

# SMART NAS net- centric airport information sharing



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*Aviation Information World - Forecasting the Future*



# SMART NAS net-centric airport information sharing

Inefficient, non-coordinated FIDS updates

Manual management of airport facilities

Lack of information on passenger status

High unpredictability of events

Limited real-time information between Airlines, airport authority and FBO

No standard communication tool for Collaborative Decision Making (CDM)

High rates of delay at the gate

Dependence on airport wired network infrastructure



# SMART NAS net-centric airport information sharing

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# SMART NAS net-centric airport information sharing

## Project objectives

### Optimize

- Information sharing
- Airport surface ops
- Air traffic management
- Safety processes
- Business operations

### Enable

- Net/Data-centric collaboration
- Total airport management
- Data reliability and timeliness
- Network resilience

### Integrate

- Data sources
- Ground and air-ground networks
- ATM tools

### Demonstrate

- Prototype template
- System/subsystem performance
- Airport resource sharing policies

# SMART NAS net-centric airport information sharing

## Project benefits

Enhanced situation and safety awareness

Better predictability tools

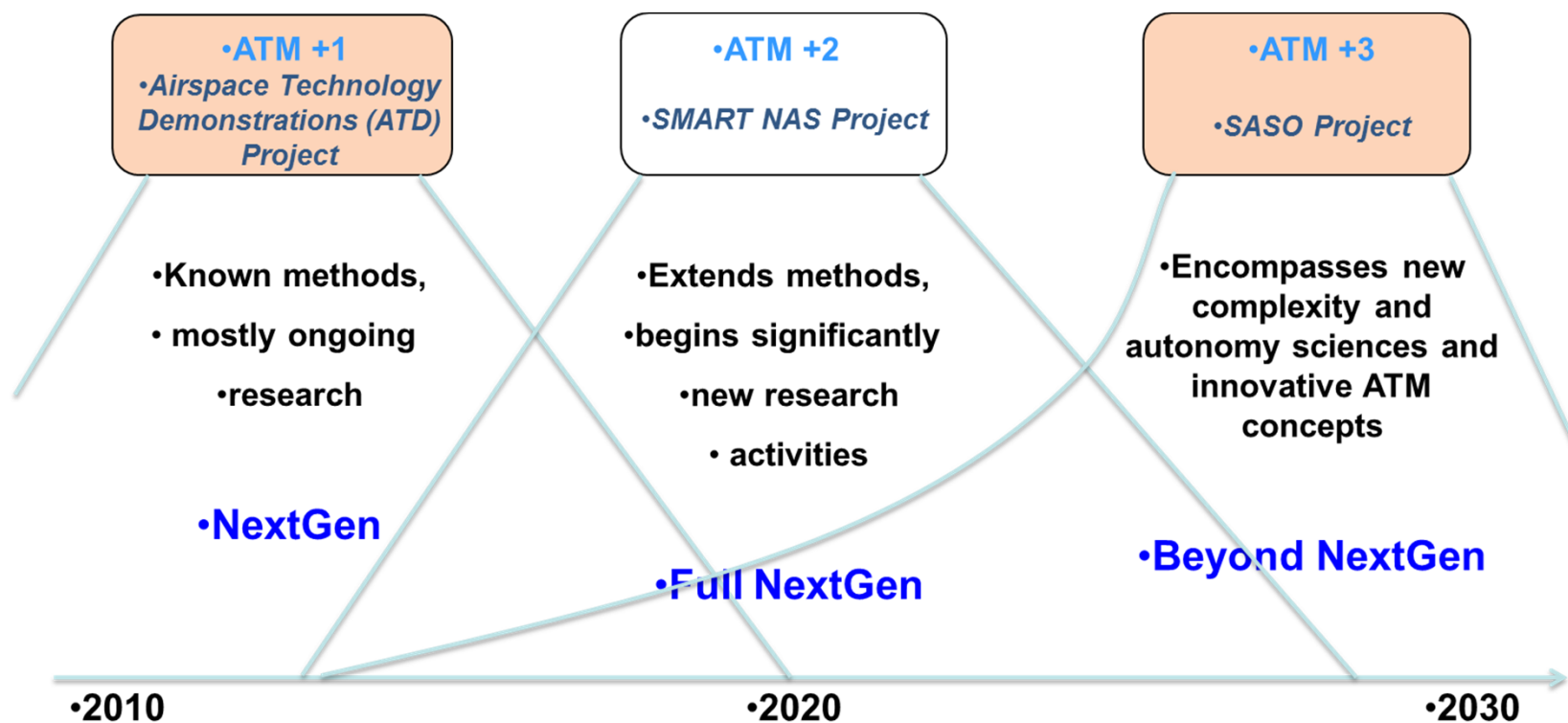
Higher efficiency, reduced cost of ownership

Higher level of collaboration and decision making



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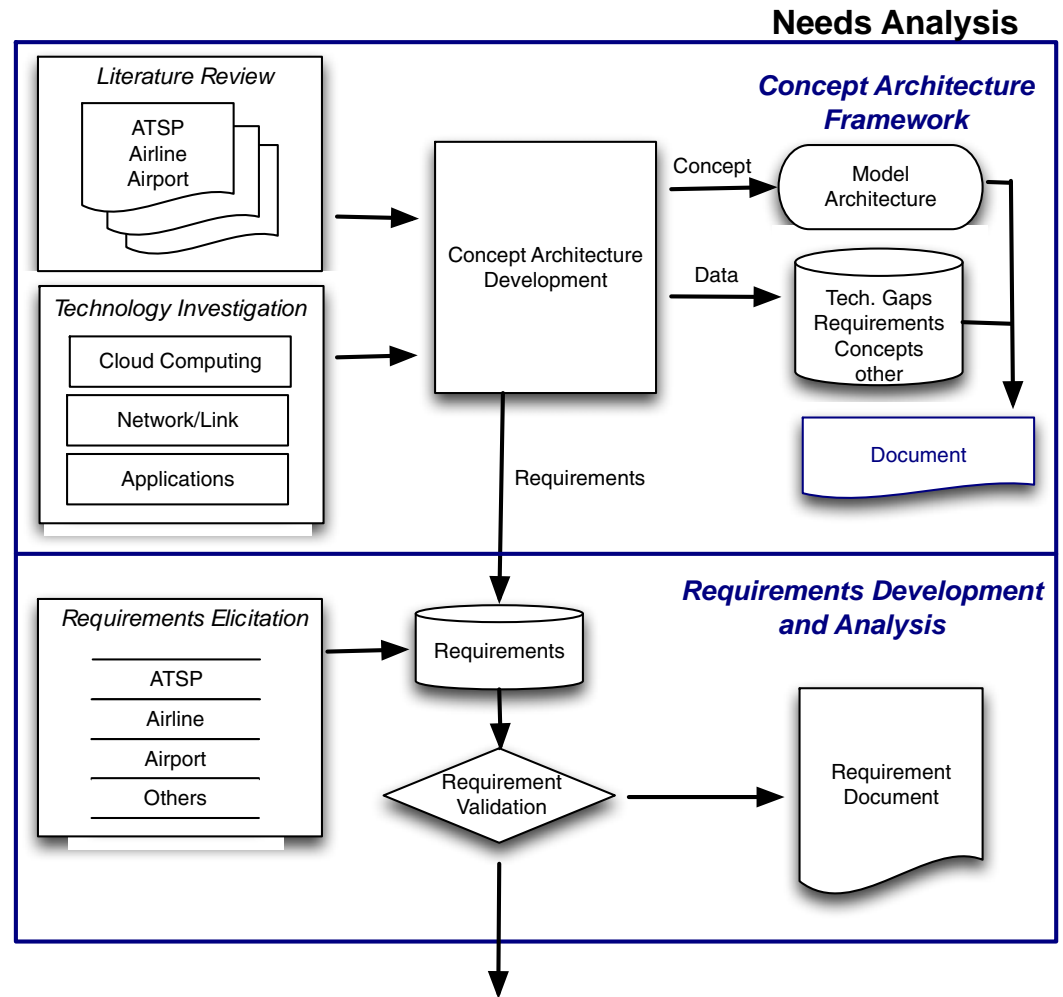
## Program framework



