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Lab as a Service

Realworld testing capability supporting Framework to 5G testing

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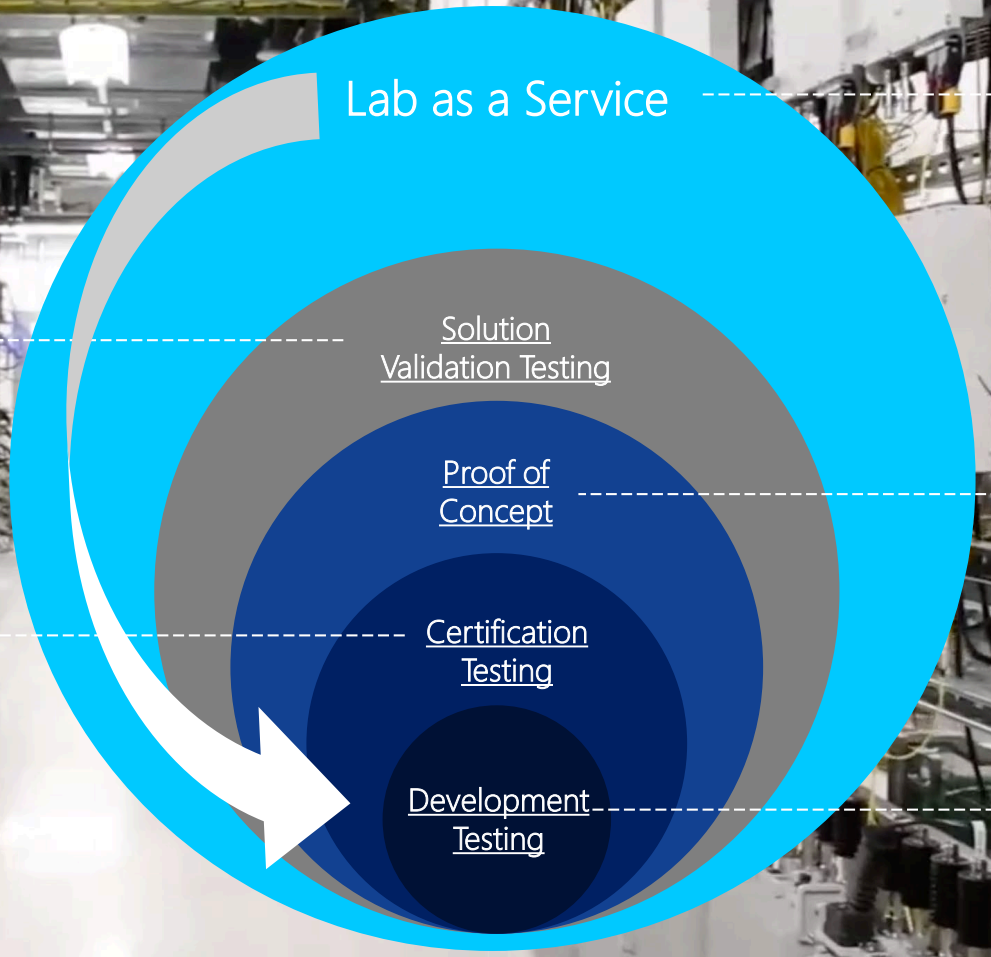
Nokia Cloud & Network Services

Nokia Lab-as-a-Service

Supporting US entities from Dallas and Murray-Hill with variety of use cases

End-to-end solution functional and operational testing

User Equipment validation against access technologies and platforms



Labs on an OPEX bases; below services performed repeatedly

Evaluation of feature, product or solution

Early testing of User Equipment and Applications in R&D stage

Nokia E2E Lab, Dallas, Texas

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Lab as a Service Solution (LaaS)

