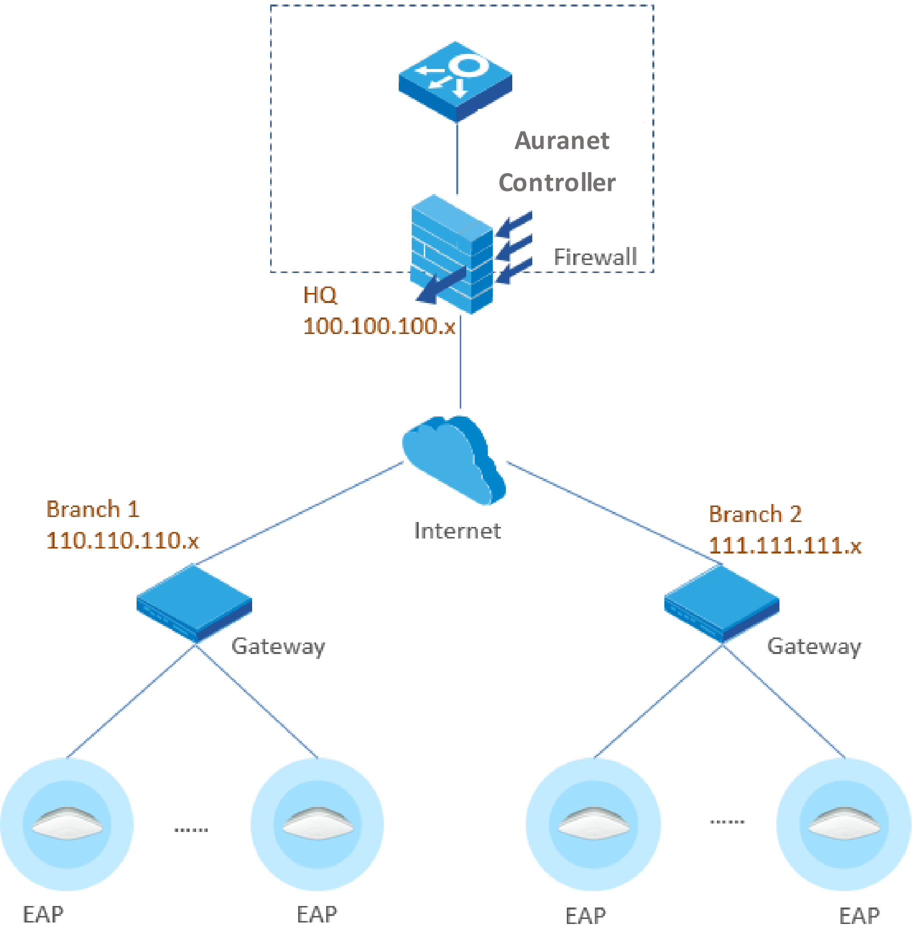
How to Deploy Auranet Controller on a Private Cloud (AWS EC2)

Updated February 2016

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

Overview

Auranet Controller (EAP Controller 2.0.3 and newer, non-cloud versions) supports L3 management. An Auranet Controller can manage Auranet APs on multiple remote networks via the Internet; however, this will require you to set up port-forwarding or VPN tunnels if there are NAT firewalls in front of the Auranet Controller. *(See FAQ913)*



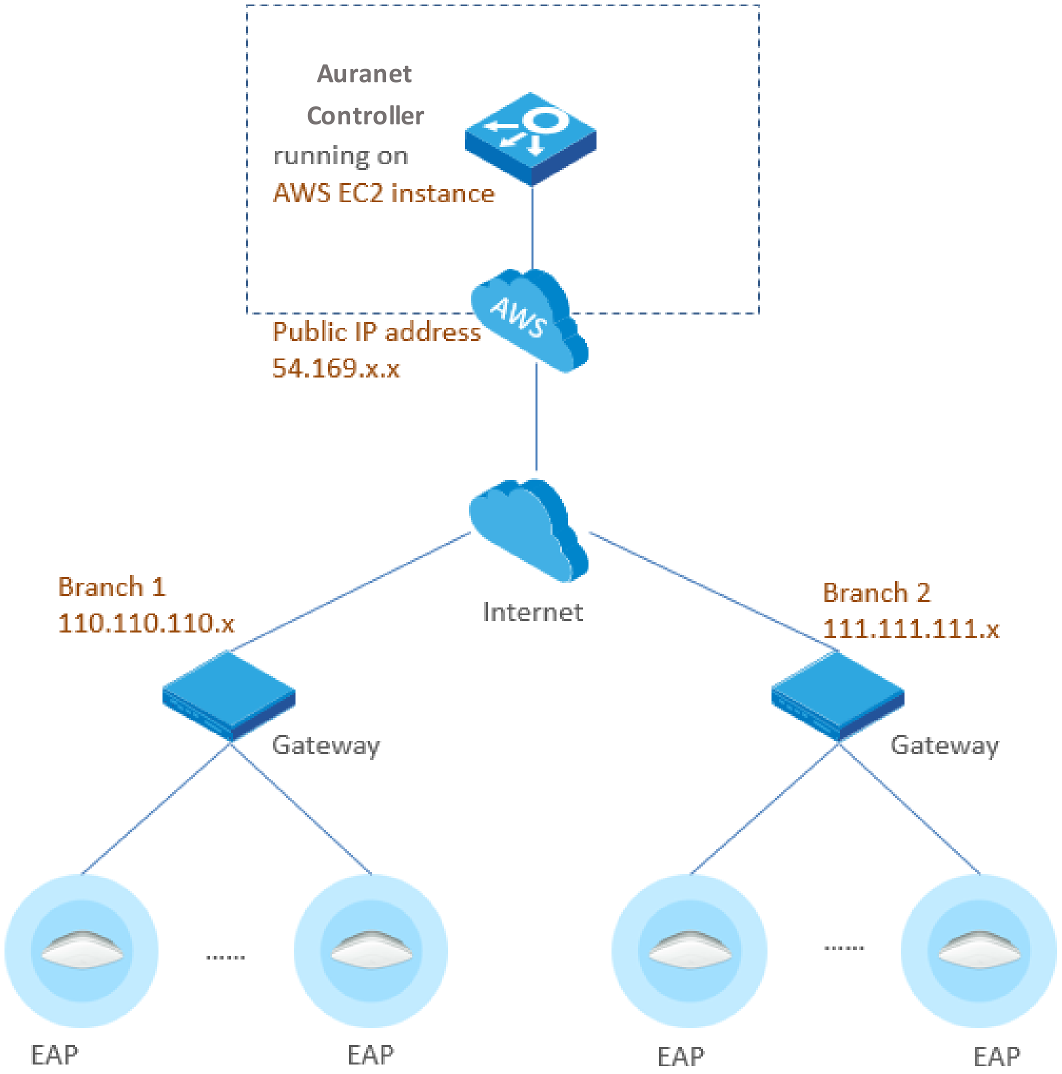
Some users may want to install the Auranet Controller on a private cloud platform to achieve L3 management from anywhere without hosting a PC LAN.

