

GSOC  
2012

# Infinispan .NET Hot Rod Client

## Project Proposal

C# .NET based client for Hot Rod Wire Protocol



## Abstract

This document proposes development of a new .NET framework based client for Infinispan Hot Rod Wire Protocol. This project will deliver a Hot Rod Client developed using Visual C#. NET.

## Personal Details

### Contact Information

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### Educational Qualifications

- Undergrad: BSc. Engineering, Majoring in Computer Science and Engineering.
- Institute: Department of Computer Science and Engineering, Faculty of Engineering, University of Moratuwa, Sri Lanka.

### Experience in Software Engineering

- Studied Object oriented design, design patterns and applications, Networking and writing network applications, Software Architecture Design, Data Structures and Algorithms and many other related modules at the university
- Programming Experience
  - Java : 3+ years
  - C: 3+ years
  - Visual C# : 2+ years
  - C++ : 1+ year
  - Assembly : 2+ years
- Related recent developments that would help me to do this project
  - Developing a client server model based multiplayer Artificial Intelligence Strategy game (TankWars) using Visual C#.NET.
    - Website : <http://www.tankwars.byethost12.com/>
    - Git repo : <https://github.com/sunimalr/TankWarsClient>

- Developing a Shop and Inventory management application that followed client server model using Java Language and MYSQL. This allowed the different clients to access a centralized Server via Internet.
  - Git repo: [https://github.com/sunimalr/OneStopShop\\_Shop\\_Management](https://github.com/sunimalr/OneStopShop_Shop_Management)
- Some of the other projects I did are hosted at <https://github.com/sunimalr/>

## Motivation

As an engineering undergraduate majoring in computer engineering who comes from a developing nation where, I understand the great service which is done by the open source community to the betterment of whole world. The more I learn deep about technology and computing, the more I value the free and open source community since there is no other way to survive in this competitive world. Since the first day I realized the value of open source community, I determined to contribute to the free and open source world in whatever the possible way.

I realized Google Summer of Code as the best way to start contributing to the open source community as it's a place where all the giants of open source world get together with students like us to take the concept of open source to great heights. This has already been proved by the thousands of success stories of GSOC in previous years.

I selected Jboss as my mentor organization as it had very interesting projects to select from. Although this is the first time Jboss is applying as an individual organization, it has been working under another umbrella organization for past years and has a lot of experience in Google Summer of Code. Even after the GSOC, I hope to keep the bonds with Jboss and continue to contribute the their projects as a developer during my career as a Computer Engineer.

## Client for the Hot Rod wire protocol in .NET/C#

### Hot Rod Protocol

Hot Rod protocol is a binary, language neutral protocol for client server communication. It is defined in <https://docs.jboss.org/author/display/ISPN/Hot+Rod+Protocol>. Hot Rod protocol and clients enable smart routing, load balancing and failover.

