

# Introduction to CCSA TC6

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Vice Chair of CCSA TC6, Vice Chair of ITU-T SG15, Chair of IETF CCAMP



**1**

**Overview of Technical Committee 6 (TC6)**

**2**

**Working Group Progress, Mission & Plan of TC6**

**3**

**Discussion: Collaboration with ETSI F5G ISG**

# CCSA Defines the Standards for ICT Area of China

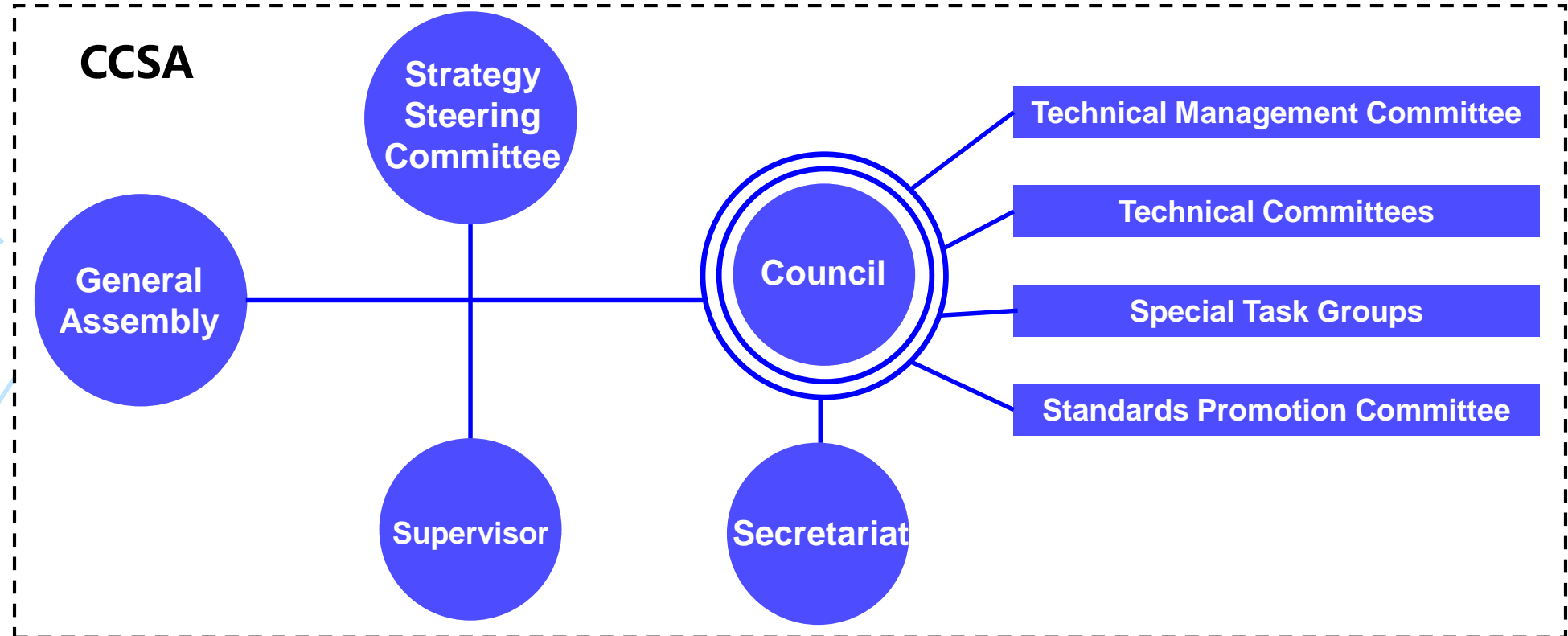


## China Communication Standards Association (CCSA)

### Regulation

Standardization Administration of P.R.C

Ministry of Industry and Information Technology



- CCSA is a non-profit organization and was established in 2002
- CCSA has 1041 members including operators, vendors, research institutes, etc.



