CHALLENGES AND DEVELOPMENTS FOR A DATA CENTRIC AND MICROSERVICE BASED INFRASTRUCTURE FOR BIG DATA AND AI

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NATO IST 160 specialists meeting, 31-05-2018

CONTENTS

- The military big data world
- Three IT trends for Big Data and AI
  - Data centric
  - Microservices
  - Containerization
- Challenges in developing a data centric/microservices architecture
  - Applicable in static and tactical conditions
  - Interoperability in a NATO context
  - Complying to NATO
- Solution direction

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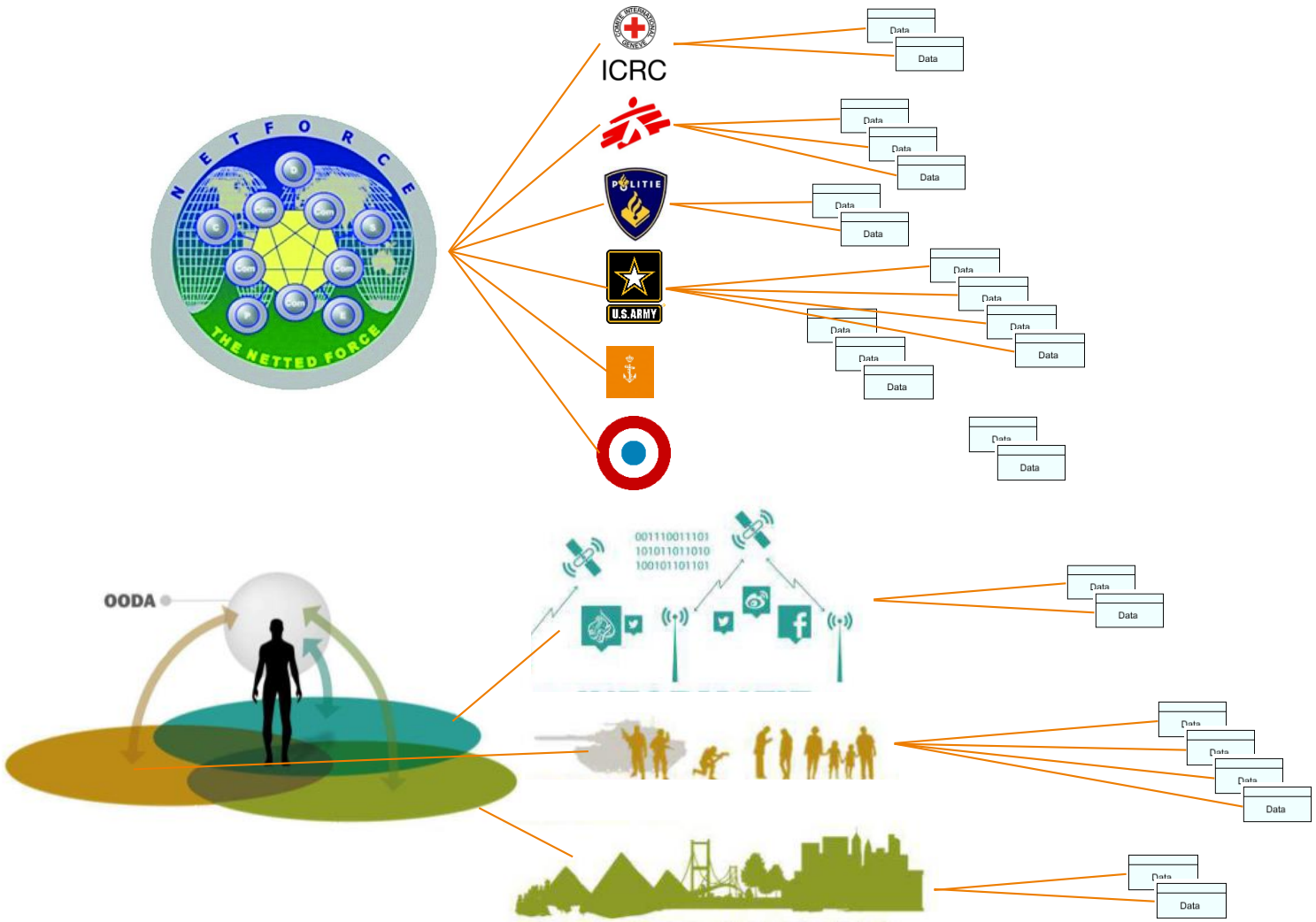
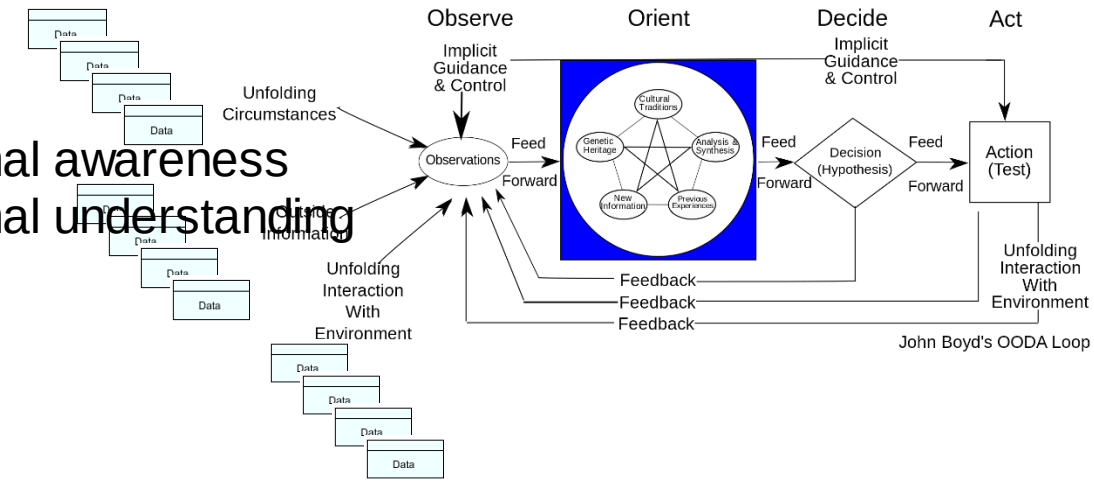
THE MILITARY BIG DATA WORLD



