Mobile User To Cloud Application Connectivity

Overview

This quickstart guide will provide all the steps to create a secure service between a remote user and an application hosted in Azure Cloud using NetFoundry Overlay Fabric (NFOF).



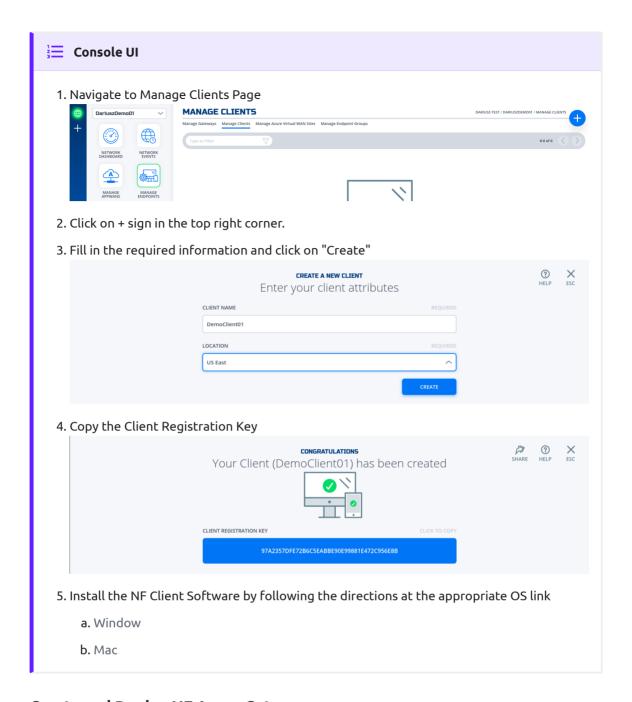
Important

Assumption is that the NF Fabric is already up and the NF Client is installed.

Through NF Web Console UI

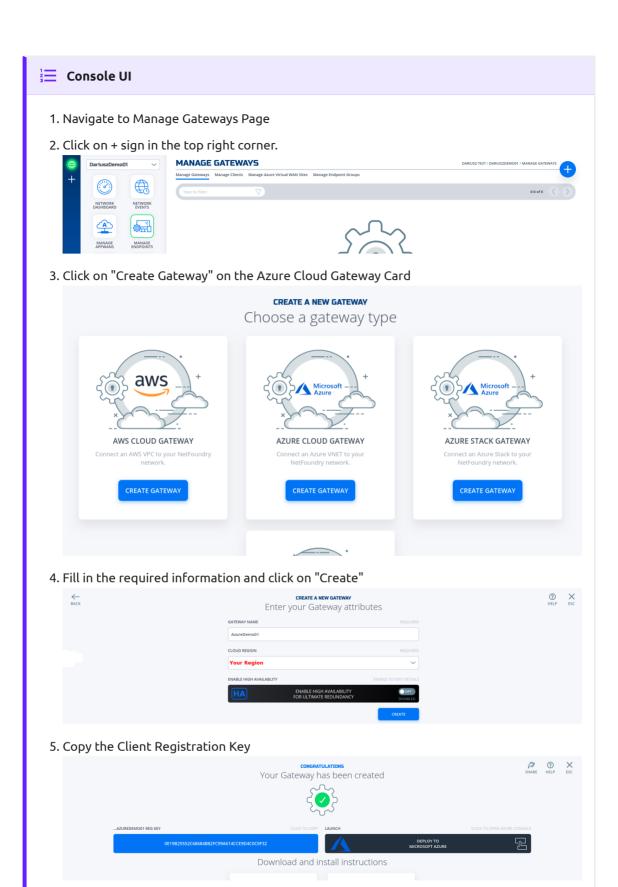
Create and install NF Client

This section will guide a user through the steps on how to create a client in the NF Console UI. Then, it will provide links to Guides on how to install the NetFoundry Client Software for Windows and MAC Clients, including the registration with the NF Network Fabric.



