ITU-T Study Group 15

Optical and other Transport Networks

by

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Nortel Networks

Chairman SG 15

ITU-T Study Group 15

Optical and other transport networks

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Responsibility and Mandate

- **Focal point** in ITU-T for studies on optical and other transport networks, systems and equipment. This encompasses the development of transmission layer related standards for access, metropolitan and long haul sections of communication networks.

- **Lead Study Group** on:
  - Access Network Transport (ANT)
  - Optical Technology

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SG15 Objectives

- Focal point for global standards on Transport Networks
- Market driven and timely standards in major work areas
- 'Value-added' coordination and cooperation effort
- Support ITU-T as preeminent Internat. Stds. Organization
- Promote SG 15 standardization activities

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Organization

SG 15 - Optical and other Transport Networks

→ WP 1 - Network Access

→ WP 2 - Network Signal Processing

→ WP 3 - OTN Structure

→ WP 4 - OTN Technology

→ WP 5 - Projects and Promotion

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The Team

- SG Chair: P. Wery   (CAN)
    - Vice-Chair: G. Bonaventura   (I)
                    H. Okamura   (J)
                    S. Trowbridge   (USA)
    - WP Chair: G. Bonaventura   (I)
                    A. Nunn   (G)
                    H. Okamura   (J)
                    Y.Naito   (J)
                    S. Trowbridge   (USA)

      - Rapporteurs, Editors, SG Representatives

- TSB Counsellor: P. Rosa
  TSB Support: I. Garde

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Some statistics

- Work Program (Questions for study) — 19
- Recommendations under development — Approx. 100
- Study Group meeting interval — Approx. 8 months
- Rapporteur Group meetings — Frequently
- Work by correspondence (EDH) — Continuous
- Approval procedure — AAP
- Rapporteurs — 17
- Editors — Approx. 60 - 70
- SG Representatives — 14
- SG meeting participants (Avrg. 97-00/01-03) — 347/299
- Number of countries (Admin. and/or ROA) — 39/26
- Number of Scient. & Indust. Orgs. (SIO) — 74/74
- Recommendation texts approved — 69/122 (22 May 2003)

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Cooperation with SDOs, Forums, Consortia

- Key SG 15 communication and cooperation partners:

Organization	Technical area/Topic
◆ ATM Forum	Traffic & network management
◆ DSL Forum	Access network
◆ TM Forum	Network management
◆ ANSI T1	Access network, SONET/SDH, OTN
◆ ETSI	Access network, SDH
◆ ISO/IEC	Optical fibers, components
◆ ISOC/IETF	Optical transport network
◆ ISOC/IETF and 3GPP	Network signal processing
◆ TIA, OIF	Optical networks & technology
◆ IEEE, MEF	Ethernet; Metro-Ethernet

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Cooperation with SDOs, Forums, Consortia (cont'd)

■ SG 15 communication and cooperation partners:

<u>Organization</u>   <u>Liaison topics</u>

◆ ATM Forum   Traffic & network management

- RM cells with undefined **code points** in the Protocol ID field
- Optical Transport Networks & Technologies **Standardization Work Plan**
- **Distributed** Call and Connection Management based on PNNI
- Initiation of work on **ASON routing**
- **PNNI extensions** for transport networks (ATMF)

◆ DSL Forum   Access Network

- VDSL **line code** selection

◆ TM Forum   Network management

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Cooperation with SDOs, Forums, Consortia (cont'd)

- SG 15 communication and cooperation partners:

Organization	Liaison topics
◆ ANSI	Access network
- T1E1	- Carrier sets (tones) for regionally specified **VDSL**
	- VDSL **line code** selection
	SONET/SDH, OTN
- T1P1	- Transmission of **Time & Date** Information
- T1X1	- Optical Transport Networks & Technologies **Standardization Work Plan**
	- **Sub-rate Fiber Channel** signal encapsulation in GFP
- T11.3	- **Sub-rate Fiber Channel** signal encapsulation in GFP

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **SG 15 communication and cooperation partners:**

  <u>Organization</u>   <u>Liaison topics</u>

  - ◆ ETSI   SDH
    - Transmission of **Time & Date** Information

    - TM6   Access Network
      - Carrier sets (tones) for regionally specified **VDSL**
      - VDSL **line code** selection
      - **Voice over** DSL, DDR
      - **SDSL, SHDSL, VDSL**

