Telefónica

2nd Visions for Future Communications Summit

SLICING WITH NON-PUBLIC NETWORKS

An other orchestration challenges for the next decade

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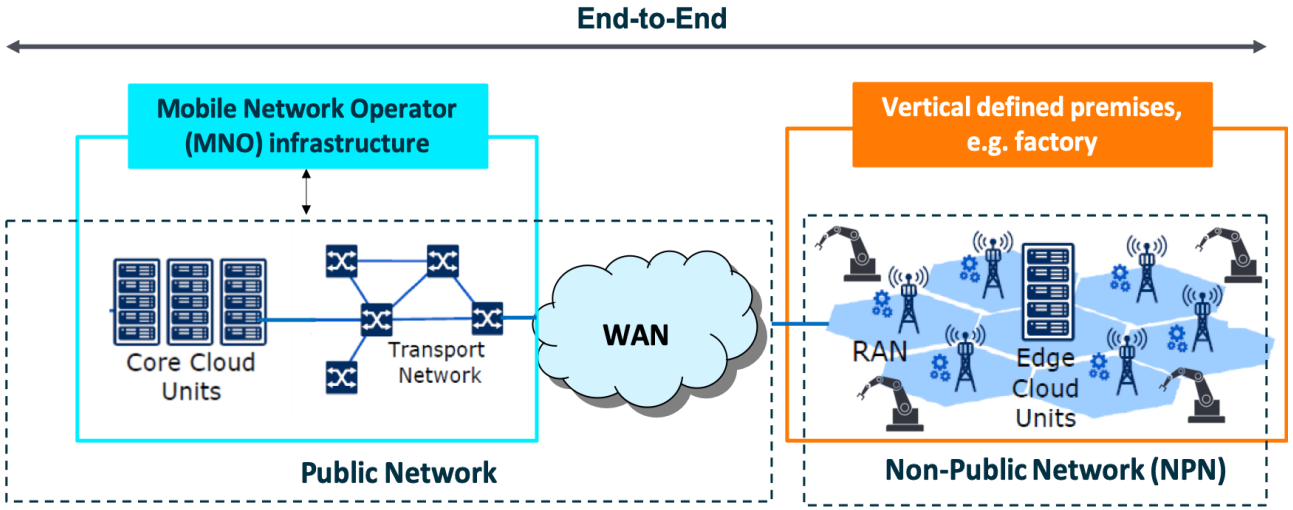
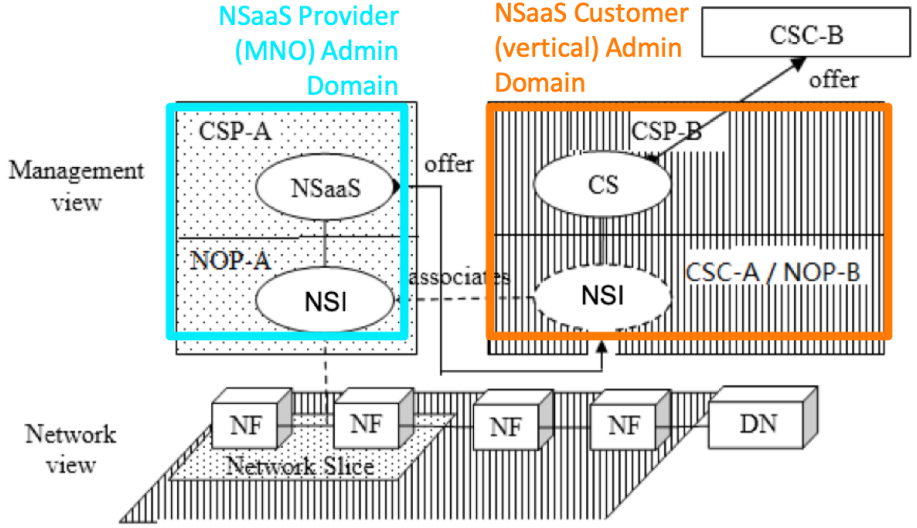
Exploring the future: public and non-public networks

- Vertical use cases may involve the combination of public networks and NPNs.
- The MNO may need to provide network **resources, functions and services** to industry verticals
  - ☛ From the public network
  - ☛ In a cost-effective manner





- Network Slice as-a-service (NSaaS) as a future-proof service delivery model, with the NSI…
  - ☛ provided by the MNO
  - ☛ consisting of network functions hosted by the public network

