

VCPKG

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Talk Scope


- Windows
- Visual Studio
- VCPKG does much, much more.

Package Management – language solutions

- Javascript
 - Npm
- Java
 - Maven
- Python
 - Pip
- C#
 - Nuget
- ...
- C++ ?

The Problem

cppcon | 2017
THE C++ CONFERENCE • BELLEVUE, WASHINGTON



BJARNE STROUSTRUP

**Learning
and
Teaching
Modern C++**

CppCon.org

Morgan Stanley

We need better package/build system

- How can a student install a GUI system and a database in the second week of a first programming course?
 - Different libraries provide different build support
 - Different systems have different build support
 - Different libraries don't interoperate well
- A dozen incompatible package managers is not a solution
 - Make simple tasks simple!

```
> download gui_xyz  
> install gui_xyz
```

- Or equivalent (e.g., IDE)

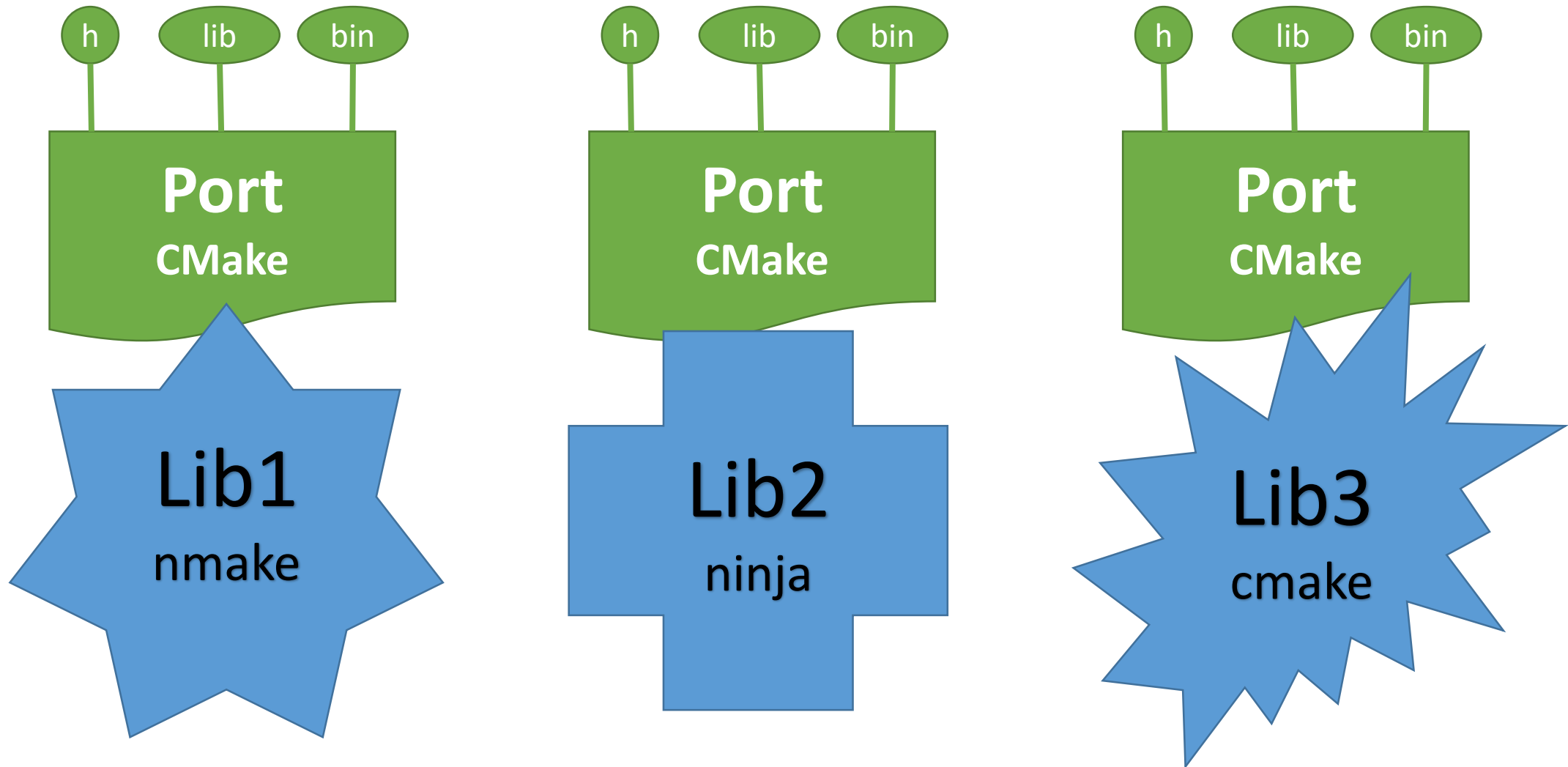
```
import gui_xyz;    // in code
```

Stroustrup - Teaching C++ - CppCon'17

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VCPKG demo – consuming packages

