



Stream Telemetry Data

This document will help you understand the process of streaming telemetry data and its core components.

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Telemetry - Scope, Need, and Benefits

Scope

Streaming telemetry lets users direct data to a configured receiver. This data can be used for analysis and troubleshooting purposes to maintain the health of the network. This is achieved by leveraging the capabilities of machine-to-machine communication.

The data is used by development and operations (DevOps) personnel who plan to optimize networks by collecting analytics of the network in real-time, locate where problems occur, and investigate issues in a collaborative manner.

Need

Collecting data for analyzing and troubleshooting has always been an important aspect in monitoring the health of a network.

IOS XR provides several mechanisms such as SNMP, CLI and Syslog to collect data from a network. These mechanisms have limitations that restrict automation and scale. One limitation is the use of the pull model, where the initial request for data from network elements originates from the client. The pull model does not scale when there is more than one network management station (NMS) in the network. With this model, the server sends data only when clients request it. To initiate such requests, continual manual intervention is required. This continual manual intervention makes the pull model inefficient.

Network state indicators, network statistics, and critical infrastructure information are exposed to the application layer, where they are used to enhance operational performance and to reduce troubleshooting time. A push model uses this capability to continuously stream data out of the network and notify the client. Telemetry enables the push model, which provides near-real-time access to monitoring data.

Streaming telemetry provides a mechanism to select data of interest from IOS XR routers and to transmit it in a structured format to remote management stations for monitoring. This mechanism enables automatic tuning of the network based on real-time data, which is crucial for its seamless operation. The finer granularity and higher frequency of data available through telemetry enables better performance monitoring and therefore, better troubleshooting. It helps a more service-efficient bandwidth utilization, link utilization, risk assessment

and control, remote monitoring and scalability. Streaming telemetry, thus, converts the monitoring process into a Big Data proposition that enables the rapid extraction and analysis of massive data sets to improve decision-making.

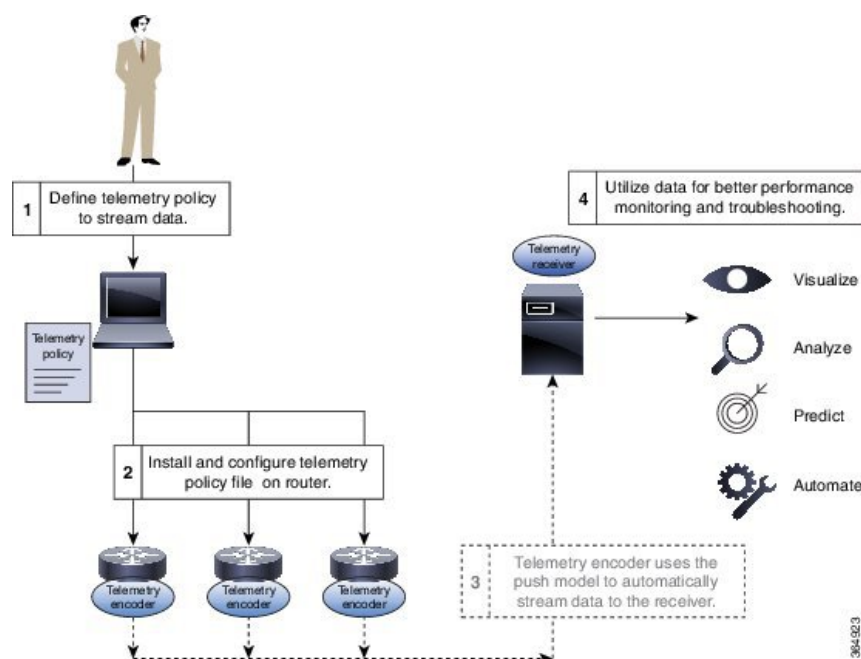
The process of streaming telemetry data uses three core components:

- **Telemetry Policy File** specifies the kind of telemetry data to be generated, at a specified frequency.
- **Telemetry Encoder** encapsulates the generated data into the desired format and transmits to the receiver.
- **Telemetry Receiver** is the remote management system that stores the telemetry data.

For more information about the three core components, see [Core Components of Policy-based Telemetry Streaming](#)

Figure 1 shows the core components used in streaming telemetry data.

Figure 1: Streaming Telemetry Data



Note The data is continuously streamed out of the router and the monitoring systems act on the data. The data at any point is real-time and no history of the data is stored.

Benefits

Streamed real-time telemetry data is useful in:

- **Traffic optimization:** When link utilization and packet drops in a network are monitored frequently, it is easier to add or remove links, re-direct traffic, modify policing, and so on. With technologies like fast reroute, the network can switch to a new path and re-route faster than the SNMP poll interval mechanism. Streaming telemetry data helps in providing quick response time for faster traffic.

- **Preventive troubleshooting:** Helps to quickly detect and avert failure situations that result after a problematic condition exists for a certain duration.

Policy-based Telemetry Process

The process of streaming real-time data using telemetry involves:

- Defining streaming frequency
- Specifying user-defined format for data collection
- Transmitting collected data to a user-specified receiver
- Viewing and analyzing the data

Figure 2 shows the tasks involved in the process of streaming telemetry data:

Figure 2: Telemetry Process