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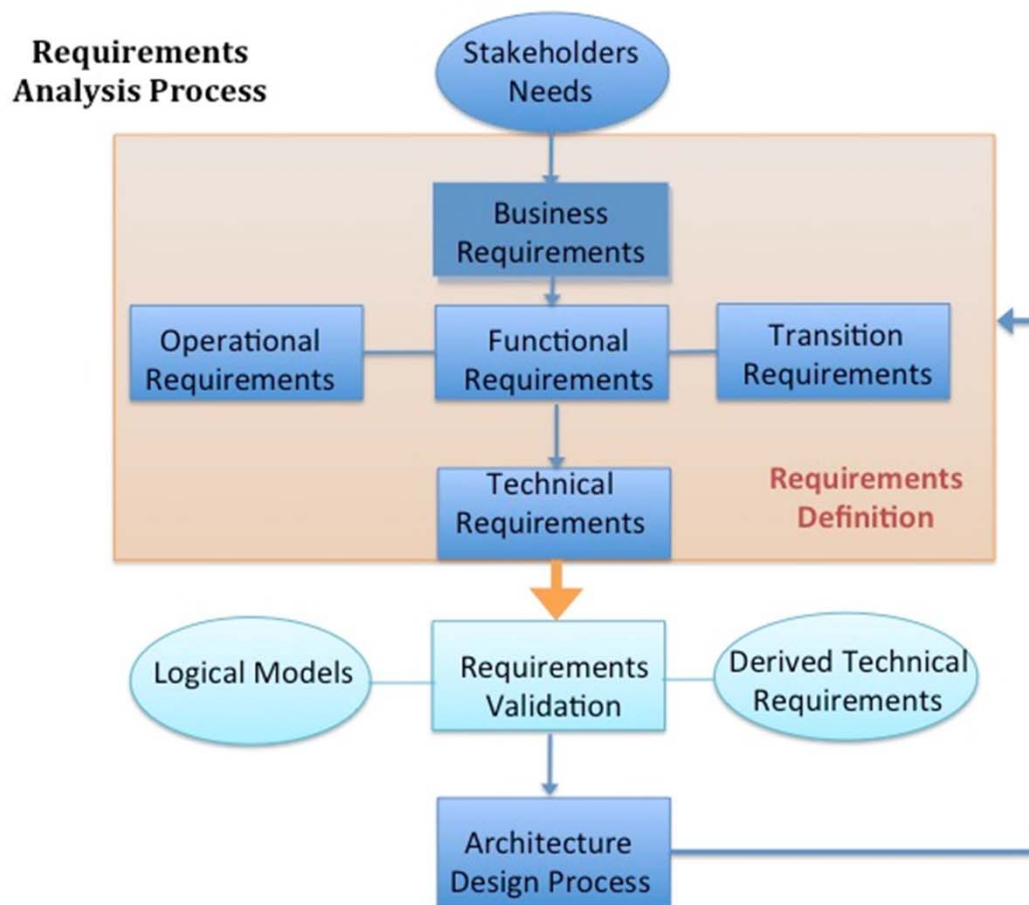
## Project tasks

Deliverables expected  
by September 2016



# SMART NAS net-centric airport information sharing

## Requirement analysis





# SMART NAS net-centric airport information sharing

## Set of requirements example

BU04 The architecture development shall enable ground-ground and air-ground communications to integrate fixed and mobile assets.

