

***“The position of ITU-T Study Group 13 in  
global IMT2020/ 5G Standardization:  
Softwarization, Fix Mobile Convergence and  
Data Aware Networking”***



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Chairman ITU-T SG13

# ITU-T SG13 & IMT2020/ 5G



- Lead study group on future networks such as IMT-2020 networks (non-radio related parts)
- Lead study group on mobility management
- Lead study group on cloud computing
- Lead study group on trusted network infrastructures

# SG13 IMT2020/ 5G Working Parties

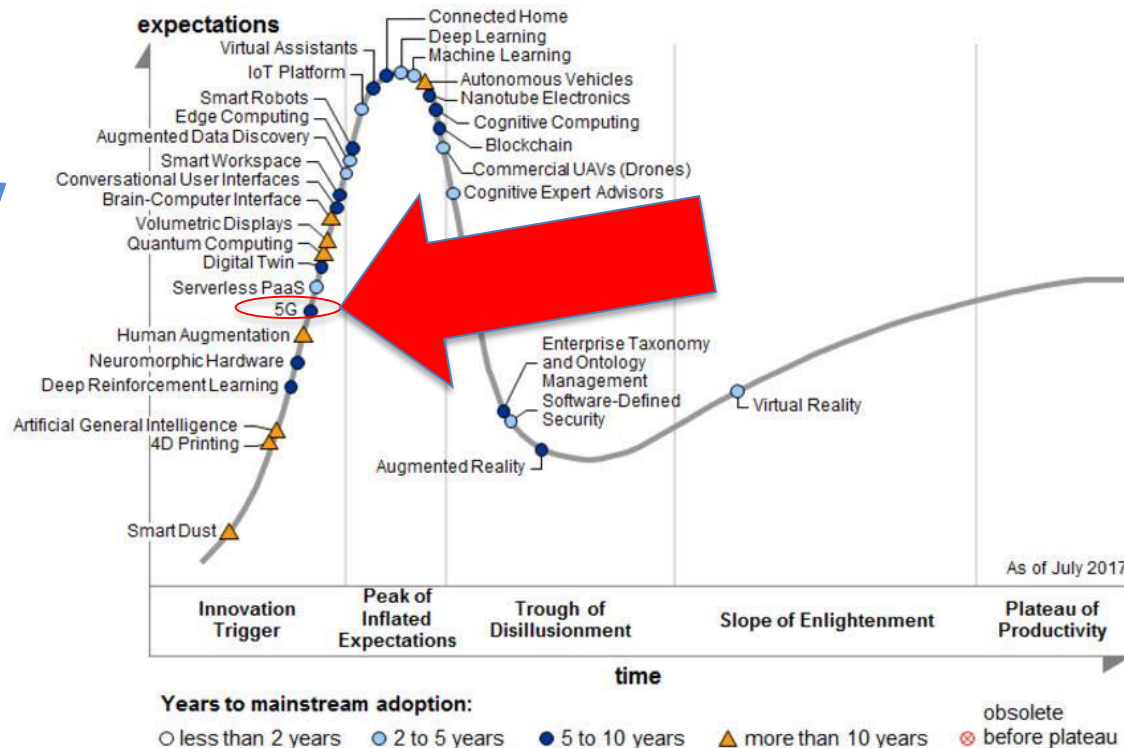
WP	Title	Questions
1	IMT-2020 Networks & Systems	Q.6: Quality of service (QoS) aspects including IMT-2020 networks
		Q.20: IMT-2020: Network requirements and functional architecture
		Q.21: Network softwarization including software-defined networking, network slicing and orchestration
		Q.22: Upcoming network technologies for IMT-2020 and future networks
		Q.23: Fixed-mobile convergence including IMT-2020

# IMT2020/5G Vision



# IMT2020/5G: From Vision to Standardization

Hype Cycle for Emerging Technologies, 2017



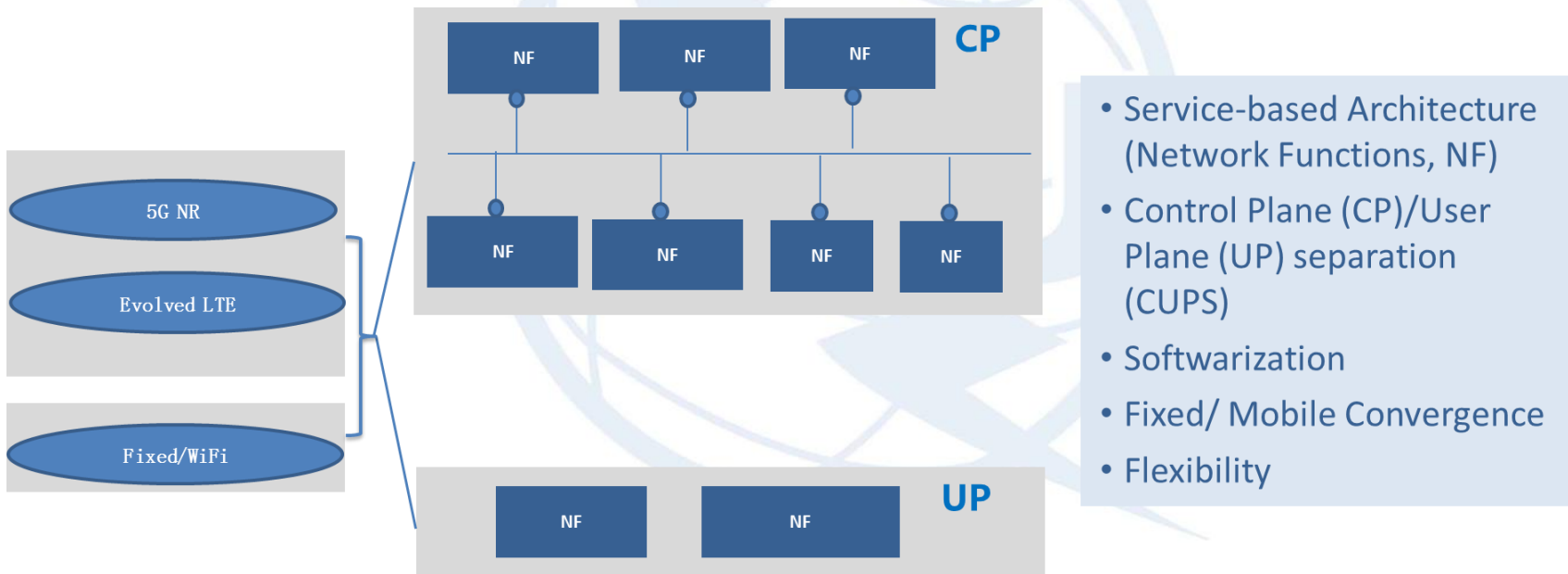
Note: PaaS = platform as a service; UAVs = unmanned aerial vehicles

