IP SHOWCASE THEATRE

CURATED BY VSF VIDEO SERVICES FORUM

Programmability, Integration and Visibility for Media Networks

Gerard Phillips, Systems Engineer
Arista Networks

ARISTA

IP SHOWCASE THEATRE AT IBC – SEPT. 14-18, 2018

IP SHOWCASE THEATRE

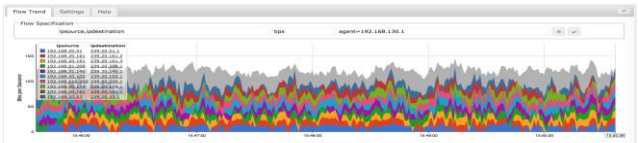
The visibility challenge

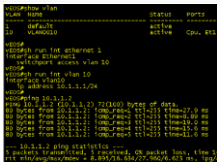
-- physical
-- coding
-- baseband

-- Single essence per BNC
-- Single duplex
-- Direct measurement
-- Synchronous transport

7 layer OSI model --
More to keep an eye on! --

Multiple essence per Fiber --
Full duplex --
Indirect measurement --
Asynchronous transport --





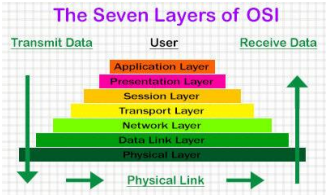
ARISTA

2

We need more visibility

Network monitoring is all about:

- Transforming data into actionable information
- Spotting trends
- Preventing service outage pro-actively
- Managing performance as the network:
  - Expands
  - Evolves
  - Gets upgraded
  - Supports new functionality



- Physical health – PSU/Fans/Temp
- CPU - load, memory, processes
- Connectivity - optics, optical strength, BER
- Logical links, topology, host presence
- Bandwidth use – host and link
- CRC errors, dropped packets, multicast paths, congestion
- PTP / SDN / IGMP / PIM / BGP / STP…
- sFlow, latency analysis, buffer usage…
- Status of High Availability components in the network
- Flow credentials (TTL, L2/L3 addressing)
- New device introduction
- Security….
- **NONE of this is about baseband video**

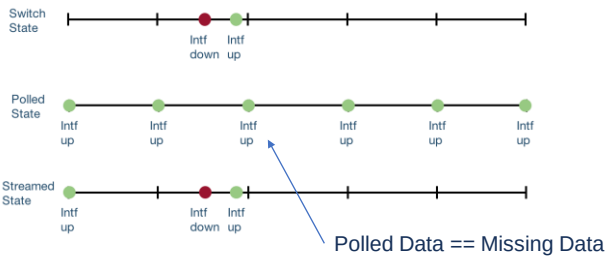
ARISTA

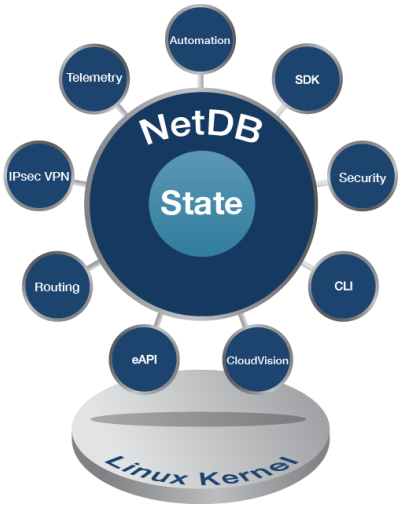
3

For more visibility we need a rich data set

- Rich data
- Timely
- Fine grained

- SNMP – is it timely or fine grained?





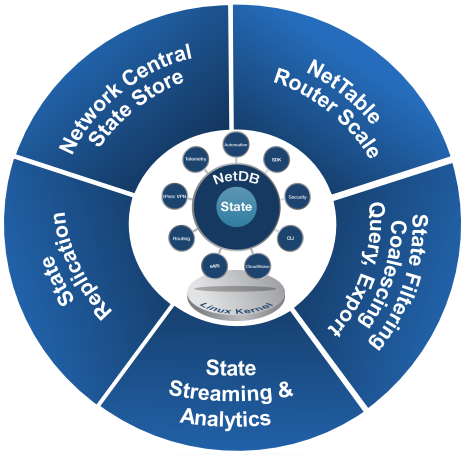
ARISTA

4

IP SHOWCASE THEATRE

Beyond SNMP

- Streaming telemetry is the future!
- Timely + fine grained : Events are streamed when they happen
- No more 30-60s SNMP sampling cycles
- Redundant data eradicated : lower processing load and network bandwidth



ARISTA

5

IP SHOWCASE THEATRE

OPENCONFIG

- User Driven
- Vendor-neutral
- Configuration & Streaming Telemetry
- Model-based
  - Common data model for management and operations
  - Multiple transports available

