



# GigaVUE Cloud Suite Deployment Guide - OpenStack

**GigaVUE Cloud Suite**

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# Contents

<b>GigaVUE Cloud Suite Deployment Guide - OpenStack</b>	<b>1</b>
Change Notes	3
Contents	4
<b>GigaVUE Cloud Suite Deployment Guide - OpenStack</b>	<b>9</b>
<b>Overview of GigaVUE Cloud Suite for OpenStack</b>	<b>9</b>
GigaVUE-FM	10
UCT-V	10
UCT-V Controller	11
GigaVUE V Series Node	11
GigaVUE V Series Proxy	11
Monitoring Domain	11
Monitoring Session	12
<b>Introduction to the Supported Features for OpenStack</b>	<b>12</b>
Precryption™	12
How Gigamon Precryption Technology Works	13
Why Gigamon Precryption	14
Key Features	14
Key Benefits	14
How Gigamon Precryption Technology Works	15
Supported Platforms	17
Prerequisites	18
Secure Tunnels	19
Prefiltering	20
Customer Orchestrated Source - Use Case	21
<b>Licensing GigaVUE Cloud Suite</b>	<b>22</b>
Purchase GigaVUE Cloud Suite using CPPO	22
Volume Based License (VBL)	22
Base Bundles	23
Add-on Packages	23
How GigaVUE-FM Tracks Volume-Based License Usage	24
Manage Volume-based Licenses	24
<b>Get Started with GigaVUE Cloud Suite for OpenStack</b>	
<b>Deployment</b>	<b>29</b>
Before You Begin	29

Supported Hypervisor .....	29
Minimum Compute Requirements .....	30
Network Requirements .....	31
Virtual Network Interface Cards (vNICs) .....	32
Security Group for OpenStack .....	32
Key Pairs .....	37
Prerequisites for OVS Mirroring .....	37
OpenStack Cloud Environment Requirements .....	38
Default Login Credentials .....	40
Install and Upgrade GigaVUE-FM .....	41
<b>Deploy GigaVUE Cloud Suite for OpenStack .....</b>	<b>42</b>
Deployment Options for GigaVUE Cloud Suite for OpenStack .....	42
Deploy GigaVUE Fabric Components using OpenStack .....	43
Deploy GigaVUE Fabric Components using GigaVUE-FM .....	43
Upload Fabric Images .....	45
Install GigaVUE-FM on OpenStack .....	47
Initial GigaVUE-FM Configuration .....	49
Install UCT-V .....	50
Supported Operating Systems for UCT-V .....	51
Modes of Installing UCT-V .....	51
Linux UCT-V Installation .....	52
Windows UCT-V Installation .....	57
Install UCT-V OVS Agent for OVS Mirroring .....	62
Uninstall UCT-V .....	65
Uninstall Linux UCT-V .....	65
Uninstall Windows UCT-V .....	65
Upgrade or Reinstall UCT-V .....	66
Pre-Configuration Checklist for OpenStack .....	66
Install Custom Certificate .....	67
Upload Custom Certificates using GigaVUE-FM .....	67
Upload Custom Certificate using Third Party Orchestration .....	68
Adding Certificate Authority .....	68
CA List .....	69
Create Monitoring Domain .....	69
Managing Monitoring Domain .....	71
Monitoring Domain .....	72
Connections Domain .....	73
Fabric .....	73
UCT-Vs .....	74
Configure GigaVUE Fabric Components in GigaVUE-FM .....	75
Configure UCT-V Controller .....	77
Configure GigaVUE V Series Proxy .....	80

Configure GigaVUE V Series Node .....	81
Configure Role-Based Access for Third Party Orchestration .....	83
Users .....	83
Role .....	84
User Groups .....	86
Configure GigaVUE Fabric Components in OpenStack .....	87
Configure V Series Nodes and Proxy in OpenStack .....	88
Configure UCT-V Controller in OpenStack .....	91
Configure UCT-V in OpenStack .....	96
Upgrade GigaVUE Fabric Components in GigaVUE-FM for OpenStack .....	98
Prerequisite .....	98
Upgrade UCT-V Controller .....	98
Upgrade GigaVUE V Series Nodes and GigaVUE V Series Proxy .....	100
<b>Configure Secure Tunnel (OpenStack) .....</b>	<b>102</b>
Precrypted Traffic .....	102
Mirrored Traffic .....	103
Prerequisites .....	103
Notes .....	103
Configure Secure Tunnel from UCT-V to GigaVUE V Series Node .....	103
Configure Secure Tunnel between GigaVUE V Series Nodes .....	105
Viewing Status of Secure Tunnel .....	108
<b>Create Prefiltering Policy Template .....</b>	<b>109</b>
<b>Configure Monitoring Session .....</b>	<b>111</b>
Create a Monitoring Session (OpenStack) .....	111
Edit Monitoring Session .....	113
Monitoring Session Options (OpenStack) .....	114
Interface Mapping (OpenStack) .....	115
Create Ingress and Egress Tunnels .....	116
Create a New Map .....	123
Example- Create a New Map using Inclusion and Exclusion Maps .....	128
Map Library .....	128
Add Applications to Monitoring Session .....	129
Deploy Monitoring Session .....	129
View Monitoring Session Statistics .....	131
Visualize the Network Topology .....	132
<b>Configure Precryption in UCT-V .....</b>	<b>133</b>
Validate Precryption connection .....	134
Rules and Notes .....	134
<b>Configuration Health Monitoring .....</b>	<b>135</b>
<b>Traffic Health Monitoring .....</b>	<b>135</b>
Create Threshold Template .....	137

Apply Threshold Template .....	137
Apply Threshold Template to Monitoring Session .....	137
Apply Threshold Template to Applications .....	138
Edit Threshold Template .....	138
Clear Thresholds .....	139
Clear Thresholds for Applications .....	139
Clear Thresholds across the Monitoring Session .....	139
Supported Resources and Metrics .....	139
<b>View Health Status .....</b>	<b>141</b>
View Health Status of the Entire Monitoring Session .....	141
View Health Status of an Application .....	142
View Health Status for Individual V Series Nodes .....	142
View Application Health Status for Individual V Series Nodes .....	142
<b>View Health Status on the Monitoring Session Page .....</b>	<b>143</b>
Health .....	143
V Series Node Health .....	143
Target Source Health .....	144
<b>Analytics for Virtual Resources .....</b>	<b>144</b>
Virtual Inventory Statistics and Cloud Applications Dashboard .....	144
<b>Administer GigaVUE Cloud Suite for OpenStack .....</b>	<b>150</b>
Configure the OpenStack Settings .....	150
Shutdown or Restart of OVS traffic .....	151
Manual shutdown or restart of OVS traffic .....	152
Automatic shutdown or restart of OVS traffic .....	152
Role Based Access Control .....	153
About Audit Logs .....	154
About Events .....	156
<b>GigaVUE-FM Version Compatibility Matrix .....</b>	<b>158</b>
<b>Troubleshooting .....</b>	<b>159</b>
OpenStack Connection Failed .....	159
Handshake Alert: unrecognized_name .....	159
GigaVUE V Series Node or UCT-V Controller is Unreachable .....	160
<b>Additional Sources of Information .....</b>	<b>161</b>
Documentation .....	161
How to Download Software and Release Notes from My Gigamon .....	163
Documentation Feedback .....	164
Contact Technical Support .....	165
Contact Sales .....	165
Premium Support .....	166
The VUE Community .....	166

**Glossary** ..... **167**



# GigaVUE Cloud Suite Deployment Guide - OpenStack

This guide describes how to install, configure and deploy the GigaVUE Cloud solution on OpenStack. Use this document for instructions on configuring the GigaVUE Cloud components and setting up the traffic monitoring sessions for OpenStack.

Refer to the following sections for details:

- [Overview of GigaVUE Cloud Suite for OpenStack](#)
- [Get Started with GigaVUE Cloud Suite for OpenStack Deployment](#)
- [Deploy GigaVUE Cloud Suite for OpenStack](#)
- [Configure Monitoring Session](#)
- [Administer GigaVUE Cloud Suite for OpenStack](#)
- [GigaVUE-FM Version Compatibility Matrix](#)
- [Troubleshooting](#)

## Overview of GigaVUE Cloud Suite for OpenStack

GigaVUE-FM fabric manager is a web-based fabric management interface that provides a single-pane-of-glass visibility and management of both the physical and virtual traffic. GigaVUE-FM is a key component of the GigaVUE Cloud Suite for OpenStack.

The OpenStack software is designed for multi-tenancy (multiple projects), where a common set of physical compute and network resources are used to create project domains that provide isolation and security. Characteristics of a typical OpenStack deployment include the following:

- Projects are unaware of the physical hosts on which their instances are running.
- A project can have several virtual networks and may span across multiple hosts.

In a multi-project OpenStack cloud, where project isolation is critical, the Gigamon solution extends visibility for the project's workloads without impacting others by doing the following:

- Support project-wide monitoring domains—a project may monitor any of its instances.
- Honor project isolation boundaries—no traffic leakage from one project to any other project during monitoring.
- Monitor traffic without needing cloud administration privileges. There is no requirement to create port mirror sessions and so on.
- Monitor traffic activity of one project without adversely affecting other projects.

Refer [Deploying Gigamon CloudSuite on OpenStack to scale-in and Open vSwitch with Hardware offload and scale-out monitoring tools](#) for more detailed information.

## GigaVUE-FM

**GigaVUE-FM fabric manager** provides unified access, centralized administration, and high-level visibility for all GigaVUE traffic visibility nodes in the enterprise or data center, allowing a global perspective which is not possible from individual nodes.

In addition to centralized management and monitoring GigaVUE-FM helps you with configuration of the physical and virtual traffic policies for the visibility fabric thereby allowing administrators to map and direct network traffic to the tools and analytics infrastructure.

You have the flexibility of installing GigaVUE-FM across various supported platforms. Additionally, you can effectively manage deployments in any of the cloud platform as long as there exists IP connectivity for seamless operation.

## UCT-V

**UCT-V** (earlier known as G-vTAP Agent) is an agent that is installed in the VM instance. This agent mirrors the selected traffic from the instances (virtual machines) to the GigaVUE V Series Node. The UCT-V is offered as a Debian (.deb), Redhat Package Manager (.rpm) package, ZIP and MSI .

**Next generation UCT-V** is a lightweight solution that acquires traffic from Virtual Machines and in-turn improves the performance of the UCT-V mirroring capability. The solution has a prefiltering capability at the tap level that reduces the traffic flow from the agent to GigaVUE V Series Node and in-turn reduces the load on the GigaVUE V Series Node. Next generation UCT-V gets activated only on Linux systems with a Kernel version above 5.4.

Prefiltering helps you reduce the costs significantly. It allows you to filter the traffic at UCT-Vs before sending it to the GigaVUE V Series Node. For prefiltering the traffic, GigaVUE-FM allows you to create a prefiltering policy template and the template can be applied to a monitoring session.

For more information on installing the UCT-V see [Install UCT-V](#) .

## UCT-V Controller

UCT-V Controller (earlier known as G-vTAP Controller) manages multiple UCT-Vs and orchestrates the flow of mirrored traffic to GigaVUE V Series nodes. GigaVUE-FM uses one or more UCT-V Controllers to communicate with the UCT-Vs. A UCT-V Controller can only manage UCT-Vs that has the same version. For example, the UCT-V Controller v1.7 can only manage UCT-Vs v1.7. If you have UCT-Vs v1.6 still deployed in the EC2 instances, you must configure both UCT-V Controller v1.6 and v1.7. While configuring the UCT-V Controllers, you can also specify the tunnel type to be used for carrying the mirrored traffic from the UCT-Vs to the GigaVUE V Series nodes. The tunnel type can be L2GRE or VXLAN.

**NOTE:** A single UCT-V Controller can manage up to 1000 UCT-Vs.

## GigaVUE V Series Node

**GigaVUE® V Series Node** is a visibility node that aggregates mirrored traffic. It applies filters, manipulates the packets using GigaSMART applications, and distributes the optimized traffic to cloud-based tools or backhaul to on premise device or tools. GigaVUE Cloud Suite for AWS uses the TLS-PCAPNG, ERSPAN, L2GRE, UDPGRE and, VXLAN tunnels to deliver traffic to tool endpoints.

For more information on installing and configuring a GigaVUE V Series Node, refer to [Configure GigaVUE Fabric Components in GigaVUE-FM](#).

## GigaVUE V Series Proxy

**GigaVUE V Series Proxy** manages multiple GigaVUE V Series nodes and orchestrates the flow of traffic from GigaVUE V Series nodes to the GigaVUE-FM. GigaVUE-FM uses one or more GigaVUE V Series Proxies to communicate with the GigaVUE V Series nodes.

For more information on installing and configuring a GigaVUE V Series Proxy, refer to [Configure GigaVUE Fabric Components in GigaVUE-FM](#).

## Monitoring Domain

Monitoring domain helps you establish connection in between GigaVUE-FM and AWS platform. Once the connection is established, you can use GigaVUE-FM to launch the GigaVUE V Series Nodes, GigaVUE V Series Proxy and UCT-V Controller.

For more information on creating a Monitoring Domain, see [Create Monitoring Domain](#).

## Monitoring Session

Monitoring sessions are the rules created in GigaVUE-FM to collect inventory data from all target instances in your cloud environment. You can design your monitoring session to include or exclude the instances you want to monitor. You can also choose to monitor egress, ingress, or all traffic.

When a new target instance is added to your cloud environment, GigaVUE-FM automatically detects and adds the instance to your monitoring session. Similarly, when an instance is removed, it updates the monitoring sessions.

For more information on creating a monitoring session, see [Configure Monitoring Session](#).

## Introduction to the Supported Features for OpenStack

GigaVUE Cloud Suite for OpenStack supports the following features:

- [Precryption™](#)
- [Secure Tunnels](#)
- [Prefiltering](#)
- [Load Balancer](#)
- [Analytics for Virtual Resources](#)
- [Traffic Health Monitoring](#)

### Precryption™

**License:** Requires **SecureVUE Plus** license.

Gigamon Precryption™ technology<sup>1</sup> redefines security for virtual, cloud, and containerized applications, delivering plain text visibility of encrypted communications to the full security stack, without the traditional cost and complexity of decryption.

This section explains about:

- [How Gigamon Precryption Technology Works](#)
- [Why Gigamon Precryption](#)
- [Key Features](#)
- [Key Benefits](#)
- [Precryption Technology on Single Node](#)
- [Precryption Technology on Multi-Node](#)
- [Supported Platforms](#)
- [Prerequisites](#)

## How Gigamon Precryption Technology Works

Precryption technology leverages native Linux functionality to tap, or copy, communications between the application and the encryption library, such as OpenSSL.



In this way, Precryption captures network traffic in plaintext, either before it has been encrypted, or after it has been decrypted. Precryption functionality doesn't interfere with the actual encryption of the message nor its transmission across the network. There's no proxy, no retransmissions, no break-and-inspect. Instead, this plaintext copy is forwarded to the Gigamon Deep Observability Pipeline for further optimization, transformation, replication, and delivery to tools.

---

**Disclaimer:** The Precryption feature allows users to acquire traffic after it has been decrypted. This traffic can be acquired from both virtual machine (VM) and container-based solutions, and is then sent to the V Series product for further processing. The Precryption feature provides an option to use encrypted tunnels for communication between the acquisition (via UCT or G-vTAP) of unencrypted traffic and the traffic processing (at the V Series) which will better safeguard the traffic while in transit. However, if a user does not use the option for encrypted tunnels for communication, decrypted traffic will remain unencrypted while in transit between the point of acquisition and processing.

Please note that this information is subject to change, and we encourage you to stay updated on any modifications or improvements made to this feature.

By using this feature, you acknowledge and accept the current limitations and potential risks associated with the transmission of decrypted traffic.

Precryption technology is built on GigaVUE® Universal Cloud Tap (UCT) and works across hybrid and multi-cloud environments, including on-prem and virtual platforms. As a bonus, UCT with Precryption technology runs independent of the application, and doesn't have to be baked into the application development life cycle.

## Why Gigamon Precryption

GigaVUE Universal Cloud Tap with Precryption technology is a lightweight, friction-free solution that eliminates blind spots present in modern hybrid cloud infrastructure, providing East-West visibility into virtual, cloud, and container platforms. It delivers unobscured visibility into all encryption types including TLS 1.3, without managing and maintaining decryption keys. IT organizations can now manage compliance, keep private communications private, architect the necessary foundation for Zero Trust, and boost security tool effectiveness by a factor of 5x or more.

## Key Features

The following are the key features of this technology:

- Plain text visibility into communications with modern encryption (TLS 1.3, mTLS, and TLS 1.2 with Perfect Forward Secrecy).
- Plain text visibility into communications with legacy encryption (TLS 1.2 and earlier).
- Non intrusive traffic access without agents running inside container workloads.
- Elimination of expensive resource consumption associated with traditional traffic decryption.
- Elimination of key management required by traditional traffic decryption.
- Zero performance impact based on cipher type, strength, or version.
- Support across hybrid and multi-cloud environments, including on-prem, virtual, and container platforms.
- Keep private communications private across the network with plaintext threat activity delivered to security tools.
- Integration with Gigamon Deep Observability Pipeline for the full suite of optimization, transformation, and brokering capabilities.

## Key Benefits

The following are the key benefits of this technology:

- Eliminate blind spots for encrypted East-West (lateral) and North-South communications, including traffic that may not cross firewalls.
- Monitor application communications with an independent approach that enhances development team velocity.
- Extend security tools' visibility to all communications, regardless of encryption type.
- Achieve maximum traffic tapping efficiency across virtual environments.

- Leverage a 5–7x performance boost for security tools by consuming unencrypted data.
- Support a Zero Trust architecture founded on deep observability.
- Maintain privacy and compliance adherence associated with decrypted traffic management.

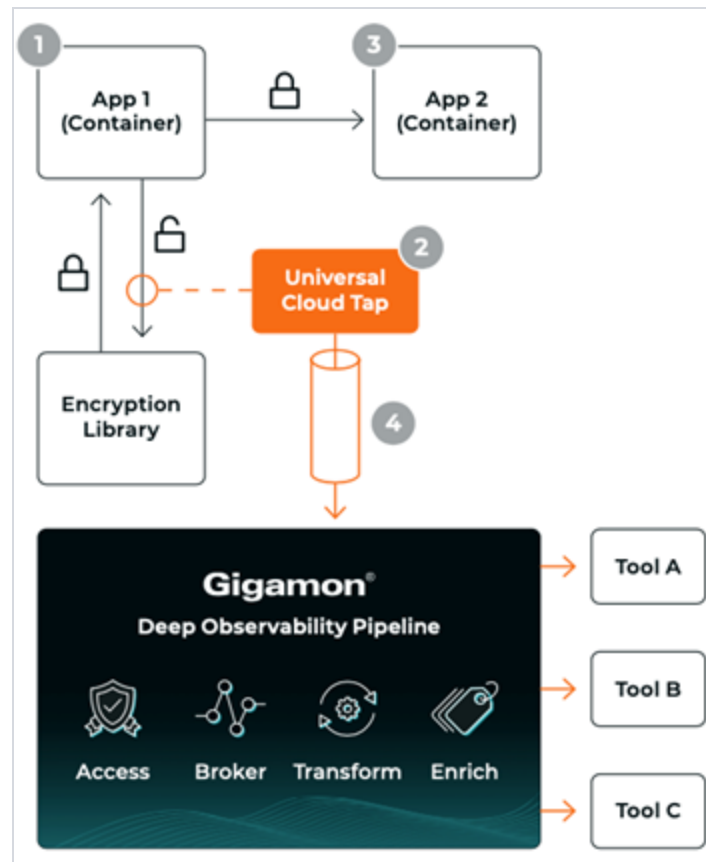
## How Gigamon Precryption Technology Works

This section explains about how Precryption technology works on single node and multiple node in the following sections:

- [Precryption Technology on Single Node](#)
- [Precryption Technology on Multi-Node](#)

### Precryption Technology on Single Node

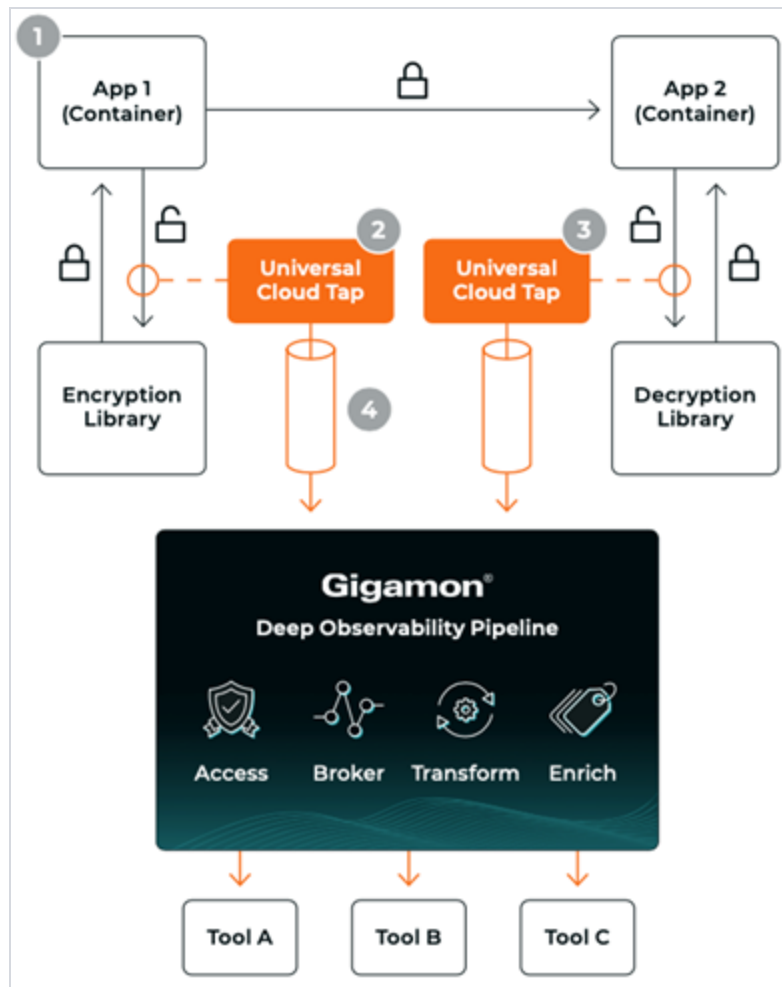
1. When any application needs to encrypt a message, it uses an encryption library, such as OpenSSL, to perform the actual encryption.
2. GigaVUE Universal Cloud Tap (UCT), enabled with Precryption technology, gets a copy of this message before it's encrypted on the network.
3. The encrypted message is sent to the receiving application, with unmodified encryption. No proxy, no re- encryption, no retransmissions.
4. GigaVUE UCT creates packet headers as needed, encapsulates in a tunnel, and forwards to GigaVUE V Series in the deep observability pipeline. Gigamon further optimizes, transforms, and delivers data to tools, without need for further decryption



## Pre-encryption Technology on Multi-Node

1. When any application needs to encrypt a message, it uses an encryption library, such as OpenSSL, to perform the actual encryption.
2. GigaVUE Universal Cloud Tap (UCT), enabled with Pre-encryption, gets a copy of this message before it's encrypted on the network.
3. Optionally, GigaVUE UCT enabled with Pre-encryption can also acquire a copy of the message from the server end, after the decryption.
4. GigaVUE UCT creates packet headers as needed, encapsulates in a tunnel, and forwards to V Series in the deep observability pipeline where it is further enriched, transformed, and delivered to tools, without further decryption.





## Supported Platforms

**VM environments:** Precryption™ is supported on the following VM platforms where UCT-V is supported:

Platform Type	Platform
Public Cloud	<ul style="list-style-type: none"> <li>● AWS</li> <li>● Azure</li> <li>● GCP (via Third Party Orchestration)</li> </ul>
Private Cloud	<ul style="list-style-type: none"> <li>● OpenStack</li> <li>● VMware ESXi (via Third Party Orchestration only)</li> <li>● VMware NSX-T (via Third Party Orchestration only)</li> </ul>

**Container environments:** Precryption™ is supported on the following container platforms where UCT-C is supported:

Platform Type	Platform
Public Cloud	<ul style="list-style-type: none"> <li>● EKS</li> <li>● AKS</li> </ul>
Private Cloud	<ul style="list-style-type: none"> <li>● OpenShift</li> <li>● Native Kubernetes (VMware)</li> </ul>

## Prerequisites

### Deployment Prerequisites

- OpenSSL version 1.0.2, version 1.1.0, version 1.1.1, and version 3.x
- For GigaVUE-FM, to capture the statistics, you must add the port 5671 in the security group
- Port 9900 should be enabled in security group settings on the UCT-V controller to receive the statistics information from UCT-V agent
- For UCT-C, you must add the port 42042 and port 5671 in the security group

### License Prerequisite

- Precryption™ requires SecureVUE Plus license.

### Supported Kernel Version

Precryption is supported for Kernel Version 5.4 and above for all Linux and Ubuntu Operating Systems. For the Kernel versions below 5.4, refer to the following table:

Kernel Version	Operating System
4.18.0-193.el8.x86_64	RHEL release 8.2 (Ootpa)
4.18.0-240.el8.x86_64	RHEL release 8.3 (Ootpa)
4.18.0-305.76.1.el8_4.x86_64	RHEL release 8.4 (Ootpa)
4.18.0-348.12.2.el8_5.x86_64	RHEL release 8.5 (Ootpa)
4.18.0-372.9.1.el8.x86_64	RHEL release 8.6 (Ootpa)
4.18.0-423.el8.x86_64	RHEL release 8.7 Beta (Ootpa)
4.18.0-477.15.1.el8_8.x86_64	RHEL release 8.8 (Ootpa)
5.3.0-1024-kvm	ubuntu19.10
4.18.0-305.3.1	Rocky Linux 8.4
4.18.0-348	Rocky Linux 8.5
4.18.0-372.9.1	Rocky Linux 8.6
4.18.0-425.10.1	Rocky Linux 8.7
4.18.0-477.10.1	Rocky Linux 8.8

Kernel Version	Operating System
4.18.0-80.el8.x86_64	centos 8.2
4.18.0-240.1.1.el8_3.x86_64	centos 8.3
4.18.0-305.3.1.el8_4.x86_64	centos 8.4
4.18.0-408.el8.x86_64	centos 8.5

## Note

- See the [Configure Precryption in UCT-V](#) section for details on how to enable Precryption™ in VM environments.
- See the [Configure in UCT-C](#) section for details on how to enable Precryption™ in container environments.
- See how [Secure Tunnels](#) feature can enable secure delivery of precrypted data.

## Secure Tunnels

Secure Tunnel securely transfers the cloud captured packets on UCT-V and UCT-C to a GigaVUE V Series Node or Tool (only in case of UCT-C). The data from UCT-V and UCT-C are encapsulated in PCAPng format, and the encrypted data is sent over a TLS connection to a GigaVUE V Series Node.

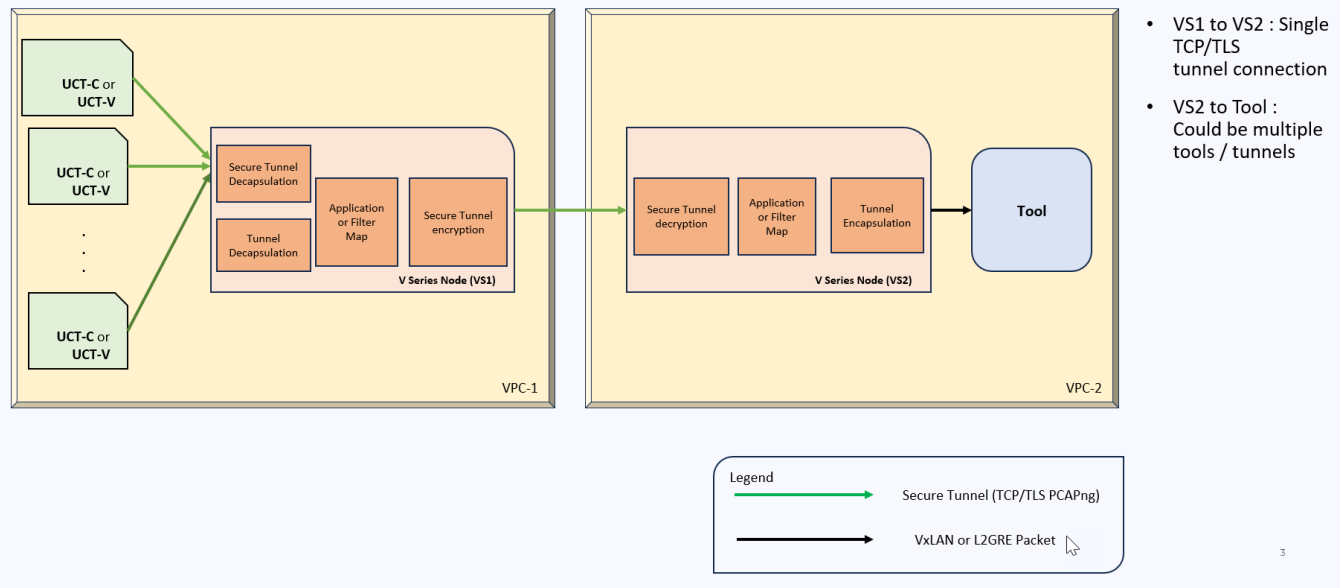
Secure Tunnel can also transfer the cloud captured packets from a GigaVUE V Series Node to another GigaVUE V Series Node.

In case of GigaVUE V Series Node to GigaVUE V Series node, the traffic from the GigaVUE V Series Node 1 is encapped using PCAPng format and transported to GigaVUE V Series Node 2 where the traffic is decapped. The secure tunnels between V Series Node to V Series Node have multiple uses cases.

The GigaVUE V Series Node decapsulates and processes the packet per the configuration. The decapsulated packet can be sent to the application such as De-duplication, Application Intelligence, Load balancer and to the tool. The Load Balancer on this node can send the packets to multiple V Series Nodes, in this case the packets can be encapsulated again and sent over a secure tunnel.

## Secure Tunnel Use Case

Tool in remote Virtual Private Cloud (VPC) – Single V Series Node



## Supported Platforms

Secure tunnel is supported on:

- OpenStack
- Azure
- AWS
- VMware NSX-T (only for Third Party Orchestration)
- VMware ESXi (only for Third Party Orchestration)
- Nutanix (only for Third Party Orchestration)
- Google Cloud Platform (only for Third Party Orchestration)

For information about how to configure secure tunnels, refer to the section [Configure Secure Tunnel \(OpenStack\)](#).

## Prefiltering

Prefiltering allows you to filter the traffic at UCT-Vs before sending it to the GigaVUE V Series Nodes. For prefiltering the traffic, GigaVUE-FM allows you to create a prefiltering policy template and the policy template can be applied to a monitoring session.

You can define a policy template with rules and filter values. A policy template once created can be applied to multiple monitoring sessions. However a monitoring session can use only one template.

Each monitoring session can have a maximum of 16 rules.

You can also edit a specific policy template with required rules and filter values for a particular monitoring session while editing a monitoring session. However, the customized changes are not saved in the template.

Some of the points that must be remembered for prefiltering in Next Generation UCT-Vs are:

- Prefiltering is supported only in Next Generation UCT-Vs. It is not supported for classic mirroring mechanism.
- Prefiltering is supported for both Linux and Windows UCT-Vs .
- For single monitoring session only one prefiltering policy is applicable. All the agents in that monitoring sessions are configured with respective prefiltering policy .
- For multiple monitoring session using the same agent to acquire the traffic, if a monitoring session uses a prefilter and the other monitoring session does not use a prefilter, then the prefiltering policy cannot be applied. The policy is set to PassAll and prefiltering is not performed.
- When multiple monitoring sessions utilize a single agent to capture traffic, and one session uses a prefilter while the other does not, then the prefiltering policy is not applied. In this scenario, the policy defaults to PassAll, resulting in the omission of any prefiltering.

For more information on configuring a prefilter, refer to [Create Prefiltering Policy Template](#)

## Customer Orchestrated Source - Use Case

Customer Orchestrated Source is a traffic acquisition method that allows to tunnel traffic directly to the GigaVUE V Series Nodes. In cases where UCT-V or VPC Mirroring cannot be configured due to firewall or other restrictions, you can use this method and tunnel the traffic to GigaVUE V Series Node, where the traffic is processed.

When using Customer Orchestrated Source, you can directly configure tunnels or raw endpoints in the monitoring session, where you can use other applications like Slicing, Masking, Application Metadata, Application Filtering, etc., to process the tunneled traffic. Refer to [Create Ingress and Egress Tunnels](#) for more detailed information on how to configure Tunnels in the Monitoring Session.

You can configure an Ingress tunnel in the Monitoring Session with the GigaVUE V Series Node IP address as the destination IP address, then the traffic is directly tunneled to that GigaVUE V Series Node.

# Licensing GigaVUE Cloud Suite

You can license the GigaVUE Cloud Suite using one of the following method:

- [Purchase GigaVUE Cloud Suite using CPPO](#)
- [Volume Based License \(VBL\)](#)

For purchasing licenses with the Volume-Based License (VBL) option, contact our Sales. Refer to [Contact Sales](#). For instructions on how to generate and apply license refer to the *GigaVUE Administration Guide* and the GigaVUE Licensing Guide.

## Purchase GigaVUE Cloud Suite using CPPO

GigaVUE Cloud Suite is available as an Amazon Machine Image (AMI) product within the AWS Marketplace. GigaVUE Cloud Suite purchased through the AWS Marketplace with Consulting Partner Private Offers (CPPO) comes with a volume-based license.

The list of SKUs available on the AWS Marketplace through the Cloud Professional Partner Organization (CPPO) are:

- VBL-250T-BN-SVP
- VBL-50T-BN-SVP
- VBL-2500T-BN-NV

Refer [Volume Based License \(VBL\)](#) for more detailed information on VBL and the available add-on packages.

## Volume Based License (VBL)

All the GigaVUE V Series Nodes connected to GigaVUE-FM periodically report statistics on the amount of traffic that flows through the V Series Nodes. The statistics provide information on the actual data volume that flows through the V Series Nodes. All licensed applications, when running on the node, generate usage statistics.

Licensing for GigaVUE Cloud Suite is volume-based. In the Volume-Based Licensing (VBL) scheme, a license entitles specific applications on your V Series Nodes to use a specified amount of total data volume over the term of the license. The distribution of the license to individual nodes becomes irrelevant for GigaVUE accounting purpose. GigaVUE-FM tracks the total amount of data processed by the various licensed applications and provides visibility on the actual amount of data, each licensed application is using on each node, and tracks the overuse, if any.

