Application Servers
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Session 8 – Sub-Topic Presentation
CORBA 3 Component-Based Computing Environments

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Agenda

- CORBA 3 OMA Services
- CORBA 3 CCM
- CORBA 3 Environments
- Enterprise Component Development with CORBA 3
- Designing CORBA 3 Component-Based Architectures
Application Servers Architectures

- Application Servers for Enhanced HTML (traditional)
  - a.k.a., Page-Based Application Servers
  - Mostly Used to Support Standalone Web Applications
- New Generation Page-Based Script-Oriented App. Servers
  - First Generation Extensions (e.g., Microsoft IIS with COM+/ASP)
  - Servlet/JSP Environments
  - XSP Environment
  - Can now be used as front-end to enterprise applications
  - Hybrid development environments
- Distributed Object Computing Platforms
  - Provide an infrastructure for distributed communications enabling
  - Still need to merge traditional web-oriented computing with object computing
- Object Management Architectures
  - DOC Platform + APIs to reusable services and facilities
  - OMAs + Component Models -> J2EE, CCM, DNA

Part I

CORBA 3 OMA Services Detailed

Also See:

and
CORBA OMA Services

- Activation Services
  - CORBA POA
  - CORBA Lifecycle
- Naming Service
  - CosNaming
- Directory and Trading Services
  - CosTrading
- Object Transaction Service (OTS)*
- Messaging Services*
  - CORBA Event Service
  - CORBA Notification Service
- Security Service*

Transaction Service at Work

- Create list from catalog
- Check for inventory
- Complete order list

- Begin
  - Update inventory
  - Update customer account
- Commit
  - Transaction process

Order supplies

Oracle

Application Server(s)

CICS
CORBA OTS and Messaging Services

- CORBA Transaction Service
  - Available as an OMG specification
  - Implementations: Orbacus OTS, Encina++, OrbixOTM, etc.
  - Specification used to derive JTS described in part II of this slide set (implements Java mapping of the CORBA OTS 1.1)

- CORBA Messaging Service
  - Based on CosEvents and CosNotification Services
  - CORBA 3 adds Filters, Quality of Service, and Structured Events
    - Structured events promote lightweight notification
  - Implementations: TAO 1.1
  - Contenders: IBM MQSeries, Microsoft Message Queue Server, TIBCO ETX, and PeerLogic Inc. PIPES

CORBA 3 Structured Events
CORBA Services - Security

CORBA Security Reference Model

Client

ORB(s)

Object Implementation

Request

Client-side and target-side security on invocations, security association, access control, message protection and audit.
**CORBA Security Architecture**

**TAO’s SSLIOP (IIOP over SSL)**

**Pluggable Protocol**

- Protocol must be loaded
  
  ```
  dynamic SSLIOP_Factory Service_Object *
  
  TAO_SSLIOP: make_TAO_SSLIOP_Protocol_Factory y() ""
    static Resource_Factory "- ORBProtocolFactory SSLIOP_Factory"
  ```

- SSLIOP enforces integrity, confidentiality, and secure invocation for client requests
- X.509 certificate-based request authorization can also be implemented programmatically via SSLIOP
CORBA Web-Enabling
(Second Generation Client/Server Architectures)

- Need Domain Boundary Controllers (e.g., www.xtradyne.com) until HTTP-NG, or CORBA 3 firewall specification get implemented

CORBA Web-Enabling
(Gatekeeper, Wonderwall, etc.)

- Application Servers include IIOP gateway products
- CORBA 3 includes a firewall spec. for IIOP support
Part II

**CORBA 3’s CORBAComponents Container (CCM) Environment**

*See Sub-Topic Presentation on “CORBA 3 Introduction”*

*Also See John Siegel’s*
  
  **CORBA 3 Fundamentals and Programming**
  
  **Quick CORBA 3**

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**CCM v.s. EJB**

- EJBs are reusable into the CCM platform
- CCM supports component assembly
- CCM is programming language independent and tailored towards legacy application connectivity
- EJBs are not components
- EJB servers provide an object platform and manage containers that support bean deployment with an abstraction to the developer concerning persistence, transaction, and security management
CCM Component Development

- Component Declaration
  - IDL 3 compiler generates stubs and metadata for components

- Component Implementation
  - Component implementations (structure and state) and homes are declared using CIDL (declarative language)
  - Developer provides implementation business logic

- Component Packaging
  - Archive that contains implementations, deployment info, etc.

- Component Assembly
  - Used to deploy a set of components that may need to be linked

- Component Deployment and Installation
  - System generates all connections for component assemblies

- Component Instance Activation
  - Retrieve Home and/or Component reference to invoke business methods

Part III

CORBA 3 Environments
CORBA 3 Environments

See:

http://ditec.um.es/~dsevilla/ccm/

Implementations (mostly open source):

- GOAL Group OpenCCM - http://corbaweb.lifl.fr/OpenCCM/
- ExoLab.org OpenCCM - http://openccm.exolab.org/
- iCMG K2-CCM (C++) - K2-CCM
- MICO/E (Eiffel ORB) - MicoCCM page
- JavaCCM - http://dog.team.free.fr/details_javaccm.html
- Other companies: Eurescom/GMD/Humboldt U, Computational Physics/Photon Research, Sprint, ONE, Siemens, Sourceforge MI-3 (“Mission Impossible 3”) and CIF projects (http://sourceforge.net/projects/cif/), etc.

Generic CORBA 3 Platform
Part IV

Conclusion
Summary

- CORBA OTS is implemented in several CORBA products and provides the basic standard on which J2EE JTS implementations are based.
- CORBA Messaging Event and Notification services are still being developed to allow for efficient filtering of messages currently unsupported in mainstream solutions.
- Interoperable secure CORBA implementations are complex to implement, and mainstream products only provide partial security solutions.
- CORBA 3’s added-value is in the area of Internet Integration, Quality of Service and CCM support.
- Only a few open source and commercial implementation of CORBA 3 are available today.