How to deploy Auranet Controller on a private cloud (AWS EC2)

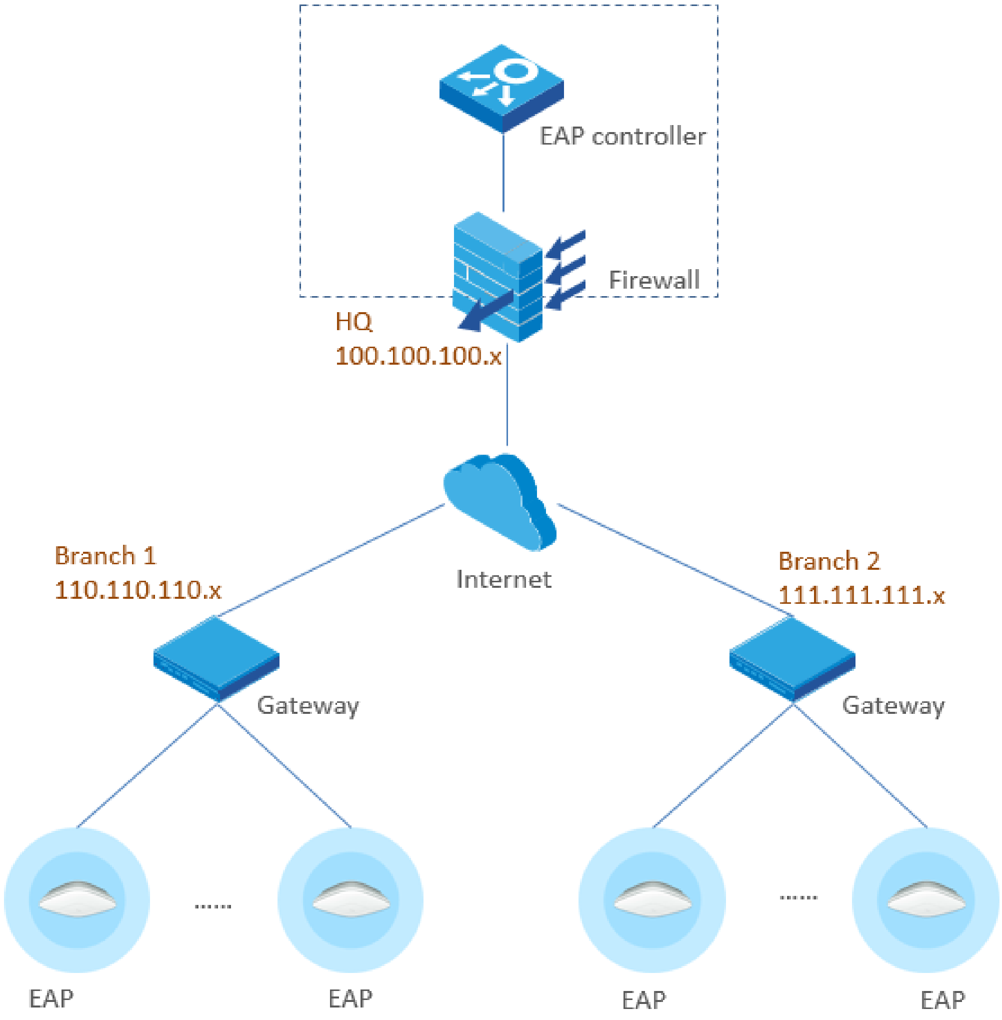
Updated at 2016/11

This article applies to Auranet Controller 2.0.3 and later non-cloud-based controller.

YouTube Tutorial

Overview

Auranet Controller (2.0.3 and newer non-cloud versions) supports L3 management. An Auranet Controller can manage EAPs of multiple remote networks crossing internet. However, it will require to set up port-forwarding or VPN tunnels if there are NAT firewalls in front of Auranet Controller. *(See FAQ913)*

