

# Branch Application To Cloud Application Connectivity

## Overview

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



### Important

Assumption is that the NF Fabric is already up.

## Through NF Web Console UI

### Create and Deploy NF Gateway in Branch Datacenter

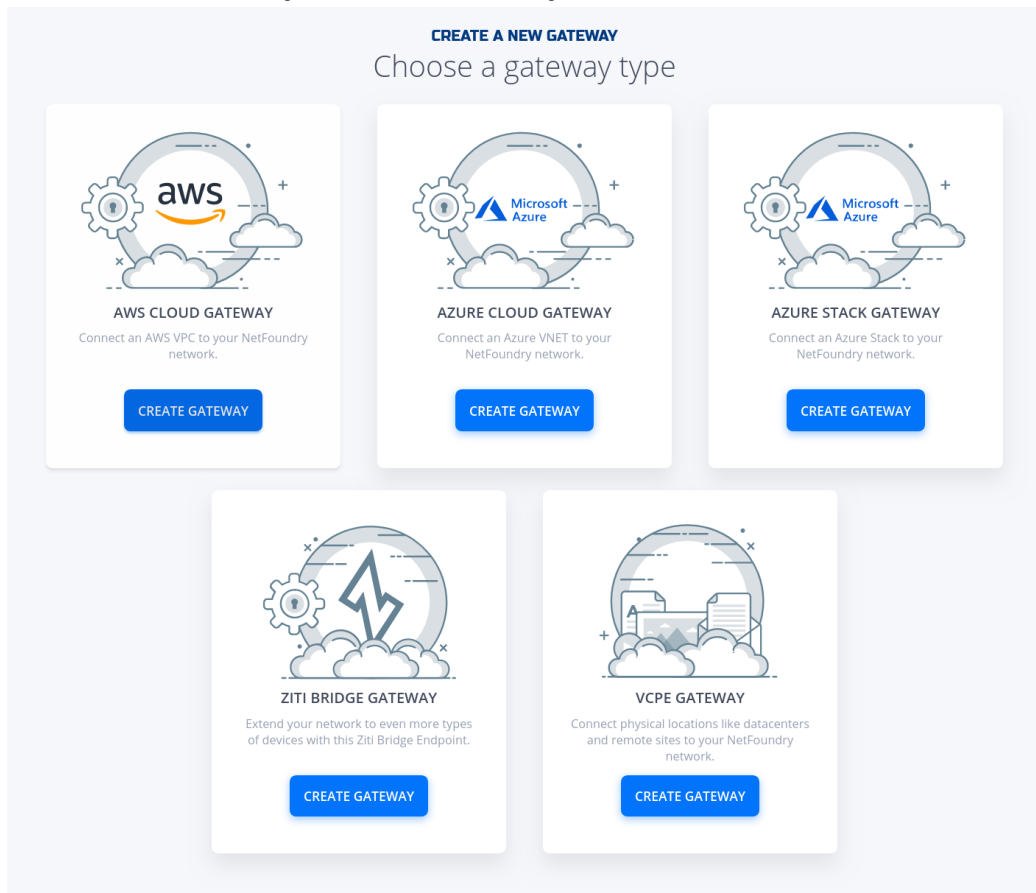
This section will guide a user through the steps on how to create a NF Manage Gateway in the NF Console UI and install it in the Branch Datacenter.



1. Navigate to Manage Gateways Page
2. Click on + sign in the top right corner.



3. Click on "Create Gateway" on the VCPE Gateway Card



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

CREATE A NEW GATEWAY

Enter your Gateway attributes

GATEWAY NAME

REQUIRED

YourBranchGatewayName

CLOUD REGION

REQUIRED

US East

ENABLE HIGH AVAILABILITY

ENABLE TO EDIT DETAILS

HA

ENABLE HIGH AVAILABILITY  
FOR ULTIMATE REDUNDANCY

OFF


DISABLED

CREATE

5. Copy the Client Registration Key

CONGRATULATIONS

Your Gateway has been created

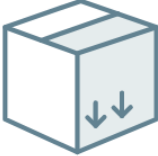


YOURBRANCHGATEWAYNAME REGISTRATION KEY

CLICK TO COPY

FB18C6EBEAD65B723E9C86B6882A3298ED77DBBF


Download and install instructions



DOWNLOAD INSTALL PACKAGE

vCPE Gateway to connect to private networks, branches, & data centers using this customer-managed virtual gateway.

DOWNLOAD



VIEW INSTALL INSTRUCTIONS

Connect public or private IP space inside your vCPE using a customer-managed cloud gateway.

VIEW

## 6. Click on "Download" button on the Installation Package Card

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### AWS Cloud Gateway

Deploy secure, high performance, global networks as easily and effectively as you spin up your AWS instances. Download it now from the AWS Marketplace. Not sure how to install it? [Click Here](#) to read our simple install instructions.

[VISIT MARKETPLACE](#)

### Azure Cloud Gateway

Improve the agility, security and performance of your cloud applications in Azure. Download it now from the Azure Marketplace. Not sure how to install it? [Click Here](#) to read our simple install instructions.

[VISIT MARKETPLACE](#)

### OVA for VMWare ESXi 5.0 or greater

This is a V-CPE Gateway to connect to private networks, branches, & datacenters using this customer-managed virtual gateway. Not sure how to install it? [Click Here](#) to read our simple install instructions.

[DOWNLOAD](#)

### Microsoft Hyper-V VHD Image

This is a V-CPE Gateway to connect to private networks, branches, & datacenters using this customer-managed virtual gateway. Not sure how to install it? [Click Here](#) to read our simple install instructions.

### KVM QCOW2 Image

This is a V-CPE Gateway to connect to private networks, branches, & datacenters using this customer-managed virtual gateway. Not sure how to install it? [Click Here](#) to read our simple install instructions.

### OVA for Virtual Box

This is a V-CPE Gateway to connect to private networks, branches, & datacenters using this customer-managed virtual gateway. Not sure how to install it? [Click Here](#) to read our simple install instructions.

