NGMN Alliance Overview

NGMN Office
August, 2017

History and Key Characteristics

Founded by leading international mobile network operators in 2006 "Objective to ensure that functionality and performance of next generation mobile network infrastructure, service platforms and devices will meet the requirements of operators and, ultimately, will satisfy end user demand and expectations."

- **Well-established global partnership** – Operators, Telco & IT vendors, Research Institutes, Co-operations with International Industry Associations

- **Open to new Players** - Internet & Media, Vertical Industries, Service Providers

- **Business driven -** focus on customer and end-user demand

- **Global alignment** – objective to avoid fragmentation and to guarantee industry scale

- **Focus on innovation** – covering end-to-end system aspects

- **Working on requirements level** – standards are being developed by SDOs

- **Based on Partner contributions** – projects are staffed by NGMN Partner companies

- **Comprehensive Communication** - White Papers, Liaison Statements, NGMN Industry Conferences to publish results, requirements, solutions, and guidelines

- **Decision-oriented governance and lean organisation structure –** operator-driven approach, project-oriented approach and efficient processes

Introduction

- The NGMN Alliance is developing, consolidating and communicating **requirements to ensure that customer needs and expectations on mobile services** are fulfilled.

- The Alliance actively drives **global alignment and convergence of technology standards and industry initiatives** with the objective to avoid fragmentation and to guarantee industry scale.

- A global presence has been established that comprises a **leadership network of more than 90 partners**: Operators, Vendors, Software Companies, Vertical Industry Representatives and Universities. Several Cooperation Partners support the NGMN Alliance in projects, conferences, and through liaison statements.

- The **focus of the Work Programme is on 5G**: NGMN will develop end to end operator requirements to satisfy the needs of customers and markets in 2020+.

The Global Partnership of the NGMN Alliance…

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

at&t · Bell · BT · China Mobile · Chunghwa Telecom · T·· · HKT · kpn · kt · Liberty Global

ligado NETWORKS · MTN · NTT docomo · orange · Singtel · SK telecom · Sprint · T··Mobile· · TELE2 · TIM

Telefónica · Telia Company · Telekom Austria Group · TELUS the future is friendly · TURKCELL · U.S. Cellular · VEON · verizon · vodafone
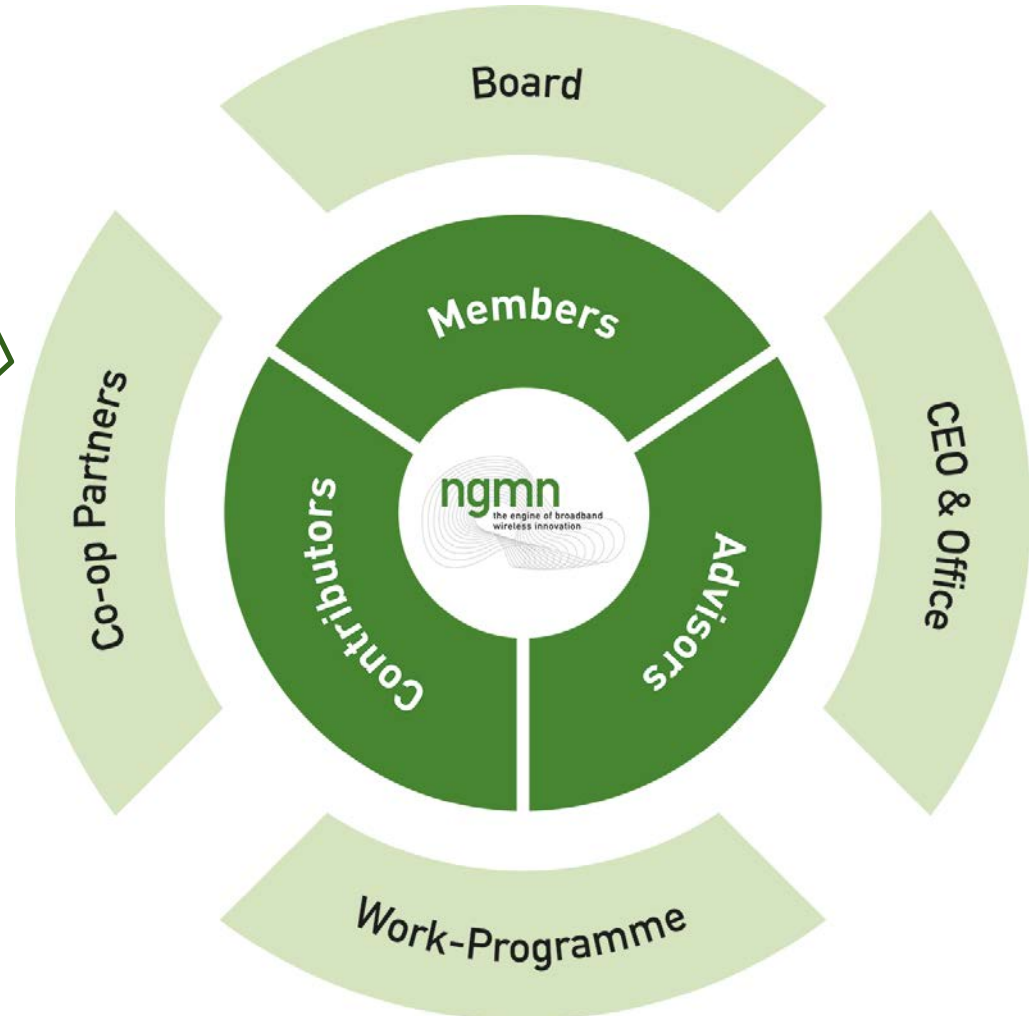
Contributors: NGMN telco vendors, software companies and many other leading industry players contributing and driving the advancement of future mobile network technologies, …

