COMP[1298] Postgraduate Project Proposal
Investigation of Java RMI application for potential security vulnerability

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Overview:

RMI or Remote Method Invocation is a java API that is used to perform the Object Oriented equivalent of Remote Procedure Calls with support for serialized objects transfer and distributed garbage collection. Since the transfer of objects takes place between machines in different address spaces, there are various security measures which are controlled by java security manager.

This project will investigate what these security measures are, how and to what extent they are controlled by the java security manager, whether there are any holes in the current scope of the java security manager, and consequently whether such security issues pose any threat to the host of a remote object when unaddressed.

Aims and Objectives:

1.1 Aim:

Evaluating the security strength of Java RMI.

1.2 Objectives:

The project is broken down in various objectives. These are:

1.2.1 Proposal, Literature Review and Initial Report

Proposal and planning

RMI Technology based literature review and documentation

Reflection & Evaluation of the feedback and implementing any suggestion

1.2.2 Analysis of RMI security aspects

RMI security focused literature review and documentation

Reflection & Evaluation of the feedback and implementing any suggestion

1.2.3 Test bed prototype development

Coding and Testing of a simple RMI based prototype application and GUI layer

An attempt to exploiting security vulnerability by adding malicious code on the Client Side

Documentation

1.2.4 Report Writing

Consolidation of documentations

Reviewing and Critical evaluation: what worked well and what didn't

Evaluation of strengths and weakness

Future works

Tidying up, referencing and finalising report

Task ID	Task Name	Start Date	End Date	Dependencies	Duration	% Complete	Comments
1	**Initial works**						
1.1	Researching ideas and Project selection						
1.2	Getting supervisor's approval on project idea						
1.3	Hands on RMI technology, fixing & resolving technical issues, research, working on various tutorials, getting a basic working application			Not Applicable		100%	This tasks are now completed.
2	**Proposal, Literature Review and Initial Report**	**01/07/14**	**08/07/14**		**9**	**46%**	**Project Title:** **Investigation of security implications of Java RMI.**

2.1	Proposal and planning	01/07/14	02/07/14		2	100%	
2.2	Submission of proposal	03/07/14	03/07/14	2.1	1	100%	
2.3	RMI Technology based literature review and documentation + upload on Project Portal	04/07/14	07/07/14	2.2	4	30%	

2.4	Feedback from Supervisor (Afternoon session would be helpful)	07/07/14	07/07/14		1		A literature focused feedback at this stage will be regarded very beneficial and would help me: 1. Identify and close any gaps in RMI technology based research and documentation 2. Gauge the depth of research and documentation needed for security analysis 3. Discuss the appropriateness of the planned testbed prototype application

2.5	Reflection & Evaluation of the feedback and implementing any suggestion	08/07/14	09/07/14		1		
3	**Analysis of RMI security aspects**	**10/07/14**	**28/08/14**		**18**		
3.1	RMI security focused literature review and documentation	10/07/14	20/07/14		11		

3.2	Feedback from Supervisor	21/07/14	21/07/14		1		Need to discuss what exploitation and experiments can be carried out: 1. What to be achieved? 2. How to demostrate this achivement? 3. Revisit the planned testbed prototype application

3.3	Reflection & Evaluation of the feedback and implementing any suggestion	########	########		6	
4	**Test bed prototype development**	**01/08/14**	**19/08/14**		**20**	
4.1	Prototype Application and GUI layer	01/08/14	07/08/14		7	Currently the plan is to write a simple program that carries out various exhuastive calculations with different number of threads and gauges the performance for lapsed time. This application will measure whether increasing number of threads will increase performance for a given task.

4.2	**Feedback from Supervisor (Afternoon session due to other appointments in the morning)**	**08/08/14**	**08/08/14**		**1**		**Feedback here may be focused on:** **1. How the application serves the purpose** **2. What can be done to cause a security vulnerability and exploit it**
4.3	Adding security vulnerability code to the Client Side	09/08/14	10/08/14		2		Client application will try to access user areas on the Server side
4.4	Exploitation of security vulnerability	11/08/14	12/08/14		2		

4.5	**Feedback from Supervisor**	**13/08/14**	**13/08/14**		**1**		**Discuss the findings, what and what not went well, how to present this effectively.**
4.6	Documentation	14/08/14	19/08/14		6		
5	**Report Writing**	**20/08/14**	**02/09/14**		**14**		
5.1	Consolidation of documentations	20/08/14	22/08/14		3		
5.2	Reviewing and Critical evaluation: what worked well and what didn't	23/08/14	26/08/14		4		

5.3	Evaluation of strengths and weakness	27/08/14	28/08/14		2		
5.4	Future works	29/08/14	29/08/14		1		
5.5	Tidying up, referencing and finalising report	30/08/14	02/09/14		3		

2 Gantt Chart: