

5G PPP



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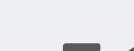
Telefónica
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ONEACCESS



5GENESIS End-to-End Facility Instantiations

I. Mesogiti, F. Setaki

INFOCOM Athens, 26.11.2019

<https://www.infocomworld.gr>

5genesis.eu

@5genesis_h2020

5GENESIS Facility & Objectives

- The project's objective is to design and establish a 5G experimentation blueprint that unifies diverse 5G components to support verticals and develop a 5G **Facility** that instantiates the identified experimentation blueprint in 5 interoperable end-to-end **Platforms** so that to qualitatively assess and quantitatively validate business, performance, and societal 5G PPP KPIs in representative 5G use cases
- The 5GENESIS Facility is comprised of 5 distinct platforms:
 - The Athens Platform
 - The Malaga Platform
 - The Limassol Platform
 - The Surrey Platform
 - The Berlin Platform



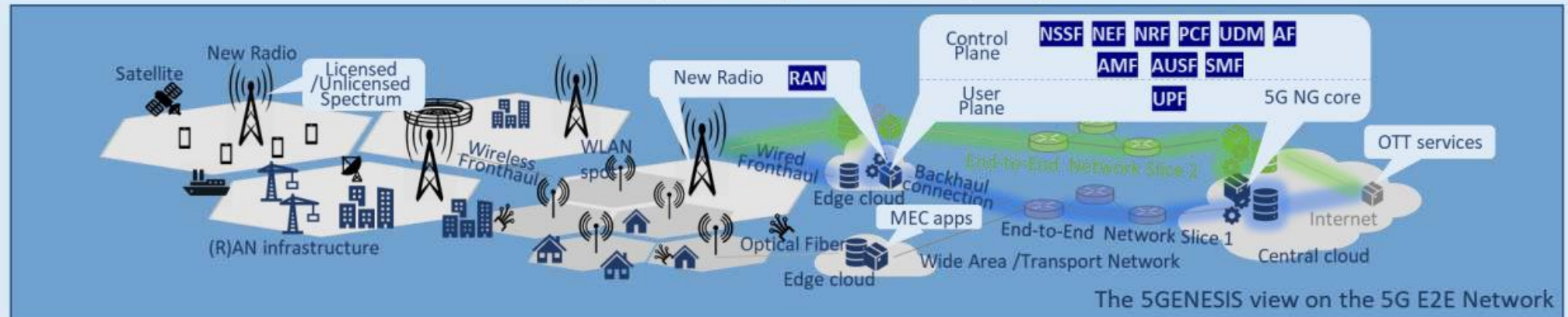
5GENESIS Approach

Early versions of the
5G Standard

Vast experience in
5G-PPP projects

Ownership of key
testbeds around Europe

Blueprint of the 5G experimentation facility



Instantiation of the 5GENESIS Facility

