ORIGAMI

Optimized Resource Integration And Global Architecture For Mobile Infrastructure For 6G

STREAM B STREAM D WORKSHOP

Marco Gramaglia
mgramagl@it.uc3m.es
UC3M

Enabling Technologies and KPIs

Enabling Technologies

- ORIGAMI aims to bring down 8 barriers that are currently making difficult the transitions towards 6G through a set of compelling use cases, leveraging on enabling technologies.
- Network Intelligence (NI): application of AI/ML solutions deep into the network architecture, including the edge and the far edge (i.e., radio)
- Architectural Elements: new items in the 6G Network Architecture that enable the utilization of the NI solutions in the network operation

Technologies

- Infrastructure awareness and hardware accelerator pooling
  - KPIs: Network Energy Efficiency, CAPEX and OPEX reduction, Service Reliability
- Interoperability of RAN Intelligent Controller
  - KPIs: Network Energy Efficiency, CAPEX and OPEX reduction, Service Reliability
- Scalable solutions for 6G complex network problem
  - KPIs: Network Energy efficiency, Accuracy and Maximum Latency of ML
- Distributed, and streamlined access to transport domain computing
  - Accuracy, Maximum Latency of ML, Peak Data Rate
- Global Operator Model
  - CAPEX and OPEX reduction, Control Plane Latency
- Decentralized Identity Model
  - Control Plane Latency
- Intelligent Anomaly Detection
  - Anomaly Detection recall and sensitivity, CAPEX and OPEX reduction
- Cloud Native Core
  - Control Plane efficiency (reduced signaling)

KPI Targets

KPI	Description	Network domain	Target	Score
K1	Energy efficiency (bits-per-joule)	RAN	100% higher than today's vRANs	1
K2	Cost efficiency (bps-per-$)	RAN	10x higher than today's vRANs	1
K3	Reliability (%)	RAN	99.999% probability of meeting deadlines	1
K4	In-band ML model inference latency (ms/ms)	RAN, Transport	Sub-ms (RAN), or sub-ms (transport)	1
K5	In-band ML model inference accuracy (%)	RAN and Transport	≥95%	1
K6	In-band ML model inference throughput (Gbps)	Transport	100 Gbps	1
K7	Network CAPEX ($)	Core	50% reduction	1
K8	Network energy consumption (KWh)	Core	35% less energy consumption	1
K9	Control plane latency (ms)	Core	50% lower latency than current procedures	1
K10	Anomaly detection recall and sensitivity	Core	> 0.85	1
K11	OPEX gains ($)	Core	30% reduction	1
K12	Control-plane efficiency (%)	Core	25% lower signaling overhead compared to network core without SCP	1

KVIs

Addressing KVIs, KVs and Sustainability in ORIGAMI

Methodology (to be evolved)

1. *Identification KVs relevant to ORIGAMI**
    1. *Environmental sustainability*
    2. *Economical sustainability and innovation*
    3. *Digital inclusion*
    4. *….*
2. *Association of KVs either "use-case specific" or "architectural"*
3. *Definition and conceptualization of KVIs and mapping with KVs (At least one KVI per KV. Ideally, more than one KVI per KV):*
    1. *Definition of the KVI*
    2. *Metric: The measure used to assess performance or progress.*
    3. *Target value: the specific goal or objective*
        1. *Percentage of improvement*
        2. *The period/timeframe in which the target value should be achieved…*
        3. *Increase/decrease*
4. *Identify specific performance measurements (KPIs) that can contribute to achieve the target value*

KV	Use-case or architectural	KVI (definition)	KVI (metric & target value	Target Value	KPIs contributing
Trustworthiness	Architectural	Architecture resilience	Ratio of computing resources successfully services provisioned vs experienced failures	99'999 %	KPI 1 KPI 2 KPI 3

*Full list in 6G-IA Whitepaper "What societal values will 6G address? Societal Key Values and Key Value Indicators analysed through 6G use cases.", May, 2022.

ORIGAMI

Thanks!

The ORIGAMI project has received funding from the
Smart Networks and Services Joint Undertaking (SNS JU)
under the European Union's Horizon Europe research and
innovation programme under Grant Agreement No 101139270
www.smart-networks.europa.eu

Co-funded by the European Union

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