Unified Access Gateway PowerShell Deployment to Amazon Web Services

Technical Note
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Unified Access Gateway 3.8

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Contents

Introduction

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This technical note describes the use of PowerShell command to deploy Unified Access Gateway 3.5 or later to Amazon Web Services Elastic Compute Cloud (EC2). It describes the steps needed to prepare the EC2 environment before creating any Unified Access Gateway instances. It also provides the details of the `.INI` file containing the configuration settings and shows how to run the deployment PowerShell command. These are general guidelines. For more detailed information, see *Amazon AWS Documentation*.

Prepare the Windows Client Machine for Powershell

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Prepare your Windows client for Powershell deployment

Prerequisites

Ensure that you are running this from Windows 10 machine with access to the internet.

Note Other Windows operating systems may also be supported but these instructions are for Windows 10.

Procedure

1 Open the Powershell command window with administrative rights.

2 Run the command

```
Install-Module -Name AWSPowerShell -Force
Install-Package 7Zip4PowerShell
```

What to do next

Prepare the Amazon AWS EC2 environment.

Prepare the AWS EC2 Environment

3

Please refer to the official Amazon AWS PowerShell documentation for full details of the steps outlined in this section.

Prerequisites

Create an Amazon AWS account if you don't already have one.

Procedure

1 In the AWS Console, create an Access Key and obtain the Access Key ID and Secret Access Key. Set them in the default profile.

This step is applicable only if you don't have an access key ID and Secret Access Key

```
Set-AWSCredential -AccessKey AKIAI6428NKYOEXAMPLE `
-SecretKey bvfhkvvfhsbvhsdbhfbvfhfhvfhdskvbhfvbfhEXAMPLE `
-StoreAs default
```

2 Create a bucket in Amazon S3 to store Unified Access Gateway `.vmdk` images if one doesn't already exist.

```
$bucket="uag-images"
New-S3Bucket -BucketName $bucket -Region us-east-2
```

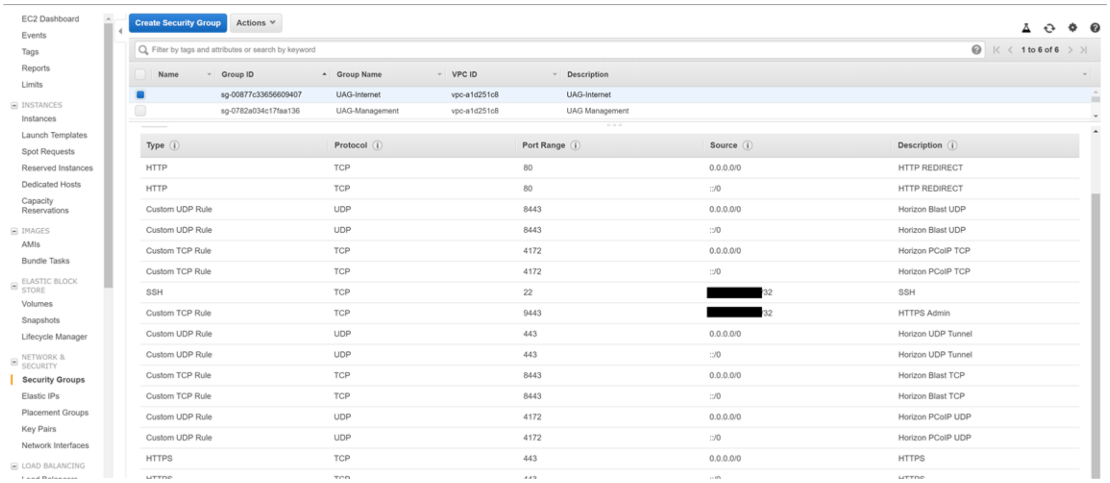
3 Create an IAM role in Amazon AWS called `vmimport` and apply a policy to the role.

```
$importPolicyDocument = @"
{
"Version":"2012-10-17",
"Statement":[
{
"Sid":"",
"Effect":"Allow",
"Principal":{
"Service":"vmie.amazonaws.com"
},
"Action":"sts:AssumeRole",
"Condition":{
"StringEquals":{
"sts:ExternalId":"vmimport"
}
}
}
]
}
"@

New-IAMRole -RoleName vmimport -AssumeRolePolicyDocument $importPolicyDocument

$bucket="uag-images"
$rolePolicyDocument = @"
{
"Version": "2012-10-17",
"Statement": [
{
"Effect": "Allow",
"Action": [
"s3:GetBucketLocation",
"s3:GetObject",
"s3:ListBucket"
],
"Resource": [
"arn:aws:s3:::$bucket",
"arn:aws:s3:::$bucket/*"
]
},
{
"Effect": "Allow",
"Action": [
"ec2:ModifySnapshotAttribute",
"ec2:CopySnapshot",
"ec2:RegisterImage",
"ec2:Describe*"
],
"Resource": "*"
}
]
}
"@

Write-IAMRolePolicy -RoleName vmimport -PolicyName vmimport -PolicyDocument $rolePolicyDocument
```