The Athens platform

5G Networking Services
to be demonstrated in
Egaleo City Sport Event



The Malaga platform

5G Mission Critical Services
to be demonstrated
in Public Safety Scenario



The Limassol platform

5G Satellite Services
to be demonstrated
in Cargo Vessel Route



The Surrey platform

5G Massive IoT Services
to be demonstrated
in Surrey Sport Event



The Berlin platform

5G Immersive Services
to be demonstrated
in the Festival of Lights

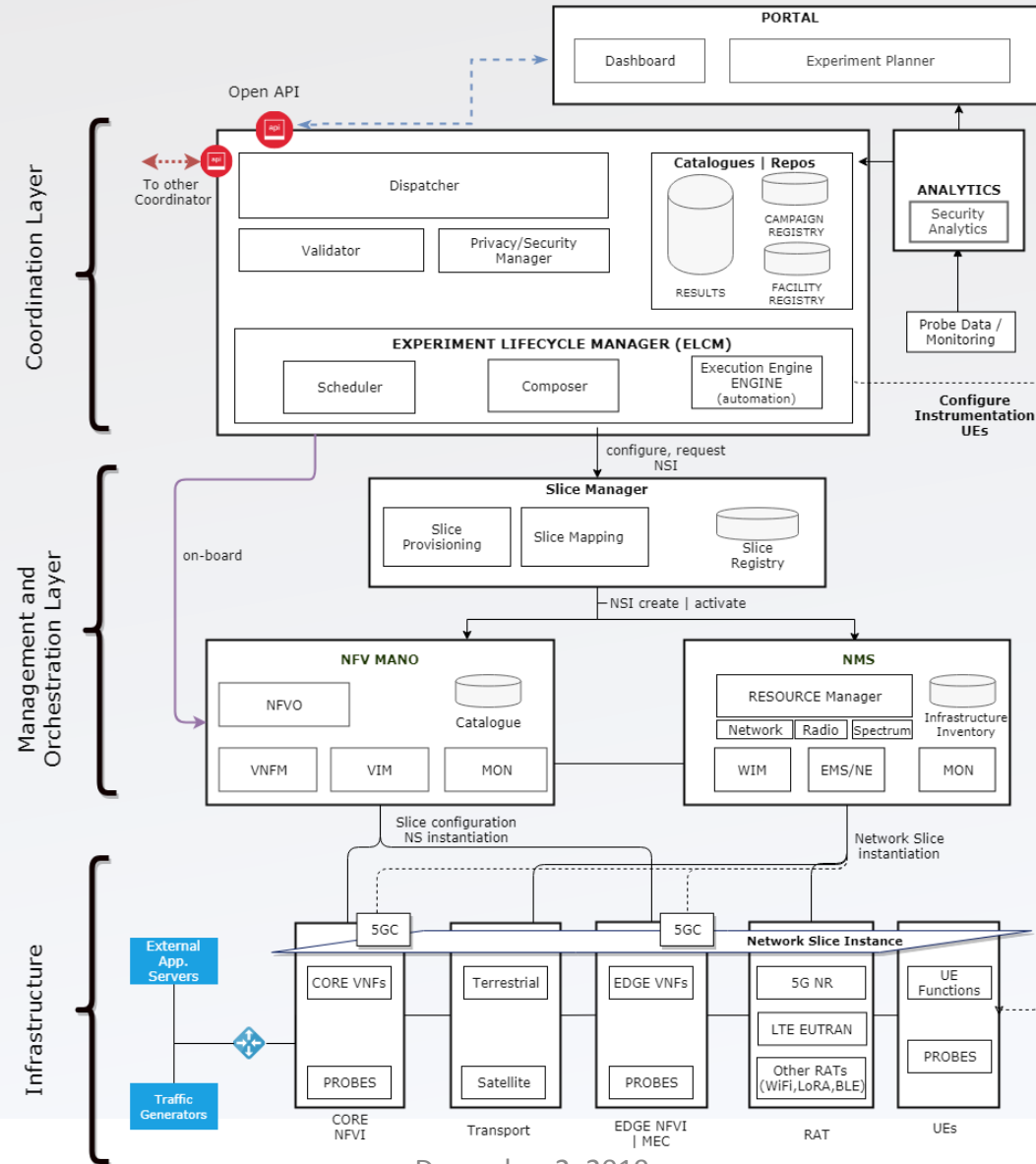


Thorough 5G-PPP KPIs validation in events with multiple users and release of the 5G facility as a portable demonstrator with management API

Guiding Principles

1. The 5GENESIS Facility is distributed and is comprised of various geographically dispersed platforms;
2. The platforms are complementary in terms of features, nevertheless aligned to the proposed common reference architecture;
3. The platforms are administratively independent, exposing open interfaces for inter-platform coordination and verticals experimentation;
4. The platforms accommodate multiple experiments from various verticals with diverse requirements;
5. The platforms are fully interoperable and can be interconnected in order to form a truly end-to-end Facility.

