

INSTRUMENTED CONNECTORS

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Instrumented Connectors

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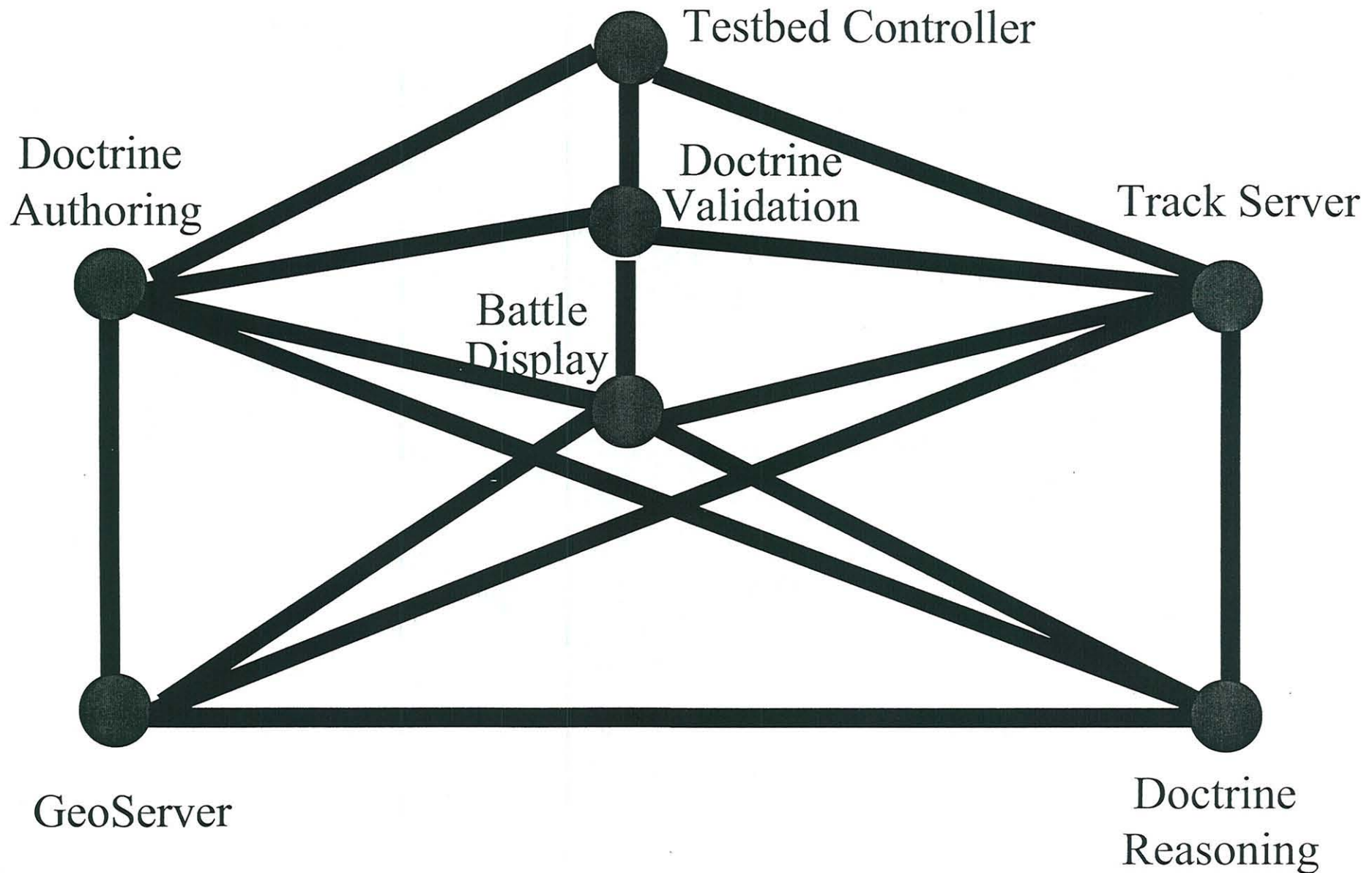
ISI