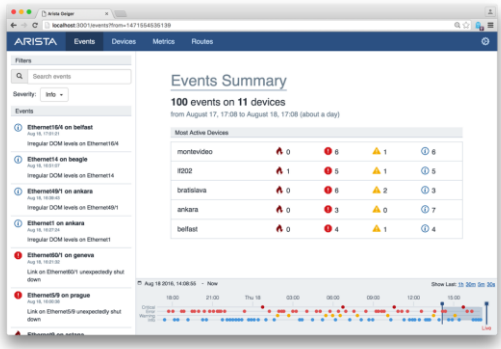
Google, AT&T, Microsoft, BT, facebook, COMCAST, verizon, Level (3), COX, YAHOO!, Apple, JIVE, T··, Bell, SK telecom, Bloomberg, NETFLIX, CLOUDFLARE, ORACLE, Tencent 腾讯, Baidu 百度

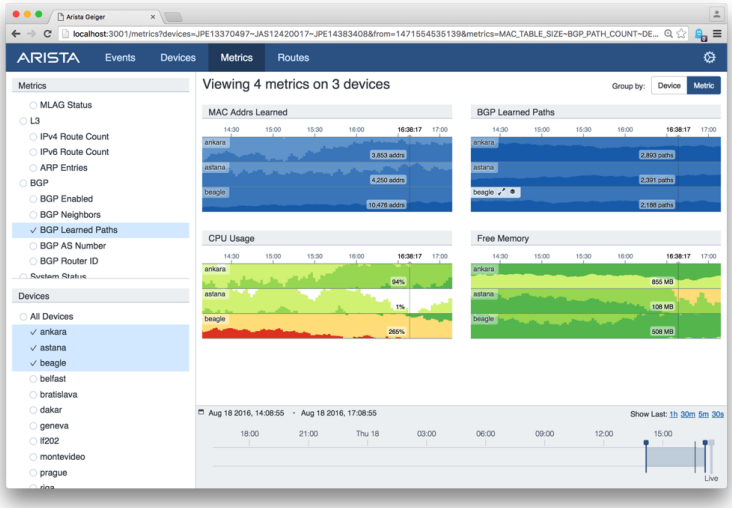
ARISTA

IP SHOWCASE THEATRE

Empowered by streaming telemetry..

- Real-time network health insight provided across an entire networking estate
- Device - device & time - time comparisons uncover trends, outliers and anomalies





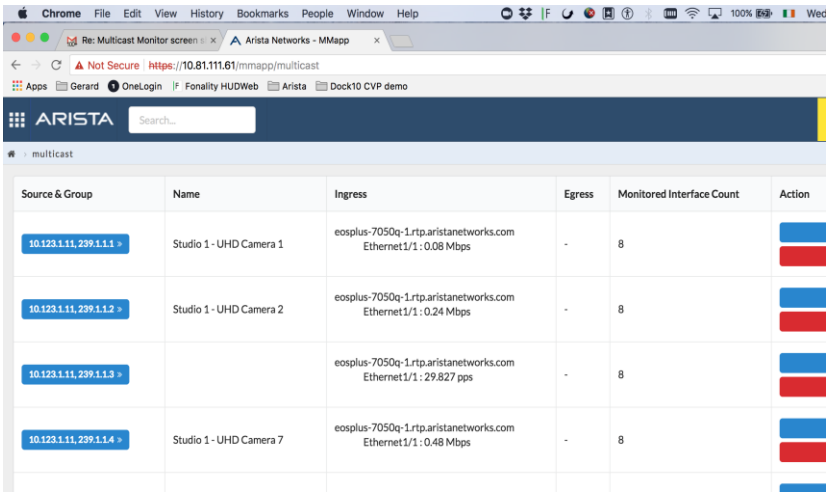
ARISTA

7

IP SHOWCASE THEATRE

Empowered by streaming telemetry..

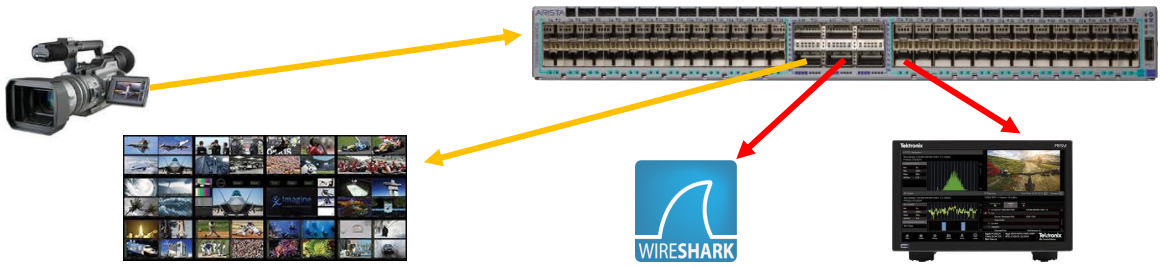
- Map multicast flows through a complex network
- Identify ingress, replication and egress points
- Network data converted to Broadcast Information



