



End-to-End Cognitive Network Slicing and Slice Management Framework in Virtualized Multi-Domain, Multi-Tenant 5G Networks

SliceNet is a **5G-PPP** initiative with partners from France, Germany, Greece, Ireland, Isra-el, Italy, Portugal, Romania, Spain and UK.

SliceNet focuses on management of network **slicing** by use of **cognitive** techniques and **arti-ficial intelligence**.

SliceNet is a second phase 5G infrastructure PPP project, which is part of the **European Horizon 2020 pro-gramme** for research and innovation.

Project Partners



SliceNet Project

			Q1		Q2		Q3		Q4		Q5		Q6		Q7		Q8		Q9		Q10		Q11		Q12														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
WP 1	Project Management	LEADER	STA	END																																			
		EURES	M1	M36																																			
T1.1	Project Coordination	EURES	M1	M36																																			
T1.2	Technical Coordination	UWS	M1	M36																																			
T1.3	Quality Assurance	EURES	M1	M36																																			
WP 2	SliceNet System Definition	ORO	M1	M9																																			
T2.1	Vertical Sector Requirements Analysis and Use Case Definition	EFA	M1	M5																																			
T2.2	Overall Architecture and Interfaces Definition	ALB	M1	M6																																			
T2.3	Control Plane System Definition, APIs and Interfaces	OTE	M4	M7																																			
T2.4	Management Plane System Definition, APIs and Interfaces	ORO	M4	M8																																			
WP 3	5G Integrated Multi-Domain Slicing-Friendly Infrastructure	ECOM	M4	M12																																			
T3.1	Virtualized Mobile Edge Computing Infrastructure	UWS	M4	M9																																			
T3.2	Virtualized 5G RAN-Core Infrastructure	ECOM	M4	M10																																			
T3.3	5G-Connected Virtualized Enterprise Infrastructure and Services	ORO	M4	M11																																			
T3.4	Integrated Multi-Domain SliceNet Infrastructure	ECOM	M7	M12																																			
WP 4	5G Multi-Domain Slice Control Plane	TEI	M7	M20																																			
T4.1	Plug & Play Control Plane for Sliced Networks	NXW	M7	M16																																			
T4.2	5G RAN-Core Slicing	ECOM	M7	M17																																			
T4.3	Single-Domain Multi-Tenant Network Slicing Control	TEI	M7	M18																																			
T4.4	Multi-Domain Network Slicing Control and Negotiation	RZ	M7	M20																																			
WP 5	Cognitive, Service-Level QoE Management	IBM	M9	M24																																			
T5.1	Framework for Cognitive SLA and QoE Slice Management	IBM	M9	M24																																			
T5.2	Modelling, Design and Implementation of Vertical-Informed QoE Sensors	ORO	M9	M18																																			
T5.3	Modelling, Design and Implementation of QoE Monitoring, Analytics and Optimisation Engine	IBM	M9	M21																																			
T5.4	Modelling, Design and Implementation of Vertical-Informed QoE Actuators	UPC	M9	M21																																			
WP 6	5G Multi-Domain Slice Management Plane	DELL	M13	M26																																			
T6.1	Single-Domain Slices Management (Fault, Configuration & Accounting)	TEI	M13	M22																																			
T6.2	Single-Domain Slices Management (Performance & SLA)	CSE	M13	M23																																			
T6.3	Management for the Plug & Play Control Plane	NXW	M13	M24																																			
T6.4	Multi-Domain Slice Management	OTE	M13	M25																																			
T6.5	Security in Intra and Inter Domains	DELL	M13	M26																																			
T6.6	Security in Intra and Inter Domains	ALB	M19	M30																																			
WP 7	Cross-Plane Orchestration and Use Cases Prototyping	ALB	M19	M30																																			
T7.1	Cross-Plane Slice and Service Orchestrator	ALB	M19	M29																																			
T7.2	Prototyping of Vertical Business Use Cases	INF	M19	M30																																			
WP 8	System Integration and Demonstration	OTE	M13	M26																																			
T8.1	Northbound APIs and Graphical Interfaces	CSE	M13	M32																																			
T8.2	System Integration & Testing	OTE	M13	M33																																			
T8.3	Integration, Validation and Demonstration of Use Cases in Integrated Framework	EFA	M29	M36																																			
WP 9	Dissemination and Exploitation	UWS	M1	M36																																			
T9.1	Dissemination and Project Awareness	RZ	M1	M36																																			
T9.2	Project Exploitation & Standardization	ALB	M1	M36																																			
T9.3	5G Programme Level Activities	UWS	M1	M36																																			
			Milestones																																				