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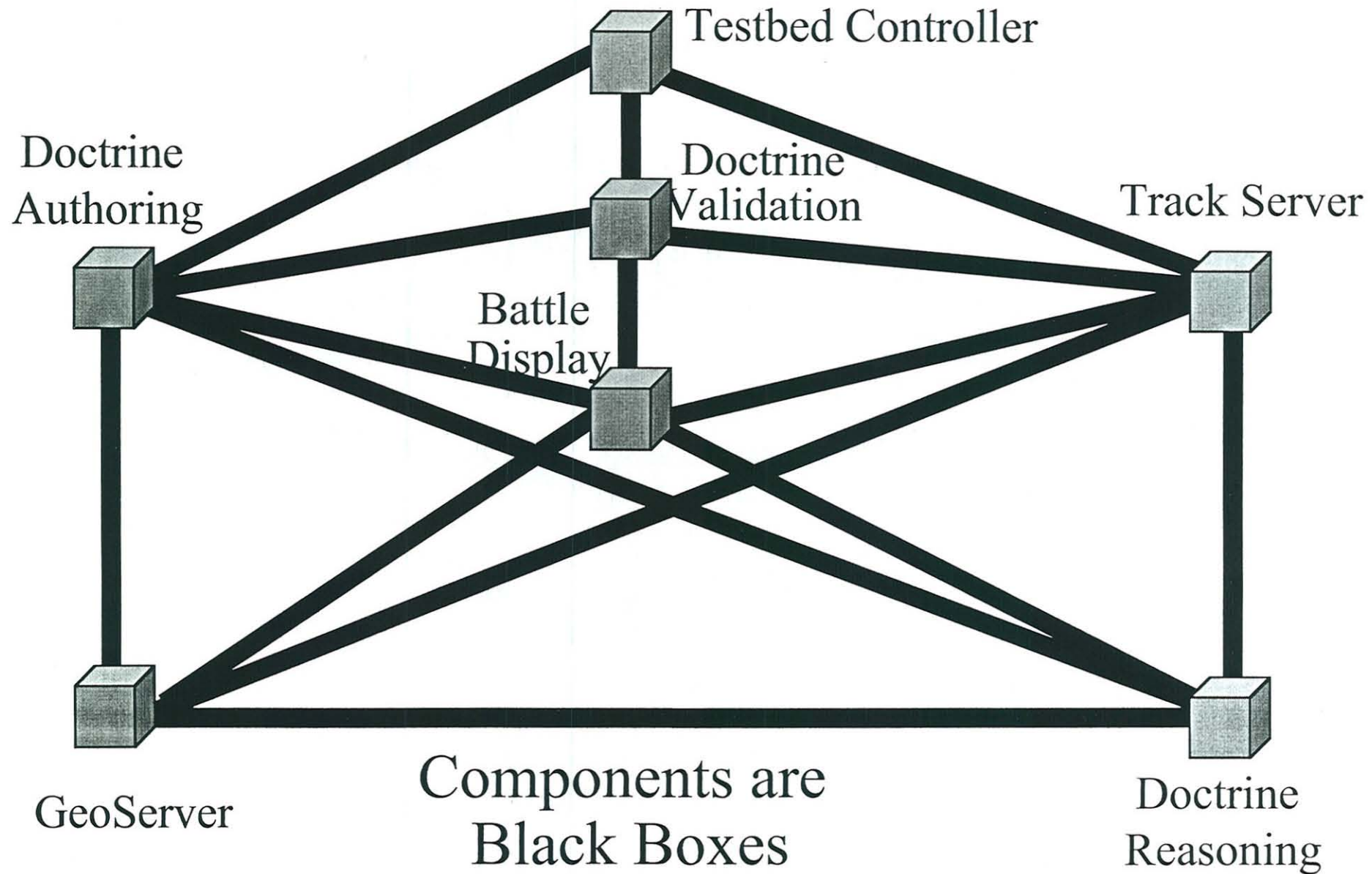
How Do You Debug an Architecture?

- Observe
 - What
 - Control Flow
 - Intermediate Values
 - How
 - Traces
 - Breakpoints
 - Single Step
- Inject Faults
 - Component
 - Architectural
 - Environmental