# Overview of Technical Committee (TC)

TC1: Internet and applications

TC3: Network and service

TC4: Power and station Environment

TC5: Wireless communication

**TC6: Transport and access network**

TC7: Network management & operation

TC8: Network & information security

TC9: EMC and safety

TC10: Internet of things

TC11: Mobile internet and terminal

TC12: Aerospace communication

TC13: Industrial internet

WG1: Transport network

Liaise to ITU-T SG15, OIF & IETF

- Working on standards related to the transport system, including architecture, system requirement, etc.

WG2: Access & home network

Liaise to ITU-T SG15, IEEE 802.3, ETSI, ANSI, BBF

- Working on standards related to architecture, management, security, and QoS access network and broadband technologies and applications

WG3: Optical fiber and cable

Liaise to ITU-T SG15, IEC TC86/SC86A

- Working on standards related to optical fiber characteristics and test methods, and cable for communication, digital transmission, RF transmission, etc.

WG4: Optical devices

Liaise to ITU-T SG15, IEC TC86/SC86A/SC86C

- Working on standards related to optical active and passive devices for communication.

# Leadership of CCSA TC6

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## TC6: Transport and access network

- **Chair: YANG Zhuang (CICT)**
- Vice Chair: AO Li (CAICT), ZHANG Chengliang (China Telecom), SONG Zhituo (Chengdu Tairui), ZHANG Fatai (Huawei), WANG Guangquan (China Unicom)

### WG1: Transport network

- **Chair: ZHANG Chengliang (China Telecom)**
- Vice Chair: Zhang Haiyi (CAICT), Wang Haijun (China Unicom), Han Liuyan (China Mobile)
- Hot topics: OTN, OSU, SPN, etc.

### WG3: Optical fiber and cable

- **Chair: LIU Cheng (CICT)**
- Vice Chair: Xue Mengchi (Chengdu Tairui), Liu Tai (CAICT), Wang Bo (Huawei)
- Hot topics: fibre and cable spec

### WG2: Access & home network

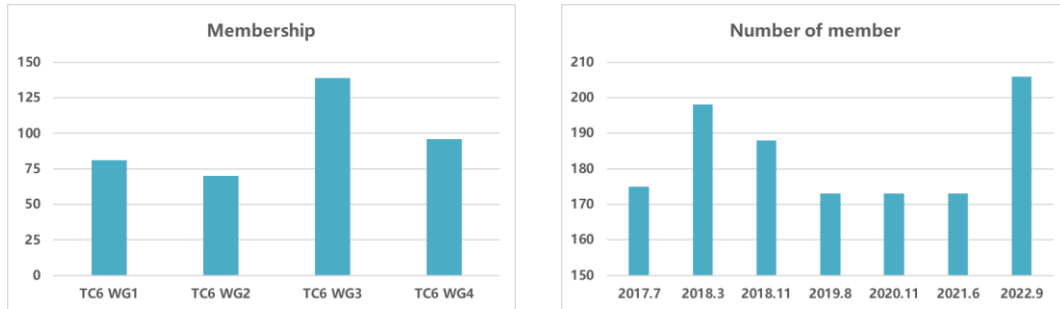
- **Chair: AO Li (CAICT)**
- Vice Chair: Wang Bo (China Telecom), Zhang Dechao (China Mobile), Shao Yan (China Unicom)
- Hot topics: PON, FTTR, RGW, edge computing

### WG4: Optical devices

- **Chair: HU Qianggao (CICT)**
- Vice Chair: Gao Qiang (ZTE), Shen Shikui (China Unicom)
- Hot topics: fibre and cable components, including connectors, splitter, etc.

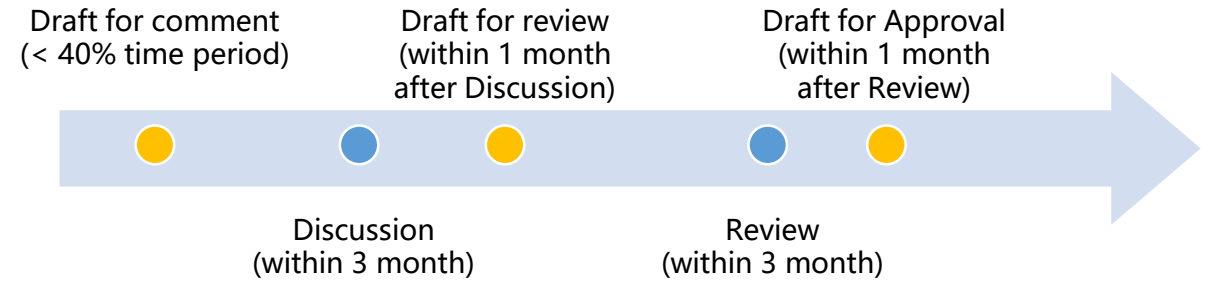
# CCSA TC6 Membership & Standards Development

