CBS350-8 Auto-configuration

General Info.

This is in no case an exhaustive configuration procedure, It's a simple guide on how to configure these switches to use them with Ravenna/AES67 networks.
This guide applies to CBS350-8T-E-2G and CBS350-8P-E-2G / CBS350-8P-2G

Before Starting

Important! If you have problems accessing the switch for configuration when connected to the Merging MassCore PCIe Ethernet card (NET-MSC-GBEX1) please connect it to the PC's on-board Ethernet port. When configuration is completed reconnect the switch to the MassCore Ethernet card.

Connecting several Cisco switches together requires additional configuration.
Please also see the Multiple network switches considerations page and Cisco Multiple switches configuration guide.

Dante-AES67 devices requires an additional configuration, not included in the configuration files.
See the Dante devices Multicast Group configuration page for details

Cisco CBS350 Switch Auto-configuration Procedure

Note: For Cisco CBS350 Switches other than the **CBS350-8T/P-E-2G/P-2G** please use the manual configuration procedure.

1. Plug a network cable from the switch and to your computer.
   The switch will need to initialize, this will take a few minutes before being accessible.
2. Set your computer to use an IP in the **192.168.1.x** address pool.

How to manually setup an IP address on Windows

Go in *Windows Control Panel > Network and Sharing Center*, then click on *Change Adapter settings* (left)

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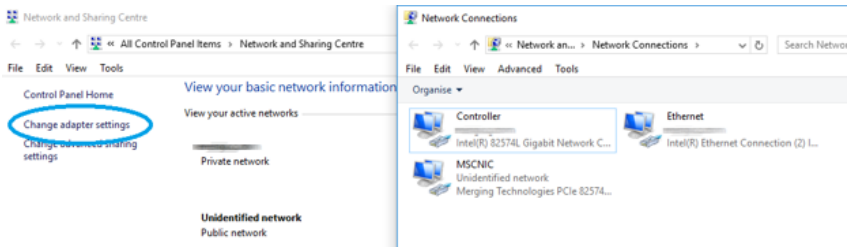


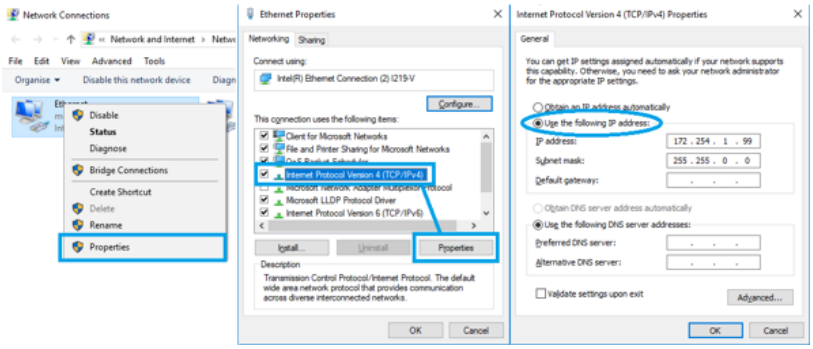
Right click on the adapter that you have to configure and select *Properties*.

Select the *Internet Protocol Version 4 (TCP/IP)*, then click on the *Properties* button.

Set it to "**Use the following IP addresses**", then enter the IP address. It must be in the same range as the Cisco switch connected on it, for example : adapter IP is **192.168.1.1**

The Subnet mask is mandatory; Windows can set it automatically, simply click in the Subnet mask field.

You may need to also change the attached network device(s) IP address, consult their documentation for details.



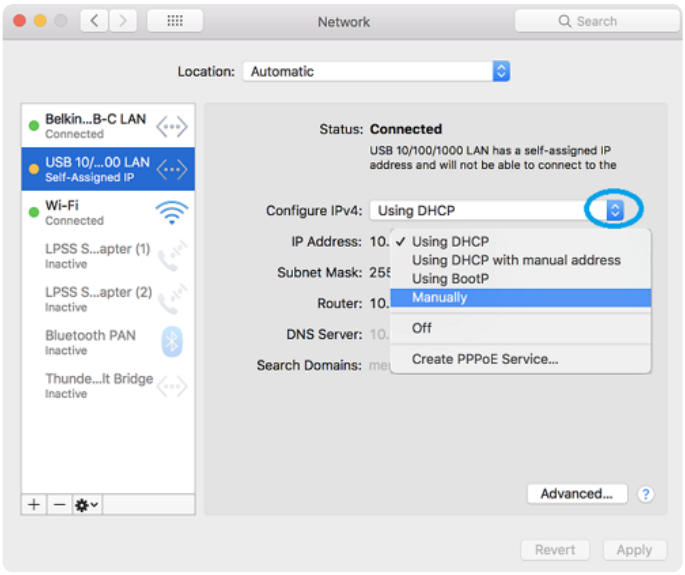
How to manually setup an IP address on MacOS

Go in the *System Preferences* and select *Network.*

Select the adapter that needs to be configured, and click on the arrow next to *Configure IPv4*.

Select **Manually** in the drop down list, and enter the required IP address.

It must be in the same range as the Cisco switch connected on it, for example : adapter IP is **192.168.1.1**



The Subnet mask is mandatory; MacOS can set it automatically, simply click in the Subnet mask field.

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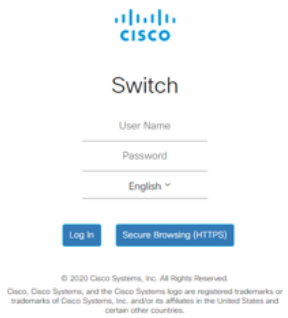
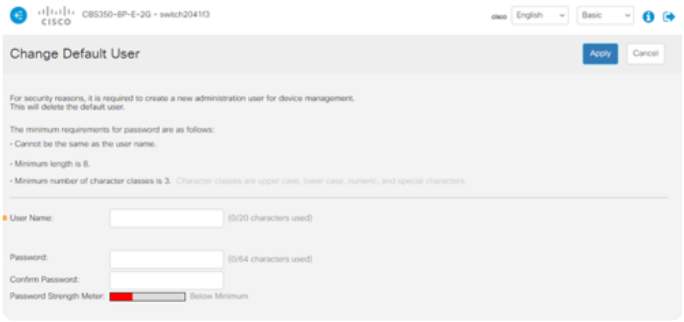
3. Open a navigator page to navigate to **http://192.168.1.254** (Cisco switches default IP address)

   You will be prompted to enter the user name and password to login.

   Default user name: **cisco** Default password: **cisco**



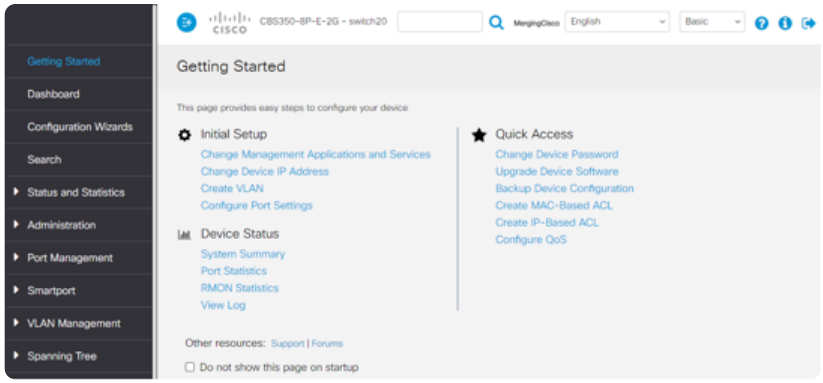
4. After the login prompt, you will be asked to set your own password.
   Please note the minimum character numbers and password complexity required.



