



# SAP HANA ON AZURE (LARGE INSTANCES) SETUP

End to End Setup for SAP HANA on Azure Large Instances

## Abstract

Learn the various steps required for the HANA large instance setup.

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## Summary

This document helps you to understand the various steps involved for the SAP HANA on Azure Large Instances provisioning.

**Disclaimer:** This document is a “how to” version of the information posted on <https://docs.microsoft.com/en-us/azure/virtual-machines/workloads/sap/hana-overview-architecture>

This does NOT replace any of the SAP HANA on Azure Large Instances or SAP documentations. Rather it complements them. The intent of this blog is to make “How to?” part easy for the customers.

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## End to End Setup for SAP HANA on Azure Large Instances

So, you are ready for “SAP HANA on Azure Large Instances” deployment, Great! And, you want to know the step by step process with screen shots to start the work? Then you are reading the right article.

This blog illustrates the various steps required for the SAP HANA on Azure Large Instances (or in short HANA Large Instances) setup.

Here are the high-level steps:

1. Setup the vNet
2. Provide the details to Microsoft for provisioning the HANA Large Instances
3. Connect your Azure vNet to HANA Large Instances
4. Test the connectivity from Azure VM to HANA Large Instances
5. Install the HANA on HANA Large Instances server

The following are considered completed from the customer’s side, before you begin with the Step1.

- You have read the “[Overview and Architecture](#)” documentation
- SAP Sizing has been completed
- SAP Large Instance contract has been arranged (Microsoft account team arrange this)
- Operating system version have been validated to support your planned HANA version
- Operating system subscription/license have been obtained (You will need to activate operating system after the provisioning is complete by Microsoft team)
- SAP HANA licensing to install the HANA has been put in place

## Definitions

Let’s understand the various terms used in this documentation.

- SAP HANA on Azure Large Instances or in short HANA Large Instances: Official name for the offer in Azure to run HANA instances in on SAP HANA TDI certified hardware that is deployed in Large Instance stamps in different Azure regions. The related term HANA Large Instances is short for SAP HANA on Azure (Large Instances)
- VNet: Virtual Network. Your own network in the Azure
- P2P range: Point to Point range. Express route P2P Connections that connect Azure VNet to HANA Large Instances
- Address space: The virtual network address range
- Gateway: Azure Gateway

## 1. Setup the vNet

The very first step is to setup the vNet in the Azure. You will need to provide the following information to the Microsoft to setup the HANA Large Instances server and the Express Route circuit from Azure vNet to the HANA Large Instance server.

- vNet Address space
- P2P Range
- ServerIP Address Pool

**Note** vNet address space, P2P range, and ServerIP address pool MUST NOT overlap with each other and/or with your other connected networks like on-prem or other Azure networks.

### 1.1 Pre-requisite

You have an Azure subscription. Please get one from Azure site <https://portal.azure.com/>, if needed.

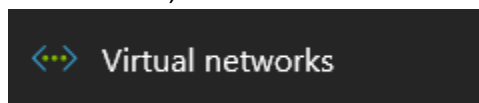
### 1.2 Create a Virtual Network

This section helps you to setup the vNet in Azure. We will use the following sample ranges to setup the vNet, Subnet and the Gateway.

**vNet Name:** Testing\_vNet  
**Address Space:** 10.11.0.0/24, Range will be 10.11.0.0-10.11.0.255 (256 IP addresses)  
**Virtual Machine Subnet:** 10.11.0.0/25, Range will be 10.11.0.0 - 10.11.0.127 (128 IPs for VMs)  
**Gateway Subnet:** 10.11.0.128/27, Range will be 10.11.0.128 - 10.11.0.159 (32 IPs for Gateway)

**Note** If you want to calculate IP ranges, use any online CIDR calculators like <http://www.ipaddressguide.com/cidr>

1. Login to Azure portal <https://portal.azure.com/>
2. From the services bar, click “Virtual Networks”



3. Click “Add”
4. Enter the Name, Address Space, SubnetName, Subnet address range, Subscription, Resource Groups, and location

Create virtual network

\*

Name

Testing\_vNet

✓

\*

Address space ⓘ

10.11.0.0/24

✓

10.11.0.0 - 10.11.0.255 (256 addresses)

\*

Subnet name

VirtualMachine\_Subnet

✓

\*

Subnet address range ⓘ

10.11.0.0/25

✓

10.11.0.0 - 10.11.0.127 (128 addresses)