SURVIVAL OF THE FASTEST

Situational awareness
Situational understanding



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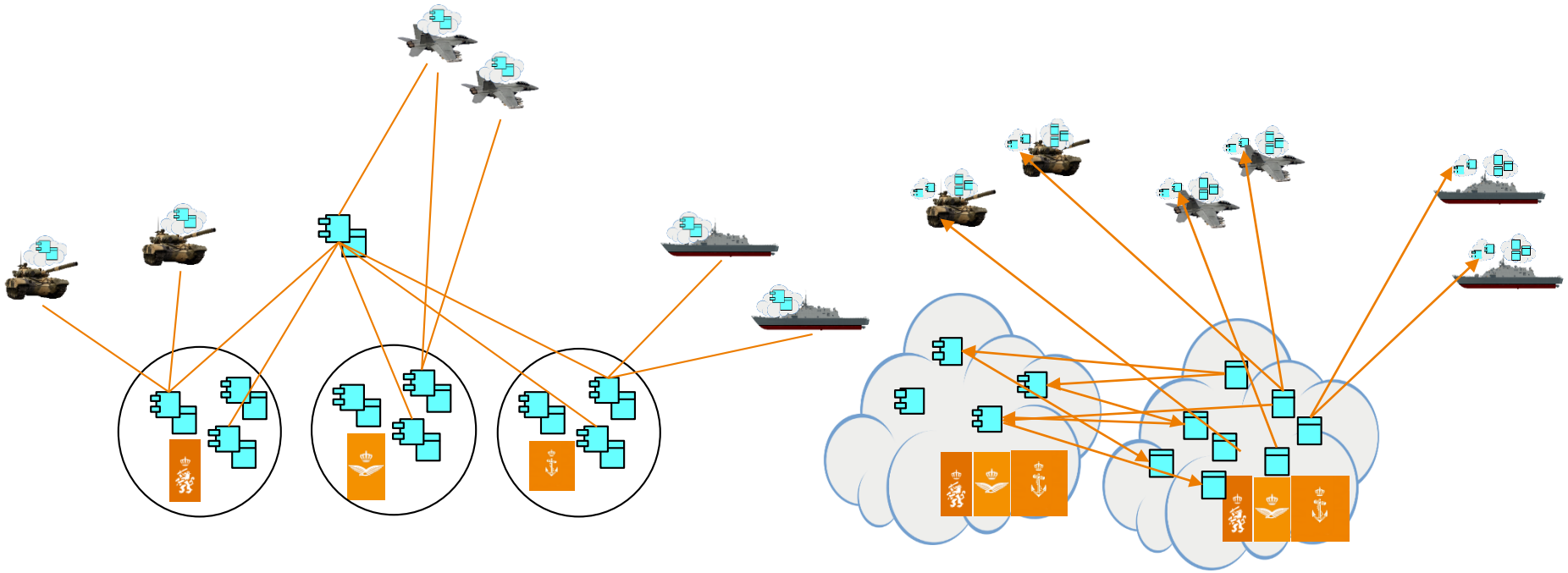
FROM APPLICATION CENTRIC TO DATA CENTRIC



DATA CENTRIC APPROACH

- Advantages
  - Interfacing with a relatively low number of standardized data stores interfaces instead of interfacing with many application specific API's
    - Limits the number of interfaces in a big-data world
    - Makes it easier to share data between different parties
  - In the Mobile-Dismounted-on-foot conditions it is easier to determine where the data should reside in order to have it available when necessary
    - It is no longer bound to an application
    - Easier to synchronize

