Build Automation at Model Level

MBuild

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Existing Process in Code Based Development

Code Based Development

Master  Hotfix  Release  Develop  Feature  Feature

v0.1  v0.2  v1.0

Montreal-Dec, 2017
Existing Process in Model Based Development

Model Based Development

Model Versions

M1

M2

M3

Source Code Versions

C1

C2

C3

Problem ??

Redundant Work

Need for Synchronization

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Existing Process in Model Based Development

UML-RT Model

Incremental Code Generation

In Local Workspace

C++ Code for changed element and make script for whole model

Existing Code Generation process of Model Based Development
Solution in Model Based Development

Model version in Git Repository

M1

M2

M3

Access the source code

Impact Analysis on Models

Incremental Code Generation

Full Code Generation
Approach

Model Version 1

Model Version 2

Present in Git Repository

✓ Compare Models
✓ Impact Analysis on Models

Code Generation for Changed Elements

Patch Generation

Incremental Build Or Complete Build for Model Level Changes

Build Automation Tool - MBuild
Example

Impacted Elements – Top

Change

Pinger

Impacted Elements – Top
## Typical Code Generation vs MBuild

<table>
<thead>
<tr>
<th>Existing Code Generation</th>
<th>MBuild</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMakeLists.txt</td>
<td>CMakeLists.txt</td>
</tr>
<tr>
<td>Makefile</td>
<td>Makefile</td>
</tr>
<tr>
<td>MakefileTop.mk</td>
<td>MakefileTop.mk</td>
</tr>
<tr>
<td>Pinger.cc</td>
<td>Pinger.cc</td>
</tr>
<tr>
<td>Pinger.hh</td>
<td>Pinger.hh</td>
</tr>
<tr>
<td>PingPong.cc</td>
<td>PingPong.hh</td>
</tr>
<tr>
<td>PingPong.hh</td>
<td>PingPong.hh</td>
</tr>
<tr>
<td>Ponger.cc</td>
<td>Ponger.hh</td>
</tr>
<tr>
<td>Ponger.hh</td>
<td>Ponger.hh</td>
</tr>
<tr>
<td>Top-connections.log</td>
<td>Top-connections.log</td>
</tr>
<tr>
<td>Top.cc</td>
<td>Top.cc</td>
</tr>
<tr>
<td>Top.hh</td>
<td>Top.hh</td>
</tr>
<tr>
<td>TopControllers.cc</td>
<td>TopControllers.cc</td>
</tr>
<tr>
<td>TopControllers.hh</td>
<td>TopControllers.hh</td>
</tr>
<tr>
<td>TopMain.cc</td>
<td>TopMain.cc</td>
</tr>
</tbody>
</table>
Why Do We Need This??

- Access to any version of models and its Source code from Repository
- Revise historical changes on models.
- Helps to predict the cost and complexity of changes.
- No need to be in the local workspace for code generation.
- Helps to decide whether to implement changes in a new release or not.
Thank You