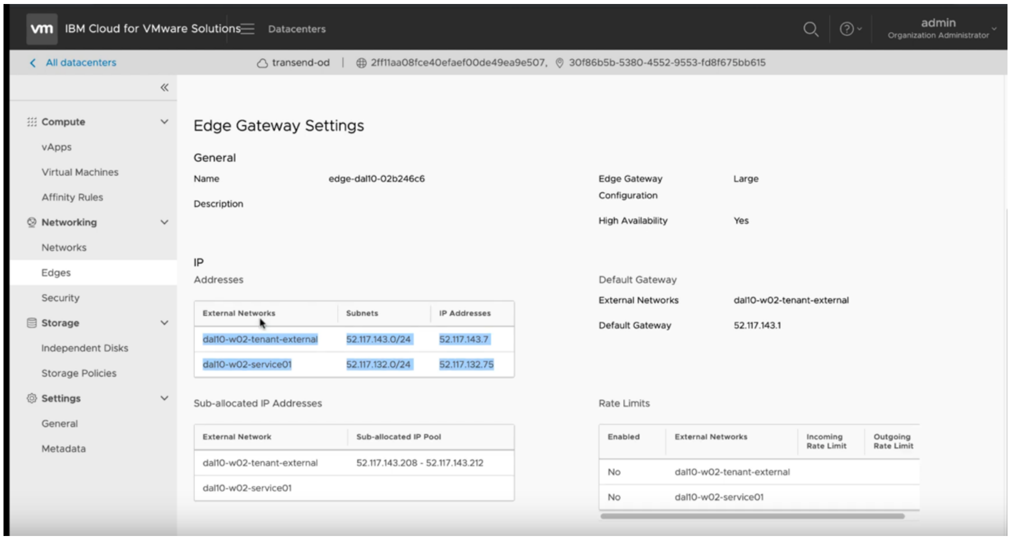
Please wait

Enabled

Show only user-defined rules

| No. | Name | Type | Source | Destination | Service | Action | Enable logging |
|---|---|---|---|---|---|---|---|
| 1✓ | firewall | Internal Hig | vse | Any | Any | Accept | □ |
| 2✓ | Web-Network | User | Web-Network | Any | Any | Accept | □ |
| 3✓ | highAvailability | Internal Hig | 169.254.1.81/30<br>169.254.1.82/30 | 169.254.1.81/30<br>169.254.1.82/30<br>224.0.0.81 | Any | Accept | □ |
| 4✓ | dns | Internal Hig | internal | 10.255.255.249 | udp:53:any<br>tcp:53:any | Accept | □ |
| 5✓ | default rule for ingress | Default Pol | Any | Any | Any | Deny | □ |

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.



Edge Gateway Settings

General

| | | | |
|---|---|---|---|
| Name | edge-dal10-02b246c6 | Edge Gateway Configuration | Large |
| Description | | High Availability | Yes |

IP Addresses

| External Networks | Subnets | IP Addresses |
|---|---|---|
| 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 |

Default Gateway

External Networks dal10-w02-tenant-external

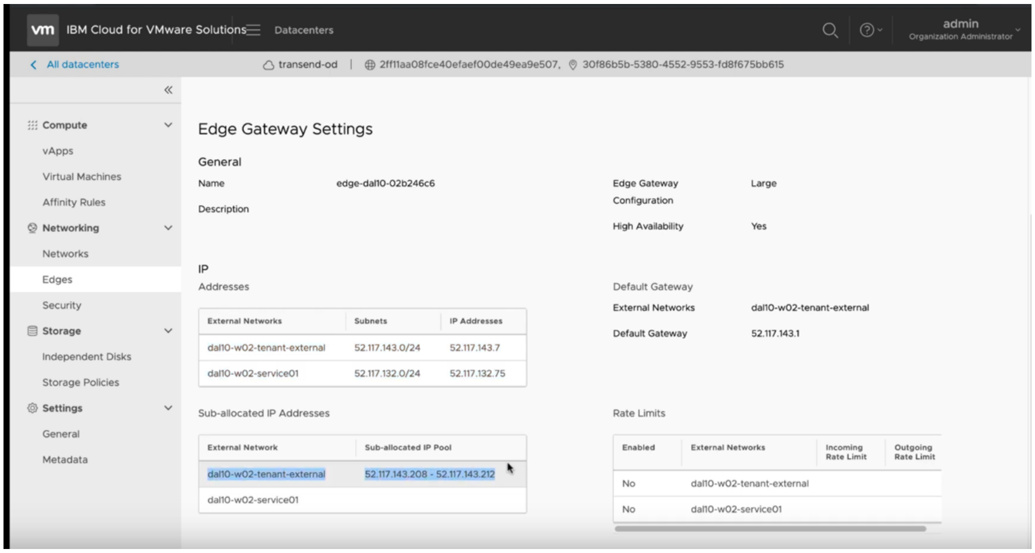
Default Gateway 52.117.143.1

Sub-allocated IP Addresses

| External Network | Sub-allocated IP Pool |
|---|---|
| dal10-w02-tenant-external | 52.117.143.208 - 52.117.143.212 |
| dal10-w02-service01 | |

Rate Limits

| Enabled | External Networks | Incoming Rate Limit | Outgoing Rate Limit |
|---|---|---|---|
| No | dal10-w02-tenant-external | | |
| No | dal10-w02-service01 | | |


Edge Gateway Settings

General

| | | | |
|---|---|---|---|
| Name | edge-dal10-02b246c6 | Edge Gateway Configuration | Large |
| Description | | High Availability | Yes |

IP Addresses

| External Networks | Subnets | IP Addresses |
|---|---|---|
| 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 |

Default Gateway

External Networks dal10-w02-tenant-external

Default Gateway 52.117.143.1

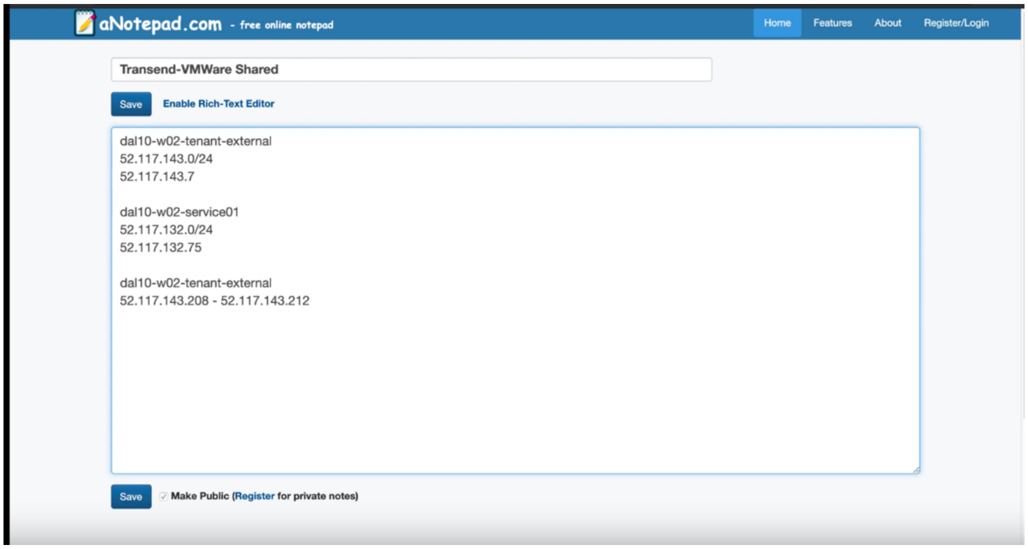
Sub-allocated IP Addresses

| External Network | Sub-allocated IP Pool |
|---|---|
| dal10-w02-tenant-external | 52.117.143.208 - 52.117.143.212 |
| dal10-w02-service01 | |

Rate Limits

| Enabled | External Networks | Incoming Rate Limit | Outgoing Rate Limit |
|---|---|---|---|
| No | dal10-w02-tenant-external | | |
| No | dal10-w02-service01 | | |

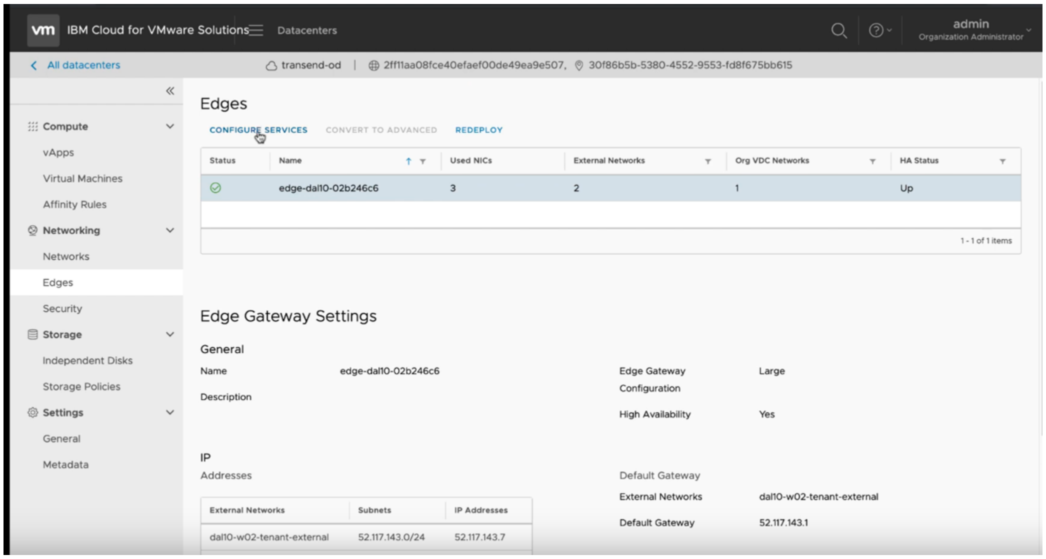
The -external addresses are for external access and the -service01 addresses are for internal access. The last part, sub-allocated IP addresses are 5 IP addresses to be used to assign to your VMs to allow external access. You may request additional IPs if you have more than 5 VMs. You will need to open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


aNotepad.com - free online notepad
Home
Features
About
Register/Login
Save
Enable Rich-Text Editor
Save
Make Public (Register for private notes)

Transend-VMWare Shared

```
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
```

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



Edges

| Status | Name | Used NICs | External Networks | Org VDC Networks | HA Status |
|---|---|---|---|---|---|
| ✓ | edge-dal10-02b246c6 | 3 | 2 | 1 | Up |

1 - 1 of 1 items

Edge Gateway Settings

General

| | | | |
|---|---|---|---|
| Name | edge-dal10-02b246c6 | Edge Gateway Configuration | Large |
| Description | | High Availability | Yes |

IP

Addresses

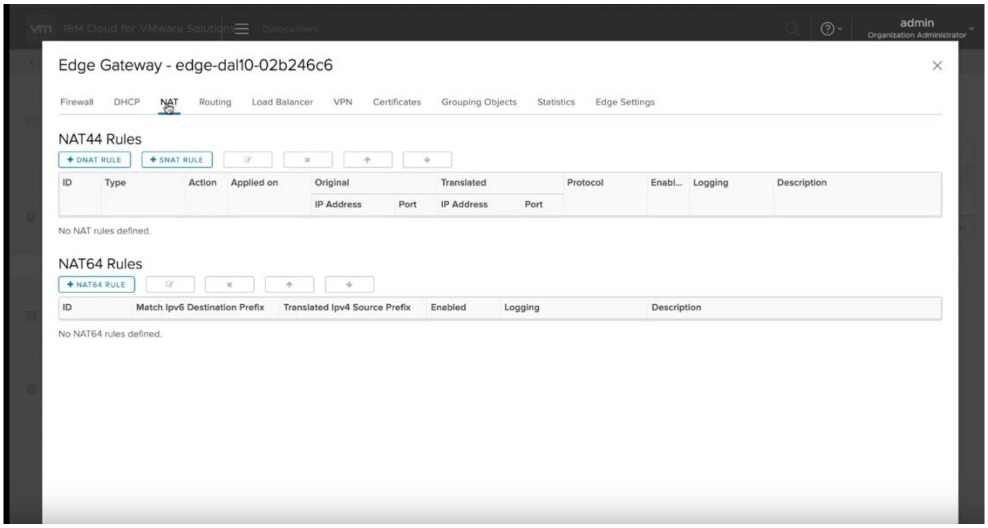
| External Networks | Subnets | IP Addresses |
|---|---|---|
| dal10-w02-tenant-external | 52.117.143.0/24 | 52.117.143.7 |

