

# Joint IETF/ITU-T work on T-MPLS

Co chair: Joint Working Team on T-MPLS

Malcolm Betts

**NORTEL**



**OIF**

OPTICAL  
INTERNETWORKING  
FORUM

# About the author

- ◆ Malcolm Betts – Nortel Networks
- ◆ Involved all aspects of the development of Transport Networks and equipment for over 35 years
- ◆ Started to work on standardization in 1988
- ◆ Currently:
  - Rapporteur Q.12/15 (Transport Network Architecture)
  - Co chair:
    - ITU-T Ad Hoc group on T-MPLS
    - Joint Working Team on T-MPLS
    - IETF MPLS Interoperability Design Team

# Agenda

- ◆ Background
- ◆ Organization of the work
- ◆ Joint work to date
- ◆ Next Steps

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- ◆ **Background**
  - **Why do we need joint work?**
- ◆ Organization of the work
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# Background – Initial work

- ◆ **Work on T-MPLS initiated by the ITU-T in 2005**
  - **Initial intent was to define the subset of MPLS functionality required for use in a Transport Network**
    - **i.e. connection oriented behaviour e.g. no PHP, no ECMP**
  - **The first Recommendations were approved in 2006**
- ◆ **However, to fully meet the requirements of the transport network some extensions to the functionality provided by IETF MPLS were required – particularly for OAM, protection switching etc.**
  - **Primary consideration was compatibility/reuse of Ethernet OAM (Y.1731/IEEE 802.1ag)**
  - **The IETF identified incompatibilities between these extensions and IETF MPLS**

# Background – IETF reaction

- ◆ July 2007 - A liaison from the IETF and IAB to the ITU-T identified compatibility problems between MPLS and T-MPLS
  - Potential for network problems if MPLS and T-MPLS (as being defined by the ITU-T) were interconnected
  - The liaison offered 2 options:
    - 1) Work jointly with the IETF to develop the necessary extensions to MPLS that were compatible with the IETF MPLS architecture or:
    - 2) Ensure that MPLS and T-MPLS are deployed as disjoint networks
      - Request a new Ethertype
      - Remove MPLS from the name of the ITU-T technology to avoid confusion in the market place

# Background – ITU-T SG15 interim meetings

- ◆ **September 2007 – Q.12 meeting in Stuttgart**
  - Q12/15 is responsible for the architecture
  - Good representation from the IETF (3 Area Directors)
  - Discussion resulted in a recommendation to adopt option 1 – the “Stuttgart agreement”
  - Identified the need to establish an organizational framework for the cooperative work
- ◆ **Fall 2007**
  - Q.9/15 and Q.11/15 endorsed the proposal from Q.12/15

# Background – ITU-T SG 13

- ◆ **January 2008 SG 13 meeting in Seoul**
  - Q.5/13 is responsible T-MPLS OAM
  - SG13 agreed to adopt the decision of SG 15 on the selection of option 1/2
    - Work on T-MPLS OAM is expected to move to SG15 for the 2009-2012 Study period
  - OAM Recommendations consented April 2007 (Y.1372/G.8113 and Y.1373/G.8114) were not approved
    - IETF had identified 61 issues requiring resolution
    - An edited version of Y.1372/G.8113 (T-MPLS OAM Requirements) was published as an informative supplement (Y Suppl.4)