\*

Subscription

Sf... Azure

▼

\*

Resource group ⓘ

Create new

Use existing

Testing

▼

\*

Location

East US

▼

Pin to dashboard

Create

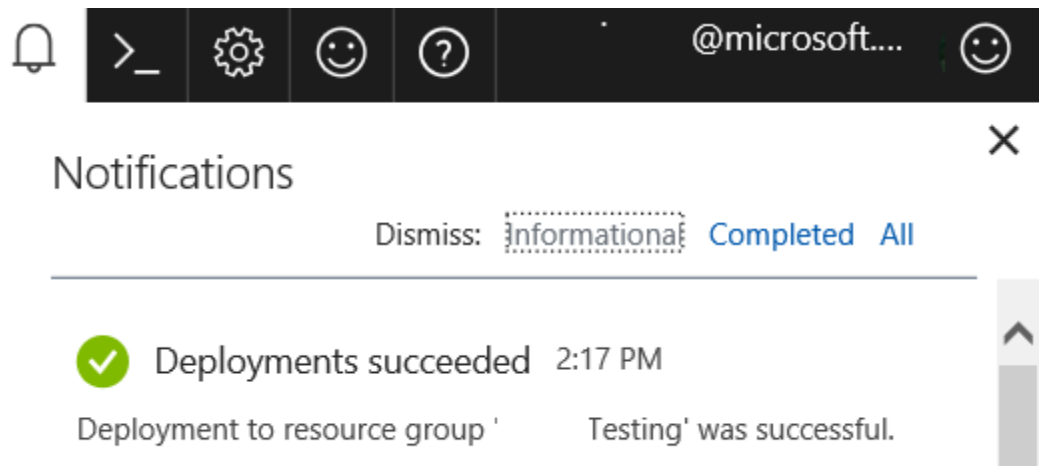
Automation options

5. Click Create

6. It takes about 30 seconds to create a vNet. You can see the status from “Notification” area

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5 | Page



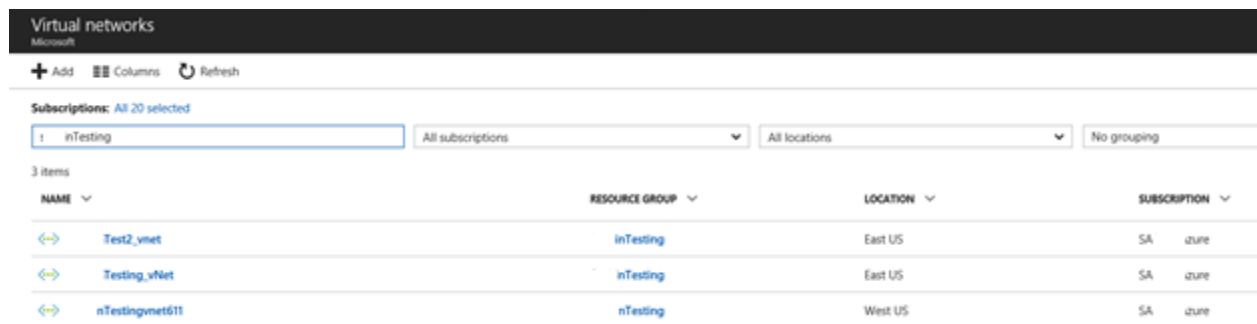
7. Now you have Virtual Network (vNet) created successfully

After the vNet is created, you can proceed to setup the GatewaySubnet.


### 1.3 GatewaySubnet creation


Let's create a GatewaySubnet inside the Virtual Network.


1. Go to "Virtual networks" and search for newly create virtual network





2. Click the name of the virtual network (In this example "Testing\_vNet")
3. Click "Address space" under the "Settings"

 **Testing\_vNet**  
Virtual network


 Overview


 Activity log


 Access control (IAM)


 Tags


SETTINGS


 Address space


 Connected devices

 Subnets

 DNS servers

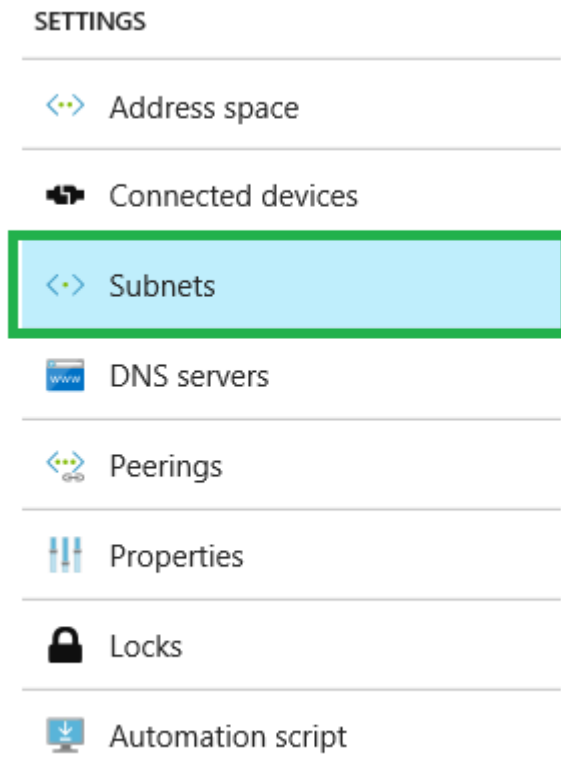
 Peerings

 Properties

 Locks



4. Validate this is the address space you wanted during setup
5. Now, let's create gateway subnet
6. Click on "Subnets"



#### Gateway subnet

7. Select "Gateway subnet"
8. Enter the address range for Gateway subnet (10.11.0.128/27) and click OK

**Note** Name of the GatewaySubnet is grayed out and you can NOT change it

Add subnet

SachinTesting\_vNet

\*

Name

GatewaySubnet

\*

Address range (CIDR block)

10.11.0.128/27

10.11.0.128 - 10.11.0.159 (32 addresses)

Route table

None

OK

9. You will see “GatewaySubnet” Created as below.

+ Subnet + Gateway subnet

Search subnets

NAME	ADDRESS RANGE	AVAILABLE ADDRESSES	SECURITY GROUP
VirtualMachine_Subnet	10.11.0.0/25	123	-
GatewaySubnet	10.11.0.128/27	27	-

10. Once the Gateway subnet is created, we are ready to create a Gateway

#### 1.4 Gateway creation

- From the services bar, please select “Virtual network gateway”. If you don’t find it, chose “More services” or search for it.



Virtual network gateways



- Create a new Gateway by clicking “Add” button

- Gateway Type: ExpressRoute
- SKU: High performance or Ultra performance

**Note** Only High performance and Ultra performance SKUs are supported for HANA Large instances

Create virtual network gate...