Default Gateway

External Networks dal10-w02-tenant-external

Default Gateway 52.117.143.1

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



Edge Gateway - edge-dal10-02b246c6

NAT44 Rules

| ID | Type | Action | Applied on | Original | | Translated | | Protocol | Enabl... | Logging | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | IP Address | Port | IP Address | Port | | | | |

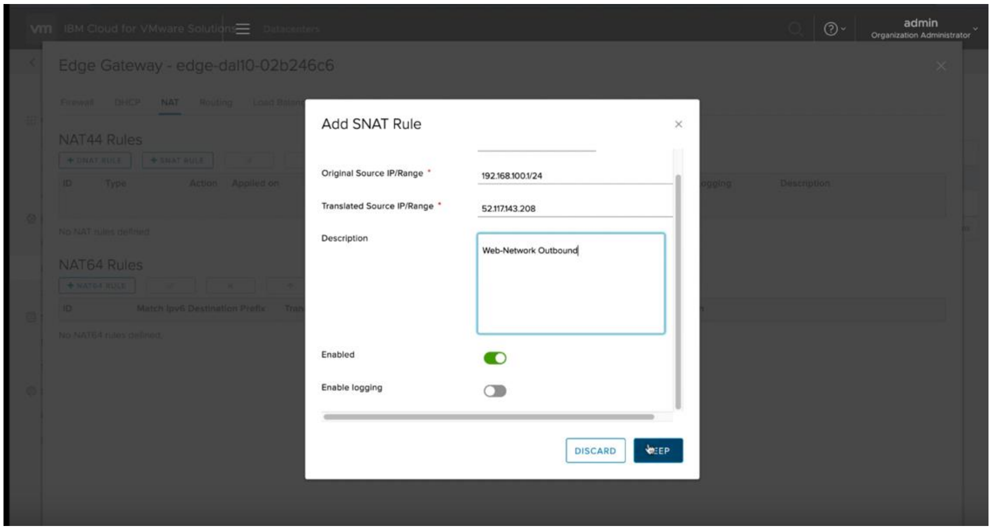
No NAT rules defined.

NAT64 Rules

| ID | Match Ipv6 Destination Prefix | Translated Ipv4 Source Prefix | Enabled | Logging | Description |
|---|---|---|---|---|---|

No NAT64 rules defined.

- ➢ *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*



Add SNAT Rule

Original Source IP/Range * 192.168.100.1/24

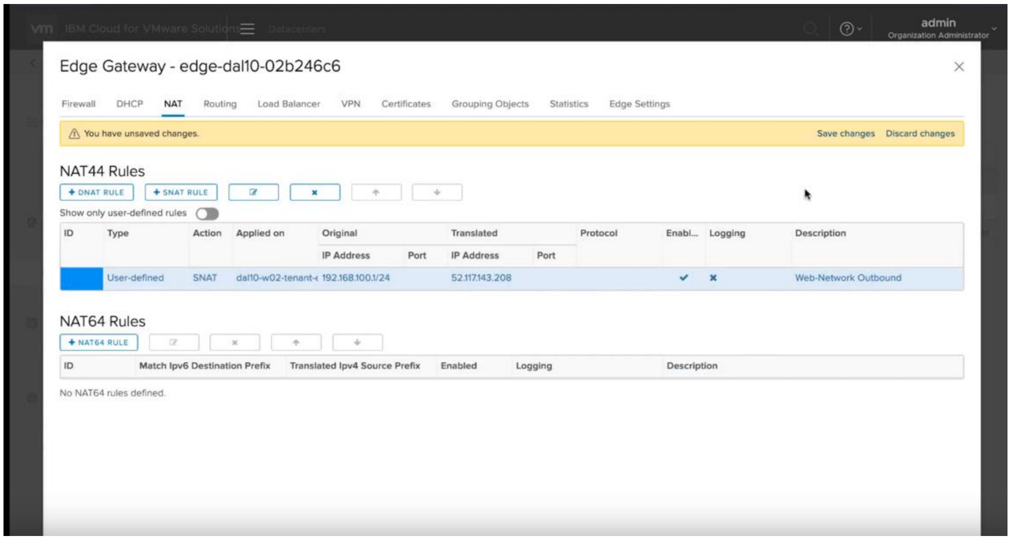
Translated Source IP/Range * 52.117.143.208

Description: Web-Network Outbound

Enabled: on

Enable logging: off

- ➢ *Press Next*
- ➢ *Press "save changes"*



Edge Gateway - edge-dal10-02b246c6

You have unsaved changes. Save changes Discard changes

NAT44 Rules

Show only user-defined rules

| ID | Type | Action | Applied on | Original | | Translated | | Protocol | Enabl... | Logging | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | IP Address | Port | IP Address | Port | | | | |
| | User-defined | SNAT | dal10-w02-tenant-‹ | 192.168.100.1/24 | | 52.117.143.208 | | | ✓ | ✖ | Web-Network Outbound |

NAT64 Rules

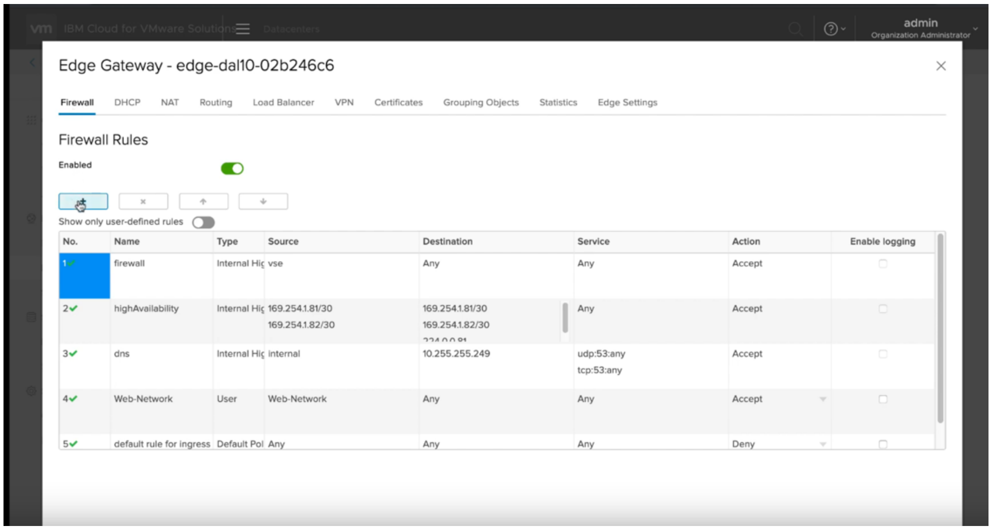
| ID | Match Ipv6 Destination Prefix | Translated Ipv4 Source Prefix | Enabled | Logging | Description |
|---|---|---|---|---|---|

No NAT64 rules 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 “+”



Edge Gateway - edge-dal10-02b246c6

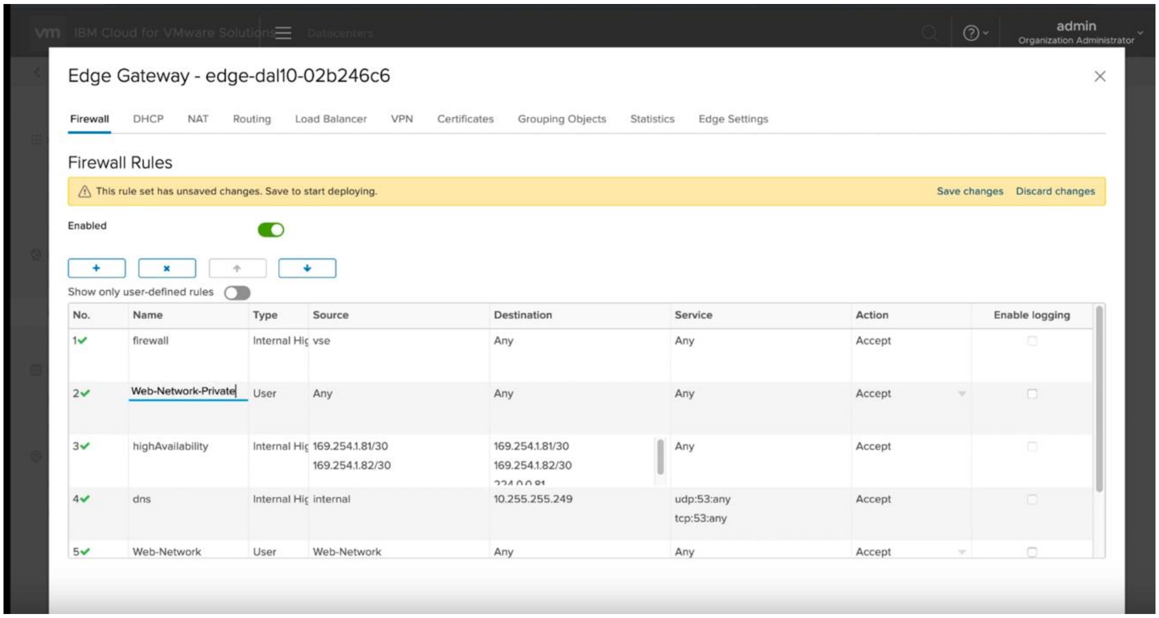
Firewall Rules

Enabled

Show only user-defined rules

| No. | Name | Type | Source | Destination | Service | Action | Enable logging |
|---|---|---|---|---|---|---|---|
| 1✓ | firewall | Internal Hiç | vse | Any | Any | Accept | □ |
| 2✓ | highAvailability | Internal Hiç | 169.254.1.81/30<br>169.254.1.82/30 | 169.254.1.81/30<br>169.254.1.82/30<br>224.0.0.81 | Any | Accept | □ |
| 3✓ | dns | Internal Hiç | internal | 10.255.255.249 | udp:53:any<br>tcp:53:any | Accept | □ |
| 4✓ | Web-Network | User | Web-Network | Any | Any | Accept | □ |
| 5✓ | default rule for ingress | Default Pol | Any | Any | Any | Deny | □ |

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



Edge Gateway - edge-dal10-02b246c6

Firewall Rules

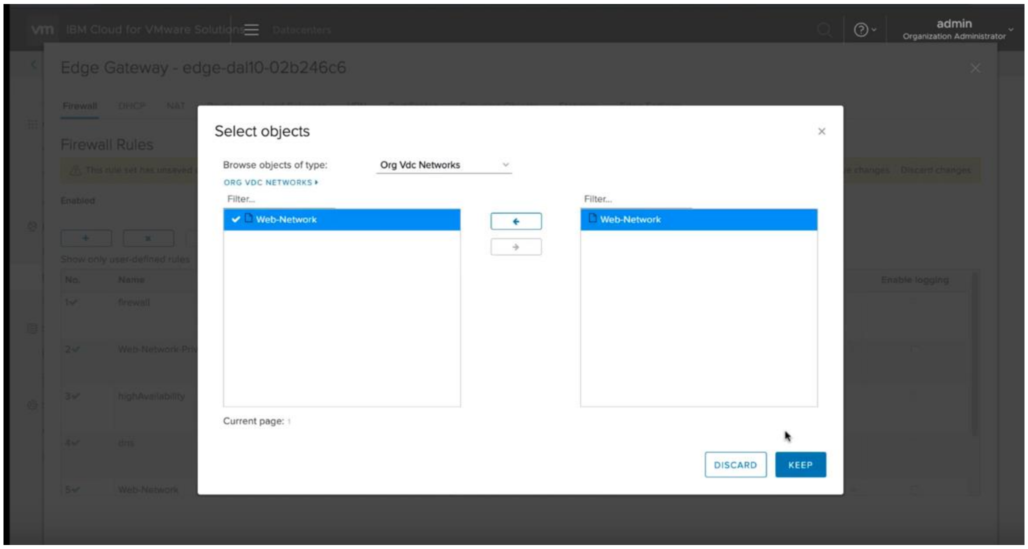
This rule set has unsaved changes. Save to start deploying.

Enabled

Show only user-defined rules

| No. | Name | Type | Source | Destination | Service | Action | Enable logging |
|---|---|---|---|---|---|---|---|
| 1✓ | firewall | Internal Hig | vse | Any | Any | Accept | ☐ |
| 2✓ | Web-Network-Private | User | Any | Any | Any | Accept | ☐ |
| 3✓ | highAvailability | Internal Hig | 169.254.1.81/30<br>169.254.1.82/30 | 169.254.1.81/30<br>169.254.1.82/30<br>224.0.0.81 | Any | Accept | ☐ |
| 4✓ | dns | Internal Hig | internal | 10.255.255.249 | udp:53:any<br>tcp:53:any | Accept | ☐ |
| 5✓ | Web-Network | User | Web-Network | Any | Any | Accept | ☐ |

Select the web-network.


vm IBM Cloud for VMware Solutions
Datacenters
admin
Organization Administrator
Edge Gateway - edge-dal10-02b246c6
Firewall Rules
DISCARD
KEEP

Select objects

Browse objects of type: Org Vdc Networks

ORG VDC NETWORKS ▸

Filter...

