→ BALTIC FROM SPACE WORKSHOP

29–31 March 2017 | Helsinki, Finland

European Space Agency

EO and National Geospatial Data handling and exploitation

Kęstutis Papšys, PhD

Spatial Research and Technology Chief Officer

SE „GIS-Centras", Vilnius, Lithuania

k.papsys@gis-centras.lt

esa

EO and „another" Geospatial data always was different but heavily dependent.

- Sometimes differs by data model (raster and vector).
- Sometimes differs by processing methods.
- Sometimes differences are in software.
- Sometimes differences are in institutions.
- Other sometimes…

European Space Agency

But there always was idea and it is crystal clear now that to use EO and „another" Geospatial data together is absolutely essential

- The combining different data layers is basis of most powerful technology for supporting of decision making known today. It is essential to GIS.
- Vector, raster, images, 3D data, network data and more.
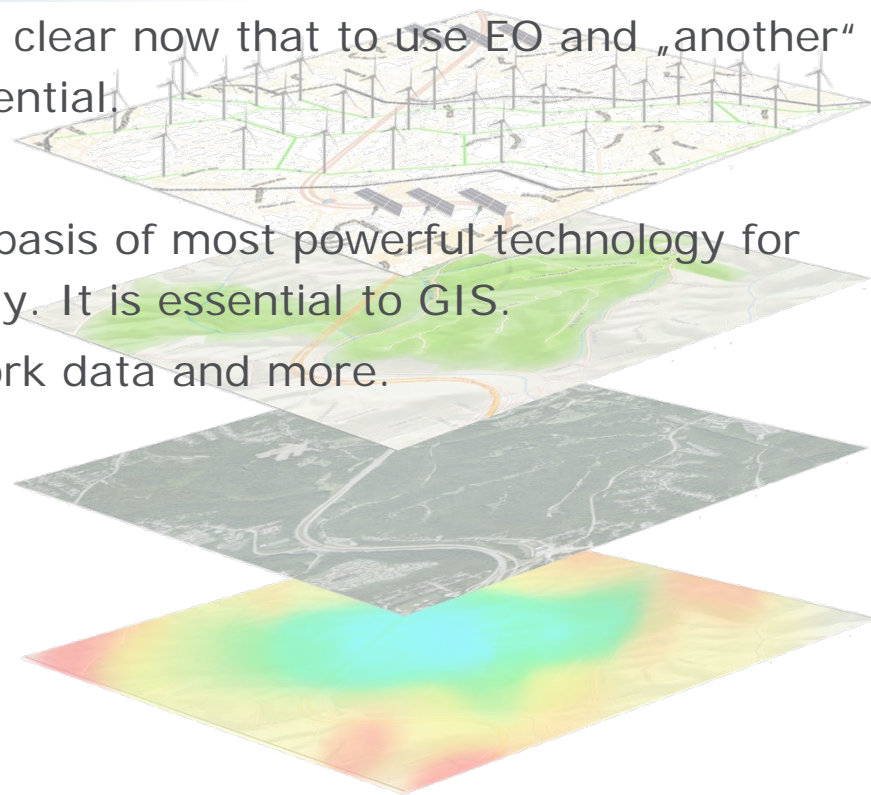
Why there are difficulties to use data together till now?

The awareness of potential users of EO data is not very high.

The price of data

Data availability and accessibility

Computer calculation power

Organizational issues

European Space Agency

How is it possible to elevate the idea of using EO and „another" Geospatial data together?

• Awareness of potential users must be raised.

• Today we have very good source of EO data free of charge it is Copernicus data from sentinel satellites.

• A lot of state enterprises which manages data disseminate it free of charge as well.

• For data availability and accessibility, computes calculation power and organizational – management issues can be solved as it done with NSDI cases.

European Space Agency

There is huge potential in this synergy of two data types.

•	It is possible to mashup EO data with road, insolation and cadaster data for finding the best places for different type of agricultures.

•	Also it is possible to combine EO daily basis monitoring with river water quality data to find interesting dependencies.

•	Etc. Etc.
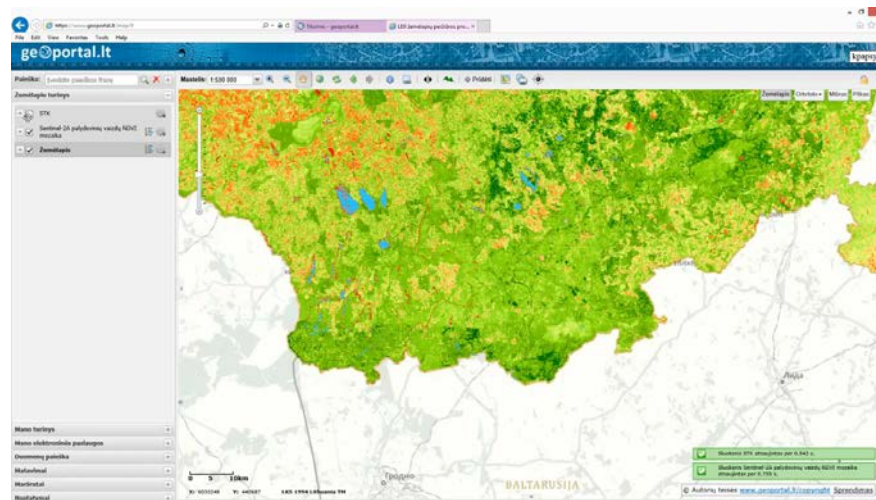
Today there is very favorable condition regarding to geospatial data.

- There are a lot of public, actual and high quality data. (Lithuanian situation)
- And also we have huge amount of Sentinels data which are supplemented on every day basis.
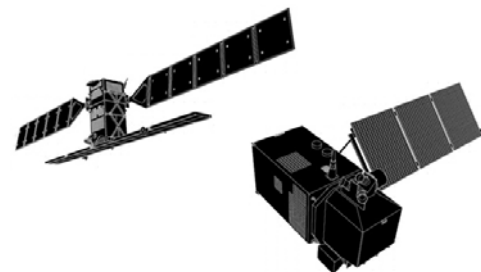
Lithuanian NSDI & geoportal

Copernicus Programme Sentinel satellite data
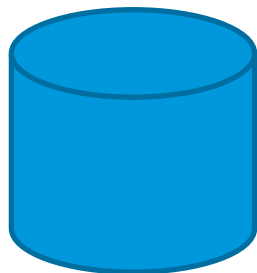
Free of charge data

Free of charge data

European Space Agency

The situation about hardware.

- If you build new system you must build it from scratch (server room, infrastructure, servers, internet providers, software, applications, Data storages)

- If you update existed system you must only enrich it with calculation power and place for data storage.
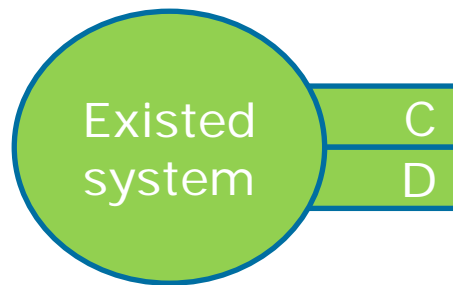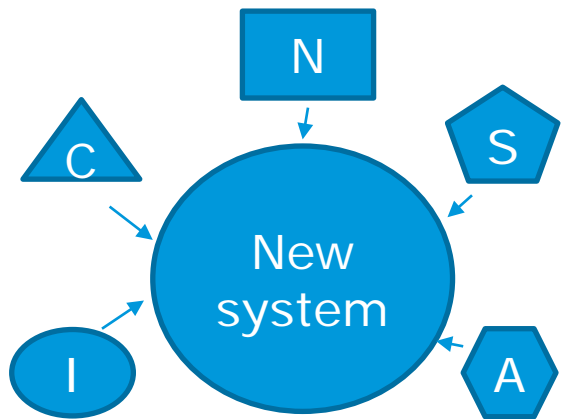
Organizational issues

Different data types different responsible organizations

- Ministry of Economy (responsible for Lithuanian space program)
- Ministry of Agriculture (manager of NSDI and owner of different datasets)
- Ministry of Transport, Environment etc. (owners of different datasets)
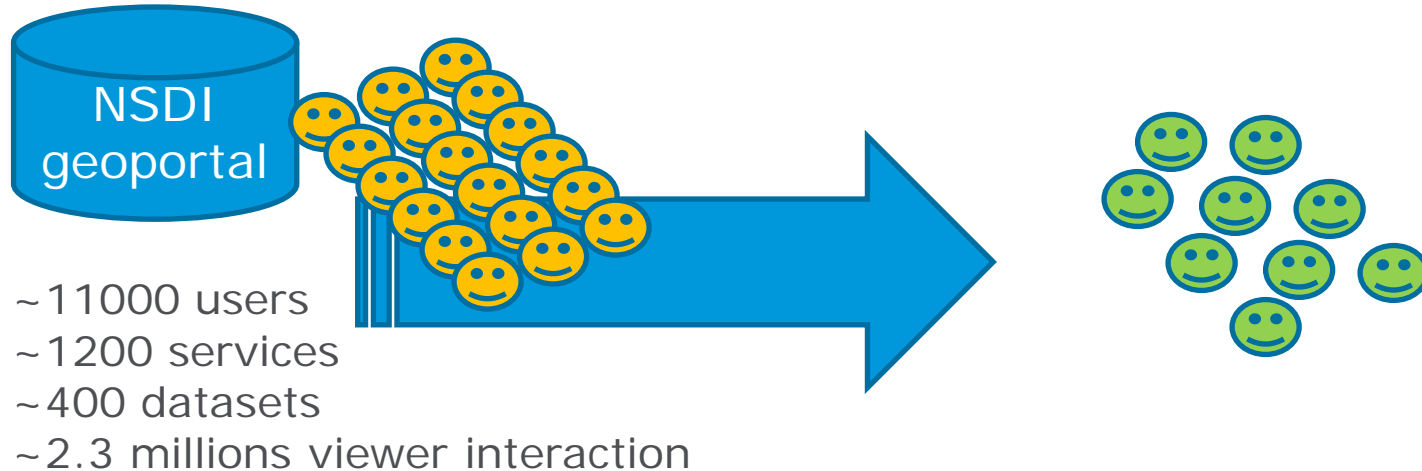- Ministry of Justice (manager of real estate cadaster information)

Who will pay for the wedding?

- How many will cost to connect two systems - Sentinels data and NSDI (in our case)

- How many will cost data processing environment and processed data storage.

- Expenditures of user training

- Cost of maintenance.

European Space Agency

And the last but not least - the users

- It is needed to rise awareness of using EO

- They are coming as NSDI users

NSDI geoportal

~11000 users
~1200 services
~400 datasets
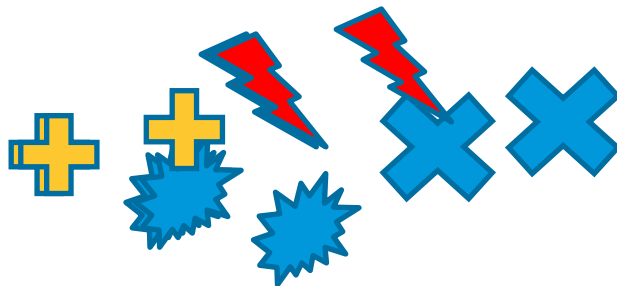~2.3 millions viewer interaction

European Space Agency

So lets do it.

- First we need technological chain to build smooth resource (data) flowing from Sentinels satellites to NSDI end-user .

- To Design, Develop and Test it.