×

★ Name

Testing\_GW

✓

Gateway type ⓘ

VPN

ExpressRoute

★ SKU ⓘ

High performance

▼

★ Virtual network ⓘ

Testing\_vNet

>

★ Public IP address ⓘ

Testing\_GW

>

★ Subscription

SA | Azure

▼

Resource group ⓘ

Testing

★ Location ⓘ

East US

▼

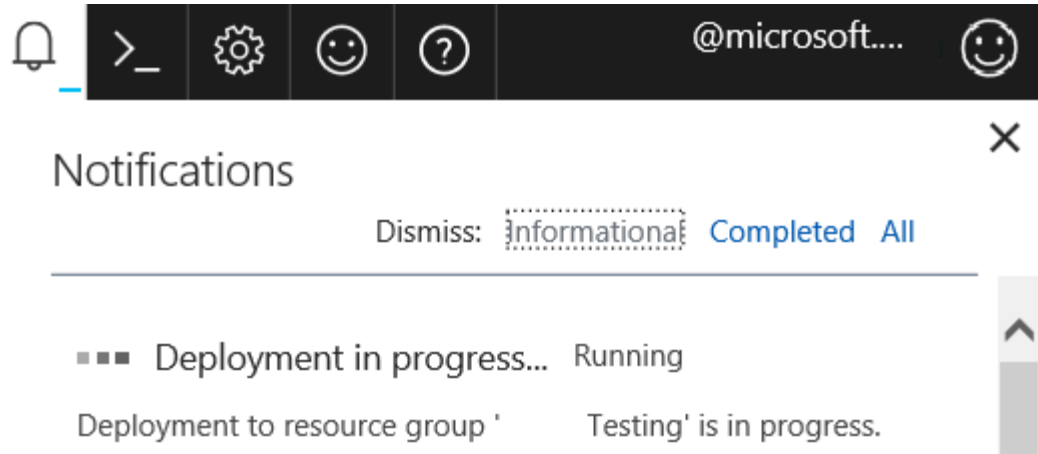
☐ Pin to dashboard

Create

Automation options

Provisioning a virtual network gateway may take up to 45 minutes.

- It may take up to 45 minutes to create gateway. You can check status from “Notification” area. You don’t need to be on the page to monitor it. it will run in background and send the notification in “Notification” area when ready (or have any errors)



- After the gateway is created, you are ready to provide the information to Microsoft team to provision the Express Route Circuit and the HANA Large Instance server.

## 2. Provide the details to Microsoft for provisioning HANA Large Instances

Once you are done with above step “Setup the vNet”, please contact your Microsoft Account executive or Technical Account Manager (TAM) to reach out to Microsoft team to receive an onboarding form. In the onboarding form, you need to provide the following information.

- vNet Address space**  
 This you have setup in the step above “Setup the vNet”. In this example, the value is 10.11.0.0/24
- P2P Range**  
 This range MUST be /29 subnet. Use 10.12.0.0/29 for example.
- ServerIP Address Pool**  
 The recommended range is /24. You can use 10.13.0.0/24 for example.
- Server IP address**  
 Please pick an IP from “ServerIP Address Pool”. However, first 30 IP addresses are reserved for Microsoft infra configuration. So, in this example, your first IP for blade can be 10.13.0.30
- Region**  
 Which region you need HANA Large instances to be deployed. Example North America GA, US East
- SKU**

You have various options for SKUs, please select one based on your requirements and per the enterprise agreement with Microsoft. Example: S192

- **HANA SID**  
HANA System Identifier you plan to use so storage mount points can be configured accordingly during the onboarding. Example: HLM
- **UID**  
Sidadm user ID. Example: 1005
- **GID**  
Sapsys group ID. Example 1001

**Note** vNet address space, P2P range or ServerIP address pool MUST NOT overlap with each other and/or with your other connected networks like on-prem or other Azure networks.

### 3. Connect your Azure vNet to HANA Large Instances

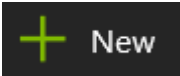
Once Microsoft team have completed the onboarding, they will provide you following information back to you.

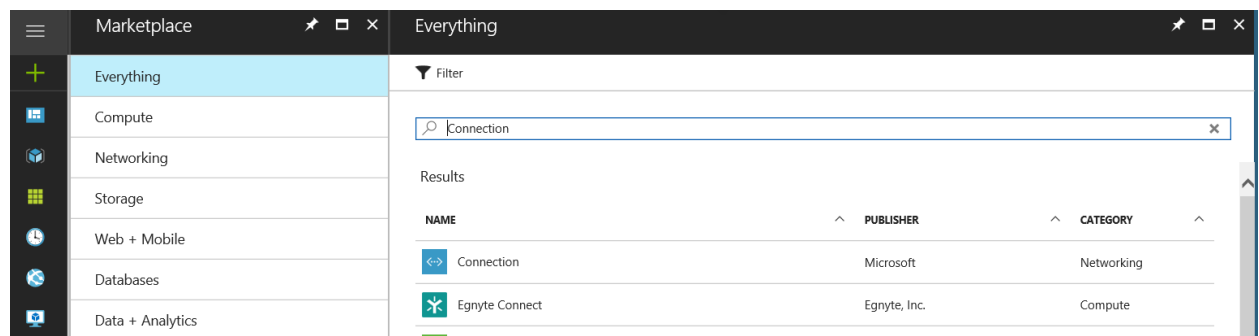
- Circuit ID
- Authorization Key
- Root credentials
- IP address of the server (this is the same IP which you had provided in the onboarding form)
- Storage layout (Volume Size and the mount points created)

To connect the Azure vNet to HANA Large Instances, you will need Circuit ID and Authorization Key so you can connect them using Express-Route.


You can use Azure portal or PowerShell to connect the vNet for Large instance ER. We are going to use Portal in this blog. If you prefer PowerShell then the script to use is located [here](#).

1. From the Services bar, click “Connection”

- a. If you don’t find “Connection” please click the “+New” button  and search for connection and click “Connection”



2. Click “Create” button to create a new connection







 **Connection**  
Microsoft

A VPN connection securely connects two Azure virtual networks, or a virtual network and your local network using Internet Protocol security (IPsec). It can also be used to connect a virtual network to an ExpressRoute circuit. Traffic between the two networks is encrypted by one gateway and decrypted by the other, to protect data when transmitted via the Internet.

