VOLTA
Networks

Rethink Networking
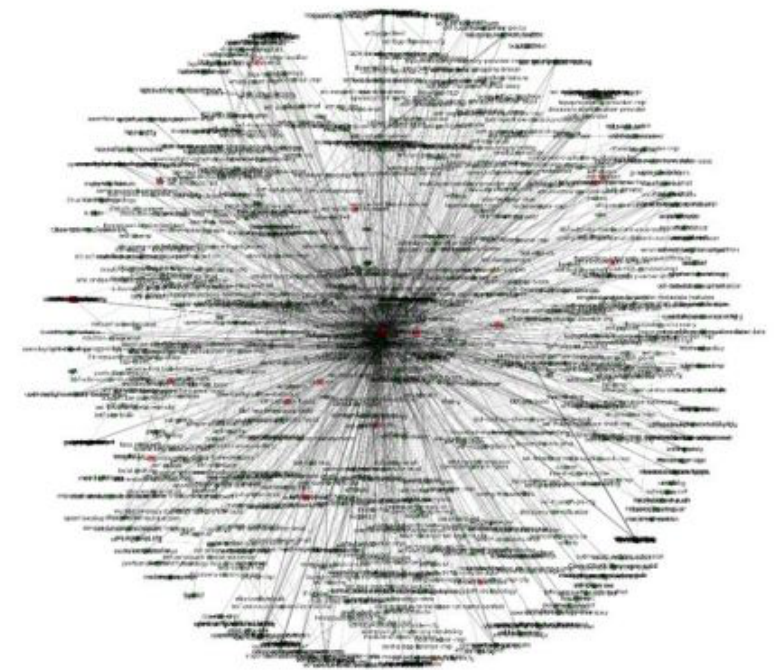
Device vs Service models in Network Automation

Dean Bogdanovic

dean@voltanet.io

Increasing Adoption of Network Automation

- 70% still use manual CLI-based network configuration

- automating 70% of network configuration changes can cut the number of unplanned outages by 50%