   If you wish to change the password later, you will have to go in the Administration > User Accounts page.
   Resetting the switch to "factory defaults" will also require to do this step again.

5. For ease of use, please activate the side bar by clicking on the blue icon on the top left corner.

6. The Administration page will now load and you can start configuring your switch.

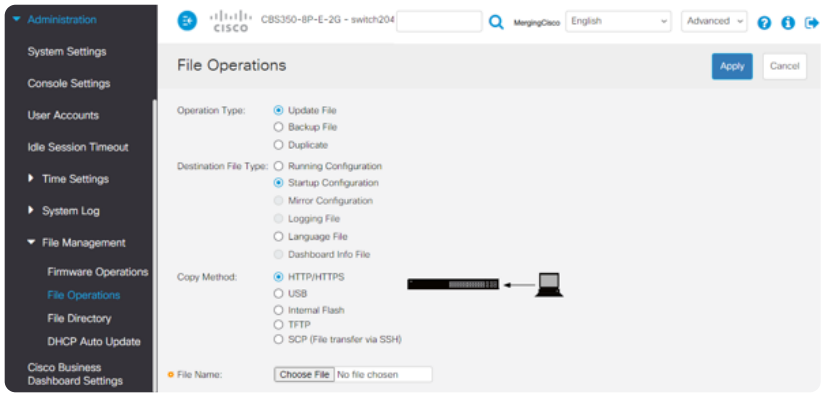


7. Download the latest configuration file for your Cisco CBS 350 switch model :

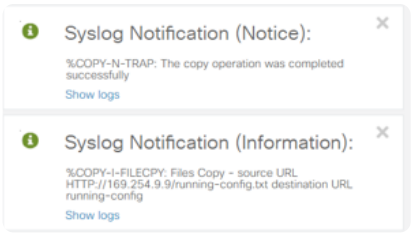
> Cisco CBS350-8T/P-E-2G
> Cisco CBS350-8T/P-E-2G - Dual VLAN Port 1 to 5 : RAVENNA/AES67 Port 6 to 10 : Regular network.
> Note : After applying the Dual VLAN config file, the switch Administration pages will only be accessible on port 6 to 10.
>
> Cisco CBS350-8T/P-E-2G - ACL Port 8 (Port **8** configured to filter all Multicast Streams, allowing to connect a non-RAVENNA/AES67 Network. Eg. Connect directly an AP WIFI for some remote control purpose (tablet, smartphone), connect your Internet router.)

   The Merging RAVENNA configuration file will auto-configure various settings /protocols to optimize the RAVENNA / AES67 network, and also sets the definitive fixed IP address of the switch: **169.254.1.254**)

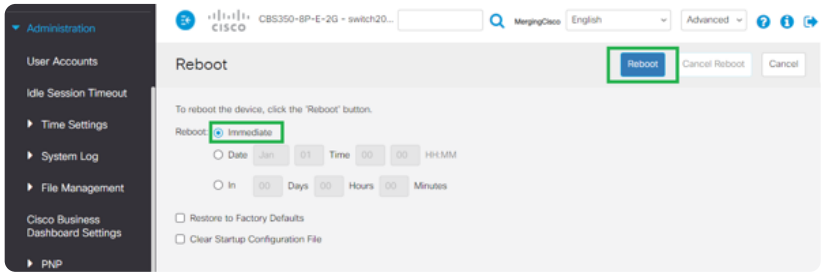
8. Go to **Administration** > **File Management.**
   Select **File Operations**.
9. *Operation Type* : **Update File**
   Destination File Type : **Startup Configuration**
   Copy Method : **HTTP/HTTPS**



10. Now click on **Choose File** and in the choose file window, browse to the configuration file you want to import. Select the configuration file and click on **Open.**
11. Back in the main window, click on **Apply** to load your configuration file into the Startup Configuration. Once imported, the switch will send a notification that the operation has been completed.



12. You must now restart the switch for the changes to apply.
    Click **Administration** > **Reboot**
    Select **Immediate** and click on **Reboot** button.
    Note that the device might take some time to reboot.



13. The switch will now change its IP address to **169.254.1.254**, therefore the 192.168.1.254 page you are actually using will stop responding.
    To be able to access the switch now, please set your computer to use an IP in the **169.254.x.x** address pool.
    Refer to the *"How to manually setup an IP address"* above, but this time, set your network adapter to *automatically obtain an IP address* (Windows) - *Using DHCP* (MacOS)
14. The switch is now configured and ready to use, and the Merging RAVENNA Network Card should have auto-configured itself with an IP in the 169.254.x.x range.
    You can now log in and set your own user name and/or password in **Administration > User Accounts.**
    Please note that any changes requires you to click on **Apply** and that you then have to go in **Administration > File Management > File Operations** to properly save the changes (Duplicate from the Running Configuration to the Startup Configuration)

SSM - IGMP V3

The configuration files are set to use IGMP v2. If you plan to use SSM (Source-Specific Multicast - see Merging devices Advanced pages), you will have to activate IGMP v3 manually.
Please see the CBS350 Manual configuration

Cisco CBS350 Managed switch manual configuration

General Info.

This is in no case an exhaustive configuration procedure, It's a simple guide on how to configure these switches to use them with Ravenna/AES67 networks.

Connecting several Cisco switches together requires additional configuration.
Please also see the Multiple network switches considerations page and Cisco Multiple switches configuration guide.

Important note for DANTE-AES67 devices
When Dante devices are connected to a Cisco switch configured with the Merging settings, an additional configuration step is required.
Please follow the instructions below after the switch configuration.

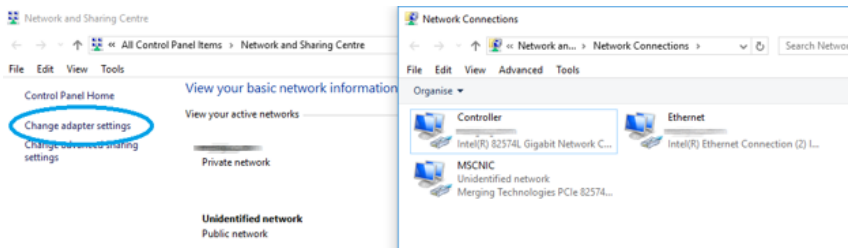
- Access CBS350 switch Administration page
- Single VLAN Configuration
- Dual VLAN Configuration
- Dante AES67 Additional configuration
- How to Backup and import configuration files
  - Backup your configuration to a file
  - Import a configuration file

Access CBS350 switch Administration page

1. Plug a network cable from the switch and to your computer.
   The switch will need to initialize, this will take a few minutes before being accessible.
2. Set your computer to use an IP in the **192.168.1.x** address pool.

