Pascal Roques Formation & Conseil

Clarity

Ecosystem for the Model Based Systems Engineering Solution Capella

Clock Radio Example - 07/2015

bpifrance

INVESTISSEMENTS D'AVENIR

DGE DIRECTION GÉNÉRALE DES ENTREPRISES

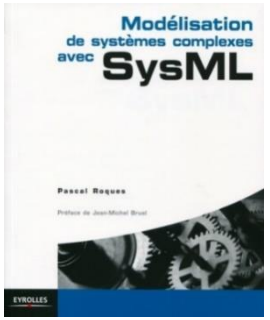
Presentations

Pascal Roques Formation & Conseil {PRFC}

www.prfc.fr

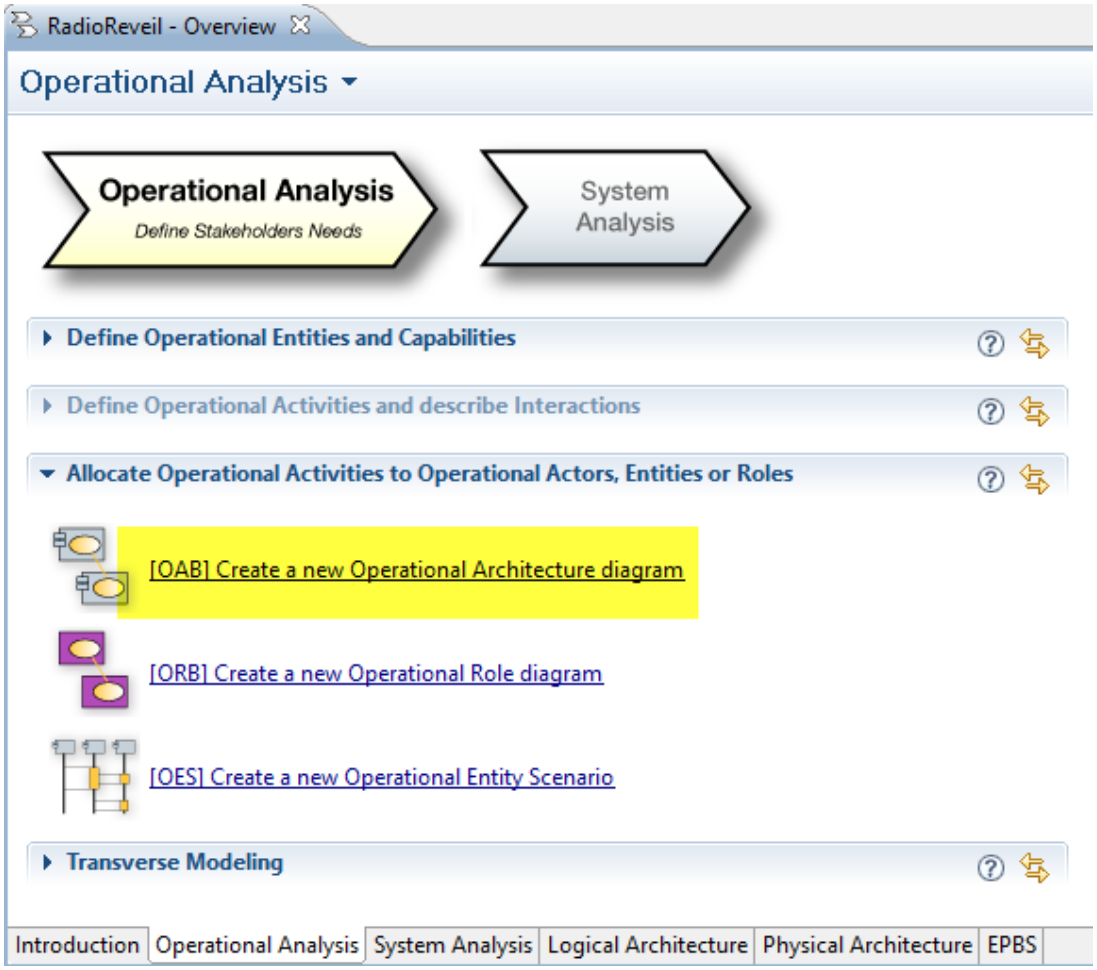
- Pascal Roques: senior consultant, 25 years of experience
  - SADT, OMT, UML, SysML, ARCADIA

- UML2 and SysML Certified by OMG
- Co-founder of the SysML France association
- Trainer for Thales on ARCADIA / Melody
  - 80+ sessions, 1000+ trainees
  - Member of the Clarity consortium
- Author of the most widely read books in France on UML … and of the first French book on SysML

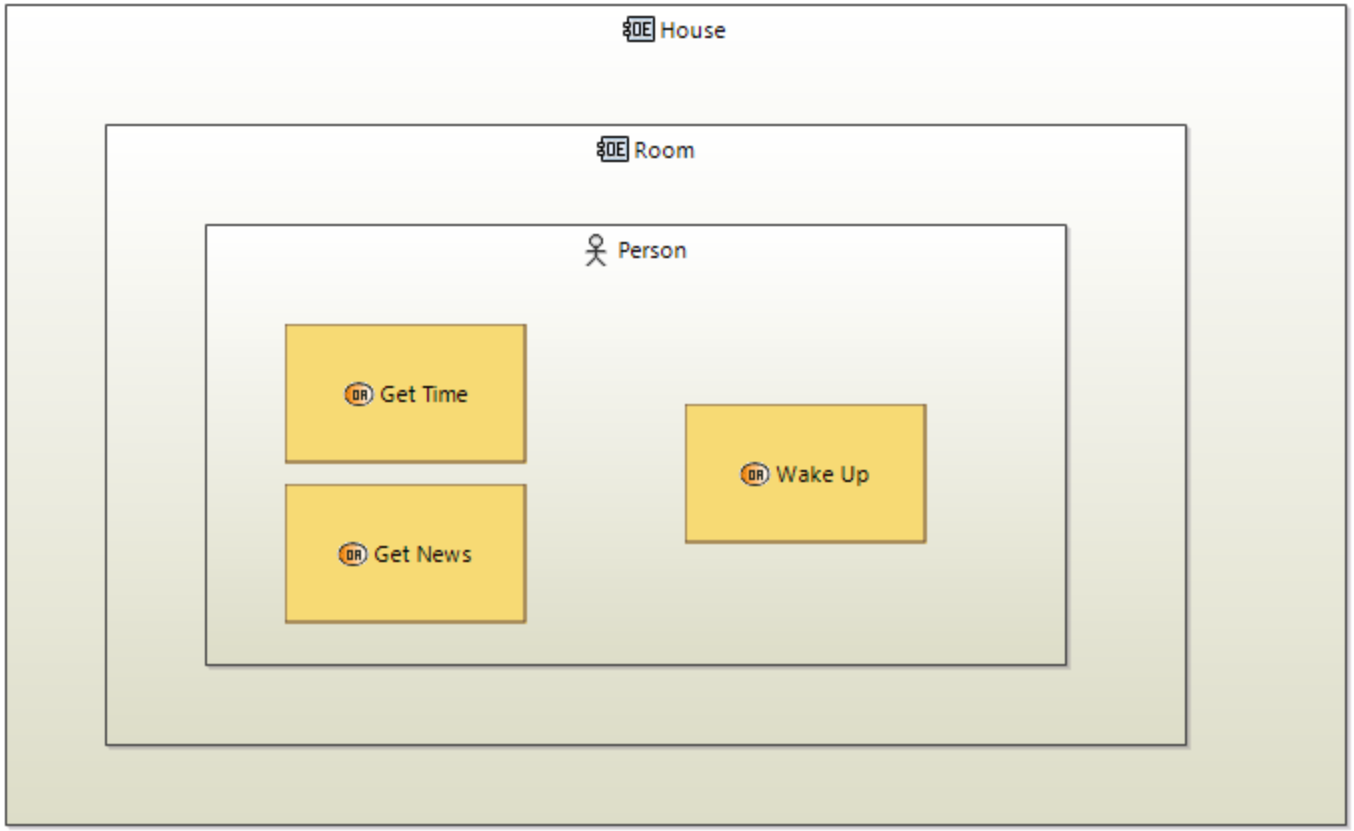


Clarity

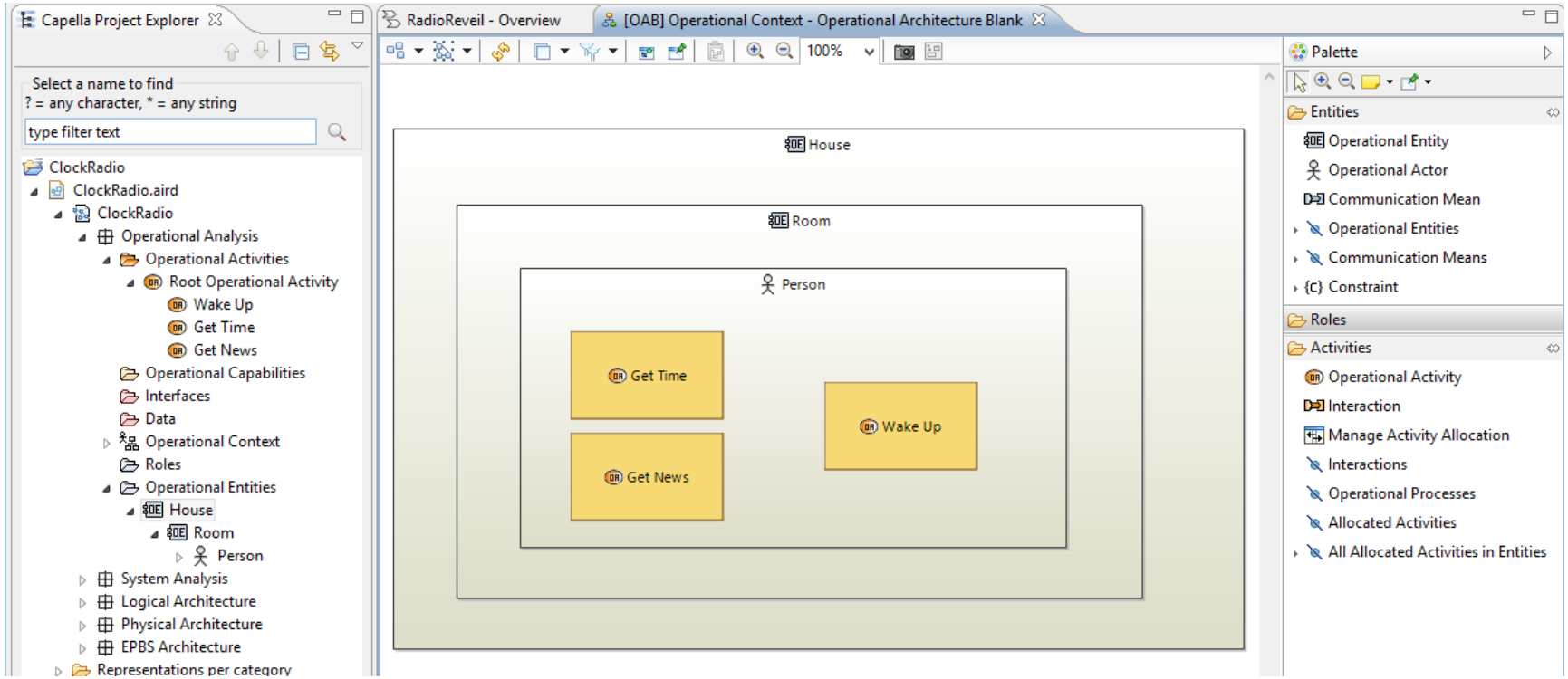
Operational Analysis (OA)



Operational Architecture Blank

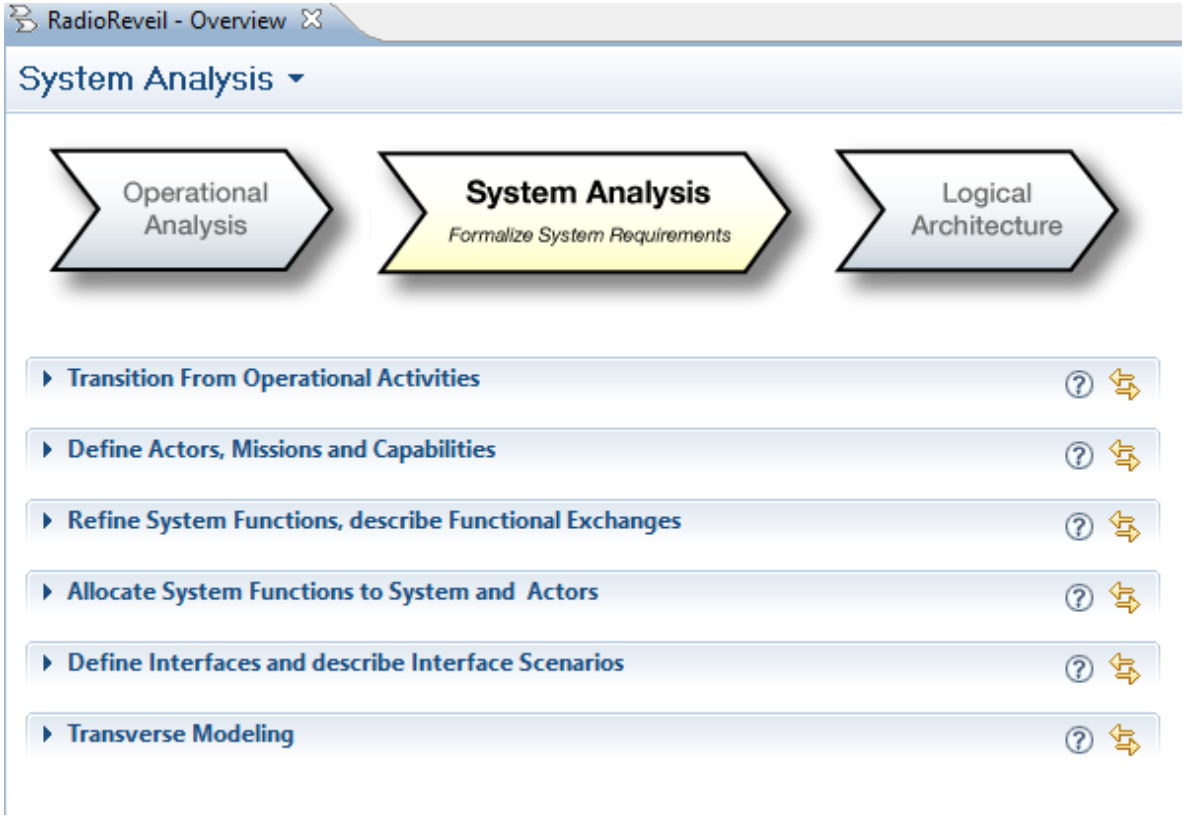


OAB

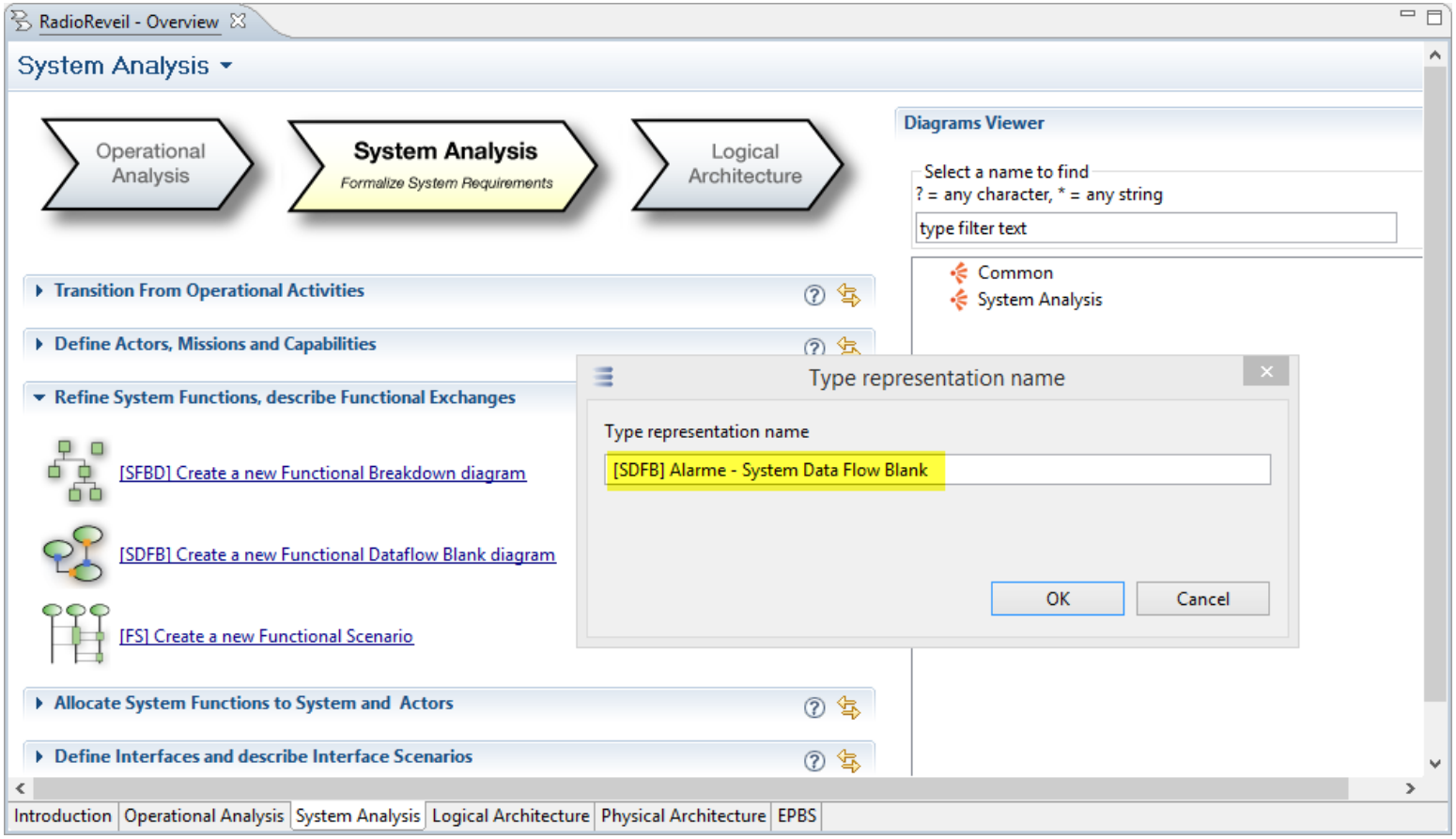

Capella Project Explorer
Select a name to find
? = any character, * = any string
type filter text
ClockRadio
ClockRadio.aird
ClockRadio
Operational Analysis
Operational Activities
Root Operational Activity
Wake Up
Get Time
Get News
Operational Capabilities
Interfaces
Data
Operational Context
Roles
Operational Entities
House
Room
Person
System Analysis
Logical Architecture
Physical Architecture
EPBS Architecture
Representations per category
RadioReveil - Overview
[OAB] Operational Context - Operational Architecture Blank
100%
House
Room
Person
Get Time
Get News
Wake Up
Palette
Entities
Operational Entity
Operational Actor
Communication Mean
Operational Entities
Communication Means
Constraint
Roles
Activities
Operational Activity
Interaction
Manage Activity Allocation
Interactions
Operational Processes
Allocated Activities
All Allocated Activities in Entities

