A framework for Management and Control of microwave and millimeter wave interface parameters
draft-ietf-ccamp-microwave-framework-00

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Status

- The draft was adopted by CCAMP WG, Dec 2016
- No open topic:
  - Microwave design team(MDT) consider the framework to be complete
  - MDT has used it as the basis for the YANG Data Model for Microwave Radio Link
  - No feedback on the framework since adoption
- Next step: WG LC?

A YANG Data Model for Microwave Radio Link
draft-mwdt-ccamp-mw-yang-01

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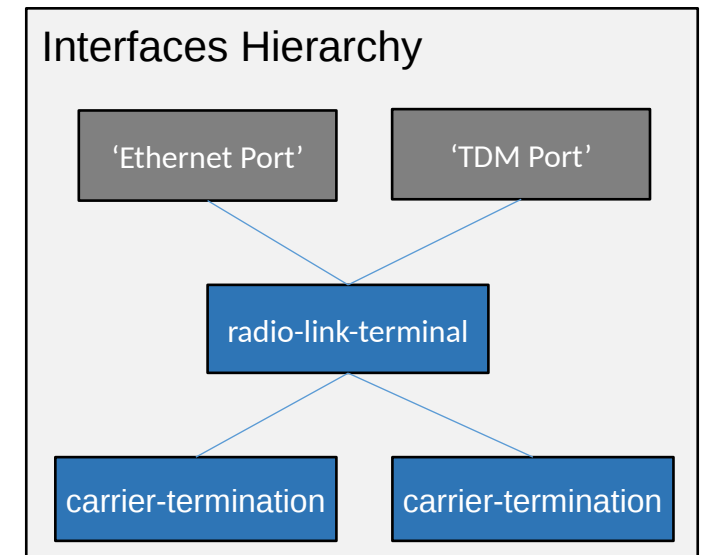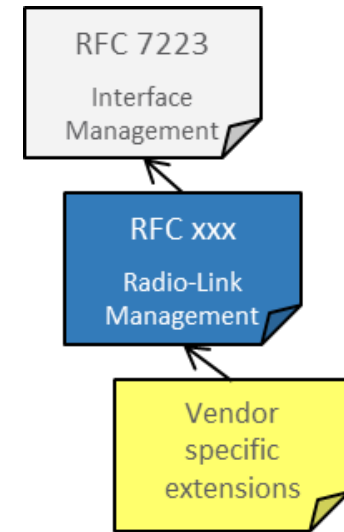
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Overview

- The draft defines a YANG data model in order to control and manage the radio link interfaces, and the connectivity to packet (typically Ethernet) interfaces in a microwave/millimeter wave node.
  - **follows the framework in [draft-mwdt-ccamp-fmwk-00],** which defines the use cases and requirements, and provides detailed gap analysis of the current existing/drafts models
  - **augments RFC 7223** to align with the same structure for management of the packet interfaces.
  - **use the [draft-ahlberg-ccamp-microwave-radio-link-01] and the ONF Microwave Models as the basis** for the definition of the detailed configuration parameters and proposing new ones to cover the identified gaps that are analyzed in [draft-mwdt-ccamp-fmwk-00]

RFC 7223
Interface Management

RFC xxx
Radio-Link Management

Vendor specific extensions

Interfaces Hierarchy

'Ethernet Port'   'TDM Port'

radio-link-terminal

carrier-termination   carrier-termination

Update from -00

- A new co-author

- Complete the microwave YANG data model:
  - add the attributes for tdm-connections, RLT-Config/State, CT-State, radio-link-protection-group, XPIC, MIMO
  - The Yang data model has been successfully validated by Pyang (v1.1)

- Article about the microwave YANG modelling in IETF journal
  - https://wp.internetsociety.org/ietfjournal/wp-content/uploads/sites/22/2017/03/IETF-Journal-12.3_Webb.pdf

```
augment /if:interfaces-state/if:interface:
  +--ro tx-oper-status?                 enumeration
  +--ro actual-transmitted-level?       power
  +--ro actual-received-level?          power
  +--ro actual-tx-cm?                   identityref
  +--ro actual-snir?                    decimal64
  +--ro actual-xpi?                     decimal64 {xpic}?
  +--ro capabilities
     +--ro min-tx-frequency?            uint32
     +--ro max-tx-frequency?            uint32
     +--ro min-rx-frequency?            uint32
     +--ro max-rx-frequency?            uint32
     +--ro available-min-output-power?  power
     +--ro available-max-output-power?  power
     +--ro available-min-acm?           identityref
     +--ro available-max-acm?           identityref
```