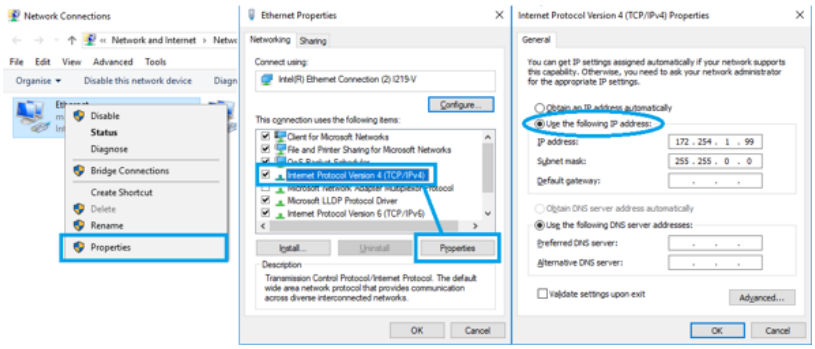
How to manually setup an IP address on Windows

Go in *Windows Control Panel > Network and Sharing Center*, then click on *Change Adapter settings* (left)



Right click on the adapter that you have to configure and select *Properties*.
Select the *Internet Protocol Version 4 (TCP/IP)*, then click on the *Properties* button.
Set it to "**Use the following IP addresses**", then enter the IP address. It must be in the same range as the Cisco switch connected on it, for example : adapter IP is **192.168.1.1**

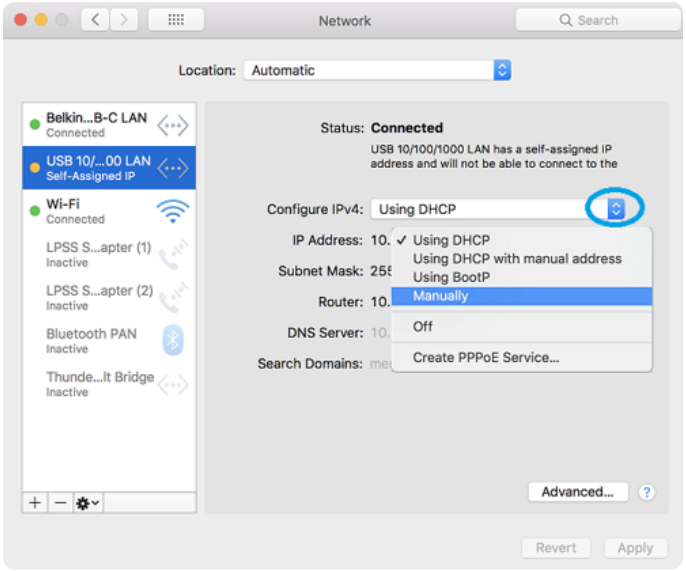
The Subnet mask is mandatory; Windows can set it automatically, simply click in the Subnet mask field.
You may need to also change the attached network device(s) IP address, consult their documentation for details.



How to manually setup an IP address on MacOS

Go in the *System Preferences* and select *Network.*

Select the adapter that needs to be configured, and click on the arrow next to *Configure IPv4*.
Select **Manually** in the drop down list, and enter the required IP address.
It must be in the same range as the Cisco switch connected on it, for example : adapter IP is **192.168.1.1**



The Subnet mask is mandatory; MacOS can set it automatically, simply click in the Subnet mask field.

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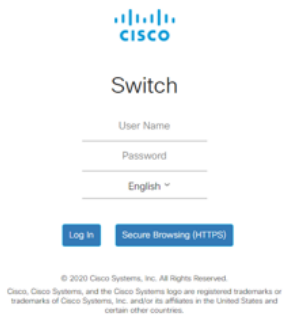
3. Open a navigator page to navigate to **http://192.168.1.254** (Cisco switches default IP address)
4. **You will be prompted to enter the user name and password to login.**

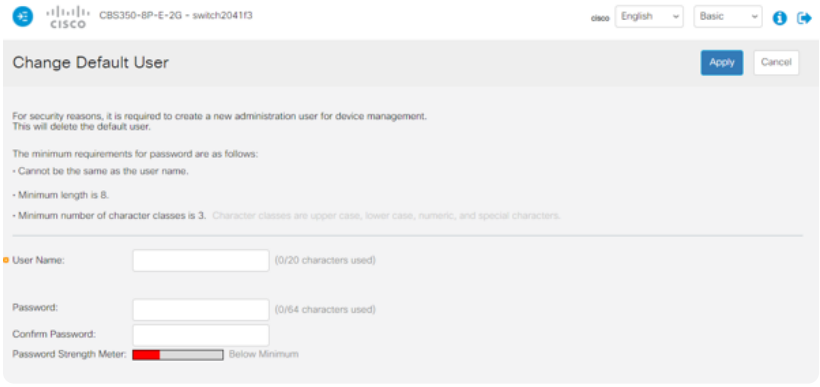
Default user name: **cisco**

Default password: **cisco**



5. After the login prompt, you will be asked to set your own password.

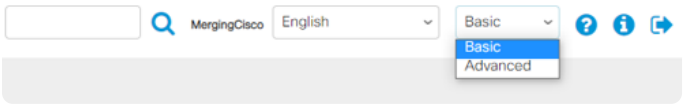
   Please note the minimum character numbers and password complexity required.



   If you wish to change the password later, you will have to go in the Administration > User Accounts page.

   Resetting the switch to "factory defaults" will also require to do this step again.

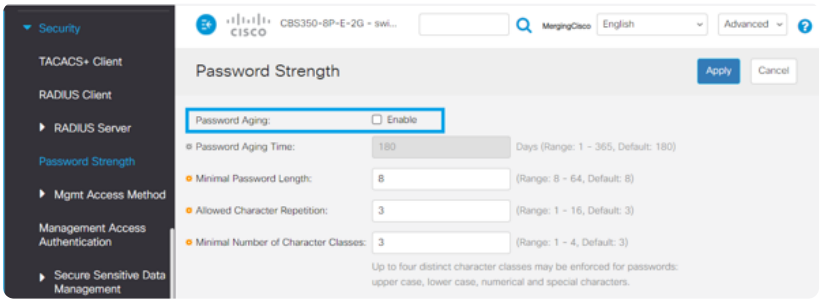
6. Set the switch in **Advanced mode** on the top right corner.



   For ease of use, please also activate the side bar by clicking on the blue icon on the top left corner.

7. By default, the switch will ask you to renew the password every 6 months.

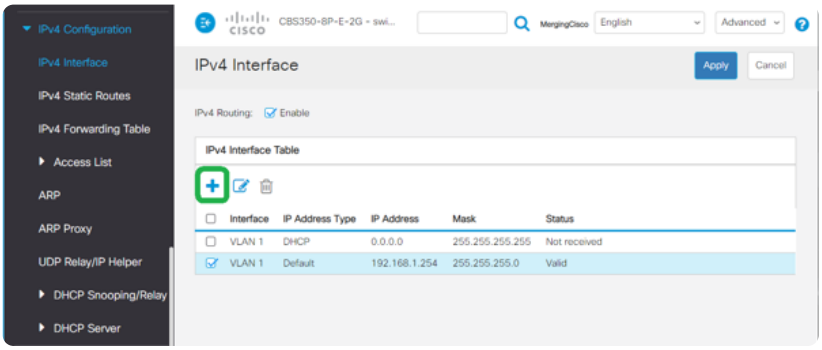
   While this behavior enhances the security, you may disable it in **Security** > **Password Strength**, by removing the **Password Aging** option.

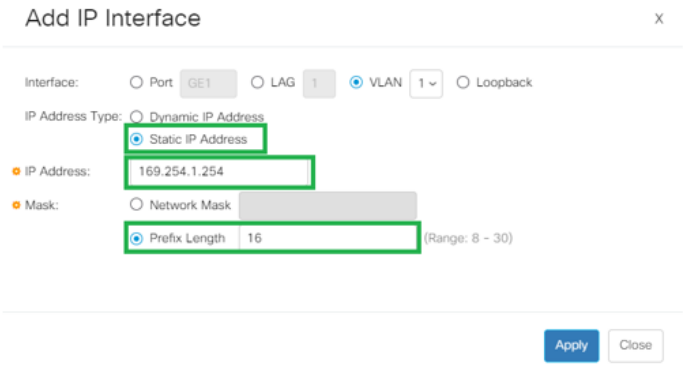


Single VLAN Configuration

The first step is to change the IP configuration to use an APIPA address (Automatic Private Internet Protocol Addressing).
The administration page will then be only accessed trough this new IP.

Setting the switch in the APIPA IP range (`169.254.0.0/16`) will ensure that you can always access its administration page.
Merging and Neumann Ravenna devices generally use APIPA IP range to communicate over the network (Network - Auto setting on Horus/Hapi/Anubis/...)

