

Software Engineering of Distributed Systems, KTH

A Brief Description of AMS, DF and ACC

[Distributed AI and Intelligent Agents, Homework 2, Question 3]

Question 3: (bonus point 02)

FIPA describes reference model for an agent platform in form of key roles necessary for managing the agent platform, these are

- I. Agent Management System (AMS),
- II. Agent Communication Channel (ACC) and
- III. Directory Facilitator (DF).

Describe all these roles in the context of JADE Agent Platform, services provided by representative agents for these roles, their interaction among each other. (max 1-2 pages). Use bullets and precise points.

AMS:

The AMS is a mandatory component of an AP and is responsible for managing the operation of an AP, such as the creation and deletion of agents, and overseeing the migration of agents to and from the AP.

Roles in the context of JADE Agent Platform:

The JADE AMS is a special agent which is tightly bound to the main container.

Services provided by representative agents for these roles:

It supervises the entire platform. It is the contact point for all agents that need to interact in order to access the white pages of the platform as well as to manage their life cycle. Every agent is required to register with the AMS (automatically carried out by JADE at agent start-up) in order to obtain a valid AID.

ACC:

The Agent Communication Channel (ACC) is the agent that provides the path for basic contact between agents inside and outside the platform; it is the default communication method which offers a reliable, orderly and accurate message routine service; it must also support IOP (Internet Inter-ORB Protocol) for interoperability between different agent platforms.

Roles in the context of JADE Agent Platform:

Transparently provide a Message Transport Service (MTS for short), relying upon one or more FIPA compliant Message Transport Protocols (MTPs).

Services provided by representative agents for these roles:

- Multiple MTPs, deployed as plug-ins on multiple containers.
- One hop message routing for outgoing and incoming messages.
- Protocol independent addresses caching.

DF:

The DF is an optional component of an AP providing yellow pages services to other agents. It maintains an accurate, complete and timely list of agents and must provide the most current information about agents in its directory on a non-discriminatory basis to all authorized agents.

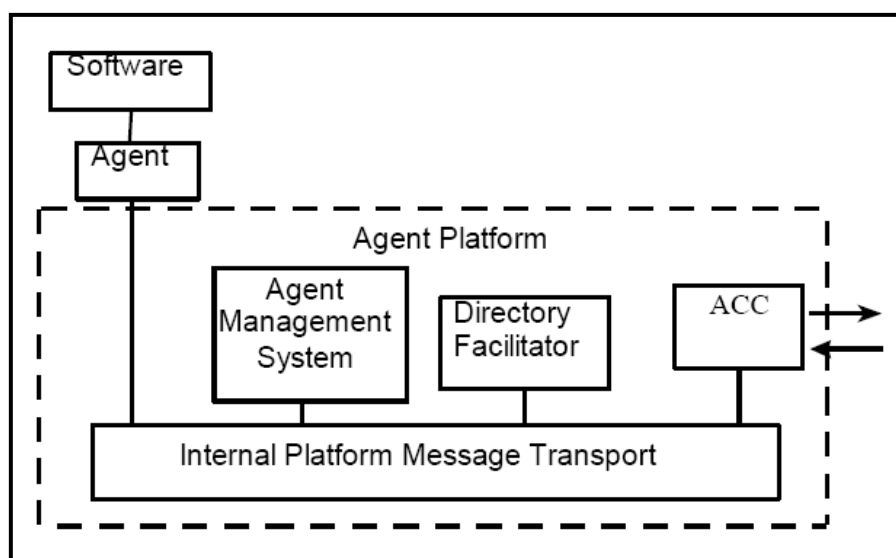
Roles in the context of JADE Agent Platform:

The JADE DF is a special agent, and it can be interacted with it as with any other agent by exchanging ACL messages using a proper content language and a proper ontology.

Services provided by representative agents for these roles:

It implements the yellow pages service, used by any agent wishing to register its services or search for other available services. The JADE DF also accepts subscriptions from agents that wish to be notified whenever a service registration or modification is made that match some specified criteria. Multiple DFs can be started concurrently in order to distribute the yellow pages service across several domains.

Interaction among each other:



1. As shown on the figure above, AMS, DF, ACC are three key mandatory roles identified in Jade Agent Platform.
2. DF and ACC register on AMS, AMS can be used to show and manage DF and ACC.
3. There are not much explicitly direct interactions among each other. They communicate with each other via Internal Platform Message Transport.

References:

- [1]. Fabio Belfemine, Giovanni Caire, Dominic Greenwood. *Developing Multi-Agent Systems with JADE*. John Wiley & Sons Ltd, 2007.
- [2]. Fabio Belfemine, Agostino Poggi, Giovanni Rimassa. *JADE – A FIPA-compliant agent framework*. <http://jade.cselt.it/papers/PAAM.pdf>, 1999.