

Webinar on SRIA



Strategic Research and Innovation Agenda (SRIA) 2021-27 “Smart Networks in the context of NGI”

Emerging Technologies and Challenging Trends (technology views)

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Based on Networld2020 SRIAv3.0



❑ What is the ETCT chapter?

- ✓ A wide-ranged set of topics, which were identified as potential game changers
- ✓ Several points here identified were touched (often in a particular view) in different chapters
- ✓ Often topics very summarized, but mostly with strong overall impact at system level

❑ Contents

✓ The Physical Stratum: Communication and Computing Resources

- ✓ Nano- and Bio-Nano Things
- ✓ Quantum Networking
- ✓ AI/ML for the Physical Layer
- ✓ DSL
- ✓ The Air Mobility Network

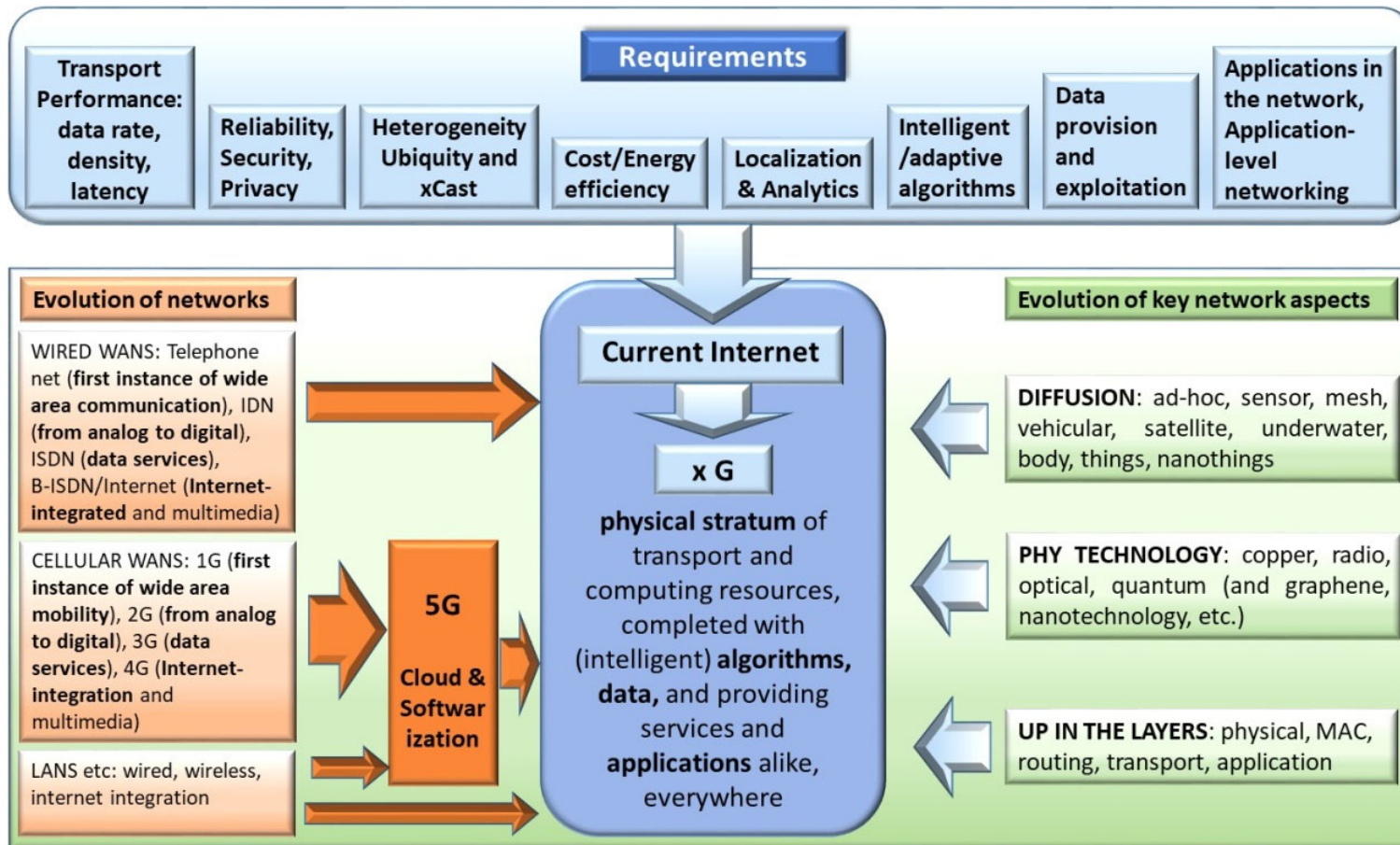
✓ Protocols, Algorithms and Data

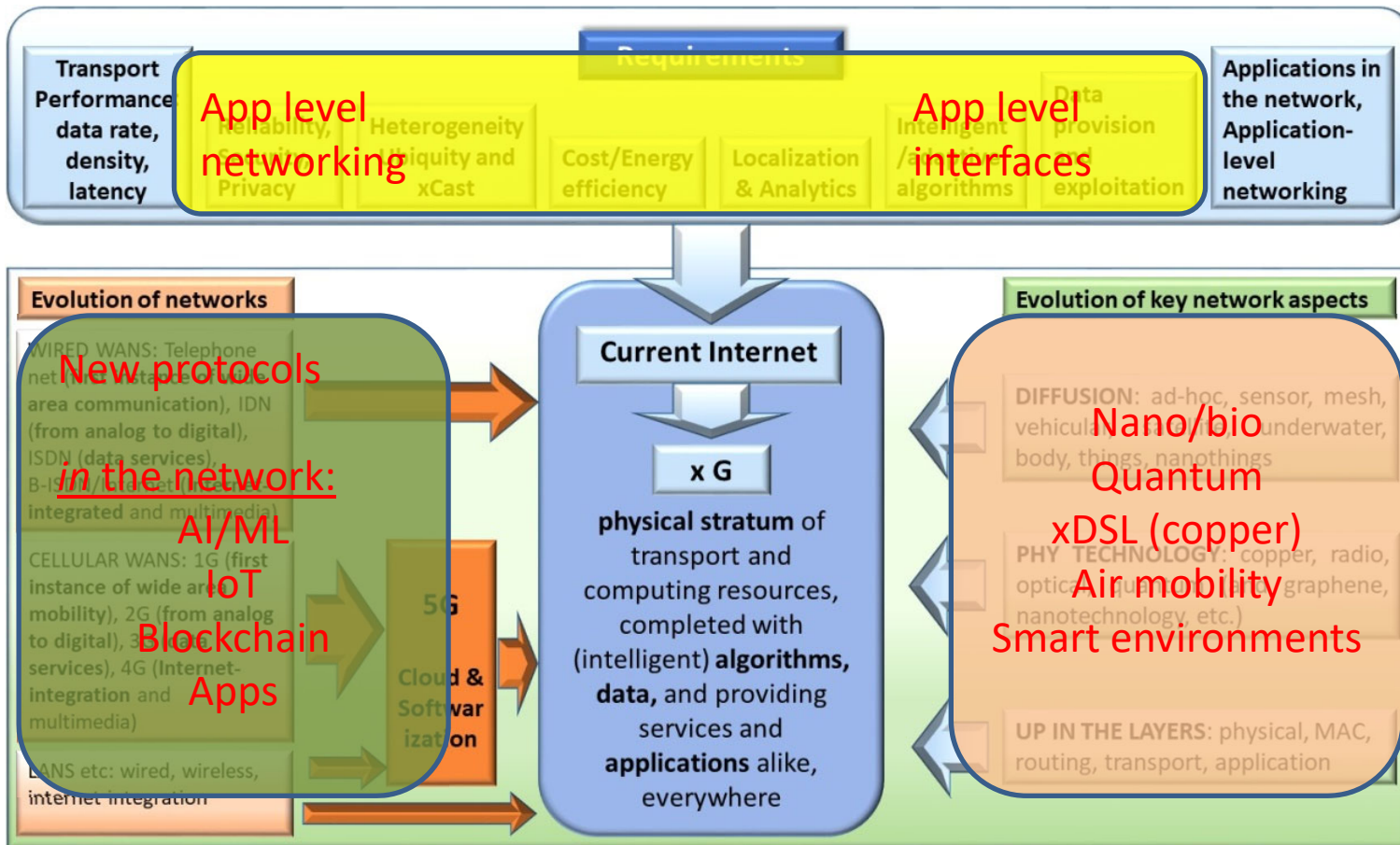
- ✓ Impact of AI/ML on the Network
- ✓ Impact of IoT on the Network
- ✓ Impact of Blockchain Technologies on the Network
- ✓ Evolution of Protocols
- ✓ Smart Living Environments

