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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 a 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:

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```
+---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)?
|   |   |   +--:(prefix-length)
|   |   |   |   +--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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