PREEvision 7.0

Roadmap and new Features

3rd of March 2014
PREEvision Status and Strategic Update

PREEvision Strategy 2013/2014

Electric/Electronic Development from Architecture Design to Series-Production Readiness

- Series-Production Use Cases
  - Requirements Engineering
  - Function, System and Component Design
  - AUTOSAR Software & System Design
  - Network Communication Design
  - Product Line Engineering
  - Wiring Harness Concept Design
  - Test Data Management (vTESTcenter)
  - Process Support (Versioning, Life Cycles, ...)

- Usability, Performance
  - Multi User Operation, Many Users
  - Sporadic Users
  - Lazy Loading / Partial Model Support

- Integration
  - Requested Import and Export filters
  - Synchronization with ALM and PLM systems

- IT Requirements (Security, User Admin, ...)

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Roadmap PREEvision 7.0 und 7.5 Release

- **PREEvision 6.5**
  - 6.5 SP1
  - 6.5 SP2
  - 6.5 SP3
  - 6.5 SP4

- **PREEvision 7.0**
  - Start of Development: 23.09.2013
  - SOD 7.5: 30.06.2014
  - Q4 2014

- **PREEvision 7.5**
  - 6.5 SP1
  - 6.5 SP2
  - 6.5 SP3
  - 6.5 SP4

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Features PREEvision 7.0

Focus areas

- Communication
- WH and Geometry
- Integrated Test Data Management
- ALM integration
- Team collaboration: 3-Tier (IT Requirements)
PREEvision Use Cases

Overview

- Requirement Engineering and Mgmt.
- Integrated Requirements Management
- Architecture Design and Evaluation
- Design of Safety Relevant Systems
- Test Data Management
- E/E Backbone/ Collaboration Platform
- File Management
- Product Line Management
- Function Driven Development
- HW Component Development
- AUTOSAR SW/HW/COM Design and Development
- EE Concept Design
PREEvision Product Line Layers
Use Case 1: Architecture Design and Evaluation

- All Product Line Layers used
- Concept Design
- Evaluation
- Optimization
- Documentation
- Import of Legacy Data
- Export of new Design

No use case specific new features in PREEvision 7.0
PREEvision Use Cases

Use Case 2: Requirements Engineering and Management

- VM, Customer Features and Requirements Layers used
- RIF Import
- Excel Import and Export
- Documentation/Reporting
- For Integrated Requirements Management also HW and SW Layers used
 Update Support for RIF Import
No use case specific new features in PREEvision 7.0

- Customer Features, Requirements, Logical Architecture, Software Architecture, Hardware Network, Hardware Component, Communication Layer used
- Function Design
- Documentation
PREEvision Use Cases

Use Case 4: AUTOSAR SW and System Design

- Software Library,
  Software Architecture,
  Hardware Network, and
  Mapping Mapping Layer used
  - SW Design
  - HW Design
  - Mapping
  - Documentation
  - AUTOSAR Import and Export

No use case specific new features in PREEvision 7.0
The Vector AUTOSAR Solution

AUTOSAR Workflow

AUTOSAR System Description → Import → AUTOSAR System Design → PREEvision → Export → AUTOSAR System Description

AUTOSAR System Design → Update → SW Component Description → Export → ECU Extract of System Description

SWC Detailed Design (RTE Configuration) → DaVinci Developer

RTE Configuration BSW Configuration → DaVinci Configurator Pro

<table>
<thead>
<tr>
<th>Format</th>
<th>Use Case</th>
<th>AUTOSAR version</th>
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<td>System Description</td>
<td>Import Export Update</td>
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<td>Software Component</td>
<td>Update</td>
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</tr>
</tbody>
</table>
AUTOSAR Software and System Design in PREEvision

Overview
AUTOSAR Software and System Design in PREEvision

PREEvision Layers supporting AUTOSAR

AUTOSAR in PREEvision

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PREEvision Use Cases

Use Case 5: Network Communication Design

- Communication Layer used for CAN, LIN, FlexRay Designs
- AUTOSAR Import and Export
- DBC Import and Export
- LDF Import and Export
- FIBEX Import and Export
- Documentation
PREEvision Use Case “Network Communication Design”

New in PREEvision 7.0: FlexRay Support

- FlexRay Scheduling Editor
- AUTOSAR Import and Export
- FIBEX Import and Export

