

# Acquisition of an Integrated Data Environment in the U.S. Army PM Crusader program



**FIRE SUPPORT SYSTEM  
BOS**

**CRUSADER SYSTEM**

**SELF-PROPELLED  
HOWITZER SYSTEM**



**SYSTEM CHARACTERISTICS:**

- Length: 522 inches with cannon in travel lock
- Width: 316 inches chassis length
- Height: 138 inches
- Height: 162 inches with cannon in travel lock
- Ground Clearance: 139 inches chassis width
- Top Speed: 17 inches
- Top Speed: 42-48 mph highway
  - ✓ Cross Country: 24-30 mph
  - ✓ 10% Slope: 17 mph
  - ✓ 60% Slope: 4 mph
- Weight: 50 tons curb weight
- Armament: 155mm cannon and secondary armament
- Crew: 3 in SPH, 3 in RSV

**SYSTEM DESCRIPTION:** The Crusader weapon system will be the indirect fire support “system of systems”, providing an advanced direct support/general support 155mm self-propelled howitzer (SPH) and resupply vehicle (RSV) to support the future maneuver force. Crusader will provide a significant increase in artillery survivability, lethality, mobility and operational capability and effectiveness through use and integration of advanced technology in its subsystems and combat components. The SPH will deliver unprecedented firepower capabilities at extended ranges. Crusader is the Army’s highest ACAT 1D priority acquisition program.



# The Crusader Program

## “Fueling the Fires of Force XXI”



- Crusader is the Next Generation Field Artillery System for the U.S. Army
- Currently near end of PDRR phase
- Acquisition Reform Program
- Three Deliverables
  - 2 Weapon Systems (1 Self Propelled Howitzer + 1 Resupply Vehicle = 1 system)
  - 1 Integrated Data Environment



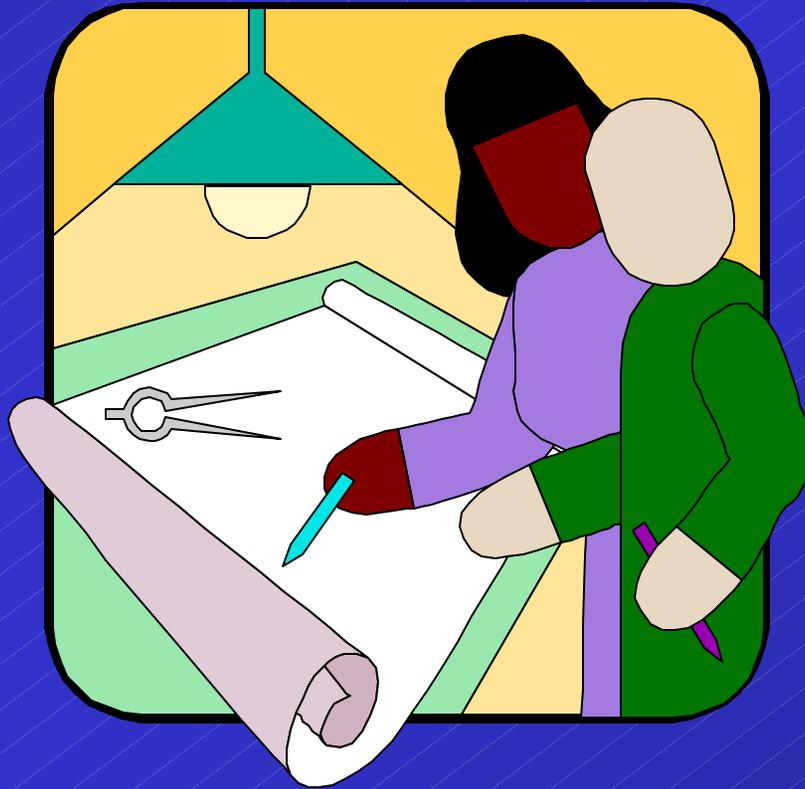
# Crusader Program Needs for an Integrated Data Environment



- Support Geographically Distributed Teams
- Support Access to Work In Process Information
- Support Concurrent Engineering
- Mitigate Program Execution Risk
- Support Program Management
- Provide Information Security
- Provide Configuration Management of All Data

