Collaboration Control using Dynamic Aspect Oriented Technology

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February 9, 2010

1 Research Background

Recently it becomes in practical use to realize collaboration of multiple devices connected to networks. For example, a collaboration of home electronic appliances makes it realize theater-like environment at home. Most of these collaborations are controlled by central server in which detailed of collaborations are predefined.

2 Problems

These collaborations are defined depending on operating environment and devices. Hence it is impossible to prepare collaborations considering every operating environment and devices along with types of collaboration and layouts of houses.

3   Propose of this research

To solve this problem, we propose a flexible control method using dynamic aspect-oriented technology in which collaborations are defined in terms of "Views" which are characteristics of devices or collaborations.

"Views" are cross cutting concerns among devices or collaborations. For example, luminiferous features are defined as "Light" view, and audio features are defined as "Sound" view. Like this, the "Views" are defined based on the features of each device.

We categorize "Views" into "Common Views" and "Auxiliary Views". "Common Views" are views focusing the basic function of the devices. These views cross cut among devices. "Auxiliary Views" are views focusing on conditions and definitions of the collaboration. These views cross cut among collaborations. By using these views, the various services can be defined without depending on concrete devices or operating environments.

In this research, we propose a flexible method of device collaboration. In order to demonstrate the proposal, we develop a prototype system using Spring that is a dynamic aspect-oriented framework.

4   Organization of this thesis

Chapter 1 describes the background and the format of this thesis.

Chapter 2 describes the problem of the implementation of the collaboration control and the solution to this.

Chapter 3 introduces the Aspect Oriented Technology, Dynamic Aspect Oriented Technology and Spring Framework as the existing technology.

Chapter 4 explains the concept of the proposal method.

Chapter 5 introduces a prototype system using Spring.

Chapter 6 shows the example of the application of the proposal method: application results, evaluation and consideration to this method.

Chapter 7 describes the summary of this research and the further tasks.