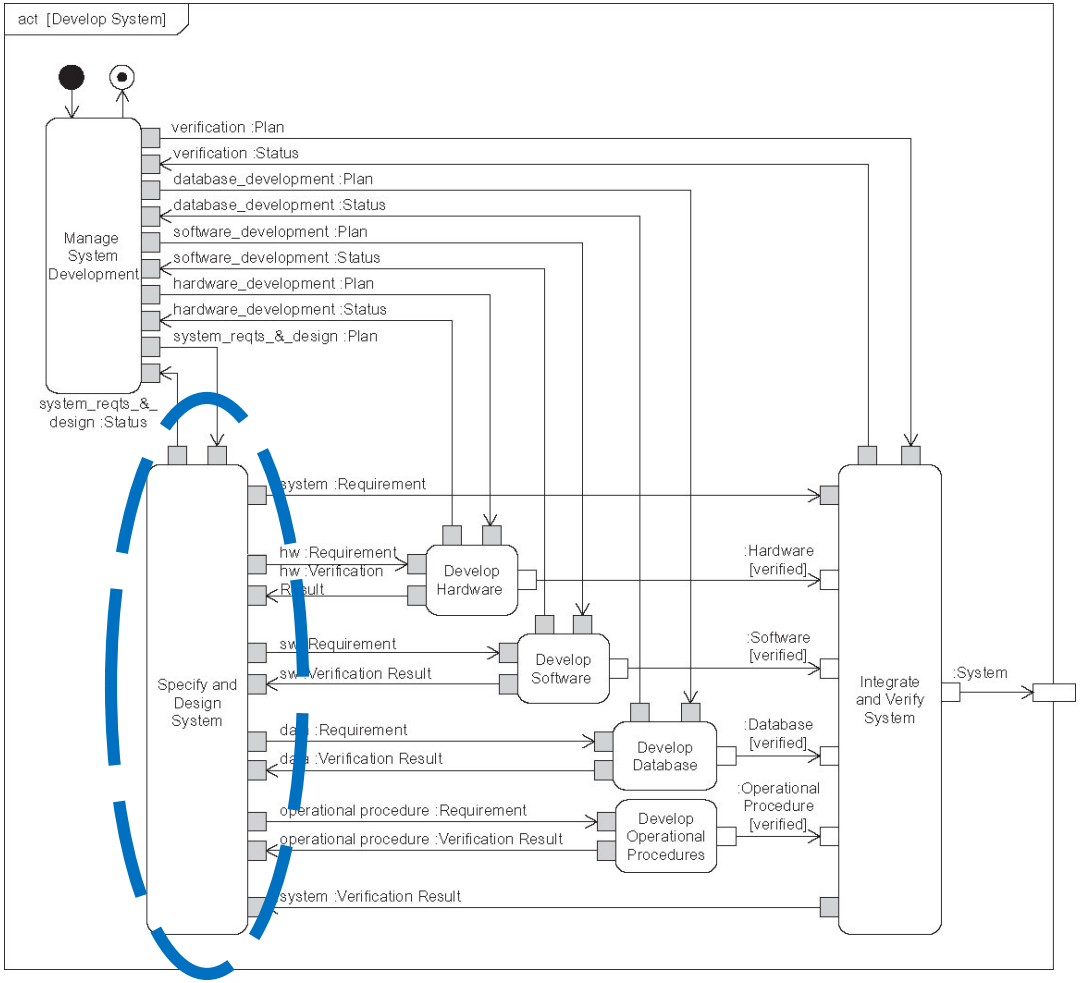
SysEng 6542
Model Based Systems Engineering

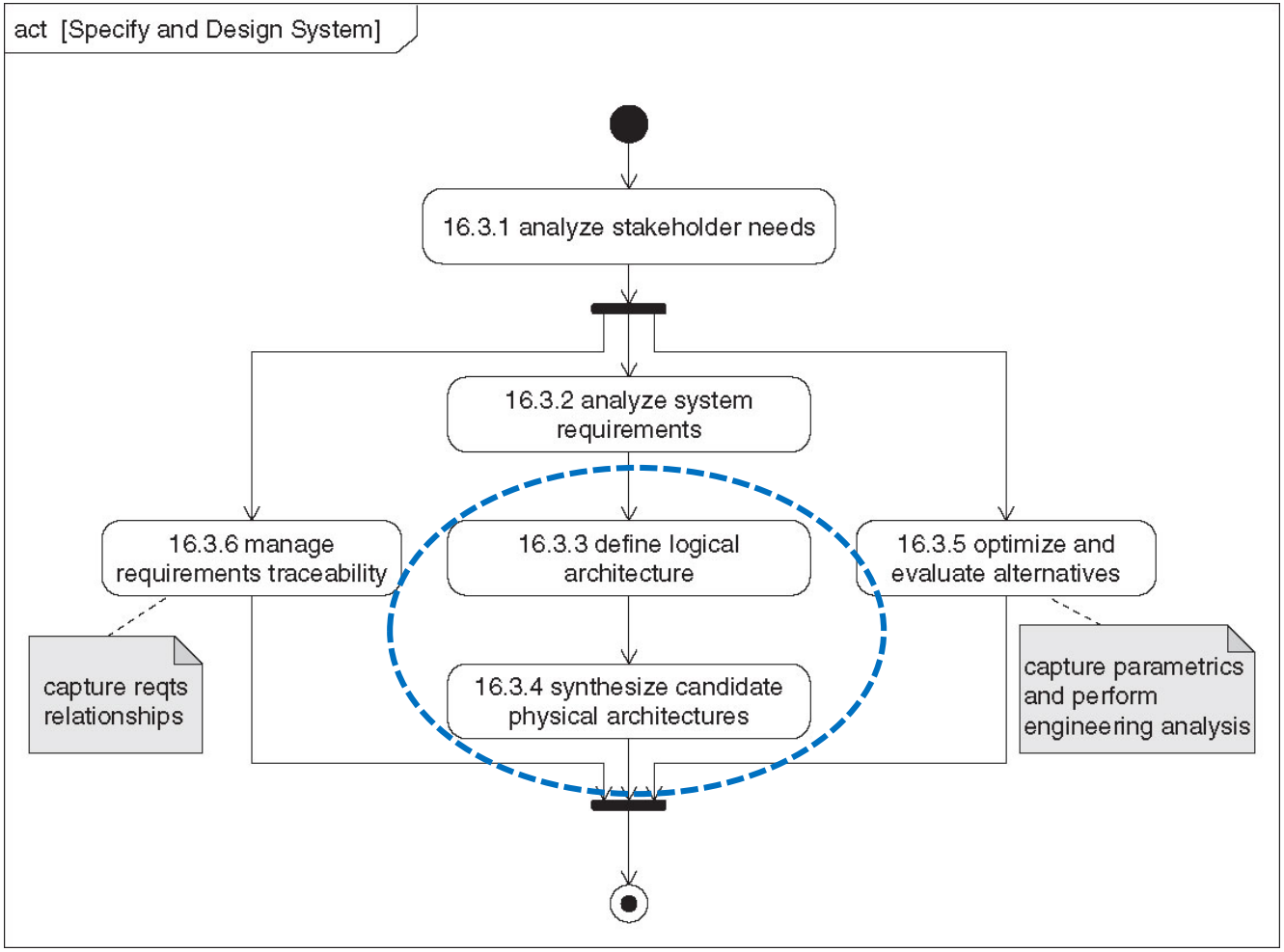
MBSE Example: Part B - Residential Security System (Cont)

Dr Quoc Do

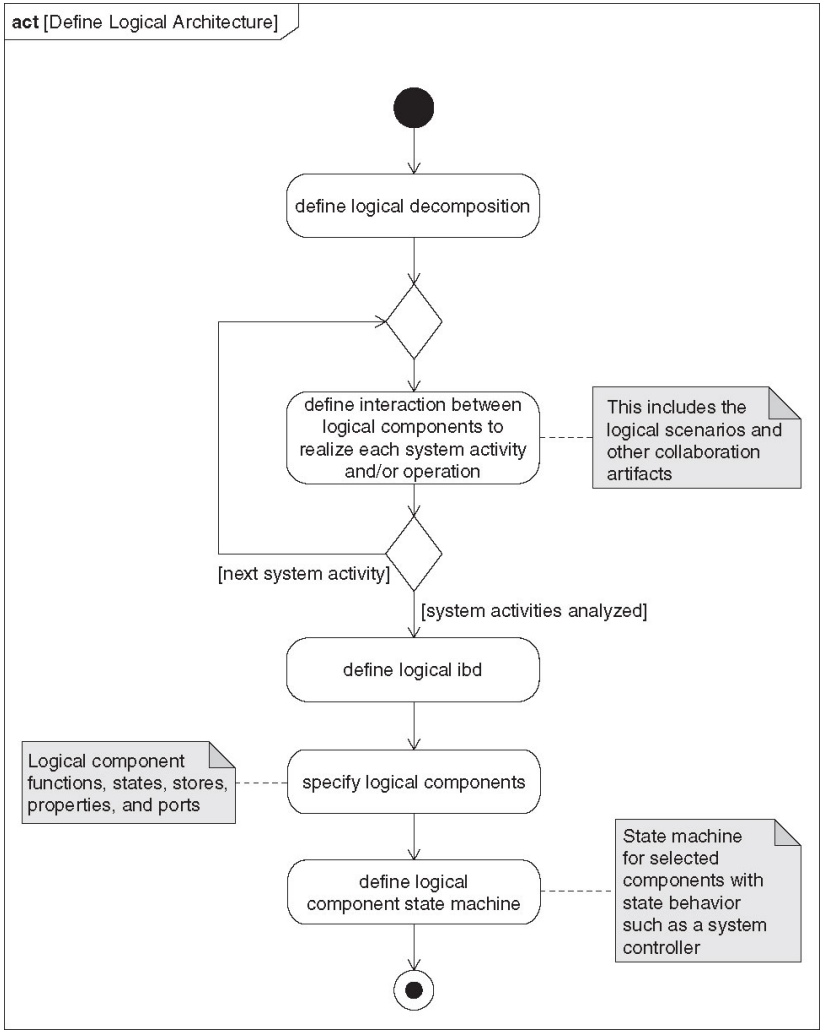
Overview
(Specify and Design System process)



