Per-Node Capabilities for Optimum Operational Data Collection

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IETF 113
Automation is as Good as ...

- The number of YANG models
- The toolchain
- The YANG models metadata
- The per-node capabilities
YANG-Push Notification Capabilities
[RFC9196]

• ietf-system-capabilities: provides a placeholder structure that can be used to discover YANG-related system capabilities for servers.
• ietf-notification-capabilities augments "ietf-system-capabilities" to specify capabilities related to "Subscription to YANG Notifications for Datastore Updates" (RFC 8641):
  – Max-nodes-per-update,
  – periodic-notifications-supported,
  – minimum-update-period,
  – supported-update-period,
  – on-change-supported,
  – minimum-dampening-period
This draft

• Provides some additional per-node capabilities for optimum operational data collection (as an extension to RFC9196)
• Provide 2 RPCs for simplified operations

• Disclaimer: draft not updated, waiting for feedback before updating
Suggested and computed observable-period

leaf suggested-observable-period {
    type uint64;
    units "nanoseconds";
    description
        "The suggested observable period for this node-selector. This value represents factory default suggested information, only available at implementation time."
};

leaf computed-observable-period {
    type uint64;
    units "nanoseconds";
    description
        "the computed observable period for this node-selector (and optimized-measurement-point). The system internally dynamically computes the suggested observable period (relevant for polling or streaming cadence) which can be greater-or-equal to the minimal-observable-period. Since this value is dynamic, this metadata is only available in a run time environment.";
}

- Different than the RFC9196 minimum-update-period
- Ex: FIB observable-period depends on the FIB size
In some server design, operational data are usually modeled/structured in a way that the relevant data are grouped together and reside together.

In most cases, it is more performant to fetch this data together than as individual leaves: data are structured together internally, grouped together, and therefore fetched together.
Corresponding-mib-oid

- The object identifier (OID) assigned to a SMIv2 definition, corresponding to the node-selector.
- Existing SNMP MIBs based automations can use this information to migrate to more analytics-ready YANG Modeled data.
Related-node

leaf related-node {
  type yang:node-instance-identifier;
  description
    "In case the node instance is an operational node then the
    associated node-instance-identifier represents the config
    leaf directly related to this operational node. In case the
    node instance is an config node then the associated
    node-instance-identifier represents the operational leaf
directly related to this configuration node. A typical
example is the relationship between the admin-status and
oper-status, which is impossible to detect automatically in
a non-NMDA environment or for non-openconfig YANG moduels.
The related-node SHOULD NOT reported for NMDA architectures
and openconfig YANG modules."
}

• For non NMDA, non openconfig: oper and config
• Ex: RFC7223  admin-status & oper-status
RPCs

rpcs:
  +---x get-measurement-metadata
    | +---w input
    | | +---w node-selector?  yang:node-instance-identifier
    | +--ro output
    |   +--ro optimized-measurement-point?  yang:node-instance-identifier {optimized-measurement-point-feature}?
    |   +--ro computed-observable-period?  uint64
    |   +--ro active-measurements* []
    |   +--ro subscribed-measurement-period?  uint64
  +---x get-system-node-capabilities
    +---w input
    | +---w node-selector?  yang:node-instance-identifier
    +--ro output
      +--ro node-selector-capability* []
        +--ro node?  yang:node-instance-identifier
        +--ro suggested-observable-period?  uint64
        +--ro optimized-measurement-point? empty {optimized-measurement-point-feature}?
        +--ro corresponding-mib-oid?  yang:object-identifier-128
        +--ro related-node?  yang:node-instance-identifier
Open Issues

• "related-node" should be split into two: "related-config-node" and "related-state-node"?
• Explain how to use the RPC from the client side, along with the different options.
• Expand on the active measurement use case
Feedback

• Do you recognize the problem statement?
• Which objects are relevant to you?

• Ask:
  – Read the draft
  – Provide feedback
  – Let’s work on it, or forget about it