Create and Deploy NF Azure Gateway

This section will guide a user through the steps on how to create a NF Manage Gateway in the NF Console UI and install it in the Azure vNet.

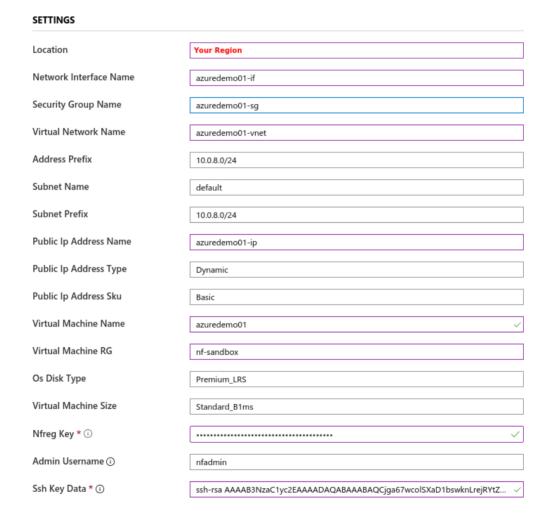


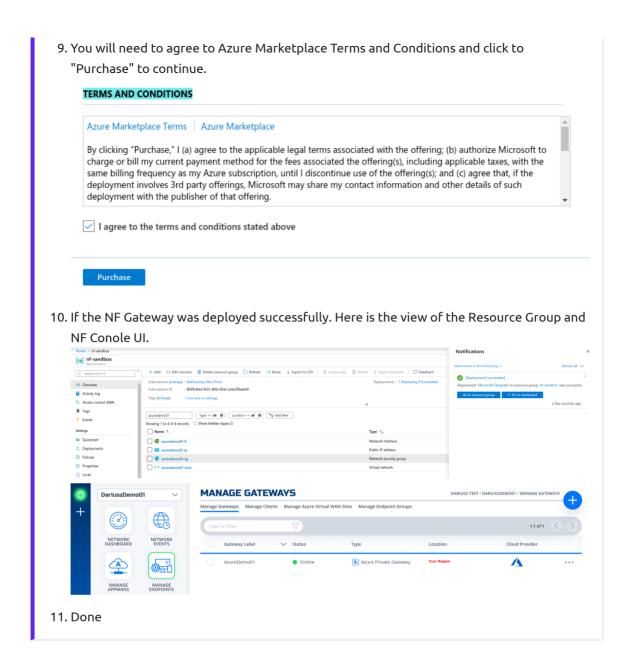
6. Click on "Deploy to Microsoft Azure". It will take you to the Azure Portal and ask you for your login credentials.

7. You will be presented with the template that needs to be filled. The first section is the Basics regarding your Subscription and Resource Group this gateway will be deployed in.

BASICS Subscription * Resource group * Create new Location * (US) East US

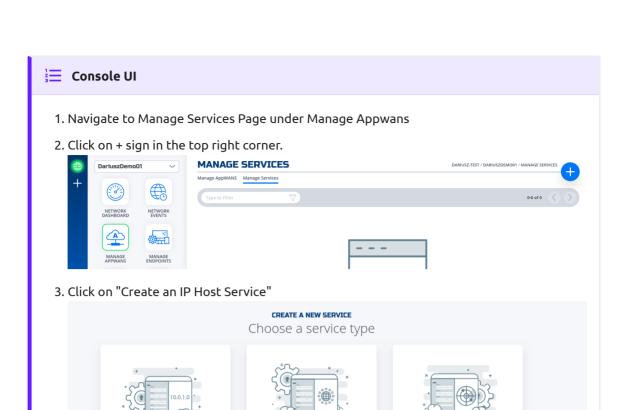
8. The second section related to resources associated with this gateway. e.g. vm name, ip address space, security groups, etc. you will paste the registration key copied in step 5. You will also need the public ssh key to use for access to this gateway remotely.





