

# MS Office 365 Optimize

## Overview

We will guide users how to deploy a NF Gateway to optimize the connectivity to Microsoft O365 Services. The services that will be optimized are share-point and one-drive

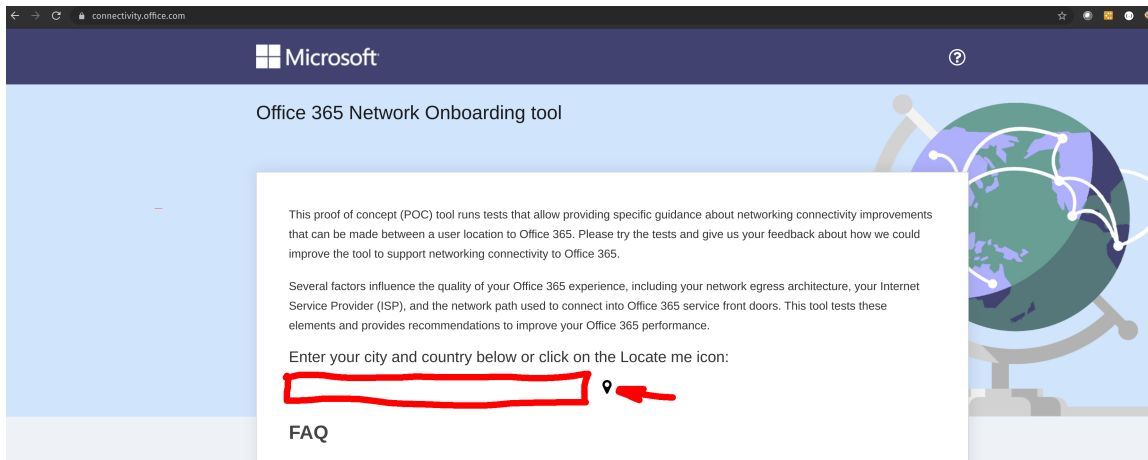
Microsoft deployed content delivery network (CDN), where they offer many entry points around the World to access Office 365 Services like sharepoint, onedrive, etc. By providing these "front doors" (also known as) to O365 services, MS wanted to improve user experience by optimizing reach-ability and access. With that in mind, Microsoft is pushing Enterprises to utilize this CDN by creating O365 bypass at the edge of the Enterprise Network. The bypass is a configuration change, where a policy routing is enforced to allow the O365 services to be short circuited to the Internet. The idea is to avoid going through a central location, where all content is inspected and checked for security threats before released to World Wide Web.

NetFoundry Edge has the ability to provide such bypass if desired, but in this Quickstart we are showing how our customers can configure NF Network to complement the MS CDN, utilize their optimization and still keep using NF Secure tunnels for connectivity.

## Find the Closest Front Door

Microsoft created an online tool to test from user's location, where the best entry to their Network is. Please open a browser on your windows computer and type the following url <https://connectivity.office.com/>.


As it is stated there, click on the location icon. Once the test is finished, it will show where the closest location is.




Results and impact

Details and solutions

1 Proof of concept user tests

Test	Result
User location ?	[REDACTED], United States found by Web browser
Network egress location ?	[REDACTED] US
User to network egress distance ?	 1 miles (3 kilometers)

2 Proof of Concept tests to Exchange Online service front door

Test	Result
Office 365 Exchange Online service front door location ?	 Ashburn, VA, US (28 ms).
	Alpharetta

In our example, the user's closest location is Ashburn, VA (Azure USEAST).



### Select Region

Make sure you replace "Your Region" with the location of Azure DC given by the location tool.

Most of the time, our Orchestration Platform will optimize the network to provide direct connectivity from where you are and Azure GW you are about to create. We will test if that is the case. We continuously update our optimization algorithm to pick the best path all the time based on ongoing data collection and feedback from the network fabric.

