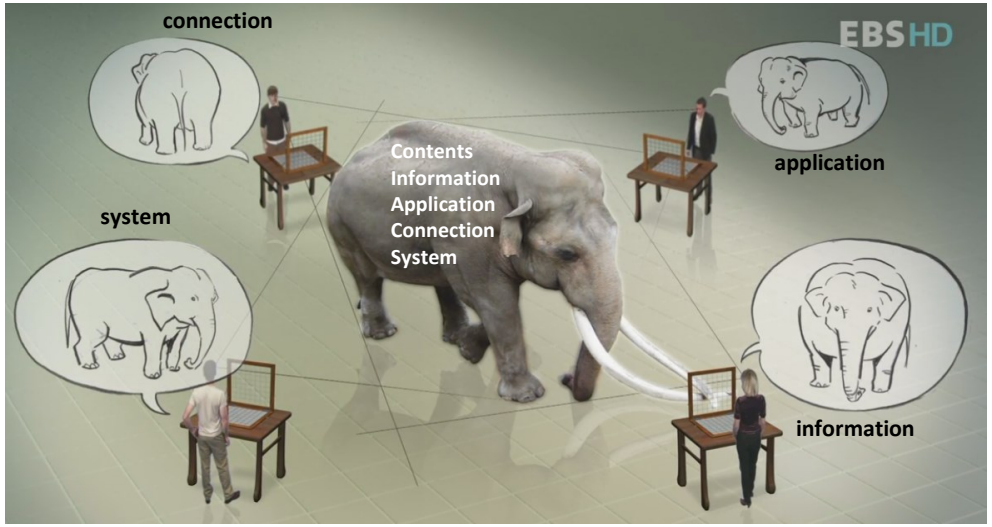
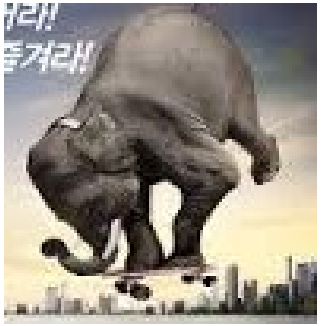
ITU-T Vision @ 2020

International Telecommunication Union
~ United Nations specialized agency for ICTs


Today &
Problem Spaces

Problem Spaces 1 (different observations)



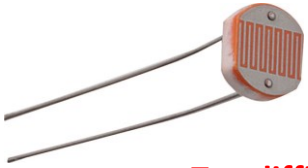


Present

Problem Spaces 2 (objects of smart)

Could be OK

But



Too difficult and costly

Problem Spaces 3 (multi-video vs big data)

Could be OK

BUT

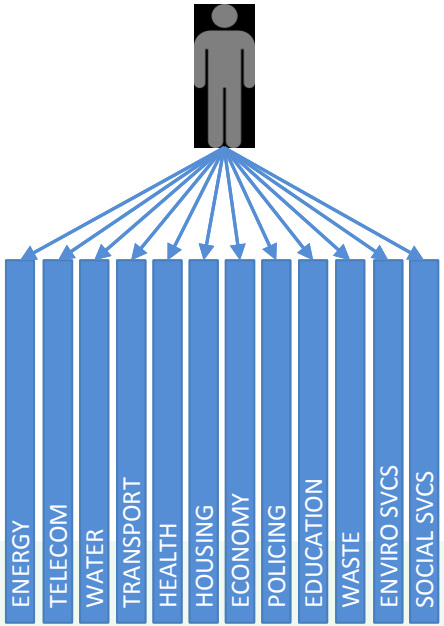
Problem Spaces 4 (security)

Offender	Defender
	

Problem Spaces 5 (verticals part of horizontals)

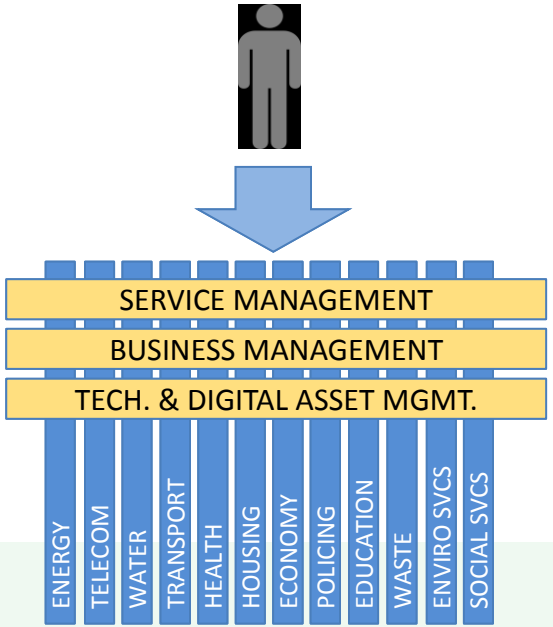
FROM

Closed & unconnected **vertical silos** of functionally oriented service providers



