



QoS for Enterprise Applications

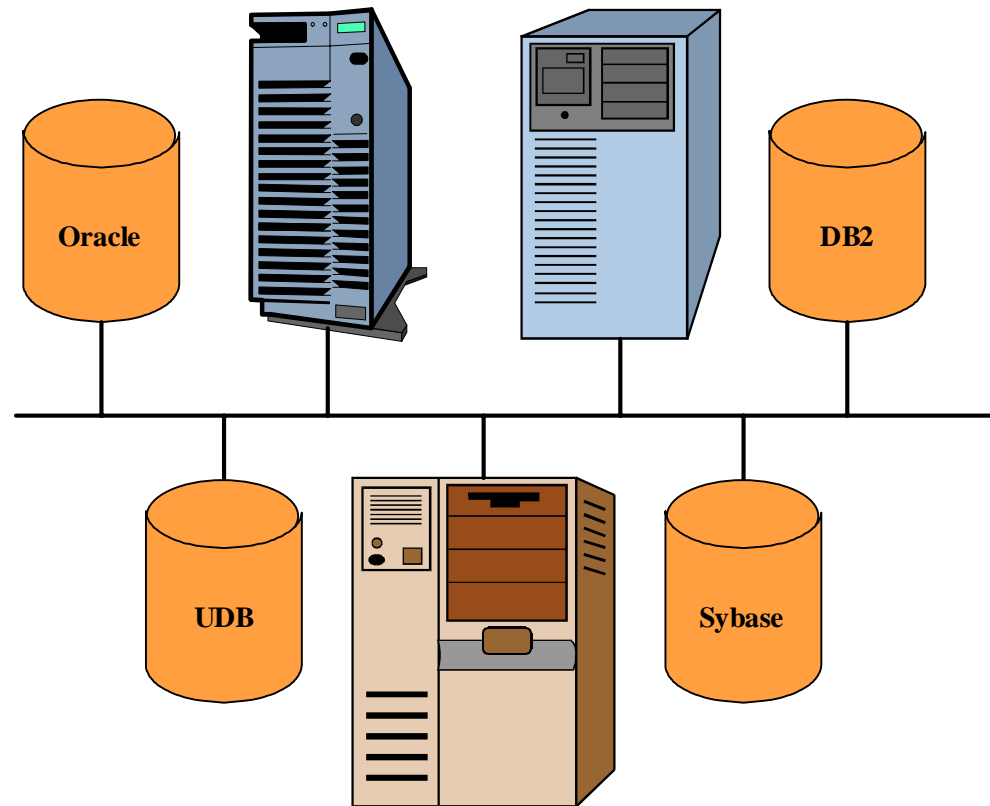
Paul Tunney

WhiteView

QoS Taskforce: Paris April 2002

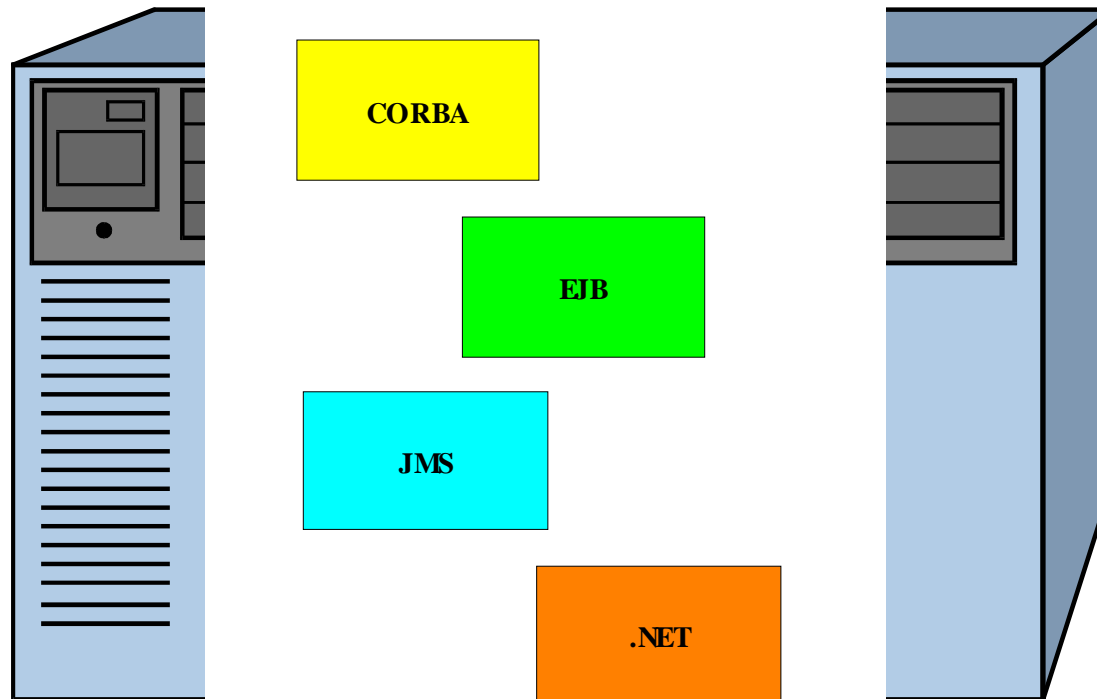


Current Topology



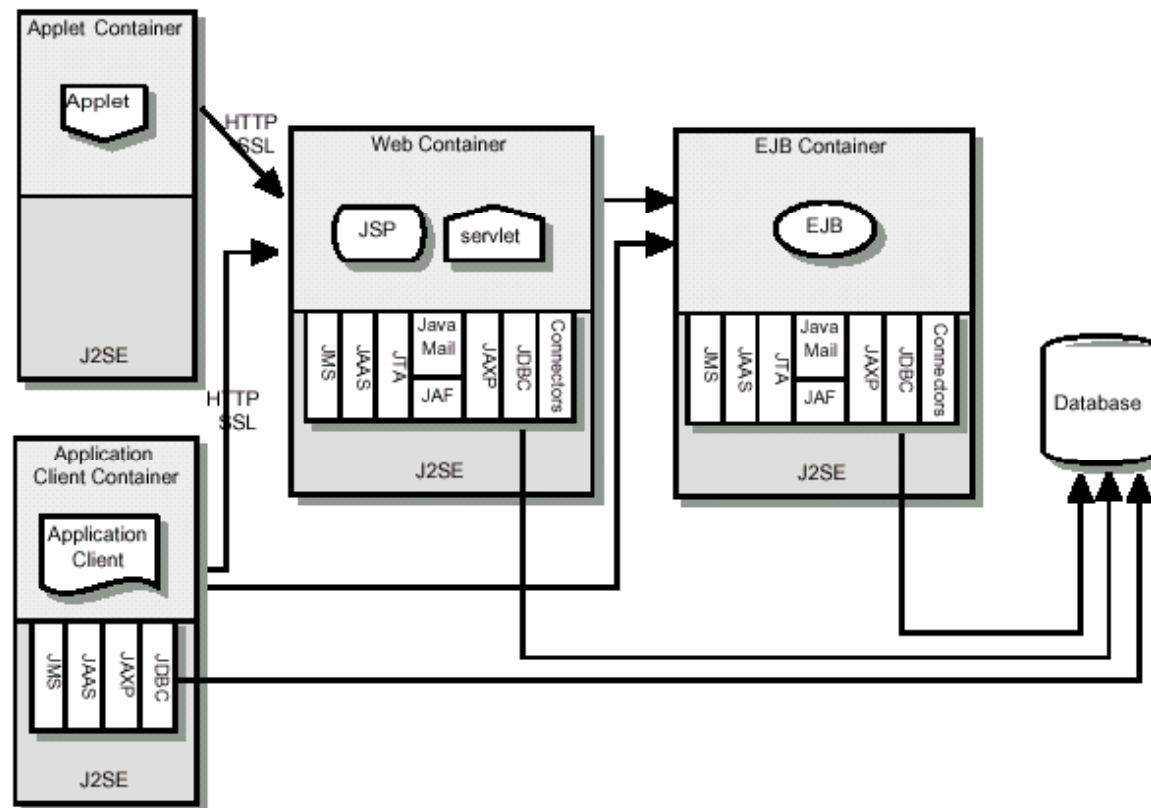


What's in the box



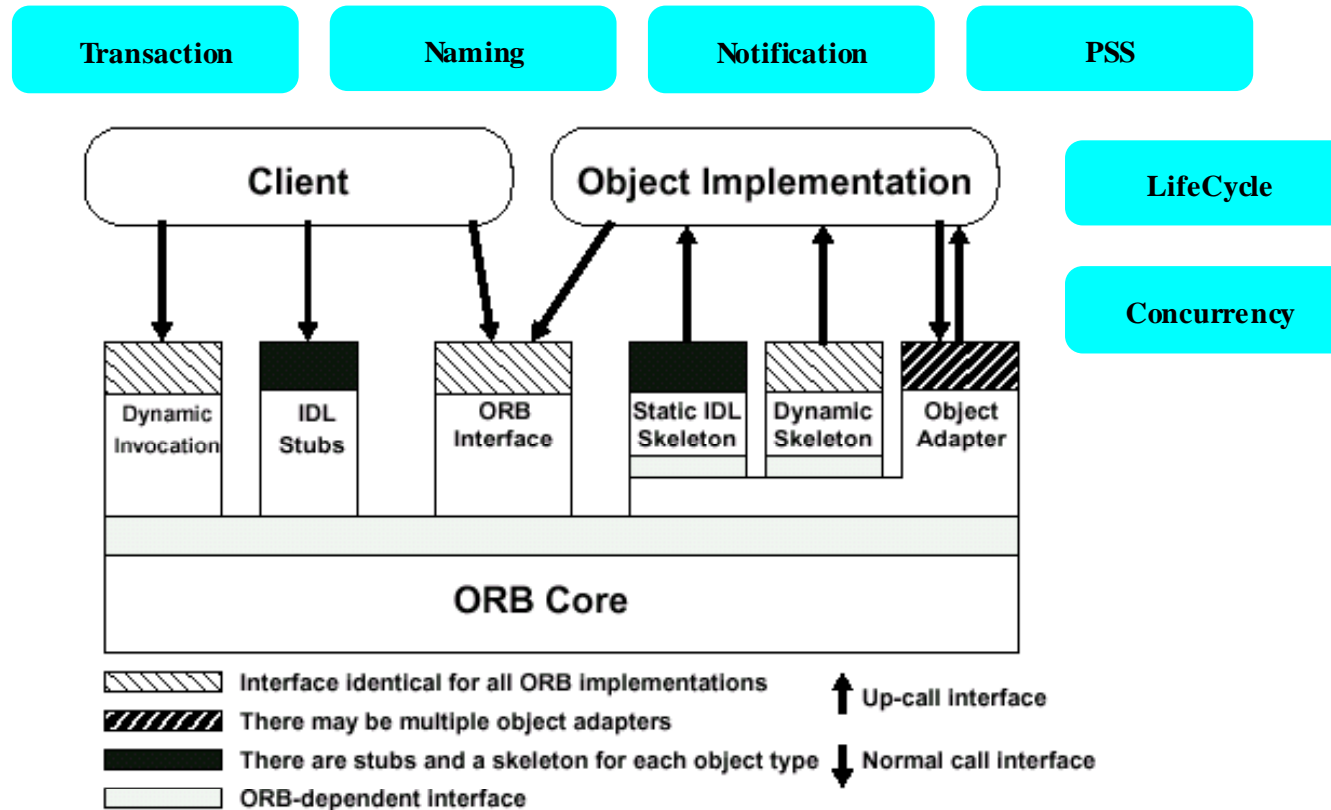


J2EE Application Server Architecture





CORBA Architecture



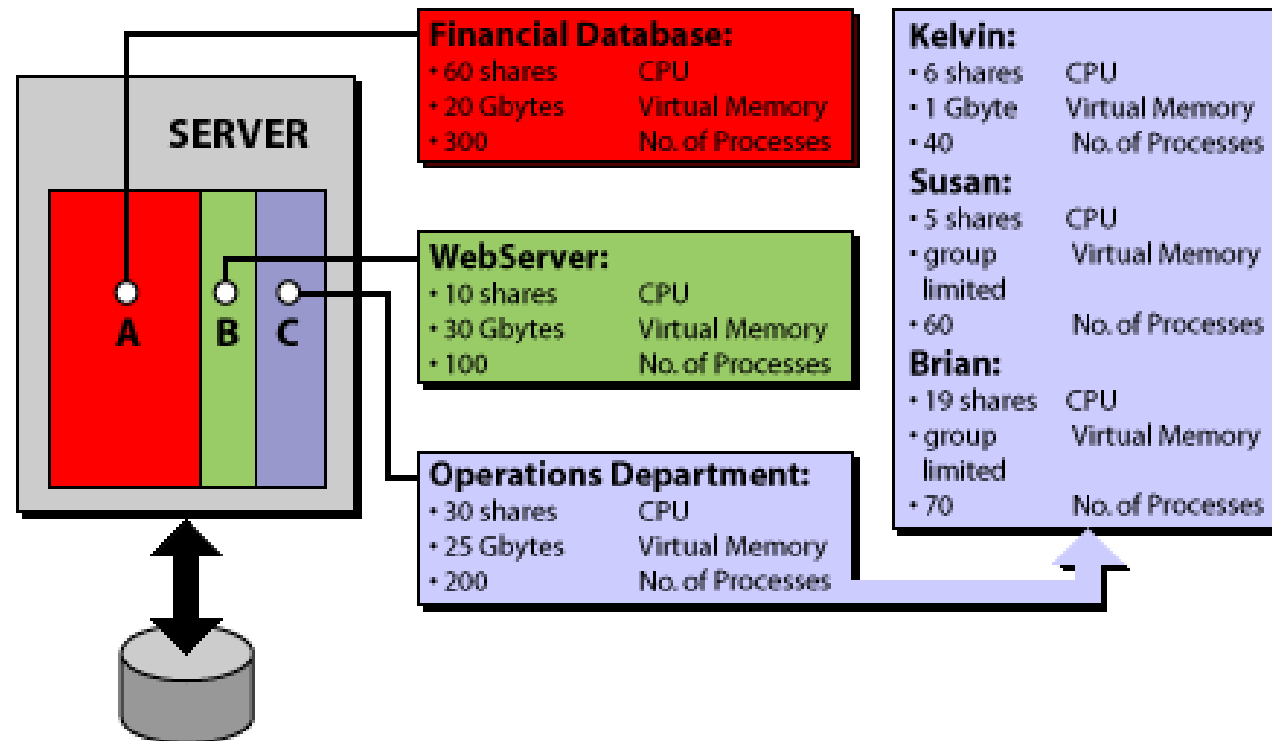


Where's the applications process

```
X Desktop
ptunney 1597 1583 0 Mar19 pts/4 00:00:00 [java]
ptunney 1598 1583 0 Mar19 pts/4 00:00:00 [java]
ptunney 1602 1518 0 Mar19 ? 00:00:00 [itnaming]
ptunney 1669 1501 0 Mar19 pts/1 00:00:00 [java]
ptunney 1895 978 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1922 1895 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1923 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1924 