- OP07.1 The exchange of information shall consider physical layer technologies, link layer (L2) configuration and network technologies.
- OP07.2 The information sharing shall be made based on the TCP/IP layer approach
- OP07.3 Air-ground communication end-systems shall operate in the systems if the access is authorized and the spectrum protection regulations are acceptable by the corresponding authority.
- ❖ FU09 The system shall process any EFB updates
  - FU09.1 EFB shall be capable of data retrieval and data publications
  - OP08 EFB shall require log-in stage to the aircrew



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## Dynamic behavior

### Actions

#### Who uses the system?

ATCT, AOC/FOC, aircrew, airport AOCC, ground handling

#### What processes does the system support?

Aircraft turnaround, flight planning, arrival, departure, scheduling, itinerary management, airport operation planning

### Interfaces

#### What communication points are used to interact with the system?

AODB, FAA web service, SWIM DMS, public network (VPN/open)

#### What type of interaction?

Info request/response, subscription, publication

### Data

#### What domain?

SWIM, IATA, ACI, airline Global Distribution Systems (GDS)

#### What type of data?

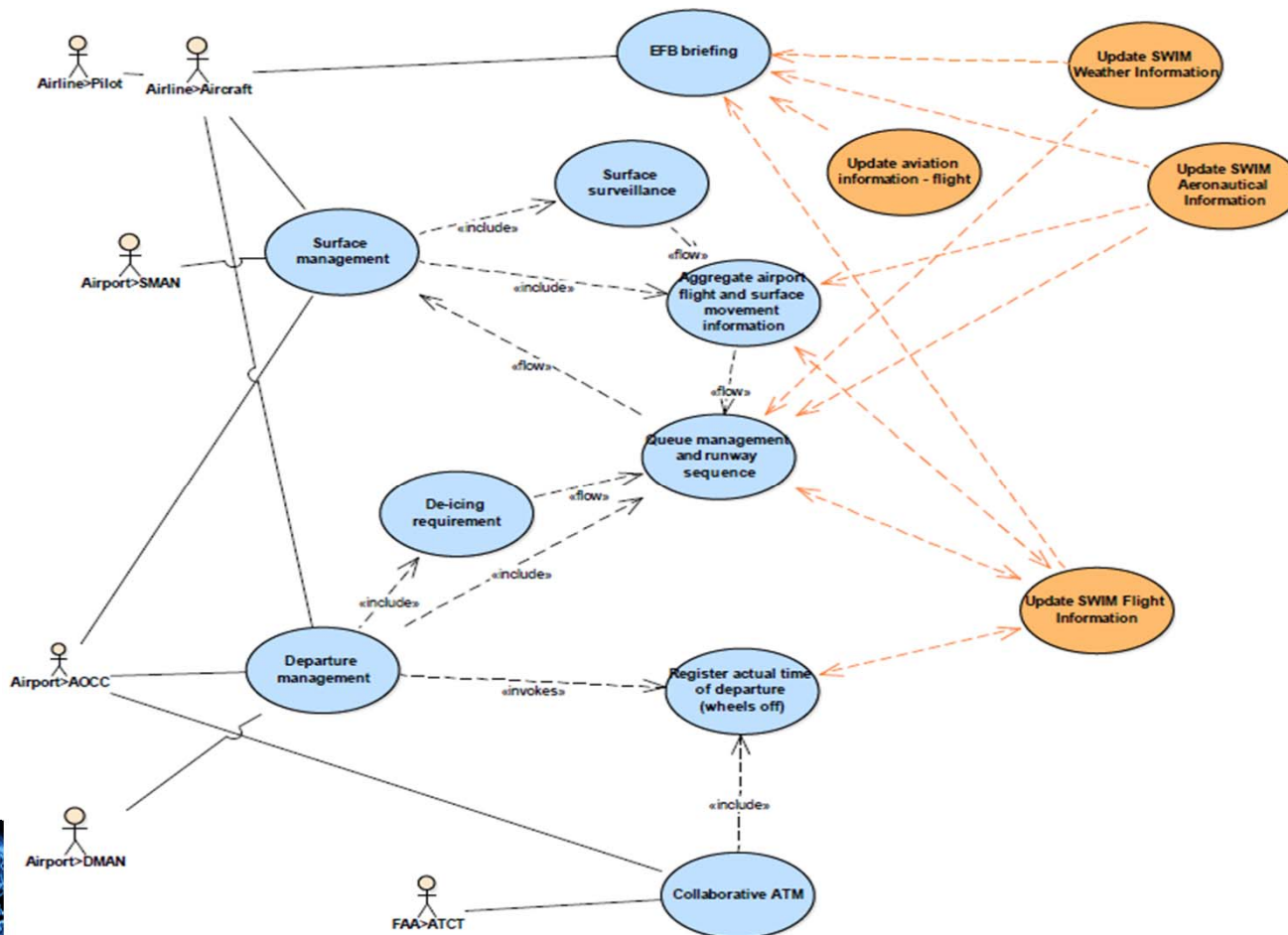
Flight, schedule, surface, TFM, aeronautical, weather, passenger/bag