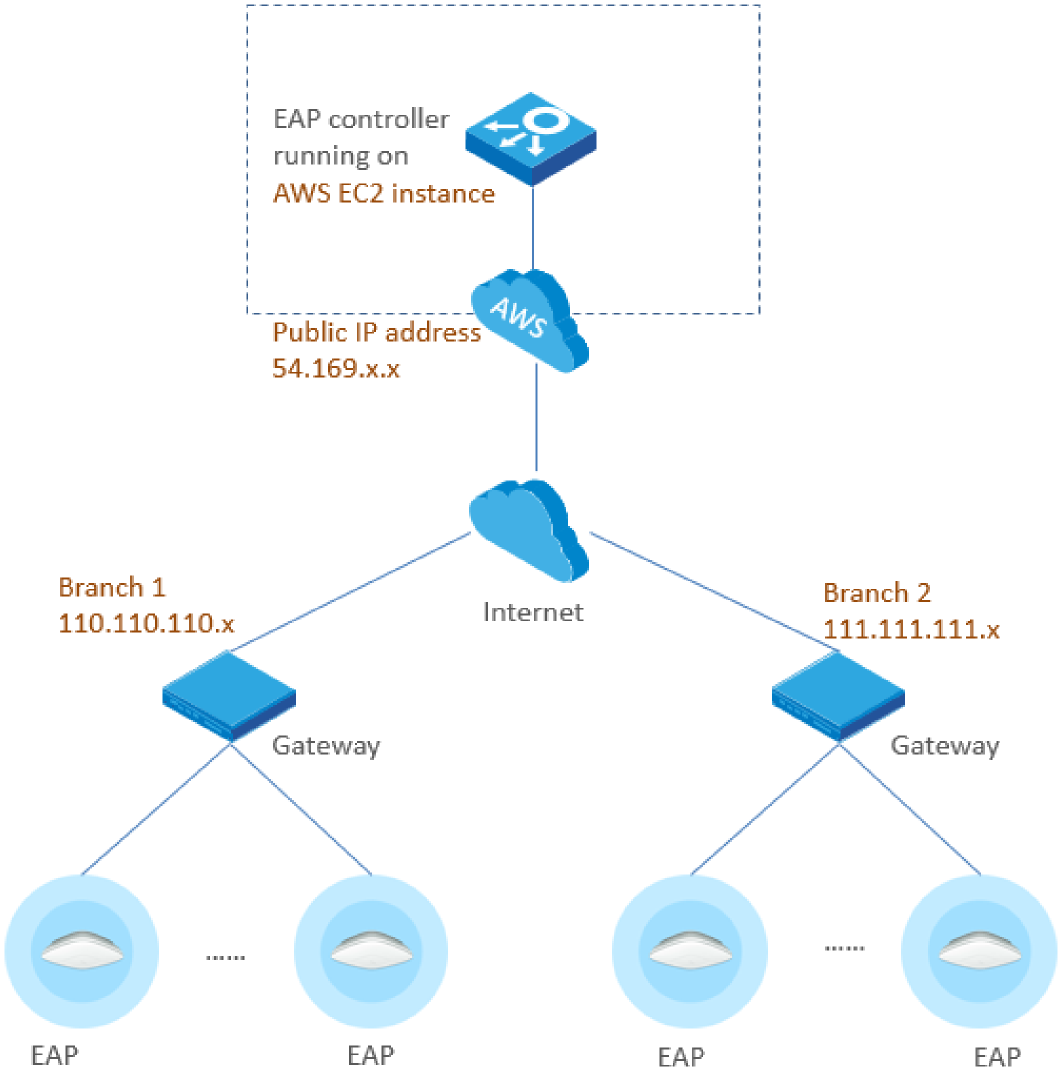


Some users may want to install the Auranet Controller on a private cloud platform, so as to achieve L3 management from anywhere without hosting a LAN PC. Moreover, if the cloud server comes with public IP addresses, it can also save the work of setting up port-forwarding or VPN tunnels for penetrating through NAT firewalls.

A Workaround

Although Auranet Controller is a non-cloud-application, it can still be installed on a cloud-based Windows host, which can be a workaround to achieve part of the demand.

In this article, readers will learn how to install and run an Auranet Controller on an AWS EC2 Windows host.



About AWS EC2

Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud. One significant feature of EC2 is virtual computing environments, known as instances, which includes Windows virtual hosts.

The Amazon Web Services (AWS) Free Tier provides new registered users with 750 hours per month of Windows t2.micro instance usage for free within certain usage limits. You are now strongly recommended to refer to the *page of AWS Free Tier* for detailed information. All information given herein are subject to changes or update by AWS without prior notice.

Here we take AWS EC2 as an example to introduce how to install and run an Auranet Controller on a private cloud.

Part 1: Get AWS EC2 Ready

1.1 Create an AWS account

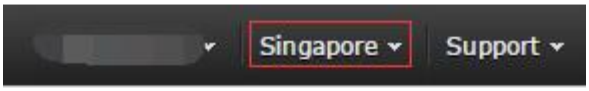
- Open http://aws.amazon.com/, and then choose Create an AWS Account.
- Follow the online instructions to create an AWS account.

Note: Skip this step 1 and login directly if you have already an AWS account.

About Region

Amazon has data centers in different areas of the world (for example, North America, Europe, and Asia). Correspondingly, Amazon EC2 is available to use in different *regions*. By launching instances in separate regions, you can design your application to be closer to specific customers or to meet legal or other requirements.

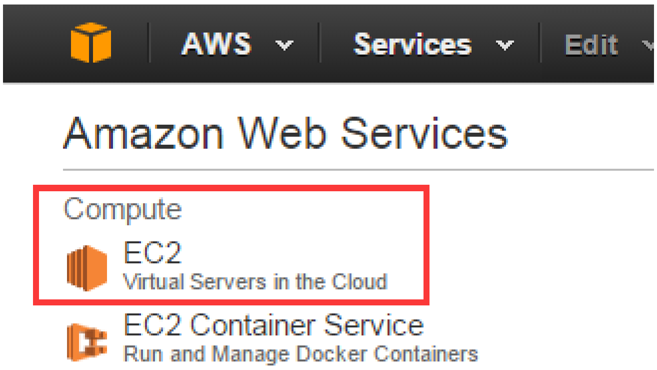
You can choose a preferred region before creating a Windows instance.



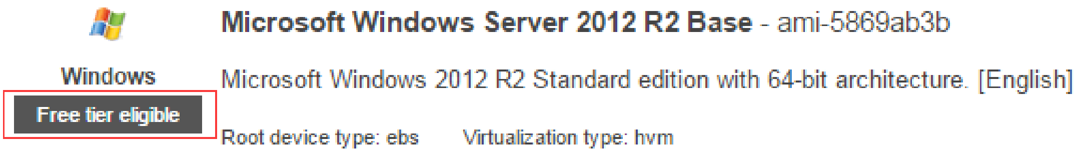
1.2 Launch a Windows instance

(Note: Skip this step 2 if you have already a Windows instance available for running an Auranet Controller.)

- Open the Amazon EC2 console at https://console.aws.amazon.com/ec2/. From the console dashboard, choose **Launch Instance**.



- The **Choose an Amazon Machine Image (AMI)** page displays a list of basic configurations, *called Amazon Machine Images (AMIs)*, which serve as templates for your instance. Select the AMI for Microsoft Windows Server. Notice that in this tutorial we choose Windows Server 2012 R2 marked "Free tier eligible" as an example.



Windows

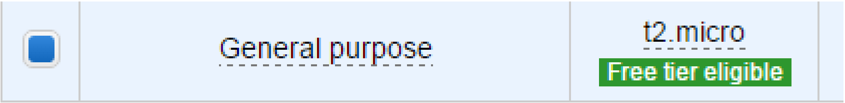
Free tier eligible

Microsoft Windows Server 2012 R2 Base - ami-5869ab3b

Microsoft Windows 2012 R2 Standard edition with 64-bit architecture. [English]

Root device type: ebs Virtualization type: hvm

- On the **Choose an Instance Type** page, you can select the hardware configuration of your instance. Select the t2.micro type, which is selected by default. Notice that this instance type is eligible for the free tier.



■	General purpose	t2.micro Free tier eligible

- Choose **Review and Launch** to let the wizard complete the other configuration settings for you.