TO

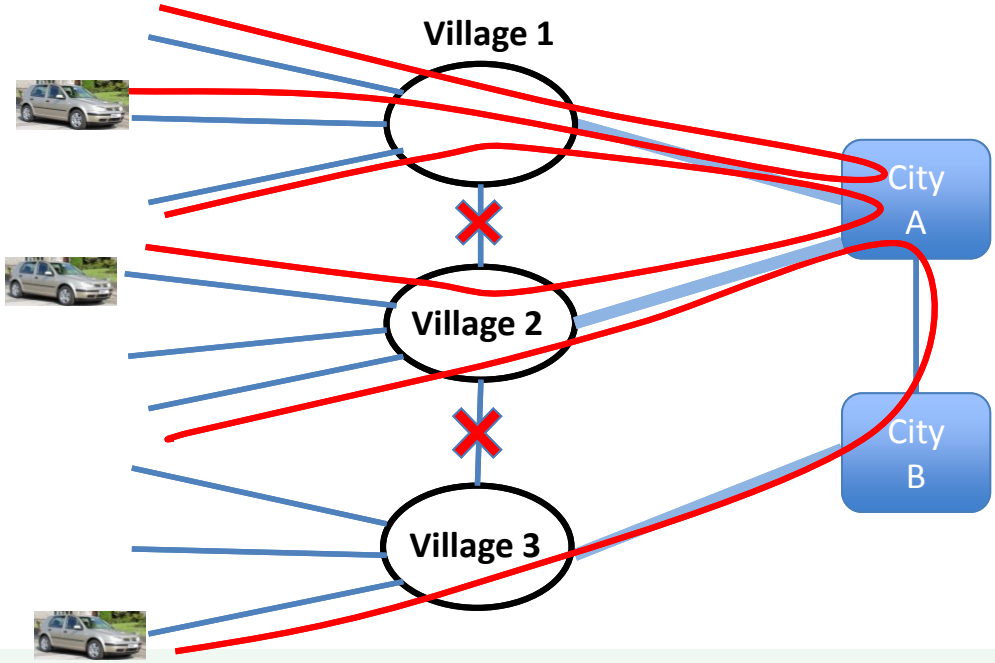
Innovative and Collaborative new models that **connect these vertical silos**



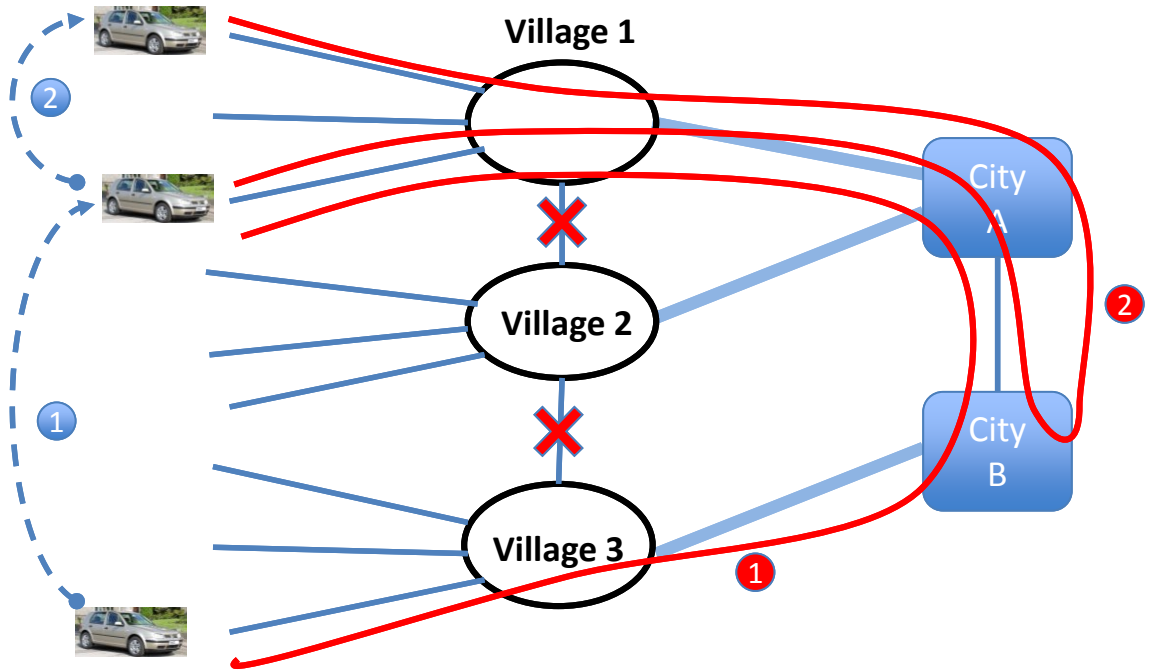
1956 2016 CCITT / ITU-T

ITU

Problem Spaces 6-1 (traffic routing)