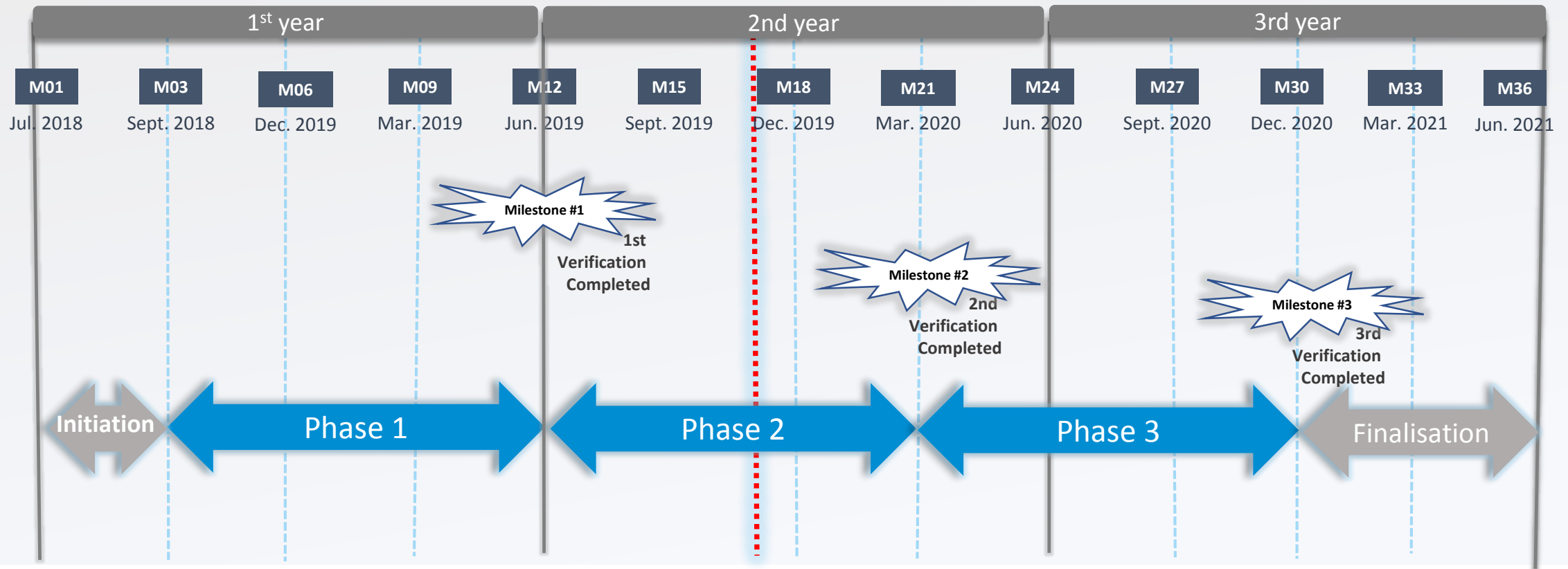
5Genesis Reference Architecture



December 2, 2019

Aligned Milestones and Timeline

- All platforms align to the same implementation plan
 - 3 Integration Phases, each followed by verification, operation and KPI collection activities



5Genesis Architecture Readiness Phase 1

Architecture Components	ATHENS	MALAGA	BERLIN	SURREY	LIMASSOL	Portable
	Phase	Phase	Phase	Phase	Phase	Phase
Portal		●				
Repository (Influx DB)	●	●				
ELCM	●	●		●		
Analytics		●				
Security Framework						
Slice Manager	●	●				●
NFV/MANO	●	●	●	●	●	●
NMS/EMS	●	●	●		●	
Probes (Monroe)		●	●			
vEPC/5G NSA	●	●	●	●	●	●
eNodeB	●	●	●	●	●	●
5G Core SA						
gNodeB	●	●		●		
VIM	●	●	●	●	●	●

