

Grandstream Networks, Inc.

GCC6000 –  
**VRRP User Guide**



# GCC6000 – VRRP User Guide

## Introduction to VRRP

The **Virtual Router Redundancy Protocol (VRRP)** is a powerful tool for ensuring network reliability and minimizing downtime. Typically deployed on egress gateway devices within a Local Area Network (LAN), VRRP creates a seamless failover mechanism by grouping multiple gateway devices into a virtual router. This virtual router serves as the default gateway for devices in the LAN, enabling uninterrupted connectivity even if one gateway device fails.

VRRP is particularly well-suited for small networks or scenarios with limited budgets, providing a cost-effective and simple solution for network redundancy.

### Key Features of VRRP:

- **Flexible Configuration Options:** Configure VRRP protocol message parameters to suit your network's needs.
- **Load Balancing:** Distribute traffic across multiple routers for improved performance and resource utilization.
- **Interface Support:** Configure VRRP on both **WAN** and **VLAN** interfaces to ensure comprehensive redundancy.
- **Synchronization Groups:** Switch the roles of a group (e.g., VLAN ↔ WAN) as a single unit for consistent failover.
- **VPN Compatibility:** WAN port VRRP supports synchronous switching of VPN services, ensuring secure and reliable connections.
- **Multi-Vendor Support:** Group VRRP-enabled devices from different manufacturers for enhanced flexibility.
- **Comprehensive Logs:** View detailed VRRP log information to monitor and troubleshoot your setup.
- **Protocol Support:** Compatible with both **VRRPv2** and **VRRPv3** protocols. (**Note:** IPv6 is not supported).

## Configuring a VRRP Group

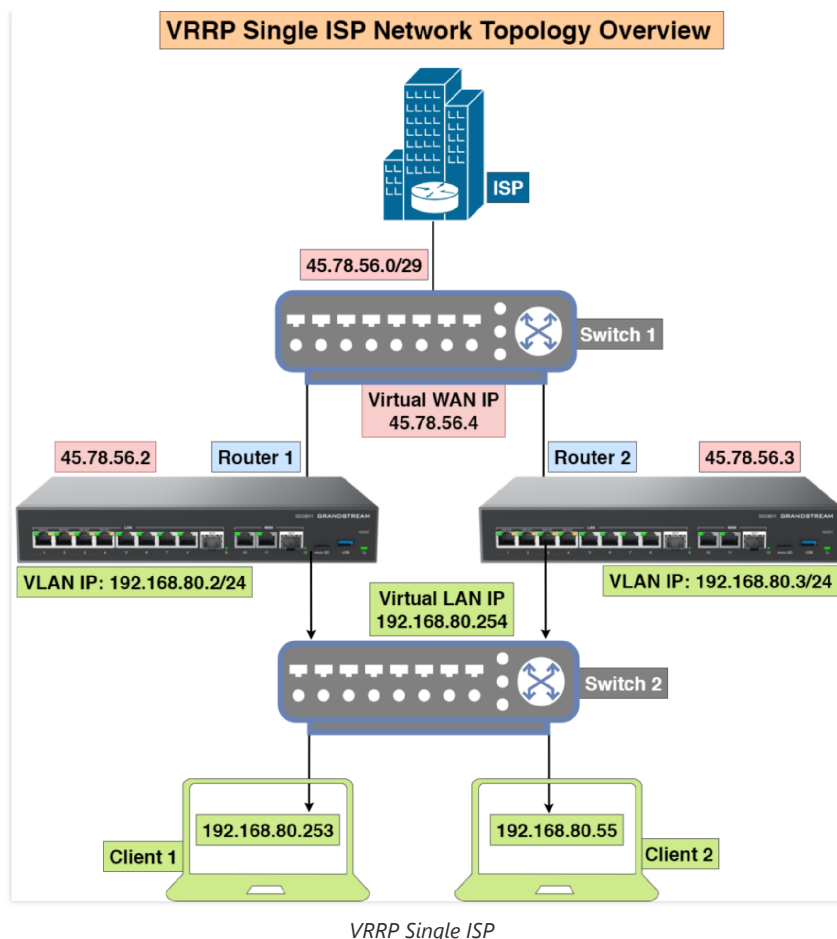
### Network Topology Overview

These two network topologies illustrate two VRRP implementation scenarios: one involving a single ISP and the other utilizing dual ISPs.

#### VRRP with a Single ISP:

In a **single ISP** environment, deploying two routers configured with VRRP enhances network reliability and ensures continuous service. The **primary Router 1**, acting as the master VRRP router, handles all network traffic during normal operations. The **secondary Router 2** remains on standby, ready to assume control automatically in the event of a hardware failure, scheduled maintenance, or unexpected outages.

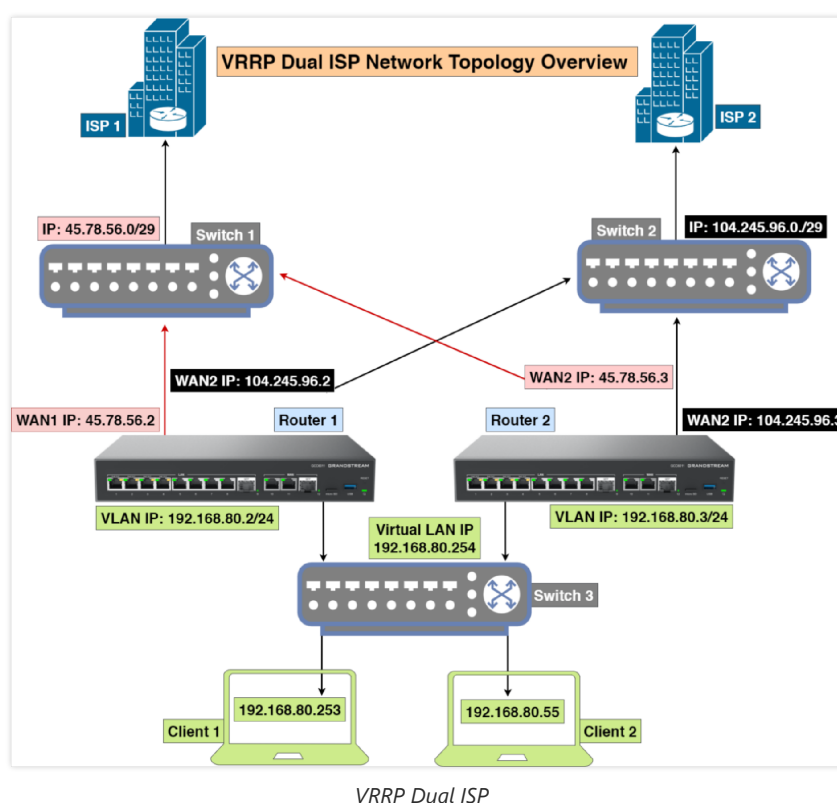
This setup significantly boosts network availability by reducing potential downtime. Seamless role switching between the master and backup devices ensures uninterrupted connectivity, maintaining critical services without manual intervention. Additionally, this redundancy improves fault tolerance and adds a layer of resilience to the overall network infrastructure.



#### VRRP with dual ISP:

In a **dual ISP** setup, two routers configured with VRRP not only provide redundancy at the device level but also enhance network resilience by leveraging **multiple ISP connections**. Each router connects to a **separate ISP**, ensuring that even if one ISP experiences an outage, the network can seamlessly failover to the secondary connection.

Unlike the single ISP configuration, this setup improves both availability and performance by enabling load balancing across ISPs. The master VRRP router manages traffic distribution, while the backup router remains in standby, ready to take over in case of device failure or network disruptions. This dual-path redundancy minimizes downtime, increases fault tolerance, and ensures high availability, offering uninterrupted connectivity even during ISP-level issues.

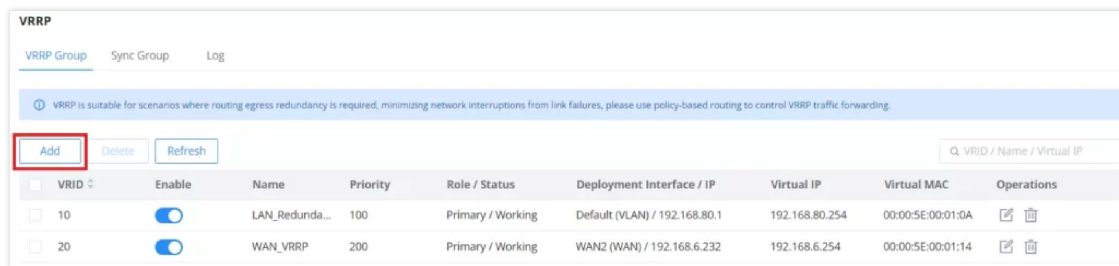


## VRRP group

To properly configure and activate a VRRP group, follow these steps:

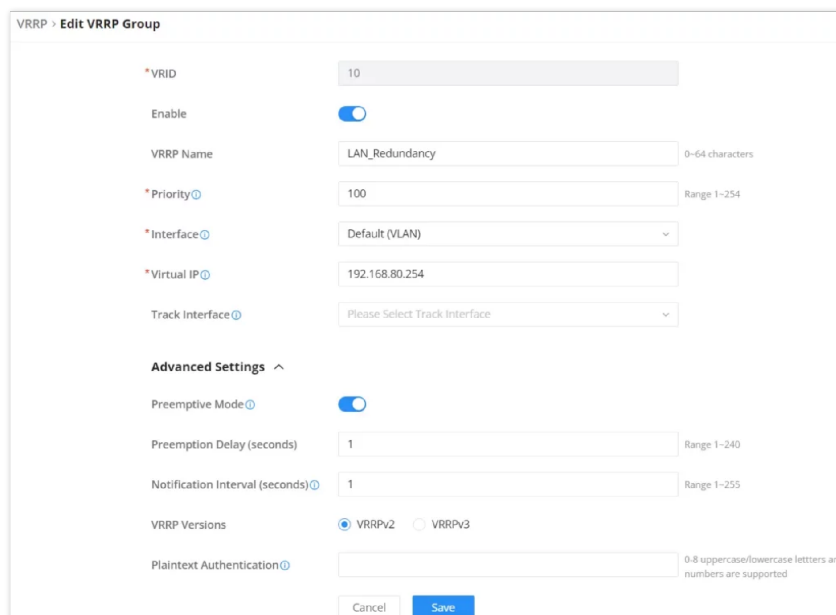
1. Navigate to **GCC WebUI** → **VRRP page** then **create the VRRP group**.
2. Configure the following key settings:
  - **VRID**: Set the unique Virtual Router ID for the group.
  - **Priority**: Assign the priority level to determine the primary device.
  - **Deployment Interface**: Select the interface where VRRP will operate.
  - **Virtual IP Address**: Specify the shared floating IP for the group.
3. **Enable the VRRP group** to ensure it functions as intended.