Moreover, if the cloud server comes with public IP addresses, you will not need to set up port forwarding or VPN tunnels to penetrate NAT firewalls.

Workaround

Although Auranet Controller is a non-cloud-based application, it can still be installed on a cloud-based Windows host, a workaround that allows you to achieve the same ends and assure that the Auranet Controller meets your needs.

This guide explains how to install and run the Auranet Controller on an AWS EC2 Windows host.



***Note**: TP-LINK is developing a true cloud-based Auranet Controller service. The workaround solution introduced in this article is intended to provide a temporary solution that can be used prior to the final release of the official cloud-based controller service.*

About AWS EC2

Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity via the Amazon Web Services (AWS) Cloud. One significant feature of EC2 is the existence of virtual computing environments, known as instances, which include 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, free of charge within certain limits. We strongly recommend that you refer to *AWS Free Tier* website for more detailed information. All information provided in this guide is subject to change by AWS at any time and without notice.

Here we use AWS EC2 as an example and outline how you can install and run the Auranet Controller on a private cloud.

Part 1: Prepare the AWS EC2

1.1 Create an AWS Account

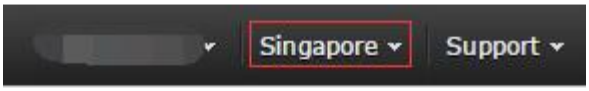
- Navigate to http://aws.amazon.com/ and click **Create an AWS Account**
- Follow the on-screen instructions to create an AWS account

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

About Regions

Amazon maintains data centers in different areas of the world, for example, North America, Europe, and Asia. Accordingly, Amazon EC2 service may differ slightly in different regions. By launching instances in separate regions, you can design your application to be closer to specific customers, achieve legal compliance, or meet other requirements.

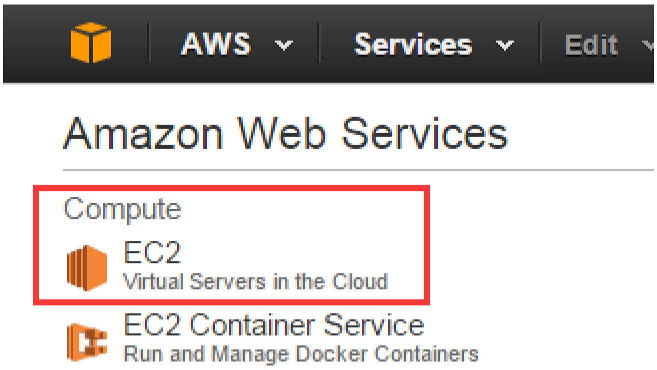
You can choose your preferred region before creating a Windows instance.



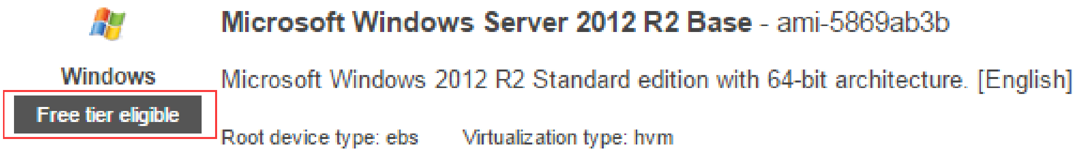
1.2 Launch a Windows Instance

Note: Skip this step if you have already a Windows instance available that you can use to run the Auranet *Controller*

- Open the Amazon EC2 console at https://console.aws.amazon.com/ec2/
  From the console dashboard, sselect **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. Note that, in this tutorial, we choose Windows Server 2012 R2, which is marked "Free Tier eligible" as our example.

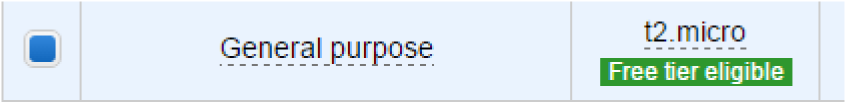


Microsoft Windows Server 2012 R2 Base - ami-5869ab3b

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. Note that this instance type is eligible in the free tier.



