

# **YANG Data Node Self Explanation Tags**

draft-tao-netmod-yang-node-tags-00

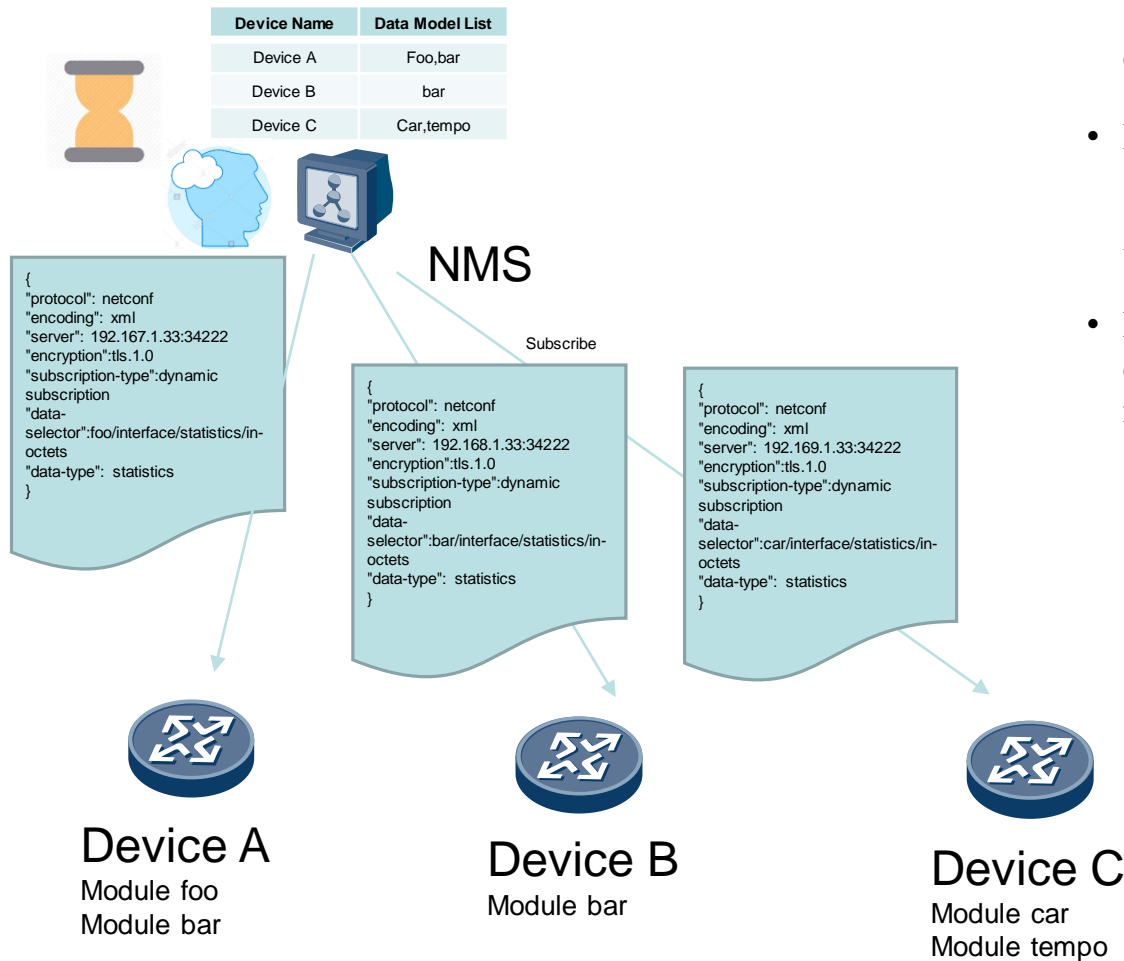
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# Background

