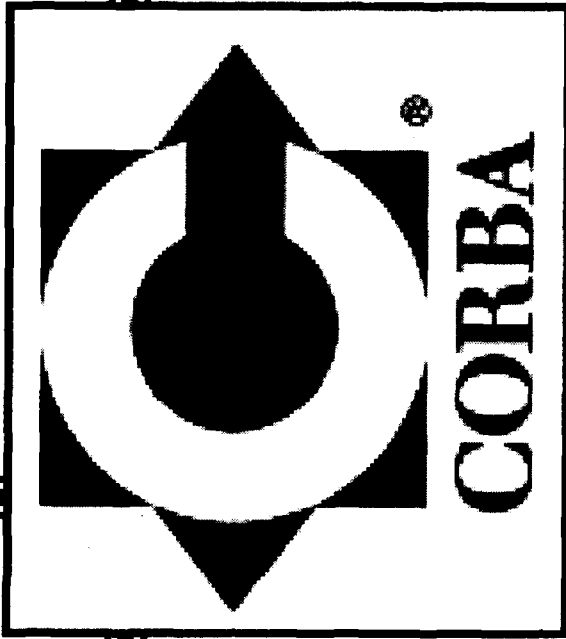


분산객체 기술표준 동향

Dr. Jon Siegel
(OMG)



OMG: Interoperability through Object- Oriented Standards

Presented by

Jon Siegel, Ph.D.

**Director, Domain Technology
Object Management Group**

siegel@omg.org

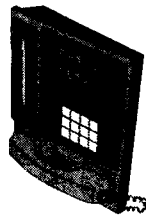
508-820-4300

<http://www.omg.org>

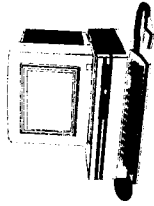
1999/10/19



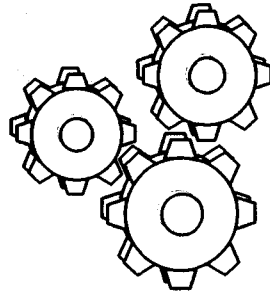
Why Distributed Computing?



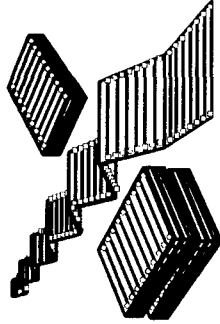
Sales



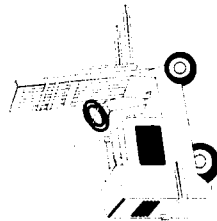
Engineering



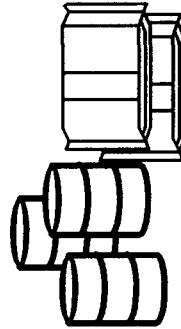
Manufacturing



Accounting



Shipping/
Receiving



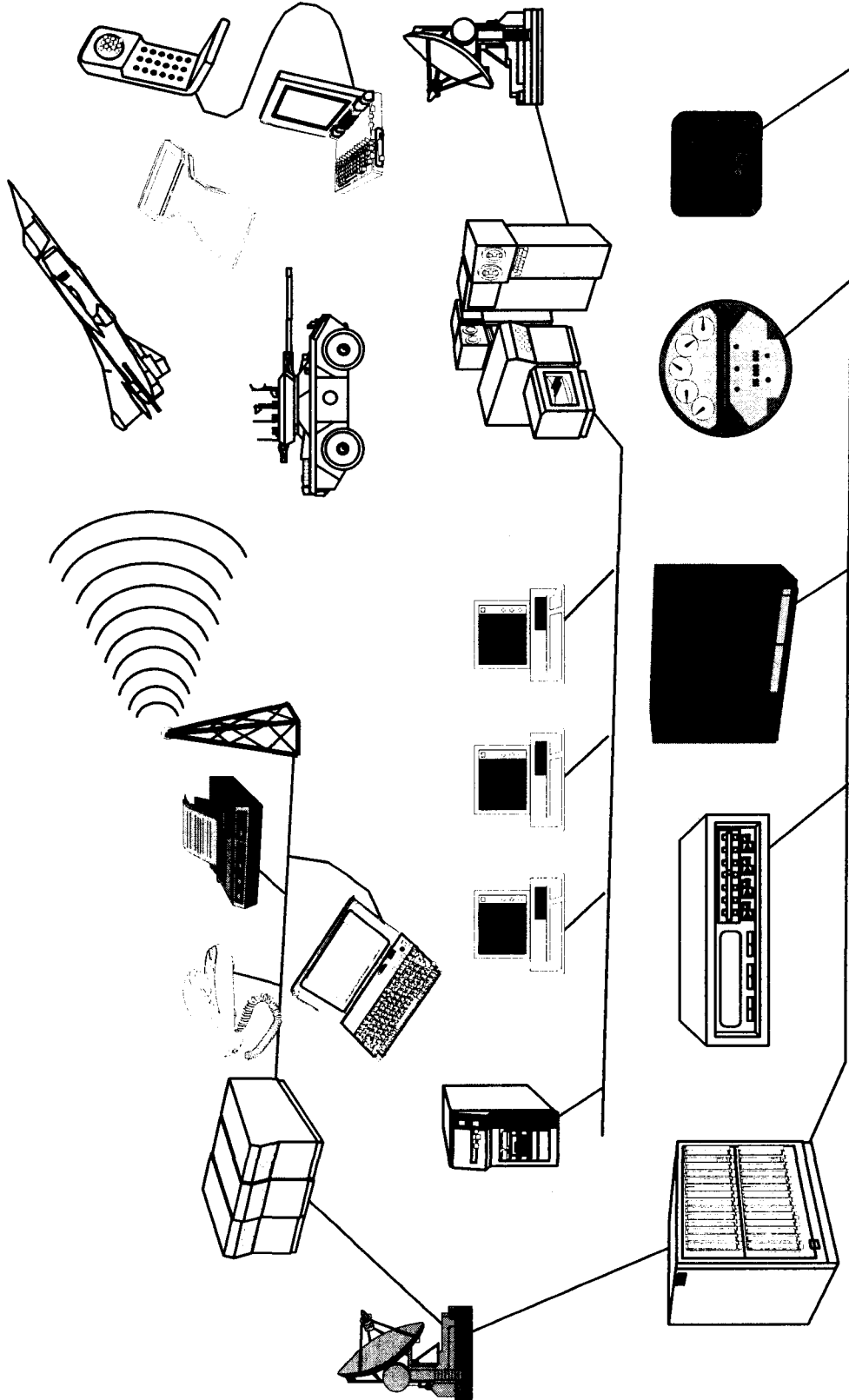
Inventory

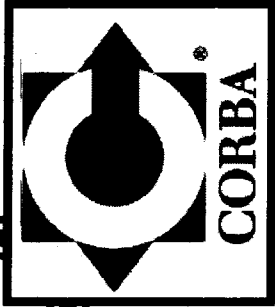


Payables/
Receivables

Distributed Hardware needs Distributed Software !