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1925 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1926 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1927 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1928 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1929 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
ptunney 1930 1922 0 Mar19 pts/3 00:00:00 /opt/jdk1.3.1_02/bin/i386/native
root 2064 945 0 Mar19 pts/2 00:00:00 su - ptunney
ptunney 2067 2064 0 Mar19 pts/2 00:00:00 -bash
root 2090 1 0 Mar19 pts/1 00:00:00 /usr/X11R6/bin/xterm -name Termi
root 2091 2090 0 Mar19 pts/6 00:00:00 bash
root 2158 2091 0 Mar19 pts/6 00:00:00 xterm
root 2159 2158 0 Mar19 pts/7 00:00:00 bash
root 2314 2159 0 Mar19 pts/7 00:00:00 su - ptunney
ptunney 2317 2314 0 Mar19 pts/7 00:00:00 -bash
ptunney 2834 2067 0 18:05 pts/2 00:00:00 ps -aef
[ptunney@tyson ptunney]$
```



Solaris Resource Manager





QoS Characteristics

- Timeliness (e.g. request/response time)
- Capacity (e.g. throughput)
- Accuracy (e.g. error probability)
- Security (e.g. access control, integrity, auth)
- Precedence (e.g. priority)



Deployment Descriptors could be the way

```
<enterprise-beans>
  <entity>
    <description>Inventory CMP EJB</description>
    <display-name>InventoryEB</display-name>
    <ejb-name>InventoryEJB</ejb-name>
    <local-home>com.sun.j2ee.blueprints.supplier.inventory.ejb.InventoryLocalHome</local-home>
    <local>com.sun.j2ee.blueprints.supplier.inventory.ejb.InventoryLocal</local>
    <ejb-class>com.sun.j2ee.blueprints.supplier.inventory.ejb.InventoryEJB</ejb-class>
    <persistence-type>Container</persistence-type>
    <prim-key-class>java.lang.String</prim-key-class>
    <reentrant>False</reentrant>
    <cmp-version>2.x</cmp-version>
    <abstract-schema-name>Inventory</abstract-schema-name>
    <cmp-field>
      <field-name>itemId</field-name>
    </cmp-field>
    <cmp-field>
      <field-name>quantity</field-name>
    </cmp-field>
    <primkey-field>itemId</primkey-field>
    <security-identity>
      <description></description>
      <use-caller-identity></use-caller-identity>
    </security-identity>
    <query>
      <description>EJBQL to find all Inventory Items</description>
      <query-method>
        <method-name>findAllInventoryItems</method-name>
        <!--method-intf>LocalHome</method-intf-->
        <method-params />
      </query-method>
      <ejb-ql>Select OBJECT(a) From Inventory a</ejb-ql>
    </query>
  </entity>
</enterprise-beans>
```