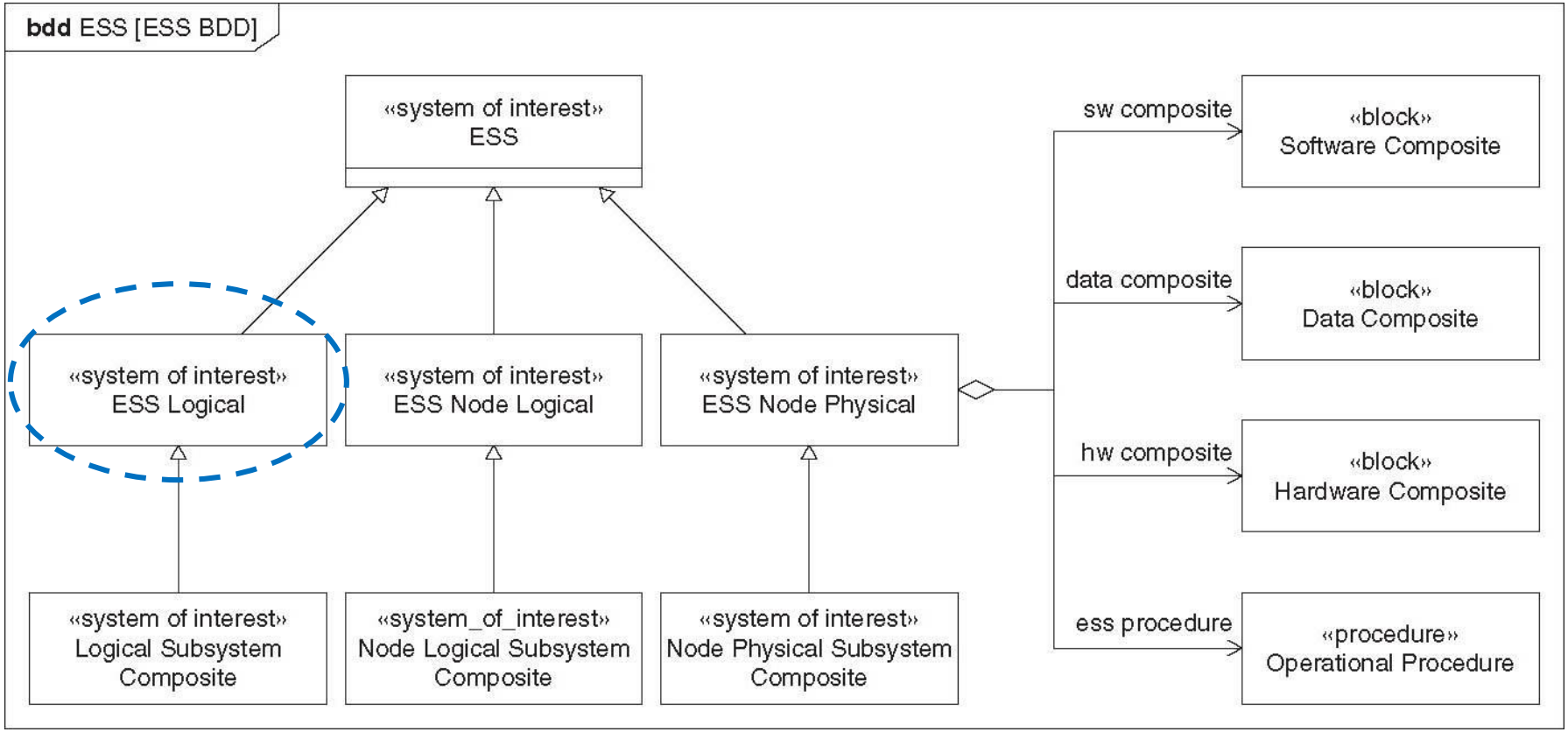
Overview
(Specify and Design System process)



