Ninth joint IEEE 802 and ITU-T Study Group 15 Workshop

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Workshop Agenda

- Opening Remarks
  - James E. Matthews, President, IEEE SA
  - Seizo Onoe, Director, TSB, ITU
  - James Gilb, Chair, IEEE 802
  - Glenn Parsons, Chair, ITU-T SG15
- Session 1: Exploration of Optical PHYs Addressing 800 Gb/s and Beyond
  - Moderators: John D'Ambrosia, Futurewei, IEEE P802.3dj Task Force Chair & Steve Gorshe, Microchip, ITU-T Q11/15 Rapporteur
- Session 2: Access and In-Premises Networks
  - Moderators: George Zimmerman, CME Consulting, IEEE P802.3dg Task Force Chair & Frank Effenberger, Futurewei, ITU-T Q2/15 Rapporteur
- Session 3: Synchronization and TSN
  - Moderators: János Farkas, Ericsson, IEEE 802.1 TSN Task Group Chair & Stefano Ruffini, Calnex, ITU-T Q13/15
- Session 4: YANG and Data Modelling
  - Moderators: Scott Mansfield, IEEE 802 YANGsters Chair, ITU-T Q14/15 Rapporteur, Principal Researcher, Ericsson: Session 4 Introduction – YANG and Data Modelling
- Wrap-up, Takeaways, Closing
  - Moderators: James Gilb, Chair, IEEE 802 & Glenn Parsons, Chair, ITU-T SG15

Workshop objectives

- This workshop focused on topics of common interest such as:
  - Optical interfaces beyond 1T transmission,
  - Access and in-premises networks,
  - Synchronization and time-sensitive networking (TSN),
  - YANG and data modelling.

- The objectives of this workshop include, but are not limited to, enhancing long-standing collaboration and coordination between IEEE 802 and ITU-T Study Group 15 through discussion and information exchange on topics of common interest.

ITU-T SG15 mandate

SG15 is responsible for the development of **standards** on:

- optical transport network
- optical access network
- home network and power utility network infrastructures
- equipment
- Gigabit copper transmission
- maintenance
- optical fibers and cables and their related installation
- management
- instrumentation and measurement techniques
- test
- control and management plane technologies

to enable the evolution toward intelligent optical networks.

IEEE 802 ITU

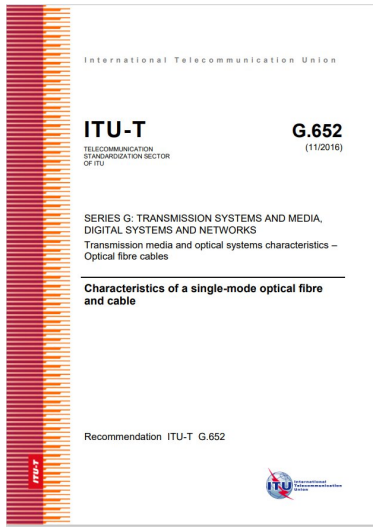
Questions and Working Parties of SG15

	Question Number	Question title
WP1	1/15	Coordination of Access and Home Network Transport Standards
WP1	2/15	Optical systems for fibre access networks
WP1	3/15	Technologies for in-premises networking and related access applications
WP1	4/15	Broadband access over metallic conductors
WP2	5/15	Characteristics and test methods of optical fibres and cables, and installation guidance
WP2	6/15	Characteristics of optical components, subsystems and systems for optical transport networks
WP2	7/15	Connectivity, Operation and Maintenance of optical physical infrastructures
WP2	8/15	Characteristics of optical fibre submarine cable systems
WP3	10/15	Interfaces, interworking, OAM, protection and equipment specifications for packet-based transport networks
WP3	11/15	Signal structures, interfaces, equipment functions, protection and interworking for optical transport networks
WP3	12/15	Transport network architectures
WP3	13/15	Network synchronization and time distribution performance
WP3	14/15	Management and control of transport systems and equipment

WP: Working Party

ITU-T SG 15 deliverables

- Work products:
  - Recommendations
  - Supplements
  - Technical papers and reports
  - Flyers


International Telecommunication Union

ITU-T G.652 (11/2016)

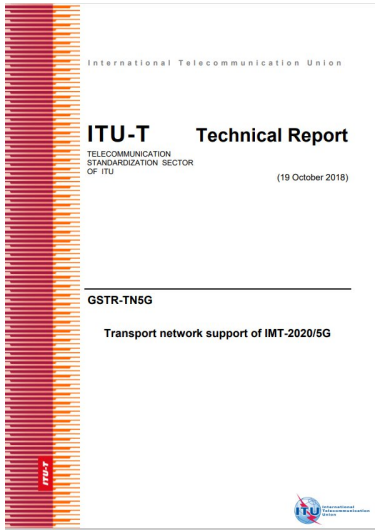
TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Transmission media and optical systems characteristics – Optical fibre cables

