Platform-as-a-Service és Telekom felhő

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TELCO GRADE PAAS

PaaS – what is missing,

Telecom requirements: PaaS is coming from the IT (web) world

- Usually there is a loadbalancer for HTTP only
  - Other protocols (SIP, diameter, TCP session) are not supported
- Internal state info to be stored in external DB/cache
  - Performance issues
- No guarantee on QoS/ response times
- VMs and networks compeletely hidden
  - Colocation of VMs that communicate a lot with each other?
  - No networkin optimization (e.g., intel DPDK)
- No standard PaaS
  - Migration from one operator to the other?

Requirements for a PaaS

- What does it take to write a „PaaS-compatible” app?
- Actually it is the same for any Saas, PaaS,… app
- http://12factor.net/

PaaS criteria 1/2

- I. Codebase
- One codebase tracked in revision control, many deploys
- II. Dependencies
- Explicitly declare and isolate dependencies
- III. Config
- Store config in the environment
- IV. Backing Services
- Treat backing services as attached resources
- V. Build, release, run
- Strictly separate build and run stages
- VI. Processes
- Execute the app as one or more stateless processes

PaaS criteria 2/2

- VII. Port binding
- Export services via port binding
- VIII. Concurrency
- Scale out via the process model
- IX. Disposability
- Maximize robustness with fast startup and graceful shutdown
- X. Dev/prod parity
- Keep development, staging, and production as similar as possible
- XI. Logs
- Treat logs as event streams
- XII. Admin processes
- Run admin/management tasks as one-off processes

Microservices

- Micro services = software module implementing a given function
  - Own states
  - Multiple microservices cooperating to complete a compelx task
  - The change offered my microservice based architectures:
    - Instead of a monolith, multiple smaller (micro) modules
  - Scaling only the modules that run into bottlenecks
  - Useful paradigm in telco world – deployment of a given microservices depending on the operator's needs

- http://martinfowler.com/articles/microservices.html

TelcoGrade PaaS – examples

- FeedHenry – Mbaas
- http://www.feedhenry.com/mobile-application-platform/mbaas/
  - (Twillio)
  - https://www.twilio.com/customers

