DHS Enterprise Architecture

The Open Group Conference

Boundaryless Information Flow
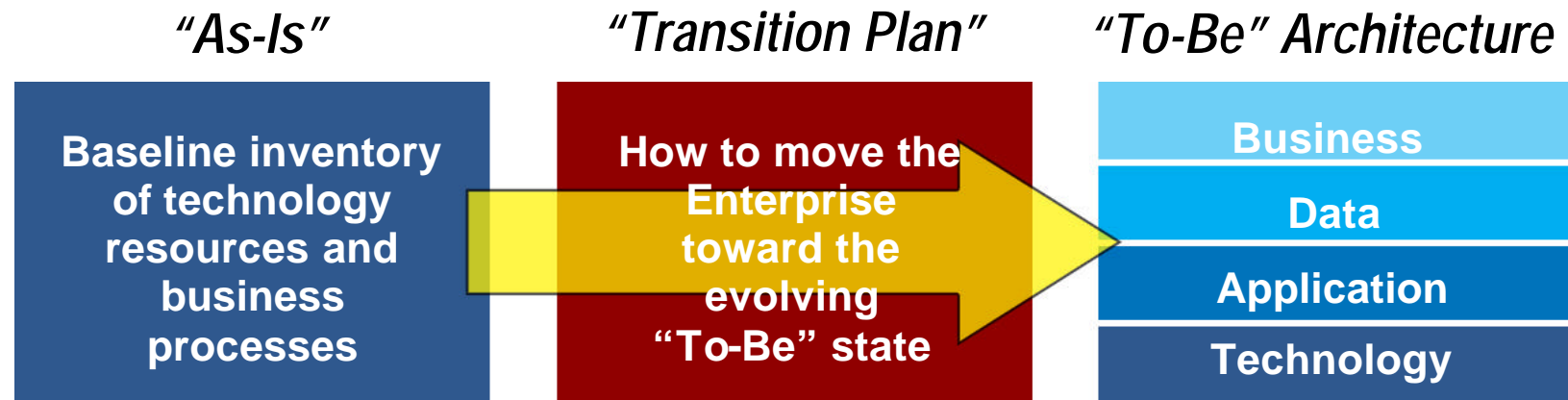
October 20, 2003

U.S. Department of
Homeland Security

Our EA Challenge

▶ **Support the FY05 budget formulation process**

▶ **Develop high-level, conceptual Homeland Security EA**

▶ **Develop a realistic, actionable Transition Strategy**

▶ **Interact with DHS business units**

▶ **Incorporate State and Local perspectives**

"As-Is"	*"Transition Plan"*	*"To-Be" Architecture*
Baseline inventory of technology resources and business processes	**How to move the Enterprise toward the evolving "To-Be" state**	**Business** / **Data** / **Application** / **Technology**

- **Length: 4 Months**
  - May 2003 through Sept 2003
- **Cost: $1.2M**
- **People/Groups involved:**
  - CIO's office
    - Applied Technology Board; EA Team
  - DHS Architecture Working Group
    - Directorates Represented: S&T, IAIP, CBP, ICE, EP&R, TSA, FLETC
    - Organizational Elements Represented: USSS, USCG; BCIS
    - Mitre
  - Financial / Resource Management

