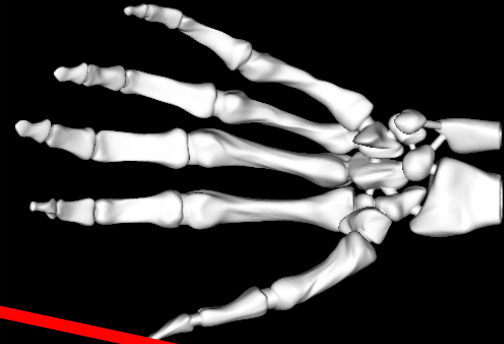


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2003



Microsoft Tech Ed 2003
J2EE vs.
.NET Enterprise
Services

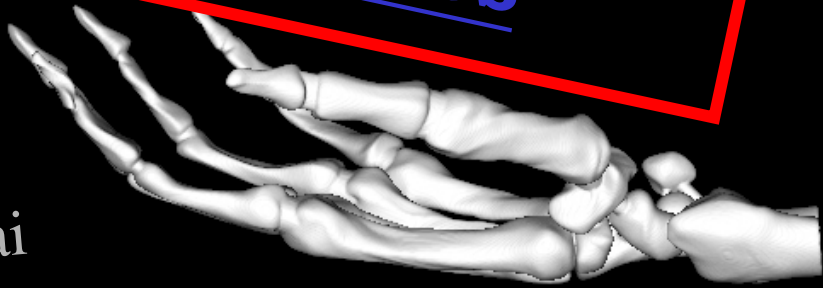
Shinewave International

Jerry Tsai (蔡學鏞)

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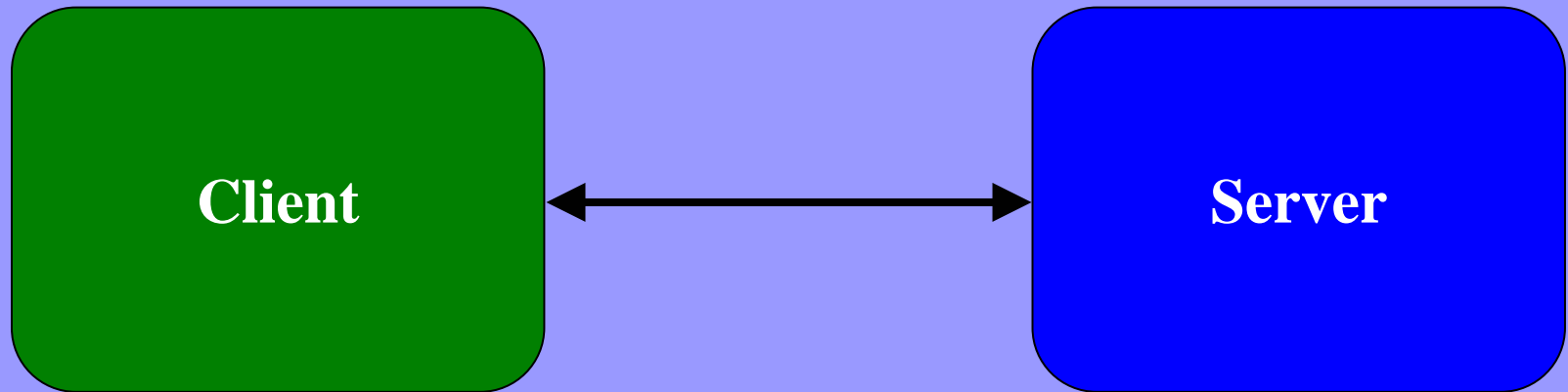




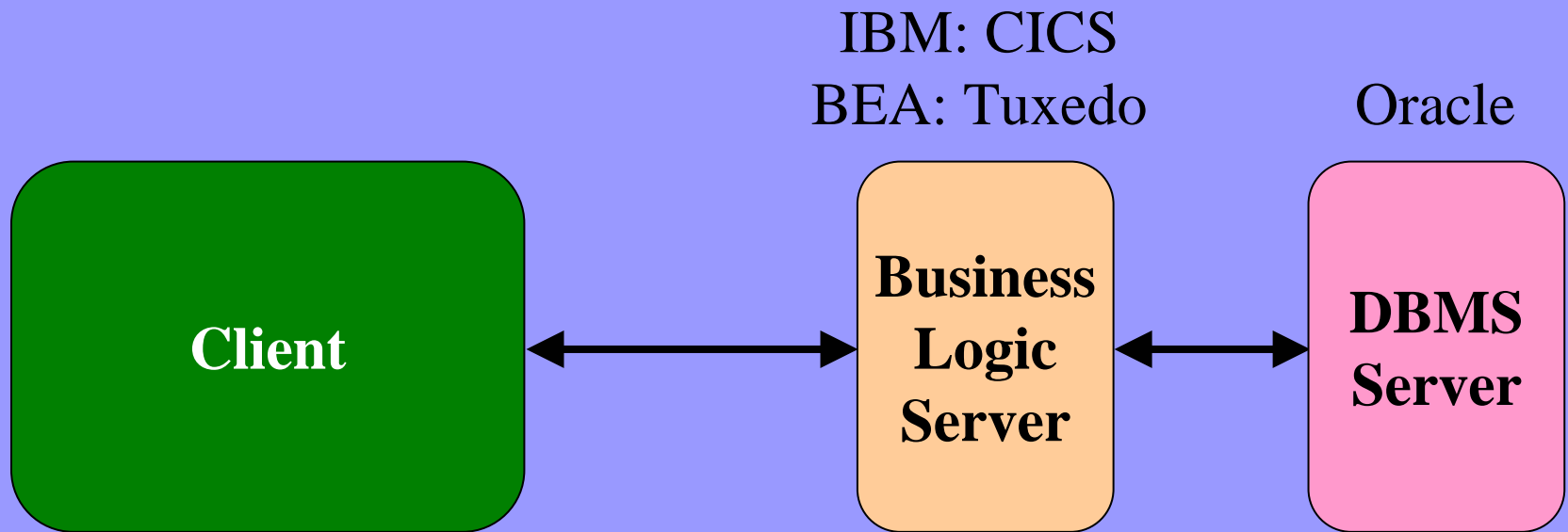
From 2-Tier Architecture to 4-Tier Architecture