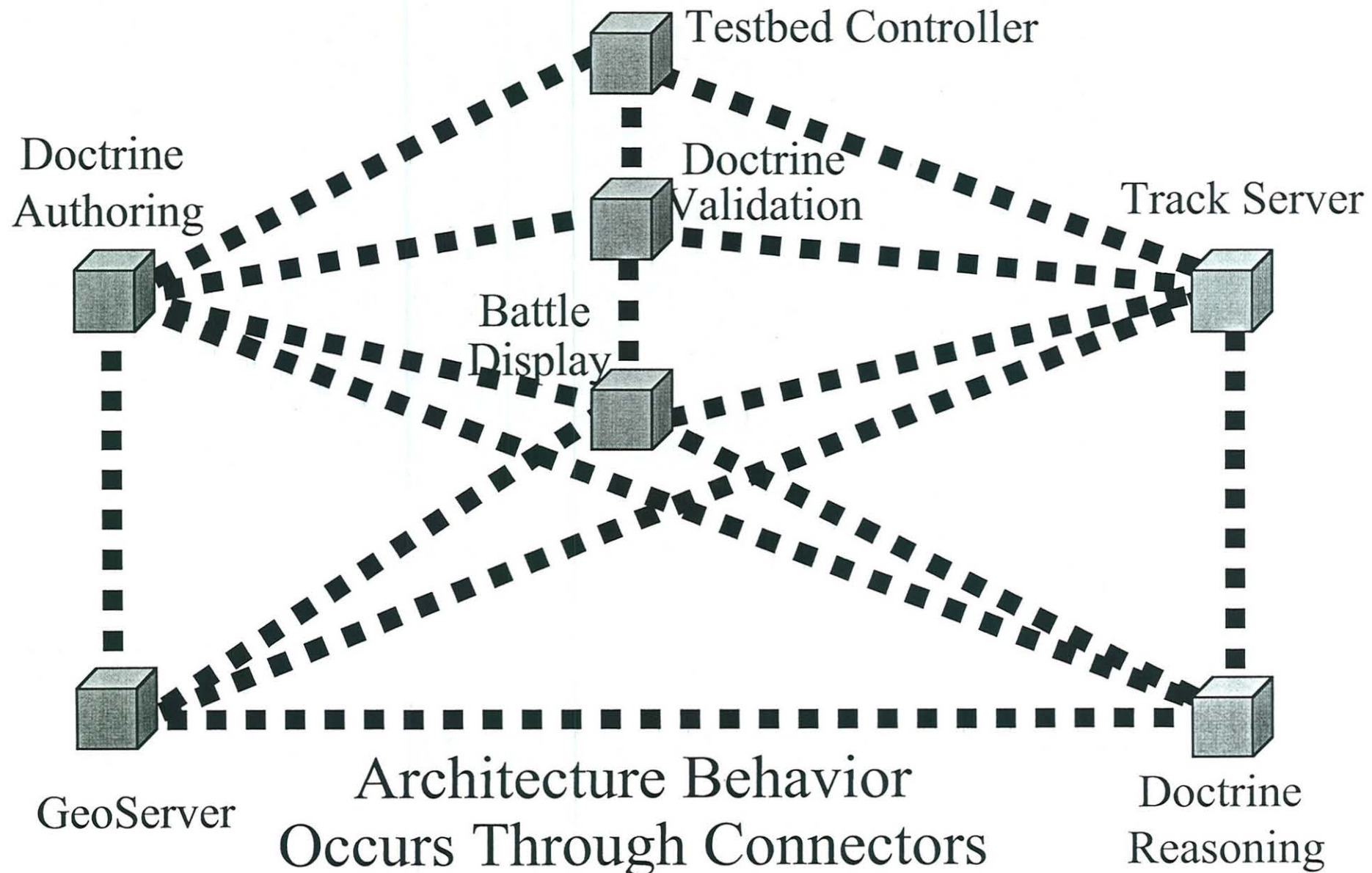
Software Architectures



Software Architectures

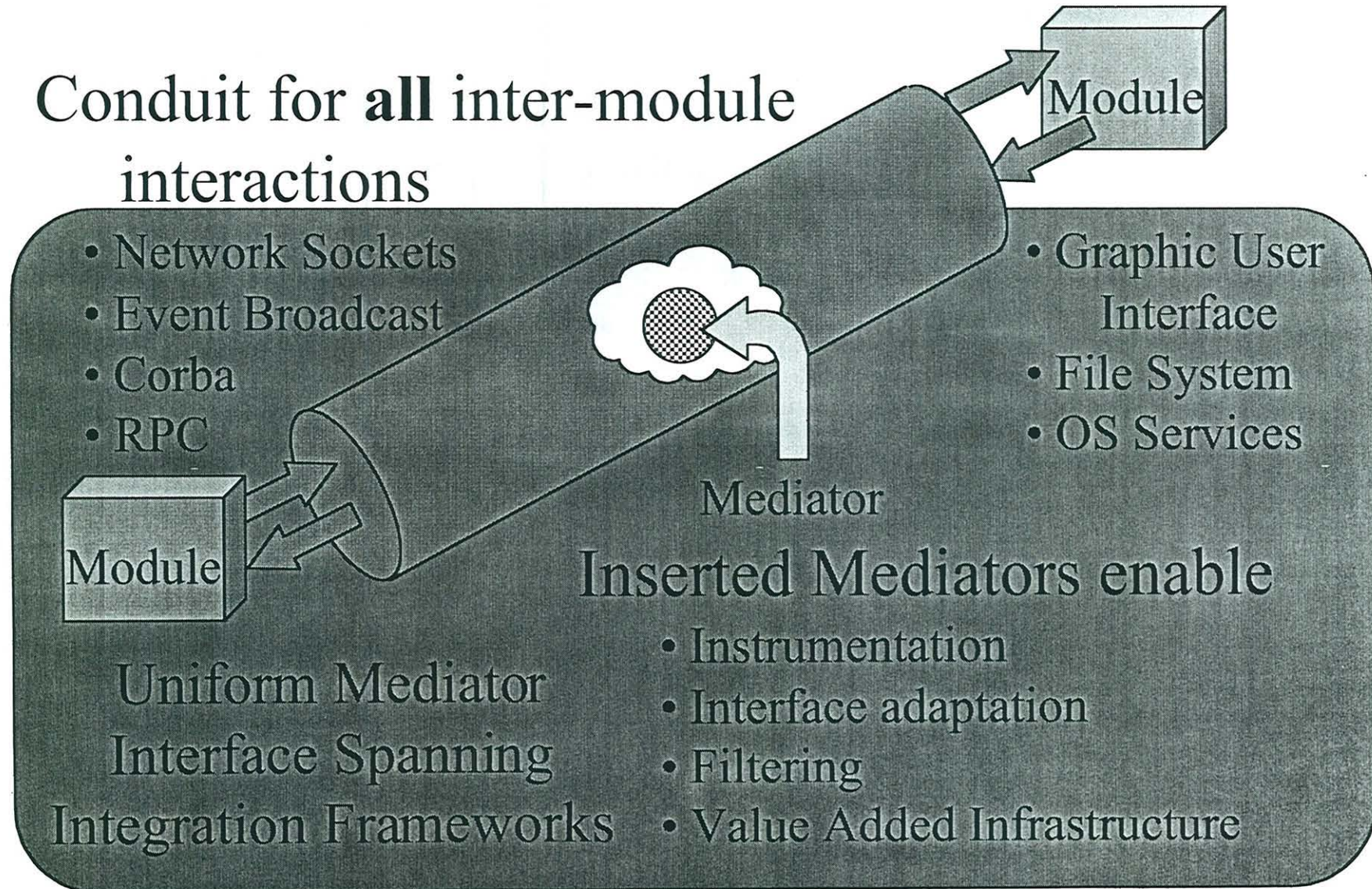


Software Architectures



Instrumented Connectors

Conduit for **all** inter-module interactions



