



GrassHog

Vladimir Tsyshnatiy

Technical architect



Telegram: @Tsyshnatiy



About me

- 15 years C++ experience
- Team leader
- System programmer
- CV engineer
- Hardware engineer
- DIY enthusiast



Agenda



Introduction



Embedding vs Extending



Conclusion



Why use other languages?



- 1 **C++ development is slow**
 - Dependencies + linkage + recompilations
 - High risk of crashes (unsafe MT)
 - High entry threshold

Why use other languages?



- 2 Hiring (Positive Technologies statistics)**
 - JavaScript ~3x faster
 - Python ~2.5x faster

- 3 C++ performance is often unnecessary**

What if...?



Embedding

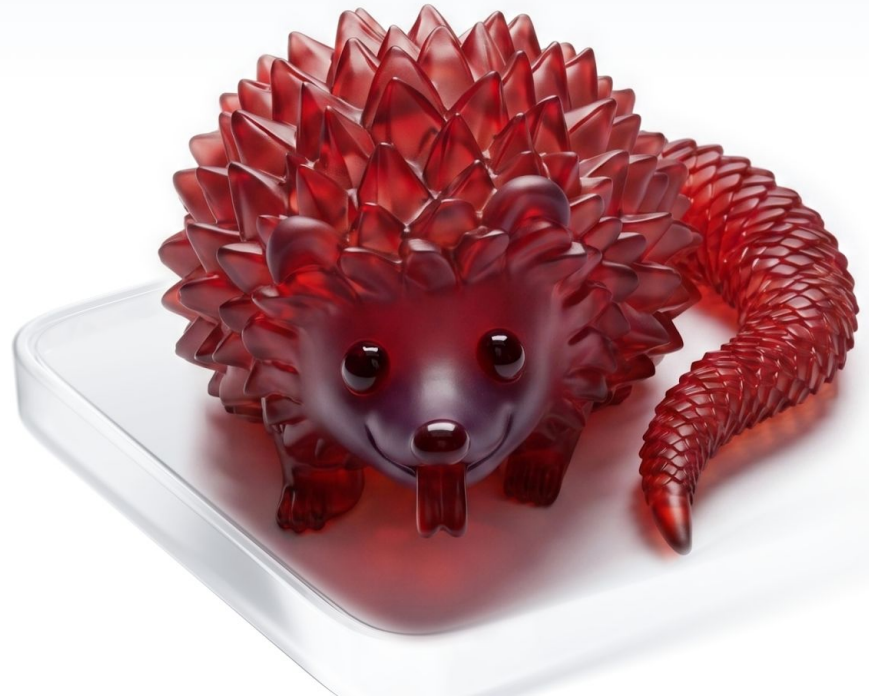


Embedding.Lua.Demo



- Basics
- Exceptions
- Third-party libraries
- GC
- Threads

[Full example](#) ↗



Embedding.Lua.Async



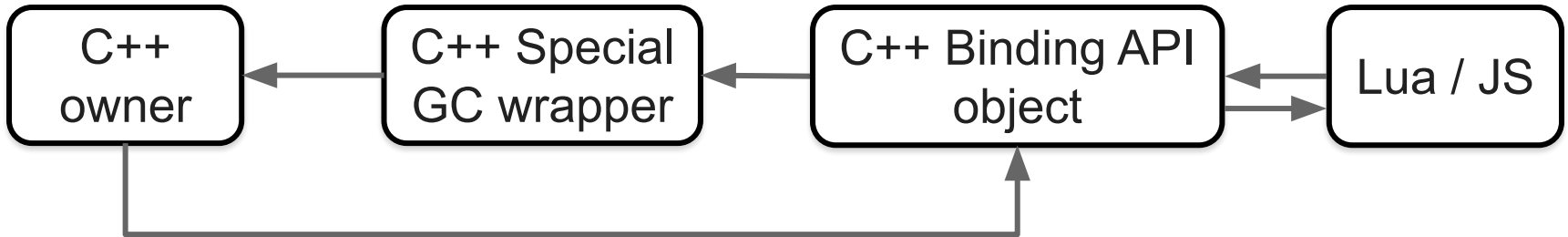
lua_State is not thread-safe



std::thread
Use with caution!

