



SAF User Documentation : Physical Internal Exchange Viewpoint

Domain	Aspect	Maturity
Physical	Interaction & Collaboration	 under construction

Example

 Physical-Internal-Exchange-Viewpoint-example.svg

 Physical-Internal-Exchange-Viewpoint-example-1.svg

Purpose

The Physical Internal Exchange Viewpoint serves for the identification and definition of interfaces of elements of the SOI. Also, the delegation of SOI element interfaces to SOI boundary interfaces is covered. The Physical Internal Exchange Viewpoint

- identifies SOI element interfaces on a Physical Level
- states to which other SOI elements the interfaces are connected to
- assigns interface specifications to interfaces
- defines the usage of interfaces, e.g., if only a subset of the interfaces is used
- defines the delegation of SOI element interfaces to SOI boundary interfaces

Applicability

The Physical Internal Exchange Viewpoint supports the "Create System Design " activity included in "Design Definition Process" activities of the INCOSE SYSTEMS ENGINEERING HANDBOOK 2023 [§ 2.3.5.5] and contributes to the System Interface definition.

It also supports the "Interface Management" method of the INCOSE SYSTEMS ENGINEERING HANDBOOK 2023 [§ 3.2.4].

Presentation

One or more IBD featuring the Physical Elements of the SOI, and the SOI boundary, containing connectors for each identified SOI interface delegation to SOI elements, as well as connectors between related interfaces of SOI parts. An interface is a connection resource for hooking on the Physical SOI Elements to other Physical

SOI Elements. Item flows are defined for each exchange on the identified interface. Recommendation: Use more than one IBD focused on different areas of interest to keep the view comprehensive. Depending on the Stakeholder Concerns the physical item exchange information might be suppressed.

Stakeholder

- [Hardware Developer](#)
- [IV&V Engineer](#)
- [Regulation Authority](#)
- [Safety Expert](#)
- [Security Expert](#)
- [Software Developer](#)
- [System Architect](#)

Concern

- How do internal system elements interact with each other to provide the system function or service?
- What additional information the system or a system element needs to generate to enable testing?
- What are data / information items exchanged?
- What are the protocols for exchanging items on an interface?
- What kind of information is exchanged and processed within the system?
- Which HW interfaces are necessary?
- Which SW interfaces are necessary?
- Which interface design items are on an interface of a physical architecture element?
- Which interface partners does a HW item have?
- Which interface partners does a SW item have?

Profile Model Reference

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

- Connector [UML_Standard_Profile]
- FlowProperty [SysML Profile]
- ItemFlow [SysML Profile]
- ProxyPort [SysML Profile]
- [SAF_PhysicalElement](#)
- [SAF_PhysicalExchangeType](#)
- [SAF_PhysicalHardwareElement](#)
- [SAF_PhysicalSoftwareElement](#)
- [SAF_ProtocolLayerRelationship](#)
- [SAF_SPV04b_View](#)

Input from other Viewpoints

Required Viewpoints

- [Physical Structure Viewpoint](#)

Recommended Viewpoints

none