Architecture Visibility

NEWCASTLE

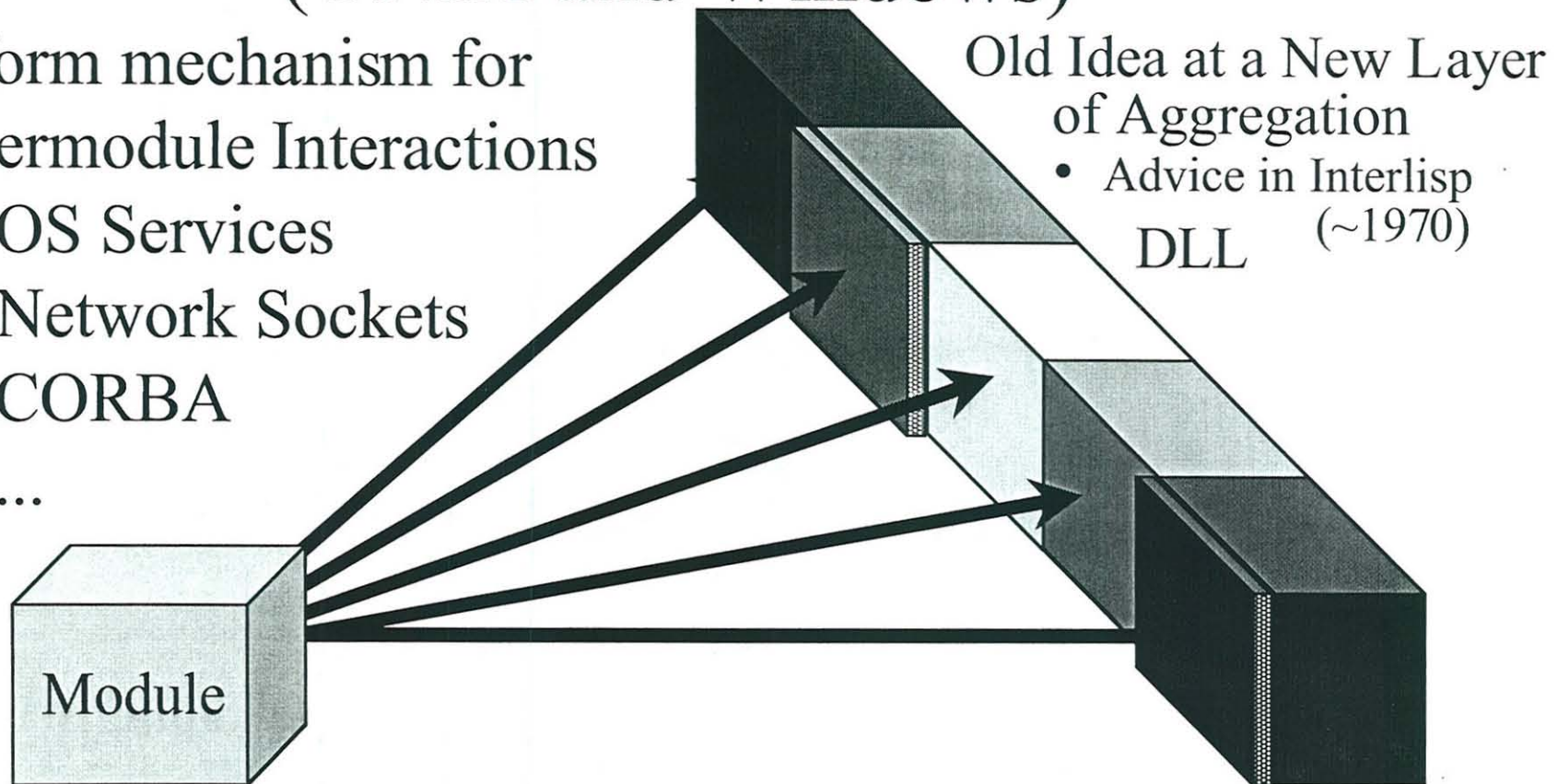
- Program Application Interface (API)
- Operating System Interface
- Connector (Services/Communications) Interface
- Graphic User Interface

