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# MIDAS Overview

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# **(U) Agenda**

- **(U) History**
- **(U) Development Methodology**
- **(U) MIDAS Inc.**
- **(U) Applications**
- **(U) Future**
- **(U) Questions**

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## (U) What Is MIDAS

*M*ulti-User *I*nteractive *D*evelopment and *A*nalysis *S*oftware

- (U) A Portable, Networked, Interactive Environment for Software Signal Processing and Analysis Comprised of:
  - ◆ Suite of Primitive Modules
  - ◆ Mechanisms for Extending the Suite and Combining the Modules into Applications
  - ◆ High-Level Graphical User Interfaces
  - ◆ Real-Time Performance Capabilities that Can Be Migrated from Proof-of-Concept Prototypes to Operational Systems
  
- (U//~~FOUO~~) Developed by U.S. Intelligence Community

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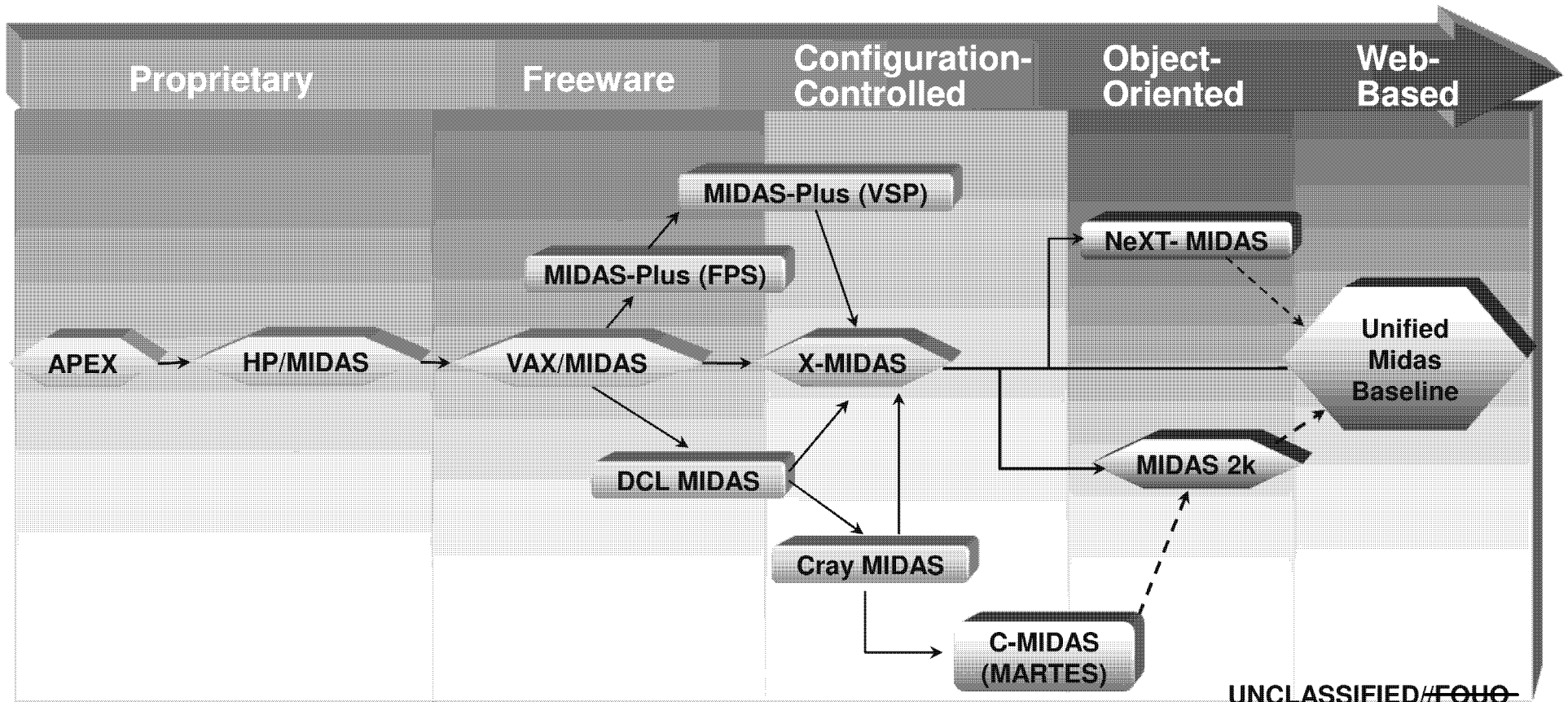
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# (U) MIDAS Evolution

1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2001 2002

HW-Based Processing with Custom HW  
Waterfall Developments, Long Lead Times  
(Years to Provide Functionality)

SW-Based Processing with Minimal COTS HW,  
Rapid Deployment of Functionality, Greatly  
Reduced Lead Times (Weeks, Months)