Please refer to the figures and table below for more details:



| VRID | Enable                              | Name           | Priority | Role / Status     | Deployment Interface / IP     | Virtual IP     | Virtual MAC       | Operations |
|------|-------------------------------------|----------------|----------|-------------------|-------------------------------|----------------|-------------------|------------|
| 10   | <input checked="" type="checkbox"/> | LAN_Redunda... | 100      | Primary / Working | Default (VLAN) / 192.168.80.1 | 192.168.80.254 | 00:00:5E:00:01:0A |            |
| 20   | <input checked="" type="checkbox"/> | WAN_VRRP       | 200      | Primary / Working | WAN2 (WAN) / 192.168.6.232    | 192.168.6.254  | 00:00:5E:00:01:14 |            |

VRRP Group page



**VRRP > Edit VRRP Group**

\*VRID: 10

Enable: ☒

VRRP Name: LAN\_Redundancy (0-64 characters)

\*Priority: 100 (Range 1-254)

\*Interface: Default (VLAN)

\*Virtual IP: 192.168.80.254

Track Interface: Please Select Track Interface

**Advanced Settings**

Preemptive Mode: ☒

Preemption Delay (seconds): 1 (Range 1-240)

Notification Interval (seconds): 1 (Range 1-255)

VRRP Versions: ☒ VRRPv2 ☐ VRRPv3

Plaintext Authentication: (0-8 uppercase/lowercase letters and numbers are supported)

Cancel Save

AddEdit VRRP Group

| Field     | Description                                                                                                                                                                                         |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VRID      | Specifies the Virtual Router ID for the VRRP group. Each VRRP group must have a unique VRID, and devices within the same group must use the same VRID. A single device cannot have duplicate VRIDs. |
| Enable    | Enables or disables the VRRP group. Toggle this option to activate VRRP for the specified configuration.                                                                                            |
| VRRP Name | Assigns a descriptive name to the VRRP group. If left blank, the system uses a default format: VRRP+VRID (e.g., VRRP10).                                                                            |

|                                 |                                                                                                                                                                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Priority                        | Determines the router's priority within the VRRP group. The router with the highest priority becomes the primary device. In case of a tie, the router with the larger interface IP address takes precedence.                              |
| Interface                       | Selects the network interface where VRRP will operate. Options include Default (VLAN) for LAN redundancy and WAN for egress redundancy. Each interface can only belong to one VRRP group.                                                 |
| Virtual IP                      | The Virtual IP (VIP) must be in the same subnet as the deployment interface but cannot match the interface's assigned IP. For VLAN interfaces, the VIP should be the default gateway for devices in the VLAN, ensuring seamless failover. |
| Track Interface                 | Monitors the status of uplink interfaces (e.g., WAN). If all tracked interfaces are down, the router relinquishes its primary role.                                                                                                       |
| Advanced Settings               |                                                                                                                                                                                                                                           |
| Preemption Mode                 | Allows a backup router with a higher priority to preempt the current primary router.                                                                                                                                                      |
| Preemption Delay (seconds)      | Specifies the time (default: 1 second) to wait before initiating preemption. This minimizes disruptions caused by transient network issues.                                                                                               |
| Notification Interval (seconds) | Sets the frequency at which the primary router sends VRRP advertisements. All routers in the VRRP group must use the same interval to ensure proper synchronization.                                                                      |
| VRRP Versions                   | Configures the VRRP version: VRRPv2 supports IPv4 networks, while VRRPv3 supports both IPv4 and IPv6. Note: IPv6 is currently not supported.                                                                                              |
| Plaintext Authentication        | Enables authentication to secure VRRP communication and prevent unauthorized devices from joining the group. Both primary and backup devices must use the same authentication string. Only supported in VRRPv2.                           |

Add/Edit VRRP Group

**GCC 1: Primary:** create two VRRP Groups, one for LAN and another one for WAN with high priority.

|                                                                                                                                                                                                      |      |                                     |                |          |                   |                               |                |                   |                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------|----------------|----------|-------------------|-------------------------------|----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VRRP                                                                                                                                                                                                 |      |                                     |                |          |                   |                               |                |                   |                                                                                                                                                                             |
| VRRP Group Sync Group Log                                                                                                                                                                            |      |                                     |                |          |                   |                               |                |                   |                                                                                                                                                                             |
| VRRP is suitable for scenarios where routing egress redundancy is required, minimizing network interruptions from link failures, please use policy-based routing to control VRRP traffic forwarding. |      |                                     |                |          |                   |                               |                |                   |                                                                                                                                                                             |
| Add Delete Refresh                                                                                                                                                                                   |      |                                     |                |          |                   |                               |                |                   |                                                                                                                                                                             |
| Q VRID / Name / Virtual IP                                                                                                                                                                           |      |                                     |                |          |                   |                               |                |                   |                                                                                                                                                                             |
| <input type="checkbox"/>                                                                                                                                                                             | VRID | Enable                              | Name           | Priority | Role / Status     | Deployment Interface / IP     | Virtual IP     | Virtual MAC       | Operations                                                                                                                                                                  |
| <input type="checkbox"/>                                                                                                                                                                             | 10   | <input checked="" type="checkbox"/> | LAN_Redunda... | 100      | Primary / Working | Default (VLAN) / 192.168.80.1 | 192.168.80.254 | 00:00:5E:00:01:0A |   |
| <input type="checkbox"/>                                                                                                                                                                             | 20   | <input checked="" type="checkbox"/> | WAN_VRRP       | 200      | Primary / Working | WAN2 (WAN) / 192.168.6.232    | 192.168.6.254  | 00:00:5E:00:01:14 |   |

GCC 1 Primary

**GCC 2: Secondary:** create two VRRP Groups, one for LAN and another one for WAN with lower priority.

|                                                                                                                                                                                                      |      |                                     |                |          |                     |                               |                |                   |                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------|----------------|----------|---------------------|-------------------------------|----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VRRP                                                                                                                                                                                                 |      |                                     |                |          |                     |                               |                |                   |                                                                                                                                                                             |
| VRRP Group Sync Group Log                                                                                                                                                                            |      |                                     |                |          |                     |                               |                |                   |                                                                                                                                                                             |
| VRRP is suitable for scenarios where routing egress redundancy is required, minimizing network interruptions from link failures, please use policy-based routing to control VRRP traffic forwarding. |      |                                     |                |          |                     |                               |                |                   |                                                                                                                                                                             |
| Add Delete Refresh                                                                                                                                                                                   |      |                                     |                |          |                     |                               |                |                   |                                                                                                                                                                             |
| Q VRID / Name / Virtual IP                                                                                                                                                                           |      |                                     |                |          |                     |                               |                |                   |                                                                                                                                                                             |
| <input type="checkbox"/>                                                                                                                                                                             | VRID | Enable                              | Name           | Priority | Role / Status       | Deployment Interface / IP     | Virtual IP     | Virtual MAC       | Operations                                                                                                                                                                  |
| <input type="checkbox"/>                                                                                                                                                                             | 10   | <input checked="" type="checkbox"/> | LAN_Redunda... | 80       | Secondary / Working | Default (VLAN) / 192.168.80.1 | 192.168.80.254 | 00:00:5E:00:01:0A |   |
| <input type="checkbox"/>                                                                                                                                                                             | 20   | <input checked="" type="checkbox"/> | WAN_VRRP       | 80       | Secondary / Working | WAN2 (WAN) / 192.168.6.26     | 192.168.6.254  | 00:00:5E:00:01:14 |   |

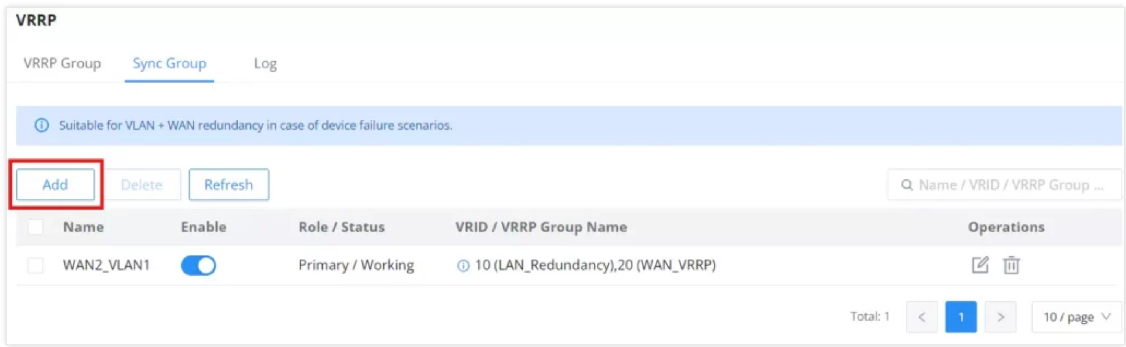
GCC 2 Secondary

VRRP Synchronization Group

A VRRP synchronization group ensures that all VRRP instances within the group maintain synchronized states. If one instance changes its role, the other instances in the group automatically transition to the same role.

