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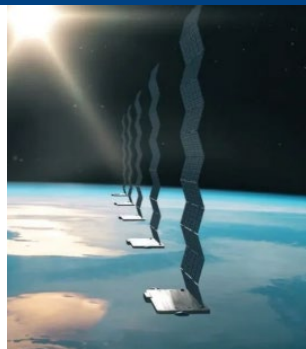
FOR A SAFER WORLD

Frequentis & ESA Projects

IRIS²



Frequentis at a glance: for a safer world!

Drivers of growth

Mobility

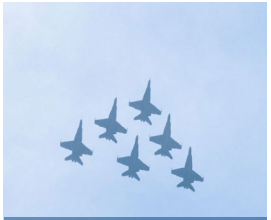
Technology

Safety and security

Air Traffic Management

Civil

- Civil air traffic control
- Flight information services
- Airports



Defence

- Military air traffic control
- Homeland Security Organisations

Public Safety and Transport

Public Safety

- Police
- Fire brigade
- Rescue services

Public Transport

- Railways
- Public and local passenger transport

Maritime

- Coastguard / Navy
- Harbour operators
- Search & rescue services

Global provider of communication and information solutions for safety-critical applications

Technological leadership through close cooperation with customers and ongoing product development

Examples of long-term customer relationships:

German Air Traffic Control

Federal Aviation Administration

National Aeronautics and Space Administration

London MET Police

Swiss Federal Railways

Canadian Coast Guard

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Control room solutions and reliable data-links for the remote management of automated vehicle fleets

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The Need for Control Rooms in Automated Vehicles

Autonomous driving on public roads will become a reality.

- Until recently: assumption that vehicles will manage themselves
- First pilots hit public roads: the mindset of the industry changed and the **operations processes for automated robots driving on public roads** have become a topic.
- High technical complexity: early versions of automated vehicles are expected to demand **close monitoring** and **frequent remote intervention.**
- As the products will evolve and need less support, the **numbers of operational vehicles will increase**
  - creating a permanent demand for **professional dispatching, monitoring and incident/exception-handling** of the vehicle fleets.

Picture: with friendly support from MAN Truck and Bus

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The potential “first-wave” clients and their pain

Market drivers: transfer hub and public transportation

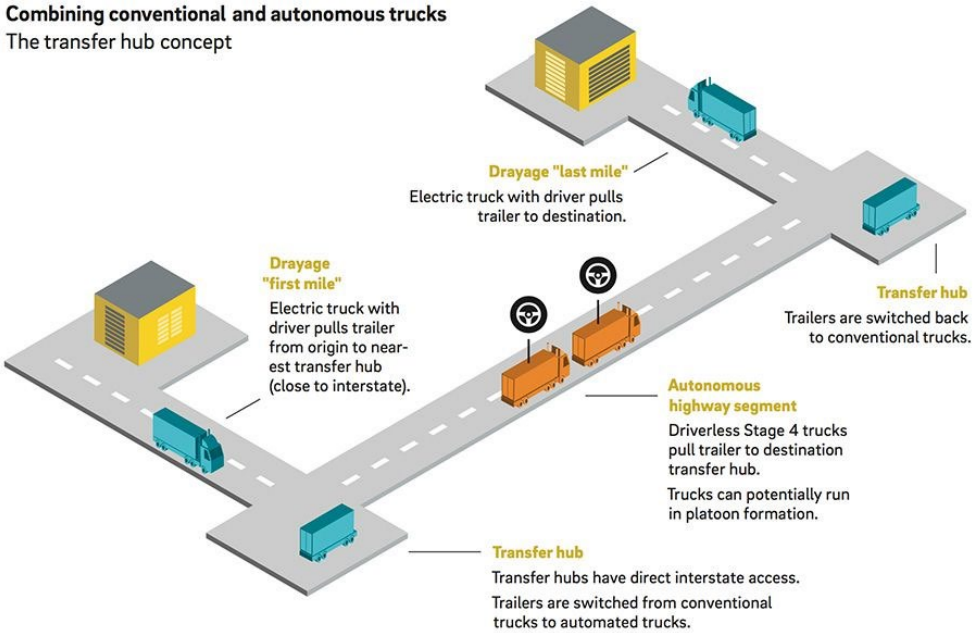
- easier implementation
- high demand from **logistic companies** and **truck manufacturers** as prime customers (dependent on working end-to-end concepts)
- looking for partners that help **defining the operational processes** and provide **technical solutions for the management of the truck fleets** under real world conditions.

.