## Through NF Web Console UI

### **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.

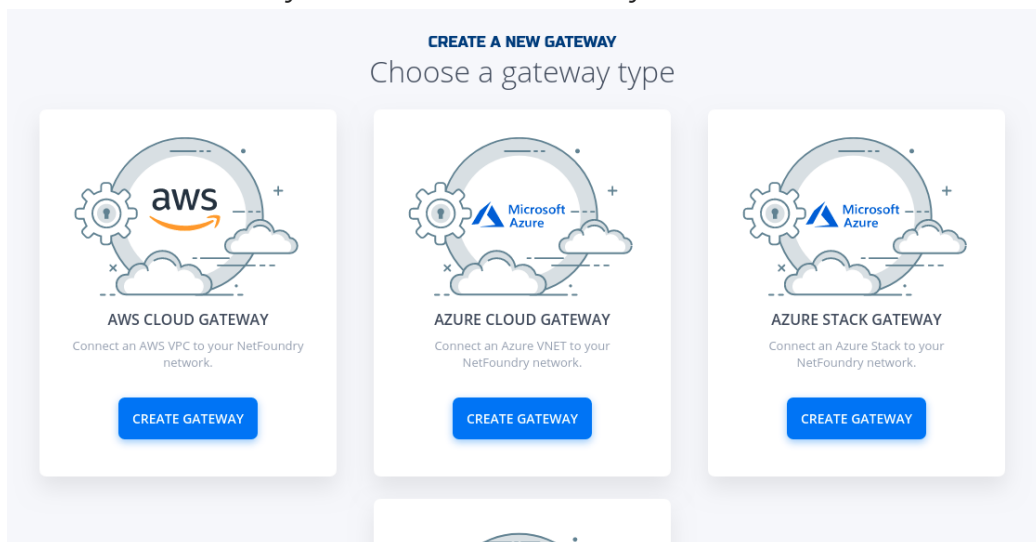


## Console UI

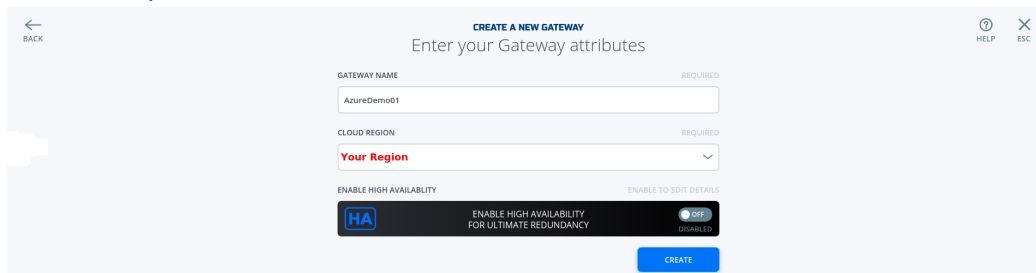
1. Navigate to Manage Gateways Page
2. Click on + sign in the top right corner.



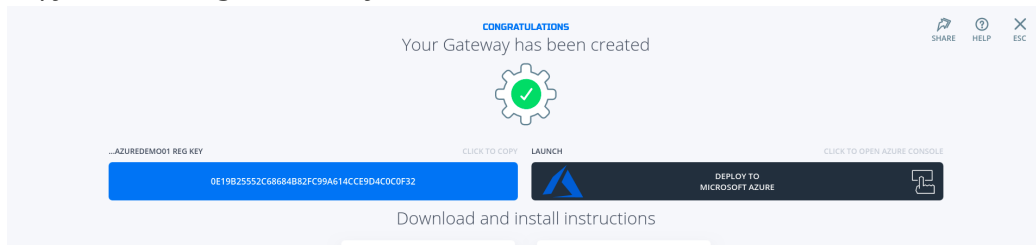
3. Click on "Create Gateway" on the Azure Cloud Gateway Card



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 *	<input type="text" value="Your Subscription Name"/>
Resource group *	<input type="text" value="Your Resource Group Name"/> <a href="#">Create new</a>
Location *	<input type="text" value="(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.

#### SETTINGS

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

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

#### TERMS AND CONDITIONS

[Azure Marketplace Terms](#) | [Azure Marketplace](#)

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 '8699c8d4-4d25-4d7a-85ef-c9b299ba64f'. 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 'MANAGE GATEWAYS' section is also 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', and location 'Your Region'. A notification on the right states 'Deployment succeeded' for 'Microsoft.Template' to resource group 'nf-sandbox'.

