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Resource Manager

Resource Transactions

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JOB TITLE	Signature	Date	pine:/users/cell/resource/docs/transact/transact.tex	
Senior Software Engineer			ORIGINATING DEPT: ENGINEERING	
			CONTROLLING DEPT: ENGINEERING	
			CONTROL SHEET	NO. of SHEETS
				5
AUTHOR: John Juer			DOC. TYPE: Software Design Specification	
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			DOCUMENT NUMBER HP024105C310	SHT. 1

DOCUMENT REVISION HISTORY

Doc. Revision	Date	Changes
1	Jan 1992	Initial Draft

1 Scope

This document gives an overview of messaging and transactions to be supported by nodes running the Resource.

2 Related Documents

- [1] Resource Manager Release 1 Specification HP024105
- [2] Resource Manager Design and Architecture HP024105C300
- [3] Communication Messaging Services HP024105C301
- [4] The Router Task HP024105C302
- [5] Resource Messaging HP024105C303
- [6] Var References HP024105C304
- [7] GAD Format HP024105C305
- [8] Rex Executive (In preparation)
- [9] EI-LIN Application Layer Interface Specification HP024106C301

3 Introduction

The Resource Manager was originally designed with a view to supporting distributed IEC65 applications. Its design dealt mainly with the issue of how ST tasks running in one Resource could communicate and interact with tasks in another Resource, and how this could be embedded in the IEC65 language in as a transparent and natural way as possible.

One very important area not covered by the original design was the issue of how nodes running Resources were to be loaded, how Resources (i.e IEC Tasks) were to be run, and how other facilities such as file transfer were to be implemented. An important consideration in the above is any support for other protocols, in particular MMS.

This document outlines how this is to be done.

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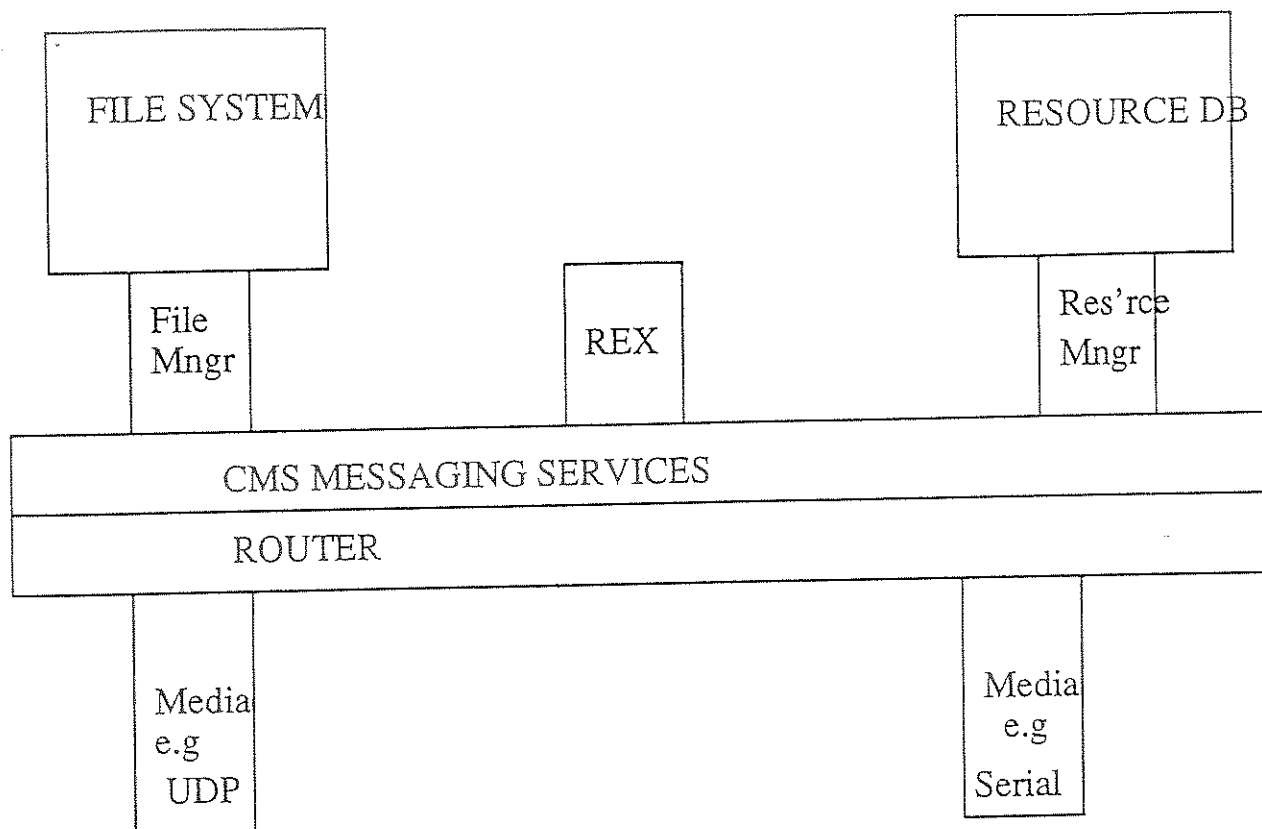


