

Java Remote Method Invocation (RMI)

Object Request Brokers (ORB)

简单题

- Providing a framework where remote objects can be consumed over the network in the same way as consuming local objects
 - Providing functionalities for marshalling and unmarshalling when objects are transmitted between clients and servers
 - Hiding implementation details, which enables developers to implement distributed applications efficiently without facing the complex underlying operating systems and network communications

Overview of Java RMI

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- Writing distributed objects using Java
- Simple and direct model for distributed computation with Java objects
- Centered around Java, thus bringing the power of Java safety and portability to distributed computing
- Behavior can be moved
- Connected to existing and legacy systems via JNI; connected to relational DB via JDBC

Advantages

要考 要展开来讲

- Object oriented
 - Full objects as arguments and return values
- Mobile behavior
 - Class implementations can be moved
- Design patterns
 - Passing objects ensures full power of OO tech
- Safe and secure
 - Built-in Java security mechanisms: security manager

所有的完整的对象都可以当做参数或者返回值

整个可以在远端运行

Advantages (cont.)

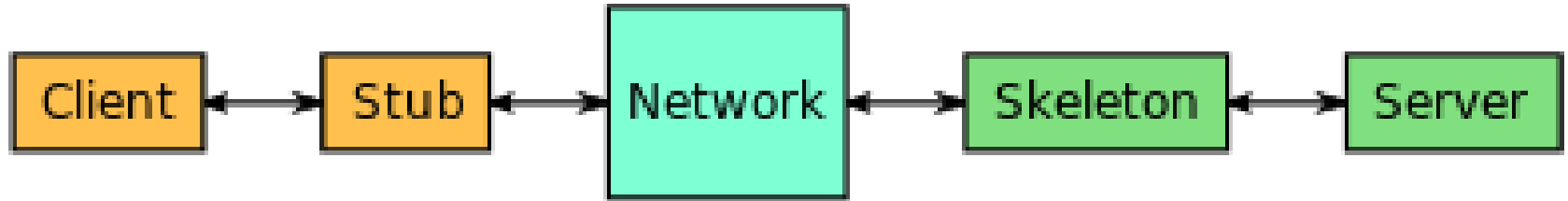
- Easy to write/use/maintain
- Connects to existing/legacy systems
 - RMI/JNI, RMI/JDBC
- Write once, run anywhere
 - 100% portable to any JVM
- Distributed garbage collection
- Parallel computing
 - Multi-threaded, concurrent processing

是因为基于java

由于基于...

Architecture

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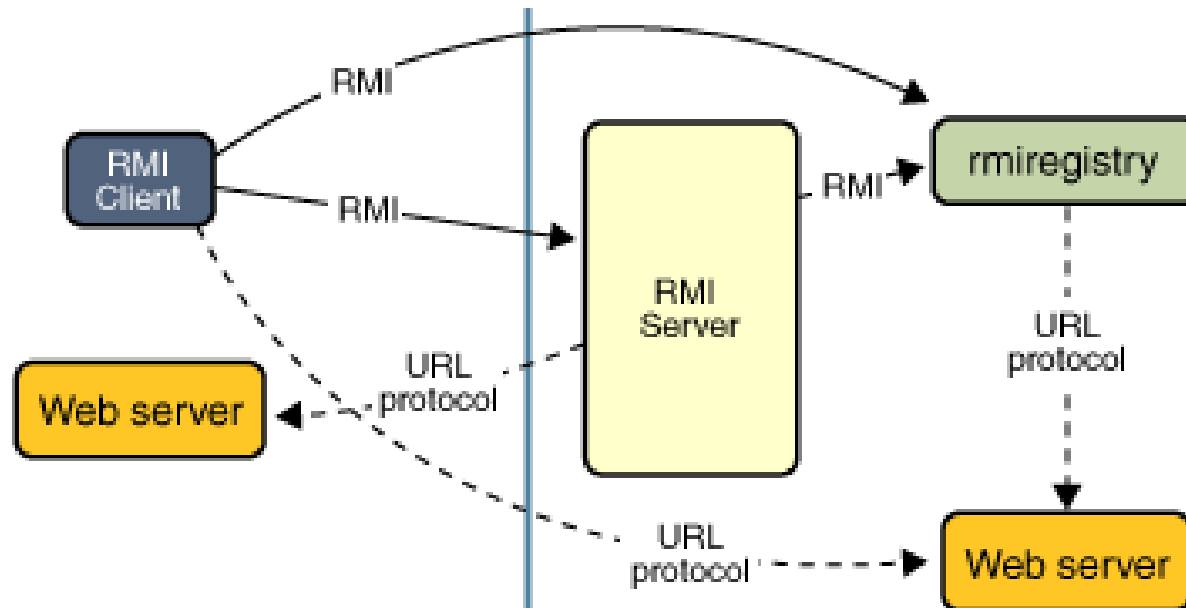


- Stub
 - Marshaling arguments, sending invocation
- Skeleton
 - Unmarshaling arguments, invoking server's implementation

RMI Distributed Application

这个不用管

- Locate remote objects
- Communicate with remote objects
- Load class definitions for objects that are passed around



Remote Interfaces, Objects and Methods

- An object becomes remote by implementing a remote interface with following characteristics

- A remote interface extends the interface

java.rmi.Remote

- Each method of the interface declares

java.rmi.RemoteException in its throws clause

会考程序 接口的名称

所有的方法都要抛出这个异常

Major Steps

- Defining the remote interfaces
 - Specifying the methods that can be invoked remotely
- Implementing the remote objects
 - May include implementations of interfaces/methods that are local
- Implementing the clients
 - Implemented at any time after remote interfaces are defined

Lab

- Using Java RMI to implement distributed applications

Programming Practice

- Develop a light-weight geographic information library system
 - Server maintains a geographic information library including lists of countries and cities
 - Services provided by the server
 - Add/delete a country
 - Add/delete a city for a specified country
 - Retrieve the list of countries
 - Retrieve the list of cities for a specified country
 - The client application supports console-based UI