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YANG Data Center Baseline Switch Profile
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Abstract

[Insert abstract here]

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1. Introduction

Disclaimer - this is a -00 draft.

This is a normative profile for Baseline Switch Profile (send into IETF RTG) intended to be published as RFC on completion of DMTF spec to wrap Baseline Switch Profile.

2. What is a Redfish Baseline Switch?

The baseline switch profile contains basic system, interface, L2, and L3 configuration elements sufficient to set up the device for use in a controller based converged infrastructure environment.

The following list of IETF drafts, RFCs, and Redfish models will constitute the management interface to the baseline switch.

3. Core YANG RFCs

RFC6020 [1] provides the YANG modeling language definition.

RFC6991 [2] provides the Common YANG Data Types used by many other IETF YANG modules.

Interface management requires at set of RFCs to provide all relevant capabilities:

<https://tools.ietf.org/html/rfc7223>
<https://tools.ietf.org/html/rfc7277>
<https://tools.ietf.org/html/rfc7224>
<https://tools.ietf.org/html/rfc7317>

3.1. RFC7223 provides:

```

+--rw interfaces
|   +--rw interface* [name]
|   |   +--rw name                string
|   |   +--rw description?        string
|   |   +--rw type                identityref
|   |   +--rw enabled?            boolean
|   |   +--rw link-up-down-trap-enable? enumeration
+--ro interfaces-state
|   +--ro interface* [name]
|   |   +--ro name                string
|   |   +--ro type                identityref
|   |   +--ro admin-status        enumeration
|   |   +--ro oper-status         enumeration
|   |   +--ro last-change?        YANG:date-and-time
|   |   +--ro if-index            int32
|   |   +--ro phys-address?       YANG:phys-address
|   |   +--ro higher-layer-if*    interface-state-ref
|   |   +--ro lower-layer-if*    interface-state-ref
|   |   +--ro speed?             YANG:gauge64
|   +--ro statistics
|   |   +--ro discontinuity-time  YANG:date-and-time
|   |   +--ro in-octets?          YANG:counter64
|   |   +--ro in-unicast-pkts?    YANG:counter64
|   |   +--ro in-broadcast-pkts?  YANG:counter64
|   |   +--ro in-multicast-pkts?  YANG:counter64
|   |   +--ro in-discards?        YANG:counter32
|   |   +--ro in-errors?          YANG:counter32
|   |   +--ro in-unknown-protos?  YANG:counter32
|   |   +--ro out-octets?         YANG:counter64
|   |   +--ro out-unicast-pkts?   YANG:counter64
|   |   +--ro out-broadcast-pkts? YANG:counter64
|   |   +--ro out-multicast-pkts? YANG:counter64
|   |   +--ro out-discards?       YANG:counter32
|   |   +--ro out-errors?         YANG:counter32

```

3.2. RFC7277 adds:

```

+--rw if:interfaces
|   +--rw if:interface* [name]
|   |   ...
|   |   +--rw ipv4!
|   |   |   +--rw enabled?        boolean
|   |   |   +--rw forwarding?     boolean
|   |   |   +--rw mtu?            uint16
|   |   |   +--rw address* [ip]
|   |   |   |   +--rw ip          inet:ipv4-address-no-zone
|   |   |   |   +--rw (subnet)
|   |   |   |   |   +--:(prefix-length)

```

```

| | | | +-rw ip:prefix-length?   uint8
| | | | +---:(netmask)
| | | | +-rw ip:netmask?         YANG:dotted-quad
| +-rw neighbor* [ip]
| | +-rw ip                     inet:ipv4-address-no-zone
| | +-rw link-layer-address     YANG:phys-address
+-rw ipv6!
| +-rw enabled?                 boolean
| +-rw forwarding?              boolean
| +-rw mtu?                     uint32
| +-rw address* [ip]
| | +-rw ip                     inet:ipv6-address-no-zone
| | +-rw prefix-length          uint8
| +-rw neighbor* [ip]
| | +-rw ip                     inet:ipv6-address-no-zone
| | +-rw link-layer-address     YANG:phys-address
+-rw dup-addr-detect-transmits? uint32
+-rw autoconf
| +-rw create-global-addresses? boolean
| +-rw create-temporary-addresses? boolean
| +-rw temporary-valid-lifetime? uint32
| +-rw temporary-preferred-lifetime? uint32

```

AND

```

+-ro if:interfaces-state
+-ro if:interface* [name]
...
+-ro ipv4!
| +-ro forwarding?             boolean
| +-ro mtu?                     uint16
| +-ro address* [ip]
| | +-ro ip                     inet:ipv4-address-no-zone
| | +-ro (subnet)?
| | | +-ro prefix-length?      uint8
| | | +---:(netmask)
| | | +-ro netmask?            YANG:dotted-quad
| | +-ro origin?               ip-address-origin
+-ro neighbor* [ip]
| +-ro ip                       inet:ipv4-address-no-zone
| +-ro link-layer-address?     YANG:phys-address
| +-ro origin?                 neighbor-origin
+-ro ipv6!
| +-ro forwarding?             boolean
| +-ro mtu?                     uint32
| +-ro address* [ip]
| | +-ro ip                     inet:ipv6-address-no-zone

```

```

      |   +--ro prefix-length      uint8
      |   +--ro origin?           ip-address-origin
      |   +--ro status?          enumeration
+--ro neighbor* [ip]
      |   +--ro ip                inet:ipv6-address-no-zone
      |   +--ro link-layer-address? YANG:phys-address
      |   +--ro origin?          neighbor-origin
      |   +--ro is-router?       empty
      |   +--ro state?           enumeration

```

3.3. RFC7224 provides:

The set of YANG identity statement for the IANA defined interface types.