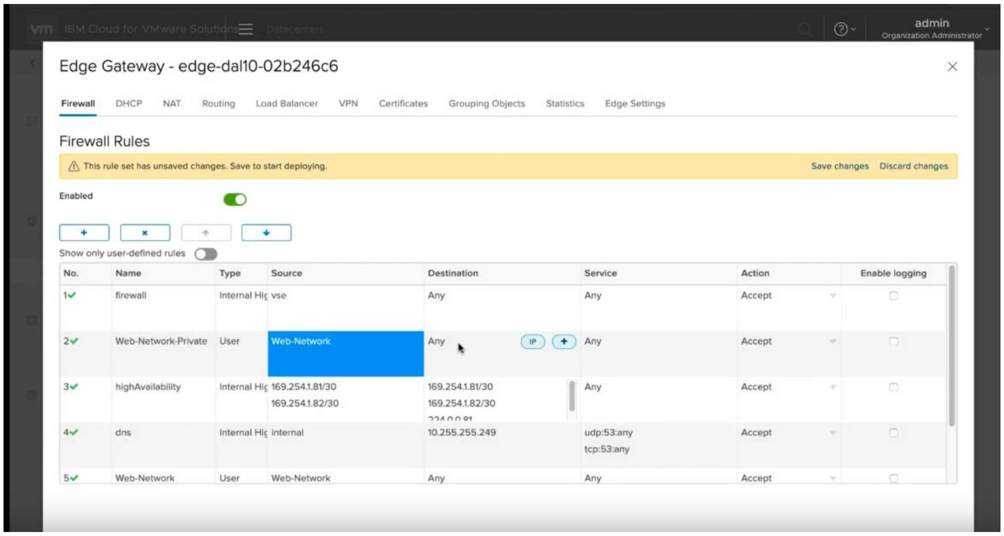
✓ Web-Network

Filter...

Web-Network

Current page: 1

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



Edge Gateway - edge-dal10-02b246c6

Firewall Rules

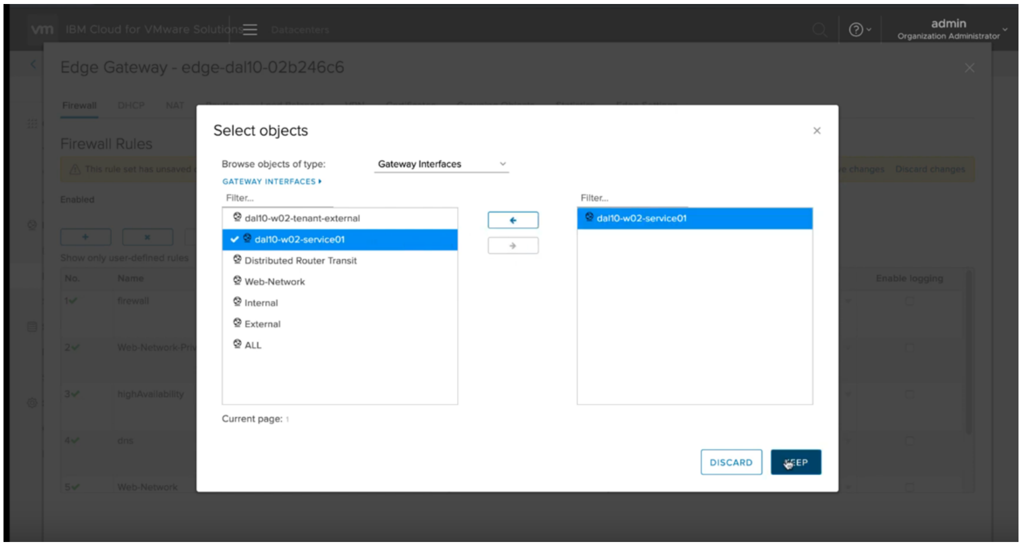
⚠ This rule set has unsaved changes. Save to start deploying.

Enabled ●

Show only user-defined rules ○

| No. | Name | Type | Source | Destination | Service | Action | Enable logging |
|---|---|---|---|---|---|---|---|
| 1✓ | firewall | Internal Hiç | vse | Any | Any | Accept | □ |
| 2✓ | Web-Network-Private | User | Web-Network | Any | Any | Accept | □ |
| 3✓ | highAvailability | Internal Hiç | 169.254.1.81/30<br>169.254.1.82/30 | 169.254.1.81/30<br>169.254.1.82/30<br>224.0.0.81 | Any | Accept | □ |
| 4✓ | dns | Internal Hiç | internal | 10.255.255.249 | udp:53:any<br>tcp:53:any | Accept | □ |
| 5✓ | Web-Network | User | Web-Network | Any | Any | Accept | □ |

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


vm IBM Cloud for VMware Solutions
Datacenters
admin
Organization Administrator
Edge Gateway - edge-dal10-02b246c6
Firewall Rules
DISCARD
KEEP

Select objects

Browse objects of type: Gateway Interfaces

GATEWAY INTERFACES ▸

Filter...

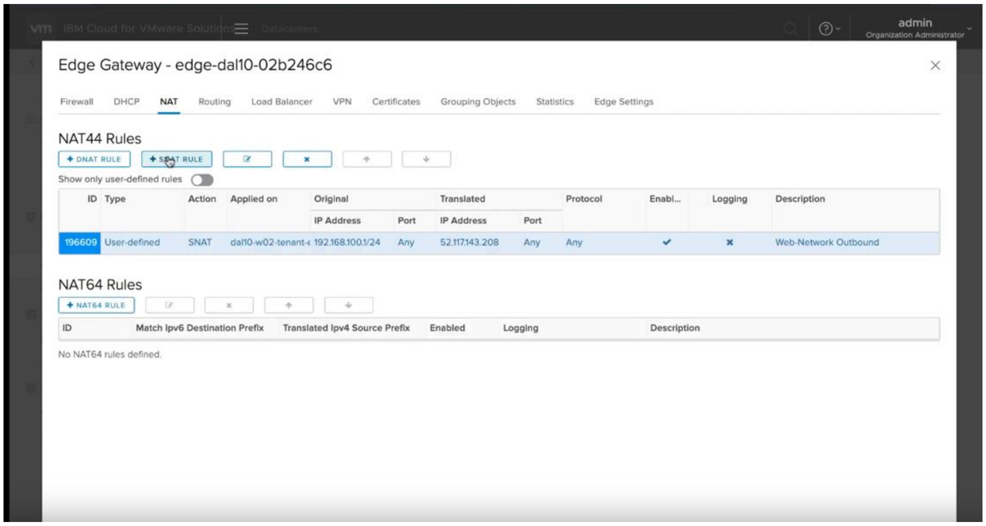
- dal10-w02-tenant-external
- ✓ dal10-w02-service01
- Distributed Router Transit
- Web-Network
- Internal
- External
- ALL

Filter...

- dal10-w02-service01

Current page: 1

Then press the NAT and select Source NAT.



Edge Gateway - edge-dal10-02b246c6

NAT44 Rules

Show only user-defined rules

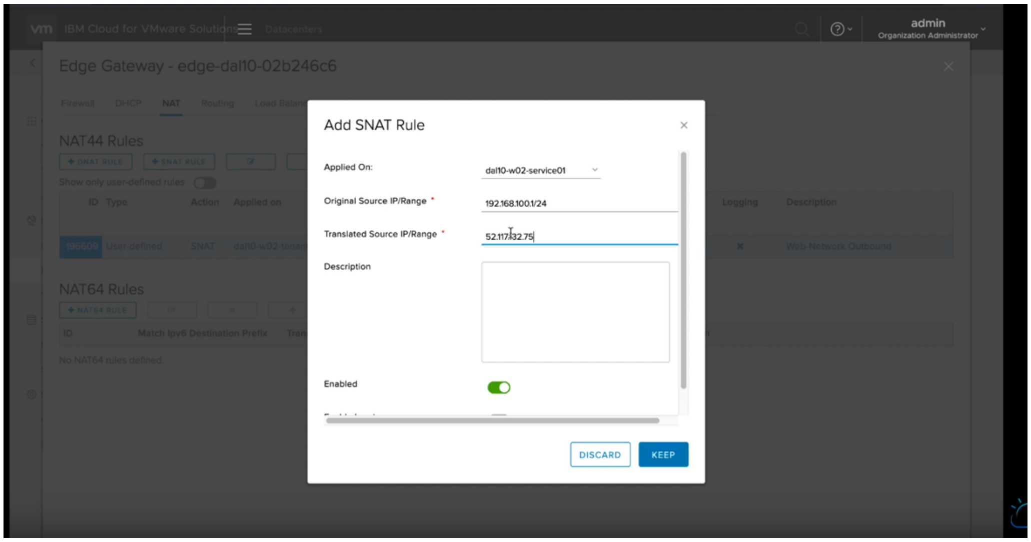
| ID | Type | Action | Applied on | Original | | Translated | | Protocol | Enabl... | Logging | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | IP Address | Port | IP Address | Port | | | | |
| 196609 | User-defined | SNAT | dal10-w02-tenant-( | 192.168.100.1/24 | Any | 52.117.143.208 | Any | Any | ✓ | ✗ | Web-Network Outbound |

NAT64 Rules

| ID | Match Ipv6 Destination Prefix | Translated Ipv4 Source Prefix | Enabled | Logging | Description |
|---|---|---|---|---|---|

No NAT64 rules defined.

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.



Add SNAT Rule

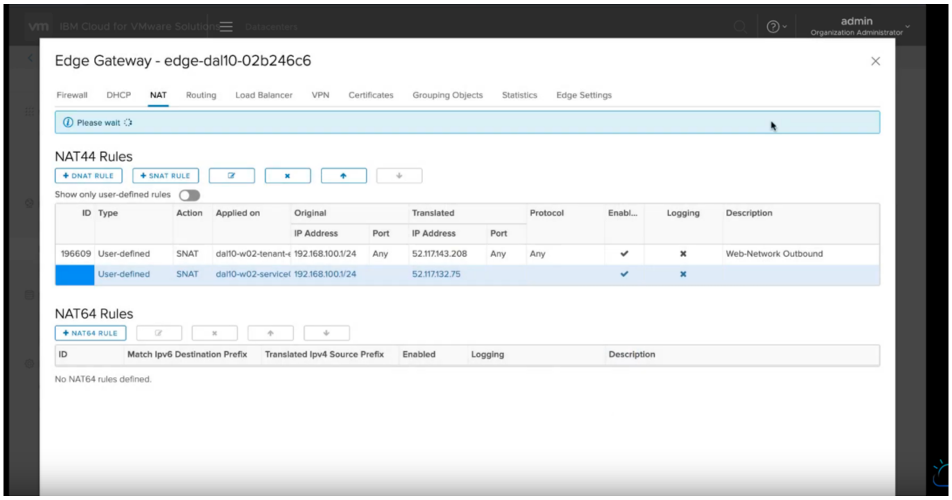
Applied On: dal10-w02-service01

Original Source IP/Range * 192.168.100.1/24

Translated Source IP/Range * 52.117.32.75

Description

Enabled



Edge Gateway - edge-dal10-02b246c6

ⓘ Please wait

NAT44 Rules

Show only user-defined rules

| ID | Type | Action | Applied on | Original |  | Translated |  | Protocol | Enabl... | Logging | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | IP Address | Port | IP Address | Port |  |  |  |  |
| 196609 | User-defined | SNAT | dal10-w02-tenant-e | 192.168.100.1/24 | Any | 52.117.143.208 | Any | Any | ✓ | ✖ | Web-Network Outbound |
|  | User-defined | SNAT | dal10-w02-service( | 192.168.100.1/24 |  | 52.117.132.75 |  |  | ✓ | ✖ |  |

NAT64 Rules

| ID | Match Ipv6 Destination Prefix | Translated Ipv4 Source Prefix | Enabled | Logging | Description |
|---|---|---|---|---|---|

No NAT64 rules defined.

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.

