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Proxy Agent Requirements for COTS Software Manageability

**White paper - Not intended for formal review
or Government approval.**

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RESPONSIBLE ENGINEER

Mark Alabastro /s/	6/20/96
<hr/>	
Mark Alabastro, MTS - Associate EOSDIS Core System Project	Date

SUBMITTED BY

Paul Palmer /s/	6/20/96
<hr/>	
Paul Palmer, Development Engineering Manager EOSDIS Core System Project	Date

Hughes Information Technology Systems
Upper Marlboro, Maryland

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Abstract

This white paper identifies the technical direction for Common-Of-The-Shelf (COTS) Software Manageability. The impetus is to define the criteria for COTS software, e.g., life-cycle services, COTS resource reporting, etc., to provide particular data sets to system management and to execute operations for system management.

Given the magnitude of the COTS software used in ECS which spans multiple releases, the issue of COTS software manageability arises due to different software baselines and different software versions. Analysis of the delivered¹ UNIX COTS software is required to identify common characteristics of each software package.

As a result the appropriate COTS software experts identify the deployed/operational COTS software and its corresponding characteristics; define the minimum information that a proxy agent, a software component (event handlers like Tivoli, ESSM, or custom developed code) acting as an interface between a COTS software product and a system management component, is required to capture and log; and the assumptions made to accomplish consistency across all COTS with respect to event handling, proxy agents, and life-cycle services.

This white paper provides the foundation for a consistent COTS software management scheme across the EOSDIS Core System (ECS). This paper focuses on proxy agent requirements and not on the COTS software management policies.

Keywords: UNIX, COTS software, proxy agent, operational environment

¹ Any development tools; i.e., compilers, ClearCase, etc., is not under COTS software management.

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Contents

Abstract

Contents

1. Introduction

1.1 Purpose.....	1
1.2 Organization	1
1.3 Review and Approval.....	1

2. COTS Software Proxy Agent Development Responsibilities

2.1 Responsibility Overview	1
2.2 COTS Software Proxy Agent Development Assignment.....	2

3. COTS Software Proxy Agent Development Criteria

3.1 Purpose of COTS Software Proxy Agent	1
3.2 Assumptions for Development of COTS Proxy Agent	1
3.3 Minimum Functionality Description	2
3.3.1 COTS Software Monitoring.....	2
3.3.2 COTS Software Management	3

Appendix A. COTS Software Characteristics

A.1 Purpose of Identifying COTS Software Characteristics	1
A.2 Assumptions	1
A.3 COTS Software Characteristics Definition.....	1
A.4 COTS Software Analysis.....	2

A.4.1 Summary of Release A COTS Software Characteristics.....2
A.4.2 Summary of Release B COTS Software Characteristics.....4

Abbreviations and Acronyms

1. Introduction

1.1 Purpose

The document's purpose is to specify the minimum requirements for developing a COTS software proxy agent; a proxy agent is a software component (event handlers like Tivoli, ESSM, or custom developed code) acting as an interface between a COTS software product and a system management component. The COTS software proxy agent is to pass information collected from COTS software components to the appropriate management logs and to respond to certain management operations. The COTS software that a subsystem is responsible for is identified in Section 2.

1.2 Organization

This paper is organized as follows:

Section 1 of this document defines the purpose and outlines the content.

Section 2 of this document defines the responsible subsystem for developing a COTS software proxy agent based on the baseline COTS software for each release.

Section 3 of this document identifies the required information that a proxy agent must capture in order to provide the data needed for COTS software management for both Releases A and B.

Appendix A of this document presents background material for Sections 2 and 3.

1.3 Review and Approval

This White Paper is an informal document approved at the Office Manager level. It does not require formal Government review or approval; however, it is submitted with the intent that review and comments will be forthcoming.

Questions regarding technical information contained within this Paper should be addressed to the following ECS and/or GSFC contacts:

- ECS Contacts
 - Mark Alabastro, MTS - Associate, 301.925.1054, malabast@eos.hitc.com

Questions concerning distribution or control of this document should be addressed to:

Data Management Office
The ECS Project Office
Hughes Information Technology Systems
1616 McCormick Drive
Upper Marlboro, MD 20774-5372

2. COTS Software Proxy Agent Development Responsibilities

2.1 Responsibility Overview

This section presents the findings of the analysis found in Appendix A. For the purpose of this document “the baseline COTS software,” in Table 2-1, are UNIX-based COTS software that are not development tools but are server or COTS software in the operational environment. It is noted that the baseline COTS software in this document is a subset of the COTS software baseline for each release. The following section identifies the responsible subsystem for developing or customizing an existing or off-the-shelf (OTS) proxy agent under the requirements defined in Section 3.

