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Redfish Baseline Switch Model

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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.

Core YANG RFCs

[RFC6020](https://tools.ietf.org/html/rfc6020) provides the YANG modeling language definition.

[RFC6991](https://tools.ietf.org/html/rfc6991) 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
```

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

```

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. RFC7224 provides:

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

4. RFC7317 provides:

- System Identification
- System Time Date
- NTP
- 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
```

Additional YANG models

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

- VLANs
- ACLs
- Syslog

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

5. VLAN and interface extensions:

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

- <https://tools.ietf.org/html/draft-ietf-netmod-intf-ext-yang-03>
- <https://tools.ietf.org/html/draft-wilton-intf-vlan-yang-00>

6. ACL

To handle ACL configuration the following YANG model is under consideration.

- <https://tools.ietf.org/html/draft-ietf-netmod-acl-model-09>

7. Syslog

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

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

Applicable Redfish system management models

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

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

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

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)
```