Relying on Jenkins CI to facilitate strategic re-use of software assets

Flemming Ask Sørensen
Project Manager
Global Support
GRUNDFOS A/S
flemmingsorensen@grundfos.com www.grundfos.com

Outline

- **Briefly about Grundfos**
- Motivation for Software @ Grundfos
- From Project Oriented to Core Asset Development
- The Build Environment

Grundfos in brief

Grundfos primarily manufactures:

- Circulator pumps
- Water booster pumps/systems
- Submersible pumps
- Industrial pumps
- Dosing pumps

- The world's largest manufacturer of pumps and pump systems
- Production and sales of electronic motors
- Development, production and sale of electronics for the control of pumps and pump systems
- Development, production and sales of New Business products

The Grundfos Purpose

Grundfos is a global leader in advanced pump solutions and a trendsetter in water technology. We contribute to global sustainability by pioneering technologies that improve quality of life for people and care for the planet.

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Sustainability is one of the motivations for software in pumps

Typically, existing pumps are D-labelled. Replacing them with new Grundfos A-labelled products can provide huge energy savings. A-labelled circulator pumps use up to 80% less energy than D-labelled pumps, and can cut up to 10% off an average household’s energy bill.

The internationally recognised independent organisation Europump estimated that changing all the D-labelled pumps in Europe to A-labelled models would save 44 billion kWh every year. That's the same as the total power output of five nuclear plants.

Source: http://www.grundfos.com/about-us/news-and-press/news/grundfos-helps-combatglobalwarming.html


Control Mode
AUTO
ADAPT


GRUNDFOS


DASHBOARD
Performance
Alarms and warnings


R 100
GRUNDFOS


GRUNDFOS REMOTE MANAGEMENT
INTERNET
Local Telecom network
BE THINK INNOVATE
GRUNDFOS


ALPHA2 Explorer

Grundfos Development Sites with Software development

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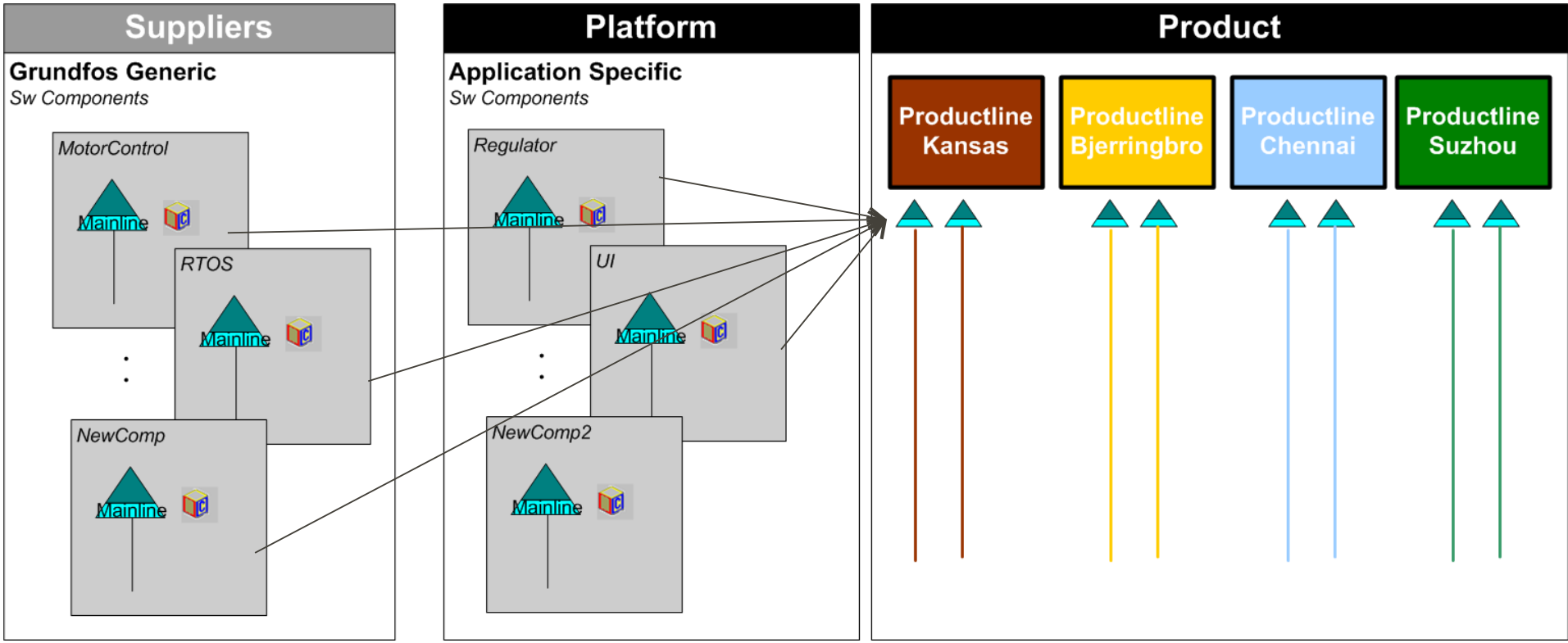
Grundfos Global Software Core Asset Development and Product line Configuration



