Framework for GMPLS based control of Flexi-grid DWDM networks
draft-ogrcetal-ccamp-flexi-grid-fwk-01
CCAMP WG, IETF 85

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v3

Intro draft-ogrcetal-ccamp-flexi-grid-fwk-01

- Goals:
  - Establish a framework, for the purposes of GMPLS control, of ITU-T DWDM flexi-grid enabled networks, including:
    - Terminology,
    - Data plane element models (i.e., "link and node characterization"),
    - Layered / hierarchical network model,
    - Routing and Spectrum Assignment modes,
    - Control Plane requirements

  - Lockstep with ITU-T data plane standardization
    - →G.872 approved without changes [version sent with the liaison statement from the September meeting of SG15]

Intro draft-ogrcetal-ccamp-flexi-grid-fwk-01

- **Changes from -00**, reflect:
  - Latest changes from ITU-T Geneva September meeting
    - Mainly in terminology and ref. network
  - Agreements during IETF84 (Vancouver) meeting
    - "m" parameter, deprecate terms & sections, focus on media layer
- **Updates**
  - Typos, fixes, removed editors' notes, added refs [RFC4397][G800].
  - Terminology
    - Deprecated terms
      - Fiber FS, FS channel, Common FS, SCFS, MCFS,…
      - ROADM → media layer switching elements & matrixes, filter components
    - Stable around the concepts of
      - Media Channel & Network Media Channel
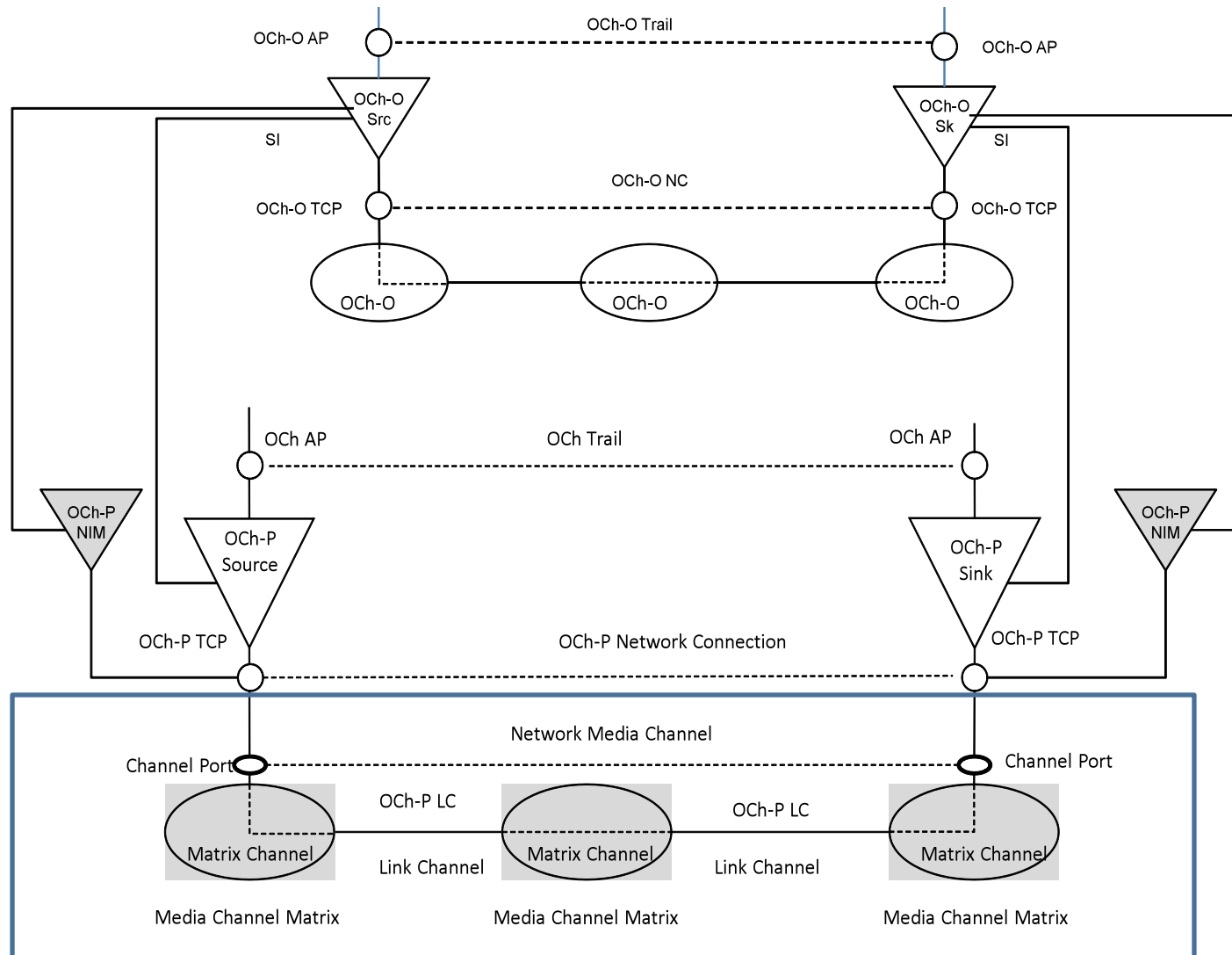
(Network) Media Channels (1/3)

