



# **ITU-T activities to support digital transformation in cities and communities**

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**ITU-T SG20 Vice-chair and JCA-IoT and SC&C co-convener**

# Before ITU-T SG20

## M2M/IoT-related entities in ITU-T before SG20

### Joint Coordination Activity on Internet of Things (2011.3 ~)

- 30 participating entities: All ITU-T SGs, ITU-R WP1A, WP1B, WP5A, ISO TC 122, 204, ISO/IEC JTC 1 SC 6, 31, WG 7, ETSI, CEN, OMA, GS1/EPC global, YRP, ECMA, GSIFI, TIA, GSM MSTF, OGC
- Working deliverable: IoT Standards Roadmap

### IoT Standards Roadmap

- On-going and published work on IoT in other SDOs and ITU
- Open to public ([free download](#))

other SDOs

coordination

JCA-IoT

coordination

SG 5 ... SG 11 ... SG 16 ... **New**

WPs

WPs

WPs

Qs

Qs

Qs

FG SSC

FG M2M

participation

other SDOs

Y.2060  
(2012)

TSAG

report

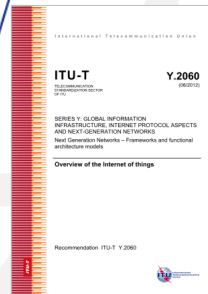
report

IoT-GSI

participation

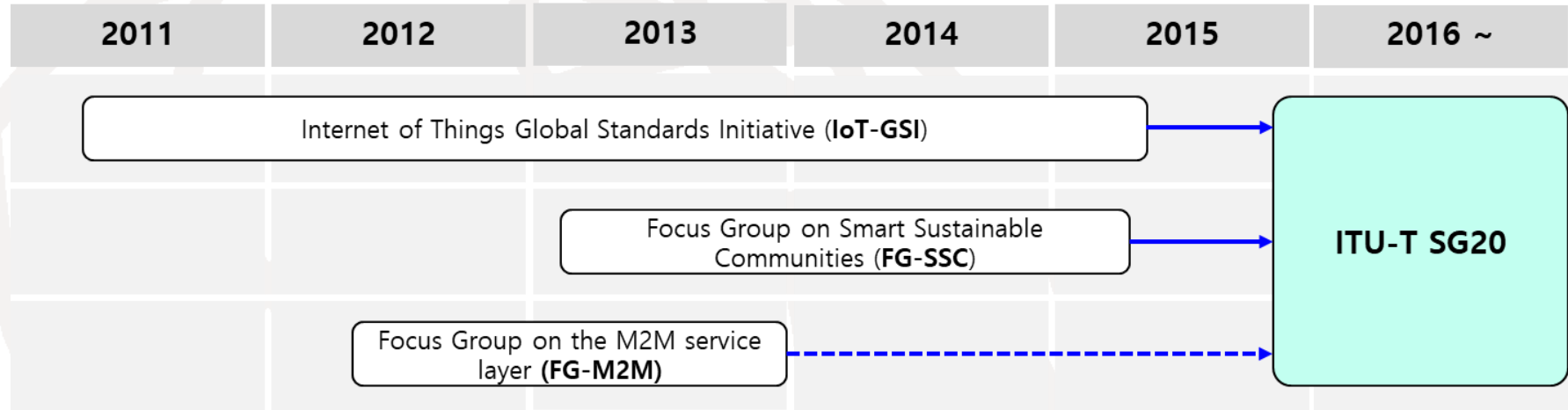
### Internet of Things Global Standards Initiative (2011.5 ~)

- Core Questions: Q1/3, Q12/11, Q3/13, Q4/13, Q5/13, Q7/13, Q12/13, Q16/13, Q25/13, Q21/16, Q22/16, Q25/16, Q6/17
- Additional Questions: 16 Qs