4. Prepare the network environment in EC2. These steps can be performed from the EC2 Management Console or with PowerShell. They just need to be done once to prepare the EC2 environment for Unified Access Gateway deployments. For this, at least one subnet is needed. For multi NIC Unified Access Gateway deployments, each NIC can either be on the same subnet or on different subnets.

5. Create a Security Group for each type of NIC.

   A security group contains a set of firewall rules to restrict TCP and UDP port access. A security group can be shared among multiple Unified Access Gateway appliances. For example you can create a security group called **UAG-Internet** for `eth0` and associate with the first NIC automatically when the Unified Access Gateway appliance is created. For Horizon use, the first (UAG-Internet) could allow TCP ports 80, 443, 8443, 4172 and UDP ports 443, 8443, 4172 from any client. If you want to allow `ssh` access to Unified Access Gateway then you must specify `sshEnabled=true` in the General section of each `.ini` file. SSH should generally only be enabled for testing purposes and not for a production deployment. You should also make sure that access to `ssh` on TCP port 22 is restricted in the security group to individual source IP addresses so that it is not open to all.



	Name	Group ID	Group Name	VPC ID	Description
☑		sg-00877c33656609407	UAG-Internet	vpc-a1d251c8	UAG-Internet
☐		sg-0782a034c17faa136	UAG-Management	vpc-a1d251c8	UAG Management

Type	Protocol	Port Range	Source	Description
HTTP	TCP	80	0.0.0.0/0	HTTP REDIRECT
HTTP	TCP	80	::/0	HTTP REDIRECT
Custom UDP Rule	UDP	8443	0.0.0.0/0	Horizon Blast UDP
Custom UDP Rule	UDP	8443	::/0	Horizon Blast UDP
Custom TCP Rule	TCP	4172	0.0.0.0/0	Horizon PCoIP TCP
Custom TCP Rule	TCP	4172	::/0	Horizon PCoIP TCP
SSH	TCP	22	[redacted]32	SSH
Custom TCP Rule	TCP	9443	[redacted]32	HTTPS Admin
Custom UDP Rule	UDP	443	0.0.0.0/0	Horizon UDP Tunnel
Custom UDP Rule	UDP	443	::/0	Horizon UDP Tunnel
Custom TCP Rule	TCP	8443	0.0.0.0/0	Horizon Blast TCP
Custom TCP Rule	TCP	8443	::/0	Horizon Blast TCP
Custom UDP Rule	UDP	4172	0.0.0.0/0	Horizon PCoIP UDP
Custom UDP Rule	UDP	4172	::/0	Horizon PCoIP UDP
HTTPS	TCP	443	0.0.0.0/0	HTTPS

6. If the Unified Access Gateway appliance is directly accessible from the Internet, then each NIC requiring access must also have an associated public IP address known as Elastic IPs.

7. For each NIC, determine the Subnet ID, the Security Group ID and the Public IP Allocation ID. If you do not specify a Security Group ID for any NIC then the default Security Group will be used. If you don't specify a Public IP ID then there won't be a public IP address for that NIC and it won't be directly accessible from the Internet. This may be the case if a load balancer is used in front of a group of Unified Access Gateway appliances.

Uploading the Unified Access Gateway Image with PowerShell

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You can upload the Unified Access Gateway image with PowerShell. The image can be imported and registered to other regions as well if required.

Procedure

1. Download the Unified Access Gateway `.ova` image file from VMware. The version of this file must be 3.5 or later.
2. Extract the `.vmdk` image from the `.ova` file.

