Semantic versioning, structure for IETF specs, and evolving IETF outputs

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OPSAWG IETF 99
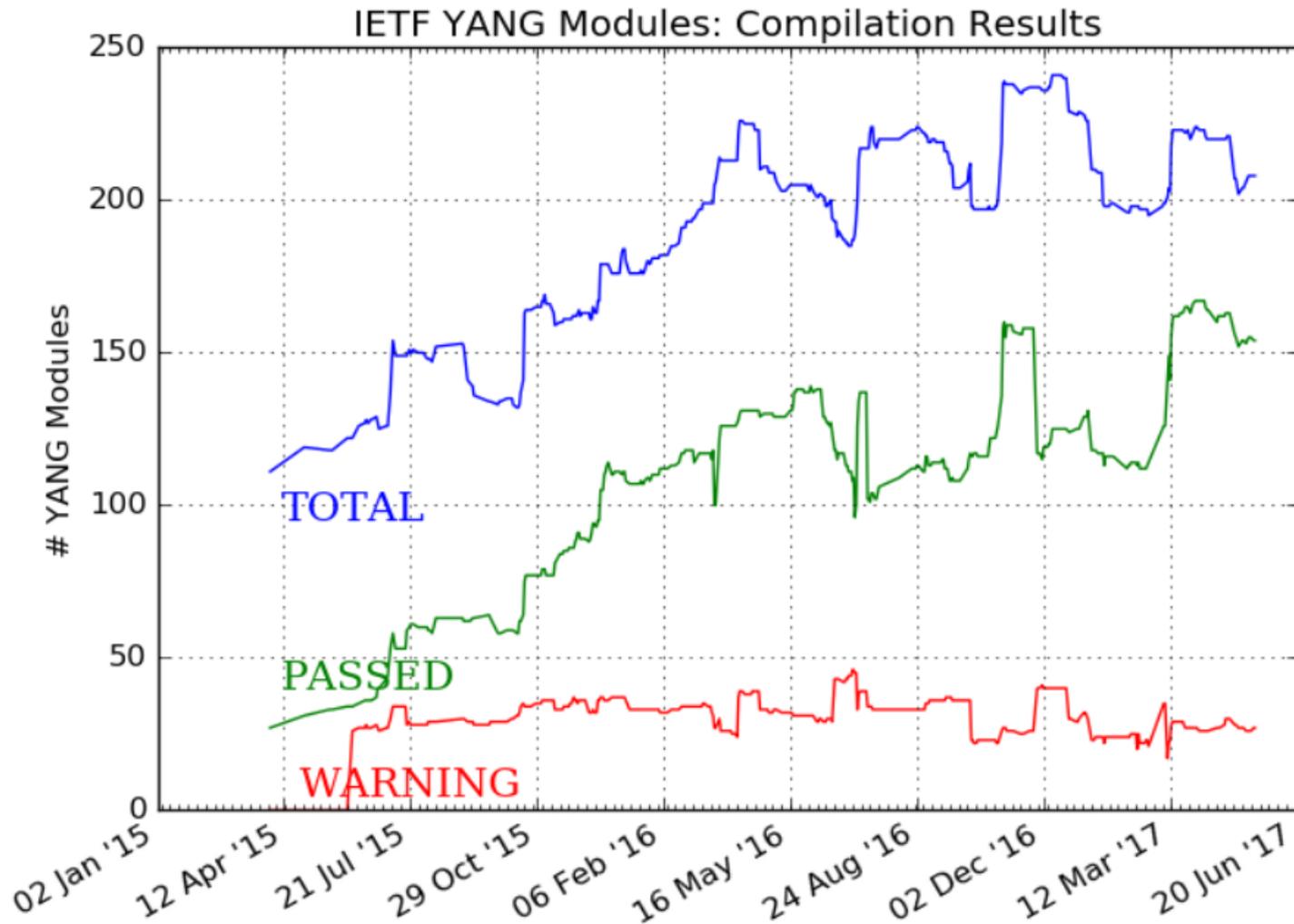
Data Modeling-driven Management (YANG, NETCONF, RESTCONF, etc…) in the Industry and the IETF. Observations and next steps for the IETF!
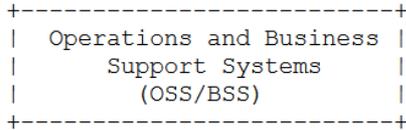
Benoît, IESG Retreat

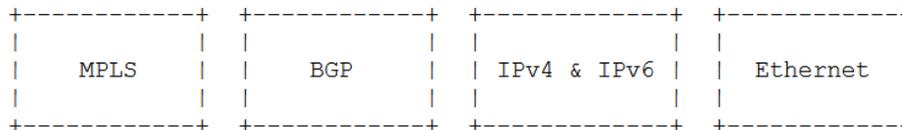May 19th 2017

IETF: YANG Models Growth

IETF YANG Modules: Compilation Results

YANG Tsunami in the Industry

SDOs Alignement and Trajectory

```
+-------------------------+
|  Operations and Business |
|     Support Systems      |
|        (OSS/BSS)         |
+-------------------------+

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Network Service YANG data models

+------------+    +------------+    +------------+
|            |    |            |    |            |
|  - VPWS    |    |  - VPLS    |    |   L3VPN    |
|  - L2VPN   |    |  - L2VPN   |    |            |
|            |    |            |    |            |
+------------+    +------------+    +------------+

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Network Element YANG data models

+------------+  +------------+  +------------+  +------------+
|            |  |            |  |            |  |            |
|   MPLS     |  |    BGP     |  | IPv4 & IPv6|  |  Ethernet  |
|            |  |            |  |            |  |            |
+------------+  +------------+  +------------+  +------------+
```

Numbers

- IETF YANG modules
  - Total from RFC: 43
  - Total in drafts: 208
    - Correctly validates: 154
- Number of YANG data models in my VM
  - Total : 6908
  - Duplicates removed: 2128
  - Operational removed: 1999
  - Vendors removed: 736

- This is not an IETF problem any longer

Success?