Future Networks

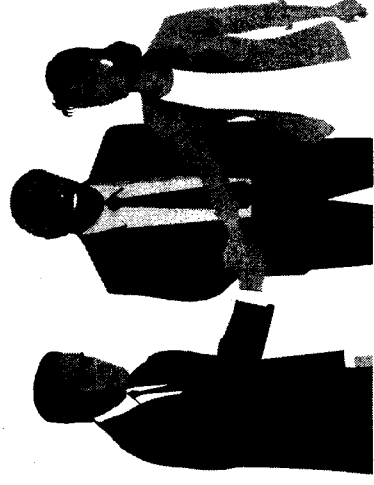




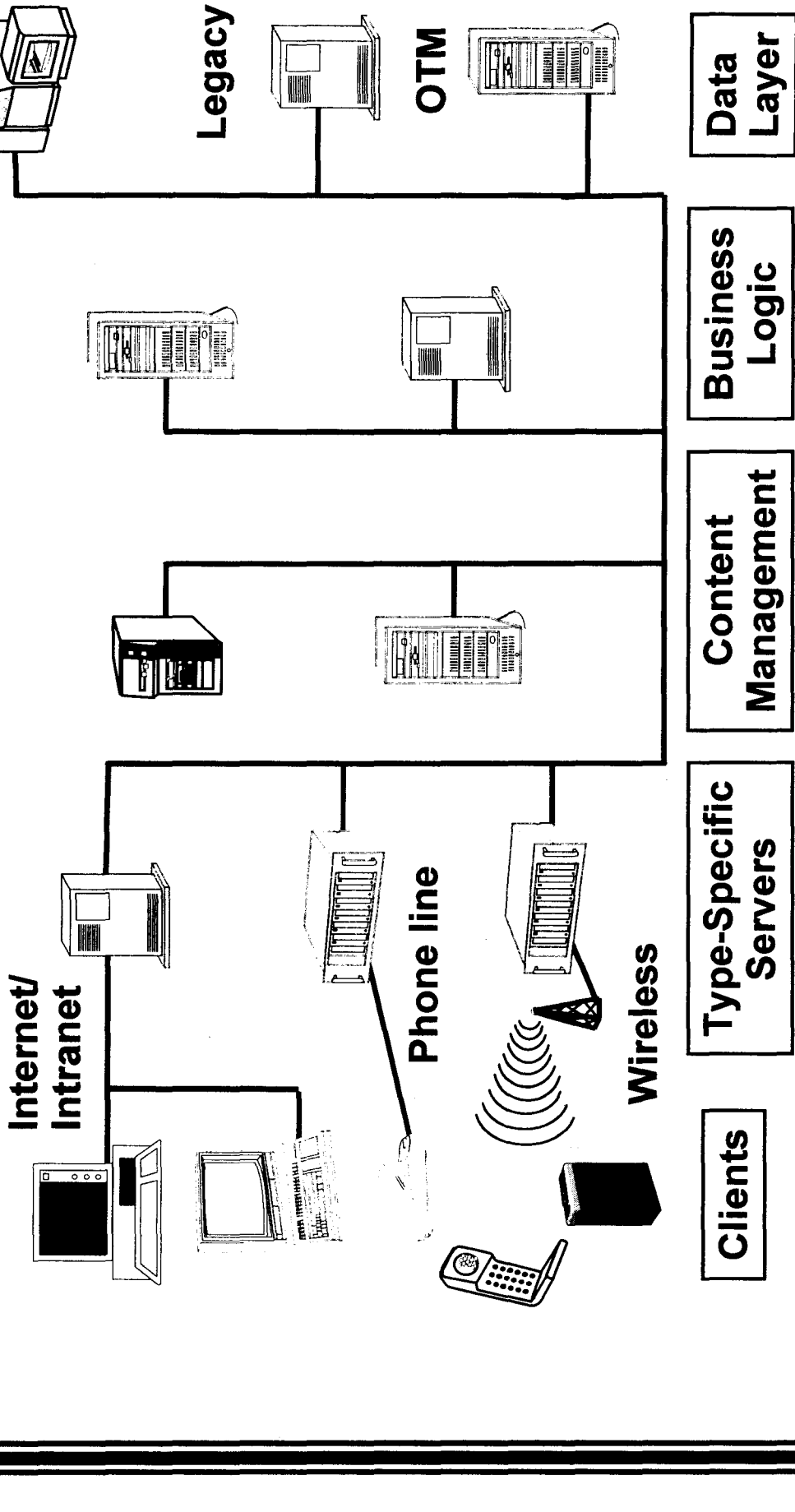
Focus on Interoperability

- There will *not* be consensus on hardware platforms;
- There will *not* be consensus on operating systems;
- There will *not* be consensus on network protocols;
- There will *not* be consensus on application formats.

**There *must* be consensus
on interoperability.**



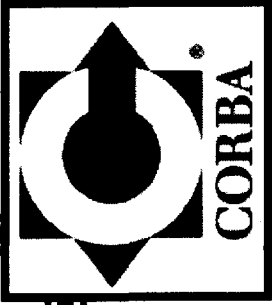
Today's Architecture





Who's Using CORBA?

- **Wells-Fargo Bank**
 - Integrate all legacy systems
 - Home Banking, ATMs
- **More Banks & Financial Companies:**
 - BankBoston, Banque Paribas, Britannia, Capital One Financial Corporation, Chemical Bank, Credit Suisse, Dresdner Bank AG, Macquarie Bank, Nations Bank, Nomura International Securities, Charles Schwab & Co., Commerzbank Capital Markets, Chicago Stock Exchange



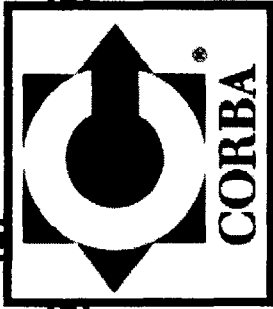
BankBoston 1998 ROI Study

- **CORBA Project ROI - Raw Figures:**
 - Quantified Return-on-Investment for EMSTR Analytics was 627%;
 - Payback period was 7.3 months.
- **More payoff than could be quantified:**
 - More timely and more accurate information to the traders
 - New and deeper analytics.
 - Making the bank's analytics system available to its customers
- **These benefits overwhelm the quantified benefits**



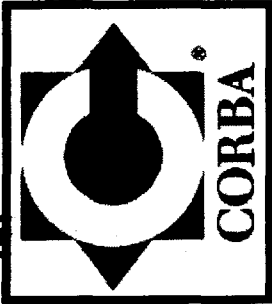
More CORBA Users...

- **UK Immigration Department**
 - **Suspect Index System**
- **CNN Interactive**
 - **News feeds from hundreds of sources on multiple machine types and formats are managed with CORBA**
- **Pratt & Whitney**
 - **Program Planning and Control for jet engine production**
- **Matra Datavision**
 - **integration of EUCLID QUANTUM software for CAD/CAM**
- **Aircraft Manufacture: Boeing, Airbus**



Still more CORBA Users...

- **AWACS Systems Integration**
 - **Also US Air Force and Navy**
- **Retail: The Gap; Home Depot**
- **Transportation: DHL, Fedex, Sabre**
CargoManager, German Railway Company,
Port of Singapore



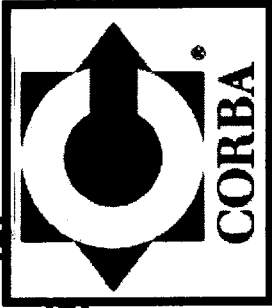
Who Makes/Sells ORBs?

- There are over 70 ORBs on the Market
- From different types of companies:
 - System Vendors
 - ORB Vendors
 - Integrated Services Vendors (e.g. ORB-based Transaction Systems)
 - Free ORBs from Universities and Independents
- A Thriving Market, Started by OMG



Testing, Certification

- **OMG/Open Group Testing/Certification**
 - **Announced 5/99: CORBA 2.1 now, 2.3 soon**
 - **3 Certified ORBs so far:**
 - Fujitsu, AT&T OmniORB, MICO
 - **Test Suite Partially funded by ESPRIT**
- **CORBA.net (www.corba.net)**
 - **Web-based interoperability demo**
- **DOPG, Japan, tested Interoperability**
 - **ORBs and Transaction Systems**
 - **Fourteen ORBs shown to interoperate**
 - **Four OTS Impls shown to interoperate**
 - **1-Phase & 2-Phase commit and rollback**

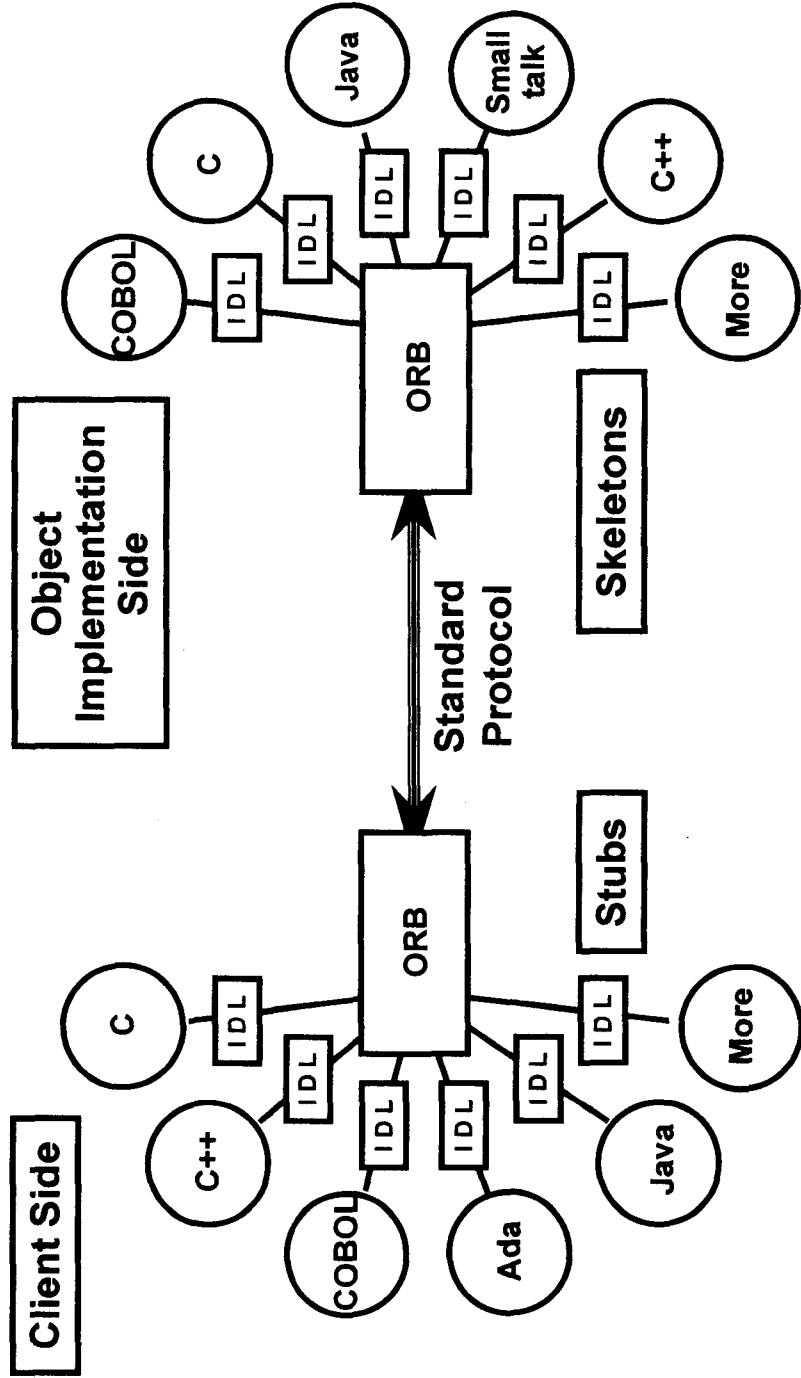


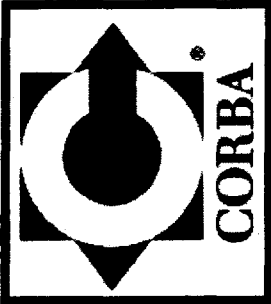
What is an Object?

