Extending the vertiport management tool VERTIGER for innovative air mobility scenarios: A drone cage demonstration

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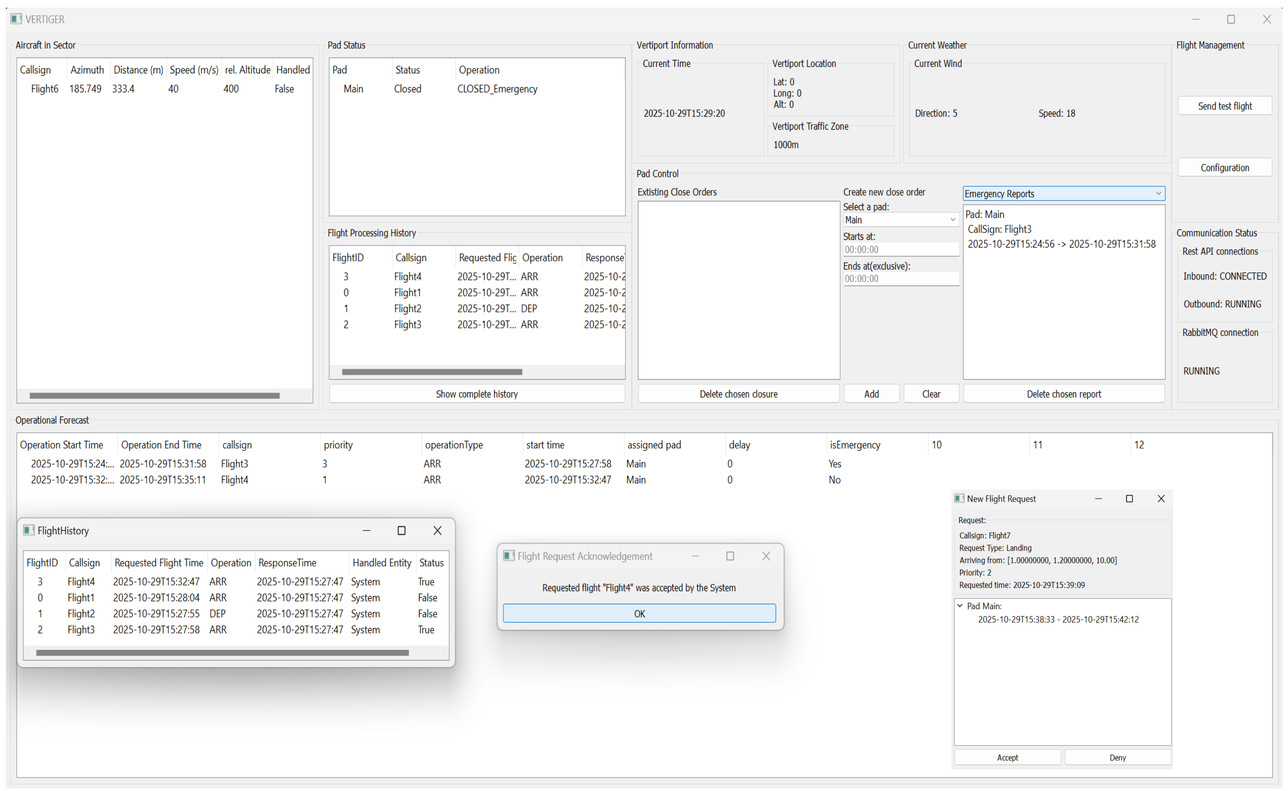
VERTtiport ManaGER VERTIGER

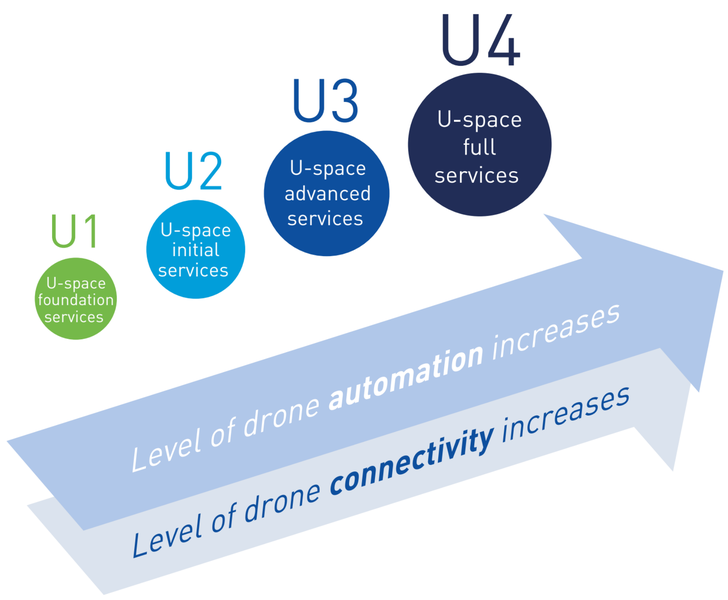
One of the main infrastructure elements in the Innovative Air Mobility (IAM) concept is the vertiport, which serve as the start and/or the end of each journey. Similar to an airport for regular air traffic, there are several tasks that need to be handled on the air-side of a vertiport. The vertiport manager is a tool for handling these task. The drone cage provides a platform for validating these procedures on a small scale.