OA: Diagrams Viewer

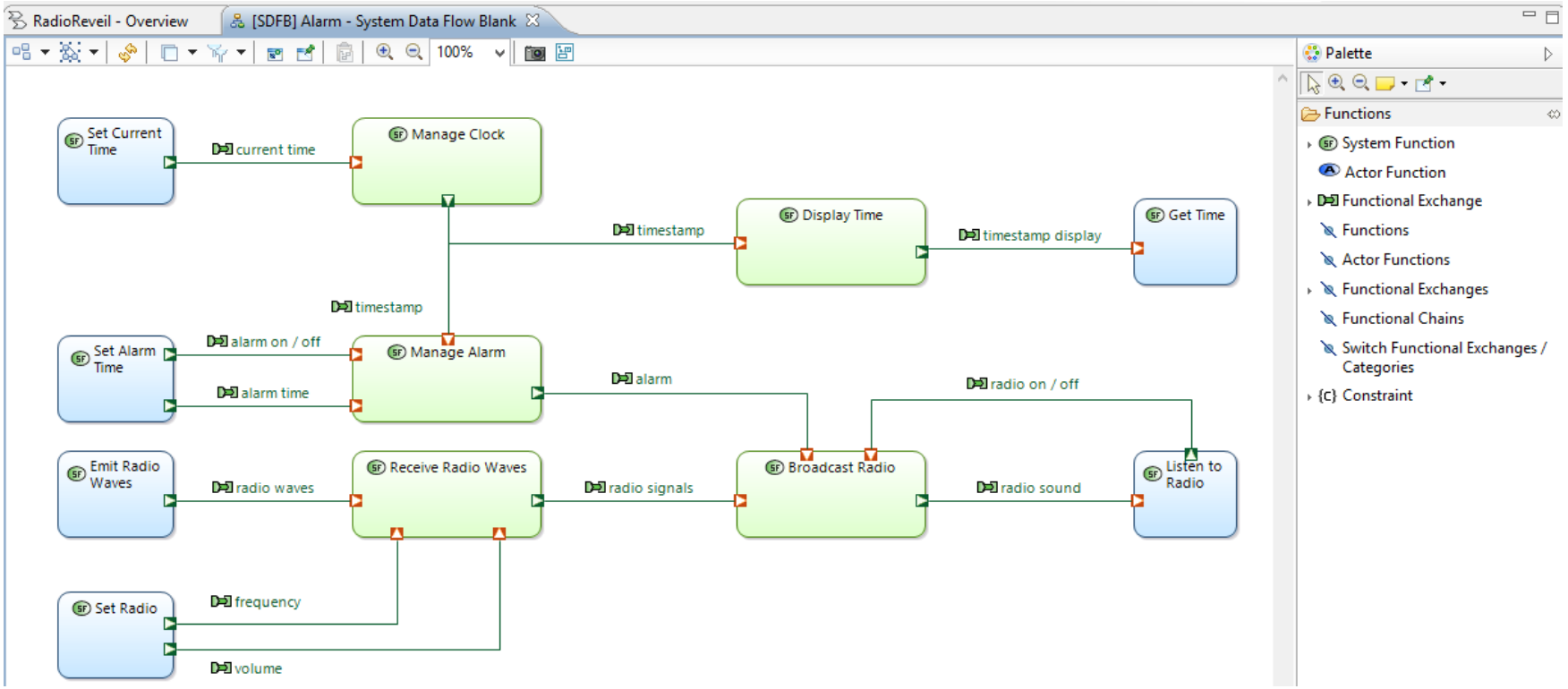
System Analysis (SA)



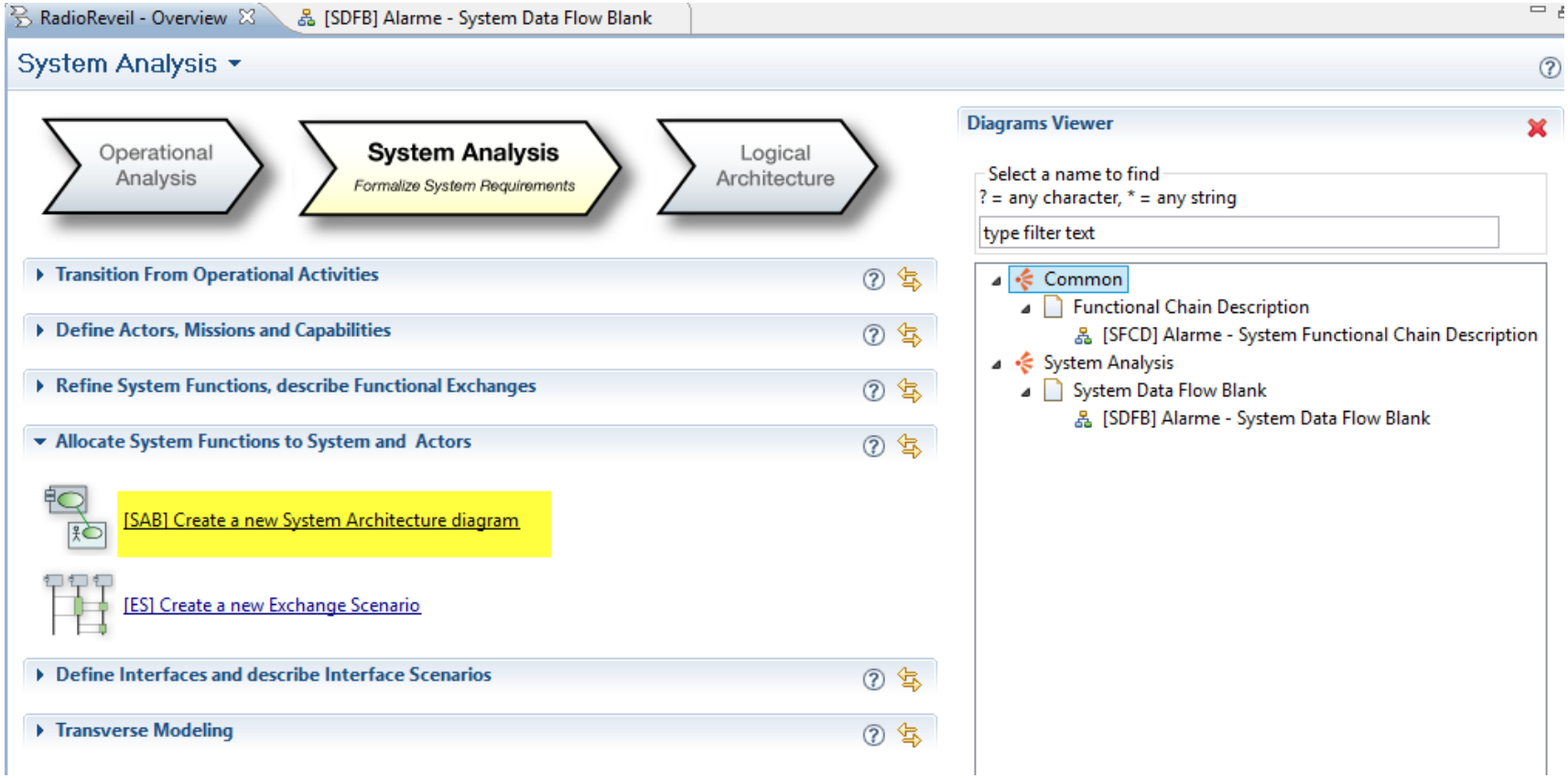
System Data Flow Blank



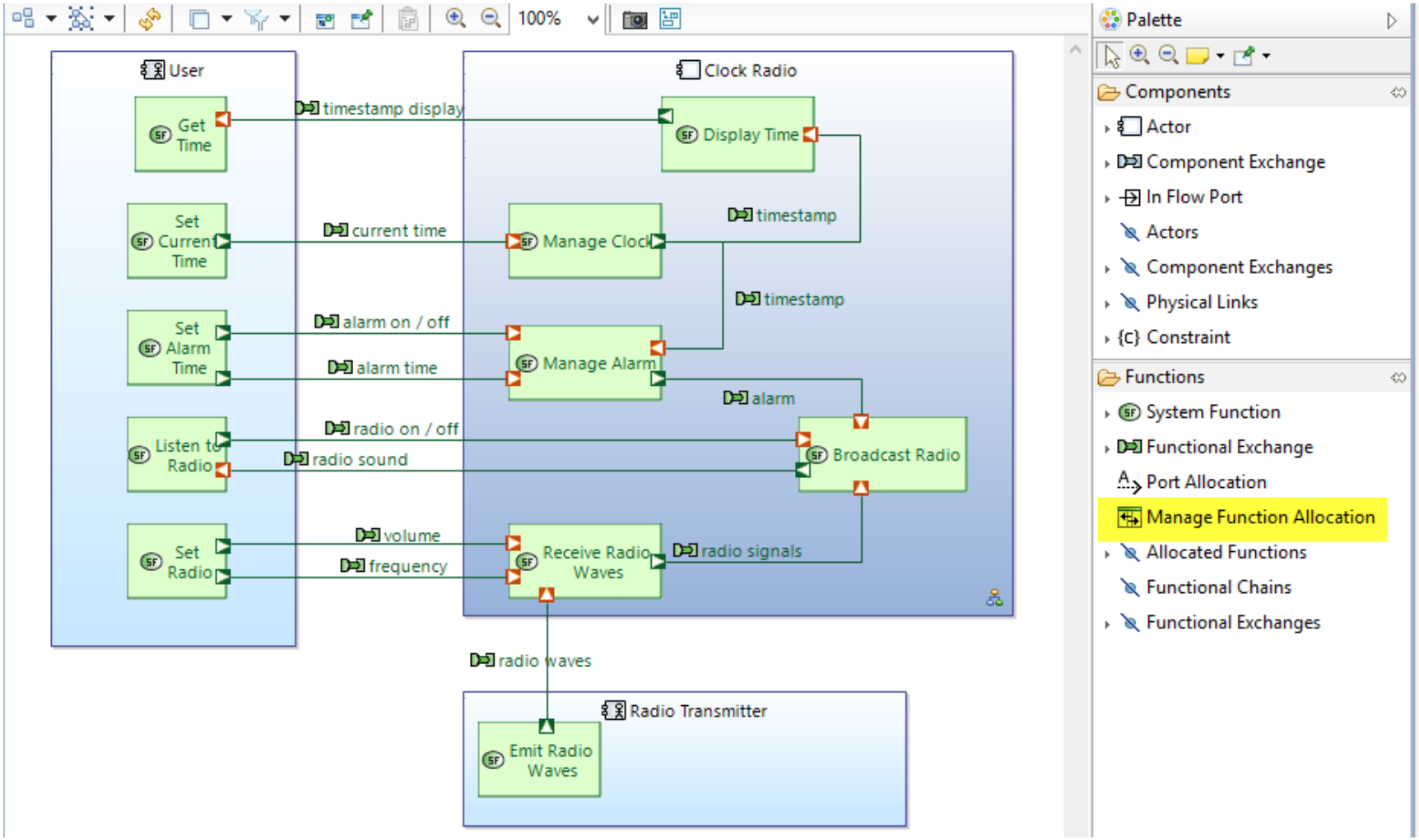
System Data Flow Blank (SDFB)



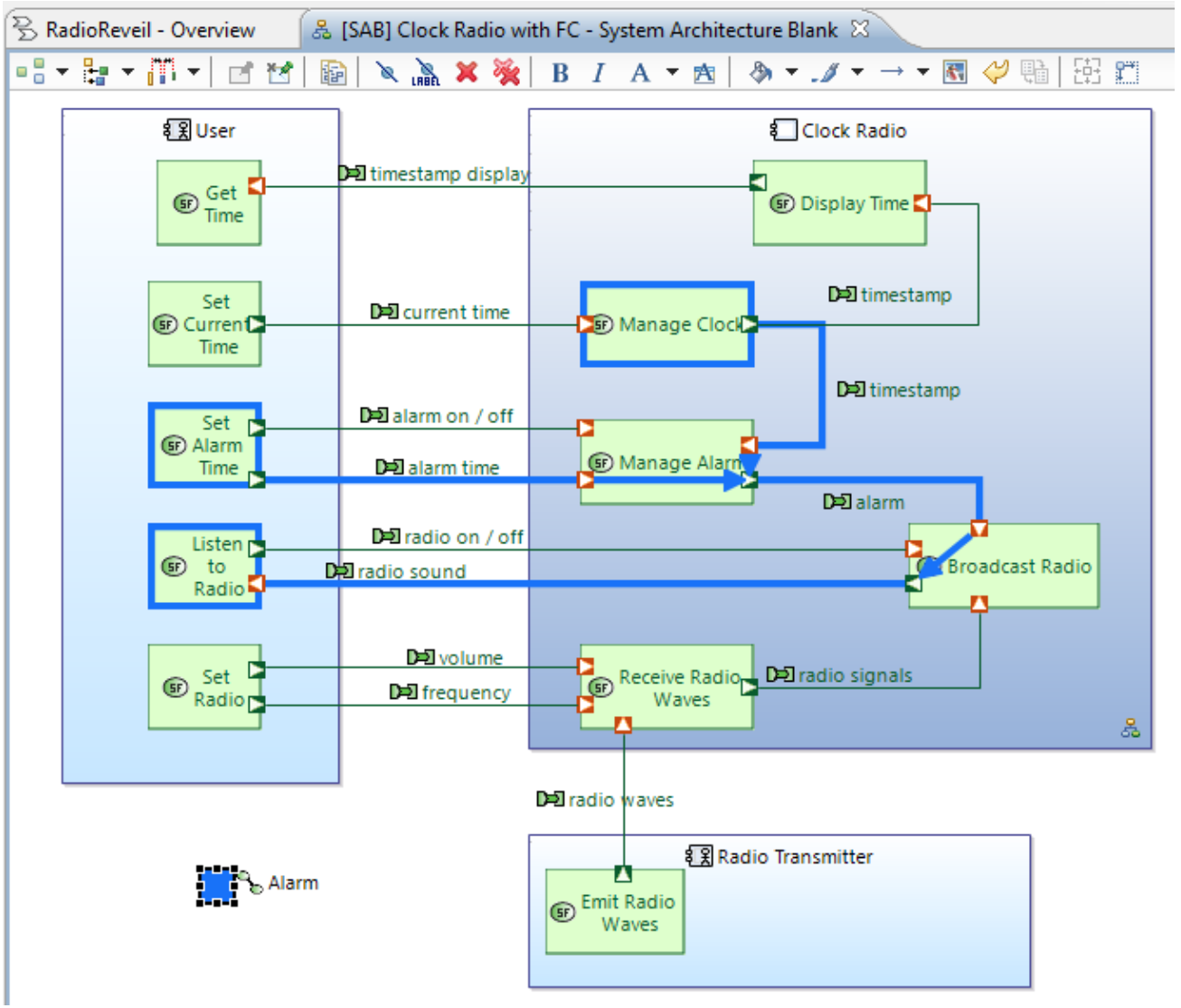
System Architecture Blank



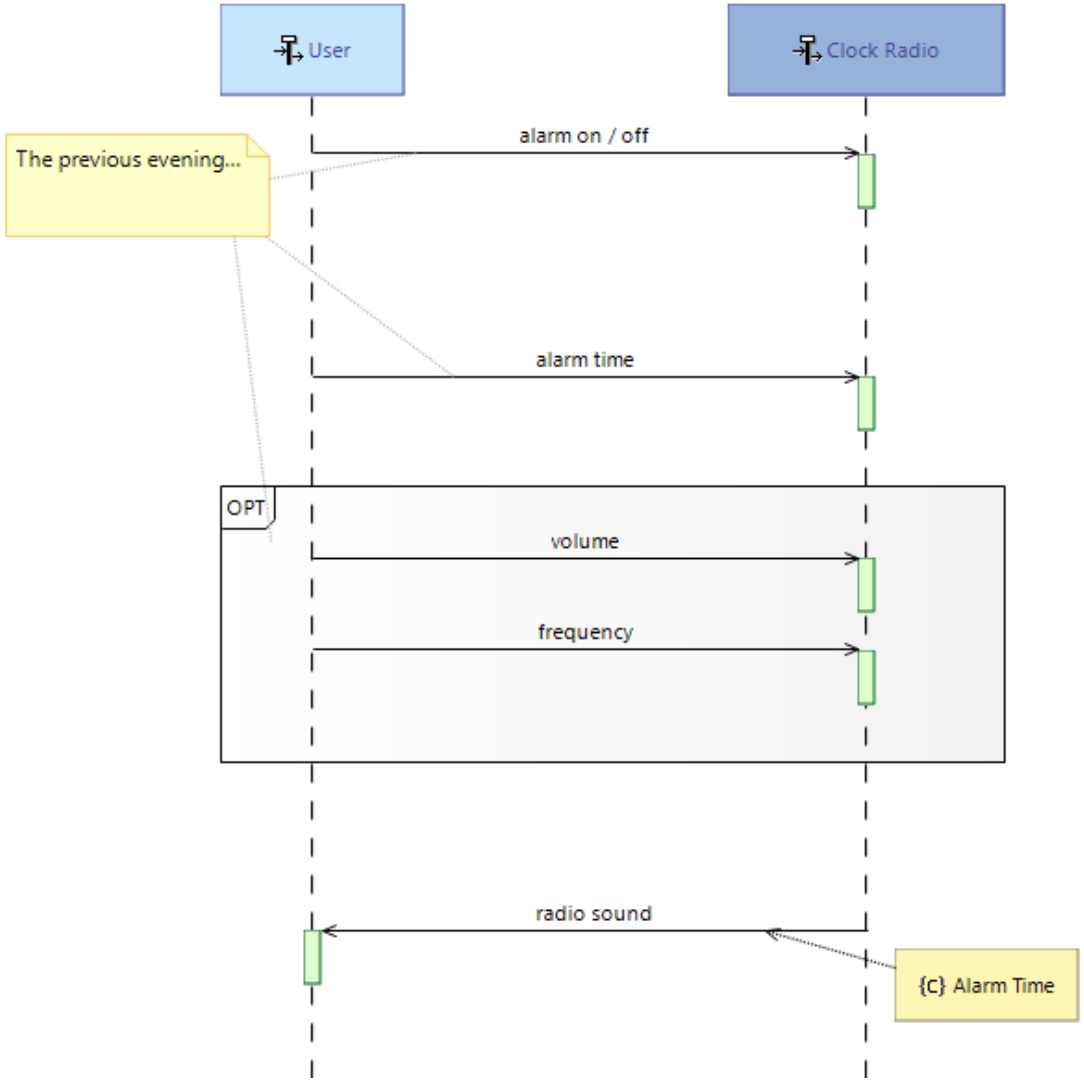
SAB: Functions Allocation



SAB + FC


RadioReveil - Overview
[SAB] Clock Radio with FC - System Architecture Blank
User
Clock Radio
Get Time
timestamp display
Display Time
Set Current Time
current time
Manage Clock
timestamp
timestamp
Set Alarm Time
alarm on / off
alarm time
Manage Alarm
alarm
Listen to Radio
radio on / off
radio sound
Broadcast Radio
Set Radio
volume
frequency
Receive Radio Waves
radio signals
radio waves
Radio Transmitter
Emit Radio Waves
Alarm

