



Project Variants

Bringing configurations to the platform

September, 2010

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CDT vs Platform – the battle

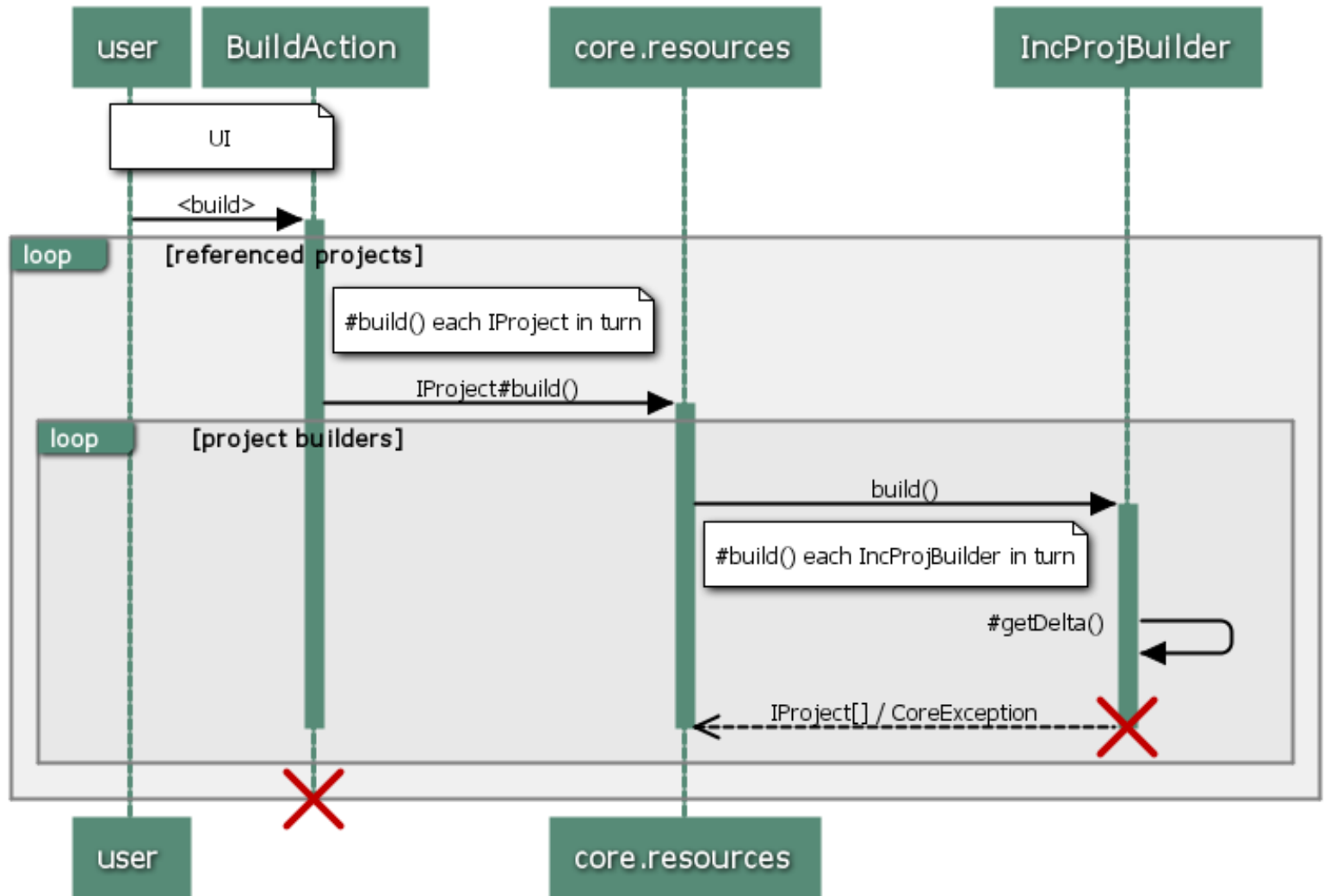
- **Platform**

- Java centric build model
- No real support for references
 - Why am I being built?
 - No API to build Project + References
- No support for ‘configurations’
 - All project builds are identical
- Builders are assumed to be fast