## 7. Download the correct image for the desired Hypervisor.

## 8. Follow the installation procedure linked in the description of each image type (i.e. "Click Here").

## 9. Once installed, login into it locally with ssh and register it using the key copied in the previous step. Run the following command `sudo nfnreg "reg key"`

```
Infadmin@yourBranchGatewayName ~]$ sudo nfnreg 368FD32C7F09883BA4C0C3D0991D3BB013D89EA87
Created symlink from /etc/systemd/system/multi-user.target.wants/dvn-driver.service to /usr/lib/systemd/system/dvn-driver.service.
Created symlink from /etc/systemd/system/multi-user.target.wants/dvn.service to /usr/lib/systemd/system/dvn.service.
Registration complete
Infadmin@yourBranchGatewayName ~]$
```

## 10. Once registered, one should see the gateway status turn to green in NF Console UI

### MANAGE GATEWAYS

[Manage Gateways](#) [Manage Clients](#) [Manage Azure Virtual WAN Sites](#) [Manage Endpoint Groups](#)

Type to Filter			
<input type="radio"/> Gateway Label	<input checked="" type="radio"/> Status	Type	Location
<input type="radio"/> YourBranchGatewayName	<span style="color: green;">●</span> Online	V-CPE Gateway	US East

## 11. Done

## **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.

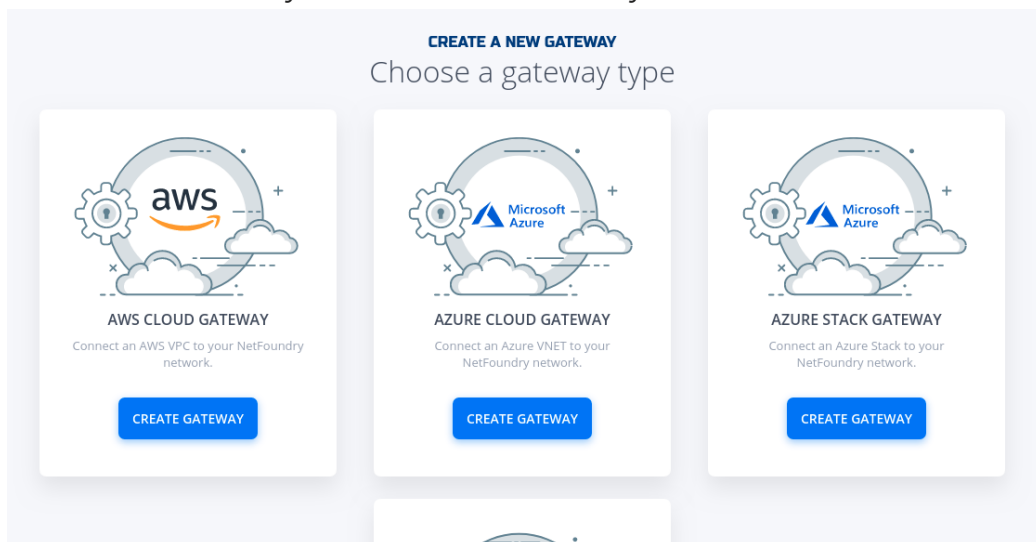


## Console UI

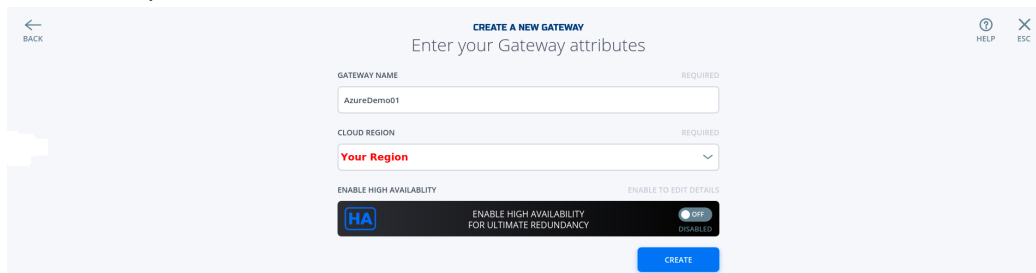
1. Navigate to Manage Gateways Page
2. Click on + sign in the top right corner.



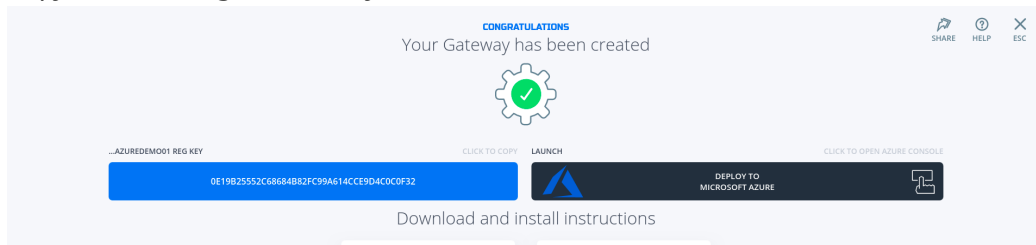
3. Click on "Create Gateway" on the Azure Cloud Gateway Card



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



5. Copy the Client Registration Key



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 *	<div>Your Subscription Name</div>
Resource group *	<div><div>Your Resource Group Name</div><div>Create new</div></div>
Location *	<div>(US) East US</div>

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.

**SETTINGS**

Location	<div>Your Region</div>
Network Interface Name	<div>azuredemo01-if</div>
Security Group Name	<div>azuredemo01-sg</div>
Virtual Network Name	<div>azuredemo01-vnet</div>
Address Prefix	<div>10.0.8.0/24</div>
Subnet Name	<div>default</div>
Subnet Prefix	<div>10.0.8.0/24</div>
Public Ip Address Name	<div>azuredemo01-ip</div>
Public Ip Address Type	<div>Dynamic</div>
Public Ip Address Sku	<div>Basic</div>
Virtual Machine Name	<div>azuredemo01</div>
Virtual Machine RG	<div>nf-sandbox</div>
Os Disk Type	<div>Premium_LRS</div>
Virtual Machine Size	<div>Standard_B1ms</div>
Nfreg Key * ⓘ	<div>.....</div>
Admin Username ⓘ	<div>nfadmin</div>
Ssh Key Data * ⓘ	<div>ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQJCjga67wcoISXaD1bswknLrejRYtZ...</div>

9. You will need to agree to Azure Marketplace Terms and Conditions and click to "Purchase" to continue.

#### TERMS AND CONDITIONS

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By clicking "Purchase," I (a) agree to the applicable legal terms associated with the offering; (b) authorize Microsoft to charge or bill my current payment method for the fees associated the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until I discontinue use of the offering(s); and (c) agree that, if the deployment involves 3rd party offerings, Microsoft may share my contact information and other details of such deployment with the publisher of that offering.

