



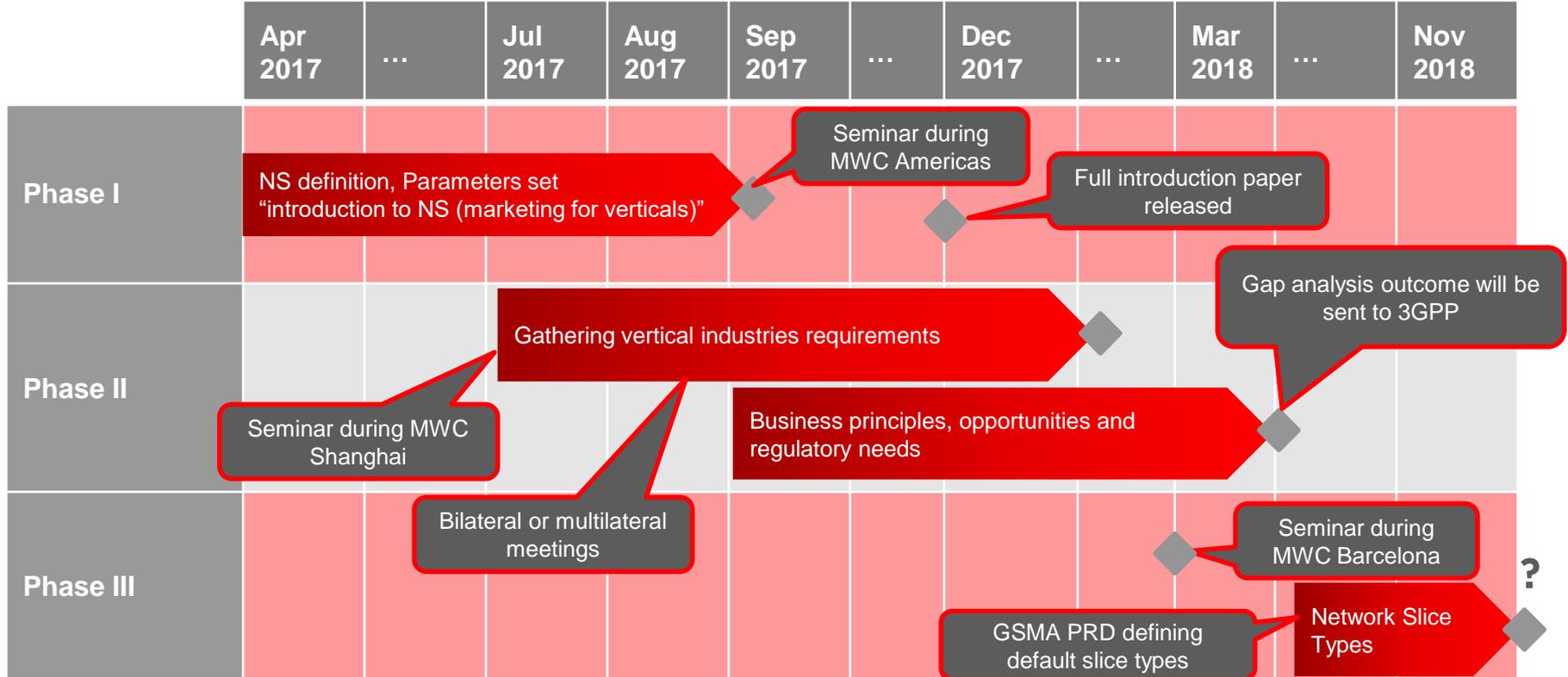
Network Slicing in GSMA

GSMA



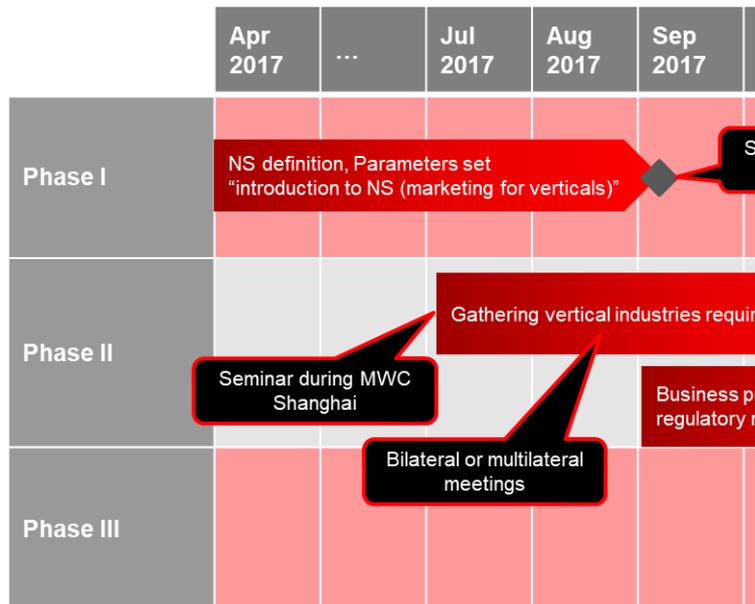


Project timeline overview





Project execution (1/)



The story so far

- Jul-17: hosted seminar focusing on operators point of view
- Sep-17 Published booklet proposing a common terminology and describing in not-too-technical terms what the advantages of network slicing are
- Sep-17 hosted seminars focusing on vendors point of view
- Started the collection of requirements of vertical industries

Proposing a common terminology

GSMA definition of Network Slicing

- GSMA NEST has studied the literature and decided to define the concept of Network Slicing as follows:

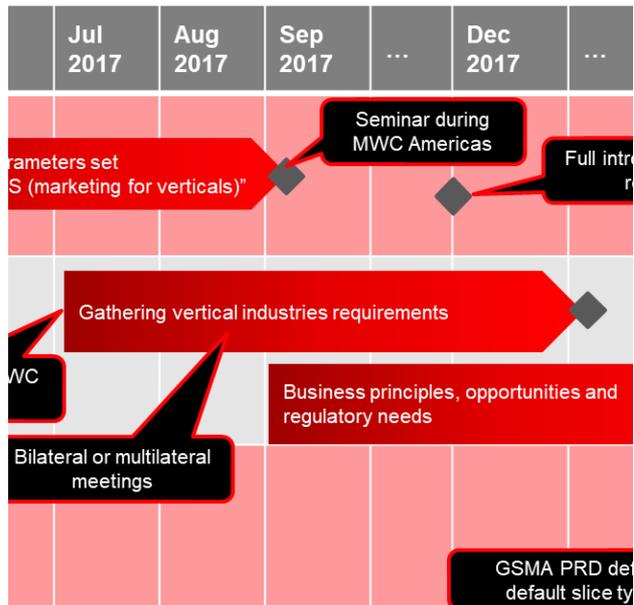
A novel architecture solution that allows the creation of a set of **logically independent networks** that run on a **common physical architecture**. Each Network Slice can be designed to **fulfil specific business needs**, making 5G a truly smart network

- GSMA NEST is working with its partners to ensure commonality of intent





Project execution (2/)

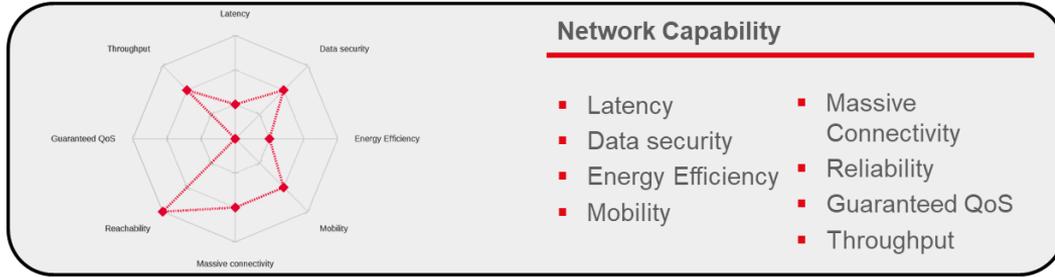


The story so far

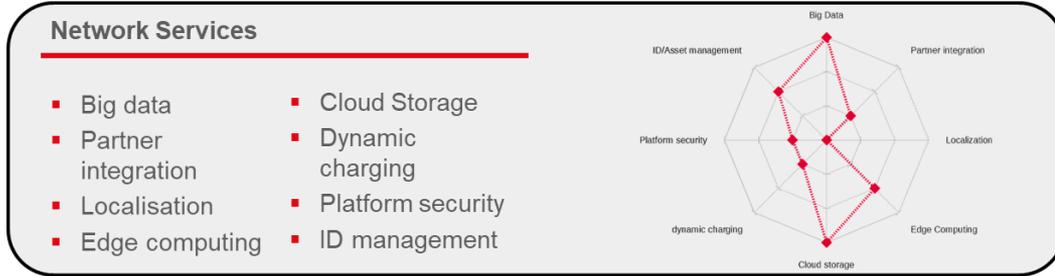
- Sep-17: started work on new paper on business principles, opportunities and regulatory needs
- Nov-17: full paper on network slicing introduction published
- Jan-18: industry requirements gathering completion and analysis