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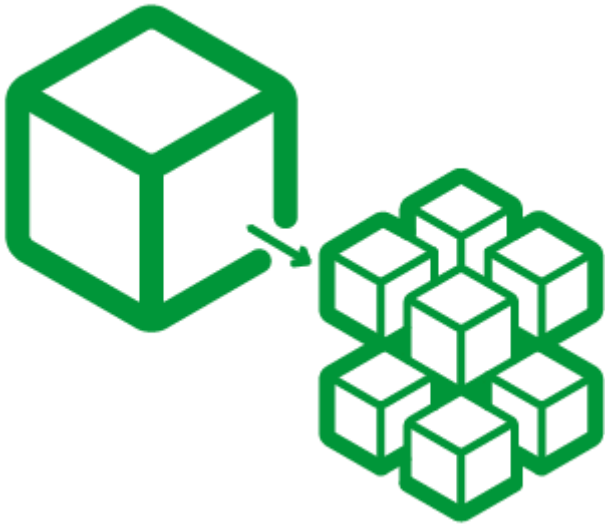
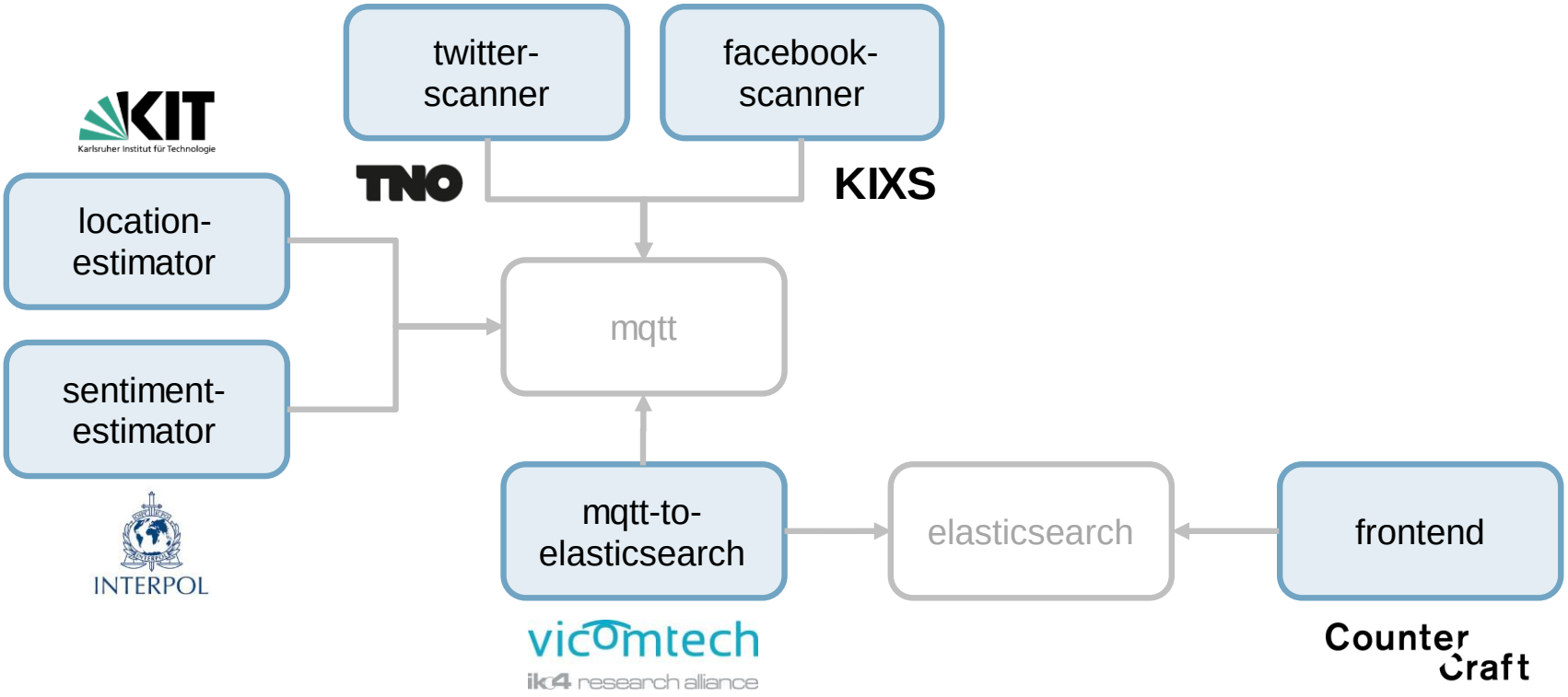
MICROSERVICES

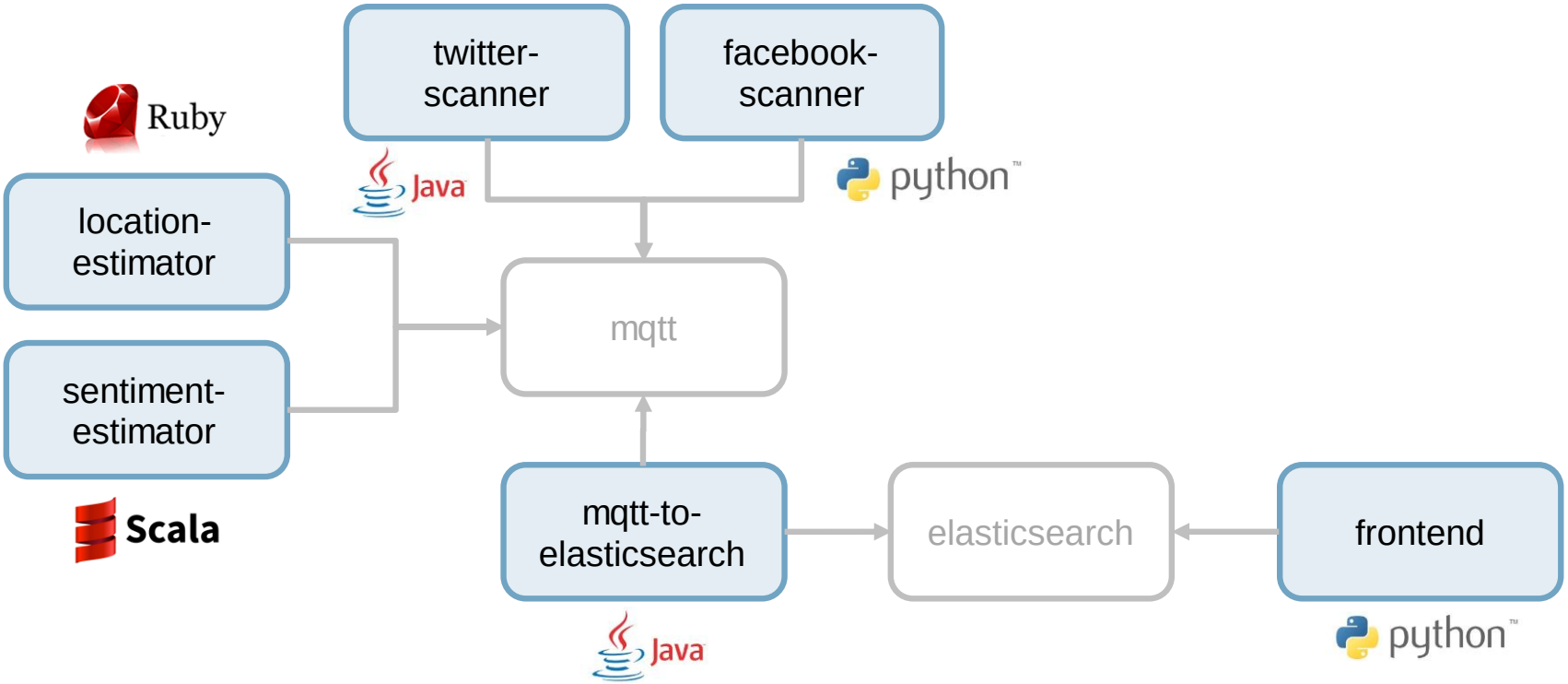
- SOA done properly?
- Do one thing and do it properly