- **An Object - -**
 - **Combines Functionality and Data**
 - **Typically represents a real-world object**
 - **Has a well-defined interface**
 - **and an “object reference” or address**
 - **Follows basic OO principles:**
 - **Encapsulation** **Inheritance**
 - **Polymorphism** **Instantiation**



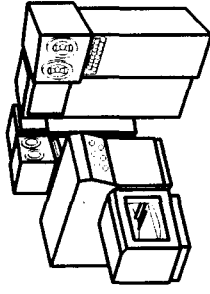
OMG/ISO IDL and CORBA Architecture





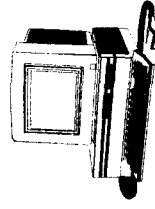
CORBA Interoperability

- CORBA 2.0 Interoperability Comprises:
- An overall architecture for CORBA-CORBA communications;
- An API for adding bridges;
- A general multi-transport message format (General Inter-ORB Protocol or GIOP);
- An API for gateways using ESIOPs -- (Environment-Specific Inter-ORB Protocols)



UNIVERSAL, OUT-OF-THE-BOX INTEROPERABILITY:

- GIOP over TCP/IP is *mandatory* for compliance either internally or via a half-bridge;
- Specialized protocols are optional and well-supported by the specifications.



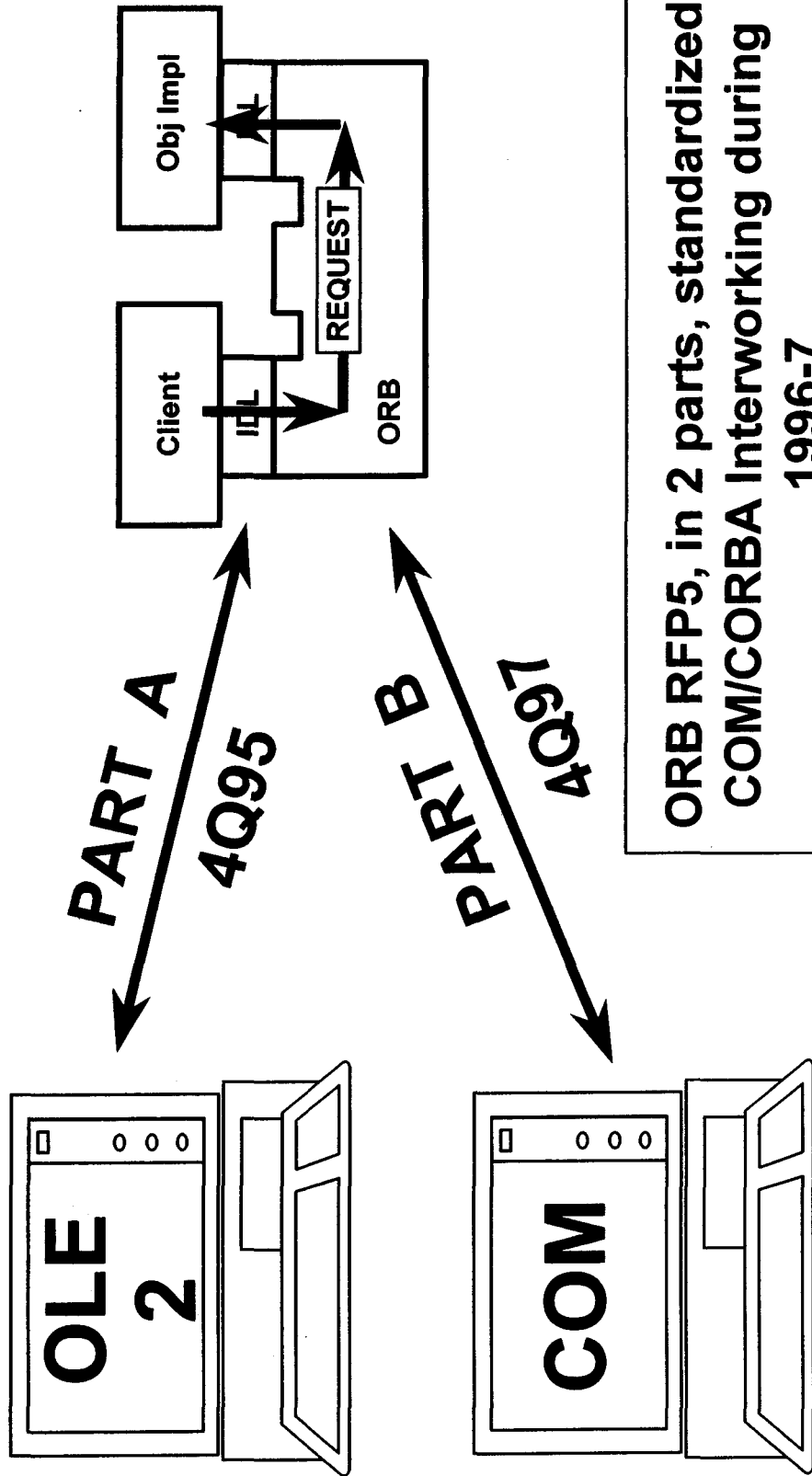


Server-Side Scalability

- **Simple CORBA Client-Side Model**
- **Scalability is implemented on the Server**
- **Several different Resource and Memory Allocation Models adjust for load**
- **CORBA Server Mechanisms:**
 - **Portable Object Adapter (POA)**
 - **CORBA Component Model (CCM)**



