Deployment Guide

RUCKUS WAN Gateway – Basic Setup

June 2023

Rev. 1

Table of Contents

Changes in Revision 1

- Minor corrections and text changes.
- Added new location for RWG .ISO files.
- Added section on Config Templates.

Intended Audience

This document shows supported topologies, basic navigation and step-by-step procedures to manage and configure the basic functions in RWG.

This document is written for and intended for use by technical engineers with background in switching, Wi-Fi design and 802.11 wireless engineering principles.

For more information on how to configure RUCKUS products, please refer to the appropriate RUCKUS user guide available on the RUCKUS support site at https://support.ruckuswireless.com/

The RWG documentation is embedded in the product.
You can access it by navigating to https://{your RWG_IP_address}/admin/manual/help_online

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Overview

This document includes the following sections:

- Supported Topologies
- Basic UI Navigation
- SSH Keys and SSH Access
- SSL Certificates
- Network Topology Diagrams
- RWG Software Upgrade
- RWG Backup and Restore
- Config Templates
- Basic Troubleshooting

Supported Topologies

RWG stands for RUCKUS Wireless Gateway, and as such, it is a router running NAT and DHCP, plus a RADIUS server, NAC and many other services.

Its main usage is at the edge of an enterprise network, branch office, hotel property or MDU/MTU, where it can control the incoming and outgoing traffic, using packet filters and rate limiting, act as SD-WAN/VPN endpoint, and apply policies to the wireless and wired devices in the internal network.

Therefore, in most environments, RWG is installed locally, even though it is also possible to install it remotely for specific use cases. The SmartZone controller installation can be local or remote.

The next section shows the details for the supported topologies.

Local RWG and SmartZone

In this topology RWG and SmartZone are local to the hotel property, MDU, enterprise network, etc.

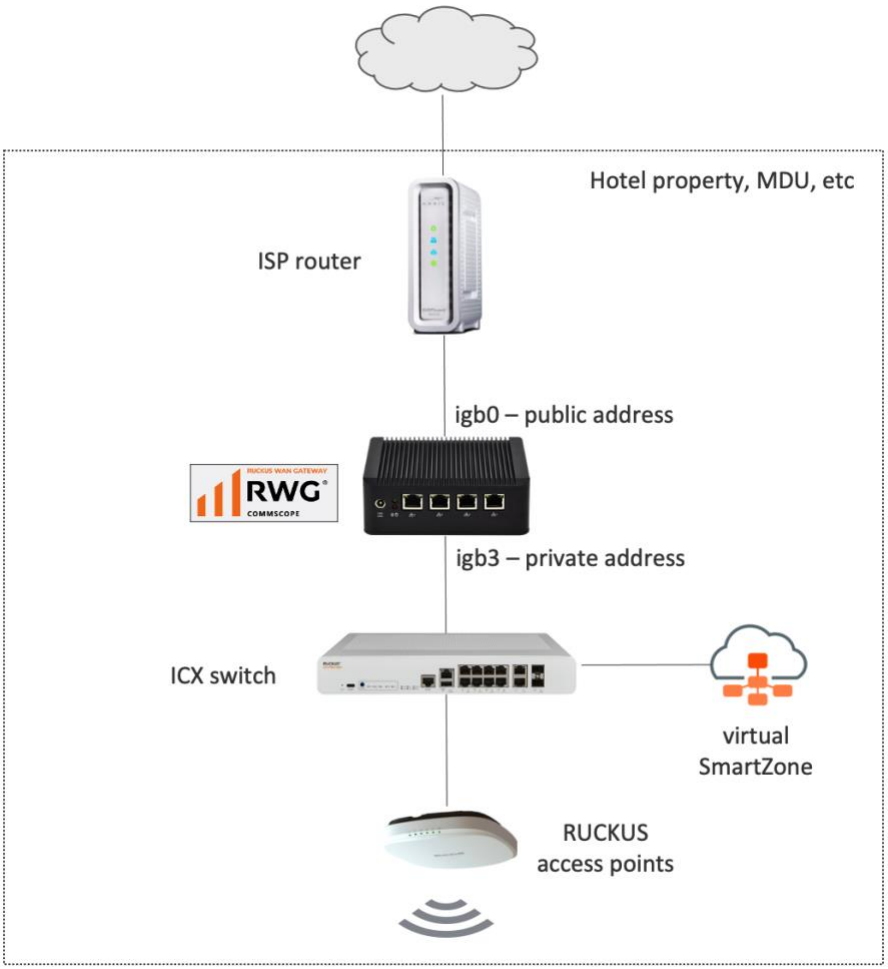


FIGURE 1 – LOCAL RWG AND SMARTZONE

RWG acquires a public IP address from the ISP router and provides private IP address to the devices and clients connected at the LAN side. Microsegmentation is fully supported, and its configuration is automated by RWG. The ICX switch and the SmartZone controller are configured by RWG automatically. SmartZone acts as a proxy authenticator, and RWG is the RADIUS/NAC server.

Note: It is possible to use a private IP address in the RWG WAN interface, but in that case SD-WAN features like IPsec VPNs may not work.

Local RWG and Remote SmartZone

In this topology RWG is local and SmartZone is installed in a remote location.

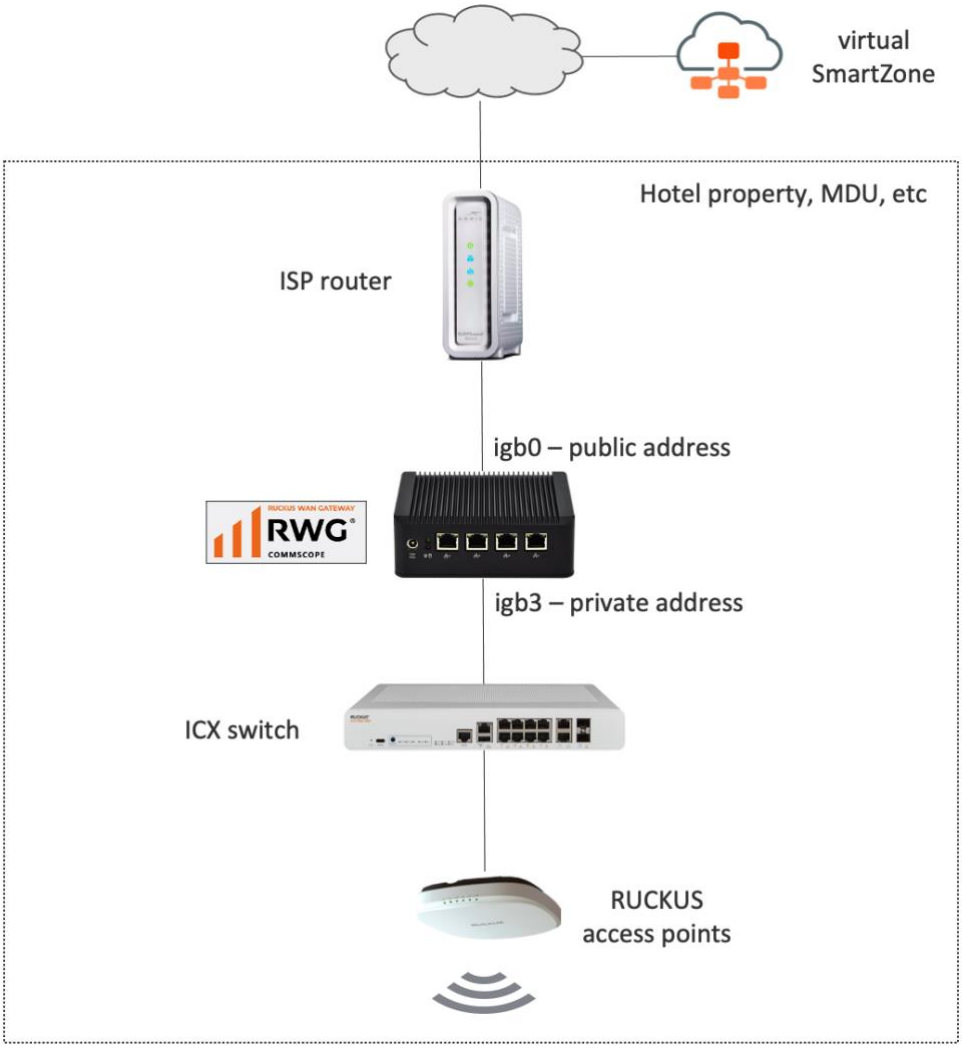


FIGURE 2 – LOCAL RWG AND REMOTE SMARTZONE

As with the previous topology, RWG acquires a public IP address from the ISP router and provides private IP address to the devices and clients connected at the LAN side. Microsegmentation is also fully supported, and its

configuration is fully automated by RWG. The ICX switch and the SmartZone controller are configured by RWG automatically. But in this topology, SmartZone acts as a non-proxy authenticator.

This topology will work equally well as the topology where RWG and SmartZone are local to the network.

Local RWG and Remote SmartZone

In this topology both RWG and SmartZone are installed in a remote location.

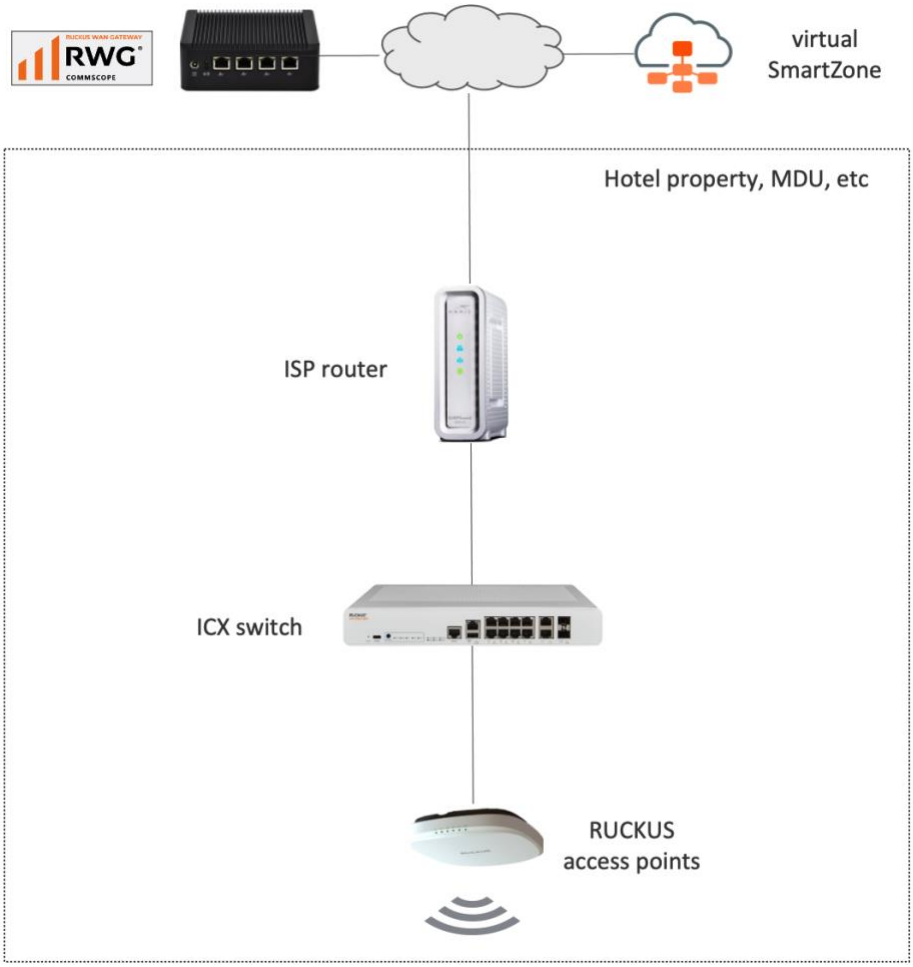


FIGURE 3 – REMOTE RWG AND REMOTE SMARTZONE

Microsegmentation is not supported when RWG is installed remotely. For every microsegmentation use case, RWG defines the VLAN assignments and the DHCP scopes used by the clients. The RADIUS response from RWG with the VLAN assignment will reach the wireless clients, but the client's DHCP request will fail, because there is a router between RWG and the client network. RWG does not have control on that router. The router would

need to be manually configured with DHCP helper services for all scopes provided by RWG, and that may not be feasible in many cases.

Apart from that, there are specific use cases that do not require microsegmentation – like providing simple WiFi access to the wireless clients using authentication portals and billing – and that is fully supported in this topology. Because SmartZone is also remote, it is configured as a non-proxy authenticator.

Default Security Rules

A fresh installed RWG has a WAN and a LAN subnet, a NAT entry configured for the WAN uplink, a DHCP scope enabled for a LAN interface using the network 192.168.5.0/24, and a **Block Subnets** policy applied to all local subnets by default.

All traffic initiated from clients at the LAN side is allowed to go to the Internet, but if different subnets and DHCP scopes are created at the LAN side, the client traffic between any local subnets will be isolated.

If required, the block subnets policy can be disabled, or specific hosts can be whitelisted.

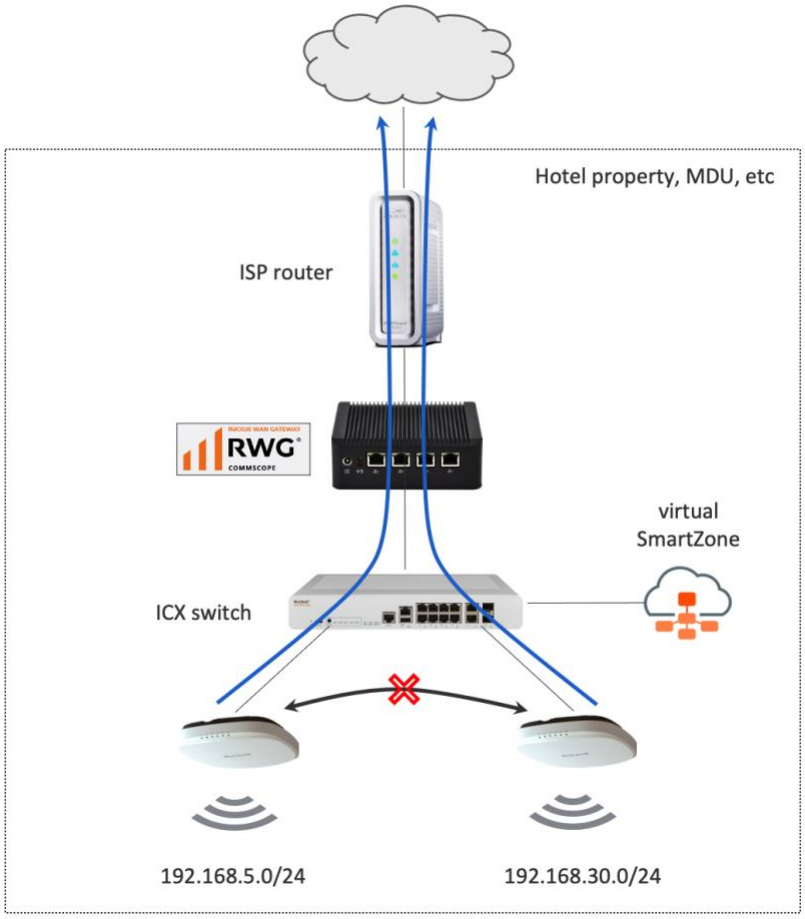


FIGURE 4 – DEFAULT SECURITY RULES

Basic UI Navigation

Login and Logout

To login to RWG, type https://{RWG_ip_address}/admin in your browser.

RWG does not have a default administrator account. One or more accounts should have been created during the RWG installation process. Enter the credentials and click **Authenticate** to login.

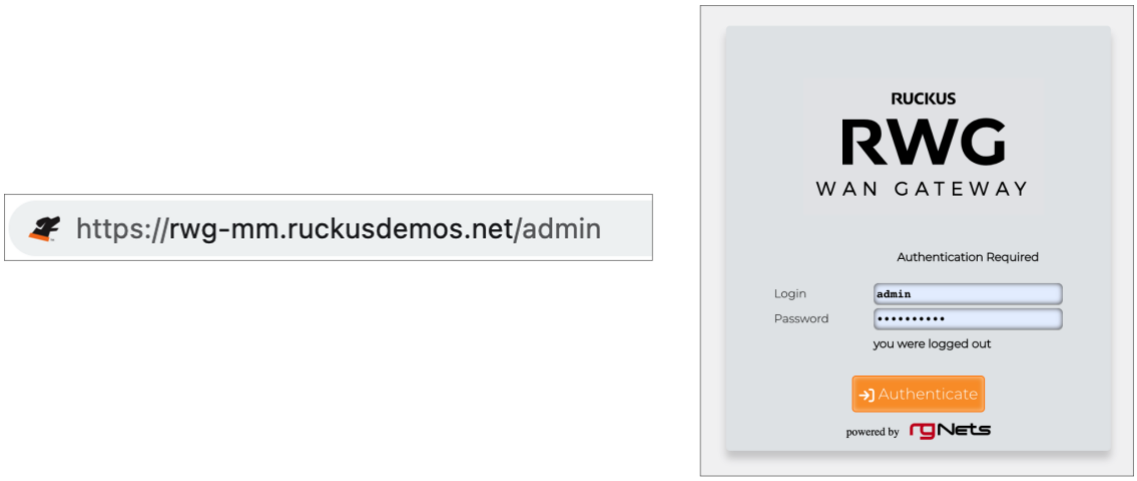


FIGURE 5 – RWG LOGIN

Right after login, the **Instruments** panel is shown. To logout, click **logout admin.**

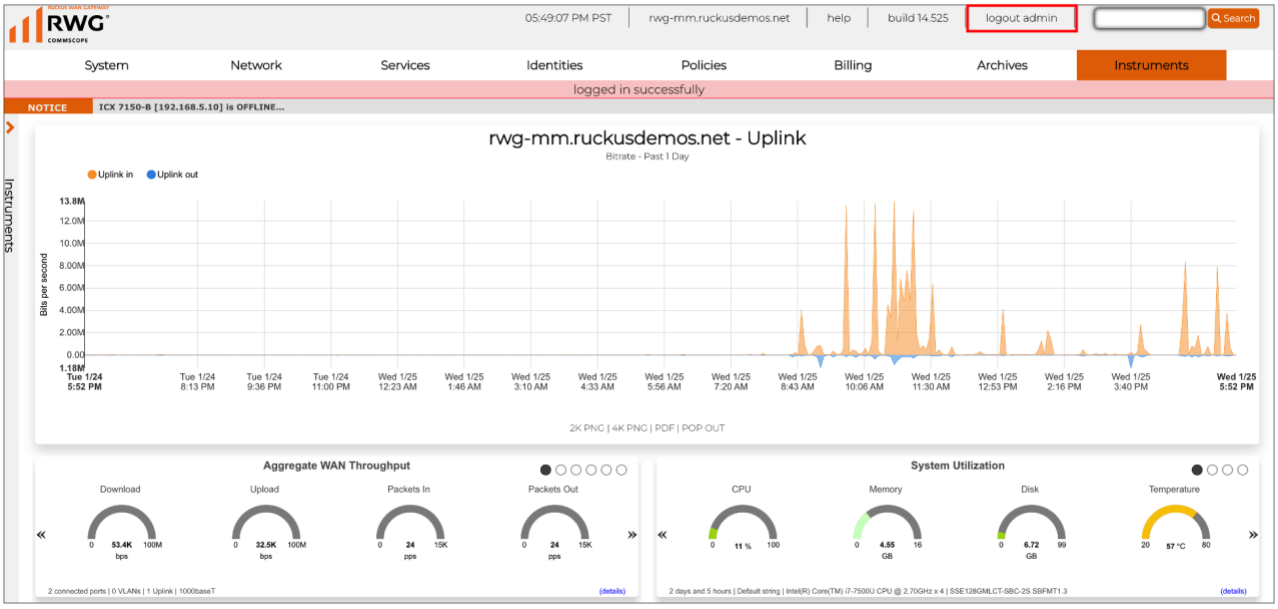


FIGURE 6 – LOGOUT

The RWG User Interface

Navigation in the RWG UI starts at the top menu. The diagram below shows all menu options displayed at the same time.

