Cloud Security Connector GRE – AWS with Private Cloud Private Access

(For Amazon Web Services – AWS)

Version 1.0

January 2022

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1 Introduction to Cloud Security Connectors for Netskope.

The Cloud Security Connector (CSC) is a device that enables easy deployments of the Netskope SASE solution in any customer environment.

The Cloud Security Connector (CSC) for AWS is an EC2 instance that connects internal AWS resources to Netskope NewEdge.

The CSC for AWS lets you connect securely to Netskope NewEdge up to 1 Gbps without hassle.

The primary purpose of the CSC family is simplicity. The CSC for AWS comes with all configurations required.

After launching the CSC from the AWS Marketplace using the CloudFormation template provided, the CSC will automatically select the best Netskope Edge nodes and do the GRE tunnels Primary and Secondary.

The CSC GRE contains the perfect configuration for GRE tunnels, firewall rules and routing tables that are necessary.

All Netskope functionalities are available, providing complete visibility of all Internet traffic.

In addition to this, the CSC provides high availability changing the default route to Netskope when configured as High Availability pair, and an easy way to manage direct bypasses to trusted sites using your public IP.

Includes Private Cloud Private Access functionality that allows you to create a full mesh among the CSCs communicating your private traffic on a Zero Trust model.

Simple to install with complete management using Amazon Systems Manager, Rundeck (or similar, like Ansible, Salt, Etc.) and SSH.

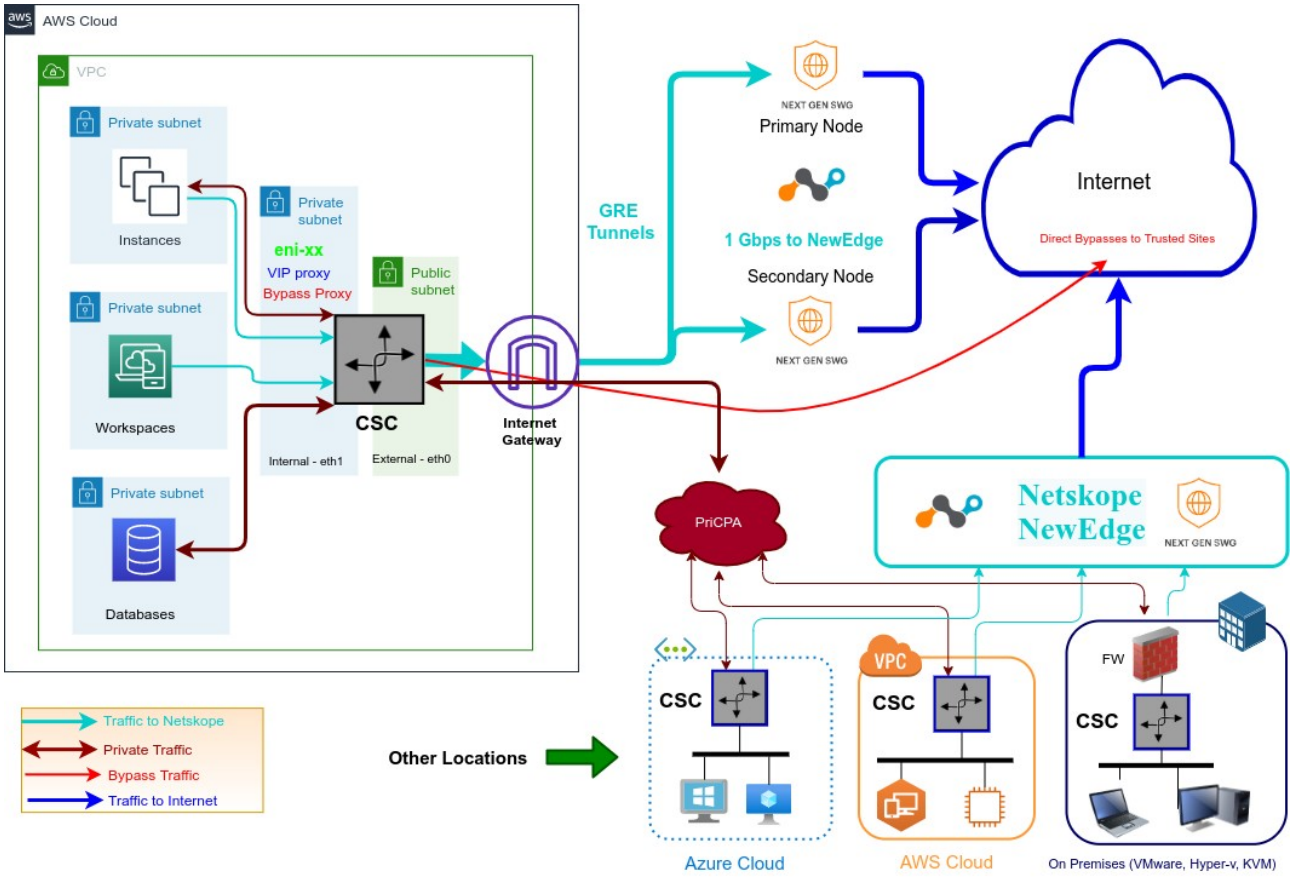
2 Key benefits of the Cloud Security Connector GRE

- No Networking knowledge is required.
- Automated deployment using Cloudformation or your tool of choice. (i.e. Terraform)
- Enables any Location to be connected to Netskope NewEdge up to 1 Gbps.
- With Private Cloud Private Access you can connect all sites securely on a Zero Trust model. The CSC secures your Private Traffic between your physical and cloud locations.
- The CSC comes with the optimal values to work with Netskope NewEdge.
- Full tunnel redundancy.

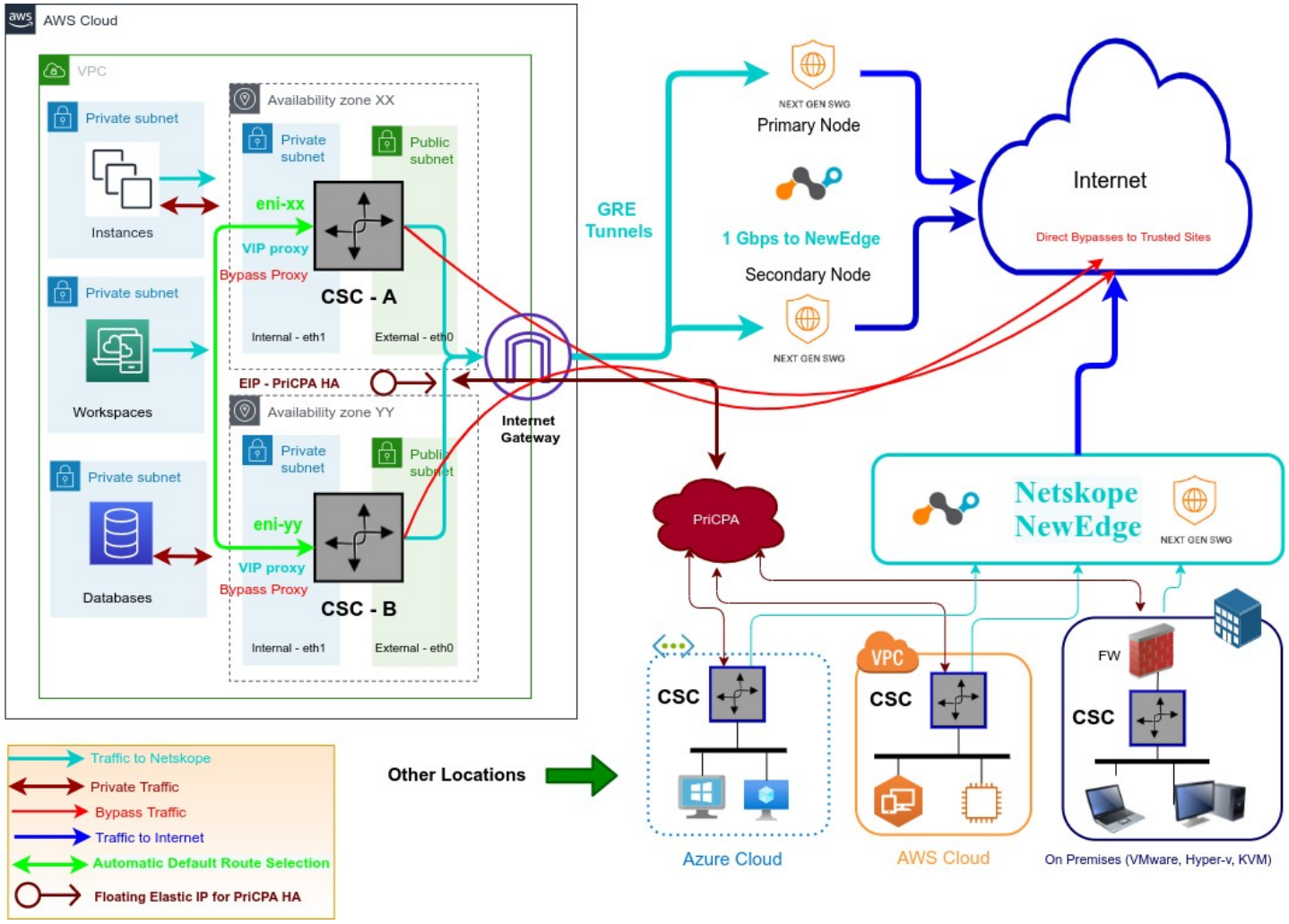
- High Availability with automatic default route to Internet selection on multiple routes.
- All traffic steering options supported:
  - Route all traffic to Netskope (or http/s only).
  - Use of PAC files.
  - Use of Explicit Proxy.
  - No default Route scenarios.
- Multiple options to Bypass Traffic:
  - Layer 7 Proxy Bypass to Trusted Web Sites.
  - Layer 4 Routed Bypass: TCP, UDP and ICMP per source/destination Network and Port (UDP/TCP)
- Cloud Firewall and Cloud Web Security.
- Complete visibility of internal IPs on Netskope Console.
- No operational burden for Administrators.
- Full hardened device.
- Multiple tools for testing and troubleshooting included: Speed Test, MTR (MyTraceRoute), Keepalives statuses, Etc.
- Allow the internal communication between your locations with Private Cloud Private Access.
- Management via SSH, AWS Systems Manager, Rundeck or similar. (Ansible, Salt, Etc.)
- It runs on a cheap AWS instance: t2, t3a and t3 instances.

3 Network Diagrams

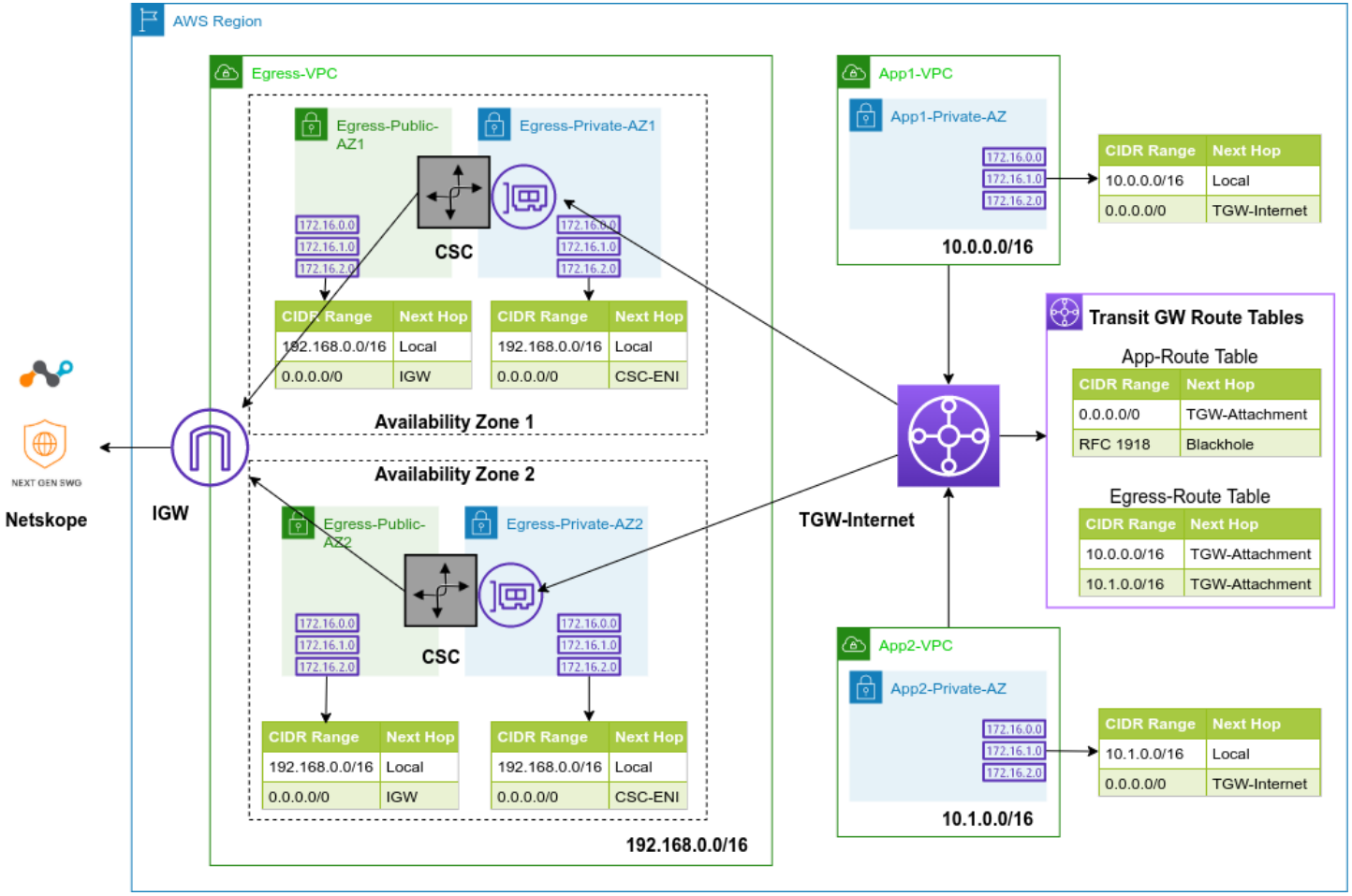
3.1 CSC GRE for AWS – Single deployment



3.2 CSC GRE for AWS – High Availability Deployment



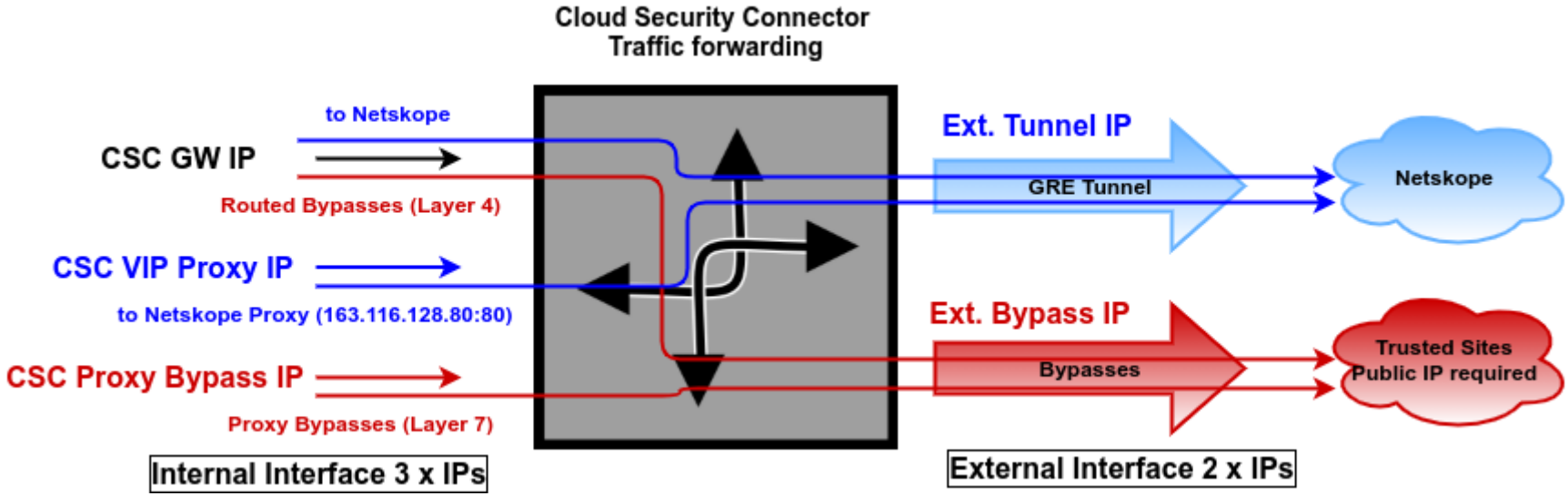
3.3 CSC GRE for AWS – High Availability when using Single Exit to Internet



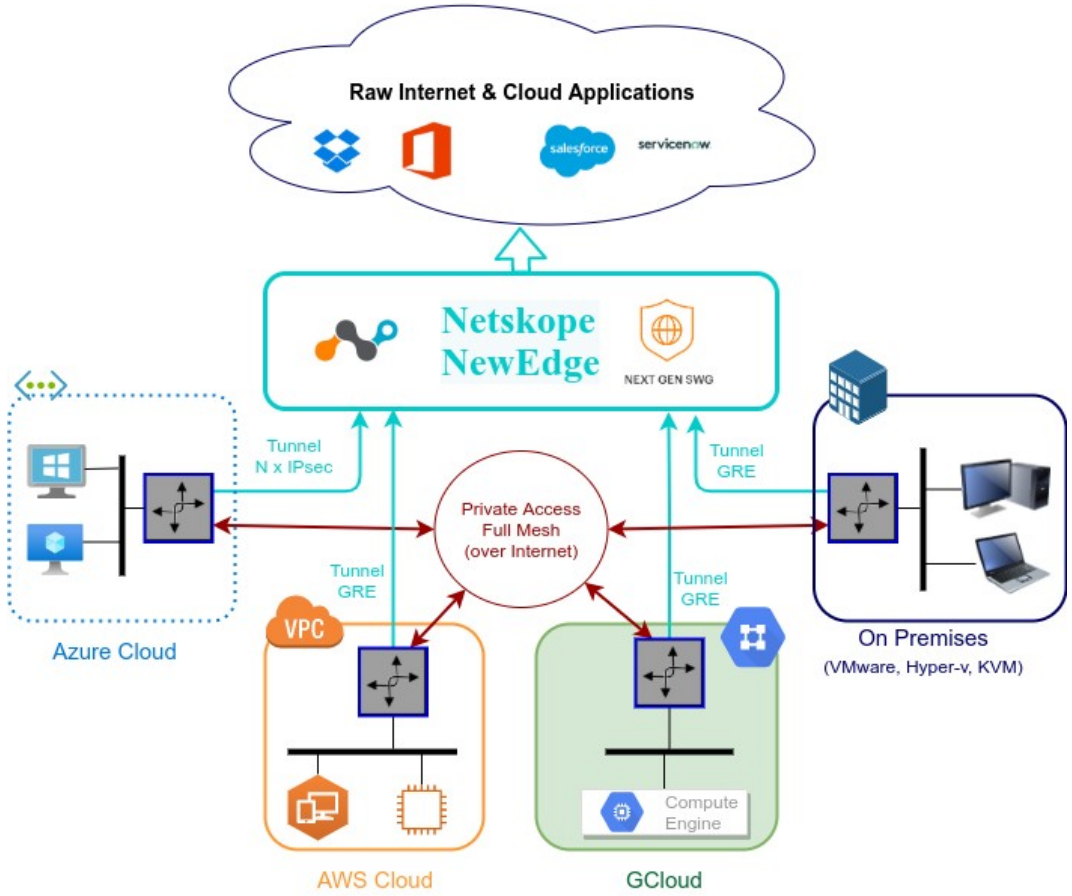
3.4 Steering: Routing and Proxying all together.

The most significant benefit of the Cloud Security Connector for Netskope is that it covers all possible scenarios (routed traffic, PAC files, explicit proxy, Etc.) for any device on your organization: Laptops, Desktops, Servers, IoT devices, Virtual Desktops, Etc.

The following picture shows the CSC working will all scenarios combined.



3.5 Private Cloud Private Access (PriCPA)



With the CSCs for Netskope, you can create your Private Cloud for connecting all your internal devices in a Zero Trust model from your physical and cloud locations.

4 Creating the Cloud Security Connector for AWS

There are two ways to deploy the CSC: Basic and Advanced mode (Adding "User Data" on the CloudFormation template.). The difference between these methods are:

1. **Basic Mode:**

   1.1. Deploy the CSC via Cloudformation, selecting External and Internal Subnet and no further parametrization (leave Cloudformation field "User Data" empty).

   1.2. The Cloudformation template will create all AWS resources (Instance, Security Groups, Public IPs, etc.)

   1.3. After the initial boot, the CSC will select the nearest Primary and Secondary Netskope NewEdge nodes and automatically create the tunnels.

   1.4. Your next task is to add the Public IP of the GRE tunnels to your Netskope console. (Go to Settings -> Security Cloud Platform -> Traffic Steering -> GRE.) You can obtain the Public IP from AWS or access the CSC via SSH console.

2. **Advanced Mode (filling User Data):**

   2.1. Deploy the CSC via Cloudformation, selecting External and Internal Subnet and paste the userConfigData.json file on the "User Data" field.

   2.2. The Cloudformation template will create all AWS resources (Instance, Security Groups, Public IPs, etc.)

   2.3. After the initial boot, the CSC will select the nearest Primary and Secondary Netskope NewEdge nodes and automatically create the tunnels.

   2.4. Your next task is to add the Public IP of the GRE tunnels to your Netskope console. (Go to Settings -> Security Cloud Platform -> Traffic Steering -> GRE.) You can obtain the Public IP from AWS or access the CSC via SSH console.

   2.5. Bypass Proxy and Routed Bypass rules will be applied from the URLs provided.

   2.6. AWS SSM Agent registration will be done automatically.

4.1 Basic Mode deployment

4.1.1 Prerequisites

Before to launch the CSC you need to have this elements ready:

1. **SSH Key.** (you can use any ssh key already in use or to create one specific for the CSC)
2. **VPC ID**
3. **External Subnet:** The External Subnet must be on the same VPC and Availability Zone than the Internal Subnet.
4. **Internal Subnet:** The Internal Subnet must be on the same VPC and Availability Zone than the External Subnet.

4.1.2 Prerequisites EXAMPLE:

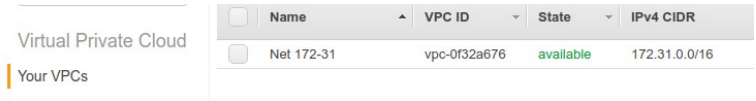
Following an EXAMPLE of prerequisites and how to obtain it.

a) Go to your EC2 Dashboard to get the Key Pairs or to create new ones.

1 – SSH Keys: us-east-key

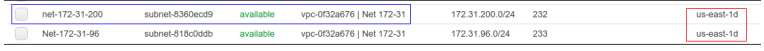
b) Go to your VPC Dashboard, to obtain VPC ID, and Subnets.

2 – VPC ID: vpc-of32a676



3 – External Subnet: subnet-818c0ddb (Note: Availability Zone us-east-1d and VPC ID vpc-of32a676)

4- Internal Subnet: subnet-8360ecd9 (Note: Availability Zone us-east-1d and VPC ID vpc-of32a676)



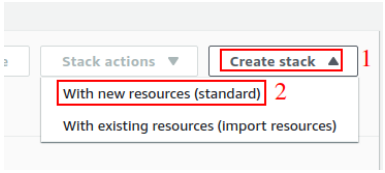
4.1.3 Launching the CSC from AWS Marketplace

1. Search for "Maidenhead Bridge" on AWS Marketplace.
2. Select **"Cloud Security Connector GRE for Netskope"**
3. Click **"Continue to Subscribe"** and accept the EULA.
4. Click **"Continue to Configuration"** and select the Region.
5. Click **"Continue to Launch"** and select "Choose Action" → "Launch Cloudformation".#
6. Click **"Launch"** and Next. You will redirected to the CloudFormation Page.

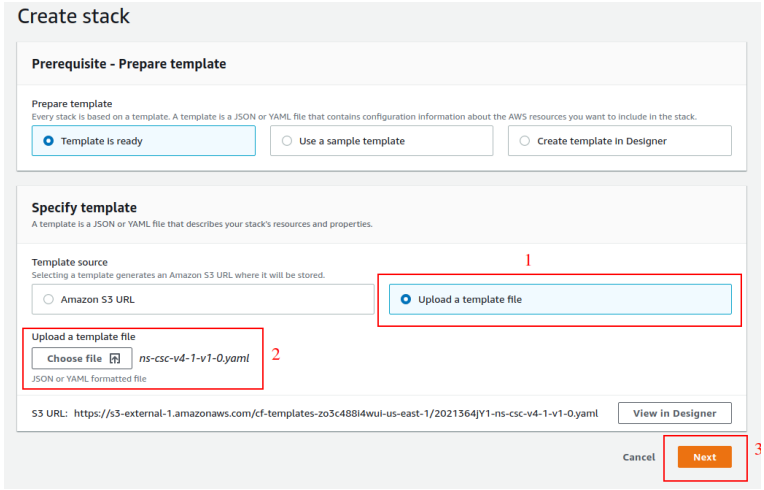
See next section for further steps.

4.1.4 Launching the CSC using the CloudFormation template directly.

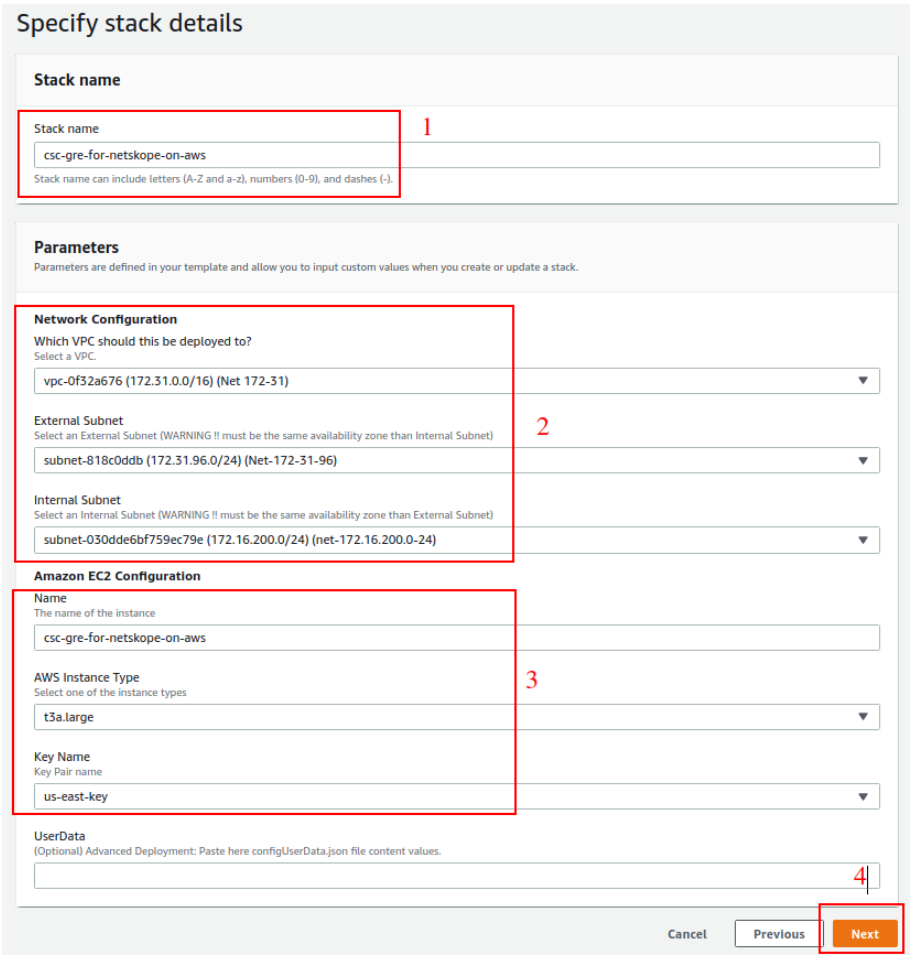
1. Download the Cloudformation template using this link (click here).
2. On you AWS Console, Click **"Services"** and select **CloudFormation.**
3. On the right hand side, click **"Create Stack"** and select **"With new resources (standard)"**



4. Select **"Upload a template file"**, then **"Choose file"**



5. Click **"Next".**
6. The page to **"Specify Stack details"** will appear.



7. Specify Details. Please insert here your values:

→ **Stack Name**

→ **VPC**

→ **External Subnet** (WARNING !! must be the same availability zone as Internal Subnet)

→ **Internal Subnet** (WARNING !! must be the same availability zone as External Subnet)

→ **Name** [of the instance] *(we recommend to use the same name for the stack and the instance for easy visualization)*

→ **AWS Instance Type** t3a.large (default). (*)

→ **Key Name**

(*) The following tables shows the recommended instances. The information is an extract from:

https://aws.amazon.com/ec2/instance-types/ and https://aws.amazon.com/ec2/pricing/on-demand/

Instance	Vcpu	Memory	Bandwidth
t3a.medium	2	4	Up to 5 Gigabit
t3.medium	2	4	Up to 5 Gigabit
t2.medium	2	4	Low to Moderate
t3a.large	2	8	Up to 5 Gigabit
t3.large	2	8	Up to 5 Gigabit
m5a.large	2	8	up to 10 Gbps
t2.large	2	8	Low to Moderate
m5.large	2	8	up to 10 Gbps
m5n.large	2	8	up to 25 Gbps
m5zn.large	2	8	up to 25 Gbps
m5a.xlarge	4	16	up to 10 Gbps
m5.xlarge	4	16	up to 10 Gbps
m5n.xlarge	4	16	up to 25 Gbps
m5zn.xlarge	4	16	up to 25 Gbps

The table is ordered by instance price, where t3a.medium is the cheapest and m5zn.xlarge is the more expensive. Some recommendations:

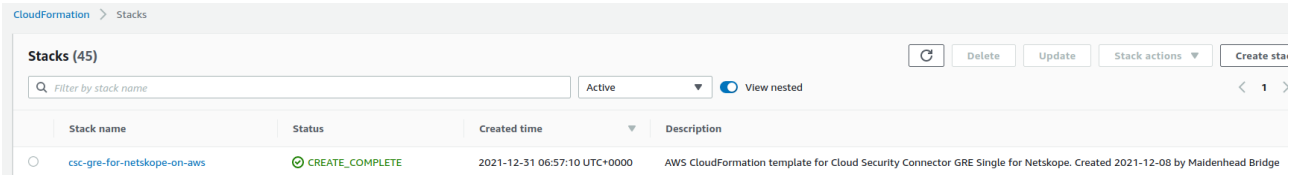
→ You can use t3a.medium or t3.medium when the traffic required is less than 1 Gbps.

→ Use any instance in Green in all other cases.

→ Avoid using t2 instances if possible because of bandwidth constraints.

8. Click **"Next"**
9. "Options Section": Click **"Next"**
10. "Review": Click **"Create Stack"**

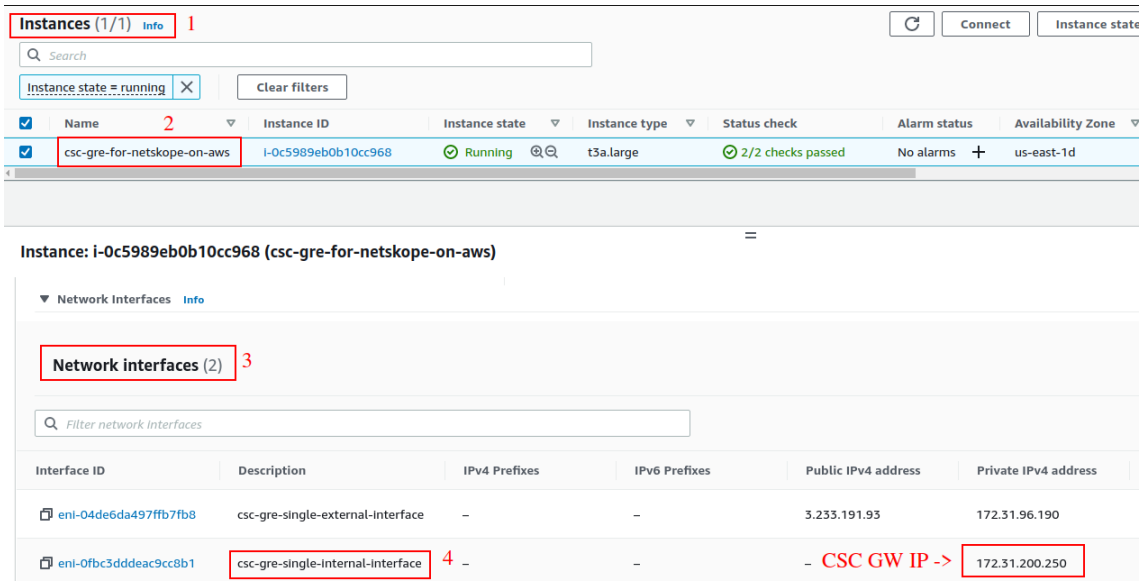
The Stack will show "status" CREATE_IN_PROGRESS, and after a while:



Done! Your CSC is deployed.

4.1.5 Accessing for first time to your CSC

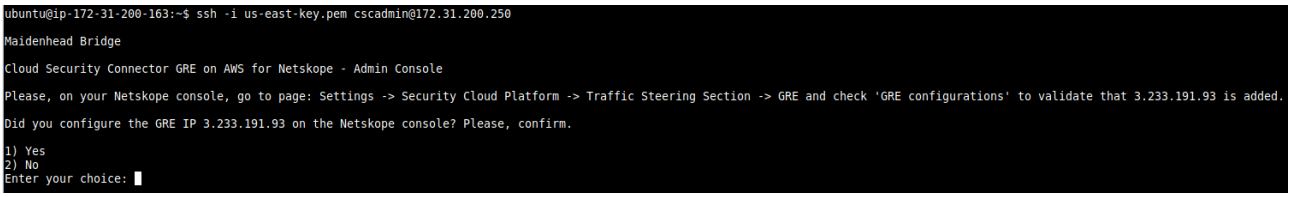
1. Go to your EC2 Dashboard → Instances and select the CSC created. Go to "Networking" and scroll down.



2. Find the "csc-gre-single-internal-interface" and take a look at the first Private IP address (CSC GW IP). This example is: 172.31.200.250
3. From a machine inside the VPC, ssh the CSC using the Key.

   ssh -i <keyname.pem> cscadmin@<CSC GW IP>

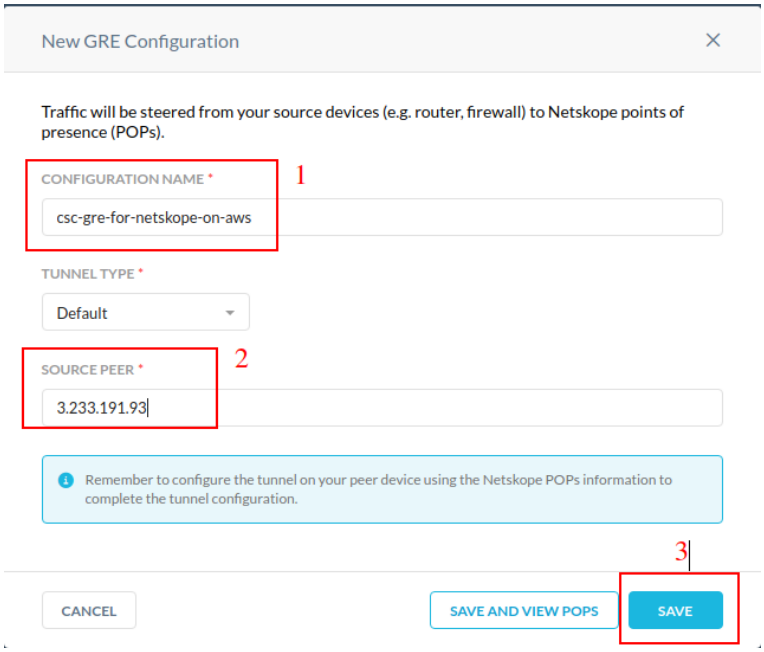
In our example, the value is $ ssh -i us-east-key.pem cscadmin@172.31.200.250



4. Your CSC is ready. Your next task is to add the Public IP of the GRE tunnels on your Netskope console. See next section for details.

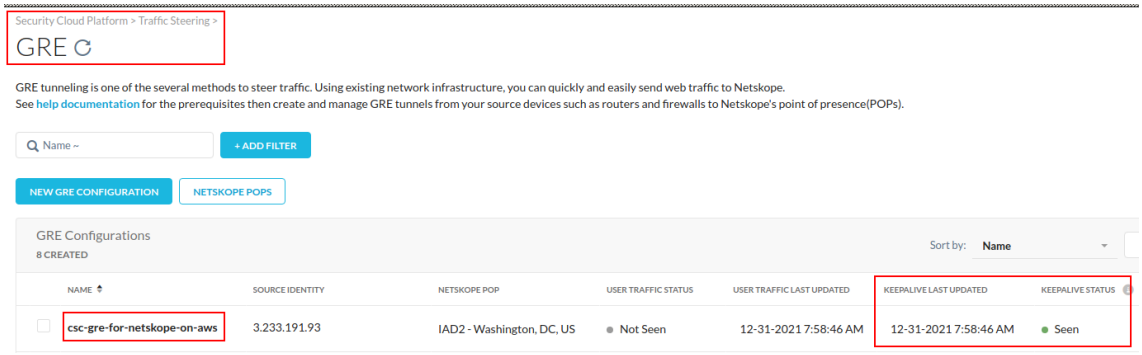
4.2 Adding your Public IP to the Netskope console

On your Netskope Console go to: Settings -> Security Cloud Platform -> (Traffic Steering) GRE and click "NEW GRE CONFIGURATION"



1. Put a Name for the GRE configuration in "Configuration Name"
2. Put your Public IP in "Source Peer"
3. Save.

You new configuration will appear on the GRE Menu and after a while the Keepalive Status will show "Seen".



