



ESPRIT Project No. 25 338

Work package D

Autonomous Agents

Requirements

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Author(s):	Nick Taylor	Status:	
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Change History

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1	Introduction	1
2	Domain Object Model	2
3	Use-Cases	4
4	References	7

1 Introduction

Mobile agents are emerging as an enabling technology for distributed computing. Unlike more static architectures such as CORBA or DCE which use RPCs as their network transport mechanism, mobile agents systems use agents as their transport entity which leads to greater flexibility in operation. As with other distributed architectures, the transport should be transparent to the user which leads to a slightly unusual situation for the Autonomous Agents WP in that it is the “filling” in the FollowMe sandwich; on the user side it interacts with the User Access workpackage and on the server side it interacts with the Service Interaction workpackage and there is also interaction with the Personal Profiles WP. This leads to a number of diverse requirements which this document will attempt to capture.

This document will follow the approach described by Jacobson et al [1] in developing a requirements model which be presented as a Use Case Model and a Domain Object Model. It will describe the requirements of the Autonomous Agents WP and define the functionality of the AA WP.

2 Domain Object Model

A domain object model is useful because it allows the objects in the problem domain to be clearly stated in context with all other domain objects. Here, we will outline a domain object model for the Autonomous Agents workpackage which will include objects elicited from [2] and [3].

2.1 Domain Object Model for the AA WP

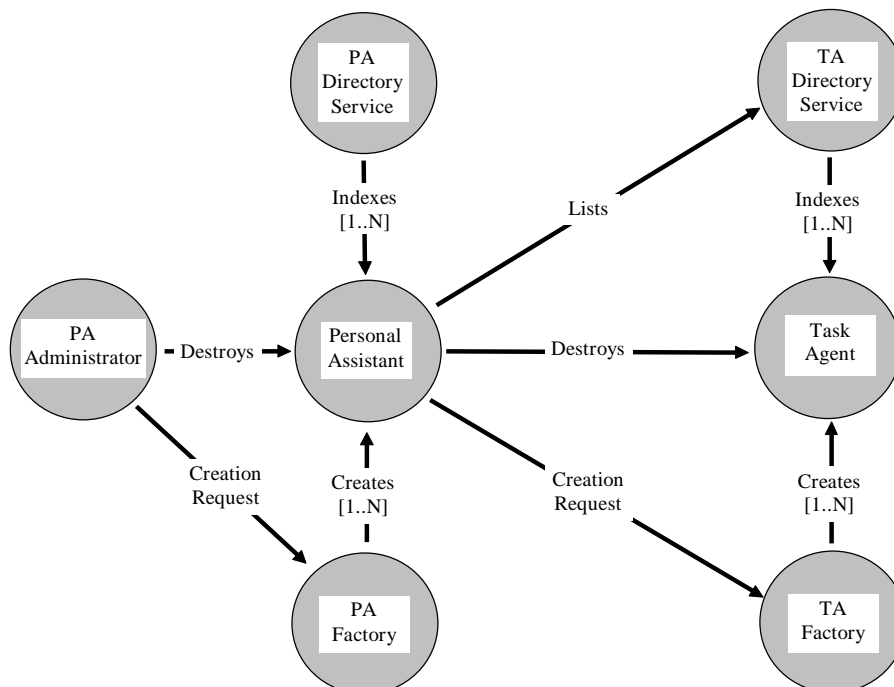


Figure 1

Figure 1 shows the domain objects in the Autonomous Agents workpackage. The role of each will now be briefly described.

Personal Assistant Administrator

The PA Administrator has special privileges and is responsible for initiating the creation of new user PAs in the system, and conversely, the removal of PAs.

Personal Assistant Factory

The PA Factory is responsible for creating PAs. When a new user is added to the system, a PA is created for them and is registered with the PA Directory Service to allow it to be located. There is a one-to-one mapping between users and PAs, that is, a user will have only one PA.

