



# 5G-TRANSFORMER

## 5G Mobile Transport Platform for Verticals

5G-PPP Architecture WG Presentation

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# Project Overview (<http://5g-transformer.eu>)

- **Vision:** Mobile Transport Networks shall transform from today's rigid interconnection solutions into an **SDN/NFV-based 5G Mobile Transport and Computing Platform** supporting diverse vertical industries.
- **Technical Approach:** bring “**Network Slicing**” into mobile transport networks by provisioning and managing slices tailored to the needs of verticals.
  - Enable **Vertical Industries** to meet their service requirements within customized **network** (i.e. mobile transport infrastructure) **slices**;



Automotive



Healthcare



Media



M(V)NO

- Aggregate and **Federate** transport networking and computing fabric, from the edge up to the core and cloud, to create and manage **slices** throughout a **federated virtualized infrastructure**.

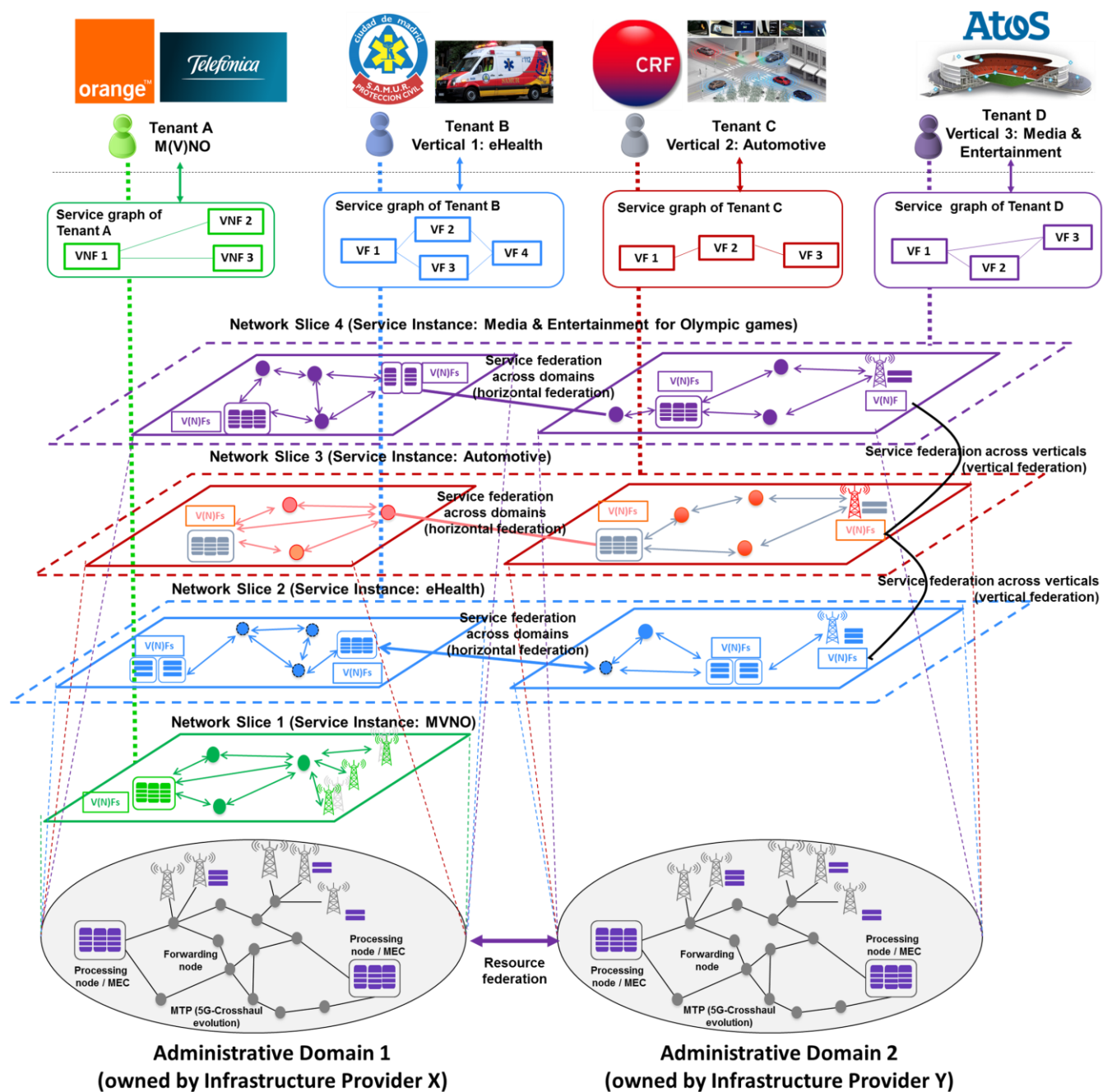
# 5G-TTRANSFORMER Project Vision

## Key architectural concept

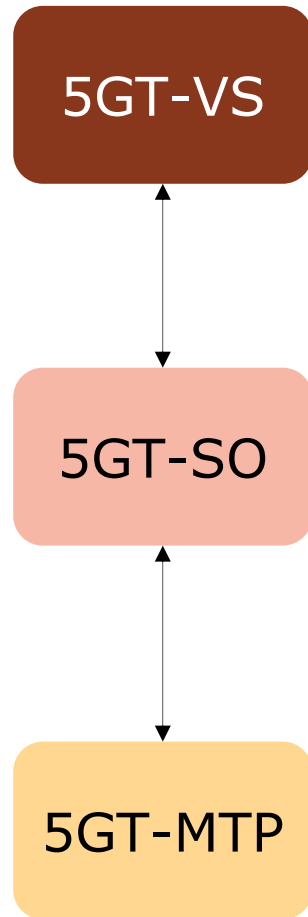
Network Slicing aligns network functionality to business needs in order to support adaptation between the needs of Verticals and 5G-T Service Provider