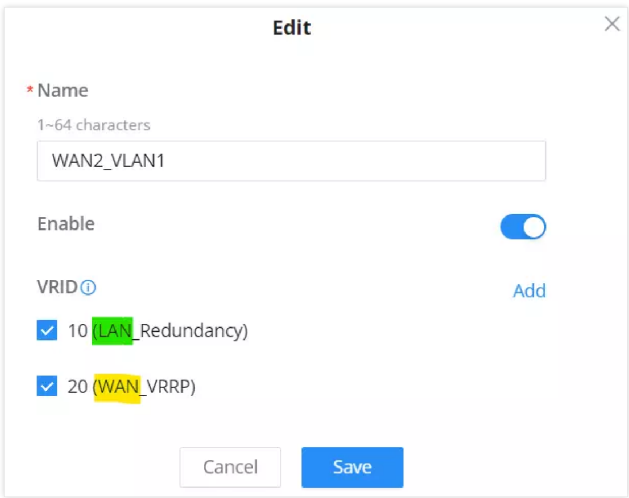
When VLAN and WAN interfaces are part of a synchronization group, policy routing must be implemented in conjunction to ensure proper functionality.

To add Sync Group, Navigate to **VRRP** → **Sync Group** then click on the “Add” button as shown below:



VRRP Sync Group

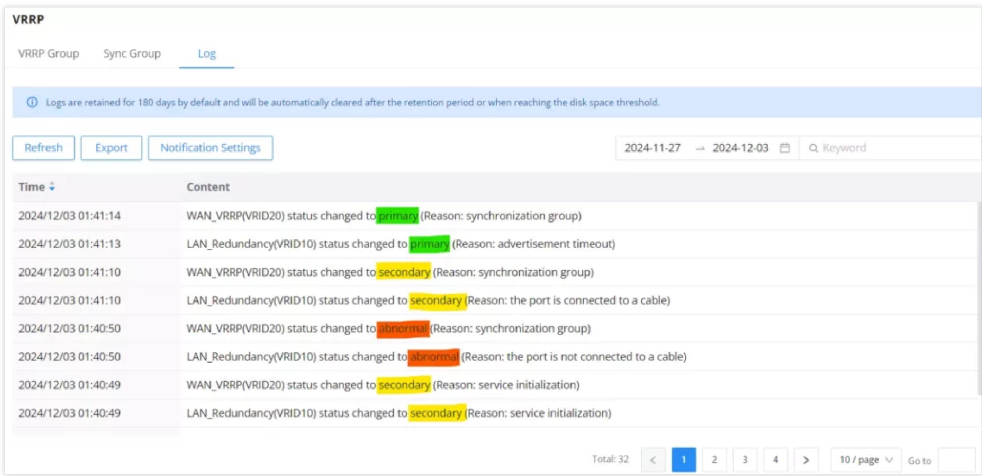
Select the VRRP Groups (WAN/LAN) combination.



VRRP Add Sync Group

VRRP Logs

VRRP logs capture events and status changes during the operation of VRRP instances. They provide critical insights for monitoring instance behavior, diagnosing issues, and troubleshooting effectively.



VRRP Log

Examples Using Two GCC Devices (Same Vendor)

Below are scenarios demonstrating the effective use of two Grandstream GCC devices, showcasing their combined capabilities and benefits.

#### Note:

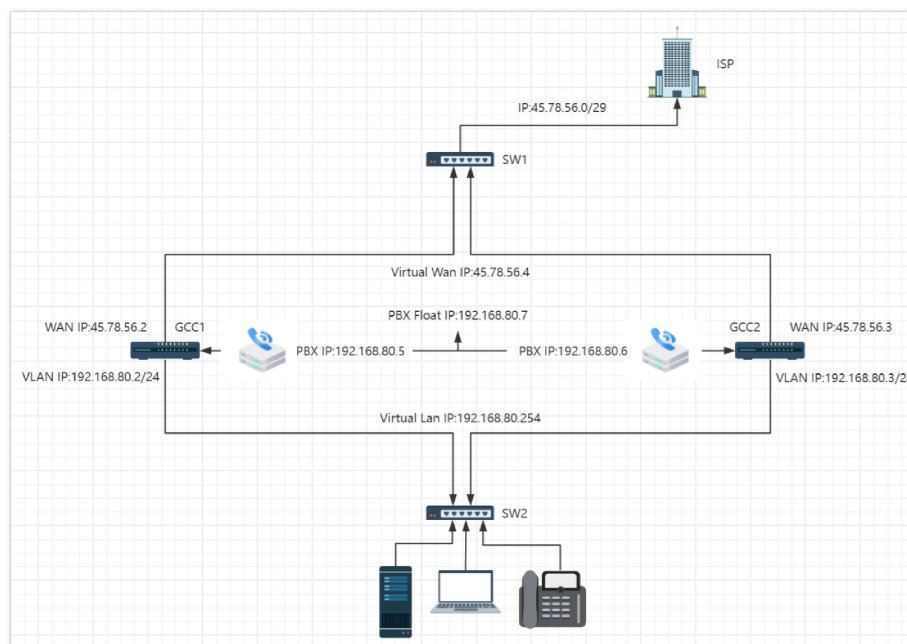
While this guide focuses on configuring VRRP with Grandstream GCC6000 series devices, it is important to note that VRRP is a standardized protocol defined by RFC 5798. As such, it is designed to work across devices from different manufacturers that also support VRRP. To ensure compatibility, make sure that key configuration parameters such as VRID, Virtual IP, Preemption Mode, and authentication settings are consistent across all devices, regardless of the manufacturer.

## Single ISP Usage Scenario

In a single ISP environment, two GCC devices can be deployed using VRRP to ensure network reliability. One device functions as the master VRRP router, managing traffic under normal conditions, while the second serves as a backup, ready to take over in case of failure or maintenance.

This configuration provides high availability and minimizes downtime, ensuring uninterrupted connectivity through seamless role-switching between the devices.

## Network Topology (Single ISP)



VRRP Single ISP Two GCC devices

In the topology shown, GCC1 is initially configured as the Primary router, while GCC2 serves as the Secondary. The ISP has allocated a public network segment of 45.78.56.0/29. After enabling VRRP on the WAN interface, intranet services can be accessed via the virtual IP address 45.78.56.4. On the internal LAN, the gateway IP is configured as 192.168.80.254.

### Initial State

GCC1, as the Primary node, handles both intranet access and internet connectivity. If GCC1 experiences a failure (such as a system freeze, power outage, or LAN port disconnection), GCC2 automatically assumes the Primary role. This ensures continued access to both the intranet and the Internet without interruption.

### Virtual IP Address Management

- **Intranet Gateway:** The gateway IP (192.168.80.254) is only active on the Primary router. This IP is exclusive to either GCC1 or GCC2, depending on the active Primary role.
- **External Network Access:** Similarly, the virtual WAN IP (45.78.56.4) is assigned only to the active Primary router.

### Failover Process

When GCC1 fails, VRRP seamlessly transfers the virtual WAN IP and virtual VLAN gateway IP to GCC2. A gratuitous ARP is broadcast to refresh the ARP table on the connected switch, enabling the switch to forward traffic to GCC2. This transition from Secondary to Primary is virtually transparent, ensuring clients and the ISP experience no service disruptions due to unchanged IP addresses.

## Notes:

- **WAN VRRP Considerations:** If the ISP provides fewer than three IP addresses, enabling VRRP on the WAN interface is not recommended.
- **Switch Configuration:**
  - Both routers' WAN interfaces must be connected to the same switch, and their VLAN interfaces should also be connected to the same switch for proper communication. Please refer to the [topology above](#).
  - If the switch has Spanning Tree Protocol (STP) enabled to prevent loops, the ports may not immediately enter the forwarding state. This delay can influence the VRRP role election process, potentially affecting failover performance.

## GCC1 Configuration (Single ISP)

### 1. Add WAN VRRP Group

To configure WAN VRRP, create a VRRP group and select WAN1 as the deployment interface. Ensure the following parameters match the settings on the WAN\_VRRP interface of the GCC2 router: VRID, Virtual IP, Preemption Mode, VRRP Version, and plaintext authentication. Set the WAN\_VRRP priority for GCC1 to 100 and for GCC2 to 80. With this configuration, GCC1 will assume the Primary role for WAN\_VRRP.

To begin the configuration, navigate to **Networking** → **VRRP** → **Add VRRP Group**.

VRID: 1 (Range 1-255)

Enable: ☒

VRRP Name: VRRP 1 (0-64 characters)

\* Priority: 100 (Range 1-254)

\* Interface: WAN1 (WAN)

\* Virtual IP: 45.78.56.4

Track Interface: Please Select Track Interface

Advanced Settings ▾

Cancel Save

Add WAN VRRP Group

### 2. Add VLAN VRRP Group

To configure VLAN VRRP, create a VRRP group and select any VLAN as the deployment interface. Ensure that the following parameters match the VLAN\_VRRP configuration on the GCC2 router: VRID, Virtual IP, Preemption Mode, VRRP Version, and plaintext authentication. Set the VLAN\_VRRP priority of GCC1 to 100 and GCC2 to 80, making GCC1 the Primary for VLAN VRRP.

Additionally, configure the **Track Interface** to WAN1 to enable automatic role switching between Primary and Secondary in the event of a failure on the uplink interface of the Primary device, preventing service disruption.

To begin the configuration, navigate to **Networking** → **VRRP** → **VRRP Group**.

Add LAN VRRP Group

### 3. Configuring a VRRP Synchronization Group

To ensure seamless failover, the WAN and LAN interfaces should be synchronized. Add both the WAN and VLAN interfaces on the router to the same synchronization group. When one interface switches roles, the other will automatically follow, ensuring consistent performance.

