



**ORACLE®**

## **Oracle Web Services Manager (WSM)**

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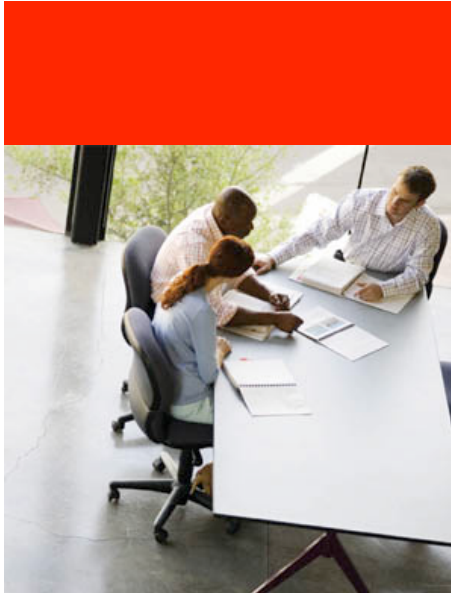


# Outline

- Introduction
- Product Overview
- Typical Use-Case Scenarios
- Roadmap
- Q & A



# Introduction



# Oracle Fusion Middleware



**Development Tools**  
SOA Tools & Framework



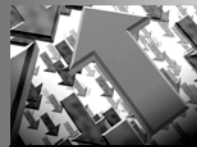
## User Interaction

Portals, Content, Search,  
Desktop, Mobile, VoIP



## Business Intelligence

ETL, Q&A, OLAP, Reports,  
Alerts, Real Time



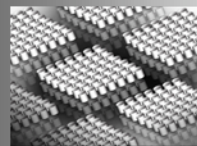
## Integration & Process Management

Messaging, ESB, BPM, B2B, BAM, MDM



## Application Server

J2EE, WS-\*, Events, Rules



## Grid Infrastructure

Clusters, Metadata, Registry, Security



## Systems Management

System Application  
Services



## Identity Management

SSO, Access Control,  
Id Admin, Provisioning,  
Directory Services

# Oracle Identity Management



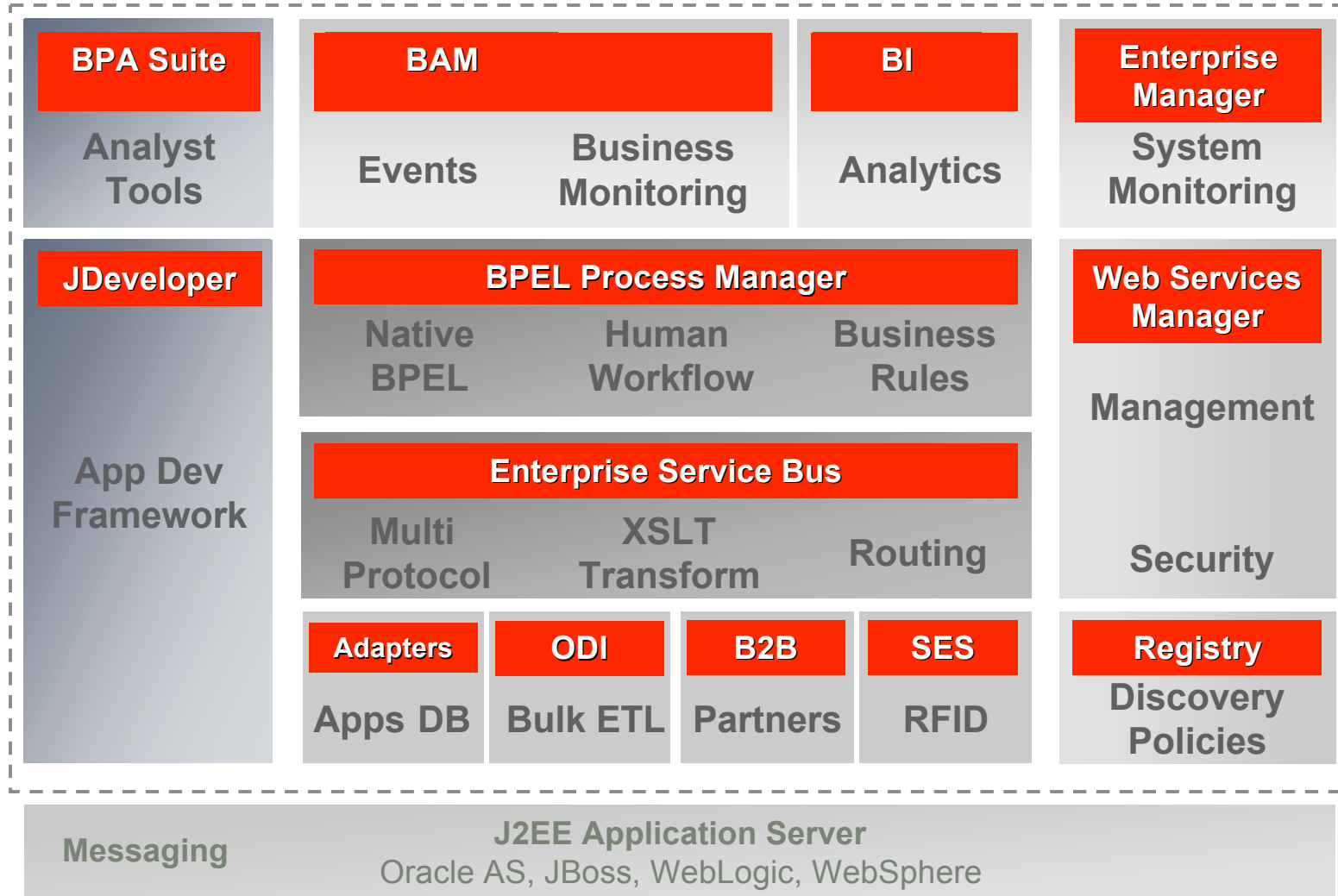
**Auditing & Reporting**  
Compliance &  
Attestation