Personal Assistant Directory Service

This object is responsible for keeping track of all the Personal Assistants created. When a new PA is created, it is registered with this object and conversely, when a PA is destroyed, it is de-registered.

Personal Assistant

The PA is responsible for keeping track of all ongoing tasks and relaying any pertinent data back to the user.

Task Agent Factory

The TA Factory is responsible for the creation of TAs. When a TA is created, it is registered with the TA Directory Service to allow subsequent location of the TA.

Task Agent Directory Service

This directory service keeps a listing of all the TAs available to the user.

Task Agent

The TA performs an allocated task. When it has completed its task, it informs the PA which then destroys it.

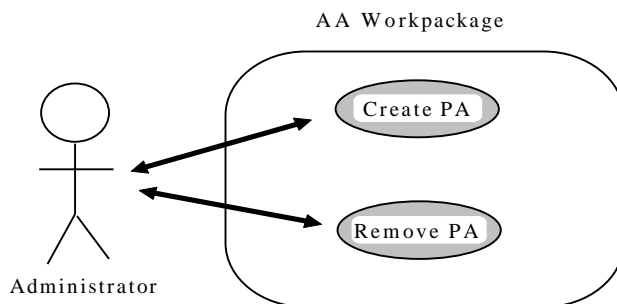
2.2 Relationship with other WPs

The domain objects in the AA WP will have to interact with domain objects from other WPs. In particular, the AA objects will have to interact with Personal Profile objects to enable the creation of a new Profile when a new PA is created and conversely, the removal of a Profile when a PA is destroyed. The agent entities constructed will inherit certain qualities from Mobile Objects in the Mobile Object Workbench workpackage. There will also be interaction with entities in the User Access and Service Deployment WPs although details of the latter are vague at this time.

3 Use-Case Model

A number of use-cases for the AA WP have been identified from [2] and [3]. These will be now be outlined.

3.1 System administrator as an actor



Create a Personal Assistant

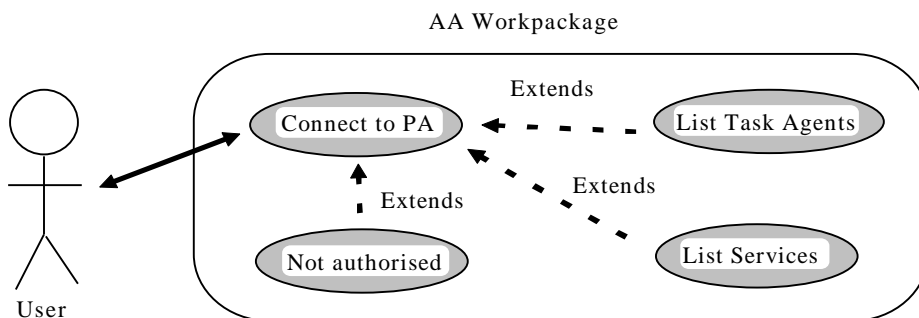
The administrator must be able to initiate the creation of new Personal Assistants. This use-case will use use-cases from other packages to, for example, initiate the creation of Personal Profile.

Remove a Personal Assistant

The administrator must be able remove Personal Assistants which will initiate the clean-up procedurs for a user such as removing the Personal Profile associated with the user.

3.2 A user as an actor

3.3.1 Task Agent and Service discovery use-cases



Connect to PA

This is the primary use-case which all other user-as-actor use-cases extend. It describes the procedure where the user wants to make a connection to their PA.

Not authorised

This use-case describes the situation when a user attempts to connect to a PA other than their own, or incorrect identification details have been entered and access to the PA is denied by the system.