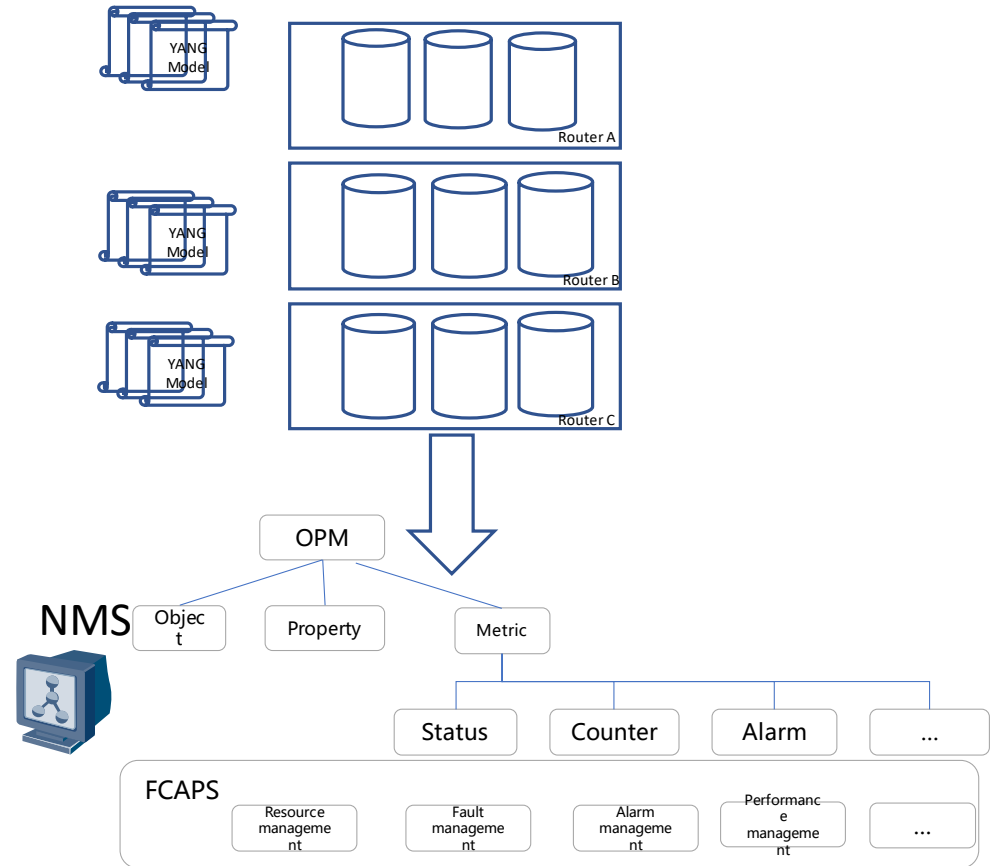
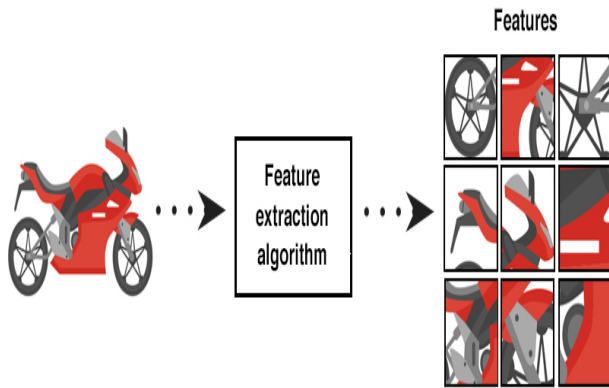
- The use of tags for classification and organization is fairly ubiquitous not only within IETF protocols, but in the internet itself(e.g., "#hashtags").
- A module tag is defined in [I.D-ietf-netmod-module-tags] and a string associated only with a module name at module level.
- Module tag is used to help classify and organize modules

# Why this draft



- YANG Push Telemetry provides a mechanism to select and subscribe to operational state data objects based on selection filter[].
- However there is no document to discuss how such selection filter is specified and based on which input, instruction, indication.
- However without self-explanation information on data node within the data model or device indicating which data object can be collected,
  - it is hard for NETCONF clients to automatically select which data objects are of interest,
    - e.g., extract feature from management data objects such as performance metric
  - Management object collection grows exponentially with rate of 10~50 times faster than before, filtering 99% raw data deemed as noise data or not useful data wastes network bandwidth between the management system and managed device;

# Proposal: Feature extraction

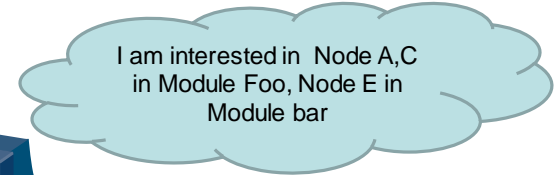


# Self Explanation Data Node Tag Example

Device Name	telemetry data node	xpath	Self-explanation tag	Statistics operation
Device A	Node A	foo/A	Performance metric	min
Device A	Node C	foo/C	Performance metric	average
Device B	Node E	bar/E	Performance metric	max
Device C	Node H	car/H	Performance metric	min



NMS



2. Automatically learn Tag from live server in device or from offline server

3. Subscribe interested data based on self explanation tag indication and xpath of data node

1.Tag data node in each device model to indicate data that has common characteristic  
Tagging information can be stored in network element or controller/ website



Device A  
Module foo

```
Module foo {
  Node A //performance metric;min
  Node B
  Node C//performance metric;average
}
```