	<b>Access Manager</b> Web Access Control/Single Sign-On
	<b>Web Services Manager</b> SOA Security
	<b>eSSO Suite</b> Desktop/Legacy Single Sign-On
	<b>Identity Federation</b> Cross Domain Single Sign-On
	<b>Identity Manager</b> Enterprise User Provisioning
	<b>Directory Services</b> Identity Virtualization, Synch & Storage

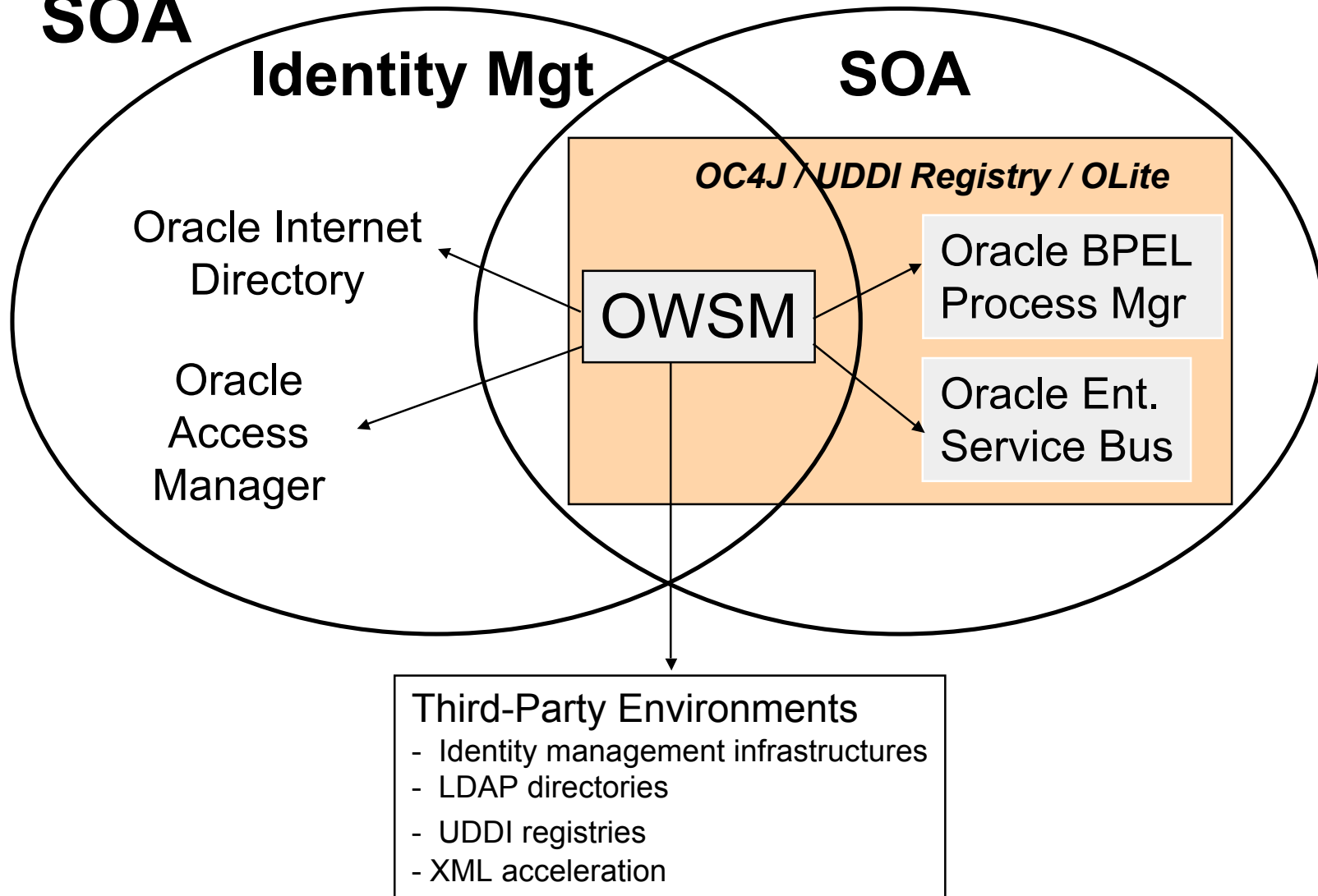


**Systems Mgmt**  
Monitoring &  
Management

# Oracle SOA Suite



# Intersecting Identity Management and SOA



# Web Services Security & Mgt Concerns

## Service Providers

- How do I control who can access my services?
- How do I define and monitor SLAs?
- How do I manage QoS (reliability, prioritization, load balancing)?
- How do I manage auditing?
- How do I upgrade to new web services versions without disrupting customers?

## Service consumers

- How do I handle failures in services my application depends upon?
- How do I do root-cause analysis and identify the services causing performance/availability issues for my application?
- How do I log service requests for auditing purposes? (How much do I think I should be billed?)
- How do I handle the disparity in security mechanisms across different back-end services?
- How do I switch to new providers, without changing my calling application?

