



<p>COURSE TITLE : Java Security COURSE PREREQUISITE : Introduction to Programming COURSE DURATION : 16 weeks (3 hours/week) COURSE METHODOLOGY: Combination of lecture, lab exercises and written exercises.</p>

Course Description

Java Security teaches the students the basics of the Java Security Model. This course provides the student a background on the low-level security features of J2SE up to the Application-wide security considerations.

Topics from week 1 to 12 are considered essential and should be covered all throughout the course. Topics labeled * are advance topics but should be covered if time permits. Topics labeled ** are considered optional.

Course Outline

Week	Topics
1	<p>Security Overview</p> <ul style="list-style-type: none"> • What is security? • The Key Aspects of Security <ul style="list-style-type: none"> • Confidentiality • Integrity • Availability • Security Practices <ul style="list-style-type: none"> • Identification and Authentication • Authorization • Access Control • Non-Repudiation • Auditing
2	<p>Java Sandbox Security Model</p> <ul style="list-style-type: none"> • Overview of Sandbox • Java Sandbox Components <ul style="list-style-type: none"> • Class Loader • Byte-Code Verifier • Security Manager • Elements of the Java Sandbox <ul style="list-style-type: none"> • Permissions • Code Sources • Protection Domains • Policy File • Keystores

3	Class Loaders <ul style="list-style-type: none"> • Overview of Class Loaders • Java Class Loading Architecture • Class Loaders and Namespaces • Resource Loading and Naming • Class Loader and Delegation • Class Loader Security Considerations • Class Loader Classes • Implementing Class Loaders
4	Security Managers <ul style="list-style-type: none"> • Overview of the Security Manager • Security Managers and Applications • Security Manager Methods • Building Custom Security Managers • Installing Security Managers •
5	Java Security Classes <ul style="list-style-type: none"> • Permissions and Security Policy • Policy class • Permissions Class • Access Control • Exceptions • Building you own Permission Class
6	Java Authentication and Authorization System <ul style="list-style-type: none"> • JAAS Overview • JAAS Architecture • JAAS Common Classes • JAAS Policy and Configuration files • JAAS Authentication Classes • JAAS Authorization Classes
7	Keys <ul style="list-style-type: none"> • Keys Overview • Generating Keys • Key Factories • Keystore Architecture • Keytool utility • Key Management/Key Management API
8	Cryptography <ul style="list-style-type: none"> • Overview of Cryptography • Cryptographic Algorithms <ul style="list-style-type: none"> • Symmetric Algorithm • Asymmetric Algorithm • Hybrid Algorithm • Java Cryptography Architecture <ul style="list-style-type: none"> • Provider Class • Security Class • Engine Classes

9	<p>Message Digests</p> <ul style="list-style-type: none"> • Overview of Message Digests • Common Message Digest Algorithms • Common Message Digest Applications • The Message Digest Class • Message Digest Implementation
10	<p>Digital Signatures and Certificates</p> <ul style="list-style-type: none"> • Overview of Certificates • X.509 Certificates • Overview of Digital Signatures • Signature Class • Signed Object classes • Digital Signature Classes • Policy File • Signing a Jar file • Jarsigner Utility • Using the Keytool • Modifying the Security Policy
11	<p>Access Control List (ACL)</p> <ul style="list-style-type: none"> • Overview of ACLs <ul style="list-style-type: none"> • Introduction to ACLs • Characteristics of ACLs • Model for Access Control • Calculation of Granted Permissions • Java and ACL <ul style="list-style-type: none"> • ACL Structure • The ACL Class • Interfaces • Exceptions • ACL Implementation
12	<p>Encryption and SSL</p> <ul style="list-style-type: none"> • Java Cryptography Extension <ul style="list-style-type: none"> • JCE Packages • JCE Providers • JCE Keystore • SSL Overview • Ciphers • JSSE Overview • JSSE Packages • JSSE Usage <ul style="list-style-type: none"> • HTTPS Protocol Handler • Secure Sockets

Requirements

Minimum Hardware Configuration

- **Microsoft Windows operating systems:**
 - **Processor:** 500 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 384 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Solaris™ operating system:**
 - **Processor:** 450 MHz Ultra™ 10 workstation or equivalent
 - **Memory:** 384 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Linux operating system:**
 - **Processor:** 500 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 384 megabytes
 - **Disk space:** 125 megabytes of free disk space

Recommended Hardware Configuration

- **Microsoft Windows operating systems:**
 - **Processor:** 780 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 512 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Solaris™ operating system:**
 - **Processor:** 500 MHz Ultra™ 60 workstation or equivalent
 - **Memory:** 512 megabytes
 - **Disk space:** 125 megabytes of free disk space
- **Linux operating system:**
 - **Processor:** 800 MHz Intel Pentium III workstation or equivalent
 - **Memory:** 512 megabytes
 - **Disk space:** 125 megabytes of free disk space

Operating System

NetBeans IDE runs on operating systems that support the Java™ VM. Below is a list of platforms that NetBeans IDE has been tested on.

- Microsoft Windows XP Professional SP1
- Microsoft Windows 2000 Professional SP3
- Solaris operating system (SPARC® Platform Edition), versions 8, 9, and 10
- Solaris operating system (x86 Platform Edition), versions 8, 9, and 10
- Red Hat Linux 9.0
- Red Hat Enterprise Linux 3
- Sun Java Desktop System

NetBeans IDE is also known to run on the following platforms:

- Various other Linux distributions
- Mac OS X 10.1.1 or later
- Open VMS 7.2-1 or later
- Other UNIX® platforms, such as HP-UX

Software

NetBeans IDE runs on the J2SE JDK 5.0 (Java™ 2 JDK, Standard Edition), which consists of the Java Runtime Environment plus developers tools for compiling, debugging, and running applications written in the Java™ language. NetBeans IDE 4.0 has also been tested on J2SE SDK version 1.4.2.

For more information, please visit:

<http://www.netbeans.org/community/releases/40/relnotes.html>

Make sure you have J2SDK/JDK and J2ME installed on your workstation. For more details, please visit the following sites:

J2SDK - <http://java.sun.com/j2se/1.4.2/download.html>

JDK 5.0 - <http://java.sun.com/j2se/1.5.0/download.jsp>

J2ME - <http://java.sun.com/j2me/>