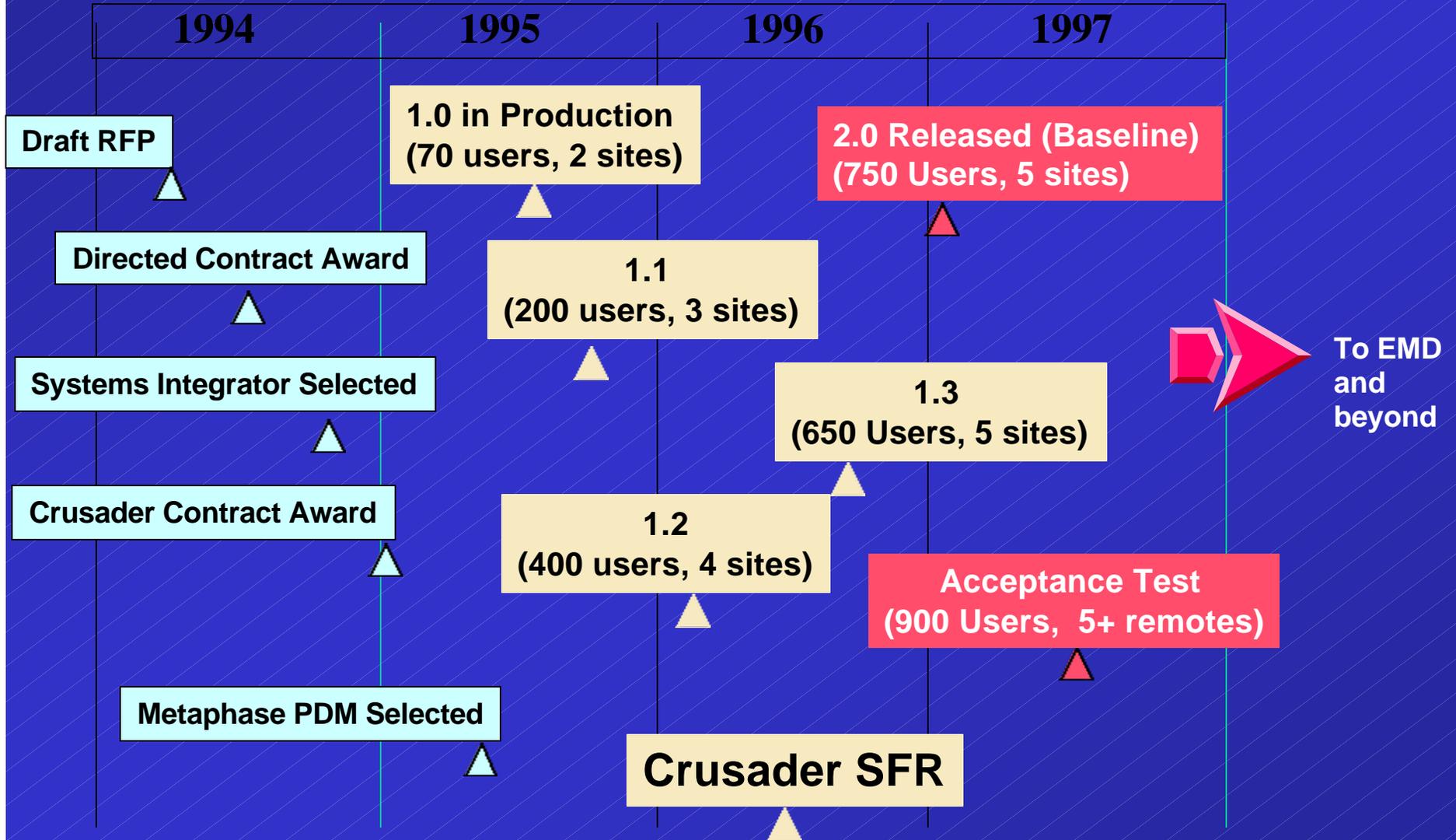


# IDE Overview





# IDE Program Timeline Highlights





# Integrated Data Environment Content

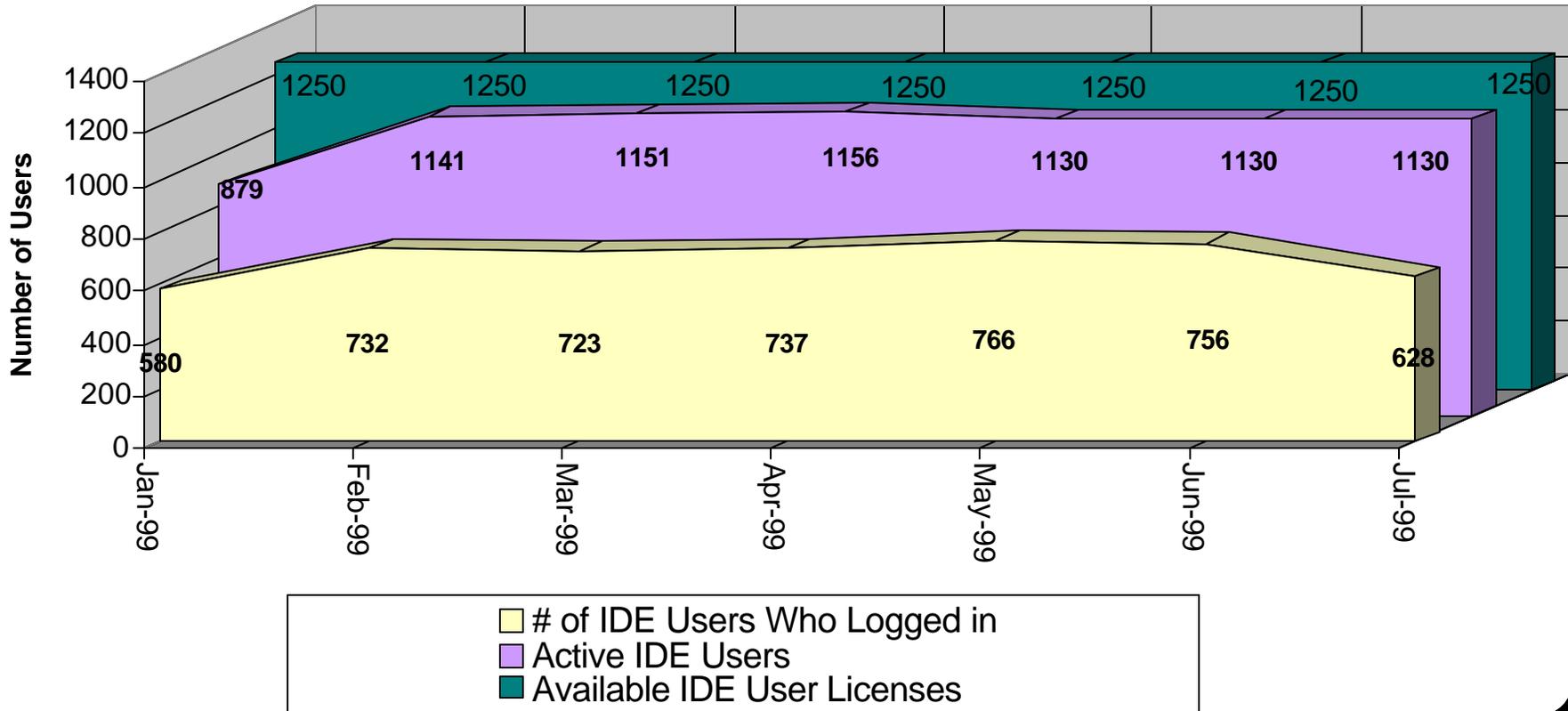


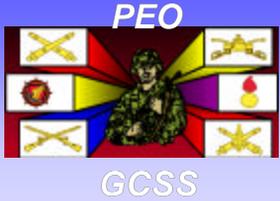
- Management data: cost, schedule, contractual data, program mgmt, etc
- Support data: planning, LSA, supply, maintenance plans, reports, training data, transportation & packaging, etc
- Engineering data: scientific, engineering drawings, CAD models, specifications, documentation, logistics, software and design data, etc