# Background – ITU-T SG 15

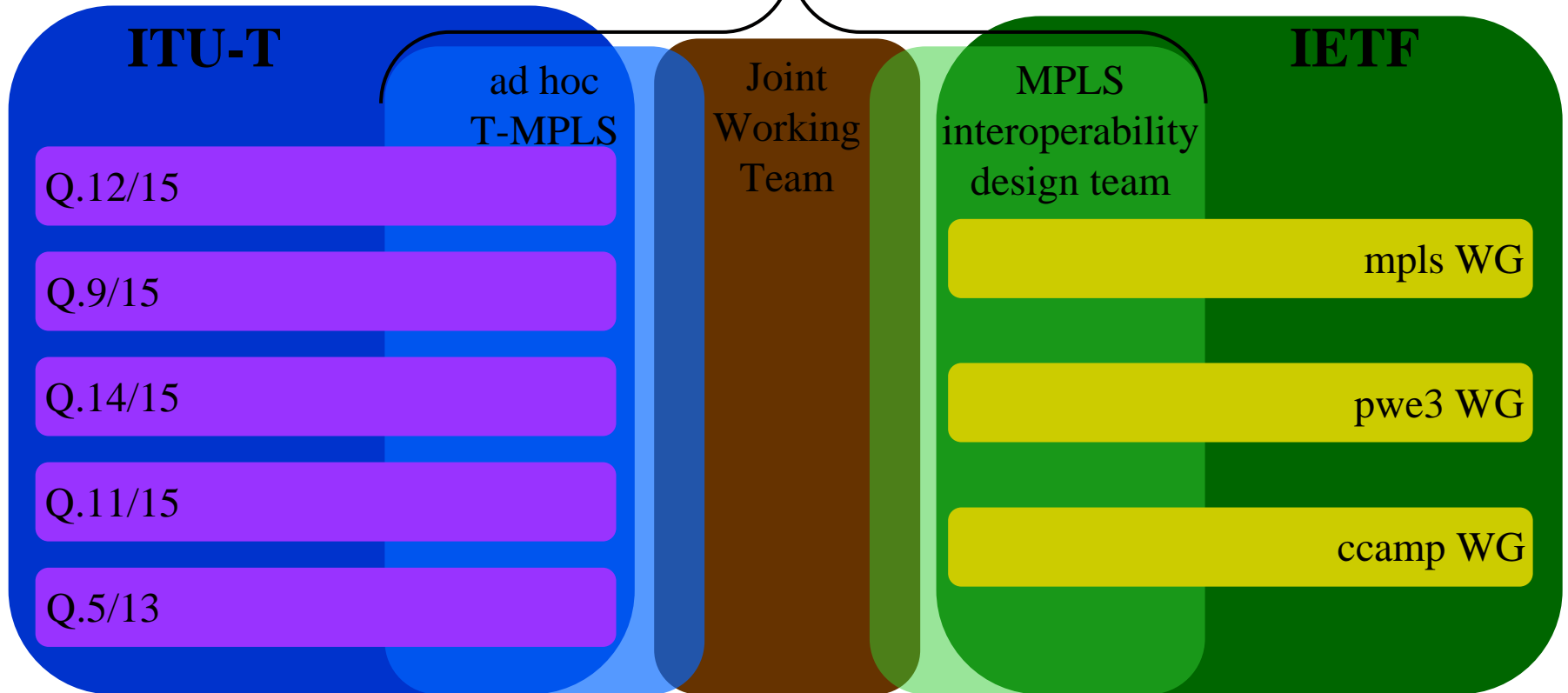
- ◆ February 2008 SG 15 meeting in Geneva
  - Agreed to work jointly with IETF
    - Established the organization to support this work
      - See SG 15 TD515/PLEN or the ad hoc T-MPLS home page:  
<http://www.itu.int/ITU-T/studygroups/com15/ahtmlmpls.html>
    - Initial task (completed mid April 2008):
      - Provide a recommendation to SG 15 on the selection of Option 1 (cooperation) or 2 (disjoint networks)
  - First meeting of the ad hoc on T-MPLS
    - Provided an overview of the ITU-T transport network requirements
  - Current work on T-MPLS in ITU-T put on hold pending selection of option 1/2

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- ◆ Joint work to date
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# Organization structure for the joint work

co chairs:  
Malcolm Betts ITU-T/Nortel  
David Ward IETF/Cisco



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  - **Selection of option 1 or option 2**
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# Work in March/April

- ◆ **IETF 71 – March 2008 in Philadelphia PA**
  - **IETF MPLS interoperability design team discussed a “straw man” proposal to address the ITU-T OAM and forwarding requirements**
- ◆ **March/April 2008**
  - **JWT conference calls**

# Results of JWT work

- ◆ Based on a technical analysis the JWT concluded that the ITU-T requirements could be addressed by extensions to the IETF MPLS architecture
- ◆ Therefore, the JWT recommended option 1
  - **Support for transport requirements requires extensions to the IETF MPLS architecture and implementations**
    - These extension will be know as the transport profile for MPLS (MPLS-TP)
    - MPLS-TP will be developed in the IETF
    - ITU-T will develop new or revised Recommendations to integrate MPLS-TP into the Transport Network
- ◆ ITU-T accepted option 1 in April 2008
  - **Liaison to IETF and IAB also an ITU-T newslog entry @ <http://www.itu.int/ITU-T/newslog/ITUTIETF+Interoperability+Issues+Addressed.aspx>**