amdocs · Amphenol Antenna Solutions · Anritsu envision:ensure · Apple · AVANCI · ciena · CISCO · cohere technologies · COMMSCOPE · 大唐電信 大唐电信科技产业集团

ERICSSON · facebook · FIH · FUJITSU · gemalto security to be free · Giesecke & Devrient · HUAWEI · intel · INTERDIGITAL · JUNIPER NETWORKS

KATHREIN · KEYSIGHT TECHNOLOGIES · lenovo · LG Electronics · Microsoft · MOBI 摩比 · MPEGLA · NEC · NOKIA · P3

QUALCOMM · RF DSP Multiplying the Spectrum™ · ROHDE&SCHWARZ · Rosenberger · SAMSUNG · SISVEL · smoptics · SPINNER · SPIRENT Communications · VECTIS

VENCORE LABS · VIA LICENSING · ZTE

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

RWTH AACHEN UNIVERSITY · ASTRI · EURECOM Sophia Antipolis · Fraunhofer Heinrich Hertz Institut · III · Industrial Technology Research Institute · 国立中兴大学 National Chung Hsing University · National Dong Hwa University

National Sun Yat-sen University · NYU POLYTECHNIC SCHOOL OF ENGINEERING · TNO innovation for life · TTA · Technische Universität Braunschweig · TECHNISCHE UNIVERSITÄT DARMSTADT · TECHNISCHE UNIVERSITÄT DRESDEN · UNIVERSITÄT DUISBURG ESSEN

UNIKASSEL VERSITÄT · University of Stuttgart Germany · UNIVERSITY OF TORONTO · UNIVERSITY OF WATERLOO

…and Strong Co-Operations

NGMN Alliance Strengths and Characteristics

- **Well-established and growing partnership of worldwide leading operators and vendors** – strong, international industry backing

- **Clear focus on next generation technology** – covering end-to-end system aspects

- **Business-driven** – consideration of end user demand, guided by operator requirements

- **Open perspective** – activities across standards, co-operations with international fora

- **Global alignment** – aiming at the harmonisation and convergence of technology standards and industry initiatives with the objective to avoid fragmentation and to guarantee industry scale

- **Decision-oriented governance through Board** – operator-driven approach

- **Lean organisational structure** – project-oriented approach and efficient processes

- **Based on Partner contributions** – Projects under the lead of NGMN Partner representatives and fully staffed with experts from NGMN Partner companies

- **Working on requirements level** – the standards are being developed by SDOs

- **NGMN Industry Conference & Exhibition** – established international key event

5G Initiative successfully implemented

Characteristics 5G Initiative   **Deliverable**   **Impact**

Efficient Organisation

(Work-streams, Steering Committee)

Broad Communication

(Press releases, press conference)

Industry Alignment

(Liaisons to all relevant organisations)

