YANG Updating and Versioning impact on IEEE 802.1

Scott Mansfield (Ericsson)

IEEE 802.1 YANGsters

- https://1.ieee802.org/yangsters/
- Has some guidelines to help ensure consistency when creating YANG modules for IEEE 802.1
  - https://1.ieee802.org/yangsters/yangsters-guidelines/

- This presentation looks at the latest work in the IETF on versioning and module updating

References

- RFC 7950 Section 11
  - https://datatracker.ietf.org/doc/html/rfc7950#section-11
- RFC 8407 Section 4.27
  - https://datatracker.ietf.org/doc/html/rfc8407#section-4.27
- YANG Module Versioning Requirements
  - https://datatracker.ietf.org/doc/html/draft-ietf-netmod-yang-versioning-reqs

Review of RFC 7950 Section 11

- What must NOT be changed
  - Module Name or namespace
  - Obsolete definitions MUST NOT be removed
- If semantics change, then a new object (leaf, list etc...) must be added
- Don't reorder data definition statements
  - data definition statement: A statement that defines new data nodes. One of "container", "leaf", "leaf-list", "list", "choice", "case", "augment", "uses", "anydata", and "anyxml".

status statement

- current
  - current and valid
- deprecated
  - obsolete but permits new/continued usage
- obsolete
  - should not be used, can be removed from implementations
    - but... the data definition statement must not be removed from the module

RFC 7950 list of allowed changes

- An "enumeration" type may have new enums added, provided the old enums's values do not change.

- A "bits" type may have new bits added, provided the old bit positions do not change.

- A "range", "length", or "pattern" statement may expand the allowed value space.

- A "default" statement may be added to a leaf that does not have a default value (either directly or indirectly through its type).

- A "units" statement may be added.

- A "reference" statement may be added or updated.

- A "must" statement may be removed or its constraint relaxed.

- A "when" statement may be removed or its constraint relaxed.

- A "mandatory" statement may be removed or changed from "true" to "false".

- A "min-elements" statement may be removed, or changed to require fewer elements.

- A "max-elements" statement may be removed, or changed to allow more elements.

- A "description" statement may be added or changed without changing the semantics of the definition.

- A "base" statement may be added to an "identity" statement.

- A "base" statement may be removed from an "identityref" type, provided there is at least one "base" statement left.

- New typedefs, groupings, rpcs, notifications, extensions, features, and identities may be added.

- New data definition statements may be added if they do not add mandatory nodes (Section 3) to existing nodes or at the top level in a module or submodule, or if they are conditionally dependent on a new feature.

- A new "case" statement may be added.

- A node that represented state data may be changed to represent configuration, provided it is not mandatory (Section 3).

- An "if-feature" statement may be removed, provided its node is not mandatory (Section 3).

- A "status" statement may be added, or changed from "current" to "deprecated" or "obsolete", or changed from "deprecated" to "obsolete".

- A "type" statement may be replaced with another "type" statement that does not change the syntax or semantics of the type.

- Any set of data definition nodes may be replaced with another set of syntactically and semantically equivalent nodes.

- A module may be split into a set of submodules or a submodule may be removed, provided the definitions in the module do not change in any way other than those allowed here.

- The "prefix" statement may be changed, provided all local uses of the prefix are also changed.

draft-ietf-netmod-yang-versioning-reqs

- Provides new guidance and describes some problems when modifying modules

- Provides guidelines and new mechanisms to indicate how backwards-compatible a YANG module is

- Some modules are not backwards compatible

Example Diffs

- https://github.com/YangModels/yang/commit/913ba431596a88e5d25267522d92c9d30cb84c69#diff-71afc089b10d34938374690dcbe8d66418996db2791604e56328e50609db38b6
- bridge module Qrev – Pub
  - 450c444,446
    ```
    <          when "../../bridge-type != 'two-port-mac-relay-bridge'" {
    ---
    >          when
    >            "not(derived-from-or-self(../../bridge-type, "+
    >            "'two-port-mac-relay-bridge'))" {
    ```
- Changes that need discussion
  - Changing the key of a list (may require a new object)
  - Changing from string to leafref
  - Pretty printing --- shouldn't cause a NBC, but may violate the 7950 rule about reordering statements