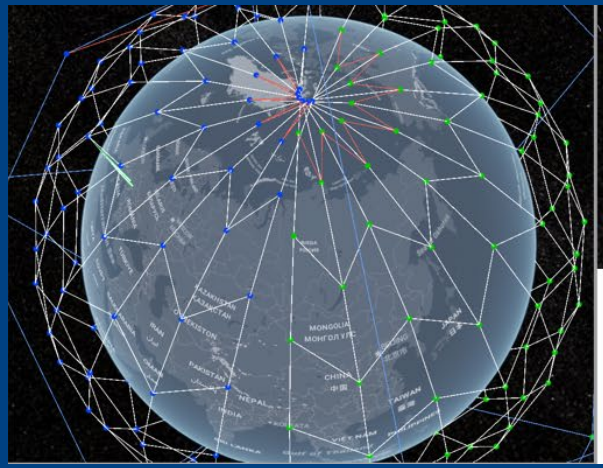
Public Road Authorities claimed that they will need **monitoring solutions to keep track of the automated vehicles on their road network for safety reasons**

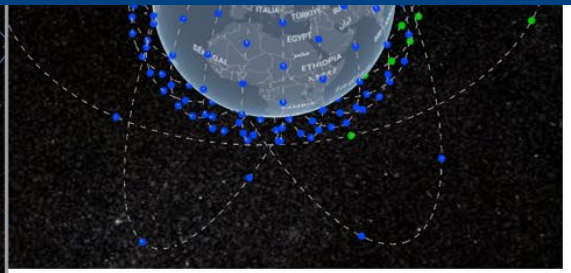
Robust data-links as another **essential key technology to maintain connectivity between the moving trucks and the control room**.

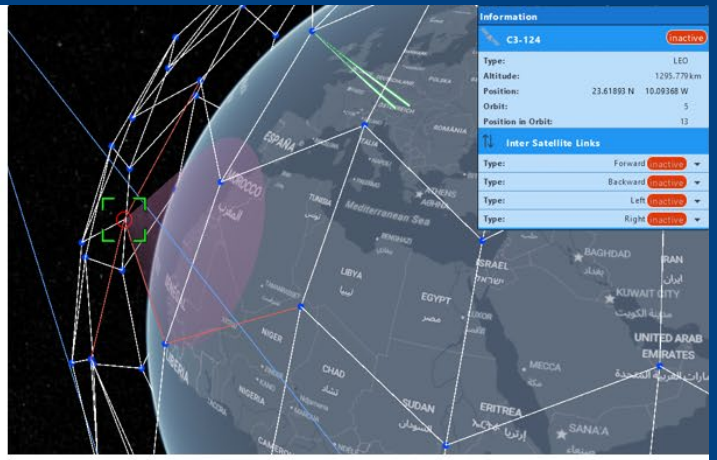
- Significant bandwidth
- low latency connections are needed to gain situational awareness during incidents



Source: https://www.consultancy.eu/news/1970/trends-in-trucking-self-driving-trucks-electrification-and-digitalisation







Frequentis and Iris²

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Frequentis Services in IRIS^2

- Frequentis provides Mission Critical services in an integrated terrestrial non-terrestrial environment (TN/NTN).
- ESA awarded Frequentis with the delivery of a 5G TN/NTN Benchmark, Network Level Simulator Tools (NLST), enabling the Agency to verify the candidate architectures for IRIS^2
- Frequentis Space can grow in downstream segment both as:
  - 1) Secure Mission Critical Service provider
  - 2) 6G TN/NTN Ground Gateway supplier

