

# Deriving Product Architectures from an ADLARS Described Reference Architecture using Leopard

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## POSTER PRESENTATION ABSTRACT

In Product Line Architectures, a reference architecture is designed for a family of software systems that share a set of common properties. Variability points are used to capture variations among the different family members. Different product architectures within the family are then derived from the reference architecture based on the set of features chosen for each given product. No methods have been formalized yet on how to derive product architectures from a reference architecture. This process can, in many cases, be very time consuming especially with large-scale systems comprising thousands of variability points. In this case, manual techniques could become tedious and would introduce a high error margin which makes the need for automation and tool support of high importance.

In this presentation we demonstrate a technique for deriving product architectures from an *ADLARS*<sup>1</sup> described reference architecture using *Leopard*<sup>2</sup>.

*ADLARS* is an architecture description language that was developed within our research group. *ADLARS* relates system features to architectural structure: *Tasks*, *Components*, and *Connectors* enabling the generation of product architectures from a reference architecture by specifying the product desired feature set.

*Leopard* is one of the tools within the *ADLARS Development Studio*, a toolset used for developing and maintaining *ADLARS* architectures. It is an *ADLARS* integrated development environment (IDE) and compiler. It can parse *ADLARS* reference architectures and automatically generate product architectures based on the feature set included.

Both *ADLARS* and *Leopard* are mature projects and have been used to develop different case studies<sup>3 4 5</sup>.

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<sup>1</sup> T.J. Brown, I. Spence, and P. Kilpatrick. *ADLARS: A Relational Architecture Description Language for Software Families. Proceedings of the Fifth International Workshop on Product Family Engineering*, Siena, Italy, 2003

<sup>2</sup> R. Bashroush, I. Spence, P. Kilpatrick, and TJ Brown. Towards an Automated Evaluation Process for Software Architectures. *Proc. of the IASTED international conference on Software Engineering SE 2004*, Innsbruck, Austria, 2004

<sup>3</sup> R. Bashroush, I. Spence, P. Kilpatrick, and T.J. Brown. A Real-time Network Emulator: *ADLARS Case Study. Proceedings of the Third Asia Pacific International Symposium on Information Technology*, Istanbul, Turkey, 2004

<sup>4</sup> R. Bashroush, I. Spence, P. Kilpatrick, and TJ Brown. A Network Architectural Style for Real-time Systems: NaSr. *Proc. of the 4<sup>th</sup> Working IEEE/IFIP International Conference on Software Architecture WICSA'04*, Oslo, Norway, 2004

<sup>5</sup> R. Bashroush, I. Spence, P. Kilpatrick, and TJ Brown. A Generic Reference Software Architecture for Load Balancing over Mirrored Web Servers: NaSr Case Study. *Submitted to the 3rd ACS/IEEE International Conference on Computer Systems and Applications*, Cairo, Egypt, 2005