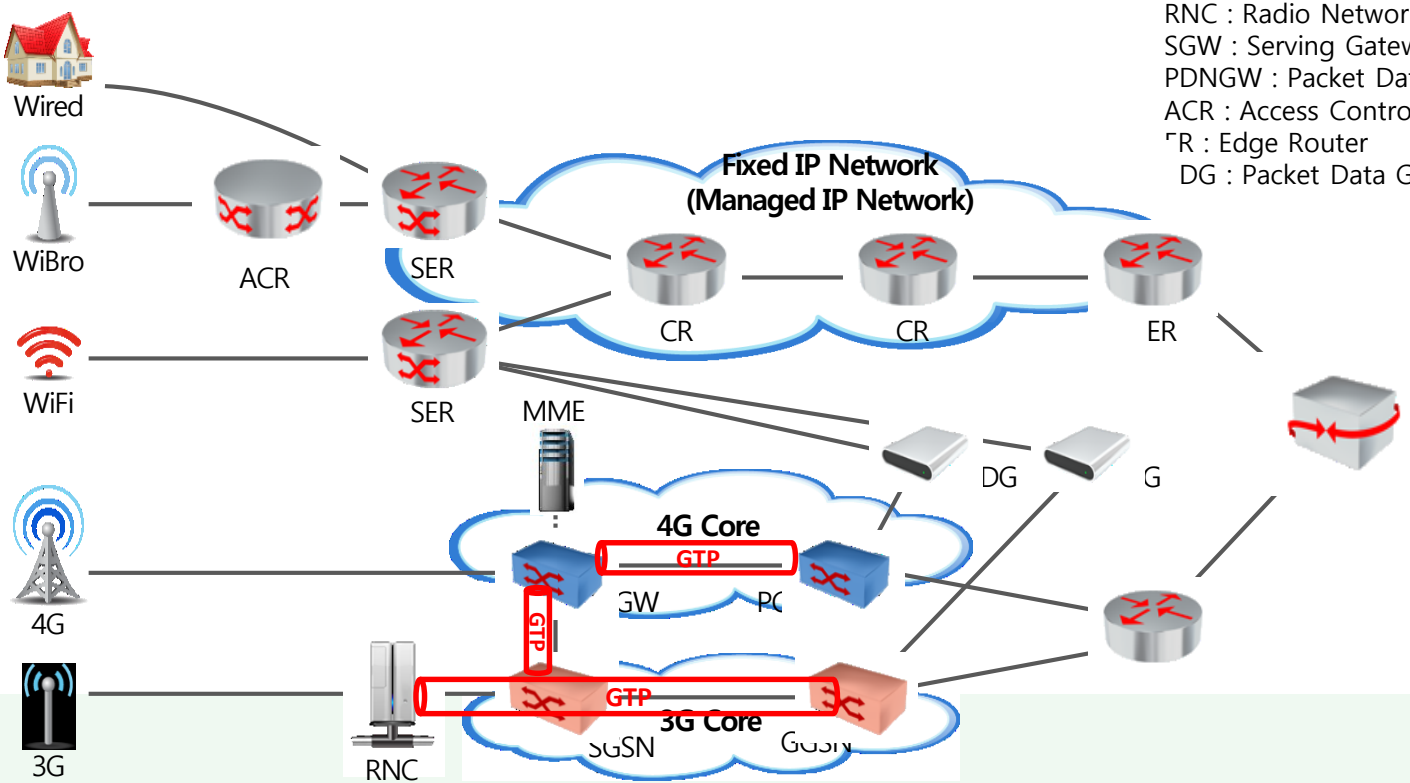


Problem Spaces 6-2 (traffic routing)



