



Cloud Native Service-Based Architecture Deployment Considerations for NPNs: An Evolution of NFV

Dr. Sebastian Robitzsch
sebastian.robitzsch@interdigital.com
InterDigital Europe, Ltd.

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Outline

- Introduction to Cloud Native, Microservices and Service-based Architecture
- 5GC Provisioning: Current State of the Art
- Mapping to Non-public Networks



Introduction

Cloud native, microservices and Service-based Architecture

Cloud Native

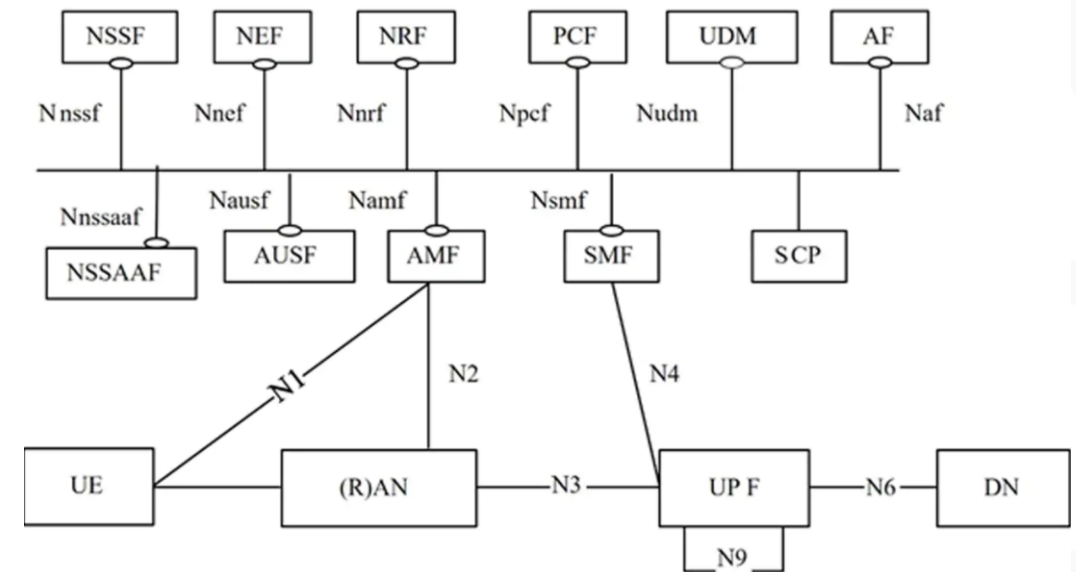
- Cloud Native defines provisioning principles for cloud applications
- ETSI MANO reference architecture published a mapping for container-based applications (IFA 040)
 - Aims at providing the necessary interfaces for provisioning of Cloud Native Network Functions (CNFs)

Microservices

- Software engineering methodology to disintegrate monolithic function to a set of microservices
- Commonly known “12 factor app” defines principles to achieve that
- Key characteristic for a microservice architecture is ability to scale the number instances of a particular microservice to cope with demand

Service-based Architecture (SBA)

- SBA brings cloud principles to a 5G cellular telecommunication system
 - HTTP/2 was adopted as protocol among 5GC Network Functions (NFs)
 - Except the interface to the UPF
 - Service-centric communication principles manifested in a new component: the Service Communication Proxy (SCP)

