



BUILDING KV STORE PROJECT

C++20 and CMake

FABIO GALUPPO
C++ MasterClass

Building KV Store Project on Windows

pt-BR	en-US
Garanta que o ambiente de desenvolvimento esteja devidamente configurado. O exemplo abaixo mostra o x64 Native Tools for Visual Studio 2022, com o compilador Microsoft (R) C/C++ Optimizing Compiler versão 19.44.35112.1 para x64.	Make sure your development environment is properly configured. The example below shows <i>x64 Native Tools for Visual Studio 2022</i> , using the Microsoft (R) C/C++ Optimizing Compiler Version 19.44.35112.1 for x64.

```
CHM x64 Native Tools Command Prompt for VS 2022
*****
** Visual Studio 2022 Developer Command Prompt v17.14.0-pre.4.0
** Copyright (c) 2022 Microsoft Corporation
*****
[vcvarsall.bat] Environment initialized for: 'x64'

C:\Users\Fabio Galuppo>cl
Microsoft (R) C/C++ Optimizing Compiler Version 19.44.35112.1 for x64
Copyright (C) Microsoft Corporation. All rights reserved.
```

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Clone o repositório Git a partir do seguinte endereço: <ul style="list-style-type: none">• https://github.com/fabiogaluppo/kv_store.git	Clone the Git repository from the following URL: <ul style="list-style-type: none">• https://github.com/fabiogaluppo/kv_store.git

```
D:\Fabio Galuppo\git>git clone https://github.com/fabiogaluppo/kv_store.git
Cloning into 'kv_store'...
remote: Enumerating objects: 122, done.
remote: Counting objects: 100% (122/122), done.
remote: Compressing objects: 100% (118/118), done.
remote: Total 122 (delta 34), reused 0 (delta 0), pack-reused 0 (from 0) eceiving objects: 71% (87/122), 5.91 MiB | 11.81 MiB/s
Receiving objects: 100% (122/122), 13.25 MiB | 18.09 MiB/s, done.
Resolving deltas: 100% (34/34), done.
```

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Extraia as dependências (deps.zip) no diretório deps do projeto. Conforme exemplo abaixo:	Extract the dependencies (deps.zip) into the project's deps directory. As per the example below:

```
D:\Fabio Galuppo\git>cd kv_store\deps
D:\Fabio Galuppo\git\kv_store\deps>tar -xf deps.zip
D:\Fabio Galuppo\git\kv_store\deps>del deps.zip
D:\Fabio Galuppo\git\kv_store\deps>cd ..
```

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Com o CMake, compile a dependência ZeroMQ:	Build the ZeroMQ dependency using CMake:
<ul style="list-style-type: none">cmake -S ./deps/libzmq-master -B ./deps/build/zmq -DCMAKE_INSTALL_PREFIX=./deps/install -DCMAKE_POLICY_VERSION_MINIMUM=3.5cmake --build ./deps/build/zmq --config Release --target install	

```
D:\Fabio Galuppo\git\kv_store>cmake -S ./deps/libzmq-master -B ./deps/build/zmq -DCMAKE_INSTALL_PREFIX=./deps/install -DCMAKE_POLICY_VERSION_MINIMUM=3.5
-- Building for: Visual Studio 17 2022
```

```
-- Selecting Windows SDK version 10.0.26100.0 to target Windows 10.0.19045.
-- The C compiler identification is MSVC 19.44.35112.1
-- The CXX compiler identification is MSVC 19.44.35112.1
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
```

...

```
D:\Fabio Galuppo\git\kv_store>cmake --build ./deps/build/zmq --config Release --target install
MSBuild version 17.14.4+fc19b0515 for .NET Framework
```

```
1>Checking Build System
Generating NSIS.template.in
Building Custom Rule D:/Fabio Galuppo/git/kv_store/deps/libzmq-master/CMakeLists.txt
```

...

```
-- Install configuration: "Release"
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/lib/pkgconfig/libzmq.pc
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/local_lat.exe
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/remote_lat.exe
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/local_thr.exe
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/remote_thr.exe
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/inproc_lat.exe
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/inproc_thr.exe
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/proxy_thr.exe
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/lib/libzmq-v143-mt-4_3_6.lib
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/libzmq-v143-mt-4_3_6.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/zmq.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/zmq_utils.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/lib/libzmq-v143-mt-s-4_3_6.lib
-- Up-to-date: D:/Fabio Galuppo/git/kv_store/deps/install/include/zmq.h
-- Up-to-date: D:/Fabio Galuppo/git/kv_store/deps/install/include/zmq_utils.h
-- Up-to-date: D:/Fabio Galuppo/git/kv_store/deps/install/bin/libzmq-v143-mt-4_3_6.dll
-- Up-to-date: D:/Fabio Galuppo/git/kv_store/deps/install/include/zmq.h
-- Up-to-date: D:/Fabio Galuppo/git/kv_store/deps/install/include/zmq_utils.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/share/zmq/AUTHORS.txt
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/share/zmq/LICENSE.txt
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/share/zmq/NEWS.txt
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/CMake/ZeroMQTargets.cmake
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/CMake/ZeroMQTargets-release.cmake
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/CMake/ZeroMQConfig.cmake
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/CMake/ZeroMQConfigVersion.cmake
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/msvcpr140.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/msvcpr140_1.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/msvcpr140_2.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/msvcpr140_atomic_wait.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/msvcpr140_codecvt_ids.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/vcruntime140_1.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/vcruntime140.dll
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/bin/concrt140.dll
-- Up-to-date: D:/Fabio Galuppo/git/kv_store/deps/install/bin
```

