Hot Patching Model Changes in Papyrus-RT

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Dynamic Software Updating

• Dynamic software updating is the process of updating a running piece of software without halting the execution – fixing bugs
– adding new features

• Important for critical non-stop systems
– telecommunication
– air traffic control
– financial transaction processing
Dynamic Software Updating - Examples

- Unreal Engine
- Crytek Engine
- Bitsquid Engine
- Visual Studio Edit and Continue
- Runtime Compiled C++
- Kitsune for patching the Linux kernel
- Oracle's Java Hotswap VM
- The Erlang programming language
- ...
Hot Patching Model Changes
General Approach

1. **Dynamic Loading**: code changes are loaded at runtime as shared libraries

2. **Dynamic Linking**: existing references are updated to point to newly loaded definitions

3. **State Transfer**: state of the program must be transferred correctly to the updated program
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