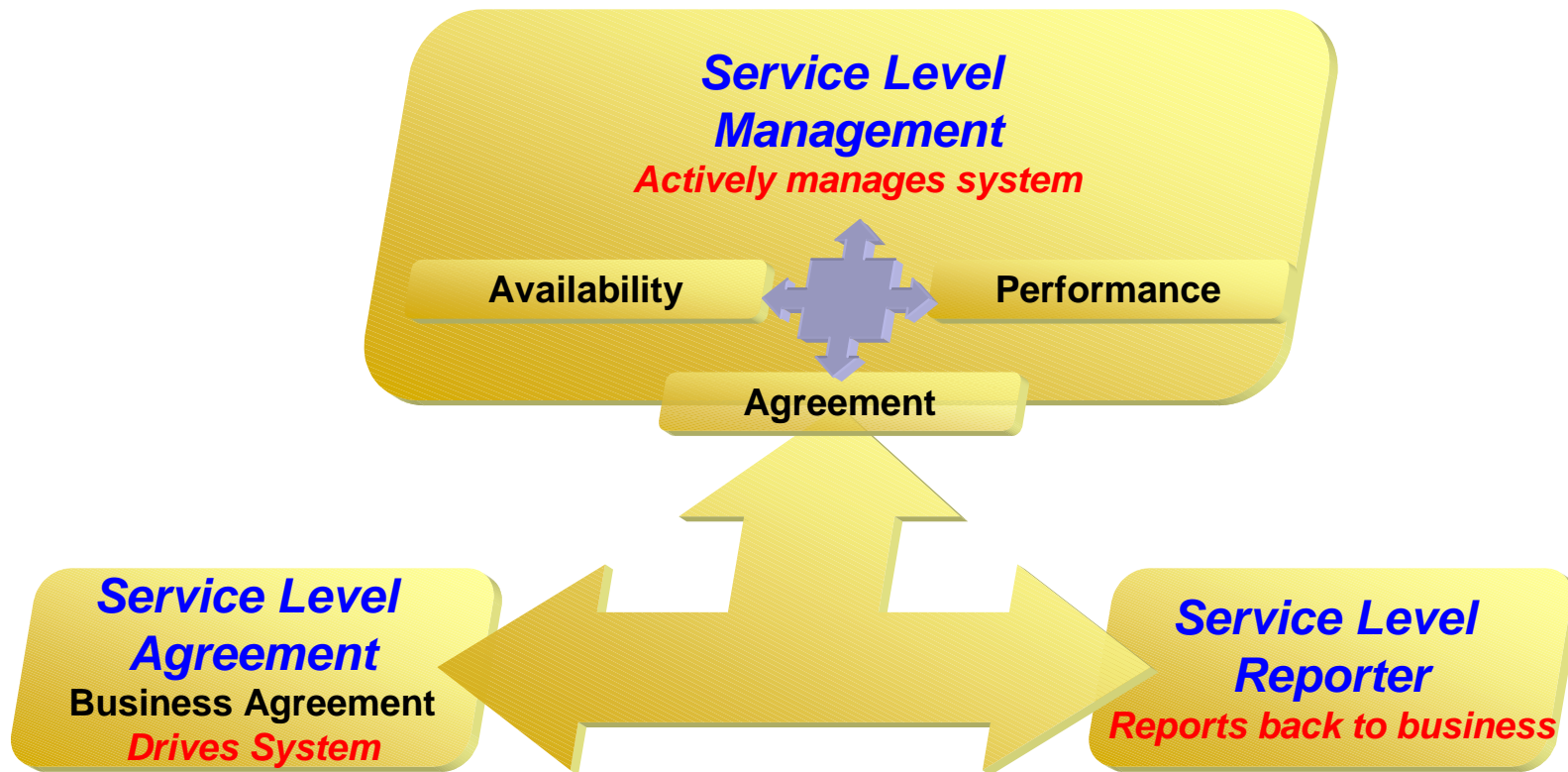
QML - Quality Meta Language from Hewlett Parkard Labs

```
type Reliability = contract {  
  numberOfFailures : decreasing numeric no/ year;  
  TTR : decreasing numeric sec;  
  availability : increasing numeric;  
};  
  
type Performance = contract {  
  delay : decreasing numeric msec;  
  throughput : increasing numeric mb/ sec;  
};  
  
systemReliability = Reliability contract {  
  numberOfFailures < 10 no/ year;  
  TTR {  
    percentile 100 < 2000;  
    mean < 500;  
    variance < 0.3;  
  };  
  availability > 0.8;  
};
```

