Discovering The Unknown

Open Architecture Access for 5G/6G Innovations

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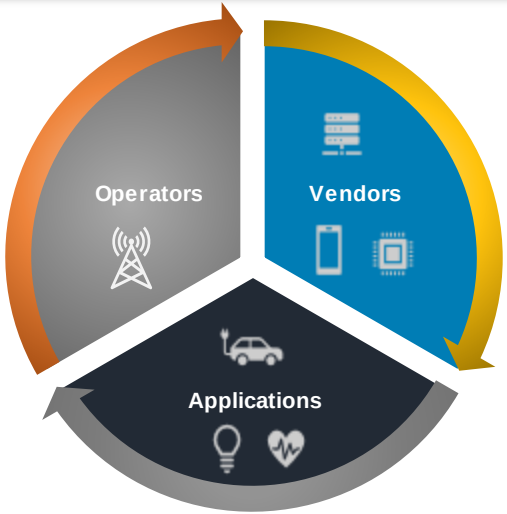
IEEE 5G/6G Testbed Project

The IEEE 5G/6G Innovation Project brings together industry participants across the broad range of 5G/6G technologies to enable win-win collaboration opportunities and contribute to the roadmap for future technological direction.

- A virtual end-to-end 5G network testing and innovation platform
- Use cases: Interoperability and conformance testing, load testing, sandbox innovation, proof of concepts, security tests, and more
- Reduced-cost experimentation and development for interdependent industry players will speed up innovation in a time of cost-cutting
- Increase industry engagement for IEEE
- Opportunities for academia as an educational tool or to create academic/industry research projects
- ***Project open for any industry vendors, operators, etc. to participate***



Founding Members

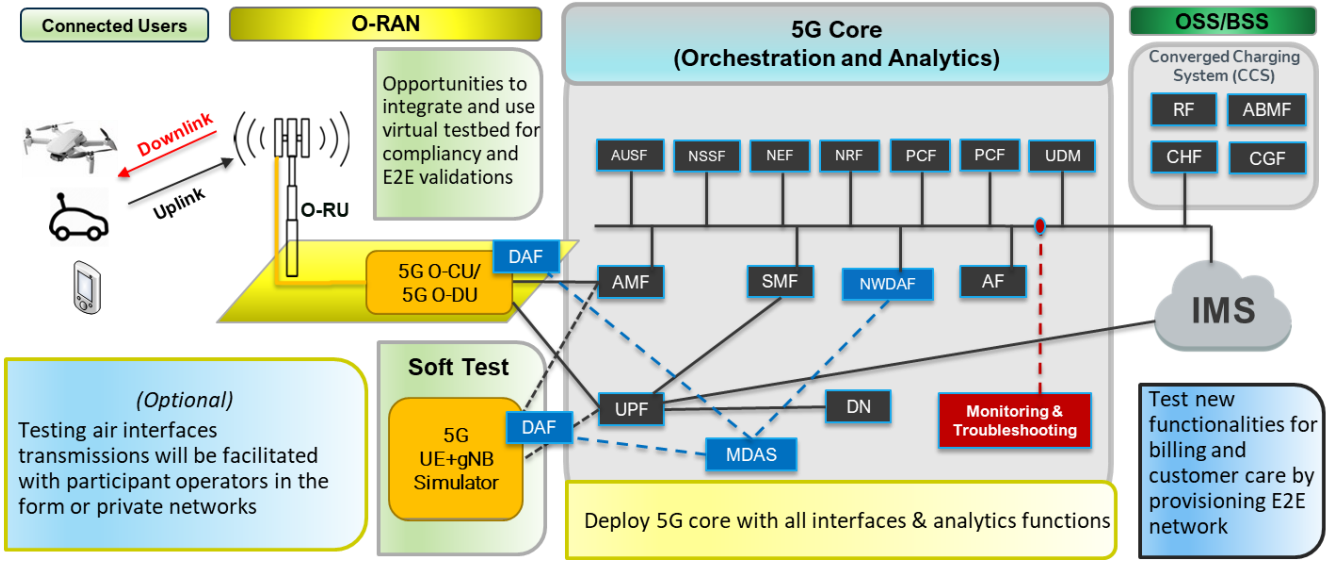
AT&T · 中国移动 China Mobile · SAMSUNG · vmware · Tech Mahindra BUSINESS PROCESS SERVICES · EXFO · IEEE Future NETWORKS Enabling 5G and Beyond