- **Business Model**
  - Activities: 80
  - Workplace Types: 15
  - Work Zones: 4
- **Target Enterprise Architecture**
  - Data
    - Subject Areas: 17
    - Data Objects: 47
  - Application
    - Applications: 25
    - Reusable Components: 66
  - Technology
    - Technology Patterns: 12
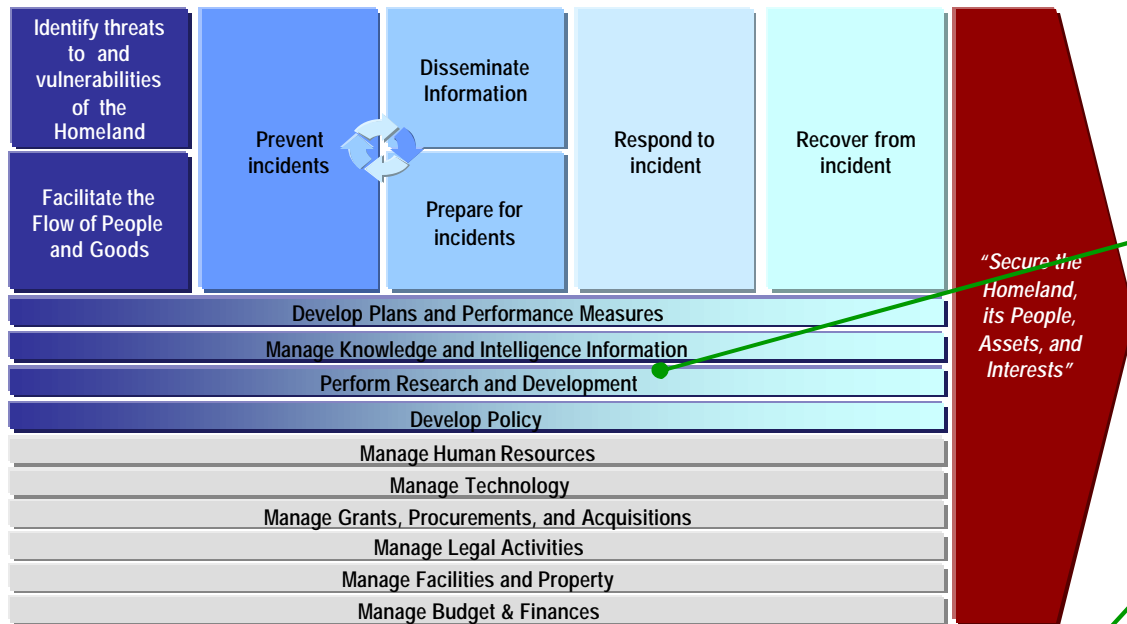   - Technical Reference Model Technology Categories: 60
- **Transition Strategy**
  - Conceptual Projects: 28
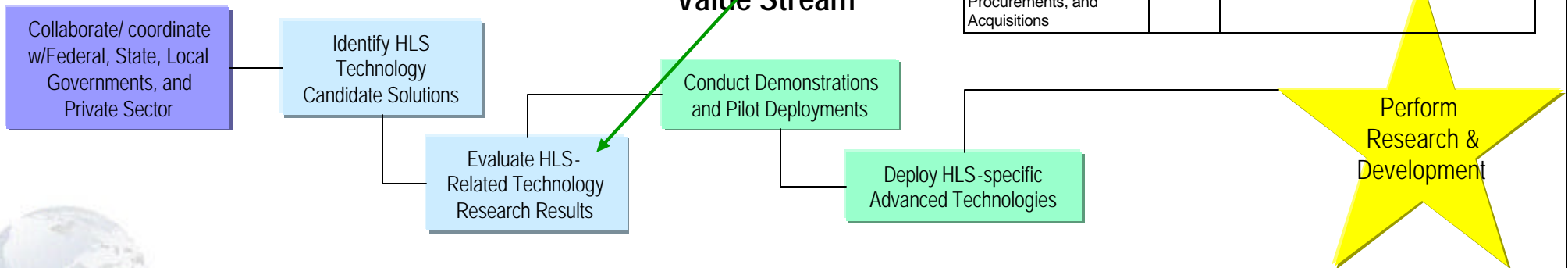
Business Architecture

Value Chain

Identify threats to and vulnerabilities of the Homeland	Prevent incidents	Disseminate Information / Prepare for incidents		Respond to incident	Recover from incident
Facilitate the Flow of People and Goods					

Develop Plans and Performance Measures

Manage Knowledge and Intelligence Information

Perform Research and Development

Develop Policy

Manage Human Resources

Manage Technology

Manage Grants, Procurements, and Acquisitions

Manage Legal Activities

Manage Facilities and Property

Manage Budget & Finances

"Secure the Homeland, its People, Assets, and Interests"

