



CONFIG

Control Plane Architecture for 5G Systems

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5G-PPP WS, Network Slicing and C-Plane Architecture and SDN for 5G
Athens, February 6th and 7th, 2017

Presentation Outline

- Project Objectives
- Project Achievements and Relationship to Network Slicing
- Open Issues and Next Steps

Project Objectives

To build 5G on top of the key **High Level Requirements** at the time the project proposal was written ('14) , CONFIG identified 4 key objectives:

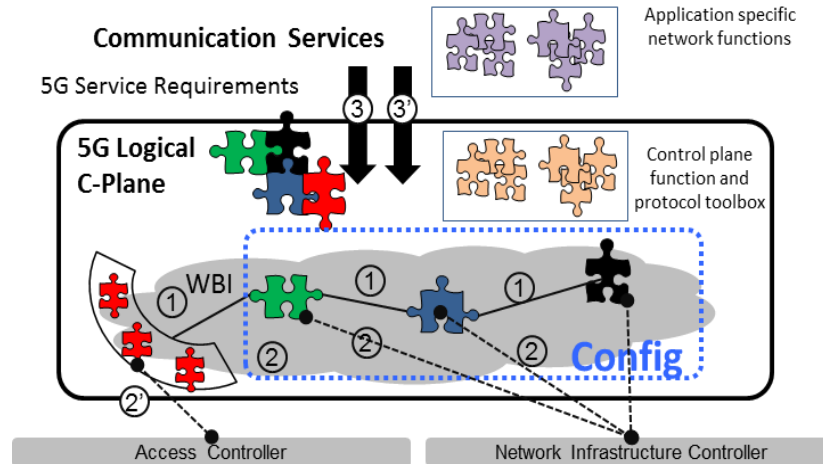
- ❑ Develop a 5G modular ~~functional~~ framework
(**Architecture Flexibility / Vertical Integration**)
- ❑ Conceive an access-agnostic 5G Core Network
(**Heterogeneous Access Integration**)
- ❑ Develop a Context Information framework
(**Providing Smart/Tailored Connectivity**)
- ❑ Lead standardisation future paths, impacting on 3GPP, IETF, ONF
(**Impact on Real Systems**)



Slicing Concept Looming

Project Objectives: Architecture Modularisation

Zooming-in the Control Plane

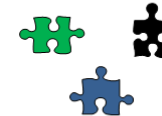


Key Questions:

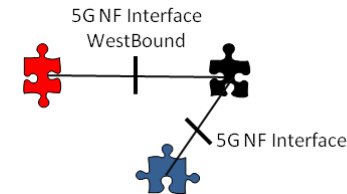
- Which accesses do we want to integrate?



- Which Logical Network functions do we need?



- Which 5G NF interface do we need to define?



Modularisation as design principle,
allowing flexibility and Verticals integration