# Before ITU-T SG20

## IoT-GSI + FG-M2M + FG-SSC = ITU-T SG20



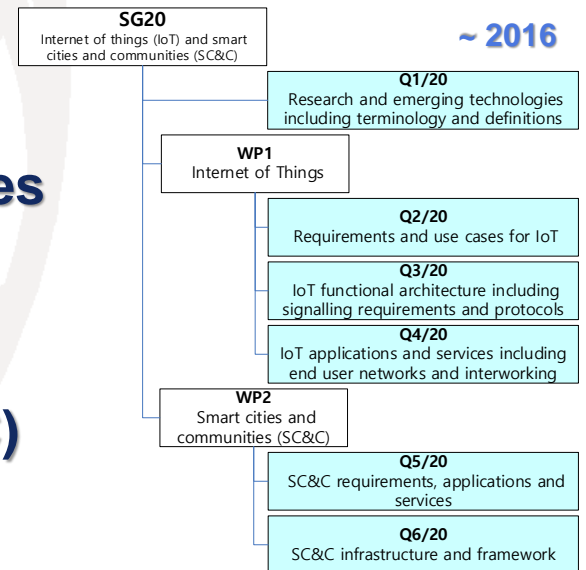
~ 2016

**IoT and its applications including smart cities and communities**



2017 ~

**Internet of Things (IoT) and smart cities and communities (SC&C)**



# Core Recommendations for IoT

**Overview**  
International Telecommunication Union

ITU-T Y.2060 (06/2012)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS  
Next Generation Networks – Frameworks and functional architecture models

Overview of the Internet of things

Recommendation ITU-T Y.2060

Y.2060 (2012)

**Common reqts.**  
International Telecommunication Union

ITU-T Y.2066 (06/2014)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS  
Next Generation Networks – Frameworks and functional architecture models

Common requirements of the Internet of things

Recommendation ITU-T Y.2066

Y.2066 (2014)

**Apps reqts.**  
International Telecommunication Union

ITU-T F.748.0 (10/2014)

SERIES F: NON-TELEPHONE TELECOMMUNICATION SERVICES  
Audiovisual services

Common requirements for Internet of things (IoT) applications

Recommendation ITU-T F.748.0

F.748.0 (2014)

**GW reqts.**  
International Telecommunication Union

ITU-T Y.4101/Y.2067 (10/2017)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES  
Internet of things and smart cities and communities – Requirements and use cases

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES  
Next Generation Networks – Frameworks and functional architecture models

Common requirements and capabilities of a gateway for Internet of things applications

Recommendation ITU-T Y.4101/Y.2067

Y.2067 (2014, 2017)

**NW reqts.**  
International Telecommunication Union

ITU-T Y.4113 (09/2016)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES  
Internet of things and smart cities and communities – Requirements and use cases

Requirements of the network for the Internet of things

Recommendation ITU-T Y.4113

Y.4113 (2016)

**DM reqts.**  
International Telecommunication Union

ITU-T Y.4702 (03/2016)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES  
Internet of Things and smart cities and communities – Management, control and performance

Common requirements and capabilities of device management in the Internet of things

Recommendation ITU-T Y.4702

Y.4702 (2015)

**Functional framework**  
International Telecommunication Union

ITU-T Y.2068 (03/2015)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS  
Next Generation Networks – Frameworks and functional architecture models

Functional framework and capabilities of the Internet of things

Recommendation ITU-T Y.2068

Y.2068 (2015)

After SG20

**one M2M**  
International Telecommunication Union

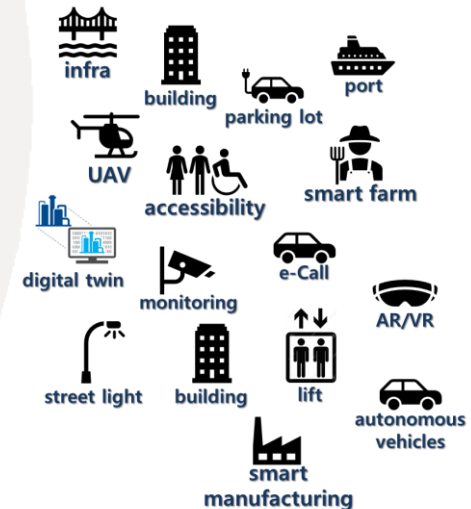
ITU-T Y.4500.1 (01/2018)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES  
Internet of things and smart cities and communities – Frameworks, architectures and protocols

oneM2M – Functional architecture

Recommendation ITU-T Y.4500.1

Y.4500.x (2018)



