

Installing OIC (Gen3) Agent on OCI

Architecture, Integration

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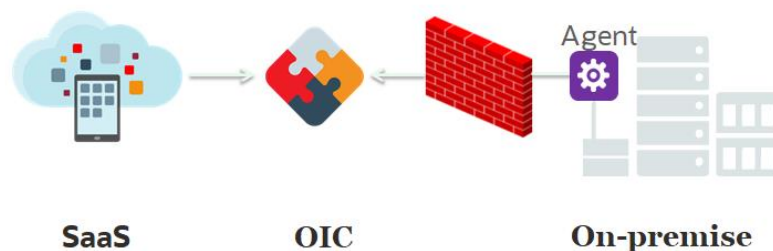
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OIC connectivity to private OCI resources and installing OIC agent in OCI using Bastion Service

This Article should demonstrate how easy is to create and manage connectivity between the Oracle Integration Cloud and private resources in OCI or VPN to on-premise or different cloud resources.

Using the connectivity agent, you can create hybrid integrations and exchange messages between applications in private or on-premises networks and Oracle Integration.



OIC connectivity agent values:

- Enables secure integration with on-premises systems without firewall pin-holes
- Brokers all communications between both OIC UI Designer and Runtime and the on-premises systems
- No DMZ components required (however can cohabit with it)
- Only requires HTTPS (443) access to the outside world
- OIC will never reach into the customer's data center
- Communication is always initiated from on-premises upstream via the Agent
- Ground Agent dis-allows any explicit inbound connections. Connection always established to ORACLE cloud
- Uses JCA adapters and JCA framework to invoke on-premises application endpoints.

See more in [About Creating Hybrid Integrations Using Oracle Integration](#).

OIC connectivity creation prerequisites

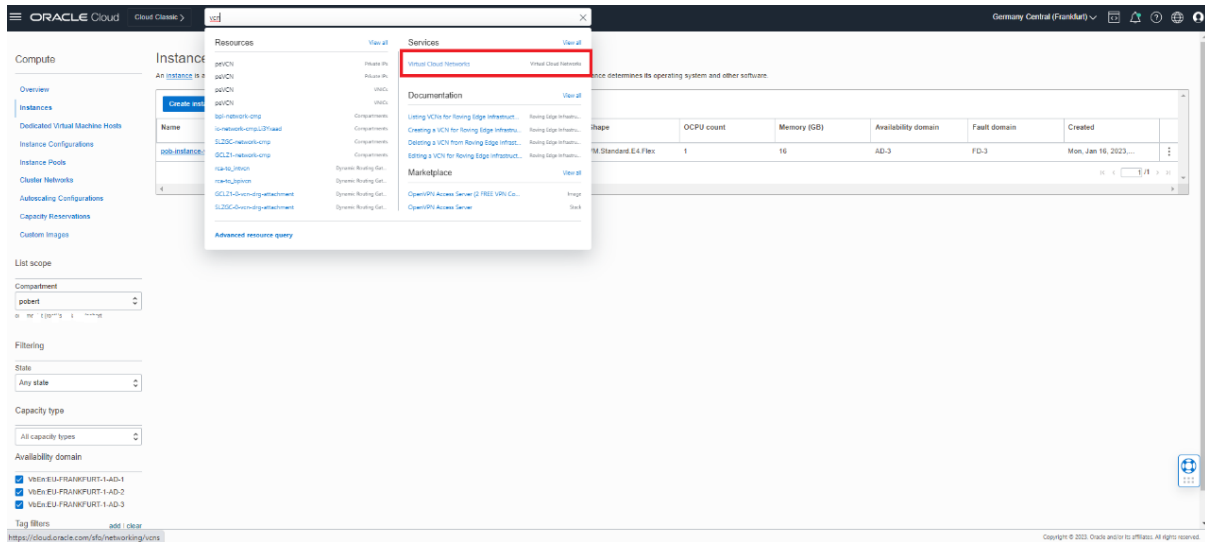
Infrastructure Architecture Design or minimally Deployment or Physical Architecture view is a must to have before starting.

Then it is easy for any OCI Administrator to understand what needs to be done.

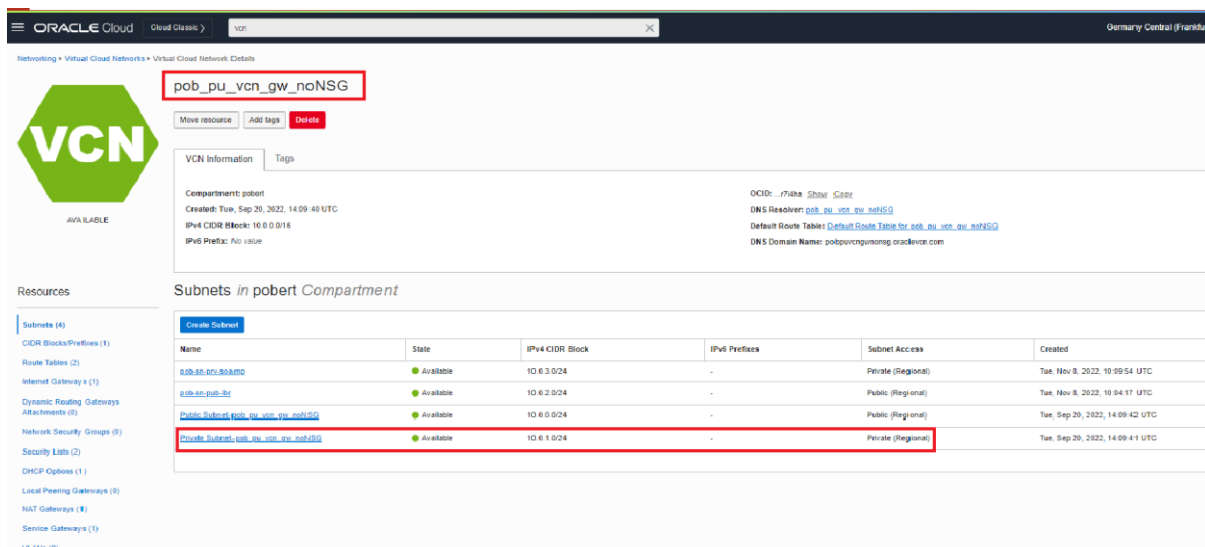
e.g. We have to establish connectivity to Oracle EBS in OCI – to EBS DB Staging Schemas.

OIC connectivity to OIC private resources creation – Detailed OCI Prerequisites

- ✓ Prepare Virtual Cloud Network and Private Subnet for hosting OIC Connectivity Agent VMs



- ✓ Prepare Private Subnet for hosting OIC Connectivity Agent VMs



- ✓ Prepare Service Gateway which provides connectivity between VCN and all the OCI regional services in the Oracle Services Network (OIC as Cloud Native PaaS is provisioned to Oracle Services Network)

The screenshot shows the Oracle Cloud console for a VCN named 'pob_pu_vcn_noNSG'. The VCN is in the 'AVAILABLE' state. The 'Service Gateways' section shows a table with one entry: 'Service Gateway pob_pu_vcn_noNSG' in the 'AVAILABLE' state, with a link to 'All OCI Services in Oracle Services Network'.

Name	State	Services	Route Table	Created
Service Gateway pob_pu_vcn_noNSG	Available	All OCI Services in Oracle Services Network	-	Tue, Sep 26, 2023, 14:09:42 UTC

- ✓ Ensure that OIC Agents subnet is associated with the security List which contains Ingress rules for the SSH Remote Login Protocol and HTTPs protocol.

The screenshot shows the Oracle Cloud console for a Security List named 'Security List for Private Subnet-pob_pu_vcn_noNSG'. The 'Ingress Rules' section shows a table with three rules: 'TCP traffic for ports 22 SSH Remote Login Protocol', 'ICMP traffic for 1, 4 Destination Unreachable, Fragmentation Needed and Don't Fragment van Set', and 'TCP traffic for ports 443 HTTPS'.