   ```
   expand-7zip C:\uag\euc-unified-access-gateway-x.y.0.0-12345678_OVF10.ova C:\uag\
   ```

3. Upload the .vmdk image into the S3 bucket

   ```

   $vmdkImage="euc-unified-access-gateway-x.y.0.0-12345678-system.vmdk"
   $bucket="uag-images"
   $region="us-east-2"

   $params = @{
   "BucketName"=$bucket
   "File"="C:\uag\"+$vmdkImage
   "key"="/"+$vmdkImage
   "Region"=$region
   }
   Write-S3Object @params
   ```

4. Import the EC2 snapshot

   ```
   $params = @{
   "DiskContainer_Format"="VMDK"
   "DiskContainer_S3Bucket"=$bucket
   "DiskContainer_S3Key"=$vmdkImage
   "Region"=$region
   }
   $impId=Import-EC2Snapshot @params
   ```

5 To track the import, periodically run the following command to obtain progress status.

Note The import will take several minutes.

```
(Get-EC2ImportSnapshotTask -ImportTaskId `
$impId.ImportTaskId).SnapshotTaskDetail
```

6 Once complete, the following command should show the SnapshotId

```
(Get-EC2ImportSnapshotTask -ImportTaskId `
$impId.ImportTaskId).SnapshotTaskDetail.SnapshotId
```

7 Register the Image as an Amazon Machine Image (AMI)

```
$bdm=New-Object Amazon.EC2.Model.BlockDeviceMapping
$bd=New-Object Amazon.EC2.Model.EbsBlockDevice
$bd.SnapshotId=(Get-EC2ImportSnapshotTask `
-ImportTaskId $impId.ImportTaskId).SnapshotTaskDetail.SnapshotId
$bd.DeleteOnTermination=$true
$bdm.DeviceName="/dev/sda1"
$bdm.Ebs=$bd
$params = @{
"BlockDeviceMapping"=$bdm
"RootDeviceName"="/dev/sda1"
"Name"=$vmdkImage
"Architecture"="x86_64"
"VirtualizationType"="hvm"
"EnaSupport"=$true
}
Register-EC2Image @params
```

Results

In AWS Console you should see your imported image in EC2 AMI Images.

Prepare an INI File

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Most sections of the `INI` file are identical to the standard `INI` settings for Unified Access Gateway as supported for vSphere, Hyper-V and Azure deployments.

Refer to https://communities.vmware.com/docs/DOC-30835.

- Create an Amazon AWS account if you do not have one.
- Create an access key and obtain the values of the Access Key ID and Secret Access Key. See https://docs.aws.amazon.com/powershell/latest/userguide/pstools-appendix-sign-up.html
- For security reasons, the .INI file will not contain the Access Key ID or Secret Access Key so they must be stored in a named or default profile. These AWS credentials are used to crypto graphically sign the corresponding web service requests used by the PowerShell script. They should be stored in a named profile which is then referenced from the .INI file. See https://docs.aws.amazon.com/powershell/latest/userguide/specifying-your-aws-credentials.html. Use the following PowerShell example command to store these values in a profile named `awsCredentialProfile`:

```
Set-AWSCredential-AccessKey AKIAIOSFODNN7EXAMPLE `
-SecretKey wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY `
-StoreAs awsCredentialProfile
```

For AWS EC2 deployments, the following settings in the General section are not used.

- diskMode
- ds
- folder
- netInternet
- netManagementNetwork
- netmask0
- netmask1
- netmask2
- netBackendNetwork
- source
- target

- All of the IPv4 settings
- All of the IPv6 settings

For AWS EC2 there is a new group called AmazonEC2 that contains all of the settings specific to AWS EC2.

Table 5-1. Settings specific to AWS EC2

Group	Value	Example	Description
AmazonEC2	`amiId`	`amiId=ami-1986bb7c`	The ID of the registered Amazon Machine Image (AMI). This represents the Unified Access Gateway appliance image uploaded to Amazon S3. **Note** This is a mandatory setting.
	`credentialProfileName`	`credentialProfileName=MyUAGProfile`	The name of the credential profile containing the Access Key ID and Secret Access Key. This must be setup first. See https://docs.aws.amazon.com/powershell/latest/userguide/specifying-your-aws-credentials.html. If this is not set, the deployment will attempt to use the default credential profile.
	`instanceType`	`instanceType=c4.large`	AWS EC2 instance type. Default is c4.large.
	`region`	`region=us-east-2`	The AWS EC2 region name. **Note** This is a mandatory setting.

	`privateIPAddress0`
	`privateIPAddress1`
	`privateIPAddress2`
		`privateIPAddress1=172.31.7.222`	Optional fixed IP address used by EC2 DHCP for `eth0`, `eth1`, or `eth2`. Normally this is not required but can be used to set a static private IP address instead of a dynamic one.

	`publicIPId0`
	`publicIPId1`
	`publicIPId2`
		`publicIPId0=eipalloc-027afa45f34984c87`	AWS EC2 Elastic Public IP address ID associated with `eth0`, `eth1` or `eth2`. This setting is optional for each NIC.

