The Operational Domain of the System Architecture Framework (SAF)

19.11.2020 Tag des Systems Engineering (TdSE)– Online –

Zur Person

- Dipl.-Ing Elektrotechnik (Nachrichtentechnik)
- 2005 - 2015 Systems Engineer bei Airbus Defence & Space
- 2016 - 2020 System Engineer bei Continental, BU ADAS
- 2020 - heute Head of Process Group Technical Engineering Processes @ Continental Automotive
- Schwerpunkt im Bereich der (modellbasierten) Systementwicklung (MBSE)
- Schriftführer der Gesellschaft für Systems Engineering (GfSE)

Teilnehmer in der SAF- Arbeitsgruppe

GfSE Gesellschaft für Systems Engineering e.V. GERMAN CHAPTER OF INCOSE

AIRBUS

ATLAS ELEKTRONIK

AVL

Continental

HENSOLDT Detect and Protect.

invenio

SODIUS WILLERT

ZF

Goal of Operational Domain

- Understanding the Need behind a customer request, the stakeholders in general and of the environment.

- ISO15288 relation:
  - "Business and Mission Analysis" and "Stakeholder Needs and Req. Def. Process"

- per se solution free:
  - Focus on organisational Entities and operational processes

- Identification of Development Scope and Context (functional/physical)
- Stakeholder Identification and their Needs
- Supports ConOps definition
- Self-Constraint: Compatibility to UAF/NAF for carry-over

Operational Domain (OD) Application Cases

- **Application Case 1 :** Product development (pre-market)

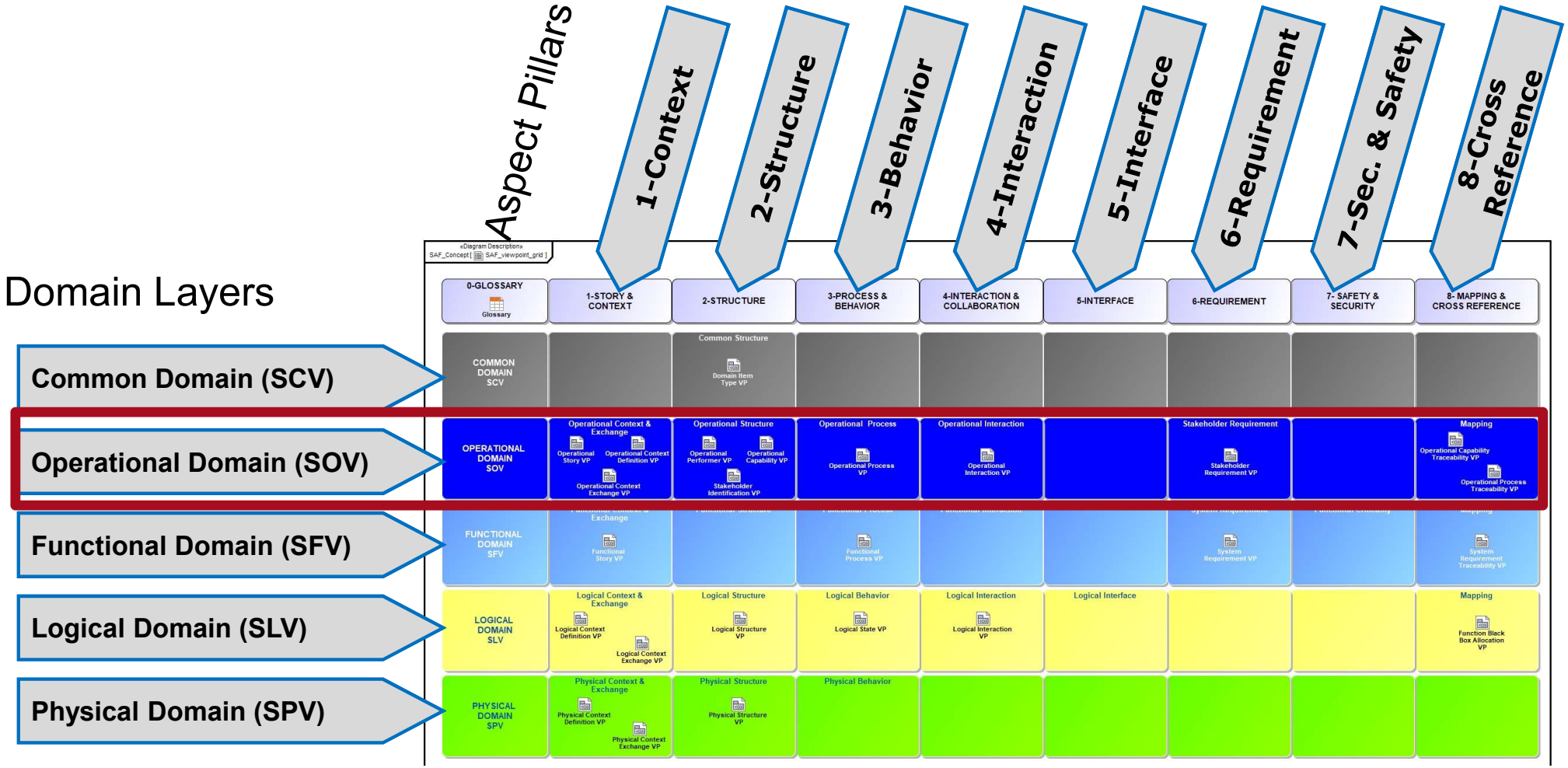
  Anticipate and Analyze Operational Environment, Processes and Needs
  -> derive valid Stakeholder Requirements for a future Product

- **Application Case 2 :** Engineering on existing Stakeholder Requirements (understanding request)

  Validate and Improve Stakeholder Requirements Understanding
  by supporting them with modeling

- **Application Case 3:** Continue existing Enterprise Framework (EF) Model with SAF (carry on UAF/NAF/... model)
  - Metamodel of SAF Operational Domain is compatible to Enterprise Frameworks for seamless transition to SAF Functional/Logical/Physical Domains

