Routing Correlated Network Analytics

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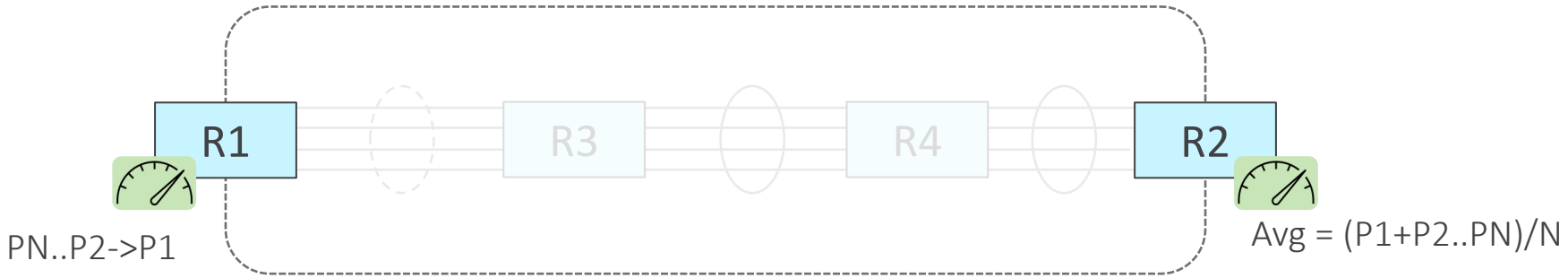
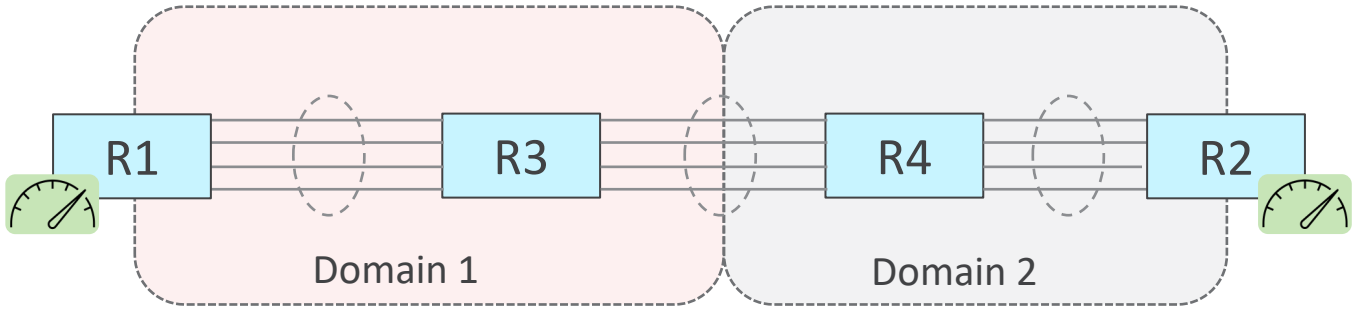
Network as Blackbox



- No Real Analytics
  - Computes average latency across all probes
  - Compares the Avg vs a statically configured threshold
  - Alert if Avg > threshold
  - Min, Max, Avg doesn't help analyzing issues
- Only dashboards with raw-data:
  - Plot everything along with threshold
  - 40k latency graph for 200 PE network
- Routing information absent

Network as Blackbox: There is so much missing



- What about the routing information and ECMP?
  - How many ECMP paths between R1 and R2?
  - End-to-End across multiple domains?
  - What is the expected latency of each ECMP path ?
  - What is Latency distribution across the ECMP paths?
  - How many ECMP are having issues ?
- What about (in)stability ?
  - How often does the topology and path changes?
  - What is the best ever topology (Topology*)?
  - What is the best ever latency of a given path?