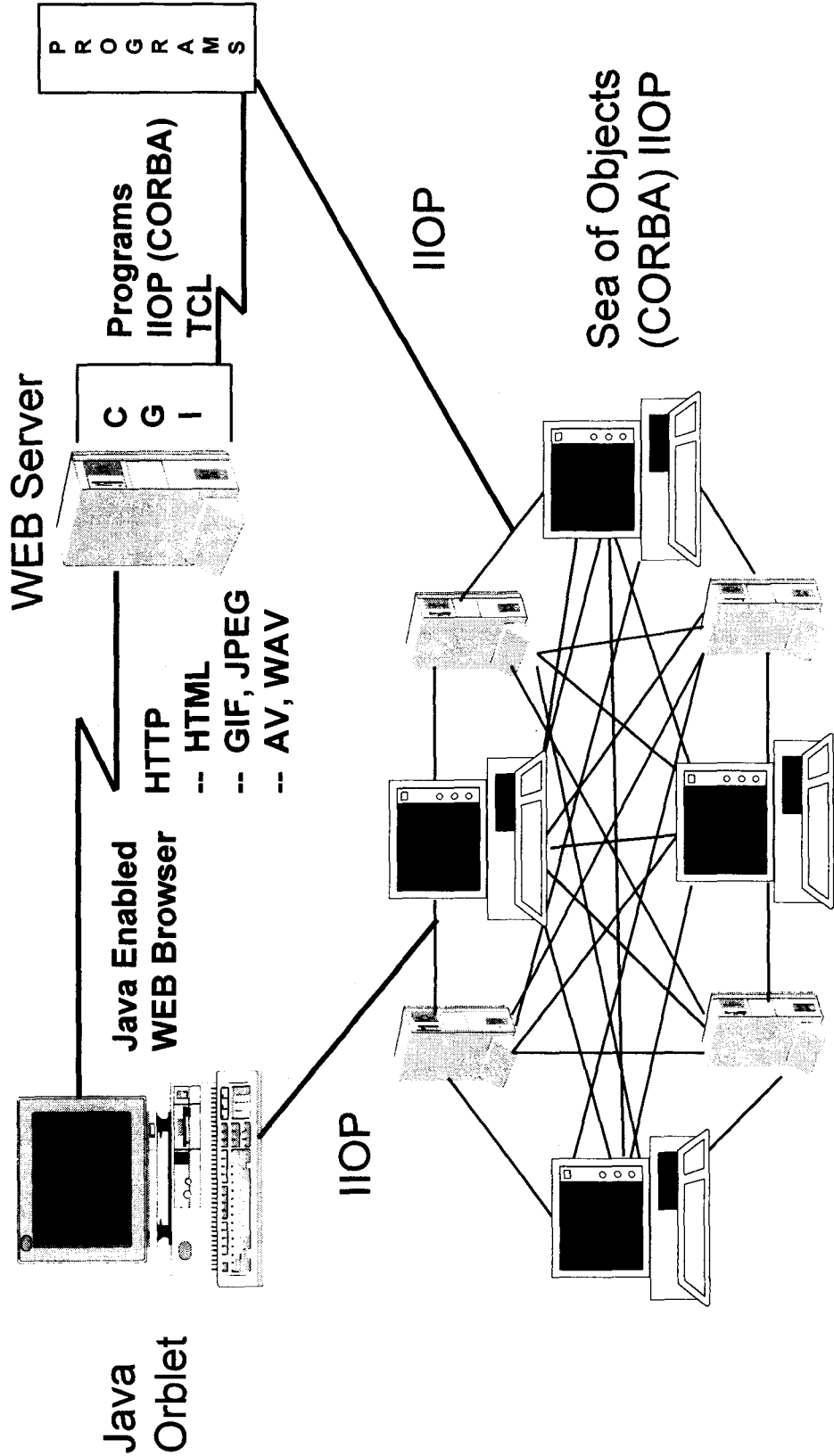
COM/CORBA Interworking

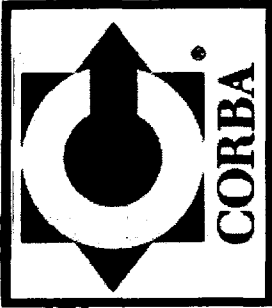


ORB RFP5, in 2 parts, standardized
COM/CORBA Interworking during
1996-7



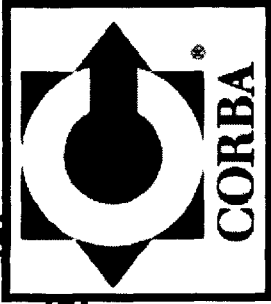
Strategy -- Leveraging Java





CORBA 3.0 Adds --

- **Improved Java and Internet Integration**
 - Java-to-IDL (reverse) Mapping
 - Firewall Specification
 - CORBA Object URLs
- **Quality of Service Control**
 - Asynchronous Invocation/Messaging
 - Invocation QoS Control
 - Realtime, Minimum, Fault Tolerant CORBA
- **CORBA Component Model**
 - Objects Pass-by-Value
 - Component container
 - Transactional, Persistent, Secure
 - Distribution Format
 - Scripting Language Specification



CORBA Component Model (CCM)

- CORBA is great for building Enterprise and Internet applications
- But, of the thousands of CORBA usage patterns, a few stand out
- CCM packages up these successful patterns, including
 - POA servant management
 - Transactions and Persistence
 - Security
 - Event Handling
 - Configuration
 - Interface Connection and Assembly
- This speeds and simplifies application building, and ensures success

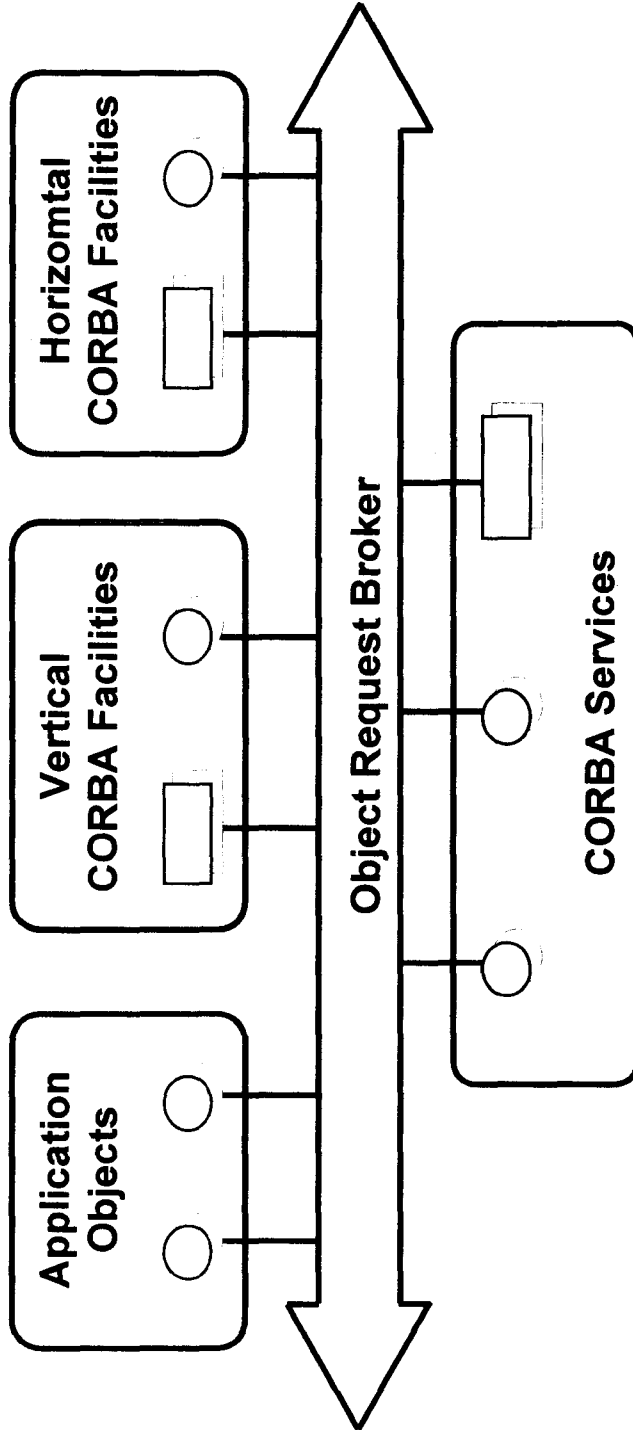


What this Means to You:

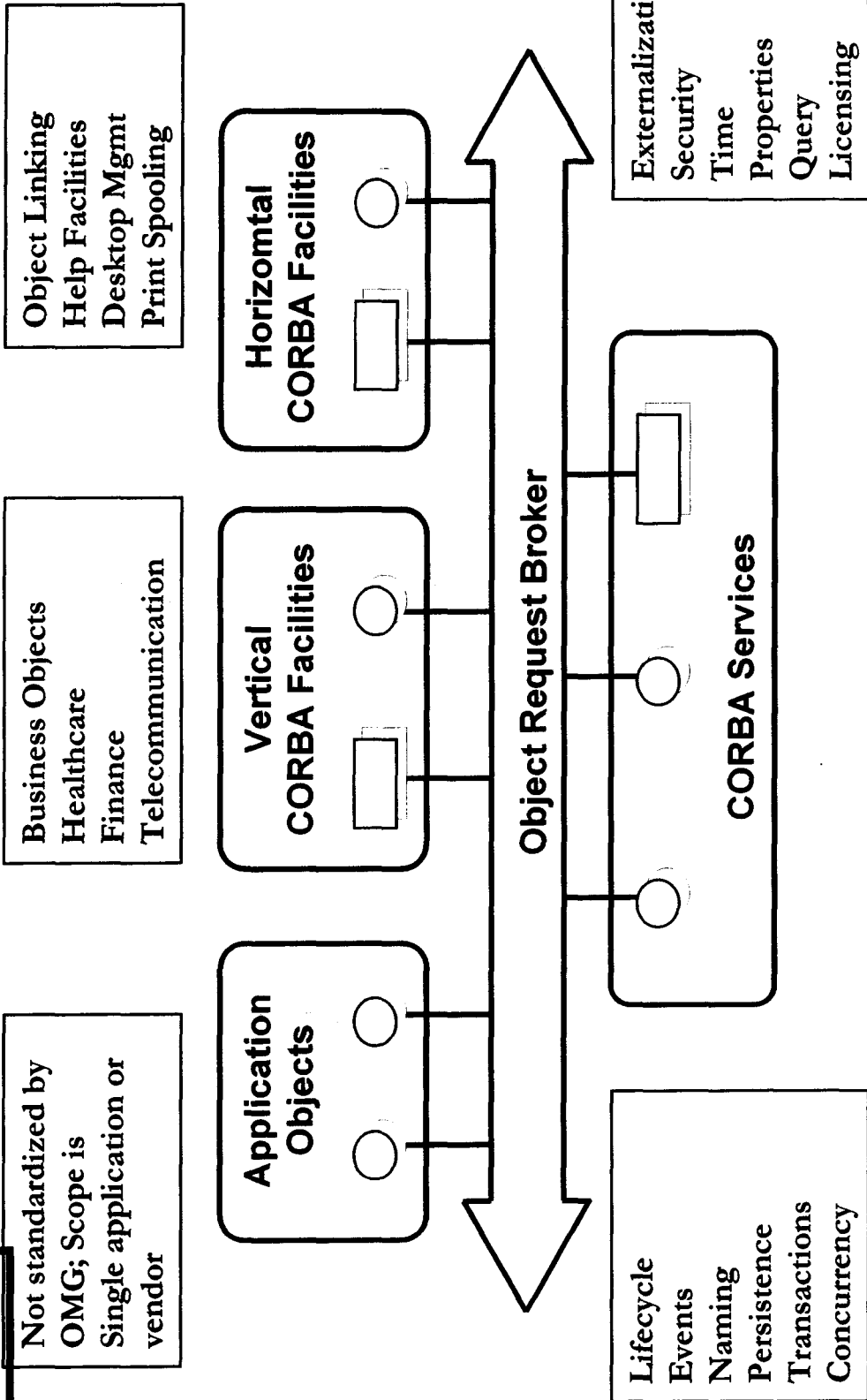
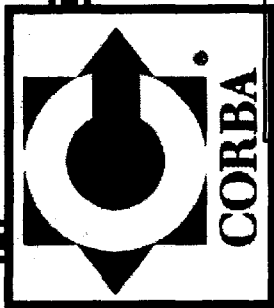
- CCM Applications are very compact:
 - Much less code required
 - Developer code devotes to the business problem
- CCM Applications are easier to code:
 - Only successful patterns included in CCM
 - Much code is generated automatically
 - In declarative languages derived from IDL
- CCM Applications are Modular:
 - Components assemble into applications
 - Combine commercial, in-house, and custom components
 - Standardized Assembly, Packaging, Distribution, Deployment
- CCM Applications scale to Internet and Enterprise
 - Patterns known to scale well
 - Vendor experience used to build and tune products
 - Resource handling coded automatically in the best way