1. Browse to **IPv4 Configuration** > **IPv4 Interface**
   Click on the **+** button to add a static address
   

2. Set the *IP Address type* to **Static IP Address**.
   Enter **169.254.1.254** in the *IP Address* field.
   For the *Mask* setting, select **Prefix Length** and enter **16**.
   That will make your switch administration page respond to that IP address.
   

3. Click on **Apply** to save the changes.
   The switch will ask you to confirm the change.
4. The switch will now change its IP address to **169.254.1.254**, therefore the 192.168.1.254 page you are actually using will stop responding.
5. To be able to access the switch now, please set your computer to use an IP in the **169.254.x.x** address pool.
   Refer to the *"How to manually setup an IP address"* above, but this time, set your network adapter to *automatically obtain an IP address* (Windows) - *Using DHCP* (MacOS)

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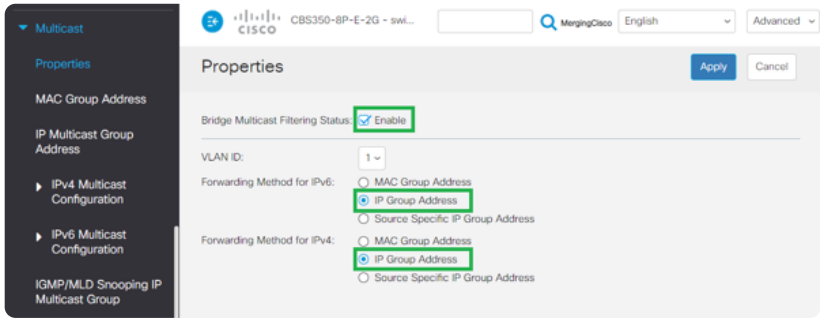
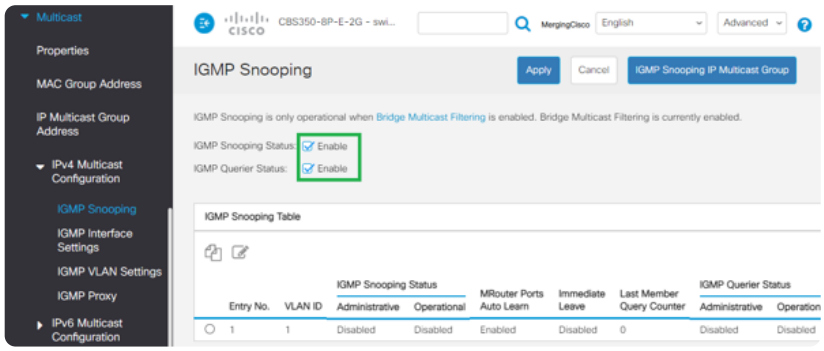
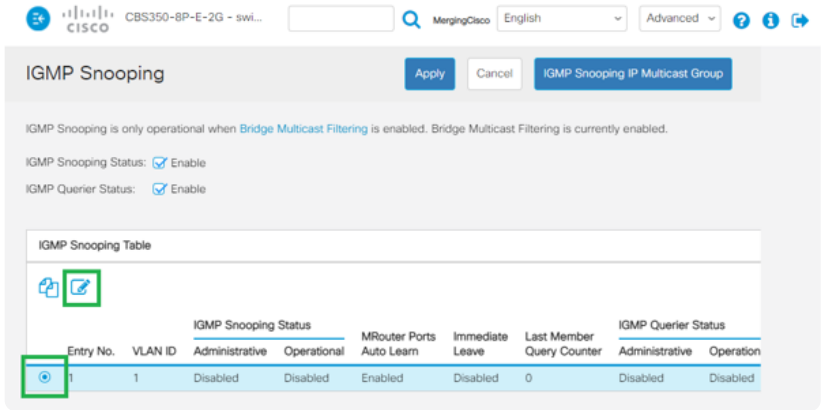
6. Enter **169.254.1.254** in your browser, and enter your credentials.
   Make sure the switch administration page is in **Advanced mode** (top right corner)
7. Please browse to **Multicast** > **Properties.**
   Set the *Bridge Multicast Filtering Status* to **Enable**
   Set both *Forwarding method for IPv6* and *IPv4* to **IP Group address.**
   Click on **Apply** once done.



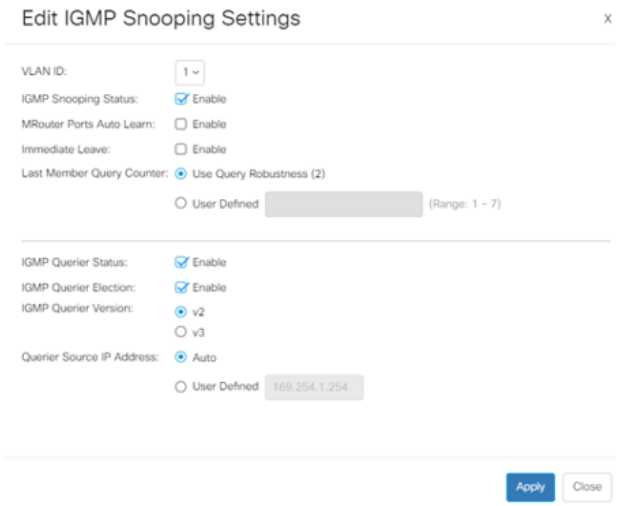
8. Now go in **Multicast** > **IPV4 Multicast Configuration > IGMP Snooping.**
   Enable both the **IGMP Snooping Status** and **IGMP Querier Status** checkboxes.
   Then click on on **Apply.**



9. On the **IGMP Snooping Table**, click on the radio button to select and then click on the **Edit** icon.



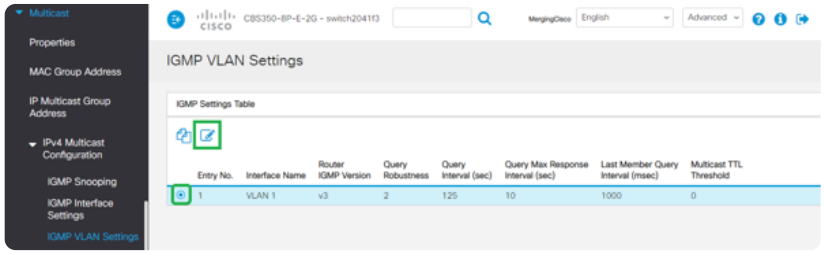
10. Configure the *IGMP Snooping Settings* as on the picture below, and click **Apply** once done.



Note: **SSM - IGMP v3**

If you plan to use SSM (Source-Specific Multicast - see Merging devices Advanced pages),please activate IGMP v3.

11. Go in **Multicast** > **IPV4 Multicast Configuration > IGMP VLAN Settings**
    Click on the radio button to select and then click on the **Edit** icon.

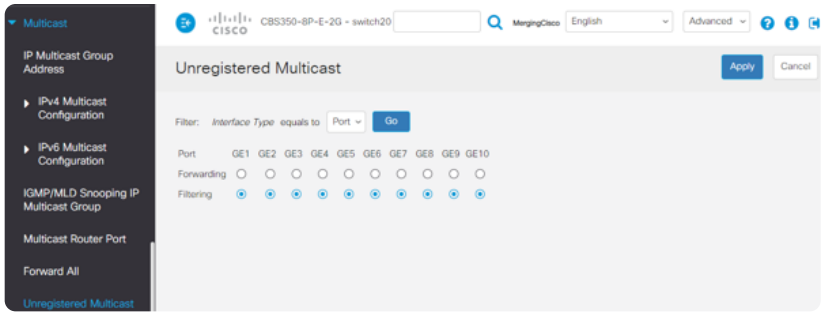


12. Please set the *Router IGMP Version* to **v2**
    And the *Query Interval* to **30**
    Click on **Apply**

Note: **SSM - IGMP v3**

If you plan to use SSM (Source-Specific Multicast - see Merging devices Advanced pages),please activate IGMP v3.