11. Done

## Create SharePoint & OneDrive Services

Once can find the ip address that are allocated by Microsoft for SharePoint and OneDrive service. Click on this link and write them down

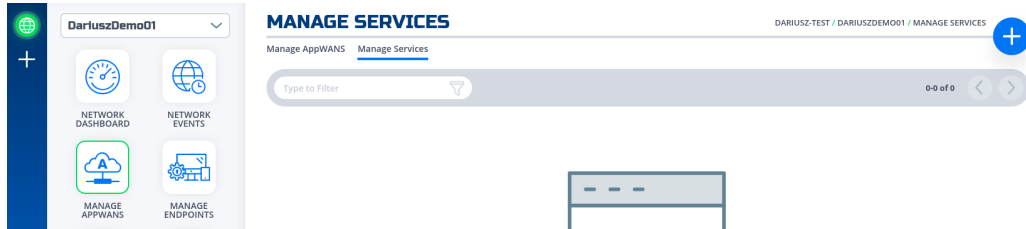
We only required to use "Optimize Required" (ID 31), and they are 13.107.136.0/22, 40.108.128.0/17, 52.104.0.0/14, 104.146.128.0/17, 150.171.40.0/22. Create 5 services by repeating the next section for each of them. Replace Network Address in Step 4 with the ones above and Intercept Ports with 80, 443.

## Create IP Network Service

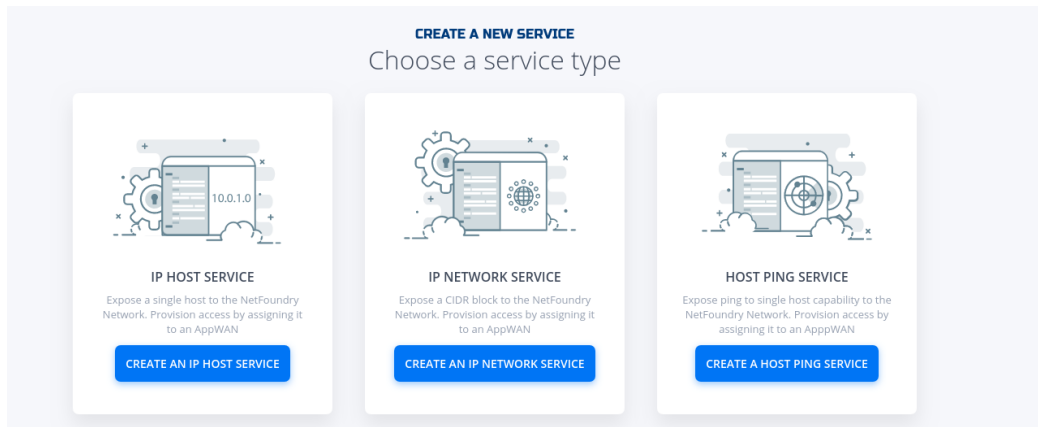
This section will guide a user through the steps on how to create a NF Service.



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



3. Click on "Create an IP Network Service"



4. Fill in the required information for the Network your wanting to access.

CREATE A NEW IP NETWORK SERVICE

Enter your service attributes

SERVICE NAME

REQUIRED

access-to-10.0.0.0/24

GATEWAY

REQUIRED

AWS-us-east-1-Gateway01

NETWORK ADDRESS

REQUIRED

10.0.0.0/24

INTERCEPT ADDRESS

10.0.0.0/24

PORT INTERCEPT MODE

REQUIRED

Specific Ports

SPECIFY INTERCEPT PORTS AND RANGES

REQUIRED

22

SPECIFY EXCLUDED INTERCEPT PORTS AND RANGES

REQUIRED

Example: 1271, 1800-1871

ADVANCED OPTIONS

OPEN TO EDIT DETAILS

ADVANCED OPTIONS

CREATE



### Important

Please make sure the service you want to access is behind the gateway you specify here.

5. If successfully, the service is green.

+

Network Dashboard

Network Events

Manage AppWans

Manage Endpoints

Demo01

MANAGE SERVICES

Manage AppWans Manage Services

Type to Filter

1-1 of 1

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

All services configured.

MANAGE SERVICES

DARIUSZ-TEST / DARIUSZO365 / MANAGE SERVICES

Manage AppWANSManage Services

Type to Filter

1-5 of 5

<input type="radio"/> Service Name	Type	Protocol	IP Address	Intercept IP	Port Range	
<input checked="" type="radio"/> SharePoint-OneDrive-01	Network	ALL	13.107.136.0/22	13.107.136.0	ALL	...
<input checked="" type="radio"/> SharePoint-OneDrive-02	Network	ALL	40.108.128.0/17	40.108.128.0	ALL	...
<input checked="" type="radio"/> SharePoint-OneDrive-03	Network	ALL	52.104.0.0/17	52.104.0.0	ALL	...
<input checked="" type="radio"/> SharePoint-OneDrive-04	Network	ALL	104.146.128.0/17	104.146.128.0	ALL	...
<input checked="" type="radio"/> SharePoint-OneDrive-05	Network	ALL	150.171.40.0/22	150.171.40.0	ALL	...