Sentinels data
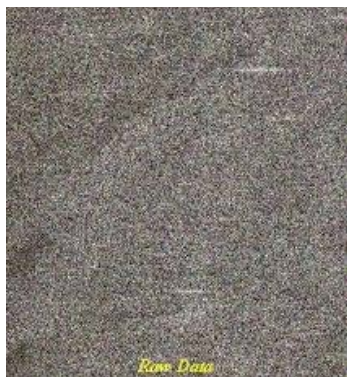
ETL +

NSDI geoportal
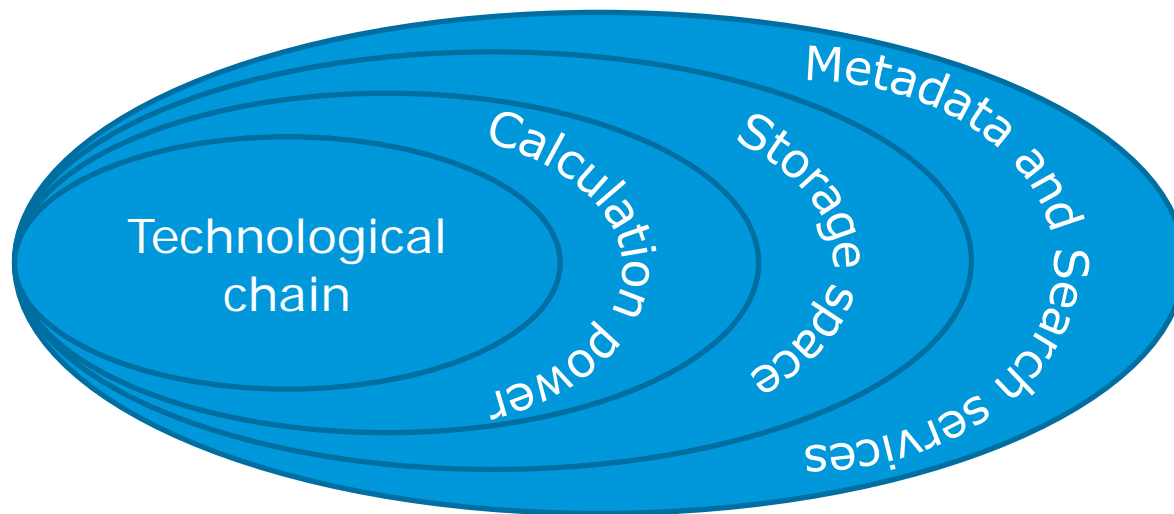algorithms, data, maps

European Space Agency

Next step - we want to grow

We need dedicated calculation power

We need space to store products

We need integrated with NSDI and European Metadata and Search services.

Then users must be aware how to use this new products

- Specialized courses for target groups must be organized

- Awareness must be raised in parallel with evolution of EO and „another"
Geospatial data system

- User will be spatial aware if the existed NSDI will be used

Fist stage

Second stage

Third stage

User EO awareness rising steps

European Space Agency
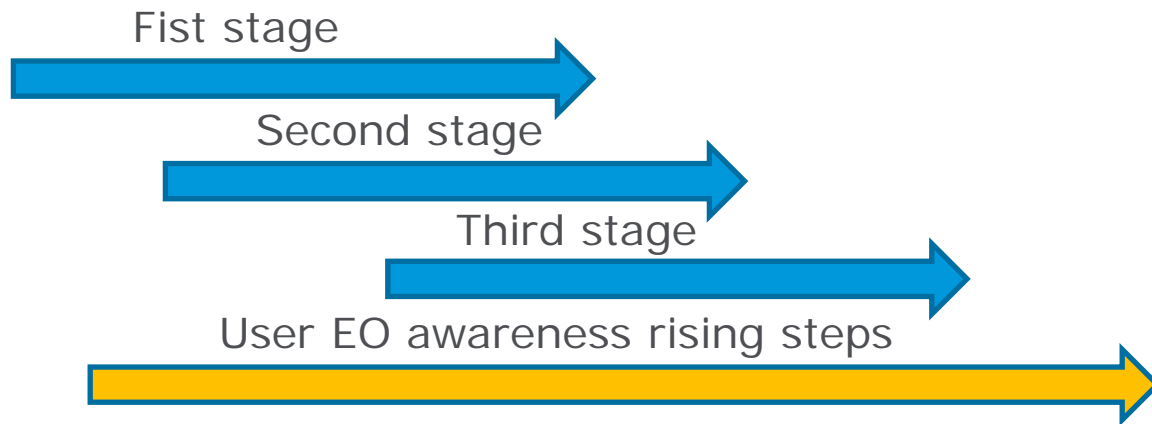
For full integration we will try to do steps of creating new **A**erospace **D**ata And Ser**v**ices Management **I**nformation **S**yst**e**m ADVISE (AKIS) system.

- Ministry of Economics (responsible of Lithuanian space program) and Ministry of Agriculture manager of Lithuanian NSDI have an idea to create specialized state information system

- Fully integrated into excited operational NSDI with geoportal as user single access point.