lua coroutines
are used freely

*.GC

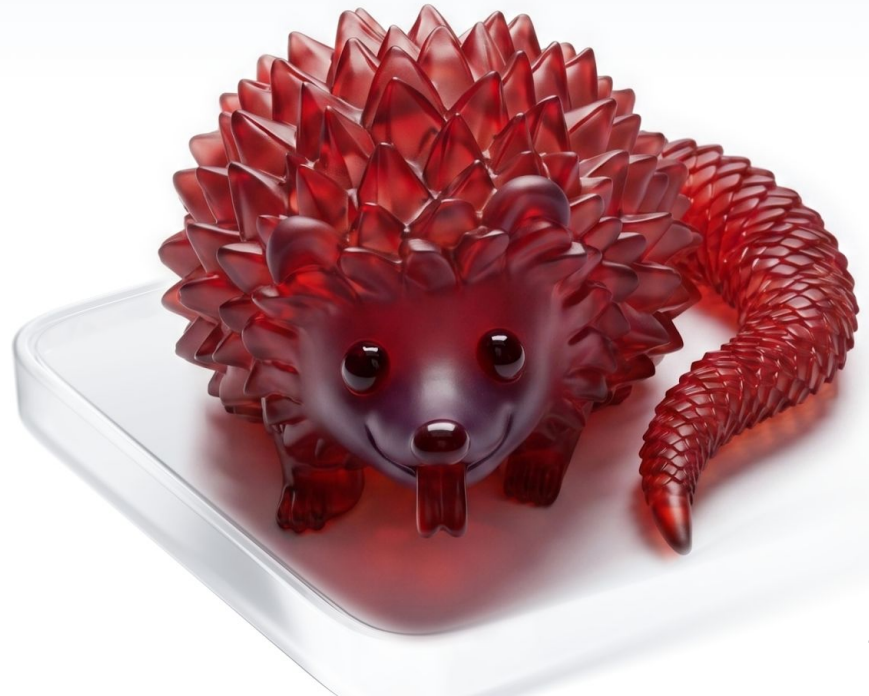


Embedding.JS.V8.Demo



- Basics
- Exceptions

[Full example](#) ↗



Embedding.JS.V8.ThirdParties

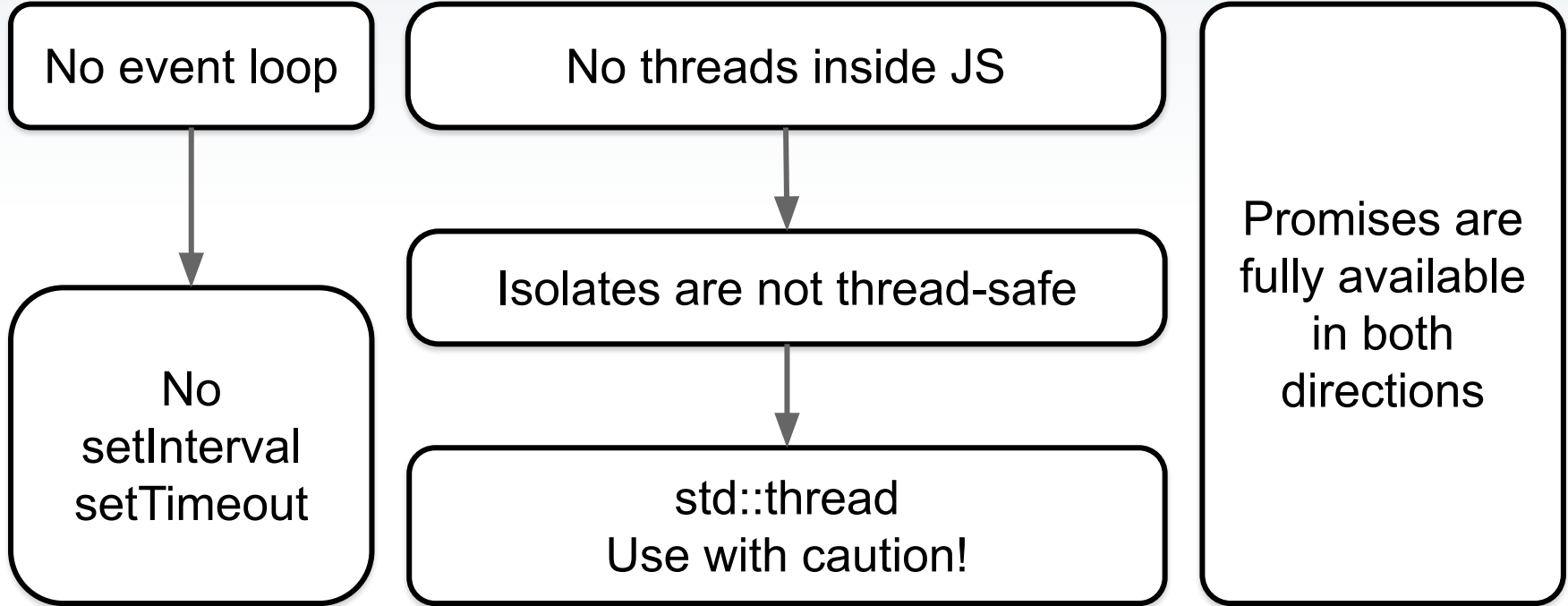


No dependency management system



No third-party libraries

Embedding.JS.V8.Async

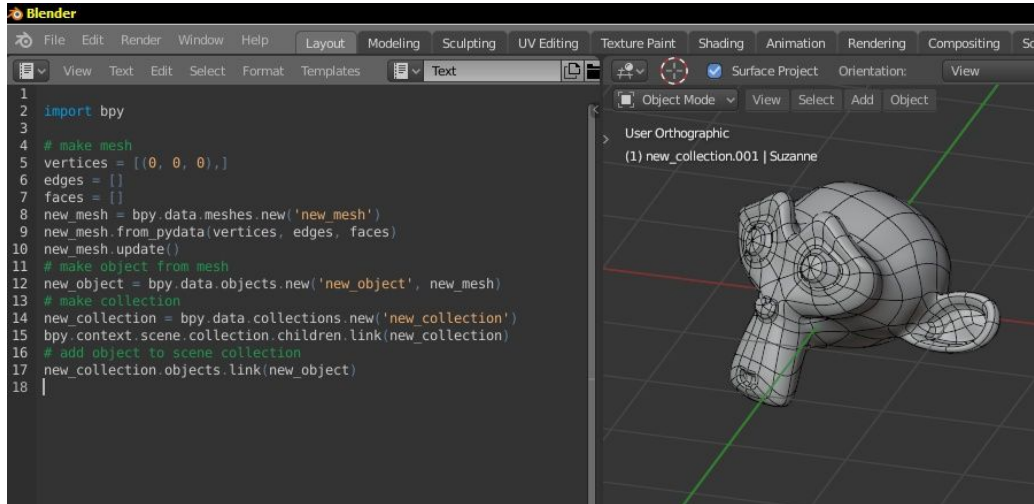


Why use embedding?