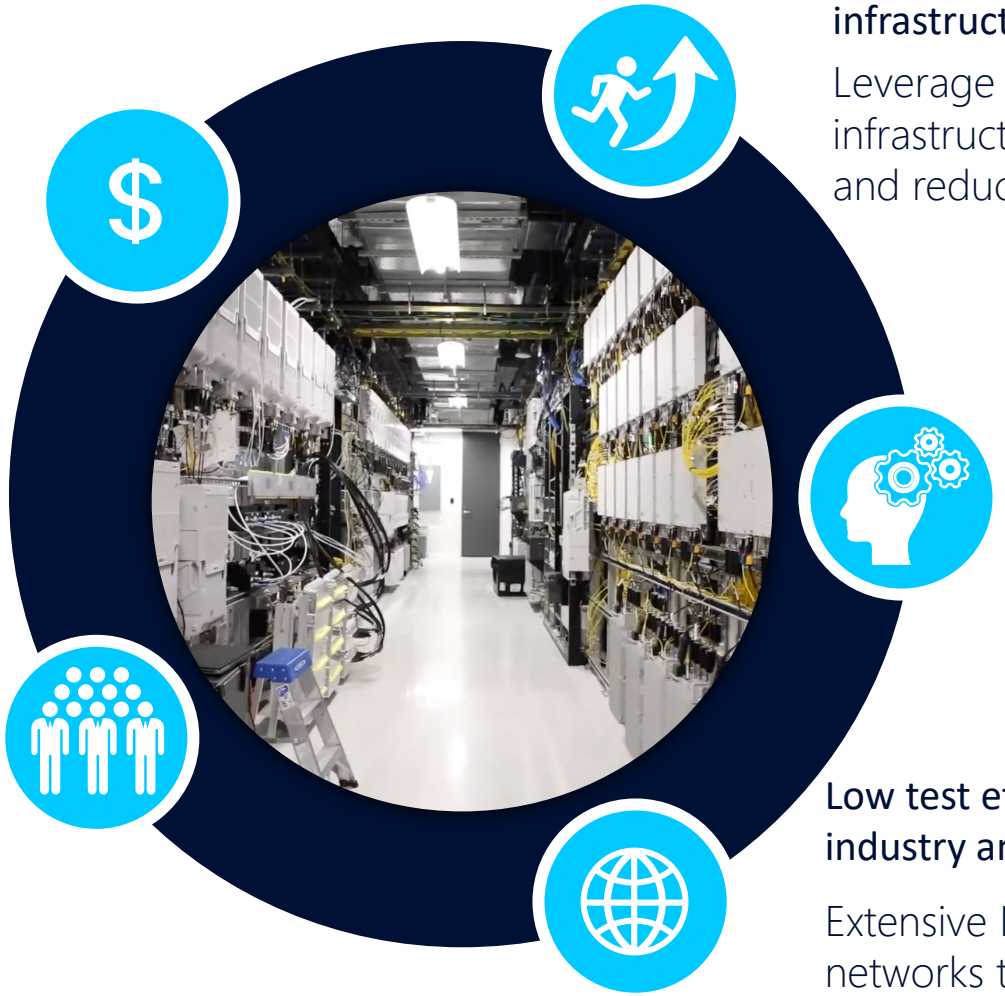
Customer lab deployment made easy

Skip initial lab infrastructure cost

No CAPEX and low OPEX for access to carrier grade lab equipment

No more lack of resources

Ensured lab availability and support for customer use cases with Nokia SME's



Avoid long lead times to deploy new infrastructure

Leverage existing Nokia LaaS infrastructure to rapidly offer lab services and reduce time to market