Business Model
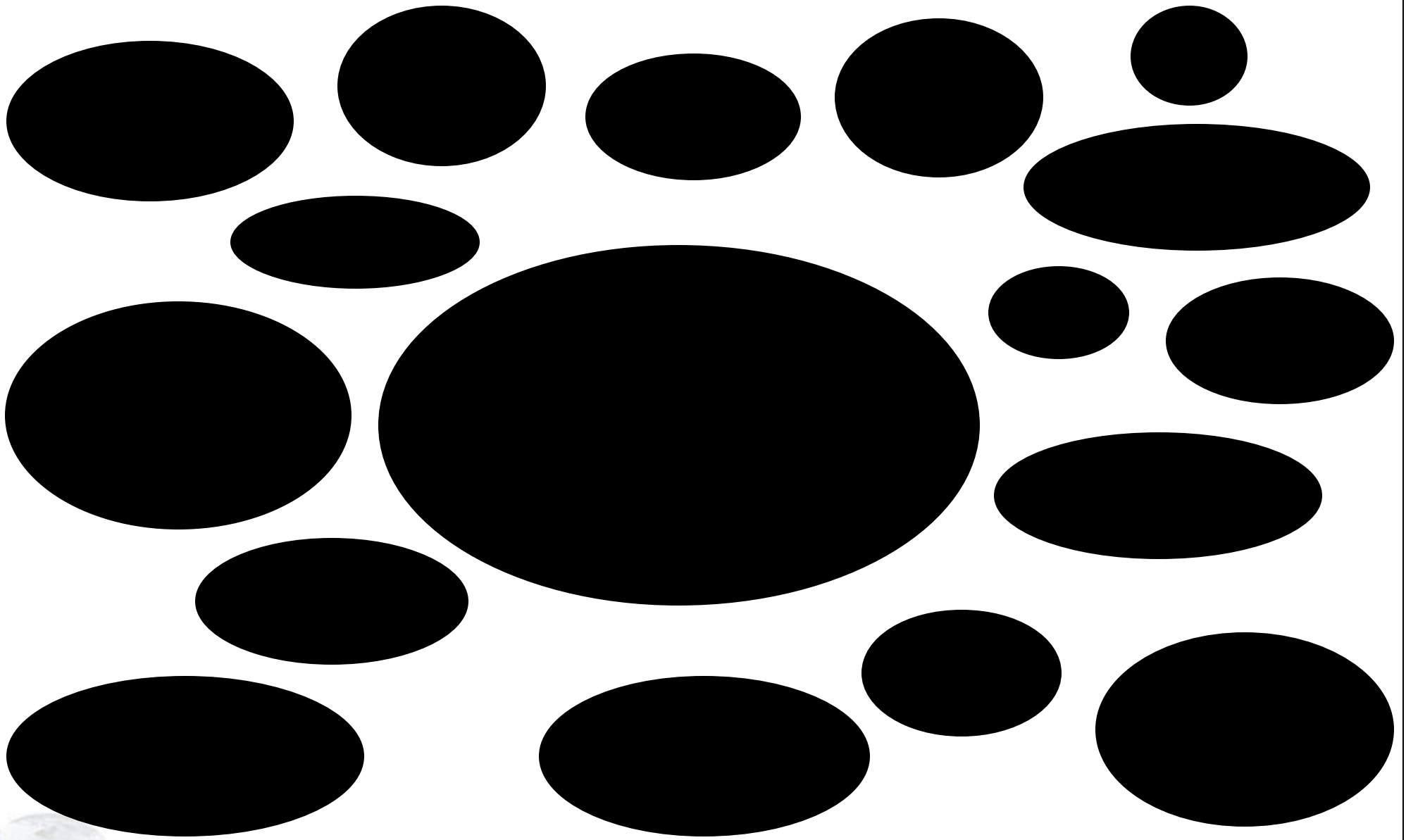
Manage Knowledge and Intelligence Information	HLS005	Collaborate/coordinate w/Federal, State, Local Governments, and Private Sector
Perform Research and Development	HLS059	Identify HLS Technology Candidate Solutions
Perform Research and Development	HLS061	Evaluate HLS-Related Technology Research Results
Perform Research and Development	HLS062	Conduct Demonstrations and Pilot Deployments
Perform Research and Development	HLS063	Deploy HLS-specific Advanced Technologies
Develop Policy	HLS111	Set Homeland Security Standards
Manage Grants, Procurements, and Acquisitions	HLS082	Administer Agreements and Contracts
Manage Grants, Procurements, and Acquisitions	HLS083	Certify Acceptance
Manage Grants, Procurements, and Acquisitions	HLS084	Determine Purchase Sources / Methods
Manage Grants, Procurements, and Acquisitions	HLS085	Establish Acquisition Vehicle to Procure Goods / Services
Manage Grants, Procurements, and Acquisitions	HLS086	Develop Acquisition Requirements
Manage Grants, Procurements, and Acquisitions	HLS112	Administer Grants