Define Logical Architecture



Define Logical Decomposition

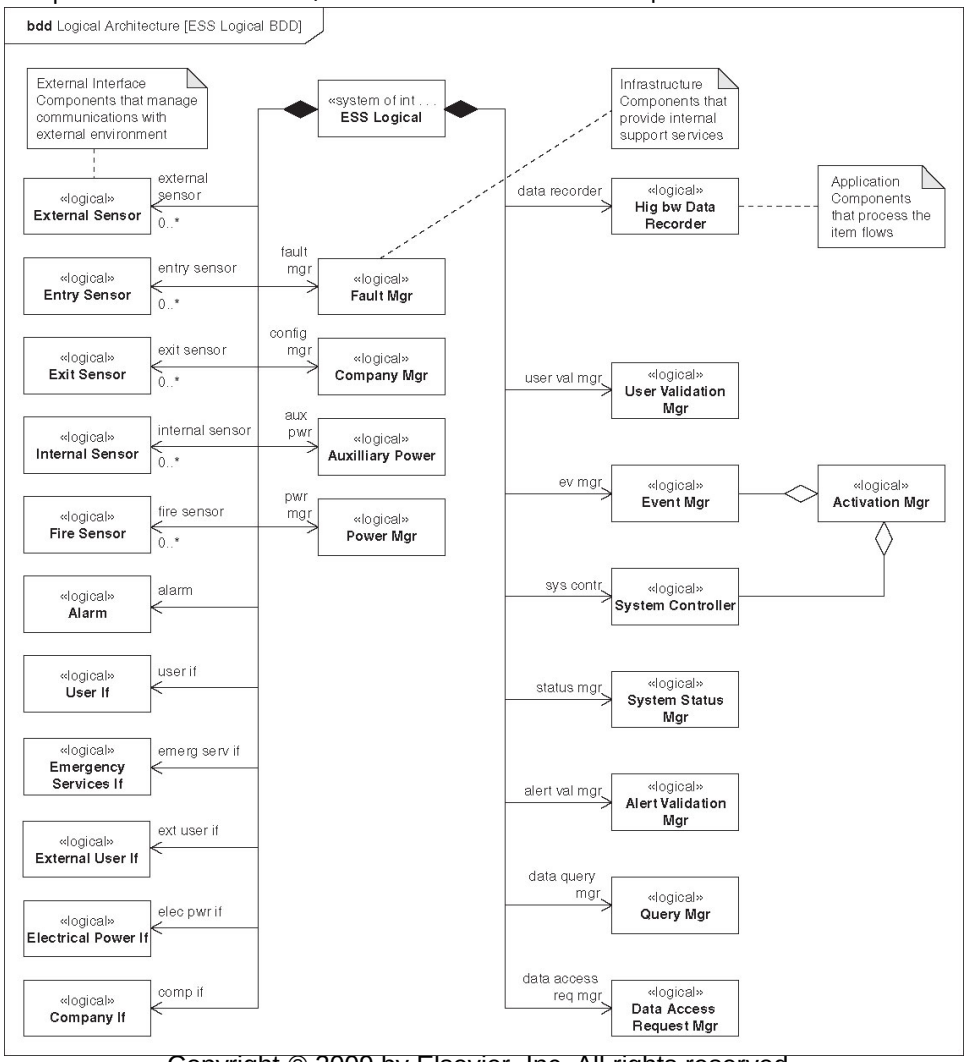


ESS Logical Decomposition

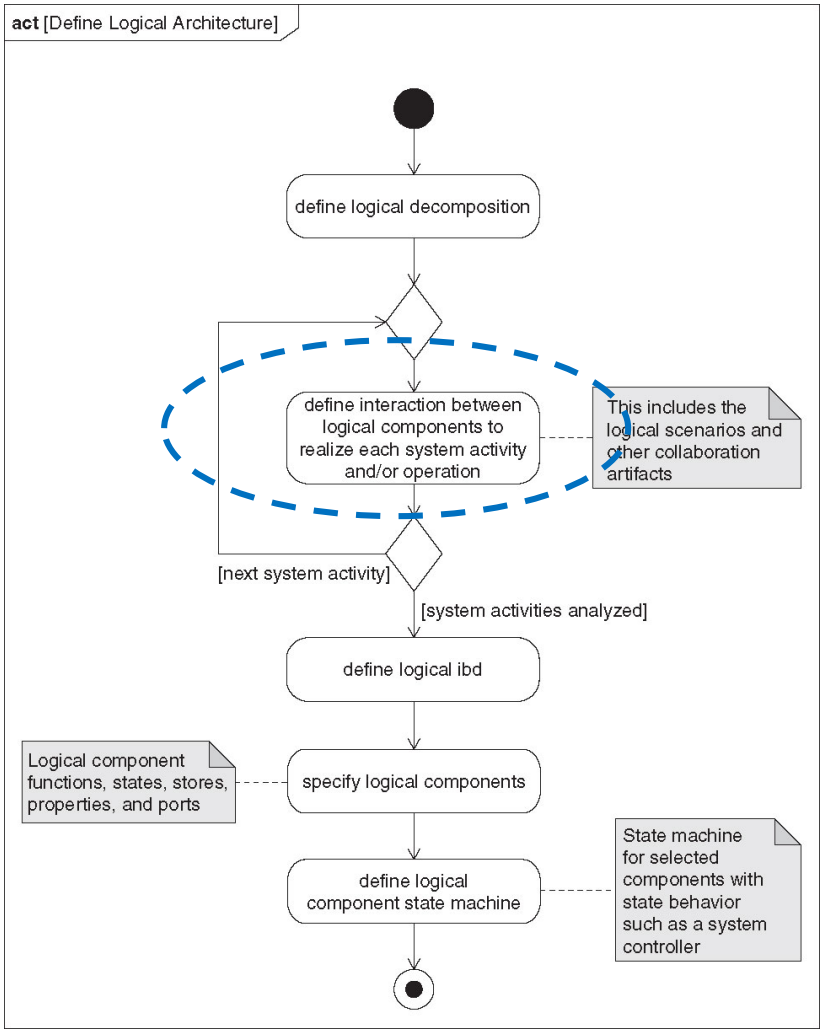
External Interface components

Infrastructure components

Application components

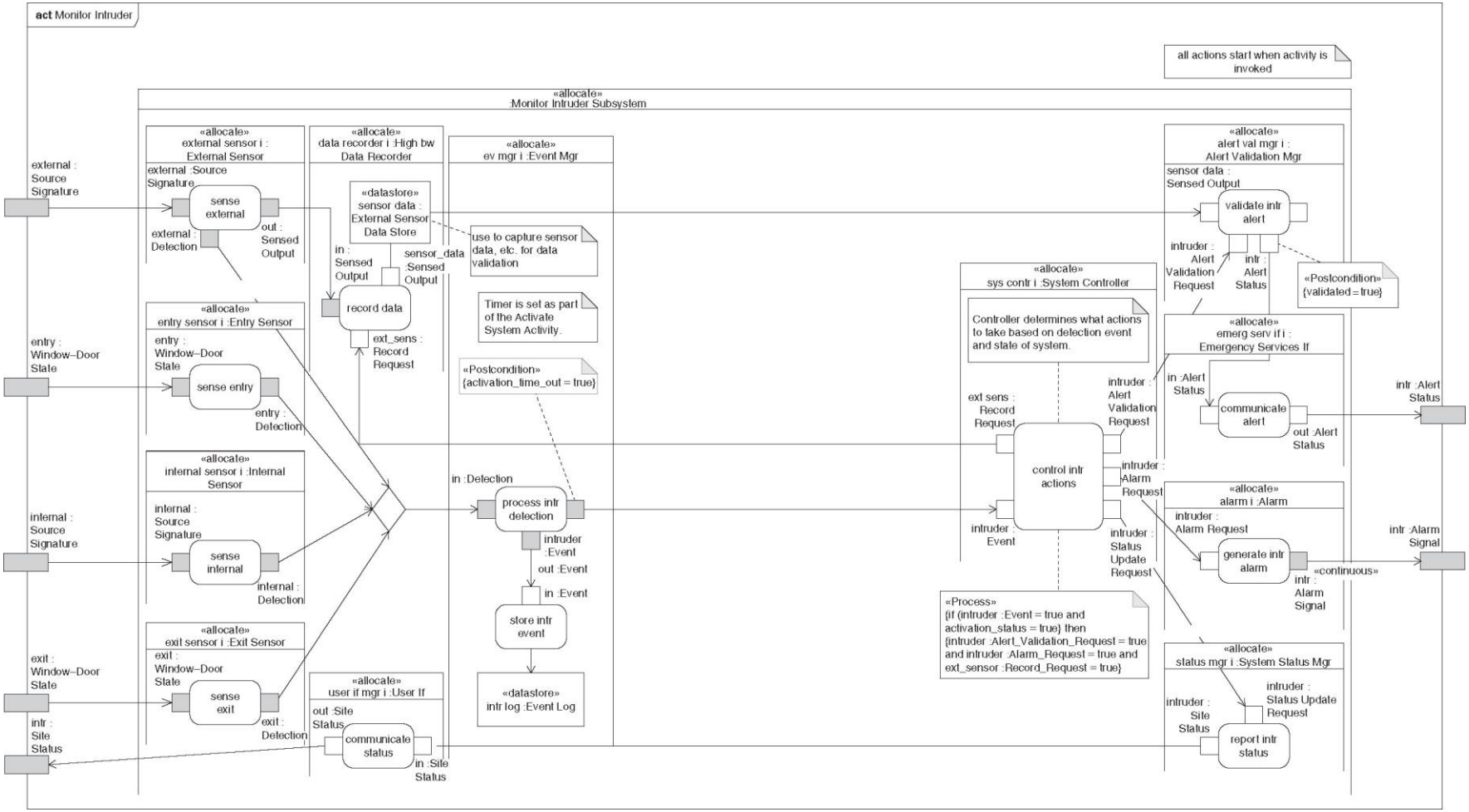


Define Interaction Between Logical Components



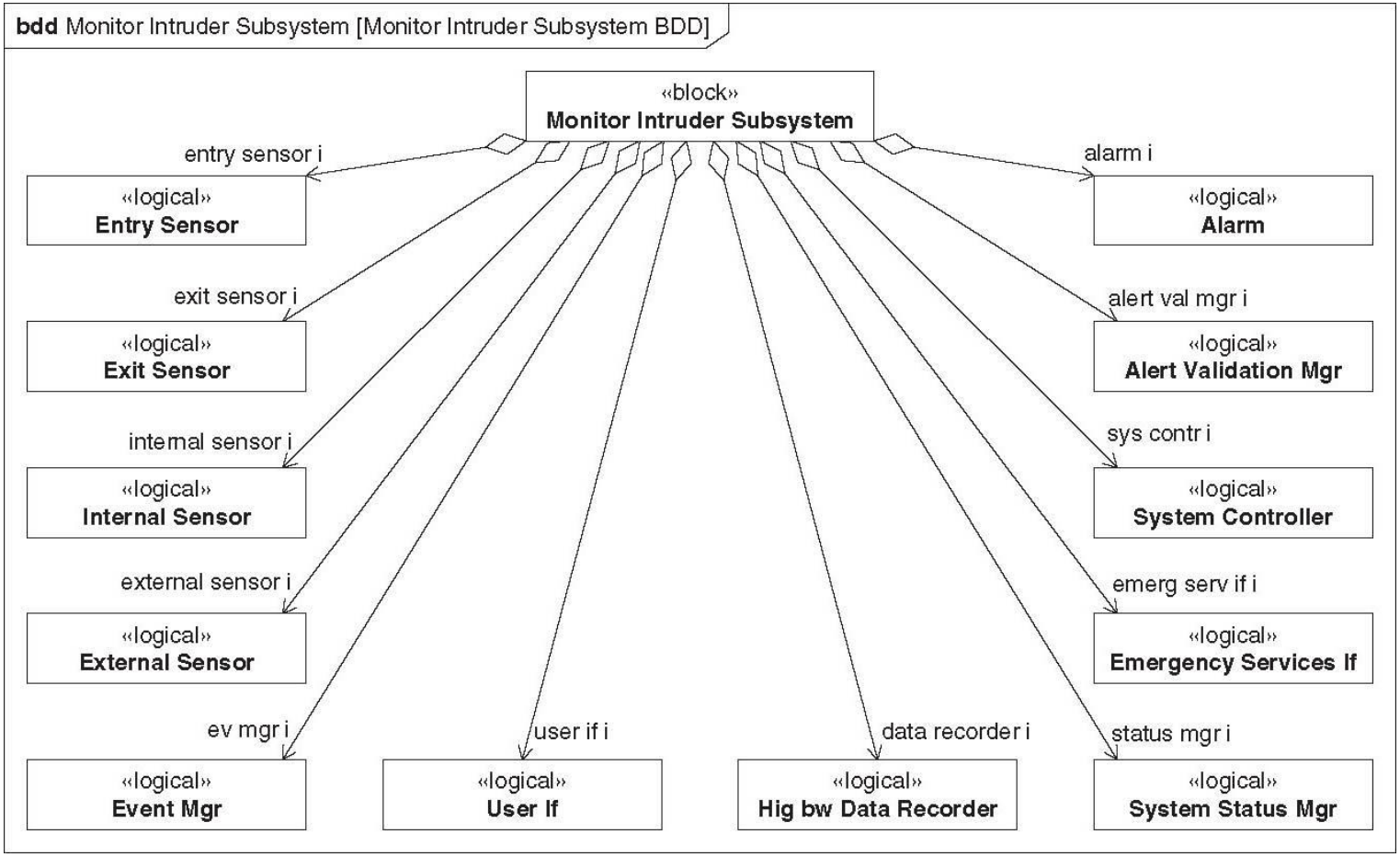
Define Interaction Between Logical Components

- Activity diagram is defined for each activity in the Logical Component (Monitor Intruder Activity)



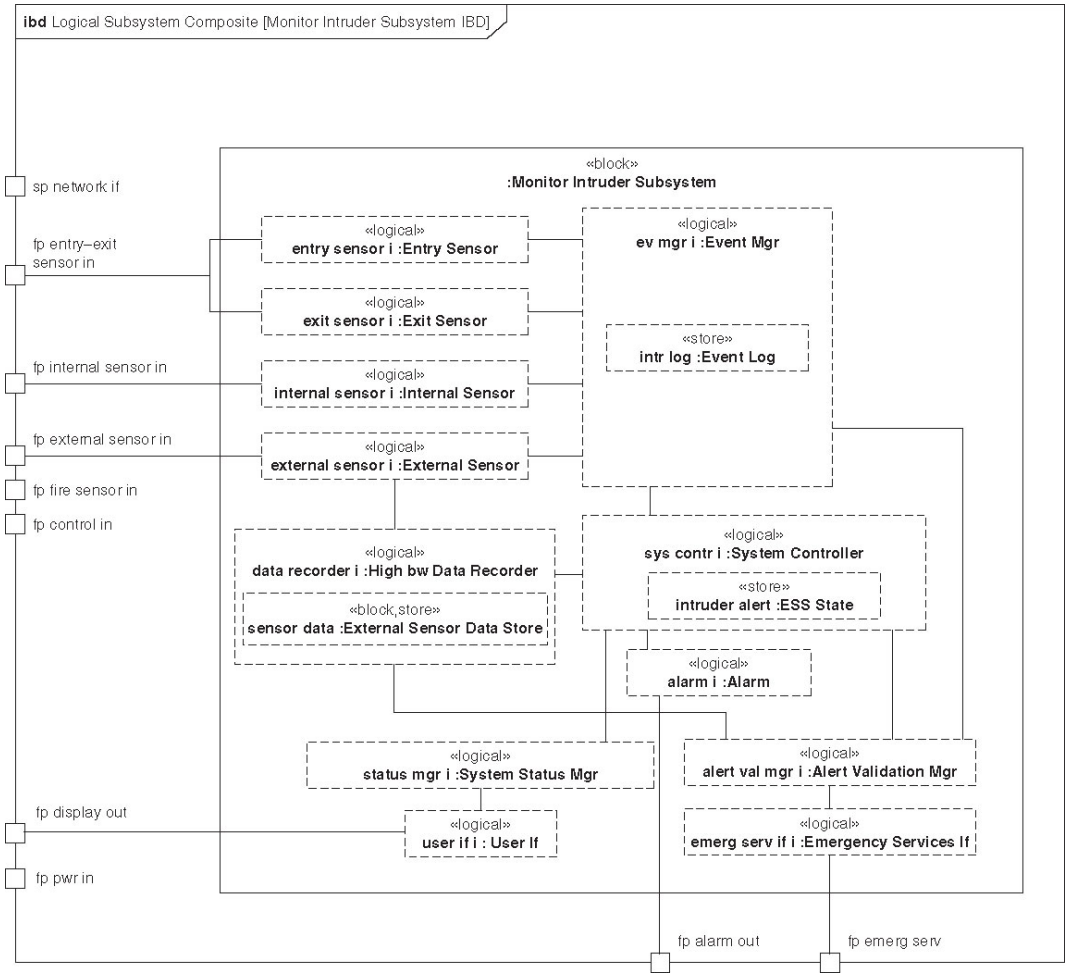
Define Interaction Between Logical Components

- Block Definition diagram of the Monitor Intruder Subsystem that realises the Monitor Intruder operation/activity.