Volume-based licenses are available as monthly subscription licenses with a service period of one month. Service period is the period of time for which the total usage or overage is tracked. There is a grace period for each license that is encoded in the license file. The license effectively provides data allowance for this additional time after the official end time of the license.

For purchasing licenses with the Volume-Based License (VBL) option, contact our Sales. Refer to [Contact Sales](#).

## Base Bundles

In volume-based licensing scheme, licenses are offered as bundles. The following three base bundle types are available:

- CoreVUE
- NetVUE
- SecureVUEPlus

The bundles are available as SKUs<sup>1</sup>. The number in the SKU indicates the total volume allowance of the SKU for that base bundle. For example, VBL-250T-BN-CORE has a daily volume allowance of 250 terabytes for CoreVUE bundle.

## Bundle Replacement Policy

Refer to the following notes:

- You can always upgrade to a higher bundle but you cannot move to a lower version.
- You cannot have two different base bundles at the same time however, you can have multiple base bundles of the same type.
- Once upgraded to a higher bundle, the existing lower bundles will be automatically deactivated.

## Add-on Packages

GigaVUE-FM allows you to add additional packages called add-on packages to the base bundles. These add-on packages allow you to add additional applications to your base bundles. Add-on packages have their own start/end date and volume specifications.

### Rules for add-on packages:

- Add-on packages can only to be added when there is an active base bundle available in GigaVUE-FM.
- The base bundle limits the total volume usage of the add-on package.

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<sup>1</sup>Stock Keeping Unit. Refer to the [What is a License SKU?](#) section in the FAQs for Licenses chapter.

- If your add-on package has volume allowance less than the base bundle, then your add-on package can only handle volume allocated for add-on package.
- When the life term of an add-on package extends beyond the base bundle, then when the base bundle expires, the volume allowance of the add-on package will be reduced to zero until a new base bundle is added.

For more information about SKUs refer to the respective Data Sheets as follows:

GigaVUE Data Sheets
<a href="#">GigaVUE Cloud Suite for VMware Data Sheet</a>
<a href="#">GigaVUE Cloud Suite for AWS Data Sheet</a>
<a href="#">GigaVUE Cloud Suite for Azure Data Sheet</a>
<a href="#">GigaVUE Cloud Suite for OpenStack</a>
<a href="#">GigaVUE Cloud Suite for Nutanix</a>
<a href="#">GigaVUE Cloud Suite for Kubernetes</a>

## How GigaVUE-FM Tracks Volume-Based License Usage

GigaVUE-FM tracks the license usage for each V Series node as follows:

- When you create and deploy a monitoring session, GigaVUE-FM allows you to use only those applications that are licensed at that point (applicable only for ACTIVE licenses, licenses in grace period are not included).
- When a license goes into grace period, you will be notified with an audit log.
- When a license expires (and has not been renewed yet), the monitoring sessions using the corresponding license will not be undeployed.

For releases prior to 6.4:


- The monitoring sessions using the corresponding license will be undeployed (but not deleted from the database).
- When a license is later renewed or newly imported, any undeployed monitoring sessions are redeployed.

**NOTE:** When the license expires, GigaVUE-FM displays a notification on the screen.

## Manage Volume-based Licenses

To manage active Volume-based License:



1. On the left navigation pane, click .
2. Go to **System > Licenses**. From the top navigation bar, select the **VBL Active** from the **FM/Cloud** drop-down.

This page lists the following information about the active Volume-based Licenses:

Field	Description
SKUs	Unique identifier associated with the license
Bundles	Bundle to which the license belongs to
Volume	Total daily allowance volume
Starts	License start date
Ends	License end date
Type	Type of license (Commercial, Trial, Lab and other license types).
Activation ID	Activation ID
Entitlement ID	Entitlement ID

**NOTE:** The License Type and Activation ID are displayed by default in the VBL Active page. To display the Entitlement ID field, click on the column setting configuration option to enable the Entitlement ID field.

The expired licenses are displayed in the **VBL Inactive** page, which can be found under the **FM/Cloud** drop-down in the top navigation bar. This page lists the following information about the inactive Volume-based Licenses:

Field	Description
SKUs	Unique identifier associated with the license.
Bundles	Bundle to which the license belongs to.
Ends	License end date
Grace Period	Number of days the license is in grace period
Deactivation Date	Date the license got deactivated.
Revocation Code	License revocation code.
Status	License status.

**NOTE:** The License Type, Activation ID and Entitlement ID fields are not displayed by default in the VBL Inactive page. To display these fields, click on the column setting configuration option and enable these fields.

Use the following buttons to manage your VBL.


Button	Description
<b>Activate Licenses</b>	Use this button to activate a Volume-based License. Refer to <a href="#">Activate Volume-based Licenses</a> for more information.
<b>Email Volume Usage</b>	Use this button to send the volume usage details to the email recipients.
<b>Filter</b>	Use this button to narrow down the list of active Volume-based Licenses that are displayed on the VBL active page.
<b>Export</b>	Use this button to export the details in the VBL active page to a CSV or XLSX file.
<b>Deactivate</b>	Use this button to deactivate the licenses. You can only deactivate licenses that are in grace period or that have expired.

For more detailed information on dashboards and reports generation for Volume-based Licensing refer to the following table:

For details about:	Reference section	Guide
How to generate Volume-based License reports	<a href="#">Generate VBL Usage Reports</a>	GigaVUE Administration Guide
Volume-based Licensed report details	<a href="#">Volume Based License Usage Report</a>	GigaVUE Administration Guide
Fabric health analytics dashboards for Volume-based Licenses usage	<a href="#">Dashboards for Volume Based Licenses Usage</a>	GigaVUE-FM User Guide

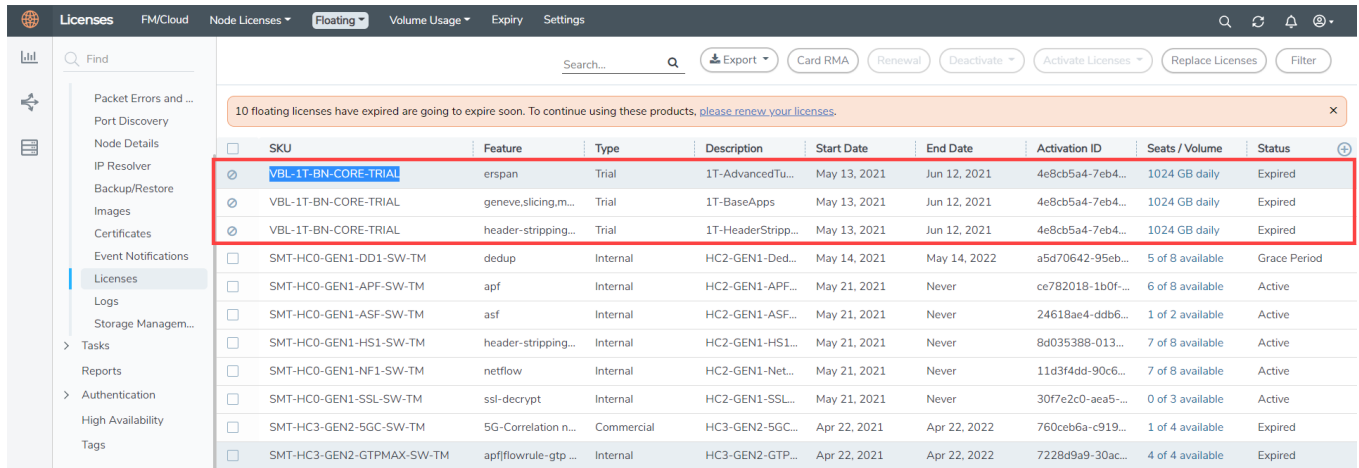
## Activate Volume-based Licenses

To activate Volume-based licenses:

1. On the left navigation pane, click .
2. Go to **System > Licenses**. From the top navigation bar, select the **VBL Active** from the **FM/Cloud** drop-down.
3. Click **Activate Licenses**. The **Activate License** page appears. Perform the following steps:
  - a. Download the fabric inventory file that contains information about GigaVUE-FM. Click **Next**. Refer to the [What is a Fabric Inventory File?](#) section for more details.
  - b. Navigate to the Licensing Portal. Upload the Fabric Inventory file in the portal. Once the fabric inventory file is uploaded, select the required license and click **Activate**. A license key is provided. Record the license key or keys.
  - c. Return to GigaVUE-FM and add the additional licenses.

## Default Trial Licenses

After you install GigaVUE-FM, a default free 1TB of CoreVUE trial volume-based license (VBL) is provided one-time for 30 days (from the date of installation).



SKU	Feature	Type	Description	Start Date	End Date	Activation ID	Seats / Volume	Status
VBL-1T-BN-CORE-TRIAL	erspan	Trial	1T-AdvancedTu...	May 13, 2021	Jun 12, 2021	4e8cb5a4-7eb4...	1024 GB daily	Expired
VBL-1T-BN-CORE-TRIAL	geneve.slicing.m...	Trial	1T-BaseApps	May 13, 2021	Jun 12, 2021	4e8cb5a4-7eb4...	1024 GB daily	Expired
VBL-1T-BN-CORE-TRIAL	header-stripping...	Trial	1T-HeaderStripp...	May 13, 2021	Jun 12, 2021	4e8cb5a4-7eb4...	1024 GB daily	Expired
SMT-HC0-GEN1-DD1-SW-TM	dedup	Internal	HC2-GEN1-Ded...	May 14, 2021	May 14, 2022	a5d70642-95eb...	5 of 8 available	Grace Period
SMT-HC0-GEN1-APF-SW-TM	apf	Internal	HC2-GEN1-APF...	May 21, 2021	Never	ce782018-1b0f...	6 of 8 available	Active
SMT-HC0-GEN1-ASF-SW-TM	asf	Internal	HC2-GEN1-ASF...	May 21, 2021	Never	24618ae4-ddb6...	1 of 2 available	Active
SMT-HC0-GEN1-HS1-SW-TM	header-stripping...	Internal	HC2-GEN1-HS1...	May 21, 2021	Never	8d035388-013...	7 of 8 available	Active
SMT-HC0-GEN1-NF1-SW-TM	netflow	Internal	HC2-GEN1-Net...	May 21, 2021	Never	11d3f4dd-90c6...	7 of 8 available	Active
SMT-HC0-GEN1-SSL-SW-TM	ssl-decrypt	Internal	HC2-GEN1-SSL...	May 21, 2021	Never	30f7e2c0-aea5...	0 of 3 available	Active
SMT-HC3-GEN2-5GC-SW-TM	5G-Correlation n...	Commercial	HC3-GEN2-5GC...	Apr 22, 2021	Apr 22, 2022	760ceb5a-c919...	1 of 4 available	Expired
SMT-HC3-GEN2-GTPMAX-SW-TM	apfflowrule-gtp...	Internal	HC3-GEN2-GTP...	Apr 22, 2021	Apr 22, 2022	7228d9a9-30ac...	4 of 4 available	Expired

This license includes the following applications:


- ERSPAN
- Geneve
- Slicing
- Masking
- Trailer
- Tunneling
- Load Balancing
- Enhanced Load Balancing
- Flowmap
- Header-stripping
- Add header

**NOTE:** There is no grace period for the trial license. If you do not have any other Volume-based licenses installed, then after 30 days, on expiry of the trial license, any deployed monitoring sessions will be undeployed from the existing GigaVUE V Series Nodes.

To deactivate the trial VBL refer to [Delete Default Trial Licenses](#) section for details.

## Delete Default Trial Licenses

GigaVUE-FM allows you to deactivate the default trial licenses from this page. To deactivate the license:

1. On the left navigation pane, click  .
2. Go to **System > Licenses > Floating**. Click **Activated**.
3. Click **Deactivate > Default Trial VBL**.

The VBL trial licenses is deactivated and is no longer listed in the Activated page. However, you can view these deactivated licenses from the Deactivated page.

# Get Started with GigaVUE Cloud Suite for OpenStack Deployment

This chapter describes how to configure GigaVUE-FM fabric manager, UCT-V Controllers, GigaVUE V Series Proxy, and GigaVUE V Series Nodes in your OpenStack Cloud (Project). Refer to the following sections for details:

- [License Information](#)
- [Before You Begin](#)
- [Install and Upgrade GigaVUE-FM](#)

## Before You Begin

This section describes the requirements and prerequisites for configuring the GigaVUE Cloud Suite for OpenStack. Refer to the following section for details.

- [Supported Hypervisor](#)
- [Minimum Compute Requirements](#)
- [Network Requirements](#)
- [Virtual Network Interface Cards \(vNICs\)](#)
- [Security Group for OpenStack](#)
- [Create a Security Group](#)
- [Key Pairs](#)

## Supported Hypervisor

The following table lists the hypervisor with the supported versions for UCT-V.

Hypervisor	Version
KVM	<b>UCT-V</b> —Pike through Stein releases <b>OVS Mirroring</b> —Rocky and above

## Minimum Compute Requirements

In OpenStack, flavors set the vCPU, memory, and storage requirements for an image. Gigamon recommends that you create a flavor on your choice that matches or exceeds the minimum recommended requirements listed in the following table.

Compute Instances	vCPU	Memory	Disk Space	Description
UCT-V	2 vCPU	4GB	N/A	Available as rpm or debian package. Instances can have a single vNIC or dual vNICs configured for monitoring the traffic.
UCT-V Controller	1 vCPU	4GB	8GB	Based on the number of agents being monitored, multiple controllers will be required to scale out horizontally.
GigaVUE V Series Node	2 vCPU	3.75GB	20GB	NIC 1: Monitored Network IP; Can be used as Tunnel IP NIC 2: Tunnel IP (optional) NIC 3: Management IP
GigaVUE V Series Proxy	1 vCPU	4GB	8GB	Based on the number of GigaVUE V Series nodes being monitored, multiple controllers will be required to scale out horizontally
GigaVUE-FM	4 vCPU	8GB	40GB	GigaVUE-FM must be able to access the controller instance for relaying the commands. Use a flavor with a root disk of minimum 40GB and an ephemeral disk of minimum 4GB.

The instance size of the GigaVUE V Series is configured and packaged as part of the qcow2 image file.

## Network Requirements

The following table lists the recommended requirements to setup the network topology.

Network	Purpose
<b>Management</b>	Identify the subnets that GigaVUE-FM uses to communicate with the GigaVUE V Series nodes and controllers.
<b>Data</b>	Identify the subnets that receives the mirrored tunnel traffic from the monitored instances. In data network, if a tool subnet is selected then the V Series node egress traffic on to the destinations or tools.

**NOTE:** If you are using IPv6 in the tenant network, then it is recommended to use SLAAC or stateless DHCPv6 for dynamic address assignment.

## Virtual Network Interface Cards (vNICs)

OpenStack Cloud Instances with UCT-V can be configured with one or more vNICs.

- **Single vNIC**—If there is only one interface configured on the instance with the UCT-V, the UCT-V sends the mirrored traffic out using the same interface.
- **Multiple vNICs**—If there are two or more interfaces configured on the instance with the UCT-V, the UCT-V monitors any number of interfaces. It provides an option to send the mirrored traffic out using any one of the interfaces or using a separate, non-monitored interface. When multiple interfaces are added to the controller, floating IP is used to make the first interface as management interface.

**NOTE:** vNICs are only applicable if the UCT-V is installed on the instances being monitored. It is not applicable for OVS Mirroring or OVS Mirroring +DPDK.

## Security Group for OpenStack

A security group defines the virtual firewall rules for your instance to control inbound and outbound traffic. When you launch GigaVUE-FM, GigaVUE V Series Proxies, GigaVUE V Series Nodes, and UCT-V Controllers in your project, you add rules that control the inbound traffic to instances, and a separate set of rules that control the outbound traffic.

The following table lists the Network Firewall / Security Group requirements for GigaVUE Cloud Suite.

**NOTE:** When using dual stack network, the below mentioned ports must be opened for both IPv4 and IPv6.

Direction	Protocol	Port	CIDR	Purpose
<b>GigaVUE-FM</b>				
Inbound	TCP	443	Administrator Subnet	Allows GigaVUE-FM to accept Management connection using REST API. Allows users to access GigaVUE-FM UI securely through HTTPS connection.
Inbound	TCP	22	Administrator Subnet	Allows CLI access to user-initiated management and diagnostics.
Inbound (This is the port used for Third Party Orchestration)	TCP	443	UCT-V Controller IP	Allows GigaVUE-FM to receive registration requests from UCT-V Controller using REST API.



Direction	Protocol	Port	CIDR	Purpose
Inbound (This is the port used for Third Party Orchestration)	TCP	443	GigaVUE V Series Node IP	Allows GigaVUE-FM to receive registration requests from GigaVUE V Series Node using REST API when GigaVUE V Series Proxy is not used.
Inbound (This is the port used for Third Party Orchestration)	TCP	443	GigaVUE V Series Proxy IP	Allows GigaVUE-FM to receive registration requests from GigaVUE V Series Proxy using REST API.
Inbound	TCP	5671	GigaVUE V Series Node IP	Allows GigaVUE-FM to receive traffic health updates from GigaVUE V Series Nodes.
Inbound	TCP	5671	UCT-V or Subnet IP	Allows GigaVUE-FM to receive statistics from Next Generation UCT-V.
Inbound	UDP	2056	GigaVUE V Series Node IP	Allows GigaVUE-FM to receive Application Intelligence and Application Visualization reports from GigaVUE V Series Node.
Outbound	TCP	9900	GigaVUE-FM IP	Allows GigaVUE-FM to communicate control and management plane traffic with UCT-V Controller
Outbound (optional)	TCP	8890	GigaVUE V Series Proxy IP	Allows GigaVUE-FM to communicate control and management plane traffic to GigaVUE V Series Proxy
Outbound	TCP	8889	GigaVUE V Series Node IP	Allows GigaVUE-FM to communicate control and management plane traffic to GigaVUE V Series Node
Outbound	TCP	443	Any IP Address	Allows GigaVUE-FM to reach the Public Cloud Platform APIs.
<b>UCT-V Controller</b>				
Inbound	TCP	9900	GigaVUE-FM IP	Allows UCT-V Controller to communicate control and management plane traffic with GigaVUE-FM
Inbound (This is the port used for Third Party Orchestration)	TCP	8891	UCT-V or Subnet IP	Allows UCT-V Controller to receive the registration requests from UCT-V.

Direction	Protocol	Port	CIDR	Purpose
Inbound	TCP	22	Administrator Subnet	Allows CLI access for user-initiated management and diagnostics, specifically when using third party orchestration.
Outbound (This is the port used for Third Party Orchestration)	TCP	443	GigaVUE-FM IP	Allows UCT-V Controller to send the registration requests to GigaVUE-FM using REST API.
Outbound	TCP	9901	UCT-V Controller IP	Allows UCT-V Controller to communicate control and management plane traffic with UCT-Vs.
Outbound	TCP	5671	GigaVUE-FM IP	Allows UCT-V Controller to send traffic health updates to GigaVUE-FM.
<b>UCT-V</b>				
Inbound	TCP	9901	UCT-V Controller IP	Allows UCT-V to receive control and management plane traffic from UCT-V Controller
Outbound (This is the port used for Third Party Orchestration)	TCP	8891	UCT-V Subnet IP	Allows UCT-V to communicate with UCT-V Controller for registration and Heartbeat
Outbound	UDP (VXLAN)	VXLAN (default 4789)	UCT-V Subnet IP	Allows UCT-V to tunnel VXLAN traffic to GigaVUE V Series Nodes
Outbound	IP Protocol (L2GRE)	VXLAN (default 4789)	UCT-V Subnet IP	Allows UCT-V to tunnel L2GRE traffic to GigaVUE V Series Nodes
Outbound (Optional - This port is used only for Secure Tunnels)	TCP	11443	UCT-V subnet	Allows UCT-V to securely transfer the traffic to the GigaVUE V Series Node
Outbound	TCP	9900	UCT-V Controller IP	Allows UCT-V to send traffic health updates to UCT-V Controller.
<b>GigaVUE V Series Proxy (optional)</b>				
Inbound	TCP	8890	GigaVUE-FM IP	Allows GigaVUE-FM to communicate control and management plane traffic with GigaVUE V Series Proxy.

Direction	Protocol	Port	CIDR	Purpose
Inbound (This is the port used for Third Party Orchestration)	TCP	8891	GigaVUE V Series Node IP	Allows GigaVUE V Series Proxy to receive registration requests and heartbeat messages from GigaVUE V Series Node.
Inbound	TCP	22	Administrator Subnet	Allows CLI access for user-initiated management and diagnostics, specifically when using third party orchestration.
Outbound	TCP	443	GigaVUE-FM IP	Allows GigaVUE V Series Proxy to communicate the registration requests to GigaVUE-FM
Outbound	TCP	8889	GigaVUE V Series Node IP	Allows GigaVUE V Series Proxy to communicate control and management plane traffic with GigaVUE V Series Node
<b>GigaVUE V Series Node</b>				
Inbound	TCP	8889	GigaVUE-FM IP	Allows GigaVUE V Series Node to communicate control and management plane traffic with GigaVUE-FM
Inbound	TCP	8889	GigaVUE V Series Proxy IP	Allows GigaVUE V Series Node to communicate control and management plane traffic with GigaVUE V Series Proxy.
Inbound	UDP (VXLAN)	VXLAN (default 4789)	UCT-V Subnet IP	Allows GigaVUE V Series Nodes to receive VXLAN tunnel traffic to UCT-V
Inbound	IP Protocol (L2GRE)	L2GRE	UCT-V Subnet IP	Allows GigaVUE V Series Nodes to receive L2GRE tunnel traffic to UCT-V
Inbound	UDPGRE	4754	Ingress Tunnel	Allows GigaVUE V Series Node to receive tunnel traffic from UDPGRE Tunnel
Inbound	TCP	22	Administrator Subnet	Allows CLI access for user-initiated management and diagnostics, specifically when using third party orchestration.
Inbound (Optional - This port is used only for Secure Tunnels)	TCP	11443	UCT-V subnet	Allows to securely transfer the traffic to GigaVUE V Series Nodes.

Direction	Protocol	Port	CIDR	Purpose
Outbound	TCP	5671	GigaVUE-FM IP	Allows GigaVUE V Series Node to send traffic health updates to GigaVUE-FM.
Outbound	UDP (VXLAN)	VXLAN (default 4789)	Tool IP	Allows GigaVUE V Series Node to tunnel output to the tool.
Outbound	IP Protocol (L2GRE)	VXLAN (default 4789)	Tool IP	Allows GigaVUE V Series Node to tunnel output to the tool.
Outbound	UDP	2056	GigaVUE-FM IP	Allows GigaVUE V Series Node to send Application Intelligence and Application Visualization reports to GigaVUE-FM.
Outbound	UDP	2055	Tool IP	Allows GigaVUE V Series Node to send NetFlow traffic to an external tool.
Outbound	UDP	514	Tool IP	Allows GigaVUE V Series Node to send Application Metadata Intelligence log messages to external tools.
Bidirectional (optional)	ICMP	<ul style="list-style-type: none"> <li>● echo request</li> <li>● echo reply</li> </ul>	Tool IP	Allows GigaVUE V Series Node to send health check tunnel destination traffic.
Outbound (This is the port used for Third Party Orchestration)	TCP	8891	GigaVUE V Series Proxy IP	Allows GigaVUE V Series Node to send registration requests and heartbeat messages to GigaVUE V Series Proxy when GigaVUE V Series Proxy is used.
Outbound (This is the port used for Third Party Orchestration)	TCP	443	GigaVUE-FM IP	Allows GigaVUE V Series Node to send registration requests and heartbeat messages to GigaVUE-FM when GigaVUE V Series Proxy is not used.
Outbound (Optional - This port is used only for Secure Tunnels)	TCP	11443	Tool IP	Allows to securely transfer the traffic to an external tool.
<b>Universal Cloud Tap - Container</b> deployed inside Kubernetes worker node				
Outbound	TCP	42042	Any IP address	Allows UCT-C to send statistics information to UCT-C Controller.
Outbound	UDP	VXLAN (default 4789)	Any IP address	Allows UCT-C to tunnel traffic to the GigaVUE V Series Node or other destination.
<b>UCT-C Controller</b> deployed inside Kubernetes worker node				

Direction	Protocol	Port	CIDR	Purpose
Inbound	TCP	8443 (configurable)	Load Balancer IP Address	Allows GigaVUE-FM to communicate with UCT- C Controller.
Outbound	TCP	5671	Any IP address	Allows UCT-C Controller to send statistics to GigaVUE-FM.
Outbound	TCP	443	GigaVUE-FM IP address	Allows UCT-C Controller to communicate with GigaVUE- FM.

The following table list the Network Firewall or Security Group requirements when using OVS Mirroring.

Direction	Protocol	Port	CIDR	Purpose
<b>UCT-V OVS Controller</b>				
Inbound	TCP	9900	GigaVUE-FM IP	Allows GigaVUE-FM to communicate with UCT-V OVS Controllers
<b>UCT-V OVS Agent</b>				
Inbound	TCP	9901	UCT-V OVS Controller IP	Allows UCT-V OVS Controllers to communicate with UCT-V OVS Agents

**NOTE:** The Security Group Rules table lists only the ingress rules. Make sure the egress ports are open for communication. Along with the ports listed in the Security Group Rules table, make sure the suitable ports required to communicate with Service Endpoints such as Identity, Compute, and Cloud Metadata are also open.

## Key Pairs

A key pair consists of a public key and a private key. You must create a key pair and select the name of this key pair when you launch the UCT-V Controllers, GigaVUE V Series nodes, and GigaVUE V Series Controllers from GigaVUE-FM. Then, you must provide the private key to connect to these instances. For information about creating a key pair, refer to OpenStack documentation.

## Prerequisites for OVS Mirroring

This section is only applicable if you which to use OVS Mirroring as your traffic acquisition method. The following items are required to deploy a UCT-V OVS agent:

- An existing OpenStack cloud environment should be available with admin project and login credentials to create a monitoring domain.

- A user with OVS access is required to enable OVS-Mirror. The user can be an admin or can be a user with a custom role that has the permissions and the ability to list projects.
- A working GigaVUE-FM with latest build.

## OpenStack Cloud Environment Requirements

- ML2 mechanism driver: Open vSwitch.
- You must have the following role privileges as shown in the table for the respective files to enable OVS mirroring:

File	Command
/etc/nova/policy.json	"os_compute_api:os-hypervisors": "role:gigamon", "os_compute_api:servers:detail:get_all_tenants": "role:gigamon", "os_compute_api:servers:index:get_all_tenants": "role:gigamon", "os_compute_api:servers:allow_all_filters": "role:gigamon", "os_compute_api:os-extended-server-attributes": "role:gigamon"
/etc/keystone/policy.json	"identity:list_projects": "role:admin or role:gigamon", "identity:list_user_projects": "role:admin or role:gigamon or rule:owner", "identity:list_users": "role:admin or role:gigamon"
/etc/neutron/policy.json	"context_is_advsvc": "role:advsvc or role:gigamon", "get_subnet": "rule:admin_or_owner or rule:shared or rule:gigamon", "get_network": "rule:admin_or_owner or rule:shared or rule:external or rule:context_is_advsvc", "update_floatingip": "rule:admin_or_owner or role:gigamon", "get_floatingip": "rule:admin_or_owner or role:gigamon", "get_security_groups": "rule:admin_or_owner or role:gigamon", "get_security_group": "rule:admin_or_owner or rule:gigamon", "get_port": "rule:context_is_advsvc or rule:admin_owner_or_network_owner", "get_port:binding:vif_details": "rule:admin_only or rule:context_is_gigamon"

- Here are the APIs and commands required for OVS mirroring

OpenStack CLI command	Supported API/Action	Description
openstack hypervisor list	GET /os-hypervisors	Should list all hypervisors in the domain.
openstack server list --all -- host <hostname>	GET /servers	Should list all the servers on a specified host
openstack server list-all	GET /servers	Should list servers of all projects in the domain.
openstack project list	GET /v3/projects	Should list all projects in the domain.
openstack project list -user <user with custom role>	GET /v3/projects	Should list all projects that a specified user (user specified in FM config) is associated with

OpenStack CLI command	Supported API/Action	Description
openstack user show <userName>	GET /v3/users	Should list all users by username
openstack subnet list	GET /subnets	Should list all subnets for all projects in the domain.
openstack network list	GET /network	Should list all networks for all projects in the domain.
openstack floating ip list	GET /floatingips	Should list all floating ips for all projects in the domain.
openstack floating ip set-port <portid> <floating ip>	PUT /floatingips/{floatingip_ID}	Used to attach floating ip to fabric nodes.
openstack security group list	GET /security-groups	Should list security groups for all projects in the domain
openstack security group show <security group id>	GET /security-groups/{security_group_id}	Should list details of specified security group
openstack port list	GET /ports	Should list ports for all projects in the domain
openstack port show <portID>	GET /ports/{portID}	Should list port details including bridge name.
openstack server create	POST /servers	Launch fabric nodes
openstack server <action> <serverName>	POST /servers/{server_id}/action	stop/start/reboot fabric nodes
openstack server delete <serverName>	DELETE /servers/{serverID}	Delete fabric nodes
openstack server set	PUT /servers/{serverID}/metadata	Update fabric node metadata
openstack flavor list	GET /flavors	Get list of flavors
openstack availability zone list	GET /os-availability-zone	Get list of availability zones
openstack keypair list	GET /os-keypairs	Get list of keypairs



If the OpenStack CLI command `openstack hypervisor list` does not return a reachable IP for the hypervisors that are being monitored, you must manually enter a reachable



IP for each hypervisor in OpenStack CLI using project properties. For each hypervisor you will need to add a key value pair property in the following format:

- key: value
- key: must be in the form gigamon-hv-<hypervisorID>
- value: reachable IP for hypervisor

For example: `openstack project set --property gigamon-hv-1=1.2.3.4 project-name`

## Default Login Credentials

You can login to the GigaVUE V Series Node, GigaVUE V Series proxy, and UCT-V Controller by using the default credentials.

Product	Login credentials
GigaVUE V Series Node and GigaVUE V Series proxy	<p>You can login to the GigaVUE V Series Node and GigaVUE V Series proxy by using ssh. The default username and password is:</p> <p>Username: gigamon</p> <p>Password: Gigamon123!</p>
UCT-V Controllers	<p>You can login to the UCT-V Controller by using ssh. The default username and password is:</p> <p>Username: gigamon</p> <p>Password: Gigamon123!</p>



## Install and Upgrade GigaVUE-FM

You can install and upgrade the GigaVUE-FM fabric manager on cloud or on-premises. You can also upgrade GigaVUE-FM deployed in OpenStack environment.

- Cloud—To install GigaVUE-FM inside your OpenStack environment, you can simply launch the GigaVUE-FM instance in your Project. For installing the GigaVUE-FM instance, refer to [Install GigaVUE-FM on OpenStack](#)

**NOTE:** You cannot upgrade your 5.7.00 or lower versions of the GigaVUE-FM instance deployed in OpenStack environment to GigaVUE-FM 5.8.00 or higher versions. You must perform a fresh installation of GigaVUE-FM 5.8.00 or higher versions.

- On-premises—To install and upgrade GigaVUE-FM in your enterprise data center, refer to *GigaVUE-FM Installation and Upgrade Guide* available in the [Gigamon Documentation Library](#).

# Deploy GigaVUE Cloud Suite for OpenStack

This chapter describes how to connect, launch, and deploy fabric components of GigaVUE Cloud Suite for OpenStack in your OpenStack environment.

Refer to the following sections for details:

- [Upload Fabric Images](#)
- [Install UCT-V](#)
- [Pre-Configuration Checklist for OpenStack](#)
- [Create Monitoring Domain](#)
- [Configure GigaVUE Fabric Components in GigaVUE-FM](#)
- [Configure GigaVUE Fabric Components in OpenStack](#)
- [Upgrade GigaVUE Fabric Components in GigaVUE-FM for OpenStack](#)

Refer to the following Gigamon Validated Designs for more detailed information:

- [Deploying V Series 2 visibility solution for OpenStack](#)
- [Gaining Visibility and Optimizing the Traffic Between Containerized Workloads for Seamless Monitoring](#)

## Deployment Options for GigaVUE Cloud Suite for OpenStack

This section provides a detailed information on the multiple ways in which GigaVUE Cloud Suite for OpenStack can be configured to provide visibility for physical and virtual traffic. There are four different ways in which GigaVUE Cloud Suite for OpenStack can be configured based on the traffic acquisition method and the method in which you want to deploy fabric components. Refer to the [Before You Begin](#) topic for minimum requirements and prerequisites. For more detailed information and work flow refer the following topics:

- [Deploy GigaVUE Fabric Components using OpenStack](#)
- [Deploy GigaVUE Fabric Components using GigaVUE-FM](#)
  - [Traffic Acquisition Method as UCT-V](#)
  - [Traffic Acquisition Method as OVS Mirroring](#)
  - [Traffic Acquisition Method as Tunnel](#)

## Deploy GigaVUE Fabric Components using OpenStack

GigaVUE-FM allows you to use OpenStack as an orchestrator to deploy GigaVUE fabric nodes and then use GigaVUE-FM to configure the advanced features supported by these nodes. Refer the following table for the step-by-step instructions.

Step No	Task	Refer the following topics
1	Install GigaVUE-FM on OpenStack	<a href="#">Install GigaVUE-FM on OpenStack</a>
2	Install UCT-Vs <b>NOTE:</b> When using OpenStack as your orchestration system you can only use G-TAP Agents.	For Linux: <a href="#">Linux UCT-V Installation</a> For Windows: <a href="#">Windows UCT-V Installation</a>
3	Create a Monitoring Domain <b>NOTE:</b> Ensure that the 'Use FM to Launch Fabric' toggle button is disabled.	<a href="#">Create Monitoring Domain</a>
4	Configure GigaVUE Fabric Components <b>NOTE:</b> Select UCT-V as the Traffic Acquisition Method.	<a href="#">Configure GigaVUE Fabric Components in OpenStack</a>
5	Create Monitoring session	<a href="#">Create a Monitoring Session (OpenStack)</a>
6	Add Applications to the Monitoring Session	<a href="#">Add Applications to Monitoring Session</a> <a href="#">Add Applications to Monitoring Session</a>
7	Deploy Monitoring Session	<a href="#">Deploy Monitoring Session</a>
8	View Monitoring Session Statistics	<a href="#">View Monitoring Session Statistics</a>

## Deploy GigaVUE Fabric Components using GigaVUE-FM

If you wish to deploy your fabric components using GigaVUE-FM, it can be done in three ways based on the traffic acquisition method you chose.