PaaS a in practice

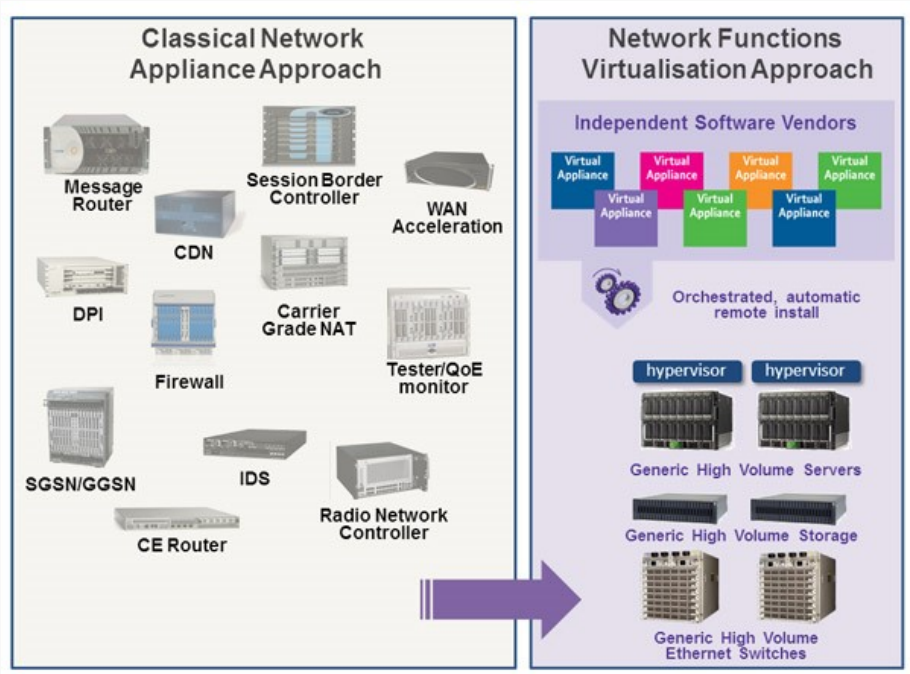
- PaaS based on a set of requirements

- http://www.paasify.it/vendors

Network Function Virtualization

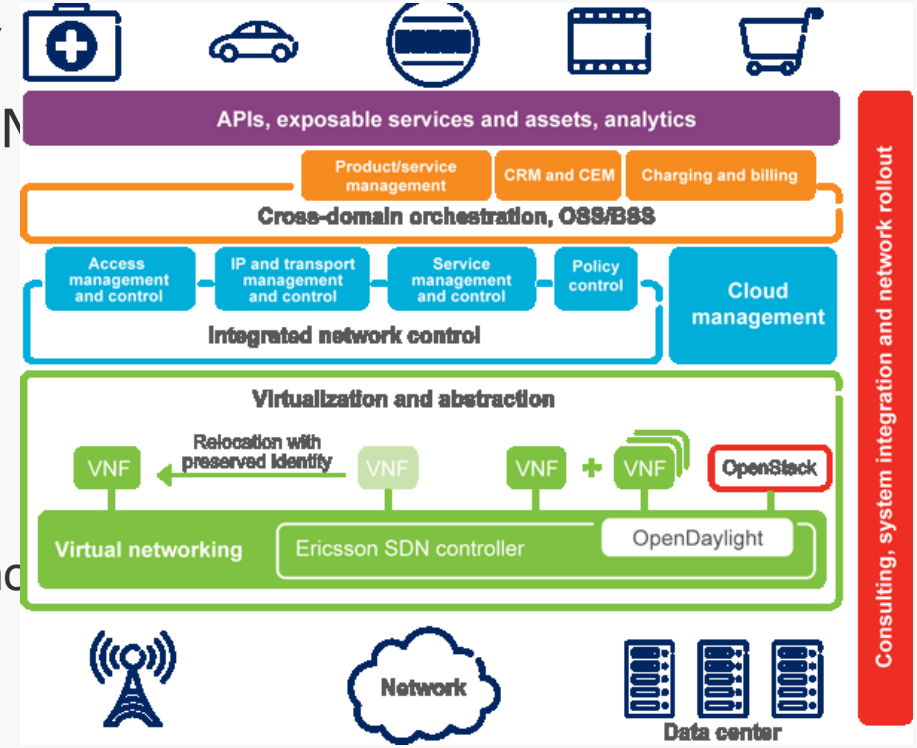
Network Functions Virtualization – NFV

- Network Functions Virtualization – NFV
  - Network function (e.g., cache, firewall) independent from the hardware
  - Functionality implemented in software
    - Running over a generic server architecture (e.g., no need for ASICs)
- Operator point of view / Motivation
  - Reduce the CapEx/OpEx
  - Faster service instantiation
  - Flexibility, adaptation
- Standard groups
  - ETSI NFV
  - Open Platform for NFV (OPNFV)