#### What data format?

XML... others?

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## Dynamic behavior: use case example

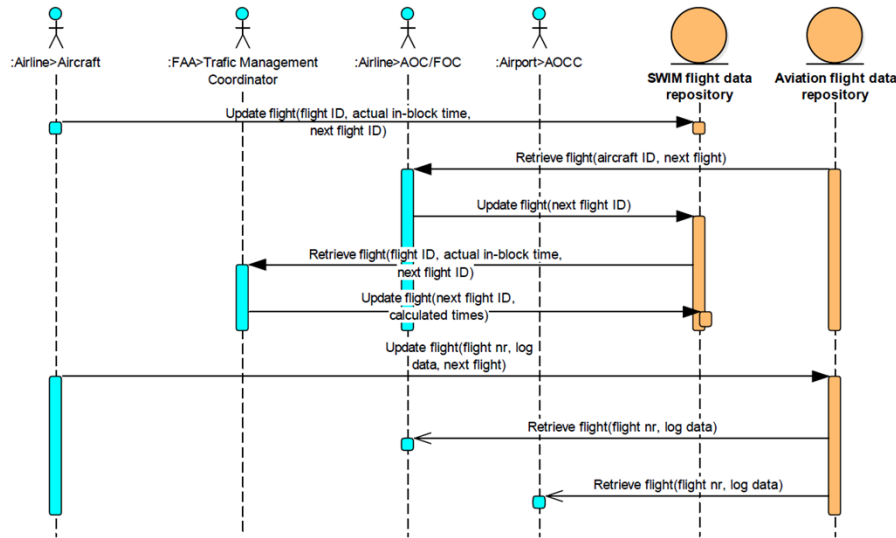


Aircraft departure

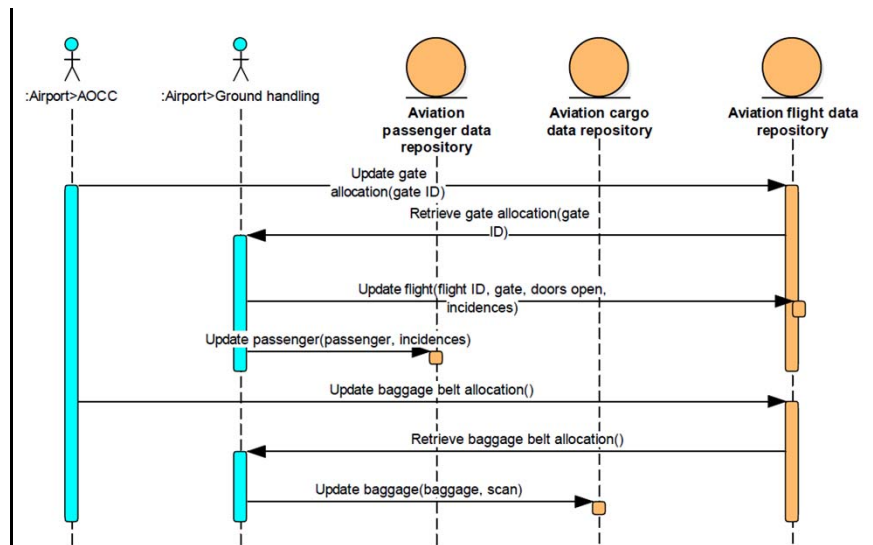


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## Dynamic behavior: information flow example