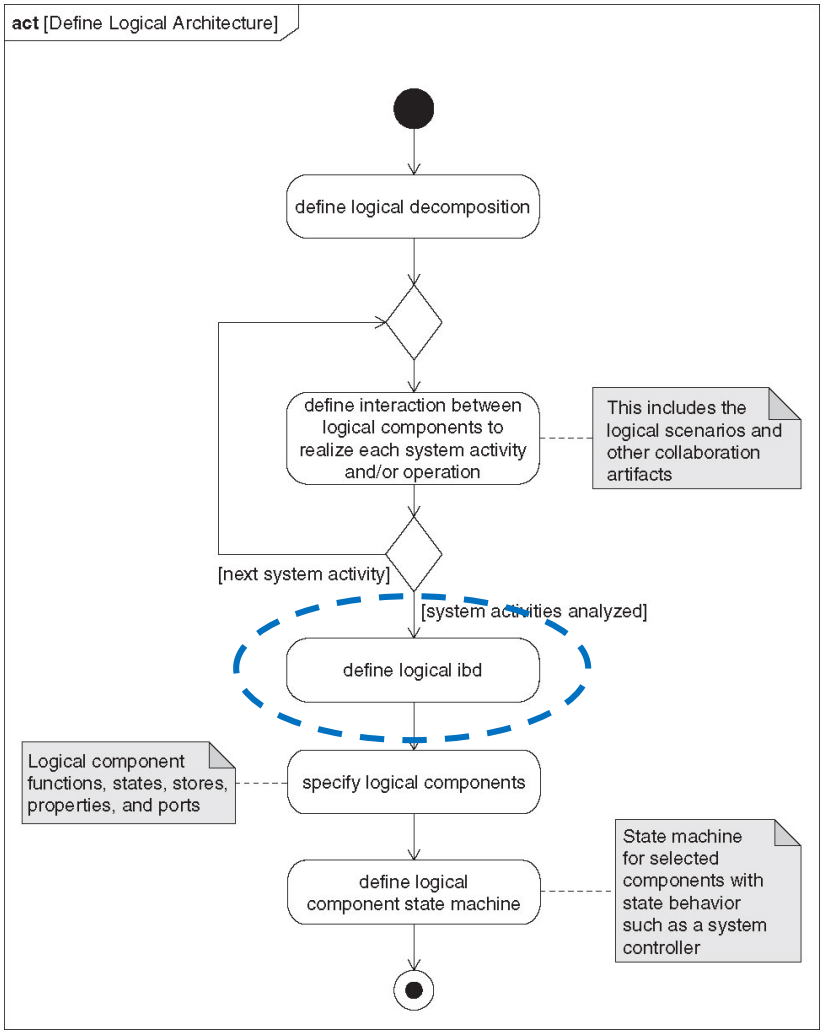


Define Interaction Between Logical Components

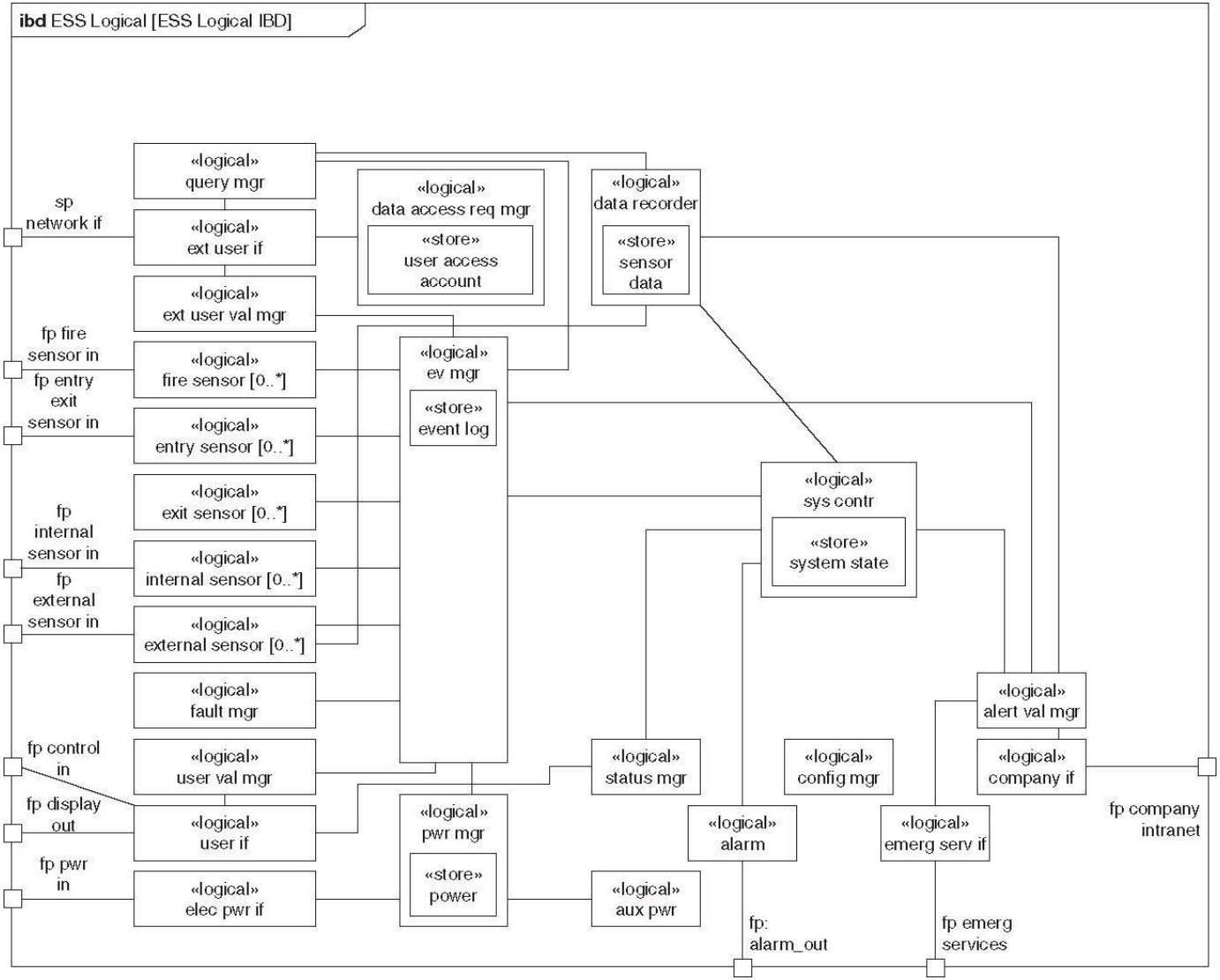
- Internal Block Definition diagram of the Monitor Intruder Subsystem that shows the interconnection of the parts.



