DEFENCE AND SPACE

DOMINO-X

The future standardized Earth Observation ground segment architecture

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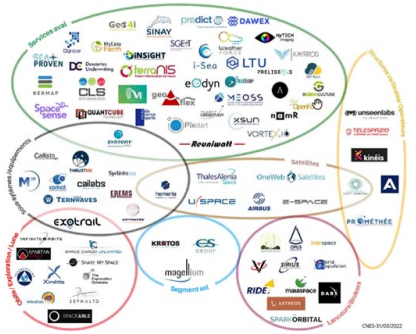
Trends for future Earth Observation Ground Systems

Technical & business trends for EO GS

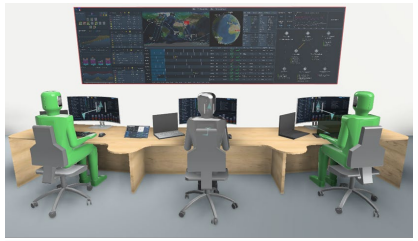
Master the complexity & variability of systems

Benefit from massive innovation from New Space

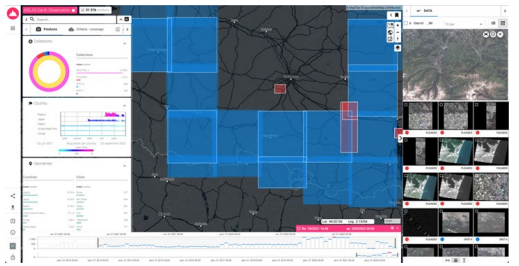


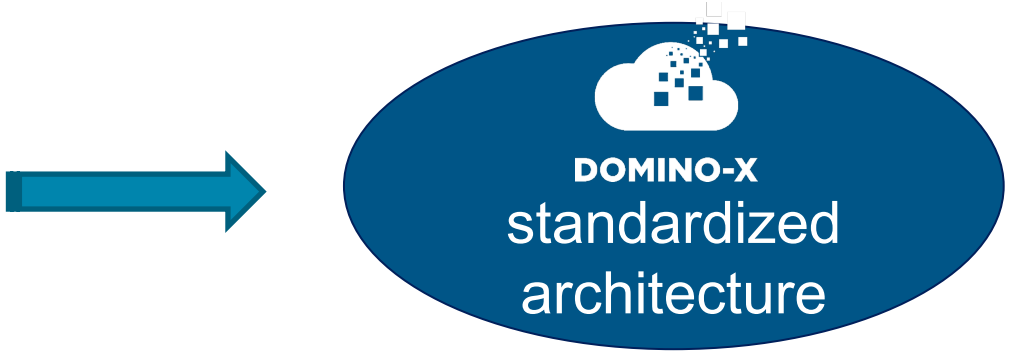
Increase competitiveness on planning & prices