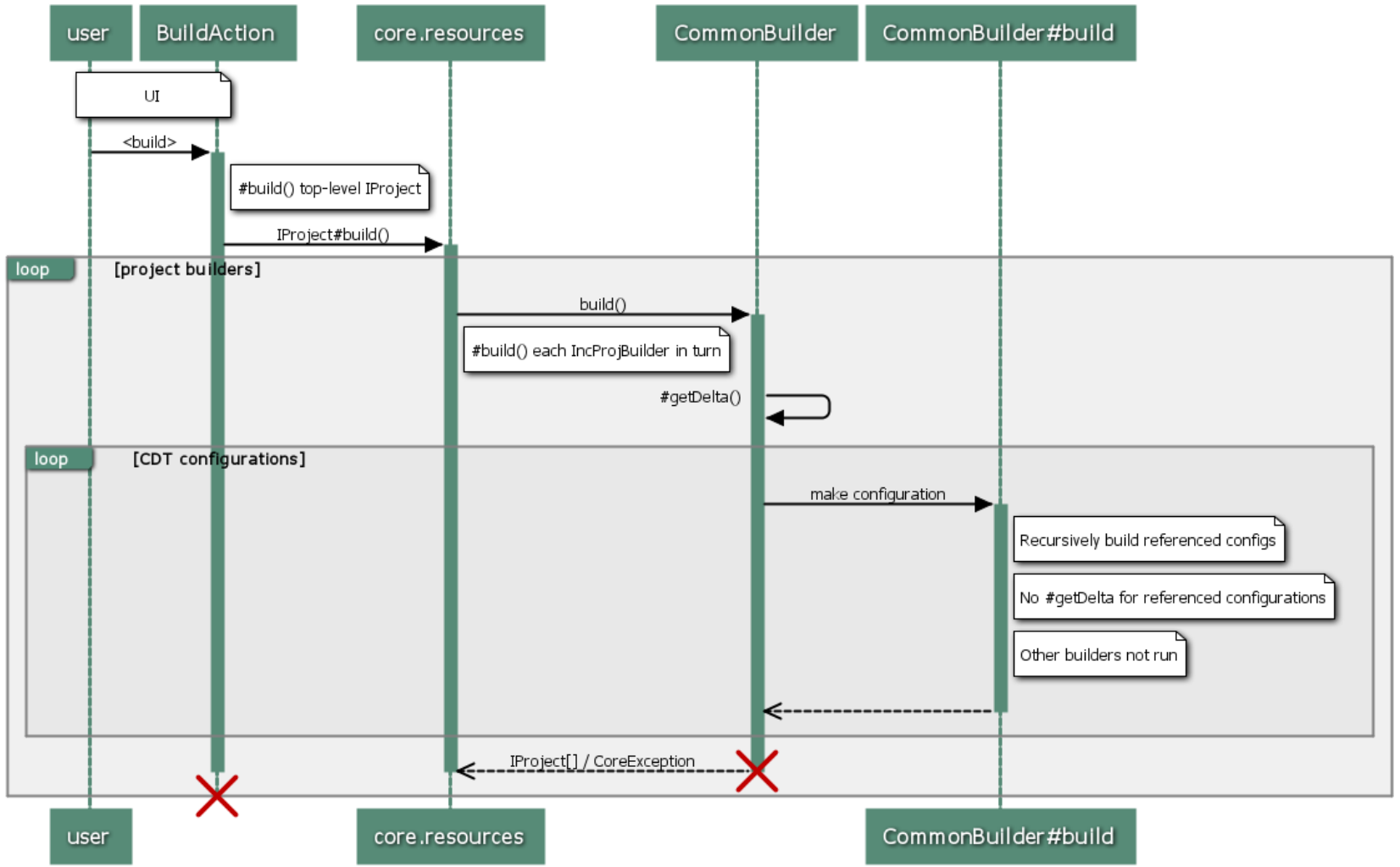
- **CDT**

- Many configurations
- Slow builders
- Complex references between configurations