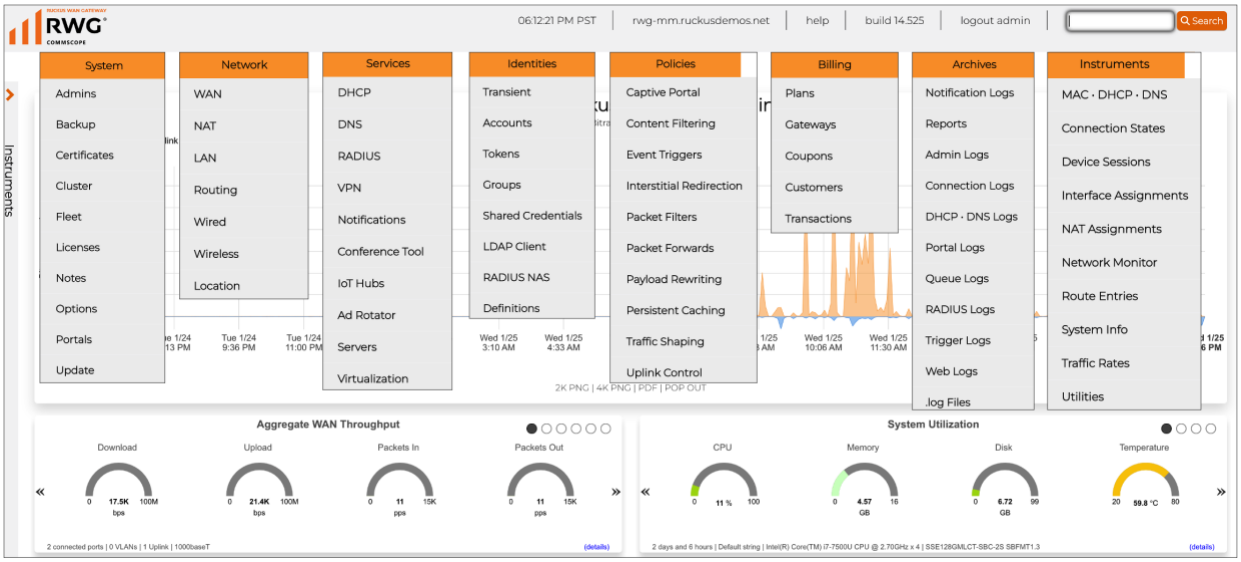


FIGURE 7 – RWG USER INTERFACE

RWG uses **scaffolds**. Scaffolds are the forms and tables used throughout the RWG user interface.

In the example below, we navigated to **Network/Wired**, and we see scaffolds for **Switches**, **Switch Fabrics**, **Switch Port Profiles** and **Switch Ports**.

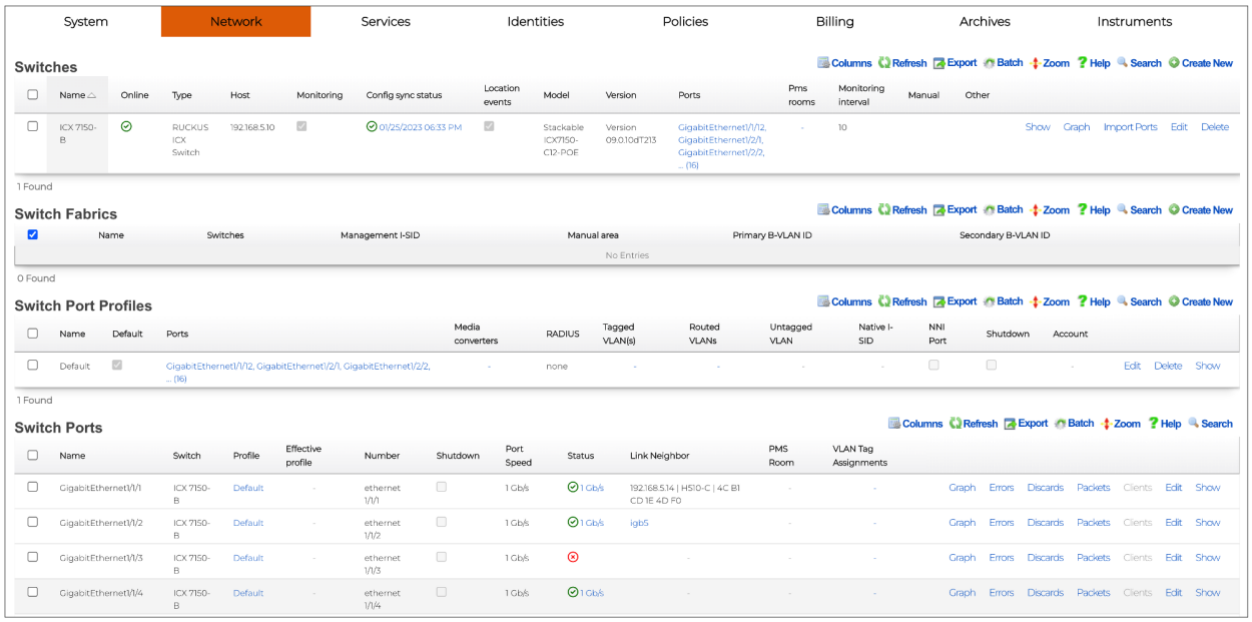
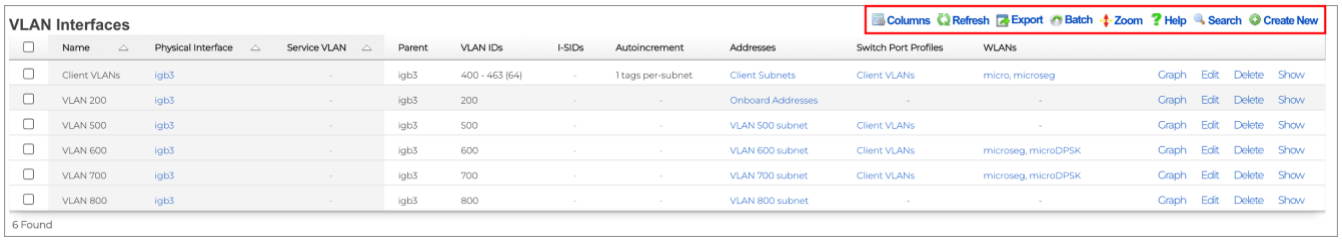


FIGURE 8 – RWG SCAFFOLDS

The most common scaffold options appear in this example:



VLAN Interfaces

Columns Refresh Export Batch Zoom Help Search Create New

Name	Physical Interface	Service VLAN	Parent	VLAN IDs	I-SIDs	Autoincrement	Addresses	Switch Port Profiles	WLANs				
Client VLANs	igb3	-	igb3	400 - 463 (64)	-	1 tags per-subnet	Client Subnets	Client VLANs	micro, microseg	Graph	Edit	Delete	Show
VLAN 200	igb3	-	igb3	200	-	-	Onboard Addresses	-	-	Graph	Edit	Delete	Show
VLAN 500	igb3	-	igb3	500	-	-	VLAN 500 subnet	Client VLANs	-	Graph	Edit	Delete	Show
VLAN 600	igb3	-	igb3	600	-	-	VLAN 600 subnet	Client VLANs	microseg, microDPSK	Graph	Edit	Delete	Show
VLAN 700	igb3	-	igb3	700	-	-	VLAN 700 subnet	Client VLANs	microseg, microDPSK	Graph	Edit	Delete	Show
VLAN 800	igb3	-	igb3	800	-	-	VLAN 800 subnet	-	-	Graph	Edit	Delete	Show

6 Found

FIGURE 9 – THE VLAN INTERFACES SCAFFOLD

- **Columns**: Allows you to select which columns will be displayed in the table.
- **Refresh**: Click to refresh the items in the table.
- **Export**: Allows you to export the items in the table using .CSV, .XLSX or create config templates using YAML.
- **Batch**: Used to delete table items. Hover over **Destroy** to see **listed** or **marked**, to delete all items in the table or only the checked items.
- **Zoom**: Opens a new window to display the table only.
- **Help**: Shows a context-based help for the scaffold.
- **Search**: Allows you to filter items in the table. Only the items that match will show.
- **Create New**: Allows you to create a new item in the table.

RWG Shutdown

If RWG is installed in bare metal, you can shutdown RWG by simply pressing the power on/power off button in the server, provided that this starts a graceful shutdown (i.e., the services and OS stops, the disks are unmounted, etc). Do not use the power on/power off button if it powers off the server immediately.

A safer way to do a shutdown is to click **System** at the top menu, then scroll down and click **Shutdown**.

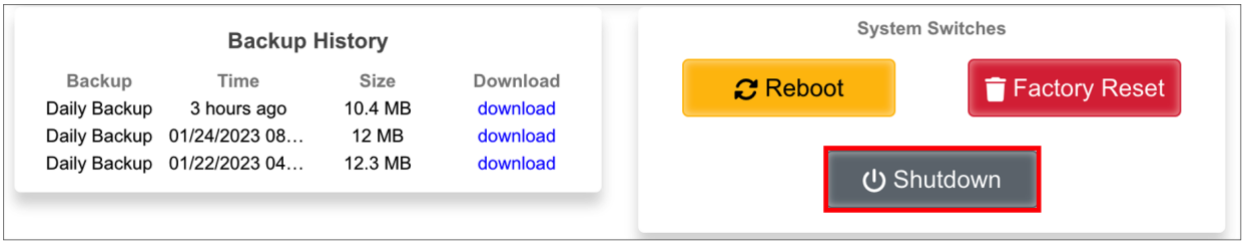


FIGURE 10 – SHUTDOWN

SSH Access

You need to install a public SSH key in RWG's administrator accounts in order to access the RWG console via SSH. Let's start by creating a new administrator. Navigate to **System/Administrator** and click **Create New**.

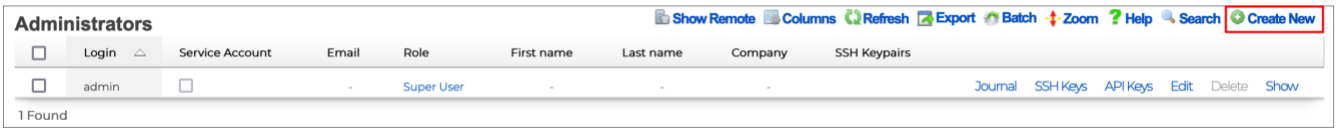


FIGURE 11 – CREATE A NEW ADMINISTRATOR ACCOUNT

The **Create Administrator** form will show:

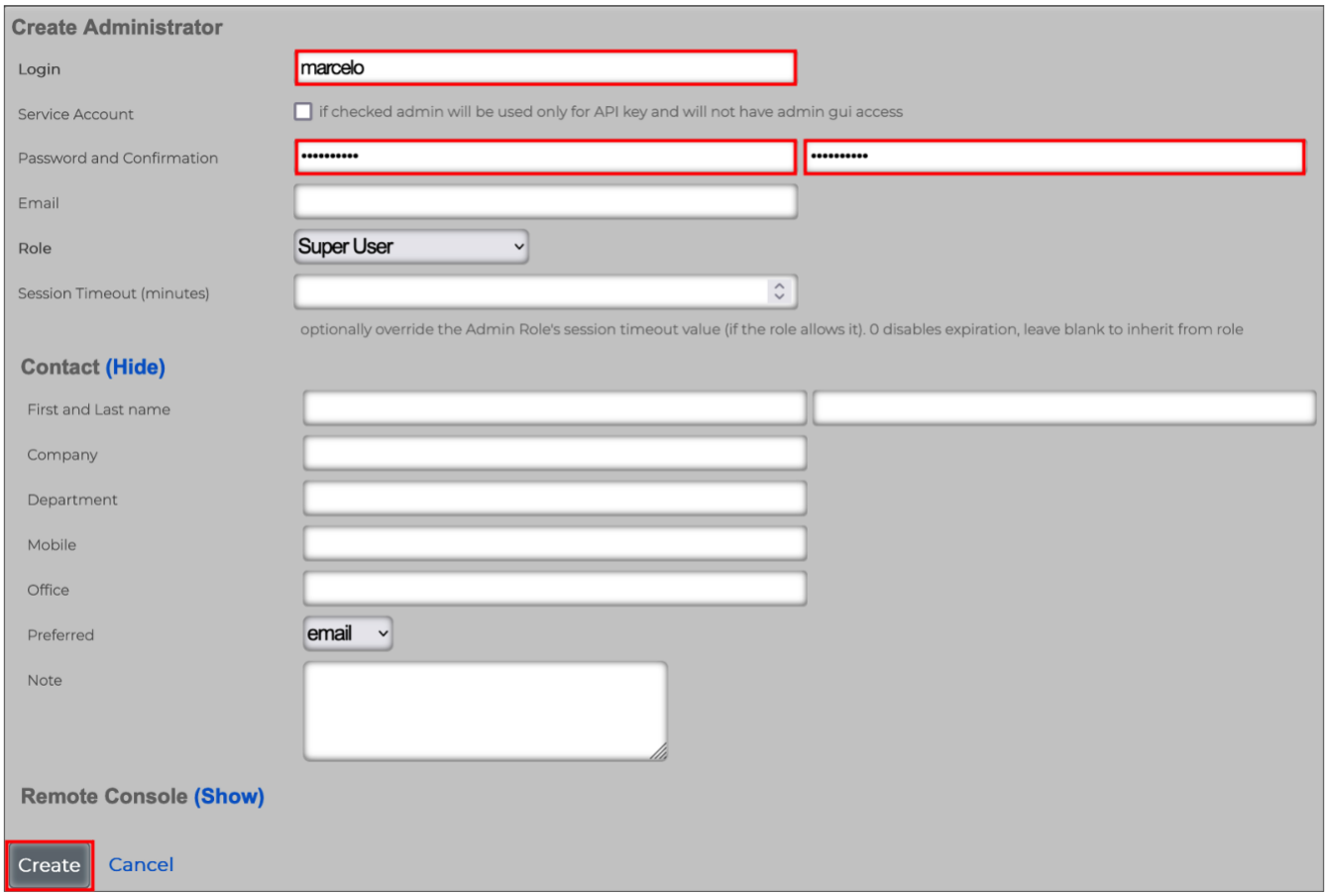


FIGURE 12 – CREATE ADMINISTRATOR

Enter the following information:

- **Login**: Enter a username
- **Password and Confirmation**: Enter the password.

Click **Create** to finish.

Let's now see three methods to create a SSH key pair:

- Using MacOS in a Mac computer
- Using Termius in a Mac computer
- Using PuTTYgen in Windows

Create a SSH Key Pair Using MacOS

Open a terminal in your Mac computer and enter the command `ssh-keygen -b 4096 -t rsa`, then follow the instructions.

You can keep the proposed filename (id_rsa) and the passphrase (empty).

```
Marcelos-MacBook-Pro:home marcelo$ ssh-keygen -b 4096 -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/marcelo/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /Users/marcelo/.ssh/id_rsa
Your public key has been saved in /Users/marcelo/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:FYtaYJnF46fMCvQzlz2Qovg2XUNbMfLixsYPHao1l2s marcelo@Marcelos-MacBook-Pro.local
The key's randomart image is:
+---[RSA 4096]----+
|      o=. .      |
|     .o.+.oo     |
|       .o=oo     |
|    . .o*.=      |
|   o o.OS% o     |
|  . o + ^ *      |
|   . o @ * o     |
|    + +   E      |
|   . .   .       |
+----[SHA256]-----+
Marcelos-MacBook-Pro:home marcelo$
```

FIGURE 13 – CREATE THE SSH KEY PAIR

Use the command `cat /Users/marcelo/.ssh/id_rsa.pub` to see the public key and copy the entire string. Change the path to match your environment.

```
Marcelos-MacBook-Pro:home marcelo$ cat /Users/marcelo/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDW8BMidgspiF+BO7WMfRrN16sMaPu1DIaro/IIk1l2AQ2H33J5EkI4WKUSxgWc6+VNVNXsglGp
75jl4zuZNHK775qUkWkyP02yusiLhORI2hFPOzWU1TdyvC31ZPkvHMor4KagC5qno+W2WE68WxVtrY0B7wiDs2JCeqGkFsK03OKwZdCvcObrxgP6
0LT0tEHE5J26UjB1w8496baXXRtBCRXmbXHWufxRmv3ISaq+DsSrYNai6isnkspGXQVcCBf+tcfvfLNey+EwJvTPv4TLtlQtCIZQHvH8LNFXCCPy
/IeDHIvJ6/q5EvrlkZqTMwHaHx+ApxMW6bqYKN//2nxK4Okk9uzKcEAWzX6776HP8pxf/Y51RuXjjomYBvtk6AM84QRuyXOQfxLMyuV2U7IPlCT2
aLRUHlSLuUZAGjVyiMiGDvvzNLriBM0nDlxXUTUNOr+GxhO+P8kN+jURmpdeK7mATjdDubZTyHMv5fMwwICyf3W7Vdhga8I4cfl9zNpMwnJq+jDN
XJmeSwBdHGF/SXRFpOTglRYzNkGGmB+WVyjgeOHOUUSifyIamLzB5Ood6ilMgs3a/VuoTERcqqps4L5BPd0vUqhY93gALsMK2dp4UtHpIpEgLN32
kCZY/8h7uO5ZtlBNBqwNWYHOkcT8pdFS0den8tRSpGAFggcEjQ== marcelo@Marcelos-MacBook-Pro.local
```

FIGURE 14 – COPY THE PUBLIC KEY

Now, navigate to **System/Administrators** and click **Edit** on the entry where you wish to add the public key.