NSDI geoportal

ADVISE (AKIS)

European Space Agency
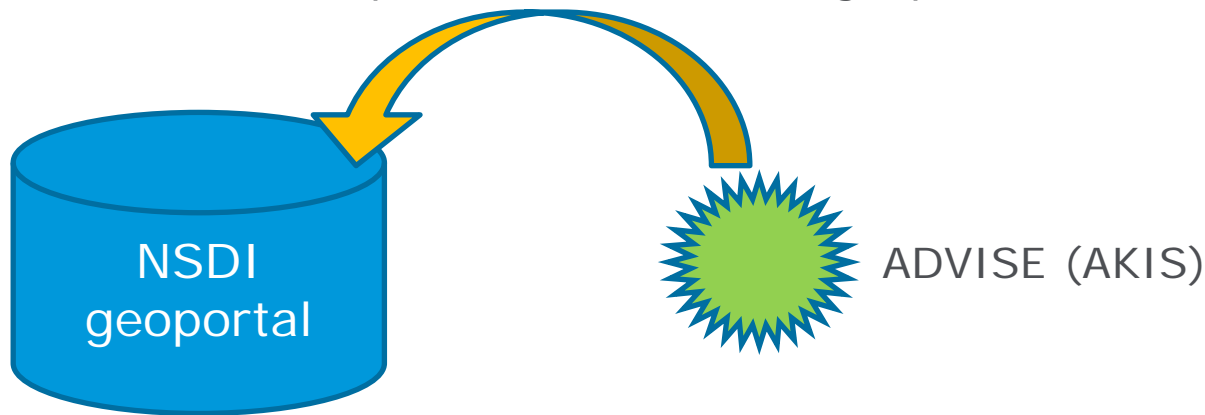
The final task is full geoportal.lt (portal of NSDI) business model applied to EO products.

- With data processing algorithms as products

- With data as products

- With mashups maps as products

- With possibilities to serve every product to public free of charge or using sophisticated cost models (per area, per click, etc…)

Management tier

ADPVIS (ADVISE) manager — Coordination Council

Operational tier

ADPVIS (ADVISE) operator

Technological platform

Usage tier

ADPVIS (ADVISE) users

Users suppliers — Users receivers
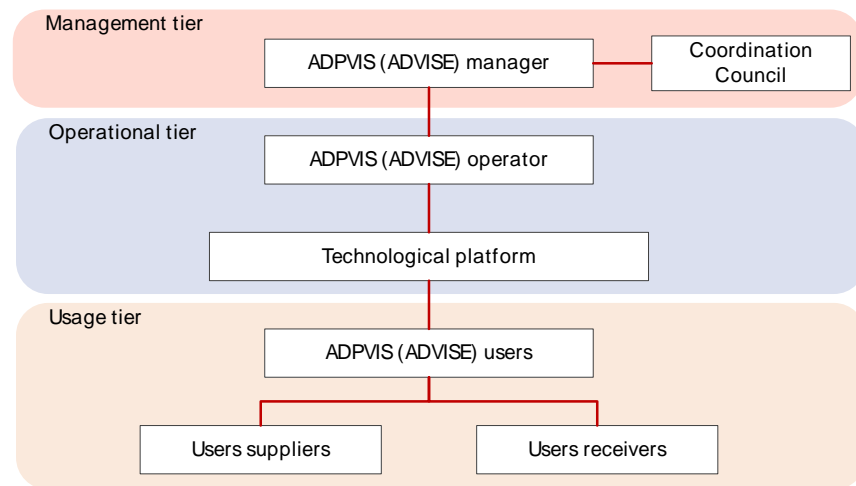
All other satellite data integration

- The first steps of system is oriented to Sentinels data
- Next steps of course integrate all possible satellite data for state territory