To configure the synchronization group, navigate to **Networking** → **VRRP** → **Sync Group**.

Configuring a VRRP Synchronization Group

#### Note:

Set the VLAN port according to the actual network configuration. If the port associated with the VLAN has no cable connected, the VLAN link is considered abnormal. As a result, the VLAN VRRP state will switch to “abnormal,” triggering the WAN role in the synchronization group to also switch to “abnormal.” For example, when the NET1, NET3-NET4, and NET6-NET7 ports on the GCC device have no network cable connected, the VLAN80 VRRP state will be marked as abnormal.

To configure VLAN port settings, navigate to **Networking** → **Network Settings** → **LAN**.

| LAN        |                   |                           |
|------------|-------------------|---------------------------|
| VLAN       | PBX Trunk VLAN    | <u>VLAN Port Settings</u> |
|            | Static IP Binding | Local DNS Records         |
|            |                   | Bonjour Gateway           |
| Port       | PVID              | Allowed VLANs             |
| NET1 (GE)  | 80                | 1,10,80                   |
| NET2 (GE)  | 10                | 10                        |
| NET3 (GE)  | 1                 | 1,10,80                   |
| NET4 (GE)  | 1                 | 1,10,80                   |
| SFP6 (SFP) | 1                 | 1,10,80                   |
| SFP7 (SFP) | 1                 | 1,10,80                   |

GCC VLAN Port Settings

#### 4. Modify VLAN gateway address

If the DHCP service is enabled for the corresponding VLAN, users can change the gateway address to a virtual IP address, such as 192.168.80.254.

For clients with static IP configurations, users can manually set the gateway to the specified virtual IP address.

To configure the VLAN gateway, navigate to **Networking → Network Settings → LAN**.

VRRP Modify the gateway

#### 5. Configuring Policy Routing

The load balancing policy pool is a configuration used to implement load balancing and failover across multiple WAN ports, which will be referenced in policy routing. Users can select the appropriate policy mode based on their requirements: **Load Balancing** or **Backup Mode**.

- **Load Balancing:** Traffic is distributed across interfaces in proportion to the set load balancing weights. Ensure weights are allocated based on actual bandwidth to optimize performance.
- **Backup Mode:** In this mode, when the preferred interface fails, traffic will automatically switch to the backup interface. Both interfaces can share traffic based on the load balancing weights to ensure uninterrupted network connectivity.

In this configuration, **Backup Mode** is selected. By default, VLAN traffic will route through the **WAN1 VRRP interface**. If the **WAN1 VRRP interface** fails, traffic will be directed to the **WAN1 interface**.

To view or configure policy routes, navigate to **Networking → Routing → Policy Routes**.

Policy Routes > **Edit Load Balance Rule**

\* Name: Default

Mode: ☐ Load Balance ☒ Backup

Balancing Strategy: Connection-Based

\* Preferred Interface: Interface: WAN1 (WAN VRRP) Weight: 1

\* Alternate Interface: Interface: WAN1 (WAN) Weight: 1

Buttons: Cancel, Save

Add Load Balance Rule

Policy Routes > **Add Policy Route**

\* Name: VLAN80 → WAN1\_VRRP

Enable: ☒

IP Family: ☒ Any ☐ IPv4

Protocol Type: All

Source Group: Default (VLAN)

Source IP Address:

Destination IP Address:

Load Balance: WAN1\_VRRP

Schedule: None

Buttons: Cancel, Save

Add Policy Route

## 6. Configure VPN

After setting up WAN VRRP, users can select the WAN VRRP interface for VPN configuration.

For example, when configuring an OpenVPN® server, select the interface as WAN1 (WAN VRRP). In this case, the WAN1 VRRP interface on the GCC1 device will be active, and the OpenVPN® server service will be supported by the GCC1 device.

To configure the OpenVPN® server, navigate to **Networking → VPN → OpenVPN®**:

OpenVPN® > **Add OpenVPN® Server**

\* Name: Open\_Server\_VRRP\_GCC1

Enable: ☒

Protocol: ☒ UDP ☐ TCP

Interface: WAN1 (WAN VRRP)

Destination: All

\* Local Port: 1194

Server Mode: SSL

Encryption Algorithm: AES-256-CBC

Digest Algorithm: SHA256

OpenVPN® Server VRRP Interface

OpenVPN®

OpenVPN® Clients OpenVPN® Servers

Buttons: Add, Delete

|                          | Name                  | Enable                              | Interface       | Server Address | Uptime | Operations |
|--------------------------|-----------------------|-------------------------------------|-----------------|----------------|--------|------------|
| <input type="checkbox"/> | open_server_vrrp_gcc1 | <input checked="" type="checkbox"/> | WAN1 (WAN VRRP) | 192.168.3.6    | 4s     |            |

**Note:**

If the VPN is configured with a VRRP interface, the VPN will take effect only when the VRRP is active (Primary).

## 7. Configure port forwarding

External network users can access internal web services via the virtual IP 45.78.56.4 on the GCC device.

Configure the port forwarding function on both GCC1 and GCC2. External users will be able to access the web page of the PC (192.168.80.213) in VLAN 80 by using the URL: <http://45.78.56.4:10000>.

To configure port forwarding, navigate to **Networking → External Access → Port Forwarding**:

*VRRP interface with Port Forwarding*

## 8. Configuring Firewall Rules

Users can configure firewall rules for the WAN\_VRRP interface based on specific requirements.

For example, when configuring forwarding rules, both GCC1 and GCC2 devices should define forwarding rules where the **Source Group** is set to the WAN VRRP interface, the **Destination Group** is set to the VLAN where the PC is located, and the **Destination IP Address** is the accessible IP (e.g., 192.168.80.213). This configuration allows external users to access the web page hosted on the PC in the internal subnet.

To configure forwarding rules, navigate to **Firewall → Firewall Policy → Traffic Rules**.

*VRRP Interface with Firewall*

**Note:**

Users can add a route to the ISP in advance with the destination address 192.168.80.213 and the next hop being the GCC virtual IP address 45.78.56.4.

## GCC2 Configuration (Single ISP)

## 1. Add WAN VRRP Group

Set the WAN\_VRRP priority of GCC1 to 100 and the **WAN\_VRRP priority of GCC2 to 80**. GCC2 WAN\_VRRP will become **Secondary**.

To configure WAN VRRP, please navigate to **Networking → VRRP → VRRP Group**:

The screenshot shows the 'VRRP > Edit VRRP Group' configuration page. The settings are as follows:

- \*VRID**: 1
- Enable**: ☒
- VRRP Name**: WAN (0-64 characters)
- \*Priority**: 80 (Range 1-254)
- \*Interface**: WAN (WAN) (dropdown)
- \*Virtual IP**: 45.78.56.4
- Track Interface**: Please Select Track Interface (dropdown)
- Advanced Settings** (expanded):
  - Preemptive Mode**: ☐
  - Notification Interval (seconds)**: 1 (Range 1-255)
  - VRRP Versions**: ☒ VRRPv2 ☐ VRRPv3
  - Plaintext Authentication**: (empty field, 0-8 uppercase/lowercase letters and numbers are supported)

Buttons: Cancel, Save

GCC2 Configuration VRRP WAN

## 2. Add VLAN VRRP Group

Set the VLAN\_VRRP priority of GCC1 to 100 and **the VLAN\_VRRP priority of GCC2 to 80**. GCC2 VLAN\_VRRP will become **Secondary**.

To configure VLAN VRRP, please navigate to **Networking → VRRP → VRRP Group**:

The screenshot shows the 'VRRP > Edit VRRP Group' configuration page. The settings are as follows:

- \*VRID**: 80
- Enable**: ☒
- VRRP Name**: VLAN80 (0-64 characters)
- \*Priority**: 80 (Range 1-254)
- \*Interface**: Default LAN (VLAN) (dropdown, highlighted with a red box)
- \*Virtual IP**: 192.168.80.254
- Track Interface**: WAN (WAN) X (dropdown)
- Advanced Settings** (expanded):
  - Preemptive Mode**: ☐
  - Notification Interval (seconds)**: 1 (Range 1-255)
  - VRRP Versions**: ☒ VRRPv2 ☐ VRRPv3
  - Plaintext Authentication**: (empty field, 0-8 uppercase/lowercase letters and numbers are supported)

Buttons: Cancel, Save

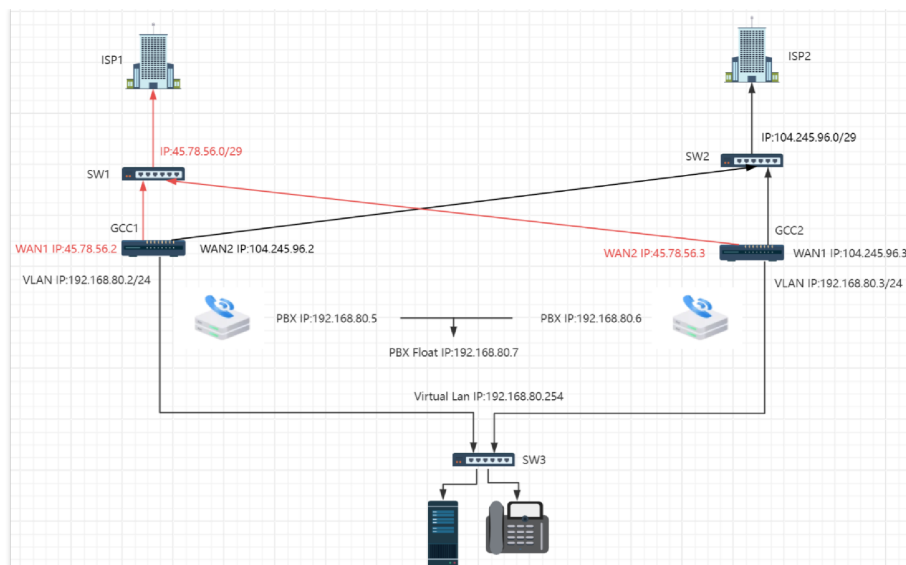
GCC 2 VRRP VLAN Group

The rest of the steps are similar to the [GCC 1 configuration](#).

