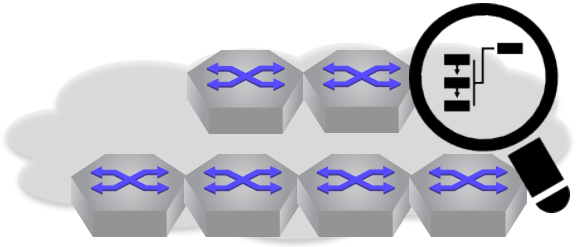
Next-Gen Telemetry and Flow Tracking

David Murray <dm@arista.com>

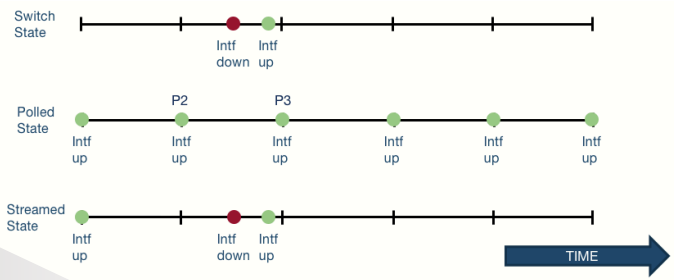
Today's Telemetry Trends

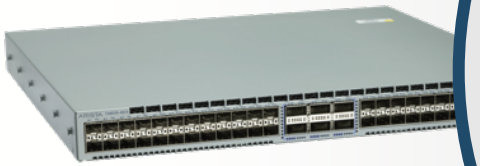


Traditional / Legacy Approach	Next-Gen Telemetry Requirements
1990's networking	Cloud DC Architectures
Polling Approach (5 min)	Real-time streaming
State scope limited to MIB definition	Complete state history
Per-Switch Per Device	Network-wide scope
Static, discrete events. Manually correlated	Dynamic event correlation

Driving new telemetry approaches….

What is State Streaming?





Interface Counters

Fan Speed

sFlow Data

Temperature Sensor

Power Draw

Configurations

Routing Tables

MAC Tables

ACL Counters

VXLAN Mappings

Table Utilization

Buffer Utilization

System logs

CPU Load

State Streaming

State Repository

Every state change triggers an update…

…and streamed to a central state repository

Every state change. From every device. Instantaneously.

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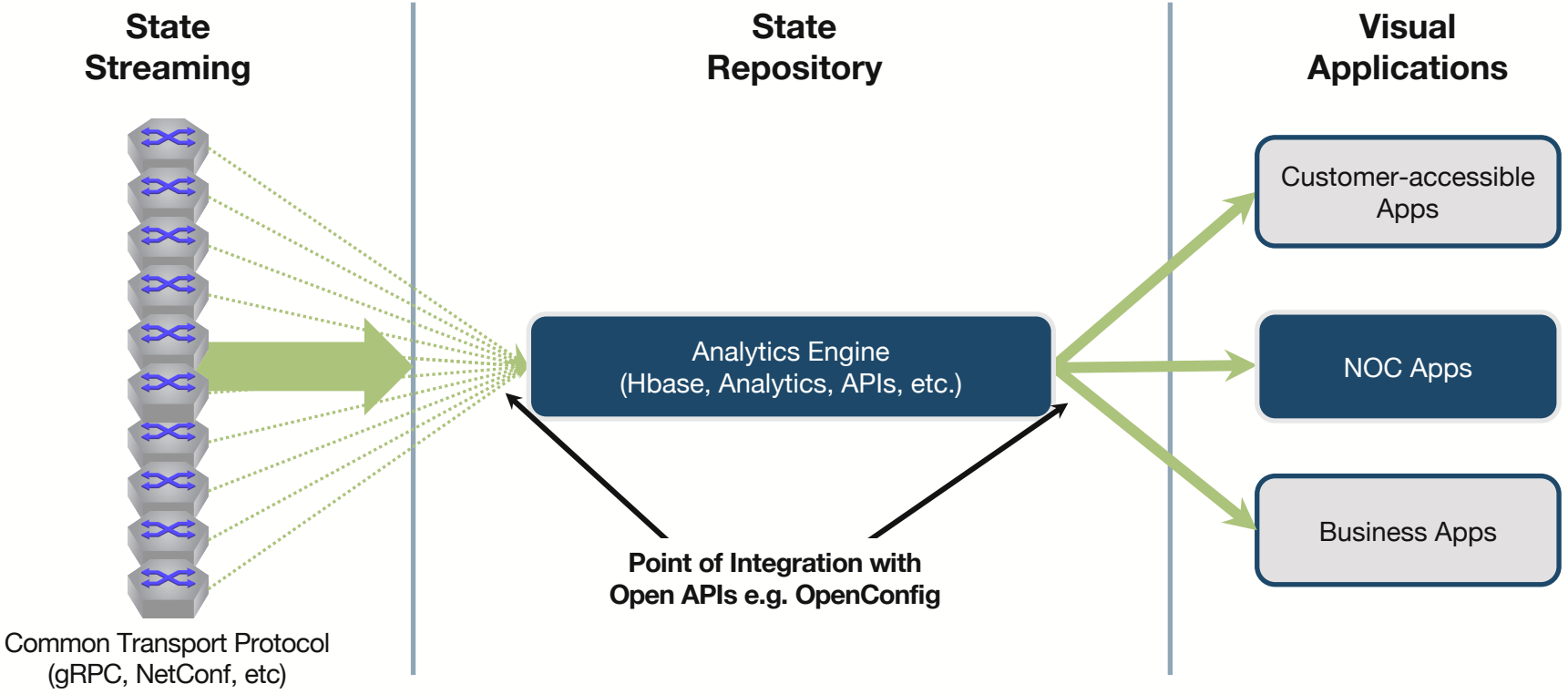
Analytics Open Framework