### Traffic Acquisition Method as UCT-V

Follow instruction in the below table if you wish to use UCT-V as your traffic acquisition method. In this case the traffic from the Virtual Machines are acquired using the UCT-Vs and it is sent to the V Series nodes.

Step No	Task	Refer the following topics
1	Install GigaVUE-FM on OpenStack	<a href="#">Install GigaVUE-FM on OpenStack</a>
2	Install UCT-Vs	For Linux: <a href="#">Linux UCT-V Installation</a> For Windows: <a href="#">Windows UCT-V</a>

Step No	Task	Refer the following topics
		Installation
3	Create a Monitoring Domain <b>NOTE:</b> Ensure that the 'Use FM to Launch Fabric' toggle button is enabled.	Create Monitoring Domain
4	Configure GigaVUE Fabric Components <b>NOTE:</b> Select UCT-V as the Traffic Acquisition Method.	Configure GigaVUE Fabric Components in GigaVUE-FM
5	Create Monitoring session	Create a Monitoring Session (OpenStack)
6	Add Applications to the Monitoring Session	Add Applications to Monitoring Session Add Applications to Monitoring Session
7	Deploy Monitoring Session	Deploy Monitoring Session
8	View Monitoring Session Statistics	View Monitoring Session Statistics

## Traffic Acquisition Method as OVS Mirroring

Follow instruction in the below table if you wish to use OVS Mirroring as your traffic acquisition method. Open vSwitch Mirroring Agent is deployed on the hypervisor where the Virtual Machines you wish to monitor are located. Refer to the [Prerequisites for OVS Mirroring](#) topic for OpenStack cloud requirements before using OVS Mirroring as your traffic acquisition type.

Step No	Task	Refer the following topics
1	Install GigaVUE-FM on OpenStack	Install GigaVUE-FM on OpenStack
2	Install UCT-V OVS Agents	Install UCT-V OVS Agent for OVS Mirroring
3	Create a Monitoring Domain <b>NOTE:</b> Ensure that the 'Use FM to Launch Fabric' toggle button is enabled.	Create Monitoring Domain
4	Configure GigaVUE Fabric Components <b>NOTE:</b> Select OVS Mirroring as the Traffic Acquisition Method.	Configure GigaVUE Fabric Components in GigaVUE-FM
5	Create Monitoring session	Create a Monitoring Session (OpenStack)
6	Add Applications to the Monitoring Session	Add Applications to Monitoring Session Add Applications to Monitoring Session
7	Deploy Monitoring Session	Deploy Monitoring Session
8	View Monitoring Session Statistics	View Monitoring Session Statistics

## Traffic Acquisition Method as Tunnel

Follow instruction in the below table if you wish to use Tunnel as your traffic acquisition method. In this case you can use tunnels as a source where the traffic is directly tunneled to V Series nodes without deploying UCT-Vs or UCT-V Controllers.

Step No	Task	Refer the following topics
1	Install GigaVUE-FM on OpenStack	<a href="#">Install GigaVUE-FM on OpenStack</a>
2	Create a Monitoring Domain  <b>NOTE:</b> Ensure that the 'Use FM to Launch Fabric' toggle button is enabled.	<a href="#">Create Monitoring Domain</a>
3	Configure GigaVUE Fabric Components  <b>NOTE:</b> Select Tunnel as the Traffic Acquisition Method.	<a href="#">Configure GigaVUE Fabric Components in GigaVUE-FM</a>
4	Create Monitoring session	<a href="#">Create a Monitoring Session (OpenStack)</a>
5	Create Ingress and Egress Tunnel Endpoints	<a href="#">Create Ingress and Egress Tunnels</a>
6	Add Applications to the Monitoring Session	<a href="#">Add Applications to Monitoring Session</a> <a href="#">Add Applications to Monitoring Session</a>
7	Deploy Monitoring Session	<a href="#">Deploy Monitoring Session</a>
8	View Monitoring Session Statistics	<a href="#">View Monitoring Session Statistics</a>

## Upload Fabric Images

First, you must fetch the images from [Gigamon Customer Portal](#) using FTP, SCP, or other desired method and copy it to your cloud controller. After fetching the images, you must source the credentials file and then upload the qcow2 images to Glance.

For example, you can source the credentials file with admin credentials using the following command:

```
$ source admin_openrc.sh
```

To upload the qcow2 images to Glance, use one of the following commands:

```
glance image-create --disk-format qcow2 --visibility public --container-format bare --progress --name gigamon-gigavue-uctv-ovs-cntlr-6.7 --file gigamon-gigavue-uctv-ovs-cntlr-6.7.qcow2
```

```
glance image-create --disk-format qcow2 --visibility public --container-format bare --progress --name gigamon-gigavue-uctv-cntlr-6.7 --file gigamon-gigavue-uctv-cntlr-6.7.qcow2
```

```
glance image-create --disk-format qcow2 --visibility public --container-format bare --progress --name gigamon-gigavue-vseries-node-6.7 --file gigamon-gigavue-vseries-node-6.7.qcow2
```

While uploading images to OpenStack, the names of the image files should be of the following format:

- gigamon-gigavue-vseries-node-6.7
- gigamon-gigavue-vseries-proxy-6.7
- gigamon-gigavue-uctv-cntlr-6.7
- gigamon-gigavue-uctv-ovs-cntlr-6.7

**NOTE:** Always use '-' after the build number when providing designation details. For example, "**gigamon-gigavue-uctv-ovs-cntlr-buildNumber-**". Failure to follow this pattern will result in controller's deployment failure.

## Install GigaVUE-FM on OpenStack

To launch the GigaVUE-FM instance inside the cloud:

1. Log into Horizon.
2. From the Horizon GUI, select the appropriate project, and select **Compute > Images**. The list of existing images is displayed.
3. Select the GigaVUE-FM image and click **Launch**. The Launch Instance dialog box is displayed.
4. In the **Details** tab, enter the following information and Click **Next**.

Parameter	Attribute
Instance Name	Initial hostname for the instance
Availability Zone	Availability zone where the image will be deployed.
Count	Number of instances to be launched

5. In the **Source** tab, verify that the selected GigaVUE-FM image is displayed under **Allocated** section and click **Next**.
6. In the **Flavor** tab, select a flavor complying the [Minimum Compute Requirements](#) and then move the flavor from the **Available** section to the **Allocated** section. The selected GigaVUE-FM flavor is displayed under Allocated and click **Next**.
7. In the **Networks** tab, select the specific network for the GigaVUE-FM instance from the **Available** section and then move the Network to the **Allocated** section. The selected network is displayed under Allocated and Click **Next**.
8. In the **Network Ports** tab, click **Next** again.
9. In the **Security Groups** tab, select the appropriate security group for the GigaVUE-FM instance from the **Available** section and then move the Security Group to the **Allocated** section. For information about the security groups, refer to [Security Group for OpenStack](#) . The selected security group is displayed under Allocated. Click **Next**.
10. In the **Key Pair** tab, select the existing key pair from the **Available** section and then move the Key Pair to the **Allocated** section. or create a new key pair. For information about the key pairs, refer to [Key Pairs](#). The selected key pair is displayed under Allocated. Click **Next**.
11. Click **Launch Instance**. The GigaVUE-FM instance takes few minutes to fully initialize.
12. From the Horizon GUI, navigate to **Compute > Instances**. You can view the launched instance displayed in the **Instances** page. During the initial boot-up sequence, click **Associate Floating IP**. The **Manage Floating IP Associations** dialog box appears.

13. In the Manage Floating IP Associations dialog box, enter the following information and click **Associate**.

Parameter	Attribute
IP Address	Floating IP address of the instance
Port to be associated	Port for the GigaVUE-FM instance

The Floating IP is then displayed in the **IP Address** column of the corresponding Instance.



## Initial GigaVUE-FM Configuration

After you have deployed a new GigaVUE-FM instance, you need to perform an initial configuration before you can start using GigaVUE-FM. This is a one-time activity that must be performed for each GigaVUE-FM instance deployed.

1. From the Horizon GUI, navigate to **Compute > Instances**.
2. In the Instances page, click the GigaVUE-FM instance name. The GigaVUE-FM instance **Overview** tab is displayed by default.
3. Click the **Console** tab and the **Instance Console** appears.
4. Log in as admin with password as admin123A!! and then the console prompts you to change the default password.

```
CentOS Linux 7 (Core)
Kernel 3.10.0-1062.9.1.el7.x86_64 on an x86_64

123 login:

CentOS Linux 7 (Core)
Kernel 3.10.0-1062.9.1.el7.x86_64 on an x86_64

123 login: admin
Password:
You are required to change your password immediately (root enforced)
Changing password for admin.
(current) UNIX password:
New password:
Retype new password:
[admin@123 ~]$_
```

**NOTE:** You can also choose to perform the IP Networking and NTP configurations by running the **fmctl jump-start** command after you power on the GigaVUE-FM instance

5. To access GigaVUE-FM GUI, enter **wget -q -O - http://169.254.169.254/latest/meta-data/instance-id** command in the Instance Console and retrieve the instance ID in the format of **i-000000###** which is the default password for the admin user. If GigaVUE-FM is deployed inside OpenStack, use the **Instance ID** as the password for the admin user to login to GigaVUE-FM, however if GigaVUE-FM is deployed outside OpenStack, use admin123A!! as the default admin password.

## Install UCT-V

UCT-V is the primary Gigamon monitoring module that is installed in your Virtual Machines (VMs). UCT-V mirrors the selected traffic from a source interface to a destination mirror interface. The mirrored traffic is encapsulated using GRE or VXLAN tunneling and then sent to the GigaVUE Cloud Suite® V Series Node.

**NOTE:** The UCT-V installation is applicable only when the UCT-V is your traffic acquisition method.

A UCT-V can consists of multiple source interface and a single destination interface. The network packets collected from the source interface are sent to the destination interface. From the destination interface, the packets traverse through the L2GRE, VXLAN tunnel interface, or Secure Tunnels to the GigaVUE V Series Node.

A source interface can be configured with one or more Network Interfaces. While configuring a source interface, you can specify the direction of the traffic to be monitored in the instance. The direction of the traffic can be egress or ingress or both.

**NOTE:** For environments with both Windows and Linux or just windows UCT-V, VXLAN tunnels in the UCT-V Controller specification is required.

Refer to the following sections for more information:

- [Supported Operating Systems for UCT-V](#)
- [Modes of Installing UCT-V](#)
- [Linux UCT-V Installation](#)
- [Windows UCT-V Installation](#)
- [Install UCT-V OVS Agent for OVS Mirroring](#)

## Supported Operating Systems for UCT-V

**Supported Operating System for UCT-V<sup>1</sup> is v6.4.00, 6.5.00, 6.6.00, 6.7.00**

**Supported Operating Systems for G-vTAP Agents are v1.8-3, v1.8-4, v1.8-5, v1.8-7, v6.1.00, v6.2.00, v6.3.00**

The below table lists the validated and the supported versions of the Operating Systems for UCT-V.

Operating System	Supported Versions	Validated Versions
Ubuntu/Debian	Versions 18-04 and above are supported.	Versions 16.04 and 20.04
CentOS	Versions 7.5 and above.	Versions 7.9 and 8.2
Fedora	Versions 7.5 and above.	Versions 7.5
RHEL	Versions 7.5 and above.	Versions 8.8 and 9.2
Windows Server	Versions 2012 through 2022	Versions 2022
Windows Client	Versions 10 and 11	Versions 10 and 11
Amazon Linux	Versions 1 and 2	NA
Rocky OS	Versions 8.4 and above	Versions 8.5 and 8.8

GigaVUE-FM version 6.7 supports UCT-V version 6.7 as well as (n-2) versions. It is always recommended to use the latest version of UCT-V with GigaVUE-FM, for better compatibility.

## Modes of Installing UCT-V

You can install UCT-V in your virtual machine in two ways. Refer to the following points for more detailed information and step-by-step instructions on how to configure UCT-V:

1. **Third Party Orchestration:** The third-party orchestration feature allows you to deploy UCT-V using your own orchestration system. UCT-V register themselves with GigaVUE-FM using the information provided by the user. UCT-V can be registered with GigaVUE-FM using Third Party Orchestration in two ways:
  - Generic Mode - [Deploy Fabric Components using Generic Mode](#) section in GigaVUE Cloud Suite Deployment Guide - Third Party Orchestration
  - Integrated Mode - [Deploy Fabric Components using Integrated Mode](#) section in [GigaVUE Cloud Suite Deployment Guide - Third Party Orchestration](#)

Refer to [Modes of Deployments](#) section in GigaVUE Cloud Suite Deployment Guide - Third Party Orchestration for more detailed information on generic and integrated mode.

2. **GigaVUE-FM Orchestration:** Refer to *Install UCT-V* section in the respective cloud guides for more detailed information.

---

<sup>1</sup>From Software version 6.4.00, G-vTAP is renamed to UCT-V.

## Linux UCT-V Installation

You can install UCT-V on various Linux distributions using Debian or RPM packages.

Refer to the following sections for the Linux UCT-V installation:

- [Single Network Interface Configuration](#)
- [Multiple Network Interface Configuration](#)
- [Linux Network Firewall Requirements](#)
- [Install UCT-Vs](#)

### Single Network Interface Configuration

A single network interface card (NIC) acts both as the source and the destination interface. A UCT-V with a single network interface configuration lets you monitor the ingress or egress traffic from the network interface. The monitored traffic is sent out using the same network interface.

For example, assume that there is only one interface eth0 in the monitoring instance. In the UCT-V configuration, you can configure eth0 as the source and the destination interface, and specify both egress and ingress traffic to be selected for monitoring purpose. The egress and ingress traffic from eth0 is mirrored and sent out using the same interface.

Using a single network interface card as the source and the destination interface can sometimes cause increased latency in sending the traffic out from the instance.

Example of the UCT-V configuration file for a single NIC configuration:

Grant permission to monitor ingress and egress traffic at iface

```
# eth0 mirror-src-ingress mirror-src-egress mirror-dst
```

### Multiple Network Interface Configuration

A UCT-V lets you configure two network interface cards (NICs). One network interface card can be configured as the source interface and another network interface card can be configured as the destination interface.

For example, assume that there is eth0 and eth1 in the monitoring instance. In the UCT-V configuration, eth0 can be configured as the source interface and egress traffic can be selected for monitoring purpose. The eth1 interface can be configured as the destination interface. So, the mirrored traffic from eth0 is sent to eth1. From eth1, the traffic is sent to the GigaVUE V Series Node.

Example of the UCT-V configuration file for a dual NIC configuration:

Grant permission to monitor ingress and egress traffic at iface

```
# 'eth0' to monitor and 'eth1' to transmit the mirrored packets.
# eth0 mirror-src-ingress mirror-src-egress
# eth1 mirror-dst
```

## Linux Network Firewall Requirements

If Network Firewall requirements or security groups are configured in your environment, then you must open the following ports for the virtual machine. Refer to [Network Firewall Requirement for GigaVUE Cloud Suite](#) to know more details on the firewall requirements or security groups required for your environment.

Direction	Port	Protocol	CIDR	Purpose
Inbound	9901	TCP	UCT-V Controller IP	Allows UCT-V to receive control and management plane traffic from UCT-V Controller

You can use the following commands to add the Network Firewall rule.

```
sudo firewall-cmd --add-port=9901/tcp
sudo firewall-cmd --runtime-to-permanent
```

## Install UCT-Vs

You must have sudo/root access to edit the UCT-V configuration file.

For dual or multiple network interface configuration, you may need to modify the network configuration files to make sure that the extra NIC/Network Interface will initialize at boot time.

### Prerequisites

Before installing UCT-V.**deb** or **.rpm** packages on your Linux VMs, ensure you have the following packages:

- Python3
- Python3-pip
- Python modules
  - netifaces
  - urllib3
  - requests
- iproute-tc for RHEL and CentOS VMs

**NOTE:** When using Amazon Linux version 2, ensure iproute-tc package is installed first.

You can install the UCT-Vs either from Debian or RPM packages.

Refer to the following topics for details:

- [Install UCT-V from Ubuntu/Debian Package](#)
- [Install UCT-V from RPM package](#)
- [Install UCT-V from Red Hat Enterprise Linux and CentOS with Selinux Enabled](#)

Install UCT-V from Ubuntu/Debian Package



**NOTE:** When using Kernel version less than 5.4 on Ubuntu 16.04 with Python version 3.5 installed, follow the instructions given below before installing UCT-V.

```
sudo apt-get update
sudo apt install python3-netifaces
curl https://bootstrap.pypa.io/pip/3.5/get-pip.py -o get-pip.py
/usr/bin/python3.5 get-pip.py
sudo /usr/bin/python3.5 -m pip uninstall requests
sudo /usr/bin/python3.5 -m pip install requests==2.22.
```

To install from a Debian package:

1. Download the UCT-V6.7.00 Debian (.deb) package from the [Gigamon Customer Portal](#). For assistance contact [Contact Technical Support](#).
2. Copy this package to your instance. Install the package with root privileges, for example:

```
$ ls gigamon-gigavue_uctv_6.7.00_amd64.deb
$ sudo dpkg -i gigamon-gigavue_uctv_6.7.00_amd64.deb
```

- Once the UCT-V package is installed, modify the file `/etc/uctv/uctv.conf` to configure and register the source and destination interfaces. The following examples registers eth0 as the mirror source for both ingress and egress traffic and eth1 as the destination for this traffic:

**NOTE:** When you have an active, successful monitoring session deployed, any changes to the UCT-V config file made after the initial setup require an UCT-V restart and an inventory refresh or sync from GigaVUE-FM to pick up the new changes and re-initiate the traffic mirroring. GigaVUE-FM does a periodic sync on its own every 15 minutes.

**Example 1**—Configuration example to monitor ingress and egress traffic at interface eth0 and use the same interface to send out the mirrored packets

```
# eth0    mirror-src-ingress mirror-src-egress mirror-dst
```

**Example 2**—Configuration example to monitor ingress and egress traffic at interface eth0 and use the interface eth1 to send out the mirrored packets

```
# eth0    mirror-src-ingress mirror-src-egress
# eth1    mirror-dst
```

**Example 3**—Configuration example to monitor ingress and egress traffic at interface eth0 and eth 1; use the interface eth1 to send out the mirrored packets

```
# eth0    mirror-src-ingress mirror-src-egress
# eth1    mirror-src-ingress mirror-src-egress mirror-dst
```

**NOTE:** Ensure that the configuration for a single interface is provided on a single line.

- Save the file.
- Restart the UCT-V service.

```
$ sudo service uctv restart
```

The UCT-V status will be displayed as running. Check the status using the following command:

```
$ sudo service uctv status
```

Install UCT-V from RPM package

Use the following commands to install the required packages:

```
sudo yum install iproute-tc -y
sudo yum install python3 -y
sudo yum install python3-pip -y
sudo pip3 install urllib3
sudo pip3 install requests
```

```
sudo pip3 install netifaces
```

To install from an RPM (.rpm) package on a Redhat, CentOS, or other RPM-based system:

1. Download the UCT-V6.7.00 RPM (.rpm) package from the [Gigamon Customer Portal](#). For assistance contact [Contact Technical Support](#).
2. Copy this package to your instance. Install the package with root privileges, for example:
 

```
$ ls gigamon-gigavue_uctv_6.7.00_x86_64.rpm
$ sudo rpm -i gigamon-gigavue_uctv_6.7.00_x86_64.rpm
```
3. Modify the `/etc/uctv/uctv.conf` file to configure and register the source and destination interfaces. The following example registers the eth0 as the mirror source for both ingress and egress traffic and registers eth1 as the destination for this traffic as follows:

**NOTE:** When you have an active, successful monitoring session deployed, any changes to the UCT-V config file made after the initial setup require an UCT-V restart and an inventory refresh or sync from GigaVUE-FM to pick up the new changes and re-initiate the traffic mirroring. GigaVUE-FM does a periodic sync on its own every 15 minutes.

**Example 1**—Configuration example to monitor ingress and egress traffic at interface eth0 and use the same interface to send out the mirrored packets

```
# eth0 mirror-src-ingress mirror-src-egress mirror-dst
```

**Example 2**—Configuration example to monitor ingress and egress traffic at interface eth0 and use the interface eth1 to send out the mirrored packets

```
# eth0 mirror-src-ingress mirror-src-egress# eth1 mirror-dst
```

**Example 3**—Configuration example to monitor ingress and egress traffic at interface eth0 and eth 1; use the interface eth1 to send out the mirrored packets

```
# eth0 mirror-src-ingress mirror-src-egress# eth1 mirror-src-
ingress mirror-src-egress mirror-dst
```

4. Save the file.
5. Restart the UCT-V service.
 

```
$ sudo service uctv restart
```

The UCT-V status will be displayed as running. Check the status with the following command:

```
$ sudo service uctv status
```



Install UCT-V from Red Hat Enterprise Linux and CentOS with Selinux Enabled

1. Launch the RHEL/CentOS UCT-V AMI image.
2. Download the following packages from the [Gigamon Customer Portal](#). For assistance contact [Contact Technical Support](#).
  - gigamon-gigavue\_uctv\_6.7.00\_x86\_64.rpm
3. Copy the downloaded UCT-V package files and strongSwan TAR file to UCT-V.
4. Install UCT-V package:

```
sudo rpm -ivh gigamon-gigavue_uctv_6.7.00_x86_64.rpm
```
5. Edit uctv.conf file to configure the required interface as source/destination for mirror:

**NOTE:** When you have an active, successful monitoring session deployed, any changes to the UCT-V config file made after the initial setup require an UCT-V restart and an inventory refresh or sync from GigaVUE-FM to pick up the new changes and re-initiate the traffic mirroring. GigaVUE-FM does a periodic sync on its own every 15 minutes.

```
# eth0 mirror-src-ingress mirror-src-egress mirror-dst
```

6. Restart the UCT-V service.

```
$ sudo service uctv restart
```

The UCT-V status will be displayed as running. Check the status with the following command:

```
$ sudo service uctv status
```

## Windows UCT-V Installation

Windows UCT-V allows you to select the network interfaces by subnet/CIDR and modify the corresponding monitoring permissions in the configuration file. This gives you more granular control over what traffic is monitored and mirrored.

VXLAN is the only supported tunnel type for Windows UCT-V.

### Windows Network Firewall Requirements

If Network Firewall requirements or Security Groups are configured in your environment, then you must open the following ports for the virtual machine. Refer to [Network Firewall Requirement for GigaVUE Cloud Suite](#) to know more details on the firewall requirements or security groups required for your environment.

The following ports for Network Firewall rules can be added from Firewall Settings.

Direction	Port	Protocol	CIDR	Purpose
Inbound	9901	TCP	UCT-V Controller IP	Allows UCT-V to receive control and management plane traffic from UCT-V Controller
Outbound	8891	TCP	UCT-V Subnet IP	Allows UCT-V to communicate with UCT-V Controller for registration and heartbeat
Outbound	4789	TCP	UCT-V Subnet IP	Allows UCT-V to tunnel VXLAN traffic to GigaVUE V Series Nodes
Outbound	4789	TCP	UCT-V Subnet IP	Allows UCT-V to tunnel L2GRE traffic to GigaVUE V Series Nodes

## Windows UCT-V Installation Using MSI Package

To install the Windows UCT-V using the MSI file:

1. Download the Windows UCT-V **6.7.00** MSI package from the [Gigamon Customer Portal](#). For assistance contact [Contact Technical Support](#).
2. Install the downloaded MSI package as **Administrator** and the UCT-V service starts automatically.

- Once the UCT-V package is installed, modify the file **C:\ProgramData\Uct-v\uctv.conf** to configure and register the source and destination interfaces.

**NOTE:** When you have an active, successful monitoring session deployed, any changes to the UCT-V config file made after the initial setup require an UCT-V restart and an inventory refresh or sync from GigaVUE-FM to pick up the new changes and re-initiate the traffic mirroring. GigaVUE-FM does a periodic sync on its own every 15 minutes.



Following are the rules to modify the UCT-V configuration file:

- Interface is selected by matching its CIDR address with config entries.
- For the VMs with single interface (*.conf file modification is optional*):
  - if neither mirror-src permissions is granted to the interface, both mirror-src-ingress and mirror-src-egress are granted to it.
  - mirror-dst is always granted implicitly to the interface.
- For the VMs with multiple interfaces:
  - mirror-dst needs to be granted explicitly in the config file. Only the first matched interface is selected for mirror-dst, all other matched interfaces are ignored.
  - if none interfaces is granted any mirror-src permission, all interfaces will be granted mirror-src-ingress and mirror-src-egress.

**Example 1**—Configuration example to monitor ingress and egress traffic at interface 192.168.1.0/24 and use the same interface to send out the mirrored packets.

**For IPv4:**

```
# 192.168.1.0/24 mirror-src-ingress mirror-src-egress mirror-dst
```

**For IPv6:**

```
2001:db8:abcd:ef01::/64 mirror-src-ingress mirror-src-egress
2001:db8:abcd:ef01::/64 mirror-src-egress
2001:db8:abcd:ef01::/64 mirror-dst
```

**Example 2**—Configuration example to monitor ingress and egress traffic at interface 192.168.1.0/24 and use the interface 192.168.2.0/24 to send out the mirrored packets.

**For IPv4:**

```
192.168.1.0/24 mirror-src-ingress mirror-src-egress
192.168.2.0/24 mirror-dst
```

**For IPv6:**

```
2001:db8:abcd:ef01::/64 mirror-src-ingress mirror-src-egress
2001:db8:abcd:ef02::/64 mirror-src-egress
2001:db8:abcd:ef01::/64 mirror-dst
```

- Save the file.

5. Restart the Windows UCT-V using one of the following actions:
  - Run 'sc stop uctv' and 'sc start uctv' from the command prompt.
  - Restart the UCT-V from the Windows Task Manager.

You can check the status of the UCT-V in the Service tab of the Windows Task Manager.

## Windows UCT-V Installation Using ZIP Package

To install the Windows UCT-V using the ZIP package:

1. Download the Windows UCT-V **6.7.00** ZIP package from the [Gigamon Customer Portal](#). For assistance contact [Contact Technical Support](#).
2. Extract the contents of the .zip file into a convenient location.
3. Run 'install.bat' as an **Administrator** and the UCT-V service starts automatically.

- Once the UCT-V package is installed, modify the file **C:\ProgramData\Uct-v\uctv.conf** to configure and register the source and destination interfaces.

**NOTE:** When you have an active, successful monitoring session deployed, any changes to the UCT-V config file made after the initial setup require an UCT-V restart and an inventory refresh or sync from GigaVUE-FM to pick up the new changes and re-initiate the traffic mirroring. GigaVUE-FM does a periodic sync on its own every 15 minutes.



Following are the rules to modify the UCT-V configuration file:

- Interface is selected by matching its CIDR address with config entries.
- For the VMs with single interface (*.conf file modification is optional*):
  - if neither mirror-src permissions is granted to the interface, both mirror-src-ingress and mirror-src-egress are granted to it.
  - mirror-dst is always granted implicitly to the interface.
- For the VMs with multiple interfaces:
  - mirror-dst needs to be granted explicitly in the config file. Only the first matched interface is selected for mirror-dst, all other matched interfaces are ignored.
  - if none interfaces is granted any mirror-src permission, all interfaces will be granted mirror-src-ingress and mirror-src-egress.

**Example 1**—Configuration example to monitor ingress and egress traffic at interface 192.168.1.0/24 and use the same interface to send out the mirrored packets.

**For IPv4**

```
# 192.168.1.0/24 mirror-src-ingress mirror-src-egress mirror-dst
```

**For IPv6**

```
2001:db8:abcd:ef01::/64 mirror-src-ingress mirror-src-egress
2001:db8:abcd:ef02::/64 mirror-src-egress
2001:db8:abcd:ef01::2/64 mirror-dst
```

**Example 2**—Configuration example to monitor ingress and egress traffic at interface 192.168.1.0/24 and use the interface 192.168.2.0/24 to send out the mirrored packets.

**For IPv4**

```
192.168.1.0/24 mirror-src-ingress mirror-src-egress
192.168.2.0/24 mirror-dst
```

**For IPv6**

```
2001:db8:abcd:ef01::/64 mirror-src-ingress mirror-src-egress
2001:db8:abcd:ef02::/64 mirror-src-egress
2001:db8:abcd:ef01::2/64 mirror-dst
```

- Save the file.

- Restart the Windows UCT-V using one of the following actions:
  - Run 'sc stop uctv' and 'sc start uctv' from the command prompt.
  - Restart the UCT-V from the Windows Task Manager.

You can check the status of the UCT-V in the Service tab of the Windows Task Manager.

**NOTE:** You must edit the Windows Firewall settings to grant access to the uctv process. To do this, access the Windows Firewall settings and find “uctvd” in the list of apps and features. Select it to grant access. Be sure to select both Private and Public check boxes. If “uctvd” does not appear in the list, click **Add another app...** Browse your program files for the uctv application (uctvd.exe) and then click **Add**.

**(Disclaimer:** These are general guidelines for changing Windows Firewall settings. See Microsoft Windows help for official instructions on Windows functionality.)

## Install UCT-V OVS Agent for OVS Mirroring

This is applicable only if you are using UCT-V OVS agent as the source of acquiring traffic. You must have sudo/root access to edit the UCT-V OVS agent configuration file. Before installing the UCT-V OVS agents, you must have launched the GigaVUE-FM instance.

**NOTE:** After rebooting your Ubuntu, you must redeploy the respective monitoring sessions to restore the mirror traffic on the respective Ubuntu VM interfaces.

You can install the UCT-V OVS agents either from Debian or RPM packages as follows:

- [Install the UCT-V OVS Agent from Ubuntu/Debian Package](#)
- [Install the UCT-V OVS Agent from RPM package](#)

### Install the UCT-V OVS Agent from Ubuntu/Debian Package

To install from a Debian package:

- Download the latest version of UCT-V OVS Agent Debian (.deb) package from the [Gigamon Customer Portal](#).
- Copy this package to OpenStack compute nodes. Install the package with root privileges, for example:

```
$ ls gigamon-gigavue-uctv-ovs-agent_6.7.00_amd64.deb
$ sudo dpkg -i gigamon-gigavue-uctv-ovs-agent_6.7.00_amd64.deb
```

- Once the UCT-V OVS agent package is installed, modify the file **/etc/uctv/uctv.conf** to configure and grant permission to monitor ingress and egress traffic and to transmit the mirrored packets.

**NOTE:** When you have an active, successful monitoring session deployed, any changes to the UCT-V config file made after the initial setup require an UCT-V restart and an inventory refresh or sync from GigaVUE-FM to pick up the new changes and re-initiate the traffic mirroring. GigaVUE-FM does a periodic sync on its own every 15 minutes.

```
br-int mirror-dst
```

```
# Changes for OVS Mirroring
```

```
# This Value will be used as local Ip in OVS Mirror Config
```

```
tunnel-src 172.20.20.11
```

```
# This Value will be used as Next Hop for Tunneled Packets
```

```
tunnel-gw 172.20.20.1
```

```
This Value will be used as local Ipv6 in OVS Mirror Config
```

```
tunnel-src-v6 2001::161
```

```
This Value will be used as Next Hop ipv6 addr for Tunneled Packets
```

```
tunnel-gw-v6 2001::1
```

```
# OVS Agent Mode, Values: auto|standard|dpdk|hw-offload
```

```
ovs-agent-mode auto
```

```
# VLAN Tag value (valid: 0-4094)
```

```
ovs-vlan-tag 2020
```

```
# Egress Interface for OVS Mirrored Traffic
```

```
ovs-egress-if vlan2020
```

- After modifying the UCT-V OVS config file, start the agent service.

```
$ sudo service uctv start
```

- The UCT-V OVS agent status will be displayed as running. Check the status using the following command:

```
$ sudo service uctv status
```

```
UCT-V is running
```

## Install the UCT-V OVS Agent from RPM package

To install from an RPM (.rpm) package on a Redhat, CentOS, or other RPM-based system:

1. Download the UCT-V OVS Agent RPM (.rpm) package from the [Gigamon Customer Portal](#).
2. Copy this package to OpenStack compute nodes. Install the package with root privileges, for example:
 

```
$ ls gigamon-gigavue-uctv-ovs-agent_6.7.00_x86_64.rpm
$ sudo rpm -ivh gigamon-gigavue-uctv-ovs-agent_6.7.00_x86_64.rpm
```
3. Once the OVS agent package is installed, modify the file `/etc/uctv/uctv.conf` to configure and grant permission to monitor ingress and egress traffic and transmit the mirrored packets.

**NOTE:** When you have an active, successful monitoring session deployed, any changes to the UCT-V config file made after the initial setup require an UCT-V restart and an inventory refresh or sync from GigaVUE-FM to pick up the new changes and re-initiate the traffic mirroring. GigaVUE-FM does a periodic sync on its own every 15 minutes.

```
# br-int mirror-dst

# Changes for OVS Mirroring
# This Value will be used as local Ip in OVS Mirror Config
tunnel-src 172.20.20.11
# This Value will be used as Next Hop for Tunneled Packets
tunnel-gw 172.20.20.1
This Value will be used as local Ipv6 in OVS Mirror Config
tunnel-src-v6 2001::161
This Value will be used as Next Hop ipv6 addr for Tunneled Packets
tunnel-gw-v6 2001::1
# OVS Agent Mode, Values: auto|standard|dpdk|hw-offload
ovs-agent-mode auto
# VLAN Tag value (valid: 0-4094)
ovs-vlan-tag 2020
# Egress Interface for OVS Mirrored Traffic
ovs-egress-if vlan2020
```

4. After modifying the UCT-V OVS config file, start the agent service and verify its status.

```
$ systemctl start uctv.service
$ sudo service uctv status
UCT-V is running
```



When you are installing a self-signed RPM package, you must execute the following command to import the signing key into the RPM db.





```
sudo rpm --import /path/to/YOUR-RPM-GPG-KEY
```



To upgrade UCT-V OVS agent:

- You must backup the **/etc/uctv/uctv.conf** configuration file before upgrading the UCT-V OVS Agent and uninstall the old OVS agents.
- Follow the same installation procedure to upgrade the UCT-V OVS agents.
- After upgrading the UCT-V OVS Agent, copy and modify the **uctv.conf** file, stop the agent, and start the agent. Redeploy the Monitoring Session if required.

```
service uctv stop
service uctv start
```

## Uninstall UCT-V

This section describes how to uninstall UCT-V for Windows UCT-V and Linux UCT-V

### Uninstall Linux UCT-V

The following steps provide instructions on how to uninstall Linux UCT-V

Stop the UCT-V service using the following commands:

For Ubuntu/Debian Package:

```
sudo service uctv stop
```

For RPM package or Red Hat Enterprise Linux and CentOS with Selinux Enabled:

```
sudo systemctl stop uctv
```

Uninstall the UCT-V using the following:

For Ubuntu/Debian Package:

```
sudo dpkg -r uctv
```

For RPM package:

```
sudo rpm -e uctv
```

For Red Hat Enterprise Linux and CentOS with Selinux Enabled:

```
sudo rpm -e uctv
```

### Uninstall Windows UCT-V

To uninstall Windows UCT-V:

1. On your windows, go to **Task Manager > Services**. Search for **uctv**.
2. Right click **uctv** and select **Stop**.
3. Go to **Control Panel** search for uctv and uninstall.

## Upgrade or Reinstall UCT-V

To upgrade UCT-V, delete the existing UCT-V and installing the new version of UCT-V.

**NOTE:** Before deleting the UCT-V, take a back up copy of **/etc/uctv/uctv.conf** configuration file. Follow this step to avoid reconfiguring the source and destination interfaces.

1. Uninstall the existing UCT-V. Refer to [Uninstall UCT-V](#) for more detailed information on how to uninstall UCT-V.
2. Install the latest version or the new UCT-V. Refer to the following topics for more detailed information on how to install a new UCT-V:
  - [Linux UCT-V Installation](#)
  - [Windows UCT-V Installation](#)
3. Restart the UCT-V service.
  - Linux platform:  

```
$ sudo service uctv restart
```
  - Windows platform: Restart from the Task Manager.

**NOTE:** When the openssl version on the UCT-V is upgraded, Monitoring Session needs to be redeployed

## Pre-Configuration Checklist for OpenStack

The following table provides information that you would need while launching the visibility components using GigaVUE-FM. Obtaining this information will ensure a successful and efficient deployment of the GigaVUE Cloud Suite for OpenStack.

You can log in to GigaVUE-FM and use the CLI command: **ip host <controller-hostname> <ip-address of the controller>**. (For example: **ip host os-controller1 192.168.2.3**.) Then, add the connection to the OpenStack tenant.

In order for GigaVUE-FM to make a connection to an OpenStack tenant, GigaVUE-FM must be able to resolve the hostname of the OpenStack controller, even if using an IP address in the Identity URL. For example, if GigaVUE-FM is configured to use DNS, and that controller hostname is in the DNS, this will work, and no further configuration will be needed. If not, then you must add a host entry to GigaVUE-FM.

**NOTE:** If you are not using DNS, you must manually enter the host entry in /etc/hosts on GigaVUE-FM for the OpenStack Controller. On using DNS you can directly enter the host entry in GigaVUE-FM.

	Required Information
<input type="checkbox"/>	Authentication URL
<input type="checkbox"/>	Project Name
<input type="checkbox"/>	Floating IP
<input type="checkbox"/>	Region name for the Project
<input type="checkbox"/>	Domain
<input type="checkbox"/>	SSH Key Pair
<input type="checkbox"/>	Networks
<input type="checkbox"/>	Security groups

## Install Custom Certificate

GigaVUE V Series Node, GigaVUE V Series Proxy, and UCT-V Controllers have default self-signed certificates installed. The communication between GigaVUE-FM and the fabric components happens in a secure way using these default self-signed certificates, however you can also add custom certificates like SSL/TLS certificate to avoid the trust issues that occurs when the GigaVUE V Series Nodes, GigaVUE V Series Proxy, or UCT-V Controllers run through the security scanners.

You can upload the custom certificate in two ways:

- [Upload Custom Certificates using GigaVUE-FM](#)
- [Upload Custom Certificate using Third Party Orchestration](#)

### Upload Custom Certificates using GigaVUE-FM

To upload the custom certificate using GigaVUE-FM follow the steps given below:

1. Go to **Inventory > Security > Custom SSL Certificate**. The **Custom Certificate Configuration** page appears.
2. On the Custom Certificate Configuration page, click **Add**. The **New Custom Certificate**

page appears.

3. Enter or select the appropriate information as shown in the following table.

Field	Action
Certificate Name	Enter the custom certificate name.
Certificate	Click on the Upload Button to upload the certificate.
Private Key	Click on the Upload Button to upload the private key associated with the certificate.

4. Click **Save**.

You must also add root or the leaf CA certificate in the Trust Store. For more detailed information on how to add root CA Certificate, refer to Trust Store topic in *GigaVUE Administration Guide*.

The certificates uploaded here can be linked to the respective GigaVUE V Series Node, GigaVUE V Series Proxy, and UCT-V Controller in the Fabric Launch Configuration Page. Refer to *Configure GigaVUE Fabric Components in GigaVUE-FM* topic in the respective cloud guides for more detailed information.

## Upload Custom Certificate using Third Party Orchestration

You can also upload custom certificates to GigaVUE V Series Nodes, GigaVUE V Series Proxy, and UCT-V Controller using your own cloud platform at the time of deploying the fabric components. Refer to the following topics on more detailed information on how to upload custom certificates using third party orchestration in the respective platforms:

For integrated mode:

- [Configure GigaVUE Fabric Components in AWS](#)
- [Configure GigaVUE Fabric Components in Azure](#)
- [Configure GigaVUE Fabric Components in OpenStack](#)

For generic mode:

- [Configure GigaVUE Fabric Components in AWS](#)
- [Configure GigaVUE Fabric Components in Azure](#)
- [Configure GigaVUE Fabric Components in GCP](#)
- [Configure GigaVUE Fabric Components in Nutanix](#)
- [Configure GigaVUE Fabric Components in OpenStack](#)
- [Configure GigaVUE V Series Nodes using VMware ESXi](#)

## Adding Certificate Authority

This section describes how to add Certificate Authority in GigaVUE-FM.

## CA List

The Certificate Authority (CA) List page allows you to add the root CA for the devices.

To upload the CA using GigaVUE-FM follow the steps given below:

1. Go to **Inventory > Resources > Security > CA List**.
2. Click **Add**, to add a new Custom Authority. The **Add Certificate Authority** page appears.
3. Enter or select the following information.

Field	Action
Alias	Alias name of the CA.
File Upload	Choose the certificate from the desired location.

4. Click **Save**.

## Create Monitoring Domain

To create a monitoring domain in GigaVUE-FM:

1. Go to **Inventory > VIRTUAL > OpenStack**. The Monitoring Domain page appears.
2. On the Monitoring Domain page, click **New**. The **Monitoring Domain Configuration** page appears.

3. Enter or select the appropriate information to configure Monitoring Domain for OpenStack. Refer to the following table for field-level details.

**NOTE:** For the URL, User Domain Name, Project Domain Name, and Region field values, refer to the RC file downloaded from your OpenStack dashboard.

Field	Description
<b>Monitoring Domain</b>	<p>A name for the monitoring domain.</p> <p><b>NOTE:</b> You can only view and delete the existing configuration for V Series node 1. You cannot create and perform any other actions on the existing configuration for GigaVUE V Series node 1 as the features are deprecated from GigaVUE-FM fabric manager (GigaVUE-FM).</p>
<b>Alias</b>	An alias used to identify the monitoring domain.
<b>URL</b>	<p>The authentication URL is the Keystone URL of the OpenStack cloud. This IP address must be DNS resolvable.</p> <p>Refer to the OpenStack User Manual for more information on retrieving the authentication URL from the OpenStack.</p>
<b>User Domain Name</b>	<p>The domain name of your OpenStack authentication domain.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If you are using a separate domain for AUTH, enter that domain name as User Domain Name.</li> <li>If you are not using a separate domain, you can use the same domain for User and Project Domain Name.</li> </ul>
<b>Project Domain Name</b>	The domain name of your OpenStack project.
<b>Project Name</b>	The name of the project used for OpenStack authentication.
<b>Region</b>	<p>The region where the Project resides. You can find your region by running one of these commands, depending on your OpenStack version.</p> <p><b>keystone endpoint-list</b> or <b>openstack endpoint list</b> or looking at the RC file in OpenStack to view your credentials.</p>
<b>Username</b>	<p>The username used to connect to your OpenStack cloud.</p> <p><b>NOTE:</b> If you are using OVS mirroring, you must belong to a role that meets the OpenStack minimum requirements for OVS Mirroring. Refer to <a href="#">OVS Mirroring Prerequisites</a> for more information.</p>
<b>Password</b>	The password of your OpenStack cloud.
<b>Traffic Acquisition</b>	<p>Select the type of agent used to capture traffic for monitoring:</p> <ul style="list-style-type: none"> <li><b>UCT-V:</b> If you select UCT-V as the tapping method, the traffic is acquired from the</li> </ul>

Field	Description
<b>Method</b>	<p>UCT-Vs installed on the VMs. You must configure the UCT-V Controller to monitor the UCT-Vs.</p> <ul style="list-style-type: none"> <li>• <b>OVS Mirroring:</b> If you select OVS Mirroring as your tapping method, the traffic is acquired from the UCT-Vs installed on the hypervisors. Refer to <a href="#">Open vSwitch (OVS) Mirroring</a> for detailed information. You must configure the UCT-V Controller to monitor the UCT-Vs.</li> </ul> <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p><b>NOTE:</b> For software release 6.7.00, only OVS Mirroring is supported on RHOSP 17.1 version.</p> </div> <ul style="list-style-type: none"> <li>• <b>Customer Orchestrated Source:</b> If you select Customer Orchestrated Source as the tapping method, you can use tunnels as a source where the traffic is directly tunneled to V Series nodes without deploying UCT-Vs or UCT-V Controllers.</li> </ul>
<b>Projects to Monitor</b> (Only for OVS Mirroring traffic acquisition method)	<p>This field only appears for OVS Mirroring traffic acquisition method.</p> <ul style="list-style-type: none"> <li>• Click the <b>Get Project List</b> to view the list of projects.</li> </ul> <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <p><b>NOTE:</b> The <b>Get Project List</b> button will only work if all the OpenStack credentials have been provided. Refer to <a href="#">OVS Mirroring Prerequisites</a>.</p> </div> <ul style="list-style-type: none"> <li>• Select projects that you want to monitor from the list.</li> <li>• You can click <b>Select None</b> to clear existing selections or <b>Select All</b> to add all available projects to the connection configuration.</li> </ul>
<b>Traffic Acquisition Tunnel MTU</b> (Maximum Transmission Unit)	<p>The Maximum Transmission Unit (MTU) is the maximum size of each packet that the tunnel endpoint can carry from the UCT-V to the GigaVUE Cloud Suite V Series node.</p> <ul style="list-style-type: none"> <li>• For GRE, the default value is 1450.</li> <li>• For VXLAN, the default value is 1400. However, the UCT-V tunnel MTU should be 50 bytes less than the default MTU size.</li> </ul>

4. Click **Save**. The **OpenStack Fabric Launch Configuration** page appears. Refer to [Configure GigaVUE Fabric Components in GigaVUE-FM](#) for detailed information.


**NOTE:** If GigaVUE-FM fails to connect to OpenStack, an error message is displayed specifying the cause of failure. The connection status is also displayed in Audit Logs, refer to [About Audit Logs](#) for more information.

## Managing Monitoring Domain

You can view the details of the monitoring domain that are created in the list view. The list view details can be viewed based on:

- [Monitoring Domain](#)
- [Connections Domain](#)
- [Connections Domain](#)
- [UCT-Vs](#)

You can also filter the monitoring domain based on a specified criterion. In the monitoring domain page there are two filter options as follows:

- Right filter - Click the Filter button on the right to filter the monitoring domain based on a specific criterion.
- Left filter - Click the  to filter the monitoring domain based on the domain and connections. You can click **+** to create a new monitoring domain. This filter once applied also works even when the tabs are swapped.

To edit or delete a specific monitoring domain, select the monitoring domain, click the ellipses "...".

When you click a monitoring domain, you can view details of it in a split view of the window. In the split view window, you can view the details such as Configuration, Launch Configuration and V Series configuration.

## Monitoring Domain

The list view shows the following information in the monitoring domain page:

- Monitoring Domain
- Connections
- Tunnel MTU
- Acquisition Method
- Centralized connection
- Management Network

**NOTE:** Click the  to select the columns that should appear in the list view.

Use the following buttons to manage your Monitoring Domain:

Button	Description
New	Use to create new connection
Actions	<p>You can select a monitoring domain and then perform the following options:</p> <ul style="list-style-type: none"> <li>● <b>Edit Monitoring Domain</b>- Select a monitoring domain and then click <b>Edit Monitoring domain</b> to update the configuration.</li> <li>● <b>Delete Domain</b> - You can select a monitoring domain or multiple monitoring domains to delete them.</li> <li>● <b>Edit Fabric</b>-You can select one fabric or multiple fabrics of the same monitoring domain to edit a fabric. You cannot choose different fabrics of multiple monitoring domains at the same time and edit their fabrics</li> <li>● <b>Deploy Fabric</b> - -You can select a monitoring domain to deploy a fabric, you cannot choose multiple monitoring domains at the same time to deploy fabrics. This option is only enabled when there is No FABRIC (launch configuration) for</li> </ul>



Button	Description
	<p>that specific monitoring domain and GigaVUE-FM orchestration is enabled.. You must create a fabric in the monitoring domain, if the option is disabled</p> <ul style="list-style-type: none"> <li>● <b>Upgrade Fabric</b>-You can select a monitoring domain or multiple monitoring domains to upgrade the fabric. You can upgrade the V Series nodes using this option.</li> <li>● <b>Delete Fabric</b>- You can delete all the fabrics associated with the monitoring domain of the selected Fabric.</li> <li>● <b>Shut down OVS Traffic</b> - You can shut down the OVS traffic. You can view the <b>Shut down OVS Traffic</b> option only when you enable the check box <b>OVS Agent Traffic when V Series unreachable</b> in <b>Advanced Settings</b>. For more information on settings, refer to <a href="#">Configure the OpenStack Settings</a></li> <li>● <b>Restart OVS Traffic</b> - You can restart the OVS traffic. You can view the <b>Restart OVS Traffic</b> option only when you enable the check box <b>OVS Agent Traffic when V Series unreachable</b> in <b>Advanced Settings</b>. For more information on settings, refer to <a href="#">Configure the OpenStack Settings</a></li> <li>● <b>Edit SSL Configuration</b> - You can use this option to add Certificate Authority and the SSL Keys when using the Secure Tunnels.</li> </ul>
Filter	<p>Filters the monitoring domain based on the list view options that are configured:</p> <ul style="list-style-type: none"> <li>● <b>Tunnel MTU</b></li> <li>● <b>Acquisition Method</b></li> <li>● <b>Centralised Connection</b></li> <li>● <b>Management Subnet</b></li> </ul> <p>You can view the filters applied on the top of the monitoring domain page as a button. You can remove the filters by closing the button.</p>

## Connections Domain

To view the connection related details for a monitoring domain, click the **Connections** tab.

The list view shows the following details:

- Connections
- Monitoring Domain
- Status
- Fabric Nodes
- User Name
- Region

## Fabric

To view the fabric related details for a monitoring domain, click the **Fabric** tab.

The list view shows the following details:

- Connections

- Monitoring Domain
- Fabric Nodes
- Type
- Management IP
- Version
- Status - Click to view the upgrade status for a monitoring domain.
- Security groups

## UCT-Vs

To view all the UCT-Vs associated with the available monitoring domains click the **UCT-Vs** tab.

The list view shows the following details:

- Monitoring Domain
- IP address
- Registration time
- Last heartbeat time
- Agent mode
- Status

.Refer to [Configure the OpenStack Settings](#), for information regarding **Settings**.

## Configure GigaVUE Fabric Components in GigaVUE-FM

After configuring the Monitoring Domain, you will be navigated to the OpenStack Fabric Launch Configuration page. In the same **OpenStack Fabric Launch Configuration** page, you can configure the following fabric components:

- [Configure UCT-V Controller](#)
- [Configure GigaVUE V Series Proxy](#)
- [Configure GigaVUE V Series Node](#)

In the **OpenStack Fabric Launch Configuration** page, enter or select the required information as described in the following table.

Fields	Description
SSH Key Pair	The SSH key pair for the UCT-V Controller. For more information about SSH key pair, refer to <a href="#">Key Pairs</a> .
Availability Zone	The distinct locations (zones) of the OpenStack region.
Security Groups	The security group created for the UCT-V Controller. For more information, refer to <a href="#">Security Group for OpenStack</a> .
Prefer IPv6	Enables IPv6 to deploy all the Fabric Controllers, and the tunnel between hypervisor to V Series node using IPv6 address. If the IPv6 address is unavailable, it uses an IPv4 address. This functionality is supported only in OVS Mirroring.
Enable Custom Certificates	Enable this option to validate the custom certificate during SSL Communication. GigaVUE-FM validates the Custom certificate with the trust store. If the certificate is not available in Trust Store, communication does not happen, and an handshake error occurs.  <b>NOTE:</b> If the certificate expires after the successful deployment of the fabric components, then the fabric components moves to failed state.
Certificate	Select the custom certificate from the drop-down menu. You can also upload the custom certificate for GigaVUE V Series Nodes, GigaVUE V Series Proxy, and UCT-V Controllers. For more detailed information, refer to <a href="#">Install Custom Certificate</a> .

Select **Yes** to configure a GigaVUE V Series Proxy.

SSH Key Pair

Select SSH Key Pair...

Availability Zone

Select Availability Zone...

Security Groups

Select management subnet security group...

Configure a V Series Proxy

No

## Configure UCT-V Controller

A UCT-V Controller manages multiple UCT-Vs and orchestrates the flow of mirrored traffic to GigaVUE V Series nodes. While configuring the UCT-V Controllers, you can also specify the tunnel type to be used for carrying the mirrored traffic from the UCT-Vs to the GigaVUE V Series nodes.

### UCT-V Controller

The screenshot displays the configuration page for UCT-V Controllers. On the left, a sidebar lists various configuration sections: Controller Version(s), Management Network, Additional Network(s), Tags, Cloud-Init User Data (Optional), Agent Tunnel Type, Agent Tunnel CA, and UCT-V Controller Name. The main area contains two 'Add' buttons for controller instances. The first instance is configured with 'Image', 'Flavor', and 'Number of Instances' fields. The second instance includes additional fields for 'IP Address Type' (with radio buttons for Private and Floating), 'Network', 'Floating IPs', and 'Port'. Below the instances, there are sections for 'Additional Network(s)', 'Tags', 'Cloud-Init User Data (Optional)', 'Agent Tunnel Type' (set to VXLAN), 'Agent Tunnel CA', and a 'Configuration Drive' checkbox. At the bottom, a summary table shows the controller name 'Gigamon-UCT-VController-', the number of instances '1', and the full name 'Gigamon-UCT-VController-1'.



- Only if UCT-Vs are used for capturing traffic, then the UCT-V Controllers must be configured in the OpenStack cloud.
- A UCT-V Controller can only manage UCT-Vs that have the same version.

Enter or select the required information in the UCT-V Controller section as described in the following table.

Fields	Description
Controller Version(s)	<p>The UCT-V Controller version that you configure must always have the same version number as the UCT-Vs deployed in the instances. For more detailed information refer <a href="#">GigaVUE-FM Version Compatibility Matrix</a>.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p><b>NOTE:</b> If there is a version mismatch between the UCT-V Controllers and UCT-Vs, GigaVUE-FM cannot detect the agents in the instances.</p> </div> <p>To add UCT-V Controllers:</p> <ol style="list-style-type: none"> <li>a. Under <b>Controller Versions</b>, click <b>Add</b>.</li> <li>b. From the <b>Image</b> drop-down list, select a UCT-V Controller image that matches with the version number of UCT-Vs installed in the instances.</li> <li>c. From the <b>Flavor</b> drop-down list, select a size for the UCT-V Controller.</li> <li>d. In <b>Number of Instances</b>, specify the number of UCT-V Controllers to launch. The minimum number you can specify is 1.</li> </ol>
Management Network	<p>This segment defines the management network that GigaVUE-FM uses to communicate with UCT-V Controllers, GigaVUE V Series Proxy, and GigaVUE V Series Nodes.</p> <p><b>Network</b> - Select the management network ID.</p> <p><b>Ports</b> - Select a port, you can choose a port related to the selected management network ID.</p> <p><b>IP Address Type</b></p> <p>The type of IP address GigaVUE-FM needs to communicate with UCT-V Controllers:</p> <ul style="list-style-type: none"> <li>o <b>Private</b>—A private IP can be used when GigaVUE-FM, the UCT-V Controller, or the GigaVUE V Series Proxy reside inside the same project.</li> <li>o <b>Floating</b>—A floating IP is needed only if GigaVUE-FM is not in the same project in the cloud or is outside the cloud. GigaVUE-FM needs a floating IP to communicate with the controllers from an external network.</li> </ul>
Additional Network(s)	<p>(Optional) If there are UCT-Vs on networks that are not IP routable from the management network, additional networks or subnets must be specified so that the UCT-V Controller can communicate with all the UCT-Vs.</p> <p>Click <b>Add</b> to specify additional networks (subnets), if needed. Also, make sure that you specify a list of security groups for each additional network.</p>

Fields	Description
	<b>Ports:</b> Select a port associated with the network.
Tag(s)	<p>(Optional) The key name and value that helps to identify the UCT-V Controller instances in your environment. For example, you might have UCT-V Controllers deployed in many regions. To distinguish these UCT-V Controllers based on the regions, you can provide a name (also known as a tag) that is easy to identify such as us-west-2-uctv-controllers. There is a specific UCT-V Controller Version for OVS Mirroring and OVS Mirroring + DPDK.</p> <p>To add a tag:</p> <ol style="list-style-type: none"> <li>Click <b>Add</b>.</li> <li>In the <b>Key</b> field, enter the key. For example, enter Name.</li> <li>In the <b>Value</b> field, enter the key value. For example, us-west-2-uctv-controllers.</li> </ol>
Cloud-Init User Data (Optional)	Enter the cloud-init user data in cloud-config format.
Agent Tunnel Type	The type of tunnel used for sending the traffic from UCT-Vs to GigaVUE V Series nodes. The options are GRE, VXLAN, and Secure tunnels (TLS-PCAPNG).
Agent Tunnel CA	The Certificate Authority (CA) that should be used in the UCT-V Controller for connecting the tunnel.
UCT-V Controller Name	<p>(Optional) Enter the name of the UCT-V Controller.</p> <p>The UCT-V Controller name must meet the following criteria:</p> <ul style="list-style-type: none"> <li>o The entire name can be a minimum of 1 to a maximum of 128 characters.</li> <li>o The suffix must only be a numeral and it should range between 0 to 999999999.</li> <li>o When deploying multiple UCT-V Controllers, the suffix of the consecutive UCT-V Controller name is updated successively. E.g., 000, 001, 002, 003, etc..</li> </ul>

## Configure GigaVUE V Series Proxy

The fields in the GigaVUE V Series Proxy configuration section are the same as those on the UCT-V Configuration page. Refer to [Configure UCT-V Controller](#) for the field descriptions.



## Configure GigaVUE V Series Node

Creating a GigaVUE V Series node profile automatically launches the V Series node. Enter or select the required information in the GigaVUE V Series Node section as described in the following table.

### Prerequisites

Enable **Host pass through** by editing the *nova.conf* file and changing the *cpu\_mode = host-passthrough*

Parameter	Description
Image	Select the GigaVUE V Series node image file.
Flavor	Select the form of the GigaVUE V Series node.
Management Network	<p>For the GigaVUE V Series Node, the Management Network is what is used by the GigaVUE V Series Proxy to communicate with the GigaVUE V Series Nodes. Select the management network ID.</p> <p><b>Ports</b>— Select a port, you can choose a port related to the selected management network ID.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> When both IPv4 and IPv6 addresses are available, IPv6 address is preferred, however if IPv6 address is not reachable then IPv4 address is used.</p> </div>
Data Network	<p>Click <b>Add</b> to add additional networks. This is the network that the GigaVUE V Series node uses to communicate with the monitoring tools. Multiple networks are supported.</p> <ul style="list-style-type: none"> <li>• <b>Tool Subnet</b>—Select a tool subnet, this is the default subnet that the GigaVUE-FM use to egress traffic to your tools. This subnet must have proper connectivity to your endpoint.</li> <li>• <b>IP Address Type</b> <ul style="list-style-type: none"> <li>◦ <b>Private</b>—A private IP can be used when GigaVUE-FM, the UCT-V Controller, or the GigaVUE V Series Proxy, or the GigaVUE V Series node 2 reside inside the same project.</li> <li>◦ <b>Floating</b>—A floating IP address specified here will be where V Series node 2x.x can be directly managed by GigaVUE-FM or can optionally managed by controllers.</li> </ul> </li> <li>• <b>Network 1</b>—Select a network type.</li> <li>• <b>Ports</b> —Select a port associated with the network.</li> </ul> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <ul style="list-style-type: none"> <li>• For OVS Mirroring or OVS Mirroring + DPDK deployments, must select <b>Floating</b> in the Data Network section and then specify the IPs in the <b>Floating IPs</b> field. You can have multiple Floating IPs.</li> <li>• A network provider that is able to receive the monitored traffic may also be used here for OVS Mirroring and OVS Mirroring + DPDK. In this case, you would not need to provide a floating IP; but could select "private" and choose the provider network.</li> </ul> </div>

Parameter	Description
Tag(s)	<p>(Optional) The key name and value that helps to identify the UCT-V Controller instances in your environment. For example, you might have UCT-V Controllers deployed in many regions. To distinguish these UCT-V Controllers based on the regions, you can provide a name (also known as a tag) that is easy to identify such as us-west-2-uctv-controllers.</p> <p>To add a tag:</p> <ol style="list-style-type: none"> <li>Click <b>Add</b>.</li> <li>In the <b>Key</b> field, enter the key. For example, enter Name.</li> <li>In the <b>Value</b> field, enter the key value. For example, us-west-2-uctv-controllers.</li> </ol>
Cloud-Init User Data (Optional)	Enter the cloud-init user data in cloud-config format.
Min Instances	<p>The minimum number of GigaVUE V Series nodes to be launched in OpenStack. The minimum number can be 1.</p> <ul style="list-style-type: none"> <li>When you deploy an OVS Mirroring or OVS Mirroring + DPDK monitoring session, the V Series nodes will automatically be deployed based on the # of hypervisors being monitored.</li> <li>When you deploy a UCT-V based monitoring session, the V Series nodes will automatically be deployed based on the # of VMs being monitored and the instance per V Series node ratio defined in the <a href="#">OpenStack Settings</a> page.</li> </ul> <p><b>NOTE:</b> GigaVUE-FM will delete the nodes if they are idle for over 15 minutes.</p>
Max Instances	The maximum number of GigaVUE V Series nodes that can be launched in OpenStack.
V Series Node Name	<p>(Optional) Enter the name of the V Series Node.</p> <p>The V Series Node name must meet the following criteria:</p> <ul style="list-style-type: none"> <li>The entire name can be a minimum of 1 to a maximum of 128 characters.</li> <li>The suffix must only be a numeral and it should range between 0 to 999999999.</li> <li>When deploying multiple V Series Nodes, the suffix of the consecutive V Series Node name is updated successively. E.g., 000, 001, 002, 003, etc..</li> </ul>
Tunnel MTU (Maximum Transmission Unit)	<p>The Maximum Transmission Unit (MTU) is applied on the outgoing tunnel endpoints of the GigaVUE-FM V Series node when a monitoring session is deployed. The default value is 1450. The value must be 42 bytes less than the default MTU for GRE tunneling, or 50 bytes less than default MTU for VXLAN tunnels.</p>

Click **Save** to save the OpenStack Fabric Launch Configuration.

To view the fabric launch configuration specification of a fabric node, click on a fabric node or proxy, and a quick view of the Fabric Launch Configuration appears on the Monitoring Domain page.

# Configure Role-Based Access for Third Party Orchestration

Before deploying the fabric components using a third party orchestrator, we must create users, roles and the respective user groups in GigaVUE-FM. The Username and the Password provided in the User Management page will be used in the registration data that can be used to deploy the fabric components in your orchestrator.

Refer to following topics for more detailed information on how to add users, create roles and user groups:

- [Users](#)
- [Role](#)
- [User Groups](#)


## Users

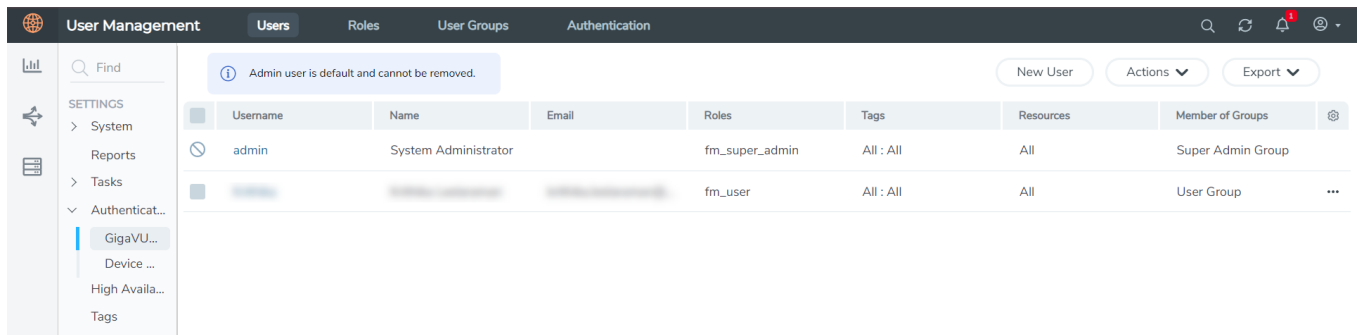
You can also configure user's role and user groups to control the access privileges of the user in GigaVUE-FM.

### Add Users

This section provides the steps for adding users. You can add users only if you are a user with **fm\_super\_admin role** or a user with either read/write access to the FM security Management category.

To add users perform the following steps:

1. On the left navigation pane, click  and select **Authentication > GigaVUE-FM User Management > Users**. The **User** page is displayed.



**Figure 1** FM Users Page

2. Click **New User**. In the Add User wizard that appears perform the following steps.

**Add User** ✕

i All form elements are required unless indicated as optional. ✕

**Name**

**Username**

**Password**

**Confirm password**

**Email**

**User Group**  
 ?

**i** Your new password must contain:

- ✓ At least 8 characters and up to a maximum of 64 characters in length
- ✓ At least one numerical character
- ✓ At least one uppercase character
- ✓ At least one lowercase character
- ✓ At least one special character from `!@#S%^&*()+`

Cancel Ok

**Figure 2** *Create User*

- a. In the Add User pop-up box, enter the following details:
  - o **Name:** Actual name of the user
  - o **Username:** User name configured in GigaVUE-FM
  - o **Email:** Email ID of the user
  - o **Password/Confirm Password:** Password for the user.
  - o **User Group:** User group

**NOTE:** GigaVUE-FM will prompt for your password.

- b. Click **Ok** to save the configuration.

The new user is added to the summary list view.

The username and password created in this section will be used in the registration data, used for deploying the fabric components.

## Role

A user role defines permission for users to perform any task or operation in GigaVUE-FM or on the managed device. You can associate a role with user.

## Create Roles


This section describes the steps for creating roles and assigning user(s) to those roles.

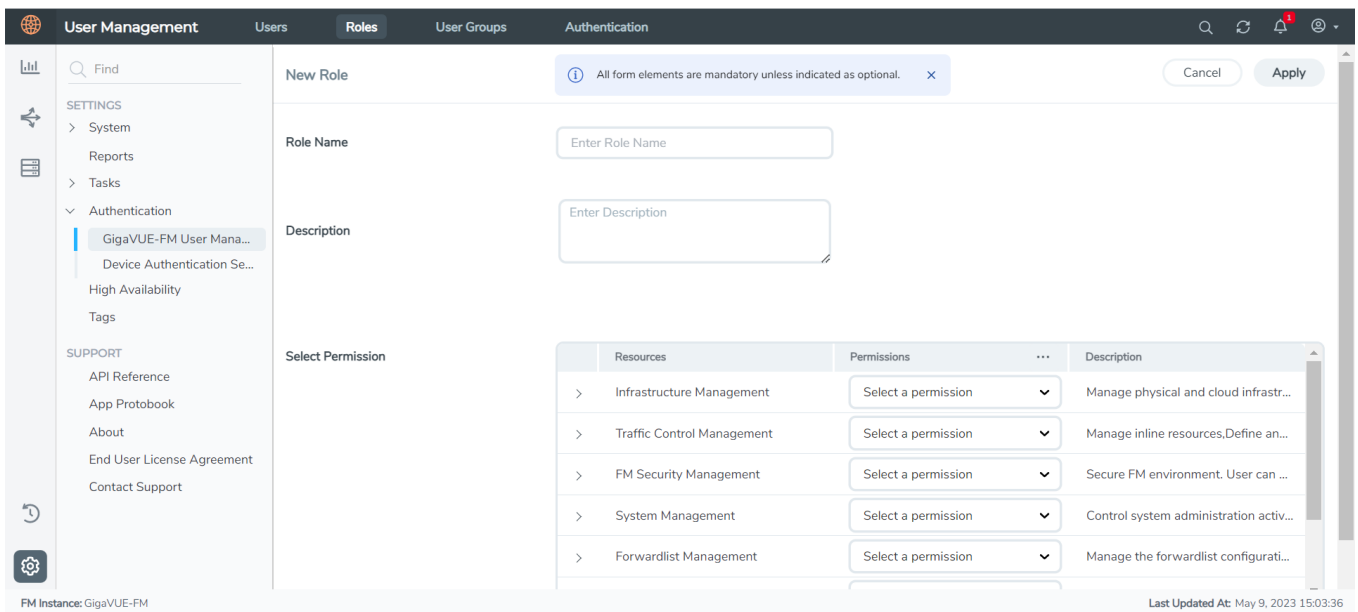
GigaVUE-FM has the following default roles:

- **fm\_super\_admin** — Allows a user to do everything in GigaVUE-FM fabric manager, including adding or modifying users and configuring all AAA settings in the RADIUS, TACACS+, and LDAP tabs. Can change password for all users.
- **fm\_admin** — Allows a user to do everything in GigaVUE-FM fabric manager except add or modify users and change AAA settings. Can only change own password.
- **fm\_user** — Allows a user to view everything in GigaVUE-FM fabric manager, including AAA settings, but cannot make any changes.

**NOTE:** If you are a user with read-only access you will be restricted from performing any configurations on the screen. The menus and action buttons in the UI pages will be disabled appropriately.

To create a role

1. On the left navigation pane, click  and select **Authentication > GigaVUE-FM User Management > Roles**.
2. Click **New Role**.