Vendor and Research Involvement
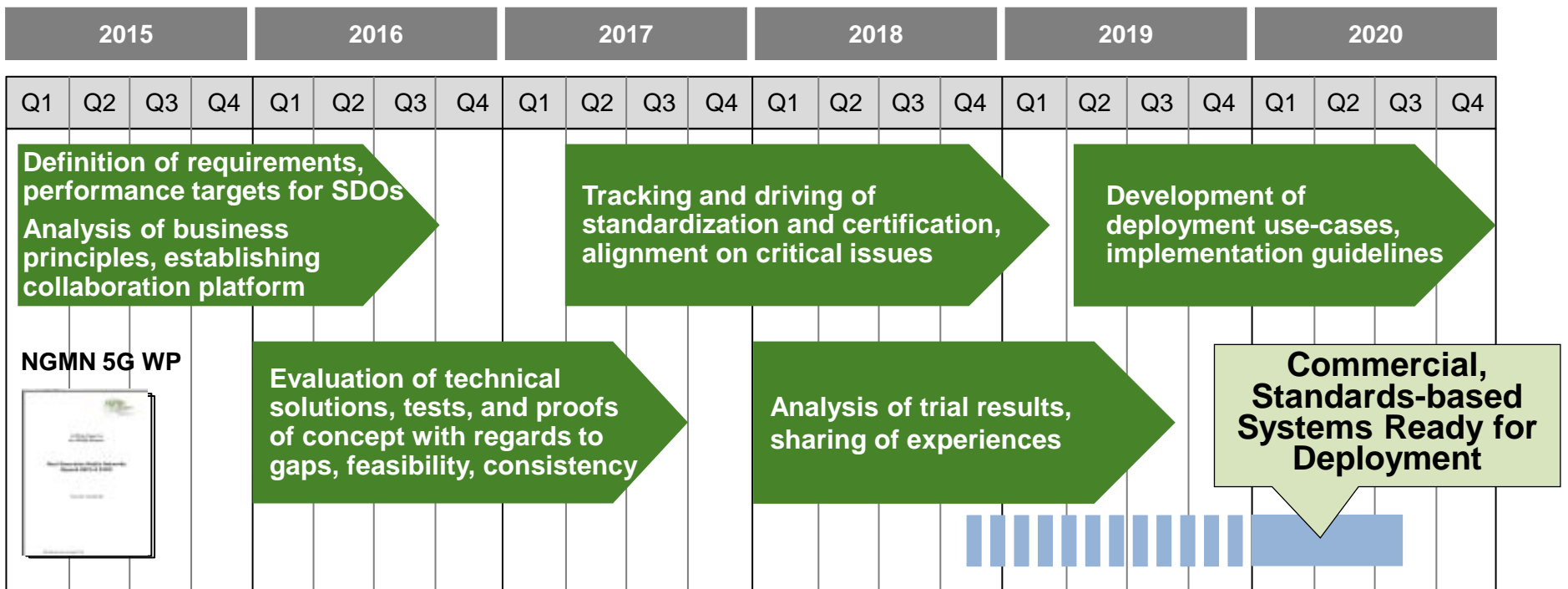
(NGMN workshop and forum)

NGMN 5G White Paper

- Global view
- End-to-end scope
- Specific, comprehensive requirements
- Business perspective, operator led

… supports the standardisation and subsequent availability of 5G from 2020 onwards …

… sets challenging technical and ecosystem requirements for 5G, and accelerates the adoption of emerging technology innovations …
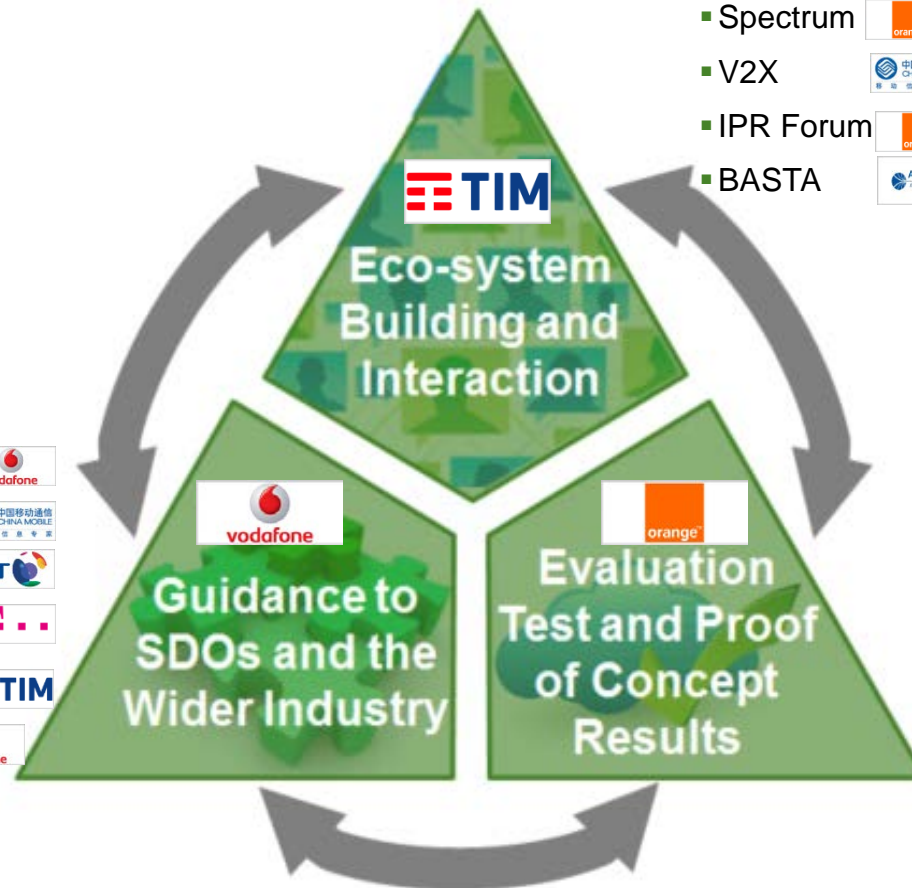
NGMN Role in the 5G Development