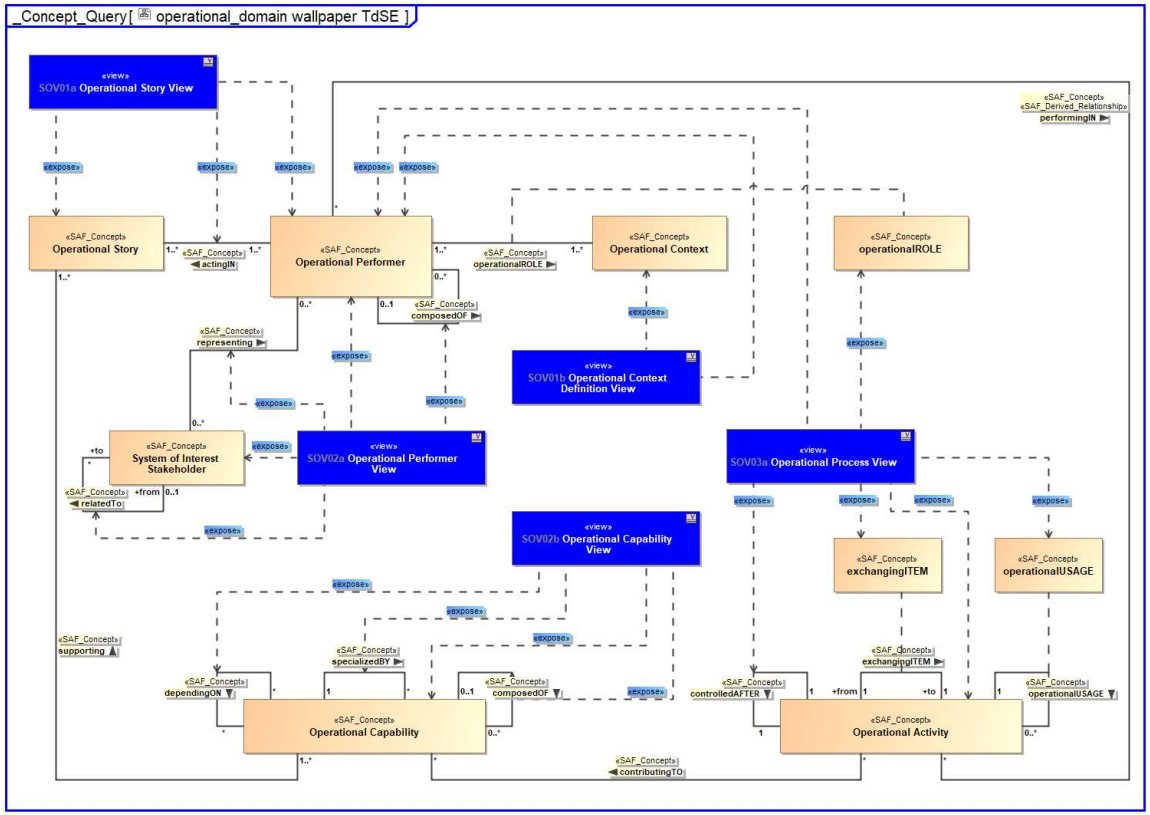
SAF Grid



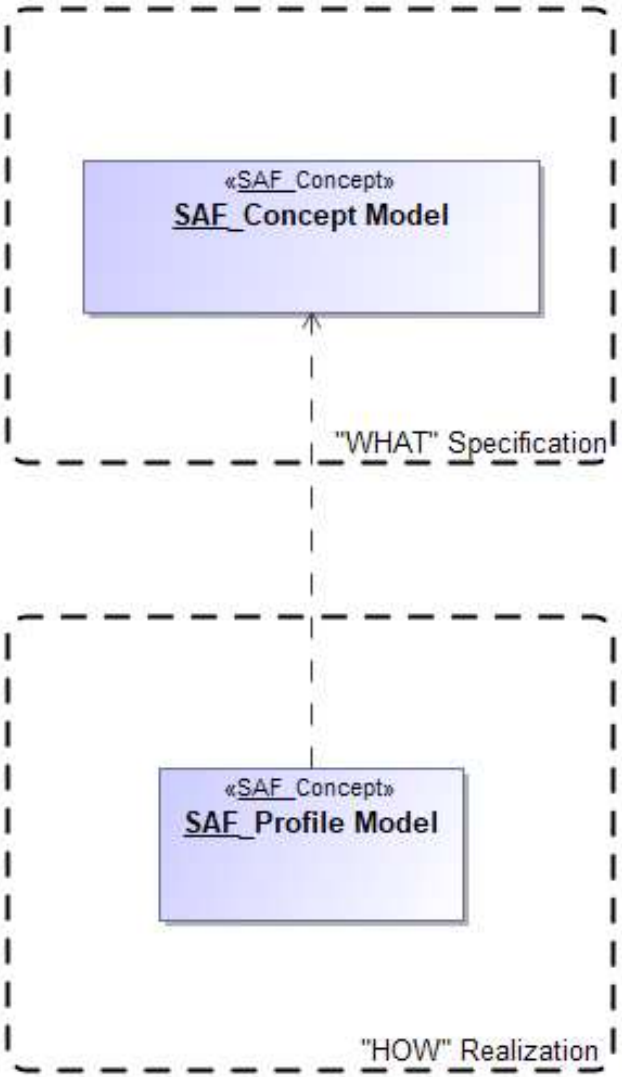
Note: Shown Viewpoints in presentation are only a SOV sub-set!

Concept Definition / View und Viewpoints

- Models contain extensive information
- stakeholder need only specific information at a dedicated time
- A **Viewpoint** specifies a specific data collection
- In SAF Concept also the Relations between **Model Elements**



SAF Concept und Profile Model



SAF Concept Model defines

- ➜ Which model elements are used in architecture model
- ➜ Relationships between model elements
- ➜ Viewpoints available
- ➜ Model elements represented in particular view

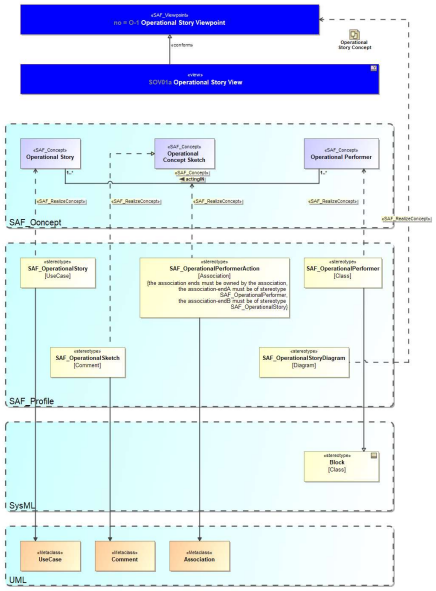
Poses binding definition for realization!

SAF Profile Model

- ➜ Definies how the model elements and realations are modelled
- ➜ Founds on SysML (and UML)
- ➜ Provides additional Stereotypes

Is compliant to Concept Model

From Concept to Profile



«stereotype»
SAF_OperationalStory
[UseCase]

«stereotype»
SAF_OperationalPerformerAction
[Association]
{the association ends must be owned by the association,
the association-endA must be of stereotype
SAF_OperationalPerformer,
the association-endB must be of stereotype
SAF_OperationalStory}

«stereotype»
SAF_OperationalPerformer
[Class]

«stereotype»
SAF_OperationalSketch
[Comment]

«stereotype»
SAF_OperationalStoryDiagram
[Diagram]

SAF_Profile

«stereotype»
Block
[Class]