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# (U) Agenda

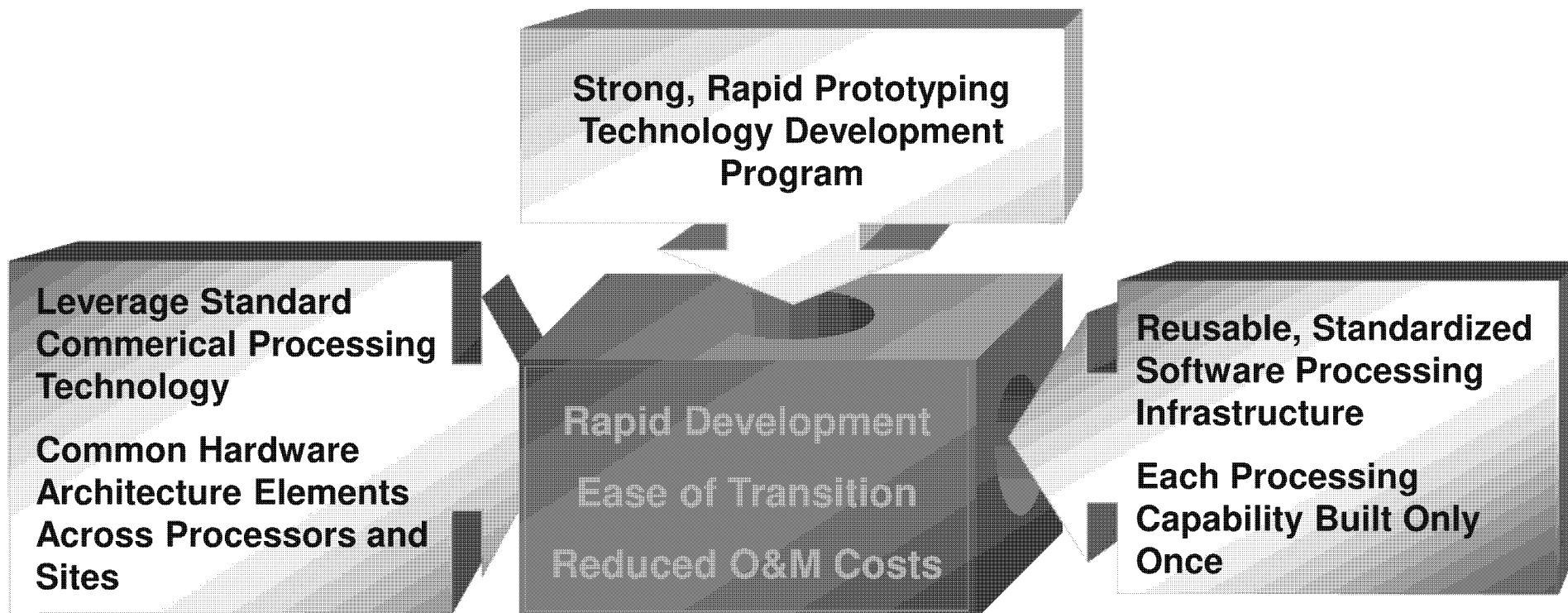
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# (U) Flexible Approach to Changing Requirements



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# (U) A Modern Development Paradigm

- Common HW/SW Baseline Addresses All "INTs"
- Standards at the Application Level ("OSI Layer 7")
- Eliminate Development Redundancies
- Minimize Prototype Development Time
- Simplifies Integration

Quicker Fielding of Capability

Production

Standard COTS Vendor Hardware

Contractor Focuses Effort on the Solution to the Problem

Software Baseline Available to Contractors

Hardware and New Software by Exception

## 3. Ops Baseline

Modifications & Final Docs

- OPS Decides!!!
- Fully Operational
- Taskable
- O&M Begins
- Final Documents

## 2. Migration Path

- OPS Decides!!!
- Ops "Kick Tires"
- Taskable
- Config Control
- Draft Documents