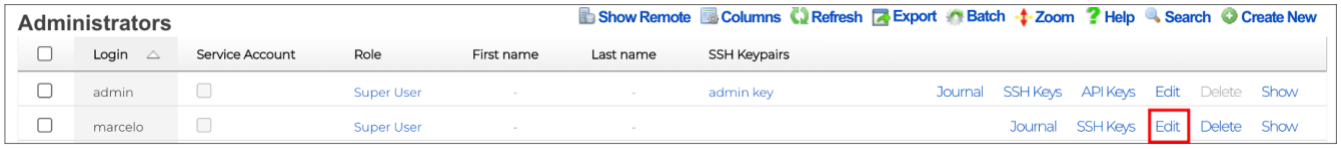


FIGURE 15 – EDIT THE ADMINISTRATOR ACCOUNT

The update account form will show. Enter the following information:

- **Name**: Enter a name for the key
- **Public key**: Paste the public key you copied from the MacOS terminal.
- **Authorized for Admin login**: Make sure the checkbox is marked.

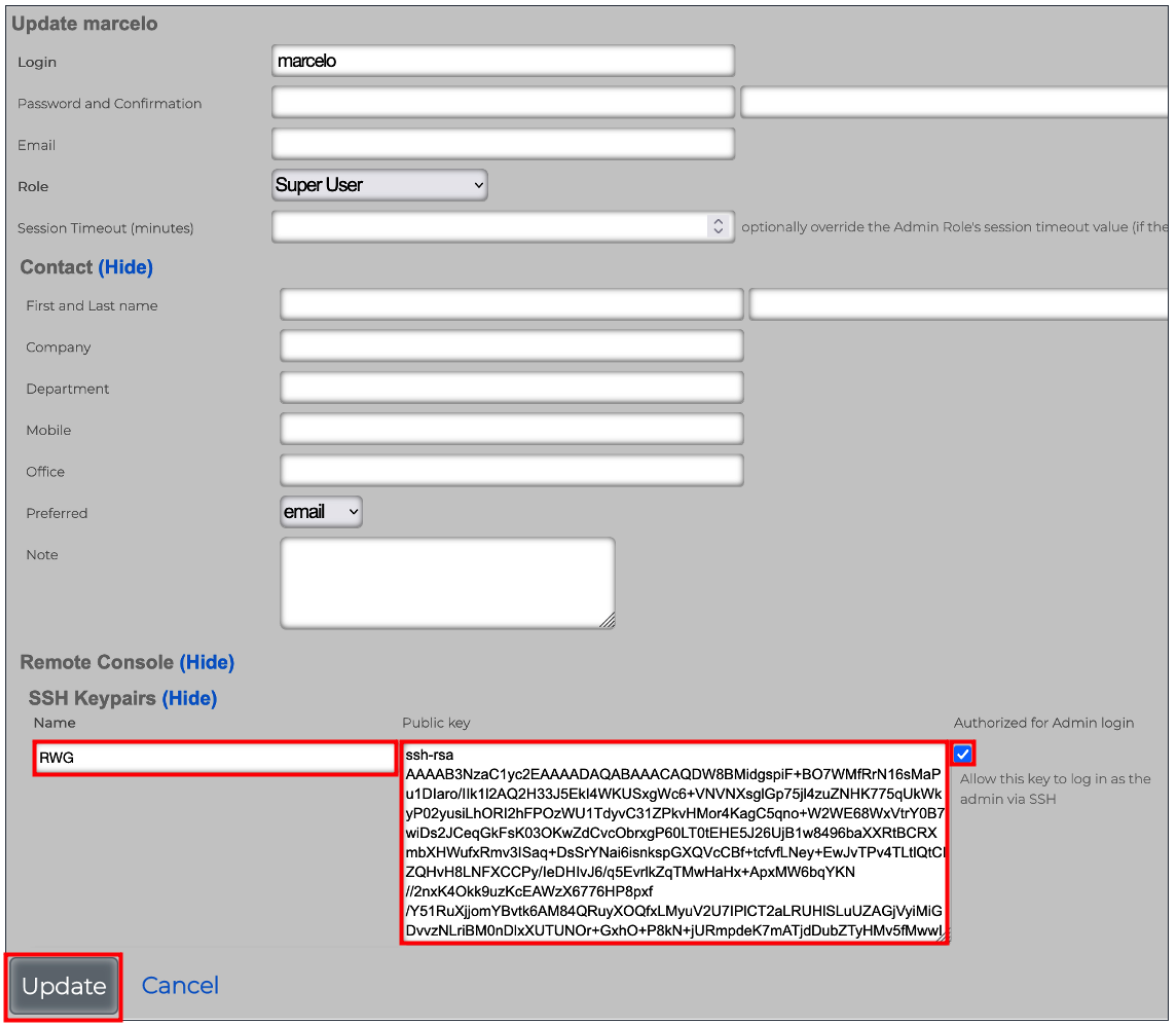


FIGURE 16 – UPDATE THE ACCOUNT

Click **Update** to finish.

Using the account where you copied the public key, connect from a MacOS terminal using the command `ssh username@FQDN-or-IP-address`

```
Marcelos-MacBook-Pro:~ marcelo$ ssh marcelo@10.0.0.144
The authenticity of host '10.0.0.144 (10.0.0.144)' can't be established.
ED25519 key fingerprint is SHA256:YdrzGctyybNeDSvhprgqJR9O9cOmxuVSHFFCxPSH7hA.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.0.144' (ED25519) to the list of known hosts.


YOU CAN EASILY BREAK THINGS HERE

**********************************************************

CLI access is for troubleshooting and advanced integration only.

Please use the web GUI for all normal administrative operations.

https://rwg-mm.ruckusdemos.net/admin

**********************************************************
```

FIGURE 17 – SSH CONNECTION TO RWG

Create a SSH Key Pair Using Termius

Termius is a popular SSH client for Mac computers.

At the Mac's top menu, select **Termius/Settings/Keychain**, then click **NEW/Generate new key**:

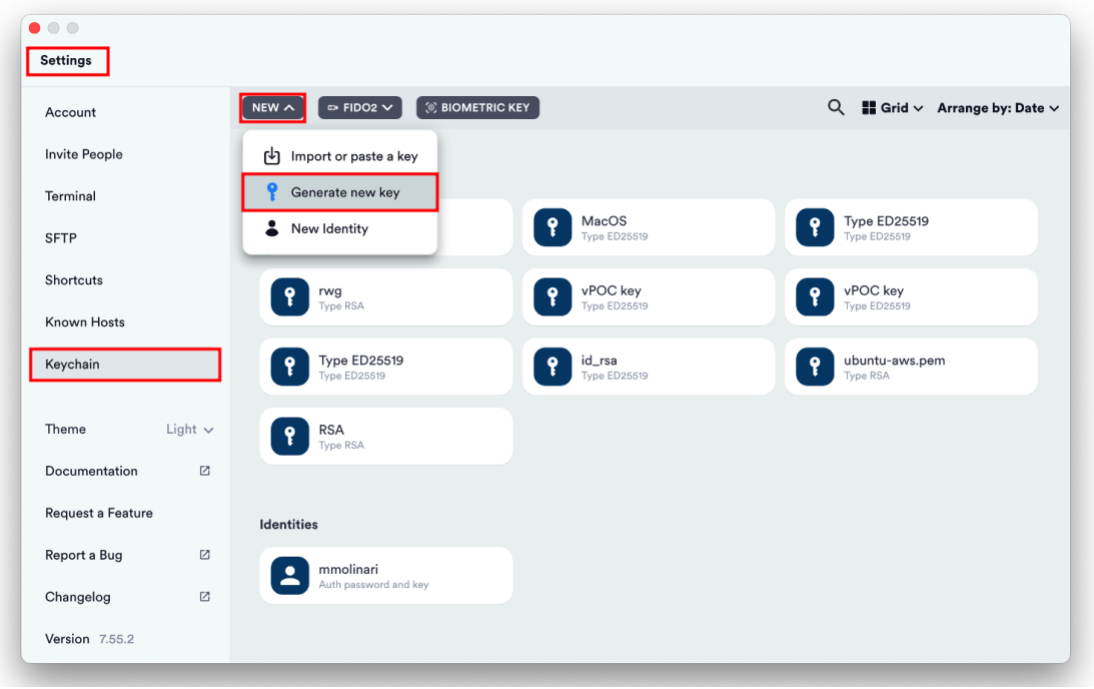


FIGURE 18 – GENERATE SSH KEYS USING TERMIUS

Enter the following information:

- **Label**: Enter a name for the key
- **Key type**: Select **RSA**
- **Key size (bits):** Select **4096**

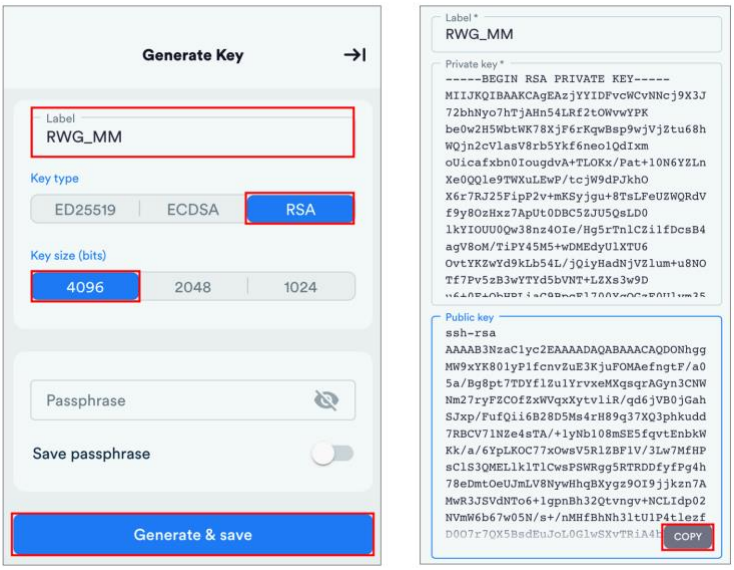


FIGURE 19 – GENERATE KEY AND COPY THE PUBLIC KEY

Click **Generate & save** to finish, then copy the public key using the **COPY** button.

Now, navigate to **System/Administrators** and click **Edit** on the entry where you wish to add the public key.

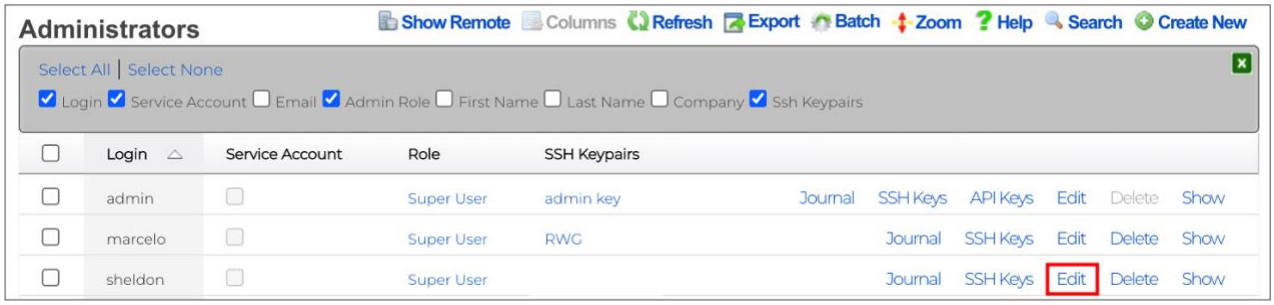


FIGURE 20 – EDIT THE ADMINISTRATOR ACCOUNT

The update account form will show. Enter the following information:

- **Name**: Enter a name for the key
- **Public key**: Paste the public key you copied from Termius.
- **Authorized for Admin login**: Make sure the checkbox is marked.

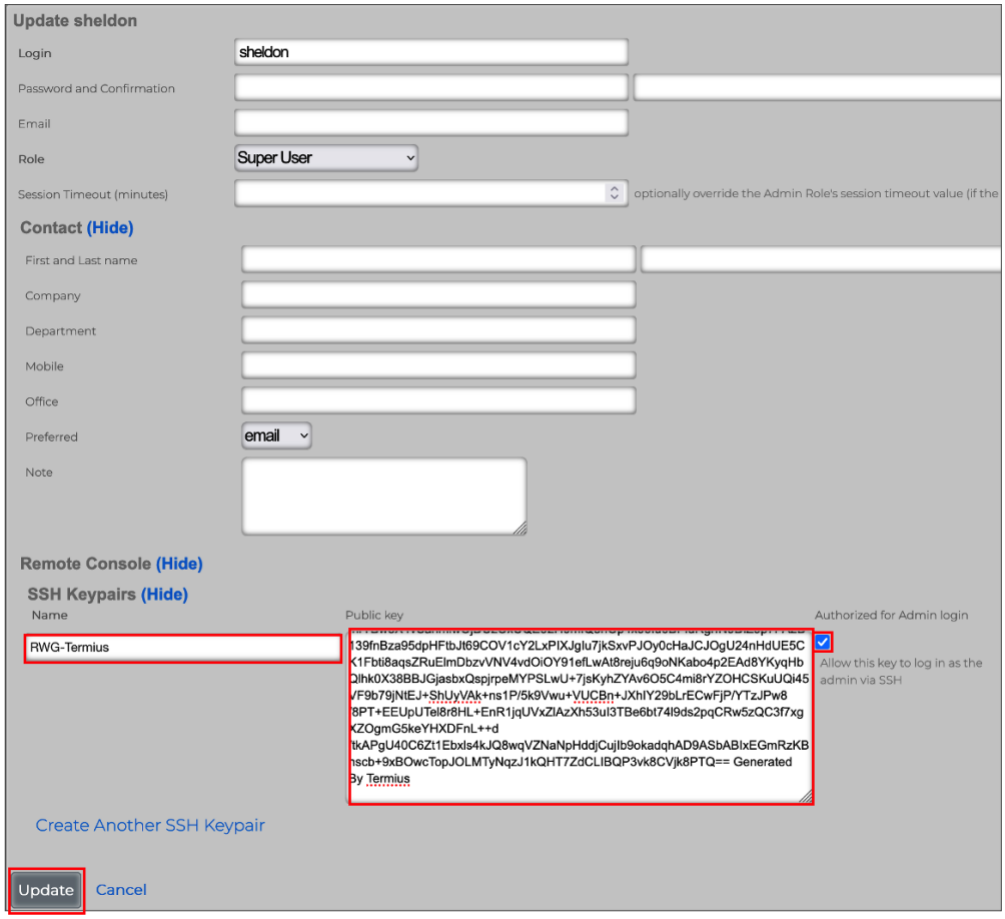


FIGURE 21 – UPDATE THE ACCOUNT

Click **Update** to finish.

On Termius, click **Hosts/Add/New Host**, then enter the following information:

- **Label**: Enter a name for the host
- **Address**: Enter the IP address or FQDN
- **SSH**: Make sure SSH is on
- **Username**: Enter the account in RWG where the public key was copied
- **Set a Key**: Click and select the SSH key pair you created earlier.

The host profile will be saved automatically.

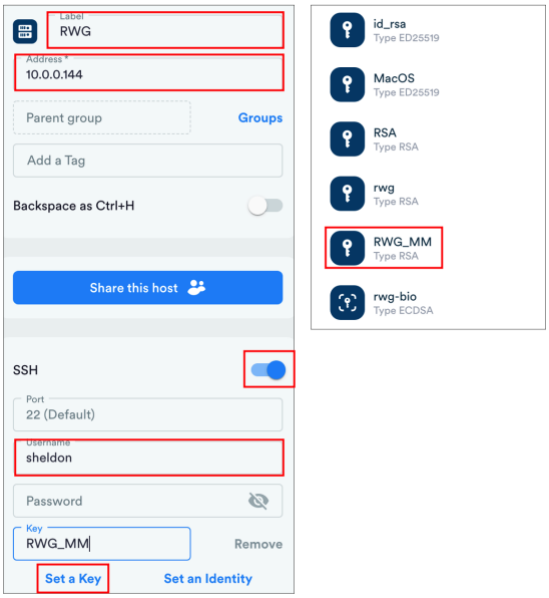


FIGURE 22 – CREATE A NEW HOST IN TERMIUS

Click on the host profile at the Termius main panel to connect to RWG:

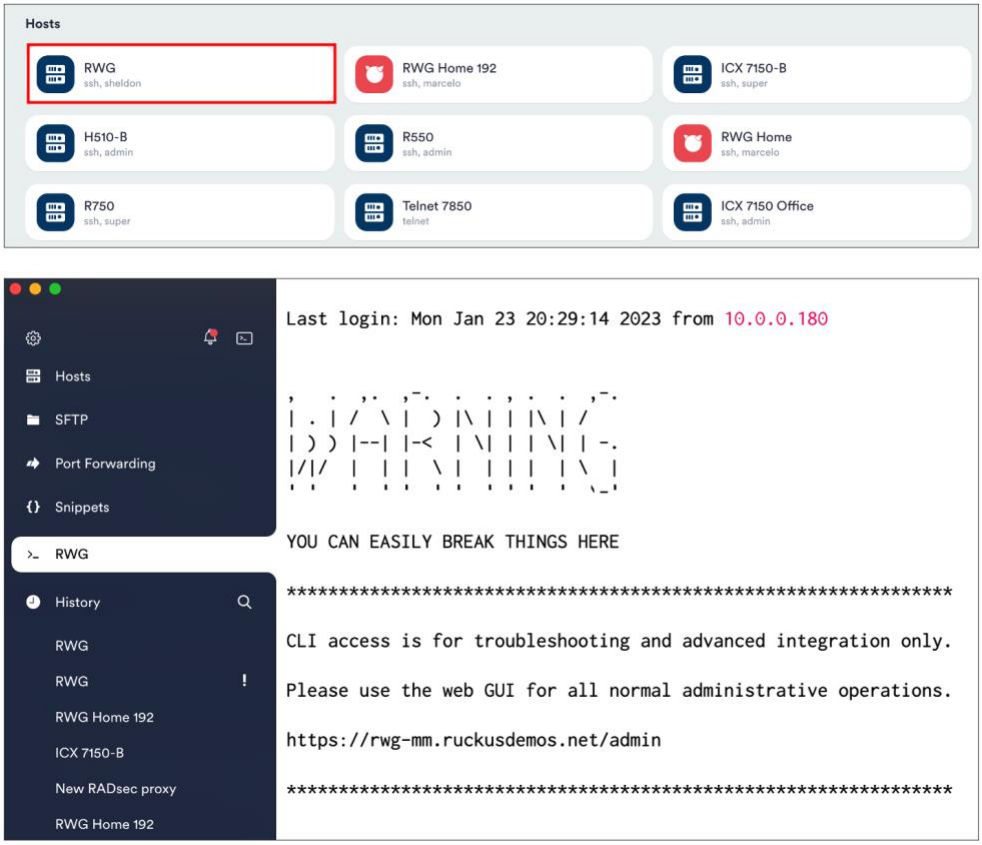


FIGURE 23 – SSH CONNECTION TO RWG

Create a SSH Key Pair Using PuTTYgen

PuTTY and **PuTTYgen** are popular SSH tools used in Windows computers. Type `puttygen` in the search field at the Windows bar to invoke PuTTYgen.