Table 5-1. Settings specific to AWS EC2 (continued)

Group	Value	Example	Description

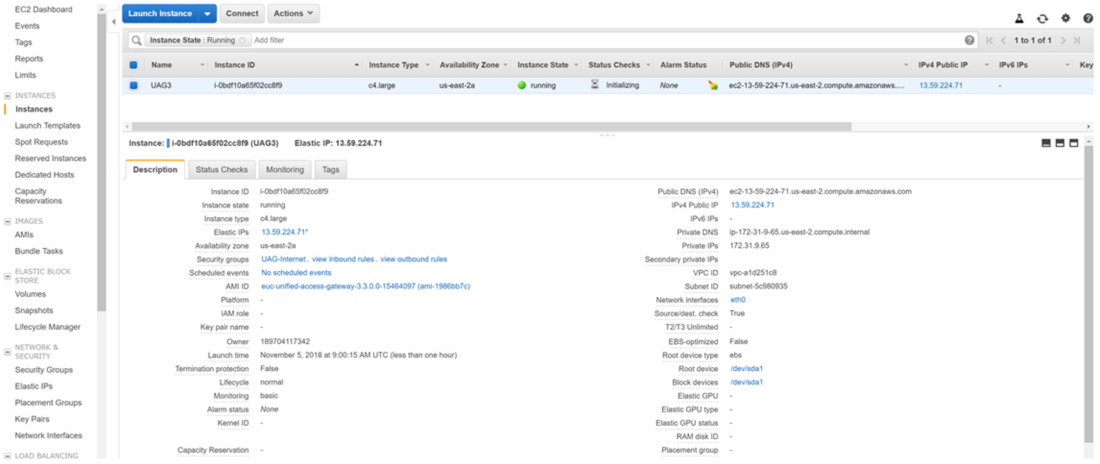
	`securityGroupId0`
	`securityGroupId1`
	`securityGroupId2`
		`securityGroupId0=sg-00877c33656609407`	AWS EC2 Security Group ID associated with `eth0`, `eth1`, or `eth2`. The same Security Group can be used by multiple Unified Access Gateway instances.
			Note This setting is optional.
			If this setting is not specified, the default EC2 Security Group will be used.

	`subnetId0`
	`subnetId1`
	`subnetId2`
		`subnetId1=subnet-5c980935`	AWS EC2 Subnet ID associated with `eth0`, `eth1` or `eth2`.
			■ For one NIC `subnetId0` is mandatory.
			■ For two NIC `subnetId0` and `subnetId1` are mandatory.
			■ For three NIC `subnetId0`, `subnetId1`, and `subnetId2` are mandatory.

INI File Definition Example

```
[General]
name=UAG12
deploymentOption=twonic
honorCipherOrder=true

[AmazonEC2]

# authentication

credentialProfileName=awsCredentialProfile

# type, region and image

instanceType=c4.large
region=us-east-2
amiId=ami-1986bb7c

# eth0 settings
subnetId0=subnet-5c980935
securityGroupId0=sg-00877c33656609407
```

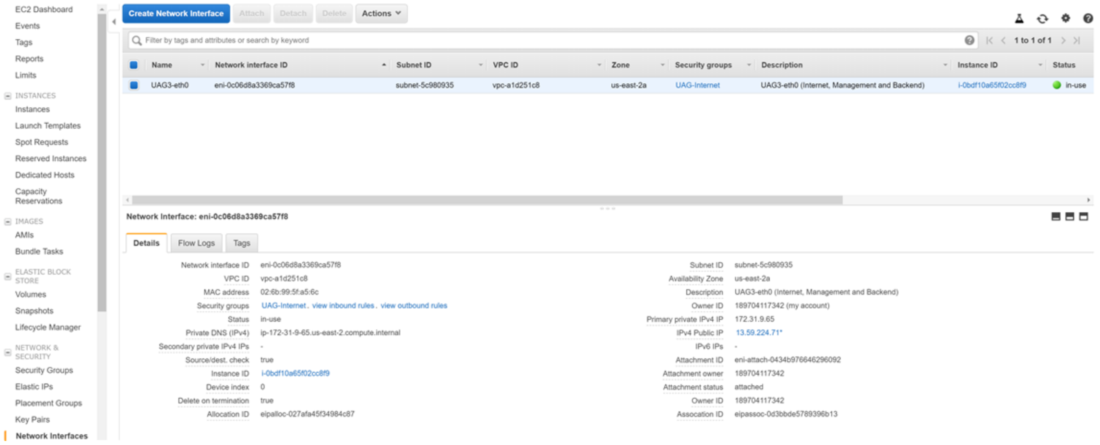
```
publicIPId0=eipalloc-027afa45f34984c87

# eth1 settings
subnetId1=subnet-1f2743c2
```