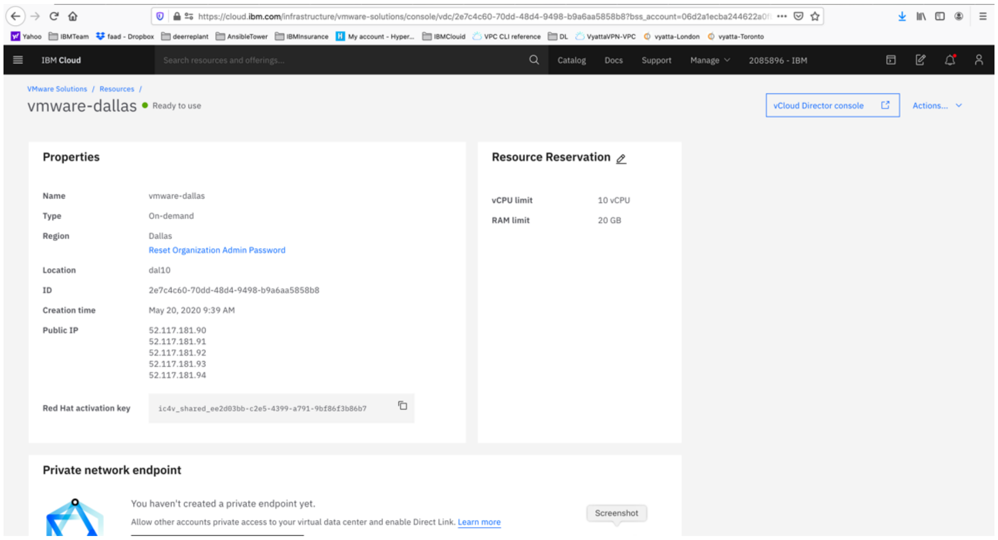
At this point, you can start to provision a VM in your VMware Shared service and be able to access external and internal network.

## 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.



VMware Solutions / Resources /

vmware-dallas ● Ready to use

**Properties**

| | |
|---|---|
| Name | vmware-dallas |
| Type | On-demand |
| Region | Dallas<br>Reset Organization Admin Password |
| Location | dal10 |
| ID | 2e7c4c60-70dd-48d4-9498-b9a6aa5858b8 |
| Creation time | May 20, 2020 9:39 AM |
| Public IP | 52.117.181.90<br>52.117.181.91<br>52.117.181.92<br>52.117.181.93<br>52.117.181.94 |
| Red Hat activation key | ic4v_shared_ee2d03bb-c2e5-4399-a791-9bf86f3b86b7 |

**Resource Reservation**

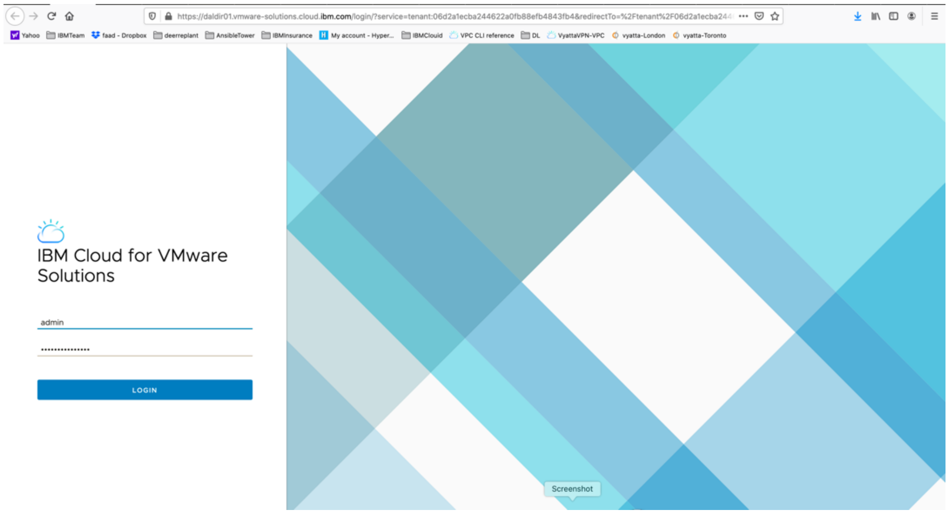
| | |
|---|---|
| vCPU limit | 10 vCPU |
| RAM limit | 20 GB |

**Private network endpoint**

You haven't created a private endpoint yet.

Allow other accounts private access to your virtual data center and enable Direct Link. Learn more

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

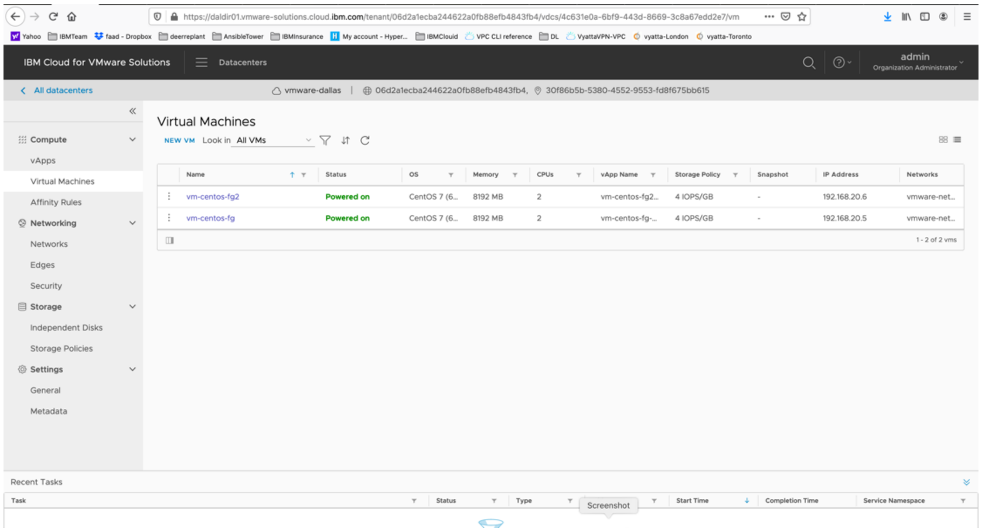


IBM Cloud for VMware Solutions

admin

················

Login to the console using admin and password provided.

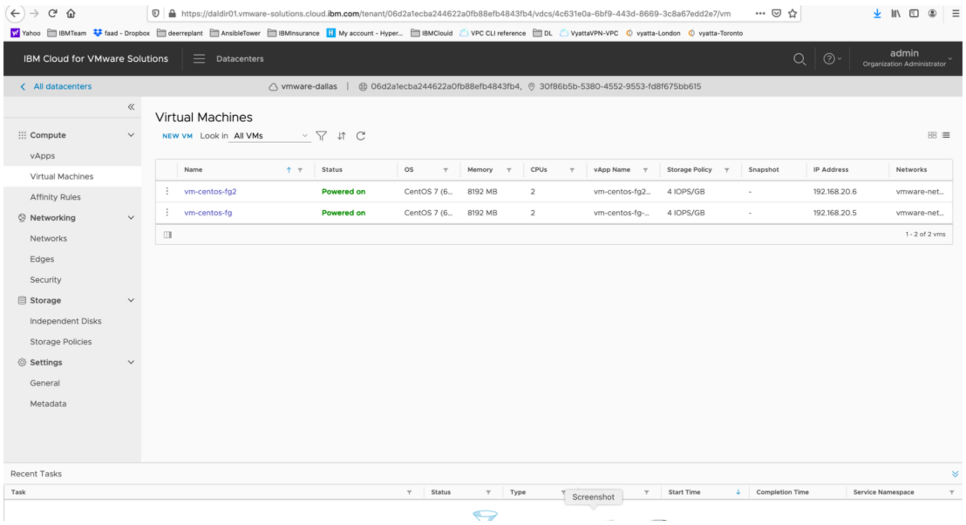


| Name | Status | OS | Memory | CPUs | vApp Name | Storage Policy | Snapshot | IP Address | Networks |
|---|---|---|---|---|---|---|---|---|---|
| vm-centos-fg2 | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg2... | 4 IOPS/GB | - | 192.168.20.6 | vmware-net... |
| vm-centos-fg | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg-... | 4 IOPS/GB | - | 192.168.20.5 | vmware-net... |

1 - 2 of 2 vms

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

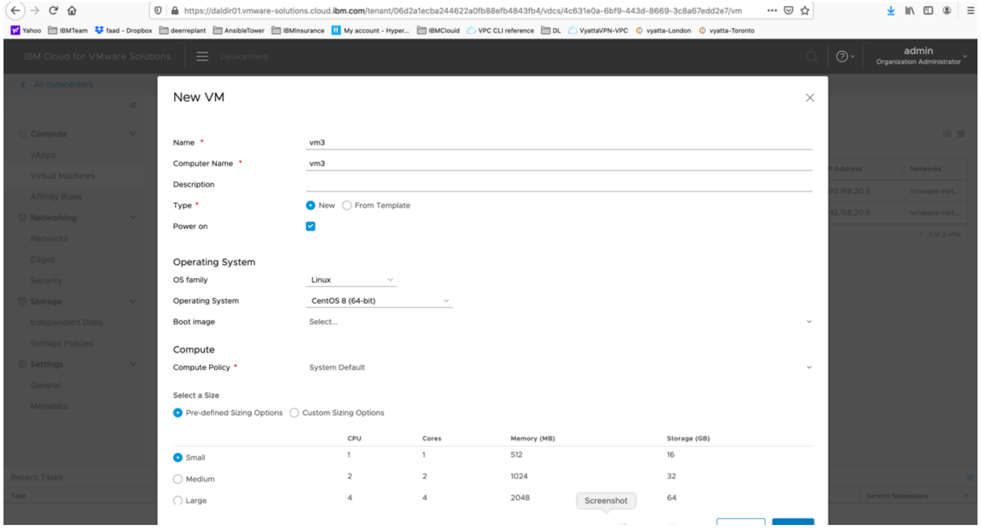
Choose New VM.



| Name | Status | OS | Memory | CPUs | vApp Name | Storage Policy | Snapshot | IP Address | Networks |
|---|---|---|---|---|---|---|---|---|---|
| vm-centos-fg2 | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg2... | 4 IOPS/GB | - | 192.168.20.6 | vmware-net... |
| vm-centos-fg | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg-... | 4 IOPS/GB | - | 192.168.20.5 | vmware-net... |

1 - 2 of 2 vms

- *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.*



New VM

Name * vm3
Computer Name * vm3
Description
Type * ● New ○ From Template
Power on ☑

Operating System
OS family Linux
Operating System CentOS 8 (64-bit)
Boot image Select...

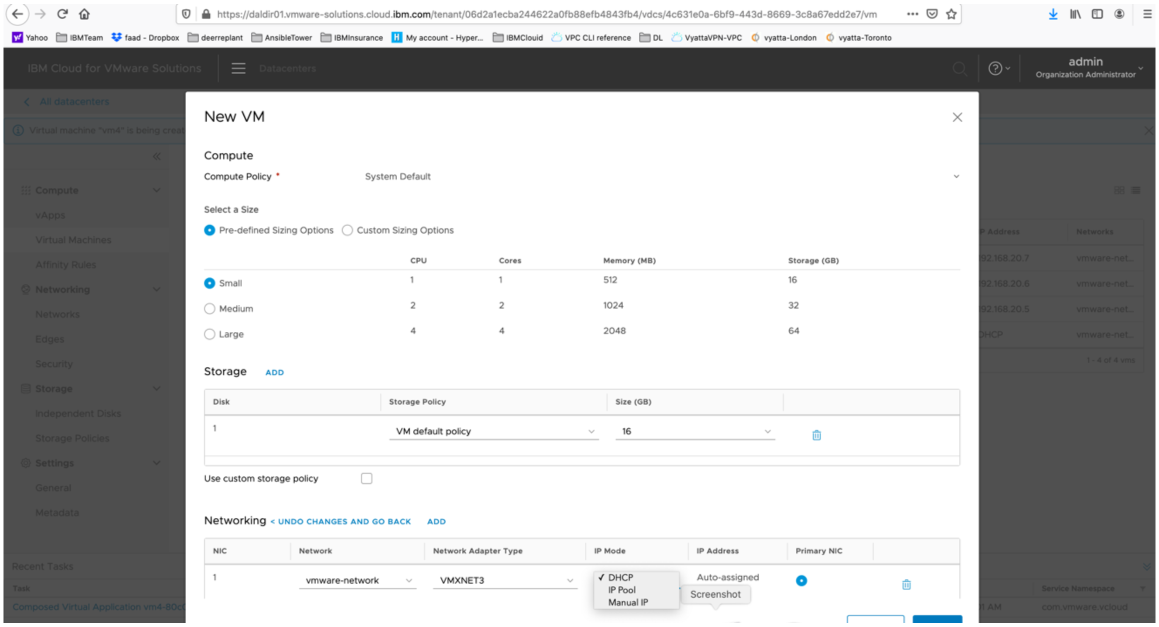
Compute
Compute Policy * System Default

Select a Size
● Pre-defined Sizing Options ○ Custom Sizing Options

| | CPU | Cores | Memory (MB) | Storage (GB) |
|---|---|---|---|---|
| ● Small | 1 | 1 | 512 | 16 |
| ○ Medium | 2 | 2 | 1024 | 32 |
| ○ Large | 4 | 4 | 2048 | 64 |

https://daldir01.vmware-solutions.cloud.ibm.com/tenant/06d2a1ecba244622a0fb88efb4843fb4/vdcs/4c631e0a-6bf9-443d-8669-3c8a67edd2e7/vm
IBM Cloud for VMware Solutions
Datacenters
admin
Organization Administrator
Screenshot