## Dual ISP usage scenario

### Network Topology (Dual ISP)

In this topology, we have now two ISPs with different IP segments as shown below:



Dual ISP Two GCC devices

GCC1 is initially configured as the Primary router, and GCC2 is the Secondary. Two ISPs provide separate network segments: **45.78.56.0/29** and **104.245.96.0/29**, both of which can independently access the Internet. The internal LAN uses **192.168.80.254** as the gateway IP.

### Failover and Role Switching

- **Initial State:** GCC1, as the Primary, handles all network services.
- **ISP Failover:** If one of GCC1's ISP services fails, the WAN port failover feature automatically switches to the other WAN port for continued Internet access.
- **Device Failover:** If both ISP connections on GCC1 fail, or if GCC1 encounters hardware issues (e.g., freeze, power outage, or LAN port failure), VRRP triggers a role switch, promoting GCC2 to the Primary role to continue providing network services.

### Notes:

1. **WAN VRRP Considerations:** When using dual WAN, it is recommended to rely on the WAN failover feature for network switching rather than enabling the WAN VRRP feature.
2. **Independent ISP Access:** Both ISP-provided IP ranges can access the Internet independently.
3. **Switch Configuration:**
  - VLANs of both routers must connect to the same switch.
  - WAN ports on both routers should be configured to match the settings required by each ISP, including VPN, policy routing, and port forwarding.
4. **STP Impact:** If the switch uses the Spanning Tree Protocol (STP) to prevent loops, its ports may take time to enter the forwarding state, potentially delaying VRRP role elections.

### GCC1 Configuration (Dual ISP)

#### 1. Add VLAN VRRP Group

- Add a VRRP group and select a VLAN as the deployment interface.
- Ensure that the following settings match those configured on the VLAN\_VRRP interface of GCC2:
  - **VRID**
  - **Virtual IP**
  - **Preemption Mode**
  - **VRRP Version**
  - **Plaintext Authentication**
- Set the VLAN\_VRRP priority for GCC1 to **100** (Primary) and for GCC2 to **80** (Secondary).

- Configure the Track Interface to monitor **WAN1** and **WAN2** to ensure seamless role switching. If both uplink interfaces on the Primary fail, the VLAN VRRP role will switch to the Secondary, avoiding any service disruption.

To configure VLAN VRRP, navigate to **Networking → VRRP → VRRP Group**:

*Dual ISP Two GCC devices VRRP VLAN Group*

2. **Modify VLAN gateway address:** Please refer to the steps mentioned above.

### 3. Configuring Policy Routing

In this scenario, select **Backup Mode**. Default VLAN traffic will initially pass through the **WAN1 interface**. If the WAN1 interface becomes unavailable, the traffic will automatically switch to the **WAN2 interface**, maintaining uninterrupted connectivity.

To configure policy routes, navigate to **Networking → Routing → Policy Routes**.

*VRRP Dual ISP GCC Add Load Balance Rule Part 1*

*VRRP Dual ISP GCC Add Load Balance Rule Part 2*

## GCC2 Configuration (Dual ISP)

### 1. Add VLAN VRRP Group

The VLAN\_VRRP priority is configured with GCC1 set to **100 (Primary)** and GCC2 set to **80 (Secondary)**. This setup ensures that **GCC2 operates as the Secondary**. Additionally, the Track Interface can be configured to monitor **WAN1** and **WAN2**. This allows for seamless role switching of the VLAN VRRP in the event of a complete failure of the uplink interfaces on the Primary device, effectively preventing service interruptions.

To configure VLAN VRRP, go to **Networking → VRRP → VRRP Group**:

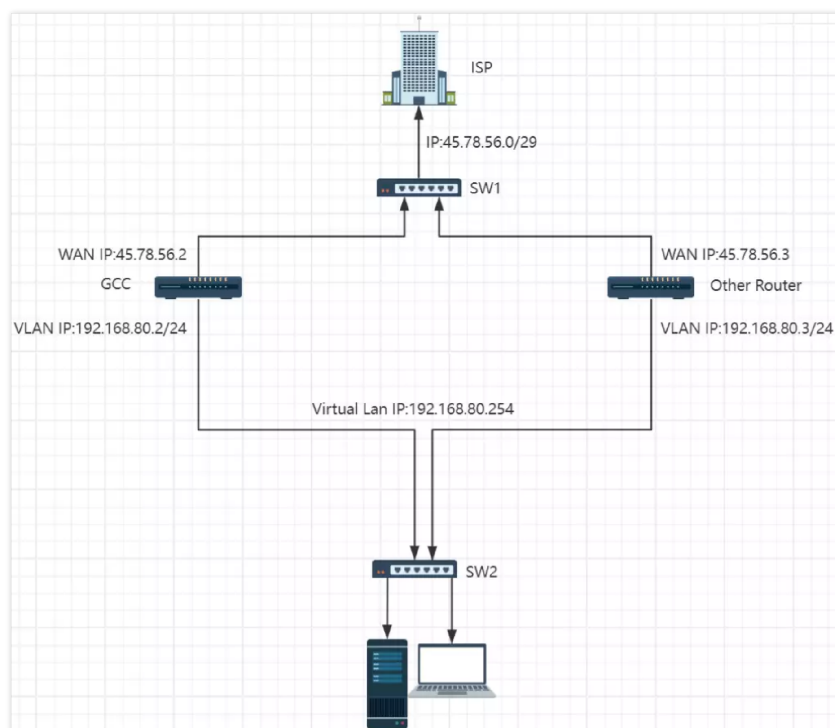
*GCC2 Configuration Dual ISP Two GCC devices*

2. **Modify VLAN gateway address:** Please refer to the steps mentioned above.
3. **Configuring Policy Routing:** same steps as GCC1.

## Examples with Different Vendors

### Single ISP Scenario

#### Network Topology – Different Vendor (Single ISP)



As shown in the topology above, GCC is initially configured as the Primary router, and the Other Router as the Secondary. The ISP allocates the network segment 45.78.56.0/29, with IPs 45.78.56.2 and 45.78.56.3 assigned to the WAN ports of each router, respectively. The internal LAN gateway IP is set to 192.168.80.254.

In the event of a failure on GCC, such as a device freeze, power outage, or LAN port unavailability, the Other Router will automatically take over as the Primary and continue to provide network services.

#### Notes:

- It is recommended to enable VRRP only on the LAN side and not on the WAN port.
- In the actual deployment, both routers' WAN ports are assigned public IPs by the ISP, allowing independent Internet access.
- The VLANs of both routers must be connected to the same switch (SW2).
- If STP (Spanning Tree Protocol) is enabled on the switch to prevent network loops, it may delay the VRRP role election until the switch port reaches the forwarding state.

## GCC Configuration – Single ISP

### 1. Add VLAN VRRP Group

Any VLAN interface can be used as the deployment interface. Ensure that the **VRID**, **Virtual IP**, **Preemption Mode**, **VRRP Version**, and **Plaintext Authentication** settings match those of the other routers. The device with the higher priority will automatically assume the primary role. Additionally, users can configure the **Track Interface** to WAN1 to enable automatic switching of the VLAN VRRP primary-slave role if the primary device's uplink interface fails, preventing service disruption.

To configure VLAN VRRP, navigate to **Networking → VRRP → VRRP Group**.

The screenshot shows the 'VRRP > Edit VRRP Group' configuration window. The main configuration area includes:
 

- \*VRID**: 80
- Enable**: Checked (blue toggle)
- VRRP Name**: VLAN80 (0-64 characters)
- \*Priority**: 100 (Range 1-254)
- \*Interface**: Default LAN (VLAN) (highlighted in a red box)
- \*Virtual IP**: 192.168.80.254 (highlighted in a red box)
- Track Interface**: WAN1 (WAN) (highlighted in a red box)

 The **Advanced Settings** section is expanded, showing:
 

- Preemptive Mode**: Unchecked
- Notification Interval (seconds)**: 1 (Range 1-255)
- VRRP Versions**: VRRPv2 (selected), VRRPv3
- Plaintext Authentication**: (empty field, 0-8 uppercase/lowercase letters and numbers supported)

 At the bottom are 'Cancel' and 'Save' buttons.

Add VLAN VRRP Group

### 2. Modify VLAN Gateway Address

If the DHCP service is enabled for the corresponding VLAN, users can change the gateway address to a virtual IP address, such as **192.168.80.254**.

For clients with static IP configurations, users can manually set the gateway to the specified virtual IP address.

To configure the VLAN gateway, navigate to **Networking → Network Settings → LAN**.