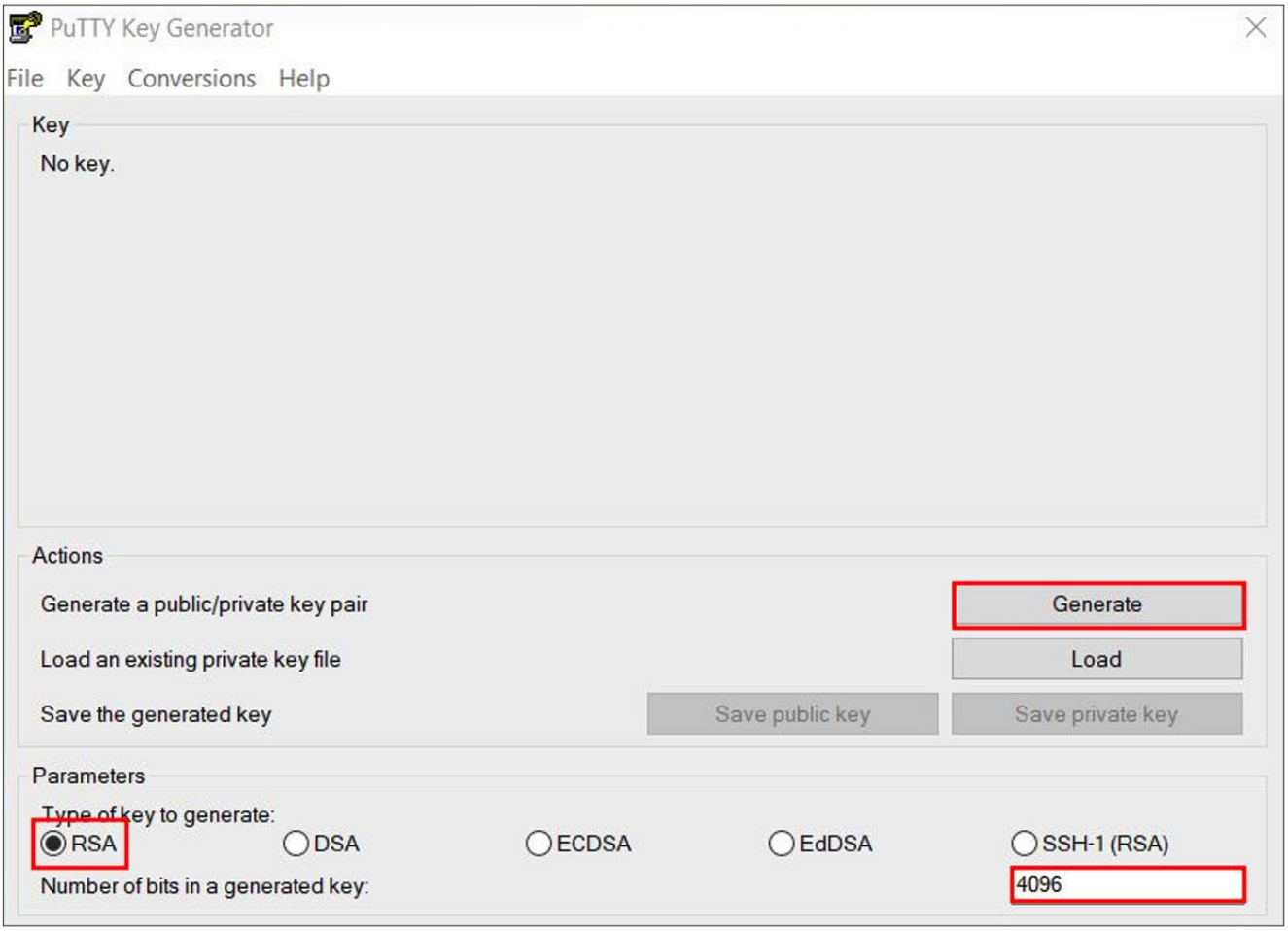


FIGURE 24 – CREATE A SSH KEY USING PUTTYGEN

Select **RSA** and enter **4096**, then click **Generate**.

Move your mouse over the blank area to randomize the creation of the key pair.

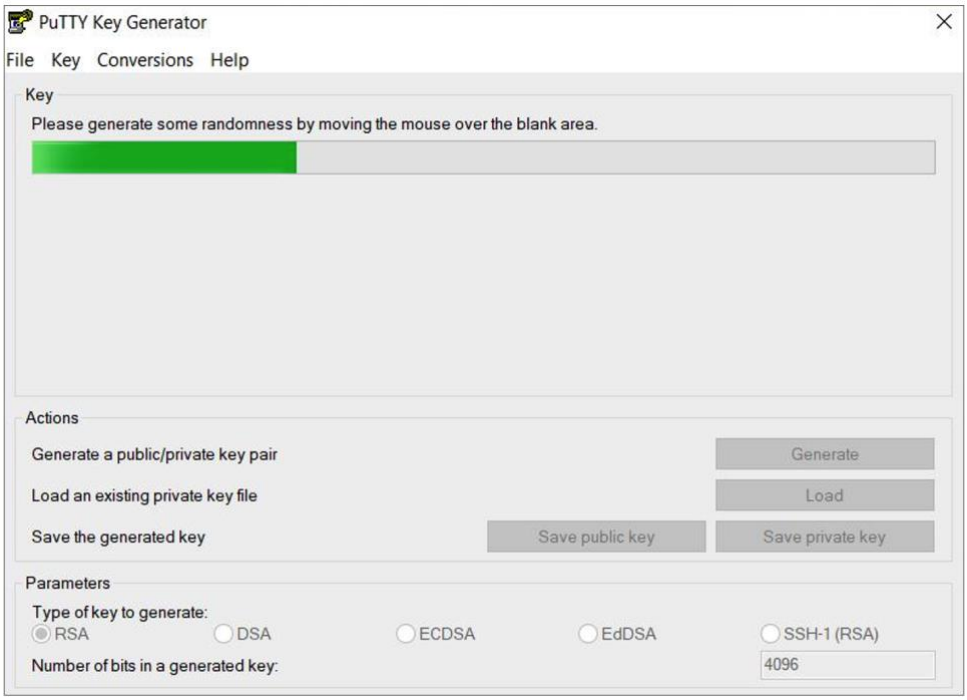


FIGURE 25– CREATE SOME RANDOMNESS

After the key pair is created, click **Save public key** and **Save private key** to save them in your computer.

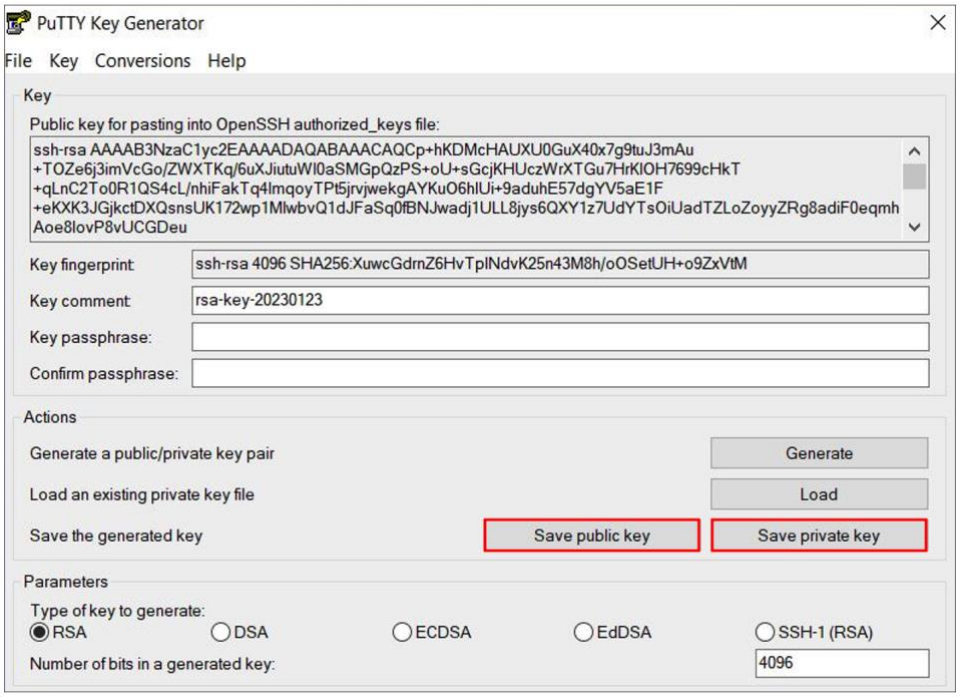


FIGURE 26 – SAVE BOTH KEYS

Open the file for the public key and copy its entire content.

Navigate to **System/Administrators** and click **Edit** on the entry where you wish to add the public key.

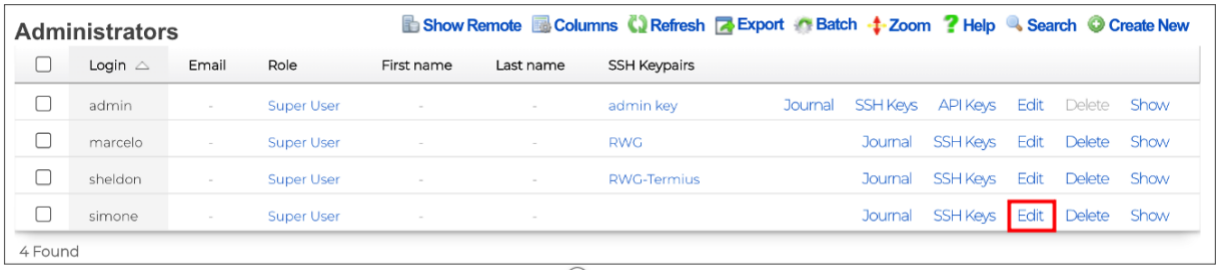


FIGURE 27 – EDIT THE ADMINISTRATOR ACCOUNT

Enter the following information:

- **Name**: Enter a name for the key
- **Public key**: Paste the public key you copied from the file.
- **Authorized for Admin login**: Make sure the checkbox is marked.

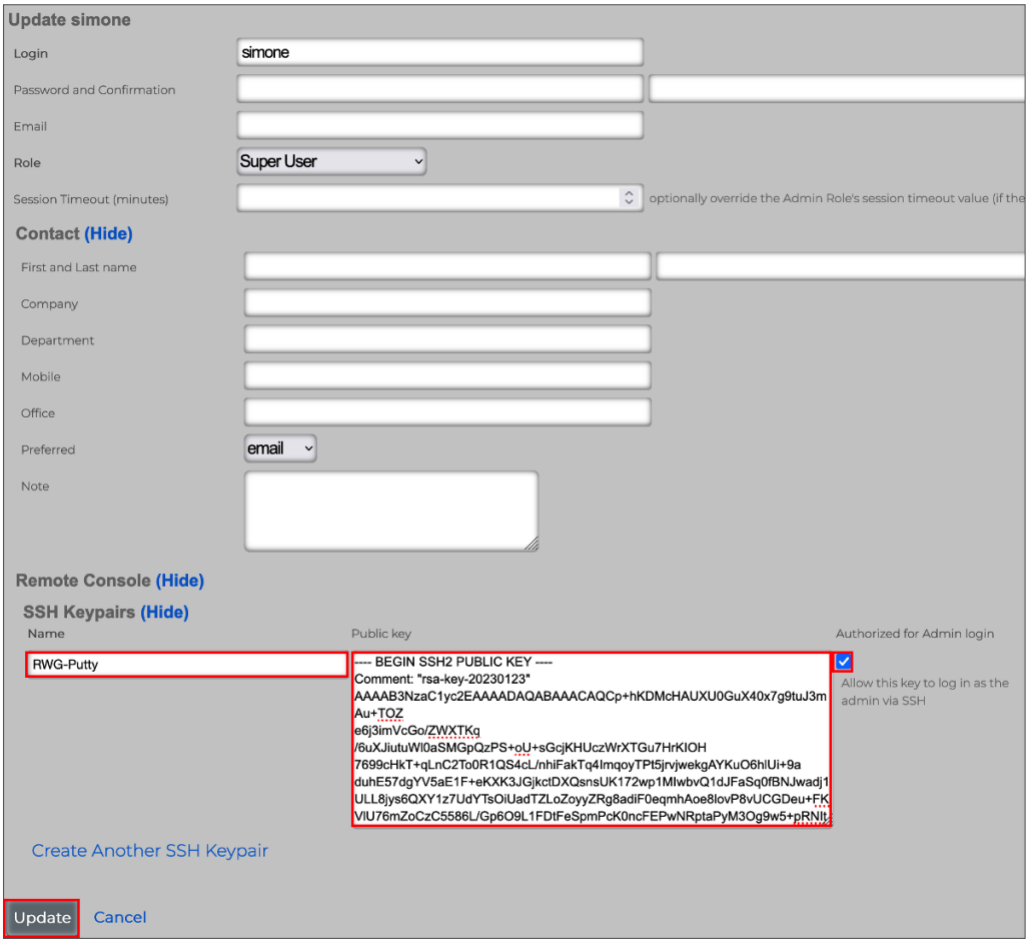


FIGURE 28 – UPDATE ACCOUNT

Click **Update** to finish.

Type **putty** in the search field at the Windows bar to invoke PuTTY.

Click **Session** and enter the FQDN or IP address for your RWG instance.

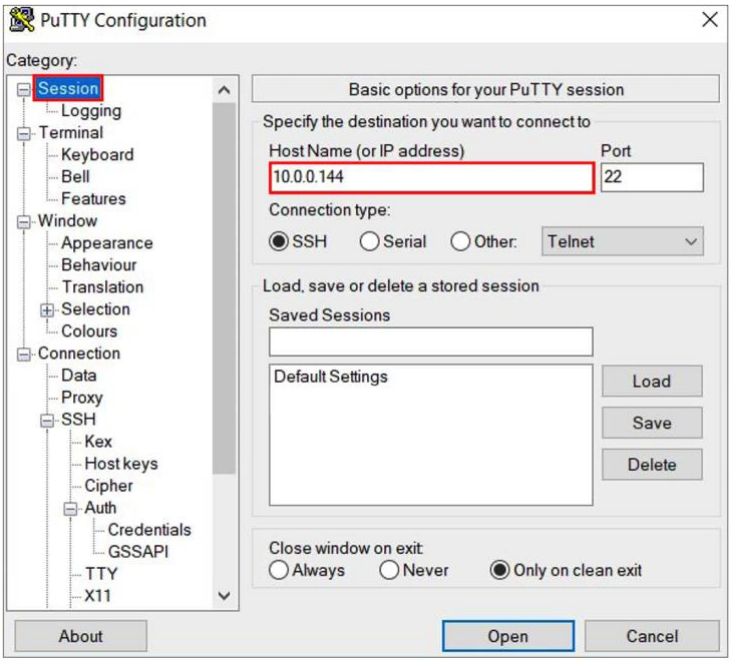


FIGURE 29 – PUTTY CONFIGURATION

Click **Data** and enter the account name in RWG where the public key was copied.

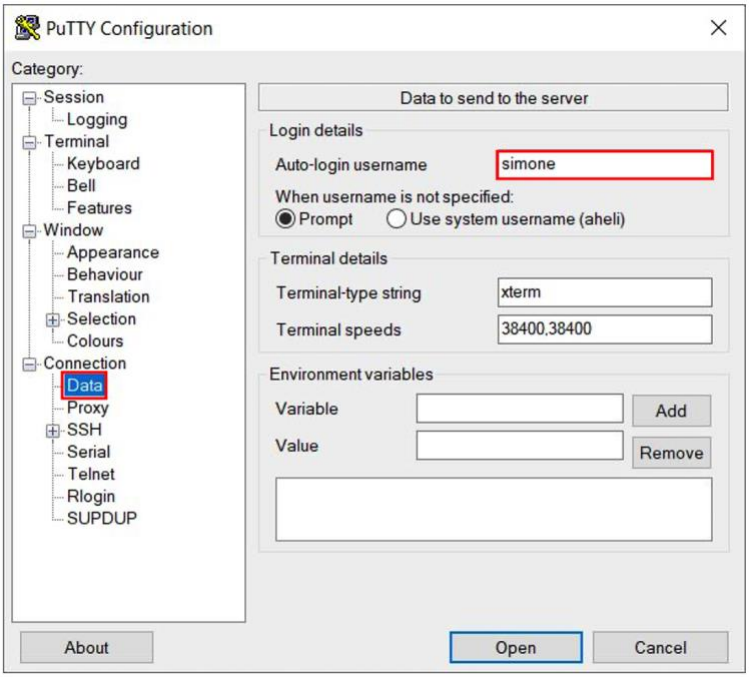


FIGURE 30 – ENTER THE ACCOUNT NAME

Click **Credentials** then click **Browse...** and select the file you saved earlier with the private key.

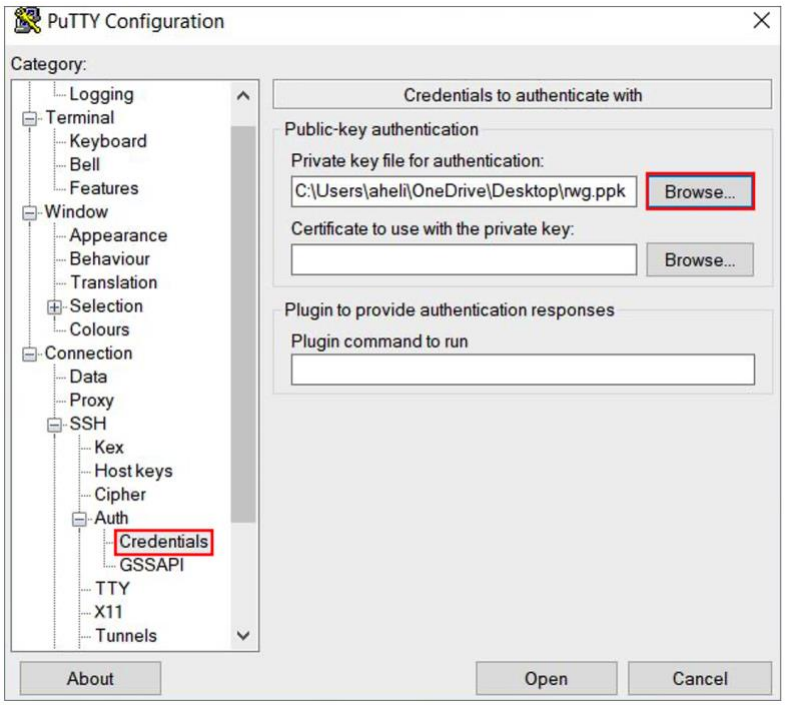


FIGURE 31 – ADD THE PRIVATE KEY

Go back to **Session**, then enter a name for the session and click **Save** to save the configuration.