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

AppWan successfully configured would look like this.

### 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.



#### NEW CLIENTS

Share Client Registration Info



#### NEW GATEWAYS

Tap to Launch and Register



#### 1 APPWAN NAME

DemoAppWan

#### 2 ENDPOINTS

CLIENTS

[SHARE NEW CLIENTS](#)

GATEWAYS

[REGISTER NEW GATEWAYS](#)

[O365GW](#)

#### 3 SERVICES

SERVICE DEFINITIONS

[SharePoint-OneDrive-01](#)

[SharePoint-OneDrive-02](#)

[SharePoint-OneDrive-03](#)

[SharePoint-OneDrive-04](#)

[SharePoint-OneDrive-05](#)

#### 4 ENDPOINT GROUPS

GROUPS



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

TAP TO CLONE

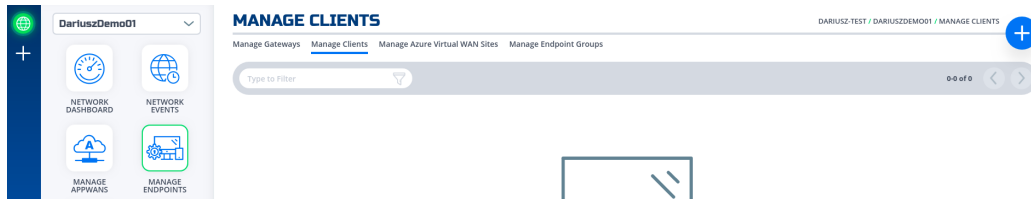


## Create and install NF Client

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.