Value Stream

Collaborate/ coordinate w/Federal, State, Local Governments, and Private Sector → Identify HLS Technology Candidate Solutions → Evaluate HLS-Related Technology Research Results

Conduct Demonstrations and Pilot Deployments → Deploy HLS-specific Advanced Technologies

Perform Research & Development

CURE Matrix

User Classes

Domain Specific Components

Domain Independent Components

Application List	
ID	**Application**
Business Applications	
APP001	Homeland Security Collaboration Zone Application
APP014	Planning and Performance Management
APP023	Research and Development Administration
APP015	Contract and Acquistion Management
APP007	Grants Management Application
Domain Specific Components	
COMP044	Mandate Administration
COMP011	Contract Administration
COMP009	Compliance Management
Domain Independent Components	
COMP043	Risk Management
COMP012	Correspondence Management
COMP004	Application Processing
COMP008	Case Manaegment
COMP015	Decision Support

► # Components

– A self contained business process or service with predetermined functionality that may be exposed through a business or technology interface

– are independently deployable software units that integrate easily to compose larger systems-applications

– may contain multiple implementations to support many technology platforms

► # Applications

– are enablers of business workflows within the enterprise

– are structured of smaller independent functional parts called components

– components are assembled to achieve overall application functionality

Target Architecture
Technical Architecture—Patterns , Model, and Profiles

N-Tier Dynamic Web
Application Architecture

Pervasive Device Support

Portal
- Personalization
- Content Management

Workflow / Business
Process Management

Broker
- Decomposition
- Router
- Agent

Business Rules Engine

Integration and
Interoperability
- Web Services
- Message Oriented Middleware

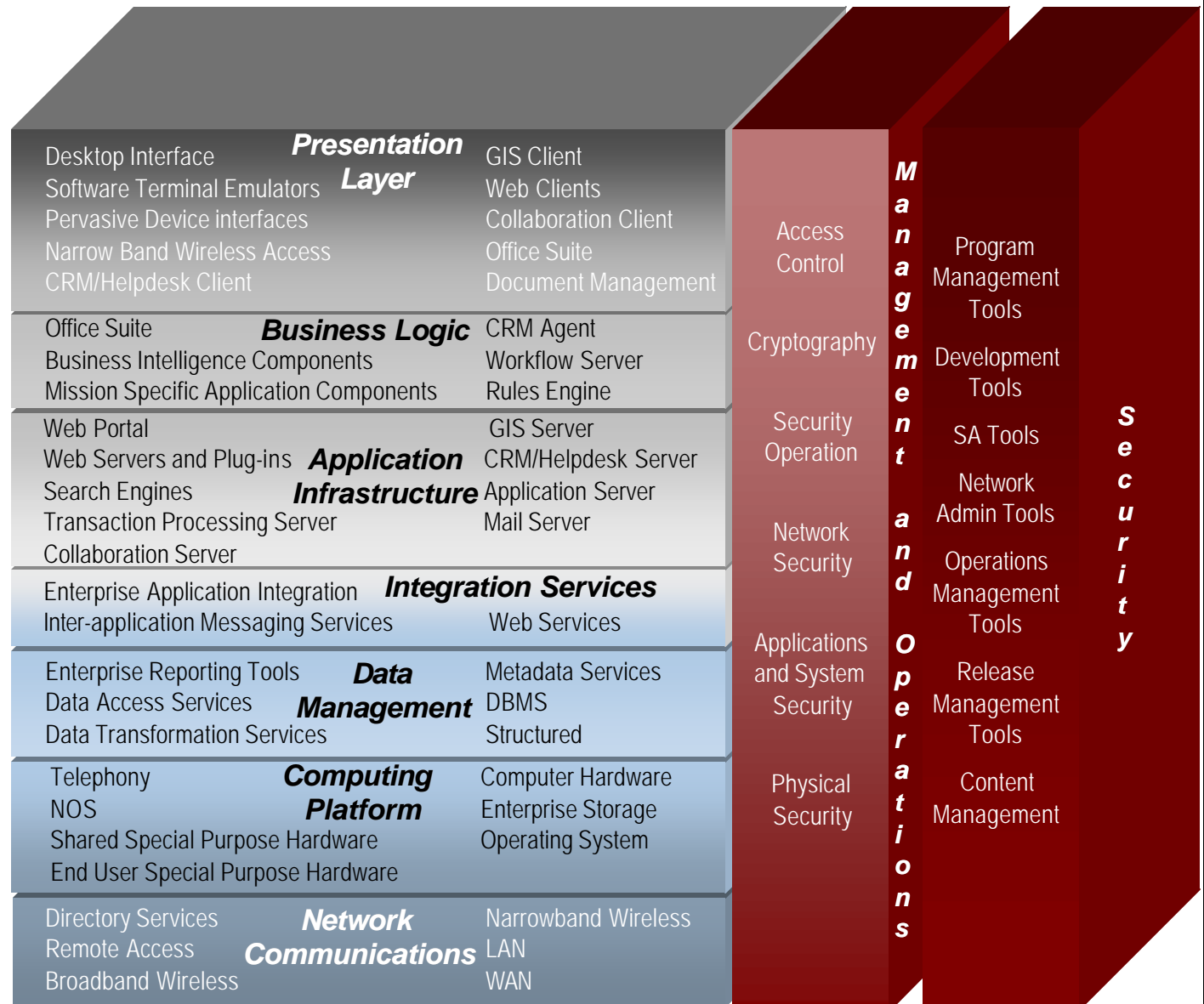Business Intelligence /
Data Warehouse
- Pattern Matching

Data Access
- Asynchronous Access
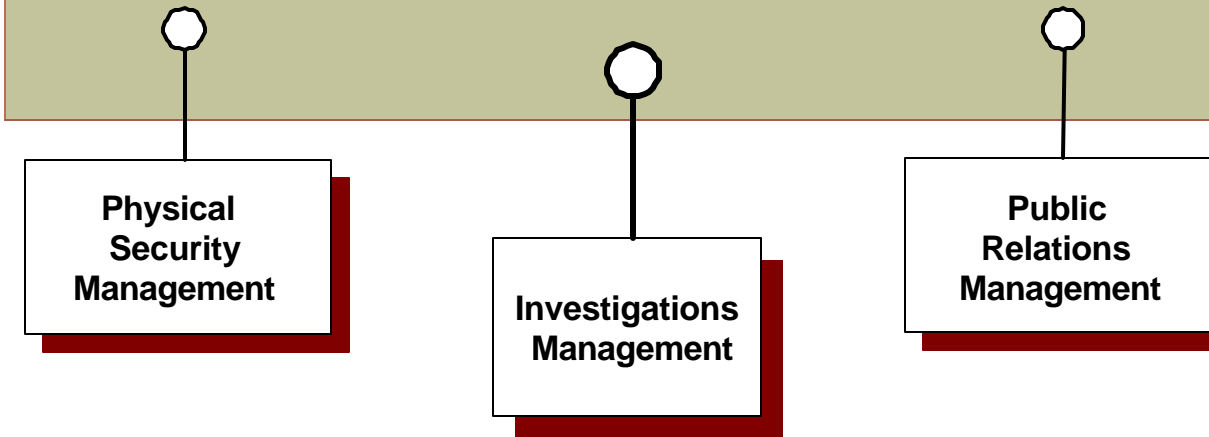
Collaboration