Finally, click **Open** to connect to RWG. Click **Accept** to continue.

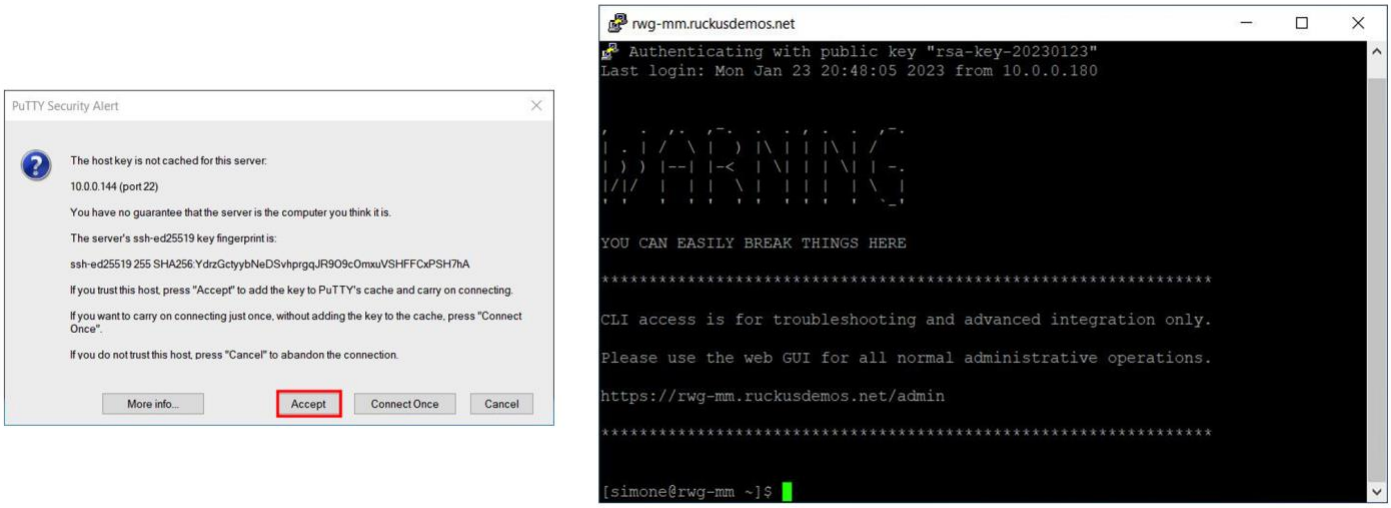


FIGURE 32 – SSH CONNECTION TO RWG

SSL Certificates

RWG comes with a self-signed SSL certificate. For production networks you will need a valid certificate. It's recommended that a non-wildcard certificate be used. Some Windows computers might not work correctly when using 802.1X-EAP, if RWG is configured with a wildcard certificate.

You can generate a CSR request from RWG directly. Your RWG instance needs to have a public DNS entry before you start the CSR request.

In our example RWG will send the CSR to **Let's Encrypt**. Let's Encrypt offers free SSL certificates with the following limitations:

- The certificate expires after 3 months (but it is renewed by RWG automatically).
- Let's Encrypt rate-limits the certificate renewals. Large service providers with hundreds of SSL certificates will not be able to use Let's Encrypt.
- The security level of the Let's Encrypt certificates is not adequate for PCI transactions.

For large deployments, or for use cases not covered by Let's Encrypt, simply generate the CSR in RWG, then download the CSR and send it to your preferred certificate issuer.

After you have a public DNS entry set and published for your RWG, you need to change the RWG FQDN. By default, RWG's FQDN is **rxg.local**.

Navigate to **System/Options**, then click **Edit** in the **Default** entry at the section **Device Options**.

FIGURE 33 – DEVICE OPTIONS

Enter a new name and the FQDN for your instance:

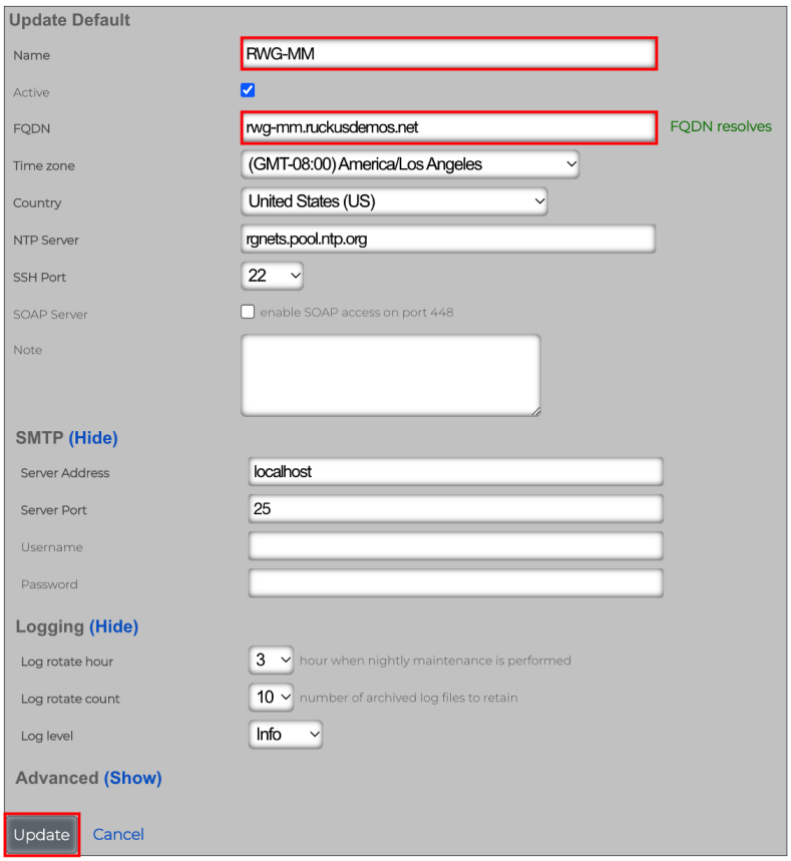


FIGURE 34 – UPDATE DEFAULT

Click **Update** to finish. RWG's web service will reinitialize automatically.

Next, navigate to **System/Certificates**, scroll down and click **Create New** in the section **Certificates**.

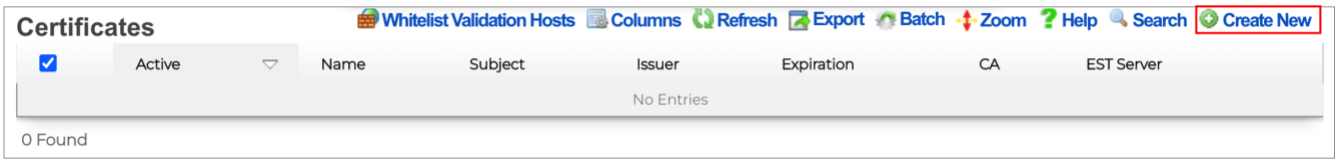


FIGURE 35 – CERTIFICATES

The **Create Certificate** form shows. Enter the following information:

- **Name**: Enter the name for the certificate. Here, we used the FQDN for RWG.
- **CA**: Select **Trusted third-party**
- **Sign mode**: Select **Generate CSR and obtain certificate from Let's Encrypt**

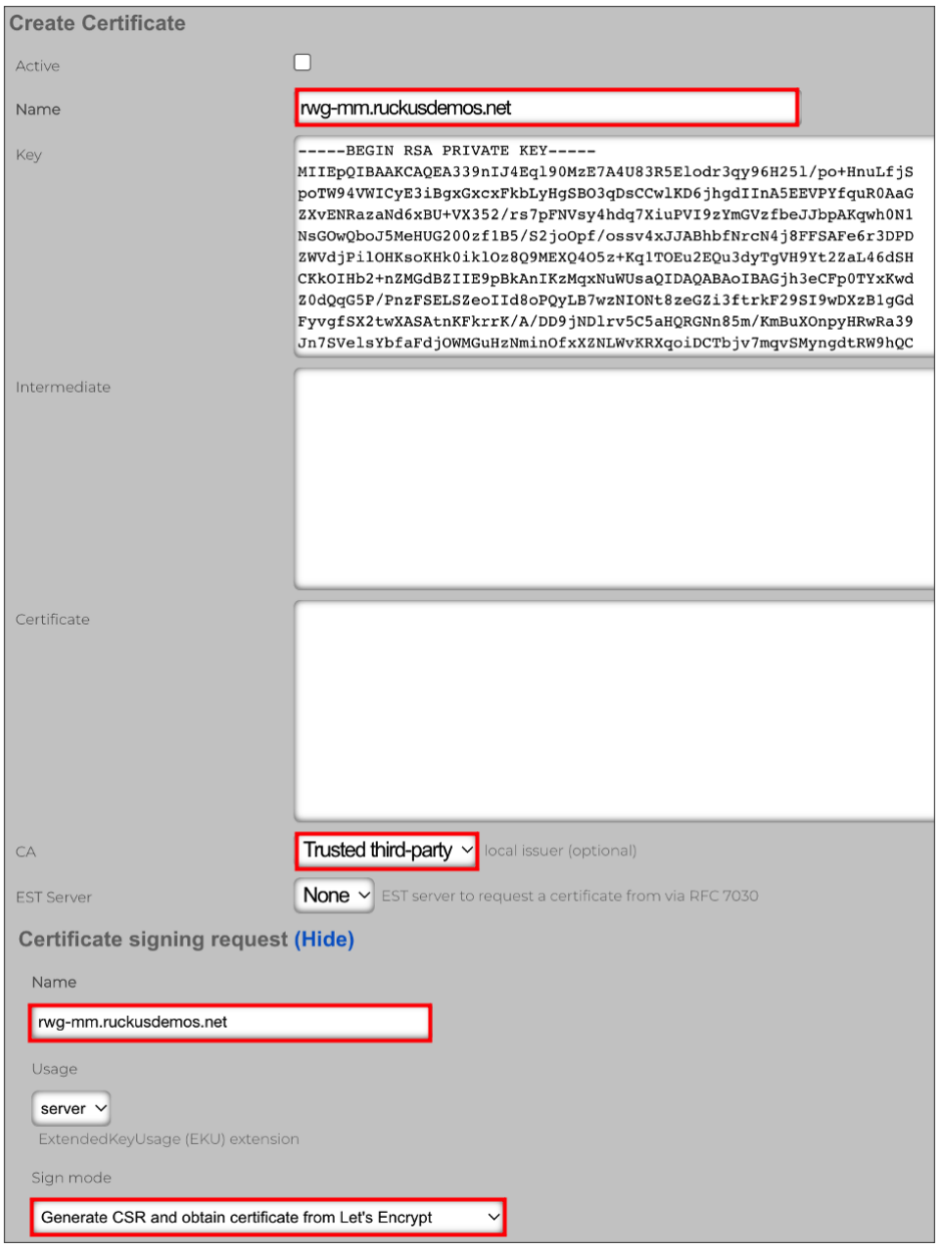


FIGURE 36 – CREATE CERTIFICATE

Scroll down and enter the following information:

- **Common Name (CN)**: Enter the FQDN for RWG.
- **Country Code (C)**: Enter the 2-letter country code for where RWG is installed.
- **State (ST)**: Enter the state. Do not use initials.
- **Locality (L)**: Enter the city.
- **Email address**: Enter an email for contact. Do not use your personal email.

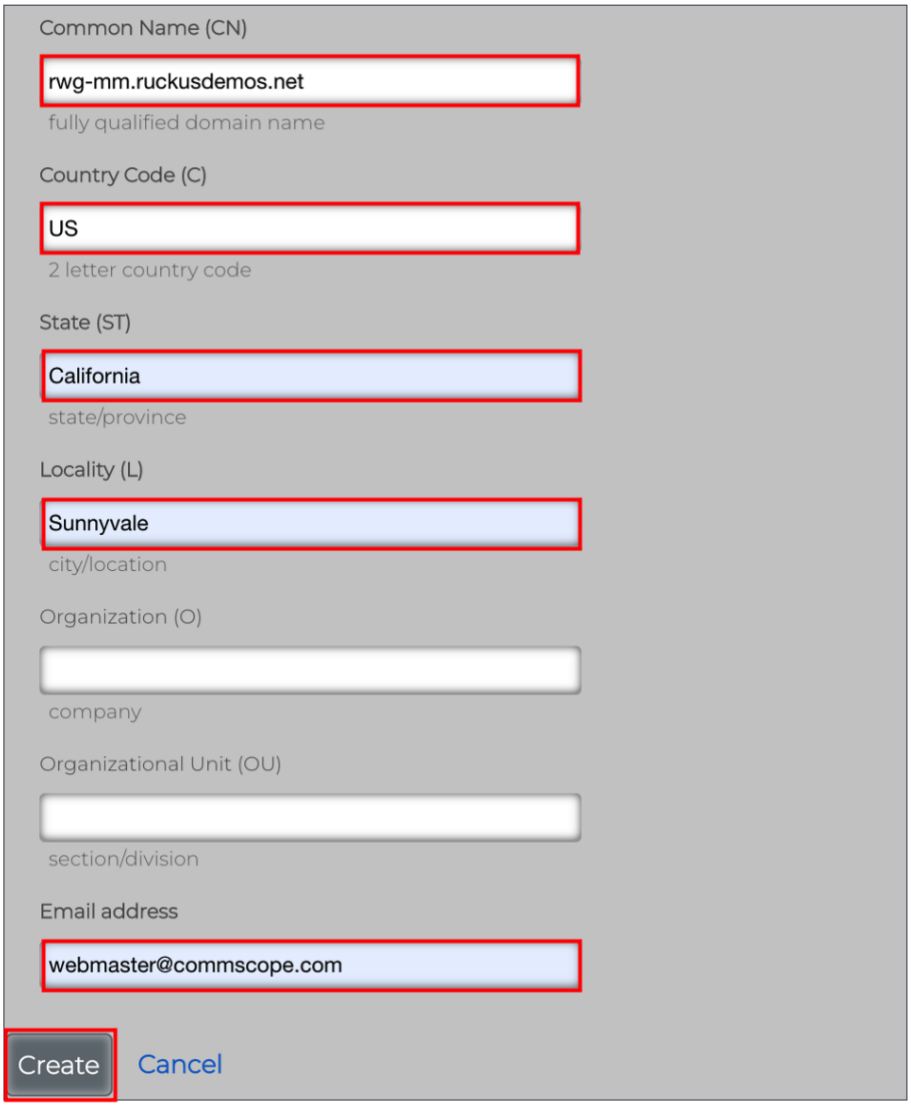


FIGURE 37 – CREATE CERTIFICATE (CONT'D)

Click **Create** to finish.

RWG will contact Let's Encrypt and send the CSR. If all is right, a new certificate entry will show in the **Certificates** section.

Click **Edit** in the certificate entry, then mark the **Active** checkbox. Scroll down and click **Update** to finish.

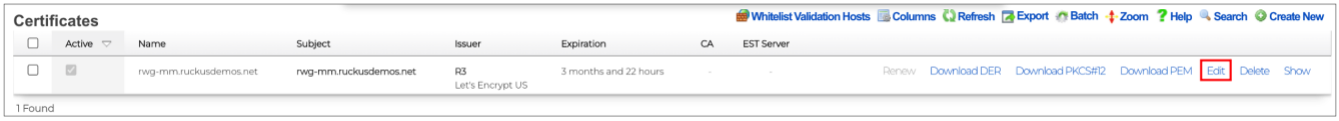


FIGURE 38 – MAKING THE CERTIFICATE ACTIVE

Now, if you close and restart your browser, the URL will show a secure SSL connection.

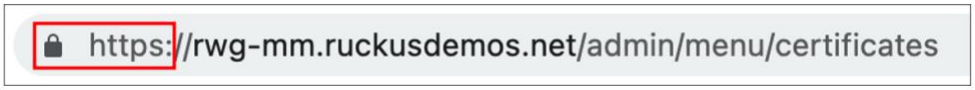


FIGURE 39 – A SECURE CONNECTION

Network Topology Diagrams

RWG uses discovery protocols like LLDP or CDP to learn about infrastructure devices and to create topology diagrams including adopted devices.

By default, all discovery protocols are disabled.

Click **Network** at the top menu to see the basic diagram created by RWG, showing its physical interfaces only.

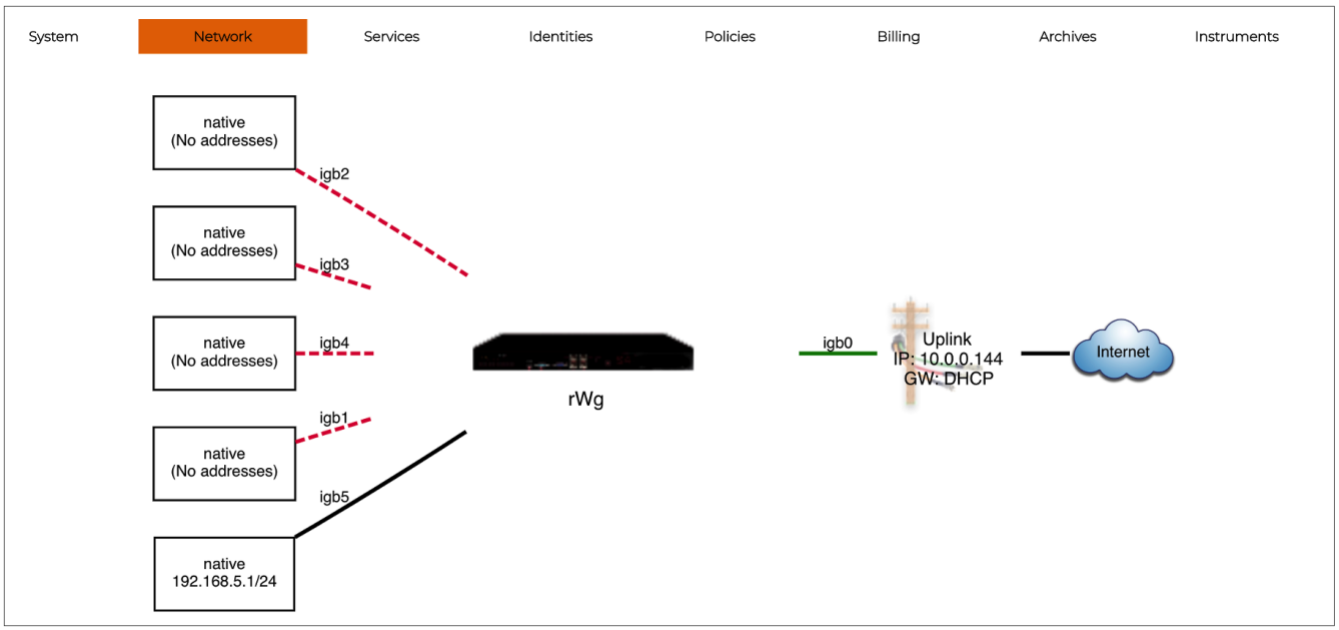


FIGURE 40 – DEFAULT TOPOLOGY DIAGRAM

Navigate to **Services/Server**, then click **Create New** in the LLDP Servers section.