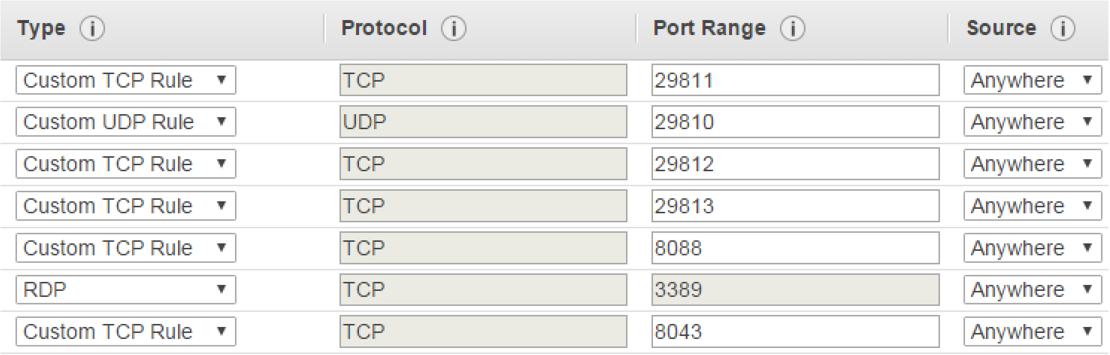
- On the **Review Instance Launch** page, under Security Groups, you'll see that the wizard created and selected a security group for you. Now choose **Edit security groups**.

Security Group Settings (Important)

A security group is a set of firewall rules that control the traffic for your instance. To achieve the goal of managing remote EAPs, add rules that allow unrestricted access to the following ports.

- *TCP PORT 8088*
- *TCP PORT 8043*
- *UDP PORT 29810*
- *TCP PORT 29811*
- *TCP PORT 29812*
- *TCP PORT 29813*

Also allow RDP access for Windows Remote Desktop access.



Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ
Custom TCP Rule ▼	TCP	29811	Anywhere ▼
Custom UDP Rule ▼	UDP	29810	Anywhere ▼
Custom TCP Rule ▼	TCP	29812	Anywhere ▼
Custom TCP Rule ▼	TCP	29813	Anywhere ▼
Custom TCP Rule ▼	TCP	8088	Anywhere ▼
RDP ▼	TCP	3389	Anywhere ▼
Custom TCP Rule ▼	TCP	8043	Anywhere ▼

- Then choose **Review and Launch**.

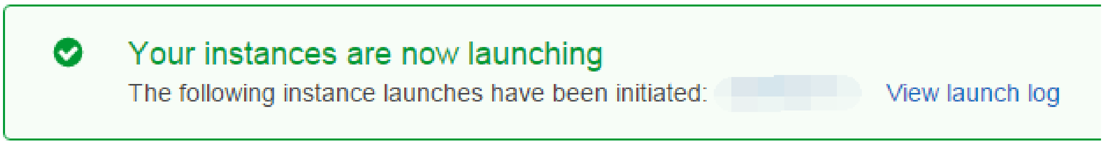
- On the **Review Instance Launch** page, choose **Launch**.

- When prompted for a key pair, select the key pair that you created if you have one. Otherwise, you can create a new key pair. Select **Create a new key pair**, enter a name for the key pair, and then choose **Download Key Pair**. This is the only chance for you to save the private key file, so be sure to download it. Save the private key file in a safe place. You'll need to provide the name of your key pair when you launch an instance and the corresponding private key each time you connect to the instance.

Caution: *Don't select the* ***Proceed without a key pair*** *option. If you launch your instance without a key pair, then you can't connect to it.*

- When you are ready, select the acknowledgement check box, and then choose **Launch Instances**.

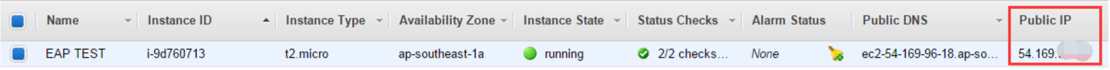
- A confirmation page lets you know that your instance is launching. Choose **View Instances** at the bottom of the page to close the confirmation page and return to the EC2 console.



Your instances are now launching

The following instance launches have been initiated: [redacted] View launch log

- Back to ***EC2 console*** → ***Instances*** menu, you can see that the newly launched Windows instance is now running.



□	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
□	EAP TEST	i-9d760713	t2.micro	ap-southeast-1a	● running	✓ 2/2 checks...	None	ec2-54-169-96-18.ap-so...	54.169.[redacted]

1.3 Assign an Elastic IP address for the Windows host

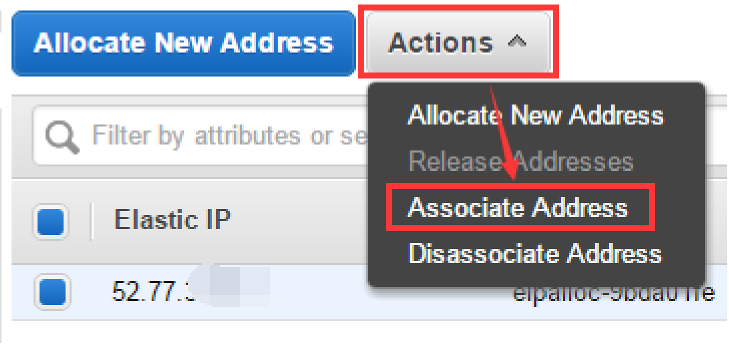
Although it shows that the instance is assigned a public IP address now, but this default IP address is not permanent. Once you shut down or reboot the instance, it can be released or changed to another one.

To have static public IP address for the Windows, we need to create an Elastic IP address and assign it to the instance. An Elastic IP address is a static public IP address that you can allocate to your account. You can associate it to and from instances as you require, and it's allocated to your account until you choose to release it.