Routing Correlated Analytics

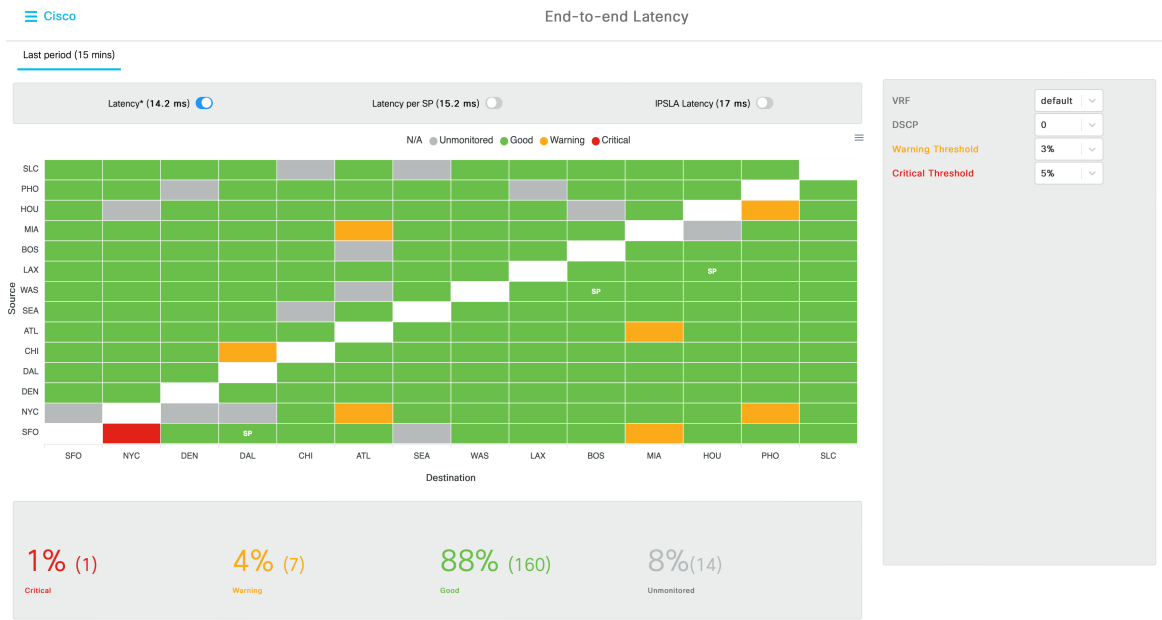
- Intelligent data
  - No point in plotting 40k graphs with latency
  - We process raw/brute data and correlate it with routing to obtain intelligent data
  - Automatically drawing your attention to what matters and only trigger an alert strictly when needed
  - Identify suspected troublemakers and trigger further troubleshooting
- Path Analyzer
  - Topology & Path history
  - The ECMP paths between R1 and R2: End-to-End across multiple domains
  - Expected Latency for each ECMP path
  - The best ever topology (Topology*)
  - The best ever latency of a given path
  - Latency distribution across the ECMP paths
  - Number of ECMP experiencing issues

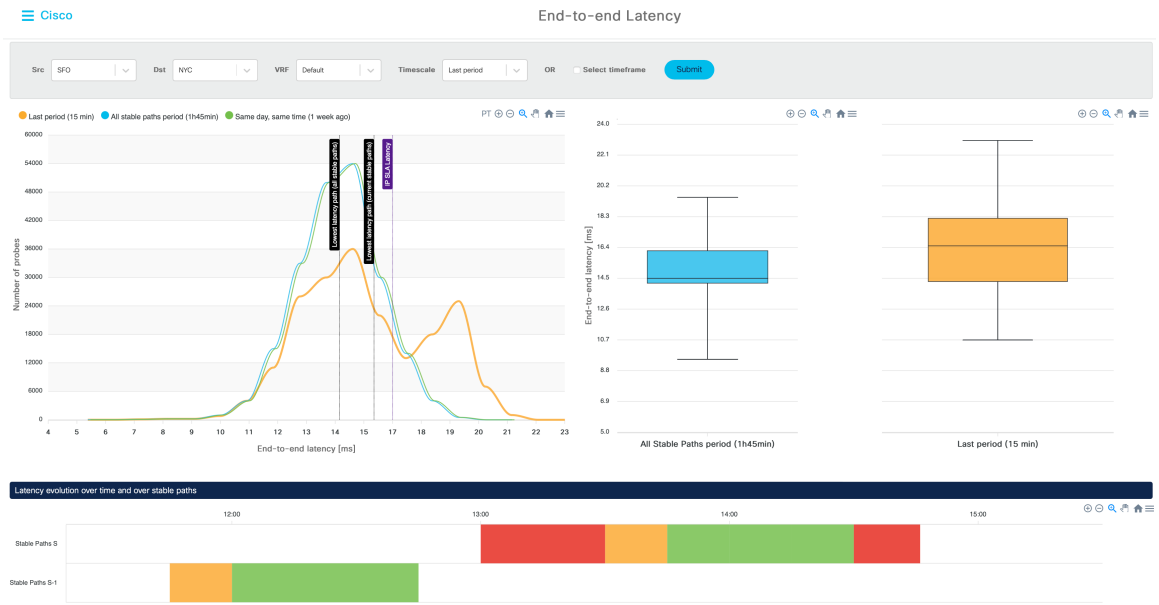
Latency Analytics

- 30-bin Latency histogram
  - All ECMP Path are measured
  - Latency distribution across ECMP Paths
  - Multimode detection (One/More ECMP with issues)
- Path Analyzer
  - Path Stability
  - List of ECMP Paths & Expected Latency
  - ECMP Paths experiencing issues
  - Latency distribution outliers
- Historical evolution of the latency
  - Per Stable Path & Across Stable Paths

Latency Analytics (cont.)

