

SAF User Documentation : Physical Functional Mapping Viewpoint

Domain	Aspect	Maturity
Physical	Traceability & Mapping	 released

Example

Legend		Proof Of Concept FFDS System 1														
FunctionsOfPhysicalElement		15	3													
FFDS_UseCase																
24-hour Fire Detection and Monitoring																
FFDS A Day in the Life of FFDS(context FFDS Context)																
Add a Sensor Node																
Add a Sensor Node(context FFDS Context)																
Detect and Report Fire		15	3							6	6					
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 analyses the assignment of the System Functions and the System Partial Functions to the Physical SOI Elements.

Applicability

The Physical Functional Mapping Viewpoint supports the "System Architecture Definition process" activities of the INCOSE SYSTEMS ENGINEERING HANDBOOK 2015 .

Presentation

A Physical Functional Mapping Matrix featuring

- the call behavior action representing usage of System Functions
- Physical SOI Elements or Physical SOI
- a derived relationship

Stakeholder

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

Concern

- [What is the allocation of functions to the Physical Elements in the physical architecture?](#)
- [Which 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_FunctionAction](#)
- [SAF_PhysicalElement](#)
- [SAF_PhysicalHardwareElement](#)
- [SAF_PhysicalSoftwareElement](#)
- [SAF_SPV08b_View](#)
- [SAF_SystemFunction](#)
- [SAF_SystemPartialFunction](#)

Input from other Viewpoints

Required Viewpoints

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

Recommended Viewpoints

- [System Process Viewpoint](#)
- [System Functional Refinement Viewpoint](#)