

CORBA 2.0 Object Services

Ref: The Essential Distributed Objects
Survival Guide: Orfali, Harky & Edwards

Object Services

- System level services packaged as objects.
- Extend the functionality of the ORB.
- Components can be built to take advantage of object services:
 - Can use inheritance to provide all necessary system level services.
 - Customer can provide necessary implementations of system services to meet their needs.

Custom Component Example

- Vendor A develops an employee database object without worrying about any system services.
 - New object can be created by inheriting from employee object and a security object.
 - Secure version is created at IDL level, no new source code is necessary!

Corba Object Services

- Life Cycle
- Persistence
- Naming
- Event
- Concurrency Control
- Transaction
- Relationship
- Externalization
- Query
- Licensing
- Properties
- Security
- Time

Life Cycle Service

- Creating, Copying, Moving and Deleting Objects
- Includes support for compound Objects:
 - relationships among a group of objects are established.
 - Entire group of objects can be managed as if it was a single object.

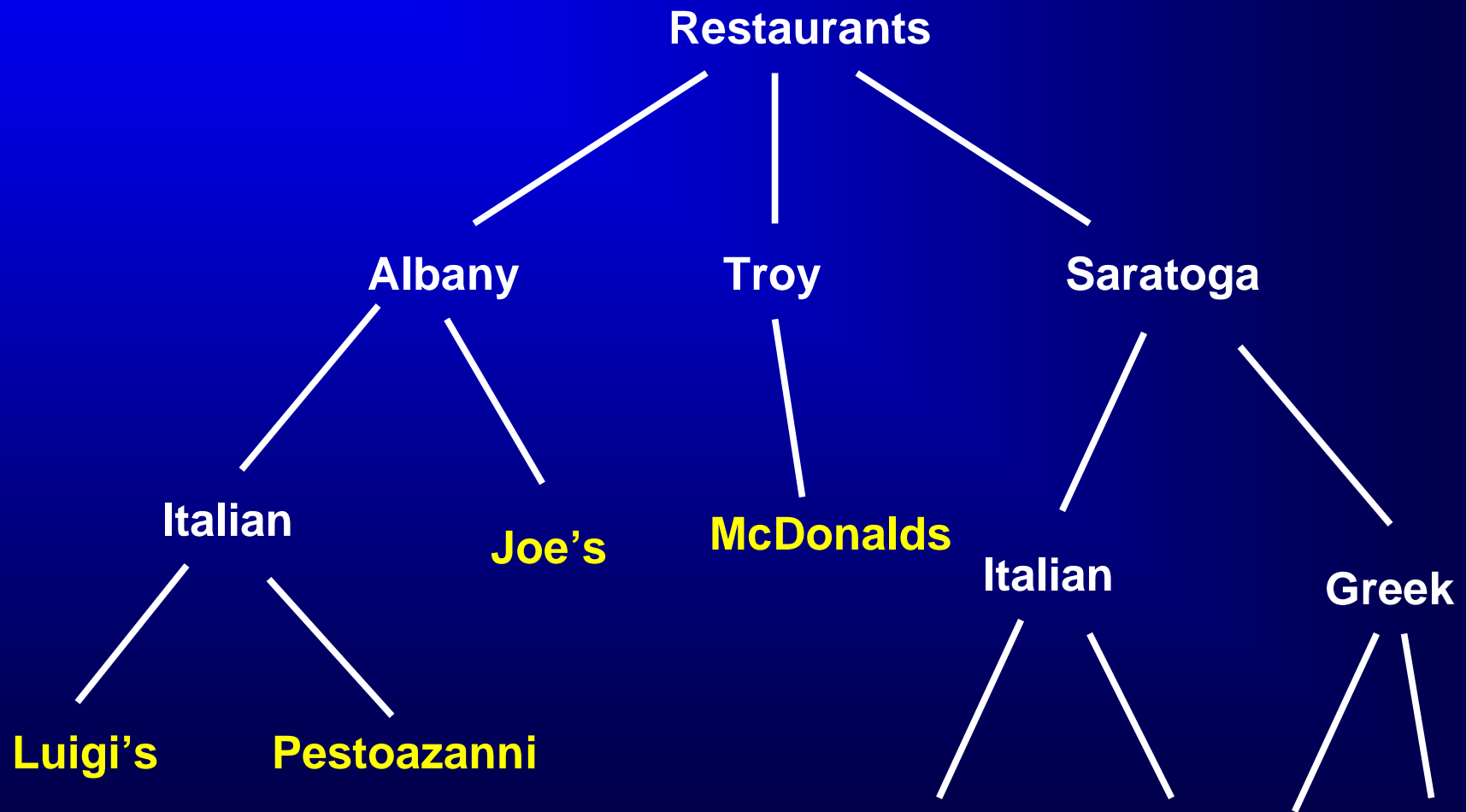
Persistent Object Service

- Common interface for providing storage and retrieval of objects from storage.
- “Storage” can be
 - Object Database Management System
 - Relational Database Management System
 - Flat files.
- Objects can hide persistence from clients, or can allow clients to control persistence.