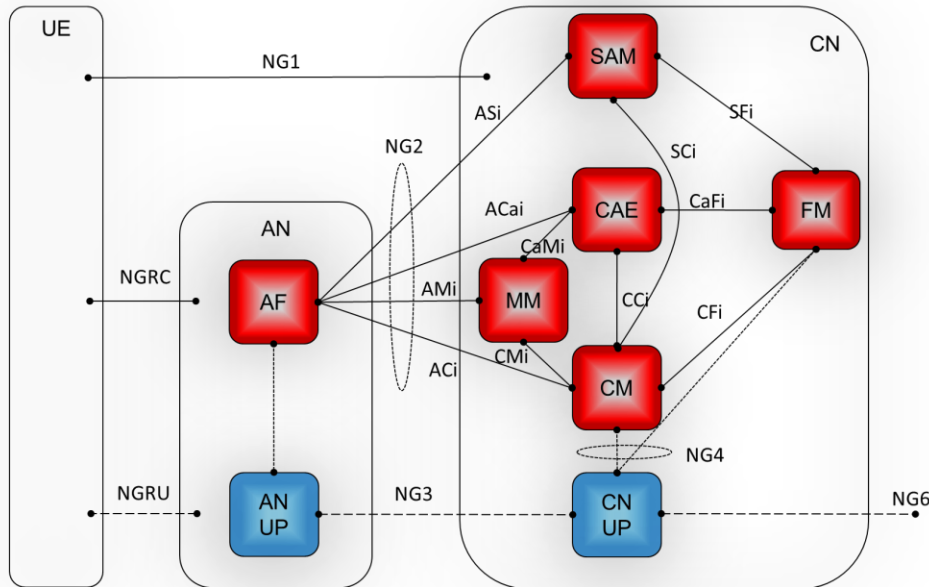
Key Network Slicing enabler

Presentation Outline

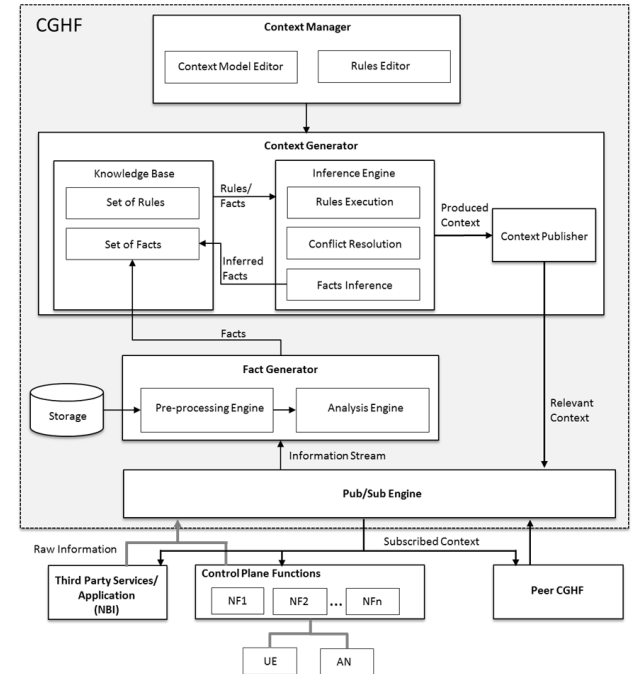
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Project Achievements: 5G Modularised Architecture, Supporting Network Slicing

Network Functions and Interfaces



Context Awareness Framework



Relationship to Network Slicing

Definitions and Lifetime

Consolidated Definitions, NGMN, Jan'16

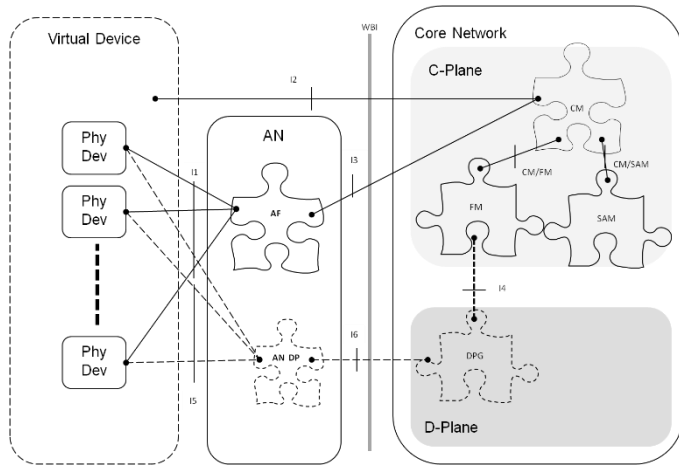
- ❑ **Network Slice Blueprint:** A complete description of the ^{Logical Architecture} structure, ^{Management} configuration and the plans/work flows for how to instantiate and control the Network Slice Instance during its life cycle
- ❑ **Network Slice Instance:** a set of ^{Control/User Plane} network functions, and ^{Infrastructure} resources to run these, forming a complete instantiated logical network to meet certain network characteristics required by the Service Instance(s)

CONFIG Definition and Scope of Network Slicing:

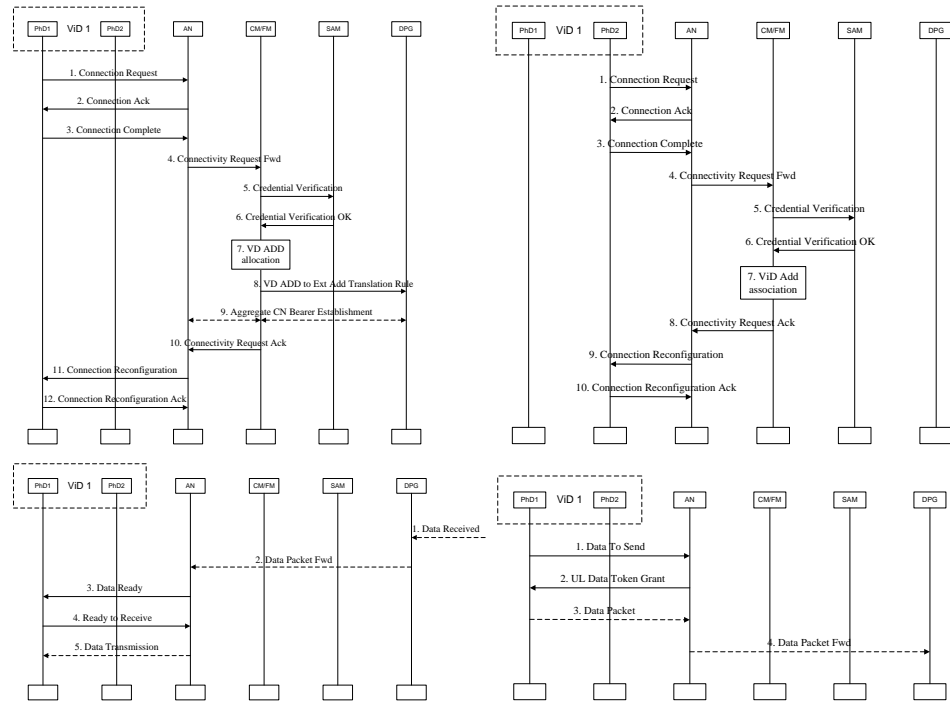
- ❑ A network slice is an independent logical network, defined by the interconnection of a set of basic building blocks, composing both C-plane and D-plane, and which can be independently instantiated and operated over a set of physical infrastructure, to support the communication service requirements of a particular or multiple use cases.
- ❑ End to End: a network slice spanning all the components of the communication system needed to provide devices with the requested communication service