# Role of ITU-T SG20

## ITU accelerating digital transformation in cities



**ITU:**  
International Telecommunication Union –  
the UN specialized agency for ICTs



**ITU-T Study Group 20:**  
ITU study group on IoT and  
Smart Cities and Communities



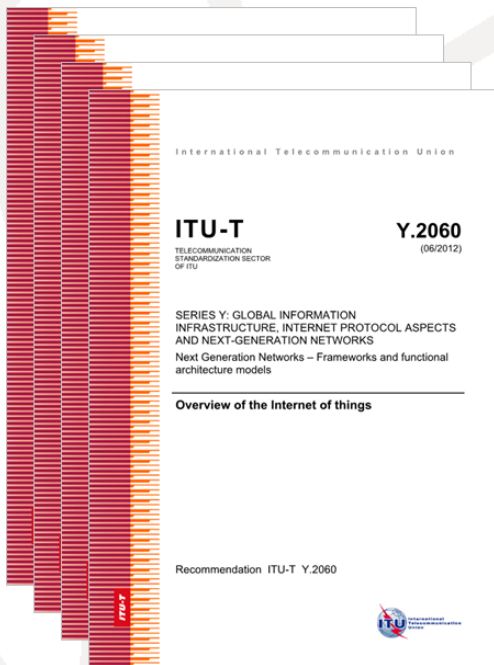
**ITU-T:**  
Telecommunication  
Standardization Sector



# After ITU-T SG20

## Internet of Things

### Core Recommendations



requirements and architectures on ...



Y.4500.x series (2018)



service



accessibility



smart farm



blockchain



monitoring



e-Call



AR/VR



identification



building



lift



smart manufacturing



AR/VR

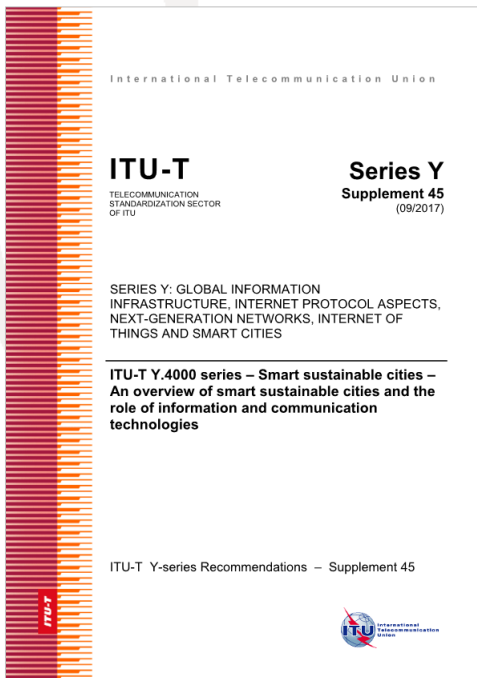


autonomous vehicles

# After ITU-T SG20

## Smart cities

### FG-SSC ('13~'15)




requirements and architectures on ...

- Y.4200(2018) (Requirements for the interoperability of smart city platforms)
- Y.4201(2018) (High-level requirements and reference framework of smart city platforms)
- Y.DPM-Interop (Requirements and functional model to support data interoperability in IoT environments )



# After ITU-T SG20

## KPIs



International Telecommunication Union

**ITU-T** Y.4900/L.1600 (06/2016)

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES


Internet of things and smart cities and communities – Evaluation and assessment

SERIES L: ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

Internet of things and smart cities and communities – Evaluation and assessment

**Overview of key performance indicators in smart sustainable cities**

Recommendation ITU-T Y.4900/L.1600



## Case studies on U4SSC KPIs



ITU-T

Search... "Smart Dubai, the happiest city on Earth"

Implementing ITU-T International Standards to Shape Smart Sustainable Cities: The Case of Dubai

دبي الذكية SMART DUBAI

ITU-T

Dubai, 2016.12.



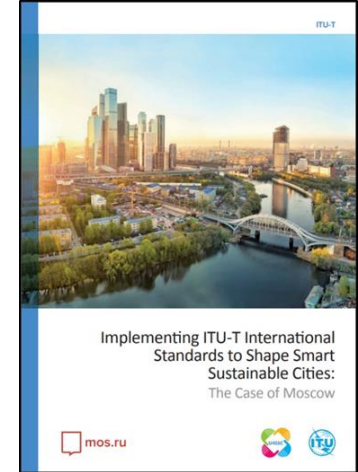
ITU-T

Implementing ITU-T International Standards to Shape Smart Sustainable Cities: The Case of Singapore

INDOCORUM INNOVATION DEVELOPMENT PARTNERSHIP

ITU-T

Singapore, 2017.11.



ITU-T

Implementing ITU-T International Standards to Shape Smart Sustainable Cities: The Case of Moscow

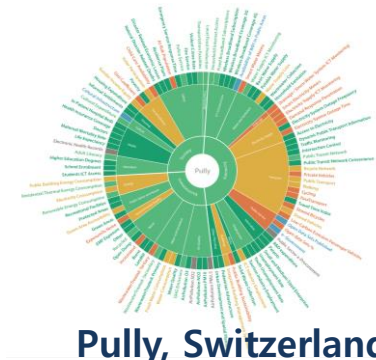
mos.ru

ITU-T

Moscow, 2018.10.

