



# Red Hat Data Grid 8.1

## Hot Rod C++ Client Guide

Configure and use Hot Rod C++ clients



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## Abstract

Hot Rod C++ clients allow C++ runtime applications to connect and interact with remote Data Grid clusters.

## Table of Contents

<b>CHAPTER 1. RED HAT DATA GRID .....</b>	<b>3</b>
1.1. DATA GRID DOCUMENTATION	3
1.2. DATA GRID DOWNLOADS	3
1.3. MAKING OPEN SOURCE MORE INCLUSIVE	3
<b>CHAPTER 2. INSTALLING THE HOT ROD C++ CLIENT .....</b>	<b>4</b>
2.1. C++ COMPILER REQUIREMENTS	4
2.2. INSTALLING HOT ROD C++ CLIENTS ON RED HAT ENTERPRISE LINUX (RHEL)	4
2.3. INSTALLING HOT ROD C++ CLIENTS ON MICROSOFT WINDOWS	4
<b>CHAPTER 3. COMPILING PROTOBUF SCHEMA .....</b>	<b>6</b>
3.1. COMPILING PROTOBUF SCHEMA ON RED HAT ENTERPRISE LINUX (RHEL)	6
3.2. COMPILING PROTOBUF SCHEMA ON MICROSOFT WINDOWS	6
<b>CHAPTER 4. CONFIGURING THE HOT ROD C++ CLIENT .....</b>	<b>8</b>
4.1. CONFIGURATION AND REMOTE CACHE MANAGER APIS	8



# CHAPTER 1. RED HAT DATA GRID

Data Grid is a high-performance, distributed in-memory data store.

## Schemaless data structure

Flexibility to store different objects as key-value pairs.

## Grid-based data storage

Designed to distribute and replicate data across clusters.

## Elastic scaling

Dynamically adjust the number of nodes to meet demand without service disruption.

## Data interoperability

Store, retrieve, and query data in the grid from different endpoints.

## 1.1. DATA GRID DOCUMENTATION

Documentation for Data Grid is available on the Red Hat customer portal.

- [Data Grid 8.1 Documentation](#)
- [Data Grid 8.1 Component Details](#)
- [Supported Configurations for Data Grid 8.1](#)
- [Data Grid 8 Feature Support](#)
- [Data Grid Deprecated Features and Functionality](#)

## 1.2. DATA GRID DOWNLOADS

Access the [Data Grid Software Downloads](#) on the Red Hat customer portal.



### NOTE

You must have a Red Hat account to access and download Data Grid software.

## 1.3. MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see [our CTO Chris Wright's message](#).

## CHAPTER 2. INSTALLING THE HOT ROD C++ CLIENT

Install the Hot Rod C++ client on your host system as a dynamic library.

### 2.1. C++ COMPILER REQUIREMENTS

Operating system	Required compiler
Red Hat Enterprise Linux (RHEL) 7, 64-bit	C++ 11 compiler (GCC 4.8.1)
RHEL 8, 64-bit	C++ 11 compiler (GCC 4.8.1)
Microsoft Windows 7 x64	C 11 compiler (Visual Studio 2015, Microsoft Visual C 2013 Redistributable Package for the x64 platform)

### 2.2. INSTALLING HOT ROD C++ CLIENTS ON RED HAT ENTERPRISE LINUX (RHEL)

Data Grid provides an RPM distribution of the Hot Rod C++ client for RHEL.

#### Procedure

1. Enable the repository for the Hot Rod C++ client on RHEL.

RHEL version	Repository
RHEL 7	<b>jb-datagrid-8.1-for-rhel-7-server-rpms</b>
RHEL 8	<b>jb-datagrid-8.1-for-rhel-8-x86_64-rpms</b>

2. Install the Hot Rod C++ client.

```
# yum install jdgcpp-client
```

#### Additional resources

- [Enabling or disabling a repository using Red Hat Subscription Management](#) (Red Hat Knowledgebase)
- [Red Hat Package Browser](#)

### 2.3. INSTALLING HOT ROD C++ CLIENTS ON MICROSOFT WINDOWS

Data Grid provides an archived version of the Hot Rod C++ client for installation on Windows.