## Enterprise IT

- SOA implemented for loosely-coupled approach for business-logic, but operational issues are deeply buried into applications
- Business parameters are hard-coded within every connection (SLAs, security certificates, connection type)
- Security is buried in applications
- Verifying compliance with policy guidelines is difficult
- Education and training on new standards and technologies requires significant investment
- Very difficult to deal with changing policies
- Integrations and software upgrades are costly



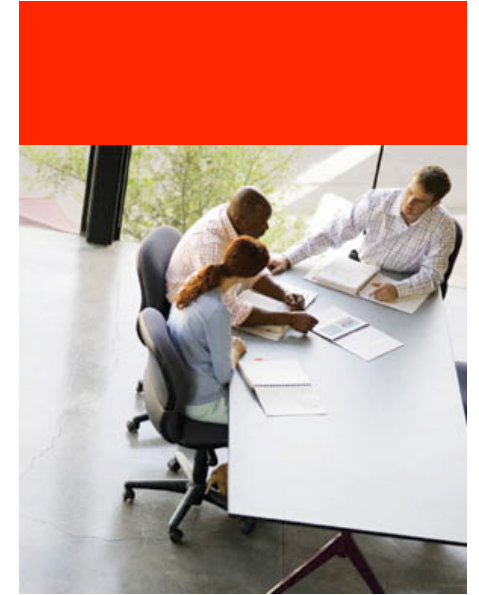


# Web Services Security & Mgt Benefits

- Externalizing web services security
  - No web services security “silos”
- Focusing on domain expertise
  - Developers focus on business logic
  - Security architects and administrators focus on security and management
- Meeting governance requirements
  - Centralized corporate rules are applied
  - Security policies are defined in a single point of control
- Lowering costs of administration
  - Security policy changes are handled centrally, not in each web service
  - Security audits / reports are run across all web services from a single point of administration
  - Web services security and management environment is easier to deploy, maintain, and upgrade



# Product Overview





# Introducing Oracle WSM

- Standalone platform for securing and managing access to web services
  - Used by a developer, deployer, or security administrator
  - Does not require developers to modify applications or services (no programmatic security necessary)
  - Executes security policies in real time
  - Monitors all access-control events (graphical reports)
  - Provides tools for defining and monitoring service-level agreements (SLA)
  - Leverages backend identity management infrastructures such as Oracle Access Manager for authentication and authorization



# Support For Key Security Standards

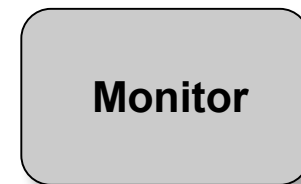
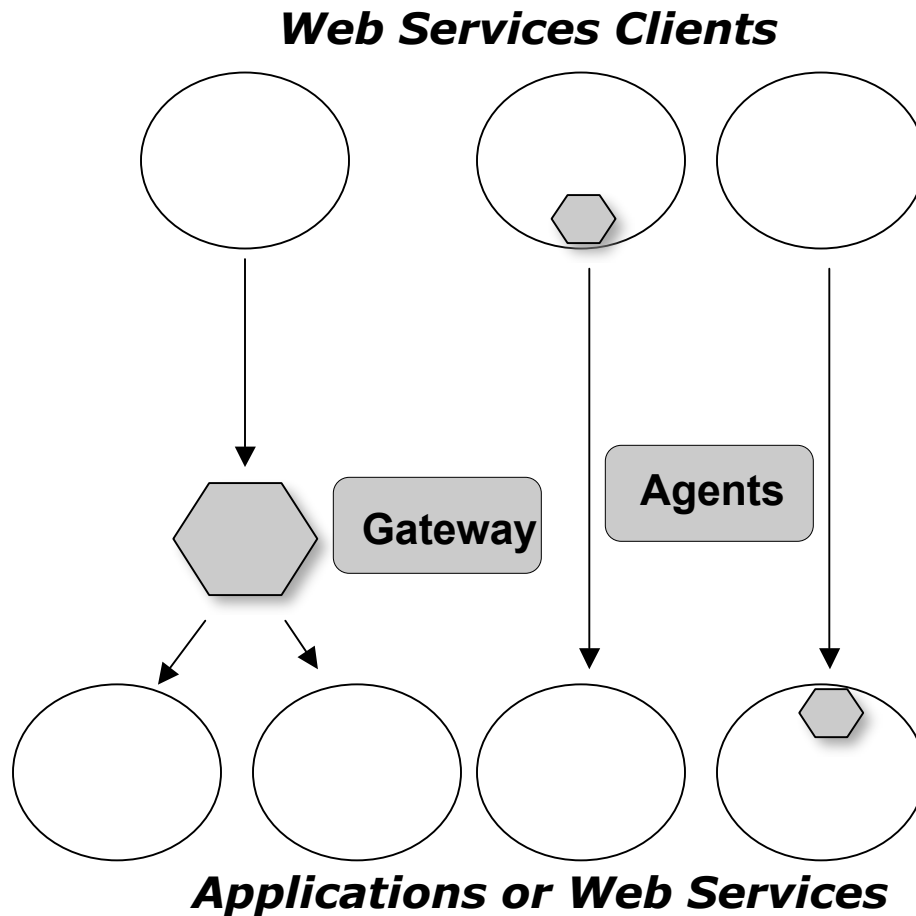
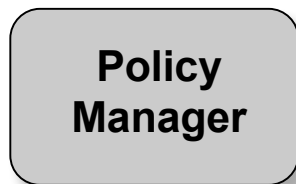
- Encryption algorithms: AES-128, AES-256, 3-DES
- Message digests: MD5, SHA-1
- Message structure: XML / SOAP / WS-Security1.0
  - Security token profiles: Username, X.509, SAML
- Message integrity: XML Signature,
- Message confidentiality: XML Encryption
- PKI
  - Key encryption: RSA OAEP-MGF1P, RSA V1.5
  - Signature algorithms: RSA (PKCS #1) (1024-, 2048-bit keys), DSA
  - Credentials store, wallets: PKCS#12