## City snapshots

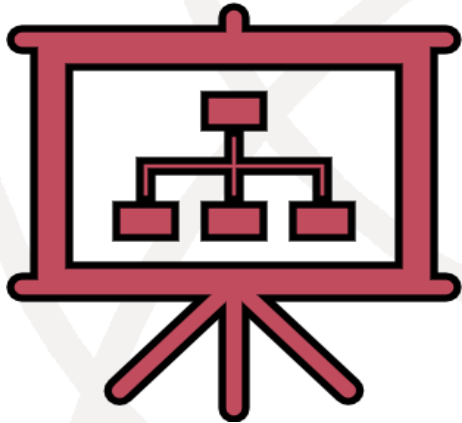
● 95%+ Target ● 66-95% of Target ● 33-66% of Target





# JCA-IoT and SC&C

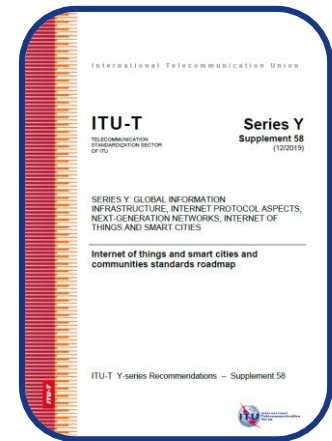
## Joint Coordination Activity on Internet of Things and Smart Cities and Communities



**Coordinates ITU-T work  
on IoT and SC&C**



**Provides contact point for  
IoT & applications, incl.  
SC&C activities**



**Presents the JCA-IoT and  
SC&C roadmap**

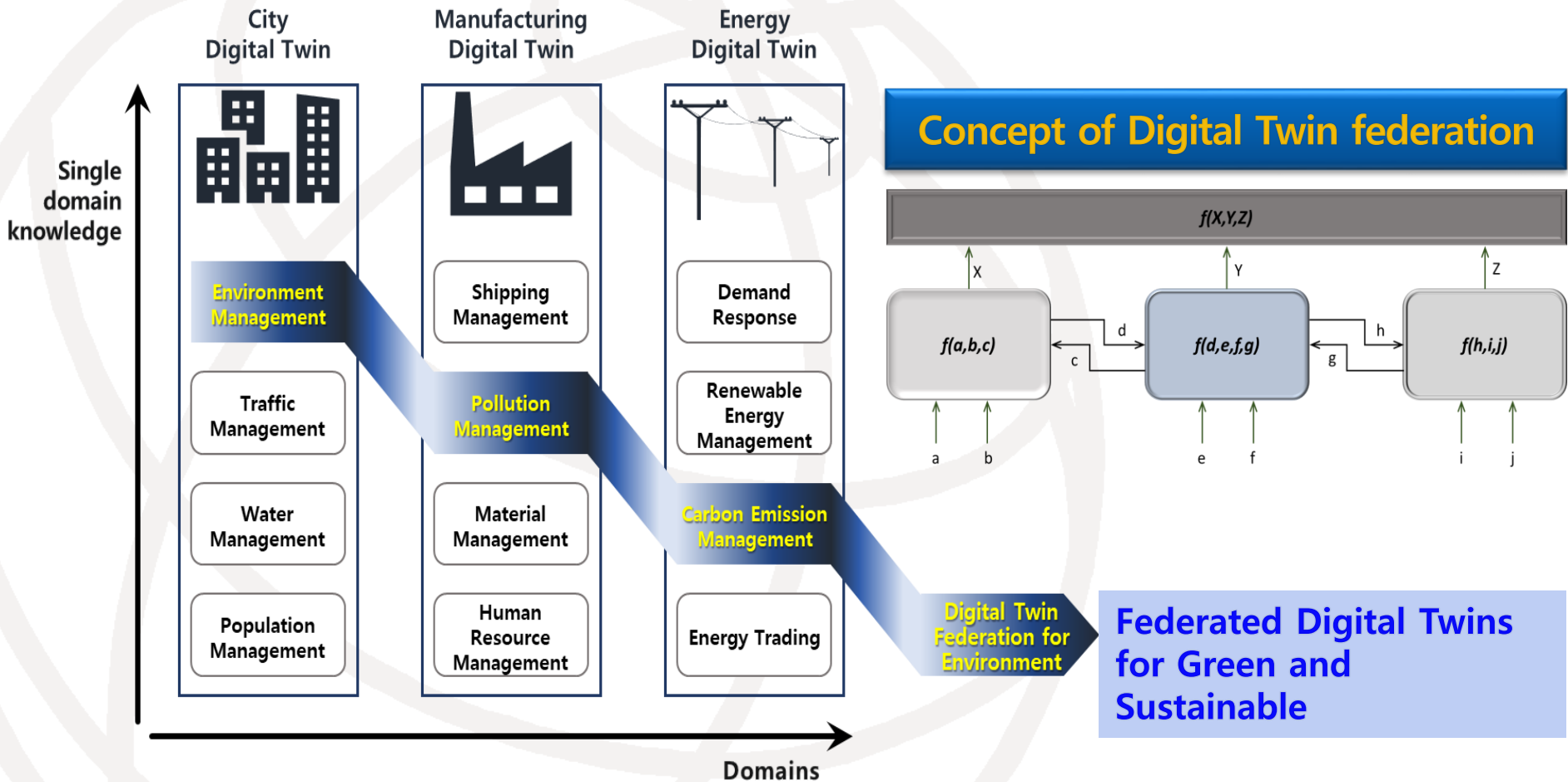
# An emerging topic: Digital Twin and its federation