Share the 5G mobile transport and computing infrastructure efficiently among verticals and M(V)NOs to enhance the 5G-T provider network efficiency

Aligned with existing architectures in SDOs supporting network slicing (e.g: 3GPP, NGMN, ETSI)

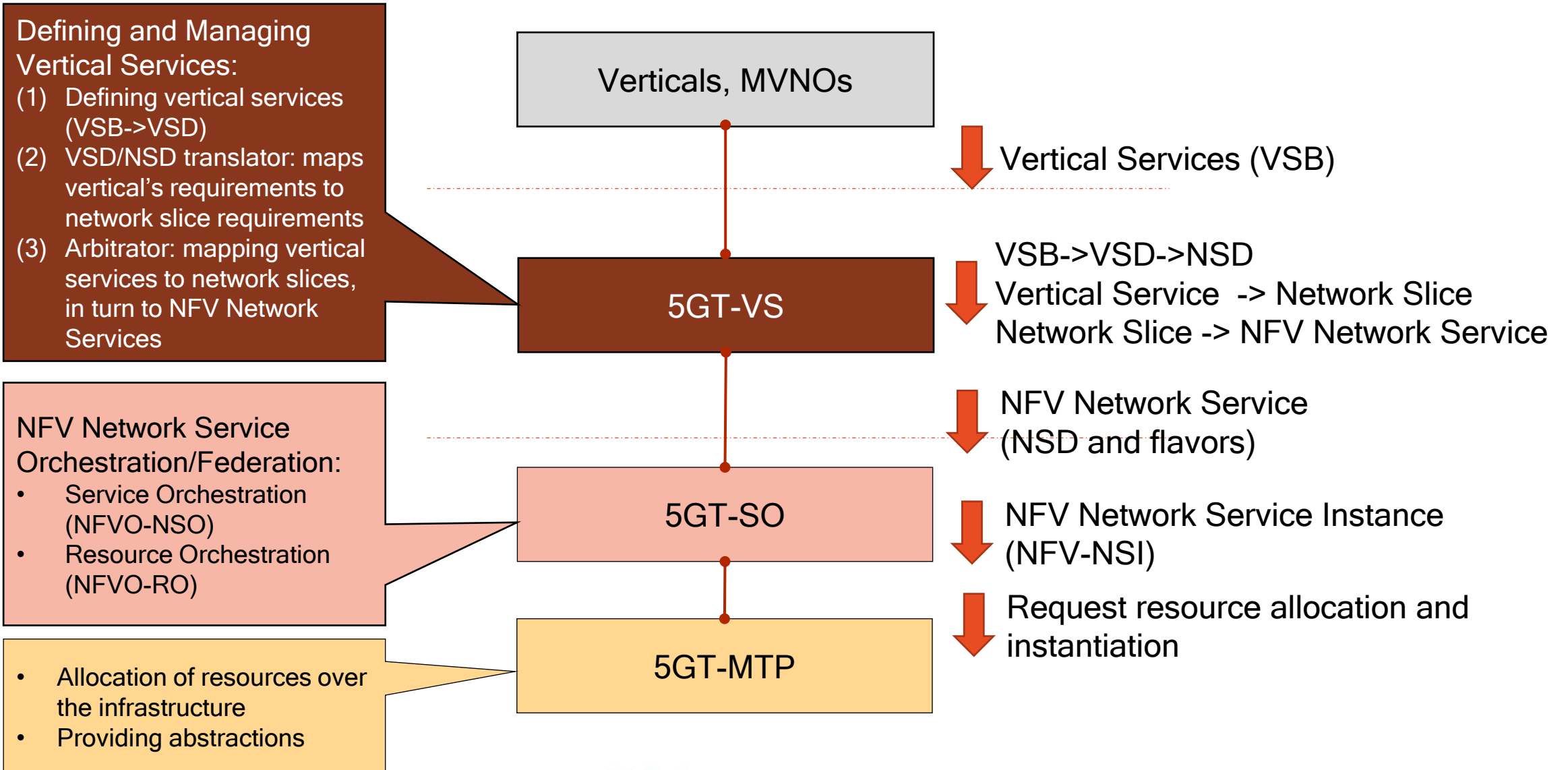


# Main Building Blocks



- **Vertical Slicer**
  - Logical entry point for verticals and MVNOs to support the creation of their transport slices in a short time-scale. It dynamically creates and maps the vertical services onto network slices according to their requirements, and manages their lifecycle.
- **Service Orchestrator**
  - Orchestration and federation of service or resources from multiple domains
    - **Orchestration** entails managing end-to-end services or resources that may be split into multiple segments belonging to different administrative domains based on requirements and availability.
    - **Federation** entails managing administrative relations at the interface between 5GT-SOs of different domains and handling abstraction of services and resources.
- **Mobile Transport and Computing Platform**
  - Underlying unified transport stratum for integrated fronthaul (FH) and backhaul (BH) networks, responsible for providing virtual resources and instantiation over the underlying physical transport infrastructure.