# Oracle WSM Security Principles

**BUILD**  
Policies

**ENFORCE and EXECUTE**  
Policies

**MONITOR**  
Policies



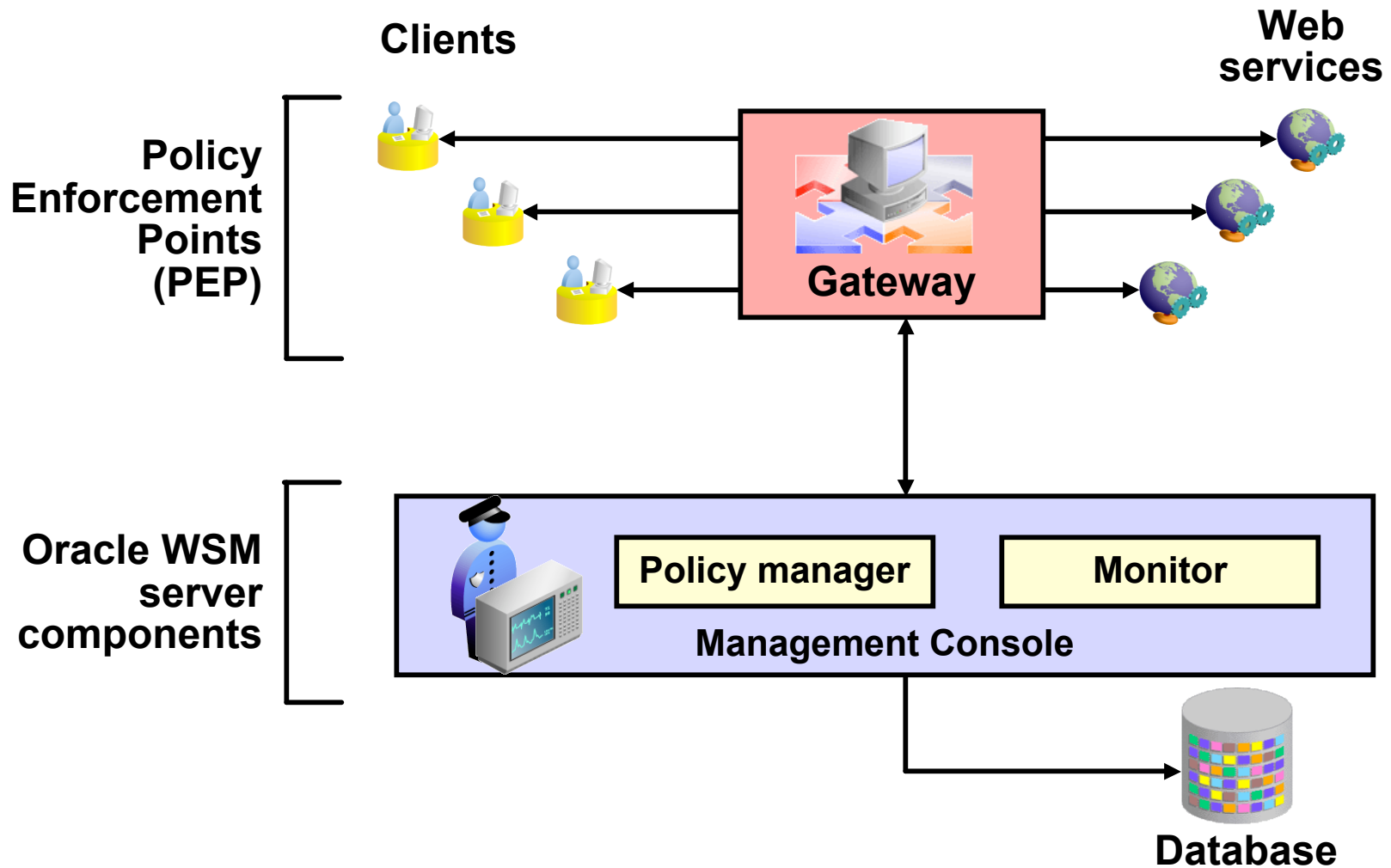
# Oracle WSM Management Console

The screenshot shows the Oracle Web Services Manager (WSM) Management Console interface within a Microsoft Internet Explorer browser window. The browser's address bar displays the URL `http://mchanlia-pc.us.oracle.com:8888/ccore/index.jsp`. The page title is "ORACLE Enterprise Manager 10g Web Services Manager Control". A navigation sidebar on the left contains four main categories: "Policy Management" (selected), "Operational Management", "Tools", and "Administration". The main content area is titled "Enforcement Points" and includes a "Help" link. Below this, there is a "List of Components:" section with an "Add New Component" button. A table lists two gateway components:

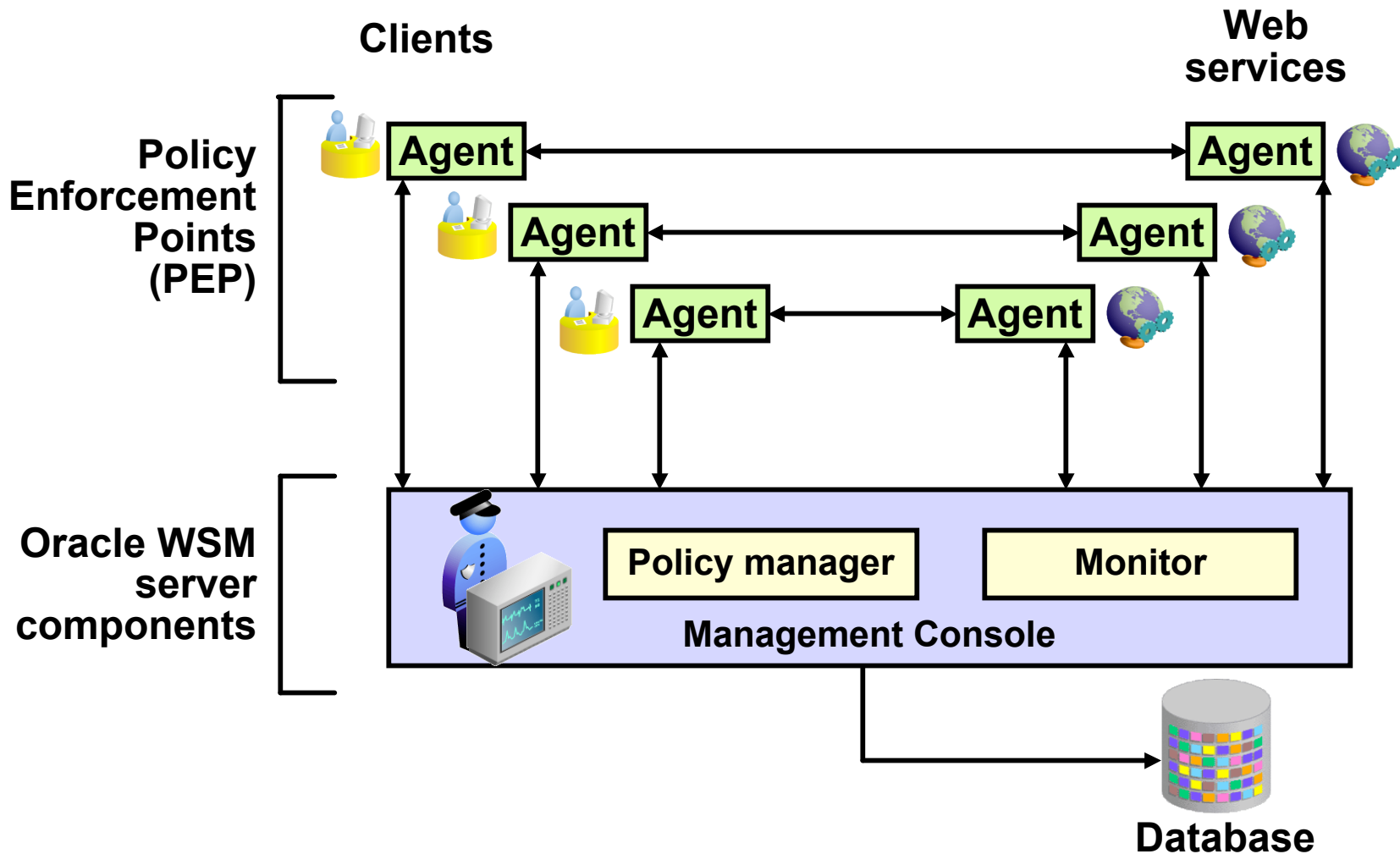
Id	Name	Type	Details	Edit	Delete	Policies	Steps
C0003001	MyGateway	Gateway	<a href="#">Details</a>	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Policies</a>	<a href="#">Steps</a>
C0003002	anotherGateway	Gateway	<a href="#">Details</a>	<a href="#">Edit</a>	<a href="#">Delete</a>	<a href="#">Policies</a>	<a href="#">Steps</a>

The browser's status bar at the bottom indicates "Local intranet".

