

## Enabling 5G with NFV

New Joint White Paper Outlining Network Operator Perspectives

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# Acknowledgement

This presentation references material contained in the joint-operator white paper published February 21, 2017:

*“Network Operator Perspectives on NFV priorities for 5G” \**

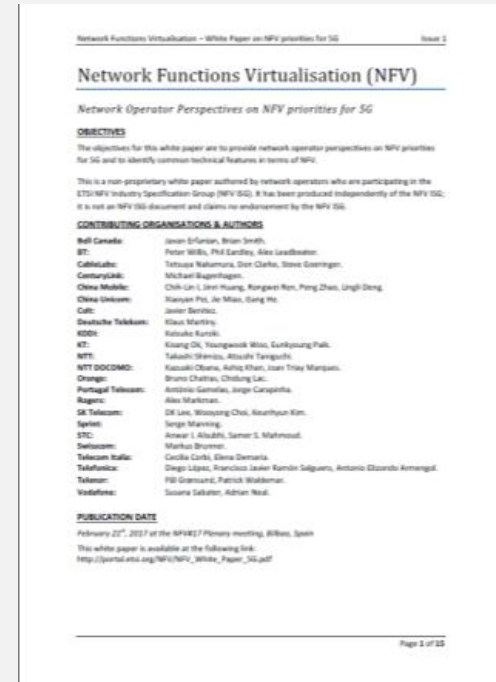
This white paper was co-authored by representatives of 23 global network operators whose input is gratefully acknowledged here....

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\*White paper download: [http://portal.etsi.org/NFV/NFV\\_White\\_Paper\\_5G.pdf](http://portal.etsi.org/NFV/NFV_White_Paper_5G.pdf)

- “5G” is the first global communications technology to be designed from the ground up using NFV techniques
- Global industry collaboration on NFV began October 2012 with the seminal joint-operator white paper introducing the NFV concept\*
  - Operators launched the ETSI NFV Industry Specification Group (ETSI NFV)
  - ETSI NFV delegates have contributed >80,000 man hours in 17 face-to-face plenary meetings since 2012 to deliver the foundation NFV specifications
    - Not including time spent in on-line meetings, interim working group meetings, or travelling!
  - The ETSI NFV Foundation specs are now being referenced globally
- This document outlines global operator priorities for NFV to deliver the industry vision for 5G and calls for enhanced collaboration
- Main targets are users, standards bodies & open source groups who are influential in specifying and implementing end-end 5G networks



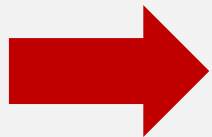
\* Original joint-operator NFV white paper: [http://portal.etsi.org/NFV/NFV\\_White\\_Paper.pdf](http://portal.etsi.org/NFV/NFV_White_Paper.pdf)

- Breadth of 5G use cases and environments implies high scalability, ultra-low latency, support for massive number of concurrent sessions, ultra-high reliability and security
- Network Slicing is a key attribute enabling a common network to provide and expose concurrent, partitioned, self-contained “slices” to support different type of services
  - Each network slice is designed and dimensioned for specific or multiple use cases with similar requirements
- Slice Management is an Operations Support System (OSS) functional area which needs to be standardised on top of NFV
- Features required to enable network slicing are already incorporated in the NFV ISG Architectural Framework and deliverables published over the past four years
- An end-to-end Service Management vision is necessary to realise the benefits of an NFV-based 5G network
  - Interworking with legacy networks must be taken into account
  - New industry collaboration on Networks & Services Management getting underway\*

\* See contact on final slide

# Key Messages (2 of 2)

- NFV should be applied to 5G networks end-to-end, including both core networks and Radio Access Networks (RAN), as well as Network & Service Management Systems
  - RAN cloudification is expected to provide operators with unprecedented efficiency, flexibility and agility
- 5G networks should be deployed as highly distributed systems, where network functions most sensitive to latency run on servers located close to end-user devices
- VNFs should follow cloud-native design principles:
  - Designed according to a component-based software engineering style (e.g. Micro-services)
  - Built for quick restoration under failure conditions (e.g. consideration given to state & data storage)
- The industry is looking for a common distributed NFV infrastructure & associated MANO functions which accommodates all aspects of 5G as well as the mainstream NFV use cases
  - Fixed and mobile networks use cases, as well as applications, all running on same NFV infrastructure



**5G standards and open source groups should reference the ETSI NFV foundation work to avoid duplication and ensure a common NFV-based 5G infrastructure can support all future network requirements**

- White Paper Co-authors (See Section 5):
  - [http://portal.etsi.org/NFV/NFV\\_White\\_Paper\\_5G.pdf](http://portal.etsi.org/NFV/NFV_White_Paper_5G.pdf)
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