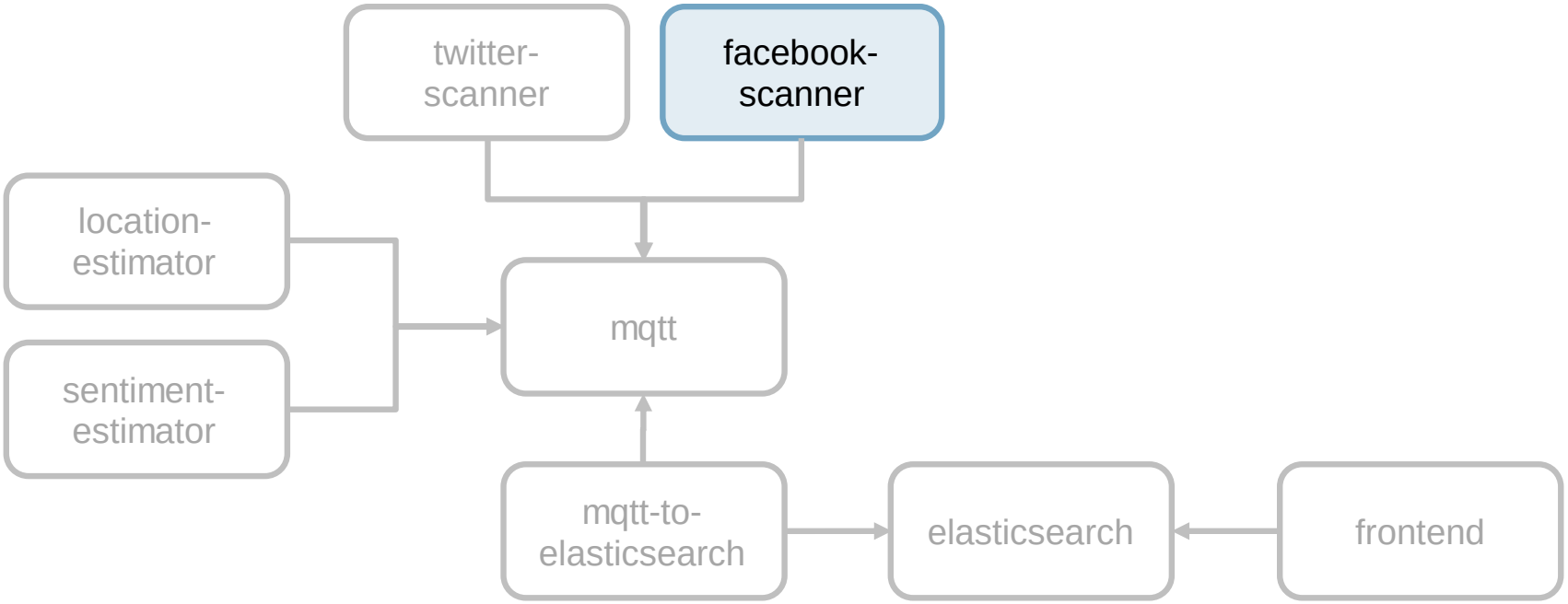
MULTIPLE PARTIES



MULTIPLE LANGUAGES

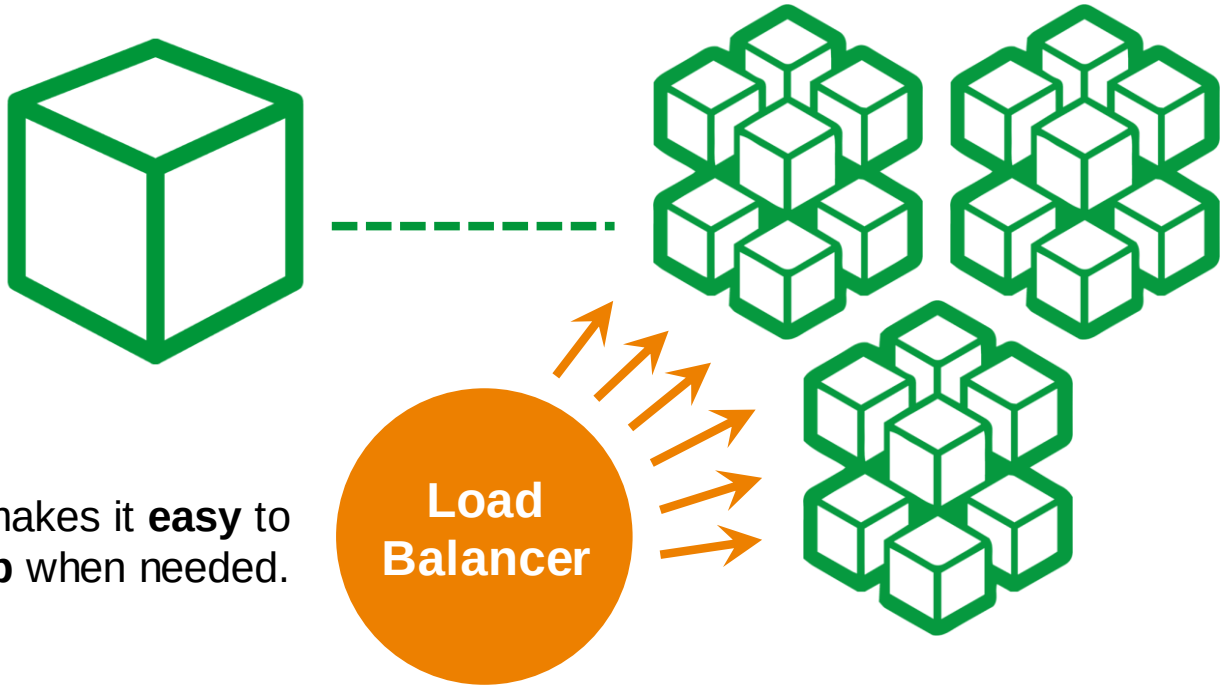


CONFIGURABLE, ADAPTABLE, REPLACEABLE



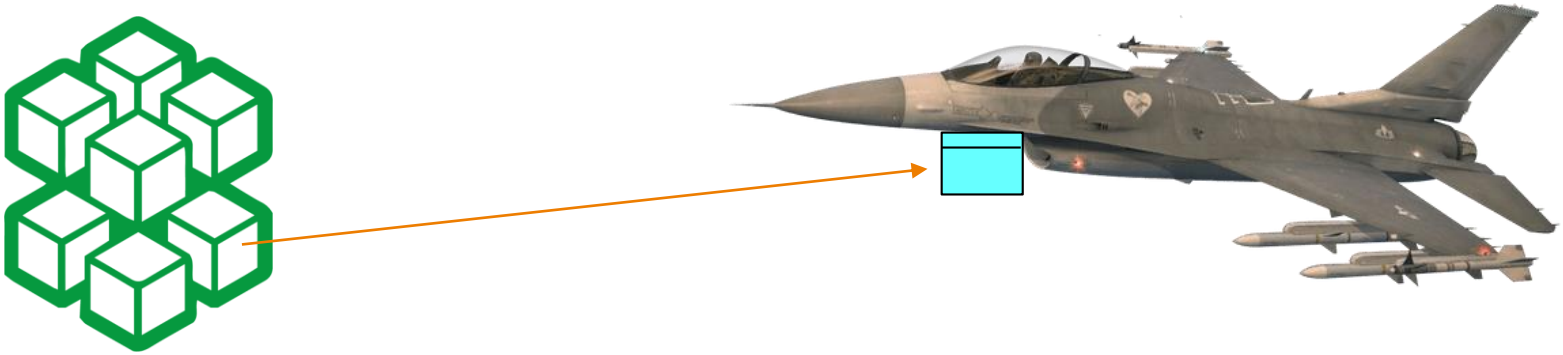
STATELESS MICROSERVICES: SCALABILITY

Multiplier microservice
Input: 3 * 3
Output: 9



