

# NGMN 5G Update for ETSI NFV

Klaus Martiny  
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# Table of Contents



- Partner Updates
- Co-operation Partner Updates
- Work-Programme Results and Deliverables
- Future Work-Programme

# The Global Partnership of the NGMN Alliance



## Members: NGMN Operators with over 200 networks serving more than 60 % of all global customers,...



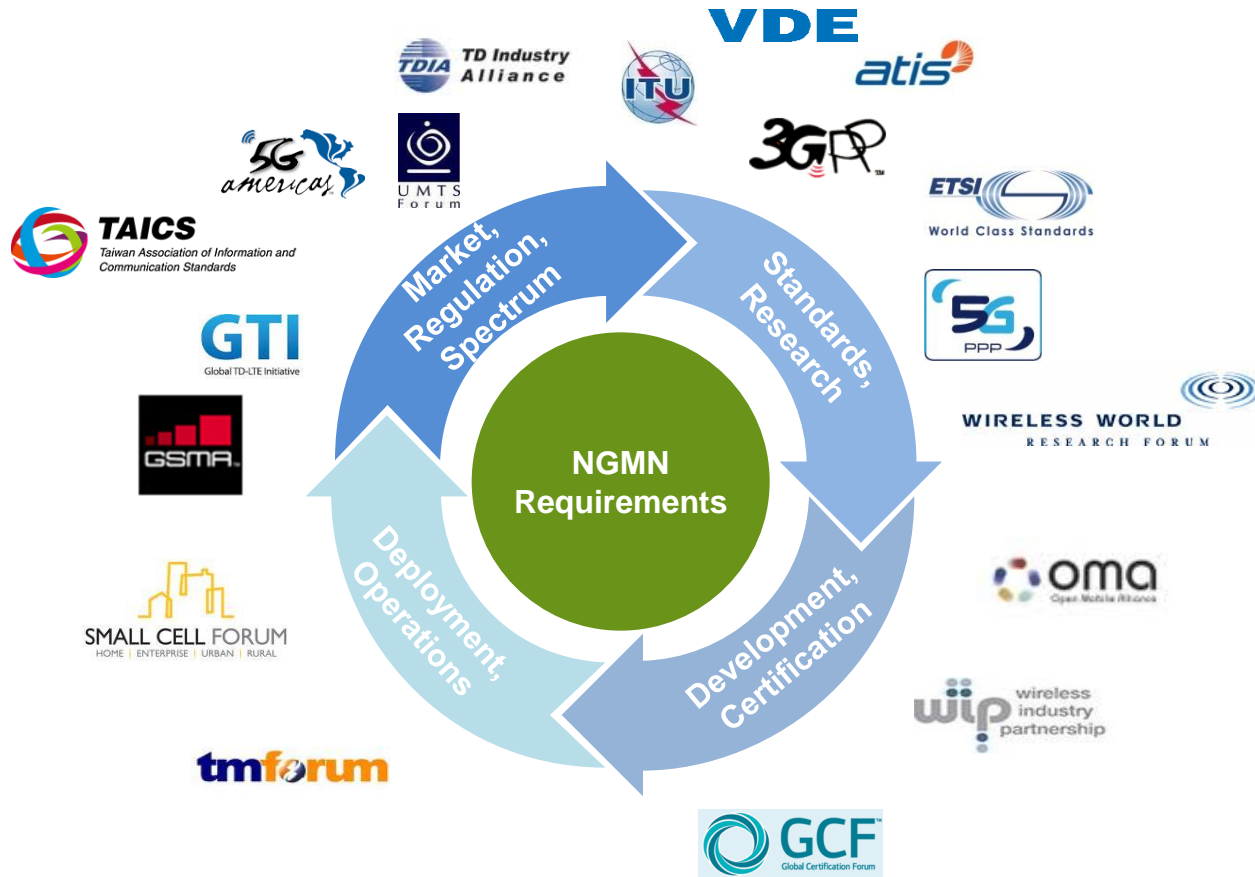
## Contributors: NGMN telco vendors, software companies and many other leading industry players contributing and driving the advancement of future mobile network technologies, ...



## Advisors: NGMN research institutes contributing substantially to mid- to long-term innovation,....



# Close co-operation with key industry organisations and research initiatives



# NGMN 5G White Paper Finalised – Approved by the NGMN Board



## NGMN 5G White Paper

1. Executive Summary
2. Introduction
3. 5G Outlook
4. Requirements
5. Technology & Architecture
6. Spectrum
7. IPR
8. Way Forward

NGMN 5G White Paper,  
Version 1.0, 17-February-2015

- Global view
- End-to-end scope
- Specific, comprehensive requirements
- High quality
- Timely delivery
- Business perspective, operator led

