Monthly Research 2016.11

An Example of use the Threat Modeling Tool

FFRI, Inc.
http://www.ffri.jp/en/

E-Mail: research-feedback[at]ffri.jp
Twitter: @FFRI_Research

Agenda

- About threat analysis support tool
- Examples of tools
- Analysis target system
- Analysis result
  - How to read result
  - Overview of threats
- Effective usage
  - About template
  - Additional definition of threat information
- Conclusions
- References

About threat analysis support tool

- There are various analysis support tools.
  - DFD drawing, automated threat identification
  - Benefits of tools
    - Reduce analysis time by automatically identifying threats and generating a report
    - Possibility to discover potential threats you could not find
    - Reducing dependency on individual skills
      - The same analysis result can be obtained for the same input data.

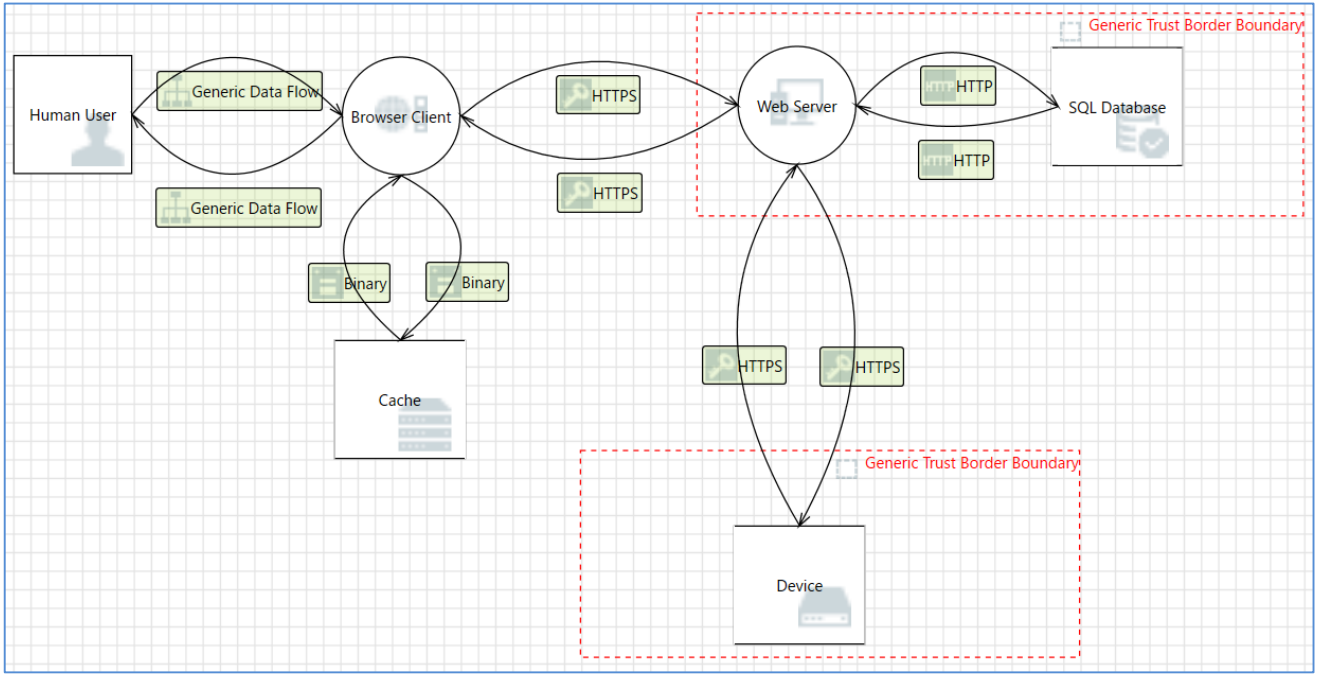
Examples of tools

- Microsoft Threat Modeling Tool
  - DFD creation, tool to derive threats automatically from DFD
- TRIKE
  - DFD creation, drawing tool including security requirements
- SeaMonster
  - Attack tree and misuse case drawing tool
    - A misuse case is an unintended operation.
- SecurITree
  - Attack tree creation tool

- In this report, we explain an example of use the Microsoft Threat Modeling Tool 2016.

Analysis target system

- The target is a general network camera system.
- The figure below is a DFD created using the tool.
  - Add elements and data flow of the system to design view.



