Creating Abuse Cases Based on CAPEC Attack Patterns

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SEPTEMBER 26, 2017
Normal and Abusive Interactions by different actors

Aims:

- To propose a method to help novices (students) develop abuse case using CAPEC
- To evaluate the effectiveness of the method with a user study
Study Design and Proposed Method

Materials given to students

1. **Use Cases**
   - Reading of Chapter 8 Abuse Cases in Software Security: building security [1]
   - Four use cases (login, update account, checkout and logout) for a mock shopping web application.

2. **INSTRUCTIONS**
   - Instructions on how to follow the proposed method

3. **SURVEY**
   - Each student answered survey questionnaire and interview questions

4. **Select Keywords from Use Case Description**
   - During this task, no guideline was provided for selecting a keyword.

5. **Use Keywords to Search CAPEC Attack Patterns using TrAP**
   - TrAP returns keywords that were found in the attack patterns summary.

6. **Select Relevant Attack Patterns**
   - Selecting patterns based on its name, summary and attack flow, hints to the pattern's relevance.

7. **Create Abuse Cases from the Selected Attack Patterns**
   - Create abuse cases based on a prescribed template.

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Data collected from Students

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Create abuse cases based on a prescribed template.

Data collected from students

1. Assignment reports of the Abuse Cases developed

2. Survey and interview responses

Survey results

Survey Responses: 15 participants

About the method

➢ The method increased students’ knowledge of security for building applications.

Issues encountered with the method

➢ Some attack patterns were not detailed enough to complete abuse cases using the given abuse case template.
Interview results

Interview Responses: 7 participants

Use Case & Attack Pattern Relationship

- All 7 students were more familiar with the “login” use case than the rest.
- Some students noticed that some attack patterns can be applied to several use cases.

Benefit of Method

- Increased knowledge on different security attacks and mitigation strategies.
- Allow students to applying risk analysis at the requirement stage.
Thank you!