System Exchange Scenario



SA – OA Matrices

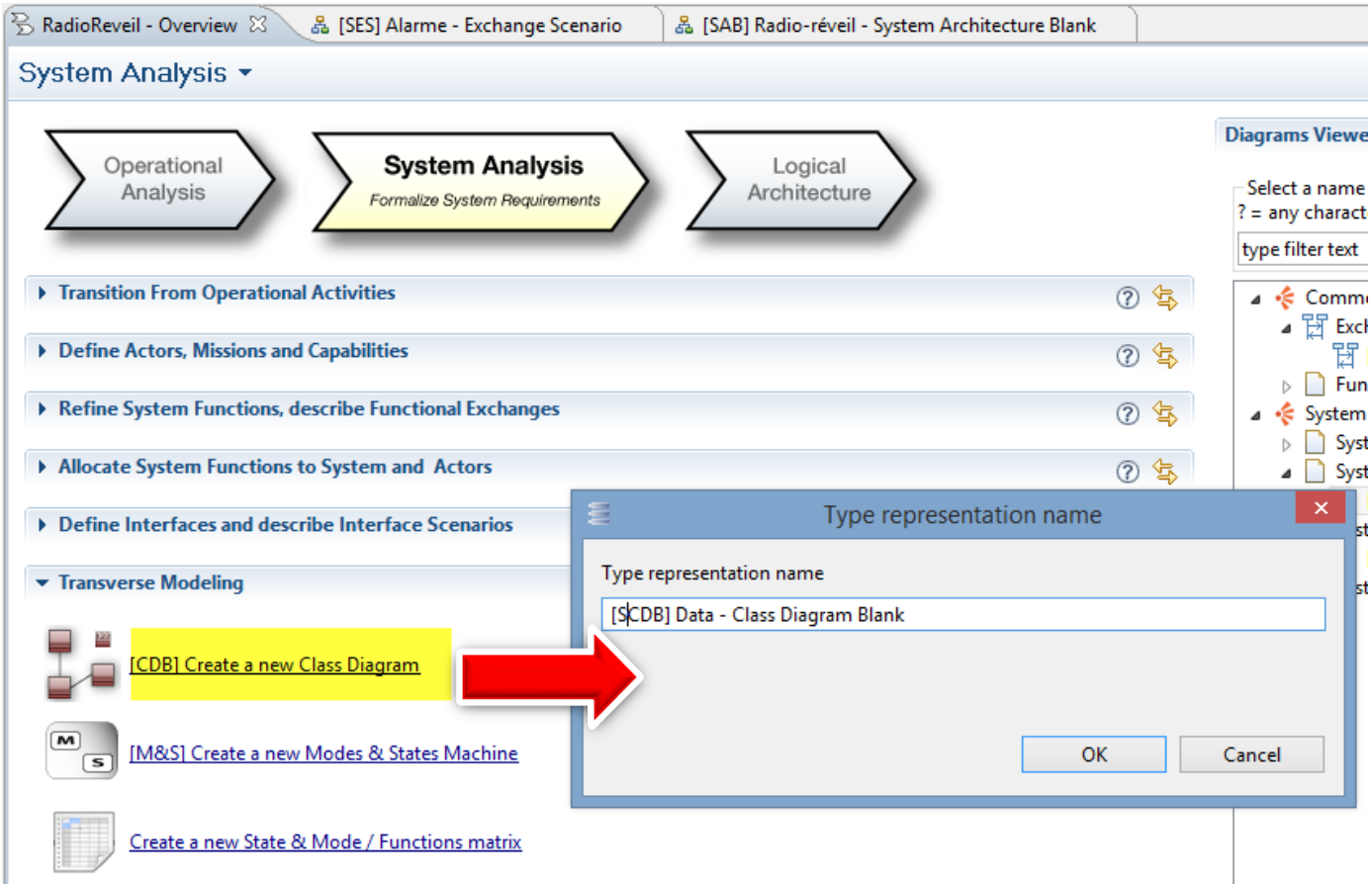
RadioReveil - Overview | Clock Radio System Functions - Operational Activities

	Wake Up	Get Time	Get News
Manage Clock	X	X	
Manage Alarm	X		
Set Current Time		X	
Set Alarm Time	X		
Display Time		X	
Broadcast Radio	X		X
Emit Radio Waves			
Get Time		X	
Listen to Radio			X
Receive Radio Waves	X		X
Set Radio	X		X

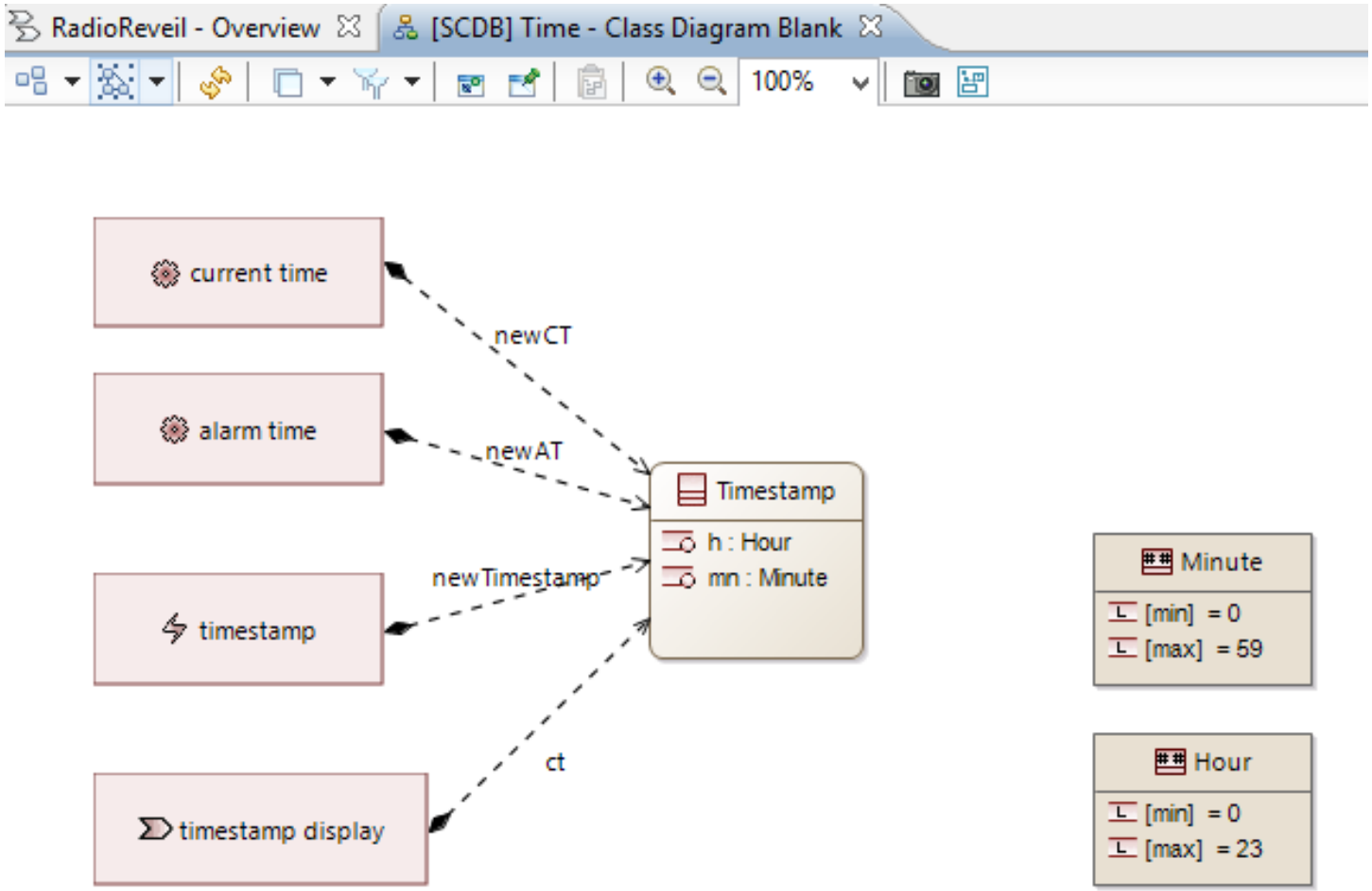
RadioReveil - Overview | System Actors - Operational Actors/Operational Entities