☒ I agree to the terms and conditions stated above

Purchase

10. If the NF Gateway was deployed successfully. Here is the view of the Resource Group and NF Console UI.

The screenshot displays the Azure portal interface for the 'nf-sandbox' resource group. The left sidebar shows navigation options like Overview, Activity log, Access control (IAM), Tags, Events, Settings, Quickstart, Deployments, Policies, Properties, and Locks. The main area shows the 'nf-sandbox' resource group details, including the subscription 'NefFoundry Non-Prod' and the subscription ID '8699c8d4-4d25-48fa-85ef-c9b299ba64ff'. Below this, a table lists resources: 'azuredemo01' (Type: all), 'azuredemo01-if' (Network interface), 'azuredemo01-ip' (Public IP address), 'azuredemo01-sg' (Network security group), and 'azuredemo01-vnet' (Virtual network). A notification on the right states 'Deployment succeeded' for 'Microsoft.Template' to resource group 'nf-sandbox'. Below the notification, a 'MANAGE GATEWAYS' section is visible, showing a table with columns: Gateway Label, Status, Type, Location, and Cloud Provider. The table contains one entry: 'AzureDemo01' with status 'Online', type 'Azure Private Gateway', location 'Your Region', and cloud provider 'A'.

11. Done

## Create IP Host Service

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

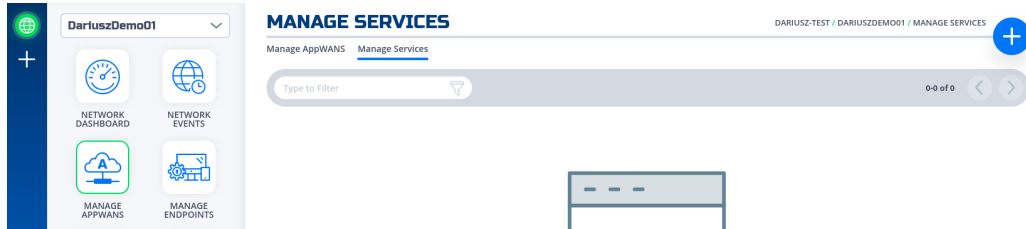




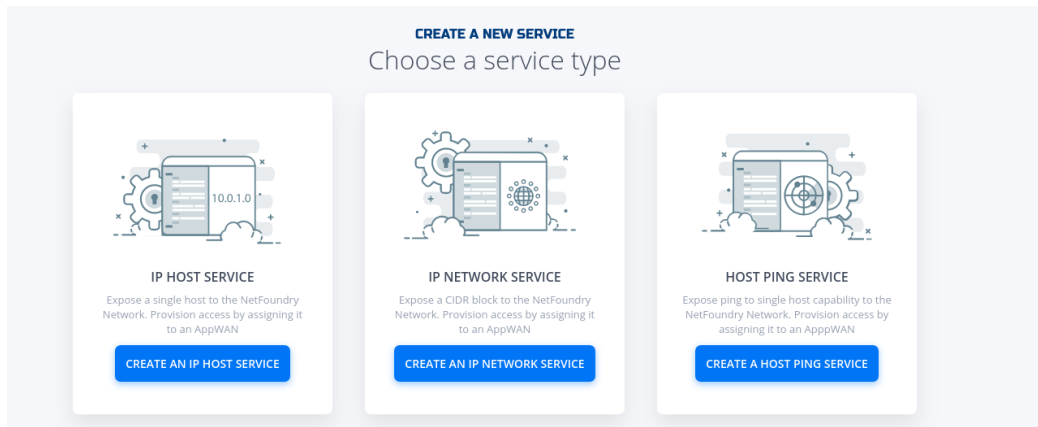
## Console UI

1. Navigate to Manage Services Page under Manage Appwans

2. Click on + sign in the top right corner.



3. Click on "Create an IP Host Service"



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

### CREATE A NEW IP HOST SERVICE

Enter your service attributes

SERVICE NAME

REQUIRED

DemoServiceSsh

GATEWAY

REQUIRED

AzureDemo01

IP ADDRESS

REQUIRED

10.0.8.5

PORT/RANGE

REQUIRED

22

INTERCEPT IP ADDRESS

10.0.8.5

INTERCEPT PORT/RANGE

22

PROTOCOL TYPE

REQUIRED

TCP

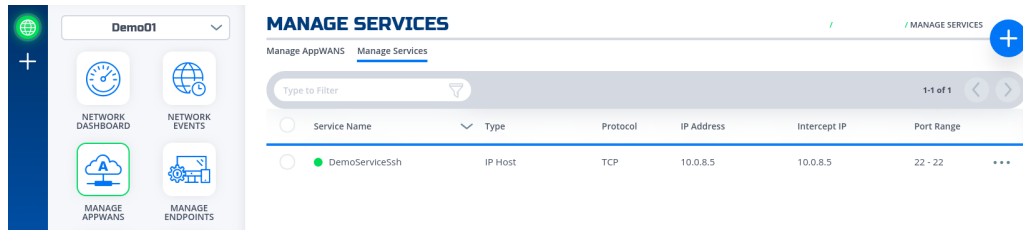
ADVANCED OPTIONS

OPEN TO EDIT DETAILS

ADVANCED OPTIONS

CREATE

5. If successfully, the service is green.



The screenshot displays the 'MANAGE SERVICES' interface. On the left, a sidebar contains a '+', a globe icon, and four menu items: 'NETWORK DASHBOARD', 'NETWORK EVENTS', 'MANAGE APPWANS', and 'MANAGE ENDPOINTS'. The main area has a header with 'MANAGE SERVICES' and a breadcrumb trail 'Manage AppWANS / Manage Services'. Below the header is a search bar labeled 'Type to Filter' and a table with columns: 'Service Name', 'Type', 'Protocol', 'IP Address', 'Intercept IP', and 'Port Range'. A single service, 'DemoServiceSsh', is listed with a green status indicator, 'IP Host' type, 'TCP' protocol, and IP addresses '10.0.8.5' and '10.0.8.5'.

Service Name	Type	Protocol	IP Address	Intercept IP	Port Range
DemoServiceSsh	IP Host	TCP	10.0.8.5	10.0.8.5	22 - 22