## 1. Lab Testing

Delivery with Draft Docs

- OPS Need
- OPS Talks over Task with Lab

Already Developed Functions Accelerate Design and Development

Work on Task-Specific Algorithm

Bottom Up Requirement

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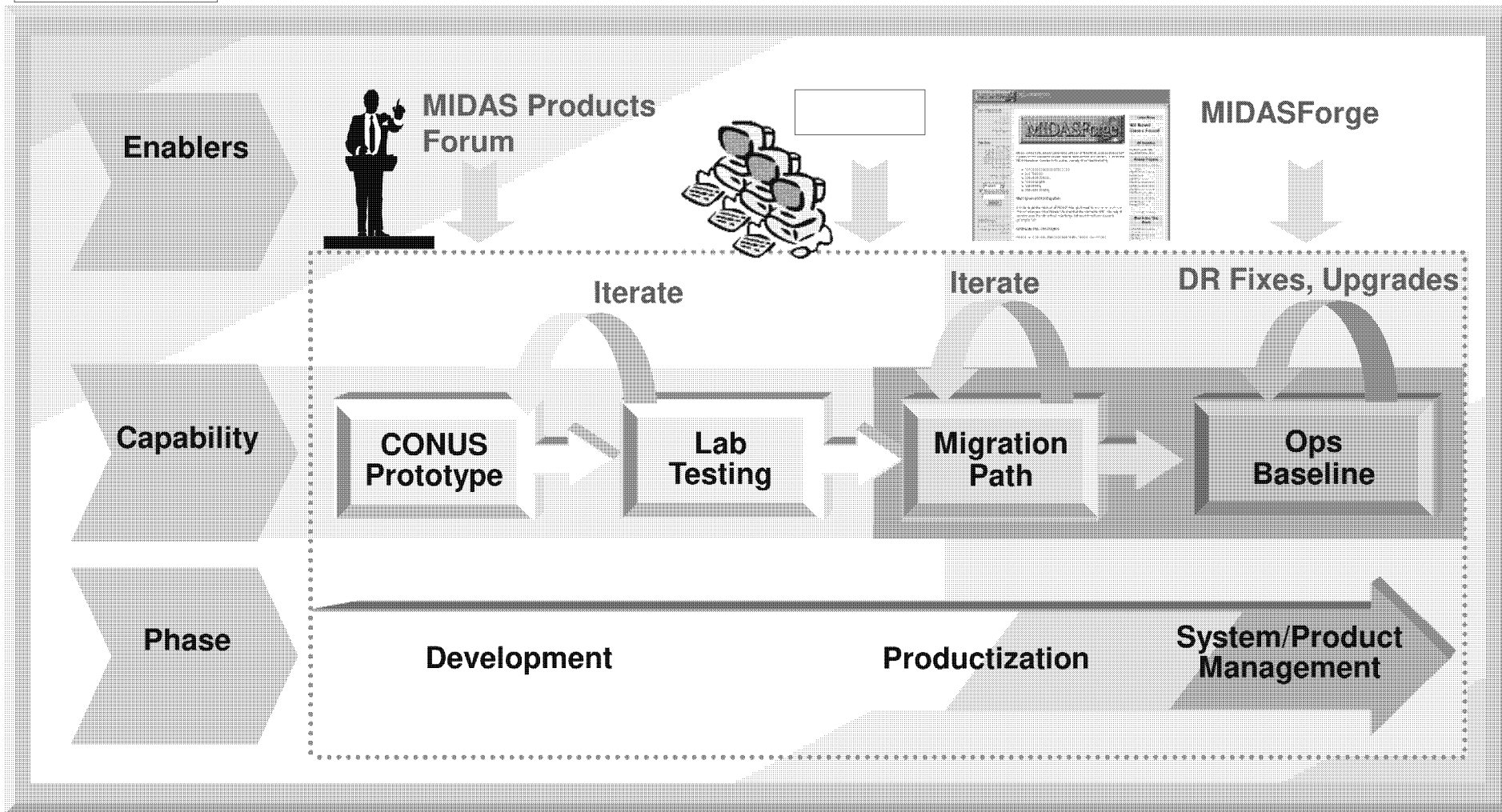
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# (U) Another View



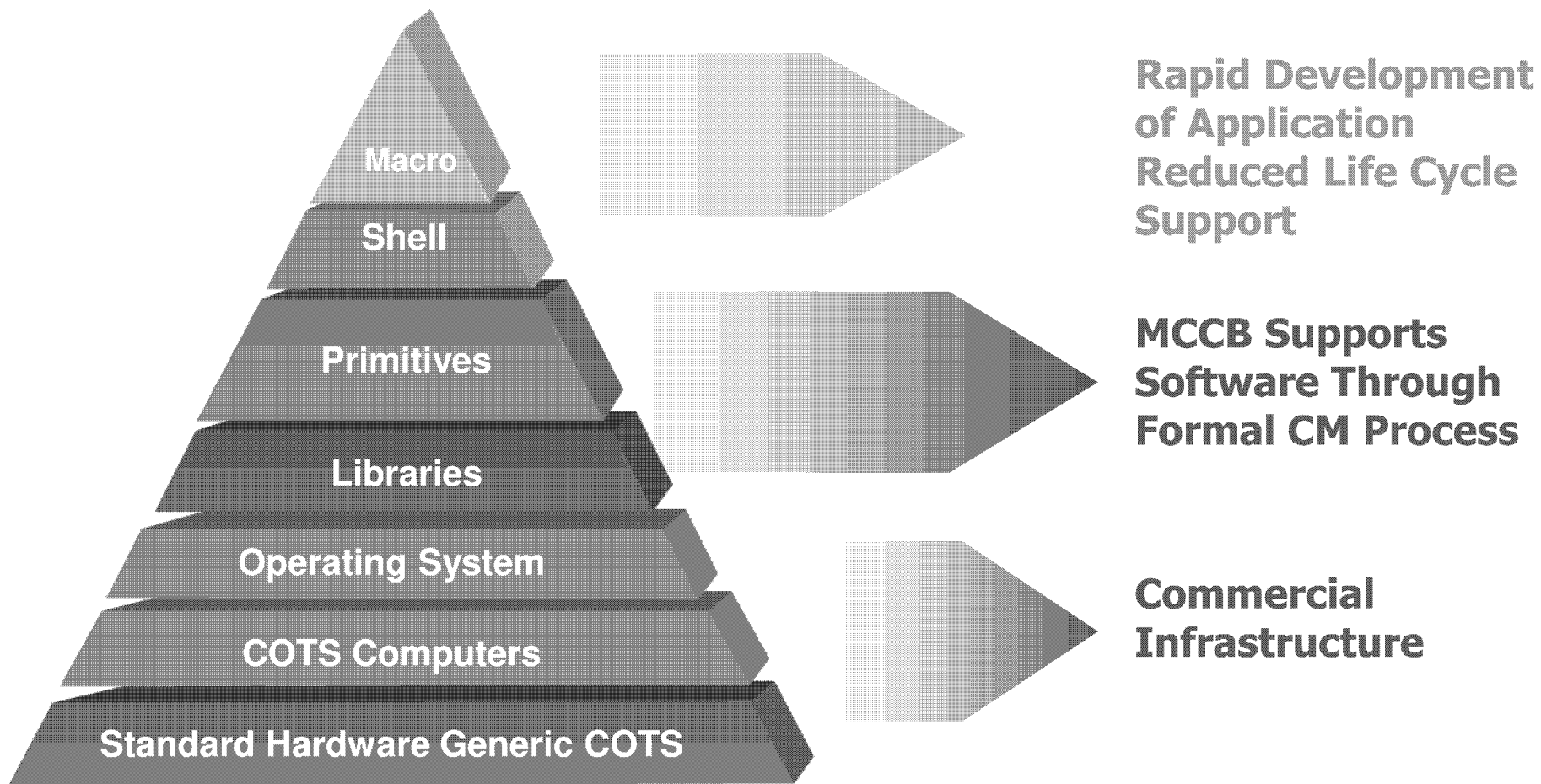
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# (U) The MIDAS Development Pyramid