FIBEX 3.1.0

AUTOSAR 3.1.0 and 4.x

PREEvision

FlexRay Scheduling

FIBEX 3.1.0

AUTOSAR 3.1.0 and 4.x
PREEvision Use Case “Network Communication Design”

New in PREEvision 7.0: CAN-FD Support

- Optional higher bit rate in data phase
  - up to 15Mbit/s in ISO bus topology (max 1Mbit/s @ classic CAN)

- Optional extended payload
  - up to 64bytes in one CAN-FD frame (max 8bytes @ classic CAN)
PREEvision Use Case “Network Communication Design”

New in PREEvision 7.0: CAN Multiplexor Signal Support (1/2)

- Multiplexor Signal:
  - The multiplexor signal carries the “selector” information and is contained in each frame.
  - All multiplexed signals do have the same length and position within the frame.

CAN frame with multiplexed Signals

Multiplexor Signal | Static Part (optional) | Dynamic Part (optional)
---|---|---
Mux Sign. [0x0] | Static Signal 01 | Multiplexed Signal 00
Mux Sign. [0x1] | Static Signal 01 | Multiplexed Signal 01
Mux Sign. [0x2] | Static Signal 01 | Multiplexed Signal 02
Mux Sign. [0x3] | Static Signal 01 | Multiplexed Signal 03
CAN frame containing multiplexed IPDU with multiplexor signal, multiplexed signal and static signal.
PREEvision Use Cases

Use Case 6: HW Component Development

- Customer Features, Requirements, Hardware Network, HW Component Layer used
- HW design
- Documentation

No use case specific new features in PREEvision 7.0
PREEvision Use Cases

Use Case 7: Electric Concept Design

- HW Network, Schematics, Wiring Harness Layer used
- Geometry Layer used
- KBL Import and Export
- ELOG Import and Export
- Optimization
- Variant Management
- Documentation
PREEvision Use Case “Electric Concept Design”

New in PREEvision 7.0: Connectors in the Geometry Diagram

- Within the Geometry Diagram
  - Enable the display of connectors
  - Enable user defined graphics for Connectors and Segment Points
- Draw customer defined Connectors and Segment Points in the device template editor for the respective types
- Rotation of connectors defined by last segment part
PREEvision Use Case “Electric Concept Design”

New in PREEvision 7.0: Color Switching for Segment Intervals

- Color of a segment interval is switched automatically
  - if more than one interval is created on a segment

- Overlapping segment intervals are drawn in dashed lines
  - allows the recognition of the different segment colors

- Length of the dashes is fix in all zoom factors of the diagram
  - allows zooming into short segments to see the intervals

>> zoom in >>
Diagrams get a filter mechanism on a class basis comparable to the model view

- Filter dialog is available in diagrams
- Toolbar button to switch filter on/off
- Multiple filters can be defined and saved
- Context menu on diagram allows to add class to filter
- Set filter in object configuration of diagram or legend
Enable the display of tables within diagrams

Tables in diagrams are view only within the diagram
  - Double click on table >> table is opened in standard table editor, editing possible

The table to be shown can come from different sources
  - Tables available on the artifact itself
  - Table templates available for the meta class of the artifact
  - Tables referenced through a model query
Use Case 8: Test Data Management

- Customer Features and Requirements Layers used
- RIF Import
- vTESTcenter used: Test Design, Test Implementation, Test Execution
- Excel Import and Export
- Documentation

Please note the related Feature List of the standalone product vTESTcenter
Vector Testing Portfolio

Overview

Test Data Management

vTESTcenter
- Configuration Management for test implementations and test parameters
- Scalable Team Collaboration Platform
- Traceability from test reports to requirements and vice versa
- Analysis of test results
- Management of testing projects

Test Design and Authoring Tool

vTESTstudio
- Test programming (CAPL, C#)
- Interactive test design: Test Table Editor "style of Test Automation Editor"
- Test Diagram Editor
- Definition of parameters and curves

HIL Test Bench (applicable for SIL, MIL, … as well)

CANoe + VT Modules + Bus Interfaces
- Real-time execution engine for tests and experiments
- Access to System under Test via bus systems and protocols (I/Os, diagnostics, XCP, DebugInterface, …)
- Test reporting
vTESTcenter

Information Flow

Requirements & Test Engineering → Implementation → Planning → Execution → Analysis

- Requirements
- Test Specs
- Manual tests
- Automatic tests
- Test Plan, Test Tasks
- Test script
- Report
- Check-in, parse for Verdicts and Req-/ TestSpec Associations
- Metrics
- Analyze
- Reports

File-System

- Requirements Source (opt.)