A connection consists of different components depending on the connection type. When configuring a connection between two virtual networks, also known as a VNet-to-VNet connection, each network contains a virtual network gateway. The two virtual networks can be in different regions and subscriptions, and different deployment models. For example, use a VNet-to-VNet connection to connect a Classic virtual network to one deployed using Resource Manager.

When configuring a connection between a virtual network and your local network, also known as a site-to-site connection, the virtual network contains a virtual network gateway for the Azure side of the VPN connection, and a local network gateway represents the hardware or software VPN device on your side. The connection wizard creates the right resources depending on the connection type.

Microsoft Azure provides a [99.9% uptime SLA](#) for virtual network gateways.



PUBLISHER	Microsoft
USEFUL LINKS	<a href="#">Service overview</a> <a href="#">Documentation</a> <a href="#">Pricing details</a>

Create

3. Fill out the Basics information. Ensure to select Connection type as “ExpressRoute”

**Create connection**

**Basics**

**1 Basics**  
Configure basic settings

**2 Settings**  
Configure connection settings

**3 Summary**  
Review and create

\* Connection type ⓘ  
ExpressRoute

\* Subscription  
SA .zure

\* Resource group ⓘ  
☐ Create new ☒ Use existing  
Testing

\* Location  
East US

OK

4. From Settings
  - a. Select the Gateway you had created (In our example "Testing\_GW")
  - b. Select Redeem authorization



- c. Peer circuit URI should be in format and will be provided by Microsoft as part of Large Instance onboarding  
"/subscriptions/your\_subscription\_id/resourceGroups/resource\_group\_name/providers/Microsoft.Network/expressRouteCircuits/ExpressRoute\_circuit\_name"

**Note** You don't find the "Redeem authorization" option if you try to create connection directly from the Gateway.

The screenshot shows the 'Create connection' wizard with the following details:

- 1 Basics** (Configure basic settings) - Completed (green checkmark)
- 2 Settings** (Configure connection settings) - Active (highlighted in blue)
- 3 Summary** (Review and create) - Pending (greyed out)

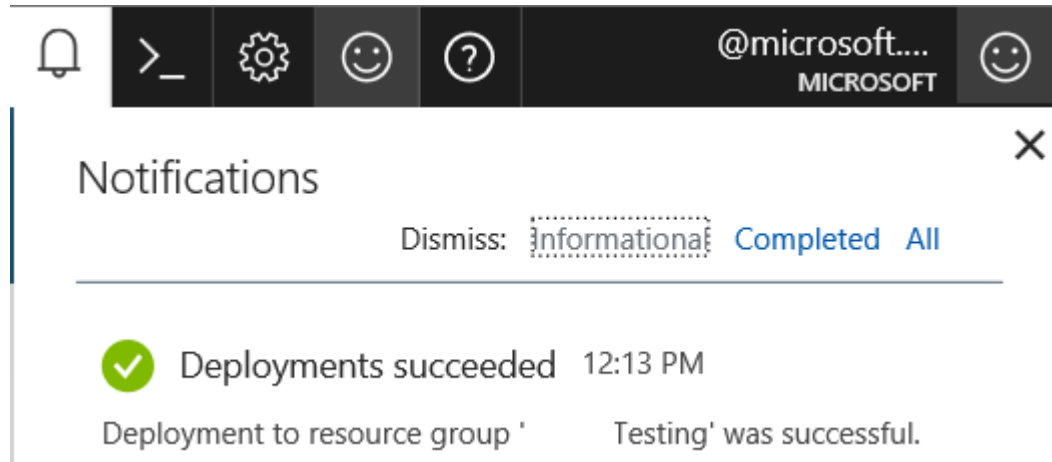
**Settings**

- \* Virtual network gateway**: Testing\_GW
- ☒ **Redeem authorization**
- \* Authorization key**: 31903c...j24c5f47
- \* Peer circuit URI**: /subscriptions/b146b9...-ac6f-1b...
- \* Connection name**: Testing\_ER\_Connection