13. Browse now to **Multicast** > **Unregistered Multicast**
    Set all ports to **Filtering**
    Click on **Apply**

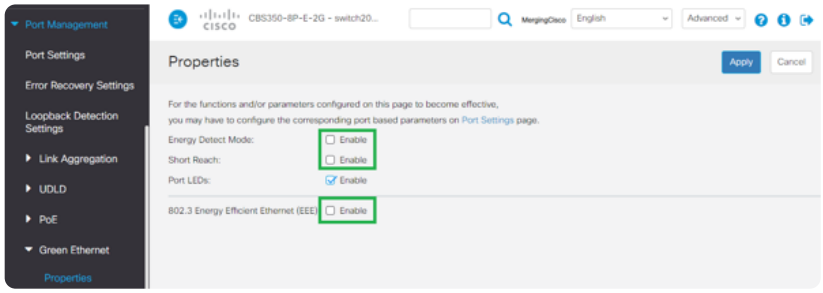


14. By default, *Green Ethernet* settings are applied, this needs to be disabled.

    Please browse to **Port Management > Green Ethernet > Properties**

    Untick both **Energy Detect Mode** and **Short Reach**, and untick **802.3 Energy Efficient Ethernet (IEEE)** as well.

    Click on **Apply** once done.



15. Browse now to **Quality of Service > General > QoS Properties**.

    Set **QoS Mode** to **Basic**.

    Click on **Apply**

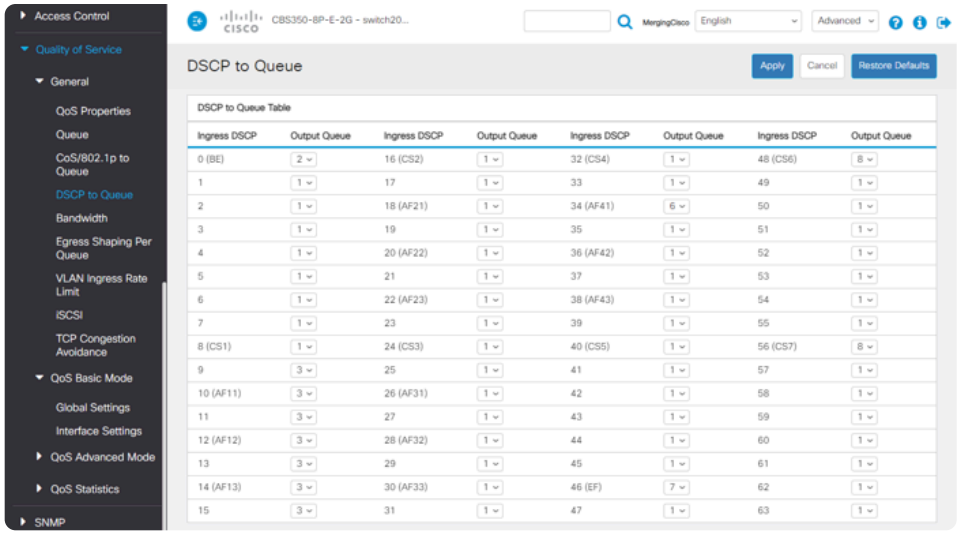
16. Go now in **Quality of Service > QoS Basic Mode > Global settings**.

    Set **Trust Mode** to **DSCP**

    Click on **Apply.**

17. Go back to **Quality of Service > General > DSCP to Queue.**

    Change the **DSCP to Queue** Settings as shown in the following picture and click **Apply** once done.



Note : Queue 34 : RTP AES67 / Queue 46 : PTP AES67 / RTP Ravenna / Queue 48 : PTP Ravenna / Queue 56 : PTP Dante

18. Now is a good time to save the configuration.

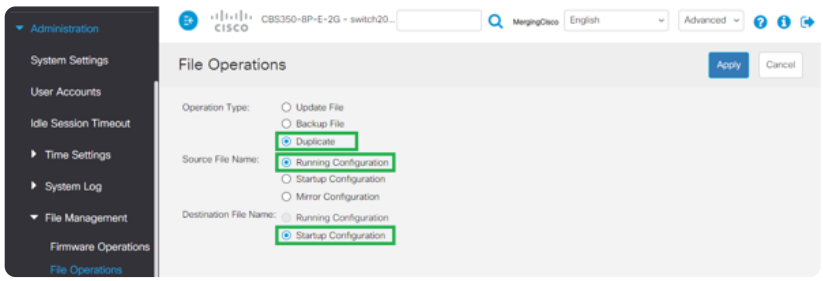
    Go in **Administration** > **File Management** > **File Operations**.

    Select **Duplicate** as *Operation Type*.

    Source File Name : **Running Configuration**

    Destination File Name : **Startup Configuration**

    Click on **Apply**



This will apply the current settings to the start up configuration.

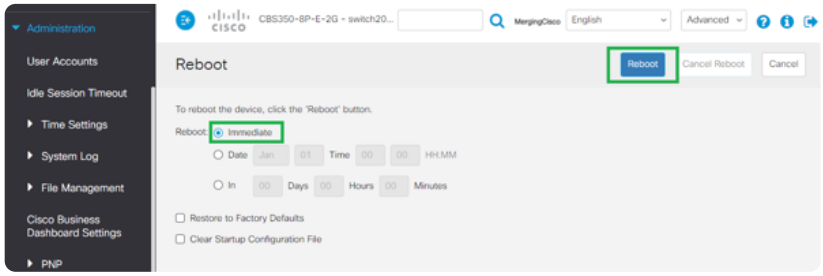
In other terms that makes the configuration to be permanent (unless a reset of the device is done).

19. You must now restart the switch for the changes to apply.

    Click **Administration** > **Reboot**

    Select **Immediate** and click on **Reboot** button.

    Note that the device might take some time to reboot.



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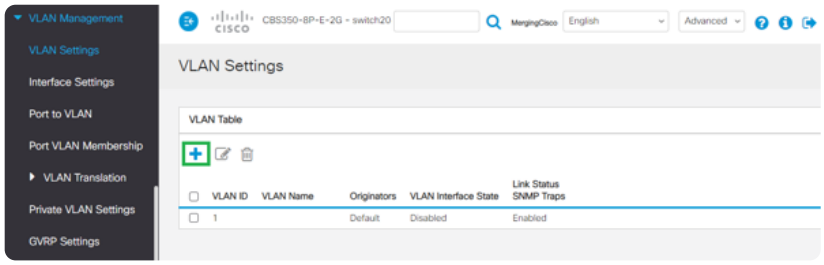
Dual VLAN Configuration

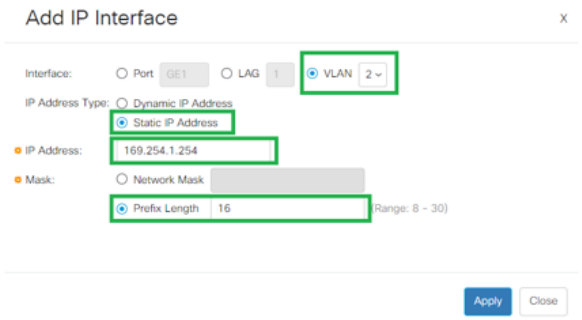
By default the switch already has VLAN1 created with defaults for regular networking.
So we will be adding VLAN2 for the for the Ravenna AES67 networking.
VLAN1 : will be used for regular networking.
VLAN2 : will be used for Ravenna AES67.