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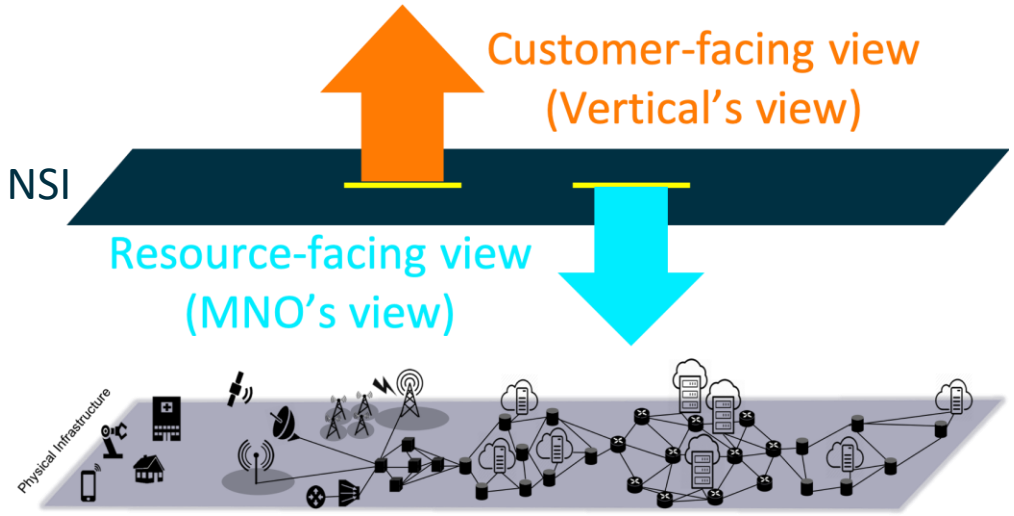
The gist of NSaaS: slice capability exposure

- Two complementary service views in NSaaS:
  - ☛ **Resource-facing view** (NSI deployment details) **VS Customer-facing view** (NSI exposed capabilities)
  - ☛ **Abstraction** to preserve the required **demarcation point** between the MNO and the industry vertical



- A vertical could want to retain some control over the NSI provided (as a service) by the MNO
  - ☛ Getting involved **beyond passive monitoring**
  - ☛ **Operational coordination** with the service components deployed on the NPN.
- Tailored customer-facing view of the NSI -> **slice capability exposure**
  - ☛ Allows the MNO to grant an industry vertical with necessary control capabilities over the NSI

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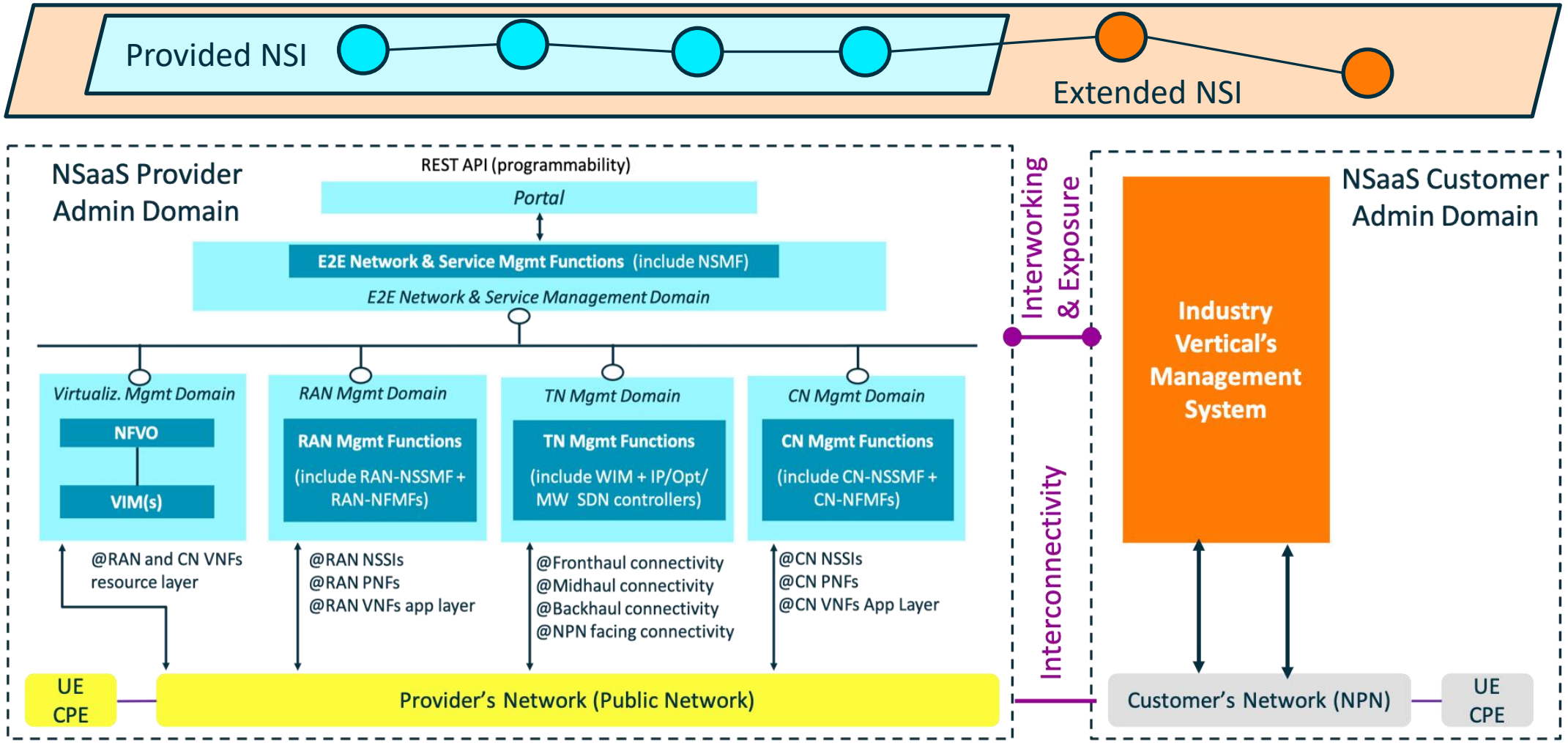
Reference architectural framework in NSaaS



