Instrumented Connectors

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Software Architectures

Architecture Connectors

Conduit for all inter-module interactions

- Network Sockets
- Event Broadcast
- CORBA
- RPC
- Graphic User Interface
- File System
- OS Services

Inserted Mediators enable

- Interface Spanning
- Integration Frameworks
- Value Added Infrastructure
Semi-Transparent Interfaces

- Transparent API
  - Useable by Unmodified Applications
- Augmented API
  - Provides Value-Added Capabilities
  - Sources of Control
    - Static "Resource" Configuration Files
    - Dynamic Third-Party Controller

Caching Connector

Legend
- Transparent API
- Augmented API
Caching Connector
Augmented API

• What to Cache
  – Matching Client Request with Server Response

• Cache Integrity
  – Is a Cached object still valid
    • Always
    • Time Duration or Observable Event
    • Query to Determine

• Cache Retention Policy
  – Flush Least Recently Used
  – Retain/Flush Selector

• Cache Allocation
  – Initial size
  – Dynamic Growth

Augmented Infrastructure
Through Indirect Invocation
Architecture Infrastructure for Inter-Module Interaction

- Provide infrastructure for managing and manipulating inter-module connectors
  - (All inter-module interactions occur through these connectors)
  - dynamic probes - instrument & monitor behavior
  - redirect or alter messages, spawn reactive processes
  - move events from one integration space to another
- Allow others to provide middle-ware services based on this infrastructure

Integration Paradigms

- Old Style - CoResident
  - Shared Memory (including global variables)
  - Direct Subroutine Calls

- New Style - Distributed & Autonomous
  - Object-Oriented (ODABA, OLE2)
  - Event-Based (Broadcast Message Server)
  - RPC
  - CORBA
  - Protocol stacks
Architecture Connectors

Conduit for all inter-module interactions

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Inserted Mediators enable
- Instrumentation
- Interface adaptation
- Filtering
- Value Added Infrastructure

Dynamic Link Library (DLL)
(UNIX and Windows)

Uniform mechanism for Intermodule Interactions
- OS Services
- Network Sockets
- CORBA
- ...
Dynamic Link Library (DLL)
(UNIX and Windows)

Uniform mechanism for Intermodule Interactions
- OS Services
- Network Sockets
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- ...

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

Architecture Connectors
Status
Conduit for all inter-module interactions

- Network Sockets
- Event Broadcast
- Corba
- RPC
- ...

Uniform Mediator
Interface Spanning
Integration Frameworks

Inserted Mediators enable
- Instrumentation
- Interface adaptation
- Filtering
- Value Added Infrastructure
Instrumented Connector Demos

- Network Sockets (UNIX)
  - Architecture Animator
  - Architecture Driver
- Graphic User Interface (Windows)
  - Compose Eudora Replies in EMACS
- File System (Windows)
  - Encryption Archive

Example Architecture Tools
NSWC GeoServer

- Calculate which targets are in which regions
- Determine Response
  - Operator Alerts
  - ID Targets
  - Issue Engagement Orders
- Determine Radar Coverage Adequacy

GeoServer Architecture
Self Guided Demonstration Service
Step 3: Novice Plays Back Scenario

Playback Modes:
- Single Step
- Auto Advance
- Exploration

Annotated Scenario