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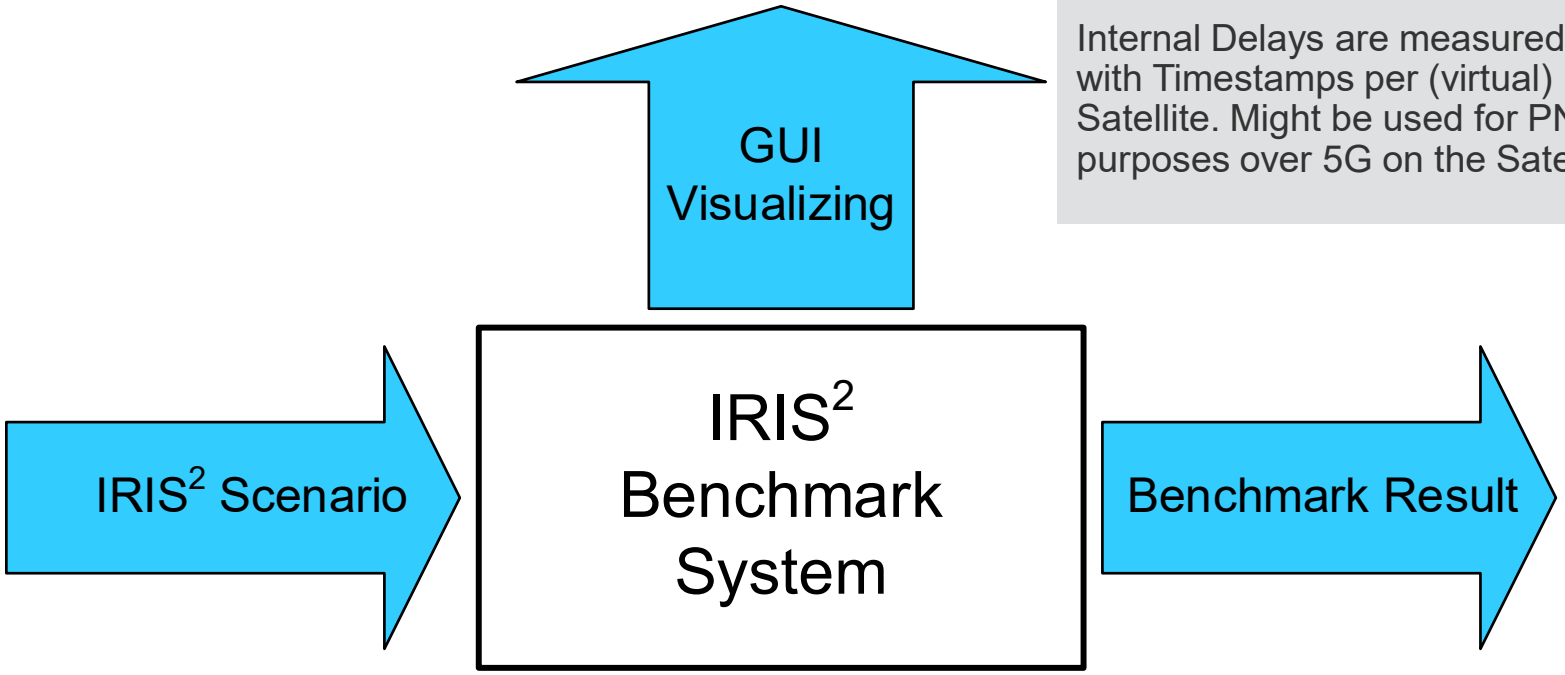
IRIS² NLST Black Box View



Internal Delays are measured with Timestamps per (virtual) Satellite. Might be used for PNT purposes over 5G on the Satellite

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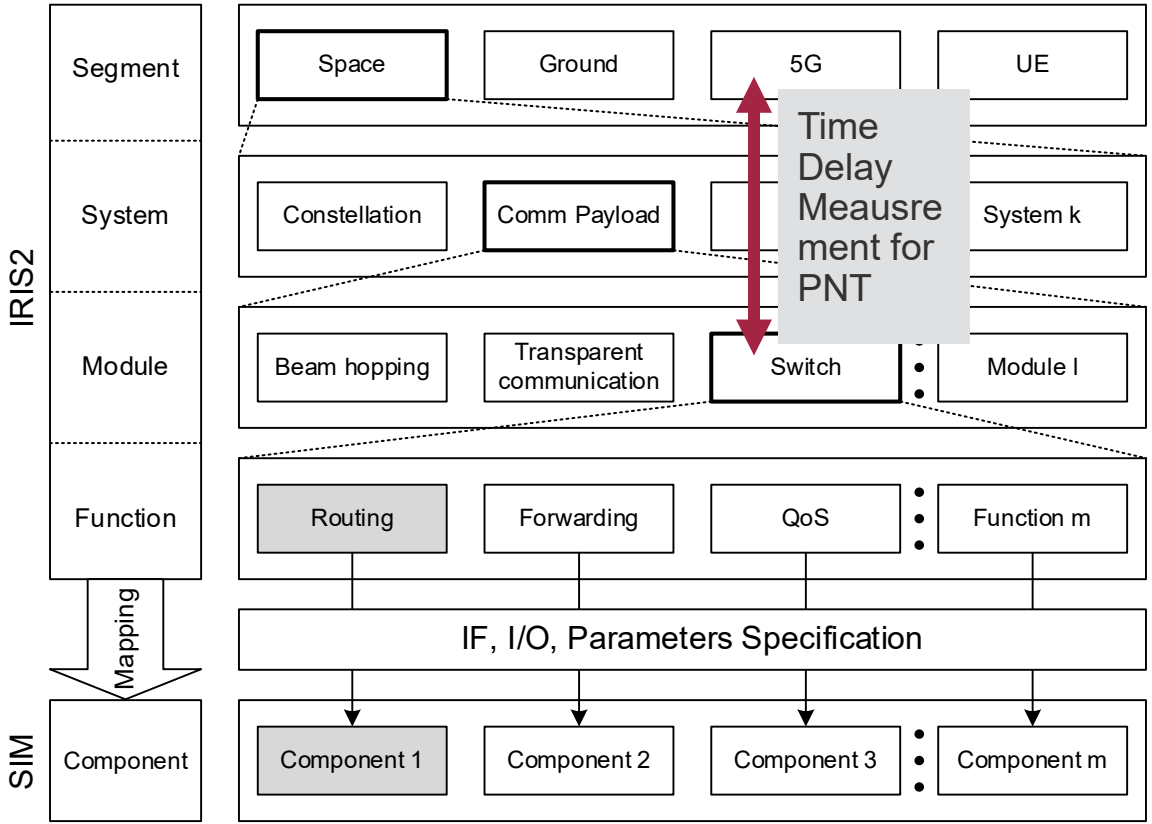
NLST Simulator Hierarchal Modular Design