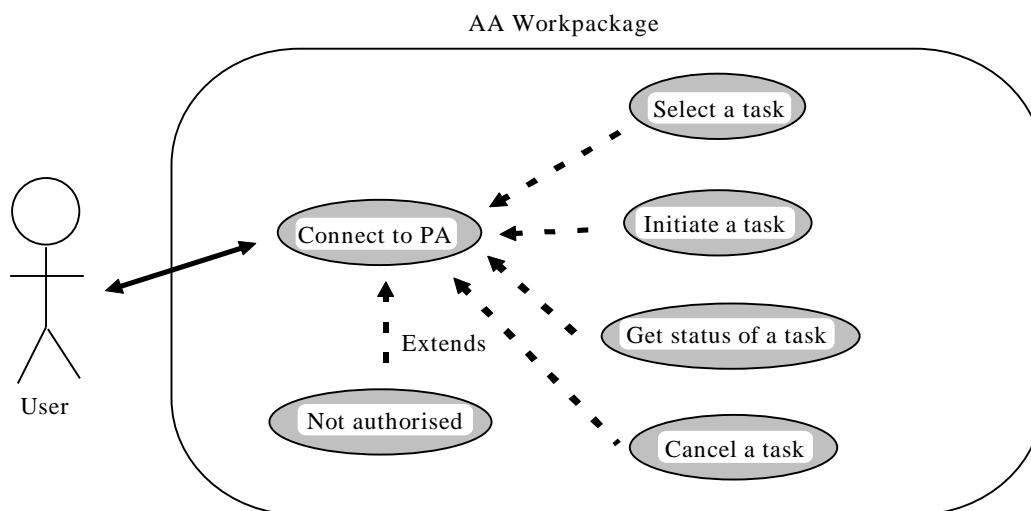
List Task Agents

Lists the tasks agents available for selection to the user. This is personalised list and may contain multiple TAs operating against a single service.

List Services

Lists the services available for the user to initiate tasks against. This is a global list of all the provider's offering services to the users of FollowMe.

3.3.2 Task Agent related use-cases

**Select a task**

Selects a task agent from a list of available task agents. The user may need to enter additional details to completely specify a task or the task may already be completely defined.

Launch a task

Set the selected task agent running. Once a task has been selected and specified, the user launches the task agent against the appropriate service.

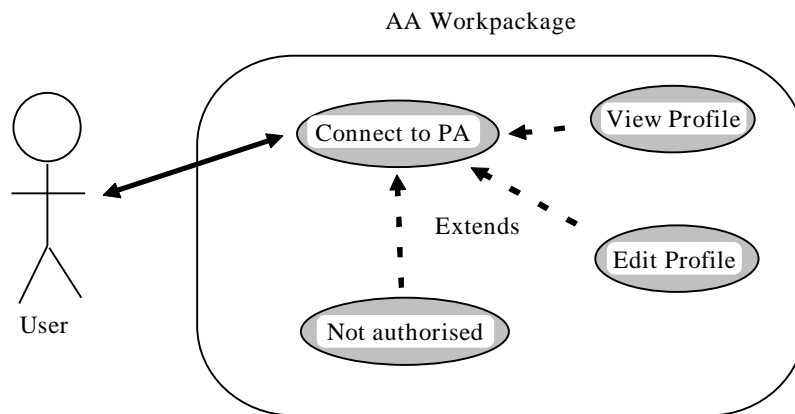
Get status of a task

Get the status of an executing task agent. The user may wish to get the partial results of a task that has not completed, or a task that is repetitive in nature.

Cancel a task

Terminate the activities of a task agent. A task agent may be recalled at any time and any partial results examined.

3.2.3 Personal Profile related Use-Cases



View Personal Profile

The user wants to look at the current status of their profile.

Edit Personal Profile

The user wishes to change some aspect of their profile.

4 References

- [1] **Object-Oriented Software Engineering**, Jacobson, Christerson, Jonsson, Overgaard, ISBN 0-201-54435-0
- [2] **Process Descriptions for Pilot Applications**, Stein, WP_I_Processes v 1.0, Project Internal Document
- [3] **Deliverable DI1 - Survey**, Rajakarunanayake and Stein, Survey v1.0, Project Internal Deliverable