FIGURE 41 – LLDP SERVERS

Enter the following information:

- **Name**: Enter a name for the server. Here, we kept the default name.
- **Active**: Make sure the checkbox is marked.
- **Auto-enable protocols**: You can unmark the checkbox if you define the protocols manually.
- **CDP, LLDP, EDP and NDP**: Mark the checkbox for the protocols you want to use.
- **Listen-only**: Unmark the checkbox, so RWG will be discovered by the infrastructure devices.
- **Interfaces**: Mark all interfaces that needs to use the discovery protocols.

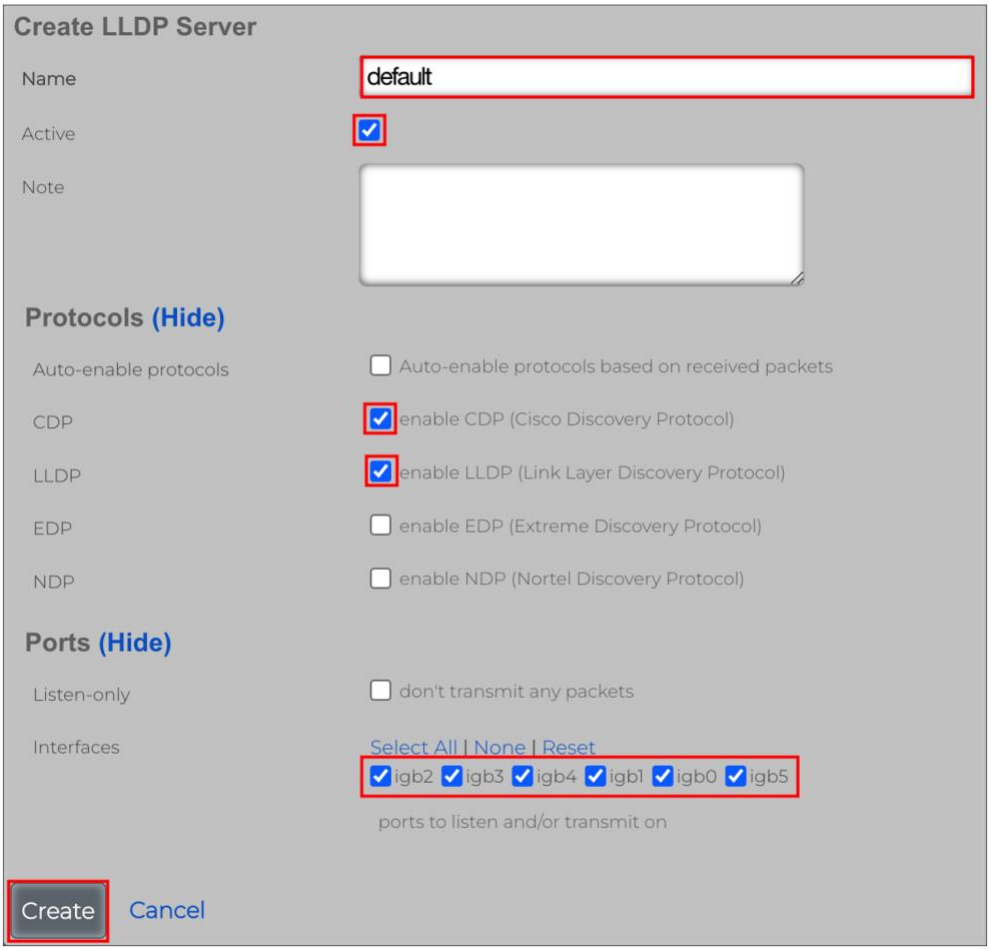
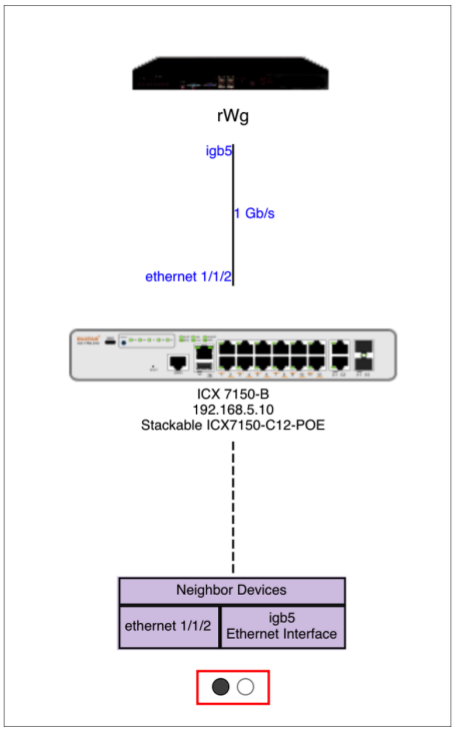


FIGURE 42 – CREATE LLDP SERVER

After the infrastructure devices are adopted and discovered, you will see new topology diagrams in **Networks**.

Here we show an example after an ICX switch is adopted.




```
SSH@ICX 7150-B#sh lldp neig det
Local port: 1/1/2
  Neighbor: 207c.14a2.7ce1, TTL 179 seconds
  + Chassis ID (MAC address): 207c.14a2.7cdc
  + Port ID (interface name): igb5
  + Time to live: 180 seconds
  + Port description    : "Intel(R) I211 (Copper)"
  + System name         : "rwg-mm.ruckusdemos.net"
  + System description    : "FreeBSD 13.1-RELEASE #74 7beb23cb amd64"
  + System capabilities : router
    Enabled capabilities: router
  + Management address (IPv4): 192.168.5.1
  + Management address (MAC address): 207c.14a2.7ce1
```

FIGURE 43 – NEW TOPOLOGY DIAGRAM AND ICX NEIGHBORS LIST

You can use the dots at the bottom of the diagram to navigate between the discovered topology and the original one showing the RWG interfaces.

The ICX switch also discovers RWG, including information of its hardware and software releases.

RWG Software Upgrade

RWG can download new software automatically, or you can download a .ISO file manually from the RUCKUS support site. Navigate to the RUCKUS support site at https://support.ruckuswireless.com/software, and select RUCKUS WAN Gateway (RWG) in the dropdown list.

The **Downloads** tab will show the recommended ISO images. Download the latest recommended image to your computer.

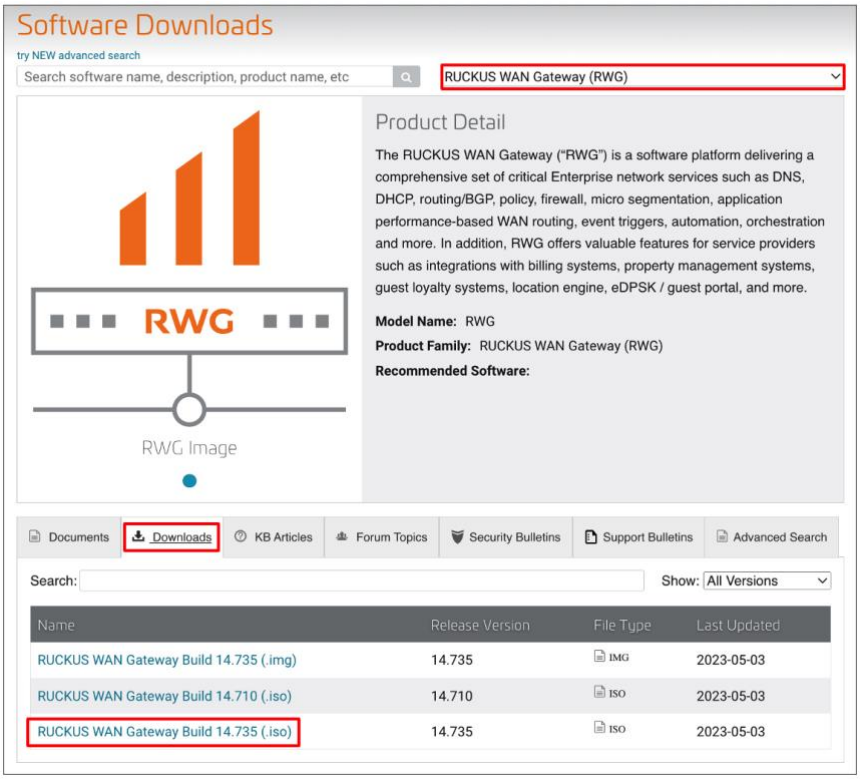


FIGURE 44 – IMAGE DOWNLOAD FROM THE RUCKUS SUPPORT SITE

You can upgrade only the RWG software, or the RWG software and OS. Before upgrading, it is recommended that you perform a configuration backup of your system.

The upgrade process might take several minutes depending on your link speed, and RWG will be unavailable during the process.

Navigate to **System/Update** and click **Download Backup** to backup your system. A .tgz file will be downloaded to your computer.

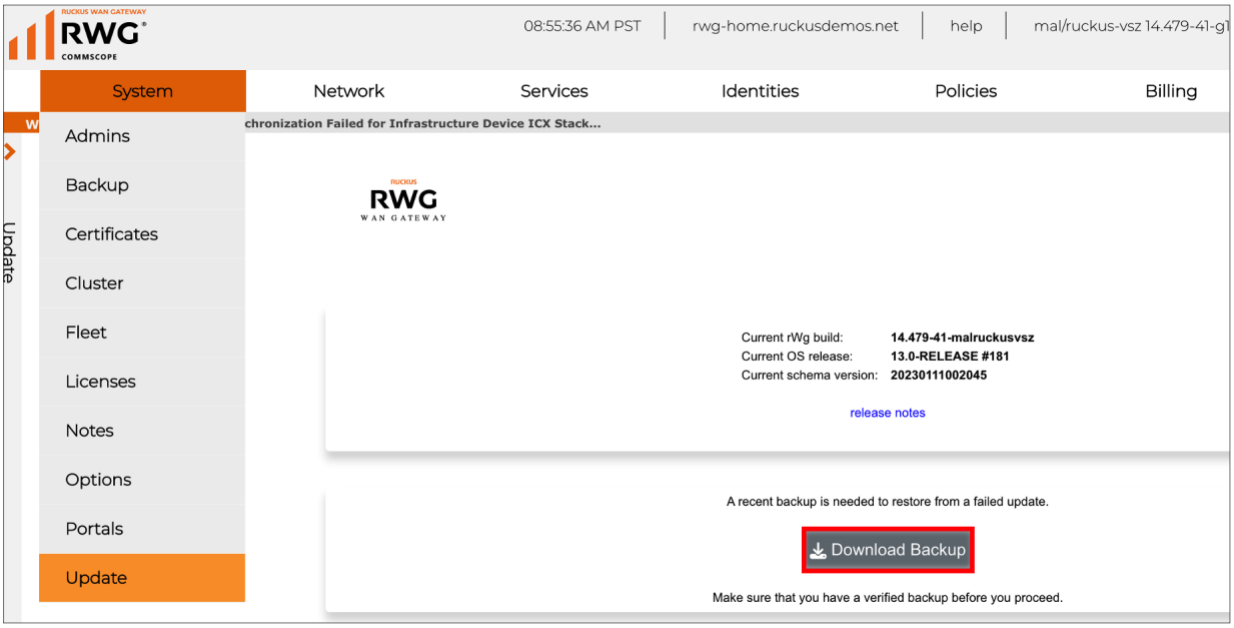


FIGURE 45 – DOWNLOAD BACKUP

Scroll down to see the upgrade options. You can perform three types of upgrades:

- OS and RWG software
- Only RWG software
- Using a local file

If you choose the options that fetch the software automatically, you need to enter your RUCKUS support credentials. In our example we see that both the RWG software and the OS need to be upgraded. Click **Update RWG + OS.**

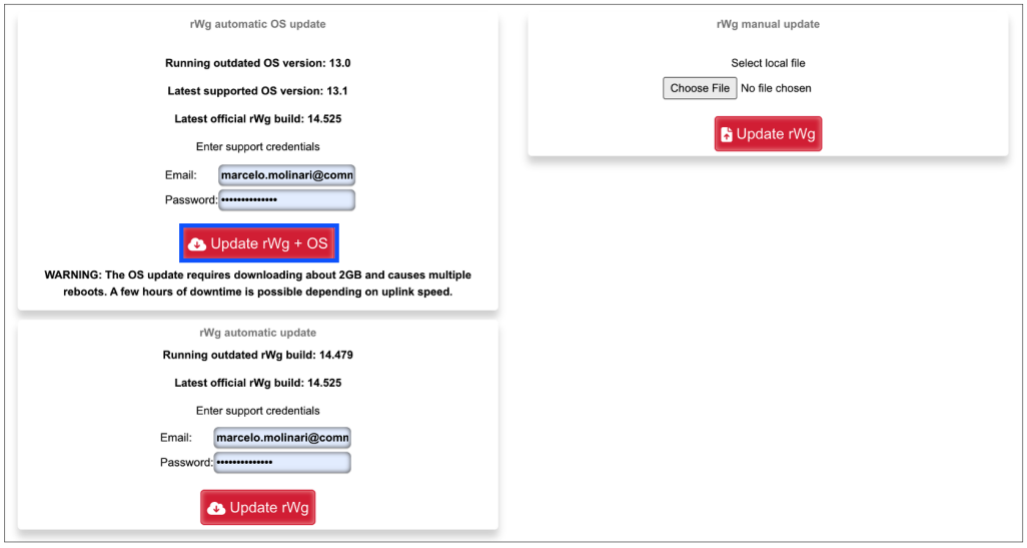


FIGURE 46 – UPGRADE RWG + OS

Click **OK** to proceed. The **Upgrade Log** panel shows the upgrade progress. After the first reboot, you can follow the upgrade process using the **tfuf** command in a SSH session to RWG.

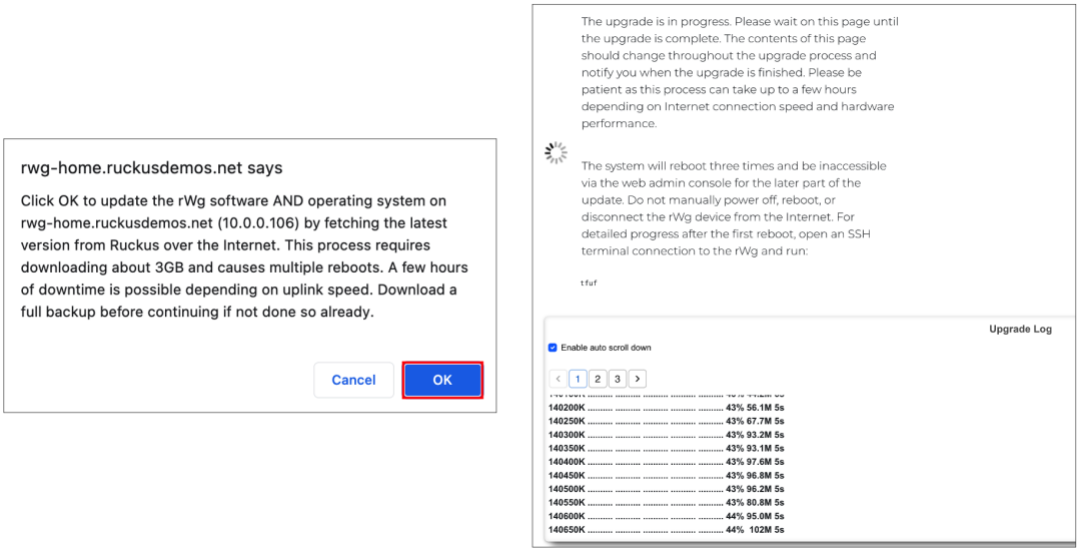


FIGURE 47 – UPGRADE IN PROGRESS

The upgrade process completes after the 3rd reboot. The new build shows at the top menu.

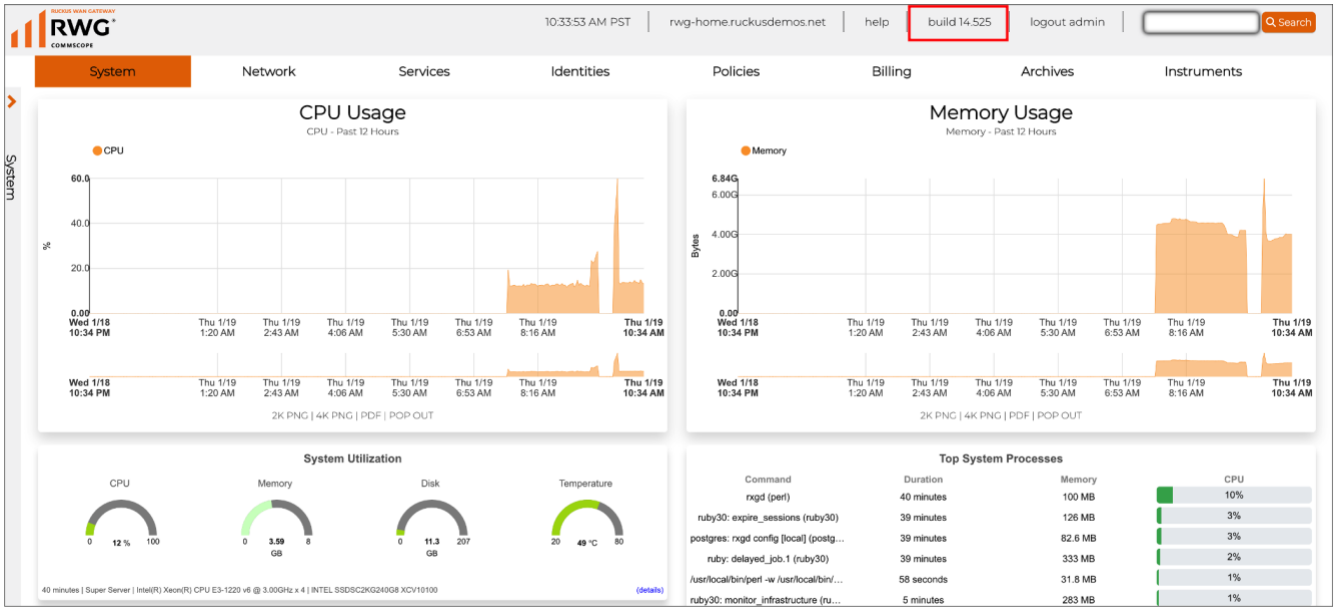


FIGURE 48 – UPGRADE COMPLETED

RWG Backup and Restore

You can perform a RWG configuration backup at any moment.

