FAS Method

White Paper

Ports in SysML 1.3 and their use
in the context of the FAS method

Author: Jesko G. Lamm and Tim Weilkiens
Working group "FAS" of GfSE – fas@gfse.de
(GfSE is the German chapter of INCOSE)

Document Version: 2013-08-23

1 Introduction

The FAS method [1] is a method for the use-case-driven creation of a functional architecture for systems. The representation of functional architectures in SysML according to [1] is based on SysML 1.2. A key concept in system architecture and thus in functional architecture with SysML is the description of interfaces via ports.

Since the modeling of ports has changed from SysML 1.2 to SysML 1.3, this document provides guidance on modeling ports in functional architectures according to the FAS method while using SysML 1.3.

2 Ports in SysML 1.3

SysML changed the port model elements in version 1.3 [3]. The overall concept is still the same. A port is an interaction point that could provide or request operations and could specify objects that's flow through a port inside or outside the owning block.

3 Using SysML 1.3 Ports in the context of the FAS Method

3.1 Functional Blocks

Ports between functional blocks shall be proxy ports with *isBehavior=true* and flow properties that specify the objects that are exchanged. The owning functional block implements the behavior/structure that is provided or requested by the port.

Particularly for top level models, which do not detail out the inner structure of functional blocks, this underlines the fact that the functional blocks and their ports can be modeled without the detailed knowledge of the functions inside a functional block.
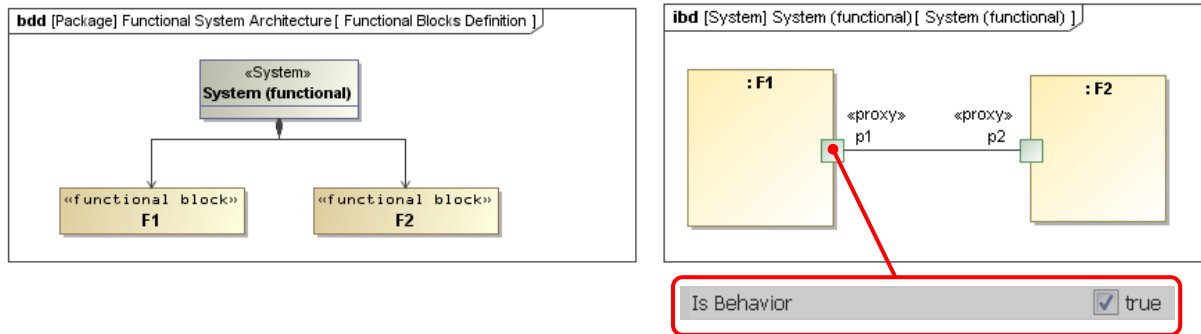
3.2 <<Layer>> blocks

The paper [2] describes an approach for layered modeling of system architecture in SysML that is compatible with the FAS method. The corresponding profiles for modeling tools have been provided on www.fas-method.org as far as available by the time of writing this document.

When using the modeling approach according to [2] with SysML 1.3, the interfaces between ports of <<Layer>> blocks shall be proxy ports, because layers can only offer operations that they own internally.
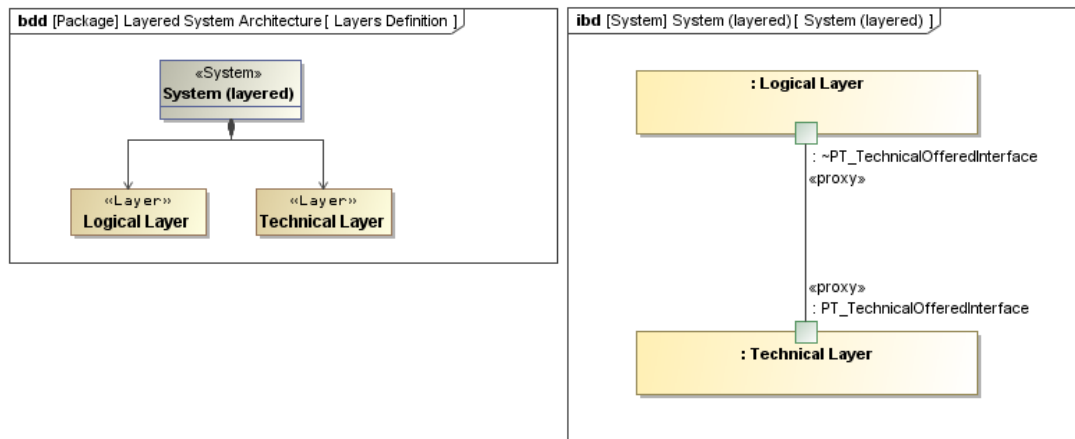
4 References

[1] J. G. Lamm, and T. Weilkiens, Funktionale Architekturen in SysML, in M. Maurer und S.-O. Schulze (eds.), Tag des Systems Engineering 2010, pp. 109–118. Carl Hanser Verlag, München, Germany, November 2010. In German. English translation „Functional Architectures in SysML" available via www.fas-method.org

[2] M. Dänzer, W. Gerritsen, J. G. Lamm and T. Weilkiens, "Funktionale Architektur trifft Schichtenarchitektur", in M. Maurer and S.-O. Schulze (Eds.), Tag des Systems Engineering, Paderborn, 7.-9. November 2012, Carl Hanser Verlag, München, Germany, pp. 363-372. In German. English translation „Functional Architecture Meets Layered Architecture " available via www.fas-method.org

[3] T. Weilkiens, Blog Model Based Systems Engineering: What's new in SysML 1.3, available via http://model-based-systems-engineering.com/2012/04/02/whats-new-in-sysml-1-3/ (checked 20.08.2013)