LAN > Edit VLAN

\*VLAN ID: 1

Name: Default LAN (0-64 characters)

Destination: All

VLAN Port IPv4 Address: ☐

\*IPv4 Address: 192.168.80.2

\*Subnet Mask: 255.255.255.0

DHCP Service: ☒

Gateway Address: 192.168.80.254 (Allow same as IPv4 address)

\*IPv4 Address Allocation Range: 192.168.80.4 - 192.168.80.253

\*Release Time(m): 120 (Default: 120, range: 60-2880)

DHCP Option: Option: , Type: ASCII, Service: , Content: (Add)

Preferred DNS Server:

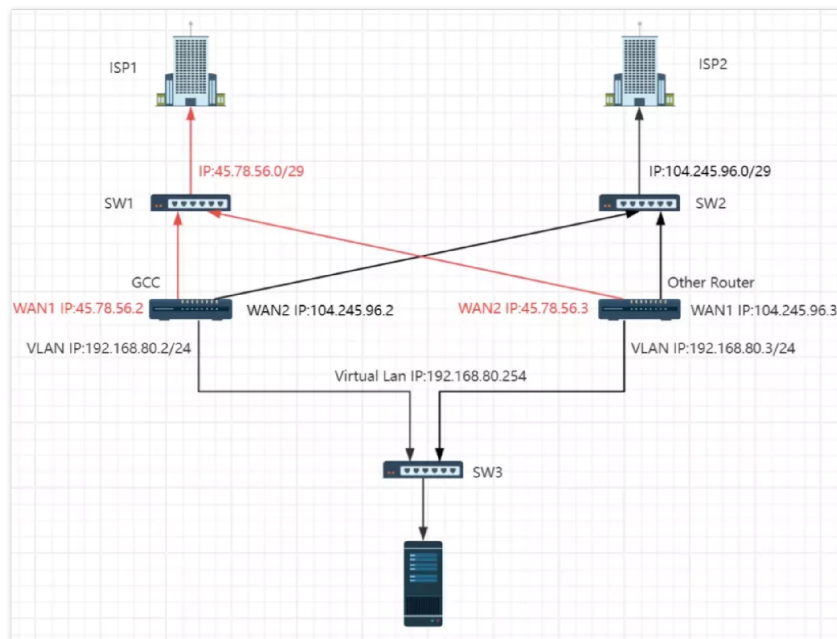
Advanced DHCP Feature:

Cancel Save

Modify VLAN Gateway Address

## Dual ISP Scenario

### Network Topology – Different Vendor (Dual ISP)



VRRP Dual ISP with different vendor

As shown in the topology above, GCC is initially set as the Primary router, while the Other Router serves as the Secondary. Two ISPs are assigned separate network segments: 45.78.56.0/29 and 104.245.96.0/29, with each segment having independent Internet access. The gateway IP for the internal LAN is 192.168.80.254.

Initially, GCC handles network services as the Primary router. If one of GCC's ISP services fails, the WAN port failover feature will activate, switching to the backup WAN port to maintain Internet access. If both ISP services of GCC fail, a role switch occurs, making the Other Router the Primary, ensuring continued network services. Similarly, if GCC experiences a device freeze, power outage, or LAN port failure, the Other Router will automatically assume the Primary role and continue providing services.

#### Notes:

- When using dual WAN, it's recommended to enable the dual WAN failover feature instead of the WAN VRRP feature for automatic network switching.
- The IPs from both ISPs are capable of independent Internet access.
- Both routers' VLANs should be connected to the same switch.

- WAN ports on both routers must be configured to support the respective ISP settings (including VPN, policy routing, port forwarding, etc.).
- If STP (Spanning Tree Protocol) is enabled on the switch to prevent network loops, the VRRP role election might be delayed until the switch port reaches the forwarding state.

## GCC Configuration – Dual ISP

### 1. Add VLAN VRRP Group

To configure VLAN VRRP, select any VLAN as the deployment interface and ensure the **VRID**, **Virtual IP**, **Preemption Mode**, **VRRP Version**, and **Plaintext Authentication** settings match those of the other routers. The device with the highest priority will assume the primary role. Additionally, set the **Track Interface** to WAN1 and WAN2 to ensure that the VLAN VRRP primary and secondary roles switch if the uplink interface of the primary device fails completely, preventing service interruptions.

To configure VLAN VRRP, please navigate to **Networking → VRRP → VRRP Group**:

The screenshot shows the 'VRRP → Edit VRRP Group' configuration window. The following settings are visible:

- \*VRID**: 80
- Enable**: ☒
- VRRP Name**: VLAN80 (0-64 characters)
- \*Priority**: 100 (Range 1-254)
- \*Interface**: Default LAN (VLAN)
- \*Virtual IP**: 192.168.80.254
- Track Interface**: WAN1 (WAN) × WAN2 (WAN) ×
- Advanced Settings** (expanded):
  - Preemptive Mode**: ☐
  - Notification Interval (seconds)**: 1 (Range 1-255)
  - VRRP Versions**: ☒ VRRPv2 ☐ VRRPv3
  - Plaintext Authentication**: (empty field, 0-8 uppercase/lowercase letters and numbers supported)
- Buttons**: Cancel, Save

Add VLAN VRRP Group

### 2. Modify VLAN Gateway Address

If the DHCP service is enabled for the corresponding VLAN, users can change the gateway address to a virtual IP address, such as **192.168.80.254**.

For clients with static IP configurations, users can manually set the gateway to the specified virtual IP address.

To configure the VLAN gateway, navigate to **Networking → Network Settings → LAN**.

LAN > Edit VLAN

\*VLAN ID: 1

Name: Default (0-64 characters)

Destination: All

VLAN Port IPv4 Address: ☐

\*IPv4 Address: 192.168.80.2

\*Subnet Mask: 255.255.255.0

DHCP Service: ☒

\*Gateway Address: 192.168.80.254 (Follow same as IPv4 address)

\*IPv4 Address Allocation Range: 192.168.80.4 - 192.168.80.253

\*Release Time(m): 120 (Default 120, range 60-2880)

DHCP Option:

| Option | Type  | Service | Content                     |
|--------|-------|---------|-----------------------------|
| 66     | ASCII |         | https://192.168.80.55:8089/ |
| 141    | ASCII |         | 192.168.80.55:6060          |

Preferred DNS Server:

Cancel Save

Modify VLAN Gateway Address

### 3. Configure Policy Routing

In this scenario, select **Backup Mode**. Default VLAN traffic will initially pass through the **WAN1 interface**. If the WAN1 interface becomes unavailable, the traffic will automatically switch to the **WAN2 interface**, maintaining uninterrupted connectivity.

To configure policy routes, navigate to **Networking → Routing → Policy Routes**.

Policy Routes > Add Load Balance Rule

\*Name: WAN1\_WAN2 (1-64 characters)

Mode: ☐ Load Balance ☒ Backup

Balancing Strategy: Connection-Based

\*Preferred Interface: Interface WAN1 (WAN) Weight: 1

\*Alternate Interface: Interface WAN2 (WAN) Weight: 1

Cancel Save

Configure Policy Routing Backup

Then, apply the created Load Balance rule to the Source Group, in our case, it's the Default VLAN.

Policy Routes > Edit Policy Route

\*Name: VLAN80\_Policy Routes (1-64 characters)

Enable: ☒

IP Family: ☒ Any ☐ IPv4

Protocol Type: All

Source Group: Default (VLAN)

Source IP Address:  (Enter the IP address/mask length, such as "192.168.122.0/24")

Destination IP Address:  (Enter the IP address/mask length, such as "192.168.122.0/24")

\*Load Balance: WAN1\_WAN2

Schedule: None

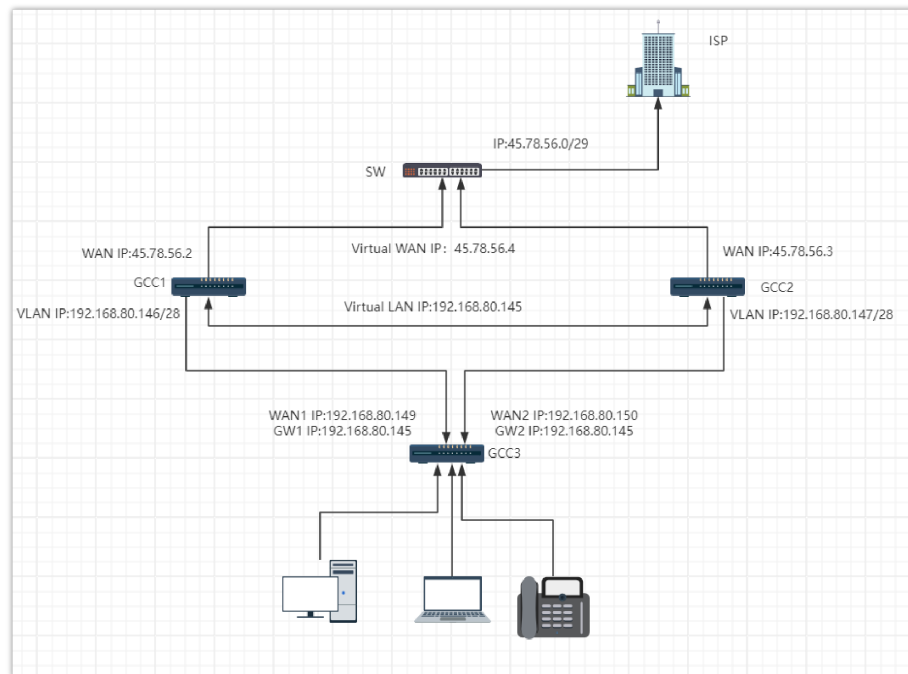
Cancel Save

Configure Policy Routing Apply to the default VLAN

# Example Using Three GCCs and a Single ISP (Direct Connection)

This section covers configuring a three-GCC setup consisting of two GCC devices running VRRP and one additional GCC acting as a dual-WAN CPE positioned behind them. All three GCC units are directly connected to each other with no switch in between, ensuring that VRRP heartbeats, failover communication, and upstream routing occur smoothly in this direct-link topology.

Please refer to the set up below that will be configured:



Examples with Three GCCs Without a Switch

## GCC1 Configuration

### Add WAN VRRP – GCC1

Add a VRRP group, select WAN (the connected interface) as the deployment interface, and ensure that the VRID, Virtual IP, Preemption Mode, VRRP Version, and Simple Text Authentication parameters are the same as those configured on the WAN\_VRRP interface of the GCC2 router. Also, set the priority of GCC1's WAN\_VRRP to be higher than that of GCC2's WAN\_VRRP, and GCC1's WAN\_VRRP will become the Primary. You can also enable preemption mode.