OMA Overview

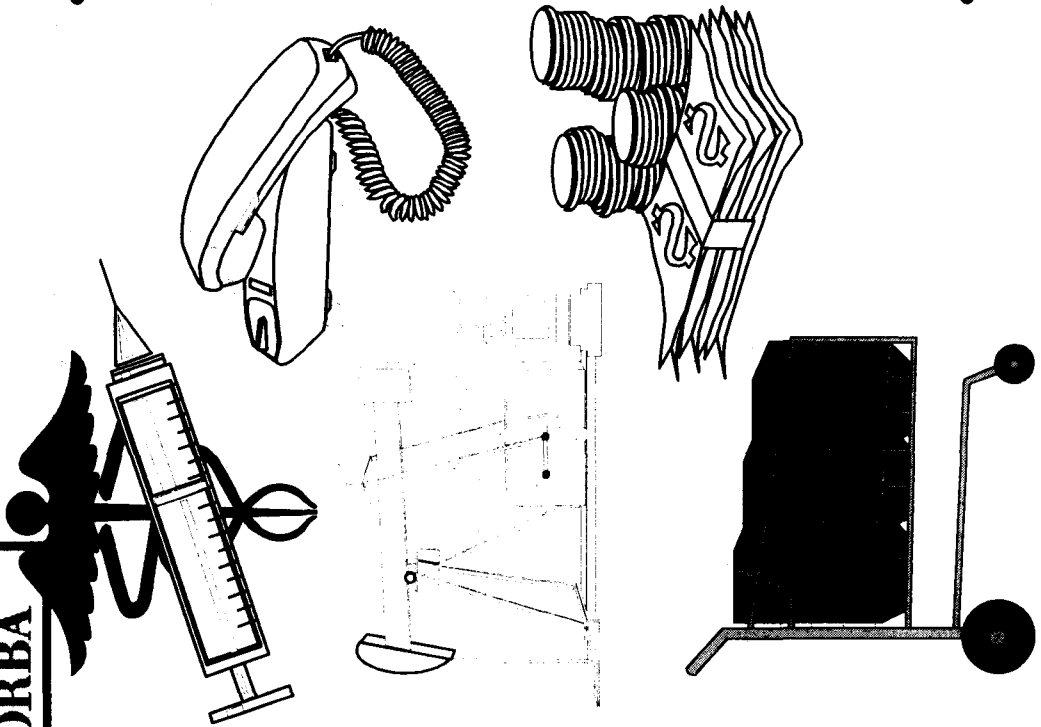


OMA Overview





Vertical CORBAfacilities



• Official OMG specifications in vertical market domains:

- Business Objects
- Finance/Insurance
- Electronic Commerce
- Healthcare
- Telecommunications
- Transportation
- Manufacturing
- Life Sciences Research
- Utilities
- Coming: Retail, Broadcasting, Satellites, Statistics, Call Center
- Bring benefits of CORBA and OMA to Domains.



Current Telecom Specs

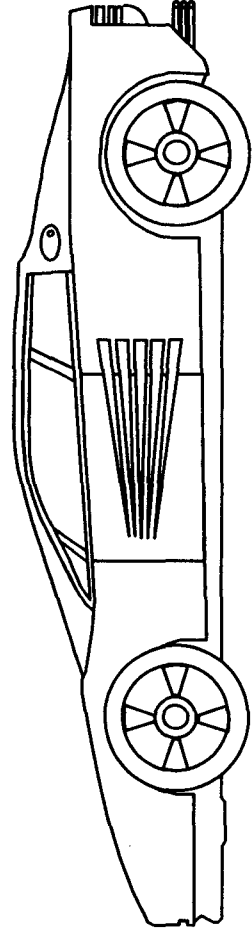
Telecommunications Domain Task Force:

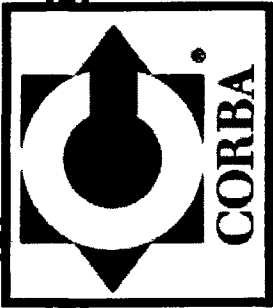
- **Control and Management of A/V Streams**
- **Notification Service**
- **CORBA/TMN Interworking**
- **CORBA/IN Interworking**
- **Telecom Log Service Facility**



Manufacturing Specifications

- Manufacturing Domain Task Force:
- Product Data Management Enablers Specification
- Distributed Simulation HLA Specification

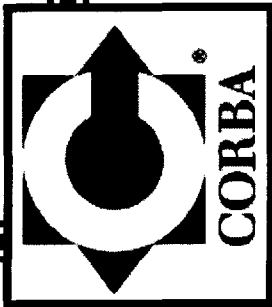




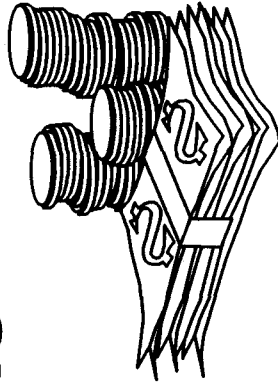
Healthcare Specifications

Healthcare Domain Task Force

- **Master Patient Identifier Specification**
- **Healthcare Lexicon Service**
- **Specification Clinical Observations RFP**
- **Healthcare Resource Access Control**



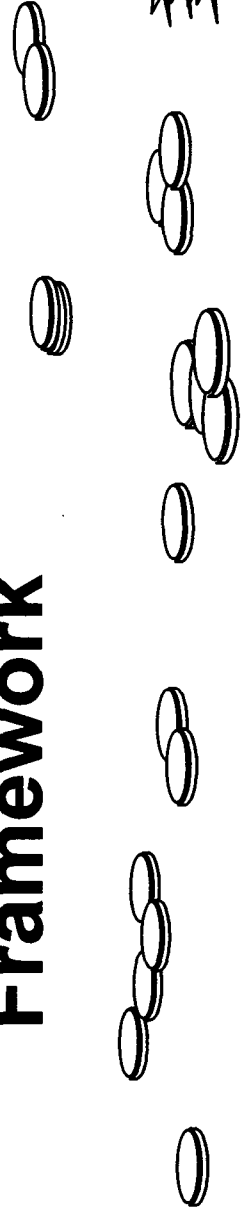
Finance Specifications

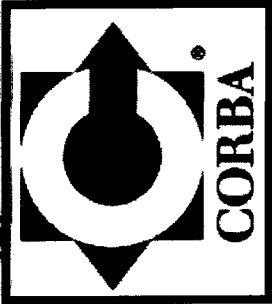


- **Currency Specification**
- **Party Management Facility**
- **General Ledger Spec**
- **e-Commerce Negotiation**