Object Naming Service

- Primary mechanism used by objects to locate each other.
- Provides a mapping of names (human readable values) to object references.
- Namespaces are provided by *naming contexts*.
- Name contexts are arranged in a hierarchy

Object Naming Hierarchy



Object Naming

- Each name includes:
 - identifier: string that holds the name
 - kind: string that holds properties
- Object Naming Service operations include methods that allow clients to traverse a naming context hierarchy.

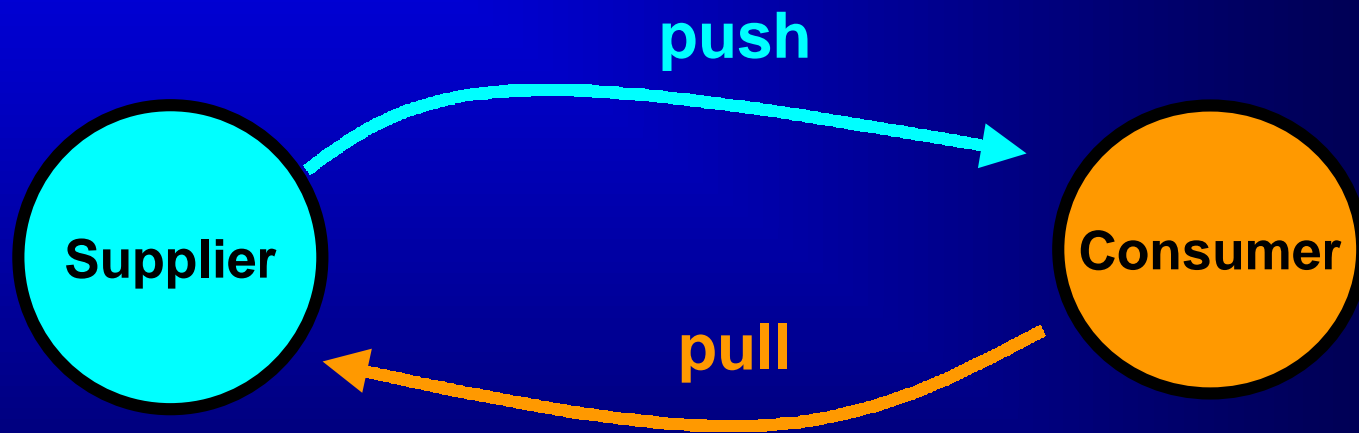
Event Service

- Provides mechanism for an object to notify other interested objects that an event has occurred.
- Supplier is an object that generates an event.
- Consumer is an object that receives an event.
- Events are transmitted as Corba requests.
- Supports loosely coupled communication:
 - objects don't need to know much about each other.

