

Toward a Network Telemetry Framework

[draft-song-ntf-00](#)

Haoyu Song

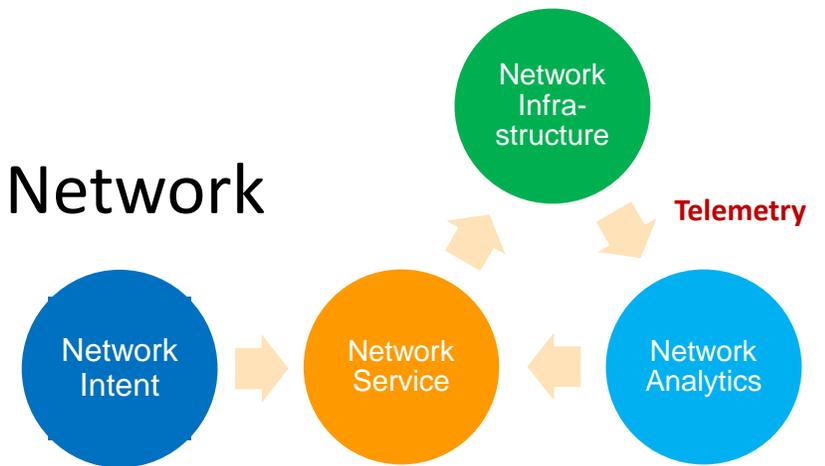
Contributors: Tianran Zhou, Zhenbin Li, Yunan Gu, James Guichard

What's Network Telemetry

- Telemetry's Greek roots:
 - Tele = Remote
 - Metron = Measure
- Techniques to gain network visibility, through network data collection for network analysis and measurement.
 - Conventional OAM techniques can be considered "telemetry"
 - But, new "telemetry" brings more new characteristics

Motivation

- Network evolves to become intent-driven and automatic
 - Reduce human labor
 - Improve agility and performance
 - Optimize resource efficiency
- Network visibility is key to realize Intent Driven Network
 - Telemetry should be promoted as a first class citizen in network technologies and protocols
 - Telemetry work should be better unified, consolidated, and integrated to support IDN



Current Situation

- Old OAM means are inefficient and insufficient to sustain IDN
 - SNMP is based on low frequent polling and CLI
 - Lack of coverage, timeliness, and accuracy
- Existing OAM mechanisms are scattered and unorganized
 - Piecemeal vertical solutions are hard to be composed into a cohesive one
 - Repetitive and redundant work, lack of collaboration and consolidation
 - Designed as afterthought patches and on a case-by-case basis, lack of holistic and systematic view
- A framework is needed to normalize the concepts, terms, and technology/standard developments

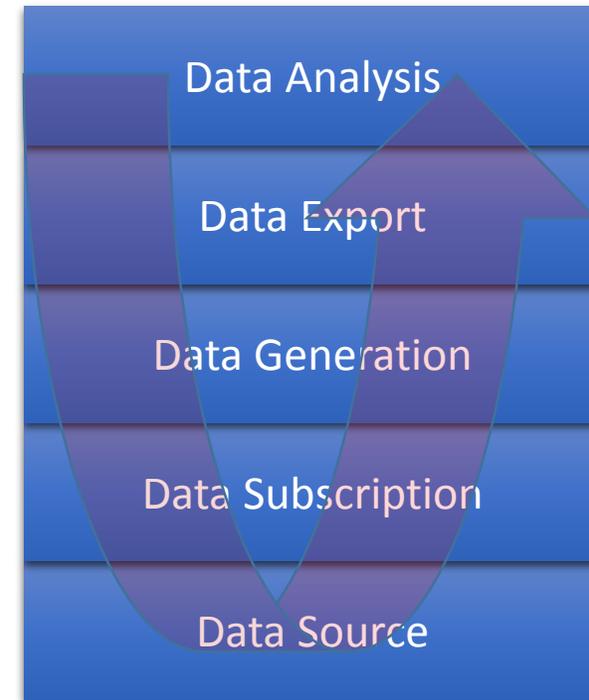
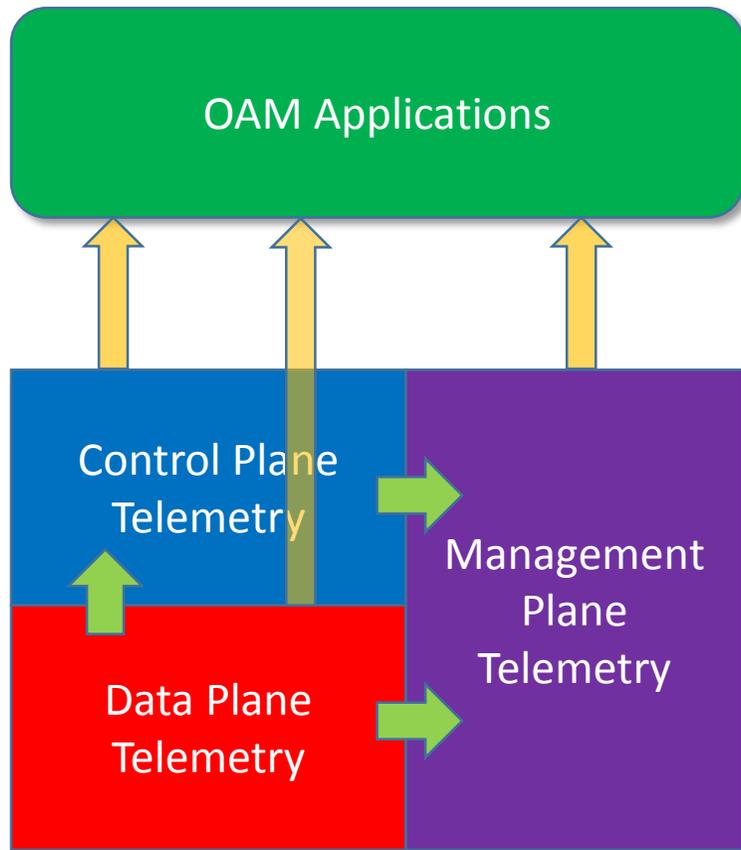
Telemetry Requirements