# 5G-T Main Building Blocks



# 5G-T baseline architecture design

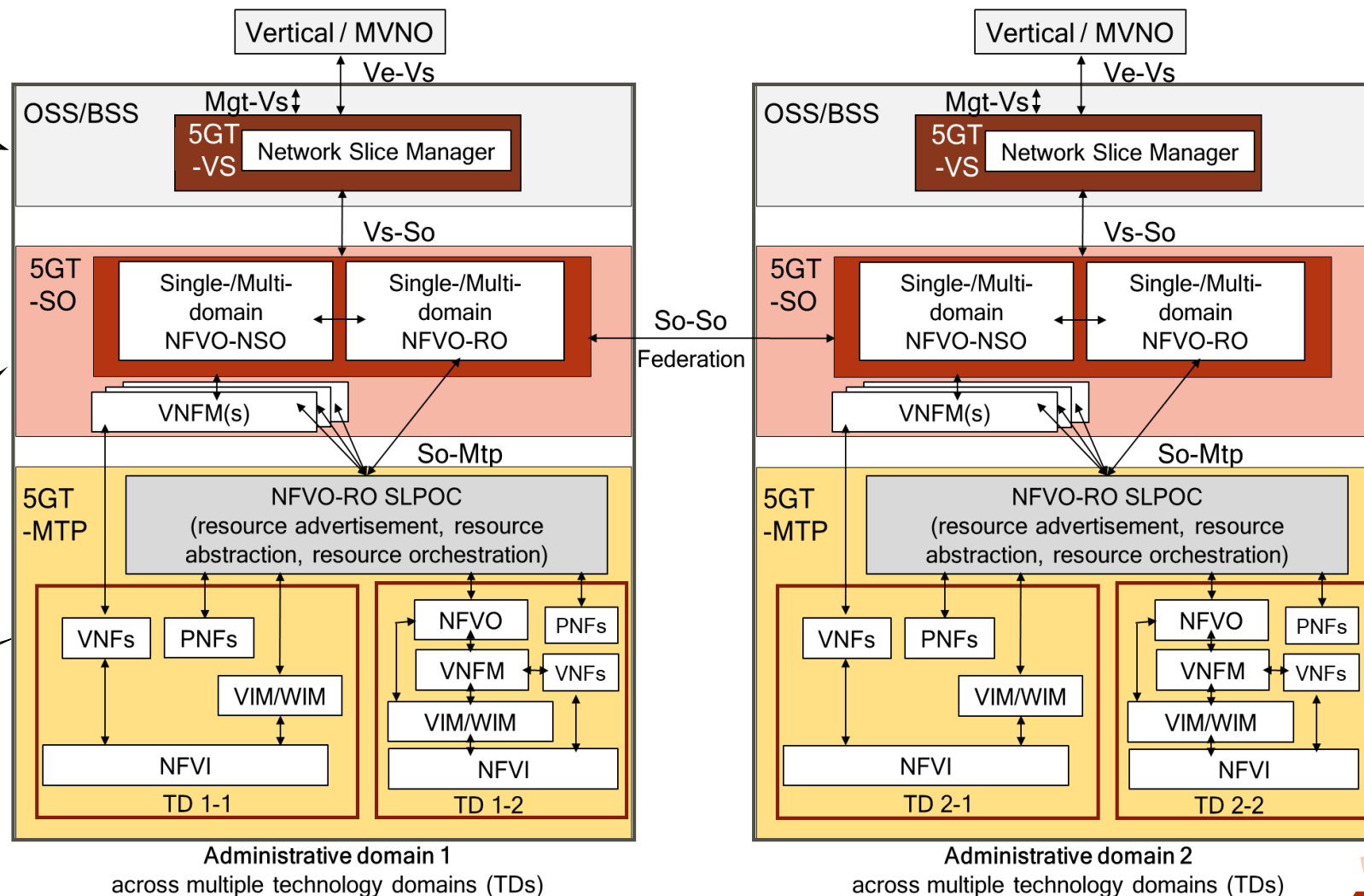
## Defining and Managing Vertical Services:

- (1) Defining vertical services (VSB->VSD)
- (2) VSD/NSD translator: maps vertical's requirements to network slice requirements
- (3) Arbitrator: mapping vertical services to network slices, in turn to NFV Network Services

## NFV Network Service Orchestration/Federation:

- Service Orchestration (NFVO-NSO)
- Resource Orchestration (NFVO-RO)

- Allocation of resources over the infrastructure
- Providing abstractions



# 5G-T baseline architecture design

Interfaces are aligned with ETSI NFV Interface and Information Model Specifications (IFA)