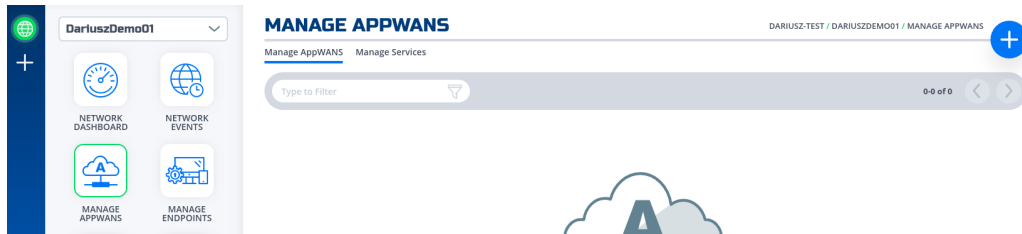
6. Done

## Create AppWan

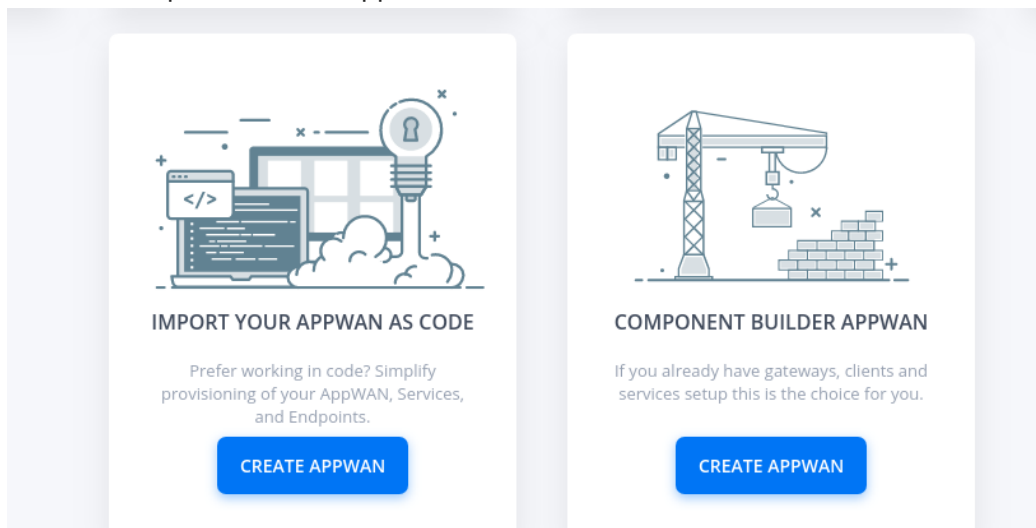
This section will guide a user through the steps on how to enable service connectivity to users by creating an appwan.



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 gateway (e.g. DemoGateway01) from "Available" Gateways 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 REQUIRED

DemoAppWan

2 ADD CLIENTS, GATEWAYS, OR ENDPOINT GROUPS

Search for Endpoints

AVAILABLE GROUPS ADD NEW +

AVAILABLE CLIENTS ADD NEW +

AVAILABLE GATEWAYS ADD NEW +

AzureDemo01

SELECTED ENDPOINTS

YourBranchGatewayName

3 ADD SERVICES

Search for a Service

AVAILABLE SERVICES ADD NEW +

SELECTED SERVICES

DemoServiceSsh

CREATE

5. Click on "Create".

**YOUR APPWAN SUMMARY**

Your AppWAN has been created! A network summary is below.

What's next? Finish connecting your network by registering new clients and gateways.

**HINT** NEW CLIENTS  
Share Client Registration Info

**HINT** NEW GATEWAYS  
Tap to Launch and Register

1 APPWAN NAME  
DemoAppWan

2 ENDPOINTS  
CLIENTS SHARE NEW CLIENTS  
GATEWAYS REGISTER NEW GATEWAYS  
● YOURBRANCHGATEWAYNAME

3 SERVICES  
SERVICE DEFINITIONS  
● DemoServiceSsh

4 ENDPOINT GROUPS  
GROUPS

6. Done

## Test Connectivity to Application Server



### Route to vNet

The private IP of NF Gateway (e.g. YourBranchGatewayName) needs to be the next hop to reach the vNet in Azure (e.g. 10.0.8.0/24). Thus, a static route will need to be configured in one of the branch routers. NF Gateway can support dynamic routing if needed (e.g.bgp, ospf)



## Steps

1. Log in to a Client App Host in Branch DataCenter
2. Run `ssh username@privatelPOfServerAppHostInAzure`

```
nfadmin@azuredemoapp:~  
PS C:\>  
PS C:\>  
PS C:\> ssh nfadmin@10.0.8.5  
[nfadmin@azuredemoapp ~]$  
[nfadmin@azuredemoapp ~]$ ls  
[nfadmin@azuredemoapp ~]$ pwd  
/home/nfadmin  
[nfadmin@azuredemoapp ~]$  
[nfadmin@azuredemoapp ~]$
```

## Programmatically

### via Python and Terraform



## 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.



## Steps

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
  regkeys:
  - 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: .

```

**MANAGE GATEWAYS**

Manage Gateways | Manage Clients | Manage Azure Virtual WAN Sites | Manage Endpoint Groups

1-1 of 1

Gateway Label	Status	Type	Location	Cloud Provider
AZCPEGW-0-WESTUS	Online	Azure Private Gateway	West US	

Home > Resource groups > demoPythonTerraform01

**demoPythonTerraform01**

Subscription (change) : NetFoundry Non-Prod  
 Subscription ID : 8699c8dd-4425-46fa-85ef-cefe299aeb4f  
 Tags (change) : environment : TerraformDemo

Deployments : No deployments

Filter by name... Type == all Location == all Add filter

Showing 1 to 8 of 8 records. Show hidden types

Name	Type	Location
AZCPEGW-0-WESTUS	Virtual machine	West US
AZCPEGW-0-WESTUS-nic	Network interface	West US
AZCPEGW-0-WESTUS-publicip	Public IP address	West US
AZCPEGW-0-WESTUS-routeTable	Route table	West US
AZCPEGW-0-WESTUS-securityGroup	Network security group	West US
AZCPEGW-0-WESTUS-vNet	Virtual network	West US
AZCPEGW-0-WESTUSOsDisk	Disk	West US
storage974e569b7cc2b56	Storage account	West US

## 5. Create a test server vm on the same vNet if not already present.

Home > CreateVm-Canonical UbuntuServer-18.04-LTS-20191216113538 - Overview > DemoTestServer01

**DemoTestServer01**

Virtual machine

Connect | Start | Restart | Stop | Capture | Delete | Refresh

Resource group (change) : demoPythonTerraform01

Status : Running

Location : West US

Subscription (change) : NetFoundry Non-Prod

Subscription ID : 8699c8dd-4425-46fa-85ef-cefe299aeb4f

Computer name : DemoTestServer01

Operating system : Linux (ubuntu 18.04)

Size : Standard B1ms (1 vcpu, 2 GiB memory)

Tags (change) : Click here to add tags

Azure Spot : N/A

Public IP address : 40.118.150.170

Private IP address : 10.20.10.5

Public IP address (IPv6) : -

Private IP address (IPv6) : -

Virtual network/subnet : AZCPEGW-0-WESTUS-vNet/AZCPEGW-0-WESTUS-subnet

DNS name : Configure

Scale Set : N/A

## 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
  regkeys:
  - 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.

