ActiveState

Solving Dependency Hell at Enterprise Scale

About ActiveState

Used by Millions of Developers and 97% of Fortune 1000

20+ Years of Open Source Language Experience

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Introductions

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CTO

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ActiveState

Housekeeping

- Session: 30 minutes; Live Q&A: 15 minutes
- You can also ask questions in the Q&A tab
- There will be two polls and a survey afterwards - your feedback is crucial!
- Recording of this will be available and sent to you

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Agenda

- Time Managing Dependencies
- Causes of Dependency Hell
- Best Practices: Pros & Cons
- ActiveState Platform
- Demo
- Q&A

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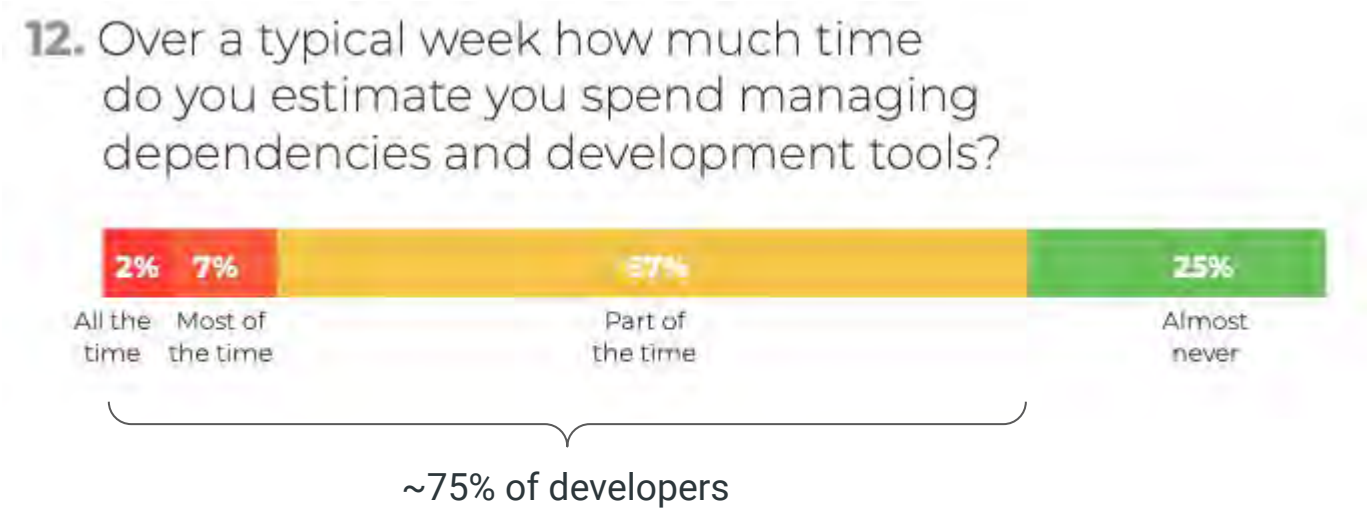
Time Spent Managing Dependencies



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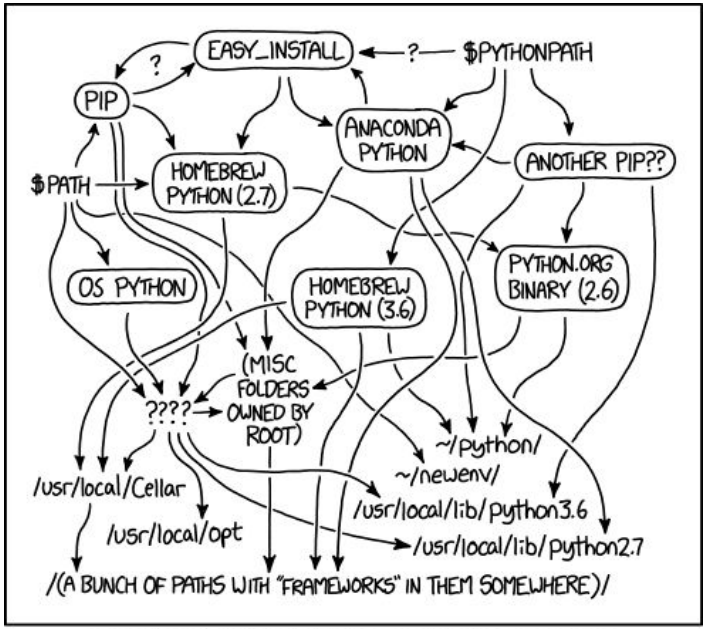
How Did We Get Here?