Risks inherent to Reuse Strategies

- **Complexity:** Reuse can add complexity by creating dependencies between previously autonomous organizational units.
- **Web of dependencies**: Can lead to a “lockstep” evolution model in which everyone has to evolve synchronously.
- **Coordination cost**: Dependencies require significant synchronization and alignment.
- **Integration cost**: Often the cost is higher than expected due to the complexity of configuring and integrating the selected shared assets.
- **Process & tool divergence**: Teams with diverging “external” interfaces, e.g. different release cycles and mechanisms, “creative” interface management, immature requirements management, lacking quality management, etc. CAN jeopardize the product line effort.

Strategic reuse creates competitive advantage
as long as we succeed to manage to these risks

Bosch.pdf

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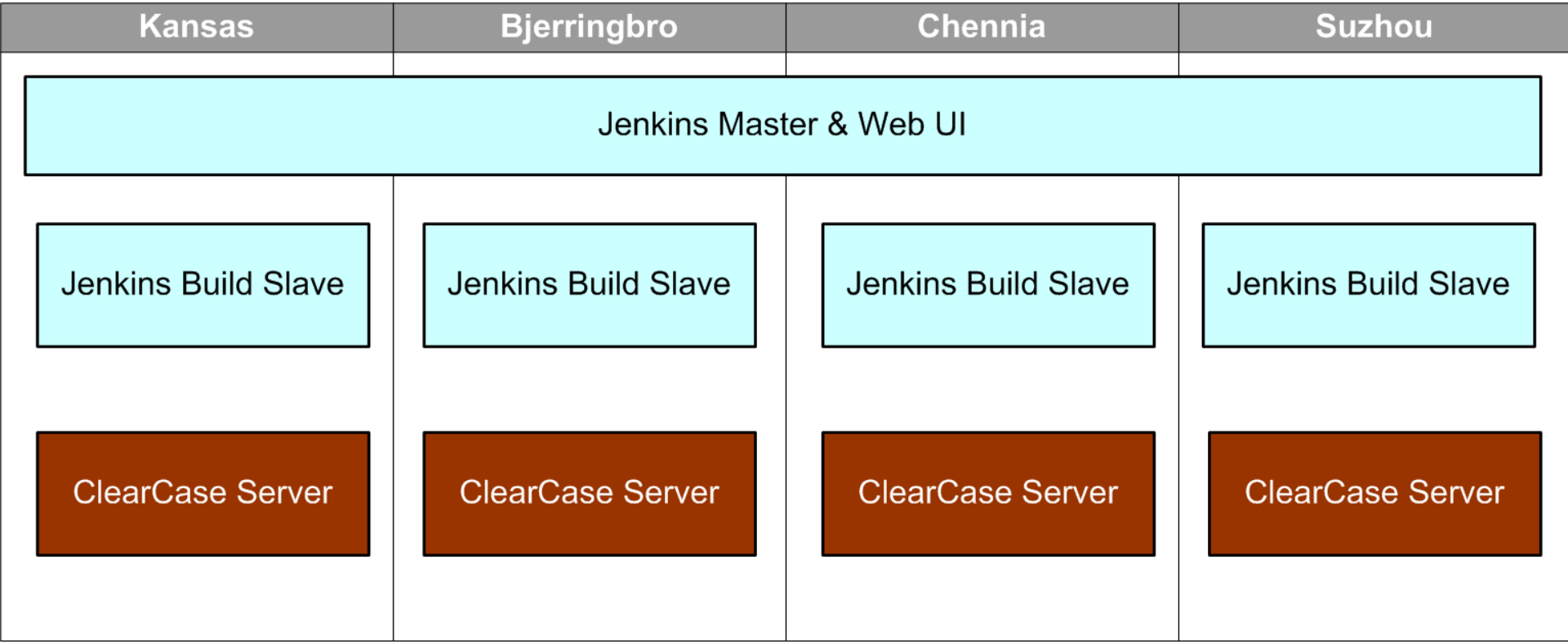
- **The Build Environment**