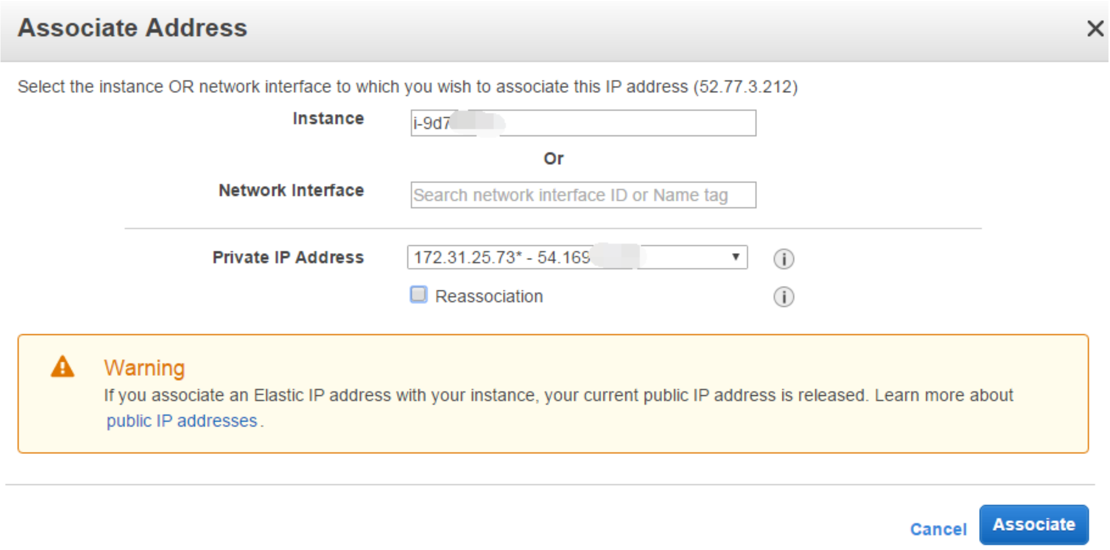
In the EC2 console, navigate to ***NETWORK & SECURITY*** -> ***Elastic IPs***, the list should be empty if you haven't create any. Now click Allocate New Address, confirm to allocate when prompted.

Then a new Elastic IP address entry will be shown in the list.

Select the entry, click ***Actions*** -> ***Associate Address***.



Click the **Instance** input box and choose the Windows instance in the drop-down list. Click **Associate** to associate this Elastic IP address to the Windows instance.



Associate Address ✕

Select the instance OR network interface to which you wish to associate this IP address (52.77.3.212)

Instance: i-9d7[redacted]

Or

Network Interface: Search network interface ID or Name tag

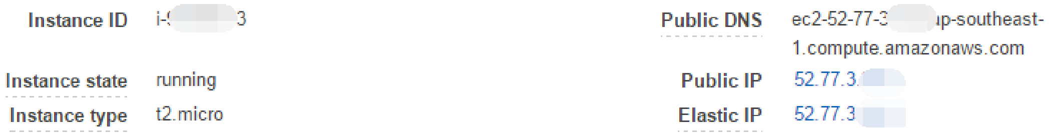
Private IP Address: 172.31.25.73* - 54.169[redacted] ▾ ⓘ

□ Reassociation ⓘ

⚠ Warning
If you associate an Elastic IP address with your instance, your current public IP address is released. Learn more about public IP addresses.

Cancel | Associate

Go back to Instances menu, now you can see the Windows instance is now associated with the Elastic IP address.



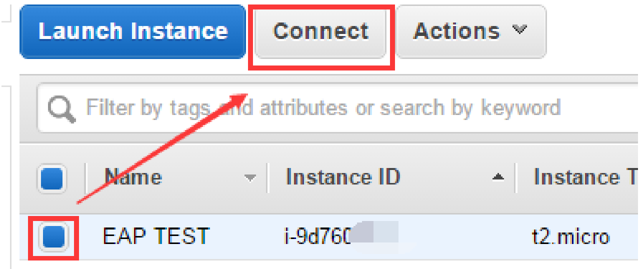
Instance ID: i-[redacted]3
Instance state: running
Instance type: t2.micro
Public DNS: ec2-52-77-3[redacted]ap-southeast-1.compute.amazonaws.com
Public IP: 52.77.3.[redacted]
Elastic IP: 52.77.3[redacted]

With all the above steps, the AWS EC2 Windows host is now ready.

Part 2: Install Auranet Controller on EC2

2.1 Connect to Windows through Remote Desktop

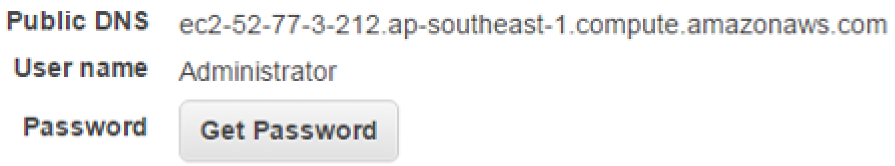
In **EC2 console**, select the Windows instance and click **Connect**.



	Name	Instance ID	Instance T
☐	EAP TEST	i-9d760[redacted]	t2.micro

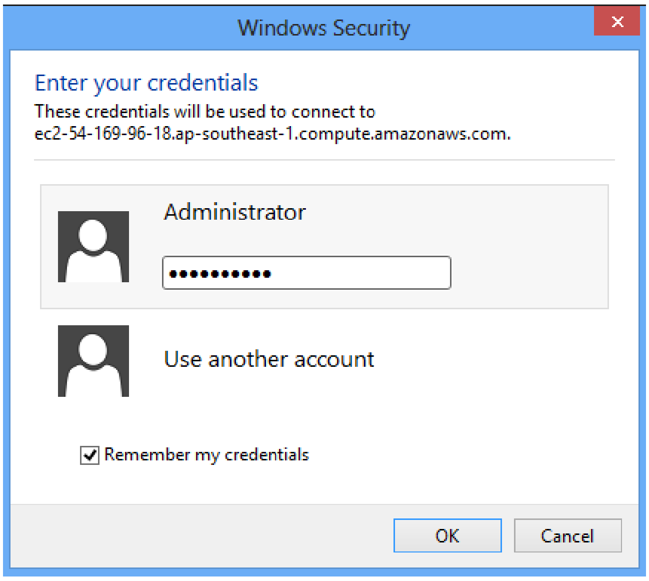
You can connect to your Windows instance using a remote desktop client of your choice, and by downloading and running the RDP shortcut file as the prompted instruction says.

Before actually connect through RDP, you must **Get Password** using your **Key file** which is saved in previous steps. Upload the Key file and then choose Decrypt **Password** to get your password.



Public DNS	ec2-52-77-3-212.ap-southeast-1.compute.amazonaws.com
User name	Administrator
Password	Get Password

With the provided username/password now you can connect to the Windows instance through remote desktop (RDP) client from any remote PC at anywhere you like.