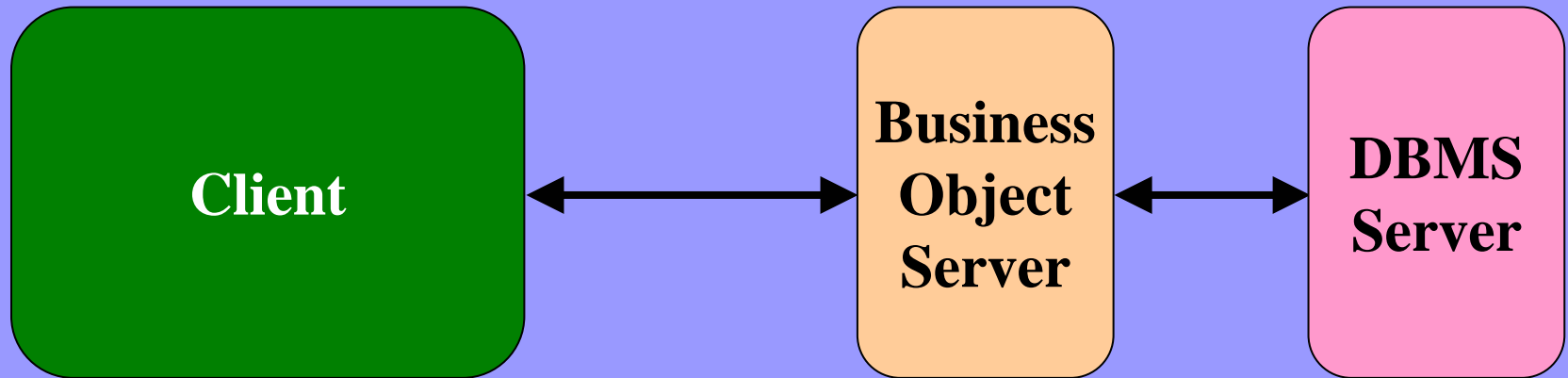
2-Tier



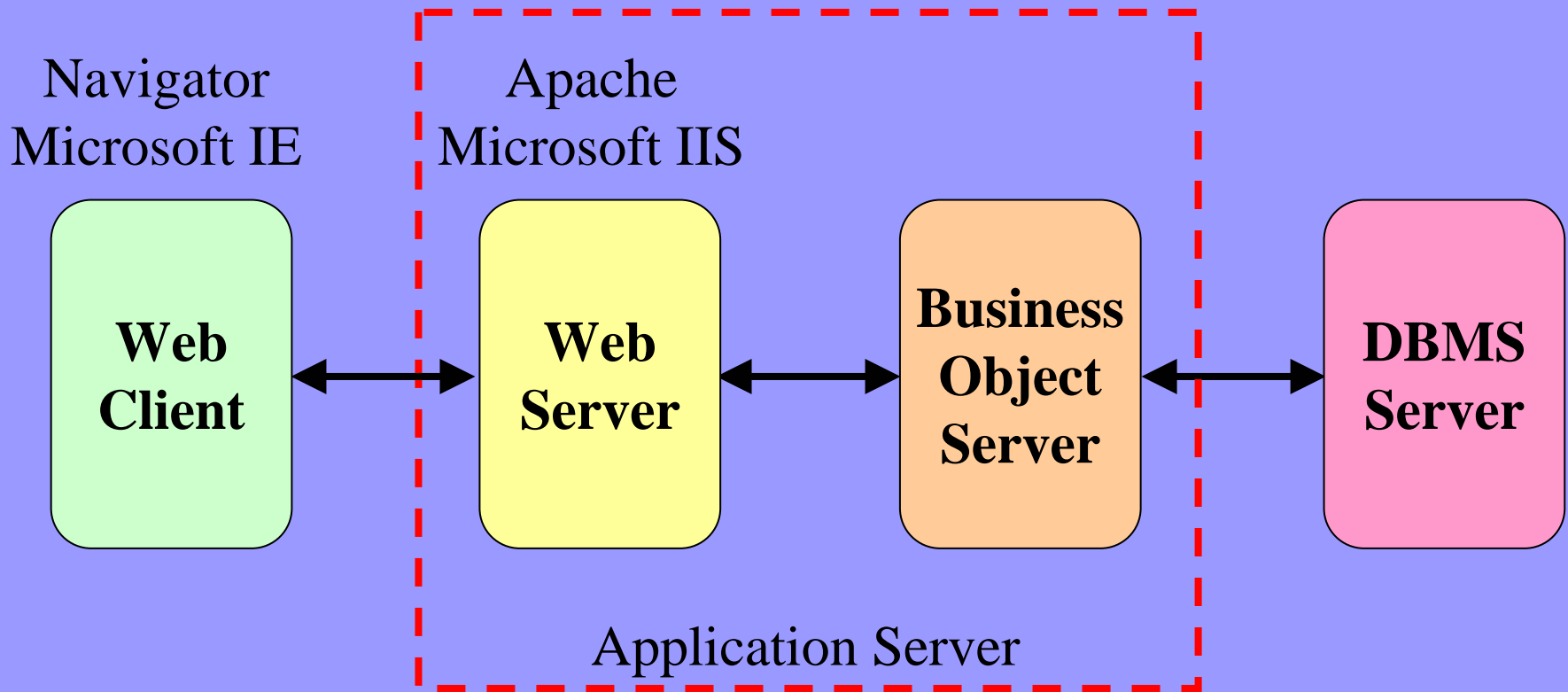
3-Tier



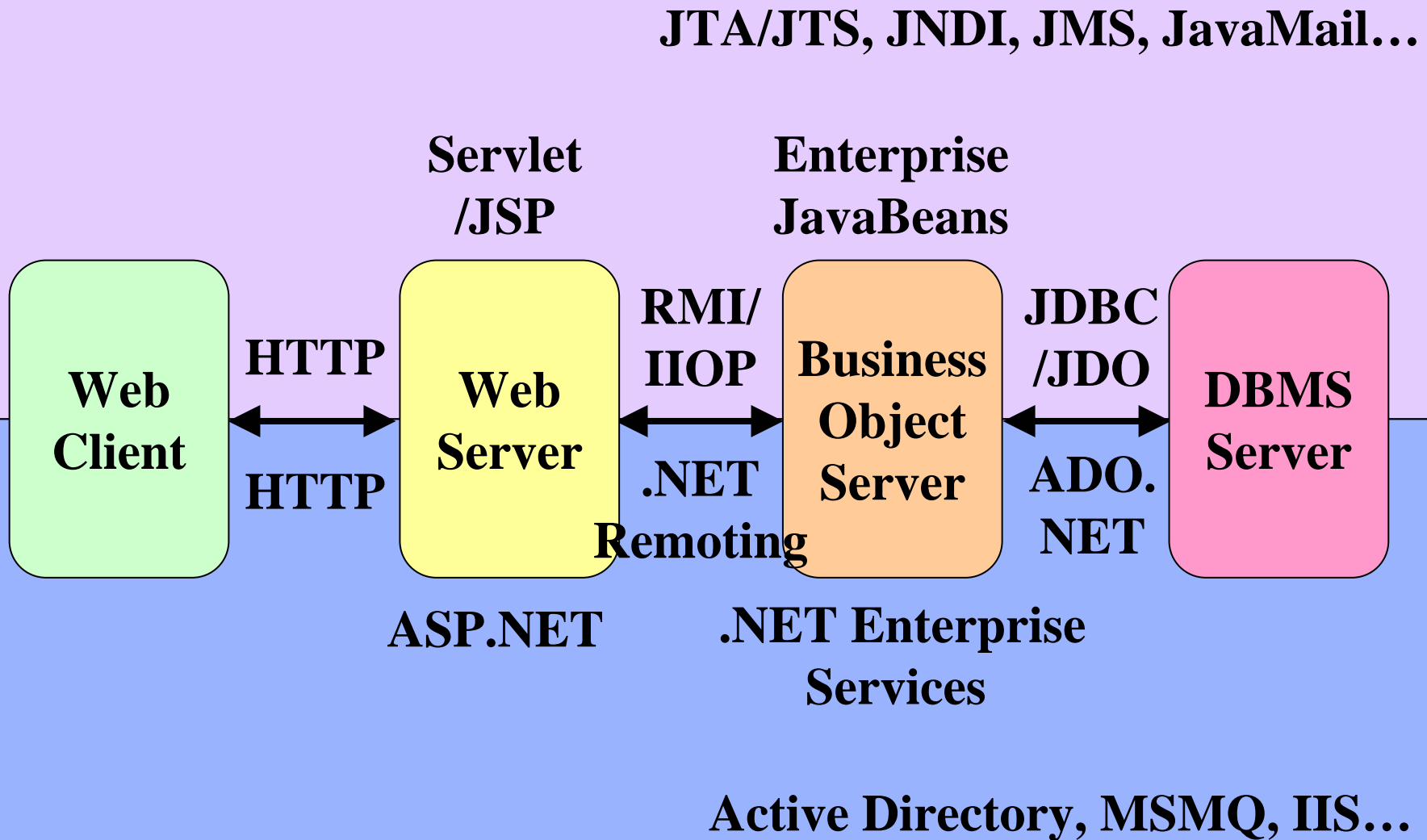
3-Tier



4-Tier



J2EE vs. .NET

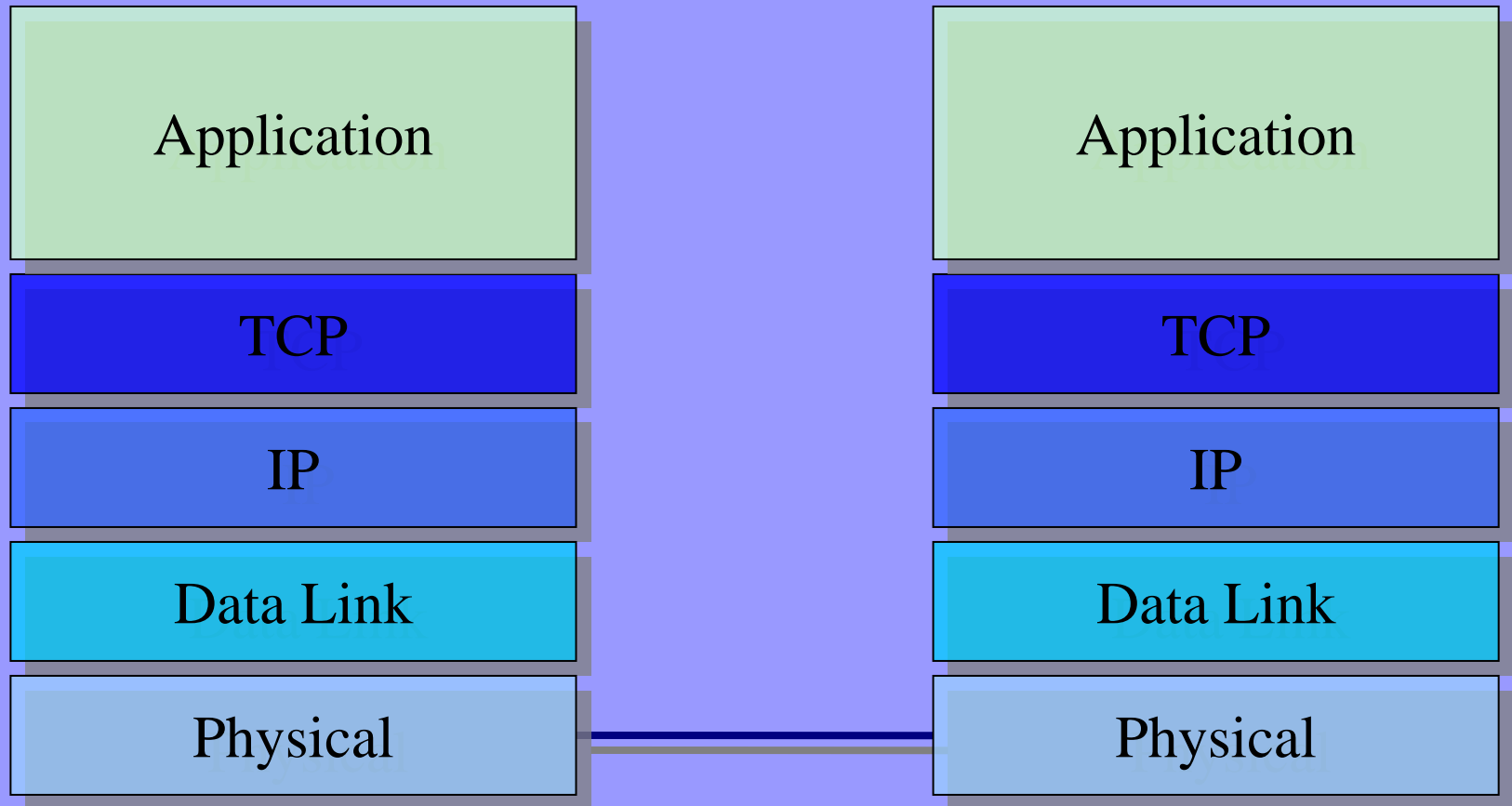




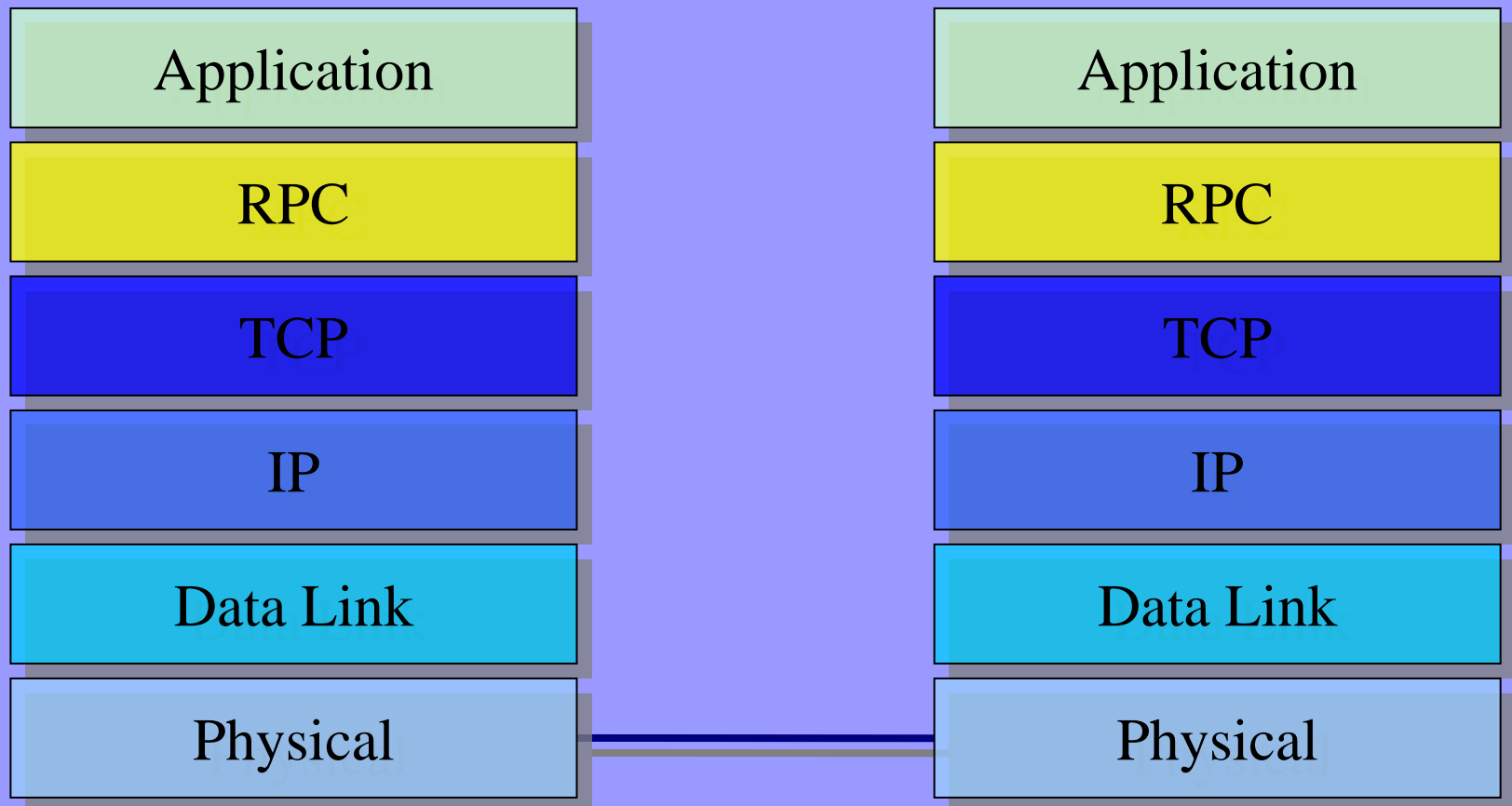
Remote Method Invocation (RMI)