## NGMN Board Members



# Work-programme achievements 2015/2016: Guidance through results and deliverables



- **“Better Broadband & Telco Services”:**
  - Input to 3GPP 5G RAN meetings and workshops on deployment scenarios, requirements metrics values and definition: ***RAN 5G Workshop (September 2015), TSG RAN#70 (December 2015), TSG RAN ad-hoc (January 2016), TSG RAN#71 (March 2016), and planned for TSG RAN#72 (June 2016)***
  - Input to **ITU-R WP5D (February 2016)** for ITU-R General Technical Performance Requirements and Evaluation Criteria/Methods.
- **Liaison to 3GPP (December 2015)** on “NGMN view of 5G as an end-to-end ecosystem - Alignment of **3GPP SA and RAN**”
- **“End-to-End Architecture”:** Input to **3GPP SA** on Network Slicing (**January 2016**)
- **“Spectrum”:** NGMN Press Release for WRC-15 and briefing paper on “Future IMT mobile spectrum goals for **ITU WRC-15**” (both **October 2015**)
- **“IPR Forum”:** Analysis of Standards Essential Patents assessment and declaration, 5G patent pool framework (2015/2016) – **ETSI** contribution to the IPR Forum (**May 2015**)
- **“Security”** deliverable on Network Slicing and deliverable on Security Recommendations for 5G for **3GPP SA3 and SA2 (May 2016)** and **ETSI NFV**
- **“Verticals”:** Deliverable for **GSMA and 3GPP** on Perspectives on Vertical Industries and Implications for 5G (**June 2016**)
- **“BPG (Business Principles Group)”:** Deliverable for **3GPP** on 5G Prospects – Key Capabilities to Unlock Digital Opportunities (**July 2016**)
- **“BPG (Business Principles Group)”:** Liaison Statement to **GSMA** on a Business Architecture Vision for 5G

# Flagship projects launched in each focus area



## Eco-system Building and Interaction

- **IPR Forum:** SEP declarations / assessment, Patent Pools
- **Spectrum:** Candidate bands, spectrum requirements
- **Vertical Industries + V2X:**
  - V2X: Operator alignment on V2X, co-operation with automotive industry, evaluation/promotion V2X
  - Selected other verticals



## Guidance to SDOs and the Wider Industry

- **E2E Architecture:** E2E Architecture framework/ “big picture”, global alignment perspective – input to 3GPP SA planned
- **Security:** Finalisation deliverable covering MEC, low latency use cases, user experience
- **Operations:** 5G Network & Service Management and Orchestration



## Evaluation Test and Proof of Concept Results

- **5G Trial & Testing Initiative:** Definition proof points, evaluation and benchmarking, reporting 5G progress and promoting options



# Focus Area “Guidance to SDOs and the Wider Industry”



Focus Area Lead:



## E2E Architecture Framework

- E2E Architecture framework/ “big picture” via architecture principles / requirements – covering e.g. slicing, device aspects, management, interfaces/compatibility, ...
- Global alignment on architecture – input to 3GPP SA (and other SDOs) planned



## Security

- Slicing
- Access NW, DoS attacks
- MEC, low latency use cases, user experience



## NW Service Management and Orchestration

- Network & Service Management E2E
- Orchestration E2E
- User Stories will lead to Requirement
- Requirements will be the basis for the NMS Architecture
- Management of Slices



Other work-items might be added at a later stage



# Focus Area “Guidance to SDOs and the Wider Industry”: E2E Architecture



## E2E Architecture activity:

- **Network Slicing:** NGMN paper from January 2016 has been updated.
  - Liaison Statement undergoing approval. To be sent to 3GPP SA2 and ISG NFV IFA.
  - New section on Guidelines for Applicability across Administrative Domains added.
  - Section 4 on the Concept of Network Slicing has been revised.
  - NGMN kindly requests ETSI ISG NFV to consider the document as an input to their work on the composition and management of virtualised networks or sub-networks.

## E2E Architecture Framework Activity:

- **New deliverable “E2E Architecture Framework”:**
  - Has sections for architecture principles (requirements) on NW Slicing and NWMO (including management of slices).
- **NFV relevant subjects agreed:**
  - Slices should be managed via ETSI NFV + SA5 procedures.
  - Network slice VNFs, associated resources and elasticity shall be managed at VNF/NFVI level as per ETSI MANO.
- **NFV relevant subjects under discussion:**
  - Shall network slices be managed at the granularity of a slice? (Compose, instantiate, rehost, remove, etc).
  - Which entity creates the slice and who manages it?
  - How will a network slice be implemented across operators?
  - etc.
- **Target date December 2016:**
  - Could result in an LS to ISG NFV for NFV#16.

# Focus Area “Guidance to SDOs and the Wider Industry”: NWMO



## Network and Service Management (NWMO) Activities :

- **Network Slicing:**
  - Management / Orchestration concept of slices are under discussion

## E2E Network and Service Management (NSM) : 30 User Stories

9 / 2016	Self Care capabilities
10 / 2016	Dashboard capabilities
11 / 2016	Plug and Play
12 / 2016	Manage highly dynamic infrastructure
13 / 2016	Proactive CEM User Story
14 / 2016	Redundant deployment
15 / 2016	Historical data
16 / 2016	Scalability
17 / 2016	Service Recursion
18 / 2016	Service convergence
19 / 2016	Management of hybrid PNF / VNF network slice
20 / 2016	Management of multi-vendor VNF network slice
21 / 2016	Manage isolation of resources between network slices
22 / 2016	§ Management of SLAs in the network slices
23 / 2016	5G Exchange environment for trading, management and orchestration of multi-provider resources
24 / 2016	Attestability (Traffic VNF)
25 / 2016	Attestability (Integrity VNF)
26 / 2016	5G End-to-End Service Management
27 / 2016	5G Ultra low latency/real-time challenges concerning the End-to-End (E2E) Service Management (SM)
28 / 2016	Network management and orchestration for mixed network which is composed of both NG network and non-NG network.
	Network management and orchestration for NG network
29 / 2016	Network management and orchestration for NG network in the virtualized scenario
30 / 2016	End to end network management and orchestration with network slices

- 5G Standards should be based on harmonised and open interfaces.
- A Common Information Model should be used