5. Review the details and click OK

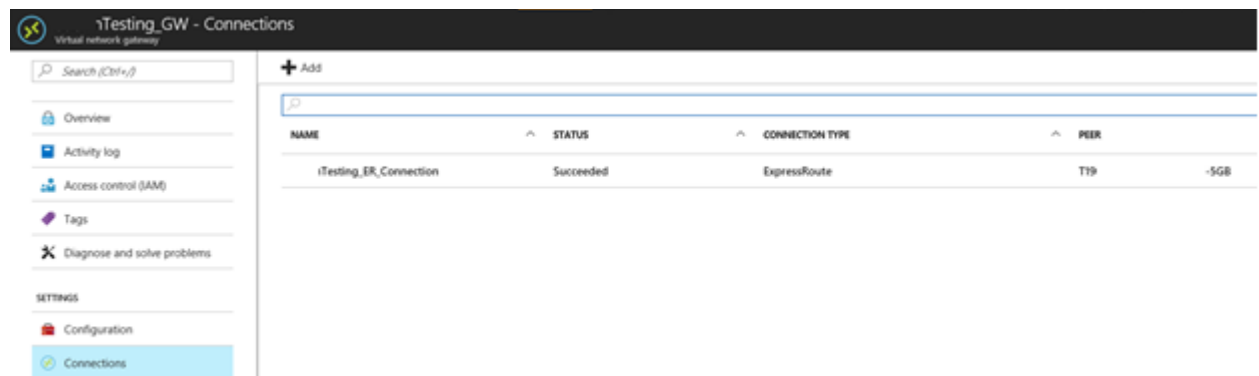
- | Country | Year | Population (millions) | Urban population (millions) | Urban population (%) | Population density (per sq km) | Urban population density (per sq km) |
|---------|------|-----------------------|-----------------------------|----------------------|--------------------------------|--------------------------------------|
| Algeria | 1990 | 10.5                  | 5.5                         | 52.4                 | 102                            | 1,000                                |
| Algeria | 2000 | 12.5                  | 7.5                         | 60.0                 | 125                            | 1,250                                |
| Algeria | 2010 | 14.5                  | 9.5                         | 65.5                 | 145                            | 1,450                                |
| Algeria | 2020 | 16.5                  | 11.5                        | 70.0                 | 165                            | 1,650                                |
| Algeria | 2030 | 18.5                  | 13.5                        | 73.0                 | 185                            | 1,850                                |
| Algeria | 2040 | 20.5                  | 15.5                        | 75.6                 | 205                            | 2,050                                |
| Algeria | 2050 | 22.5                  | 17.5                        | 77.8                 | 225                            | 2,250                                |
| Algeria | 2060 | 24.5                  | 19.5                        | 79.6                 | 245                            | 2,450                                |
| Algeria | 2070 | 26.5                  | 21.5                        | 81.1                 | 265                            | 2,650                                |
| Algeria | 2080 | 28.5                  | 23.5                        | 82.5                 | 285                            | 2,850                                |
| Algeria | 2090 | 30.5                  | 25.5                        | 83.6                 | 305                            | 3,050                                |
| Algeria | 2100 | 32.5                  | 27.5                        | 84.6                 | 325                            | 3,250                                |
| Algeria | 2110 | 34.5                  | 29.5                        | 85.5                 | 345                            | 3,450                                |
| Algeria | 2120 | 36.5                  | 31.5                        | 86.3                 | 365                            | 3,650                                |
| Algeria | 2130 | 38.5                  | 33.5                        | 87.0                 | 385                            | 3,850                                |
| Algeria | 2140 | 40.5                  | 35.5                        | 87.7                 | 405                            | 4,050                                |
| Algeria | 2150 | 42.5                  | 37.5                        | 88.2                 | 425                            | 4,250                                |
| Algeria | 2160 | 44.5                  | 39.5                        | 88.8                 | 445                            | 4,450                                |
| Algeria | 2170 | 46.5                  | 41.5                        | 89.2                 | 465                            | 4,650                                |
| Algeria | 2180 | 48.5                  | 43.5                        | 90.0                 | 485                            | 4,850                                |
| Algeria | 2190 | 50.5                  | 45.5                        | 90.3                 | 505                            | 5,050                                |
| Algeria | 2200 | 52.5                  | 47.5                        | 90.7                 | 525                            | 5,250                                |
| Algeria | 2210 | 54.5                  | 49.5                        | 90.9                 | 545                            | 5,450                                |
| Algeria | 2220 | 56.5                  | 51.5                        | 91.2                 | 565                            | 5,650                                |
| Algeria | 2230 | 58.5                  | 53.5                        | 91.5                 | 585                            | 5,850                                |
| Algeria | 2240 | 60.5                  | 55.5                        | 91.8                 | 605                            | 6,050                                |
| Algeria | 2250 | 62.5                  | 57.5                        | 92.0                 | 625                            | 6,250                                |
| Algeria | 2260 | 64.5                  | 59.5                        | 92.3                 | 645                            | 6,450                                |
| Algeria | 2270 | 66.5                  | 61.5                        | 92.5                 | 665                            | 6,650                                |
| Algeria | 2280 | 68.5                  | 63.5                        | 92.7                 | 685                            | 6,850                                |
| Algeria | 2290 | 70.5                  | 65.5                        | 92.9                 | 705                            | 7,050                                |
| Algeria | 2300 | 72.5                  | 67.5                        | 93.1                 | 725                            | 7,250                                |
| Algeria | 2310 | 74.5                  | 69.5                        | 93.3                 | 745                            | 7,450                                |
| Algeria | 2320 | 76.5                  | 71.5                        | 93.5                 | 765                            | 7,650                                |
| Algeria | 2330 | 78.5                  | 73.5                        | 93.7                 | 785                            | 7,850                                |
| Algeria | 2340 | 80.5                  | 75.5                        | 93.9                 | 805                            | 8,050                                |
| Algeria | 2350 | 82.5                  | 77.5                        | 94.0                 | 825                            | 8,250                                |
| Algeria | 2360 | 84.5                  | 79.5                        | 94.1                 | 845                            | 8,450                                |
| Algeria | 2370 | 86.5                  | 81.5                        | 94.2                 | 865                            | 8,650                                |
| Algeria | 2380 | 88.5                  | 83.5                        | 94.3                 | 885                            | 8,850                                |
| Algeria | 2390 | 90.5                  | 85.5                        | 94.5                 | 905                            | 9,050                                |
| Algeria | 2400 | 92.5                  | 87.5                        | 94.6                 | 925                            | 9,250                                |
| Algeria | 2410 | 94.5                  | 89.5                        | 94.7                 | 945                            | 9,450                                |
| Algeria | 2420 | 96.5                  | 91.5                        | 94.8                 | 965                            | 9,650                                |
| Algeria | 2430 | 98.5                  | 93.5                        | 94.9                 | 985                            | 9,850                                |
| Algeria | 2440 | 100.5                 | 95.5                        | 95.0                 | 1,005                          | 10,050                               |
| Algeria | 2450 | 102.5                 | 97.5                        | 95.1                 | 1,025                          | 10,250                               |
| Algeria | 2460 | 104.5                 | 99.5                        | 95.2                 | 1,045                          | 10,450                               |
| Algeria | 2470 | 106.5                 | 101.5                       | 95.3                 | 1,065                          | 10,650                               |
| Algeria | 2480 | 108.5                 | 103.5                       | 95.4                 | 1,085                          | 10,850                               |
| Algeria | 2490 | 110.5                 | 105.5                       | 95.5                 | 1,105                          | 11,050                               |
| Algeria | 2500 | 112.5                 | 107.5                       | 95.6                 | 1,125                          | 11,250                               |
| Algeria | 2510 |                       |                             |                      |                                |                                      |