Dynamic Link Library(DLL)

(UNIX and Windows)

Uniform mechanism for
Intermodule Interactions

- OS Services
- Network Sockets
- CORBA
- ...



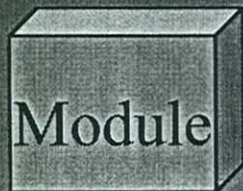
- Mediator added between Module & DLL component
- Mediator maintains DLL component API

Instrumented Connectors

Status

Conduit for **all** inter-module interactions

- ✓ • Network Sockets
- Event Broadcast
- Corba
- RPC



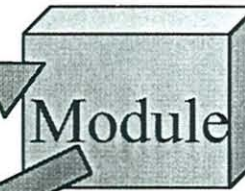
Uniform Mediator
Interface Spanning
Integration Frameworks



Mediator

Inserted Mediators enable

- Instrumentation
- Interface adaptation
- Filtering
- Value Added Infrastructure



- ✓ • Graphic User Interface
- ✓ • File System
- ✓ • OS Services

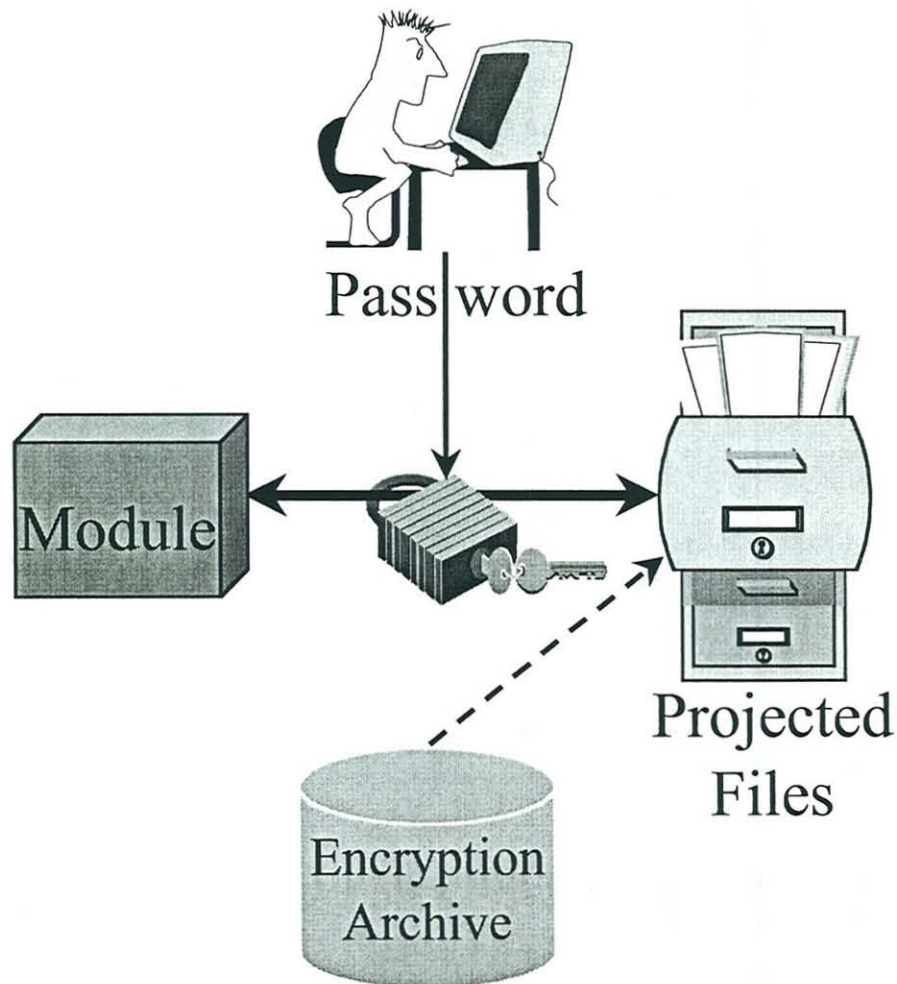