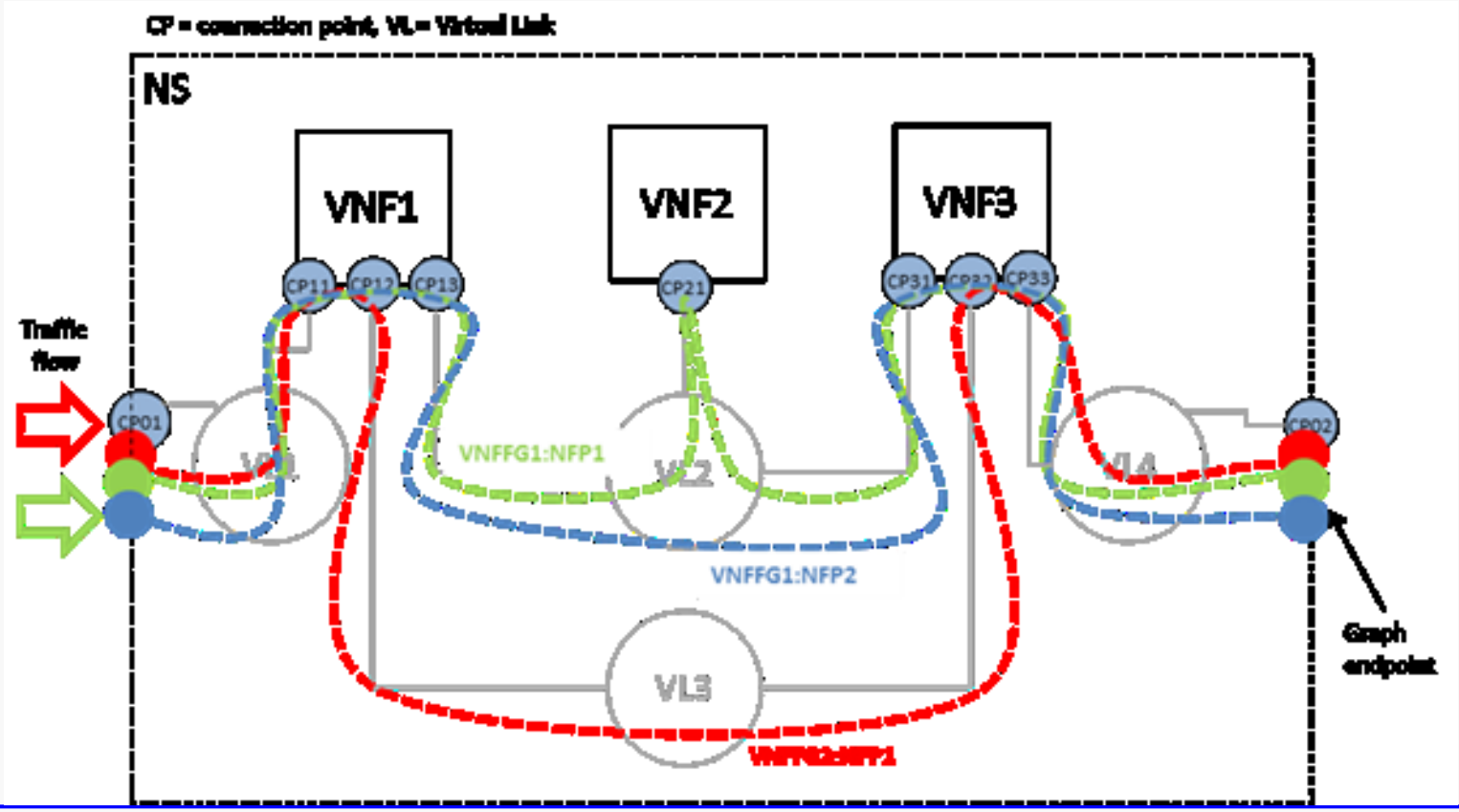
Telco cloud

- Virtualized telco functions
  - Packet switched core (EPC)
  - IMS/VoLTE components (CSCF, HSS,...)
  - Content Delivery Networks (CDN
  - Deep Pckt Inspection (DPI)
- Performance
  - Load balancing, scalability
  - VNFs moved to end users
  - TelCo grade service
    - Deployment, monitoring, resilienc billing...
  - Hardware acceleraration?
    - Virtual switch, network card
- Ericsson: real-time cloud
  - Combining SDN, NFV and cloud