	House	Room	Person
User			X
Radio Transmitter			

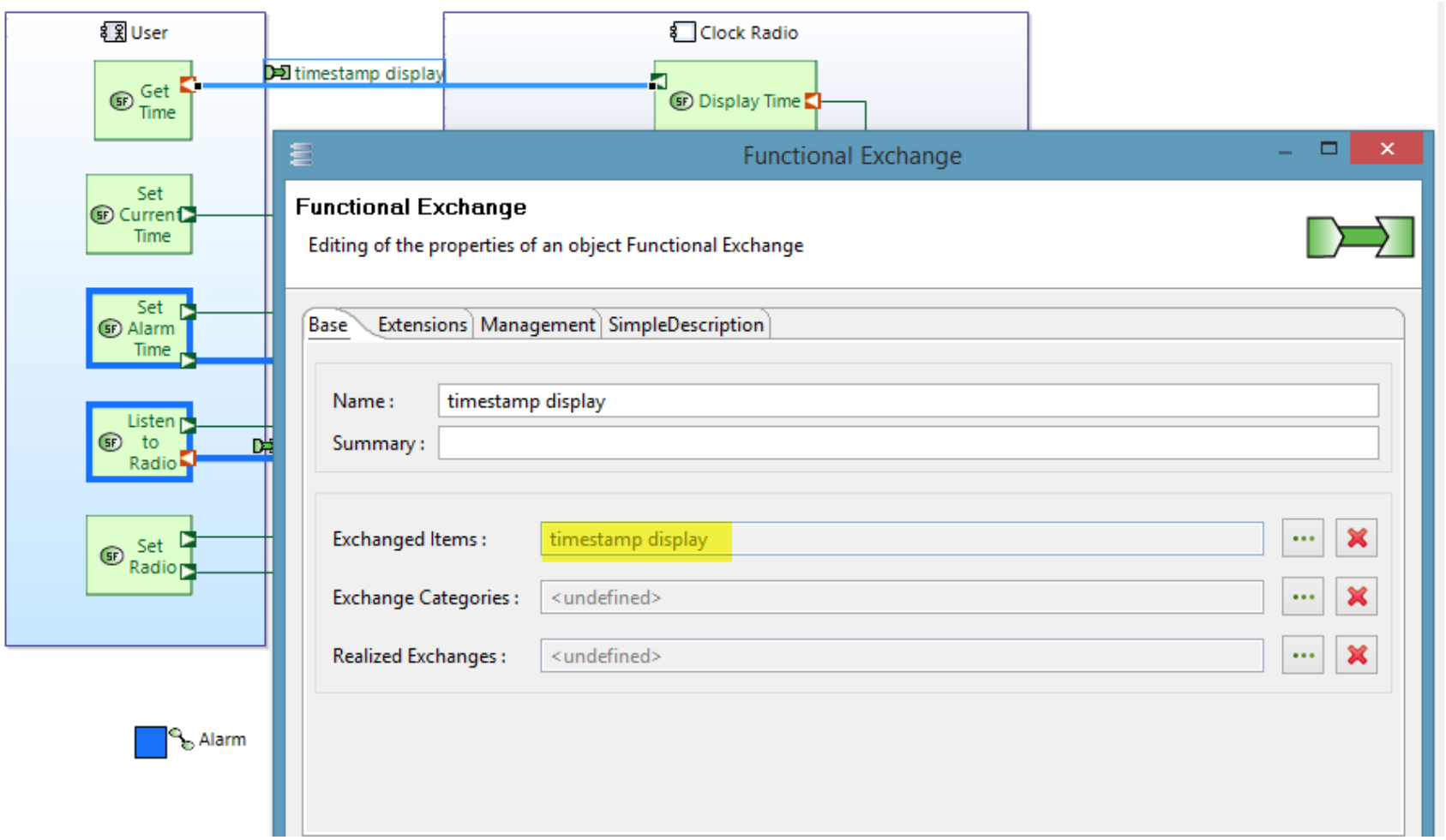
Class Diagram Blank



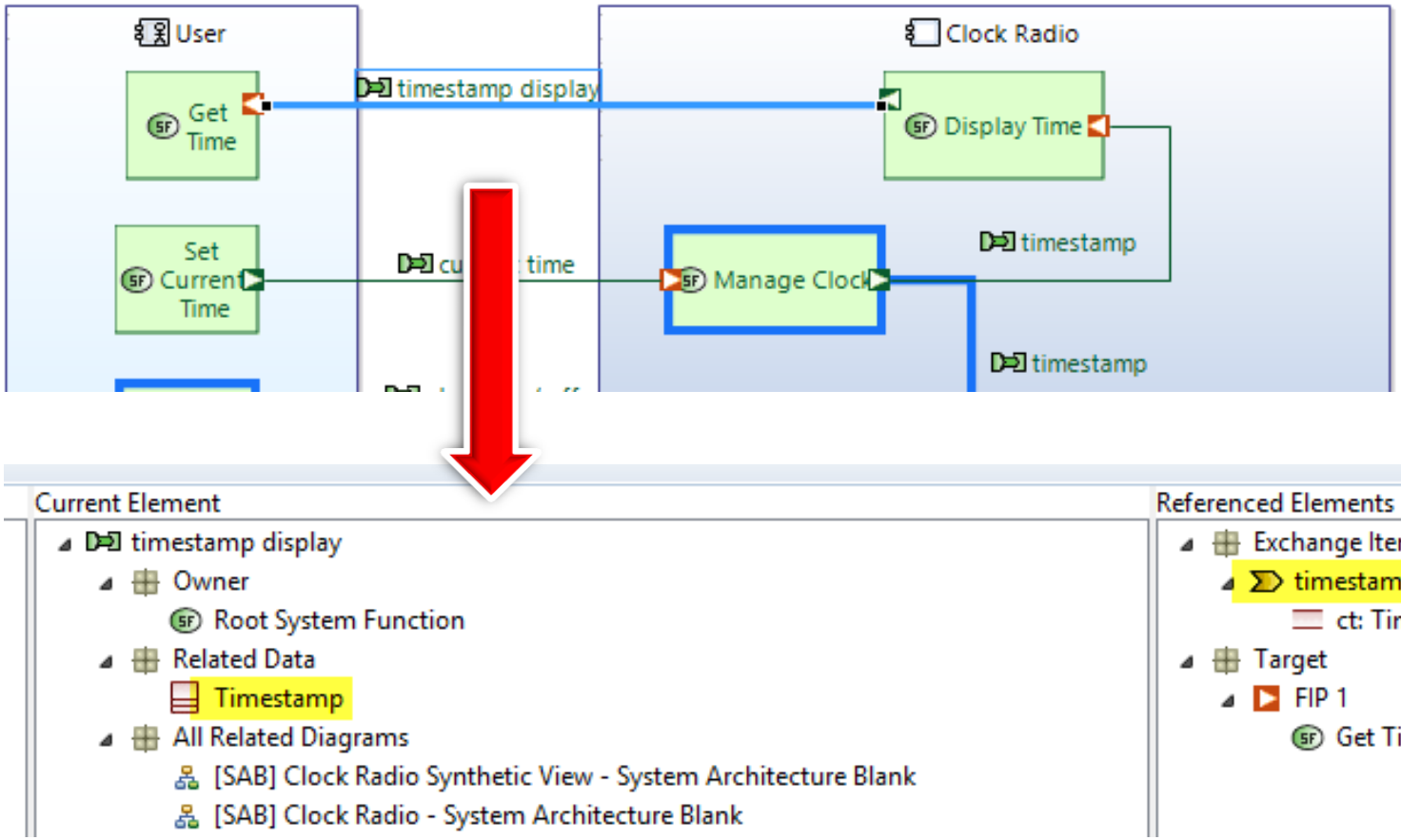
SCDB: Exchange Items and Types



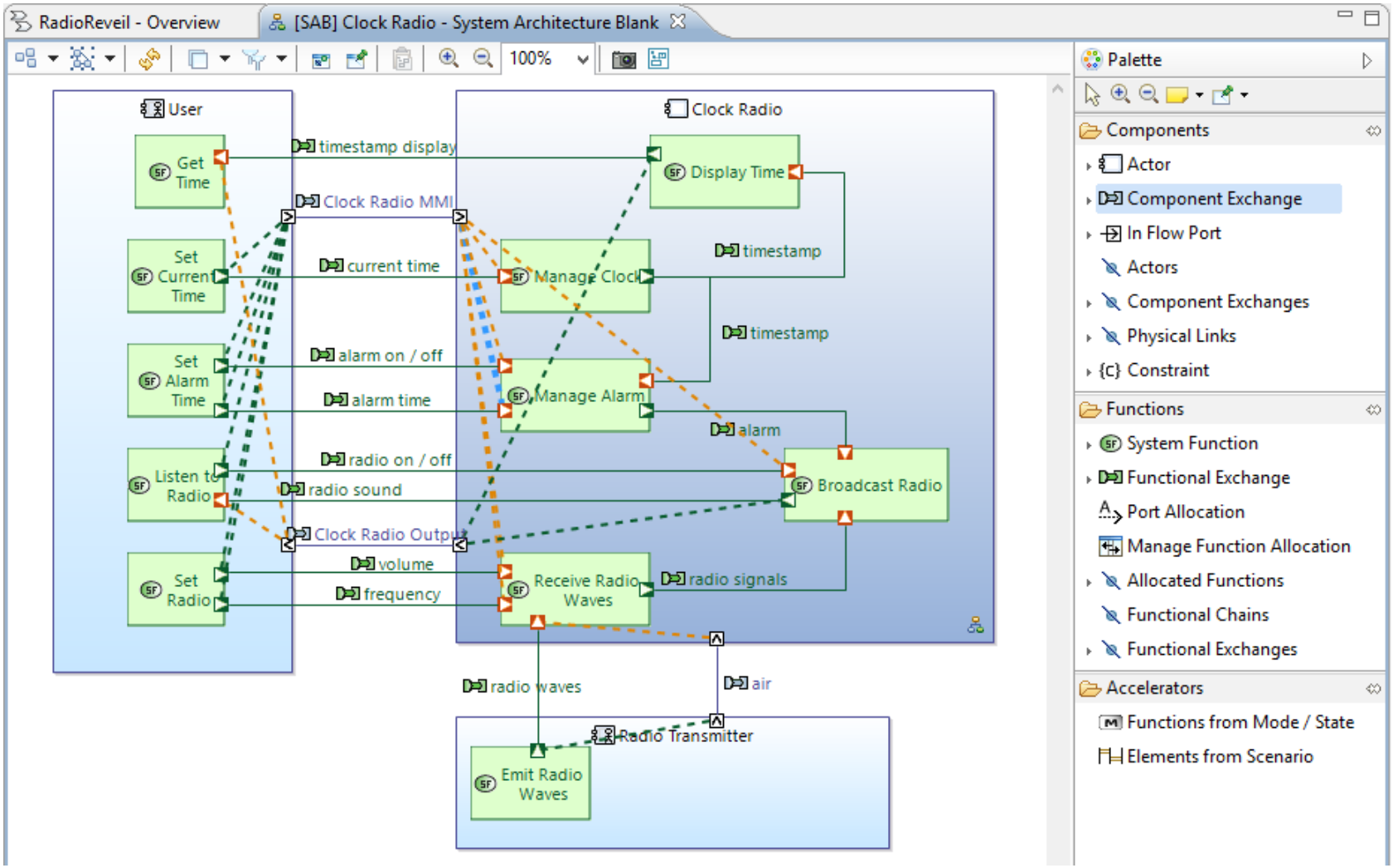
SAB: Exchange Item and FE



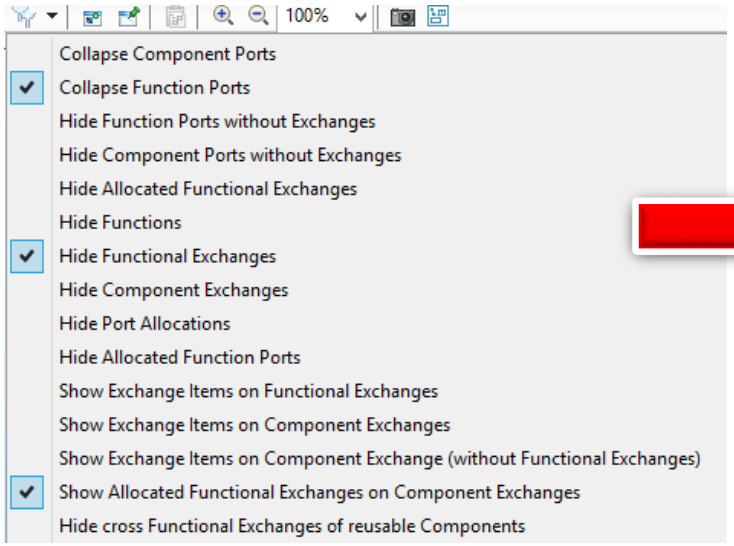
Semantic Browser

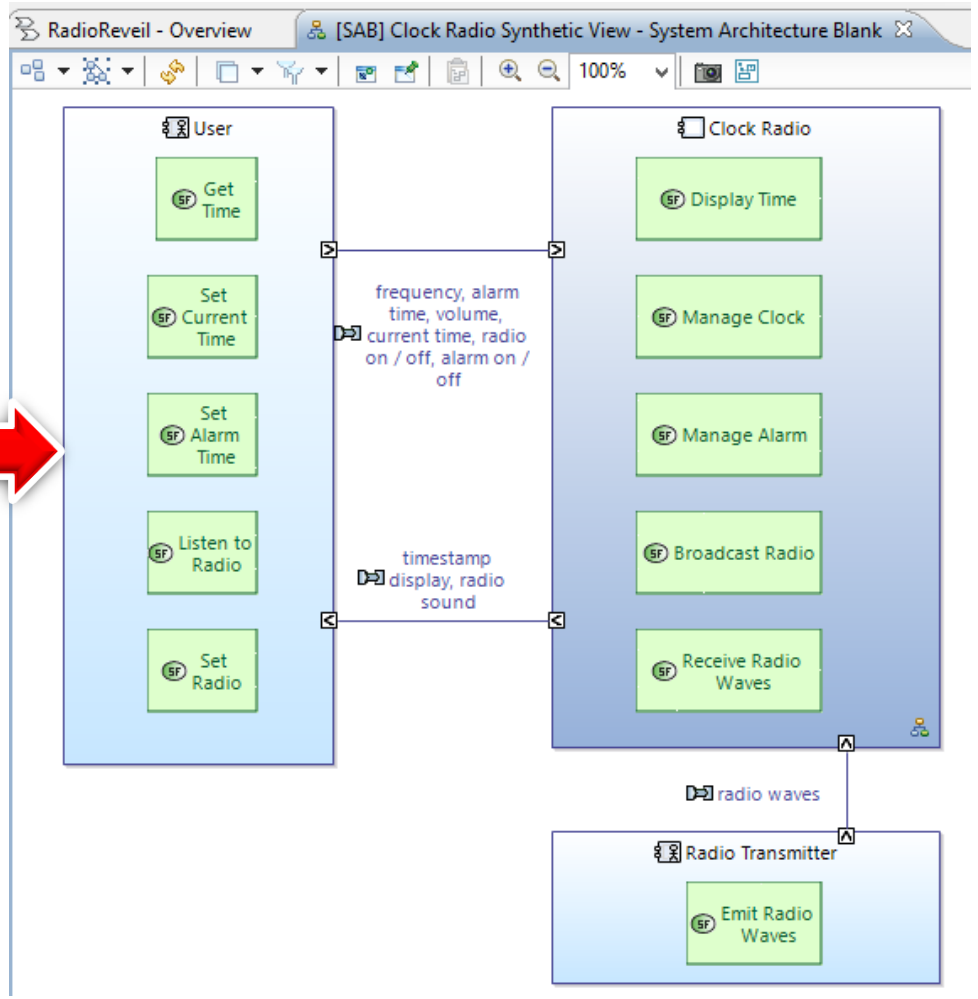


Completed SAB with CEs and Allocations

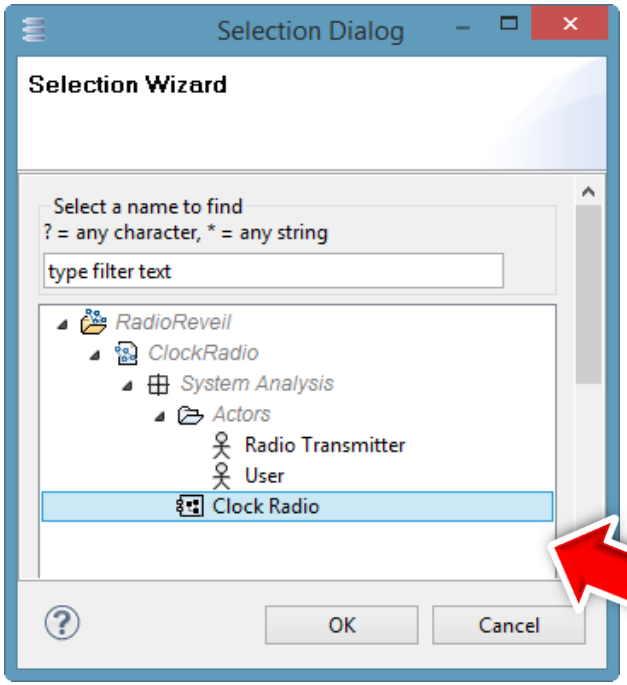


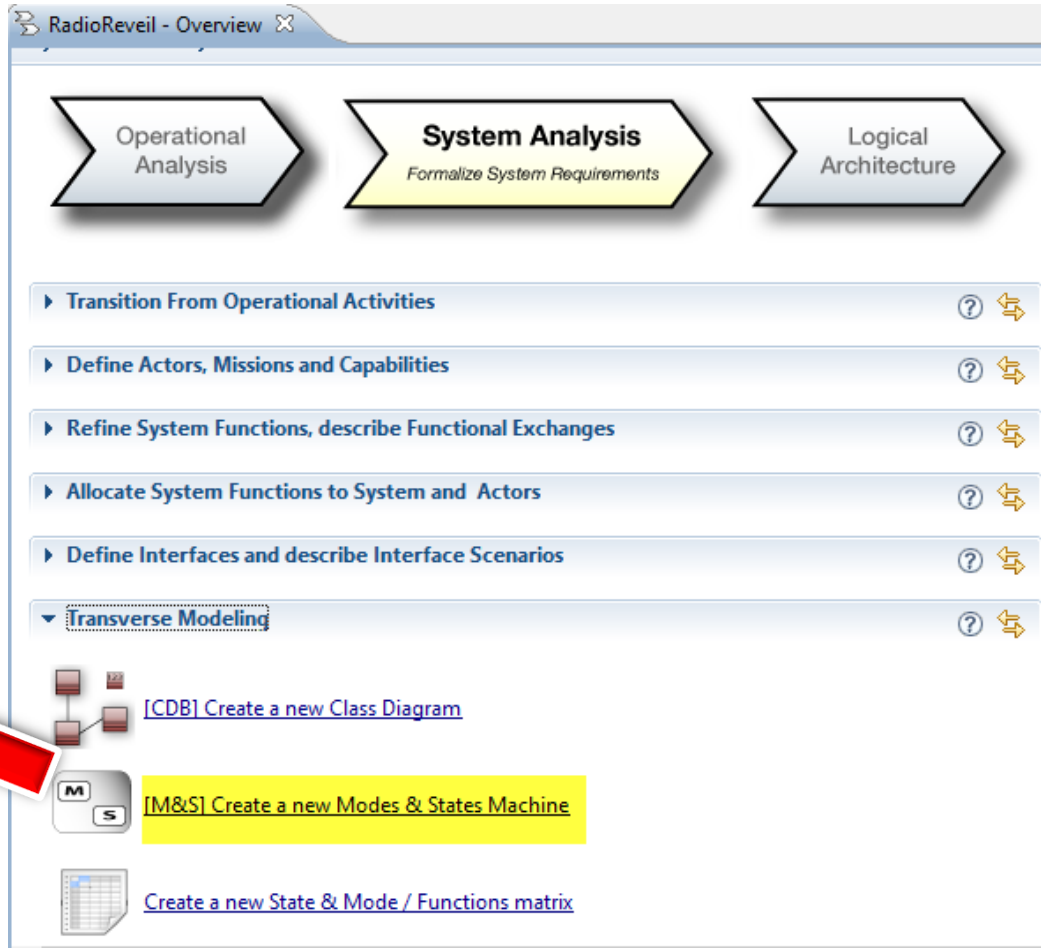
SAB: Filters Combination



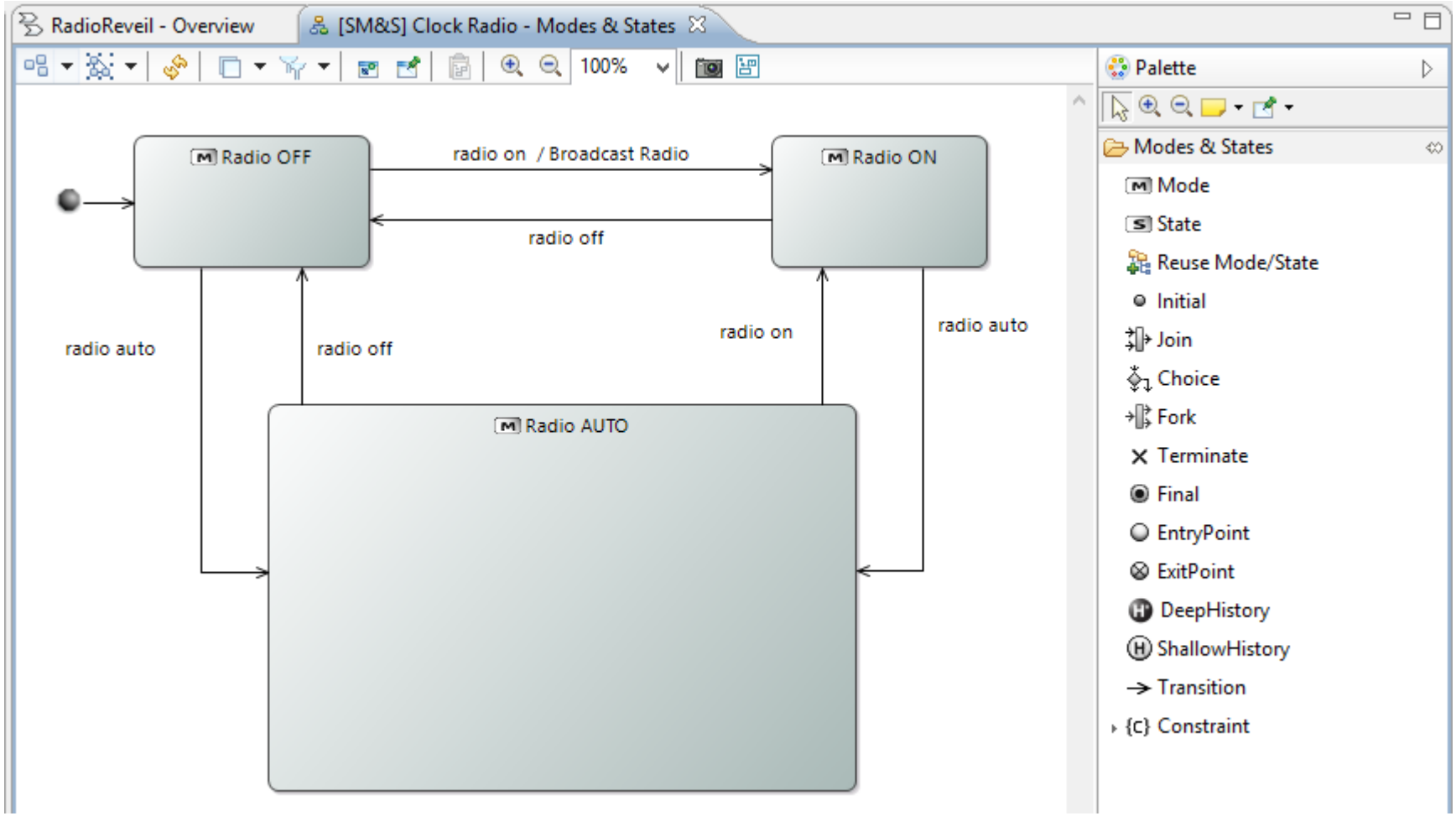


SA: Modes & States Machine

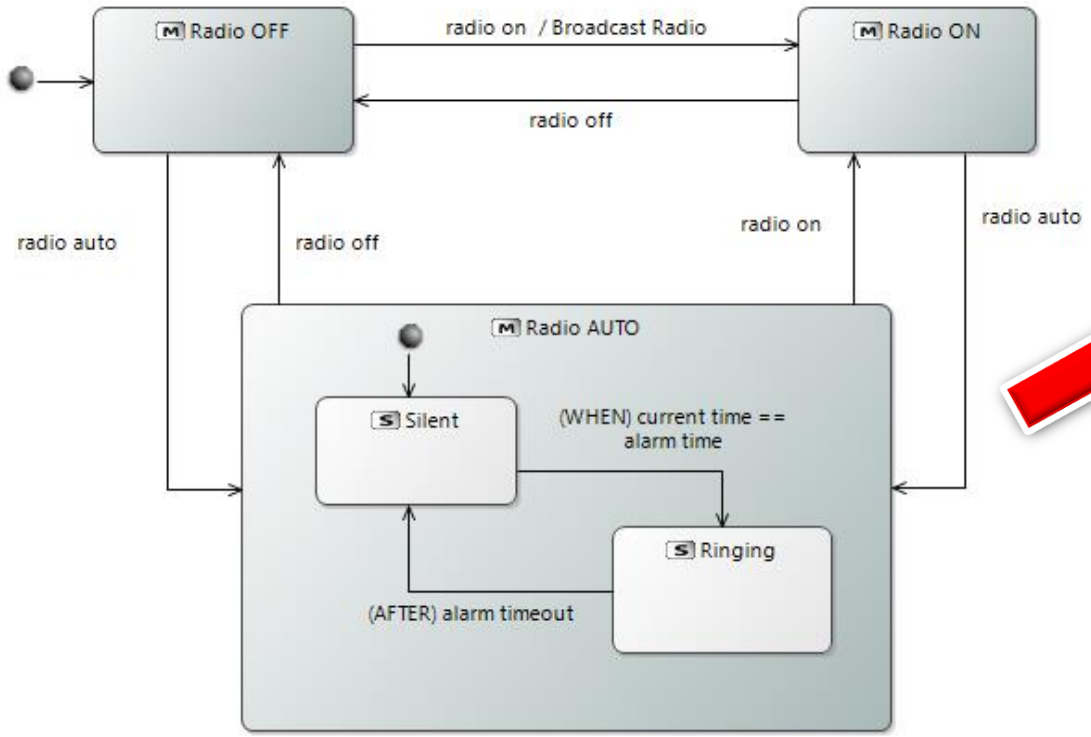


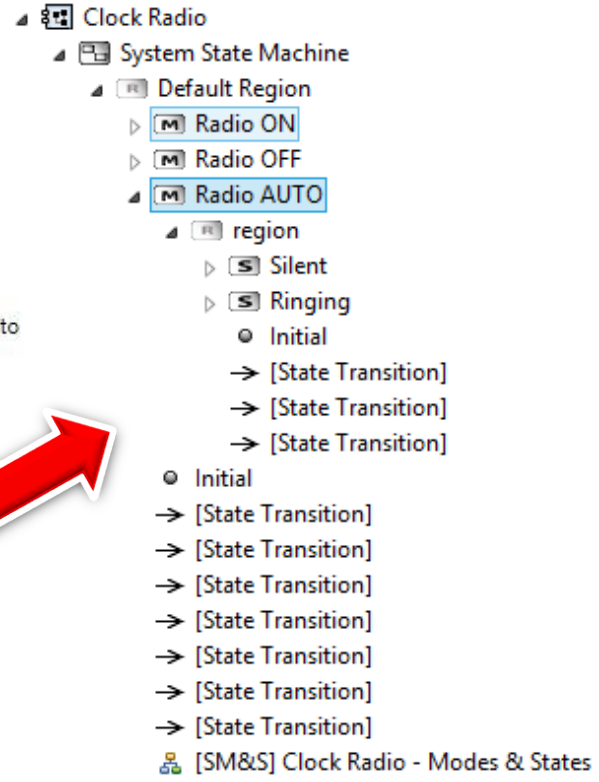


SA: S&M Diagram (Start)