How can you use Architecture Mediators

Demo

- Instrument Architecture
 - Logging and Interactive Probes
 - C++ metrics
 - 007 spy
- Extend Architecture Infrastructure
 - Encryption Archive
 - Virtual File System
- Integrate COTS products
 - Eudora/Emacs
 - Survey Administration
- Extend COTS products
 - PowerPoint: subject of my second talk
- Restrict COTS products
 - Safe Execution Environments



Encryption Archive

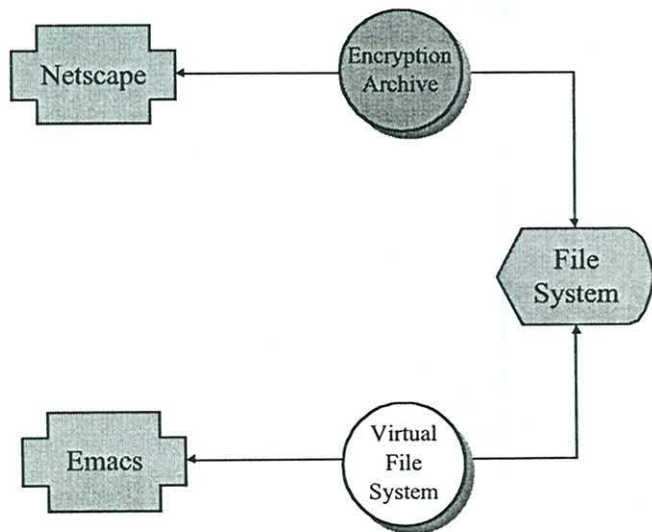


- Password Protected Access
 - Existence projected into target directory
 - Decrypted upon access
- Hidden Persistent Storage
 - Encrypted file contents
 - Encrypted file name

Architecture

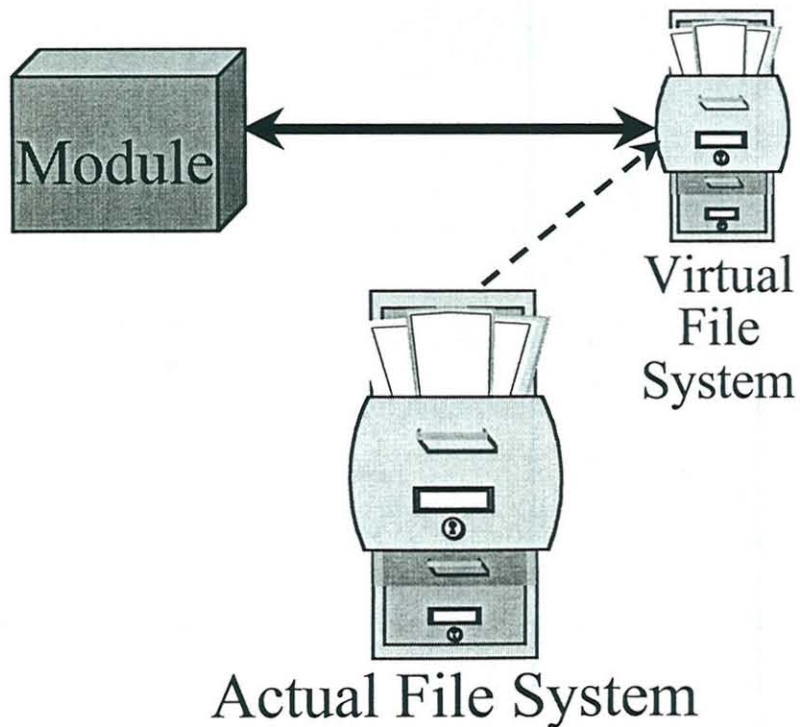
Instrumentation Controller

PowerPoint GUI:



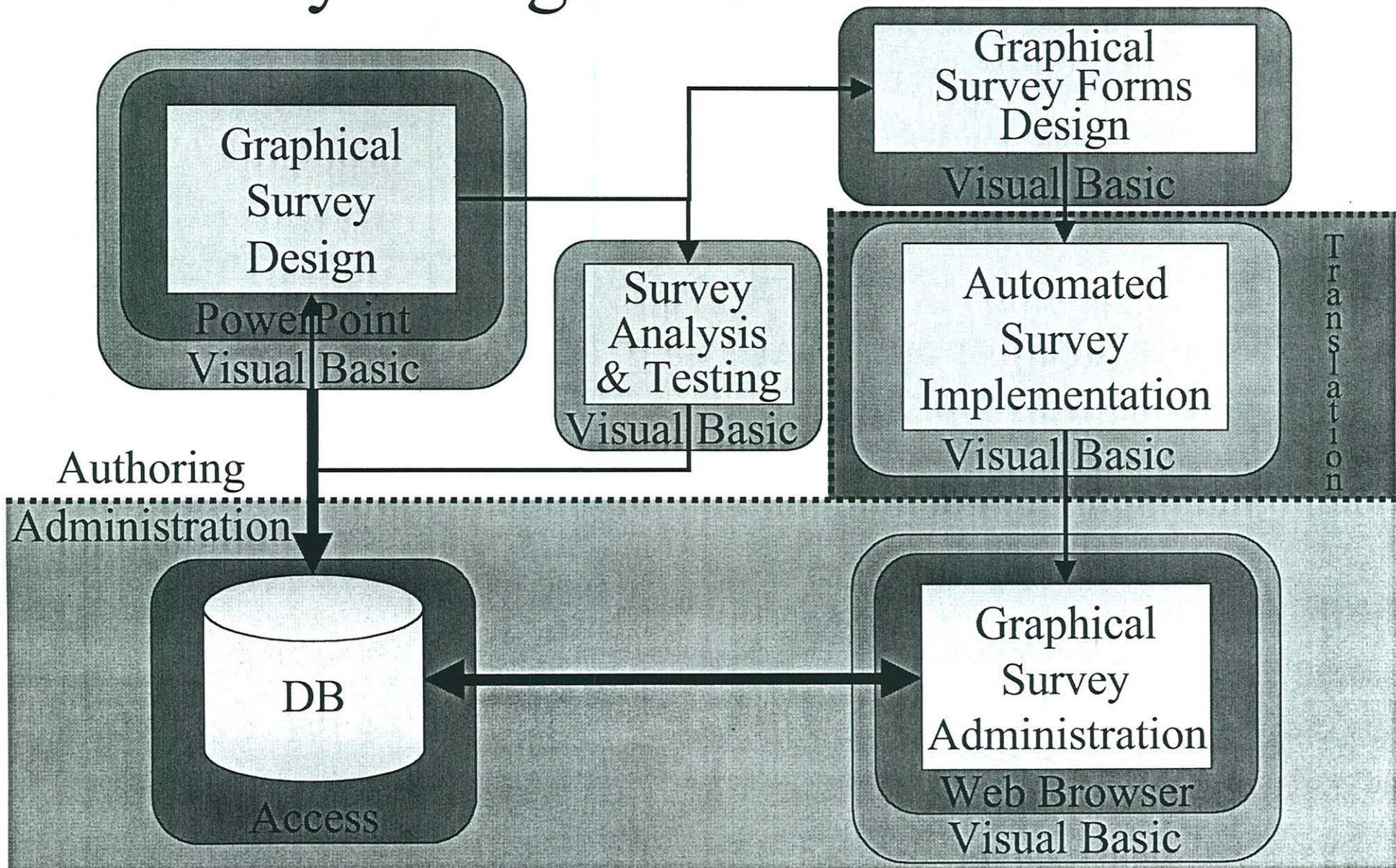
- Instrumentation Specification
 - Instrumentation Shape attached to connector
 - Form specifies Instrumentation
- Instrumentation Installation
 - Selected from mouse menu
 - Installation affects running processes
 - Color indicates installation state