➤ Speeding up development
(no compilations)

➤ Macros / Plugins / Modding



[Credit](#) ↗

Why use embedding?



> DSL

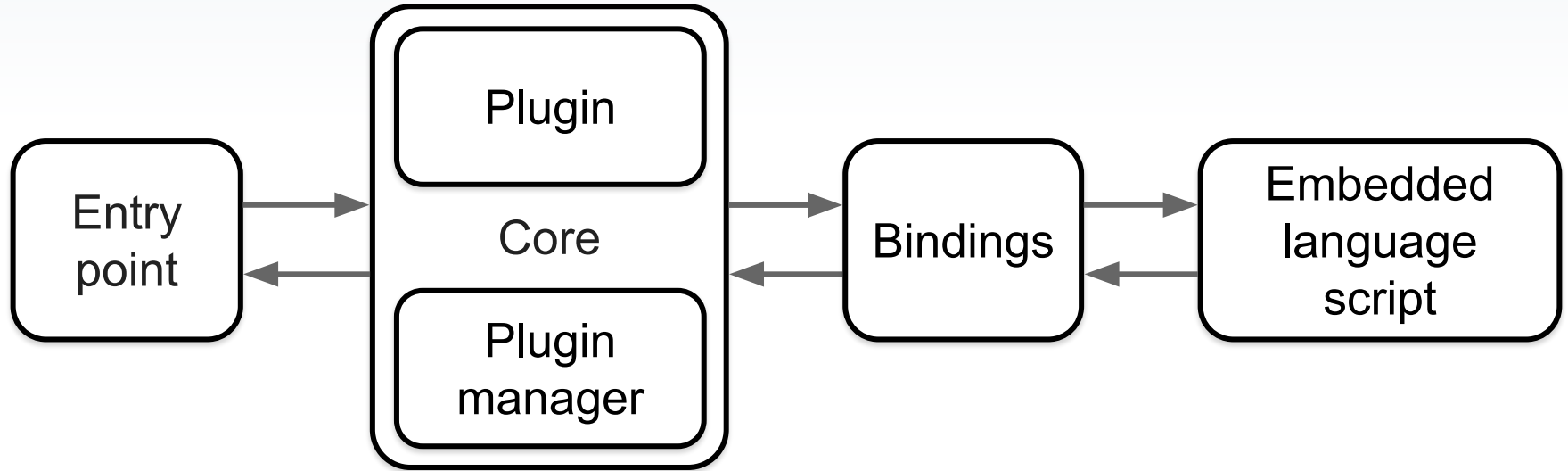
```
plugins {  
    id 'com.android.application'  
    id 'org.jetbrains.kotlin.android'  
}  
dependencies {  
    implementation 'androidx.appcompat:appcompat:1.6.1'  
    testImplementation 'junit:junit:4.13.2'  
}
```