Device B  
Module bar

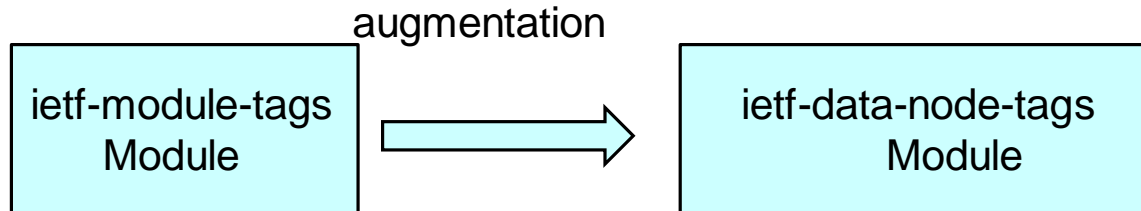
```
Module bar {
  Node E //performance metric;max
  Node F
  Node G
}
```



Device C  
Module car

```
Module car {
  Node H //performance metric;min
  Node I
  Node J
}
```

# Self explanation data node tag Proposal



- Self Explanation Data Node Tag Model provide self explanation information for data objects that are of interests.
- Augment module tag model [I-D.ietf-netmod-module-tags] and provide a list of data node entries to
  - allow for adding or removing of data node tags
  - as well as viewing the set of tags associated with a YANG module
  - specification of which group of data nodes share common characteristics.
- These self explanation information for data objects can be used to
  - help filter different discrete categories of YANG data node within YANG modules supported by a device.
  - help coordination when clients are interacting with large amount of devices with the same categories of YANG data node across different YANG modules.

# Model Design Overview

```
module: ietf-data-node-tags
augment /tags:module-tags/tags:module:
  +--rw data-node-tags
    +--rw data-node* [node-name]
      +--rw node-name          nacm:node-instance-identifier
      +--rw tag*               tags:tag
      +--rw masked-tag*       tags:tag
      +--rw group-id           string
```

- **node tag:** The 'operational' state view of this list is constructed using the following steps: 1) System tags are added. 2) User configured tags are added. 3) Any tag that is equal to a masked-tag is removed.
- **node-masked-tag:** The list of tags that should not be associated with this data node. The user can remove (mask) tags from the operational state datastore by adding them to this list.
- **Group-id:** identify a set of data nodes of the same group which have a common characteristic

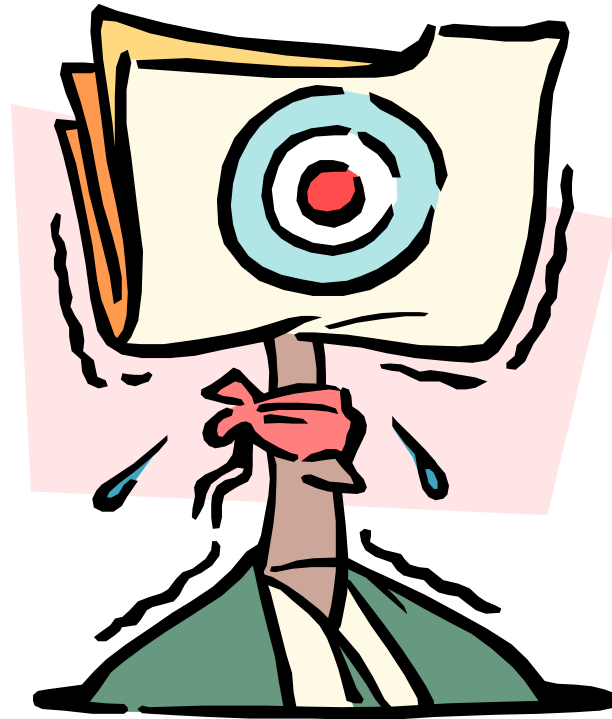
## Node tag module example:

```
module example-module {
  //...
  import ietf-data-node-tags { prefix ntags; }
  container top {
    ntags:node-tag "ietf:dn:object-type";
  }
  list X {
    ntags:node-tag "ietf:dn:property";
  }
  container Y {
    ntags:node-tag "ietf:dn:performance-metric";
  }
  // ...
}
```

Tag	Description	Reference
ietf:dn:object-type	Relates to object type (e.g., interfaces).	[This document]
ietf:dn:performance-metric	Relates to performance metric (e.g., ifstatistics).	[This document]
ietf:dn:property	Represents a object property (e.g., ifindex).	[This document]
ietf:dn:statistics-operation	Relates to statistics operation (e.g., average, min, max, sum, etc)	[This document]