# Oracle WSM Components



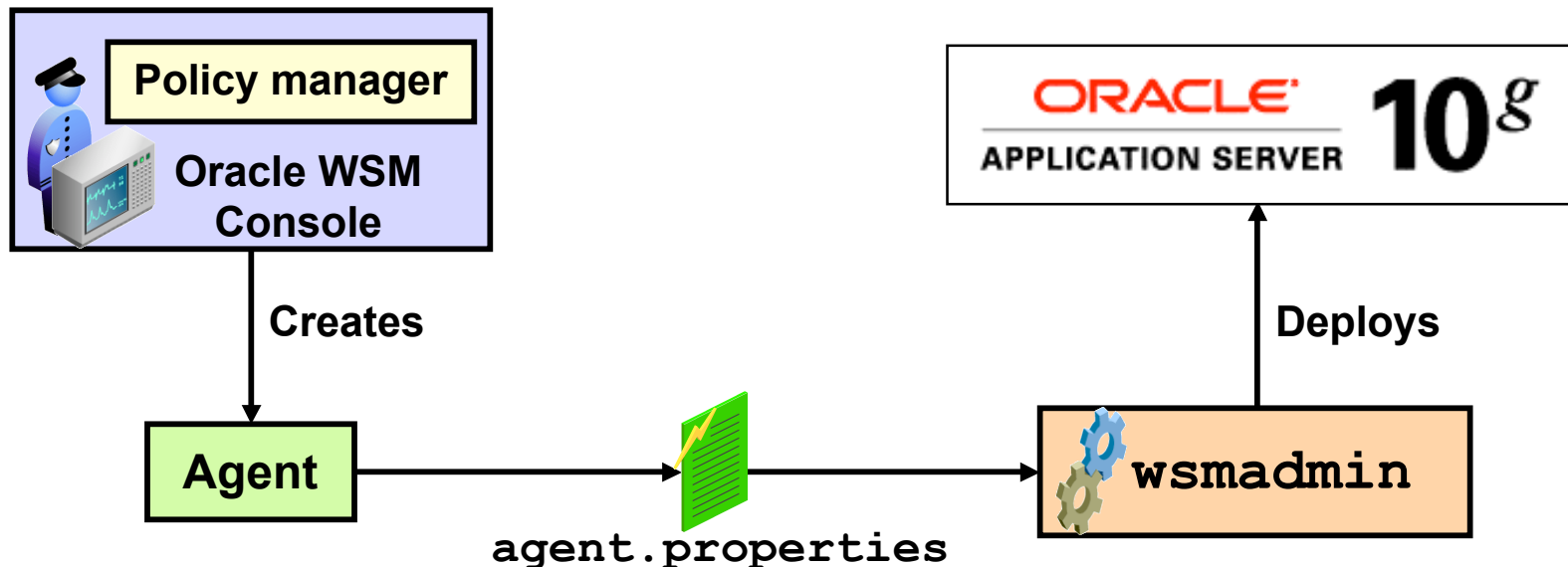
# Oracle WSM Components















# Deploying a Server Agent to the Oracle Application Server

- Register the server agent and define security policies using the Oracle WSM console
- Deploy the server agent to the Oracle Application Server using the `wsmadmin` tool



# Comparing Gateways and Agents

Features	Gateways	Agents
Administration	 Provides a central location	 No new component to administer
Protocol Support	 Can perform protocols translation	 Leverages existing platforms and existing protocol support
Securing Services	 Cannot guarantee endpoint-level security  Single enforcement points to administer	 Provides endpoint-level security  Several enforcement points to administer
Impact on Clients	 Need to point the client to the Gateway	 No need to make changes in the client or the UDDI registry

# Monitoring: Snapshot of all Activities

ORACLE Enterprise Manager 10g  
Web Services Manager Control logout oc4jadmin

**Policy Management**

**Operational Management**

- Snapshot
  - Overall Statistics
  - Security Statistics
  - Service Statistics
- My Views
- Alarms
  - Alarm Rules

**Tools**

**Administration**

Operation Management > Snapshot

### Snapshot [Help](#)

Snapshot Display Criteria

Component:  Service:  Time Range:

### Snapshot

Component:	Service	Start:	End:
MyGateway	TimeService	Tuesday, August 15, 2006 04:46:00 PM	Tuesday, August 15, 2006 05:46:00 PM

#### Overall Statistics

Overall Failures 91.7%

Overall Latency 15

#### Security Statistics

Authentication Failures 25%

Authorization Failures 66.7%

#### Service Statistics

Service Failures 0%

Service Latency 15

# Monitoring: Authentication & Authorization Events

ORACLE Enterprise Manager 10g  
Web Services Manager Control

logout oc4jadmin

**Policy Management**

**Operational Management**

- Snapshot
- Overall Statistics**
- Security Statistics
  - Access Control
- Service Statistics

My Views

Alarms

**Alarm Rules**

**Tools**

**Administration**

[Operation Management](#) > [Security Statistics](#) > Access Control

### Access Control [Help](#)

**Access Control Display Criteria**

Component:  Service:  Time Range:

**Access Control**

<b>Component:</b> MyGateway	<b>Service:</b> ALL SERVICES	<b>Start:</b> Tuesday, August 15, 2006 04:39:00 PM	<b>End:</b> Tuesday, August 15, 2006 05:39:00 PM
--------------------------------	------------------------------	----------------------------------------------------	--------------------------------------------------

**Access Violation Of All Services:**

- Access granted
- Access denied: Authentication failure
- Access Denied: Authorization Failure

**Access Violation Per Service:**

Service	Access denied (%)
TimeService	~90%

Click on bars to drill down into details, move your mouse over the graphs to see more information.

# Monitoring: Traffic Analysis

ORACLE Enterprise Manager 10g  
Web Services Manager Control logout oc4jadmin

**Policy Management**

**Operational Management**

- Snapshot
- Overall Statistics**
- Security Statistics**
- Service Statistics**
  - Latency Variance
  - Traffic Analysis
- My Views
- Alarms
- Alarm Rules**

**Tools**

**Administration**

[Operation Management](#) > [Service Statistics](#) > Traffic Analysis

## Traffic Analysis [Help](#)

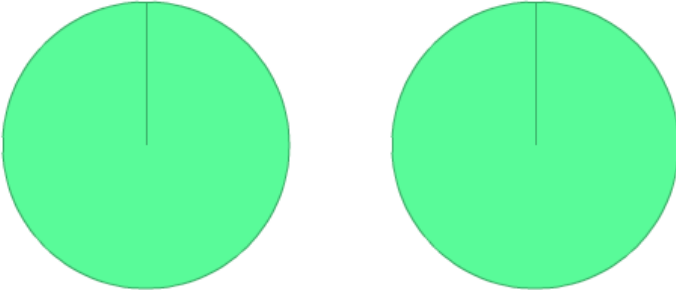
**Traffic Analysis Display Criteria**

Component:  Service:  Time Range:

**Traffic Analysis**

Component:	Service:	Start:	End:
MyGateway	TimeService	Monday, August 14, 2006 06:16:00 PM	Tuesday, August 15, 2006 06:16:00 PM

Number of Messages Per Operation: Number of Bytes Per Operation:



■ getTime

Move your mouse over the graphs to see more information.