State	Source	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows	Description
<input checked="" type="checkbox"/>	No	TCP	All	22	TCP	TCP traffic for ports 22 SSH Remote Login Protocol	
<input checked="" type="checkbox"/>	No	ICMP	0-0	0-0	ICMP	ICMP traffic for 1, 4 Destination Unreachable, Fragmentation Needed and Don't Fragment van Set	
<input checked="" type="checkbox"/>	No	TCP	All	443	TCP	TCP traffic for ports 443 HTTPS	

- ✓ Ensure that OIC Agents subnet is associated with the security List which contains Egress rules to communicate with outside world from subnet. In our case we enabled traffic to all possible destinations

The screenshot shows the Oracle Cloud console for a Security List named 'Security List for Private Subnet-pob_pu_vcn_noNSG'. The 'Egress Rules' section shows a table with one rule: 'All traffic for all ports'.

State	Destination	IP Protocol	Source Port Range	Destination Port Range	Type and Code	Allows	Description
<input checked="" type="checkbox"/>	0.0.0.0/0	All Protocols			All	All traffic for all ports	

- ✓ Ensure that routing between OIC Agents subnet and OCI Services Network is enabled

ORACLE Cloud Cloud Console vcn

Germany Central (Frankfurt)

Networking > Virtual Cloud Networks > pob_pu_vcn_gw_noNSG > Route Table Details

Route Table for Private Subnet-pob_pu_vcn_gw_noNSG

Move resource Add tags **Terminate**

RT
AVAILABLE

Resources
Route Rules (2)

Route Table Information Tags

OCID: a2mja Show Copy
Created: Tue, Sep 26, 2022, 14:09:42 UTC
Compartment: pobrt

Route Rules

Traffic within the VCN is handled by the VCN's local routing by default. Intra-VCN routing allows you more control over routing between subnets. [Learn more](#)

Add Route Rules Edit Remove

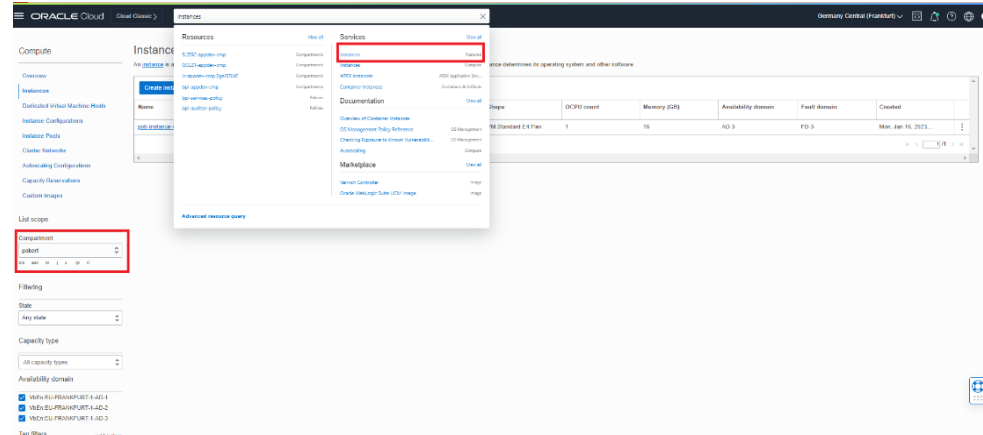
Destination	Target Type	Target	Route Type	Description
<input type="checkbox"/> 0.0.0.0/0	Internet Gateway	Internet Gateway-pob_pu_vcn_gw_noNSG	Static	
<input type="checkbox"/> All IPNs, Services in Oracle Services Network	Service Gateway	Service Gateway-pob_pu_vcn_gw_noNSG	Static	

0 Selected Showing 2 items < 1 of 1 >

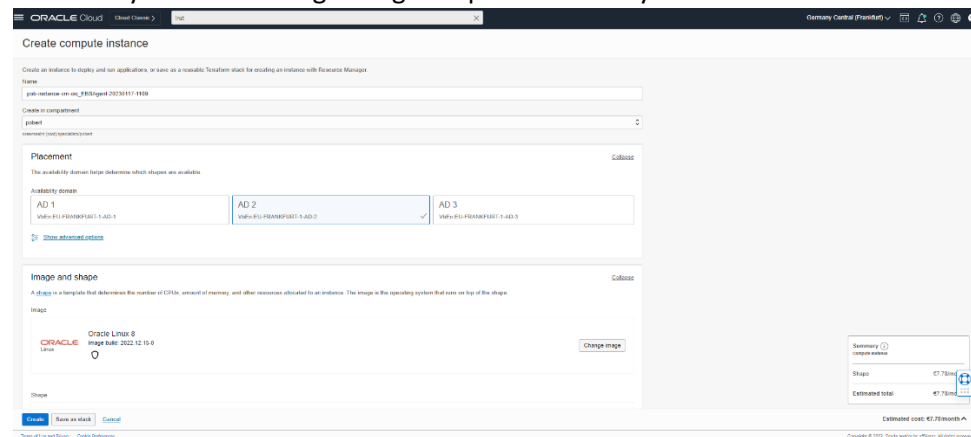
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OIC connectivity agent physical VM Instance provisioning using OCI Terraform Stack

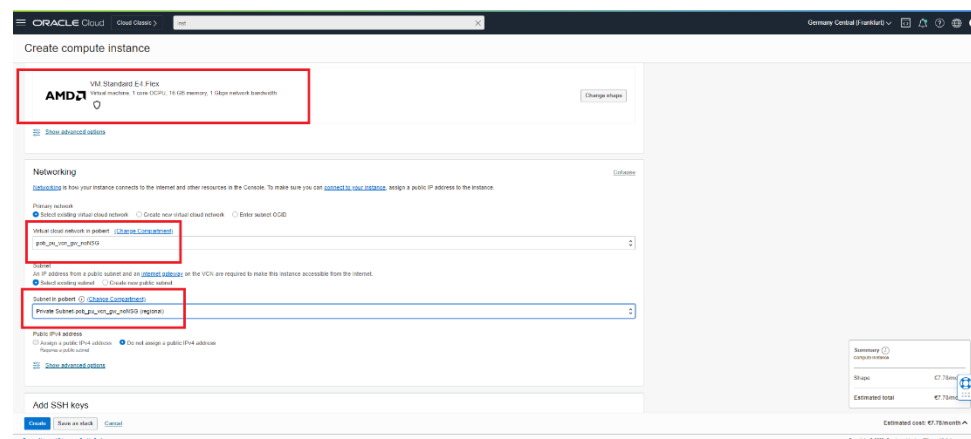
- Now we can provision new VM instance which will be dedicated to OIC connectivity Agent for EBS Connection. Chose Correct Compartment and jump into the OCI Instances Resource types.



- Create new Instance. Assign Name according to your organization naming Standards, chose availability domain. Change image shape if different you want to use.



- You can change/adjust shape but do not forget to check [minimum of 8 GB memory needed for the running Agent process](#). Provide VCN and Subnet.



- Download OCI generated or provide your own public and private key to access the instance in the future. If you want to automate this in the future, we recommend to click to Save as Stack button

Create compute instance

Generate an [SSH key](#) to connect to the instance using a Secure Shell (SSH) connection, or upload a public key that you already have.

Add SSH keys

Generate a key pair for me ☐ Upload public key files (pub) ☐ Private public keys ☐ No SSH keys

Download the private key so that you can connect to the instance using SSH. It will not be shown again.

☒ Save private key ☒ Download public key

Boot volume

A boot volume is a detachable device that contains the image used to boot the compute instance.