## TC 6 membership



- TC6 has 206 members in the new 2022 study period
- Members cover E2E optical telecom industry chain in China

## General procedures of standard development



Project development time period:  
 new project (24 month) , amendment (18 month)

## New projects

|        | NS | IS | CS | RD | Total |
|--------|----|----|----|----|-------|
| TC6WG1 | 0  | 6  | 5  | 6  | 17    |
| TC6WG2 | 5  | 13 | 0  | 4  | 22    |
| TC6WG3 | 5  | 9  | 0  | 2  | 16    |
| TC6WG4 | 1  | 16 | 0  | 3  | 20    |
| Total  | 11 | 44 | 5  | 15 | 75    |

## On-going projects

|        | NS | IS  | CS | RD | Total |
|--------|----|-----|----|----|-------|
| TC6WG1 | 0  | 23  | 2  | 21 | 46    |
| TC6WG2 | 1  | 52  | 0  | 12 | 65    |
| TC6WG3 | 7  | 42  | 3  | 9  | 61    |
| TC6WG4 | 3  | 31  | 2  | 11 | 47    |
| Total  | 11 | 148 | 7  | 53 | 219   |

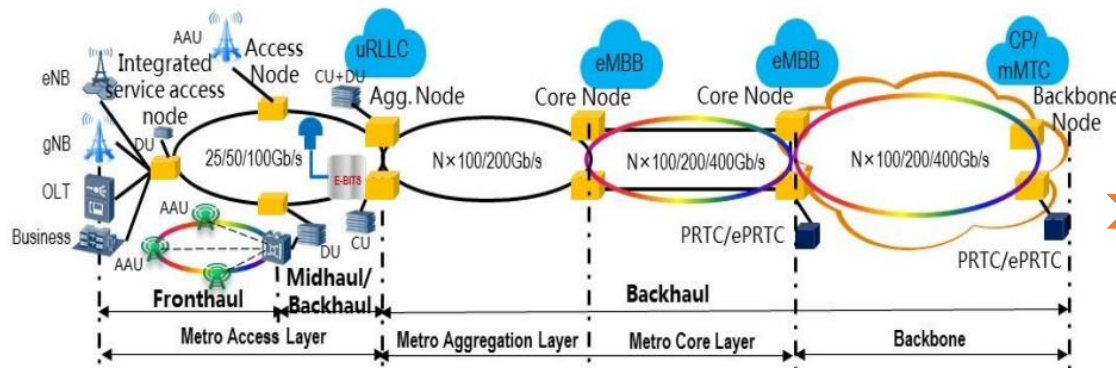
# WG1: Transport Network Standards

## ● 100+STD and 55+RD during 2017-2022



## ● Workshops:

1. ROADM Network Technology Evolution and Application
2. 5G Fronthaul and Backhaul High-Speed Optical Module
3. Open optical networks



Transport network overview

## ● Define Transport network standards:

### 1. Support 5G fronthaul, midhaul & synchronization:

- Technical requirements for metro N×25 Gbit/s wavelength division multiplexing (WDM) systems
- Sliced Packet Network (SPN), OTN, High-Speed Optical Modules, High-Precision Time Synchronization

### 2. Optical service unit (OSU)

- Technical requirements, management & control, support sub 1Gbps, test methodology