Virtual File System

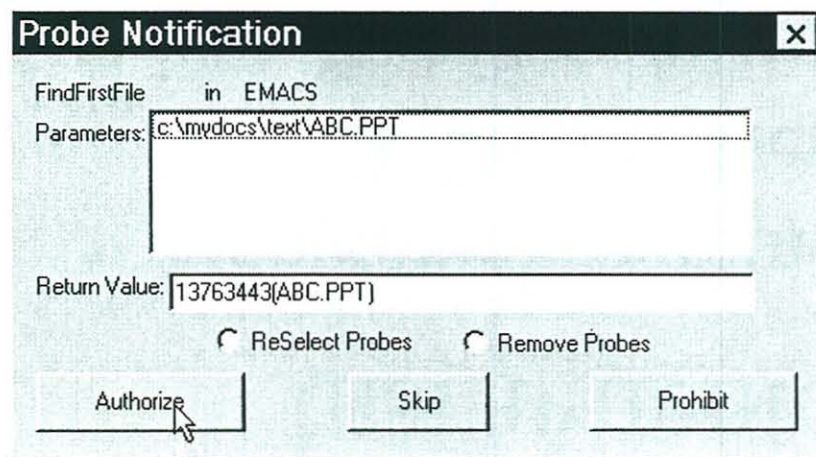


- Defines file system subset available to Program
- Features:
 - Hidden Directories/Files
 - Existence Undetectable
 - Virtual Directories/Files
 - Projected from elsewhere
 - Access Restrictions
 - By Directory, File, Pattern

COTS Infrastructure for Survey Design and Administration



Interactive Probes

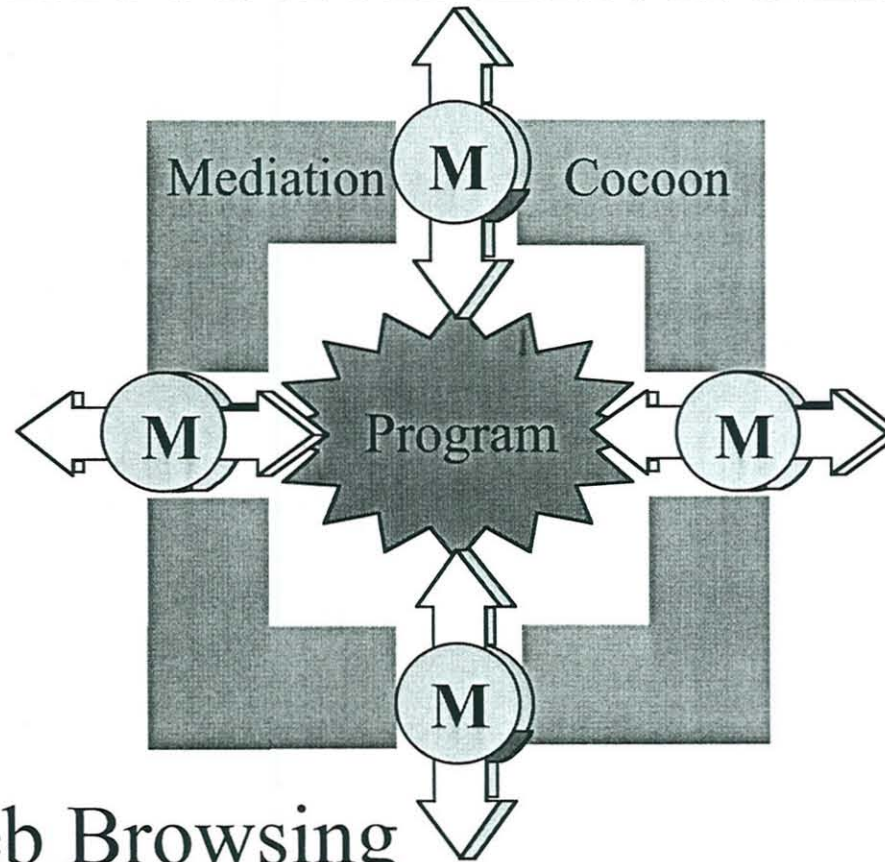


- Interactive Probe Selection
 - Process to Instrument
 - Interfaces to Inspect
- Interactive Probe Events
 - Displays interface arguments
 - Return Value (if applicable)
 - User may
 - Authorize/Prohibit request
 - Change Arguments
 - Change Return Value
 - Stop further Probes
 - Reselect Probes

Non-ByPassable NT Instrumented Connectors

- Malicious Program could not
ByPass or Remove
installed Instrumented Connectors
- Target
 - Security Applications
 - Sandboxing Programs
- Delivery: Nov. 1998
- Non-Non-ByPassable Instrumented Connectors
Available Now

Safe Execution Environments



- Safe Web Browsing
- Safe Agent Execution
- Safe Download Execution