Peek Inside – package builds



Peek Inside – package builds

- Triplets – provide consistency.
cpu, os, compiler, runtime, and more.
- Inspect existing:
 - Vcpkg help triplet
 - Triplets folder
- Additionally, a triplet controls **VCPKG_LIBRARY_LINKAGE**
 - *NOT environment!*

Peek inside – MSBuild integration

- MSBuild is wired to look into
`%MSBuild%\Microsoft.Cpp\v4.0\V140\ImportBefore`
- `...\ImportBefore\Default` includes a file called `vcpkg.system.props`
- This props file directs to
`$(LOCALAPPDATA)\vcpkg\vcpkg.user.targets`
- Which directs to
`vcpkg\scripts\buildsystems\msbuild\vcpkg.targets`
- `Vcpkg.targets` includes:
 - per-triplet folder routing logic
 - Actual `AdditionalIncludeDirectories`, `AdditionalLibraryDirectories`, and
`AdditionalDependencies = '*.lib'`

Link against *.lib ??

- Per-system package management, not per-project
- Upside:
 - Dependencies can be upgraded without changing the project
- Major Caveat:
 - Lack of granular control.
What if two libraries export the same symbol?
 - Gtest + gmock export main() and are used together.
- Mitigation:
 - 'manual-link' folder
 - Add the lib name manually.
 - <https://github.com/Microsoft/vcpkg/issues/306>

Versioning Story

- No individual package versioning! All packages are versioned together.
- *“This approach minimizes the burden on library authors and maintainers (how many boost versions must you test against? We say: only the latest supported upstream release), though the user experience can be rough as you've experienced and we do want to improve it in the future.”*
<https://github.com/Microsoft/vcpkg/issues/1681#issuecomment-324160402>
- *“An incredible, long-needed, non-sucky package manager for C++ and it's heel is donated from Achilles himself.”*
<https://github.com/Microsoft/vcpkg/issues/2823#issuecomment-400305613>

Package export demo

- `vcpkg export jsoncpp --zip`
- `vcpkg export jsoncpp -nuget`
 - Undocumented options: `--nuget-id`, `--nuget-version`
- Per-project, invasive, can be managed centrally
- The real versioning solution.

Alternatives:

- Hunter
- Buckaroo
- Cget
- CPM
- **Conan**

Alternatives: Conan

conan-io / conan

Watch 113 Star 2,549 Fork 335

Code Issues 612 Pull requests 51 Projects 12 Wiki Insights

Conan.io - The open-source C/C++ package manager <https://conan.io>

package-manager cpp c cplusplus multi-platform cmake conan

3,201 commits 121 branches 125 releases 131 contributors MIT

Microsoft / vcpkg

Watch 321 Star 4,827 Fork 1,200

Code Issues 1,288 Pull requests 140 Projects 0 Wiki Insights

C++ Library Manager for Windows, Linux, and MacOS





vcpkg visual-studio libraries windows cpp package-manager packages c cplusplus cmake

7,603 commits 407 branches 0 releases 502 contributors View license

Alternatives: Conan

Owned Repositories

Search by repository name

All (4)	Public (4)	Private (0)	OSS (2)	Premium (2)
 conan-center (Conan)				174 packages
 conan-transit (Conan)				936 packages
 installers (Generic)				1 package
 Sources (Generic)				1 package

Ofek Shilon > source > repos > vcpkg > ports

Name	Date modified
benchmark	9/13/2018 1:34
berkeleydb	2/2/2019 7:06 P
bigint	9/13/2018 1:34
bitserializer	2/2/2019 7:06 P
bitserializer-cpprestjson	2/2/2019 7:06 P
bitserializer-rapidjson	2/2/2019 7:06 P
blaze	9/13/2018 1:34
blosc	9/13/2018 1:34
bond	6/16/2018 4:33
boost	2/2/2019 7:06 P
boost-accumulators	2/2/2019 7:06 P
boost-algorithm	2/2/2019 7:06 P
boost-align	2/2/2019 7:06 P
boost-any	2/2/2019 7:06 P
boost-array	2/2/2019 7:06 P
boost-asio	2/2/2019 7:06 P
boost-assert	2/2/2019 7:06 P

885 items

VCPKG: A lot of right calls.

- Scope limits: C++ libraries
- Traction
- Owned.

People



- <https://vimeo.com/14075000>
- <https://www.youtube.com/watch?v=sBP17HQAQjk>