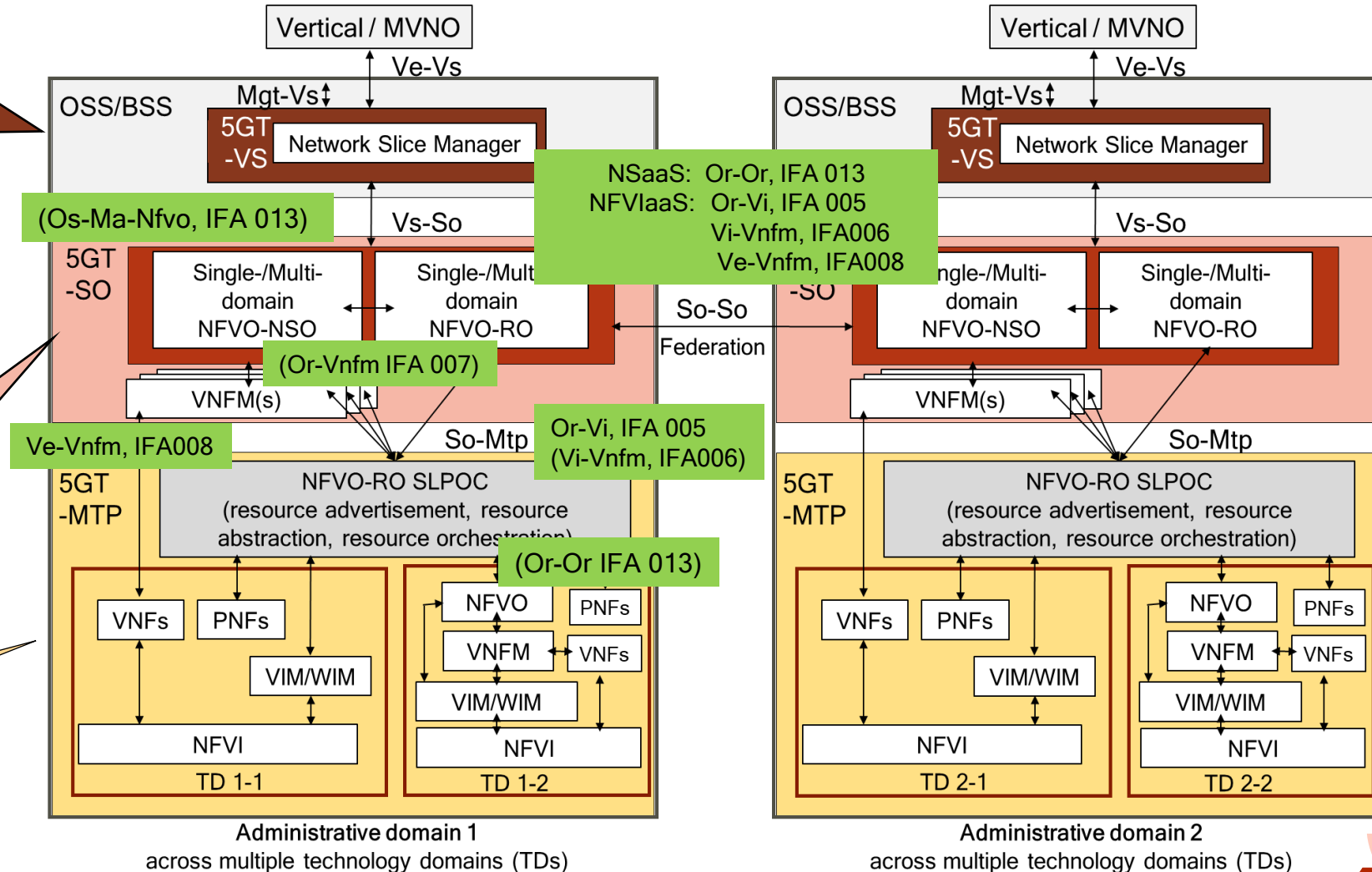
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## NFV Network Service Orchestration/Federation:

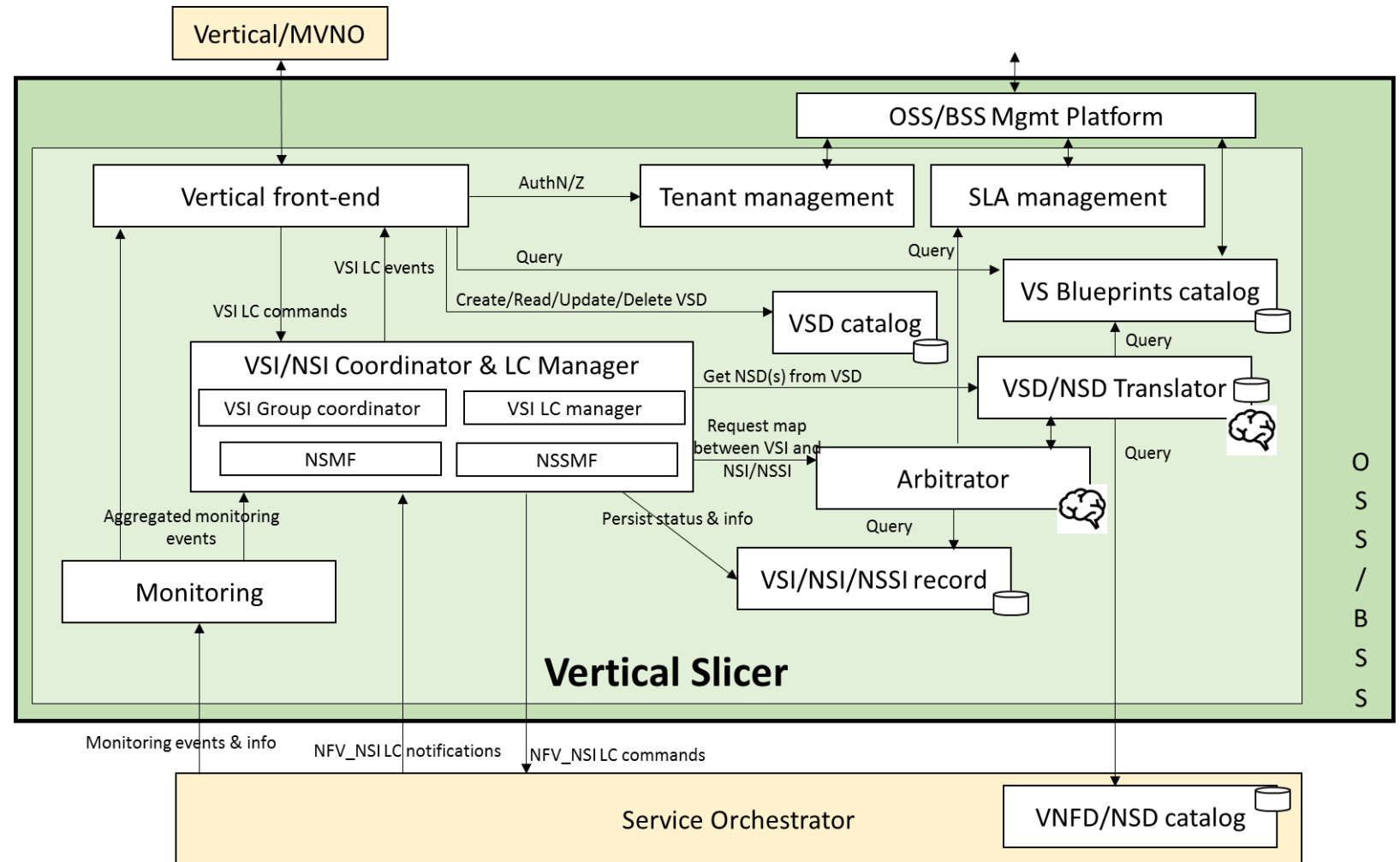
- Service Orchestration (NFVO-NSO)
- Resource Orchestration (NFVO-RO)

- Allocation of resources over the infrastructure
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# 5GT-VS Architecture

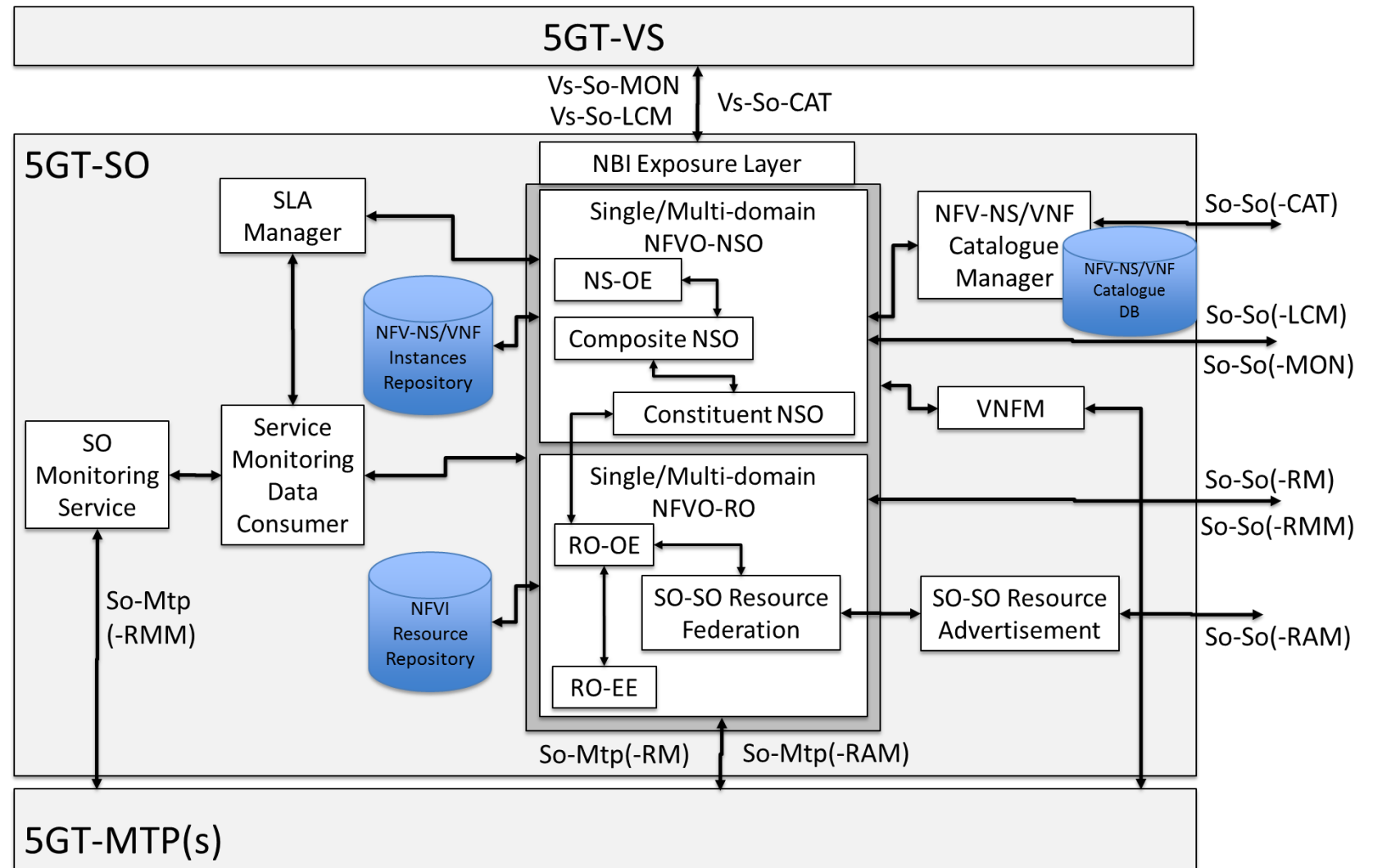
- Tenant mgmt
- SLA mgmt
- Coord. & LCM
- Translator
- Arbitrator
- Monitoring
- Rest-based NBI
- NFV IFA013 SBI





