Eclipse ALM on wheels

- Jyothi G Shivashankar
  (Robert Bosch Engineering and Business Solutions)

- Ryan D Brooks
  (The Boeing Company)

Eclipsecon 2012

27 Mar 2012  16:15 – 16:40
Room : Lake Audubon
AGENDA

- Complexities in Automotive Embedded software development
- Proposal: Standard Automotive Engineering Tools Platform
- A solution in BOSCH: iCTeam
- Overview of OSEE
- Demo of iCTeam
Virtual teams across the globe
Plug & Play Components

Data exchange between OEM & Suppliers

Complex Architecture
Large number of variants
Huge Codesize & data sets

Schedule inter-dependencies
across packages and components
Eclipse ALM on wheels

VARIANT MANAGEMENT

Ford
GM
BMW
TOYOTA
Mercedes-Benz
HYUNDAI
NISSAN

RENault
Audi
CHRYSLER

Robert Bosch Engineering and Business Solutions Limited 2008. All rights reserved, also regarding any disposal, exploitation, reproduction, editing, distribution, as well as in the event of applications for industrial property rights.
Integrated Collaborative Toolchain for Engineering Application LifeCycle Management
The proposal: Standard Automotive Tools Platform

BOSCH Plug ins
- VARIANTS
- E-MODEL
- V-TEAM
- TRACE
- AUTODAT
- C-BUILD
- TEST-M
- SDL-M
- DATAEX

Automotive Co-operation layer

OSEE Platform

Automotive Engineering Tools Platform

Application Development
- GEF
- Web Tools Platform
- Nobula
- JDT

Configuration Management
- Zest
- BIRT
- CDT
- Other

Systems Engineering
- Dynamic Afford Model
- Multi-Level Transactions
- Multi-Level Branching
- Data Store Adapter
- Access Control

Requirements Management
- Multi-Level Branching
- Access Control
- Peer-to-Peer

Testing Environment
- Session Management & Authentication

OSEE Application Framework

Eclipse Platform
- Java Virtual Machine
- JINI (Peer-to-Peer)

Extensions and Legacy Software
- OSGI
- Relational DB

Operating System
- Windows
- Linux
- OSX
- Solaris
iCTeam : Tools integration & Traceability

Interface to REQM Tools
- ClearQuest
- DOORS
  - CM-API
  - CQ Connector
  - C-API
  - Doors Connector

Interface to SCM Tools
- Clear Case
- SVN
  - CC-Provider
  - CC Connector
  - SVN-Team Provider
  - SVN Connector

iCTeam

OSEE

Requirement Traceability
Design Traceability
Source Code Traceability
Test Case Traceability

Requirements

Relation Reports

Vertical Matrix-Report

Horizontal Matrix-Report

Relations

Artifact

Relation

id

Artifact

Relation

id

Artifact

Relation

Design Artifact

Code Artifact

Test Case Artifact
iCTeam : Model Based development

- ClearQuest
- DOORS

Model Element

EMF Model

Sphinx

Simulink

AUTOSAR

ARtop

<<Generate>>

Code Files

Code Files

AST Nodes

CDT Representation

iCTeam

Requirement Artifact

Model Artifact

Code Artifact

Traceability Reports

Relations

CDT Representation
iCTeam : Continuous Integration

Eclipse SVN / CC Team Provider

Source Code Check-In

Source Repository

MyIn Connector (Builds)

Jenkins

Polling Repo

Development Team

Developer

QA

Manager

Continuous Integration Server

CI Server Emails Results

Compile/Build Product

Build Install/Deploy

Run Code Analysis

Run Automated Test

Report Results
iCTeam : Project Management

Action: Adding a help menu

Dev Team Workflow

Test Team Workflow

Workflow Artifact's

Workflow id

Artifact id

Relation

Workflow Processor

Workflow State Processor

Workflow State Processor

Workflow State Processor

iCTeam

Report Processor

Team Wise Efficiency

Team-Work Distribution

Hour Burndown

FuncDev Team

RQ Team

Test Team

Process Team

BOSCH
OSEE Configuration Management
Relational DB (Oracle, PostGreSQL, H2)
Object-Oriented Persistence
User Mgmt & Authentication
Version Control
Access Control
Multi-Level Branching
Metrics
Rich Traceability
Project Mgmt / Planning
Reporting
Access Control
Task Scheduling
Database Analyzer
Training Services
Third-Party Extensions and Legacy Software
Operating System (Windows, Linux, OSX, Solaris)
Java Virtual Machine
Relational DB (Oracle, PostGreSQL, H2)
Operating System (Windows, Linux, OSX, Solaris)
Eclipse Platform
Jetty
Xtext
Web Tools Platform
BIRT
Nebula
CDT
JDT
Other
OSEE Application Framework
Extensible Framework
Exemplary Applications
Exemplary Applications
Extensible Framework
Manage Variants / Product Lines

Flag Ship Program
Build 1

Create Branch

Transactions

Edit Artifacts / Change Report

Commit

Merge

Baseline Branches

Working Branches

Introduce

Flag Ship Program – Build 2

Flag Ship Program – Build 3

International Program X – Build 1

International Program X – Build 2

Common Branch (User Artifacts, Action Data, etc…)

Time →

Copyright © 2012 Boeing. Made available under the Eclipse Public License.
Safety and Mission Critical Systems

• Structural Coverage Analysis
  – Test Environment coordinates with mission software to capture raw coverage data
  – Raw coverage data is imported and merged into OSEE Database
  – ATS used to disposition coverage methods
  – ATS provides tracking of code, test, and requirements changes needed to resolve missing coverage
  – Auto generation of coverage reports for delivery to customer

• Safety Critical Analysis
  – Traceability thread from System and Subsystem functions through all levels of requirements down to code units
  – Safety Criticality and Development Assurance Level
toString()
Integrated processes and workflows in OSEE allow engineers to focus more on engineering and less on process training and manual metrics reporting.

- **Work Definitions** model the team's workflow and actively guide them through the work to be completed.
- **Work Definitions** are created and stored in OSEE and consist of state machines with their own widgets, rules, and routing.
- Each state can be assigned, statuased, and transitioned.
Demo : A complete SDLC using iCTeam

- Create new action in OSEE- ATS
- Import a requirement from DOORS
- Establish tracebility to Simulink Model
- Traceability to source code in SVN
- Continuous Build integration
- Traceability to Test plan
- Generate Traceability report
Questions
Give Feedback on the Sessions

1. Sign In: www.eclipsecon.org

2. Select Session Evaluate

3. Vote +1 0 -1