

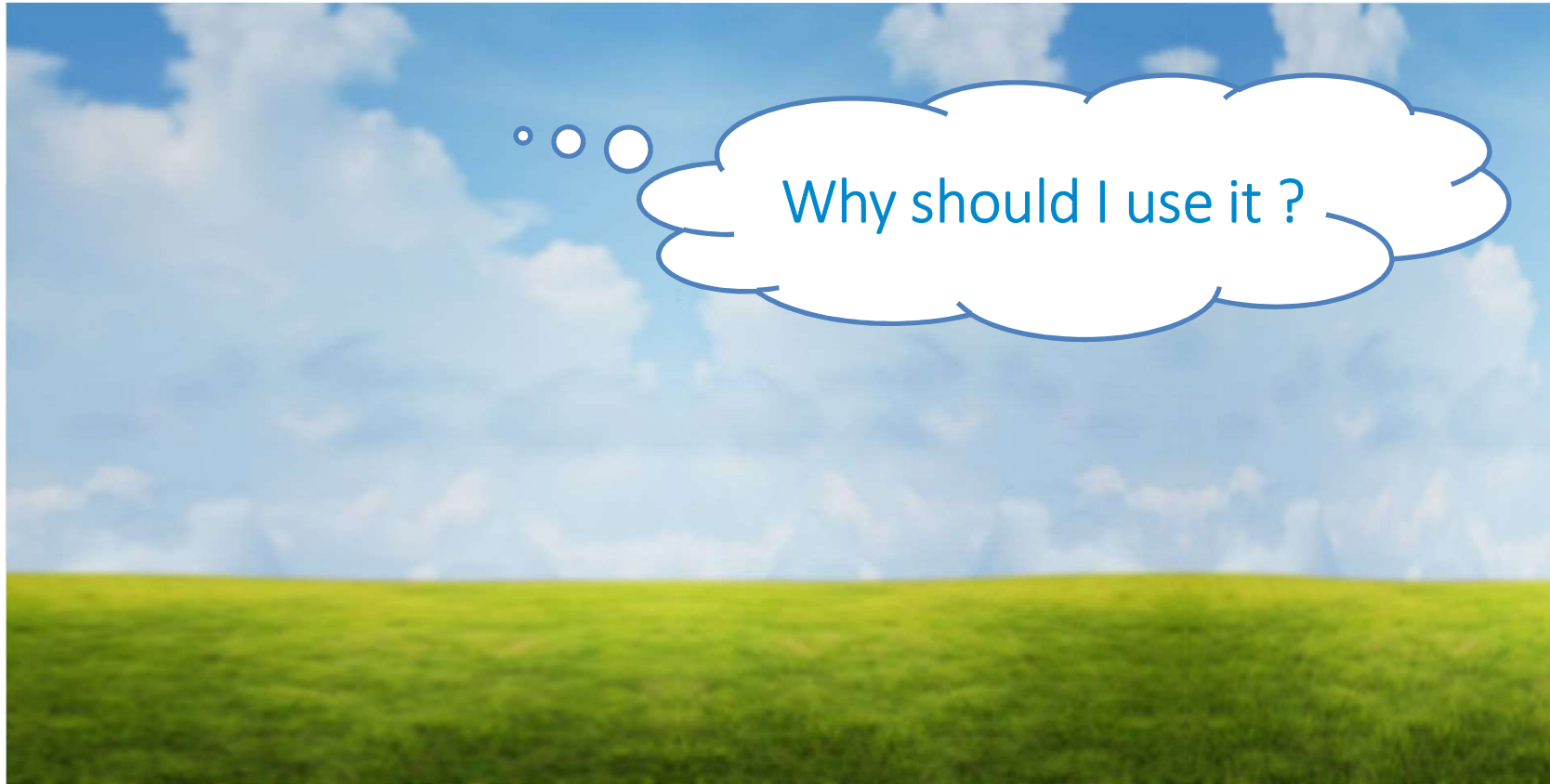


Barracuda.
TECHSUMMIT19
BARRACUDA TECHNICAL SUMMIT

Barracuda CloudGen Firewall

CloudGen Firewall Firmware 8.x
Azure CGF Automation

What Is Infrastructure as Code (IaC) ?



What Is Infrastructure as Code (IaC) ?



Pets and Cattle ?

Cattle:

There are so many of them
You don't notice when they come and go

Pets:

You name them
and love them



How to Manage a Herd of Cattle ?



Time is money !
Automation is mandatory !

Zero
downtime

Blue-Green
Deployment

Disaster
recovery all
the time





CGF Automation Focus



- Continuously expanding the REST API
- Automate Firewall ruleset
- Automate VPN connectivity
 - Auto VPN
 - Virtual WAN
- Lifecycle management API

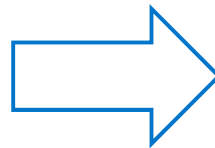




Deploy CGF in Azure (+ Rest API)

- **Challenges**

- Cost optimization
- Process automation
- Public cloud - Zero Touch CGFs
- ...



- **CGF Rest API**

- Create Rest user
- Create network objects
- Create access rules
- Create AutoVPN
-

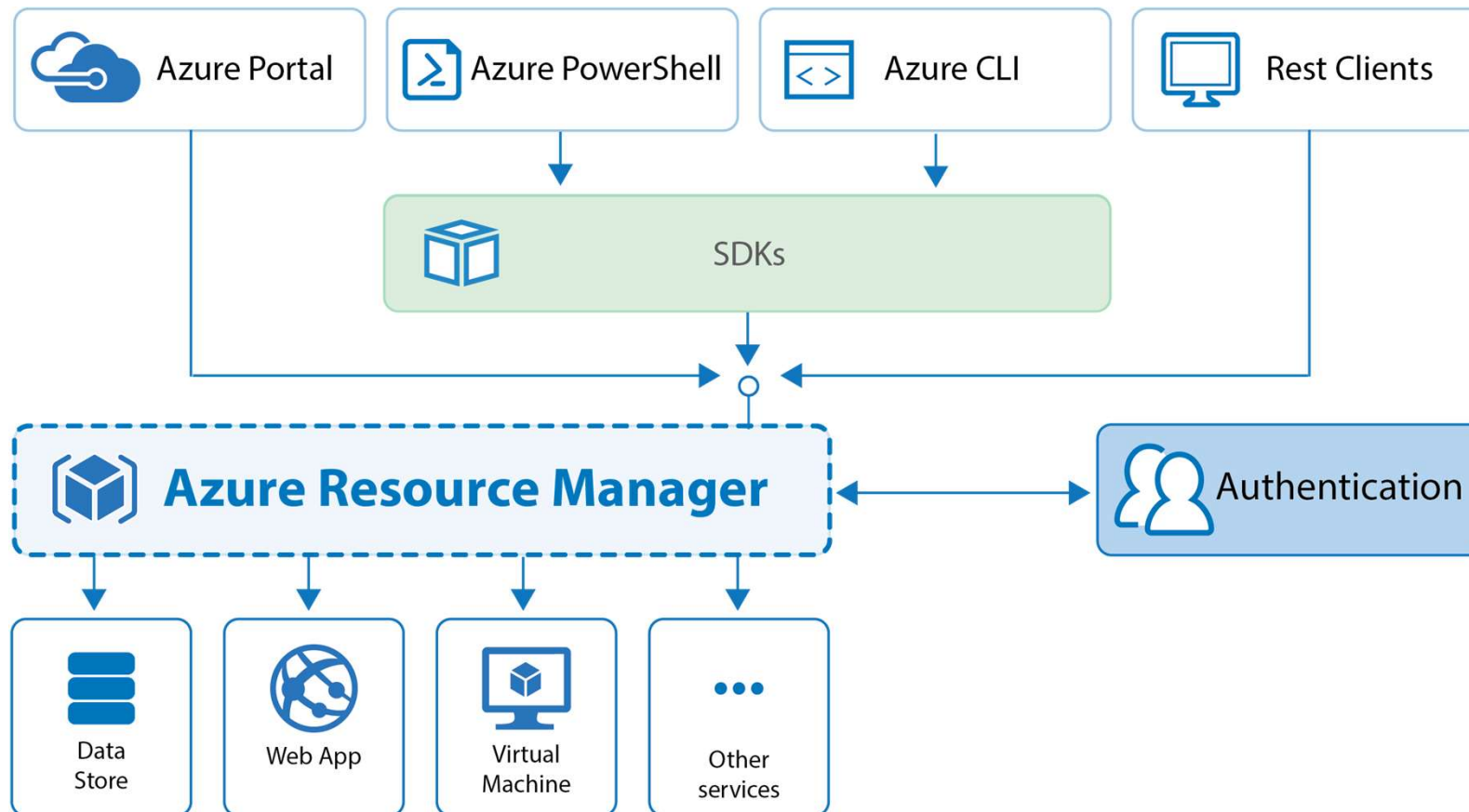




- **Azure**
 - ARM template deployment
 - Cloud Shell bash/PowerShell
 - Ansible
- **CGF**
 - GitHub/Barracuda Networks Deployment
 - Rest API
 - AutoVPN