# 5GT-SO Architecture

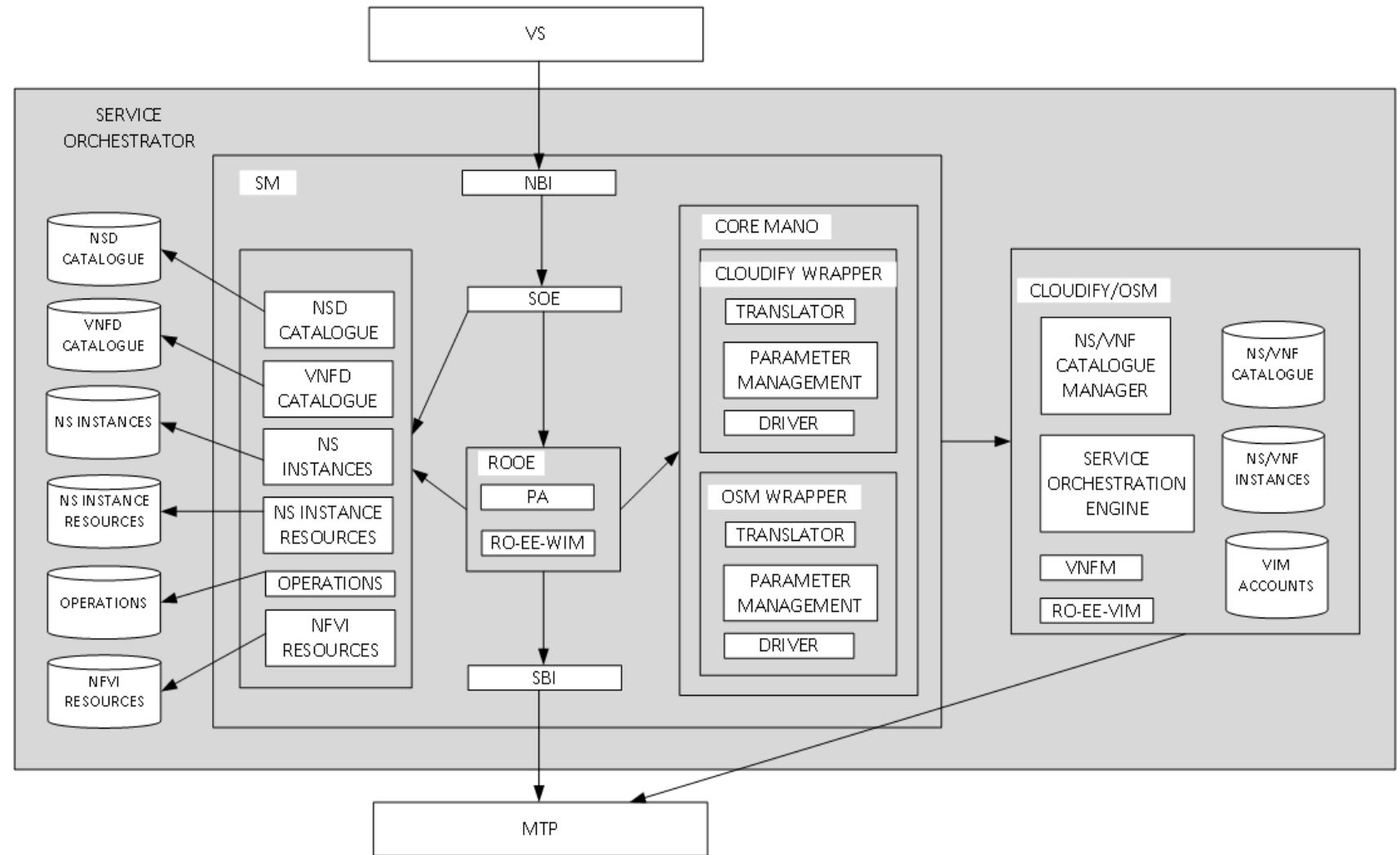
- Single / Multi-domain Orchestration
  - NFVO-NSO
  - NFVO-RO
- NFV-NS/VNF mgmt
  - Catalogue mgmt
  - NFV-NS/VNF instance DB
  - VNFM
- Resource DB & Advertisement
- Service Monitoring
- SLA mgmt
- Interfaces based on ETSI NFV Specifications
  - IFA013 NBI
  - IFA005 SBI
  - IFA013/005/006/008 E/WBI