3.4. RFC7317 provides:

- o System Identification
- o System Time Date
- o NTP
- o DNS Client

System Identification

```

+--rw system
  |   +--rw contact?             string
  |   +--rw hostname?           inet:domain-name
  |   +--rw location?           string
+--ro system-state
  |   +--ro platform
  |       +--ro os-name?         string
  |       +--ro os-release?      string
  |       +--ro os-version?      string
  |       +--ro machine?         string

```

System Time

```

+--rw system
|   +--rw clock
|   |   +--rw (timezone)?
|   |   |   +--:(timezone-name)
|   |   |   |   +--rw timezone-name?      timezone-name
|   |   |   +--:(timezone-utc-offset)
|   |   |   |   +--rw timezone-utc-offset?  int16
|   +--rw ntp!
|   |   +--rw enabled?      boolean
|   |   +--rw server* [name]
|   |   |   +--rw name      string
|   |   |   +--rw (transport)
|   |   |   |   +--:(udp)
|   |   |   |   |   +--rw udp
|   |   |   |   |   |   +--rw address      inet:host
|   |   |   |   |   |   +--rw port?       inet:port-number
|   |   |   +--rw association-type?      enumeration
|   |   +--rw iburst?                    boolean
|   |   +--rw prefer?                    boolean
+--ro system-state
|   +--ro clock
|   |   +--ro current-datetime?          YANG:date-and-time
|   |   +--ro boot-datetime?            YANG:date-and-time

```

DNS Client

```

+--rw system
|   +--rw dns-resolver
|   |   +--rw search*      inet:domain-name
|   |   +--rw server* [name]
|   |   |   +--rw name      string
|   |   |   +--rw (transport)
|   |   |   |   +--:(udp-and-tcp)
|   |   |   |   |   +--udp-and-tcp
|   |   |   |   |   |   +--rw address      inet:ip-address
|   |   |   |   |   |   +--rw port?       inet:port-number
|   +--rw options
|   |   +--rw timeout?      uint8
|   |   +--rw attempts?    uint8

```

User Authentication

```
  +--rw system
    +--rw authentication
      +--rw user-authentication-order*  identityref
      +--rw user* [name]
        +--rw name      string
        +--rw password?  ianach:crypt-hash
        +--rw authorized-key* [name]
          +--rw name      string
          +--rw algorithm  string
          +--rw key-data   binary
```

4. Additional YANG models

In addition to the above RFCs, the baseline switch models needs to cover:

- o VLANs
- o ACLs
- o Syslog

The following lists of IETF drafts sets our recommendation to cover the above three areas.

4.1. VLAN and interface extensions:

To handle VLANs and with related interface configuration the following YANG models are under evaluation.

- o <https://tools.ietf.org/html/draft-ietf-netmod-intf-ext-yang-03>
- o <https://tools.ietf.org/html/draft-wilton-intf-vlan-yang-00.txt> ## ACL To handle ACL configuration the following YANG model is under consideration.
- o <https://tools.ietf.org/html/draft-ietf-netmod-acl-model-09>

4.2. Syslog

To handle configuration and access to syslog the following YANG model is under consideration.

- o <https://tools.ietf.org/html/draft-ietf-netmod-syslog-model-11>

5. Applicable Redfish system management models

The following standard Redfish systems management models apply to the baseline network switch profile. Reference: Redfish schema index [3]. The use of these Redfish management models allows a converged infrastructure manager to have a consistent view of server, storage and network systems.

- o Chassis
- o ComputerSystem
- o Manager
- o ManagerAccount
- o Power
- o Thermal
- o SoftwareInventory plus UpdateService
- o Event configuration using Event, EventDestination, and Event Service
- o Access to logs using LogEntry, and LogService
- o Management interface configuration using EthernetInterface and related
- o Console configuration using SerialInterface
- o PrivilegeRegistry and Privileges

Where YANG and Redfish overlap, the commonality of YANG vs Redfish is TBD.

6. Overall Baseline Switch Profile Structure

```
./redfish/v1/Systems
./redfish/v1/Chassis
./redfish/v1/NetworkDevices/BaselineSwitch/...
... other redfish resource blocks...
(resource from RFCs and Redfish bullet list, above)
```


7. References

7.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

7.2. URIs

- [1] <https://tools.ietf.org/html/rfc6020>
[2] <https://tools.ietf.org/html/rfc6991>
[3] http://redfish.dmtf.org/redfish/schema_index

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