    - SA4   Network Signal Processing
      - Voice Enhancement Devises (**VED**) and Tandem-Free Operation (**TFO**)
      - **TFO control** for Circuit Multiplication Equipment (CME)

  - ◆ 3GPP   - Voice Enhancement Devises (**VED**) and Tandem-Free Operation (**TFO**)

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Cooperation with SDOs, Forums, Consortia (cont'd)

- SG 15 communication and cooperation partners:

Organization	Liaison topics
◆ ISO/IEC	Optical fibers, components
	- Optical Transport Networks & Technologies **Standardization Work Plan**
- SC86A	- IEC SC86A activities on **Fibers and Cables**
- SC86B	- Transmission characteristics opt. **components, subsystems** (G.671)
	- **Harmonization of Classes** of WDM Components; ITU-T and IEC
	- **Specifications and test methods**; Return loss; Reflectance
	- Operation of optical components at **high power levels**
- SC86C	- **High optical intensities** from fibre optic amplification
	- **Max. permissible optical power** levels safe and damage free use of optical amplifiers, including Raman amplifiers optical
- JTC1/SC06/WG7	- Connection **routing protocols** for use in ASON (ref. ISO 10589)

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Cooperation with SDOs, Forums, Consortia (cont'd)

■ SG 15 communication and cooperation partners:

Organization	Liaison topics
◆ ISOC/IETF	Optical transport network
- sub-IP WGs	- Optical Transport Networks & Technologies **Standardization Work Plan** - ASON **routing** activities
- ccamp	- **SDH** group signals (AUG, TUG) - SDH/ SONET **labels** - New **ASON** related Recommendations - ASON **signalling protocols** (GMPLS RSVP-TE & CR-LDP) - **Automatic discovery** work (G.7714 series) - ASON status and **GMPLS protocol** support for restoration/rerouting capabilities - SDH and OTN **discovery mechanisms** - ASON **routing** activities

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Cooperation with SDOs, Forums, Consortia (cont'd)

■ SG 15 communication and cooperation partners:

<u>Organization</u>   <u>Liaison topics</u>

◆ ISOC/IETF   Network signal processing

- sigtran   - **Signalling protocols** for equipment interconnectiong GSTN and IP networks (G.799.1)

                       - IP-based **Circuit Multiplication Equipment** (IP-CME) and transmission of call signaling messages

- megaco   - CAS and MF Based **Signalling** (G.799.1)

- is-is   - Architecture and Specification of **Data Communication Network** (G.7712)

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Cooperation with SDOs, Forums, Consortia (cont'd)

- SG 15 communication and cooperation partners:

Organization | Liaison topics

◆ TIA | Optical networks & technology

- TR 45 | - Transmission of **Time & Date** Information

- FO-4.1; FO-4.5 | - Optical Transport Networks & Technologies **Standardization Work Plan**

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Cooperation with SDOs, Forums, Consortia (cont'd)

■ SG 15 communication and cooperation partners:

<u>Organization</u>   <u>Liaison topics</u>

◆ OIF   Optical networks & technology

- Optical Transport Networks & Technologies **Standardization Work Plan**
- On OIF **Project VSR4** (new serial 1310 VSR interface)

      - Architect. & Signaling

- New **ASON** related Recommendations
- ASON **signaling protocols** (GMPLS RSVP-TE & CR-LDP; ATMF UNI and PNNI)
- **Automatic discovery** work (G.7714 series)
- Architecture and Requirements for **Routing** in ASON (G.7715/Y.1706)

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■ SG 15 communication and cooperation partners:

Organization   Liaison topics

◆ OIF   Optical networks & technology

　- PLL   - **Optical interfaces** for intra-office systems

　 - **CWDM**

　 - **Mapping** of 10 Gbit/s Ethernet 802.3

　 - ASON **signal. prot.** (G7713 series) and **routing protocol**
　 (future G.7715.1)

　 - E-NNI requirements (OIF)

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **SG 15 communication and cooperation partners:**