Grundfos Development Sites and Tool deployment



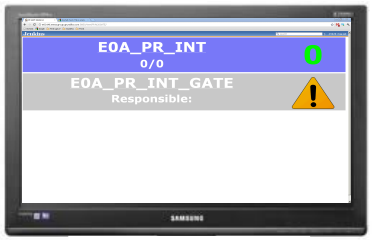
Grundfos Global Software strives towards a situation where:

- Software engineer checks in code => system compiles, links, tests and “deploys” the new code

- The automated QA infrastructure, NOT the Software engineer, is responsible for checking that the system does not go down

GATE - Automated test and work flow vision on the product level

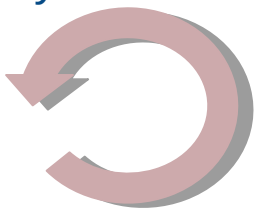
Display on wall



Instant test feedback to developer

Test beds

Fully automated

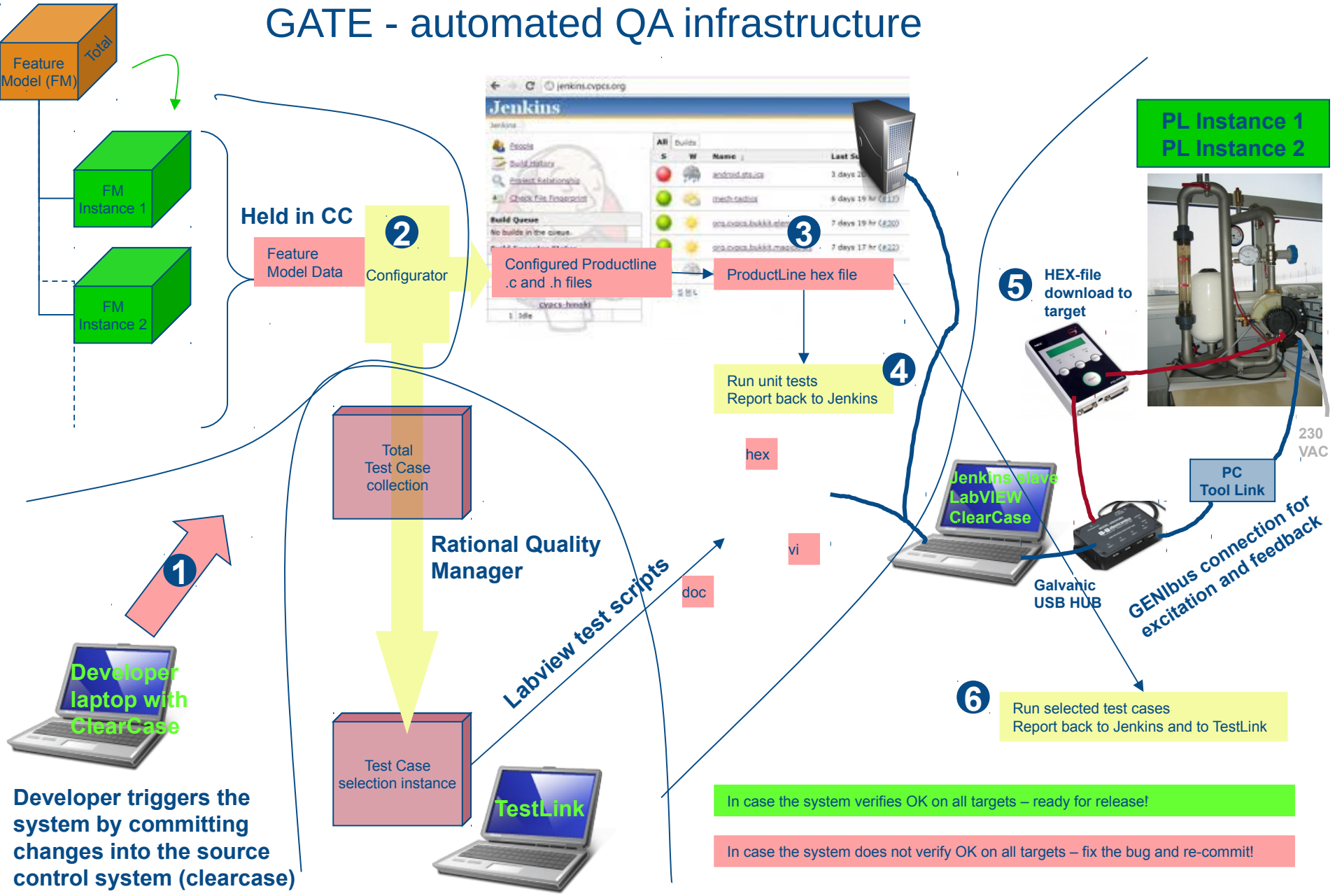


Developer

Commits changes to

Tested in all targets

GATE - automated QA infrastructure




Brandmateriel

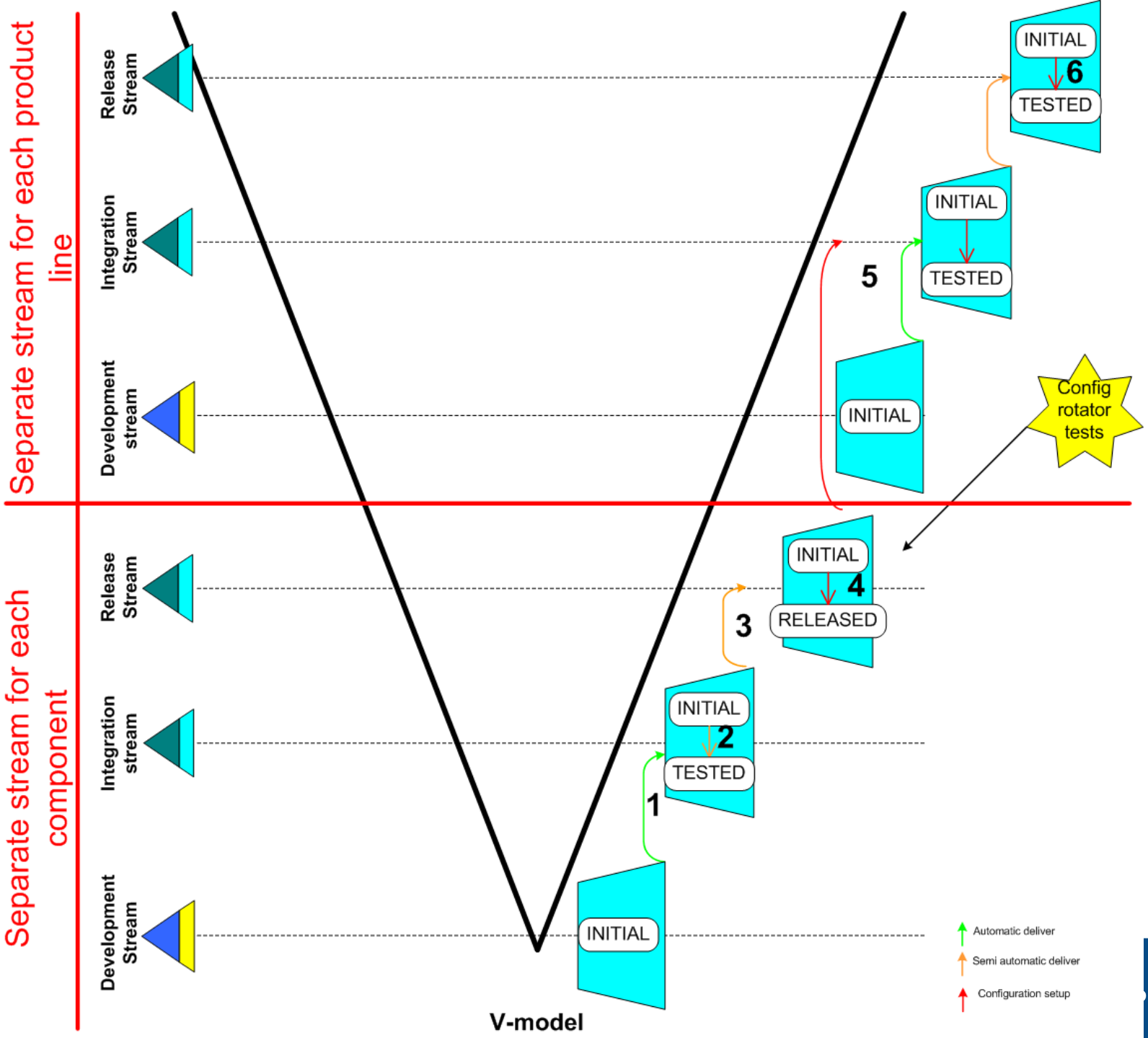
Jenkins Plugins used:

- ClearCase UCM Plugin — A Praqmatic integration to ClearCase UCM, simplifying continuous integration with Jenkins. Developed by Praqma
  https://wiki.jenkins-ci.org/display/JENKINS/ClearCase+UCM+Plugin

- Config Rotator Plugin. Developed by Praqma based on ideas from Grundfos
  https://wiki.jenkins-ci.org/display/JENKINS/Config+Rotator+Plugin

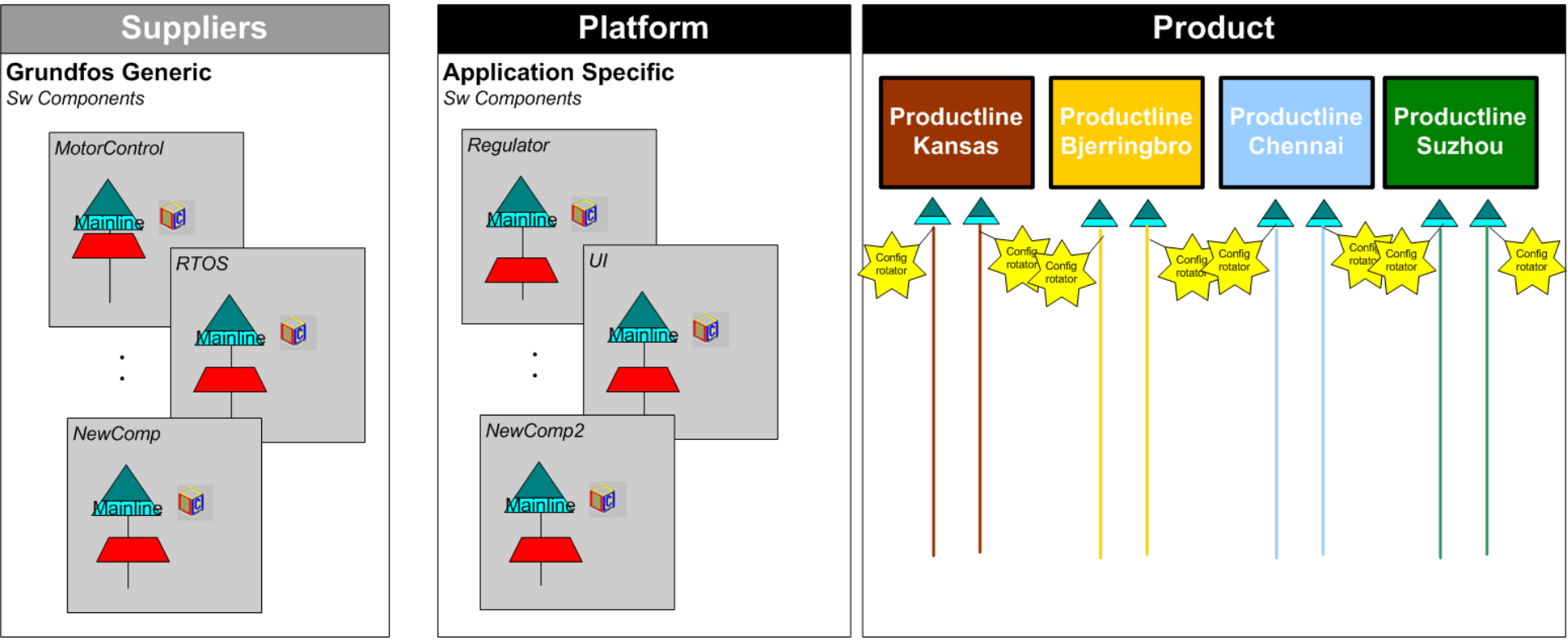
- Testlink Plugin.
  https://wiki.jenkins-ci.org/display/JENKINS/TestLink+Plugin