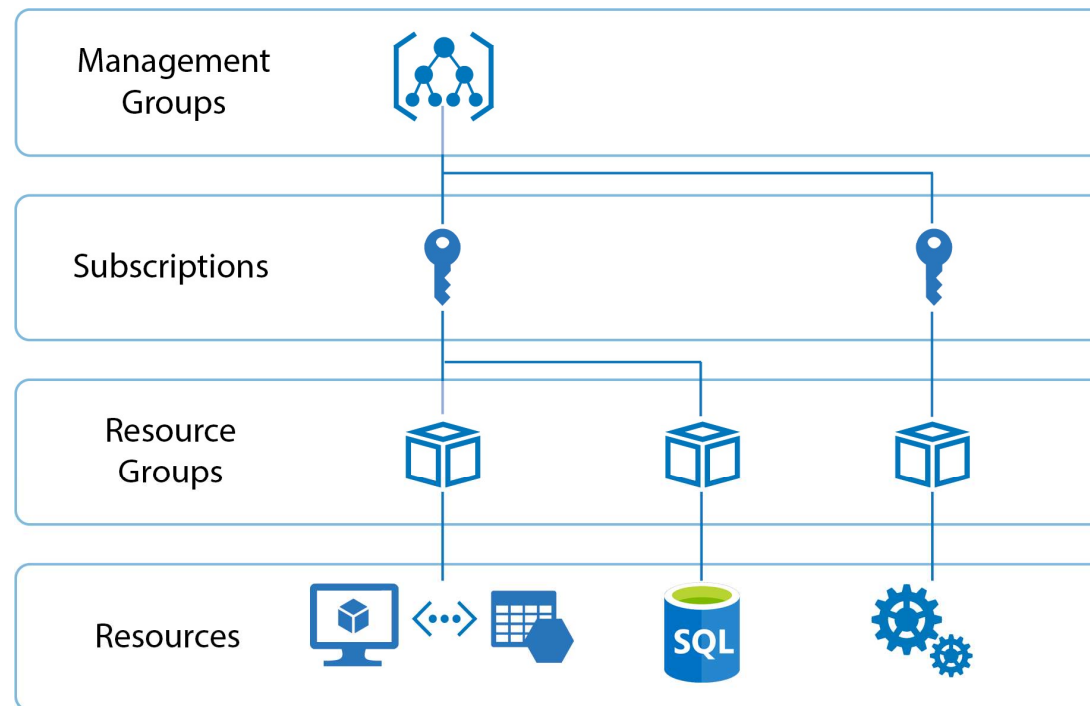


Basics - Azure Resource Manager





Azure provides four levels of scope:



ARM Template Deployment



- **Benefits**

- Human-readable, file based in JSON (JavaScript Object Notation)
- The same template usable with different parameters
- Automation script

- **Configuration Tools**

- Azure portal
- Azure CLI
- PowerShell
- Visual studio



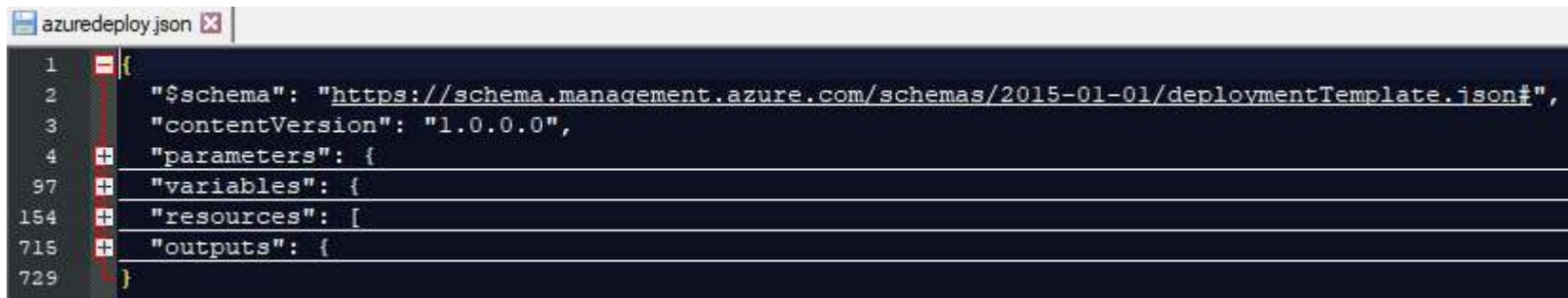
<https://azure.microsoft.com/en-us/downloads/>





Every JSON file contains four main sections:

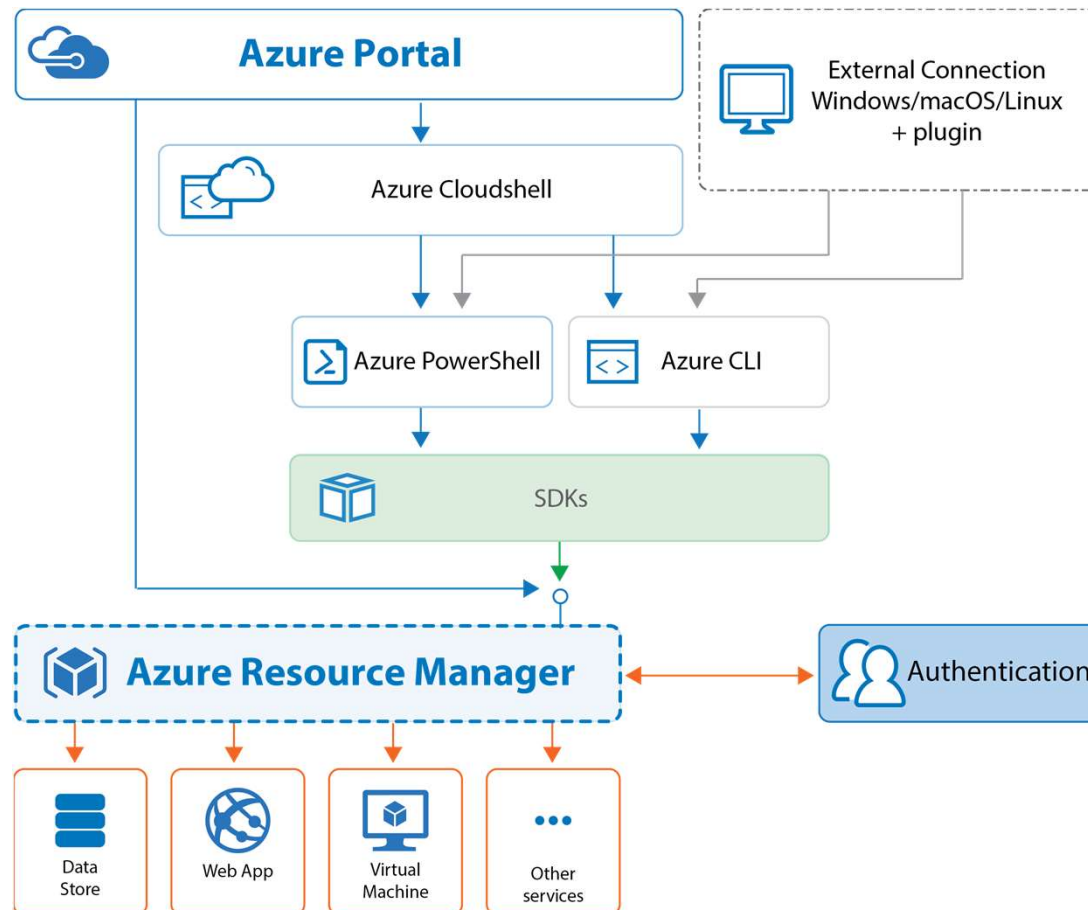
- Parameters
- Variables
- Resources
- Output



```
1 {
2   "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
97  "variables": {
154 "resources": [
715 "outputs": {
729 }
```



ARM Template Deployment





- **Runs on a temporary host: “Bash or PowerShell”**
 - Provided on a per-session, per-user basis
 - Times out after 20 minutes without interactive activity
- **Permissions set as a regular Linux user in Bash**
- **Requires an Azure file share to be mounted**
 - Persists \$HOME using a 5-GB image held in your file share
 - Uses the same Azure file share for both Bash and PowerShell



<https://docs.microsoft.com/en-us/azure/cloud-shell/overview>



Azure Command-Line Interface (CLI)



- Perfect tool for building custom automation
- Supported platforms:
 - Get started by running it in Cloud Shell
 - Installation package for:

Windows 10 / Ubuntu 16.04+ / macOS

- Recommended CLI documentation:



<https://docs.microsoft.com/en-us/cli/azure/?view=azure-cli-latest>



<https://docs.microsoft.com/en-us/azure/virtual-machines/azure-cli-arm-commands>



Troubleshoot Deployment Errors



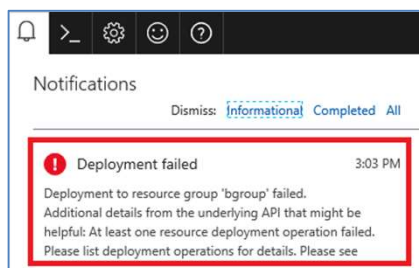
- Azure PowerShell:

```
(Get-AzResourceGroupDeploymentOperation -DeploymentName  
exampledeployment -ResourceGroupName  
examplegroup).Properties.statusMessage
```