Post-arrival process: a) Airside



b) Groundside

# SMART NAS net-centric airport information sharing

## Architecture description - options

- **SOA B2B**

- WS-SOAP or REST
- HTTP or AMQP

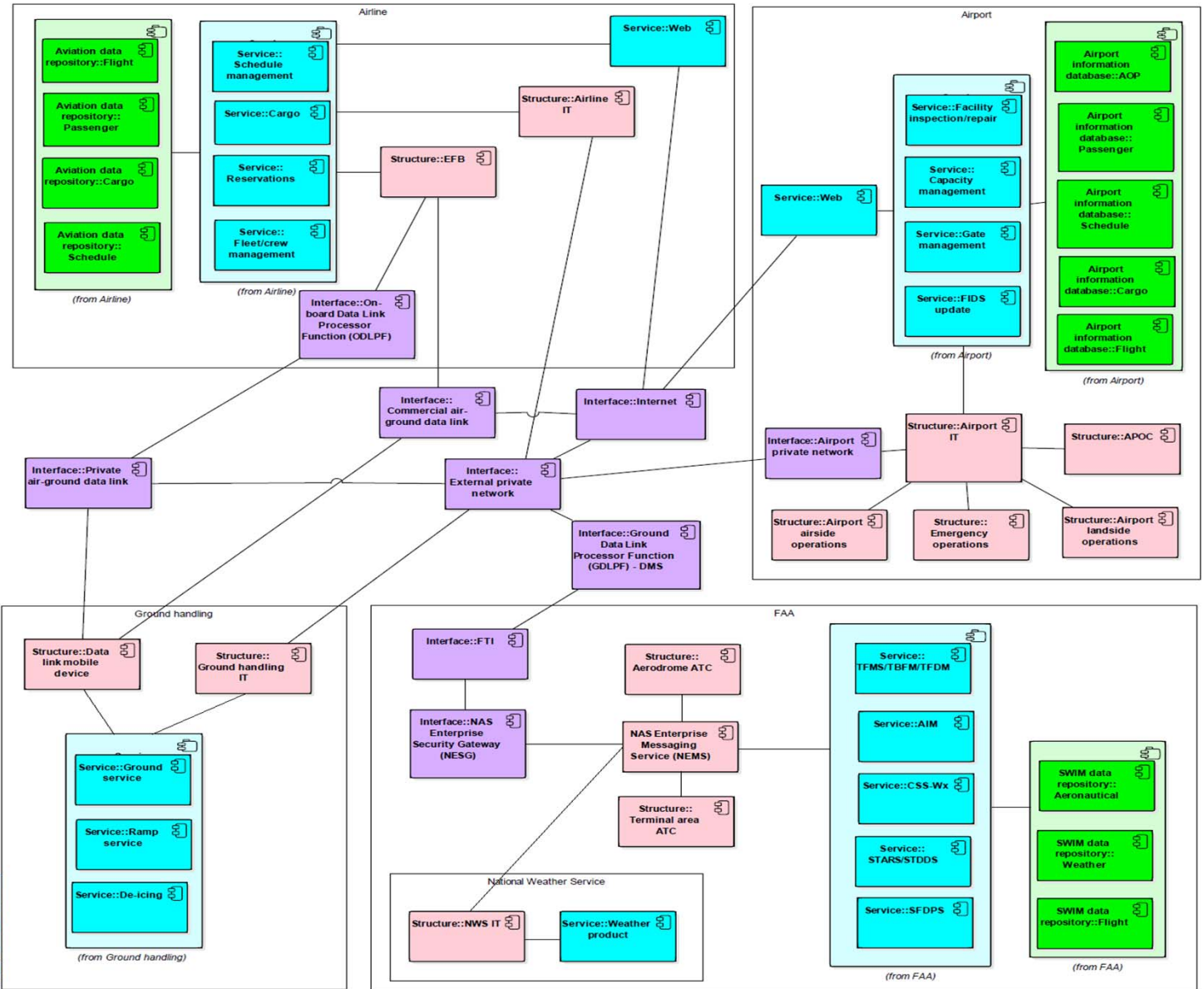
- **Shared data on Cloud**

- Global airport and airline access to IaaS, PaaS and SaaS service models
- Deployment model depends on application: service ecosystem, data analytics, IoT device integration