- Newbies & out of date READMEs
- Incompatible packages you require (new features/ bug fixes/security updates)
- New operating environment
- Installers don't check existing dependencies before stepping on them
- Monkey patching third-party code
- Using multiple package managers per language (ie., pip + conda for Python)



MY PYTHON ENVIRONMENT HAS BECOME SO DEGRADED THAT MY LAPTOP HAS BEEN DECLARED A SUPERFUND SITE.

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Poll: How much time do your devs spend managing dependencies?

- <10% of a sprint
- 10-25%
- 25-50%
- >50%

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Ramifications of Poor Dependency Management

- Don't want to touch the environment since it might break the build
- Updates snowball if not fixed quickly enough, making the problem worse
- “Works on my machine” & environment reproducibility issues
- Auditing open source dependencies becomes increasingly difficult

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Tactics for Managing Dependency Hell

1. Rely on package managers and direct repository access
2. Repository Proxy/Caching
3. Standardize Native Deps with VMs/Container Images
4. Vendor code under source control

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Rely on Package Managers

PROS

- Easy to set up
- Community support
- Infrastructure as code

CONS

- Tool proliferation: you need O + L tools
- Availability of prebuilt packages vary by OS (they'll have to be built at some point)
- Poor locking support leads to inconsistent states
- Things change on the Internet

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Repository Proxy/Caching

PROS

- Keep teams and environments consistent (mostly)
- Modest level of provenance tracking
- Share internally built artifacts
- Central place to audit package use
- Vet packages before others use them

CONS

- **Poor support for native libraries**
- Inconsistent states still possible
- Building still an issue
- **Vetting introduces friction**

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VMs/Container Images - (for native libraries)

PROS

- Better support for consistent use of native packages
- Faster deployment speeds
- Reduces the number of tools downstream consumers need to worry about

CONS

- No universal image format. Tool usage is now O+L+I for DevOps
- Building and using images is hard
- Distribution mechanic synchronization, backwards compatibility
- Multiple project issues
- **Even more vetting friction**

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Vendoring Dependencies (reduce vetting friction)

PROS

- Building from source is the ultimate way to support Native
- Support for provenance tracking
- Allows for customization and patching that upstream authors may be slow to bring in

CONS

- Need to setup a CI system and toolchains to support building
- Need to be an expert for each supported OS
- Need a local build process tool like Bazel, Make, Scons, etc.
- Need artifact storage

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Make it Someone Else's Problem

PROS

- It's someone else problem!

CONS

- Finding something to do with your free time

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Poll: How do you manage dependencies?

- Use native package manager to pin everything
- Use a pre-resolved set of dependencies in an artifact repository
- Use VM/Container base images
- Self vendor all dependencies in source control system

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The Need for Good Dependency Management

- $$
- Optimal utilization of your most valuable devs
- Maximize dev satisfaction by letting them work on the things they want to work on
- Delayed time to market

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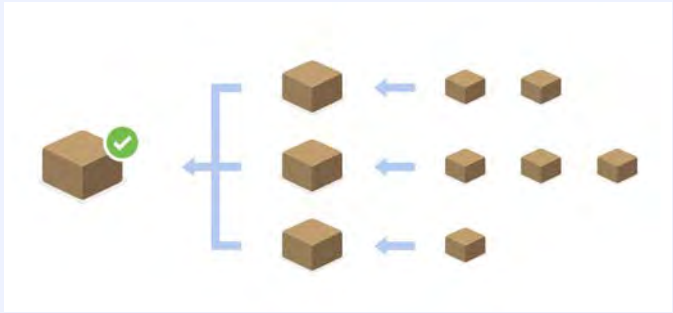
ActiveState Platform — Your Team's Supply Chain for Trusted Open Source Artifacts

Includes:

- Catalog of 4M+ Vendored Open Source Components & Recipes
- Universal Dependency Solver
- Hermetically Sealed Multi-OS Build Farm
- Declarative Project Oriented UX/API
- Powerful Revision Control Features



