Introduction to Product Line Engineering for Systems and Software

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BigLever at a Glance

- **Industry leader** in Systems and Software Product Line (SPL) engineering tools and services
  - 10 years of commercial practice with *Gears™* technology and methods
  - Strategic partner of IBM Rational

- **Industry standard** SPL framework, tools and methodology
  - *Gears SPL Lifecycle Framework™* and industry-wide integrations
  - *BigLever 3-Tiered SPL Methodology™*

- **Proven success** in large-scale SPL deployments
Systems and Software Product Lines

• Most of today's systems and software development organizations must deliver a **product line**
  - A portfolio of similar products or systems with **variations in features and functions**
  - Not just an individual product or system

• Systems and software product line (**SPL**) engineering and delivery has emerged as a new approach that
  - provides an **efficient means of production** for systems and software product lines
  - supports the **full** product line development and delivery **lifecycle**
An Efficient Means of Production for Systems and Software Product Lines
Complexity of Product-centric Thinking Impedes Portfolio Production

Order $N^2$ Complexity

“Vertical” Product Perspective
The Challenge of Product Line Engineering: Harnessing Complexity

- Processes, tools and techniques cannot overcome the exponential complexity
- A new approach is required...
The Gears SPL Lifecycle Framework

Feature-based Abstraction

Requirements Engineers
Architects
Developers
Quality Assurance
Shared SPL Assets

Product Line Management
Profile A
Feature Profiles

Gears Product Configurator

Key

Variation Points

Requirements
Design Models
Source Code
Test Cases

Product A
Product B
Product N
The Gears SPL Lifecycle Framework

Feature-based Abstraction
- Product Line Management

Simplicity of a Single Automated Production Line

“Horizontal” Shared Asset Perspective

Requirements Engineers
- Requirements

Architects
- Design Models

Developers
- Source Code

Quality Assurance
- Test Cases

Key
- Variation Points

Shared SPL Assets

Product A

Product B

Product N
Benefits of a Software Production Line

• **Economy of Scale from Automated Production**
  - Increase in the scope of product diversity
  - Increase in the scale of different products delivered and maintained

• **Cost Savings from Efficiency and Productivity**
  - Increase in productivity and efficiency
  - Reduction in per-product development cost and overhead
  - Higher profit margins

• **Faster Profits from Faster Time to Market**
  - Reduction in time-to-market for new and updated products
  - Increased agility to react to new opportunities and changing markets

• **Better Products from Better Quality**
  - Increase in customer-perceived product quality
  - Reduction in defect density
  - Improved risk management
Synchronous concerns in a SPL Solution

- **Multi-product.** Feature-based variation management and automated production line
- **Multi-phase.** Product line lifecycle assets, architecture and traceability
- **Multi-baseline.** Product line change management and baseline management
The BigLever 3-Tiered SPL Methodology

1. Feature-based Variation Management and Automated Production
2. Feature-based Asset Engineering
3. Feature-based Portfolio Management
Tools and Services
for Systems and Software
Product Line Engineering
What We Offer

- **Gears™**
  - Software product line engineering tool & lifecycle framework
  - Powerful patented technology
  - Industry leading
  - Award winning

- **Off the shelf integrated solutions for IBM Rational**
  - DOORS/Gears Bridge™
  - Rhapsody/Gears Bridge™
  - Rational Quality Manager/Gears Bridge™
  - ClearCase/Gears CM Bridge Connector™
  - Synergy/Gears CM Bridge Connector™
  - Rational Team Concert/Gears CM Bridge Connector™
  - Methodology integrations:
    - Rational Publishing Engine
    - Focal Point

- **The industry’s most innovative software product line services**
Services for Success

Industry Leading Experience and Expertise

• *Getting Started* Package (recommended first step)
  - Intense, accelerated, hands-on pilot project
  - 3-days onsite, half-day prep, half-day post

• À la carte
  - Pilots
  - Assessments
  - Transitions
  - Training
The New Frontier for Systems and Software
Product Line Engineering and Delivery
Next Steps to Learn More

• Gain hands-on experience
  - www.biglever.com/learn/evaluations.html
  - Customer-recommended favorite: Getting Started Package

• Sign up for BigLever Software technical newsletter
  - www.biglever.com/learn/newsletters.html

• Read our white papers, case studies and articles
  - www.biglever.com/learn/resources.html

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