Vector, 3rd party

Test Design & Implementation Tool

Vector, 3rd party

Test Execution Tool

Vector, 3rd party

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PREEvision Use Cases

Use Case 9: Product Line Management

- Variant Model with Concept Space or Customer Feature Model
- Resolver used
- Variant highlighting
- Technical model specified with all PL Layers
- Documentation
- Import and Export of Variants
- Reuse in different Product Lines
- Branches

No use case specific new features in PREEvision 7.0
PREEvision Use Cases

Use Case 10: E/E Backbone, Collaboration Platform, File Management

- All Product Line Layers used
- File Management
- Many Users
- Sporadic Users
- Change and Release Management
- Branches and Reuse

E/E Backbone/ Collaboration Platform/ File Management
3-Tier Collaboration Platform

- PREEvision Client
- PREEvision Server
- Oracle Server
- Subversion Server
- PREEvision Collaboration Platform (3-Tier)

Connections:
- HTTP/HTTPS (e.g., Port 8080)
- TCP/IP (e.g., Port 1521)
- HTTP/HTTPS (e.g., Port 8080)
PREEvision Collaboration Platform

New in PREEvision 7.0: Performance improvements

- Improved Client Server Communication
  - Better update performance
New in PREEvision 7.0: Multi Site Support – Introduction

Challenges:
- Limited Bandwidth
- High Latency
PREEvision Collaboration Platform

New in PREEvision 7.0: Multi Site Support – Concept (1/3)

Site A (e.g. US)

Site B (e.g. EU)

PREEvision Multi Site Concept

„Local“ artifacts of Site A

„Global“ artifacts

„Local“ artifacts of Site B

Supported Concepts:

• Synchronization of Artifacts
• Linking of Artifacts
PREEvision Collaboration Platform

New in PREEvision 7.0: Multi Site Support – Concept (2/3)

Site A (e.g. US) | Site B (e.g. EU)

PREEvision Multi Site Concept

Ownership of X1

• write

No Ownership of X1

• read only

Supported Concepts:

- Synchronization of Artifacts
- Linking of Artifacts
PREEvision Collaboration Platform

New in PREEvision 7.0: Multi Site Support – Concept (3/3)

Site A (e.g. US)

Site B (e.g. EU)

PREEvision Multi Site Concept

“Local” artifacts of Site A

Artifact A2 linked with Artifact X2

“Global” artifacts

Supported Concepts:

- Synchronization of Artifacts
- Linking of Artifacts
**PREEvision IT Infrastructure**

**New in PREEvision 7.0: Fulfilling Customer IT Requirements**

- WebSphere 8.5 Support
- WebSeal Integration
- Public Key Infrastructure (PKI)
**PREEvision Interoperability**

New in PREEvision 7.0: Sync Server for ALM and PLM integration

- First Sync-Server project started.
- Development partner is PTC Integrity.
- Customer is a big Tier1, who uses both tools on a strategic base.
- First Use Case is round-trip for requirements management and exchange.

**Features:**
- External links
- Synchronization of artifacts
- Ownership Concept: Borrow data from other server
- Navigation in both directions

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PREEvision Use Cases

Use Case 11: Design of Safety Relevant Systems (ISO 26262)

- All Product Line Layers used
- Hazard and Risk Analysis
- Safety Goals
- FMEA
- Documentation

Design of Safety Relevant Systems (ISO 26262)

No use case specific new features in PREEvision 7.0
PREEvision Use Case “Design of Safety Relevant Systems”
Current feature coverage

1. Item Definition
   - Available

2. Hazard and Risk Analysis
   - Available

3. System safety concept
   - Available

4. System and component design
   - Available

5. Qualitative Safety Analyses
   - Available (FMEA)

6. Quantitative Safety Analyses

7. Verification and Validation
   - Research Phase: Automatically generating Safety Case Reports

8. Safety Case
   - Approved
Thank you for your attention.

For detailed information about Vector and our products please have a look at:

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