Characteristics of a single-mode optical fibre and cable

Recommendation ITU-T G.652


International Telecommunication Union

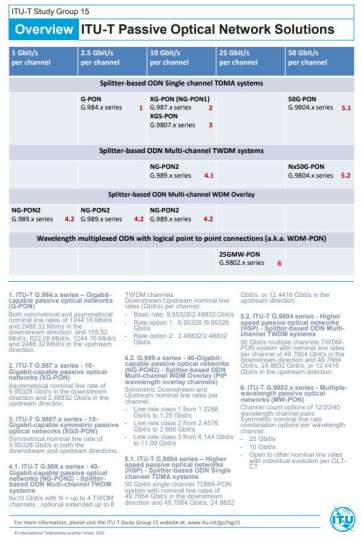
ITU-T **Technical Report**

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

(19 October 2018)

GSTR-TN5G

Transport network support of IMT-2020/5G


ITU-T Study Group 15

Overview ITU-T Passive Optical Network Solutions

1 Gbit/s per channel	2.5 Gbit/s per channel	10 Gbit/s per channel	25 Gbit/s per channel	50 Gbit/s per channel
Splitter-based ODN Single channel TDMA systems				
G-PON G.984.x series 1		XG-PON (NG-PON1) G.987.x series 2 XGS-PON G.9807.x series 3		50G-PON G.9804.x series 5.1
Splitter-based ODN Multi-channel TWDM systems				
		NG-PON2 G.989.x series 4.1		Nx50G-PON G.9804.x series 5.2
Splitter-based ODN Multi-channel WDM Overlay				
NG-PON2 G.989.x series 4.2	NG-PON2 G.989.x series 4.2	NG-PON2 G.989.x series 4.2		
Wavelength multiplexed ODN with logical point to point connections (a.k.a. WDM-PON)				
			25GMW-PON G.9802.x series 6	

1. ITU-T G.984.x series – Gigabit-capable passive optical networks (GPON)

Both symmetrical and asymmetrical nominal line rates of 1244.16 Mbit/s and 2488.32 Mbit/s in the downstream direction, and 155.52 Mbit/s, 622.08 Mbit/s, 1244.16 Mbit/s and 2488.32 Mbit/s in the upstream direction.

2. ITU-T G.987.x series - 10-Gigabit-capable passive optical networks (XG-PON)

Asymmetrical nominal line rate of 9.95328 Gbit/s in the downstream direction and 2.48832 Gbit/s in the upstream direction.

3. ITU-T G.9807.x series - 10-Gigabit-capable symmetric passive optical networks (XGS-PON)

Symmetrical nominal line rate of 9.95328 Gbit/s in both the downstream and upstream directions.

4.1. ITU-T G.989.x series - 40-Gigabit-capable passive optical networks (NG-PON2) - Splitter-based ODN Multi-channel TWDM systems

No.10 Gbit/s with N = up to 4 TWDM channels , optional extended up to 8 TWDM channels

Downstream/Upstream nominal line rates (Gbit/s) per channel:

- Basic rate: 9.95328/2.48832 Gbit/s
- Rate option 1: 9.95328 /9.95328 Gbit/s
- Rate option 2: 2.48832/2.48832 Gbit/s

4.2. G.989.x series - 40-Gigabit-capable passive optical networks (NG-PON2) - Splitter-based ODN Multi-channel WDM Overlay (PtP wavelength overlay channels)

Symmetric Downstream and Upstream nominal line rates per channel:

- Line rate class 1 from 1.2288 Gbit/s to 1.25 Gbit/s
- Line rate class 2 from 2.4576 Gbit/s to 2.666 Gbit/s
- Line rate class 3 from 6.144 Gbit/s to 11.09 Gbit/s

5.1. ITU-T G.9804 series – Higher speed passive optical networks (HSP) - Splitter-based ODN Single channel TDMA systems

50 Gbit/s single channel TDMA-PON system with nominal line rates of 49.7664 Gbit/s in the downstream direction and 49.7664 Gbit/s, 24.8832 Gbit/s, or 12.4416 Gbit/s in the upstream direction.

5.2. ITU-T G.9804 series - Higher speed passive optical networks (HSP) - Splitter-based ODN Multi-channel TWDM systems

50 Gbit/s multiple channels TWDM-PON system with nominal line rates per channel of 49.7664 Gbit/s in the downstream direction and 49.7664 Gbit/s, 24.8832 Gbit/s, or 12.4416 Gbit/s in the upstream direction.

6. ITU-T G.9802.x series - Multiple-wavelength passive optical networks (MW-PON)

Channel count options of 12/20/40 wavelength channel pairs.

Symmetric nominal line rate combination options per wavelength channel:

- 25 Gbit/s
- 10 Gbit/s
- Open to other nominal line rates with individual evolution per OLT-CT

For more information, please visit the ITU-T Study Group 15 website at: www.itu.int/go/tsg15

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- Recommendation series
  - G.600-G.699: Transmission media and optical systems characteristics
  - G.700-G.799: Digital terminal equipments
  - G.800-G.899: Digital networks
  - G.900-G.999: Digital sections and digital line system
  - G.7000-G.7999: Data over Transport – Generic aspects
  - G.8000-G.8999: Packet over Transport aspects
  - G.9000-G.9999: Access networks
  - G supplements: Supplements to ITU-T G-series Recommendations

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