Reduce CAPEX & OPEX costs



Inject awaited new features

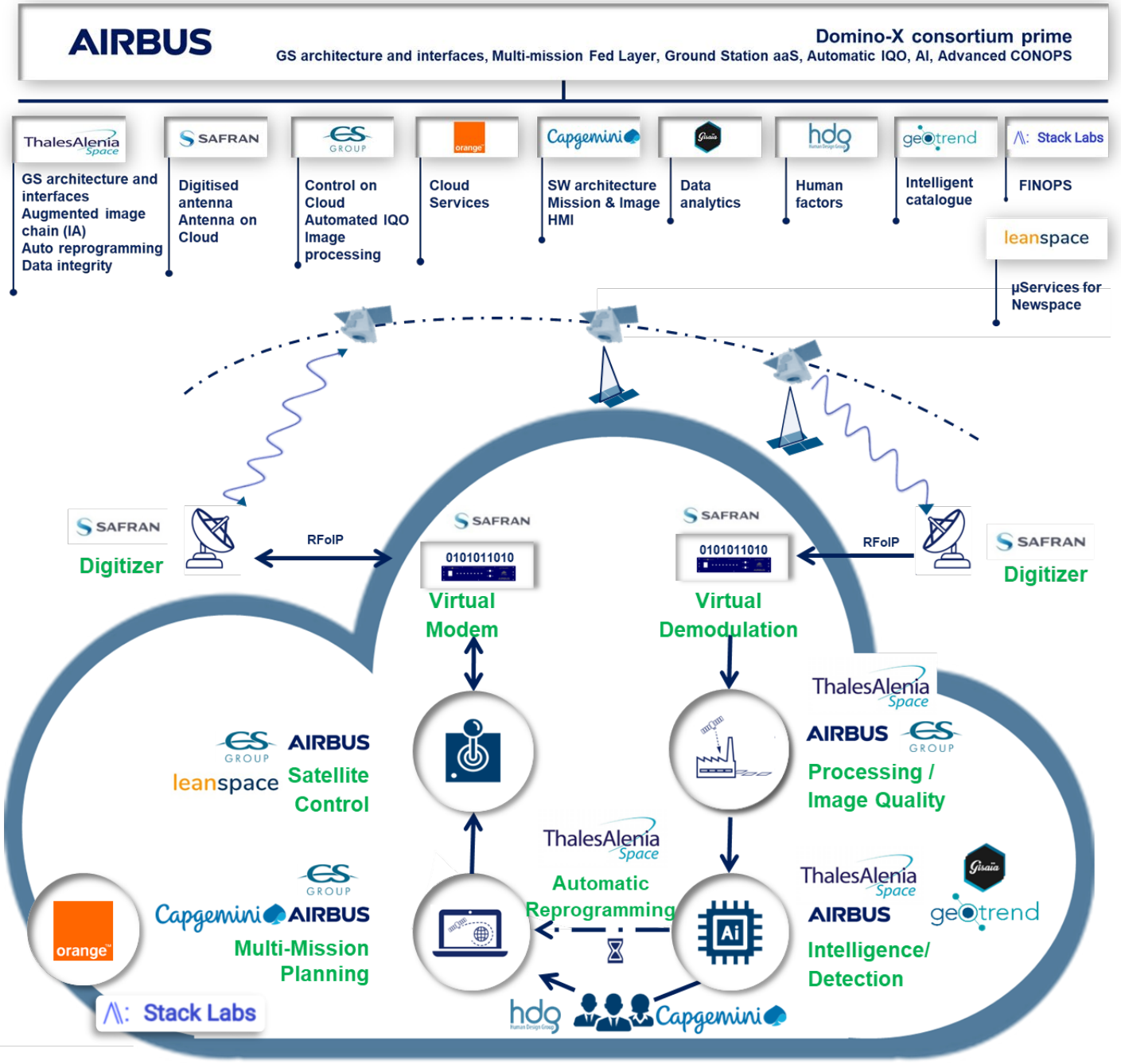




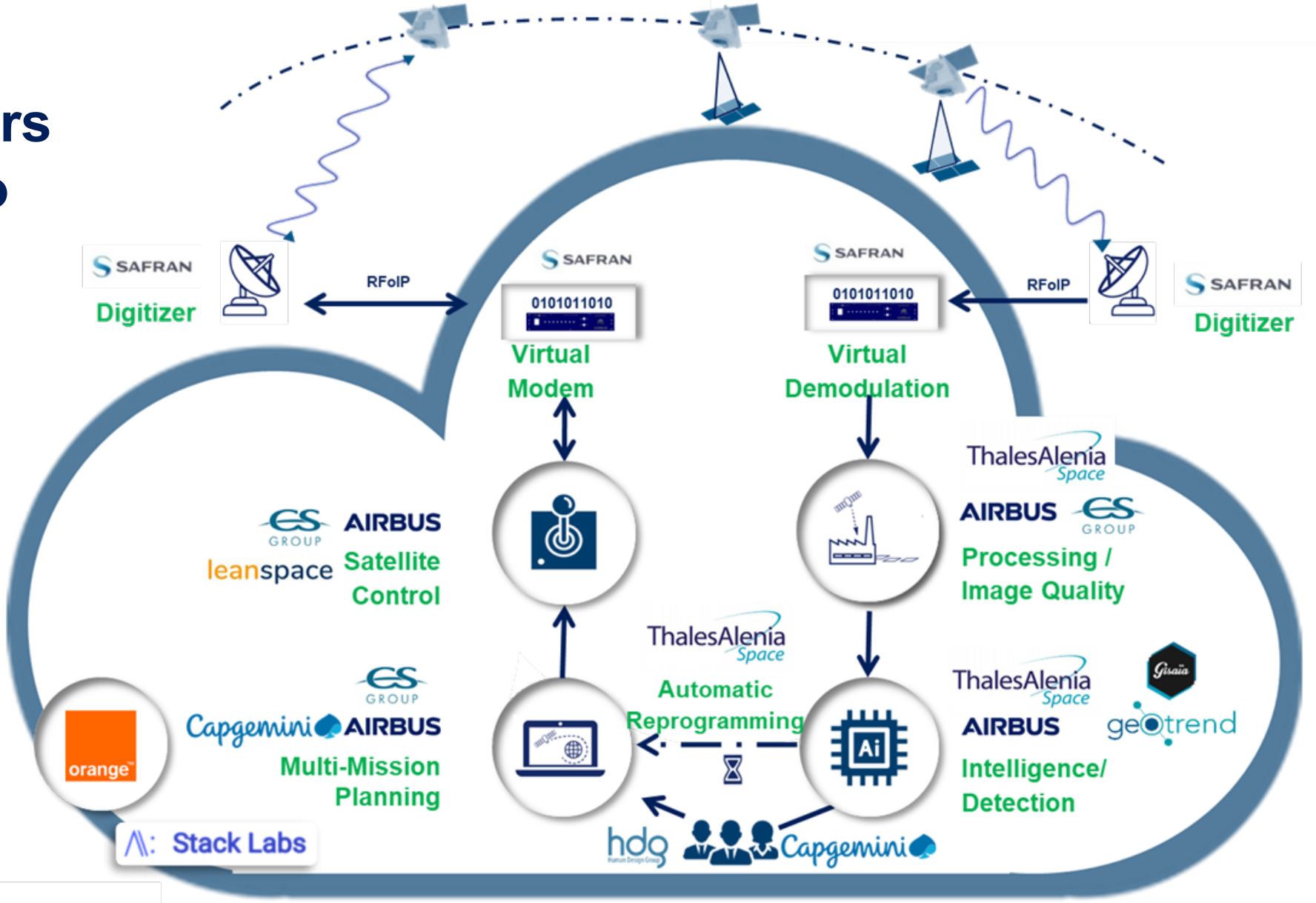
- **Standardized and public GS architecture addressing institutional, defence and export markets**
- **Covering a wide range of system use cases, including new features for increased reactivity & automation**
- **Constellation-ready**
- **Cloud-ready and IT-agnostic**
- **As a service approach whenever relevant**
- **Will to on-board space agencies & industry, facilitating the emergence of an ecosystem of Domino providers**