testbed.ieee.org

Phases for Platform Integration: Grand Branch

Virtual Lab Integration

Phase 1	Phase 2 (We are here)	Phase 3 (October)	Phase 4 (December)
▪ 5G Core/RAN Network lab ▪ Voice/Data Call Emulator	▪ Full E2E network lab ▪ OTT App/Service Testing	▪ Edge Cloud support ▪ URLLC use cases	▪ Orchestration/Closed Loop ▪ Security & Resource Management

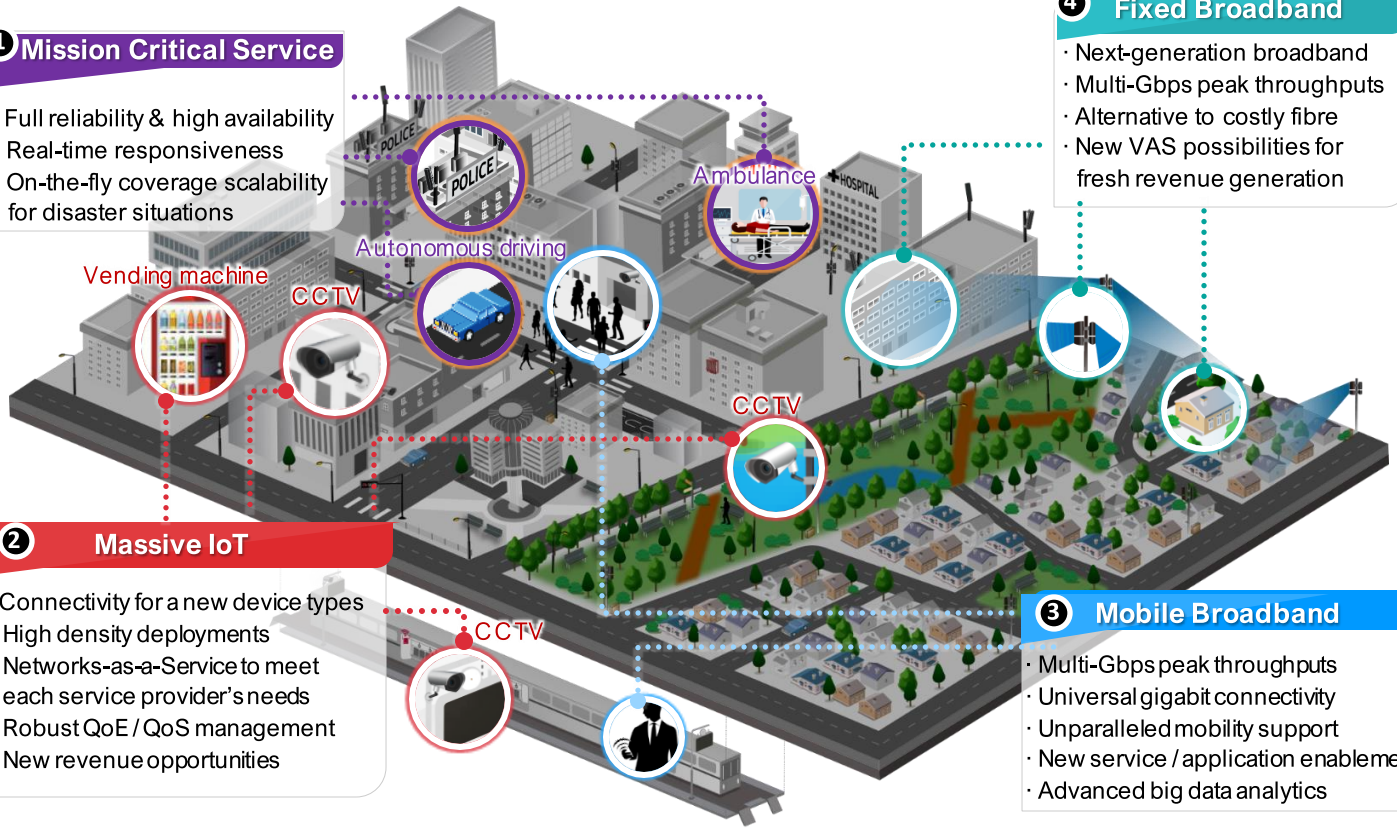


Further Testbed Evolution

- Physical network integration
- 3rd Party Application Testing
- Open API for external system integration

IEEE 5G/6G InnovationTestbed™

Verticals Available for Testing (June 2023)



1 Mission Critical Service

- Full reliability & high availability
- Real-time responsiveness
- On-the-fly coverage scalability for disaster situations

2 Massive IoT

- Connectivity for a new device types
- High density deployments
- Networks-as-a-Service to meet each service provider's needs
