Diplomarbeit: Extending CASA to support lower-level services adaptation

Background:

CASA – CASA (Contract-based Adaptive Software Architecture) provides a framework for enabling the development and operation of dynamically and transparently adaptive applications. In order to meet the adaptation needs of a broad range of applications, CASA supports adaptation at different levels of an application – from lower-level services to application code. A prototype system based on CASA has been implemented in Java. This system currently implements dynamic recomposition of application components. More details on CASA can be found at http://www.ifi.unizh.ch/req/casa/

Lower-level services adaptation – Lower-level services here mean the underlying services required by an application for its execution, such as data transmission service, compression service, video codec service etc. A change in lower-level services may be required in response to a change in the execution environment, e.g. changing the compression level of the data being transmitted in response to a change in the available communication bandwidth. A number of lower-level services adaptation systems have been developed by various research groups around the world.

Tasks:

Investigate the available lower-level services adaptation systems, and select an appropriate system based on its functionality, performance and compatibility with CASA. Integrate the selected system with the CASA prototype, and demonstrate the lower-level services adaptation features on a demo application.
Carry out performance evaluation tests on the integrated system, and analyze the performance results.
If the time permits, integrate a dynamic AOP system called PROSE (used for dynamically adding and removing aspects, more details at http://prose.ethz.ch/) with the CASA prototype, and demonstrate the dynamic AOP features on a demo application.

Required Skills: Good analytical skills, and good programming skills in Java.

Benefits: By working on this project, the student will get an opportunity to:

get an insight into lower-level services adaptation
learn more about dynamically and transparently adaptive applications
sharpen programming skills in Java

Starting Date: As early as possible

Language: English or German

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