2015				2016				2017				2018				2019				2020			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Definition of requirements, performance targets for SDOs

Analysis of business principles, establishing collaboration platform

NGMN 5G WP

Evaluation of technical solutions, tests, and proofs of concept with regards to gaps, feasibility, consistency

Tracking and driving of standardization and certification, alignment on critical issues

Analysis of trial results, sharing of experiences

Development of deployment use-cases, implementation guidelines

Commercial, Standards-based Systems Ready for Deployment

NGMN Work Programme current status

Overview Workstream and -leads

- Spectrum — orange
- V2X — CHINA MOBILE
- IPR Forum — orange
- BASTA — Amphenol

- E2E Architecture:
  - Framework and Principles — vodafone
  - Service-based Architecture — CHINA MOBILE
  - RAN Functional Split — BT
  - Management & Operations — T··
- Security Competence Team — TIM
- Extreme Requirements — vodafone

- Trial & Testing — orange
  - Tech. Building Blocks — kt
  - Proof of Concept — T··
  - Interworking — SK telecom
  - Pre-commercial NWs — vodafone

Eco-system Building and Interaction — TIM

Guidance to SDOs and the Wider Industry — vodafone

Evaluation Test and Proof of Concept Results — orange

Plus: "3GPP Reporting" done by — Sprint, TIM

Current 5G Work-Programme Scope (1/2)

Guidance to SDOs and the Wider Industry

Security

- Security of network capability exposure in 5G
- Security related to V2X

End-to-End Architecture FW

- Definition of requirements in terms of entities and functions that characterize the capabilities of an e2e framework.

Extreme 5G Requirements

- Assessment of "extreme" 5G requirements for certain use-cases and the impact on the architecture

Eco-System Building and Interaction

IPR Forum

- Declaration of Standard Essential Patents
- Legal requirements for patent pools in 5 regions
- Open Source and Standards in 5G

Spectrum

- Spectrum licensing and other regulatory issues for 5G
- Additional spectrum bands for 5G

V2X

- Drive adoption and success of V2X and promote LTE-V2X for V2V and V2I communication

BASTA

- Active Antennas
- Review and Update of White Paper published in Q1/2017

Guidance Given to International SDOs and other Organisations via Liaisons, White Papers etc.

Current 5G Work-Programme Scope (2/2)

Evaluation Test and Proof of Concept Results

Trial and Testing Initiative			
Technology Building Blocks	**Proof of Concept**	**Interoperability**	**Pre-commercial Networks**
▪ Collection of 5G Building Blocks and corresponding test cases and test results	▪ Definition of a PoC approach by reviewing scenarios, system dependencies and testing strategies	▪ Testing of key interfaces for ensuring that there are no different interpretations of the standard between solutions of 2 to 3 different providers	▪ Development of a testing framework for 5G NR (3GPP) allowing the harmonization of the testing methodologies between the different parties conducting trials

other work items:

TF 4.3-10 Connector
▪ 4.3-10 Radio Frequency Connector Migration Strategies

Recent 5G Work-Programme Deliverables

End-to-end Architecture

Security

- 5G Security - Mobile Edge Computing / Low Latency / Consistent User Experience

End-to-End Architecture FW

- Architecture Principles
- Preliminary White Paper version
- Contributions to 3GPP on Service Based Architecture

Network Management & Orchestration

- 5G Network and Service Management including Orchestration

IPR Forum

- Recommendations to Improve SEP Declarations
- Compilation of legal requirements for patent pool in 5 regions

Spectrum

- NGMN 5G Spectrum White Paper

BASTA

- Recommendations on Base Station Antenna Standards (V10.0)

TF 4.3-10 Connector

- 4.3-10 RF Connector Migration Strategies

Guidance Given to International SDOs and other Organisations via Liaisons, White Papers etc.

NGMN at MWC in Barcelona and NGMN Industry Conference in Vancouver

NGMN Press & Industry Briefing at Mobile World Congress 2018
26th Feb until 1st of March 2018 in Barcelona, Spain, Canada

NGMN Industry Conference & Exhibition
planned for November 2018 in Vancouver, Canada kindly hosted by Telus