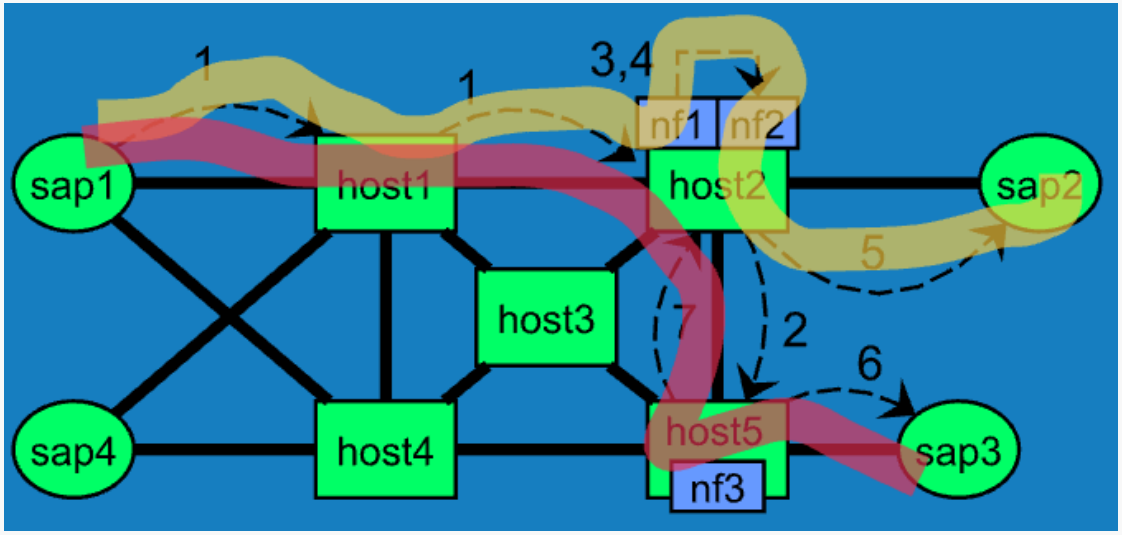
Dynamic service chaining

- New service (NS) = linking the VNFs
  - VNF Forwarding Graph



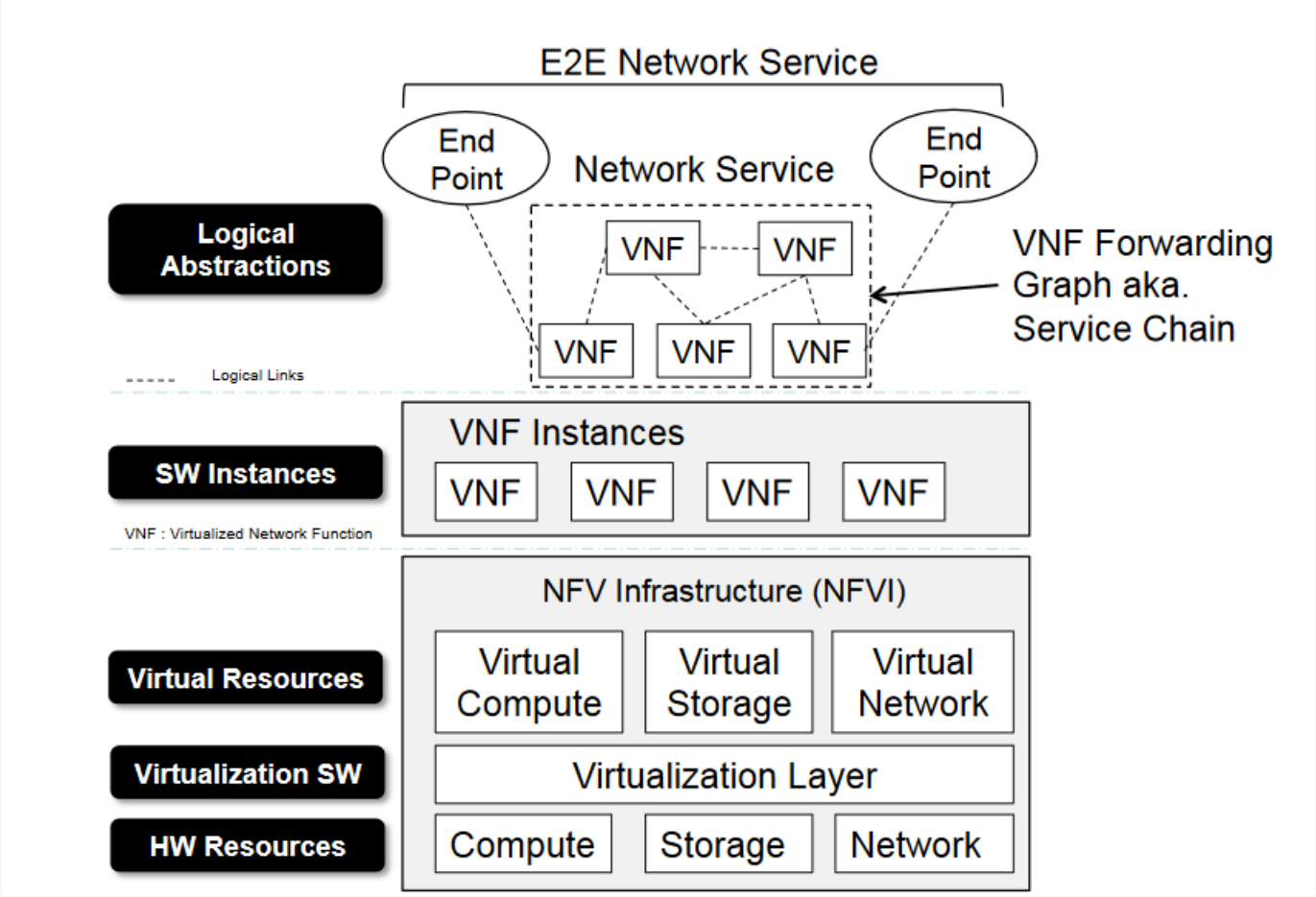
Service Function Chaining

- VNF management
- QoS enforcement
- Monitoring
- Data and Ctrl Plane optimization
- Scalability, Reliability