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

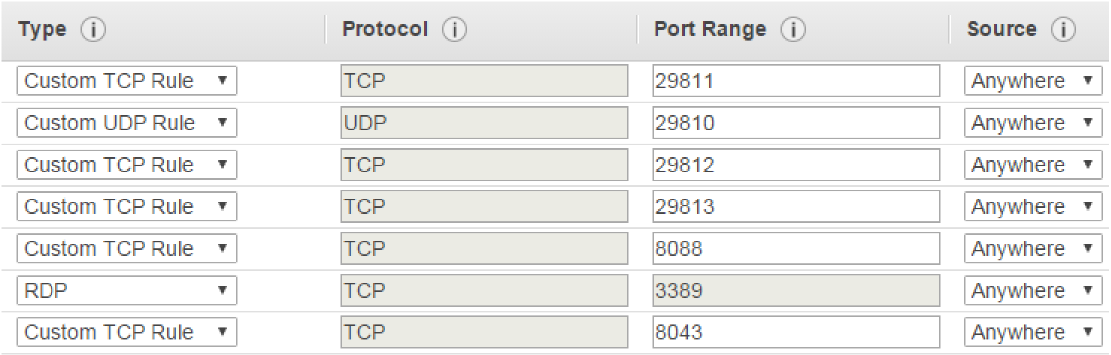
- On the **Review Instance Launch** page, under **Security Groups**, you will see that the wizard has created and selected a security group for you. Now, choose **Edit Security Groups**.

Security Group Settings (Important)

A security group is a set of firewall rules that control the traffic for your instance. To manage remote Auranet APs, add rules that allow unrestricted access to the following ports:

- *TCPPORT8088*
- *TCP PORT 8043*
- *UDP PORT 29810*
- *TCPPORT 29811*
- *TCP PORT 29812*
- *TCP PORT 29813*

You should also allow RDP access for Windows Remote Desktop



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

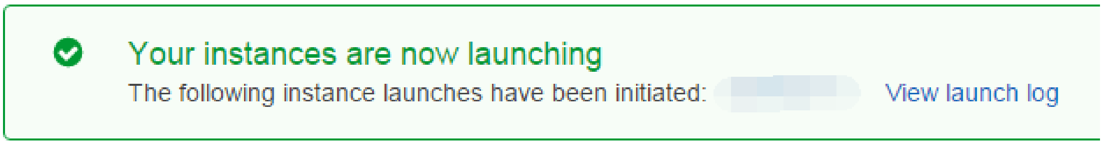
- Click **Review and Launch**
- On the **Review Instance Launch** page, click **Launch**

- 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 will 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: *Do not select the* ***Proceed Without a Key Pair*** *option. If you launch your instance without a key pair, you will not be able to connect to it.*

- When you are ready, click the acknowledgement check box and click **Launch Instances**

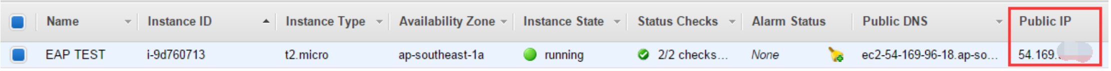
- A confirmation box will tell you that your instance is launching. Choose **View Instances** at the bottom of the page to close the confirmation box and return to the EC2 console.



Your instances are now launching

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

- From the ***EC2 Console****, navigate to the* ***Instances*** menu. Here 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 the platform indicates that the instance has been assigned a public IP address, this default IP address is not permanent. Once you shut down or reboot the instance, the IP address may be released or changed.

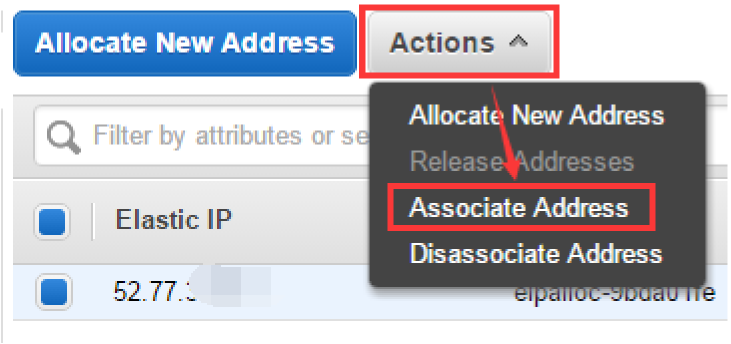
To create static public IP address for the Windows instance, create an Elastic IP address and assign it to the instance. An Elastic IP address is a static public IP address that you can assign to your account. You can associate it to instances as needed and it remains assigned to your account until you choose to release it.

In the EC2 console, navigate to ***NETWORK & SECURITY***, then to ***Elastic IPs***.

