

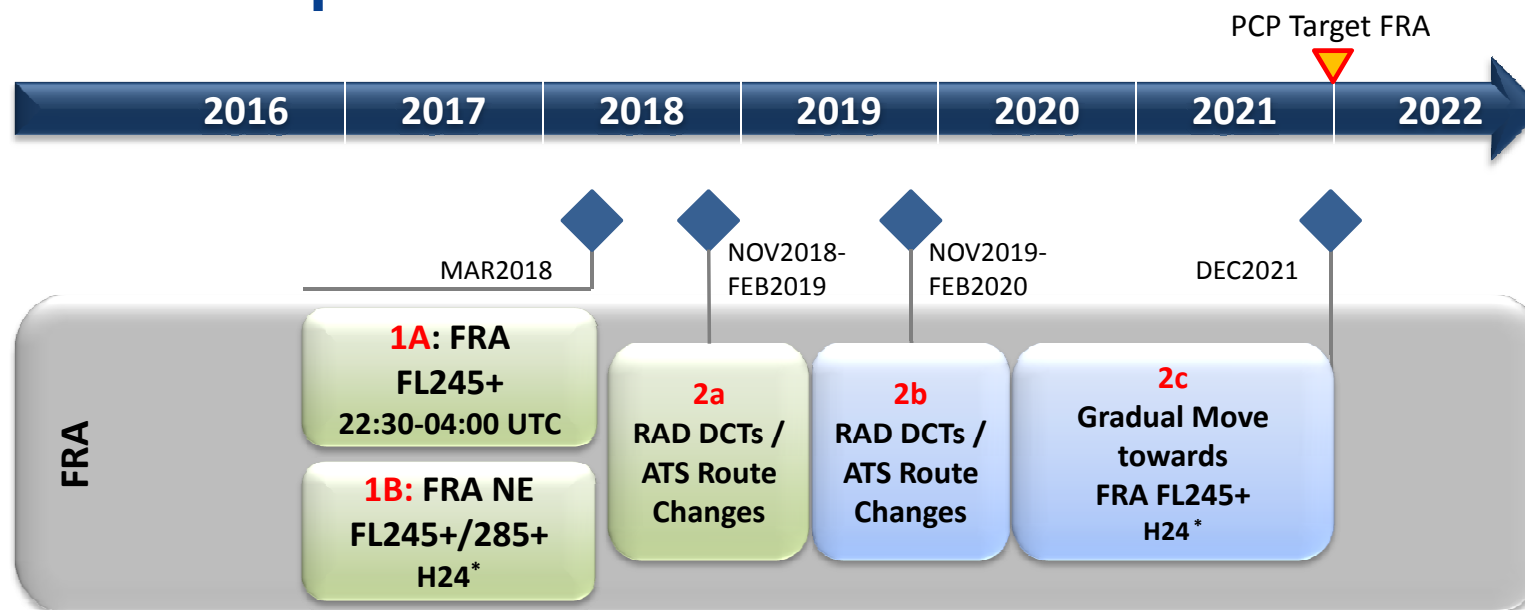
FRA implementation in Germany- DFS

FABEC Expert Workshop on FRA – Paris 12 February 2020

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DFS FRA Roadmap



- Solution 1: MAR 2018
 - FRA @ Night
 - FRA H24 in the North-East
- Solution 2:
 - a - W 2018/19 RAD APP 4 DCTs + ATS Route Changes
 - b - W 2019/20 RAD APP 4 DCTs + ATS Route Changes
 - c - JUN 2020-DEC 2021 FRA FL 245+ H24