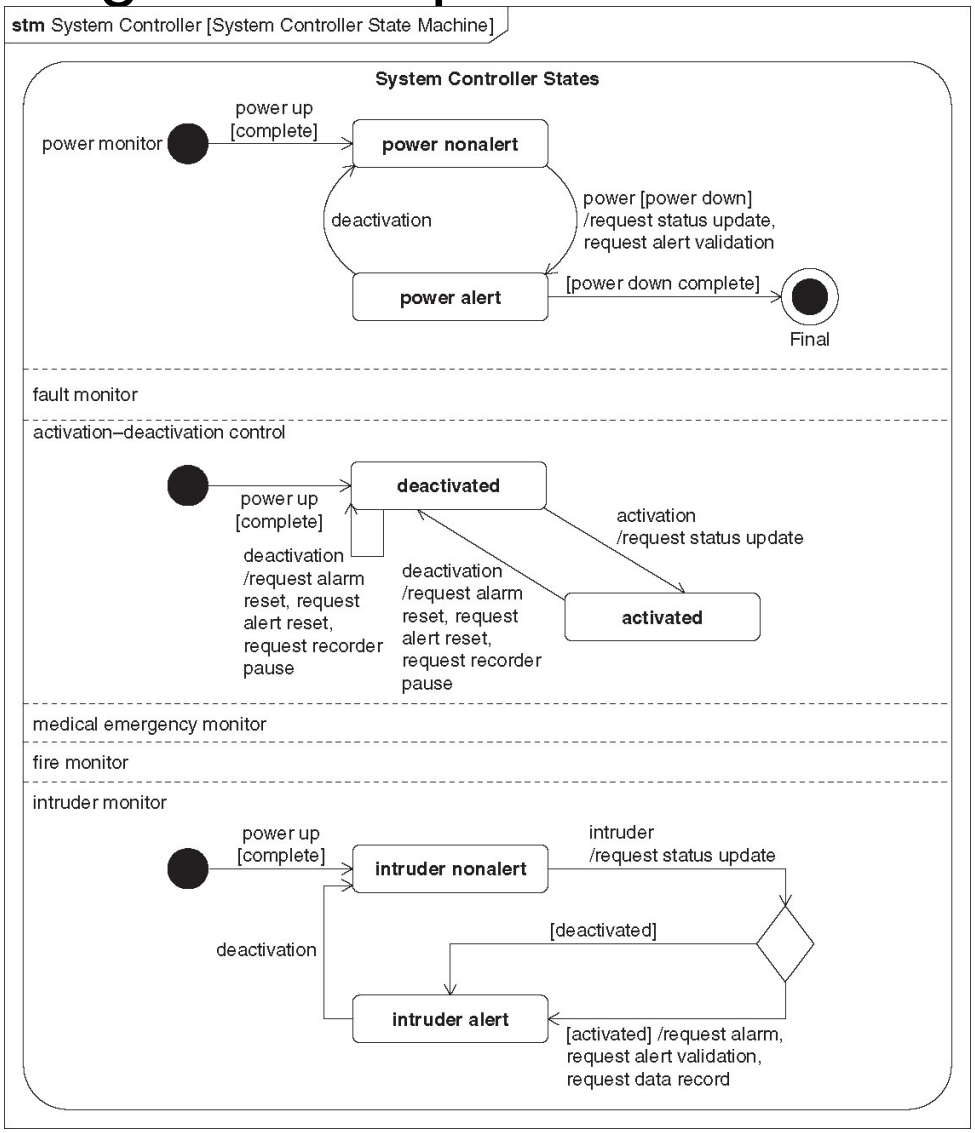
Define Logical IBD



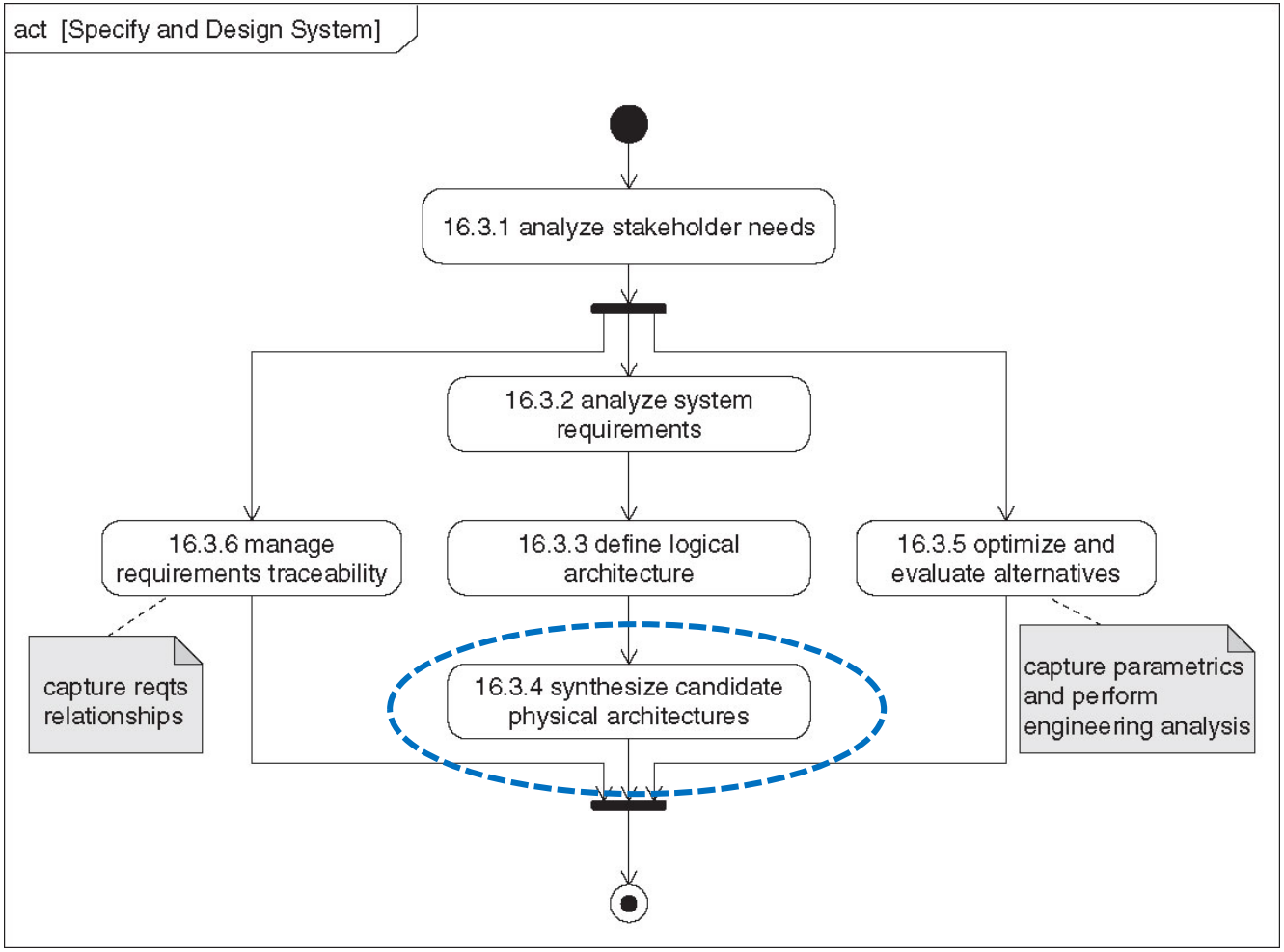
Define Logical IBD



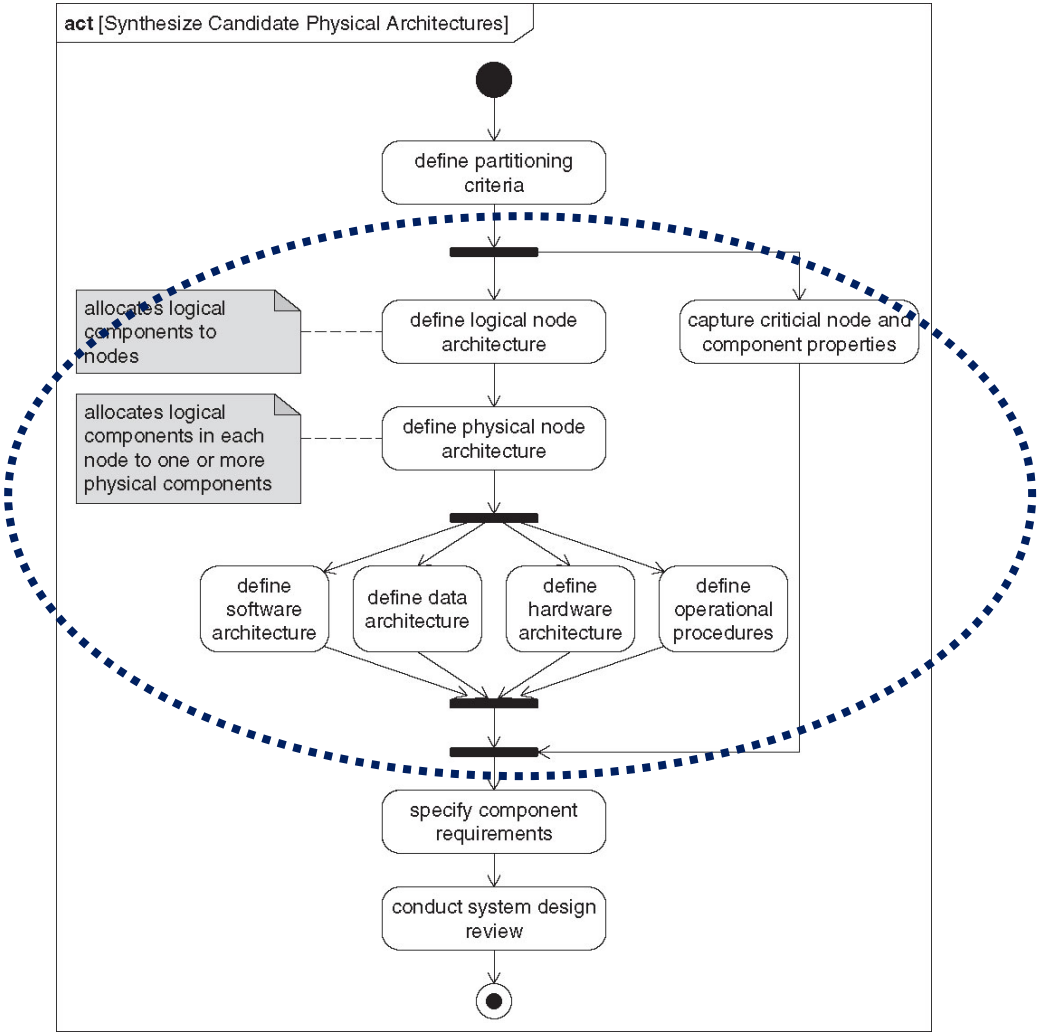
Define Logical Component State Machines



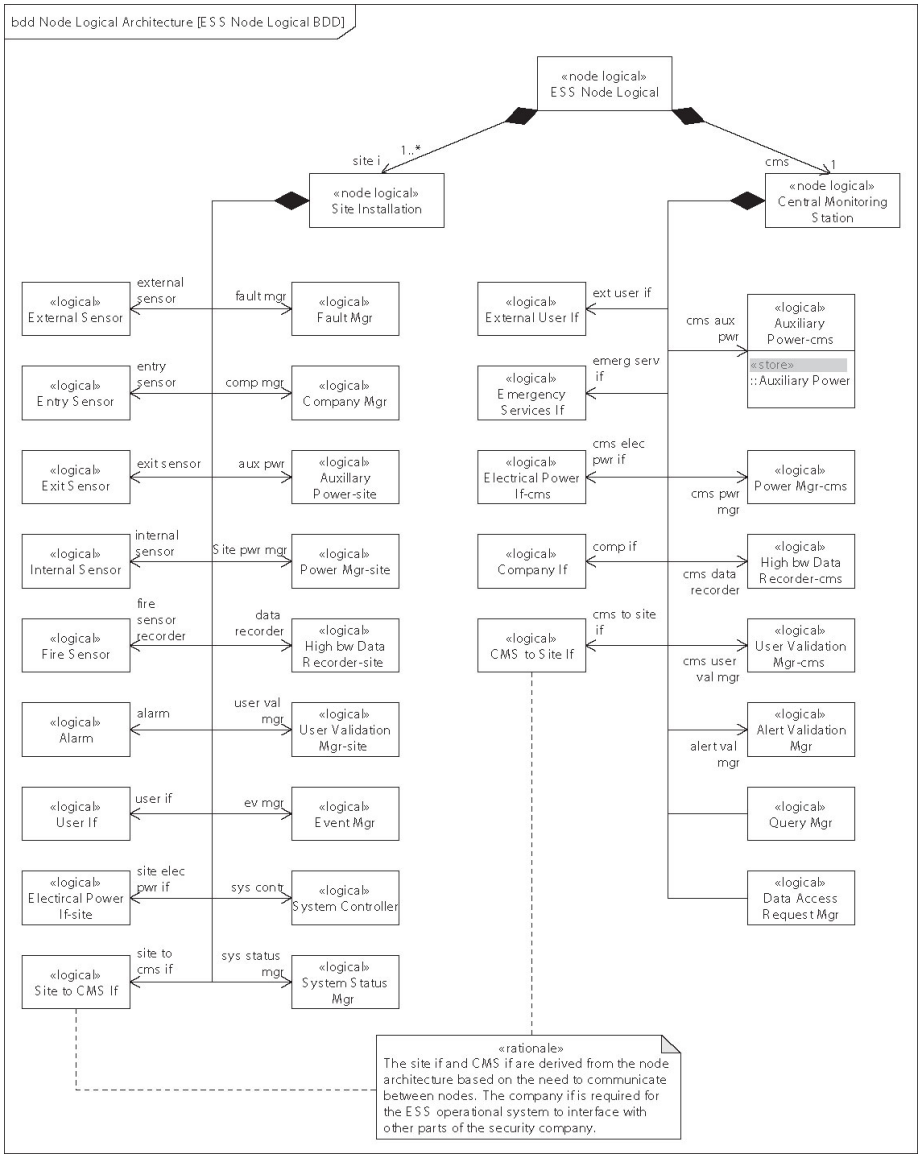
Synthesize Candidate Physical Solutions



Synthesize Candidate Physical Solutions Overview

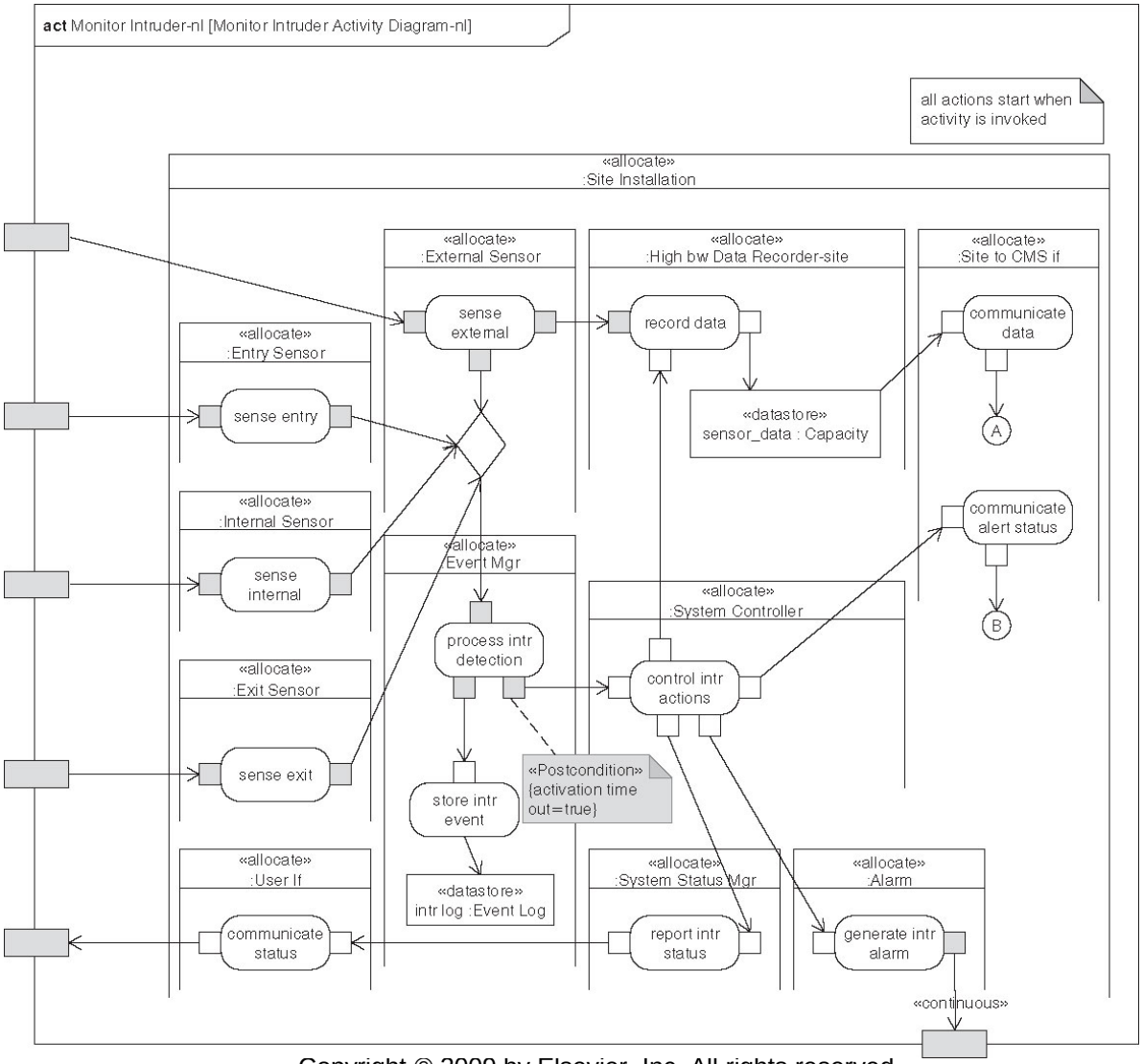


Define Logical Node Architecture
Logical Components allocate to site installation



Define Logical Node Architecture

Logical Node Activity – Monitor Intruder

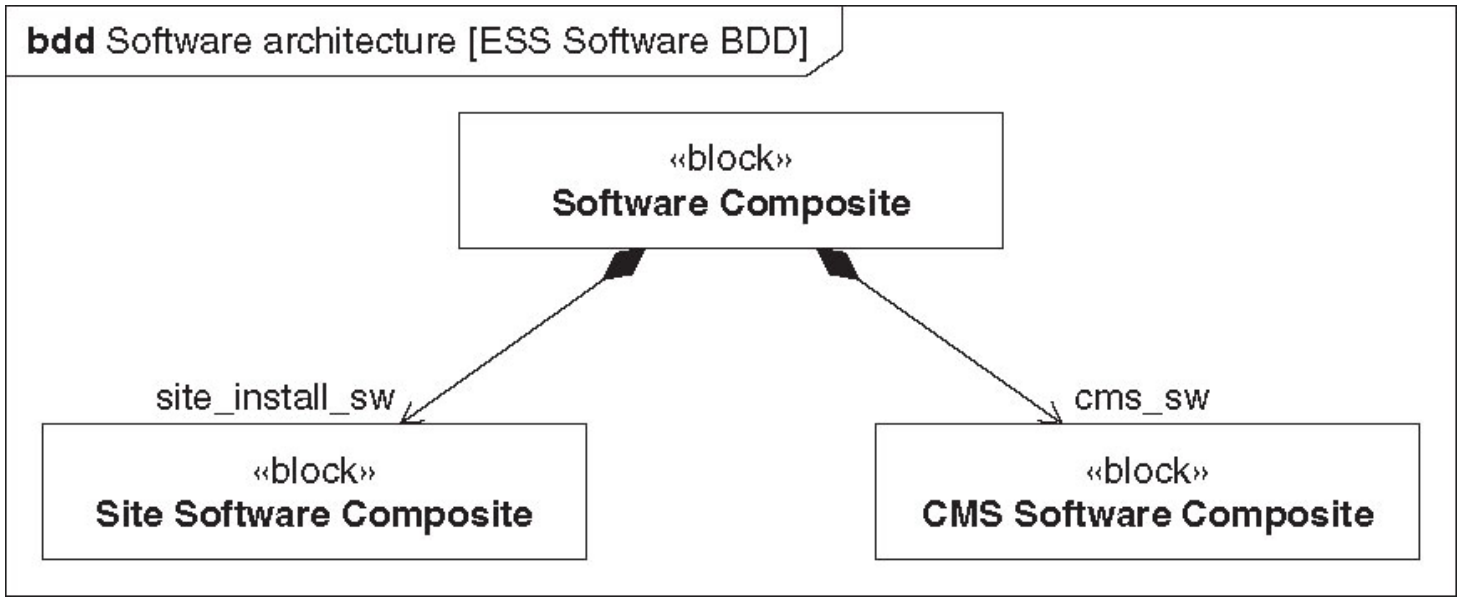


Define Physical Node Architecture
Allocation of Logical components to Physical Nodes

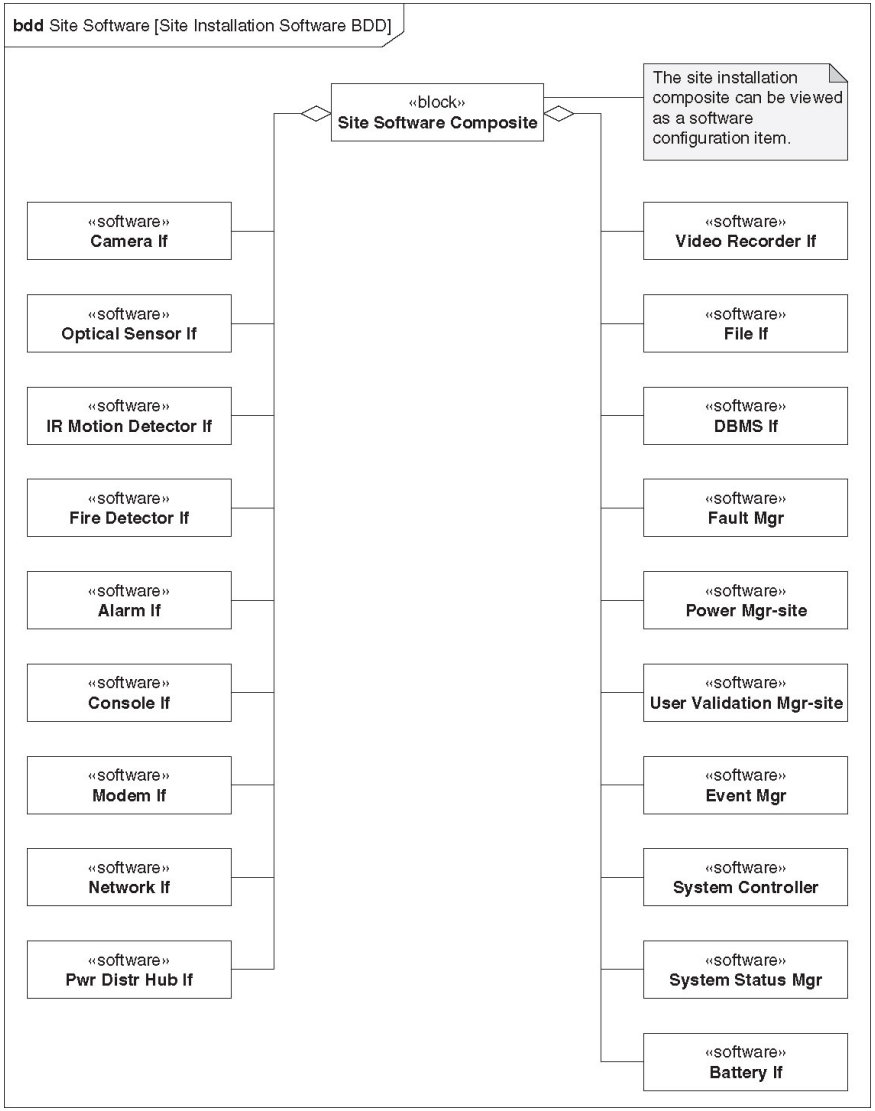
table [Package] Site [Logical to Physical]

From Type	From Name	Relation	To Type	To Name
logical	Alarm	allocate	hardware	Light Alarm
logical	Alarm	allocate	hardware	Sound Alarm
logical	Alarm	allocate	hardware	Recorded Alarm
logical	Alarm	allocate	software	Alarm If
logical	Auxillary Power-site	allocate	software	Battery If
logical	Auxillary Power-site	allocate	hardware	Battery
logical	Company Mgr	allocate	software	Config Mgr
logical	Electrical Power If-site	allocate	hardware	Power Adapter-site
logical	Entry Sensor	allocate	hardware	Magnetic Sensor