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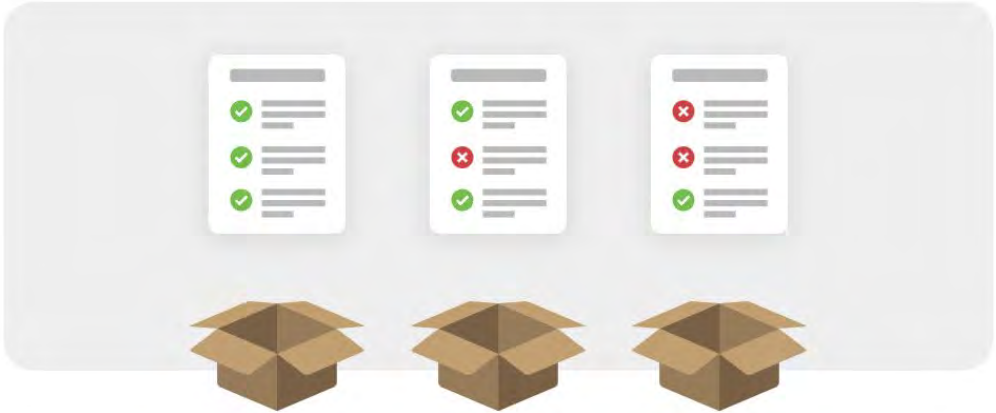
Single Set of Cloud Based Cross Platform Tools for:

- Build
- Distribute
- Maintain
- Monitor



Runtimes for your Open Source based projects

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How it Works

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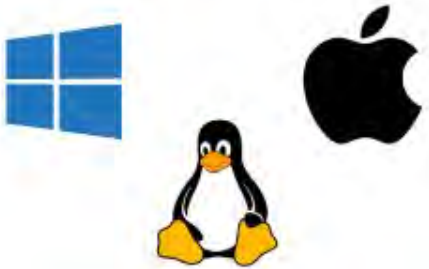
Create a Project with Requirements and Operating Systems

+ request 2.19.1
+ wxPython 4.0.2



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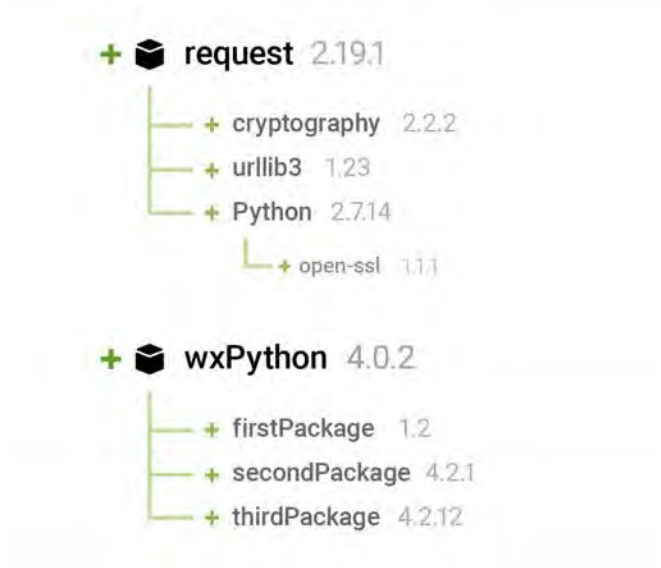
ActiveState Resolves the Complete Set of Dependencies



Including native libraries!

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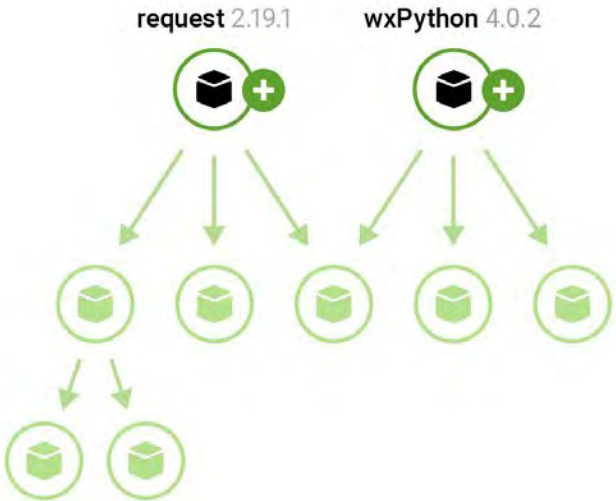
All Components are Built, Hermetically Sealed, in the Cloud from Source!