SysML

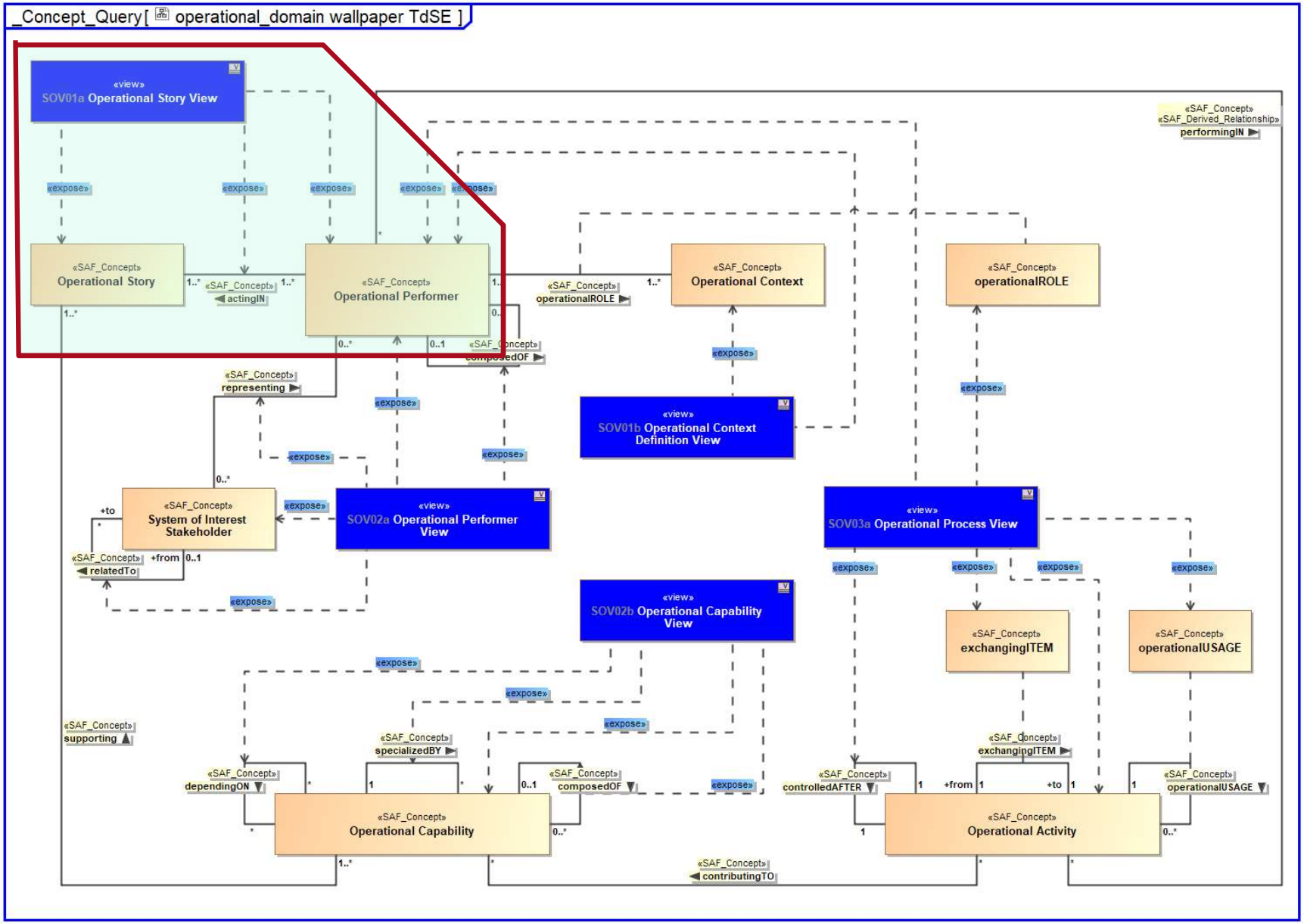
«Metaclass»
UseCase

«Metaclass»
Comment

«Metaclass»
Association

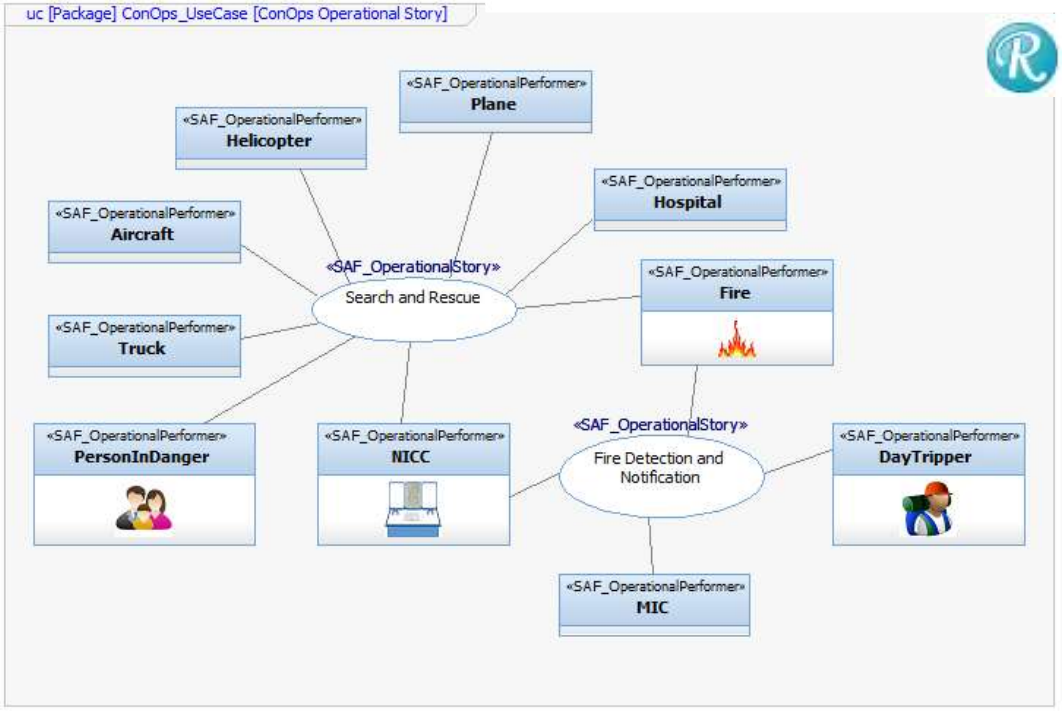
UML

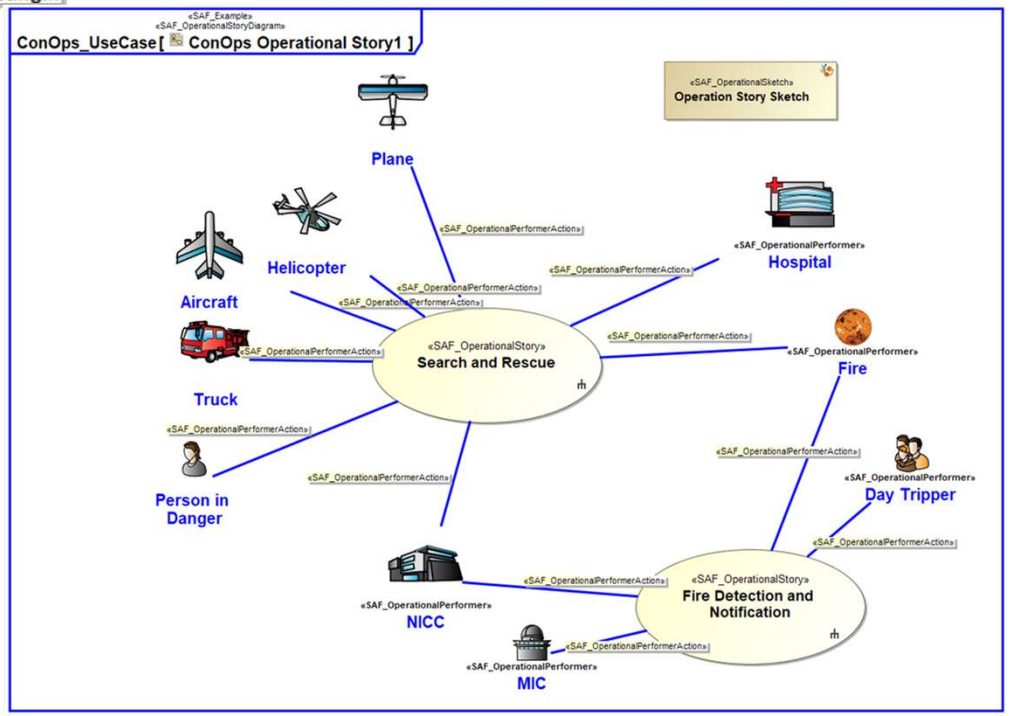