NSaaS phases

- Two main phases

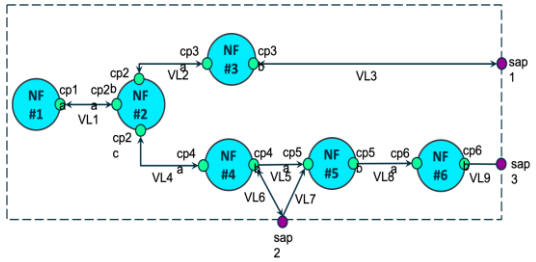
Network Slice (aaS) Request

The NSaaS customer issues a service order towards NSaaS provider, requesting the deployment of a tailored network slice.

NSI is deployed and activated

Network Slice (aaS) Operation

The NSaaS customer monitors and takes (some) control over the network slice, deployed and made available by the NSaaS provider.



Slice Topology

Slice Requirements

Slice performance assurance and fault supervision

Slice Management & Control

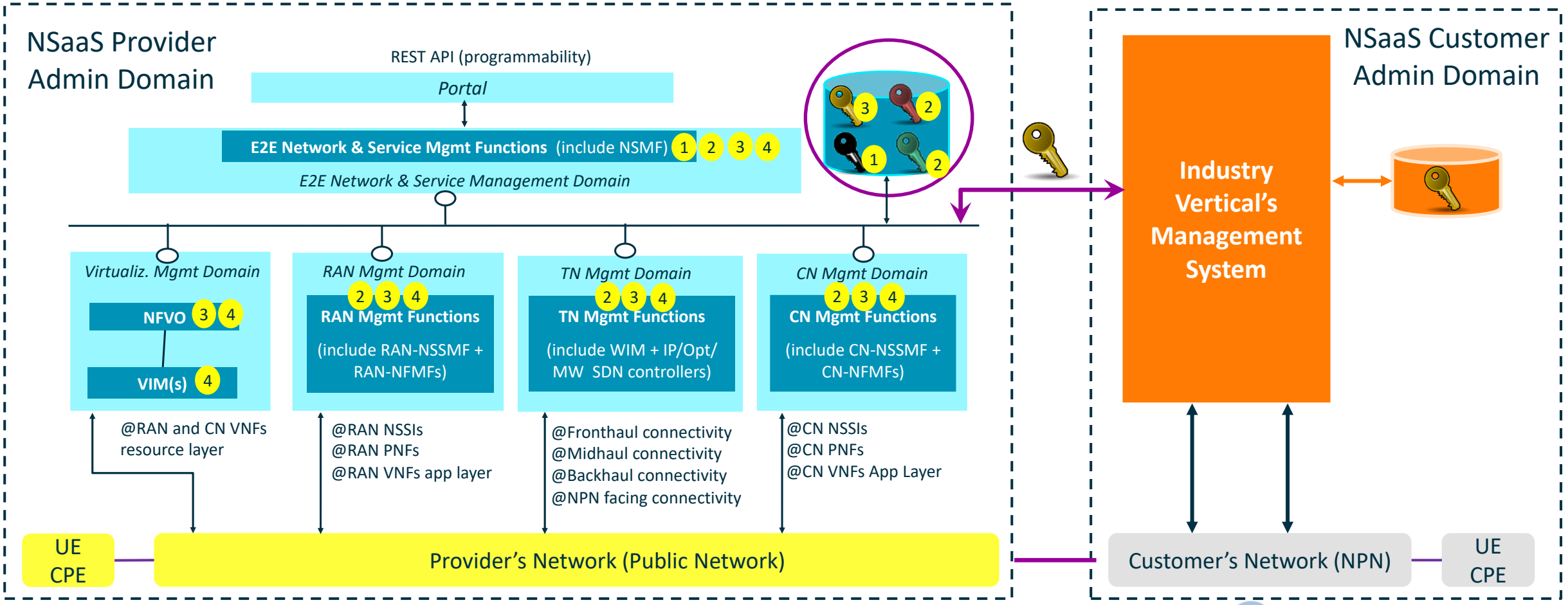
Network Slice (aaS) operation – Exposure levels