DOMINO-X project

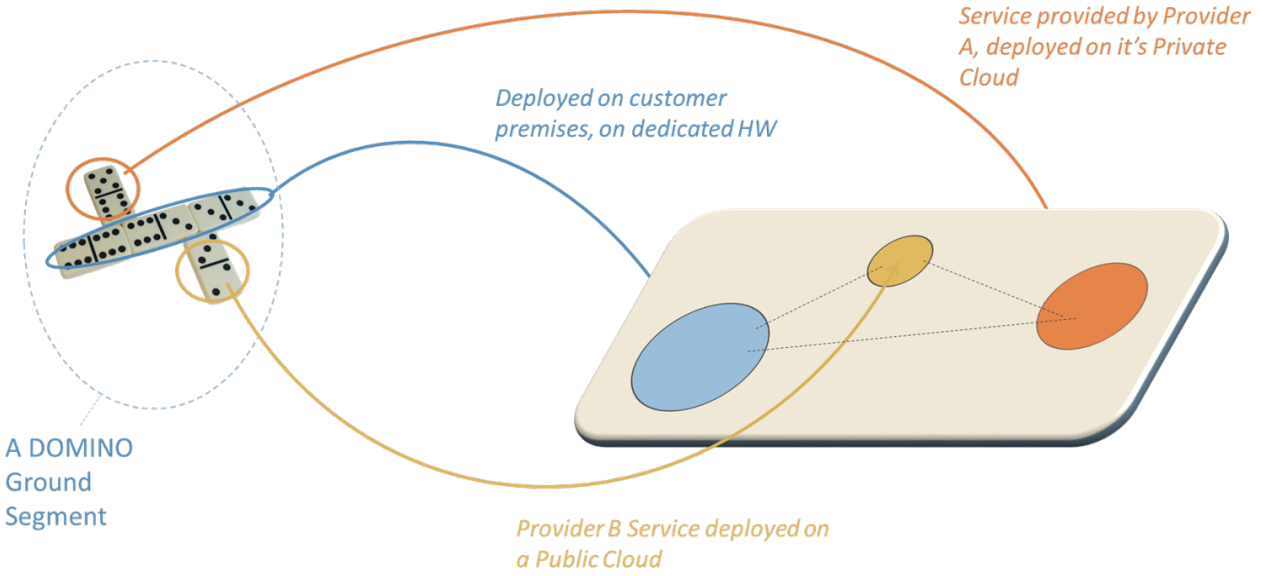
- Broad EO GS transformation project funded by France Relance program
  - 50% standard GS architecture based on “DOMINO vision” → public deliverables
  - 50% new features
    - Multi-Mission federation
    - Artificial Intelligence
    - Image enrichment with external data
    - Data integrity and trustability
    - Automated programming & image calibration
    - Ground Stations as a Service
- TRL targets = 5/6/8, depending on topic
- Target System = 2 VHR + 8 HR
- Airbus prime + 10 partners covering all parts of EO GS, and CNES as project approver



Domino-X partners & overall Domino user story



Defining Domino architecture



A domino

- Provides a valuable service useful to any EO GS
- May serve more than one mission
- Is loosely coupled with other building blocks
- Is standalone
- Is monitored
- Provides KPIs on the delivered service
- May rely on its own infrastructure, while favouring cloud readiness & IT agnosticism