☐ Specify a custom boot volume size. [View boot volume sizes with resource tags.](#) Default boot volume size: 40 GB. When you specify a custom boot volume size, consider the following:

☐ Use a shared encryption key. [View shared encryption keys.](#) To encrypt the boot volume, the boot volume, and the boot volume.

☐ Encrypt the volume with a key that you manage. By default, Oracle manages the keys that encrypt the volume, but you can choose a key from a vault that you have access to if you want greater control over the keys that encrypt and how to use them. [View the Oracle Key Management vault.](#)

Create **Save as stack** **Cancel**

Summary

Shape: E7.75m

Estimated total: \$7.75m

Estimated cost: \$7.75/month

- Now you can create the instance or create and run Terraform stack that in the future you are able to repeat the process easily in different environment/compartments. Click next.

Create stack

Stack origin: Compute instance "pub-instance-vm-oci_ESSAgent_20230117-1109"

Working directory: You must enter a valid path on the working directory.

Custom providers

☐ Use custom Terraform providers. [View custom Terraform providers in a vault.](#)

Name: Optional
pub-instance-vm-oci_ESSAgent_20230117-1109

Description: Optional

Create in compartment: project

Terraform version: 1.0.x

Tags: Add tags to organize your resources. [What can I do with tags?](#)

Tag namespace: Name (and a free-form tag) Tag value

Next **Cancel**

- Run and Apply the stack. Click Create.

Create stack

Verify your configuration variables, and then create your stack. Due to limited space, we show only variables without default values or that you define.

Stack information

Name: pub-instance-vm-oci_ESSAgent_20230117-1109

Description:

Compartment:

Terraform version: 1.0.x

No variable values added or changed.

Run apply on the created stack?

Immediately provision the resources defined in the Terraform configuration by running the apply action on the new stack.

☒ Run apply

Previous **Create** **Cancel**

- Now Terraform stack is running

ORACLE Cloud Cloud Classic > not

Germany Central (Frankfurt)

Resource Manager > Stacks > Stack details > Job details

RMJ ACCEPTED

ormjob20230117101552

While the job is running, only partial logs are available. You can get a complete log when the job is finished.

Download Terraform configuration Add tags Cancel job

Job information Tags

OCID: o-...beqmg-230ar-500s
Job type: Apply
State: Accepted
Start time: Tue, Jan 17, 2023, 10:15:52 UTC
Upgrade provider versions: No

Compartment: o-...n-.../specidsp-...en
Plan job ID: Automatically approved
Working directory: Not specified
End time: N/A

Resources

Logs

Download logs Show timestamps

Download logs

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ssh-key-2023-01-...pub ssh-key-2023-01-17-key Show all

- After successful or failed job execution you can still download provisioning logs.

ORACLE Cloud Cloud Classic > not

Germany Central (Frankfurt)

Resource Manager > Stacks > Stack details > Job details

RMJ SUCCEEDED

ormjob20230117101552

Edit job Download Terraform configuration Download Terraform state Add tags

Job information Tags

OCID: o-...beqmg-230ar-500s
Job type: Apply
State: Succeeded
Start time: Tue, Jan 17, 2023, 10:15:52 UTC
Upgrade provider versions: No

Compartment: o-...n-.../specidsp-...up000t
Plan job ID: Automatically approved
Working directory: Not specified
End time: Tue, Jan 17, 2023, 10:16:43 UTC

Resources

Logs

Download logs Show timestamps

Setting providers from hashicorp registry and/or custom terraform providers
Installing provider plugins...
- Finding latest version of hashicorp/terraform...
- Installing hashicorp/terraform v1.6.6...
- Installing hashicorp/terraform v1.6.6 (unauthenticated)
Terraform has been successfully installed!
You may now begin working with Terraform. Try running "terraform plan" to see the changes that are required for your infrastructure. All Terraform commands should now work.
If you ever set or change modules or backend configuration for Terraform, rerun this command to reinitialize your working directory. If you forget, other commands will detect it and remind you to do so if necessary.

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ssh-key-2023-01-...pub ssh-key-2023-01-17-key Show all

- You can always find the stack in the compartment you provisioned the instance and Edit it or export using Code Editor

ORACLE Cloud Cloud Classic > not

Germany Central (Frankfurt)

Resource Manager > Stacks > Stack details

RMS ACTIVE

pob-instance-vm-oci_EBSAgent-20230117-1109

Edit Plan Apply Undeploy More actions

Edit stack

Edit Terraform configuration in code editor

Description:
OCID: b-...51-...500s
Created: Tue, Jan 17, 2023, 10:15:51 UTC
Time of drift detection (last run): N/A. See drift detection page

Compartment: o-...n-.../specidsp-...up000t
Terraform configuration: Updated Download
Terraform version: 1.0.x
Status of drift detection (last run): Not checked

Resources

Jobs

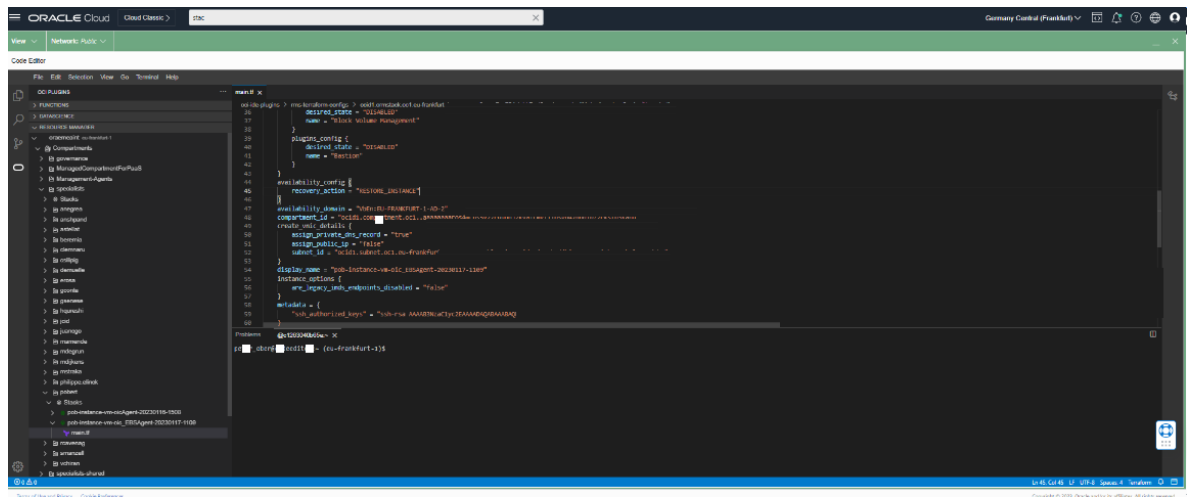
A job is created when you run a Terraform action on a stack. Use these Terraform actions to plan, discuss, and deploy your OCI resources according to your configuration. You can also import state files.