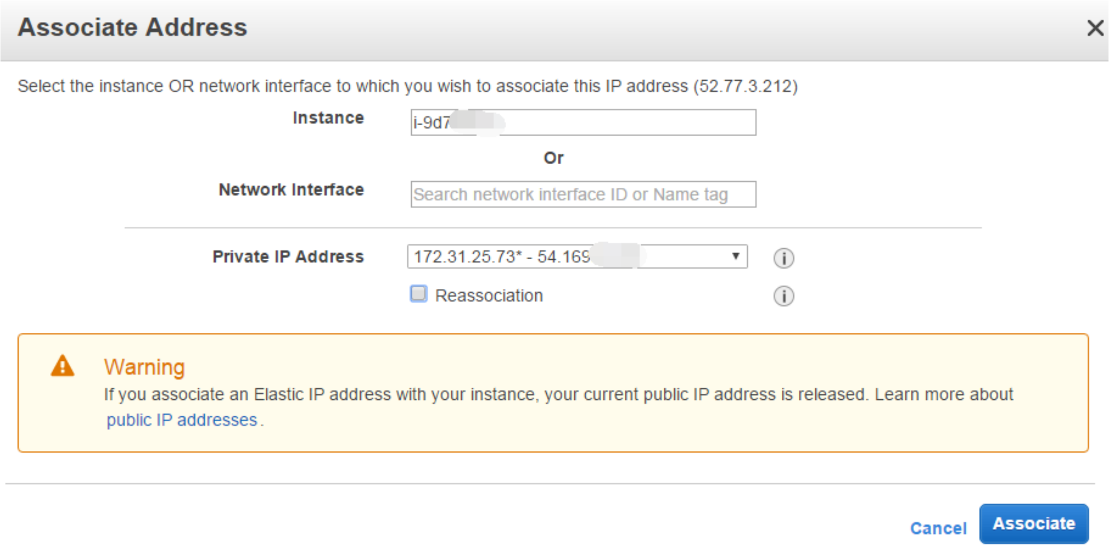
The list should be empty if you have not yet created any. Now click Allocate **New Address** and confirm when prompted.

A new Elastic IP address entry will now appear on the list.

Select the entry, click ***Actions,*** and click ***Associate Address.***



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

Or

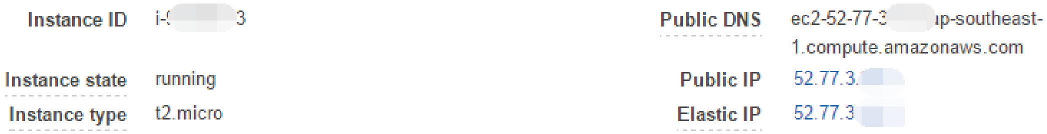
Network Interface: Search network interface ID or Name tag

Private IP Address: 172.31.25.73* - 54.169

□ 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.

Return to the **Instances** menu. Here you can see that the Windows instance is now associated with the Elastic IP address.



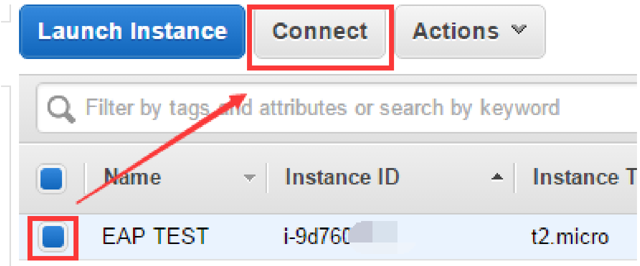
Instance ID	i-3	Public DNS	ec2-52-77-3 up-southeast-1.compute.amazonaws.com
Instance state	running	Public IP	52.77.3.
Instance type	t2.micro	Elastic IP	52.77.3

After following these steps, your AWS EC2 Windows host will be ready.

Part 2: Install **Auranet Controller** on EC2

2.1 Connect to Windows Via Remote Desktop

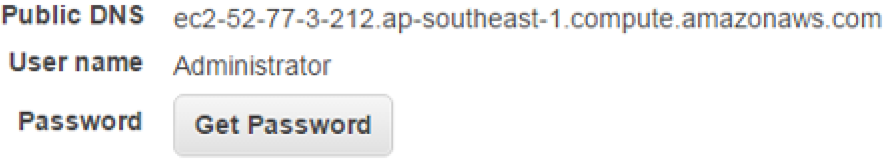
In the **EC2 Console**, select the Windows instance and click **Connect**.



	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 or by downloading and running the RDP shortcut file as prompted.

Before connecting via RDP, you must **Get Password** using your **Key File,** which you saved during a previous step. Upload the Key File and then choose **Decrypt Password** to obtain your password.

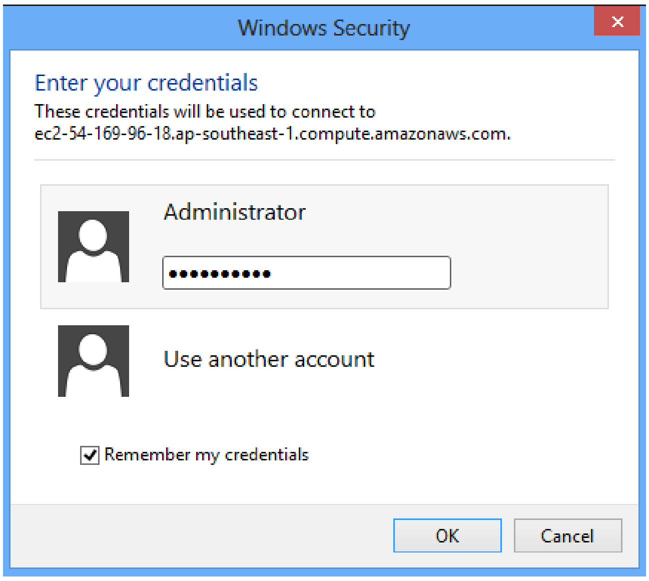


Public DNS ec2-52-77-3-212.ap-southeast-1.compute.amazonaws.com

User name Administrator

Password

With the provided username and password, you can connect to the Windows instance from a remote PC in any location via the remote desktop (RDP) client.