Table 2-1. Baseline COTS Software for Releases A and B

COTS Software	Release A Version	Release B Version
ClearCase	2.02	2.01 and 2.02
DDTS	3.1.12	3.1.12
DCE Server Software (Transarc)	1.0.3a	OSF/DCE 1.1
DCE Server Software (HP)	1.2.1	OSF/DCE 1.1
DCE Server Software (DEC)	1.3	OSF/DCE 1.1
DCE Server Software (SGI)	1.02	OSF/DCE 1.1
DCE Server Software (IBM)	1.3 (&1.2)	OSF/DCE 1.1
Sybase SQL Server	10.01	11.0
Sybase Open Gateways	N/A	11.0
Sybase Replication Server	10.01 ²	11.0
Sybase SQR Workbench	10.01	N/A
Sybase SQS	10.01	N/A
Illustra	3.3	3.3
TOPIC	1.0.2	1.0.3
Netscape Commerce Server	2.0	2.0
Web Server for IDM-B	N/A	TBD
AutoSys	3.2	4.0
AutoSys Xpert	1.0	4.0

² Release A PDPS uses Sybase Replication Server 11.0

Table 2-1. Baseline COTS Software for Releases A and B

COTS Software	Release A Version	Release B Version
HP9000/Distribute Account Manager	N/A	10.0
HP9000/Distribute Configuration Manager	N/A	10.0
HP OpenView/Network Node Manager (NNM)	4.0	4.0
Tivoli/Enterprise Console (EC)	2.0.2	2.5
Tivoli/Admin	2.0.2	2.5
Tivoli/Sentry	2.0.2	2.5
Tivoli/Courier	2.0.2	2.5
HAL DCE Cell Manager	1.1	N/A
AMASS License Manager	4.5	4.5
XRP-II Baseline Manager	3.0	2.0
Remedy ARS	2.0.2	N/A
Accugraph PNM	N/A	2.1
Billing and Accounting	N/A	TBD
ILM Manager	N/A	TBD
Report Writer/Generator	N/A	TBD
Trending/Statistical Analysis	N/A	TBD
Mail Server	TBD	TBD
Bulletinboard Server	TBD	TBD
FTP Server	TBD	TBD
SGI BDS	N/A	TBD

2.2 COTS Software Proxy Agent Development Assignment

For the baseline COTS software, a specific subsystem is responsible for maintaining that piece of software. Part of their responsibility is to develop a proxy agent fulfilling the minimum requirements defined in Section 3, COTS Software Proxy Agent Development.

The following two tables, Tables 2-2 and 2-3, identify the responsible subsystem for developing a proxy agent for each COTS software component. Therefore, one development organization develops particular instances of a proxy agent for other subsystems to utilize; other subsystems that utilize a given COTS software component are identified in Appendix A.

Table 2-2. Release A Responsible Subsystem for COTS Software Proxy Agent Development

COTS Software	Version	Responsible Subsystem for Proxy Agent Development
Mail Server	<i>TBD</i>	CSS
Bulletinboard Server	<i>TBD</i>	CSS
FTP Server	<i>TBD</i>	CSS
Sybase Replication Server	10.01	DMS
Sybase SQR Workbench	10.01	DMS
Sybase SQS	10.01	DMS
Illustra	3.3	DSS
TOPIC	1.0.2	DSS
Netscape Commerce Server	2.0	DSS
AMASS License Manager	4.5	DSS
DCE Server Software (Transarc)	1.0.3a	MSS
DCE Server Software (HP)	1.2.1	MSS
DCE Server Software (DEC)	1.3	MSS
DCE Server Software (SGI)	1.02	MSS
DCE Server Software (IBM)	1.3 (&1.2)	MSS
ClearCase	2.02	MSS
DDTS	3.1.12	MSS
Sybase SQL Server	10.01	MSS
Sybase Replication Server	10.01	MSS
Sybase SQR Workbench	10.01	MSS
Sybase SQS	10.01	MSS
HP OpenView/NNM	4.0	MSS
HAL DCE Cell Manager	1.1	MSS
XRP-II Baseline Manager	3.0	MSS
Remedy ARS	2.0.2	MSS
Accugraph PNM	2.1	MSS
Sybase Replication Server	11.0	PDPS
AutoSys	3.2	PDPS
AutoSys Xpert	1.0	PDPS