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



New VM

Compute
Compute Policy * System Default

Select a Size
● Pre-defined Sizing Options ○ Custom Sizing Options

| | CPU | Cores | Memory (MB) | Storage (GB) |
|---|---|---|---|---|
| ● Small | 1 | 1 | 512 | 16 |
| ○ Medium | 2 | 2 | 1024 | 32 |
| ○ Large | 4 | 4 | 2048 | 64 |

Storage ADD

| Disk | Storage Policy | Size (GB) |
|---|---|---|
| 1 | VM default policy | 16 |

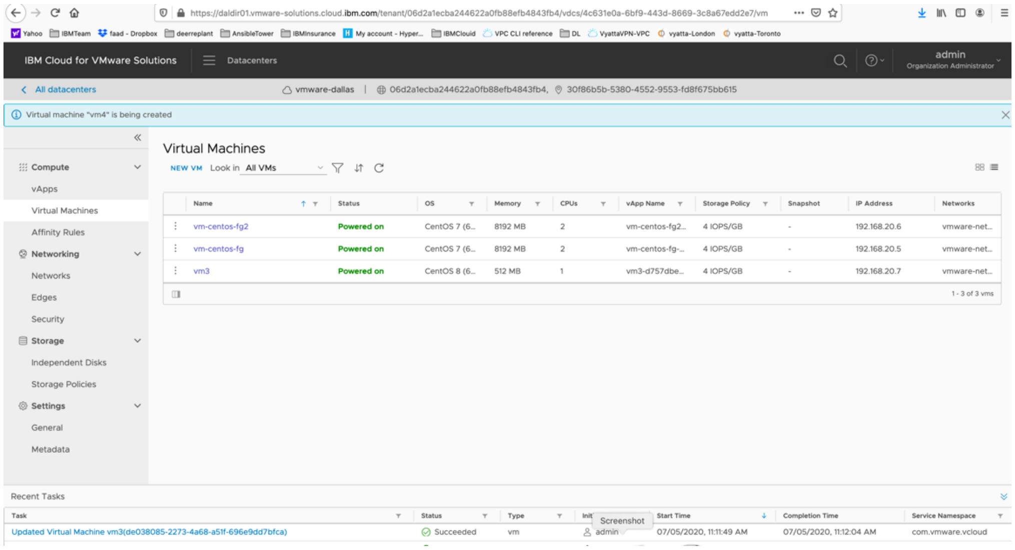
Use custom storage policy □

Networking < UNDO CHANGES AND GO BACK ADD

| NIC | Network | Network Adapter Type | IP Mode | IP Address | Primary NIC |
|---|---|---|---|---|---|
| 1 | vmware-network | VMXNET3 | ✓ DHCP<br>IP Pool<br>Manual IP | Auto-assigned | ● |

https://daldir01.vmware-solutions.cloud.ibm.com/tenant/06d2a1ecba244622a0fb88efb4843fb4/vdcs/4c631e0a-6bf9-443d-8669-3c8a67edd2e7/vm
IBM Cloud for VMware Solutions
Datacenters
admin
Organization Administrator
Virtual machine "vm4" is being creat
Screenshot

Press OK
Now your VM is being provisioned.



Virtual machine "vm4" is being created

Virtual Machines

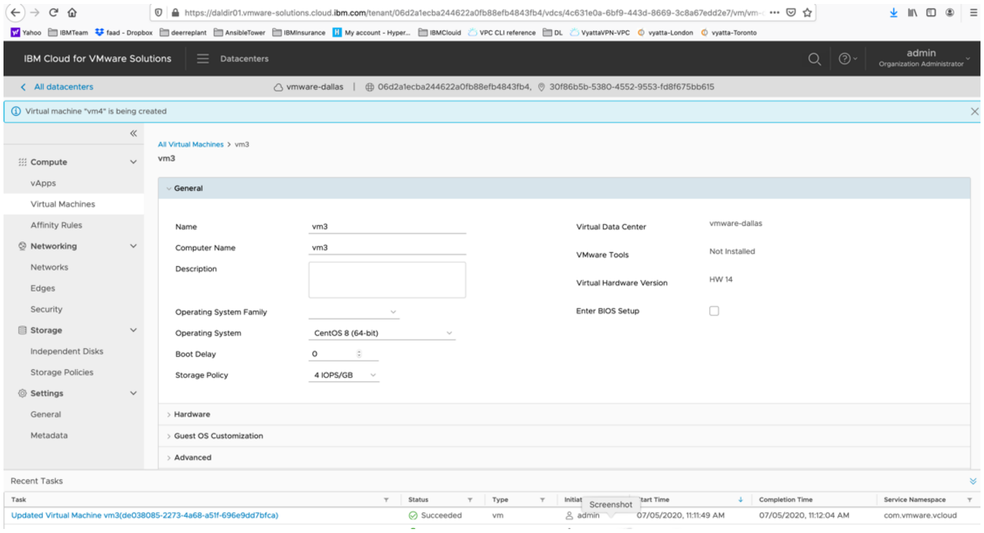
| Name | Status | OS | Memory | CPUs | vApp Name | Storage Policy | Snapshot | IP Address | Networks |
|---|---|---|---|---|---|---|---|---|---|
| vm-centos-fg2 | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg2... | 4 IOPS/GB | - | 192.168.20.6 | vmware-net... |
| vm-centos-fg | Powered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg-... | 4 IOPS/GB | - | 192.168.20.5 | vmware-net... |
| vm3 | Powered on | CentOS 8 (6... | 512 MB | 1 | vm3-d757dbe... | 4 IOPS/GB | - | 192.168.20.7 | vmware-net... |

1 - 3 of 3 vms

Recent Tasks

| Task | Status | Type | Init | Start Time | Completion Time | Service Namespace |
|---|---|---|---|---|---|---|
| Updated Virtual Machine vm3(de038085-2273-4a68-a51f-696e9dd7bfca) | Succeeded | vm | admin | 07/05/2020, 11:11:49 AM | 07/05/2020, 11:12:04 AM | com.vmware.vcloud |

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



Virtual machine "vm4" is being created

vm3

General

| | | | |
|---|---|---|---|
| Name | vm3 | Virtual Data Center | vmware-dallas |
| Computer Name | vm3 | VMware Tools | Not Installed |
| Description | | Virtual Hardware Version | HW 14 |
| Operating System Family | | Enter BIOS Setup | □ |
| Operating System | CentOS 8 (64-bit) | | |
| Boot Delay | 0 | | |
| Storage Policy | 4 IOPS/GB | | |

Hardware

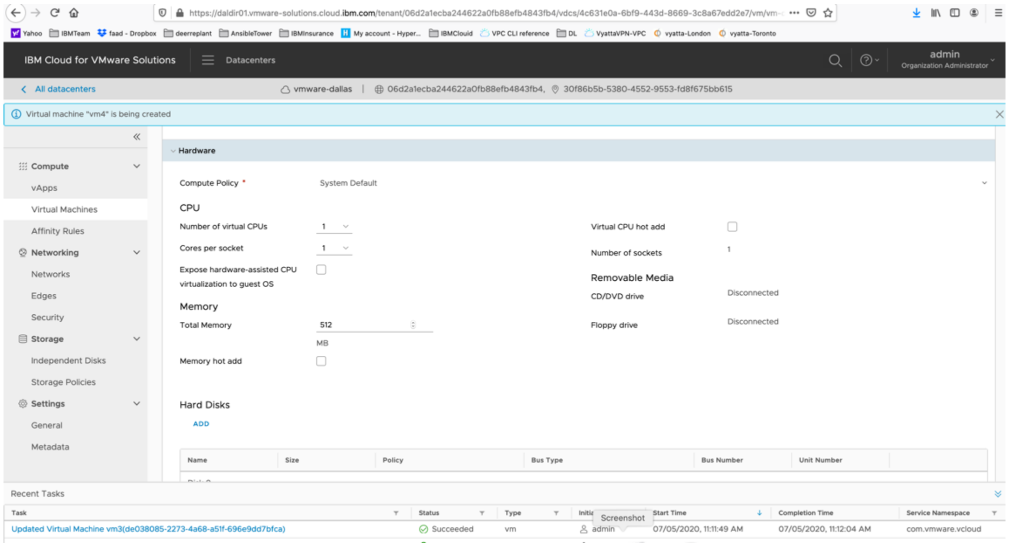
Guest OS Customization

Advanced

Recent Tasks

| Task | Status | Type | Initiat | Start Time | Completion Time | Service Namespace |
|---|---|---|---|---|---|---|
| Updated Virtual Machine vm3(de038085-2273-4a68-a51f-696e9dd7bfca) | Succeeded | vm | admin | 07/05/2020, 11:11:49 AM | 07/05/2020, 11:12:04 AM | com.vmware.vcloud |

To see more details, expand the Hardware tab.



Virtual machine "vm4" is being created

Hardware

Compute Policy * System Default

CPU

Number of virtual CPUs 1

Cores per socket 1

Expose hardware-assisted CPU virtualization to guest OS □

Virtual CPU hot add □

Number of sockets 1

Removable Media

CD/DVD drive Disconnected

Floppy drive Disconnected

Memory

Total Memory 512 MB

Memory hot add □

Hard Disks

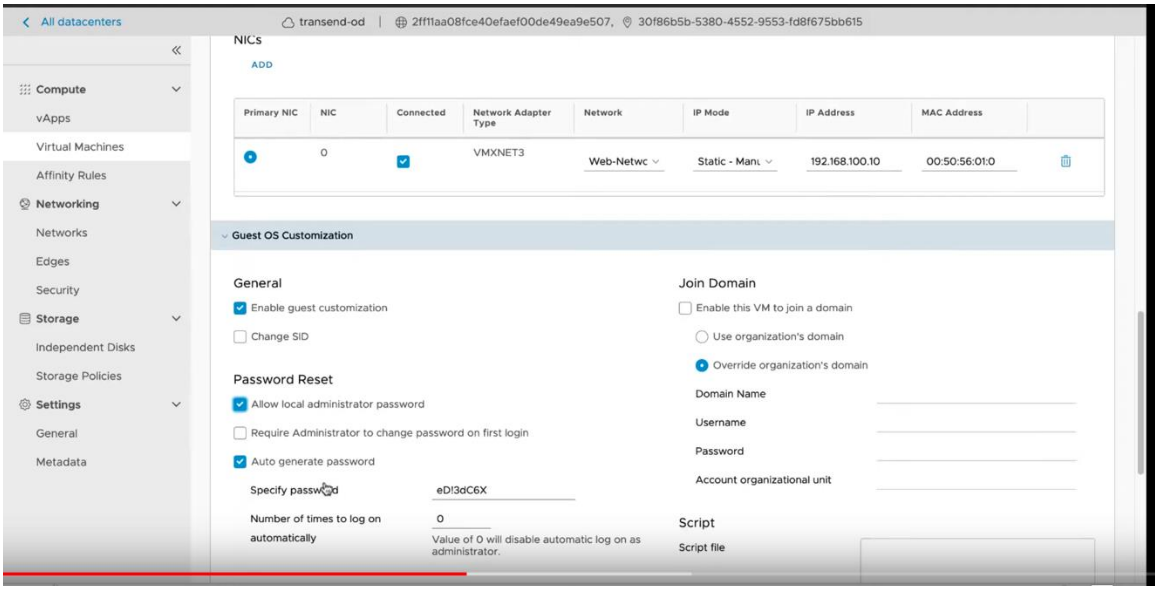
| Name | Size | Policy | Bus Type | Bus Number | Unit Number |
|---|---|---|---|---|---|

Recent Tasks

| Task | Status | Type | Initia | Start Time | Completion Time | Service Namespace |
|---|---|---|---|---|---|---|
| Updated Virtual Machine vm3(de038085-2273-4a68-a51f-696e9dd7bfca) | Succeeded | vm | admin | 07/05/2020, 11:11:49 AM | 07/05/2020, 11:12:04 AM | com.vmware.vcloud |

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*



NICs

| Primary NIC | NIC | Connected | Network Adapter Type | Network | IP Mode | IP Address | MAC Address |
|---|---|---|---|---|---|---|---|
| ● | 0 | ☑ | VMXNET3 | Web-Netwc | Static - Manu | 192.168.100.10 | 00:50:56:01:0 |

Guest OS Customization

General

☑ Enable guest customization

□ Change SID

Password Reset

☑ Allow local administrator password

□ Require Administrator to change password on first login

☑ Auto generate password

Specify password eD!3dC6X

Number of times to log on automatically 0

Value of 0 will disable automatic log on as administrator.