- RFC 8199 data model classification
  - Device models
    - 100s of models available
      - IETF, OpenConfig, vendors
  - Service models
    - IETF - L2SM, L3SM
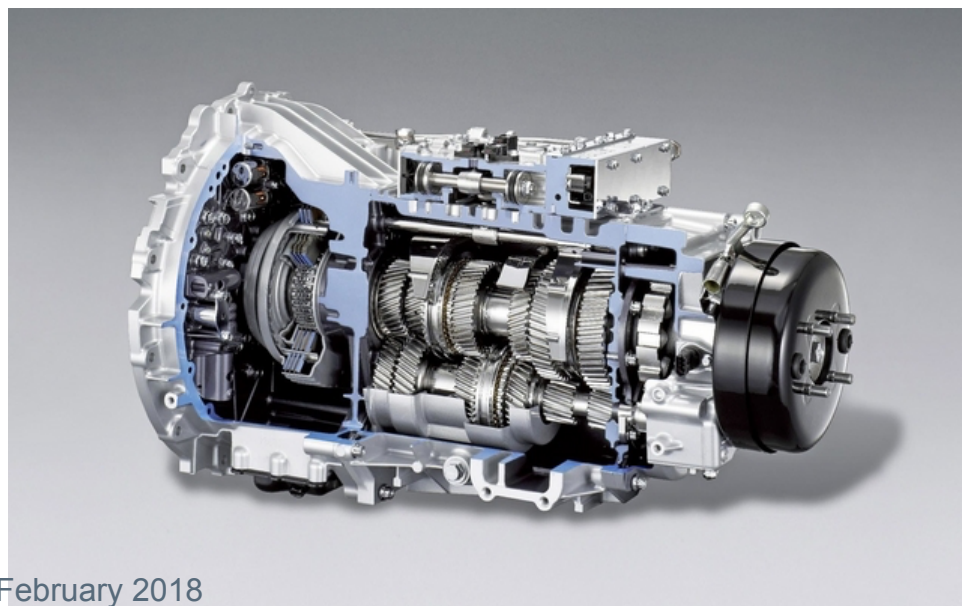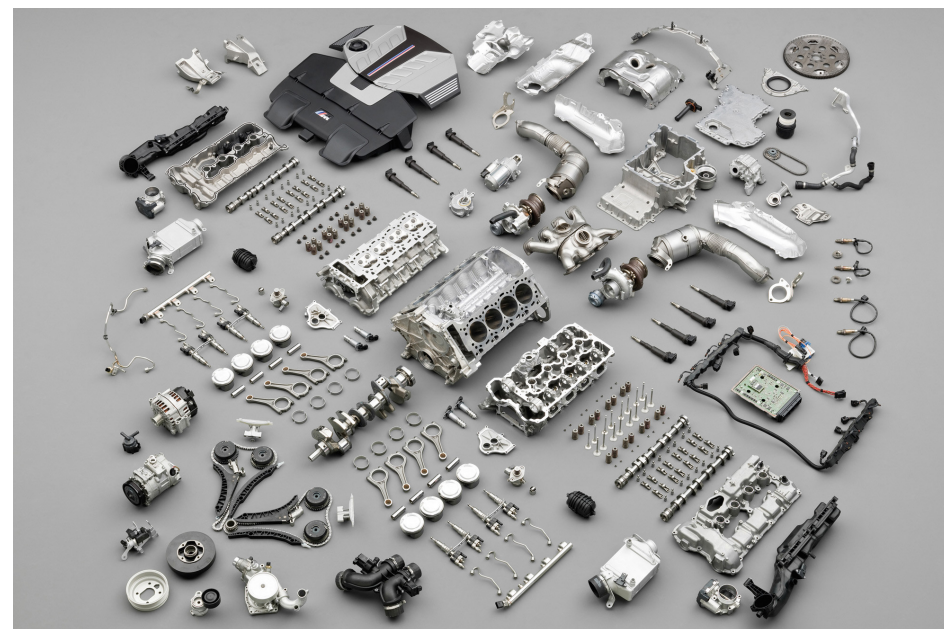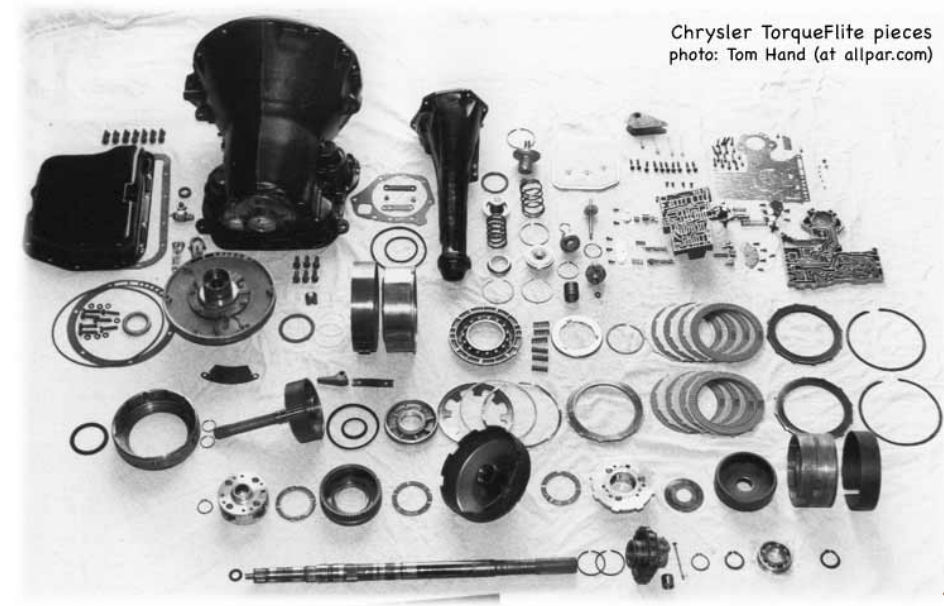   - MEF – available only to members