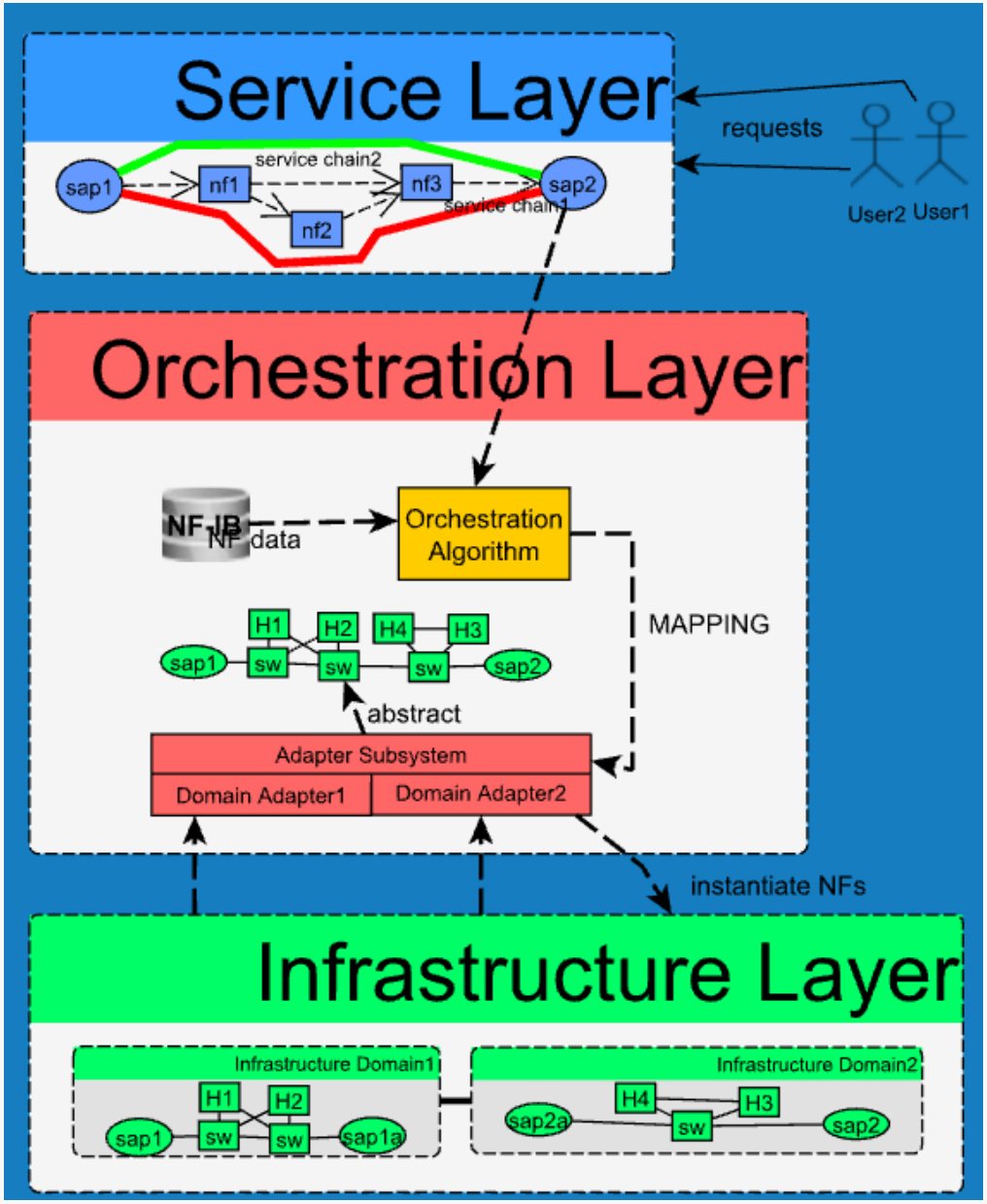
Dynamic service chaining

» New service = Linking the VNFs



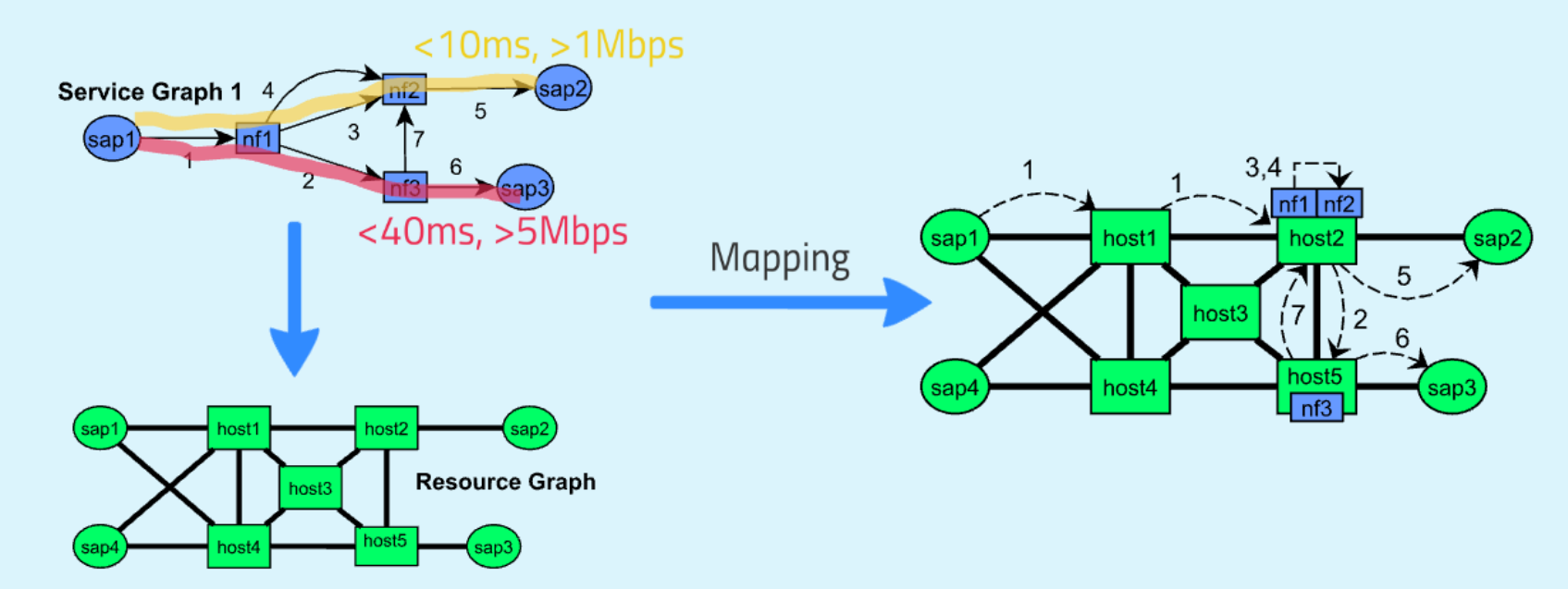
Dynamic service chaining

- Orchestration