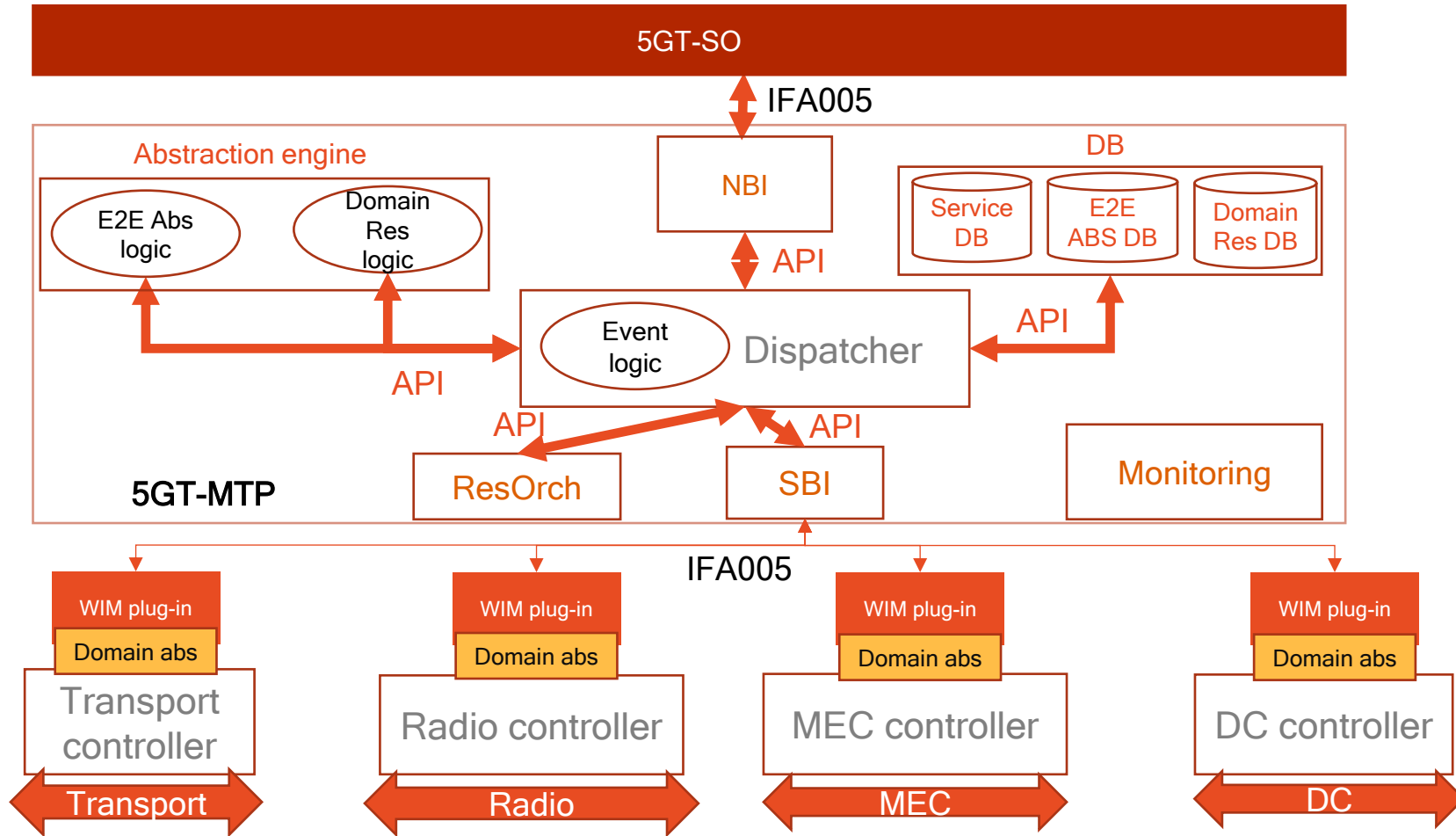
# 5GT-SO Software Architecture

We propose a module design advancing SoA orchestration approaches

- 1) Embedding several novel orchestration algorithms for dynamic selection of resources and function placement
- 2) Support of integration of heterogeneous cloud and WAN technologies
- 3) Support of various MANO platforms (e.g. OSM, Cloudify)
- 4) Support of WAN Transport to deal with different type of WAN resources allowing multi-site, multi-VIM network service deployments
- 5) Support for Federation (service / resource federation)
- 6) Support of MEC services

