Operational Analysis

Several stakeholders have relationships with the IFE system, they all have different goals. The focus is put here on the operational needs the IFE system will somehow contribute to. **What is the precise scope or content of the IFE system is not elicited yet at this stage**.

Discover the entities and their goals in his the operational capabilities diagram: **[OCB] Operational Capabilities**.

Operational Architecture Diagrams provide a comprehensive view of the activities performed by the entities in order to reach their goals.

- **[OAB] High-Level Expected Activities**
- And its refined version **[OAB] All Operational Activities and Entities**

The different phases of a flight are described in **[M&S] Aircraft Flying Phases** and their sequence in **[OES] Flight Phases**.

System Need Analysis

The focus here is put on the IFE system itself. **The objective is to set the boundaries and provide a clear vision of the need**.

The **[MCB] All Missions and Capabilities** diagram shows on the capabilities of the IFE system. Three other diagrams provide interesting entry points to the model:

- **[SC] System Actors** lists all the Actors (the aircraft is considered as an actor)
- **[SDFB] Top Level Functional Overview** provides a first functional overview of what the actors actually do and what kind of exchanges they have with the IFE system
- **[SAB] Top Level System Overview** and its slightly refined version **[SAB] High Level System Overview** are **very good entry points to further navigate in the model**.

Starting from these high level diagrams, a typical reading path is to dive into the function to visualize their refinement. For example, **[SDFB] [CTX] Run Services**. And recursively.

Using capabilities as a driver to browse the model is recommended. Some diagrams are specifically marked for that purpose, for instance **[SDFB] [CAPABILITY] Provide Video Entertainment Services**. From this capability covering VOD services to the passengers, browse the functional chains and scenarios to better understand how the capability is fulfilled.

- Functional chains: **[SFCD] Start Playing VOD Movie, [SFCD] Resume VOD Movie**
- Scenarios: **[ES] Start VOD Service**, **[ES] Start Playing VOD Movie**

Check the global mode machine of the system with [**M&S] IFE Operating Modes**. Among others, this mode machine is intended to specify under which operational conditions the IFE system is running. Another Mode machine is specifically modelled for what will become the Seat TV: **[M&S] Seat TV - Movie Player Modes**

Logical Architecture

The Logical Architecture provides an intermediate design, hiding some of the implementation-dependent complexity.

The main architectural drivers are explained in the **[LCBD] Architecture Drivers** diagram. Another global view of the logical components is provided by **[LAB] IFE System - All Components, CEs**

Among others, the refined functional analysis is detailed in the following dataflow diagrams (**[LDFB] Top Level Functions** is an entry point):

- **[LDFB] [CTX] Provide Aircraft Interface** explains the functional interfacing with the aircraft (the idea being to isolate these functions in an easily replaceable component to ease the integration of the IFE system in different aircrafts)
- **[LDFB] [CTX] Manage Audio and Video Diffusion** refines how audio and video request are processed.
  - **[LDFB] [CTX] Process Audio Video Requests** distinguishes between VOD and imposed videos requests
  - **[LDFB] [CTX] Broadcast Stored Audio Video Streams** describes the broadcast initialization of content coming from the digital media library
  - **[LDFB] [CTX] Display Video and Play Audio** describes how the different media streams are actually rendered

The allocation of functions to components is exhaustively described in **[LAB] [BUILD] Template**. Functional chains and scenarios are refined.

- Functional chains
  - **[LAB][CTX] Broadcast Audio Announcement FC** (equivalent to **[LFCD] Broadcast Audio Announcement)**
  - **[LAB][CTX] Start Playing VOD Movie FC** (equivalent to **[LFCD] Start Playing VOD Movie**)
- Scenarios
  - **[ES] Perform Audio Announcement**
  - **[ES] Start Playing VOD Movie**

A (partial) data model is defined to support the "Start Playing VOD Movie" functional chain. Data and exchanged items are detailed in **[CDB] Play Video Movie - Logical**.

Physical Architecture

The Physical Architecture describes how the system will be built.

[PAB] Implementation and Behaviour Components provides an exhaustive view of all physical components. Separate views are available in the breakdown diagrams:

- **[PCBD] Implementation Components**
- **[PCBD] Behavioural Components**

The allocation of functions to components is exhaustively described in **[PAB] [BUILD] Template**. Streaming topics are refined and described in the following dataflow and architecture diagrams:

- **[PDFB] [CTX] Broadcast Stored Audio and Video Streams**
- **[PDFB] [CTX] Play Video Stream on Seat TV**
- **[PAB] [CTX] Start Playing VOD Movie FC**

Network topics are only slightly covered in this model.

- Usage of REC-RPL mechanisms to replicate network adapters
  - **REC - Unit Network Adapter** describes the REC (i.e., what will be replicated)
  - **RPL - Instantiations of Unit Network Adapter** describes the three RPLs (replicas).
  - The connection between RPLs is detailed in **[PAB] Focus on Network Setup, Configuration and Tests**
- The transport of data from one connected equipment to another is described in this diagram: **[PAB] Focus on Network Transport**

The data model related to the "Start Playing VOD Movie" functional chain is refined in **[CDB] Play Video Movie - Physical**

End-Product Breakdown Structure

The EPBS architecture is minimal in this model. The **[EAB] Configuration Items and Realized Artefacts** **diagram** indicates how physical components, ports and links are allocated to configuration items.