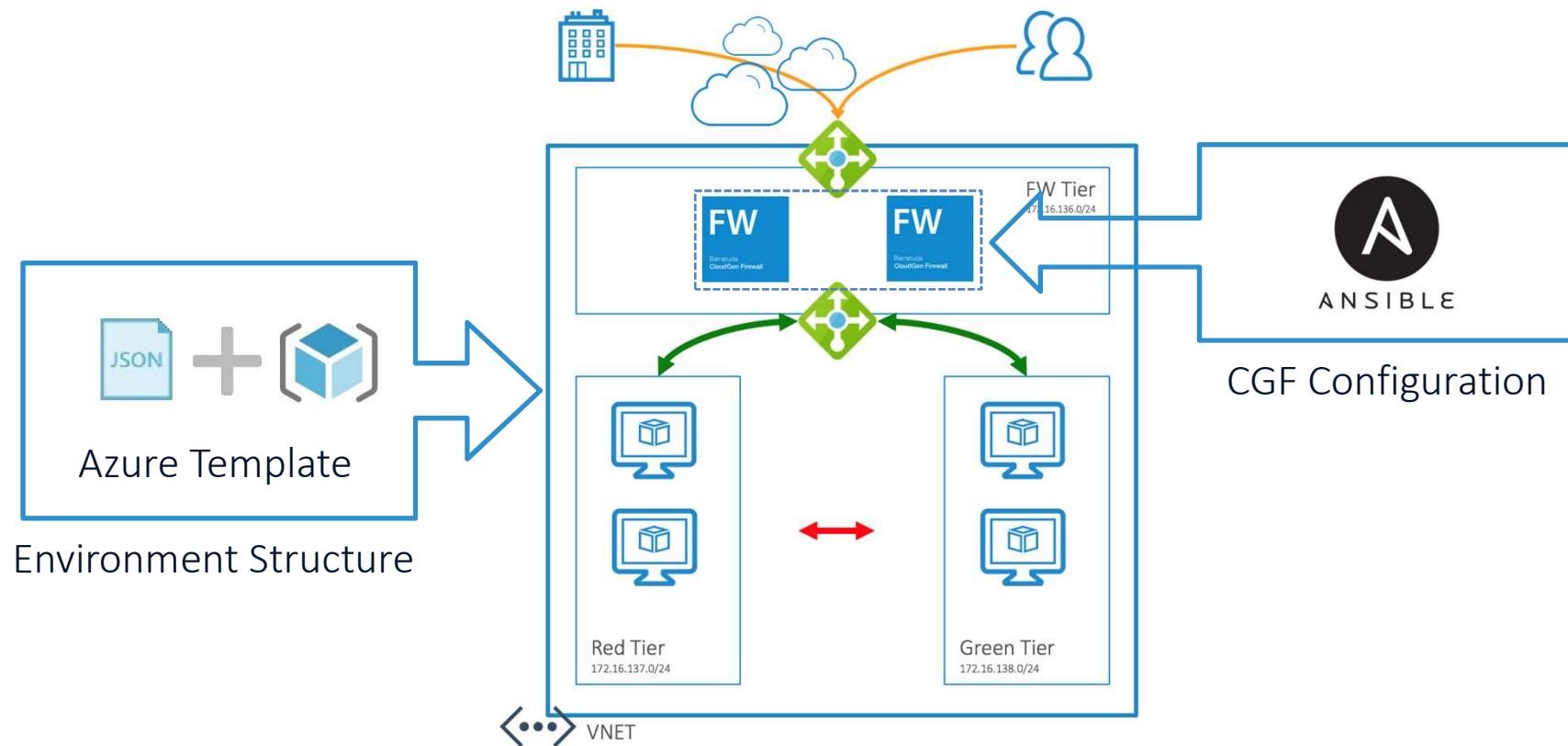
- Azure CLI:

```
az group deployment operation list --name exampledeployment  
-g examplegroup --query "[*].properties.statusMessage"
```

- Portal:



Azure Template + Ansible





- **Why Ansible?**
 - Most simple automation tool
 - Human-readable automation files (YAML)
 - No special coding skills needed
- **Automation of nearly everything:**
 - Cloud provisioning
 - Configuration management
 - Application deployment
 - Intra-service orchestration

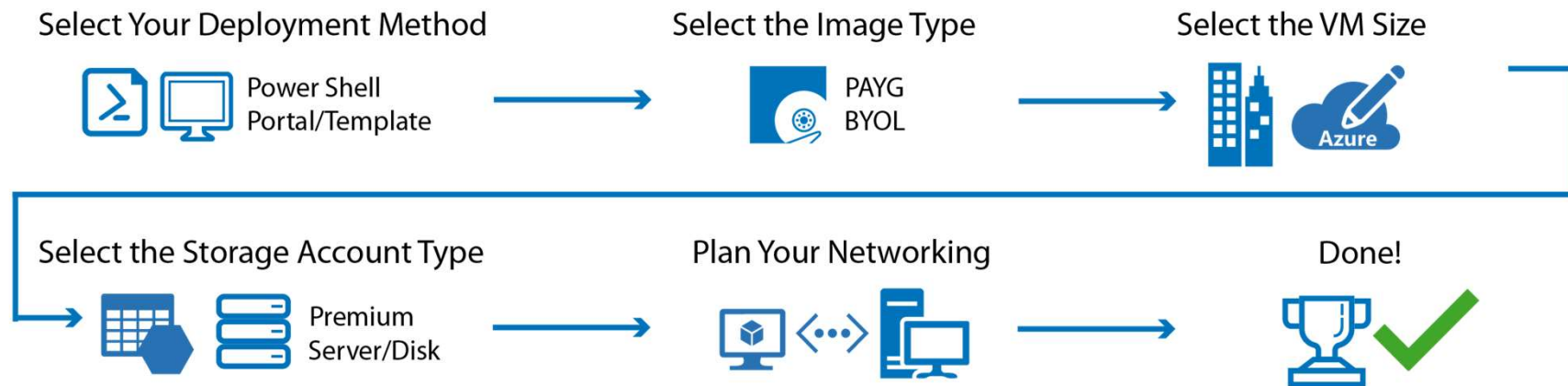


CGF

Deployment Methods



Planning Your CGF Deployment





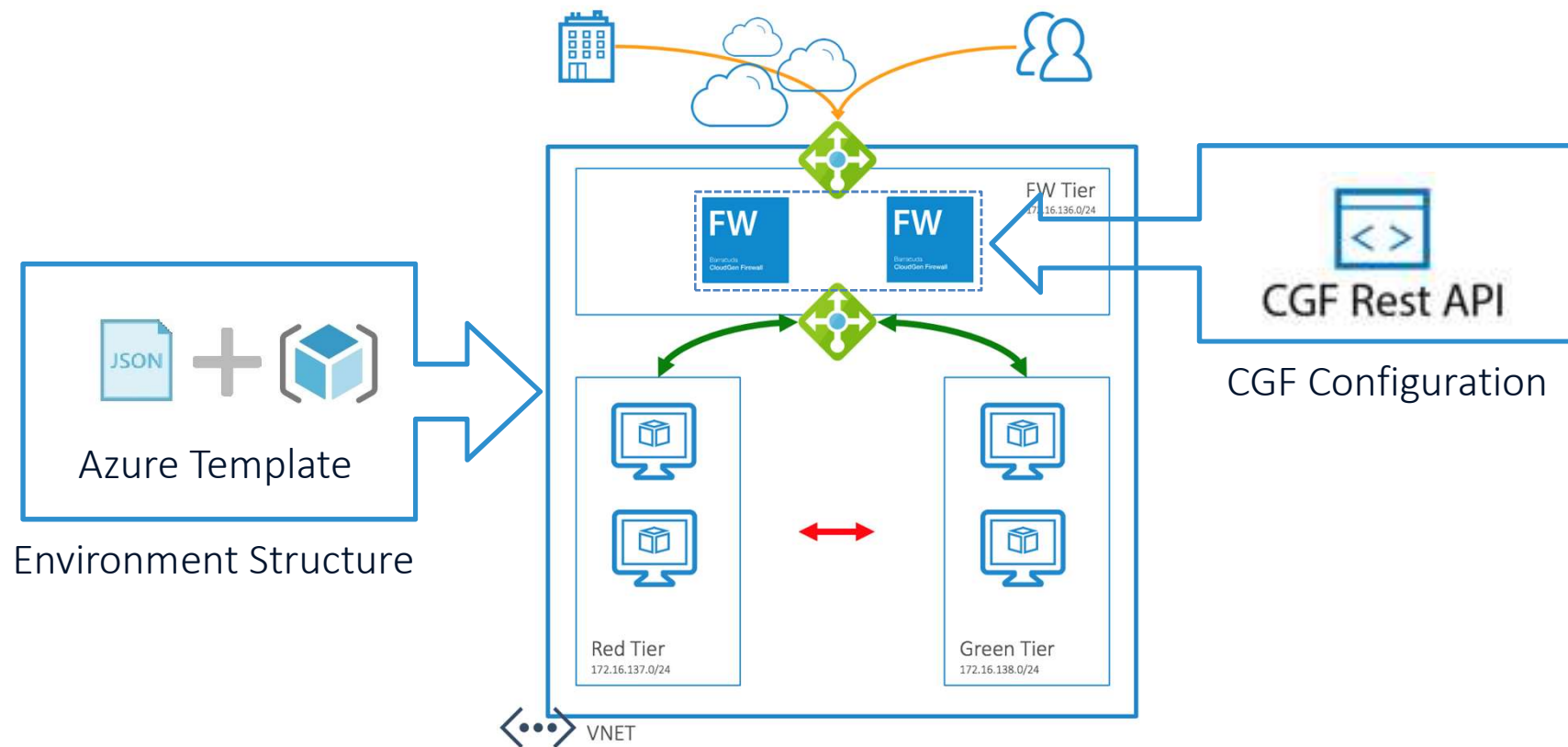
Deployment Options



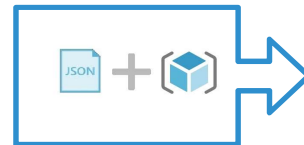
- Web portal
 - Solution templates available
- Azure templates
- Azure PowerShell
- VHD disk images via Barracuda Download Portal
 - For older firmware versions
- <https://github.com/barracudaNetworks>