Name	Type	Status	Start time	End time	State file
ormjob20230117101552	Apply	Succeeded	Tue, Jan 17, 2023, 10:15:52 UTC	Tue, Jan 17, 2023, 10:16:43 UTC	View state

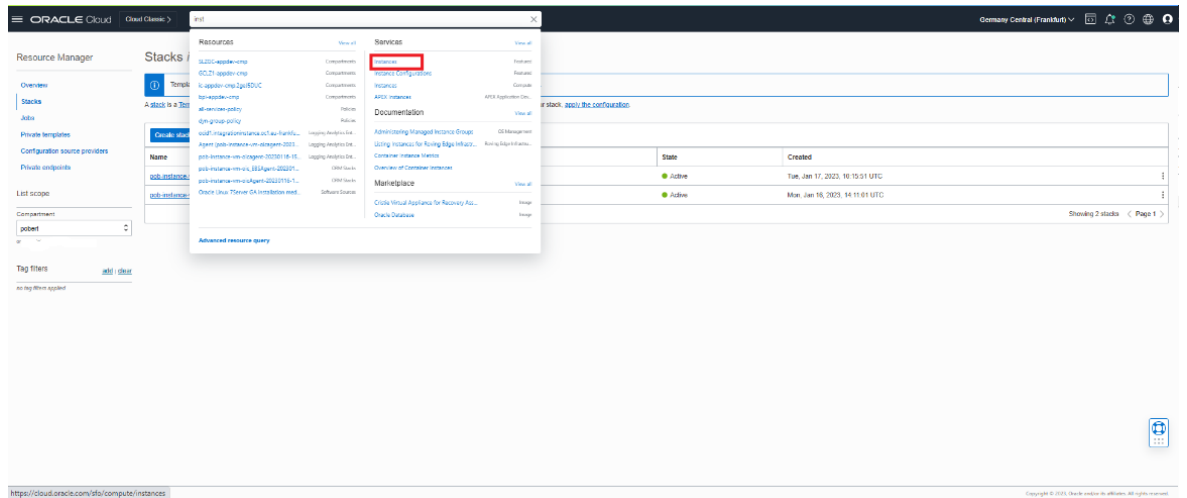
Showing 1 job < Page 1 >

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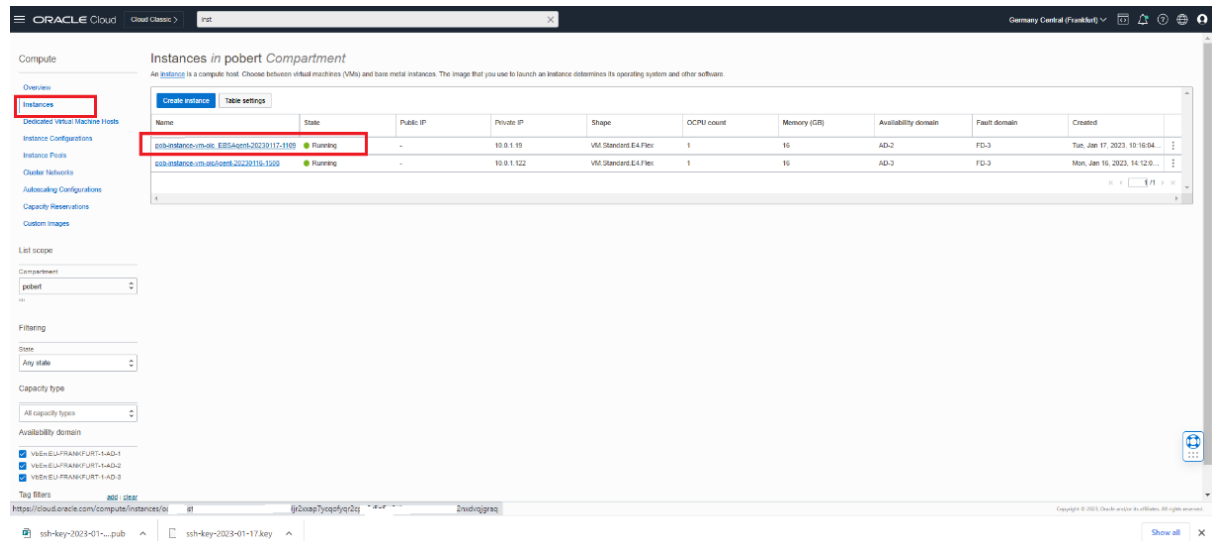


- Jump to your instances

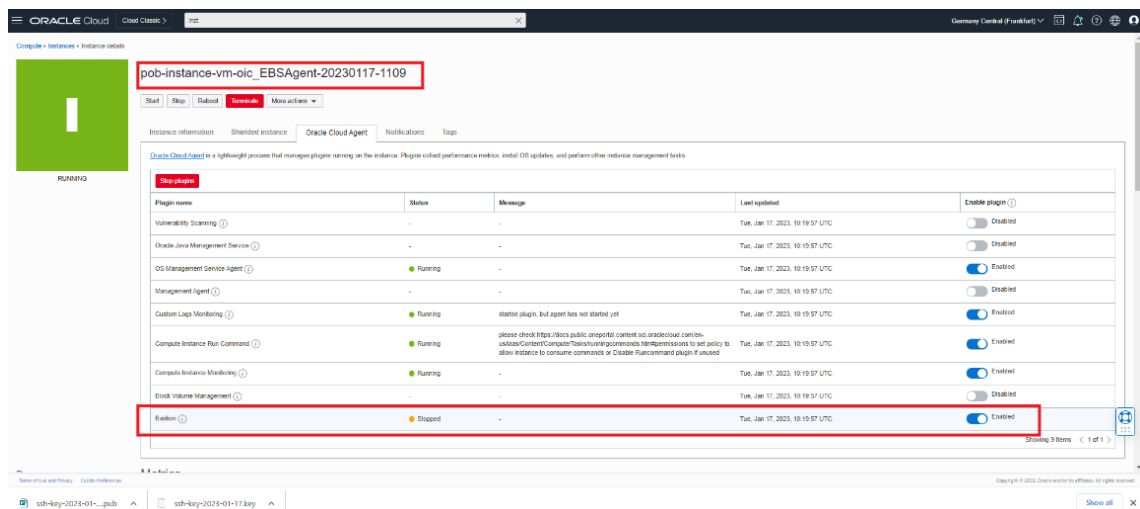


OIC connectivity agent VM Instance configuration and Agent Installation using Bastion Service

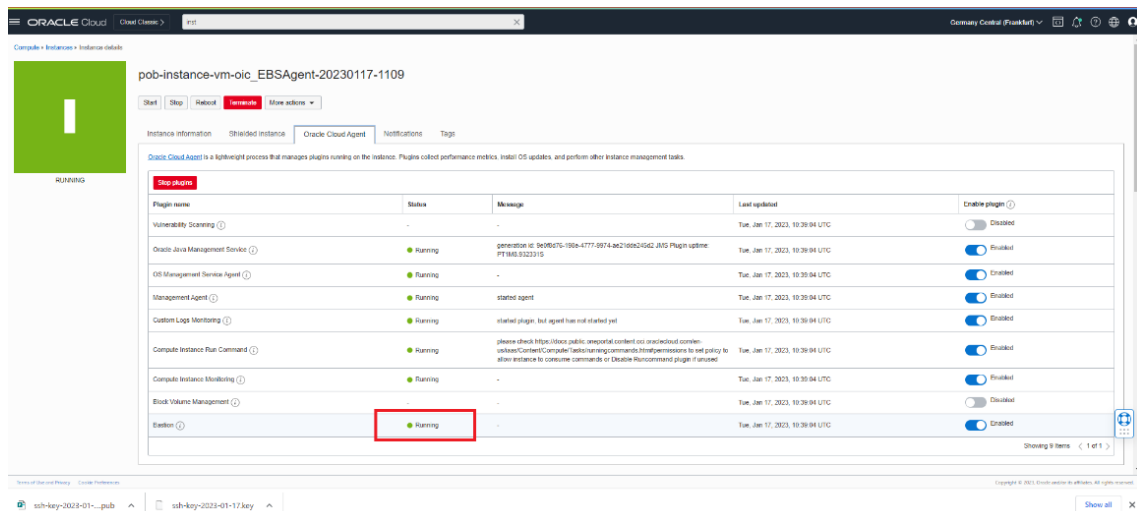
Our VM which will host OIC Connectivity Agent is running.



