Trusted Sharing of Big Data Assets in Industrial context

ON*Vector workshop Feb 23st 2017
Calit2/QI at UC San Diego

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Science Officer
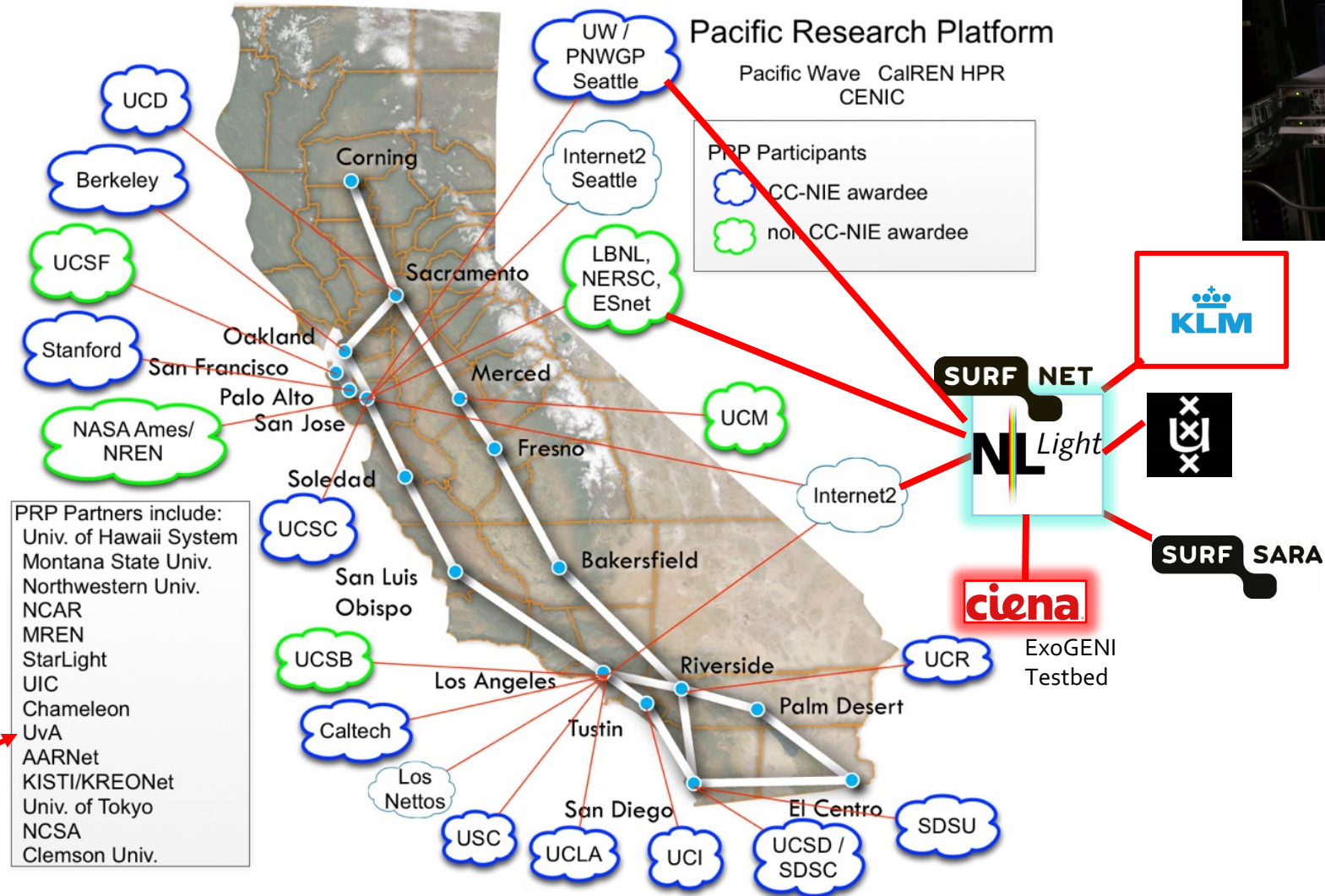
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UvA/KLM and Pacific Research Platform Testbed

Research goal:
Explore value of academic network research enabling big data sharing

Thanks to UvA, SURFnet and Ciena

ExoGENI Testbed

PRP Partners include:
Univ. of Hawaii System
Montana State Univ.
Northwestern Univ.
NCAR
MREN
StarLight
UIC
Chameleon
UvA
AARNet
KISTI/KREONet
Univ. of Tokyo
NCSA
Clemson Univ.

Pacific Research Platform
Pacific Wave CalREN HPR CENIC

PRP Participants
CC-NIE awardee
non CC-NIE awardee

Note: this diagram represents a subset of sites and connections.

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Researching Big Data Sharing: KLM Use Cases

Global Scale

National Scale

City / regional Scale

Campus / Enterprise Scale

Aircraft MRO
NWO/STW CIMPLO project

Cybersecurity
NWO COMMIT/
SARNET project

Logistics
Data sharing
NLIP iShare project
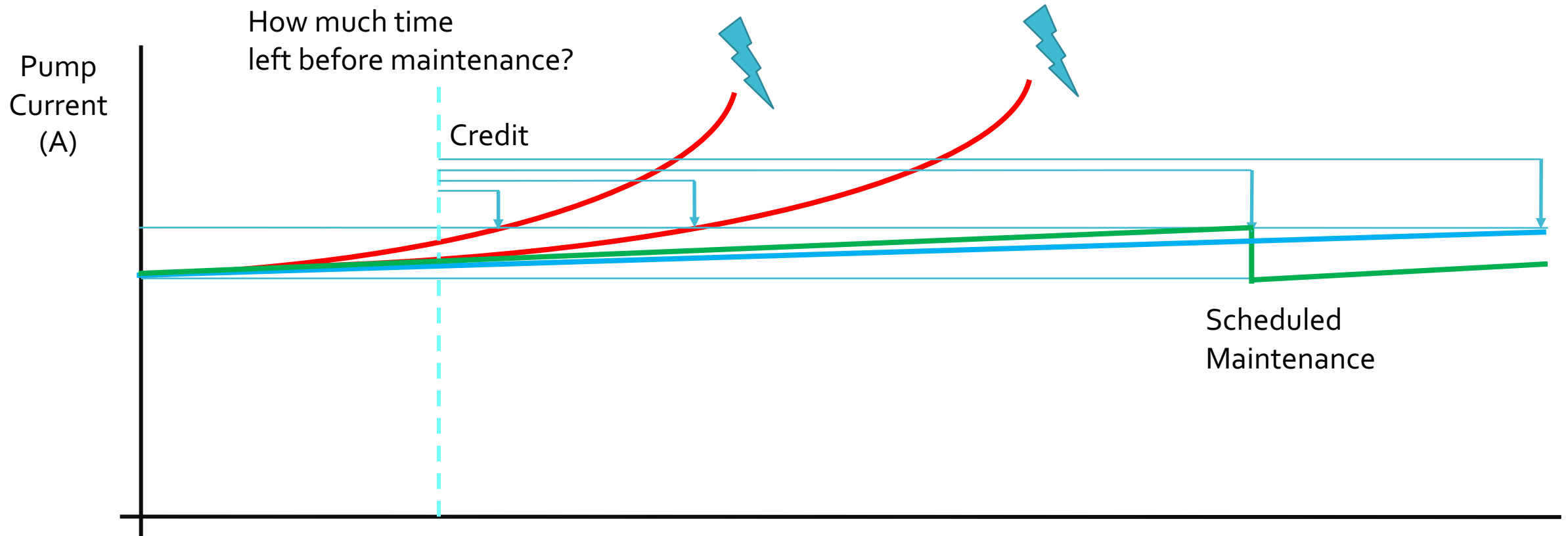
Passenger Flows