Stateless makes it **easy** to **scale up** when needed.

BRINGING CODE TO THE DATA



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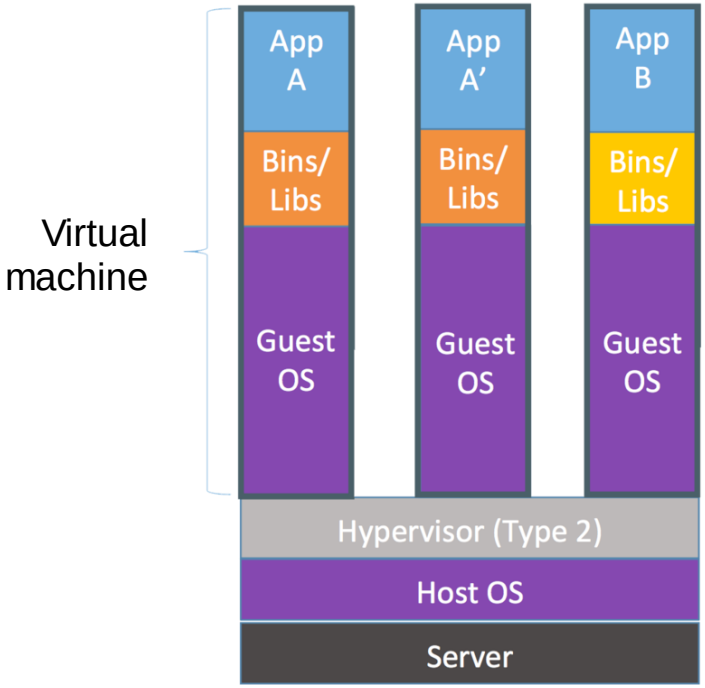
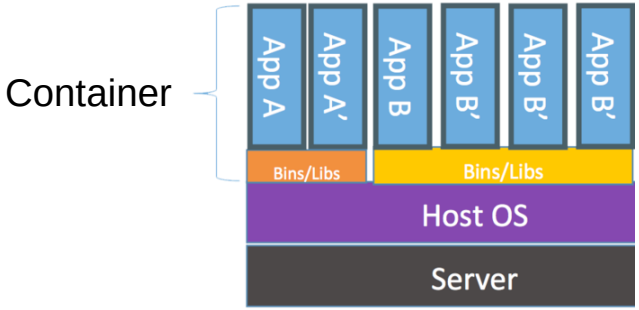
CONTAINERIZATION



Containers provide **isolation**, but share the same OS and kernel.