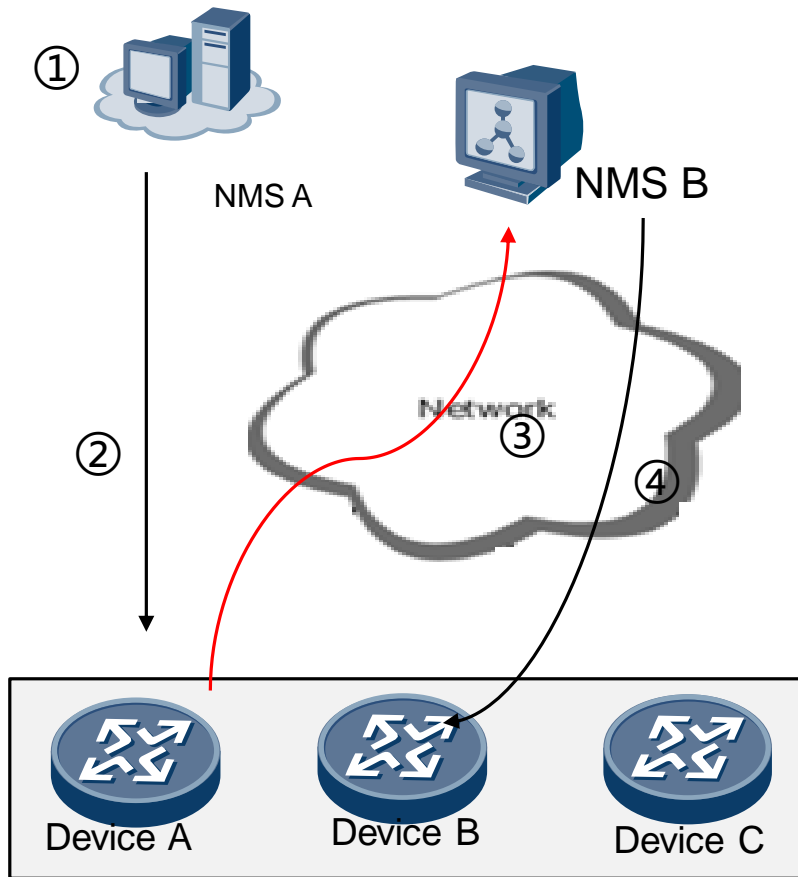
# Feedback?

Do we agree this is a problem that need to be solved and document as RFC?

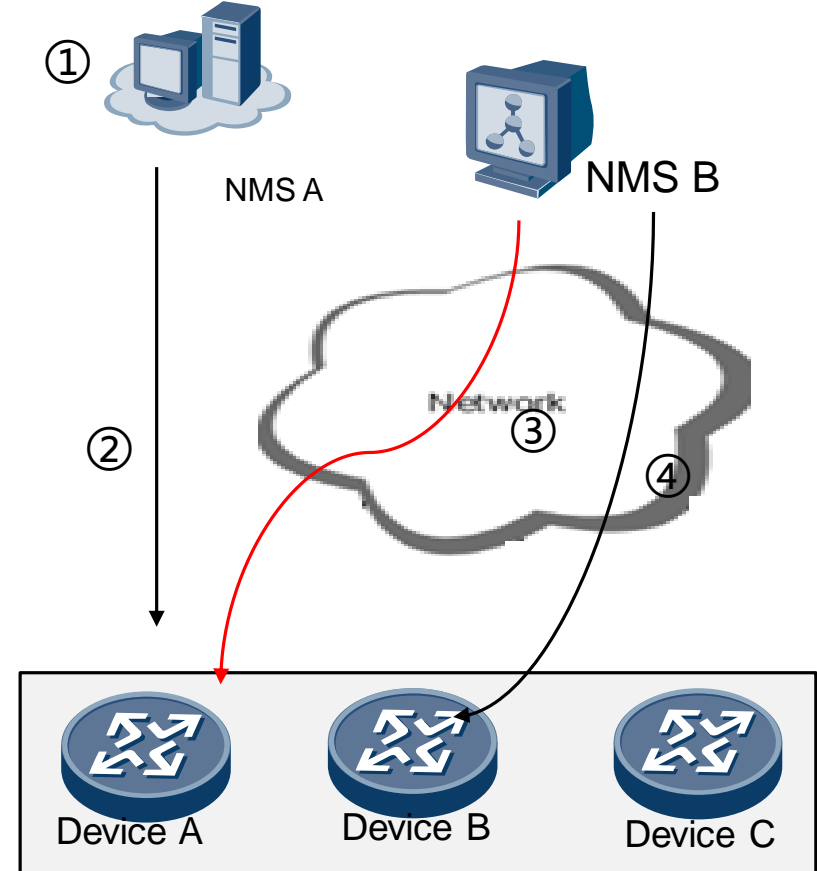




# Two Typical Cases



1. Add Self explanation Node tag into Device Model (e.g., interface model);
2. Deploy Device Model onto device A,B,C and publish on the website.
3. Automatic learn tag via Notification Capability Extension;
4. YANG Push Subscription;



1. Add Self explanation Node tag into Device Model (e.g., interface model);
2. Deploy Device Model onto device A,B,C or publish on the website
3. Automatic learn tag vis <get-schema>operation
4. YANG Push Subscription;