Passenger Experience

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Smart Industry example: Maintenance credit system

- **System needs evidence collected from monitored components: implies big data sharing across equipment operators.**
- **In aviation it also means: safety authorities (FAA, EASA,..) must approve.**

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Problem: Big Data Sharing in B2B environments
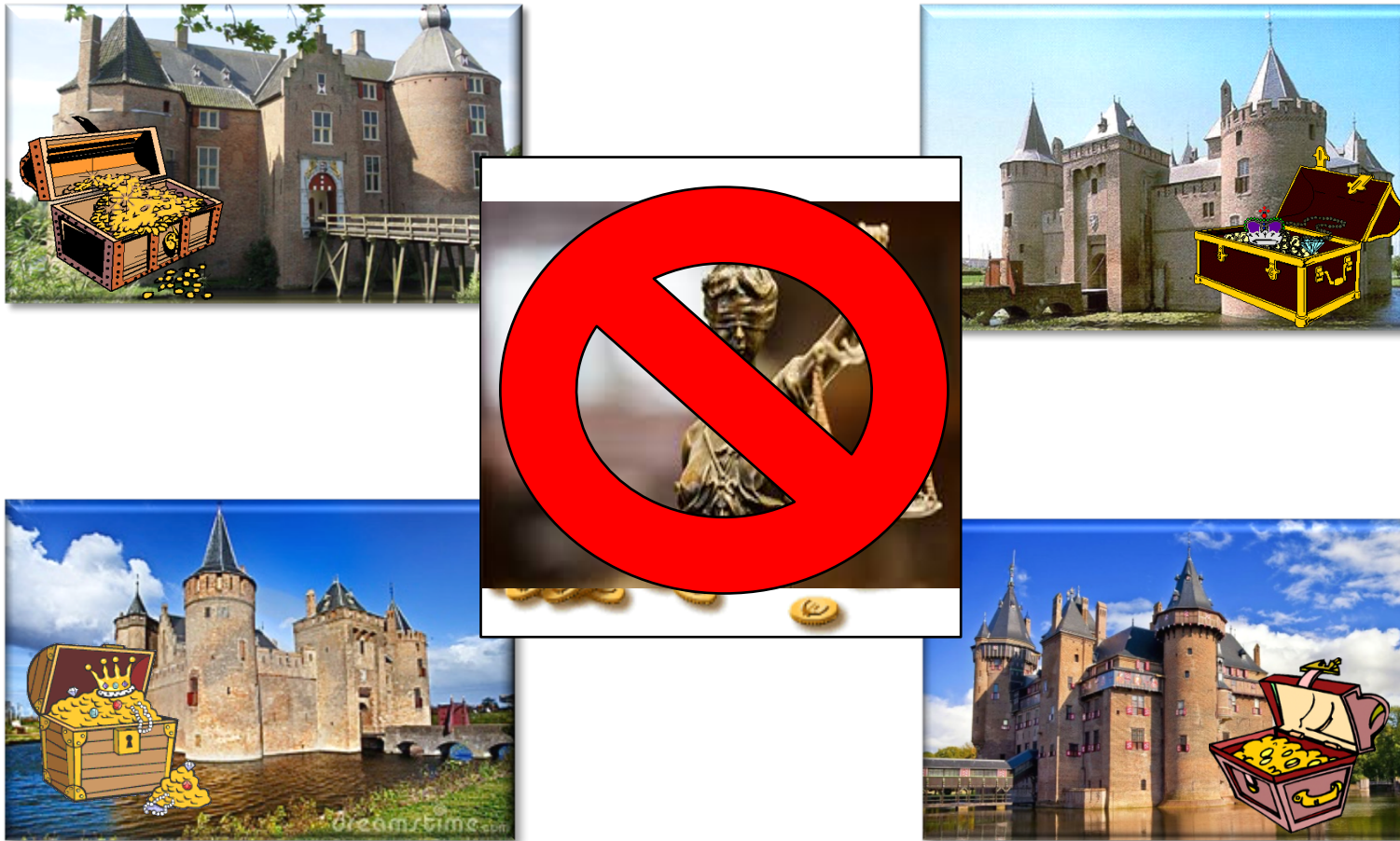
Sharing Big Data Assets needs:

Clearly defined and agreed common benefit

Established common rules governing <u>use</u>, <u>access</u> **AND** <u>benefit</u> sharing.

Organizing trust amongst group members as means to reduce <u>risk</u>

Infrastructure supporting implementation of trust

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Secure Digital Market Place allowing community members to share data according to market rules.

- Digital Market Place (DMP) is a member organization as **independent legal entity.**

- Goal of the DMP is to **organize trust between members** wanting to gain a particular common benefit no single member can gain on its own.

- Members of the DMP can be a supplier or consumer of data or both.

- All members have **equal rights** within a DMP

- DMP is **governed by a board of members** in which all members participate

- DMP establishes a regulation consisting of **market rules and the admission** requirements

- DMP appoints a **market master** in charge of market operations

- DMP establishes a regulation for **conflict** settlement

- DMP appoints an **adjudication committee**

- Members can obtain rights (licenses) from the DMP within the framework of the DMP regulation to act in a particular defined market role.

- What elements of the DMP can be digitized?

