

FUDGE-5G: Fully Disintegrated Private Networks for 5G Verticals

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The NPN concept allows for designing, deploying, and interconnecting capabilities for the specific needs of the use cases, motivating the NPN deployment in the first place. 3GPP studies two types of NPNs, falling under the categories of Standalone Non-Public Networks (S-NPNs) and Public Network Integrated NPNs (PNI-NPNs)

PLATFORM ARCHITECTURE

FUDGE-5G assumes:

1. a unified access domain across all Access Networks as the shared communication denominator;
2. utilising Software-defined Networking (SDN) on both control and user planes is fully supported by the platform;
3. Network Function Virtualisation (NFV)-enabled infrastructure.

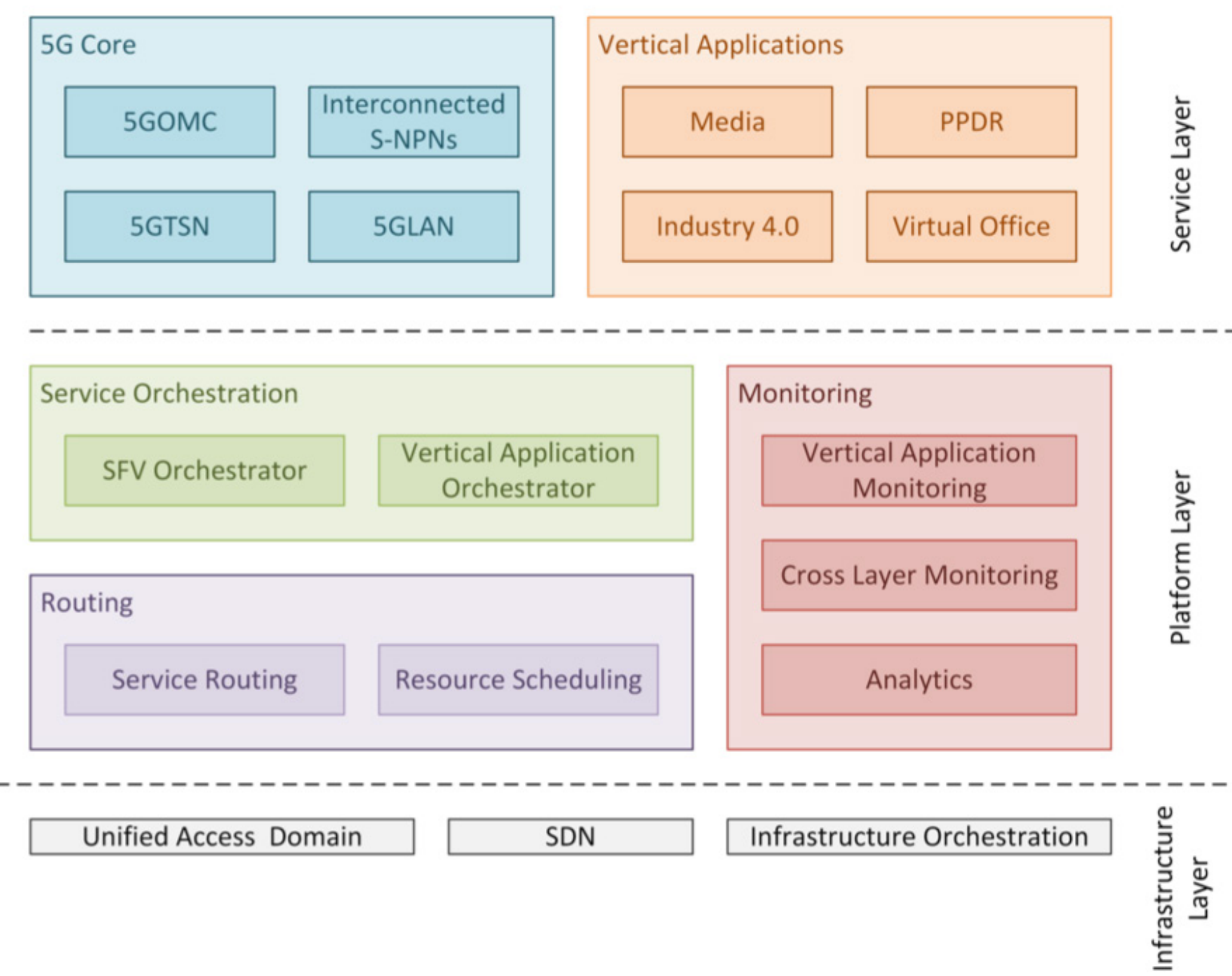
Both for control and user plane 5G services, FUDGE-5G offers a **Service-based Architecture** platform realization covering:

- unified service routing;
- orchestration;
- monitoring capabilities.

