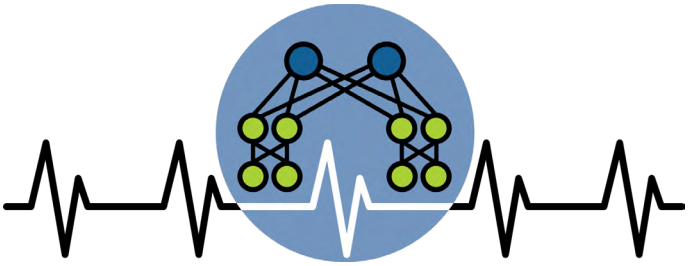
Monitoring Like It's 1995?

Let's Talk State Streaming

In an environment where downtime is costly and network infrastructure and applications must operate flawlessly, gaining *real-time visibility* across your network is no longer a nice-to-have — it's a necessity. Network state streaming is a transformative approach that delivers rich, continuous, real-time telemetry, enabling organizations to move beyond periodic glimpses and gain a continuous, accurate view of their infrastructure. It's the basis for any form of AIOps.



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Unlike traditional polling methods such as SNMP where state visibility is only available at any given periodic polling cycle, state streaming delivers a high-fidelity always-on view of device and network behavior. This evolutionary shift enables network teams to detect anomalies instantly, isolate root causes quickly, and optimize performance in ways that were simply not possible with legacy approaches.

State - What, How, Why?

Network state is a *collection of dynamic information* that the device continuously maintains. Most state is continuously changing as device or network conditions change. State can also abruptly *change due to short-duration bursts (microbursts), errors, or other such anomalies and it is important to capture all state* to be able to diagnose such conditions. Traditional methods involved a pull method of polling a device at fixed intervals leading to missed state between polling cycles.

Network State Examples

- Routing and forwarding tables
- System and network protocol status
- Interface conditions and counters
- Network flow information
- Hardware status and environmentals
- Device configuration
- Device events
- Connected endpoint information

Arista EOS State Management

Arista's method of gathering network state is to *continuously stream all real-time state* to CloudVision. The transport layer used between the NetDL Streamer and CloudVision is the gRPC remote procedure call. gRPC is a modern high-performance framework built on top of Google's open source Protocol Buffers mechanism and HTTP2, providing scale and performance to stream full network state from each EOS-based device into CloudVision. This ensures no *state 'blind spots'* are encountered and all state is available for purposes such as *troubleshooting, performance monitoring, and capacity management.*

In an EOS-based device, the scope of streamed data is roughly equivalent to the continuous output of up to 2000 'show commands' from the CLI. With traditional polling methods as shown below, crucial network state can be missed between polling cycles. Arista does not have this problem because every single state change is time-stamped and sent to CloudVision.

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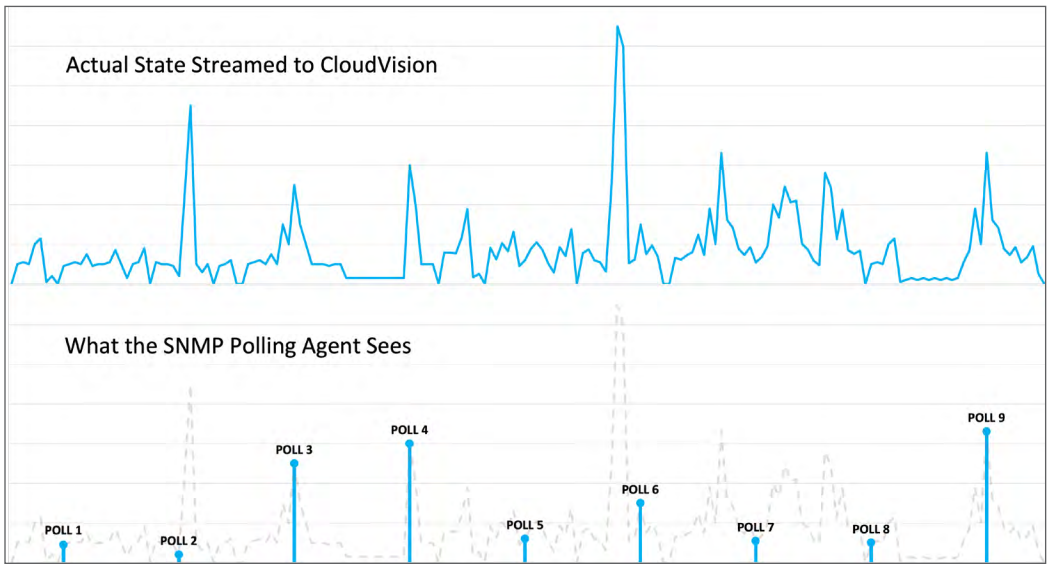