- Will support self-healing networks



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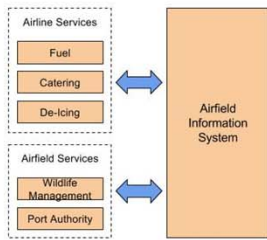
Airport  
SOA  
network



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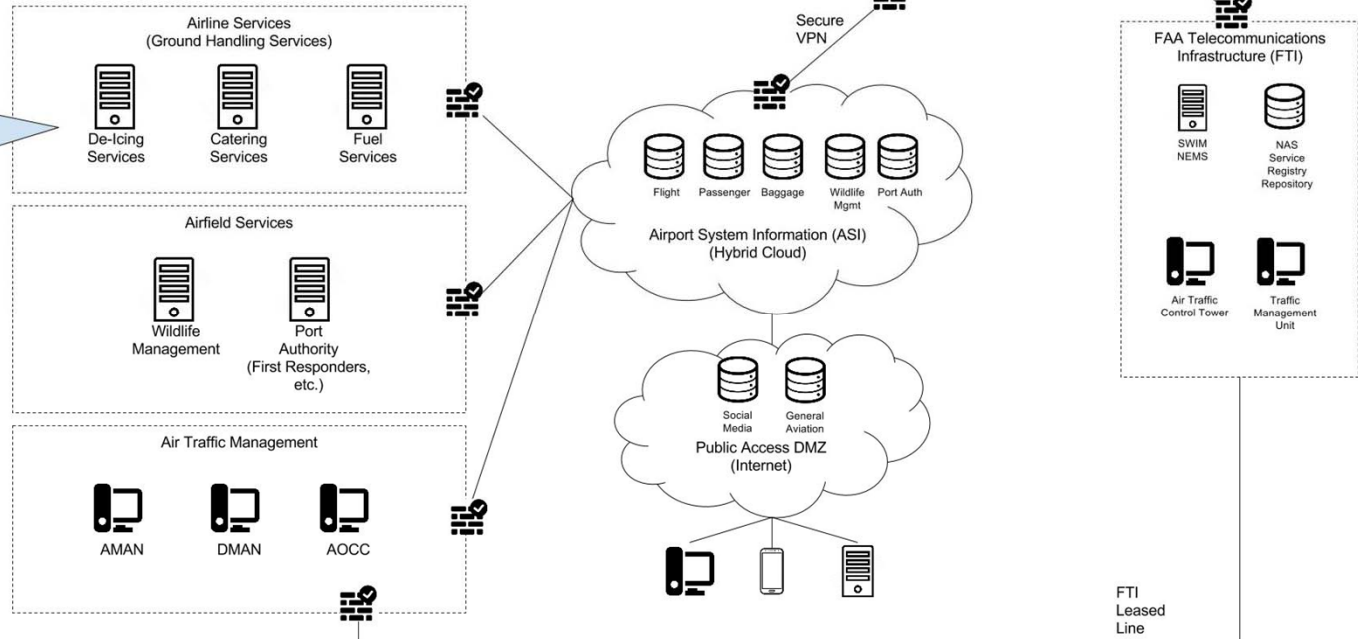
## SMART airport cloud

Smart Airport Concept > Airfield Information System



Could add the following:  
 General Aviation  
 Maintenance & Repair Operations (MRO)  
 Cargo (FedEx, UPS, etc.)

