Lesson 4
Use Cases and Misuse Cases

Use case analysis using UML Notation Use Case Diagrams

- Enables the analysis of FCs of a Security FG

- Oracle Unified Method (OUM) framework

- IBM Rational Unified Process (RUP) framework

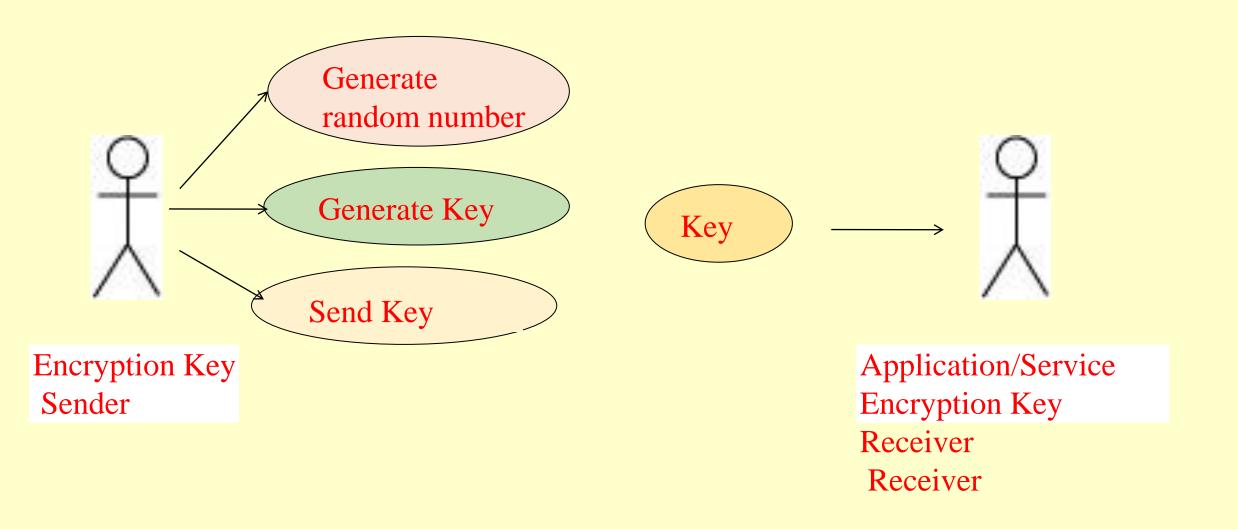- Software development process models

- Requirements analyses

Fig. 10.3 Simple Use Case diagram for generating and communicating a key

Security Issues For Which Use Cases Required In Iot

- Boot process protection: Run Boot process initial programs. If it corrupts then then system fails.

- Secure software and firmware update: When Updating software and firmware then the secure updates needed

- Stored data encryption and integrity protection: Needed Data storage protection from hackers

Security Issues For Which Use Cases Required In Iot

- Platform integrity verification: Need the device platform integrity verification, else fake device platform communicates and the fake sends the command spoofing as the IoT device platform commands.

- Key generation, management and exchanges: Need security as these are prerequisite for authentication, authorisation and messages encryption.

Security Issues For Which Use Cases Required In IoT

- Authentication of sender and receiver must for secure message communication

- Secured communication through a network: Required for the secure message exchanges between IoT devices and applications or services.

- Lifecycle management: Need specific life of all messages, keys and data and needed discarding or deleting from the system.

Misuse Cases

- Firstly, identify the actors and collaborating actors

- Develop Misuse Cases for each of them

- Purpose: Creation of specifications for communicating the potential risks and rationale

- Security-relevant decisions to the device platform, application or service.

Security Issues for which Misuse Cases Required In IoT

- Identity Misuse Cases: Non-repudiation
- Crypto offloads: The transfer of cryptographic keys and messages need to be protected from eavesdropper or hackers

Security Issues for which Misuse Cases Required In IoT

- Eavesdropping

- Fake server

- Fake device platform

- Flooding of TCP/SYN

- Unauthorised access to a data store

- Audit and accountability: Need each transaction to be securely stored to later on auditing and fixing accountabilities.

Summary

We learnt

- UML notation use case diagrams requirement
- Use Cases analysis
- Examples of use cases
- Boot process protection, secure software, firmware update, stored data encryption and integrity protection
- Data storage need protection from hackers.

Summary

We learnt

- Misuse Cases define the required behaviour of components under development which should not Happen

- Examples of Misuse Cases requirements: Identity Misuse Cases and non-repudiation, Eavesdropping,

- Eclipse IoT stack
- Xively, Nimbits Cloud platform for applications development, data storage and services

End of Lesson 4 on
Use Cases and Misuse Cases