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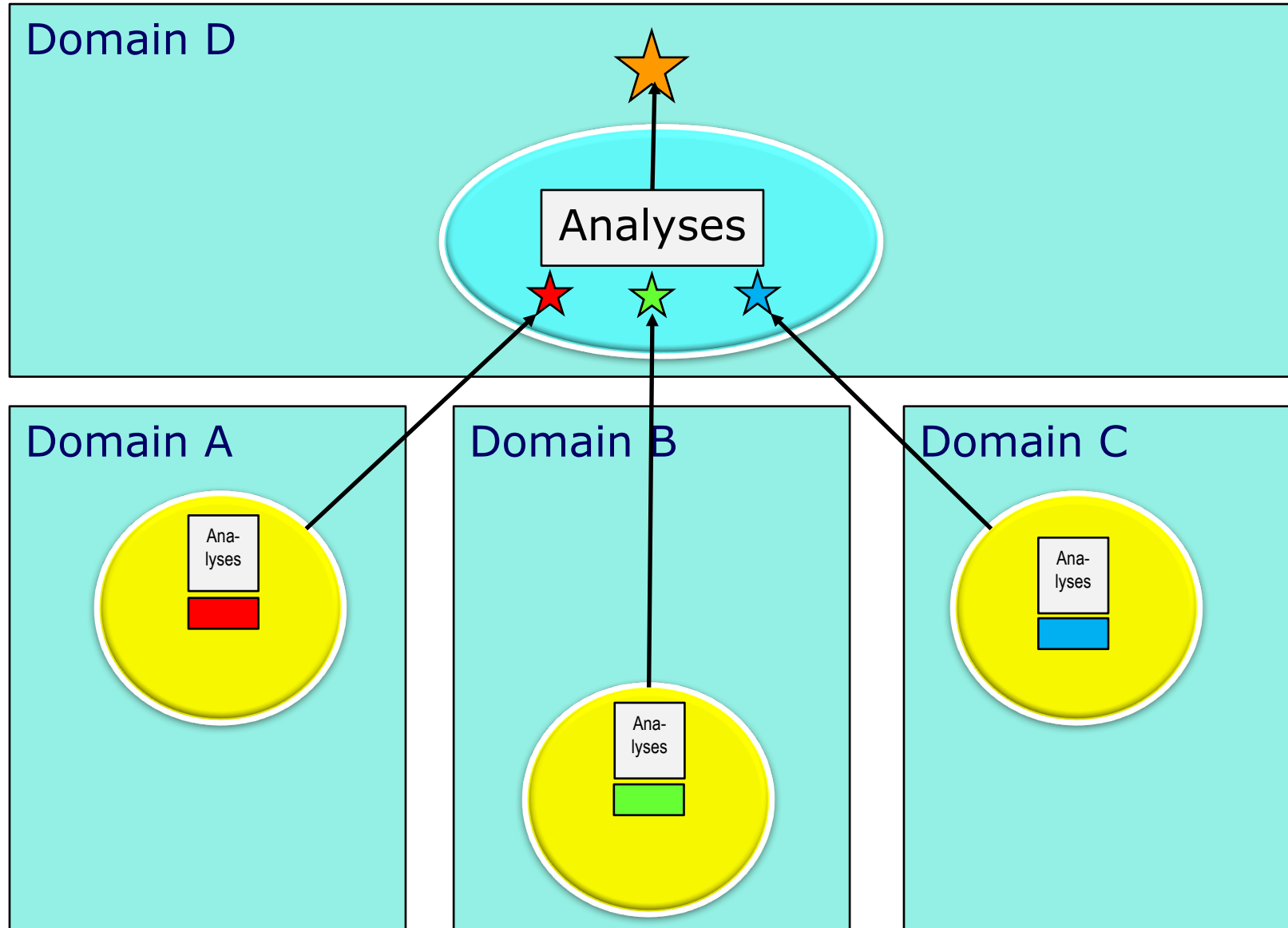# Secure Digital Market Place architectural sketch
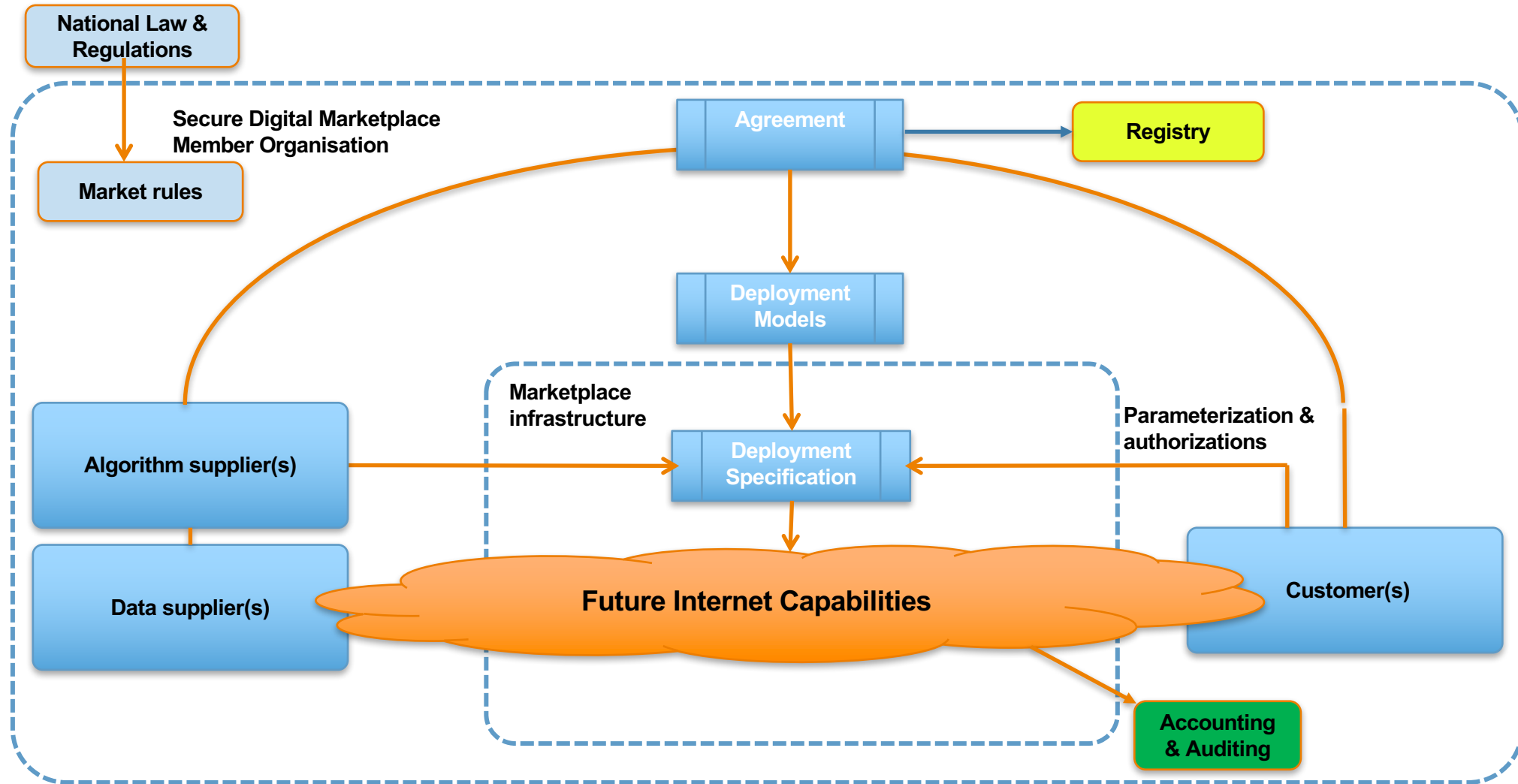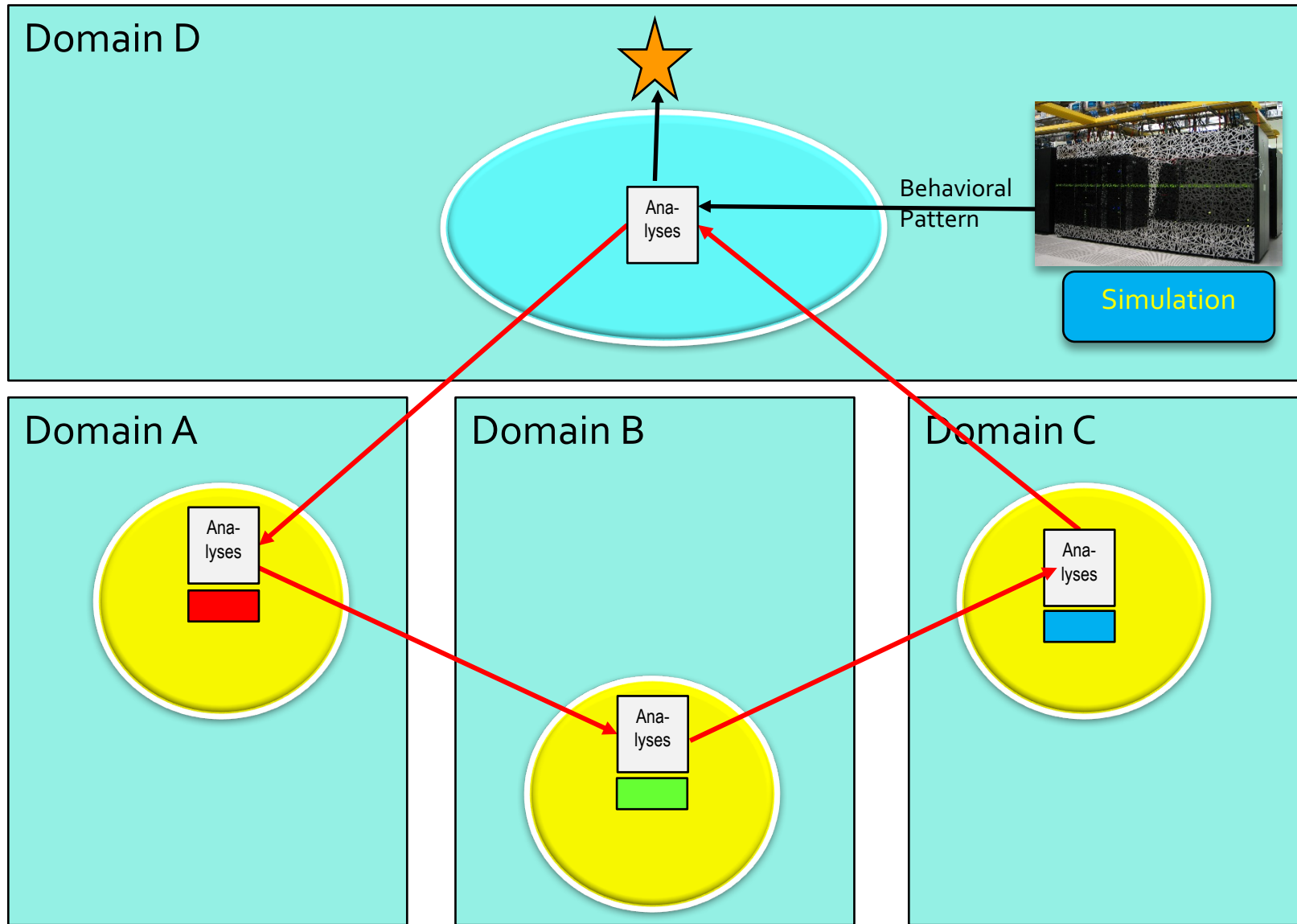
Traditional Data Sharing model.
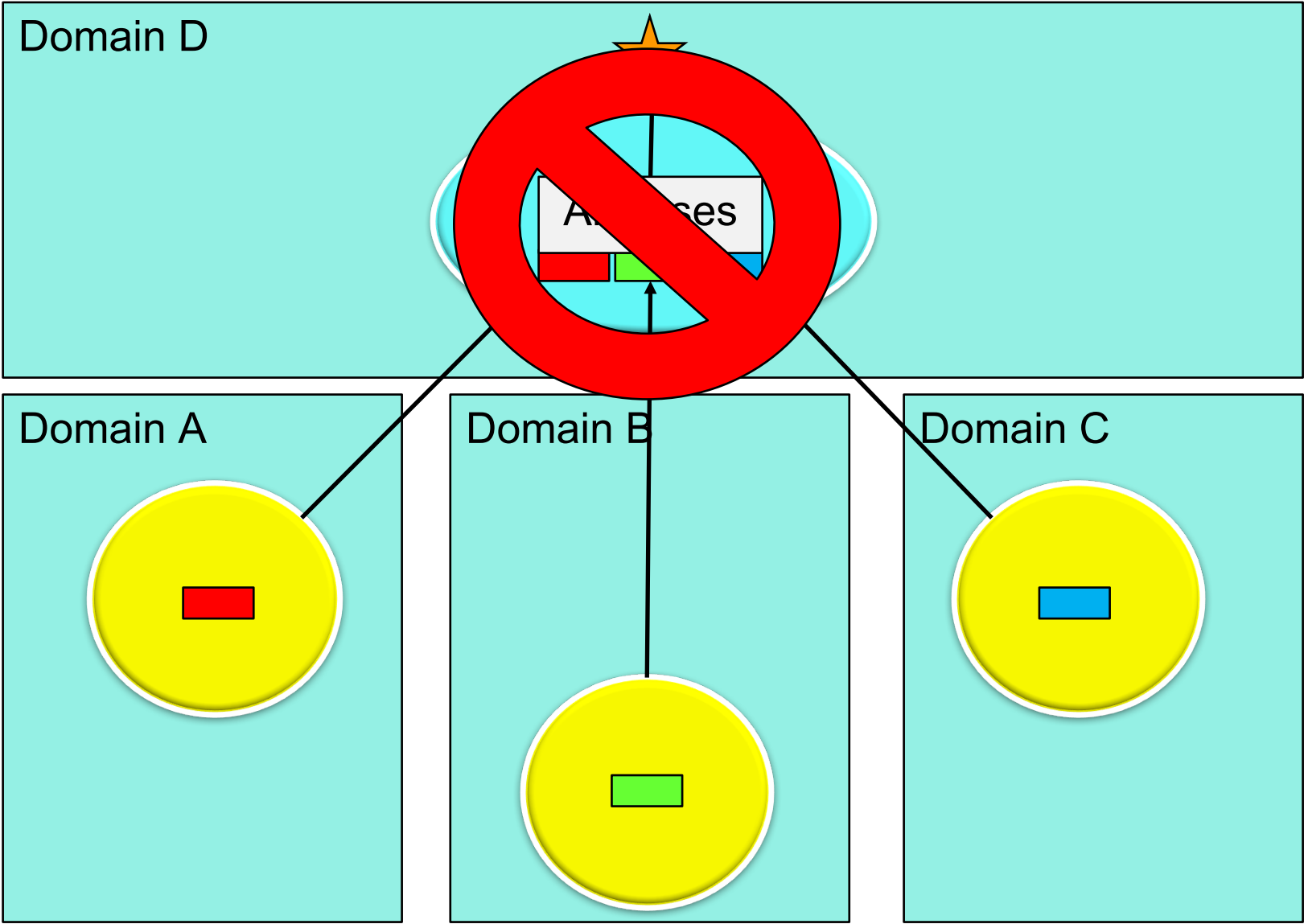
Domain =
Autonomous
Organization
with own
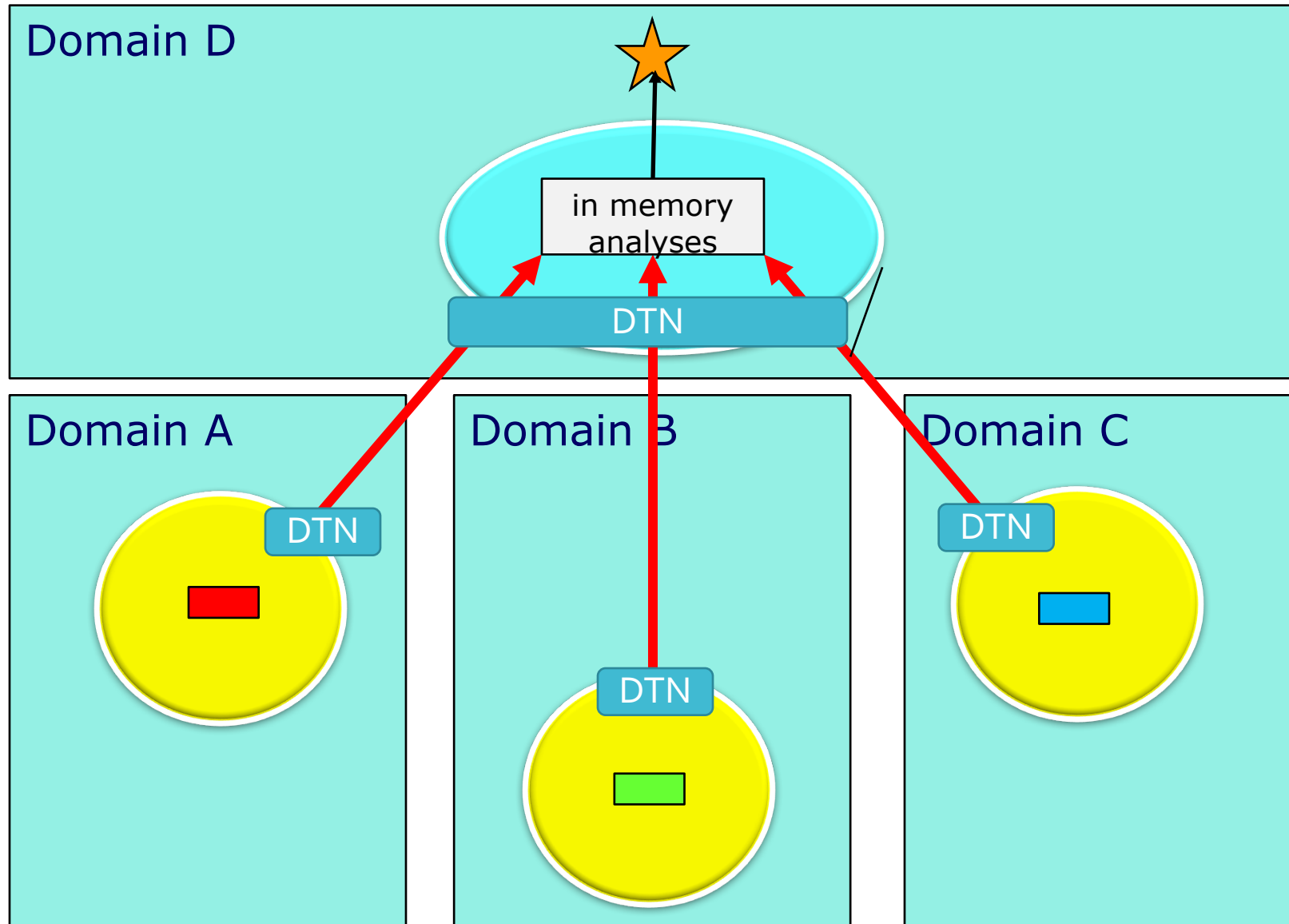administration and
enforcement