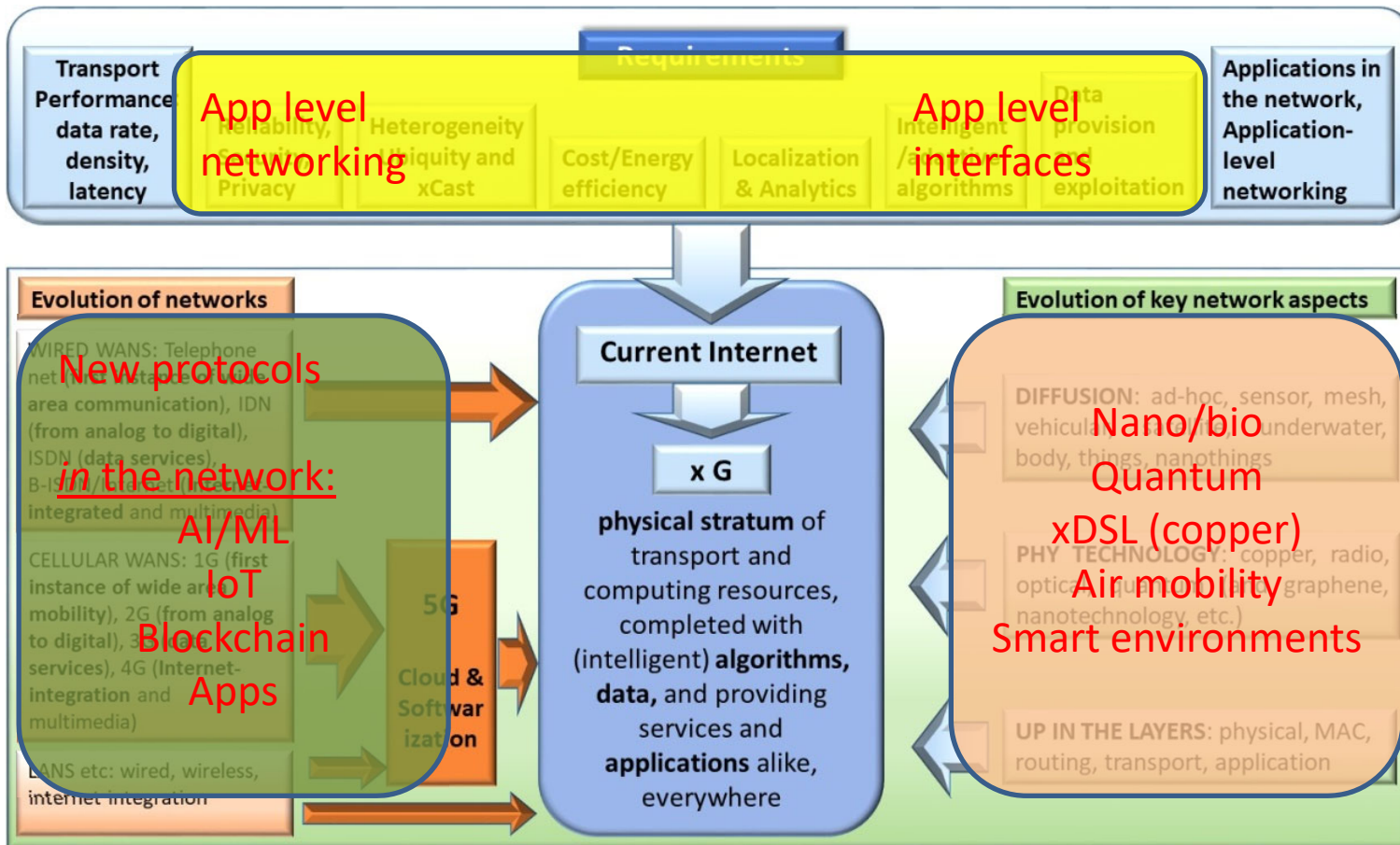
✓ Applications

- ✓ Application Level Networking
- ✓ Applications (Components) in the Network
- ✓ Applications Making Specific Demands to the Network









The SciFi versus the vintage



- Bio/nano networks
 - Human body (and more..) will become an environment for multiple devices.
 - Nano technology will impact both medicine and materials engineering
 - Both coupled together - Internet of Bio-Nano-Things
- newDSL
 - Digital divide is here to stay
 - BB base on fiber will be expensive – and hard to get in many areas
 - Wireless will not provide all alternative solutions
 - Terabits are (speculatively) possible in coax.



Improving intelligence



- Physical layer also becomes “AI”ed
 - Online, dynamic optimization of many channels, and its variation
 - Offline optimization of computational blocks for the operation of communication chains
- Computational (energy) intensive techniques required
 - Reinforcement learning, evolutionary computation, communication chain as autoencoder



Air mobility



- Planes? Drones? UAVs? Balloons?
Future Air mobility transportation
- Planes vs UAVs
 - Very different requirements
 - Air-to-ground? Air-to-air? Air-to-satellite?
 - Hierarchical communications
 - Interference
 - Spectrum (co)usage
 - Energy
 - Velocity and channel stability



To communicate and Not to communicate



- Quantum will be the future
 - Quantum communications and quantum computing
 - A breadth of technologies, platforms and applications
 - Quantum key distribution (QKD)
 - single photon sources (at room temperature)
 - Free-space
 - Quantum computers, switches



Questions are welcomed!