SOV Operational Story ViewPoint



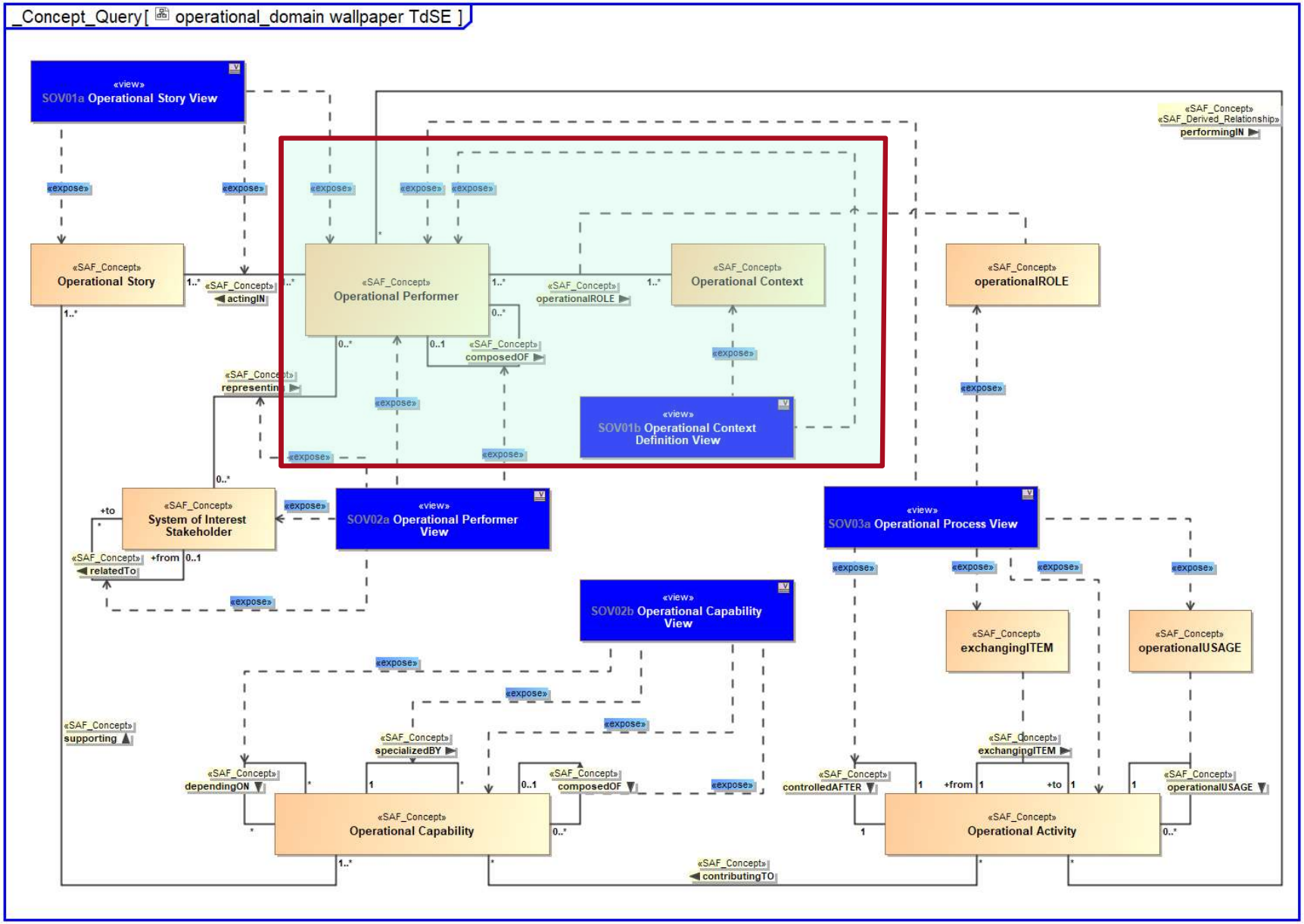
SOV Operational Story ViewPoint

- Purpose: Identify Operational Stories and Operational Performers and the relationship between them