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# (U) MIDAS Software

## (U) Primitives

- ◆ **Basic System Building Blocks Written in FORTRAN or C, Using a Standard MIDAS Library and MIDAS Interface**

## (U) Macros

- ◆ **Collection of Primitives and Other Macros to Implement a Signal Processing Thread**
- ◆ **Allows for Rapid Development of Interactive Graphical Interfaces**
- ◆ **Similar to Tcl/Tk**

## (U) Option Trees

- ◆ **Collection of Primitives and Macros to Implement a Signal Processing Function**
- ◆ **Collection of Programs**

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# (U) MIDAS Hardware

## GOALS

- ◆ *Do All Signal Processing in Software (in Hardware by Exception)*
- ◆ **Get Signal into Computer as Quickly as Possible**
- ◆ **Design Architecture that Can Be Updated as Technology Advances**
- ◆ **Use Only COTS Equipment**

## CURRENT VENDORS

- ◆ **COMPAQ (DEC): Servers (Currently ES-45; soon to be PCs)**
- ◆ **TMS: Large-Scale Data Acquisition/DSP (SAM-450)**
- ◆ **ICE: Small-Scale Data Acquisition/DSP**
- ◆ **STL: Switch Matrices, ATMICs, Resamplers, AD/DAs**

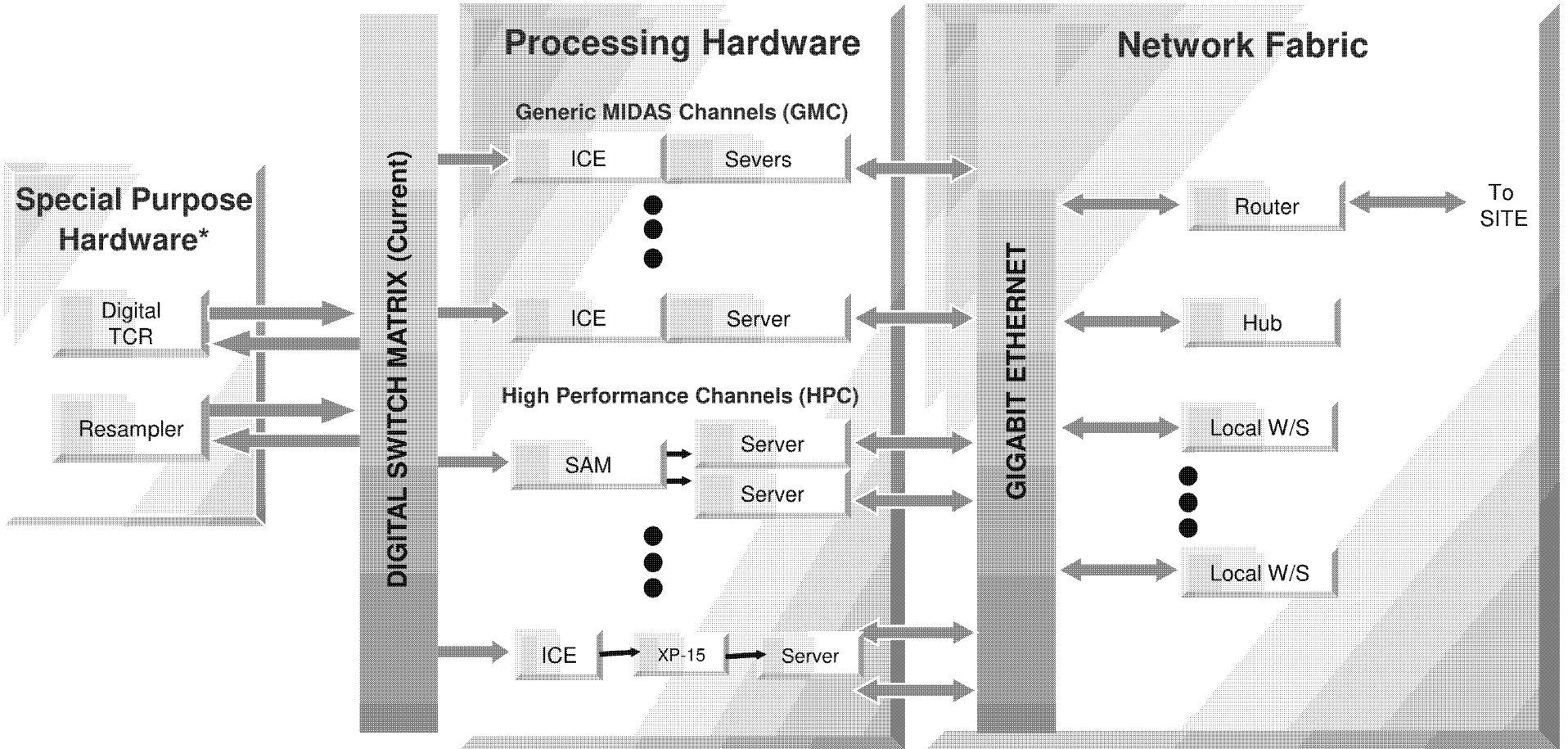
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# (U) Common System Architecture