Enter your credentials

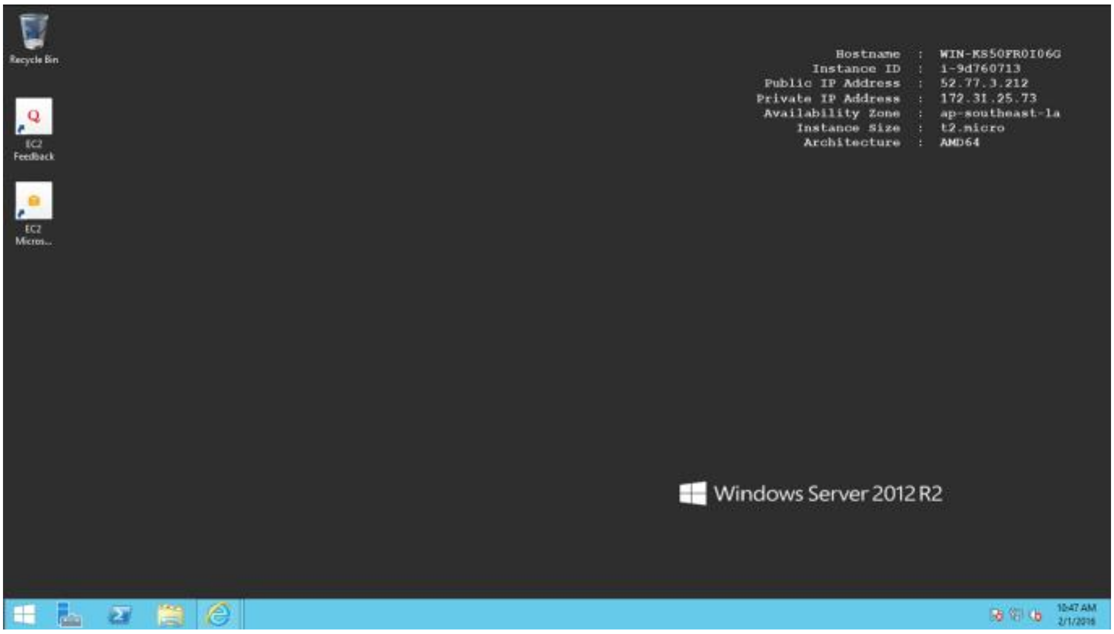
These credentials will be used to connect to ec2-54-169-96-18.ap-southeast-1.compute.amazonaws.com.

Administrator

•••••••••••

Use another account

☑ Remember my credentials

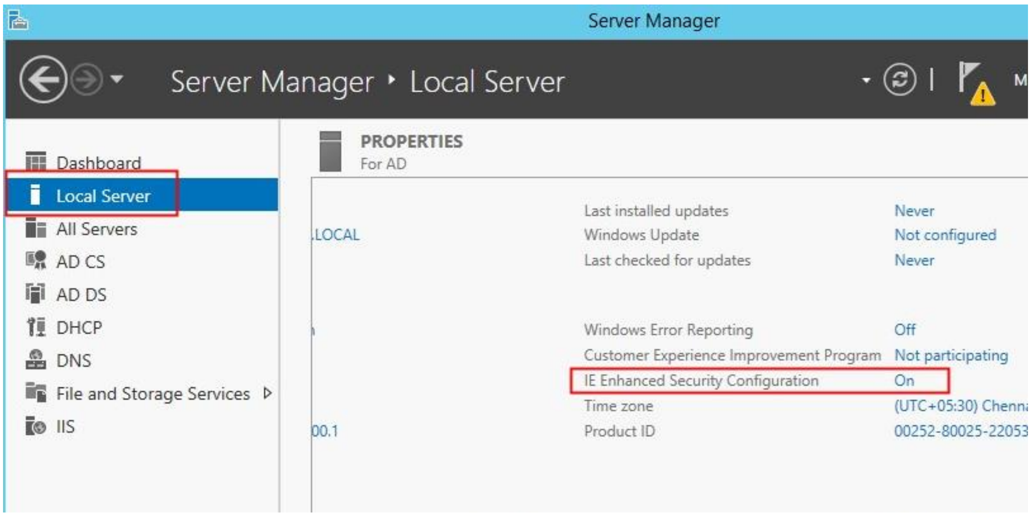


```
         Hostname  :  WIN-KS50FR0I06G
      Instance ID  :  i-9d760713
Public IP Address  :  52.77.3.212
Private IP Address :  172.31.25.73
Availability Zone  :  ap-southeast-1a
    Instance Size  :  t2.micro
     Architecture  :  AMD64
```

2.2 Download and Install Auranet Controller on EC2

TIPs: When the **IE ESC** is enabled, you get pop-up all the time and you are asked to add every new URL to the IE trusted sites zone. You may want to disable IE ESC temporarily for the convenience of downloading the Auranet Controller from TP-Link official websites.

To disable IE enhanced security in windows server 2012 R2, launch the **Server Manager**, on the left hand side click on **Local Server.** On the right hand side click on the **On** link next to **IE Enhanced Security Configuration**.



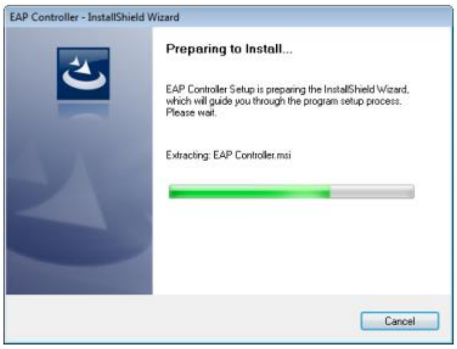
Last installed updates	Never
Windows Update	Not configured
Last checked for updates	Never
Windows Error Reporting	Off
Customer Experience Improvement Program	Not participating
IE Enhanced Security Configuration	On
Time zone	(UTC+05:30) Chenn
Product ID	00252-80025-22053

In the prompted windows, click on **Off** to turn off the **IE ESC**.

Then visit www.tp-link.com, search any model of the EAP series, e.g. EAP220. In the product page, navigate to **Support** page and download the latest

Auranet Controller under **Utility** tab.

After download, extra the zip and install the Auranet Controller through the setup wizard.