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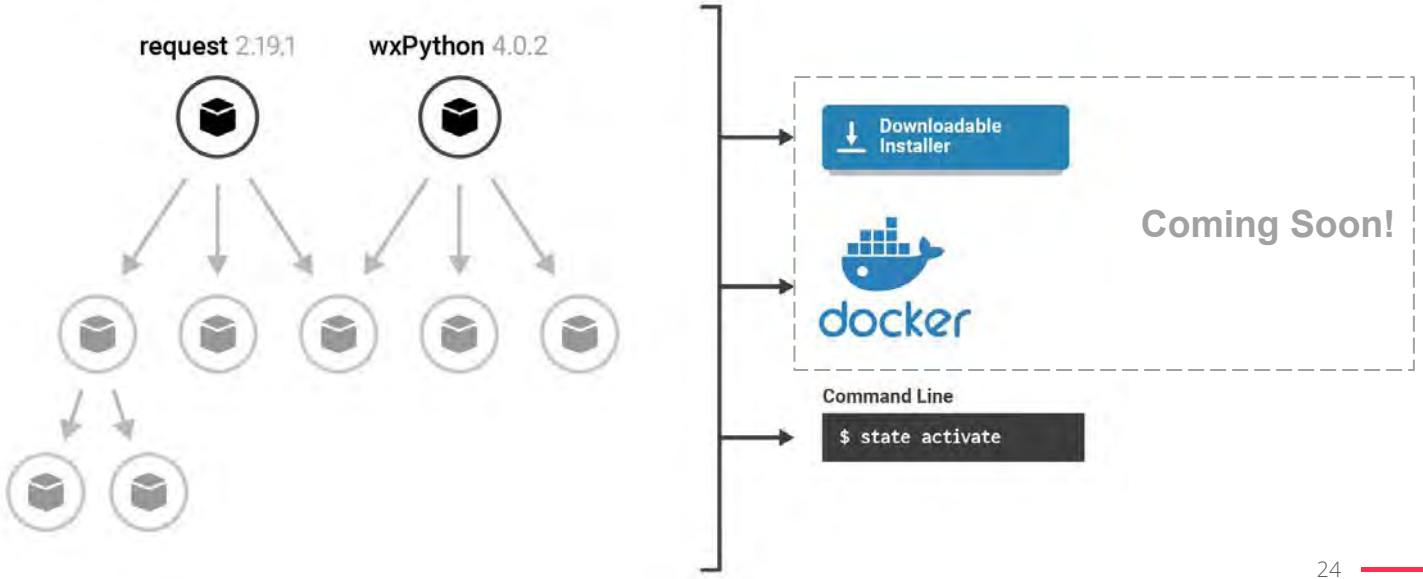
An Array of Distribution Mechanisms



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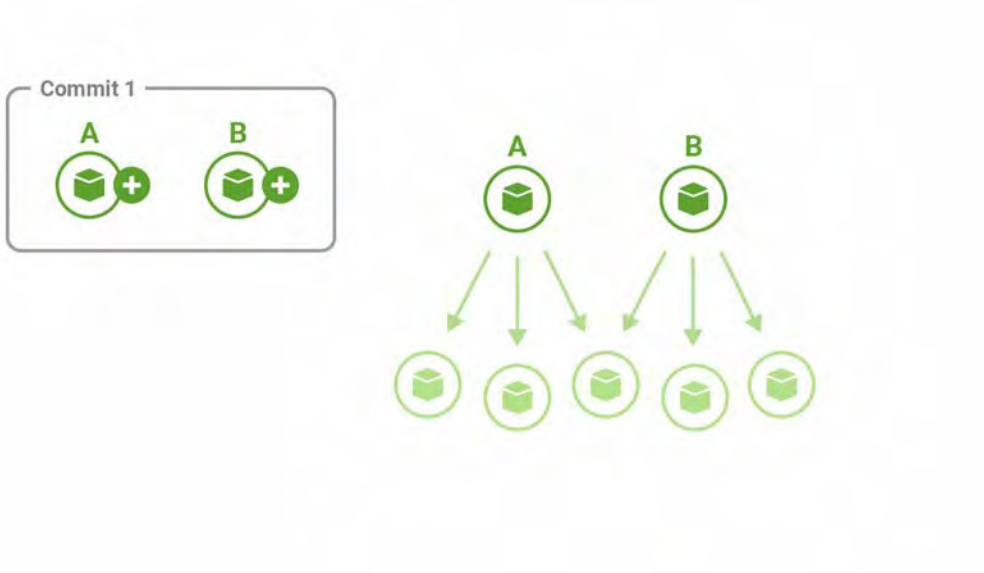
We've Marries Dependency Management with Revision Control