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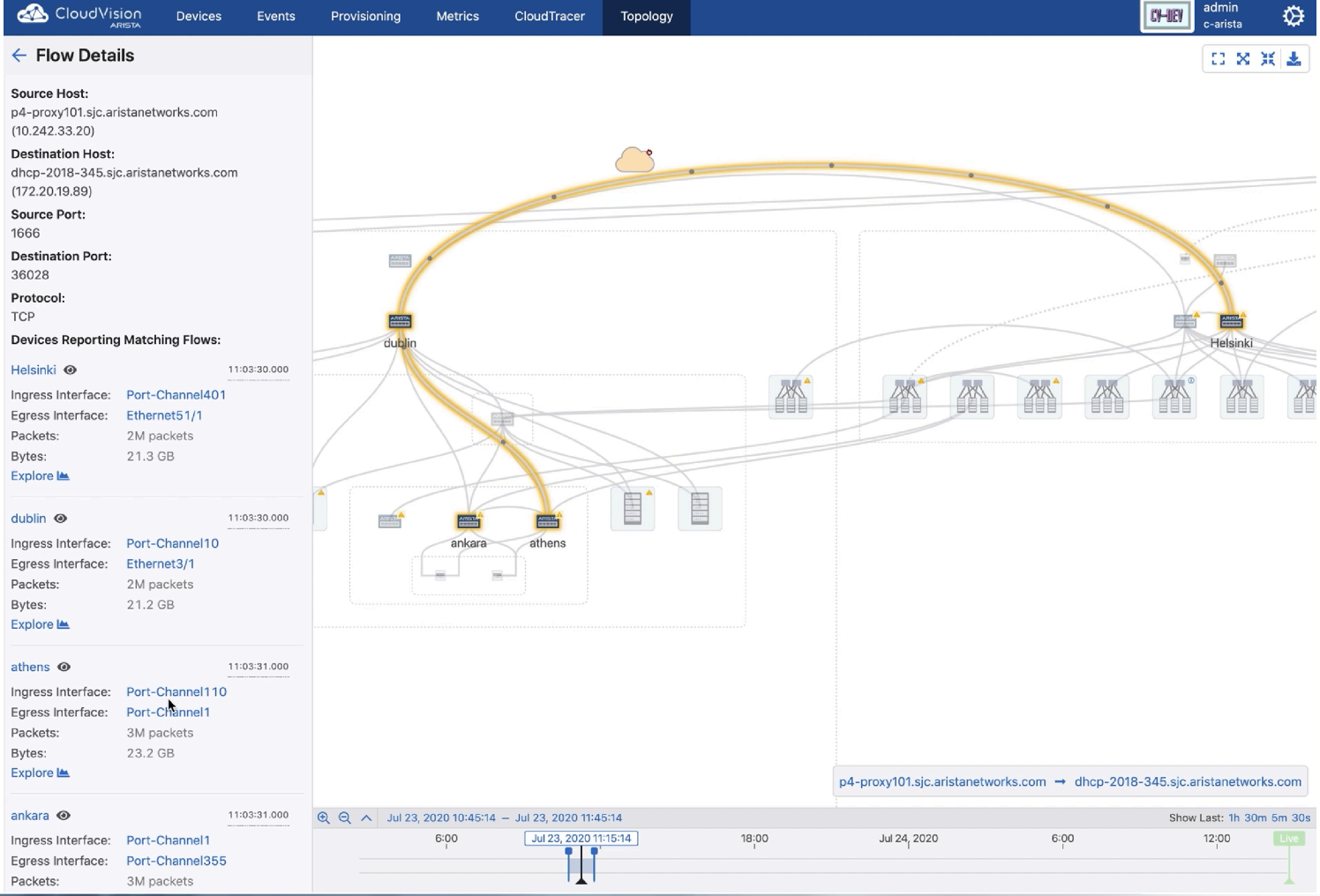
Build Your Own Telemetry System – Some Examples