YANG Model Layers
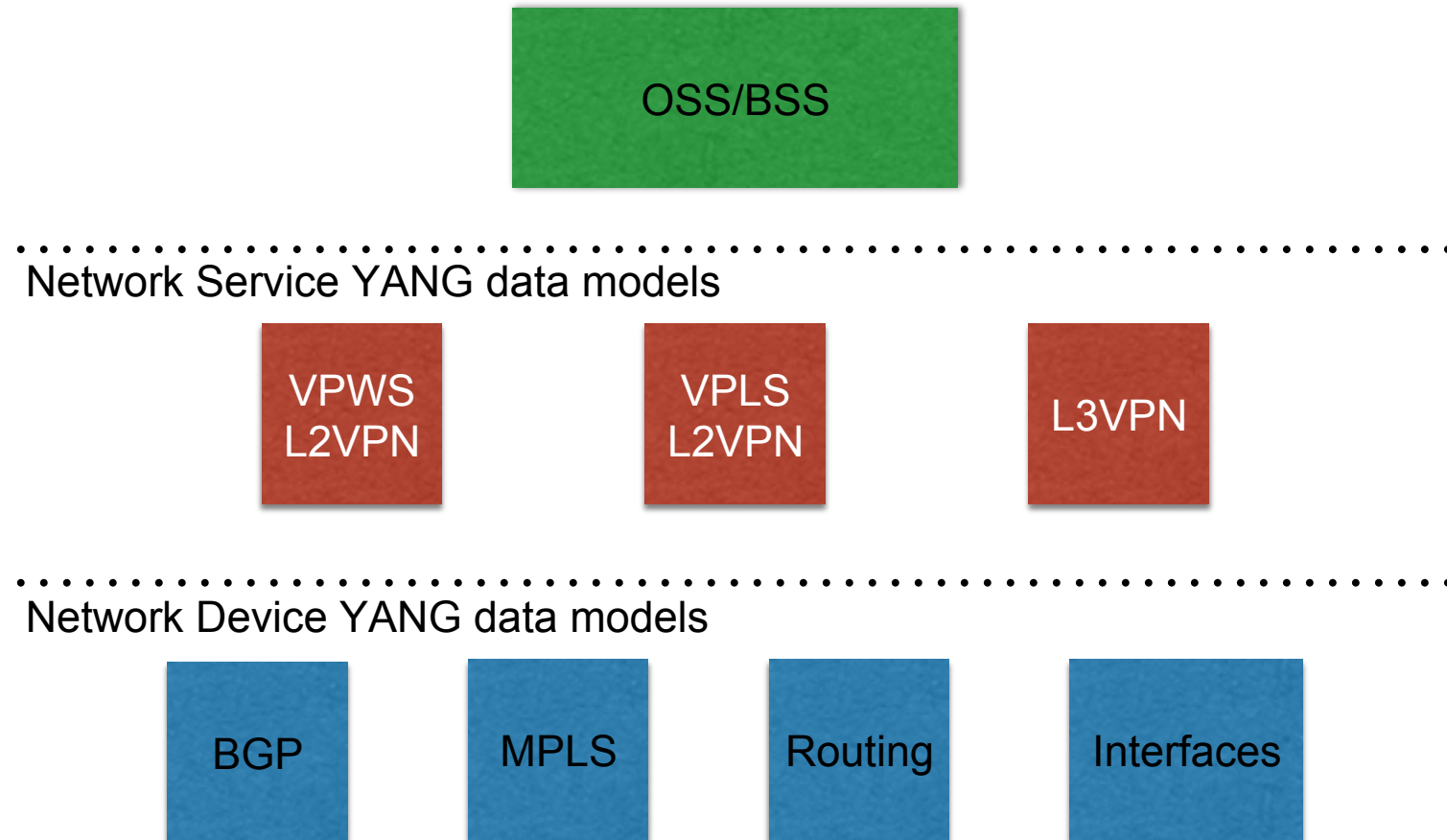
VS

Network Automation

- Easy migration from Device Management to Network Service Management

- New Management API (Device and Network Service)
  - Operator programs directly changing Op States of Control-Plane or Forwarding-Plane elements

- YANG data-models (Device and Network Service)
  - Operators only need to load the required network-service data-models in their network (L2 switching, L3 routing, VPN, Firewall, Class-of-service, etc..)
  - Lots of choices of data-models (vendors, IETF, OpenConfig, user-customized, etc)

- Same capabilities regardless of the methods chosen

L2VPN data-model

```
module: l2vpn
   +--rw network-service
      +--rw l2vpn* [model-id instance-id]
         +--rw model-id          uint64
         +--rw instance-id       uint64
         +--ro service-id?       string
         +--rw l2vpn-type        enumeration
         +--rw provider-edge* [router-address interface]
            +--rw router-address    union
            +--rw interface         string
            +--ro service-id?       string
            +--rw neighbor* [router-address]
               +--rw router-address    inet:ip-address
```

L2VPN Network Instance (device view)

```
network-service : {
    l2vpn : {
        model-id : 177,
        instance-id : 11,
        l2vpn-type : vpls,
        service-id : 101,            # system generated
        provider-edge : [
                {
                router-address : "1.1.1.1",
                interface : "xge3.101",
                neighbor : [ { router-address : "2.2.2.2" } ]
                },
                router-address : "2.2.2.2",
                interface : "xge6.101",
                neighbor : [ { router-address : "1.1.1.1" } ]
                }
        ]
    }
}
```

- When devices are managed individually, users need to specify all parameters

Network Automation:
L2VPN Network Instance (network-service view)

```
network-service : {
      l2vpn : {
            model-id : 177,
            instance-id : 11,
            l2vpn-type : vpls,
            service-id : 101,              # system generated
             provider-edge : [
                        {
                        router-address : "1.1.1.1",
                        interface : "xge3.101",
                        neighbor : [ { router-address : "2.2.2.2" } ]        # system generated w/ Topology discovery
                        },
                        router-address : "2.2.2.2",
                        interface : "xge6.101",
                        neighbor : [ { router-address : "1.1.1.1" } ]        # system generated w/ Topology discovery
                        }
            ]
      }
}
```

- When using the network-service view, network topology is discovered by system Discovery Service, the l2vpn tunnel connections are calculated by the system SW

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Thank you

dean@voltanet.io

Volta, from the Italian word voltare which means turn.
Now is the time to turn networking around to new architecture