Existing Mobile networks

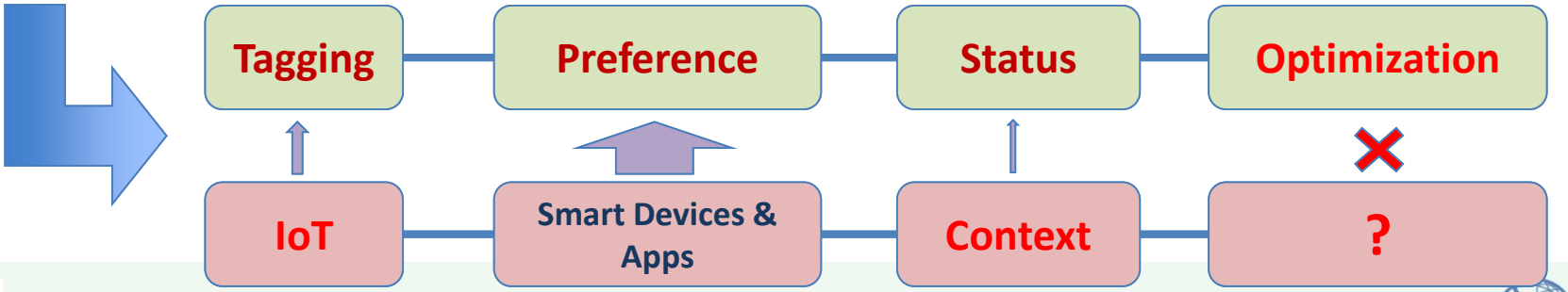
SGSN : Serving GPRS Support Node
RNC : Radio Network Controller
SGW : Serving Gateway
PDNGW : Packet Data Network GW
ACR : Access Control Router
ER : Edge Router
DG : Packet Data Gateway



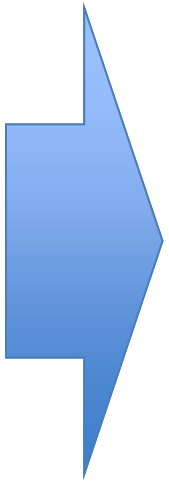
New Waves

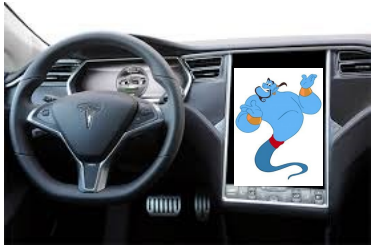
New Wave 1: Autonomy

- Increase **distributed** processing, computing & communication
- More **software** based environments
- Expand **automatics:** functions, systems, services & application (Automatic driving)
- Becoming **Resources: sharing** and **binding** (slicing and virtualization)



New Wave 2: Agent

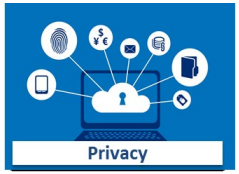




New Wave 3: Trustworthy

Smart

Intelligent



Building trust

Benefit of Trustworthy

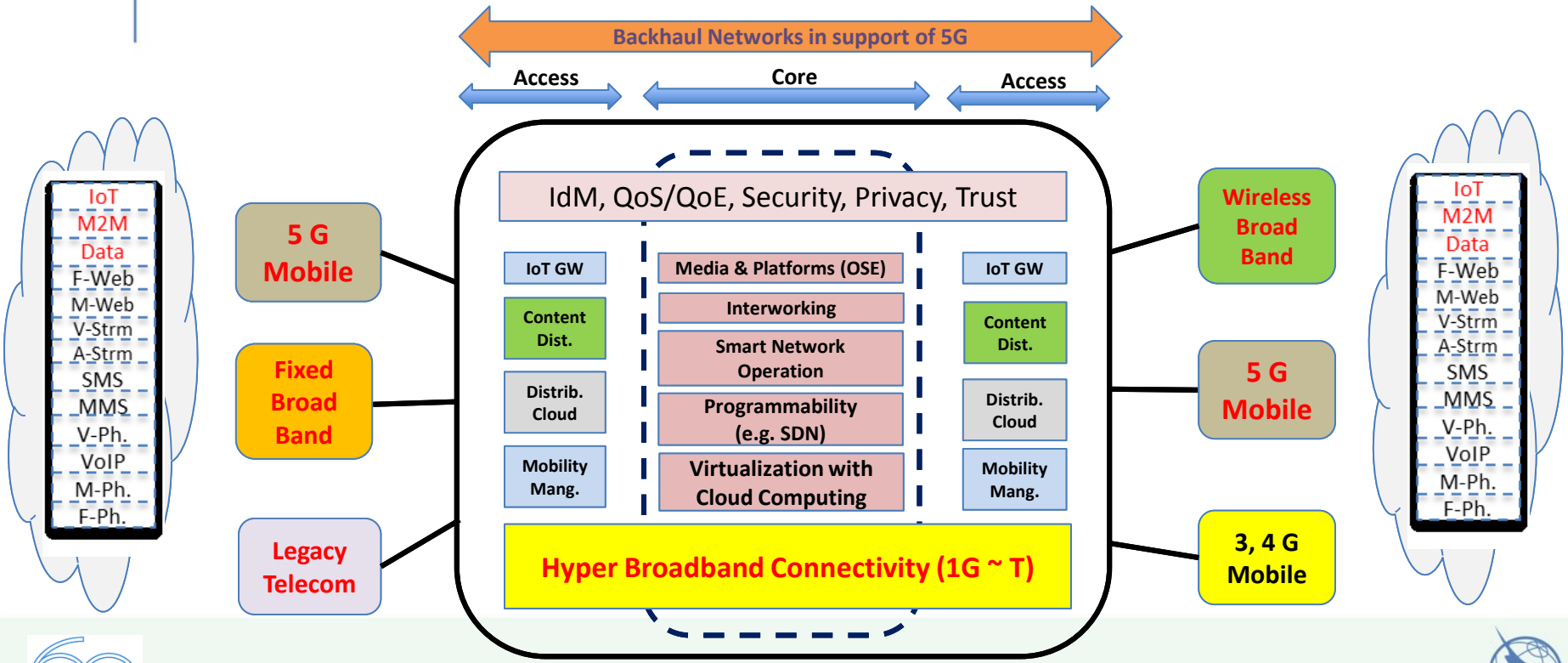
Trust complements to enhance Safety and reduce Complexity