Component	Distributed Key-value Database	Queuing System	Analytics Pipeline	Visualization
Options	HBase, Cassandra, Kudu, Druid, Prometheus, etc	Kafka, ActiveMQ, ZeroMQ, RabbitMQ	Spark, Storm, Heron, etc	Kibana, Grafana
Arista Telemetry	HBase	Kafka	CloudVision Turbines	CloudVision Telemetry Viewers

Telemetry based on cloud scale approaches



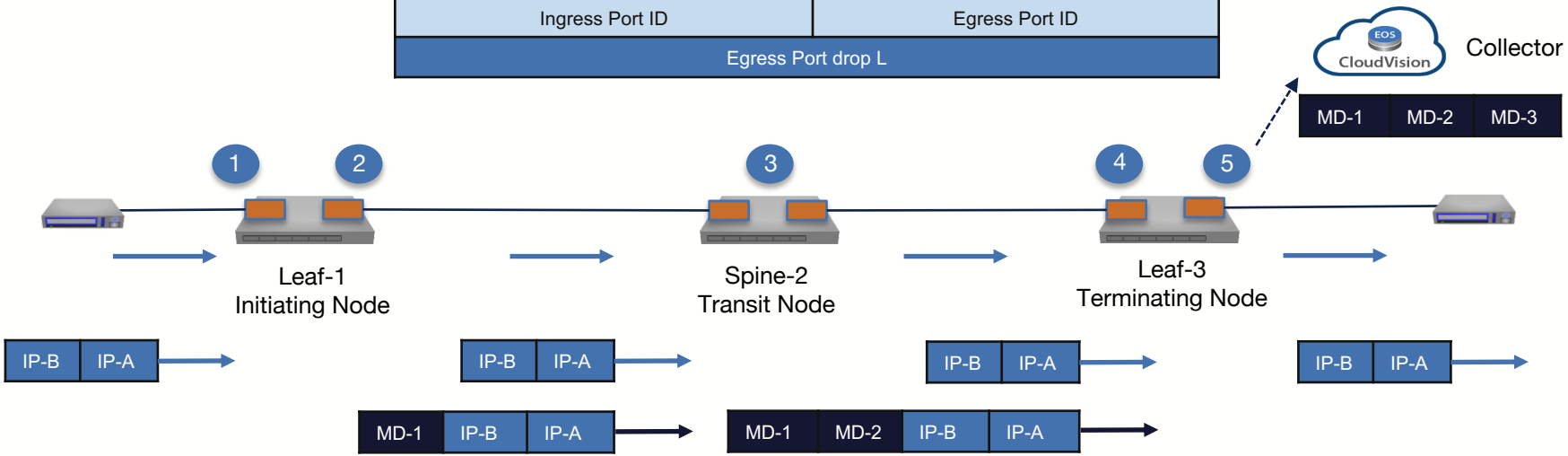
Flow Tracking - sFlow / IPFIX

- IPFIX and sFlow may be considered a form of flow Telemetry
  - Provides visibility into traffic flows being forwarded by individual network nodes
  - Provides statistics of a flow at a node level
  - Trend analysis, Troubleshooting, Capacity planning & Accounting/Billing

- Doesn't provide a real-time end-to-end view of a packet flow
  - What was the path at time T^1 for this specific flow
  - Path, hop-by-hop node(s) and ingress/egress for the packet as its forwarded through the network
- Doesn't provide visibility of the data plane state
  - What was the hardware state of node in path as the packets was forwarded.
  - What was the TC, Queue congestion, latency of the node at the time the packet was forwarded

Inband Flow Analyzer - draft-kumar-ippm-ifa-02

Device ID				
TID=1	CN	Eg port drop U	TTL	Queue ID
RX Time Stamp U				
RX Time Stamp L		RX Time Stamp ns U		
RX Time Stamp ns L		TX Time Stamp ns U		
TX Time Stamp ns L		Egress port Utilization		
Ingress Port ID		Egress Port ID		
Egress Port drop L				



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