Create IP Host Service

This section will guide a user through the steps on how to create a NF Service.

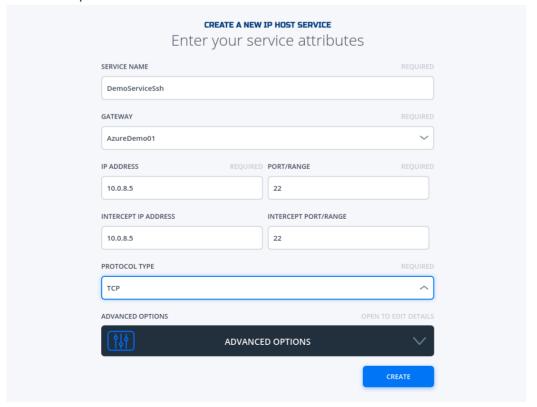


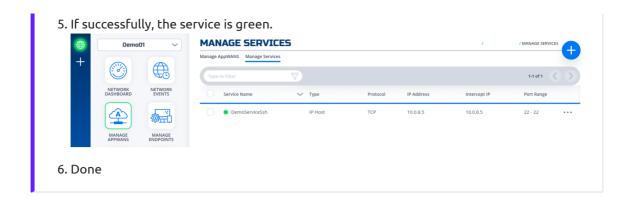
IP NETWORK SERVICE

HOST PING SERVICE

4. Fill in the required information for SSH and click on "Create"

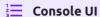
IP HOST SERVICE





Create AppWan

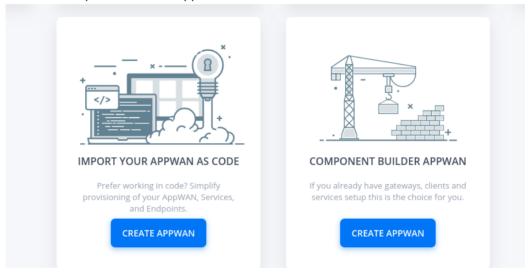
This section will guide a user through the steps on how to enable service connectivity to users by creating an appwan.



- 1. Navigate to Manage AppWANS Page under Manage Appwans
- 2. Click on + sign in the top right corner.

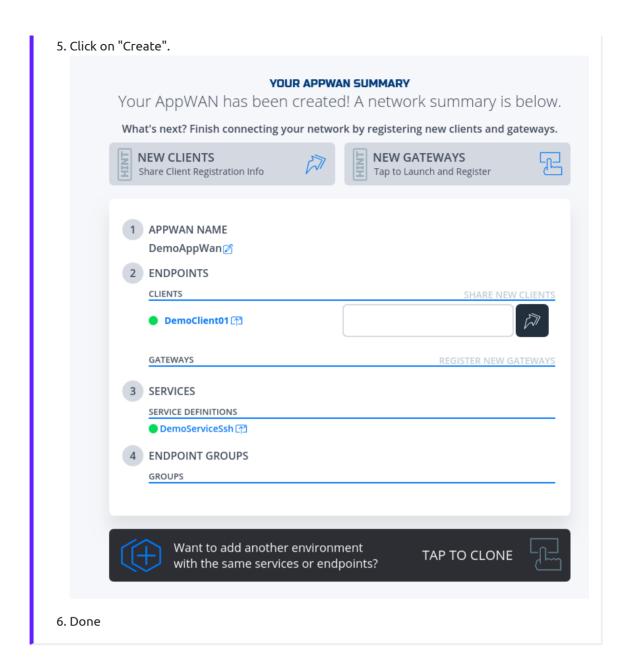


3. Click on "Component Builder Appwan"



4. Move the desired client (e.g. DemoClient01) from "Available" Clients to "Selected" Endpoints. Move the desired service (e.g. DemoServiceSsh) from "Available" to "Selected"

