

Leveraging Integrated Model-Driven Development and Software Product Line Development Technologies

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Abstract

As emerging Software Product Line (SPL) technologies have evolved, Model-Driven Development (MDD) has remained an under-served part of the SPL portfolio development lifecycle, making it difficult to simultaneously leverage the benefits of both practices. The Telelogic Rhapsody®/BigLever Gears™ Bridge is the industry's first solution to provide fully integrated MDD and SPL technologies. With the Bridge's innovative capabilities, you can achieve new levels of efficiency by utilizing: (1) Rhapsody MDD models, rather than working with conventional source code, and (2) Gears' SPL consolidation, first-class model variation points, and automated production capabilities – rather than creating “clone-and-own” copies of MDD models for each product or building “one-size-fits-all” models for all products. This increased efficiency enables you to deliver more new products and features faster, while reducing the development effort and optimizing product quality.

Categories and Subject Descriptors D.2.13 [Software Engineering]: Reusable Software – *domain engineering, reusable libraries, and reuse models.*

General Terms Design, Economics, Management, Measurement, Theory.

Keywords Software Product Lines. Model-driven Development.

1. Telelogic Rhapsody® / BigLever Gears™ Bridge

While Model-Driven Development™ (MDD™) technology provides a powerful enabler for the rapid development of individual products within a product line, as well as greater conceptual clarity for the maintenance and evolution of those products over time, companies face complex challenges in managing product diversity across a product line. Software Product Line (SPL) methods and tools are specifically designed to provide these essential capabilities.

Now, with the integration of Telelogic's leading-edge MDD product and BigLever's innovative SPL engineering solution, the new Rhapsody/Gears Bridge provides a simple, elegant approach for effectively incorporating the management of product diversity into your MDD processes.

2. Integrated MDD and SPL Capabilities

The Rhapsody/Gears Bridge solution – co-developed by Telelogic and BigLever Software – offers fully integrated MDD and SPL technologies that enable you to easily leverage the benefits of MDD in your product line development lifecycle.

With the Bridge solution, you can utilize:

- Rhapsody MDD models as first-class reusable assets in the Gears SPL portfolio development lifecycle
- Gears SPL constructs as first-class software engineering mechanisms for managing product line diversity in Rhapsody MDD models, orthogonal to the model UML.

More specifically, the Rhapsody/Gears Bridge allows you to:

- Use SPL mechanisms to manage the diversity for a full product line portfolio in a single, consolidated MDD model, as a highly scalable alternative to cloned copies of models or one-size-fits-all UML™ models.
- Automatically configure different Rhapsody model behaviors for different products, simply by making product feature choices in a Gears feature profile.
- Convert Rhapsody model elements into Gears variation points to encapsulate the SPL diversity for that model element, without extending or complicating the UML model.
- Use one or more Rhapsody models – either packages or projects – in a larger collection of reusable assets for the full development lifecycle of a Gears SPL portfolio.
- Perform integrated SPL operations – such as product configuration, variation point editing and variation impact analysis – directly from Rhapsody menus.

