ERCIM “Alain Bensoussan” Fellowship Scientific Report

Fellow: Natenapa Sriharee
Visited Location : Department of Telematics, NTNU, Norway
Duration of Visit: (Dec 3, 2007 – Dec 2, 2008)

I - Scientific activity

I gave a talk to introduce myself in the first week of arrival. The talk includes my personal information, research experience and career. The meeting was arranged in the meeting room of the department with around 10 persons attended. The presentation took time around 30 minutes.

During stay in the first three months I studied how to apply ontology to capability. I have learned what is adaptable service systems, goal and architecture. TAPAS (Telematics Architecture for Play-based Adaptable Systems) is focused. It is an architecture for telecommunication services that provides a core platform for invoking the services under the environment that the systems can adapt when there may have changes. However, capability is described in terms of XML file and the description is bound to capability object provided in terms of JAVA class. There are many Ph.D. students worked with TAPAS and they tried to enhance the TAPAS architecture by proposing additional functionalities that the system can gain benefit in network and service management. I did several papers that focus on using ontology and declarative languages, OWL and OWL-S, to network and service management. . However, the works need to be improved to make it flexible to TAPAS architecture framework.

The overall topic for my research is focused on creating capability ontology for use in an adaptable service system. Ontology is needed for classification of capabilities, services, and capability and service performance. A capability is an inherent property of a node, which defines the ability to do something. Capability can be classified into: Resources, Functions and data. The capability ontology is depicted as shown in Figure 1.

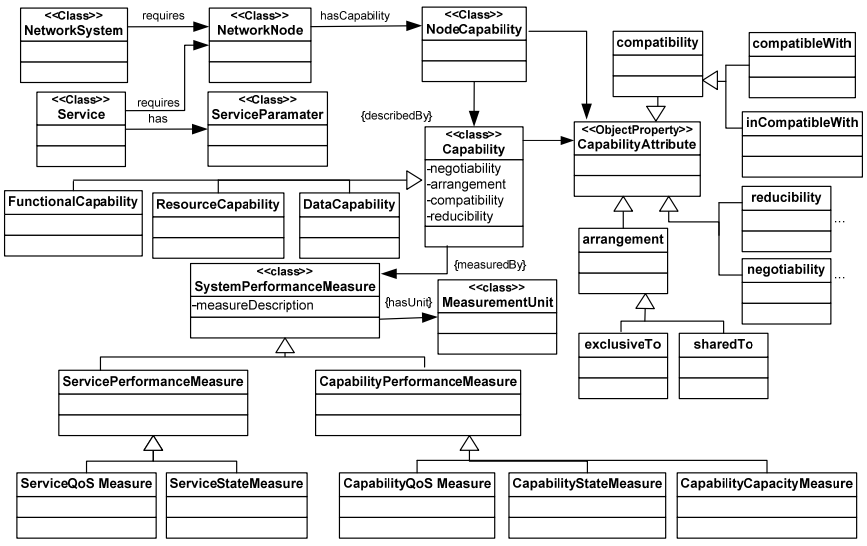

Figure 1 Capability ontology

II- Publication(s) during your fellowship

Ontology-based Capability Self-Configuration
Thongtra, P., Aagesen, F.A., and Sriharee, N.
In *the 14th Eunice Open European Summer School*, France, September, 2008.

Abstract
Capability configuration management is the allocation, re-allocation and de-allocation of capabilities. A capability is here defined as an inherent physical property of a network node which is a basis for implementing networked services. Capability configuration management requires a specification of the capability configuration management process. This paper proposes a framework for capability configuration process specification (CCPS) production and execution. CCPS is a set of actions with related parameters and is used to configure the capability objects of the network nodes prior to service deployment and instantiation. A CCPS is based on Web services. The production of CCPS is based on capability requirements defined by the networked services to be deployed and instantiated. The framework has an ontological reasoning ability. A case study to configure a VLAN connection using switches is also provided.

III -Attended Seminars, Workshops, and Conferences

- The International of Semantic Web Conference (ISWC2008), Karlshue, Germany, October 26-30, 2008.
- The tutorial of ontology reasoning and usage. In ISWC2008, Karlshue, Germany, October 27, 2008.

IV – Research Exchange Programme (12 month scheme)

First Period: 1 week in University of Luxembourg, June 23 – 27, 2008.
Project team: RESIST
The Scientific contact is Professor Nicolas Guelfi.
E-Mail: Nicolas.Guelfi@uni.lu

I had a discussion with Marcos Da Silveira, the postdoc who was responsible in RESIST project. During stay in one week, I studied about e-health service and architecture to support e-health. Objective of the project is to analyze technology and requirements for e-Health service in Luxembourg. Scenario of e-Health service is synthesized into sub-systems. The needed components for e-health service framework is layered into three sub-systems: Monitoring system, healthcare monitoring center, and medical terminal. *Monitoring System (MSY)* is a system to measure the vital signs of the patients (e.g. heart rate, weight). The Monitoring System is located near to the patient. It consists of different measurement devices (MD) and one central unit (CU) to which they are connected. This system communicates with the monitoring center to send patient's data, but also to receive some information like configuration parameters, fail or urgency alerts, messages, etc. *Healthcare Monitoring Center (HMC)* is a system to receive and store the patient's data. The monitoring center is mainly composed of a database and normally placed into an H-center such as hospitals and clinics. The management of the database includes data structure definition, data access control, equipment configuration, security procedures definition, maintenance data, legislation respect's monitoring, etc. *Medical Terminal (MT)* is a system to connect the existing systems of IT services of H-professional (physicians, nurses, etc.) and it is responsible for providing information to medical services

such as data visualization, diagnosis, alerts, messages, etc. The project team had expectation to use TAPAS as a core platform to support e-health service. However, the students who implemented e-health lack of understanding in TAPAS architecture thus, implementation becomes difficult. Later, they implemented the e-health service using Web services architecture.

In this visiting, I gave a talk about my research in 30 minutes to the students. Also, I analyzed and studied if it is possible to apply e-health service on TAPAS and how to implement in a way that is flexible. The report is sent to the scientific contacts.

Second Period: 1 week in INRIA, Nancy, October 6-10, 2008.
Project team: MADYNES (Management of dynamic networks and services
The Scientific contact is Professor Olivier Festor.
E-Mail: Olivier.Festor@loria.fr

In this visiting, I presented my research to the students and professors in the working group MADYNES. The goal of the MADYNES research group is to design, to validate and to deploy novel management and control paradigms as well as software novel architectures that are able to cope with the growing dynamicity and the scalability issues induced by the ubiquitous Internet. The foundation of the MADYNES research activity is the ever increasing need for automated monitoring and control within networked environments. This need is mainly due to the increasing dependency of both people and goods towards communication infrastructures as well as the growing demand towards services of higher quality.

I studied the projects that they have experience. The research works are focused in the data link layer and physical layer. Thus, the application used to automated network and service management for example, configuration management tool. Most of research works of this group focuses on an analysis and management using the network tools particularly network monitoring tool.

I had a discussion with a Ph.D. student, Tom Leclerc and his supervision about ad-hoc network and service. The student is dealing with service discovery in ad-hoc network. He also interests in applying semantics for service discovery for example, creating the service description for ad-hoc network service and creating semantic registry, as well as the language such as OWL and OWL-S. I gave some advises about implementation and what should be focused in the framework when semantics is applied. Also, I gave a talk about my research in 30 minutes to the project team.