Services. CREATE A NEW APPWAN Choose from existing components, or add new ones 1 APPWAN NAME DemoAppWan 2 ADD CLIENTS, GATEWAYS, OR ENDPOINT GROUPS ADD NEW 🕕 SELECTED ENDPOINTS AVAILABLE GROUPS DemoClient01 ADD NEW 🕕 AVAILABLE CLIENTS AVAILABLE GATEWAYS ADD NEW 🕕 AzureDemo01 3 ADD SERVICES Search for a Service AVAILABLE SERVICES ADD NEW 🜐 SELECTED SERVICES DemoServiceSsh



Test Connectivity to Application Server

```
To test connectivity, log in to the DemoClinet01 and run ssh username@privatelp

Infadmin@azuredemoapp:~

Infadmin@azuredemoapp ~| S |

Infadmin@azuredemoap
```

Programmatically

via Python and Terraform

1

Python Modules

For the code clarity, we have broken down the code into multiple Python modules

- 1. NF REST CRUD (Create, Read, Update and Delete) operations
- 2. Get MOP Session Token
- 3. Create NF Network
- 4. Create NF Gateway(s)
- 5. Create NF Service(s)
- 6. Create NF AppWan(s)
- 7. Wrapper Script to Create NF Resources based on Resource yaml file

Environment Setup Requirements

- 1. ~/.env to store NF Credentials in (e.g. clientId, clientSecret) to obtain a session token for NF API
- 2. Export Azure Credentials (e.g, export ARM_TENANT_ID, ARM_CLIENT_ID, ARM_CLIENT_SECRET, ARM_SUBSCRIPTION_ID) to enable resource gateway creation in Azure Resource Group via Terraform.
- 3. Terraform and Python3 installed in path.

Additional Information:

- 1. The new Resource Group in Azure is created based on then name provided in Resource yml, if one does not exist already in the same region (e.g. centralus). The action delete gateway will delete the RG as well even if it was an existing RG. If one does not want to delete the RG, the command terraform state rm "{tf resource name for RG}" needs to be run before running the gateway delete step. This will ensure that the RG is not deleted.
- 2. A new vNet will be created and NF Gateway will be placed in it.
- 3. Environment means the NF Console Environment used (e.g. production), not Azure.

- 1. Clone this repo (git clone https://github.com/netfoundry/mop.git)
- 2. Update Resource yaml file with the desired options to feed into the wrapper script as described in the following code snippet. All Resource.yml Options
- 3. Run this from the root folder to create GW in NF Console UI and Azure.

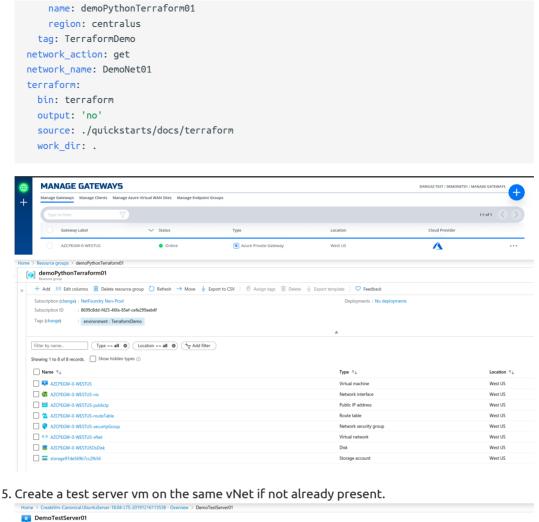
```
python3 quickstarts/docs/api/python/source/netfoundry/nf_resources.py --file quickstarts/
docs/api/python/etc/nf resources.yml
```

Required Configuration Parameters for Gateway Creation

```
environment: production
network action: get
network name: DemoNet01
gateway list:
- action: create
 cloud: azure
  count: 1
  names: []
  region: westus
  regionalCidr: [10.20.10.0/24]
  regkeys: []
  resourceGroup:
   name: demoPythonTerraform01
   region: centralus
  tag: TerraformDemo
terraform:
  bin: terraform
  output: 'no'
  source: ./quickstarts/docs/terraform
  work_dir: .
```