Extract from the YANG Model showing
Carrier Termination Status

How to use the model

Example: 1+0 & Ethernet iF
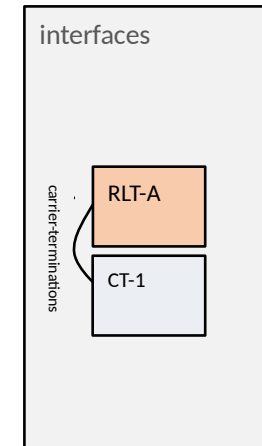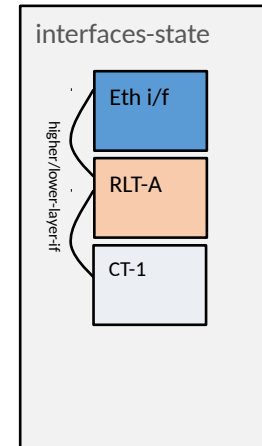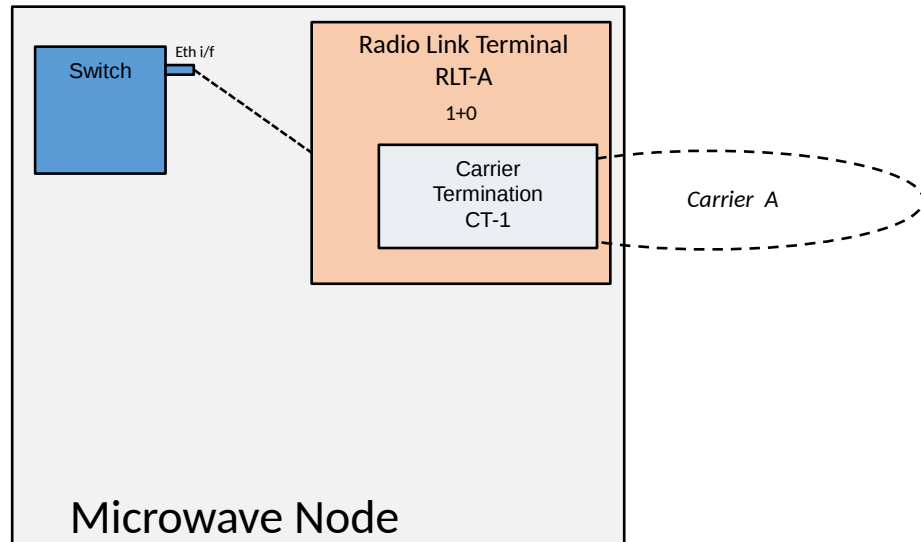
Eth i/f
State
type = 'ethernet-interface'
name = 'Eth i/f'
higher-layer-if = interface-state-ref (...)
lower-layer-if = interface-state-ref (RLT-A)

RLT-A
RLT-Config
type = 'mrl:radio-link-terminal'
name = 'RLT-A'
mode = 'one-plus-zero'
carrier-terminations = interface-ref (CT-1)

RLT-State
type = 'mrl:radio-link-terminal'
name = 'RLT-A'
higher-layer-if = interface-state-ref (Eth i/f)
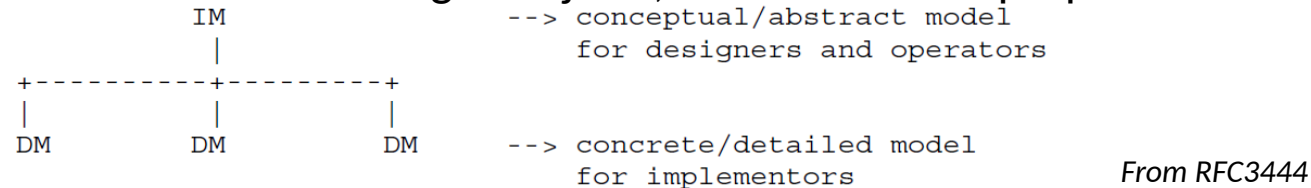lower-layer-if = interface-state-ref (CT-1)

CT-1
CT-Config
type = 'mrl:carrier-termination'
name = 'CT-1'
carrier-id = 'A'

CT-State
type = 'mrl:carrier-termination'
name = 'CT-1'
higher-layer-if = interface-state-ref (RLT-A)

Clarification

- There's a microwave information model(IM) defined in ONF. What's defined in this draft is YANG data model(DM).

- What's the difference or relationship between IM and DM?

  - IM and DM are both to define managed objects, but for different purposes.

```
                IM              --> conceptual/abstract model
                |                   for designers and operators
   +----------+---------+
   |          |         |
  DM         DM        DM       --> concrete/detailed model
                                    for implementors
```
From RFC3444

	IM	DM
RFC3444	The main purpose of an IM is to model managed objects at **a conceptual level**, independent of any specific implementations or protocols used to transport the data. Another important characteristic of an IM is that it defines relationships between managed objects.	DMs, conversely, are defined at **a lower level of abstraction and include many details**. Since conceptual models can be implemented in different ways, multiple DMs can be derived from a single IM.
RFC3198	An **abstraction and representation of the entities** in a managed environment, their properties, attributes and operations, and the way that they relate to each other. It is independent of any specific repository, software usage, protocol, or platform.	A mapping of the contents of an information model into a form that is **specific to a particular type of data store or repository. A "data model" is basically the rendering of an information model** according to a specific set of mechanisms for representing, organizing, storing and handling data.

- The ONF IM is been taken referenced and used as an input when developing the IETF YANG data model.

Discussion

- Received good comments from the list:
  - Some are missing: in capability, configuration
  - Some to be clarified: protection, tdm-connections
  - Some to be updated: range of the ct-performance-thresholds
- To add technology specific alarm definitions
- Should the model examples to be included in the draft, e.g., as an annex?
- Should capability be added into the model?
- Should the protection related attributes be defined in a general draft?

```
+--rw radio-link-protection-groups
|  +--rw radio-link-protection-group* [name]
|     +--rw name                          string
|     +--rw protection-architecture-type?    identityref
|     +--rw protection-operation-type?    enumeration
|     +--rw working-entity*               if:interface-ref
|     +--rw revertive-wait-to-restore?    uint16
|     +--rw radio-link-protection-members*   if:interface-ref
|     +---x protection-external-commands
|        +---w input
|           +---w protection-external-command?  identityref
+--ro radio-link-protection-groups-state
|  +--ro radio-link-protection-group* [name]
|     +--ro name                 string
|     +--ro protection-status?    identityref
```

Next steps

- Resolve the comments
- Ask for adoption

- Side discussion during this week, welcome to join