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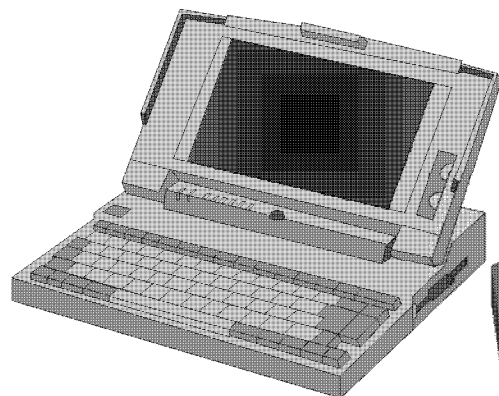
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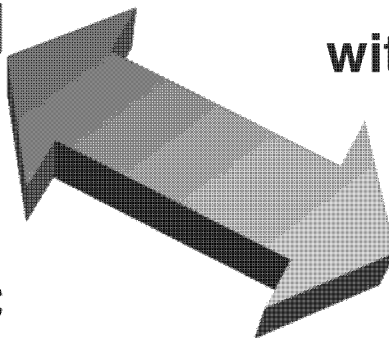
# (U) Common Hardware *But Many Flavors*



**Portable Laptop  
with ICE-slimPIC**

**Scalability**

**... to Racks of ES-45s  
with ICE-MBTs and Tera Bytes of Storage**



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**(U) MIDAS Inc.**

- **(U) Brand Name Recognition**
  - ◆ **Expectation of Quality**
  - ◆ **Customer Trust and Good Will**
  - ◆ **Concept of a “Product Line”**
- **(U) Goals**
  - ◆ **Consistency of Service**
  - ◆ **Individual Product Focus**
  - ◆ **Change Friendly Environment**
  - ◆ **Amortization of Support Cost Across Life Cycle**
  - ◆ **Maximize Position Lifetime**
- **(U) Support Network**
  - ◆ **Multiple Independently Contracted Companies**
  - ◆ **Cooperative Competition**

