

# YANG Current State of Affairs

Benoit Claise

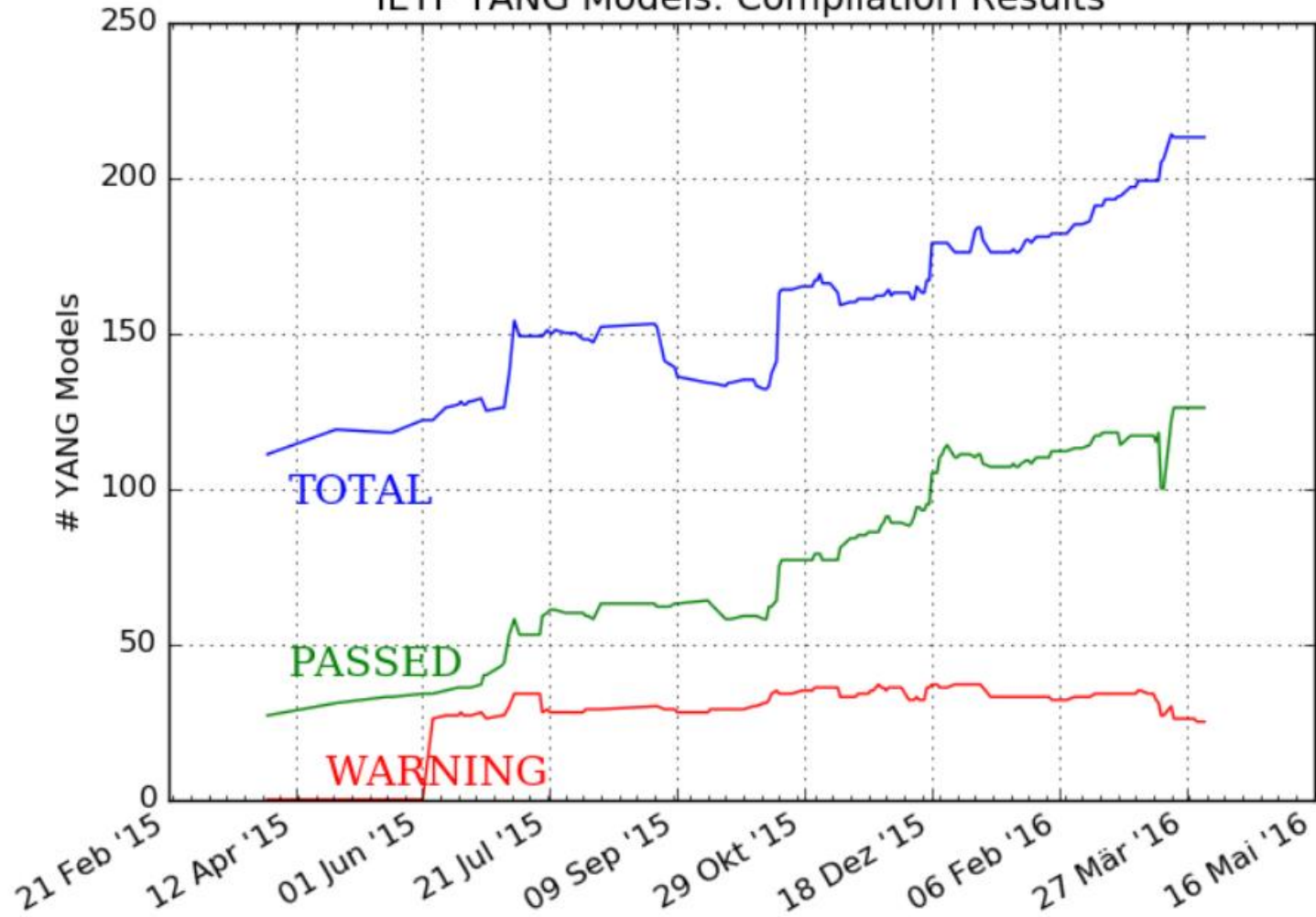
IETF 95, Buenos Aires

Apr 2016

# Information Modelling Workshop

- ETSI NFV organized
- Participants from 3GPP, ATIS, Broadband Forum, DMTF, ETSI NFV, IETF, ITU-T SG15, MEF, OASIS/TOSCA, Open Cloud Connect, ONF, OpenDaylight, OPNFV and TM-Forum.
- The goal was to collaborate on the information model and data model in this SDN and NFV world.
- Explained: IETF, YANG, information model versus data model, data model driven management
- Presentations [here](#).