Azure Template + CGF REST API



CGF Azure Template + CGF REST API



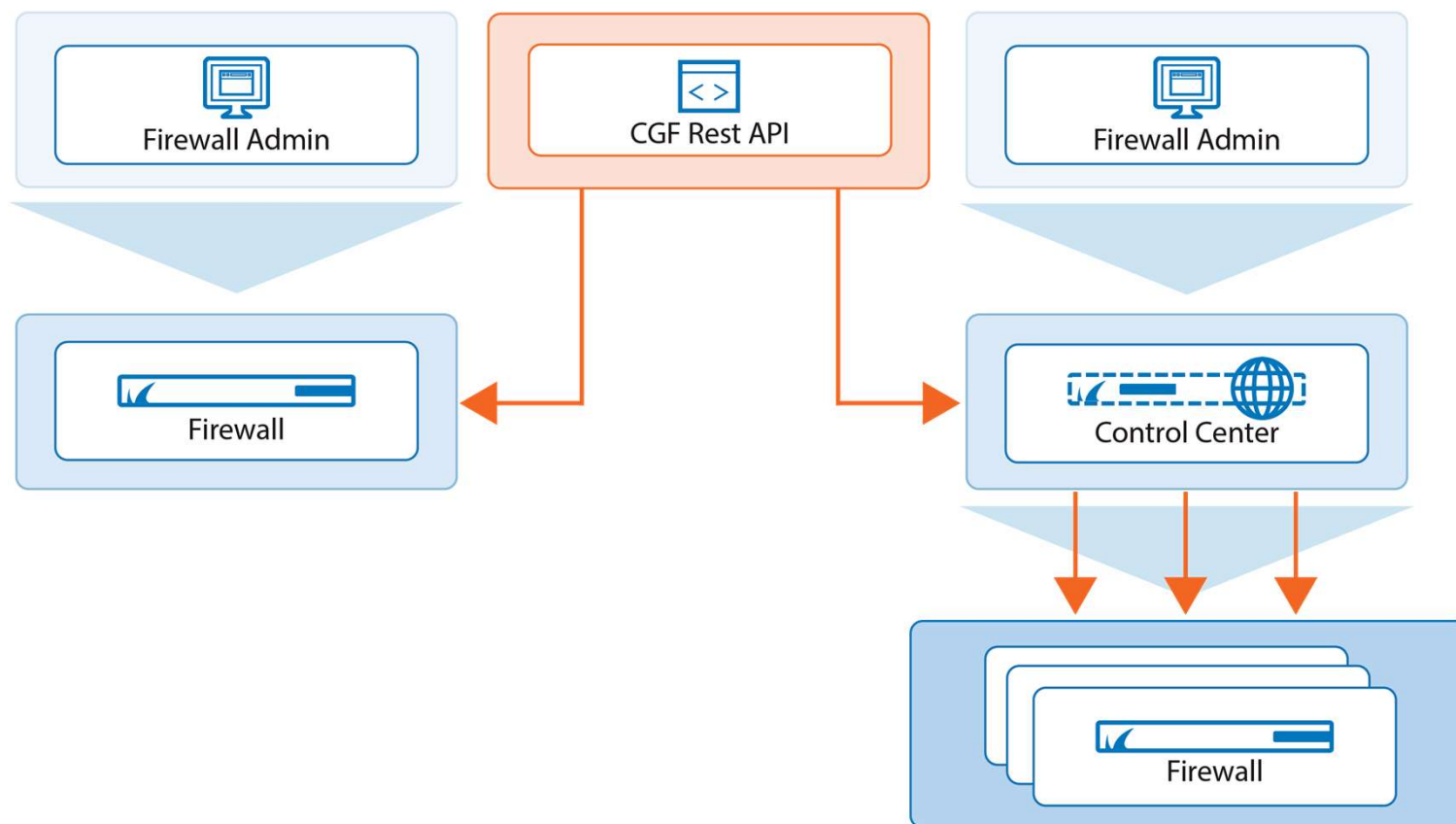
Environment
Structure

```
azuredploy.json

"variables": {
  "computeApiVersion": "2017-03-30",
  "networkApiVersion": "2017-08-01",
  "cgfCustomData": "[Base64(concat( '#!/bin/bash\n\n/opt/phion/bin/cloud-enable-rest ', '\n'))]"
},
"resources": [
  {
    "condition": "[equals(parameters('ccManaged'),'no')]",
    "apiVersion": "[variables('computeApiVersion')]",
    "type": "Microsoft.Compute/virtualMachines",
    "identity": {
      "type": "SystemAssigned"
    },
    "zones": [
      "1"
    ],
    "name": "[variables('cgfVmName1')]",
    "location": "[resourceGroup().location]",
    "dependsOn": [
      "[resourceId('Microsoft.Network/networkInterfaces/', variables('cgfNicName1'))]"
    ],
    "properties": {
      "hardwareProfile": {
        "vmSize": "[parameters('vmSize')]"
      },
      "osProfile": {
        "computerName": "[variables('cgfVmName1')]",
        "adminUsername": "[variables('adminUsername')]",
        "adminPassword": "[parameters('adminPassword')]",
        "customData": "[variables('cgfCustomData')]"
      }
    }
  },
  {
    "condition": "[equals(parameters('ccManaged'),'no')]",
    "apiVersion": "[variables('networkApiVersion')]",
    "type": "Microsoft.Network/networkInterfaces",
    "name": "[variables('cgfNicName1')]",
    "location": "[resourceGroup().location]",
    "properties": {
      "ipConfigurations": [
        {
          "name": "ipconfig1",
          "properties": {
            "subnet": "[resourceId('Microsoft.Network/virtualNetworks/', variables('cgfVnetName1'), 'Subnets', variables('cgfSubnetName1'))]",
            "privateIpAddress": "[parameters('cgfPrivateIpAddress')]"
          }
        }
      ]
    }
  }
]
```



CGF Configuration

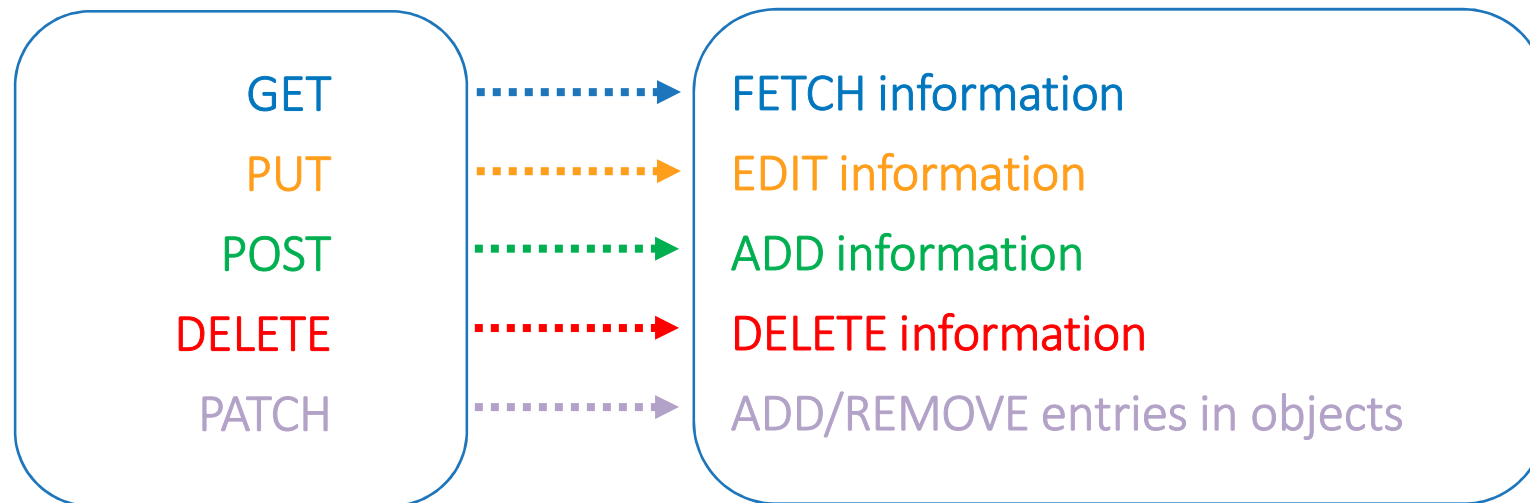


HTTP Methods – API Objects Actions



- HTTP methods

- API objects actions



Rest API – Developer Documentation



- GET
- POST
- PUT
- PATCH
- DELETE

BarracudaCampus Search in Barracuda CloudGen Firewall

Barracuda CloudGen Firewall

Overview Documentation Training Certification

VERSION 8.0 VERSION 7.2

API List [Toggle List](#)

Administrative session data	CC Firewall Service Objects	Firewall data
Box Administrators	Dynamic Firewall Rules	General data
Box configuration	Firewall Custom External Objects	License activation and operative data
Box services	Firewall Custom External Objects (deprecated)	Network operative data
CC	Firewall IPS	Password Change
CC Configuration	Firewall Network Objects	Resource operative data
CC Firewall IPS	Firewall Network Objects (deprecated)	Server services
CC Firewall Network Objects	Firewall Rules	Servers
CC Firewall Rules	Firewall Service Objects	VPN



- Be sure to select the correct REST-API command
- Do you want to create a NW-Object in:
 - Host Firewall
 - Forwarding Firewall



CGF Rest API Config – Step by Step



- Create a new administrator
 - Administrators > New (restadmin/AssignedRoles: Manager/....default)
- Create a new REST API certificate
 - Infrastructure Services/REST API Service > New Key+Certificate
- Create a new REST API token for the new administrator
 - Infrastructure Services/REST API Service > New Access Token linked to restadmin
 - COPY this access token