Enter your credentials

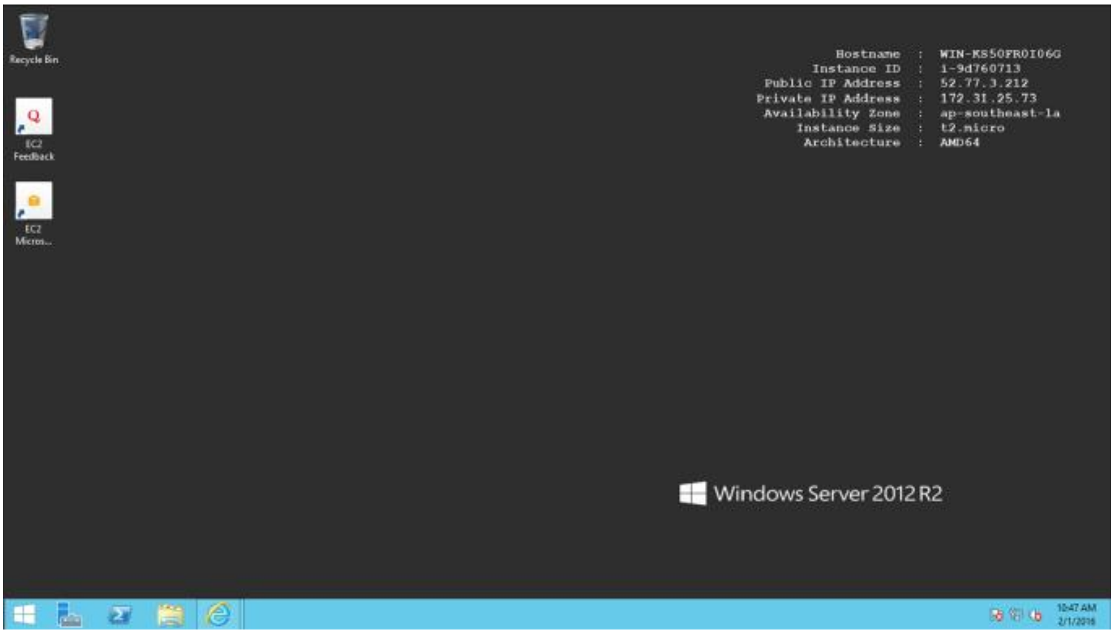
These credentials will be used to connect to ec2-54-169-96-18.ap-southeast-1.compute.amazonaws.com.

Administrator

•••••••••••

Use another account

☑ Remember my credentials

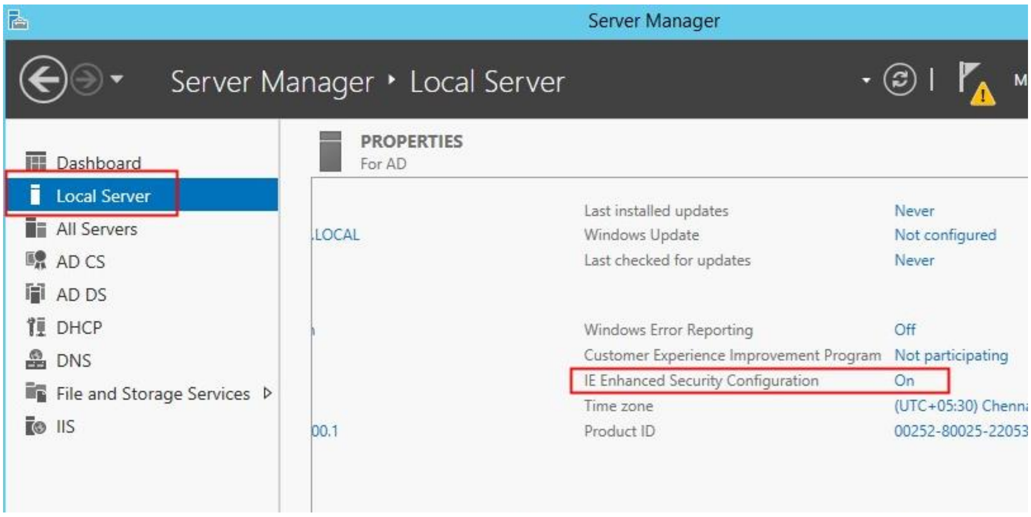


```
           Hostname  :  WIN-KS50FROI06G
        Instance ID  :  i-9d760713
  Public IP Address  :  52.77.3.212
 Private IP Address  :  172.31.25.73
  Availability Zone  :  ap-southeast-1a
      Instance Size  :  t2.micro
       Architecture  :  AMD64
```

2.2 Download and Install the Auranet Controller on EC2

Tip: When the **IE ESC** is enabled, you may notice frequent popup notifications that prompt you to add every new URL to the IE trusted sites list. For convenience, you may want to temporarily disable IE ESC while downloading the Auranet Controller from the official TP-LINK websites.

To disable IE Enhanced Security in Windows Server 2012 R2, launch the **Server Manager** on the left hand side of the screen and click on **Local Server.** On the right hand side of the screen, click the **On** button, which is next to **IE Enhanced Security Configuration**.



.LOCAL

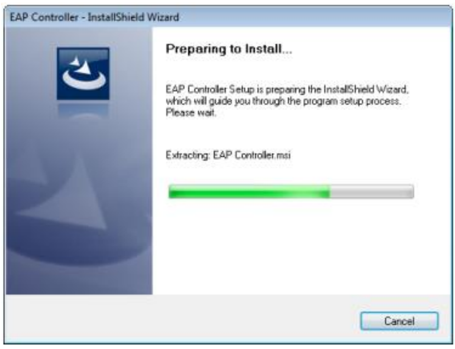
00.1

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

The next time the prompt appears, you can click **Off** to turn off the **IE ESC**.

