Module Versioning: Imports

IETF NETMOD Interim
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Introduction

Two issues related to versioning and imports:
1) Impact of NBC changes on imports. Do we need import by revision-or-derived-compatible?
   
   - [https://github.com/netmod-wg/yang-ver-dt/issues/75](https://github.com/netmod-wg/yang-ver-dt/issues/75)

2) Impact of changing an import statement -> BC or NBC?
   
Impact of NBC changes on imports

- Import sub-statement extension “revision-or-derived” was introduced in module-versioning to alleviate the restrictions of import by date. It reduces the set of importable revisions to those which are derived from a particular revision.

- Consider module A (1.0.0) which imports module B using “2.0.0 or derived” and that there is no revision-label with MAJOR version > 2. This means A will be importing rev 2.Y.Z of module B.

- If new revision 3.0.0 of module B is created (NBC changes), module A may end up importing 3.0.0 and this could break clients using module A. It’s also possible module A does not want the changes made in 3.0.0 of module B.

- Should we also have another extension “revision-or-derived-compatible” to limit the import set to BC revisions? e.g “2.0.0 or derived compatible” would limit the imported version to 2.Y.Z, 3.0.0 would NOT be a candidate. Note that this would be done by looking at the revision history: revisions after 2.0.0 which are marked NBC via the rev:nbc-changes extension would be excluded.
Reminder on import

RFC7950:
import module-b {
  revision-date 2018-04-02; // specific revision
}

draft-ietf-netmod-module-versioning:
import module-b {
  revision-or-derived 2.0.0; // revision 2.0.0 or any descendent
}

What we are considering:
import module-b {
  revision-or-derived-compatible 2.0.0; // revision 2.0.0 or any descendent compatible with 2.0.0
}
Example 1: obsoleting if-index from ietf-interfaces

- Consider scenario where if-index is deprecated and eventually obsoleted. Adding the obsolete status is an NBC change, and ietf-interfaces would e.g. go from version 2.x.y to 3.0.0
- With "revision-or-derived 2.0.0", all importing modules would be able to import the new version automatically
- With "revision-or-derived-compatible 2.0.0", all importing modules would be stuck importing 2.x.y. They would need to be modified to be able to import 3.0.0
Example 2: changing a type in an imported module

- Module B 2.0.0 has a grouping containing node \textit{vpn-id} as an \textit{integer}. Module A uses that grouping.

- In 3.0.0 of module B, \textit{vpn-id} is modified to be a \textit{string}

- Some servers/implementations may want to keep \textit{vpn-id} as \textit{integer} while others may desire the new \textit{string} definition

- With \textit{"revision-or-derived 2.0.0"}, all importing modules would get the new definition

- With \textit{"revision-or-derived-compatible 2.0.0"}, all importing modules would keep the old definition

- Both statements are useful. Module A could be branched accordingly.
Pros

- No accidental breakage to an importing module due to an NBC change in an imported module i.e. the owner of an importing module has control.
- We know exactly what major version is being used and the impact of changing the major version is clear.
- Can be used for reactive repair of including module if newer version of included module breaks the including module (e.g. grouping removed) or is not desired.

Cons

- If import of an NBC revision is desired, this requires modification of many importing modules. This is similar to import by date.
- Do not automatically get NBC fixes made to imported modules.
- Potentially confusing to have 2 flavours of the import by derived substatement. Module owners may pick one not fully understanding the implications.
Impact of changing import stmt

- Consider module A (1.0.0) which imports module B using “2.0.0 or derived” and that there are revision-labels with MAJOR version 2 and 3. This means A will import rev 2.Y.Z or 3.Y.Z of module B.
- If module A is modified to importing module B using “3.0.0 or derived”, is this a BC or NBC change?
- **Authors/contributors believe that a change to an import statement should always considered to be a BC change to the importing module.**
- The revision label of a module represents the schema defined in *that module*.
- Clients know all the module versions in the schema (via YANG packages or YANG Library). The NBC change in module B is reported in the schema, no need to also change the version of module A
- The revision-label of the corresponding YANG package is updated according to the impact on the package’s schema.
Impact of changing import stmt (other option considered)

- We also considered changing the version of module A depending on the BC/NBC impact but have the following concerns:
  - Potential ripple effect, e.g. if module A includes module B which includes C etc etc, changing one import statement at the bottom could lead to many modules having their version updated to reflect NBC change.
  - There is no need to reflect the NBC change on including modules since clients have to look at the whole schema