4.3 Advanced Mode Deployment (filling User Data)

In Advanced Mode Deployment, you can pass values of configuration to the CSC directly, like: Proxy Bypass URL, Routed Bypass URL, Netskope Nodes, DNS, AWS SSM Agent registration, etc.

4.3.1 Prerequisites

The prerequisites are the same as Basic Mode Deployment: External Subnet, Internet Subnet, SSH Key; plus the addition to pasting the contents of the "configUserData.json" file on the UserData field of the CloudFormation template.

*The fields in **bold** are not configurable. So please, do not modify.*

configUserData.json

```
{
   "model": "csc-gre-ns-aws",
   "type": "configUserData",
   "version": "1.0",
   "dns": {
      "useCloudDNS": true,
      "primaryDnsIP": "",
      "secondaryDnsIP": ""
   },
   "syslogServers": {
      "primarySyslogIP": "",
      "secondarySyslogIP": "",
      "syslogTcpPort": 514
   },
   "ssmAgent": {
      "activationCode": "",
      "activationID": "",
      "awsRegion": ""
   },
   "greCredentials": {
      "autoDiscovery": true,
      "grePublicIP": "",
      "primaryGreGateway": "",
      "primaryProbeIpAddress": "",
      "primaryLocation": "",
      "secondaryGreGateway": "",
      "secondaryProbeIpAddress": "",
      "secondaryLocation": ""
   },
   "tunnelRedundancy": {
      "returnToPrimaryTunnel": true
   },
   "bypassProxyPacUrl": "",
   "routedBypassJsonFileUrl": ""
}
```

4.3.1.1 configUserData.json file fields values

Note: We recommend using Visual Studio Code to validate the integrity of JSON files.

4.3.1.1.1 File Header – Do not change.

```
"model": "csc-gre-ns-aws",
"type": "configUserData",
"version": "1.0",
```

4.3.1.1.2 "dns":

```
"dns": {
   "useCloudDNS": true,
   "primaryDnsIP": "",
   "secondaryDnsIP": ""
},
```

Select "useCloudDNS": true, if you want to use the AWS DNS 169.254.169.253 and Google 8.8.8.8 servers.

Select "useCloudDNS": false, if you want to use your DNS servers. In this case, you must fill the "primaryDnsIP" and "secondaryDnsIP" values.

4.3.1.1.3 "syslogServers":

```
"syslogServers": {
   "primarySyslogIP": "",
   "secondarySyslogIP": "",
   "syslogTcpPort": 514
},
```

Input the IP value of your Primary Syslog Server and the TCP port on "syslogTcpPort". Secondary Syslog IP is optional.

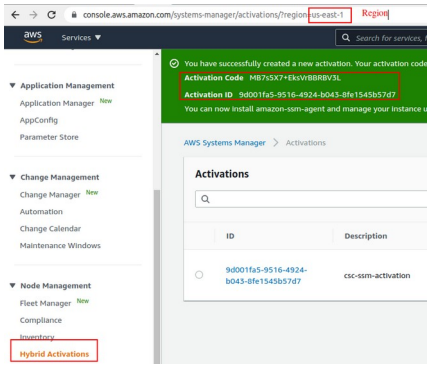
Leave these fields blank if you don't want to configure Syslog Servers.

4.3.1.1.4 "ssmAgent":

```
"ssmAgent": {
   "activationCode": "",
   "activationID": "",
   "awsRegion": ""
},
```

The CSC can be managed using AWS Systems Manager.

Input here the values of Activation Code, Activation ID and AWS Region of the “Hybrid Activation” of the AWS Systems Manager.



4.3.1.1.5 "greCredentials":

```
"greCredentials": {
    "autoDiscovery": true,
    "grePublicIP": "",
    "primaryGreGateway": "",
    "primaryProbeIpAddress": "",
    "primaryLocation": "",
    "secondaryGreGateway": "",
    "secondaryProbeIpAddress": "",
    "secondaryLocation": ""
},
```

Select "autoDiscovery": true, for automatic discovery and setup of the nearest Netskope NewEdge nodes (Primary and Secondary)

Select "autoDiscovery": false for Manual input of Primary and Secondary nodes. Please, be careful with the format for "primaryLocation": and "secondaryLocation":. The format must be: <Country Code>,<City Name without spaces>, <Netskope Node ID>

Example:

```
"greCredentials": {
    "autoDiscovery": true,
    "grePublicIP": "",
    "primaryGreGateway": "163.116.146.36",
    "primaryProbeIpAddress": "10.146.6.209",
    "primaryLocation": "US,Washington,IAD2",
    "secondaryGreGateway": "163.116.135.36",
    "secondaryProbeIpAddress": "10.135.6.209",
    "secondaryLocation": "US,NewYork,NYC1"
},
```

4.3.1.1.6 "tunnelRedundancy":

```
"tunnelRedundancy": {
    "returnToPrimaryTunnel": true
},
```

Please select 'true' if you want the CSC to return to the Primary tunnel (after 10 min of stability) when using the Secondary tunnel.

Select 'false' if you want to remain using the Secondary Tunnel and not return to Primary. (Secondary will be nominated as 'new' Primary).

4.3.1.1.7 "bypassProxyPacUrl":

```
"bypassProxyPacUrl": "",
```

Insert here your Proxy Bypass PAC URL. The PAC URL contains the list of Proxy Bypasses to implement. For example:https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac

4.3.1.1.8 "routedBypassJsonFileUrl":

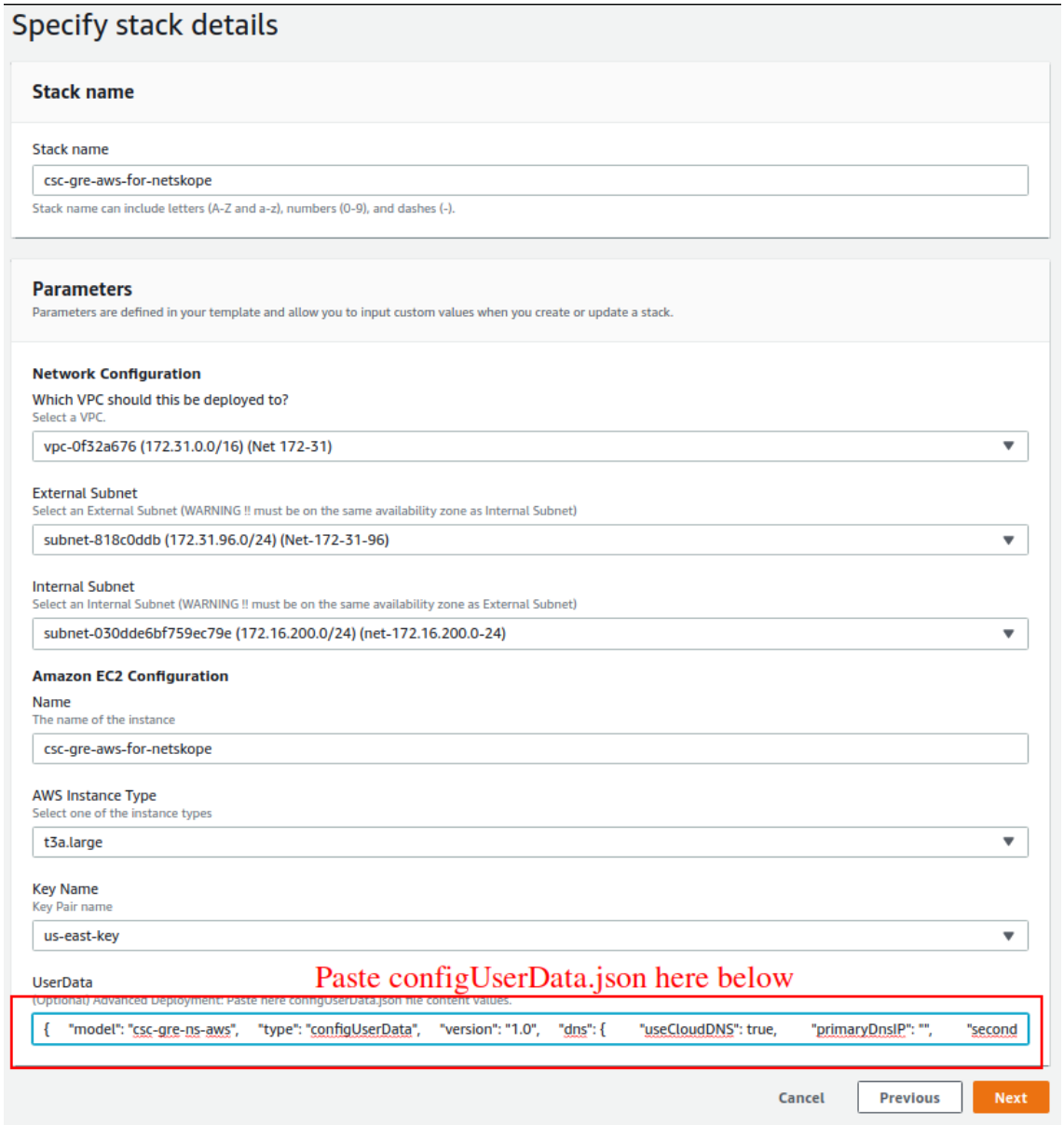
```
"routedBypassJsonFileUrl": ""
```

Insert here your Routed Bypass URL that points to the JSON file with the Routed Bypass Rules (I.e. routedBypassRulesFile.json) . For example:https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json

4.3.2 Filling "User Data" on the CloudFormation Template.

The only difference between Basic and Advanced Deployment is filling the last section of the CloudFormation template. (UserData).

Simply copy the contents of the userDataConfig.json file and paste it into the section UserData.



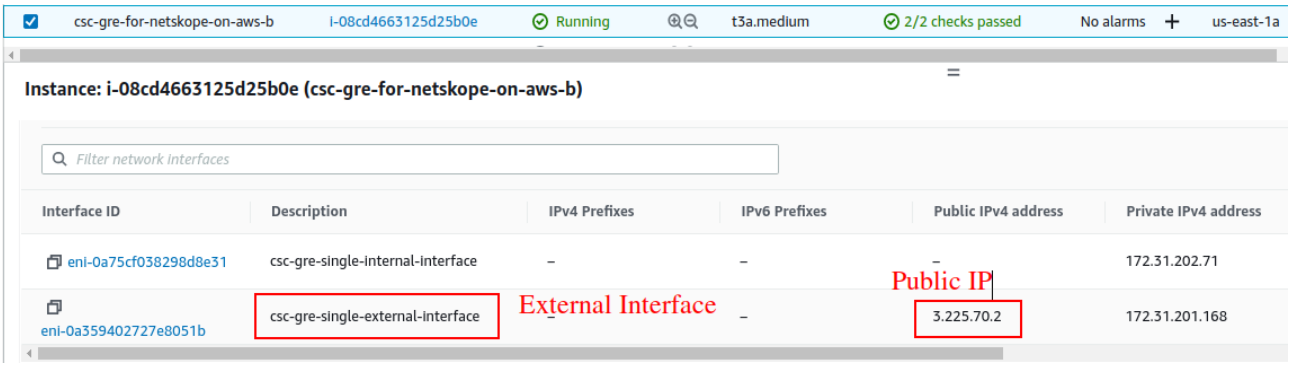
and Click "Next", "Next" , "Create Stack".

4.3.3 Log information when using Advanced Deployment

When using Advanced Deployment, all resources are created automatically on the CSC.

```
Jan  2 18:44:37 ip-172-31-201-168 root: (MHB-CSC)(INFO) SYSLOG configured using Primary= 172.31.200.163, Secondary= none and TCP port= 514
Jan  2 18:44:41 ip-172-31-201-168 root: (MHB-CSC)(INFO) AWS SSM Agent is  active (running) since Sun 2022-01-02 18:44:40 UTC; 601ms ago. Registration values: {"ManagedInstanceID":"mi-0ff86ef8572caaf4d","Region":"us-east-1"}
Jan  2 18:44:59 ip-172-31-201-168 root: (MHB-CSC)(INFO) Proxy Bypass List updated sucessfully.(using PAC URL https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac)
Jan  2 18:45:03 ip-172-31-201-168 root: (MHB-CSC)(INFO) GRE tunnel configured with Primary Node: 163.116.146.36 (US,Washington,IAD2), Secondary Node: 163.116.135.36 (US,NewYork,NYC1).
Jan  2 18:45:03 ip-172-31-201-168 root: (MHB-CSC)(INFO) Routed Bypass Rules JSON file created successfuly from config.json (using Routed Bypass URL https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-docu
mentation.json).
Jan  2 18:45:53 ip-172-31-201-168 root: (MHB-CSC)(UP) CSC GRE for AWS was powered ON: Sun  2 Jan 18:45:53 UTC 2022
Jan  2 18:45:54 ip-172-31-201-168 root: (MHB-CSC)(INFO) Routed Bypass - Routed Bypass Rules JSON file integrity is OK
Jan  2 18:45:54 ip-172-31-201-168 root: (MHB-CSC)(INFO) Routed Bypass - (Index: 0) Rule "O365 Login URLs 1" was created succesfully.
Jan  2 18:45:54 ip-172-31-201-168 root: (MHB-CSC)(INFO) Routed Bypass - (Index: 1) Rule "O365 Login URLs 2" was created succesfully.
Jan  2 18:45:55 ip-172-31-201-168 root: (MHB-CSC)(INFO) Routed Bypass - (Index: 2) Rule "O365 Login URLs 3" was created succesfully.
Jan  2 18:45:55 ip-172-31-201-168 root: (MHB-CSC)(INFO) Routed Bypass - (Index: 3) Rule "O365 Login URLs 4" was created succesfully.
Jan  2 18:45:55 ip-172-31-201-168 root: (MHB-CSC)(INFO) Routed Bypass - (Index: 4) Rule "portquiz.net" was created succesfully.
Jan  2 18:46:26 ip-172-31-201-168 root: (MHB-CSC)(DOWN) No active tunnel since: Sun  2 Jan 18:46:26 UTC 2022
Jan  2 18:51:27 ip-172-31-201-168 root: (MHB-CSC)(UP) Primary tunnel is active since: Sun  2 Jan 18:51:26 UTC 2022
```

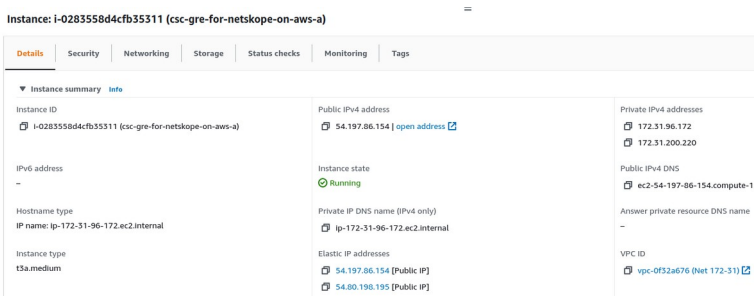
The only manual task required is to add the Tunnel Public IP on your Netskope Console. You can read the Tunnel Public IP from the SSH console or AWS console.



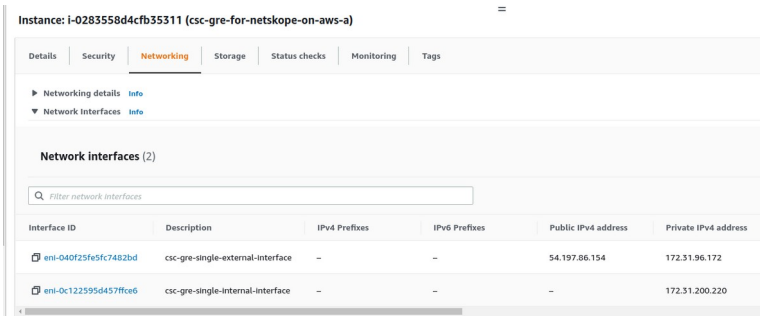
5 Resources creates by the CloudFormation template

The following resources are created by the CloudFormation template:

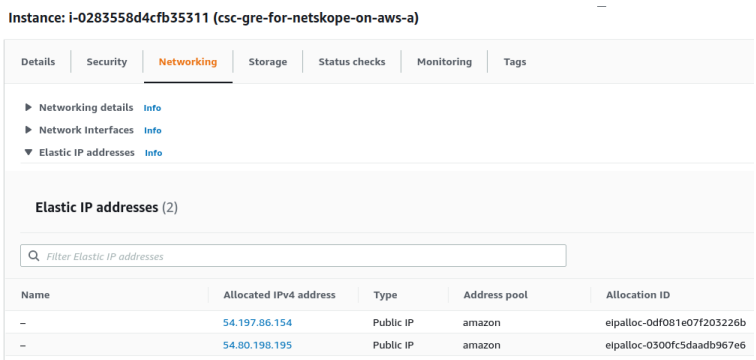
1. Instance.



2. Interfaces External and Internal.

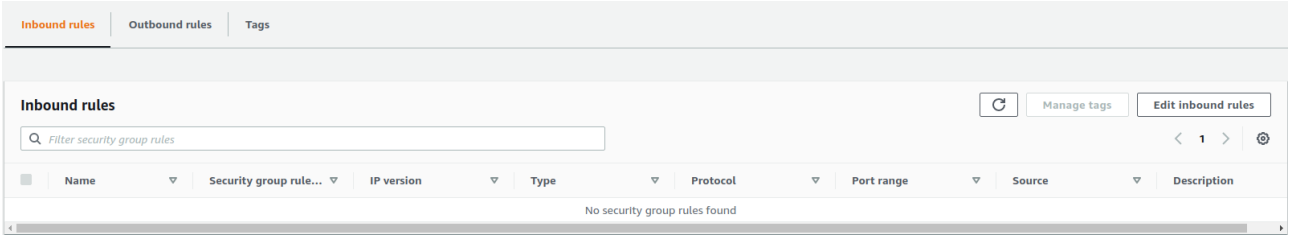


3. 1 x Elastic IP for the GRE tunnel and 1 x Elastic IP used by Bypass functionality and Private Access.

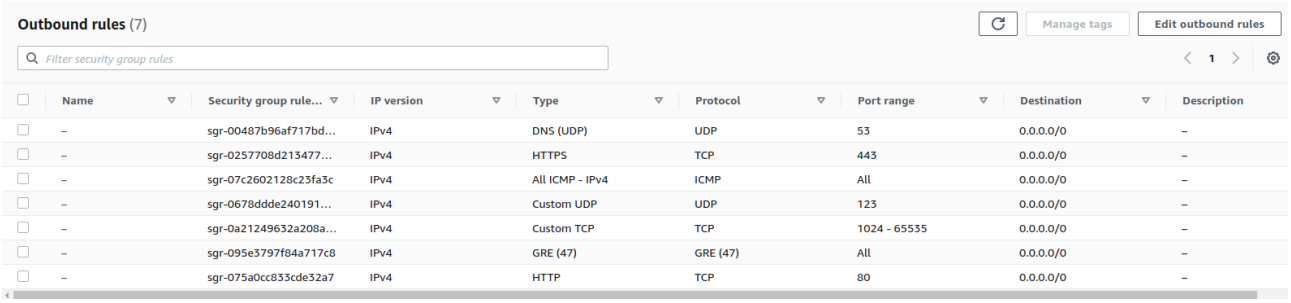


4. Security Group for External Interface. [1] [2]

4.1. Inbound Rules

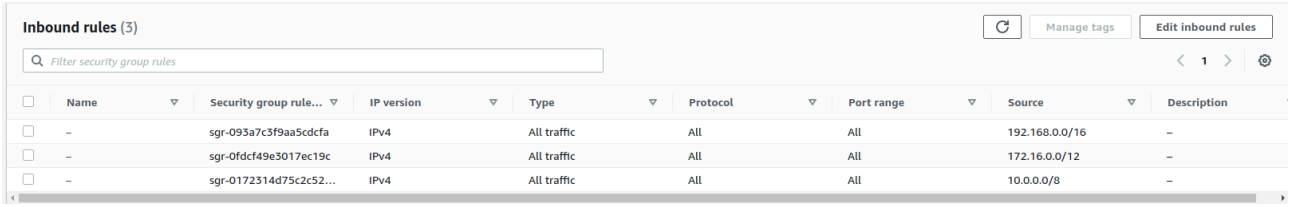


4.2. Outbound Rules

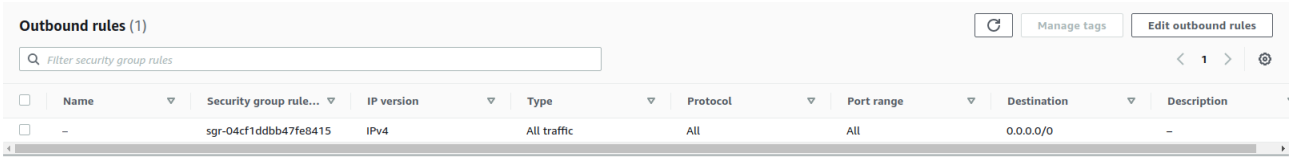


5. Security Group for Internal Interface.

5.1. Inbound Rules



5.2. Outbound Rules



1 The CSC contains Firewall Rules on each interface that are more specific in some cases. For example, the CSC only allows reaching the configured Netskope Nodes for GRE traffic. Therefore, there is double protection: The AWS Security Group and the internal Firewall Rules of the CSC.

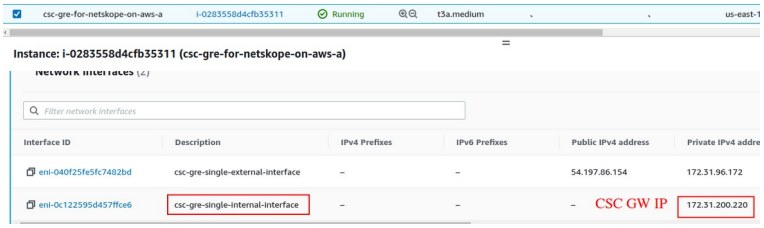
2 When using Private Access (PriCPA), the CSC automatically updates the internal FW rules and Security Groups to allow Peers to communicate with each other.

6 The Cloud Security Connector Admin Console:

The CSC's SSH Console simplifies administrative tasks showing what is essential to administrators for operation and troubleshooting. In addition to this, using AWS System Manager, you can do all monitoring tasks via AWS Console. Register the CSC instance on AWS as a managed instance, and you are ready to control the CSC using all AWS System Manager tools.

When accessing the console via SSH (using the CSC GW IP), you will receive the Admin Console.

For example:

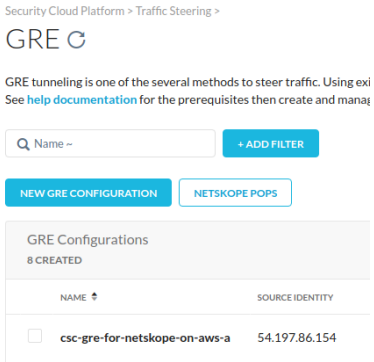



```
ssh -i us-east-key.pem cscadmin@172.31.200.220
```

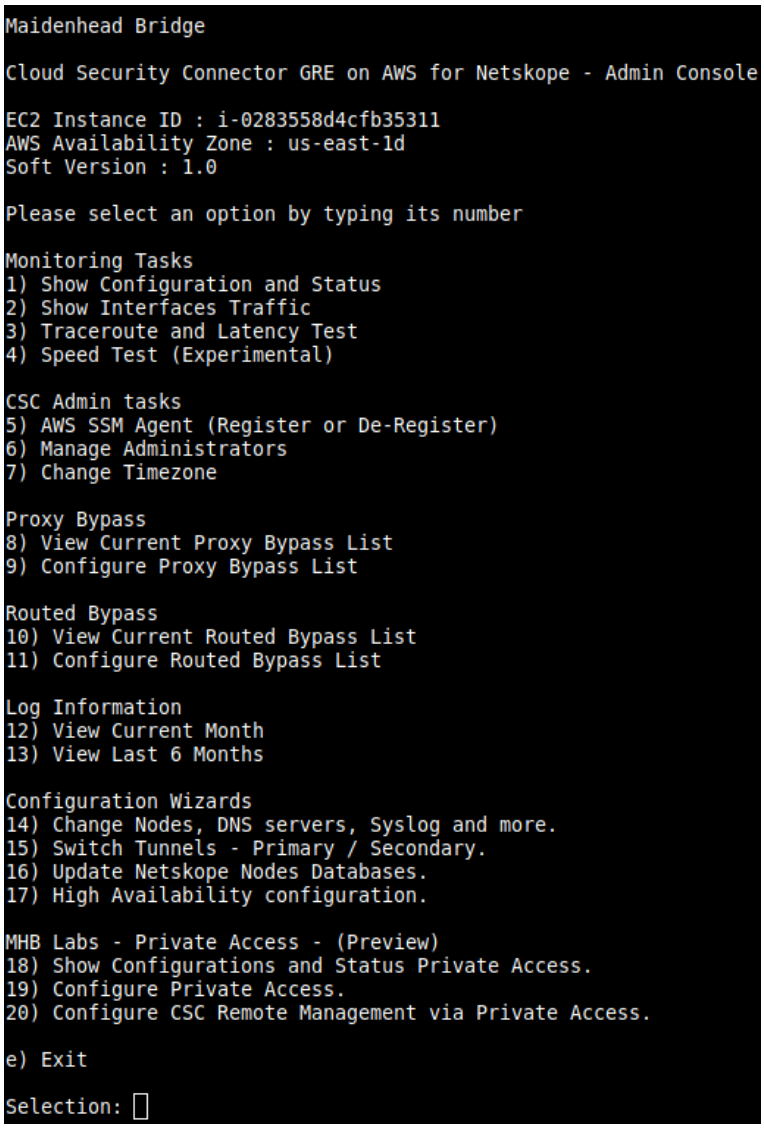
The initial screen will show a reminder to configure the Public IP of the GRE tunnel on your Netskope Console:

```
Maidenhead Bridge

Cloud Security Connector GRE on AWS for Netskope - Admin Console

Please, on your Netskope console, go to page: Settings -> Security Cloud Platform -> Traffic Steering Section -> GRE and check 'GRE configurations' to validate that 54.197.86.154 is added.

Did you configure the GRE IP 54.197.86.154 on the Netskope console? Please, confirm.

1) Yes
2) No
Enter your choice:
```

→ Please, configure the Public IP of the GRE tunnel on your Netskope console.



→ Select 1) Yes to confirm.



The Main Sections are:

- **Monitoring Tasks:** To check statuses, real-time traffic, speed, etc.
- **CSC Admin Tasks:** To register the CSC for AWS management, manage administrator and change timezone.
- **Proxy Bypass:** To manage the Proxy Bypass PAC URL or to enter the Proxy Bypasses manually.
- **Routed Bypass:** To manage the Routed Bypass URL or to enter the Routed Bypasses manually.
- **Log Information:** Shows activity logs.
- **Configuration Wizards:** To rerun the initial wizard, switch tunnels and configuring HA.
- **MHB Labs – Private Access:** To configure and monitor Private Access.

6.1 Monitoring Tasks

6.1.1 Show Configuration and Status

```
GENERAL INFORMATION
Availability Zone: us-east-1d
EC2 Instance id: i-0283558d4cfb35311 | Instance Type: t3a.medium | ami-id: ami-08c2df7e5356a8de6
External Interface (eth0) Subnet-id: subnet-818c0ddb | Interface-id: eni-040f25fe5fc7482bd | Security-Group-id: sg-0b81ea809def53ee8
Internal Interface (eth1) Subnet-id: subnet-8360ecd9 | Interface-id: eni-0c122595d457ffce6 | Security-Group-id: sg-007aabb93a98a659b
CSC date: Sun 2 Jan 20:09:45 UTC 2022
Soft version : 1.0

INTERFACES INFORMATION
External: Tunnel IP (eth0): 172.31.96.172/24 | Bypass Proxy Egress IP: 172.31.96.185 | Network Gateway: 172.31.96.1 is Alive
Internal: CSC GW IP (eth1): 172.31.200.220/24 | Network Gateway: 172.31.200.1 is Alive

TRAFFIC REDIRECTION Options
To Netskope: VIP Proxy: 172.31.200.68:80 | Route all traffic via CSC GW IP | Netskope Global Proxy IP: 163.116.128.80:80 via CSC GW IP
Direct to Internet: Bypass Proxy: 172.31.200.128:3128 | Netskope Global Proxy IP: 163.116.128.80:3128 via CSC GW IP

ELASTIC (PUBLIC) IPs INFORMATION
GRE tunnels Public IP: 54.197.86.154
Bypass Proxy Public IP: 54.80.198.195

DNS INFORMATION
DNS Server (1) IP: 1.1.1.1 is Alive
DNS Server (2) IP: 8.8.8.8 is Alive

NETSKOPE INFORMATION
GRE tunnels egress Public IP: 54.197.86.154

Primary Tunnel:
                Node : US,Washington,IAD2
                Node Public IP: 163.116.146.36
                Node Probe: 10.146.6.209
Secondary Tunnel:
                Node : US,NewYork,NYC1
                Node Public IP: 163.116.135.36
                Node Probe: 10.135.6.209

TUNNEL STATUS
Primary Tunnel (reachability):
                            Node Keepalive is: Alive
                            GRE Tunnel IP is: Alive
Secondary Tunnel (reachability):
                            Node Keepalive is: Alive
                            GRE Tunnel IP is: Alive
returnToPrimaryTunnel: false

Tunnel Status: Primary tunnel is active since: Sun 2 Jan 16:26:12 UTC 2022

HTTP://WWW.NOTSKOPE.COM PAGE STATUS
163.116.146.117 Ashburn, United States (IAD2)

PROXY BYPASS - EGRESS INTERFACE STATUS
Proxy Bypass Egress Interface 172.31.96.185 can reach test page (https://ip.maidenheadbridge.com) via Public IP 54.80.198.195

ROUTED BYPASS
Using Routed Bypass URL: https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json
Routed Bypass URL https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json is reachable
Routed Bypass Rules configured via URL: 5

AWS SSM AGENT
AWS SSM Agent is active (running) since Sun 2022-01-02 16:25:38 UTC; 3h 44min ago
Registration values: {"ManagedInstanceID":"mi-0fc0d5394a2bfefed","Region":"us-east-1"}

SYSLOG INFORMATION
SYSLOG Server (1) IP: 172.31.200.163 is Alive
SYSLOG Server (2) IP is not configured
SYSLOG TCP Port: 514

HIGH AVAILABILITY Information
The HA service is:  active (running) since Sun 2022-01-02 20:04:14 UTC; 5min ago
IAM role in use: arn:aws:iam::544690173127:instance-profile/csc-ha-aws-role
The Default Route to Internet is using this Gateway (Target): eni-0c122595d457ffce6 (this CSC)
Current values configured are:
Route Table/s Configured (Qty)= 1  (using VPC: vpc-0f32a676)
Route Table ID= rtb-d090c8a8
Instance ID of other CSC in the pair= i-08cd4663125d25b0e
SNS message ARN= arn:aws:sns:us-east-1:544690173127:csc-aws-ha-notification
Private Access Public IP= 54.80.198.195

Press Enter to continue...
```

6.1.1.1 GENERAL INFORMATION

This section contains general information about the instance:

```
GENERAL INFORMATION
Availability Zone: us-east-1d
EC2 Instance id: i-0283558d4cfb35311 | Instance Type: t3a.medium | ami-id: ami-08c2df7e5356a8de6
External Interface (eth0) Subnet-id: subnet-818c0ddb | Interface-id: eni-040f25fe5fc7482bd | Security-Group-id: sg-0b81ea809def53ee8
Internal Interface (eth1) Subnet-id: subnet-8360ecd9 | Interface-id: eni-0c122595d457ffce6 | Security-Group-id: sg-007aabb93a98a659b
CSC date: Sun 2 Jan 11:13:36 UTC 2022
Soft version : 1.0
```

Important: *Please, note the "Interface-id:" value. You will need it if routing traffic via the CSC.*

6.1.1.2 INTERFACES INFORMATION

This section contains the interfaces information:

```
INTERFACES INFORMATION
External: Tunnel IP (eth0): 172.31.96.172/24 | Bypass Proxy Egress IP: 172.31.96.185 | Network Gateway: 172.31.96.1 is Alive
Internal: CSC GW IP (eth1): 172.31.200.220/24 | Network Gateway: 172.31.200.1 is Alive
```

6.1.1.3 TRAFFIC REDIRECTION Options

The section contains information about how to steer traffic to Netskope.

```
TRAFFIC REDIRECTION Options
To Netskope: VIP Proxy: 172.31.200.68:80 | Route all traffic via CSC GW IP | Netskope Global Proxy IP: 163.116.128.80:80 via CSC GW IP
Direct to Internet: Bypass Proxy: 172.31.200.128:3128 | Netskope Global Proxy IP: 163.116.128.80:3128 via CSC GW IP
```

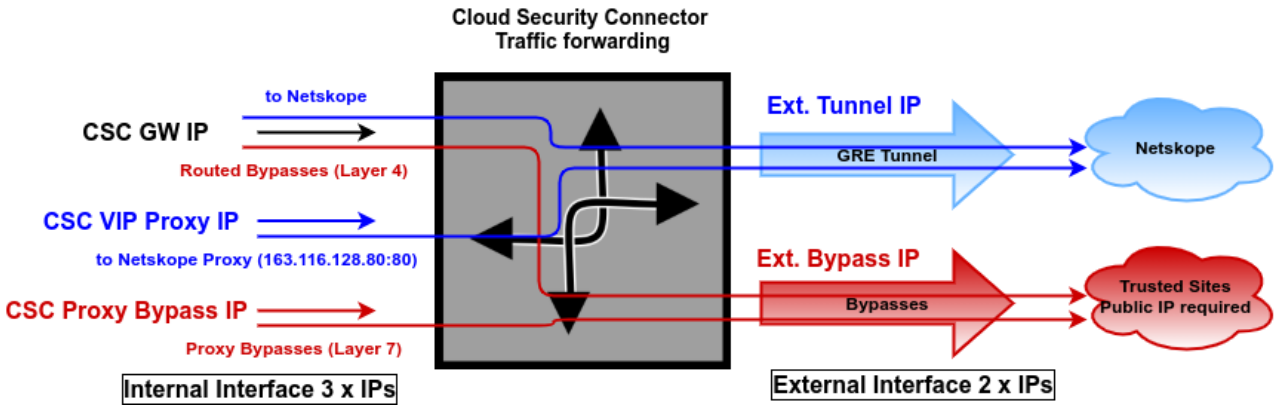
The objective of the Cloud Security Connectors of Maidenhead Bridge is to provide a simple architecture, 100% proven that works when connecting to Netskope.

Every member of the CSC family follows the principle of "three IPs" on the internal side:

- **CSC GW IP (*)**: To be used as Default Gateway for internal devices behind the CSC redirecting all ports and protocols to Netskope when using Cloud Firewall. Traffic routed via CSC GW IP can be bypassed from Netskope using "Routed Bypasses" (Layer 4).
- **VIP Proxy:** This Virtual IP Proxy translates the packets directly to the Netskope proxy. To be used when PAC files are implemented or explicit proxy.
- **Bypass Proxy IP:** The Bypass Proxy enables a simple way to do Layer 7 Bypasses to the Internet. To be used when PAC files are implemented.