- IRIS2 encompasses:
  - Space Segment
  - Ground Segment
  - 5GS
  - User Equipment

- Each Component is identified by a Component ID:

  SP.02.03.04 Beam Hopping
  5G.02.02.01 N3IWF



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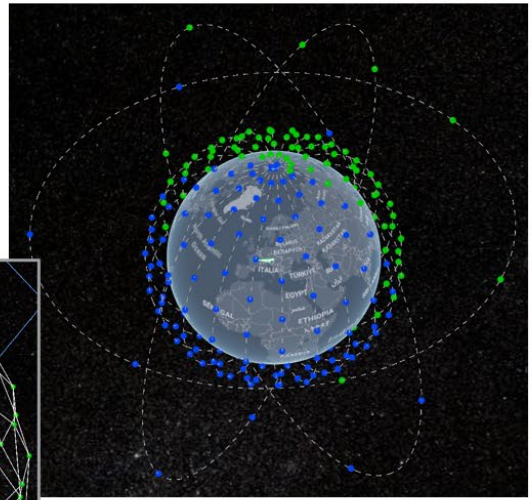
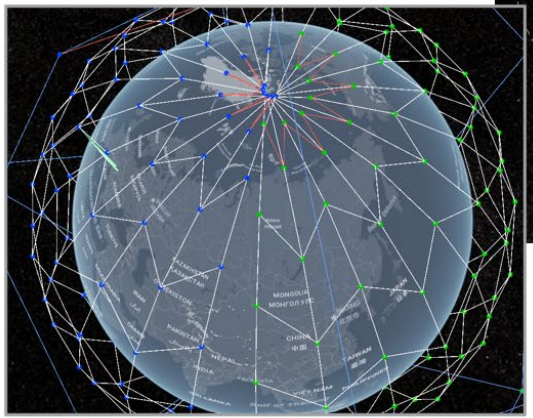
NLST Overview

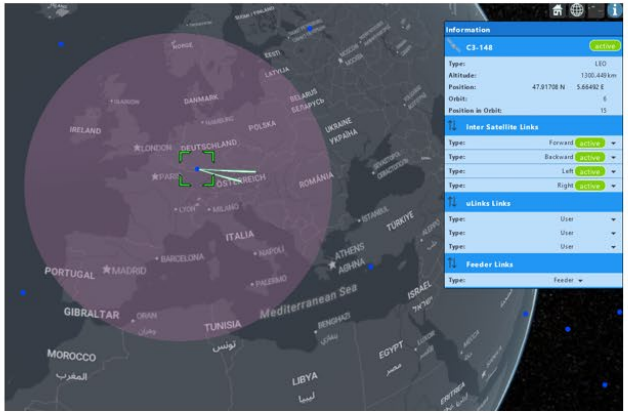
Using NLST (3)

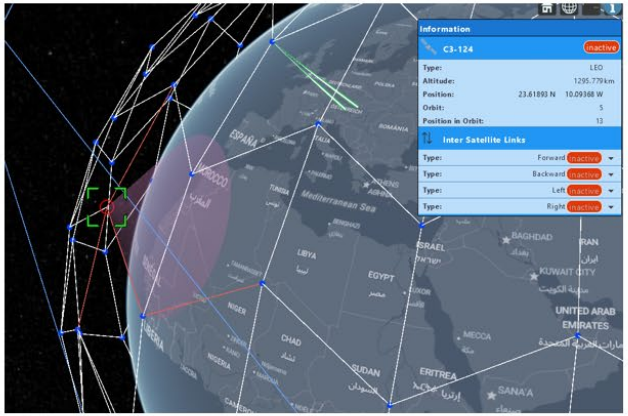
NLST-Viewer (NVIEW)

- Web based
- Visualization of current constellation state
- Automatically updated as simulation runs
- Intercative control (e.g., disable a satellite or link)









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Closing Remarks

- Could a Network like IRIS² be used to improve/Support Positioning?
- Can Communication Links be a backup in Postioning if main spoofed?

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