```

services:
- action: create
  gateway: AZCPEGWx0xWESTUS
  ip: 10.20.10.5
  name: AZCPEGWx0xWESTUS--10.20.10.5--22
  port: 22
  type: host

```

**MANAGE SERVICES** / MANAGE SERVICES +

Manage AppWANs Manage Services

Type to Filter 1-1 of 1 < >

<input type="radio"/> Service Name	<input type="radio"/> Type	Protocol	IP Address	Intercept IP	Port Range	
<input checked="" type="radio"/> AZCPEGWx0xWESTUS--10.20.10.5-22	IP Host	TCP	10.20.10.5	10.20.10.5	22 - 22	...

8. Create a gateway in the branch as the steps in the UI section indicated. We will provide code snippets for private hypervisors deployment through python in later releases (e.g. vSphere)

## MANAGE GATEWAYS

Manage Gateways Manage Clients Manage Azure Virtual WAN Sites Manage Endpoint Groups

Type to Filter 🔍

<input type="radio"/> Gateway Label	<input type="radio"/> Status	Type	Location
<input type="radio"/> YourBranchGatewayName	<span style="color: green;">●</span> Online	<span style="border: 1px solid blue; padding: 0 2px;">S</span> V-CPE Gateway	US East

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".

```

environment: production
gateway_list:
- action: get
  cloud: azure
  count: 1
  names:

```

```
- AZCPEGWx0xWESTUS
region: westus
regionalCidr:
- 10.20.10.0/24
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.

**HINT** EDIT YOUR APPWAN  
Tap the Edit icon to make changes


**HINT** ENDPOINTS & SERVICES  
Tap to Edit Advanced Options

1 APPWAN NAME  
appwan-ssh-22


2 ENDPOINTS  
CLIENTS  
ClientName  
GATEWAYS  
BRANCHGATEWAYNAME

3 SERVICES  
SERVICE DEFINITIONS  
AZCPEGWx0xWESTUS--10.20.10.5-22

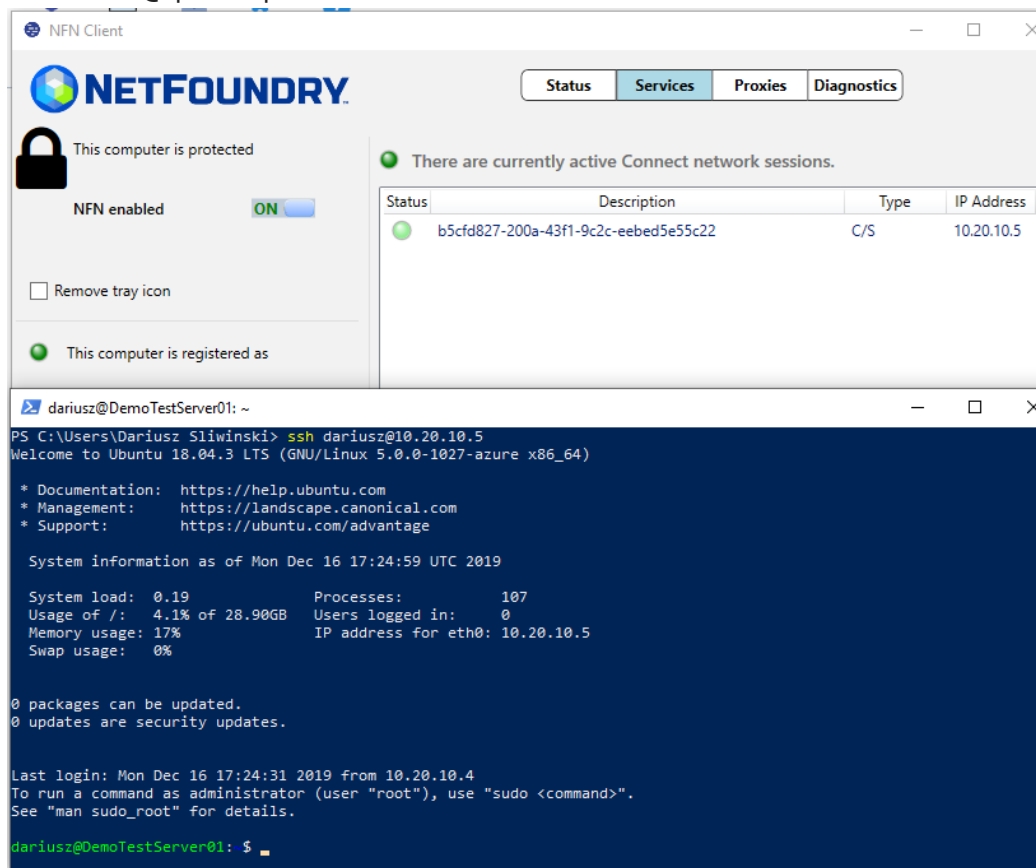
4 ENDPOINT GROUPS  
GROUPS

 Want to add another environment  
with the same services or endpoints?

TAP TO CLONE



11. To test connectivity, log in to the Remote Client or Branch App Server and run ssh "username"@ "privatelp"



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 yml` along with `Jenkinsfile` to show how to automate the steps further by creating the Jenkins Job



## Jenkins Requirements

1. java
2. docker

Then follow jenkins installation using docker to install Jenkins on the localhost and choose "Install suggested plugins". After successful installation, one should be able to reach the Jenkins Dashboard (8080 is default port).

The screenshot shows the Jenkins Dashboard in a web browser at localhost:8080. The interface includes a top navigation bar with the Jenkins logo, a search bar, and links for 'Jenkins Admin' and 'log out'. Below the navigation bar is a sidebar with various links: 'New Item', 'People', 'Build History', 'Manage Jenkins', 'My Views', 'Open Blue Ocean', 'Credentials', 'Lockable Resources', and 'New View'. The main content area displays two sections: 'Build Queue' and 'Build Executor Status'. The 'Build Queue' section shows 'No builds in the queue.' The 'Build Executor Status' section shows two executors, both in an 'Idle' state. At the bottom right of the main content area, there is a link to 'add description'. Below the main content area, a large 'Welcome to Jenkins!' message is displayed, followed by a light blue box containing the text: 'Please **create new jobs** to get started.'

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

[add description](#)

## Welcome to Jenkins!

Please **create new jobs** to get started.



## 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 your Project, select pipeline option and click "Ok"

### Enter an item name

NetFoundryDeploy2Cloud

» Required field

**Freestyle project**  
This is the central feature of Jenkins. Jenkins will build your project, combining something other than software build.

**Pipeline**  
Orchestrates long-running activities that can span multiple build agents. Suitable for organizing complex activities that do not easily fit in free-style job type.