Reference: Svend Frølund, Jari Koistinen,
Software Technology Laboratory,
HPL-98-10, February 1998

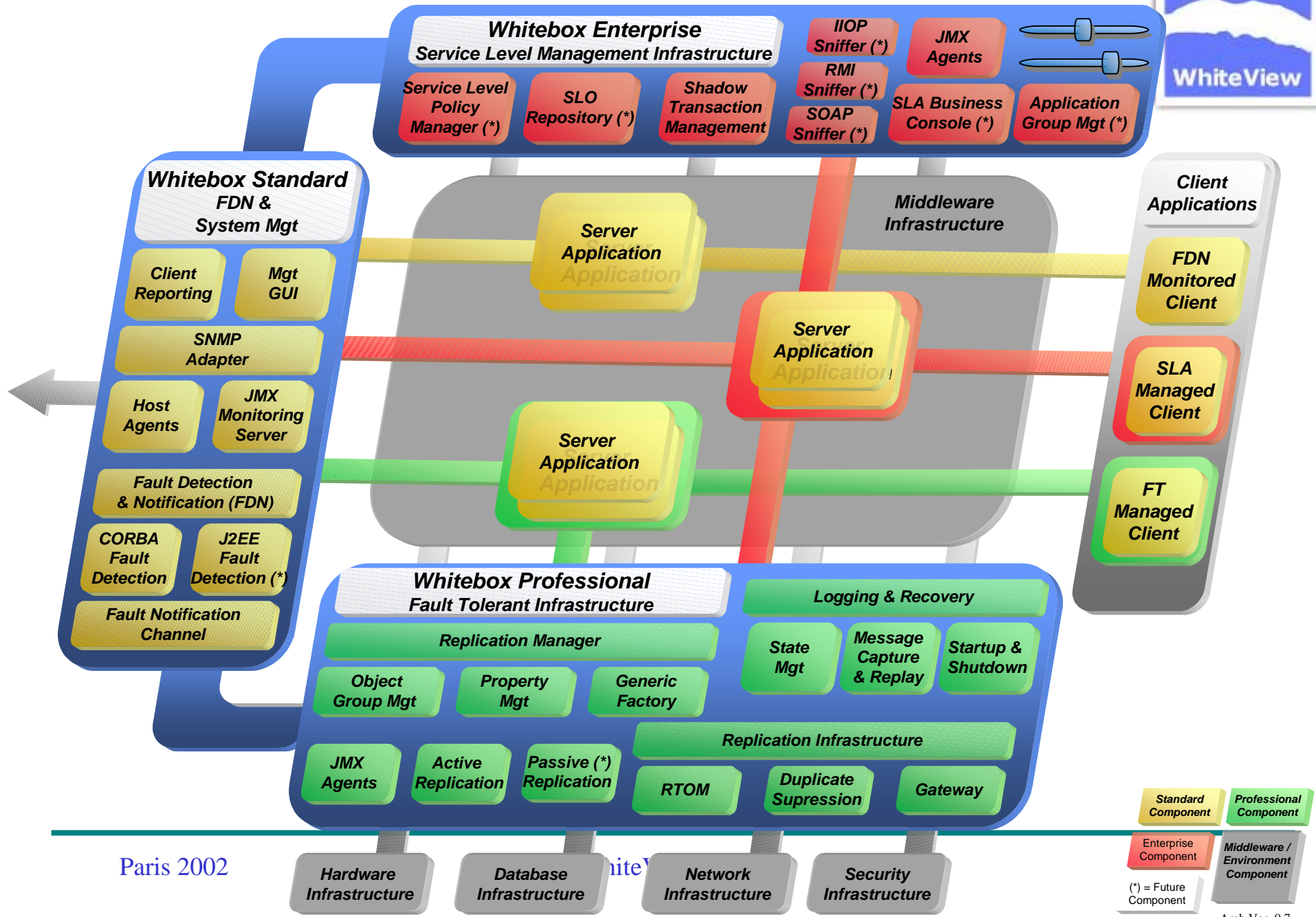


'The How' of Active Service Level Management



- Standards based Active Service Level Management
- High Availability, Applications focus

