



# Encrypted Visibility Engine

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Encrypted Visibility Engine (EVE) is used to identify client applications and processes utilizing TLS encryption. It enables visibility and allows administrators to take actions and enforce policy within their environments. The EVE technology can also be used to identify and stop malware.

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## Overview of Encrypted Visibility Engine

The encrypted visibility engine (EVE) is used to provide more visibility into the encrypted sessions without the need to decrypt them. These insights into encrypted sessions are obtained by Cisco's open-source library that is packaged in Cisco's vulnerability database (VDB). The library fingerprints and analyzes incoming encrypted sessions and matches it against a set of known fingerprints. This database of known fingerprints is also available in the Cisco VDB.



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**Note** The encrypted visibility engine feature is supported only on management center-managed devices running Snort 3. This feature is not supported on Snort 2 devices, device manager-managed devices, or CDO.

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Some of the important features of EVE are the following:

- You can take access control policy actions on the traffic using information derived from EVE.
- The VDB included in Cisco Secure Firewall has the ability to assign applications to some processes detected by EVE with a high confidence value. Alternatively, you can create custom application detectors to:
  - Map EVE-detected processes to new user-defined applications.
  - Override the built-in value of process confidence that is used to assign applications to EVE-detected processes.

See the **Configuring Custom Application Detectors** and **Specifying EVE Process Assignments** sections in the **Application Detection** chapter of the [Cisco Secure Firewall Management Center Device Configuration Guide](#).

- EVE can detect the operating system type and version of the client that created a Client Hello packet in the encrypted traffic.
- EVE supports fingerprinting and analysis of Quick UDP Internet Connections (QUIC) traffic too. The server name from the Client Hello packet is displayed in the URL field of the **Connection Events** page.



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**Attention** To use EVE on management center, you must have a valid IPS license on your device. In the absence of a IPS license, the policy displays a warning and deployment is not allowed.

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**Note** EVE can detect the operating system type and version of SSL sessions. Normal usage of the operating system, such as running applications and package management software, can trigger OS detection. To view client OS detection, in addition to enabling the EVE toggle button, you must enable **Hosts** under **Policies > Network Discovery**. To view a list of possible operating systems on the host IP address, click **Analysis > Hosts > Network Map**, and then choose the required host.

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#### Related Links

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## How EVE Works

The encrypted visibility engine (EVE) inspects the Client Hello portion of the TLS handshake to identify client processes. The Client Hello is the initial data packet that is sent to the server. This gives a good indication of the client process on the host. This fingerprint, combined with other data such as destination IP address, provides the basis for EVE's application identification. By identifying specific application fingerprints in the TLS session establishment, the system can identify the client process and take appropriate action (allow/block).

EVE can identify over 5,000 client processes. The system maps a number of these processes to client applications for use as criteria in access control rules. This gives the system the ability to identify and control these applications without enabling TLS decryption. By using fingerprints of known malicious processes, EVE technology can also be used to identify and block encrypted malicious traffic without outbound decryption.

Through machine learning (ML) technology, Cisco processes over one billion TLS fingerprints and over 10000 malware samples daily to create and update EVE fingerprints. These updates are then delivered to customers using Cisco's Vulnerability Database (VDB) packages.

## Indications of Compromise Events

The host's Indications of Compromise (IoC) events for encrypted visibility engine detection allows you to check connection events with a very high malware confidence level, as reported by EVE. IoC events are triggered for encrypted sessions generated from a host using a malicious client. You can view information, such as IP address, MAC address, and OS information of the malicious host, and the timestamp of the suspicious activity.

A session with Encrypted Visibility Threat Confidence score 'Very High' as seen in connection events generates an IoC event. You must enable **Hosts** from **Policies > Network Discovery**. In the management center, you can view the IoC event existence from:

- **Analysis > Indications of Compromise**.
- **Analysis > Network Map > Indications of Compromise** > Choose the host that must be checked.

You can view the process information of the session that generated the IoC from:

**Analysis > Connection Events > Table View of Connection Events > IoC** column. Note that you must manually select the Encrypted Visibility fields and IoC field.

## QUIC Fingerprinting in EVE

Snort can identify client applications in Quick UDP Internet Connections (QUIC sessions) based on EVE. QUIC fingerprinting can:

- Detect applications over QUIC without enabling decryption.
- Identify malware without enabling decryption.
- Detect service applications. You can assign access control rules based on the service detected over the QUIC protocol.

## Configure EVE

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- Step 1** Choose **Policies > Access Control**.
  - Step 2** Click **Edit** (✎) next to the access control policy you want to edit.
  - Step 3** Choose **Advanced Settings** from the **More** drop-down arrow at the end of the packet flow line.
  - Step 4** Click **Edit** (✎) next to **Encrypted Visibility Engine**.
  - Step 5** In the **Encrypted Visibility Engine** page, enable the **Encrypted Visibility Engine (EVE)** toggle button.
  - Step 6** Click **OK**.
  - Step 7** Click **Save**.
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### What to do next

Deploy configuration changes.

## View EVE Events

After enabling the **Encrypted Visibility Engine** and deploying your access control policy, you can start sending live traffic through your system. You can view the logged connection events in the **Connection Events** page. To access the connection events, in the management center:

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**Step 1** Click **Analysis > Connections > Events**.

**Step 2** Click the **Table View of Connection Events** tab.

You can also view the connection event fields in the **Unified Events** viewer, which is under the **Analysis** menu.

Encrypted Visibility Engine can identify the client process that initiated a connection, the OS on the client, and if the process contains malware or not.

**Step 3** In the **Connection Events** page, view the following columns that are added for Encrypted Visibility Engine. Note that you must explicitly enable the mentioned columns.

- Encrypted Visibility Process Name
- Encrypted Visibility Process Confidence Score
- Encrypted Visibility Threat Confidence
- Encrypted Visibility Threat Confidence Score
- Detection Type

For information about these fields, see the section **Connection and Security Intelligence Event Fields** in the **Connection and Security-Related Connection Events** chapter of the [Cisco Secure Firewall Management Center Administration Guide](#).

**Note** In the **Connection Events** page, if processes are assigned applications, the **Detection Type** column displays **Encrypted Visibility Engine** indicating that the client application was identified by EVE. Without application assignments to process names, the **Detection Type** column displays **AppID** indicating that the engine that identified the client application was AppID.

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## View EVE Dashboard

You can view the EVE analysis information in two dashboards. To access the dashboards:

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**Step 1** Under **Overview > Dashboards**, click **Dashboard**.

**Step 2** In the **Summary Dashboard** window, click the **switch dashboard** link and choose **Application Statistics** from the dropdown box.

**Step 3** Choose the **Encrypted Visibility Engine** tab to view the following two dashboards:

- **Top Encrypted Visibility Engine Discovered Processes**—Displays the top TLS process names being used in your network and the connection count. You can click the process name in the table to see the filtered view of the **Connection Events** page, which is filtered by the process name.
  - **Connections by Encrypted Visibility Engine Threat Confidence**—Displays the connections by the confidence levels (Very High, Very Low, and so on). You can click the Threat confidence level in the table to see the filtered view of the **Connection Events** page, which is filtered by the confidence level.
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