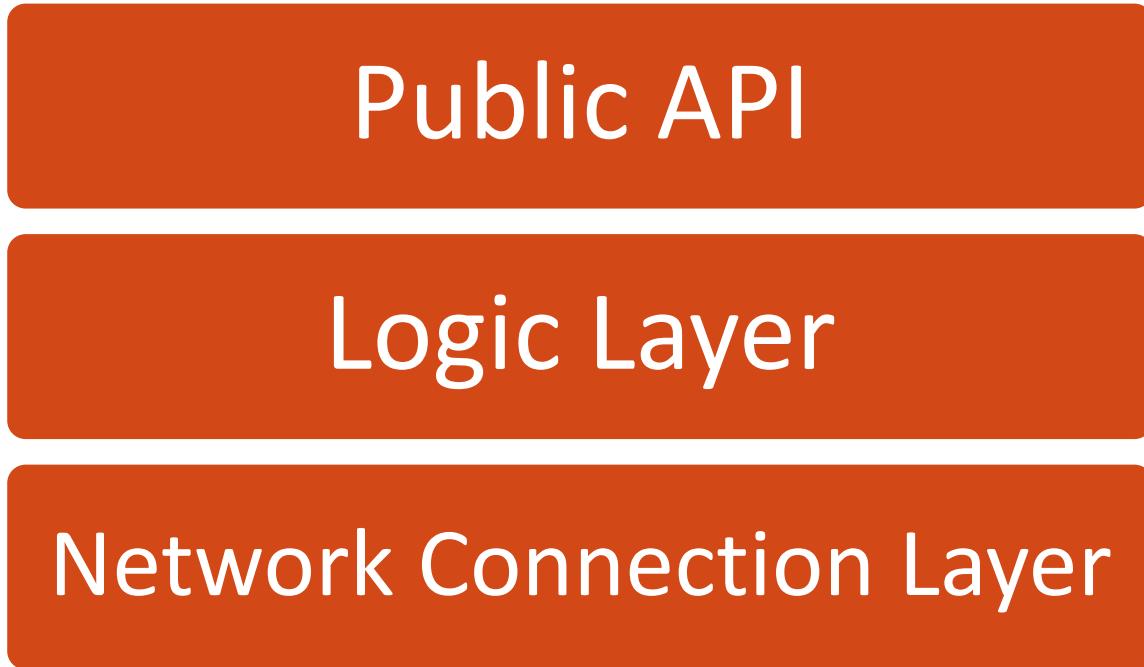
### Supported Operations

- Get/Remove/ContainsKey/GetWithVersion
- BulkGet
- Put/PutIfAbsent/Replace
- ReplaceIfUnmodified
- RemoveIfUnmodified
- Clear
- Stats
- Ping

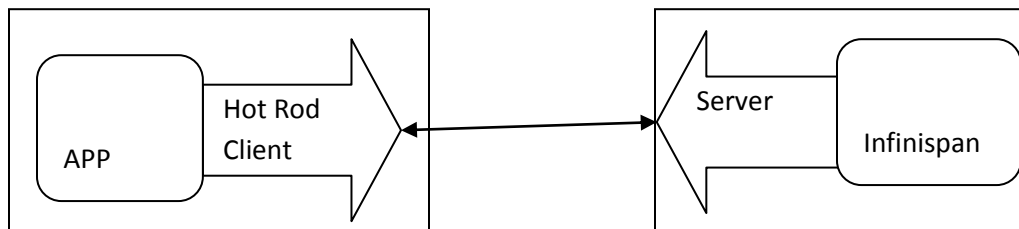
These all operations are supported by Hot Rod protocol. I would also implement an operation for multiple get operations at the same time using the same protocol with parallelized get operations on the client side which I will be developing.

## Design

The client follows a three layer architecture. The upper client being the public API and others being Logic layer and Communication layer respectively.