Bring processing to the data.
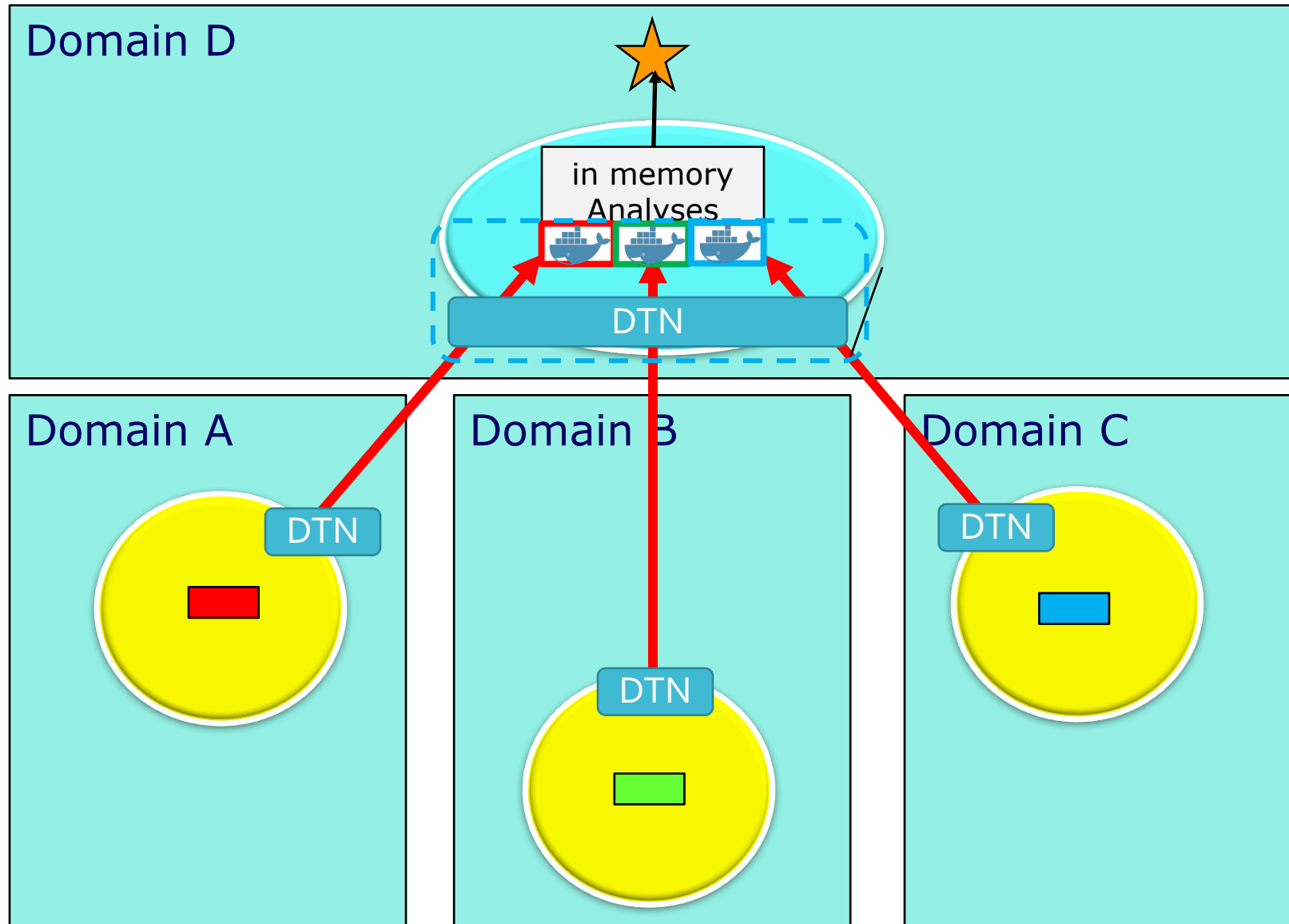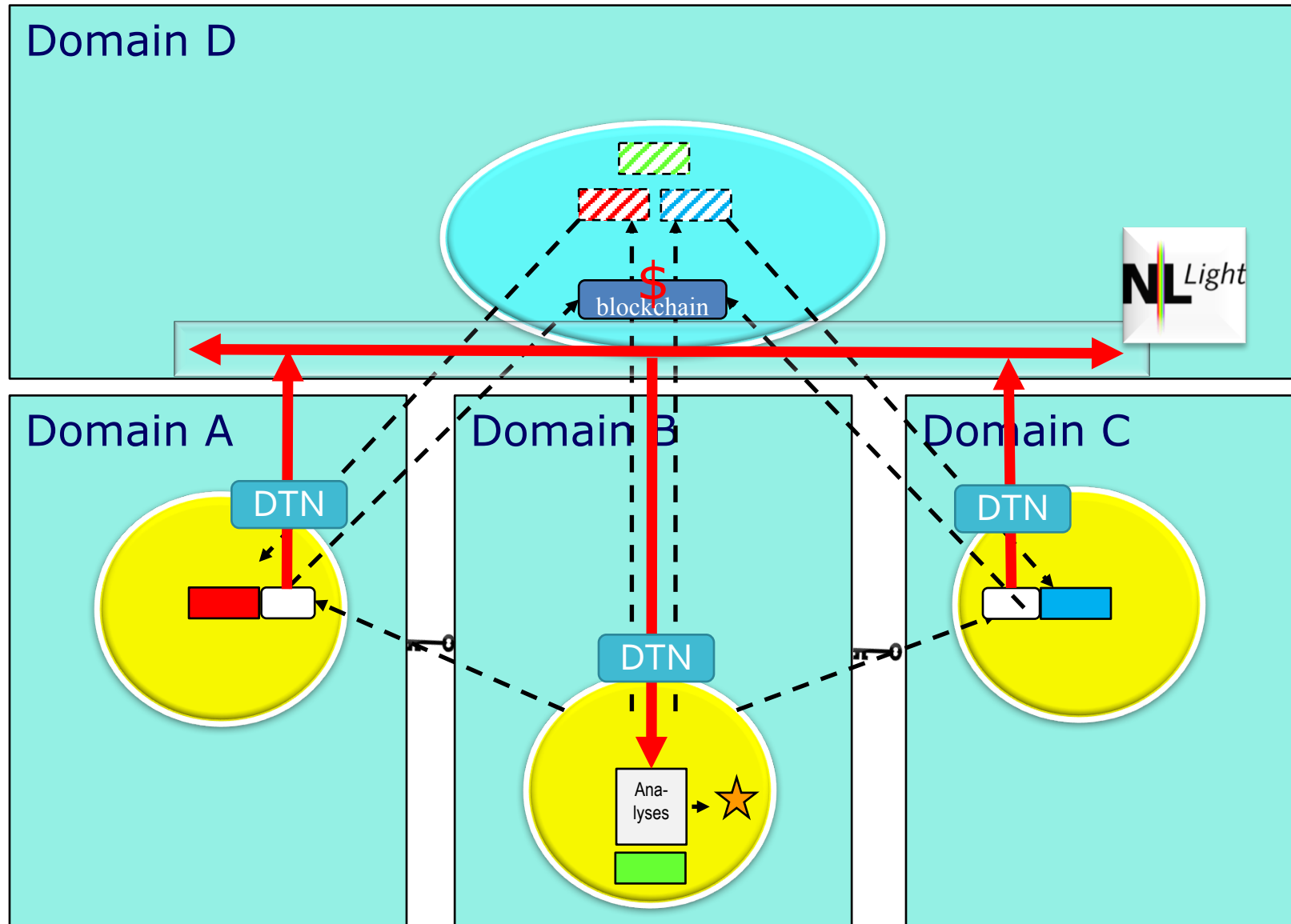
VM Turntable to perform pattern searches

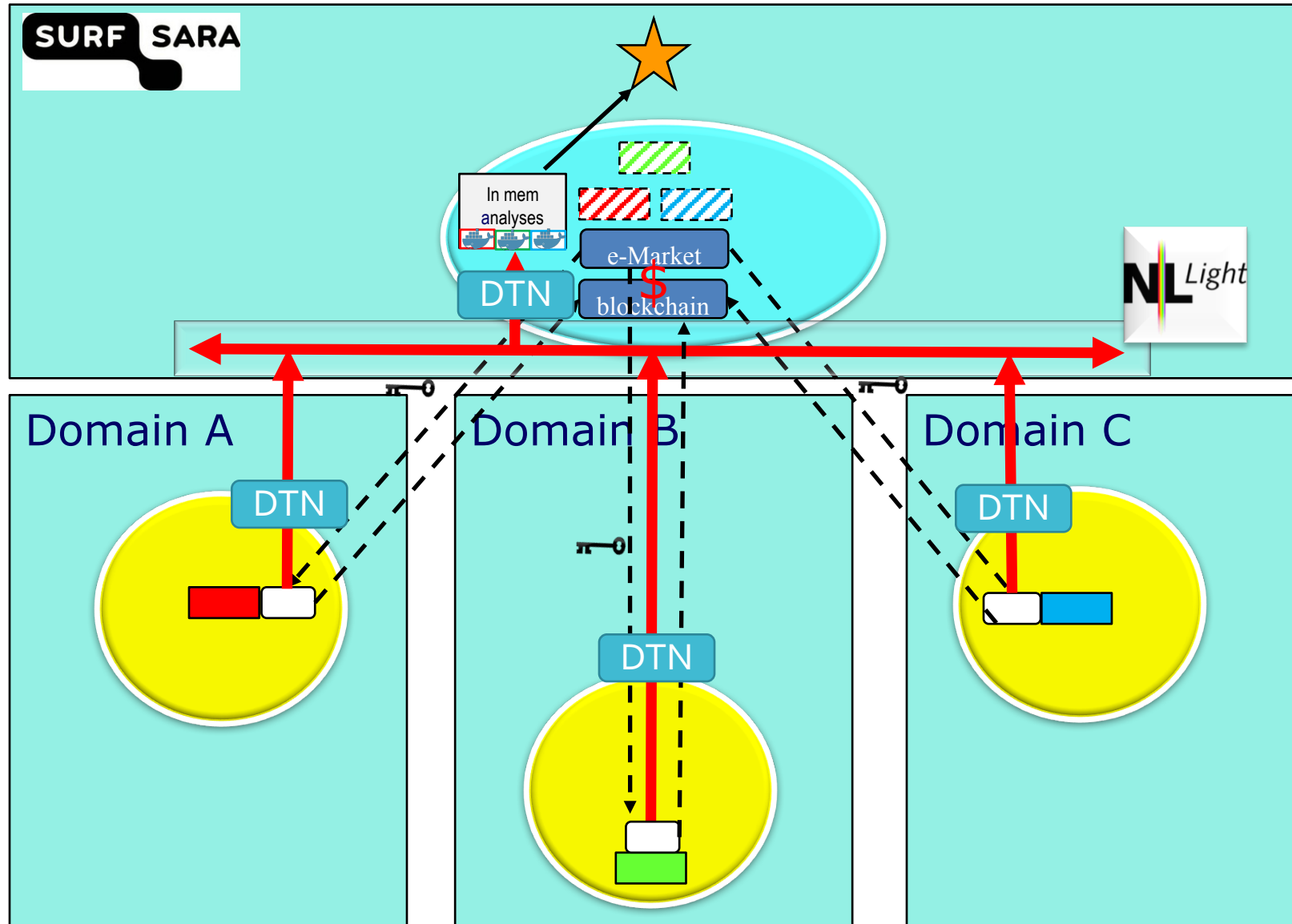# Separating data from compute via high performance links.