4. After the script is run successfully, one can see that the gateway name and registration key were saved in Resource.yml file. The name is created automatically based on region and gateway type joined with x and gateway count (AZCPEGW means an azure type gateway in NF console). One can create more than one gateway in the same region by increasing the count to more than 1.

```
environment: production
gateway_list:
- action: create
 cloud: azure
 count: 1
 names:
 - AZCPEGWx0xWESTUS
 region: westus
 regionalCidr:
 - 10.20.10.0/24
  - 21DB86724EC3F31C11C1C9D68CE5ECD6A06F057E
 resourceGroup:
```





6. Update the Resoure.yaml file to include the Service option to create the NF service on the gateway create in the previous step. Don't forget to change the action on the gateway to "get".

```
environment: production
gateway_list:
- action: get
 cloud: azure
 count: 1
 names:
  - AZCPEGWx0xWESTUS
 region: westus
 regionalCidr:
  - 10.20.10.0/24
  - 21DB86724EC3F31C11C1C9D68CE5ECD6A06F057E
  resourceGroup:
```

```
name: demoPythonTerraform01
   region: centralus
 tag: TerraformDemo
network_action: get
network_name: DemoNet01
terraform:
 bin: terraform
 output: 'no'
 source: ./quickstarts/docs/terraform
 work dir: .
services:
- action: create
 gateway: AZCPEGWx0xWESTUS
 ip: 10.20.10.5
 port: 22
 name:
 type: host
```

7. After the script run again successfully, the service section should have been populated with the service name as so.



8. Create a client endpoint if not already done so.



9. Update the Resoure.yaml file to include the AppWan option to create the NF AppWan tying the gateway, client and service created in the previous steps. Don't forget to change the action on the service option to "get".

```
regkeys:
 - 21DB86724EC3F31C11C1C9D68CE5ECD6A06F057E
 resourceGroup:
   name: demoPythonTerraform01
   region: centralus
tag: TerraformDemo
network_action: get
network_name: DemoNet01
services:
- action: get
 gateway: AZCPEGWx0xWESTUS
 ip: 10.20.10.5
 name: AZCPEGWx0xWESTUS--10.20.10.5--22
 port: 22
 type: host
terraform:
 bin: terraform
 output: 'no'
 source: ./quickstarts/docs/terraform
 work_dir: .
appwans:
- action: create
 endpoints:
 - BranchGatewayName
 - ClientName
 name: appwan-ssh-22
 services:
 - AZCPEGWx0xWESTUS--10.20.10.5--22
```

10. After the script ran again successfully, the connectivity should have been up. YOUR APPWAN SUMMARY Your AppWAN's details are below. Looking to make some changes? Follow the hints below to edit your AppWAN, Endpoints, and or Services. ENDPOINTS & SERVICES
Tap to Edit Advanced Options EDIT YOUR APPWAN

Tap the Edit icon to make changes **EDIT YOUR APPWAN** 1 APPWAN NAME appwan-ssh-22 🛭 2 ENDPOINTS CLIENTS ClientName <a>\textsize GATEWAYS BRANCHGATEWAYNAME(3 SERVICES SERVICE DEFINITIONS AZCPEGWx0xWESTUS--10.20.10.5-22 1 4 ENDPOINT GROUPS GROUPS Want to add another environment TAP TO CLONE with the same services or endpoints?