This results in **faster deployments, easier migration, less overhead** and **faster restarts**.



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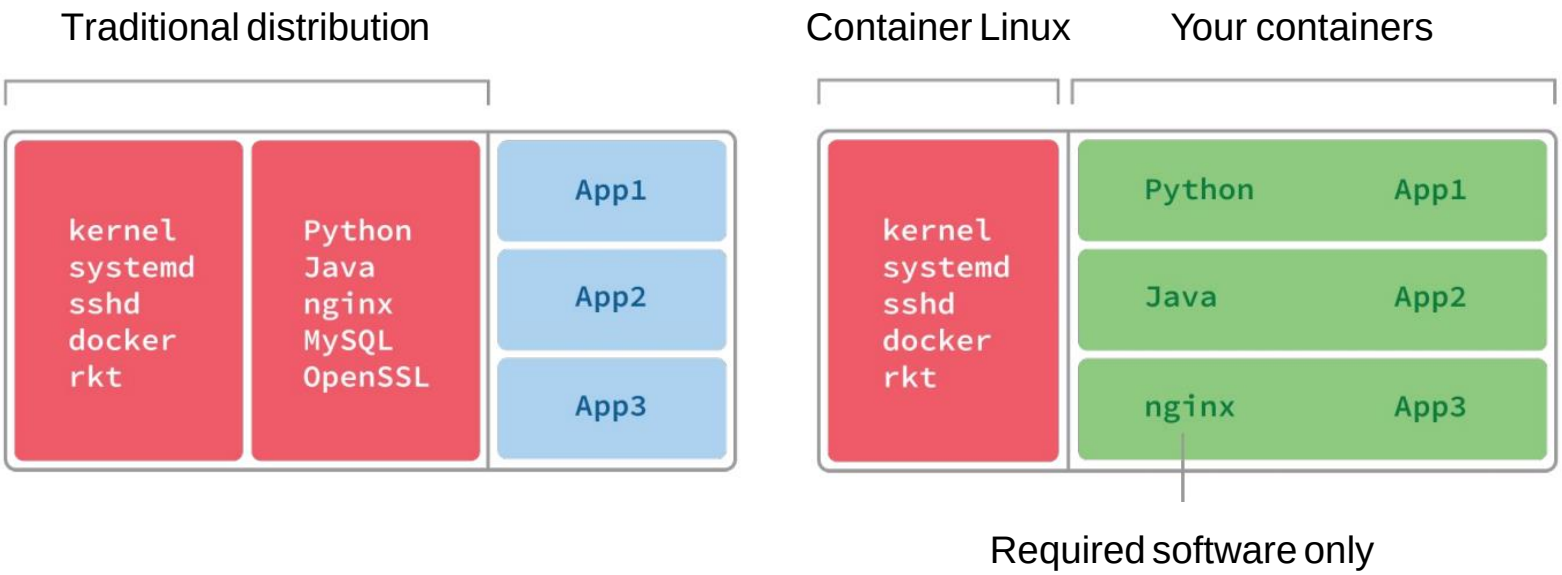

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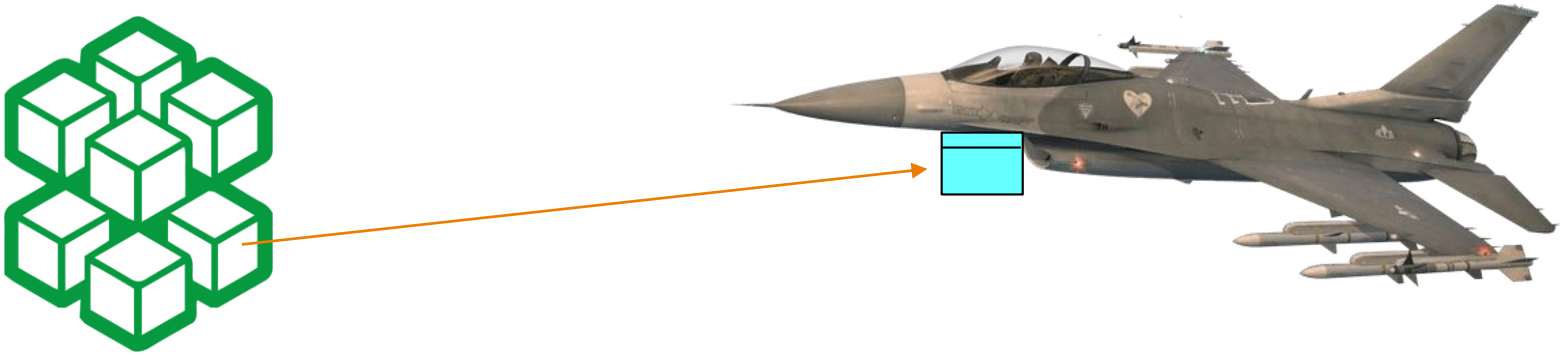