- Designed to provide both automated and manual control over flight requests, with slots generated based on requested flight time
- Shows relevant reports from foreign object detection to emergencies
- Integration of different sensors at the vertiport, e.g., local weather detection
- Provides airspace surveillance of cooperative and uncooperative airspace users in the vertiport airspace



Full U-space integration

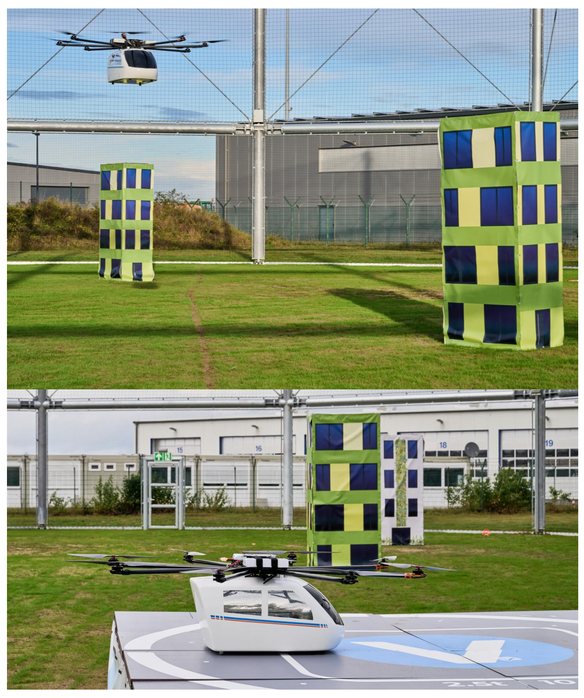
As part of the transformation of uncontrolled low level airspace to U-space airspace, the U-space development is envisioned to be in 4 stages with increasing automation. The last level of U-space, as envisioned by the European Union, is a nearly fully automated set of services that are provided by dedicated service providers. The VERTIGER is one such service provider, that is envisioned to handle all task from surveillance to interactive slot management at a vertiport.



Envisioned U-space development phases
SESAR Joint Undertaking, "SESAR U-space Blueprint," 2017

Drone cage at DLR Braunschweig

- Constructed with a net that covers the whole drone cage and fixed to several steel pylons
- 45 m in diameter and 13 m in height
- 1.500 m^2 base area and 18.750 m^3 airspace volume
- Suitable for multiple drones, that cannot leave it
- Intended for short tests in a safe environment, without the need for long authorization processes

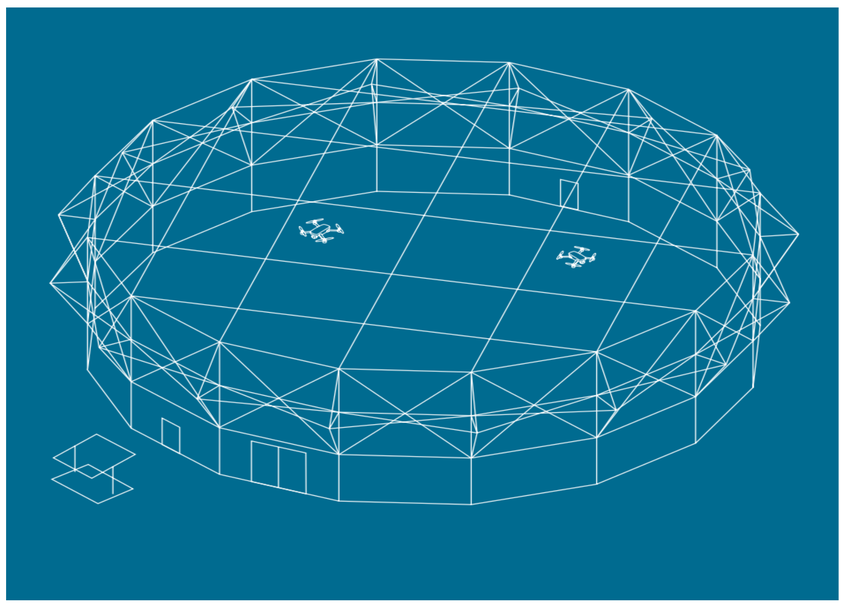


Planned U3 services (developed or extended)

- Vertiport Availability Service
- Dynamic Capacity Management
- Cooperative Interface to ATC
- Emergency Management

Integrated U2 services

- Tracking
- Weather Information



Ongoing scenario exercises

- Demonstration showcasing the flight of an air taxi between two vertiports, which is interrupted by an emergency flight
- Drones could be flown manually or automated (work in progress)
- Initial flight plans could be send using a Fleet Management tool and could be accepted by the three involved vertiports using three separate instances of VERTIGER
- Cancelation of the flight plan of the air taxi could be send successfully

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