Building KV Store Project on Windows

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Com o CMake, compile a dependência Quill:	Build the Quill dependency using CMake:
<ul style="list-style-type: none"> cmake -S ./deps/quill-master -B ./deps/build/quill -DCMAKE_INSTALL_PREFIX=./deps/install cmake --build ./deps/build/quill --config Release --target install 	

```
D:\Fabio Galuppo\git\kv_store>cmake -S ./deps/quill-master -B ./deps/build/quill -DCMAKE_INSTALL_PREFIX=./deps/install
-- Building for: Visual Studio 17 2022
-- Selecting Windows SDK version 10.0.26100.0 to target Windows 10.0.19045.
-- The C compiler identification is MSVC 19.44.35112.1
-- The CXX compiler identification is MSVC 19.44.35112.1
```

...

```
D:\Fabio Galuppo\git\kv_store>cmake --build ./deps/build/quill --config Release --target install
MSBuild version 17.14.4+fc19b0515 for .NET Framework

1>Checking Build System
Building Custom Rule D:/Fabio Galuppo/git/kv_store/deps/quill-master/CMakeLists.txt
Building Custom Rule D:/Fabio Galuppo/git/kv_store/deps/quill-master/CMakeLists.txt
1>
-- Install configuration: "Release"
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/lib/pkgconfig/quill.pc
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/lib/cmake/quill/quill-config.cmake
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/lib/cmake/quill/quill-config-version.cmake
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/BackendManager.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/BackendOptions.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/BackendUtilities.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/BackendWorker.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/BackendWorkerLock.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/BacktraceStorage.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/ManualBackendWorker.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/PatternFormatter.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/RdtscClock.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/SignalHandler.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/StringFromTime.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/ThreadUtilities.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/TimestampFormatter.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/TransitEvent.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/TransitEventBuffer.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/backend/Utf8Conv.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/Backend.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/BackendTscClock.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/bundled
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/bundled/fmt
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/bundled/fmt/args.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/bundled/fmt/base.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/bundled/fmt/chrono.h
-- Installing: D:/Fabio Galuppo/git/kv_store/deps/install/include/quill/bundled/fmt/color.h
```

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Crie o diretório build e acesse-o com o seguinte comando:	Create the build directory and navigate into it using the following command:
<ul style="list-style-type: none"> mkdir build && cd build 	

```
D:\Fabio Galuppo\git\kv_store>mkdir build && cd build
D:\Fabio Galuppo\git\kv_store\build>
```

Building KV Store Project on Windows

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Com o CMake, compile o KV Store em modo Release:	Build the KV Store using CMake in Release mode:
<ul style="list-style-type: none"> cmake .. -DCMAKE_POLICY_VERSION_MINIMUM=3.5 -DEASTL_BACKEND=OFF cmake --build . --config Release 	

```
D:\Fabio Galuppo\git\kv_store\build>cmake .. -DCMAKE_POLICY_VERSION_MINIMUM=3.5 -DEASTL_BACKEND=OFF
-- Building for: Visual Studio 17 2022
-- Selecting Windows SDK version 10.0.26100.0 to target Windows 10.0.19045.
-- The CXX compiler identification is MSVC 19.44.35112.1
```

...

```
-- STL Backend Selected
-- Configuring done (6.7s)
-- Generating done (0.0s)
```

...

```
D:\Fabio Galuppo\git\kv_store\build>cmake --build . --config Release
MSBuild version 17.14.4+fc19b0515 for .NET Framework

1>Checking Build System
Building Custom Rule D:/Fabio Galuppo/git/kv_store/CMakeLists.txt
server_main.cpp
kv_store.vcxproj -> D:\Fabio Galuppo\git\kv_store\build\Release\kv_store.exe
Copying libzmq DLL to output directory
Building Custom Rule D:/Fabio Galuppo/git/kv_store/CMakeLists.txt
unit_tests.cpp
tests.vcxproj -> D:\Fabio Galuppo\git\kv_store\build\Release\tests.exe
Building Custom Rule D:/Fabio Galuppo/git/kv_store/CMakeLists.txt
```

KV Store Tests and Running

```
D:\Fabio Galuppo\git\kv_store\build>. \Release\tests.exe
[doctest] doctest version is "2.4.11"
[doctest] run with "--help" for options
=====
[doctest] test cases: 26 | 26 passed | 0 failed | 0 skipped
[doctest] assertions: 68 | 68 passed | 0 failed |
[doctest] Status: SUCCESS!

D:\Fabio Galuppo\git\kv_store\build>. \Release\kv_store.exe

  KV STORE
  C++ MasterClass - cppmasterclass.com.br - 2025 version 0.1

ZMQ version 4.3.6 (Backend: STL)

12:48:15.604605566 [1468] server_main.cpp:214          LOG_TRACE_L1 root          Listening at tcp://*:1234
```

Endnote

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Para compilar no Linux ou macOS, basta utilizar um toolchain compatível com C++20 e garantir que o CMake esteja instalado.	To compile on Linux or macOS, simply switch to a toolchain compatible with C++20 and make sure CMake is installed.