### 3. Open optical network

- Interconnection requirement, open WDM/WTN, OTN for access application

### 4. Performance Monitoring and Artificial Intelligence

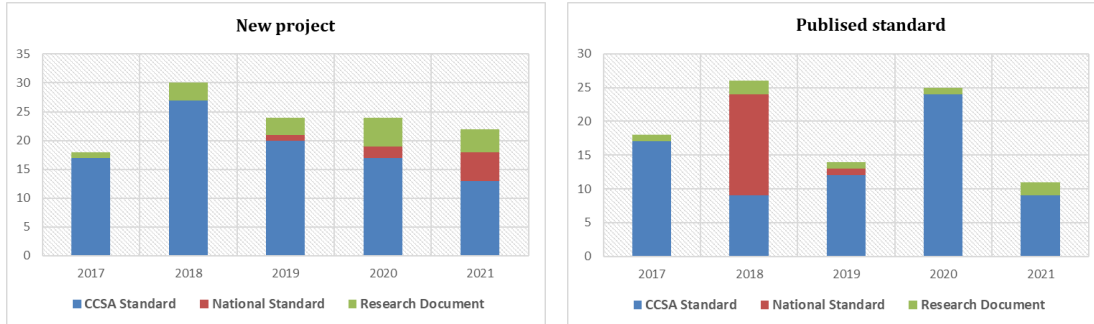
- Technical Requirements for WDM & PTN, research on AI in Transport Network

### 5. Coordination between different networks

- SDN-based IP+optical networking architecture, WDM with quantum channels, FlexE requirements and test methodology

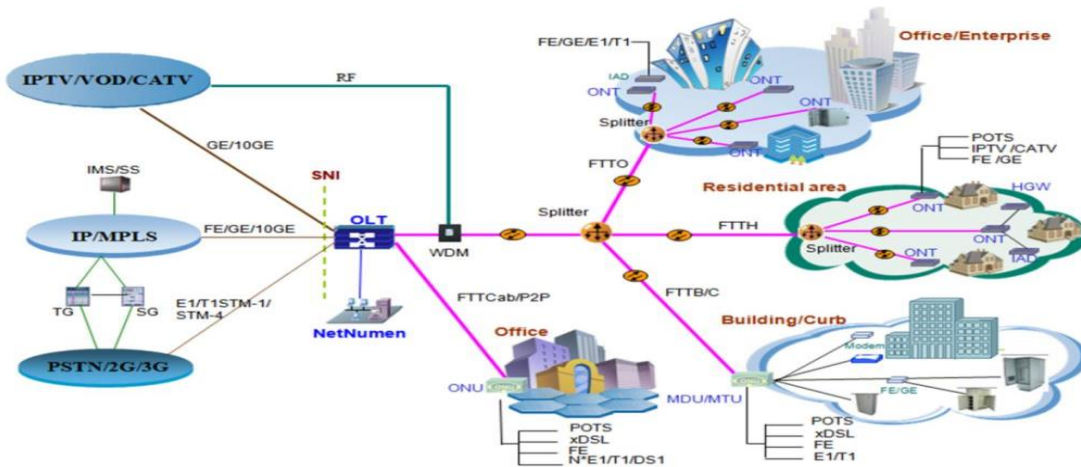
# WG2: Access & Home Network Standards

- 110+ new & 90+ published during last 5 years



- **Standard Focus:**

1. PON: WDM-PON, industrial PON, XGS-PON, IODN
2. Home network: smart RGW, Wi-Fi testing, PLC, VLC
3. Access Network: TSN, Broadband requirement, SDN



Access network overview

- **Define standards for Access and home network:**

1. High speed PON system:

- WDM PON (PMD, TC, OAM specification)
- GPON, EPON, XGPON & 50 GPON specifications
- Performance testing for NG-PON2, WDM-PON, XGPON

2. Software define network (SDN)

- Residential and enterprise VRG specification

3. Smart gateway

- Platform requirements, device requirement, networking requirements, management requirements, WLAN interface testing, etc.