Once connected to the switch as described on Access CBS350 switch Administration page.
Note : The switch Administration pages will only be accessible from VLAN 2.

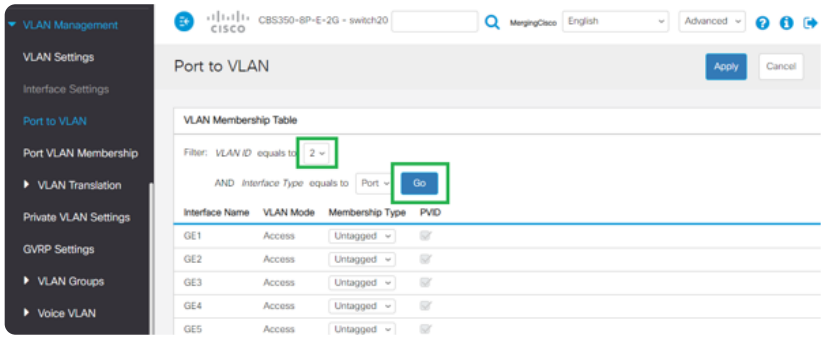
1. Go in **VLAN Management** > **VLAN Settings**
   Click on the **+** button at the bottom of the VLAN Table.



2. Set the **VLAN ID**: 2 and enter a **VLAN NAME** (can be anything you want, please do not use special characters).
   Make sure **VLAN Interface Status** and **Link Status SNMP Traps** are both active.
   Click on **Apply** once done.



3. Go to **VLAN Management > Port to VLAN**,
   In the *Filter* section, set the *VLAN ID* to **2**, and *Interface Type* to **Port**.
   Click on **Go**.



4. Now you can see that all ports for VLAN 2 are excluded, you need to assign the required ports to this RAVENNA/AES67 VLAN.
   Set the required ports from *Excluded* to **Untagged** (in the picture below, ports 5 to 8 and port 10 are assigned to VLAN 2.
   Click on **Apply** once done.

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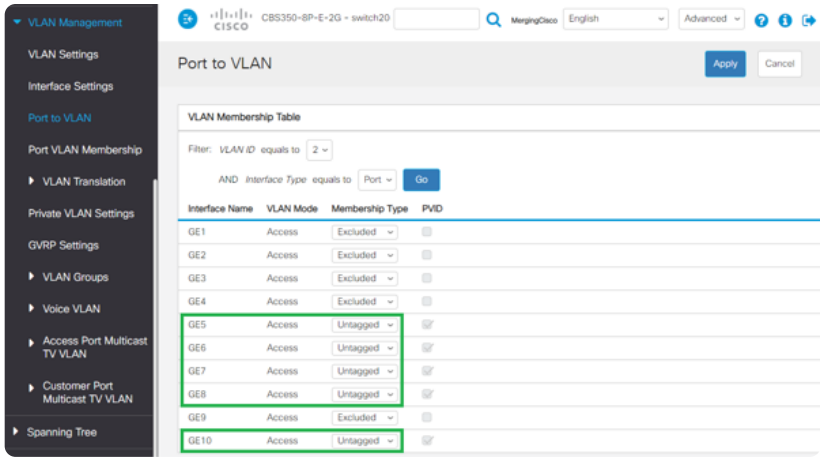
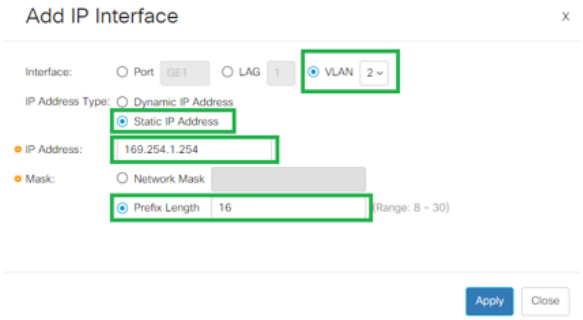


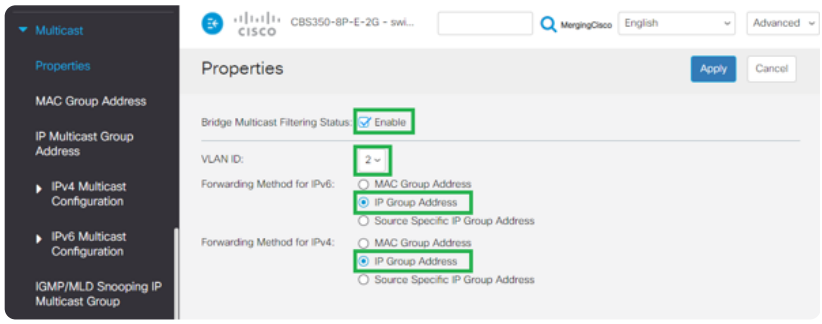
5. You may now check your VLAN1 config.
   In the *Filter* section, set the *VLAN ID* to **1**, and *Interface Type* to **Port**.
   Click on **Go**.
   You can see that the ports you have added to VLAN 2 are excluded from VLAN 1.
6. Browse to **IPv4 Configuration** > **IPv4 Interface**
   Click on the **+** button to add a static address
7. Make sure **VLAN is set to 2**
   Set the *IP Address type* to **Static IP Address**.
   Enter **169.254.1.254** in the *IP Address* field.
   For the *Mask* setting, select **Prefix Length** and enter **16**.



8. Click on **Apply** to save the changes.
   The switch will ask you to confirm the change.
9. The switch will now change its IP address to **169.254.1.254**, therefore the 192.168.1.254 page you are actually using will stop responding.
10. To be able to access the switch now, please set your computer to use an IP in the **169.254.x.x** address pool.
    Refer to the *"How to manually setup an IP address"* above, but this time, set your network adapter to *automatically obtain an IP address* (Windows) - *Using DHCP* (MacOS)
11. Please make sure you are physically connected to a port assign to **VLAN2** (in our example, port 6)
    Note : you can do the same operation for VLAN1, to be able to access the Management interface for both VLANs.
    But you have to use another IP address (192.168.1.254 for example)
    Enter **169.254.1.254** in your browser, and enter your credentials.
    Make sure the switch administration page is in **Advanced mode** (top right corner)
12. Please browse to **Multicast** > **Properties.**
    First set the *VLAN ID* to **2**
    Set the *Bridge Multicast Filtering Status* to **Enable**

Set both *Forwarding method for IPv6* and *IPv4* to **IP Group address.**

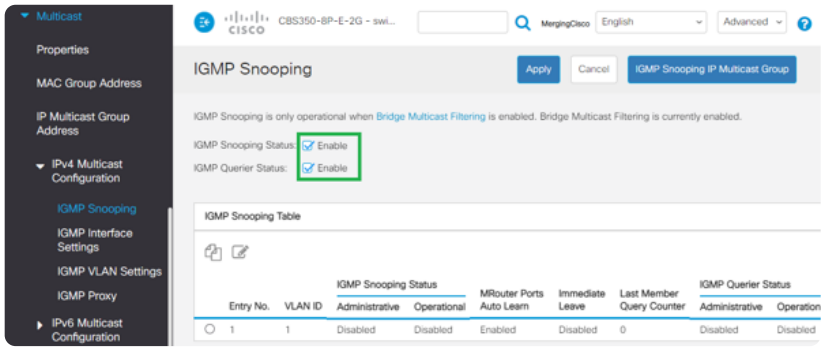
Click on **Apply** once done.