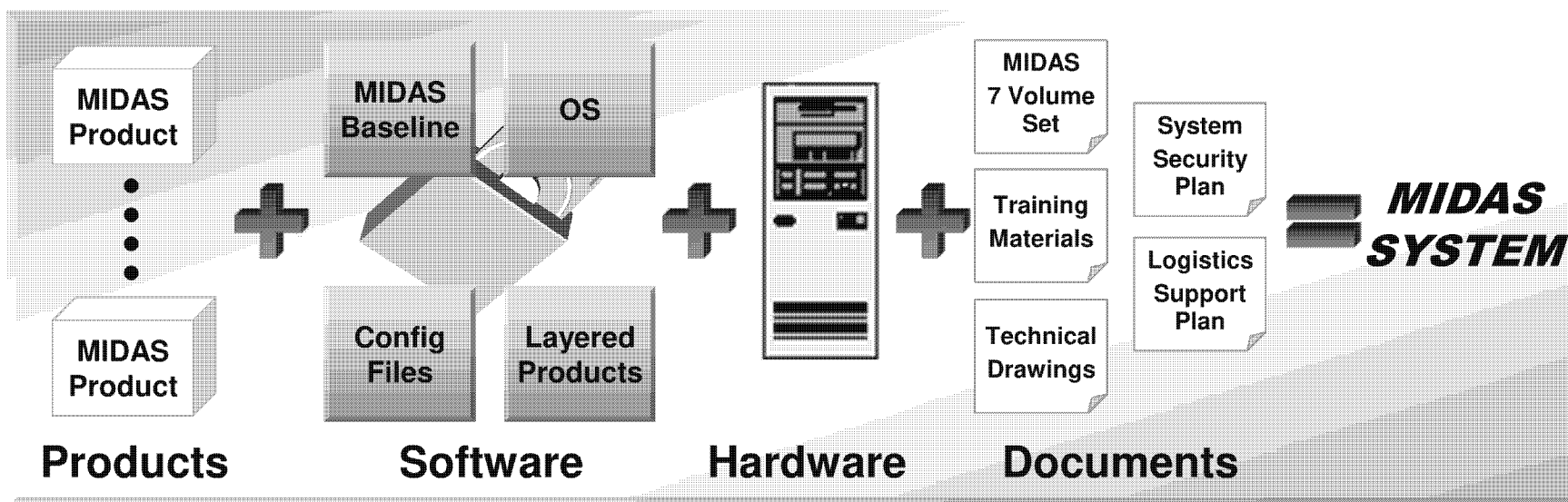
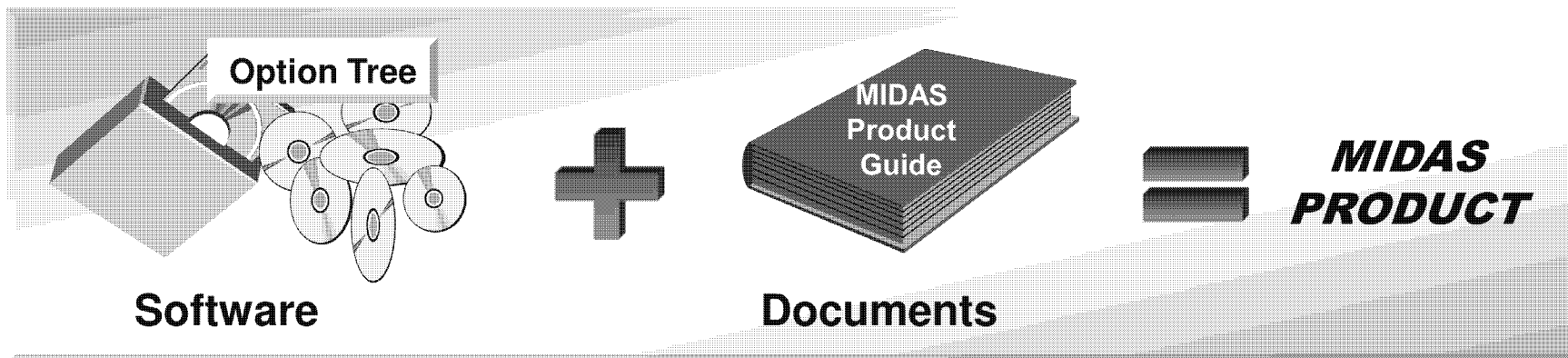
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# (U) MIDAS Products and Systems