Embedding.WhoUses?



Embedding.Architecture.

AppLevel



Extending

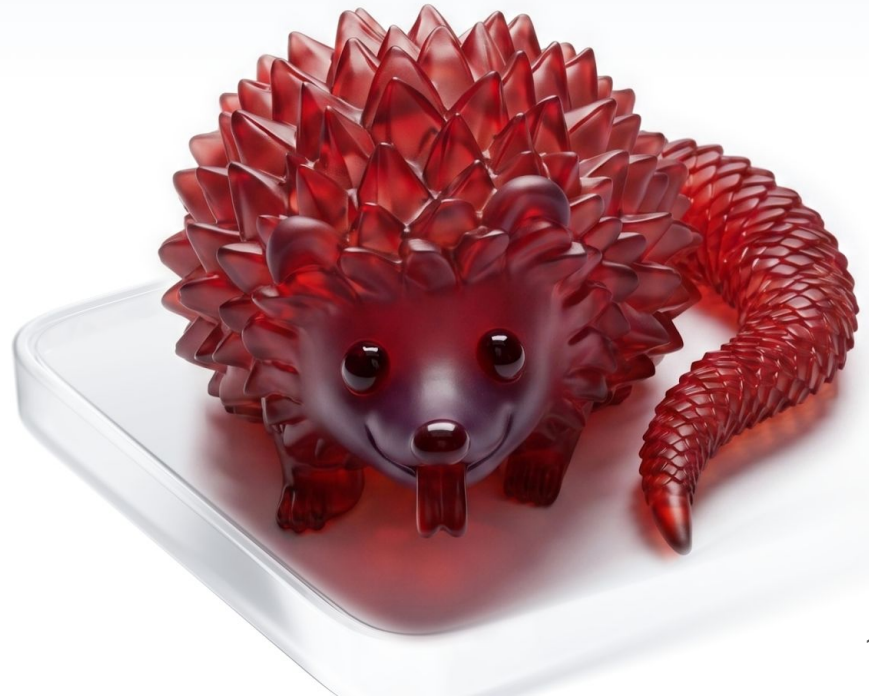


Extending.JS.Node.Demo



- DI
- Exceptions
- Third-party libraries
- Async

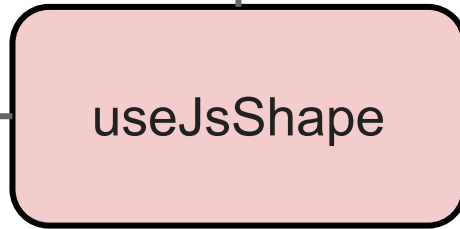
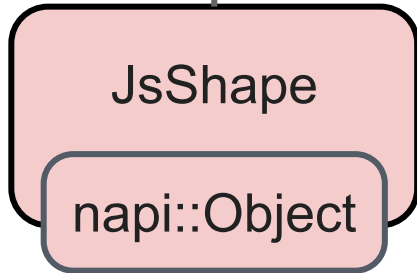
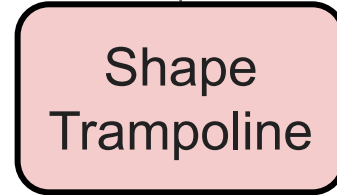
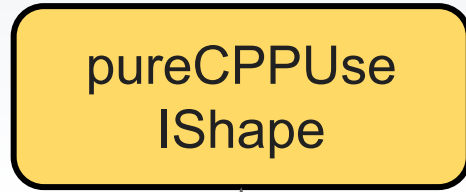
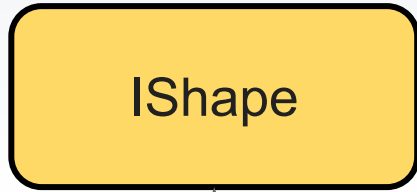
[Full example](#) ↗