Table 2-3. Release B Responsible Subsystem for COTS Software Proxy Agent

COTS Software	Version	Responsible Subsystem for Proxy Agent Development
DCE Server Software (Transarc)	OSF/DCE 1.1	CSS/MSS ³
DCE Server Software (HP)	OSF/DCE 1.1	CSS/MSS
DCE Server Software (DEC)	OSF/DCE 1.1	CSS/MSS
DCE Server Software (SGI)	OSF/DCE 1.1	CSS/MSS
DCE Server Software (IBM)	OSF/DCE 1.1	CSS/MSS
Mail Server	TBD	CSS
Bulletinboard Server	TBD	CSS
FTP Server	TBD	CSS
Sybase Replication Server	11.0	DMS
Sybase Replication Server	11.0	IOS
Web Server	TBD	IOS
Illustra	3.3	DSS/MSS ⁴
TOPIC	1.0.3	DSS
Netscape Commerce Server	2.0	DSS
AMASS License Manager	4.5	DSS
ClearCase	2.01 and 2.02	MSS
DDTS	3.1.12	MSS
Sybase SQL Server	11.0	MSS
HP9000/Distribute Account Manager	10.0	MSS

Table 2-3. Release B Responsible Subsystem for COTS Software Proxy Agent

COTS Software	Version	Responsible Subsystem for Proxy Agent Development
HP9000/Distribute Configuration Manager	10.0	MSS
HP OpenView/NNM	4.0	MSS
Tivoli/EC	2.5	MSS
Tivoli/Admin	2.5	MSS
Tivoli/Sentry	2.5	MSS
Tivoli/Courier	2.5	MSS
Accugraph PNM	2.1	MSS

³ Developed jointly by the Communications and Management Subsystem Teams

⁴ Developed jointly by the Data Server Subsystem Team with support from the Management Subsystem Team

Remedy ARS	2.1	MSS
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Table 2-3. Release B Responsible Subsystem for COTS Software Proxy Agent

COTS Software	Version	Responsible Subsystem for Proxy Agent Development
Billing and Accounting	<i>TBD</i>	MSS
ILM Manager	<i>TBD</i>	MSS
Report Writer/Generator	<i>TBD</i>	MSS
Trending/Statistical Analysis	<i>TBD</i>	MSS
Sybase SQL Server	11.0	PDPS
AutoSys	3.3	PDPS
AutoSys Xpert	3.3	PDPS

3. COTS Software Proxy Agent Development Criteria

3.1 Purpose of COTS Software Proxy Agent

The Proxy Agent for each COTS software is to monitor certain types of information and to manage certain operations. The type of information to monitor and the operations to manage differ from release to release as presented in this section.

3.2 Assumptions for Development of COTS Proxy Agent

An SNMP (Simple Network Management Protocol) proxy agent and/or Tivoli Sentry/Event adaptor shall be developed to monitor and control COTS software. Life-cycle services (startup/shutdown) for mode dependent COTS software shall be provided via an SNMP proxy agent. Life-cycle service for mode independent COTS software may be provided by Tivoli/EC.

The ECS management environment will use the following COTS management environment software versions for Releases A and B as presented in Table 3-1.

Table 3-1. ECS Releases A and B Management Environment

COTS Management Environment Software	Release A Version	Release B Version
Tivoli Management Platform	2.0.2	2.5
Tivoli/Enterprise Console	2.0.2	2.5
Tivoli/TME (Tivoli Management Environment)	2.0.2	2.5
Tivoli/Admin	2.0.2	2.5
Tivoli/Sentry	2.0.2	2.5
Tivoli/Courier	2.0.2	2.5
Tivoli/EIF (Event Integration Facility)	2.0.2	2.5
HP OpenView/(NNM) Network Node Manager	4.0	4.0

Additionally, any custom SNMP proxy agent will report to HP OpenView in both Releases A and B.

Of these products, it is assumed that the primary integration would be done to Tivoli/Sentry for monitoring activities and Tivoli/EC for management activities. The integration may use Tivoli/TME Adapters and/or the EIF. For life-cycle services, it is assumed to be an SNMP proxy agent.