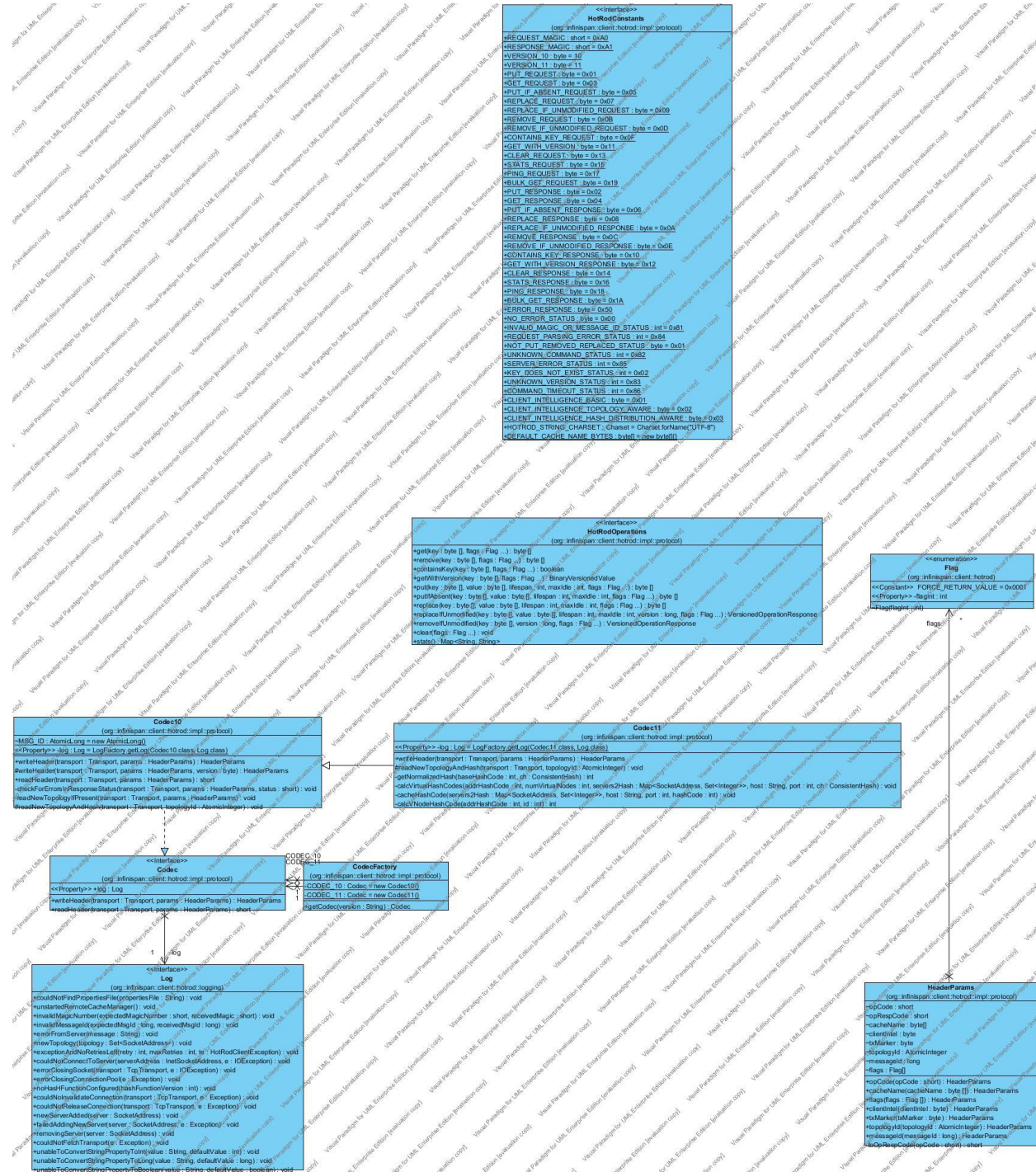


It gives a machine that is not running JVM the opportunity to access the Server using Hot Rod Protocol.



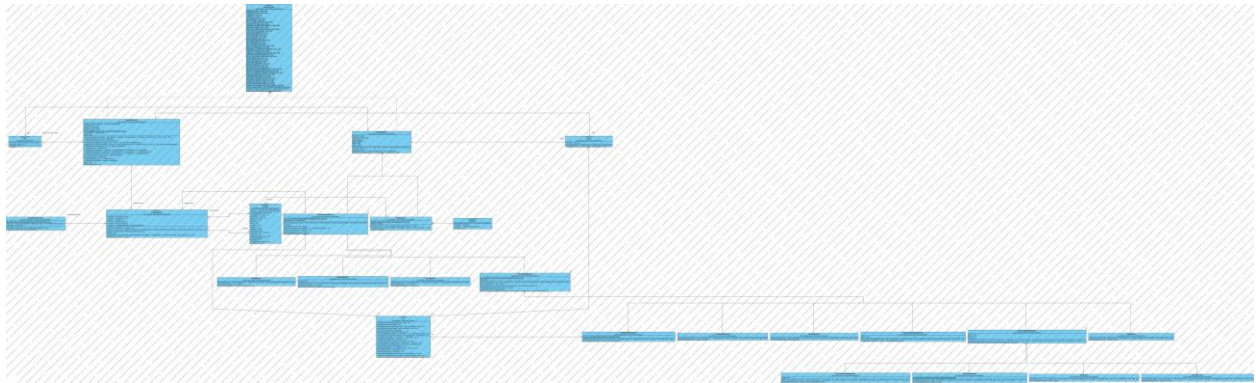
Currently, there is a well written client for Hot Rod protocol that has been developed using Java. As I'm advised by potential mentors at infinispn, I would be using almost the same design for my .NET based client. Following are few UML class diagrams that show the design of the existing java Hot Rod Client which I will use for the development of .NET based client.