(*) *On AWS routing tables, the value to use as a GW is the "Interface-id:" (eni-xxyyzz)*

Here an illustration about this:



Important: *Please, see Chapter 7 for detailed information about traffic redirection (with examples)*

6.1.1.4 ELASTIC (PUBLIC) IPs INFORMATION

This section shows the Public IP used to initiate the tunnels to Netskope and the Public IP used for the Bypass Proxy functionality.

```
ELASTIC (PUBLIC) IPs INFORMATION
GRE tunnels Public IP: 54.197.86.154
Bypass Proxy Public IP: 54.80.198.195
```

6.1.1.5 DNS INFORMATION

This section displays the DNS information. You can use the default DNS server from AWS and Google or set up your DNS servers.

```
DNS INFORMATION
DNS Server (1) AWS DNS IP: 169.254.169.253
DNS Server (2) Google DNS IP: 8.8.8.8
```

6.1.1.6 NETSKOPE INFORMATION

This section show the GRE tunnel information.

```
NETSKOPE INFORMATION
GRE tunnels egress Public IP: 54.197.86.154

Primary Tunnel:
                Node : US,Washington,IAD2
                Node Public IP: 163.116.146.36
                Node Probe: 10.146.6.209
Secondary Tunnel:
                Node : US,NewYork,NYC1
                Node Public IP: 163.116.135.36
                Node Probe: 10.135.6.209
```

6.1.1.7 TUNNEL STATUS

This section shows the KeepAlives & Probes to Netskope's Primary and Secondary Nodes and the Tunnel Status.

```
TUNNEL STATUS
Primary Tunnel (reachability):
                              Node Keepalive is: Alive
                              GRE Tunnel IP is: Alive
Secondary Tunnel (reachability):
                              Node Keepalive is: Alive
                              GRE Tunnel IP is: Alive
returnToPrimaryTunnel: true

Tunnel Status: Primary tunnel is active since: Sun 2 Jan 09:58:23 UTC 2022
```

6.1.1.8 HTTP://WWW.NOTSKOPE.COM PAGE STATUS

This section shows the result of a HTTP GET from inside the CSC to URL: http://www.notskope.com

```
HTTP://WWW.NOTSKOPE.COM PAGE STATUS
163.116.146.119 Ashburn, United States (IAD2)
```

6.1.1.9 PROXY BYPASS - EGRESS INTERFACE STATUS

This sections validates if the Proxy Bypass can access internet directly going to https://ip.maidenheadbridge.com

```
PROXY BYPASS - EGRESS INTERFACE STATUS
Proxy Bypass Egress Interface 172.31.96.185 can reach test page (https://ip.maidenheadbridge.com) via Public IP 54.80.198.195
```

6.1.1.10 ROUTED BYPASS

This section shows the configuration of Routed Bypasses.

```
ROUTED BYPASS
Using Routed Bypass URL: https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json
Routed Bypass URL https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json is reachable
Routed Bypass Rules configured via URL: 5
```

6.1.1.11 AWS SSM AGENT

This section shows the status of the AWS SSM Agent.

```
AWS SSM AGENT
AWS SSM Agent is active (running) since Sun 2022-01-02 12:45:11 UTC; 6min ago
Registration values: {"ManagedInstanceID":"mi-0fc0d5394a2bfefed","Region":"us-east-1"}
```

6.1.1.12 SYSLOG/SIEM Servers Information

When configured, this section will show the IP/s and TCP port of your Syslog/SIEM server.

```
SYSLOG INFORMATION
SYSLOG Server (1) IP: 172.31.200.163 is Alive
SYSLOG Server (2) IP is not configured
SYSLOG TCP Port: 514
```

6.1.1.13 HIGH AVAILABILITY Information

This section all the information when the CSC are configured on HA pair:

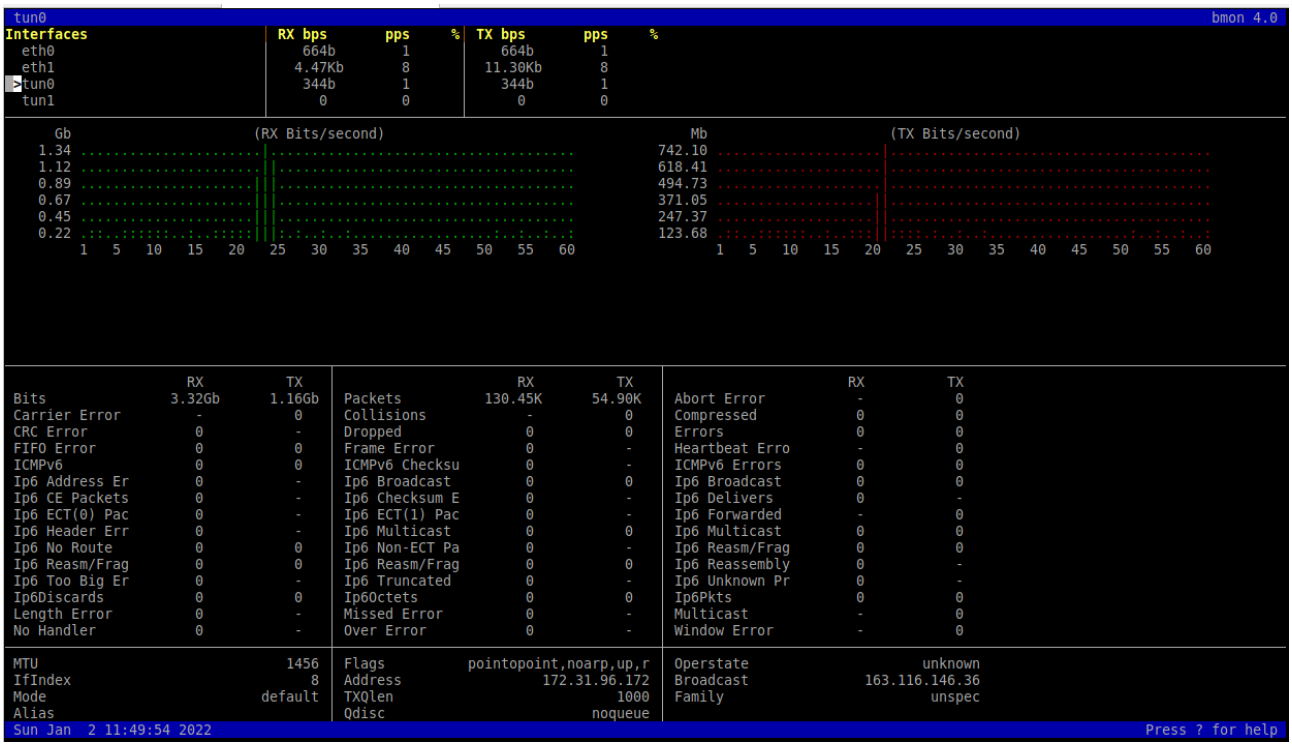
```
HIGH AVAILABILITY Information
The HA service is:  active (running) since Sun 2022-01-02 20:04:14 UTC; 12h ago
IAM role in use: arn:aws:iam::544690173127:instance-profile/csc-ha-aws-role
The Default Route to Internet is using this Gateway (Target): eni-0c122595d457ffce6 (this CSC)
Current values configured are:
Route Table/s Configured (Qty)= 1  (using VPC: vpc-0f32a676)
Route Table ID= rtb-d090c8a8
Instance ID of other CSC in the pair= i-08cd4663125d25b0e
SNS message ARN= arn:aws:sns:us-east-1:544690173127:csc-aws-ha-notification
Private Access Public IP= 54.80.198.195
```

- If HA service is active.
- The IAM role in use.
- The current “eni-xxyy” that is the default GW to the Internet for the Route Table/s.
- Amount of Route Tables configured and VPC in use.
- The Route table ID/s.

- Which is the Instance ID of other CSC on the HA pair.
- The SNS message used for notification.
- Private Access Public IP.

6.1.2 Show Interfaces Traffic

Use this section to see the traffic in real time.



6.1.3 Traceroute and Latency Test

This test can validate the quality of the Internet path between your location and Netskope. You can run it with tunnels down or up. When the tunnels are up, it does a “Reverse Path” test from your active Netskope node to your location. This test is beneficial to check if there is any packet loss at some point.

```
My TraceRoute (MTR) Test Report
This test does 10 probes DIRECT to Primary / Secondary Netskope Nodes and a Reverse test via Active Tunnel to Public IP: 54.197.86.154.
NOTE 1: Max Hops is equal 30. This test can take a while.
NOTE 2: If you cannot see intermediate steps to Primary / Secondary, check if ICMP Time exceed (icmp type 11) is allowed to reach IP: 172.31.96.172 from the Internet.
NOTE 3: For the Reverse test to work, you need to allow ICMP out to 'Any' on the Netskope Console.

Testing Primary Node: 163.116.146.36
Start: 2022-01-02T11:54:11+0000
HOST: ip-172-31-96-172                                          Loss%   Snt   Last   Avg  Best  Wrst StDev
  1. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  2. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  3. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  4. AS???    241.0.4.85                                          0.0%   10    0.4   0.4   0.3   0.5   0.1
  5. AS???    243.253.19.70                                       0.0%   10    0.3   0.4   0.3   0.4   0.0
  6. AS???    240.0.36.17                                         0.0%   10    0.4   0.4   0.3   0.4   0.0
  7. AS???    240.0.36.6                                          0.0%   10    0.4   0.4   0.3   0.6   0.1
  8. AS???    242.0.163.33                                        0.0%   10    0.7   0.6   0.4   0.8   0.2
  9. AS???    52.93.28.155                                        0.0%   10   16.4   3.0   1.0  16.4   4.7
 10. AS???    100.100.2.72                                        0.0%   10    1.2   1.5   1.0   3.7   0.8
 11. AS174    be5855.ccr42.dca01.atlas.cogentco.com (38.140.146.185)   0.0%   10    2.6   2.6   2.5   2.8   0.1
 12. AS174    be3084.ccr41.iad02.atlas.cogentco.com (154.54.30.66)     0.0%   10    2.8   2.9   2.7   3.4   0.2
 13. AS174    te0-0-0-0.agr11.iad02.atlas.cogentco.com (154.54.44.198)   0.0%   10    2.7   2.7   2.6   3.0   0.1
 14. AS174    te0-0-1-0.nr12.b045972-0.iad02.atlas.cogentco.com (154.24.32.134)   0.0%   10    3.2   3.3   3.2   3.8   0.2
 15. AS1299   netskope-svc070515-ic356561.ip.twelve99-cust.net (62.115.147.51)   0.0%   10    2.7   2.7   2.6   2.7   0.0
 16. AS55256  163.116.146.36                                       0.0%   10    2.5   2.6   2.5   2.6   0.1

Testing Secondary Node: 163.116.135.36
Start: 2022-01-02T11:54:27+0000
HOST: ip-172-31-96-172                                          Loss%   Snt   Last   Avg  Best  Wrst StDev
  1. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  2. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  3. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  4. AS???    241.0.4.219                                         0.0%   10    0.4   0.3   0.3   0.4   0.0
  5. AS???    243.253.22.206                                      0.0%   10    0.3   0.4   0.3   0.6   0.1
  6. AS???    240.0.40.16                                         0.0%   10    0.3   0.4   0.3   1.2   0.3
  7. AS???    240.0.40.7                                          0.0%   10    0.3   0.3   0.3   0.4   0.0
  8. AS???    242.0.171.129                                       0.0%   10    0.4   0.5   0.3   0.7   0.1
  9. AS???    52.93.28.173                                        0.0%   10    1.3   1.6   0.9   4.5   1.1
 10. AS???    100.100.8.6                                         0.0%   10    1.1   1.1   1.0   1.2   0.1
 11. AS???    100.91.192.9                                        0.0%   10    6.5   6.5   6.5   6.7   0.1
 12. AS???    52.93.1.1                                           0.0%   10   11.5  14.2   7.1  18.6   4.1
 13. AS???    52.93.51.32                                         0.0%   10    6.5   7.4   6.5  13.0   2.0
 14. AS???    ipv4.de-cix.nyc.us.as55256.netskope.com (206.82.104.169)   0.0%   10    7.0   7.0   6.9   7.2   0.1
 15. AS55256  163.116.135.36                                      0.0%   10    6.9   7.0   6.9   7.1   0.1

Reverse path from: 163.116.146.36 to your Public IP: 54.197.86.154
Start: 2022-01-02T11:54:42+0000
HOST: ip-172-31-96-172                                          Loss%   Snt   Last   Avg  Best  Wrst StDev
  1. AS???    ip-10-146-6-209.ec2.internal (10.146.6.209)         0.0%   10    2.6   2.7   2.6   2.8   0.0
  2. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  3. AS55256  163.116.146.3                                       0.0%   10    3.3   3.2   3.1   3.4   0.1
  4. AS1299   ash-b1-link.ip.twelve99.net (62.115.147.50)        0.0%   10    3.6   3.7   3.5   4.1   0.2
  5. AS1299   vadata-svc077201-lag003749.ip.twelve99-cust.net (62.115.63.81)   0.0%   10    3.8   4.1   3.3   6.4   1.1
  6. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  7. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
  8. AS???    52.93.29.202                                        0.0%   10    4.8   4.5   4.2   4.8   0.2
  9. AS???    ???                                               100.0    10    0.0   0.0   0.0   0.0   0.0
```

6.1.4 SPEED TEST

This test is experimental because we use third-party tools (speedtest.net), but it works fine in most cases.

```
SPEED TEST
This is experimental. We are using third party tools. (Speedtest.net)
Results can be inaccurate or none. The test takes a while

Retrieving speedtest.net configuration...
Testing from Netskope (163.116.146.119)...
Retrieving speedtest.net server list...
Selecting best server based on ping...
Hosted by Netprotect (Ashburn, VA) [0.81 km]: 5.564 ms
Testing download speed................................................
Download: 1317.16 Mbit/s
Testing upload speed..................................................
Upload: 1137.61 Mbit/s
```

6.2 CSC Admin Tasks

```
CSC Admin tasks
5) AWS SSM Agent (Register or De-Register)
6) Manage Administrators
7) Change Timezone
```

6.2.1 AWS SSM Agent (Register or De-Register)

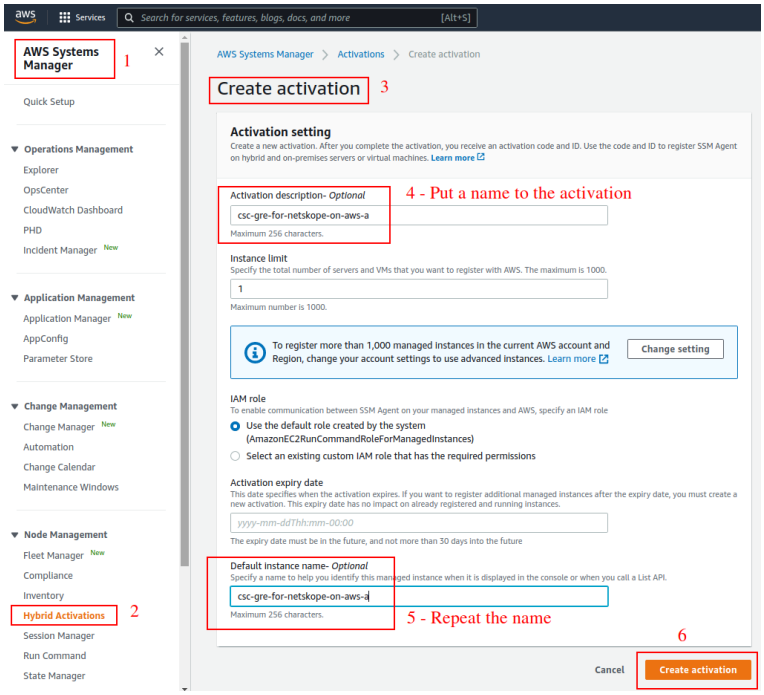
The CSC AWS has installed the AWS SSM Agent that allows you to check remotely the status of the CSC and “Run Commands” using AWS Systems Manager. You can manage all CSCs models[3] using AWS Systems Manager.

***Note**: You can learn more about “Run Commands” on Appendix B*

Steps to create a "Hybrid Activation" and "Register the CSC".

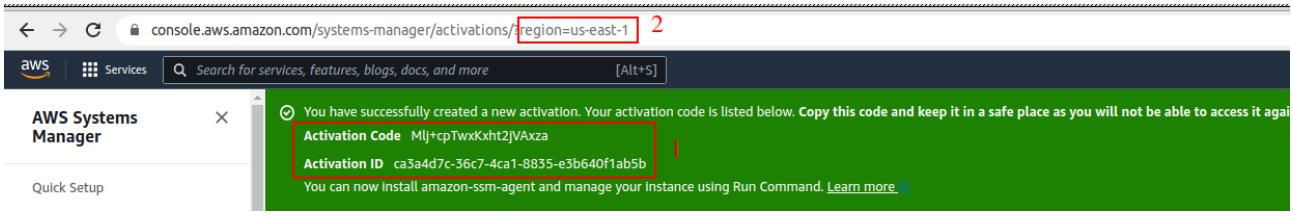
6.2.1.1 Create a "Hybrid Activation" from AWS console.

On your AWS Console, go to Services → Systems Manager → Node Management → Hybrid Actications and click "Create". Fill the values on shown below:



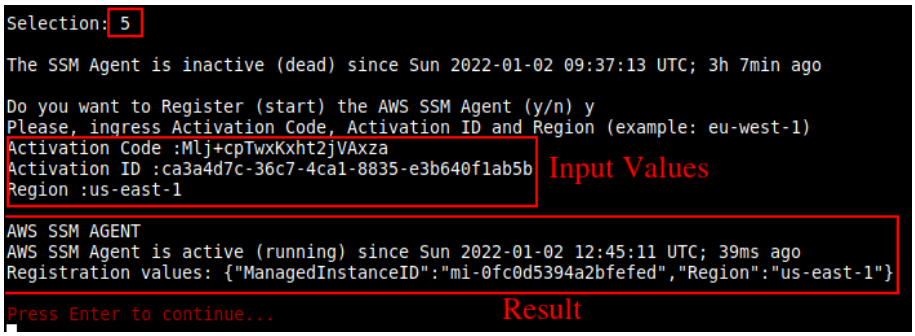
3 For Vmware, Hyper-V, KVM, Azure, Gcloud and AWS.

→ Click "Create Activation"

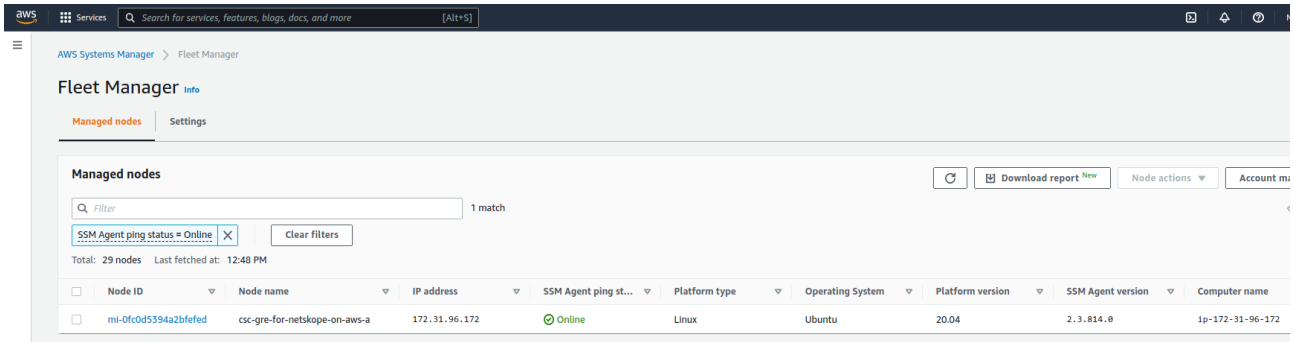


The vaules of Actication Code, Activation ID and Region are required to register the CSC. Keep this values on a safe place.

6.2.1.2 Register the CSC



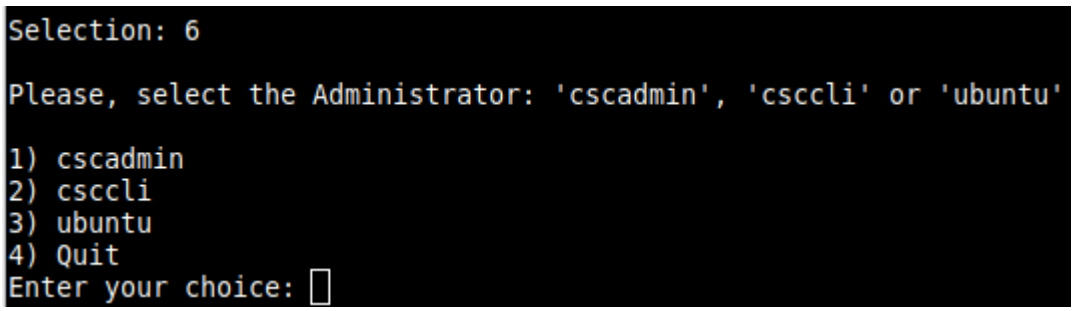
6.2.1.3 View the Registered CSC on AWS Systems Manager



6.2.2 Manage Administrators

The CSC for AWS has 3 users configured: cscadmin (for SSH Administrator Console Access), csccli (standard user) and ubuntu (standard user).

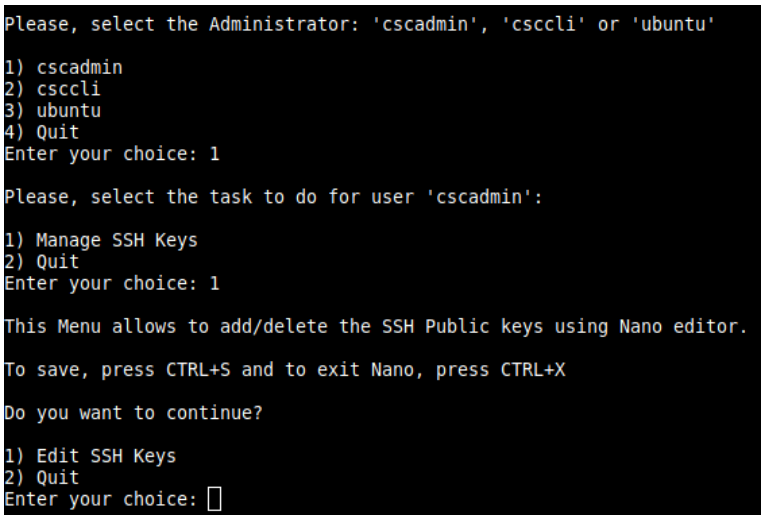
From this menu, you can edit the SSH Keys of each one or to disable the user. By default, cscadmin and ubuntu user have the same SSH key configured and are enabled. The user csccli is disabled by default.



Note: *the user "cscadmin" cannot be disabled.*

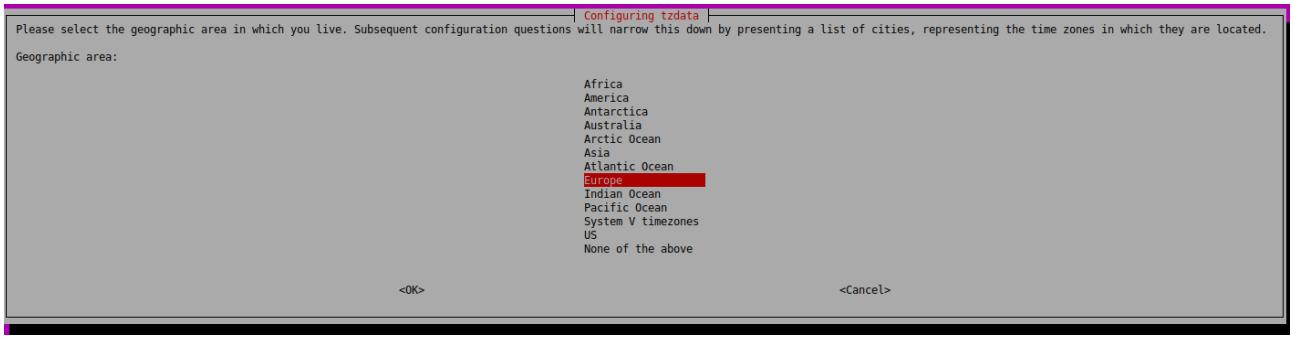
6.2.2.1 Managing the SSH Key of a User

You can add/remove keys for a User using "nano editor" when selecting the user from the previous menu.



6.2.3 Change Timezone

Use this menu to select the timezone of the CSC.

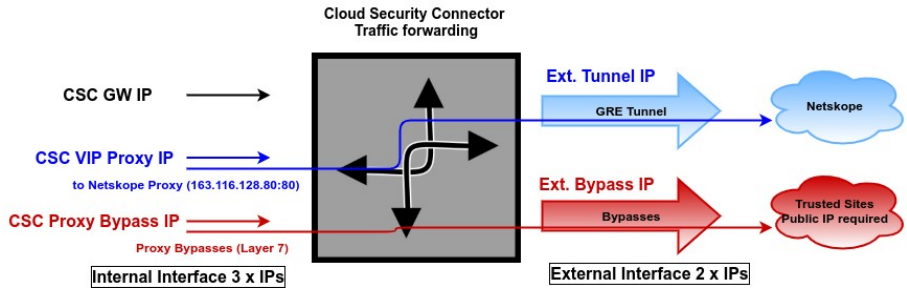

Configuring tzdata
Please select the geographic area in which you live. Subsequent configuration questions will narrow this down by presenting a list of cities, representing the time zones in which they are located.
Geographic area:
Africa
America
Antarctica
Australia
Arctic Ocean
Asia
Atlantic Ocean
Europe
Indian Ocean
Pacific Ocean
System V timezones
US
None of the above
<OK>
<Cancel>

6.3 Proxy Bypass

The Proxy Bypass functionality allows doing layer 7 bypasses. This functionality works in conjunction with PAC files.

```
Proxy Bypass
8) View Current Proxy Bypass List
9) Configure Proxy Bypass List
```

6.3.1 Proxy Bypass - Traffic Flow



6.3.2 View Current Proxy Bypass List

This menu displays the current Proxy Bypass List. For example:

```
Selection: 8

This is the list of current Domains configured:

login.microsoftonline.com
login.microsoft.com
login.windows.net
portquiz.net

Press Enter to continue...
```

6.3.3 Configure Proxy Bypass List

This menu allows to configure the Proxy Bypass List.

```
Please, select method to configure Proxy Bypass List

1) Auto - Proxy Bypass PAC URL
2) Manual
3) Quit
Enter your choice:
```

6.3.3.1 Auto - Proxy Bypass PAC URL

Auto–Proxy Bypass PAC URL is the recommended method to use. You need to create a "Proxy Bypass PAC file" and host the PAC file somewhere on the internet, for example, using an AWS S3 bucket. The CSC will read the "Proxy Bypass List" from the "Proxy Bypass PAC file" URL.

The "Proxy Bypass PAC file" URL acts is a central repository of all Layer 7 bypasses required. Moreover, if you manage the CSCs using AWS Systems Manager (or another tool), you can update all CSCs in your network doing one command.

Example of Proxy Bypass PAC:

```
Please, select method to configure Proxy Bypass List

1) Auto - Proxy Bypass PAC URL
2) Manual
3) Quit
Enter your choice: 1

Please, select method to configure Proxy Bypass List

1) Configure Proxy Bypass PAC URL and/or Update Proxy Bypasses
2) See PAC Proxy Bypass Example
3) Quit
Enter your choice: 2

function FindProxyForURL(url, host) {
        var bypassproxy="PROXY 1.1.1.1:3128; PROXY 2.2.2.2:3128";

// ======================================================
    // Section 3: Bypass via Cloud Security Connectors

    // Bypass via CSC Public IPs (Examples)
    // Okta Domains (for Location Rules)
    if ((shExpMatch(host, "*.okta.com")) ||
        (shExpMatch(host, "*.oktacdn.com")) ||
        (shExpMatch(host, "*.okta-emea.com")) ||
        (shExpMatch(host, "login.mydomain.com")) ||
        // O365 Domains for ConditionalAccess
        (shExpMatch(host, "login.microsoftonline.com")) ||
        (shExpMatch(host, "login.microsoft.com")) ||
        (shExpMatch(host, "login.windows.net")) ||
        // IP Test Page
        (shExpMatch(host, "ip.maidenheadbridge.com"))) {
        return bypassproxy
    }

    return bypassproxy
}
```

Note 1: It is mandatory to use this function and format. Feel free to add lines but don't change the format. We recommend to start filling the first line and the last line. Use middle lines for copy/paste.

Note 2: The Bypass Proxy port is 3128

Configuring the Proxy Bypass PAC URL and Refresh the List

```
Selection: 9

Please, select method to configure Proxy Bypass List

1) Auto - Proxy Bypass PAC URL
2) Manual
3) Quit
Enter your choice: 1

Please, select method to configure Proxy Bypass List

1) Configure Proxy Bypass PAC URL and/or Update Proxy Bypasses
2) See PAC Proxy Bypass Example
3) Quit
Enter your choice: 1
Proxy Bypass Configuration

Your current Proxy Bypass PAC URL is https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac

Do you want to change the Proxy Bypass PAC URL?
1) Yes
2) No
Enter your choice: 1

Please, input Proxy Bypass PAC URL
Bypass PAC URL:https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac

Your current Proxy Bypass PAC URL is https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac

Do you want to refresh Proxy Bypass List?
1) Yes
2) No
Enter your choice: 1

This is your current Proxy Bypass List

login.microsoftonline.com
login.microsoft.com
login.windows.net
portquiz.net


Do you want apply changes?
1) Yes
2) No
Enter your choice: 1

Proxy Bypass List updated sucessfully.
```

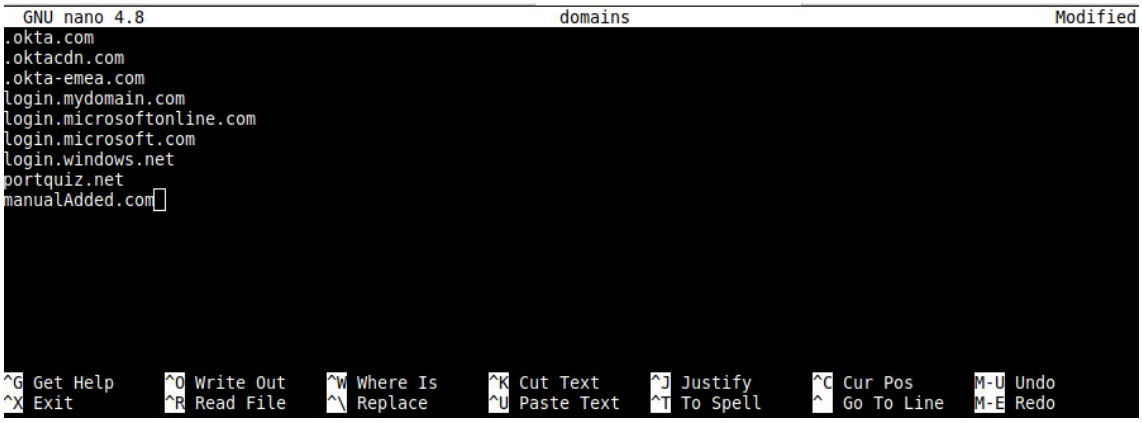
6.3.3.2 Manual Proxy Bypass Configuration.

If you want to update manually your Proxy Bypass list, follow this steps.

1. Select Option 2)

```
1) Auto - Proxy Bypass PAC URL
2) Manual
3) Quit
Enter your choice: 2

Please, read the instructions carefully:

You are going to edit the list using NANO editor

The following formats are accepted:

Full Domains:  'www.example.com'
Wildcard for subdomains: '.example.com' - This will allow all subdomains of example.com

To save, press CTRL-X and 'Yes'

Paid attention to ERROR messages if any. ERRORs must be corrected before to continue

Do you want to continue? (y/n)?
```

2. Input "y"



3. Add / Delete / Modify your full domains and subdomains
4. Please, CTL+X and "Yes" (and after next prompt Enter) to Save
5. The modified Bypass List will be displayed.

```
This is your current Proxy Bypass List

.okta.com
.oktacdn.com
.okta-emea.com
login.mydomain.com
login.microsoftonline.com
login.microsoft.com
login.windows.net
portquiz.net
manualAdded.com


Do you want apply changes?
1) Yes
2) No
Enter your choice:
```

6. Apply Changes Yes or No. If "1" you will receive the following message:

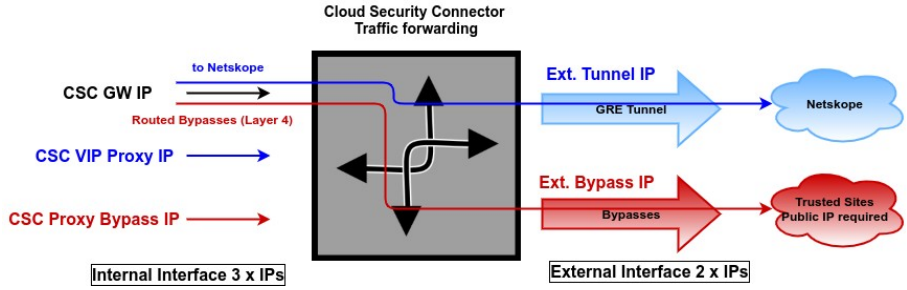
```
Do you want apply changes?
1) Yes
2) No
Enter your choice: 1

Proxy Bypass List updated sucessfully.
```

6.4 Routed Bypass

When routing all traffic via the CSC GW IP, the Routed Bypass functionality allows you to connect specific destinations (IP/Subnet) direct to the Internet, using your Public IP. By default, all destinations will travel via the GRE tunnel to Netskope. If you want to bypass the GRE tunnel, you need to create a Routed Bypass Rule.

```
Routed Bypass
10) View Current Routed Bypass List
11) Configure Routed Bypass List
```

6.4.1 Routed Bypass - Traffic Flow



6.4.2 View Current Routed Bypass List

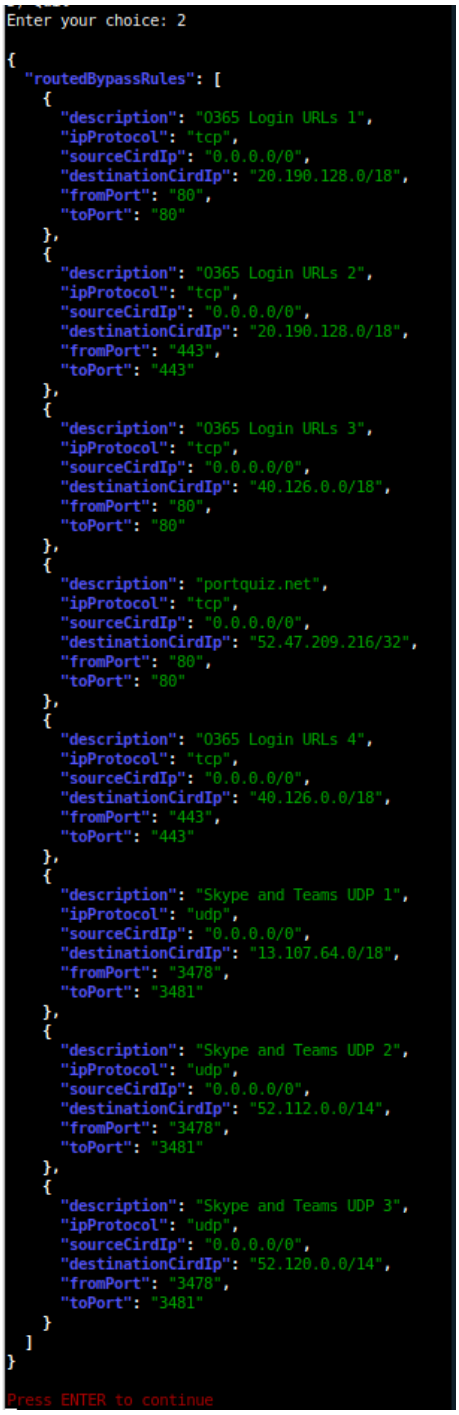
You can select to view the Routed Bypass Rules in Compact format or JSON.

```
Selection: 10

Please, Select 'Compact' or 'Json' format
1) Compact
2) Json
3) Quit
Enter your choice:
```

6.4.2.1 Compact

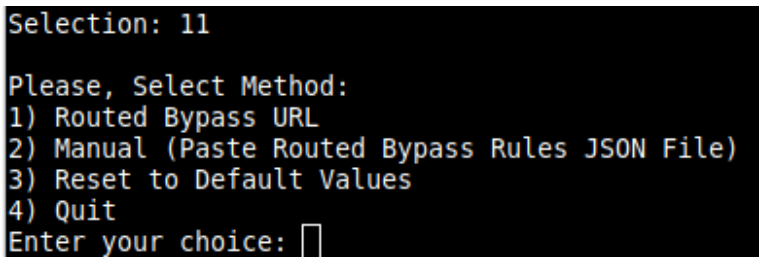
```
Current Values configured are:

Index: 0, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 20.190.128.0/18, FromPort: 80, To Port: 80, Description: "O365 Login URLs 1"
Index: 1, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 20.190.128.0/18, FromPort: 443, To Port: 443, Description: "O365 Login URLs 2"
Index: 2, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 40.126.0.0/18, FromPort: 80, To Port: 80, Description: "O365 Login URLs 3"
Index: 3, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 52.47.209.216/32, FromPort: 80, To Port: 80, Description: "portquiz.net"
Index: 4, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 40.126.0.0/18, FromPort: 443, To Port: 443, Description: "O365 Login URLs 4"
Index: 5, Protocol: udp, SourceIP: 0.0.0.0/0, DestinationIP: 13.107.64.0/18, FromPort: 3478, To Port: 3481, Description: "Skype and Teams UDP 1"
Index: 6, Protocol: udp, SourceIP: 0.0.0.0/0, DestinationIP: 52.112.0.0/14, FromPort: 3478, To Port: 3481, Description: "Skype and Teams UDP 2"
Index: 7, Protocol: udp, SourceIP: 0.0.0.0/0, DestinationIP: 52.120.0.0/14, FromPort: 3478, To Port: 3481, Description: "Skype and Teams UDP 3"
```

6.4.2.2 Json


Enter your choice: 2
{
"routedBypassRules": [
{
"description": "O365 Login URLs 1",
"ipProtocol": "tcp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "20.190.128.0/18",
"fromPort": "80",
"toPort": "80"
},
{
"description": "O365 Login URLs 2",
"ipProtocol": "tcp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "20.190.128.0/18",
"fromPort": "443",
"toPort": "443"
},
{
"description": "O365 Login URLs 3",
"ipProtocol": "tcp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "40.126.0.0/18",
"fromPort": "80",
"toPort": "80"
},
{
"description": "portquiz.net",
"ipProtocol": "tcp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "52.47.209.216/32",
"fromPort": "80",
"toPort": "80"
},
{
"description": "O365 Login URLs 4",
"ipProtocol": "tcp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "40.126.0.0/18",
"fromPort": "443",
"toPort": "443"
},
{
"description": "Skype and Teams UDP 1",
"ipProtocol": "udp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "13.107.64.0/18",
"fromPort": "3478",
"toPort": "3481"
},
{
"description": "Skype and Teams UDP 2",
"ipProtocol": "udp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "52.112.0.0/14",
"fromPort": "3478",
"toPort": "3481"
},
{
"description": "Skype and Teams UDP 3",
"ipProtocol": "udp",
"sourceCirdIp": "0.0.0.0/0",
"destinationCirdIp": "52.120.0.0/14",
"fromPort": "3478",
"toPort": "3481"
}
]
}
Press ENTER to continue

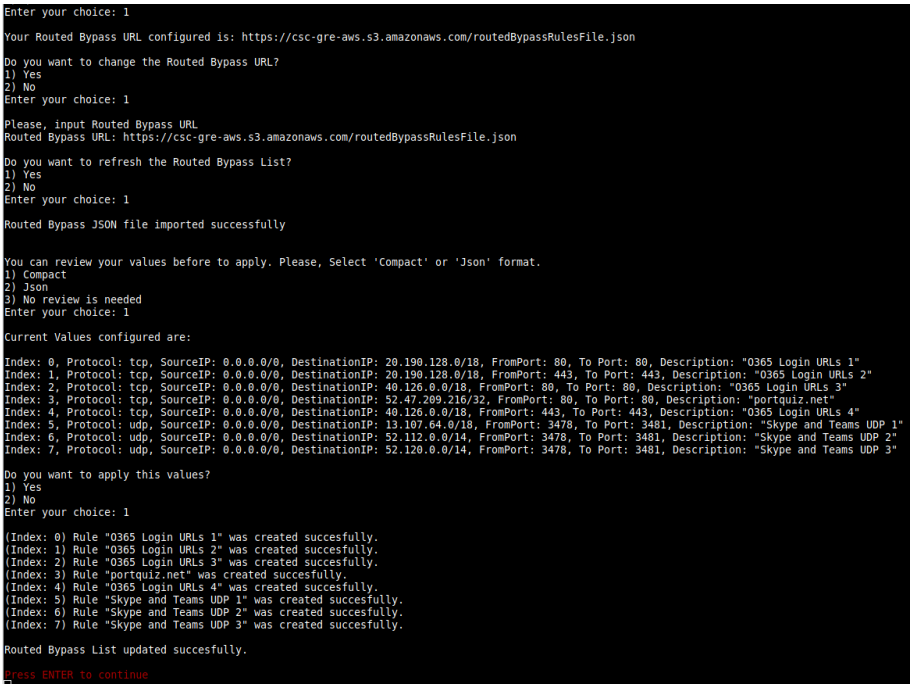
6.4.3 Configure Routed Bypass List

There are two methods to configure the Routed Bypass List: Routed Bypass URL and Manual. The recommended method is to use Routed Bypass URL.



6.4.3.1 Routed Bypass URL

Routed Bypass URL is the recommended method. Create an AWS bucket and place your JSON file on it. Here an example:
https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json



6.4.3.2 Manual (Paste Routed Bypass JSON file)

Another option to configure Routed Bypass Rules is to paste the JSON file using the following menu:

```
Enter your choice: 2


WARNING: Manual Configuration will remove the Bypass Routed URL if configured.

Do you want to paste the Routed Bypass Rules JSON File?
1) Yes
2) No
Enter your choice: 1

Please, paste Routed Bypass JSON File and press 'Enter' if required.

NOTE: If the json file has errors, it is possible that the script will hang. Press '}' and 'Enter' to end the operation.

Routed Bypass JSON file:
```

and paste the JSON file. The JSON file will be displayed, and if no errors are found, you can apply the changes:

```
        },
        {
            "description": "Skype and Teams UDP 3",
            "ipProtocol": "udp",
            "sourceCirdIp": "0.0.0.0/0",
            "destinationCirdIp": "52.120.0.0/14",
            "fromPort": "3478",
            "toPort": "3481"
        }
    ]
}

Routed Bypass JSON file imported successfully


You can review your values before to apply. Please, Select 'Compact' or 'Json' format.
1) Compact
2) Json
3) No review is needed
Enter your choice: 1

Current Values configured are:

Index: 0, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 20.190.128.0/18, FromPort: 80, To Port: 80, Description: "O365 Login URLs 1"
Index: 1, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 20.190.128.0/18, FromPort: 443, To Port: 443, Description: "O365 Login URLs 2"
Index: 2, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 40.126.0.0/18, FromPort: 80, To Port: 80, Description: "O365 Login URLs 3"
Index: 3, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 52.47.209.216/32, FromPort: 80, To Port: 80, Description: "portquiz.net"
Index: 4, Protocol: tcp, SourceIP: 0.0.0.0/0, DestinationIP: 40.126.0.0/18, FromPort: 443, To Port: 443, Description: "O365 Login URLs 4"
Index: 5, Protocol: udp, SourceIP: 0.0.0.0/0, DestinationIP: 13.107.64.0/18, FromPort: 3478, To Port: 3481, Description: "Skype and Teams UDP 1"
Index: 6, Protocol: udp, SourceIP: 0.0.0.0/0, DestinationIP: 52.112.0.0/14, FromPort: 3478, To Port: 3481, Description: "Skype and Teams UDP 2"
Index: 7, Protocol: udp, SourceIP: 0.0.0.0/0, DestinationIP: 52.120.0.0/14, FromPort: 3478, To Port: 3481, Description: "Skype and Teams UDP 3"

Do you want to apply this values?
1) Yes
2) No
Enter your choice: 1

(Index: 0) Rule "O365 Login URLs 1" was created succesfully.
(Index: 1) Rule "O365 Login URLs 2" was created succesfully.
(Index: 2) Rule "O365 Login URLs 3" was created succesfully.
(Index: 3) Rule "portquiz.net" was created succesfully.
(Index: 4) Rule "O365 Login URLs 4" was created succesfully.
(Index: 5) Rule "Skype and Teams UDP 1" was created succesfully.
(Index: 6) Rule "Skype and Teams UDP 2" was created succesfully.
(Index: 7) Rule "Skype and Teams UDP 3" was created succesfully.

Routed Bypass List updated succesfully.

Press ENTER to continue
```

6.5 Log Information

This section shows the Logs. You can see the Current Month or Last 6 Months.

```
Log Information
12) View Current Month
13) View Last 6 Months
```

6.5.1 View Current Month

```
Selection: 12

Current Month (October 2021) Logs for ns-cgc00002-a

Oct  4 18:31:06 root: (MHB-CSC)(STANDBY) ns-cgc00002-a is Cluster StandBy - No active tunnels
Oct  4 18:31:11 root: (MHB-CSC)(UP) CSC GRE Cluster was powered ON: Mon  4 Oct 18:31:11 UTC 2021
Oct  4 18:31:15 root: (MHB-CSC)(INFO) Routed Bypass Rules JSON file integrity is OK
Oct  4 18:31:16 root: (MHB-CSC)(INFO) (Index: 0) Rule "O365 Login URLs 1" was created succesfully.
Oct  4 18:31:17 root: (MHB-CSC)(INFO) (Index: 1) Rule "O365 Login URLs 2" was created succesfully.
Oct  4 18:31:18 root: (MHB-CSC)(INFO) (Index: 2) Rule "O365 Login URLs 3" was created succesfully.
Oct  4 18:31:18 root: (MHB-CSC)(INFO) (Index: 3) Rule "portquiz.net" was created succesfully.
Oct  4 18:31:19 root: (MHB-CSC)(INFO) (Index: 4) Rule "O365 Login URLs 4" was created succesfully.
Oct  4 18:31:20 root: (MHB-CSC)(INFO) (Index: 5) Rule "Skype and Teams UDP 1" was created succesfully.
Oct  4 18:31:21 root: (MHB-CSC)(INFO) (Index: 6) Rule "Skype and Teams UDP 2" was created succesfully.
Oct  4 18:31:21 root: (MHB-CSC)(INFO) (Index: 7) Rule "Skype and Teams UDP 3" was created succesfully.
Oct  4 18:32:16 root: (MHB-CSC)(UP) Primary tunnel is active since: Mon  4 Oct 18:32:16 UTC 2021
Oct  4 18:32:16 root: (MHB-CSC)(ACTIVE) ns-cgc00002-a is Cluster Active
Oct  4 18:38:01 cscadmin: (MHB-CSC)(INFO) User 'csccli' was enabled via console.
Oct  4 18:38:07 cscadmin: (MHB-CSC)(INFO) SSH Key file was modified for user 'csccli'.
```

6.5.2 View Last 6 Months

```
Selection: 13

Last 6 Months Logs up to Current Month (October 2021) for ns-cgc00002-a

Oct  4 18:31:06 root: (MHB-CSC)(STANDBY) ns-cgc00002-a is Cluster StandBy - No active tunnels
Oct  4 18:31:11 root: (MHB-CSC)(UP) CSC GRE Cluster was powered ON: Mon  4 Oct 18:31:11 UTC 2021
Oct  4 18:31:15 root: (MHB-CSC)(INFO) Routed Bypass Rules JSON file integrity is OK
Oct  4 18:31:16 root: (MHB-CSC)(INFO) (Index: 0) Rule "O365 Login URLs 1" was created succesfully.
Oct  4 18:31:17 root: (MHB-CSC)(INFO) (Index: 1) Rule "O365 Login URLs 2" was created succesfully.
Oct  4 18:31:18 root: (MHB-CSC)(INFO) (Index: 2) Rule "O365 Login URLs 3" was created succesfully.
Oct  4 18:31:18 root: (MHB-CSC)(INFO) (Index: 3) Rule "portquiz.net" was created succesfully.
Oct  4 18:31:19 root: (MHB-CSC)(INFO) (Index: 4) Rule "O365 Login URLs 4" was created succesfully.
Oct  4 18:31:20 root: (MHB-CSC)(INFO) (Index: 5) Rule "Skype and Teams UDP 1" was created succesfully.
Oct  4 18:31:21 root: (MHB-CSC)(INFO) (Index: 6) Rule "Skype and Teams UDP 2" was created succesfully.
Oct  4 18:31:21 root: (MHB-CSC)(INFO) (Index: 7) Rule "Skype and Teams UDP 3" was created succesfully.
Oct  4 18:32:16 root: (MHB-CSC)(UP) Primary tunnel is active since: Mon  4 Oct 18:32:16 UTC 2021
Oct  4 18:32:16 root: (MHB-CSC)(ACTIVE) ns-cgc00002-a is Cluster Active
```

6.6 Configuration Wizards

In this section, you can run the Configuration Wizard to change GRE Nodes, DNS servers, Etc; Switch tunnels, Update Netskope Nodes Databases and configure High Availability.

```
Configuration Wizards
14) Change Nodes, DNS servers, Syslog and more.
15) Switch Tunnels - Primary / Secondary.
16) Update Netskope Nodes Databases.
17) High Availability configuration.
```

6.6.1 Change Nodes, DNS servers, Syslog and more.

With this wizard you can change:

1. Netskope Nodes
2. DNS Servers
3. Bypass Proxy PAC URL
4. Routed Bypass JSON URL
5. Syslog Servers.

```
Selection: 14

Welcome to the CSC GRE Configuration Wizard

Please go to page: Settings -> Security Cloud Platform -> Traffic Steering Section -> GRE and check 'GRE configurations' to validate that 82.68.6.74 is added.

Current Values Configured:
------------------
NETSKOPE INFORMATION
GRE tunnels egress Public IP: 82.68.6.74

Primary Tunnel:
               Node : GB,London,LON1
               Node Public IP: 163.116.162.36
               Node Probe: 10.162.6.209
Secondary Tunnel:
               Node : GB,Manchester,MAN1
               Node Public IP: 163.116.165.36
               Node Probe: 10.165.6.209
returnToPrimaryTunnel: true
------------------
DNS Servers: 172.19.0.100 ; 1.1.1.1
------------------
Bypass Proxy PAC URL
Your current Proxy Bypass PAC URL is https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac
------------------
Routed Bypass URL
Your current Routed Bypass URL is https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json
------------------
Syslog / SIEM information
Primary Syslog / SIEM IP: 172.19.0.199
Secondary Syslog / SIEM IP: Not configured
Syslog / SIEM TCP port: 514
------------------
Are you ready to continue?
1) Yes
2) No
Enter your choice:
```

6.6.1.1 Running the Configuration Wizard

Select Nodes, Auto o Manual.

If you select "Auto" the CSC will select the nearest Netskope Nodes to "GRE Tunnels egress Public IP". If you select Manual, you can choose manually the Nodes Primary and Secondary.

```
--------------------
Are you ready to continue?
1) Yes
2) No
Enter your choice: 1
--------------------
NETSKOPE INFORMATION
GRE tunnels egress Public IP: 82.68.6.74

Primary Tunnel:
                Node : GB,London,LON1
                Node Public IP: 163.116.162.36
                Node Probe: 10.162.6.209
Secondary Tunnel:
                Node : GB,Manchester,MAN1
                Node Public IP: 163.116.165.36
                Node Probe: 10.165.6.209
returnToPrimaryTunnel: true

Do you want to change the Netskope Tunnel values?
1) Yes
2) No
Enter your choice: 1


------------------------------
Please, select Manual or Auto Node Selection

1) Manual
2) Auto
3) Quit
Enter your choice: 1
```

Selecting "Manual"

-> Select your Primary Node.

```
--------------------------
Please, select your Primary Node (Country/City/NodeID)

1) AE,Dubai,DXB1                9) BR,SaoPaulo,SAO1             17) DE,Frankfort,FRA1           25) IN,Chennai,MAA1             33) NZ,Auckland,AKL1            41) US,LosAngeles,LAX1          49) Not in the list? Input Manually
2) AE,Dubai,DXB2                10) CA,Montreal,YMQ1            18) ES,Madrid,MAD1              26) IN,Delhi,DEL1               34) SE,Stockholm,STO1           42) US,Miami,MIA1               50) Quit
3) AR,BuenosAires,BUE1          11) CA,Toronto,YYZ1             19) FR,Marseille,MRS1           27) IN,Mumbai,BOM1              35) SG,Singapore,SIN1           43) US,NewYork,NYC1
4) AT,Vienna,VIE1               12) CA,Vancouver,YVR1           20) FR,Paris,PAR1               28) IT,Milan,MIL1               36) US,Ashburn,DC11             44) US,Phoenix,PHX1
5) AU,Brisbane,BNE1             13) CH,Zurich,ZUR1              21) GB,London,LON1              29) JP,Osaka,OSA1               37) US,Atlanta,ATL1             45) US,SanFrancisco,SFO1
6) AU,Melbourne,MEL1            14) CL,Santiago,SCL1            22) GB,Manchester,MAN1          30) JP,Tokyo,NRT1               38) US,Chicago,ORD1             46) US,Seattle,SEA1
7) AU,Perth,PER1                15) CO,Bogota,BOG1              23) HK,HongKong,HKG1            31) KR,Seoul,ICN1               39) US,Dallas,DFW1              47) US,Washington,IAD2
8) AU,Sydney,SYD1               16) DE,Dusseldorf,DUS1          24) IL,TelAviv,TLV1             32) NL,Amsterdam,AMS1           40) US,Denver,DEN1              48) ZA,Johannesburg,JNB1
Enter your choice: 43
```

-> Select your Secondary Node

```
---------------------------
Please, select your Secondary Node (Country/City/NodeID)

1) AE,Dubai,DXB1                9) BR,SaoPaulo,SAO1             17) DE,Frankfurt,FRA1           25) IN,Chennai,MAA1             33) NZ,Auckland,AKL1            41) US,LosAngeles,LAX1          49) Not in the list? Input Manually
2) AE,Dubai,DXB2                10) CA,Montreal,YMQ1            18) ES,Madrid,MAD1              26) IN,Delhi,DEL1               34) SE,Stockholm,STO1           42) US,Miami,MIA1               50) Quit
3) AR,BuenosAires,BUE1          11) CA,Toronto,YYZ1             19) FR,Marseille,MRS1           27) IN,Mumbai,BOM1              35) SG,Singapore,SIN1           43) US,NewYork,NYC1
4) AT,Vienna,VIE1               12) CA,Vancouver,YVR1           20) FR,Paris,PAR1               28) IT,Milan,MIL1               36) US,Ashburn,DC11             44) US,Phoenix,PHX1
5) AU,Brisbane,BNE1             13) CH,Zurich,ZUR1              21) GB,London,LON1              29) JP,Osaka,OSA1               37) US,Atlanta,ATL1             45) US,SanFrancisco,SFO1
6) AU,Melbourne,MEL1            14) CL,Santiago,SCL1            22) GB,Manchester,MAN1          30) JP,Tokyo,NRT1               38) US,Chicago,ORD1             46) US,Seattle,SEA1
7) AU,Perth,PER1                15) CO,Bogota,BOG1              23) HK,HongKong,HKG1            31) KR,Seoul,ICN1               39) US,Dallas,DFW1              47) US,Washington,IAD2
8) AU,Sydney,SYD1               16) DE,Dusseldorf,DUS1          24) IL,TelAviv,TLV1             32) NL,Amsterdam,AMS1           40) US,Denver,DEN1              48) ZA,Johannesburg,JNB1
Enter your choice: 47
```

-> Select 'returnToPrimaryTunnel' variable:

Please select 'true' if you want the CSC to return to Primary tunnel (after 10 min of stability) when using Secondary tunnel.

Select 'false' if you want to remain using Secondary Tunnel and not to return to Primary.(Secondary will be nominated as 'new' Primary)

```
'returnToPrimaryTunnel' variable:
Please select 'true' if you want the CSC to return to Primary tunnel (after 10 min of stability) when using Secondary tunnel.
Select 'false' if you want to remain using Secondary Tunnel and not to return to Primary.(Secondary will be nominated as 'new' Primary)

1) true
2) false
Enter your choice: 1
```

DNS Configuration

```
--------------------
DNS Configuration

Your current DNS Servers are: 172.19.0.100 ; 1.1.1.1

Do you want to change the DNS servers?
1) Yes
2) No
Enter your choice: 2
```

Proxy Bypass Configuration

```
--------------------
Proxy Bypass Configuration

Your current Proxy Bypass PAC URL is https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac

Do you want to change the Proxy Bypass PAC URL?
1) Yes
2) No
Enter your choice: 2

Do you want to refresh Proxy Bypass List?
1) Yes
2) No
Enter your choice: 2
```

Routed Bypass Configuration

```
Routed Bypass Configuration

Your Routed Bypass URL configured is: https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json

Do you want to change the Routed Bypass URL?
1) Yes
2) No
Enter your choice: 2

Do you want to refresh the Routed Bypass List?
1) Yes
2) No
Enter your choice: 2
```

Syslog / SIEM Configuration

```
Syslog / SIEM Configuration

Primary Syslog / SIEM IP: 172.19.0.199
Secondary Syslog / SIEM IP: Not configured
Syslog / SIEM TCP port: 514

Do you want to change Syslog / SIEM Servers values?

1) Yes
2) No
3) Reset default values
Enter your choice: 2
```

At the end of the Wizard, you will be asked to confirm this values.

```
Please confirm these values:
------------------
NETSKOPE INFORMATION
GRE tunnels egress Public IP: 82.68.6.74

Primary Tunnel:
                Node : US,NewYork,NYC1
                Node Public IP: 163.116.135.36
                Node Probe: 10.135.6.209
Secondary Tunnel:
                Node : US,Washington,IAD2
                Node Public IP: 163.116.146.36
                Node Probe: 10.146.6.209
returnToPrimaryTunnel: true
------------------
DNS Servers: 172.19.0.100 ; 1.1.1.1
------------------
Bypass Proxy PAC URL
Your current Proxy Bypass PAC URL is https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-csc-bypass-pac-documentation.pac
------------------
Routed Bypass URL
Your current Routed Bypass URL is https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json
------------------
Primary Syslog / SIEM server IP: 172.19.0.199
Syslog / SIEM TCP port IP: 514
------------------
Do you want to implement these values? (The CSC will reboot)
1) Yes
2) No
Enter your choice:
```

Done!

6.6.2 Switch Tunnels - Primary / Secondary.

This Wizard allows to Switch Tunnels Primary to Secondary and vice-versa.

```
Selection: 15

NETSKOPE INFORMATION
GRE tunnels egress Public IP: 82.68.6.74

Primary Tunnel:
                Node : GB,London,LON1
                Node Public IP: 163.116.162.36
                Node Probe: 10.162.6.209
Secondary Tunnel:
                Node : GB,Manchester,MAN1
                Node Public IP: 163.116.165.36
                Node Probe: 10.165.6.209

TUNNEL STATUS
Primary Tunnel (reachability):
                              Node Keepalive is: Alive
                              GRE Tunnel IP is: Alive
Secondary Tunnel (reachability):
                              Node Keepalive is: Alive
                              GRE Tunnel IP is: Alive
returnToPrimaryTunnel: true

Tunnel Status: Primary tunnel is active since: Fri 8 Oct 03:19:08 BST 2021

HTTP://WWW.NOTSKOPE.COM PAGE STATUS
163.116.162.116 London, United Kingdom (LON1)
------------------
Do you want to Switch Primary / Secondary Tunnel?
Selecting Yes will disrupt all current connections.

1) Yes
2) No
Enter your choice:
```

6.6.3 Update Netskope Nodes Databases.

This command retrieves the latest Netskope Node Database.

```
Selection: 16

Checking Netskope Nodes Databases...
This CSC has the latest version: 1.2
```

6.6.4 High Availability configuration

In this section you can configure the CSC on HA pair to manage automatically the default route to Internet.

```
Selection: 17

This Wizard is for High Availability scenarios when changing default route to Internet.

----------------------
How to configure:
1) Deploy a pair of CSCs with the following conditions:
        1.1) There is connectivity each other via their internal interfaces. (Mandatory)
        1.2) They are in different availability zones. (Recommended)
2) Create an IAM role with the following permissions and apply it to each CSC:
_____________________________________

{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "ec2:DisassociateAddress",
                "ec2:AuthorizeSecurityGroupEgress",
                "ec2:AuthorizeSecurityGroupIngress",
                "ec2:DescribeAddresses",
                "ec2:DescribeInstances",
                "sns:ListSubscriptionsByTopic",
                "ec2:CreateTags",
                "ec2:DescribeSecurityGroups",
                "ec2:ReplaceRoute",
                "ec2:RevokeSecurityGroupIngress",
                "sns:Publish",
                "ec2:DescribeSecurityGroupRules",
                "ec2:RevokeSecurityGroupEgress",
                "ec2:AssociateAddress",
                "ec2:DescribeRouteTables"
            ],
            "Resource": "*"
        }
    ]
}
_____________________________________

3) Get the 'Route Table ID' of the Route Table/s where there is Default Route (0.0.0.0/0) to Internet
4) Get the 'Instance ID' of the other CSC on the pair
5) Create a SNS notification and get the 'ARN'
6) Run the Wizard on the FIRST CSC and input the following values manually: (all values are mandatory)
  6.1) Route Table ID/s (where there is Default Route to internet).
  6.2) Instance ID of other CSC on the pair.
  6.3) ARN of the SNS message for Notications of Route changes.
7) Run the Wizard on the SECOND CSC pasting the JSON file obtained from the FIRST CSC

How it works:
The CSCs on the HA pair will automatically select the Gateway (Target) for the Default Route on the Route Table/s.
When a change occurs, you will receive a SNS message notifying the new Gateway (Target).
On the routing table you can check Destination: 0.0.0.0/0 Target: eni-xxxyyyzzz
The 'Private Access Public IP' will be moved to the CSC with the default route to the Internet.
----------------------

The HA service in NOT Active

Do you want to configure it?

1) Yes
2) No
Enter your choice:
```

Help provided:

How to configure:

1) Deploy a pair of CSCs with the following conditions:

   1.1) There is connectivity each other via their internal interfaces. (Mandatory)

   1.2) They are in different availability zones. (Recommended)

2) Create an IAM role with the following permissions and apply it to each CSC:

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Sid": "VisualEditor0",
         "Effect": "Allow",
         "Action": [
            "ec2:DisassociateAddress",
            "ec2:AuthorizeSecurityGroupEgress",
            "ec2:AuthorizeSecurityGroupIngress",
            "ec2:DescribeAddresses",
            "ec2:DescribeInstances",
            "sns:ListSubscriptionsByTopic",
            "ec2:CreateTags",
            "ec2:DescribeSecurityGroups",
            "ec2:ReplaceRoute",
            "ec2:RevokeSecurityGroupIngress",
            "sns:Publish",
            "ec2:DescribeSecurityGroupRules",
            "ec2:RevokeSecurityGroupEgress",
            "ec2:AssociateAddress",
            "ec2:DescribeRouteTables"
         ],
         "Resource": "*"
      }
   ]
}
```

3) Get the 'Route Table ID' of the Route Table/s where there is Default Route (0.0.0.0/0) to Internet

4) Get the 'Instance ID' of the other CSC on the pair

5) Create a SNS notification and get the 'ARN'.

6) Run the Wizard on the FIRST CSC and input the following values manually: (all values are mandatory)

6.1) Route Table ID/s (where there is Default Route to internet).

6.2) Instance ID of other CSC on the pair.

6.3) ARN of the SNS message for Notications of Route changes.

7) Run the Wizard on the SECOND CSC pasting the JSON file obtained from the FIRST CSC

How it works:

The CSCs on the HA pair will automatically select the Gateway (Target) for the Default Route on the Route Table/s.

When a change occurs, you will receive a SNS message notifying the new Gateway (Target).

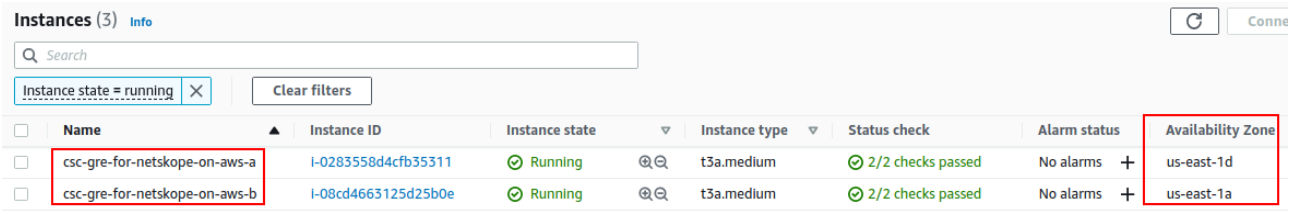
On the routing table you can check Destination: 0.0.0.0/0 Target: eni-xxxyyyzzz

The 'Private Access Public IP' will be moved to the CSC with the default route to the Internet.

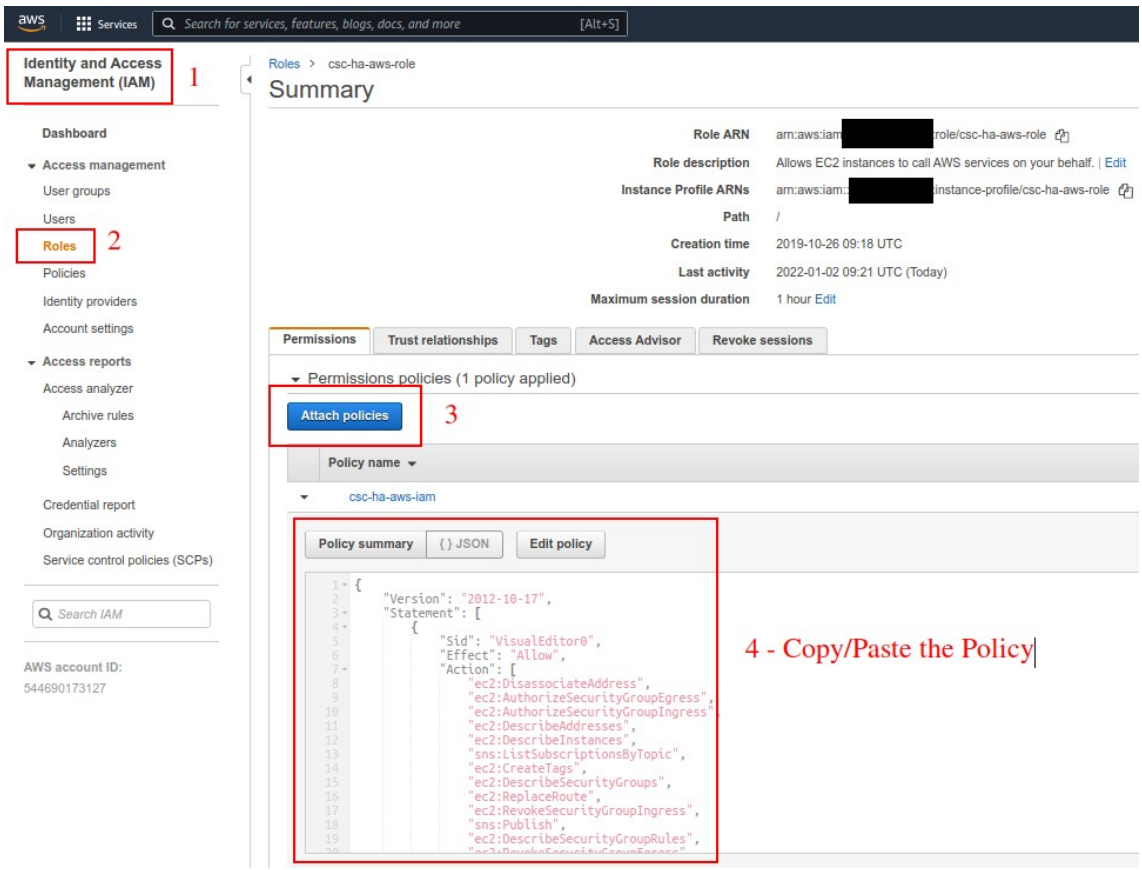
6.6.4.1 High Availability configuration on detail

This section shows in detail how to deploy a pair of CSC on High Availability.

6.6.4.1.1 Deploy a pair of CSC on the different availability zones.

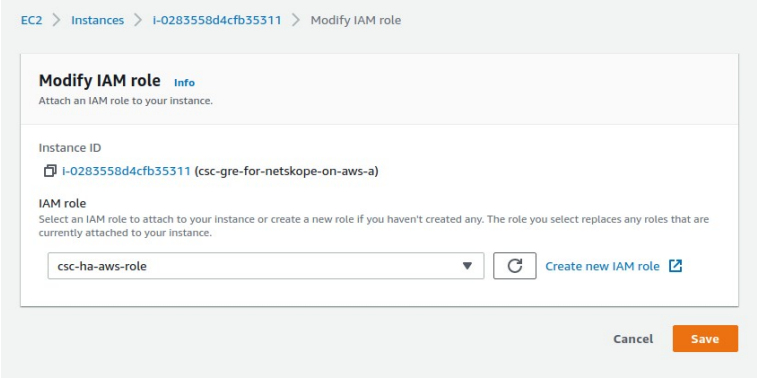


6.6.4.1.2 Create an IAM role with the following policies



Next, apply the Role created to each CSC on the pair.

Rigth click the instance → Security → Modify IAM role

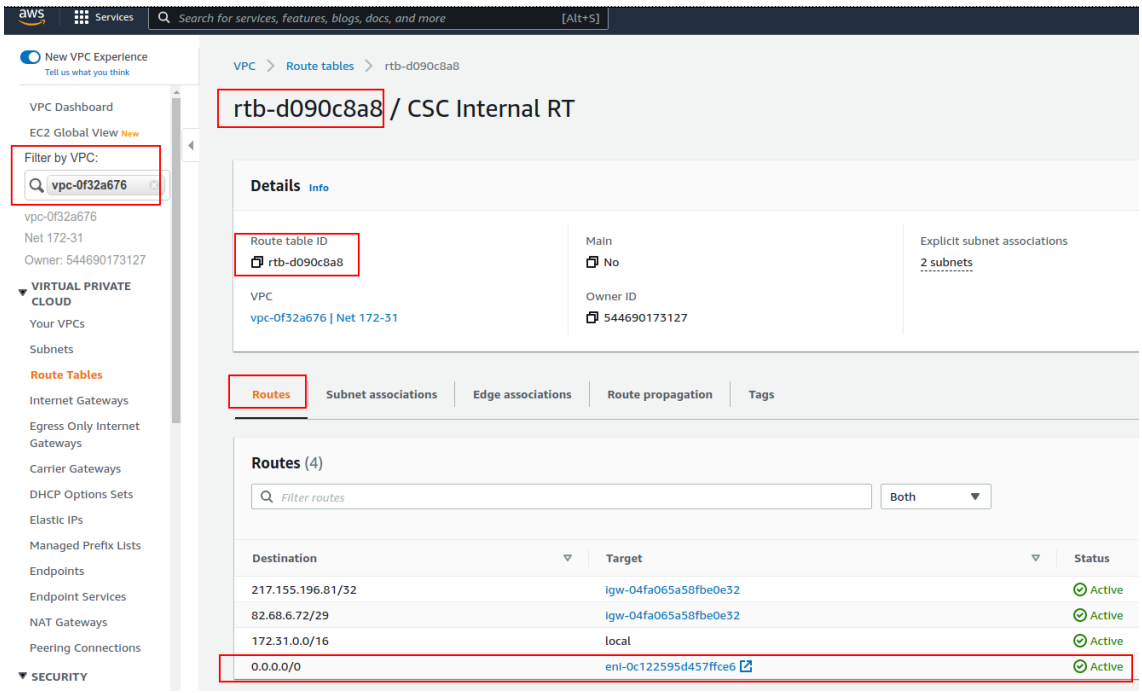


Select the Role and Save. Do the same for the other CSC.

6.6.4.1.3 Get the 'Route Table ID' of the Route Table/s where there is Default Route (0.0.0.0/0) to Internet

Go to VPC → Route Tables and get the 'Route Table ID' of the Route Table/s where there is Default Route (0.0.0.0/0) to Internet.

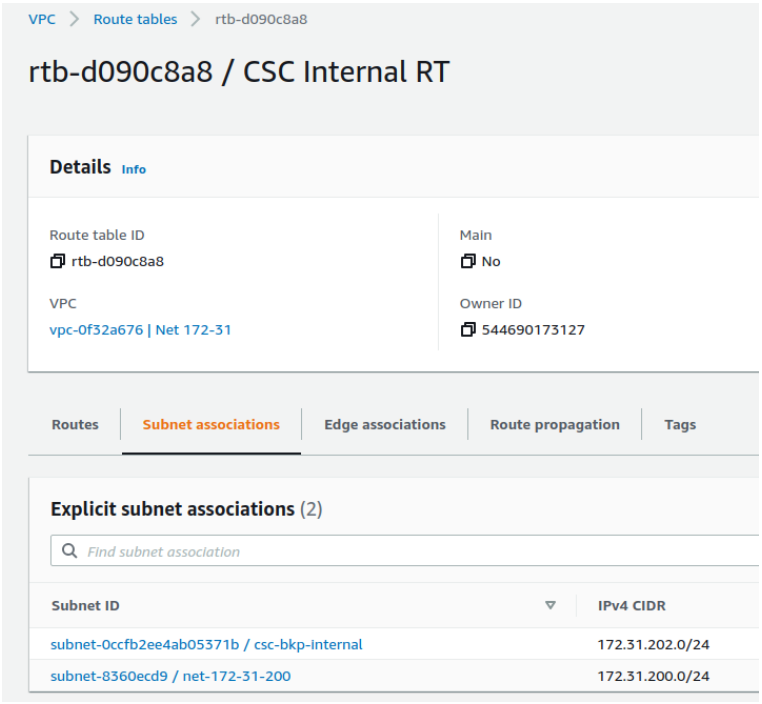
Create or modify the route 0.0.0.0/0 via Target → eni-xxyy (select the eni number from the internal interface of one CSC on the pair)



Note 1: The CSC pair will modify the "Target" of Route 0.0.0.0/0. Other Destinations will remain untouched.

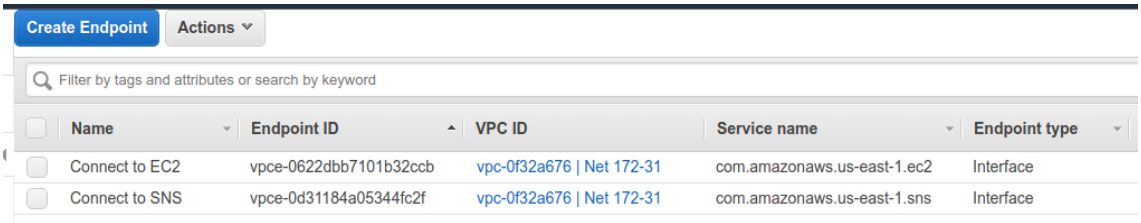
Note 2: Be sure to add other destinations, like your internal subnets or your public IPs, via the proper “Target” to avoid losing connectivity to the VPC

Next, apply the Subnet Associations to the Routing Table:



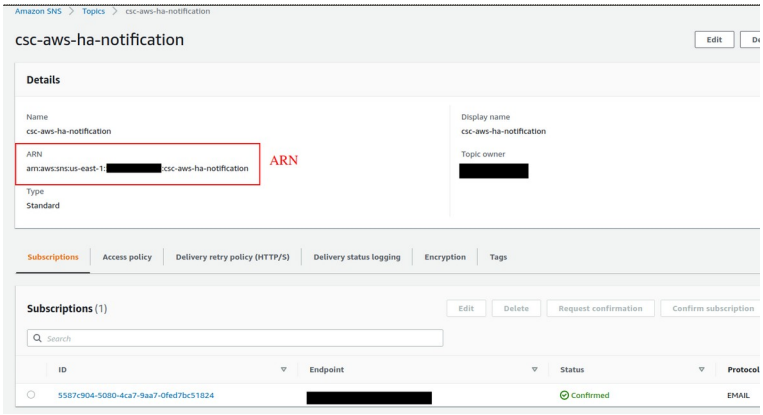
6.6.4.1.4 Create "Endpoints" to AWS services (EC2, SNS, S3, etc.)

When changing the default route to the internet via Netskope, your subnets will potentially lose contact with some AWS services: EC2, SNS, S3, etc. The CSC on the HA requires creating two endpoints: EC2 and SNS.



6.6.4.1.5 Create SNS message for Alerts.

Go to Amazon SNS → Topics and create a Topic. Obtain the ARN



6.6.4.1.6 Run the HA Wizard on the First CSC

Input the values manually on the First CSC.