# Technical analysis/potential solution - 1

- ◆ Provide support for the ITU-T transport network requirements by defining:
  - **A new reserved label as the MPLS-TP Alert label (TAL)**
    - The TAL will be “exposed” at a
      - Maintenance End Point (MEP) by its position in the label stack
      - Maintenance Intermediate Point (MIP) by TTL expiry
  - **A “generic” Associated Channel (GE ACh)**
    - The TAL indicates that a GE ACh is present at the bottom of the stack
    - The GE ACh will provide code points to support the full set of functions traditionally supported by “overhead” in the transport network
      - OAM, DCC/SCC, APS signaling...

# Technical analysis/potential solution -2

- ◆ **JWT was structured into 5 sub teams to consider**
  - **Forwarding**
  - **OAM**
    - TAL and GE ACh provide a potential solution for forwarding and OAM
      - Avoids the problems of stacked MELs
  - **Protection/restoration**
    - Multiple potential solutions were identified:
      - Facility bypass; detours; ITU APS
  - **Control Plane**
    - Some extensions required but no major issues
  - **Network and equipment management**
    - Some extensions required but no major issues

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  - **Organization**
  - **Responsibilities**
  - **Schedule**

# Future inter-SDO organizational structure

- ◆ The existing organizational structure will be retained with the following roles:
  - Facilitate the rapid exchange of information between the IETF and ITU-T
  - Ensure that the work is progressing with a consistent set of priorities
  - Identify gaps/inconsistencies in the solutions under development
    - Propose solutions for consideration by the appropriate WG/Question
  - Provide guidance when work on a topic is stalled or technical decision must be mediated
- ◆ None of these groups has the authority to create or modify IETF RFCs or ITU-T Recommendations
  - Any such work will be progressed via the normal process of the respective standards body
  - Direct participation in the work by experts from the IETF and ITU-T is required

# Development of RFCs on MPLS-TP

- ◆ **Work areas will be assigned to the appropriate IETF Working Groups to develop the RFCs**
  - **Existing Working Group charters and milestones will be updated to reflect the new work**
    - **Expected to be completed before IETF 72 (July 2008)**
  - **WGs will appoint authors and where appropriate form WG design teams to develop the RFCs**
    - **It is assumed that ITU-T participants will be active members of these design teams**
      - **The draft will be reviewed by the ITU-T prior to completion of WG last call**
    - **Apply for early allocation of RFC numbers and IANA codepoints once a document has completed IESG review**

# Development of Recommendations on MPLS-TP

- ◆ The definition of the MPLS-TP that supports the ITU-T transport network requirements will be in IETF RFCs
  - **ITU-T Recommendations will make normative references to the appropriate RFCs**
- ◆ Work will be assigned to the Question as per the normal ITU-T practice
- ◆ The ITU-T SG 15 will terminate the work on current T-MPLS and develop new or revised Recommendations to:
  - **Align the current T-MPLS Recommendations with MPLS-TP**
  - **Integrate MPLS-TP into the transport network**
- ◆ Draft text for consent will be reviewed by the IETF

# Tentative schedule

- ◆ **First draft of the MPLS-TP Architectural Framework**
  - IETF 72 (July 2008)
  - **WG last call completion Q2/2009**
- ◆ **Draft to request allocation of reserved label for the MPLS-TP alert label (TAL)**
  - IETF 72 (July 2008)
- ◆ **RFCs on Alert Label and GE ACh definition**
  - **WG last call completion Q2/2009**
- ◆ **Updated ITU-T Recommendations**
  - **Q2/2009 (may need to schedule experts meeting/WP plenary to avoid delaying consent to the October 2009 meeting of SG 15)**

A significant amount of work is required to achieve these milestones

- Need a commitment from interested parties to edit and drive the drafts

Thank you

For further details see the output of the JWT is available @  
[http://ties.itu.int/ftp/public/itu-t/ahtmls/readandwrite/doc\\_exchange/overview/](http://ties.itu.int/ftp/public/itu-t/ahtmls/readandwrite/doc_exchange/overview/)