*In process data and deliverables!!*

# IDE - License/User Profile





# The Team Crusader Virtual Enterprise



 Internet Connection, *not all locations listed*

 Main IDE Site

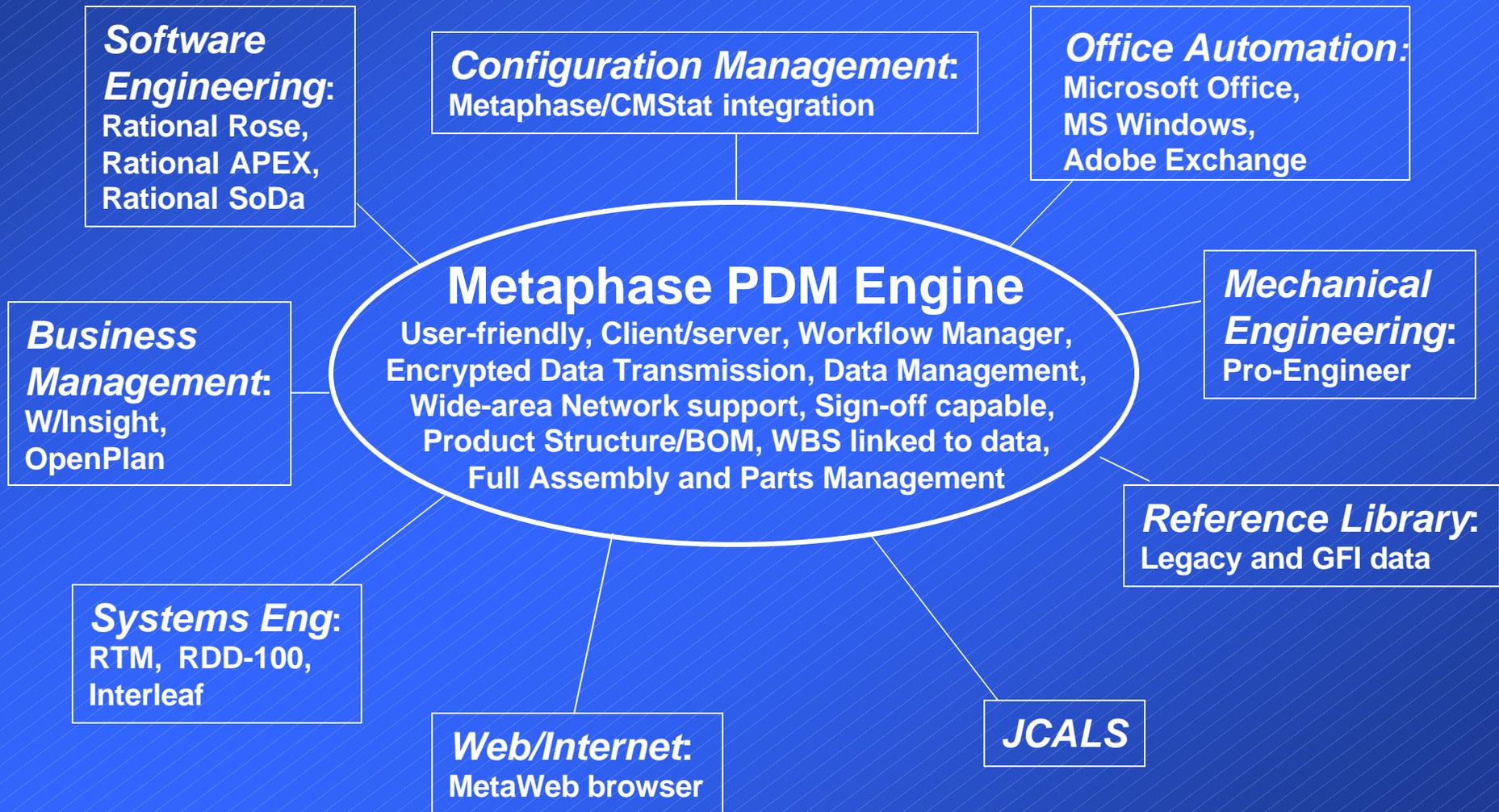


Encryption over intranet and internet lines



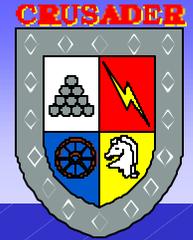
# IDE Functionality

## Common Development Environment

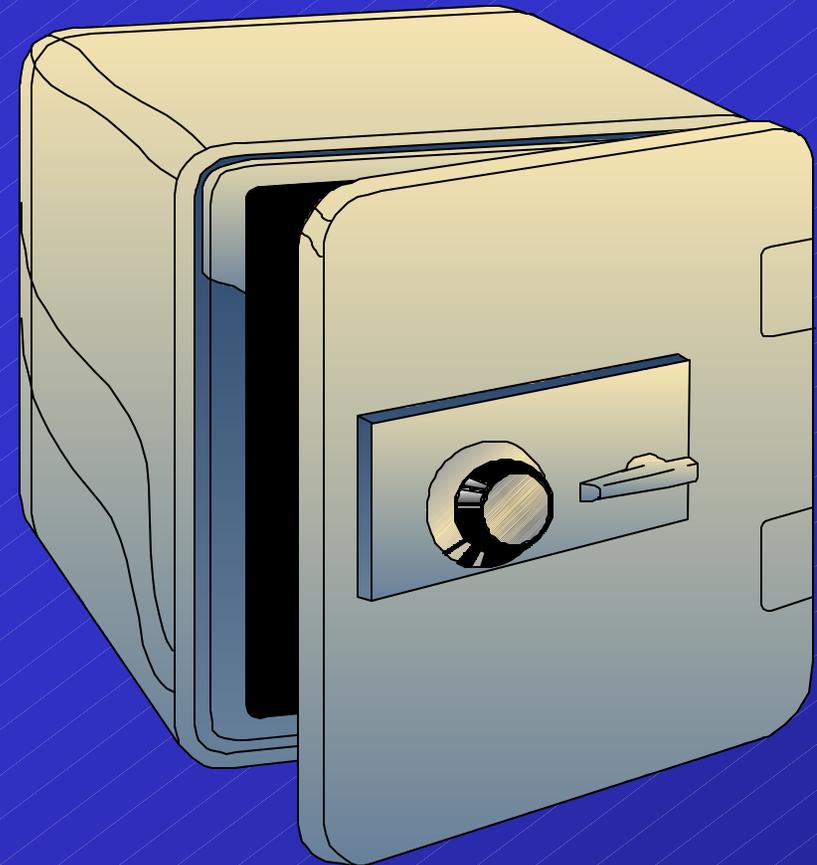




# Vaulting



Vaults contains all data, to include business, logistic and engineering documents and models. Multiple data formats can be stored within business or product configurations. Access is controlled by a series of rules that take into consideration roles and assigned responsibilities. Provides check-in and check-out procedures to control the change process



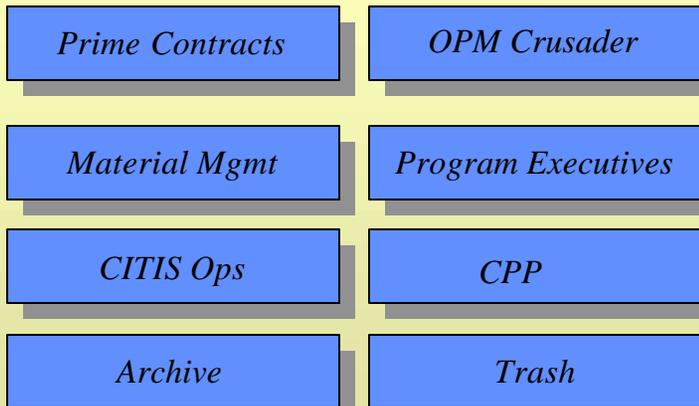
# IDE Vault Architecture (Crusader PD/RR)

