

Graduate Student Research Day 2012

Florida Atlantic University

COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Adding Security to BPEL Workflows of Web Services

Ola Ajaj

Department of Computer and Electrical Engineering and Computer Science (CEECS), College of Engineering and Computer Science, Florida Atlantic University, Boca Raton, FL

Purpose: BPEL (Business Process Enterprise Language) is a language for web services composition. BPEL provides functional aspects and any non-functional aspects are addressed by other (lower-level) specifications. BPEL doesn't present any means to specify security constraints for workflows. We present here a way to specify security requirements in BPEL to make it more effective. Background/Significance: Two common notations used for process modeling are the BPMN and the UML. BPMN is a modeling notation aimed specifically at business process modeling. UML is a general-purpose modeling notation used for designing software-intensive systems. A few approaches exist to specify BPMN security but they lack some important aspects. BPEL includes some low-level aspects and it is better to specify process structuring in a more abstract way. We propose a model based on our previous work on threat enumeration. We developed an approach for security requirements elicitation based on misuse activities and threat analysis. Method(s): We use (UML) to draw Sequence and Activity diagrams where threats can be enumerated. Since BPEL describes workflows, we present its activities using UML diagrams, where we apply a threat enumeration approach to determine the required security mechanisms to stop these threats. Results: Our approach appears of practical value and we have published these results. Our approach goes beyond BPEL and can be applied to BPMN and other business flow languages. Discussion: Our contribution stems from finding a better way to add security to workflows, which differently from other approaches, defines security specifications without the need for security specialists.

Adding Security to BPEL Workflows of Web Services

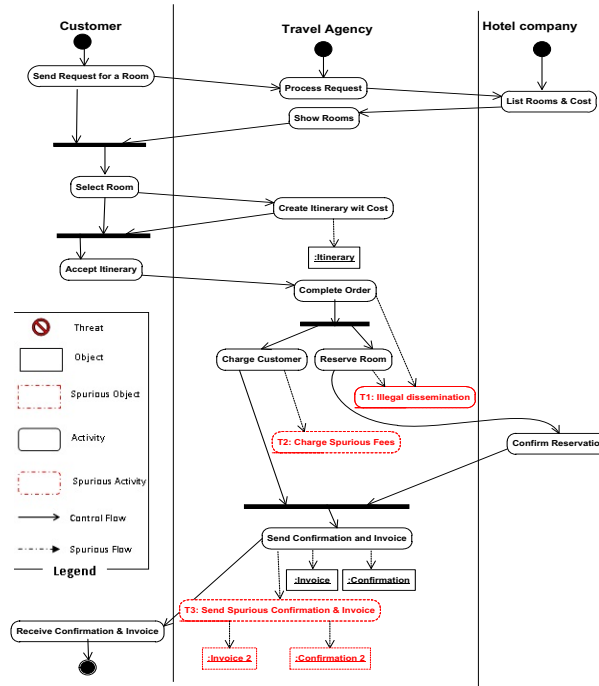
Ola Ajaj Advisor: Dr. Eduardo B. Fernandez
Department of Computer and Electrical Engineering and Computer Science

Motivation

- BPEL (Business Process Enterprise Language) is a language for web services composition.
- BPEL doesn't present any means to specify security constraints for workflows.
- BPEL includes some low-level aspects and it is better to specify process structuring in a more abstract way.

Approach

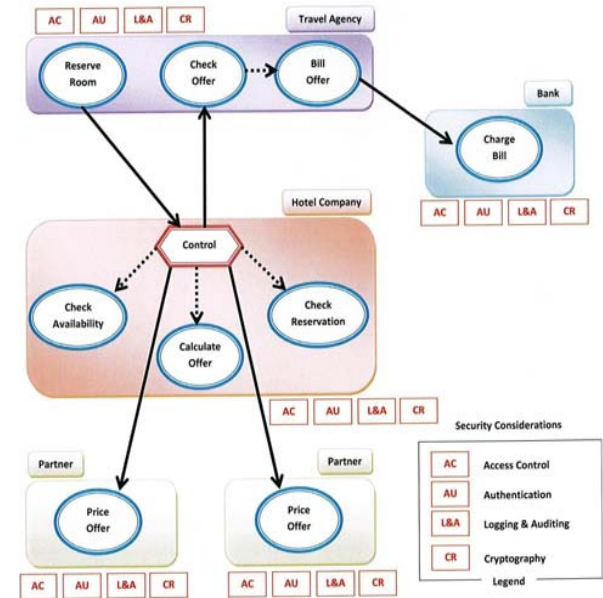
- We propose a model based on our previous work on threat enumeration.
- We developed an approach for security requirements elicitation based on misuse activities and threat analysis.



Some threats to the BPEL activity diagram

Results

- Our approach appears of practical value and we have published these results.
- Our approach goes beyond BPEL and can be applied to BPMN and other business flow languages.



Addressing Security Considerations for BPEL

Experiments

- We applied the process to travel agency software and showed how its security and business interactions can be improved.
- We use (UML) to draw Sequence and Activity diagrams to enumerate threats.

Conclusions

- Our contribution stems from finding a better way to add security to workflows, which differently from other approaches, defines security specifications without the need for security specialists.