Now, visit www.tp-link.com, search for any Auranet model, e.g. EAP220. In the product page, navigate to the **Support** page and download the latest Auranet Controller package from the **Utility** tab.

After the download is complete, unzip the package and install the Auranet Controller using the setup wizard.

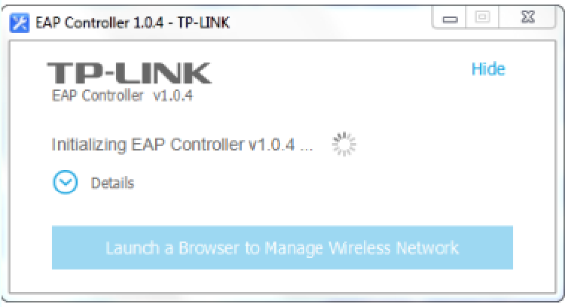


EAP Controller - InstallShield Wizard

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

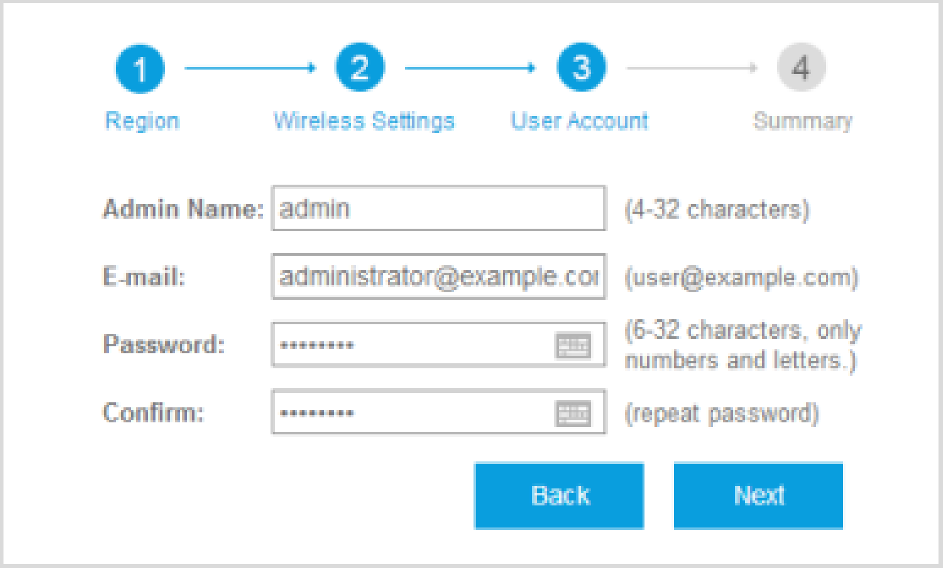


EAP Controller 1.0.4 - TP-LINK

TP-LINK
EAP Controller v1.0.4

Initializing EAP Controller v1.0.4 ...

After installation is complete, launch AuranetController.exe and proceed through the steps included in the Quick Setup Wizard. Remember to record the **Username/Password** and keep the Auranet Controller running.



Admin Name: admin (4-32 characters)

E-mail: administrator@example.co (user@example.com)

Password: •••••••• (6-32 characters, only numbers and letters.)

Confirm: •••••••• (repeat password)

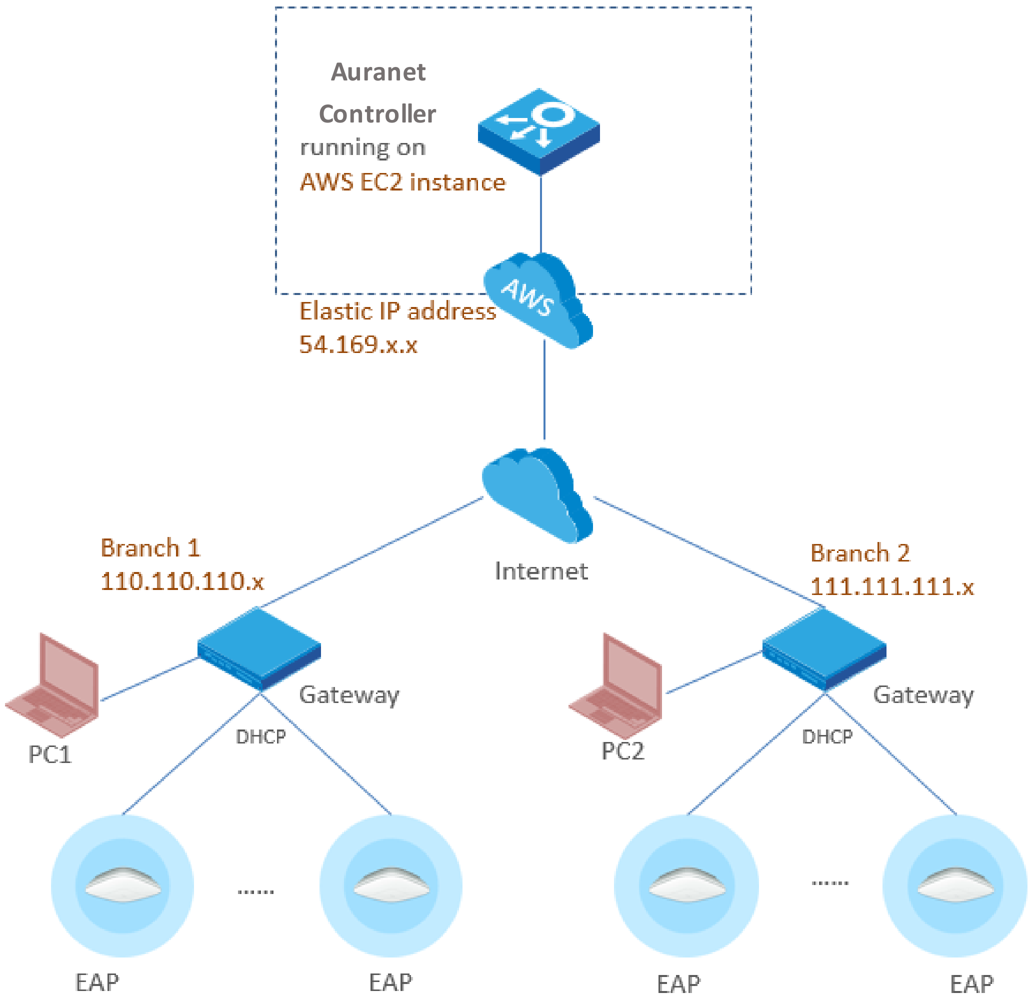
The EC2 instance is ready. You can leave the EC2 running, as all of the updated settings have now been implemented.