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Every Dependency Change is Tracked, Including who Made it and Why

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Includes Fine Grain Control of Dependencies by Operating Environment

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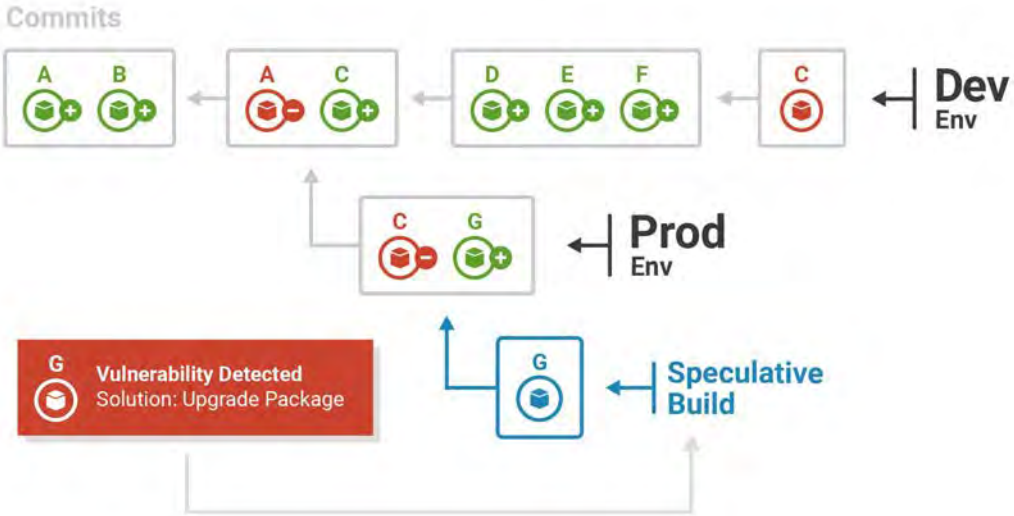
ActiveState Monitors for Risks and Suggests Upgrades Where Appropriate



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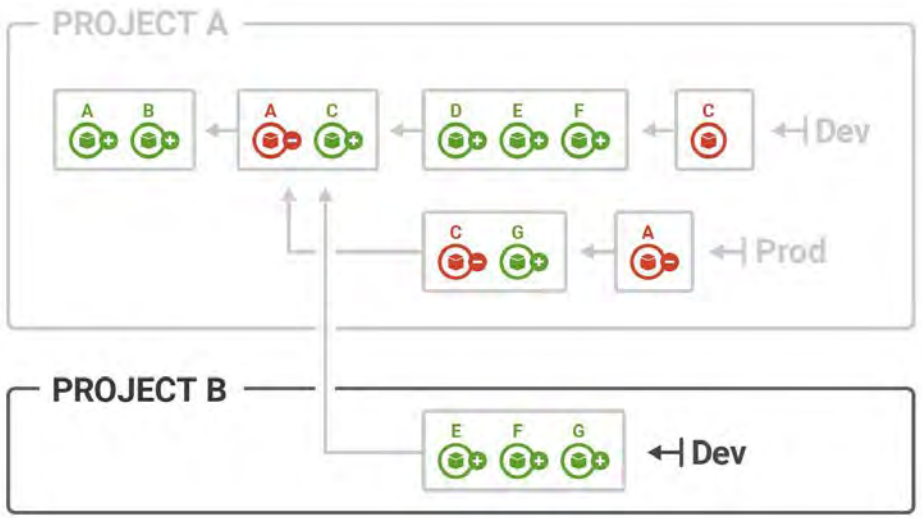
Existing PRojects Can be Used as Templates



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Platform Demo

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Demo: Getting Out of Dependency Hell

https://www.youtube.com/watch?v=4WIL_cNVZ1E

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Next Steps

Schedule a demo with our product experts:
https://www.activestate.com/get-demo/

Learn more about dependency management:
https://www.activestate.com/blog/dependency-resolution-optimization-activestates-approach/

Try the ActiveState Platform for free:
https://platform.activestate.com/

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Webinar Feedback

Take our quick survey!
https://www.surveymonkey.com/r/dependency-hell