- In NSaaS scenarios, different verticals may want to take a more or less proactive role in the operation of their slices.
- Exposure levels -> levels of control the vertical can take over the provided slice.

Customer is able to consume operations related to…	Level 1	Level 2	Level 3	Level 4
E2E network slice application layer config & management	✓	✓	✓	✓
Network slice subnet (and NF) application layer config & management -> 3GPP scope for RAN and CN, IETF scope for TN.	✕	✓	✓	✓
Network slice subnet (and NF) virtualized resource layer config & management -> ETSI NFV network service (and VNF) orchestration	✕	✕	✓	✓
Resource control and management at the virtual infrastructure layer -> NFVI with optional EPA capabilities and infrastructural SDN control	✕	✕	✕	✓

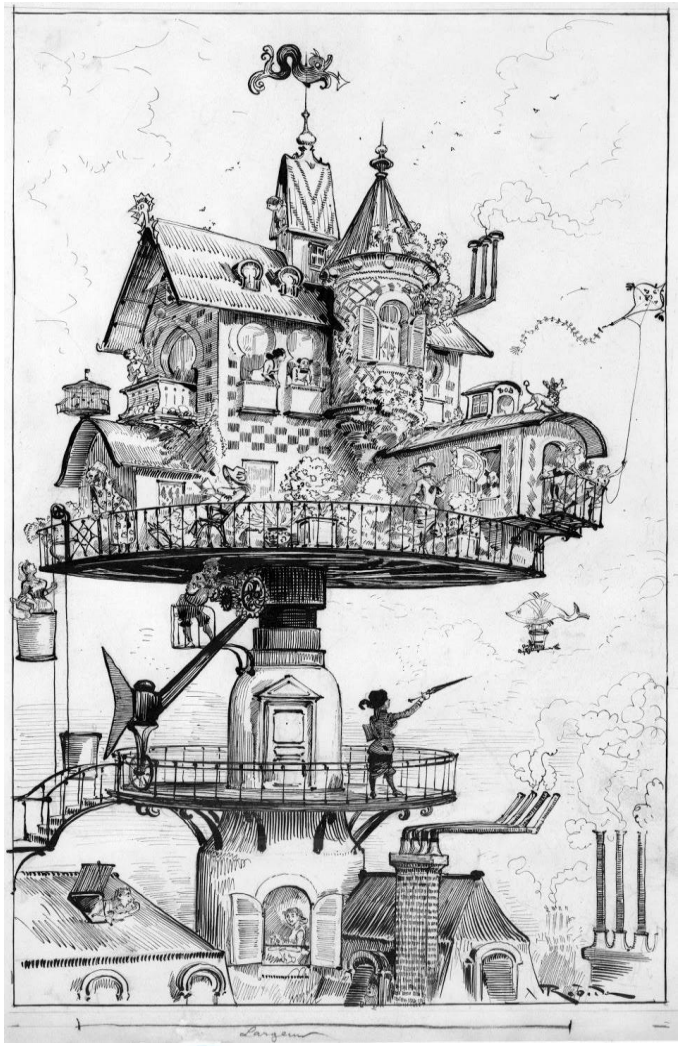
Network Slice (aaS) operation – Exposure levels

- Token-based authentication



The Challenges Ahead - A Matter of Balance

- Integrated support for management and orchestration
  - ☛ At all segments and all technologies
  - ☛ Towards full network programmability
- Open full accountability
  - ☛ Non-repudiation and auditability
  - ☛ Means for assurance and SLA verification
- Predictive orchestration
  - ☛ Aiding seemingly infinite capacity and zero perceived latency
- User requirements and operational policies
  - ☛ Intent dialectics and elastic policy enforcement
  - ☛ Compositional mechanisms for requests in multi-tenant environments
- Sensing and acting
  - ☛ Open and extensible mechanisms for data and action streams
  - ☛ Apply and manage (meta-)data about the network to improve orchestration
  - ☛ Converged control action representations



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