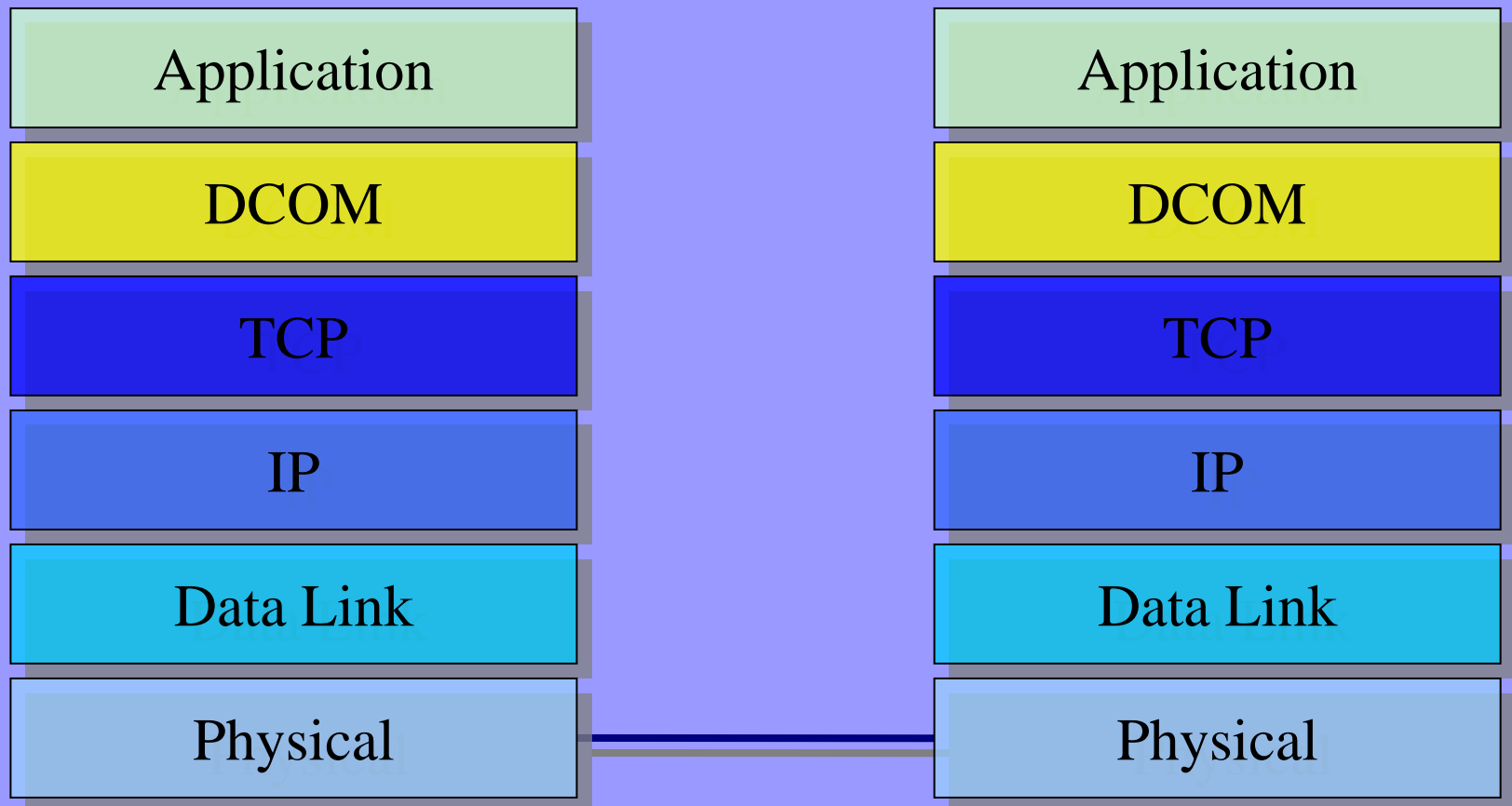
TCP



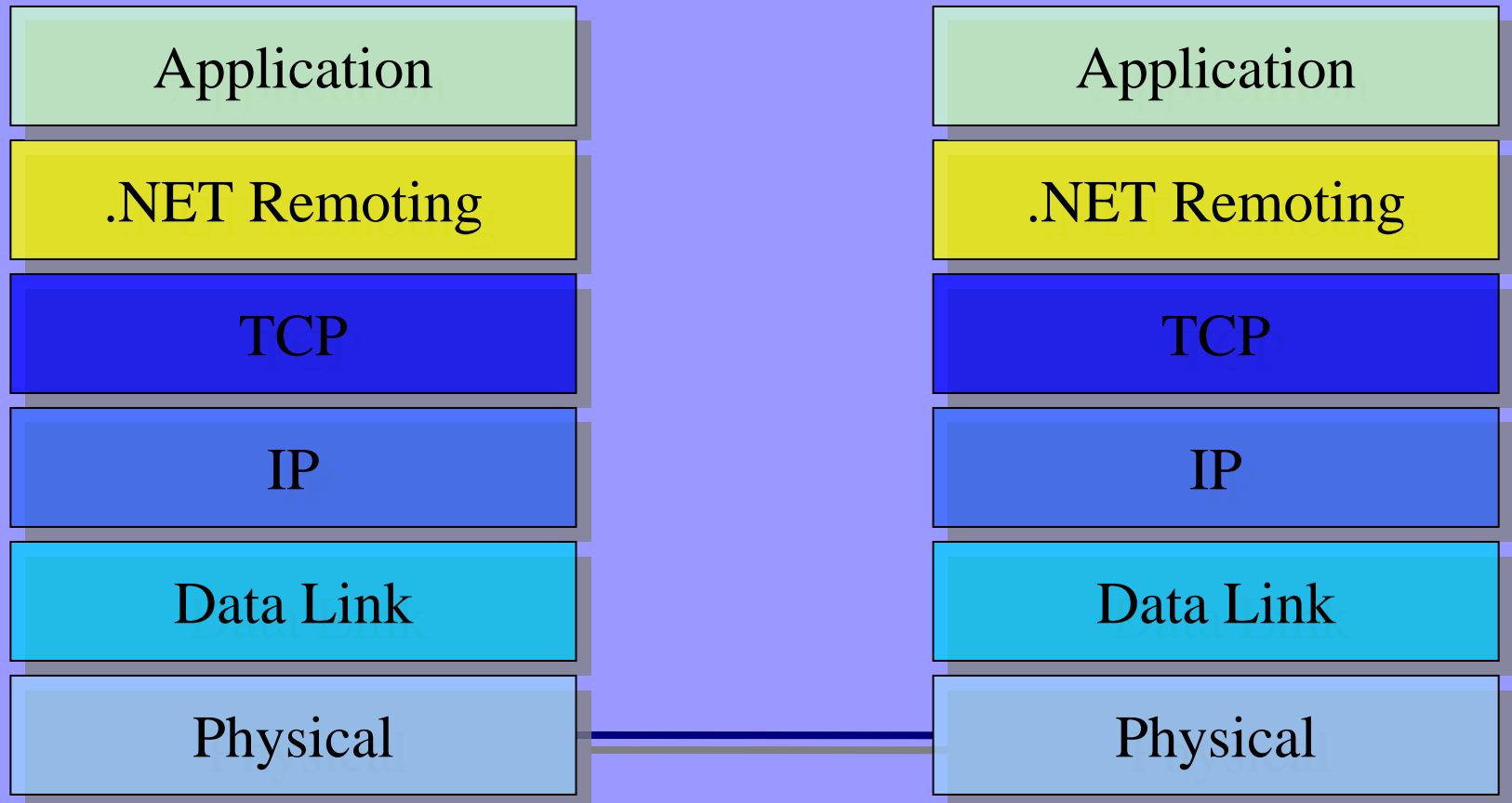
DCOM



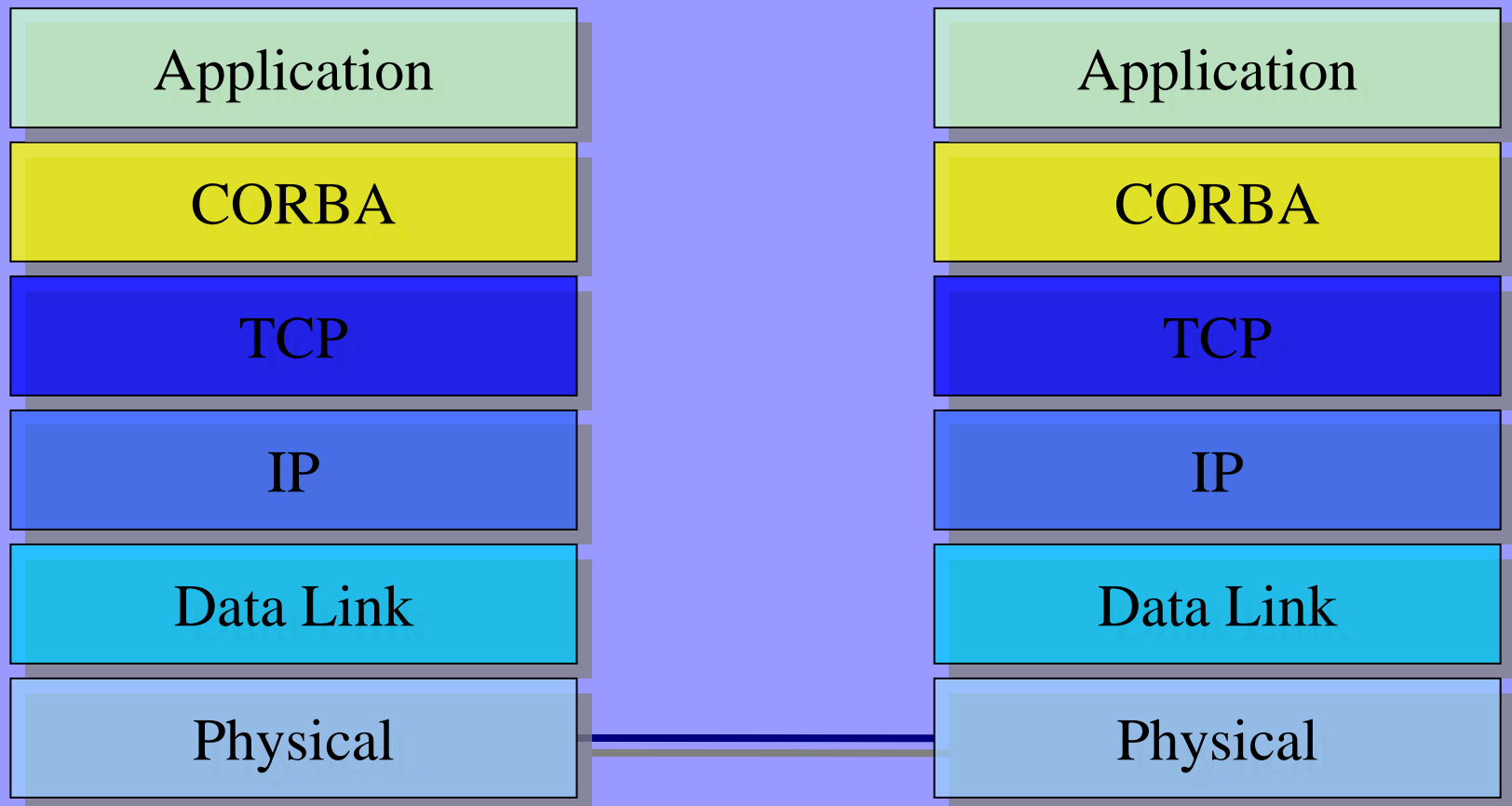
DCOM



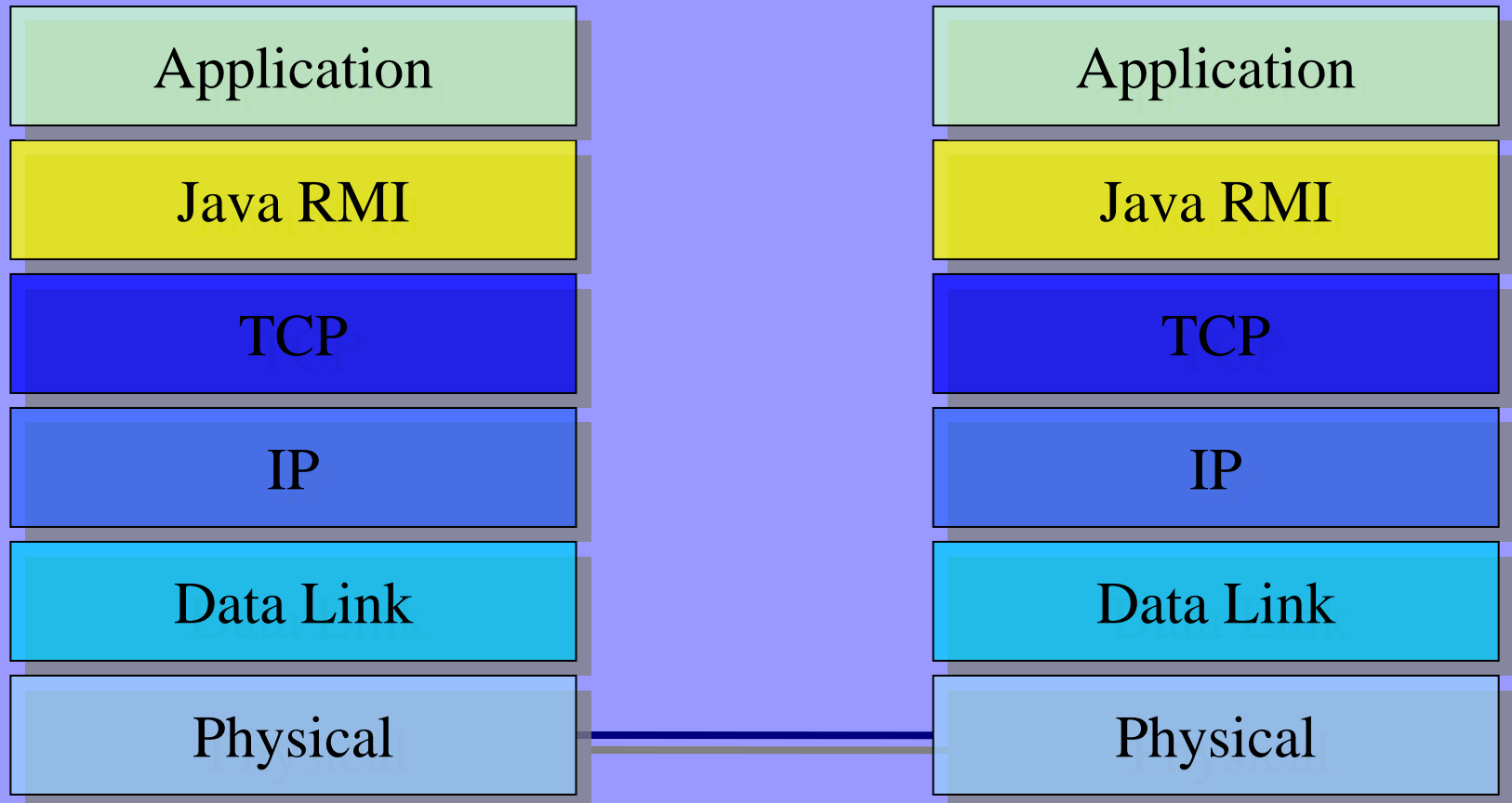
.NET Remoting



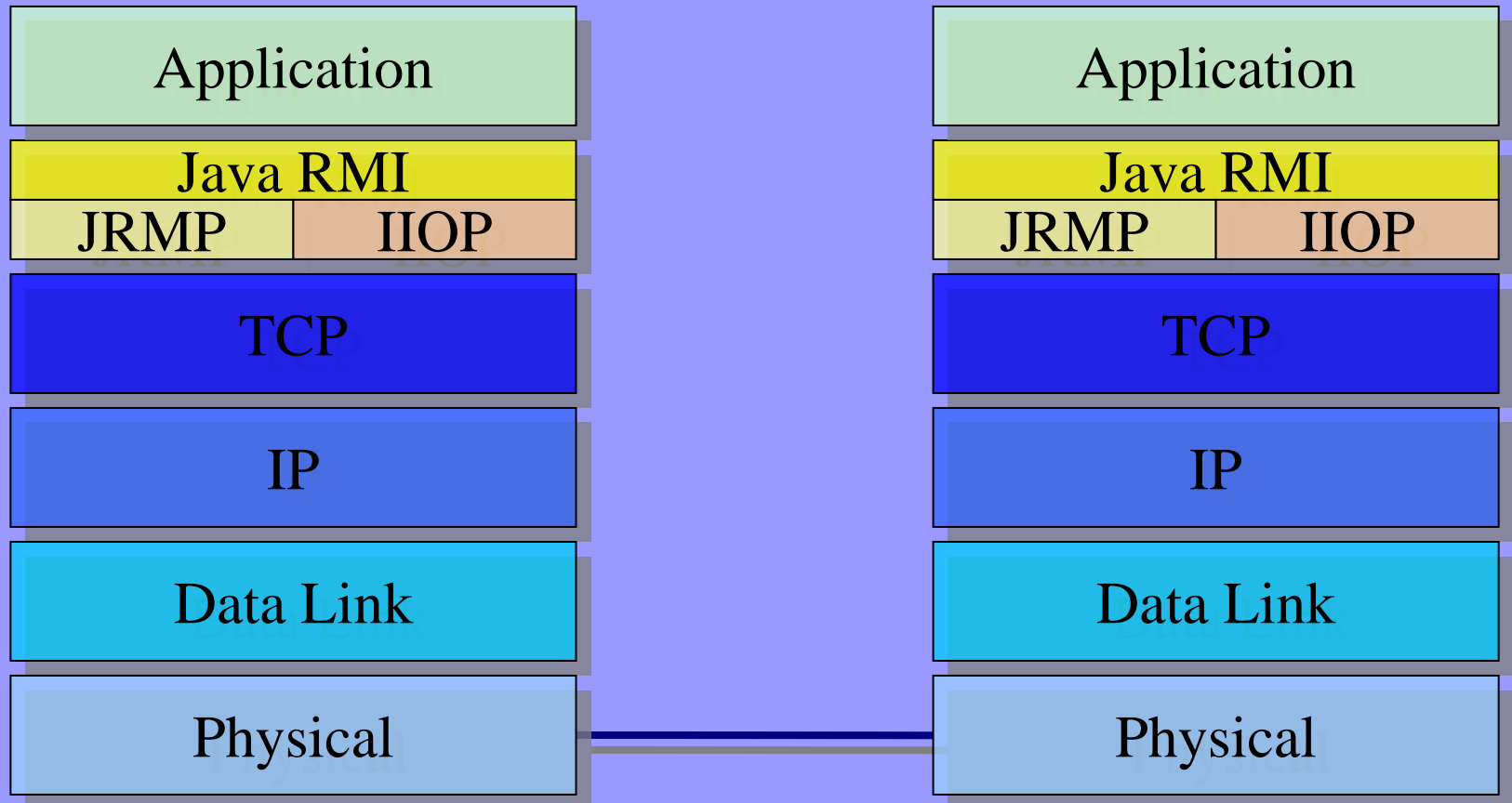
Java RMI



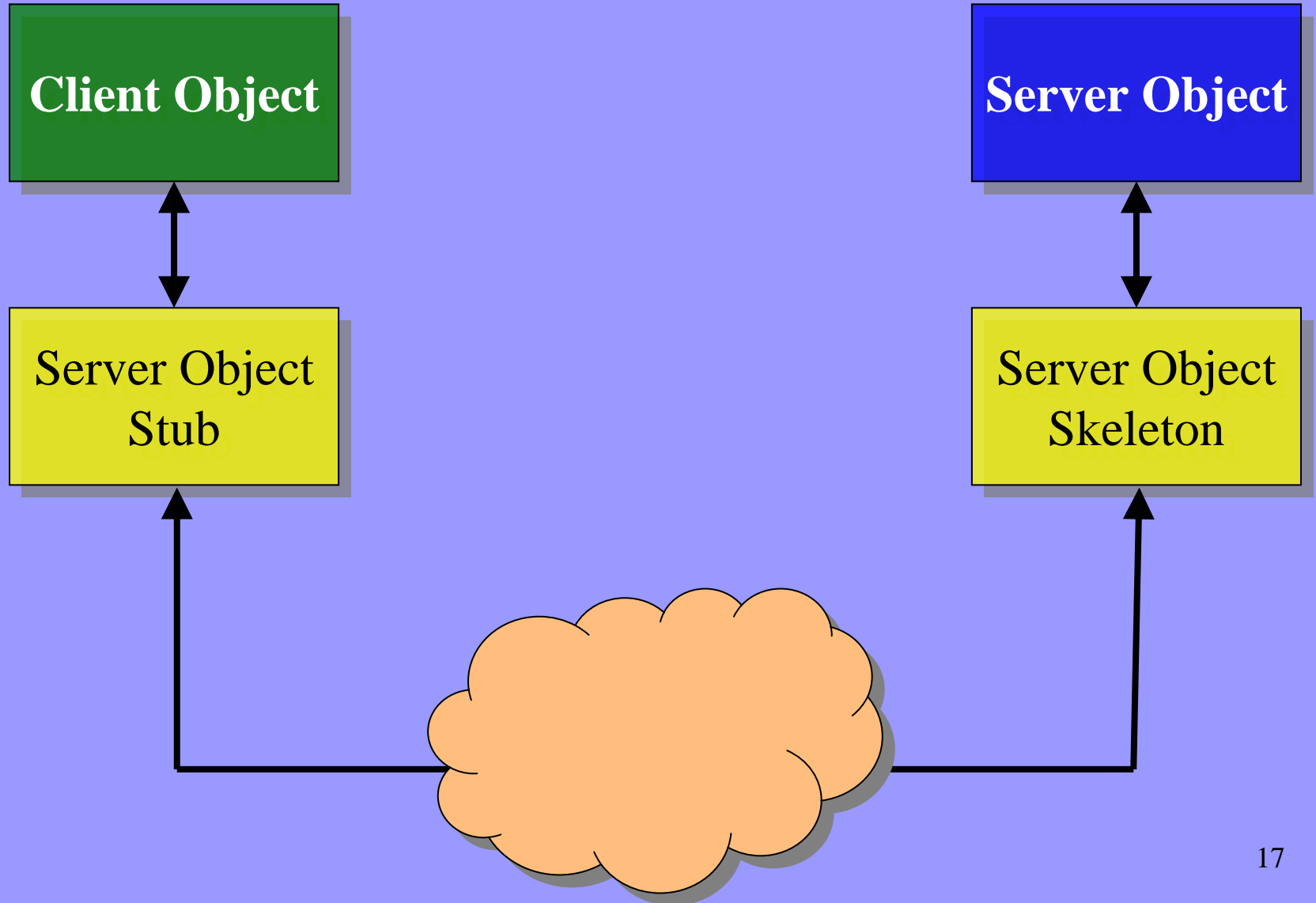
Java RMI



Java RMI over CORBA IIOP



Stub and Skeleton

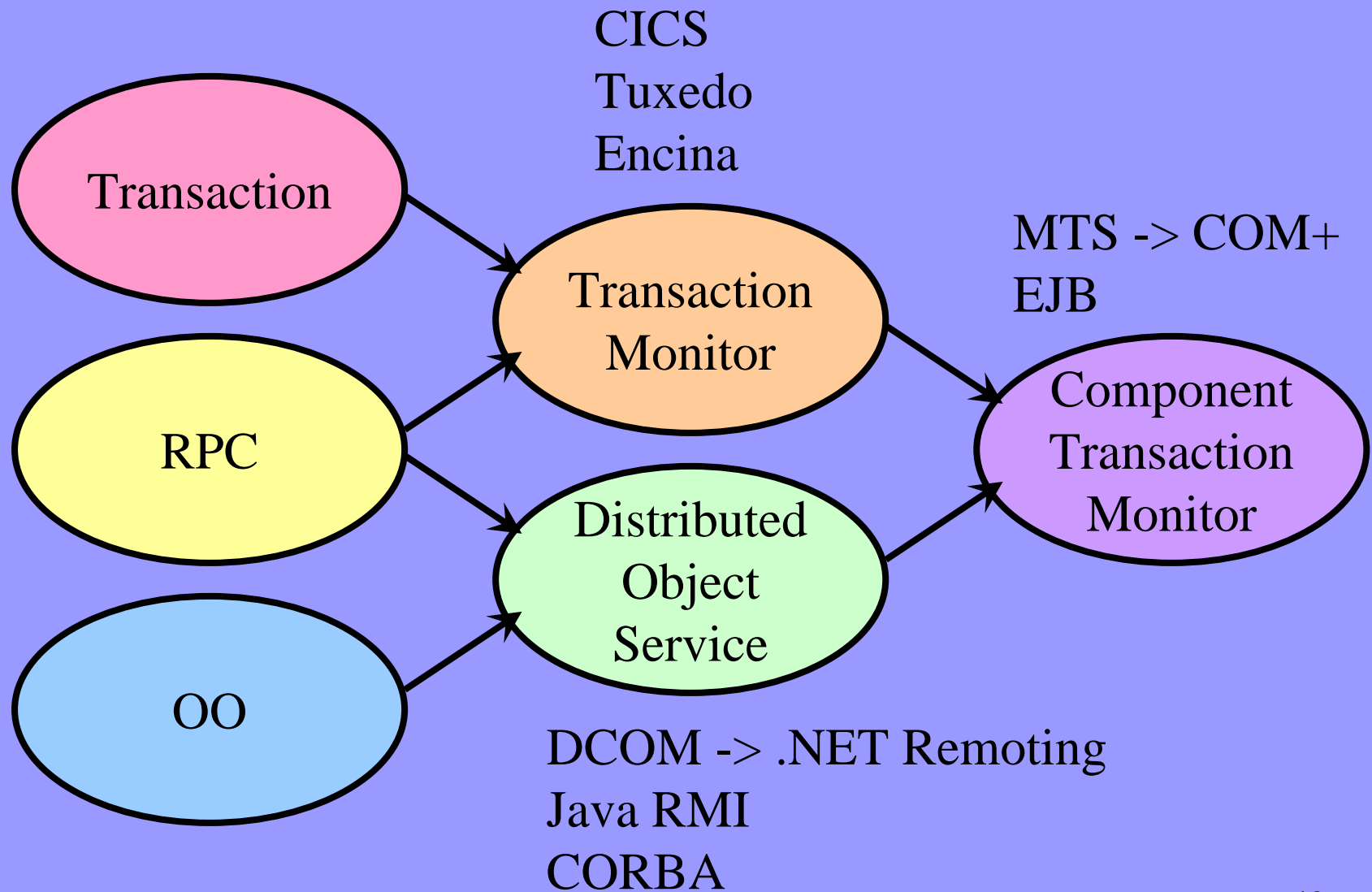




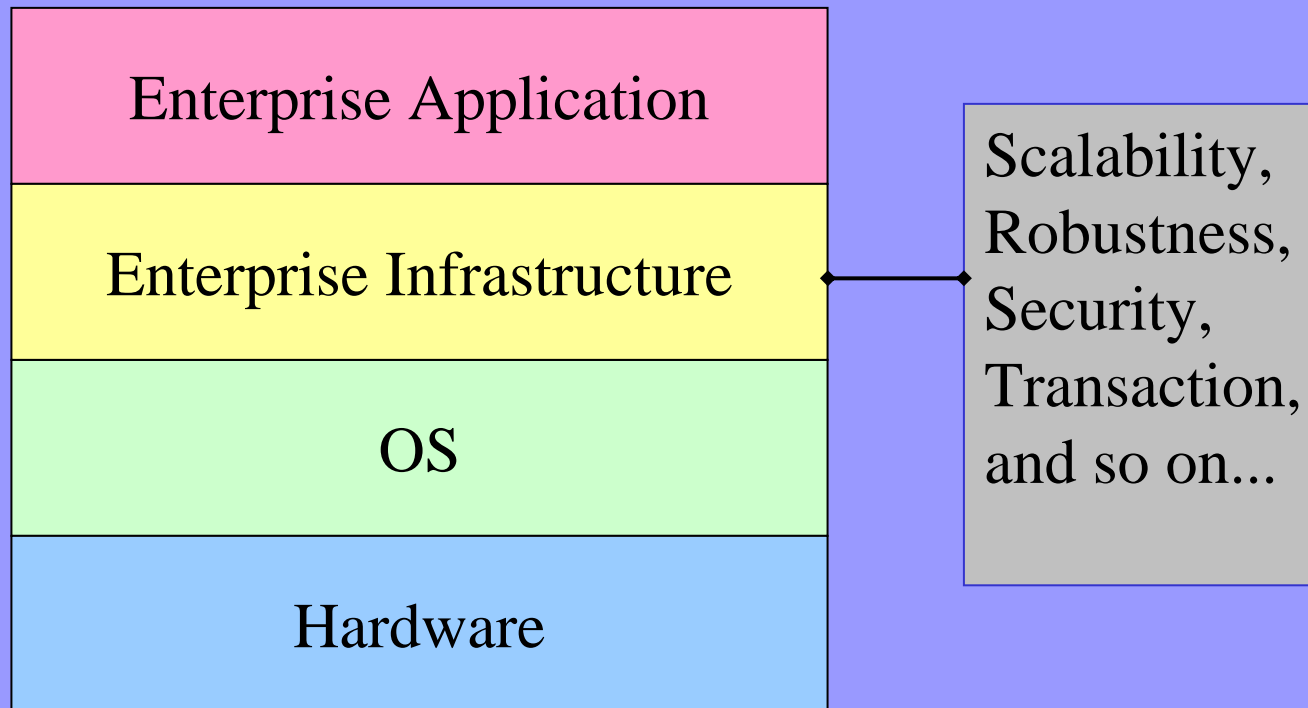
Component Transaction Monitor (CTM)



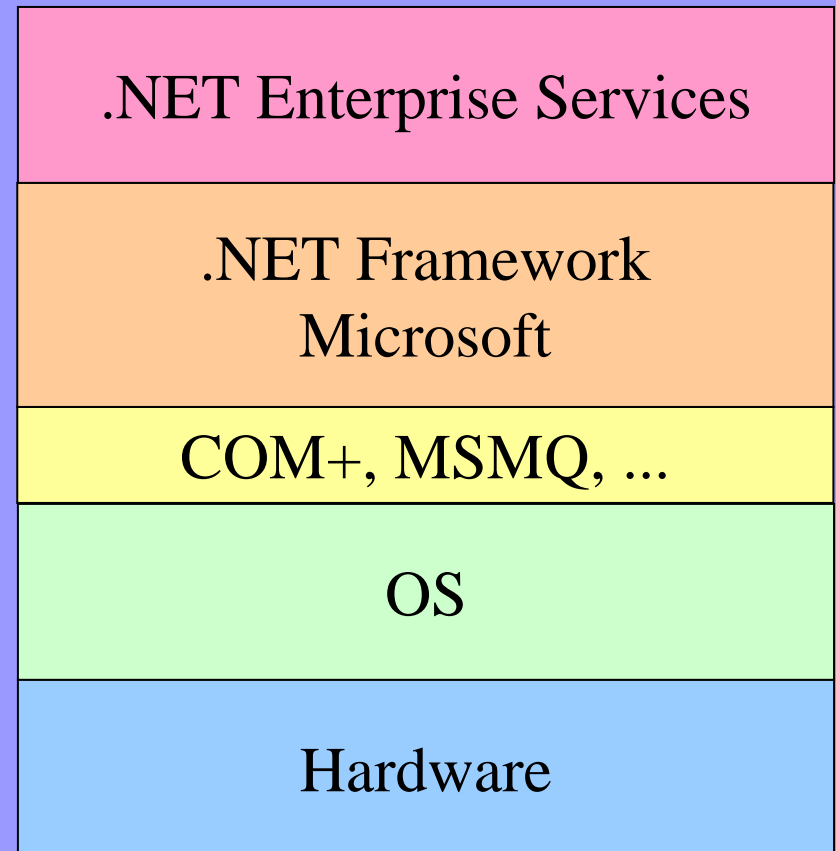
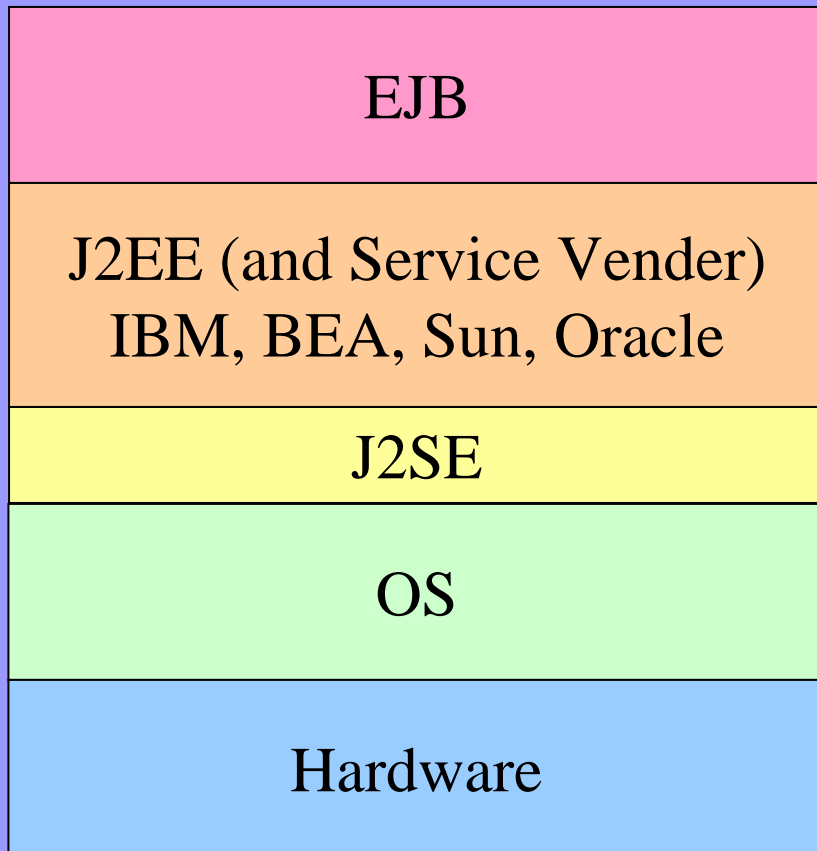
CTM and Its Preexistence