Anatomy of a Build



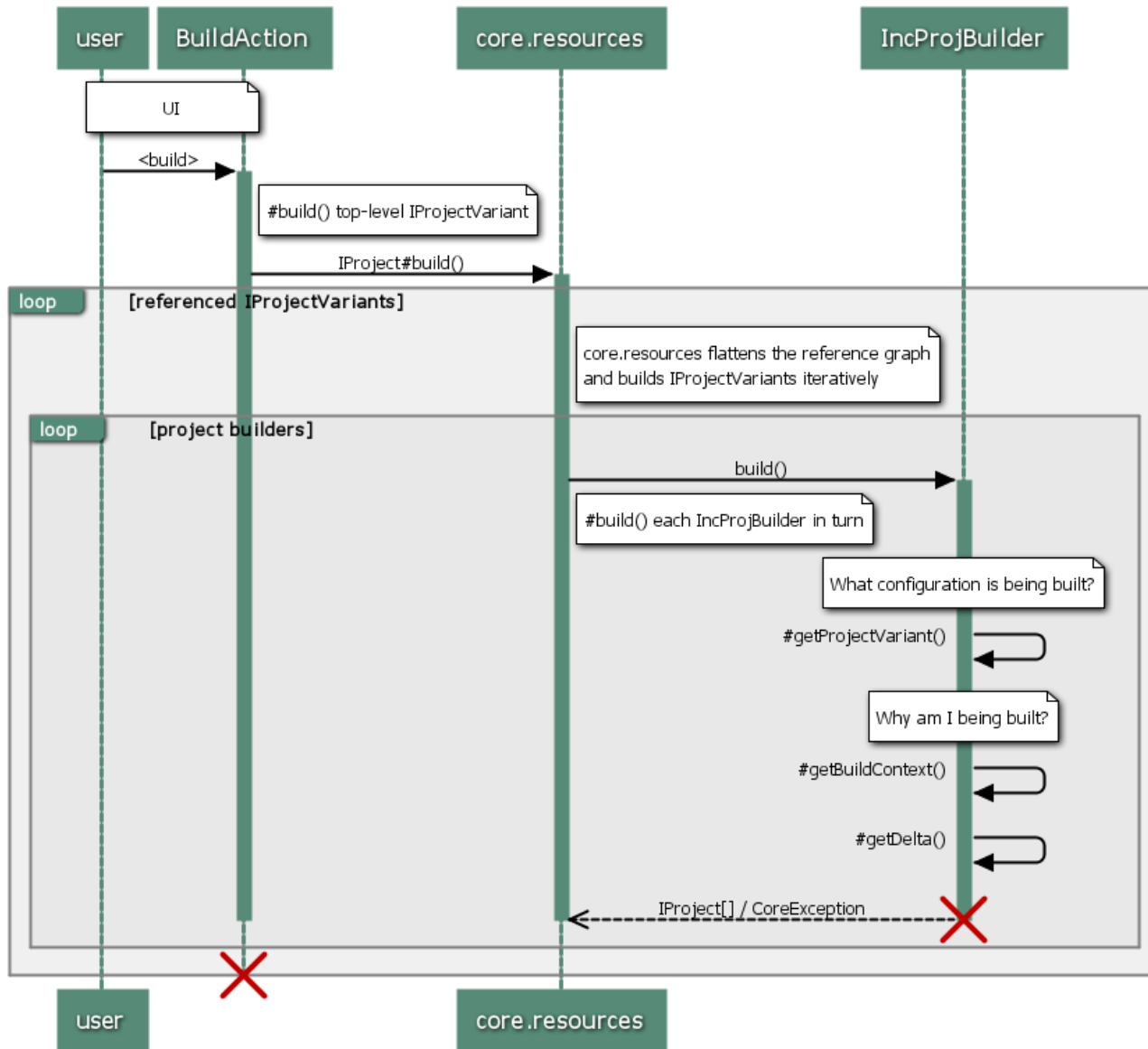
Anatomy of a CDT Build



Problems

- **Too much building**
 - CDT implicitly builds referenced configurations
 - BuildAction builds project references
 - Workspace locked → User blocked for significant periods
- **Not enough building**
 - Only 1 of N project configuration up to date
 - #getDelta() is per-Project not per-Configuration
 - Platform builders aren't run
- **Incorrect builds**
 - Building with out-of-date makefiles
 - #getDelta() not useful → must regenerate makefiles
 - Build failures
 - Referenced configuration are built recursively
 - *Or worse: 'successful', but broken builds*

IProjectVariants to the rescue



Requirements

- **core.resources: API for callers**
 - API for building IProjectVariant + references
 - Single entry point for all callers: BuildAction; Launch; Auto-build...
 - Reference graph is flattened
 - Low-level references built only once
 - Unified set of platform references
 - Straightforward + clean

- **core.resources: API for builders**
 - Builders which don't care about Variants are unchanged
 - Builders have context about why the Variant is being built
 - Decide what needs building
 - Allow postponing a build if the build output isn't necessary
 - e.g. References of static libraries
 - Builders have access to a reliable per-Variant delta
 - Even with relaxed scheduling rules!

User API to manage IProjectVariants

- **IProject / IProject Description**
 - newVariant(String name)
 - IProjectVariant[] getVariants()
 - setReferencedProjectVariants(...)
 - get/setActiveVariant
- **IProjectVariant – a project configuration**
 - String getVariantName()
 - IProject getProject()
- **IProjectVariantReference – reference to another IProjectVariant**
 - get/setVariantName(...)
 - getProject(...)

Build API

- **IncrementalProjectBuilder**
 - IProjectVariant getProjectVariant()
 - IBuildContext getBuildContext()
 - rememberLastBuildDelta()
- **IBuildContext**
 - getBuiltProjectVariants()
 - getReferencingVariants()
- **IWorkspace**
 - build(IProjectVariant[] ...)
 - computeProjectVariantOrder(...)
- **IProject**
 - build(IProjectVariant...)

- [Bug 325489](#) Add support for Project Variants
- [Bug 309769](#) CDT Project References problems (top-level)
 [+16 dependents]
 - [Bug 309714](#) Common Builder is a mess
 - [Bug 291751](#) Referenced projects built twice
 - [Bug 317402](#) Not all builders invoked for referenced projects
 - [Bug 320423](#) Changed projects built multiple times
 - [Bug 256233](#) Option to prevent building referenced project
 - [Bug 317162](#) Two project reference dialogs
 - ...



Thank You