### 1. Navigate to Manage Clients Page



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

### 3. Fill in the required information and click on "Create"

**CREATE A NEW CLIENT** HELP ESC

Enter your client attributes

CLIENT NAME REQUIRED

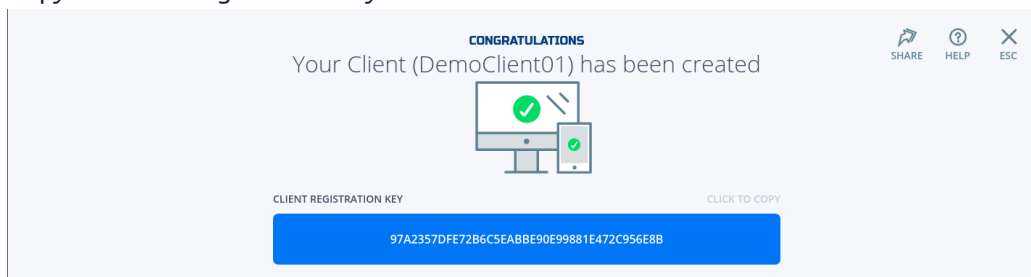
DemoClient01

LOCATION REQUIRED

US East

**CREATE**

### 4. Copy the Client Registration Key



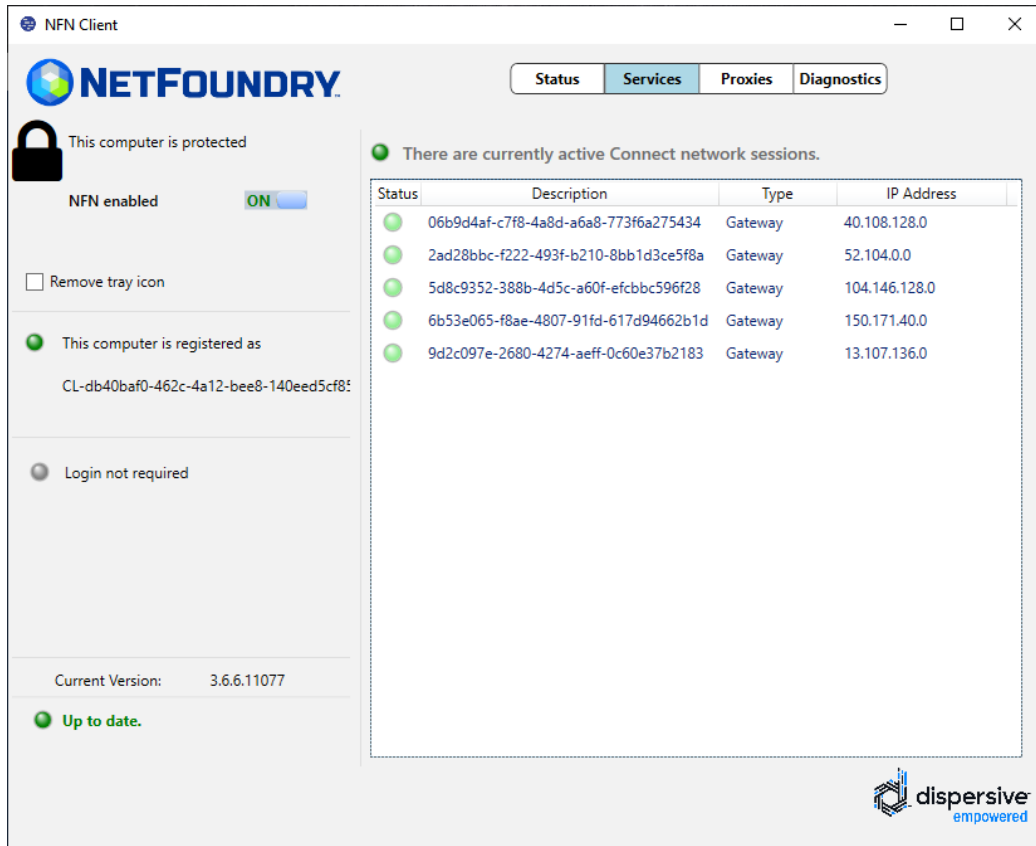
### 5. Install the NF Client Software by following the directions at the appropriate OS link

a. Window

b. Mac

### 6. Add this Endpoint to the AppWan

7. Once endpoint is added to the AppWan, here is what the services tab should look like.



## Programmatically

### Create 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. Change directory to mop: `cd mop`
3. Update `quickstarts/docs/api/python/etc/nf_resources.yml` as so:

```
environment: production
network_action: create
network_name: Network0365
gateway_list:
- action: create
  cloud: azure
  count: 1
  names:
  - GATEWAY-0365-01
  region: "region found by the connectivity test, e.g. eastus"
  regionalCidr:
  - 10.20.10.0/24
  regkeys: []
  resourceGroup:
    name: "you resource RG Name"
    region: "region of your RG"
  tag: null
services:
- action: create
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive01
  netCidr: 22
  netIp: 13.107.136.0
  type: network
- action: create
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive02
  netCidr: 17
  netIp: 40.108.128.0
  type: network
- action: create
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive03
  netCidr: 14
  netIp: 52.104.0.0
  type: network
- action: create
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive04
  netCidr: 17
  netIp: 104.146.128.0
  type: network
- action: create
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive05
  netCidr: 22
  netIp: 150.171.40.0
  type: network
appwans:
- action: create
  endpoints: []
```

```
name: AppWanSharepoint
services:
  - SharePointOneDrive01
  - SharePointOneDrive02
  - SharePointOneDrive03
  - SharePointOneDrive04
  - SharePointOneDrive05
terraform:
  bin: terraform
  output: 'no'
  source: ./quickstarts/docs/terraform
  work_dir: .
```

4. Run this from the root folder (mop) to create network, gateway, services, and appwan through NF API and deploy Virtual Machine to host NF Gateway in your Azure RG.

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

5. Run this command if to keep RG (replace "RG Region" with your RG's region, e.g. centralus)

```
terraform state rm module."RG Region"_rg.azure_rm_resource_group.terraformgroup
```

6. Once the script is finished, all the resources in NF Console and Azure RG will have been deployed.

#### Note

If something went wrong, please check logoutput.txt file generated in the root directory for details on any errors that may have occurred during the deployment.

## Create Windows Client via Powershell

This section provides the powershell code to spin up a NF client with the name as computer name fetched by PS script.