5G Roadmap

Project Phases	Phase 1		Phase 2		Phase 3	
	Technology Core + Radio + UE	3GPP	Technology Core + Radio + UE	3GPP	Technology Core + Radio + UE	3GPP
Athens	<ul style="list-style-type: none"> Athonet EPC + Nokia/OAI eNB + 4G Handset OAI vEPC + OAI eNB + 4G Handset Amarisoft 4G vEPC+ Amarisoft + 4G Handset 	Option 1	<ul style="list-style-type: none"> Athonet 5G Core r. 15 CUPS + OAI/RunEL gNB + OAI SDR Ettus Athonet 5G Core r. 15 CUPS + Nokia mRRH-BTS + 5G Handset 	Option 3	<ul style="list-style-type: none"> Athonet 5G Core + Commercial gNB + 5G Handset 	Option 2
Malaga	<ul style="list-style-type: none"> Athonet EPC + Nokia eNB + 4G Handset Polaris + Keysight 4G Emulator + 4G Handset + OAI gNB + OAI UE + RunEL gNB + RunEL Emulator 	Option 1 <hr/> Physical Video DL	Athonet 5G Core r. 15 CUPS + OAI gNB + OAI UE	Option 3	Athonet 5G Core + RunELgNB + 5G Handset	Option 2
Berlin	Open5GCore r.3 + AirSpan Fempto + 4G Handset	Option 1	Open5GCore r.4 + OAI/commercial gNB+ OAI UE/5G SA prototypes	Option 2	Open5GCore r.5 + Commercial SA gNB+ 5G Handset	Option 2
Limassol	<ul style="list-style-type: none"> Athonet EPC + OAI eNB + 4G Handset 	Option 1	Athonet 5G Core r. 15 CUPS + OAI gNB + 5G Handset	Option 3	Athonet 5G Core + OAI gNB + 5G Handset	Option 2
Surrey	<ul style="list-style-type: none"> 5GIC 4G vEPC + HUAWEI/AIRSPAN + 4G Handset 5GIC 5GC (Rel. 15 CUPS) – NSA + HUAWEI Small Cells + 5G Handset 	Option 1 <hr/> Option 3	5GIC 5GC SA + Commercial gNB + 5G Handset	Option 2	5GIC 5GC SA + Commercial gNB + 5G Handset	Option 2

5Genesis Platforms Strengths

Platform	Strengths
Athens	<ul style="list-style-type: none">• Multi-site core and edge computing infrastructure orchestration and management• End-to-end slicing• Concurrent deployment of eMBB and URLLC slices• Automated security policies deployment and enforcement
Malaga	<ul style="list-style-type: none">• Outdoor deployment design to demonstrate MOCN• Edge capabilities to increase reliability of 3GPP MCS• Multi-domain orchestration with heterogeneous VIMs
Berlin	<ul style="list-style-type: none">• Indoor-outdoor Infrastructure• Multi-site orchestration• Integration of anonymization mechanisms• Berlin platform Blueprint used by industry to replicate 5G testbeds at their premises
Limassol	<ul style="list-style-type: none">• Satcom & 5G integration• End-to-end Satcom/5G slicing• Management of satellite edge services• Satellite/terrestrial link aggregation• Satellite/terrestrial spectrum management
Surrey	<ul style="list-style-type: none">• Complete 5G core and 5G access deployment - already available and functional.• Significant flexibility to implement and instantiate SURREY use-case & RAT selection

5Genesis Platforms Challenges

- 5G NR Equipment availability
- Slicing Support at the RAN and Core
- Slicing Support at the UE
- NR component availability for use case coverage
- Procurement delays
- Spectrum not available

Phase 1 Conclusions

- All platforms have adapted their design to conform to the 5GENESIS blueprint
- Data centers deployed and configured, further extensions are planned
- The sites constituting the platforms are interconnected and the transport/backhaul networks are in place
- Basic tools and methodology to implement 5GENESIS components horizontally agreed, procured and deployed
- Most platforms have progressed to incorporate first WP3 releases and support the WP5 integration activities
- Preliminary management and orchestration solutions, including some kind of monitoring infrastructure
- 5G preparation per platform is ongoing
- The Portable demonstrator's role has been clarified, the related 5GENESIS components have been identified, relevant products have been selected and their optimum placement to a portable placeholder is on-going.
- All platforms have been operated to execute the test cases defined in WP6 and have provided the KPI validation results of Phase 1

Thank you
Questions?