```
The HA service in NOT Active

Do you want to configure it?

1) Yes
2) No
Enter your choice: 1   1

Please, Select 'Manual' to configure the First CSC on the HA pair or 'Json' for the Second CSC.

1) Manual
2) Json
3) Quit
Enter your choice: 1   2

IAM role in use: arn:aws:iam::544690173127:instance-profile/csc-ha-aws-role

---------------------
Please, input the following values:

Route Table ID= rtb-d090c8a8   3

Do you want to add another Route Table ID?

1) Yes
2) No
Enter your choice: 2

Instance ID of other CSC in the pair= i-08cd4663125d25b0e

SNS message ARN= arn:aws:sns:us-east-1:544690173127:csc-aws-ha-notification   4

---------------------
Values to configure are:

Routing Tables=1
Routing Table ID= rtb-d090c8a8
Instance ID of other CSC in the pair= i-08cd4663125d25b0e
SNS message ARN= arn:aws:sns:us-east-1:544690173127:csc-aws-ha-notification

Do you want to apply changes?

1) Yes
2) No
Enter your choice: 1   5
```

Please, copy the JSON file. You will need to paste it on the second CSC on the HA Pair.

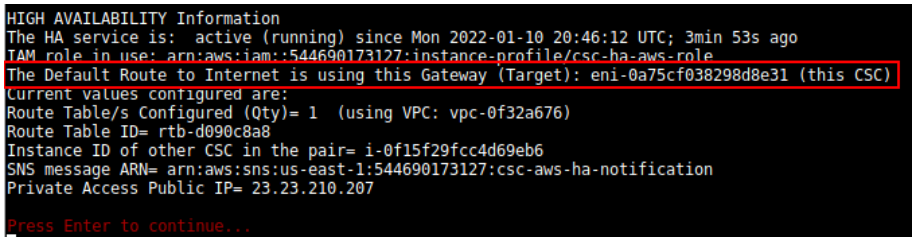
6.6.4.1.7 Configure the second CSC on the HA pair.

Run the HA Wizard on the second CSC.

Done!

6.6.4.1.8 Checking HA Status

Run "Show Configuration and Status" and check High Availability Section.



6.6.4.1.9 Notifications from CSC on HA

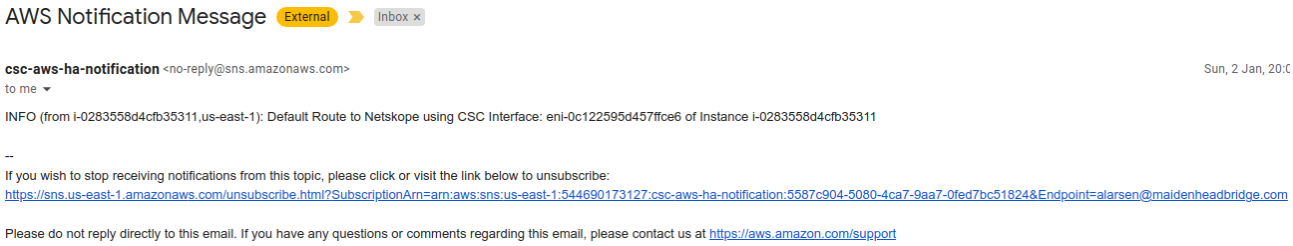
Each CSC on the pair will send notifications when:

→ There is no connectivity at all with Netskope. No CSC is able to reach Netskope.

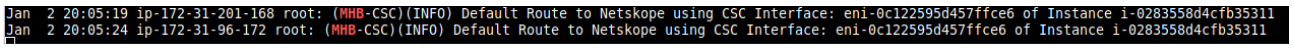
→ At power up the CSC will notify the current “eni-xxyy” used as default GW to internet

→ On routing change, the CSCs will notify the changes.

Example of notifications:



Logs generated:



7 Steering traffic to NewEdge with the CSC GRE for AWS.

In Chapter 3 of this Administrator Guide, we showed the Network Diagrams of different scenarios of traffic steering.

When connecting Instances, Workspaces, AppStream, etc., to Netskope using the CSC, you have two options of steering traffic: routing and proxying.

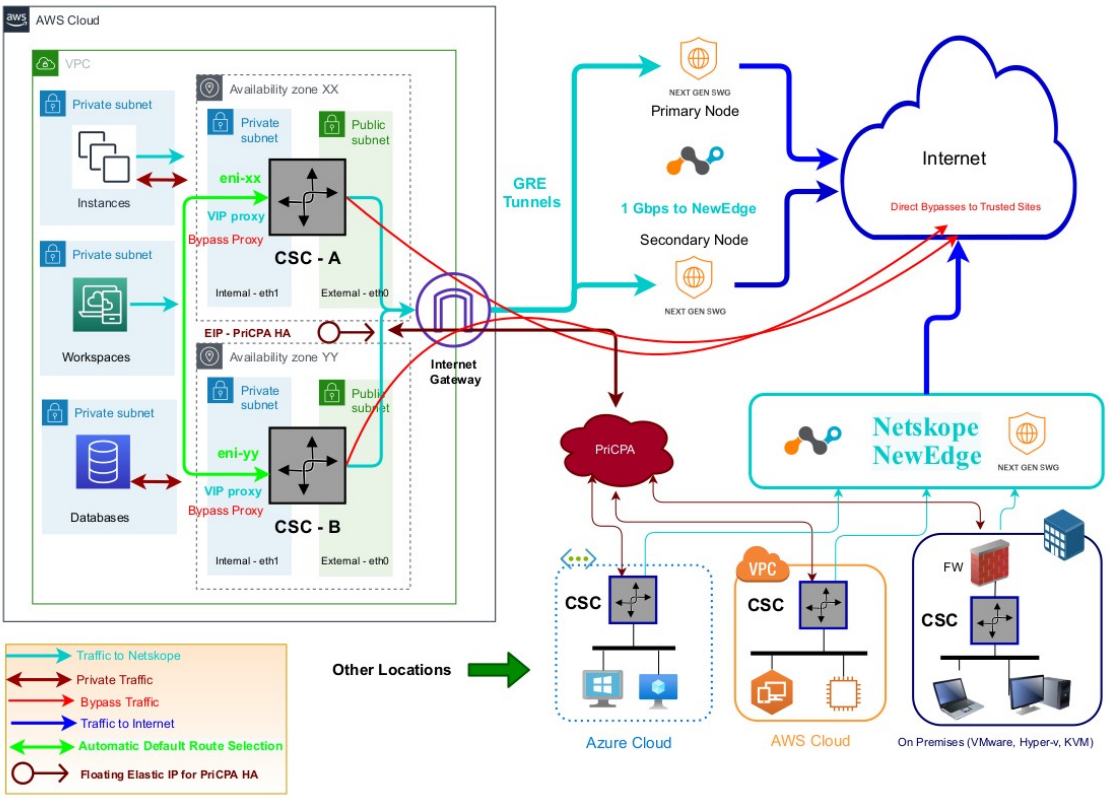
The options are not mutually exclusive. You can use both at the same time. Moreover, when the CSC is on a HA pair, you can use both simultaneously, duplicating the capacity for Web Traffic to 2 Gbps.

In both cases, it is possible to bypass traffic from the tunnel to Netskope and send it directly using the "routed" and "proxied" bypass functionalities.

This chapter will dig into more detail about the configuration required, showing examples when the CSC is on High Availability and when using a single CSC.

7.1 CSC on HA Pair

7.1.1 Network Diagram



7.1.2 Prerequisites

1. Deploy 2 x CSC as HA Pair. (See section "6.6.4 High Availability configuration")
2. Create the Routed Bypasses. (See section "6.4 Routed Bypass")
3. Obtain the VIP Proxy and Bypass Proxy of each CSC running "Show Configuration and Status" from SSH console or AWS Systems Manager.
4. Created the Proxy Bypasses. (See section "6.3 Proxy Bypass")

7.1.3 Routing traffic via the CSC HA pair.

7.1.3.1 Traffic to Netskope

The "High Availability" setup will manage the Target of the default route to the internet (0.0.0.0/0) on all route tables configured. Nothing extra is required. Your only task is to attach the Subnets to the Route Tables.

7.1.3.2 "Routed Bypass" traffic

The "Routed Bypass" functionality will do the task. Your task is to create the JSON file and to add the Routed Bypasses to it.

7.1.4 Proxy traffic via the CSC HA Pair.

7.1.4.1 Using PAC files

You can manage the traffic "to Netskope" and "Proxy Bypass" on a single PAC file when using PAC files.

You have three options:

1. Use both CSC at the same time doing Load Balancing per Source IP. With this method, you can achieve 2 Gbps for Web traffic.
2. Use Netskope's Global Proxy: VIP 163.116.128.80:80, Bypass 163.116.128.80:3128
3. Use CSC's VIP and Bypass Addresses as Primary and Secondary proxy.

7.1.4.1.1 PAC file for Load Balancing

See Section 2) of the PAC file below. In this section, the Source IP of the device is read on the variable "nicIP".
The values of variables "tonetskope" and "bypassproxy" are assigned by odd or even values of "nicIP".

PAC file with Load Balancing

```
function FindProxyForURL(url, host) {
   // ======================================================
   // Section 1: Standard PAC values

   var privateIP = /^(0|10|127|192\.168|172\.1[6789]|172\.2[0-9]|172\.3[01]|169\.254|192\.88\.99)\.[0-9.]+$/;
   var resolved_ip = dnsResolve(host);

   /* Don't send non-FQDN or private IP auths to us */
   if (isPlainHostName(host) || isInNet(resolved_ip, "192.0.2.0", "255.255.255.0") || privateIP.test(resolved_ip))
      return "DIRECT";

   /* FTP goes directly */
   if (url.substring(0, 4) == "ftp:")
      return "DIRECT";

   // ======================================================
   // Section 2: Define Variables

   // Get NIC IP address
   nicIp = myIpAddress();

   // Assigning values to "tonetskope" and "bypassproxy"
   if (isInNet(nicIp, "0.0.0.0", "0.0.0.1")) {
      var tonetskope = "PROXY csc1vip:80; PROXY csc2vip:80";
      var bypassproxy = "PROXY csc1bypass:3128; PROXY csc2bypass:3128";
   }

   if (isInNet(nicIp, "0.0.0.1", "0.0.0.1")) {
      var tonetskope = "PROXY csc2vip:80; PROXY csc1vip:80";
      var bypassproxy = "PROXY csc2bypass:3128; PROXY csc1bypass:3128";
   }

   // ======================================================
   // Section 3: Bypass via Cloud Security Connectors

   // Bypass via CSC Public IPs (Examples)
   // Okta Domains (for Location Rules)
   if ((shExpMatch(host, "*.okta.com")) ||
      (shExpMatch(host, "*.oktacdn.com")) ||
      (shExpMatch(host, "*.okta-emea.com")) ||
      (shExpMatch(host, "login.mydomain.com")) ||
      // O365 Domains for ConditionalAccess
      (shExpMatch(host, "login.microsoftonline.com")) ||
      (shExpMatch(host, "login.microsoft.com")) ||
      (shExpMatch(host, "login.windows.net")) ||
      // IP / Port test page
      (shExpMatch(host, "portquiz.net"))) {
      return bypassproxy
   }

   // ======================================================
   // Section 4: Default Traffic

   // Default Traffic Forwarding.
   return tonetskope
}
```

7.1.4.1.2 PAC file using Netskope's Global Proxy

See section 2 of the PAC file below. This section defines the use of IP: 163.116.128.80 as a proxy for both "tonetskope" and "bypassproxy", with different ports for each one.

How does this work? The IP 163.116.128.80 will be routed via the default route to the internet (0.0.0.0/0) to the eni-xx of the CSC active of the HA pair. The CSC can intercept the IP 163.116.128.80 and redirect the traffic to the tunnel if the port is 80 and bypass when the port is 3128.

PAC file using Netskope's Global Proxy

```
function FindProxyForURL(url, host) {
   // ======================================================
   // Section 1: Standard PAC values

   var privateIP = /^(0|10|127|192\.168|172\.1[6789]|172\.2[0-9]|172\.3[01]|169\.254|192\.88\.99)\.[0-9.]+$/;
   var resolved_ip = dnsResolve(host);

   /* Don't send non-FQDN or private IP auths to us */
   if (isPlainHostName(host) || isInNet(resolved_ip, "192.0.2.0", "255.255.255.0") || privateIP.test(resolved_ip))
      return "DIRECT";

   /* FTP goes directly */
   if (url.substring(0, 4) == "ftp:")
      return "DIRECT";

   // ======================================================
   // Section 2: Define Variables

   var tonetskope = "PROXY 163.116.128.80:80";
   var bypassproxy = "PROXY 163.116.128.80:3128";

   // ======================================================
   // Section 3: Bypass via Cloud Security Connectors

   // Bypass via CSC Public IPs (Examples)
   // Okta Domains (for Location Rules)
   if ((shExpMatch(host, "*.okta.com")) ||
      (shExpMatch(host, "*.oktacdn.com")) ||
      (shExpMatch(host, "*.okta-emea.com")) ||
      (shExpMatch(host, "login.mydomain.com")) ||
      // O365 Domains for ConditionalAccess
      (shExpMatch(host, "login.microsoftonline.com")) ||
      (shExpMatch(host, "login.microsoft.com")) ||
      (shExpMatch(host, "login.windows.net")) ||
      // IP / Port test page
      (shExpMatch(host, "portquiz.net"))) {
      return bypassproxy
   }

   // ======================================================
   // Section 4: Default Traffic

   // Default Traffic Forwarding.
   return tonetskope
}
```

7.1.4.1.3 PAC file using CSC's VIP and Bypass Proxy Address (Pri/Sec)

PAC file using CSC's VIPand Bypass Proxy Address for Primary and Secondary Proxy.

```
function FindProxyForURL(url, host) {
   // ======================================================
   // Section 1: Standard PAC values

   var privateIP = /^(0|10|127|192\.168|172\.1[6789]|172\.2[0-9]|172\.3[01]|169\.254|192\.88\.99)\.[0-9.]+$/;
   var resolved_ip = dnsResolve(host);

   /* Don't send non-FQDN or private IP auths to us */
   if (isPlainHostName(host) || isInNet(resolved_ip, "192.0.2.0", "255.255.255.0") || privateIP.test(resolved_ip))
      return "DIRECT";

   /* FTP goes directly */
   if (url.substring(0, 4) == "ftp:")
      return "DIRECT";

   // ======================================================
   // Section 2: Define Variables

   var tonetskope = "PROXY csc1vip:80; PROXY csc2vip:80";
   var bypassproxy = "PROXY csc1bypass:3128; PROXY csc2bypass:3128";

   // ======================================================
   // Section 3: Bypass via Cloud Security Connectors

   // Bypass via CSC Public IPs (Examples)
   // Okta Domains (for Location Rules)
   if ((shExpMatch(host, "*.okta.com")) ||
      (shExpMatch(host, "*.oktacdn.com")) ||
      (shExpMatch(host, "*.okta-emea.com")) ||
      (shExpMatch(host, "login.mydomain.com")) ||
      // O365 Domains for ConditionalAccess
      (shExpMatch(host, "login.microsoftonline.com")) ||
      (shExpMatch(host, "login.microsoft.com")) ||
      (shExpMatch(host, "login.windows.net")) ||
      // IP / Port test page
      (shExpMatch(host, "portquiz.net"))) {
      return bypassproxy
   }

   // ======================================================
   // Section 4: Default Traffic

   // Default Traffic Forwarding.
   return tonetskope
}
```

7.1.4.2 Using Explicit Proxy on devices that cannot support PAC files.

For devices that cannot be configured with PAC files, you need to set up an Explicit Proxy (IP:Port) and exclusions.

The recommendation, in this case, is to use the Netskope's Global Proxy IP (163.116.128.80) for Explicit Proxy and to allow the exclusion to do direct to the Internet using "Routing Bypasses".

Here an example of a Linux Server.

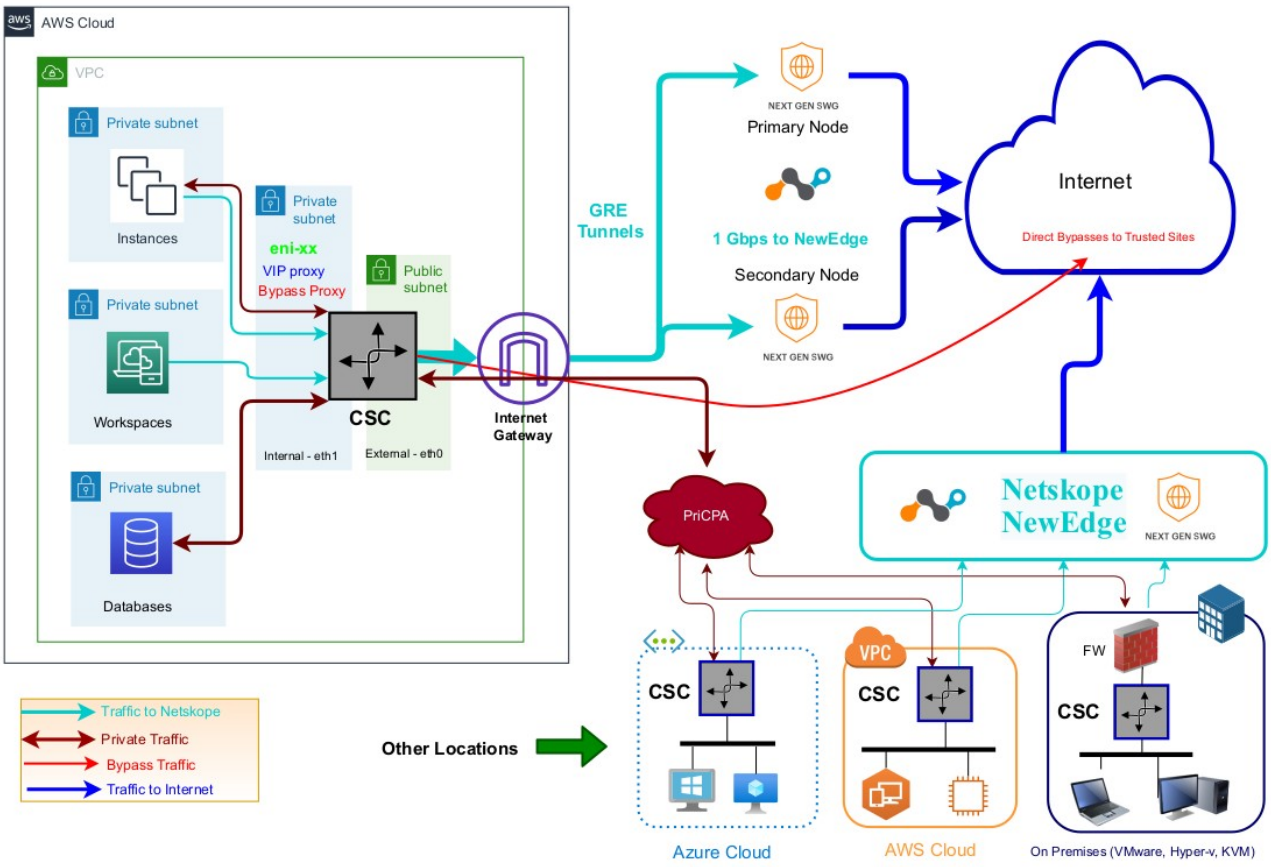
Settings Variables for http, https and no_proxy[4]
export[5] http_proxy=http://163.116.128.80:80 export https_proxy=http://163.116.128.80:80 export no_proxy=portquiz.net

Test	**Return**	**Observations**
curl http://www.notskope.com	163.116.146.120 Ashburn, United States (IAD2)	OK. http via Netskope.
curl https://ip.maidenheadbridge.com	163.116.146.120	OK. https via Netskope
curl http://portquiz.net	Port 80 test successful! Your IP: 54.80.198.195	OK. portquiz.net via bypass using "Routed Bypass"

4 Add this lines to "/etc/environment" to make this changes permanent.
5 Use command $unset <variable name> to clear the values.

7.2 CSC Single

7.2.1 Network Diagram



7.2.2 Prerequisites

1. Obtain the eni-xx value of the Internal Interface of the CSC running "Show Configuration and Status" from SSH console or AWS Systems Manager.
2. Create the Routed Bypasses. (See section "6.4 Routed Bypass")
3. Obtain the VIP Proxy and Bypass Proxy of each CSC running "Show Configuration and Status" from SSH console or AWS Systems Manager.
4. Created the Proxy Bypasses. (See section "6.3 Proxy Bypass")

7.2.3 Routing traffic via the CSC Single.

7.2.3.1 Traffic to Netskope

On your Route Tables, configure the default route to the Internet (0.0.0.0/0) with "Target" the eni-xx of the CSC.

7.2.3.2 "Routed Bypass" traffic

The "Routed Bypass" functionality will do the task. Your task is to create the JSON file and to add the Routed Bypasses to it.

7.2.4 Proxy traffic via the CSC Single.

7.2.4.1 Using PAC files

You can manage the traffic "to Netskope" and "Proxy Bypass" on a single PAC file when using PAC files.

You have two options:

1. Use Netskope's Global Proxy: VIP 163.116.128.80:80, Bypass 163.116.128.80:3128
2. Use CSC's VIP and Bypass Addresses as Primary

7.2.4.1.1 PAC file using Netskope's Global Proxy

See section 2 of the PAC file below. This section defines the use of IP: 163.116.128.80 as a proxy for both "tonetskope" and "bypassproxy", with different ports for each one.

How does this work? The IP 163.116.128.80 will be routed via the default route to the internet (0.0.0.0/0) to the eni-xx of the CSC. The CSC can intercept the IP 163.116.128.80 and redirect the traffic to the tunnel if the port is 80 and bypass when the port is 3128.

PAC file using Netskope's Global Proxy

```
function FindProxyForURL(url, host) {
   // ==========================================================
   // Section 1: Standard PAC values

   var privateIP = /^(0|10|127|192\.168|172\.1[6789]|172\.2[0-9]|172\.3[01]|169\.254|192\.88\.99)\.[0-9.]+$/;
   var resolved_ip = dnsResolve(host);

   /* Don't send non-FQDN or private IP auths to us */
   if (isPlainHostName(host) || isInNet(resolved_ip, "192.0.2.0", "255.255.255.0") || privateIP.test(resolved_ip))
      return "DIRECT";

   /* FTP goes directly */
   if (url.substring(0, 4) == "ftp:")
      return "DIRECT";

   // ==========================================================
   // Section 2: Define Variables

   var tonetskope = "PROXY 163.116.128.80:80";
   var bypassproxy = "PROXY 163.116.128.80:3128";

   // ==========================================================
   // Section 3: Bypass via Cloud Security Connectors

   // Bypass via CSC Public IPs (Examples)
   // Okta Domains (for Location Rules)
   if ((shExpMatch(host, "*.okta.com")) ||
      (shExpMatch(host, "*.oktacdn.com")) ||
      (shExpMatch(host, "*.okta-emea.com")) ||
      (shExpMatch(host, "login.mydomain.com")) ||
      // O365 Domains for ConditionalAccess
      (shExpMatch(host, "login.microsoftonline.com")) ||
      (shExpMatch(host, "login.microsoft.com")) ||
      (shExpMatch(host, "login.windows.net")) ||
      // IP / Port test page
      (shExpMatch(host, "portquiz.net"))) {
      return bypassproxy
   }

   // ==========================================================
   // Section 4: Default Traffic

   // Default Traffic Forwarding.
   return tonetskope
}
```

7.2.4.1.2 PAC file using CSC's VIP and Bypass Proxy Address (Pri/Sec)

PAC file using CSC's VIPand Bypass Proxy Address for Primary and Secondary Proxy.

```
function FindProxyForURL(url, host) {
   // ======================================================
   // Section 1: Standard PAC values

   var privateIP = /^(0|10|127|192\.168|172\.1[6789]|172\.2[0-9]|172\.3[01]|169\.254|192\.88\.99)\.[0-9.]+$/;
   var resolved_ip = dnsResolve(host);

   /* Don't send non-FQDN or private IP auths to us */
   if (isPlainHostName(host) || isInNet(resolved_ip, "192.0.2.0", "255.255.255.0") || privateIP.test(resolved_ip))
      return "DIRECT";

   /* FTP goes directly */
   if (url.substring(0, 4) == "ftp:")
      return "DIRECT";

   // ======================================================
   // Section 2: Define Variables

   var tonetskope = "PROXY cscvip:80";
   var bypassproxy = "PROXY cscbypass:3128";

   // ======================================================
   // Section 3: Bypass via Cloud Security Connectors

   // Bypass via CSC Public IPs (Examples)
   // Okta Domains (for Location Rules)
   if ((shExpMatch(host, "*.okta.com")) ||
      (shExpMatch(host, "*.oktacdn.com")) ||
      (shExpMatch(host, "*.okta-emea.com")) ||
      (shExpMatch(host, "login.mydomain.com")) ||
      // O365 Domains for ConditionalAccess
      (shExpMatch(host, "login.microsoftonline.com")) ||
      (shExpMatch(host, "login.microsoft.com")) ||
      (shExpMatch(host, "login.windows.net")) ||
      // IP / Port test page
      (shExpMatch(host, "portquiz.net"))) {
      return bypassproxy
   }

   // ======================================================
   // Section 4: Default Traffic

   // Default Traffic Forwarding.
   return tonetskope
}
```

7.2.4.2 Using Explicit Proxy on devices that cannot support PAC files.

For devices that cannot be configured with PAC files, you need to set up an Explicit Proxy (IP:Port) and exclusions.

With a single CSC, you have to options:

1. Use the Netskope's Global Proxy IP (163.116.128.80) for Explicit Proxy and to allow the exclusion to do direct to the Internet using "Routing Bypasses".
2. Use CSC VIP IP for Explicit Proxy and to allow the exclusion to do direct to the Internet using "Routing Bypasses".

Here an example of a Linux Server using the Netskope's Global Proxy IP (163.116.128.80)

Settings Variables for http, https and no_proxy[6]
export[7] http_proxy=http://163.116.128.80:80 export https_proxy=http://163.116.128.80:80 export no_proxy=portquiz.net

Test	**Return**	**Observations**
curl http://www.notskope.com	163.116.146.120 Ashburn, United States (IAD2)	OK. http via Netskope.
curl https://ip.maidenheadbridge.com	163.116.146.120	OK. https via Netskope
curl http://portquiz.net	Port 80 test successful! Your IP: 54.80.198.195	OK. portquiz.net via bypass using "Routed Bypass"

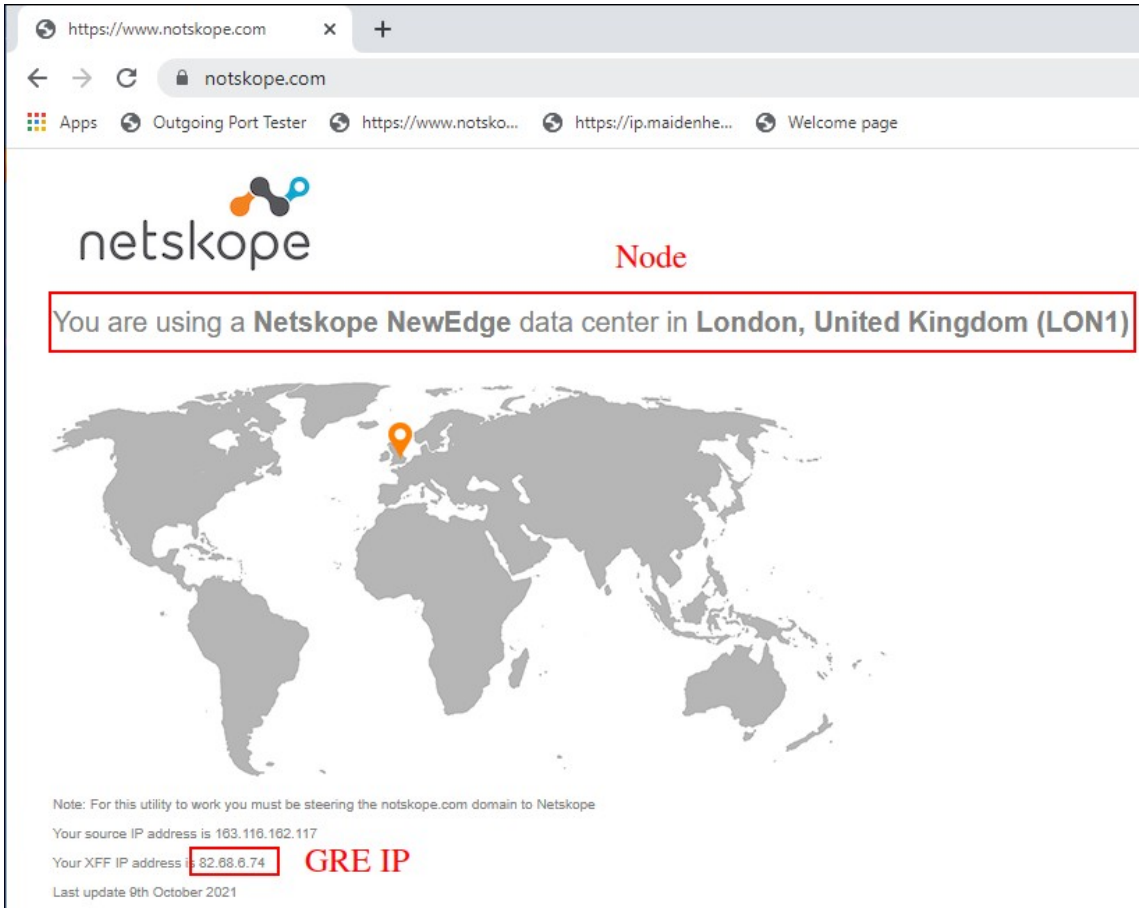
6 Add this lines to "/etc/environment" to make this changes permanent.
7 Use command $unset <variable name> to clear the values.

7.3 Testing traffic to Netskope

7.3.1 www.notskope.com

The page www.notskope.com shows the Netskope Datacenter.

Using the browser:



Using curl command from CMD or Terminal

Proxy environment:

Command	curl --proxy http://**<CSC VIP>**:80 www.notskope.com (i.e. $curl --proxy http://172.19.0.61:80 www.notskope.com)
Expected Result	<NewEdge Node IP> <City>,<Country> (<NodeID>) (i.e. 163.116.162.117 London, United Kingdom (LON1))

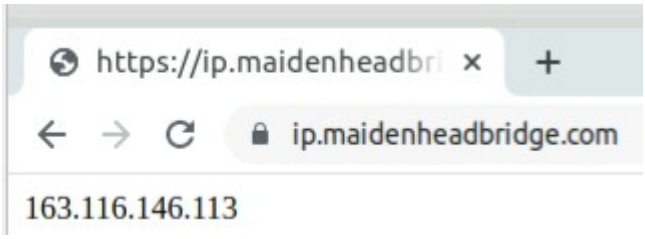
Routed environment:

Command	curl www.notskope.com (i.e. $curl www.notskope.com)
Expected Result	<NewEdge Node IP> <City>,<Country> (<NodeID>) (i.e. 163.116.162.117 London, United Kingdom (LON1))

7.3.2 https://ip.maidenheadbridge.com

Maidenhead Bridge provides a HTTPS page to check the IP.

Using the Browser:



Using curl command from CMD or Terminal

(Note: the switch "-k" on curl command is to avoid SSL certificate validation)

Proxy environment:

Command	curl -k --proxy http://**<CSC VIP>**:80 https://ip.maidenheadbridge.com (i.e. $curl --proxy http://172.19.0.61:80 https://ip.maidenheadbridge.com)
Expected Result	<Netskope Node IP> (i.e. 163.116.162.117)

Routed environment:

Command	curl -k https://ip.maidenheadbridge.com (i.e. $curl -k https://ip.maidenheadbridge.com)
Expected Result	<Netskope Node IP> (i.e. 163.116.162.117)

7.3.3 SpeedTest

The CSC contains the SpeedTest client. You can run it from the SSH console or using any Management tool (AWS Systems Manager, Rundeck, Salt, Ansible, etc.)