Source: Gartner (July 2017)

Standards bodies, industry associations and open-source initiatives are now working with high pace to develop IMT2020/5G

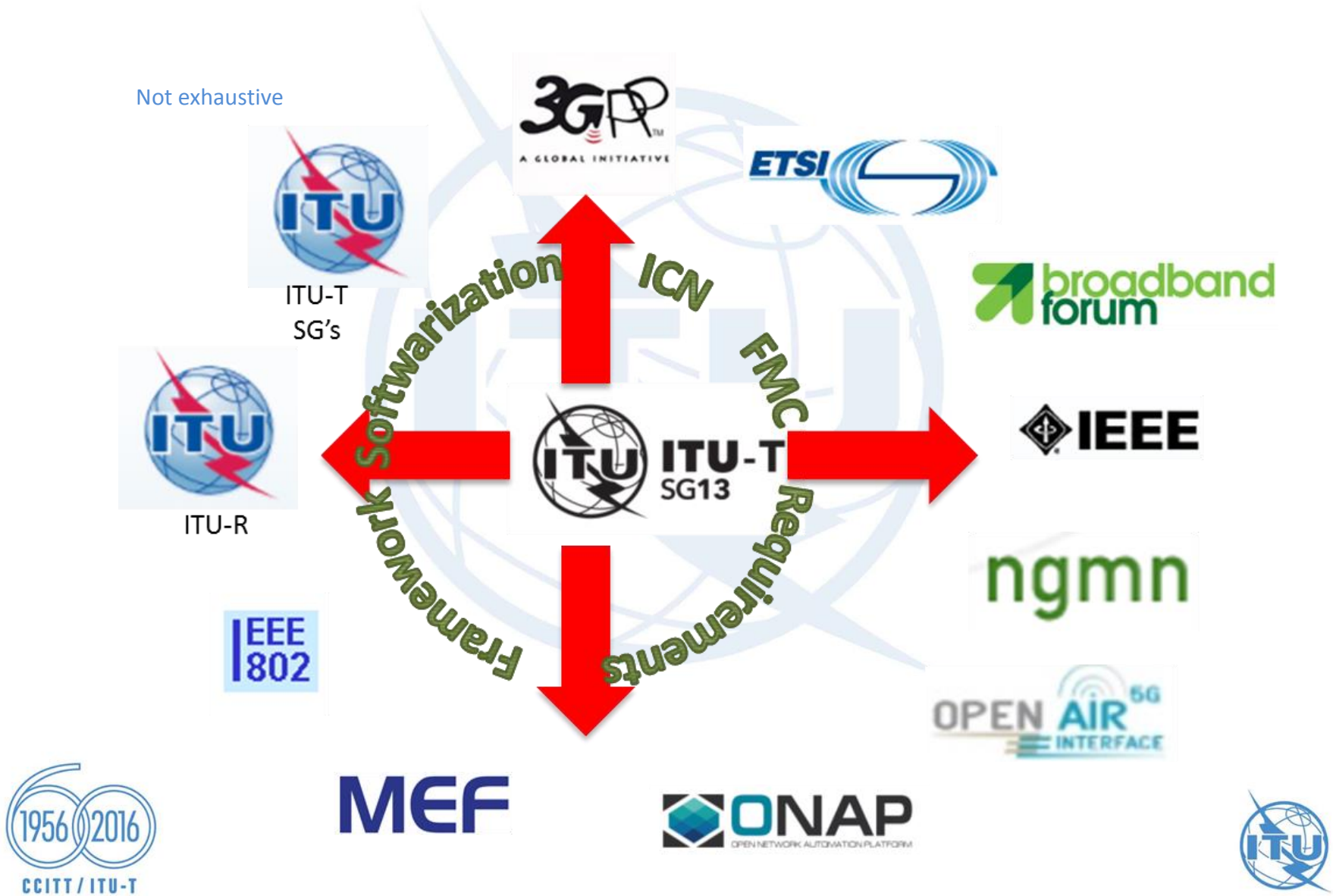
# IMT2020/ 5G - Concept

Most of the innovation to deliver 5G needs to happen in the fixed network

