OpenCCM: The Open CORBA Components Platform

3rd ObjectWeb Conference
20th November 2003, INRIA Rocquencourt, France

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Outline

- CORBA Components specification
- OpenCCM goals
- OpenCCM main features
  - The open production tool chain
  - The open packaging and assembling tool chain
  - The open distributed deployment infrastructure
  - The open container runtime framework
  - The open management framework
- OpenCCM supported environments
- OpenCCM perspectives
CORBA Components Specification

- Defined by the Object Management Group (OMG)
- A set of concepts, notations, and APIs to
  - Design
  - Implement
  - Package
  - Assemble
  - Deploy
  - Execute
distributed, heterogeneous, secure, transactional, server-side scalable, CORBA component-based applications

OpenCCM Goals

- Federate a world-wide community around CORBA component-based middleware and applications
  - Users, developers, and contributors
  - Industrial and academic R&D
    - THALES, Cadena from Kansas University, …
- Provide the Open CORBA Components platform
  - Reference implementation
  - ORB product independent
  - Modular, extensible and adaptable for building CCM++
- See at http://openccm.objectweb.org
  - Open source licensed under LGPL
  - Hosted by the ObjectWeb consortium
Main Features

→ The open production tool chain
  ➢ Design, define, implement, and compile CORBA components

→ The open packaging and assembling tool chain
  ➢ Package and assemble CORBA components

→ The open distributed deployment infrastructure
  ➢ Deploy, install, instantiate, and configure CORBA components

→ The open container runtime framework
  ➢ Host and execute CORBA components

→ The open management framework
  ➢ Discover, introspect, manage, monitor and reconfigure CORBA components

The Open Production Tool Chain

→ Front-end compilers for
  ➢ OMG Interface Definition Language 3.0 (OMG IDL)
  ➢ OMG Persistent State Definition Language (OMG PSS)
  ➢ OMG Component Implementation Definition Language (OMG CIDL)
  ➢ UML Profile for CORBA Components

→ Middle-end repository
  ➢ Abstract Syntax Tree (AST)
  ➢ CORBA 3.0.x Interface Repository

→ Back-end generators for
  ➢ Client and server equivalent OMG IDL 2.x mapping
  ➢ CIDL related Java container code
  ➢ PSDL related Java interfaces and implementations
  ➢ Java templates for implementing components
  ➢ OMG IDL 3.0, PSDL, CIDL, and UML pretty-printers

→ To do
  ➢ Generation of XML CCD, CSD, and CPF from OMG CIDL
The Open Production Tool Chain
Modular & Extensible Architecture

OpenCCM Interface Repository

XMI UML Front end
OMG IDL/PSDL/CIDL Front end
Other Front ends

XMI UML Generator
IDL/PSDL/CIDL Generators
Container code Generators
XML CCD Generator
Component Implementation Generators
Other generators

IDE

OMG IDL/PSDL/CIDL
Front end

XML CORBA Component descriptors
Implementation templates
Other Files

OMG IDL/PSDL/CIDL
Front end

Other Notations

Cadena from Kansas University = IDE Eclipse + OpenCCM
The Open Packaging and Assembling Tool Chain

➤ A stand-one packaging and assembling tool
➤ All CCM XML descriptors and ZIP archives supported

The Open Packaging and Assembling Tool Chain

➤ A software framework for building customized packaging and assembling tools

Zeus = XML DTD → Java Data classes
Apollon = XML DTD → Java GUI classes

➤ Users can build their own P&A tool
The Open Distributed Deployment Infrastructure

- **Main supported features**
  - All CCM XML descriptors and ZIP archives
  - CosNaming, CosTrading, and HomeFinder services
  - All Components::Deployment API

- **Component-based deployment infrastructure**
  - IST COACH Distributed Computing Infrastructure (DCI)
  - Possible injection of non functional properties as persistency, transactions, security, etc. via containers

- **Transactional distributed deployment**
  - Rollback deployment when failures
Permanent Components