RADARSAT Pleiades CryoSat Proba Landsat SPOT JERS RapidEye Swarm Aura WorldView IRS Sentinels ALOS DMC Envisat Deimos SMOS KOMPSAT GRACE GOSAT Ikonos QuickSCAT SciSat Ocaensat Odin MetOp Meteosat SeaSat TerraSAR-X
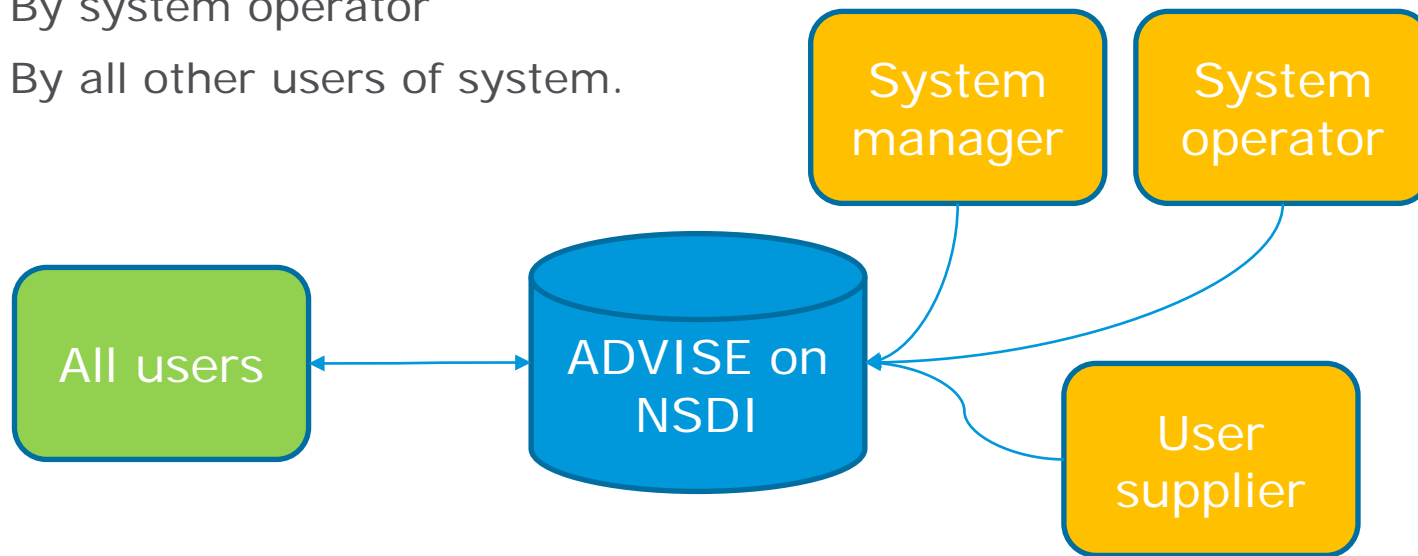
European Space Agency

Possibilities of integration of commercial satellites data

- The main problem with commercial satellites data is multiply paying for the same data.

- Licensing changes?

European Space Agency

New applications

- New applications can be implemented in to the system
- By system manager request
- By system operator
- By all other users of system.

Possible differences in neighborhood countries.

- Can be different rules of data accessibility

- Different data managers

- The level of NSDI and presence of single access point – geoportal

- Different users awareness

European Space Agency

Lithuanian EO NSDI synthetic system as node of BalticRegional Earth Observation Exploitation Platform.

- National node of access
- Collaboration trough the single land page
- Issues of integration
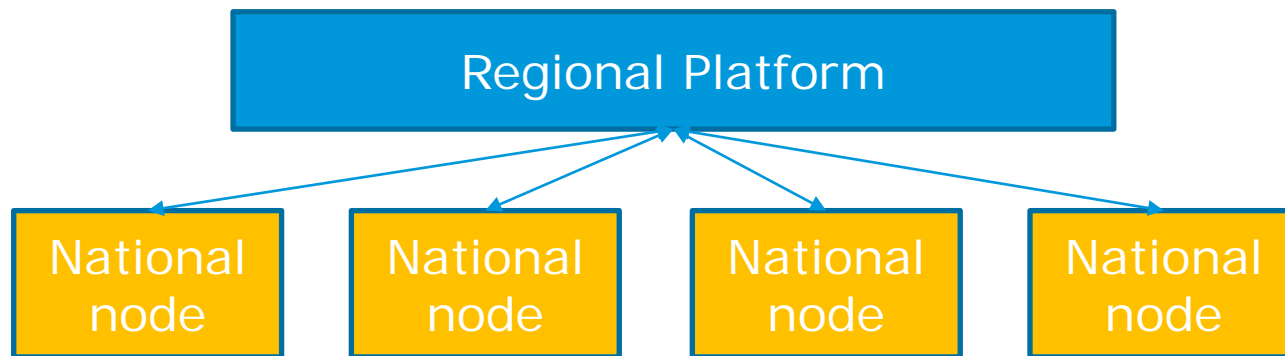
Insights

- EO and „another" Geospatial data must be seen as one for end-users.

- There is good situation to mashup EO and „another" Geospatial data.

- The support for this kind of operation must be done by using existed NSDI infrastructures.

- The same model for faster implementation can be used in higher structural levels.

"The journey of a thousand miles begins with one step"

Lao Tzu

European Space Agency