Network Slicing customisation parameters



- Latency
- Data security
- Energy Efficiency
- Mobility
- Massive Connectivity
- Reliability
- Guaranteed QoS
- Throughput



- ## Mapping requirements into slice types
- Use case discussed with vertical
 - Requirements mapped into network capability requirements and network services requirements
 - A general network slice definition template is also produced during this phase



Primary industry segments in scope

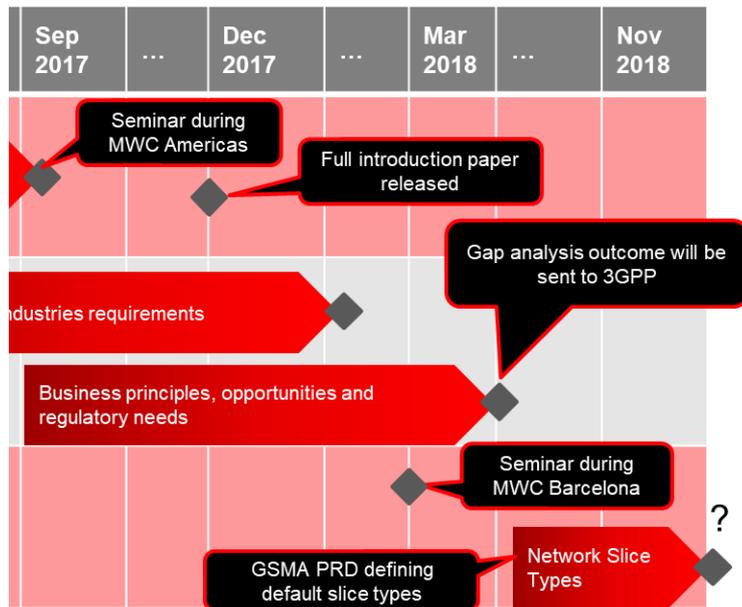


Industry segments vs use cases

- Vertical industries have been categorized into 9 segments plus a special segment (Consumer)
- Several use cases for each segment exist each with its own set of requirements
- Automotive will have at least the following use cases: telemetry, infotainment, assisted driving (V2I, V2V)



Project execution (3/)



The next chapter

- Feb-18: Third seminar focusing on vertical point of view
- Mar-18: full paper on vertical requirements analysis business principles, opportunities and regulatory needs
- Apr-18: handover of network slicing types based on vertical requirements study to NG
- Nov-18? (NG-8): publication of GSMA PRD



Cooperation with 3GPP

- GSMA NEST is happy to provide support for the completion of the “*Study on Business Role Models for Network Slicing*” by:
 - Sharing the insights of requirements from vertical industries
 - Sharing their findings on possible business models
 - Sharing their considerations on Service Level Agreements (both between operator and customer and between two operators)
 - Sharing their analysis of potential regulatory and policy aspects that may have impacts on deployment of network slicing
- GSMA endeavours to make such information available in 2018Q1
- GSMA welcomes any feedback 3GPP SA WG 1 may have and look forward to a fruitful collaboration



Additional Information

**Everything that can be digitalised
in our industry will be digitalised**

Examples of business relations

Hosting applications

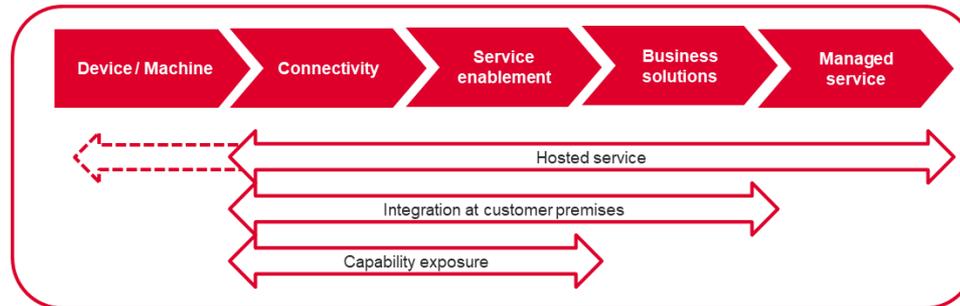
- In this model the operator hosts the customer's application in its own network
- Slice administration is with the operator