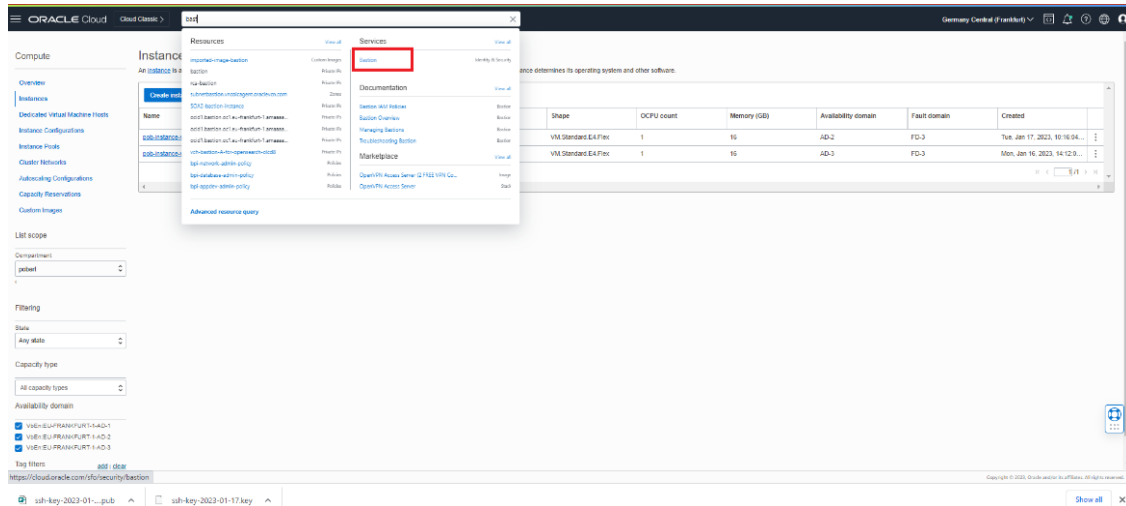
- By Default, Bastion plug-in is disabled on the VM during the provisioning. We could change it in the terraform stack in the editor or we can enable it manually or using OCI REST API or Cloud Shell CLI. Click to Enable.



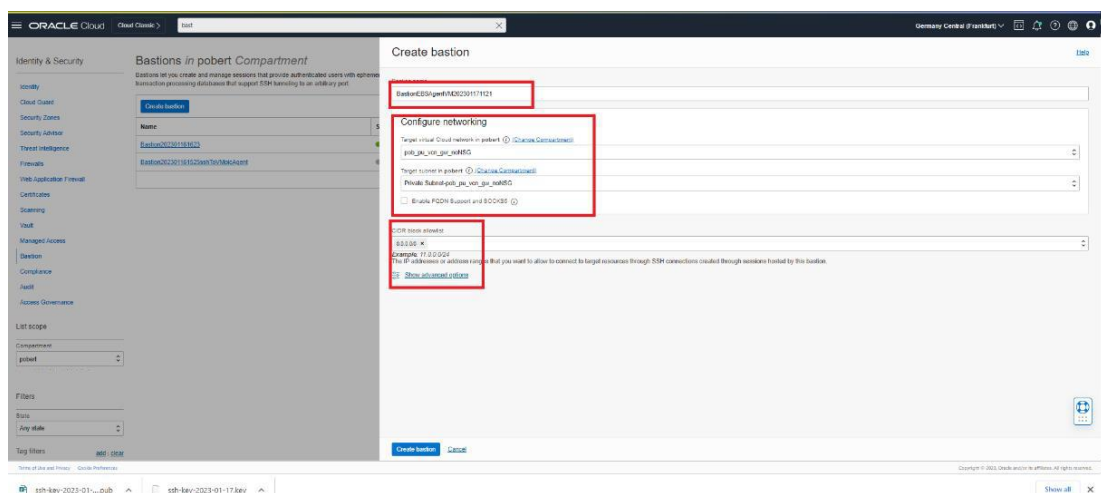
- After some time the Bastion plug-in should be running. If not then use Stop plugins button – then Start Plugins should appear.



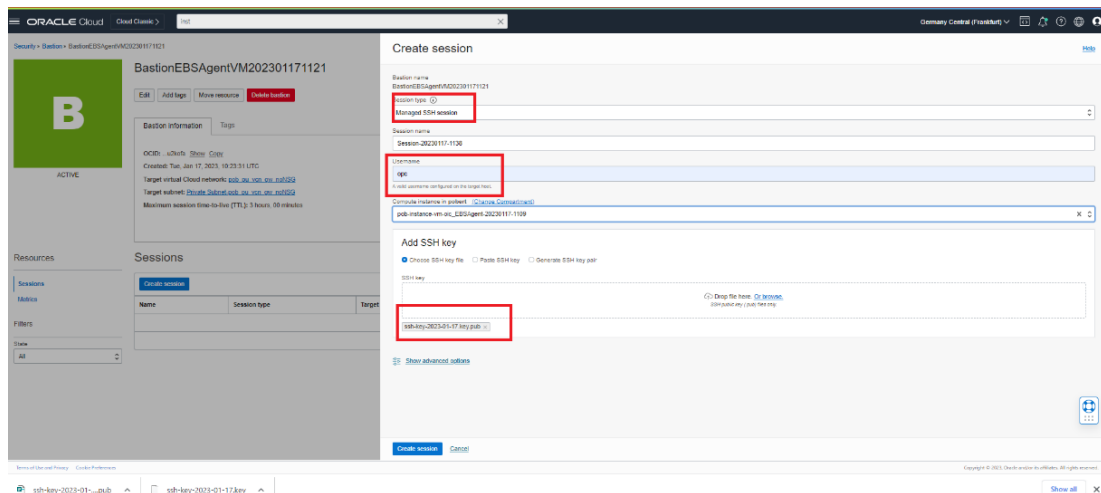
- Now we can create Bastion Service and Bastion session which allows us to maintain the Instance and install OIC connectivity Agent.



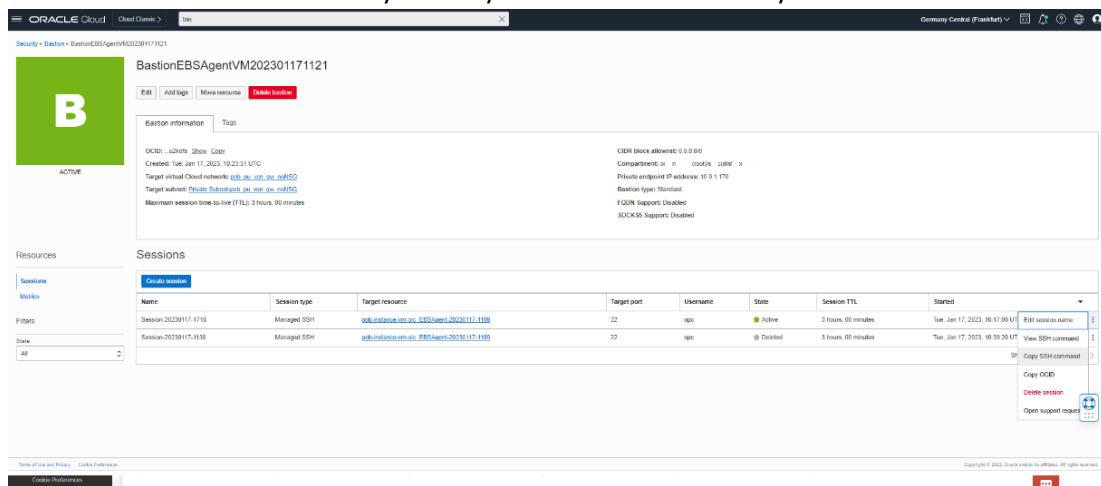
- Provide nice Bastion Service Name, Networking Detail(for the resources in the Agents private subnet) and IP Address from which you will be accessing the resources in the subnet. I allowed all 0.0.0.0/0 (not recommended for PROD type resources ;-)



- Now we can create Bastion SSH session to manage the VM easily



- When the Bastion SSH Session is active then Copy SSH Command and store it into some file – the best some notes in the directory where you stored the Server keys.