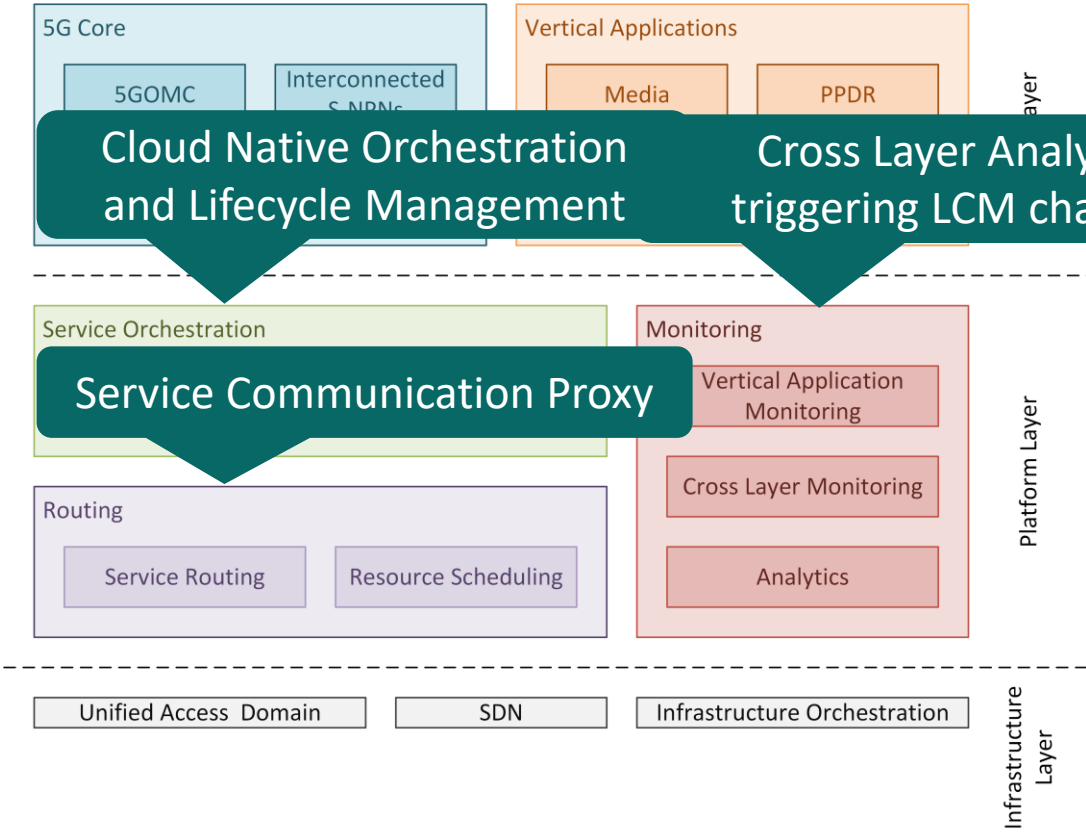


While cloud communication principles have been partially adopted, provisioning and run-time lifecycle management and monitoring have not.

Service Function Virtualisation

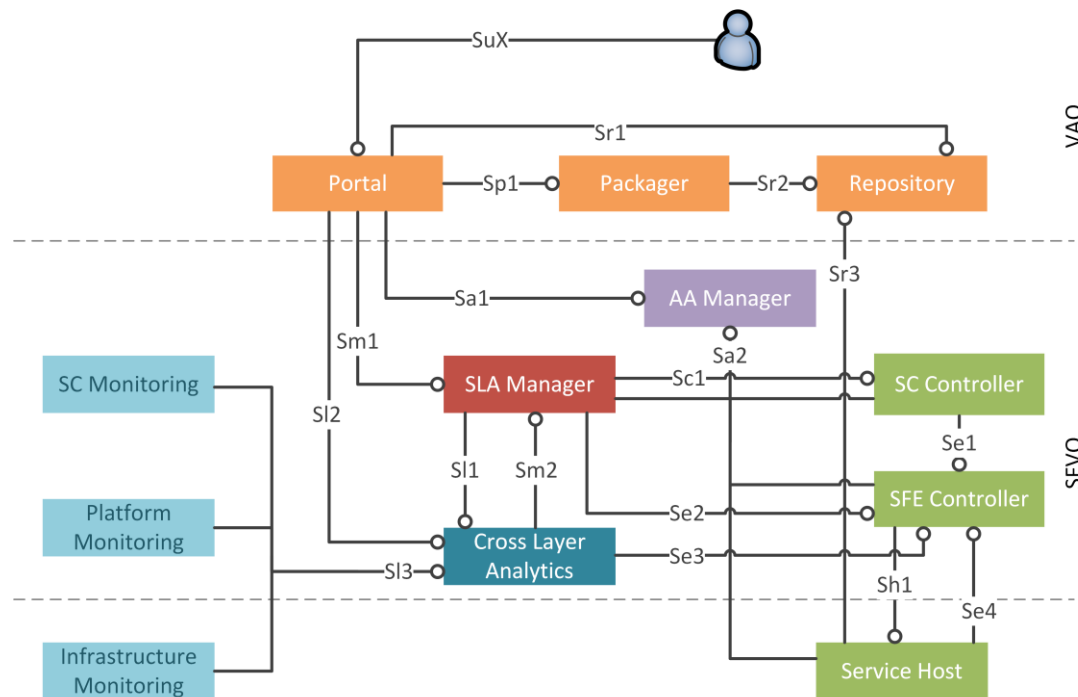
An NFV evolution for location-aware cloud native orchestration and lifecycle management