Crusader Folder: 00003085  
 CAGE Code: 44114  
 Contract: DAAE30-95-C-0009

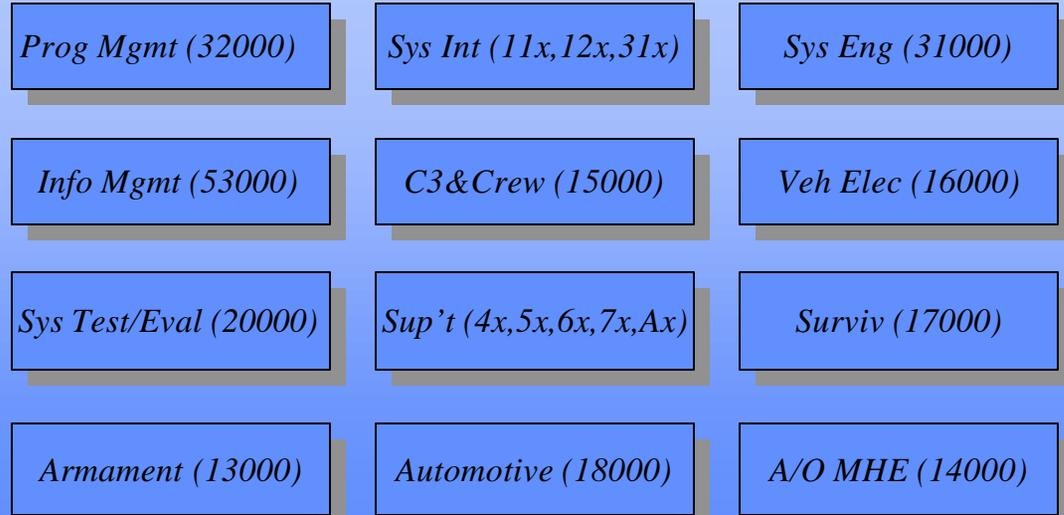
## “Public” Vaults



## “Special” Vaults



## “Work Breakdown