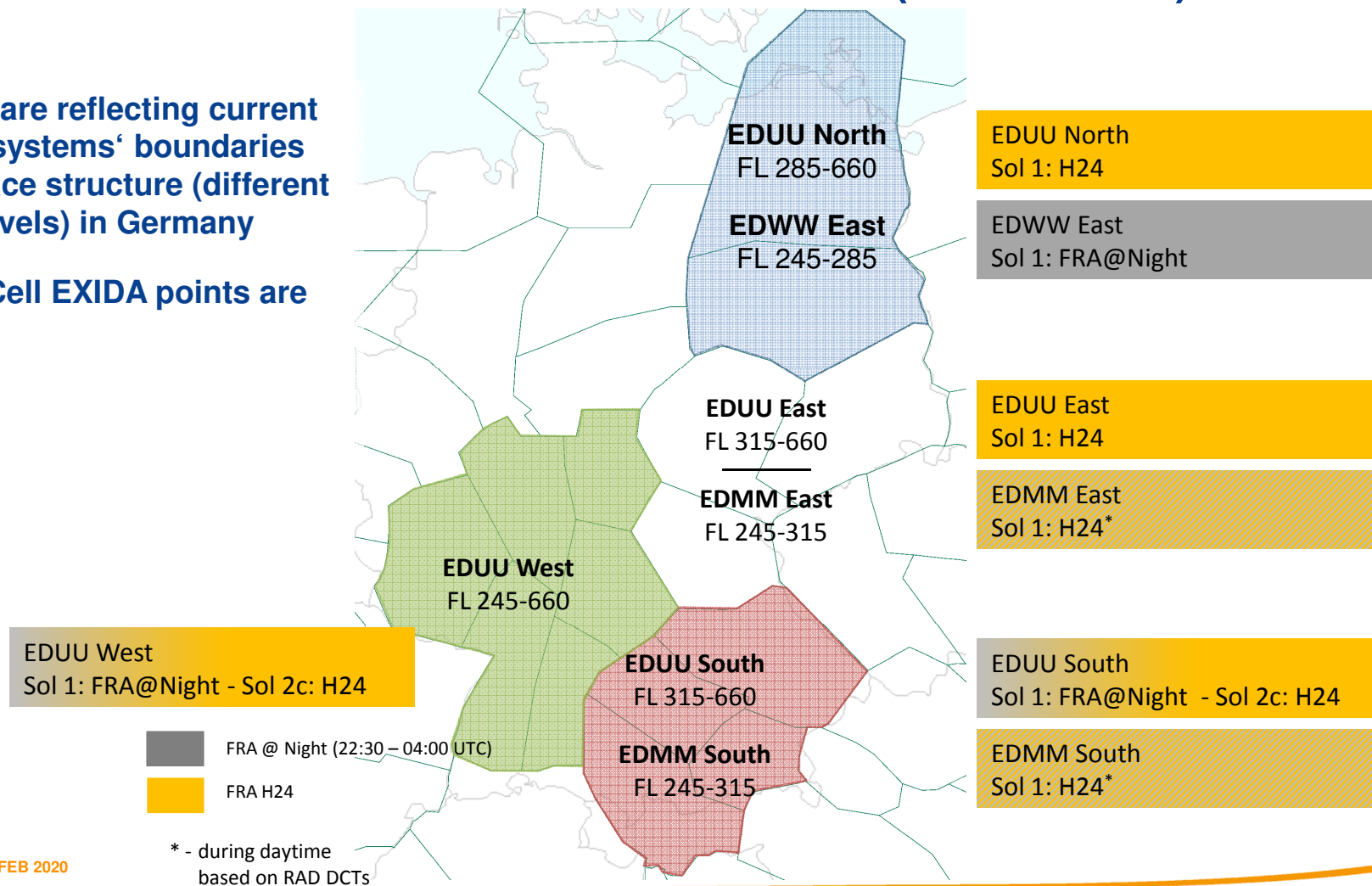
* In daytime Bremen ACC und Munich ACC will offer FRA with compulsory intermediate points or by means of RAD APP 4 DCTs.



FRA Cells

Solution 1 - MAR 2018 (AIRAC 1803) Solution 2c - DEC 2021 (AIRAC 2112)

- FRA Cells are reflecting current technical systems' boundaries and airspace structure (different division levels) in Germany
- For each Cell EXIDA points are published



