



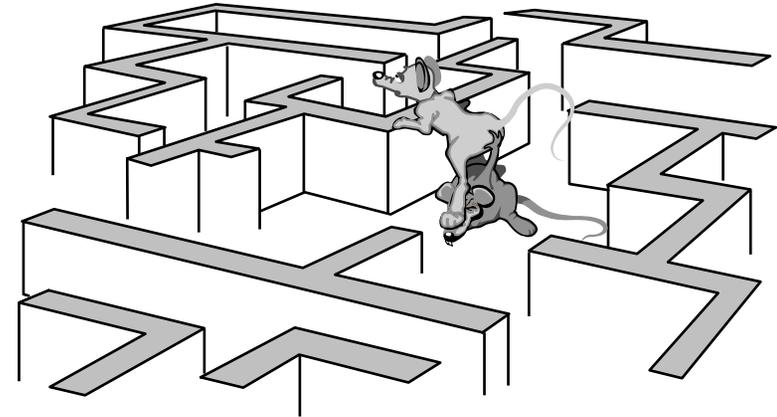
# Configuration Management

July 2006

# Overview of Lesson



- **Introduction**
- **Configuration Management Topics**
  - **EMD Configuration Management (CM) Activities**
  - **Configuration Control Boards (CCBs)**
  - **Configuration Change Requests (CCRs)**
  - **Software Baselines and Changes**
  - **Changes to Hardware Baselines**
  - **Changes to the Baseline**
- **Practical Exercise**



# Objectives



- **Overall: Proficiency in Configuration Management**
  - Describe the EMD CM activities
  - List Configuration Control Boards (CCBs), roles, and responsibilities
  - Process a Configuration Change Request (CCR)
  - Review Configuration Parameters in Configuration Registry
  - Access baseline information
  - Process a change to the inventory

# Importance



**Lesson provides preparation for several roles to ensure effective CM for implementation of system changes**

- **CM Administrators**
- **System Engineers, System Test Engineers, Maintenance Engineers**



# EMD CM Activities



- **Configuration Management team's primary responsibility is to provide and protect the integrity of the EMD baseline**
  - Also must ensure that baseline changes are made using formal processes
- **Objectives of EMD configuration control are to ensure:**
  - Changes are adequately defined, assessed for technical, cost, and schedule impacts by the EMD office(s), and formally considered by the appropriate CCB
  - Only approved changes are incorporated in the appropriate baseline in an orderly and systematic manner
  - Actions assigned by each CCB are monitored and brought to closure

# EMD CM Activities (Cont.)



- **DAAC Unique Extensions (DUEs)**
  - **SCDV CCB reviews the DUEs for potential impact to the EMD Configuration Baseline System and for potential inclusion in the EMD Baseline System**
  - **If warranted, the SCDV CCB authorizes inclusion in the EMD Configuration Baseline System**

# EMD CM Activities (Cont.)



- **Software Configuration Management (SCM)**
  - Uses the CCR process to release COTS and custom software to the sites
  - A custom software component can only change with the issuance of an NCR using the Distributed Defect Tracking System (DDTS™) tool
  - The base upon which the change is made is the custom code design baseline, which is maintained by the ClearCase™ software configuration management tool

# EMD CM Activities (Cont.)



- **Software Configuration Management Tools**
  - **Remedy™ Trouble Ticketing**
  - **Distributed Defect Tracking System (DDTS™)**
  - **Software Turnover Tracking System (STTS)**
  - **ClearCase™ Software Configuration Management System (ClearCase™)**
  - **ClearCase™ Baseline Manager (BLM)**
  - **EMD Change Manager (ECM)**
  - **Proposal Assessment Board (PAB) Database**
  - **Data Management Tool**
  - **ClearCase™ Delivery Tool**
  - **Engineering Software Delivery Daemon**
  - **Source Code Delivery Tool**
  - **Custom Code Installation Emulator**

# EMD CM Activities (Cont.)



- **EMD Baseline Information System (EBIS)**
  - Implemented with a physical web server internal at Landover and locally at the DAACS
  - **EBIS URLs are:**
    - <http://pete.hitc.com/baseline/> (Internal EBIS web server)
    - (External EBIS web servers)
      - LPDAAC <http://e0ins01.edcb.ecs.nasa.gov:10160/baseline/>
      - GES <http://g0ins01.gsfc.ecs.nasa.gov:10160/baseline/>
      - LaRC <http://l0ins01.larc.ecs.nasa.gov:10160/baseline/>
      - NSIDC <http://n0ins02u.ecs.nasa.gov:10160/baseline/>
      - SMC <http://m0mss04.ecs.nasa.gov:10160/baseline/>

# EMD CM Activities (Cont.)



- **Library Maintenance**
  - **EMD program uses two distinct libraries**
    - **Document Center (maintained by the Data Management group)**
    - **COTS Software Library (managed by the ClearCase™ Support Group)**

# EMD CM Activities (Cont.)



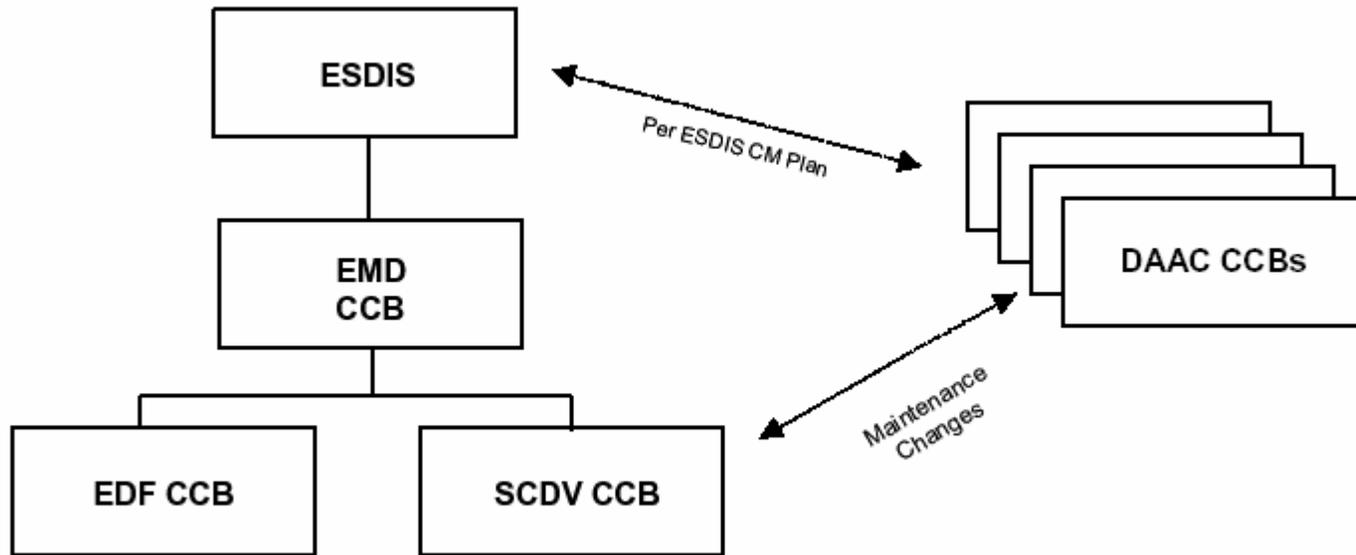
- **Configuration identification**
  - Maintenance and control of technical documentation
- **Configuration status accounting**
  - Recording and reporting information about the configuration status of system documentation, hardware, and software
  - BLM reports

# EMD CM Activities (Cont.)



- **Configuration audits**
  - **Physical Configuration Audits (PCAs)** are formal assessments of the actual configurations of all baselined EMD hosts
    - **Software PCAs** compare the COTS software, custom software, O/S patches, and UNIX® kernel parameters of the actual hosts to the EBIS design baseline
    - **Hardware PCAs** compare the physical hardware to the EBIS design baseline, and covers items such as memory, disks, and host configuration
  - **Functional Configuration Audits (FCAs)** are conducted to assure that each EMD product meets its specified performance requirements to the extent that can be determined by testing

# Configuration Control Boards



# Configuration Control Boards (Cont.)



- **ESDIS CCB**
  - Level 2 board responsible for interfacing with higher-level boards for changes that affect Level 1 requirements, controlling Level 2 requirements, approving specified documentation, and procurements
- **EMD CCB**
  - Responsible for establishing and managing the configured baselines at the project level
- **EDF (Infrastructure) CCB**
  - Responsible for establishing and managing development
- **Science and Development (SCDV) CCB**
  - Has the authority and responsibility for controlling system releases

# Configuration Change Requests (CCRs)



- **No undocumented changes**
  - all requests for change documented using CCR form
  - CCR generated against the baseline affected by the proposed change
  - Form can be completed electronically
    - Word processing form
    - Change Request Manager tool (CM Administrator)
- **CCB review**
  - CCR submitted to appropriate CCB

# Software Baselines and Changes



- **CSG ships the physical media, or delivers the files using the ClearCase™ Delivery Tool to the designated sites**
  - **Electronic delivery is performed via secure copy (scp) to target DAACs**
- **DAAC CCB approves the installation of the delivered software into a DAAC Operational Baseline (e.g., a mode, “OPS”, “TS1”, etc.)**
  - **Software is installed in accordance with CCR installation instructions, and in accordance with local DAAC procedures/processes**

# Configuration Parameters



- **Default settings may or may not be optimal for local operations**
- **Changing parameter settings**
  - **May require coordination among Configuration Management Administrator, Database Administrator, and Operations personnel**
  - **Some parameters accessible on GUIs**
  - **Some parameters changed by editing configuration files**
  - **Some parameters stored in databases**
- **Configuration Registry**
  - **Script loads values from configuration files**
  - **GUI for display and modification of parameters**
  - **Move (re-name) configuration files so system servers obtain needed parameters from Registry Server when starting**

# Configuration Registry



**Database Login**

User Id:

Password:

Server:

DB Name:

**ECS REGISTRY (1.0)**

File Utilities

Attribute Tree Name: TS2\_5B.01

- TS2\_5B.01
  - t1ins02
  - t1ins01
  - t1dms02
  - t1icg01
    - config
      - CFG
        - EcDsStIngestFtpServer
        - EcDsStStagingDiskServer
        - EcInAuto
        - EcInGran**
        - EcInGran0
        - EcInGran1
        - EcInInter
        - EcInPolling.ASTERDEM
        - EcInPolling.ASTER\_OSF
        - EcInPolling.DD1ST
        - EcInPolling.EDOS
        - EcInPolling.EMOS
        - EcInPolling.FDD
        - EcInPolling.IGSASA
        - EcInPolling.LaRC\_SAGE\_III\_MOC
        - EcInPolling.SAGE\_III\_SCF
        - EcInPolling.ias002
        - EcInReqMgr
  - t1acg01
  - t1acs02
  - t1acs03
  - t1ais01
  - t1ais03
  - t1dps01
  - t1dps04
  - t1drg01
  - t1mss06
  - t1mss07
  - t1pls01
  - t1pls02
  - t1sps02
  - t1wkg01
  - EcCsRegistry

Attribute Listing <75>

PseudoAttribute	One	Two	Three
Name	EcInGran		
ProgramID	5800000		
ApplicationID	5000000		
Site	vatc		
DeltaTime	3600		
MajorVersion	1		
MinorVersion	0		
Release	B		
SubSysName	INS		
AppLogSize	5000000		
AppLogLevel	0		
HostPolicy	multiple		
ServerDescription	This is ../subsys/ecs/server		
oid_EcInGranObj	80e4c765-7b28-1023-891b-0800e		
oid_EcAgManager_TS2	80e4c766-7b28-1023-891b-0800e		
ListenThreads	20		
Protocol	EMPTY		
KeyFile	CUSTOM/security/EcInGran.Keyf		
PrincipalName	EcInGran		
AcIPermission	x		
AcIDBTableName	IngestAcItable		
AcIName	InGranObj		
AppStrtNum	12345		
DBAcIKey	PfAcIKey		
DBLibrary	SYBASE_CT		
DBServer	t1mss07_srvr		
DBLoginName	acluser		

Attribute Information  
Mapped To Mode: TS2

# Configuration Registry (Cont.)

The screenshot shows a dialog box titled 'Attribute Information'. It is divided into two main sections: 'Attribute Information' on the left and 'Configured Values' on the right. In the 'Attribute Information' section, the 'Attribute Name' field contains 'ListenThreads'. Below it is a 'Description' text area. There are 'Update Attribute' and 'Delete Attribute' buttons. The 'Attribute Properties' section includes a dropdown for 'Attribute Data Type' set to 'String', and 'MIN: 0' and 'MAX: 0' input fields. An 'Update attribute properties' button is at the bottom of this section. The 'Configured Values' section has a list box containing the value '20'. Below the list box is a 'Change Comment' text area. At the bottom of this section are 'Update', 'Delete', 'Create', and 'Properties' buttons. At the very bottom of the dialog are 'Ok' and 'Exit' buttons.

# Hardware Baselines and Changes

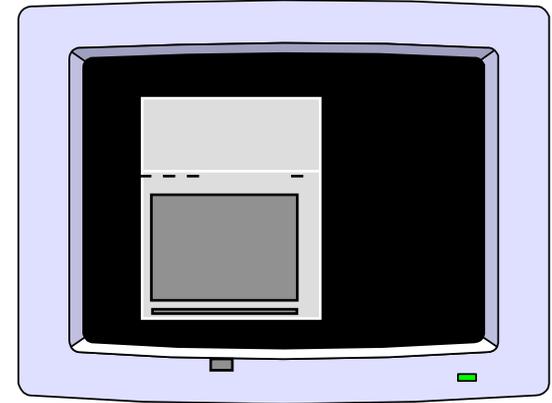


- **Change Scenarios**
  - COTS hardware problem repair that requires a CCR
  - System enhancement
- **Repair with part of same make, model, version does not require CCR**
- **Change in make, model, version of a part to be used for repair, e.g., in an emergency, necessitates CCR to document the change**
  - Review/approval by site CCB
  - EMD/ESDIS review for impacts/applicability to other sites
  - Provision of controlled document updates to Document Maintenance and entry into CM
  - CM system updates to reflect change
  - Audits (FCA/PCA)

# Changes to the Baseline



- **CM Tools for baseline changes**
  - **Baseline Manager (BLM): ClearCase**
  - **Inventory/Logistical Maintenance (ILM) Manager: Remedy**
- **Related tools**
  - **From Management Subfunction software**
    - **Trouble Ticket System (TTS)**
    - **Problem reporting and tracking**
    - **Used by users, operators, system administrators**



# Baseline Terms and Concepts



- ***Baseline Management*** is to identify and control baselined versions of hardware and software, and maintain a complete history of baseline changes
- ***Control Item*** is any EMD item under version control by CM
- ***Configuration Item (CI)*** is an aggregation of hardware, firmware, software, or any discrete component or portion, which satisfies an end user function and is designated for configuration control
- ***Baseline*** is a configuration identification document or set of such documents formally designated by the Government at a specific time in the life cycle of a CI
- ***Configured Article*** is a control item reportable as part of the Configured Articles List (CAL)

# Baseline Terms and Concepts (Cont.)



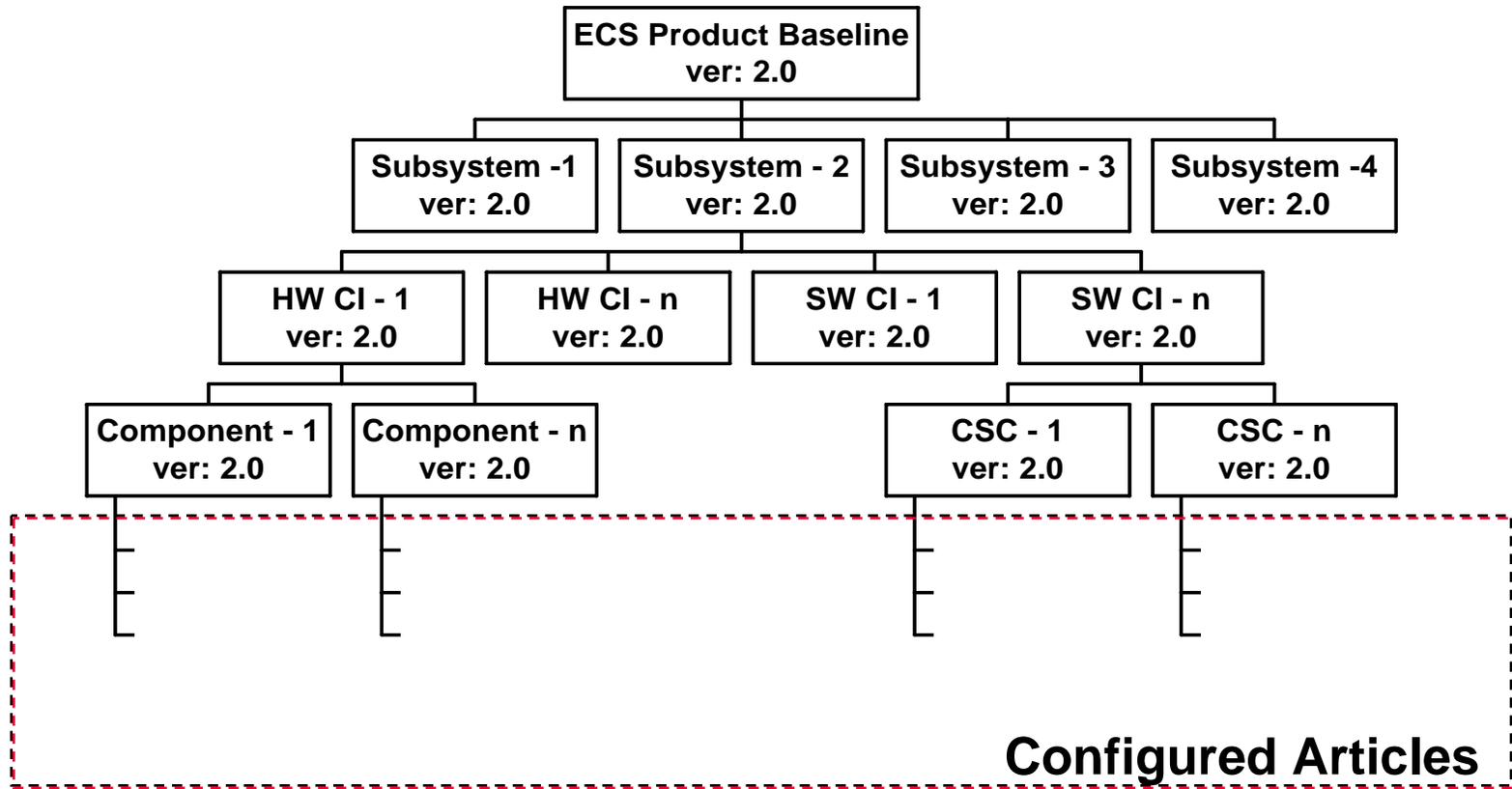
- **EMD Structure and Baseline Terms**
  - **Assembly:** an item made up of other items
    - **Parent:** a higher-level item (e.g., an assembly)
    - **Child:** an item that is a component of a higher-level item
  - **Bill of Material:** list of items that comprise an assembly
  - **Product Structure:** the parent-child pairings that define the bill of material for an assembly; each product structure record specifies the effective dates and quantities for a single component of a parent for each engineering change
  - **Active Date:** the date a component becomes effective in an assembly's bill of material
  - **Inactive Date:** the date a component is no longer effective in an assembly's bill of material

# Baseline Terms and Concepts (Cont.)

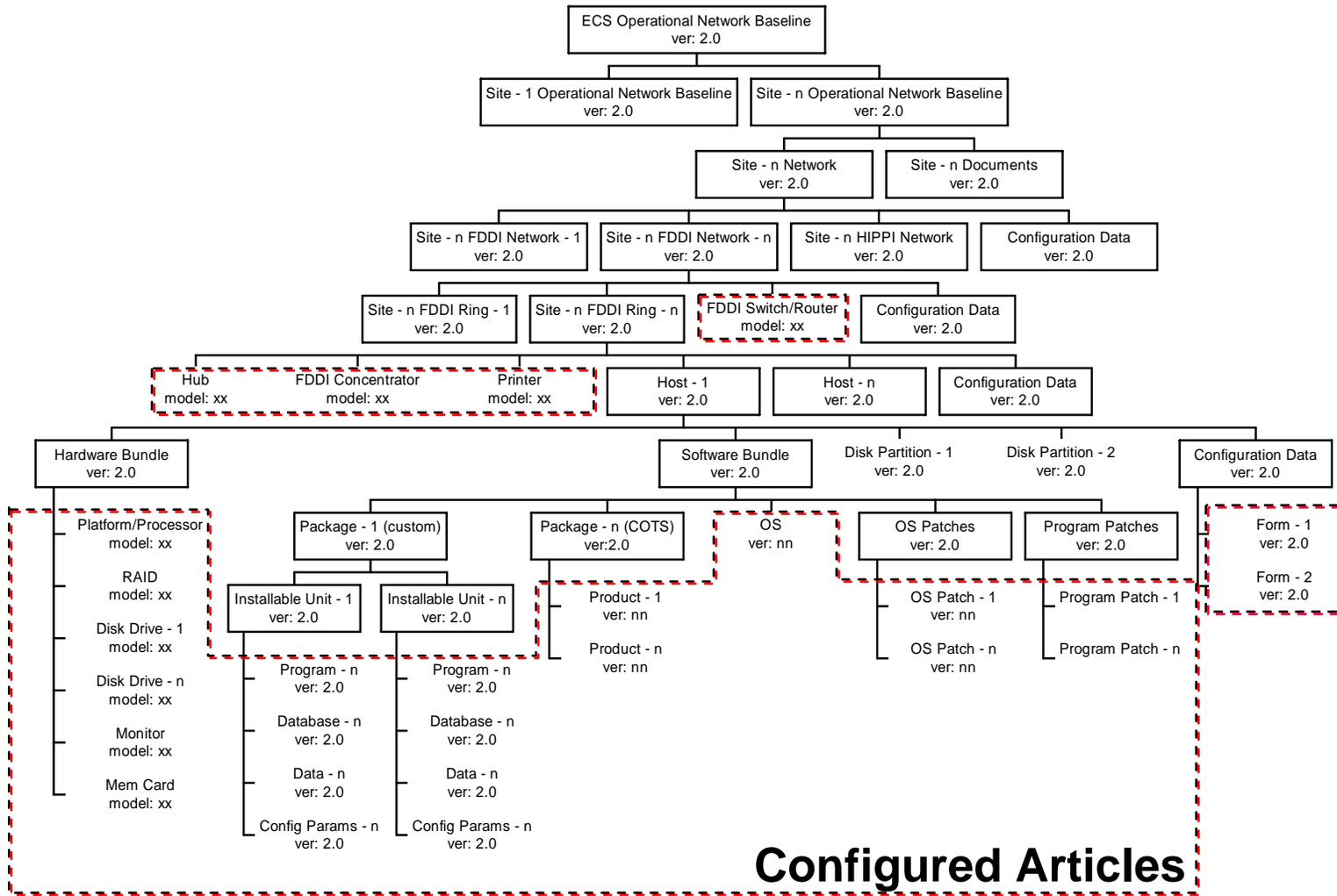


- **EMD Structure and Baseline Terms (Cont.)**
  - ***Engineering Change***: a mechanism for grouping, reporting, and controlling product changes collectively
  - ***Revision***: sequence number of a product structure change to an assembly; signifies a change to the configuration of an assembly that does not alter its form, fit, or function
  - ***Implementation Status***: a record describing the deployment of a control item to a site and the current state and associated date of its implementation; each control item has one record for each site to which it is deployed
  - ***Exporting Data***: creating a formatted file or records extracted from the BLM database; control item engineering change, product structure, and interdependency records may be extracted and sent to another BLM site via ftp
  - ***Importing Data***: loading BLM data from a formatted file

# Product Structure - Design View

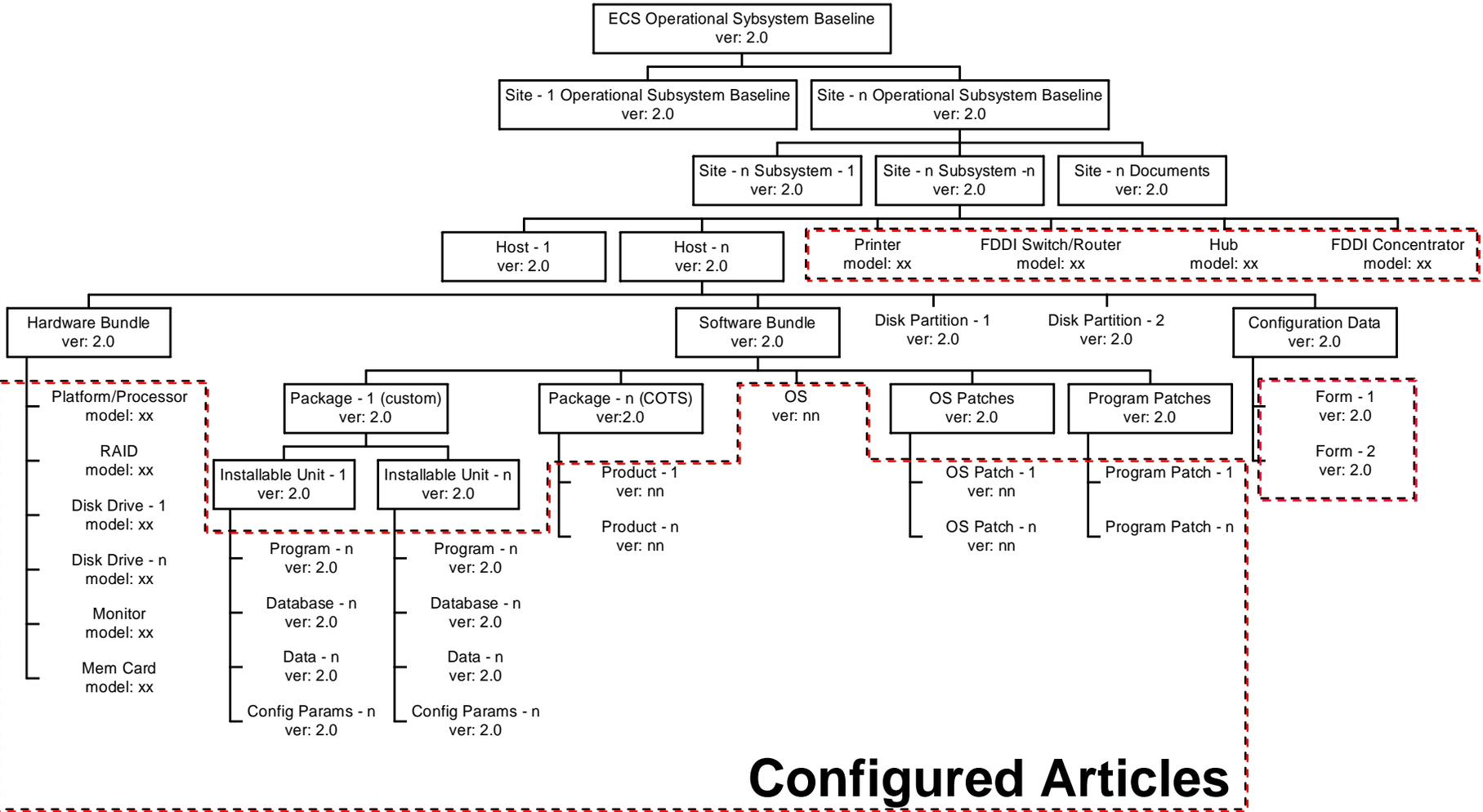


# Product Structure - Operational (Network) View



**Configured Articles**

# Product Structure - Operational (Subsystem) View



# Baseline and Inventory Management: Tools



- **Baseline Management (BLM): ClearCase**
  - Manages Baseline Records on software, scripts, GUIs
  - Maintained at ECS Development Facility (EDF)
  - Technical Document outputs posted to EMD Baseline Information System (EBIS) at <http://cmdm-ldo.raytheon.com/>
    - Including 910-series affecting all sites and 920-series site-specific documents
- **Inventory/Logistical Management (ILM): Remedy**
  - Used at EDF to maintain property, repair, and software license data
  - Used at sites to create Maintenance Work Orders (MWOs) and record equipment maintenance activity

# EMD Baseline Information System (EBIS)



The screenshot shows a Netscape browser window displaying the EMD Baseline Information System (EBIS) website. The browser's address bar shows the URL <http://cmdm-ldo.raytheon.com/baseline/>. The website has a navigation menu with buttons for [EBIS Home](#), [Tech Docs](#), [VDD](#), [Interrogation](#), [Custom SW](#), [COTS Rel](#), [COTS Inv](#), [Modes](#), and [SMC](#). The main heading is **EMD Baseline Information System**, with the Raytheon Systems logo in the top right corner. A **Tools** button is on the left, and **EDHS** and **NCR web** buttons are on the right. A blue banner displays the text "Number of hits on this site since 11/01/98: 35247". Below this is a **PLEASE NOTE:** section with a list of six items:

1. All of the embedded links have been updated to reference the new name, [cmdm-ldo.raytheon.com](http://cmdm-ldo.raytheon.com), for the external site.
2. All of the scripts that generate these pages have been updated.
3. "pdf" formats of the approved CCRs can be found from the "2005 CCRs" button below.
4. "html" formats of the approved CCRs can be found from the "2005 eCCRs (new)" button below.
5. There are no outstanding issues with email.
6. If there are any questions, please call me at (301) 925-1137.

Below the notes is an **EBIS Bulletin:** section with a list of three items:

1. New electronic CCRs are now available from the new ECM tool (2005 eCCRs button).
2. These pages are generated from a Microsoft Access application, and launch faster.
3. Over time, the Additional Sheet, Stakeholders page, and ECOs will be viewable.

The bottom of the page features three highlighted buttons with corresponding descriptions:

- Technical Documents**: EMD Baseline Technical Documentation
- 6A.08 Custom S/W**: Detail Information on Release 6A.08 Custom Code CCRs, Deliveries, and Installation Status
- Custom S/W Tracking**: Detail Information on Release 7: 7.00, 7.01, 7.02, and 7.03 Custom Code CCRs, Deliveries, and

The browser's status bar at the bottom indicates "Document: Done (1.527 secs)".

# EBIS List of Technical Documents

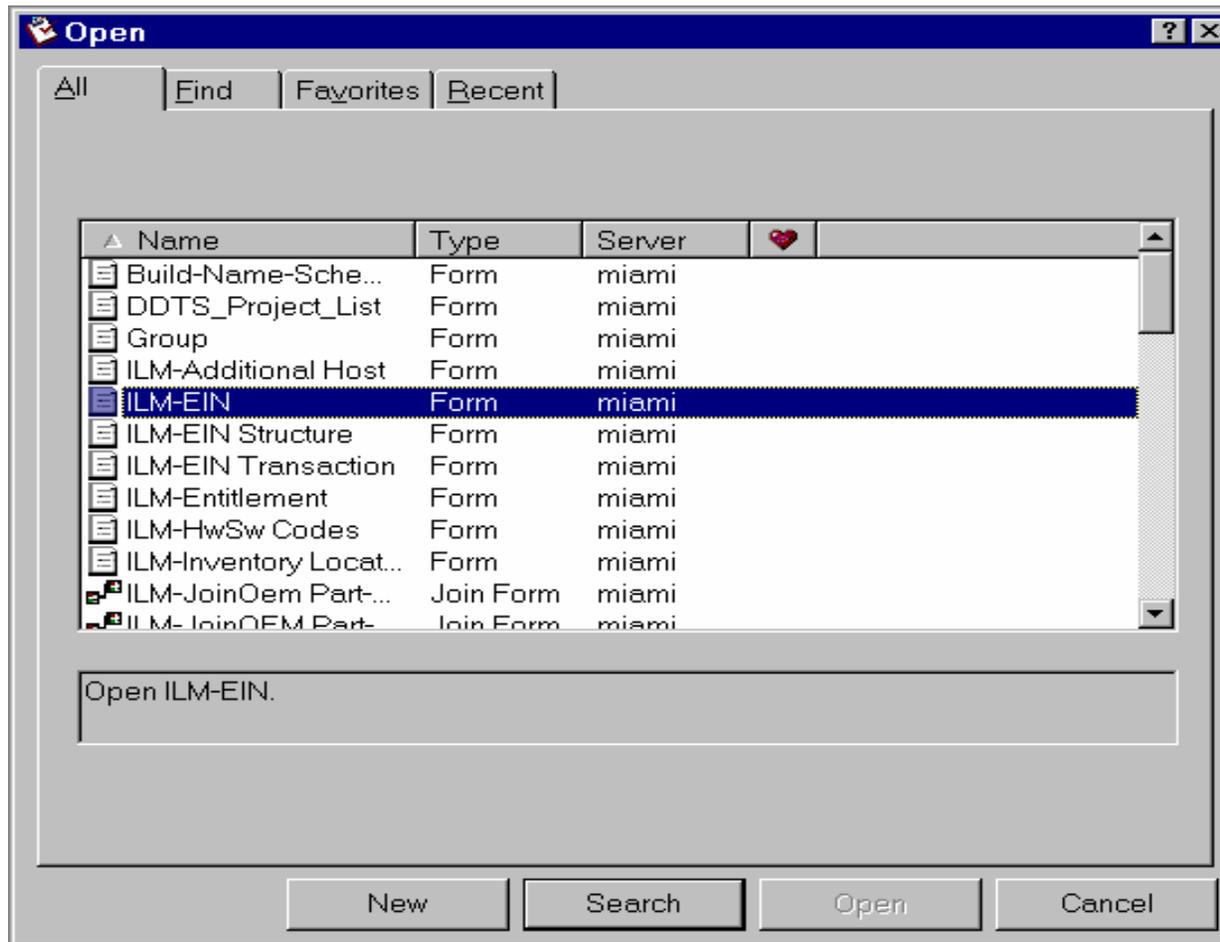


**Technical Documentation Notes:**

1. Documents highlighted in **PINK** are restricted documents. Users will not be able to access restricted documents from the **cmdm-ldo.raytheon.com** baseline mirror site. Contact CM for access to the restricted documents.
2. If you wish to print out this table listing all technical documents, you will need to set your web browser printer orientation to **Landscape**.
3. All **Official** documents have the new **9xx-TDX-xxx-Revxx** document numbers.
  - **9xx**: Document series number
  - **TDX**: TD=Technical Document, X=site identifier (A=Applicable to all sites, E=EDC, G=GSFC, L=L aRC, N=NSIDC, S=SMC, V=VATC, P=PVC)
  - **xxx**: Document ID within a document series.
  - **Revxx**: Revision number xx  
(example: 920-TDG-001-Rev01 is document 920 series for GSFC DAAC, document ID 001, revision 01)
4. Each document has a "Current" and "Previous" folder. Navigate up by clicking on "Parent directory".
5. Previous versions of documents reside in the "Previous" folder.

<b>905</b>	<b>ECS System</b>	
001	ECS System Baseline Specification	<a href="#">905-TDA-001-Rev02.doc</a>
002	ECS Host Naming Convention	<a href="#">905-TDA-002-Rev01.pdf</a>
<b>910</b>	<b>General Baseline</b>	
002	Software Port Mapping	<a href="#">910-TDA-002-Rev13.pdf</a>
003	COTS S/W VERSION B/L REPORT (ClearCase BLM)	<a href="#">910-TDA-003-Rev212.html</a>
005	SITE-HOST MAP REPORT (ClearCase BLM)	<a href="#">910-TDA-005-Rev165.html</a>
008	Baseline Install Matrix	<a href="#">910-TDA-008-Rev03.pdf</a>

# Remedy OPEN Dialog for ILM Access



# New ILM-EIN Entry Form



Remedy User - [ILM-EIN (New)]

File Edit View Tools Actions ILM Reports Window Help

New ILM-EIN Save

EIN  Parent EIN  ECS Name

**Part Information**

Serial No  Part No  Add New Part

Description

MFR  Hw-Sw Code  Mod\_Ver

Location & Purchasing Info | Maintenance & Other Info | Components | Maintenance Contract | History

Location  Building  Room  Item Status

Vendor ID  PO Number  Cost  Quantity

Receive Date  Installation Date  Audit Date  Exp

EMD MOD

ttran ilmserv

# ILM-OEM Parts Form



Remedy User - [ILM-OEM Parts (New)]

File Edit View Tools Actions Window Help

New ILM-OEM Parts Save

### OEM Part Information

Part No	<input type="text"/>				
MFR	<input type="text"/> ▼	Hw-Sw Code	<input type="text"/> ▼		
Description	<input type="text"/>				
Mod-Ver	<input type="text"/>				
Create Date	<input type="text"/> ...	Submitter	ttran	Last Modified By	<input type="text"/>

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# ILM-EIN Transaction Form



Remedy User - [ILM-EIN Transaction (New)]

File Edit View Tools Actions Window Help

Parent EIN  Effective Date 9/30/03 TransactionType

**Parent Information**

ECS Name  System Serial No

Part No  Description

MFR  Location  Building  Room

Install/Move/Ship/RTS Relocate Archive

Return (P)arent-(C)omponent  Ship (P)arent-(C)omponent

New ECS Name  New Location

New Building  New Room

Execute Transaction Select Components To Process

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# ILM-EIN Process Component Form



Remedy User - [ILM-Join-Process Component (Modify)]

File Edit View Tools Actions Window Help

Matching ILM-Join-Process Component 0:01

Parent EIN	Component EIN	Description	Serial No	Process	Active D...	Inactiv...
00011679	C0041911	SINGLE CHANNEL ULTRA	9191755100		9/11/	
00011679	C0041913	OPT INTERNAL 20GB 72	3ECOWW8A		9/11/	
00011679	C0041911	SINGLE CHANNEL ULTRA	9191755100		9/11/	
00011679	C0041913	OPT INTERNAL 20GB 72	3ECOWW8A		9/11/	
00011679	00003900	TAPE DRIVE - 14 GB -	803G2397		7/8/0	

Modify ILM-Join-Process Component 00000000074502|000000000025478 Save

Parent EIN  ECS Name

Component EIN  Process

**Component's Information**

Part No  Serial No

Description

MFR  Hw-Sw Code  Item Status

Location  Building  Room

Active Date  Inactive Date

Ready Number 1 of 9 ttran miami