Structure” Vaults



## “Business” Vaults

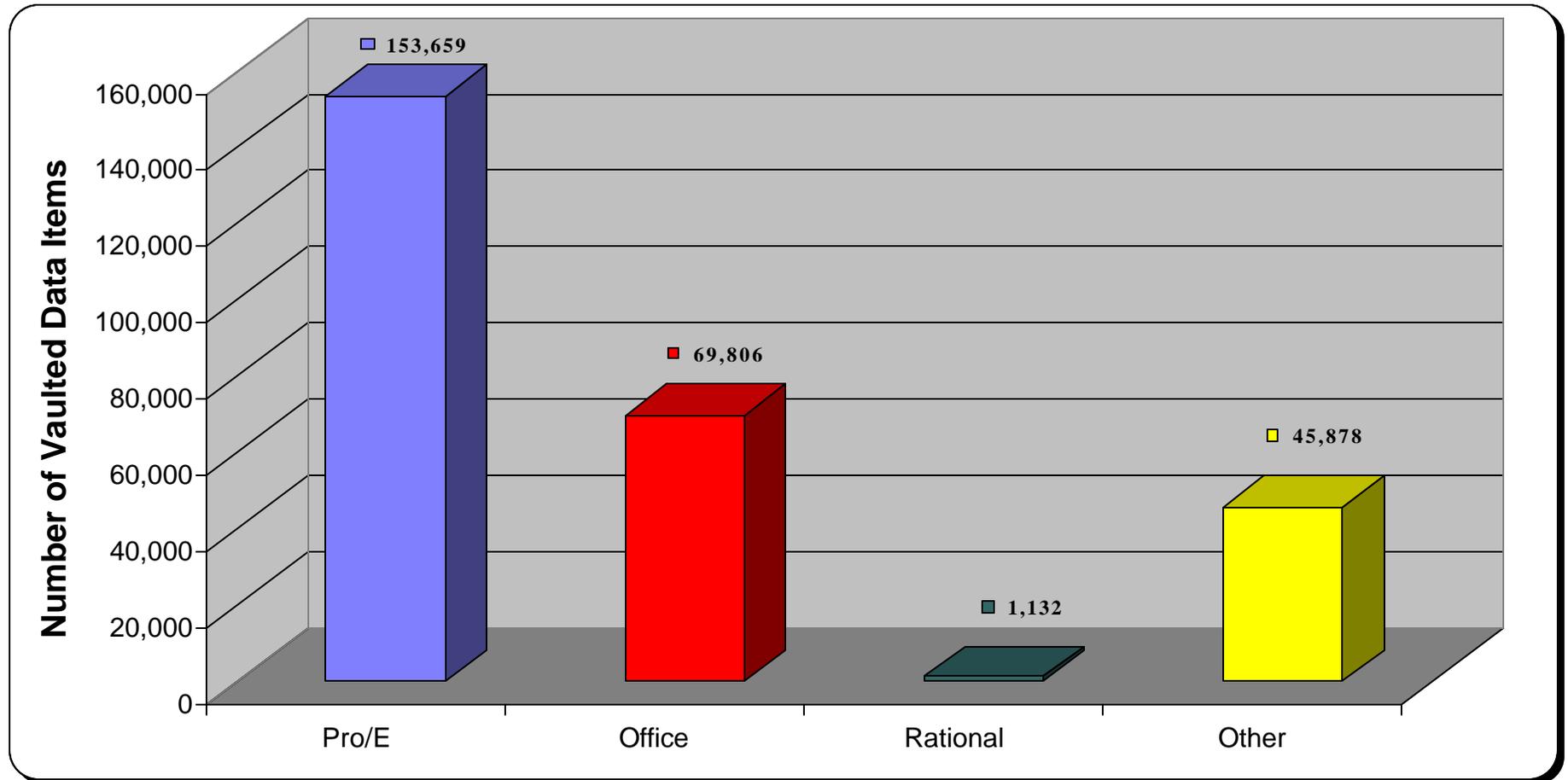


## “Subcontractor WIP” Vaults



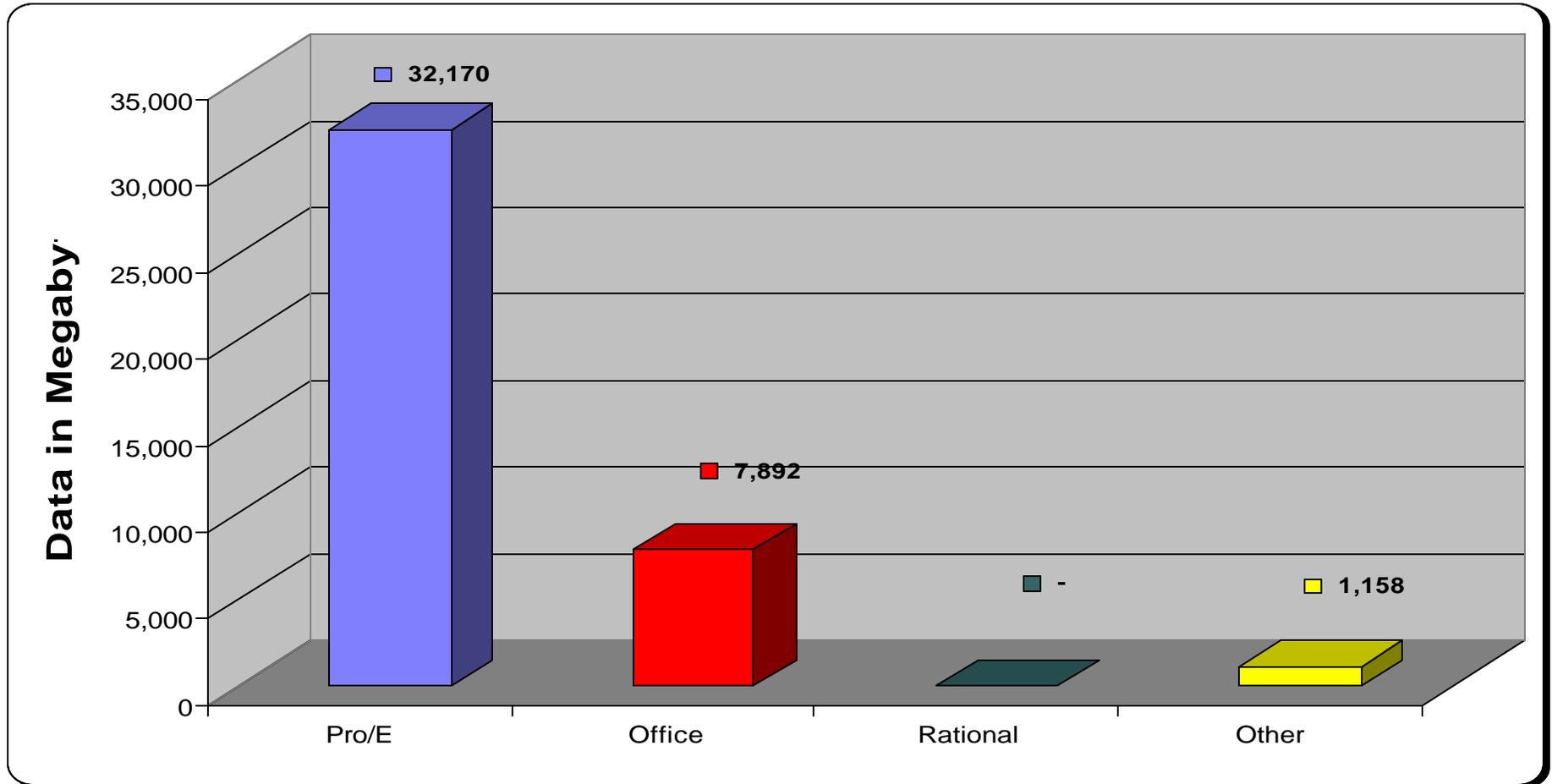
## User “Work Locations”