- Robust QoE / QoS management
- New revenue opportunities

3 Mobile Broadband

- Multi-Gbps peak throughputs
- Universal gigabit connectivity
- Unparalleled mobility support
- New service / application enablement
- Advanced big data analytics

4 Fixed Broadband

- Next-generation broadband
- Multi-Gbps peak throughputs
- Alternative to costly fibre
- New VAS possibilities for fresh revenue generation

What we support:

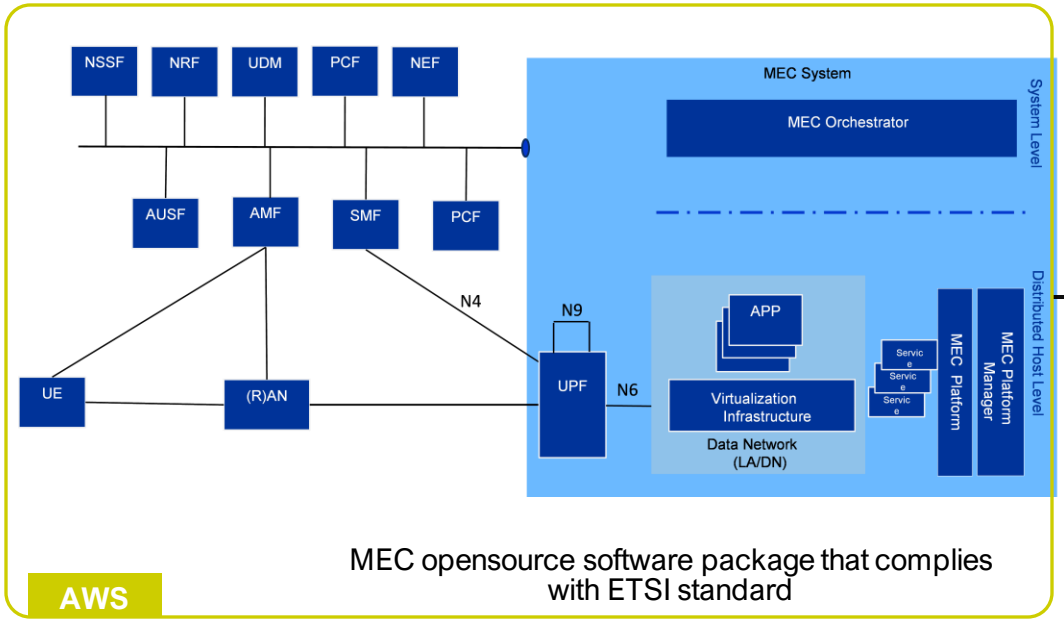
- Multi KPI per use case according to 3GPP standards
- Ability to create new verticals with custom KPIs and components
- Interfacing 3rd party applications through API

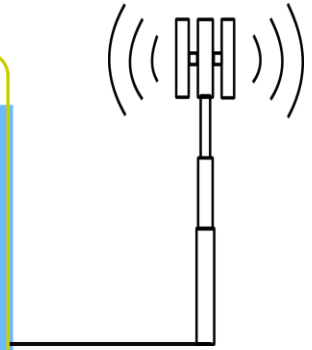
MEC Architecture Branch

Development starts soon with Eurecom

- Support of remote testing in hybrid physical to virtual domains
- Use cases: Interoperability and conformance testing, load testing, sandbox innovation, proof of concepts, security tests, and more.