Join Domain

□ Enable this VM to join a domain

○ Use organization's domain

● Override organization's domain

Domain Name

Username

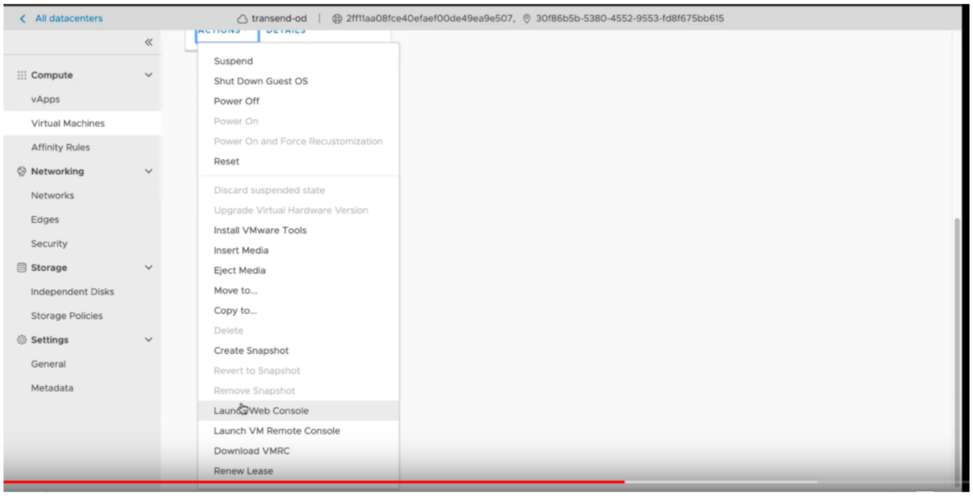
Password

Account organizational unit

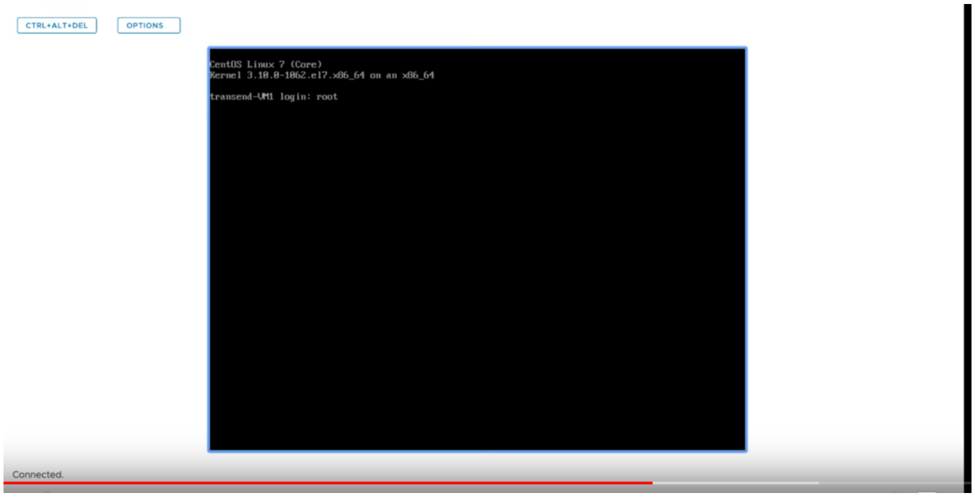
Script

Script file

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

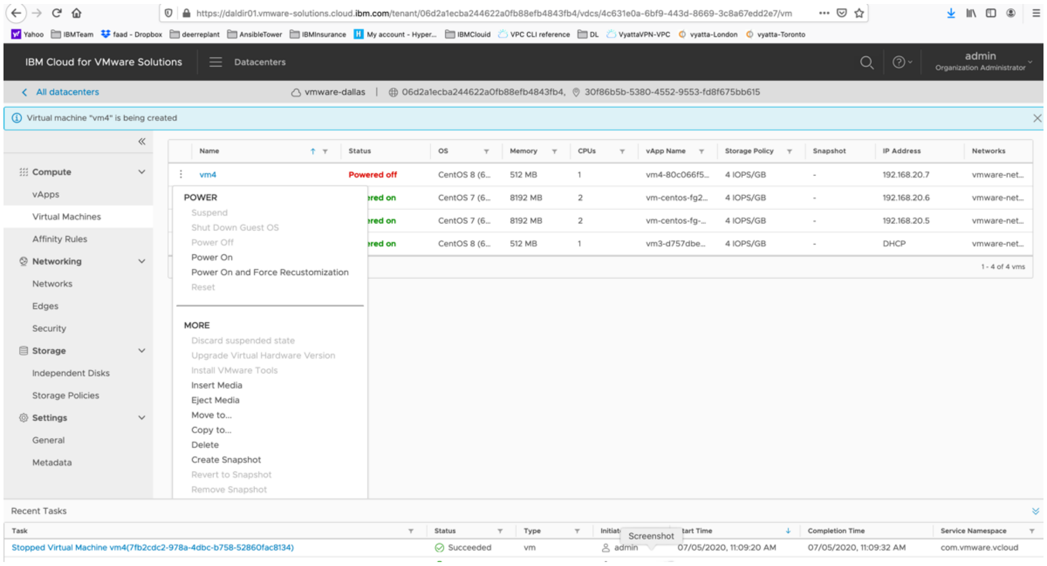


User the root and password you created before to login.



```
CentOS Linux 7 (Core)
Kernel 3.10.0-1062.el7.x86_64 on an x86_64

transend-VM1 login: root
```

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.



Virtual machine "vm4" is being created

| Name | Status | OS | Memory | CPUs | vApp Name | Storage Policy | Snapshot | IP Address | Networks |
|---|---|---|---|---|---|---|---|---|---|
| vm4 | Powered off | CentOS 8 (6... | 512 MB | 1 | vm4-80c066f5... | 4 IOPS/GB | - | 192.168.20.7 | vmware-net... |
|  | ered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg2... | 4 IOPS/GB | - | 192.168.20.6 | vmware-net... |
|  | ered on | CentOS 7 (6... | 8192 MB | 2 | vm-centos-fg-... | 4 IOPS/GB | - | 192.168.20.5 | vmware-net... |
|  | ered on | CentOS 8 (6... | 512 MB | 1 | vm3-d757dbe... | 4 IOPS/GB | - | DHCP | vmware-net... |

1 - 4 of 4 vms

Recent Tasks

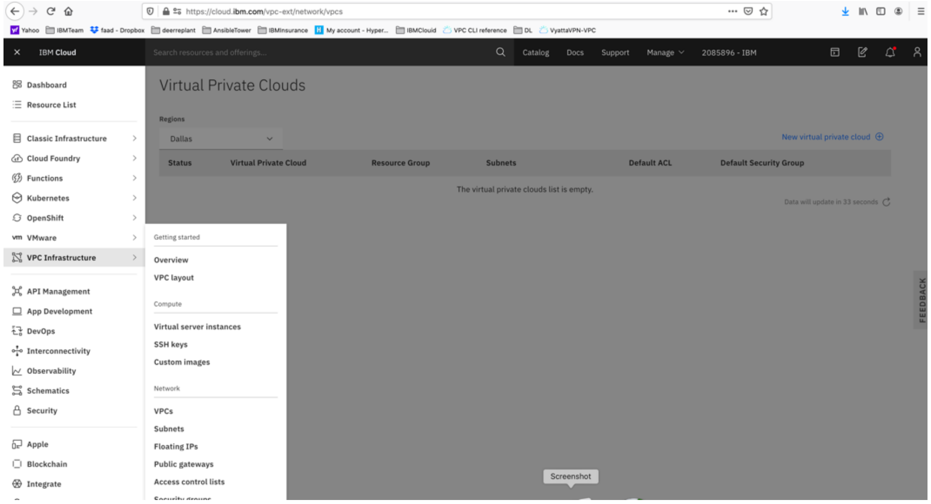
| Task | Status | Type | Initiat | tart Time | Completion Time | Service Namespace |
|---|---|---|---|---|---|---|
| Stopped Virtual Machine vm4(7fb2cdc2-978a-4dbc-b758-52860fac8134) | Succeeded | vm | admin | 07/05/2020, 11:09:20 AM | 07/05/2020, 11:09:32 AM | com.vmware.vcloud |

# 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”



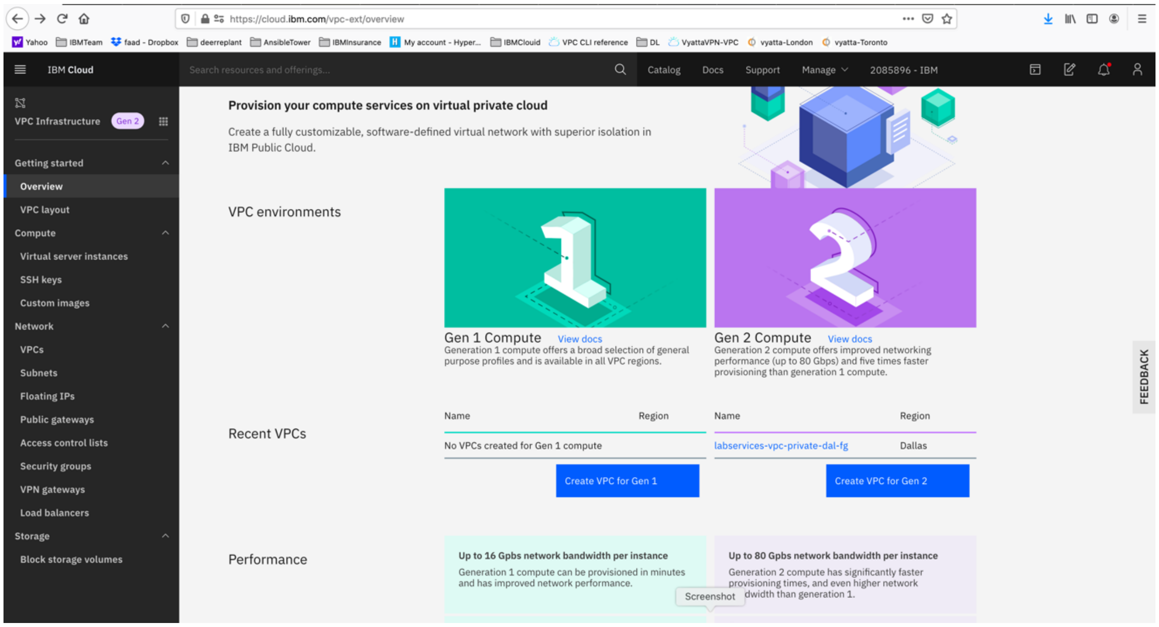
Virtual Private Clouds

| Status | Virtual Private Cloud | Resource Group | Subnets | Default ACL | Default Security Group |
|---|---|---|---|---|---|

The virtual private clouds list is empty.

Data will update in 33 seconds

Here you can provision your Gen 2 VPC.
Press “Create VPC Gen 2”



Provision your compute services on virtual private cloud

Create a fully customizable, software-defined virtual network with superior isolation in IBM Public Cloud.

VPC environments

Gen 1 Compute View docs
Generation 1 compute offers a broad selection of general purpose profiles and is available in all VPC regions.

Gen 2 Compute View docs
Generation 2 compute offers improved networking performance (up to 80 Gbps) and five times faster provisioning than generation 1 compute.