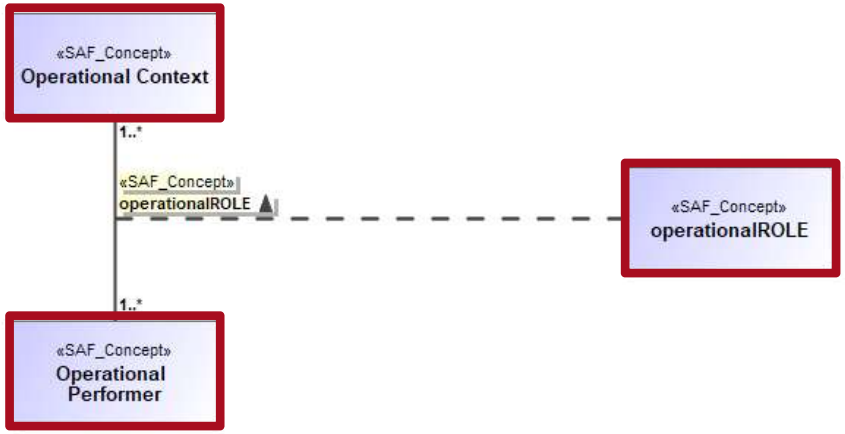
SOV Context Definition ViewPoint

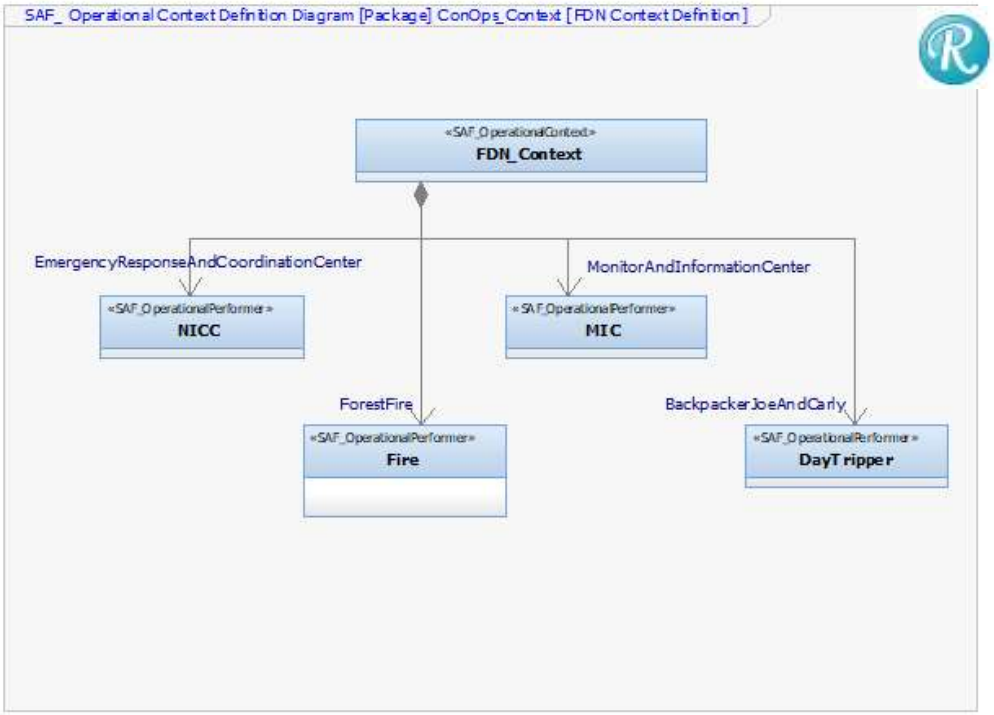


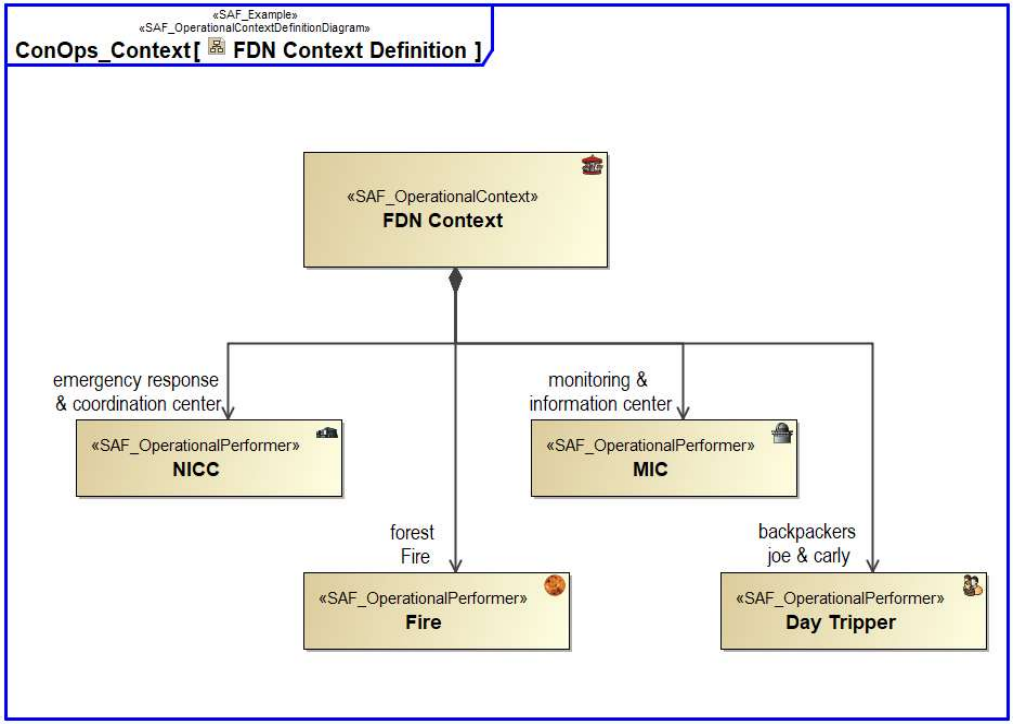
SOV Context Definition ViewPoint

- Purpose:

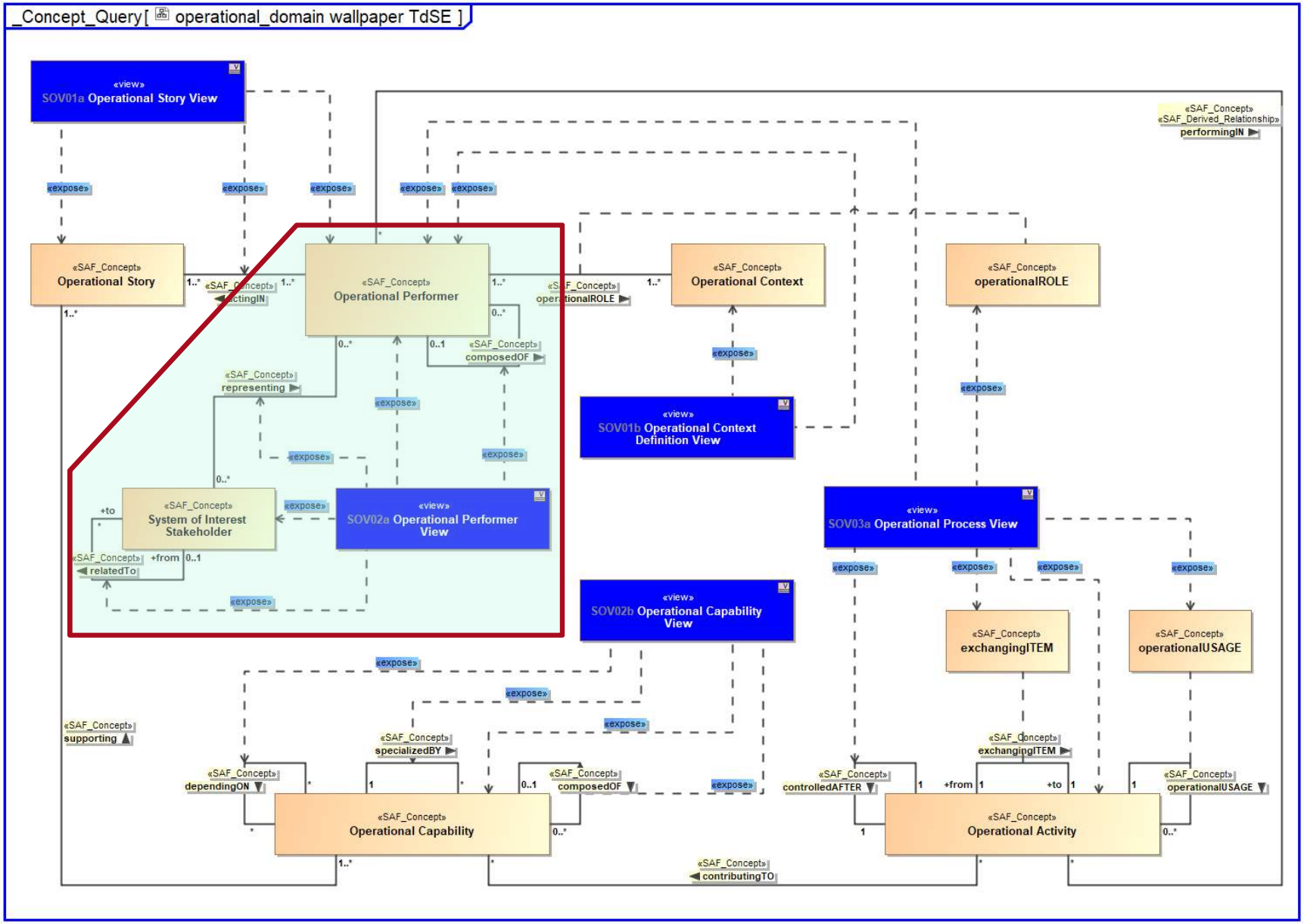
Identify the Operation Performers and their Operational Role in a defined Operational Context





