

335-EMD-002

## **EOSDIS Maintenance and Development Project**

# **EMD COTS Deployment Plan (01/05 through 01/06)**

Revision 01

January 2006

Raytheon Company  
Upper Marlboro, Maryland

# **EMD COTS Deployment Plan (01/05 through 01/06)**

**Revision 01**

**January 2006**

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# Preface

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This document is a formal contract deliverable. It requires Government review and approval within 20 business days. Changes to this document will be made by document change notice (DCN) or by complete revision.

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## Abstract

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This document provides the second in a series of EMD project documents that provide information and details associated with the upgrading of COTS. This document provides information regarding COTS products and freeware that are being upgraded, added or removed, the rationale for the upgrade, schedule for upgrade, and the process used to report weekly status. The document also provides information about the reviews and risk mitigation activities performed throughout the upgrade cycle.

**Keywords:** EMD, upgrade, status, hardware, software, COTS, Solaris, IRIX, Sun, SGI, Linux, ECS Deployment, Task 109

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# Contents

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## Preface

## Abstract

## Contents

### 1. Introduction

1.1	Identification.....	1-1
1.2	Scope .....	1-1
1.3	Purpose.....	1-1
1.4	Status and Schedule .....	1-1
1.5	Organization.....	1-2

### 2. Related Documents

2.1	Parent Documents .....	2-1
2.2	Applicable Documents.....	2-1

### 3. COTS Upgrade Overview

3.1	COTS Upgrade Process Overview.....	3-1
3.2	Mitigating Risks.....	3-1
3.3	Identification of Defect/NCRs .....	3-1
3.4	Vendor Support.....	3-2
3.4.1	COTS Software Support .....	3-2
3.4.2	Cross Product Software Compatibility .....	3-4

3.4.3	Features/Performance Upgrades .....	3-6
3.4.4	Monitoring and Mitigating Security Risks/Critical Bug Fixes .....	3-6
3.5	COTS Upgrade Summary .....	3-7

## 4. EMD COTS Software Upgrades

4.1	Status of Upgrades Mentioned in Original DID 335-EMD-002.....	4-1
4.1.1	Solaris Compiler Upgrade Target Changed to Studio 10 .....	4-1
4.1.2	Upgrade Needed for Sybase ASE Security Issue .....	4-1
4.2	Patches to COTS Products .....	4-1
4.2.1	SQS 3.4.2.28 .....	4-1
4.2.2	ACSLs PUT0502S .....	4-1
4.3	IRIX 6.5.26 Patch Upgrade.....	4-2
4.3.1	Description of COTS .....	4-2
4.3.2	Rationale for Upgrade.....	4-2
4.3.3	Operational Impact.....	4-4
4.3.4	Custom Code Impact.....	4-4
4.3.5	Security Impact .....	4-4
4.3.6	Licensing Impact.....	4-4
4.3.7	External Drivers .....	4-5
4.3.8	Other Impacts/Comments .....	4-5
4.3.9	COTS Installation Sequence/Dependencies .....	4-5
4.4	SGI MIPSpro Compilers 7.4.2/ProDev Workshop 2.9.4.....	4-5
4.4.1	Description of COTS .....	4-5
4.4.2	Rationale for Upgrade.....	4-5
4.4.3	Operational Impact.....	4-7
4.4.4	Custom Code Impact.....	4-7
4.4.5	Security Impact .....	4-7
4.4.6	Licensing Impact.....	4-7
4.4.7	External Drivers .....	4-7
4.4.8	Other Impacts/Comments .....	4-8
4.4.9	COTS Installation Sequence/Dependencies .....	4-8
4.5	ACSLs 7.1 .....	4-8

4.5.1	Description of COTS .....	4-8
4.5.2	Rationale for Upgrade.....	4-8
4.5.3	Operational Impact.....	4-9
4.5.4	Custom Code Impact.....	4-9
4.5.5	Security Impact .....	4-9
4.5.6	Licensing Impact.....	4-10
4.5.7	External Drivers .....	4-10
4.5.8	Other Impacts/Comments .....	4-10
4.5.9	COTS Installation Sequence/Dependencies .....	4-10
4.6	Sybase SDK (Open Client) 12.5.1 .....	4-10
4.6.1	Description of COTS .....	4-10
4.6.2	Rationale for Upgrade.....	4-10
4.6.3	Operational Impact.....	4-11
4.6.4	Custom Code Impact.....	4-12
4.6.5	Security Impact .....	4-12
4.6.6	Licensing Impact.....	4-12
4.6.7	External Drivers .....	4-12
4.6.8	Other Impacts/Comments .....	4-12
4.6.9	COTS Installation Sequence/Dependencies .....	4-12
4.7	Portus 5.1.5 Upgrade.....	4-12
4.7.1	Description of COTS .....	4-12
4.7.2	Rationale for Upgrade.....	4-13
4.7.3	Operational Impact.....	4-13
4.7.4	Custom Code Impact.....	4-14
4.7.5	Security Impact .....	4-14
4.7.6	Licensing Impact.....	4-14
4.7.7	External Drivers .....	4-14
4.7.8	Other Impacts/Comments .....	4-14
4.7.9	COTS Installation Sequence/Dependencies .....	4-14
4.8	Autosys 4.5 Upgrade.....	4-14
4.8.1	Description of COTS .....	4-14
4.8.2	Rationale for Upgrade.....	4-14
4.8.3	Operational Impact.....	4-15

4.8.4	Custom Code Impact.....	4-15
4.8.5	Security Impact.....	4-16
4.8.6	Licensing Impact.....	4-16
4.8.7	External Drivers.....	4-16
4.8.8	Other Impacts/Comments.....	4-16
4.8.9	COTS Installation Sequence/Dependencies.....	4-16
4.9	Sun ONE Studio 10.....	4-16
4.9.1	Description of COTS.....	4-16
4.9.2	Rationale for Upgrade.....	4-16
4.9.3	Operational Impact.....	4-18
4.9.4	Custom Code Impact.....	4-18
4.9.5	Security Impact.....	4-18
4.9.6	Licensing Impact.....	4-18
4.9.7	External Drivers.....	4-18
4.9.8	Other Impacts/Comments.....	4-18
4.9.9	COTS Installation Sequence/Dependencies.....	4-18
4.10	PERL 5.8.5.....	4-19
4.10.1	Description of COTS.....	4-19
4.10.2	Rationale for Upgrade.....	4-19
4.10.3	Operational Impact.....	4-20
4.10.4	Custom Code Impact.....	4-20
4.10.5	Security Impact.....	4-20
4.10.6	Licensing Impact.....	4-20
4.10.7	External Drivers.....	4-20
4.10.8	Other Impacts/Comments.....	4-20
4.10.9	COTS Installation Sequence/Dependencies.....	4-20
4.11	Permeo SDK 1.4.2.....	4-20
4.11.1	Description of COTS.....	4-20
4.11.2	Rationale for Upgrade.....	4-21
4.11.3	Operational Impact.....	4-22
4.11.4	Custom Code Impact.....	4-22
4.11.5	Security Impact.....	4-22
4.11.6	Licensing Impact.....	4-22

4.11.7	External Drivers .....	4-22
4.11.8	Other Impacts/Comments .....	4-22
4.11.9	COTS Installation Sequence/Dependencies .....	4-22
4.12	Anti-Virus Software for PCs.....	4-22
4.12.1	Description of COTS .....	4-22
4.12.2	Rationale for Upgrade.....	4-23
4.12.3	Operational Impact.....	4-23
4.12.4	Custom Code Impact.....	4-23
4.12.5	Security Impact .....	4-23
4.12.6	Licensing Impact.....	4-23
4.12.7	External Drivers .....	4-24
4.12.8	Other Impacts/Comments .....	4-24
4.12.9	COTS Installation Sequence/Dependencies .....	4-24

## **5. Potential Software Upgrades**

5.1	Linux 7.x Security Patches .....	5-1
-----	----------------------------------	-----

## **6. COTS Hardware Upgrades**

6.1	Status of Hardware Upgrades mentioned in previous DID 335 .....	6-1
6.1.1	Hardware Replacements for Equipment Reaching EOSL.....	6-1
6.1.2	Other Hardware-related Upgrades .....	6-1
6.2	IP Readdressing .....	6-1
6.2.1	Description of COTS .....	6-1
6.2.2	Rationale for Upgrade.....	6-2
6.2.3	Software Impact (COTS/Custom).....	6-2
6.2.4	Network Impact .....	6-2
6.2.5	DAAC Facility Impacts .....	6-2
6.2.6	Transition Impacts .....	6-2
6.2.7	External Drivers .....	6-2
6.2.8	Other Impacts/Comments .....	6-3
6.2.9	COTS Installation Sequence/Dependencies .....	6-3
6.2.10	Replacement Matrix.....	6-3

## **7. Task 106, Synergy V COTS Upgrades**

7.1	Completed Synergy V Upgrade Summary .....	7-1
7.1.1	Archive Capacity Upgrade at GES .....	7-1
7.1.2	StorNext .....	7-1
7.1.3	WU-FTP.....	7-1
7.2	Planned Synergy V Upgrades .....	7-1
7.2.1	Linux Red Hat Enterprise Edition 3.0.....	7-3
7.2.2	COTS Software Deliveries to DAACs .....	7-3
7.2.3	Synergy V Development COTS Software .....	7-7
7.2.4	Linux Versions of Current Products .....	7-8

## **8. Task 109 COTS Refresh Proposal**

8.1	Permeo Enterprise COTS Software .....	8-1
8.1.1	Description of COTS .....	8-1
8.1.2	Rationale for Upgrade.....	8-2
8.1.3	Operational Impact.....	8-3
8.1.4	Custom Code Impact.....	8-3
8.1.5	Security Impact .....	8-3
8.1.6	Licensing Impact.....	8-3
8.1.7	External Drivers .....	8-3
8.1.8	Other Impacts/Comments .....	8-4
8.1.9	COTS Installation/Sequence Dependencies .....	8-4
8.2	RogueWave Software .....	8-4
8.3	PC Upgrades .....	8-4
8.3.1	Windows XP and Memory Upgrades .....	8-4
8.3.2	Rationale for Upgrade.....	8-4
8.3.3	Custom Code Impact.....	8-5
8.3.4	Security Impact .....	8-6
8.3.5	Licensing Impact.....	8-6
8.3.6	External Drivers .....	8-6
8.3.7	Other Impacts/Comments .....	8-6

8.3.8	COTS Installation/Sequence Dependencies .....	8-6
8.4	Sun Ultra Servers .....	8-6
8.4.1	Description of COTS .....	8-6
8.4.2	Rationale for Upgrade.....	8-6
8.4.3	Software Impact (COTS/Custom).....	8-7
8.4.4	Network Impacts.....	8-7
8.4.5	DAAC Facility Impacts .....	8-7
8.4.6	Transition Impacts .....	8-7
8.4.7	External Drivers .....	8-7
8.4.8	Other Impacts/Comments .....	8-7
8.4.9	COTS Installation Sequence/Dependencies .....	8-7
8.4.10	Replacement Matrix.....	8-8
8.5	Clariion SCSI & FC RAID Replacement .....	8-8
8.5.1	Description of COTS .....	8-8
8.5.2	Rationale for Upgrade.....	8-9
8.5.3	Software Impact (COTS/Custom).....	8-10
8.5.4	Network Impacts.....	8-10
8.5.5	DAAC Facility Impacts .....	8-10
8.5.6	Transition Impacts .....	8-10
8.5.7	External Drivers .....	8-10
8.5.8	Other Impacts/Comments .....	8-10
8.5.9	COTS Installation Sequence/Dependencies .....	8-10
8.5.10	Replacement Matrix.....	8-10
8.6	Sun RAID Model 219 .....	8-11
8.6.1	Description of COTS .....	8-11
8.6.2	Rationale for Upgrade.....	8-11
8.6.3	Software Impact (COTS/Custom).....	8-12
8.6.4	Network Impacts.....	8-12
8.6.5	DAAC Facility Impacts .....	8-12
8.6.6	Transition Impacts .....	8-12
8.6.7	External Drivers .....	8-12
8.6.8	Other Impacts/Comments .....	8-12
8.6.9	COTS Installation Sequence/Dependencies .....	8-13

8.6.10	Replacement Matrix.....	8-13
8.7	Linux Software.....	8-13
8.8	X-terminal Upgrades.....	8-13
8.9	System Backup Hardware.....	8-14
8.9.1	Description of COTS .....	8-14
8.9.2	Rationale for Upgrade.....	8-14
8.9.3	Software Impact (COTS/Custom).....	8-15
8.9.4	Network Impacts.....	8-15
8.9.5	DAAC Facility Impacts .....	8-16
8.9.6	Transition Impacts .....	8-16
8.9.7	External Drivers .....	8-16
8.9.8	Other Impacts/Comments .....	8-16
8.9.9	COTS Installation Sequence/Dependencies .....	8-16
8.9.10	Replacement Matrix.....	8-16
8.10	Catalyst 6000 Network Switch Replacement .....	8-16
8.10.1	Description of COTS .....	8-16
8.10.2	Rationale for Upgrade.....	8-17
8.10.3	Software Impact (COTS/Custom).....	8-17
8.10.4	Network Impacts.....	8-17
8.10.5	DAAC Facility Impacts .....	8-17
8.10.6	Transition Impacts .....	8-17
8.10.7	External Drivers .....	8-18
8.10.8	Other Impacts/Comments .....	8-18
8.10.9	COTS Installation Sequence/Dependencies .....	8-18
8.10.10	Replacement Matrix.....	8-18

### **List of Tables**

Table 3-1.	Critical COTS Patches.....	3-7
Table 3-2.	Planned COTS Hardware/Software Upgrades Summary.....	3-8
Table 4-1.	NCRs Against IRIX 6.5.22.....	4-2
Table 4-2.	NCRs Against AMASS 5.3.3.....	4-3

Table 4-3. NCRs Against ACSLS .....	4-8
Table 4-4. NCRs Against Sybase SDK.....	4-11
Table 4-5. NCRs Against PERL 5.6.1 .....	4-19
Table 4-6. NCRs Against Permeo SDK 1.4.....	4-21
Table 7-1. Baselined COTS Software for Synergy V Linux 3.0 .....	7-9
Table 8-1. NCRs Against Windows XP Upgrade.....	8-5
Table 8-2. Ultra Replacement Matrix .....	8-8
Table 8-3. Replacement Matrix for Clariion RAID Replacement.....	8-10
Table 8-4. NSIDC NCD X-Terminal Replacement Matrix .....	8-14

## **Appendix A. Weekly CUT Matrix Example**

## **Appendix B. COTS Compatibility Matrix**

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# 1. Introduction

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## 1.1 Identification

This document is an update to the original issue of COTS Deployment Plan (01/05 through 01/06), as defined by CDRL Item #023, EMD-EDP-23. This document identifies COTS hardware and software products being upgraded from January 2005 through January 2006 for the EMD Project. This CDRL document for EMD will be updated on a yearly basis. This revision (01) primarily provides updates on Task 109 activities that were outlined in the original document.

## 1.2 Scope

The “EMD COTS Deployment Plan (01/05 through 01/06)” documents the ECS approach and currently identified plans for deploying COTS hardware and software upgrades to all EMD sites. This document includes upgrades that will occur, or are in progress during the period January 2005 through January 2006. Some COTS upgrades are also included in this document that have been completed since the delivery of the original ECS COTS Deployment document (EMD COTS Deployment Plan (01/05 through 01/06)). This revision provides interim updates to COTS deliveries, primarily focusing on providing additional information regarding Task 109 activities.

## 1.3 Purpose

The purpose of this plan is to identify the COTS products planned for upgrade during the coverage period. This plan describes the process used for determining which products to upgrade and it discusses key consideration for each selected upgrade.

## 1.4 Status and Schedule

This document revision will be formally delivered in October 2005. Status on the COTS software upgrades identified in this document will be reported on a weekly basis through the COTS Upgrade Team (CUT) Matrix (refer to Appendix A for recent CUT Matrix) and hardware migration weekly updates/discussions with appropriate DAAC personnel. Updates to COTS Hardware and Software will also be provided as part of the Deployment Monthly Patch Plans.

It is essential to understand that as the identification of requirements and risks progresses, some elements of this document may change, e.g., additional products may be identified for upgrade during the period specified herein.

## **1.5 Organization**

Section 1 provides information regarding the identification, scope, purpose, objectives and organization of this document.

Section 2 provides a listing of the related documents, which may be used to supplement and provide additional cross-reference information other than that which is contained in this document.

Section 3 provides an overview and introduction of the requirements driving COTS upgrades, such as custom code integration, vendor support policies or COTS product interdependencies. This section provides a summary table of all identified COTS upgrades for the targeted document period. The summary table has been updated for Revision 01. The identified COTS products are discussed in more detail in sections 4, 5, 6, 7 and 8.

Section 4 identifies and discusses the COTS software upgrades that are planned to take place during the targeted document coverage period under Task 101. Section 4.1 provides changes to upgrades identified in the original document. Additional COTS upgrades and deliveries are also briefly noted in Revision 01.

Section 5 provides a brief discussion of software upgrades that may be planned during the document period. These may not take place if certain specific events do not occur.

Section 6 identifies and discusses the COTS hardware upgrades that are planned to take place in the covered period of this COTS Deployment Plan.

Section 7 provides a brief discussion of upgrades that are planned for Synergy V, Task 106.

Section 8 identifies and discusses the COTS hardware and software deliveries currently planned for Task 109, COTS Refresh. Discussion will only include upgrades that will have impact the DAACs. In Revision 01, information is expanded on each task that impacts the DAACs. Task 109 also included upgrades for the EDF infrastructure. These are not discussed in this document.

Appendix A provides an example of the Weekly CUT Matrix, which is used to provide updates on COTS upgrades discussed in this document.

Appendix B provides an example of report of the information that is tracked to verify that COTS product upgrade compatibility and that the COTS product is actively supported by the COTS vendor.

## 2. Related Documents

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### 2.1 Parent Documents

The following are the documents from which the ECS COTS Deployment Plan scope and content are derived.

335-CD-001	ECS COTS Deployment Plan, Volume 1
335-CD-002	ECS COTS Deployment Plan, Volume 2
335-CD-003	ECS COTS Deployment Plan, Volume 3
335-CD-004	ECS COTS Deployment Plan, Volume 4
335-CD-005	ECS COTS Deployment Plan, Volume 5
335-CD-006	ECS COTS Deployment Plan, Volume 6
335-CD-007	ECS COTS Deployment Plan, Volume 7
335-CD-008	ECS COTS Deployment Plan, Volume 8
335-EMD-001	EMD COTS Deployment Plan
335-EMD-002	EMD COTS Deployment Plan

### 2.2 Applicable Documents

The following documents are referenced within this COTS Deployment Plan. Upgrades are directly applicable. These reference documents may contain policies or other directives that are binding upon the content of the current release of the COTS Deployment Plan.

CM-004	CCB Change Control Process
IL-006	COTS Software License Administration and COTS Maintenance Support
SD-034	Development Planning and Tracking of Operational NCRs (Sustaining Engineering) Project Instruction
EMD-MPP-20	Monthly Patch Plan
EMD-EDP-23	ECS SDPD Documentation Package

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## 3. COTS Upgrade Overview

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### 3.1 COTS Upgrade Process Overview

This document provides information on upgrades that are scheduled, tentatively planned to be initiated, or in progress through the period of 01/01/2005 through 01/01/2006. The COTS upgrade information detail that is available at the time of release of this plan is included in the following sections. Additional information and updates are also provided throughout the COTS upgrade process including:

- Weekly update and distribution of COTS Upgrade Team (CUT) Matrix (Refer to Appendix A for recent CUT Matrix)
- Weekly discussions with DAACs on hardware issues
- Deployment Monthly Patch Plan Updates
- COTS PSRs and Release Notes.

The sections that follow summarize the process by which upgrades to ECS COTS products are identified. The specific risks mitigated with each COTS product are discussed in the detailed section addressing the specific COTS product.

### 3.2 Mitigating Risks

Various factors are included in identifying COTS products for upgrades, replacements or additions. EMD works to mitigate risks in multiple ways. Defects against a COTS product are identified and tracked in a manner similar to defects with custom code. COTS products also have additional potential risks that need to be considered in reducing scheduling and operational impacts that are inherent to COTS products. The efforts that EMD makes to mitigate both types of risk are discussed in the following sections.

### 3.3 Identification of Defect/NCRs

A Non-Conformance Report (NCR) can be identified against a COTS product as well as against custom code. This process is discussed in ECS Project Instruction SD-034. In many cases, risks related to the COTS product can be mitigated by custom code or configuration changes. Occasionally risks identified in the NCR process are best mitigated by an upgrade of a COTS product. In some cases, patches are provided by the vendor that will sufficiently mitigate the risk. Other cases may warrant that the risk be mitigated by a versioned upgrade of the COTS product. When an upgrade is identified as the resolution to an NCR, a patch or version upgrade is scheduled as soon as possible. If the problem warrants, the upgrade may be fielded as a “test executable” in advance of completing the full COTS upgrade process.

Some vendors release product fixes as patches on a frequent, recurring basis. Unless a special problem warrants urgent deployment of a certain patch, these patches are generally deployed as a bundle for EMD on a less frequent basis. This reduces potential impact to ECS custom code and the associated delivery schedules. These patch bundle upgrades are usually limited to COTS with substantial impact such as operating systems and databases.

### **3.4 Vendor Support**

Although some terms and concepts differ, full life cycle support is provided for both COTS software and hardware products in the EMD Project. A significant part of this concept is maintenance support for these COTS products. The process for renewing and funding software maintenance agreements is discussed in EMD Project Instruction IL-006. The discussion of “support” in this document refers to the technical support provided by the vendor under the ECS maintenance contract with the vendor, not the payment for the maintenance support.

#### **3.4.1 COTS Software Support**

Software support agreements for most COTS vendors include consultation, problem assistance, patches and upgrades. In any COTS product life cycle, there are points at which a product may be “supported” at a different level. This support level is usually identified by the COTS product having reached one of the following milestones in the COTS product life cycle:

- Specific version is identified by the vendor to have reached end-of-life
- Specific version is identified by the vendor to have reached end-of-support
- Product is merged/evolved to another product or is made obsolete.

Many large vendors have formulated very specific policies on these milestones and when they occur. Some of these are published on the vendor’s web site. Others will provide the criteria for these milestones, upon request. Other vendors have not defined a policy as would be preferred, but generally these are not COTS products with major impact for ECS.

Reaching any of these milestones has the potential to cause some level of risk to the project. To mitigate these risks, these milestones are tracked in the COTS Compatibility Matrix<sup>1</sup> and are updated on a quarterly basis. An overview of each of these milestones and their potential impact is provided in the following sections to serve as a reference for the upgrade discussions in Sections 4, 5 and 6. The CUT reviews these milestones for every COTS software product when identifying the upgrades for each rolling wave period.

##### **3.4.1.1 COTS Software Product End-of-Life: Best Effort Support**

COTS products are under active support for a period after release. Many COTS products reach a stage where the vendor no longer provides development engineering support for the product version, i.e., no bug fixes to the code are provided. This phase is sometimes referred to as End of

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<sup>1</sup> An example of some of the compatibility information maintained in the COTS Compatibility Database is provided in Appendix B.

Ship date, End of Life or Bug Fix Desupport dates. Some vendors, such as Sybase, call this phase End of Support (for bug fixes). Many vendors will continue to provide bug fixes on a best effort basis at this stage, but vendors may also identify that an upgrade is required to fix the identified problem. Planning upgrades when COTS products reach this stage mitigates risks and delays incurred by unplanned upgrades.

However, some levels of end-of-life risk can be tolerated and, in the case of COTS vendors that have a very rapid end-of-life cycle, tolerated prudently. The CUT team reviews the risk and the possible impacts when identifying the COTS upgrades for each rolling wave and mitigates the highest levels of risk possible with the COTS selected for upgrade.

The end-of-life policy among vendors differs considerably. The most common practice is to provide support for a specified number of older versions. The larger vendors with this type of support policy often support the most current version and the last two preceding it. Some vendors support only one preceding version, while others actively support only the most current version. The vendor's published version obsolescence policies or historical release schedules are captured to assist with planning and scheduling COTS upgrades to mitigate these risks.

#### **3.4.1.2 COTS Software Product End-of-Support**

All COTS products finally reach a stage where a specific product version is no longer supported, i.e., an upgrade to a supported version will be recommended to resolve almost any reported problem.

Many COTS vendors identify an end-of-support date for versions of their COTS products. In some cases, often with the major operating system vendors, this occurs  $x$  number of years after the end-of-life date or when some number of new major versions of the product have been released.

There are some vendors who do not have a defined end-of-support date, but the ability to obtain active support for resolution of problems with older versions decreases over time. There is greater risk that there will not be timely and effective resolution of problems that require "bug" fixes. The vendor's published version obsolescence policies or historical release schedules are captured to assist with planning and scheduling COTS upgrades to mitigate these risks.

#### **3.4.1.3 COTS Software Product Evolution or Obsolescence**

Vendors may also consolidate or sell specific products that no longer adhere to their product line. There have been a number of mergers among COTS product vendors in recent years that have also led to COTS software evolution or obsolescence.

COTS products are tracked to identify and mitigate risks that may be associated with any of the following:

- No new development done for a specific COTS product
- Stand-alone product merged with other products that will no longer be available as a separate product

- Product sold to a new vendor.

Some COTS products also have end-of-support risks associated with dependencies on other versions/models of COTS products. Risks associated with cross product software compatibility are discussed in more detail in the following section.

### **3.4.2 Cross Product Software Compatibility**

Cross-product dependencies and compatibilities of COTS products are tracked to identify risk and risk mitigation steps. When upgrades are identified for any COTS product, a cross-product versioning support compatibility analysis is performed to identify any risks to the upgrade. The CUT team provides input on methods that may be considered to mitigate the identified risks. A consensus is reached on the most efficient method of mitigating the risks, balancing risk levels and available resources. The primary cross product compatibilities are discussed in the following sections and include:

- Operating System Version Compatibility
- Database Version Compatibility
- Compiler Version Compatibility
- Other COTS Product Compatibility
- Hardware/Software Product Compatibility

#### **3.4.2.1 Operating System Version Compatibility**

All COTS software is dependent on operating system (OS) versioning compatibility. COTS vendors identify the operating system versions that their product versions will support. In general, COTS vendors support the versions actively supported by the OS vendor and drop support for OS versions, which have reached end-of-life or are near to end-of-life. Changes in what OS version a product will support usually occur in a six-month to eighteen month cycle, depending on the timing of the release of the new COTS product version.

Occasionally, a COTS vendor will announce that no new development/version is planned for one or more of the operating systems that are utilized for the COTS product. The CUT team identifies these risks and works to mitigate these risks in some of the following ways:

- Discussion with the vendor of the impacted COTS product
- Discussion with the Operating System Vendor on the withdrawal of support for a specific OS
- Identification of possible alternative operating system hosting
- Identification of alternative COTS/Freeware product or custom code implementation.

The COTS Hardware/Software compatibilities are discussed in section 3.4.2.5.

### **3.4.2.2 Database Version Dependencies**

A number of COTS products in ECS are dependent on a Sybase database version. It is typical that although Sybase may actively support several Sybase ASE and SDK (OpenClient) versions at the same time, a third-party COTS product might be certified for only one or perhaps two Sybase/OpenClient versions. In some cases, where the vendor has not formally certified a specific Sybase version, the vendor will resolve problems with some other versions and/or report that customers are using a version and reporting no problems. On occasion, there are identifiable incompatibilities between a COTS product version and a Sybase database version. The CUT team identifies these potential risks and works to mitigate them. These may include:

- Identification of the actual level of risk (vendor information/EDF testing, etc.)
- Identification of COTS product upgrade that is certified or capable of supporting compatibility with the identified baselined (or to be baselined) version
- Identification of alternative implementation (i.e., different operating system, script, etc.).

### **3.4.2.3 Compiler Version Compatibility**

Some COTS products are certified for a specific compiler version. The level of support will be most complete if the certified compiler version is in use. Generally, only a single compiler version is certified for a specific OS version. The CUT team reviews upgrades to mitigate any identified risks associated with compiler version dependencies.

### **3.4.2.4 Other Compatibility Issues**

The CUT team also identifies other potential risk factors associated with COTS products, including the following:

- Compatibility between related COTS products versions. For example, the RogueWave SourcePro products require compatible versions between the 3 libraries and also require compatible versions (same versions) across all OS platforms.
- Some COTS products have dependencies on Motif versions, JRE/JDK and/or HDF versions.

### **3.4.2.5 Hardware/Software Compatibility**

Hardware/software compatibility issues are identified and reviewed for risk and risk mitigation, including the following:

- Support for all planned and existing hardware devices will be available at the time of hardware upgrades
- Hardware firmware is currently supported.

### **3.4.3 Features/Performance Upgrades**

Some COTS upgrades are identified to address performance issues and/or introduce new features/benefits. Functional and Performance specification requirements (F&PRS) are provided for the upgrades discussed in this document, when there is a change or impact to the current requirements met by the COTS products.

#### **3.4.3.1 Performance**

If performance risks are identified, the CUT team works to identify the necessary COTS upgrades/replacements or configuration changes to address the performance issues.

#### **3.4.3.2 Features**

On occasion, an upgrade to a COTS/Freeware product is generated by the need for specific features. If specific new features are required by an EMD development organization for custom code or to support specific capabilities at operational sites, an upgrade is scheduled to provide the required features.

#### **3.4.3.3 Hardware Support**

As part of the COTS Life Cycle Implementation, EMD provides maintenance for hardware products deployed to the DAACs. Firmware maintenance is included with hardware maintenance support. Hardware maintenance for failed components is addressed with individual Maintenance Work Orders (MWO).

Hardware and firmware products can reach end-of-life and/or end-of-support, just as software products may reach this stage. Replacement or upgrade support for hardware components as a class or individually is not covered by standard industry hardware maintenance contracts. Hardware replacements and upgrades generally require procurement of new or additional components.

Risk for some hardware components that have reached end-of-life can be, or are mitigated by availability of a pool of hardware components in case replacement is necessary prior to a planned hardware upgrade.

In some cases, a hardware vendor may identify that equipment will no longer be supported after a certain date. In cases where there are other hardware, software and/or firmware dependencies that cause risks for the EMD Project, a migration or replacement to supported hardware devices is required to mitigate risks.

### **3.4.4 Monitoring and Mitigating Security Risks/Critical Bug Fixes**

Critical security issues and other critical defects may also need to be mitigated over the course of a COTS product lifecycle. Security vulnerabilities occur most commonly in operating systems, but vulnerabilities can manifest themselves in Database, Web Server, Java modules and other COTS product implementations. Product patches and/or operating system patches may be required to mitigate the critical risk.

A weekly review of Operating System patches is performed. Information on the patches and fixes released come from various sources, including subscriptions to following automated notification systems:

- CERT notifications (on as needed basis)
- Sybase product notifications (daily)
- ClearCase patch releases/notifications (on as needed basis)

When automated e-mail notification is not available, an on-line review of recent patches and bug fixes for critical COTS software is conducted on a weekly basis. These would include the Solaris and IRIX operating systems and AMASS. This scan and review is primarily to identify critical patches required for fast-track delivery to the DAACs.

Criticality of delivery is determined by review by appropriate stakeholders, i.e., a security issue in Sybase ASE would be reviewed by the Security Group and the DDM group.

To expedite deployment, a critical security or product patch upgrade is evaluated using a fast-track process and, typically, is delivered as a COTS TE upon successful checkout in the PVC or VATC. The delivery is eventually followed by a conventional PSR. Table 3-1 provides examples of updates delivered under this process.

**Table 3-1. Critical COTS Patches**

<b>COTS Product</b>	<b>Specific Impact Area</b>	<b>Criticality Issue</b>	<b>Delivery Mechanism</b>
Solaris	Sendmail	CERT identified vulnerability to systems running the sendmail daemon.	CCR
IBM	Sendmail	CERT identified vulnerability to systems running the sendmail daemon.	CCR
AMASS	Off-line Media Manager	Off-line Media Manager identified as required for 9940A migration.	Engineering Technical Directive

### **3.5 COTS Upgrade Summary**

Table 3-2 provides a summary of the COTS hardware and software upgrades planned since the previous DID 335 document was published. The table also identifies any dependencies in these upgrades. Estimated delivery dates are also provided. These COTS upgrades are discussed in detail in the following sections of this document. This table has been updated for Revision 01.

**Table 3-2. Planned COTS Hardware/Software Upgrades Summary (1 of 2)**

COTS Product	Baseline Version	Upgrade Version	Dependencies/ Installation Sequence Requirements	Criticality for OPS Support	NCR	Estimated Delivery of PSR
Archive Upgrade at GES	N/A	9940B	Synergy V	Med.	None	Completed
ACSLs	6.1	7.1	None	Med.	40532 40785	Completed
Sybase SDK (OpenClient)	12.0	12.5.1	None	Med.	39607	Completed
Permeo SDK	1.4	1.4.2	Bundled with 7.03 custom code release	Low	38483 40397	Completed
SQS Patch	3.4.2.25	3.4.2.28	None	Low	41468	Completed
IRIX Early Delivery for SPGs	6.5.22	6.5.26	None	Low	41500 41585	Completed
Portus	5.09	5.1.5	None	Low	None	Completed
Autosys	3.5	4.5	None	Low	None	Completed
PERL for Linux	5.6.1	5.8.5	None	Low	41031	Completed
IP Readdressing (Phase 1)	N/A	N/A	N/A	Med.	N/A	Completed
IP Readdressing (Phase 2)	N/A	N/A	N/A	Med.	N/A	Definition of activities remain under discussion.
Sun ONE Compilers	Studio 7/Forte 6.2	Studio 10	None	Low	None	01/2006
IRIX for all SGI hosts	6.5.22	6.5.26	<ul style="list-style-type: none"> <li>• AMASS 5.4.1</li> <li>• StorNext 2.5.2</li> <li>• ClearCase patches 14 &amp; 16</li> </ul>	High	41500 41585	Completed
SGI MIPSpro Compilers	7.3.1	7.4.2	<ul style="list-style-type: none"> <li>• Bundled with IRIX 6.5.26</li> <li>• Purify patch</li> </ul>	Low	None	Completed
ProDev Workshop	2.9.2	2.9.4	Bundled with IRIX 6.5.26	Low	None	Completed
PERL for Solaris/IRIX	5.6.1	5.8.5	None	Med	41031	Being Reviewed
Linux 7.x Security Patches	7.x	Patch Updates	None	Low	None	Completed with Linux 3.0 Upgrade for Task 109
Anti-Virus Software for PCs	N/A	9.0	None	Low	None	Completed

**Table 3-2. Planned COTS Hardware/Software Upgrades Summary (2 of 2)**

<b>COTS Product</b>	<b>Baseline Version</b>	<b>Upgrade Version</b>	<b>Dependencies/ Installation Sequence Requirements</b>	<b>Criticality for OPS Support</b>	<b>NCR</b>	<b>Estimated Delivery of PSR</b>
PERL for Linux	N/A	5.8.5	Synergy V	Med.	None	Completed
JDOM for Linux	N/A	1.0	Synergy V	Med.	None	Completed
J2SDK for Linux	N/A	1.4.7	Synergy V	Med.	None	Completed
Tcl/tk for Linux	N/A	8.4.9	Synergy V	Med.	None	Completed
Java Web Services Developer Pack for Linux	N/A	1.4	Synergy V	Med.	None	Completed
IONIC IAS	N/A	TBD	Synergy V	Med.	None	Completed
Jzkit for Linux	N/A	1.2.1	Synergy V	Med.	None	Completed
Apache Ant	N/A	1.6.2	Synergy V	Low	None	Completed
ECHO Client Toolkit	N/A	6.0	Synergy V	Low	None	Completed
httpunit	N/A	1.54	Synergy V	Low	None	Completed
WU-FTP	2.6.2 patch2	2.6.2 patch 3	Synergy V	Low	41510	Completed
Linux	N/A	3.0	Synergy V	Med.	None	Completed

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## 4. EMD COTS Software Upgrades

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This section identifies the COTS software products that are planned and scheduled for upgrade or are upgrades in progress or planned as of January 2005. These COTS software products are discussed below in section 4.

### 4.1 Status of Upgrades Mentioned in Original DID 335-EMD-002

The status of two COTS product upgrades described in the previous COTS Deployment Plan has changed. The following sections identify products where there has been a change to the original upgrade plan. A brief description of the changes and current status are provided.

#### 4.1.1 Solaris Compiler Upgrade Target Changed to Studio 10

Studio 9 had originally been targeted as the upgrade to the Forte 6.2/Sun ONE Studio 7 compilers. This upgrade was delayed and Sun Microsystems released a more recent upgrade, Studio 10. Studio 10 was targeted for upgrade in order to minimize upgrades and provide the best features available for developers in the EDF and at the DAACs. A small number of updates in Section, 4.9 Sun ONE Studio 10, have been included in this revision to reflect this.

#### 4.1.2 Upgrade Needed for Sybase ASE Security Issue

A multiple security issues were identified for Sybase ASE versions earlier than version 12.5.3. These vulnerabilities could allow a remote attacker to create a denial of service (DoS) condition, execute arbitrary code and obtain elevated privileges on the affected system were identified. An upgrade to Sybase ASE to version 12.5.3 EBF 12454 was delivered by CCR 05-0394 (Document #914-TDA-321) to address these identified vulnerabilities.

### 4.2 Patches to COTS Products

#### 4.2.1 SQS 3.4.2.28

NCR ECSed 41468 was originally issued against Sybase relating to problems with an SQS server instance at LARC. Working with Sybase, the problem was finally identified to be related to the SQS product. Sybase has been working with Boeing (formerly Autometrics) to resolve the issue. A recompile of SQS with the new Sybase SDK (OpenClient) 12.5.1 is identified as the resolution to the issue. Boeing has delivered a patch update to current baseline 3.4.2.25 version (3.4.2.28). This update has been tested and delivered as Test Executable (TE) delivery.

#### 4.2.2 ACSLS PUT0502S

Patch for ACSLS (PUT0502S) was delivered to resolve NCR ECSed40785 and ECSed40532. Vendor continues to work on a full resolution to NCR ECSed42725.

## 4.3 IRIX 6.5.26 Patch Upgrade

### 4.3.1 Description of COTS

SGI provides operating system patch updates as minor operating system releases on a quarterly basis in order to provide patch baseline consistency for IRIX 6.5 hosts.

### 4.3.2 Rationale for Upgrade

The rationale for upgrading the ECS IRIX operating system baseline to IRIX 6.5.26 is that bug fixes are not guaranteed to be provided for IRIX Operating System versions older than 1 year or 3 versions prior to the current IRIX 6.5.x release. IRIX 6.5.22, the current baseline IRIX patch version, was released by the vendor on 11/11/2003.

#### 4.3.2.1 Vendor Support

As is the standard practice of SGI, IRIX 6.5.26 will include all operating system patches from previous releases. The vendor delivers additional patches as bug fixes to recently identified issues. A small number of these recent patches are expected to be included with the IRIX 6.5.26 delivery. The available IRIX 6.5.26 patches will be reviewed during the planning process and added to the delivery where appropriate for EMD implementation and configurations.

#### 4.3.2.2 NCRs

**Table 4-1. NCRs Against IRIX 6.5.22**

NCR	Description	State	Sev.
ECSed 41585	GSFC/SMC:g0acg01 - Need sgi patch 5739 fix for bug 921056 system panic	D	2
ECSed 41500	GSFC/SMC: g0acg01 panic 9/29, 10/25, 10/27 and 11/1	T	2

The fixes provided with patch 5739 (NFS fixes for 6.5.22) have been included in the IRIX 6.5.26 delivery. A new NFS fixes patch (5818) is planned to be included as an additional patch for IRIX 6.5.26. Delivery of IRIX 6.5.26 should resolve these NCRs.

#### 4.3.2.3 Features/Performance Upgrades

No specific performance or feature enhancements are targeted to be provided with this upgrade.

#### 4.3.2.4 Cross Software Product Compatibility

While most ECS COTS products, such as Sybase, are certified for IRIX 6.5, there are four COTS products that certify software versions at the patch or “dot” release version levels. These COTS products are Legato Networker, IBM/Rational ClearCase, AMASS and StorNext. The approach that will be used with these products is provided below. The overall IRIX 6.5.26 schedule may be impacted based on the availability of compatible versions/patches as described below.

- ClearCase:

ClearCase has been recently upgraded to version 2003.06. IRIX 6.5.26 had not been released when this upgrade delivery was completed. At the time of delivery, ClearCase 2003.06 was certified through IRIX 6.5.22 with the patches provided with the ClearCase PSR delivery. Rational has provided patches 14 and 16 for ClearCase version 2003.06, which will provide official certification for IRIX 6.5.26. Delivery of ClearCase 2003.06 patch 14 and patch 16 is being planned for delivery on or about the same time as the IRIX 6.5.26 delivery.

- Legato Networker:

Testing will include compatibility testing with Legato Networker if the vendor has not formally certified for IRIX 6.5.26 operating system patch release for the recently delivered 7.1.2 version of Networker. Uncertified versions have been baselined and used in ECS in the past and no problems have resulted. Legato Networker 7.1.2 is currently certified through IRIX 6.5.24.

- AMASS:

In the original delivery of this document, the version of AMASS that would be used with IRIX 6.5.26 was not finalized. ADIC provided AMASS 5.4.1 for compatibility with IRIX 6.5.26. Upgrade to this version was included in an AMASS 5.4.1 PSR document and the IRIX 6.5.26 document.

There are NCRs against AMASS 5.3.3. The vendor is currently working with EMD to include as many fixes as possible in the 5.4.1 version to resolve the NCRs identified in Table 4-2.

**Table 4-2. NCRs Against AMASS 5.3.3**

NCR	Description
ECSed 41262	GSFC/SMC: g0drg02 - panic on AMASS killdaemons
ECSed 41502	GSFC/SMC-g0drg04 PANIC: CPU 3: vnode ref count negative c000000005280ee0
ECSed 41715	AMASS libio hangs
ECSed 41745	Should record delete files in EclnCleanPollEDR.log

- StorNext:

StorNext is also certified/supported on minor patch versions of IRIX 6.5.x. StorNext, like AMASS, is a COTS product from ADIC. The current baseline version of StorNext (2.3.2) is currently not certified/supported on IRIX 6.5.26, a situation similar to that of the ADIC AMASS product. ADIC has identified that StorNext version 2.5 is planned to be certified for IRIX 6.5.26. ADIC has identified that they have targeted GA version availability for March of 2005. An upgrade to StorNext

version 2.5 is being planned to address IRIX 6.5.26 compatibility. EMD will continue to work with ADIC throughout the upgrade and testing process to assure compatibility.

#### **4.3.2.5 Operating System Compatibility**

All SGI hardware baselined for the IRIX operating system at the DAACs will be upgraded to the delivered IRIX 6.5.26 patch level.

#### **4.3.2.6 Hardware Product Compatibility**

There are some EDF hosts and non-EMD baselined IRIS Consoles which need to be reviewed for a hardware product compatibility approach. SGI has announced that IRIX 6.5.22 was the last version that would support older IRIX hardware, including the Challenge and Indigo units. The following approaches will be considered during the upgrade planning process:

- Leaving all impacted machines at the IRIX 6.5.22 level until replaced or consolidated.
- Upgrade to IRIX 6.5.26 where risk is sufficiently minimal.
- Near term replacement of machines if significant risk is identified.

#### **4.3.3 Operational Impact**

No operational impacts have been identified beyond installation downtime. Any additional impacts will be reported at or before the PSR.

#### **4.3.4 Custom Code Impact**

No custom code impacts are expected with this COTS product upgrade. All custom code will be tested for compatibility. SGI has a published binary compatibility policy for custom code through all 6.5.x releases. Additionally, there were no custom code issues with the IRIX 6.5.14, 6.5.17 or 6.5.22 upgrades, and none are expected with the IRIX 6.5.26 upgrade. The previous IRIX 6.5.x upgrades have had no negative issues for custom code. In some cases, outstanding custom code issues have been resolved due to fixes in the patches delivered with the upgrade.

#### **4.3.5 Security Impact**

No security impacts have been identified for this COTS product. However, updated security patches are generally included in these “patch” releases.

#### **4.3.6 Licensing Impact**

License keys not are required for this COTS product.

### **4.3.7 External Drivers**

GSFC recommended more frequent IRIX upgrades to support software development. An early delivery of IRIX 6.5.26 is planned as a TE for the DAAC to test and debug DAAC Unique Extensions (DUEs).

### **4.3.8 Other Impacts/Comments**

The MIPSpro and ProDev upgrades in the following section are currently planned to be bundled with the IRIX 6.5.26 delivery.

### **4.3.9 COTS Installation Sequence/Dependencies**

There are some prerequisites for this upgrade that require that certain processes, such as AMASS processes, to be in a quiescent state before the upgrade and restarted after the upgrade. These steps have been addressed in previous IRIX Upgrade PSRs and are planned to be included in the IRIX 6.5.26 PSR. Currently no new or additional steps are expected to be required than were present in previous IRIX Upgrade PSRs.

## **4.4 SGI MIPSpro Compilers 7.4.2/ProDev Workshop 2.9.4**

### **4.4.1 Description of COTS**

IRIX MIPSpro upgrades for C, C++, FORTRAN77, FORTRAN90 compilers and ProDev WorkShop upgrades are planned.

SGI's ProDev WorkShop provides an integrated set of powerful and highly visual tools for creating, debugging and tuning software and includes the following components:

- Visual Debugger
- Graphical Code Analyzer
- Powerful Performance Analyzer
- Integrated Build Manager

ProDev WorkShop covers all phases of software development, from initial coding through debugging and performance tuning, with powerful graphics to speed development. Languages supported include C, C++, FORTRAN77 and FORTRAN90.

### **4.4.2 Rationale for Upgrade**

Although the SGI 7.3.1.3 compilers have not reached formal end of support, like the Sun compilers, the vendor is no longer actively patching this older version. A strong case would need to be made to have the vendor provide a patch for 7.3.1.3. It would be highly probable that an upgrade would be recommended to resolve the issue.

The ProDev Workshop version currently baselined (2.9.2) is no longer supported by SGI and an upgrade is required for guaranteed full bug fix support. SGI has recently released version 2.9.4. Upgrade to this most recently released version is targeted.

#### **4.4.2.1 Vendor Support**

Although not formally at end of support, the current MIPSpro Compilers (7.3.1.3) and ProDev Workshop (2.9.2) versions are no longer actively supported with bug fixes.

#### **4.4.2.2 NCRs**

No NCRs are identified in association with this COTS product.

#### **4.4.2.3 Features/Performance Upgrades**

No specific features, enhancements or performance upgrades are targeted with this upgrade.

#### **4.4.2.4 Cross Software Product Compatibility**

- RogueWave Edition 2 Libraries, when released, had specific compatibility requirements for SGI C++ compilers. As RogueWave has dropped support for SGI, we are no longer upgrading to the latest versions of the RogueWave Libraries. However, in order to obtain continuing support for SGI compilers, EMD needed to upgrade from the version used originally with RogueWave Edition 2. The last SGI compiler upgrade used a version later than that certified as compatible with RogueWave Edition 2. There were no compatibility issues with the previous upgrade and none are expected with the current upgrade.
- PurifyPlus 2003.06 does not currently formally certify support for MIPSpro 7.4.2. A minor patch upgrade (2003.06.13) supplied by IBM/Rational will support formal certification through MIPSpro 7.4.1. Previous SGI compiler upgrades have been successfully implemented when formal certification has not been available. No issues have been identified in these upgrades. If problems are identified with the current baseline version of PurifyPlus (2003.06) in the MIPSpro 7.4.2 testing, an upgrade will be planned to version 2003.06.13 or the 2003.06.xx version update that IBM/Rational identifies is expected to be released by the end of March 2005.
- ClearCase is currently baselined at version 2003.06. ClearCase does not certify specific compiler versions, although some versions are mentioned in the product release notes. Release notes for ClearCase 2003.06 indicate a requirement for patch SG0004932, 7.4 C++ runtime environment. SGI has since replaced patch SG0004932 with patch SG0005377. Patch SG0005377 is planned to be delivered with the MIPSpro 7.4 compilers.

#### **4.4.2.5 Operating System Compatibility**

The MIPSpro 7.4 series of compilers and ProDev Workshop 2.9.4 versions are supported on all 6.5.x versions. There are SGI several patches that will be included in this delivery. There are currently some MIPSpro compiler-related patches on the current baseline. The following additional patches will be delivered with the MIPSpro 7.4 compiler upgrade.

- SG0005673: MIPSpro 7.4.2m Compiler Backend #1
- SG0005600: MIPSpro 7.4.2m F90 Front-End #1
- SG0005700: MIPSpro 7.4.2m 64-bit built linker #1
- SG0005075: MIPSpro 7.4 C++ Front-End #1
- SG0005329: 7.4 Compiler Header Files for Unix98, C99 and ANSI C++ namespace std #2
- SG0005377: 7.4 C++ runtime environment
- SG0005731: 7.4.x Fortran runtime #2 for IRIX 6.5

#### **4.4.2.6 Hardware Product Compatibility**

There are no known hardware compatibility issues associated with this product.

#### **4.4.3 Operational Impact**

No operational impacts have been identified other than the installation downtime as identified in the COTS product PSR. Upgrade is planned to be bundled with the IRIX 6.5.26 delivery and therefore will minimize downtime for this upgrade.

#### **4.4.4 Custom Code Impact**

Initial testing has identified that there may be some impact to existing custom code. This issue will continue to be monitored and will be factored into the schedule if verified.

#### **4.4.5 Security Impact**

No security impacts have been identified for this COTS product.

#### **4.4.6 Licensing Impact**

License keys are required when MIPSpro is first installed on a machine. Licensing will be addressed in SGI Compiler Upgrade PSR. COTS product is a FLEXlm license-managed COTS product.

#### **4.4.7 External Drivers**

No external drivers have been identified for this COTS product.

#### 4.4.8 Other Impacts/Comments

Upgrade is currently planned to be delivered bundled with the IRIX 6.5.26 upgrade discussed in the previous section.

#### 4.4.9 COTS Installation Sequence/Dependencies

There are no installation or COTS product dependencies associated with product.

### 4.5 ACSLS 7.1

#### 4.5.1 Description of COTS

Automated Cartridge System Library Software (ACSL) from StorageTek is a software package that runs the front-end for the STK Powderhorn and Wolfcreek tape silos.

#### 4.5.2 Rationale for Upgrade

StorageTek (STK) has announced that ACSLS 6.x versions will reach end of support on 12/31/2004. End of support is the primary driver for the upgrade.

##### 4.5.2.1 Vendor Support

The current baseline version, 6.1, has reached end of support as of 12/31/2004. Vendor has released ACSLS 7.1. Upgrade will target this recently released version.

##### 4.5.2.2 NCRs

**Table 4-3. NCRs Against ACSLS**

NCR	Description	State	Sev.
ECSe40532	ACSL loses volumes during audit	A	2
ECSe40785	AMASS & ACSLS lose communication	R	2

These NCRs will not be completely addressed with delivery of ACSLS 7.1. Current status is provided below.

- **NCR 40532**

NCR 40532, identified in Table 4-3 will not be resolved with the delivery of ACSLS version 7.1. STK is unable to reproduce the error that has generated NCR 40532. The vendor has provided several patches that had potential to address the issue. These patches have been installed and tested in the EDF as appropriate for both the current 6.1 version and the planned 7.1 upgrade versions. The patches provided did not provide a fix for the identified problem.

A work-around has been identified to avoid the issue identified in NCR ECSe40532. DAACs are aware of the workaround. EMD will continue to work with STK to install

and test patches to resolve NCR ECSed40532. When a patch for this NCR has been successfully identified and tested in the EDF, it will be delivered to the DAACs as a patch for ACSLS 7.1.

- **NCR 40785**

NCR 40785, identified in Table 4-3 will not be fully resolved with the delivery of ACSLS version 7.1. ADIC has provided several patches to address the issues identified in this NCR. The patches have been installed and tested in Landover. Although there are some remaining minor issues, the patches provided have significantly mitigated the problems identified in this NCR. These additional patches will be delivered with ACSLS version 7.1. EMD will continue working with vendor to address the remaining minor issues. When the patch or patches have been successfully identified, the patches will be delivered to the DAACs as part of closing this NCR.

#### **4.5.2.3 Features/Performance Upgrades**

No specific features or enhancements are targeted with this upgrade.

#### **4.5.2.4 Cross Software Product Compatibility**

Although there are some potential software compatibility issues with AMASS, there are none currently existing between AMASS 5.3.3 and ACSLS 7.1. As mentioned in section 0, 4.3

IRIX 6.5.26 Patch Upgrade an upgrade is currently planned for AMASS to support the IRIX 6.5.26 delivery. No upgrade will be needed for ACSLS since all compatibility issues can be addressed with configuration options. If needed, these would be provided with the AMASS upgrade delivery.

#### **4.5.2.5 Operating System Compatibility**

ACSLs 7.1 is certified for Solaris 8 and no additional Solaris 8 patches have been identified as needed, other than those currently delivered and installed.

#### **4.5.2.6 Hardware Product Compatibility**

This product is compatible with FSMS COTS product hardware.

#### **4.5.3 Operational Impact**

No operational impact beyond the downtime for installation of the COTS product is expected for the upgrade installation of this product.

#### **4.5.4 Custom Code Impact**

There are no identified custom code impacts associated with this COTS product.

#### **4.5.5 Security Impact**

No security impacts have been identified for this COTS product.

#### **4.5.6 Licensing Impact**

Product requires license keys. These will be requested with the upgrade media and will be provided in the PSR document. Sufficient licenses for deployment have been identified.

#### **4.5.7 External Drivers**

No external drivers have been identified for this COTS product.

#### **4.5.8 Other Impacts/Comments**

No other impacts have been identified for this COTS product.

#### **4.5.9 COTS Installation Sequence/Dependencies**

There are no installation sequence dependencies associated with upgrading this product.

### **4.6 Sybase SDK (Open Client) 12.5.1**

#### **4.6.1 Description of COTS**

Sybase Software Development Kit (SDK), previously known as Open Client, provides a portable, standard interface for client applications, which need to communicate with a Sybase SQL Server. Sybase SDK includes both DBLIB and CTLIB libraries. These libraries have the following functions:

- DB-Library, a collection of routines for use in writing client applications. DB-Library includes a bulk copy library and the two-phase commit special library. DB-Library provides source-code compatibility for older Sybase applications.
- Client-Library, a collection of routines for use in writing client applications. Client-Library is a library designed to accommodate cursors and other advanced features.

The Sybase SDK provides the following features:

- code portability between supported operating systems
- network transparency
- code modularity.

#### **4.6.2 Rationale for Upgrade**

Sybase has announced that Open Client (now named SDK) 12.0 will reach end of support on 12/31/2004. This is the principal driver for the upgrade. Additionally, a significant number of fixes have been incorporated in the most recent version. Upgrade will provide access to these fixes and provide a more current version to facilitate assistance from the vendor when needed.

##### **4.6.2.1 Vendor Support**

Vendor released end of support notification for 12/31/2004 in December of 2003.

#### 4.6.2.2 NCRs

**Table 4-4. NCRs Against Sybase SDK**

NCR	Description	State	Sev.
ECSed39607	39607 - SDSRV Termination with Assertion Failed	T	2

NCR ECSed39607 will be resolved with the delivery of Sybase SDK 12.5.1.

#### 4.6.2.3 Features/Performance Upgrades

No specific performance or enhancements are targeted with this 12.5.1 upgrade.

#### 4.6.2.4 Cross Software Product Compatibility

There are no outstanding cross-software product compatibility issues with the Sybase SDK 12.5.1 upgrade:

- Sybase SDK 12.5.1 is compatible with the current baseline versions of Sybase ASE, Sybase Replication Server, Autosys, and Remedy.
- The RogueWave SourcePro DB module also interfaces with Sybase SDK. EMD is currently using Edition 2 of the SourcePro modules. Although RogueWave does not identify Sybase SDK 12.5.1 as a compatible version for Edition 2, no issues were identified in the rebuilding of RogueWave DB libraries with version 12.5.1. Nor were there any issues identified with the rebuilt libraries during any testing of the Sybase SDK 12.5.1 upgrade.
- A minor compatibility issue was identified with current versions of the PERL modules, DBD::Sybase 0.91 and PERL DBI 1.19. The issue was caused by a change in file names in SDK version 12.5.1 and was resolved by linking the necessary file names. An upgrade to all PERL modules is planned and this work around will no longer be necessary with the planned PERL upgrade delivery.

#### 4.6.2.5 Operating System Compatibility

Sybase SDK 12.5.1 is certified for Solaris 8 and IRIX 6.5. There are no operating system incompatibilities.

#### 4.6.2.6 Hardware Product Compatibility

There are no hardware compatibility issues associated with this Sybase SDK 12.5.1.

#### 4.6.3 Operational Impact

No operational impacts have been identified beyond installation downtime and impacts identified in the PSR.

#### **4.6.4 Custom Code Impact**

Sybase SDK 12.5.1 has been tested and configured to support the custom code release to be delivered in early 2005 (7.03). Installation of Sybase 12.5.1 is required prior to running this custom code release.

#### **4.6.5 Security Impact**

No security impacts have been identified for this COTS product.

#### **4.6.6 Licensing Impact**

No impact to current licensing will occur with delivery of Sybase SDK 12.5.1.

#### **4.6.7 External Drivers**

No external drivers have been identified.

#### **4.6.8 Other Impacts/Comments**

The impacts to the following COTS products are being addressed with the delivery.

- WU-FTP will have a patch delivery that includes a copy of the Sybase SDK 12.5.1 libraries. This patch delivery is planned immediately after the release of the Sybase SDK 12.5.1 PSR. This addresses NCR ECSed 41510.

#### **4.6.9 COTS Installation Sequence/Dependencies**

Sybase SDK 12.5.1 is not dependent on any custom code delivery. It will function correctly with custom code version 7.02+. However, the Custom Code release targeted for early 2005 (sometimes referred to as version 7.03) requires Sybase SDK 12.5.1 to be installed. The custom code release documentation will address this installation dependency.

### **4.7 Portus 5.1.5 Upgrade**

#### **4.7.1 Description of COTS**

Portus is the principal firewall software installed on the ECS firewall servers. The software provides individual proxy binaries. Additional individual proxy binaries can be added without reinstalling the existing software or impacting the existing installation and configuration.

In addition to the Portus 5.1.5 upgrade, an update of the Berkeley Internet Name Domain (BIND) named module for AIX will also be included. The new version of BIND 9.2.3 will replace current BIND 8.2.3. Although not specifically required for the Portus 5.1.5 upgrade, this upgrade is included with the Portus 5.1.5 CDs and is strongly recommended by the vendor.

## **4.7.2 Rationale for Upgrade**

The current Portus 5.0.9 version reached end of support as of 12/31/2004. Upgrade is planned to assure full bug fix and other security patch support is available. Named upgrade is planned because of the security fixes and features included in the most recent versions.

### **4.7.2.1 Vendor Support**

Full vendor support for bug fixes and security updates will be provided with this upgrade.

### **4.7.2.2 NCRs**

No NCRs are outstanding for this COTS product.

### **4.7.2.3 Features/Performance Upgrades**

The new Portus upgrade will provide a DAAC specific request feature to better control inbound email. There are two new real time monitoring tools that will provide better normal and troubleshooting help. The Ftproxy has a new debug feature that can be turned on for flow troubleshooting support. The outbound HTTP proxy now uses Apache 2 as the basis for its proxy functions rather than Apache 1.3.9 that during security scans always came up as an issue. In the Fwcop program that controls several of the type of proxies, there are new logging features that will help keep system logs size down while at the same retaining information at several of the DAACs. Finally the states that the email proxy, Smwrap, has new build features that provide much better protection against 'bad' emails.

### **4.7.2.4 Cross Software Product Compatibility**

Portus 5.1.5 is fully supported on Firewall Servers running the baselined IBM AIX 5.1. Named 9.2.3 is fully supported by both IBM and Portus. There are no other cross software compatibility issues.

### **4.7.2.5 Operating System Compatibility**

Portus 5.1.5 is fully supported on AIX 5.1, the current Operating System baseline version for all IBM Firewall Servers.

### **4.7.2.6 Hardware Product Compatibility**

There are no hardware product compatibility issues related to this Portus patch delivery.

## **4.7.3 Operational Impact**

Portus 5.1.5 upgrade is expected to be low impact to the DAAC operational environment. There have been no issues with previous Portus upgrades.

#### **4.7.4 Custom Code Impact**

Data Pool uses some Portus features such as logging in DataPool custom code. No changes have been made by the vendor to the logging feature and no impacts are expected. Testing is planned to validate that there is no impact to the Data Pool custom code by this upgrade.

#### **4.7.5 Security Impact**

Upgrade of Portus to version 5.1.5 and named to version 9.2.3 will provide a number of security fixes and provide a solid framework for future firewall security fixes and enhancements.

#### **4.7.6 Licensing Impact**

The same license key for the current installation will be used with the Portus 5.1.5 upgrade.

#### **4.7.7 External Drivers**

No external drivers have been identified for this COTS product.

#### **4.7.8 Other Impacts/Comments**

No other impacts have been identified for this COTS product.

#### **4.7.9 COTS Installation Sequence/Dependencies**

There are no installation sequence dependencies related to this upgrade other than that specified in the PSR for Portus 5.1.5 and named 9.2.3.

### **4.8 Autosys 4.5 Upgrade**

#### **4.8.1 Description of COTS**

Autosys is an automated control system for scheduling, monitoring, and reporting on computer jobs. ECS uses Autosys to control PRONG (Processing) administrative jobs running on the DPS Queuing Server computer and science production jobs running on the science computers. The Autosys COTS product delivery includes Autosys Server/Autosys Xpert components and Autosys Remote Agent components. Autosys Server/Autosys Xpert and Autosys Remote Agent are delivered for the Solaris 8 platform. Only Autosys Remote Agent is delivered for the SGI platform.

#### **4.8.2 Rationale for Upgrade**

The current Autosys version 3.5 utilizes Sybase ASE version 12.0, multiple versions below the Sybase ASE 12.5.2 version used elsewhere in EMD. Autosys version 3.5 does not support a more recent version of Sybase ASE than 12.0. Although Autosys 3.5 is not at end of support (EOS), Sybase has announced that Sybase ASE 12.0 has reached end of support on 12/31/2004. Although Computer Associates (CA) has not officially announced End-of-Support for the Autosys 3.5 version of the product, assistance or bug fixes for problems related to the database will no longer be provided by CA because of the Sybase 12.0 end of support announcement. It is

common support practice in the industry adhere to the third party end of support dates when the database implementation is from a third party vendor.

Upgrade to Autosys 4.5 for the Solaris Autosys Server and Solaris Remote Agent will both mitigate the Sybase ASE 12 EOS issue and streamline future testing and delivery of ASE upgrades to a single version.

#### **4.8.2.1 Vendor Support**

All Autosys 4.5 components support Solaris 8. As mentioned above only Autosys Remote Agent is utilized on the SGI platform. Version 3.5 is the most recent version available from Autosys vendor Computer Associates (CA). Version 3.5 is fully supported by CA. This is the current implemented version on SGI. Vendor performed certification tests in CA labs to verify that Solaris Autosys Server/Autosys Xpert/Autosys Remote Agent version 4.5, SGI Autosys Remote Agent version 3.5 and Sybase ASE 12.5.2 were compatible.

#### **4.8.2.2 NCRs**

There are no NCRs associated with this COTS product.

#### **4.8.2.3 Features/Performance Upgrades**

No specific enhanced performance or other additional features have been targeted with this upgrade.

#### **4.8.2.4 Operating System Compatibility**

Autosys Server, Autosys Xpert and Autosys Remote Agent 4.5 for Solaris are compatible with Solaris 8. Autosys Remote Agent 3.5 is compatible with SGI IRIX 6.5.

#### **4.8.2.5 Cross Software Product Compatibility**

Autosys has a Sybase ASE version dependency. Upgrade to Server version 4.5 on Solaris will provide support for the current baselined Sybase ASE 12.5.2. An upgrade of the DPS Queuing Server to Sybase 12.5.2 will be included as part of the Autosys 4.5 PSR.

#### **4.8.2.6 Hardware Product Compatibility**

There are no known hardware product compatibility issues with this COTS product.

#### **4.8.3 Operational Impact**

No additional operational impacts are expected beyond those identified in the product's Release Notes.

#### **4.8.4 Custom Code Impact**

Custom code involved with the ASTER routine has potential to be impacted by this upgrade. This custom code will be specifically tested for impact and updated if needed.

#### **4.8.5 Security Impact**

There are no security impacts related to this upgrade.

#### **4.8.6 Licensing Impact**

Product required licensing keys. Procedures to obtain and install licensing keys will be included in the PSR for the upgrade.

#### **4.8.7 External Drivers**

No external drivers have been identified.

#### **4.8.8 Other Impacts/Comments**

No other impacts have been identified for this COTS product upgrade.

#### **4.8.9 COTS Installation Sequence/Dependencies**

An upgrade to Sybase ASE 12.5.2 on the Queuing Server will be included as part of this upgrade. The sequence of the Autosys and Sybase ASE product upgrades will be addressed in the Autosys PSR.

### **4.9 Sun ONE Studio 10**

#### **4.9.1 Description of COTS**

The Sun ONE Studio 10 software provides a tightly integrated programming environment designed to speed software development. This development workshop contains a full set of graphical tools that provides the ability to create and maintain C, C++ and FORTRAN custom code applications for the Solaris 8 Operating System Environment. The product simplifies the tasks performed most often: compiling, building, browsing, editing, debugging, and tuning.

The Sun ONE Studio 10 currently baselined will replace Sun ONE, Studio 7 Enterprise Edition and Forte 6.2 compilers.

Sun ONE, Studio 10 includes the following individual products:

- Sun ONE, Studio 10 C++
- Sun ONE Studio 10 FORTRAN (providing FORTRAN 95, which supports FORTRAN90)
- Sun ONE C, Studio 10

#### **4.9.2 Rationale for Upgrade**

The current Sun ONE Studio 7 and the Forte 6, update 2 compiler toolset is near end of support and will no longer be actively patched as more recent compiler versions, such as Sun ONE Studio 10. Sun has also encouraged upgrade to this Studio 10 because there are significant

performance improvements with this upgrade. The current baselined versions are lacking strong performance characteristics.

Additionally, since the Sun compilers and SGI compilers are nearing end of support, upgrade before coding starts on Synergy V, will minimize impact to the Synergy development environment. An end of support announcement would be expected within the next 6 months.

#### **4.9.2.1 NCRs**

No NCRs are identified in association with this COTS product.

#### **4.9.2.2 Features/Performance Upgrades**

The following additional features are provided with the upgrade:

- Significant improvements in SPARC performance.
- Shorter C and C++ compile times via automated pre-compiler headers support.
- OpenMP Autoscopying in Fortran (SPARC platform only)

EMD is targeting performance improvements with this upgrade.

#### **4.9.2.3 Cross Software Product Compatibility**

Cross software compatibility with Sun ONE, Studio 10 is discussed below for the following products:

- RogueWave Edition 2 Libraries, when released, had specific compatibility requirements for Sun C++ compilers. As RogueWave has dropped support for SGI, we are no longer upgrading to the latest versions of the RogueWave Libraries. However, in order to obtain continuing support for Sun compilers, EMD needed to upgrade from the version used originally with RogueWave Edition 2. The last Sun compiler upgrade used a version later than that certified as compatible with RogueWave Edition 2. There were no compatibility issues with the previous upgrade and none are expected with the current upgrade.
- PurifyPlus 2003.06 does not formally support Sun ONE Studio 10. A minor patch upgrade (2003.06.13) supplied by IBM/Rational will support formal certification of Sun ONE Studio 10. Previous Solaris compiler upgrades have been successfully implemented when formal certification has not been available. No issues have been identified in these upgrades. If problems are identified with the current baseline version of PurifyPlus (2003.06) in the Sun ONE Studio 10 testing, an upgrade will be planned to version 2003.06.13 or the 2003.06 version update that Rational/IBM identifies is expected to be released by the end of March 2005.
- ClearCase does not certify specific compilers, although some are mentioned in the product release notes. In response to a trouble ticket, Rational indicated that they expect no problems with using Sun ONE Studio 10 with ClearCase 2003.06.

- Although vendor ICS has not certified Builder Accessory (BX) and Epak Development Software for use with Sun ONE Studio 10, they have indicated that they do not envision there would be any issues. BX and Epak are not delivered to the DAACs and are used only in the development environment.

#### **4.9.2.4 Operating System Compatibility**

Sun ONE, Studio 10 compilers are supported on Solaris 8, the current baselined Solaris Operating System for EMD. This compiler version also supports Solaris 9 and Solaris 10, should an Operating System upgrade be needed in the future.

#### **4.9.2.5 Hardware Product Compatibility**

There are no known hardware compatibility issues associated with this product.

#### **4.9.3 Operational Impact**

Operational impacts are limited to the installation downtime as will be identified in the COTS product's Release Notes prior to PSR.

#### **4.9.4 Custom Code Impact**

Custom code will be recompiled using Sun ONE, Studio 10 compilers. Initial planning and testing has identified that some modifications to the EMD custom code will be necessary and will be incorporated in the upgrade schedule.

#### **4.9.5 Security Impact**

There are no security impacts related to this upgrade.

#### **4.9.6 Licensing Impact**

License keys are required for specific functionality to be available. PSR will address licensing steps.

#### **4.9.7 External Drivers**

No external drivers have been identified for this COTS product.

#### **4.9.8 Other Impacts/Comments**

No other impacts have been identified for this COTS product.

#### **4.9.9 COTS Installation Sequence/Dependencies**

There are no dependencies or installation sequences required for this upgrade.

## 4.10 PERL 5.8.5

### 4.10.1 Description of COTS

Perl is a language optimized for scanning arbitrary text files, extracting information from those text files, and printing reports based on that information. Perl scripts are used throughout the ECS code. PERL is the principal product, but several additional PERL modules are included in the delivery.

### 4.10.2 Rationale for Upgrade

A PERL module perlLIO::gzip that is used with ECHO and DAACs CRT (Catalog Reconciliation Tool) was identified as not supported by current baselined PERL 5.6.1 in NCR ECSed41031. NCR additionally identified that PERL version 5.6.1 was at risk of non-support by CSPAN, the provider/maintainer of the freeware products and associated modules.

Revision Note: NCR ECSed41031 has been closed since the original document was published. Upgrade to a consistent PERL version is still planned, although this may be accomplished with the evolutionary migration to Linux rather than an upgrade of IRIX and/or Solaris 8 versions.

#### 4.10.2.1 Vendor Support

The PERL freeware product continues to evolve rapidly. Although there are no formal maintenance support issues with freeware products, falling significantly below the freeware vendor's current baseline introduces compatibility and upgrade risks over time. The last full PERL upgrade was in July 2002, although there have been some PERL module additions since that time. The 5.8.5 upgrade will address the current NCR issues and mitigate other potential risks of not migrating to a recent freeware product release. Version 5.8.5 is the most recent version available at the time of upgrade planning.

#### 4.10.2.2 NCRs

**Table 4-5. NCRs Against PERL 5.6.1**

NCR	Description	State	Sev.
ECSed41031	Upgrade to PERL 5.8 or better	C	5

NCR has been closed since original publication.

#### 4.10.2.3 Features/Performance Upgrades

No additional features or performance upgrades are expected from this upgrade.

#### **4.10.2.4 Cross Software Product Compatibility**

There are no known software product compatibility issues.

#### **4.10.2.5 Operating System Compatibility**

The PERL modules identified will be compiled and tested with baselined compilers to support Solaris 8 and IRIX 6.5.x deliveries. Current Linux platforms are currently at version 5.8.5.

#### **4.10.2.6 Hardware Product Compatibility**

There are no identified hardware compatibility issues associated with this product.

#### **4.10.3 Operational Impact**

No operational impacts have been identified other than installation or transition downtime as will be identified in the COTS product Release Notes.

#### **4.10.4 Custom Code Impact**

There are no identified custom code impacts associated with this COTS product.

#### **4.10.5 Security Impact**

No security impacts have been identified for this COTS product.

#### **4.10.6 Licensing Impact**

There are no licensing issues with this software.

#### **4.10.7 External Drivers**

No external drivers have been identified for this COTS product.

#### **4.10.8 Other Impacts/Comments**

No other impacts have been identified for this COTS product.

#### **4.10.9 COTS Installation Sequence/Dependencies**

The Solaris 8 Operating System upgrade is required to be installed before upgrading the COTS product.

### **4.11 Permeo SDK 1.4.2**

#### **4.11.1 Description of COTS**

The Permeo Software Development Kit (SDK) is a tool to support development of SOCKS 5 compliant libraries. Although there are SOCKS 5 libraries available as freeware, this COTS product is needed to provide support for the high number of processes needed within EMD.

Freeware products were unable to efficiently support the large number of processes. This COTS product is used within the development process and is released to the DAACs as only as custom code, not as an installable COTS product. The custom code patch released in January 2005 will include this upgraded custom code. The custom code generated with the Permeo 1.4.2 upgrade will be delivered with the 7.03 build.

#### **4.11.2 Rationale for Upgrade**

Upgrade will resolve issues identified in NCRs ECSed38483 and ECSed40397.

##### **4.11.2.1 Vendor Support**

Analysis of NCRs identified that issues may be related to Permeo SDK. Vendor reviewed analysis, made Permeo SDK code adjustments and tested code. Vendor released version 1.4.2 for SGI IRIX with bug fixes to resolve the NCRs. EMD Development Testing has confirmed that the vendor bug fixes have resolved the NCR issues.

##### **4.11.2.2 NCRs**

***Table 4-6. NCRs Against Permeo SDK 1.4***

<b>NCR</b>	<b>Description</b>	<b>State</b>	<b>Sev.</b>
38483	FTP Server on g0acg01 core	T	2
40397	FTP Server unable to connect to remote host	T	2

These NCRs are expected to be resolved with the delivery of custom code created with this COTS product upgrade.

##### **4.11.2.3 Features/Performance Upgrades**

No specific features or performance upgrades are targeted with this upgrade, other than resolution of the identified NCRs.

##### **4.11.2.4 Cross Software Product Compatibility**

There are no cross software product compatibility issues with this upgrade. No upgrades are required for any other Firewall-related product.

#### **4.11.2.5 Operating System Compatibility**

Issues identified only for SGI platforms. Only SGI custom code upgraded.

#### **4.11.2.6 Hardware Product Compatibility**

There are no Hardware product compatibility issues with this product upgrade.

#### **4.11.3 Operational Impact**

No operational impact is expected with this upgrade other than that which is associated delivery and installation of custom code patches.

#### **4.11.4 Custom Code Impact**

COTS development product upgrade requires new delivery of custom code. Delivery is planned to be included in a previously scheduled custom code delivery early in 2005.

#### **4.11.5 Security Impact**

No security impacts have been identified for this COTS product.

#### **4.11.6 Licensing Impact**

There are no licensing issues with this software.

#### **4.11.7 External Drivers**

No external drivers have been identified for this COTS product.

#### **4.11.8 Other Impacts/Comments**

No other impacts have been identified for this COTS product.

#### **4.11.9 COTS Installation Sequence/Dependencies**

Any installation sequence and dependencies will be addressed in the delivery documentation accompanying the custom code patch.

### **4.12 Anti-Virus Software for PCs**

#### **4.12.1 Description of COTS**

Anti-Virus software identifies potentially damaging viruses on personal computers. The anti-virus software notifies the user of possible viruses and provides options to safely remove or isolate the viruses. Symantec Antivirus software, version 9, is currently targeted to provide this capability for PCs on the Production LAN.

## **4.12.2 Rationale for Upgrade**

Delivery of Anti-Virus product will address security vulnerabilities for PCs on the Production LAN.

### **4.12.2.1 Vendor Support**

There are no vendor support issues.

### **4.12.2.2 NCRs**

There are no NCRs against this COTS product.

### **4.12.2.3 Features/Performance Upgrades**

Antivirus protection for PCs on the Production LAN is targeted by this upgrade.

### **4.12.2.4 Cross Software Product Compatibility**

Symantec Antivirus 9.0 software supports Windows 2000 and Window XP. There are no other software compatibility issues.

### **4.12.2.5 Operating System Compatibility**

Symantec Antivirus 9.0 software supports both Windows 2000 and Window XP. Therefore software will be compatible with the current Windows 2000 baseline operating system as well as the XP upgrade being considered in Task 109.

### **4.12.2.6 Hardware Product Compatibility**

There are no Hardware product compatibility issues with this product upgrade.

## **4.12.3 Operational Impact**

No operational impact is expected with this upgrade.

## **4.12.4 Custom Code Impact**

There are no custom code impacts associated with this delivery.

## **4.12.5 Security Impact**

No security impacts have been identified for this COTS product. Product will address security issues.

## **4.12.6 Licensing Impact**

There are no licensing issues with this software. Licenses are available for all PCs on the Production LAN.

#### **4.12.7 External Drivers**

An upgrade of the Windows 2000 Operating System to Windows XP is being considered in Task 109. If this proposed task is approved, a review will need to consider if the Antivirus Software delivery should be included with this upgrade or delivered separately either before or after the OS upgrade.

#### **4.12.8 Other Impacts/Comments**

No other impacts have been identified for this COTS product.

#### **4.12.9 COTS Installation Sequence/Dependencies**

The installation sequence may be dependent on whether this product will be delivered with the Windows Operating System upgrade proposed for Task 109. This issue will be identified in the planning phase of the delivery of this COTS product and any installation dependencies will be identified and addressed in the product Release Notes.

## 5. Potential Software Upgrades

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The COTS software upgrades in the previous section have been identified for upgrade within the next six months to a year. The schedule for these upgrades will be entered into Primavera Project Planner (P3) when the all resources that could impact schedule are available. There are however a number of other COTS software products that have been identified for possible upgrades in the future. It is not certain if these upgrades will be undertaken, can be completed in the time frame addressed by this document or may be needed over the long term.

### 5.1 Linux 7.x Security Patches

An upgrade of security patches for Linux 7.x hosts (Modis Direct Broadcast and Security Workstations) had been planned to mitigate security issues. However, it has been proposed in Task 109 that all Linux workstations be upgraded to Red Hat Linux Enterprise 3.0 version. An upgrade to Linux 3.0 would mitigate not only the security patch risks, but overall support and other potential security risks. Task 109 activities are summarized in section 0, 8. Task 109 COTS Refresh Proposal.

Additionally, new Synergy V hosts discussed in section 0, 7. Task 106, Synergy V COTS Upgrades are targeted to be baselined at Red Hat Linux Enterprise 3.0. Moving the Modis Direct Broadcast and Security Workstations to this same Red Hat Linux 3.0 baseline will bring all EMD Linux hosts to a consistent and actively supported operating system baseline, similar to the other EMD operating system platforms.

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## 6. COTS Hardware Upgrades

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This section identifies the planned COTS hardware-related activities and upgrades currently planned through January 2006. Hardware COTS upgrades are performed in accordance with the CM-004 Project Instruction. The COTS hardware upgrades are reviewed with the DAACs at the weekly EMD CCB before approval. If actions are required to complete the CCR, these actions are assigned to the DAAC and reviewed by the CCB.

A Maintenance Work Order (MWO) tracks individual hardware failures. Identification of operational problems, related to performance and functionality are tracked through the COTS software NCR process.

Over the past year, EMD has identified a number of End of Support (EOS)/End of Service Life (EOSL) risks for existing hardware and infrastructure components. These were addressed in a proposal to the Government entitled Task 109 COTS Refresh Study for the EMD Project. Refer to section 0, 8. Task 109 COTS Refresh for a summary of these proposed upgrades, the majority of which are hardware/infrastructure upgrades.

### 6.1 Status of Hardware Upgrades mentioned in previous DID 335

The following COTS product hardware upgrades were mentioned as potential upgrades in the previous volume of DID 335. A status summary of these upgrades is provided below.

#### 6.1.1 Hardware Replacements for Equipment Reaching EOSL

The previous volume identified that replacement or upgrade of certain CISCO Catalyst 6000 engine equipment and a second consolidation of Solaris hosts was being evaluated. These activities and other hardware refresh activities are currently being proposed to the Government and are briefly discussed in section 0, 8. Task 109 COTS Refresh .

#### 6.1.2 Other Hardware-related Upgrades

Other hardware-related upgrades are currently being planned for Synergy V. These are discussed in section 0, 7. Task 106, Synergy V COTS Upgrades.

### 6.2 IP Readdressing

#### 6.2.1 Description of COTS

Revision 01 Update: Phase 1 of this activity was completed in February 2005. In Phase 1, the LARC and NSIDC DAAC's routing was changed to peer with NISN instead of EBnet. The Phase 2 activities are to readdress the external network interfaces for LARC and NSIDC DAACs. Because the LARC network address assigned for use has not been released and other issues have been identified, there are ongoing discussions to determine if phase 2 activities are still required.

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ESDIS is transitioning its Wide Area Network from EBnet to NISN. Once this task is complete, EMD will be required to readdress the NSIDC and LaRC DAACs external IP addresses from EBnet to NISN address space. (Reference Severity 5 NCR 41270). This task is similar to the IP readdressing task, which was performed under ECS ESD163 in 2002.

## **6.2.2 Rationale for Upgrade**

The EBnet assigned IP addresses will not be advertised via NISN. If the IP readdressing does not transition to NISN address space, network connectivity with the NSIDC and LaRC DAACs will be limited to the Internet. There would be no high-speed WAN connectivity.

### **6.2.2.1 Hardware/Software Product Compatibility**

There are no hardware or software compatibility issues associated with this upgrade.

### **6.2.2.2 Equipment End-of-Life/End-of-Support**

There are no equipment end of life or end of support issues associated with this upgrade.

### **6.2.2.3 Features/Performance Upgrades**

There are no new features or performance improvements associated with this upgrade.

## **6.2.3 Software Impact (COTS/Custom)**

There are no COTS product or custom code impacts related to this upgrade.

## **6.2.4 Network Impacts**

The firewall alias IP addresses and DNS entries for domains nsidcb.ecs.nasa.gov and larcb.ecs.nasa.gov will need to transition from EBnet to NISN address space.

## **6.2.5 DAAC Facility Impacts**

NSIDC and LaRC DAACs will be down for approximately 4 hours in April 2005 to perform the IP readdressing. The LaRC DAAC will transition about one week after the NSIDC DAAC. This task will be scheduled to be performed during the DAACs normal weekly maintenance period.

## **6.2.6 Transition Impacts**

During the IP readdressing activities, there will be limited network connectivity with the NSIDC and LaRC DAACs.

## **6.2.7 External Drivers**

NISN must complete their EBnet transition (Phase 1) before the IP readdressing can be performed. Phase 1 was completed in February 2005.

### **6.2.8 Other Impacts/Comments**

There are no other impacts related to this upgrade. This task is dependant on the Government making a final decision on what networks need to be readdressed into IPv6 address space. Until that decision is made, this task is on hold.

### **6.2.9 COTS Installation Sequence/Dependencies**

There are no installation sequence dependencies associated with this upgrade.

### **6.2.10 Replacement Matrix**

There are no hardware replacements associated with this upgrade.

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## 7. Task 106, Synergy V COTS Upgrades

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Some upgrades targeted to support Synergy V have been completed, while others are in the early implementation phases. The completed activities are summarized in section 0. The activities that are in progress are described in section 0. These upgrades are summarized in this document but additional detail will be available with documentation that will be delivered with Synergy V.

### 7.1 Completed Synergy V Upgrade Summary

The following COTS Hardware and Software products have already been delivered for Synergy V.

#### 7.1.1 Archive Capacity Upgrade at GES

The Archive Capacity Upgrade at GES to replace the current archive tape drives (STK T9940A) with higher density tape drives (STK T9940B Fibre Channel) has been completed as of December 2004. The GES upgrade included the addition of nine STK T9940B tape drives, a Brocade 3900 32-Port SAN Fabric Switch, and an SGI Origin 2000 Server with a locally attached TP9400 RAID. These components were integrated with the existing configuration at GES to support Synergy V.

#### 7.1.2 StorNext

The StorNext File System (SNFS) from vendor ADIC is a data management application, enabling multiple, heterogeneous clients to share access to the same files over a fibre attached SAN file system. This COTS product is being used to replace the current SAN file system offering of SANergy/QFS/RDAC for the EMD Data Pool filesystem. The ability to perform adequate volume management on the Data Pool (DPL) filesystem is supported by this COTS product to a significantly greater extent than with the SANergy/QFS/RDAC solution. This delivery is described in detail in the PSR for this product: 914-TDA-287 rev. 01. SANergy, QFS and RDAC will be removed from the EMD baseline as each DAAC implements the StorNext upgrade.

#### 7.1.3 WU-FTP

An update to WU-FTP 2.6.2 has been delivered to support FTP checksum capabilities for Synergy IV and V. A patch update of this delivery included a copy of Sybase SDK, version 12.5.1. This will be needed to maintain a common baseline with upgrade identified in section 10, 4.6 Sybase SDK (Open Client) 12.5.1. This delivery addresses NCR ECSed 41510.

### 7.2 Planned Synergy V Upgrades

Task 106 will include COTS upgrades to support the following Synergy V objectives:

- Integration of media-distribution into the Order Manager Service (OMS)

- Adding support for additional order types, including the following:
  - Orders for products processed by a HDF-EOS to GeoTIFF (HEG) tool
  - Orders submitted through the Science Data Server Command Line Interface (SCLI)
  - Orders containing billable and restricted granules
- Addition of a new capability whereby the Data Pool Insert Service will store granules that are staged to the Data Pool only for ordering purposes. Granules will be stored in separate directories whose contents are not visible to anonymous ftp users.
- Addition of a mechanism that will allow the Earth Science Gateway Portal and other OpenGeospatial Consortium (OGC) clients to access a subset of LPDAAC's Data Pool inventory by the following OGC services. This is described in section 0, 7.2.2.9 IONIC Image Archive Server (IAS).
- Support for OGC interoperability information to ECHO so that ECHO can serve as the OGC catalog for data pool holdings.
- A standard interface to the HEG for use by the DOWS Conversion Utility and by the Order Management Subsystem (OMS). OMS is replacing the Data Pool Web Access component as the manager of HEG orders placed from the Data Pool Web Access shopping cart. In Synergy V, Data Pool Web Access will no longer allow users the option of submitting HEG conversion requests directly from the results page, so Web Access will not need to use the standard HEG interface.
- Improve data flow of EOS data from DAACs to the Global Modeling and Data Assimilation Group (GMAO).

Synergy V will deliver a custom code release to support these and other objectives. The Synergy V Custom Code to meet these objectives will be addressed in the Synergy V Release Notes. This document will address only the COTS products that will be delivered to support the above objectives.

In order to support the services mentioned above, the following new COTS hardware platforms will be introduced:

- DOWS (DAAC OpenGeospatial Web Services) host and dedicated storage

The hardware unit for this host will be an HP Proliant DL740 with 4 Xeon processors.

This unit is currently planned to be initially deployed as a pre-operational capability at the LPDAAC. It will be deployed with a package of COTS and custom code software components. A DOWS host will also be deployed in the PVC for testing and support of the LPDAAC unit.

- New HEG (HDF-EOS to GeoTiff) host

HEG capabilities are currently provided on the Data Pool host (xxdps01). In order to provide improved HEG performance, a new host will be purchased for each DAAC. The HEG executables will be migrated from their current location on the Data Pool host machine to the new HEG host. Additional HEG extensions to OpenGeospatial Web Services (OWS) will also be provided on this new host.

The hardware unit for this platform will be a Dell PowerEdge 1800 Tower with 2 Xeon processors.

These new hardware platforms for DOWS and HEG will utilize the Red Hat Linux Operating System Enterprise 3.0. This will require deployment of several existing ECS COTS products for this Operating System platform. In addition, some custom code requirements for Synergy V have required upgrades to existing COTS products and the introduction of some new COTS products. Some of these new software products will be deployed to the DAACs and other COTS products will be used in the Synergy V development/prototyping environment only.

### **7.2.1 Linux Red Hat Enterprise Edition 3.0**

The new hosts will utilize Red Hat Linux Enterprise Edition 3.0. Synergy V will utilize several utilities bundled with the Linux Operating System in a similar fashion to the bundled operating system utilities used in Solaris 8 and IRIX 6.5. The following bundled utilities are included with the Linux Operating System delivery:

- Compress
- Gzip
- Bzip2
- Procps (a process command similar to the top command provided for Solaris and bundled with SGI)
- Printer software (Common Unit Printing System)
- TCP Wrappers 7.6-34
- Expect 5.38.0-92
- Expat (XML parser library written in C – required by the RATS security utility)
- GNU compilers for C, C++ and FORTRAN for Linux 3.0.

### **7.2.2 COTS Software Deliveries to DAACs**

Synergy V will upgrade and extend use of Java products and utilities and deliver other COTS products.

### **7.2.2.1 J2SDK 1.4.2\_06**

An upgrade to the Java Development Kit (J2SDK) is planned to support the IONIC Client software discussed in one of the following sections. A minimum version of J2SDK 1.4.2\_06 is required for the IONIC software. This upgrade to version 1.4.2\_06 will also address a security issue outstanding with the current baselined version.

### **7.2.2.2 Java Web Services Developer Pack (Java WSDP) 1.4**

The Java Web Services Developer Pack (Java WSDP) is a free integrated toolkit provided by Sun Microsystems to build, test and deploy XML applications, Web services, and Web applications with the latest Web service technologies including the following:

- The JAXB API provides an efficient and standard way of mapping between XML and Java code. It allows developers to easily extend their applications with XML and web services technologies.

The JAXP API supports processing of XML documents using DOM, SAX, and XSLT. It enables applications to parse and transform XML documents independent of a particular XML processing implementation.

- The JAXR API is an abstract uniform Java API for accessing different kinds of XML registries.
- JAX-RPC v1.1.2 API enables Java developers to develop SOAP-based interoperable and portable web services.

### **7.2.2.3 JDOM 1.0/Xerces 2.6.0**

JDOM is a Java representation of an XML document. It provides a way to represent the document for easy and efficient reading, manipulation, and writing. It has a straightforward API, is lightweight and fast, and is optimized for the Java programmer. Upgrade from version 1.0 Beta 8 to version 1.0 will provide needed capabilities for the Synergy V implementation.

Xerces will be upgraded from version 2.0.1 to version 2.6.0. Xerces provides a complete framework for building parser components and configurations. Xerces 2.6.0 is a fully conforming XML Schema processor. Xerces is needed by and will be bundled with the JDOM 1.0 delivery.

### **7.2.2.4 JZKit 1.2.1**

JZKit is a pure java toolset for building advanced search and retrieve applications. It provides a powerful modular framework into which component-based search providers can be installed to provide powerful heterogeneous cross searching of practically any electronic resource set. The framework provides components that cover all aspects of building modern cross searching applications from directory and collection description services through to record schema / syntax translation and aggregate item duplication. Each of these services is presented using a common API with pluggable back ends, to ensure maximum possible integration with any existing

enterprise information system or application infrastructure. Out of the box, the JZKit default configuration already provides powerful cross search facilities. An online demo of the JZKit portal is available, but access is controlled to manage server usage.

#### **7.2.2.5 Ant 1.6.2**

Apache Ant is a Java-based build tool. Ant can be extended using Java classes. Instead of shell commands, the configuration files are XML-based, calling out a target tree where various tasks get executed. Each task is run by an object that implements a particular task interface.

#### **7.2.2.6 Apache 1.3.29 with OpenSSL 0.9.6g**

Apache 1.3.29 will be rebuilt with the OpenSSL freeware product and delivered for use with Synergy V. Two additional freeware products are also bundled in this delivery:

- mm, version 1.1.3, a shared memory module.
- mod-ssl, version 2.8.16, providing strong cryptography via the Secure Socket Layer (v2/v3) and Transport Layer Security (TLS v1) protocols.

The inclusion of OpenSSL 0.9.6g with mm and mod-ssl will support secure authentication in Synergy V's applications.

#### **7.2.2.7 HttpUnit 1.6**

HttpUnit is a tool that enables testing the correct functioning of a Web site. Written in Java, HttpUnit emulates the relevant portions of browser behavior, including form submission, JavaScript, basic http authentication, cookies and automatic page redirection. This allows Java test code to examine returned pages either as text, an XML DOM, or containers of forms, tables, and links.

#### **7.2.2.8 PERL 5.8.5**

As identified in section 0, 4.10 PERL 5.8.5, an upgrade of PERL 5.6.1 is needed to enable inclusion of some new PERL modules for Data Flows to Models that are not supported under the current baseline version 5.6.1. The upgrade version planned for Solaris and IRIX will also be delivered for the new Synergy V Linux platforms for consistency across all EMD platforms. Although all platforms (Solaris, IRIX and Linux) will be upgraded to PERL 5.8.5, there will be some variation in the specific additional modules that will also be included with the Linux delivery. The Linux PERL 5.8.5 delivery includes the following modules/versions.

- CGI 3.05
- Crypt::Blowfish 2.09
- Crypt::CBC 1.25
- DB 1.86

- DB\_File 1.808
- DBD-Sybase 1.04
- DBI 1.45
- MD5-2.03
- String::Approx 3.23
- Test::Harness 2.42
- Test::Simple 0.47
- Time::HiRes 1.65
- Tk 804.027
- zlib 1.2.2

#### **7.2.2.9 IONIC Image Archive Server (IAS)**

The Image Archive Server (IAS), developed by IONIC, is a suite of services that implements international standards as defined by OpenGeospatial Consortium and ISO tc211. Product provides solutions for geospatial publishing using Web Services and Location Based Services. Product is 100% written in Java. The planned IAS implementation includes the following Web Services:

- Web Mapping Service (WMS)
 

WMS provides three operations protocols (GetCapabilities, GetMap, and GetFeatureInfo) in support of the creation and display of registered and superimposed map-like views of information that come simultaneously from multiple sources that are both remote and heterogeneous.
- Web Coverage Service (WCS)
 

WCS extends the Web Map Server (WMS) interface to allow access to geospatial "coverages" that represent values or properties of geographic locations, rather than WMS generated maps (pictures).
- Web Registry Service (WRS)
 

WRS is a Registry Service that defines a common mechanism to classify, register, describe, search, maintain and access information about OGC Web resources. The OGC Service Registry provides the methods for managing a repository; a Registry Client is an application used to access the Registry.

In addition, IAS includes tailored HDF-EOS connectors using the HEG tool. This software will only be delivered to LPDAAC and PVC for the DOWS pre-operational capability implementation.

### **7.2.2.10 TCL/tk 8.4.9**

An upgrade of TCL/tk is planned for Synergy V for compatibility with Linux 3.0. This delivery includes the following modules:

- BLTwish 2.4z
- Incr\_tcl 8.3.5
- Incl\_tcl 3.2.1
- Incr\_tk 3.2.1
- Incr\_widgets 402
- Tclx 8.3.5
- Tcl-dp 4.0.1

### **7.2.2.11 Lahey FORTRAN 90 Pro 6.2**

The Lahey FORTRAN 90 Pro 6.2 will be delivered only for the Standalone OGC (WCS/WMS) Archive for use by the development team dedicated to this effort.

## **7.2.3 Synergy V Development COTS Software**

The Synergy Development group will continue use of the current baselined compilers for Sun and SGI where applicable. Use of Borland's JBuilder will also continue for Java Development. The following sections briefly discuss other development products that will be used in the development process, but will not be delivered to the DAACs.

### **7.2.3.1 Apache Axis 1-2RC1**

Apache Axis is an implementation of the SOAP ("Simple Object Access Protocol"). This is an open protocol submitted to the W3C organization. As described in the draft W3C specification:

“SOAP is a lightweight protocol for exchange of information in a decentralized, distributed environment. It is an XML based protocol that consists of three parts: an envelope that defines a framework for describing what is in a message and how to process it, a set of encoding rules for expressing instances of application-defined datatypes, and a convention for representing remote procedure calls and responses.”

### **7.2.3.2 Jakarta Commons Pool 1.2**

The Jakarta Commons Pool 1.2 is a generic object pooling API with several implementations. The org.apache.commons.pool package defines a simple interface for a pool of object instances, and a handful of base classes that may be useful when creating pool implementations. The API supports pooling of unique objects which can be requested via a key as well as pools where all objects are equivalent.

### **7.2.3.3 Mock Objects 0.09**

Mock Objects is a group of Java packages that will be used as part of the Synergy V unit testing strategy. One of the included java objects (Verifiable) is an object that can confirm that the correct behavior has occurred. Mock Objects shields external and unnecessary factors from testing and helps developers focus on a specific function to be tested.

### **7.2.3.4 JUnit 3.8.1**

JUnit is a simple framework to write repeatable tests. It is an instance of the xUnit architecture for unit testing frameworks. It reduces the time and energy required to keep code well-tested, and prevents regression errors from persisting uncaught for long periods of time. JUnit is a freeware product.

### **7.2.3.5 Together 6.0.1**

Together will be used as a Java Integrated Development Environment (IDE), which includes code generation, debugging tools and Unified Modeling Language (UML) diagram generation for code design. Product is a licensed COTS product from Borland.

### **7.2.3.6 Rough Auditing Tool for Security (RATS)**

Rough Auditing Tool for Security (RATS) is a free, open-source tool to help identify potential security risks in custom code software.

### **7.2.3.7 ECHO Client Toolkit**

This toolkit is provided for use by the NASA ECHO group. The toolkit will enable ECHO to serve as the OpenGeospatial catalog for data pool holdings.

### **7.2.3.8 Other Synergy V Development Software**

The GNU compilers for C, C++ and FORTRAN bundled with Linux 3.0 will be utilized by the Synergy V Development Group.

A ClearCase 2003.06 build environment has been created to support development builds and deliveries for Linux 3.0.

## **7.2.4 Linux Versions of Current Products**

Linux versions of various currently baselined COTS products will be required for Synergy V. Table 7-1 provides a listing of the current baseline products which will be needed on Synergy V for Linux hosts. Some of these products will be re-packaged and re-delivered (Java), some will be new deliveries and some have been previously delivered for use with Red Hat Linux 3.0.

**Table 7-1. Baselined COTS Software for Synergy V Linux 3.0**

<b>Product</b>
Anlpassword 3.0
F-Secure 3.3
JAF 1.01
FTP Beans 2.01
JavaMail 1.2
JAXP 1.0.1
JConnect 5.5 (EBF10349)
JDBC API 2.0
Legato Networker 7.1.2
Sybase SDK (OC) 12.5.1
StorNext Client 2.6.2
Tripwire 1.3.1
WebGLIS 3.2.1

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## 8. Task 109 COTS Refresh Proposal

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Over time some of the COTS software products and several of the COTS HW products utilized in EMD have reached or are nearing End of Support (EOS) or End of Service Life (EOSL). In the case of certain COTS software products, vendors may have reduced the number of operating system platforms that the vendor previously supported. To address these issues, a COTS Technical Refreshment Proposal was submitted to the Government. The proposal included options that could be considered to mitigate the identified risks. Some of the proposed changes will force a corresponding change to other COTS products. Task 109 included some subtasks or portions of subtasks that only apply to Landover. These upgrades are not discussed in this document. The subtasks that will include delivery of upgrades to the DAACs are discussed in the following sections.

### 8.1 Permeo Enterprise COTS Software

#### 8.1.1 Description of COTS

Permeo Enterprise Server V.4 is an AIX application which implements the SOCKS networking proxy protocol in support of secure firewall transfers. EMD custom code utilizes SOCKS in all of its outbound ftp and SSH transfers through its firewalls.

##### 8.1.1.1 Original COTS Refresh Issue/Recommendation

The vendor is dropping AIX support for this product effective 5/31/2005. The proposed plan to address this issue is to:

- Procure CY05 Maintenance to permit time to transition firewall software to a Linux platform. Procurement of CY05 maintenance under Task 101 for Permeo Enterprise server and its SGI static libraries was completed 12/2004.
- Procure IBM Linux platforms for Firewalls and transition to the Linux platforms. End of Service Life for current IBM 7025-6F1 platforms (at DAACs) and 7025-F80 platforms at VATC/PVC had been identified by the vendor for the end of 2006. Transition to Linux would address this EOSL issue.
- Replace VATC firewall with de-commissioned 2<sup>nd</sup> GES firewall, and install Linux.

##### 8.1.1.2 Revised COTS Refresh Issue/Recommendation

At the time the original recommendation was identified, Permeo Enterprise Software supported Linux and Windows platforms. It was subsequently identified that these platforms and the COTS product itself was not planned for continuing support beyond 2006. In teleconference with senior vendor and EMD technical and management representatives, it was also determined

that a new product that was being released by Permeo would not be a suitable replacement for EMD Firewall requirements.

Discussions were then initiated with the principal Firewall product vendor regarding alternatives for the replacement of the capabilities provided by the Permeo Enterprise Server and the Permeo SOCKS SDK libraries. Livermore Laboratories, which provides the Portus Firewall product, identified a solution that would provide an alternative for the current Permeo functionality. A Statement of Work (SOW) was developed, revised and accepted by potentially impacted EMD COTS and Custom Code technical and management leads. The vendor accepted this SOW with minor revisions.

Hardware replacements for the current IBM 7025-6F1 and 7025-F80 AIX platforms were no longer planned because of the following:

- A new operating system platform was not required for the Portus Firewall alternative.
- After an EMD visit with the vendor, IBM extended the EOSL for the IBM 7025-6F1 and 7025-F80 AIX platforms through 9/03/2008.

### **8.1.2 Rationale for Upgrade**

Long term support for the Permeo Enterprise Server and SDK libraries are not available. Complete replacement of firewall solution would have substantial schedule impact, extending well beyond the period of support from Permeo. Replacement of the Permeo products with software provided by the Portus vendor has the following advantages:

- Capability to continue with current security levels as implemented in a proxy server.
- Capability to retain existing use of Portus features by EMD custom code implementation.
- Capability to deliver a replacement solution without an extended non-support period.
- Implement a significantly lower cost replacement than other alternatives.

#### **8.1.2.1 Vendor Support**

Vendors of both products (Permeo and Portus) provided considerable support for the analysis of this issue.

#### **8.1.2.2 NCRs**

There are no NCRs on this issue.

#### **8.1.2.3 Features/Performance Upgrades**

Testing of solution with custom code is planned in the PVC and VATC environments. Testing relating to performance characteristics will also be included.

#### **8.1.2.4 Cross Software Product Compatibility**

The additional software provided by Portus will have no cross software compatibility issues, since Portus will be the only remaining Firewall COTS product, other than the operating system.

#### **8.1.2.5 Operating System Compatibility**

The Portus alternative will enable continuing implementation on the existing hardware and on the existing operating system software (IBM AIX).

#### **8.1.2.6 Hardware Product Compatibility**

The Portus alternative will enable continuing implementation on the IBM hardware platforms. The Portus vendor plans continued support for IBM AIX and the hardware platforms that support AIX.

#### **8.1.3 Operational Impact**

The Portus alternative will have significantly less operational impact than a complete replacement. The transition plan will be developed during testing and included with the delivery of the new software and removal of the Permeo software.

#### **8.1.4 Custom Code Impact**

Custom code will be impacted to some extent. Some custom code will be rewritten to interface with the Permeo alternative rather than the Permeo SDK libraries. Custom code testing is also planned to test the performance of the Portus alternative solution.

#### **8.1.5 Security Impact**

The Portus alternative will allow continued implementation of the strong security features and flexibility of the current EMD Proxy Firewall.

#### **8.1.6 Licensing Impact**

The Portus alternative software will be developed and maintained by the vendor. There will be no license keys associated with this software extension.

#### **8.1.7 External Drivers**

Work is currently in progress to replace the Permeo Enterprise Server and Socks SDK libraries. The schedule for this replacement will be planned to complete work, including testing as soon as possible, minimizing the period where there will be no support from the Permeo vendor. Support for Permeo on AIX and the SOCKS SDK libraries ends 12/31/2005. This is considered to be relatively low risk as there was only one support call in the past year, and that issue had no major impact. The Permeo Enterprise Server software and SOCKS libraries may be used as long as needed, but no bug fixes will be provided after 12/31/2005.

### **8.1.8 Other Impacts/Comments**

None.

### **8.1.9 COTS Installation/Sequence Dependencies**

COTS installation sequence dependencies will be captured during testing and provided with the delivery documents.

## **8.2 RogueWave Software**

EMD custom code makes extensive use of the RogueWave Edition 2 (RW-2) class libraries to provide a common implementation for utility functions and database/network interfaces on both Solaris and IRIX platforms.

RogueWave has dropped support for the SGI IRIX operating system. The plan to address this issue is to:

- Procure licenses as a one-time, non-recurring purchase and continue to self-maintain. Procurement of RW licenses under Task 101 was completed 12/2004.
- Port RW-2 to current and future operating systems identified in EMD.

## **8.3 PC Upgrades**

### **8.3.1 Windows XP and Memory Upgrades**

PCs are used throughout the EMD production environment to support media distribution and QA, system monitoring, trouble ticket administration, and ASTER DEM product generation at the LP DAAC.

#### **8.3.1.1 COTS Refresh Issue/Recommendation**

All PCs had been running Windows 2000. This operating system version reached EOS in March 2005. Additionally, NASA has issued a security directive for its centers, which requires the migration to Windows XP. The proposed plan to address this issue is to procure Windows XP OS for all production PCs and supplement RAM as needed. Some server class PCs required upgrades to Windows Server 2003, as Dell does not provide support for drivers for XP on server class machines.

#### **8.3.2 Rationale for Upgrade**

It is expected that future versions of COTS products, that are implemented on EMD Windows PCs, will drop support for Windows 2000 and the Windows 2000 product vendors will no longer provide support and bug fixes for this OS version. Additionally, EMD will not be able to adequately address security issues with an operating system that has reached end of support.

### 8.3.2.1 Vendor Support

Microsoft has identified that Windows 2000 reached end of support in March of 2005. Some PCs, especially those that support CD/DVD creation, have been identified as requiring memory upgrades to support performance under Windows XP/Server 2003. Memory upgrades have been provided to bring all PCs to a minimum of 512MB.

### 8.3.2.2 NCRs

**Table 8-1. NCRs Against Windows XP Upgrade**

NCR	Description	State	Sev.
44046	Rimage Windows XP Upgrade Failure	A	3

This problem was identified after initial delivery as there were no Windows server class machines in the Landover testing facility. The Windows Server 2003 licenses have been procured for delivery to the DAACs with these devices.

### 8.3.2.3 Features/Performance Upgrades

Features and performance upgrades are not specifically targeted by the upgrade.

### 8.3.2.4 Cross Software Product Compatibility

All COTS products versions currently implemented on production PCs are also compatible with Windows XP SP1/Server 2003.

### 8.3.2.5 Operating System Compatibility

All COTS products versions currently implemented on production PCs are also compatible with Windows XP SP1/Server 2003.

### 8.3.2.6 Hardware Product Compatibility

All PC hardware will be upgraded to a minimum of 1 GB for Rimage PCs and 512 MB for Remedy PCs.

### 8.3.2.7 Operational Impact

There will be some operational impact related to these upgrades, as all PC COTS products will need to be re-installed after the Windows XP/Server 2003 installation.

### 8.3.3 Custom Code Impact

There is no custom code impact.

### **8.3.4 Security Impact**

Upgrade will improve security for the PC operating system.

### **8.3.5 Licensing Impact**

New licenses for XP/Server 2003 have been procured for these upgrades and are provided with the CDs.

### **8.3.6 External Drivers**

The NASA security directive requiring its centers to migrate to Windows XP has been considered in recommending this upgrade.

### **8.3.7 Other Impacts/Comments**

None.

### **8.3.8 COTS Installation/Sequence Dependencies**

The COTS installation sequence and dependencies were identified in the Release Notes document #914-TDA-318 Rev 01, which was delivered by CCR 05-0439 on August 23, 2005. Upgrades are in progress.

## **8.4 Sun Ultra Servers**

### **8.4.1 Description of COTS**

SUN Ultra 2 servers host the Development Defect Tracking System (DDTS) and also function as DAAC operator workstations.

### **8.4.2 Rationale for Upgrade**

SUN Ultra 2 systems will reach EOSL in August 2006. The plan to address this issue is to:

- Replace Sun Ultra 2 workstations and servers at the DAACs with SUN Blade 150s Workstations and Sun Fire V120/V240s.
- Return Ultra 2s from the DAACs to the EDF for use as spares.

Note that Ultra 2s which host SUN SPARC Storage Arrays (SSAs) are addressed in a separate item (Subtask 7, COTS-11, SUN SSA Raid 219) in section 0, 8.6 Sun RAID Model 219.

#### **8.4.2.1 Hardware/Software Product Compatibility**

The Sun Blade 150s and Sun Fire V240/V120s have no hardware/software compatibility issues.

#### **8.4.2.2 Equipment End-of-Life/End-of-Support**

No end of life or end of support had been identified for Sun Fire V240s/V120s. The SUN Blade 150 end of life was announced Dec. 2005 with ESOL in 5 years.

#### **8.4.2.3 Features/Performance Upgrades**

Although new features and performance improvements are not specifically targeted with this upgrade, performance improvements are expected with this upgrade.

#### **8.4.3 Software Impact (COTS/Custom)**

There is no custom code software impact for this upgrade.

#### **8.4.4 Network Impacts**

There are no network impacts associated with this upgrade.

#### **8.4.5 DAAC Facility Impacts**

Upgrade is for a one-to-one replacement and the power supply requirements and footprints should be identical to the replaced units.

#### **8.4.6 Transition Impacts**

Transition plans will be provided in the PSR that delivers this hardware. The transition plan has been designed to minimize operational impacts to the DAACs.

#### **8.4.7 External Drivers**

There are no other external drivers associated with this delivery other than those mentioned above.

#### **8.4.8 Other Impacts/Comments**

There are no other impacts related to this upgrade.

#### **8.4.9 COTS Installation Sequence/Dependencies**

Any COTS installation sequences and dependencies will be identified in the PSR that delivers these devices.

## 8.4.10 Replacement Matrix

**Table 8-2. Ultra Replacement Matrix**

DAAC	Ultra Host	Replacement Device
ASDC	l0dms05	Sun Blade 150
ASDC	l0acs06	Sun Blade 150
ASDC	l0ais09	Sun Blade 150
LP DAAC	e0acs03	Sun Blade 150
LP DAAC	e0ais02	Sun Blade 150
LP DAAC	e0ais03	Sun Blade 150
LP DAAC	e0ass01	Sun Fire V240
LP DAAC	e0ass02	Sun Fire V240
LP DAAC	e0dms03	Sun Blade 150
LP DAAC	e0dms04	Sun Blade 150
LP DAAC	e0dms05 (replacing e0pls03)	Sun Blade 150
NSIDC	n0ais01	Sun Blade 150
NSIDC	n0ais05	Sun Blade 150
NSIDC	n0mss03	Sun Blade 150
NSIDC	n0dms04	Sun Blade 150
NSIDC	n0dms05	Sun Blade 150
PVC	p0css02	Sun Fire V120
SMC	m0mss02	Sun Blade 150
VATC	t1acs02	Sun Blade 150
VATC	t1ais01	Sun Fire V240
VATC	t1css01	Sun Fire V120
VATC	t1dms02	Sun Fire V240
VATC SMC	t0ins01	Sun Blade 150
VATC SMC	t0mss01	Sun Fire V240

## 8.5 Clariion SCSI & FC RAID Replacement

### 8.5.1 Description of COTS

Clariion RAID is used throughout EMD on both SGI and SUN hosts. It is used as high performance storage for databases and data caches.

## 8.5.2 Rationale for Upgrade

Clariion SCSI RAID is past EOSL and is currently under “best effort” maintenance by SGI with refurbished parts, with limited availability. FC RAID will reach EOSL on 1/22/2006. The plan to address this issue is to:

- Replace SCSI and FC systems with TP9700 RAID. Where servers have both Clariion and TP9400 RAIDs mixed on the system, consolidate all RAID into one unit.
- Re-use TP9400 decommissioned from DAACs for VATC/EDF replacements.
- Installation of TP9700 in the PVC will be performed first. This gives Landover operational experience with TP9700. Landover will then deploy TP9700 to the DAACs.
- In order to minimize impact at the sites and maximize resources, this task will be completed with three (3) PSR documents and activities. Three of these have been completed. The completion date and PSR documentation references are included where applicable.
  - Delivery of TPSSM 9.14H Management Software for the SGI TP9700 RAID, Document # 914-TDA-320 Rev 01 by CCR 05-0383A on August 11, 2005. This PSR included delivery of the TP9700 devices for DRG hosts.
  - Delivery of Task 109 FSMS and SPR Hosts RAID Replacement for the EOSDIS Core System (ECS), Document # 914-TDA-325 by CCR 05-0423 on August 25, 2005.
  - Delivery of Task 109 ACG and ICG Hosts RAID Replacement. This replacement has potential impact for Sybase Server implementations. A transition plan is being included with this upgrade to minimize the impact of the upgrade on the Sybase database implementations. This delivery has been implemented via CCR 05-0551 and Task 109 ACM and ICL Hosts RAID Replacement for the EOSDIS Core System (ECS), Document # 914-TDA-332.

### 8.5.2.1 Hardware/Software Product Compatibility

The TP9700 RAID units are compatible with all SGI IRIX hardware. The SGI servers require an upgrade of the TPSSM software to version 9.14H to connect to the TP9700 RAID with the Yuma 9 firmware. This has been delivered by CCR 05-0383A.

### 8.5.2.2 Equipment End-of-Life/End-of-Support

End of support for Clariion SCSI and FC RAID is the driver for this upgrade.

### 8.5.2.3 Features/Performance Upgrades

Although new features and performance improvements are not specifically targeted with this upgrade, performance improvements are expected with this upgrade.

### 8.5.3 Software Impact (COTS/Custom)

There is no direct impact to custom code with this delivery. Task 109 ACG and ICG Hosts RAID Replacement PSR included a transition plan to address migration of Sybase to the new RAID devices to assure that the Sybase database was migrated successfully and did not indirectly impact custom code.

### 8.5.4 Network Impacts

There are no network impacts associated with this upgrade.

### 8.5.5 DAAC Facility Impacts

Upgrade will reduce footprints and power requirements in most facilities.

### 8.5.6 Transition Impacts

Transition plans in the PSRs have been designed to minimize operational impacts to the DAACs. Landover personnel will be available to assist with the transition if needed.

### 8.5.7 External Drivers

There are no other external drivers associated with this delivery other than those mentioned above.

### 8.5.8 Other Impacts/Comments

There are no other impacts related to this upgrade.

### 8.5.9 COTS Installation Sequence/Dependencies

Installation sequence dependencies have been addressed in the three PSRs identified above that have delivered this hardware to the DAACs.

### 8.5.10 Replacement Matrix

Table 8-3 identifies the hosts that will receive new TP9700 devices.

**Table 8-3. Replacement Matrix for Clariion RAID Replacement (1 of 2)**

Site	Host Name	Subsystem	Host Function	Hardware
ASDC	l0drg03	DRP	DRP Server 03	SGI Origin 350
	l0spg11	SPR	SPR Server 02	SGI Origin 300
GES	g0spg10	SPR	SPR Server 01	SGI Origin 2000
	g0drg01	DRP	DRP Server 01	SGI Origin 2000
	g0drg02	DRP	DRP Server 02	SGI Origin 2000
	g0drg03	DRP	DRP Server 03	SGI Origin 2000
	g0drg04	DRP	DRP Server 04	SGI Origin 2000
	g0acg01*	ACM	ACM Server 01	SGI Origin 2000
	g0icg01	ICL	ICL Server 01	SGI Origin 2000

**Table 8-3. Replacement Matrix for Clariion RAID Replacement (2 of 2)**

Site	Host Name	Subsystem	Host Function	Hardware
LP DAAC	e0drg11	DRP	DRP Server 01	SGI Origin 2000
	e0drg12	DRP	DRP Server 02	SGI Origin 2000
	e0acg11	ACM	ACM Server 01	SGI Origin 2000
	e0icg01**	ICL	ICL Server 01	SGI Origin 300
NSIDC	n0drg01	DRP	DRP Server 01	SGI Origin 2000
PVC	p0drg01	DRP	DRP Server 01	SGI Origin 300
	p0drg04	DRP	DRP Server 02	SGI Origin 2000
	p0acg05	ACM	ACM Server 01	SGI Origin 2000
	p0icg01	ICL	ICL Server 01	SGI Origin 300

\* \* Installing new shelves only

\*\* Reuse of rack from e0acg11 TP9400.

## 8.6 Sun RAID Model 219

The SUN SPARC Storage Arrays (SSA) in EMD provide redundant storage for home directories, automount tools, databases, and COTS/custom code distribution. The SSAs are attached to Sun Ultra 2 or Enterprise 3000 (E3000) servers.

The SSA storage devices reach EOSL on 12/31/2005. SUN E3000s are supported through June 2006. However, newer replacement RAID devices only support PCI-based HBAs, which are not compatible on the current Ultra 2/E3000s.

### 8.6.1 Description of COTS

The plan to address the EOSL for the SSA and current servers is to:

1. Selectively replace SSAs with internal disks or multi-packs where the current SSA capacity can be duplicated or exceeded.
2. For some larger SSA configurations, replace existing servers with servers with comparable or larger internal disks than the current SSA disks.
3. For the largest SSAs, such as those currently used as the Home Directory Servers, provide new RAID devices attached to a new server.

### 8.6.2 Rationale for Upgrade

Upgrade of servers and SSAs are being planned because of end of service life of these devices as identified above.

### **8.6.2.1 Hardware/Software Product Compatibility**

No hardware or software compatibility issues are expected with these upgrades. Where a Linux operating system may be considered appropriate for long term evolution, testing and prototyping will be performed to verify hardware/software compatibility.

### **8.6.2.2 Equipment End-of-Life/End-of-Support**

This upgrade is driven by the end of life and end of support issues associated with the current Sun SSAs and servers.

### **8.6.2.3 Features/Performance Upgrades**

There are no new specific features or performance improvements targeted with this upgrade.

### **8.6.3 Software Impact (COTS/Custom)**

No custom code runs on these devices. If in looking at the long term evolution of EMD, Linux is identified as the targeted server operating system of any of the SSA server replacements, impacts will be identified with dialog with all appropriate vendors, prototyping and other testing. If software upgrades are identified, these will be planned, implemented and scheduled with the server upgrade delivery.

### **8.6.4 Network Impacts**

There are no network impacts associated with this upgrade.

### **8.6.5 DAAC Facility Impacts**

The delivery and transition of the Home Directory servers is expected to impact DAAC facilities. The transition will focus on recommending an approach that would reduce this impact as much as possible.

### **8.6.6 Transition Impacts**

The delivery of these replacements will include a Transition Approach to minimize impacts as much as possible.

### **8.6.7 External Drivers**

EMD is evaluating possible alternative operating systems for the Home Directory Servers in order to support evolution.

### **8.6.8 Other Impacts/Comments**

Maintenance is planned to be obtained for the equipment to be replaced for through June 2006, so that the DAAC will have support for the current equipment until it is replaced.

### **8.6.9 COTS Installation Sequence/Dependencies**

There are no installation sequence dependencies associated with this upgrade.

### **8.6.10 Replacement Matrix**

Replacement matrix is not available at this time as the replacement configurations are still under discussion.

## **8.7 Linux Software**

Linux Red Hat 7.3 OS had been the operating system for the following 14 machines:

- 5 security workstations (1 at each DAAC and 1 in the PVC)
- 3 toolkit integration machines in Landover
- 2 MODIS Direct Broadcast production platforms at GES
- 2 MODIS DB machines in Landover.

Red Hat Linux 7.3 is past EOL. The vendor's current replacement product is Red Hat Enterprise 3.0. The following plan has been implemented to address this issue:

- The licenses for these machines have been procured.
- An existing Linux 3.0 Release Notes document was updated and redelivered to include these machines. Refer to CCR 05-0448, Update Red Hat Enterprise Linux 3.0 release and Release Notes document #914-TDA-311 Rev 01 for additional details.
- Upgrade of these machines to Linux 3.0 is in progress.

## **8.8 X-terminal Upgrades**

X-Terminals are used throughout EMD for the operation of graphical user interfaces used to monitor and manage production, ingest and distribution. Development support of sustaining engineering is also performed using X-terminals.

The NCD X-Terminals have been at EOSL since December 2002. X-terminals are in operation at the NSIDC DAAC (6) and Landover only (31). The proposed plan to address this issue is to replace X-Terminals with SUN RAY clients.

After discussion with NSIDC, all of the NCD terminals at this site will be replaced with Sun Blade 150 workstations. The NCD X-terminals in use at Landover will be replaced with Sun Ray units. Some of the Sun Ray units will utilize new Sun Ray monitors and others will utilize existing monitors that are available and suitable for this purpose.

No PSR for the Sun Ray Server software (version 3.1) will be delivered as there will be no use of this software (or hardware) at any of the DAACs. The NCDWare software utilized with the

obsolete NCD X-terminals will be removed from the baseline when all devices are replaced. Table 8-4 provides the replacement matrix for the NSIDC X-Terminals.

**Table 8-4. NSIDC NCD X-Terminal Replacement Matrix**

DAAC	X-Terminal Host	Sun Blade Host Replacement	Replacement Device
NSIDC	n0aix04	n0ais04	Sun Blade 150
NSIDC	n0spx04	n0dms07	Sun Blade 150
NSIDC	n0spx05	n0dms08	Sun Blade 150
NSIDC	n0spx06	n0dms09	Sun Blade 150
NSIDC	n0spx07	n0dms10	Sun Blade 150

## 8.9 System Backup Hardware

STK 9710 and 9714 tape libraries are configured with SUN Enterprise 3000 servers, and support the Legato Networker backups of all production hosts.

### 8.9.1 Description of COTS

The STK 9710 series with DLT drives will reach EOSL on 12/31/2005. The plan to address this issue is to:

- Replace STK 9700 tape libraries with more efficient and effective backup devices.
- Replace the E3000 backup servers with servers that are capable of supporting the throughput of the new backup storage devices.

The replacement storage device will be ADIC's Pathlight VX. This is a disk-based backup solution. The Pathlight VX 650 is a scalable enterprise backup and recovery system that integrates disk and tape into a single system. The solution that will be deployed at the DAACs will be 3.8TB of SATA disk and a Scalar 100 with 2 LTO 3 Tape drives. The Pathlight VX's embedded path from disk to tape and policy-based management options let the users balance their recovery level. The Pathlight VX will easily integrate into the existing DAAC environment.

### 8.9.2 Rationale for Upgrade

Currently, DAACs cannot backup and especially restore system data efficiently. The current backup system cannot efficiently perform full backups or restores because of throughput limitations. This limitation has significant operational impact when a restore is needed for critical systems.

A new generation of backup devices has recently come to market. These devices have been designed specifically to support increased speed and efficiency for backups. These devices combine the best characteristics of disk and tape in a unified storage management environment.

The PathLight VX has been selected as the replacement for the current STK 9710 and 9714 tape libraries. With the PathLight, the initial backup occurs to disk (with the accompanying speed of disk). The physical creation of tape can occur outside the backup window and with transparent impact to backup server and backup application. The planned configuration will provide a significant amount of virtual media to allow for high speed restoration.

The current E3000 Backup Servers cannot be upgraded to take advantage of available network throughput to maximize the efficiency of backup devices such as the PathLight VX. An upgrade to a server platform that is capable of supporting the throughput of the PathLight is required. Potential server platforms are currently being review and tested with the PathLight. Additionally, since no custom code is run on the backup server, consideration is being given to utilizing a server running under the Linux Operating System. Prototyping of potential server platforms is planned to verify there are no impacts or issues to the selected operating system and server platform delivery.

#### **8.9.2.1 Hardware/Software Product Compatibility**

Prototyping of the PathLight and potential Backup Servers is in progress and will continue to assure compatibility of all hardware and software.

#### **8.9.2.2 Equipment End-of-Life/End-of-Support**

The end of life or end of support dates of the current backup server and tape libraries are the primary drivers of this upgrade. The PathLight VX selected as a replacement has no end of life date. The replacement Backup Servers under consideration are all recently released models and have no end of life dates.

#### **8.9.2.3 Features/Performance Upgrades**

Upgrade will address system backup and restore efficiency and effectiveness at the DAACs.

#### **8.9.3 Software Impact (COTS/Custom)**

A minor version upgrade of Legato Networker to version 7.2.1 is planned to support Linear Tape Option Level 3 (LTO3). The current 7.1.2 version only supports LTO2. The LTO3 option provide significantly more virtual media space.

To minimize impact for the DAAC, the upgrade to this Networker version will be delivered installed on the new backup server. Existing Networker 7.1.2 clients will be compatible with the 7.2.1 Server version and can be used until the DAAC can complete upgrades of the existing 7.1.2 IRIX, Solaris, Linux and Windows clients to the 7.2.1 version. This compatibility has been verified by the vendor and in testing that has been completed in a prototype lab. Legato Networker supports Red Hat Linux as well as Solaris 8 as a Server platform.

#### **8.9.4 Network Impacts**

There are no network impacts associated with this upgrade.

### **8.9.5 DAAC Facility Impacts**

There will be DAAC facility impacts with this delivery. A Transition Plan will be developed to minimize the impact as much as possible.

### **8.9.6 Transition Impacts**

A Transition Plan will be delivered with or in addition to the hardware PSR that will deliver the hardware devices.

### **8.9.7 External Drivers**

As mentioned in the following section, the selection and delivery of all hardware and software will be reviewed in context of the long term evolution of EMD.

### **8.9.8 Other Impacts/Comments**

To support evolution, Linux servers may be considered as replacement servers since there is no custom code impact. Prototyping and other testing would be planned to verify compatibility of all hardware and software deliveries.

### **8.9.9 COTS Installation Sequence/Dependencies**

COTS installation sequence and dependencies are planned to be identified in the Transition Plan and PSR documents.

### **8.9.10 Replacement Matrix**

The current backup device and server replacements are planned as a one to one replacement at GSFC, NSIDC, LPDAAC and LARC sites.

## **8.10 Catalyst 6000 Network Switch Replacement**

### **8.10.1 Description of COTS**

The Cisco Catalyst 6000 switches support the network connectivity between all ECS production network hosts at each site.

The Catalyst 6000 supervisory engine HW/SW reached EOS in July 2005.

#### **8.10.1.1 Original COTS Refresh Issue/Recommendation**

The proposed plan to address this issue was to upgrade the existing Catalyst Supervisory Engine to the Catalyst 6000 Supervisory Engine 2. At the time of the original proposal, no End of Support (EOS) had been announced for this replacement.

#### **8.10.1.2 Revised COTS Refresh Issue/Recommendation**

After the proposal was approved, CISCO identified that the Catalyst 6000 Supervisory Engine 2 would be reaching EOS in the second quarter of 2005. In order to mitigate the Catalyst

Supervisory Engine EOS issue, it became necessary to upgrade to the Catalyst 6500 Supervisory Engine 32. This upgrade also requires a new chassis and power supply for hardware compatibility. The current line cards (GB Ethernet, 10-100 Base T Ethernet) can be reused in the new configuration.

## **8.10.2 Rationale for Upgrade**

The Supervisory Engine of the Catalyst is a critical networking component of the EMD Infrastructure. Efficient and effective product maintenance needs to be in place to minimize outages and/or recovery downtime.

### **8.10.2.1 Hardware/Software Product Compatibility**

The replacement solution identified above has considered all hardware compatibility and hardware EOS issues. The Catalyst 6500 will utilize a new IOS than the Catalyst 6006. Upgrade to the new operating system version has been included in the replacement planning and scheduling.

### **8.10.2.2 Equipment End-of-Life/End-of-Support**

Equipment end of support has been the major driver of proposing the replacement of the current Catalyst 6000 supervisory engine.

### **8.10.2.3 Features/Performance Upgrades**

There are no specific features or performance improvements targeted with this upgrade.

## **8.10.3 Software Impact (COTS/Custom)**

The hardware upgrade will include an upgrade to a new operating system version for the Catalyst 6500 and this has been included in the replacement planning and scheduling.

## **8.10.4 Network Impacts**

Minimizing network impacts will be a major focus of the delivery. The installation and transition will be tested and refined in the PVC. Landover support personnel that will participate in the VATC/PVC installation and testing will be on-site at each DAAC to install, configure and transition the replacement.

## **8.10.5 DAAC Facility Impacts**

Minimizing overall DAAC facility impacts will also be a major focus of the delivery. The installation and transition will be tested and refined in the PVC to accomplish this objective.

## **8.10.6 Transition Impacts**

As identified above, there will be significant focus to minimize network and DAAC facility impacts in development of the transition plan/PSR.

### **8.10.7 External Drivers**

There are no external drivers to this replacement.

### **8.10.8 Other Impacts/Comments**

There are no other impacts related to this upgrade.

### **8.10.9 COTS Installation Sequence/Dependencies**

Any installation sequence dependencies associated with this upgrade will be identified in the Transition Plan/PSR document that will be developed for delivery with the replacement hardware.

### **8.10.10 Replacement Matrix**

This activity is planned as a one-to-one replacement of existing installations. The existing Catalyst 6000 switch at each site will be replaced by a Catalyst 6500 chassis, Supervisory 32 engine, and new power supply. The line cards of the older unit will be inserted in the new chassis.

# Appendix A. Weekly CUT Matrix Example

**Table A-1. Weekly CUT Matrix Example (1 of 6)**

Product Name	B/Lver.	Upgrade Version	Upgrade Rationale	NCRs	Dev. Planning	Turnover to Test Date	Internal Review date	PSR Date	COTS POC	Status as of 02/16/05 (unless otherwise noted)
SQS	3.4.2.25	3.4.2.28	Resolve NCR	41468	Requested Autometrics to recompile using Open Client 12.5.1	Upgrade delivered 1/28/2005	n/a	TE delivery planned on or about 2/21/05/PSR Int. Rev. 3/07/2005	Carol Lindsey/Milton Stevens	CCR 05-0046 approved installation in EDF, VATC and PVC on 2/10/2005. No major problems have been reported since SQS was installed in the VATC. On 2/10/05 SQS was installed in the PVC and the EDF on 02/11/05.
DDTS Migration	on CM Server	on External Server	CM Server planned to be removed.	40189	4/9/2004	n/a	n/a	n/a	Jai Howard	07/21/2004: Resolved outstanding issue. Installation instructions being finalized.
Autosys	3.5	4.5 (Sun)/3.5.1(Client)/Sybase 12.5.2	Current 3.4 version requires Sybase ASE 12.0, which reaches EOS 12/31/2004	None	11/1/2004	4/5/2005	4/18/2005	5/2/2005	Carol Lindsey	2/09/2005: Testing is being planned by Development.
IRIX	6.5.22	6.5.26	End of guaranteed support for Bug fixes	None	12/10/2004	TBD	TBD	TBD	Jason Wardenburg	IRIX 6.5.26 successfully installed on IDG Cell machines. Installation is in progress on Functionality Lab machines. Upgrades for StorNext and AMASS expected to be necessary for final delivery, but early delivery for GSFC SPG hosts still targeted for March.

**Table A-1. Weekly CUT Matrix Example (2 of 6)**

Product Name	B/Lver.	Upgrade Version	Upgrade Rationale	NCRs	Dev. Planning	Turnover to Test Date	Internal Review date	PSR Date	COTS POC	Status as of 02/16/05 (unless otherwise noted)
SGI MIPSpro Compilers/ProDev Workshop	7.3.1.3/2.9.2	7.4.2/2.9.4 & Patches 5673, 5600, 5700, 5075, 5329, 5377, 5731	EOL/Vendor Support	None	Refer to IRIX 6.5.26 schedule above	Refer to IRIX 6.5.26 schedule above	Refer to IRIX 6.5.26 schedule above	Refer to IRIX 6.5.26 schedule above	Natisha Greenway	2/09/2005: Compilers will be delivered bundled with the IRIX 6.5.26 delivery. Refer to schedule and status above.
AMASS	5.3.3	5.4.1	Address unresolved NCRs/Support for IRIX 6.5.26	37031 41262 41502	TBD	TBD	TBD	TBD	TBD	Upgrade to version 5.4.1 currently expected to support IRIX 6.5.26.
StorNext	2.3.2	2.5	Support for IRIX 6.5.26	None	TBD	TBD	TBD	TBD	TBD	Upgrade to version 2.5 currently expected to support IRIX 6.5.26.
Sun ONE Studio	6.2 IDE/Studio 7.0 compiler collection	Studio 9	EOL/Vendor Support	None	10/20/2004	3/11/2005	4/5/2005	5/10/2005	Natisha Greenway	1/26/2005: Awaiting developer assessment. Replanning schedule expected.
Brocade Fabric OS	2.60e	5.40.13.00 (12000) & 2.6.1b (2800)/ESM 93.25	EOL/Vendor Support	None	9/04 VATC/PVC Completed	To be completed with StorNext Migration at each site	To be completed with StorNext Migration at each site	To be completed with StorNext Migration at each site	Bob Byrnes	01/12/2005: VATC/PVC upgrades completed with StorNext Upgrade. Other upgrades will occur as each site migrates to StorNext.

**Table A-1. Weekly CUT Matrix Example (3 of 6)**

Product Name	B/Lver.	Upgrade Version	Upgrade Rationale	NCRs	Dev. Planning	Turnover to Test Date	Internal Review date	PSR Date	COTS POC	Status as of 02/16/05 (unless otherwise noted)
Portus & named	5.09 8.x	5.1.5 9.2.3	Vendor EOS on 12/31/2004	None	12/20/2004	2/3/2005	3/7/2005	3/21/2005	Henry Baez	PVC upgrade of Portus completed. Testing is in progress and no problems have occurred. Installation of bind planned for this week.
Permeo SDK	1.4	1.4.2	NCR	38483 40397	n/a	n/a	n/a	Upgrade delivered with Custom Code delivery 7.03	Pennghai Wang	Delivery completed with Custom Code release 7.03.
Windows	2000 SP4	XP SP1	EOL for Windows 2000 is 3/05	None	8/26/2004	3/21/2005	4/8/2005	4/20/2005	TBD	1/26/2005: Prototype completed successfully under task 101. Upgrade of other EDF/VATC/PVC/DAAC hosts has been proposed under Task 109.
Symantec Antivirus	N/A	9.0	Security issues	None	TBD	TBD	TBD	TBD	Infrastructure	Version 9.0 is in-house. This is the latest version and supports both Windows 2000 and XP.
Linux Security Patch Upgrades	Current patch level	Linux security patch upgrade	Security	None	TBD	TBD	TBD	TBD	Byron Peters	11/10/2004: A security patch upgrade is planned for the Modis Direct Broadcast PC and Security Workstation PCs.
PERL	5.6.1	5.8.5	NCR	41031	TBD	TBD	TBD	TBD	Danny Huang	Delivery for IRIX and Solaris planned in addition to delivery for Linux for Synergy V.
<b>Synergy COTS Software Upgrades</b>										
Apache 1.3.29 for Linux	n/a	New platform	Needed for Synergy V	None	12/19/2004	2/16/2005	3/25/2005	4/7/2005	Danny Huang	CCR submitted for PVC installation.

**Table A-1. Weekly CUT Matrix Example (4 of 6)**

Product Name	B/Lver.	Upgrade Version	Upgrade Rationale	NCRs	Dev. Planning	Turnover to Test Date	Internal Review date	PSR Date	COTS POC	Status as of 02/16/05 (unless otherwise noted)
IONIC Image Archive Server for DOWS	n/a	New platform	Needed for Synergy V	None	2/18/2005	4/14/2005	4/27/2005	5/11/2005		Testing is continuing in Functionality Lab.
PERL for Linux	5.6.1	5.8.5/ New Platform	NCR	41031	10/21/2004	1/17/2005	3/15/2005	3/29/2005	Danny Huang	Installed on PVC machine for HEG.
Jzkit	n/a	New platform	Needed for Synergy V Linux host	None	12/19/2004	4/14/2005	4/27/2005	5/11/2005	TBD	Awaiting the availability of DOWS machine in PVC.
JDOM/Xerces	1.0beta 8/2.01	1.0/2.6.2	Needed for Synergy V	None	11/29/2005	1/14/2005	3/8/2005	3/12/2005	TBD	01/12/2005: Upgrade of JDOM identified as needed for Synergy V.
J2SDK	1.4.1	1.4.7	Needed for Synergy V/For consistency will be upgraded for all of EMD	None	11/29/2005	1/17/2005	3/8/2005	3/22/2005	TBD	Installed on HEG machine in PVC.
TCL/tk for Linux	8.3.3	TBD	Needed for Synergy V	None	11/5/2004	1/17/2004	3/8/2005	3/22/2005	TBD	Version bundled with Red Hat Linux 3.0 did not perform as needed. Investigating other versions.
Java Web Services Developer Pack	n/a	1.4	Needed for Synergy V	None	2/9/2005	2/14/2004	3/8/2005	3/22/2005	TBD	Planning in progress.
<b>Possible Future Task 101 COTS Software Upgrades</b>										
Security Workstations	N/A	Linux	Delivery of Security Workstations	None	N/A	N/A	N/A	N/A	Byron Peters	CCR 03-0093 approved to deliver hardware pre-installed with Linux

**Table A-1. Weekly CUT Matrix Example (5 of 6)**

Product Name	B/Lver.	Upgrade Version	Upgrade Rationale	NCRs	Dev. Planning	Turnover to Test Date	Internal Review date	PSR Date	COTS POC	Status as of 02/16/05 (unless otherwise noted)
Netscape Browser	7.0	Mozilla 1.7	Issues of long term support & industry migration to Mozilla	None	TBD	TBD	TBD	TBD	TBD	7/21//04: Migration from Netscape to Mozilla planned. Longevity of Netscape as an actively supported product is questionable.
Rimage Producer Suite	6.0.35.1	6.5.x	NCR/ No bug fix support	40427 (OPS-PDS)	TBD	TBD	TBD	TBD	Ann Al-Jazrawi	NCR 40427 is currently an OPS_SEP NCR. Under analysis.
Tripwire	1.3.1 (Sun)/1.30 (SGI)	TBD	No continuing development or support	None	TBD	TBD	TBD	TBD	Byron Peters	10/13/2004: No upgrades are planned for this product.
IDL	5.5	6.0 & 2 patches	Version 5.5 is at end of bug fix support	None	TBD	TBD	TBD	TBD	Alex Schuster	3/17/2004: Two patches have been announced by vendor for version 6.0. One is for all versions the other for UNIX only.
Sybase Replication Server	12.5 EBF 10493	12.5 EBF 11480	EBF has fixes that will mitigate potential risk	None	TBD	TBD	TBD	TBD	Carol Lindsey	10/01/2003: DDM has reviewed EBF 11480 and identified that the EBF includes fixes that would include significant fixes to the EMD Rep. Server implementation.
Builder Xcessory/Epak	5.0.8/3.0.4	6.1.1/3.06	End of Support	None	TBD	TBD	TBD	TBD	Alex Schuster	4/07/2004: If Xview is used with BXPro/Epak, additional time will be needed to use native Motif. Confirmed that Xview is not used in EMD.

**Table A-1. Weekly CUT Matrix Example (6 of 6)**

Product Name	B/Lver.	Upgrade Version	Upgrade Rationale	NCRs	Dev. Planning	Turnover to Test Date	Internal Review date	PSR Date	COTS POC	Status as of 02/16/05 (unless otherwise noted)
Linux	7.x	Commercial Version	Red Hat is dropping support of freeware versions. Support for 7.3 will end 12/31/2003.	None	TBD	TBD	TBD	TBD	TBD	Upgrade to Red Hat Enterprise version 3.0 proposed as part of task 109.

## Appendix B. COTS Compatibility Matrix

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Table B-1 is a sample extract<sup>2</sup> from the COTS Compatibility Matrix that tracks COTS product version availability, end of life/end of support (EOL/EOS) status and other compatibility issues for all ECS COTS products and freeware. The end of life/end of support date provided is the earliest date that some support levels may be impacted for the product version. This may be end of life or end of support. Products with an EOL/EOS date of 12/12/2012 are products whose EOL/EOL dates are not known. It should be noted that most EOL/EOS dates are estimated from most recent releases and the vendor's published End of Life or Obsolescence Policy.

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<sup>2</sup> The COTS Software Compatibility Matrix is maintained in Microsoft Access. A Microsoft Excel extract was made from the database and imported into Word so that the Report could be electronically inserted into this document.

**Table B-1. Future Software Upgrades Availability**

<b>Current Product</b>	<b>Version</b>	<b>Depl.</b>	<b>Type</b>	<b>Future Product</b>	<b>Version</b>	<b>Est. Availability</b>
Acrobat Reader for PC	5.0.5	OPS	Freeware	Acrobat Reader for PC	5.0.5	Current
				Acrobat Reader for PC	5.1	Current
				Acrobat Reader for PC	6.0.2	Current
				Acrobat Reader for PC	7	Current
Acrobat Reader for SGI	4.05	OPS	Freeware	Acrobat Reader for SGI	4.05	Current
				Acrobat Reader for SGI	5.0.5 or higher	IRIX not listed
Acrobat Reader for Solaris	4.05	OPS	Freeware	Acrobat Reader for Solaris	4.05	Current
				Acrobat Reader for Solaris	5.1	Current
				Acrobat Reader for Solaris	6	TBD
				Acrobat Reader for Solaris	7	TBD
ACSLs	7.1	OPS	COTS	ACSLs	7.1	Current
				ACSLs	8	02/22/2005
				ACSLs	8.1	08/01/2005
AMASS	5.3.3	OPS	COTS	AMASS	5.3.3	Current
				AMASS	5.4	Current
				AMASS	5.4.1	05/01/2005
				AMASS	5.5	12/01/2005
Anlpassword	3	OPS	Freeware	Anlpassword	3	Current
Apache Web Server	1.3.29	OPS	Freeware	Apache Web Server	1.3.29	Current
				Apache Web Server	1.3.33	Current
				Apache Web Server	2.0.50	Current
				Apache Web Server	2.0.53	Current
AutoSys Remote Agent for SGI	3.5	OPS	COTS	AutoSys Remote Agent for SGI	3.5	Current
				AutoSys Remote Agent for SGI	3.5.1	Current
				AutoSys Remote Agent for SGI	4	3.5 only for SGI Client
				AutoSys Remote Agent for SGI	4.5	3.5 only for SGI Client
				AutoSys Remote Agent for SGI	5	No Announced Availability Date

AutoSys Remote Agent for Sun	3.5	OPS	COTS			
				AutoSys Remote Agent for Sun	3.5	Current
				AutoSys Remote Agent for Sun	4	Current
				AutoSys Remote Agent for Sun	4.5	Current
				AutoSys Remote Agent for Sun	5	No Announced Availability Date
AutoSys Server	3.5	OPS	COTS			
				AutoSys Server	3.5 SP03	Current
				AutoSys Server	3.5 with patches for ASE 12.0	Current
				AutoSys Server	4	Current
				AutoSys Server	4.5	Current
				AutoSys Server	5	No Announced Availability Date
AutoSys Xpert	3.5	OPS	COTS			
				AutoSys Xpert	3.5	Current
				AutoSys Xpert	4	Current
				AutoSys Xpert	4.5	Current
				AutoSys Xpert	5	No Announced Availability Date
ClearCase for Solaris	2002.06	OPS	COTS			
				ClearCase for SGI	2003.06	Current
				ClearCase for Solaris	2003.06	Current
				ClearCase for Solaris	7	6/2005
				ClearCase for Solaris	8	6/2006
Crack	5.0a	OPS	Freeware			
				Crack	5.0a	Current
DDTS	4.7	OPS	COTS			
				DDTS	4.7	Current
				DDTS	4.8	Current
				DDTS	4.9	TBD
FIND_DDOS	4.2	OPS	Freeware			
				FIND_DDOS	4.2	Current
FLEXnet Publisher for Solaris	8.0d	OPS	COTS			
				FLEXnet Publisher for Solaris	8.0d	Current
				FLEXnet Publisher for Solaris	9.2	Current
Forcheck	12.84	OPS	COTS			
				Forcheck	13.3.11	Current
				Forcheck	13.3.20	Current

Forte Compilers	6.2	OPS	COTS	Sun ONE Studio 7 Enterprise Edition	7	Current
				Sun ONE Studio 8	8	Current
FTPBeans	2.01	OPS	COTS	FTPBeans	2.01	Current
Ghostscript	6.5.2	OPS	Freeware	Ghostscript	6.52	Current
				Ghostscript	8.01	Current
GhostView	1.5	OPS	Freeware	GhostView	1.5	Current
IBM AIX for Firewall	5.1 ML04	OPS	COTS	IBM AIX for Firewall	5.1 ML4	Current
				IBM AIX for Firewall	5.2	Current
				IBM AIX for Firewall	5.3	Current
IDL for SGI	5.5	OPS	COTS	IDL for UNIX	5.5	Current
				IDL for UNIX	6.0.3	Current
				IDL for UNIX	6.1	Near Beta (est.)
Interdrive (Rhumba)	7.1	OPS	COTS	Interdrive	7.1	Current
				Interdrive	7.2	TBD
Ionic	4.13b	OPS	Freeware	a2ps	4.13b	Current
				a2ps	None announced	TBD
JAF for SGI	1.0.1	OPS	Freeware	JAF for SGI	1.0.1	Current
JAF for Sun	1.0.1	OPS	Freeware	JAF for Solaris	1.0.1	Current
				JAF for Solaris	1.0.2	Current
JavaMail API for SGI	1.2	OPS	Freeware	JavaMail for SGI	1.2	Current
				JavaMail for SGI	1.3.1	Current
JavaMail API for Solaris	1.2	OPS	Freeware	JavaMail for Solaris	1.2	Current
				JavaMail for Solaris	1.3.1	Current
				JavaMail for Solaris	1.3.2	Early Access
JAXP for SGI	1.0.1	OPS	Freeware	JAXP for SGI	1.0.1	Current
				JAXP for SGI	1.1	Current
JAXP for Solaris	1.0.1	OPS	Freeware	JAXP for Solaris	1.0.1	Current
				JAXP for Solaris (Java Web Services Developer Pack)	JAXP 1.2.6 in Java WSDP 1.4	Current
jConnect	5.5 EBF10349	OPS	Freeware	jConnect	5.5 EBF10349	Current
				jConnect	6	Current
JDBC API	2	OPS	Freeware	JDBC API for Solaris	2	Current
				JDBC API for Solaris	3	Current

JDOM for SGI	1.0beta8	OPS	Freeware	JDOM for SGI	1	Current
				JDOM for SGI	1.0beta10	Current
				JDOM for SGI	1.0beta8	Current
				JDOM for SGI	1.0beta9	Current
JDOM for Solaris	1.0beta8	OPS	Freeware	JDOM for Solaris	1	In Dev.
				JDOM for Solaris	1.0beta10	Current
				JDOM for Solaris	1.0beta8	Current
				JDOM for Solaris	1.0beta9	Current
JetDirect for Sun	E.10.18	OPS	Freeware	JetDirect for Solaris	E.10.18	Current
				JetDirect for Solaris	E.10.34	Current
JNI C Controller for Fiber Channel Host Bus Adapter	4	OPS	COTS	JNI C Controller for Fiber Channel (FCE-6410)	4	Current
				JNI C Controller for Fiber Channel (FCE-6410)	4.1.6	Current
				JRE & JDK for IRIX	1.4.1	OPS
JRE & JDK for Linux	1.4.2	OPS	Freeware	JRE & Java SDK for Linux	1.4.2	Current
				JRE & JDK for Solaris	1.4.1_01	OPS
Legato Networker Client for PC	6.1.2	OPS	COTS	JRE & Java SDK for Solaris	1.4.2	Current
				JRE & Java SDK for Solaris	1.5	Current
				Legato Networker Client for PC	7.1.2	Current
				Legato Networker Client for Linux	7.1.2	Current
				Legato Networker Client for PC	7.2	Current

Legato Networker Client for UNIX	6.0.2	OPS	COTS			
				Legato Networker Client for UNIX	7.1.2	Current
				Legato Networker Client for UNIX	7.2	Current
				Legato Networker Client for UNIX	7.2.x	TBD
Legato Networker Server for UNIX	6.0.2	OPS	COTS			
				Legato Networker Server for UNIX	7.1.2	Current
				Legato Networker Server for UNIX	7.2	Current
				Legato Networker Server for UNIX	7.2.x	TBD
Linux for Intel Science Processor	7.3	OPS	COTS			
				Linux (Red Hat Enterprise (AS/ES/WS))	3	Current
				Linux for MODIS Direct Broadcast	7.3	Current
Linux for Security Workstations	7.1.3	OPS	COTS			
				Linux (Red Hat Enterprise (AS/ES/WS))	3	Current
				Linux for Security Workstations	7.1.3	Current
				Linux for Security Workstations	7.3	Current
mkisofs	2.00.3	OPS	Freeware			
				mkisofs	2.00.3	Current
Movemail	n/a	OPS	COTS			
				POP3/IMAP	TBD	Current
NCDware	5.1.140	OPS	COTS			
				NCDWare	5.1.140	Current
				NCD software for new HW	New HW/SW	Current
Netscape Communicator for Solaris	7	OPS	COTS			
				Netscape Communicator (Mozilla) for Solaris	1.4	Current
				Netscape Communicator for Solaris	7	Current

Netscape for SGI (Mozilla)	1.1	OPS	COTS			
				Netscape Communicator (Mozilla) for IRIX	1.1	Current
				Netscape Communicator (Mozilla) for IRIX	1.6	Current
				Netscape Communicator (Mozilla) from mozilla.org	1.7.2	Current
Oracle 8i Enterprise	8.1.6	OPS	COTS			
				Oracle Server 8i	8.1.6	Current
				Oracle Server 8i	8.1.7.2 (release 3)	Current
				Oracle Server 8i	8.1.7.3	No release for SGI
				Oracle Server 8i	8.1.7.4	Release for Sun/SGI TBD
				Oracle Server 9i	9.2.0.x (v6)	Current
PERL Chart::PNGgraph	1.11	OPS	Freeware			
				PERL Chart::PNGgraph	1.11	Current
				PERL Chart::PNGgraph	1.21	Current
PERL Compress::Zlib	1.1.3	OPS	Freeware			
				PERL Compress::Zlib	1.1.3	Current
				PERL Compress::Zlib	1.33	Current
PERL Convert BinHex	1.119	OPS	Freeware			
				PERL Convert::BinHex	1.119	Current
PERL Crypt::Cracklib	0.01	OPS	Freeware			
				PERL Crypt::Cracklib	0.01	Current
PERL DBD- Sybase	0.91	OPS	Freeware			
				PERL DBD::Sybase	0.91	Current
				PERL DBD::Sybase	1.04	Current
PERL DBI	1.19	OPS	Freeware			
				PERL DBI	1.19	Current
				PERL DBI	1.45	Current
PERL for Rimage PC (Active PERL)	5.6.1	OPS	Freeware			
				PERL for Rimage QA PC (Active PERL)	5.6.1	Current
				PERL for Rimage QA PC (Active PERL)	5.8.4 Build810	Current

PERL for UNIX	5.6.1	OPS	Freeware			
				PERL for UNIX	5.6.1	Current
				PERL for UNIX	5.8.5	Current
PERL GD	1.33	OPS	Freeware			
				PERL GD	1.33	Current
				PERL GD	2.16	Current
				PERL gd	1.8.4	Current
PERL Hex-edit	1.2.2	OPS	Freeware			
				PERL Hex-edit	1.2.2	Current
PERL jpegsrc	v6b	OPS	Freeware			
				PERL jpegsrc	v6b	Current
PERL libpng	1.0.12	OPS	Freeware			
				PERL libpng	1.0.12	Current
				PERL libpng	1.2.6	Current
PERL MIME-Base64	2.11	OPS	Freeware			
				PERL MIME::Base64	2.11	Current
				PERL MIME::Base64	3.01	Current
PERL SendMail	2	OPS	Freeware			
				PERL SendMail (Mail::Box)	2	Current
				PERL SendMail (Mail::Box)	2.056	Current
PERL String::Approx	1.19	OPS	Freeware			
				PERL String::Approx	1.19	Current
				PERL String::Approx	3.23	Current
PERL TclTk	b2	OPS	Freeware			
				PERL TclTk	0.75	Current
				PERL TclTk	b2	Current
PERL Time::Hires	1.43	OPS	Freeware			
				PERL Time-Hires	1.43	Current
				PERL Time-Hires	1.59	Current
Permeo Enterprise Server	4	OPS	COTS			
				Permeo Application Security Platform	4.2	Current
				Permeo Application Security Platform	5	Current
				Permeo Application Security Platform	5.1	Current
Portus	5.09	OPS	COTS			
				Portus	5.09	Current
				Portus	5.1.5	Current
				Portus	5.2	1/01/2005
				Portus	5.3	1/01/2006

PurifyPlus for SGI	2003.06.00	OPS	COTS			
				PurifyPlus for SGI	2003.06.00	Current
				PurifyPlus for SGI	2003.06.13	Current
PurifyPlus for Solaris	2003.06.00	OPS	COTS			
				PurifyPlus for Solaris	2003.06.00	Current
				PurifyPlus for Solaris	2003a.06	Current
				PurifyPlus for Solaris	2003a.06.13	Current
PuTTY	.053b	OPS	COTS			
				PuTTY	0.53b	Current
				PuTTY	0.54	Current
QFS	3.5.0-64A	OPS	COTS			
				QFS	3.5.0-64A	Current
				QFS	4	Current
RDAC (Redundant Disk Array Controller)	08.30.02.00	OPS	COTS			
				RDAC (Redundant Disk Array Controller)	08.30.02.00	Current
				RDAC (Redundant Disk Array Controller)	08.41.02.00	Current
Remedy ARS Admin	5.01.02	OPS	COTS			
				Remedy ARS Admin	5.01.02	Current
				Remedy ARS Admin	6.03.00	Current
Remedy ARS E- mail Engine	5.01.02	OPS	COTS			
				Remedy ARS E-Mail Engine	5.01.02	Current
Remedy ARS Server	5.01.02	OPS	COTS			
				Remedy ARS Server	5.01.02	Current
Remedy Mid- Tier	5.01.02	OPS	COTS			
				Remedy ARS Mid-Tier	5.01.02	Current
				Remedy ARS Mid-Tier	6.03.00	Current
Rimage Producer Suite	6.0.35.1	OPS	COTS			
				Rimage Producer Suite	6.0.35.1	Current
				Rimage Producer Suite	6.5.6	Current
Rimage Producer Suite SDK	6.0.35.1	OPS	COTS			
				Rimage Data Producer SDK	6.0.15.0	Current
				Rimage Data Producer SDK	6.2	Current
SANergy for Linux PC	3.2.0.27	OPS	COTS			
				SANergy for Linux	3.2.0.27	Current

SANergy for SGI	3.2.1.6	OPS	COTS			
				SANergy for SGI	3.2.1.49	Current
				SANergy for SGI	3.2.3.8	Current
SANergy for Sun	3.2.1.8	OPS	COTS			
				SANergy for Sun	3.2.1.49	Current
				SANergy for Sun	3.2.3.8	Current
SANtricity for UNIX	8.30.G2.01	OPS	COTS			
				SANtricity Storage Manager for UNIX	8.30.G2.01	Current
SGI BDSpro	2.3	OPS	COTS			
				SGI BDSpro	2.3	Current
				SGI BDSpro	2.4	Current
				SGI BDSpro	2.5	No announced availability date
SGI C Compiler	7.3.1.3m	OPS	COTS			
				SGI MIPSpro C Compiler	7.3.1.3m	Current
				SGI MIPSpro C Compiler	7.4	Current
				SGI MIPSpro C Compiler	7.4.2	Current
SGI C++ Compiler	7.3.1.3m	OPS	COTS			
				SGI MIPSpro C++ Compiler	7.3.1.3m	Current
				SGI MIPSpro C++ Compiler	7.4	Current
				SGI MIPSpro C++ Compiler	7.4.2	Current
SGI Fortran 77 Compiler	7.3.1.3m	OPS	COTS			
				SGI MIPSpro Fortran 77 Compiler	7.3.1.3m	Current
				SGI MIPSpro Fortran 77 Compiler	7.4	Current
				SGI MIPSpro Fortran 77 Compiler	7.4.2	Current
SGI Fortran 90 Compiler	7.3.1.3m	OPS	COTS			
				SGI MIPSpro Fortran 90 Compiler	7.3.1.3m	Current
				SGI MIPSpro Fortran 90 Compiler	7.4	Current
				SGI MIPSpro Fortran 90 Compiler	7.4.2	Current

SGI IRISConsole	2	OPS	COTS			
				SGI IRISConsole	2	Current
SGI IRIX	6.5.22	OPS	COTS			
				SGI IRIX	6.5.22	Current
				SGI IRIX	6.5.23	Current
				SGI IRIX	6.5.24	Current
				SGI IRIX	6.5.25	Current
				SGI IRIX	6.5.26	11/5/2004
				SGI IRIX	6.5.27	Current
				SGI IRIX	6.5.28	5/5/2005
				SGI IRIX	6.5.29	8/5/2005
				SGI IRIX	6.5.30	11/5/2006
				SGI IRIX	6.5.31	2/5/2007
				SGI IRIX	6.5.32	5/5/2007
				SGI Altix	TBD	Current
SGI ProDev Workshop	2.9.2	OPS	COTS			
				SGI ProDev Workshop	2.9.2	Current
				SGI ProDev Workshop	2.9.4	Current
SGI SCSI RAID Driver	3.3	OPS	COTS			
				SGI SCSI & FC RAID Driver	3.3	Current
SGI TPSSM7 RAID Software	8.41	OPS	COTS			
				SGI TPSSM RAID Software	8.41	Current
SGI TSAPD (Tape Support Asynchronous Personality Daemon)	2.3	OPS	COTS			
				SGI TSAPD (Tape Support Asynchronous Personality Daemon)	2.3	Current
				SGI TSAPD (Tape Support Asynchronous Personality Daemon)	2.7	Current
Solaris	8	OPS	COTS			
				Solaris	10	2/2005
				Solaris	11	12/31/2007 est.
				Solaris	12	12/31/2009 est.
				Solaris	13	12/31/2011 est.
				Solaris	8	Current
				Solaris	9	Current

Solaris 8 Patch Upgrade	8 04/04	OPS	COTS	Solaris 8 Patches	04/04 Upgrade	Current
				Solaris 8 Patches	09/05 Upgrade	Current
Sony DTF-2	1.27	OPS	COTS	Sony DTF-2	1.27	Current
SQS (Spatial Query Server)	3.4.2.28	OPS	COTS	SQS (Spatial Query Server)	3.4.2.28	Current
ssh secure shell commercial (PC)	5.2	OPS	COTS	ssh secure shell commercial PC Client	5.2	Current
				ssh secure shell commercial PC Client	5.4	Current
ssh secure shell commercial client	3.3.0	OPS	COTS	ssh secure shell commercial client for UNIX	3.3.0	Current
				ssh secure shell commercial client for UNIX	5	Current
ssh secure shell commercial server	3.3.0	OPS	COTS	ssh secure shell commercial server for UNIX	3.3.0	Current
				ssh secure shell commercial server for UNIX	5	Current
StorNext File System	2.3.2 Build37	OPS	COTS	StorNext File System	2.3.2 Build37	Current
				StorNext File System	2.4.1	Current
				StorNext File System	2.5	3/05
				StorNext File System	2.5.x	11/05
Sun ONE Compilers	7	OPS	COTS	Sun ONE Studio 10	10	Current
				Sun ONE Studio 7 Enterprise Edition	7	Current
				Sun ONE Studio 9	9	Current
Sun ONE Web Server	6.0SP6	OPS	COTS	Sun ONE Web Server, Enterprise Edition	6.0 SP6	Current
				Sun ONE Web Server, Enterprise Edition	6.3	Current

Sybase ASE for SGI	12.5.2	OPS	COTS			
				Sybase ASE for SGI	12.5.2 EBF12063	Current
				Sybase ASE for SGI	12.5.3	Current
				Sybase ASE for SGI	15	6/2005
Sybase ASE for Sun	12.5.2	OPS	COTS			
				Sybase ASE for Sun	12.5.2 EBF11790	Current
				Sybase ASE for Sun	12.5.3	Current
				Sybase ASE for Sun	15	6/2005
Sybase ASE for Sun Autosys Server	12.0.0.8	OPS	COTS			
				Sybase ASE for Sun (for Autosys Server)	12.0.0.8	Current
Sybase ASE SQL Server Monitor for SGI	12.5.2	OPS	COTS			
				Sybase SQL Server Monitor for SGI	12.5.2 EBF12063	Current
				Sybase SQL Server Monitor for SGI	15	03/2004
Sybase ASE SQL Server Monitor for Sun	12.5.2	OPS	COTS			
				Sybase SQL Server Monitor for Sun	12.5.2 EBF11790	Current
				Sybase SQL Server Monitor for Sun	15	03/2004
Sybase ASE SQL Server Monitor for Sun Autosys Server	12.0.0.8	OPS	COTS			
				Sybase SQL Server Monitor for Sun Autosys Server	12.0.0.8	Current
Sybase Central Plug-in for ASE	12.5	OPS	COTS			
				Sybase Central ASE Plug-in for ASE	12.5	Current
				Sybase Central ASE Plug-in for ASE	12.5.1	Current

Sybase Central Plug-in for Rep. Server	12.5	OPS	COTS			
				Sybase Central ASE Plug-in for Rep Server	12.5	Current
				Sybase Central ASE Plug-in for Rep Server	12.5.1	Current
Sybase Central Viewer	3.2	OPS	COTS			
				Sybase Central Viewer	3.2	Current
				Sybase Central Viewer	4	Current
Sybase Replication Server/Manager	12.5 EBF10493	OPS	COTS			
				Sybase Replication Server/Manager	12.5 EBF10493	Current
				Sybase Replication Server/Manager	12.6	Current
Sybase SDK (OpenClient) for SGI	12.5.1	OPS	COTS			
				Sybase SDK (OC) for SGI	12.5	Current
				Sybase SDK (OC) for SGI	12.5.1 EBF12004	Current
				Sybase SDK (OC) for SGI	15	6/05
Sybase SDK (OpenClient) for Sun	12.5.1	OPS	COTS			
				Sybase SDK (OC) for Sun	12.5	Current
				Sybase SDK (OC) for Sun	12.5.1 EBF11980	Current
				Sybase SDK (OC) for Sun	15	6/05
Symantec Anti-virus SW for PC	8.1	OPS	COTS			
				Symantech Anti-virus SW for PC	8.1	Current
TCL/Tk	8.3.3	OPS	Freeware			
				TCL/tk	8.3.3	Current
				TCL/tk	8.4.7	Current
TCPWrappers	7.6	OPS	Freeware			
				TCP Wrappers	7.6	Current
Tomcat	4.1.24	OPS	Freeware			
				Tomcat	4.1.24	Current
				Tomcat	4.1.30	Current
				Tomcat	5.5	Current
Top	3.5beta12	OPS	Freeware			
				Top	3.5beta12	Current
				Top	3.5beta13	Current

Tripwire for SGI	1.3	OPS	Freeware			
				Tripwire for SGI	1.3.0	Current
				Tripwire (commercial)	4.1	Current
Tripwire for Solaris	1.3.1	OPS	Freeware			
				Tripwire for Solaris	1.3.1	Current
				Tripwire (commercial)	4.1	Current
Velocity	1.2	OPS	COTS			
				Velocity	1.2	Current
				Velocity	1.4	Current
Veritas Volume Manager	3.0.4	OPS	COTS			
				Veritas Volume Manager	3.0.4	Current
				Veritas Volume Manager	3.5	Current
				Veritas Volume Manager	4	Current
WebGLIS	3.2.1	OPS	Freeware			
				Webglis	3.2.1	Current
WhatsUp Gold	8	OPS	COTS			
				WhatsUp Gold	8	Current
				WhatsUp Gold	8.04 Hotfix1	Current
				WhatsUp Gold	9	6/2005
Windows	2000 SP4	OPS	COTS			
				Windows	2000 SP4	Current
				Windows Enterprise Server	2003	Current
				Windows Standard Server	2003	Current
				Windows Server	Longhorn	2006 (est.)
				Windows Server	R2 (code name)	6/01/2005 est.
				Windows XP Professional	XP	Current
WinZip	8.1	OPS	COTS			
				WinZip	8.1	Current
				WinZip	9.0 SR-1	Current
WU-FTPD	2.6.2	OPS	Freeware			
				WU-FTPD	2.6.2 NCR fixes	Current
Xerces	2.0.1	OPS	Freeware			
				Xerces	2.0.1	Current
				Xerces	2.6.2	Current

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