You can access the controller's web UI from any remote PC by visiting: *https://Elastic IP:8088*

The following steps are performed on the Auranet AP side.

Part 3: Settings at **Auranet** AP side

In this part, we use the same example topology as before.



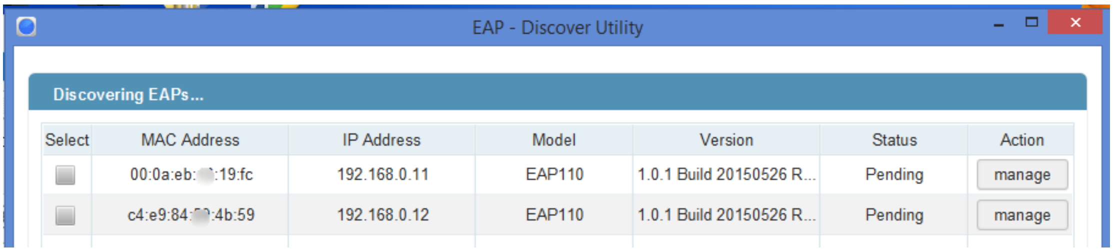
First, the Auranet APs must have internet access, which means you should assign them correct IP/gateway parameters through DHCP (recommended) or manual configuration. The Auranet APs default to DHCP, so this should not be difficult as long as the LAN has proper DHCP service.

The next part is the most important. On the Auranet side, the controller's public IP address (example: 54.169.x.x) needs to be configured for each Auranet device. This allows the Auranet AP scan to know where to find the Auranet Controller on the internet. There are two methods for configuring the controller's IP address on the Auranet APs.

Method 1: Via the Auranet Discover Utility

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

2. Run the Auranet Discover Utility, which can be found at C:\Program Files (x86)*TP-LINK\Auranet Controller\bin* as long as you have not changed the installation path. All Auranet devices in the local network will be listed.

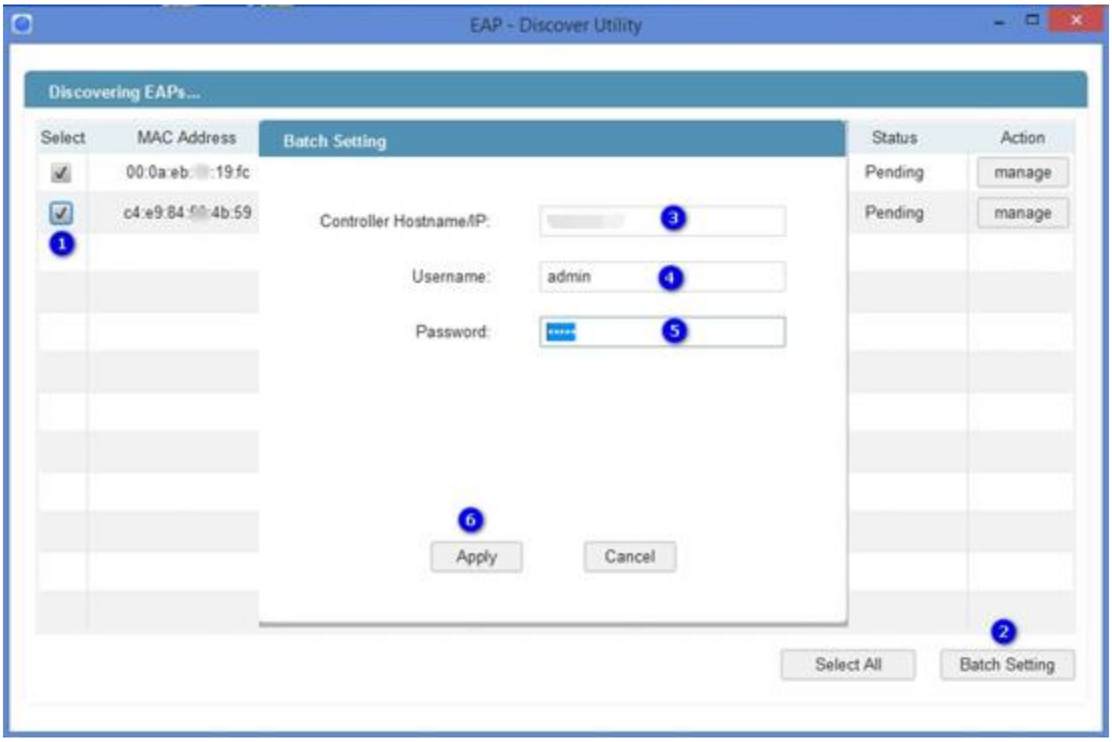


EAP - Discover Utility

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 Auranet APs have the same username and password, you may use *Batch Setting* to set the controller IP for all of them. If any of your Auranet devices have different usernames or passwords, you can use the *Manage* button to set the controller hostname and 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