ARISTA

IP SHOWCASE THEATRE

Port Mirroring

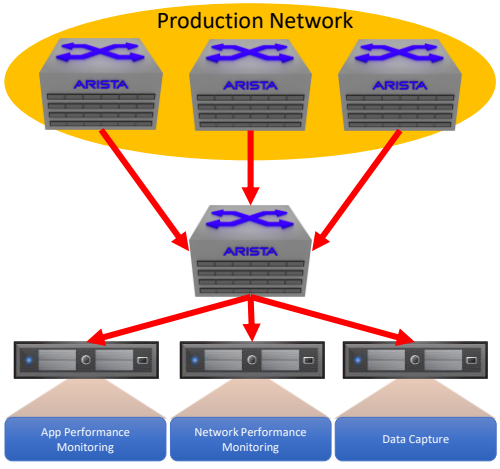


- **Port mirroring:** The switch sends a copy of all network packets seen on one or more **ports** to another **port**, where the packets can be analyzed
- **For Broadcast**: Non invasive tool access, no need for SDN or IGMP
- **Focused visibility**: Filter, truncate, and timestamp flows for more insight into the network

ARISTA

IP SHOWCASE THEATRE

Virtualizing your Toolkit



- **Tap(Span) Aggregation:** Aggregate out of band monitoring into a single scalable fabric creating a tool ecosystem
- **Virtualised:** Tap any point in your network, virtualize your toolset
- **Visibility Focused:** Manipulate, steer, slice, and timestamp flows for maximum insight across the network
- **Automation:** Build powerful automated monitoring workflows maximizing visibility and minimizing OPEX / TCO

ARISTA

Programmability

- Network visibility tools can give us a detailed and timely view into the network
- Now we need the tools to act on that information

- OpenConfig, programmatic CLI access, SSH etc provides secure switch access
- 3rd Party applications can bring Broadcast knowledge and business logic to the analysis of this network status

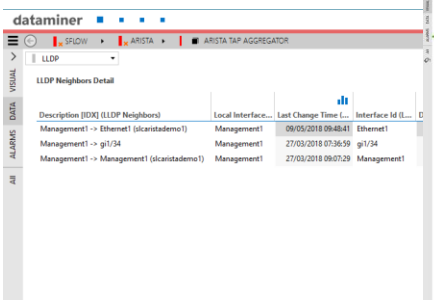
- COTS switches are typically Linux servers attached to the forwarding silicon
  - Leverage this Linux infrastructure
  - Python, bash, yum ….
  - Close coupling to both the information source and the point of influence (the switch!)

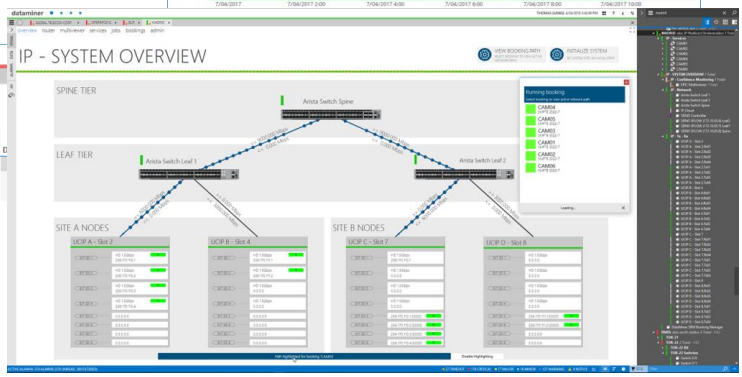
ARISTA

11

3rd Party programmability example

- Highly integrated; sFlow, interface counters, multicast flow information, automated mirroring and Tap Aggregation
- Network info is reconciled against the Broadcast Controllers view of requested flows





ARISTA

12

3rd Party programmability example

- A rich view of the network traffic status
- … is transformed through a Broadcast lens
- Network knowledge is fed back into media IP routing
- Cloud scale routing techniques applied to ST2110!

ARISTA

13

Visibility leads to flexibility, enabling choice

- IP installations for Live Production and Playout are getting more complex
- Rich, timely and fine grained data leads to information, which leads to insight
- Tight integration with the network fabric enables innovative SDN applications – in the broadest sense!
- SDN (in the broadest sense) drives improved performance and reduced OPEX
- With the right tools, the network becomes the solution, not the problem

ARISTA

14

IP SHOWCASE THEATRE
CURATED BY
VSF
VIDEO SERVICES FORUM
Thank You
Gerard Phillips, Arista Networks
gp@arista.com
+44 7949 106098
ARISTA
IP SHOWCASE THEATRE AT IBC – SEPT. 14-18, 2018