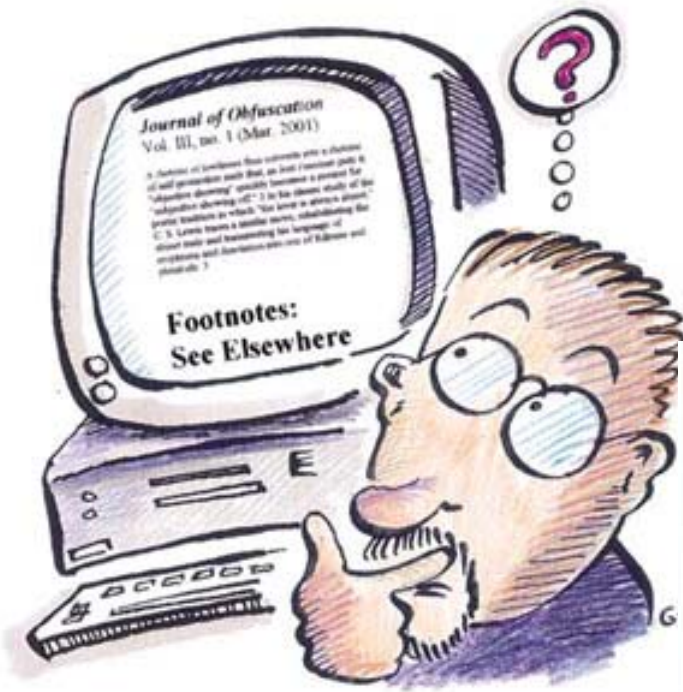


Enterprise Application Platform



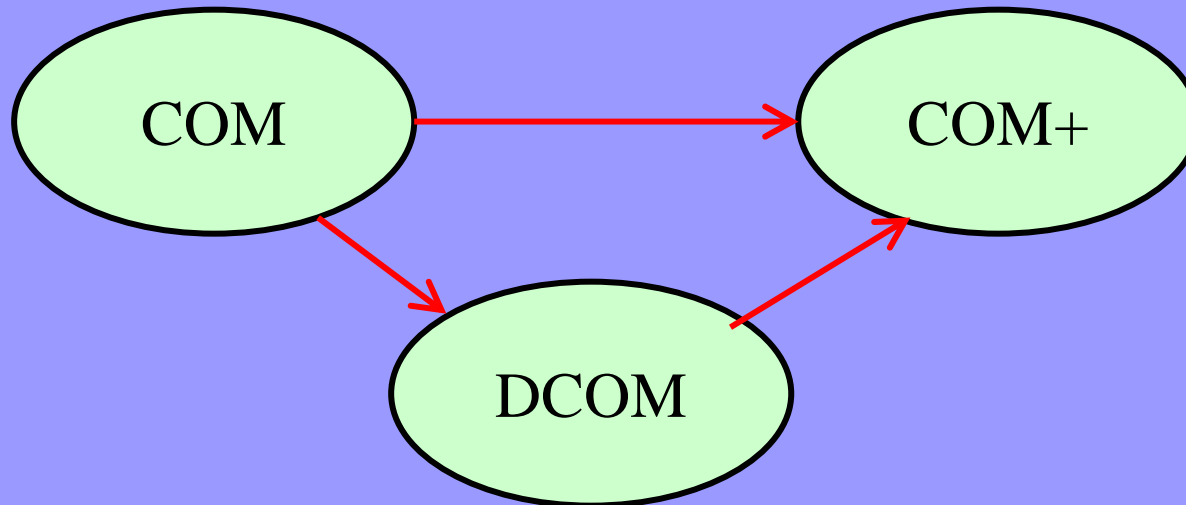
Java and .NET as Enterprise Platforms



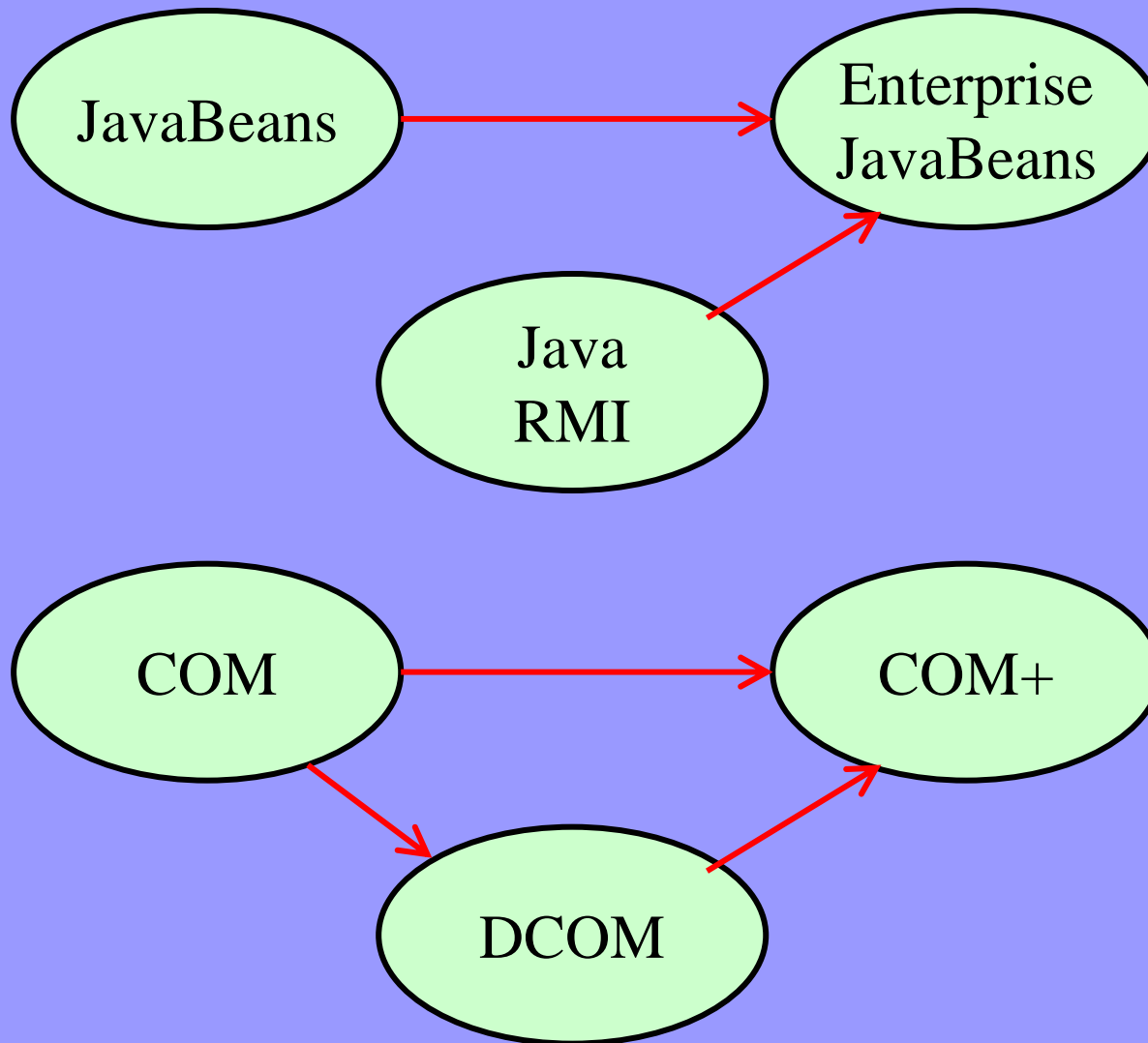


The Evolution of COM+

- MTS (WinNT)
- COM+ (Win2000)
- COM+ 1.5 (WinXP / Win Server 2003)

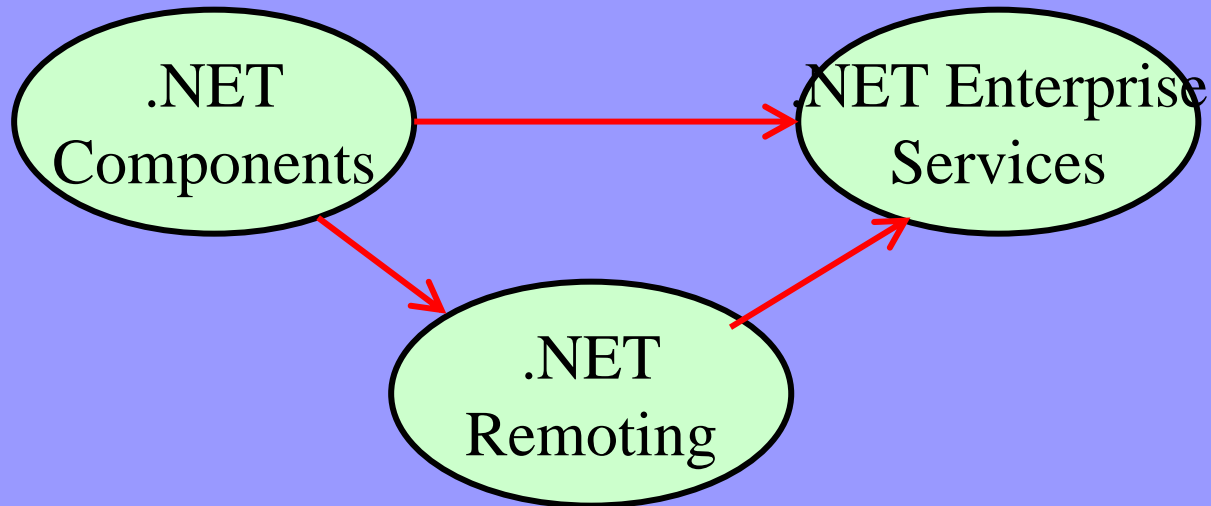


The Evolution of EJB

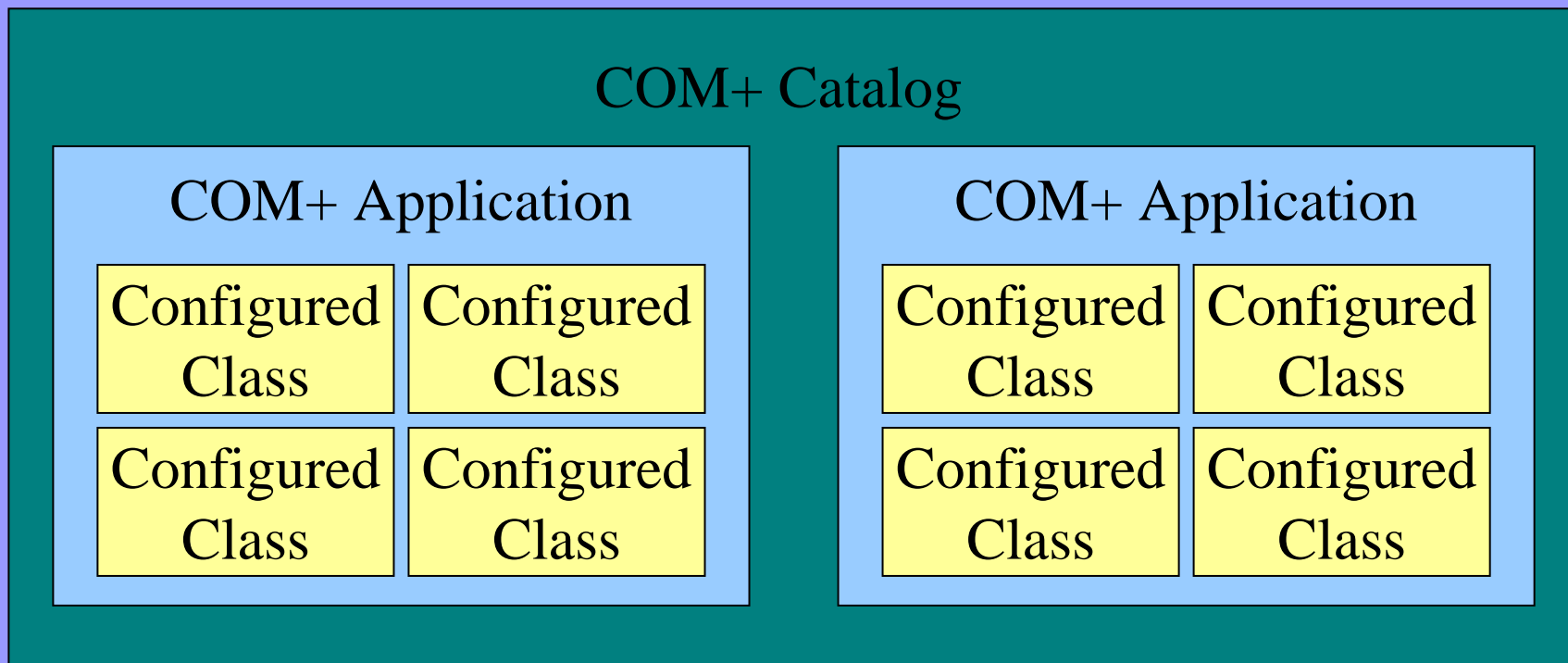


Windows -> .NET

- COM -> .NET Components
- COM+ -> .NET Enterprise Services
- DCOM -> .NET Remoting



COM+ Catalog



- COM+Application
 - Library Application
 - Server Application

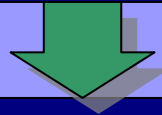


.NET Enterprise Services

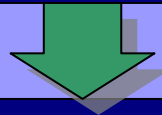


4-step Process to Create .NET Enterprise Services

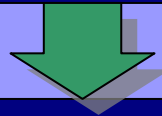
Step1: Define serviced component classes



Step2: Use declarative attributes on the classes



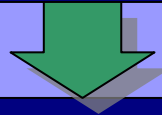
Step3: Use declarative attributes on the assembly



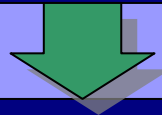
Step4: Register the serviced component

4-step Process to Create EJB beans

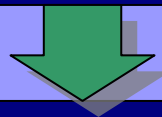
Step1: Define beans



Step2: Define declarative attributes in XML file

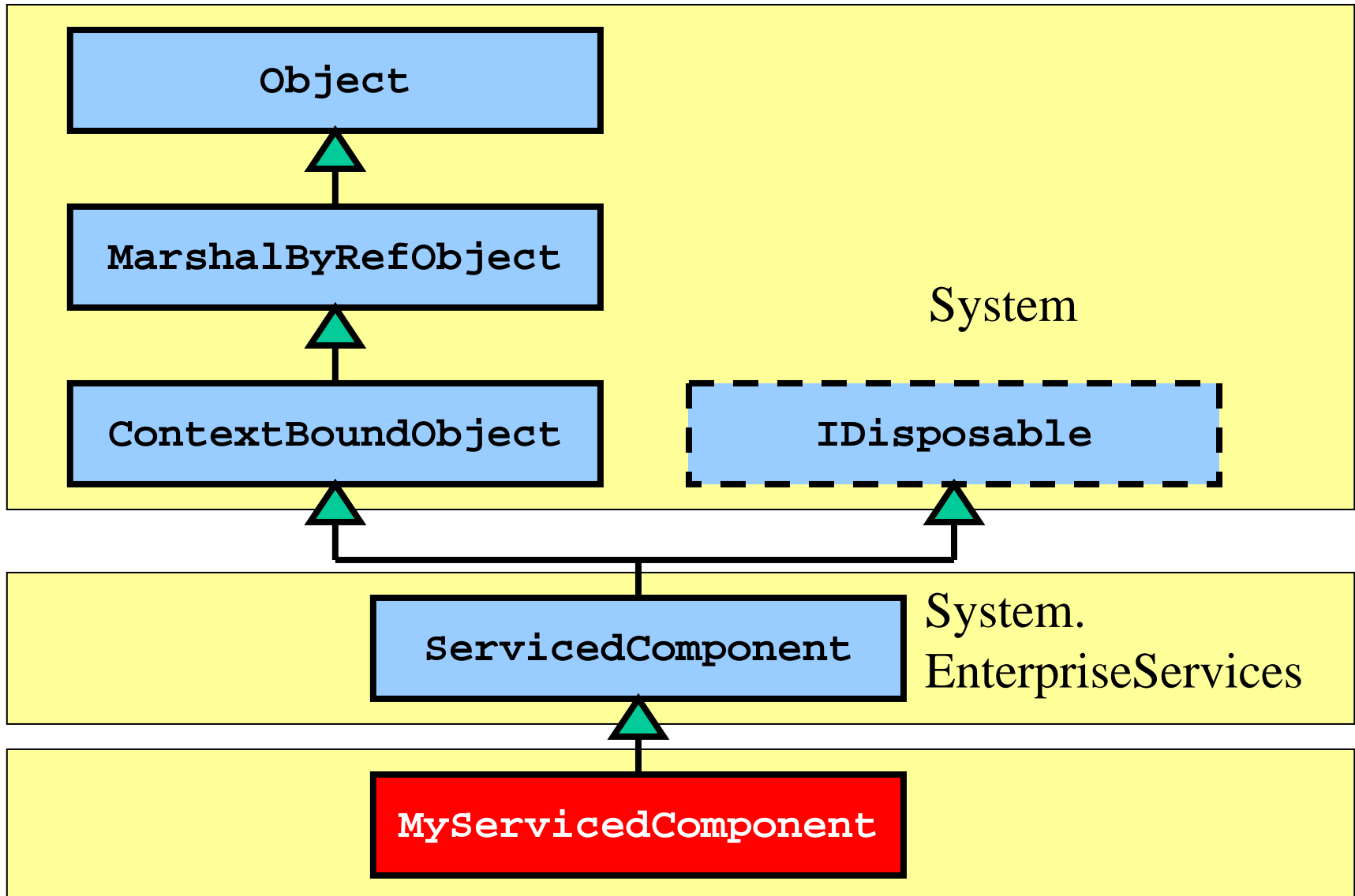


Step3: Package classes in “.ear” file



Step4: Deploy the “.ear” file.