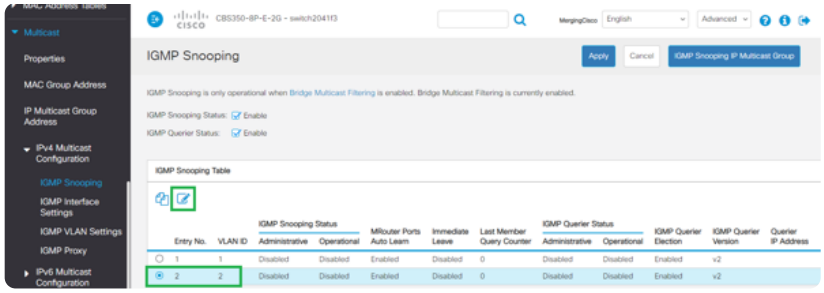
13. Now go in **Multicast** > **IPV4 Multicast Configuration > IGMP Snooping.**

    Enable both the **IGMP Snooping Status** and **IGMP Querier Status** checkboxes.

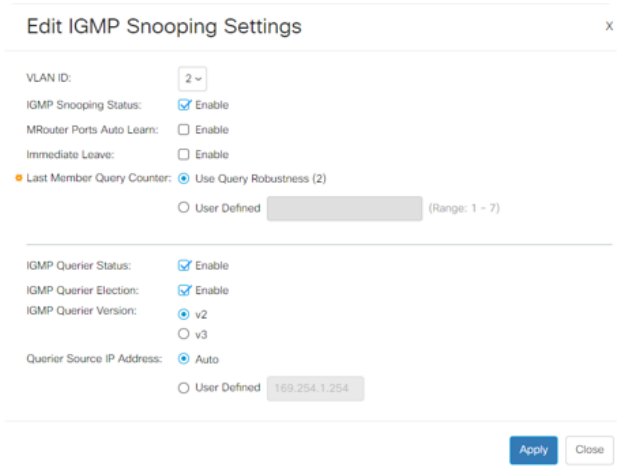
    Then click on on **Apply.**



14. On the **IGMP Snooping Table**, click on the radio button on the VLAN ID2 line to select and then click on the **Edit** icon.



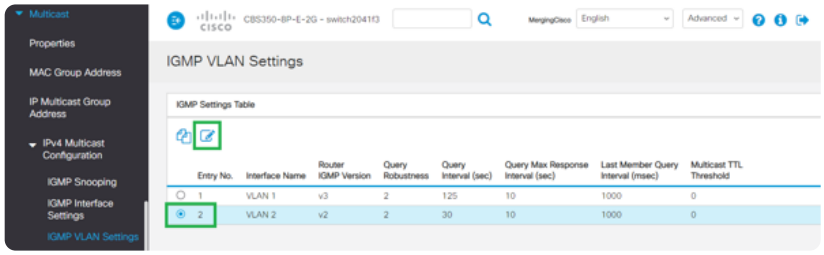
15. Configure the *IGMP Snooping Settings* as on the picture below, and click **Apply** once done.



Note: **SSM - IGMP v3**

If you plan to use SSM (Source-Specific Multicast - see Merging devices Advanced pages),please activate IGMP v3.

16. Go in **Multicast** > **IPV4 Multicast Configuration > IGMP VLAN Settings**
    Click on the radio button on the VLAN 2 line to select and then click on the **Edit** icon.

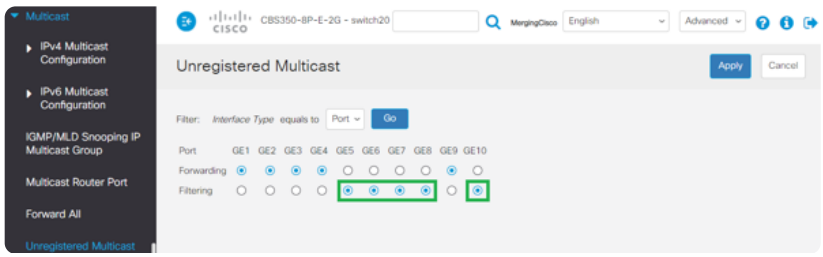


17. Please set the *Router IGMP Version* to **v2**
    And the *Query Interval* to **30**
    Click on **Apply**

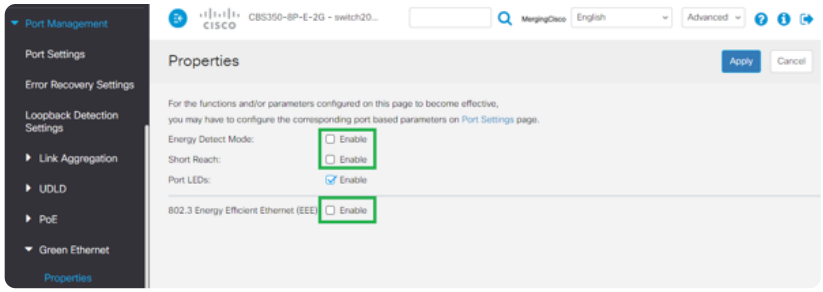
Note: **SSM - IGMP v3**

If you plan to use SSM (Source-Specific Multicast - see Merging devices Advanced pages),please activate IGMP v3.

18. Browse now to **Multicast** > **Unregistered Multicast**
    Set the ports you have assigned to VLAN 2 to **Filtering** (in our example, ports 5 to 8 and 10)
    Click on **Apply**



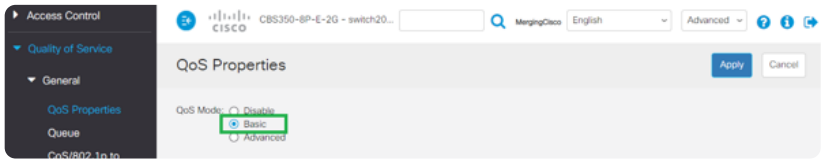
19. By default, *Green Ethernet* settings are applied, this needs to be disabled.
    Please browse to **Port Management > Green Ethernet > Properties**
    Untick both **Energy Detect Mode** and **Short Reach**, and untick **802.3 Energy Efficient Ethernet (IEEE)** as well.
    Click on **Apply** once done.



20. Browse now to **Quality of Service > General > QoS Properties**.

    Set **QoS Mode** to **Basic**.

    Click on **Apply**



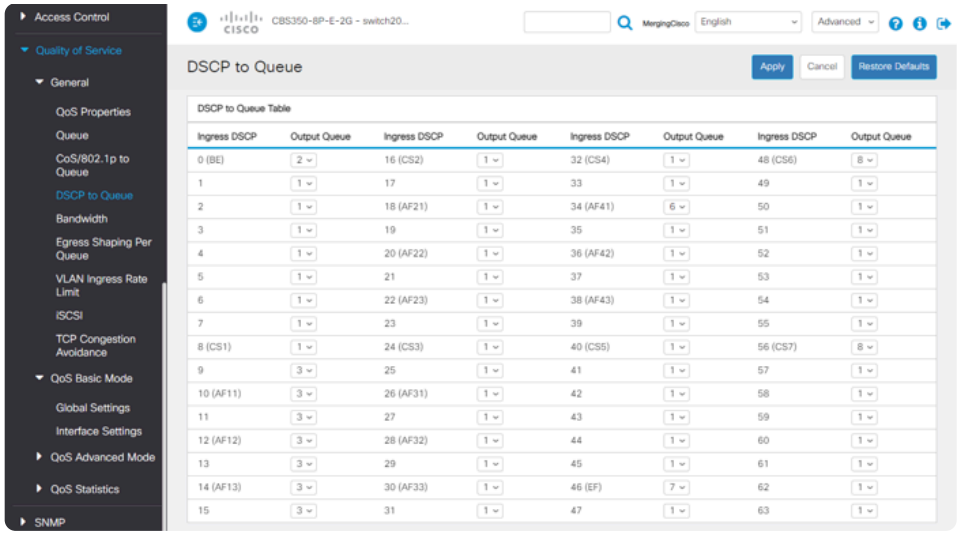
21. Go now in **Quality of Service > QoS Basic Mode > Global settings**.