Node_1

DCIManager

NodeManager

Node_2

NodeManager

NodeManager

Node_3

CORBA Middleware

COACH Middleware

CORBA Assembly Installation

Node_1

Assigned Assembly

DCIManager

NodeManager

NodeManager

NodeManager

Node_2

Node_3

Installed Assembly

XML+Code

COACH Middleware
CORBA Component Configuration & Interconnection

DCIManager = a deployment domain
  Provides AssemblyFactory and HomeFinder

NodeManager = a virtual host
  Provides ComponentInstallation and ServerActivator

ComponentServerManager = a component server
  Provides ComponentServer

ContainerManager = a container
  Provides Container

AssemblyManager = an assembly deployment controller
  Provides Assembly

Each component provides other ports for management and supervision purposes
The Open Container Runtime Framework

- Built on top of CORBA 2.4
- Scripts to start / stop CORBA services
  - CosNaming, CosTrading, and CosTransactions
- Runtime library for session components
  - Set of classes inherited by generated container code
- OMG Persistent State Service (PSS) implementation
  - Built on top of Java Data Object (JDO)
  - Currently Kodo product
  - Soon ObjectWeb Speedo
- Flexible Container Framework soon
  - IST COACH Extensible Container Architecture (ECA)

Runtime Architecture

- DCI Components
  - Domain
  - Assembly
  - Node
  - Server
- Application Components
  - Philosopher
  - Observer
  - Fork
- OpenCCM Flexible Container Framework
  - Plugin
  - CORBA 2.4 or higher
- Data Stores
  - CosNaming Service
  - CosTrading Service
  - CosTransactions Service
  - CosPersistentState Service
- OpenCCM PSS Runtime
- JDO Runtime
The Open Management Framework

- A software framework for building graphical UI management browser
  - Extensible by plug-ins

- Various browser plug-ins for
  - CORBA Object, Component and Home
  - Interface Repository
  - CosNaming
  - CosTrading
  - DCI

- IST COACH monitoring and testing infrastructure

The OpenCCM Browser
IST COACH Monitoring and Testing Infrastructure

- Interface Repository
- Actor GUI
- Web Browser
- Logging Components
- CORBA Components
- OpenCCM component servers
- Portable Interceptors for monitoring
- CORBA

IST COACH Monitoring and Testing Infrastructure

- COACH NameServer Browser
  - TypeId
    - IDL:objectweb.org/ccm/DeploymentServer:1.0
  - Host: 135.65.45.0
  - Port: 2100

IOR: OID:0000000000000002C444C345F5259565377692765726F26570006700

Buttons: refresh, delete, show, tcl shell, ping
**Supported Environments For All OpenCCM Features**

- **Java 1.2.1, 1.3.x & 1.4.x**

- **Operating systems**
  - Linux
  - Solaris
  - Windows
  - Windows CE for PDA

- **CORBA products**
  - Borland Enterprise Server (BES) 5.0.2 & 5.2
  - IONA ORBacus 4.1.x
  - JacORB 2.0
  - The Community OpenORB 1.2.1, 1.3.0, 1.3.1 & 1.4.0
  - *Potentially any full CORBA 2.4 implementation*

**Perspectives for OpenCCM 1.0**

- **Improve and complete all current main features**
- **Provide the full container support**
  - CORBA Component Descriptor generator
  - Service, Process, and Entity containers
  - All CCM container API
  - Services injected in containers
    - Persistence, transaction, security, notification
  - IST COACH Extensible Container Architecture

- **Lightweight CORBA Components in C++**
  - THALES contribution in ITEA OSMOSE project

- **Open Model-Driven CORBA Components platform**
  - Design components, implementations, and assemblies with UML
  - Generate all OMG IDL, CIDL, implementations, CAD files
  - Ready to be deployed and managed
Thank You – Q/A

» Current release = 0.8.1

» Web site
  ➢ On-line information and documentation
  ➢ http://openccm.objectweb.org

» Forge site
  ➢ Releases, CVS, bug tracking, current tasks
  ➢ http://forge.objectweb.org/projects/openccm

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