11. To test connectivity, log in to the DemoClinet01 and run ssh "username"@"privateIp" NFN Client Status Services Proxies Diagnostics NETFOUNDRY. This computer is protected There are currently active Connect network sessions. Status Description Type IP Address ON CO NFN enabled b5cfd827-200a-43f1-9c2c-eebed5e55c22 C/S 10.20.10.5 Remove trav icon This computer is registered as dariusz@DemoTestServer01: ~ 'S C:\Users\Dariusz Sliwinski> <mark>ssh</mark> dariusz@10.20.10.5 Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 5.0.0-1027-azure x86_64) * Documentation: https://help.ubuntu.com * Management: https://landscape.canonical.com * Support: https://ubuntu.com/advantage System information as of Mon Dec 16 17:24:59 UTC 2019

 System load:
 0.19
 Processes:
 107

 Usage of /:
 4.1% of 28.90GB
 Users logged in:
 0

 Memory usage:
 17%
 IP address for eth0:
 10.20.10.5

 Swap usage:
 0%

 packages can be updated. updates are security updates. Last login: Mon Dec 16 17:24:31 2019 from 10.20.10.4 To run a command as administrator (user "root"), use "sudo <command>". See "man sudo_root" for details. ariusz@DemoTestServer01:~\$ 🕳

12. To delete resources created, just follow the reverse order. Change the action to delete for AppWans first, then other resources as indicated in the code snippets.

```
appwans:
- action: delete
endpoints:
- BranchGatewayName
- ClientName
name: null
services:
- AZCPEGWx0xWESTUS--10.20.10.5--22
```

13. Services

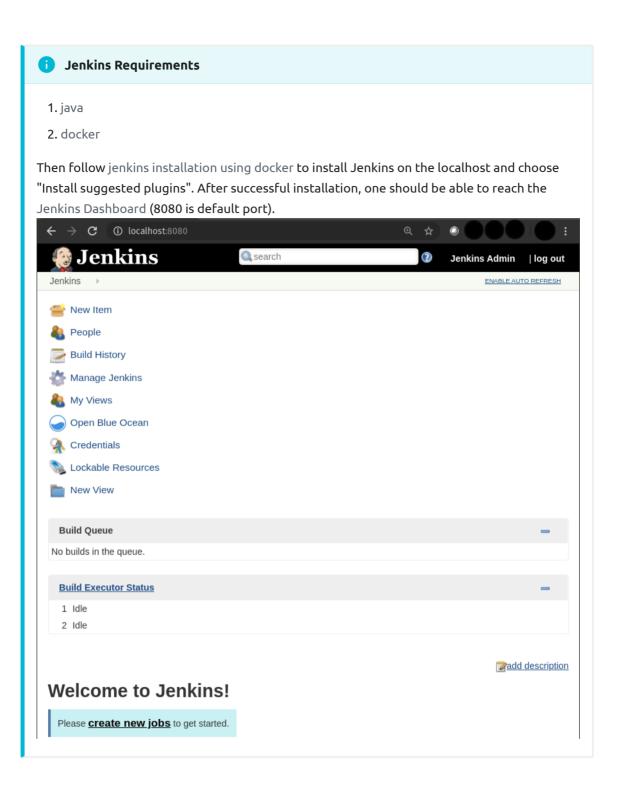
```
services:
- action: delete
  gateway: AZCPEGWx0xWESTUS
  ip: 10.20.10.5
  name: null
  port: 22
  type: host
```

- 14. Endpoints will delete all resources in Azure as well.
 - a. terraform state rm "{tf resource name for RG}" // run this before the python script if Resource Group needs to be preserved 1.

```
gateway_list:
         - action: delete
           cloud: azure
           count: 1
          names: []
          region: westus
          regionalCidr:
           - 10.20.10.0/24
           regkeys: []
           resourceGroup:
           name: demoPythonTerraform01
            region: centralus
           tag: TerraformDemo
15. Network
     environment: production
     network_action: delete
     network_name: DemoNet01
16. Done
```

via Jenkins

In this section, we will use Resource yaml along with Jenkinsfile to show how to automate the steps further by creating the Jenkins Job



Note

If one wants to add the gateway deployed in the Private DataCenter and/or NF Client, it must be created prior to running the next steps. Otherwise the options of APPWAN_PRIVATE_GATEWAY and APPWAN_PRIVATE_CLIENT can be left blank and added after the appwan is created using the steps described in the Console UI section above. GATEWAY_NAME and SERVICE_NAME are automatically generated by the scripts in this version. GATEWAY_NAME = "GW TYPE"+x0x+"LOCATION OF AZURE GW", e.g. AZCPEGWx0xWESTUS; SERVICE_NAME = "GW NAME"--"SERVICE IP"--"SERVICE PORT", e.g. AZCPEGWx0xWESTUS--10.20.10.5--22.