- and others like
  - Static Code Analysis
  - Groovy
  - and many more …….


Separate stream for each product line
Release Stream
Integration Stream
Development stream
INITIAL
6
TESTED
INITIAL
TESTED
5
INITIAL
Config rotator tests
Separate stream for each component
Release Stream
Integration stream
Development Stream
INITIAL
4
RELEASED
3
INITIAL
2
TESTED
1
INITIAL
V-model
Automatic deliver
Semi automatic deliver
Configuration setup

The purpose of the Config Rotator Plugin

To verify that a change in a component works in the Product lines that are using the component



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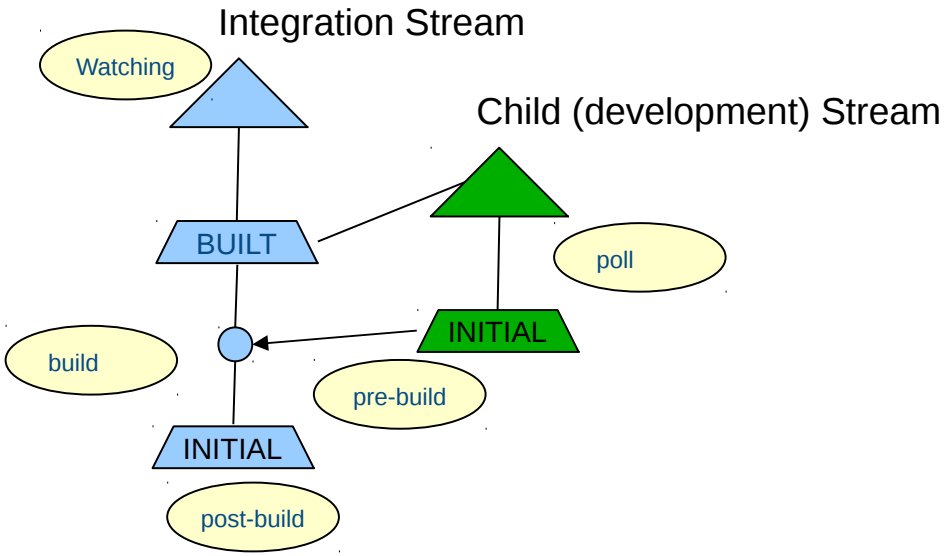
- **And finally a little bit about Jenkins plugins**

ClearCase UCM Plugin

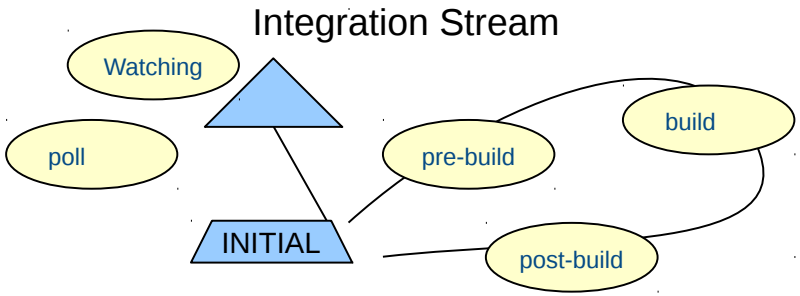
State Machine = Baseline Promotion levels

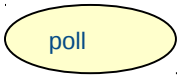
ClearCase UCM Plugin
poll child - mode



poll	Look for new baselines on all the child streams of the stream specified
pre-build	Setup a snapshot view on the baseline and deliver to the integration stream
build	Run the build steps
post-build	Complete the deliver if successful and create a baseline, else cancel