**Multi-configuration project**  
Suitable for projects that need a large number of different configurations, such as...

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

**Pipeline**

Definition: Pipeline script from SCM

SCM: Git

Repositories

Repository URL:

Credentials:  [Add](#)

[Advanced...](#)

[Add Repository](#)

Branches to build

Branch Specifier (blank for 'any'):

[Add Branch](#)

Repository browser: (Auto)

Additional Behaviours: [Add](#)


Script Path:

Lightweight checkout: ☒

[Pipeline Syntax](#)

[Save](#) [Apply](#)

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



# Jenkins

Jenkins > Credentials

- New Item
- People
- Build History
- Manage Jenkins
- My Views
- Open Blue Ocean
- Lockable Resources
- Credentials**
- System
- New View

**Build Queue**

No builds in the queue.

## Credentials

T	P	Store	Domain	ID
		<a href="#">Jenkins</a>	(global)	azure_user_creds <a href="#">164b</a>
		<a href="#">Jenkins</a>	(global)	sandbox-mop-user <a href="#">QJ9K</a>

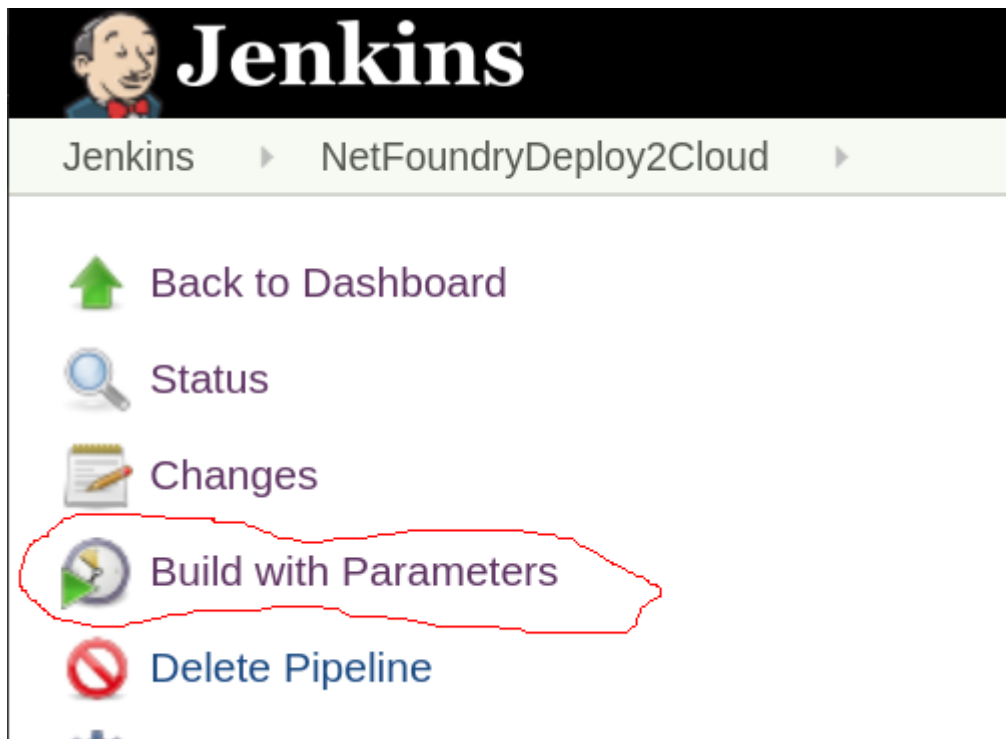
Icon: [S](#) [M](#) [L](#)

### Stores scoped to [Jenkins](#)

P	Store
	<a href="#">Jenkins</a> (global)

[Add credentials](#)

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





## 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.

← → ↻ ⓘ localhost:8080/job/NetFoundryDeploy2Cloud/build?delay=0sec

Jenkins » NetFoundryDeploy2Cloud »

Build with Parameters  
Delete Pipeline  
Configure  
Full Stage View  
Open Blue Ocean  
Rename  
Pipeline Syntax

Build History trend  
Atom feed for all Atom feed for failures

AZURE_TENANT_ID	<input type="text"/>
	Tenant ID in Azure
AZURE_SUBSCRIPTION_ID	<input type="text"/>
	Subscription ID in Azure
RESOURCE_GROUP_NAME	<input type="text"/>
	RG Name in Azure
RESOURCE_GROUP_LOC	centralus
	RG Location in Azure
	<input checked="" type="checkbox"/> KEEP_RG Not to check this if RG can be deleted
ENVIRONMENT	sandbox
	Select NF Console Environment to spin the network and gateways in
NETWORK_ACTION	create
	Select an action to perform on the network in NF
NETWORK_NAME	DEMONET
	Name to be used to create a network with
GATEWAY_ACTION	create
	Select an action to perform on the gateway in NF Network
GATEWAY_NAME	<input type="text"/>
	Name of NF Gateway generated in NF Console
SERVICE_ACTION	get
	Select an action to perform on the service in NF Network
SERVICE_NAME	<input type="text"/>
	Name of NF Service generated in NF Console
SERVICE_IP	<input type="text"/>
	IP of NF Service App
SERVICE_PORT	<input type="text"/>
	IP of NF Service App
APPWAN_ACTION	get
	Select an action to perform on the appwan in NF Network
APPWAN_NAME	<input type="text"/>
	Name of NF APPWAN to be used in NF Console
APPWAN_PRIVATE_GATEWAY	<input type="text"/>
	Endpoint Name in Private Datacenter Gateway to be included in AppWan
APPWAN_PRIVATE_CLIENT	<input type="text"/>
	Endpoint Name for Client to be included in AppWan
APPWAN_SERVICE	<input type="text"/>
	Service Name to be included in AppWan
LOCATION	westus
	Azure Cloud DC Location where to deploy GW
SUBNET_PREFIX	10.20.10.0/24
	Subnet CIDR in Azure Cloud DC Location where to deploy GW

Build

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)