.NET Serviced Component



Sample

```
// C#
using System.EnterpriseServices;

[assembly: ApplicationName("Employee Information System")]
[assembly: ApplicationID("5209F894-D801-44b4-BBBA-4706A2546467")]
[assembly: ApplicationActivation(ApplicationOption.Server)]
[assembly: AssemblyKeyFile("MyKeyFile.snk")]

namespace eis {
    [JustInTimeActivation]
    public class Employee : ServicedComponent {
        private String _name;
        public Employee() {
        }
        public String Name {
            get { return _name; }
            set { _name = value; }
        }
    }
}
```

Enterprise Service Attributes for Classes

| Attribute Class | Description |
|---------------------------------|---|
| AutoCompleteAttribute | Auto Completion of Transaction |
| ComponentAccessControlAttribute | Component, interface, and method-level access check |
| ConstructionEnabledAttribute | Object construction using externally specified construction strings |
| JustInTimeActivationAttribute | Enables JIT activation |
| ObjectPoolingAttribute | Enables object pooling |
| SecurityRoleAttribute | Role-based access check |
| TransactionAttribute | Enable transaction support |
| ... | ... |

Enterprise Service Attributes for Classes

| Attribute Class | Description |
|-----------------------------------|---|
| ApplicationNameAttribute | Name of Application |
| ApplicationIDAttributeAttribute | Unique ID for the application |
| DescriptionAttribute | Application Description |
| ApplicationActivationAttribute | Activation Mode: either library or server |
| ApplicationAccessControlAttribute | Security settings |
| ApplicationQueuingAttribute | Enables the application for queued components |
| ... | ... |

Register the Serviced Components

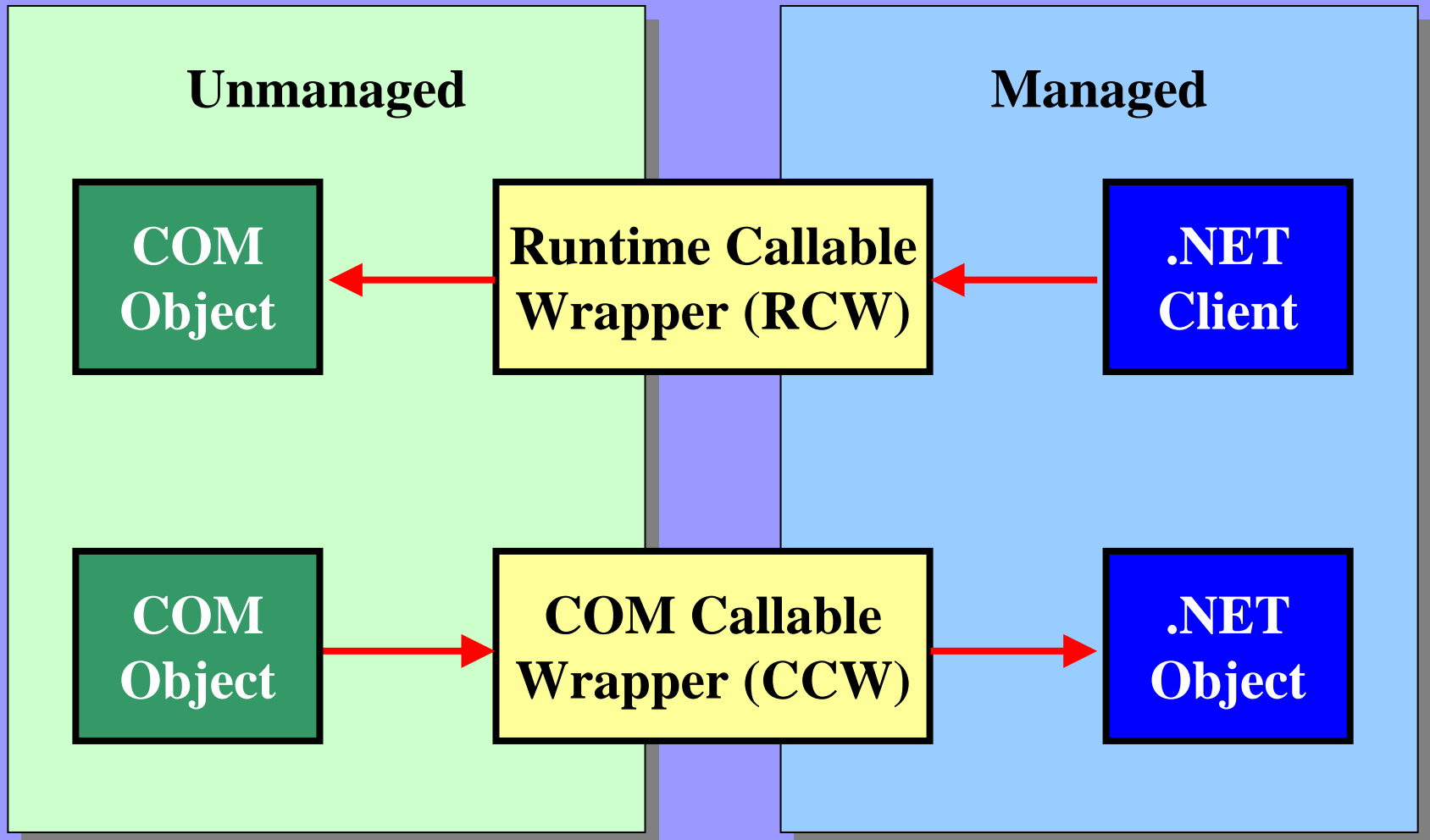
- Manually, using a tool provided by .NET (`regsvcs.exe`)
- Programmatically, using a utility class provided by .NET (`RegistrationHelper`)
- Automatically, by running the client program.



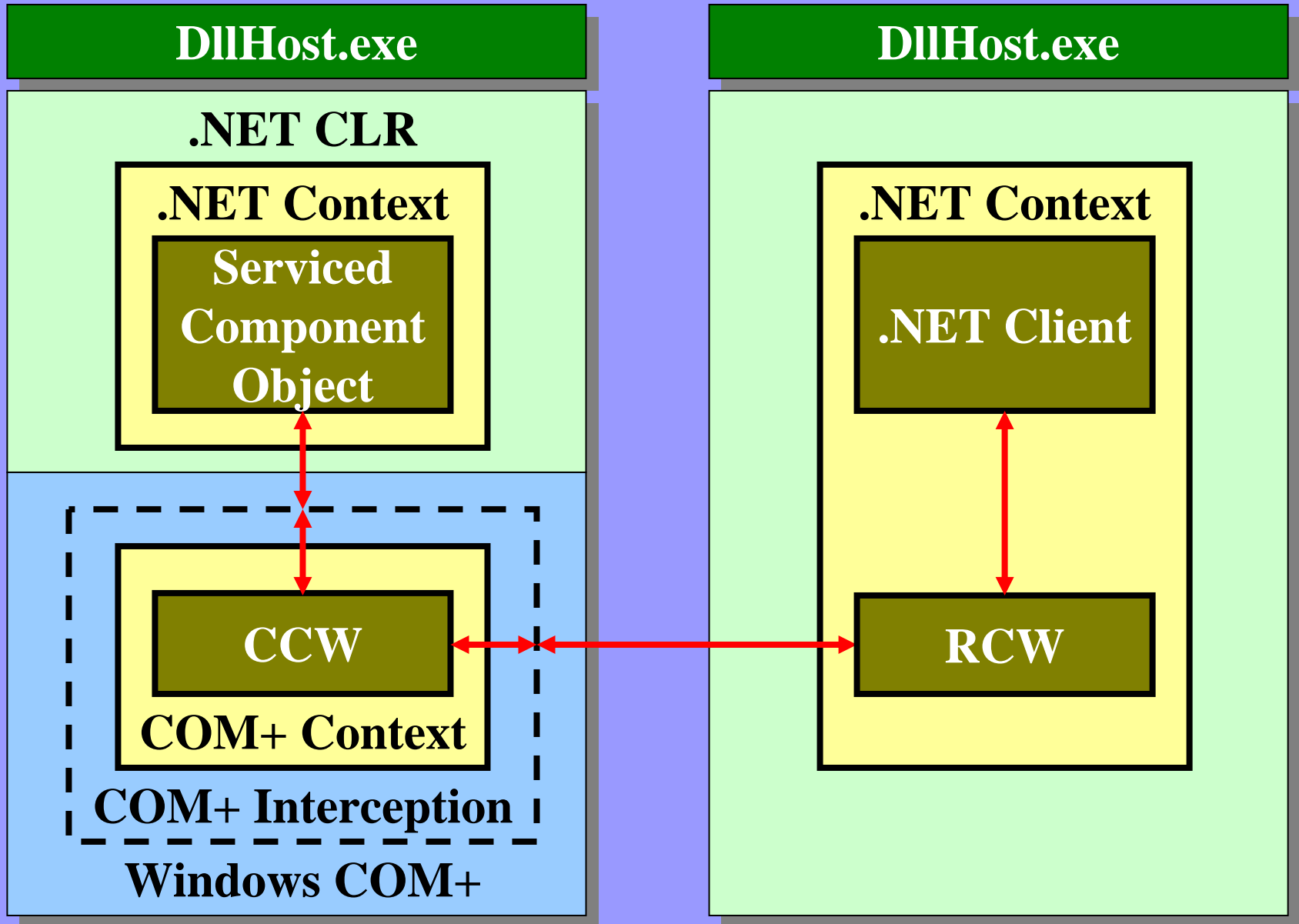
COM/COM+ And .NET



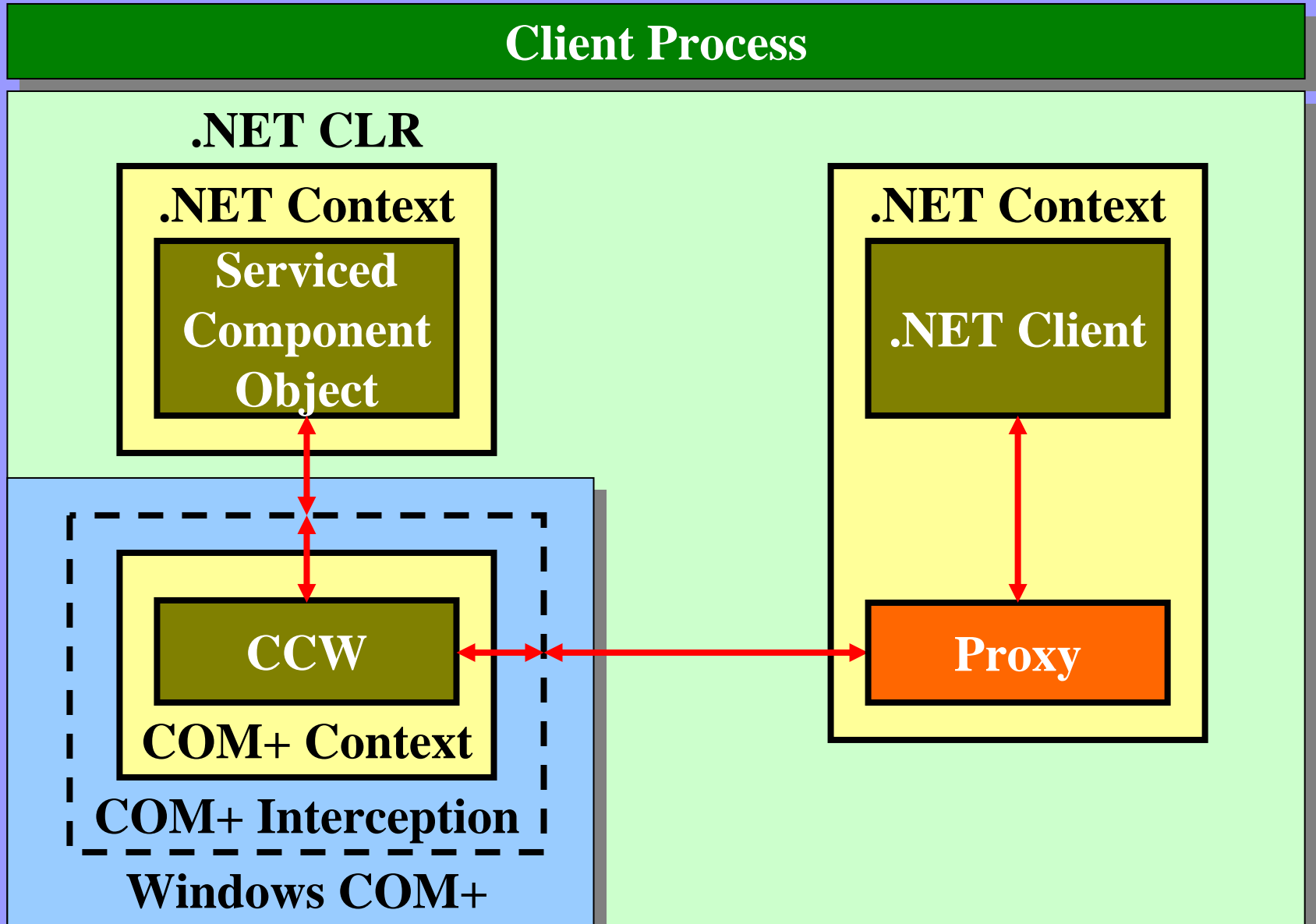
COM interop



Out-of-Process Activation



In-Process Activation





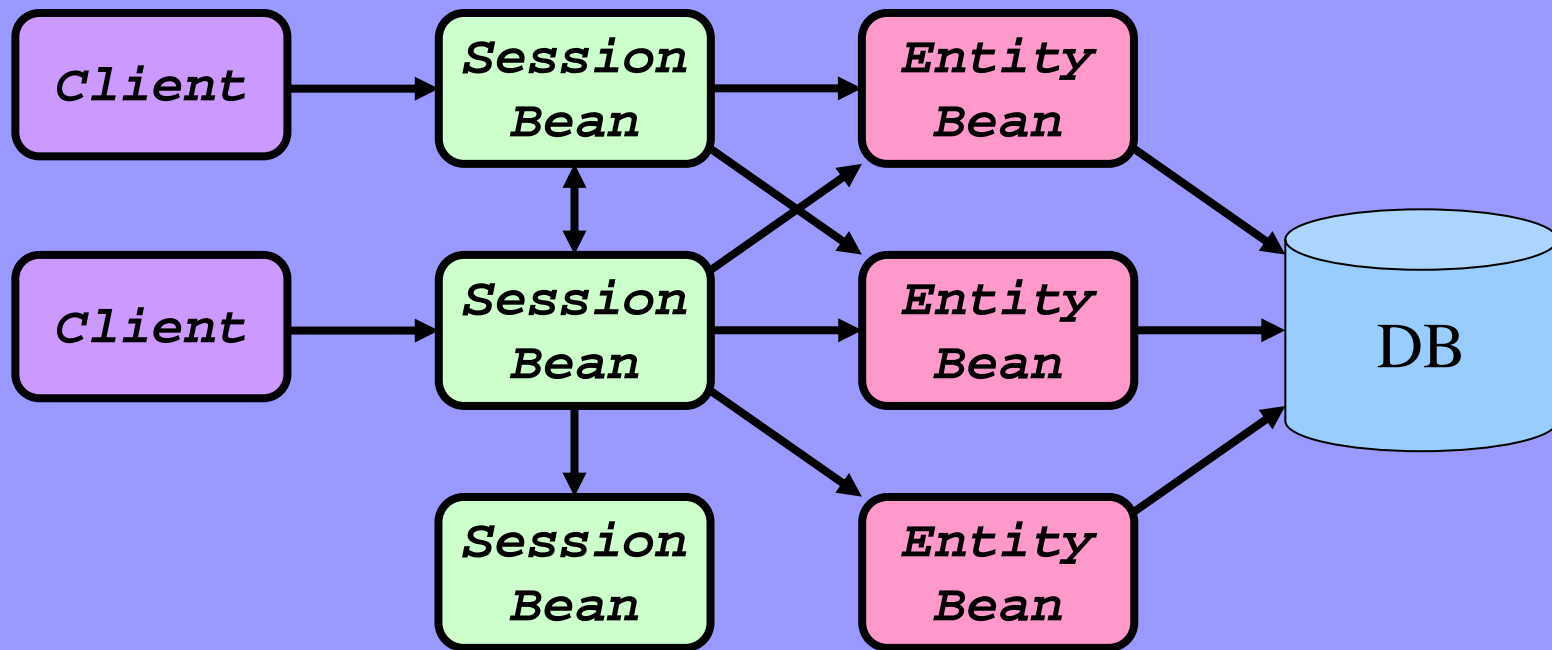
Enterprise JavaBeans (EJB)



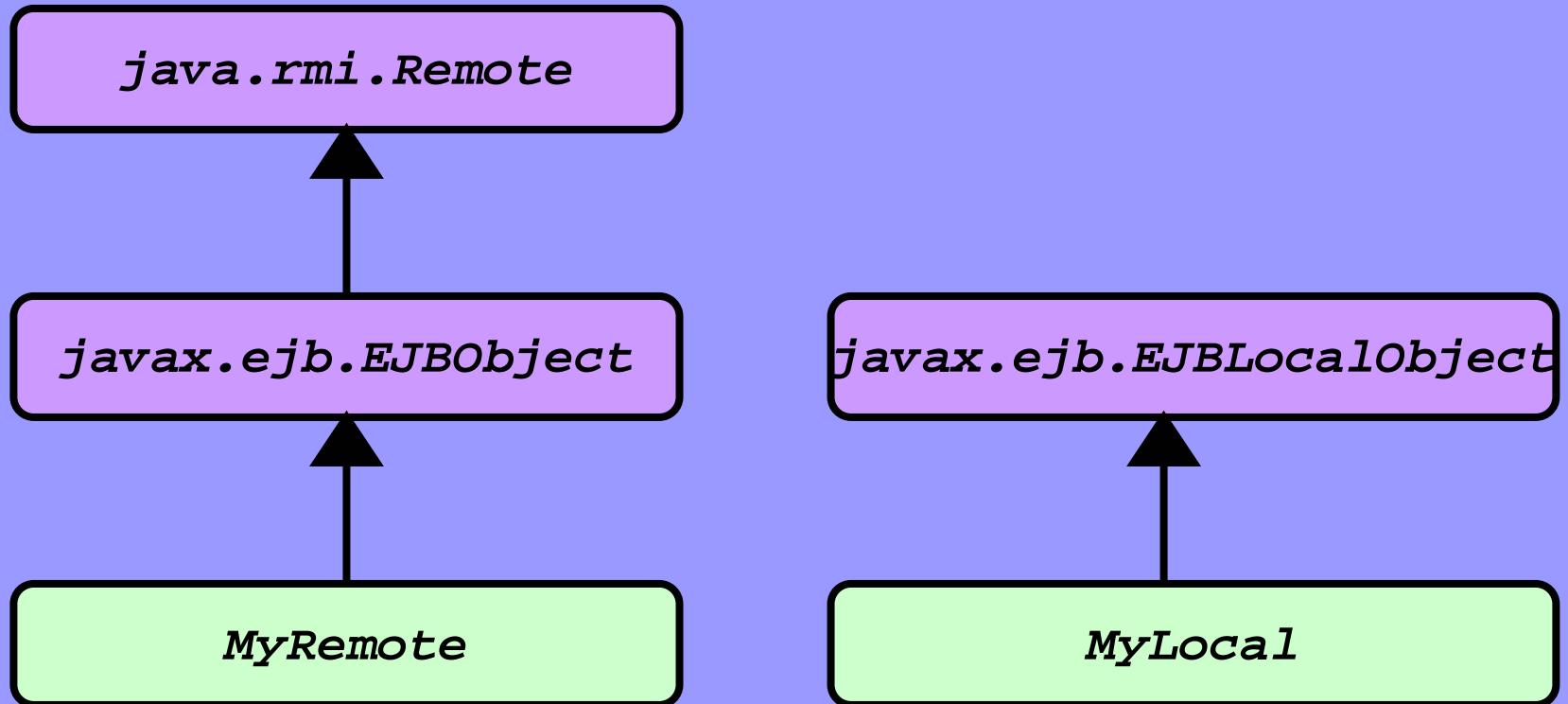
Various EJB

- Entity Bean
 - CMP
 - BMP
- Session Bean
 - Stateless
 - Stateful
- Message-Driven Bean