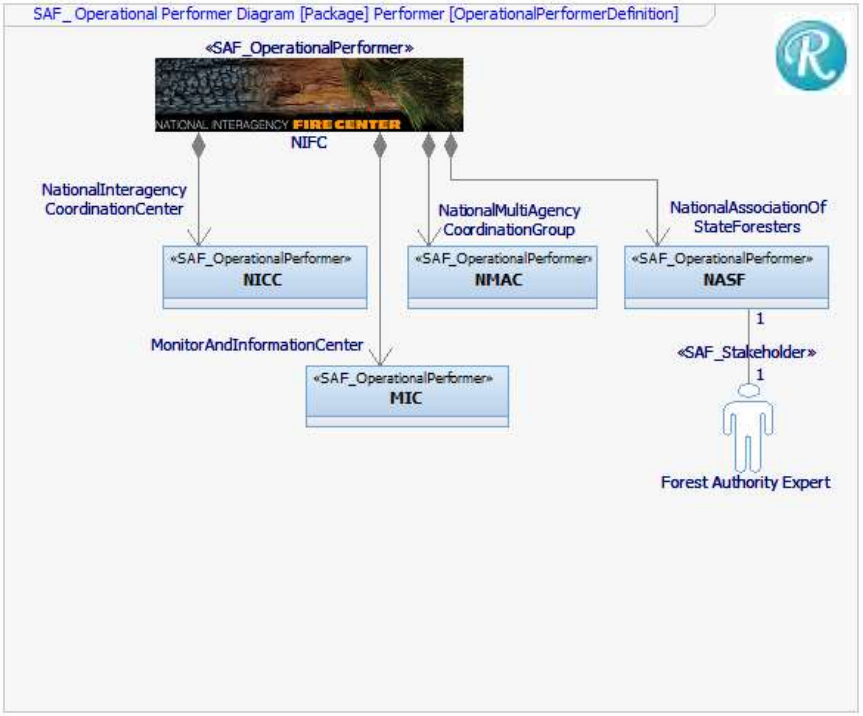


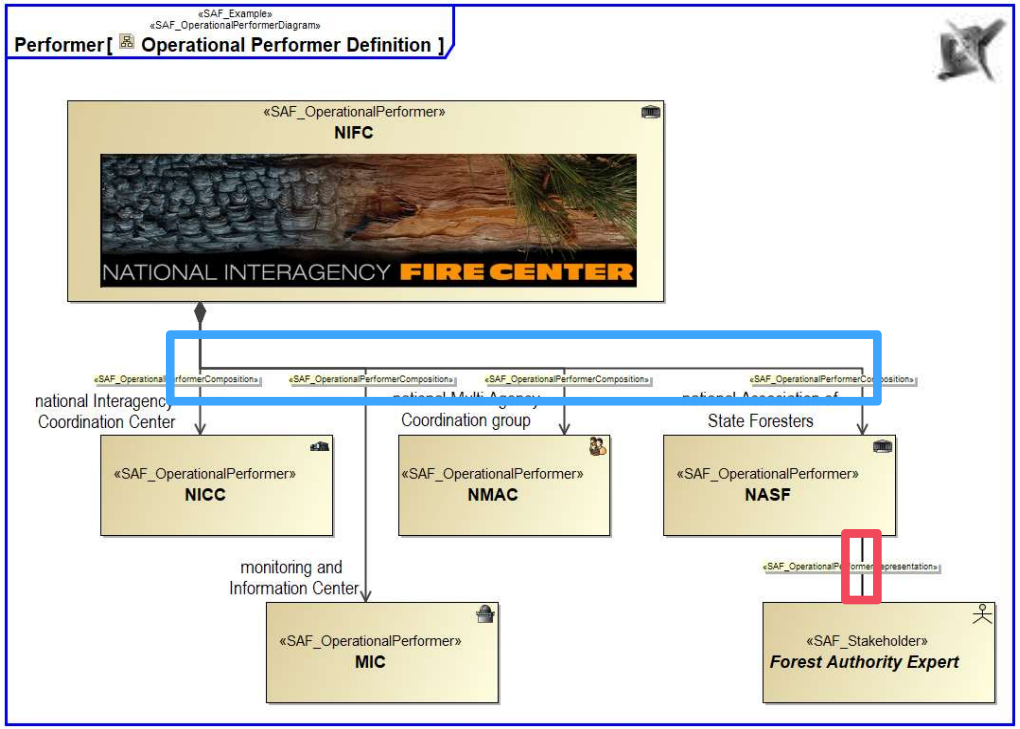
SOV Operational Performer ViewPoint



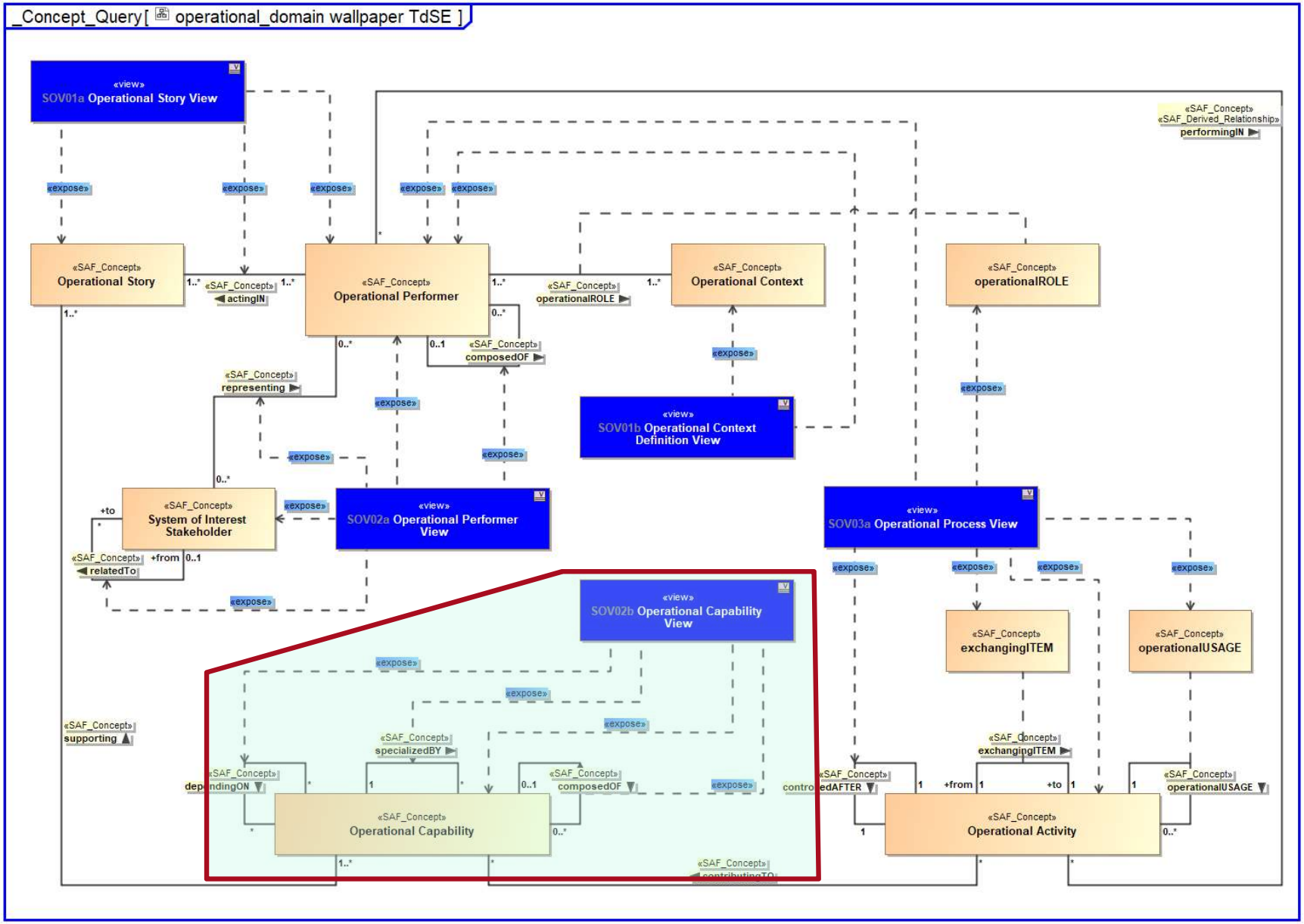
SOV Operational Performer ViewPoint

- Purpose: Represent the taxonomy of the identified Operational Performer(s) being relevant for the understanding of the operation of the solution with related stakeholders.