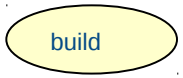
ClearCase UCM Plugin
poll self - mode





Look for new baselines on the stream itself

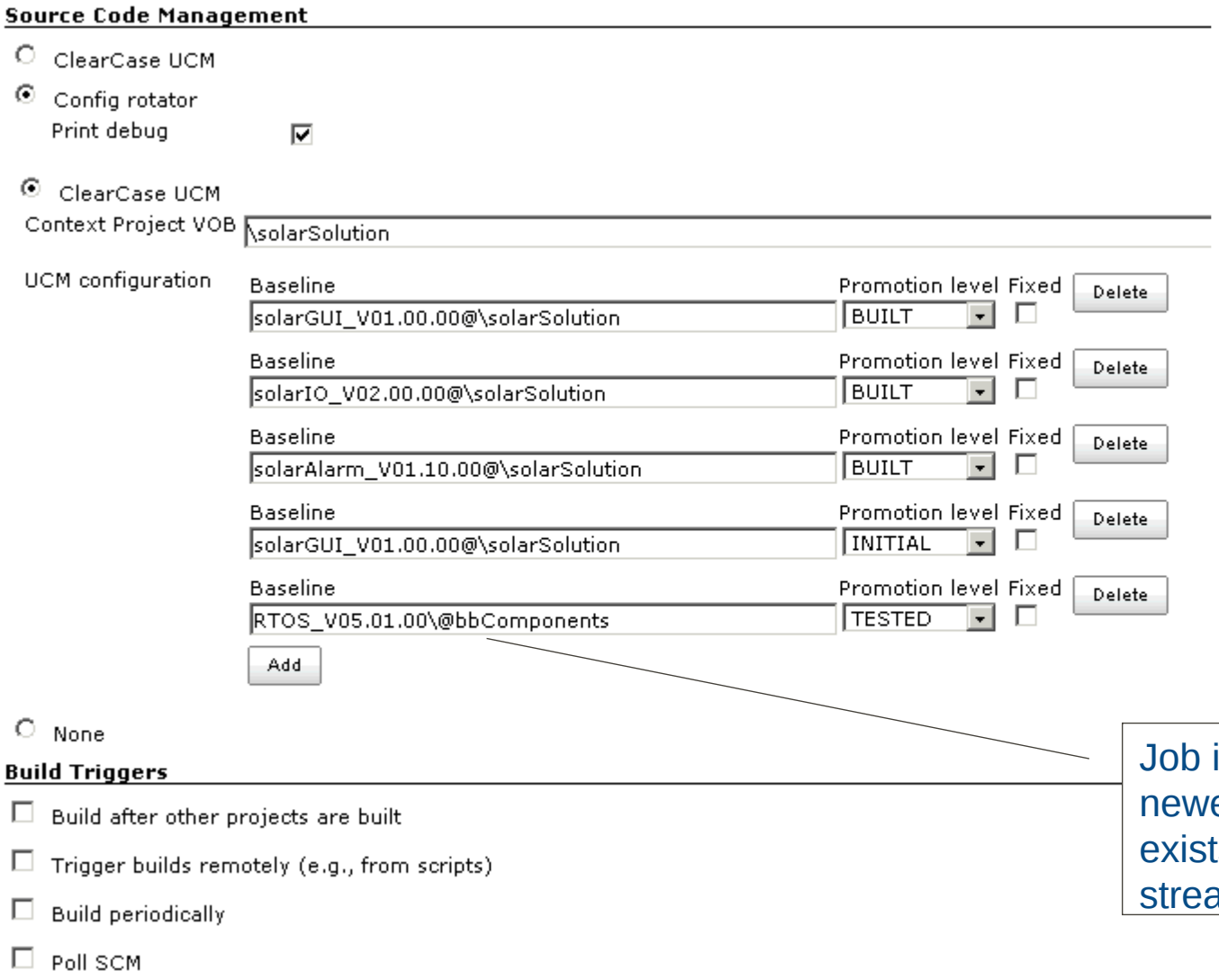
Setup a snapshot view on the baseline



Run the build steps

Promote and recommend the baseline. Or reject it

Config Rotator Plugin



Defines where your workspace is created

Defines your initial workspace

Job is executed if a newer baseline exists on the same stream

Thank You & Questions