## IDE Vaulted Data Items by Format



This chart represents the vaulted data items in IDE as of the end of the reporting month. It includes all vault locations across the Crusader Enterprise.

# IDE Vaulted Disk Storage by File Type



This chart represents the vaulted disk storage (in megabytes) of all IDE data broken down into major categories as of the end of the reporting month. It includes all vault locations across the Crusader Enterprise except GSD and ARDEC.



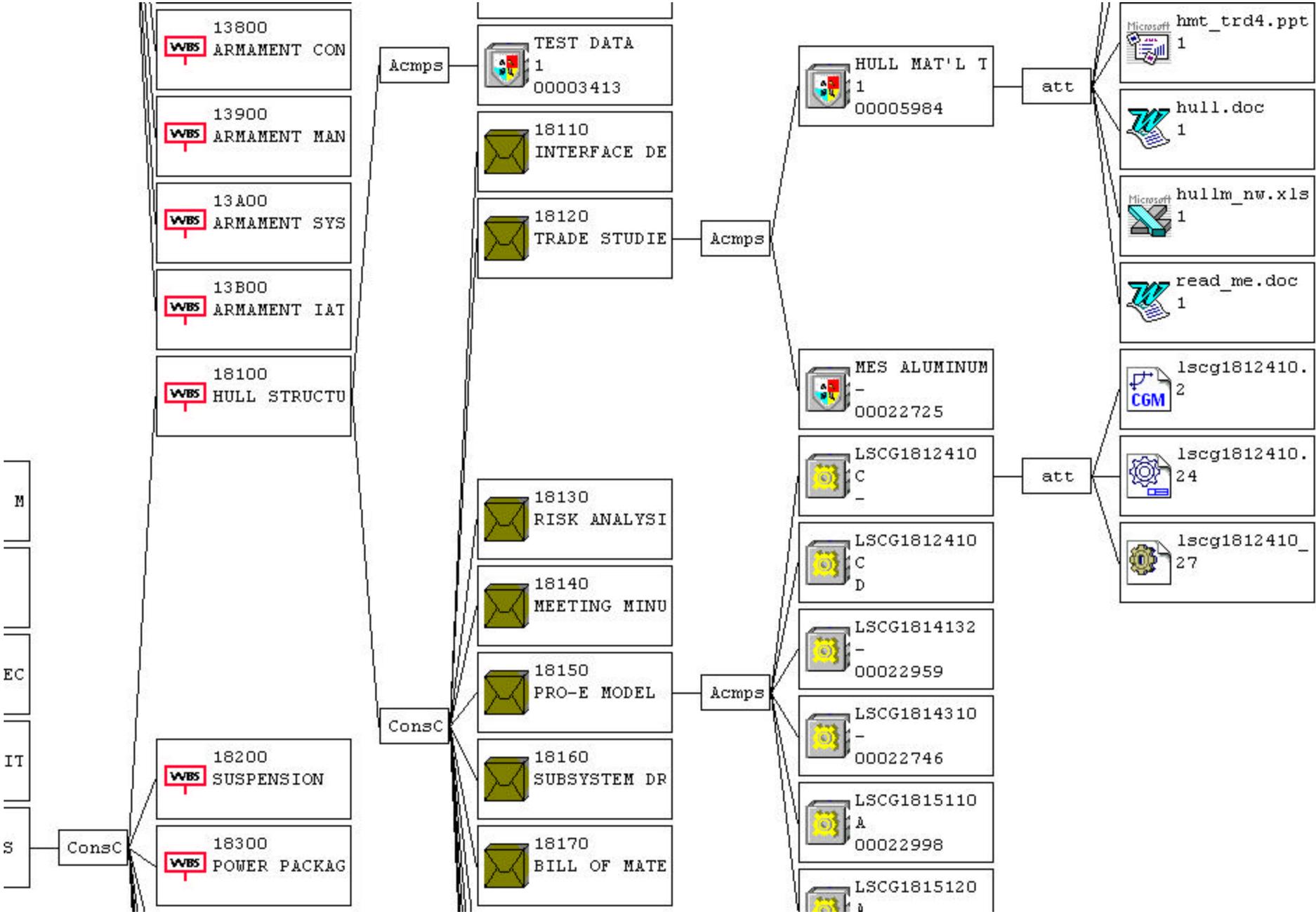
# Crusader Product Structure



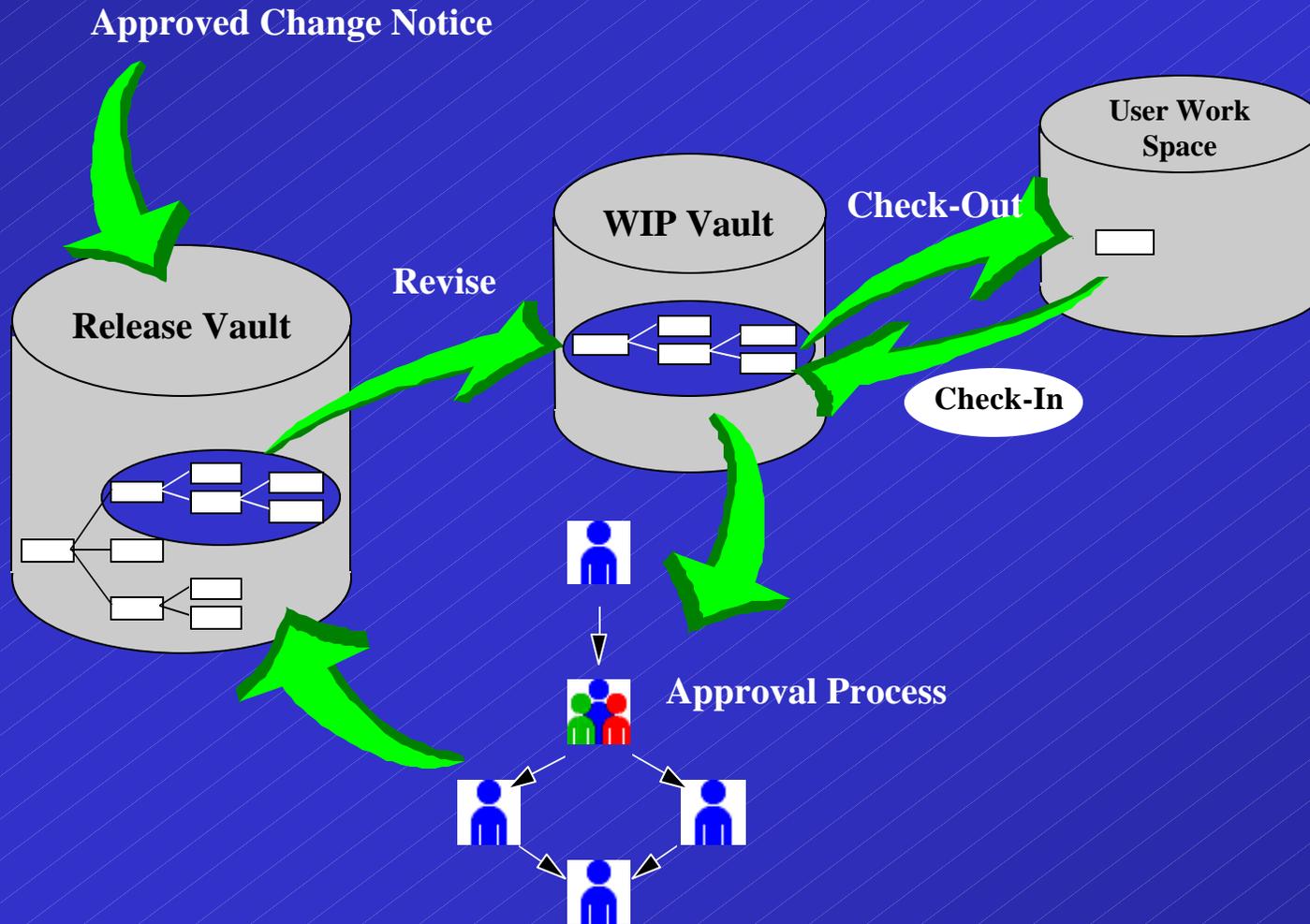
A Product Structure is a hierarchical listing of the assemblies, subassemblies, and parts that comprise a product. A PDM system allows the relevant CAD models, drawings, and documents to be attached to the Product Structure at the appropriate assembly or part. In Crusader, the Product Structure is integrated to the WBS Business Structure, and also linked with the embedded software configuration architecture.

18000, A	18000	AUTOMOTIVES
Consists of (ConsOf)		
18100, A	18100	HULL STRUCTURE SUBSYSTEM
Accomplished By (AcmpsBy)		
TEST DATA, 1, 00003413	---	---
Consists of (ConsOf)		
18110, 1	18100	INTERFACE DEFINITION
18120, 1	18100	TRADE STUDIES
Accomplished By (AcmpsBy)		
HULL MAT'L TRADE, 1, 00005984	---	---
Attaches (att)		
appndcs.xls	---	---
hmat_trd.ppt	---	---
hmt_trd4.ppt	---	---
hull.doc	---	---
hullm_nw.xls	---	---
read_me.doc	---	---
MES ALUMINUM DECISION, -, 00022725	---	---
18130, 1	18100	RISK ANALYSIS
18140, 1	18100	MEETING MINUTES
18150, 1	18100	PRO-E MODEL
Accomplished By (AcmpsBy)		
LSCG1812410, C, -, 00019442	---	---
Attaches (att)		
lscg1812410.cgm	---	---
lscg1812410.drw.41	---	---
lscg1812410_09.prt.64	---	---
LSCG1812410.C.D.00019442	---	---