4. Residential quality of service quantification

5. Visible light communication and power line communication

6. Fibre-to-The-Room (FTTR)

- Use case, System requirements, PHY, DLL, management

7. Internet of things (IoT)



# WG2: Leading International Standards Development

## CCSA TC6 WG2 members are well engaging in the standard activities of international SDO:

1. ITU-T SG15 WP1: Chinese service operator and system vendor lead 50GPON and FTTR projects in Q2 and Q3, respectively
2. ETSI F5G: contributing a couple of projects including F5G use case, residential QoS quantification, landscape, architecture, etc.
3. Broadband Forum: lead vOMCI, SDN/NFV, Wi-Fi testing projects in recent years

### ITU-T

#### • 10G & 50GPON

Rapporteur of SG15 Q2/SG15 (Futurewei)

Editors: [China Mobile](#) (Dechao Zhang), [China Telecom](#) (Dezhi Zhang), [China Unicom](#)(Jia Wu), [Huawei](#) (Dekun Liu, Wu Xuming ), [ZTE](#)(Yi Jiang) ,etc.

#### • Fibre-to-The-Room (FTTR)

AR of Q3/SG15 (Huawei)

Editors: [CAICT](#) (Qiang Cheng, Shuzhi Gou), [China Mobile](#) (Junwei Li), [China Telecom](#) (Qizheng Li, Xinrui Shi), [China Unicom](#)(Wu Jia, Yue Sun, Hai Ding), [Huawei](#) (Tony Zeng, Xuming Wu), [Hisilicon](#)(Tong Jiang)

### ETSI

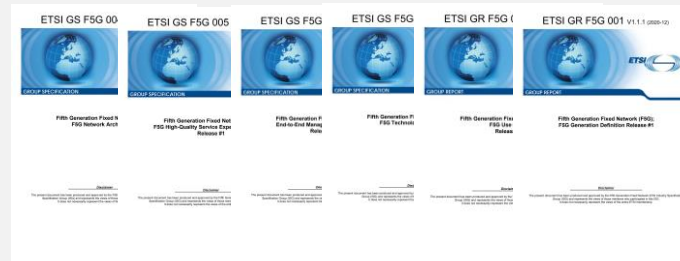
#### • F5G projects

Vice Chair of F5G ISG (China Telecom)

Editors: Use Case ([CAICT](#), Qian Liu), Architecture ([Huawei](#), Hongyu Li), Telemetry ([China Telecom](#), Jinjia Liang), QoE([CAICT](#), Xiaobo Cao), QoE testing([CAICT](#), Hang Shi)

**F5G advanced & beyond:**

Contributors: CAICT, China Telecom, China Mobile, Huawei



### BBF

#### • Virtualization

Board member, WA of PHYtx, SDN&NFV

Editors: [CAICT](#)(Jia Cheng), [China Unicom](#)(Hai Ding), [China Telecom](#) (Bo Wang), [Huawei](#) (Hongyu Li, Wei Lin, Tony Zeng), [China mobile](#) (Mengmeng Li), [ZTE](#) (Xueyan Song),

#### • Cloud-CO, Wi-Fi testing



# WG2: Engagement in SDOs Collaboration



- **WG2 leads the SDO collaboration in access & in-premises network**  
-> **FTTR joint workshop is a successful case**
  - The workshop is held by **ETSI, CCSA, ITU-T and BBF**
  - Attract more than **180+ participants from 35 countries and region**
  - Topic covers the E2E development of FTTR, including **system, chip, business case, fibre infrastructure, academic**



- **Workshop value:**

1. Attract more industrial participants for FTTR applications, and promotion. Dig out the deployment requirements of FTTR
2. Achieve common sense of industry on FTTR demand and technology development
3. Enhance the influence of multiple SDOs, and strengthen the collaboration of industry organizations

- **Workshop organization:**

1. **FTTR standardization in SDOs:** ITU-T SG15/ETSI F5G/BBF/CCSA progress
2. **Demand from service operator:** Global sharing by regional operator
3. **FTTR development:** including system, chip, business case, fibre infrastructure, academic

Co-organized by:



Qiang Cheng  
Director, Broadband Network Technologies and Standards, China Academy of Information and Communications Technology (CAICT)  
Qiang Cheng is a senior expert in the standardization, and has over 20 years of experience specializing in the research and standardization of access/home network technologies, e.g. DSL, PON, VLC, Wi-Fi. He actively participates in ITU-T SG15 Q18 and CCSA TC6 WG2. He has drafted more than 20 China national standards in access/home network area. As an editor, he participated in the formulation of G.vic and G.tin-SA recommendations.

