**JAC444 -** Lecture 11

Remote Method Invocation - RMI Segment 1 - Basics

# Remote Method Invocation

**In this lesson you will be learning about:**

* What is RMI and distributed computing in Java platform
* The RMI architecture
* The distributed object model defined and supported by RMI

# Definition of Terms

* *Remote object* is an object whose methods can be invoked from another Java virtual machine.
* *Remote method invocation (RMI)* is the action of invoking a method on a remote object.
* *Remote interface* is an interface that declares a set of methods that may be implemented by a remote Java virtual machine.

**public interface BankAccount extends java.rmi.Remote {**

**public void deposit(float amount) throws java.rmi.RemoteException;**

**}**

# Distributedobjects

The RMI architecture is based on some important principles:

* The definition of behavior and the implementation of that behavior are two separate concepts:
  1. **interfaces define behavior**
  2. **classes define implementation**
* RMI applications are comprised of two programs, a server and a client:
* A RMI server application creates remote objects, makes references to them accessible, and waits for clients to invoke methods on these remote objects
* A RMI client application gets a remote reference to one or more remote objects in the server and then invokes methods on them.

# RMI Architecture

Host A

Host B

**RMIClient**

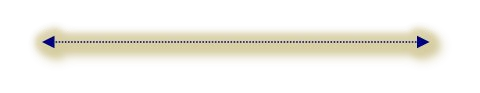
**RMIS**

**e**

**rver**

Stub

Skeleton



Virtual

Connection

Transport

# Design RMI System

Define Methods for RMI Interfaces

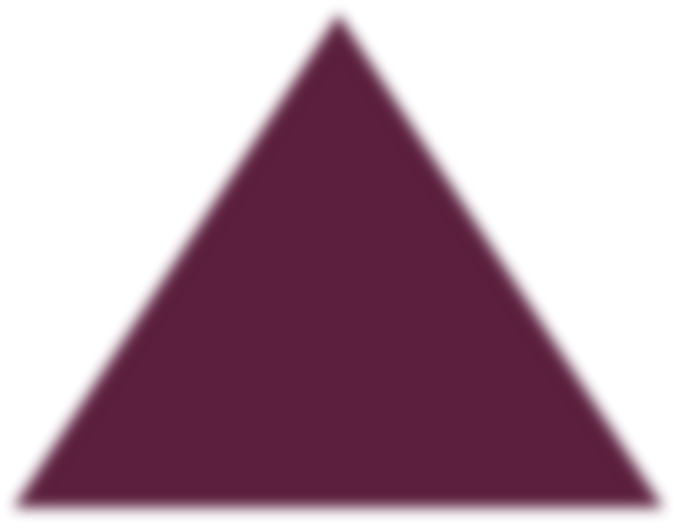
**Interfaces**

RMI

**1**

Implement Methods Invoke Methods

defined by Interfaces defined by Interfaces



RMI

**Client**

**2**

**3**

RMI

**Server**

# RMI System

**A working RMI system is composed of the following parts**:

* Interface definitions for the remote services - *programmer*
* Implementations of the remote services - *programmer*
* A server to host the remote services – *programmer*
* A client program that needs the remote services – *programmer*
* RMI Naming service allows clients to find the remote services – *RMI system*

# Building Calculator RMI System

Design and implement Java RMI Calculator interfaces

**2**

**1**

Develop Java code implementing classes defined by RMI Calculator interfaces

Develop code for Java RMI Calculator server

Develop code for Java RMI Calculator client program

**5** Install and run RMI Calculator system

**3**

**4**

# Conclusion

**After completion of this lesson you should know:**

* Distinguish Java RMI architecture
* Examine RMI components
* Categorize components of an RMI system