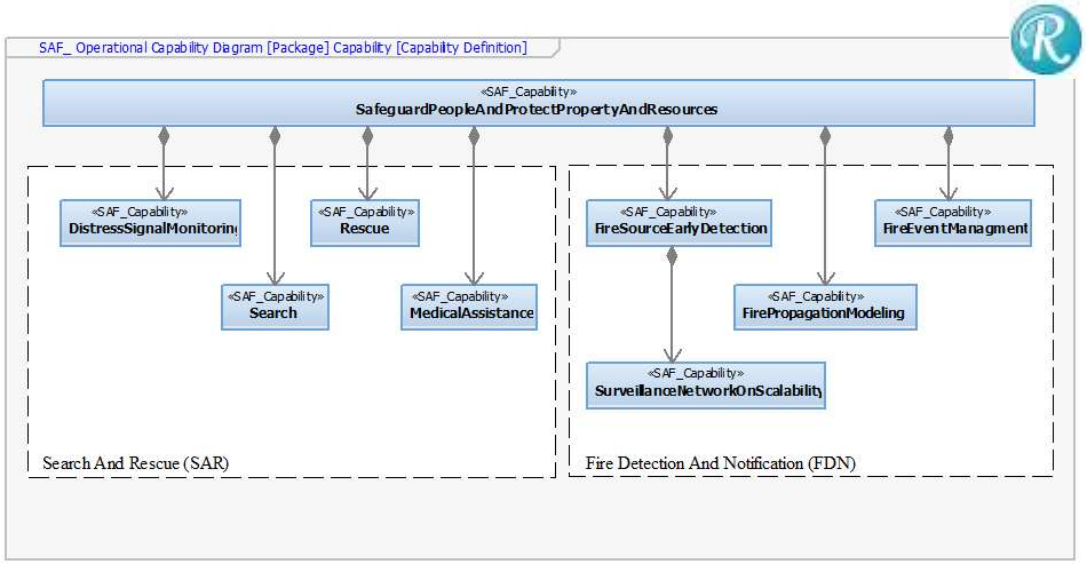


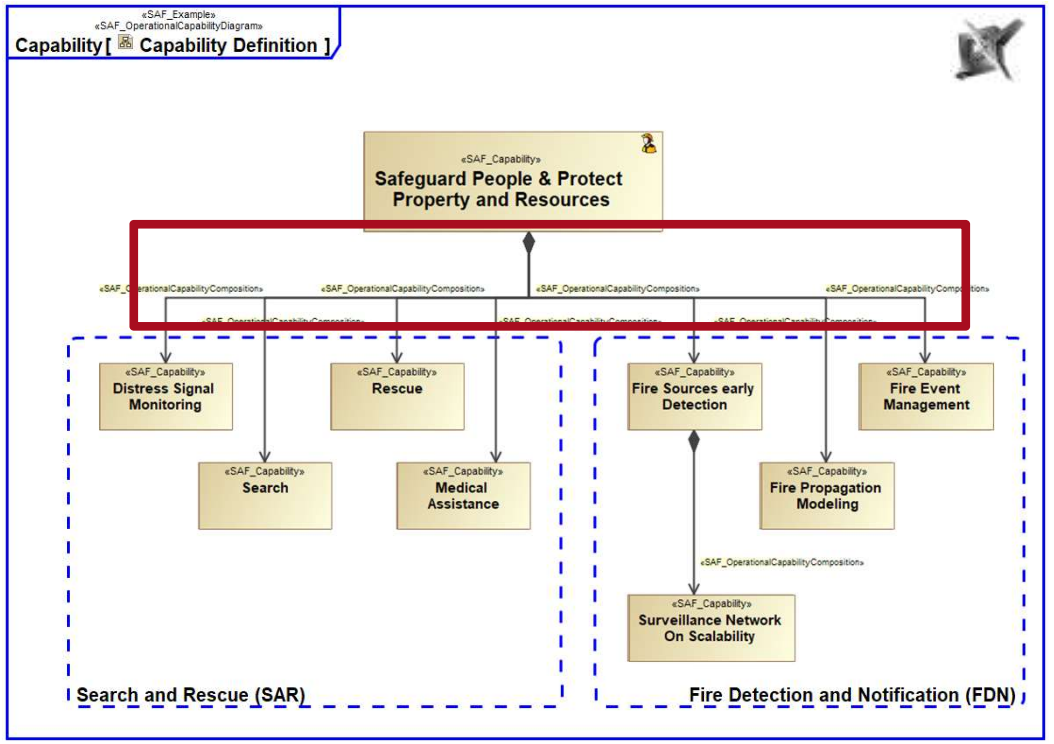
SOV Operational Capability ViewPoint



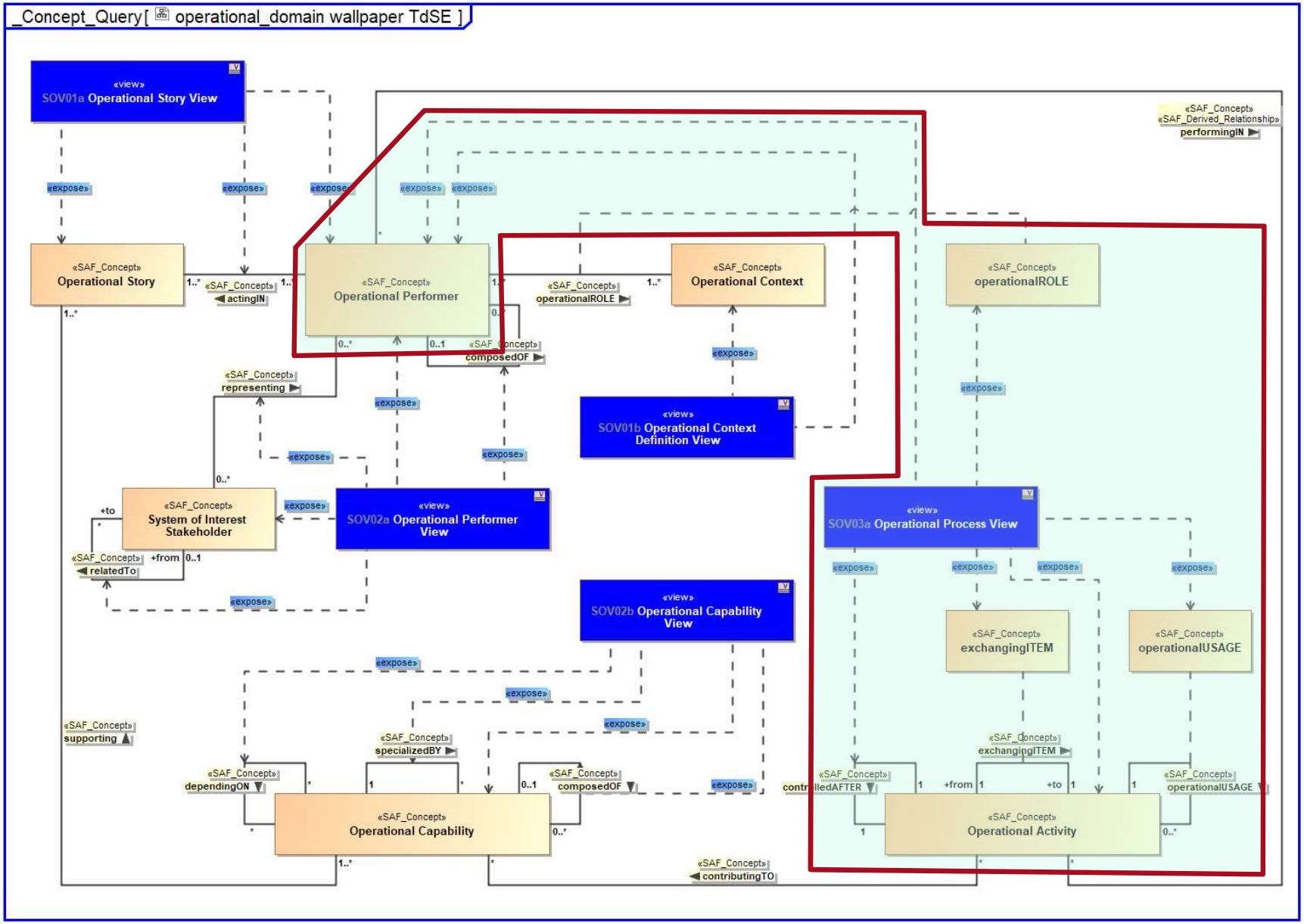
SOV Operational Capability ViewPoint

- Purpose: Define the taxonomy of capabilities from a stakeholder's perspective, including composition, specialization and dependencies between capabilities.