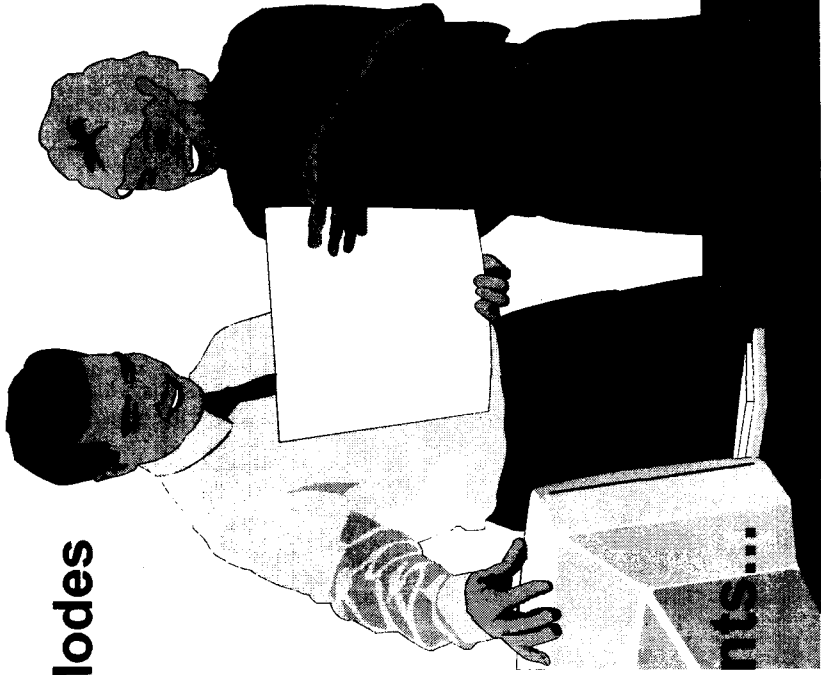
Framework





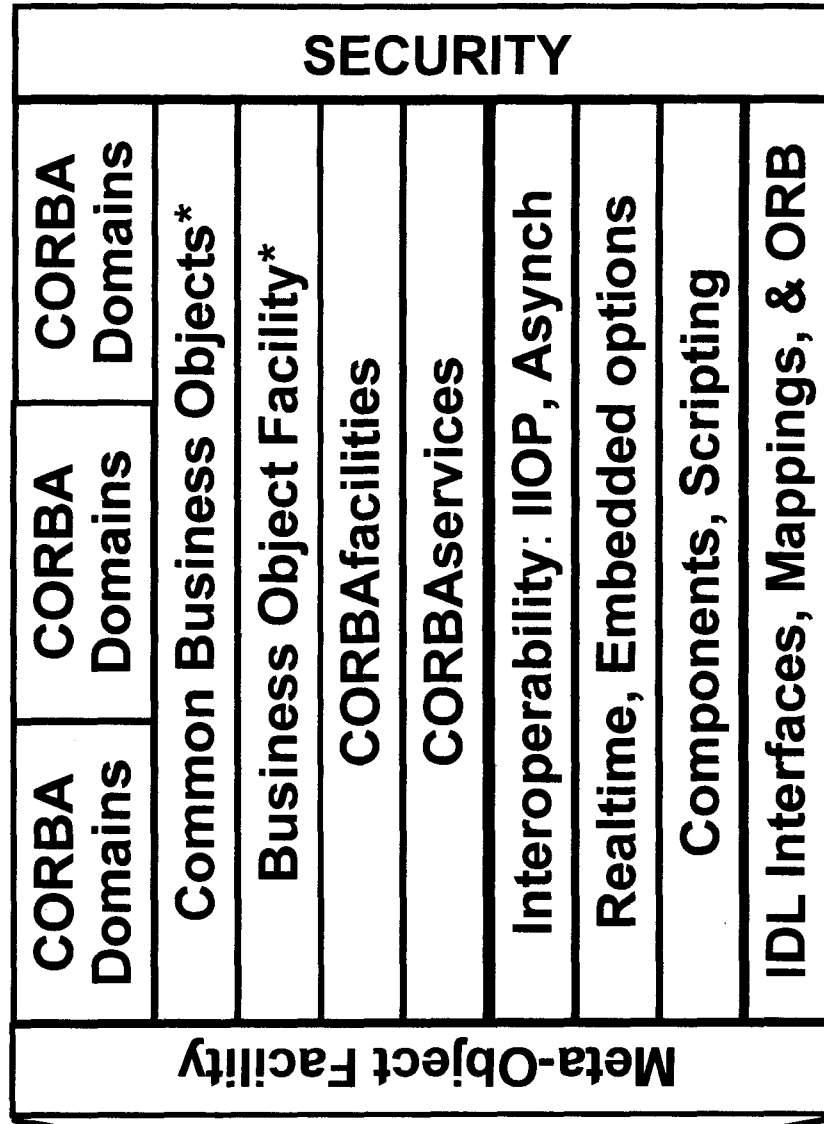
CORBA/OMA Environment

- **Starts with the Basics:**
 - IDL Interfaces & Mappings
 - ORB-based Architecture
 - Static & Dynamic Invocation Modes
 - GIOP/IIOP Interoperability
 - Optional Asynch Modes
 - Naming Service
 - Event Service
- **Add Services and Facilities:**
 - Security Service
 - Transaction Service
 - Object Trader Service
 - COM/CORBA Mapping
- **Then add Domain Components...**





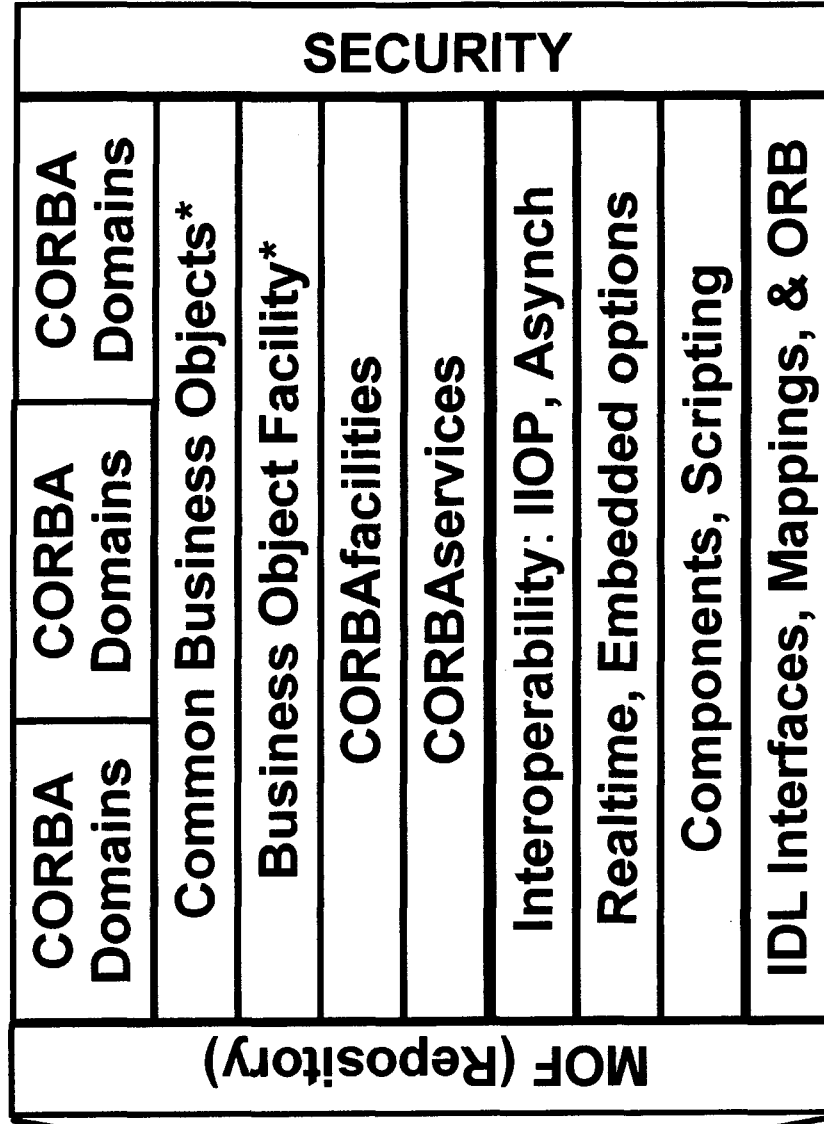
Complete Enterprise Support



*: coming soon



Complete Enterprise Support



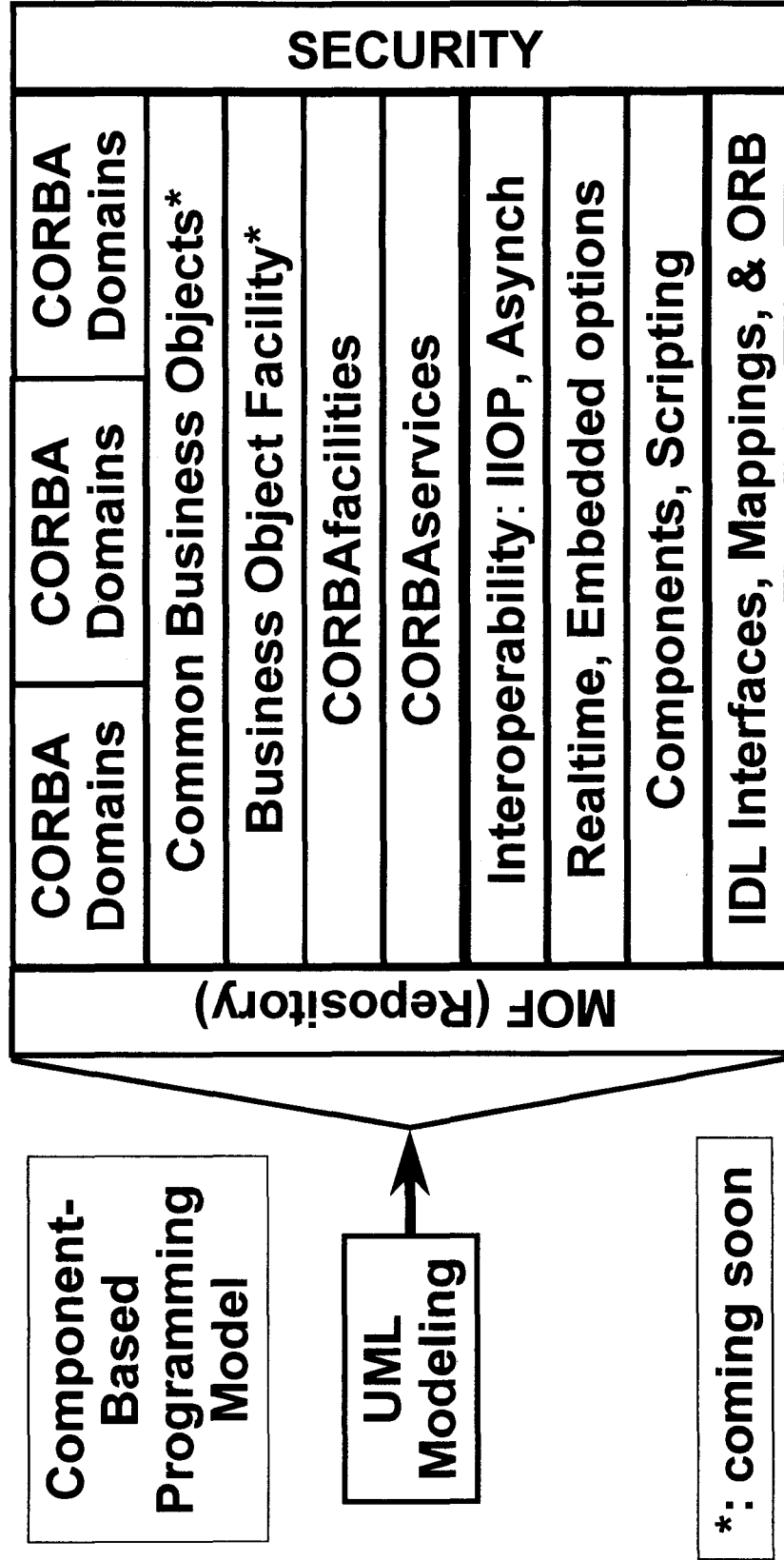
Analysis &
Design;
Warehousing;
Metadata