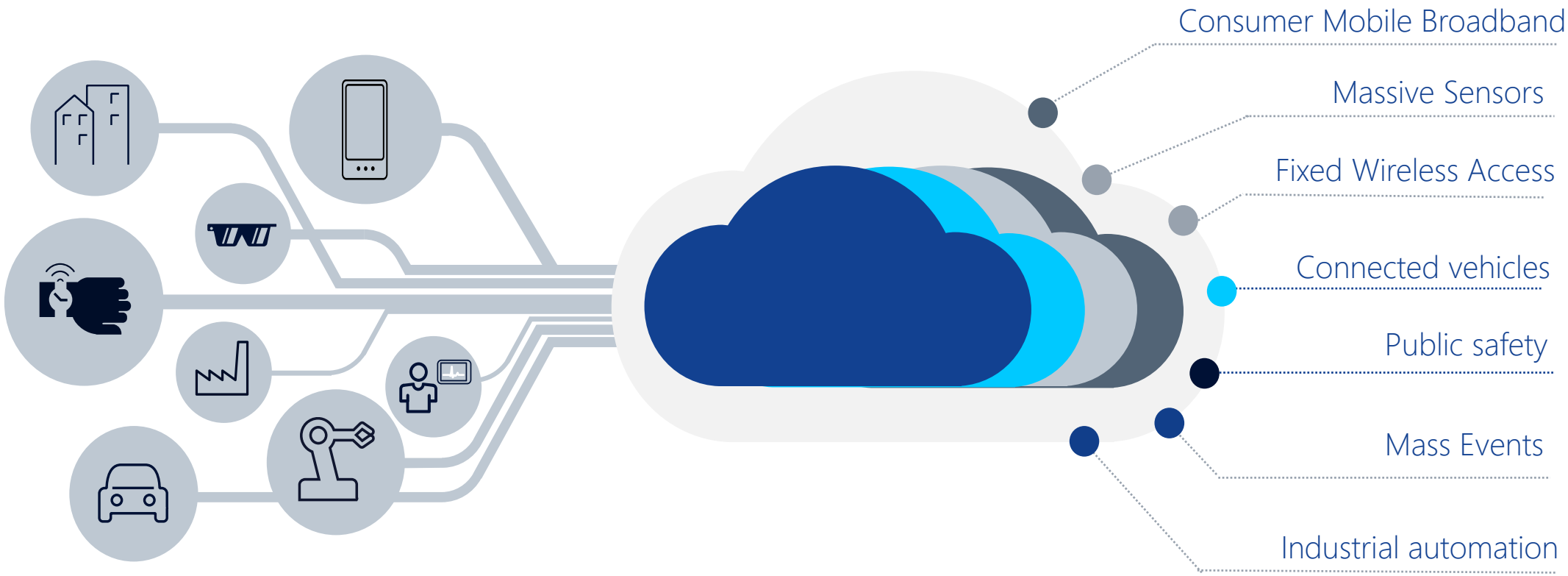
No shortage of testing and troubleshooting expertise

Provide consultancy to support test execution, test strategy, and troubleshooting

Low test efficiency due to lack of real world, industry and commercial best practices

Extensive Nokia experience with operator networks to ensure robust network and highest customer quality of service