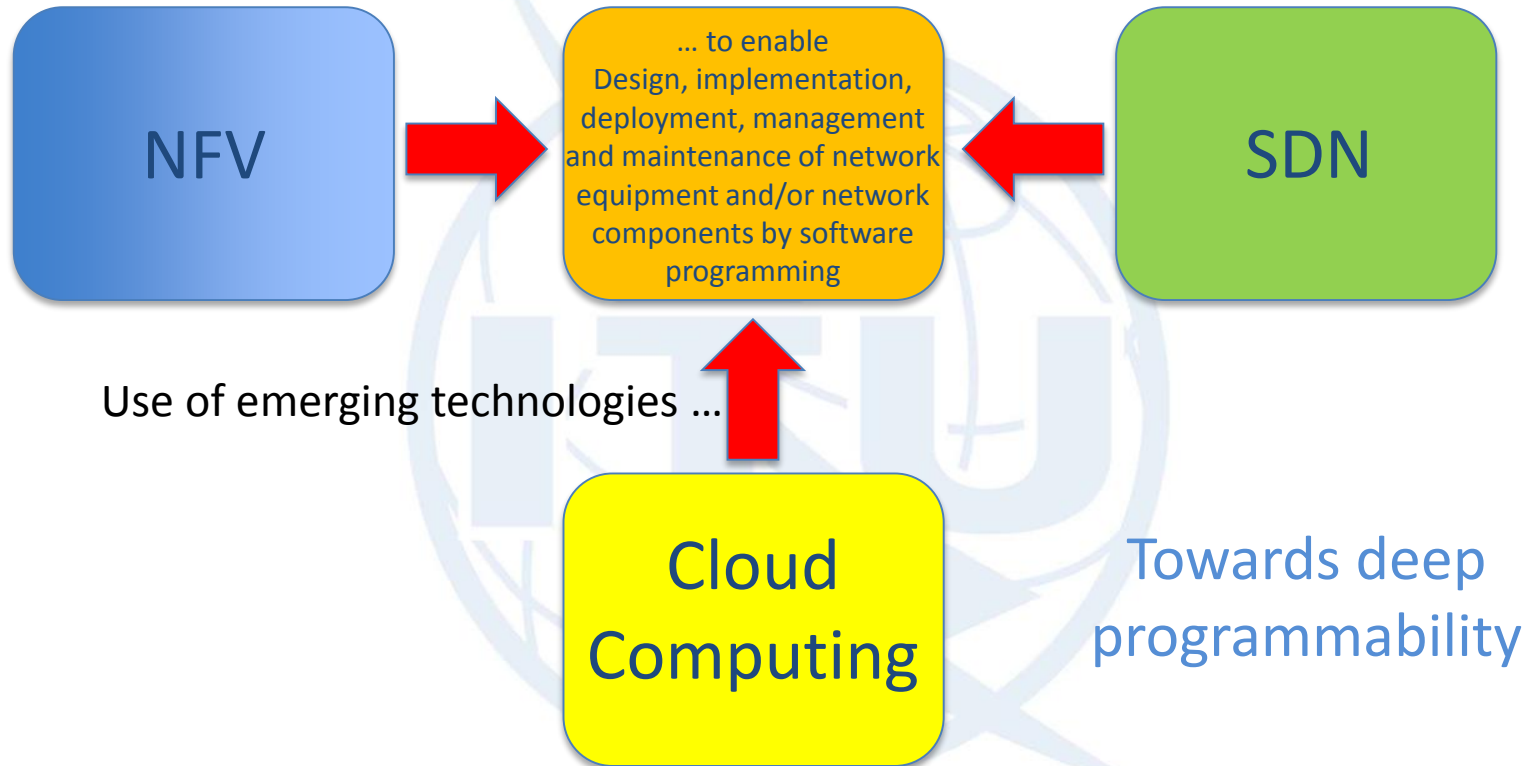


# Relationships for IMT2020/ 5G

Not exhaustive



# Network Softwarization

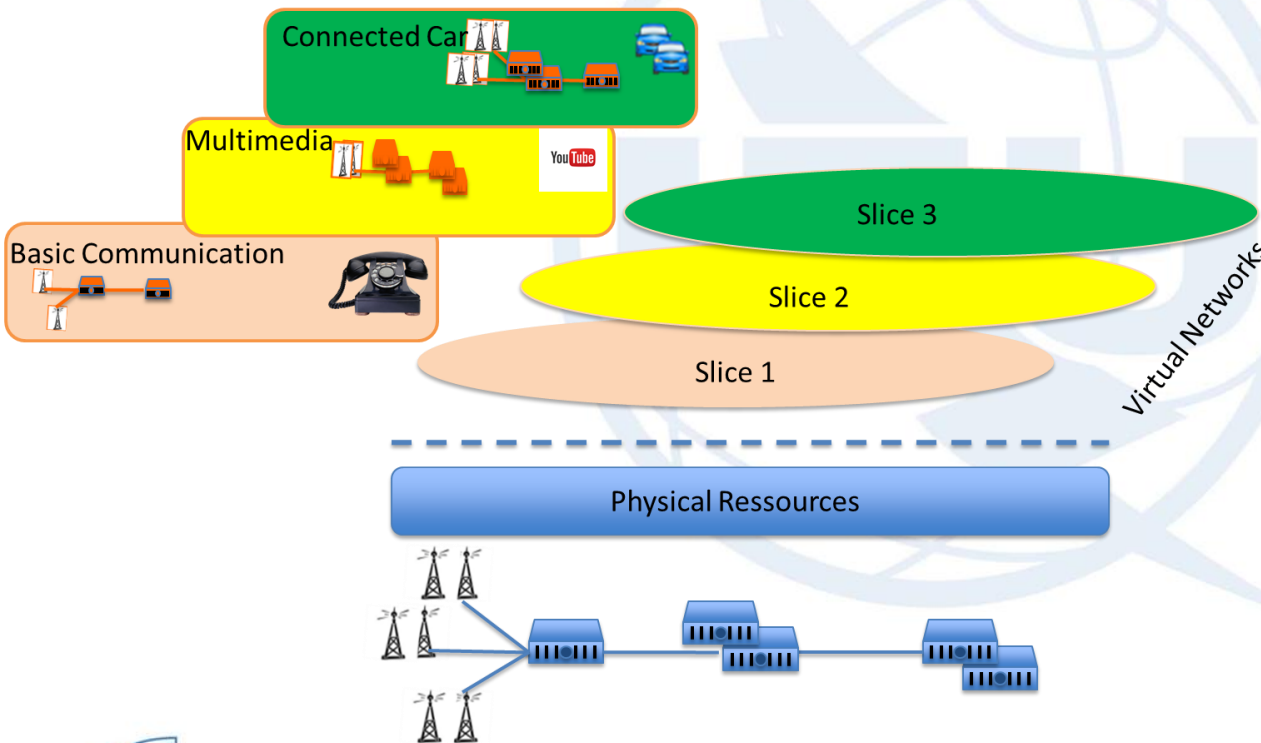


Terms & Definitions: ITU-T Y.3100



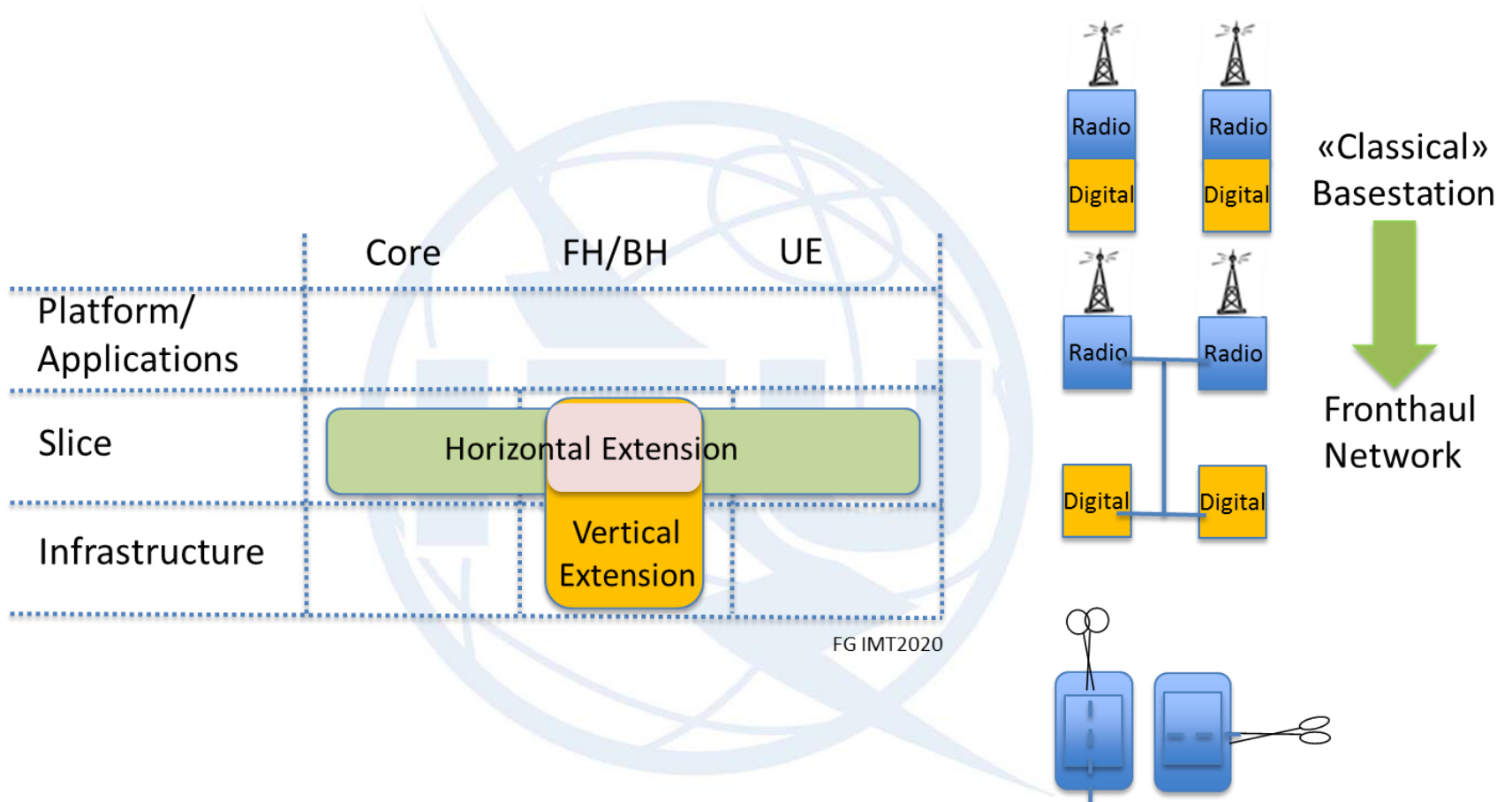
# Network Slicing General Principles

Network slice [ITU-T Y.3100]: A logical network that provides specific network capabilities and network characteristics.



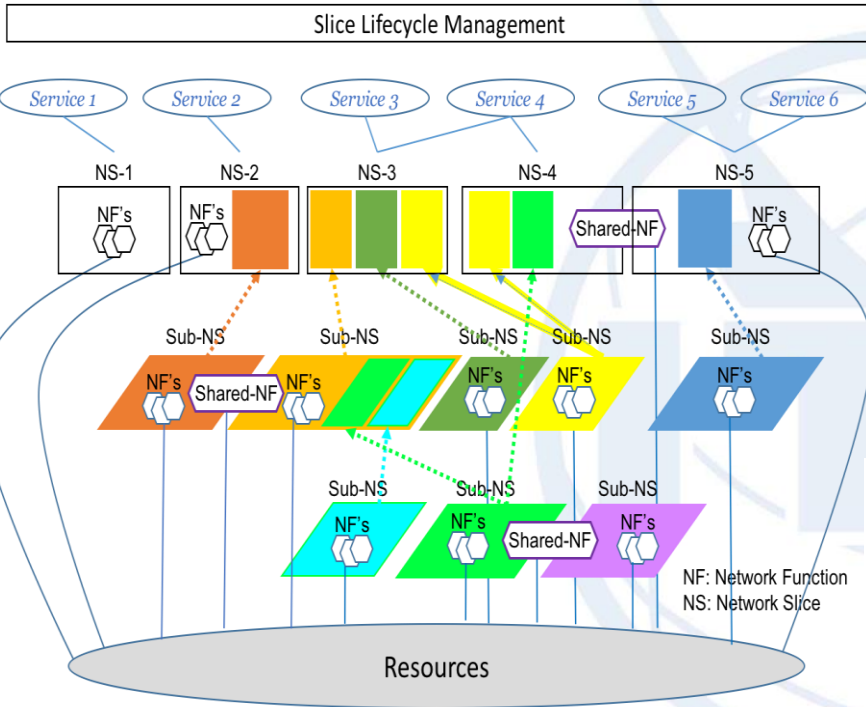
- **eMBB** (enhanced Mobile Broadband)
- **URLLC** (Ultra reliable Low Latency Communication)
- **mMTC** (massive Machine Type Communication)