```
Monitoring Tasks
1) Show Configuration and Status
2) Show Interfaces Traffic
3) Traceroute and Latency Test
4) Speed Test (Experimental)
```

```
SPEED TEST
This is experimental. We are using third party tools. (Speedtest.net)
Results can be inaccurate or none. The test takes a while

Retrieving speedtest.net configuration...
Testing from Netskope (163.116.146.119)...
Retrieving speedtest.net server list...
Selecting best server based on ping...
Hosted by Netprotect (Ashburn, VA) [0.81 km]: 5.564 ms
Testing download speed................................................
Download: 1317.16 Mbit/s
Testing upload speed..................................................
Upload: 1137.61 Mbit/s
```

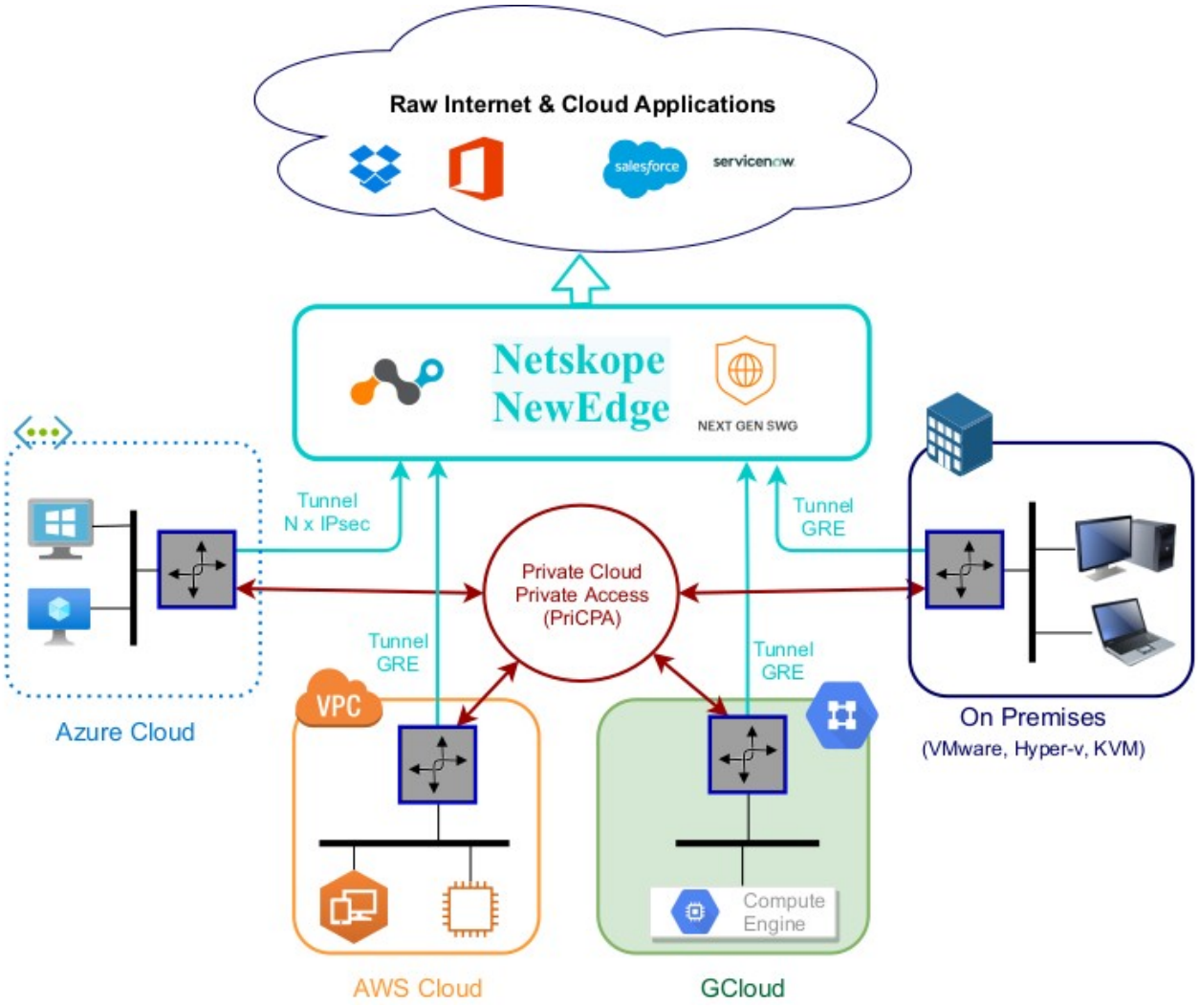
8 Private Cloud Private Access

8.1 What is Private Cloud Private Access (PriCPA)?

Private Cloud Private Access (PriCPA) is a new functionality of the Cloud Security Connector. PriCPA allows you to create a Private Cloud among all CSCs for private traffic. In a matter of minutes, you can build a full mesh encrypted topology between your locations for private traffic with Zero Trust. After making the Private Cloud, you can set up your policies to define who will talk with who inside your Private Cloud.

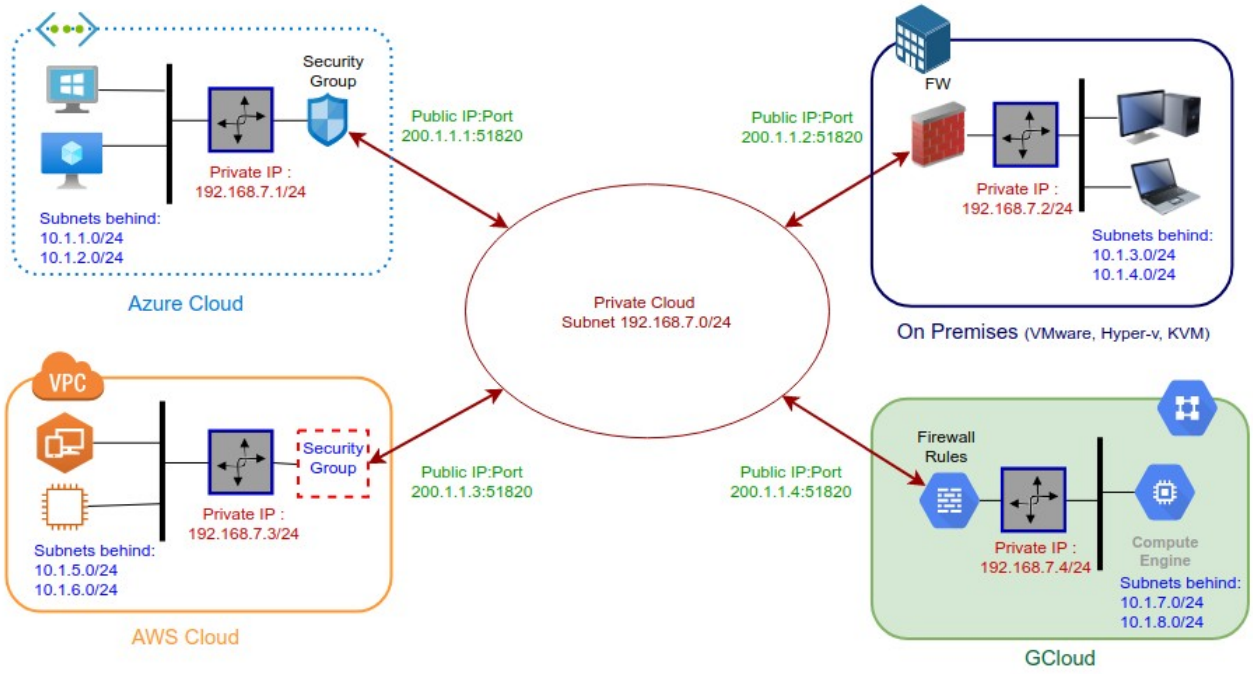
8.2 PriCPA Network Diagrams

8.2.1 High Level Network Diagram



8.2.2 Low Level Network Diagram – PriCPA only

The following network diagram shows the IP addressing for PriCPA.



Steps to design your Private Cloud:

1. Select a Subnet for your Private Cloud. The example above is 192.168.7.0/24. Due to the Subnet is /24, up to 255 CSCs can participate in this Private Cloud.
2. Assign a Cloud Private IP to each CSC. In this example, we are assigning 192.168.7.1 to 192.168.7.4
3. The Public IP to be used will be the same assigned to the Bypass of each CSC. You can choose the UDP port to use at each location. For simplicity, it is recommended to use the same port at all locations.
4. Gather the information of the private Subnets behind each CSC. This information will be required when configuring the Peers.
5. Firewall Rules (or Security Groups Rules): The CSC for Azure, AWS and Gcloud will implement the firewall rules automatically. Manual FW rules are required when the CSC is "On-Premises". The CSC provides a JSON file with the rules required.

8.3 Configuring PriCPA

The Main Menu has a section for Private Access:

```
MHB Labs - Private Access - (Preview)
18) Show Configurations and Status Private Access.
19) Configure Private Access.
20) Configure CSC Remote Management via Private Access.
```

The configuration of PriCPA is four simple steps:

1. Create the Local Node configuration. This step will initialize and enable Private Access on the Node. The result of this operation will show a "Token" and "Private Access Local JSON file".
2. (HA Pair only) Initialize the second Node of the HA pair using the "Token" and "Private Access Local JSON file".
3. Create an IAM role with the following permissions and apply it to the CSCs:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "VisualEditor0",
      "Effect": "Allow",
      "Action": [
        "ec2:DisassociateAddress",
        "ec2:AuthorizeSecurityGroupEgress",
        "ec2:AuthorizeSecurityGroupIngress",
        "ec2:DescribeAddresses",
        "ec2:DescribeInstances",
        "sns:ListSubscriptionsByTopic",
        "ec2:CreateTags",
        "ec2:DescribeSecurityGroups",
        "ec2:ReplaceRoute",
        "ec2:RevokeSecurityGroupIngress",
        "sns:Publish",
        "ec2:DescribeSecurityGroupRules",
        "ec2:RevokeSecurityGroupEgress",
        "ec2:AssociateAddress",
        "ec2:DescribeRouteTables"
      ],
      "Resource": "*"
    }
  ]
}
```

4. Create and distribute the Private Access Peers JSON file to all nodes.

IMPORTANT: *We strongly recommend using software with a JSON formatter to create the Peers JSON file, like Visual Code or Notepad ++ . See Appendix C for more detail about how to install these programs and the plugins required.*

8.3.1 Create the Local configuration (first node of the cluster)

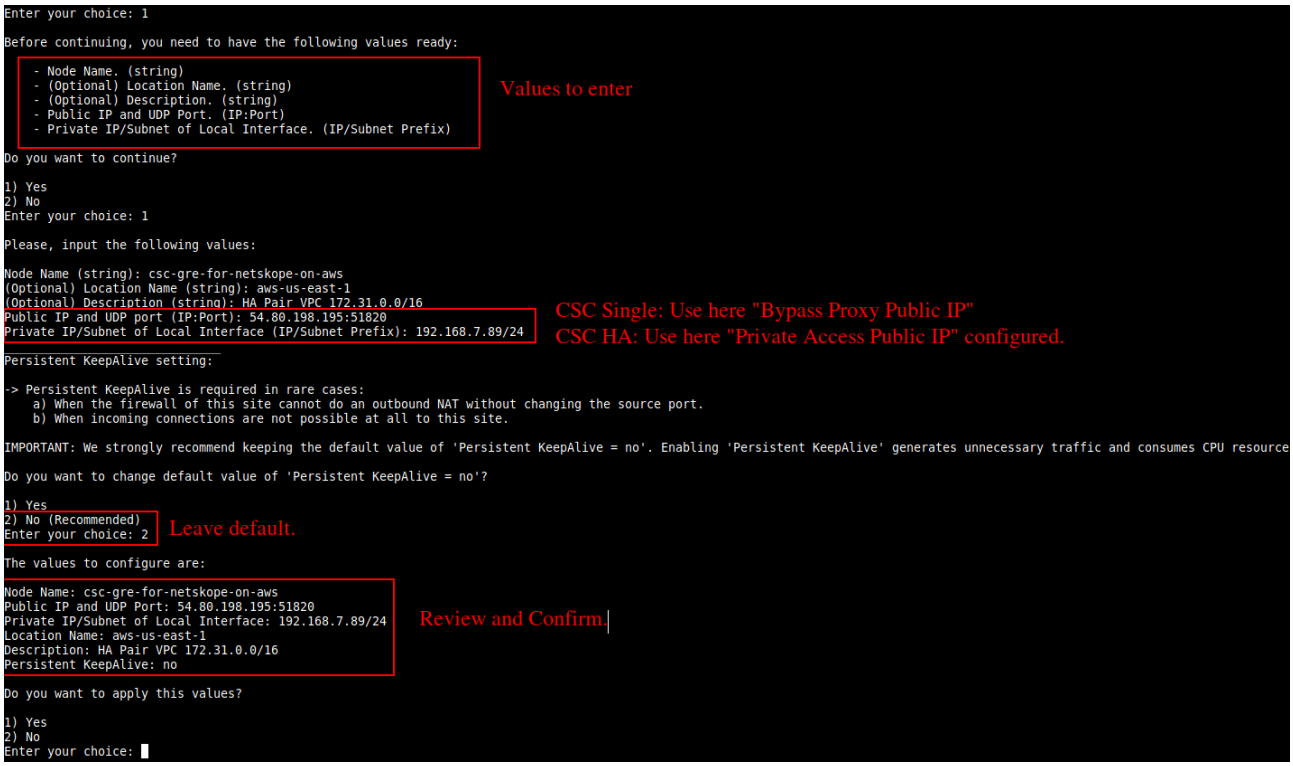
- From Main Menu, select "19) Configure Private Access."

```
Selection: 19

Private Access Configuration Wizard

Steps to configure Private Access:

  -> Create Private Access Local Configuration. (This selection also allows to change Local Configuration)
  -> (optional, if HA is enabled.) Copy Local Configuration to the other CSC in the HA pair.
  -> Create an IAM role with the following permissions and apply it to the CSC:
_____________________________________

{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "ec2:DisassociateAddress",
                "ec2:AuthorizeSecurityGroupEgress",
                "ec2:AuthorizeSecurityGroupIngress",
                "ec2:DescribeAddresses",
                "ec2:DescribeInstances",
                "sns:ListSubscriptionsByTopic",
                "ec2:CreateTags",
                "ec2:DescribeSecurityGroups",
                "ec2:ReplaceRoute",
                "ec2:RevokeSecurityGroupIngress",
                "sns:Publish",
                "ec2:DescribeSecurityGroupRules",
                "ec2:RevokeSecurityGroupEgress",
                "ec2:AssociateAddress",
                "ec2:DescribeRouteTables"
            ],
            "Resource": "*"
        }
    ]
}
_____________________________________

  -> Load Private Access Peers JSON configuration file.

1) Create (or change) Private Access Local Configuration
2) Load Private Access Peers JSON configuration file
3) Quit
Enter your choice:
```

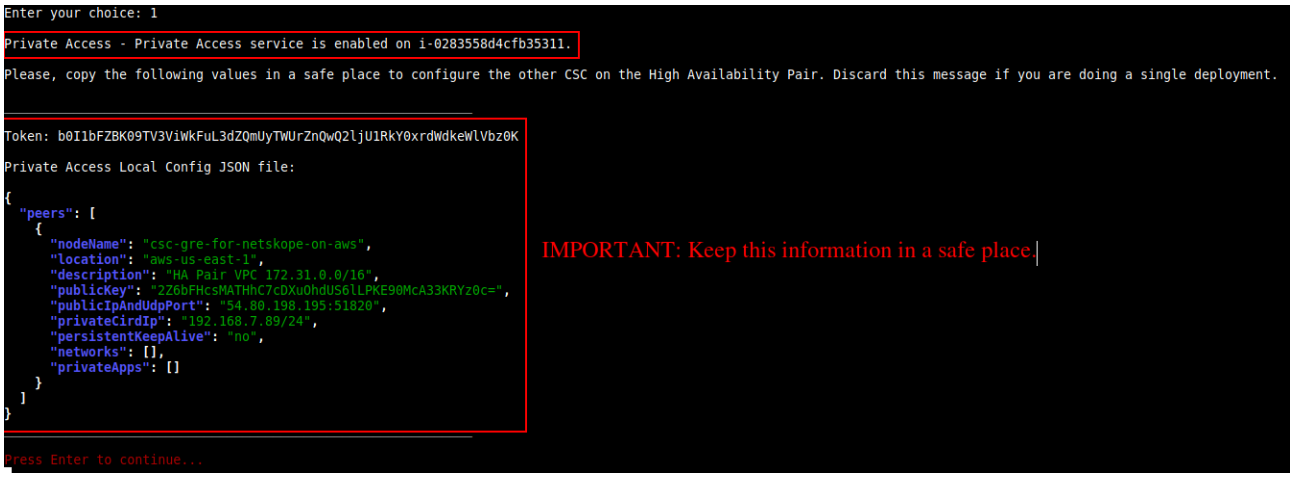
- Select "1) Create (or change) Private Access Local Configuration"

```
Enter your choice: 1

Private Access is not enabled.

IMPORTANT:
   1) Use 'Manual Configuration' to generate keys and values.
   2) Use 'Token and JSON' to load previous generated values. For example, to configure second CSC on HA Pair.

Do you want to enable Private Access?

1) Manual Configuration
2) Token and JSON
3) Quit
Enter your choice:
```

- Select "1) Manual Configuration" and input the values requested.



- Apply values

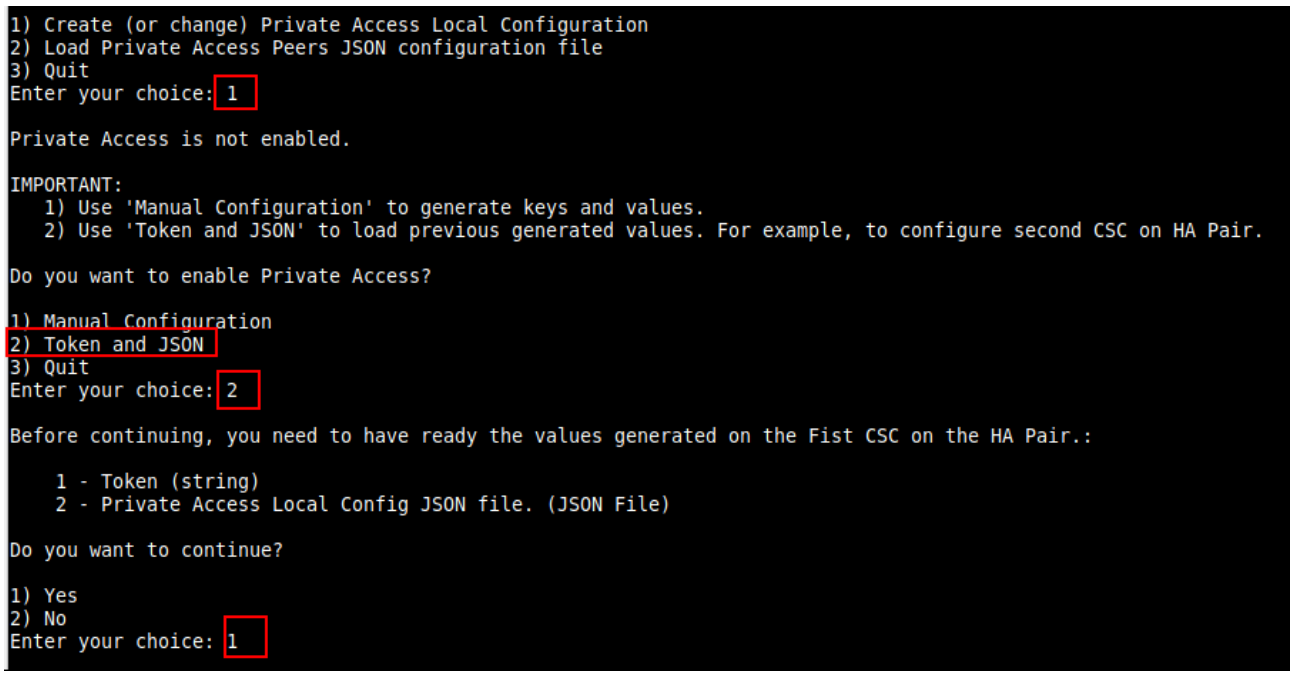


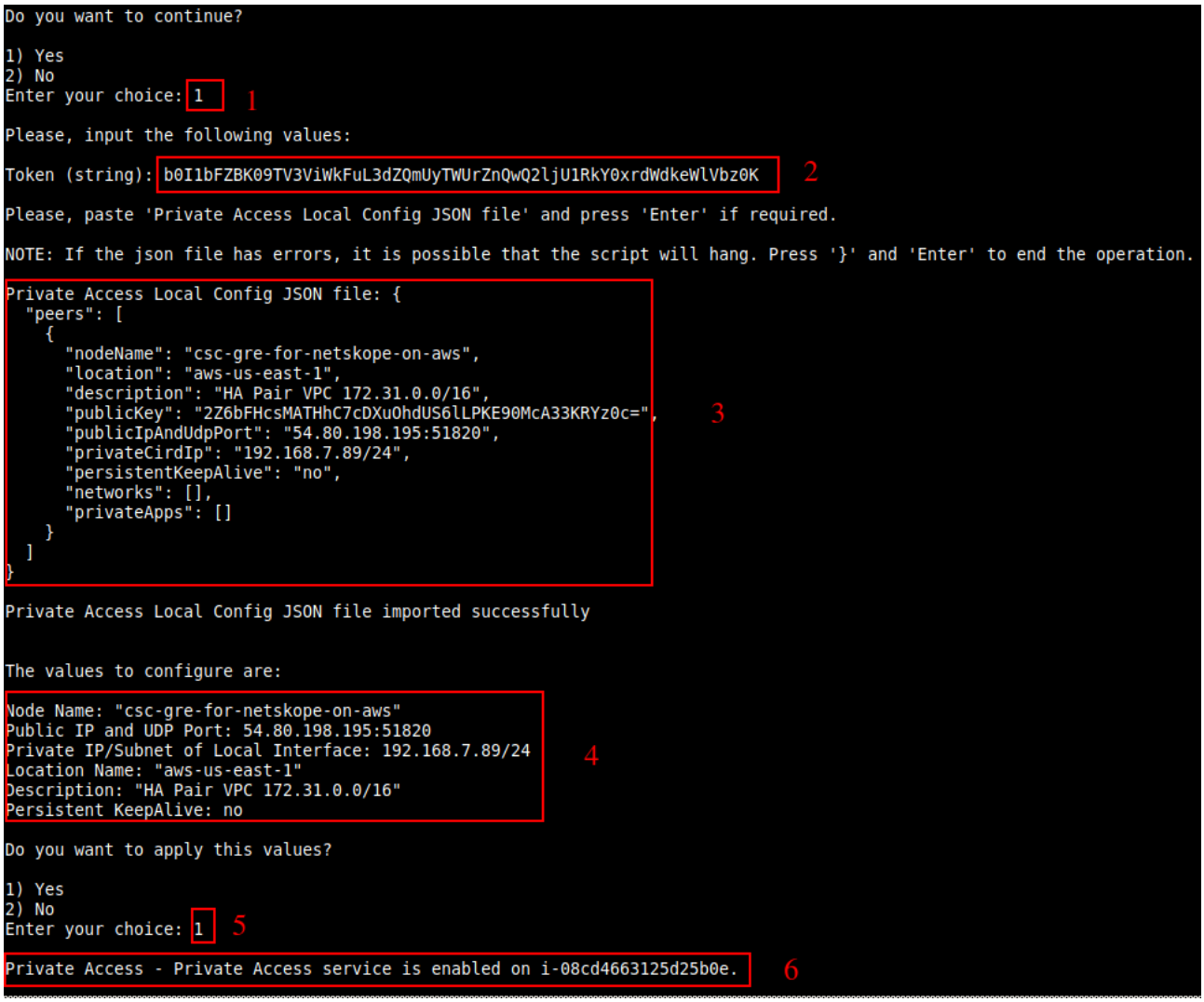
IMPORTANT: *The "Token" and "Private Access Local Config JSON file" will be used to create the local configuration on the second node of the HA pair. Please, keep these values in a safe place. You can use these values to reconfigure any node of the HA Pair if necessary in the future. For example, if you want to change the IPs or descriptions.*

8.3.2 Create the Local configuration (second node of HA Pair)

SSH the second node of the HA Pair and input the "Token" and "Private Access Local Config JSON file".

Go to 19) Configure Private Access. → 1) Create (or change) Private Access Local Configuration → 2) Token and JSON





8.3.3 Create the Private Access Peers JSON file

The Private Access Peers JSON file contains:

1. The Local configuration of each Peer.
2. The "networks" behind each Peer.
3. The "privateApps" allowed to be reached on each Peer.

Here some examples.

8.3.3.1 Full mesh Private Access Peers JSON file

Consider the following example:

We have 3 nodes and we want to allow full communication between sites for all port and protocols.

The Local Config JSON file of each node is:

ns-cgc00001

```
{
  "peers": [
    {
      "nodeName": "ns-cgc00001",
      "description": "Node on VMware Server 1",
      "location": "HQ",
      "publicKey": "yAnz5TF+lXXJte14tji3zlMNq+hd2rYUIgJBgB3fBmk=",
      "publicIpAndUdpPort": "200.1.1.1:51821",
      "privateCirdIp": "192.168.7.1/24",
      "persistentKeepAlive": "no",
      "networks": [],
      "privateApps": []
    }
  ]
}
```

ns-cgc00002

```
{
  "peers": [
    {
      "nodeName": "ns-cgc00002",
      "description": "Node on VMware Server 2",
      "location": "Datacentre 2",
      "publicKey": "xTIBA5rboUvnH4htodjb6e697QjLERt1NAB4mZqp8Dg=",
      "publicIpAndUdpPort": "200.1.1.2:51821",
      "privateCirdIp": "192.168.7.2/24",
      "persistentKeepAlive": "no",
      "networks": [],
      "privateApps": []
    }
  ]
}
```

ns-cgc00003

```
{
  "peers": [
    {
      "nodeName": "ns-cgc00003",
      "description": "Node on VMware Server 3",
      "location": "Branch",
      "publicKey": "TrMvSoP4jYQlY6RIzBgbssQqY3vxI2Pi+y71lOWWXX0=",
      "publicIpAndUdpPort": "200.1.1.3:51821",
      "privateCirdIp": "192.168.7.3/24",
      "persistentKeepAlive": "no",
      "networks": [],
      "privateApps": []
    }
  ]
}
```

Firstly, we need to create our "basic" Peers Configuration JSON file: It contains the Local Configuration of each Node plus the "networks" behind each node.

Basic Peers Configuration JSON file


```
{
  "peers": [
    {
      "nodeName": "ns-cgc00001",
      "description": "Node on VMware Server 1",
      "location": "HQ",
      "publicKey": "yAnz5TF+lXXJte14tji3zlMNq+hd2rYUIgJBgB3fBmk=",
      "publicIpAndUdpPort": "200.1.1.1:51821",
      "privateCirdIp": "192.168.7.1/24",
      "persistentKeepAlive": "no",
      "networks": [
        "10.1.1.0/24",
        "10.1.2.0/24"
      ],
      "privateApps": []
    },
    {
      "nodeName": "ns-cgc00002",
      "description": "Node on VMware Server 2",
      "location": "Datacentre 2",
      "publicKey": "xTIBA5rboUvnH4htodjb6e697QjLERt1NAB4mZqp8Dg=",
      "publicIpAndUdpPort": "200.1.1.2:51821",
      "privateCirdIp": "192.168.7.2/24",
      "persistentKeepAlive": "no",
      "networks": [
        "10.2.1.0/24",
        "10.2.2.0/24"
      ],
      "privateApps": []
    },
    {
      "nodeName": "ns-cgc00003",
      "description": "Node on VMware Server 3",
      "location": "Branch",
      "publicKey": "TrMvSoP4jYQlY6RIzBgbssQqY3vxI2Pi+y71lOWWXX0=",
      "publicIpAndUdpPort": "200.1.1.3:51821",
      "privateCirdIp": "192.168.7.3/24",
      "persistentKeepAlive": "no",
      "networks": [
        "10.3.1.0/24",
        "10.3.2.0/24"
      ],
      "privateApps": []
    }
  ]
}
```

In this "Basic Peers Configuration JSON file" we have:

- Green: The Local values generated at each node.
- Yellow: The Subnets behind each node
- Red: Nothing. No private Apps configured.

If you deployed this "Basic Peers Configuration JSON file" to all CSCs, you have created the Private Cloud. All Peers will be visible to each other, but no traffic between subnets will be allowed because there is no "privateApps" configured.

If we want to allowed traffic any to any between subnets, we need to add the corresponding "privateApps" to each node. For example for node: "ns-cgc00001"

ns-cgc00001


```
{
        "nodeName": "ns-cgc00001",
        "description": "Node on VMware Server 1",
        "location": "HQ",
        "publicKey": "yAnz5TF+lXXJte14tji3zlMNq+hd2rYUIgJBgB3fBmk=",
        "publicIpAndUdpPort": "200.1.1.1:51821",
        "privateCirdIp": "192.168.7.1/24",
        "persistentKeepAlive": "no",
        "networks": [
           "10.1.1.0/24",
           "10.1.2.0/24"
        ],
        "privateApps": [
          {
            "description": "Allow all traffic to this site",
            "ipProtocol": "all",
            "sourceCirdIp": [
              "0.0.0.0/0"
            ],
            "destinationCirdIp": [
              "10.1.1.0/24",
              "10.1.2.0/24"
            ],
            "destinationSinglePorts": [
              ""
            ],
            "destinationPortRange": {
              "fromPort": "",
              "toPort": ""
            }
          }
        ]
    },
```


In this case, we added a "privateApp" that allows any source IPs (0.0.0.0/0) to reach the "networks" (10.1.1.0/24 and 10.1.2.0/24) using "all" protocols ("ipProtocol" : "all".)

Now, completing our "Peers Configuration JSON file":

Full Mesh Peers Configuration JSON file.

```
{
  "peers": [
    {
      "nodeName": "ns-cgc00001",
      "description": "Node on VMware Server 1",
      "location": "HQ",
      "publicKey": "yAnz5TF+lXXJte14tji3zlMNq+hd2rYUIgJBgB3fBmk=",
      "publicIpAndUdpPort": "200.1.1.1:51821",
      "privateCirdIp": "192.168.7.1/24",
      "persistentKeepAlive": "no",
      "networks": [
        "10.1.1.0/24",
        "10.1.2.0/24"
      ],
      "privateApps": [
        {
          "description": "Allow all traffic to this site",
          "ipProtocol": "all",
          "sourceCirdIp": [
            "0.0.0.0/0"
          ],
          "destinationCirdIp": [
            "10.1.1.0/24",
            "10.1.2.0/24"
          ],
          "destinationSinglePorts": [
            ""
          ],
          "destinationPortRange": {
            "fromPort": "",
            "toPort": ""
          }
        }
      ]
    },
    {
      "nodeName": "ns-cgc00002",
      "description": "Node on VMware Server 2",
      "location": "Datacentre 2",
      "publicKey": "xTIBA5rboUvnH4htodjb6e697QjLERt1NAB4mZqp8Dg=",
      "publicIpAndUdpPort": "200.1.1.2:51821",
      "privateCirdIp": "192.168.7.2/24",
      "persistentKeepAlive": "no",
      "networks": [
        "10.2.1.0/24",
        "10.2.2.0/24"
      ],
      "privateApps": [
        {
          "description": "Allow all traffic to this site",
          "ipProtocol": "all",
          "sourceCirdIp": [
            "0.0.0.0/0"
          ],
          "destinationCirdIp": [
            "10.2.1.0/24",
            "10.2.2.0/24"
          ],
          "destinationSinglePorts": [
            ""
          ],
          "destinationPortRange": {
            "fromPort": "",
            "toPort": ""
          }
        }
      ]
    },
    {
      "nodeName": "ns-cgc00003",
      "description": "Node on VMware Server 3",
      "location": "Branch",
      "publicKey": "TrMvSoP4jYQlY6RIzBgbssQqY3vxI2Pi+y71lOWWXX0=",
      "publicIpAndUdpPort": "200.1.1.3:51821",
      "privateCirdIp": "192.168.7.3/24",
      "persistentKeepAlive": "no",
      "networks": [
        "10.3.1.0/24",
```

```
        "10.3.2.0/24"
      ],
      "privateApps": [
        {
          "description": "Allow all traffic to this site",
          "ipProtocol": "all",
          "sourceCirdIp": [
            "0.0.0.0/0"
          ],
          "destinationCirdIp": [
            "10.3.1.0/24",
            "10.3.2.0/24"
          ],
          "destinationSinglePorts": [
            ""
          ],
          "destinationPortRange": {
            "fromPort": "",
            "toPort": ""
          }
        }
      ]
    }
  ]
}
```

Done! Your task is to implement this JSON file on all CSCs and you will have full connectivity any to any for all protocols.

8.3.3.2 Understanding "privateApps" configuration and values

Question 1: Where to configure the "privateApps"?

Only on the node that has the "destinationCirdIp": [], that belongs to its "networks".

Example: I want to allow access to "destinationCirdIp": ["**10.1.1.50/32**"]. The rule must be created on node ns-cgc00001 that has "networks": ["**10.1.1.0/24**","10.1.2.0/24"]

Question 2 : What about the values to configure?

On "privateApps" section there are two types of values to input:

Accepts single value only -> ""

Accepts single or multiple values -> []

```
"privateApps": [
        {
          "description": "",
          "ipProtocol": "",
          "sourceCirdIp": [],
          "destinationCirdIp": [],
          "destinationSinglePorts": [],
          "destinationPortRange": {
            "fromPort": "",
            "toPort": ""
          }
        }
      ]
```

Examples:

Single value (""):

"description": " Intranet Servers",
"ipProtocol": "tcp",

Single or Multiple values ([]):

"sourceCirdIp": ["0.0.0.0/0"],

"destinationCirdIp": ["10.1.1.100/32", "10.1.2.100/32"],
"destinationSinglePorts": ["80", "443"],

The following table shows all field and values accepted

Field	Value Type	Values to configure	Example
"description": "",	Single	String	"description": "Intranet Server Access",
"ipProtocol": "",	Single	tcp,udp,icmp or all	"ipProtocol": "tcp",
"sourceCirdIp": [],	Single or Multiple	Networks in the range of: 10.0.0.0/8 172.16.0.0/12 192.168.0.0/16 and 0.0.0.0/0	"sourceCirdIp": ["10.2.1.0/24", "10.2.2.0/24", "10.3.1.0/24", "10.3.2.0/24"],
"destinationCirdIp": [],	Single or Multiple	Networks in the range of [8]: 10.0.0.0/8 172.16.0.0/12 192.168.0.0/16	"destinationCirdIp": ["10.1.1.100/32", "10.1.1.200/32"],
"destinationSinglePorts": [],	Single or Multiple	Single Port of the range 1 to 65535	"destinationSinglePorts": ["80", "443"],

"destinationPortRange": {
"fromPort": "",
"toPort": ""
}
	Single	Single Port of the range 1 to 65535	"destinationPortRange": {
			"fromPort": "3780",
			"toPort": "3784"
			}

8 The expected value here is a value that belongs to the "network" defined behind the CSC. For example, of the network behind the CSC is 10.1.1.0/24, any destination configured must belong to 10.1.1.0/24, like 10.1.1.100/32.

8.3.3.3 Example of "privateApps" for a Windows Domain controller

The following example shows how to create rules to allow access to your Domains Controllers.

The port information was taken from this article:

https://docs.microsoft.com/en-us/troubleshoot/windows-server/identity/config-firewall-for-ad-domains-and-trusts

Example: Domain Controllers IPs: "10.2.1.100/32" and "10.2.2.100/32" on Node ns-cgc00002 of previous example

```
"privateApps": [
        {
          "description": "Domain Controllers TCP",
          "ipProtocol": "tcp",
          "sourceCirdIp": [ "0.0.0.0/0" ],
          "destinationCirdIp": [ "10.2.1.100/32", "10.2.2.100/32" ],
          "destinationSinglePorts": [ "135", "464", "389", "636", "3268", "3269", "53", "88", "445" ],
          "destinationPortRange": { "fromPort": "49152", "toPort": "65535" }
        },
        {
          "description": "Domain Controllers UDP",
          "ipProtocol": "udp",
          "sourceCirdIp": [ "0.0.0.0/0" ],
          "destinationCirdIp": [ "10.2.1.100/32", "10.2.2.100/32" ],
          "destinationSinglePorts": [ "123", "464", "389", "53", "88" ],
          "destinationPortRange": { "fromPort": "", "toPort": "" }
        },
        {
          "description": "Domain Controllers Ping",
          "ipProtocol": "icmp",
          "sourceCirdIp": [ "0.0.0.0/0" ],
          "destinationCirdIp": [ "10.2.1.100/32", "10.2.2.100/32" ],
          "destinationSinglePorts": [],
          "destinationPortRange": { "fromPort": "", "toPort": "" }
        }
      ]
```

8.3.3.4 Example of "privateApps" for Internal Web Server.

In this example, we are showing how to configure access to users on ns-cgc00001 to an Internal Web server located behind node Node ns-cgc00003.

Example: Web Server "10.3.1.200/32" on Node ns-cgc00003 of previous example. Allow access to all users behind ns-cgc00001

```
"privateApps": [
        {
          "description": "Web Server 3",
          "ipProtocol": "tcp",
          "sourceCirdIp": [ "10.1.1.0/24", "10.1.2.0/24" ],
          "destinationCirdIp": [ "10.3.1.200/32" ],
          "destinationSinglePorts": [ "80", "443" ],
          "destinationPortRange": { "fromPort": "", "toPort": "" }
        }
      ]
```

8.3.4 Load the "Private Access Peers JSON file" to the CSCs.

After the Local Configuration is done and the "Private Access Peers JSON file" is created, the next task is to distribute and apply it on each CSC.

There are three methods available:

1. URL: (Recommended) Using "Private Access Peers URL" and running the command "Refresh Private Access Peers URL" using AWS Systems Manager or Rundeck.
2. DevOps: Distribute the JSON file on all CSC and run the command "Reload Private Access Peers URL" using AWS Systems Manager or Rundeck.
3. Manual: Copy/Paste the JSON file on each CSCs.

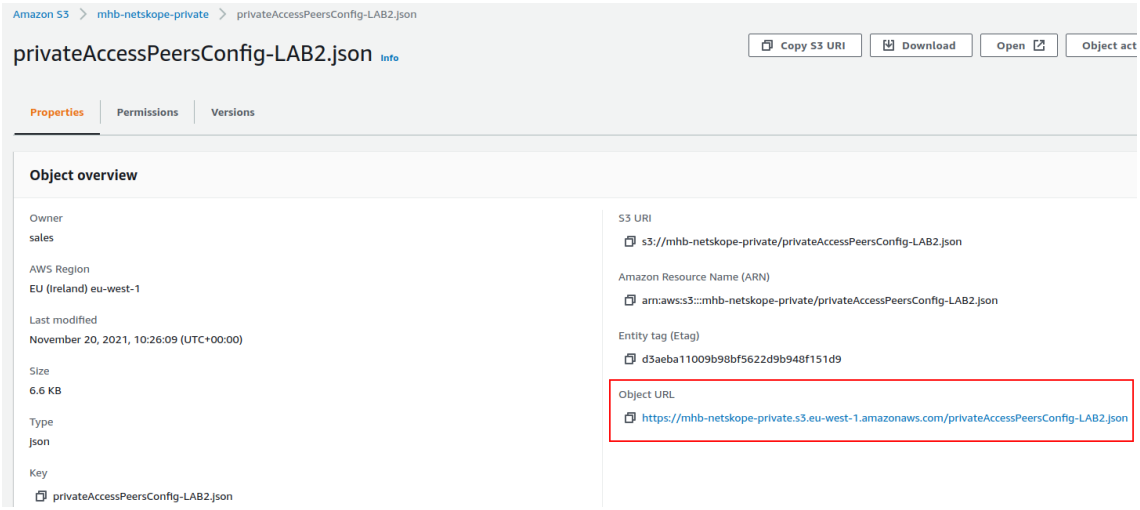
In this section we are going to explain two methods: URL and Manual Copy. The DevOps method is explained on Section12: DevOps operations.

8.3.4.1 Using "Private Access Peers URL"

This is the recommended method. The steps to configure are:

1. Place the Private Access Peers JSON file on an internal web server or an AWS bucket[9] or similar. Obtain the download URL.

Example of AWS bucket:



2. Configure the URL on each CSC.

Ssh the each CSC and go to Main Menu -> 19) Configure Private Access

9 See Appendix D to learn how to secure an AWS S3 bucket by Source IP.

```
MHB Labs - Private Access - (Preview)
18) Show Configurations and Status Private Access.
19) Configure Private Access
20) Configure CSC Remote Management via Private Access.

e) Exit

Selection: 19   1

Private Access Configuration Wizard

Steps to configure Private Access:

  -> Create Private Access Local Configuration. (This selection also allows to change Local Configuration)
  -> (optional, if HA is enabled.) Copy Local Configuration to the other CSC in the HA pair.
  -> Create an IAM role with the following permissions and apply it to the CSC:
_____________________________________

{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "VisualEditor0",
            "Effect": "Allow",
            "Action": [
                "ec2:DisassociateAddress",
                "ec2:AuthorizeSecurityGroupEgress",
                "ec2:AuthorizeSecurityGroupIngress",
                "ec2:DescribeAddresses",
                "ec2:DescribeInstances",
                "sns:ListSubscriptionsByTopic",
                "ec2:CreateTags",
                "ec2:DescribeSecurityGroups",
                "ec2:ReplaceRoute",
                "ec2:RevokeSecurityGroupIngress",
                "sns:Publish",
                "ec2:DescribeSecurityGroupRules",
                "ec2:RevokeSecurityGroupEgress",
                "ec2:AssociateAddress",
                "ec2:DescribeRouteTables"
            ],
            "Resource": "*"
        }
    ]
}
_____________________________________

  -> Load Private Access Peers JSON configuration file.

1) Create (or change) Private Access Local Configuration
2) Load Private Access Peers JSON configuration file
3) Quit
Enter your choice: 2   2
```

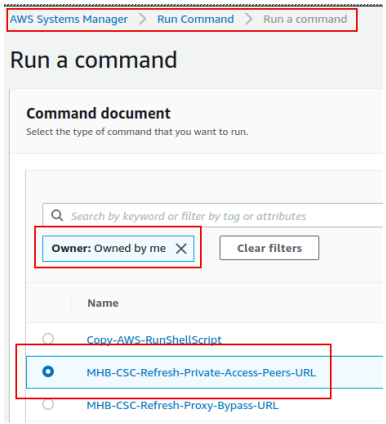
```
1) Create (or change) Private Access Local Configuration
2) Load Private Access Peers JSON configuration file
3) Quit
Enter your choice: 2   1

Private Access is enabled.

Please, Select Method:
1) Private Access Peers URL
2) Manual (Paste Private Access Peers JSON File)
3) Reset to Default Values
4) Quit
Enter your choice: 1   2

*** Private Acces Peers URL is not configured ***

Do you want to configure the Private Acces Peers URL?
1) Yes
2) No
Enter your choice: 1   3

                                                    4
Please, input Private Acces Peers URL
Private Acces Peers URL: https://mhb-netskope-private.s3.eu-west-1.amazonaws.com/privateAccessPeersConfig-LAB2.json

Do you want to refresh the Private Access Peers List?
1) Yes
2) No
Enter your choice: 1   5

Private Access Peers JSON file imported successfully
```

At this moment, you have the option to review the privateApps to configure in Compact or JSON format and to apply the values.