7. It takes few minutes to create a connection



8. After the connection is setup, you should be able to see the connection status in Gateway (Under the "Connection" option)

**Note** Ensure that connection status is "Succeeded"



## 4. Test the connectivity from Azure VM to HANA Large Instance

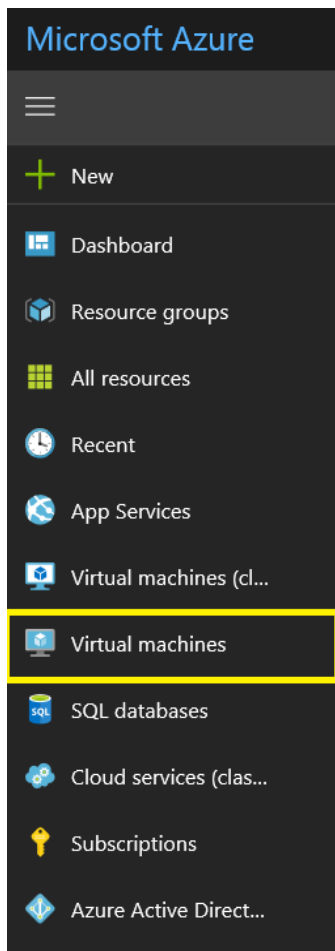
Since now you have large instance express route connection setup from the gateway, you are good to access your large instance server.

To access your large instance server, you need to setup a VM (let's call a jump box) in Azure under the same vNet from where you setup the ER connectivity.

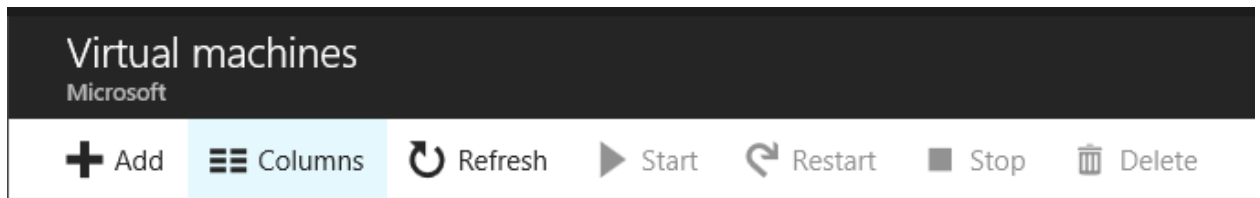
### 4.1 Setup a VM

Let's setup a VM called "TestingJB" (JB=Jump Box 🐼). To create a VM, please follow the following steps.

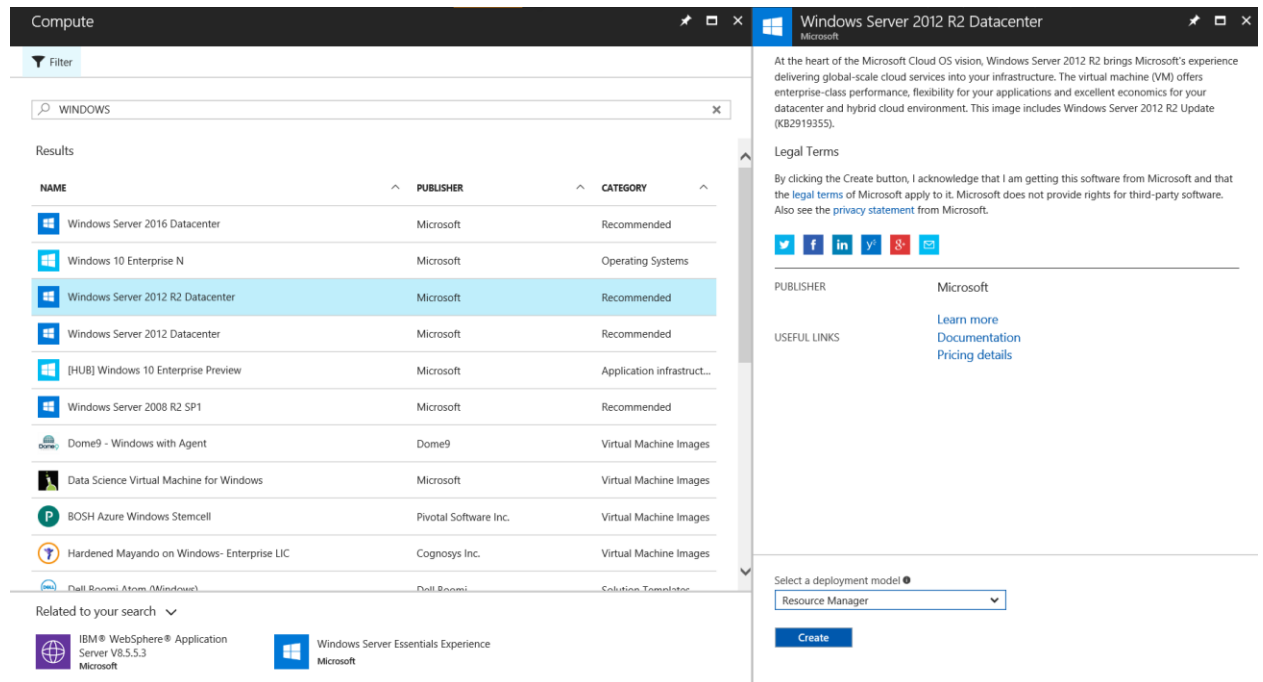
1. Click Virtual Machines



2. Click Add



3. Select the WINDOWS operating system (I chose Windows Server 2012 R2 Datacenter)



4. Click Create
5. Enter the details to setup your VM

The screenshot shows the 'Create virtual machine' wizard in the Azure portal. The 'Basics' tab is selected, and the following fields are visible:

- Name:** iTestingJB
- VM disk type:** HDD
- User name:** sac\_in
- Password:** (masked with dots)
- Confirm password:** (masked with dots)
- Subscription:** SA\_zure
- Resource group:** Use existing (selected), iTesting
- Location:** East US
- Save money:** Save up to 40% with a license you already own.
- Already have a Windows Server license?:** No (selected)

An 'OK' button is at the bottom right of the form.