# Horizontal/ Vertical Slicing

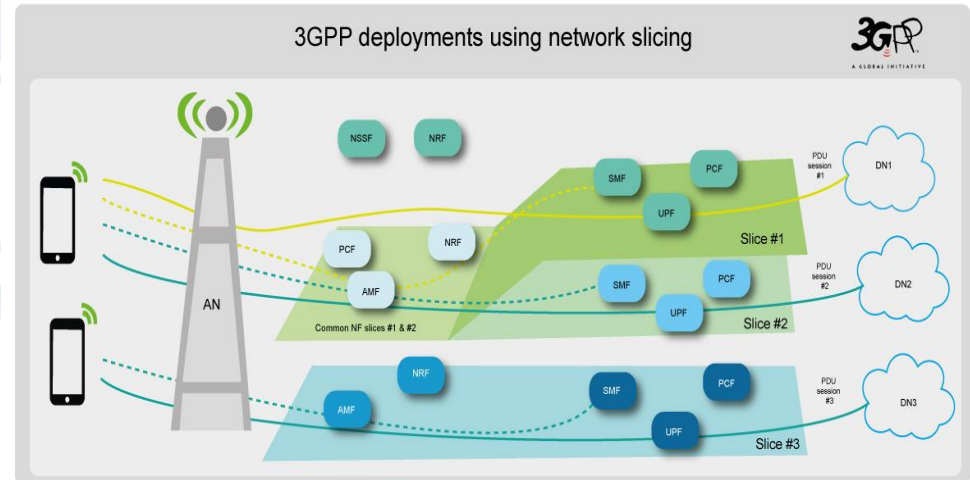


# Network Slicing and Network Functions

## Conceptual View (Draft Y.IMT2020-frame)



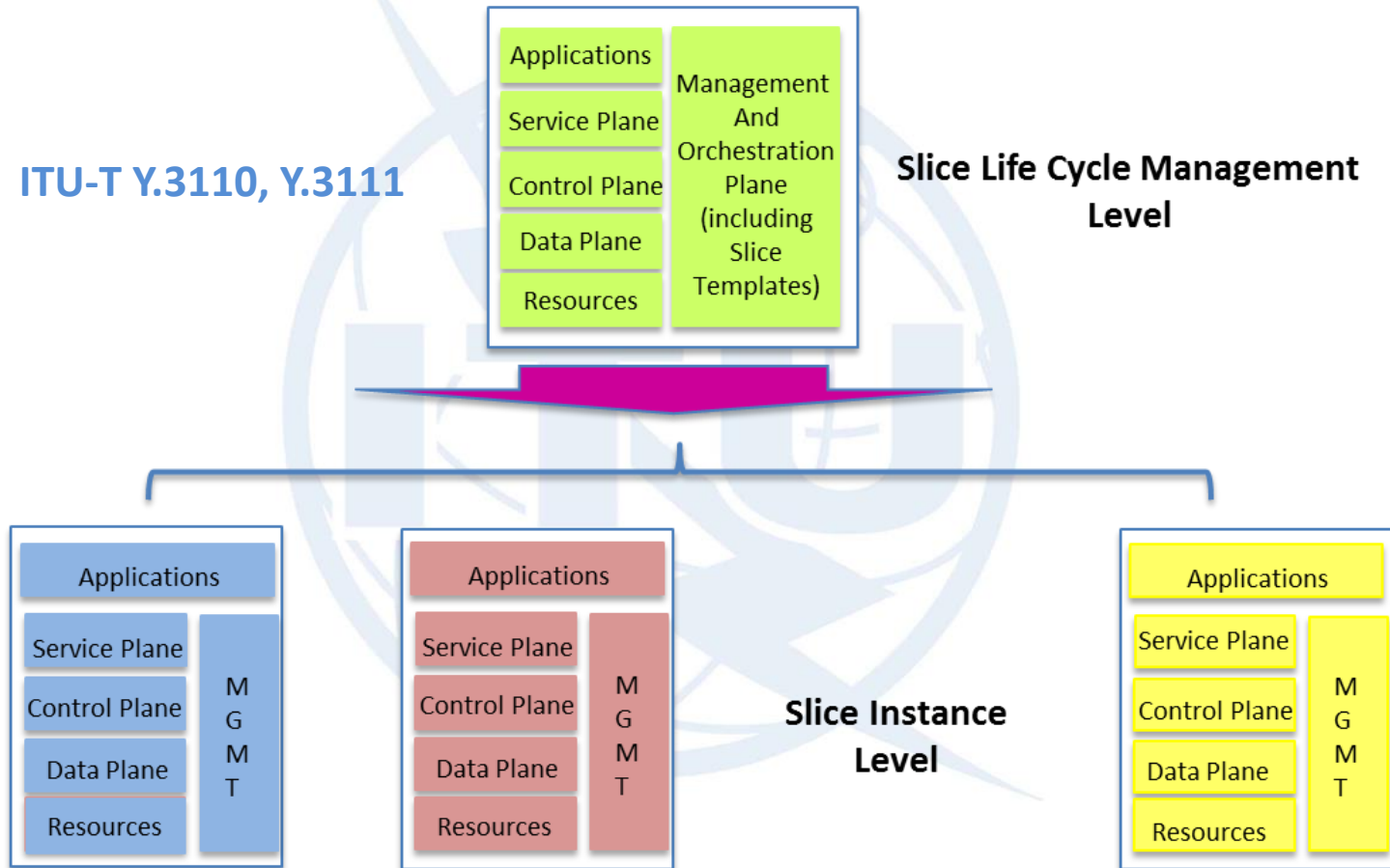
Example: 3GPP network from network slicing perspective