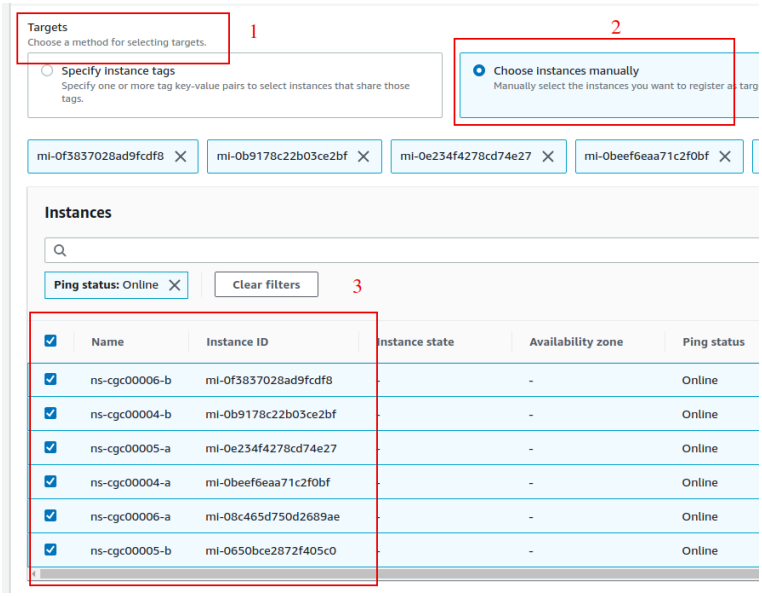
3. The next time you want to refresh the Private Access Peers JSON file, update the file, deploy it on the same location URL and Run Command: "Refresh Private Access Peers URL" using AWS SSM Agent or Rundeck.

AWS System Manager:

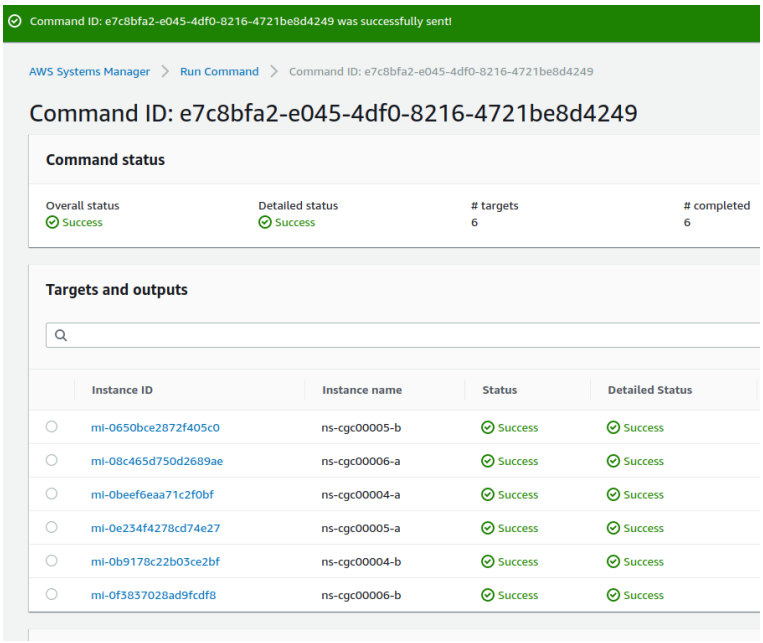
- Go to AWS Systems Manager -> Run Command -> and Select "MHB-CSC-Refresh-Private-Access-Peers-URL"



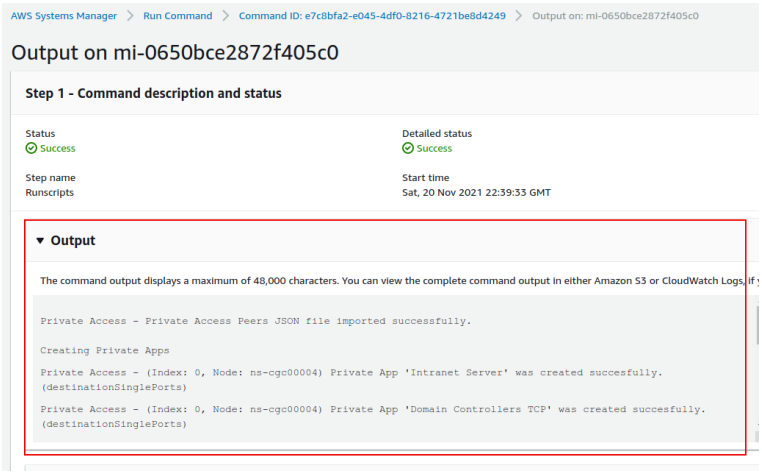
- Move down the screen and select all CSCs:



- Go to the bottom of the page and click "Run". The next page shows the status of the command on each CSC.

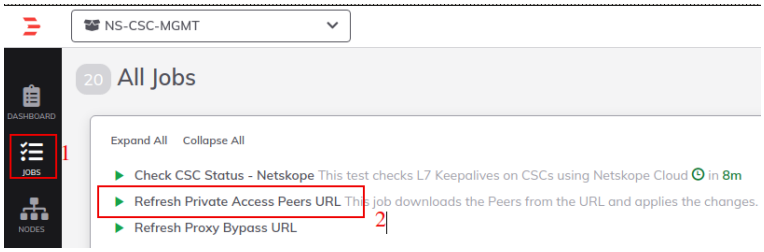


- To see the individual result, right click on the Instance ID and open it on a new TAB. Check the "Output"

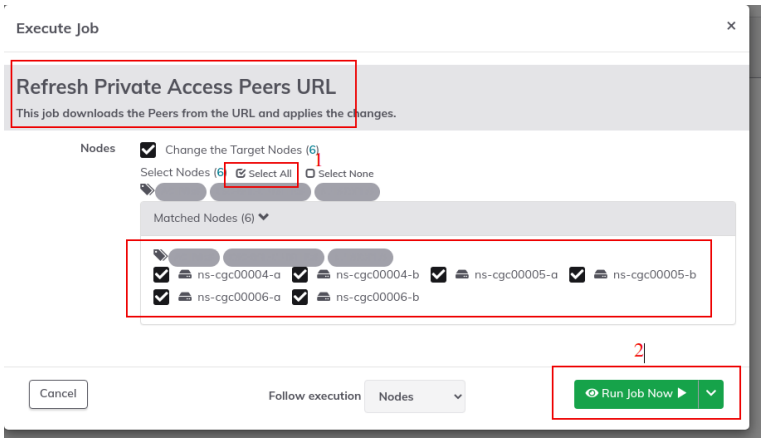

AWS Systems Manager > Run Command > Command ID: e7c8bfa2-e045-4df0-8216-4721be8d4249 > Output on: mi-0650bce2872f405c0
Output on mi-0650bce2872f405c0
Step 1 - Command description and status
Status
Success
Detailed status
Success
Step name
Runscripts
Start time
Sat, 20 Nov 2021 22:39:33 GMT
Output
The command output displays a maximum of 48,000 characters. You can view the complete command output in either Amazon S3 or CloudWatch Logs.
Private Access - Private Access Peers JSON file imported successfully.
Creating Private Apps
Private Access - (Index: 0, Node: ns-cgc00004) Private App 'Intranet Server' was created succesfully. (destinationSinglePorts)
Private Access - (Index: 0, Node: ns-cgc00004) Private App 'Domain Controllers TCP' was created succesfully. (destinationSinglePorts)

Using Rundeck

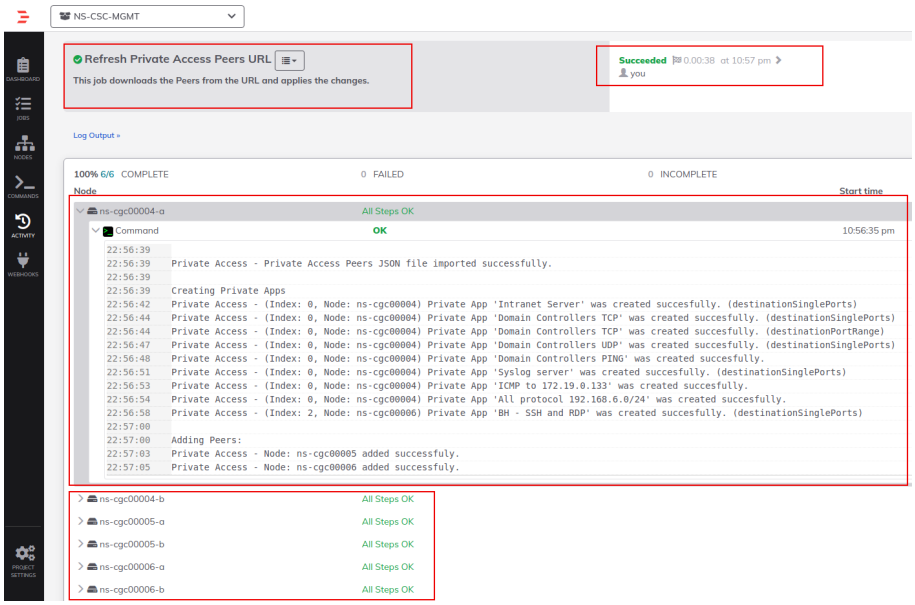
- Go to the Project <name> -> All Jobs -> Run " Refresh Private Access Peers URL"



- Select ALL nodes and click Run.

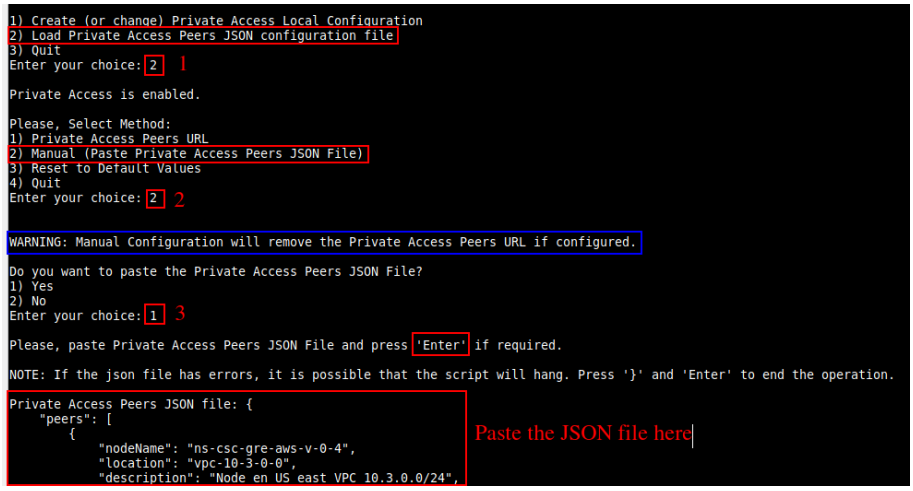


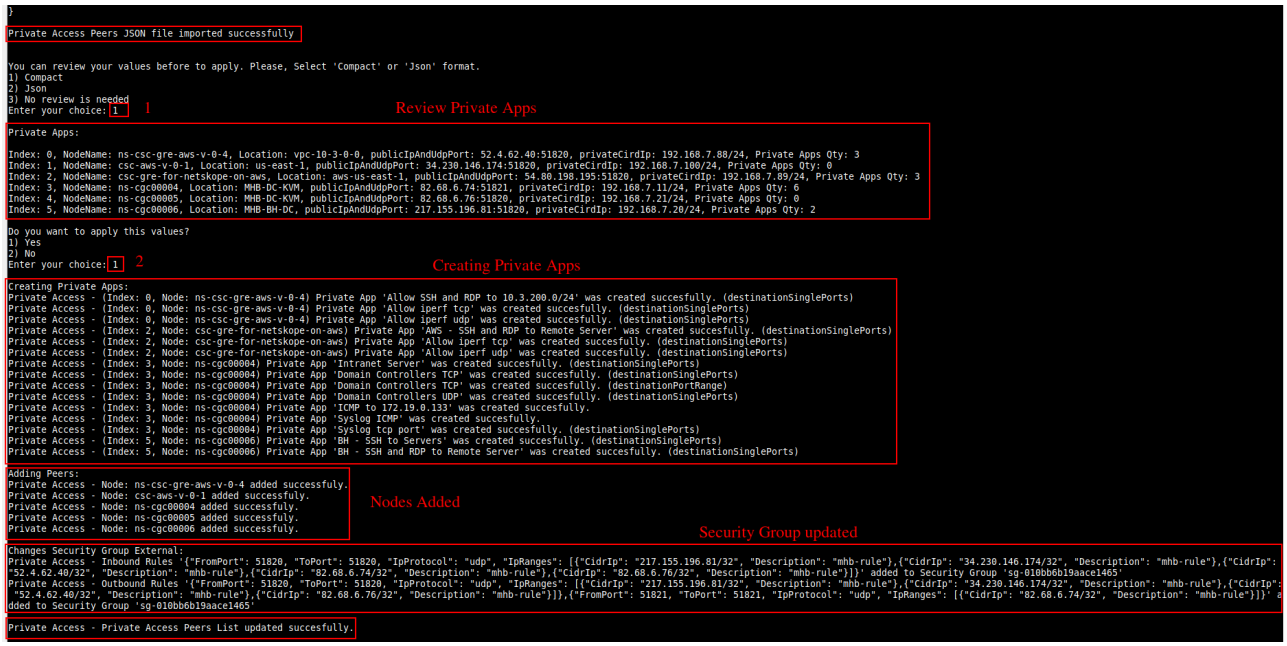
- Wait to succeeded. You can click on "command" to see the results node by node.



8.3.4.2 Manual: Copy and Paste "Private Access Peers Json file"

From Main Menu, go to 19) Configure Private Access, follow the steps below and Paste the Private Access Peers Json File:



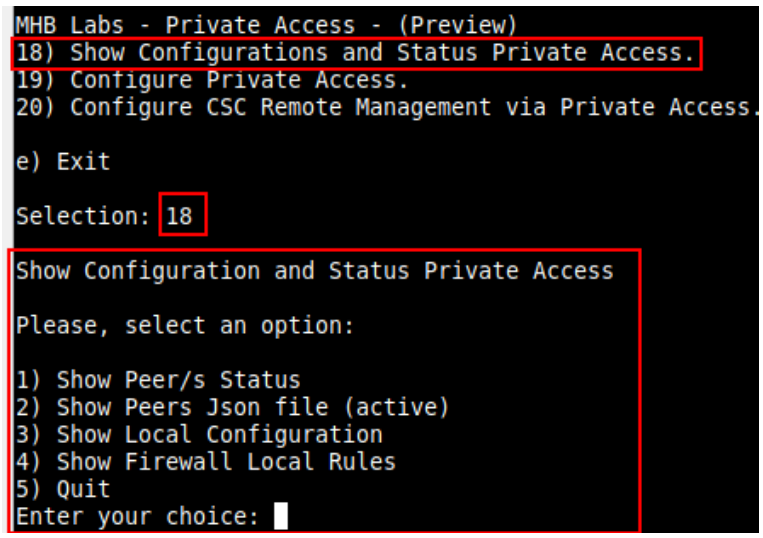


Done!

8.4 Show Configurations and Status Private Access.

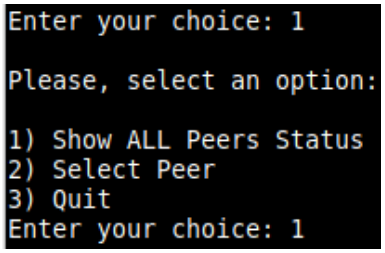
8.4.1 Via SSH console

From Main Menu, go to 18) Show Configurations and Status Private Access.

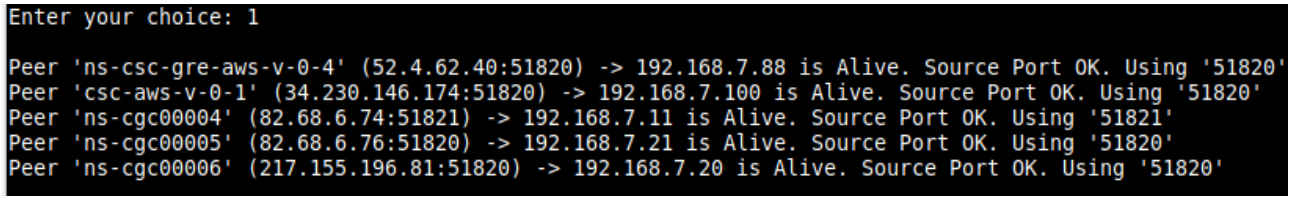


8.4.1.1 Show Peer/s Status

In this menu you can see "All Peers Status" or by peer "Select Peer".



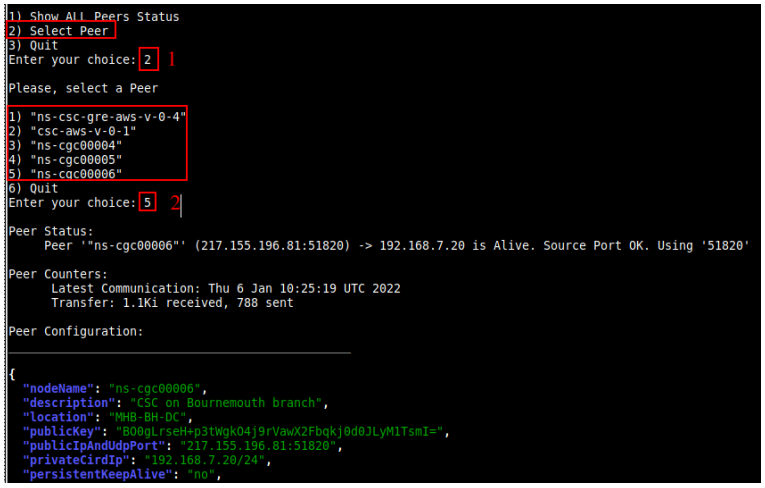
1. Show All Peers Status



IMPORTANT: This section show is the Peer is Alive and the "Source Port" that arrives at this node from the Peer. The Source Port information is essential to validate that the NAT on the Remote Peer is correct or if the FW on the other end is changing the Source Port. Please, correct the NAT on the remote Peer if you see that the Source Port differs from the expected.

2. Select Peer

This section shows a more detailed information about the Peer.

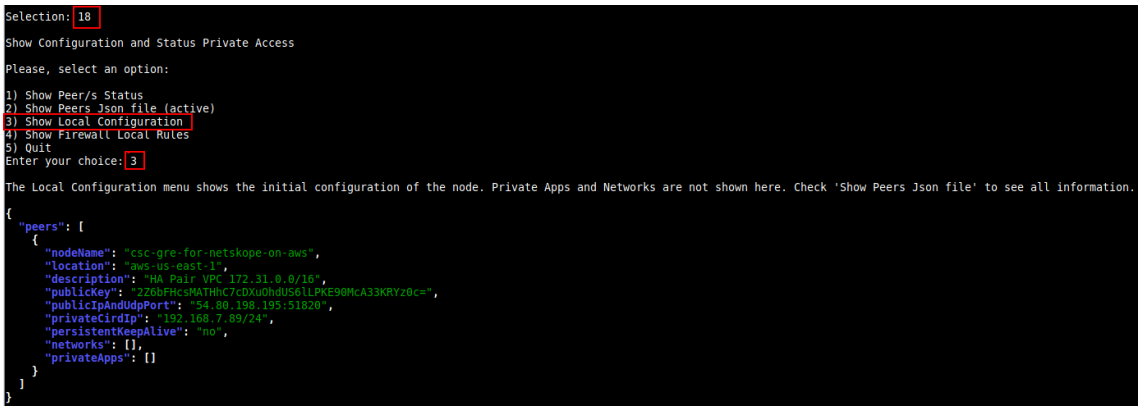


8.4.1.2 Show Peers Json file (active)

This menu shows the active Private Access Peers Json file.

8.4.1.3 Show Local Configuration

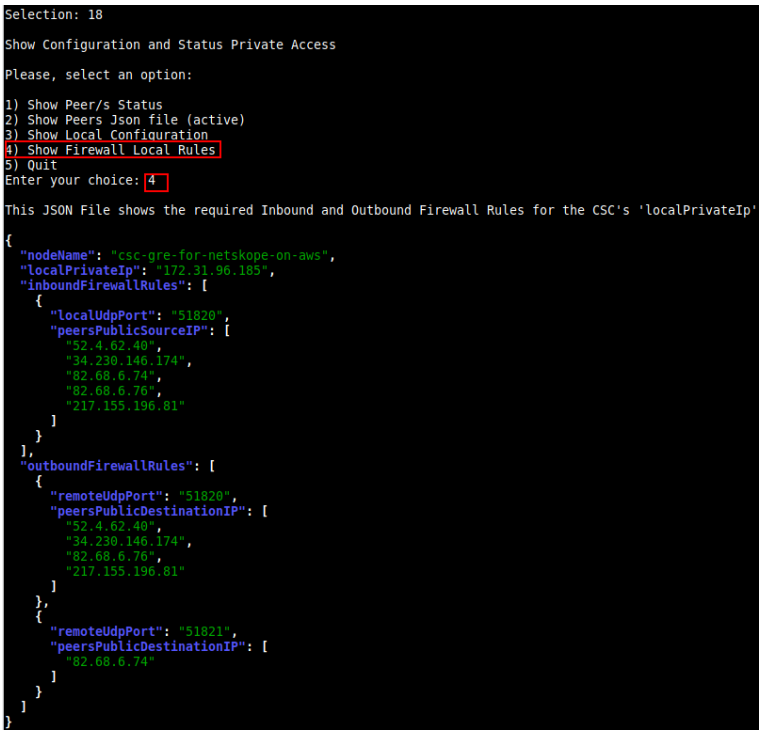
This menu shows the Local configuration of the node.



8.4.1.4 Show Firewall Local Rules

This menu shows in JSON format the Rules required on the Security Group of the external interface of the CSC.

> ***Note:*** *The CSC does the refresh of the External Security Group every time you update the Peers configuration. No manual configuration is required.*



8.4.2 via AWS Systems Manager or Rundeck

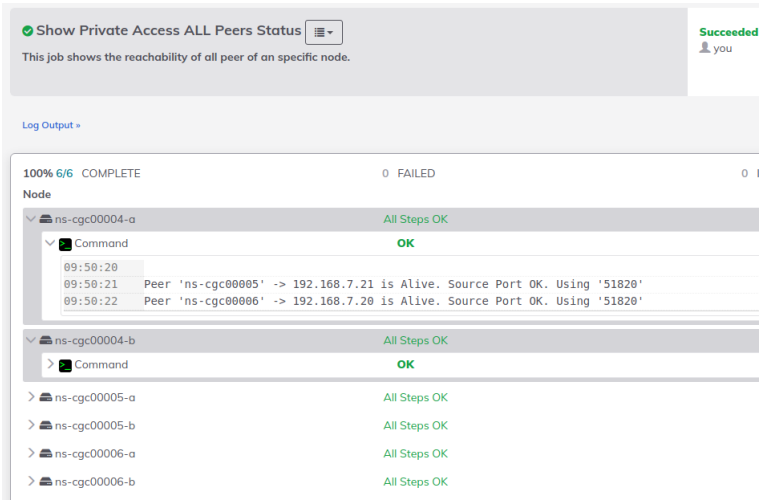
In this case, the information provided is only "Show ALL Peer Status"

8.4.2.1 AWS Systems Manager

Go to AWS Systems Manager and Run Command: "MHB-CSC-Show-Private-Access-ALL-Peers-Status" and select the Nodes. The result will show:

8.4.2.2 Rundeck

On Rundeck, run Job: "Show Private Access ALL Peers Status". Select the nodes. The output will show:



8.5 Configure CSC Remote Management via Private Access.

When the CSC is in HA, like the CSC GRE Cluster, only the active node belongs to the Private Cloud. The Standby is not. For this reason, if you want to reach the Standby node using SSH, you must configure Remote Management on both CSC of the Cluster (or HA pair).

The configuration is via SSH Main Menu. You need to add the "Management Networks". For example, in your primary Datacentre, you have the Subnet 172.19.0.0/24, and from that Subnet, you want to reach ALL CSCs on the Private Cloud.

The configuration will be:

```
MHB Labs - Private Access - (Preview)
18) Show Configurations and Status Private Access.
19) Configure Private Access.
20) Configure CSC Remote Management via Private Access.

e) Exit

Selection: 20

WARNING! You can isolate this node if the configuration is wrong.
Be careful with this settings. We recommend to be precise with the Host or Subnet configured here.
Subnet Prefixes less than /17 are not accepted.

No Management Networks are configured.

Do you want to configure Management Networks?

1) Yes
2) No
3) Reset to Default
Enter your choice: 1

Input Management Network (IP/Subnet Prefix): 172.19.0.0/24

Do you want to add another Management Network?

1) Yes
2) No
Enter your choice: 2

Management Networks to configure:

Management Networks Qty = 1
Management Network= 172.19.0.0/24

Do you want to apply changes?

1) Yes
2) No
Enter your choice: 1
Private Access - Management Network 172.19.0.0/24 was added on i-0283558d4cfb35311
```

9 Remote Management using AWS and Rundeck

You can use several tools to Remote Manage the CSC. In this chapter, we are showing how to use AWS Systems Manager (Fleet Manager) and Rundeck.

9.1 AWS Systems Manager

The easiest and accessible way to manage the Cloud Security Connectors is to use AWS Systems Manager. AWS official documentation is available here: https://aws.amazon.com/systems-manager/. The CSC has preinstalled the SSM Agent. You need to register the CSC using "Hybrid Activations" and "Run Documents" afterwards.

With AWS Systems Manager, you can manage the CSC remotely. To do it, you need to create "Documents" in advance. "Documents" are a series of commands used by the "Run Command" functionality.
This section explains how to create the "Documents" and "Run Commands".

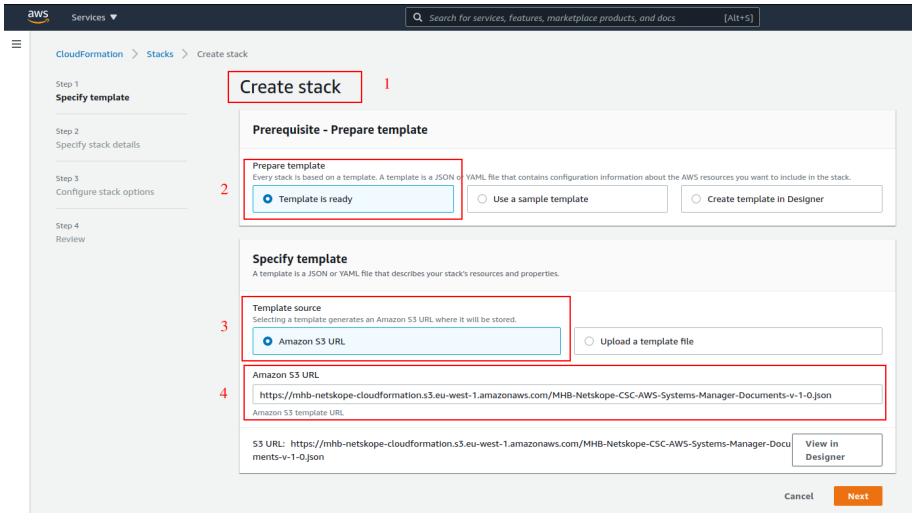
9.1.1 Create Documents

We provide a CloudFormation template to create all "Documents" in one shot.

Steps:

1. Download the CloudFormation template from:

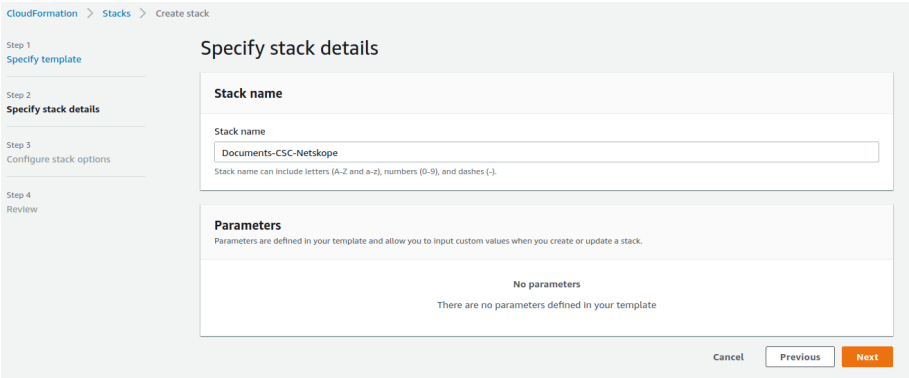
https://mhb-netskope-cloudformation.s3.eu-west-1.amazonaws.com/MHB-Netskope-CSC-AWS-Systems-Manager-Documents-v-1-1.json



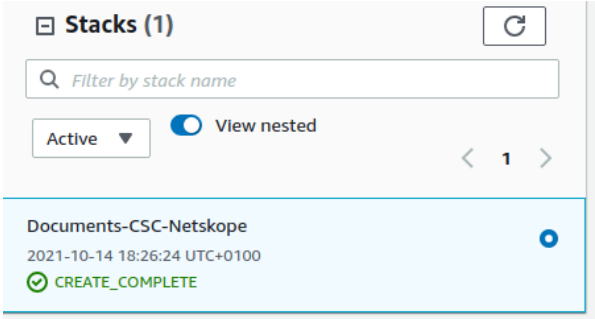
2. Deploy Stack. Go to Cloudformation →Create Stack

3. Insert the Amazon S3 URL and click next.

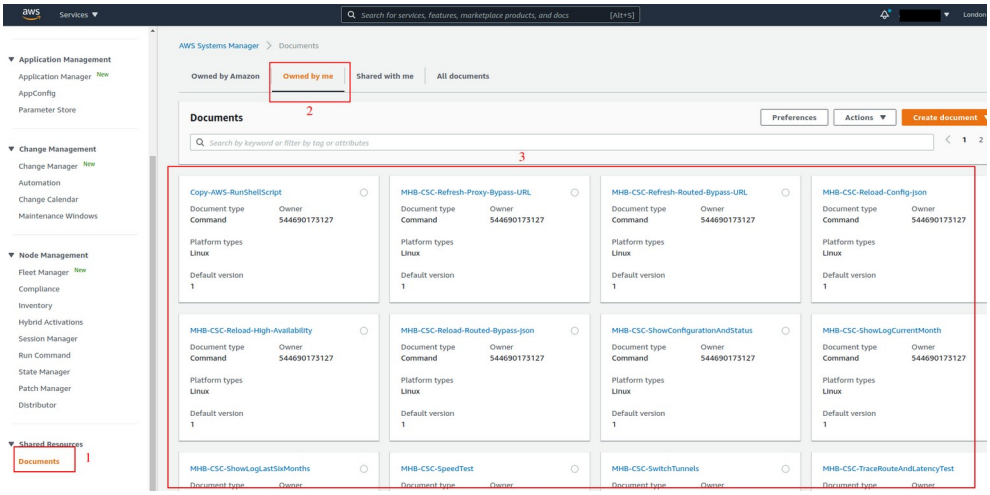
4. Put the Stack Name



5. Click Next -> Next -> Create Stack.
6. Wait the Stack to complete.



7. Now go to Services -> Systems Manager -> and click "Documents" and choose "Owned by me"



8. Done!

9.1.2 Run Commands

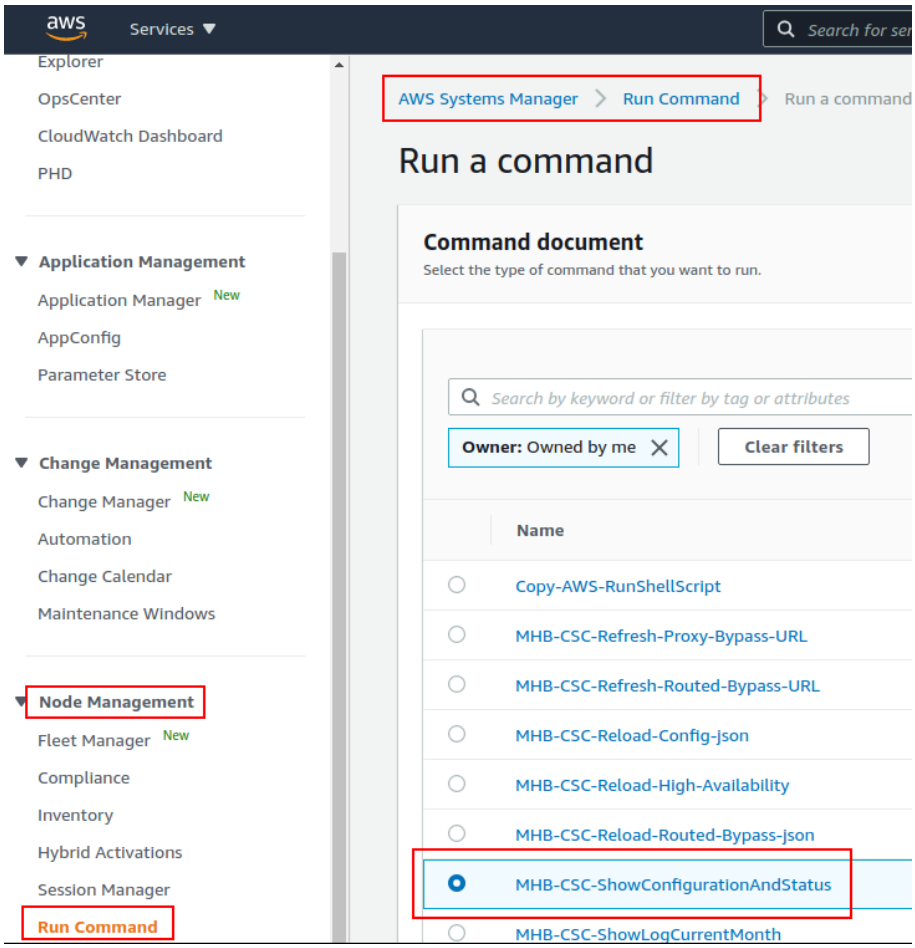
After you have created the Documents, you are ready to Run Commands on the CSC.

You can see the operation results on the "Output" section or store the results on S3 Buckets for further inspection.

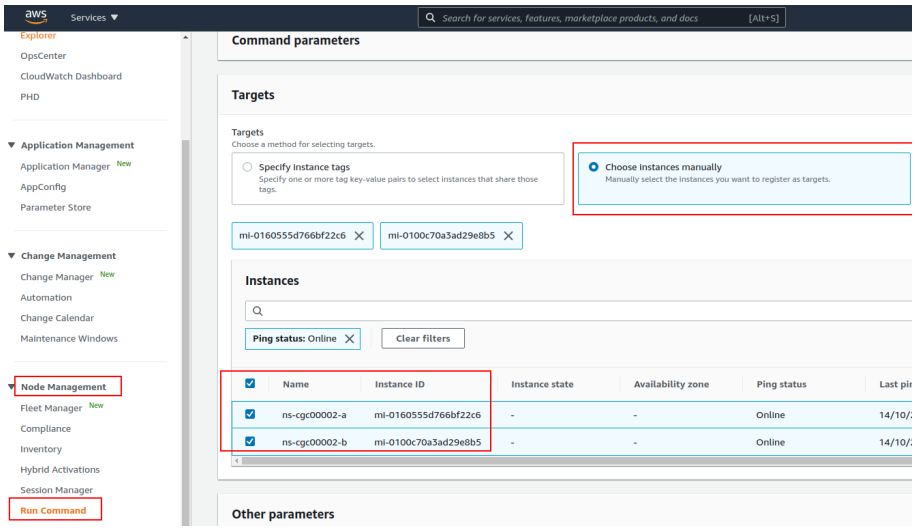
To "Run Commands", go to AWS Systems Manager → Instances & Nodes → Run Command.