UML
Modeling

*: coming soon



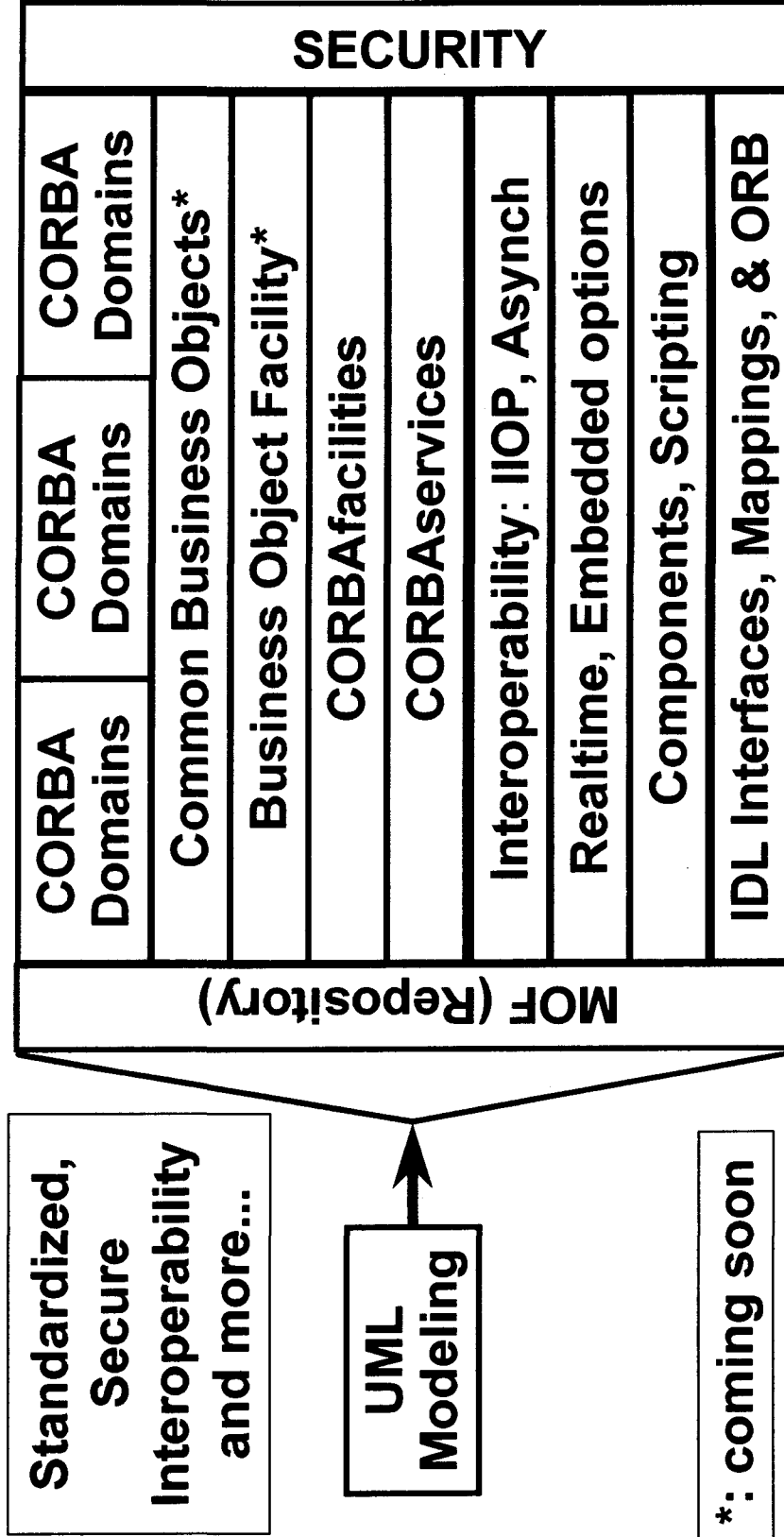
Complete Enterprise Support



*: coming soon



Complete Enterprise Support



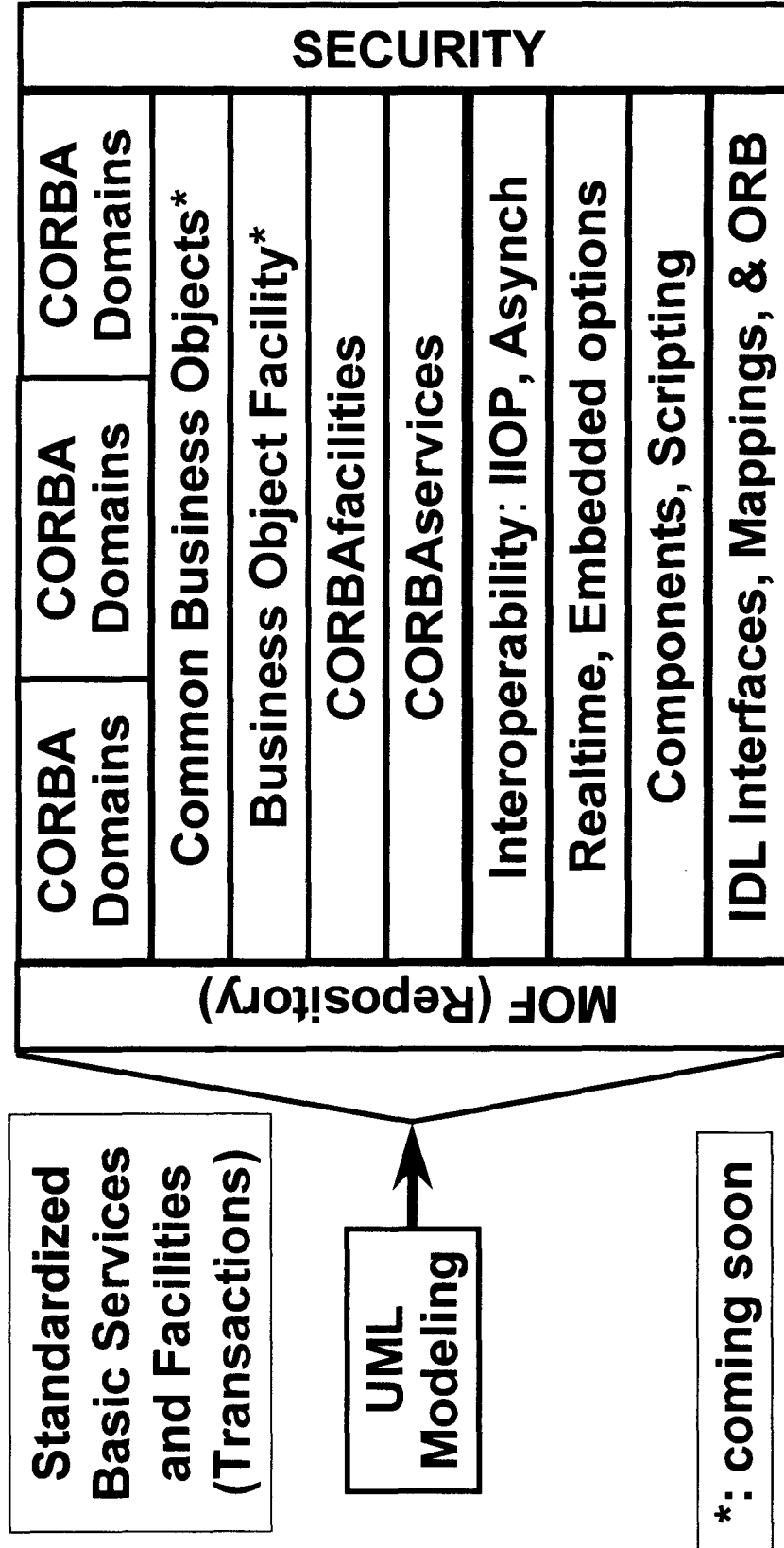
Standardized,
Secure
Interoperability
and more...

