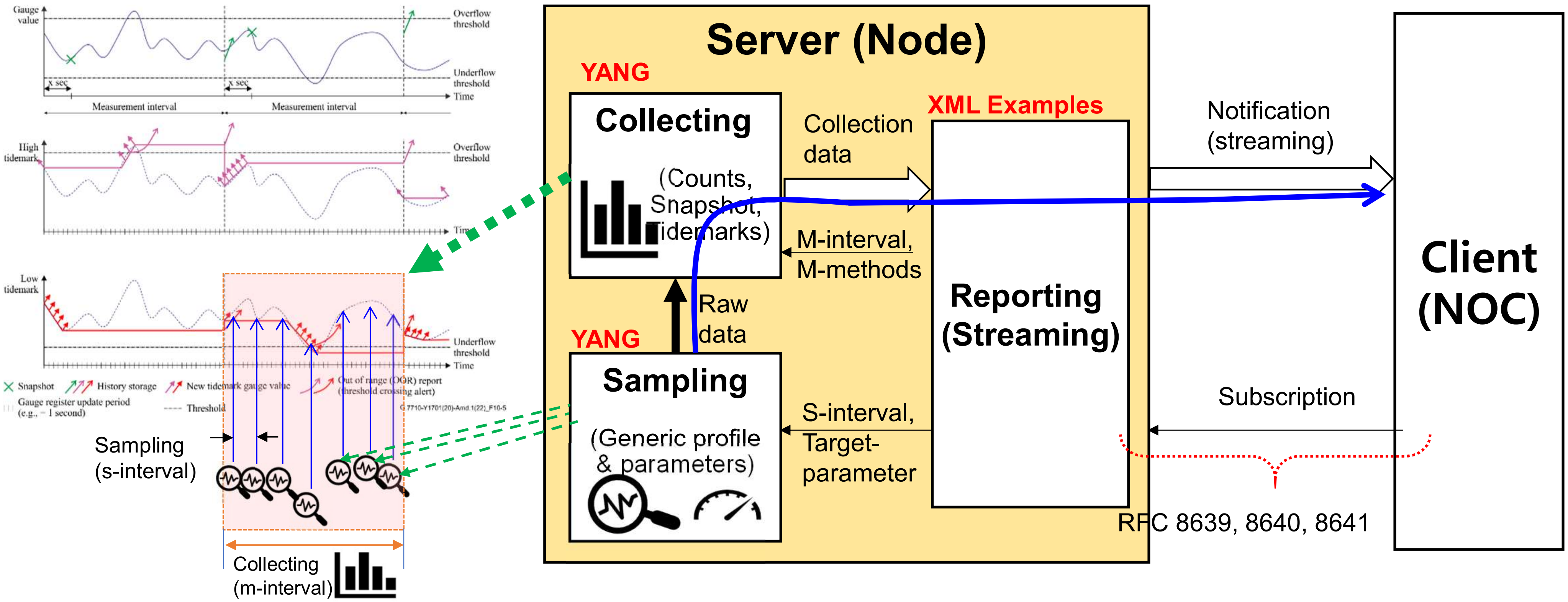
A YANG Data Model of Performance Management Streaming

(draft-yoon-ccamp-pm-streaming-02)

Bin Yeong Yoon

ETRI

Scope of the Document



Updates

- Update the pm-measurements YANG model
  - Introduce hierarchical measurement timing intervals - Including both sampling and measurement intervals
  - Suggest the naming of parameter profiles
    - (Example) itu-transport-qos-24hr
  - Refactor node names for readability and modularity
- Deprecate the pm-parameters YANG model
  - Focus on a generic PM measurements model for the current version, independent of specific PM parameters
- Update the supporting documentation to reflect changes of the YANG data models

Measurement Timing Intervals

```
+--rw pm-parameter* [name]
   +--rw name                    string
   +--rw sampling-interval* [id]
      +--rw id                   string
      +--rw interval-value?      uint32
      +--rw unit?                time-interval-unit
      +--rw measurement-interval* [id]
         +--rw id                string
         +--rw interval-value?   uint32
         +--rw unit?             time-interval-unit
         +--rw measurement-methods
```

- Sampling interval
  - Period at which network performance data is measured at consistent, predetermined time points for the continuous and timely capture of performance metrics
- Measurement interval
  - Duration over which sampled performance data is aggregated or statistically processed.