The screenshot shows the 'New Role' form in the GigaVUE-FM User Management interface. The form includes the following elements:

- Role Name:** A text input field with the placeholder 'Enter Role Name'.
- Description:** A text area with the placeholder 'Enter Description'.
- Select Permission:** A table with the following columns: Resources, Permissions, and Description.
 

Resources	Permissions	Description
> Infrastructure Management	Select a permission	Manage physical and cloud infrastr...
> Traffic Control Management	Select a permission	Manage inline resources, Define an...
> FM Security Management	Select a permission	Secure FM environment. User can ...
> System Management	Select a permission	Control system administration activ...
> Forwardlist Management	Select a permission	Manage the forwardlist configurati...

3. In the New Role page, select or enter the following details:
  - **Role Name:** Name of the role.
  - **Description:** Description of the role.

- **Select Permission:** Under the **Select Permissions** tab select **Third Party Orchestration** and provide read / write permissions.

4. Click **Apply** to save the configuration.

## User Groups


A user group consists of a set of roles and set of tags associated with users in that group. When a user is created they can be associated with one or more groups.

### Create User Groups in GigaVUE-FM

The following user groups are available by default in GigaVUE-FM. You will not be able to edit or change these groups in the system.

User Group	Tag Key and Tag Value	Permission
Super Admin Group	Tag Key = All Tag Value = All	Group with privileges of fm_super_adminrole.
Admin Group	Tag Key= All Tag Value = All	Group with privileges of fm_admin role.
View only user	Tag Key = All Tag Value = All	Group with privileges of fm_user role.

To create a custom user group:

1. On the left navigation pane, click , and then select **Authentication > GigaVUE-FM User Management > User Groups**.
2. Click **New Group**. In the Wizard that appears, perform the following steps. Click **Next** to progress forward and click **Back** to navigate backward and change the details.

The screenshot shows the 'New User Group' configuration wizard in the GigaVUE Cloud Suite User Management interface. The wizard is in the 'Assign Roles' step (step 2 of 4). The 'Roles' table lists three roles: 'fm\_super\_admin', 'fm\_admin', and 'fm\_user'. The 'fm\_admin' role is selected. The 'Resources' column shows 'Infrastructure Management+ 6 more' for the 'fm\_admin' role.

Roles	Description	Resources
<input type="checkbox"/> fm_super_admin	Allows a user to do everything in GigaVUE-FM, including add...	All
<input checked="" type="checkbox"/> fm_admin	Allows a user to do everything in GigaVUE-FM except adding...	Infrastructure Management+ 6 more
<input type="checkbox"/> fm_user	Allows a user to view everything in GigaVUE-FM, including A...	All

- In the **Group Info** tab, enter the following details:
  - Group Name**
  - Description**
- In the **Assign Roles** tab, select the required role.
- In the **Assign Tags** tab, select the required tag key and tag value.
- In the **Assign Users** tab, select the required users. Click **Apply** to save the configuration. Click **Skip and Apply** to skip this step and proceed without adding users.

The new user group is added to the summary list view.

Click on the ellipses to perform the following operations:

- o **Modify Users:** Edit the details of the users.
- o **Edit:** Edit an existing group.

## Configure GigaVUE Fabric Components in OpenStack

You can use your own OpenStack orchestration system to deploy GigaVUE fabric nodes and use GigaVUE-FM to configure the advanced features supported by these nodes. These nodes register themselves with GigaVUE-FM using the information provided by your OpenStack orchestration system. Once the nodes are registered with GigaVUE-FM, you can

configure monitoring sessions and related services in GigaVUE-FM. Health status of the registered nodes are determined by the heartbeat messages sent from the respective nodes.

## Recommended Instance Type

The following table lists the recommended instance type for deploying the fabric components:

Fabric Component	Machine type
GigaVUE V Series Node	m1.medium
GigaVUE V Series Proxy	m1.small
UCT-V Controller	m1.small

Keep in mind the following when deploying the fabric components using third party orchestration in integrated mode:

- In the above mentioned case, the Traffic Acquisition Tunnel MTU is set to the default value 1500. To edit the Traffic Acquisition Tunnel MTU, select the monitoring domain and click on the **Edit Monitoring Domain** option. Enter the **Traffic Acquisition Tunnel MTU** and click Save.
- When you deploy the fabric components using 3rd party orchestration, you cannot delete the monitoring domain without unregistering the registered fabric components.
- You can use OpenStack Orchestrator for GigaVUE fabric node configuration only using V Series 2 nodes.
- GigaVUE V Series Node must have a minimum of two Networks Interfaces (NIC) attached to it, a management NIC and a data NIC. You can add both these interfaces when deploying the GigaVUE V Series Node in OpenStack.

In your OpenStack dashboard, you can configure the following GigaVUE fabric components:

- [Configure V Series Nodes and Proxy in OpenStack](#)
- [Configure UCT-V Controller in OpenStack](#)
- [Configure UCT-V in OpenStack](#)

## Configure V Series Nodes and Proxy in OpenStack

To configure V Series Nodes and V Series Proxy in OpenStack platform:

1. Before configuring GigaVUE fabric components through OpenStack, you must create a monitoring domain in GigaVUE-FM. Refer to [Create Monitoring Domain](#) for detailed instructions.

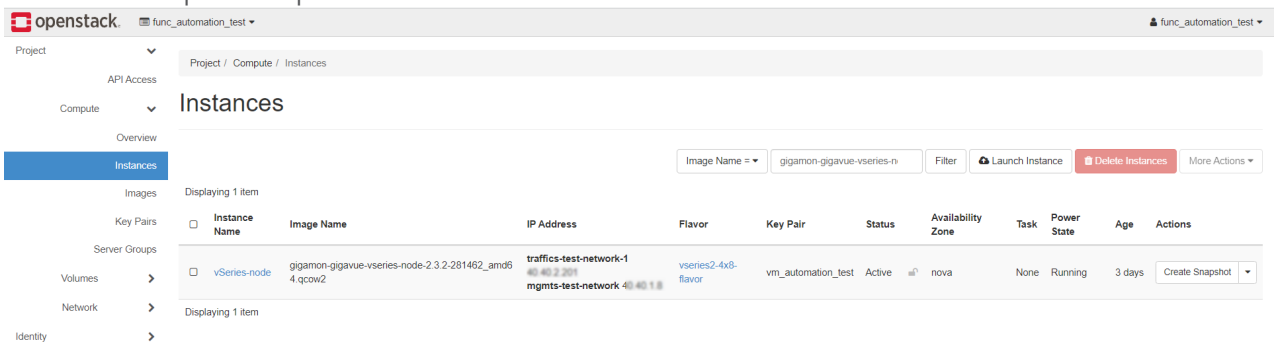


- In the **Monitoring Domain Configuration** page, select **No** for the **Use FM to Launch Fabric** field as you are going to configure the fabric components in OpenStack Orchestrator.
- In your OpenStack environment, you can deploy V Series nodes or V Series proxy using the following methods:
  - Register V Series Nodes or V Series Proxy using OpenStack GUI
  - Register V Series Node or V Series Proxy using a configuration file

## Register V Series Nodes or V Series Proxy using OpenStack GUI

To register V Series nodes or proxy using the user data in OpenStack GUI:

- On the Instance page of OpenStack dashboard, click **Launch instance**. The Launch Instance wizard appears. For detailed information, refer to [Launch and Manage Instances](#) topic in OpenStack Documentation.



The screenshot shows the OpenStack GUI interface for managing instances. The left sidebar contains navigation options: Project, API Access, Compute, Overview, Instances (selected), Images, Key Pairs, Server Groups, Volumes, Network, and Identity. The main content area is titled 'Instances' and shows a table with one instance.

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions
vSeries-node	gigamon-gigavue-vseries-node-2.3.2-281462_amd64-qcow2	traffics-test-network-1 10.0.2.201 mgmts-test-network 10.0.1.1	vseries2-4x8-flavor	vm_automation_test	Active	nova	None	Running	3 days	Create Snapshot

2. On the **Configuration** tab, enter the Customization Script as text in the following format and deploy the instance. The V Series nodes or V Series proxy uses this customization script to generate config file (**/etc/gigamon-cloud.conf**) used to register with GigaVUE-FM.

Field	User Data
User data without custom certificate	<pre>#cloud-config write_files: - path: /etc/gigamon-cloud.conf   owner: root:root   permissions: '0644'   content:       Registration:       groupName: &lt;Monitoring Domain Name&gt;       subGroupName: &lt;Connection Name&gt;       user: &lt;Username&gt;       password: &lt;Password&gt;       remoteIP: &lt;IP address of the GigaVUE-FM&gt; or &lt;IP address of the Proxy&gt;       remotePort: 443</pre>
User data with custom certificate	<pre>#cloud-config write_files: - path: /etc/cntlr-cert.conf   owner: root:root   permissions: "0644"   content:       -----BEGIN CERTIFICATE-----     &lt;certificate content&gt;     -----END CERTIFICATE----- - path: /etc/cntlr-key.conf   owner: root:root   permissions: "400"   content:       -----BEGIN PRIVATE KEY-----     &lt;private key content&gt;     -----END PRIVATE KEY----- - path: /etc/gigamon-cloud.conf   owner: root:root   permissions: '0644'   content:       Registration:       groupName: &lt;Monitoring Domain Name&gt;       subGroupName: &lt;Connection Name&gt;       user: &lt;Username&gt;       password: &lt;Password&gt;       remoteIP: &lt;IP address of the GigaVUE-FM&gt; or &lt;IP address of the Proxy&gt;       remotePort: 443</pre>



- You can register your V Series node directly with GigaVUE-FM or you can use V Series proxy to register your V Series node with GigaVUE-FM. If you wish to register V Series node directly, enter the `remotePort` value as 443 or if you wish to deploy V Series node using V Series proxy then, enter the `remotePort` value as 8891.
- User and Password must be configured in the **User Management** page. Refer to [Configure Role-Based Access for Third Party Orchestration](#) for more detailed information. Enter the Username and Password created in the **Add Users** Section.

## Register V Series Node or V Series Proxy using a configuration file

To register V Series node or proxy using a configuration file:

1. Log in to the V Series node or proxy.
2. Create a local configuration file (`/etc/gigamon-cloud.conf`) and enter the following customization script.

```
Registration:
  groupName: <Monitoring Domain Name>
  subGroupName: <Connection Name>
  user: <username>
  password: <password>
  remoteIP: <IP address of the GigaVUE-FM>
  remotePort: 443
```

**NOTE:** If you wish to register V Series node using V Series proxy then, enter the `remotePort` value as 8891.

3. Restart the V Series node or proxy service.
  - V Series node:
 

```
$ sudo service vseries-node restart
```
  - V Series proxy:
 

```
$ sudo service vps restart
```

The deployed V Series node or V Series proxy registers with the GigaVUE-FM. After successful registration the V Series node or proxy sends heartbeat messages to GigaVUE-FM every 30 seconds. If one heartbeat is missing, the fabric node status appears as 'Unhealthy'. If more than five heartbeats fail to reach GigaVUE-FM, GigaVUE-FM tries to reach the V Series node or proxy and if that fails as well then GigaVUE-FM unregisters the V Series node or proxy and it will be removed from GigaVUE-FM.

## Configure UCT-V Controller in OpenStack

To configure GigaVUE fabric components in OpenStack platform:

1. Before configuring GigaVUE fabric components through OpenStack, you must create a monitoring domain in GigaVUE-FM. While creating the monitoring domain, select **UCT-V** as the Traffic Acquisition Method. Refer to [Create Monitoring Domain](#) for detailed instructions.
2. In the **Monitoring Domain Configuration** page, select **No** for the **Use FM to Launch Fabric** field as you are going to configure the fabric components in OpenStack Dashboard.

The screenshot displays the 'Monitoring Domain Configuration' interface in OpenStack. The page title is 'OpenStack > Monitoring Domain'. The configuration is organized into a table-like structure with labels on the left and input fields on the right. The 'Use V Series 2' field is a toggle switch set to 'Yes'. The 'Monitoring Domain' field is a text input with the placeholder 'Enter a monitoring domain name'. Other fields include 'Alias', 'URL', 'User Domain Name', 'Project Domain Name', 'Project Name', 'Region', 'Username', and 'Password', all with text input fields. The 'Traffic Acquisition Method' is a dropdown menu currently showing 'G-VTAP'. The 'Traffic Acquisition Tunnel MTU' is a text input with the value '1500'. The 'Use FM to Launch Fabric' field is a toggle switch set to 'No'. At the bottom left, it says 'FM Instance: GigaVUE-FM'. At the top right, there are search, refresh, and notification icons. Below the title bar, there are 'Save' and 'Cancel' buttons.

3. In your OpenStack environment, launch the UCT-V Controller using any of the following methods:
  - [Register UCT-V Controller using OpenStack GUI](#)
  - [Register UCT-V Controller using a configuration file](#)

## Register UCT-V Controller using OpenStack GUI

To register UCT-V Controller using the user data in OpenStack GUI:

- a. On the Instance page of OpenStack dashboard, click **Launch instance**. The Launch Instance wizard appears. For detailed information, refer to [Launch and Manage Instances](#) topic in OpenStack Documentation.

The screenshot shows the OpenStack GUI 'Instances' page. The breadcrumb is 'Project / Compute / Instances'. The page title is 'Instances'. There are buttons for 'Image Name = gigamon-gigavue-vseries-n', 'Filter', 'Launch Instance', 'Delete Instances', and 'More Actions'. Below the buttons, it says 'Displaying 1 item'. The table below has the following data:

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions
vSeries-node	gigamon-gigavue-vseries-node-2.3.2-281462_amd64-qcow2	traffics-test-network-1 192.168.2.255	vseries2-4x8-flavor	vm_automation_test	Active	nova	None	Running	3 days	Create Snapshot

- b. On the **Configuration** tab, enter the Customization Script as text in the following format and deploy the instance. The UCT-V Controller uses this customization script to generate config file (**/etc/gigamon-cloud.conf**) used to register with GigaVUE-FM.

Field	User Data
User data without custom certificate	<pre>#cloud-config write_files: - path: /etc/gigamon-cloud.conf   owner: root:root   permissions: '0644'   content:       Registration:       groupName: &lt;Monitoring Domain Name&gt;       subGroupName: &lt;Connection Name&gt;       user: &lt;Username&gt;       password: &lt;Password&gt;       remoteIP: &lt;IP address of the GigaVUE-FM&gt;       sourceIP: &lt;IP address of UCT-V Controller&gt; (Optional Field)       remotePort: 443</pre>
User data with custom certificate	<pre>#cloud-config write_files: - path: /etc/cntrlr-cert.conf   owner: root:root   permissions: "0644"   content:       -----BEGIN CERTIFICATE-----     &lt;certificate content&gt;     -----END CERTIFICATE----- - path: /etc/cntrlr-key.conf   owner: root:root   permissions: "400"   content:       -----BEGIN PRIVATE KEY-----     &lt;private key content&gt;     -----END PRIVATE KEY----- - path: /etc/gigamon-cloud.conf   owner: root:root   permissions: '0644'   content:       Registration:       groupName: &lt;Monitoring Domain Name&gt;       subGroupName: &lt;Connection Name&gt;       user: &lt;Username&gt;       password: &lt;Password&gt;       remoteIP: &lt;IP address of the GigaVUE-FM&gt;       sourceIP: &lt;IP address of UCT-V Controller&gt; (Optional Field)       remotePort: 443</pre>



- User and Password must be configured in the **User Management** page. Refer to [Configure Role-Based Access for Third Party Orchestration](#) for more detailed information. Enter the Username and Password created in the **Add Users** Section.

The UCT-V Controller deployed in OpenStack appears on the Monitoring Domain page of GigaVUE-FM.

## Register UCT-V Controller using a configuration file

To register UCT-V Controller using a configuration file:

- Log in to the UCT-V Controller.
- Create a local configuration file (**/etc/gigamon-cloud.conf**) and enter the following user data.

```
Registration:
  groupName: <Monitoring Domain Name>
  subGroupName: <Connection Name>
  user: <Username>
  password: <Password>
  remoteIP: <IP address of the GigaVUE-FM>
  sourceIP: <IP address of UCT-V Controller> (Optional Field)
  remotePort: 443
```

- Restart the UCT-V Controller service.
 

```
$ sudo service uctv-cntlr restart
```

## Assign Static IP address for UCT-V Controller

By default, the UCT-V Controller gets assigned an IP address using DHCP. If you wish to assign a static IP address, follow the steps below:

- a. Navigate to **/etc/netplan/** directory.
- b. Create a new **.yaml** file. (Other than the default 50-cloud-init.yaml file)
- c. Update the file as shown in the following sample:

```
network:
  version: 2
  renderer: networkd
  ethernets:
    ens3:
      addresses:
        - <IP address>
      gateway: <IP address>
    ens4:
      addresses:
        - <IP address>
      gateway: <IP address>
    ens5:
      addresses:
        - <IP address>
      gateway: <IP address>
```

- d. Save the file.
- e. Restart the UCT-V Controller service.  
**\$ sudo service uctv-cntlr restart**

The deployed UCT-V Controller registers with the GigaVUE-FM. After successful registration the UCT-V Controller sends heartbeat messages to GigaVUE-FM every 30 seconds. If one heartbeat is missing, the fabric node status appears as 'Unhealthy'. If more than five heartbeats fail to reach GigaVUE-FM, GigaVUE-FM tries to reach the UCT-V Controller and if that fails as well then GigaVUE-FM unregisters the UCT-V Controller and it will be removed from GigaVUE-FM.

## Configure UCT-V in OpenStack

UCT-V should be registered via the registered UCT-V Controller and communicates through PORT 8891.

**NOTE:** Deployment of UCT-V Agents through a third-party orchestrator is supported on Linux and Windows platforms. Refer to [Linux UCT-V Installation](#) and [Windows UCT-V Installation](#) for detailed information.

To register UCT-V using a configuration file:

1. Install the UCT-V in the Linux or Windows platform. For detailed instructions, refer to [Linux UCT-V Installation](#) and [Windows UCT-V Installation](#).
2. Log in to the UCT-V.



3. Create a local configuration file and enter the following user data.



- **/etc/gigamon-cloud.conf** is the local configuration file in Linux platform.
- **C:\ProgramData\uctv\gigamon-cloud.conf** is the local configuration file in Windows platform.

Registration:

```

groupName: <Monitoring Domain Name>
subGroupName: <Connection Name>
user: <Username>
password: <Password>
remoteIP: <IP address of the UCT-V Controller 1>,
          <IP address of the UCT-V Controller 2>

sourceIP: <IP address of UCT-V> (Optional Field)
remotePort: 8891

```



- User and Password must be configured in the **User Management** page. Refer to [Configure Role-Based Access for Third Party Orchestration](#) for more detailed information. Enter the UserName and Password created in the **Add Users** Section.
- If you are using multiple interface in UCT-V and UCT-V Controller is not connected to the primary interface, then add the following to the above registration data:
 

```

localInterface:<Interface to which UCT-V Controller is connected>

```

4. Restart the UCT-V service.

- Linux platform:
 

```

$ sudo service uctv restart

```
- Windows platform: Restart from the Task Manager.

**NOTE:** You can configure more than one UCT-V Controller for a UCT-V, so that if one UCT-V Controller goes down, the UCT-V registration will happen through another Controller that is active.

The deployed UCT-V registers with the GigaVUE-FM through the UCT-V Controller. After successful registration the UCT-V sends heartbeat messages to GigaVUE-FM every 30 seconds. If one heartbeat is missing, UCT-V status appears as 'Unhealthy'. If more than five heartbeats fail to reach GigaVUE-FM, GigaVUE-FM tries to reach the UCT-V and if that fails as well then GigaVUE-FM unregisters the UCT-V and it will be removed from GigaVUE-FM.

**Keep in mind the following when upgrading the GigaVUE-FM to 6.1.00 or higher version (when using third party orchestration to deploy fabric components):**

When upgrading GigaVUE-FM to any version higher than 6.0.00 and if the GigaVUE V Series Nodes version deployed in that GigaVUE-FM are lower than or equal to 6.0.00, then for the seamless flow of traffic, GigaVUE-FM automatically creates **Users** and **Roles** in GigaVUE-FM with the required permission. The username would be **orchestration** and the password would be **orchestration123A!** for the user created in GigaVUE-FM. Ensure there is no existing user in GigaVUE-FM, with the username **orchestration**.

It is recommended to change the password in the Users page, once the upgrade is complete. Refer to [Configure Role-Based Access for Third Party Orchestration](#) for detailed steps on how to change password in the user page.

## Upgrade GigaVUE Fabric Components in GigaVUE-FM for OpenStack

This chapter describes how to upgrade GigaVUE V Series Proxy and GigaVUE V Series Nodes. For more detailed information about UCT-V Controller, GigaVUE V Series Proxy and Node Version refer [GigaVUE-FM Version Compatibility Matrix](#)

Refer to the following topic for more information:

- [Prerequisite](#)
- [Upgrade UCT-V Controller](#)
- [Upgrade GigaVUE V Series Nodes and GigaVUE V Series Proxy](#)

### Prerequisite

Before you upgrade the GigaVUE V Series Proxy and GigaVUE V Series nodes, you must upgrade GigaVUE-FM to software version 5.13. For better performance, Gigamon recommends you to upgrade to the latest version.

### Upgrade UCT-V Controller

**NOTE:** UCT-V Controllers cannot be upgraded. Only a new version that is compatible with the UCT-V's version can be added or removed in the **OpenStack Fabric Launch Configuration** page.

To change the UCT-V Controller version follow the steps given below:

To change UCT-V Controller version between different major versions

**NOTE:** You can only add UCT-V Controllers which has different major versions. For example, you can only add UCT-V Controller version 1.8-x if your existing version is 1.7-x.

- Under **Controller Versions**, click **Add**.
- From the **Image** drop-down list, select a UCT-V Controller image that matches with the version number of UCT-Vs installed in the instances.
- From the **Flavor** drop-down list, select a size for the UCT-V Controller.
- In **Number of Instances**, specify the number of UCT-V Controllers to launch. The minimum number you can specify is 1.

The screenshot displays the configuration interface for UCT-V Controllers. It is organized into several sections:

- Controller Version(s):** Contains an 'Add' button and two configuration cards.
  - The first card has 'Image' set to 'Select image...', 'Flavor' set to 'Select flavor...', and 'Number of Instances' set to '1'.
  - The second card has 'Image' set to 'gigamon-gvtap-ovs-ctrlr-1.8-2', 'Flavor' set to 'm1.small', and 'Number of Instances' set to '1'.
- Management Network:** Contains 'IP Address Type' (radio buttons for Private and Floating, with Floating selected), 'Network' (dropdown set to 'mgmt-test-network'), and 'Floating IPs' (dropdown set to '10.115.176.108').
- Additional Network(s):** Contains an 'Add' button.
- Tags:** Contains an 'Add' button.

You cannot change the IP Address Type and the Additional Networks details, provided at the time of UCT-V Controller configuration.

After installing the new version of UCT-V Controller, follow the steps given below:

1. Install UCT-V with the version same as the UCT-V Controller.
2. Delete the UCT-V Controller with older version.

To change UCT-V Controller version with in the same major version

**NOTE:** This is only applicable, if you wish to change your UCT-V Controller version from one minor version to another with in the same major version. For example, from 1.8-2 to 1.8-3.

- From the **Image** drop-down list, select a UCT-V Controller image with in the same major version.
- Specify the **Number of Instances**. The minimum number you can specify is 1.
- Select the **Network** from the drop-down.



- You cannot modify the rest of the fields.
- After installing the new version of UCT-V Controller, install the UCT-V with the same version.

## Upgrade GigaVUE V Series Nodes and GigaVUE V Series Proxy

GigaVUE-FM lets you upgrade GigaVUE V Series Proxy and GigaVUE V Series Nodes at a time.

There are multiple ways to upgrade the GigaVUE V Series Proxy and nodes. You can:

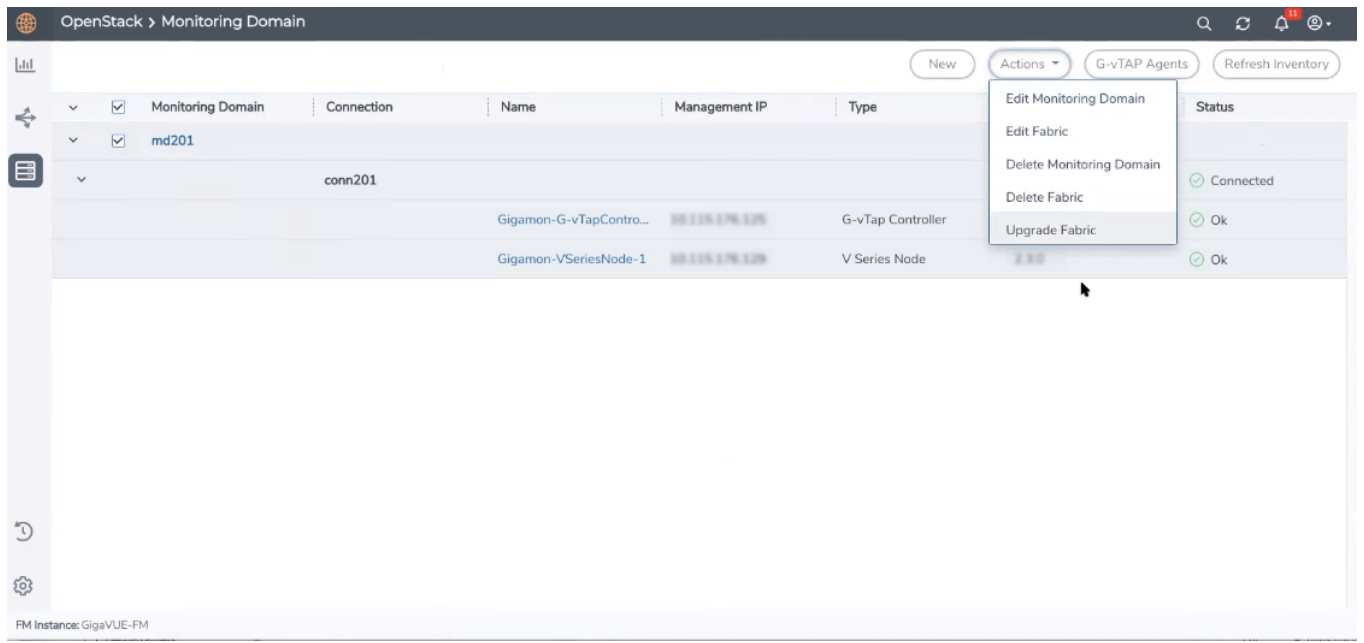
- Launch and replace the complete set of nodes and controllers at a time.
 

For example, if you have 1 GigaVUE V Series Proxy and 10 GigaVUE V Series nodes in your project, you can upgrade all of them at once. First, the new version of GigaVUE V Series Proxy is launched. Next, the new version of GigaVUE V Series Nodes are launched. Then, the old version of V Series Proxy and nodes are deleted from the project.
- NOTES:**
- When the new version of nodes and controllers are launched, the old version still exists in the project until they are deleted. Make sure the flavor determined during the configuration can accommodate the total number of new and old fabric nodes present in the project. If the flavor cannot support so many Virtual Machines, you can choose to upgrade in multiple batches.
  - If there is an error while upgrading the complete set of controllers and nodes present in the project, the new version of the fabric is immediately deleted and the old version of the fabric is retained as before.
  - Prior to upgrading the GigaVUE V Series Proxy and Nodes, you must ensure that the required number of floating IP addresses are available in the respective subnets. Otherwise, the upgrade will fail.
- Launch and replace the nodes and controllers in multiple batches.
 

For example, if there are 18 GigaVUE V Series Nodes to be upgraded, you can specify how many you want to upgrade per batch.

To upgrade the GigaVUE V Series Proxy and GigaVUE V Series Nodes:

1. Go to **Inventory > VIRTUAL > OpenStack**, and then click **Monitoring Domain**. The Monitoring Domain page appears.
2. On the Monitoring Domain page, select the connection name check box and click **Actions**



3. Select **Upgrade Fabric** from the drop-down list. The Fabric Nodes Upgrade page is displayed.

### Fabric Nodes Upgrade

#### V Series Proxy

Upgrade

#### V Series Node

Upgrade

Current Version

2.3.2

Image

Select an image...

Change Flavor

Batch Size

1

Upgrade

Cancel

4. To upgrade the GigaVUE V Series Nodes/Proxy, select the **Upgrade** checkbox.
5. From the **Image** drop-down list, select the latest version of the GigaVUE V SeriesProxy/Nodes.

6. Select the **Change Flavor** checkbox to change the flavor of the nodes/proxy, only if required.
7. To upgrade the GigaVUE V Series Nodes/Proxy, specify the batch size in the **Batch Size** box.

For example, if there are 7 GigaVUE V Series Nodes, you can specify 7 as the batch size and upgrade all of them at once. Alternatively, you can specify 3 as the batch size, and launch and replace 3 V Series nodes in each batch. In the last batch, the remaining 1 V Series node is launched.

8. Click **Upgrade**.

The upgrade process takes a while depending on the number of GigaVUE V Series Proxy and Nodes upgrading in your OpenStack environment. First, the new version of the GigaVUE V Series Proxy is launched. Next, the new version of GigaVUE V Series Nodes is launched. Then, the older version of both is deleted from the project. In the V Series Proxy page, click the link under Progress to view the upgrade status.

The monitoring session is deployed automatically.

## Configure Secure Tunnel (OpenStack)

The Secure tunnels can be configured on:

- [Preencrypted Traffic](#)
- [Mirrored Traffic](#)

### Preencrypted Traffic

You can send the preencrypted traffic through a secure tunnel. When secure tunnels for Preencryption is enabled, packets are framed and sent to the TLS socket. The packets are sent in PCAPng format.

When you enable the secure tunnel option for regular and preencrypted packets, two TLS secure tunnel sessions are created.

It is recommended always to enable secure tunnels for preencrypted traffic to securely transfer the sensitive information.

For more information about PCAPng, refer to [PCAPng Application](#).

## Mirrored Traffic

You can enable the Secure Tunnel for mirrored traffic. By default, Secure Tunnel is disabled.

Refer to the following sections for Secure Tunnel Configuration:

- [Configure Secure Tunnel from UCT-V to GigaVUE V Series Node](#) in UCT-V
- [Configure Secure Tunnel between GigaVUE V Series Nodes](#)

## Prerequisites

- While creating Secure Tunnel, you must provide the following details:
  - SSH key pair
  - CA certificate
- Port 11443 should be enabled in security group settings. Refer to [Security Group for OpenStack](#) for more detailed information on Network Firewall / Security Group.

## Notes

- Protocol versions IPv4 and IPv6 are supported.
- If you wish to use IPv6 tunnels, your GigaVUE-FM and the fabric components version must be 6.6.00 or above.
- For UCT-V with a version lower than 6.6.00, if the secure tunnel is enabled in the monitoring session, secure mirror traffic will be transmitted over IPv4, regardless of IPv6 preference.

## Configure Secure Tunnel from UCT-V to GigaVUE V Series Node

To configure a secure tunnel in UCT-V, you must configure one end of the tunnel to the UCT-V and the other end to GigaVUE V Series node. You must configure the CA certificates in UCT-V and the the private keys and SSL certificates in GigaVUE V Series node. Refer to the following steps for configuration:

S.No	Task	Description						
1.	Upload a CA	<p>You must upload a Custom Authority (CA) Certificate to UCT-V Controller for establishing a connection with the GigaVUE V Series node.</p> <p>To upload the CA using GigaVUE-FM follow the steps given below:</p> <ol style="list-style-type: none"> <li>Go to <b>Inventory &gt; Resources &gt; Security &gt; CA List</b>.</li> <li>Click <b>New</b>, to add a new Custom Authority. The <b>Add Custom Authority</b> page appears.</li> <li>Enter or select the following information. <table border="1" data-bbox="664 583 1472 747"> <thead> <tr> <th>Field</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Alias</td> <td>Alias name of the CA.</td> </tr> <tr> <td>File Upload</td> <td>Choose the certificate from the desired location.</td> </tr> </tbody> </table> </li> <li>Click <b>Save</b>.</li> </ol> <p>For more information, refer to <a href="#">Adding Certificate Authority</a> section.</p>	Field	Action	Alias	Alias name of the CA.	File Upload	Choose the certificate from the desired location.
Field	Action							
Alias	Alias name of the CA.							
File Upload	Choose the certificate from the desired location.							
2.	Upload an SSL Key	<p>You must add an SSL key to GigaVUE V Series node. To add an SSL Key, follow the steps in the section <a href="#">Upload SSL Keys</a>.</p>						



S.No	Task	Description
3	Enable the secure tunnel	<p>You should enable the secure tunnel feature to establish a connection between the UCT-V and GigaVUE V Series node. To enable the secure tunnel feature follow these steps:</p> <ol style="list-style-type: none"> <li>1. In the Edit Monitoring Session page, click <b>Options</b>. The <b>Monitoring Session options</b> page appears.</li> <li>2. Enable the <b>Secure Tunnel</b> button. You can enable secure tunnel for both mirrored and precrypted traffic.</li> </ol> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> When GigaVUE V Series is upgraded or deployed to 6.5 version, all the existing monitoring sessions will be redeployed, and individual TLS TEPs are created for each UCT-V agent in GigaVUE V Series node.</p> </div>
4.	Select the SSL Key	<p>You must select the added SSL Key in GigaVUE V Series node Key while creating a monitoring domain configuring the fabric components in GigaVUE-FM.</p> <p>To select the SSL key, follow the steps in the section <a href="#">Configure GigaVUE Fabric Components in GigaVUE-FM</a></p> <p>If the existing monitoring domain does not have a SSL key, you can add it by following the given steps:</p> <ol style="list-style-type: none"> <li>1. Select the monitoring domain for which you want to add the SSL key.</li> <li>2. Click the <b>Actions</b> drop down list and select <b>Edit SSL Configuration</b>. An <b>Edit SSL Configuration</b> window appears.</li> <li>3. Select the CA in the <b>UCT-V Agent Tunnel CA</b> drop down list.</li> <li>4. Select the SSL key in the <b>V Series Node SSL key</b> drop down list.</li> <li>5. Click <b>Save</b>.</li> </ol>
5.	Select the CA	<p>You should select the added Certificate Authority (CA) in UCT-V Controller while creating the monitoring domain configuring the fabric components in GigaVUE-FM. To select the CA certificate, follow the steps in the section <a href="#">Configure GigaVUE Fabric Components in GigaVUE-FM</a></p>

## Configure Secure Tunnel between GigaVUE V Series Nodes

You can create secure tunnel:

- Between two GigaVUE V Series Nodes.
- From one GigaVUE V Series Node to multiple GigaVUE V Series Nodes.

