

# Research and Analysis (Remote Method Invocation: Mechanisms)

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## Introduction

A Distributed system (DS) is a model/collection of independent computers linked together through a network which produce an integrated computing facility using software programs (middleware). Some widely used DS are Word Wide Web (WWW), Email, Cloud services like Google drive and Dropbox, teleconferencing services like Skype. In Distributed communication, services provided by a server can be accessed by multiple clients. The goals in mind while implementing distributed systems are – scalability, reliability, openness, transparency and performance. Inter-process communication is at the core of DS, and there are different ways to achieve that for example - Message Oriented or Stream Oriented communication but for the purpose of this research report will focus primarily on Remote Method Invocation(RMI) which is a Java implementation of Remote Procedure Calls (RPC) that allows server and client software to communicate with each other.

Lets, look at RMI in detail: Remote Method Invocation (RMI) is an object oriented Application Programming Interface which allows the creation of distributed applications using Java and this distributed environment supports/allows different computers running Java Virtual Machine(JVM) to communicate with each other using stub (client side) and skeleton (server side). Stub and Skeleton are responsible for marshalling and un-marshalling data, the RMI allow an object on client to invoke methods/services on an object running on the server running JVM. RMI does this in a way that the client application thinks its invoking a local object's methods.

All this happens over IIOP. Internet Inter-Orb Protocol(IIOP) is an object oriented communication protocol for Common Request Broker Architecture(CORBA) it defines how bits are exchanged between CORBA's client and servers. Java implementation of CORBA/IIOP is known as Java IDL (Interface Definition Language) and supports mapping for Java. Which is Java IDL, helps to define, implement and access CORBA object using Java. Previously, Java developer's had to choose between RMI and Java IDL.

These days, RMI-IIOP is widely used to bring (CORBA) capabilities to Java platform. RMI over IIOP provides Java developers the freedom to write CORBA applications without learning CORBA IDL.

Provide advantages and drawback of RMI.

Development issues under drawbacks

Key issues identified n described

Key issues critically analysed

Coherent arguments, supported by evidence

Good English technical style

26 lines to write on RMI Mechanisms and advantage and disadvantages.

All points fully cited.

## **Discussion**

My opinion and view about the RMI.

## **Implementation**

Brief explanation – How to implement RMI.



## References

Villanova University, United States, *what is Distributed Systems?* Accessed 3<sup>rd</sup> April 2017  
<http://www.csc.villanova.edu/~schrage/CSC8530/Intro.html>

Distributed Systems Goals Slides, pp.2-3  
<https://www.cis.upenn.edu/~lee/07cis505/Lec/lec-ch1-DistSys-v4.pdf>

Tanenbaum, A. and Steen, M. (2007). *Distributed systems - Principles and Paradigms*. 2nd ed. pp.115-116.  
[https://vowi.fsinf.at/images/b/bc/TU\\_Wien-Verteilte\\_Systeme\\_VO\\_\(G%C3%B6schka\)\\_-Tannenbaum-distributed\\_systems\\_principles\\_and\\_paradigms\\_2nd\\_edition.pdf](https://vowi.fsinf.at/images/b/bc/TU_Wien-Verteilte_Systeme_VO_(G%C3%B6schka)_-Tannenbaum-distributed_systems_principles_and_paradigms_2nd_edition.pdf)

What is RMI Basic's?

<http://www.javatpoint.com/RMI>, <https://www.youtube.com/watch?v=YyCUmKoigtgk>

RMI. How RMI works?

[http://infolab.stanford.edu/CHAIMS/Doc/Details/Protocols/rmi/rmi\\_description.html](http://infolab.stanford.edu/CHAIMS/Doc/Details/Protocols/rmi/rmi_description.html)

What are RMI, IIOP, and RMI-IIOP?

[https://www.ibm.com/support/knowledgecenter/SSYKE2\\_8.0.0/com.ibm.java.hybrid.80.doc/rmi-iiop/overview.html](https://www.ibm.com/support/knowledgecenter/SSYKE2_8.0.0/com.ibm.java.hybrid.80.doc/rmi-iiop/overview.html)

Getting Started with Java IDL

[http://docs.oracle.com/javase/8/docs/technotes/guides/idl/GShome.html?cm\\_mc\\_uid=72983530074714919152354&cm\\_mc\\_sid\\_5020000=1491915235](http://docs.oracle.com/javase/8/docs/technotes/guides/idl/GShome.html?cm_mc_uid=72983530074714919152354&cm_mc_sid_5020000=1491915235)

RMI PATRIK FUHRER <http://diuf.unifr.ch/drupal/sites/diuf.unifr.ch.drupal.softeng/files/file/publications/others/RMI.pdf>

RMI: Observing the Distributed Pattern

<http://www.cs.indiana.edu/~dgerman/tutorials/fie2004.pdf>