Security

Performance and Reliability

Presentation Layer
Desktop Interface | GIS Client
Software Terminal Emulators | Web Clients
Pervasive Device interfaces | Collaboration Client
Narrow Band Wireless Access | Office Suite
CRM/Helpdesk Client | Document Management

Business Logic
Office Suite | CRM Agent
Business Intelligence Components | Workflow Server
Mission Specific Application Components | Rules Engine

Application Infrastructure
Web Portal | GIS Server
Web Servers and Plug-ins | CRM/Helpdesk Server
Search Engines | Application Server
Transaction Processing Server | Mail Server
Collaboration Server

Integration Services
Enterprise Application Integration
Inter-application Messaging Services | Web Services

Data Management
Enterprise Reporting Tools | Metadata Services
Data Access Services | DBMS
Data Transformation Services | Structured

Computing Platform
Telephony | Computer Hardware
NOS | Enterprise Storage
Shared Special Purpose Hardware | Operating System
End User Special Purpose Hardware

Network Communications
Directory Services | Narrowband Wireless
Remote Access | LAN
Broadband Wireless | WAN

Access Control

Cryptography

Security Operation

Network Security

Applications and System Security

Physical Security

Management and Operations

Program Management Tools

Development Tools

SA Tools

Network Admin Tools

Operations Management Tools

Release Management Tools

Content Management

Security

The Virtual Application

Mary Jane is a Special Events Planner

Mary Jane's View

Physical Security Management

Investigations Management

Public Relations Management

Information Sharing Architecture

DHS Internal Space

- Workstations
- Servers
- LAN
- Local Directory
- Private
- Data Conversion

FIREWALL

DHS Shared Space

- Organizational Shared Data
- Organizational Shared Applications

FIREWALL

Community Space

- Full Service Directory
- Webmail
- Storage
- Collaboration
- Common Applications
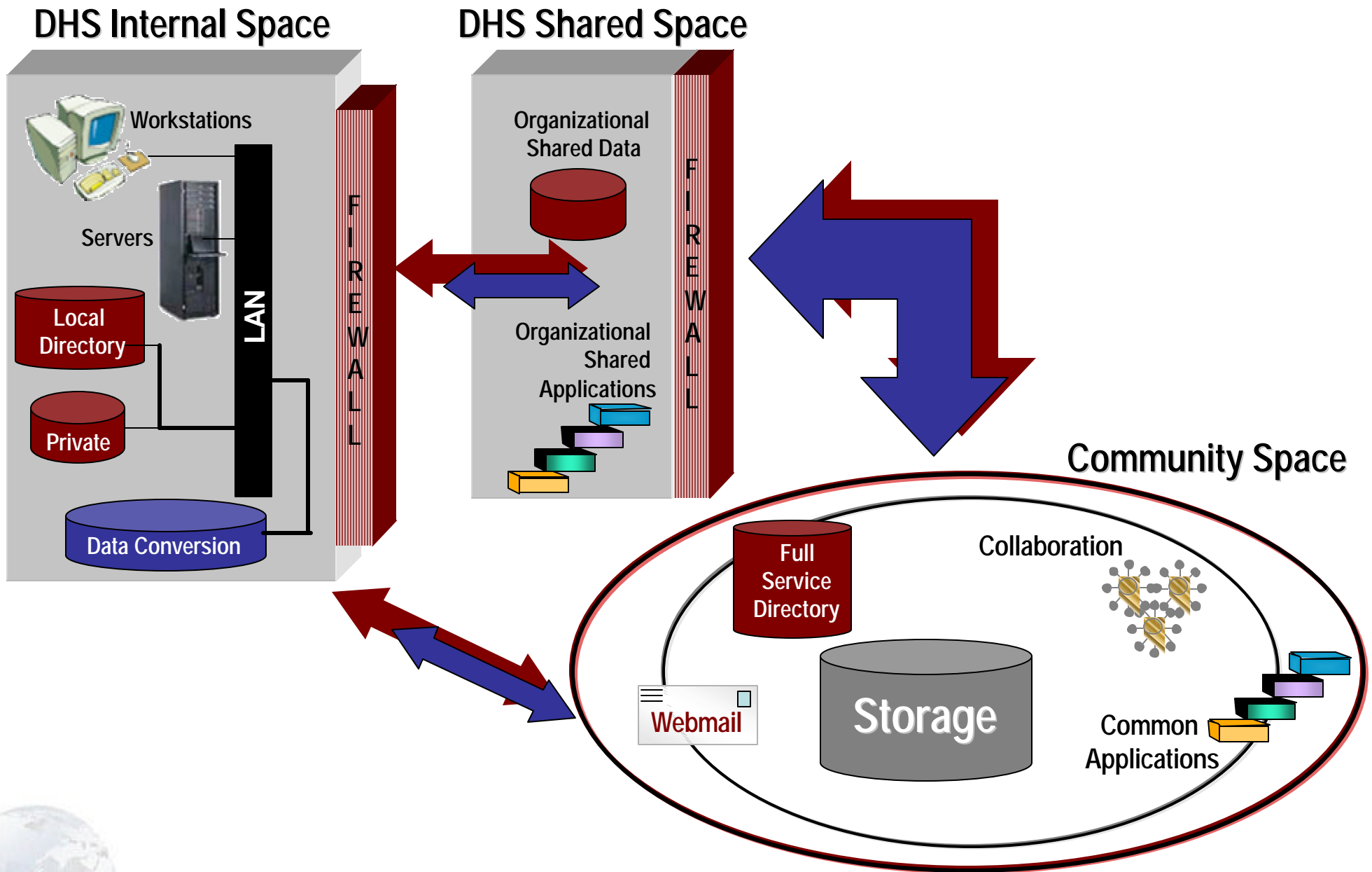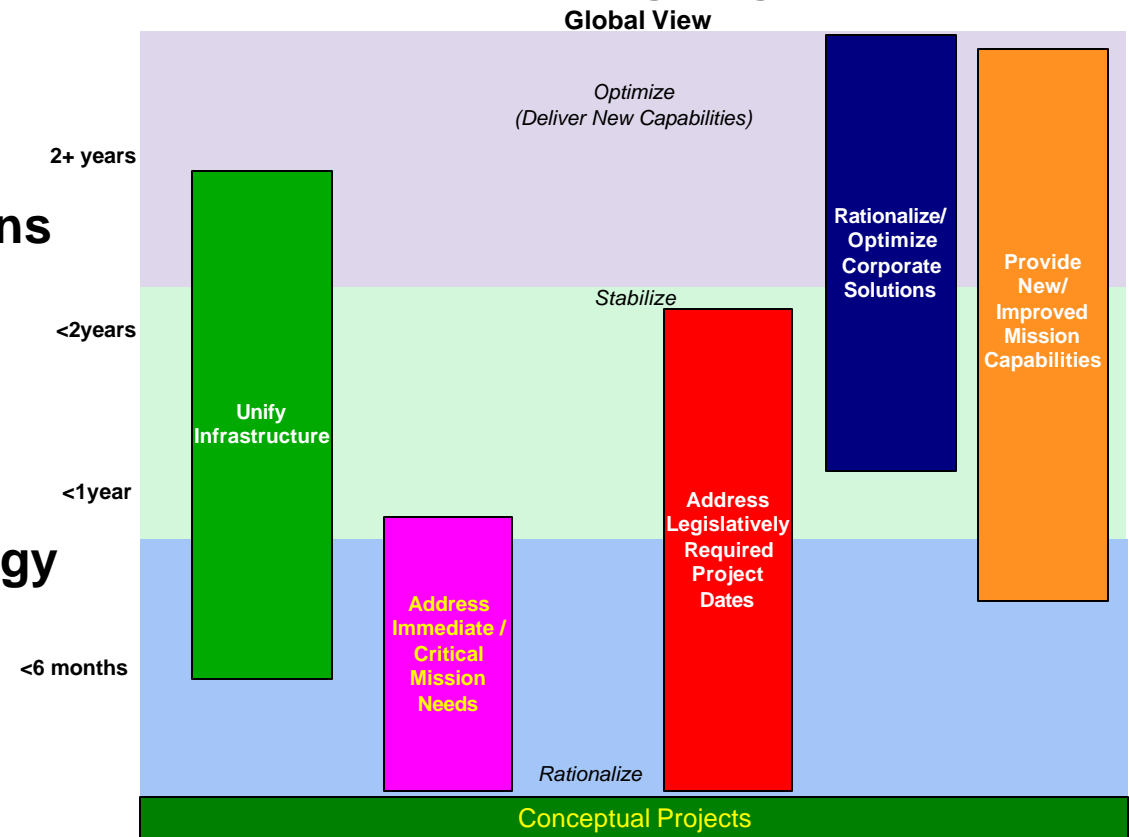
Transition Strategy
Proposed Sequence