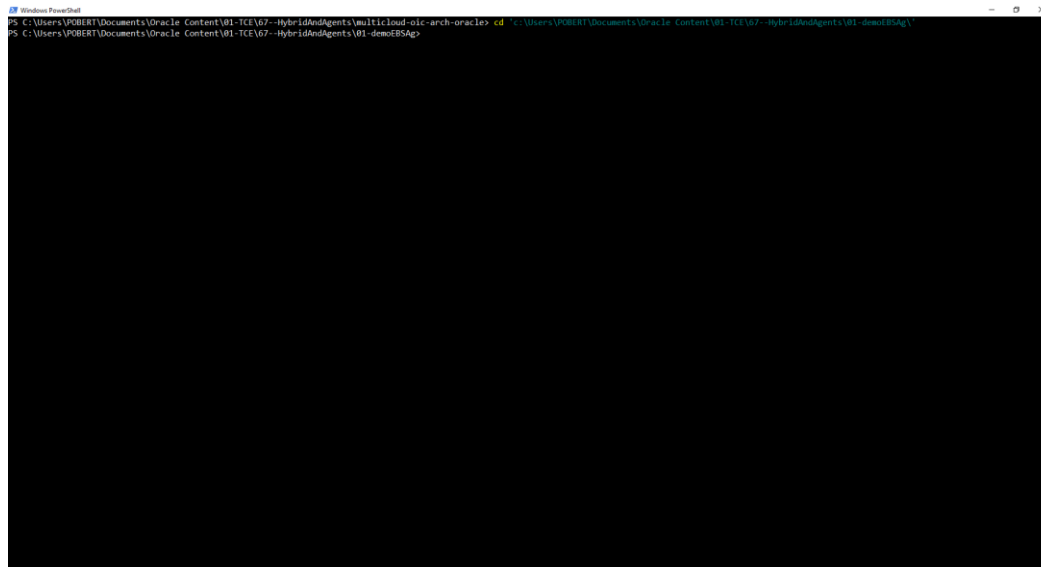
Add your private key file name into the command – you should have now something like that:

```
ssh -i vmebsagent-ssh-key-2023-01-17.key -o ProxyCommand="ssh -i vmebsagent-ssh-key-2023-01-17.key -W %h:%p -p 22 ocid1.bastionsession.oc1.eu-frankfurt-1.xxxxxxxx32q@host.bastion.eu-frankfurt-1.oci.oraclecloud.com" -p 22 opc@10.0.1.19
```

- Open your Power Shell if you are using Windows. On MacOS or Linux you can start Terminal window. Change working directory to the local directory where you stored server keys and you will put OIC connectivity Agent Artifacts. Do not use any public or shared windows folder like „Downloads“.

In my case it was

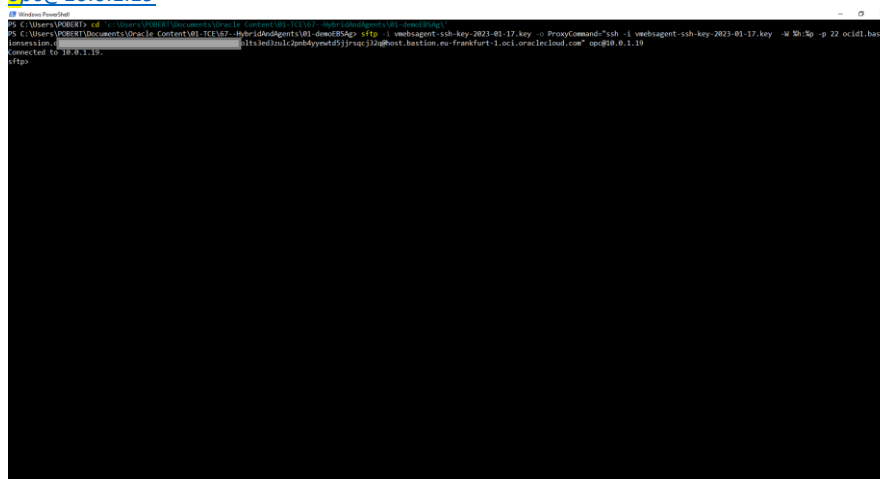
```
➤ cd 'c:\xxxxxx\67--HybridAndAgents\01-demoEBSAg\'
```



- SSH session command should work:



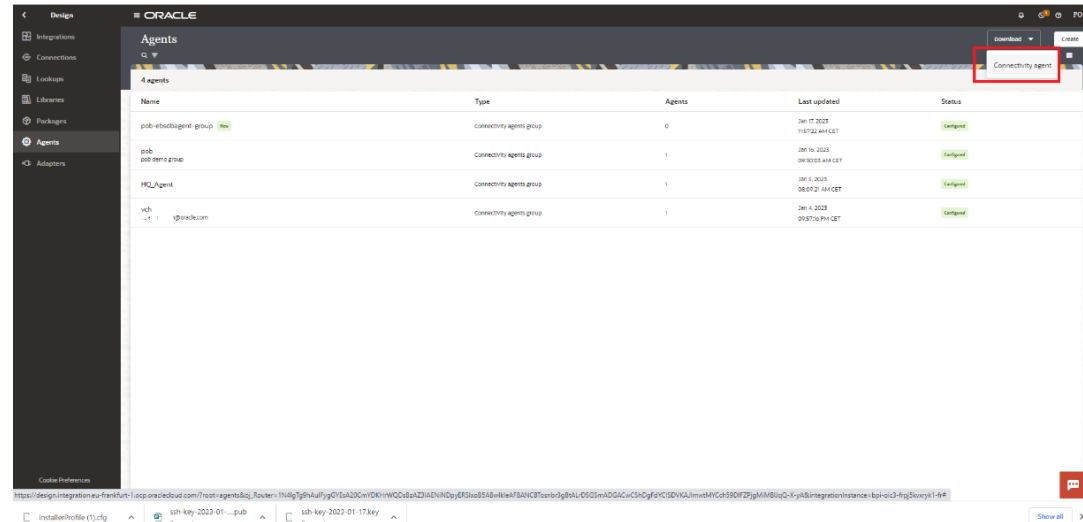
- Create directory e.g. *oic-agent* as directory you will use for dropping OIC Connectivity Agent installation files and configuration. Prepare sftp command from the ssh command. You should have something like that:
`sftp -i vmbsagent-ssh-key-2023-01-17.key -o ProxyCommand='ssh -i vmbsagent-ssh-key-2023-01-17.key -W %h:%p -p 22 ocid1.bastionsession.oc1.eu-frankfurt-1. xxxxxxxxxxx32q@host.bastion.eu-frankfurt-1.oc1.oraclecloud.com' opc@10.0.1.19`



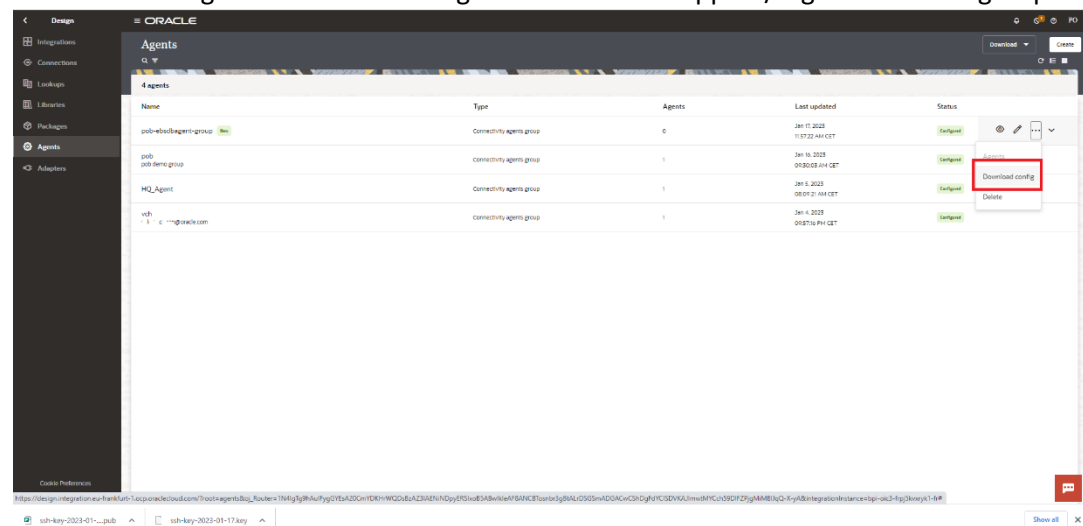
Open Oracle Integration Instance Console and go to Integrations->Design->Agents.