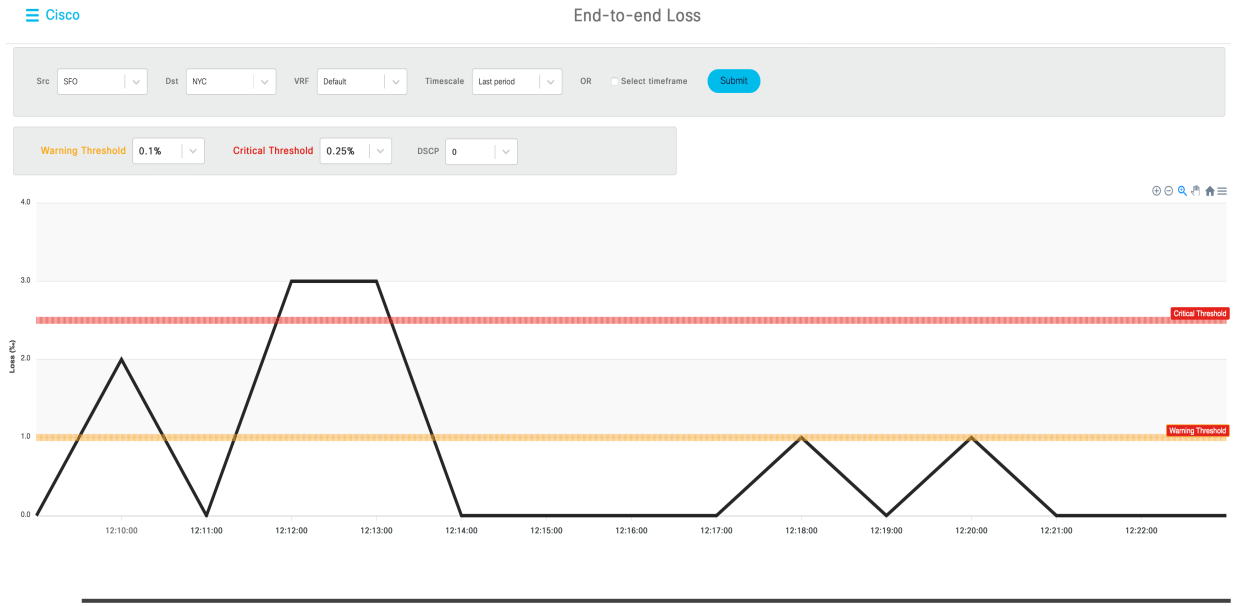
- Visualization
  - Intelligent data: drawing your attention to what matters
- Multi-level of details
  - Zoom in: detailed view between R1 and R2
  - Zoom out: network wide view