- Data modeling driven management => YES
- Protocol (NETCONF/RESTCONF) => YES
- Encoding (XML, JSON) => YES
- Data Models => Still need some industry coordination

Automation is as good as your data models, your toolchain, and the data model metadata

Tools Development During Hackathon

- Validation
- YANG DB Search
- Dependency
- Impact Analys
- Regex Validation
- GUI
- API Generation

Yangcatalog.org

Ask for github for "others", but what about the IETF?

YANG Model Development in the IETF

- The way we deal with YANG models in the IETF is ...
- Select from:
  - Inappropriate?
  - Not efficient?
  - Old fashion?
  - Stupid?

Select your answer(s)

Some Thoughts

- Should the IETF adapt? Yes
  - Github based
  - Semantic versioning (semver.org)
  - Still produce RFCs at key points
- More like openconfig
- "game changer for the IETF. Each day you don't do it, you're closer to the grave": quoting an operator
- NETMOD/NETCONF (kind of) working with github
- Ex: L3SM RFC 8049 YANG Data Model for L3VPN Service Delivery
  - Working on the RFC8049bis: update the YANG model only

Semantic Versioning and Structure for IETF Specifications

- draft-claise-semver-00
- Internet-Drafts are a poor fit for working groups that want to produce structured specifications (ex: YANG)
- This document outlines recommendations for how working groups can provide semantic versioning for, and work directly on, structured documents while still fitting within established IETF processes.

The Idea

- The IETF will maintain a Github organization for tracking YANG modules /structured specification

- One repository per document

- Structure for semantic version: MAJOR.MINOR.PATCH
  - MAJOR is incremented when the new version of the specification is incompatible with previous versions. = OBSOLETE
  - MINOR is incremented when new functionality is added in a manner that is backward-compatible with previous versions. = UPDATES
  - PATCH is incremented when bug fixes are made in a backward- compatible manner. = RFC ERRATA

The Idea

- It can be useful to mark certain versions of a work in progress as checkpoints, e.g., for reference at a hackathon.

- These checkpoints should follow their own version sequence, much like Internet drafts:
  - LABEL-VERSION
  - o LABEL is a string that identifies the feature branch
  - o VERSION is incremented whenever a new revision is tagged

Some Feedback Received Already

- Now, the default path for MINOR follows that of MAJOR, unless the AD approves a WG consensus-only minor version increment.

- The AD has no say if there are substantive changes to the security considerations or additional IANA actions. In those cases, a new I-D must be proposed.

- This new text is in GH, but has not made it into another published draft.

Example

```
...
|
* e3091df (tag:v1.0.0, tag:draft-ietf-wg-proto-02, tag:RFCXXX1)
|         Responses to IESG comments
|
* 7494725 (tag:draft-ietf-wg-proto-01) Responses to IETF LC comments
|
* 8e2be54 (tag:proto-2, tag:draft-ietf-wg-proto-00)
|         Responses to WGLC comments
|
* 9703a60 (tag:proto-1) Responses to comments at IETF meeting
|
* 2b83977 Responses to J. Smith comments
|
* 8b75e1e (tag:proto-0) Responses to BoF comments
|
* 1991498 Initial submission
```

```
...
|
*    a5f3214 (tag:v1.2.0) Merge branch 'v1.2'
|\
| * 8fb9cb6 Responses to WGLC comments on feature Y
| |
| * 39322e9 (tag:featureY-1) Responses to WG comments; ready for WGLC
| |
| * 39322e9 Add feature Y
|/
*    d1d201d (tag:v1.1.1) Fix validation errors
|
*    6571483 (tag:v1.1.0, tag:draft-ietf-wg-proto-feature-04,
|            tag:RFCXXX2) Merge branch 'v1.1'
|\
| * abc3f5e (tag:draft-ietf-wg-proto-feature-03) Resolution of DISCUSSes
| |          from Security AD
| |
| * 3ab54f3 (tag:draft-ietf-wg-proto-feature-02) Resolution of DISCUSSes
| |          from Internet and Transport ADs
| |
| * cabb1f6 (tag:draft-ietf-wg-proto-feature-01) Responses to WGLC
| |          and IETF LC comments on feature X
| |
| * fbfaa6b (tag:featureX-0, tag:draft-ietf-wg-proto-feature-00)
| |          Responses to comments on feature X
| |
| * 0630638 Add feature X
|/
* e3091df (tag:v1.0.0, tag:draft-ietf-wg-proto-02, tag:RFCXXX1)
|          Responses to IESG comments
|
...
```

Next Steps

- NETCONF/NETMOD experiment
  - Discussed with the chairs => positive feedback.
- Would require some tooling,
  - Create drafts out of models
- Could create the models metadata (for the catalog) directly in github

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