WICSA 07 Tutorial

Pattern Oriented Software Architecture: Patterns for Resource Management
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From embedded software in a mobile device to software in a large enterprise server, it is important that resources, such as memory, threading, files, or network connections are managed efficiently to allow the systems to function properly and effectively. In many systems, the actual need for resource management is discovered late in the software development lifecycle, at system-analysis or performance-analysis time. The design techniques that must be used in implementing resource management in a system depend largely upon the domain, the system constraints and requirements. A technique that works well in a particular system or configuration may not be as effective in a different system.

This tutorial uses design patterns to present techniques for implementing effective and efficient resource management in a system. The tutorial is based on the third volume of the POSA (Pattern-Oriented Software Architecture) series. The tutorial presents a thorough introduction to resource management along with two case studies in which the patterns are applied to the domains of ad hoc networking and mobile radio networks. The presented patterns are independent of any implementation technique, such as .NET, Java or C++, even though the examples are given in Java and C++. The patterns are grouped by different areas of resource management and address the complete lifecycle of resources: acquisition, management, and release.