logical	Entry Sensor	allocate	software	Optical Sensor If
logical	Entry Sensor	allocate	hardware	Contact Sensor
logical	Entry Sensor	allocate	hardware	Optical Sensor
logical	Event Mgr	allocate	software	File If
logical	Event Mgr	allocate	block	Event Log Data File
logical	Event Mgr	allocate	software	Event Mgr
logical	Exit Sensor	allocate	hardware	Magnetic Sensor
logical	Exit Sensor	allocate	hardware	Contact Sensor
logical	Exit Sensor	allocate	hardware	Optical Sensor
logical	Exit Sensor	allocate	software	Optical Sensor If
logical	External Sensor	allocate	hardware	Electric Fence
logical	External Sensor	allocate	hardware	Surveillance Camera
logical	External Sensor	allocate	software	Camera If
logical	Fault Mgr	allocate	software	Fault Mgr
logical	Fire Sensor	allocate	software	Fire Detector If
logical	Fire Sensor	allocate	hardware	Fire Detector
logical	High bw Data Recorder-site	allocate	hardware	Video Recorder
logical	High bw Data Recorder-site	allocate	software	Video Recorder If
logical	High bw Data Recorder-site	allocate	hardware	DVD
logical	Internal Sensor	allocate	software	IR Motion Detector If
logical	Internal Sensor	allocate	hardware	IR Motion Detector
logical	Power Mgr-site	allocate	software	Pwr Distr Hub If
logical	Power Mgr-site	allocate	hardware	Power Distribution Hub-site