# Monitoring: SLA Compliance

ORACLE Enterprise Manager 10g  
Web Services Manager Control

logout oc4jadmin

 Policy Management

 Operational Management

Snapshot

Overall Statistics

SLA Compliance

Execution Details

Message Logs

Flows

Security Statistics

Service Statistics

My Views

Alarms

Alarm Rules

 Tools

 Administration

[Operation Management](#) > [Overall Statistics](#) > SLA Compliance

## SLA Compliance [Help](#)

### SLA Compliance Display Criteria

Component:  Service:  Time Range:

Display

### SLA Compliance [SLA Values](#)

Component:	Service	Start:	End:
MyGateway	TimeService	Monday, August 14, 2006 06:21:00 PM	Tuesday, August 15, 2006 06:21:00 PM

Overall Availability:  80%

Availability SLA:      Max Failure Rate: 5%

Latency SLA:            Assured Latency: 5

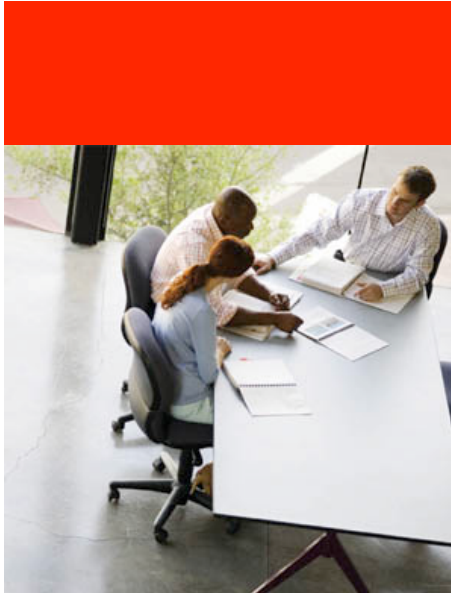
Overall Execution Summary:



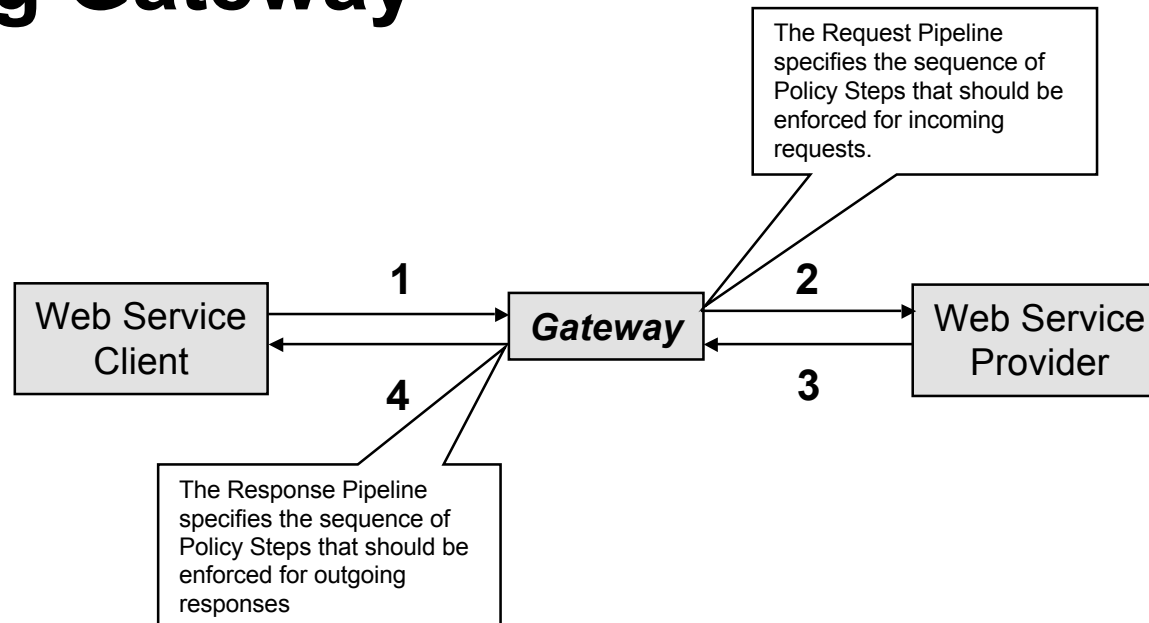
Move your mouse over the pie wedges to see more information.



# Use Cases



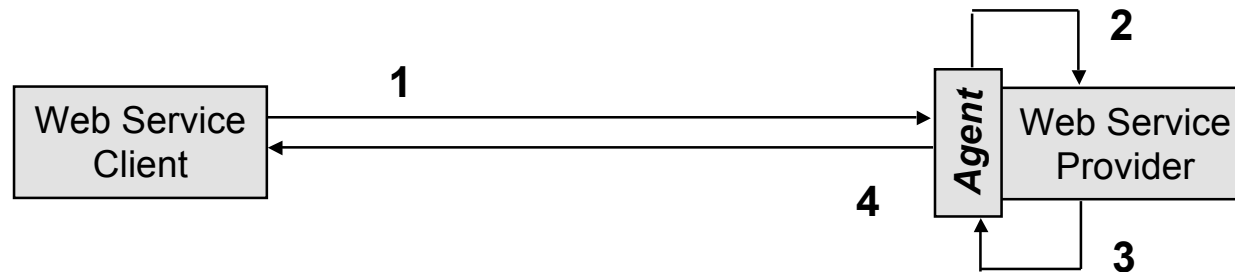
# Protecting Access To Web Services Using Gateway



- The Gateway secures access to one or more web services at the web service provider site
  - Step1: The client posts a request to a web service
  - Step2: The Gateway intercepts the request, applies security policies (e.g., decryption, signature verification, authentication, authorization), and forwards the request to the web service
  - Step3: The web service returns a response
  - Step4: The Gateway intercepts the response, applies security policies (e.g., encryption), and forwards the response to the client