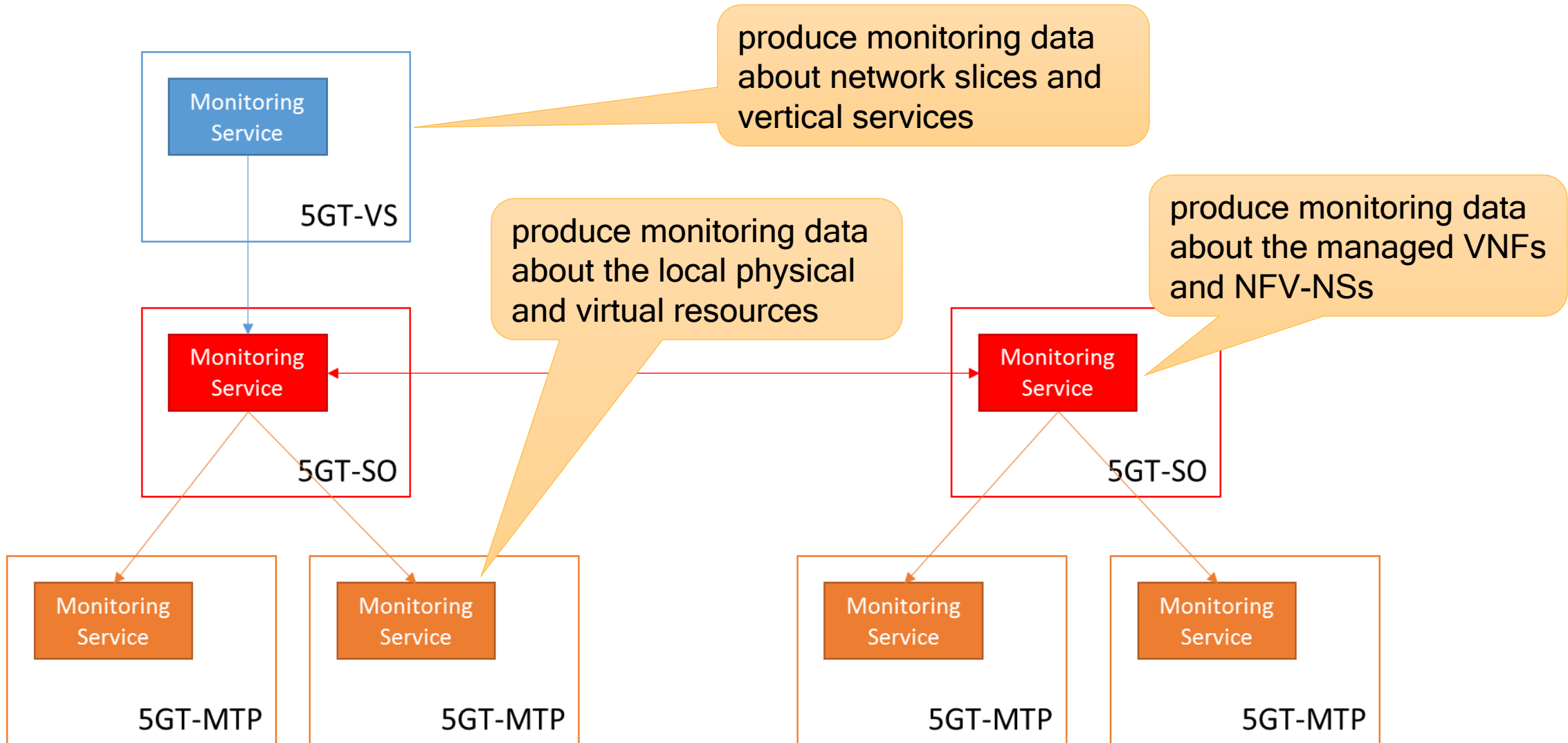


# 5GT-MTP Architecture



- Building blocks
  - Abstraction engine
  - Resource selection
  - Event logic
  - Monitoring
- API
  - IFA005 NBI
  - IFA005 SBI
- Domain plug-ins

# 5G-T Monitoring Architecture



# Summary

- The 5G-T initial system design is described in D1.2, the functional architecture design of the 5GT-VS, 5GT-SO and 5GT-MTP are reported in D2.1, D3.1 and D4.1 (<http://5g-transformer.eu/index.php/deliverables/>)
- The initial software implementation (R1) of the 5G-T platform is published as open source on github in November 2018 (<https://github.com/5g-transformer/>)
  - **Vertical Slicer Platform:** <https://github.com/5g-transformer/5gt-vs>
  - **Service Orchestrator Platform:** <https://github.com/5g-transformer/5gt-so>
  - **Mobile Transport and Computing Platform:** <https://github.com/5g-transformer/5gt-mtp>
  - **Monitoring Platform:** <https://github.com/5g-transformer/5gt-mon>
- The final software implementation (R2) of the 5G-T platform is to be delivered in End of May 2019



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# Thank you! Questions?

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