➔ 24 dominoes easy to combine into a complete EO Ground Segment

➔ Building on, and extending, ESA Copernicus model

Domino Breakdown Structure (DBS) v1

Targeted deployment

- One “VHR” 2 sat constellation
- One “HR” 8 sat constellation

Domino’s perimeter

VHR HR = dedicated to an homogenous constellation

Multi = multi-mission

Domino’s instances

1 = one unique instance of this domino

n = could be many instances deployed

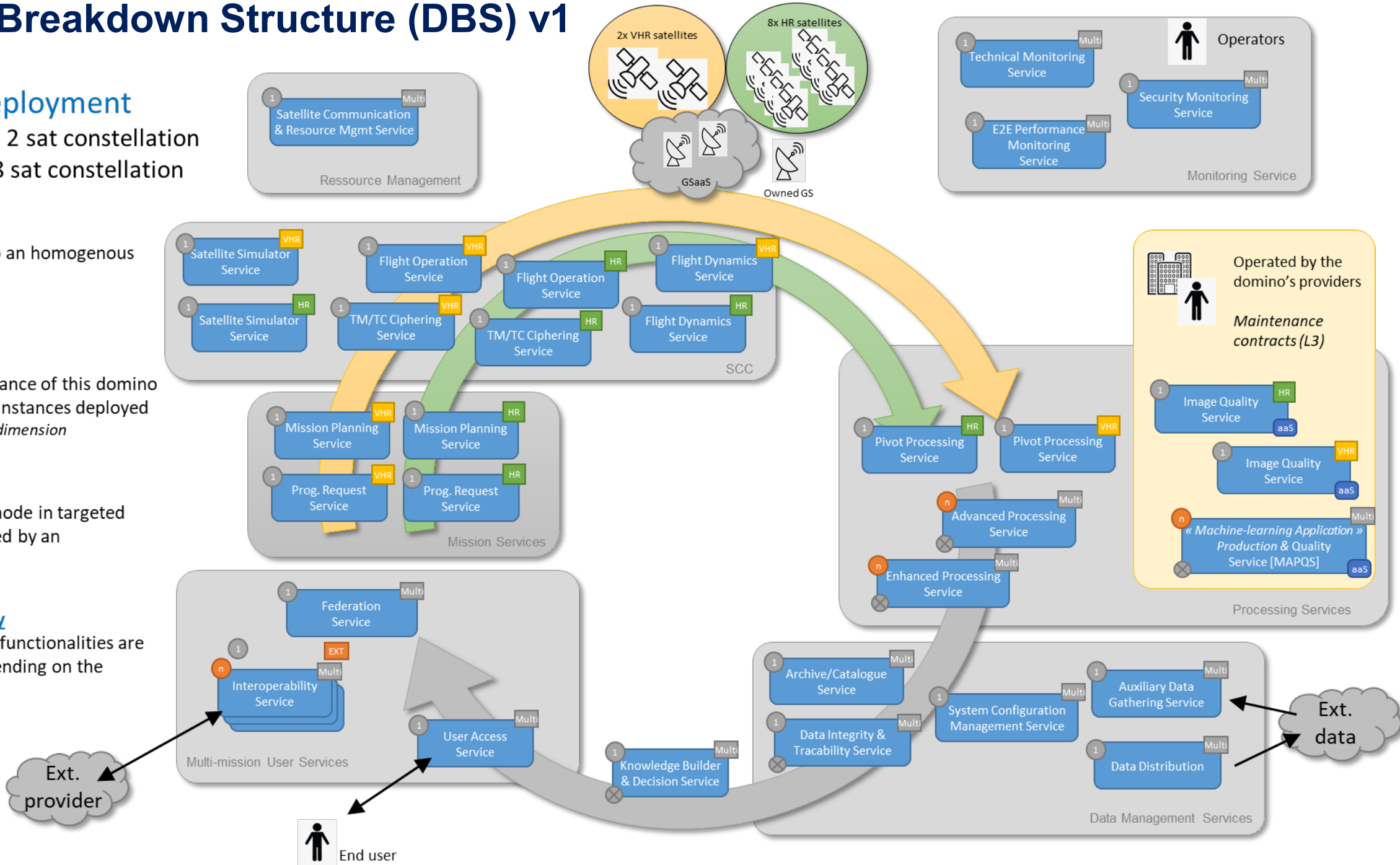
Without “redundancy” dimension

Domino’s mode

aaS = “as a service” mode in targeted deployment (operated by an industrial)

Domino’s optionality

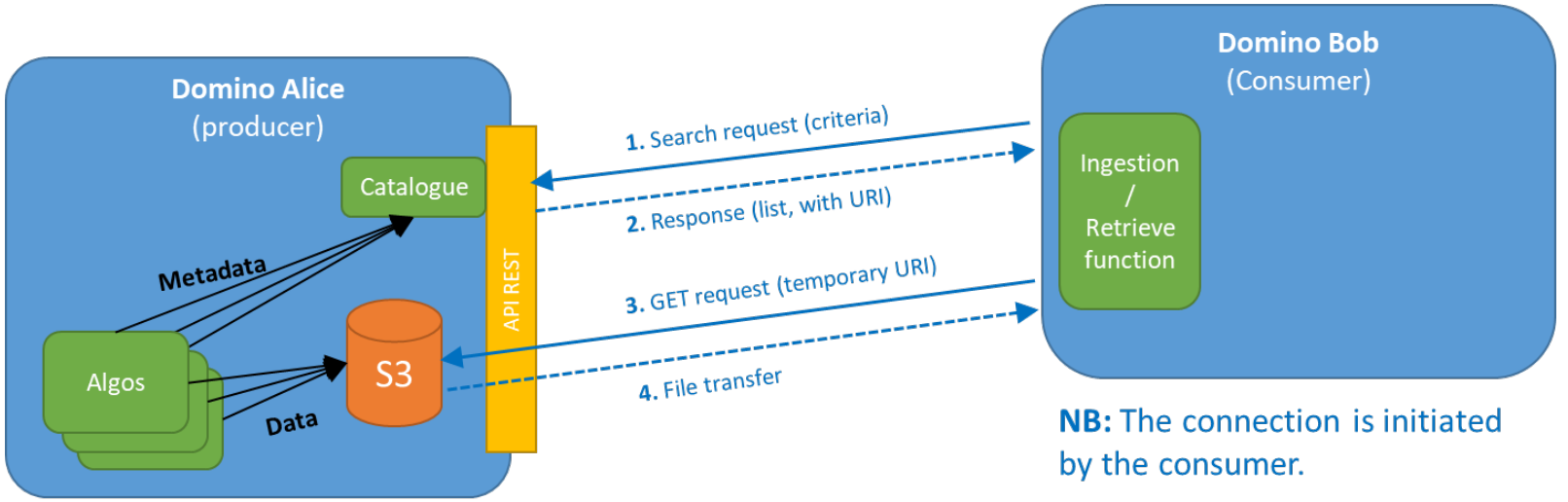
⊗ = The dominoes’ functionalities are not mandatory, depending on the needs