Token Settings

Access Token	bH73S5g0hly9SonQG792aNo5ioxneaja	
Admin Name	restadmin	<input type="checkbox"/> Other
Time to live [d]	365	
Timestamp	1559743230	
Valid	<input checked="" type="checkbox"/>	





Enable REST API

- Infrastructure Services/REST API Service

REST API Service -

Configuration

General

Access Tokens

Configuration Mode

HTTP interface

Enable HTTP Interface ☒

HTTP Port 8080

HTTPS interface

Enable HTTPS Interface ☒

HTTPS Port 8443

Bind to Management IPs ☐

Private Key New Key... Ex/Import Hash: VMDSKF 2048 Bits

Certificate Show... Ex/Import Hash: VMDSKF self-signed 2048 Bits

Logging

Log Level Debug



CGF Rest API Config – Step by Step



- Create a new access rule to allow HTTP traffic to REST API
 - New AppRedirect
Src.:Client / Srv.:8080 / Dest.:MgmtIPofCGF / Redirect:127.0.0.1:8080

App Redirect

RestAPI-for-HTTP-8080

Communication via HTTP only from the Mgmt-Client - only available on the loopback

☐ Bi-Directional ☐ Dynamic Rule ☐ Deactivate Rule

Source VR Instance default Destination VR Instance default

Source	Service	Destination
Mgmt-Client	<explicit-srv>	Management IP
172.16.138.4	TCP 8080	172.16.136.5

Redirection

Local Address

127.0.0.1:8080



CGF Rest API Config – Step by Step



- Create a new access rule to allow HTTPS traffic to REST API
 - New AppRedirect
Src.:Client / Srv.:8443 / Dest.:MgmtIPofCGF / Redirect:127.0.0.1:8443

App Redirect

RestAPI-for-HTTPS-8443

Communication via HTTPS only from the Mgmt-Client; only available on the loopback

☐ Bi-Directional ☐ Dynamic Rule ☐ Deactivate Rule

Source VR Instance default Destination VR Instance default

Source	Service	Destination
Any	<explicit-srv>	Management IP
0.0.0.0/0	TCP 8443	172.16.136.5

Redirection

Local Address

127.0.0.1:8443



CGF Rest API Config – Step by Step



- Find examples on Barracuda Campus REST API documentation
- <https://campus.barracuda.com/product/nextgenfirewallf/api#/>

GET

/rest/config/v1/forwarding-firewall/objects/networks/{name}

Query one network object

Query one network object

Parameters

CANCEL

Name	Description
token	Session token
string	If no token is given, a temporary session will be started.
(query)	token - Session token If no token is given, a te
name * required	Name of network object
string	Internet
(path)	
envelope	Wrap the response in an envelope json.
boolean	--
(query)	
X-API-Token	Authentication token
string	bH73S5g0hly9SonQG792aNo5ioxneaJa
(header)	

GENERATE

CLEAR

Responses

Curl

```
curl -X GET "https://your-cgfw-ip:8443/rest/config/v1/forwarding-firewall/objects/networks/Internet" -H "accept: application/json" -H "X-API-Token: bH73S5g0hly9SonQG792aNo5ioxneaJa"
```



CGF Rest API Config – Step by Step



Check REST API with a REST API client, such as Insomnia

The screenshot shows the Insomnia REST client interface. The top bar indicates a successful GET request to `https://172.16.136.5:8443/rest/config/v1/forwarding-firewall/objects/networks/Internet` with a status of 200 OK, response time of 172 ms, and size of 408 B. The left sidebar shows the request headers, with `X-API-Token` highlighted and its value `bH73S5g0hly9SonQG792aNo5ioxneaja` copied from the FW-Admin/REST-API config. The right pane shows the request details and the response body, which is a JSON object containing the configuration details for the Internet network.

GET `https://172.16.136.5:8443/rest/config/v1/forwarding-firewall/objects/networks/Internet` Send 200 OK TIME 172 ms SIZE 408 B 2 Minutes Ago

Body Auth Query Header Docs

Accept `application/*`

X-API-Token `bH73S5g0hly9SonQG792aNo5ioxneaja`

New Header New Value

copy from FW-Admin/REST-API config

Preview Header Cookie Timeline

* Preparing request to `https://172.16.136.5:8443/rest/config/v1/forwarding-firewall/objects/networks/Internet?expand=true`

* Using Libcurl/7.57.0-DEV OpenSSL/1.0.2o zlib/1.2.11 Libssh2/1.7.0-DEV

* Current time is 2019-06-06T09:08:38.125Z

* Disable timeout

* Enable automatic URL encoding

* Disable SSL validation

* Enable cookie sending with jar of 0 cookies

* Found bundle for host 172.16.136.5: 0xid88e50f530 [can pipeline]

* Re-using existing connection! (#0) with host 172.16.136.5

* Connected to 172.16.136.5 (172.16.136.5) port 8443 (#0)

> GET `/rest/config/v1/forwarding-firewall/objects/networks/Internet?expand=true` HTTP/1.1

> Host: 172.16.136.5:8443

> User-Agent: insomnia/6.5.4

> Accept: application/*

> X-API-Token: bH73S5g0hly9SonQG792aNo5ioxneaja

< HTTP/1.1 200 OK

< Date: Thu, 06 Jun 2019 09:08:38 UTC

< X-Frame-Options: deny

< X-Content-Type-Options: nosniff

< Transfer-Encoding: chunked

< Content-Type: application/json

< Connection: keep-alive

* Received 415 B chunk

* Received 5 B chunk

* Connection #0 to host 172.16.136.5 left intact



CGF Rest API Config – Step by Step



GET <https://172.16.136.5:8443/rest/config/v1/forwarding-firewall/objects/networks/Internet> Send 200 OK TIME 172 ms SIZE 408 B

JSON Auth Query Header 3 Docs

Configuration Tree REST API Service Forwarding Rules - NGFW (Firewall)

Forwarding Firewall - Networks

Rule Lists
Access Rules
Application Rules
Object Viewer...

Firewall Objects
Networks
Named Networks
Applications
URL Filter
SSL Inspection
File Content
User Agents
Services
User and Groups
Connections
Schedules
Interface Groups
Proxy ARPs
Generic IPS Patterns

Rule List Verification

Settings

Edit Networks

Name References Entries Comment

DYNAMIC

STATIC

Edit/Create Network Object

General

Type Generic Network Object (IP, Network, Ranges)

Name Internet

Description All routed IPv4 addresses

Network Color

Include Entries

IP / Ref / Geo	Comment
Ref: Any	

Exclude Entries

IP / Ref / Geo	Comment
10.0.0.0/8	
172.16.0.0/12	
192.168.0.0/16	

Preview Header 6 Cookie Timeline

```
1 {
2   "included": [
3     {
4       "references": "Any"
5     }
6   ],
7   "excluded": [
8     {
9       "entry": {
10        "ip": "10.0.0.0/8"
11      }
12    },
13    {
14      "entry": {
15        "ip": "172.16.0.0/12"
16      }
17    },
18    {
19      "entry": {
20        "ip": "192.168.0.0/16"
21      }
22    }
23  ],
24  "name": "Internet",
25  "comment": "All routed IPv4 addresses",
26  "type": "generic",
27  "shared": false,
28  "dynamic": false
29 }
```

Enable L3 Pseudo Bridging

OK Cancel



CGF Rest API Example – Network Object



- Create a NEW network object with REST API
- MyFirstNWObjectWithRestAPI: 1.2.3.4|2.2.2.0/22

The screenshot displays the REST API interface of the Barracuda CloudGen Firewall. The left pane shows a JSON payload for creating a network object, and the right pane shows the 'Edit/Create Network Object' dialog box.

JSON Payload (Left Pane):

```

1 {
2   "included": [
3     {
4       "entry": {
5         "ip": "1.2.3.4"
6       }
7     },
8     {
9       "entry": {
10        "ip": "2.2.2.0/22"
11      }
12    }
13  ],
14  "excluded": [],
15  "name": "MyFirstNWObjectWithRestAPI",
16  "type": "generic",
17  "shared": false,
18  "dynamic": false
19 }
  
```

REST API Dialog (Right Pane):

- Name:** MyFirstNWObjectWithRestAPI
- Type:** Generic Network Object (IP, Network, Ranges)
- Description:** (Empty text area)
- Network Color:** (Dropdown menu)
- Include Entries:**

IP / Ref / Geo	Comment
1.2.3.4	
2.2.0/22	
- Exclude Entries:** (Empty table)
- Buttons:** OK, Cancel
- Checkbox:** ☐ Enable L3 Pseudo Bridging



CGF Rest API Example – Network Object



POST https://172.16.136.5:8443/rest/config/v1/forwarding-firewall/objects/networks/

Send

JSON

Auth Query Header 3 Docs

```
1 {
2   "included": [
3     {
4       "entry": {
5         "ip": "1.2.3.4"
6       }
7     },
8     {
9       "entry": {
10        "ip": "2.2.0.0/22"
11      }
12    }
13  ],
14  "excluded": [],
15  "name": "MyFirstNWObjectWithRestAPI",
16  "type": "generic",
17  "shared": false,
18  "dynamic": false
19 }
```

Generate Client Code

Shell

cURL

HTTPie

Wget

Copy to Clipboard

```
1 curl --request POST \
2 --url https://172.16.136.4:8443/rest/config/v1/forwarding-firewall/objects/networks/ \
3 --header 'accept: application/*' \
4 --header 'content-type: application/json' \
5 --header 'x-api-token: bH73S5g0hIy9SonQG792aNoSioxneaja' \
6 --data '{
7   "included": [
8     {
9       "entry": {
10        "ip": "1.2.3.4"
11      }
12    },
13    {
14      "entry": {
15        "ip": "2.2.0.0/22"
16      }
17    }
18  ],
19   "excluded": [],
20   "name": "MyFirstNWObjectWithRestAPI",
21   "type": "generic",
22   "shared": false,
23   "dynamic": false
24 }'
```