ITU-T Vision
@ 2020

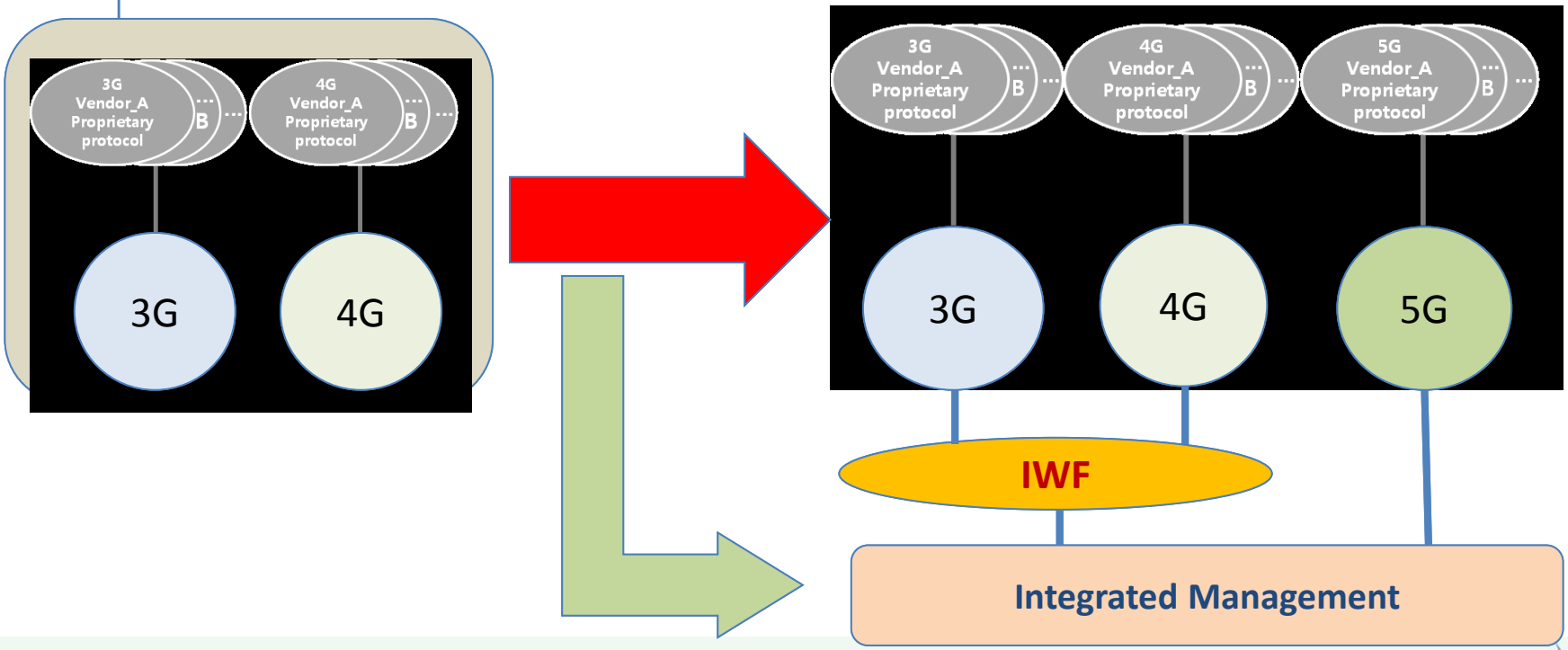
Hot ITU-T Topics

- 5G (non-radio) and Future networks
- IoT including M2M, MOC, WoO (for smart sustainable cities)
- Security, Privacy and Trust
- Transport, Access, Home
- Video coding, e-everything (e.g., e-health)
- ICT and the environment
- Digital Financial Service (e.g., Mobile money)
- Global roaming, Over The Top
- Bridging Gaps (standards, technology)