Here is an example of Running: MHB-CSC-ShowConfigurationAndStatus

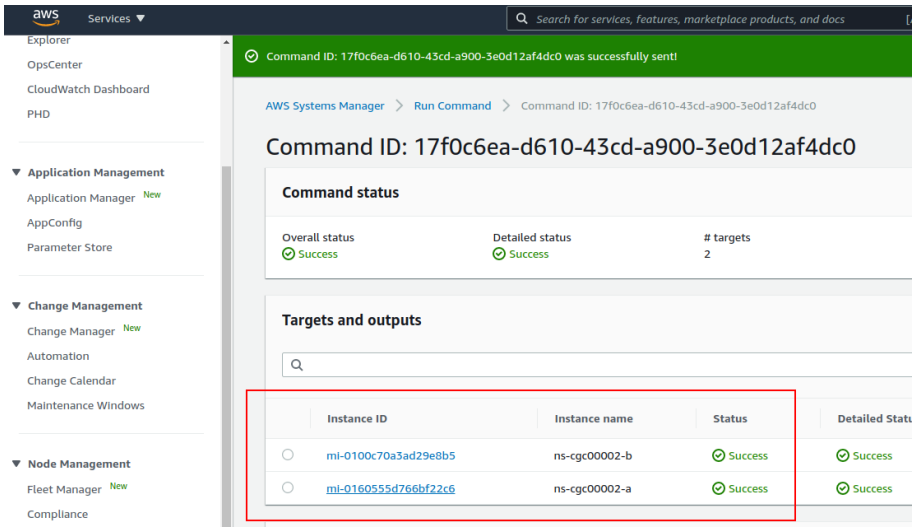
1. Run a Command
2. Select the Document created (Tip: Select "Owned by me")



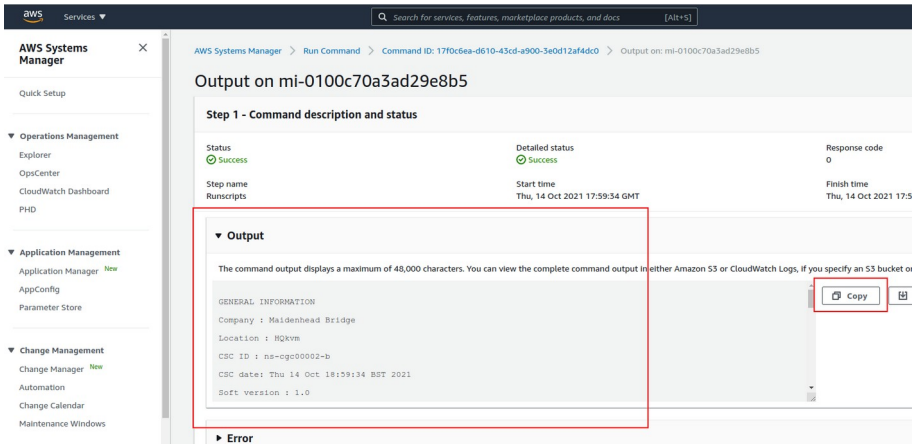
3. Scroll down and Select the Instances



4. Click "Run" . Wait for the Command Status "success"



5. Right click on Instance ID (mi-xxxx) and open in new tab. Check Output.



6. Done! (Note: You can copy the output and to display on a text editor for more visibility)

*Unsaved Document 1 ×

```
GENERAL INFORMATION
Company : Maidenhead Bridge
Location : HQkvm
CSC ID : ns-cgc00002-b
CSC date: Thu 14 Oct 18:59:34 BST 2021
Soft version : 1.0

INTERFACES INFORMATION
External: Tunnel IP: 192.168.1.60 | Bypass Proxy Egress IP: 192.168.1.61 | CSC IP(eth0): 192.168.1.63/24 | Network Gateway: 192.168.1.240 is Alive
Internal: CSC GW IP: 172.19.0.60 | CSC IP(eth1): 172.19.0.64/24 | Network Gateway: 172.19.0.133 is Alive

TRAFFIC REDIRECTION Options
To Netskope: VIP Proxy: 172.19.0.61:80 | Route all traffic via CSC GW IP | Netskope Global Proxy IP: 163.116.128.80:80 via CSC GW IP
Direct to Internet: Bypass Proxy: 172.19.0.62:3128 | Netskope Global Proxy IP: 163.116.128.80:3128 via CSC GW IP

DNS INFORMATION
DNS Server (1) IP: 172.19.0.100 is Alive
DNS Server (2) IP: 1.1.1.1 is Alive

NETSKOPE INFORMATION
GRE tunnels egress Public IP: 82.68.6.74

Primary Tunnel:
                Node : GB,London,LON1
                Node Public IP: 163.116.162.36
                Node Probe: 10.162.6.209
Secondary Tunnel:
                Node : GB,Manchester,MAN1
                Node Public IP: 163.116.165.36
                Node Probe: 10.165.6.209

TUNNEL STATUS
Primary Tunnel (reachability):
                              Node Keepalive is: Alive
                              GRE Tunnel IP is: Standby - This CSC (ns-cgc00002-b) is Cluster Standby
Secondary Tunnel (reachability):
                              Node Keepalive is: Alive
                              GRE Tunnel IP is: Standby - This CSC (ns-cgc00002-b) is Cluster Standby
returnToPrimaryTunnel: true

Tunnel Status: No active tunnel since: Tue 5 Oct 19:27:15 UTC 2021

HTTP://WWW.NOTSKOPE.COM PAGE STATUS
No test performed - This CSC (ns-cgc00002-b) is Cluster Standby

PROXY BYPASS - EGRESS INTERFACE STATUS
No test performed - This CSC (ns-cgc00002-b) is Cluster Standby

ROUTED BYPASS
Using Routed Bypass URL: https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile.json
Routed Bypass URL https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile.json is reachable
Routed Bypass Rules configured via URL: 8

AWS SSM AGENT
AWS SSM Agent is active (running) since Tue 2021-10-05 20:27:11 BST; 1 weeks 1 days ago
Registration values: {"ManagedInstanceID":"mi-0100c70a3ad29e8b5","Region":"eu-west-2"}

SYSLOG INFORMATION
SYSLOG Server (1) IP: 172.19.0.199 is Alive
SYSLOG Server (2) IP is not configured
SYSLOG TCP Port: 514

HIGH AVAILABILITY Information
This CSC (ns-cgc00002-b) is Cluster STANDBY
```

9.1.3 List of Documents available for "Run Command"

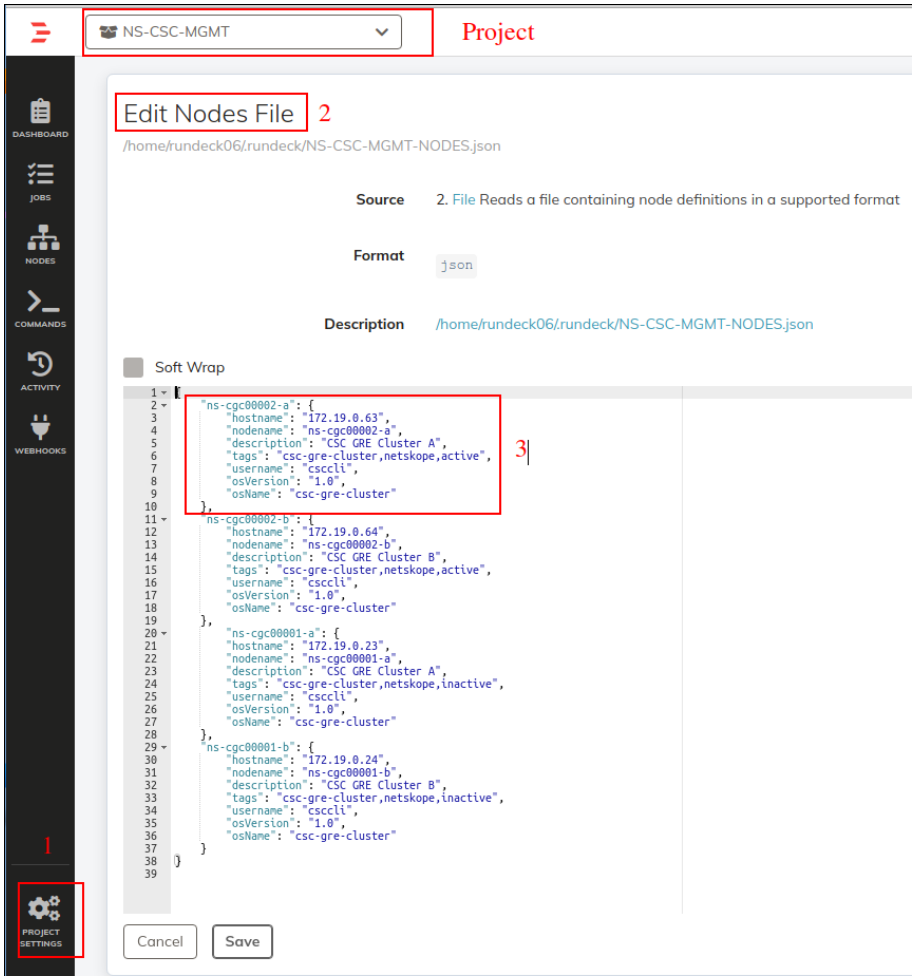
1. "MHB-CSC-ShowConfigurationAndStatus": Executes "Show Configuration and Status"
2. "MHB-CSC-SpeedTest": Performs speedtest.net on the CSC.
3. "MHB-CSC-TraceRouteAndLatencyTest": Performs MyTraceRoute test against the Primary and Secondary ZEN. It also does a Reverse Test from the tunnel active to your Public IP if the tunnel is up.
4. "MHB-CSC-Refresh-Proxy-Bypass-URL": Refresh the Proxy Bypass list using the values of the Proxy Bypass PAC file stored in the URL configured.
5. "MHB-CSC-Refresh-Routed-Bypass-URL": Refresh the Routed Bypass list using the values of the JSON file stored in the URL configured.
6. "MHB-CSC-ShowLogCurrentMonth": Shows current month logs.
7. "MHB-CSC-ShowLogLastSixMonths": Shows last six month logs.
8. "MHB-CSC-SwitchTunnels": Switch tunnels.
9. "MHB-CSC-Reload-Config-json": Reloads the values of config.json file.
10. "MHB-CSC-Reload-High-Availability": Reloads the values of highAvailability.json file. (for CSC on AWS, Azure and Gcloud. Not in use on CSC for Virtual Platforms.
11. "MHB-CSC-Reload-Routed-Bypass-json": Reloads the values of routedBypassRulesFile.json.
12. "MHB-CSC-Update-Nodes-Database": Updates the Netskope Node Database.
13. "MHB - CSC - Refresh Private Access Peers URL": Refresh the Private Access Peers list using the values of the JSON file stored in the URL configured.
14. "MHB - CSC - Reload Private Access Peers JSON file": Reloads the values of privateAccessPeersConfig.json
15. "MHB - CSC - Show Private Access ALL Peers status": Show the Status of all Private Access Peers.

9.2 Rundeck

Rundeck (https://www.rundeck.com/) is an open-source software Job scheduler and Run Book Automation system for automating routine processes across development and production environments. It combines task scheduling multi-node command execution workflow orchestration and logs everything that happens.

Installation Steps:

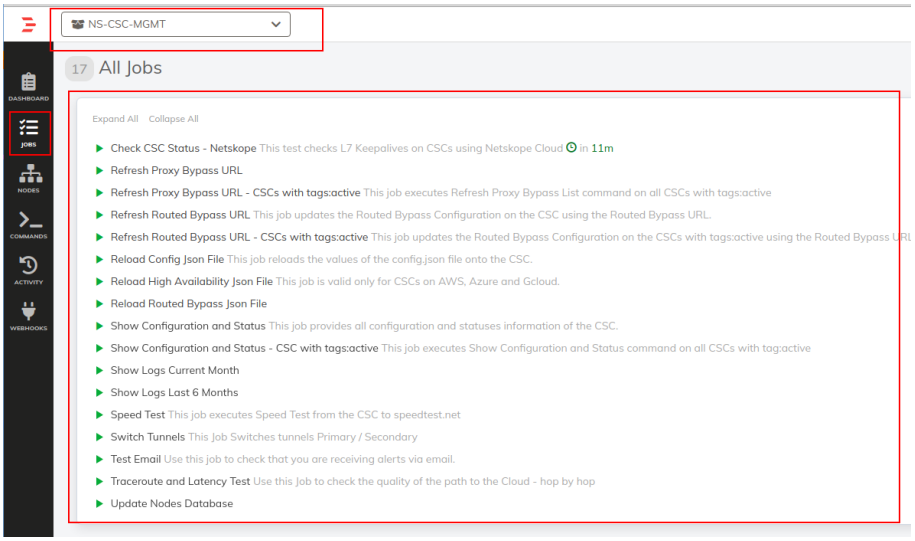
1. Install Rundeck. Intructions at: https://www.rundeck.com/open-source
2. Create a Project.
3. Enable user "csccli" and setup the SSH Public key on each CSC.
4. On the Project, setup the SSH Private and define the nodes:



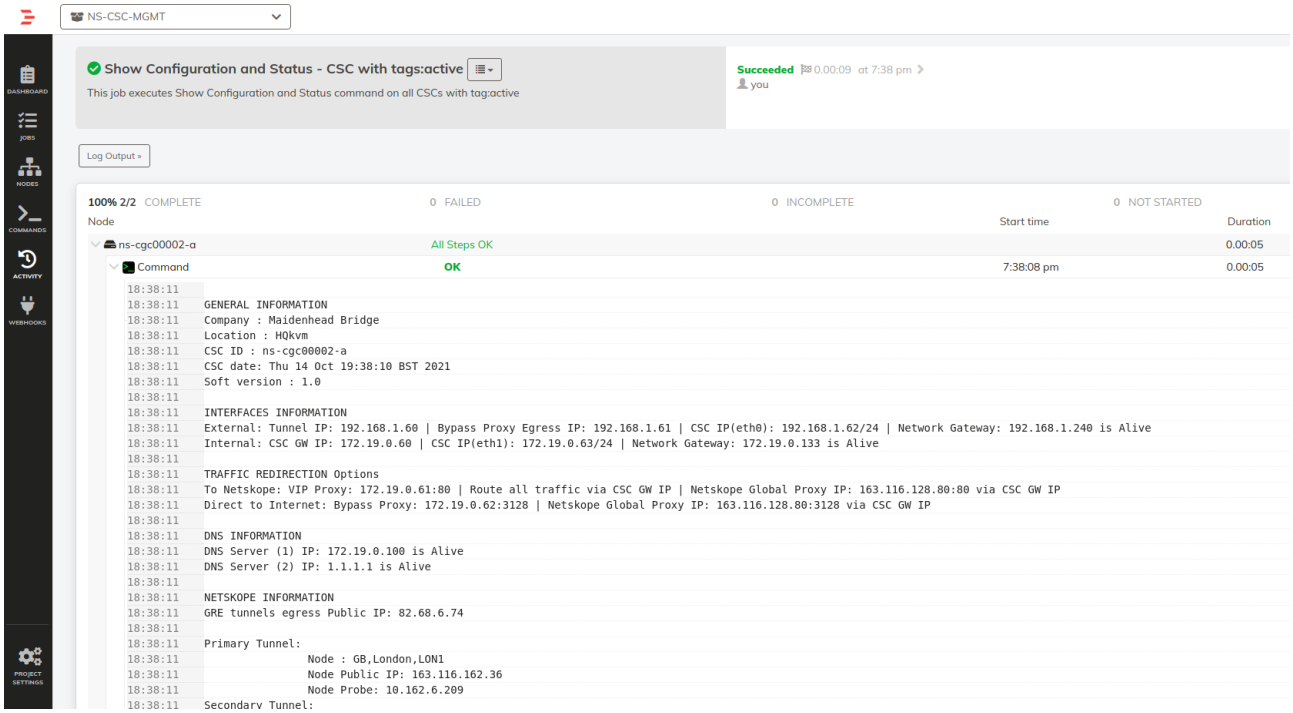
5. Create the jobs. Please, contact Support at http://support.maidenheadbridge.com for the latest Job List.

9.2.1 Jobs

The following screen shows the list of Jobs available.



9.2.2 Running job "Show Configuration and Status"



10 DevOps operations

The CSC is delivered will all configurations and is ready for production. Even so, during the life cycle of the CSC, some parametrization may be required to be changed or modified. For this reason, we provide some configuration utilities that will help with further parametrization and change management.

The CSC offers an option to do some changes using JSON config files. The operation is simple and is three steps:

1. Obtain the current JSON file from the CSC.
2. Download the modified JSON file to the CSC.
3. "Run Command" (AWS Systems Manager) of the specific "reload" document. (or use Rundeck Job)

The JSON files are available are:

1. **config.json**: Allows administrators to modify specific values on the CSC like GRE Primary, Secondary nodes, DNS, Syslog, Routed Bypass URL, Proxy Bypass URL, Etc.
2. **routedBypassRulesFile.json**: Allows administrators to manually configure Routed Bypass Rules if not using the Routed Bypass URL method.
3. **privateAccessPeersConfig.json:** Use this Json file to configure "networks" and "privateApps" on your Private Cloud.
4. **highAvailability.json**: Allows administrators to configure the CSC on HA pair.

In this chapter, we are going to explain the procedures.

10.1 config.json file

You can use this file to change DNS, Log Servers, GRE Nodes (Primary/Secondary), etc.

1. Obtain the current "config.json" from the CSC, running "Run Command" (AWS-RunShellScript.). For example:

*The fields in **bold** are not configurable. So please, do not modify.*

cat /usr/local/etc/mhb-csc/config.json

```
{
  "model": "csc-gre-ns-vm",
  "version": "1.1",
  "dns": {
    "primaryDnsIP": "172.19.0.100",
    "secondaryDnsIP": "172.19.0.101"
  },
  "bypassProxyPublicIP": "82.68.6.73",
  "bypassProxyPacUrl": "https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/mhb-netskope-bypass-vm.pac",
  "syslogServers": {
    "primarySyslogIP": "172.19.0.199",
    "secondarySyslogIP": "",
    "syslogTcpPort": 514
  },
  "greCredentials": {
    "autoDiscovery": true,
    "grePublicIP": "82.68.6.74",
    "primaryGreGateway": "163.116.162.36",
    "primaryProbeIpAddress": "10.162.6.209",
    "primaryLocation": "GB,London,LON1",
    "secondaryGreGateway": "163.116.165.36",
    "secondaryProbeIpAddress": "10.165.6.209",
    "secondaryLocation": "GB,Manchester,MAN1"
  },
  "tunnelRedundancy": {
    "returnToPrimaryTunnel": true
  },
  "routedBypassPublicIP": "82.68.6.73",
  "routedBypassJsonFileUrl": "https://mhb-netskope-pac-files.s3.eu-west-1.amazonaws.com/routedBypassRulesFile-documentation.json",
  "privateAccesPublicIpPort": "82.68.6.74:51821",
  "privateAccesPeersJsonFileUrl": "https://mhb-netskope-private.s3.eu-west-1.amazonaws.com/privateAccessPeersConfig-LAB2.json",
  "privateAccessRemoteManagement": [
      "172.19.0.0/24"
  ]
}
```

2. Create a AWS bucket and place the modified "config.json" file on it.
3. Download the file to the CSC. Run Command "AWS-RunShellScript"

```
wget <Your bucket file URL> -O /usr/local/etc/mhb-csc/config.json
```

4. Run Document "MHB-CSC-Reload-Config-json" to apply the changes.

10.2 routedBypassRulesFile.json

You can use this file to create Routed Bypass Rules manually instead of using the automatic method via Routed Bypass URL.

1. Obtain the current "routedBypassRulesFile.json" from the CSC, running "Run Command" (AWS-RunShellScript.). For example:

cat /usr/local/etc/mhb-csc/routedBypassRulesFile.json


```
{
  "routedBypassRules": [
    {
      "description": "O365 Login URLs 1",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "20.190.128.0/18",
      "fromPort": "80",
      "toPort": "80"
    },
    {
      "description": "O365 Login URLs 2",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "20.190.128.0/18",
      "fromPort": "443",
      "toPort": "443"
    },
    {
      "description": "O365 Login URLs 3",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "40.126.0.0/18",
      "fromPort": "80",
      "toPort": "80"
    },
    {
      "description": "portquiz.net",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "52.47.209.216/32",
      "fromPort": "80",
      "toPort": "80"
    },
    {
      "description": "O365 Login URLs 4",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "40.126.0.0/18",
      "fromPort": "443",
      "toPort": "443"
    },
    {
      "description": "Skype and Teams UDP 1",
      "ipProtocol": "udp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "13.107.64.0/18",
      "fromPort": "3478",
      "toPort": "3481"
    },
    {
      "description": "Skype and Teams UDP 2",
      "ipProtocol": "udp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "52.112.0.0/14",
      "fromPort": "3478",
      "toPort": "3481"
    },
    {
      "description": "Skype and Teams UDP 3",
      "ipProtocol": "udp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "52.120.0.0/14",
      "fromPort": "3478",
      "toPort": "3481"
    }
  ]
}
```

2. Create a AWS bucket and place on it the modified "routedBypassRulesFile.json" file.
3. Download the file to the CSC. Run Command "AWS-RunShellScript"

```
wget <Your bucket file URL> -O /usr/local/etc/mhb-csc/routedBypassRulesFile.json
```

4. Run Document "MHB-CSC-Reload-Routed-Bypass-json" to apply the changes.

10.3 privateAccessPeersConfig.json

You can use this file to create Private Access Peer Rules manually instead of using the automatic method via Private Access Peers URL.

1. Obtain the current "privateAccessPeersConfig.json" from the CSC, running "Run Command" (AWS-RunShellScript.). For example:

cat /usr/local/etc/mhb-csc/privateAccessPeersConfig.json


```
{
  "peers": [
    {
      "nodeName": "ns-cgc00001",
      "description": "Node on VMware Server 1",
      "location": "HQ",
      "publicKey": "yAnz5TF+lXXJte14tji3zlMNq+hd2rYUIgJBgB3fBmk=",
      "publicIpAndUdpPort": "200.1.1.1:51821",
      "privateCirdIp": "192.168.7.1/24",
      "persistentKeepAlive": "no",
      "networks": ["10.1.1.0/24", "10.1.2.0/24" ],
      "privateApps": [
        {
          "description": "Allow all traffic to this site",
          "ipProtocol": "all",
          "sourceCirdIp": [ "0.0.0.0/0" ],
          "destinationCirdIp": [ "10.1.1.0/24", "10.1.2.0/24" ],
          "destinationSinglePorts": [ "" ],
          "destinationPortRange": {  "fromPort": "", "toPort": "" }
        }
      ]
    },
    {
      "nodeName": "ns-cgc00002",
      "description": "Node on VMware Server 2",
      "location": "Datacentre 2",
      "publicKey": "xTIBA5rboUvnH4htodjb6e697QjLERt1NAB4mZqp8Dg=",
      "publicIpAndUdpPort": "200.1.1.2:51821",
      "privateCirdIp": "192.168.7.2/24",
      "persistentKeepAlive": "no",
      "networks": [ "10.2.1.0/24",  "10.2.2.0/24" ],
      "privateApps": [
        {
          "description": "Allow all traffic to this site",
          "ipProtocol": "all",
          "sourceCirdIp": [ "0.0.0.0/0" ],
          "destinationCirdIp": [ "10.2.1.0/24", "10.2.2.0/24" ],
          "destinationSinglePorts": [ "" ],
          "destinationPortRange": {  "fromPort": "",  "toPort": "" }
        }
      ]
    },
    {
      "nodeName": "ns-cgc00003",
      "description": "Node on VMware Server 3",
      "location": "Branch",
      "publicKey": "TrMvSoP4jYQlY6RIzBgbssQqY3vxI2Pi+y71lOWWXX0=",
      "publicIpAndUdpPort": "200.1.1.3:51821",
      "privateCirdIp": "192.168.7.3/24",
      "persistentKeepAlive": "no",
      "networks": [ "10.3.1.0/24", "10.3.2.0/24" ],
      "privateApps": [
        {
          "description": "Allow all traffic to this site",
          "ipProtocol": "all",
          "sourceCirdIp": [ "0.0.0.0/0" ],
          "destinationCirdIp": [ "10.3.1.0/24", "10.3.2.0/24" ],
          "destinationSinglePorts": [ "" ],
          "destinationPortRange": { "fromPort": "",  "toPort": "" }
        }
      ]
    }
  ]
}
```


2. Create a AWS bucket and place on it the modified "privateAccessPeersConfig.json" file.

3. Download the file to the CSC. Run Command "AWS-RunShellScript"

```
wget <Your bucket file URL> -O /usr/local/etc/mhb-csc/privateAccessPeersConfig.json
```

4. Run Document "MHB-CSC-Reload-Private-Access-JSON-file" to apply the changes.

10.4 highAvailability.json file

You can configure High Availability via downloading the highAvailability.json file and "Run Command" using the "MHB-CSC-Reload-High-Availability" AWS SSM document.

Steps:

1. Obtain the current "highAvailability.json" from the CSC, running "Run Command" (AWS-RunShellScript.)

*The fields in **bold** are not configurable. So please, do not modify.*

```
cat /usr/local/etc/mhb-csc/highAvailability.json
```

```
{
   "highAvailability": {
      "haEnable": false,
      "haIamRole": "",
      "haSnsMessageArn": "",
      "haInstanceIdOtherCsc": "",
      "haVPC": "",
      "haRouteTables": []
   }
}
```

2. Create a AWS bucket and place on it the modified "highAvailability.json" file. For example:

*The fields in **bold** are not configurable. So please, do not modify.*

```
{
  "highAvailability": {
   "haEnable": true,
   "haIamRole": "arn:aws:iam::544690173127:instance-profile/csc-ha-aws-role",
   "haSnsMessageArn": "arn:aws:sns:us-east-1:544690173127:csc-aws-ha-notification",
   "haInstanceIdOtherCsc": "i-08cd4663125d25b0e",
   "haVPC": "vpc-0f32a676",
   "haRouteTables": [
    {
     "routeTableId": "rtb-d090c8a8"
    }
   ],
   "haPrivateAccessPublicIp": "54.80.198.195"
  }
}
```

3. Download the file to the CSC. Run Command "AWS-RunShellScript"

```
wget <Your bucket file URL> -O /usr/local/etc/mhb-csc/highAvailability.json
```

4. Apply the IAM Role to the CSC via AWS Console and Run Document "MHB-CSC-Reload-High-Availability" to apply the changes.

11 Appendixes

11.1 Appendix A: Routed Bypass JSON file if you don't have Cloud Firewall License.

If you decide to configure the default route to the internet via the CSC and don't have a Cloud Firewall license, you need to send only HTTP and HTTPS via the GRE tunnel and the rest of the traffic via Routed Bypass.

The following JSON file does the work to redirect only Web traffic via the GRE tunnel, and the rest goes directly via the Bypass Interface.


```
{
  "routedBypassRules": [
    {
      "description": "Bypass ICMP all",
      "ipProtocol": "icmp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "0.0.0.0/0",
      "fromPort": "",
      "toPort": ""
    },
    {
      "description": "Bypass TCP Ports I",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "0.0.0.0/0",
      "fromPort": "1",
      "toPort": "79"
    },
    {
      "description": "Bypass TCP Ports II",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "0.0.0.0/0",
      "fromPort": "81",
      "toPort": "442"
    },
    {
      "description": "Bypass TCP Ports III",
      "ipProtocol": "tcp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "0.0.0.0/0",
      "fromPort": "444",
      "toPort": "65535"
    },
    {
      "description": "Bypass UDP Ports all",
      "ipProtocol": "udp",
      "sourceCirdIp": "0.0.0.0/0",
      "destinationCirdIp": "0.0.0.0/0",
      "fromPort": "1",
      "toPort": "65535"
    }
  ]
}
```

11.2 Appendix B: Release Notes

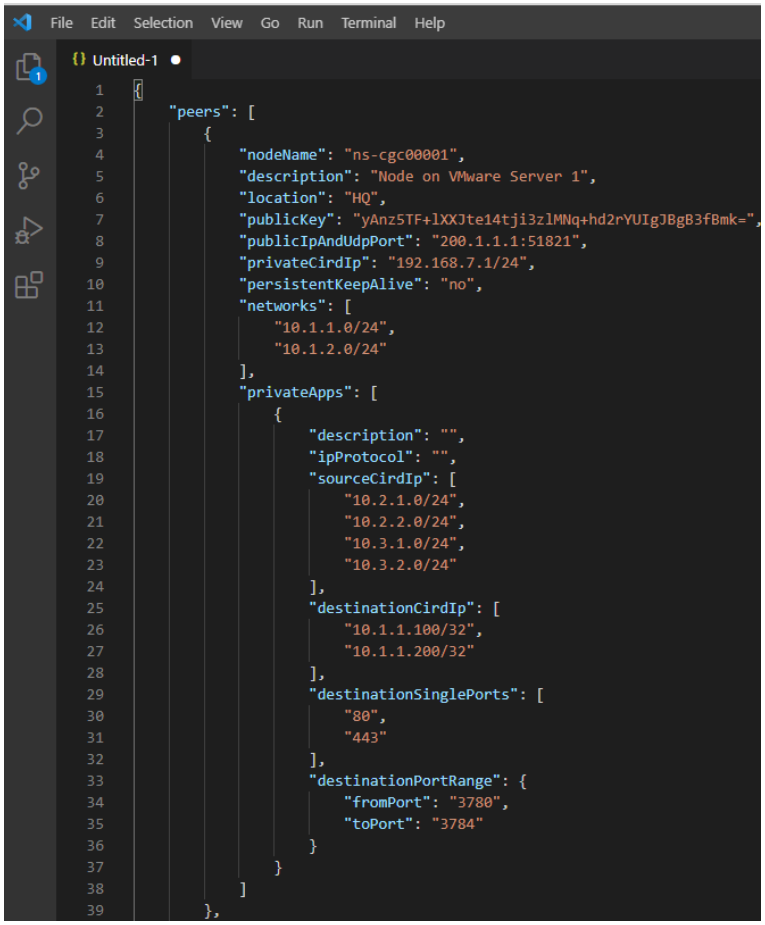
11.2.1 Version 1.0

This is the initial version of the Cloud Security Connector for Netskope on AWS.

11.3 Appendix C: JSON formatters (Visual Code, Notepad ++)

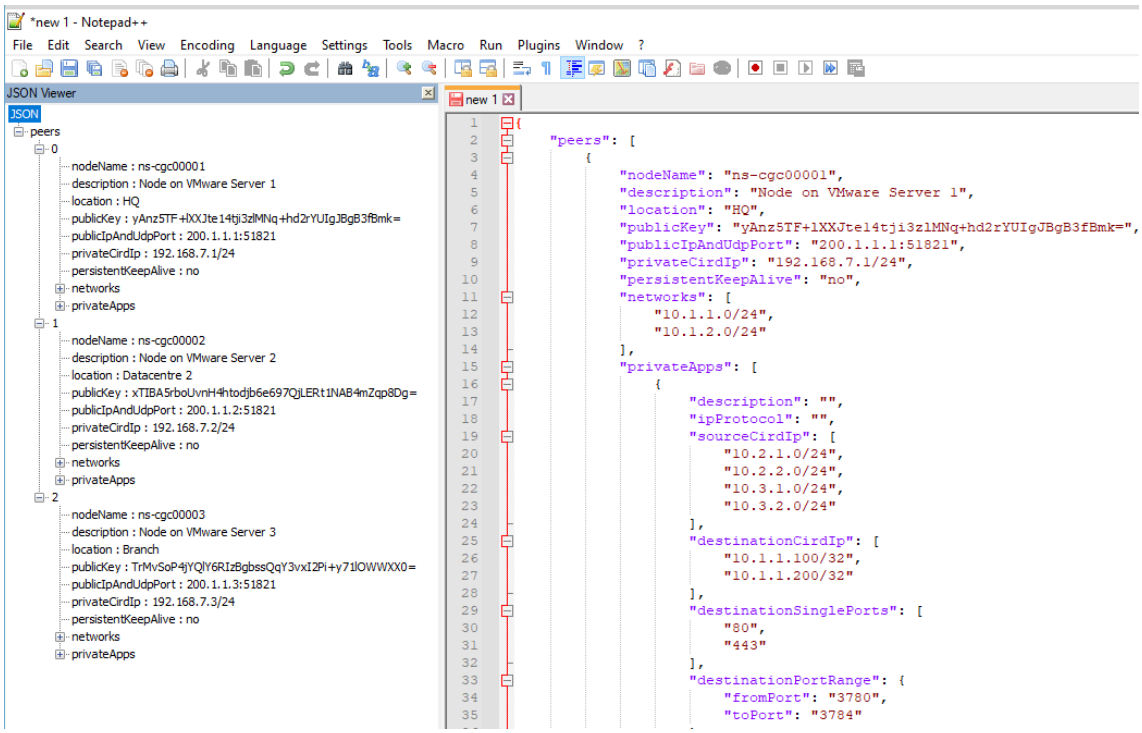
We strongly recommend using Software that can show errors on your JSON file and also can format (beautify) the file for better visibility. Below two examples.

11.3.1 Visual Code

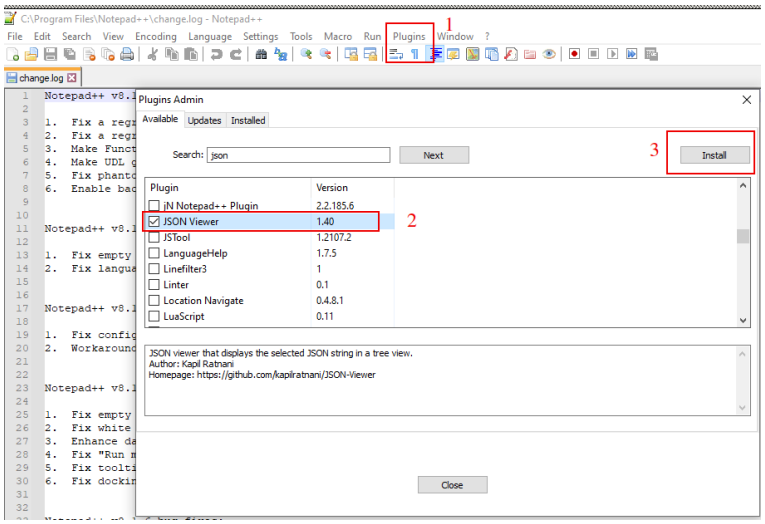


1. Download : https://code.visualstudio.com/download
2. Select your platform and install.
3. Create your JSON.
   - 3.1. Visual Code will show the errors in RED.
   - 3.2. To "Beautify" your JSON file press:
     - 3.2.1. On Windows: "Shift + Alt + F"
     - 3.2.2. On MAC: "Shift + Option + F"
     - 3.2.3. On Linux: " Ctrl + Shift + I"

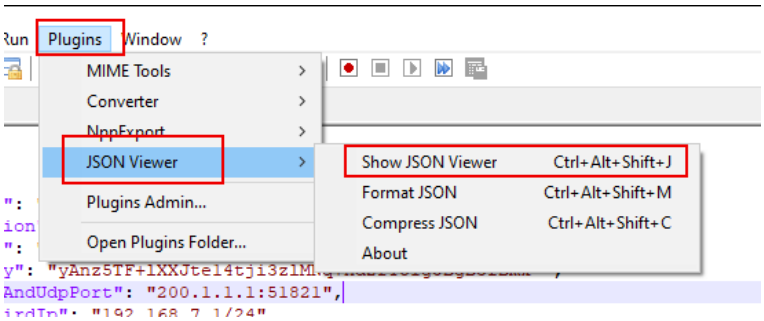
11.3.2 Notepad ++



1. Download: https://notepad-plus-plus.org/downloads/
2. Install JSON Viewer Plug in.



3. Create your JSON file.
4. To Check your JSON file go to: Plugins -> JSON Viewer -> Show JSON Viewer.

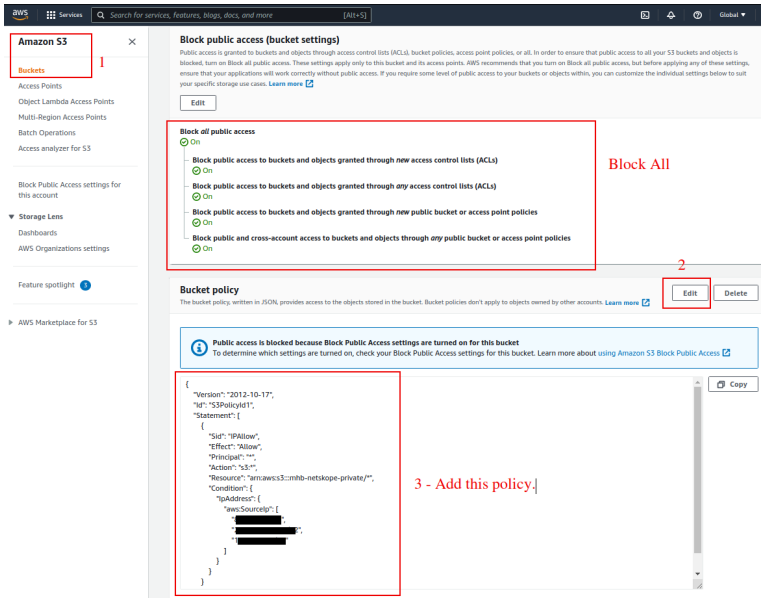


5. To format ("Beautify") your JSON go to: Plugins -> JSON Viewer -> Format JSON

11.4 Appendix D: Securing an AWS Bucket by source IP.

1. On your AWS console create a bucket with default values for permissions: "Block *all* Public Access = on"

2. On Bucket Policy, add your Public IPs in "aws:SourceIp":[]




```
{
  "Version": "2012-10-17",
  "Id": "S3PolicyId1",
  "Statement": [
    {
      "Sid": "IPAllow",
      "Effect": "Allow",
      "Principal": "*",
      "Action": "s3:*",
      "Resource": "arn:aws:s3:::mhb-netskope-private/*",
      "Condition": {
        "IpAddress": {
          "aws:SourceIp": [
            "200.1.1.1/32",
            "200.1.1.2/32",
            "200.2.0.0/24"
          ]
        }
      }
    }
  ]
}
```

3. Done!