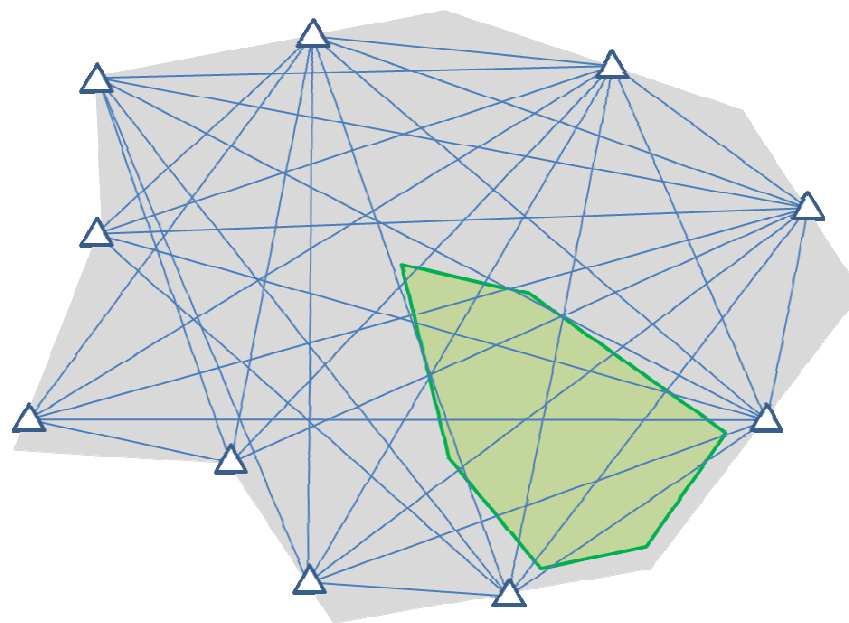
FRA Design Principles

- Unless H24 FRA operations are effective ATS network is kept; otherwise ATS routes will be deleted if feasible
- “Cross-Border” RAD APP 4 DCTs expanding over several FRA Cells will be kept.
- FRA-Volumes published with waypoints for
 - Entry (E)
 - Exit (X)
 - Intermediate (I) - Anchor Points around Special Use Airspace,
 - Avoidance of Sector Clipping and Re-Entries
 - Departure (D) - Transition/Connecting Routes
 - Arrival (A) - Transition/Connecting Routes
- Vertical entry / exit via ARR or DEP points if possible (with connection to Transition Routes), otherwise connection via ATS network
- Military Training Areas de-/activated by AUP/UUP
- Structural limitations where needed in order to ensure Capacity, in accordance with:
 - EUROCONTROL Network Manager (2016): European Route Network Improvement Plan, Part 1 – European Airspace Design Methodology – Guidelines, Edition 1.6, 28.06.2016. Brüssel.
 - EUROCONTROL Network Manager (2016): Free Route Airspace Developments – For a route-free European network, December 2016. Brüssel.
 - EUROCONTROL Network Manager (2017): FRA Application in NMOC – Guidelines, Edition 1.1, 13.02.2017. Brüssel.



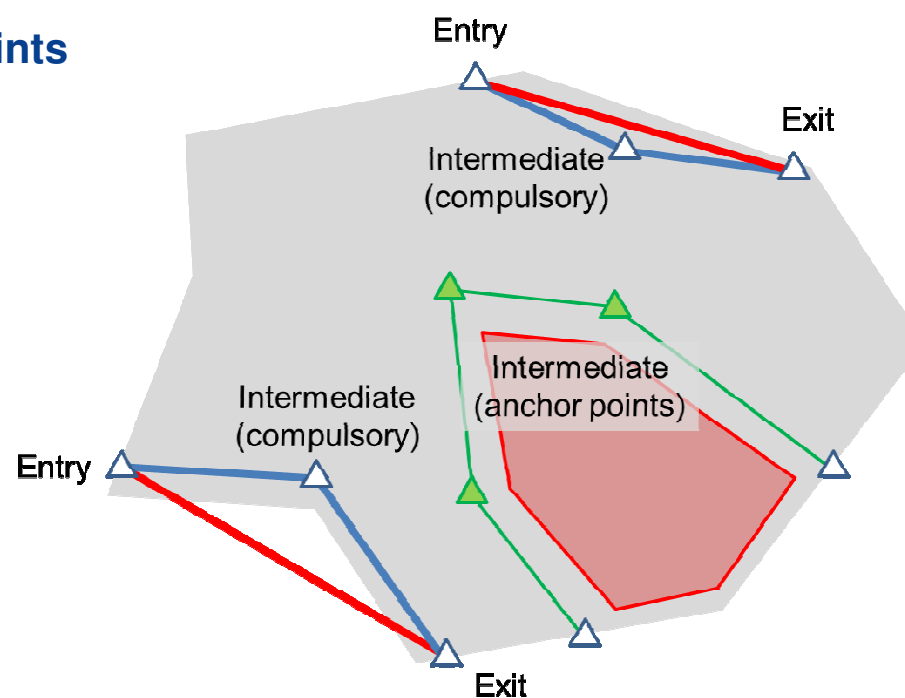
FRA: Entry/Exit Points, FUA

- From all Entry/Exit relations a huge number of FPL plannable routing options results in a very dense network.
- Due to segregation of flows the use of Entry and Exit points might be linked to specific structural requirements.
- Military airspace keeps unchanged.
 - For flight planning purposes SUAs will be encased by Flight Plan Buffer Zones.
 - Inactive FBZs are reported by AUP/UUP as FPL plannable.
 - Conditions of use are determined in FUA Restrictions (RAD APP 7).