Recent VPCs

| Name | Region |
|---|---|
| No VPCs created for Gen 1 compute | |

| Name | Region |
|---|---|
| labservices-vpc-private-dal-fg | Dallas |

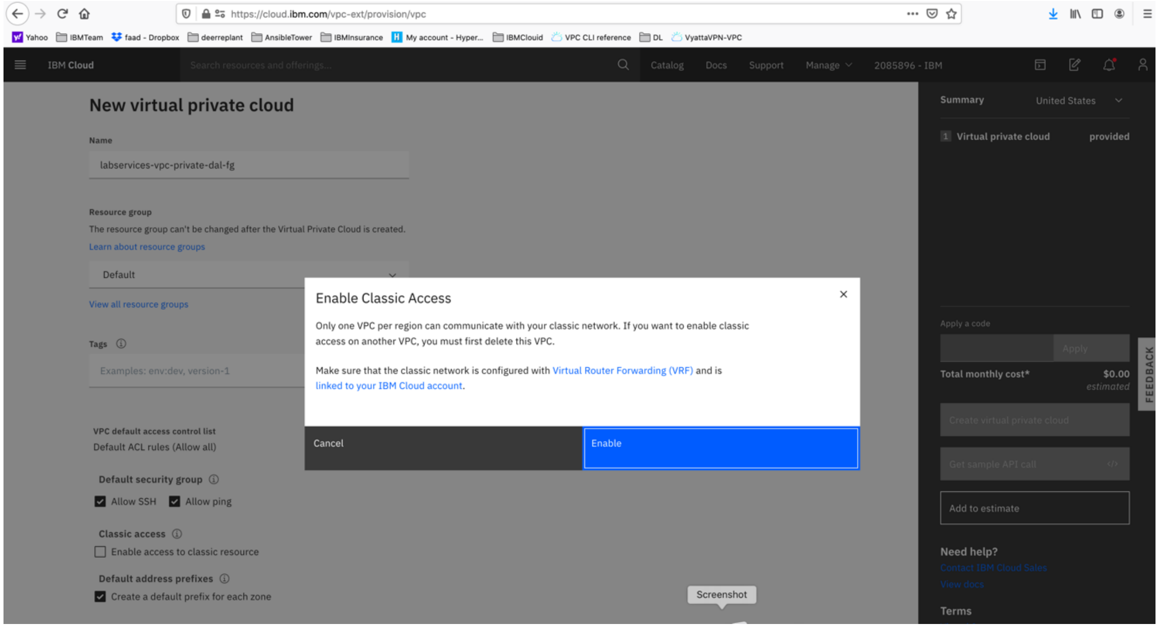
Create VPC for Gen 1

Create VPC for Gen 2

Performance

Up to 16 Gpbs network bandwidth per instance
Generation 1 compute can be provisioned in minutes and has improved network performance.

Up to 80 Gpbs network bandwidth per instance
Generation 2 compute has significantly faster provisioning times, and even higher network dwidth than generation 1.



New virtual private cloud

Name
labservices-vpc-private-dal-fg

Resource group
The resource group can't be changed after the Virtual Private Cloud is created.
Learn about resource groups
Default
View all resource groups

Tags
Examples: env:dev, version-1

VPC default access control list
Default ACL rules (Allow all)

Default security group
☑ Allow SSH ☑ Allow ping

Classic access
☐ Enable access to classic resource

Default address prefixes
☑ Create a default prefix for each zone

1 Virtual private cloud provided

Total monthly cost* $0.00 estimated

Enable Classic Access

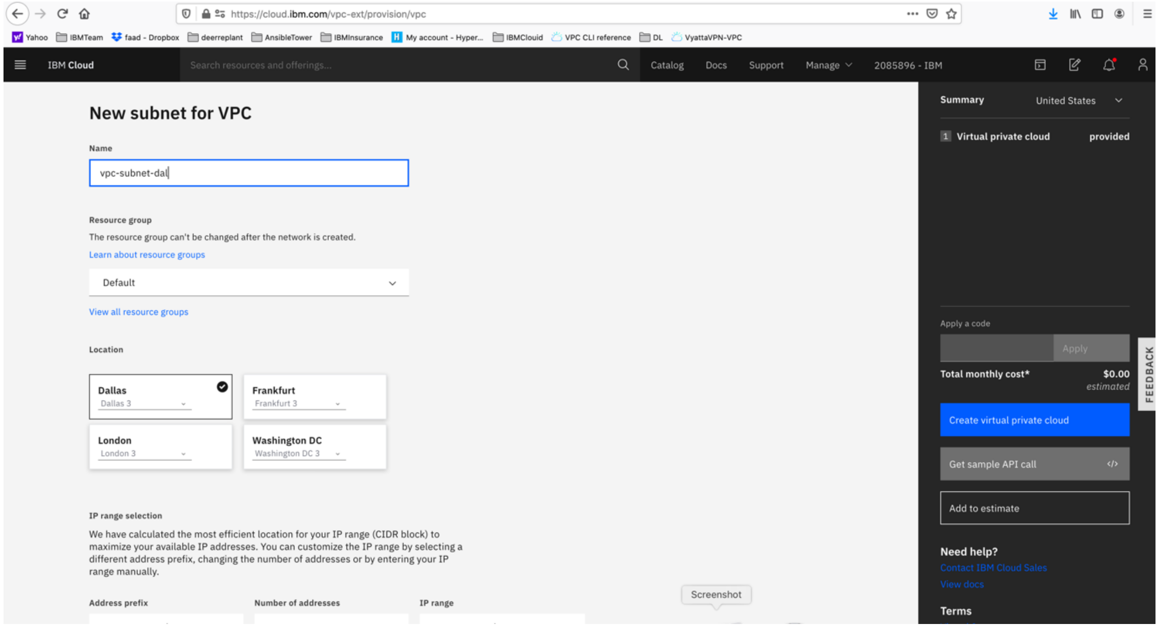
Only one VPC per region can communicate with your classic network. If you want to enable classic access on another VPC, you must first delete this VPC.

Make sure that the classic network is configured with Virtual Router Forwarding (VRF) and is linked to your IBM Cloud account.

Cancel Enable

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*



New subnet for VPC

Name: vpc-subnet-dal

Resource group

The resource group can't be changed after the network is created.

Learn about resource groups

Default

View all resource groups

Location

Dallas (Dallas 3) ✓ | Frankfurt (Frankfurt 3)

London (London 3) | Washington DC (Washington DC 3)

IP range selection

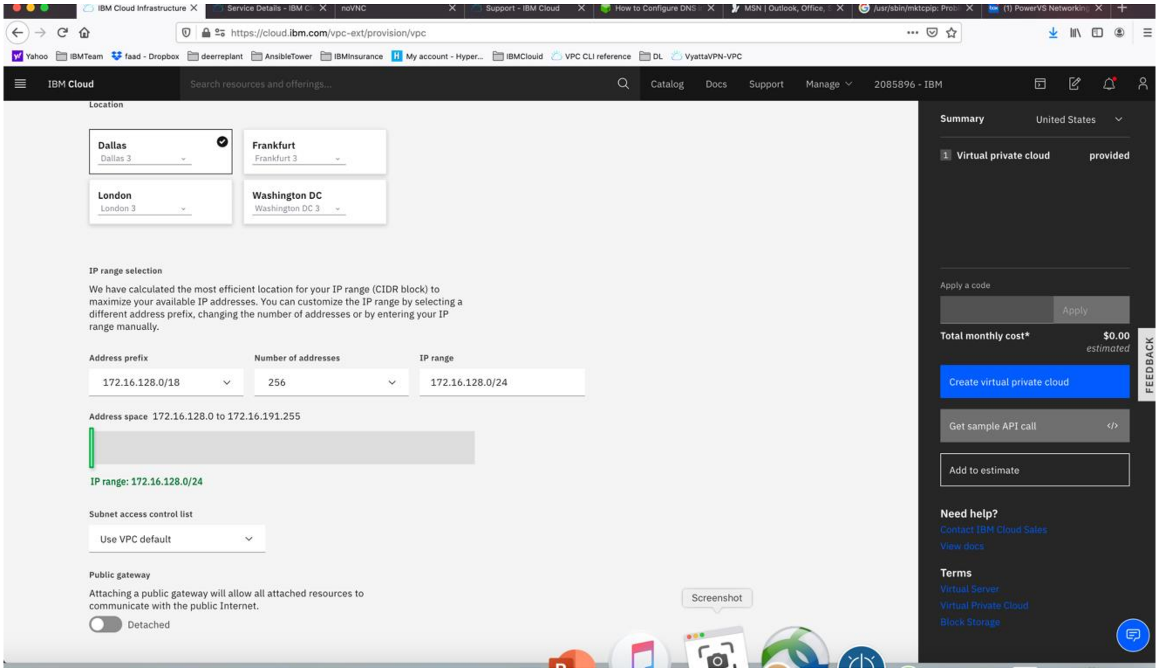
We have calculated the most efficient location for your IP range (CIDR block) to maximize your available IP addresses. You can customize the IP range by selecting a different address prefix, changing the number of addresses or by entering your IP range manually.

Address prefix | Number of addresses | IP range

Summary — United States

1 Virtual private cloud — provided

Total monthly cost* $0.00 estimated



Location

Dallas (Dallas 3) ✓ | Frankfurt (Frankfurt 3)

London (London 3) | Washington DC (Washington DC 3)

IP range selection

We have calculated the most efficient location for your IP range (CIDR block) to maximize your available IP addresses. You can customize the IP range by selecting a different address prefix, changing the number of addresses or by entering your IP range manually.

| Address prefix | Number of addresses | IP range |
|---|---|---|
| 172.16.128.0/18 | 256 | 172.16.128.0/24 |

Address space 172.16.128.0 to 172.16.191.255

IP range: 172.16.128.0/24

Subnet access control list: Use VPC default

Public gateway

Attaching a public gateway will allow all attached resources to communicate with the public Internet.

Detached

Summary — United States

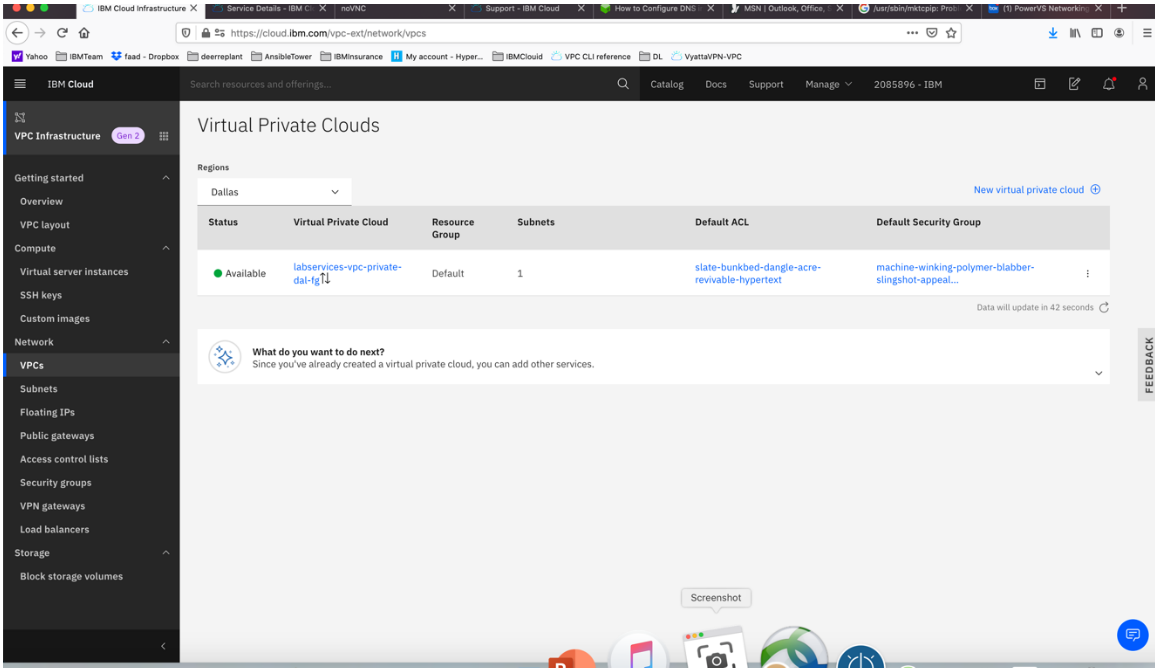
1 Virtual private cloud — provided

Total monthly cost* $0.00 estimated

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.



