

An Approach for Supporting Dynamic Software Evolution

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Abstract- Software evolution is an integral part of the software lifecycle. Fixing software bugs, extending base applications with new functionalities, as well as adapting to changing environments are among the reasons for software evolution. Typically, evolution is done offline requiring the running system to be stopped, at least momentarily, in order to make way for the evolution process. If software is thought of as providing services to its users, offline software evolution often causes disruption of services, and can be costly. In the case where high availability of services is required, such as the Air Traffic Controller System where planes can land day or night, offline software evolution is unacceptable. In order to address some of these issues, this paper describes an approach for supporting software evolution dynamically via the use of factory design patterns along with computational reflection and through a decentralized service management infrastructure. Experimentations have shown that this approach can support dynamic software upgrades, and hence, minimizing service disruptions during the evolution process.

Keywords- Dynamic Software Evolution, Software Engineering, Design Pattern

Remarks: The full paper may be found in www.charm72.com