- CAICT represent CCSA to share the views over FTTR development in China

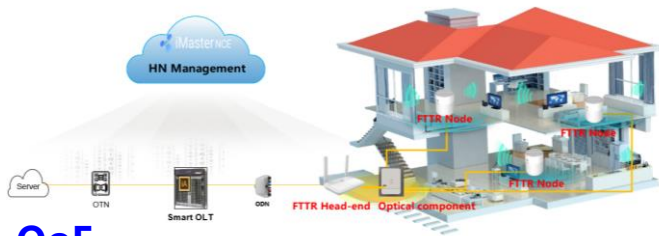
# WG2: Future Plan

**Role: Lead new technology, enhance international influence, and support Chinese regulation**

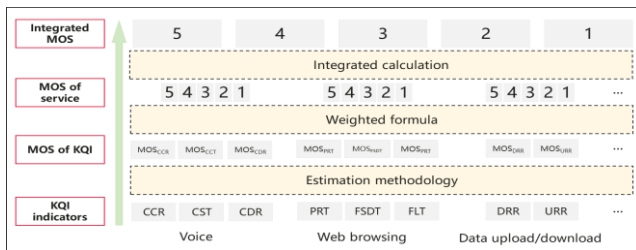
## In-premises FTTR + Wi-Fi

- FTTR key technologies
- QoE quantification & test

### FTTR



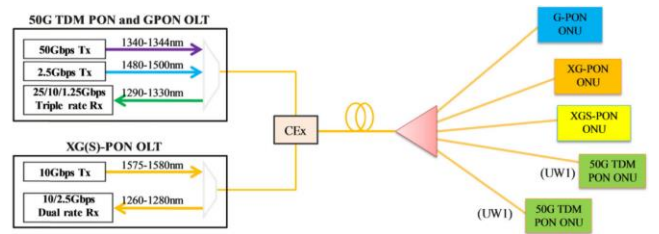
### QoE



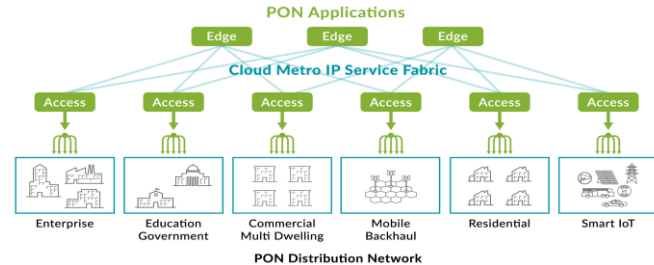
## Broadband Slicing & Verticals

- 50GPON
- Industrial optical network

### 50GPON & its evolution



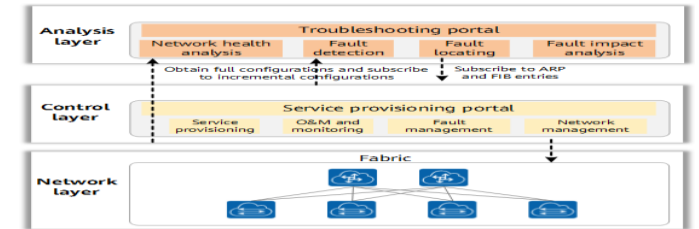
### PON in verticals



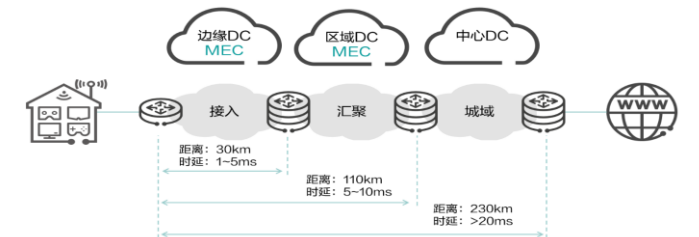
## Cloud Independent S&C, intelligent

- F5G innovative architecture
- Smart O&M, Edge computing

### Smart O&M



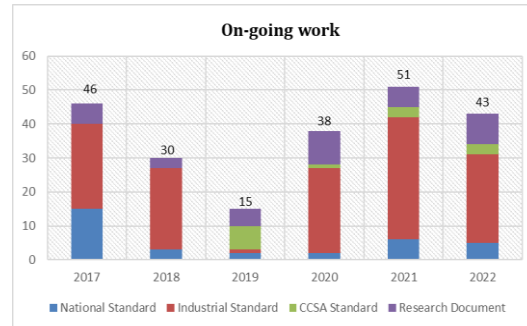
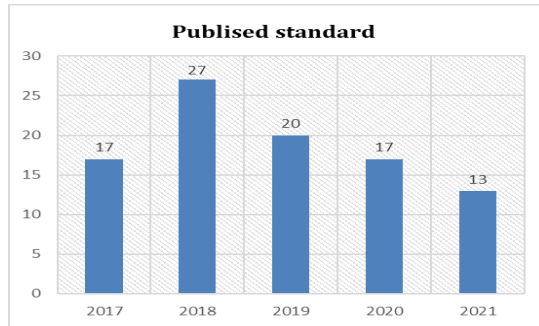
### Edge computing



1. In-premises: Quantification/test/telemetry of QoE, FTTR technology spec, Wi-Fi, smart gateway and its applications, etc.
2. Broadband: Application of PON in different verticals, 50GPON deployment guide, network slicing, time sensitive network, etc.
3. Cloud: innovative network architecture, intelligent O&M-architecture, data model and interface, edge computing, etc.