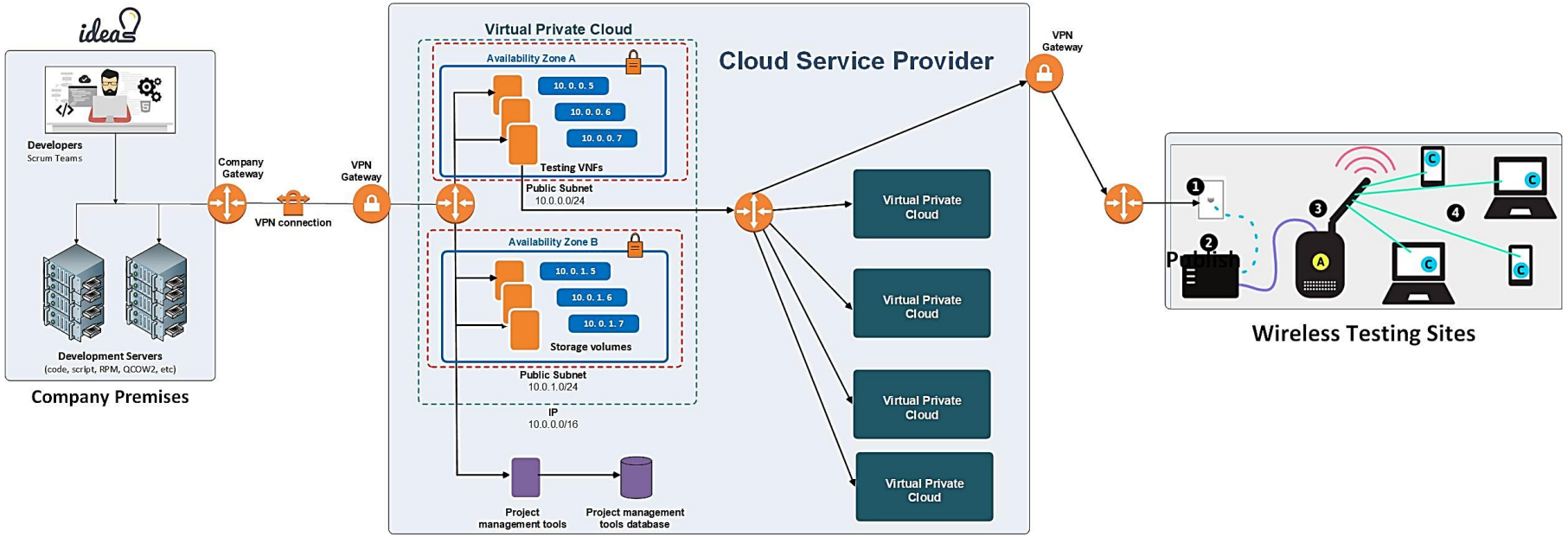
- Open API to connect different platform elements.
- enable multi-testbed integrations and access through APIs through central testing controller.
- Testing as a Service (TaaS) in form of mini-network.
- Challenges: Scalability, security, automation, etc.