## I. APPWAN\_SERVICE, e.g. AZCPEGWx0xWESTUS--10.20.10.5--22

Jenkins

localhost:8080/job/NetFoundryDeploy2Cloud/build?delay=0sec

Build with Parameters

Delete Pipeline

Configure

Full Stage View

Open Blue Ocean

Rename

Pipeline Syntax

Build History

trend

Atom feed for all

Atom feed for failures

AZURE_TENANT_ID	<input type="text"/>	Tenant ID in Azure
AZURE_SUBSCRIPTION_ID	<input type="text"/>	Subscription ID in Azure
RESOURCE_GROUP_NAME	<input type="text"/>	RG Name in Azure
RESOURCE_GROUP_LOC	<input type="text"/>	RG Location in Azure
	<input type="checkbox"/> KEEP_RG	Not to check this if RG can be deleted
ENVIRONMENT	sandbox	Select NF Console Environment to spin the network and gateways in
NETWORK_ACTION	get	Selection an action to perform on the network in NF
NETWORK_NAME	DEMONET	Name to be used to create a network with
GATEWAY_ACTION	get	Selection an action to perform on the gateway in NF Network
GATEWAY_NAME	AZCPEGWx0xWESTUS	Name of NF Gateway generated in NF Console
SERVICE_ACTION	create	Selection an action to perform on the service in NF Network
SERVICE_NAME	AZCPEGWx0xWESTUS--10.20.10.5--22	Name of NF Service generated in NF Console
SERVICE_IP	10.20.10.5	IP of NF Service App
SERVICE_PORT	22	IP of NF Service App
APPWAN_ACTION	create	Selection an action to perform on the appwan in NF Network
APPWAN_NAME	appwan-ssh-22	Name of NF APPWAN to be used in NF Console
APPWAN_PRIVATE_GATEWAY	private-gateway-name	Endpoint Name in Private Datacenter Gateway to be included in AppWan
APPWAN_PRIVATE_CLIENT	client-name	Endpoint Name for Client to be included in AppWan
APPWAN_SERVICE	AZCPEGWx0xWESTUS--10.20.10.5--22	Service Name to be included in AppWan
LOCATION	westus	Azure Cloud DC Location where to deploy GW
SUBNET_PREFIX	10.20.10.0/24	Subnet CIDR in Azure Cloud DC Location where to deploy GW


Build



## 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

**Jenkins**

Jenkins > NetFoundryDeploy2Cloud >

[Back to Dashboard](#)  
[Status](#)  
[Changes](#)  
[Build with Parameters](#)  
[Delete Pipeline](#)  
[Configure](#)  
[Full Stage View](#)  
[Open Blue Ocean](#)  
[Rename](#)  
[Pipeline Syntax](#)

**Build History** [trend](#)  
[Atom feed for all](#) [Atom feed for failures](#)

### Pipeline NetFoundryDeploy2Cloud

This build requires parameters:

AZURE_TENANT_ID	<input type="text" value="REDACTED"/>
Tenant ID in Azure	
AZURE_SUBSCRIPTION_ID	<input type="text" value="REDACTED"/>
Subscription ID in Azure	
RESOURCE_GROUP_NAME	<input type="text" value="REDACTED"/>
RG Name in Azure	
RESOURCE_GROUP_LOC	<input type="text" value="centralus"/>
RG Location in Azure	
<input type="checkbox"/> KEEP_RG	
Not to check this if RG can be deleted	
ENVIRONMENT	<input type="text" value="sandbox"/>
Select NF Console Environment to spin the network and gateways in	
NETWORK_ACTION	<input type="text" value="delete"/>
Selection an action to perform on the network in NF	
NETWORK_NAME	<input type="text" value="DEMONET"/>
Name to be used to create a network with	
GATEWAY_ACTION	<input type="text" value="delete"/>
Selection an action to perform on the gateway in NF Network	
GATEWAY_NAME	<input type="text"/>
Name of NF Gateway generated in NF Console	
SERVICE_ACTION	<input type="text" value="get"/>
Selection an action to perform on the service in NF Network	
SERVICE_NAME	<input type="text"/>
Name of NF Service generated in NF Console	
SERVICE_IP	<input type="text"/>
IP of NF Service App	
SERVICE_PORT	<input type="text"/>
IP of NF Service App	
APPWAN_ACTION	<input type="text" value="get"/>
Selection an action to perform on the appwan in NF Network	
APPWAN_NAME	<input type="text"/>
Name of NF APPWAN to be used in NF Console	
APPWAN_PRIVATE_GATEWAY	<input type="text"/>
Endpoint Name in Private Datacenter Gateway to be included in AppWan	
APPWAN_PRIVATE_CLIENT	<input type="text"/>
Endpoint Name for Client to be included in AppWan	
APPWAN_SERVICE	<input type="text"/>
Service Name to be included in AppWan	
LOCATION	<input type="text" value="westus"/>
Azure Cloud DC Location where to deploy GW	
SUBNET_PREFIX	<input type="text" value="10.20.10.0/24"/>
Subnet CIDR in Azure Cloud DC Location where to deploy GW	

Build

3. Done

## **Create IP Host Service**

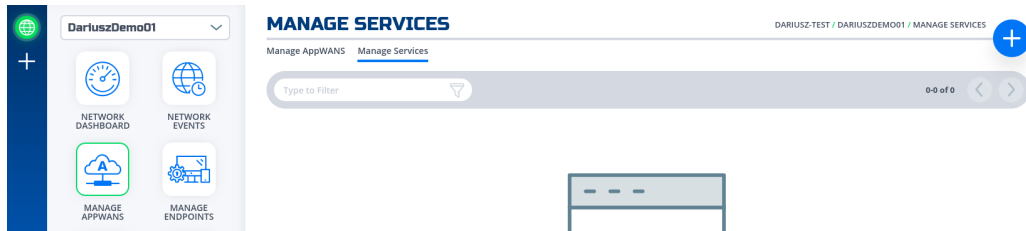
This section will guide a user through the steps on how to create a NF Service.



