**LIAISON STATEMENT (LS)**

**Title**: Multi-Domain Knowledge Planes for Service Federation for 5G & Beyond Public Working Group (MDKP-PWG) Liaison with IEEE INGR Future Networks Systems Optimization (SystOpt) WG on Invitation for Inputs to the Deliverables of the MDKP-PWG

**From**: **NIST** **MDKP-PWG**: Dr. Robert B. Bohn; Dr. Ranganai Chaparadza; Dr. Taesang Choi, may add more names interested (if necessary): robert.bohn@nist.gov ; ran4chap@yahoo.com; ranganai.chaparadza@capgemini.com; choits@etri.re.kr;

**To**: **IEEE INGR Future Networks Systems Optimization (SysOpt) WG**: Dr. Lyndon Ong; Dr. Ashutosh Dutta, lyong@ciena.com; ashutosh.dutta@ieee.org
**Date**: 08/31/2023

**Dear** Dr. Lyndon Ong, Dr. Ashutosh Dutta,

1. **Background**

National Institute of Standards and Technology (NIST) is an Agency of the United States Department of Commerce. The NIST Transformational Networks and Services group, of NIST’s Communication Technology Laboratory’s Smart Connected Systems Division, has formed the **Multi-Domain Knowledge Planes for Service Federation for 5G & Beyond Public Working Group (MDKP-PWG)**. MDKP-PWG is investigating growing trends on Requirements for Enablers for Cross-Industry Sectors End-to-End (E2E) Services Innovation and Delivery Agility that facilitate for the leveraging of dynamic resource and assets availability wherever and whenever they are discoverable for use in dynamic on-demand service innovation and composition. In the 5G and Beyond Era it is being noted that there are interesting growing trends for such an ecosystem for agile service innovation and delivery (even in an autonomic fashion). In such a new ecosystem, potential End-to-End (E2E) service innovators require Enablers for Automatic Discovery of the availability and proximity of various kinds of networking resources/assets (e.g., networks, networking devices and end-devices) and infrastructures to enable them to innovate and/or deploy services over resources or assets owned by different players seamlessly and pay for the agile resource/asset utilizations wherever and whenever it is required to pay for that. Infrastructure or asset owners may belong to different industry, enterprise, government, and research institutions. To enable such an ecosystem, it is necessary that ICT networks need to evolve to Knowledge Planes (KPs) Platforms Driven Networking by which KP Platforms for various kinds of network segments (KP Platform for Access network, KP Platform for Transport network, KP Platform for Core network, KP Platform for Telco Cloud, KP Platform for an IT Cloud, KP Platform for Data Center network, etc.) shall play the role of Enablers for Cross-Industry Sectors End-to-End (E2E) Services Innovation and Delivery Agility—thanks to their AI/ML powered capabilities for cognitive and autonomic & autonomous management and control of networks and resources, and their ability to enable resources and network technologies’ capabilities discovery by entities permissible to leverage and use them, ability to federate among each other to provision services in an End-to-End Scope across various domains (technical and administrative) and to self-adaptive perform service and security assurance across the involved domains.

The Working Group is aiming to produce the following Deliverables:

1. Produce a Generic Architecture Framework Blueprint (GAFB) that articulates the role ETSI GANA Knowledge Planes (KPs) Platforms should play as Anchors for the Federation of Autonomic/Autonomous Networks (ANs). The KP Platform concept has been standardized in ETSI TS 103 195-2: ***Early Draft September 15, 2023; Stable Draft December 31, 2023; Final Version February 2024***
2. Describe Use Cases on the KP-to-KP Federations across domains and on APIs for GANA KP Integrations with various kinds of management, control and orchestration systems: ***Early Draft October 1, 2023; Stable Draft July 31, 2024; Final Version September 2024***
3. Describe Requirements for Knowledge Plane (KP) Platforms Driven Networking in general (including KP Governance and KP-to-KP Federations) within the GAFB: ***Early Draft November 2023; Stable Draft April 2024; Final Version September 2024***
4. Discuss How Zero Trust Principles can be applied in GANA KP-to-KP Federations.

More Information on MDKP-PWG can be found at the following links:

* The main page of the MDKP-PWG: <https://www.nist.gov/programs-projects/multi-domain-knowledge-planes-service-federation-5g-beyond-public-working-group>
* The charter of the group is here: <https://www.nist.gov/ctl/smartsystems/mdkp-pwg-charter>
* Information on how to join the group can be found at the Overview page here: <https://www.nist.gov/ctl/smartsystems/mdkp-overview>
* MDKP Meeting materials, Agendas, Notes, Documents are found here: <https://www.nist.gov/ctl/smartsystems/mdkp-documents>
1. **Relevance of IEEE INGR Future Networks Systems Optimization (SysOpt) WG work on 5G and Beyond to the work of NIST MDKP-PWG**

IEEE INGR Future Networks Systems Optimization (SysOpt) WG work on Systems Optimization and Autonomic/Autonomous Networking (ANs) in 5G, 6G and Beyond is relevant to the work of the MDKP-PWG in various ways, including, but not limited to the following perspectives:

* As noted on the Main page of the NIST MDKP-PWG (<https://www.nist.gov/programs-projects/multi-domain-knowledge-planes-service-federation-5g-beyond-public-working-group> ) the MDKP-PWG would also consider the SysOpt Chapter series work on Systems Optimization and ANs
* Autonomic/Autonomous Networking (ANs) and the role of Multi-Domain Knowledge Planes for Service Federation for 5G & Beyond is of relevance to the 5G and 6G related work in SysOpt
1. **Actions being requested by NIST MDKP-PWG to be performed by IEEE INGR Future Networks Systems Optimization (SystOpt) WG**

Apart from raising awareness about the newly launched NIST MDKP-PWG, MDKP is requesting for the following actions:

1. IEEE INGR Future Networks Systems Optimization (SysOpt) WG is requested to encourage their members to contribute to the deliverables of the MDKP-PWG. The contributions can be made as joint contributions by the SysOpt and sent to MDKP-PWG and/or as contributions made by individual experts. Experts are encouraged register to join and follow discussions in MDKP-PWG at link provided above.
2. SysOpt is requested to share information on the latest version of the SysOpt Chapter as this is of relevance for NIST MDKP-PWG to consider in its work. There are various aspects outlined in the SysOpt Chapter that should be considered in specifying Knowledge Plane (KP) Platforms. Aspects that include needs for federation of Autonomic/Autonomous Networks (ANs); Common Operational Principles for ANs (COPAAN) for ANs; Architectural Principles of relevance to design of Knowledge Plane (KP) Platforms (powered by ML/AI) for Autonomic Management & Control (AMC) of Networks and Services.
3. SysOpt is requested to indicate if the Group would be interested to receive information on the NIST MDKP-PWG Deliverables as they mature as Drafts and then final versions, to and provide review and comments.