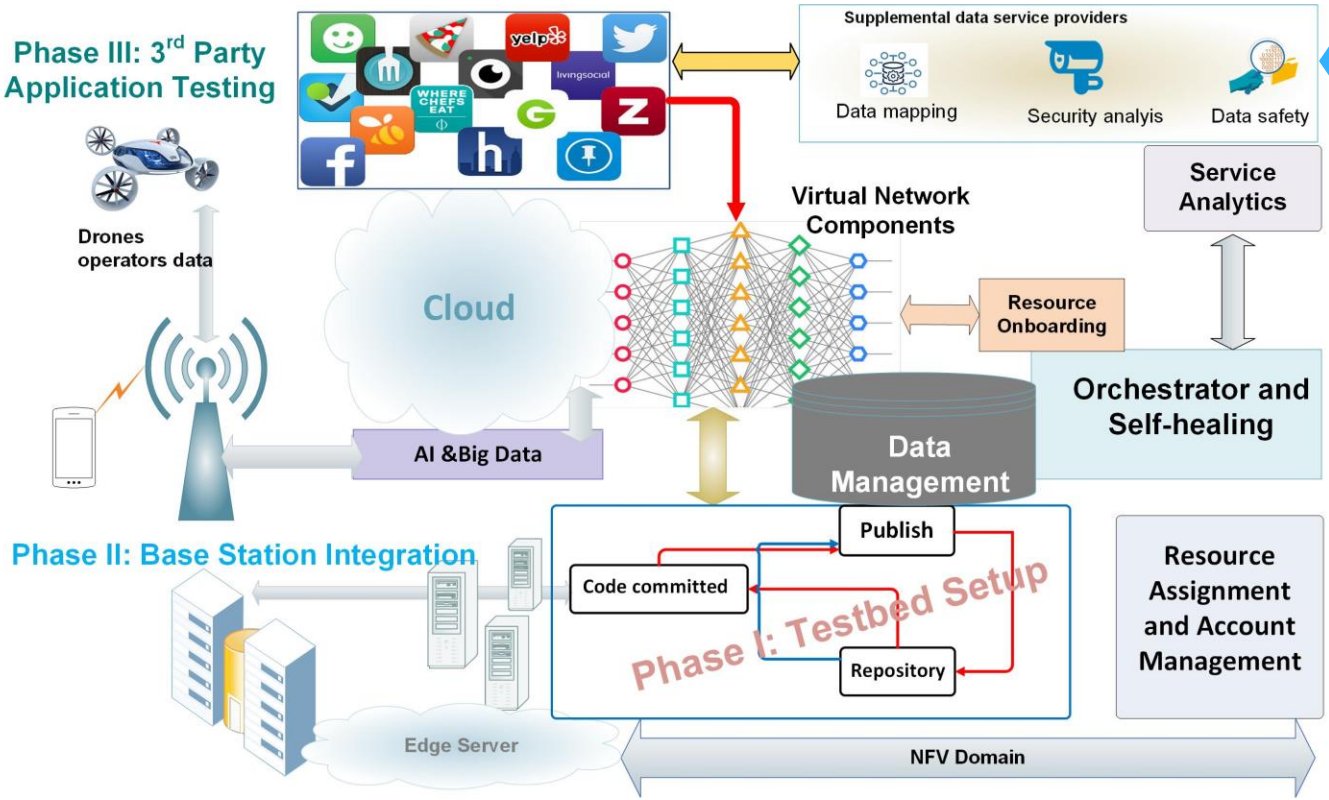
Access points available at Eurecom premises

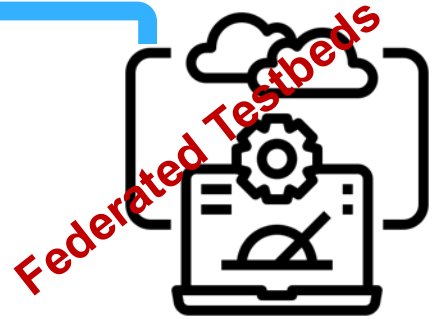
Process Flow



The testbed management team will provide accounts to member companies, and they would be responsible to deploy their components and make them accessible through API or shared network