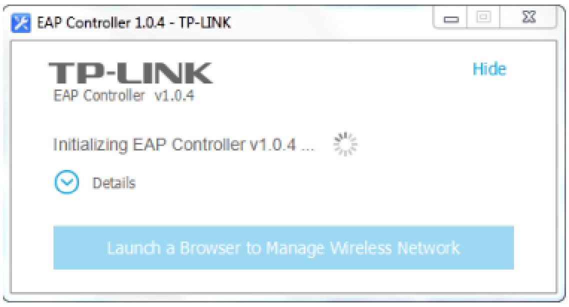


EAP Controller - InstallShield Wizard

Preparing to Install...

EAP Controller Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.

Extracting: EAP Controller.msi

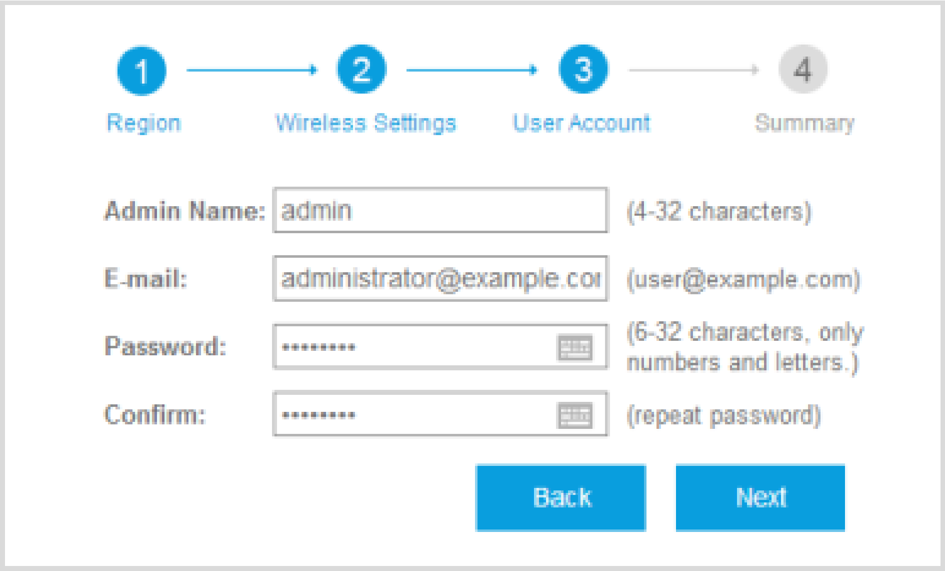


EAP Controller 1.0.4 - TP-LINK

TP-LINK
EAP Controller v1.0.4

Initializing EAP Controller v1.0.4 ...

After installation, launch Auranet Controller.exe and finish the Quick Setup Wizard. Note down the **username/password** and then keep the Auranet Controller running.



Admin Name:	admin	(4-32 characters)
E-mail:	administrator@example.coı	(user@example.com)
Password:	*********	(6-32 characters, only numbers and letters.)
Confirm:	*********	(repeat password)

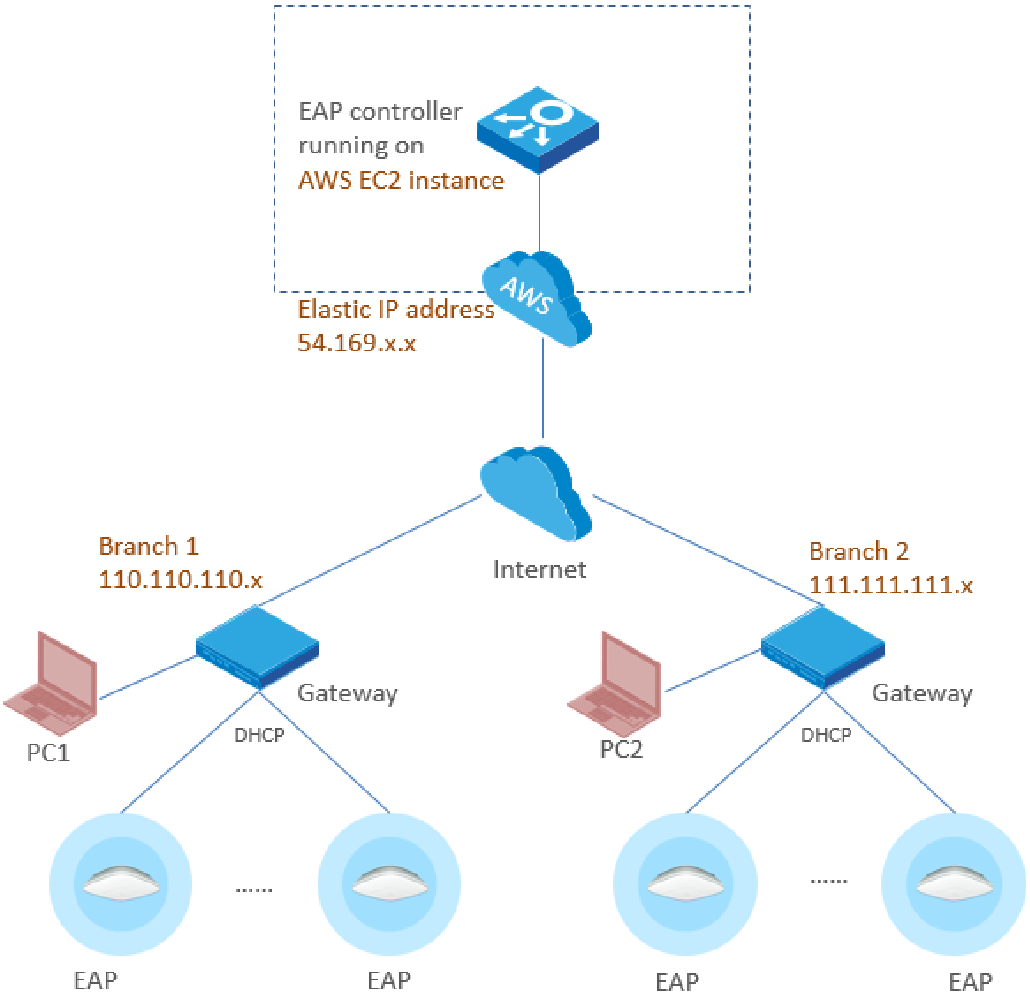
Now, everything of the EC2 instance is ready. You can now leave the EC2 running since its settings are all finished.