UML
Modeling

*: coming soon



Complete Enterprise Support



Standardized
Basic Services
and Facilities
(Transactions)

UML
Modeling

*: coming soon

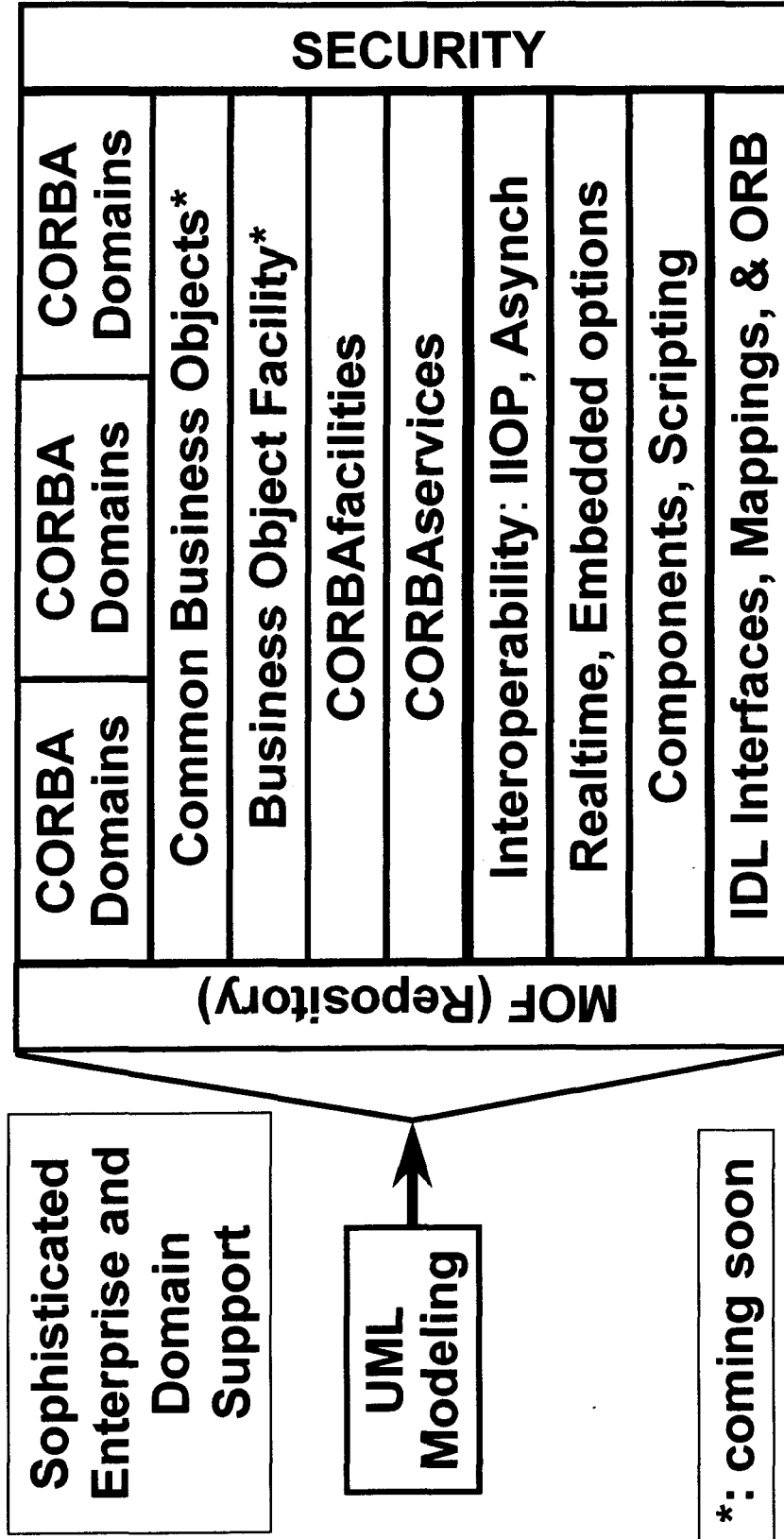
CORBA Domains		CORBA Domains	
Common Business Objects*			
Business Object Facility*			
CORBAfacilities			
CORBAservices			
Interoperability: IIOP, Asynch			
Realtime, Embedded options			
Components, Scripting			
IDL Interfaces, Mappings, & ORB			

SECURITY

MOF (Repository)



Complete Enterprise Support



Sophisticated Enterprise and Domain Support

UML Modeling

*: coming soon

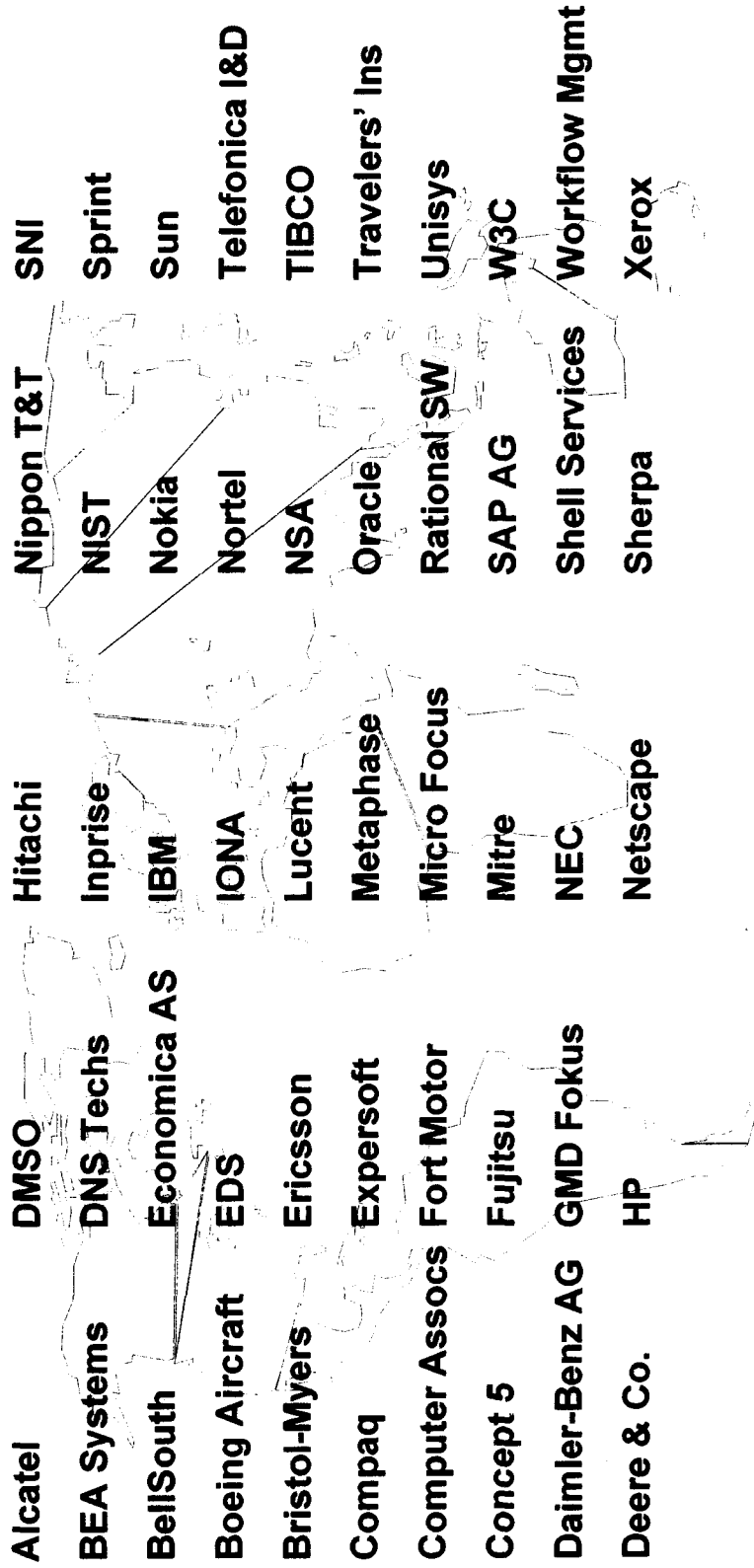


OMG: Background

- **About 800 member companies, world's largest software consortium.**
- **Founded April 1989 - Ten Years Old**
- **Small staff (27 full time); no internal development. Offices in U.S.A., Germany, Japan, U.K, Australia, India.**
- **Dedicated to creating and popularizing object-oriented standards for application integration based on existing technology.**



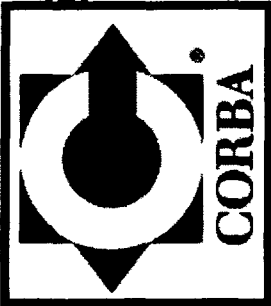
Worldwide Scope





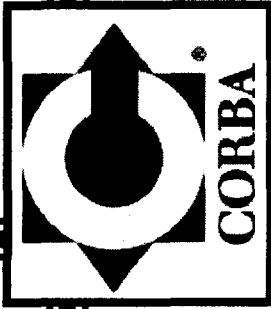
Meetings, Meetings!

- **OMG Specifications are adopted at our meetings**
- **Held Five times a year, at member companies' sites around the world**
- **Lasts a week and attracts over 500 people**
- **Every subgroup meets; up to 30 simultaneous sessions on some days**
- **Dates, locations on the web at <http://www.omg.org/library/tcinfo.htm>**
- **You're invited to come as an observer! Just let me know (email: siegel@omg.org)**



Adoption Process

- **RFI (Request for Information) to establish range of commercially available software.**
- **RFP (Request for Proposals) to gather explicit descriptions of available software.**
- **Letters of Intent to establish corporate direction.**
- **Task Force and End User evaluation & recommendation; simultaneous Business Committee examination.**
- **Board decision based on TC, End User, and BC recommendations.**



Availability

Innovative approach for selection of standard interfaces to adopt:

- 1. OMG adopts & publishes interface specifications.**
- 2. Interface Implementations must be available commercially from OMG Corporate member.**
- 3. Interface Specifications are freely available to members and non-members alike.**
- 4. Interface Specifications chosen from existing products in competitive selection process.**



Back To The Future

- Prepare for fully harmonized, innovative application systems with flexibility for future capabilities:
 - World-girding plug-in computing.
 - Heterogeneous networks & systems.
 - Domain-specific components.
 - Competitive multiple vendors.
 - Cooperative standards based.



End-user needs are driving the process!