Also, RWG comes with a pre-configured backup routine to perform backups daily. You can change that routine according to your needs. The backup files can be manually downloaded to your computer, or you can define a backup server running FTP, SFTP or HTTPS, to send the backup files to an external repository automatically.

Normally, the backup files will be restored to the same RWG. It is possible to restore the backup onto a different RWG. The destination RWG needs to run the same software version or superior, and it does not need to have the same number or interfaces. If the number of interfaces in the destination RWG is different, a dialogue form will propose the necessary changes in the configuration. After the restore process is completed, the destination RWG will use the IP addresses that exist in the backup file – the ones used by the source RWG.

Backup

Navigate to **System/Backup** to see the backup and restore dialogue form.

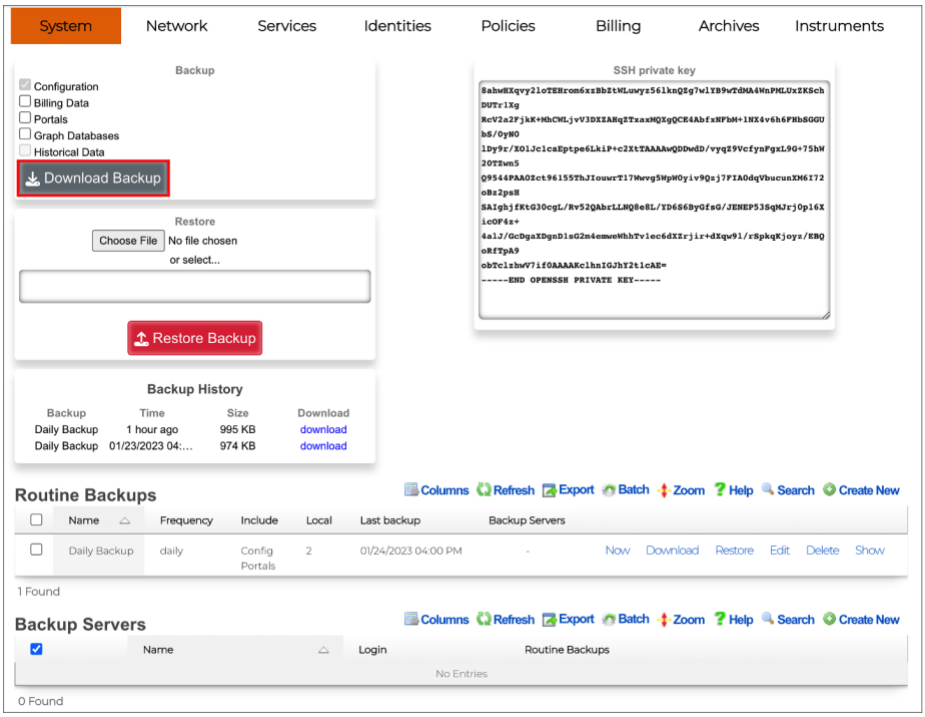


FIGURE 49 – BACKUP AND RESTORE

At the top left, you can perform a manual backup and select what type of information will be included in the backup files:

- Configuration (always checked by default)
- Billing Data
- Portals
- Graph Databases
- Historical Data

Click **Download Backup** to perform a manual backup. That will download a timestamped compressed .tgz file directly to your computer.

Routine Backups are used to schedule automatic backups. Multiple routines can be created. You can define hourly, daily, weekly and monthly backups. By default, RWG runs a daily backup routine.

The RWG configuration data is always included in the backup. As with manual backups, you can define what additional data will be backed up. The backup files will be stored inside RWG, up to a defined number. Click download to download a backup to your computer.

You can also define external **Backup Servers**, where the backup files will be sent to automatically. Backup servers can use SFTP, FTP and HTTPS. If required, multiple backup servers can be created.

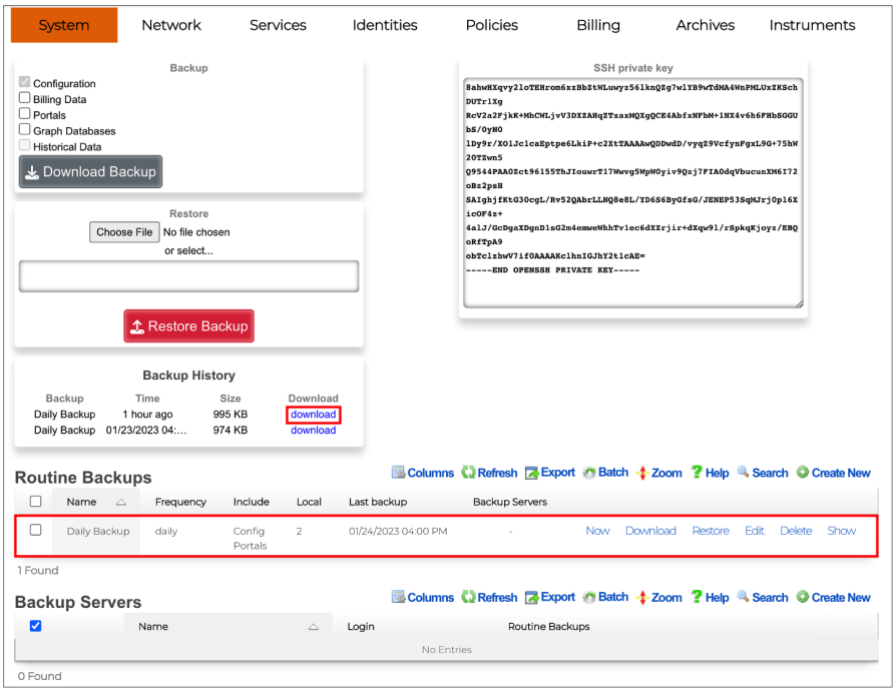


FIGURE 50 – ROUTINE BACKUPS

Restore

You can choose an external file to restore (that needs to be the compressed .tgz file), or you can select a backup file from the list of backups stored in RWG. Click **Restore Backup** to execute the restore.

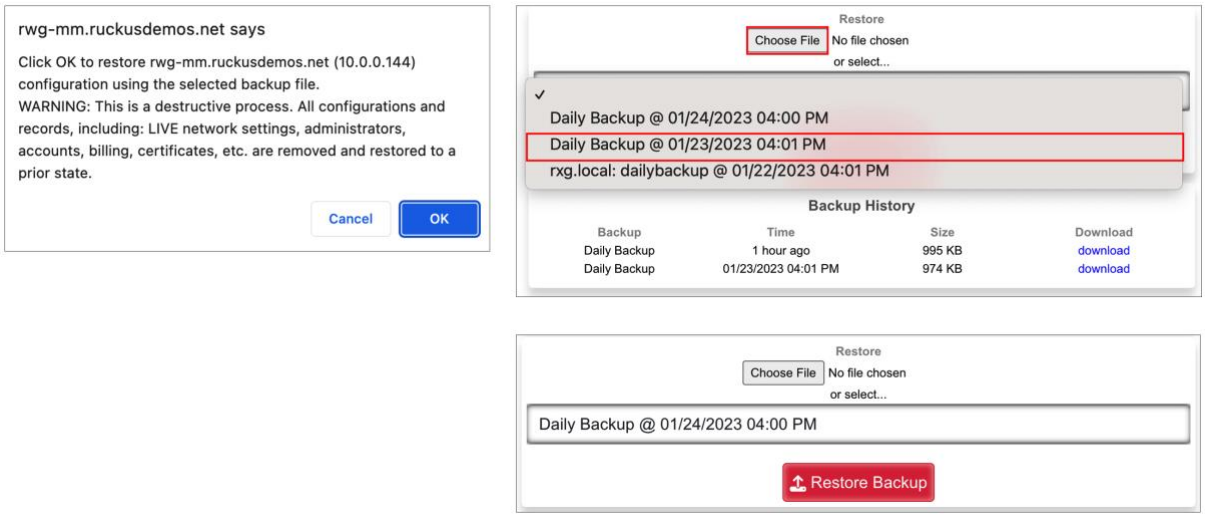


FIGURE 51 – SELECT THE BACKUP TO RESTORE

Right after the restore process starts, a **Restore Log** is shown. If required, you can download a log file to see all the steps in the restore process.

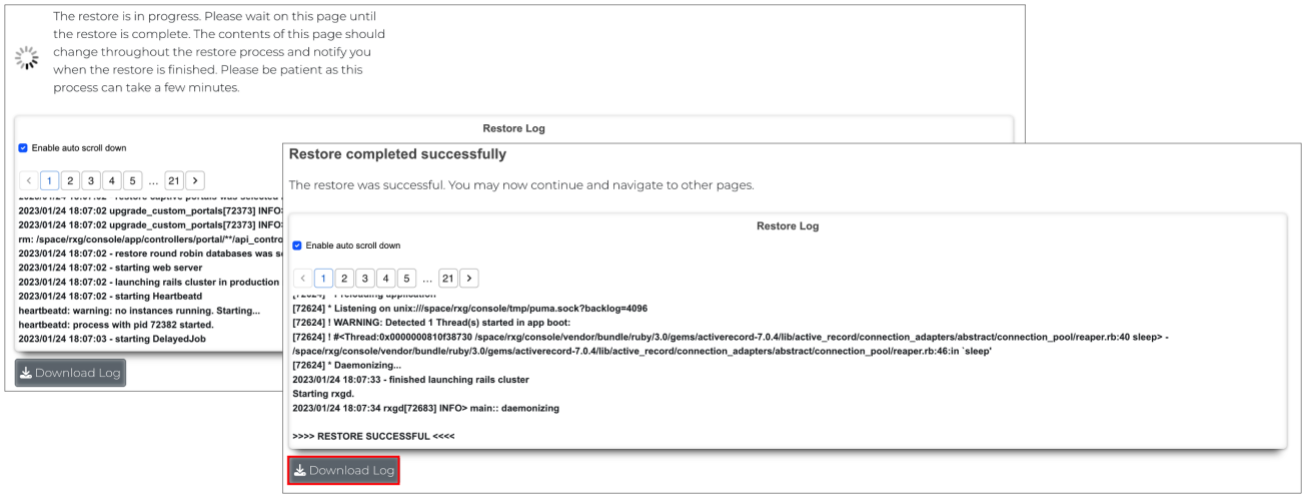


FIGURE 52 – THE RESTORE LOG

Config Templates

Configuration templates are YAML definitions used to bootstrap a new RWG node, or change the configuration of existing RWGs. The templates can be created manually, or generated automatically for any RWG scaffold, or for the entire RWG configuration. Using config templates makes it very easy to share the entire configuration for a complete MDU or HSP solution. The example below shows the YAML file for the **VLAN Interfaces** scaffold:

```yaml
---
Vlan:
- name: VLAN 100
  interface: igb5
  tag: 100
  autoincrement_mode: none
- name: VLAN 200
  interface: igb5
  tag: 200
  autoincrement_mode: none
  addresses:
  - subnet 200
- name: VLAN 150
  interface: igb5
  tag: 150
  autoincrement_mode: none
  addresses:
  - subnet 150
```

FIGURE 53 – CONFIG TEMPLATE FOR VLAN INTERFACES

Generate a Config Template for a Scaffold

To generate a config template, navigate to the desired scaffold, then click **Export/rWg Config Template**:

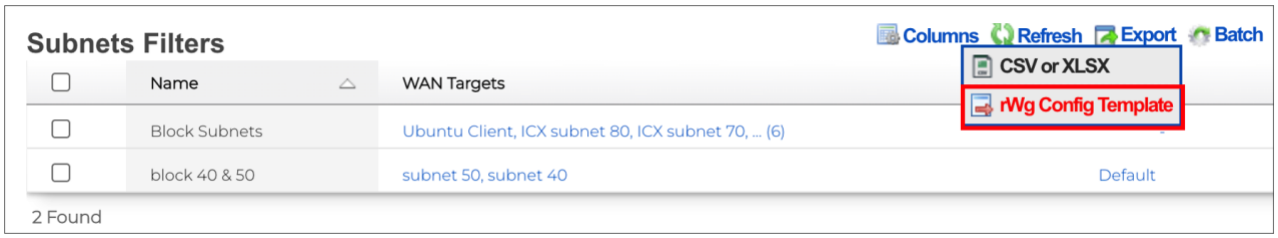


FIGURE 54 – GENERATE THE TEMPLATE FOR SUBNETS FILTERS

Accept the defaults and click **Export**. The YAML file will be downloaded to your computer.

FIGURE 55 – EXPORT THE CONFIG TEMPLATE

```yaml
---
SubnetsFilter:
- name: Block Subnets
  wan_targets:
  - ICX subnet 90
  - ICX subnet 80
  - ICX subnet 70
  - ICX subnet 60
  - Ubuntu Client
  - ISP 1
- name: block 40 & 50
  wan_targets:
  - subnet 50
  - subnet 40
  policies:
  - Default
```

FIGURE 56 – TEMPLATE FOR SUBNET FILTERS

Generate a Config Template for the Entire RWG

It is also possible to generate a config template for the entire RWG. Navigate to **System/Backup**, then click **Generate Template** at the **Config Templates** section:

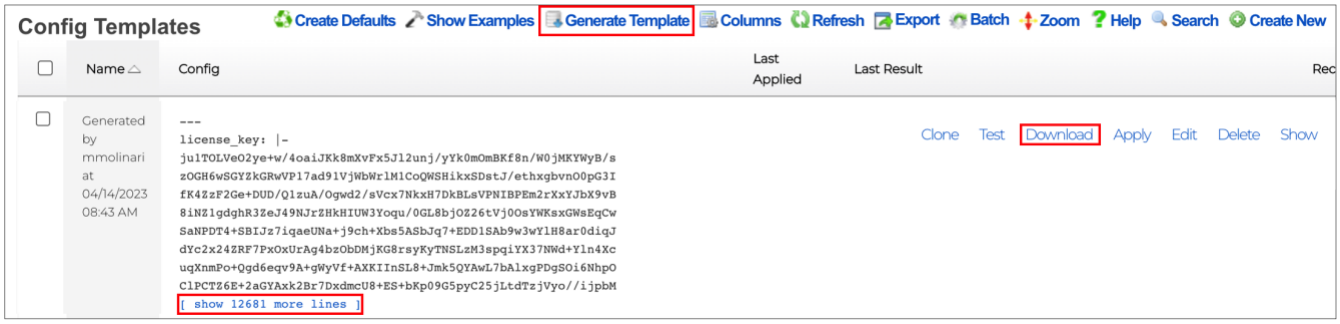


FIGURE 57 – GENERATE TEMPLATE FOR THE ENTIRE SMARTZONE

After a few seconds, a new template entry will show under the Config Templates section. You can click **show more lines** to see details or **Download** to get the YAML file.

Upload, Test and Apply a Config Template

Navigate to **System/Backup**, and click **Create New** in the section **Config Templates**. Enter the following information:

- **Name**: Enter a name for the template.
- **File Upload**: Select the YAML file with the configuration that you want to apply to RWG.

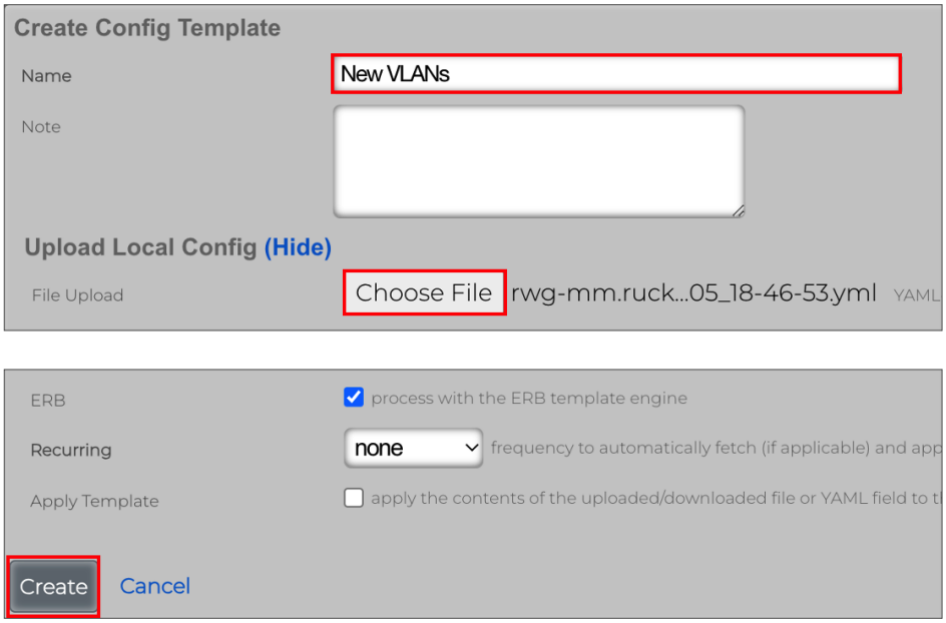


FIGURE 58 – UPLOAD THE TEMPLATE FILE

Scroll down and click **Create** to finish.

It is possible to create recurrent templates, which will execute every hour, day, week, etc. If you mark the **Apply Template** checkbox, the template will be applied to RWG as soon as it is created. Leave the checkbox unmarked for now.

To edit an existing template, click **Edit** on the new entry.

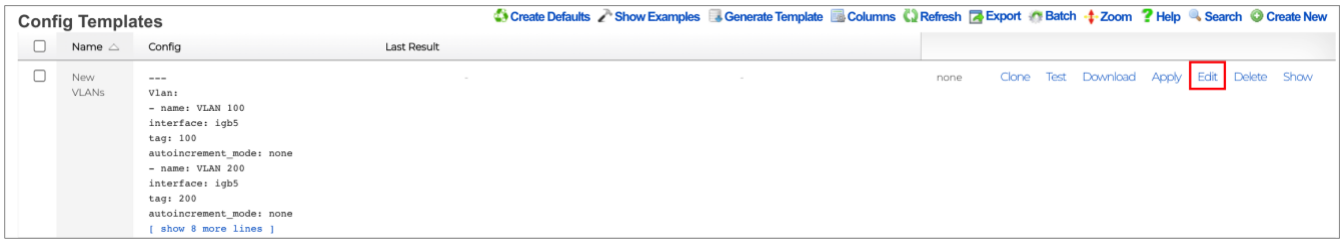


FIGURE 59 – EDIT THE TEMPLATE FILE

If required, you can edit the template lines directly inside the **Config** form.

FIGURE 60 – EDIT THE TEMPLATE LINES

Click **Test** to verify the template syntax. That does not apply the template to RWG.