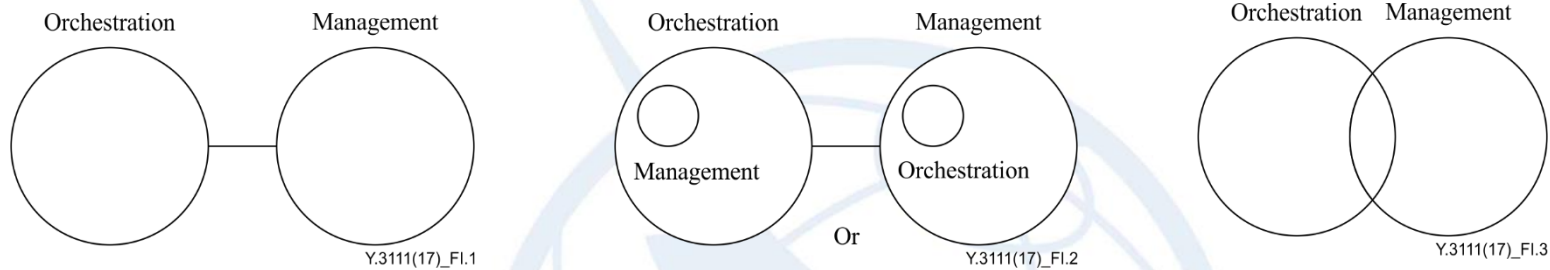
Source: 3GPP

# Network orchestration/ management

ITU-T Y.3110, Y.3111



# Network Orchestration vs Management



1. Independent orchestration and management

2. Management/orchestration includes the other

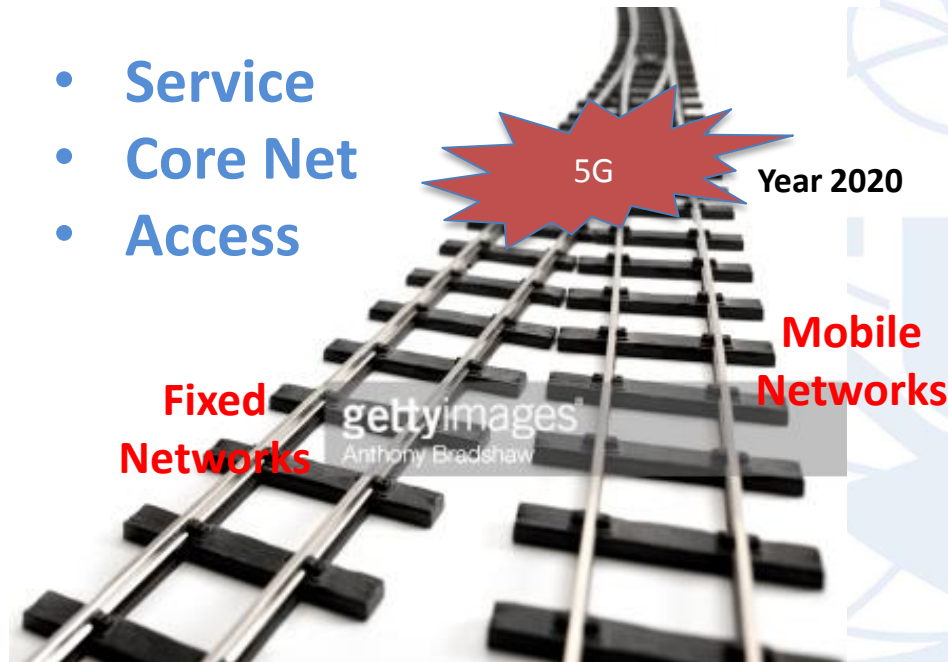
3. Orchestration and management with an intersection

	Orchestration	Management
Monitoring purpose	Availability	Healthiness
Action purpose	Provisioning	Maintaining
Representative actions	Control/Configuration Create/Destroy/Move	Monitor/Alarm for event Detection/Isolation/Resolve for fault
Target resources	Dissimilar devices	Similar devices

