

# **YANG Versioning and Semver: Its impact on you**

**Authors of YANG Versioning drafts (NETMOD WG)**

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**Presenting on behalf of the weekly versioning call attendees:  
Jason Sterne, Joe Clarke, Rob Wilton, Reshad Rahman**

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# YANG Versioning and Semver – What is it?

## Changes to YANG module update rules and documentation

- Non-backwards-compatible (NBC) changes are allowed (still encouraged to be minimized)
- Changing **status** to **obsolete** is non-backwards-compatible (NBC)
- New extension statements to:
  - Indicate revisions with NBC changes
  - Use a SemVer-like version
  - Give guidance for revision selection for imports
- New YANG filename format

# YANG Versioning and Semver – What is it?

Key drafts (expected in IETF Last Call soon):

1. Updated YANG Module Revision Handling ([draft-ietf-netmod-yang-module-versioning](#))
2. YANG Semver ([draft-ietf-netmod-yang-semver](#))
3. YANG module file name convention ([draft-ietf-netmod-yang-module-filename](#))

Also see: [draft-ietf-netmod-yang-versioning-reqs](#)

# YANG Versioning & Semver – Why?

Non-backwards-compatible changes are already happening in IETF.

NBC changes are sometimes necessary. Current rules make it impossible.

The Industry has already been moving forward with a similar approach (e.g. in OpenConfig).

Help IETF move faster with YANG models.

# What YANG authors need to do

## Checklist:

- Continue to minimize NBC changes, but allow them if needed
  
- Add **rev:non-backwards-compatible**; to the revision if there are NBC changes
  - <https://www.ietf.org/archive/id/draft-ietf-netmod-yang-module-versioning-15.html#name-backwards-compatible-rules>
  
- Add a YANG Semver (e.g. **yvs:version 1.1.0**;) to all revision statements
  - <https://www.ietf.org/archive/id/draft-ietf-netmod-yang-semver-24.html#name-semantic-versioning-scheme>
  
- Add **yvs:recommended-min-version/date** to imports where appropriate
  - <https://www.ietf.org/archive/id/draft-ietf-netmod-yang-semver-24.html#name-the-recommended-min-version>
  - If an imported module has a recommended-min-version, use it; else use recommended-min-date
  - <https://www.ietf.org/archive/id/draft-ietf-netmod-yang-module-versioning-15.html#name-recommending-a-minimum-revi>

# Examples where NBC changes are needed

Bug fixes, for example:

- Correcting a typedef to fix a range, length or pattern
- Spelling mistake in an enum, container, leaf

... particularly where client impact is low or module is changed to reflect current server behavior.

Evolution of functionality where avoiding an NBC change would make a badly convoluted or confusing data model, or ambiguity that could lead to interoperability issues across implementations

A few example cases where the IETF considered or needed NBC changes:

- RFC6991 (was debated for IP Addresses, related to zones)
- L3VPN service delivery [RFC8049] updated in a non-backwards-compatible way by [RFC8299] based on implementation

# Tooling updates for YANG Versioning

- **Xym**: Extraction of YANG modules with YANG Semver filenames (i.e., ietf-foo#1.2.3.yang) [**DONE**]
- **Pyang**: YANG Semver check and enforcement of version on latest revision [**Code complete; not yet pushed upstream**]

```
pyang --ietf ietf-yp-lite-capabilities@2024-11-11.yang
```

```
ietf-yp-lite-capabilities@2024-11-11.yang:49: warning: RFC XXXX: 6.1: The latest revision is missing a YANG Semver statement (see pyang --ietf-help for details).
```

```
pyang --ietf ietf-yp-lite-capabilities@2024-11-11.yang
```

```
ietf-yp-lite-capabilities@2024-11-11.yang:57: error: bad value "1.1.a" (should be yang-semver)
```

- **Rfcstrip**: Extraction of YANG modules with YANG Semver filenames [**Code complete; not yet pushed upstream**]

- **Libyang**: Validation of version and non-backwards-compatible extensions [**WIP PR in GitHub**]

```
libyang err : Ext plugin "ly2 ietf-yang-semver v1": Extension ysv:version has invalid semantic version format: 1.4 (/ietf-yp-lite-capabilities:{extension='ysv:version'}/1.4)
```

```
libyang err : Ext plugin "ly2 ietf-yang-revisions v1": Extension rev:recommended-min-date has invalid revision-date format: 2025-13-01 (expected YYYY-MM-DD) (/ietf-yp-lite-capabilities:{extension='rev:recommended-min-date'}/2025-13-01)
```

# IANA Considerations

For IANA-maintained modules: follow the same versioning scheme as the rest of the IETF.

IANA considerations section may need updates (YANG doctors to discuss).

Document needed with guidance for IANA YANG Module maintainers (“how to” related to various YANG versioning scenarios)

May create some simple dedicated tooling for IANA YANG authors to use (e.g. to identify NBC changes, help guide which YANG Semver to use, etc)

# BACKUP

# New extension – NBC indicator

**rev:non-backwards-compatible** extension statement

- indicate YANG module revisions that contain NBC changes

Example:

```
revision 2017-04-20 {  
  description "Rename 'foo' to 'bar'";  
  rev:non-backwards-compatible;  
}
```

# New extension – YANG Semantic Version

## **yvs:version** extension statement

- YANG Semantic Version
- Conveys additional information over a revision date

Format = X.Y.Z = <Major>.<Minor>.<Patch>

Major = NBC change (e.g. move a leaf into a different container)

Minor = Backwards compatible changes (e.g. adding a new leaf)

Patch = Editorial changes (e.g. correct a spelling mistake in a description)

## Example:

```
revision 2017-04-03 {  
  description "Add new functionality, leaf 'foo'";  
  yvs:version 1.1.0;  
}
```

There is also an optional `_COMPAT` suffix (X.Y.Z\_COMPAT, e.g. `yvs:version 1.2.1_non_compatible`) but that is for branched YANG module development and would be very rare in IETF modules.

# New extension – Import version guidance

## **rev:recommended-min-date/version** extension statement

- Guidance for revision selection for imports
- Only a recommendation. Not binding.
- Helpful for users of modules (server implementors, package authors)

## Example:

```
import example-module {  
    ysv:recommended-min-version 3.0.0;  
}
```

# New filename format

Optional new filename format:

```
current:    acme-router-module@2024-05-15.yang  
new:        acme-router-module#2.0.3.yang
```