# Protocol



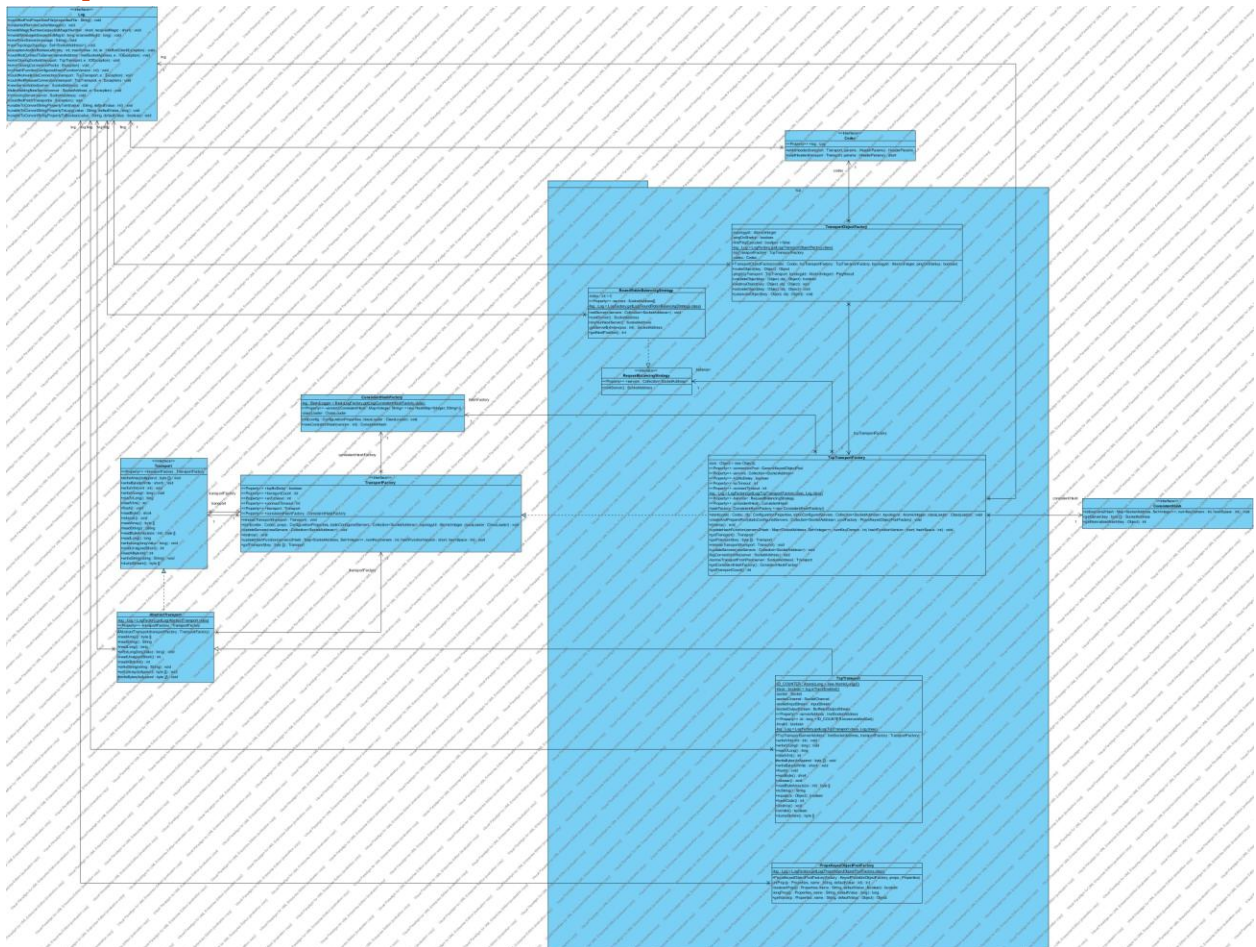
Larger image can be accessed from : <http://dl.dropbox.com/u/9182999/UML/ptotocol.jpg>

## Operations



Larger image can be accessed from : <http://dl.dropbox.com/u/9182999/UML/operations.jpg>

## Transport



Larger image can be accessed from : <http://dl.dropbox.com/u/9182999/UML/transport.jpg>

## Project Deliverables

- A complete .NET based client with an API to access functions in the Infinispan servers using Hot Rod Protocol.
- Design Documentation
- User Documentation
- Wiki Articles

## Version Controlling

Version controlling will be done using git version controlling system.

## Project milestones and draft schedule

From	To	Description
23 <sup>rd</sup> April	21 <sup>st</sup> May	<ul style="list-style-type: none"><li>• Reading and understanding Hot Rod wire protocol and contacting mentor and other resource persons to gather helpful guidelines for the implementation.</li><li>• Examining existing codebase of Java Hot Rod client and plan the .NET based implementation.</li><li>• Doing prototype development of major functions (classes) and get feedback from the mentor.</li></ul>
22 <sup>nd</sup> May	1 <sup>st</sup> July	<ul style="list-style-type: none"><li>• Actual implementation of major functions while getting feedback and suggestions from the mentor.</li></ul>
2 <sup>nd</sup> July	13 <sup>th</sup> July	<ul style="list-style-type: none"><li>• Preparation for Mid-term evaluations</li></ul>
14 <sup>th</sup> July	13 <sup>th</sup> August	<ul style="list-style-type: none"><li>• Remaining Implementations of the client with feedback from the mentor.</li></ul>
14 <sup>th</sup> August	20 <sup>th</sup> August	<ul style="list-style-type: none"><li>• Preparation for Final Evaluations</li></ul>

## Software Development Methodology

I hope to take an Agile approach to this project. I would divide functions that have to be implemented into blocks and implement them one by one. Therefore planning, development and testing stages will be there in each iteration which will deliver a working function at the end of the iteration. After implementing all functions, integration testing will be carried out to make sure individually developed components also work together with not faults.