# IMT2020 Fixed/ Mobile Convergence

## Fixed-Mobile Hybrid Networks

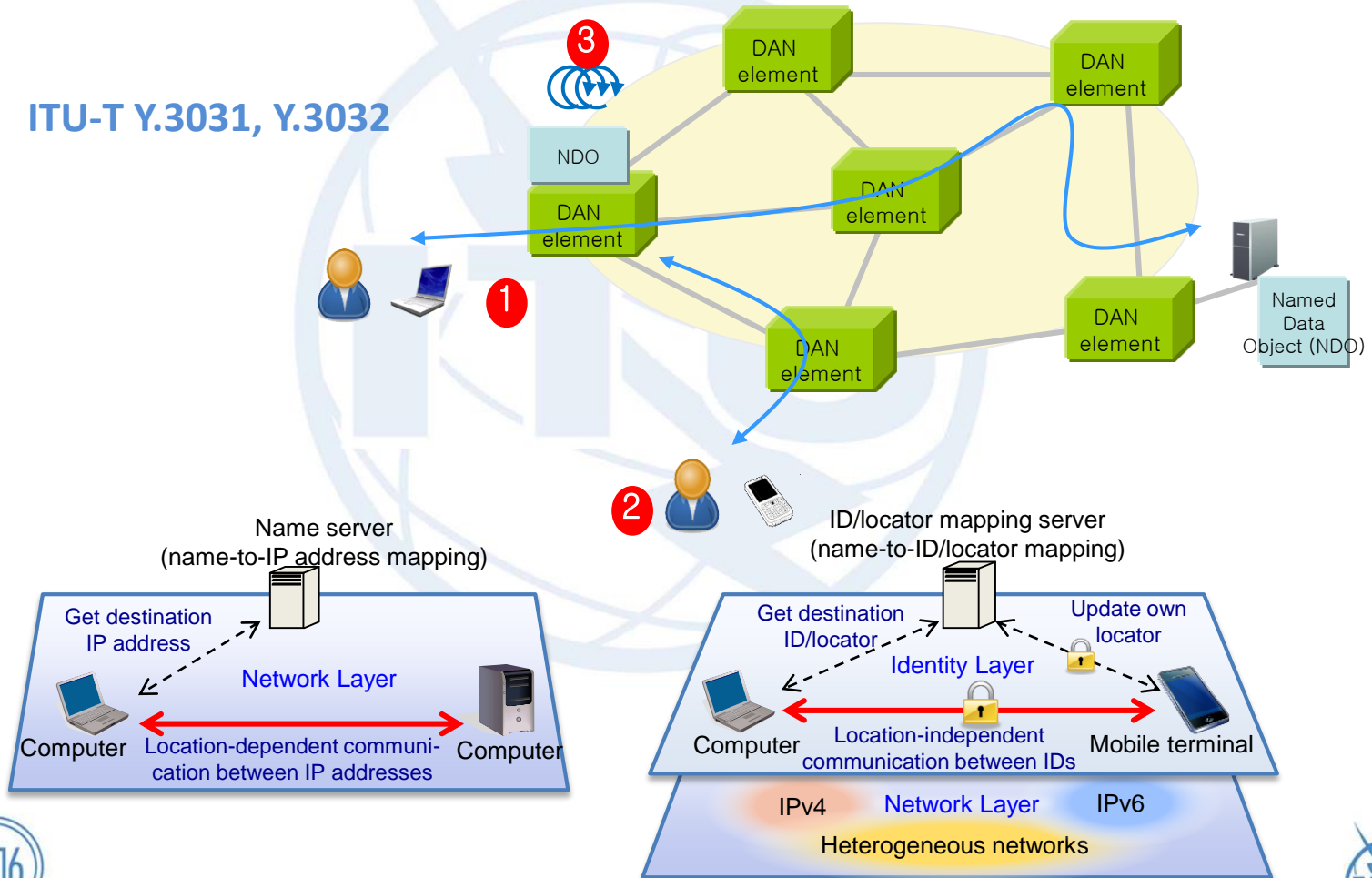
- Service
- Core Net
- Access



- Y.3130, “Requirements of IMT-2020 fixed- mobile convergence”
- Y.FMC-ARCH Functional architecture for supporting fixed mobile convergence in IMT-2020 networks
- Y.MM-RN - Mobility management framework over reconfigurable networks

# New networking technology: Data Aware Networking (DAN) (aka Information Centric Networking (ICN))

ITU-T Y.3031, Y.3032



# ITU-T Study Group 13 5G-Action-Plan

## SG13: Future networks, with focus on IMT-2020, cloud computing and trusted network infrastructures

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SG13 at a glance

SG13 Chairman's blog

Mandate and lead roles

Structure

Management team

Questions under study and Rapporteurs

Editors

Representatives and other roles

Approved deliverables

Recommendations

### MEETING IN FOCUS

#### Meeting of Working Parties 1, 2 and 3/13

Geneva, 18 April 2018

- ▶ Announcement
- ▶ Registration
- ▶ Draft agenda
- ▶ Meeting room allocation
- ▶ Webcasts

#### SG13 co-located Rapporteur group meetings (Geneva, 9-18 April 2018)

- ▶ Timeplan
- ▶ Remote Participation

#### ITU-T SG13 action plan for 5G (Technical Packages)

### MEETING DOCUMENTS

- ▶ Recently posted - Search
- ▶ Documents [ All Docs - Cs - TDs - LS in - LS out ]
- ▶ Informal FTP Area
- ▶ Direct Document Posting
- ▶ Document Templates
- ▶ Author's Guide

#### Executive Summary (6-17 November 2017)

#### Workshop on Machine Learning for 5G and beyond (Geneva, 29 January 2018)

Tools

Documentation

News

- ▶ Circulars related to SG13
- ▶ Create/manage ITU account (TIES & Guest)
- ▶ SG13 Collaboration Site
- ▶ Informal FTP area and mailing lists archives
- ▶ Delegate resources
- ▶ Electronic Working Methods (EWM)
- ▶ Document sync tool
- ▶ Meetings feedback form
- ▶ ITU-T Recommendation number allocation list
- ▶ ITU-T Recommendation series structure
- ▶ Standards Q&A

Related Groups

Special Topics

Past Periods

- ▶ ITU-T Focus Group on Machine Learning for Future Networks including 5G





# Technology Package: Softwarization

Area	Full title of document	Status (Nov.)	Approved/Planned
Terms & definitions	<a href="#">Y.3100, "Terms and definitions for IMT-2020 network"</a>	Published	13 September 2017
Management framework	<a href="#">Y.3111, "IMT-2020 Network Management Framework"</a>	Published	13 September 2017
Management requirements	<a href="#">Y.3110, "IMT-2020 Network Management Requirements"</a>	Published	13 September 2017
Activity report – NWSWarisation Supplement	<a href="#">Y.3100-series Supplement 44, "Standardization and open source activities related to network softwarization of IMT-2020"</a>	Published	14 July 2017
Frameworks	<a href="#">Y.IMT2020-frame, "Framework of IMT-2020 network"</a>	Ongoing	Apr-2018
Requirements	<a href="#">Y.3101, "Requirements of IMT-2020 network"</a>	Consented	17 Nov-2017
Architecture	<a href="#">Y.IMT2020-arch, "Architecture of IMT-2020 network"</a>	Ongoing	Nov-2018
Orchestration for slices	<a href="#">Y.NSOM, "Network slicing orchestration and management:"</a>	Ongoing	Apr-2018
Framework for multiple slice support	<a href="#">Y.IMT2020-MultiSL, "Framework for the support of Multiple Network Slicing"</a>	Ongoing	Jul-2018
Requirements of network capability exposure	<a href="#">Y.IMT2020-CE-Req, "Requirements of network capability exposure in IMT-2020 networks"</a>	Ongoing	Nov-2018
Potential directions	<a href="#">Y.3150, "High level technical characteristic of network softwarization for IMT-2020"</a>	Consented	17 Nov-2017
	<a href="#">Y.AMC, "Requirements and Architectural Framework for Autonomic Management and Control of IMT-2020 Networks"</a>	Ongoing	Jul-2018
	<a href="#">Y.IMT2020-ADDP, "Advanced Data Plane Programmability for IMT-2020"</a>	Ongoing	2019
	<a href="#">Y.IMT2020-CEF, "Network capability exposure function in IMT-2020 networks"</a>	Ongoing	2019
	<a href="#">Y.IMT2020-BM, "Business models of IMT-2020"</a>	Ongoing	Apr-2018

# Technology Package: FMC

Area	Full title of document	Status (July 17)	Approved/Planned
Requirements for FMC	<a href="#">Y.3130, "Requirements of IMT-2020 fixed- mobile convergence"</a>	Consented	17 Nov-2017
Arch for FMC	<a href="#">Y.FMC-ARCH Functional architecture for supporting fixed mobile convergence in IMT-2020 networks</a>	Ongoing	Nov-2018
Mobility management	<a href="#">Y.MM-RN - Mobility management framework over reconfigurable networks</a>	Ongoing	Nov-2018
Mobility management	<a href="#">Y.FMC-MM - Mobility management for fixed mobile convergence in IMT-2020 networks</a>	New WI	2019
Requirements on mgm	<a href="#">Y.FMC-MO-reg, "IMT-2020 FMC functional requirements for management and orchestration"</a>	New WI	Nov-2018
Service scheduling	<a href="#">Y.FMC-SS, "Service scheduling for supporting FMC in IMT-2020 network"</a>	New WI	2019
Capability exposure	<a href="#">Y.FMC-CE, "Capability exposure enhancement for supporting FMC in IMT-2020 network"</a>	New WI	2019

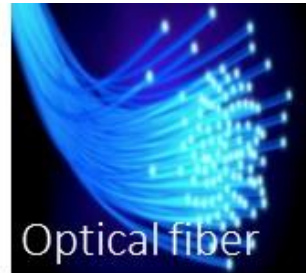
# Technology Package: ICN

Area	Full title of document	Status (Nov'17)	Approved/Planned
Data Aware Networking	<a href="#">Y.3071, "Data Aware Networking (Information Centric Networking) - Requirements and Capabilities"</a>	Published	29 March 2017
ICN	<a href="#">Y.3070-series supplement "Information-Centric Networking - Overview, Standardization Gaps and Proof-of-Concept"</a>	Ongoing	Apr-2018
	<a href="#">Y.ICN-FnChain "Framework for service function chaining in ICN"</a>	Ongoing	Nov-2018
	<a href="#">Y.ICN-ReqN "Requirements of ICN naming and name resolution in IMT- 2020"</a>	Ongoing	Nov-2018
	<a href="#">Y.ICN-DS-framework "Framework for Directory Service for Management of a Huge Number of Heterogeneously Named Objects in IMT-2020"</a>	Ongoing	Nov-2018
	<a href="#">Y.SuppICN-PoC-DaaS "PoC for IoT Data as a Service using ICN in IMT- 2020"</a>	Ongoing	Apr-2018

# Technology Package: QoS

Area	Full title of document	Status (Nov'17)	Approved/Planned
QoS	<a href="#">IMT-2020 network QoS monitoring architectural framework</a>	Ongoing	Jul-2018

# IMT2020/ 5G in ITU-T



- Currently ITU-T has 11 Study Groups that (can) work under their mandate on IMT2020/ 5G related study items
- Lead Study Group for IMT2020/5G Non-Radio related parts is SG13

# Cooperation among standards development organizations

Exchange of information and collaboration among organisations is essential for 5G (given its large spectrum of technologies, services, stakeholders)

## ITU-T SG13 “Joint Coordination Activity on IMT2020” (JCA-IMT2020)

- To promote high-level coordination in IMT2020 standardization
- A global IMT2020 standards roadmap (for non-radio aspects) will be maintained via regular exchanges with relevant external entities. Open to ITU Members and designated representatives of relevant Standards Development Organizations and Forums
- There is a mailing list for discussion and information sharing <https://www.itu.int/en/ITU-T/jca/imt2020/Pages/subscription.aspx>

## ETSI Joint SDO/Fora Industry Harmonization Initiative for Unified Standards for AMC, SDN, NFV, E2E Service Orchestration and Big-Data Analytics for AMC

- Software orientet enablers for 5G
- ITU-T SG13 is engaged



# Conclusions

- IMT2020/5G is progressing with high pace
- IMT2020/5G includes a number of SDOs, and innumerable forums, alliances, consortia and projects working on it
- ITU-T SG13 position in the IMT2020/5G ecosystem is to contributing with international harmonized Terms & Definitions as well as high level Frameworks, Principles and Requirements. As one of its missions ITU-T Study Group 13 works to include requirements and interests of the developing countries into the technical IMT2020/5G standardization
- ITU-T SG13 has created new Focus Group «on Machine Learning for Future Networks including 5G» to studying potential application of ML based mechanisms in 5G Telecommunication Networks
- ITU-T Study Group 13's Joint Coordination Activity on IMT2020 (JCA-IMT2020) is the platform for contributions and information what work is done in all of the different groups dealing with IMT2020/ 5G

# Welcome to raise questions to us



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