  <u>Organization</u>   <u>Liaison topics</u>

  - ◆ IEEE   Ethernet; Metro-Ethernet
    - 802
      - Optical Transport Networks & Technologies **Standardization Work Plan**
      - Gigabit-Capable Passive Optical Networks (**G-PON**) (G.984.1; G.984.2)
      - **OAM layer** in 100 Mbit/s p-t-p Ethernet based optical access systems (G.985)
    - 802.3
      - **Mapping** of 10 Gbit/s Ethernet 802.3
      - **VDSL line code** selection
    - 802.3ah
      - **New** access network **Recommendations** in SG 15
      - **Generic logical Packet interface** for the gamma reference point (xDSL)
      - **Code point** for OAM frames

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **SG 15 communication and cooperation partners:**

  <u>Organization</u>   <u>Liaison topics</u>

  - ◆ **IEEE** (cont'd)

    - 802.17   - **Multiple Service Rings**; **Resilient Packet Rings**;
                       Protection/Restoration

                      - On draft new Rec. **X.msr**

                      - **Assignment of user Payload Identifier** (UPI) for frame-
                       mapped GFP encapsulation of RPR client

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Cooperation with SDOs, Forums, Consortia (cont'd)

- SG 15 communication and cooperation partners:

Organization	Liaison topics
◆ MEF	Ethernet; Metro-Ethernet

- Ethernet activities in MEF
- Ethernet **activities in SG 15** (approx. 10 draft new Recs)
- Ethernet services in **G.etna** → split into several draft new Recs

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **Current SG 15 Representatives:**

To	Topic	Name
ANSI T11	Fiber Channel	Mr. Mike Scholten
IEEE 802.3ah	Ethernet	Mr. Frank Effenberger
MEF	Ethernet service over opt. transport	Mr. Glenn Parsons
OIF	Optical Networks	Mr. John McDonough

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **Current SG 15 Representatives:**

To	Topic	Name
IEC TC 86, SC 86A	Fiber Optics Fibers and cables	Mr. Thomas Hanson
IEC TC 86, SC 86B	Fiber optics interconnections, devices and passive components	Mr. André Girard
IEC TC 86, SC 86C	Fiber Optics Fiber optic systems and active devices	Mr. Pietro DiVita

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **Current SG 15 Representatives:**

To	Topic	Name
IETF ipo	Optical Transmission	Mr. Wesam Alanqar
IETF atommib	Transport Ntwk. Mgmt.	Mr. Kam Lam
hubmib		
ifmib		
disman		
snmpv3		
IETF ccamp	Ctrl. & mgmt. plane	Mr. Wesam Alanqar
IETF gsmp	General switch mgmt. protocol	Mr. Jonathan Sadler

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **Facts**
  - ◆ Different motivations/objectives for different stds. Organizations
    - Implementation agreements; Specifications; Standards; Marketing; Other
  - ◆ Standards program delineation between SDOs difficult
  - ◆ Different cultures, working methods
  - ◆ A degree of overlap/duplication unavoidable
  - ◆ Communication and Cooperation necessary

- **ITU-T recognition (meet qualifying criteria)**
  - ◆ Communicate with Forums, Consortia   (Rec. A.4)
  - ◆ Cooperate, info exchange, nat./regional SDOs (Rec. A.6)
  - ◆ Reference 'foreign' standards   (Rec. A.5)

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Cooperation with SDOs, Forums, Consortia (cont'd)

- **Formal agreements**
  - ◆ ITU-T Resolutions (Collab. with ISO/IEC)
  - ◆ IETF and ITU-T Collaboration Guidelines
    - (RFC 3356; ITU-T Supplement 3 to A-Series of Recommendations)
  - ◆ MoU (IEC, ISO, ITU and UN/ECE; ITU and ETSI)
- **Communication tools**
  - ◆ Liaison statements
  - ◆ Representatives
  - ◆ Common FTP area
  - ◆ Joint meetings

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Cooperation with SDOs, Forums, Consortia (cont'd)

- Experience
  - Collaboration agreements clarify, guide, provide transparency
  - Personal acquaintance indispensable
  - Representatives (ambassadors) in each others' meetings conducive to mutual understanding
  - Work by correspondence via (joint) email lists
  - Easy access to each other's (draft) standards/documents is essential

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