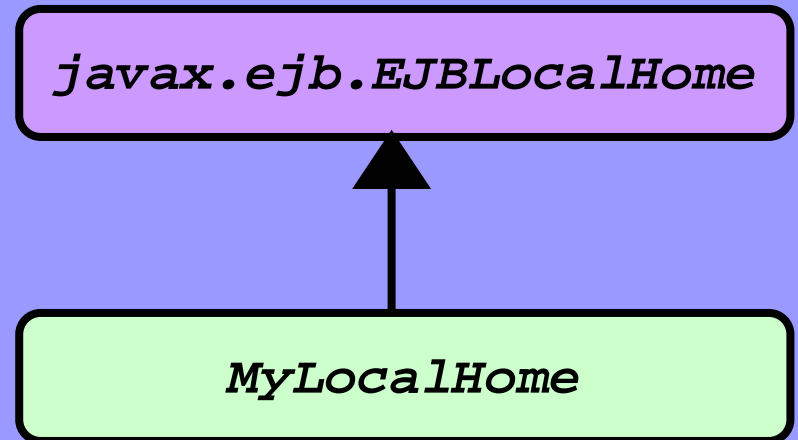
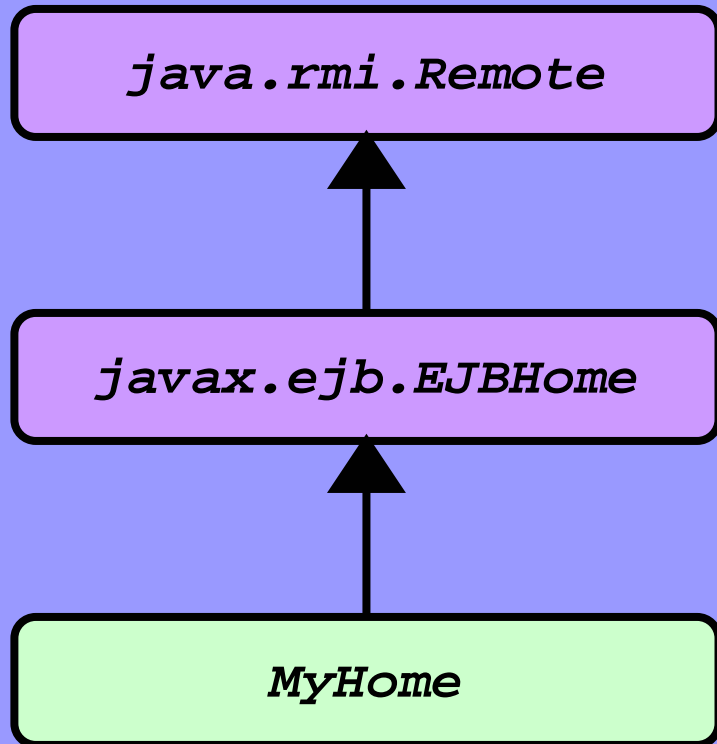
Enter Beans & Session Beans



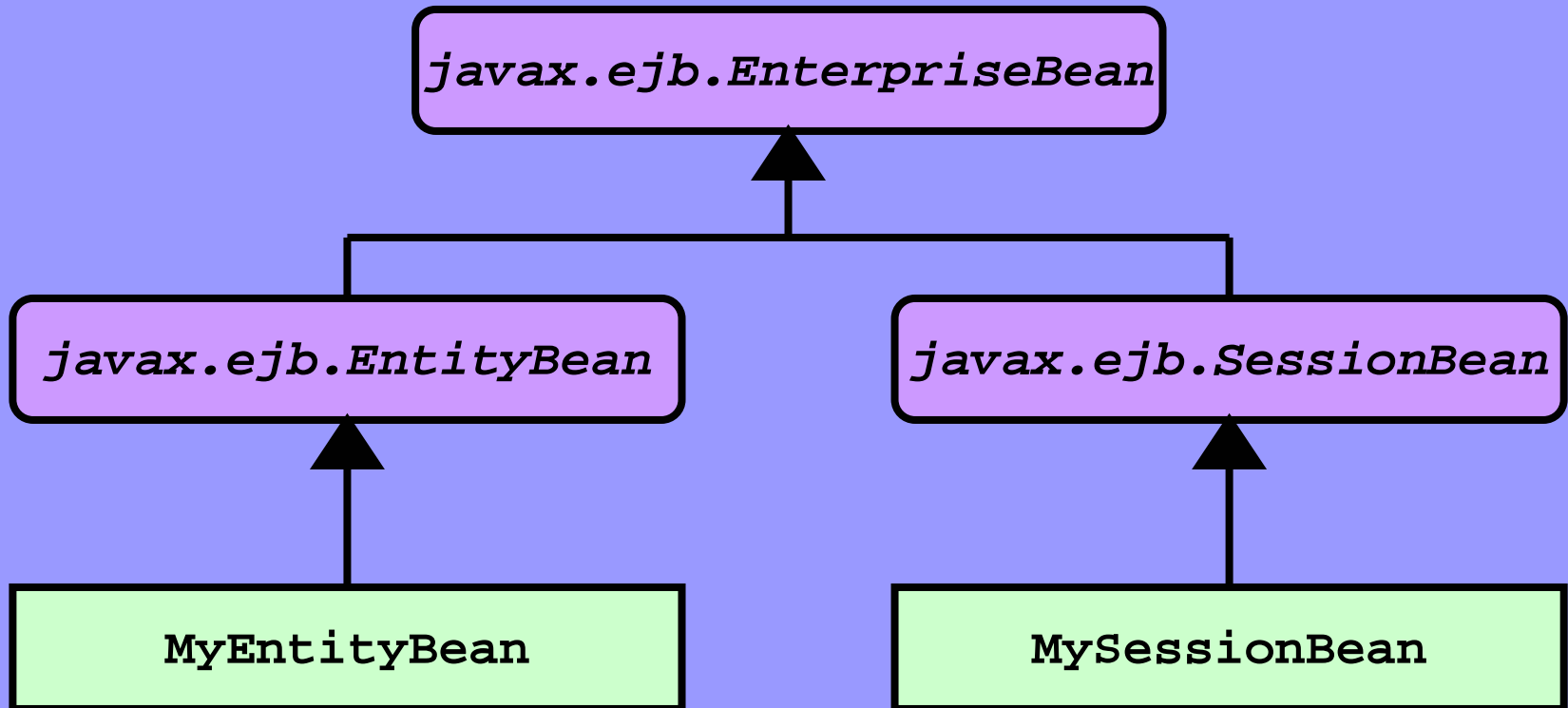
Bean Interface



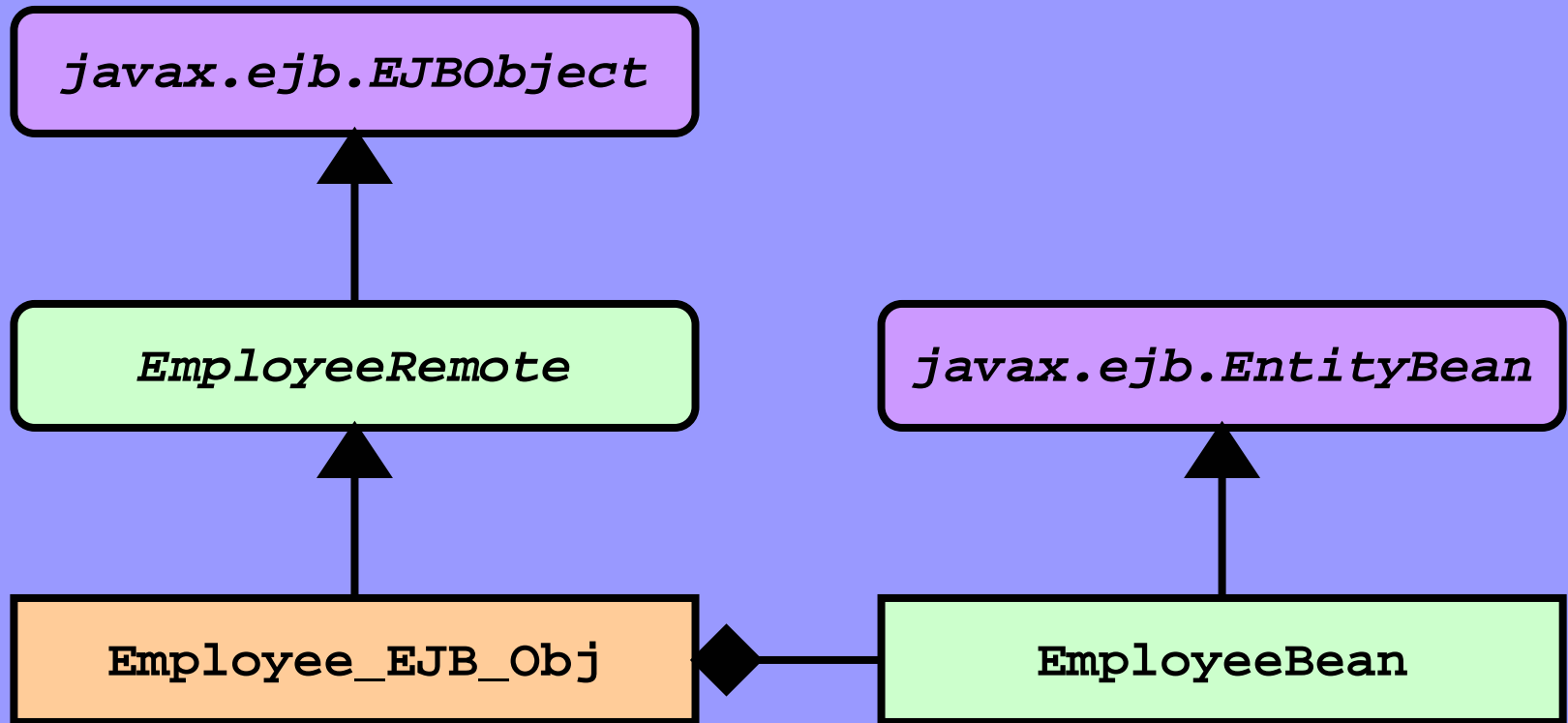
EJB Home



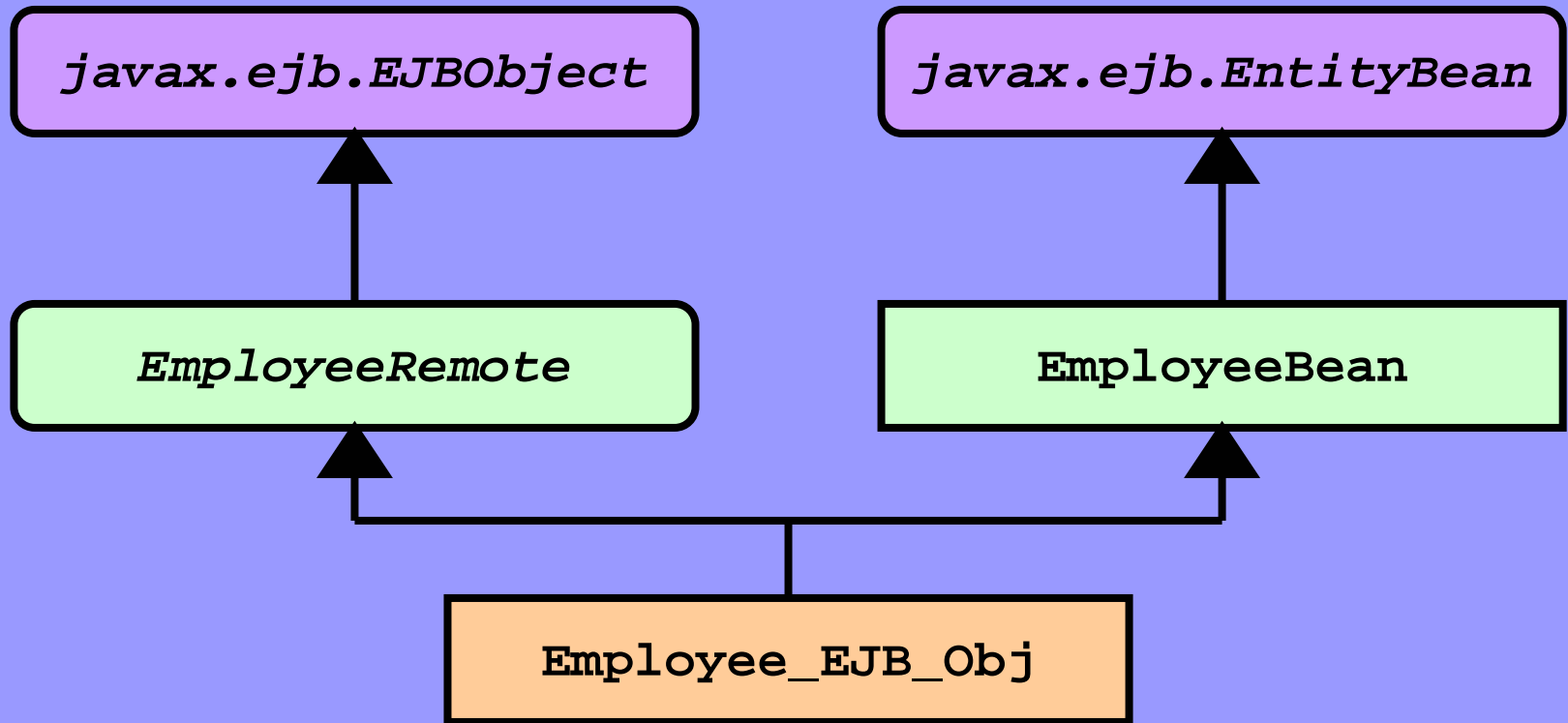
Bean Object



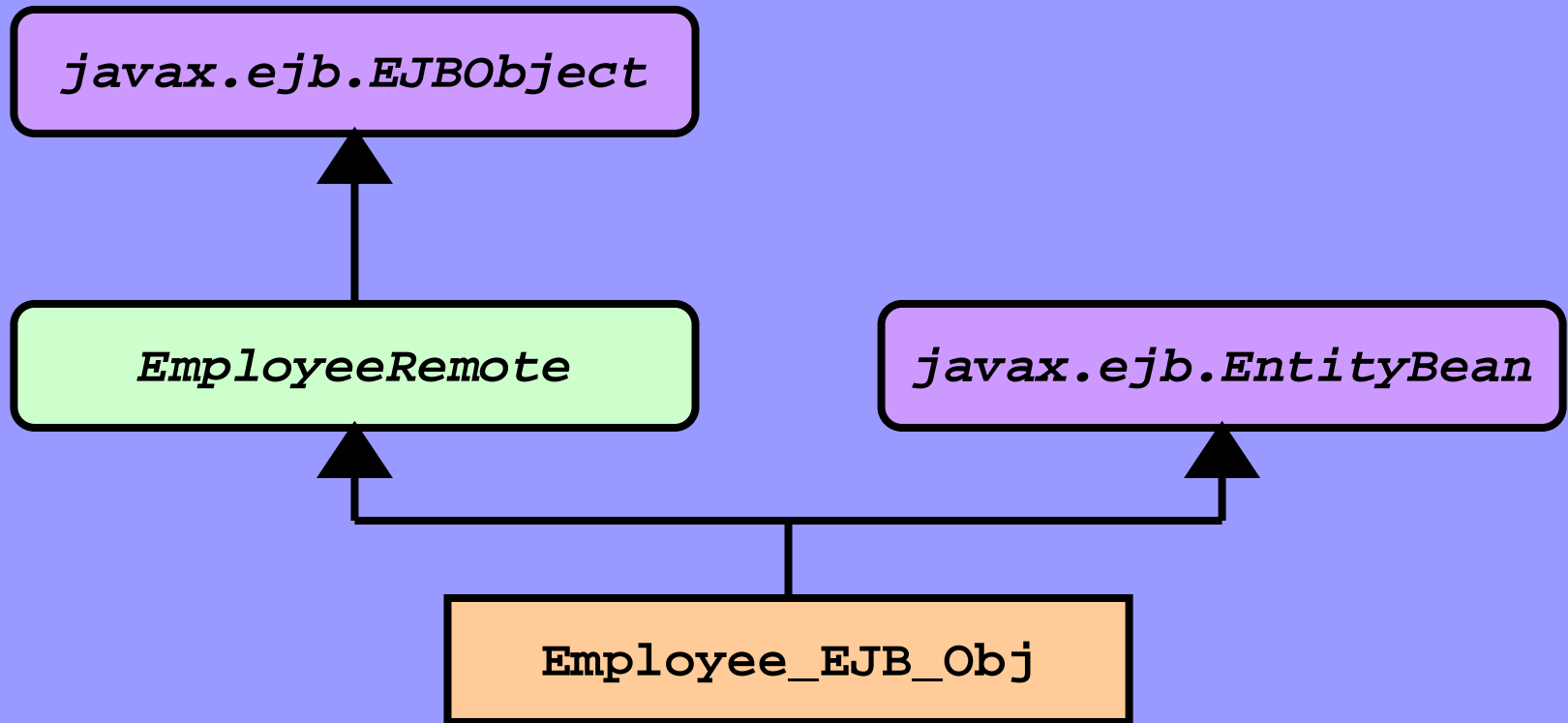
The Implementation of EJB Object (1) Delegation