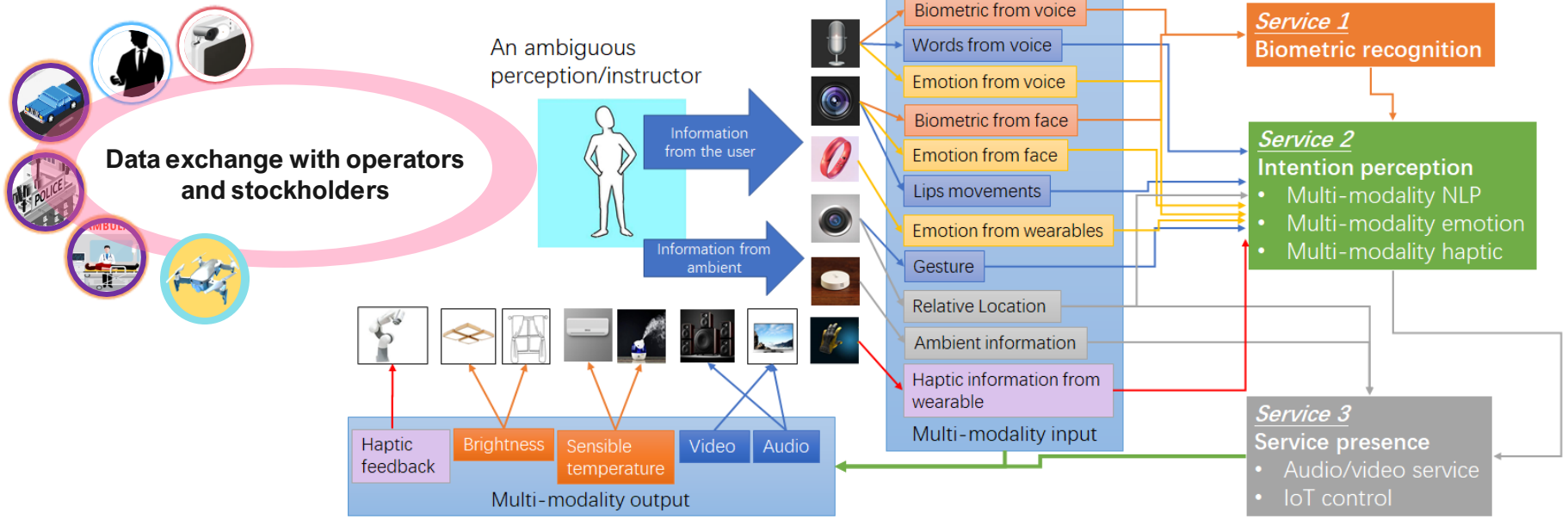
Automated Testing through Federated Testbeds





- Member companies will be able to interface multiple testbeds for full-mesh network testing
- Need to define a secure mechanism for interfacing and authenticate API access in such large and segregated platform
- Leverage AI would be the most efficient approach to manage testing and traffic directions in future federated testbeds

Where is Technology Heading?



"For immersive multi-modal VR applications, synchronization between different media components is critical in order to avoid having a negative impact on the user experience (i.e., viewers detecting lack of synchronization), particularly when the synchronization threshold between two or more modalities is less than the latency KPI for the application"

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User Engagements and Conversations

Phased release of functionality

- Bring in inaugural companies for testing and experimentation.
- Invite new companies to create accounts as early as Phase 2.
- Host training sessions and provide demos/how-to's for certain functionality.
- Create advisory group of users for feedback and development suggestions.
- Encourage collaborative testing after Phase 3 launch.
- Get users hooked on the platform! Then convert users to customers paying an annual subscription fee.

Interest in Collaboration

Telefónica

TIM

ERICSSON

EURECOM
Sophia Antipolis

Cloudify

IEEE SA
STANDARDS ASSOCIATION

O-RAN
ALLIANCE

ITU

Summary

- **Federated testbeds** interconnects multiple platforms in one pool but separates them based on requested service type
- **Open Architecture** that is entirely build of flexible and adaptive sets of open-source software packages and Open API to stimulate innovations
- **5G/6G Innovation Testbed** plan to become the main hub for chaining multiple platforms from various companies and acdemia
- **Cloud-based platforms** enables innovations as most elements are created and managed over public clouds
- **New Use Cases** will continue to emerge such as, separate slices with certain KPI, AI integration, etc.
- **Security and Scalability** are the main challenges for federated testbeds

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Questions?