IETF 103 HotRFC
Network-wide Protocol Monitoring (NPM) Framework

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2018/11/04
What are the problems?

- **Network troubleshooting:**
  - Routing errors take about 48% of the total network issues (Internal stats)
  - Routing errors are the root causes for many data service failures
  - A healthy control plane is the premise of high-quality service provisioning

- **Network planning**
  - The need for real-time inter/intra domain route optimization
  - No effective route policy/configuration validation approach
  - Lacks route-traffic correlation insight
  - A real-time route monitoring, providing route-traffic correlation analysis and route policy validation, is the foundation of better network planning.

![Internal Statistics: control protocol failures take up about 48% of all network issues.](chart)

2016 Internal statistics: Network Failure Cause

- Protocol neighbor set up failure: 20%
- Protocol neighbor damping: 18%
- Protocol table issue: 14%
- Other: 6%

Traditional troubleshooting methods:
- Time-consuming (hours)
- Labor-consuming
- Data acquisition difficult
- Require OAM experience for operators

Issues, like route flapping, hard to localize
It’s all about the use cases...

• Network troubleshooting use cases:
  • ISIS Adjacency Set Up Failure
  • Route Oscillation
  • Route Loop
  • ISIS LSDB Synchronization Issue
  • Tunnel Set Up Failure

• Network planning use cases:
  • Route/Path Optimization
  • Route Policy Validation

• Comment appeal from the use cases
  • A "tunnel" for the control plane data export
  • Adequate protocol data collection
NPM Framework

• A Control Plane Telemetry Framework is needed!
• Things to be discussed
  • Use case and requirement:
    • Identifying valuable use cases
    • Identifying and summary data types to be collected
  • Gap analysis:
    • Existing methods comparison and selection
  • Framework:
    • Architecture and components of NMPS, messages exchanged between controller and devices, ...server, type/format definition, data encoding/export options...
  • Messages definition and procedures of PMP
  • PMP extensions for different control protocols
Thank you!

Catch us after the talk if you are interested!