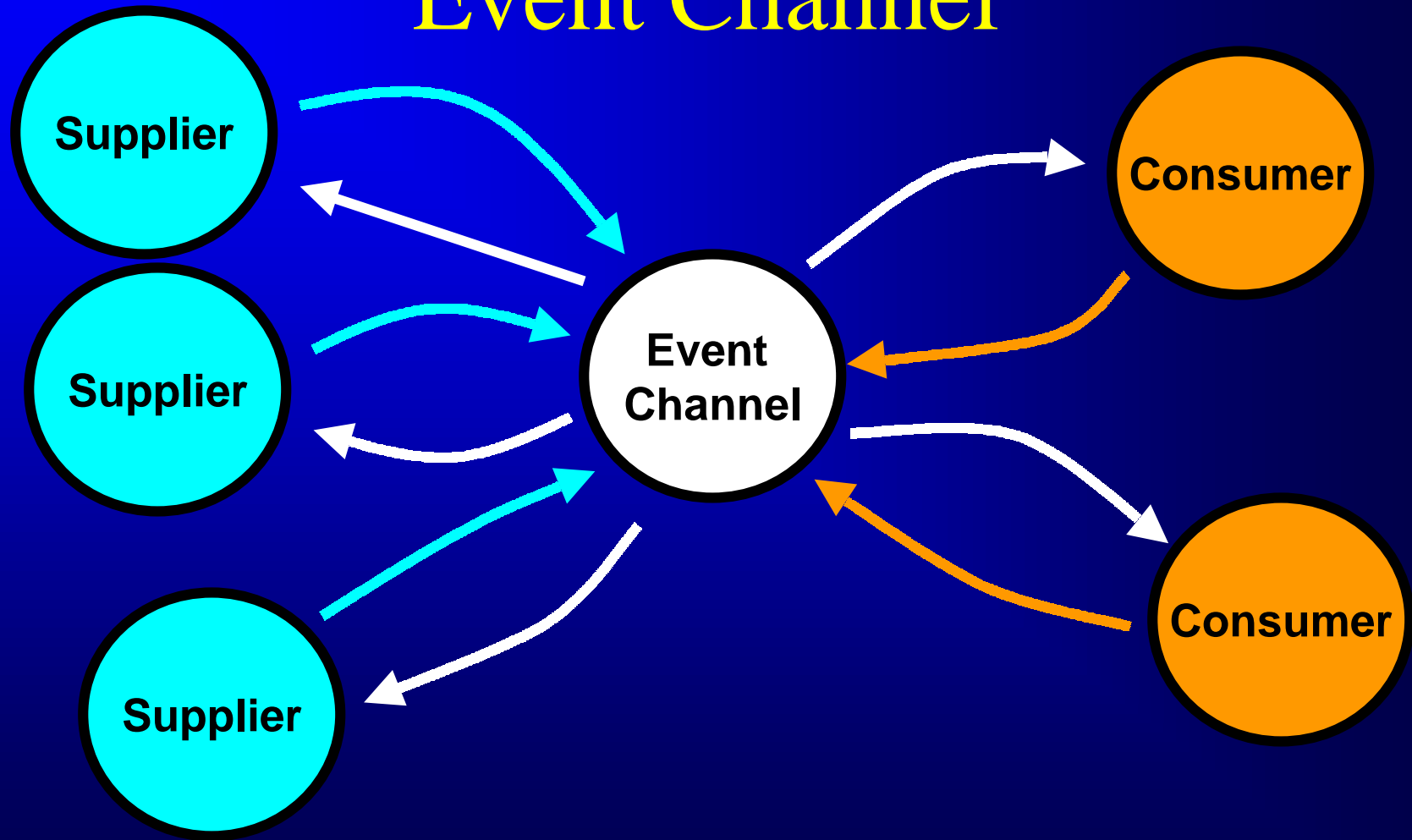
Event Channels

- An Event Channel is middleman:
 - an object that is both a supplier and consumer
 - forwards events to possibly multiple interested objects.
- Two event notification schemes:
 - Push: Supplier initiates the notification.
 - Pull: Consumers poll the supplier.

Events



Event Channel



Concurrency Control Service

- Resource Locking
- Transaction Locks
 - lock is released when transaction is complete
- Non-Transactional Lock
 - client determines when lock is released.

Object Transaction Service

- Provide reliability to (possibly complex) atomic operations.
 - All parties must agree on the result of a transaction.
 - Critical functionality required by business applications (and many other domains).
- Supports flat and nested transactions.

Relationship Service

- Objects establish dynamic relationships with other objects.
- It would be messy to have each object keep track of related objects.
- Can operate on any objects (Objects don't need to do anything special).
- Used by other services (persistence).

Query Service

- Used to find objects based on attributes.
- A variety of query languages are supported including SQL variants.
- The result of a query is collection of objects that satisfy the query, this collection is packaged as an object
 - use iterators to access objects within the collection.

Object Licensing Service

- Supports a variety of licensing options
 - allow trial usage of components
 - single license for multiple components
 - priority scheme for issuing licenses
- Any object that wants to be licensed can use the service without knowledge of how license is enforced.

Property Service

- Associate properties with objects at run time (not as part of IDL).
- Supports aggregation of properties - so objects can manipulate groups of properties.

Time Service

- Provide synchronization of clocks on networked computers.
- Support for keeping track of and adjusting for drift.
- Object wrapper for existing service?

Security Service

- “Security should be handled by the ORB”
- Authentication and propagation of credentials via method invocation context.
- Authorization is the responsibility of servers.
- Encryption and signatures.