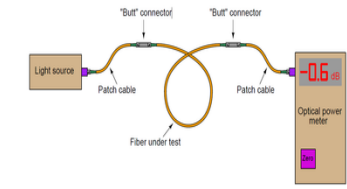
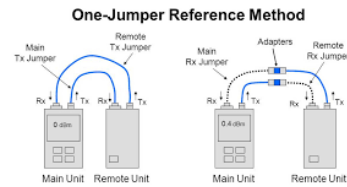
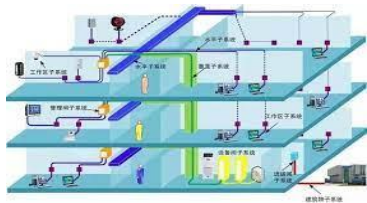
# WG3: Fibre & Cable Infrastructure

## ● 90+ published and 200+ on-going



## ● Standard Focus:

1. 6 meetings/year, hybrid mode with F2F and virtual due to Covid
2. 108 new project, focusing on FTTH fibre cable, cable infrastructure on industrial internet, FTTR & data center, submarine optical cable



Infrastructure

Cabling

Testing

## ● Standards for fibre and cable infrastructure:

### 1. Fibre and cable infrastructure:

- Industrial internet, Information & communication, data center

### 2. Materials for cabling:

- Aramid yarn, flame-retardant PE sheathing, coating materials for optical fibers(PC & TPU), water-blocking materials, Sheath Materials, non-metallic reinforcement

### 3. Cable:

- Office coaxial cable, 100-ohm balanced jumper, RF coaxial jumper, single pair digital cable

### 4. Optical Fibre:

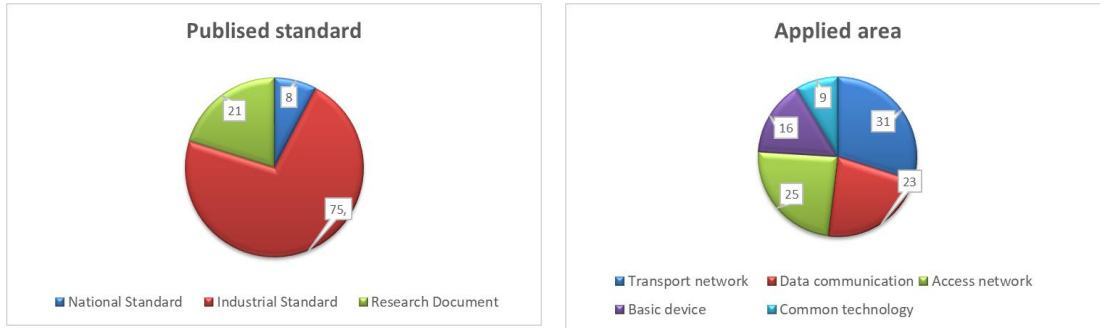
- Access network: bending loss-insensitive single-mode fiber, outdoor optical cables (stranded & central tube),
- In-premises: indoor optical cable (multi-core), optical/electrical hybrid cable, Invisible optical cable, Light optical cable
- Other: submarine optical cables