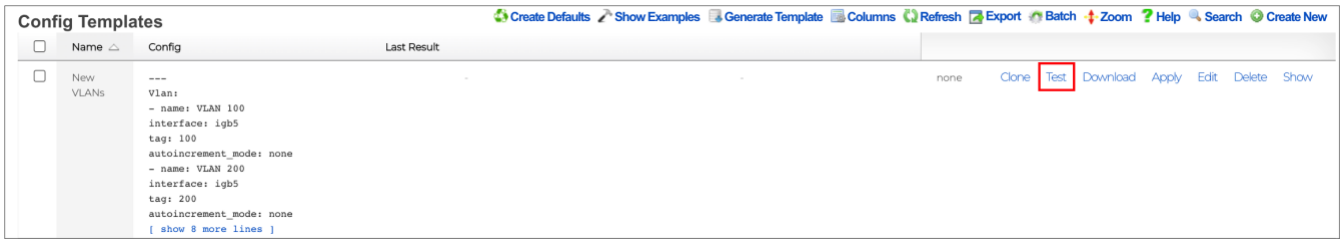


FIGURE 61 – TEST THE TEMPLATE

If all is good, the test will succeed. Otherwise, edit the template and fix the error.

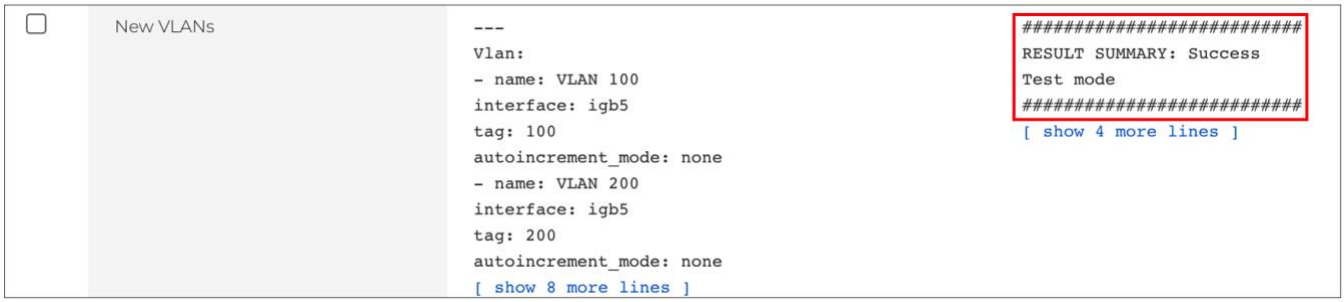


FIGURE 62 – TEST SUCCEED

To apply the template to RWG, click **Apply**:

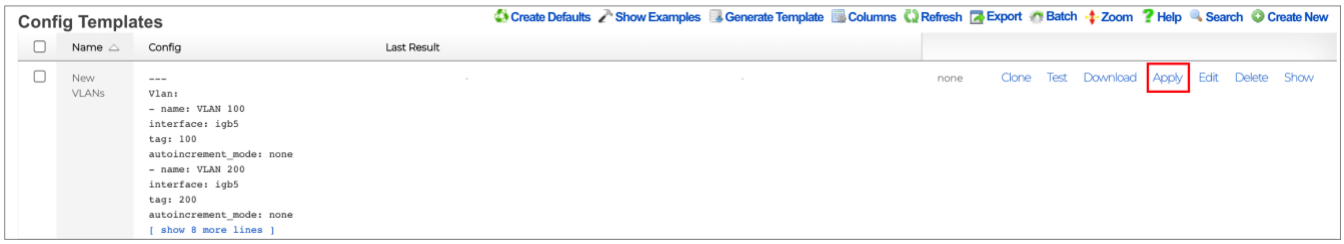
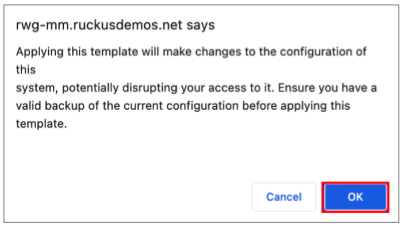


FIGURE 63 – APPLY THE TEMPLATE

Click **OK** to confirm. If all goes well, you will receive a success message:



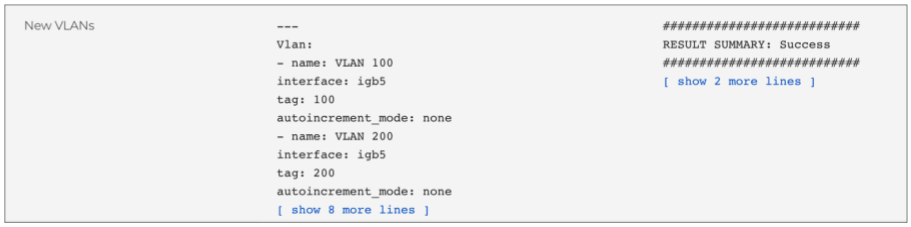


FIGURE 64 – SUCCESS

Basic Troubleshooting

RWG includes several tools to manage the solutions and to troubleshoot the network or client access problems. This document covers the following tools:

- Instruments: Ping, Traceroute and DHCP Leases
- Logs: Notification logs, RADIUS logs, etc
- Search Tool

Instruments

Click **Instruments** at the top menu to see a graph for uplink traffic, and several gauges and tables to monitor your RWG. You can rotate among different gauges by clicking the dots.

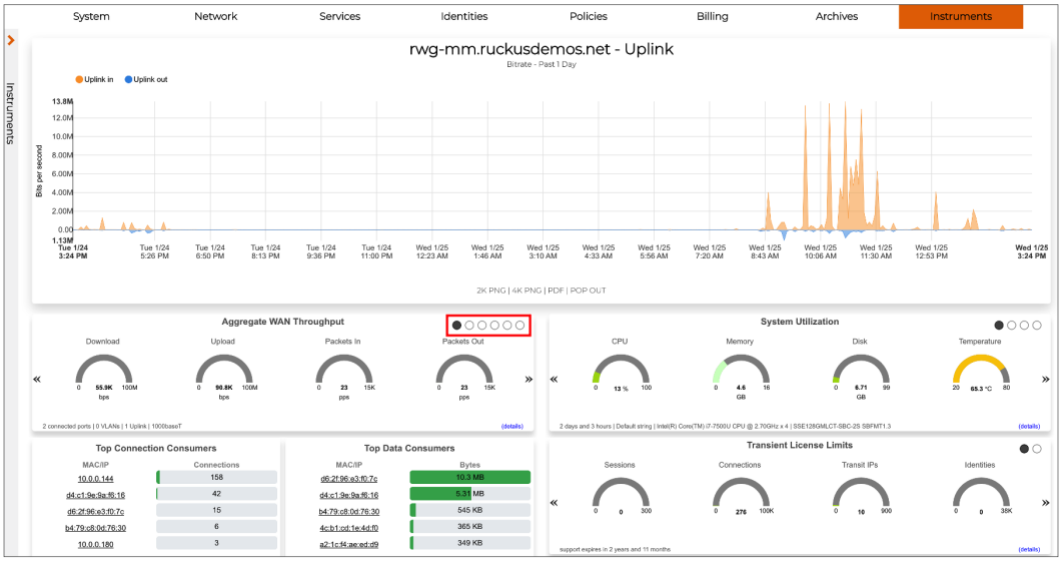


FIGURE 52 – INSTRUMENTS

The **Instruments** menu has a variety of tools to help you manage and troubleshoot your network.

Here are some of the most useful tools:

- **MAC • DHCP • DNS:** Here you can find the MAC addresses and DHCP leases for all infrastructure devices and client devices. You can see the VLAN assignment in the DHCP leased, and you can also convert a leased entry to a fixed IP address directly from the list of devices.
- **NAT Assignments**: Useful to make sure a local subnet is being NAT'ed correctly by RWG.
- **Route Entries**: Shows the RWG routing table.
- **Utilities**: Includes a ping and a traceroute tool.

DHCP Leases

Issued	IP	MAC	Vendor	Hostname	Expires	Network	Pool	Fixed Host	Ethernet	VLAN
01/25/2023 03:40:35 PM	192.168.5.253	b4:79:c8:0d:76:30	Ruckus Wireless	-	01/25/2023 04:40:35 PM	igb5	Management LAN	Create New	igb5	-
01/25/2023 03:40:11 PM	192.168.5.10	d4:c1:9e:9a:f6:16	Ruckus Wireless	-	01/25/2023 04:40:11 PM	igb5	Management LAN	ICX 7150-B	igb5	-
01/25/2023 03:40:09 PM	192.168.5.250	da:79:93:60:18:6a	-	Marcelo-s-S10	01/25/2023 04:40:09 PM	igb5	Management LAN	Create New	igb5	VLAN 600

FIGURE 53 – CONVERTING A DHCP LEASE TO A FIXED HOST ADDRESS

Logs

The **Archives** menu include logs for most of the RWG services. Here are the most useful ones:

- **Notification Logs**: Here are the warning messages shown at top of the RWG UI are stored.
- **RADIUS Logs**: Useful to check VLAN tag assignments.
- **.log Files:** Includes complete log files for all RWG services. Very useful to check detailed RADIUS responses with VLAN assignments or DHCP messages.

Let's see some examples.

Archives
- Notification Logs
- Reports
- Admin Logs
- Connection Logs
- DHCP · DNS Logs
- Portal Logs
- Queue Logs
- RADIUS Logs
- Trigger Logs
- Web Logs
- .log Files

Notification Logs

The Notification Logs show the warning messages that show at the top of the RWG UI:

System | Network | Services | Identities | Policies | Billing | Archives | Instruments

WARNING NTP is not synchronized...

Health Notices

Cure All | Columns | Refresh

Created	Name	Message	Severity	Cured	Reason
01/23/2023 11:14 AM	My Ip Conflict	another device is using my IP address!	Critical	01/25/2023 04:10 PM	I had two RWGs with the same address
01/23/2023 11:22 AM	Monitor Infrastructure Device 62	Unreachable: vSZ-249 - Failed to open TCP connection to 192.168.5.249:8443 (Connection refused - connect(2) for 192.168.5.249:8443)	Warning	-	-
01/24/2023 08:55 AM	Infrastructure Device 62 Monitor	vSZ-249 [192.168.5.249] is OFFLINE	Notice	-	-
01/24/2023 12:36 PM	Ping Target 1 Monitor	Google Public DNS 1 [8.8.8.8] is OFFLINE	Notice	-	-
01/24/2023 12:37 PM	Ping Target 2 Monitor	Google Public DNS 2 [8.8.4.4] is OFFLINE	Notice	-	-
01/24/2023 12:37 PM	Monitor Infrastructure Device 61	Unreachable: vSZ-MM - Failed to open TCP connection to vszh-mm.ruckusdemos.net:8443 (getaddrinfo: Name does not resolve)	Warning	-	-
01/25/2023 04:04 PM	Ntp Server	NTP is not synchronized	Warning	-	-
01/22/2023 04:58 PM	Infrastructure Device 53 Monitor	ICX 7150-B [192.168.5.242] is OFFLINE	Notice	01/25/2023 04:06 PM	ICX 7150-B [192.168.5.242] is ONLINE

FIGURE 54 – NOTIFICATION LOGS/HEALTH NOTICE

RADIUS Logs

The RADIUS Logs show the expired VLAN Tag Assignments:

Expired VLAN Tag Assignments

Assigned	Expired	MAC	VLAN	Tag	Account	Group	Duration (Filtered)	RADIUS Server Realm	Called-Station MAC
01/22/2023 07:30 AM	01/22/2023 04:58 PM	38:f9:d3:d4:c0:78	Client VLANs	405	-	-	9 hours and 28 minutes	Microsegmentation Realm	b4:79:c8:0d:76:30
01/21/2023 05:28 PM	01/21/2023 06:29 PM	6e:9b:45:33:32:a0	Client VLANs	404	simone	VLAN 700	1 hour	Microsegmentation Realm	b4:79:c8:0d:76:30
01/21/2023 05:28 PM	01/21/2023 10:58 PM	38:f9:d3:d4:c0:78	Client VLANs	402	-	-	5 hours and 30 minutes	Microsegmentation Realm	b4:79:c8:0d:76:30
01/21/2023 03:06 PM	01/21/2023 04:59 PM	7a:8f:7a:1c:84:63	Client VLANs	400	-	-	less than 1 second	-	b4:79:c8:0d:76:30
01/21/2023 07:11 AM	01/21/2023 05:19 PM	ae:e5:cb:69:08:2a	VLAN 700	700	simone	VLAN 700	less than 1 second	VLAN 700 Realm	b4:79:c8:0d:76:30
01/21/2023 07:11 AM	01/21/2023 01:43 PM	6e:9b:45:33:32:a0	VLAN 700	700	simone	VLAN 700	6 hours and 32 minutes	VLAN 700 Realm	b4:79:c8:0d:76:30
01/21/2023 07:10 AM	01/21/2023 07:11 AM	6e:9b:45:33:32:a0	VLAN 600	600	marcelo	VLAN 600	less than 1 second	VLAN 600 Realm	b4:79:c8:0d:76:30
01/21/2023 07:03 AM	01/21/2023 07:09 AM	ae:e5:cb:69:08:2a	VLAN 600	600	marcelo	VLAN 600	less than 1 second	VLAN 600 Realm	b4:79:c8:0d:76:30
01/21/2023 06:52 AM	01/21/2023 07:02 AM	ae:e5:cb:69:08:2a	VLAN 700	700	simone	VLAN 700	less than 1 second	VLAN 700 Realm	b4:79:c8:0d:76:30
01/21/2023 06:49 AM	01/21/2023 07:08 AM	6e:9b:45:33:32:a0	VLAN 600	600	marcelo	VLAN 600	less than 1 second	VLAN 600 Realm	b4:79:c8:0d:76:30

FIGURE 55 – RADIUS LOGS/EXPIRED VLAN TAG ASSIGNMENTS

.log Files

Here you can see all details for the RADIUS and DHCP handshake:

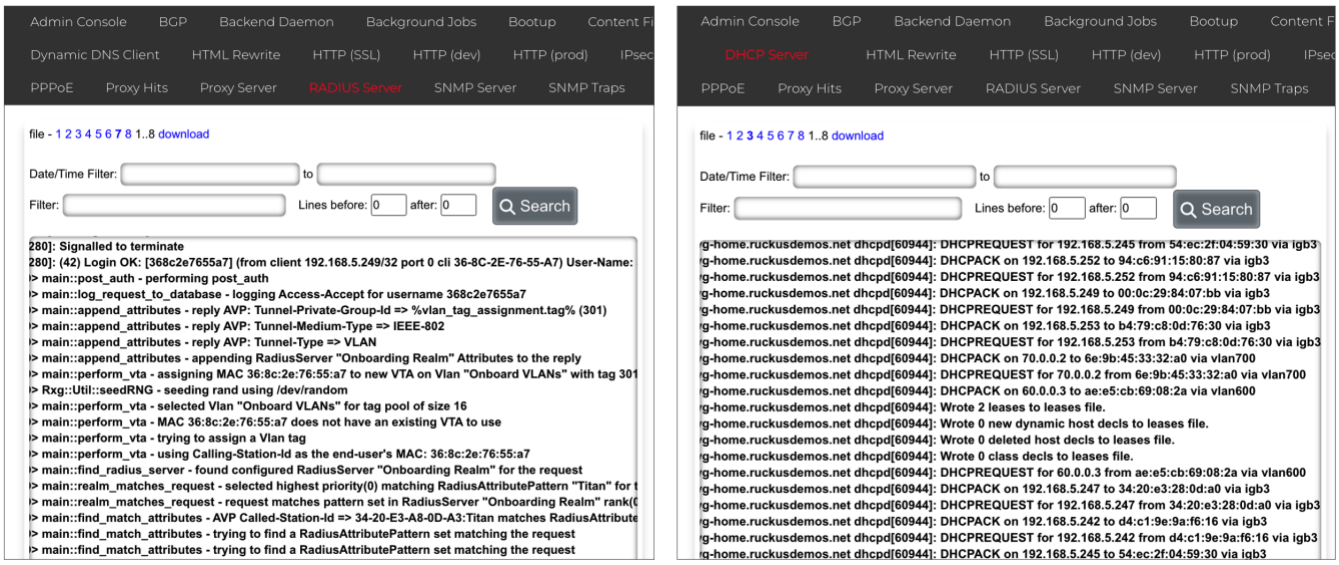


FIGURE 56 – RADIUS SERVER AND DHCP SERVER LOGS

Search Tool

The **Search** button at the top right corner is not for searching documents. It's for searching devices (either infrastructure devices or client devices). You will see the identity groups, sessions in use, and policies applied to the device. In the example we entered the IP address for an adopted ICX switch. The policy that is in use by the device is marked active.

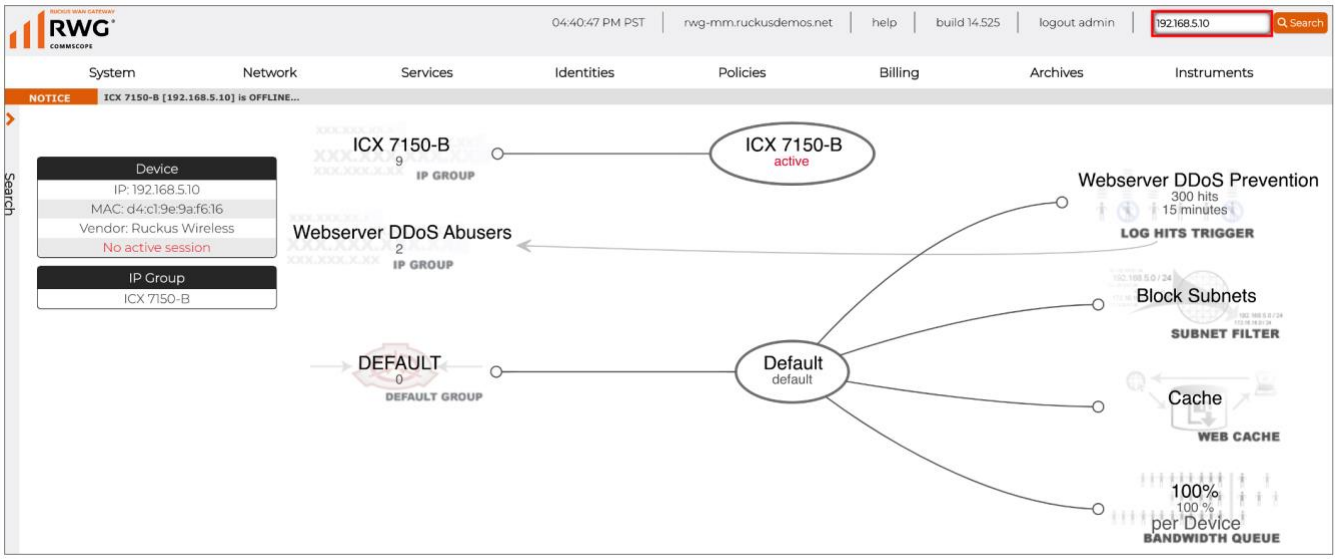


FIGURE 57 – THE SEARCH TOOL

You can also search devices by MAC address, client last name or room number.

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