## Example

1. Here are the parameters used in the script few needs to be changed to suit your need for eg. network\_name and region\_name.

```
clientId /secret: from NF console steps below.  
environment: Production  
network_name: e.g. DemoNet01  
audience: URI for the Auth0  
api_endpoint: URI for the API calls  
region_name: The region_name is the reference region or location where client will be created  
              (reference closest AWS location) e.g.us-east-1  
provider: AWS
```

2. To create a unique client we can use second half of computer name below powershell cmdlet will fetch the same.

```
#Set Endpoint name to second half of computer name:  
$endpoint_name = $ENV:COMPUTERNAME.Split("-")[-1]
```

3. This section creates an access token by an api call using parameters defined earlier.

```
# Get a auth token from Auth0  
$auth_payload = @{{  
    client_id=$client_id  
    client_secret=$client_secret  
    audience=$audience  
    grant_type='client_credentials'  
}}  
$auth_json = $auth_payload | ConvertTo-Json  
  
$post_uri = "https://netfoundry-" + $environment + ".auth0.com/oauth/token"  
  
$auth0_response = Invoke-RestMethod -Method Post -Uri $post_uri -ContentType 'application/json' -  
Body $auth_json  
  
$token = $auth0_response.access_token  
  
#Inserting auth token to headers for API calls  
$headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"  
$headers.add("Authorization", ("Bearer " + $token))
```

4. This is how to get datacenterId and networkId which basically makes an API call to strips off unwanted information. This information will be used to create client later.

```
# Get a dataCenter ID:  
  
$datacenter_uri = $api_endpoint + "/dataCenters"  
  
$dataCenter_response = Invoke-RestMethod -Method Get -Uri $datacenter_uri -ContentType  
'application/json' -Headers $headers  
  
$dataCenter = $dataCenter_response._embedded.dataCenters | where { $_.locationCode -like  
$region_name -and $_.provider -like $provider } | select _links
```

```
$dataCenterId = ($dataCenter._links.self.href).Split("/")[-1]
```

```
# Get a Network ID:
```

```
$network_uri = $api_endpoint + "/networks"
```

```
$network_response = Invoke-RestMethod -Method Get -Uri $network_uri -ContentType 'application/  
json' -Headers $headers
```

```
$network = $network_response._embedded.networks | where { $_.name -like $network_name } | select  
_links
```

```
$networkId = ($network._links.self.href).Split("/")[-1]
```

5. Below section of the script uses computername, networkId and datacenterId from above sections to make API call create a NF client and fetch the registration key.

```
# Create an Endpoint & get reg key
```

```
$endpoint_uri = $api_endpoint + "/networks/" + $networkId + "/endpoints"
```

```
$endpoint_payload = @{
```

```
    name = $endpoint_name
```

```
    endpointType = "CL"
```

```
    dataCenterId = $dataCenterId
```

```
}
```

```
$endpoint_json = $endpoint_payload | ConvertTo-Json
```

```
$endpoint_response = Invoke-RestMethod -Method Post -Uri $endpoint_uri -ContentType 'application/  
json' -Body $endpoint_json -Headers $headers
```

```
$endpoint_registration_key = $endpoint_response.registrationKey
```

6. This section will run a registration script silently to register the NF client.

```
# Run registration script
```

```
Start-Process -FilePath C:\Program Files\OVN\vtc_app\nfnreg $endpoint_registration_key
```

7. Once you download PS script onto your laptop and update it with your network details, run the following in the directory containing the script:

```
.\NF-pwrshell.ps1
```