### 5. Testing methodology for cable

- General requirements, testing methodology, performance measurement

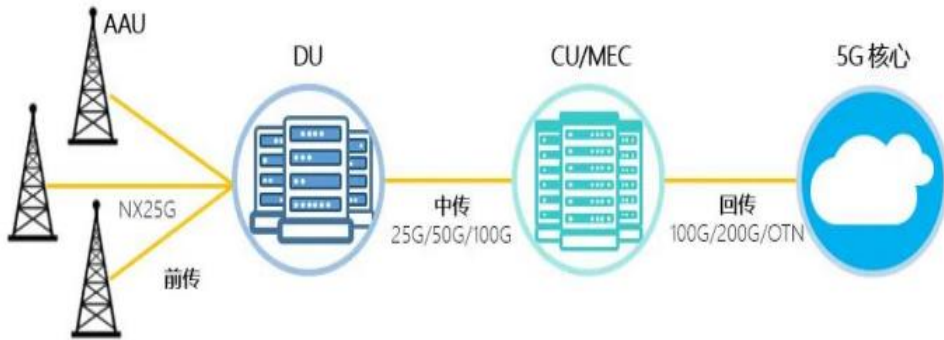
# WG4: Optical Devices

Published 80+ STD and 20+ RD during 2017-2022



## ● Standard Focus:

1. Data center: optical module on 100/200/400/800 Gbps
2. 5G: optical module on 25Gb/s WDM, 50Gb/s PAM4, etc.
3. Access: components in combo PON, 50GPON



- Support 5G data fronthaul and midhaul

## ● Standards for optical device

### 1. 5G fronthaul:

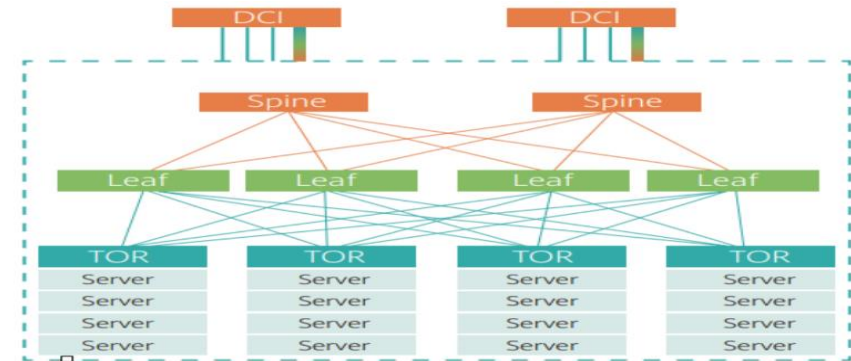
- 25Gb/s WDM optical transceiver, bidi transceiver 25 Gb/s, Enhanced 25Gb/s SFP transceiver, etc.

### 2. 5G midhaul:

- 50Gb/s PAM4 transceiver, 100Gb/s dual-polarization transceiver, 200/400 Gb/s phase modulation transceiver

### 3. Data center optical module:

- 100 Gb/s single wavelength transceiver, parallel transmission active optical module,
- 100Gb/s QSFP28 transceiver, 400Gb/s intensity modulation pluggable transceiver



- Support data center construction for Cloud service

# Open Discussion: Collaboration between CCSA TC 6 & ETSI F5G

- ◆ Establish regular communication?
  - Twice every year or annual workshop?
  
- ◆ When and what topics for next workshop?
  - What time for next workshop?
  - What specific topics for next workshop?

Appetizer for **Discussion** session

# Connect the World!

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