Guidelines for interfaces definition

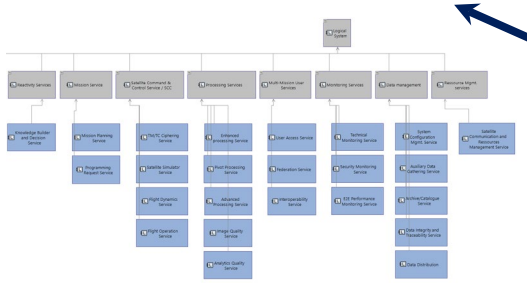
- **Mainly data-driven approach**
- **Use and extend existing standards whenever possible (eg. OGC API, ESA AUXIP…)**
- **Interfaces**
  - Webservice → guideline “API REST, https, payload JSON”
  - File Exchange → existing ESA Copernicus interface pickup points concept
- **Definition of standard image pivot level & format**

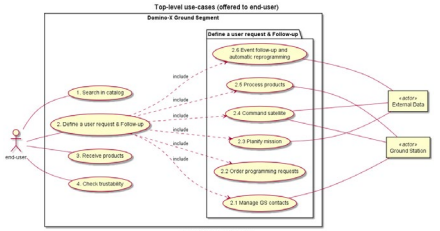
Copernicus interface pickup points



Current status on Domino architecture

DBS Domino Breakdown Structure ☑





Detailed list of System Use Cases ☑

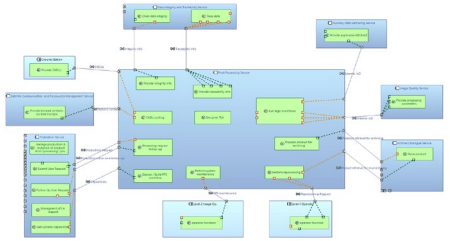
Other Dominoes pack ☐

Incremental IVV approach ☐

Domino security guidelines ☐

DOMINO-X
Architecture Dossier V1

Collaborative work with MBSE tool (Model Based System Engineering)" ☑



Cloud guidelines document for Domino makers ☑

Domino pack (detailed list of functions, external ICD) for 3 Dominoes ☑

- PPS (Pivot processing)
- FS (Federation)
- TMS (Technical Monitoring)

Conclusion : Domino in a nutshell

Master the complexity & variability of systems

- Standard & modular
- Constellation-ready + interoperability

Benefit from massive innovation

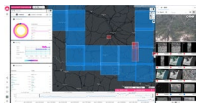
- Standardisation of processing API

DOMINO-X
standardized architecture

Reduce CAPEX & OPEX costs

- As a service approach
- Public & hybrid cloud
- Automation for operations

New features



- Reactivity and performance through mission & image automation
- GSaaS
- Data integrity and trustability

Increase competitiveness on planning & prices

- Established set of Dominoes
- Ecosystem of component & service providers

Conclusion : Domino in a nutshell

Contributions or sponsoring from space institutions & industry are welcome… and needed !

Let’s get on board with the Domino team

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