SA: S&M Diagram (with Substates)





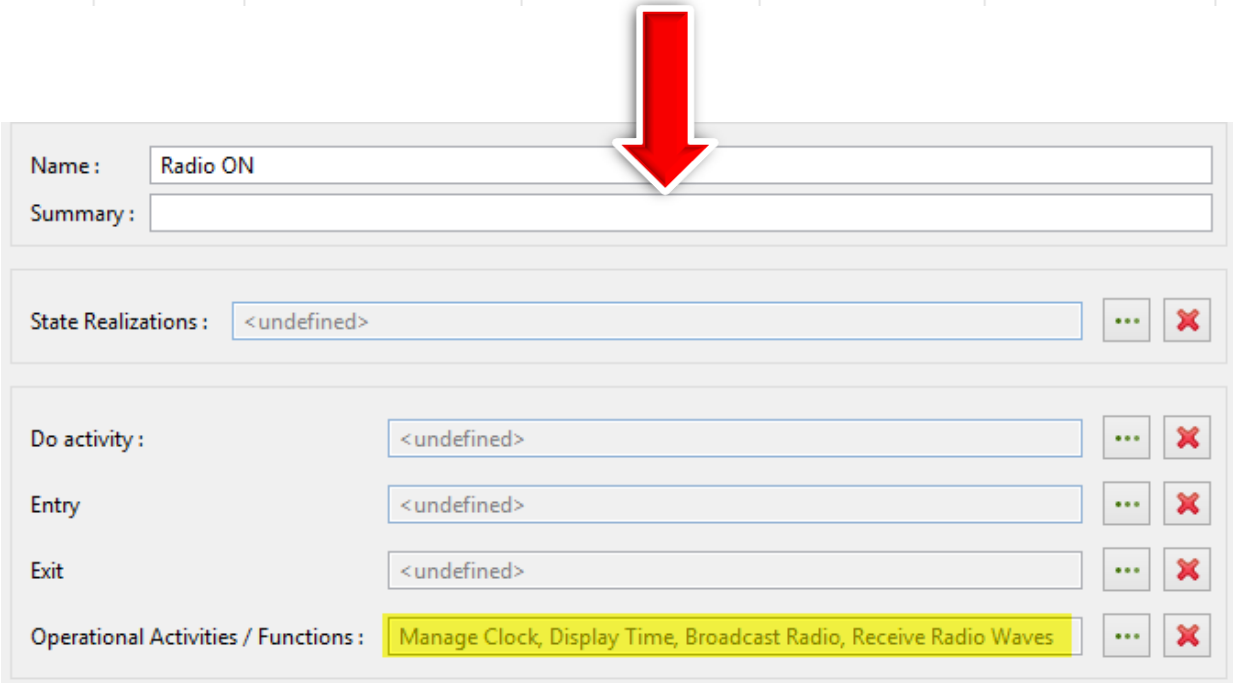
SA: S&M Matrix


Operational Analysis
System Analysis
Formalize System Requirements
Transition From Operational Activities
Define Actors, Missions and Capabilities
Refine System Functions, describe Functional Exchanges
Allocate System Functions to System and Actors
Define Interfaces and describe Interface Scenarios
Transverse Modeling
[CDB] Create a new Class Diagram
[M&S] Create a new Modes & States Machine
Describe the State
Create a new State & Mode / Functions matrix

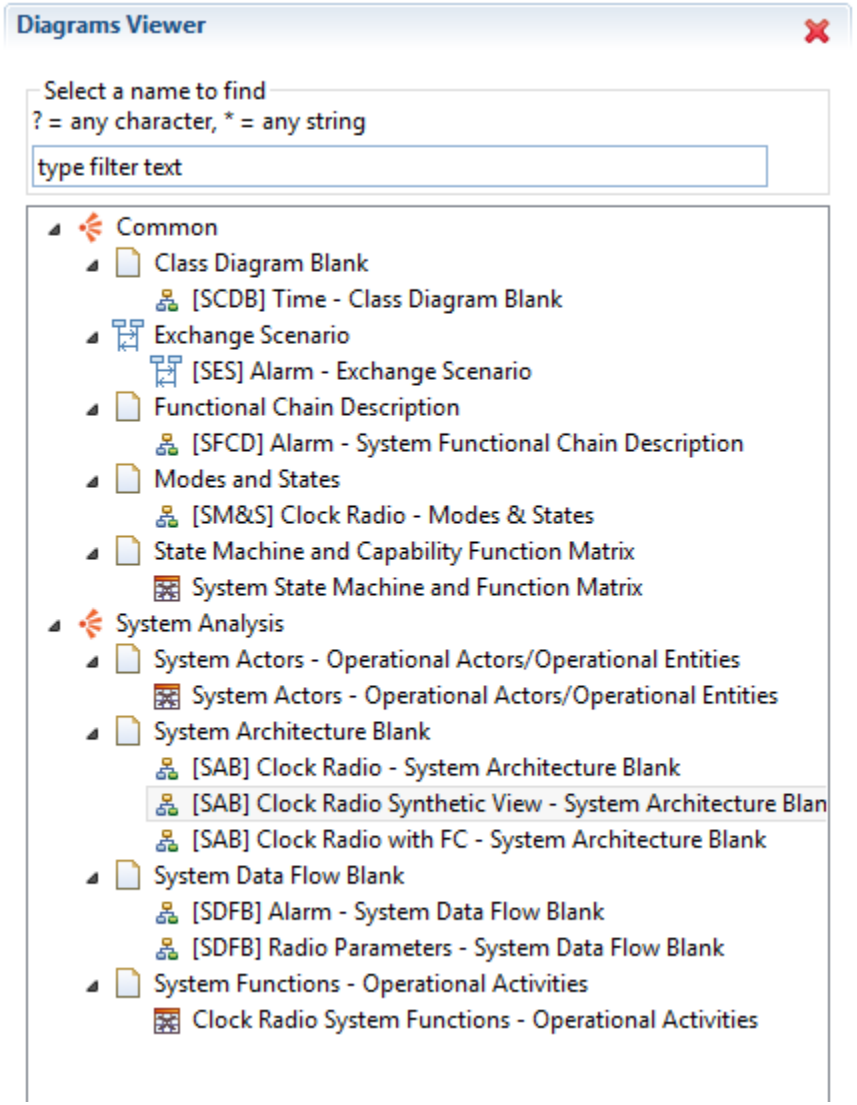
SA : S&M Matrix

RadioReveil - Overview | [SM&S] Clock Radio - Modes & States | System State Machine and Function Matrix

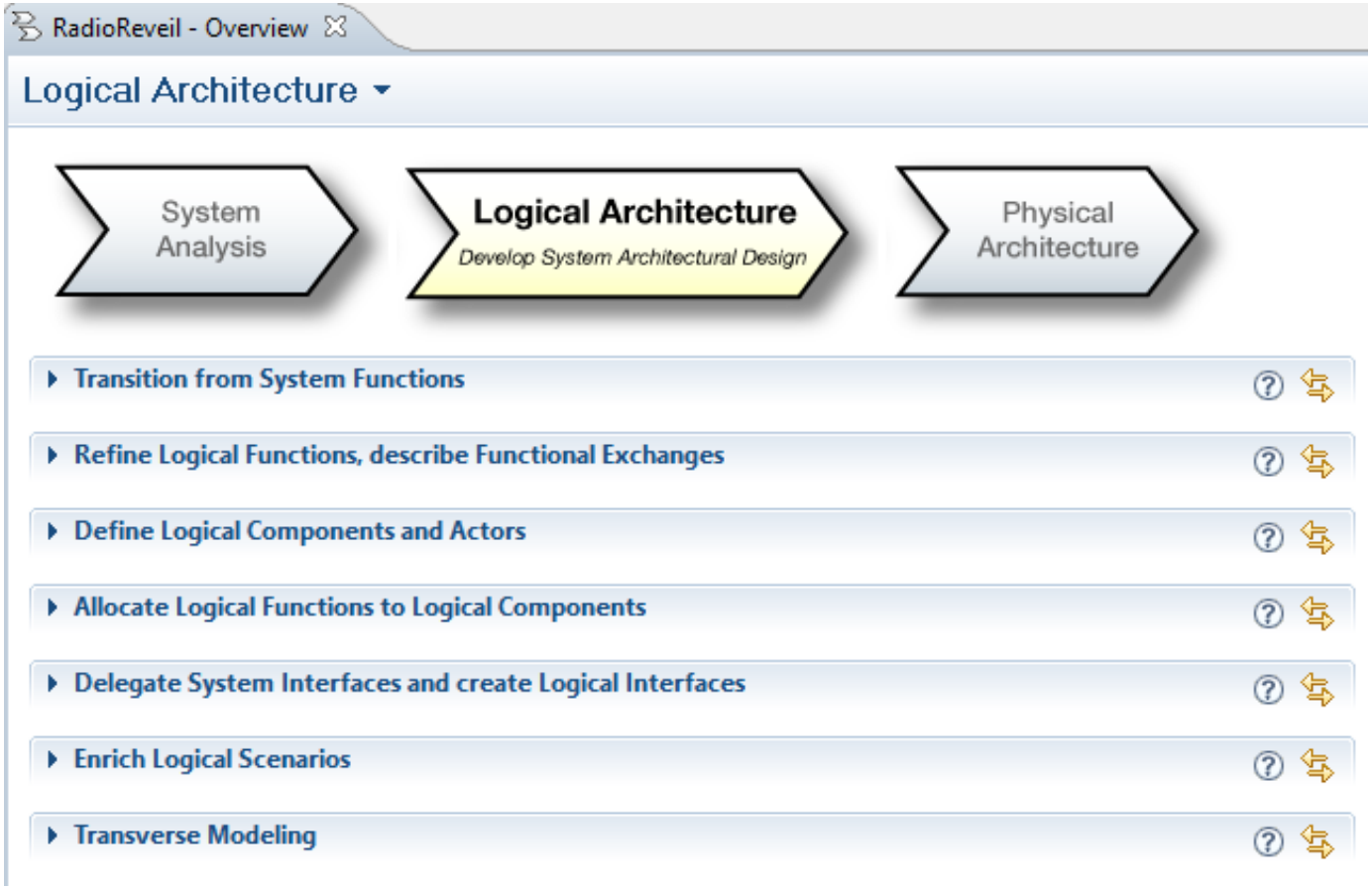
	Alarm	Receive Radio Wav...	Manage Alarm	Manage Clock	Display Time	Broadcast Radio
Clock Radio						
System State Machine						
Radio ON		X		X	X	X
Radio OFF				X	X	
Radio AUTO	X		X	X	X	
Silent						
Ringing		X				X



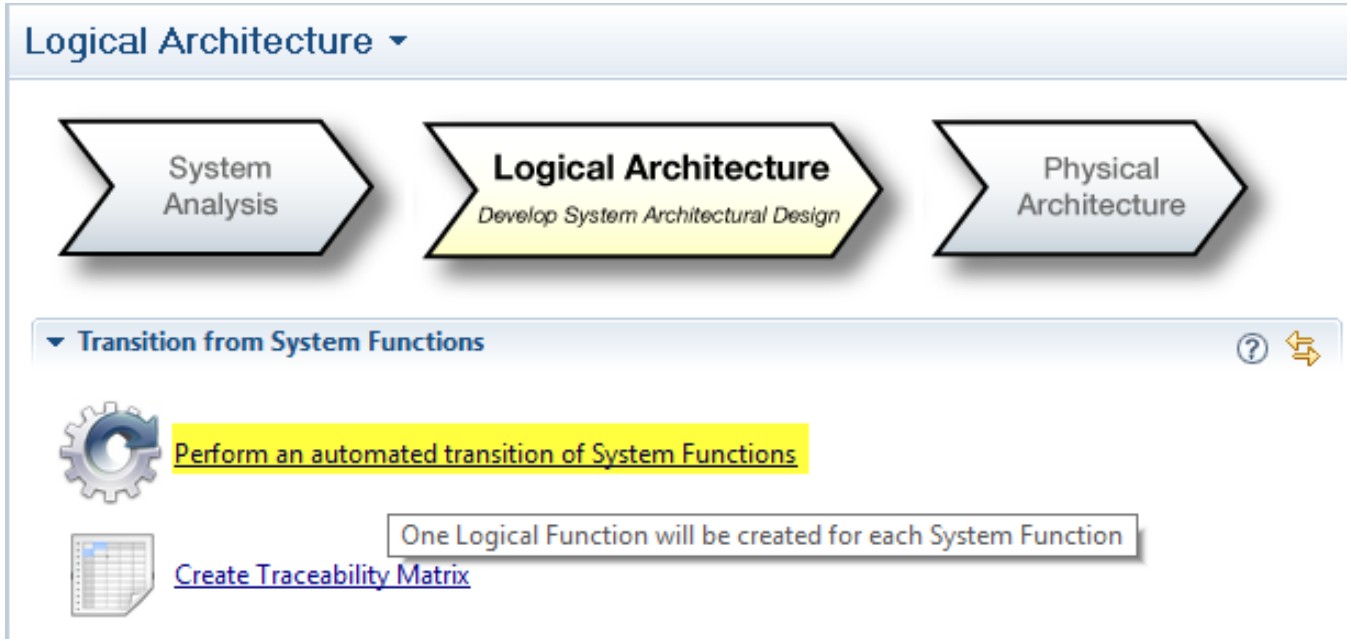
System Analysis: Diagrams Viewer



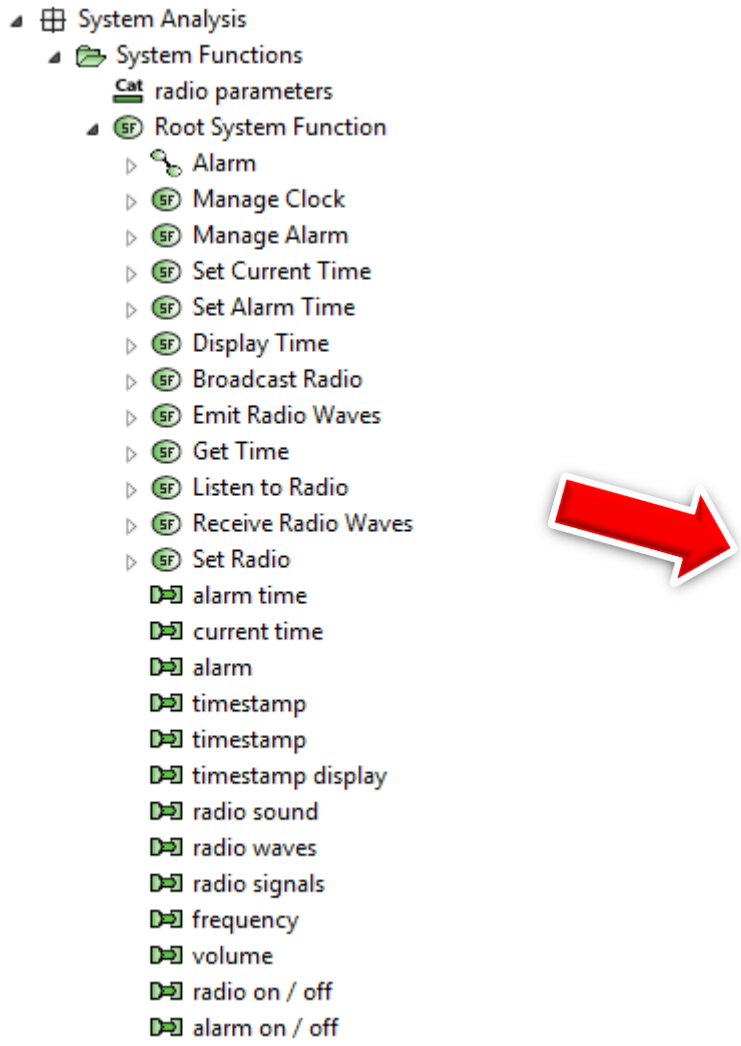
Logical Architecture (LA)