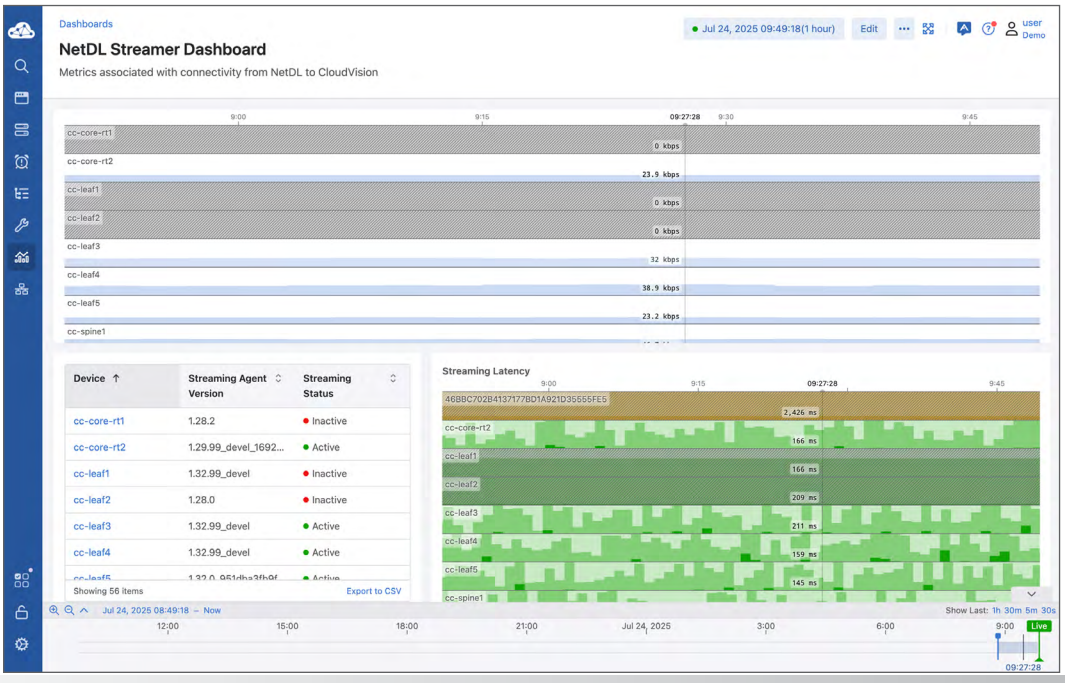
Notice the holes in the polling data? Notice the metric value peaks and valleys that are completely missed? The polled metric data and its gaping holes is not representative of the actual metric value history as shown above. By polling devices at fixed intervals, critical telemetry is missed, or delayed in its arrival. Consider a security camera that only takes a photo every 5 minutes. If a thief breaks in, steals something, and leaves in 60 seconds, you'll never capture the event. It's like nothing ever happened.

The NetDL Streamer

A state streaming service exists within every EOS-based device called *the NetDL Streamer*. Every protocol and service continually updates an internal repository every time state changes occur and changes are then continuously streamed to CloudVision. This all happens with millisecond granularity. There is no polling or other interval-based mechanism involved - *state change happens - state change streamed*, even on 100G+ interfaces!

This service streams *time-stamped state data* to CloudVision over an encrypted connection *leveraging HTTP/2+SSL* with *no perceivable CPU impact*. Bandwidth utilization of NetDL Streamer varies based on the size and configuration of the EOS-based device along with the frequency of state change events and is generally within the range of 25kbps to 200kbps per device. The NetDL Streamer can also be rate-limited if desired.

The actual streaming bitrate can be tracked per-device within CloudVision. The data is also time-stamped, it's like having your own *network state time machine*. Need to know what happened in the network yesterday at 9:27:28am, just grab the slider and go back in time as shown below. The CloudVision-as-a-Service (CVaaS) cloud service maintains up to 90 days of telemetry data.



Do I Really Need to Know Everything, All the Time?

Think 60 second polling cycles are good enough? Consider the following scenarios.

Detecting microbursts - those short, intense spikes in traffic that can cause packet loss or performance degradation. Poll your network every 5 minutes, even every minute and you're likely going to miss them.

AIOps - streaming telemetry provides real-time, high-resolution, structured data needed by AIOps to detect patterns, anomalies, and take action. Polling simply can't deliver the detail, speed, or scale that AIOps requires.

Voice and Video Traffic - monitoring latency and jitter for voice and video traffic in real-time requires sub-second telemetry granularity to detect issues. Polling is too slow to catch transient problems affecting real-time traffic.

Rapid Detection and Root Cause Analysis - instantly see and correlate events as they happen and quickly take corrective action. Polling delays detection and correlation obfuscated by misaligned device polling cycles.

Modern enterprises can no longer afford to operate their networks based on stale, fragmented snapshots. In a world that doesn't wait for polling intervals, state streaming gives you the clarity and precision to stay ahead of the curve. It's more than an upgrade; it's a shift from guessing to knowing, and in today's always-on world, that makes all the difference.

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