Capability exposure

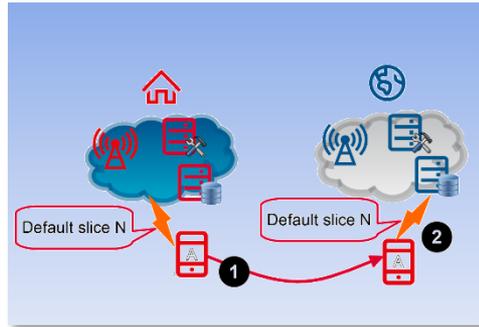
- In this model the operator provides the customer with APIs to control mobile functionality
- Slice administration is shared

Integration @ customer

- In this model the operator augments the capability of the customer's application with its own knowhow
- Slice administration is with customer

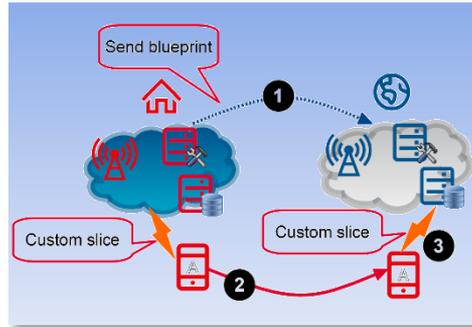


Examples of “roaming” Concepts



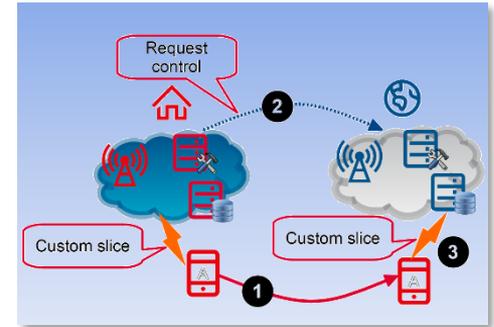
Use standardized slice types

- A globally agreed slice type allocated to the roaming device is instantiated in the visited network
- The device roams into a visited network
 - The visited network instantiates the same default slice



NS Blueprint export

- The HPLMN provides the custom slice blueprint to the VPLMN that instantiates it for the roaming device
- The HPLMN exports the custom slice template
 - The device roams in VPLMN
 - The VPLMN instantiates the custom slice



Virtual Home slice

- With the permission from the VPLMN the HPLMN takes control of the network resources
- The device roams in a visited network
 - The HPLMN request permission to control the visited network
 - The device uses the same slice as when at home

Examples of Policy and regulation questions

Net Neutrality

- Should the traffic carried by slices serving the same use case be treated equally?



Transfer of liability

- When are the legal obligations (e.g. data retention) transferred to the customer if operators expose control of its network?



Data privacy

- Should data of customers of a vertical using the connectivity from an operator be stored in the operator's country?



Examples of use cases - slice matching

	Slice 1	Slice 2	Slice 3	Slice 4	Slice 5	Slice 6	Slice 7	...	Slice N
Telematics				✖				...	
AR/VR						✖		...	
Fleet Management					✖			...	
CCTV surveillance		✖						...	
Public Safety								...	
Agriculture drones			✖					...	
Smart Grid				✖				...	
Mobile banking							✖	...	
Health monitor	✖							...	

Slice matching and consolidation

- NEST will proceed as follow:
 - For each use case a corresponding slice type is defined
 - Only one slice type left for use cases with similar/identical requirements
 - No slice type for use cases have low value (closest match instead)



How to join the GSMA project group

- The NEST project group meets electronically weekly and is open to all GSMA members
- Delegates can join following this link (delegates need to have an IC2 account):
<https://infocentre2.gsma.com/gp/pr/FNW/NEST/Pages/Default.aspx>
or by sending a request to Mr Kelvin Qin kqin@gsma.com
- The home page of the project contains all meeting documents, minutes of previous meetings, latest version of the paper.
- Download the latest Network Slicing paper [here](#), and participant the Network Slicing vertical survey [here](#).