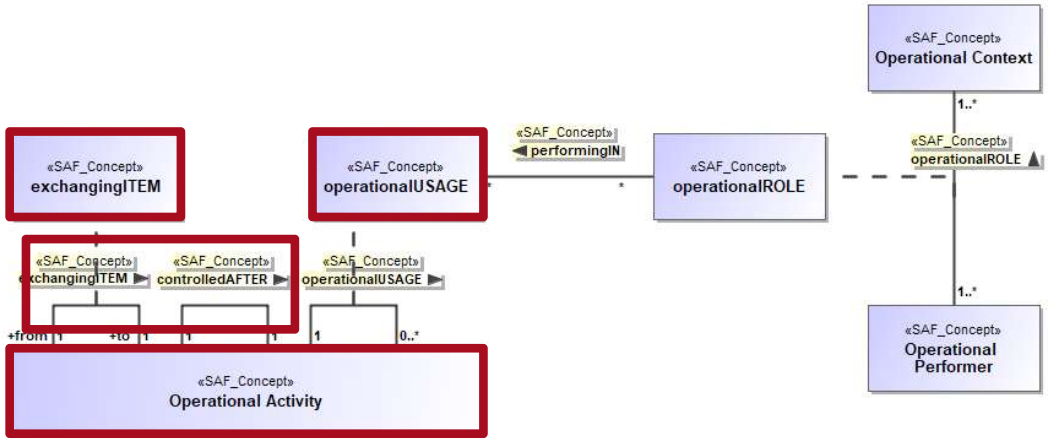


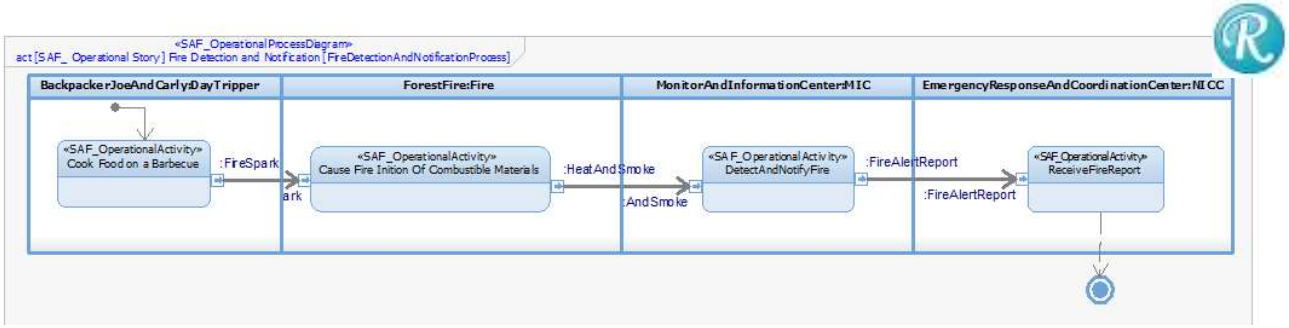
SOV Operational Process ViewPoint

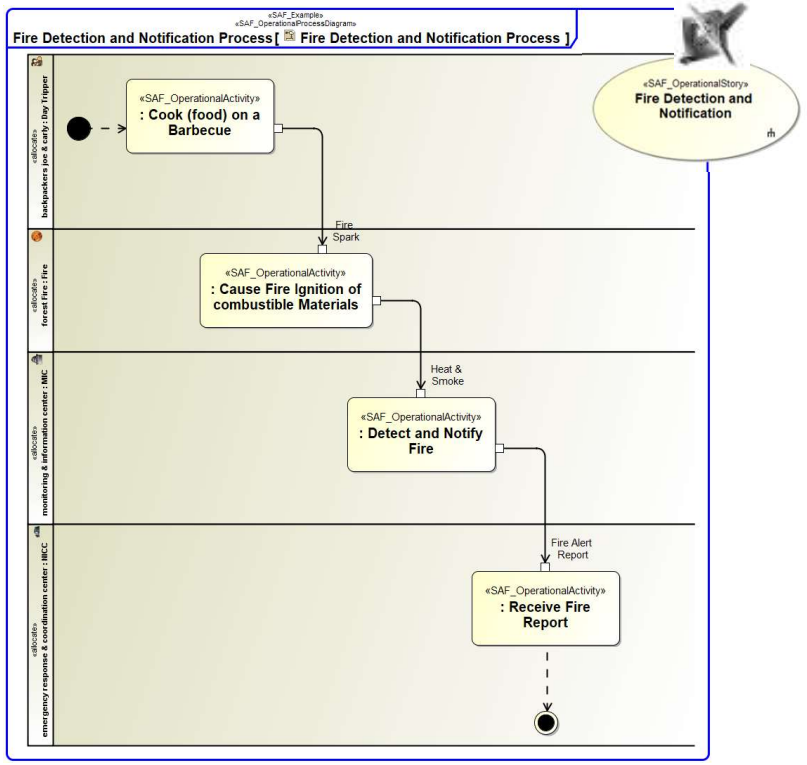


SOV Operational Process ViewPoint

- Purpose:
  Describe the operational processes with their composition of operational activities, the sequence of execution and their exchange.
  The assignment of operational processes to operational performer(s) is captured.







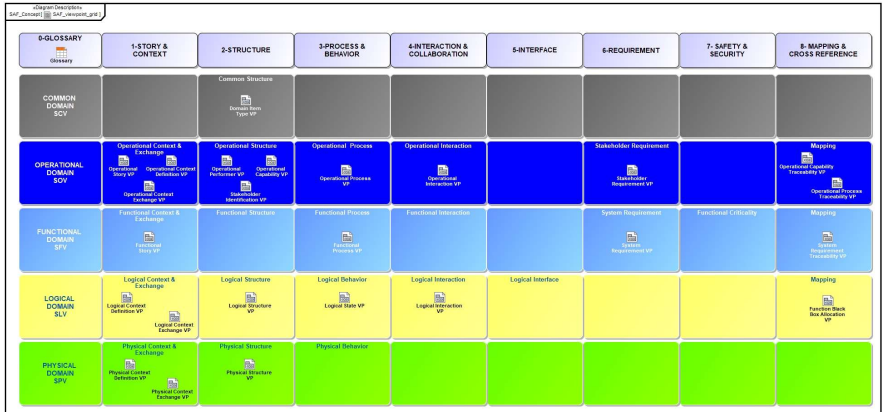
Wrap Up

We showed

- ➜ Interrelated metamodel for Operational Domain
- ➜ (sub)set of Operational ViewPoints using information consistently
- ➜ Comparability of tool representations

We did not show

- ➜ All 11 Operational ViewPoints
- ➜ The other domain layers SAF consists of



Steps in 2021

- ➜ Finalization of Operational Domain
- ➜ Move on to next SAF Domain to elaborate

Vielen Dank für Ihre Aufmerksamkeit!

Sascha Ackva
AG-Leiter SAF (mit Michael Leute)
saf@gfse.de

Gesellschaft für
Systems Engineering e.V.
World Trade Center
Hermann-Köhl-Str. 7
28199 Bremen
Tel: +49 (0) 421 9601-495
Telefax: +49 (0) 421 9601-150

www.gfse.de