5GC lists innovations around:

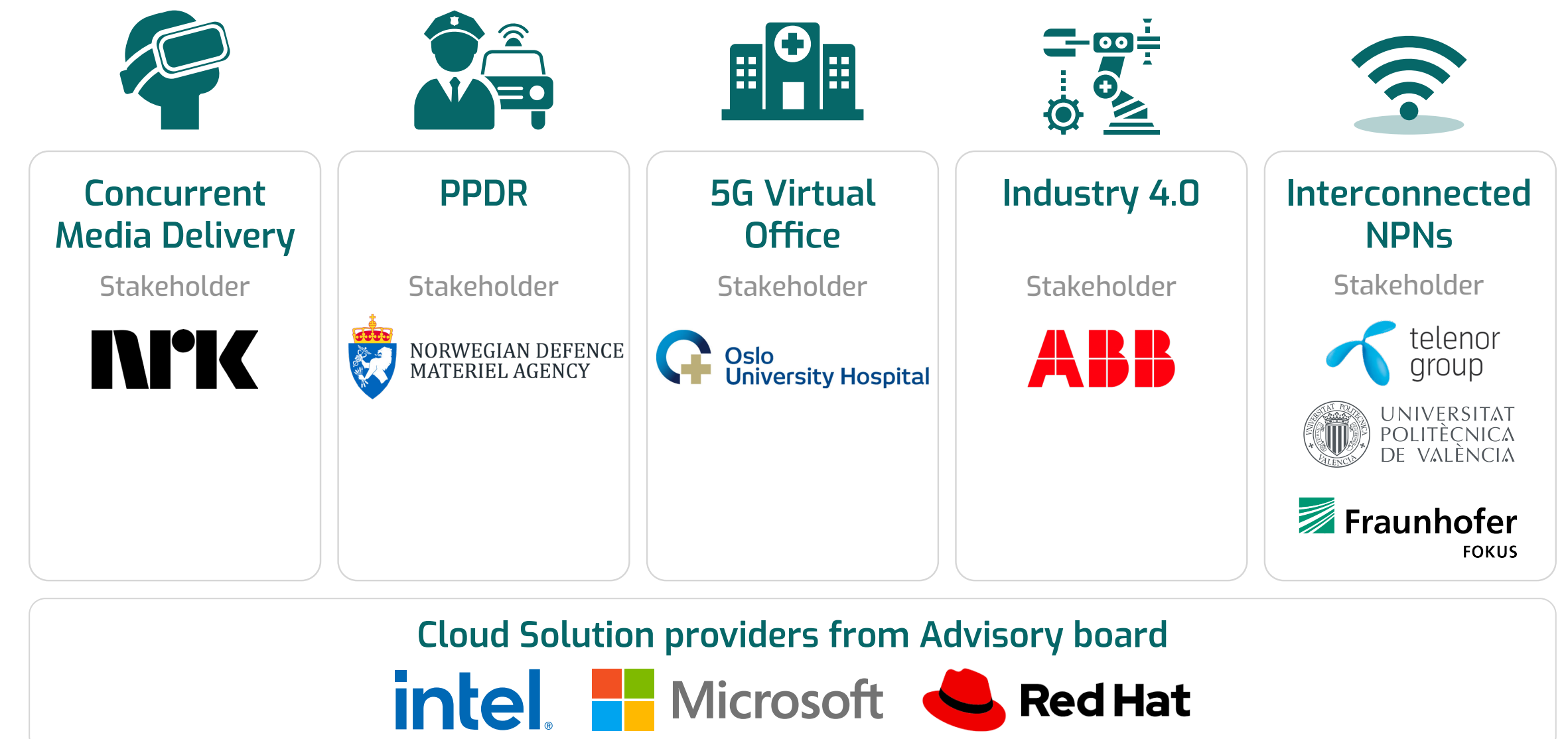
- 5G IP and Opportunistic Multicast (OMC);
- 5G Time Sensitive Networking (TSN);
- 5G Local Area Network (5GLAN); and interconnected S-NPNs.

Service routing at the **control plane** is based on Name-based Routing (NbR), one of the three official deployment options of a Service Communication Proxy (SCP). **User plane** service routing offers the integration of NbR, which is complemented by a novel resource scheduling.



USE CASES

- The use case aims to illustrate a typical remote production and media delivery scenario at the same time, but in this case using 5G technology.
- The main objective in this UC is to provision transparent mission-critical services to the end-user independently of the underlying telecommunication infrastructure.
- In this UC, innovations will allow hospital staff to be able to work more effectively and for medical knowledge and expertise to be distributed over a much wider area.
- This UC aims at demonstrating the applicability of S-NPNs and their integration with 5GLAN and TSN, replacing fixed and wired alternatives for industrial communications with 5G.
- The main motivation of this UC is deployment of 5GLAN in case of federated 5G S-NPN and authentication and authorization of subscribers across multiple domains.



PROJECT COORDINATOR



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NPN BENEFITS

With NPNs, the network can be designed, optimised, dimensioned and customized to serve different needs of enterprise and industrial verticals. It allows for:

- tight integration of UEs with the RAN and 5GC;
- customised QoS traffic flow support;
- better coverage (optimized cell location);
- high security (isolation);
- adaptability and scalability;
- greater flexibility;
- high efficiency;
- lower latency overall.



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