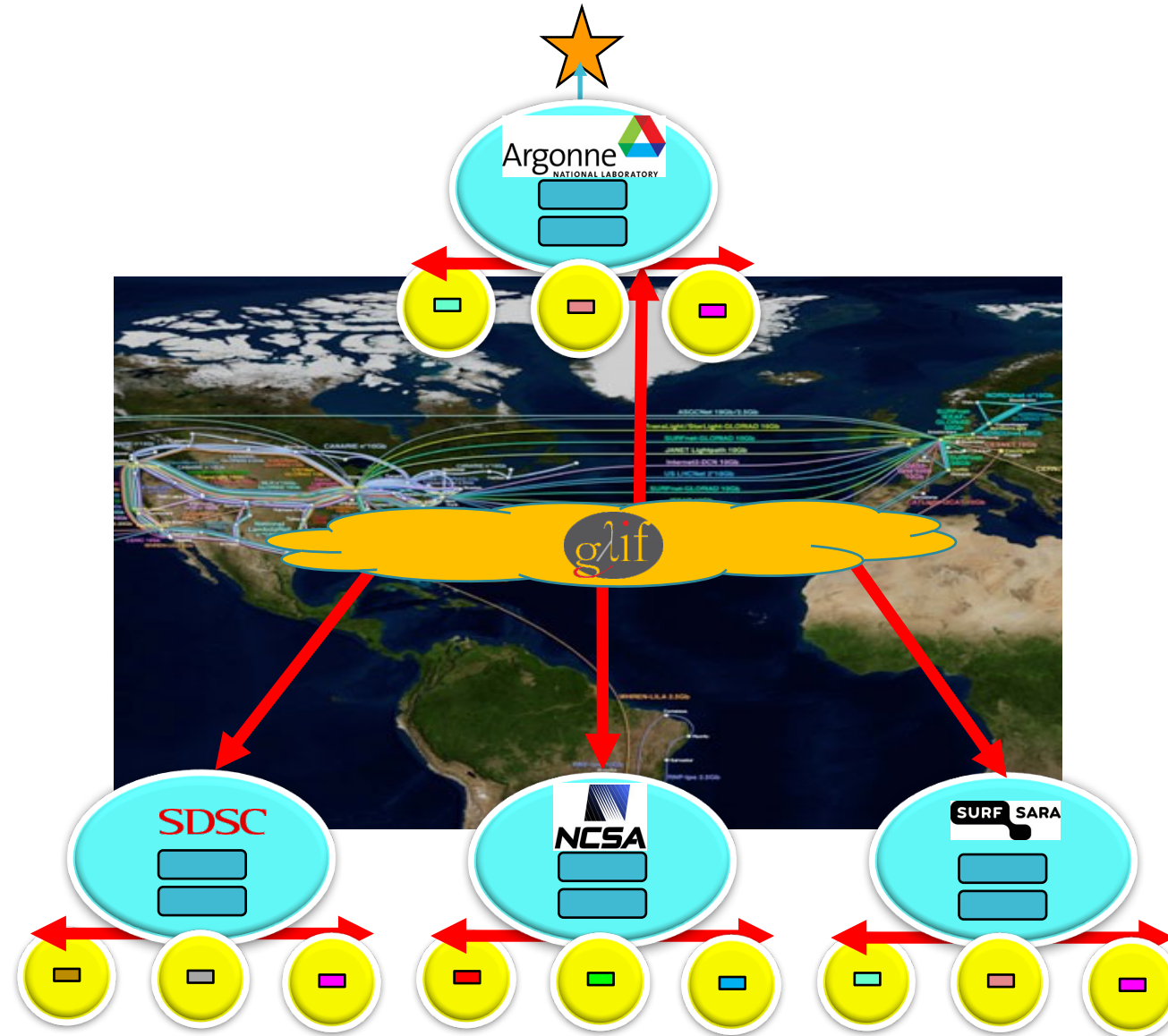# "Bring Your Own Container" reading its data via a HP links.