- Create new Agent Group for your Source/Target Integrated System. E.g. In my case *pub-ebdbagent-group*

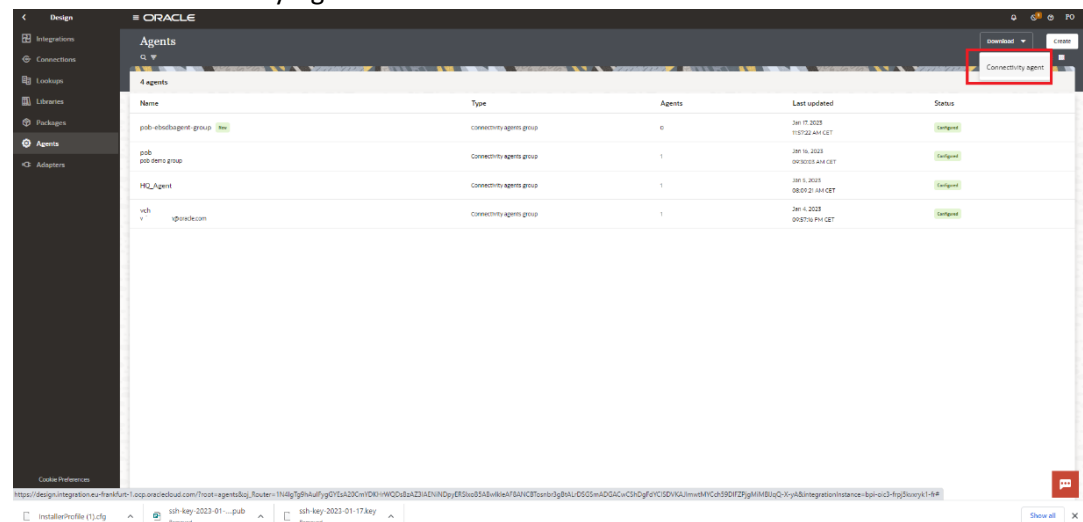
Note: 0 Agents registered for the new Agent Group



- Download configuration file for the Agent which should appear/register into this group.



- Download connectivity Agent installation Archive



- Transfer the artifacts using sftp commands into the VM instance and *oic-agent* folder

```

PS C:\Users\POBERT> cd "C:\Users\POBERT\Documents\Oracle Content\01-TCF67-HybridAgents\01-demoBSAg"
PS C:\Users\POBERT\Documents\Oracle Content\01-TCF67-HybridAgents\01-demoBSAg> sftp -i vmebsagent-ssh-key-2023-01-17.key -o ProxyCommand="ssh -i vmebsagent-ssh-key-2023-01-17.key -W %h:%p -p 22 ocid1.bast
ion@10.0.1.19" -r /zaf6amp4olts3ed3ulc2pnb4yyewtd5jjsqc32@host.bastion.eu-frankfurt-1.oc1.oraclecloud.com" opc@10.0.1.19
Connected to 10.0.1.19.
sftp> ls
oic-agent
sftp> cd oic-agent
sftp> pwd
Remote working directory: /home/opc/oic-agent
sftp> put oic*.zip
Uploading oic_conn_agent_installer.zip to /home/opc/oic-agent/oic_conn_agent_installer.zip
oic_conn_agent_installer.zip
sftp> put Inst*.cfg
Uploading InstallerProfile.cfg to /home/opc/oic-agent/InstallerProfile.cfg
InstallerProfile.cfg
sftp> ls -l
-rw-rw-r-- 1 opc   opc       723 Jan 17 11:03 InstallerProfile.cfg
-rw-rw-r-- 1 opc   opc    196294265 Jan 17 11:02 oic_conn_agent_installer.zip
sftp>

```

- Exit from SFTP and run again SSH command as before when creating the folder
 - unzip the installer zip archive – not extracting InstallerProfile.cfg. Or unzipping in additional temporary folder and replace empty InstallerProfile.cfg with the one downloaded from the OIC Agent Group menu.

```

opc@qob-instance-vm-oic-ebagent-20230117-1109 /oic-agent
PS C:\Users\POBERT> cd "C:\Users\POBERT\Documents\Oracle Content\01-TCF67-HybridAgents\01-demoBSAg"
PS C:\Users\POBERT\Documents\Oracle Content\01-TCF67-HybridAgents\01-demoBSAg> sftp -i vmebsagent-ssh-key-2023-01-17.key -o ProxyCommand="ssh -i vmebsagent-ssh-key-2023-01-17.key -W %h:%p -p 22 ocid1.bast
ion@10.0.1.19" -r /zaf6amp4olts3ed3ulc2pnb4yyewtd5jjsqc32@host.bastion.eu-frankfurt-1.oc1.oraclecloud.com" opc@10.0.1.19
Connected to 10.0.1.19.
sftp> ls
oic-agent
sftp> cd oic-agent
sftp> pwd
Remote working directory: /home/opc/oic-agent
sftp> put oic*.zip
Uploading oic_conn_agent_installer.zip to /home/opc/oic-agent/oic_conn_agent_installer.zip
oic_conn_agent_installer.zip
sftp> put Inst*.cfg
Uploading InstallerProfile.cfg to /home/opc/oic-agent/InstallerProfile.cfg
InstallerProfile.cfg
sftp> ls -l
-rw-rw-r-- 1 opc   opc       723 Jan 17 11:03 InstallerProfile.cfg
-rw-rw-r-- 1 opc   opc    196294265 Jan 17 11:02 oic_conn_agent_installer.zip
sftp> quit
PS C:\Users\POBERT\Documents\Oracle Content\01-TCF67-HybridAgents\01-demoBSAg> ssh -i vmebsagent-ssh-key-2023-01-17.key -o ProxyCommand="ssh -i vmebsagent-ssh-key-2023-01-17.key -W %h:%p -p 22 ocid1.bast
ion@10.0.1.19"
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Tue Jan 17 10:47:38 2023 from 10.0.1.170
opc@qob-instance-vm-oic-ebagent-20230117-1109 ~]$ cd oic-agent/
opc@qob-instance-vm-oic-ebagent-20230117-1109 oic-agent]$ ls
InstallerProfile.cfg  oic_conn_agent_installer.zip
opc@qob-instance-vm-oic-ebagent-20230117-1109 oic-agent]$ ls -l
total 191700
-rw-rw-r-- 1 opc opc       723 Jan 17 11:03 InstallerProfile.cfg
-rw-rw-r-- 1 opc opc    196294265 Jan 17 11:02 oic_conn_agent_installer.zip
opc@qob-instance-vm-oic-ebagent-20230117-1109 oic-agent]$ unzip *.zip
Archive:  oic_conn_agent_installer.zip
  creating: agenthome/
  creating: agenthome/agent/
  creating: agenthome/agent/cert/
  creating: agenthome/agent/config/
  creating: agenthome/agent/data/
  creating: agenthome/logs/
  creating: agenthome/bin/
  creating: agenthome/thirdparty/
  creating: agenthome/thirdparty/lib/
  creating: agenthome/lib/
replace InstallerProfile.cfg? [y]es, [n]o, [A]ll, [U]none, [r]ename: n