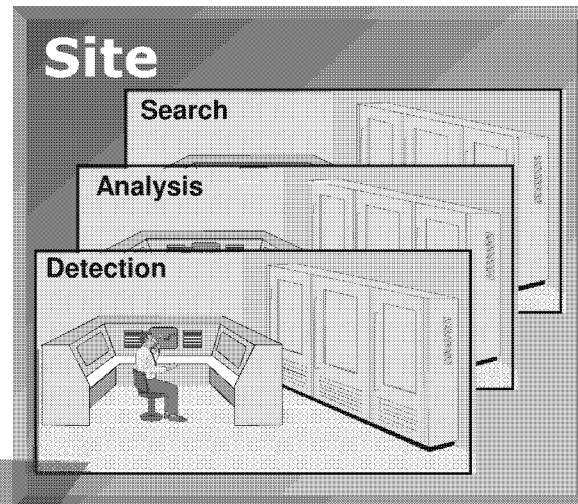
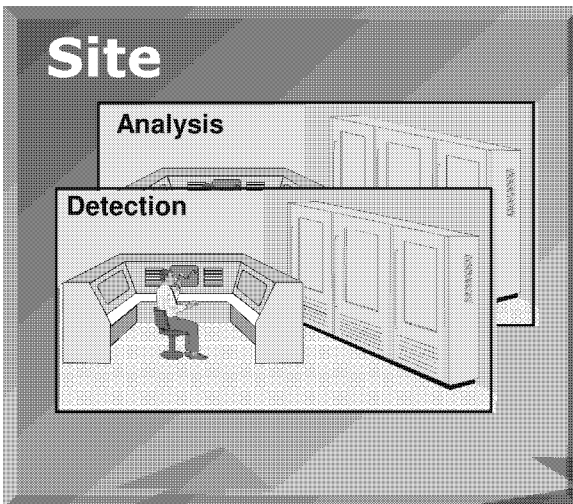
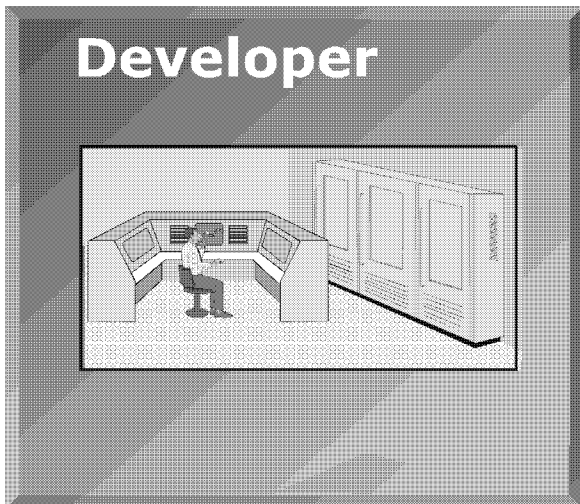
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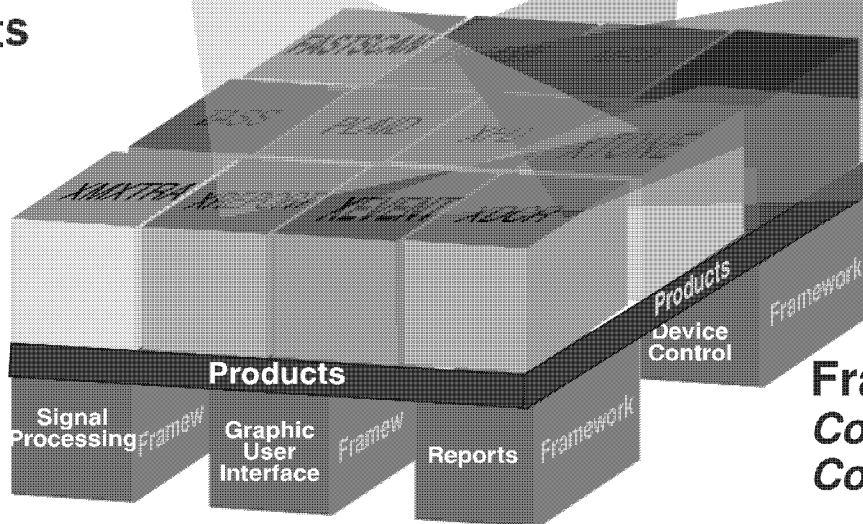
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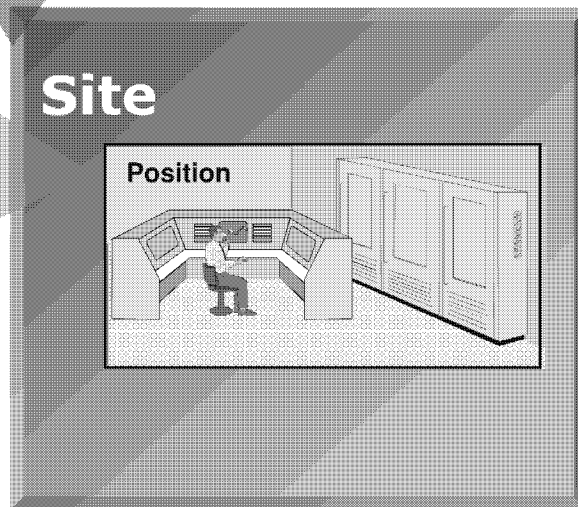
# (U) Processing Systems Are Based Upon Building Blocks



**Products  
System  
Building  
Blocks**



**Framework  
Common  
Components**



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# (U) MIDAS Product System Life Cycle

## DEVELOPMENT

- Develop/Refine Functionality
- Optimize User Interface
- Obtain Feedback from Site

## MIDAS PRODUCTS FORUM

## PRODUCTIZATION

- Configuration-Controlled Code
- Product Guide
- Technical Standards
- Go/No-Go Test
- Y2K Compliance

## SYSTEM INTEGRATION

- System Handbook
- Hardware Integration
- Software Install and Test
- O&M Training
- Site Acceptance