SliceNet project view

Time frame: **3 years**

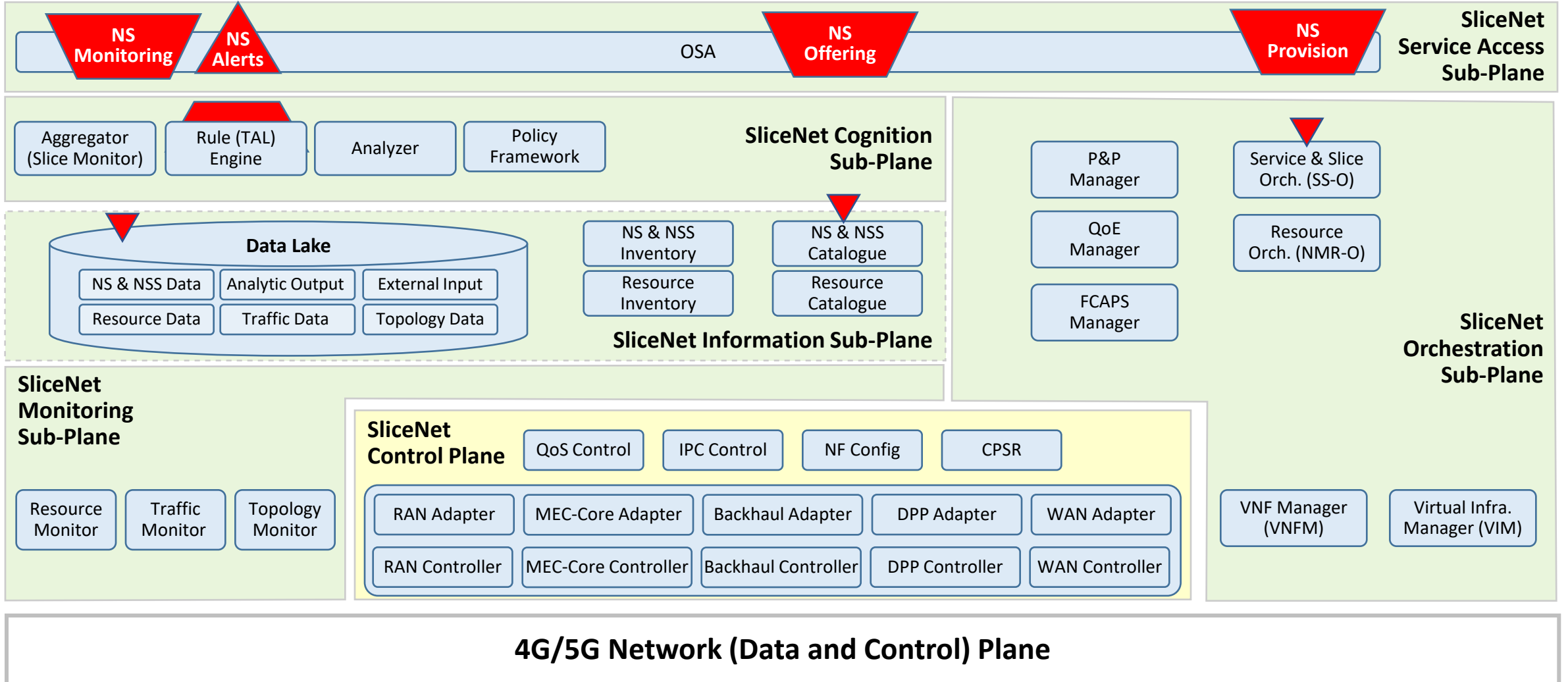
Work distribution: **32 tasks & functionalities** grouped under **9 workpages**

Effort: **943 man months**

Cost: **7,979,030 Eur**

SliceNet System Architecture

NSP



Verticals Use Cases over dedicated Slices

SliceNet Use Cases

Three use cases benefitting from network slicing in the SliceNet project are:

5G Smart Grid Self-Healing: Here self-healing and automation in energy distribution with 5G network slicing solutions will enable system operators to benefit from a significant reduction in the outage duration.

5G eHealth: This use case shows that 5G slicing could be leveraged to provide one-stop shop end to end services for offering enhanced Quality of Service and Quality of Experience for the health scenarios.

5G Smart City: IoT network and applications that aggregate information from the city itself such as intelligent lighting and water metering in order to optimise public resources.

