Manned and Unmanned Space Vehicles: Air Traffic Insertion & SESAR Requirements

F. Morlang, J. Hampe, S. Kaltenhaeuser, J. Jakobi, L. Núñez-Batista, D.-R. Schmitt

Deutsches Zentrum für Luft- und Raumfahrt e. V., Institut für Flugführung

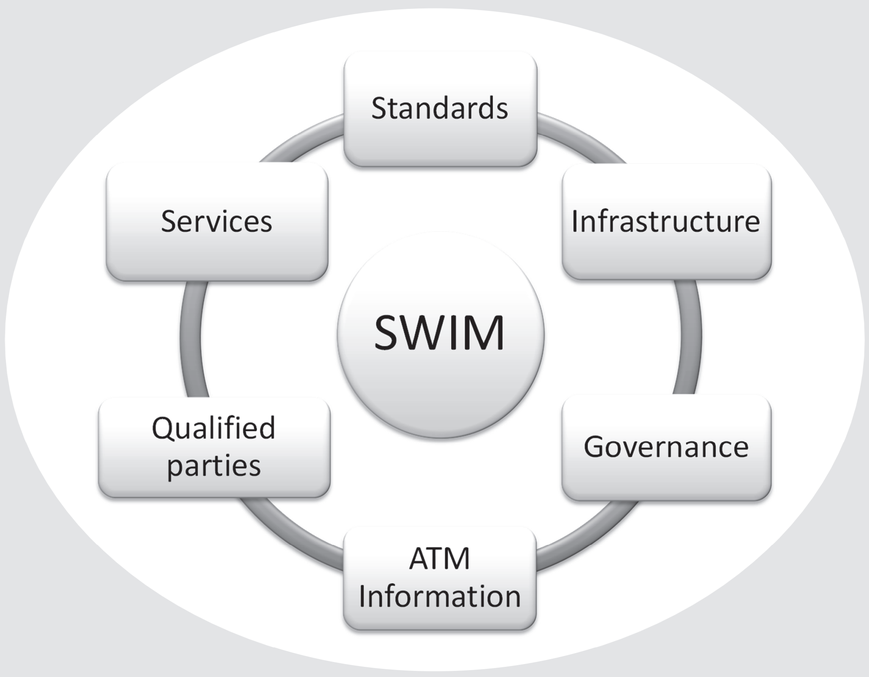
Motivation

- Commercialization of SpaceTransportation
  - More launch/reentry activities and sites
  - Needed minimum segregation of airspaces in time & size (efficient, economic joint ops)
  - **Goal:** Seamless, efficient, and safe integration of air traffic and spaceflight

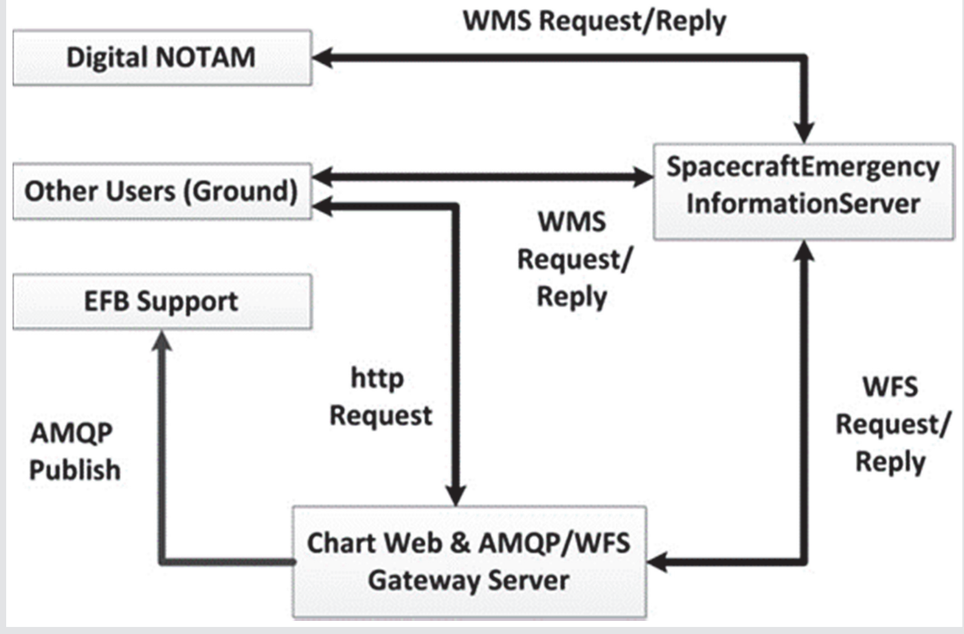
Challenges

- Launch & Reentry Operations
  - Restricted Airspace for launch/reentry window
  - Airspace in risk of falling debris

SESAR Requirements



- Improvements on safety & environmental impact
- System Wide Information Management (SWIM):
  - Business to Performance based trajectory Air Traffic Operations
  - Availability of information throughout ATM system



Approach

- Spaceport/Launch & Landing site evaluation
  - Risk Analysis
  - Impact on aircraft
  - Public Acceptance

- Efficiency of Spaceport Operation
  - International operations and landing
  - Remote Tower Control of Launch/Landing sites
  - Contingency and Continuity Operations

Future Outlook

- Development of a Spacecraft Emergency Information Provider prototype for SWIM integration
- Flight planning/execution testing through simulation
- Flight testing in a human-in-the-loop ATM simulation
- Integration of Spaceflight Operations into ATM
- International participation increase and input from emerging economincs

DLR Deutsches Zentrum für Luft- und Raumfahrt

Deutsches Zentrum für Luft- und Raumfahrt e. V. (DLR)

Institut für Flugführung

Lilienthalplatz 7, 38108 Braunschweig, Deutschland

Telefon +49 531 295-2545 | Dirk-Roger.Schmitt@dlr.de