- Mapping to resources
- Infrastrucutre



Resource mapping

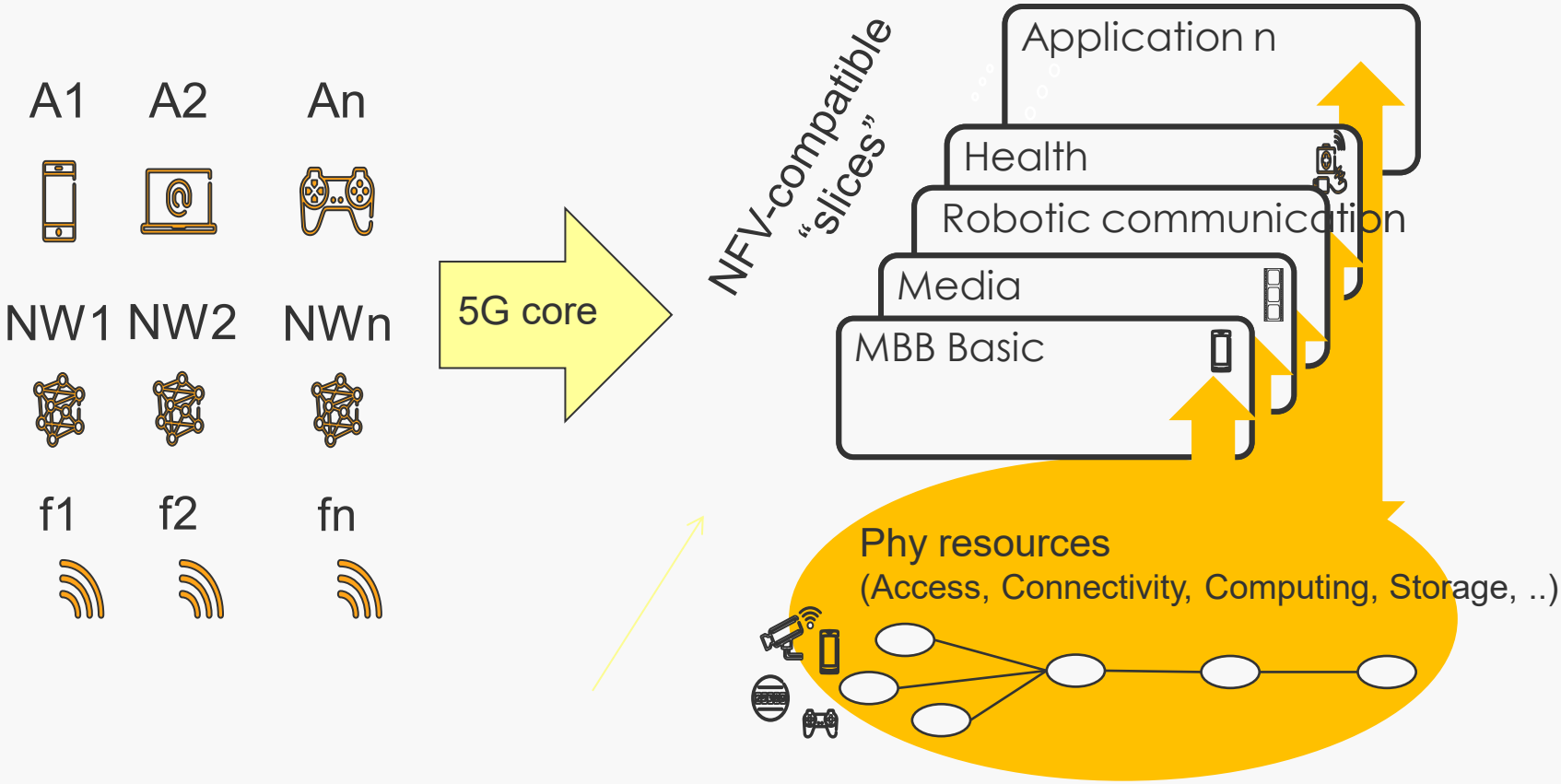
- Preferences, limitations
- Service Access Points
- Resource mapping decisions