BASIC

Send Now Ctrl+Enter

Generate Client Code

ADVANCED

Send After Delay

Repeat on Interval

Download After Send

Send And Download

CGF Rest API Example – Network Object



- CURL examples:
 - `curl -X POST "https://your-cgfw-ip:8443/rest/config/v1/forwarding-firewall/objects/networks" -H "accept: */*" -H "X-API-Token: yourRestApiToken" -H "Content-Type: application/json" -d "{ \"included\": [{ \"entry\": { \"ip\": \"1.2.3.4\" } }, { \"entry\": { \"ip\": \"2.2.2.0/22\" } }], \"excluded\": [], \"name\": \"MyFirstNWObjectWithRestAPI\", \"type\": \"generic\", \"shared\": false, \"dynamic\": false }"`
 - `curl -X POST "https://your-cgfw-ip:8443/rest/config/v1/forwarding-firewall/objects/networks" -H "accept: */*" -H "X-API-Token: yourRestApiToken" -H "Content-Type: application/json" -d "@MyJSON-File"`



CGF Rest API Example – Network Object



- Check the NEW network object with REST API
 - `curl -k -X GET "https://172.16.136.5:8443/rest/config/v1/forwarding-firewall/objects/networks/MyFirstNWObjectWithRestAPI" -H "accept: */*" -H "X-API-Token: bH73S5g0hIy9SonQG792aNo5ioxneaJa"`

GET https://172.16.136.5:8443/rest/config/v1/forwarding-firewall/objects/networks/MyFirstNWObjectWithRestAPI Send 200 OK TIME 172 ms SIZE 268 B

Body

Configuration Tree REST API Service Forwarding Rules - NGFW (Firewall)

Forwarding Rules

Rule Lists

Access Rules

Application Rules

Object Viewer...

Firewall Objects

Networks

Named Networks

Applications

URL Filter

SSL Inspection

File Content

User Agents

Services

Edit/Create Network Object

General

Type Generic Network Object (IP, Network, Ranges)

Name MyFirstNWObjectWithRestAPI Resolve

Description

Network Color

Include Entries

IP / Ref / Geo	Comment
1.2.3.4	
2.2.0.0/22	

Exclude Entries

IP / Ref / Geo	Comment
----------------	---------

Preview

Header 6 Cookie Timeline

```
1 = {
2 =   "included": [
3 =     {
4 =       "entry": {
5 =         "ip": "1.2.3.4"
6 =       },
7 =     },
8 =     {
9 =       "entry": {
10 =        "ip": "2.2.0.0/22"
11 =      },
12 =    },
13 =  ],
14 =  "excluded": [],
15 =  "name": "MyFirstNWObjectWithRestAPI",
16 =  "type": "Network"
```



Ansible Example



- `>ansible-playbook Alpbach2019-create-network-object.yml`

```
Alpbach2019-create-network-object.yml
1 - hosts: localhost
2   gather_facts: no
3   connection: local
4   roles:
5     - { role: Alpbach2019-create-network-object}
6
```

Alpbach2019-create-network-object

- .git
- defaults
- files
 - create_network_object.json
- handlers
- meta
- tasks
 - main.yml
- tests
- vars
 - main.yml
 - README.md

```
main.yml
1 ---
2 - name: CGF - Create network object
3   uri:
4     url: "https://{{ CGF.publicIP }}:{{ cgf_service_https_port }}/rest/config/v1/forwarding-firewall/objects/networks"
5     method: POST
6     headers:
7       "X-API-Token": "{{ cgf_token.json.token }}"
8     validate_certs: false
9     body_format: json
10    body: "{{lookup('file', 'create_network_object.json') | from_json }}"
11    status_code: '204'
12    timeout: 10
13
```

```
main.yml
1 ---
2 # vars file for CGF-create-user
3
4 cgf_service_https_port: "8443"
5
6
```

```
create_network_object.json
1 {
2   "name": "demo2-VNET",
3   "comment": "demo2-VNET",
4   "type": "generic",
5   "shared": false,
6   "dynamic": false,
7   "included": [
8     {
9       "entry": {
10         "ip": "172.16.136.0/22"
11       }
12     }
13   ],
14   "excluded": []
15 }
16
```



Ansible Example



- >ansible-playbook Alpbach2019-create-user.yml

```
Alpbach2019-create-user.yml
1 - hosts: localhost
2   gather_facts: no
3   connection: local
4   roles:
5     - { role: Alpbach2019-create-user}
6
```

```
Alpbach2019-create-user
└─ .git
└─ defaults
└─ files
    └─ user_body.json
└─ handlers
└─ meta
└─ tasks
    └─ main.yml
└─ tests
└─ vars
    └─ main.yml
```

```
main.yml
1 ---
2 #Create REST admin user
3 - name: Create REST Admin user
4   uri:
5     url: "https://{{ CGF.publicIP }}:{{cgf_service_https_port}}/rest/config/v1/box/admins"
6     method: POST
7     user: "{{ cgf_username }}"
8     password: "{{ cgf_password }}"
9     force_basic_auth: yes
10    headers:
11      Accept: '*/*'
12    validate_certs: false
13    body_format: json
14    body: "{{lookup('file', 'user_body.json') | from_json }}"
15    status_code: '204'
16    timeout: 10
17
```

```
main.yml
1 ---
2 # vars file for CGF-create-user
3
4 cgf_username: "root"
5 cgf_password: 'CudaL3arner!'
6 cgf_service_https_port: "8443"
```

```
user_body.json
1 {
2   "authenticationLevel": "password",
3   "enabled": true,
4   "enforcePasswordChange": false,
5   "externalLoginName": "restadmin",
6   "fullName": "REST Administrator",
7   "gracePeriod": 0,
8   "loginEvent": "serviceDefault",
9   "name": "restadmin",
10  "nextForcedChange": 30,
11  "password": "R3stAdminPassw0rd!",
12  "passwordChangeMode": "forceDifferent",
13
14  "roles": [
15    "Manager",
16    "Operator"
17  ],
18  "systemLevelAccess": "standardOsLogin",
19  "warningPeriod": 7
20 }
```

Ansible Example



- `>ansible-playbook ../Alpbach2019-1.yml`

```
demo
└─ Alpbach2019-1
└─ Alpbach2019-2
└─ Alpbach2019-connect-autovpn
└─ Alpbach2019-create-network-object
└─ Alpbach2019-create-token
└─ Alpbach2019-create-user
└─ Alpbach2019-edit-network-object
└─ Alpbach2019-enable-disable-fwrule
└─ Alpbach2019-get-token
└─ Alpbach2019-read-CGF-IP
└─ Alpbach2019-start-autovpn-listener
└─ deploy
    └─ Alpbach2019-1.yml
    └─ Alpbach2019-2.yml
    └─ Alpbach2019-connect-autovpn.yml
    └─ Alpbach2019-create-network-object.yml
    └─ Alpbach2019-create-token.yml
    └─ Alpbach2019-create-user.yml
    └─ Alpbach2019-edit-network-object.yml
    └─ Alpbach2019-enable-disable-fwrule.yml
    └─ Alpbach2019-get-token.yml
    └─ Alpbach2019-read-CGF-IP.yml
    └─ Alpbach2019-start-autovpn-listener.yml
    └─ key_body.json
```

```
Alpbach2019-1.yml
1 ---
2 # file: site.yml
3 - import_playbook: Alpbach2019-read-CGF-IP.yml
4 - import_playbook: Alpbach2019-create-user.yml
5 - import_playbook: Alpbach2019-create-token.yml
6 - import_playbook: Alpbach2019-get-token.yml
7 - import_playbook: Alpbach2019-create-network-object.yml
8 - import_playbook: Alpbach2019-enable-disable-fwrule.yml
9 - import_playbook: Alpbach2019-edit-network-object.yml
10 - import_playbook: Alpbach2019-start-autovpn-listener.yml
```

```
Alpbach2019-2.yml
1 ---
2 # file: site.yml
3 - import_playbook: Alpbach2019-read-CGF-IP.yml
4 - import_playbook: Alpbach2019-create-user.yml
5 - import_playbook: Alpbach2019-create-token.yml
6 - import_playbook: Alpbach2019-get-token.yml
7 - import_playbook: Alpbach2019-create-network-object.yml
8 - import_playbook: Alpbach2019-enable-disable-fwrule.yml
9 - import_playbook: Alpbach2019-edit-network-object.yml
10 - import_playbook: Alpbach2019-connect-autovpn.yml
```

```
Alpbach2019-read-CGF-IP.yml
1 - hosts: localhost
2   gather_facts: no
3   connection: local
4   roles:
5     - { role: Alpbach2019-read-CGF-IP}
```

```
Alpbach2019-create-user.yml
1 - hosts: localhost
2   gather_facts: no
3   connection: local
4   roles:
5     - { role: Alpbach2019-create-user}
```

