

SAF User Documentation : P8_PFUM Physical Functional Mapping Viewpoint

Domain	Aspect	Maturity
Physical	Traceability & Mapping	 released

Example

Legend		Proof Of Concept FFDS System 1									
FunctionsOfPhysicalElement		Dragino LS50V2-D20	POC CCU	CCU Software	Laptop	POC Comms Node	Cabling	stp cable	Camera Assembly	Comms Node PSU	Dragino HP0D
		6	15		3						
		6	15	3							6
FFDS_UseCase											
24-hour Fire Detection and Monitoring											
Add a Sensor Node											
Detect and Report Fire											
Detect and Report Fire(context FFDS Context)											
Acquire metadata(context FFDS Context)											
Alert fire(context FFDS Context)											
Analyze FF data(context FFDS Context)											
detect heat acc. threshold(context FFDS Context)											
detect smoke acc. threshold(context FFDS Context)											
Display Operator warning(context FFDS Context)											
get visual(context FFDS Context)											
Manage Operator warning(context FFDS Context)											
measure heat level(context FFDS Context)											
measure smoke level(context FFDS Context)											
Provide Sensor Data(context FFDS Context)											
Report fire(context FFDS Context)											
Request Ground Visual(context FFDS Context)											
Request image data(context FFDS Context)											
Request sensor data(context FFDS Context)											
Request weather data(context FFDS Context)											
Retrieve Ground Visual(context FFDS Context)											
Retrieve sat image data(context FFDS Context)											
Retrieve sensor data(context FFDS Context)											
Retrieve weather data(context FFDS Context)											
transmit heat detection(context FFDS Context)											
transmit smoke detection(context FFDS Context)											
Visualize FF data(context FFDS Context)											
Ping a Sensor Node											
Remove a Sensor Node											
Run Observation Test											
Start the System											
Stop the System											
Switch to Maintenance Mode											
Switch to Test Mode											

Purpose

The Physical Functional Mapping Viewpoint supports the analysis of the assignment of system functions and system partial functions to physical system elements. The result shall be computed from the assignment of

functions to logical system elements and the assignment of logical system elements to physical system elements

Applicability

The Physical Functional Mapping Viewpoint supports the “Design Definition Process” activities of the INCOSE SYSTEMS ENGINEERING HANDBOOK 2023 [§2.3.5.5] and contributes to the artifact "Traceability Mapping".

Furthermore, the Physical Functional Mapping Viewpoint supports the "Allocation and Partitioning of Functional Entities to Physical Entities" activities.

Presentation

A FBS_to_PBS mapping matrix featuring

- Functional Breakdown Structure (FBS)
- Physical Breakdown Structure (PBS)
- mapping (it is a derived relationship) from system functions and system partial functions to physical SOI elements

Stakeholder

- [Hardware Developer](#)
- [IV&V Engineer](#)
- [Mechanic Developer](#)
- [Software Developer](#)
- [System Architect](#)

Concern

- [What is the mapping of functions to the physical SOI physical architecture?](#)
- [Which system functions need to be tested in IV&V activities?](#)

Profile Model Reference

The following Stereotypes / Model Elements are used in the Viewpoint:

- Allocate [SysML Profile]
- Attribute "function" of SAF_PhysicalItem referencing SAF_SystemFunction
- [SAF_P8_PFUM_Matrix](#)
- [SAF_PhysicalElement](#)
- [SAF_PhysicalHardwareElement](#)
- [SAF_PhysicalSoftwareElement](#)

- [SAF_SystemFunction](#)
- [SAF_SystemPartialFunction](#)

Input from other Viewpoints

Required Viewpoints

- [Logical Structure Definition Viewpoint](#)
- [Physical Structure Definition Viewpoint](#)
- [Logical Functional Mapping Viewpoint](#)

Recommended Viewpoints

- [System Functional Breakdown Structure Viewpoint](#)