You can access the controller’s web UI from a remote PC through the URL *Https://Elastic IP:8088*

The next steps are performed at the EAP sides.

Part 3: Settings at EAP side

Still take the following topology as an example.



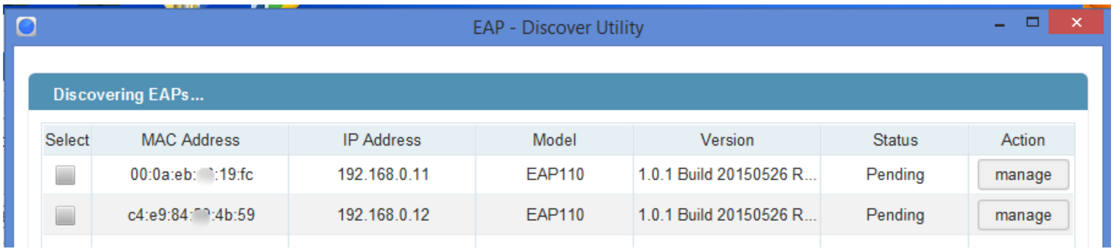
First of all, the EAPs must have internet access, which means you should assign them correct IP/gateway parameters through DHCP (recommended) or manual configuration. The EAPs default to DHCP so this shouldn’t be a problem as long as there is proper DHCP service in LAN.

Then comes the most important part. At EAP sides the controller’s public IP address, in the above example 54.169.x.x need to be configured into each EAP device, so that the EAPs can know where to find the Auranet Controller through internet. There are two methods to configure the controller’s IP address into the EAPs.

Method 1. Via EAP Discover Utility

1. Download Auranet Controller from TP-Link website. Install Auranet Controller on a PC at site Branch 1. The PC should be in the same IP subnet as EAPs. In the example it is PC1.

2. Run EAP Discover Utility (You will find it at C:\Program Files (x86)*TP-Link\Auranet Controller\bin* if you haven't changed the installation path). All the EAP devices in the local network will be listed.

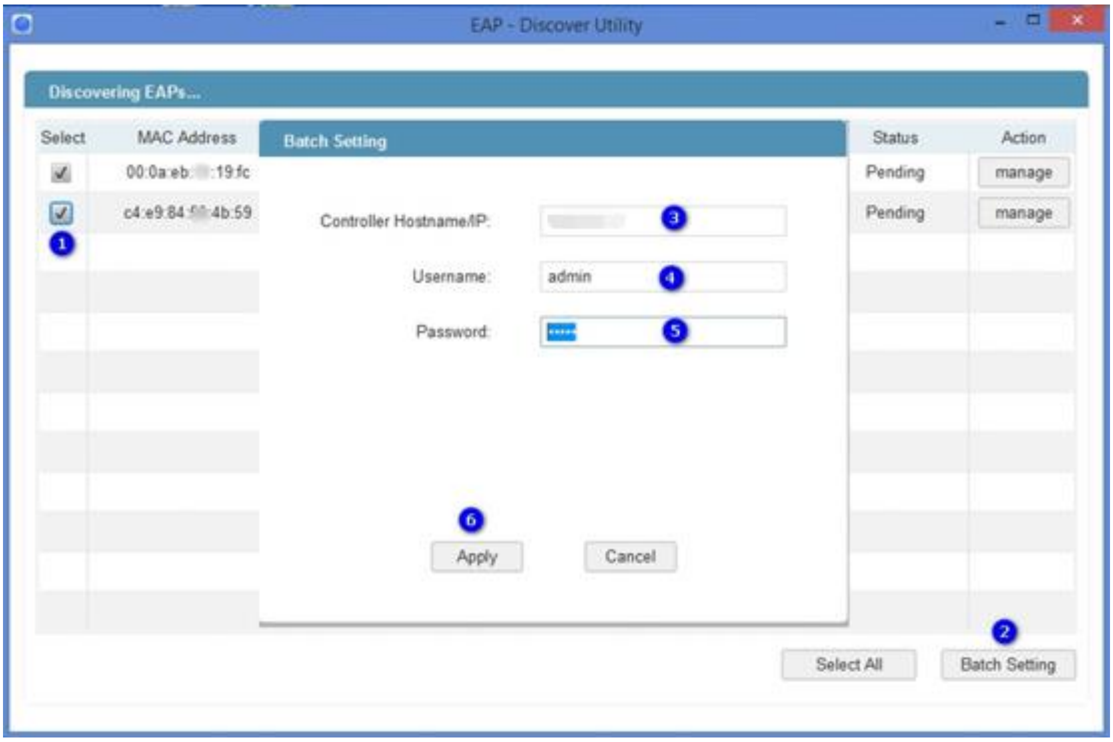


EAP - Discover Utility

Discovering EAPs...

Select	MAC Address	IP Address	Model	Version	Status	Action
□	00:0a:eb:[redacted]:19:fc	192.168.0.11	EAP110	1.0.1 Build 20150526 R...	Pending	manage
□	c4:e9:84:[redacted]:4b:59	192.168.0.12	EAP110	1.0.1 Build 20150526 R...	Pending	manage

3. Since all the EAPs have the same *Username* and *Password,* you may use *Batch Setting* to set controller IP for them all. If your EAP devices have different username and password you can use the *manage* button to set the controller hostname/IP respectively.



EAP - Discover Utility

Discovering EAPs...