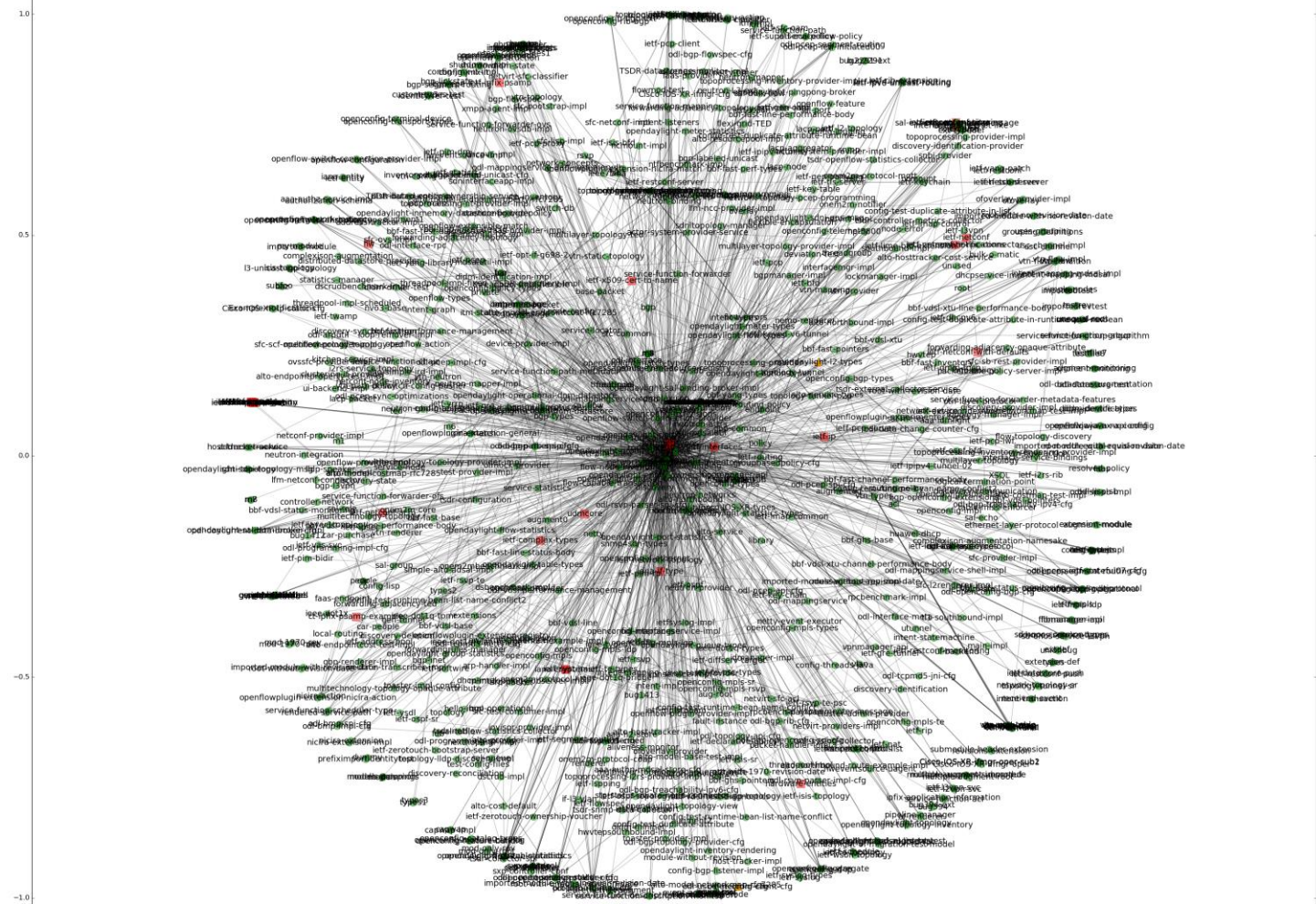
# IETF YANG Models: Compilation Results



# SDOs/Opensource

- Next to IETF ...
- BBF: about 140 YANG data models
- IEEE
  - NEW: [IEEE 802.3 Ethernet YANG Data Model\(s\) Study Group](#)
- MEF
- Openconfig
- OpenDaylight