Figure 1: Communications Architecture of a Resource Node

4 Architecture

Refer to figure 1.

Each node that can run a Resource (or that wants to co-operate in a compliant network) will have a messaging service built into it, known as CMS [3]. CMS delivers messages to tasks on particular nodes, (other terms for this are to applications on nodes, or processes on nodes). Tasks register with CMS when they start up. In figure 1, the File Manager, Rex and the Resource Manager are (sets of) particular tasks.

Tasks not only register with CMS their address, but also the protocol they talk. So in figure 1 the File Manager, the Resource Manager and Rex all talk different protocols. In fact the Resource Manager represents a set of ST tasks that all talk a protocol for exchanging data between ST applications.

The File Manager on the other hand, talks a protocol that opens, closes, reads and writes files.

Rex is discussed later.

Nodes may also have a Router (in the first instance they will have to have a Router if they wish to communicate on a network)¹ Routers are used by CMS to route messages to other remote nodes along Media.

¹ Later the concept of end-points and routers will be introduced. End-points will know enough to contact routers on the network to do actual routing. The aim of end-points is to allow for small compliant instrument type nodes.

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5 Rex

It is also assumed that compliant nodes have a set of tasks or applications, that need to be run either continuously or from time to time in response to a request. The File Manager, and the Resource Manager ST Tasks are example of this.

Rex is the application (task) that starts or stops other tasks. Rex supports a simple ascii command protocol — in fact Rex acts as a simple command interpreter that receives commands over CMS and activates or deactivates tasks, passing them any command arguments as required.

It is entirely possible, or desirable, for compliant nodes to implement any set of tasks that Rex can activate.

6 File Transfer

The file transfer protocol will be based on the transactions defined for Ei-Lin ([9]), which itself was based on MMS. The transactions are loosely speaking

- open a file
- close a file
- write n bytes at location
- read n bytes from location

As noted above Rex is the bootstrap service that allows everything else to take place.

To transfer a file, Rex will invoke an application with the commands that determine which file goes to where. The application will communicate with file managers on the appropriate node, (via CMS and the file transfer protocol) to actually perform the transfer.

7 Starting and stopping Resource Tasks

Resources can be stored in a node in the file system (possibly the file system may only contain one Resource in a small node). Rex is then used to invoke a loader application that performs any loading necessary from the file system into main memory, and then the Resource Tasks can be started directly via Rex.

Similary built in applications (invoked via Rex) can stop or unload Resource Tasks.

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8 Other utilities

Given these facilities other applications can be invoked via Rex to do target specific actions. For example a trace utility that captures output from a running set of ST tasks for off line analysis can be built using the file system and Rex services.

Possible Rex commands would be

- load a trace specification from the file
- activate a trace specification
- save a trace result to a file



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