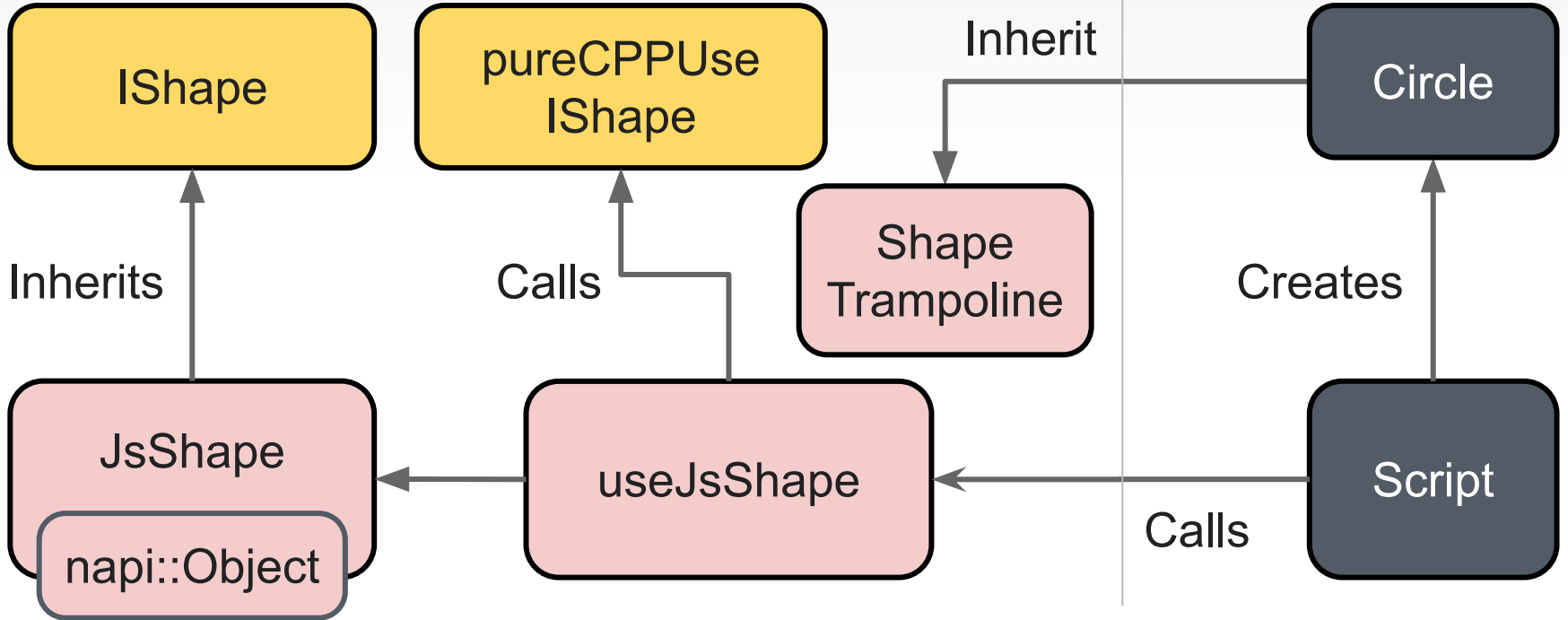
Extending.Inheritance.Pattern



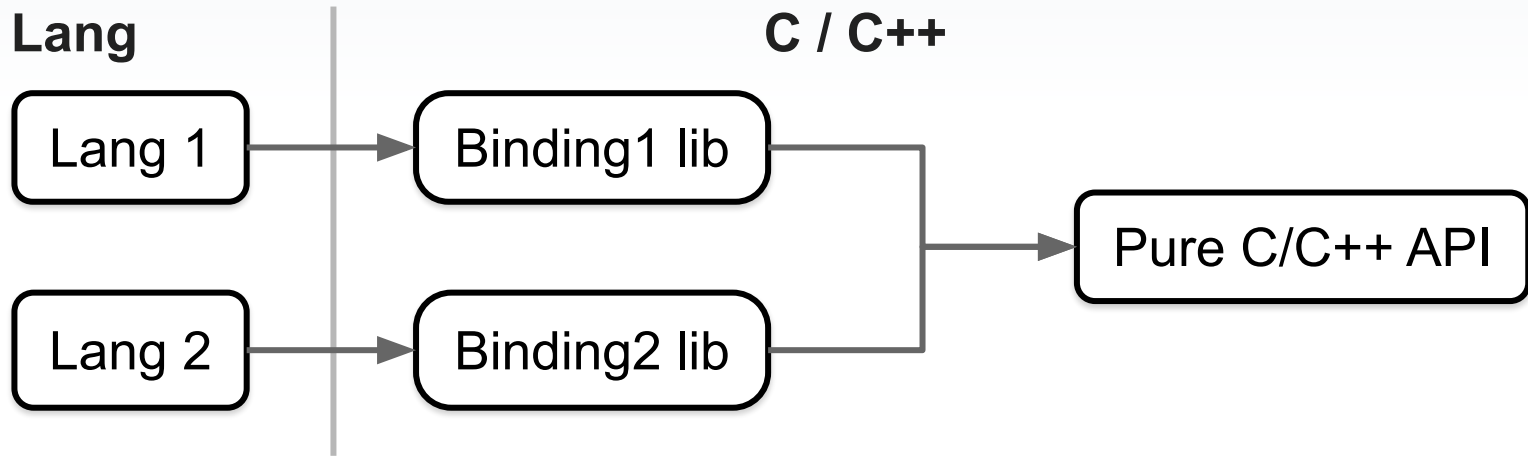
C++



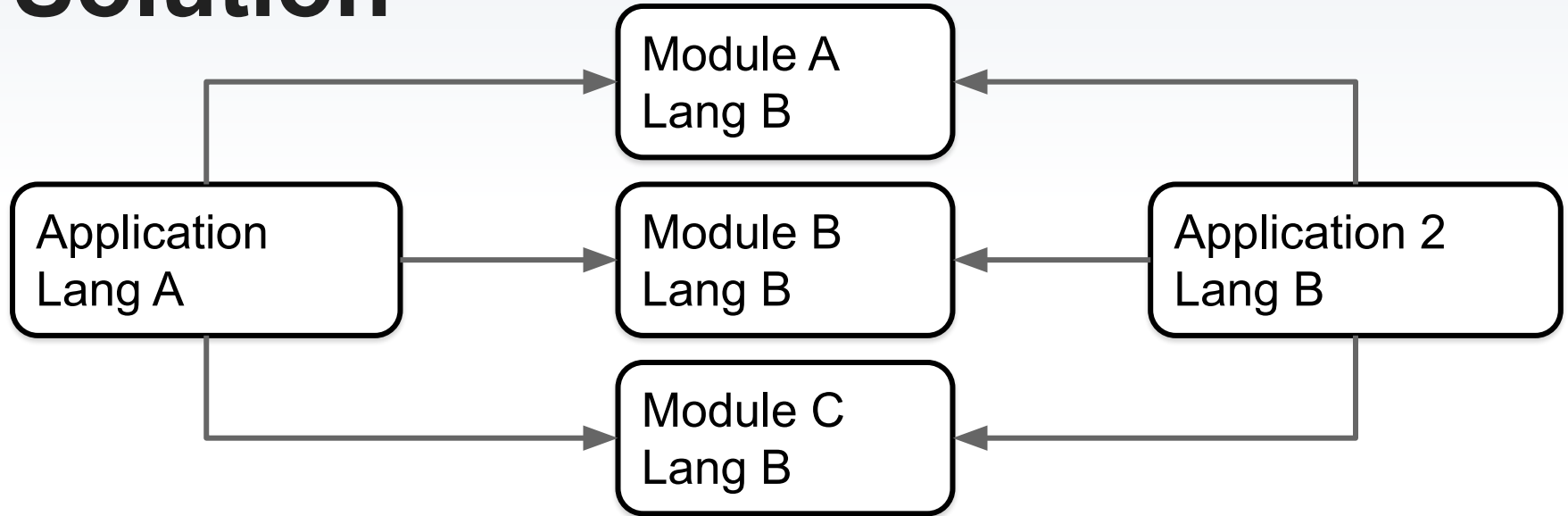
JS



Extending Architecture. Application



Extending Architecture. Solution



Extending.PracticalExample



Extending WhoUses?



Conclusion.Cons



- Additional technological complexity
- Complicated hiring processes
- Possible performance issues
- Higher entry threshold for newcomers + bindings

WhatElse?



- How to match build and package systems?
- How to debug the code under embedding/extending?
- How to test bindings layer?
- Emscripten and WASM?
- How do I choose a second language for my project?
- Bindings security?

Extending.Bonus.Lua.Demo



[Full example](#) ↗



> Gitlab

> Telegram: @Tsyshnatiy

**Thanks
for coming!**