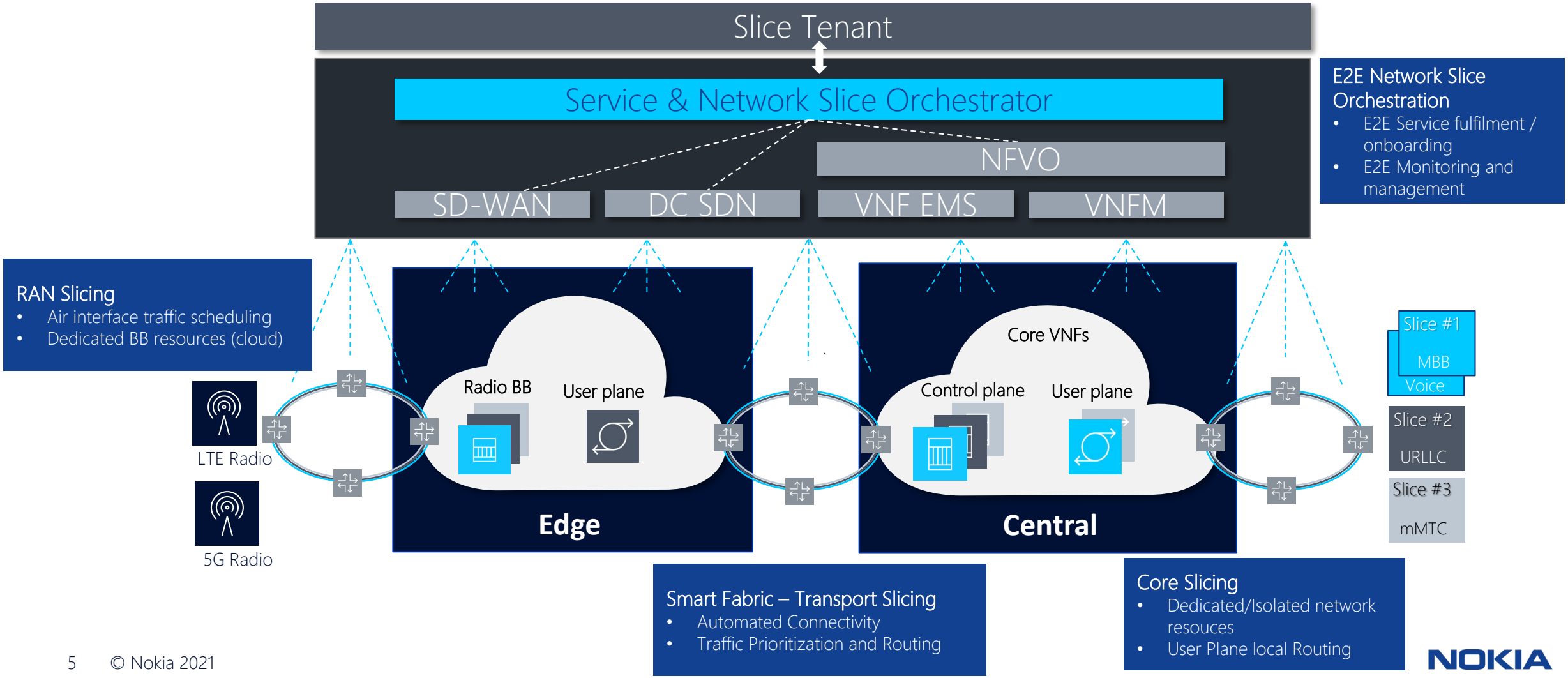
Testing Framework : Use Case - Network Slicing



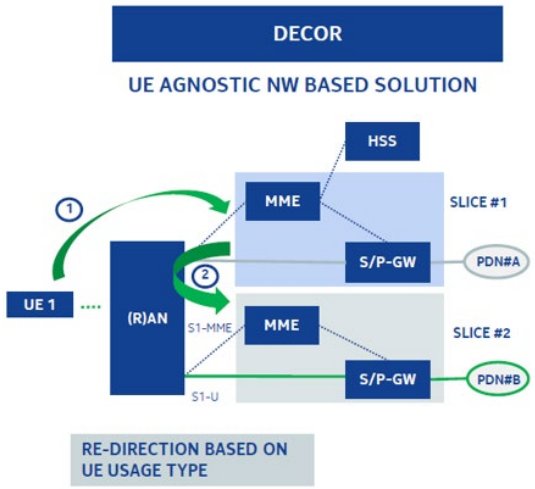
Multiple customized logical networks on shared physical infrastructure in an economic way

Focus on E2E Network Slicing, which Domains?

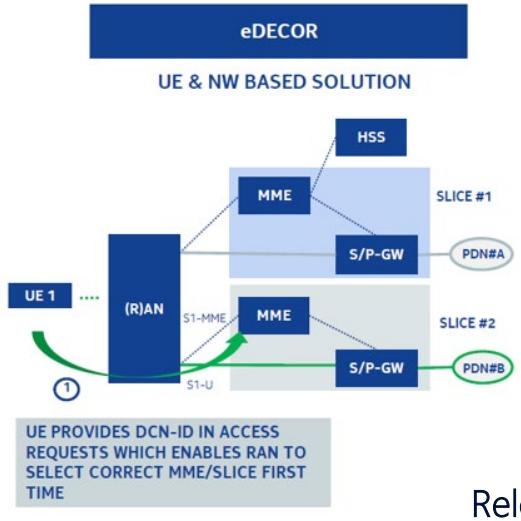
Different Domains and their relevance with Slicing