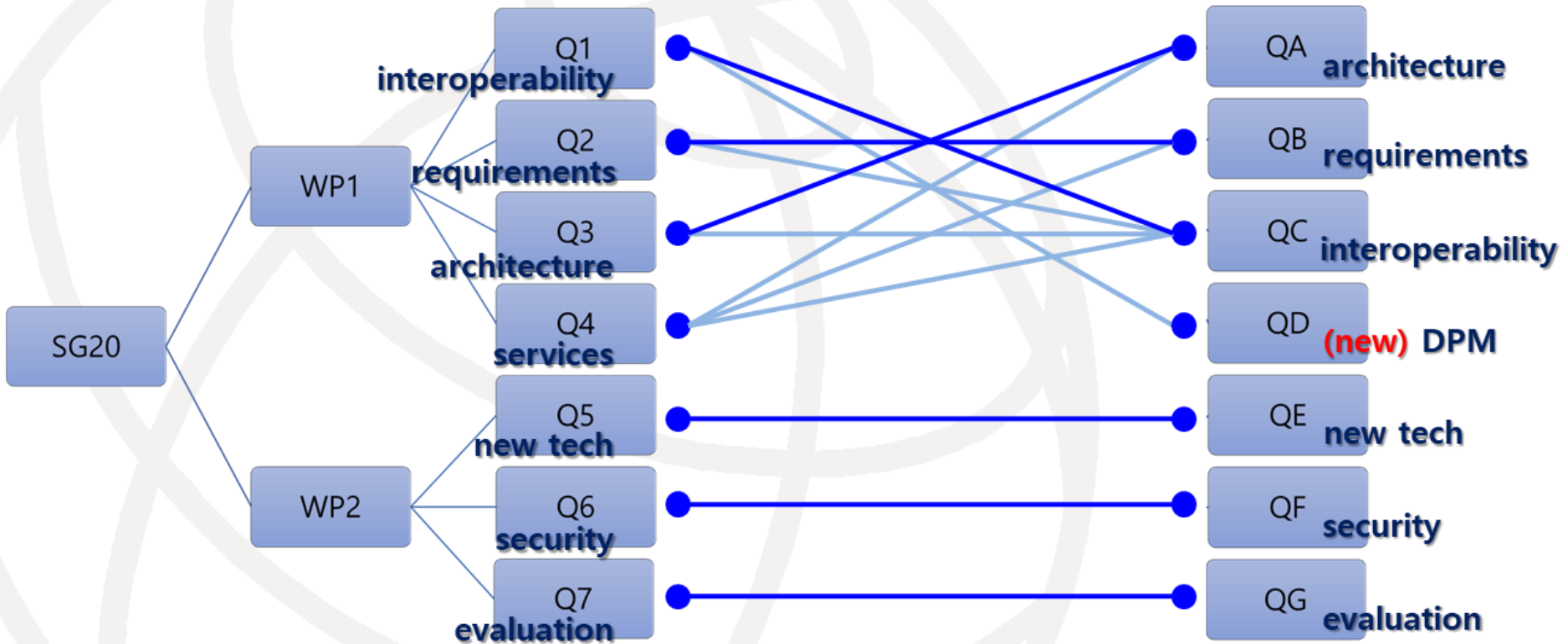
# An emerging topic: Digital Twin and its federation



# An emerging topic: Digital Twin and its federation



# ITU-T SG20 new structure (2021.1.~)





**Thank you for your attention.**

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