You must have the following details before you start configuring secure tunnels between two GigaVUE V Series Nodes:

- IP address of the tunnel destination endpoint (Second GigaVUE V Series Node).
- SSH key pair (pem file).

To configure secure tunnel between two GigaVUE V Series Nodes, refer to the following steps:

S.No	Task	Description						
1.	Upload a CA.	<p>You must upload a CA Certificate to UCT-V Controller to establish a connection between the GigaVUE V Series node.</p> <p>To upload the CA using GigaVUE-FM follow the steps given below:</p> <ol style="list-style-type: none"> <li>1. Go to <b>Inventory &gt; Resources &gt; Security &gt; CA List</b>.</li> <li>2. Click <b>Add</b>, to add a new Certificate Authority. The <b>Add Certificate Authority</b> page appears.</li> <li>3. Enter or select the following information.</li> </ol> <table border="1"> <thead> <tr> <th>Field</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Alias</td> <td>Alias name of the CA.</td> </tr> <tr> <td>File Upload</td> <td>Choose the certificate from the desired location.</td> </tr> </tbody> </table> <ol style="list-style-type: none"> <li>4. Click <b>Save</b>.</li> <li>5. Click <b>Deploy All</b>.</li> </ol> <p>For more information, refer to the <a href="#">Adding Certificate Authority</a> section.</p>	Field	Action	Alias	Alias name of the CA.	File Upload	Choose the certificate from the desired location.
Field	Action							
Alias	Alias name of the CA.							
File Upload	Choose the certificate from the desired location.							
2.	Upload an SSL Key.	You must add an SSL key to GigaVUE V Series node. To add an SSL Key, follow the steps in the section						
3	Create a secure tunnel.	<p>You should create a secure tunnel to establish a connection between the UCT-V and first GigaVUE V Series Node. To enable the secure tunnel feature follow these steps:</p> <ol style="list-style-type: none"> <li>1. In the Edit Monitoring Session page, click <b>Options</b>. The <b>Monitoring Session Options</b> page appears.</li> <li>2. Enable the <b>Secure Tunnel</b> button. You can enable secure tunnel for both mirrored and preencrypted traffic.</li> </ol>						
4.	Select the added SSL Key.	<p>Select the SSL Key added in Step 2, while creating a monitoring domain and configuring the fabric components in GigaVUE-FM for the first GigaVUE V Series Node.</p> <p>You must select the added SSL Key in the first GigaVUE V Series Node.</p> <p>To select the SSL key, follow the steps in the section <a href="#">Configure GigaVUE Fabric Components in GigaVUE-FM</a></p>						
5.	Select the added CA certificate.	You should select the added Certificate Authority (CA) in UCT-V Controller while creating the monitoring domain. To select the CA certificate, follow the steps in the section <a href="#">Configure GigaVUE Fabric Components in GigaVUE-FM</a>						
6	Create an Egress tunnel from the first GigaVUE V Series Node.	You must create an egress tunnel for traffic to flow out from the first GigaVUE V Series Node with tunnel type as TLS-PCAPNG while creating the Monitoring Session. Refer to <a href="#">Create a Monitoring Session</a> to know about Monitoring Session.						

S.No	Task	Description												
		<p>To create the egress tunnel, follow these steps:</p> <ol style="list-style-type: none"> <li>1. After creating a new Monitoring Session, or click <b>Actions &gt; Edit</b> on an existing monitoring session, the GigaVUE-FM canvas appears.</li> <li>2. In the canvas, select <b>New &gt; New Tunnel</b>, drag and drop a new tunnel template to the workspace. The <b>Add Tunnel Spec</b> quick view appears.</li> <li>3. On the New Tunnel quick view, enter or select the required information as described in the following table:</li> </ol> <table border="1"> <thead> <tr> <th>Field</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Alias</td> <td>The name of the tunnel endpoint.</td> </tr> <tr> <td>Description</td> <td>The description of the tunnel endpoint.</td> </tr> <tr> <td>Type</td> <td>Select TLS-PCAPNG for creating egress secure tunnel</td> </tr> <tr> <td>Traffic Direction</td> <td> <p>Choose <b>Out</b> (Encapsulation) for creating an egress tunnel from the V Series node to the destination. Select or enter the following values:</p> <ul style="list-style-type: none"> <li>o MTU- The default value is 1500.</li> <li>o Time to Live - Enter the value of the time interval till which the session needs to be available. The value ranges from 1 to 255. The default value is 64.</li> <li>o DSCP - Enter the Differentiated Services Code Point (DSCP) value.</li> <li>o Flow Label - Enter the Flow Label value.</li> <li>o Source L4 Port- Enter the Souce L4 Port value</li> <li>o Destination L4 Port - Enter the Destination L4 Port value.</li> <li>o Flow Label</li> <li>o Cipher- Only SHA 256 is supported.</li> <li>o TLS Version - Select TLS Version1.3.</li> <li>o Selective Acknowledgments - Choose <b>Enable</b> to turn on the TCP selective acknowledgments.</li> <li>o SYN Retries - Enter the value for number of times the SYN has to be tried. The value ranges from 1 to 6.</li> <li>o Delay Acknowledgments - Choose <b>Enable</b> to turn on delayed acknowledgments.</li> </ul> </td> </tr> <tr> <td>Remote Tunnel IP</td> <td>Enter the interface IP address of the second GigaVUE V Series Node (Destination IP).</td> </tr> </tbody> </table> <p>4. Click <b>Save</b>.</p>	Field	Action	Alias	The name of the tunnel endpoint.	Description	The description of the tunnel endpoint.	Type	Select TLS-PCAPNG for creating egress secure tunnel	Traffic Direction	<p>Choose <b>Out</b> (Encapsulation) for creating an egress tunnel from the V Series node to the destination. Select or enter the following values:</p> <ul style="list-style-type: none"> <li>o MTU- The default value is 1500.</li> <li>o Time to Live - Enter the value of the time interval till which the session needs to be available. The value ranges from 1 to 255. The default value is 64.</li> <li>o DSCP - Enter the Differentiated Services Code Point (DSCP) value.</li> <li>o Flow Label - Enter the Flow Label value.</li> <li>o Source L4 Port- Enter the Souce L4 Port value</li> <li>o Destination L4 Port - Enter the Destination L4 Port value.</li> <li>o Flow Label</li> <li>o Cipher- Only SHA 256 is supported.</li> <li>o TLS Version - Select TLS Version1.3.</li> <li>o Selective Acknowledgments - Choose <b>Enable</b> to turn on the TCP selective acknowledgments.</li> <li>o SYN Retries - Enter the value for number of times the SYN has to be tried. The value ranges from 1 to 6.</li> <li>o Delay Acknowledgments - Choose <b>Enable</b> to turn on delayed acknowledgments.</li> </ul>	Remote Tunnel IP	Enter the interface IP address of the second GigaVUE V Series Node (Destination IP).
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Remote Tunnel IP	Enter the interface IP address of the second GigaVUE V Series Node (Destination IP).													
7.	Select the added SSL Key in the GigaVUE V Series Node	You must select the added SSL Key while creating a monitoring domain and configuring the fabric components in GigaVUE-FM in the second GigaVUE V Series Node. To select the SSL key, follow the steps in the section <a href="#">Configure GigaVUE Fabric Components in GigaVUE-FM</a>												
8	Create an ingress tunnel in the second GigaVUE	You must create a ingress tunnel for traffic to flow in from the first GigaVUE V Series Node with tunnel type as TLS-PCAPNG while creating the Monitoring Session for the second GigaVUE V Series Node. Refer to <a href="#">Create a Monitoring</a>												

S.No	Task	Description														
	V Series node.	<p><a href="#">Session</a> to know about monitoring session.</p> <p>To create the ingress tunnel, follow these steps:</p> <ol style="list-style-type: none"> <li>1. After creating a new monitoring session, or click <b>Actions &gt; Edit</b> on an existing monitoring session, the GigaVUE-FM canvas appears.</li> <li>2. In the canvas, select <b>New &gt; New Tunnel</b>, drag and drop a new tunnel template to the workspace. The <b>Add Tunnel Spec</b> quick view appears.</li> <li>3. On the New Tunnel quick view, enter or select the required information as described in the following table:</li> </ol> <table border="1"> <thead> <tr> <th>Field</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Alias</td> <td>The name of the tunnel endpoint.</td> </tr> <tr> <td>Description</td> <td>The description of the tunnel endpoint.</td> </tr> <tr> <td>Type</td> <td>Select TLS-PCAPNG for creating egress secure tunnel.  <b>NOTE:</b> If you are enabling Secure tunnel in Monitoring Session with traffic acquisition method as UCT-V, you must not create TLS-PCAPNG Tunnel with direction IN, Destination L4 port 11443, and GigaVUE V Series Node version 6.5 and above.</td> </tr> <tr> <td>Traffic Direction</td> <td>Choose <b>In</b> (Decapsulation) for creating an ingress tunnel that receives traffic from the first GigaVUE V Series Node. Select or enter the values as described in Step 6:</td> </tr> <tr> <td>IP Version</td> <td>The version of the Internet Protocol. IPv4 and IPv6 are supported.</td> </tr> <tr> <td>Remote Tunnel IP</td> <td>Enter the interface IP address of the first GigaVUE V Series Node (Destination IP).</td> </tr> </tbody> </table> <ol style="list-style-type: none"> <li>4. Click <b>Save</b>.</li> </ol>	Field	Action	Alias	The name of the tunnel endpoint.	Description	The description of the tunnel endpoint.	Type	Select TLS-PCAPNG for creating egress secure tunnel.  <b>NOTE:</b> If you are enabling Secure tunnel in Monitoring Session with traffic acquisition method as UCT-V, you must not create TLS-PCAPNG Tunnel with direction IN, Destination L4 port 11443, and GigaVUE V Series Node version 6.5 and above.	Traffic Direction	Choose <b>In</b> (Decapsulation) for creating an ingress tunnel that receives traffic from the first GigaVUE V Series Node. Select or enter the values as described in Step 6:	IP Version	The version of the Internet Protocol. IPv4 and IPv6 are supported.	Remote Tunnel IP	Enter the interface IP address of the first GigaVUE V Series Node (Destination IP).
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Traffic Direction	Choose <b>In</b> (Decapsulation) for creating an ingress tunnel that receives traffic from the first GigaVUE V Series Node. Select or enter the values as described in Step 6:															
IP Version	The version of the Internet Protocol. IPv4 and IPv6 are supported.															
Remote Tunnel IP	Enter the interface IP address of the first GigaVUE V Series Node (Destination IP).															

## Viewing Status of Secure Tunnel

GigavUE-FM allows you to view the status of secure tunnel connection in UCT-C. You can verify whether the tunnel is connected to the tool or V Series node through the status.

To verify the status of secure tunnel, go to **UCT-C > Monitoring Domain**. In the monitoring domain page, **Tunnel status** column shows the status of the tunnel. The green color represents that the tunnel is connected and the red represents that the tunnel is not connected.

For configuring secure tunnel, refer to **Configure Secure Tunnel** section.

# Create Prefiltering Policy Template

GigaVUE-FM allows you to create a prefiltering policy template with a single rule or multiple rules. You can configure a rule with a single filter or multiple filters. Each monitoring session can have a maximum of 16 rules.

To create a prefiltering policy template, do the following steps:

1. Go to **Resources > Prefiltering**, and then click **UCT-V**.
2. Click **New**.
3. Enter the name of the template in the **Template Name** field.
4. Enter the name of a rule in the **Rule Name** field.
5. Click any one of the following options:
  - Pass — Passes the traffic.
  - Drop — Drops the traffic.

**NOTE:** In the absence of a prefilter rule, traffic is implicitly allowed. However, once rules are defined, they include an implicit drop rule. Should the traffic not conform to any of the specified rules, it will be dropped.

6. Click any one of the following options as per the requirement:
  - Bi-Directional — Allows the traffic in both directions of the flow. A single Bi-direction rule should consist of 1 Ingress and 1 Egress rule.
  - Ingress — Filters the traffic that flows in.
  - Egress — Filters the traffic that flows out.
7. Select the value of the priority based on which the rules must be prioritized for filtering. Select the value as 1 to pass or drop a rule in top priority. Similarly, you can select the value as 2, 3, 4 to 8, where 8 can be used for setting a rule with the least priority. Drop rules are added based on the priority and, then pass rules are added.
8. Select the **Filter Type** from the following options:
  - L3
  - L4

9. Select the **Filter Name** from the following options:

- ip4Src
- ip4Dst
- ip6Src
- ip6Dst
- Proto - It is common for both ipv4 and ipv6.

10. Select the **Filter Relation** from any one of the following options:

- Not Equal to
- Equal to

11. Enter the value for the given filter.

12. Click **Save**.

**NOTE:** Click + to add more rules or filters. Click - to remove a rule or a filter.

To enable prefiltering, refer to [Monitoring Session Options](#)..

# Configure Monitoring Session

This chapter describes how to setup ingress and egress tunnel, maps, applications in a monitoring session to receive and send traffic to the GigaVUE V Series node. It also describes how to filter, manipulate, and send the traffic from the V Series node to monitoring tools.

Refer to the following sections for details:

- [Create a Monitoring Session \(OpenStack\)](#)
- [Create Ingress and Egress Tunnels](#)
- [Create a New Map](#)
- [Add Applications to Monitoring Session](#)
- [Deploy Monitoring Session](#)
- [View Monitoring Session Statistics](#)
- [Visualize the Network Topology](#)

## Create a Monitoring Session (OpenStack)

You must a [Create Monitoring Domain](#) before creating a monitoring session.

GigaVUE-FM automatically collects inventory data on all target instances available in your cloud environment. You can design your monitoring session to include or exclude the instances that you want to monitor. You can also choose to monitor egress, ingress, or all traffic.

When a new target instance is added to your cloud environment, GigaVUE-FM automatically detects and adds the instance to your monitoring session. Similarly, when an instance is removed, it updates the monitoring sessions.

For the connections without UCT-Vs, there are no targets that are automatically selected. You can use Customer Orchestrated Source in the monitoring session to accept a tunnel from anywhere.

You can create multiple monitoring sessions per monitoring domain.

To create a new monitoring session:

1. Go to **Traffic > Virtual > Orchestrated Flows** and select your cloud platform. The **Monitoring Sessions** page appears.
2. Click **New** to open the **Create a New Monitoring Session** page.

### Create A New Monitoring Session

3. Enter the appropriate information for the monitoring session as described in the following table.

Field	Description
<b>Alias</b>	The name of the monitoring session.
<b>Monitoring Domain</b>	The name of the monitoring domain that you want to select.
<b>Connection</b>	The connection(s) that are to be included as part of the monitoring domain. You can select the required connections that need to be part of the monitoring domain.
<b>Distribute traffic</b>	Enabling the "Distribute Traffic" option identifies duplicate packets across different GigaVUE V Series Nodes when traffic from various targets is routed to these instances for monitoring.

4. Click **Create**. The **Edit Monitoring Session** Canvas page appears.

The Monitoring Session page **Actions** button also has the following options:



Button	Description
<b>Edit</b>	<p>Opens the Edit page for the selected monitoring session.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> In case of an error while editing a monitoring session, undeploy and deploy the monitoring session again.</p> </div>
<b>Delete</b>	Deletes the selected monitoring session.
<b>Clone</b>	Duplicates the selected monitoring session.
<b>Deploy</b>	Deploys the selected monitoring session.
<b>Undeploy</b>	Undeploys the selected monitoring session.
<b>Apply Threshold</b>	You can use this button to apply the threshold template created for monitoring cloud traffic health. Refer to <a href="#">Monitor Cloud Health</a> for more detailed information on cloud traffic health, how to create threshold templates, and how to apply threshold templates.
<b>Apply Policy</b>	You can use this button to enable precryption, prefiltering, or Secure Tunnel. Refer to <a href="#">Enable Prefiltering and Precryption</a> for more details.

## Edit Monitoring Session

In the edit monitoring session canvas page, you can add and configure applications, tunnel endpoints, raw endpoints, and maps.

Refer to the following topics for detailed information:

- [Create Ingress and Egress Tunnels](#)
- [Add Applications to Monitoring Session](#)
- [Create Raw Endpoint](#)
- [Create a New Map](#)

The **Edit Monitoring Session** page has the following buttons:

Button	Description
<b>Options</b>	You can enable or disable Prefiltering, Precryption, and Secure Tunnel here. You can also create prefiltering template and apply it to the monitoring session. Refer to <a href="#">Enable Prefiltering, Precryption, and Secure Tunnel</a> for more detailed information.
<b>Show Targets</b>	Use to refresh the subnets and monitored instances details that appear in the <b>Instances</b> dialog box.
<b>Dashboard</b>	The dashboard displays the statistics for all the applications, end points and the maps available in the

Button	Description
	monitoring session.
<b>Ok / Cancel</b>	<p><b>Ok:</b> Use to save the configurations in the monitoring session when the monitoring session is in undeployed state.</p> <p><b>Cancel:</b> After the monitoring session is deployed, if you have made any changes and wish to remove them, use this option.</p>
<b>Interface mapping</b>	Use to change the interfaces mapped to an individual GigaVUE V Series Node. Refer to <a href="#">Interface Mapping</a> topic for more details.
<b>Deploy</b>	Deploys the selected monitoring session. Refer to <a href="#">Deploy Monitoring Session</a> topic for more details.

## Monitoring Session Options (OpenStack)

Prefiltering, Precryption, Secure tunnel, User-defined applications, and Thresholds can be enabled for the monitoring session from the **Options** page.

To navigate to **Options** page, follow the steps given below:

1. Go to **Traffic > Virtual > Orchestrated Flows > Select your cloud platform**.
2. Select a monitoring session from the list view, click **Actions > Edit**. The Edit Monitoring Session page appears.
3. In the Edit Monitoring Session page, click **Options**. The **Options** page appears.

You can perform the following actions in the Options page:

- [Enable Prefiltering](#)
- [Enable Precryption](#)
- [Enable User Defined Applications](#)
- [Create Threshold](#)

### Enable Prefiltering

To enable Prefiltering, follow the steps given below:

1. In the **Monitoring Session Options** page, Click **Mirroring** tab.
2. Enable the **Mirroring** toggle button.
3. Enable the **Secure Tunnel** button if you wish to use Secure Tunnels. For more information about Secure Tunnel, refer to [Secure Tunnels](#).
4. You can select an existing Prefiltering template from the **Template** drop-down menu, or you can create a new template and apply it. Refer to [Create Prefiltering Policy Template](#) for more details on how to create a new template.
5. Click Save to apply the template to the monitoring session.

You can save the newly created template by using the **Save as Template** button.

## Enable Precryption

To enable Precryption, follow the steps given below:

1. In the **Monitoring Session Options** page, Click **Precryption** tab.
2. Enable the **Precryption** toggle button. Refer to [Precryption™](#) topic for more details on Precryption.
3. Enable the **Secure Tunnel** button if you wish to use Secure Tunnels. For more information about Secure Tunnel, refer to [Secure Tunnels](#).

## Enable User Defined Applications

To enable user defined application, follow the steps given below:

1. In the **Monitoring Session Options** page, Click **User-Defined Apps** tab.
2. Enable the **User-defined Applications** toggle button. Refer to [User Defined Application](#) section in the GigaVUE V Series Applications Guide for more detailed information User Defined Applications and how to configure it.

## Create Threshold

To create threshold, follow the steps given below:

1. In the **Monitoring Session Options** page, Click **Threshold** tab.
2. Refer to [Traffic Health Monitoring](#) topic for more detailed information on how to create threshold template and apply the templates to the monitoring session.

# Interface Mapping (OpenStack)

You can change the interface of individual GigaVUE V Series Nodes deployed in a monitoring session. After deploying the monitoring session, if you wish to change the interfaces mapped to an individual GigaVUE V Series Node, you can use the **Interface Mapping** button to map the interface to the respective GigaVUE V Series Nodes. To perform interface mapping:

1. Go to **Traffic > Virtual > Orchestrated Flows** and select your cloud platform. The **Monitoring Sessions** page appears.
2. Select a Monitoring session from the list view and click **Actions > Edit**. The Edit Monitoring session page appears.
3. In the Edit Monitoring session canvas page, click on the **Interface Mapping** button.
4. The **Select nodes to deploy the Monitoring Session dialog box** appears. Select the GigaVUE V Series Nodes for which you wish to map the interface.
5. After selecting the GigaVUE V Series Node, select the interfaces for each of the REPs and the TEPs deployed in the monitoring session from the drop-down menu for the selected individual GigaVUE V Series Nodes. Then, click **Deploy**.

## Create Ingress and Egress Tunnels

Traffic from the GigaVUE V Series Node is distributed to tunnel endpoints in a monitoring session. A tunnel endpoint can be created using a standard L2GRE, VXLAN, UDPGRE, or ERSPAN tunnel.

**NOTE:** GigaVUE-FM allows you to configure Ingress Tunnels in the Monitoring Session, when the **Traffic Acquisition Method** is UCT-V.

To create a new tunnel endpoint:

1. After creating a new monitoring session, or click **Actions > Edit** on an existing monitoring session, the GigaVUE-FM canvas appears.
2. In the canvas, select **New > New Tunnel**, drag and drop a new tunnel template to the workspace. The **Add Tunnel Spec** quick view appears.

X

## Add Tunnel Spec

Save

Add To Library

Alias

Alias \*

Description

Description (optional)

Type

Select a type... ▾

- Select a type...
- ERSPAN
- L2GRE**
- VXLAN

3. On the New Tunnel quick view, enter or select the required information as described in the following table.

Field	Description	
<b>Alias</b>	The name of the tunnel endpoint. <b>NOTE:</b> Do not enter spaces in the alias name.	
<b>Description</b>	The description of the tunnel endpoint.	
<b>Type</b>	The type of the tunnel. Select ERSPAN, or L2GRE, or VXLAN, TLS-PCAPNG, UDP, or UDPGRE to create a tunnel.	
<b>VXLAN</b>		
<b>Traffic Direction</b> The direction of the traffic flowing through the GigaVUE V Series Node.		
<b>In</b>	Choose <b>In</b> (Decapsulation) for creating an Ingress tunnel, traffic from the source to the GigaVUE V Series Node.	
	<b>IP Version</b>	The version of the Internet Protocol. Select IPv4 or IPv6.
	<b>Remote Tunnel IP</b>	For Ingress tunnel, Remote Tunnel IP is the IP address of the tunnel source.
	<b>VXLAN Network Identifier</b>	Unique value which is used to identify the VXLAN. The value ranges from 1 to 16777215.
	<b>Source L4 Port</b>	Port from which the connection will be established to the target. For Example, if A is the source and B is the destination, this port value belongs to A.
	<b>Destination L4 Port</b>	Port to which the connection will be established from the source. For Example, if A is the source and B is the destination, this port value belongs to B.
<b>Out</b>	Choose <b>Out</b> (Encapsulation) for creating an Egress tunnel from the V Series node to the destination endpoint.	
	<b>Remote Tunnel IP</b>	For Egress tunnel, Remote Tunnel IP is the IP address of the tunnel destination endpoint.
	<b>MTU</b>	The Maximum Transmission Unit (MTU) is the maximum size of each packet that the tunnel endpoint can carry. The default value is 1500.
	<b>Time to Live</b>	Enter the value of the time interval for which the session needs to be available. The value ranges from 1 to 255. The default value is 64.
	<b>DSCP</b>	Differentiated Services Code Point (DSCP) are the values,

Field	Description	
		which network devices use to identify traffic to be handled with higher or lower priority. The values ranges from 0 to 63 with 0 being the highest priority and 63 as the lowest priority.
	<b>Flow Label</b>	Unique value which is used to identify packets that belong to the same flow. A flow is a sequence of packets that need to be treated as a single entity that may require special handling. Accepted value is between 0 and 1048575
	<b>VXLAN Network Identifier</b>	Unique value which is used to identify the VXLAN. The value ranges from 1 to 16777215.
	<b>Source L4 Port</b>	Port from which the connection will be established to the target. For Example, if A is the source and B is the destination, this port value belongs to A.
	<b>Destination L4 Port</b>	Port to which the connection will be established from the source. For Example, if A is the source and B is the destination, this port value belongs to B.
<b>UDPGRE</b>		
<b>Traffic Direction</b>		
The direction of the traffic flowing through the GigaVUE V Series Node.		
In	Choose <b>In</b> (Decapsulation) for creating an Ingress tunnel, traffic from the source to the GigaVUE V Series Node.	
	<b>IP Version</b>	The version of the Internet Protocol. Select IPv4 or IPv6.
	<b>Remote Tunnel IP</b>	For Ingress tunnel, Remote Tunnel IP is the IP address of the tunnel source.
	<b>Key</b>	Identifier used to differentiate different UPDGRE/L2GRE tunnels. It is used to route the encapsulated frames to the appropriate tunnel on the remote endpoint. Enter value between 0 and 4294967295
	<b>Source L4 Port</b>	Port from which the connection will be established to the target. For Example, if A is the source and B is the destination, this port value belongs to A.
	<b>Destination L4 Port</b>	Port to which the connection will be established from the source. For Example, if A is the source and B is the destination, this port value belongs to B.
<b>L2GRE</b>		
<b>Traffic Direction</b>		
The direction of the traffic flowing through the GigaVUE V Series Node.		

Field	Description	
In	Choose <b>In</b> (Decapsulation) for creating an Ingress tunnel, traffic from the source to the GigaVUE V Series Node.	
	<b>IP Version</b>	The version of the Internet Protocol. Select IPv4 or IPv6.
	<b>Remote Tunnel IP</b>	For Ingress tunnel, Remote Tunnel IP is the IP address of the tunnel source.
	<b>Key</b>	Identifier used to differentiate different UPDGRE/L2GRE tunnels. It is used to route the encapsulated frames to the appropriate tunnel on the remote endpoint. Enter value between 0 and 4294967295.
Out	Choose <b>Out</b> (Encapsulation) for creating an Egress tunnel from the V Series node to the destination endpoint.	
	<b>Remote Tunnel IP</b>	For Egress tunnel, Remote Tunnel IP is the IP address of the tunnel destination endpoint.
	<b>MTU</b>	The Maximum Transmission Unit (MTU) is the maximum size of each packet that the tunnel endpoint can carry. The default value is 1500.
	<b>Time to Live</b>	Enter the value of the time interval for which the session needs to be available. The value ranges from 1 to 255. The default value is 64.
	<b>DSCP</b>	Differentiated Services Code Point (DSCP) are the values, which network devices use to identify traffic to be handled with higher or lower priority. The values ranges from 0 to 63 with 0 being the highest priority and 63 as the lowest priority.
	<b>Flow Label</b>	Unique value which is used to identify packets that belong to the same flow. A flow is a sequence of packets that need to be treated as a single entity that may require special handling. Accepted value is between 0 and 1048575.
	<b>Key</b>	Identifier used to differentiate different UPDGRE/L2GRE tunnels. It is used to route the encapsulated frames to the appropriate tunnel on the remote endpoint. Enter value between 0 and 4294967295.
<b>ERSPAN</b>		
<b>Traffic Direction</b>		
The direction of the traffic flowing through the GigaVUE V Series Node.		



Field	Description	
In	<b>IP Version</b>	The version of the Internet Protocol. Select IPv4 or IPv6.
	<b>Remote Tunnel IP</b>	For Ingress tunnel, Remote Tunnel IP is the IP address of the tunnel source.
	<b>Flow ID</b>	The ERSPAN flow ID is a numerical identifier that distinguishes different ERSPAN sessions or flows. The value ranges from 1 to 1023.
<b>TLS-PCAPNG</b>		
<b>Traffic Direction</b>		
The direction of the traffic flowing through the GigaVUE V Series Node.		
In	<b>IP Version</b>	The version of the Internet Protocol. only IPv4 is supported.
	<b>Remote Tunnel IP</b>	For Ingress tunnel, Remote Tunnel IP is the IP address of the tunnel source.
	<b>MTU</b>	The Maximum Transmission Unit (MTU) is the maximum size of each packet that the tunnel endpoint can carry. The default value is 1500.
	<b>Source L4 Port</b>	Port from which the connection will be established to the target. For Example, if A is the source and B is the destination, this port value belongs to A.
	<b>Destination L4 Port</b>	Port to which the connection will be established from the source. For Example, if A is the source and B is the destination, this port value belongs to B.
	<b>Key Alias</b>	Select the Key Alias from the drop-down.
	<b>Cipher</b>	Only SHA 256 is supported.
	<b>TLS Version</b>	Only TLS Version1.3.
	<b>Selective Acknowledgments</b>	Enable to receive the acknowledgments.
	<b>Sync Retries</b>	Enter the value for number of times the sync has to be tried. The value ranges from 1 to 6.
	<b>Delay Acknowledgments</b>	Enable to receive the acknowledgments when there is a delay.

Field	Description	
<b>Out</b>	<b>IP Version</b>	The version of the Internet Protocol. only IPv4 is supported.
	<b>Remote Tunnel IP</b>	For Ingress tunnel, Remote Tunnel IP is the IP address of the tunnel source.
	<b>MTU</b>	The Maximum Transmission Unit (MTU) is the maximum size of each packet that the tunnel endpoint can carry. The default value is 1500.
	<b>Time to Live</b>	Enter the value of the time interval for which the session needs to be available. The value ranges from 1 to 255. The default value is 64.
	<b>DSCP</b>	Differentiated Services Code Point (DSCP) are the values, which network devices use to identify traffic to be handled with higher or lower priority. The values ranges from 0 to 63 with 0 being the highest priority and 63 as the lowest priority.
	<b>Flow Label</b>	Unique value which is used to identify packets that belong to the same flow. A flow is a sequence of packets that need to be treated as a single entity that may require special handling. Accepted value is between 0 and 1048575
	<b>Source L4 Port</b>	Port from which the connection will be established to the target. For Example, if A is the source and B is the destination, this port value belongs to A.
	<b>Destination L4 Port</b>	Port to which the connection will be established from the source. For Example, if A is the source and B is the destination, this port value belongs to B.
	<b>Cipher</b>	Only SHA 256 is supported.
	<b>TLS Version</b>	Only TLS Version1.3.
	<b>Selective Acknowledgments</b>	Enable to receive the acknowledgments.
	<b>Sync Retries</b>	Enter the value for number of times the sync has to be tried. The value ranges from 1 to 6.
<b>Delay Acknowledgments</b>	Enable to receive the acknowledgments when there is a delay.	
<b>UDP:</b>		

Field	Description	
<b>Out</b>	<b>L4 Destination IP Address</b>	Enter the IP address of the tool port or when using Application Metadata Exporter (AMX), enter the IP address of the AMX application. Refer to <a href="#">Application Metadata Exporter</a> for more detailed information on what AMX application is and how to configure it.
	<b>Source L4 Port</b>	Port from which the connection will be established to the target. For Example, if A is the source and B is the destination, this port value belongs to A.
	<b>Destination L4 Port</b>	Port to which the connection will be established from the source. For Example, if A is the source and B is the destination, this port value belongs to B.

4. Click **Save**.

To delete a tunnel, select the required tunnel and click **Delete**.

To apply threshold template to Tunnel End Points, select the required tunnel end point on the canvas and click **Details**. The quick view appears, click on the Threshold tab. For more details on how to create or apply threshold template, refer to *Monitor Cloud Health* topic.

Tunnel End Points configured can also be used to send or receive traffic from GigaVUE HC Series and GigaVUE TA Series. Provide the IP address of the GigaVUE HC Series and GigaVUE TA Series as the Source or the Destination IP address as required when configuring Tunnel End Points.

After configuring the tunnels and deploying the monitoring session, you can view the names of egress tunnels configured for a monitoring session, on the Monitoring Session details page. The Egress Tunnel column displays the name of the egress tunnel configured for a particular monitoring session. When multiple egress tunnels are configured for a monitoring session, then the Egress Tunnel column displays the number of egress tunnels configured in that monitoring session. Hover over the number of egress tunnels to display the names of the egress tunnels used in that particular monitoring session.

## Create a New Map

You must have the flow map license to deploy a map in the monitoring session.

For new users, the free trial bundle will expire after 30 days, and the GigaVUE-FM prompts you to buy a new license. For licensing information, refer to *GigaVUE Licensing Guide*.

A map is used to filter the traffic flowing through the GigaVUE V Series Nodes. It is a collection of one or more rules (R). The traffic passing through a map can match one or more rules defined in the map.

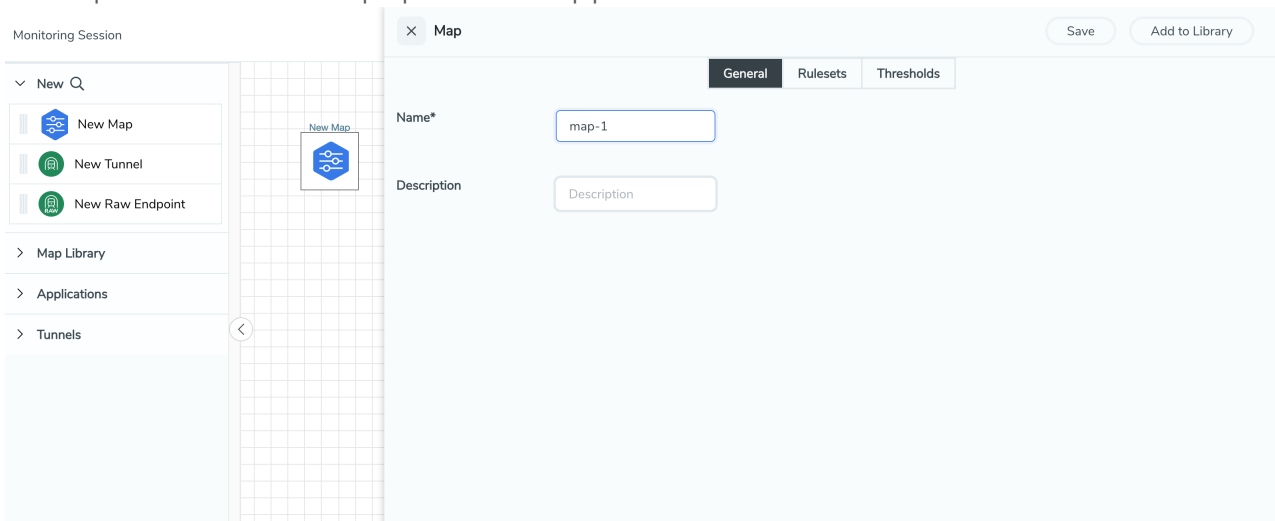
Keep in mind the following when creating a map:

Parameter	Description
<b>Rules</b>	A rule (R) contains specific filtering criteria that the packets must match. The filtering criteria lets you determine the targets and the (egress or ingress) direction of tapping the network traffic.
<b>Priority</b>	Priority determines the order in which the rules are executed. The priority value can range from 1 to 5, with 1 being the highest and 5 is the lowest priority.
<b>Pass</b>	The traffic from the virtual machine will be passed to the destination.
<b>Drop</b>	The traffic from the virtual machine is dropped when passing through the map.
<b>Traffic Filter Maps</b>	A set of maps that are used to match traffic and perform various actions on the matched traffic.
<b>Inclusion Map</b>	An inclusion map determines the instances to be included for monitoring. This map is used only for target selection.