Setting Up Jenkins Pipeline

- 1. Login to Jenkins
- 2.



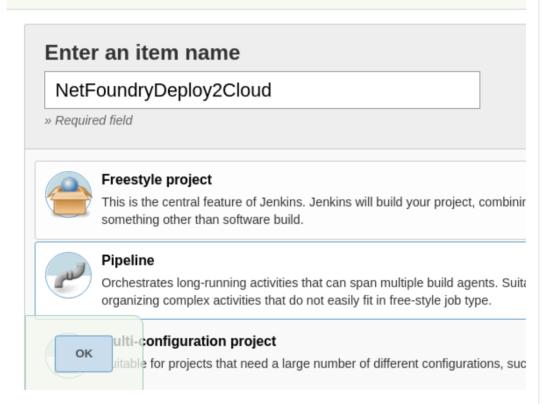






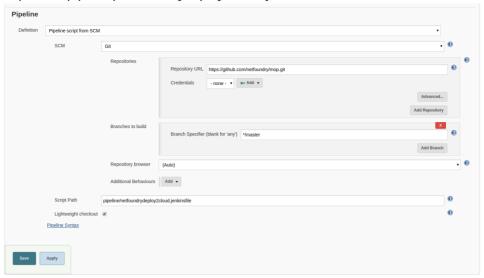
Click on " New Item"

3. Name you Project, select pipeline option and click "Ok"

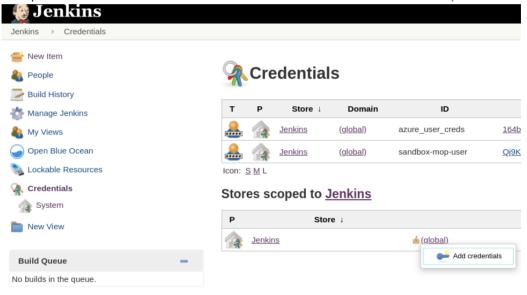


- 4. In the pipeline details, fill in the scm details as seen in the image below and click "Save". Everything default apart from:
 - a. Repository Url: https://github.com/netfoundry/mop.git

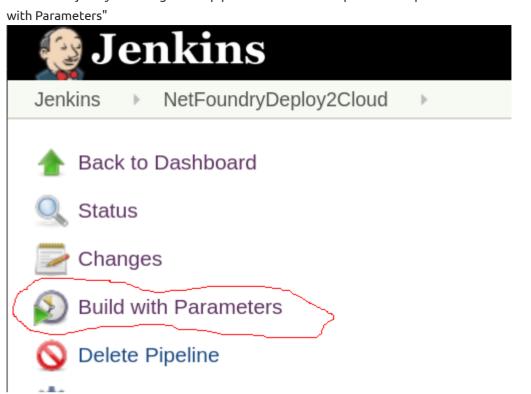
b. Script Path: pipeline/netfoundrydeploy2cloud.jenkinsfile