What information is relevant to ATM that supports decision making?



# SMART NAS net-centric airport information sharing

## Technical gaps

**Operational (e.g. reliance on CPDLC/D-ATIS)**

**Infrastructure (e.g. p2p, single point of failure networks)**

**Information (e.g. SWIM-AIDX-AODB formats)**

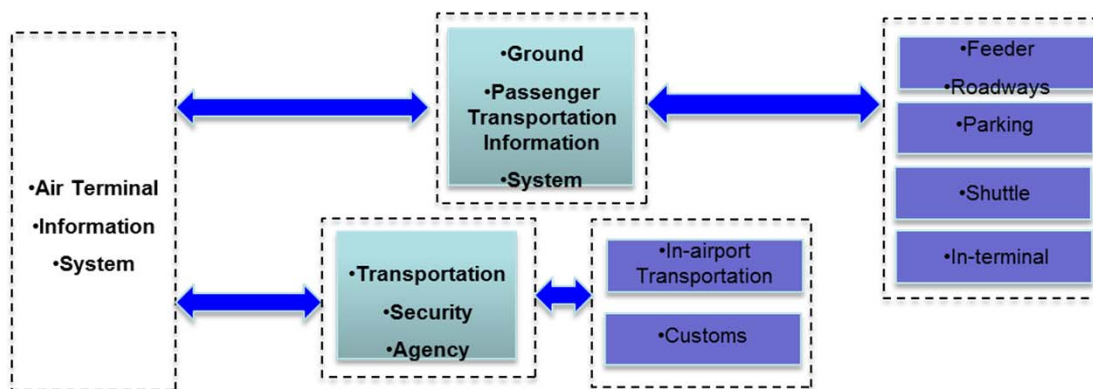
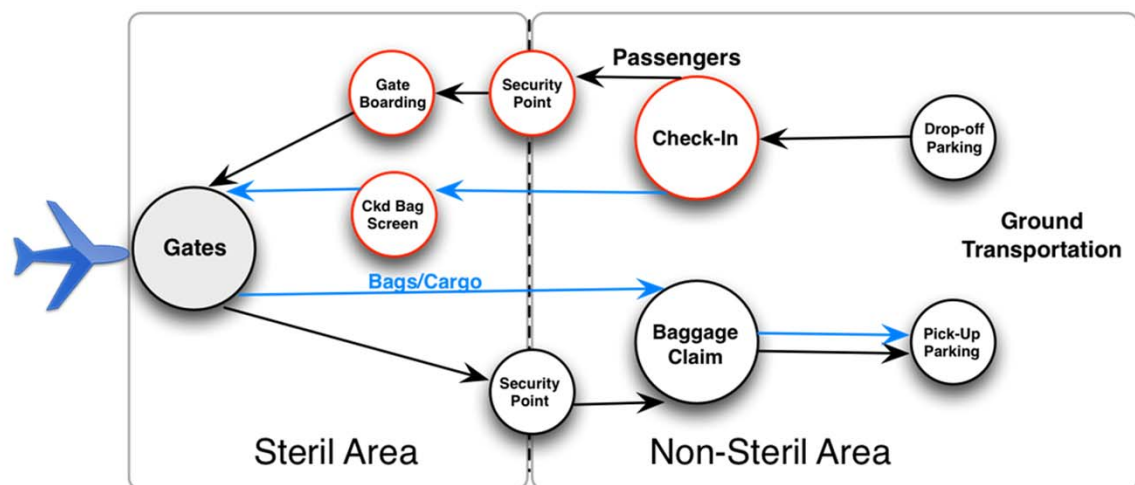
**Security (e.g. usage of business private information)**





# SMART NAS net-centric airport information sharing

Next steps –  
Terminal  
architecture



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## QUESTIONS?



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