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 IPs	Key
UAG3	i-0bdf10a65f02cc8f9	c4.large	us-east-2a	running	Initializing	None	ec2-13-59-224-71.us-east-2.compute.amazonaws....	13.59.224.71	-	

Instance: i-0bdf10a65f02cc8f9 (UAG3) Elastic IP: 13.59.224.71

Instance ID	i-0bdf10a65f02cc8f9	Public DNS (IPv4)	ec2-13-59-224-71.us-east-2.compute.amazonaws.com
Instance state	running	IPv4 Public IP	13.59.224.71
Instance type	c4.large	IPv6 IPs	-
Elastic IPs	13.59.224.71*	Private DNS	ip-172-31-9-65.us-east-2.compute.internal
Availability zone	us-east-2a	Private IPs	172.31.9.65
Security groups	UAG-Internet . view inbound rules . view outbound rules	Secondary private IPs	
Scheduled events	No scheduled events	VPC ID	vpc-a1d251c8
AMI ID	euc-unified-access-gateway-3.3.0.0-15464097 (ami-1986bb7c)	Subnet ID	subnet-5c980935
Platform	-	Network interfaces	eth0
IAM role	-	Source/dest. check	True
Key pair name	-	T2/T3 Unlimited	-
Owner	189704117342	EBS-optimized	False
Launch time	November 5, 2018 at 9:00:15 AM UTC (less than one hour)	Root device type	ebs
Termination protection	False	Root device	/dev/sda1
Lifecycle	normal	Block devices	/dev/sda1
Monitoring	basic	Elastic GPU	-
Alarm status	None	Elastic GPU type	-
Kernel ID	-	Elastic GPU status	-
		RAM disk ID	-
Capacity Reservation	-	Placement group	-



Name	Network interface ID	Subnet ID	VPC ID	Zone	Security groups	Description	Instance ID	Status
UAG3-eth0	eni-0c06d8a3369ca57f8	subnet-5c980935	vpc-a1d251c8	us-east-2a	UAG-Internet	UAG3-eth0 (Internet, Management and Backend)	i-0bdf10a65f02cc8f9	in-use

Network Interface: eni-0c06d8a3369ca57f8

Network interface ID	eni-0c06d8a3369ca57f8	Subnet ID	subnet-5c980935
VPC ID	vpc-a1d251c8	Availability Zone	us-east-2a
MAC address	02:6b:99:5f:a5:6c	Description	UAG3-eth0 (Internet, Management and Backend)
Security groups	UAG-Internet . view inbound rules . view outbound rules	Owner ID	189704117342 (my account)
Status	in-use	Primary private IPv4 IP	172.31.9.65
Private DNS (IPv4)	ip-172-31-9-65.us-east-2.compute.internal	IPv4 Public IP	13.59.224.71*
Secondary private IPv4 IPs	-	IPv6 IPs	-
Source/dest. check	true	Attachment ID	eni-attach-0434b976646296092
Instance ID	i-0bdf10a65f02cc8f9	Attachment owner	189704117342
Device index	0	Attachment status	attached
Delete on termination	true	Owner ID	189704117342
Allocation ID	eipalloc-027afa45f34984c87	Assocation ID	eipassoc-0d3bbde5789396b13

Run the Unified Access Gateway Deploy Command uagdeployec2.ps1

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You can deploy Unified Access Gateway to Amazon AWS EC2 with the PowerShell command.

Procedure

1. Download `uagdeployec2.ps1` and `uagdeploy.psm1` into a folder on your Windows machine.
2. Run the command.

   `uag12.ini` is the name of your `.INI` file.

   ```
   uagdeployec2.ps1 uag12.ini
   ```

   Note If you receive an error message `Error: Failed to deploy UAG – User data is limited to 16384 bytes`, it means that the configuration data in your INI file is too large for Amazon AWS EC2 deployment. It is a known limitation which Amazon might increase in future. While this limit is in place, it might be necessary to reduce the amount of configuration data specified in your INI file. You should check the SSL certificate files to see if unnecessary root or intermediate certificates can be removed. If necessary, do not specify the SSL certificates, and upload them using the Unified Access Gateway Admin UI after deployment.