6. Chose a VM (I chose 4 core; 8GB)

## Choose a size

Browse the available sizes and their features

Supported disk type: HDD

Minimum cores: 4

Minimum memory (GiB): 8

**Recommended** | [View all](#)

DS3_V2 Standard		DS4_V2 Standard		DS5_V2 Standard	
<b>4</b>	Cores	<b>8</b>	Cores	<b>16</b>	Cores
<b>14</b>	GB	<b>28</b>	GB	<b>56</b>	GB
	8 Data disks		16 Data disks		32 Data disks
	12800 Max IOPS		25600 Max IOPS		51200 Max IOPS
	28 GB Local SSD		56 GB Local SSD		112 GB Local SSD
	Load balancing		Load balancing		Load balancing
	Premium disk support		Premium disk support		Premium disk support

7. Select the storage and Network settings

**Create virtual machine**

- 1 Basics Done ✓
- 2 Size Done ✓
- 3 Settings **Configure optional features**
- 4 Summary Windows Server 2012 R2 Datacenter

**Settings**

You've chosen to use a standard disk on a size that supports premium disks. This could impact operating system performance and is not recommended. Consider using premium storage (SSD) instead.

**Storage**

Disk type: ☒ HDD ☐ SSD

Use managed disks: ☒ No ☐ Yes

**Network**

\* Virtual network: Testing\_vNet

\* Subnet: VirtualMachine\_Subnet (10.11.0.0...)

\* Public IP address: (new) iTestingJB-ip

\* Network security group (firewall): (new) iTestingJB-nsg

**Extensions**

Extensions: No extensions

**OK**

## 8. Review the Summary

**Create virtual machine**

- 1 Basics Done ✓
- 2 Size Done ✓
- 3 Settings Done ✓
- 4 Summary **Windows Server 2012 R2 Datacenter**

**Summary**

Validation passed

**Basics**

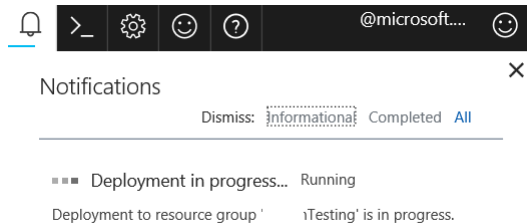
Subscription: SA  
Resource group: Testing  
Location: East US

**Settings**

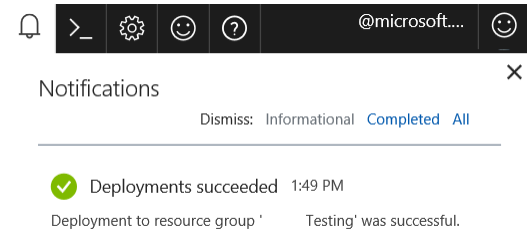
Computer name: iTestingJB  
Disk type: HDD  
User name: sa  
Size: Standard (512 v2)  
Managed: Yes  
Virtual network: Testing\_vNet  
Subnet: VirtualMachine\_Subnet (10.11.0.0/20)  
Public IP address: (new) iTestingJB-ip  
Network security group (firewall): (new) iTestingJB-nsg  
Availability set: None  
Guest OS diagnostics: Disabled  
Boot diagnostics: Enabled  
Diagnostics storage account: sas-...-sp204

**OK** [Download template and parameters](#)

## 9. You can check the status of VM creation under “Notification”



#### 10. It takes few minutes to create a VM



#### 11. After a VM is created, you can login to it by clicking "Connect" button.

**Note** If you have not setup VM in your domain, please use user name as "/your-username" during logon to the VM.

### 4.2 Download Putty

To access your HANA large instance server(s), you will need an SSH and telnet client like putty. You can download it from <http://www.putty.org/>

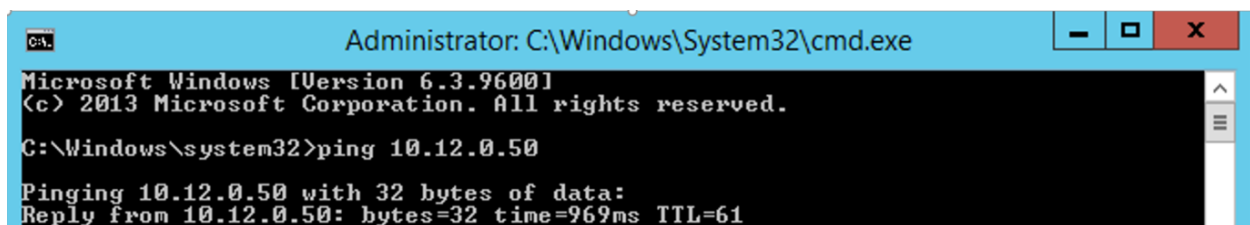
After you are done with download, copy the putty to your newly created VM ("TestingJB"). You can simply copy the putty installer file from your local on-prem machines and then paste to VM desktop in Azure.

After the file is copied to a VM, Extract the Putty installer.