FUDGE-5G System Overview



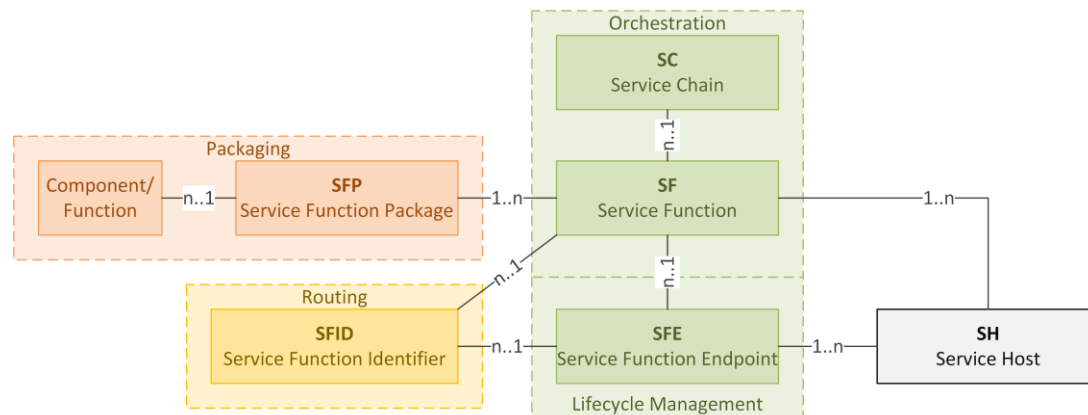
- Platform layer functionality realised as VNFs and orchestrated via an NFVO
- 5GC and vertical applications are 5G services that utilise the SFV Orchestrator (SFVO)

Service Function Virtualisation (SFV)



- SLA-driven service chain description
- Automated translation from SLAs into
 - Resource descriptor (which Service Function deployed into which location)
 - LCM policy descriptor (trigger policies with specific LCM states for each Service Function Endpoint)
 - Monitoring descriptor defining what to measure and when to send out LCM triggers

SFV Information Model



- Key difference to other frameworks (e.g., K8s):
 - Multi-location enabled
 - Direct integration with SCP
 - Registration of instances (using their FQDN) against
 - Routing identification based on FQDNs
 - FQDNs assignable to SFs or a subset of them (referred to as pinning)



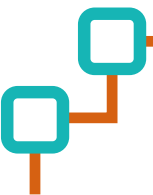
Mapping to Non-public Networks



Mapping to Non-public Networks


- Multi-location NPNs can greatly benefit from adopting cloud native orchestration and lifecycle management procedures
 - Automate range in demand based on location
 - Simplifying multi-vendor 5GCs provisioning through unification
- LCM and monitoring can be fine-tuned towards specific NPN use case
 - Public networks must support a range of use cases



Thank you.



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