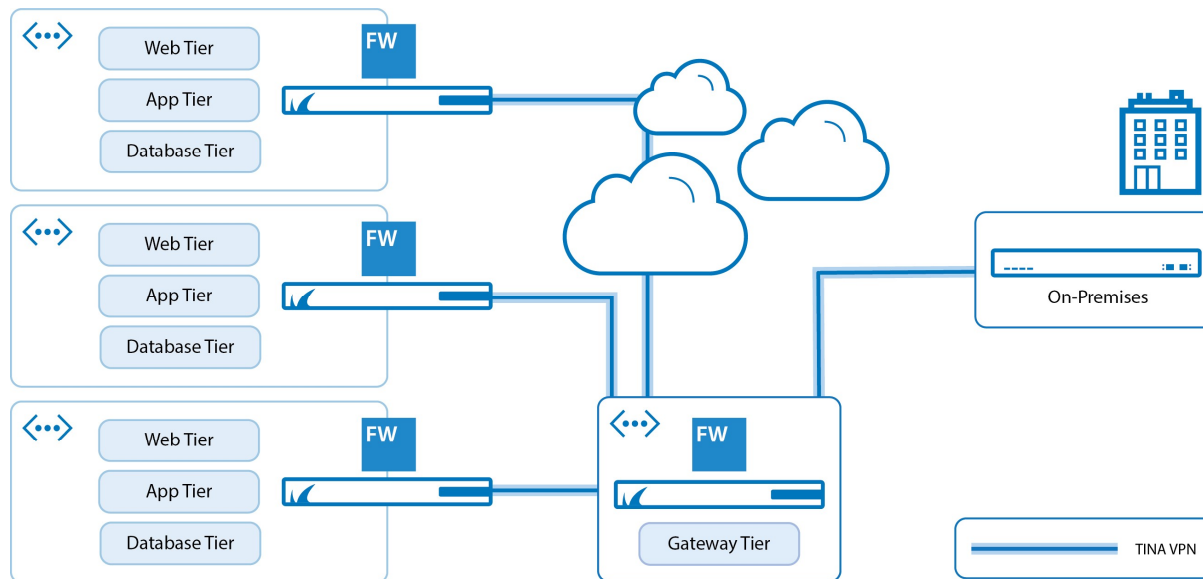
```
Alpbach2019-create-token.yml
1 - hosts: localhost
2   gather_facts: no
3   connection: local
4   roles:
5     - { role: Alpbach2019-create-token}
```



Multi-VNET with AutoVPN



But how can I automate this?





AutoVPN



- Simplify creating TINA VPN tunnels
- Automation first
 - REST API
 - CLI
- AutoVPN is a configuration tool

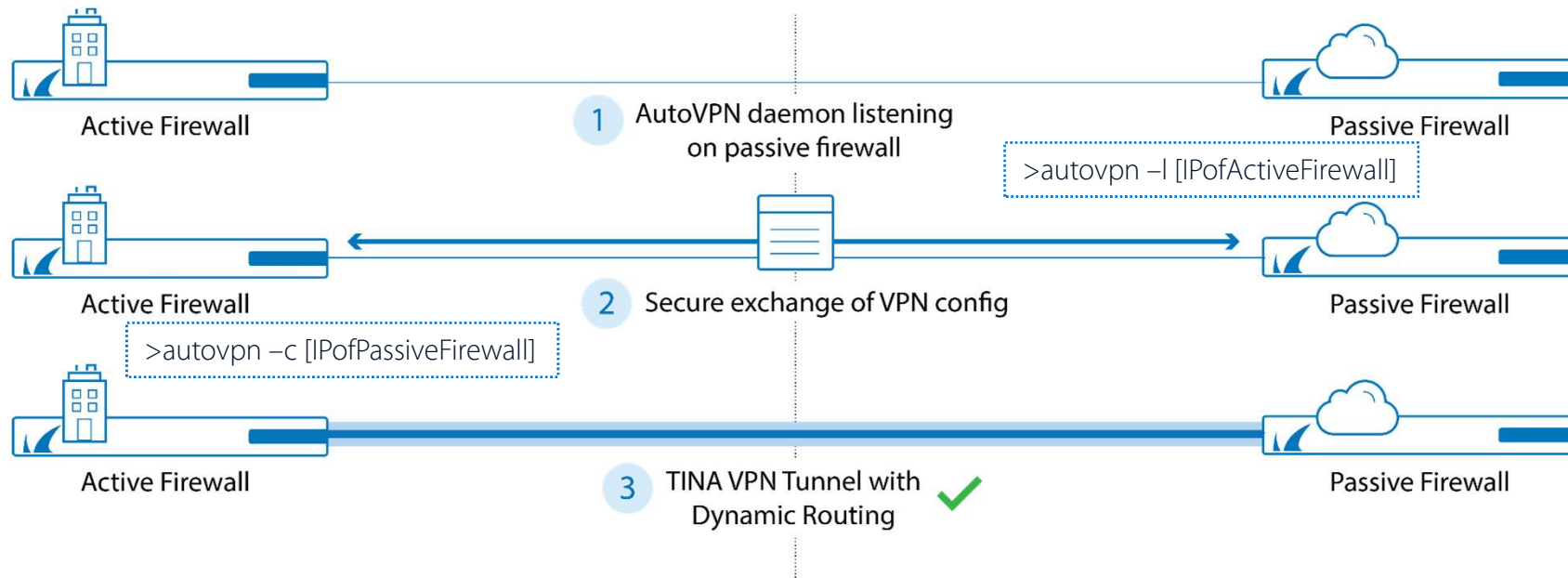


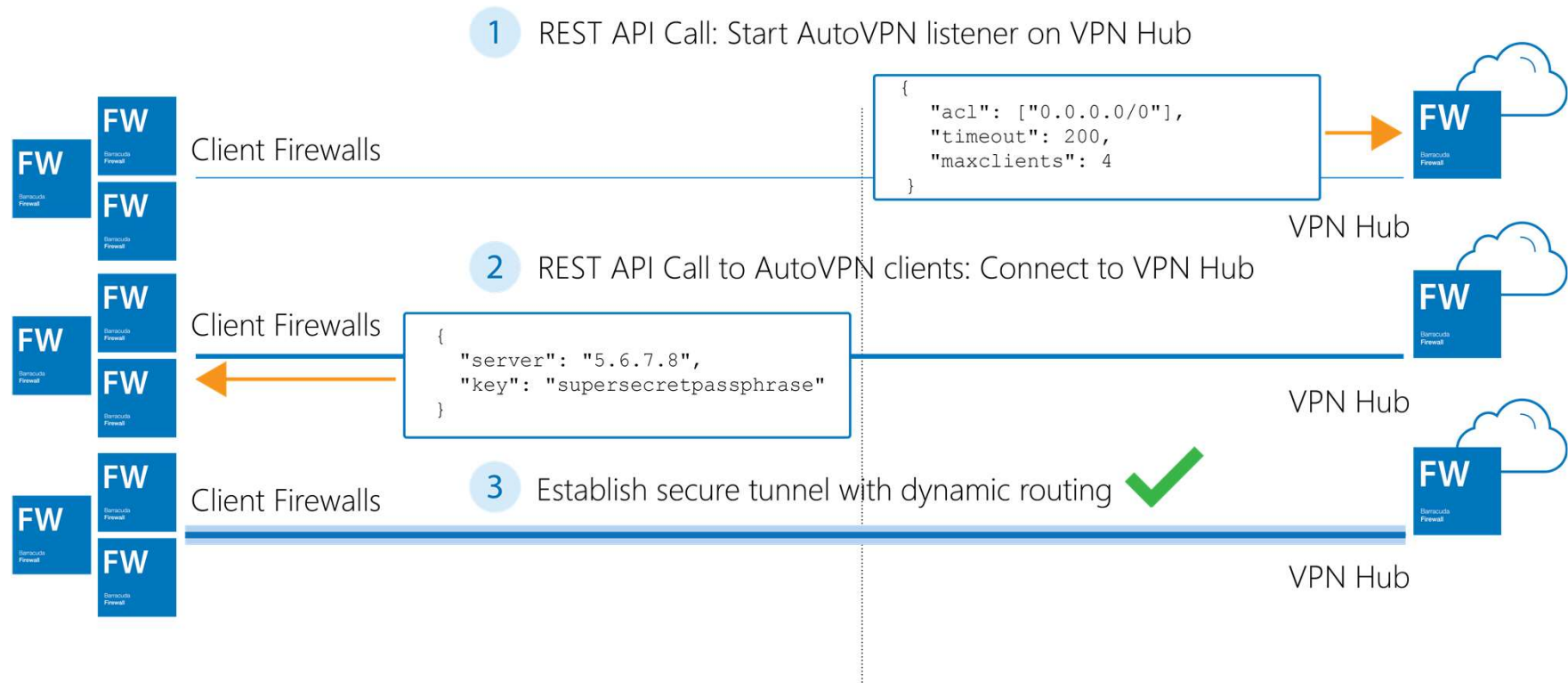
TINA AutoVPN Features



- Only 8.x platforms are supported: cloud, virtual, and hardware
- AutoVPN uses port 694







- Single transport UDP TINA tunnels
- Shared secret used for authentication
- Securing the VPN Hub
 - ACL
 - Number of connecting firewalls
 - Timeout
- REST API documentation on Campus