- **Conceptual projects and associated capabilities are enabled over time**

- **Each conceptual project aligns to objectives**

- **Each conceptual project is sequenced based on its alignment to objectives**

- **The detailed sequence strategy displays all sub-projects required by the conceptual project**

- **Conceptual projects provide target capabilities and include other non-technology projects focused on business process and organizational improvements**

Sequencing Diagram

Global View

Optimize
(Deliver New Capabilities)

Stabilize

Rationalize

2+ years

<2years

<1year

<6 months

- Unify Infrastructure
- Address Immediate / Critical Mission Needs
- Address Legislatively Required Project Dates
- Rationalize/ Optimize Corporate Solutions
- Provide New/ Improved Mission Capabilities

Conceptual Projects

Chart Displays, at a High-level, the Sequence of the types of Conceptual Projects As Shown on the Detailed Sequence Diagram

Transition Strategy

▶ **The Transition Strategy is:**
  – The first step in developing a detailed transition plan
  – A means to implement and realize benefits from implementing the HLS target architecture
  – A vehicle for sharing information with state, local, and federal agencies

▶ **Developed by:**
  – Assessing and evaluating the current state of information technology
  – Understanding HLS target architecture requirements
  – Developing conceptual projects to drive to the target

▶ **The Approach:**
  – Is principle based, developed according to a structured approach
  – Addresses key challenges
  – Is benefit focused

▶ **Consists of:**
  – Key conceptual projects
  – Potential sequencing of key conceptual projects
  – Potential benefits and milestones timeline

Summary
DHS EA Products

Business Model

▶ **Business Value Chain**

▶ **EA Values and Principles**

▶ **Hierarchical Business Model**
  – List of Activities
  – User Classes
  – Business Scenarios

▶ **Business Model to Federal Reference Model Mapping**

▶ **High-Level DHS CONOPS**

▶ **Operational Sequence Diagrams**

Target EA

▶ **Conceptual Data Model**
  – Subject Area Definitions
  – Data Object Definitions and Characteristics
  – Subject Area Relationship Diagram
  – CURE Matrix

▶ **Application and Component Architecture**
  – Application and Component Descriptions
  – Applications and Components to Business Activities Mappings
  – Applications and Components to SRM Mappings
  – Application and Component Diagrams

▶ **Technical Architecture**
  – Technology Patterns
  – Technology Patterns to Applications & Service/Components Mapping
  – Geo-Technical Architecture Diagram
  – Enhanced TRM
  – Standards Profile

Transition Strategy

▶ **Transition Strategy**
  – Briefing
  – Transition Sequence Diagram

▶ **Transition Strategy Supporting Materials**
  – Quick Hits
  – Conceptual Project Details
  – Conceptual Project Mappings
  – GAO Information Sharing Summary

▶ **Risk Mitigation Strategy**

▶ **Governance Strategy White Paper**