To configure WAN VRRP, please navigate to **Networking → VRRP → VRRP Group**:

1. **Set the VRID to 50**, this identifies the VRRP group. All routers in the same group must use the same VRID.
2. **Enable** the VRRP group by toggling the *Enable* switch on, to activate VRRP on this interface so it can participate in Master/Backup selection.
3. Enter **WAN\_pri** as the **VRRP Name**.
4. Set the **Priority to 45**, this determines the likelihood of becoming the VRRP Master. Higher numbers = higher priority.
5. Select **WAN2 (WAN)** as the **Interface** for VRRP.
6. Enter **192.168.88.164** as the **Virtual IP**. The shared gateway IP used by devices on the network. The Master router will respond to this IP.
7. Leave **Track Interface** unselected (no tracking interface configured).

#### Add WAN VRRP

Some additional advanced settings:

1. **Enable Preemptive Mode:** Allows this router to reclaim the Master role if it has a higher priority.
2. **Set Preemption Delay to 1 second:** Waits 1 second before taking over as Master when preemption occurs.
3. **Set Notification Interval to 1 second:** Sends VRRP advertisements every 1 second to maintain group status.
4. **Select VRRPv2 as the VRRP Version:** Chooses the VRRP protocol version compatible with the deployment.
5. **Leave Plaintext Authentication blank:** No authentication password is used for VRRP messages.

### Add VLAN VRRP – GCC1

Add a VRRP group, select the VLAN where the downstream router is located for the deployment interface, and ensure that the VRID, Virtual IP, Preemption Mode, VRRP Version, and Simple Text Authentication parameters are the same as those of GCC2. Also, set the priority of GCC1 to be higher than that of GCC2, making GCC1 the master device; at the same time, you can enable the preemption mode.

To configure VLAN VRRP, please navigate to **Networking → VRRP → VRRP Group**:

1. **Set the VRID to 20:** This is the Virtual Router ID for the LAN-side VRRP group. All routers participating in this LAN VRRP must use the same VRID.
2. **Enable the VRRP group:** Activates VRRP on the LAN interface so the device can function as Master or Backup.
3. **Enter “LAN\_pri” as the VRRP Name:** A friendly label used to identify this VRRP instance for the LAN side.
4. **Set the Priority to 35:** Determines which router becomes the LAN-side VRRP Master. Higher number = higher priority.
5. **Select “Default (VLAN)” as the Interface:** This defines the interface VRRP will operate on, in this case the default LAN/VLAN interface.
6. **Enter “192.168.80.145” as the Virtual IP**
  - This is the shared LAN gateway IP used by downstream devices.
  - The router acting as Master will respond to this IP.
7. **Leave Track Interface unselected:** No specific interface tracking is applied for VRRP failover logic.

## Configure VRRP synchronization group

Switching between WAN and LAN requires synchronization. By putting the WAN and VLAN on the router into the same group, when one switches roles, the other will also switch synchronously.

To configure VLAN VRRP, please navigate to **Networking → VRRP → Synchronization Group**:

1. **Enter “group1” as the Name:** This is the label for the synchronization group. It helps you identify which VRRP instances are tied together.
2. **Enable the Synchronization Group:** Activates the sync feature so the selected VRRP groups will switch roles together.
3. **Select VRID 20 (LAN\_pri)**
  - Adds the LAN-side VRRP group to the synchronization group.
  - This ensures the LAN VRRP instance will follow role changes applied to the WAN VRRP.
4. **Select VRID 50 (WAN\_pri)**
  - Adds the WAN-side VRRP group to the same synchronization group.
  - When the WAN VRRP instance switches between Master/Backup, the LAN VRRP will switch in sync.
5. **Click Save to apply the settings:** Finalizes the synchronization group configuration, linking both VRRP instances for coordinated failover.

Configure VRRP synchronization group

## Modify VLAN Gateway Address

You need to change the gateway address to the virtual IP address, for example: 192.168.80.145;

To configure VLAN, please navigate to **Networking → Network Settings → LAN**:

- **Set VLAN ID to 1**: identifies the VLAN. VLAN 1 is typically the default LAN network.
- **Enter “Default” as the VLAN Name**: Provides a clear label for this VLAN configuration.
- **Set Forwarding Destination Group to “All”**: Allows VLAN traffic to be forwarded to all destination groups configured on the device.
- **Keep Captive Portal Disabled**: No client authentication or redirection is applied to this VLAN.
- **Turn off VLAN Port IPv4 Address**: The VLAN interface will not use separate per-port IP addressing.
- **Set the IPv4 Address to 192.168.80.146**: This is the LAN-side IP address of the router inside this VLAN.
- **Set Subnet Mask to 255.255.255.240**: Defines a /28 network, supporting IPs from 192.168.80.144 to 192.168.80.159.
- **Enable DHCP Service**: Allows the router to hand out IP addresses automatically to LAN clients.
- **Set the Gateway Address to 192.168.80.145**: This is the **VRRP Virtual IP** and must be used as the default gateway by all devices.
- **Configure the DHCP Address Range: 192.168.80.148 – 192.168.80.158**: Defines the pool of IP addresses that will be assigned to clients.
- **Set DHCP Lease Time to 120 minutes**: Specifies the duration clients keep their assigned IP before renewal.
- **Leave DHCP Option fields empty**: No additional DHCP options (DNS, NTP, custom values) are being configured.

LAN > Edit VLAN

VLAN ID: 1

Name: Default (0-64 characters)

Forwarding Destination Group: All

Enable Captive Portal: ☐

IPv4 Settings ^

VLAN Port IPv4 Address: ☒

IPv4 Address: 192.168.80.146

Subnet Mask: 255.255.255.240

DHCP Service: ☒

Gateway Address: 192.168.80.145 (Allow same as IPv4 address)

IPv4 Address Allocation Range: 192.168.80.148 ~ 192.168.80.158

Release Time(m): 120 (Default: 120, range: 60-3880)

DHCP Option

| Option | Type  | Service | Content |
|--------|-------|---------|---------|
|        | ASCII |         |         |

Cancel Save Add

## GCC2 Configuration

### Add WAN VRRP – GCC2

Add a VRRP group, select WAN (the connected interface) as the deployment interface, and ensure that the VRID, Virtual IP, Preemption Mode, VRRP Version, and Simple Text Authentication parameters are the same as those configured on the WAN\_VRRP interface of the GCC1 router. Also, set the priority of WAN\_VRRP of GCC2 to be lower than that of WAN\_VRRP of GCC1, and GCC2 WAN\_VRRP will become Secondary.

To configure WAN VRRP, please navigate to **Networking → VRRP → VRRP Group**:

1. **Set the VRID to 50**: This VRRP group uses the same VRID as the Primary WAN on the other GCC, meaning both devices belong to the same failover group.
2. **Enable the VRRP group**: Activates VRRP on this interface so the router can operate as Master or Backup.
3. **Enter “wan\_seco” as the VRRP Name**: Identifies this VRRP instance as the Secondary WAN role.

4. **Set the Priority to 40:** Lower than the Primary device's priority (45), ensuring this router becomes the Backup in the VRRP group.
5. **Select "WAN2 (WAN)" as the Interface:** Specifies the WAN interface where this VRRP instance operates.
6. **Set the Virtual IP to 192.168.88.164:**
  - This is the shared VRRP Virtual IP for the WAN side.
  - Only the active Master router responds to this IP.
7. **Leave Track Interface unconfigured:** No track interface is selected for conditional failover logic.

The screenshot shows the 'VRRP > Edit VRRP Group' configuration page. The settings are as follows:

- \*VRID:** 50
- Enable:** ☒
- VRRP Name:** wan\_seco (0-64 characters)
- \*Priority:** 40 (Range 1-254)
- \*Interface:** WAN2 (WAN)
- \*Virtual IP:** 192.168.88.164
- Track Interface:** Please Select Track Interface
- Advanced Settings:** (expanded)
- Buttons:** Cancel, Save

*Add WAN VRRP GCC2*

## Add LAN VRRP – GCC2

Add a VRRP group, select the VLAN where the downstream router is located for the deployment interface, and ensure that the VRID, Virtual IP, Preemption Mode, VRRP Version and Simple Text Authentication parameters are the same as those of GCC1. Also, set the priority of GCC2 to be lower than that of GCC1, and GCC2 VLAN\_VRRP will become Secondary.

To configure VLAN VRRP, please navigate to **Networking → VRRP → VRRP Group**:

1. **Set the VRID to 20:** This VRRP LAN group uses the same VRID as the Primary's LAN VRRP, ensuring both devices participate in the same LAN failover group.
2. **Enable the VRRP group:** Activates VRRP on the LAN interface so this device can serve as a Backup router.
3. **Enter "lan\_seco" as the VRRP Name:** Identifies this LAN VRRP instance as the Secondary role.
4. **Set the Priority to 30:** Lower than the Primary router's LAN priority (35), ensuring this router becomes the Backup on the LAN side.
5. **Select "Default (VLAN)" as the Interface:** Indicates that VRRP will operate on the default LAN/VLAN interface.
6. **Set the Virtual IP to 192.168.80.145**
  - This shared VRRP Virtual IP is used by all LAN clients as their default gateway.
  - Only the VRRP Master responds to this IP.
7. **Leave Track Interface unconfigured:** No interface tracking is being used for dynamic failover triggers.