5. Set up users for Azure API and NF MOP API access -- More on Credentials setup

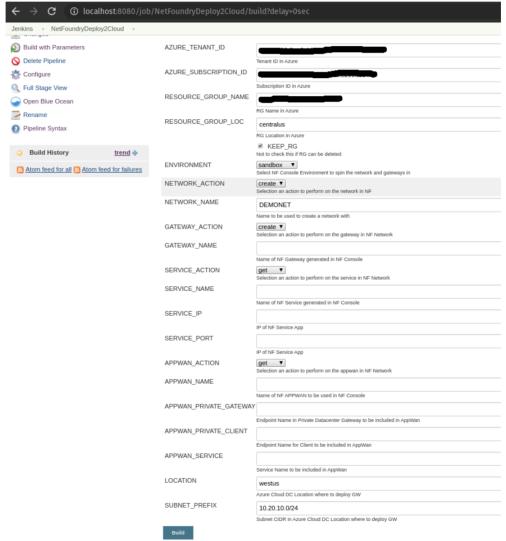


6. Run Jenkinsjob by selecting on the pipeline created in the previous step. Click on "Build



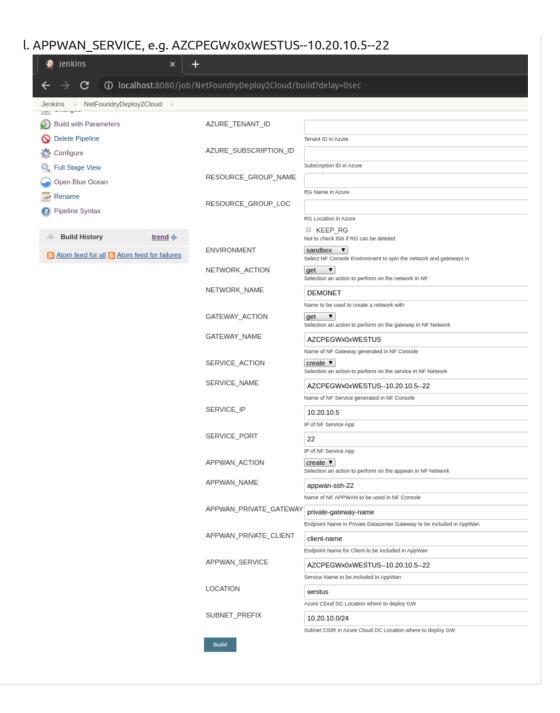
To create the resources

- 1. Fill in the Azure Details (e.g. RG, Tenant Id, etc) and select the following:
 - a. NF Environment, e.g. production
 - b. NETWORK_ACTION create
 - c. NETWORK_NAME, e.g. DEMONET
 - d. GATEWAY_ACTION create
 - e. If Azure RG needs to be preserved, then KEEP_RG option must be left checked.
 - f. LOCATION, e.g. westus location where the Azure GW will be deployed in
 - g. SUBNET_PREFIX, e.g. 10.20.10.0/24 the subnet used for the vNet in the location of the Azure GW deployment.



2. Run Jenkins job again by selecting on the pipeline created in the previous step. Click on "Build with Parameters"

- 3. Fill in service and appwan details by selecting the following:
 - a. KEEP_RG not selected
 - b. NF Environment, e.g. production
 - c. SERVICE_ACTION create
 - d. APPWAN_ACTION create
 - e. GATEWAY_NAME, e.g. AZCPEGWx0xWESTUS (this is created in the previous step automatically)
 - f. SERVICE_NAME, e.g. AZCPEGWx0xWESTUS--10.20.10.5--22 (this is created automatically during this step)
 - g. SERVICE_IP, e.g. 10.20.10.5
 - h. SERVICE_PORT, e.g. 22
 - i. APPWAN_NAME, e.g. appwan-ssh-22
 - j. APPWAN_PRIVATE_GATEWAY, e.g. private-gateway-name (this is created outside of the jenkins job, prior to running this step)
 - k. APPWAN_PRIVATE_CLIENT, e.g. client-name (this is created outside of the jenkins job, prior to running this step)



To delete the resources

- 1. Run Jenkins job again by selecting on the pipeline created in the previous step. Click on "Build with Parameters"
- 2. Fill in the Azure Details (e.g. RG, Tenant Id, etc) and select the following:
 - a. NF Environment, e.g. production
 - b. NETWORK_ACTION delete
 - c. NETWORK_NAME, e.g. DEMONET
 - d. GATEWAY_ACTION delete

Pipeline View