- …

FTII@2020: Network Functions and Architectures



5G in ITU: Integrated Management

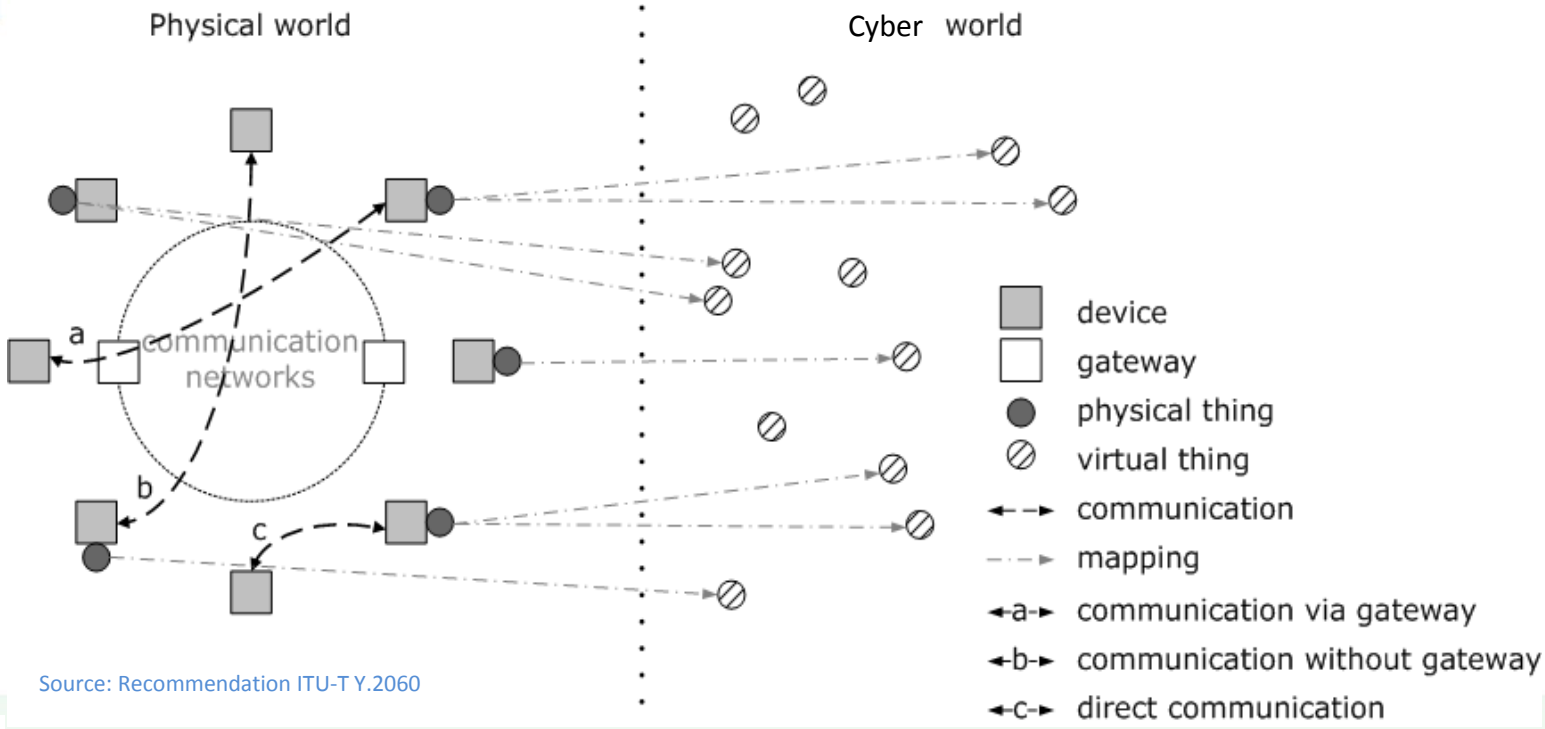


FTII@2020: Communication infrastructure by IoT

- **Things (Physical & Virtual): key communication infrastructure**
- **But more than "connected things"**
- **Infrastructure for "Connected Life"**

A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable ICTs.