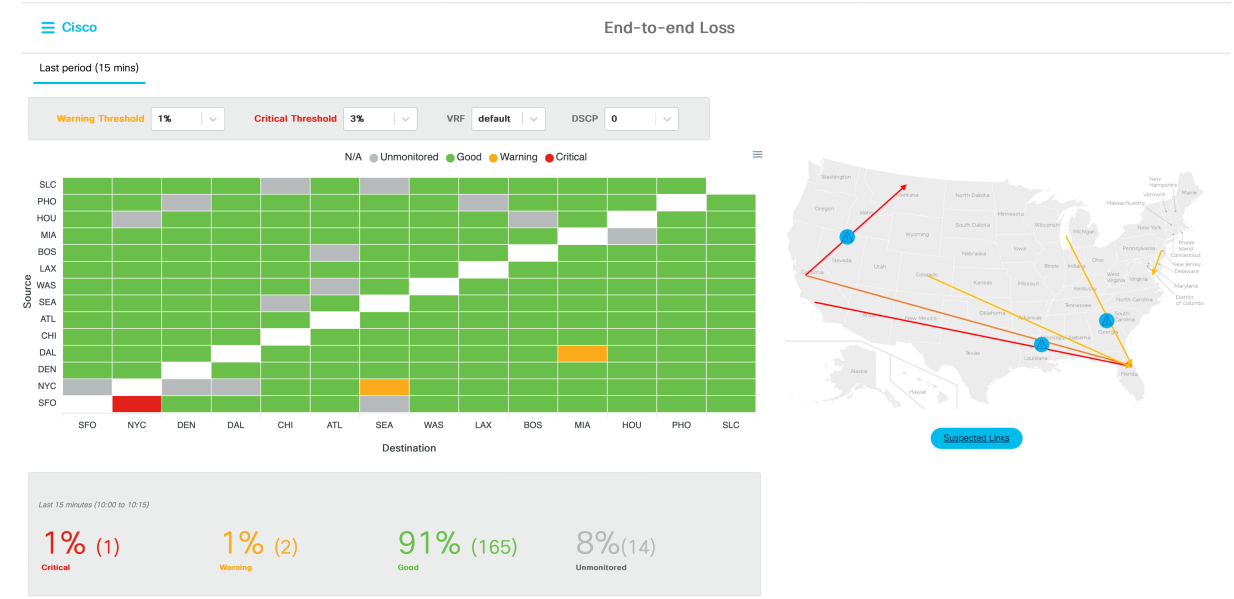




Loss Analytics

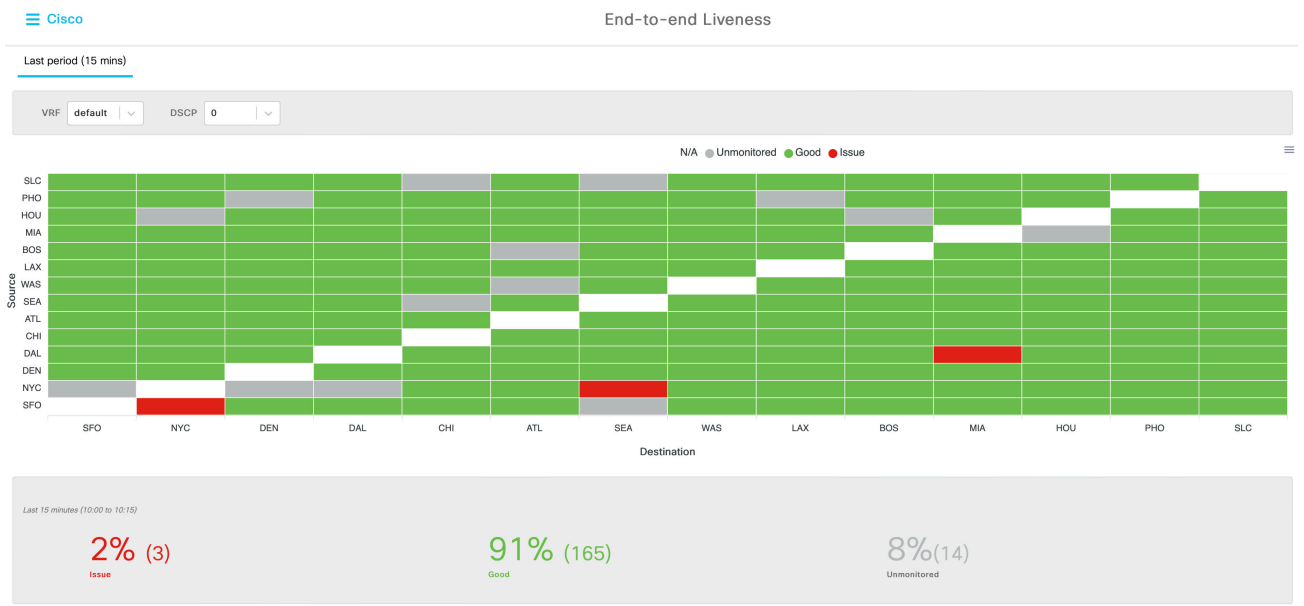
- Absolute Loss measurements
  - Alternate-Marking method
  - Every single packet loss is counted
  - All ECMP Paths are measured
- Identify suspected troublemakers (Links)
- Historical evolution of the Loss
  - Per Stable Path & Across Stable Paths
- Visualization: intelligent data





Liveness Analytics

- Across all ECMP Paths
- Feedback loop between Analytics and headend
  - Switchover to backup path, if liveness issue is detected
- Visualization: intelligent data



The bridge to possible