The Implementation of EJB Object (2) Inheritance

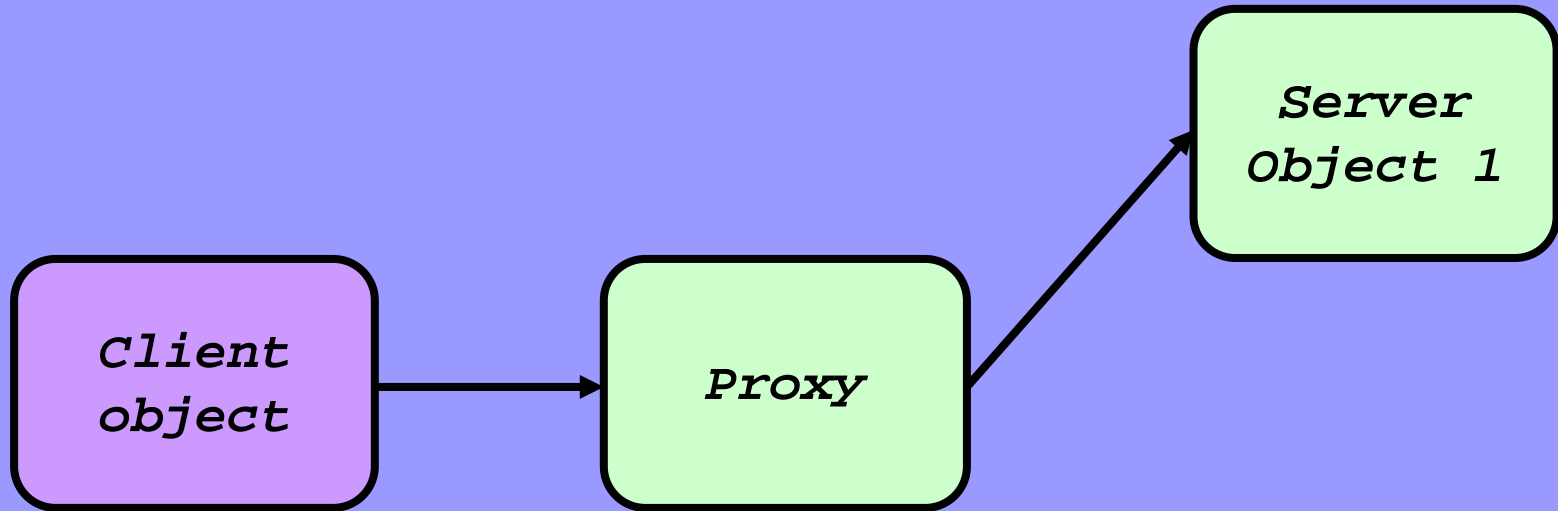


The Implementation of EJB Object (3) Redefinition

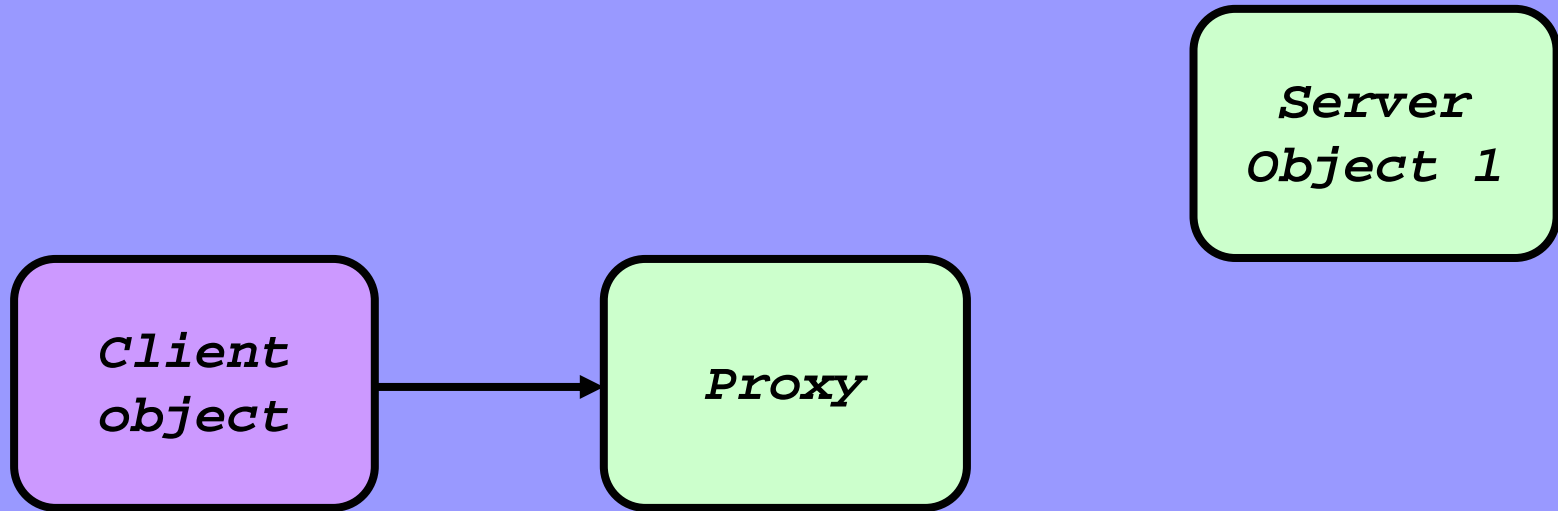




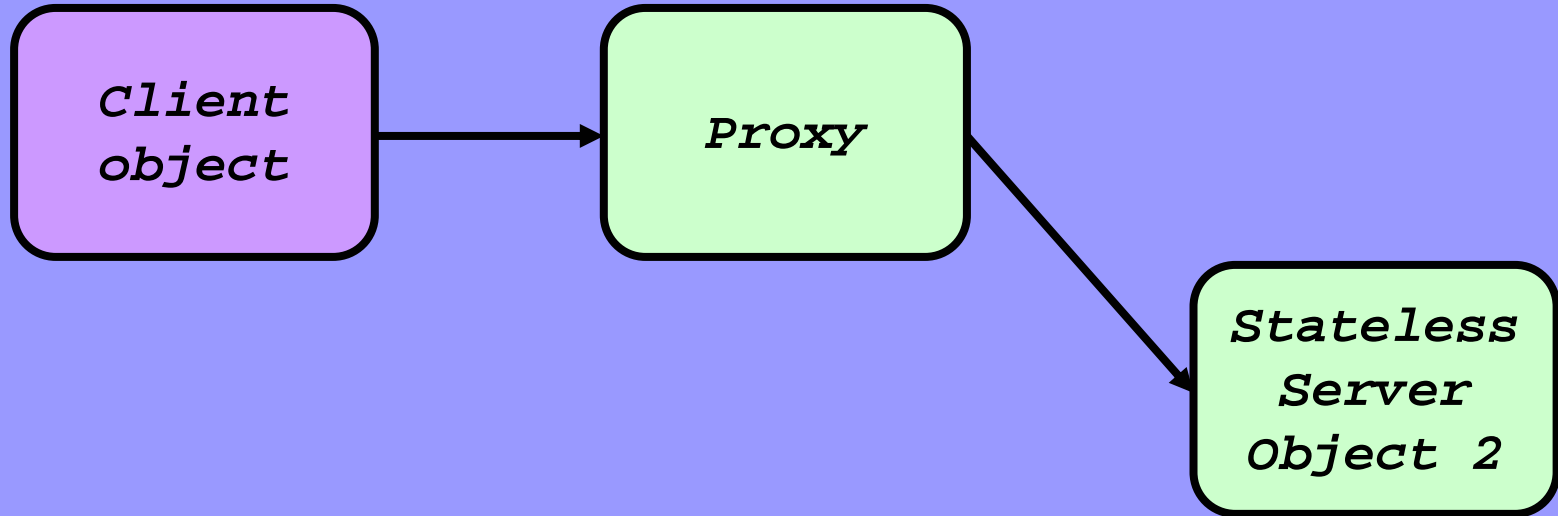
Activated



Deactivated (.NET) / Passivated (EJB)

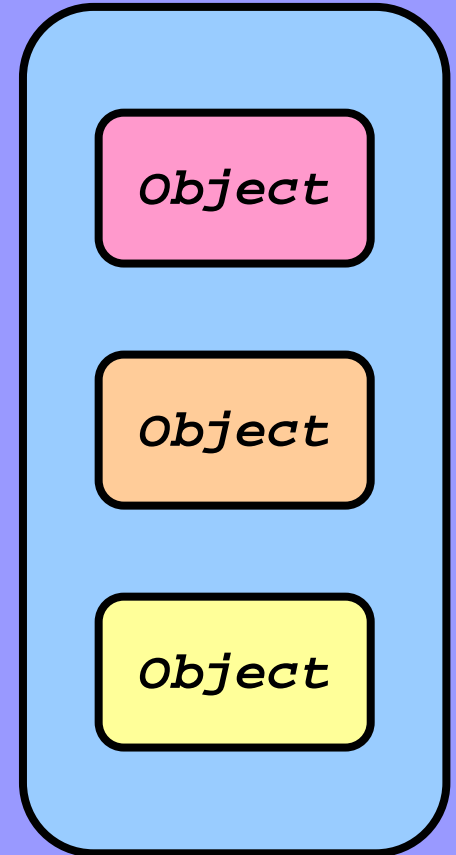
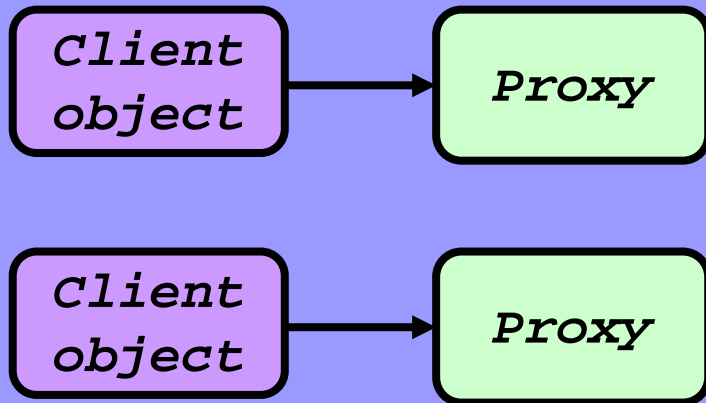


Activated, Again!

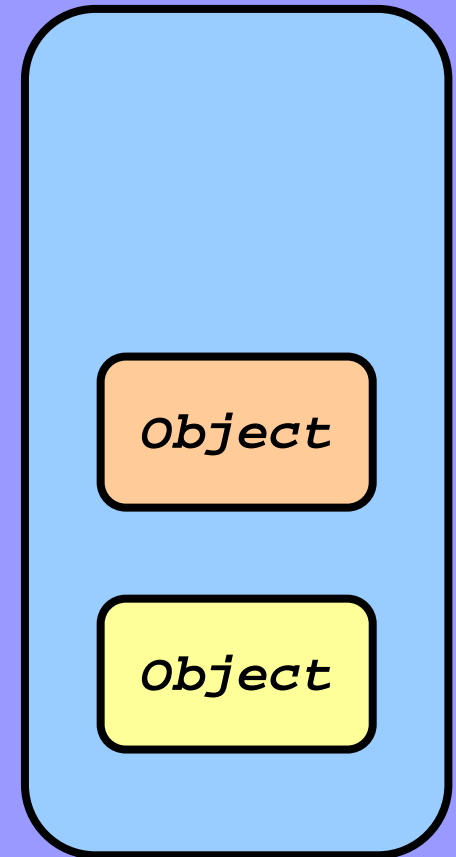
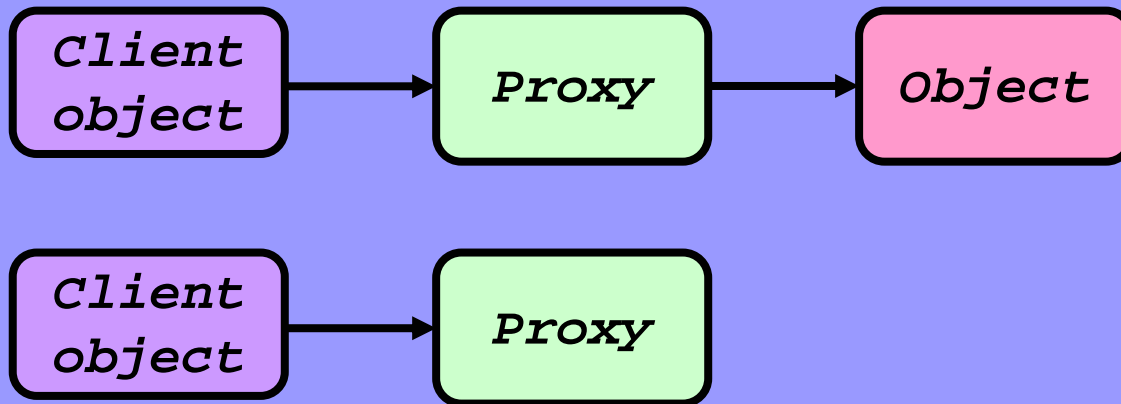




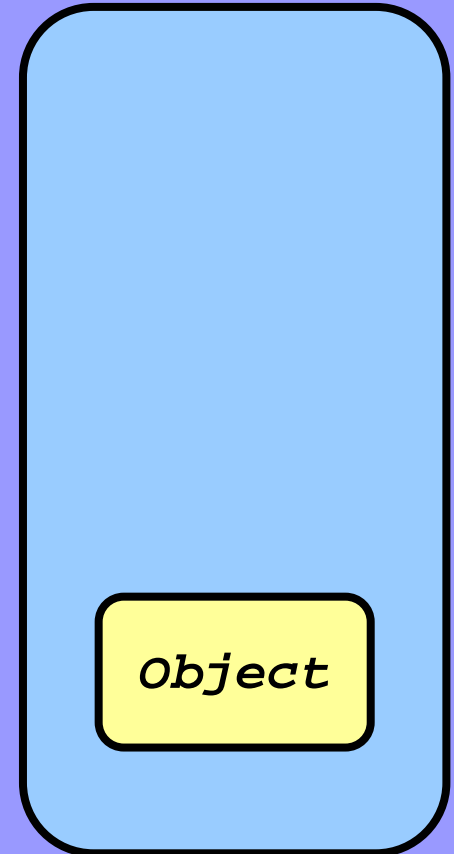
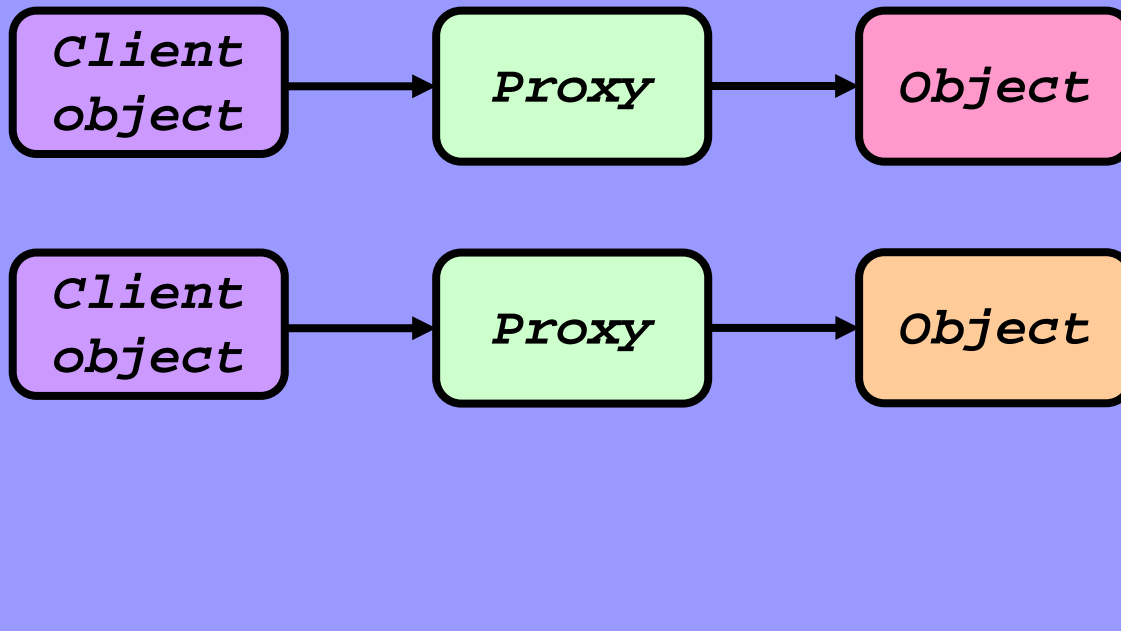
Object Pooling



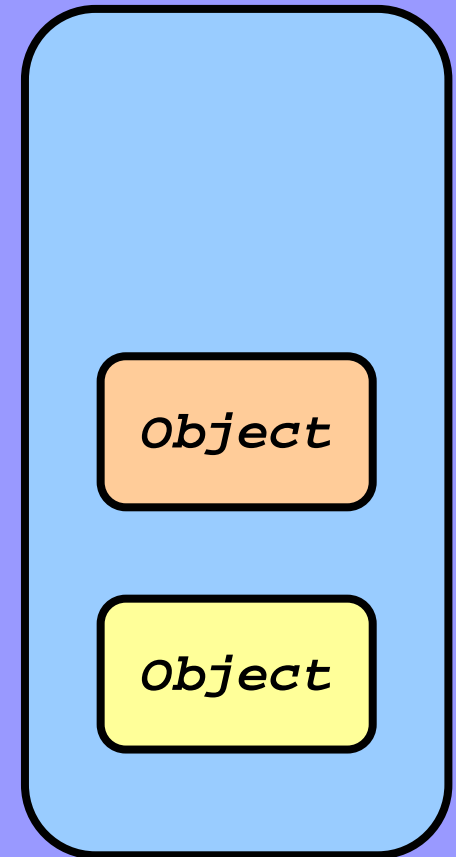
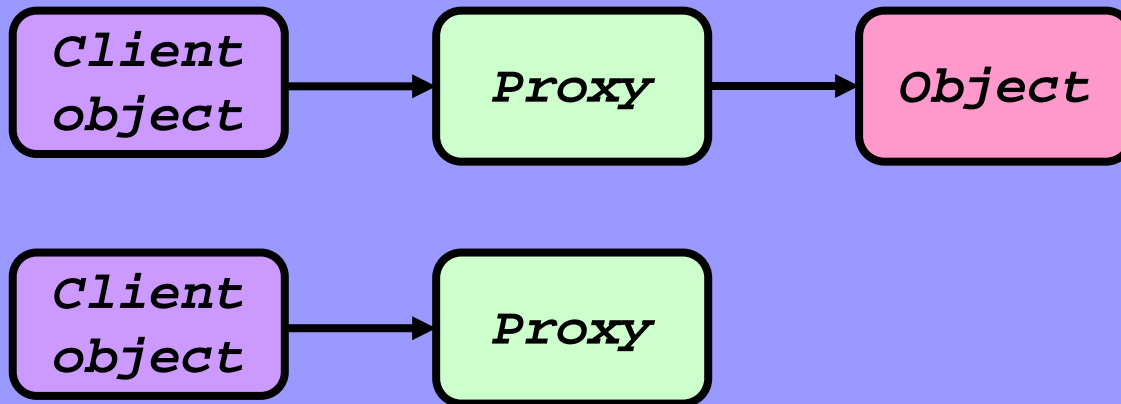
Object Pooling



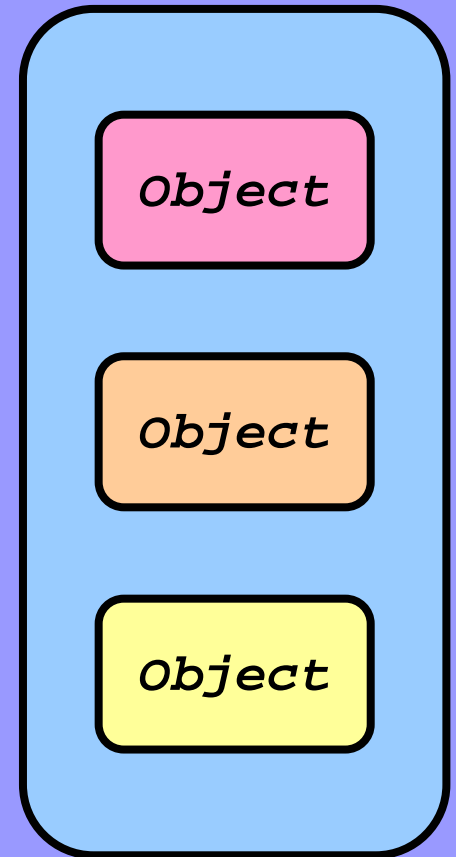
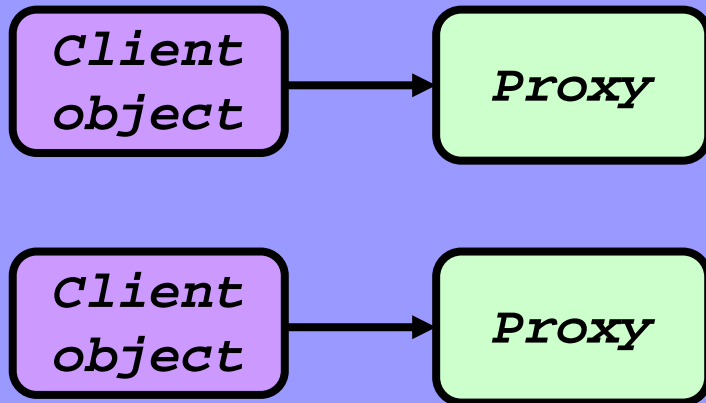
Object Pooling



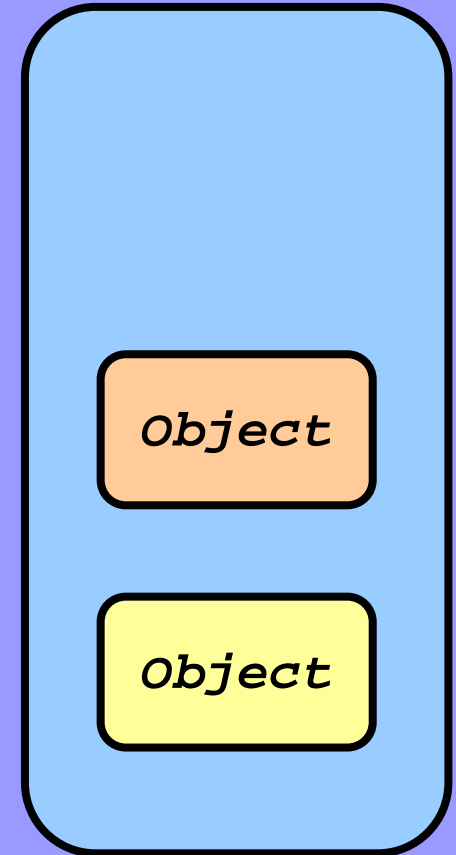
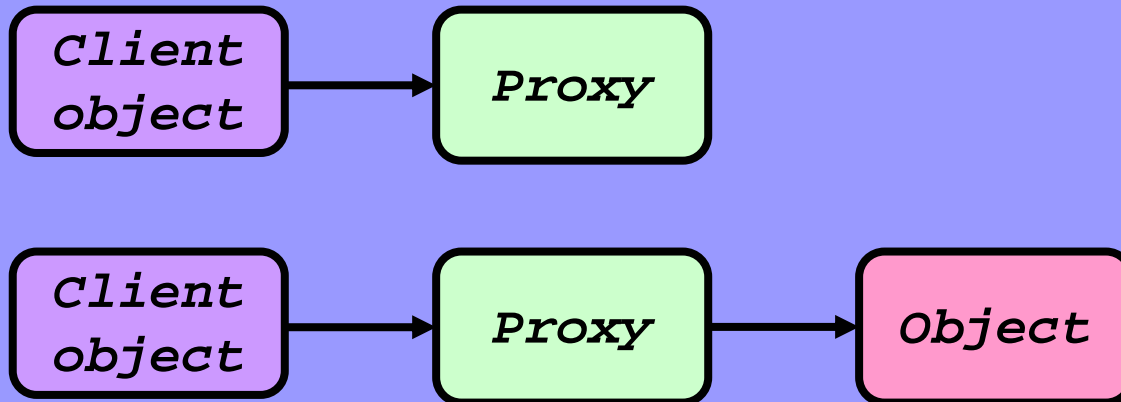
Object Pooling



Object Pooling



Object Pooling



Attribute for Object Pooling

...