<http://www.claise.be/2016/03/ietf-yang-modules-statistiques/>



# YANG at the IETF

- Many data models
  - ⇒ As foreseen
  - ⇒ Nice graphs
  - ⇒ YANG Model Coordination Group helping
  - ⇒ Improved tooling
  - ⇒ Passing compilation
- **HOWEVER, no published YANG data models for some time**

# YANG in the IETF: bottlenecks/priorities

- How to consistently model the operation status?
  - ⇒ Operational State
- How to structure all those models?
  - Ex: the logical and virtual resource representations
  - ⇒ “mount” solution, a mechanism to combine YANG modules into the schema defined in other YANG modules

**This should be our top priorities**

# Tools and Hackathon

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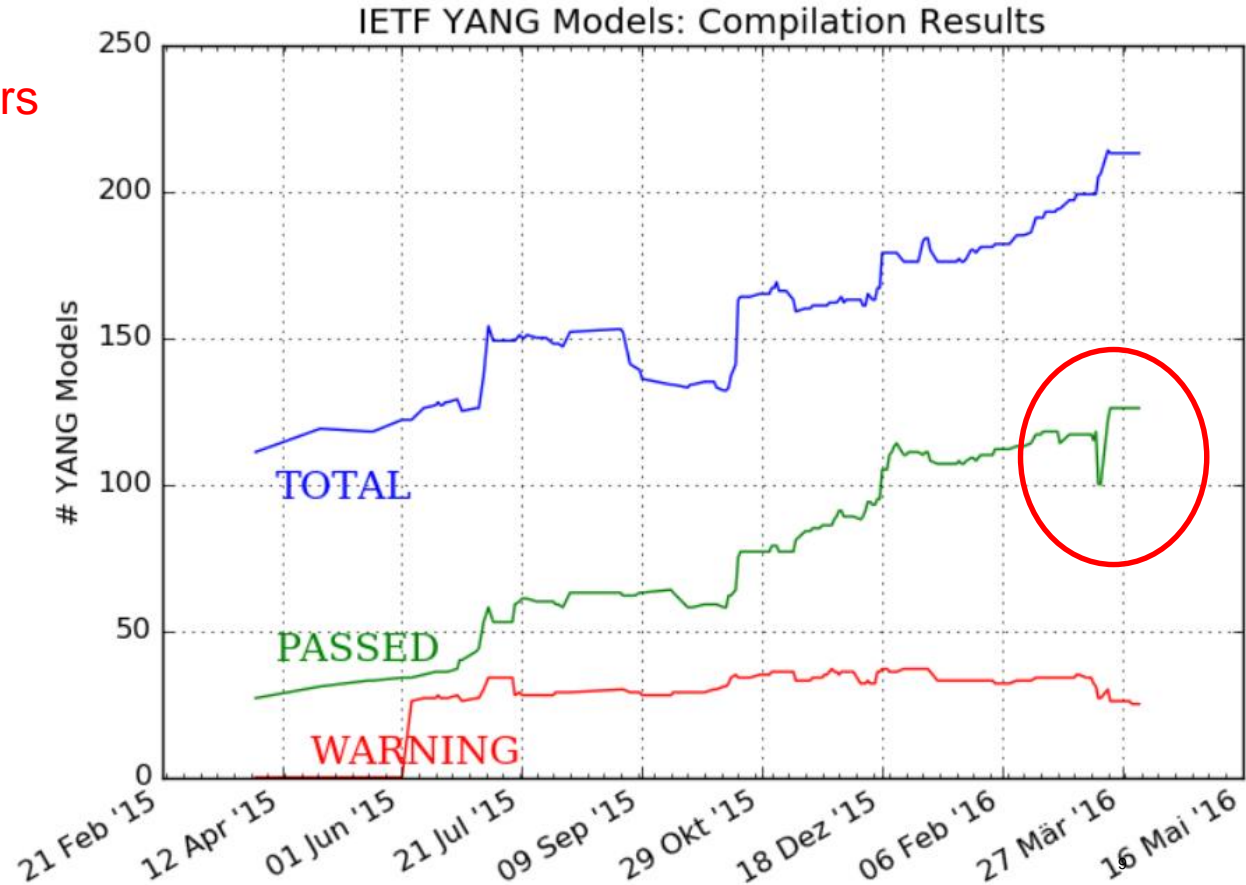
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# YANG Tooling