```

- Install the OIC Connectivity Agent by running following command:
`/usr/bin/java -jar connectivityagent.jar`

```

infalating: agenthome/lib/javax.xml.soap-api-1.4.0.jar
infalating: agenthome/lib/javax.activation-api-1.2.0.jar
infalating: agenthome/lib/javax.jws-3.1.2.jar
infalating: agenthome/lib/jaxws-api-2.3.1.jar
infalating: agenthome/lib/activation-1.3.1.jar
infalating: agenthome/lib/bc-fips-1.0.2.1.jar
infalating: agenthome/lib/slf4j-jdk16-1.7.26.jar
infalating: agenthome/lib/jsoup-1.18.2.jar
infalating: agenthome/lib/commons-lang3-3.9.jar
infalating: agenthome/lib/authentication-authenticator-1.13.46.jar
infalating: agenthome/lib/flient-bc-4.5.15.jar
infalating: agenthome/lib/authentication-signed-request-verification-1.13.46.jar
infalating: agenthome/lib/authentication-signed-request-common-1.13.46.jar
infalating: agenthome/lib/authentication-signed-request-generation-1.13.46.jar
infalating: agenthome/lib/authentication-token-verification-1.13.46.jar
infalating: agenthome/lib/authentication-token-common-1.13.46.jar
infalating: agenthome/lib/google-http-client-1.28.0.jar
infalating: agenthome/lib/authentication-client-1.13.46.jar
infalating: agenthome/lib/jet-1.0.5.jar
infalating: agenthome/lib/oci-java-sdk-common-1.9.5.jar
infalating: agenthome/lib/jersey-hk2-2.27.jar
infalating: agenthome/lib/jersey-media-json-jackson-2.27.jar
infalating: agenthome/lib/jersey-entity-filtering-2.27.jar
infalating: agenthome/lib/core-1.0.117.jar
infalating: agenthome/lib/core-regions-1.0.117.jar
infalating: agenthome/lib/core-resources-1.0.117.jar
infalating: agenthome/lib/request-id-8.1.7.jar
infalating: agenthome/lib/jackson-datatype-jdk8-2.9.9.jar
infalating: agenthome/lib/config-1.3.4.jar
infalating: agenthome/lib/bcpkix-fips-1.0.2.jar
infalating: agenthome/lib/httpcore-4.4.11.jar
infalating: agenthome/lib/joda-time-2.9.jar
infalating: agenthome/lib/commons-collections4-4.3.jar
infalating: agenthome/lib/commons-net-3.6.jar
infalating: agenthome/lib/nimbus-jose-jwt-8.2.jar
infalating: agenthome/lib/jcip-annotations-1.0-1.jar
[opc@bob-instance-via-oci-eb-agent-20220117-1109-oci-agent]$ /usr/bin/java -jar connectivityagent.jar
Proceeding to install a new agent ...
No Proxy Configuration Detected
Checking for trusted certificates ...
Making call to check OIC Version ...
Making call to check Agent group availability ...
Updating Agent with configuration details ...
Making call to register new agent instance ...
Making call for getting agent app id & keys... Starting Agent for message processing.
Done with Agent installation & configuration... Agent started successfully...Now available for new messages...

```

- Now in OIC console you should see that Agent is registered into the Agent Group. I recommend to kill the current running agent process and start it in background

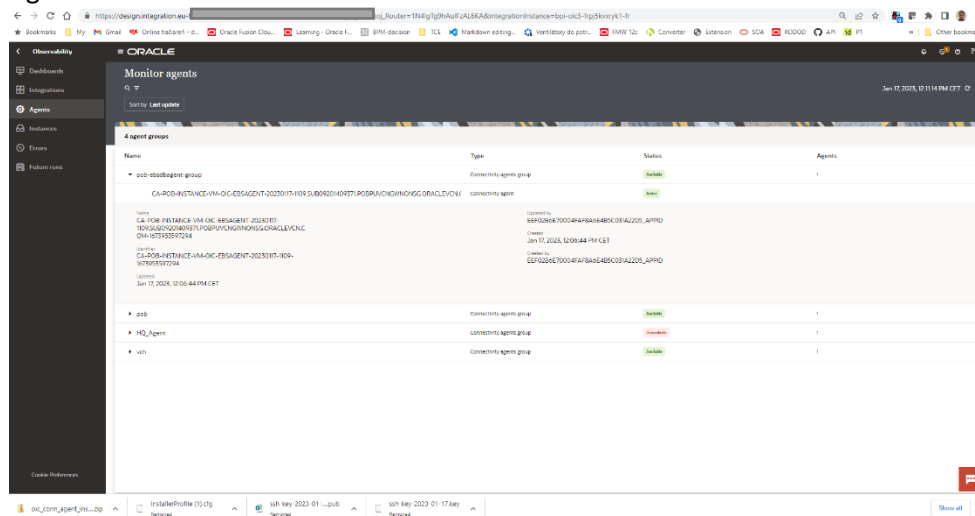
```

sudo -s
ps -ef | grep java
kill -9 <pid of the agent>
exit
nohup /usr/bin/java -jar connectivityagent.jar &

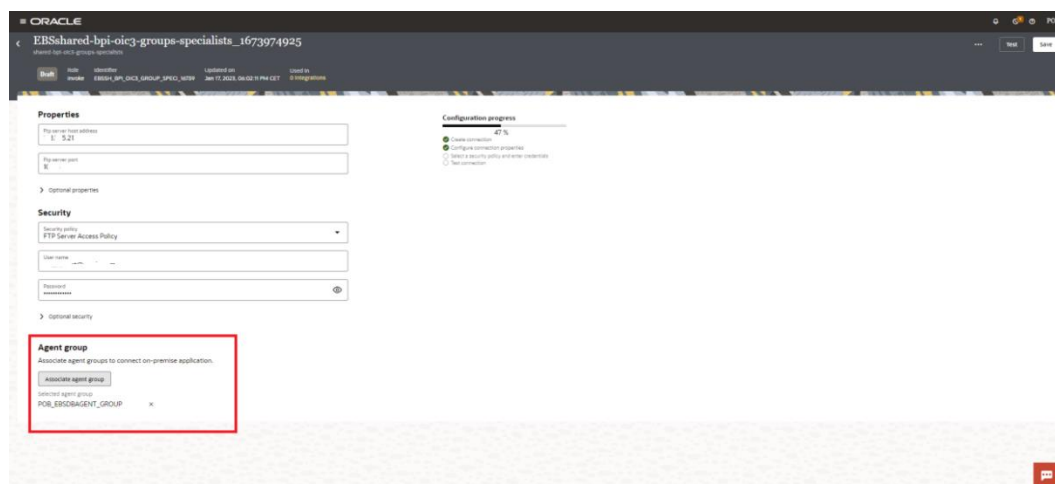
```

Name	Type	Agents	Last updated	Status
job-ebocagent-group	Connectivity agents group	1	2021/11/23 15:57:22 AEST	Configured
job-ebocagent-group	Connectivity agents group	1	2021/11/23 09:50:08 AEST	Configured
HQ_Agent	Connectivity agents group	1	2021/11/23 09:50:08 AEST	Configured
vch	Connectivity agents group	1	2021/11/23 09:50:08 AEST	Configured

- Agent health can be monitored for its health through OIC menu – Home -> Observability -> Agents



- Now we can define Integration connection to EBS using connectivity agent through Associated Agent Group



Learn More

To learn more about Oracle Integration Cloud visit [Application-Integration](#).

- [Bastion Service](#)
- [OIC Connectivity Agent](#)
- [OCI Networking](#)
- [OCI Compute Concepts](#)

I recommend to follow Oracle A-Team [Chronicles](#) and Integration Product Director [blogs](#).

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