# Product Data - tree view

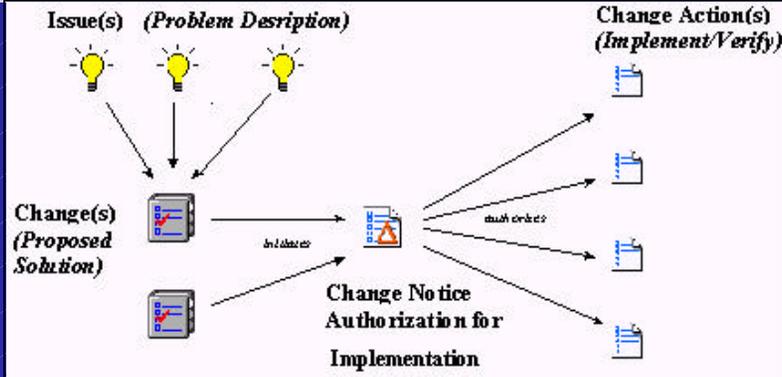


# Life Cycle Management

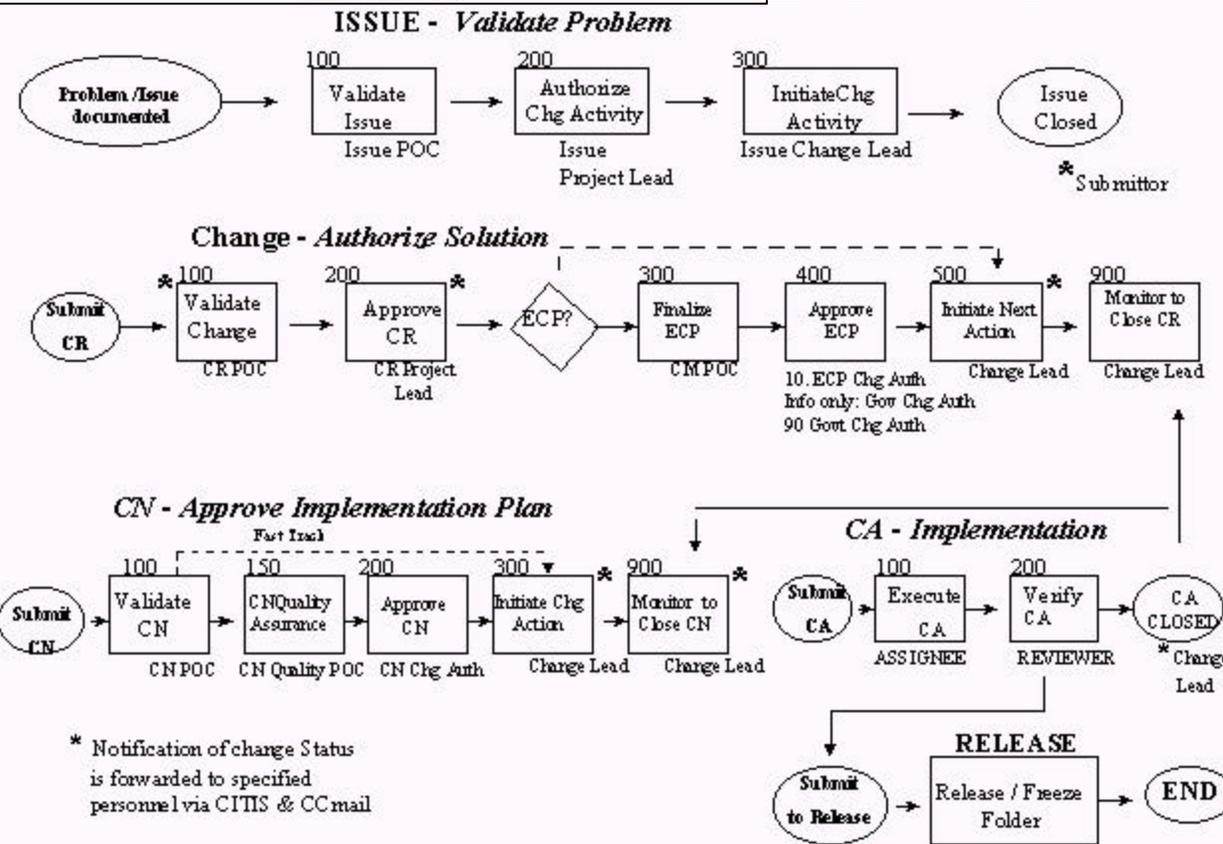




# Change Management Model & Workflow



The change management process systematically assures that product changes are identified, authorized, documented, coordinated, evaluated and approved by an appropriate level of change authority. The CM process then implements these changes into established baselines and provides for verification of correct incorporation.

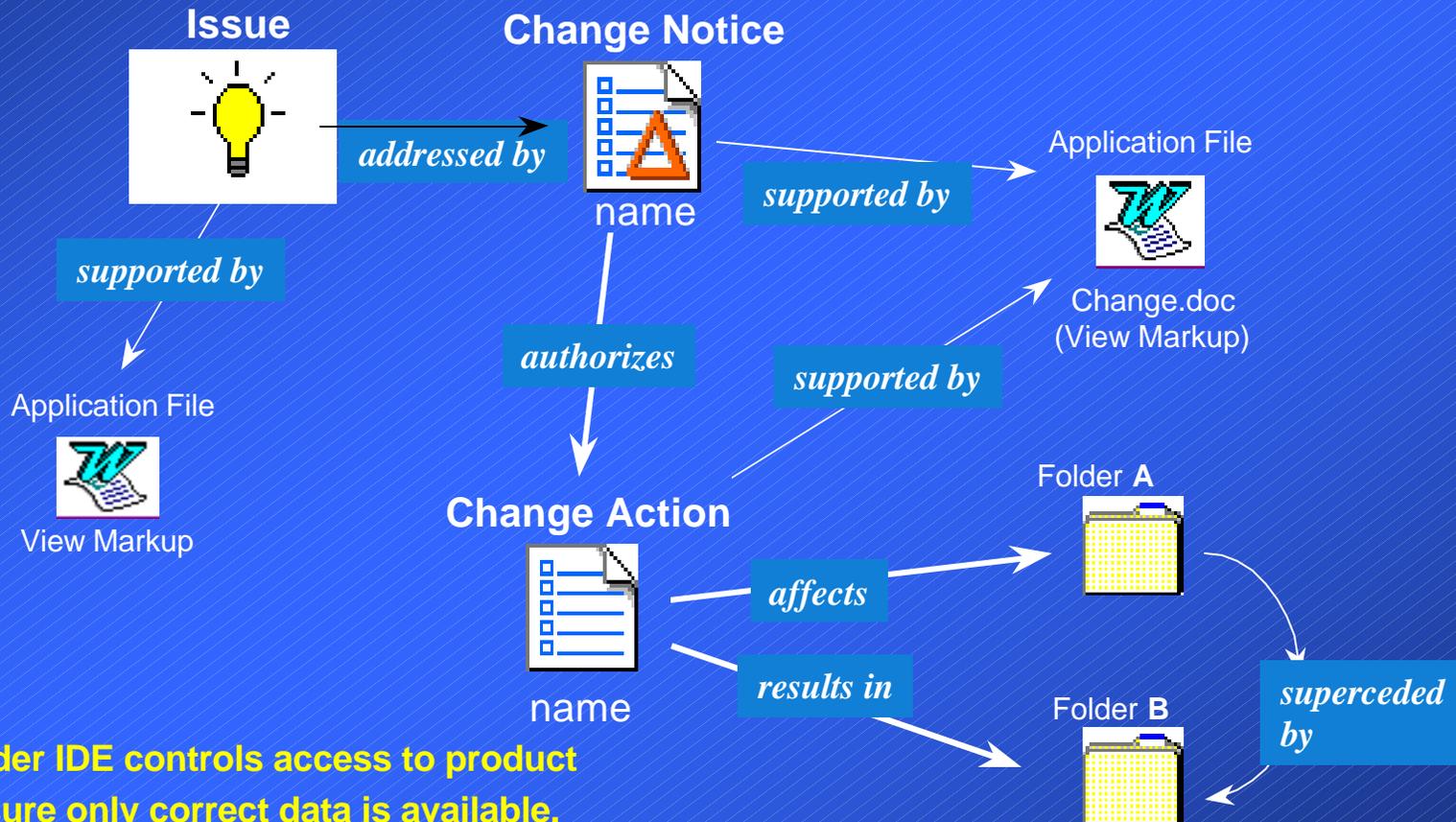


To be effective, change management is the responsibility of the entire Crusader Team, which includes the PDTs, Government, and subcontractors/vendors



# Integrated Configuration Management

Repetitive and ad-hoc business processes can be programmed within the PDM system to automatically move information between process steps. Process cycle time and work status can be monitored and reports generated.