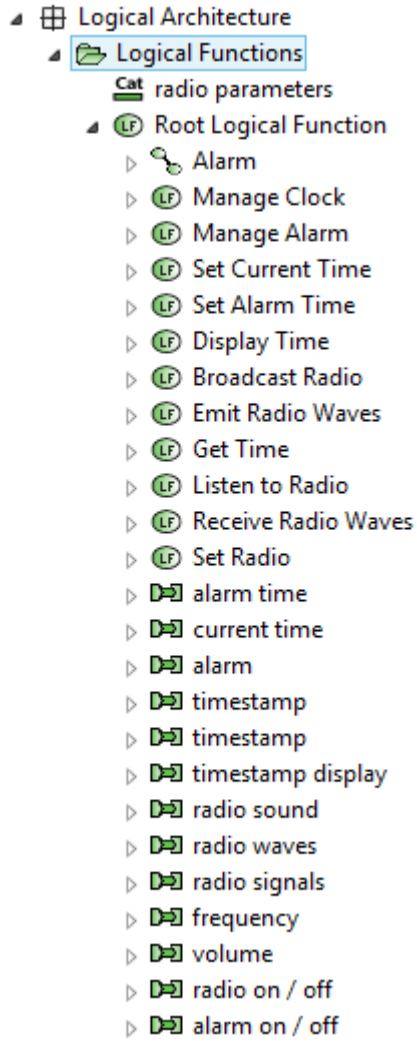


SA -> LA Transition

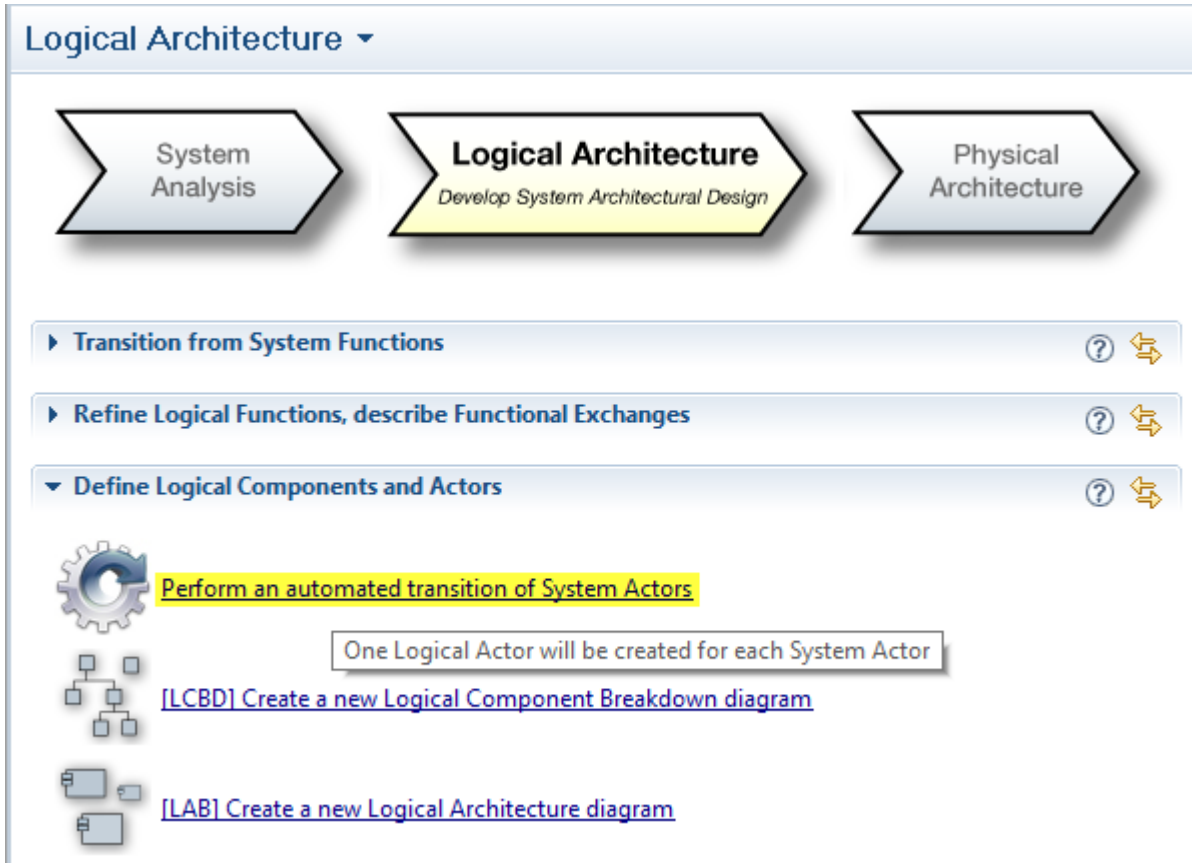


SA -> LA Transition

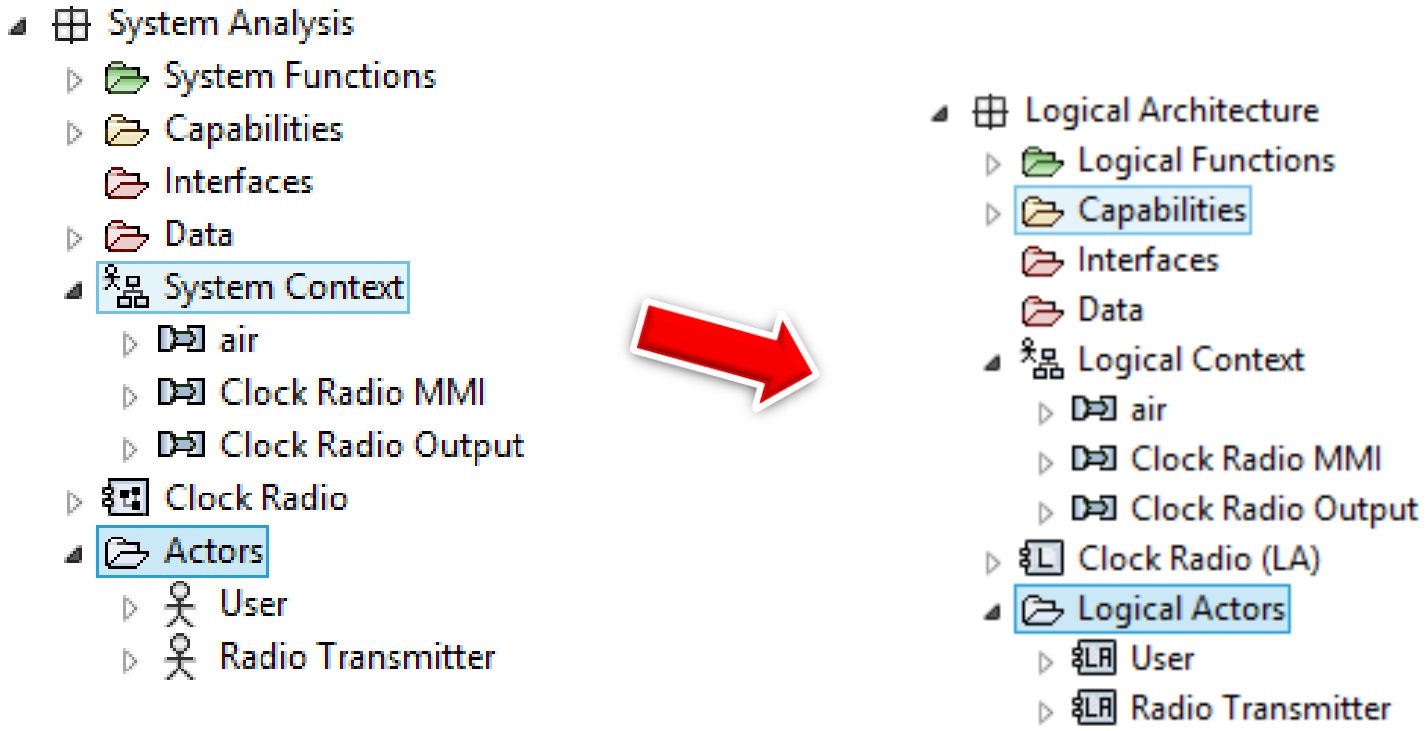




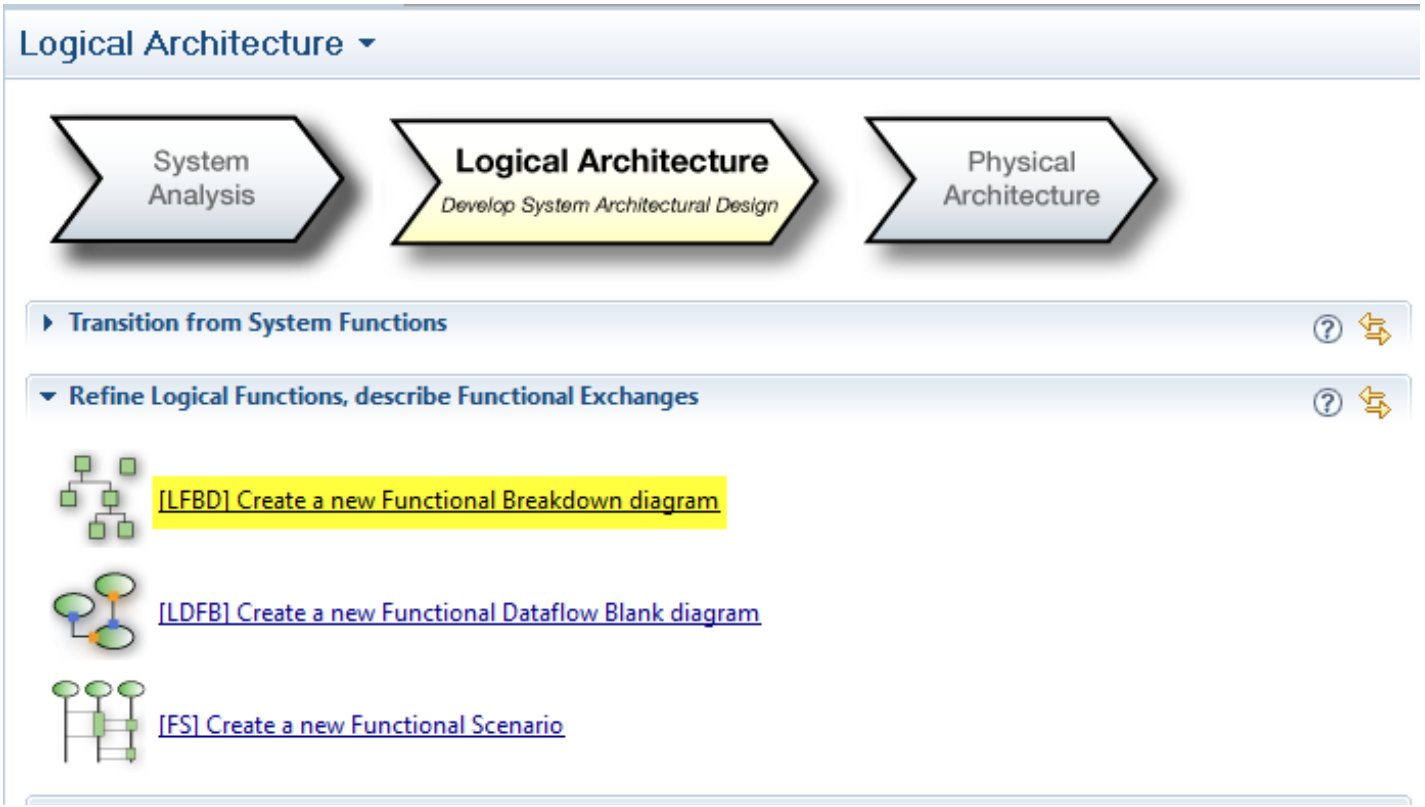
SA -> LA Transition



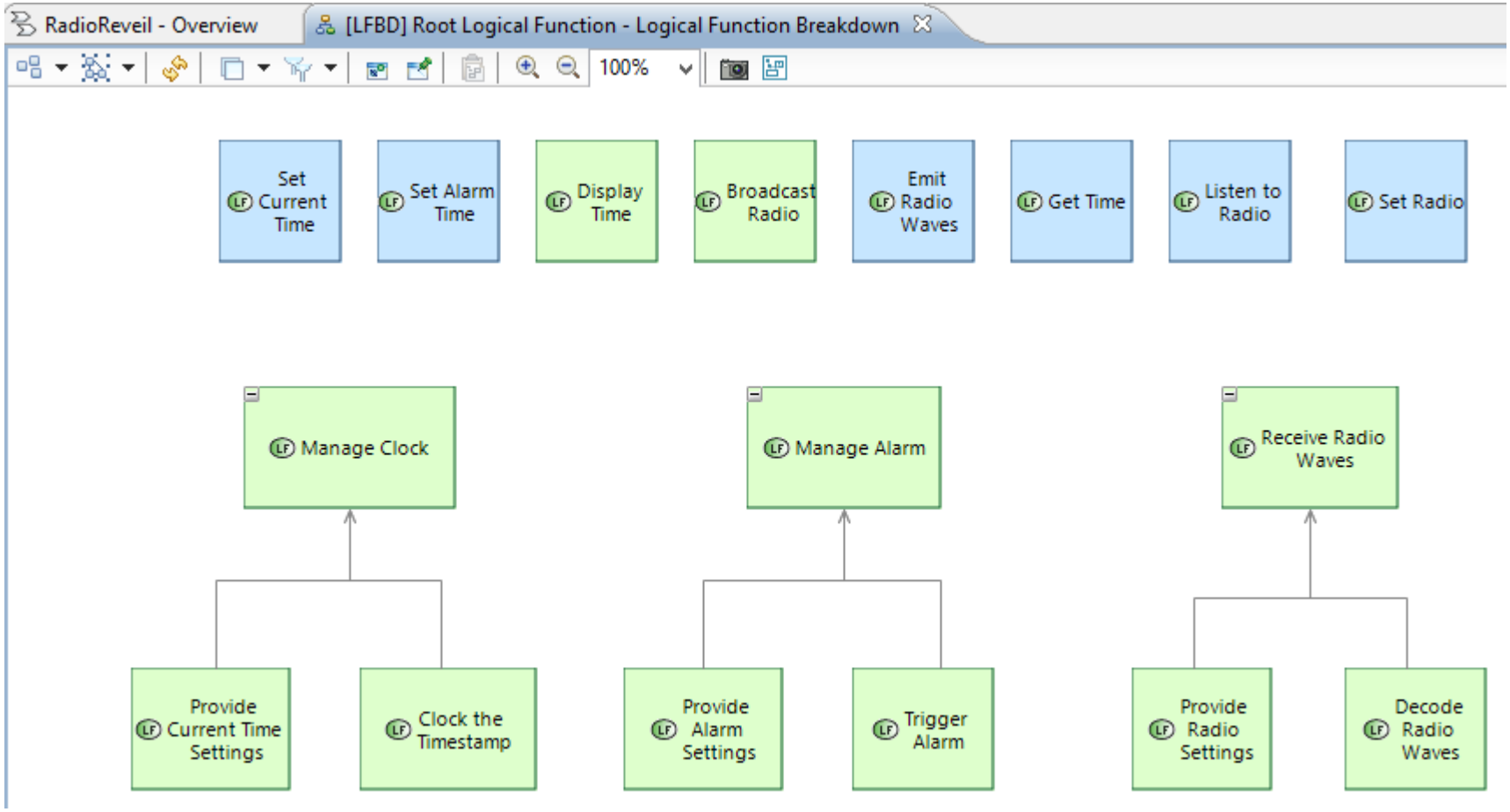
SA -> LA Transition



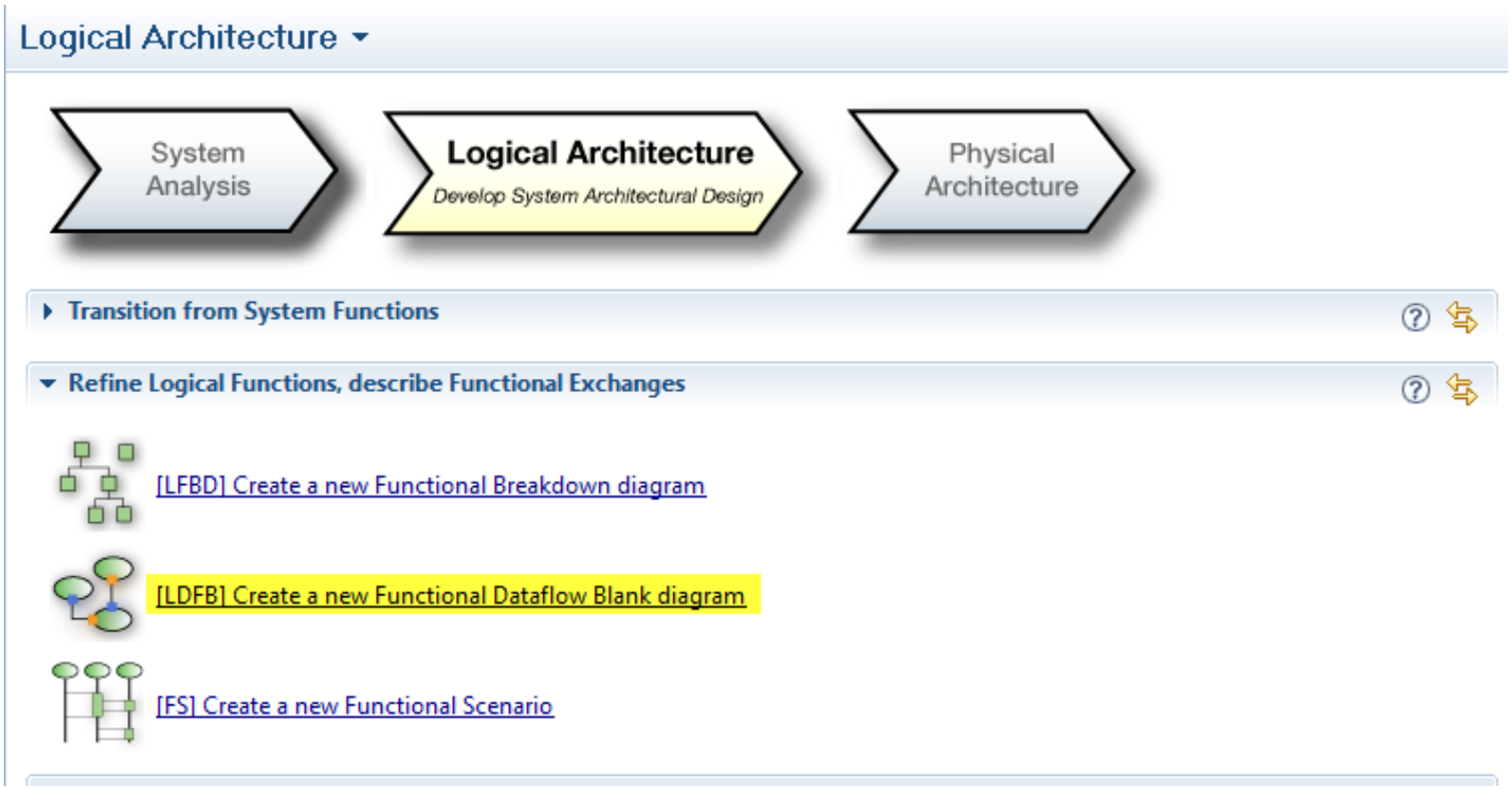
LFBD: Logical Functions Breakdown



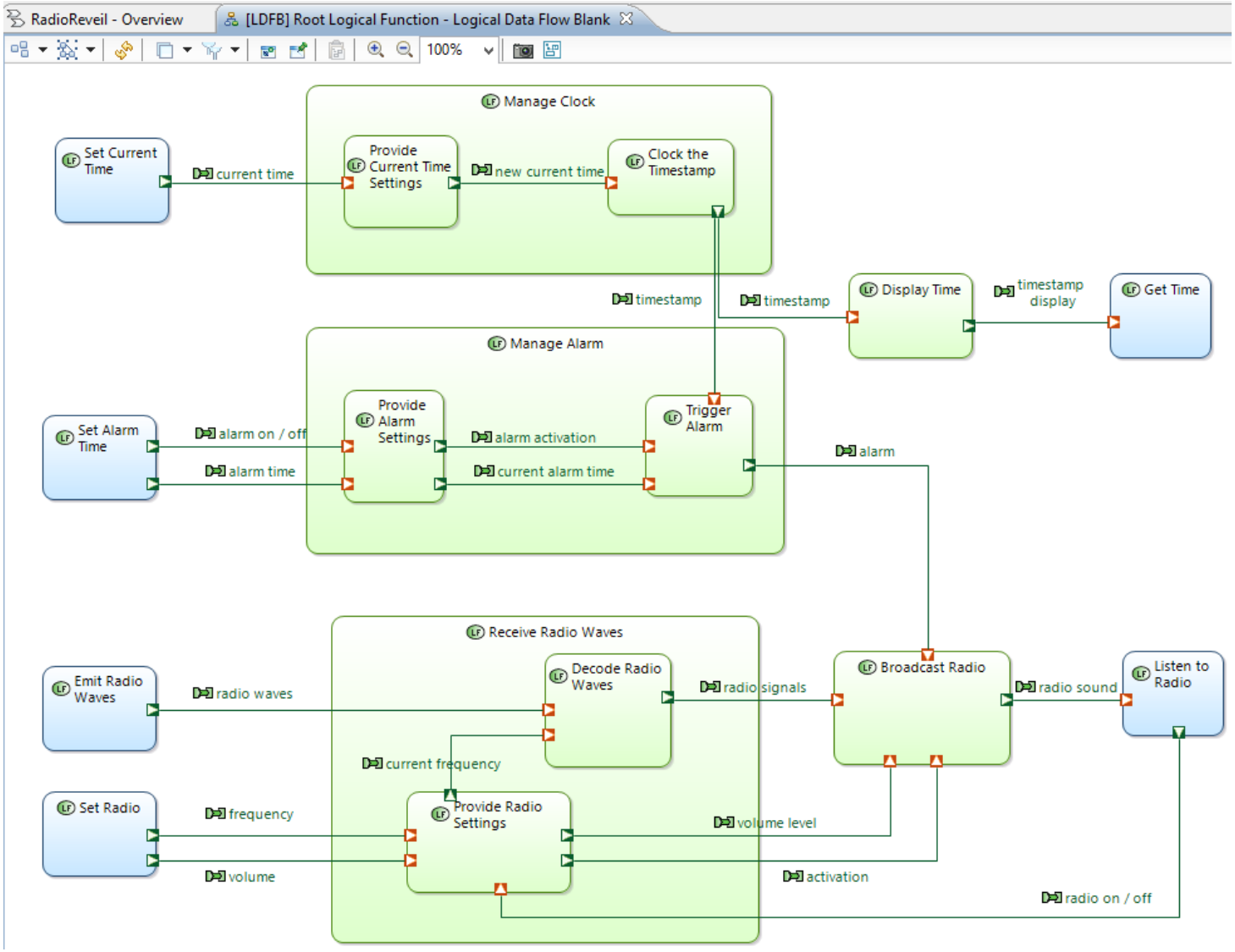
