

Noah: Environment for Distributed Agents (3)

— Applications —

3M-5

Kazuya MIYAZAKI, Hiroshi KOZUKA, Fumiaki SATO,
Hisao FUKUOKA, Junichiro TSUJI

Computer & Information Systems Laboratory, Mitsubishi Electric Corporation

1 Introduction

Noah cooperative environment allows applications to cooperate in different styles[1]. This paper describes two examples of typical cooperation styles to show the advantages of Noah.

2 Applications

2.1 System administration

Here is an example of a printer installation into distributed computing environment. This is a typical system administration issue.

In a traditional distributed computing environment such as UNIX based network environment, a system manager needs the following operations to install a new printer into that environment.

- For the network node where the printer installed.
 - Add the new network node into host name database.
 - Add the new printer information into printer capability database.
 - Set up the printer spool directory.
 - Create printer access control file.
 - Modify the equipment database.
- For other network nodes.
 - Add new printer information into printer capability data base.
 - Notification of new printer information to users.

These operations are very complicated and should be consistent. So the system manager is apt to mistake the operations.

While using Noah environment, what the system manager have to do is just putting "new printer agent" into Noah distributed environment. It works autonomously in the Lake, and does the above operations concurrently and consistently as shown in Figure 1.

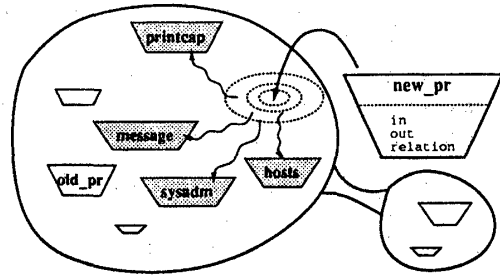


Figure 1: Installation of new printer

Because new printer agent will modify the Lake status, all agents related to printer installation — such as printcap_db agent, hosts_db agents, messaging_agents — work by themselves.

2.2 CSCW System

Conventionally, each CSCW (Computer Supported Cooperative Works) application manages information about groups and its members individually, and supports communications among the members.

The same functionality can be attained by using cooperating personal applications in conjunction with the open CSCW environment on the Noah (Figure 2). Using the open CSCW environment, it is possible to centralize the group management functions and use them for several CSCW services.

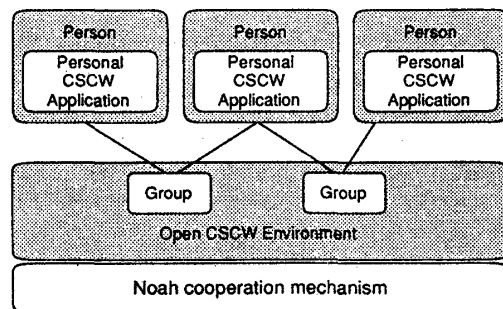


Figure 2: Open CSCW environment

The open CSCW environment can be realized as 'a field' of Noah. 'Groups' in the open CSCW environment can also be mapped to a Noah field. Other applications such as a conference room reservation system or a conference arrangement system can cooperate with CSCW applications through another 'field'.

The open CSCW environment allows these fields to construct CSCW services adaptable to organizational changes and to cooperate with many other services easily. Figure 3 shows the CSCW system structure.

CSCW manager — The CSCW manager creates a CSCW field and manages it. The CSCW manager realizes specific cooperation for CSCW. The main functions of this field include organization management, data sharing, access control, and workflow support.

OA manager — The OA manager creates an OA field and manages it. In this field, OA applications and personal information systems work together harmoniously.

Personal Information System — The personal information system maintains a personal profile and schedules for an individual. This system includes an access interface to the Noah environment.

Other Applications — OA services, such as the conference arrangement system and the conference room reservation system, are provided.

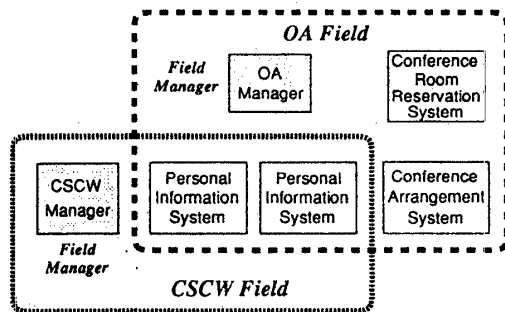


Figure 3: Noah CSCW system structure

When personal information system is connected to the Noah environment, the personal profile key is broadcasted in the Noah environment. Then the CSCW manager accepts and keeps it. The profile includes the location of the personal information system and attributes of the user that include the group names that the user belongs to and the role of the user in the groups.

Now let us assume the case of holding a conference with members of certain groups. The following are the typical services for this case.

1. The organizer of the conference requests the confirmation of members' schedules and the reservation of a conference room. For this, attending groups, date, length, and characteristics of the conference room are specified through the user access environment of the personal information system.

2. The request is sent to the CSCW manager and the OA manager through the Noah environment.

3. CSCW Manager:

- (a) After accepting the request, the CSCW manager inquires the personal information system of the specified groups' members about their unoccupied hours according to the length and the date of the conference.
- (b) The personal information systems that accept the request return the information about the unoccupied hours according to their own schedules.
- (c) Then the CSCW manager arranges the information in order and send it back to the organizer.

4. OA Manager:

- (a) After accepting the request, the OA manager requires the conference room reservation system to report the unoccupied hours of the appropriate rooms.
- (b) The conference room reservation system returns the information to the OA manager and the manager sends it to the organizer.

5. The organizer decides the date, the time and the room based on the information and sends the final decision to hold the conference to the CSCW manager and the OA manager.

6. After accepting the request, the CSCW manager informs the members of the conference and the OA manager requests the conference room reservation system to reserve the specified room at the specified time.

Since the information about organizations is centralized and collected automatically, the system can be adapted to organizations changes.

3 Summary

This paper describes two examples of typical applications - system administration and CSCW system - to show the advantages of Noah. Noah makes it easy to develop reliable and efficient software using the potentiality of the distributed environment services.

Future work includes implementation of these applications on Noah and verification of Noah architecture.

References

- [1] H. Kozuka et al. "An Architecture of Distributed Computing Environment — Noah: Network Oriented Applications Harmony," Proc. IPSJ 58th DPS, 1993.