Client Type (parameter)	Sampling Interval	Measurement Interval	Measurement Methods	Purpose
NOC (ES)	1s	15min	tidemarks	Maintenance
		24hr	tidemarks	QoS
NOC (latency)	500ms	1min	counts	Delay spikes
		30min	counts	Recurring bursts
		24hr	counts	Trends
AI/ML Analytics System (ES)	1s	1min	tidemarks	Anomaly detect
		15min	tidemarks	Trend
		24hr	tidemarks	Model training
Digital Twin (pdv)	100ms	1min	counts	Synchronization
		5min	counts	Feedback loop
		1hr	counts	Learning model

Naming of Parameter Profiles

```
typedef profile-names {
  type string {
    pattern
      '[a-zA-Z][a-zA-Z0-9_-]*-[a-zA-Z][a-zA-Z0-9_-]*-
       [a-zA-Z][a-zA-Z0-9_-]*(-[a-zA-Z][a-zA-Z0-9_-]*)?';
  }
  description
    "Parameter profile name following the format:
     <source>-<network>-<purpose>[-<characteristic>]

     Where:
     - <source>: Standards body or organization
       (e.g., itu, ieee, ietf)
     - <network>: Network domain or layer
       (e.g., transport, access, core)
     - <purpose>: Intended use or function
       (e.g., maintenance, qos, availability)
     - <characteristic>: Optional qualifying information
       (e.g., 15min, 24hr, high-priority)
```

- Define a group of parameters with associated characteristics to enhance readability and support augmentation
  - Ex) Common transport profiles in G.7710
    - itu-transport-maintenance-15min
      - ES, SES, BBE, BBC, UAS
    - itu-transport-maintenance-24hr
      - ES, SES, BBE, BBC, UAS, PJE
    - itu-transport-qos-24hr
      - ES, SES, BBE, BBC, SEP, UAS

Updated Names of Nodes

```
module: ietf-pm-measurements
  +--rw pm-periodic-measurement
     +--rw pm-parameter* [parameter-name]
        +--rw parameter-name            identityref
        +--rw count-measurement
        |  +--ro count-value?                    uint32
        |  +--ro count-unit?                     parameter-unit
        |  +--rw transient-condition-config
        |  |  +--rw high-oor-threshold?    uint32
        |  |  +--rw low-oor-threshold?     uint32
        |  +--rw standing-condition-config
        |     +--rw standing-threshold?          uint32
        |     +--rw standing-reset-threshold?    uint32
        +--rw snapshot-measurement
        |  +--rw uniform-time?          uint32
        |  +--ro snapshot-value?        uint32
        |  +--ro snapshot-unit?         parameter-unit
        |  +--rw high-oor-threshold?    uint32
        |  +--rw low-oor-threshold?     uint32
        +--rw tidemark-measurement
           +--ro high-tide-value?       uint32
           +--ro high-tide-unit?        parameter-unit
           +--ro low-tide-value?        uint32
           +--ro low-tide-unit?         parameter-unit
           +--rw high-oor-threshold?    uint32
           +--rw low-oor-threshold?     uint32
```

Example

```
+--rw measurement-methods
   +--rw counts
   |  +--rw transient-condition-config
   |  |  +--rw high-threshold?    uint32
   |  |  +--rw low-threshold?     uint32
   |  +--rw standing-condition-config
   |  |  +--rw standing-threshold?    uint32
   |  |  +--rw reset-threshold?       uint32
   |  +--ro measurement-value?             uint32
   +--rw snapshot
   |  +--rw uniform-time-config
   |  |  +--rw interval-value?    uint32
   |  |  +--rw unit?              time-interval-unit
   |  +--rw threshold-config
   |  |  +--rw high-threshold?    uint32
   |  |  +--rw low-threshold?     uint32
   |  +--ro measurement-value?     uint32
   +--rw tidemarks
      +--rw threshold-config
      |  +--rw high-threshold?    uint32
      |  +--rw low-threshold?     uint32
      +--ro high-measurement-value?    uint32
      +--ro low-measurement-value?     uint32
```

Future Work

- Update the pm-measurements YANG module as a generic model
  - Designed to accommodate various performance profiles and parameters with flexible timing intervals.
- A technology-specific YANG model for PM transport streaming will be proposed
  - Customized for common transport network parameters and measurement methods based on ITU-T G.7710
- Welcome your comments
  - GitHub: https://github.com/binyeongyoon-ietf/ietf-pm-streaming