<b>Exclusion Map</b>	An exclusion map determines the instances to be excluded from monitoring. This map is used only for target selection.
<b>Automatic Target Selection (ATS)</b>	<p>A built-in feature that automatically selects the cloud instances based on the rules defined in the traffic filter maps, inclusion maps, and exclusion maps in the monitoring session.</p> <p>The below formula describes how ATS works:</p> <p><b>Selected Targets = Traffic Filter Maps <math>\cap</math> Inclusion Maps - Exclusion Maps</b></p> <p>Below are the filter rule types that work in ATS:</p> <ul style="list-style-type: none"> <li>● mac Source</li> <li>● mac Destination</li> <li>● ipv4 Source</li> <li>● ipv4 Destination</li> <li>● ipv6 Source</li> <li>● ipv6 Destination</li> <li>● VM Name Destination</li> <li>● VM Name Source</li> <li>● VM Tag Destination - Not applicable to Nutanix.</li> <li>● VM Tag Source - Not applicable to Nutanix.</li> <li>● VM Category Source - Applicable only to Nutanix</li> <li>● VM Category Destination - Applicable only to Nutanix.</li> <li>● Host Name -Applicable only to Nutanix and VMware.</li> </ul> <p>The traffic direction is as follow:</p> <ul style="list-style-type: none"> <li>● For any rule type as Source - the traffic direction is egress.</li> <li>● For Destination rule type - the traffic direction is ingress.</li> <li>● For Hostname - As it doesn't have Source or Destination rule type, the traffic direction is Ingress and Egress.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> If no ATS rule filters listed above are used, all VMs and vNICs are selected as targets. When any ATS rule results in a null set, no target is selected and V Series Node does not receive traffic from any VM or vNIC.</p> </div>
<b>Group</b>	A group is a collection of maps that are pre-defined and saved in the map library for reuse.

To create a new map:

1. After creating a new monitoring session, or click **Actions > Edit** on an existing monitoring session, the GigaVUE-FM canvas appears.
2. In the canvas, select **New > New Map**, drag and drop a new map template to the workspace. The New Map quick view appears.




3. On the New Map quick view, click on **General** tab and enter the required information as described in the following table:

Field	Description
<b>Name</b>	Name of the new map
<b>Description</b>	Description of the map



Pass and Drop rule selection with Automatic Target Selection (ATS) differ with the Map type as follows:

- Traffic Map—Only Pass rules for ATS
- Inclusion Map—Only Pass rules for ATS
- Exclusion Map—Only Drop rules for ATS

4. Click on **Rule Sets** tab. Through the map, packets can be dropped or passed based on the highest to lowest rule priority. You can add 5 rule sets on a map. Use the + and - buttons to add or remove a rule set in the map. Each rule set can have only 25 rules per map and each rule can have a maximum of 4 conditions. To add ATS rules for an Inclusion/Exclusion map, you must select at least one rule condition. Refer to [Example-Create a New Map using Inclusion and Exclusion Maps](#) for more detailed information on how to configure Inclusion and Exclusion maps using ATS.
  - a. **To create a new rule set:**
    - i. Click **Actions > New Rule Set**.
    - ii. Enter a **Priority** value from 1 to 5 for the rule with 1 being the highest and 5 is the lowest priority.
    - iii. Enter the Application Endpoint in the Application EndPoint ID field.
    - iv. Select a required condition from the drop-down list.
    - v. Select the rule to **Pass** or **Drop** through the map.
  - b. **To create a new rule:**
    - i. Click **Actions > New Rule**.
    - ii. Select a required condition from the drop-down list. Click  and select **Add Condition** to add more conditions.
    - iii. Select the rule to **Pass** or **Drop** through the map.
5. Click **Save**.

**NOTE:** If a packet is fragmented then all the fragments will be destined to the same application end point. You can find the stats of mapped fragmented traffic in GigaVUE-FM. Refer to "Map Statistics" section in *GigaVUE Fabric Management Guide* for detailed information.

To edit a map, select the map and click **Details**, or click **Delete** to delete the map.



To apply threshold template to maps, select the required map on the canvas and click **Details**. The quick view appears, click on the Threshold tab. For more details on how to create or apply threshold templates, refer to [Monitor Cloud Health](#).

### Rules and Notes:

- Directional rules do not work on single NIC VMs that are running a Windows UCT-V.

You can also perform the following action in the Monitoring session canvas.

- Click a map and select **Details** to edit the map
- Click a map and select **Delete** to delete the map.
- Click the **Show Targets** button to refresh the subnets and monitored instances details that appear in the **Instances** dialog box.

- Click  to expand the **Targets** dialog box. To view details about a GigaVUE V Series Node, click the arrow next to the VM.
- In the Instances window, click  to filter the list of instances.

## Example- Create a New Map using Inclusion and Exclusion Maps

Consider a monitoring session with 5 cloud instances. Namely target-1-1, target-1-2, target-1-3, target-2-1, target-2-2.

1. Drag and drop a new map template to the workspace. The New map quick view appears.
2. In the **General** tab, enter the name as Map 1 and enter the description. In the **Rule sets** tab, enter the priority and Application Endpoint ID.
3. Select the condition as VM Name and enter the **target**. This includes the instances target-1-1, target-1-2, target-1-3, target-2-1, and target-2-2.
4. Click on the Expand icon at the bottom of the Monitoring session canvas. The Inclusion Maps and Exclusion Maps section appears.
5. Drag and drop a new map template to the Inclusion Maps region. The New Map quick view appears. Enter the Name and Description of the map.
  - a. In the **General** tab, enter the name as Inclusionmap1 and enter the description. In the **Rule Sets**, enter the priority and Application Endpoint ID.
  - b. Select the condition as VM Name and enter the VM Name as **target-1**. Then the instance with VM name **target-1-1**, **target-1-2**, and **target-1-3** will be included.
6. Drag and drop a new map template to the Exclusion Maps region. The New Map quick view appears. Enter the details as mentioned in the above section.
  - a. In the **General** tab, enter the name as Exclusionmap1 and enter the description. In the **Rule Sets** tab, enter the priority and Application Endpoint ID.
  - b. Select the condition as VM Name and enter the VM Name as **target-1-3**. Then the instance **target-1-3** will be excluded.

Based on this configuration, the Automatic Target Selection will select the instances target-1-1 and target-1-2 as target.

## Map Library

To reuse a map,

1. In the Monitoring Session page, Click **Actions > Edit**. The Edit Monitoring Session page opens.
2. Click the map you wish to save as a template. Click **Details**. The Application quick view appears.
3. Click **Add to Library**. Save the map using one of the following ways:



4. Select an existing group from the **Select Group** list or create a **New Group** with a name.
5. Enter a description in the **Description** field, and click **Save**.

The Map is saved to the **Map Library** in the Edit Monitoring Session Canvas page. This map can be used from any of the monitoring session. To reuse the map, drag and drop the saved map from the Map Library.

## Add Applications to Monitoring Session

GigaVUE Cloud Suite with GigaVUE V Series Node supports the following GigaSMART applications in the GigaVUE-FM canvas:

- Slicing
- Masking
- De-duplication
- Load Balancing
- PCAPng Application
- 5G-Service Based Interface Application
- 5G Cloud CASA VTAP Support
- Header Stripping
- SSL Decrypt

For more detailed information on how to configure these application, refer to *GigaVUE V Series Applications Guide*.

## Deploy Monitoring Session

To deploy the monitoring session:

1. Drag and drop the following items to the canvas as required:
  - Ingress tunnel (as a source) from the **NEW** section
  - Maps from the **MAP LIBRARY** section
  - Inclusion and Exclusion maps from the Map Library to their respective section at the bottom of the workspace.
  - GigaSMART apps from the **APPLICATIONS** section
  - Egress tunnels from the **TUNNELS** section

- After placing the required items in the canvas, hover your mouse on the map, click the red dot, and drag the arrow over to another item (map, application, or tunnel).

**NOTE:** You can drag multiple arrows from a single map and connect them to different maps.

- (Not applicable for Tunnel traffic acquisition method) Click **Show Targets** to view details about the subnets and monitored instances. The instances and the subnets that are being monitored are highlighted in orange.
- Click **Deploy** to deploy the monitoring session. The status is displayed as **Success** in the Monitoring Sessions page. The session is successfully deployed on all the V Series nodes. Click on the status link in the Status column on the Monitoring Session page to view the Monitoring Session Deployment Report. When you click on the Status link, the Deployment Report is displayed. If the monitoring session is not deployed properly, then one of the following errors is displayed in the Status column.
  - Partial Success—The session is not deployed on one or more instances due to V Series node failure.
  - Failure—The session is not deployed on the V Series Nodes.
 The **Monitoring Session Deployment Report** displays the errors that appeared during deployment.

**NOTE:** After rebooting your Ubuntu, you must redeploy the respective monitoring sessions to restore the mirror traffic on the respective Ubuntu VM interfaces.

**NOTE:** When the kernel image is not built with the options CONFIG\_NET\_SCHED and CONFIG\_NET\_SCH\_INGRESS enabled, the monitoring session deployment fails with an error: "Kernel image doesn't support TC rules".

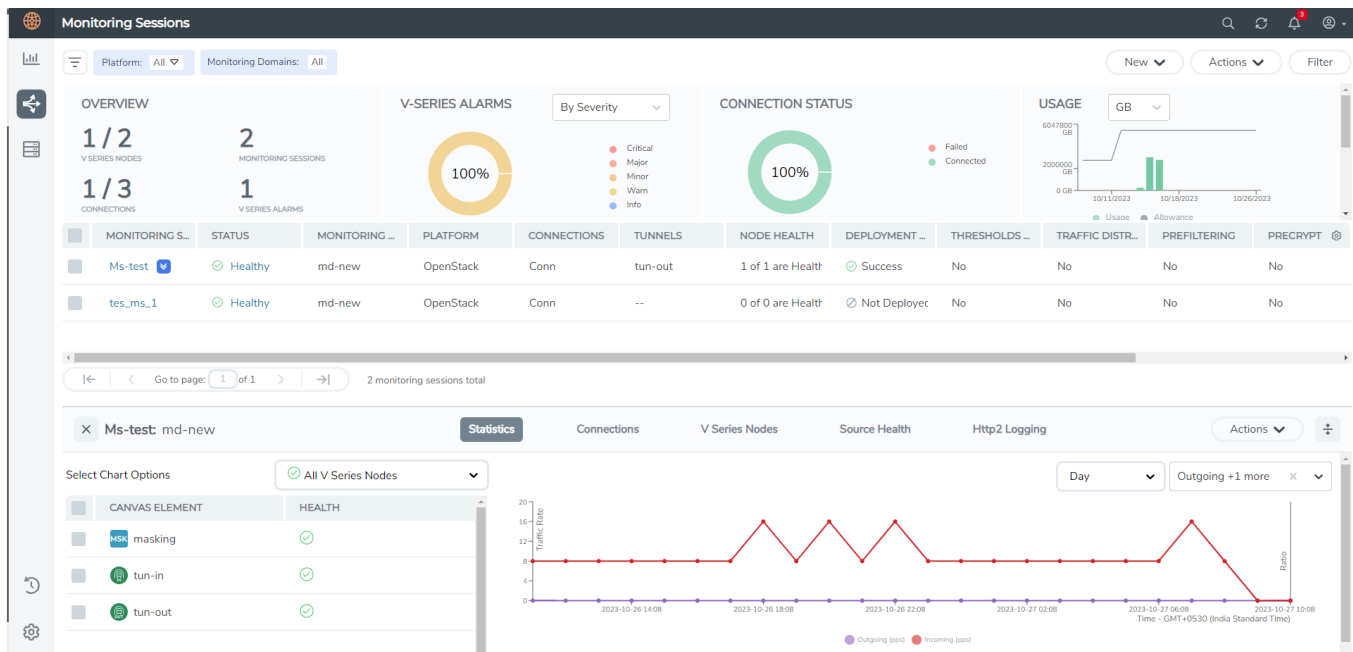
The Monitoring Session page also has the following buttons:

Button	Description
<b>Undeploy</b>	Undeploys the selected monitoring session.
<b>Clone</b>	Duplicates the selected monitoring session.
<b>Edit</b>	Opens the Edit page for the selected monitoring session.  <b>NOTE:</b> In case of an error while editing a monitoring session, undeploy and deploy the monitoring session again..
<b>Delete</b>	Deletes the selected monitoring session.
<b>Apply Template</b>	Applies the prefiltering template to a monitoring session

## View Monitoring Session Statistics

The Monitoring Session Statistics page lets you analyze the incoming and outgoing traffic on an hourly, daily, weekly, and monthly basis.

On the Monitoring Sessions page, click the name of the monitoring session, and then click **View**. A split window appears displaying the **Statistics**, **Connections**, **V Series Nodes**, **Source Health** and **Http2 Logging** of the monitoring session as shown:



To know more about the statistics of the session, click **Statistics**.

You can view the statistics by applying different filters as per the requirements of analysing the data. GigaVUE-FM allows you to perform the following actions on the Monitoring Session Statistics page:

- You can view the **Statistics** in full screen. To view in full screen, click the **Actions** drop-down list at the right corner of the window, and select **Full Screen. Statistics** appear in full screen.
- You can view the incoming and outgoing traffic on an hourly, daily, weekly, and monthly basis. You can select the options from the drop-down list box.
  - For the hourly statistics, the data points are plotted every five minutes.
  - For the daily statistics, the data points are plotted every one hour.
  - For the weekly statistics, the data points are plotted every six hours.
  - For the monthly statistics, the data points are plotted every day.
  - The data points in graph are plotted every five minutes, one hour, six hours, or a day based on the option selected in the drop-down menu.

**NOTE:** The latest data point displayed in the graph for any particular time will be less than five minutes, one hour, six hours, or day from the time at which the statistics are checked based on the option selected from the drop-down menu. For example, if you are viewing the hourly statistics at 11.30, the latest data point in the graph would be 11.25.

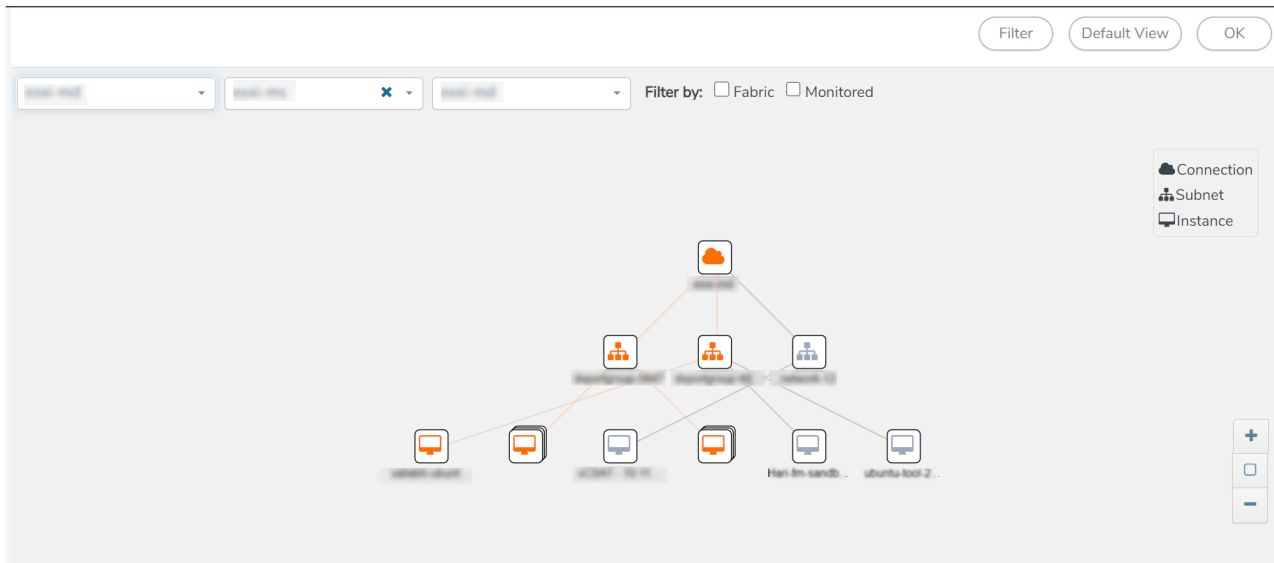
- The statistical data between two data points is displayed at the first data point. For example, the data between 11.30 and 12.30 is displayed at the data point 11.30 when viewing the daily statistics.
- You can filter the traffic and view the statistics based on factors such as **Incoming, Outgoing, Ratio (Out/In), Incoming Packets, Outgoing Packets, Ratio (Out/In) Packets**. You can select the options from the drop-down list box.
- You can also view the statistics of the monitoring session deployed in the individual V Series Nodes. To view the statistics of the individual GigaVUE V Series Node, select the name of the **V Series Node** from the drop-down list for which you want to view the statistics from the GigaVUE V Series Node drop-down menu on the top left corner of the Monitoring Session Statistics page.
- You can view the statistics of the elements involved in the monitoring session. To view the statistics, click on the **Select Chart Options** page and select the elements associated with the session.
- Directly on the graph, you can click on **Incoming(Mbps), Outgoing (Mbps), or Ratio (Out/In) (Mbps)** to view the statistics individually.

## Visualize the Network Topology

You can have multiple connections in GigaVUE-FM. Each connection can have multiple monitoring sessions configured within them. You can select the connection and the monitoring session to view the selected subnets and instances in the topology view.

To view the topology diagram in GigaVUE-FM:

1. On the Monitoring Session page, select **Topology** tab. The Topology page appears.
2. Select a monitoring domain from the **Select monitoring domain...** list.
3. Select a connection from the **Select monitoring session...**list.
4. Select a monitoring session from the **Select connection...** list. The topology view of the monitored subnets and instances in the selected session are displayed.



5. (Optional) Hover over or click the subnet or VM Group icons to view the subnets or instances present within the group.

In the topology page, you can also do the following:

- Use the **Filter** button to filter the instances based on the VM name, VM IP, Subnet ID, or Subnet IP, and view the topology based on the search results.
- Use the **Default View** button to view the topology diagram based on the source interfaces of the monitoring instances.
- Use the arrows at the right-bottom corner to move the topology page up, down, left, or right. Click the **Fit-to-Width** icon to fit the topology diagram according to the width of the page.
- Use **+** or **-** icons to zoom in and zoom out the topology view.

## Configure Precryption in UCT-V

GigaVUE-FM allows you to enable or disable the Precryption feature for a monitoring session.

To enable or disable the Precryption feature in UCT-V, refer to Create monitoring session.

To create a new monitoring session with Precryption, follow these steps:

1. In GigaVUE-FM, on the left navigation pane, select **Traffic > Virtual > Orchestrated Flows** and select your cloud platform. The **Monitoring Sessions** page appears.
2. Click **New** to open the **Create a New Monitoring Session** page.
3. Enter the appropriate information for the monitoring session as described in the following table:

Field	Description
<b>Alias</b>	The name of the monitoring session.
<b>Monitoring Domain</b>	The name of the monitoring domain that you want to select.
<b>Connection</b>	The connection(s) that are to be included as part of the monitoring domain. You can select the required connections that need to be part of the monitoring domain.

4. Click **Next**. The **Edit Monitoring Session** page appears with the new canvas.
5. Click **Options** button. The Monitoring Session Options appears.
6. Click **Precryption** tab.
7. Enable **Precryption**.
8. Click **Save**. The **Edit Monitoring Session** page appears. You can proceed to create map, tunnels, and adding applications.

**NOTE:** It is recommended to enable the secure tunnel feature whenever the Precryption feature is enabled. Secure tunnel helps to securely transfer the cloud captured packets or precrypted data to a GigaVUE V Series Node. For more information, refer to Secure Tunnel .

## Validate Precryption connection

To validate the Precryption connection, follow the steps:

- To confirm it is active, navigate to the **Monitoring Session** dashboard and check the Precryption option, which should show **yes**.
- Click **Status**, to view the rules configured.

## Rules and Notes

- To avoid packet fragmentation, you should change the option precryption-path-mtu in UCT-V configuration file (**/etc/uctv/uctv.conf**) within the range 1400-9000 based on the platform path MTU.

GigaVUE-FM allows you to monitor the traffic and configuration health status of the monitoring session and its individual components. This section provides detailed information on how to view the traffic and configuration health status of the monitoring session and its individual components.

# Configuration Health Monitoring

The configuration health status provides us detailed information about the configuration and deployment status of the deployed monitoring session.

This feature is supported for the following fabric components and features on the respective cloud platforms:

## For V Series Nodes:

- AWS
- Azure
- OpenStack
- VMware
- Nutanix

## For UCT-Vs:

- AWS
- Azure
- OpenStack

## For VPC Mirroring:

- AWS

## For OVS Mirroring and VLAN Trunk Port:

- OpenStack

To view the configuration health status, refer to the [View Health Status](#) section.

# Traffic Health Monitoring

GigaVUE-FM allows you to monitor the traffic health status of the entire monitoring session and also the individual V Series Nodes for which the monitoring session is configured. Traffic health monitoring focuses on identifying any discrepancies (packet drop or overflow etc) in the traffic flow. When any such discrepancies are identified, GigaVUE-FM propagates the

health status to corresponding monitoring session. GigaVUE-FM monitors the traffic health status in near real-time. GigaVUE V Series Node monitors the traffic, when the traffic limit goes beyond the upper or lower threshold values that is configured, it notifies GigaVUE-FM, based on which traffic health is computed.

**NOTE:** When GigaVUE-FM and GigaVUE V Series Nodes are deployed in different cloud platforms, then the GigaVUE-FM public IP address must be added to the **Data Notification Interface** as the Target Address in the Event Notifications page. Refer to [Configuration Settings](#) section in the *GigaVUE Administration Guide* for configuration details.

This feature is supported for GigaVUE V Series Nodes on the respective cloud platforms:

**For V Series Nodes:**

- AWS
- Azure
- OpenStack
- VMware

The following section gives step-by-step instructions on creating, applying, and editing threshold templates across a monitoring session or an application, and viewing the traffic health status. Refer to the following section for more detailed information:

- [Create Threshold Template](#)
- [Apply Threshold Template](#)
- [Edit Threshold Template](#)
- [Clear Thresholds](#)
- [Supported Resources and Metrics](#)

Keep in mind the following points when configuring a threshold template:

- By default Threshold Template is not configured to any monitoring session. If you wish to monitor the traffic health status, then create and apply threshold template to the monitoring session.
- Editing or redeploying the monitoring session will reapply all the threshold policies associated with that monitoring session.
- Deleting or undeploying the monitoring session will clear all the threshold policies associated with that monitoring session.
- After applying threshold template to a particular application, you need not deploy the monitoring session again.



## Create Threshold Template

To create threshold templates:

1. In GigaVUE-FM, on the left navigation pane, select **Traffic > Virtual > Orchestrated Flows** and select your cloud platform. Then, click on the **Threshold Template** tab in the top navigation bar.
2. The **Threshold Template** page appears. Click **Create** to open the **New Threshold Template** page.
3. Enter the appropriate information for the threshold template as described in the following table.

Field	Description
<b>Threshold Template Name</b>	The name of the threshold template.
<b>Thresholds</b>	
Monitored Objects	Select the resource for which you wish to apply the threshold template. Eg: TEP, REP, Maps, Applications like Slicing, Dedup etc
Time Interval	Frequency at which the traffic flow needs to be monitored.
Metric	Metrics that needs to be monitored. For example: Tx Packets, Rx Packets.
Type	<b>Difference:</b> The difference between the stats counter at the start and end time of an interval, for a given metric. <b>Derivative:</b> Average value of the statistics counter in a time interval, for a given metric.
Condition	<b>Over:</b> Checks if the statistics counter value is greater than the 'Set Trigger Value'. <b>Under:</b> Checks if the statistics counter value is lower than the 'Set Trigger Value'.
Set Trigger Value	Value at which a traffic health event is raised, if statistics counter goes below or above this value, based on the condition configured.
Clear Trigger Value	Value at which a traffic health event is cleared, if statistics counter goes below or above this value, based on the condition configured.

4. Click **Save**. The newly created threshold template is saved, and it appears on the **Threshold Template** page.

## Apply Threshold Template

You can apply your threshold template across the entire monitoring session and also to a particular application.

### Apply Threshold Template to Monitoring Session

To apply the threshold template across a monitoring session, follow the steps given below:

1. In GigaVUE-FM, on the left navigation pane, select **Traffic > Virtual > Orchestrated Flows** and select your cloud platform. The **Monitoring Session** page appears.
2. Select the monitoring session and click **Actions > Apply Thresholds**.
3. The **Apply Thresholds** page appears. To apply a threshold template across a monitoring session, select the template you wish to apply across the monitoring session from the Threshold Template drop-down menu or enter the threshold values manually.
4. Click **Done**.

## Apply Threshold Template to Applications

To apply the threshold template to a particular application in the monitoring session follow the steps given below:

**NOTE:** Applying threshold template across monitoring session will not over write the threshold value applied specifically for an application. When a threshold value is applied to a particular application, it over writes the existing threshold value for that particular application.

1. On the **Monitoring Session** page. Click **Actions > Edit**. The Edit Monitoring Session page with canvas page appears.
2. Click on the application for which you wish to apply or change a threshold template and click **Details**. The **Application** quick view opens.
3. Click on the **Thresholds** tab. Select the template you wish to apply from the Threshold Template drop-down menu or enter the threshold values manually.
4. Click **Save**.

## Edit Threshold Template

To edit a particular threshold template follow the steps given below:

1. On the Threshold Template page, Click **Edit**. The **Edit Threshold Template** page appear.
2. The existing threshold templates will be listed here. Edit the templates you wish to modify.
3. Click **Save**.

**NOTE:** Editing a threshold template does not automatically apply the template to monitoring session. You must apply the edited template to monitoring session for the changes to take effect.

## Clear Thresholds

You can clear the thresholds across the entire monitoring session and also to a particular application.

### Clear Thresholds for Applications

To clear the thresholds of a particular application in the monitoring session follow the steps given below:

1. On the **Monitoring Session** page. Click **Actions > Edit**. The Edit Monitoring Session page with canvas page appears.
2. Click on the application for which you wish to clear the thresholds and click **Details**. The **Application** quick view opens.
3. Click on the **Thresholds** tab. Click **Clear All** and then Click **Save**.

### Clear Thresholds across the Monitoring Session

To clear the applied thresholds across a monitoring session follow the steps given below:

1. In GigaVUE-FM, on the left navigation pane, select **Traffic > Virtual > Orchestrated Flows** and select your cloud platform. The **Monitoring Sessions** page appears.
2. Select the monitoring session and click **Actions > Apply Thresholds**.
3. The **Apply Thresholds page appears**. Click **Clear**.

**NOTE:** Clearing thresholds at monitoring session level does not clear the thresholds that were applied specifically at the application level. To clear thresholds for a particular application refer to [Clear Thresholds for Applications](#)

## Supported Resources and Metrics

The following table lists the resources and the respective metrics supported for traffic health monitoring

Resource	Metrics	Threshold types	Trigger Condition
Tunnel End Point	<ol style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Tx Bytes</li> <li>4. Rx Bytes</li> <li>5. Tx Dropped</li> <li>6. Rx Dropped</li> </ol>	<ol style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ol>	<ol style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ol>

	<ul style="list-style-type: none"> <li>7. Tx Errors</li> <li>8. Rx Errors</li> </ul>		
Raw End Point	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Tx Bytes</li> <li>4. Rx Bytes</li> <li>5. Tx Dropped</li> <li>6. Rx Dropped</li> <li>7. Tx Errors</li> <li>8. Rx Errors</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
Map	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Packets Dropped</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
Slicing	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Packets Dropped</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
Masking	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Packets Dropped</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
Dedup	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Packets Dropped</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
Header Stripping	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Packets Dropped</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
Tunnel Encapsulation	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Packets Dropped</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
Load Balancing	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> <li>3. Packets Dropped</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>
SSL Decryption	<ul style="list-style-type: none"> <li>1. Tx Packets</li> <li>2. Rx Packets</li> </ul>	<ul style="list-style-type: none"> <li>1. Difference</li> <li>2. Derivative</li> </ul>	<ul style="list-style-type: none"> <li>1. Over</li> <li>2. Under</li> </ul>

	3. Packets Dropped		
Application Metadata	1. Tx Packets 2. Rx Packets 3. Packets Dropped	1. Difference 2. Derivative	1. Over 2. Under
AMI Exporter	1. Tx Packets 2. Rx Packets 3. Packets Dropped	1. Difference 2. Derivative	1. Over 2. Under
Geneve	1. Tx Packets 2. Rx Packets 3. Packets Dropped	1. Difference 2. Derivative	1. Over 2. Under
5G-SBI	1. Tx Packets 2. Rx Packets 3. Packets Dropped	1. Difference 2. Derivative	1. Over 2. Under

## View Health Status

You can view the health status of the monitoring session on the Monitoring Session details page. The health status of the monitoring session is healthy only if both the configuration health and traffic health are healthy.

## View Health Status of the Entire Monitoring Session

To view the health status of a monitoring session:

1. On the Monitoring Session details page, click on the health status displayed in the **Status** column of the monitoring session.
2. The monitoring session diagram is displayed, click on the Status displayed in the top left-corner above the canvas. The quick view page appears.

This displays the configuration health and traffic health of the monitoring session and also the thresholds applied to that monitoring session.

## View Health Status of an Application

To view the health status of an application across an entire monitoring session:

1. On the Monitoring Session page, click on the health status displayed in the **Status** column of the monitoring session.
2. The monitoring session diagram is displayed.
3. To view application health, click on the application for which you wish to see the health status. The quick view page appears.
4. Click on the **Status** tab.

This displays the configuration health and traffic health of the application and also the thresholds applied to that particular application.

**NOTE:** The secure tunnel status is refreshed for every 5 minutes, and the GigaVUE-FM does not display UCT-V secure tunnel status that is older than 7 minutes. If the secure tunnel in the UCT-V is removed, it takes up to 7 minutes to reset the status on the GigaVUE-FM.

## View Health Status for Individual V Series Nodes

You can also view the health status of the view the health status of an individual GigaVUE V Series Node. To view the configuration health status and traffic health status of the V Series Nodes:

1. On the Monitoring Session page, click on the health status in the **Status** column of the monitoring session.
2. The monitoring session diagram is displayed. Select the V Series Node from the **View By** drop-down menu and then click on the Status displayed in the top left-corner above the canvas. The quick view page appears.

## View Application Health Status for Individual V Series Nodes

To view the application configuration and traffic health status of the GigaVUE V Series Nodes:

1. On the Monitoring Session page, click on the health status in the **Status** column of the monitoring session.
2. The monitoring session diagram is displayed. Select the V Series Node from the **View By** drop-down menu.

3. To view application health, click on the application for which you wish to see the health status. The quick view page appears.
4. Click on the **Status** tab.

The subsession toggle button available in the top-left corner of the canvas allows you to view the statistics of individual paths in the monitoring session. If the traffic health is not configured for monitoring session or a particular application, the traffic health is displayed as **Not Applicable**.

## View Health Status on the Monitoring Session Page

You can view the health status of the monitoring session and the components deployed, in the monitoring session page.

The following columns in the monitoring session page are used to convey the health status:

### Health

This column displays the health status (both traffic and configuration) of the entire monitoring session. The status is marked healthy only if both the traffic and configuration health status is healthy, even if either of them is unhealthy then the health status is moved to unhealthy.

### V Series Node Health

This column displays the configuration and traffic health status of the monitoring session deployed in V Series Nodes. This column provides information on the number of GigaVUE V Series Nodes that have healthy traffic flow and monitoring session successfully deployed to the total number of V Series Nodes that have monitoring session deployed.

You can view the health status of the individual V Series Nodes by clicking on the V Series Node Health column.

**NOTE:** V Series Node health only displays the health status therefore even if the V Series Node is down it will not be reflected in the monitoring session page.

## Target Source Health

This column displays the configuration health status of the monitoring session deployed in targets. This column provides information on the number of monitoring sessions successfully deployed on a particular target to the total number of monitoring session deployed on that particular target.

You can view the health status of the individual targets and also the error message associated with them, by clicking on the Target Source Health column.

## Analytics for Virtual Resources

Analytics in GigaVUE-FM is a standalone service that provides data visualization capabilities. Using Analytics<sup>1</sup> you can create visual elements such as charts that are embedded as visualizations. The visualizations are grouped together in dashboards. You can also create search objects using Analytics. Dashboards, Visualizations and Search Objects are called Analytics objects. Refer to Analytics topic in *GigaVUE Fabric Management Guide* for more detailed information on Analytics.

### Rules and Notes:

- You cannot edit or delete these default dashboards. However, you can clone the dashboards and visualizations. Refer to the Clone Dashboard section in GigaVUE-FM Installation and Upgrade Guide for more details.
- Use the Time Filter option to select the required time interval for which you need to view the visualization.

## Virtual Inventory Statistics and Cloud Applications Dashboard


Analytics dashboards allow users to monitor the physical and virtual environment and detect anomalous behavior and plan accordingly. Refer to the [Analytics](#) section in *GigaVUE Fabric Management Guide* for details on how to create a new dashboard, clone a dashboard, create a new visualization, and other information about the Discover page and Reports page.

To access the dashboards:

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<sup>1</sup>Analytics uses the OpenSearch front-end application to visualize and analyze the data in the OpenSearch database of GigaVUE-FM.