More networks over the same infra

Dedicated physical network with own control plane and per-app resources and services

"Network factory", market of resources and Service, abstraction levels for resources and services



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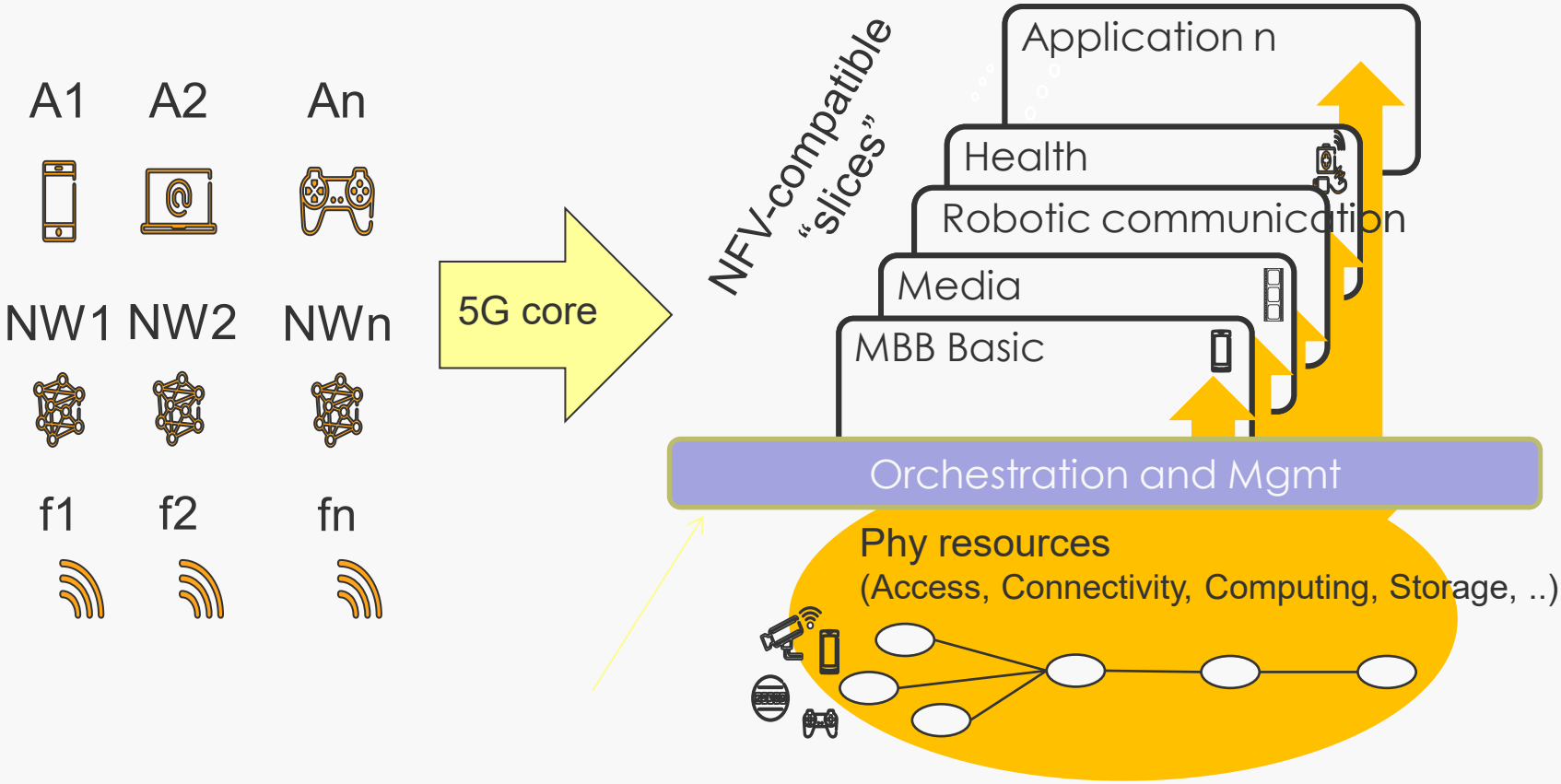