3.3 Minimum Functionality Description

The minimum functionality is divided into two categories: *monitoring* the COTS product environment from the Tivoli/Sentry framework and *managing* the COTS product environment from the Tivoli/EC. Both of these will be done via one or more intelligent agents (i.e., Tivoli(Sentry, SNMP proxy agents) which will collect statistics and provide them to the appropriate management console.

3.3.1 COTS Software Monitoring

The following resources/components, as a minimum, are to be monitored based on release criteria (see Table 3-2). However based on the software type, some items to monitor are not applicable, i.e., database, database configuration parameters, and license managers.

1. **Disk Space** - does the COTS software use the UNIX file system for its table, index, and log files? Some objects may be striped across several file systems, with system catalogs tracking which disks and file system directories are designated for each object. Because of their importance, the status of these files will be monitored. Warnings will be given through Tivoli and/or HP OpenView when thresholds are reached. These thresholds are determined by the COTS software experts for each subsystem.
2. **License Managers** - does the COTS software enforce concurrent user licensing through a license manager? A mis-functioning license manager may, in some cases disable the COTS software functionality. An interface will be provided to monitor the status of the license manager. FlexLM and iFor/CS will be monitored by MSS.
3. **Database** - administrators frequently must determine the existence and status of COTS databases. A monitoring interface will be provided to report on databases in an installation. Databases can be reported by status (e.g., active/inactive).
4. **Processes** - does the COTS software have a multiprocess server model (i.e., multiple server process will access a shared database)? The processes are spawned from a single “daemon” process. An interface will be provided to monitor the “daemon” to determine the status (e.g., up/down) of the entire COTS software environment. In addition, the interface will determine which user processes are active and which databases are being accessed by each user process.
5. **CPU Usage, Memory Usage, and Disk I/O** - because the COTS software uses a UNIX process model, operating system utilities can be used to monitor resource utilization. An interface will be provided by the COTS software subsystem expert to collect COTS software statistics using these facilities.
6. **Database Configuration Parameters** - COTS databases can be tuned with a variety of configuration parameters. An interface will be provided by the COTS software subsystem expert to report the current set of database and server parameters.

Table 3-2. Object Monitoring By Release

Monitored Object	Release A to Monitor	Release B to Monitor
Disk Space	Yes	Yes
License Managers	No	Yes
Database	Yes, if supported by ESSM	Yes
Servers	Yes, if supported by ESSM	Yes
CPU Usage, Memory Usage, and Disk I/O	Yes	Yes
Database Configuration Parameters	Yes, if supported by ESSM	Yes

3.3.2 COTS Software Management

The following operations in Table 3-3, considered critical to the successful operation of a COTS DBMS or applicable software package, will be managed by release.

Table 3-3. COTS Software Critical Operations to be Managed by Release

Operation to Manage	Release A to Manage	Release B to Manage
Starting/stopping license manager	No	Yes
Starting/Stopping database server	Yes, if ESSM supported and only on a per server basis	Yes
Backing up database	Yes, if ESSM supported and only on a per server basis	Yes
Restoring database	Yes, if ESSM supported and only on a per server basis	Yes
Vacuuming, reclaiming space and updating statistics, database	Yes, if ESSM supported and only on a per server basis	Yes

Appendix A. COTS Software Characteristics

A.1 Purpose of Identifying COTS Software Characteristics

This section provides the analysis of COTS software characteristics. The approach is to have certain characteristics of baseline COTS software identified for proxy agent development. By identifying certain characteristics, proxy agent development is aided by identifying the interface, event handler, the connection to a proxy agent, and licensing standards.

A.2 Assumptions

- the COTS software used in Releases A and B may differ in version numbers
- ↑ the COTS software used in Releases A and B may not be the same COTS software used in subsystems across releases

A.3 COTS Software Characteristics Definition

Subsequent sections of this analysis reference terms that define characteristics needed for COTS software management.

- **Subsystem** - the subsystem utilizing the COTS software
- ↑ **Version** - COTS software version number to identify changes between Releases which could have differing event handling capabilities
- **Native Interface** - COTS software management interface
- ↑ **Event Handler** - does an industry accepted event handler exist to report COTS software events and to use any recovery mechanism provided by the event handler
- ↑ **Connection to Proxy Agent** - is the connection to the proxy agent done via an API or a shell script
- ↑ **Life-cycle services** - COTS software life-cycle services available, i.e. start-up, shutdown, etc.