- A tool to **contact all authors of depending YANG models**, with a message « new imported YANG model updated, please update yours »
- Updated xym.py and symd.py
- Contact: Hariharan Ananthakrishnan





# YANG Tooling

- Pyang
  - Now in the submission tool
  - Qin Wu and Dapeng Liu: Hackathon => all the YANG models (from RFC/drafts) in the path.
  - What about YANG 1.1?
- Typedef and grouping + duplication detection
- While developing those tools => feedback to YANG authors

# YANG Data Model Catalog

- Extract the info from YANG models to populate a **YANG model catalog**, for the industry (draft-openconfig-netmod-model-catalog)
  - Based on the previous hackathon (Carl Moberg)
- "prefix": "oc-bgp-types",  
"namespace": "<http://openconfig.net/yang/bgp-types;>",  
"module-version": "2.0.1",  
"name": "openconfig-bgp-types",  
"revision": "2016-03-31"
- Next step is the catalog population (REST)
- Contact: Qin Wu, Anurag Bhargava, Michael Wang, Ignas Bagdonas

# YAM: YDK App Maker

## Is it for you?

- Starting programmer, use GUI to give data to YANG model and auto-generate YDK app.
- Have NETCONF, RESTCONF payload and want to migrate to YDK based app with minimal effort via tool.
- Looking for an educational channel on how to use YDK objects.
- YANG data model payload transcoding (convert XML to YDK to JSON to YDK to ....or vice versa)
  
- REMOTE HACKHATON:
  - Munish Nayyar, Pravin Gohite, Abhishek Keshav

# YAM: YDK App Maker (YANG -> python)

The screenshot displays the Yang Explorer 0.0.2 (Beta) web interface. The interface is divided into several main sections:

- Explorer Area:** A tree view on the left showing the YANG model structure. The selected node is `ietf-interfaces@2013-12-23` > `interfaces` > `interface`. The `interface` node is highlighted, and its children (name, description, type, enabled, link-up-down-trap-enable) are visible. A note says "Click Here to Explore Children nodes" with an arrow pointing to the `interfaces-state` node.
- Operation & Setting Options:** A central panel for configuring operations. It includes fields for "Source Datasource" (set to "Running") and "Target Datasource". Below these are radio buttons for "NetConf" (selected) and "RestConf". There are buttons for "Generate RPC" and "Get Server Capabilities".
- RPC & RPC Results:** A panel for running and saving RPCs. It features a "Console" tab showing the XML output of the RPC. The XML content is:

```
<rpc message-id="101" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <get-config>
    <source>
      <running>
    </source>
    <filter xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
      <interfaces xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces">
        <interface/>
      </interfaces>
    </filter>
  </get-config>
</rpc>
```

At the bottom of this panel are buttons for "Run RPC", "Save RPC to Collection", "Clear", and "Copy".
- Yang Properties:** A table on the right showing the properties of the selected node. The table has columns for "Property" and "Value".

Property	Value
Name	interface
Node Type	list
Data Type	
Access	read-write
Presence	
Key	
Mandatory	
Default	
Path	ietf-interfaces@2013-12-23/interfaces/interface
Description	The list of configured interfaces on the device.  The operational state of an interface is available in the /interfaces-state/interface list. If the configuration of a system-controlled interface cannot be used by the system (e.g., the interface hardware present does not match the

Additional annotations in the image include:

- "Save and Load RPCs to Collections" pointing to the "Collections" button.
- "Add, Subscribe, Delete Yang Models from User Account" pointing to the "Manage" button.
- "Opens Admin Page" pointing to the "Admin" button.
- "Refresh Yang Explorer Contents" pointing to the "Refresh" button.
- "Reset Tree Content" pointing to the "Reset" button.
- "Editable Input Box" pointing to the `<get-config>` field in the Explorer Area.
- "Server Response" pointing to the "Console" tab in the RPC & RPC Results panel.
- "Allow Editing RPCs manually" pointing to the "Custom RPC" checkbox.

Status: Tree node selected: interface

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