3GPP Evolution of Slicing



Release 13



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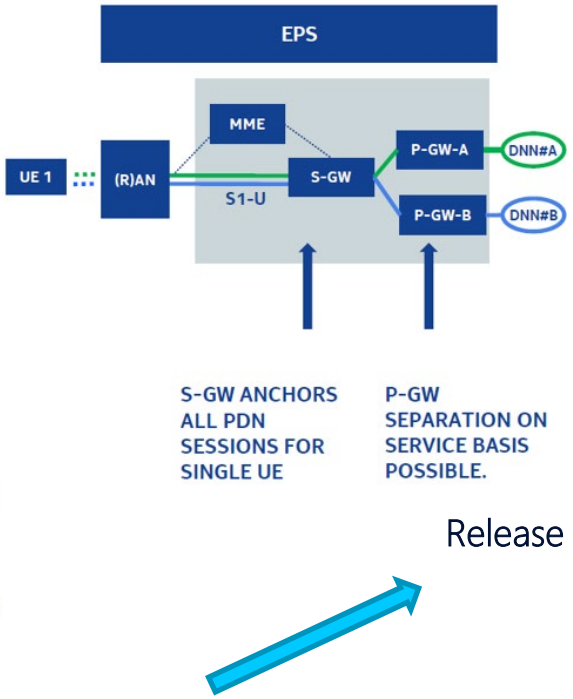

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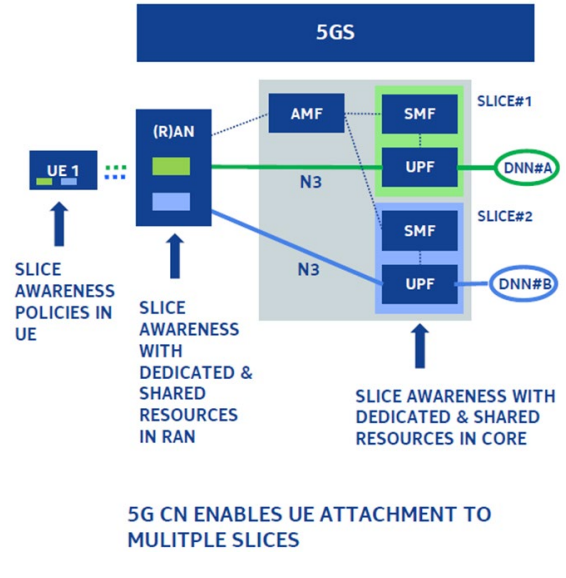

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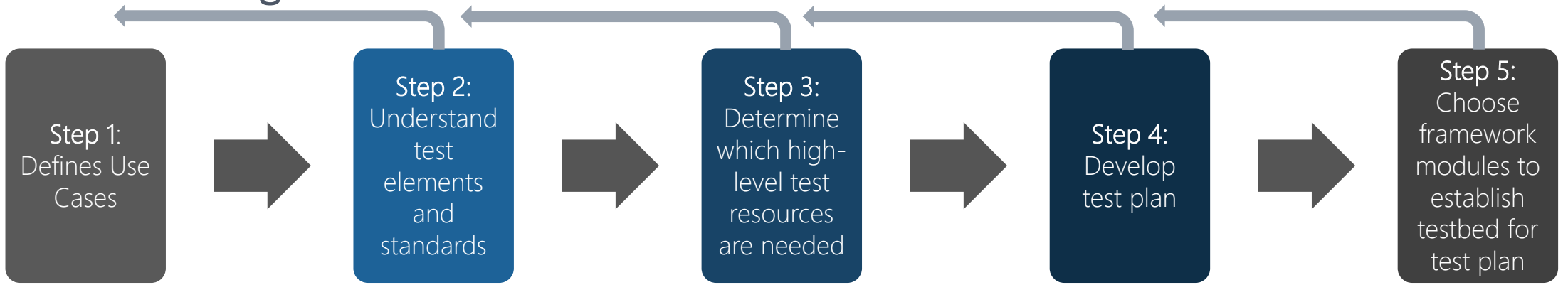
Example for Lab-as-as-Service support preparing for testing

Network Slicing use case



Customer define objective for slicing to meet various scenario expectation

- Throughput, speed and latency
- Security
- Previous 4G implementation on QCI
- Application, environment and area of operation

Create high level design of Radio, Transport and Core elements, Release and technology to be assessed leveraging lab/network assets and roadmap

- Scope of network, SA/NSA, Radio, Core, Transport, E2E
- Customer premise, remote of hybrid lab
- Size of network
- Spectrum
- Testing locations

Detailed design of lab, measuring equipment and services. Define UE and application requirements and high-level performance metrics

- Further refined performance criteria
- Support requirements for configuration, testing, troubleshooting based on high level expectation
- Budgetary estimate on cost

Define testcases, approach, durations and data collection and reporting mechanisms. Performance metrics per use case and domain

- Continuous further refined performance criteria
- Listing of test plan and initial reporting

Selection of testing resources at government locations, Nokia TX/NJ facilities, resources, support services, measurement equipment and testing automation

- Final list of material, equipment and tools
- Services scoping from Customer and suppliers
- SLA and testing timelines
- Final pricing and budgeting

Lab as a Service Solution (LaaS)

Use cases for LaaS

Device Testing

Development Testing of device HW/SW against Nokia's radio access and core networks

Application Testing

Integration testing of 3rd party applications against Nokia's radio and/or core networks

MVI IOT

3rd party network function interface-level testing & validation against Nokia's radio access / core networks

Proof of Concept

Evaluation of a Nokia feature, product or solution. Typically limited scope and duration

Solution Validation

End to end solution integration and testing for Nokia and 3rd party network functions

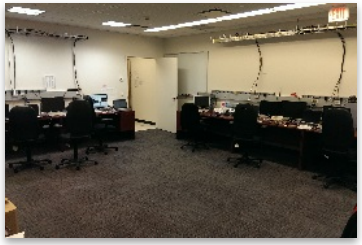
Lab Trials

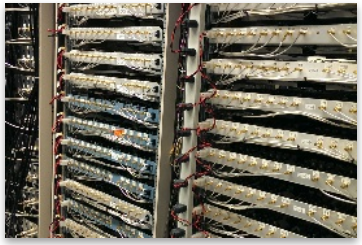
Customer lab trials or as support of RFP product evaluation

Locations of Testing Centers

Delivered from 5 locations around the world.

❖ *Radio Networks* ❖ *Core Networks* ❖ *Data Centers* ❖ *Private & Secure Customer Rooms*





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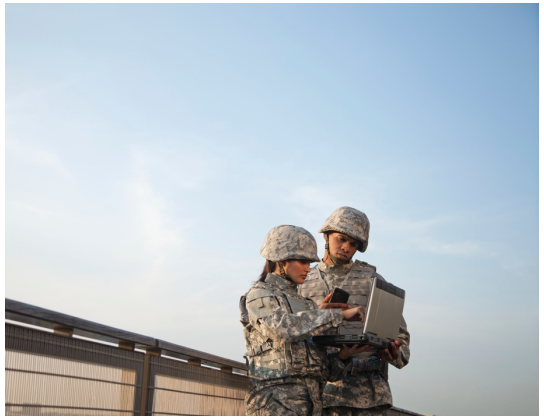
Lab as a Service Solution (LaaS)

Customer Benefits

Rapid access to carrier grade lab Infrastructure

Reduce CAPEX and OPEX investments

Faster product development and services launch through automation



Uncover and resolve issues early in the product/service introduction lifecycle

Maximize reliability of products and quality of services

Expert consultancy support to help customers in testing and trouble-shooting efforts

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