- Terms
  - **Media Channel:** a media association that represents both the topology (i.e., path through the media) and the resource (frequency slot) that it occupies.
    - As a topological construct, it represents a (effective) frequency slot supported by a concatenation of media elements (fibers, amplifiers, filters, switching matrices...).
    - Term used to identify the physical layer entity
  - **Network Media Channel:** a media channel that supports a single OCh-P network connection.
    - It represents the concatenation of all media elements between an OCh-P source and an OCh-P sink.
  - **OCh-P Frequency Slot**: The spectrum allocated to a single OCh signal supported on a Network Media Channel.

The GMPLS control of the media layer deals with the establishment of media channels, which are switched in media channel matrixes. GMPLS labels locally represent them and their associated frequency slot.

Note → still being discussed, the media channel is the general case.

(Network) Media Channels (2/3)

Source: Draft revised Recommendation ITU-T G.872v15.4 – G.-872 . Figure 8-3



Current focus on media layer

(Network) Media Channels (3/3)

- Work Items
  - Controlled Entity (~LSP) media channel or network media channel?

  - "m" (frequency slot width parameter)
    - Local, represents both "amount of resource" & "label"
    - Can it change?
      - May be constrained by media elements freq. slot granularity…
      - n/m? – how can we insure the effective freq. slot remains valid?

  - Media channel hierarchy?
    - Use case rationale to support a (logical) hierarchy of media channels, where a media channel acts as "pipe" for 1+ network media channels
    - Concept of express channel [G.872] footnote 4.
      - how do we reflect the fact that a media channel can have several network media channels even if there is no hierarchy in the data plane? → distinguish between a management or control plane view with a hierarchy and the actual physical media that does not support a hierarchy. Stack / containment of LSPs although not visible in the media?

Next Steps for -02

- Better define the relationship between
  - Media channels and Network Media Channels (containment, aggregation?)
  - Media channels and OCh-P?

- Draft content
  - Major work on control plane requirements, both routing & signaling

- For Further Study (wait & see) ITU-T updates?
  - B100G? fixed bit rate (400G and/or 1T) or k*100G, integer k >= 2?
  - A single OCh-P / signal to be split over more than one network media channels?

Backup slide: WSON / SSON
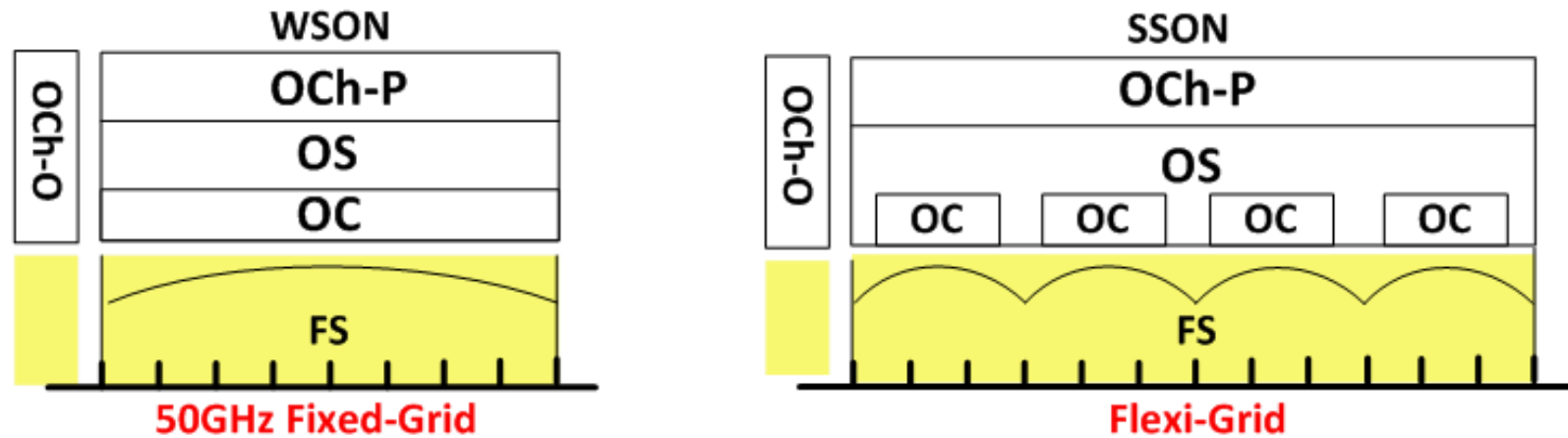
OCh-P: OCh Payload, OCh-O: OCh Overhead, OS: Optical Signal, OC: Optical Carrier, FS: Frequency Slot