Interface Descriptions

Description: Interface descriptions across the company don't really follow any sort of structured format which makes interface categorisation (WAN, LAN, uplink, downlink, etc) difficult. There are some informal standard such as describing what's on the other end of the link and/or the WAN circuit reference but it's ad hoc and not standardised. This story is to align on a standard framework (starting point might be Interface Descriptions - Chevron Digital Architecture System which was never published) but the team is free to amend as needed.

Acceptance Criteria: Framework should allow:

- interface categorisation compatible with automation and tool requirements (e.g. nautoobot, kentik, scripts)
- lldp neighbour population
- machine and human friendly format so it's readable to engineers
- probably allow a manual "suffix" to a description to allow additional information that is unlikely to be kept in Nautoobot in the short term (e.g. circuit references might be kept on the device until circuit inventory is ready) this manual suffix should have a suitable delimiter between the scripted content and the manual content (e.g. use : for the fields inside the scripted content and something like || for the manual content)

Requirements

The interface description is used by both engineers to assist in operational tasks and also network management systems to filter and provide alerts and reports. Different device types in the network have different requirements but the format provides information on:

1. What type of interface it is (a WAN or LAN connection for example)
2. The role of the interface in
    - a LAN environment (uplink, access port, etc)
    - the WAN circuit type (MPLS, P2P, etc)
    - for the core (CE UNI or PE NNI facing interface and what services the interface carries)
3. What the equipment is directly connected to (the name and interface)
4. Bandwidths and circuit references for WAN circuits, and whether it is directly connected to the Internet (a CIC requirement)

The basic requirements are:

1. Something that can be read by both a machine and a human

2. Something not so complicated that the format is impossible to read without consulting the documentation
3. Compatible with regex to allow field values such as bandwidth to be extracted, or tools such as Kentik to classify interfaces
4. Allows the monitoring tools to suppress alerts for certain types of link or links down for maintenance
5. Allows automation scripts to populate the interface description. For example, configure the connected device and interface based on LLDP or CDP neighbours.

Format

The formatted interface description uses multiple fields delimited by ":" . If any field text contains a ":" then it MUST be replaced with another character such as ";" .

{type} : {role} {VRF} : {connected_device_name} {connected_device_intf} : {OPTIONAL_fields}

Since regex is used to parse the fields it is REQUIRED that the string is formatted correctly.

Type

The type field describes the network type of the interface and is one of the values below

Type	Description
LAN	Local Area Network
WAN	Wide Area Network Private Circuit
CORE	Core Network Links
INTERNET	Internet circuit

If the type is prefixed by 'u' it means the interface is down for maintenance or testing and SHOULD be ignored by the monitoring systems. This is equivalent to the legacy UMI description used previously. Remove the 'u' prefix when the link is brought back into service.

Since WAN, INTERNET and CORE interfaces are always monitored unless prefixed by 'u', a network engineer installing or testing a circuit should use "u{type}" until it is ready to be monitored by operations and then changed to {{type}} .

Roles

The role field describes the function of the interface. Different roles apply to different interface types. For example:

- LAN : AP is a LAN port connected to an access point.
- INTERNET : ISP is a connection to an Internet Service Provider.

Local Area Network Roles

Use these roles when the interface type is LAN. The first character is U/M for unmonitored/monitored and the second is an indicator of what the port is used for.

Role	Description	Monitored	Typical Use Case
MV	Virtual Interface	Yes	LAN SVI or Loopback
MT	Trunk Interface	Yes	Any switch-to-network-device link using 802.1q
MA	Monitored Access Interface	Yes	Server interfaces or switch-to-network-device link simple vlan
MM	Monitored Management Interface	Yes	A management port
UU	Unmonitored user port connection	No	User facing LAN port (switches will apply NAC to these)
UX	Unmonitored other port connection	No	Other ports (usually have NAC applied)

Wide Area Network Roles

Use these roles when the interface type is WAN.

Role	Description
WAN	Generic WAN circuit
MPLS	A service provider MPLS IP-VPN circuit
P2P	A point to point circuit
P2MP	A point to multipoint circuit (seldom used)
SAT	A satellite circuit

Note: If a circuit is connected to the Internet, then use the INTERNET type rather than the specific type, e.g. a satellite connection to the Internet such as Starlink would be INTERNET not SAT.

Core Network Roles

Use these roles when the interface type is CORE

Role	Description	Notes
UNI	User-to-Network Interface	CE facing interfaces
NNI	Network-to-Network Interface	Core Internal interfaces
MGMT	Management Interface	fxp ports
XNI	eXtended Network Interface	Connection to Juniper Satellite equipment (like a Cisco FEX)

VRF

For interfaces that belong to a VRF, then append the VRF name to the role.

- **Example 1**: Core UNI interfaces, add the L3VPN name to the UNI role. All core UNI interfaces belonging to the L3CVX-CORP VPN will therefore use the format CORE : UNI L3CVX-CORP .
- **Example 2**: LAN Trunk interfaces belonging to a specific VRF will be added to the SW role. For example all layer 3 interfaces belonging to the L3CVX-GUEST VPN will use the format LAN : MT L3CVX-GUEST .
- **Example 3**: SVI interface belonging to a specific VRF will be added to the SV role. For example all layer 3 interfaces belonging to the L3CVX-GUEST VPN will use the format LAN : MV L3CVX-GUEST : {free_format_text} .