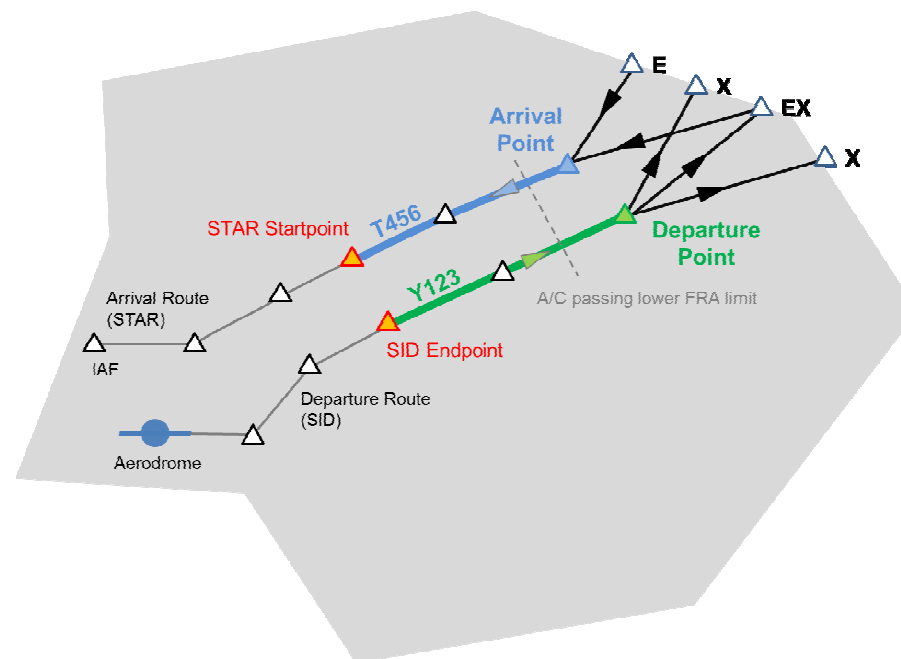
FRA: Intermediate Points

- If needed, on specific Entry/Exit relations compulsory Intermediate Points will prevent from sector clipping, re-entry.
- Intermediate Points will serve as Anchor Points for rerouting around active Flight Plan Buffer Zones (FBZ).



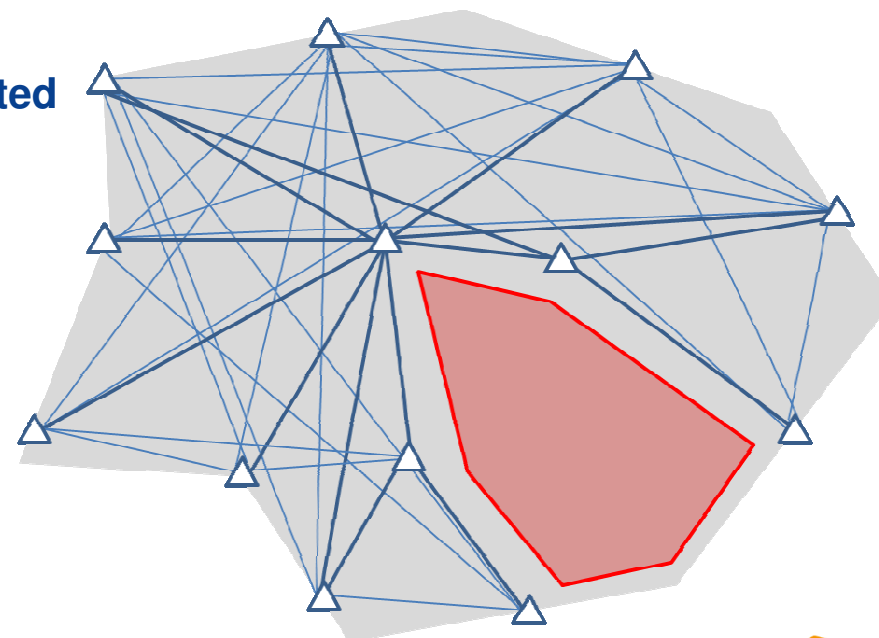
FRA: Connecting Routes

- Connecting Routes are based on existing ATS routes and connect existing SIDs und STARs with the FRA volume.
- Connecting Routes may start/end at the Arrival (A) and Departure (D) Points or at COPs connecting lower and upper airspace.
- Arrival and Departure Points may be located at the vertical FRA boundary or (e.g. for the sake of segregation) within the FRA volume.
- For major airfields Connecting Routes will be determined by RAD Annex Pan Europe.