    Set **Trust Mode** to **DSCP**

    Click on **Apply.**

22. Go back to **Quality of Service > General > DSCP to Queue.**

    Change the **DSCP to Queue** Settings as shown in the following picture and click **Apply** once done.



    Note : Queue 34 : RTP AES67 / Queue 46 : PTP AES67 / RTP Ravenna / Queue 48 : PTP Ravenna / Queue 56 : PTP Dante

23. Now is a good time to save the configuration.

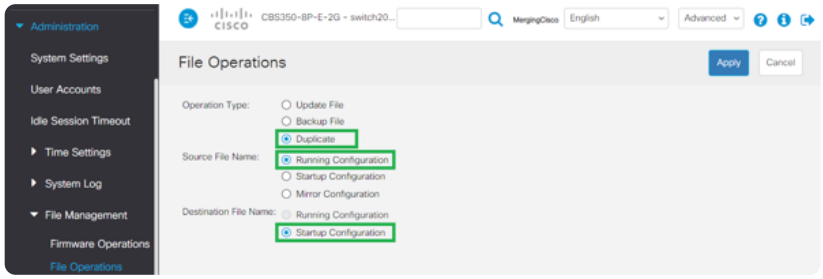
    Go in **Administration** > **File Management** > **File Operations**.

    Select **Duplicate** as *Operation Type*.

    Source File Name : **Running Configuration**

    Destination File Name : **Startup Configuration**

    Click on **Apply**



This will apply the current settings to the start up configuration.

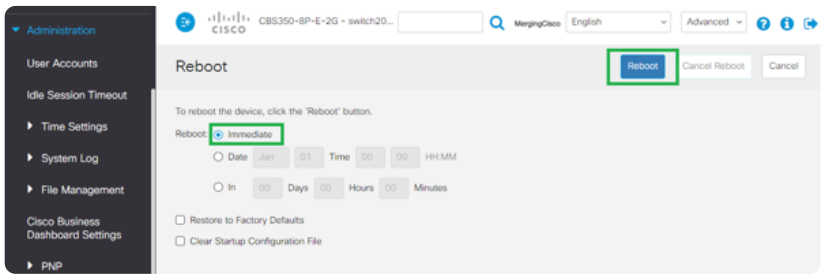
In other terms that makes the configuration to be permanent (unless a reset of the device is done).

24. You must now restart the switch for the changes to apply.

    Click **Administration** > **Reboot**

    Select **Immediate** and click on **Reboot** button.

    Note that the device might take some time to reboot.



Dante AES67 Additional configuration

Please first make sure the Dante device is compatible with AES67.

Consult the Manufacturer or Audinate website.

[Please follow the instructions on this page]

How to Backup and import configuration files

Backup your configuration to a file

This is how to backup your configuration to a file.

1. Go to **Administration** > **File Management**.

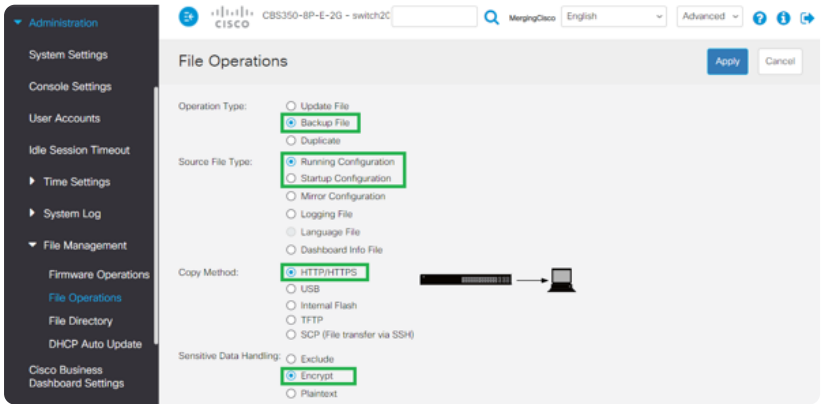
   Select **File Operations**.

2. *Operation Type* has to be set to **Backup File**.

   Source File Type : select **Running** or **Startup Configuration**, depending on your needs.

   Copy Method : **HTTP/HTTPS**

   Sensitive Data Handling : **Encrypt**



3. Click on **Apply.**

   The configuration file can be downloaded in your browser (as a .txt file)

MERGING TECHNOLOGIES

Import a configuration file

IMPORTANT NOTE :

If you try to import a configuration file into the Running Configuration (the current one), **it will fail.**

What you need to do is import from a configuration file to the **startup configuration** and then reboot.

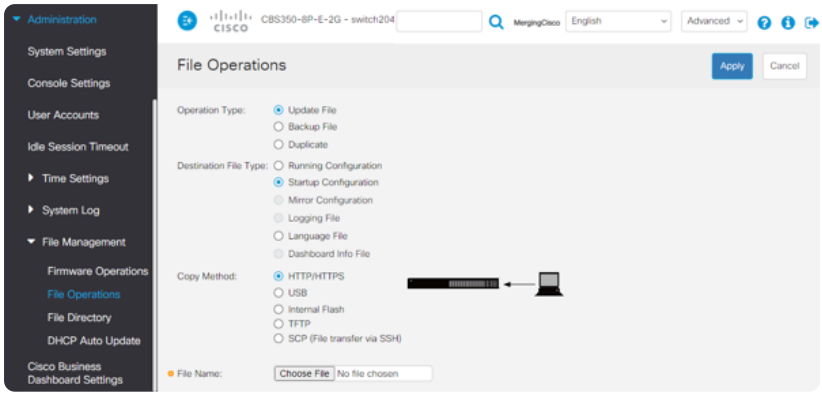
1. Go to **Administration** > **File Management.**

   Select **File Operations**.

2. *Operation Type* : **Update File**

   Destination File Type : **Startup Configuration**

   Copy Method : **HTTP/HTTPS**

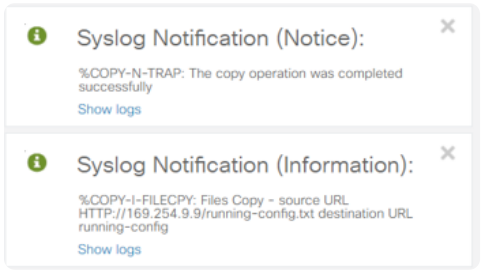


3. Now click on **Choose File** and in the choose file window, browse to the configuration file you want to import.

   Select the configuration file and click on **Open.**

4. Back in the main window, click on **Apply** to load your configuration file into the Startup Configuration.

   Once imported, the switch will send a notification that the operation has been completed.

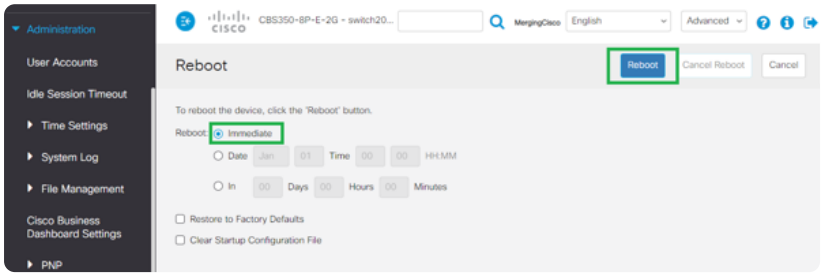


5. You must now restart the switch for the changes to apply.

   Click **Administration** > **Reboot**

   Select **Immediate** and click on **Reboot** button.

   Note that the device might take some time to reboot.



MERGING TECHNOLOGIES