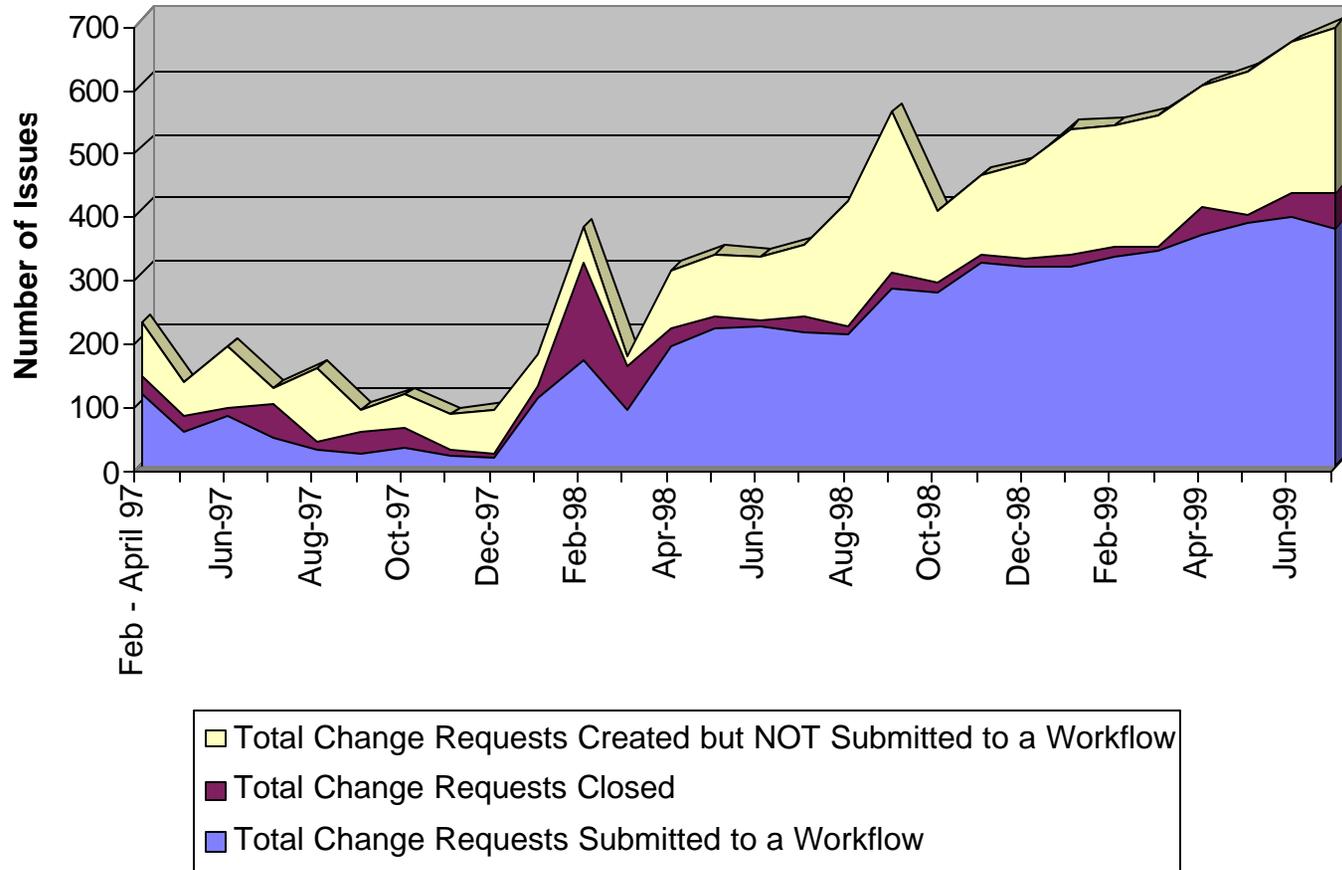


The Crusader IDE controls access to product data to assure only correct data is available.

Maintains version control and history.

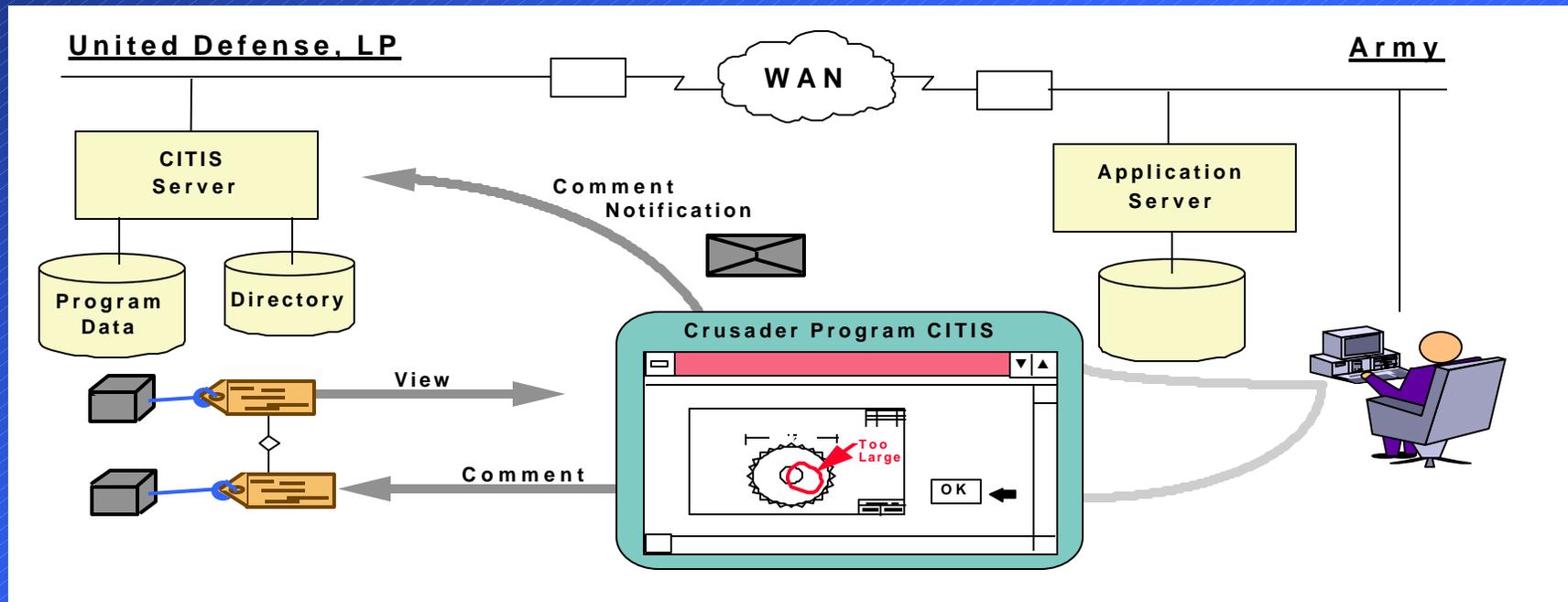
Attachments are routed through Configuration Control evaluation and approval process.

# Number of Crusader Change Requests per Month



**Includes all Crusader Change Requests**

# Workflow and View/Mark-up



**Workflow** - Supports both formal and informal review and approval of data at various stages of maturity

**View/Mark-up** - allows users located on UNIX or PC workstations to view and comment on the information. The comments are tied to the individual and to the revision level of the information and can be tracked as part of a workflow



# Lessons Learned

- Contractor and Government learned to trust each other with WIP Data
- Cost As Independent Variable
- Common Processes
- People are resistant to change





# Benefits to Crusader



- Ability to capture information at the time of its creation
- Ability to manage product and program management structures
- Support for real-time information sharing and work-flow
- Ability to ensure team members had the most current information
- The ability to assign rules regarding information access



# Benefits to Crusader



- Support for electronic notification of changes to program/product information
- Ability to facilitate communication among team members
- Ability to manage information and relationships between information product at different revision levels
- Ability to associate information products to differing versions of product structures with effectivity rules in place



# Benefits to Crusader



- Support for program formal data and configuration management policies
- Support for electronically promoting information products from one state to another/support for the engineering release process
- The ability to track scheduled activities or status of key processes
- The ability to present a single interface to the entirety of the prime contractor and subcontractors' data creation activities



# Planned



- Integration to BaaN
- Creation of an Integrated Life Cycle Support (ILCS) System
- Expansion to 2,500 users
- Integration with JCALS Workflow Manager
- Productization of Metaphase customizations
- Expansion of targeted interfaces
- Integration with PEO GCSS programs
  - PM TMAS, M829E3, Alliant Techsystems
  - PM ARMS, SADARM, Aerojet



# The IDE Supports the Entire Crusader Development



## INTEGRATED DATA ENVIRONMENT (IDE)



### IDE Solutions