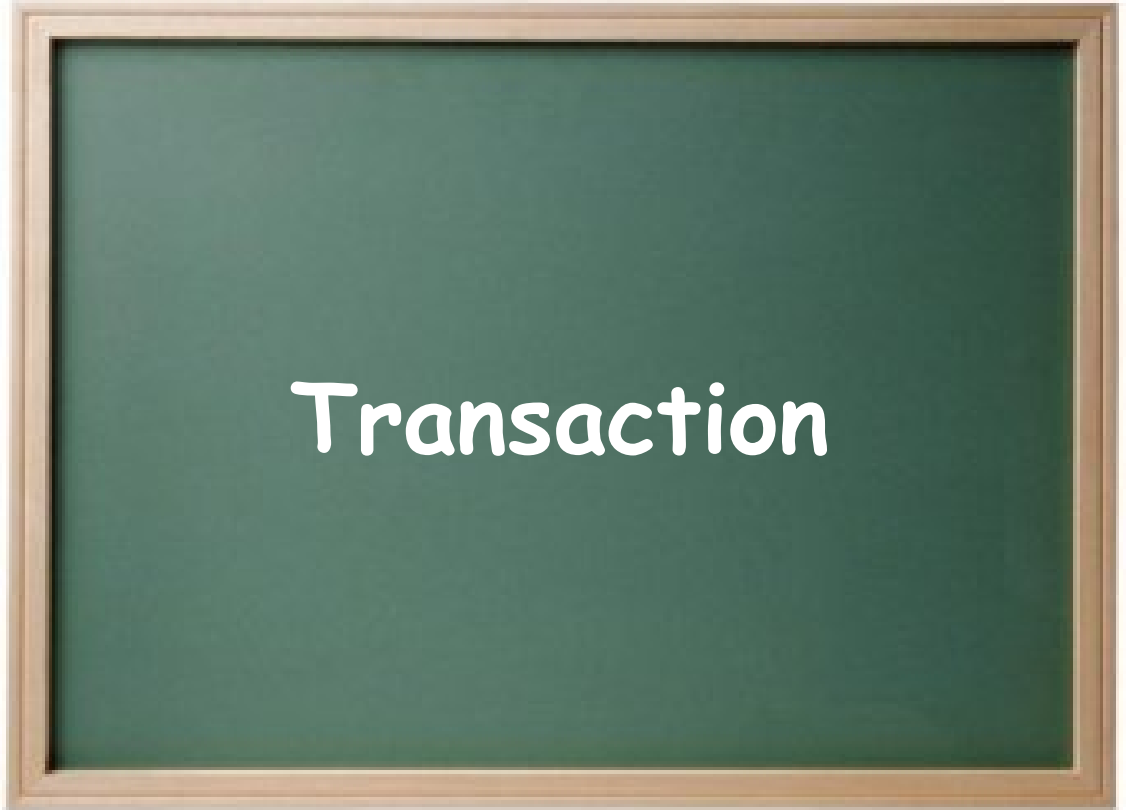
```
[ObjectPooling(MinPoolSize=2,MaxPoolSize=5, CreationTime=50)]
```

```
Public class Employee : ServicedComponent {
```

```
    ...
```

```
}
```

...

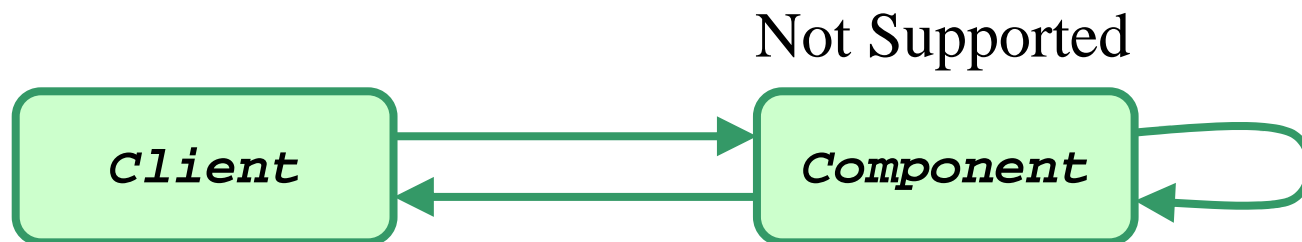
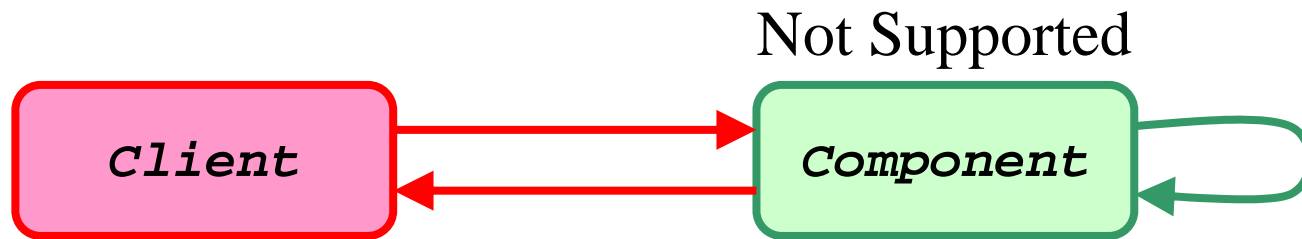


Transaction Type

```
// C#  
[Transaction(TransactionOption.Required)]  
Public class MyServicedComponent: ServicedComponent {  
    ...  
}
```

1. **NotSupported** (Both EJB and .NET)
2. **Supported** (Both EJB and .NET)
3. **Required** (Both EJB and .NET)
4. **RequiresNew** (Both EJB and .NET)
5. **Mandatory** (In EJB only. Not in .NET)
6. **Disabled** (Both EJB and .NET. In EJB, It's called "Never")

Transaction: Not Supported



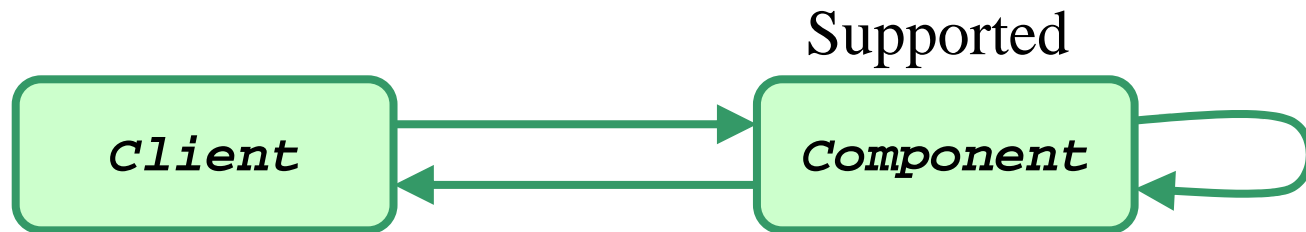
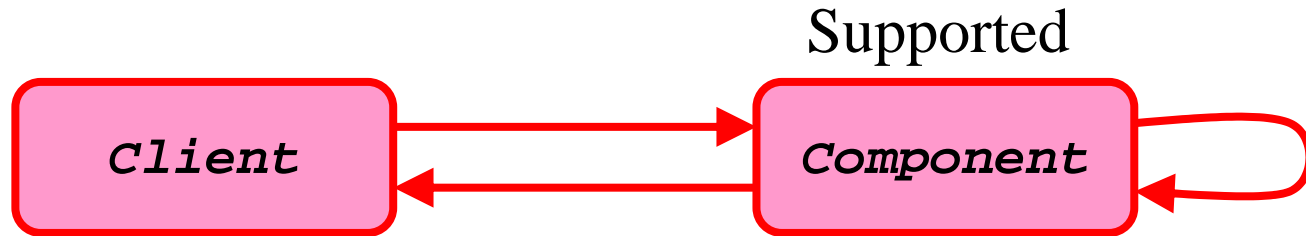
— With Transaction

— A New Transaction

— Without Transaction

- - - Raise an Exception

Transaction: Supported



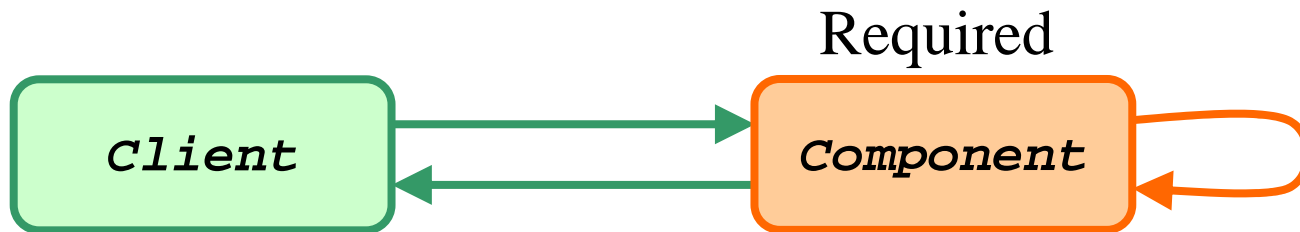
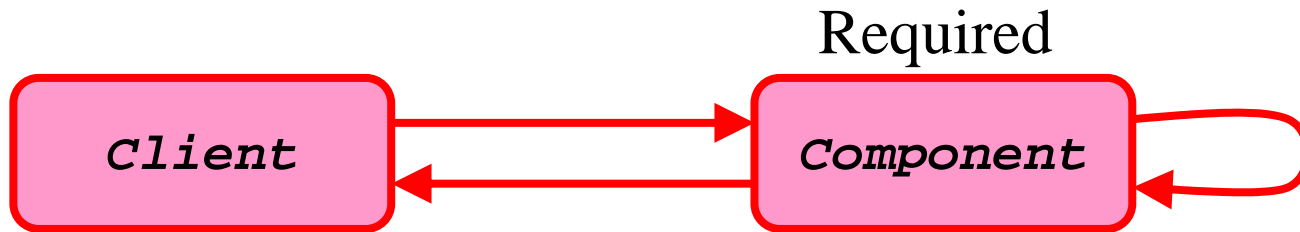
— With Transaction

— A New Transaction

— Without Transaction

- - - Raise an Exception

Transaction: Required



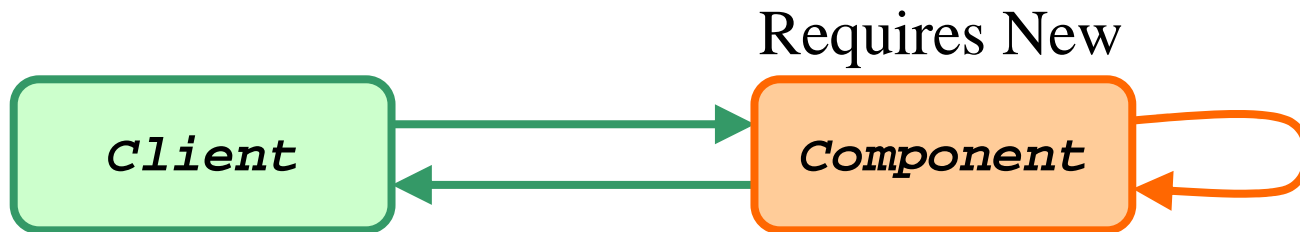
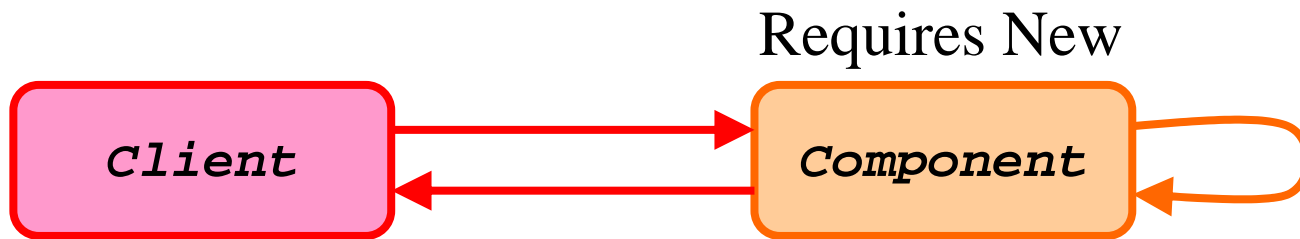
— With Transaction

— A New Transaction

— Without Transaction

- - - - Raise an Exception

Transaction: Requires New



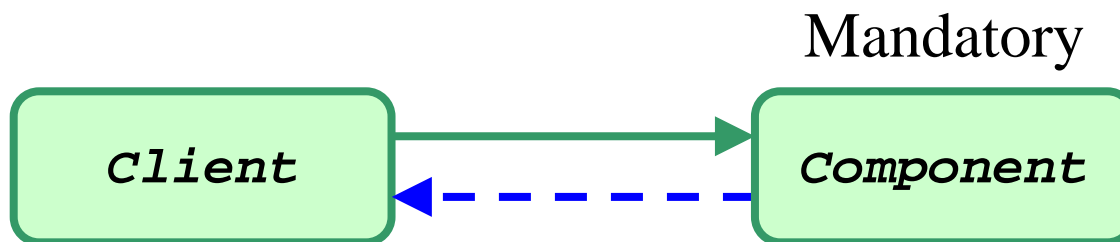
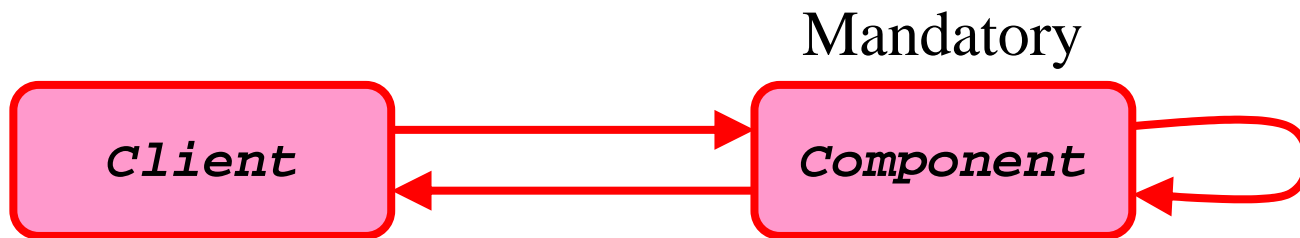
— With Transaction

— A New Transaction

— Without Transaction

- - - - Raise an Exception

Transaction: Mandatory (EJB only)



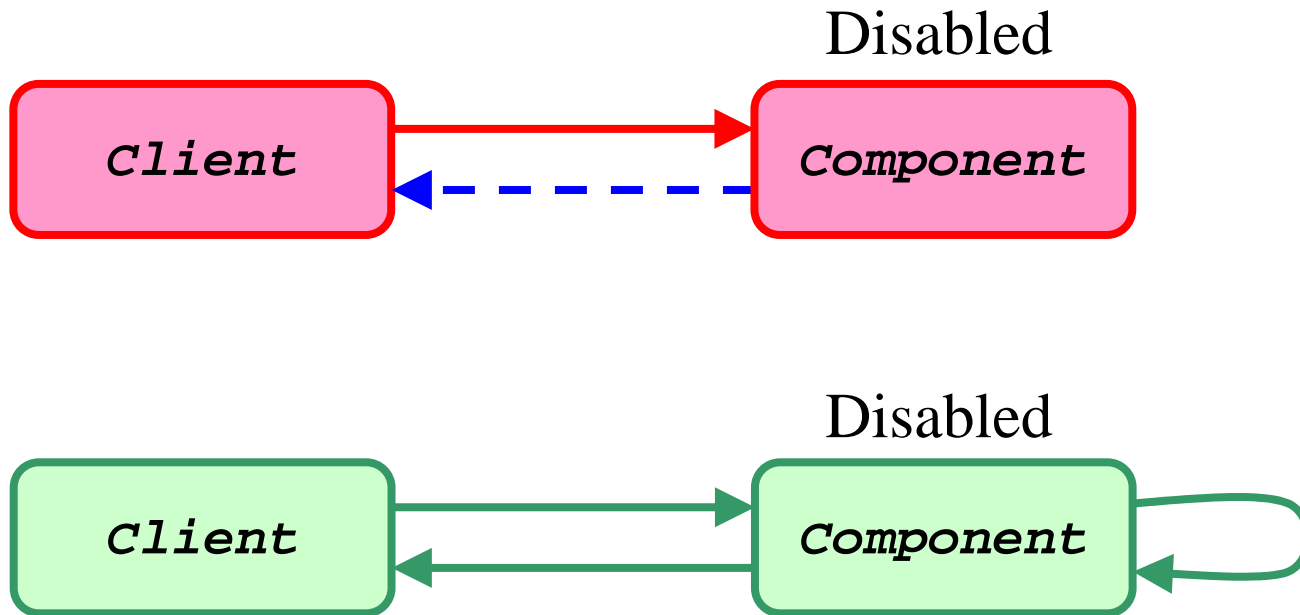
— With Transaction

— A New Transaction

— Without Transaction

- - - Raise an Exception

Transaction: Disabled / Never



— With Transaction

— A New Transaction

— Without Transaction

- - - Raise an Exception



Database Connection



Database Connection

.NET Serviced Component

- ADO.NET

EJB

- CMP
- BMP
 - JDBC / JDO

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