SAF User Documentation : Physical Context Exchange Viewpoint

Domain	Aspect	Maturity
Physical	Context & Exchange	✅ released

Example
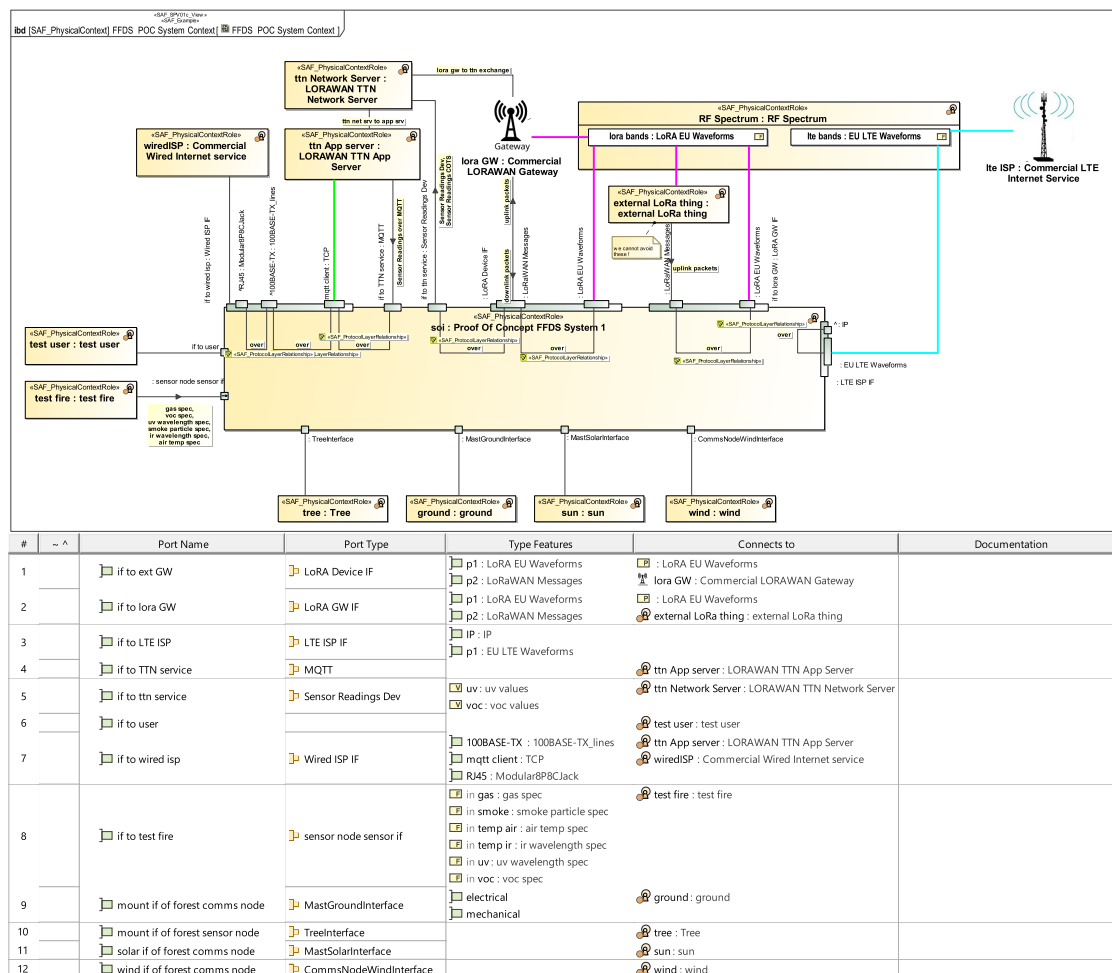
Purpose

The Physical Context Exchange Viewpoint focuses on the identification of the physical interfaces with external entities and relevant documentation. It is used to capture interface design requirements, applicable standards, protocols and format specifications, that are agreed upon the interfaces.

Applicability

The Physical Context 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 artifacts "System Design Description" and "System Interface Definition".

Furthermore, the viewpoint supports the "Interface Management" approach of the INCOSE SYSTEMS ENGINEERING HANDBOOK 2023 [§3.2.4].

Presentation

A) For each given context, an internal block diagram (IBD is used to identify the physical interfaces, the item flows, that are exchanged on that interfaces, and related documentation. Note: To understand the interfaces, a mapping of protocol layers may be depicted.

B) A tabular format providing a list of all the defined external interfaces and the applicable documentation

- context element kind (environment, external entity, physical user, etc.)
- context element role name
- port name and reference to port type
- reference to context element type

C) A tabular format listing the applicable standards, protocols and formats for the item flows exchanged via the identified interfaces.

Stakeholder

- Acquirer
- Customer
- Hardware Developer
- IV&V Engineer
- Mechanic Developer
- Safety Expert
- Security Expert
- Software Developer
- Supplier
- System Architect

Concern

- Which are the external physical entities the system interacts with in the given context?
- Which are the protocols for exchanging physical items on a specific interface?
- Which kind of physical items (energy, material, information, etc.) are exchanged between the system and external entities?

- Which kind of physical items (energy, material, information, etc.) are used on an interface of a physical architecture element?
- Which standards, protocols, and format specifications apply to a physical interface?

Profile Model Reference

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

- Attribute "realizingConnector" of InformationFlow referencing Connector
- Connector [UML_Standard_Profile]
- FlowProperty [SysML Profile]
- FlowProperty contained in SAF_PhysicalInterfaceDefinition
- FlowProperty typed by SAF_PhysicalExchangeType
- ItemFlow [SysML Profile]
- ItemFlow typed by SAF_PhysicalExchangeType
- ProxyPort [SysML Profile]
- ProxyPort typed by SAF_PhysicalInterfaceDefinition
- SAF_PhysicalEnvironment
- SAF_PhysicalExchangeType
- SAF_PhysicalExternalSystem
- SAF_PhysicalInterfaceDefinition
- SAF_PhysicalSystem
- SAF_PhysicalUser
- SAF_ProtocolLayerRelationship
- SAF_SPV01c_View

Input from other Viewpoints

Required Viewpoints

- Physical Context Definition Viewpoint

Recommended Viewpoints

none