The screenshot shows the 'VRRP > Edit VRRP Group' configuration page. The settings are as follows:

- \*VRID:** 20
- Enable:** ☒
- VRRP Name:** lan\_seco (0-64 characters)
- \*Priority:** 30 (Range 1-254)
- \*Interface:** Default (VLAN)
- \*Virtual IP:** 192.168.80.145
- Track Interface:** Please Select Track Interface
- Advanced Settings:** (expanded)
- Buttons:** Cancel, Save

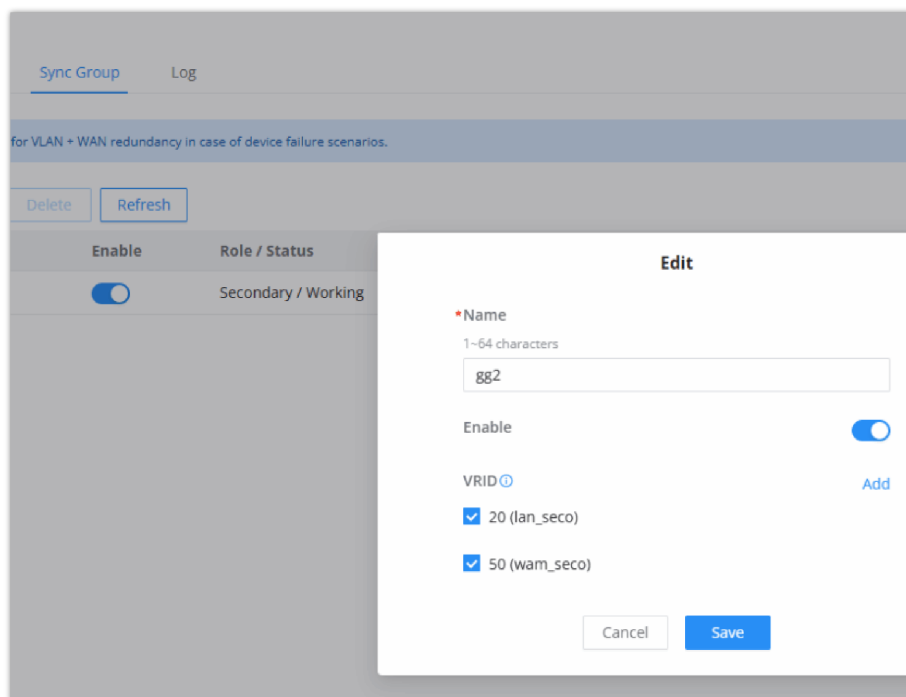
*Add LAN VRRP*

## Configure VRRP Synchronization Group – GCC2

Switching between WAN and LAN requires synchronization. By putting the WAN and VLAN on the router into the same group, when one switches roles, the other will also switch synchronously.

To configure VLAN VRRP, please navigate to **Networking → VRRP → Synchronization Group**:

1. **Enter “gg2” as the Sync Group Name:** This label identifies the synchronization group used on the secondary GCC device.
2. **Enable the Sync Group:** Activates synchronization so that both WAN and LAN VRRP instances switch roles together.
3. **Select VRID 20 (lan\_seco)**
  - Adds the LAN VRRP group of the secondary device to the sync group.
  - Ensures LAN failover always matches the WAN failover state.
4. **Select VRID 50 (wam\_seco)**
  - Adds the WAN VRRP group of the secondary device to the same sync group.
  - Links both VRRP instances so their Master/Backup states remain synchronized.
5. **Click Save to apply the configuration:** Finalizes the sync group setup and enables coordinated failover between WAN and LAN VRRP groups.



*Configure VRRP Synchronization Group*

## Modify VLAN gateway address – GCC2

You would need to change the gateway address to the virtual IP address , for example: 192.168.80.145 ;

To configure VLAN, please navigate to **Networking → Network Settings → LAN** :

1. **Set VLAN ID to 1:** Identifies this VLAN; VLAN 1 is typically the default LAN network.
2. **Enter “Default” as the VLAN Name:** A simple label describing the main LAN VLAN.
3. **Set Forwarding Destination Group to “All”:** Allows this VLAN to forward traffic to all configured destination groups.
4. **Keep Captive Portal Disabled:** No authentication or redirection portal is applied to devices on this VLAN.
5. **Disable VLAN Port IPv4 Address**
6. **Set the IPv4 Address to 192.168.80.147**
  - This is the LAN IP address for this GCC on VLAN 1.
  - It must be within the same subnet as the VRRP Virtual IP.

7. **Set Subnet Mask to 255.255.255.240:** Creates a /28 subnet covering the range 192.168.80.144 to 192.168.80.159.
8. **Enable DHCP Service:** Allows the GCC to automatically assign IP addresses to connected LAN clients.
9. **Set the Gateway Address to 192.168.80.145:** This is the **VRRP Virtual IP** used by all devices on the LAN as their default gateway.
10. **Set the DHCP Allocation Range to 192.168.80.148 – 192.168.80.158:** Defines the pool of IP addresses available for DHCP clients.
11. **Set DHCP Lease Time to 120 minutes:** Specifies how long clients retain their assigned IP before renewal.
12. **Leave DHCP Option fields empty:** No custom DHCP options (DNS, NTP, vendor configurations) are applied.

LAN > Edit VLAN

\*VLAN ID: 1

Name: Default (0-64 characters)

Forwarding Destination Group: All

Enable Captive Portal: ☐

**IPv4 Settings** ^

VLAN Port IPv4 Address: ☒

\*IPv4 Address: 192.168.80.147

\*Subnet Mask: 255.255.255.240

DHCP Service: ☒

\*Gateway Address: 192.168.80.145 (Allow same as IPv4 address)

\*IPv4 Address Allocation Range: 192.168.80.148 - 192.168.80.158

\*Release Time(m): 120 (Default: 120, range 60-2880)

DHCP Option

| Option | Type | Service | Content |
|--------|------|---------|---------|
|--------|------|---------|---------|

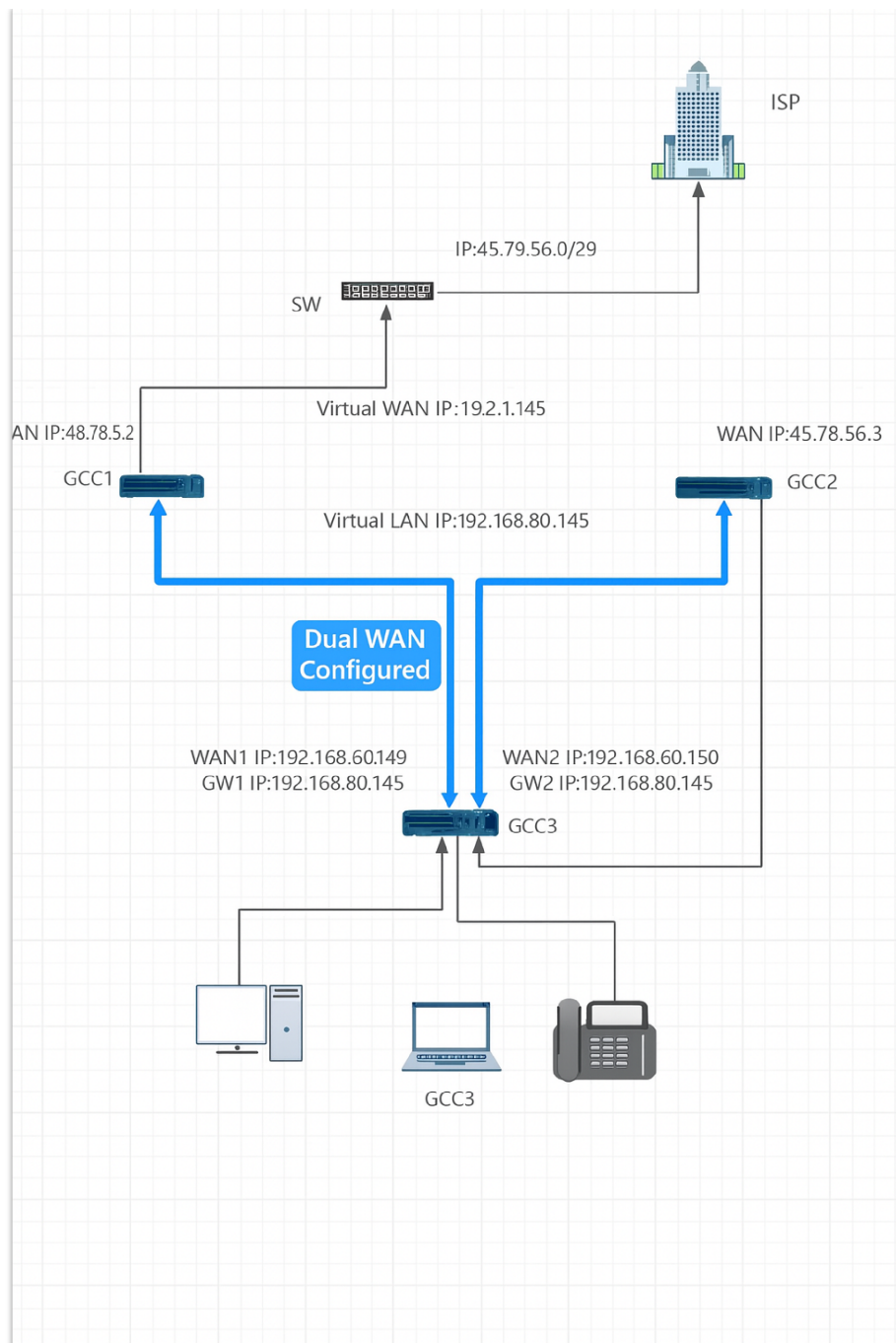
Cancel Save Add

*Modify VLAN gateway address GCC2*

## GCC3 Configuration

### Configure dual WAN

GCC3 operates as a dual-WAN downstream router and is not part of the VRRP group. Its two WAN ports are connected to the LAN ports of GCC1 and GCC2, respectively. Traffic originating from GCC3's LAN network will be balanced across both WAN interfaces and will ultimately exit through the upstream GCC that is currently the VRRP master, this ensures redundancy and continuous connectivity.



Results of configure dual WAN

#### Note

Configure the GCC3 LAN on a different subnet than the VRRP LAN (e.g., 192.168.70.1/24). This ensures that the LAN behind GCC3 does not overlap with the 192.168.80.144/28 transit network used between the GCC1/GCC2 VRRP pair and the GCC3 WAN interfaces.

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