Analysis result - How to read result

- The analysis result can be confirmed on the analysis view.
  - A threat list contains properties and outline of threats.
    - It is necessary to check whether the found threats actually.
      - Example: The web server could be a subject to a cross-site scripting attack because it does not sanitize untrusted input.
        - » The above threat does not exist on a page without input form.
  - It is possible to describe priority and countermeasure for each threat.
    - The priority is setting to 'high' by default, user should change it.
    - It is useful for sharing status with multiple analysts.

Analysis result - Overview of threats

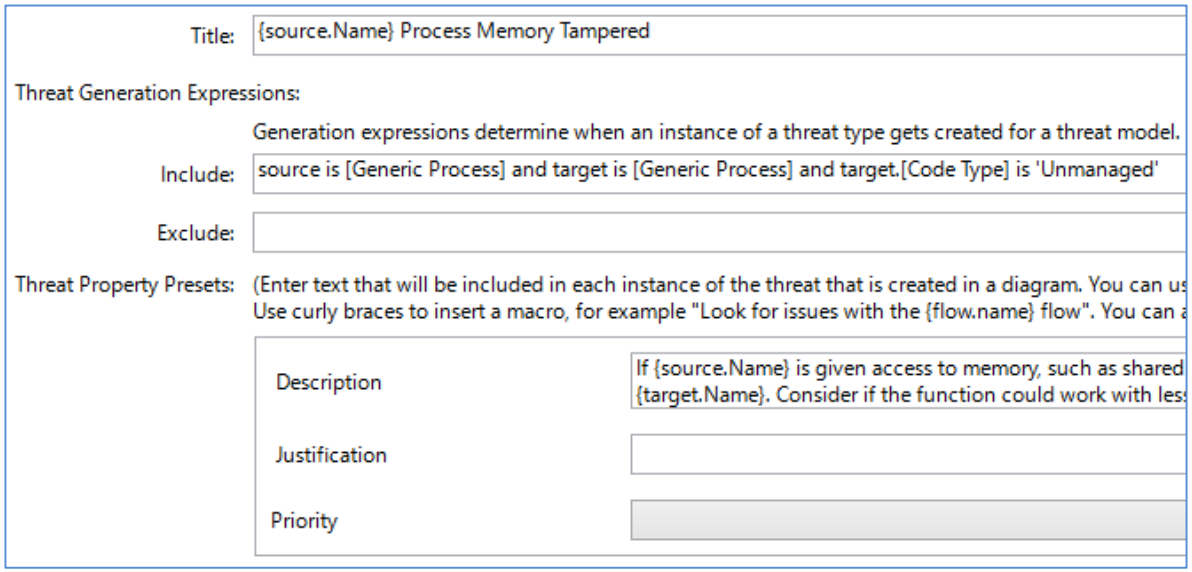
- 47 threats were pointed out in the system.
  - Spoofing 10 cases
  - Tampering 8 cases
  - Repudiation 4 cases
  - Information Disclosure 3 cases
  - Denial of Service 12 cases
  - Elevation of privilege 10 cases

- Many threats are related to web server.
  - Many categories of threats have been found there.

- The descriptions of the threat are general.
  - If a threat information is insufficient, user should add information.

Effective usage - About template

- What you can do by adding templates.
  - You can apply any picture to elements to make nice-looking DFD.
  - You can add threat information defined yourself.
- The following figure shows an entry screen when creating a template.



Effective usage - Additional definition of threat information

- Analysis efficiency will be improved by templates.
  - More extended analysis becomes possible by adding templates of threat information.

  - Template example
    - Title: Unauthorized access with default password.
    - Include: target is [Web Service]
    - Description:
      If you do not change the default password, attackers may compromise the system.

Conclusions

- Pros
  - It can be used easily because threats will be listed automatically from a DFD.
  - It helps secure system design.
  - You can share threats information and priority with your team.

- Cons
  - Threats that do not exist may be false detected.
    - You should confirm the feasibility of analyzed threats.

References

- Threat Modeling
  - http://threatmodelingbook.com/index.html
- SDL Threat Modeling Tool
  - https://www.microsoft.com/en-us/download/details.aspx?id=49168
- Microsofts New Threat Modeling Tool
  - https://blog.secodis.com/2016/07/06/microsofts-new-threat-modeling-tool/
- TRIKE
  - http://octotrike.org/
- SeaMonster
  - https://sourceforge.net/projects/seamonster/?source=navbar
- SecuriTree
  - http://www.amenaza.com/