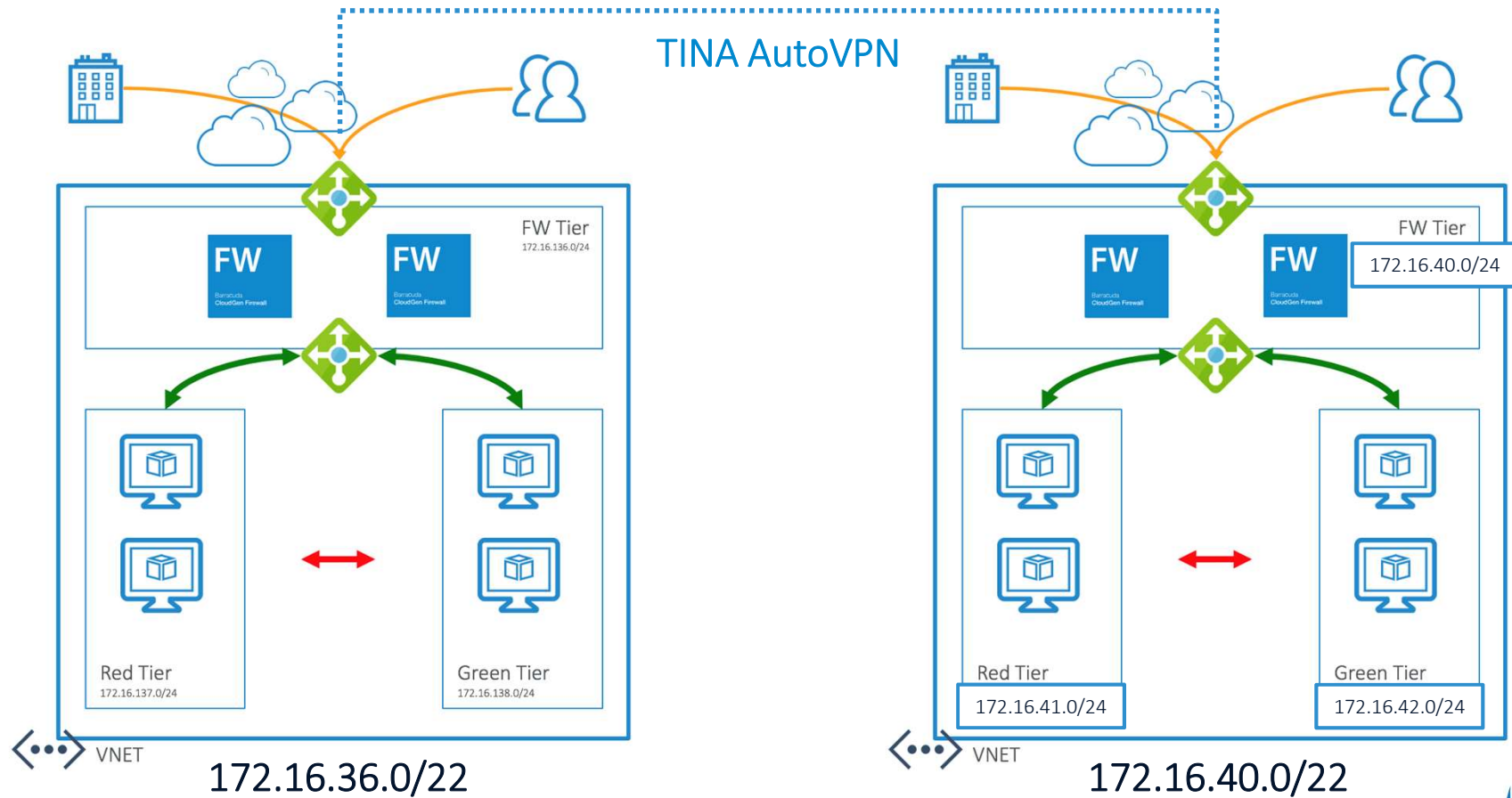


Azure CGF Automation

Demo



Azure Template + Ansible



CGF VPN-Hub Azure Automation Example



- Open Cloud Shell and start deploy.sh
 - > cd /cloudshell/... [Folder where deploy1.sh is located]
 - > ./deploy1.sh
- Check the created files
 - > cat /cloudshell/.../MyPrefix-VM.json
 - > cat /cloudshell/.../MyPrefix-VNET.json
 - > cat /cloudshell/.../Alpbach2019-create-network-object/files/ create_network_object.json



CGF Azure Automation Example



- Start Ansible
 - > cd .. [Folder where Alpbach2019-1.yml is located]
 - > ansible-playbook ./Alpbach2019-1.yml -e "var_file=./deploy/test3-VM.json"

```
koglbauer@Azure:~/clouddrive/ademo$ ansible-playbook ./Alpbach2019-1.yml -e "var_file=./deploy/test3-VM.json"
[WARNING]: No inventory was parsed, only implicit localhost is available

[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'

PLAY [localhost] *****

TASK [Alpbach2019-read-CGF-IP : Read CGF public IP from ./deploy/test3-VM.json.json.] *****
ok: [localhost]

TASK [Alpbach2019-read-CGF-IP : debug] *****
ok: [localhost] => {
  "msg": "51.145.209.100"
}

PLAY [localhost] *****

TASK [Alpbach2019-create-user : Create REST Admin user] *****
ok: [localhost]

PLAY [localhost] *****

TASK [Alpbach2019-create-token : CGF - Create token] *****
ok: [localhost]
```



CGF Azure Automation Example



- Check AutoVPN token

```

TASK [Alpbach2019-start-autovpn-listener : CGF - Start AutoVPN listener in VPN HUB Mode] *****
ok: [localhost]

TASK [Alpbach2019-start-autovpn-listener : Print out] *****
ok: [localhost] => {
  "vpnoutput.json.key": "tCH2KSPpA2t1eSB1L4zHJ/XmlsHXkUZitX5/wfV00JH0ztNj990r1pY5xANzaWQGNG8zN2V1"
}

TASK [Alpbach2019-start-autovpn-listener : Write out the key to a file] *****
changed: [localhost]

PLAY RECAP *****
localhost                : ok=12  changed=1    unreachable=0    failed=0    skipped=0    rescue=0    ignored=0

jkoglbauer@Azure:~/clouddrive/ademo$ ll
total 6
drwxrwxrwx 2 root root  0 Jul 23 12:29 ./
drwxrwxrwx 2 root root  0 Jun 17 09:39 ../
drwxrwxrwx 2 root root  0 Jul 23 12:31 Alpbach2019-1/
-rwxrwxrwx 1 root root 436 Jul 25 12:05 Alpbach2019-1.yml*
drwxrwxrwx 2 root root  0 Jul 25 12:10 Alpbach2019-2/
-rwxrwxrwx 1 root root 429 Jul 25 12:06 Alpbach2019-2.yml*
drwxrwxrwx 2 root root  0 Jul 25 11:06 Alpbach2019-connect-autovpn/
-rwxrwxrwx 1 root root 111 Jul 26 09:41 Alpbach2019-connect-autovpn.yml*
drwxrwxrwx 2 root root  0 Jul 23 12:31 Alpbach2019-create-network-object/
-rwxrwxrwx 1 root root 117 Jul 26 09:41 Alpbach2019-create-network-object.yml*
drwxrwxrwx 2 root root  0 Jul 23 12:31 Alpbach2019-create-token/
-rwxrwxrwx 1 root root 108 Jul 26 09:41 Alpbach2019-create-token.yml*
drwxrwxrwx 2 root root  0 Jul 23 12:31 Alpbach2019-create-user/
-rwxrwxrwx 1 root root 107 Jul 26 09:41 Alpbach2019-create-user.yml*
drwxrwxrwx 2 root root  0 Jul 25 07:40 Alpbach2019-edit-network-object/
-rwxrwxrwx 1 root root 115 Jul 26 09:41 Alpbach2019-edit-network-object.yml*
drwxrwxrwx 2 root root  0 Jul 24 13:43 Alpbach2019-enable-disable-fwrule/
-rwxrwxrwx 1 root root 116 Jul 26 09:41 Alpbach2019-enable-disable-fwrule.yml*
drwxrwxrwx 2 root root  0 Jul 23 12:30 Alpbach2019-get-token/
-rwxrwxrwx 1 root root 105 Jul 26 09:41 Alpbach2019-get-token.yml*
drwxrwxrwx 2 root root  0 Jul 24 12:06 Alpbach2019-read-CGF-IP/
-rwxrwxrwx 1 root root 107 Jul 26 09:41 Alpbach2019-read-CGF-IP.yml*
drwxrwxrwx 2 root root  0 Jul 25 08:10 Alpbach2019-start-autovpn-listener/
-rwxrwxrwx 1 root root 118 Jul 26 09:40 Alpbach2019-start-autovpn-listener.yml*
drwxrwxrwx 2 root root  0 Jul 23 12:29 deploy/
-rwxrwxrwx 1 root root 136 Aug  8 12:47 key_body.json*
jkoglbauer@Azure:~/clouddrive/ademo$
  
```

CGF AutoVPN Client Automation Example



- Open Cloud Shell and start deploy.sh
 - > cd /cloudshell/... [Folder where deploy2.sh is located]
 - > ./deploy2.sh

```
TASK [Alpbach2019-connect-autovpn : CGF - Connecto to AutoVPN listener in VPN HUB Mode] *****
ok: [localhost]

TASK [Alpbach2019-connect-autovpn : Print out] *****
ok: [localhost] => {
  "vpnoutput": {
    "changed": false,
    "connection": "close",
    "content": "{\n  \"sessionId\": \"4037ee\"\n}\n",
    "content_type": "application/json",
    "cookies": {},
    "cookies_string": "",
    "date": "Thu, 08 Aug 2019 13:59:31 UTC",
    "elapsed": 7,
    "failed": false,
    "json": {
      "sessionId": "4037ee"
    },
    "msg": "OK (unknown bytes)",
    "redirected": false,
    "status": 200,
    "transfer_encoding": "chunked",
    "url": "https://51.145.209.101:8443/rest/autovpn/v1/connect",
    "x_content_type_options": "nosniff",
    "x_frame_options": "deny"
  }
}

PLAY RECAP *****
localhost                : ok=11  changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

koglbauer@Azure:~/clouddrive/ademo/deploy$
```





Thank you

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