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CHALLENGES: APPLICABLE OVER STATIC AND TACTICAL CONDITIONS

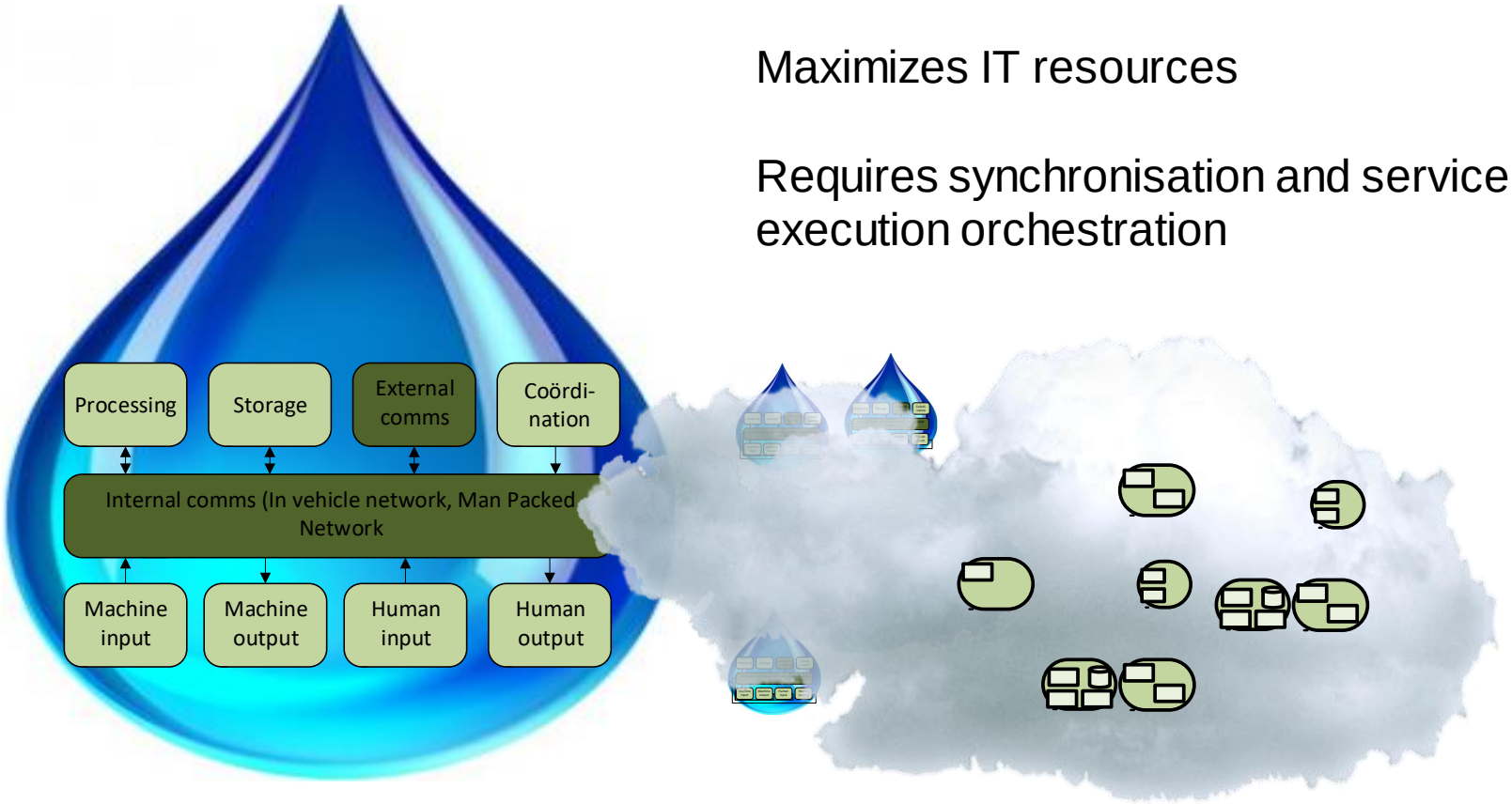
Limited

Bandwidth

Processing

Storage

SOLUTION DIRECTION: RAINDROP-TO-CLOUD



Maximizes IT resources

Requires synchronisation and service execution orchestration

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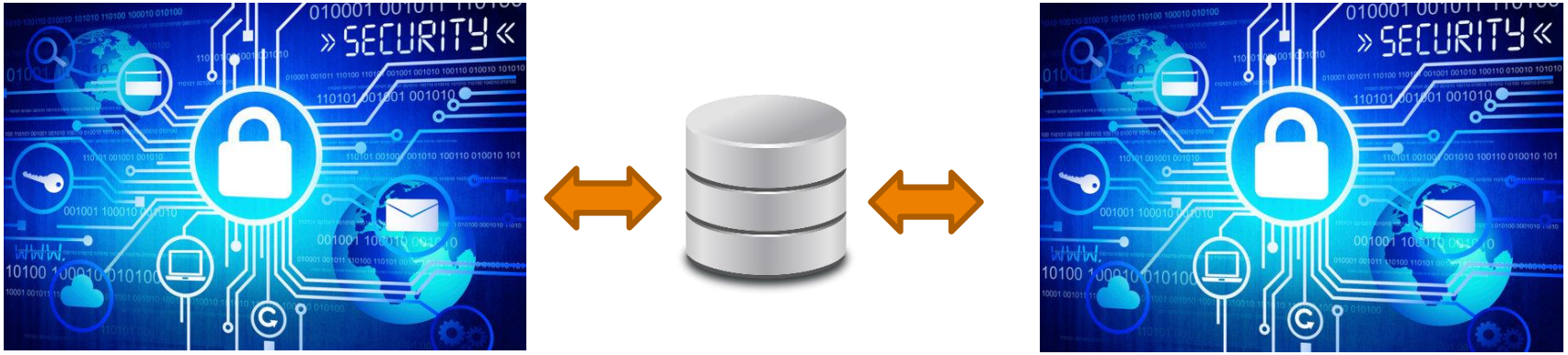
CHALLENGES: INTEROPERABILITY IN A NATO MISSION CONTEXT