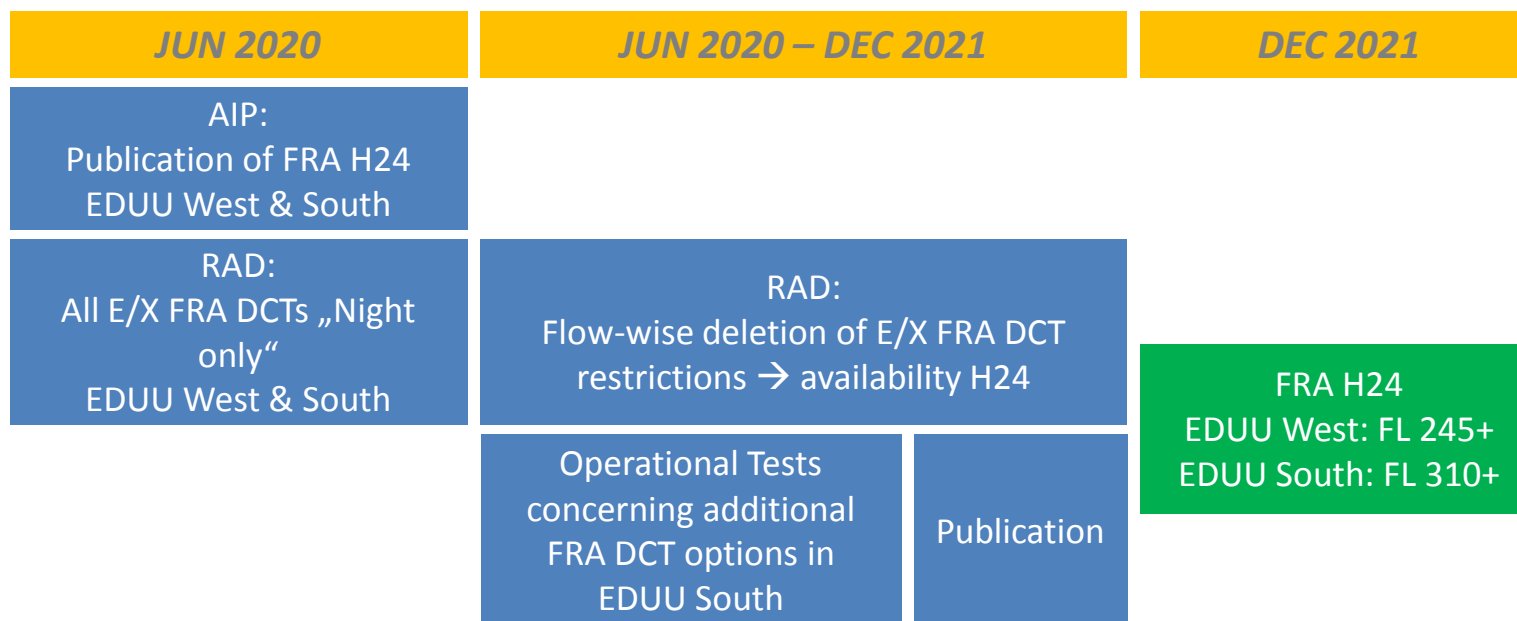
FRA: MIL Airspace

- When a Special Use Airspace is booked an associated Flight Plan Buffer Zone (FBZ) will be activated.
- The FBZ encases the SUA volume and adds a spatial buffer for separation plus a temporal buffer for flight planning.
- In exceptional cases FBZs are smaller than the associated area to allow “border clipping” if flight tracks are coordinated with Mil Users (e.g. ED-R TRA308/401)
- Doing so, all trajectories around the FBZ are available for FPL planning.
- For rerouting (FPL or tactical) Anchor Points will be available.



Solution 2c „Gradual Move towards FRA H24“

- The approach „Gradual Move...“ allows for a step- resp. flow-wise opening of FRA DCT options for H24 availability.
- With this approach there is no need for simulation-based training.



Questions?