#### Procedure

1. Download the ZIP archive for the Hot Rod C++ client from the [Data Grid Software Downloads](#).

2. Extract the ZIP archive to your file system.

## CHAPTER 3. COMPILING PROTOBUF SCHEMA

Data Grid uses the ProtoStream API to store data as Protobuf-encoded entries.

Protobuf is a language-neutral format that allows clients to create and retrieve entries in remote caches using both Hot Rod and REST endpoints.

### 3.1. COMPILING PROTOBUF SCHEMA ON RED HAT ENTERPRISE LINUX (RHEL)

Compile Protobuf schema, **.proto** files, into C++ header and source files to describe your data to Data Grid.

#### Prerequisites

- Install the Protobuf library and **protobuf-devel** package.

```
# yum install protobuf
# yum install protobuf-devel
```

#### Procedure

1. Set the **LD\_LIBRARY\_PATH** environment variable, if it is not already set.

```
# export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/lib64
```

2. Compile Protobuf schema for the Hot Rod C++ client as required.

```
# /bin/protoc --cpp_out dllexport_decl=HR_PROTO_EXPORT:/path/to/output/ $FILE
```

**HR\_PROTO\_EXPORT** is a macro that the Hot Rod C++ client expands when it compiles the Protobuf schema.

3. Register your Protobuf schema with Data Grid if you plan to use queries.

#### Additional resources

- [Registering Protobuf Schemas](#)

### 3.2. COMPILING PROTOBUF SCHEMA ON MICROSOFT WINDOWS

Compile Protobuf schema, **.proto** files, into C++ header and source files to describe your data to Data Grid.

#### Procedure

1. Open a command prompt to the installation directory for the Hot Rod C++ client.
2. Compile Protobuf schema for the Hot Rod C++ client as required.

```
bin\protoc --cpp_out dllexport_decl=HR_PROTO_EXPORT:path\to\output\ $FILE
```

**HR\_PROTO\_EXPORT** is a macro that the Hot Rod C++ client expands when it compiles the Protobuf schema.

3. Register your Protobuf schema with Data Grid if you plan to use queries.

#### Additional resources

- [Registering Protobuf Schemas](#)

## CHAPTER 4. CONFIGURING THE HOT ROD C++ CLIENT

Hot Rod C++ clients interact with remote Data Grid clusters via the **RemoteCache** API.

### 4.1. CONFIGURATION AND REMOTE CACHE MANAGER APIS

Use the **ConfigurationBuilder** API to configure Hot Rod C++ client connections and the **RemoteCacheManager** API to obtain and configure remote caches.

#### Configuration builder

```
#include "infinispan/hotrod/ConfigurationBuilder.h"
#include "infinispan/hotrod/RemoteCacheManager.h"
#include <infinispan/hotrod/RemoteCache.h>
#include <iostream>
int main () {
    ConfigurationBuilder builder;
    // Configure a cache manager to connect with Hot Rod version 2.8
    builder.protocolVersion(Configuration::PROTOCOL_VERSION_28);
    // Connect to a server at localhost with the default port.
    builder.addServer().host("127.0.0.1").port(11222);
    // Create and start a RemoteCacheManager to interact with caches.
    RemoteCacheManager cacheManager(builder.build(), false);
    cacheManager.start();
    ...
}
```

#### Cross-site replication

```
ConfigurationBuilder builder;
builder.addServer().host("127.0.0.1").port(11222);
// Configure a remote cluster and node when using cross-site replication.
builder.addCluster("NYC").addClusterNode("192.0.2.0", 11322);
```

#### Near caching

```
ConfigurationBuilder builder;
builder.addServer().host("127.0.0.1").port(11222);
// Enable near-caching for the client.
builder.nearCache().mode(NearCacheMode::INVALIDATED).maxEntries(4);
```

#### Additional resources

- [Hot Rod C++ client API](#)