## SYSTEM MANAGEMENT

- System Web Page
- Baseline Control
- DR Work-Offs
- 2nd Echelon POCs for Sites

## PRODUCT MANAGEMENT

- Maintain Product Web Page
- Version Control
- DR Work-Offs
- Product Updates

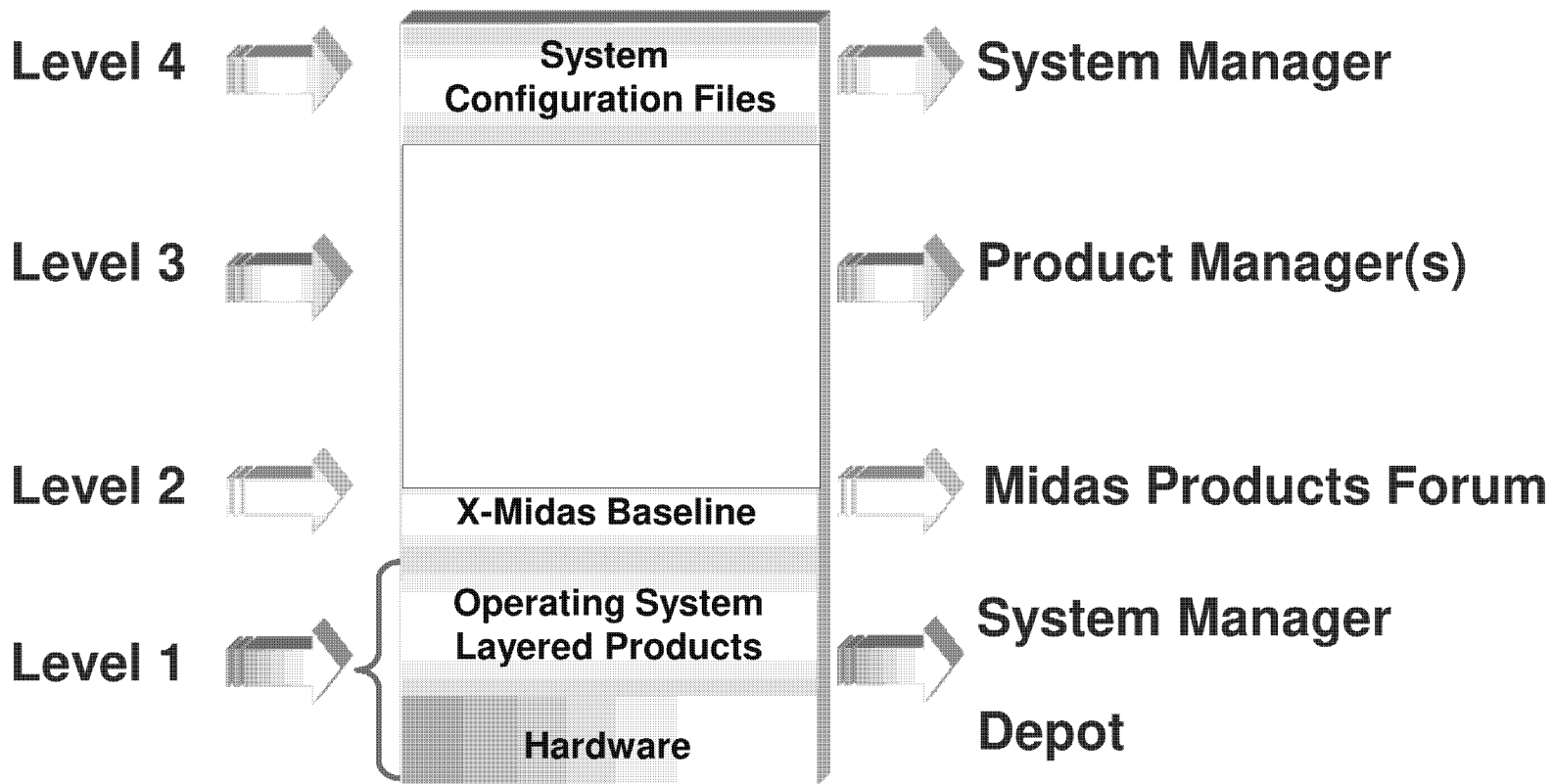
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# (U) Off-Site E2 Support Network



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## (U) Midas Products Forum

- (U) MIDAS Configuration Control Board (MCCB)
- (U) Focus for Establishing Policies and Standards
  - ◆ Documentation (MIDAS Doc Handbook)
  - ◆ Technical Standards
  - ◆ Configuration Control
  - ◆ Training
  - ◆ Sparing
  - ◆ Second Echelon Support (System and Product Managers)
  - ◆ Problem (DR) Tracking and Resolution
- (U//~~FOUO~~) Change Management Authority for PSPO Midas Systems
  - ◆ Led by PSPO/SED
  - ◆ System/Product/Framework Managers Reports
    - ◆ Changes to Baseline
    - ◆ DR Activity
    - ◆ Needs/Dependencies

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# **(U) MidasForge**

- **(U) Infrastructure for the Midas Products Forum**
  - ◆ **Based on SourceForge Development Environment for Open Source Projects**
- **(U) Centralized Service-Based Architecture Supporting:**
  - ◆ **CVS Repository**
    - ◆ **Allow Users to Check-Out and Check-In Code**
    - ◆ **Provide Access to All Versions of Code**
  - ◆ **DR Tracking**
    - ◆ **Allow Users to Check Status and Enter New DRs**
  - ◆ **Document Posting**
  - ◆ **Discussion Forums (i.e., Newsgroups)**

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# (U) Future of MIDAS

## ■ (U//~~FOUO~~) Trends

- ◆ Standard Processing Channels
- ◆ Replacement of Special Purpose Hardware with Software
- ◆ Distributed Remote Processing
- ◆ Increased Presence with Non-Traditional Customers
- ◆ Switchless Architecture as SDDS matures
- ◆ Use of LINUX
  - ◆ REDHAT is distribution of choice due to alliance with COMPAQ
  - ◆ NRO Standards issues being worked with DDSE
  - ◆ Gaining acceptance across community

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