A.4 COTS Software Analysis

A.4.1 Summary of Release A COTS Software Characteristics

Table A-1. Release A COTS Software Characteristics

COTS Software	Subsystem	Version	Native Interface (Yes or No)	Event Handler (TME, etc.)	Connection to Proxy Agent (API or Shell Script)	Life-cycle Services (enumerate)
ClearCase	MSS	2.02	No	TME	Script	start/stop
DDTS	MSS	3.1.12	No	TME	Script	start/stop
DCE Server Software (Transarc)	CSS	1.0.3a	No	TME	None	None
DCE Server Software (HP)	CSS	1.2.1	No	TME	None	None
DCE Server Software (DEC)	CSS	1.3	No	TME	None	None
DCE Server Software (SGI)	CSS	1.02	No	TME	None	None
DCE Server Software (IBM)	CSS	1.3 (& 1.2)	No	TME	None	None
Sybase SQL server	MSS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase SQL server	DMS	10.01	Yes	TME/ESSM	Sybase Script	None

Table A-1. Release A COTS Software Characteristics

COTS Software	Subsystem	Version	Native Interface (Yes or No)	Event Handler (TME, etc.)	Connection to Proxy Agent (API or Shell Script)	Life-cycle Services (enumerate)
Sybase SQL server	DPS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase SQL server	PLS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase Replication Server	MSS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase Replication Server	DMS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase Replication Server	IOS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase Replication Server	DPS	11.0	Yes	TME/ESSM	Sybase Script	None
Sybase Replication Server	PLS	11.0	Yes	TME/ESSM	Sybase Script	None
Sybase SQR Workbench	MSS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase SQR Workbench	DPS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase SQR Workbench	PLS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase SQR Workbench	DMS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase SQS	MSS	10.01	Yes	TME/ESSM	Sybase Script	None
Sybase SQS	DMS	10.01	Yes	TME/ESSM	Sybase Script	None
TOPIC	DSS	1.0.2	No	TME	API	None
Netscape Enterprise Server	DSS	2.0	No	TME	Event adaptor/API	start/stop
HP OpenView/NNM	MSS	4.0	Yes	TME	Event adaptor	None
AutoSys	PLS	3.2	Yes	HP OpenView	API	None
AutoSys	DPS	3.2	Yes	HP OpenView	API	None
AutoSys Xpert	PLS	1.0	Yes	HP OpenView	API	None
AutoSys Xpert	DPS	1.0	Yes	HP OpenView	API	None
HAL DCE Cell Manager	MSS	1.1	No	TME	None	None
AMASS License	DSS	4.5	Yes	HP OpenView	Proxy	start/stop
XRP-II Baseline Manager	MSS	3.0	No	TME	None	None
Remedy ARS	MSS	2.0.2	Yes	TME	Script	start/stop
Accugraph PNM (Physical CM)	MSS	2.1	No	TME	None	None
<i>Mail Server</i>	<i>CSS</i>	<i>TBD</i>	<i>No</i>	<i>HP OpenView</i>	<i>Shell Proxy</i>	<i>Proxy</i>
<i>Bulletinboard Server</i>	<i>CSS</i>	<i>TBD</i>	<i>No</i>	<i>HP OpenView</i>	<i>Shell Proxy</i>	<i>Proxy</i>
<i>FTP Server</i>	<i>CSS</i>	<i>TBD</i>	<i>No</i>	<i>HP OpenView</i>	<i>Shell Proxy</i>	<i>Proxy</i>