Define Software Architecture

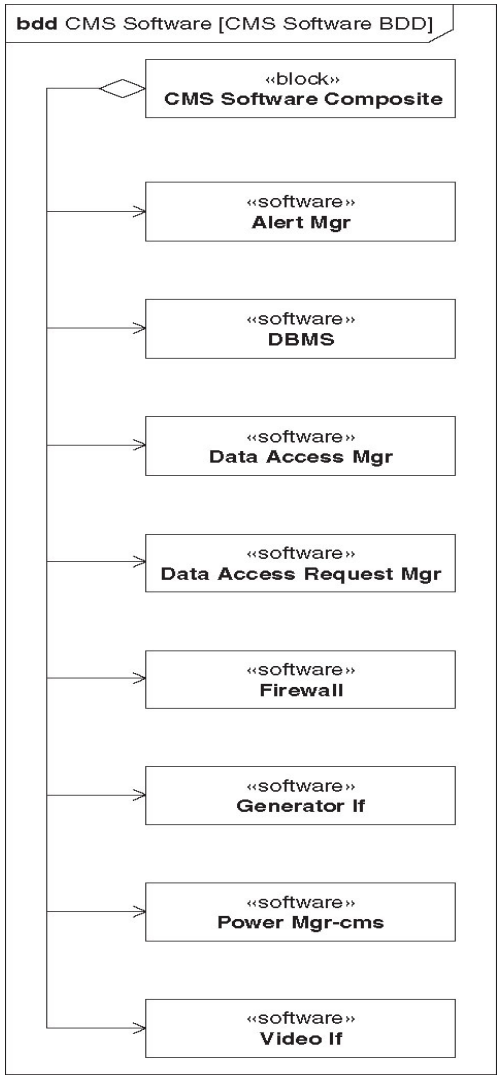


Define Software Architecture



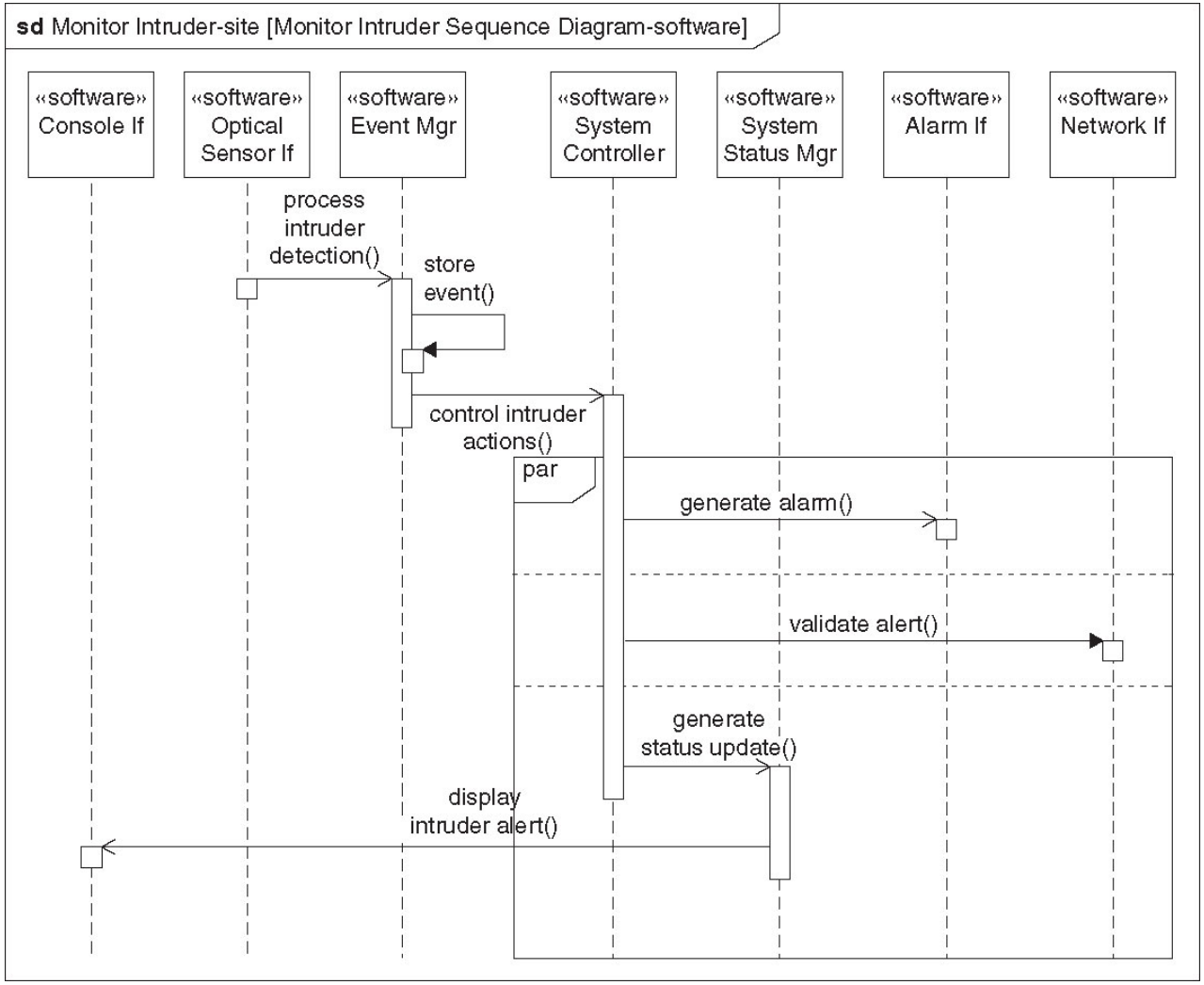
Define Software Architecture

(Central Monitoring System)