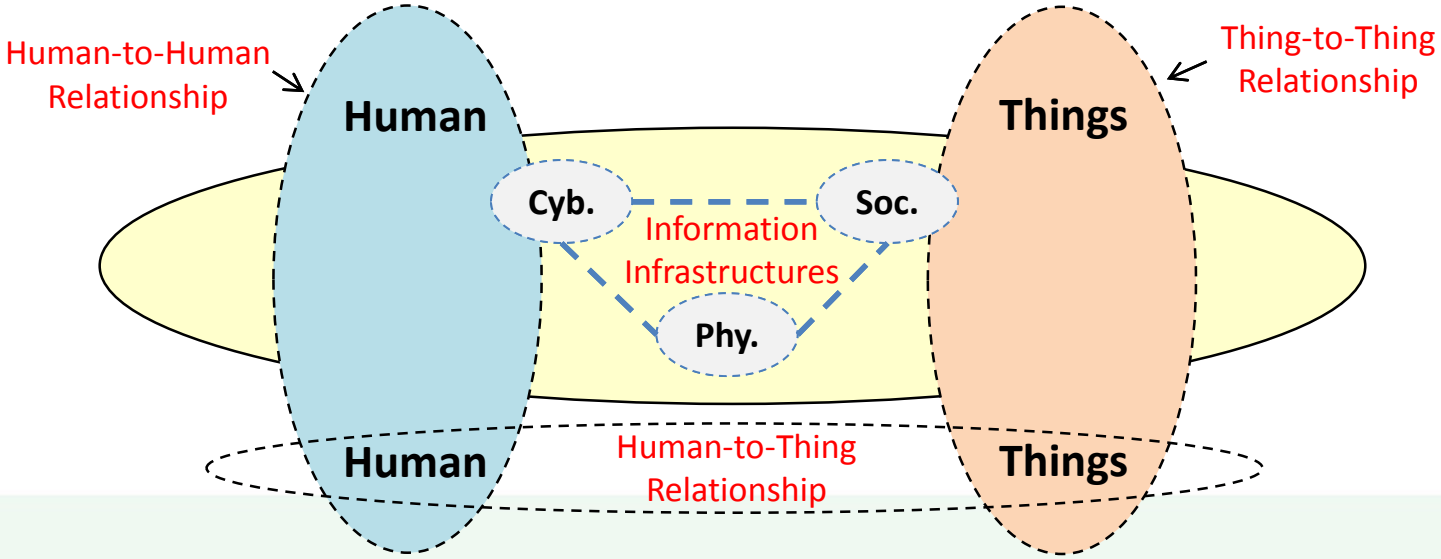
FTII@2020: CPS as Communication entities



Source: Recommendation ITU-T Y.2060

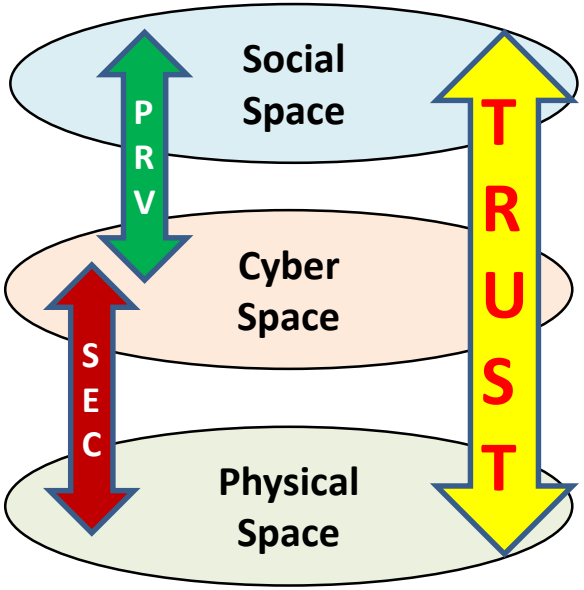
Future Environments of Information Society @2020

- Change of communication objects: Humans and Things
- Expand living spaces: Autonomous but complex