A.4.2 Summary of Release B COTS Software Characteristics

Table A-2. Release B COTS Software Characteristics

COTS Software	Subsystem	Version	Native Interface (Yes or No)	Event Handler (TME, etc.)	Connection to Proxy Agent (API or Shell Script)	Life-cycle Services (enumerate)
ClearCase	MSS	2.01 and 2.02	No	TME	Script	start/stop
DDTS	MSS	3.1.12	No	TME	Script	start/stop
DCE Server Software (Transarc)	CSS	OSF/DCE 1.1	Yes	TME/HP OpenView	DCE APIs	Proxy Agent
DCE Server Software (HP)	CSS	OSF/DCE 1.1	Yes	TME/HP OpenView	DCE APIs	Proxy Agent
DCE Server Software (DEC)	CSS	OSF/DCE 1.1	Yes	TME/HP OpenView	DCE APIs	Proxy Agent
DCE Server Software (SGI)	CSS	OSF/DCE 1.1	Yes	TME/HP OpenView	DCE APIs	Proxy Agent
DCE Server Software (IBM)	CSS	OSF/DCE 1.1	Yes	TME/HP OpenView	DCE APIs	Proxy Agent
Sybase SQL server	MSS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase SQL server	DMS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase SQL server	IOS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase SQL server	DPS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase SQL server	PLS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase SQL server	INS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase SQL server	DSS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase Open Gateways	DPS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase Open Gateways	PLS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase Replication Server	DMS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase Replication Server	IOS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase Replication Server	DPS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Sybase Replication Server	PLS	11.0	Yes	TME/ESSM	Sybase Script	ESSM
Illustra	DSS	3.3	No	HP OpenView	Illustra Script	Proxy
Illustra	MSS	3.3	No	HP OpenView	Illustra Script	Proxy
TOPIC	DSS	1.0.3	No	TME	API	None
Netscape Commerce Server	DSS	2.0	No	HP OpenView	API	start/stop
Web Server (TBD)	IOS		No	HP OpenView	Shell Script	Proxy

AutoSys	PLS	4.0	No	TME	Shell Script/Tivoli Plus	Proxy
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Table A-2. Release B COTS Software Characteristics

COTS Software	Subsystem	Version	Native Interface (Yes or No)	Event Handler (TME, etc.)	Connection to Proxy Agent (API or Shell Script)	Life-cycle Services (enumerate)
AutoSys	DPS	4.0	No	TME	Shell Script/Tivoli Plus	Proxy
AutoSys Xpert	PLS	4.0	No	TME	Shell Script/Tivoli Plus	Proxy
AutoSys Xpert	DPS	4.0	No	TME	Shell Script/Tivoli Plus	Proxy Agent
HP9000/Distribute Account Manager	MSS	10	Yes	TME	Event adaptor	None
HP9000/Distribute Configuration Manager	MSS	10	Yes	TME	Event adaptor	None
HP OpenView/NNM	MSS	4.0	Yes	TME	None	None
Tivoli/EC	MSS	2.5	Yes	HP OpenView	Shell Script	Proxy
Tivoli/ Admin	MSS	2.5	Yes	HP OpenView	Shell Script	Proxy
Tivoli/ Sentry	MSS	2.5	Yes	HP OpenView	Shell Script	Proxy
Tivoli/ Courier	MSS	2.5	Yes	HP OpenView	Shell Script	Proxy
Remedy/ARS	MSS	1.1	Yes	Tivoli Plus	Shell Script	Proxy
Accugraph PNM (Physical CM)	MSS	2.1	No	TME	None	None
<i>Billing and Accounting (TBD)</i>	<i>MSS</i>		<i>Yes</i>	<i>Tivoli Plus</i>	<i>API</i>	<i>Proxy</i>
<i>ILM Manager (TBD)</i>	<i>MSS</i>	<i>2.0</i>	<i>Yes</i>	<i>TME</i>	<i>Shell Script/Event adaptor</i>	<i>Proxy</i>
<i>Report Writer/Generator (TBD)</i>	<i>MSS</i>		<i>Yes</i>	<i>TME</i>	<i>Event adaptor</i>	<i>None</i>
<i>Trending/Statistical Analysis (TBD)</i>	<i>MSS</i>		<i>Yes</i>	<i>TME</i>	<i>Event adaptor</i>	<i>None</i>
AMASS License	DSS	4.5	Yes	HP OpenView	Shell Script	start/stop
<i>Mail Server (TBD)</i>	<i>CSS</i>		<i>No</i>	<i>HP OpenView</i>	<i>Shell Script</i>	<i>Proxy</i>
<i>Bulletinboard Server (TBD)</i>	<i>CSS</i>		<i>No</i>	<i>HP OpenView</i>	<i>Shell Script</i>	<i>Proxy</i>
<i>FTP Server (TBD)</i>	<i>CSS</i>		<i>No</i>	<i>HP OpenView</i>	<i>Shell Script</i>	<i>Proxy</i>
<i>SGI BSD (TBD)</i>	<i>CSS</i>		<i>No</i>		<i>Shell Script</i>	

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Abbreviations and Acronyms

COTS	Common-Of-The-Shelf
EC	Enterprise Console
ECS	EOSDIS Core System
EIF	Event Integration Facility
ESSM	Enterprise SQL Server Manager
NNM	Network Node Manager
PNM	Physical Network Manager
SNMP	Simple Network Management Protocol
TME	Tivoli Management Environment