Relationship to Network Slicing: Example: mMTC Network Slice

C-plane Architecture

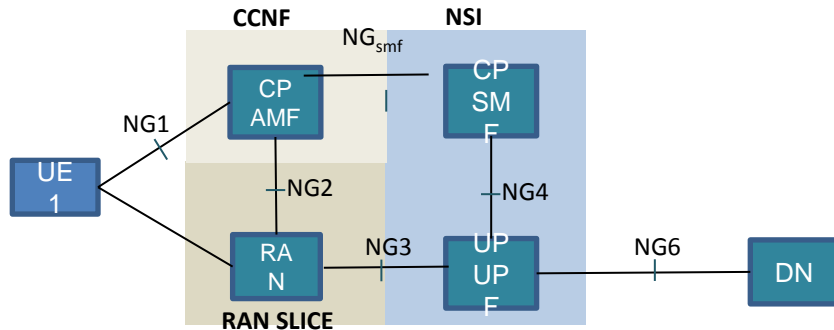
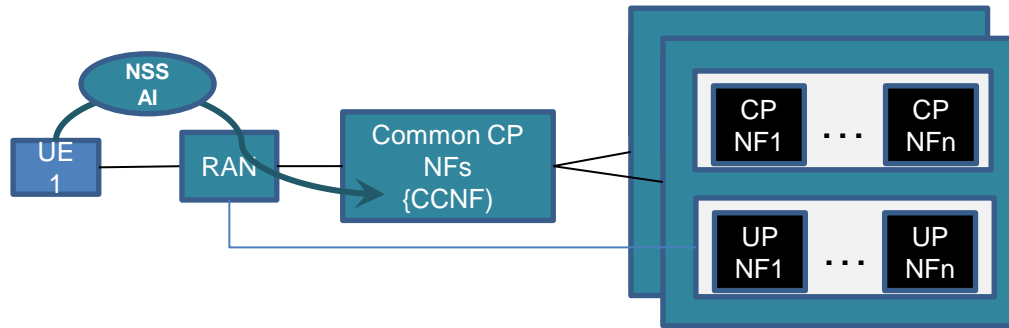


C-plane Procedures



Relationship to Network Slicing: Standardisation (3GPP SA2 Perspective)

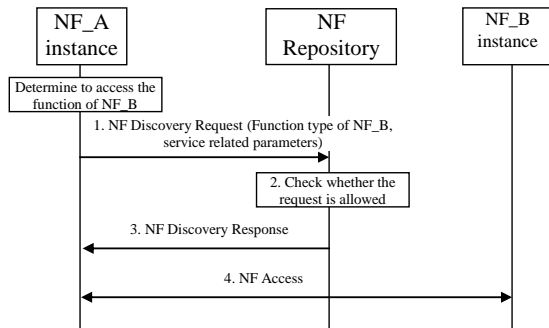
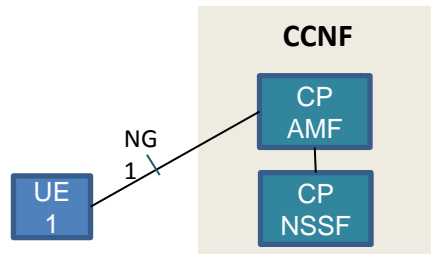
A Network Slice is a complete logical network made up of Access and Core Network Components



- Slices are selected based on NSSAI provided by the UE
 - RAN selects a CCNF (AMF/NSSF) based on the NSSAI
 - An NSSAI can generate multiple Network Slices
 - An AN can be common to all slices
 - The NSSAI includes at least: SST and SD
- CCNF Redirection can be done at RAN or CCNF
- SMF Selection is based on:
 - NSSAI (Provided by the UE), UE Subscription Info, DNN and Local Operator policies
- SM-NSSAI can be associated to an application
 - Data is routed to the PDU sessions associated to the SM-NSSAI

Relationship to Network Slicing: Standardisation (3GPP SA2 Perspective)

Network Slicing was NOT the focus of SA2 118 bis ... Network Slicing embedded in other



- **It is not decided whether NSSF is a separate function or a component within AMF**
 - Slicing is not a mandatory feature, but AMF is always required
 - NSSF can be accessed even before an AMF has been selected
- **It is not decided whether Network Slicing should be addressed as a separate feature or part of existing procedures**
 - Should NS have its own clause within the TS?
- **To be determined during normative phase what Slice-related info is to be used for NF selection**
 - E.g., Is the NSSAI used as an input to NF selection?
- **It is not clear how Network Slicing is handled in a Roaming scenario**

Thank You!

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