LFBD: Logical Functions Breakdown



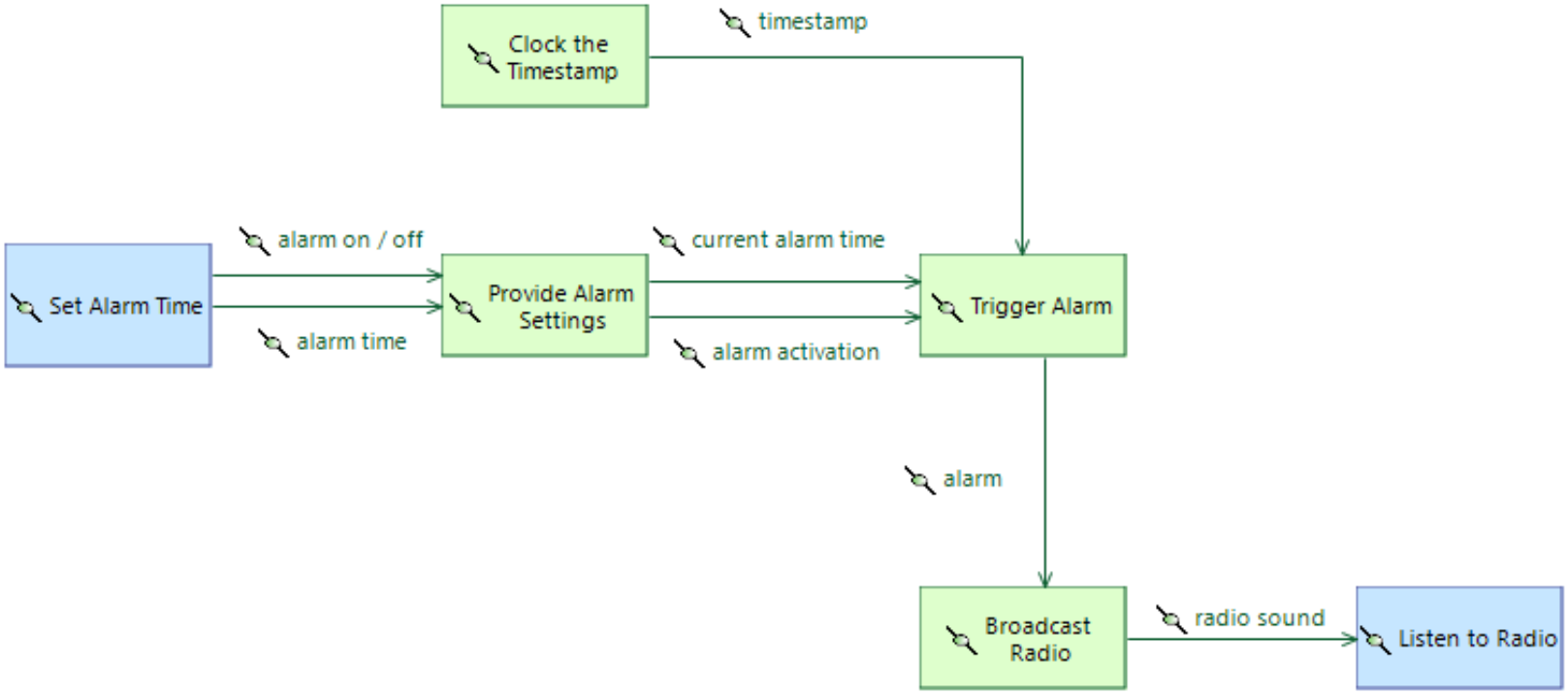
LDFB: Logical Data Flow Blank



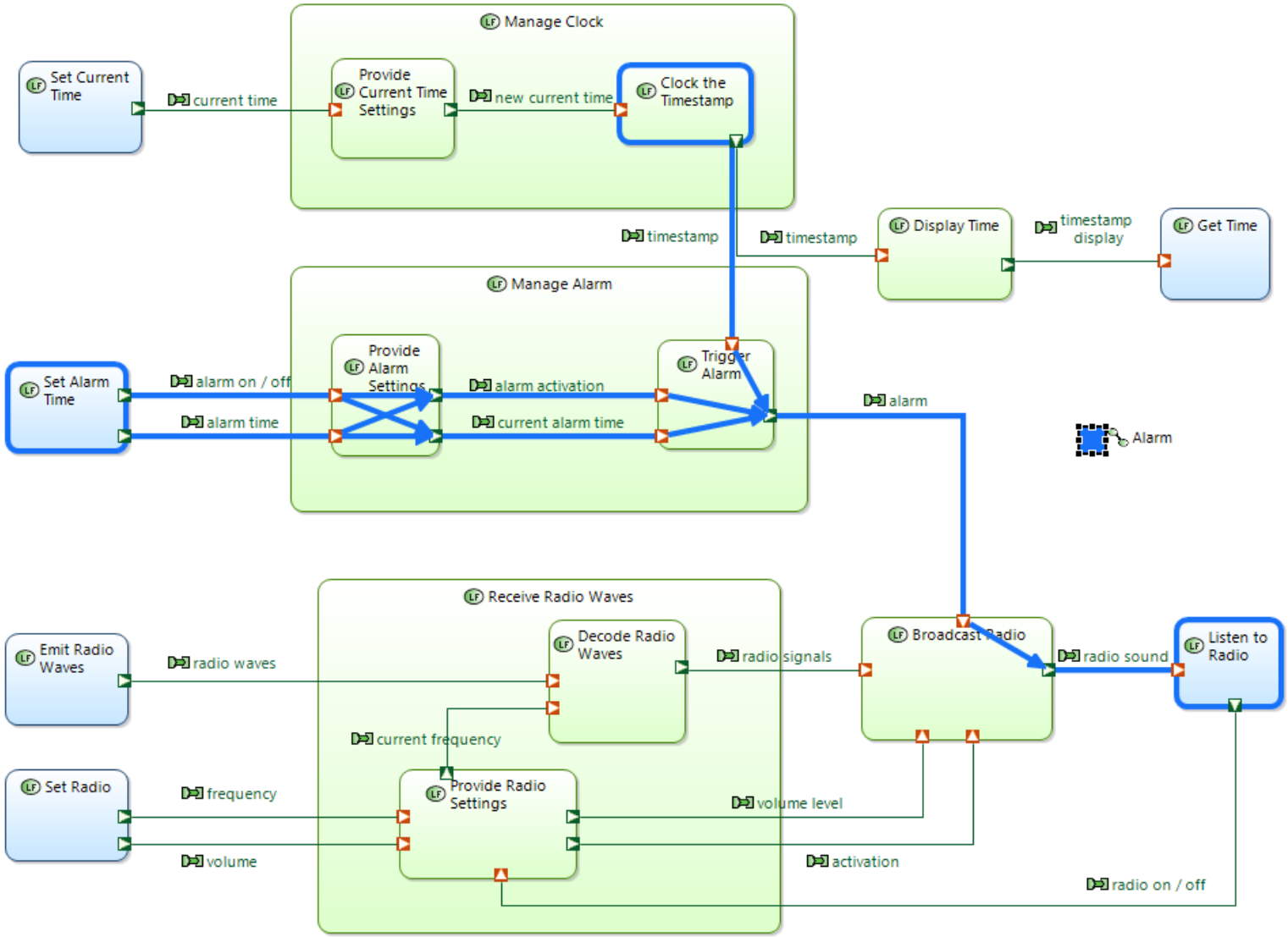
LDFB: After Modifications



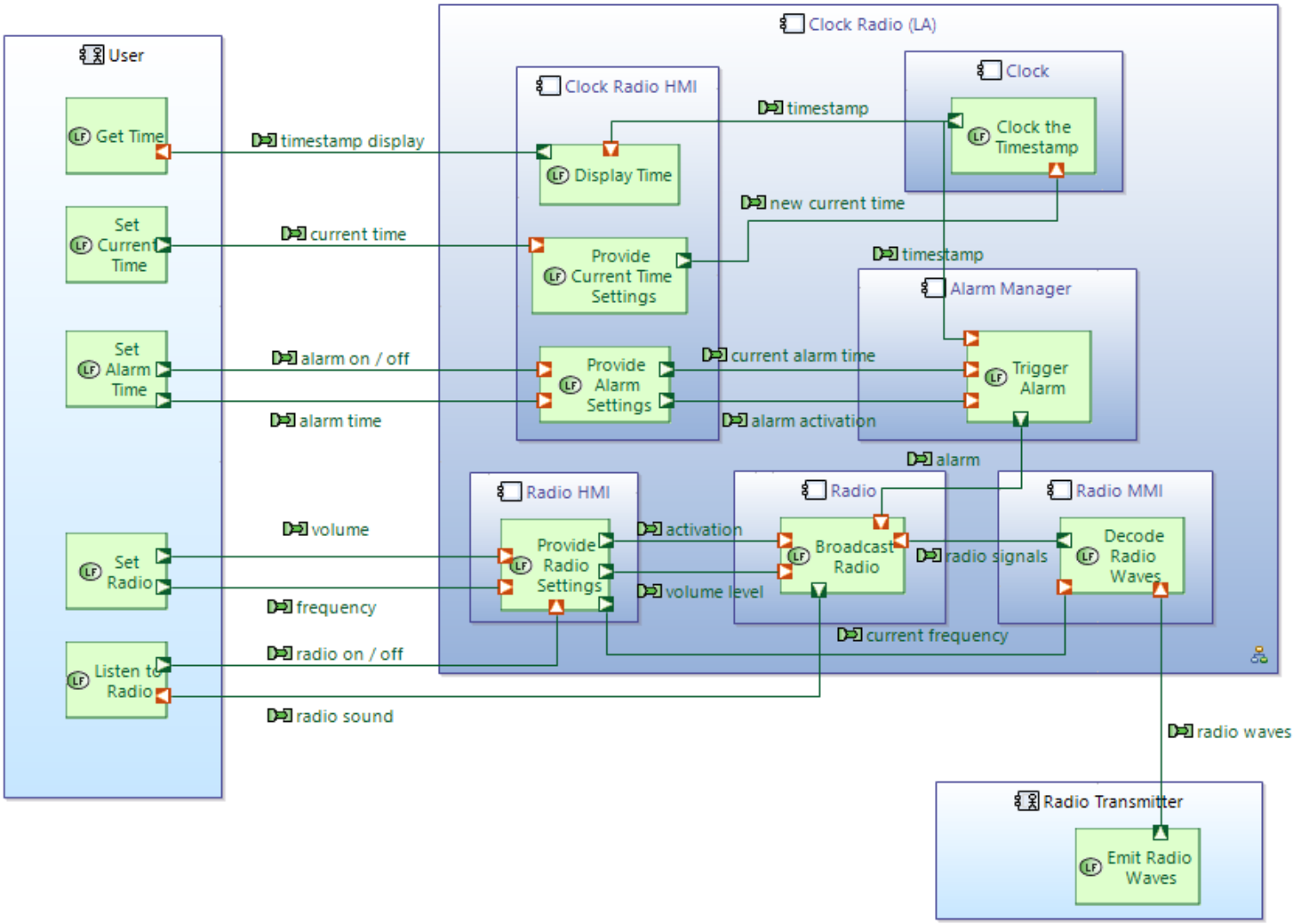
LFCD: Modified FC



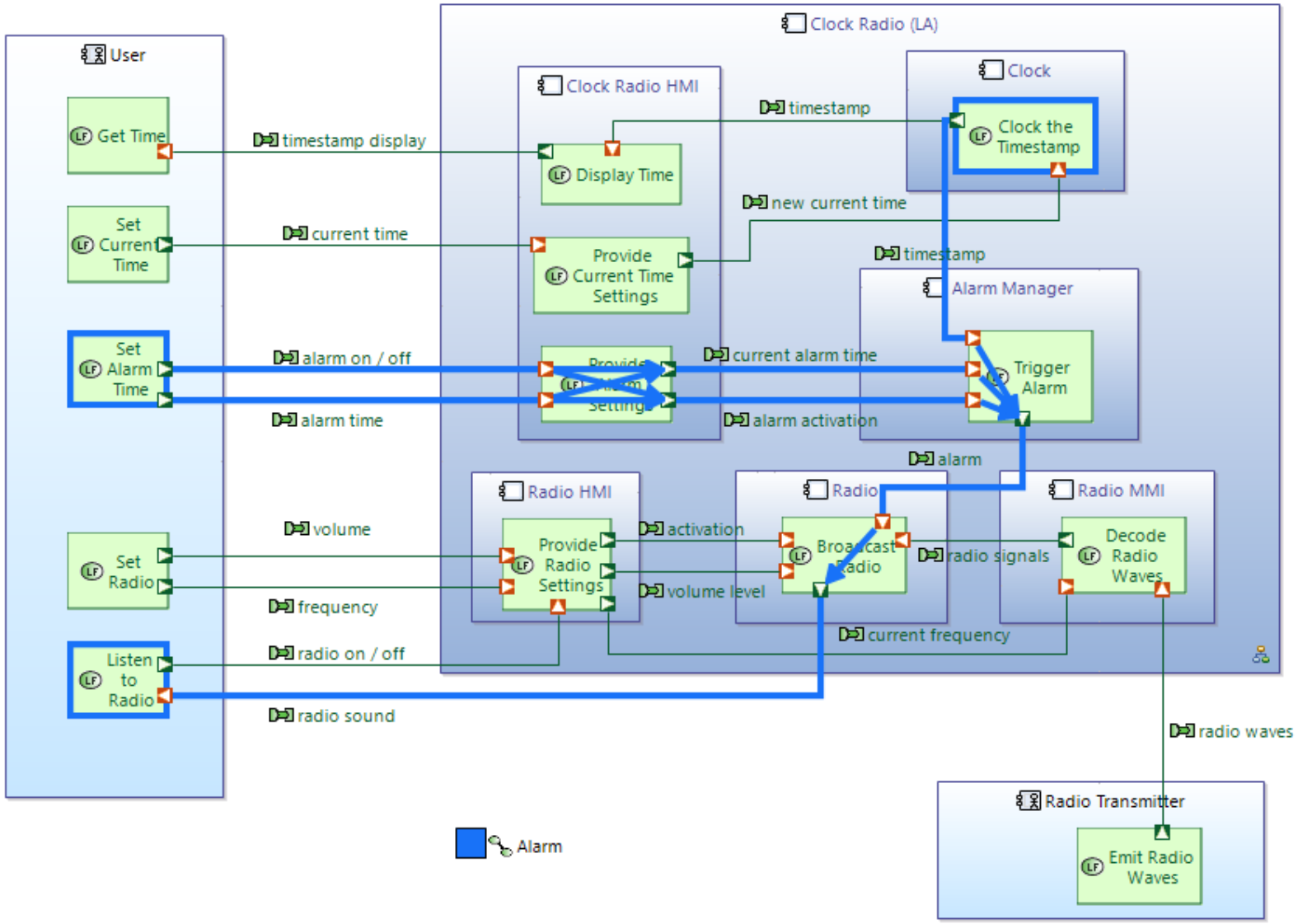
LDFB: Valid FC After Correction



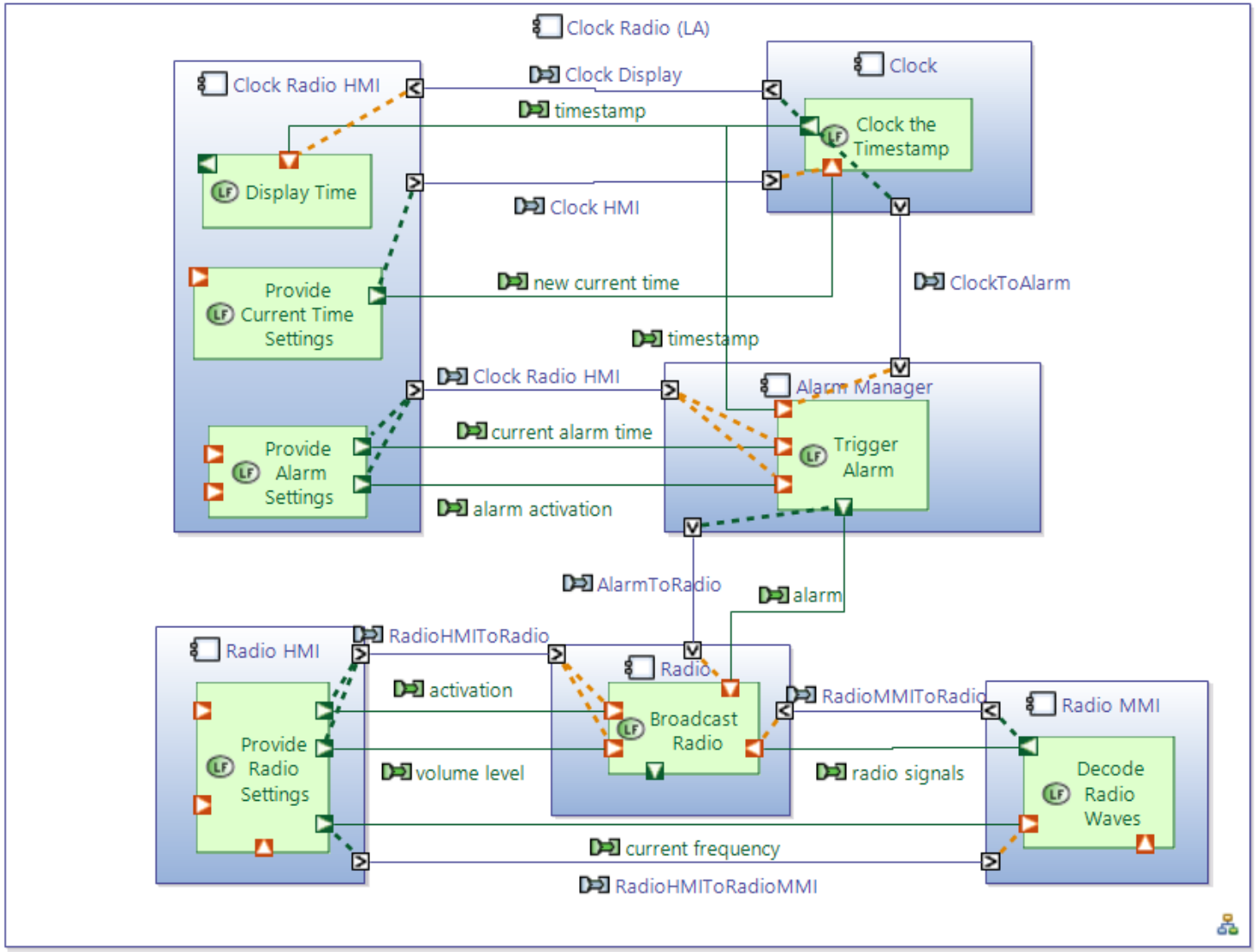
LAB: Functions Allocation



