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Strategic Research and Innovation Agenda Webinar
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SOFTWARE TECHNOLOGIES FOR TELECOMMUNICATIONS

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SOFTWARE – A FUNDAMENTAL KEY ENABLING TECHNOLOGY

What we already have in 5G

- Service-based architecture
- APIs (e.g. Network Exposure Function)
- Network slicing built on NFV, SDN, …
- DevOps
- Open Source Software
- …

What the future will show

- Computing continuum across heterogeneous federated clouds
- Continuum-native software design
- Complex software-intensive system of systems
- Extensive use of AI/ML
- …

Software will increasingly shape network architectures and capabilities

IDENTIFIED SOFTWARE RESEARCH THEMES

- AI-powered Edge Cloud Computing Continuum
- Automated and agile SW engineering
- Enablement of digital services
- Engineering complex, software-intensive, self-adaptive systems
- Software architectures
- Human centricity and digital trust
- Digital twins in the SNS context

SOME DETAILS ABOUT SOFTWARE RESEARCH THEMES (1/2)

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AI-powered Edge Cloud Computing Continuum

- Use of federated learning in distributed edge infrastructures – a decentralized ML approach
- AI as native feature for proactive networking; including proper data access and considering impact of AI based decisions on service experience

Automated and agile SW engineering

- From cloud-native to continuum native software
- Low-code and no-code platforms
- Integrated lifecycle management
- Integration of DevOps with business processes (e.g. network management, slicing, …)
- Aligned network software and data lifecycle

Enablement of digital services

- Time guarantees on virtualization and containerization
- Abstraction mechanisms for accessing network and compute resources for "passive IoT"
- Use case driven service design approaches
- Enabling sustainability in vertical industries

Engineering complex, software-intensive, self-adaptive systems

- Testing approaches and frameworks for self-adaptive systems
- Governance framework for monitoring behaviour of AI-based systems
- SW architecture and design approaches for complex systems + supporting AI-based approaches and tools

SOME DETAILS ABOUT SOFTWARE RESEARCH THEMES (2/2)

Software architectures

- Edge and embedded computing - SW architectures and mechanism for task offloading
- Quantum algorithms for complex problems in the telecom domain
- Implementation and integration of quantum computing in the telecom domain

Human centricity and digital trust

- Data authenticity and trusted digital interactions in dynamically composed service environments
- Human-centric software engineering and codes of ethics for software development
- Human-centricity by design to enable transparency and trust

Digital twins in the SNS context

- Simulation and monitoring of networks
- Managing the lifecycle of telecom digital twins
- Dynamic super twins and eco-systems of twins: composition and interworking of digital twins

Open source software and open data

- A way to develop SW
- Facilitating interoperability and setting de-facto standards
- Engine of innovation

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THANK YOU FOR YOUR ATTENTION

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