- Continuous monitoring and dynamic/interactive refining/refocusing
- Data fusion and correlation from multiple sources in one network node and throughout the network
- In-band measurement in addition to passive and active measurements
- Customized/preprocessed data is better than raw data
- Telemetry should not interfere with the device's main function

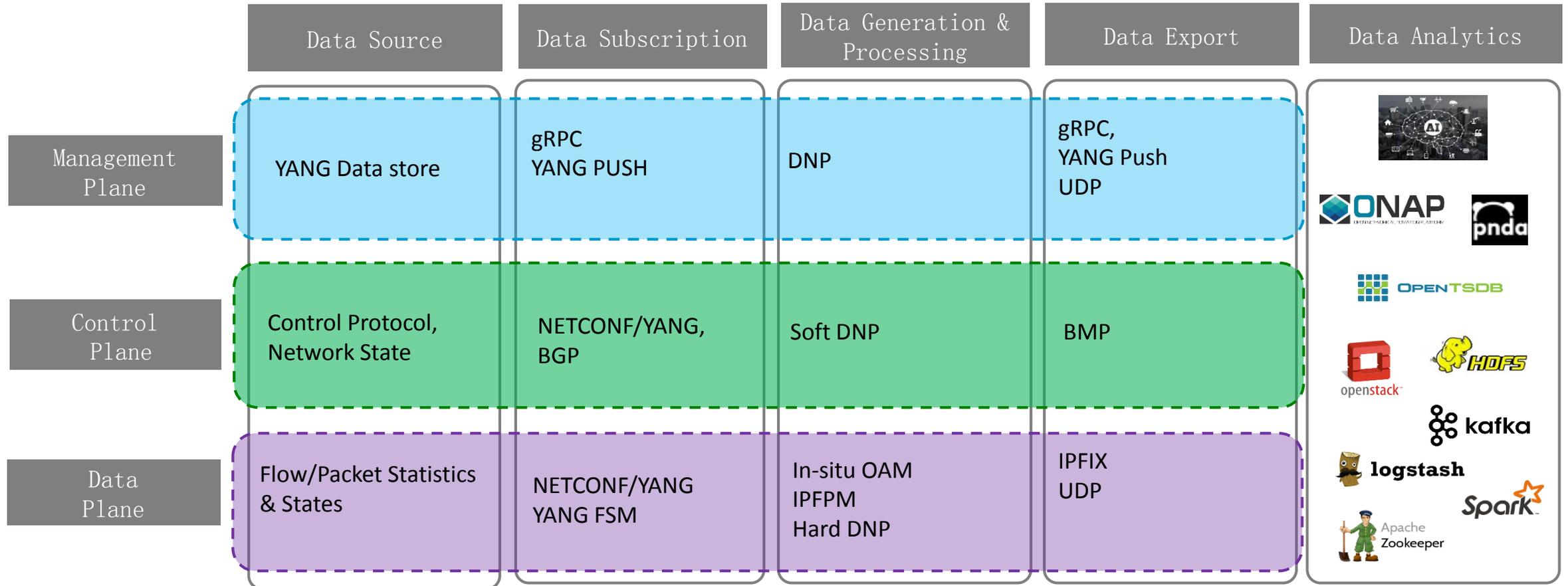
Telemetry Use Cases & New Characteristics

- Policy Compliance
- SLA Compliance
- Root Cause Analysis
- Failure Prediction
- Forwarding Optimization
 - Load Balancing & traffic engineering
- Performance Monitor
 - Micro-burst Detection
 - Packet Drop Detection
- Network Security
- Push based instead of poll based
- Streaming data, efficient encoding
- Model-based
- In-band data collection
- Custom and on-demand data
- Integrated with big data analytics or ML tools

Telemetry Categories and Components



Map Technologies into the Framework



Check out the technology/protocol details in the draft (<https://datatracker.ietf.org/doc/draft-song-ntf/>)

Recap & Conclusion

- Promote the significance of telemetry work in IETF
 - Keep the big picture in mind (IDN)
 - Make IETF the leading SDO in this area
- Formalize the telemetry-related terms and technology classification in IETF
 - Consolidate existing work
 - Guide future work
- Call for collaboration from operators and vendors