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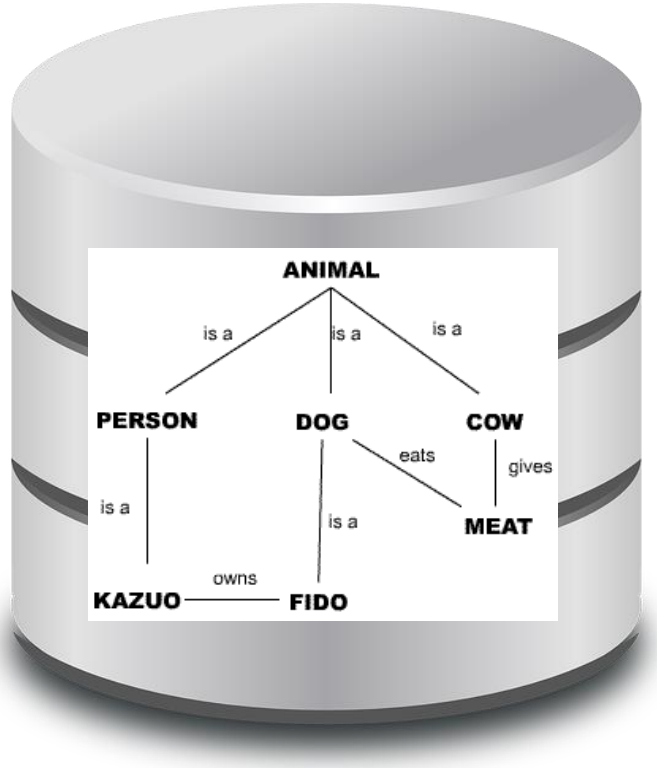

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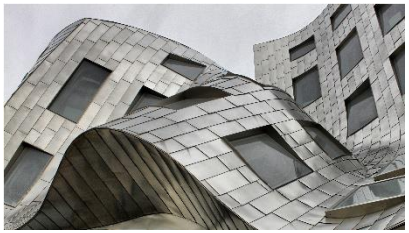
CHALLENGES: COMPLYING TO NATO

Guidelines



Policies

Standards

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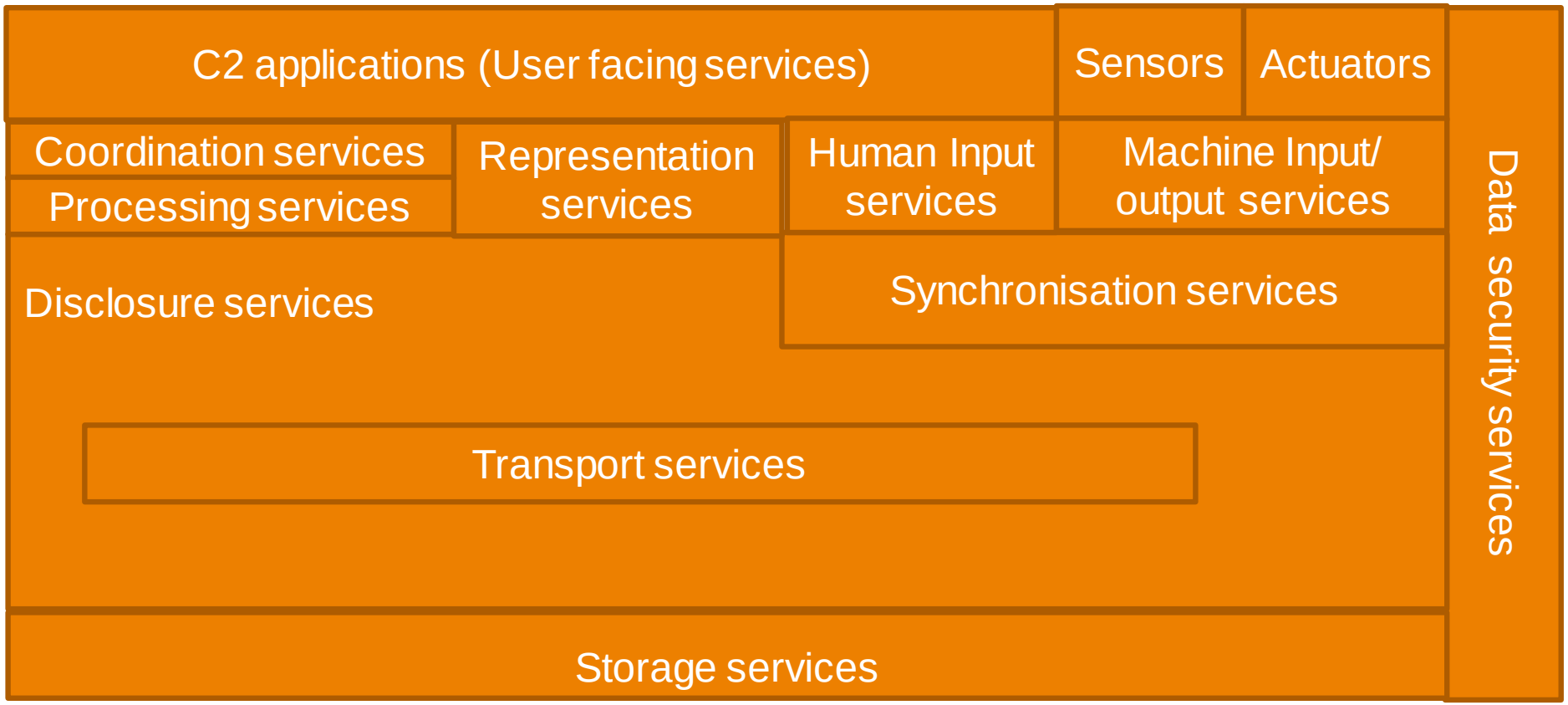

WORK IN PROGRESS - QUESTIONS

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