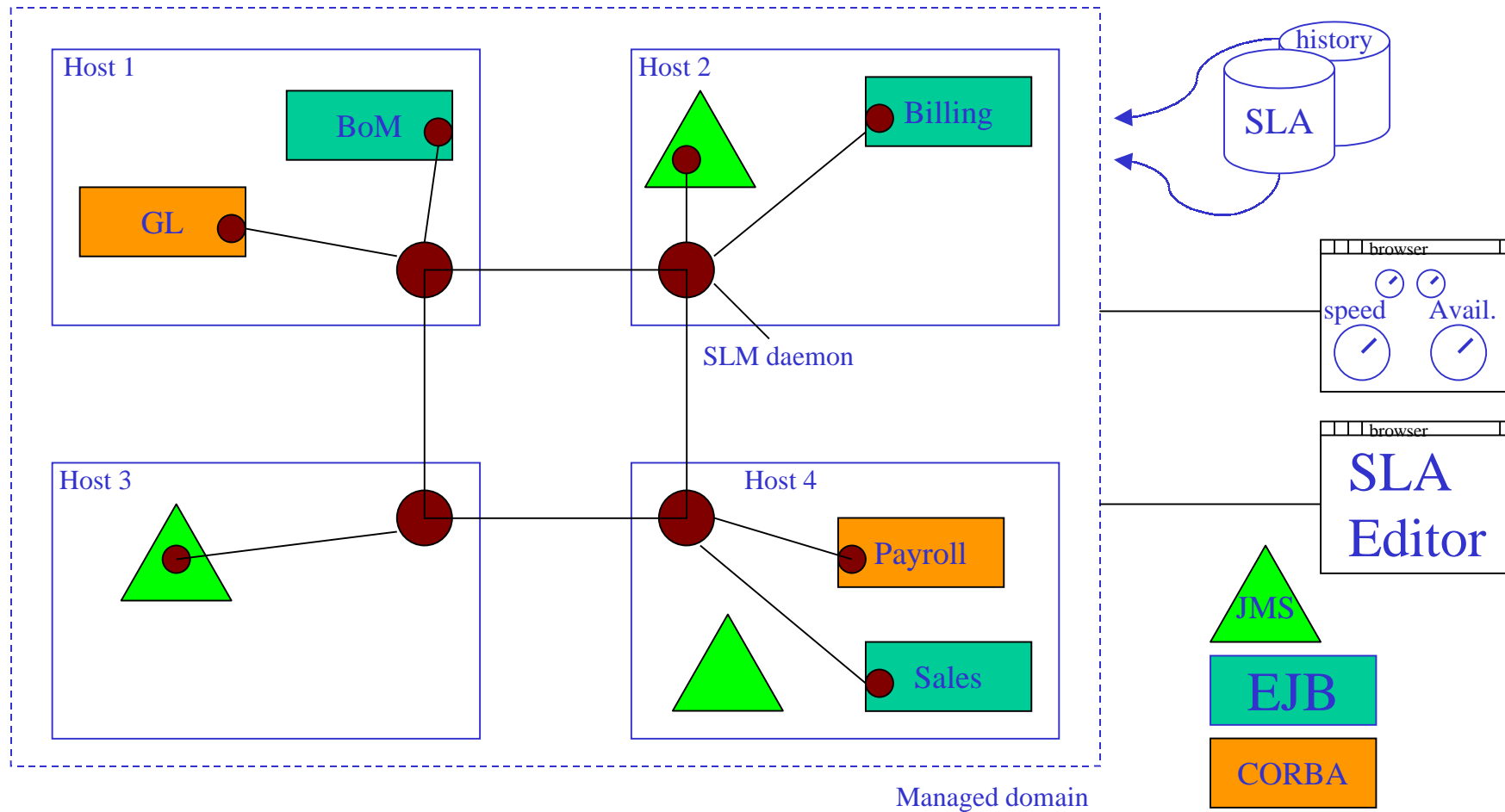
Whitebox Product Marketecture 1.0



Paris 2002

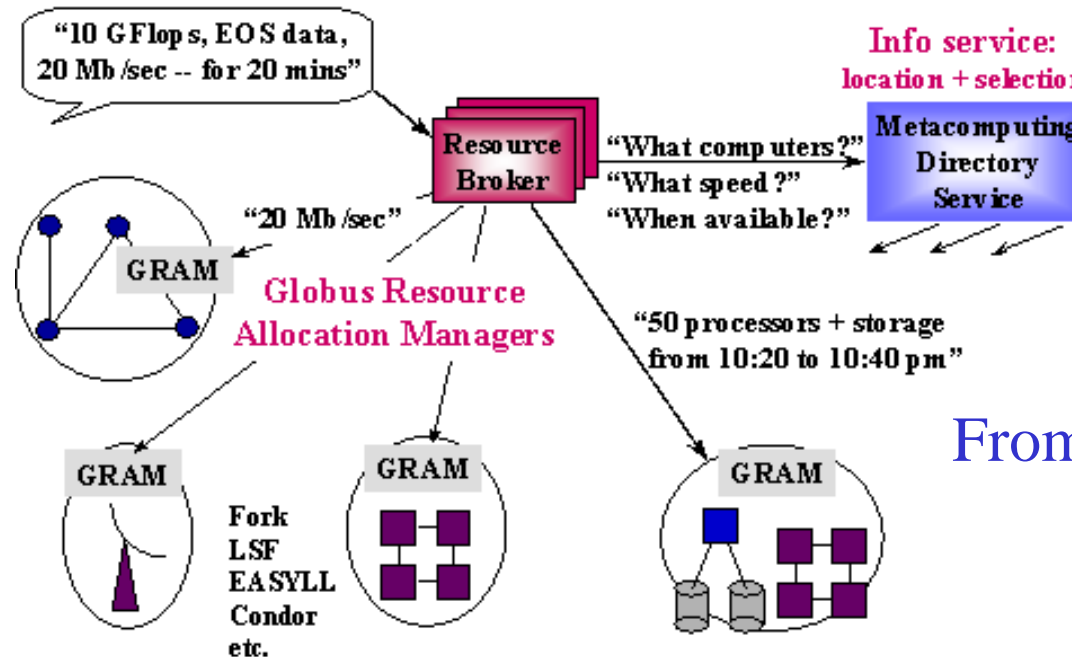


My little daemon





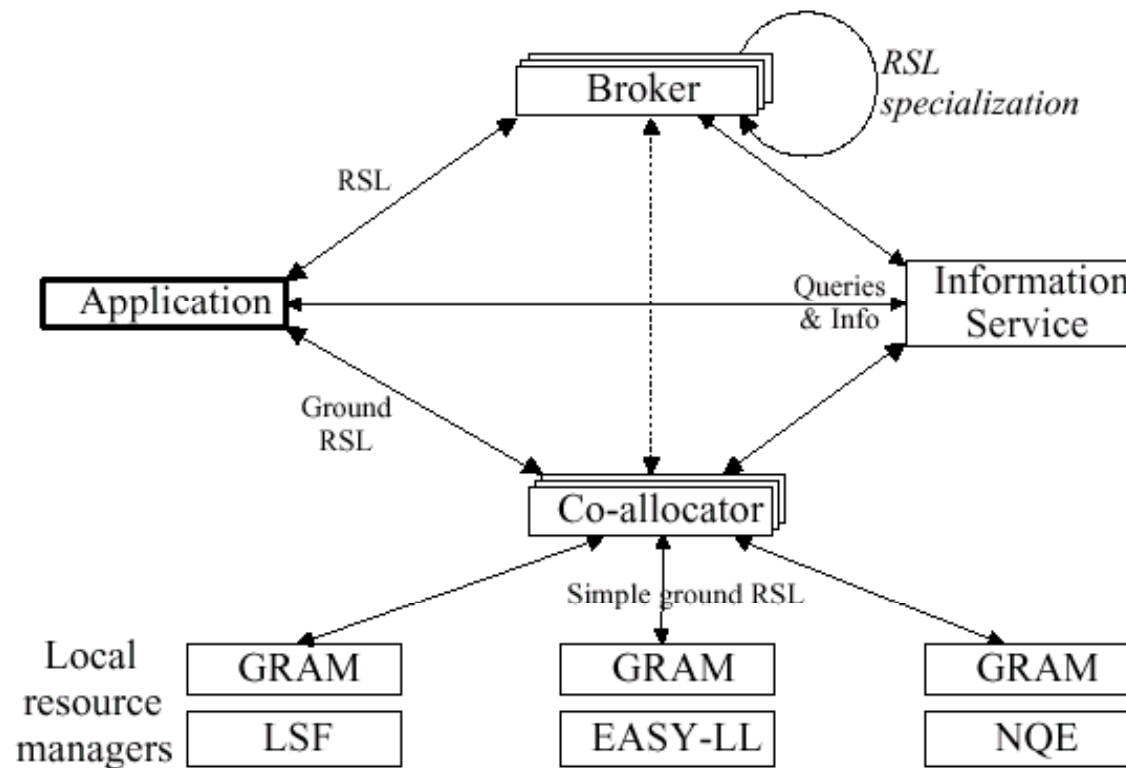
Globus Resource Allocation Manager



From globus.org



Globus Resource Broker





Where we need standards

- Portable SLAs
 - a single SLA for a service should be understood by all components in the chain
- Portable Metrics
 - need to compare apples with apples
 - this may be by component type
- Agreed interfaces
 - each component should be able to request SLA performance information from another