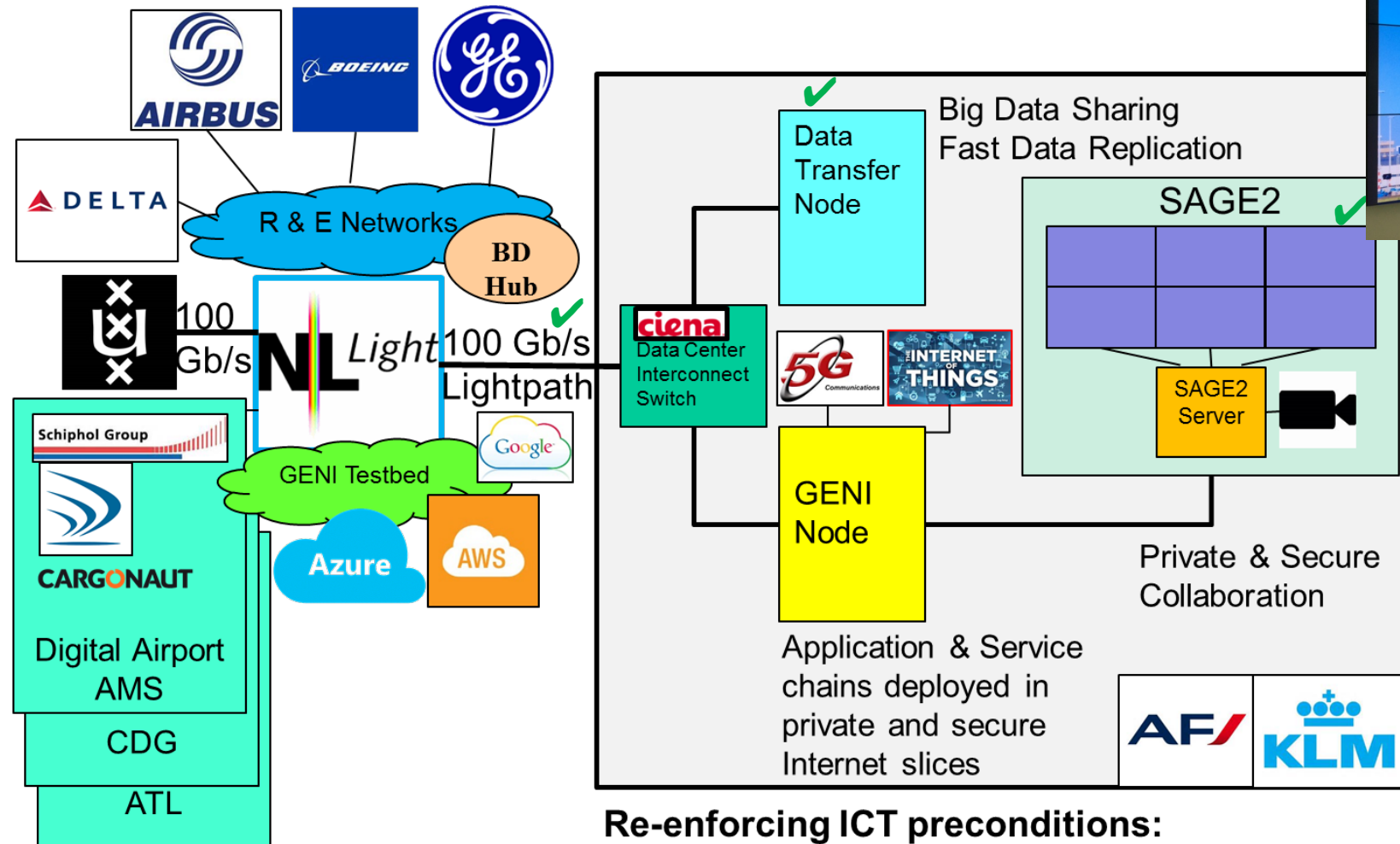# Data sharing using lightpath hub and access control

Digital Market Place model.

Experiments at global scale using existing e-Infrastructure

Ambition: AF/KL Future Internet Field Lab

Re-enforcing ICT preconditions:
Each envisaged site has similar elements

Acknowledgements

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