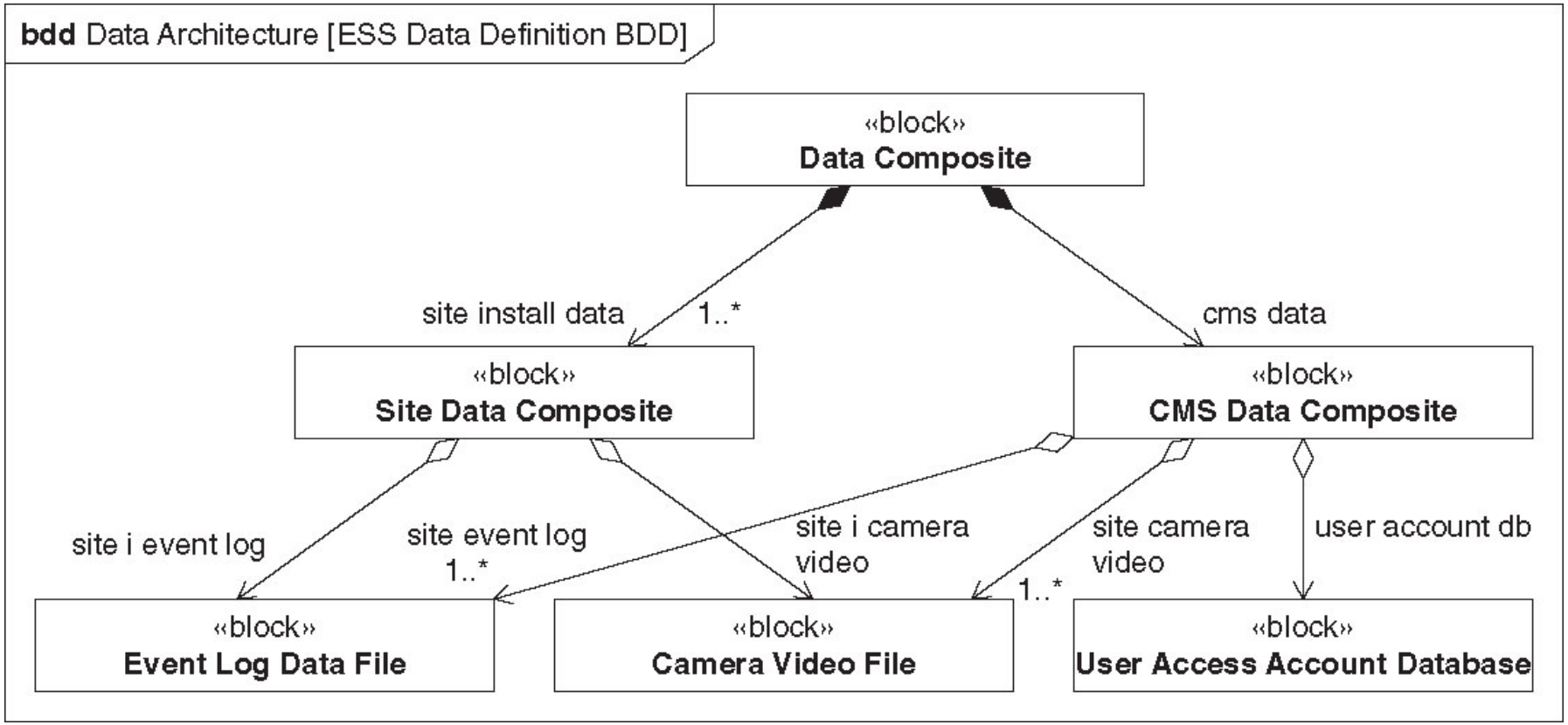


Define Software Architecture

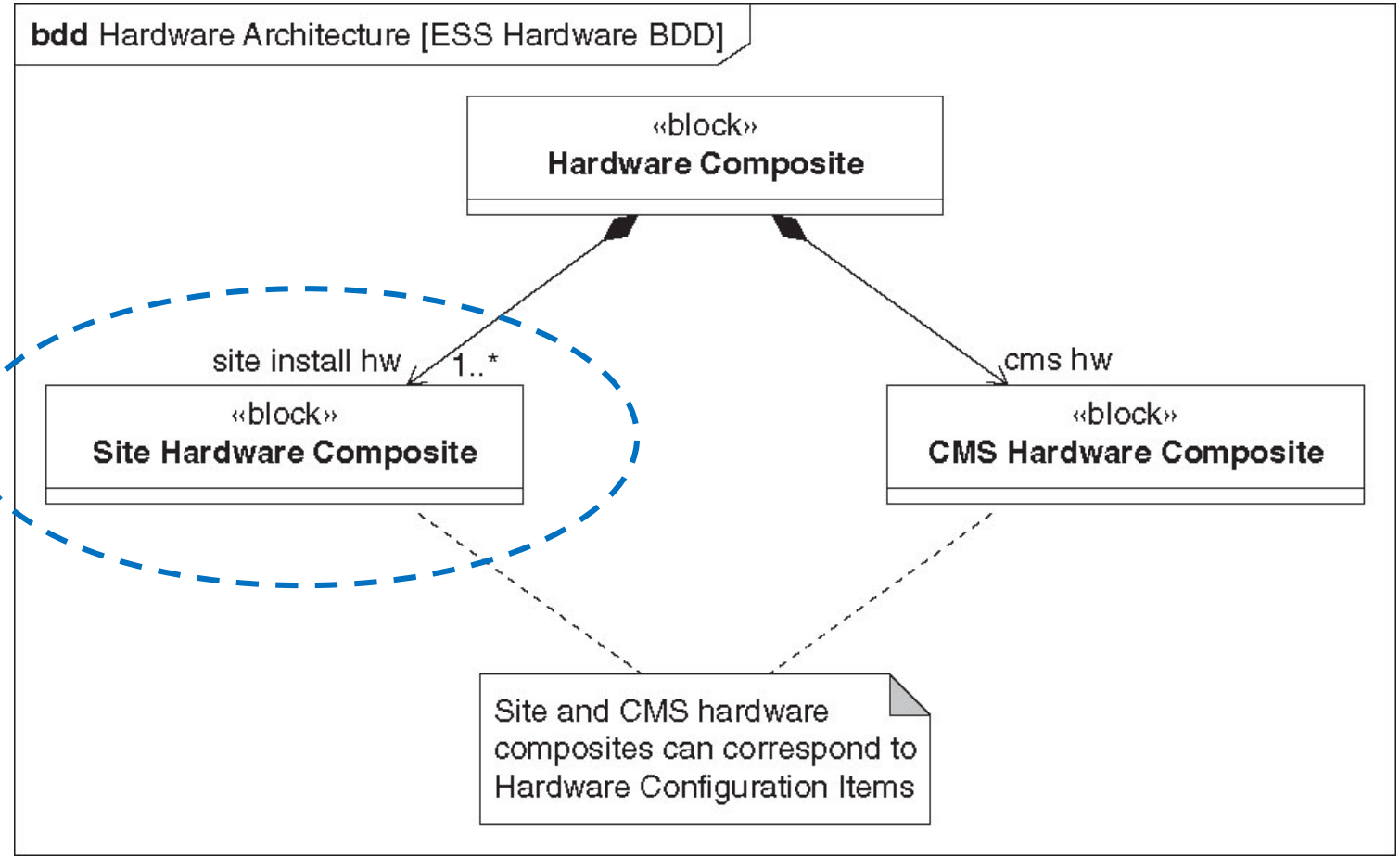
(Interaction between SW components)



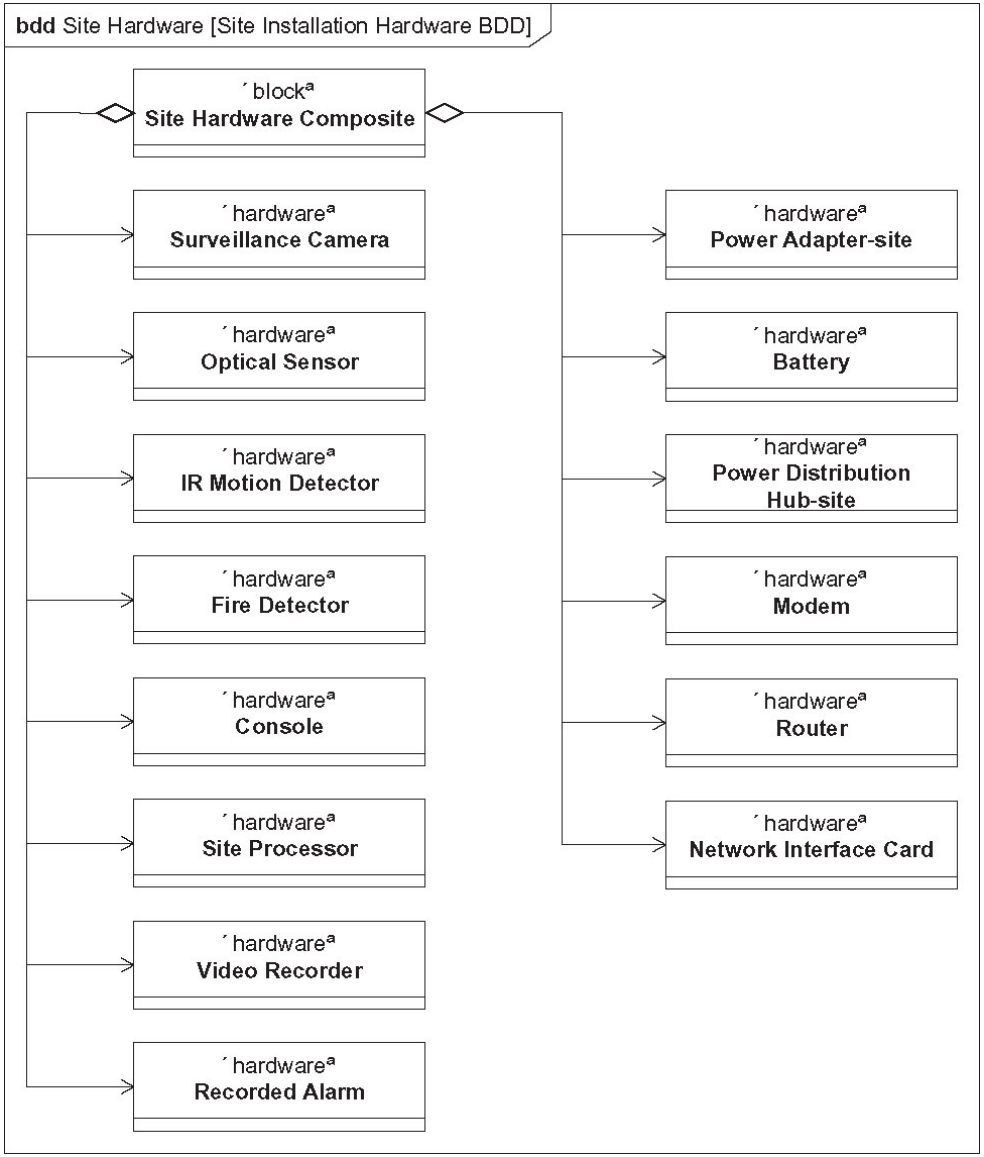
Define Data Architecture



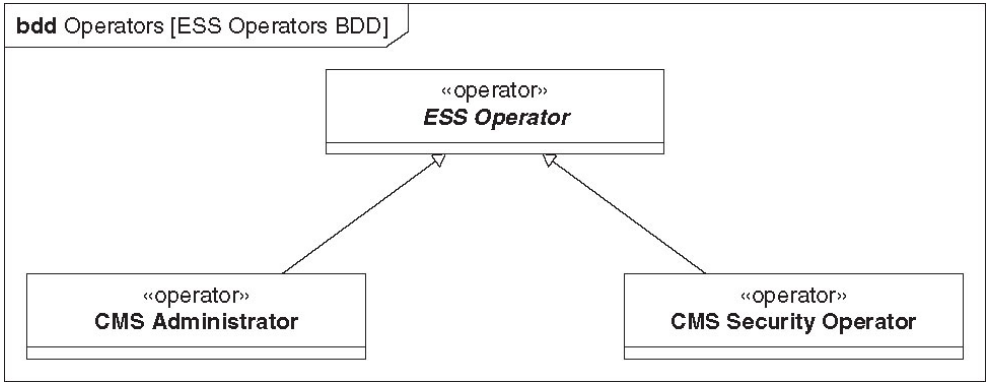
Define Hardware Architecture

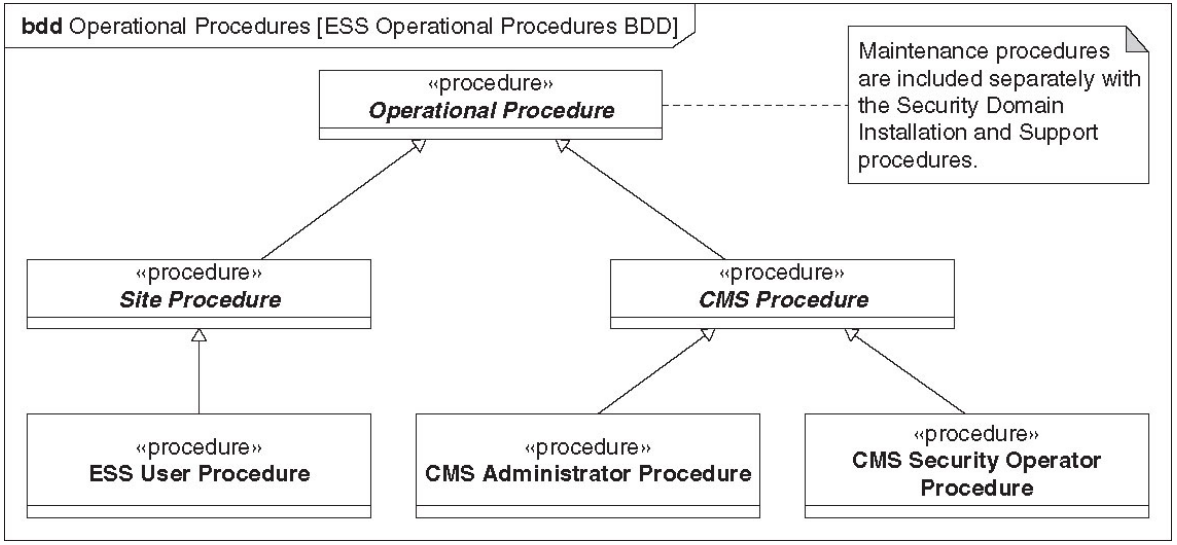


Define Hardware Architecture



Define Operating Procedures





Program Completed

Missouri University of Science & Technology