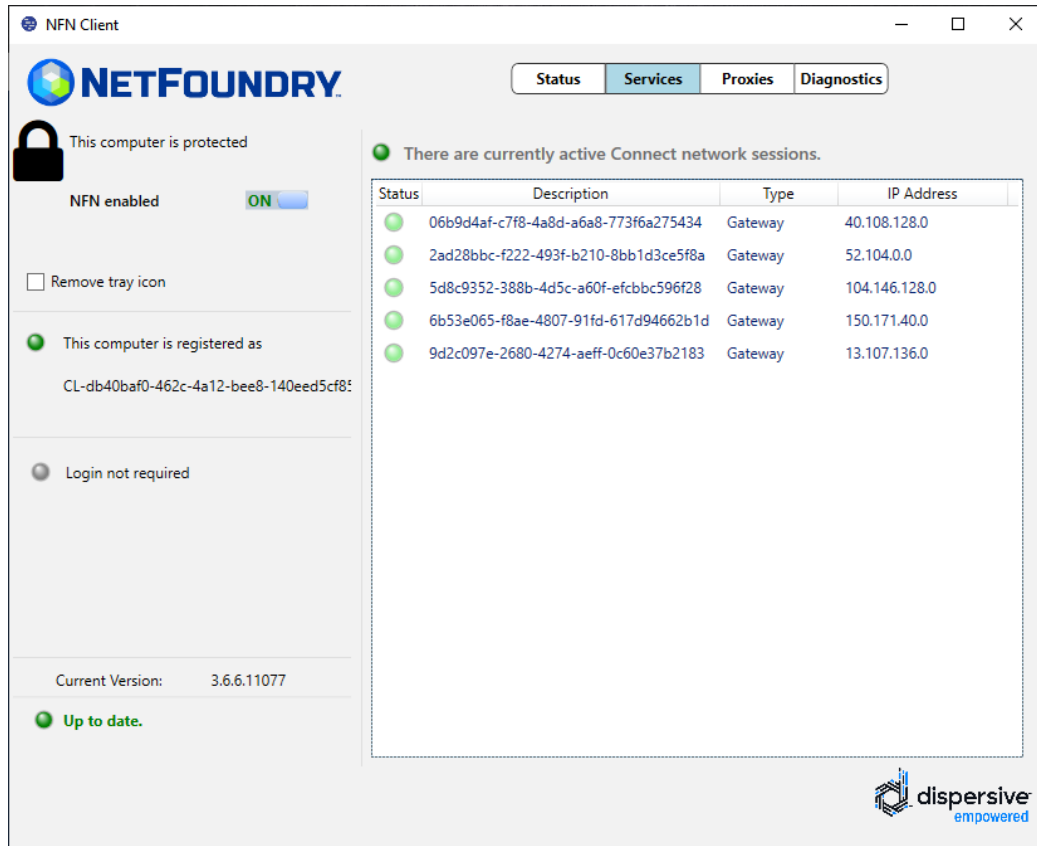
8. Update the following section of the resources.yaml file referenced at the beginning of the last section.

```
appwans:  
- action: create  
  endpoints:  
  - "your endpoint name"
```

9. Run resources.py script to add the newly created endpoint to the same AppWan.

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

10. Once endpoint is added to the AppWan, here is what the services tab should look like.



## Performance Testing

### E2 42 Verifying the performance through testing

#### E3 C9 Note

Recommended way of accessing OnDrive is through the Windows App with File Explorer. If access to OneDrive is required using a browser than Firefox is recommended by NetFoundry to get best performance.

1. Map your Business OneDrive to your local file system if not already done so.
2. Make sure the NF App is enabled.
3. Transfer large files between remote and local drive to test the performance.
4. Disable the NF App and repeat the previous step to compare the performance.
5. The performance should be at least the same if not better.

Programmatically

**Delete via Python and Terraform**



## Steps

1. Change all actions to delete in `quickstarts/docs/api/python/etc/nf_resources.yml` as so:

```
environment: production
network_action: delete
network_name: Network0365
gateway_list:
- action: delete
  cloud: azure
  count: 1
  names:
  - GATEWAY-0365-01
  region: eastus
  regionalCidr:
  - 10.20.10.0/24
  regkeys: []
  resourceGroup:
    name: RG_0365_Demo
    region: centralus
  tag: null
services:
- action: delete
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive01
  netCidr: 22
  netIp: 13.107.136.0
  type: network
- action: delete
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive02
  netCidr: 17
  netIp: 40.108.128.0
  type: network
- action: delete
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive03
  netCidr: 14
  netIp: 52.104.0.0
  type: network
- action: delete
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive04
  netCidr: 17
  netIp: 104.146.128.0
  type: network
- action: delete
  gateway: GATEWAY-0365-01
  name: SharePointOneDrive05
  netCidr: 22
  netIp: 150.171.40.0
  type: network
appwans:
- action: delete
  endpoints: []
  name: AppWanSharepoint
  services:
  - SharePointOneDrive01
  - SharePointOneDrive02
```

- SharePointOneDrive03
- SharePointOneDrive04
- SharePointOneDrive05

terraform:

```
bin: terraform
output: 'no'
source: ./quickstarts/docs/terraform
work_dir: .
```

2. Run this from the root folder (mop) to delete network, gateway, services, and appwan through NF API and destroy Virtual Machine hosting NF Gateway in your Azure RG.

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