Internet Roles

Role	Description
ISP	Internet Service Provider
CSP	Cloud Service Provider
IXP	Internet Exchange Provider

Connected Device

The {connected_device_name} and {connected_device_intf} describe what the equipment is connected to.

- **Example 1**: a LAN switch connected to US-TX-F123456-SL-01 interface Gi0/0 would have the description:

```
LAN : SW : US-TX-F123456-SL-01 Gi0/0
```

Example 2: a LAN switch connected to US-TX-F123456-SL-01 interface Port-channel100 vlan 100 would have the description:

```
LAN : SW : US-TX-F123456-SL-01 Po100.100
```

Example 3: a router connected to US-TX-F123456-RA-01 interface Gi0/0 on a point-to-point circuit would have the description:

```
WAN : P2P : US-TX-F123456-RA-01 Gi0/0
```

Circuits

Circuits from service providers require additional fields to document the bandwidth, service provider, circuit references and an information. Use a : to separate out these four fields:

`{bandwidth} : {service_provider} : {circuit_refs} : {additional_information}`

For bandwidth use a simple G rather than Gbps, M rather than Mbps.

- **Example 1**: a router connected to US-TX-F123456-RA-01 interface Gi0/0 on a Verizon 100 Mbps MPLS circuit with circuit reference 329847298472 would have the description below.

```
WAN : MPLS : : 100m : Verizon : 329847298472
```

- **Note the use of : : as the connected device is not applicable to MPLS circuits**
- **Example 2**: a router connected to US-TX-F123456-RA-01 interface Gi0/0 vlan 123 on a Lumen 1Gbps point to point circuit with circuit reference 827219831 would have the description:

```
WAN : P2P : US-TX-F123456-RA-01 Gi0/0.123 : 1g : Lumen : 827219831
```

- If the circuit above was taken down for maintenance then the description would change to UWAN ...
- **Example 3**: a router with a DIA Internet connection presented on a Cogent 1Gbps point to point circuit with circuit reference X0908204 would have the description:

```
INTERNET : ISP : : 1g : Cogent : X0908204
```

If the circuit above was taken down for maintenance then the description would change to UINTERNET ...

Example 4: a core router connected to EU-GB-LON-C-LONPWG-PE1 xe-0/0/0 vlan 300 with an NNI point to point connection presented on a Megaport 500 Mbps point to point circuit with reference ABC420938 and virtual circuit reference SLKJDLDJ would have the description:

```
CORE : NNI : EU-GB-LON-C-LONPWG-PE1 xe-0/0/0.300 : 500m : Cogent : ABC420938
: EVC SLKJDLDJ
```

If the circuit above was taken down for maintenance then the description would change to UCORE ...

Additional Core Examples

WAN CE facing interfaces

WAN interfaces facing CE equipment, either Chevron or Service Provider, SHOULD have the description in the format:

```
CORE : UNI {VRF} : {remote_device} {remote_device_intf} {vlan} : {bandwidth}
: {carrier} : {circuit_reference}
```

Examples:

- an untagged 50 Mbps WAN circuit connected to a Chevron CE called ALMRA01 Gi-0/0/0 using a carrier called Beeline

```
CORE : UNI : ALMRA01 Gi0/0/0 : 50m : Beeline : A00_VPLS_5200b02
```

- unit 110 on the same interface carrying L3CVX-CORP has this format. The service provider and circuit reference is not needed as it is already configured on the physical interface.

```
CORE : UNI L3CVX-CORP : ALMRA01 Gi0/0/0.110 : 50m
```

Management interfaces

fxp0 interfaces use this format:

```
CORE : MGMT OOB : {remote_device} {remote_interface}
```

Example:

```
CORE : MGMT OOB : TCOATY-MS1 Ggi0/4
```

Fusion interfaces

Interfaces between the PE router and the fusion switch use the format:

```
CORE : XNI : {remote_device} {remote_interface} : {bandwidth}
```

Example 1: PE interface connecting to Fusion switch on et101/0/0

```
CORE : XNI : AS-AU-SYD-A-F08734-PE1 et-101/0/0 : 40G
```

Example 2: Fusion switch connecting back to the same PE on et-0/0/0

```
CORE : XNI : AS-AU-SYD-A-F08734-PE1 et-0/0/0 : 40G
```

Regex Examples

The standard interface format allows automation scripts to take action based on what it finds.
Example 1: Suppress alerts on interfaces down for maintenance by matching on first character X

```
^X
```

Example 2: Suppress all LAN interfaces we don’t want alerts on

```
^LAN : u
```

Example 3: Extract the interface role, and circuit details from CORE links

```
^CORE : (UNI|NNI)(.*) : (.*) : (.*) : (.*) : (.*) : (.*)
```

Regex group	Match
1	UNI or NNI
2	VRF name
3	Connected device

Regex group	Match
4	Connected interface
5	Bandwidth
6	Service Provider
7	Circuit references