### 4.3 Connect the HANA Large Instances

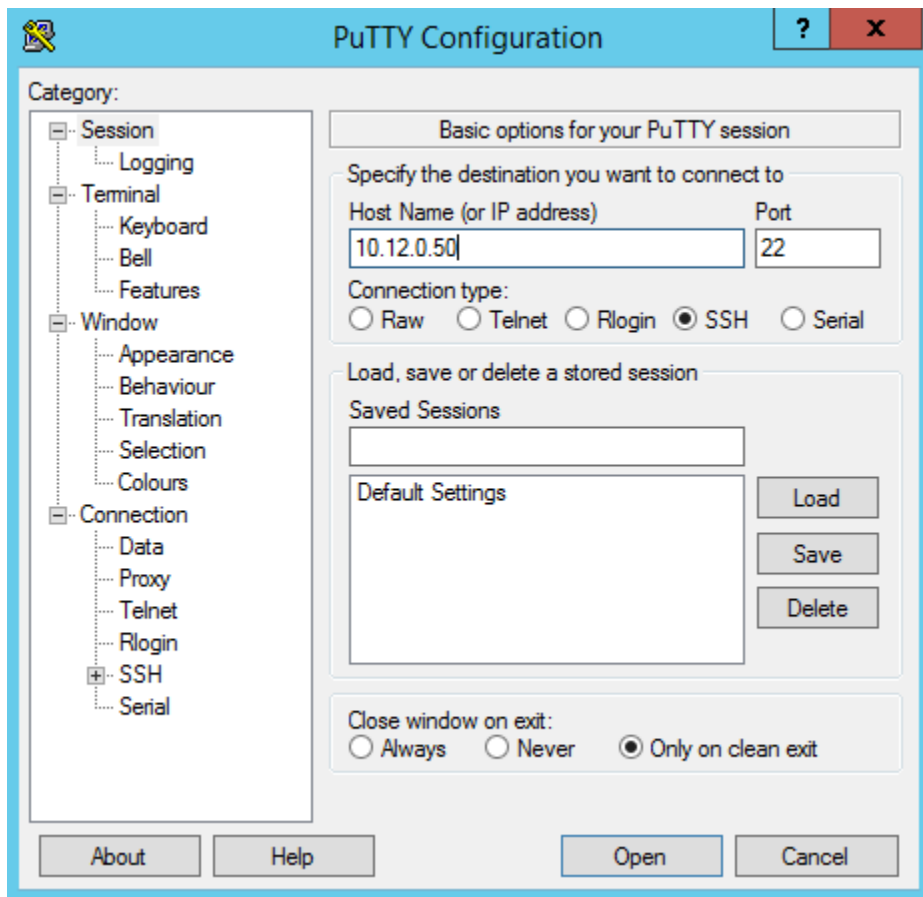
Login to your Azure VM jump box.

The very basic test it to ping the HANA Large Instances with the IP address (IP address of the Large Instance Server should have already been provided by the Microsoft team)

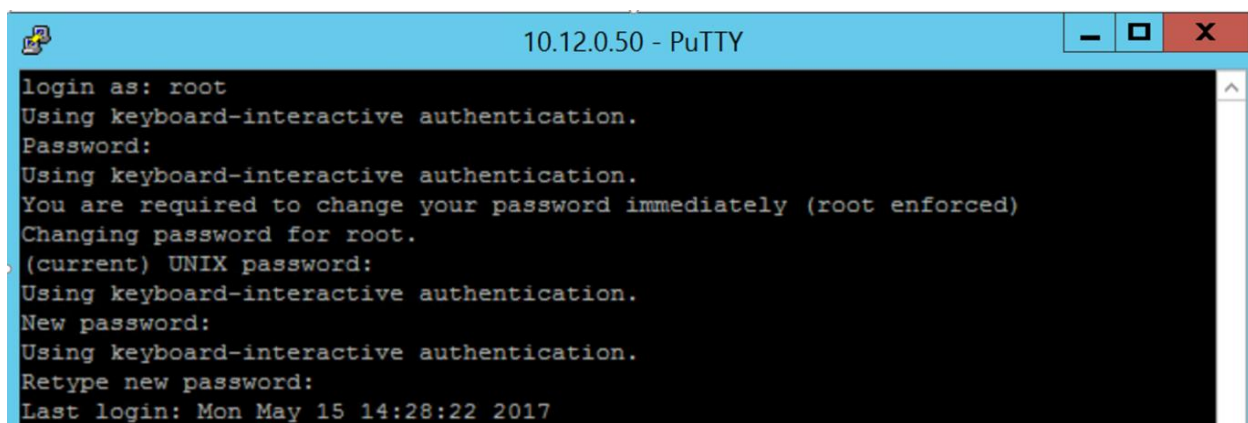




Open putty (A shortcut must be on your desktop after you have installed the putty)



Login to the Large Instance Server and change the temporary root password provided by the Microsoft team



#### 4.4 Validate the server

After you connect to the HANA Large Instances server, you may want to validate the server. Here are few commands to validate the server components.

Command	Description
<b>uname -n</b>	Network hostname
<b>uname -r</b>	Kernel release
<b>lscpu</b>	CPU Information
<b>df -h</b>	Storage space, Mount Point etc.
<b>ifconfig</b>	Network Ethernet cards

## 5. Install the HANA on Large instances server

Before you start the HANA installation, please ensure to perform the following:

1. Time server (NTP) Setup
2. Register the operating system for permanent license
3. Patch the HANA Large Instances server to appropriate patch/service pack level
4. Review the SAP notes for pre-requisite and for post installation of SAP HANA. Here are few key notes

[SAP Note 2235581 - SAP HANA: Supported Operating Systems](#)

[SAP Note 2009879 - SAP HANA Guidelines for RedHat Enterprise Linux \(RHEL\) Operating System](#)

[SAP Note 2292690 - SAP HANA DB: Recommended OS settings for RHEL 7.2](#)

[SAP Note 2247020 - SAP HANA DB: Recommended OS settings for RHEL 6.7](#)

[SAP Note 2001528 - Linux: SAP HANA Database SPS 08 revision 80 \(or higher\) on RHEL 6 or SLES 11](#)

[SAP Note 2228351 - Linux: SAP HANA Database SPS 11 revision 110 \(or higher\) on RHEL 6 or SLES 11](#)

[SAP Note 1943937 - Hardware Configuration Check Tool - Central Note \(contains the user guide for HWCCT\)](#)

**Congratulations**, you are ready now to install the SAP HANA!