Select	MAC Address	Status	Action
☑	00:0a:eb:[redacted]:19:fc	Pending	manage
☑	c4:e9:84:[redacted]:4b:59	Pending	manage

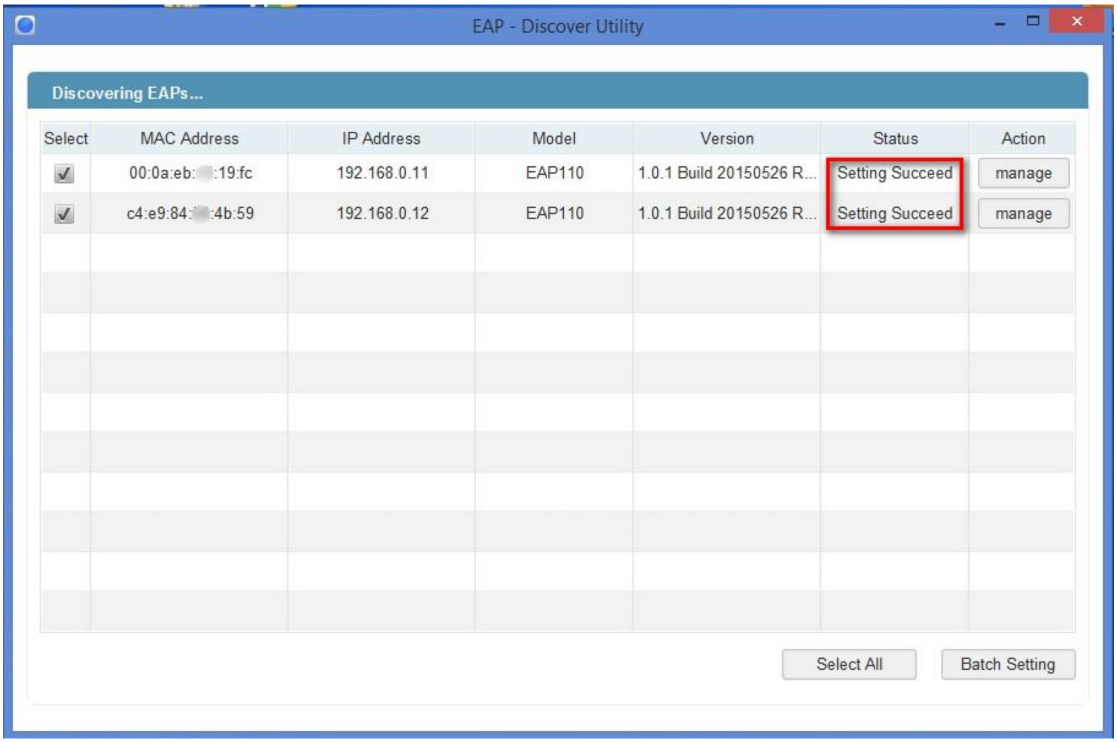
Batch Setting

Controller Hostname/IP: [redacted]

Username: admin

Password: •••••

4. Wait until the status show as *Setting Succeed*.

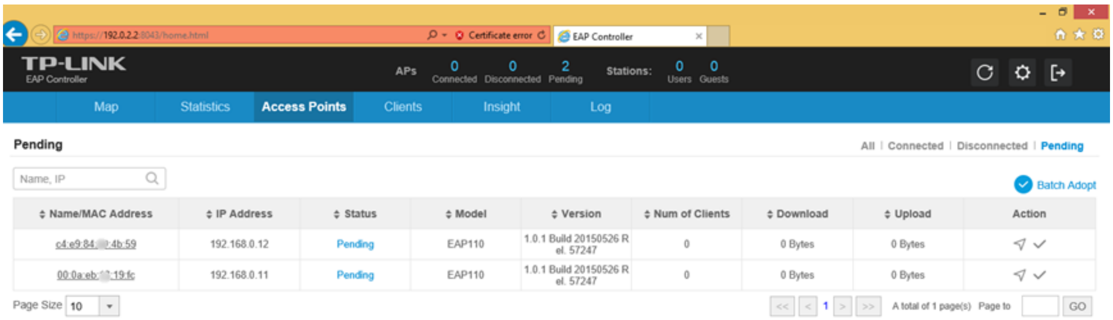


EAP - Discover Utility

Discovering EAPs...

Select	MAC Address	IP Address	Model	Version	Status	Action
☑	00:0a:eb:[redacted]:19:fc	192.168.0.11	EAP110	1.0.1 Build 20150526 R...	Setting Succeed	manage
☑	c4:e9:84:[redacted]:4b:59	192.168.0.12	EAP110	1.0.1 Build 20150526 R...	Setting Succeed	manage

5. A while later the EAPs will be displayed as pending APs on controller waiting for adoption and management. You can adopt them using the EAP's username/password. (Default: admin/admin)



https://192.0.2.2:8043/home.html
Certificate error
EAP Controller
TP-LINK
EAP Controller
APs 0 Connected 0 Disconnected 2 Pending
Stations: 0 Users 0 Guests
Map
Statistics
Access Points
Clients
Insight
Log

Pending

All | Connected | Disconnected | Pending
Name, IP
Batch Adopt

Name/MAC Address	IP Address	Status	Model	Version	Num of Clients	Download	Upload	Action
c4:e9:84:[redacted]:4b:59	192.168.0.12	Pending	EAP110	1.0.1 Build 20150526 Rel. 57247	0	0 Bytes	0 Bytes	✓
00:0a:eb:[redacted]:19:fc	192.168.0.11	Pending	EAP110	1.0.1 Build 20150526 Rel. 57247	0	0 Bytes	0 Bytes	✓

Page Size 10
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A total of 1 page(s) Page to
GO

6. For EAPs located in Branch 2 use the same methods to set the controller's IP address.

Method 2. Set option 138 on DHCP server

EAP devices can request controller IP via option 138 through DHCP.
Take Branch 1 as example.

1. Suppose the DHCP server in Branch 1 is capable of configure variable DHCP options. Set the controller IP as the option 138 value on it.

2. All the EAPs in the local network will be aware of the controller's IP address automatically through DHCP communication right after boot up.

How to set option 138 on DHCP server varies from implementation to implementation which is out of the scope of this document. Please refer to DHCP server documentation for help. The below two examples used in our test are for your reference.

Cisco IOS CLI:

```
ip dhcp pool test
network 192.168.1.0 255.255.255.0
default-router 192.168.1.1
dns-server 8.8.8.8
option 138 ip 56.169.x.x
```

For more details please refer to Cisco website.

MikroTik RouterOS CLI:

```
#Assume you have already setup a dhcp server with item number 0
#0xC0000002 equeals 56.169.x.x
/ip dhcp-server option add code=138 name=controller value=0xC0000002
/ip dhcp-server network set 0 dhcp-option=controller
```

For more details please refer to MikroTik manual.