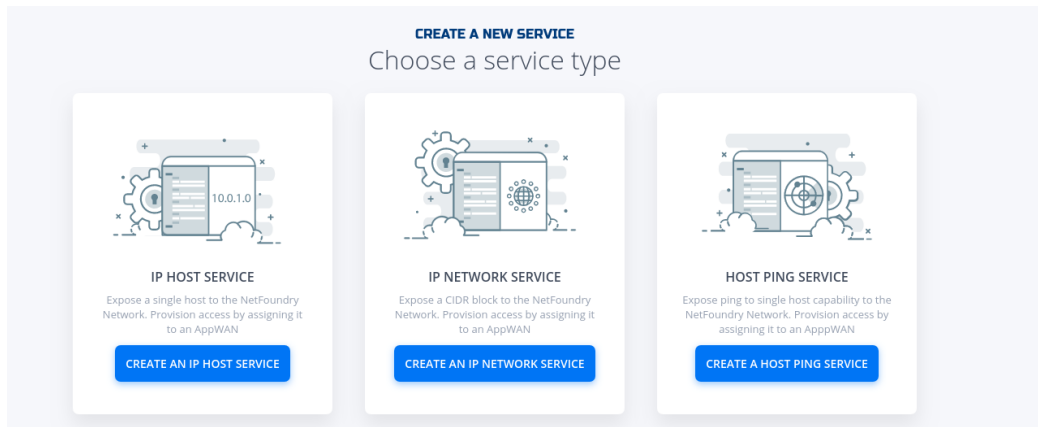


## Console UI

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



3. Click on "Create an IP Host Service"



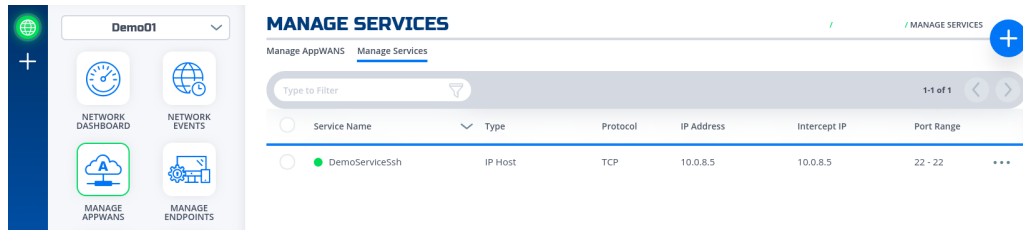
4. Fill in the required information for SSH and click on "Create"

**CREATE A NEW IP HOST SERVICE**

Enter your service attributes

SERVICE NAME	REQUIRED	<input type="text" value="DemoServiceSsh"/>	
GATEWAY	REQUIRED	<input type="text" value="AzureDemo01"/>	
IP ADDRESS	REQUIRED	PORT/RANGE	REQUIRED
<input type="text" value="10.0.8.5"/>		<input type="text" value="22"/>	
INTERCEPT IP ADDRESS		INTERCEPT PORT/RANGE	
<input type="text" value="10.0.8.5"/>		<input type="text" value="22"/>	
PROTOCOL TYPE	REQUIRED	<input type="text" value="TCP"/>	
ADVANCED OPTIONS		OPEN TO EDIT DETAILS	
<input type="checkbox"/>		ADVANCED OPTIONS	
		<input type="button" value="CREATE"/>	

5. If successfully, the service is green.



The screenshot displays the 'MANAGE SERVICES' interface. On the left, a sidebar contains a green status indicator and a '+' button. The main area shows a table of services. The first service, 'DemoServiceSsh', is highlighted with a green dot, indicating it is successfully running. The table columns include Service Name, Type, Protocol, IP Address, Intercept IP, and Port Range.

Service Name	Type	Protocol	IP Address	Intercept IP	Port Range
DemoServiceSsh	IP Host	TCP	10.0.8.5	10.0.8.5	22 - 22

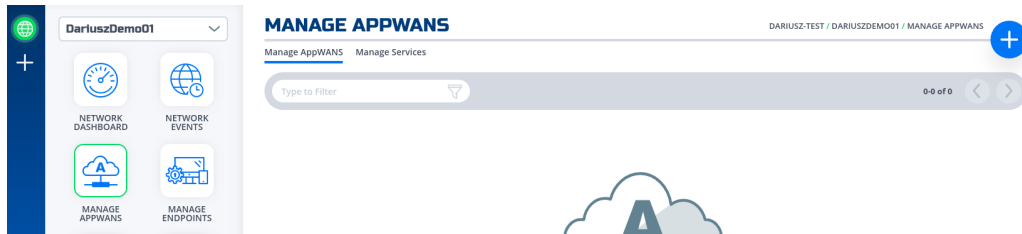
6. Done

## Create AppWan

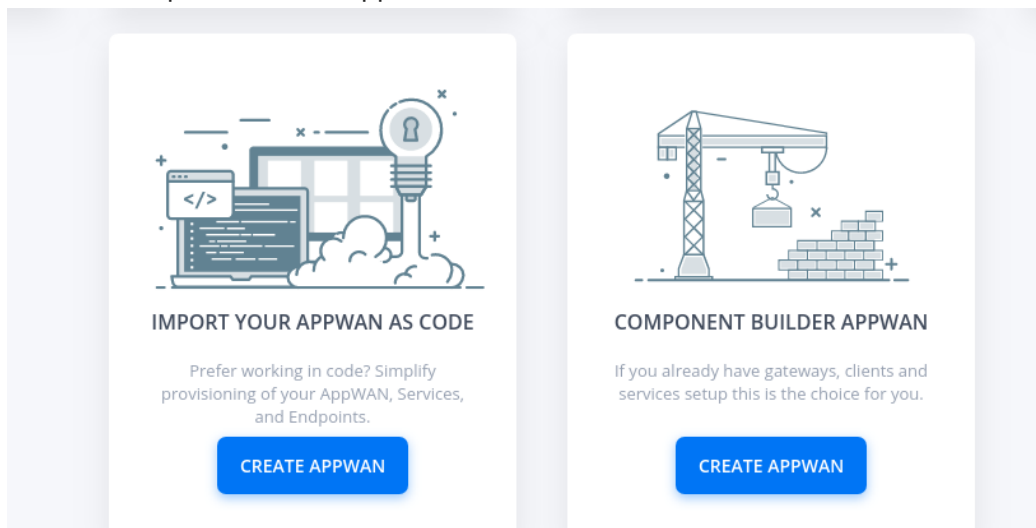
This section will guide a user through the steps on how to enable service connectivity to users by creating an appwan.



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 gateway (e.g. DemoGateway01) from "Available" Gateways 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 REQUIRED

DemoAppWan

2 ADD CLIENTS, GATEWAYS, OR ENDPOINT GROUPS

Search for Endpoints

AVAILABLE GROUPS ADD NEW +

AVAILABLE CLIENTS ADD NEW +

AVAILABLE GATEWAYS ADD NEW +

AzureDemo01

SELECTED ENDPOINTS

YourBranchGatewayName

3 ADD SERVICES

Search for a Service

AVAILABLE SERVICES ADD NEW +

SELECTED SERVICES

DemoServiceSsh

CREATE

5. Click on "Create".

## YOUR APPWAN SUMMARY

Your AppWAN has been created! A network summary is below.

What's next? Finish connecting your network by registering new clients and gateways.

HINT

**NEW CLIENTS**  
Share Client Registration Info



HINT

**NEW GATEWAYS**  
Tap to Launch and Register



- ## 1 APPWAN NAME

DemoAppWan 

- ## 2 ENDPOINTS

## CLIENTS

## SHARE NEW CLIENTS

## GATEWAYS

[REGISTER NEW GATEWAYS](#)

● YOURBRANCHGATEWAYNAME 

- ### 3 SERVICES

## SERVICE DEFINITIONS

● DemoServiceSsh 

- #### 4 ENDPOINT GROUPS

## GROUPS

6. Done