1. Go to  -> **Analytics -> Dashboards.**
2. Click on the required dashboard to view the visualizations.

The following table lists the various virtual dashboards:

Dashboard	Displays	Visualizations	Displays
<b>Inventory Status (Virtual)</b>	<p>Statistical details of the virtual inventory based on the platform and the health status.</p> <p>You can view the following metric details at the top of the dashboard:</p> <ul style="list-style-type: none"> <li>● Number of Monitoring Sessions</li> <li>● Number of V Series Nodes</li> <li>● Number of Connections</li> <li>● Number of GCB Nodes</li> </ul> <p>You can filter the visualizations based on the following control filters:</p> <ul style="list-style-type: none"> <li>● Platform</li> <li>● Health Status</li> </ul>	<i>V Series Node Status by Platform</i>	Number of healthy and unhealthy V Series Nodes for each of the supported cloud platforms.
		<i>Monitoring Session Status by Platform</i>	Number of healthy and unhealthy monitoring sessions for each of the supported cloud platforms
		<i>Connection Status by Platform</i>	Number of healthy and unhealthy connections for each of the supported cloud platforms
		<i>GCB Node Status by Platform</i>	Number of healthy and unhealthy GCB nodes for each of the supported cloud platforms
<b>V Series Node Statistics</b>	<p>Displays the Statistics of the V Series node such as the CPU usage, trend of the receiving and transmitting packets of the V Series node.</p> <p>You can filter the visualizations based on the following control filters:</p> <ul style="list-style-type: none"> <li>● Platform</li> <li>● Connection</li> <li>● V Series Node</li> </ul>	<i>V Series Node Maximum CPU Usage Trend</i>	Line chart that displays maximum CPU usage trend of the V Series node in 5 minutes interval, for the past one hour. <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> The maximum CPU Usage trend refers to the CPU usage for service cores only. Small form factor V Series nodes do not have service cores, therefore the CPU usage is reported as 0.</p> </div>
		<i>V Series Node with Most CPU Usage For Past 5 minutes</i>	Line chart that displays Maximum CPU usage of the V

Dashboard	Displays	Visualizations	Displays
			Series node for the past 5 minutes.  <b>NOTE:</b> You cannot use the time based filter options to filter and visualize the data.
		<i>V Series Node Rx Trend</i>	Receiving trend of the V Series node in 5 minutes interval, for the past one hour.
		<i>V Series Network Interfaces with Most Rx for Past 5 mins</i>	Total packets received by each of the V Series network interface for the past 5 minutes.  <b>NOTE:</b> You cannot use the time based filter options to filter and visualize the data.
		<i>V Series Node Tunnel Rx Packets/Errors</i>	Displays the reception of packet at the Tunnel RX. This is the input to V Series Node, Grouping by tunnel identifier comprising {monDomain, conn, VSN, tunnelName}, before aggregation.
		<i>V Series Node Tunnel Tx Packets/Errors</i>	TX is for output tunnels from VSN. V Series Node Tunnel Tx Packets/Errors
<b>Dedup</b>	Displays visualizations related to Dedup application.  You can filter the visualizations based on the following control filters: <ul style="list-style-type: none"> <li>Platform</li> <li>Connection</li> </ul>	<i>Dedup Packets Detected/Dedup Packets Overload</i>	Statistics of the total dedup packets received (ipV4Dup, ipV6Dup and nonIPDup) against the dedup application overload.

Dashboard	Displays	Visualizations	Displays
	<ul style="list-style-type: none"> <li>V Series Node</li> </ul>	<i>Dedup Packets Detected/Dedup Packets Overload Percentage</i>	Percentage of the dedup packets received against the dedup application overload.
		<i>Total Traffic In/Out Dedup</i>	Total incoming traffic against total outgoing traffic
<b>Tunnel (Virtual)</b>	<p>Displays visualizations related to the tunneled traffic in both bytes as well as the number of packets.</p> <p>You can select the following control filters, based on which the visualizations will get updated:</p> <ul style="list-style-type: none"> <li><b>Monitoring session:</b> Select the required monitoring session. The cloud platform, monitoring domain and connection within the monitoring domain that is used by the V Series node are shown in square brackets, comma-separated, after the name, to distinguish the whole path to it.</li> <li><b>V Series node:</b> Management IP of the V Series node. Choose the required V Series node from the drop-down.</li> <li><b>Tunnel:</b> Select any of the tunnels shown in the Tunnel drop-down. The direction for each tunnel is shown with the prefix in or out.</li> </ul> <p>The following statistics are displayed for the tunnel:</p> <ul style="list-style-type: none"> <li>Received Bytes</li> <li>Transmitted Bytes</li> <li>Received Packets</li> <li>Transmitted Packets</li> <li>Received Errored Packets</li> <li>Received Dropped Packets</li> </ul>	<i>Tunnel Bytes</i>	<p>Displays received tunnel traffic vs transmitted tunnel traffic, in bytes.</p> <ul style="list-style-type: none"> <li>For input tunnel, transmitted traffic is displayed as zero.</li> <li>For output tunnel, received traffic is displayed as zero.</li> </ul>

Dashboard	Displays	Visualizations	Displays
	<ul style="list-style-type: none"> <li>• Transmitted Errored Packets</li> <li>• Transmitted Dropped Packets</li> </ul>	<i>Tunnel Packets</i>	Displays packet-level statistics for input and output tunnels that are part of a monitoring session.
<b>App (Virtual)</b>	<p>Displays Byte and packet level statistics for the applications for the chosen monitoring session on the selected V Series node.</p> <p>You can select the following control filters, based on which the visualizations will get updated:</p> <ul style="list-style-type: none"> <li>• <b>Monitoring session</b></li> <li>• <b>V Series node</b></li> <li>• <b>Application:</b> Select the required application. By default, the visualizations displayed includes all the applications.</li> </ul> <p>By default, the following statistics are displayed:</p> <ul style="list-style-type: none"> <li>• Received Bytes</li> <li>• Transmitted Bytes</li> <li>• Received Packets</li> <li>• Transmitted Packets</li> <li>• Errored Packets</li> <li>• Dropped Packets</li> </ul>	<i>App Bytes</i>	Displays received traffic vs transmitted traffic, in Bytes.

Dashboard	Displays	Visualizations	Displays
		<i>App Packets</i>	Displays received traffic vs transmitted traffic, as the number of packets.
<b>End Point (Virtual)</b>	<p>Displays Byte and packet level statistics for the un-tunneled traffic deployed on the V Series nodes.</p> <p>The following statistics that are shown for Endpoint (Virtual):</p> <ul style="list-style-type: none"> <li>• Received Bytes</li> <li>• Transmitted Bytes</li> <li>• Received Packets</li> <li>• Transmitted Packets</li> <li>• Received Errored Packets</li> <li>• Received Dropped Packets</li> <li>• Transmitted Errored Packets</li> <li>• Transmitted Dropped Packets</li> </ul> <p>The endpoint drop-down shows <i>&lt;V Series Node Management IP address : Network Interface&gt;</i> for each endpoint.</p> <p>You can select the following control filters, based on which the visualizations will get updated:</p> <ul style="list-style-type: none"> <li>• <b>Monitoring session</b></li> <li>• <b>V Series node</b></li> <li>• <b>Endpoint:</b> Management IP of the V Series node followed by the Network Interface (NIC)</li> </ul>	<i>Endpoint Bytes</i>	Displays received traffic vs transmitted traffic, in Bytes.
		<i>Endpoint Packets</i>	Displays received traffic vs transmitted traffic, as the number of packets.

**NOTE:** The Tunnel (Virtual), App (Virtual) and Endpoint (Virtual) dashboards do not show data from the previous releases if the *Monitoring Session [Platform : Domain : Connection]* dashboard filter is applied. This is because, this filter relies on the new attributes in the OpenSearch database, which are available only from software version 5.14.00 and beyond.

# Administer GigaVUE Cloud Suite for OpenStack

You can perform the following administrative tasks in GigaVUE-FM for GigaVUE Cloud Suite for OpenStack:

- [Configure the OpenStack Settings](#)
- [Role Based Access Control](#)
- [About Audit Logs](#)
- [About Events](#)

## Configure the OpenStack Settings

To configure the OpenStack Settings:

1. Go to **Inventory > VIRTUAL > OpenStack**, and then click **Settings**.
2. Click the **Settings** drop-down, and then select **Advanced Settings**.
3. Click **Edit** to edit the Advanced Settings fields.

### Advanced Settings

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Refresh interval for VM target selection inventory (secs)	120
Refresh interval for fabric deployment inventory (secs)	900
Number of UCT-Vs per V Series Node	100
Number of hypervisors per V Series Node	5
Refresh interval for UCT-V inventory (secs)	900
OVS Mirror tunnel range start	10000
OVS Mirror tunnel range end	30000
Traffic distribution tunnel range start	8000
Traffic distribution tunnel range end	8512
Traffic distribution tunnel MTU	9001
OVS Agent Traffic when V Series is down	Disabled

Refer to the following table for descriptions of the Settings fields.

Settings	Description
<b>Refresh interval for VM target selection inventory (secs)</b>	Specifies the frequency for updating the inventory of VMs in OpenStack.
<b>Refresh interval for fabric deployment inventory (secs)</b>	Specifies the frequency for updating the inventory of GigaVUE fabrics in OpenStack.
<b>Number of UCT-Vs per V Series Node</b> (applicable only for UCT-V based connections)	Specifies the maximum number of instances that can be assigned to the V Series node.
<b>Number of hypervisors per V Series Node</b> (applicable only for OVS mirroring)	Specifies the maximum number of hypervisors that can be assigned to the V Series node.
<b>Refresh interval for UCT-V inventory (secs)</b>	Specifies the frequency for discovering the UCT-Vs available in the project. This is applicable for UCT-Vs only.
<b>OVS Mirror tunnel range start</b>	Specifies the startup range value of the OVS mirror tunnel ID. This is applicable for UCT-V OVS Agents only.
<b>OVS Mirror tunnel range end</b>	Specifies the closing range value of the OVS mirror tunnel ID. This is applicable for UCT-V OVS Agents only.
<b>Traffic distribution tunnel range start</b>	Specifies the start range value of the tunnel ID.
<b>Traffic distribution tunnel range end</b>	Specifies the closing range value of the tunnel ID.
<b>OVS Agent Traffic when V Series is down</b>	Enable this option to stop the OVS Agent from sending the traffic to the V Series node. You can stop the traffic either manually or automatically. Refer to <a href="#">Shutdown or Restart of OVS traffic</a> to know more about the manual or automatic shut down and restart.

**NOTE:** A maximum of 100 OpenStack connections are allowed for an OpenStack module.

## Shutdown or Restart of OVS traffic

GigaVUE-FM allows you to stop or restart the traffic through OVS Mirroring based on the availability of V Series node.

GigaVUE-FM helps you to stop the traffic when the V Series node is unreachable or unrecoverable, and restart it when the V Series node is reachable again in the following ways:

- [Manual shutdown or restart of OVS traffic](#)
- [Automatic shutdown or restart of OVS traffic](#)

## Manual shutdown or restart of OVS traffic

The traffic sent from the OVS Mirroring Agent can be manually stopped and started.

To shut down or restart the OVS traffic manually, follow these steps:

1. Go to **Inventory > VIRTUAL > OpenStack**, and then click **Settings**
2. Click the **Settings** drop-down, and then select **Advanced Settings**.
3. Enable the check box **OVS Agent Traffic when V Series is down**.
4. Click the **Fabric** tab.
5. Select the V Series node.
6. Click the **Actions** drop-down list and select **Shut down OVS Traffic** or **Restart OVS Traffic** as required.

**NOTE:** You can view the **Shut down OVS Traffic** or **Restart OVS Traffic** options only when you enable the check box **OVS Agent Traffic when V Series is down** in the Advanced Settings.

## Automatic shutdown or restart of OVS traffic

When the GigaVUE Cloud Suite V Series node is deleted or changed to an unrecoverable state in the OpenStack platform, GigavUE-FM performs the action as explained in the following table:



V Series node Status in OpenStack	Action in GigaVUE-FM	Action in GigaVUE-FM when you enable the option
When a V Series node is deleted from the OpenStack platform	GigaVUE-FM automatically sets the status of that V Series node as terminated.	In the <b>Advanced Settings</b> , when the <b>OVS Agent Traffic when V Series is down</b> checkbox is enabled, GigaVUE-FM removes the source interfaces of OVS Mirroring agent
When a V Series Node is changed to a stopped or shutoff state in Openstack	GigaVUE-FM Health monitoring module tries to start the V Series node. If unsuccessful after two attempts, GigaVUE-FM considers the V Series node to be unrecoverable.	In the <b>Advanced Settings</b> , when the <b>OVS Agent Traffic when V Series is down</b> checkbox is enabled, GigaVUE-FM removes the source interfaces of OVS Mirroring agent.
When a V Series node is in an active state and its connection to GigaVUE-FM is restored	GigaVUE-FM Health Monitoring module determines V Series Node is in a healthy state.	In the <b>Advanced Settings</b> , when the <b>OVS Agent Traffic when V Series is down</b> checkbox is enabled, GigaVUE-FM adds the source interfaces of the OVS Mirroring agent and restarts the OVS traffic.

## Role Based Access Control

The Role Based Access Control (RBAC) feature controls the access privileges of users and restricts users from either modifying or viewing unauthorized data. Access privileges in GigaVUE Cloud Suite works on the same principles of access privileges in GigaVUE-FM in which the access rights of a user depends on the following:

- **User role:** A user role defines permission for users to perform any task or operation
- **User group:** A user group consists of a set of roles and set of tags associated with that group. When a user is created they can be associated with one or more groups.

To access the resources and to perform a specific operation in GigaVUE Cloud Suite you must be a user with **fm\_super\_admin** role or a user with write access to the following resource category depending on the task you need to perform.

Resource Category	Cloud Configuration Task
<p><b>Physical Device Infrastructure Management:</b> This includes the following cloud infrastructure resources:</p> <ul style="list-style-type: none"> <li>• Cloud Connections</li> <li>• Cloud Fabric Deployment</li> <li>• Cloud Configurations</li> <li>• Sys Dump</li> <li>• Syslog</li> <li>• Cloud licenses</li> <li>• Cloud Inventory</li> </ul>	<ul style="list-style-type: none"> <li>• Configure GigaVUE Cloud Components</li> <li>• Create Monitoring Domain and Launch Visibility Fabric</li> </ul>
<p><b>Traffic Control Management:</b> This includes the following traffic control resources:</p> <ul style="list-style-type: none"> <li>• Monitoring session</li> <li>• Threshold Template</li> <li>• Stats</li> <li>• Map library</li> <li>• Tunnel library</li> <li>• Tools library</li> <li>• Inclusion/exclusion Maps</li> </ul>	<ul style="list-style-type: none"> <li>• Create, Clone, and Deploy Monitoring Session</li> <li>• Create and Apply Threshold Template</li> <li>• Add Applications to Monitoring Session</li> <li>• Create Maps</li> <li>• View Statistics</li> <li>• Create Tunnel End Points</li> </ul>

**NOTE:** Cloud APIs are also RBAC enabled.

Refer to the *GigaVUE Administration Guide* for detailed information about Roles, Tags, User Groups.

## About Audit Logs

Audit logs track the changes and activities that occur in the virtual nodes due to user actions. The logs can be filtered to view specific information.

Navigate to **Dashboard > SYSTEM > Audit Logs**. The **All Audit Logs** page appears.

**All Audit Logs** Filter Manage

Filter : none

Time	User	Operation Type	Entity Type	Source	Device IP	Hostname	Status	Description	Tags
2020-1...	admin	login fmUser ad...	User	fm			SUCCESS		
2020-1...	admin	logout fmUser a...	User	fm			SUCCESS		
2020-1...	admin	login fmUser ad...	User	fm			SUCCESS		
2020-1...	admin	update result of	Monitorin...	...			SUCCESS		

Go to page: 1 of 16 Total Records: 106

The Audit Logs have the following parameters:

Parameters	Description
<b>Time</b>	Provides the timestamp on the log entries.
<b>User</b>	Provides the logged user information.
<b>Operation Type</b>	Provides specific entries that are logged by the system such as: <ul style="list-style-type: none"> <li>Log in and Log out based on users.</li> <li>Create/Delete/Edit tasks, GS operations, maps, virtual ports, and so on.</li> </ul>
<b>Source</b>	Provides details on whether the user was in GigaVUE-FM or on the node when the event occurred.
<b>Status</b>	Success or Failure of the event.
<b>Description</b>	In the case of a failure, provides a brief update on the reason for the failure.

**NOTE:** Ensure that the GigaVUE-FM time is set correctly to ensure accuracy of the trending data that is captured.

Filtering the audit logs allows you to display specific type of logs. You can filter based on any of the following:

- **When:** display logs that occurred within a specified time range.
- **Who:** display logs related a specific user or users.
- **What:** display logs for one or more operations, such as Create, Read, Update, and so on.
- **Where:** display logs for GigaVUE-FM or devices.
- **Result:** display logs for success or failure.

To filter the audit logs, do the following:

1. Click **Filter**. The quick view for Audit Log Filters displays.
2. Specify any or all of the following:
  - **Start Date** and **End Date** to display logs within a specific time range.
  - **Who** limits the scope of what displays on the Audit Logs page to a specific user or users.
  - **What** narrows the logs to the types of operation that the log is related to. You can select multiple operations. Select **All Operations** to apply all operation types as part of the filter criteria.
  - **Where** narrows the logs to particular of system that the log is related to, either GigaVUE-FM or device. Select **All Systems** apply both GigaVUE-FM and device to the filter criteria.
  - **Result** narrows the logs related to failures or successes. Select All Results to apply both success and failure to the filter criteria.
3. Click **OK** to apply the selected filters to the Audit Logs page.

## About Events

The Events page displays all the events occurring in the virtual fabric component, VM Domain, and VM manager. An event is an incident that occur at a specific point in time. Examples of events include:

- Cloud provider License Expiry
- UCT-V Inventory Update Completed
- Cloud provider Connection Status Changed

An Alarm is a response to one or more related events. If an event is considered of high severity, then GigaVUE-FM raises an alarm. An example of alarm could be your cloud provider license expiry.

The alarms and events broadly fall into the following categories: Critical, Major, Minor, or info.

Navigate to **Dashboard > SYSTEM > Events**. The Event page appears.

Source	Time	Event Type	Severity	Affected Entity T...	Affected Entity	Alias	Device IP	Host Name	Scope	Description	Tags
FM	2022-08-10 0...	Licenses Expir...	Info	Floating License					FM	4 Floating	
FM	2022-08-09 0...	Licenses Expir...	Info	Floating License					FM	4 Floating	
FM	2022-08-08 0...	Licenses Expir...	Info	Floating License					FM	4 Floating	
FM	2022-08-07 0...	Licenses Expir...	Info	Floating License					FM	4 Floating	
FM	2022-08-06 0...	Licenses Expir...	Info	Floating License					FM	4 Floating	
FM	2022-08-05 1...	FM Applicatio...	Info	fm application ...				fmha1	fmService	CMS service f...	
FM	2022-08-04 1...	FM Applicatio...	Info	fm application ...				fmha1	fmService	CMS service f...	
FM	2022-08-04 1...	Alarm Delete ...	Critical	VSeries Node	vc-obc-pod2.u...				Alarm	Node Down. P...	

The following table describes the parameters recording for each alarm or event. You can also use filters to narrow down the results.

Controls/ Parameters	Description
<b>Source</b>	The source from where the events are generated. The criteria can be as follows: <ul style="list-style-type: none"> <li>FM - indicates the event was flagged by the GigaVUE-FM fabric manager.</li> <li>IP address - is the address of the GigaVUE HC Series node that detected the event. For a node to be able to send notifications to the GigaVUE-FM fabric manager, the SNMP_TRAP must be configured with the GigaVUE-FM fabric manager's IP address specified as a host. Refer to the GigaVUE Administration Guide for instructions on adding a destination for SNMP traps.</li> <li>VMM - indicates the event was flagged by the Virtual Machine Manager.</li> <li>FM Health - indicates the event was flagged due to the health status change of GigaVUE-FM.</li> </ul>
<b>Time</b>	The timestamp when the event occurred. <b>IMPORTANT:</b> Timestamps are shown in the time zone of the client browser's computer and not the time zone of the node reporting the event. The timestamp is based on the correctly configured clock on the GigaVUE-FM server and converted from UTC to the client computer's configured time zone.
<b>Event Type</b>	The type of event that generated the events. The type of events can be CPU utilization high, cluster updated, device discovery failed, fan tray changed, netflow statistics, and so on.
<b>Severity</b>	The severity is one of Critical, Major, Minor, or Info. Info is informational messages. For example, when power status change notification is displayed, then the message is displayed as Info.
Affected Entity Type	The resource type associated with the event. For example, when low disk space notification is generated, 'Chassis' is displayed as the affected entity type.
Affected Entity	The resource ID of the affected entity type. For example, when low disk space notification is generated, the IP address of the node with the low disk space is displayed as the affected entity.
Alias	Event Alias
Device IP	The IP address of the device.
Host Name	The host name of the device.
<b>Scope</b>	The category to which the events belong. Events can belong to the following category: Domain, Node, Card, Port, Stack, Cluster, Chassis, GigaVUE-FM, GigaVUE-VM, and so on. For example, if there is a notification generated for port utilization low threshold, the scope is displayed as Physical Node.

To filter the alarms and event:

1. Click **Filter**. The Filter quick view is displayed.
2. Select the filtering criteria, then click **Apply Filter**. The results are displayed in the Events page.

# GigaVUE-FM Version Compatibility Matrix

The following tables list the different versions of GigaVUE Cloud Suite Cloud solution components available with different versions of GigaVUE-FM.

**NOTE:** GigaVUE-FM version 6.7 supports the latest fabric components version as well as the (n-2) versions. It is always recommended to use the latest version of fabric components with GigaVUE-FM for better compatibility.

GigaVUE-FM	UCT-V	UCT-V OVS Agent	UCT-V Controller	GigaVUE V Series Proxy	GigaVUE V SeriesNode
6.7.00	v6.7.00	v6.7.00	v6.7.00	v6.7.00	v6.7.00
6.6.00	v6.6.00	v6.6.00	v6.6.00	v6.6.00	v6.6.00
6.5.00	v6.5.00	v6.5.00	v6.5.00	v6.5.00	v6.5.00
6.4.00	v6.4.00	v6.4.00	v6.4.00	v6.4.00	v6.4.00
6.3.00	v6.3.00	v6.3.00	v6.3.00	v6.3.00	v6.3.00
6.2.00	v6.2.00	v6.2.00	v6.2.00	v6.2.00	v6.2.00
6.1.00	v6.1.00	v6.1.00	v6.1.00	v6.1.00	v6.1.00
6.0.00	v1.8-7	v1.8-2	v1.8-7	v2.7.0	v2.7.0
5.16.00	v1.8-5	v1.8-2	v1.8-5	v2.6.0	v2.6.0
5.15.00	v1.8-5	v1.8-1	v1.8-5	v2.5.0	v2.5.0
5.14.00	v1.8-4	v1.8-1	v1.8-4	v2.4.0	v2.4.0
5.13.01	v1.8-3	v1.8-1	v1.8-3	v2.3.3	v2.3.3
5.13.00	v1.8-2	v1.8-0	v1.8-2	v2.3.0	v2.3.0
5.12.00	v1.7-1	v1	v1.7-1	v2.1.0	v2.1.0

# Troubleshooting

This section provides the information needed to troubleshoot GigaVUE-FM integration with OpenStack.

## OpenStack Connection Failed

The connFailed state indicates that the OpenStack connection has failed. Check the following troubleshoot tips to restore the connection:

- Verify if GigaVUE-FM is able to reach the OpenStack cloud controller.
- Check if the OpenStack cloud controller is DNS resolvable from GigaVUE-FM.
- Verify if the region name provided while launching the instance is accurate.
- Ensure that all the security group rules required for communication between GigaVUE-FM and OpenStack cloud controller OR GigaVUE-FM and DNS server are accurately setup.
- Check if the Compute Servers that the nova API returns are reachable from GigaVUE-FM. Refer to [Handshake Alert: unrecognized\\_name](#).

## Handshake Alert: unrecognized\_name

When setting up the OpenStack connection in GigaVUE-FM, the GigaVUE-FM logs might show a handshake alert: unrecognized\_name error. This error is related to a Server Name Indication (SNI) error. Starting with Java 7, the JDK does not ignore the unrecognized name warning. To resolve this issue, perform either of the following:

- Fix the configuration on the server where the error is occurring.
- Ignore the warning on the client side (GigaVUE-FM server) by using the Java system property `--Djsse.enableSNIExtension=false` while launching GigaVUE-FM.

Contact support for information on how to use the Java system property. However, this is not recommended for security reasons.

## GigaVUE V Series Node or UCT-V Controller is Unreachable

If GigaVUE V Series node or UCT-V Controller is unreachable, verify the following:

- The correct version of the image is uploaded.
- The network is reachable.



# Additional Sources of Information

This appendix provides additional sources of information. Refer to the following sections for details:

- [Documentation](#)
- [Documentation Feedback](#)
- [Contact Technical Support](#)
- [Contact Sales](#)
- [The VUE Community](#)

## Documentation

This table lists all the guides provided for GigaVUE Cloud Suite software and hardware. The first row provides an All-Documents Zip file that contains all the guides in the set for the release.

**NOTE:** In the online documentation, view [What's New](#) to access quick links to topics for each of the new features in this Release; view [Documentation Downloads](#) to download all PDFs.

Table 1: Documentation Set for Gigamon Products

GigaVUE Cloud Suite 6.7 Hardware and Software Guides
<p><b>DID YOU KNOW?</b> If you keep all PDFs for a release in common folder, you can easily search across the doc set by opening one of the files in Acrobat and choosing <b>Edit &gt; Advanced Search</b> from the menu. This opens an interface that allows you to select a directory and search across all PDFs in a folder.</p>
<p><b>Hardware</b></p> <p>how to unpack, assemble, rackmount, connect, and initially configure ports the respective GigaVUE Cloud Suite devices; reference information and specifications for the respective GigaVUE Cloud Suite devices</p>
<b>GigaVUE-HC1 Hardware Installation Guide</b>
<b>GigaVUE-HC3 Hardware Installation Guide</b>
<b>GigaVUE-HC1-Plus Hardware Installation Guide</b>
<b>GigaVUE-HCT Hardware Installation Guide</b>
<b>GigaVUE-TA25 Hardware Installation Guide</b>
<b>GigaVUE-TA25E Hardware Installation Guide</b>
<b>GigaVUE-TA100 Hardware Installation Guide</b>

<b>GigaVUE Cloud Suite 6.7 Hardware and Software Guides</b>	
<b>GigaVUE-TA200 Hardware Installation Guide</b>	
<b>GigaVUE-TA200E Hardware Installation Guide</b>	
<b>GigaVUE-TA400 Hardware Installation Guide</b>	
<b>GigaVUE-OS Installation Guide for DELL S4112F-ON</b>	
<b>G-TAP A Series 2 Installation Guide</b>	
<b>GigaVUE M Series Hardware Installation Guide</b>	
<b>GigaVUE-FM Hardware Appliances Guide</b>	
<b>Software Installation and Upgrade Guides</b>	
<b>GigaVUE-FM Installation, Migration, and Upgrade Guide</b>	
<b>GigaVUE-OS Upgrade Guide</b>	
<b>GigaVUE V Series Migration Guide</b>	
<b>Fabric Management and Administration Guides</b>	
<b>GigaVUE Administration Guide</b>	covers both GigaVUE-OS and GigaVUE-FM
<b>GigaVUE Fabric Management Guide</b>	how to install, deploy, and operate GigaVUE-FM; how to configure GigaSMART operations; covers both GigaVUE-FM and GigaVUE-OS features
<b>Cloud Guides</b>	
how to configure the GigaVUE Cloud Suite components and set up traffic monitoring sessions for the cloud platforms	
<b>GigaVUE V Series Applications Guide</b>	
<b>GigaVUE V Series Quick Start Guide</b>	
<b>GigaVUE Cloud Suite Deployment Guide - AWS</b>	
<b>GigaVUE Cloud Suite Deployment Guide - Azure</b>	
<b>GigaVUE Cloud Suite Deployment Guide - OpenStack</b>	
<b>GigaVUE Cloud Suite Deployment Guide - Nutanix</b>	
<b>GigaVUE Cloud Suite Deployment Guide - VMware (ESXi)</b>	
<b>GigaVUE Cloud Suite Deployment Guide - VMware (NSX-T)</b>	
<b>GigaVUE Cloud Suite Deployment Guide - Third Party Orchestration</b>	
<b>Universal Cloud TAP - Container Deployment Guide</b>	

## GigaVUE Cloud Suite 6.7 Hardware and Software Guides

### Gigamon Containerized Broker Deployment Guide

### GigaVUE Cloud Suite Deployment Guide - AWS Secret Regions

### GigaVUE Cloud Suite Deployment Guide - Azure Secret Regions

## Reference Guides

### GigaVUE-OS CLI Reference Guide

library of GigaVUE-OS CLI (Command Line Interface) commands used to configure and operate GigaVUE HC Series and GigaVUE TA Series devices

### GigaVUE-OS Security Hardening Guide

### GigaVUE Firewall and Security Guide

### GigaVUE Licensing Guide

### GigaVUE-OS Cabling Quick Reference Guide

guidelines for the different types of cables used to connect Gigamon devices

### GigaVUE-OS Compatibility and Interoperability Matrix

compatibility information and interoperability requirements for Gigamon devices

### GigaVUE-FM REST API Reference in GigaVUE-FM User's Guide

samples uses of the GigaVUE-FM Application Program Interfaces (APIs)

## Release Notes

### GigaVUE-OS, GigaVUE-FM, GigaVUE-VM, G-TAP A Series, and GigaVUE Cloud Suite Release Notes

new features, resolved issues, and known issues in this release ;  
important notes regarding installing and upgrading to this release

**NOTE:** Release Notes are not included in the online documentation.

**NOTE:** Registered Customers can log in to [My Gigamon](#) to download the Software and Release Notes from the Software and Docs page on to [My Gigamon](#). Refer to [How to Download Software and Release Notes from My Gigamon](#).

## In-Product Help

### GigaVUE-FM Online Help

how to install, deploy, and operate GigaVUE-FM.

## How to Download Software and Release Notes from My Gigamon

Registered Customers can download software and corresponding Release Notes documents from the **Software & Release Notes** page on to [My Gigamon](#). Use the My Gigamon Software & Docs page to download:

- Gigamon Software installation and upgrade images,
- Release Notes for Gigamon Software, or
- Older versions of PDFs (pre-v5.7).

**To download release-specific software, release notes, or older PDFs:**

1. Log in to [My Gigamon](#).
2. Click on the **Software & Release Notes** link.
3. Use the **Product** and **Release** filters to find documentation for the current release. For example, select Product: "GigaVUE-FM" and Release: "5.6," enter "pdf" in the search box, and then click **GO** to view all PDF documentation for GigaVUE-FM 5.6.xx.

**NOTE:** My Gigamon is available to registered customers only. Newer documentation PDFs, with the exception of release notes, are all available through the publicly available online documentation.

## Documentation Feedback

We are continuously improving our documentation to make it more accessible while maintaining accuracy and ease of use. Your feedback helps us to improve. To provide feedback and report issues in our documentation, send an email to: [documentationfeedback@gigamon.com](mailto:documentationfeedback@gigamon.com)

Please provide the following information in the email to help us identify and resolve the issue. Copy and paste this form into your email, complete it as able, and send. We will respond as soon as possible.

Documentation Feedback Form		
<b>About You</b>	<b>Your Name</b>	
	<b>Your Role</b>	
	<b>Your Company</b>	
<b>For Online Topics</b>	<b>Online doc link</b>	<i>(URL for where the issue is)</i>
	<b>Topic Heading</b>	<i>(if it's a long topic, please provide the heading of the section where the issue is)</i>

<b>For PDF Topics</b>	<b>Document Title</b>	<i>(shown on the cover page or in page header )</i>
	<b>Product Version</b>	<i>(shown on the cover page)</i>
	<b>Document Version</b>	<i>(shown on the cover page)</i>
	<b>Chapter Heading</b>	<i>(shown in footer)</i>
	<b>PDF page #</b>	<i>(shown in footer)</i>
<b>How can we improve?</b>	<b>Describe the issue</b>	<i>Describe the error or issue in the documentation. (If it helps, attach an image to show the issue.)</i>
	<b>How can we improve the content? Be as specific as possible.</b>	
	<b>Any other comments?</b>	

## Contact Technical Support

For information about Technical Support: Go to **Settings**  > **Support** > **Contact Support** in GigaVUE-FM.

You can also refer to <https://www.gigamon.com/support-and-services/contact-support> for Technical Support hours and contact information.

Email Technical Support at [support@gigamon.com](mailto:support@gigamon.com).

## Contact Sales

Use the following information to Gigamon channel partner or Gigamon sales representatives.

**Telephone:** +1.408.831.4025

**Sales:** [inside.sales@gigamon.com](mailto:inside.sales@gigamon.com)

**Partners:** [www.gigamon.com/partners.html](http://www.gigamon.com/partners.html)

## Premium Support

Email Gigamon at [inside.sales@gigamon.com](mailto:inside.sales@gigamon.com) for information on purchasing 24x7 Premium Support. Premium Support entitles you to round-the-clock phone support with a dedicated Support Engineer every day of the week.

## The VÜE Community

The **VÜE Community** is a technical site where Gigamon users, partners, security and network professionals and Gigamon employees come together to share knowledge and expertise, ask questions, build their network and learn about best practices for Gigamon products.

Visit the VÜE Community site to:

- Find knowledge base articles and documentation
- Ask and answer questions and learn best practices from other members.
- Join special-interest groups to have focused collaboration around a technology, use-case, vertical market or beta release
- Take online learning lessons and tutorials to broaden your knowledge of Gigamon products.
- Open support tickets (Customers only)
- Download the latest product updates and documentation (Customers only)

The VÜE Community is a great way to get answers fast, learn from experts and collaborate directly with other members around your areas of interest.

**Register today at** [community.gigamon.com](http://community.gigamon.com)

**Questions?** Contact our Community team at [community@gigamon.com](mailto:community@gigamon.com).

# Glossary

## D

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### decrypt list

need to decrypt (formerly blacklist)

### decryptlist

need to decrypt - CLI Command (formerly blacklist)

### drop list

selective forwarding - drop (formerly blacklist)

## F

---

### forward list

selective forwarding - forward (formerly whitelist)

## L

---

### leader

leader in clustering node relationship (formerly master)

## M

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### member node

follower in clustering node relationship (formerly slave or non-master)

## N

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### no-decrypt list

no need to decrypt (formerly whitelist)

**nodecryptlist**

no need to decrypt- CLI Command (formerly whitelist)

**P**

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**primary source**

root timing; transmits sync info to clocks in its network segment (formerly grandmaster)

**R**

---

**receiver**

follower in a bidirectional clock relationship (formerly slave)

**S**

---

**source**

leader in a bidirectional clock relationship (formerly master)