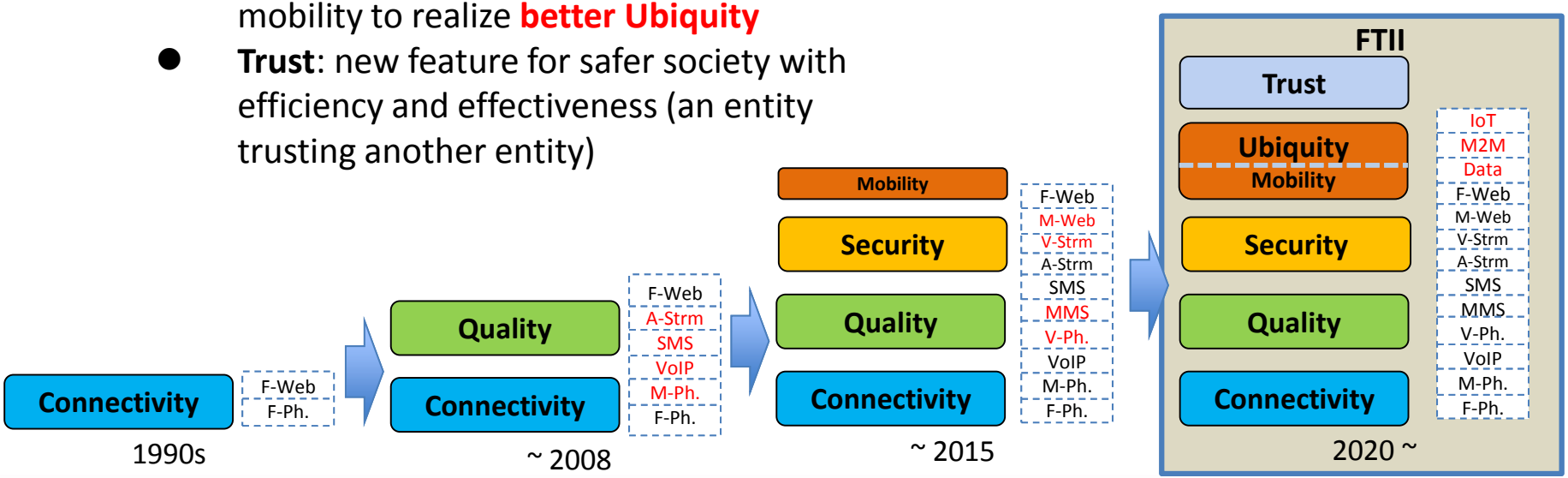
FTII@2020: SCPS as for Security and Privacy

- **Living space@2020: Social-Cyber-Physical**
- **Social-Cyber-Physical Relationships**
  - Co-existence
  - Connectivity
  - Interactivity
  - Spacio-temporal situations
- **Human-Thing Relationships**
- **Need more than "Security and Privacy"**
- **Trust as a cross domain relationship**



Future Trustworthy Information Infrastructure @2020

- Better solution for **Safer and Smarter operation of Infrastructure**, while enhancing quality (including enhanced Broadband)
- **Ubiquity and Mobility**: need enhancement (e.g. seamless) of mobility to realize **better Ubiquity**
- **Trust**: new feature for safer society with efficiency and effectiveness (an entity trusting another entity)



Future of Video (1)

Importance of Video

- Video is the chief driver of bandwidth use
- Video already accounts for more than 50% of bandwidth use – growing fast
- It is estimated that, in three years, IP video will account for 80% of all consumer Internet traffic
- By 2018, every second, nearly a million minutes of video content will cross IP networks around the globe → it would take more than 5 million years to watch one month's worth of all the video that crosses networks worldwide
- Looking at end-user viewing habits: continue to see increasing consumption of video
- Video consumption on mobile devices is forecast to grow by 44% in 2015, and by 35% in 2016

Future of Video (2)

- To ensure efficient content delivery, the network study should:
  - Cope with the high demand for video traffic and ensure high availability
  - Optimize bandwidth consumption
  - Shape the future by highlighting the requirements supported by IMT-2020/5G
- For operators also doing business as content providers, it is important to study technologies that:
  - reduce vendor lock-in
  - minimize reworking of content
  - reflect the best practices and international consensus

5G in ITU: collaboration with Open Source Community

Service Providers

Vendors

FG IMT-2020

1

1 Help consolidate POC ideas and work with Open Source bodies.

2 Co-ordinate POC tests/demos

- Containers –
- Docker
- Kubernetes
- OPNFV
- Open-O
- O3 Project
- OpenStack
- OpenLTE
- OpenAirInterface.org

- TransportSDN (Englewood)
- OpenDaylight
- ONOS
- Android
- Linux
- Fabric as a Service (FaaS)
- Open CCN

Proof-of-Concept #1

2

Proof-of-Concept #N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