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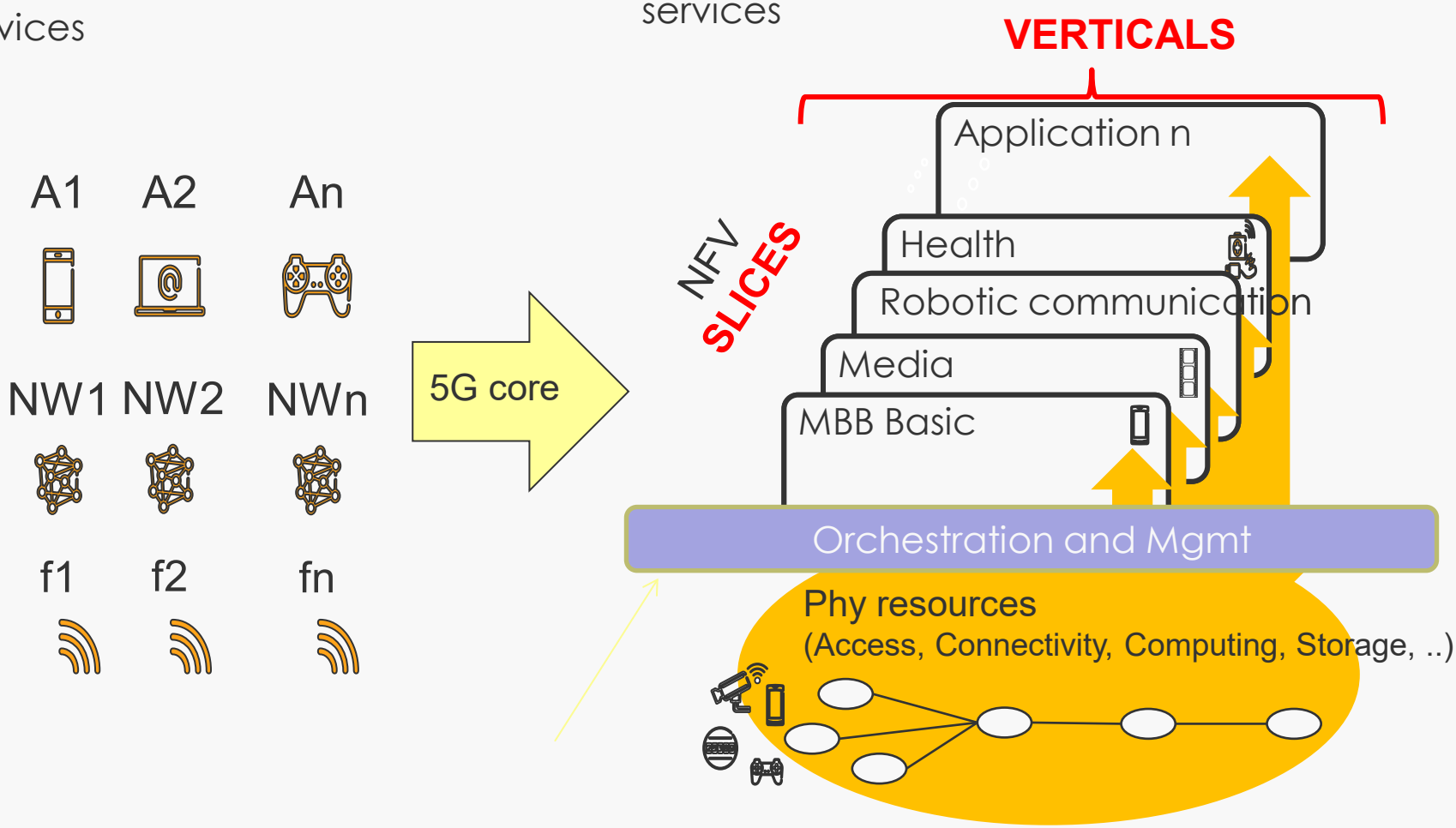

NFV architecture