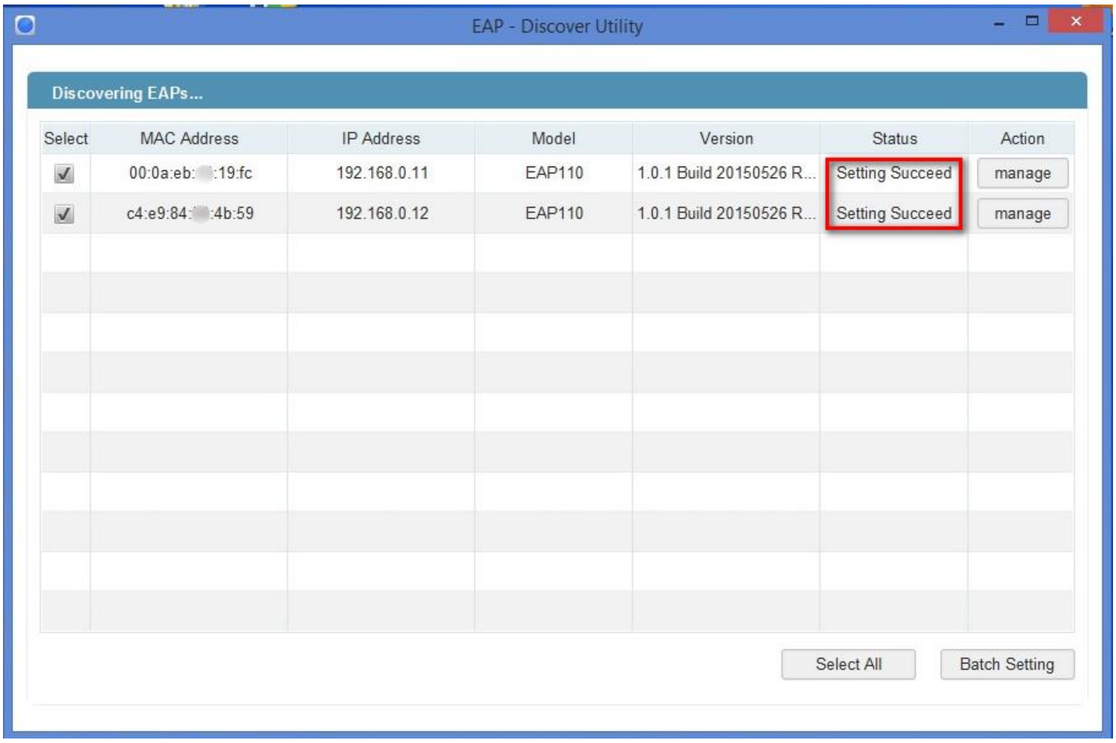
Batch Setting

Controller Hostname/IP: [redacted]

Username: admin

Password: •••••

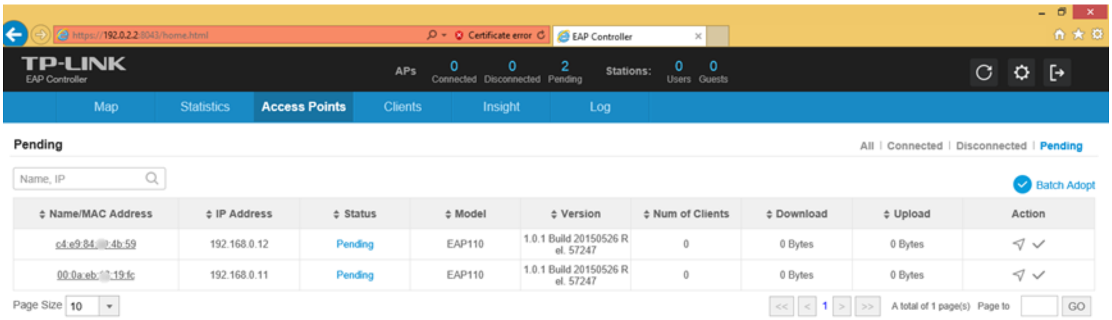
4. Now wait until the status box reads: *Setting Succeed*.



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. The Auranet APs will then be labeled as Pending while they await adoption and management. You can adopt them using their username and password. (Default: admin/admin)



Pending

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	✓

6. For Auranet APs located in Branch 2, use the same method to enter the controller's IP address.

Method 2: Set Option 138 on the DHCP Server

Auranet devices can request the controller IP via option 138 in DHCP.
Take Branch 1 as an example.

1. Suppose the DHCP server in Branch 1 is capable of configuring various DHCP options. Set the controller IP to option 138 on it.

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

How you set option 138 on DHCP server varies among implementations and is not discussed in detail in this document. Please refer to your DHCP server's documentation for more information. The two examples below are provided 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.

Further Reference

Visit our Auranet Controller web page for more information.

Visit our official Auranet Product web page for more information.

Setup tutorial of **How to deploy Auranet Controller on a private cloud (AWS)** can be found here.

Other tutorials of How to use Auranet Controller can also be found here.