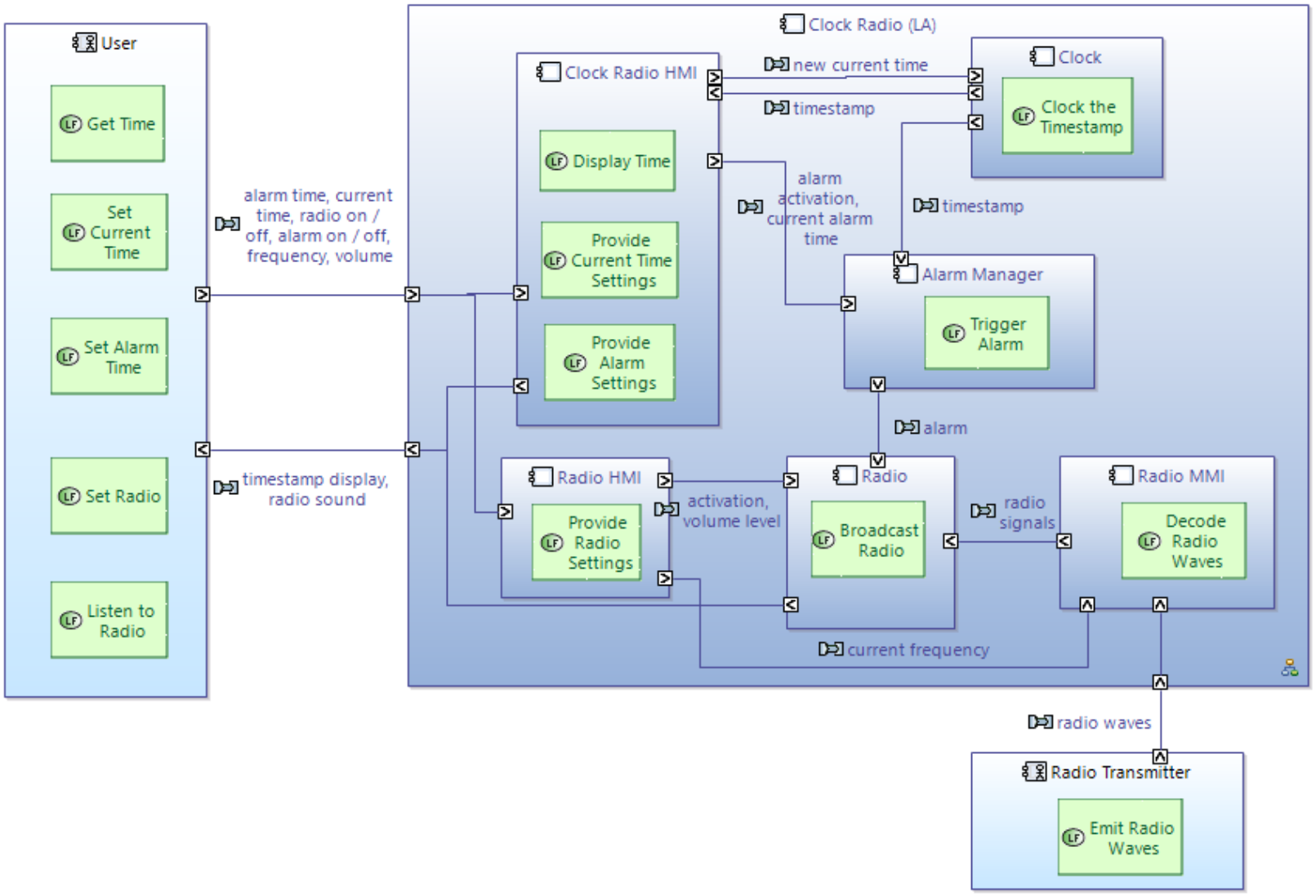
LAB: Functions Allocation + FC



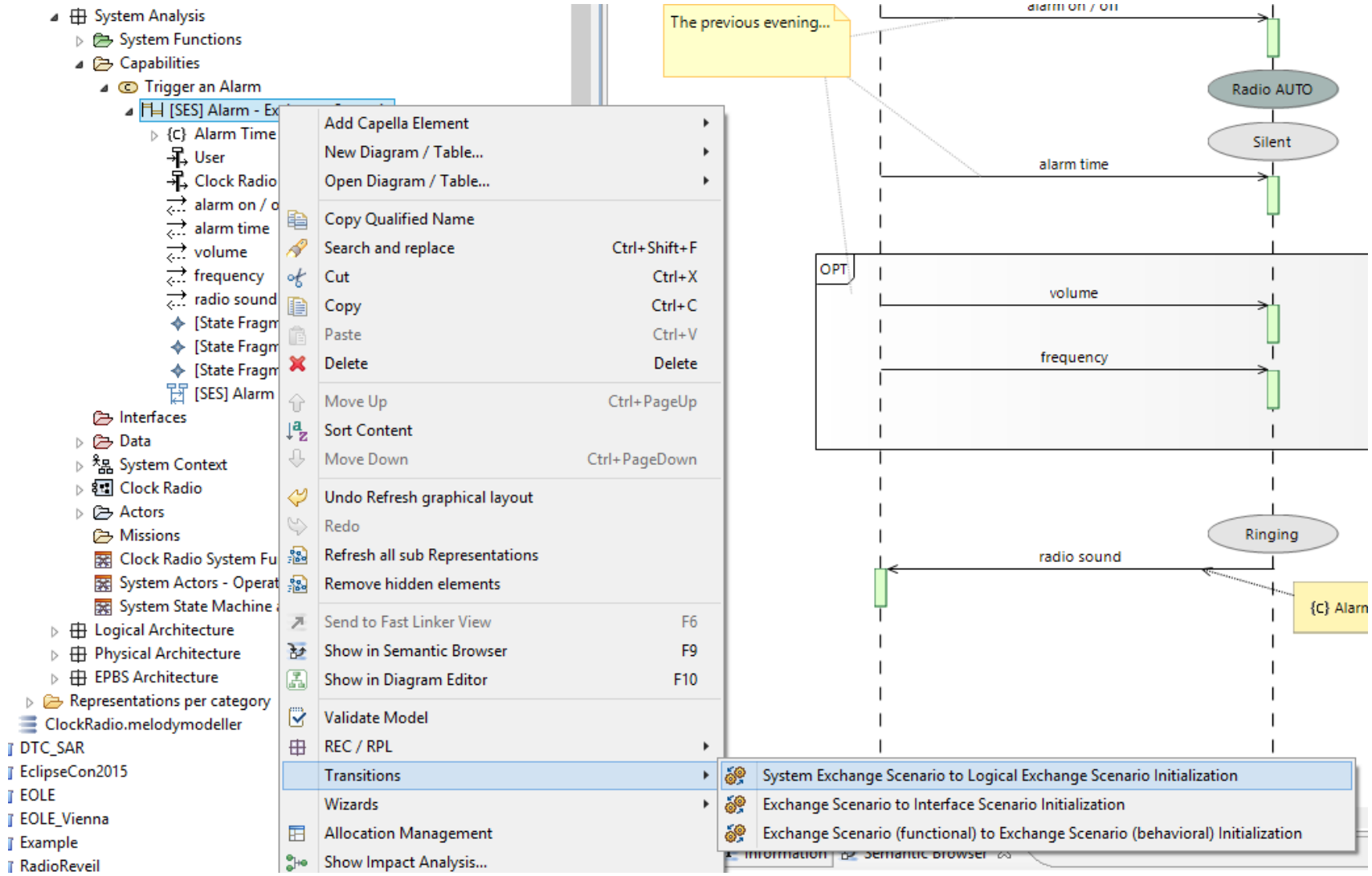
LAB: Internal CE Between LCs



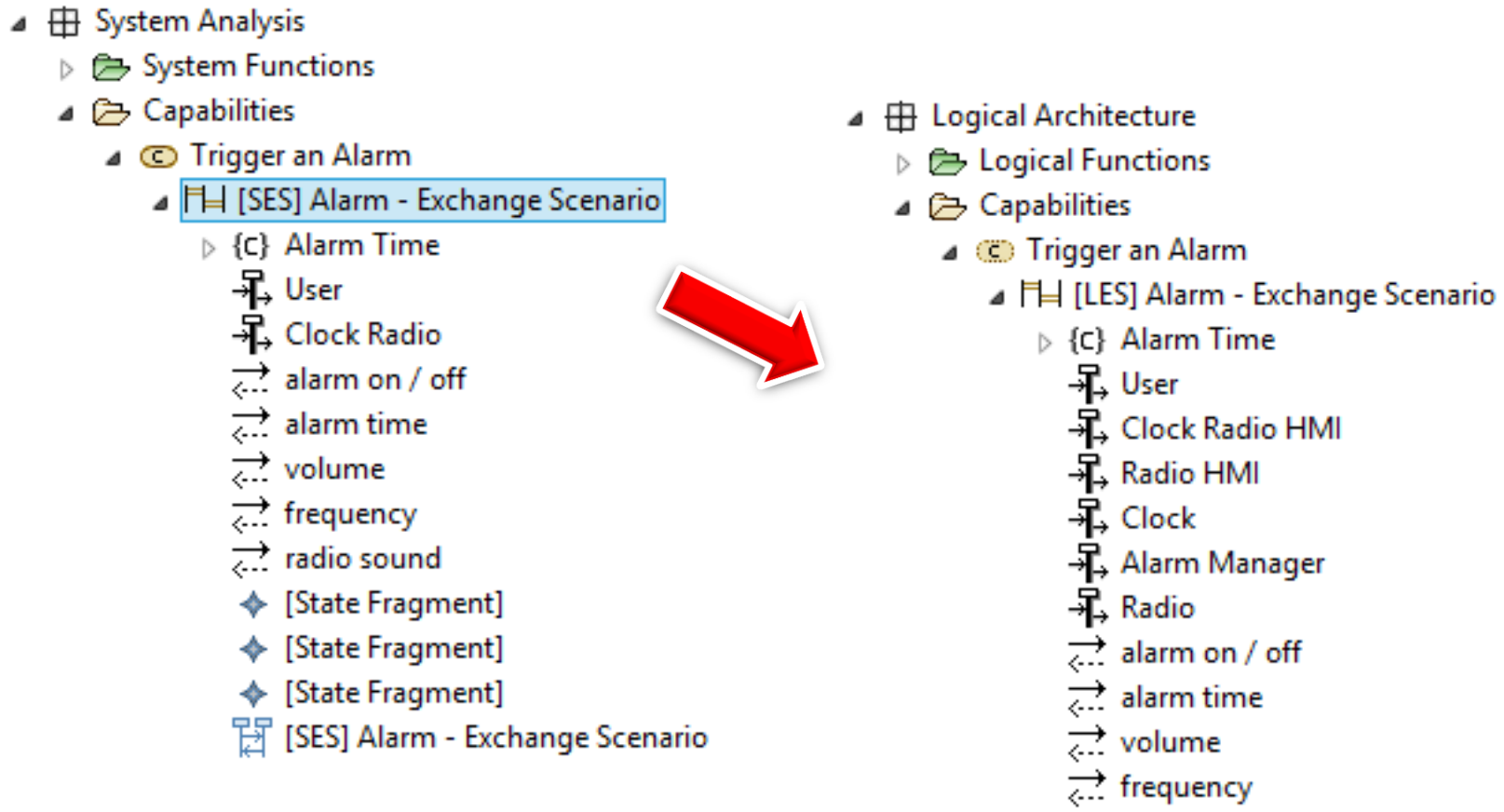
LAB Simplified View



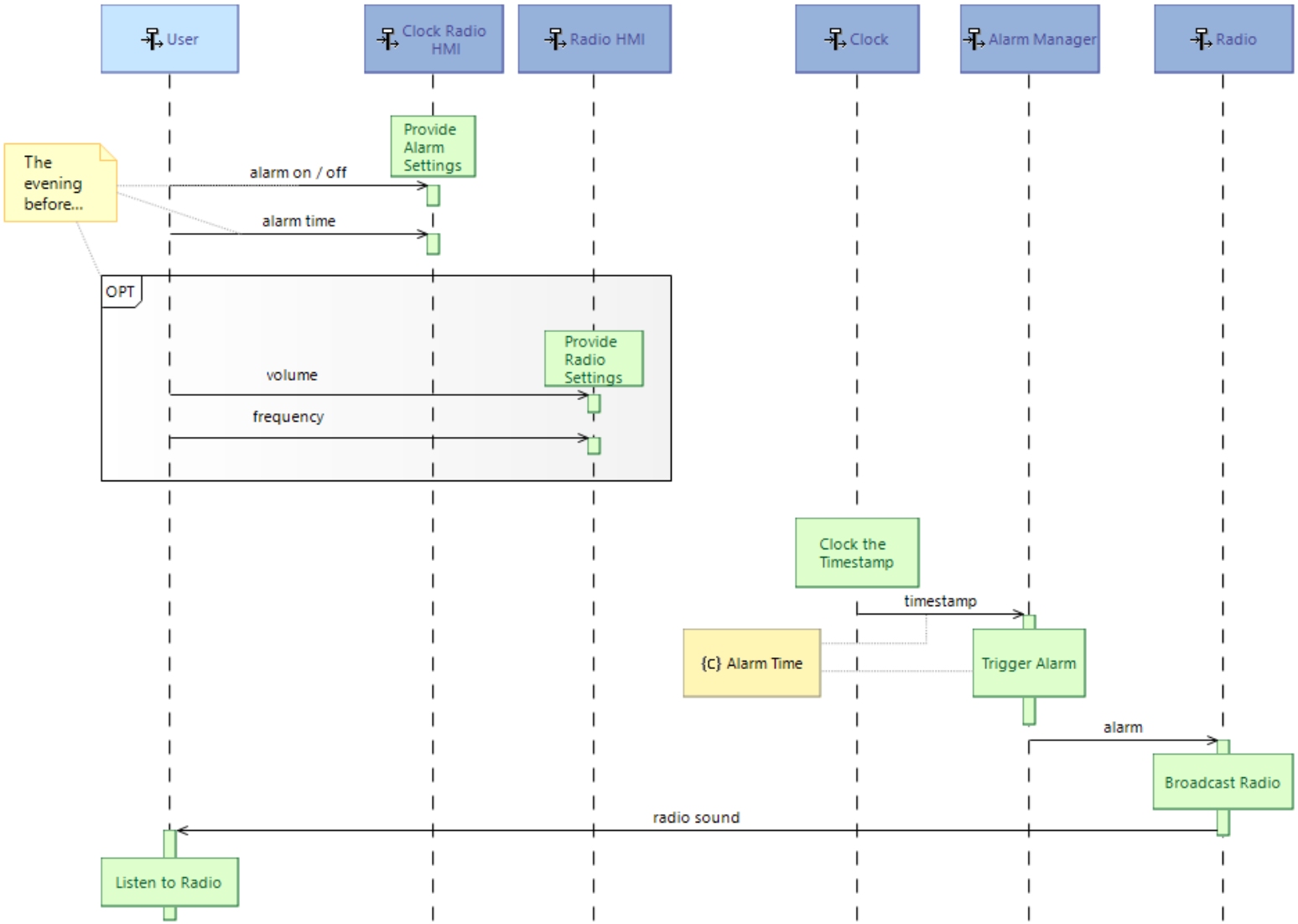
Transition from SES



Transition from SES



Enhanced LES



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- www.incose.org/
- www.afis.fr