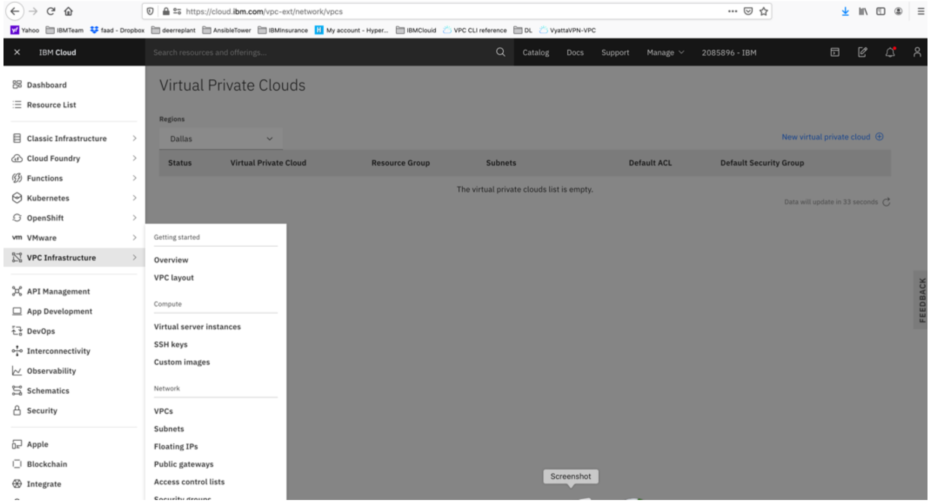
| Status | Virtual Private Cloud | Resource Group | Subnets | Default ACL | Default Security Group |
|---|---|---|---|---|---|
| Available | labservices-vpc-private-dal-fg | Default | 1 | slate-bunkbed-dangle-acre-revivable-hypertext | machine-winking-polymer-blabber-slingshot-appeal... |

Data will update in 42 seconds

What do you want to do next?
Since you've already created a virtual private cloud, you can add other services.

## Provision a VPC VSI inside the Gen 2 VPC

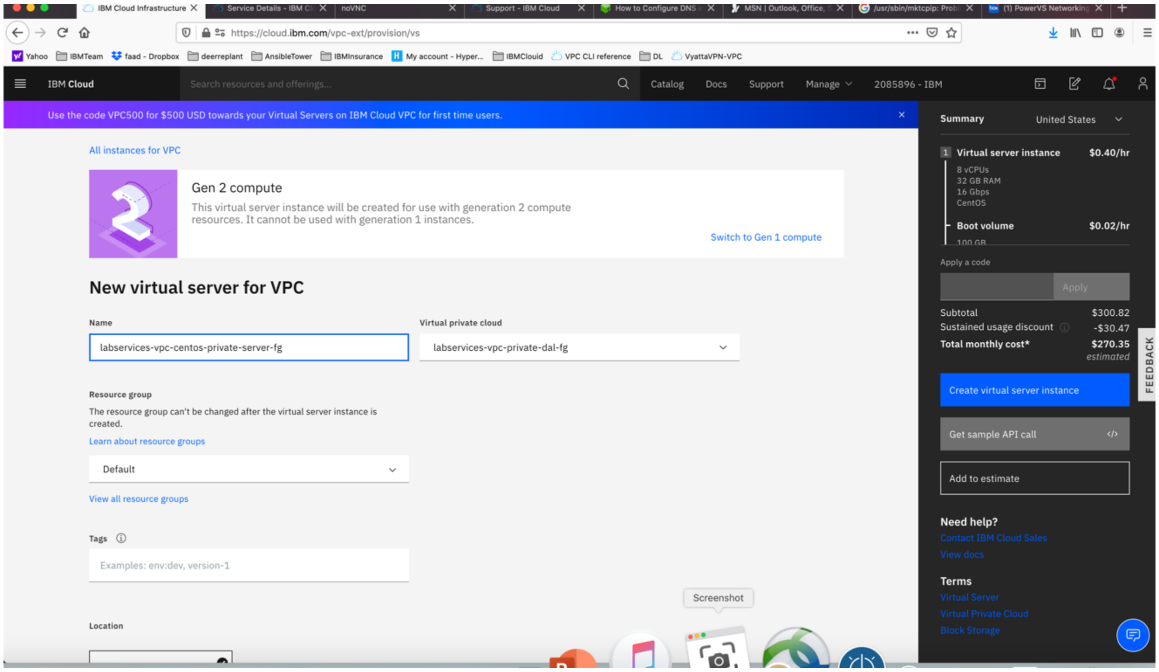
Now choose the VPC Gen 2 which you just created.
We will now add some VPC VSI into this VPC.
On Top left-hand side, click on the triple line icon and choose "VPC Infrastructure" and then "virtual server instances"



The virtual private clouds list is empty.

Data will update in 33 seconds

Choose a "new instance"



Use the code VPC500 for $500 USD towards your Virtual Servers on IBM Cloud VPC for first time users.

All instances for VPC

Gen 2 compute

This virtual server instance will be created for use with generation 2 compute resources. It cannot be used with generation 1 instances.

Switch to Gen 1 compute

New virtual server for VPC

Name: labservices-vpc-centos-private-server-fg

Virtual private cloud: labservices-vpc-private-dal-fg

Resource group

The resource group can't be changed after the virtual server instance is created.

Learn about resource groups

Default

View all resource groups

Tags: Examples: env:dev, version-1

Location

Summary United States

| | |
|---|---|
| 1 Virtual server instance | $0.40/hr |
| 8 vCPUs<br>32 GB RAM<br>16 Gbps<br>CentOS | |
| Boot volume | $0.02/hr |
| 100 GB | |

Apply a code

Apply

| | |
|---|---|
| Subtotal | $300.82 |
| Sustained usage discount | -$30.47 |
| Total monthly cost* | $270.35<br>estimated |

Create virtual server instance

Get sample API call

Add to estimate

Need help?

Contact IBM Cloud Sales

View docs

Terms

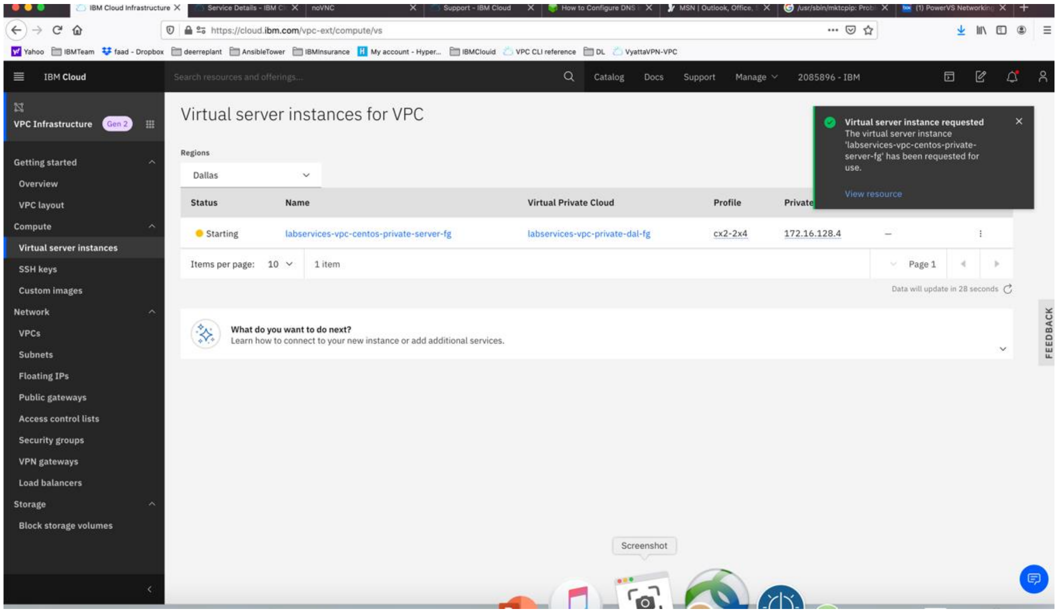
Virtual Server

Virtual Private Cloud

Block Storage

- *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.



Virtual server instances for VPC

Regions

Dallas

| Status | Name | Virtual Private Cloud | Profile | Private | |
|---|---|---|---|---|---|
| ● Starting | labservices-vpc-centos-private-server-fg | labservices-vpc-private-dal-fg | cx2-2x4 | 172.16.128.4 | – |

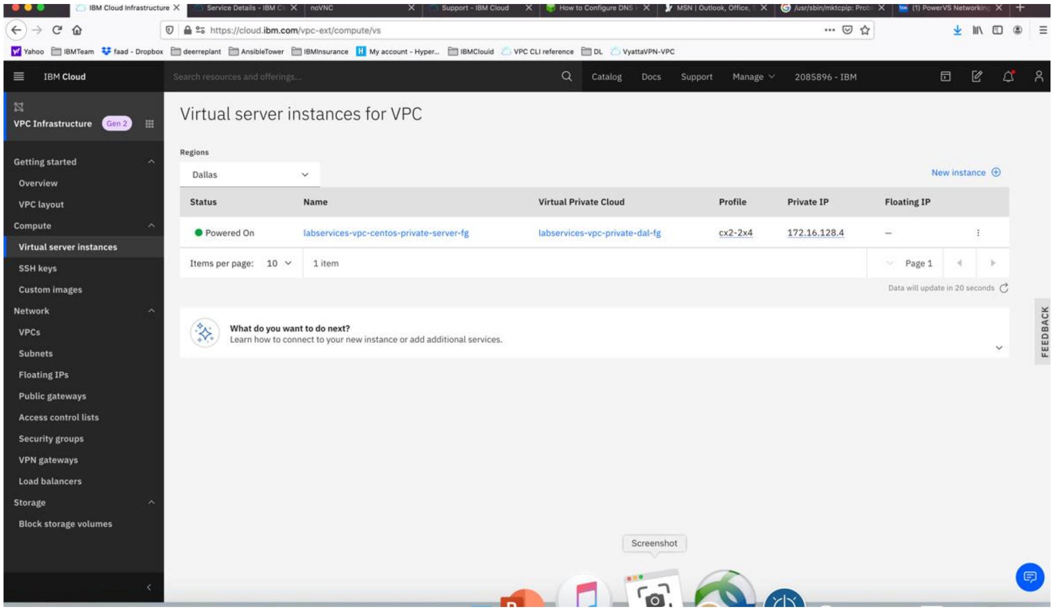
Items per page: 10 1 item Page 1

Data will update in 28 seconds

**Virtual server instance requested**
The virtual server instance 'labservices-vpc-centos-private-server-fg' has been requested for use.

View resource

**What do you want to do next?**
Learn how to connect to your new instance or add additional services.



Virtual server instances for VPC

Regions

Dallas

New instance ⊕

| Status | Name | Virtual Private Cloud | Profile | Private IP | Floating IP |
|---|---|---|---|---|---|
| ● Powered On | labservices-vpc-centos-private-server-fg | labservices-vpc-private-dal-fg | cx2-2x4 | 172.16.128.4 | – |

Items per page: 10 1 item Page 1

Data will update in 20 seconds

**What do you want to do next?**
Learn how to connect to your new instance or add additional services.

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.

# Chapter 3: Troubleshooting

## Connection fails from PowerVS location VSI to IBM Cloud Linux/Window VSI

If you chose a Public/Private IP for your Linux VSI in the IBM Cloud, 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.

This should not be an issue if you only choose Private Subnet when provisioning your Linux/Windows VSI in IBM Cloud.

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 Linux VSI which you can find by running “netstat -nr” on you Linux VSI.

- *ip route add 192.168.6.0/24 via 10.166.112.129*
- *if you have more than one PowerVS location then repeat the command for the next PowerVS location subnet CIDR*
- *We have two locations, so we need to run a second command and use CIDR for second location*
- *ip route add 192.168.50.0/24 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 by faad to support pinging to PowerVS location
ADDRESS3=192.168.6.0
GATEWAY3=10.166.112.129
NETMASK3=255.255.255.0
ADDRESS3=192.168.50.0
GATEWAY3=10.166.112.129
NETMASK3=255.255.255.0
```

# Chapter 4: Additional Resources

- *Provision a VMware VM in IBM Cloud: https://www.youtube.com/watch?v=5yl-_60gUUw*
- *IBM Cloud for VMware Solutions: https://www.vmware.com/ca/products/cloud-director.html*

- *https://www.ibm.com/demos/collection/VMware-Solutions-on-IBM-Cloud/*
- *Install AWS CLI: https://computingforgeeks.com/how-to-install-and-use-aws-cli-on-linux-ubuntu-debian-centos/*
- *https://github.com/aws/aws-cli/issues/2543*
- *GRE configuration: 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*