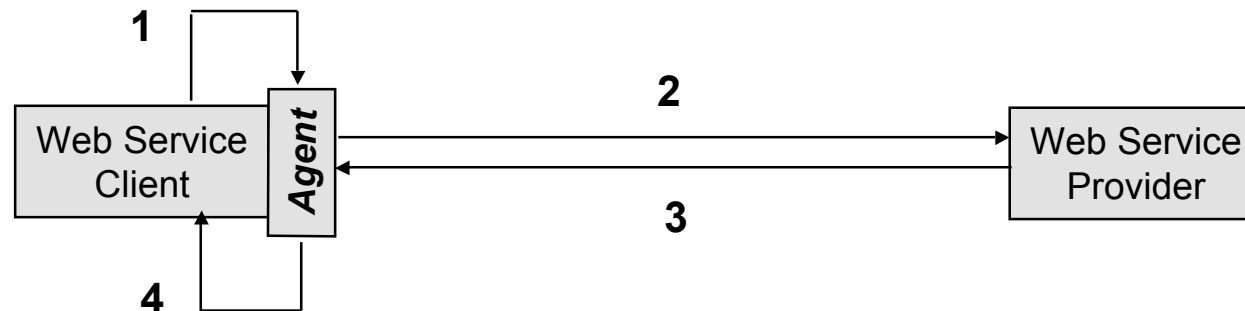


# Protecting Access to Web Service(s) Using Server-Side Agent



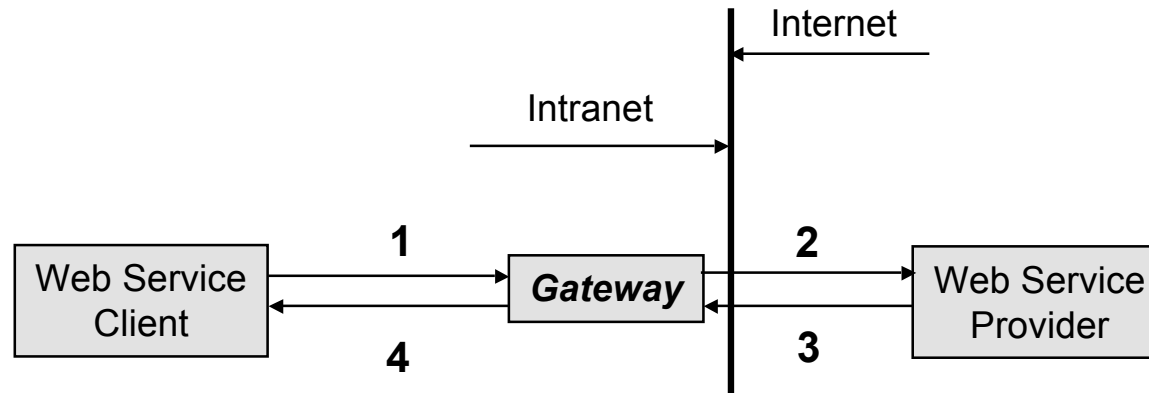
- The OWSM Agent protects access to a web service at the web service provider (server-side Agent)
  - Step1: The client posts a request to a web service
  - Step2: The Agent intercepts the request, applies security policies (e.g., decryption, signature verification, authentication, authorization), and passes the request to the web service
  - Step3: The web service returns a response
  - Step4: The Agent intercepts the response, applies security policies (e.g., encryption), and passes the response to the client

# Requesting Access To Web Service(s) Using Client-Side Agent



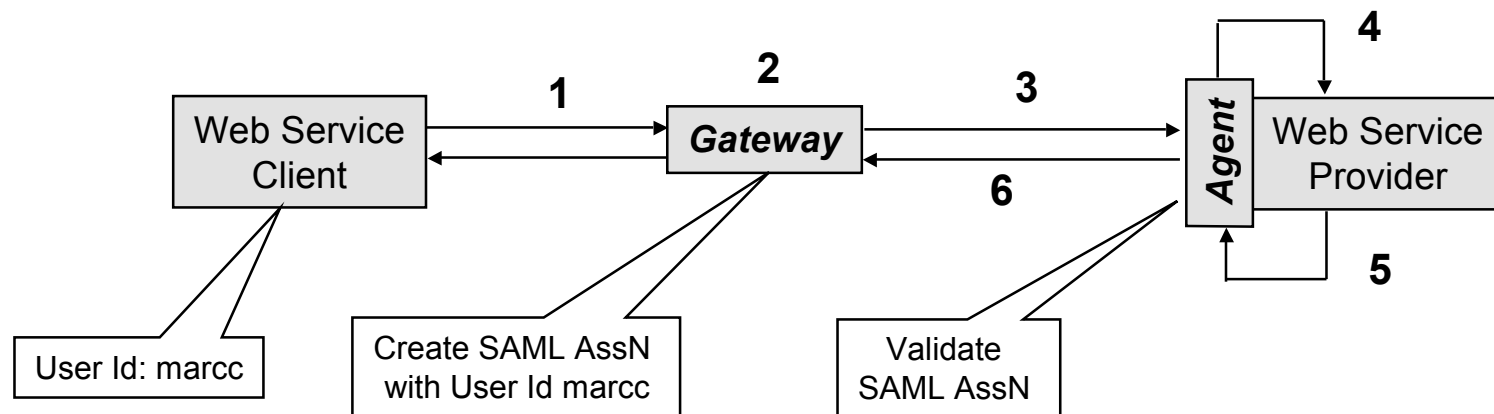
- The OWSM Client-Side Agent enforces web services policies from within the same web application as the service client
  - Step1: The client posts a request to a web service
  - Step2: The Agent intercepts the request, applies security policies (e.g., encryption, etc.), and passes the request to the web service
  - Step3: The web service processes the request and returns a response
  - Step4: The Agent intercepts the response, applies security policies (e.g., decryption), and passes the response to the client

# Accessing External Web Services Using Gateway as a Reverse Proxy Server



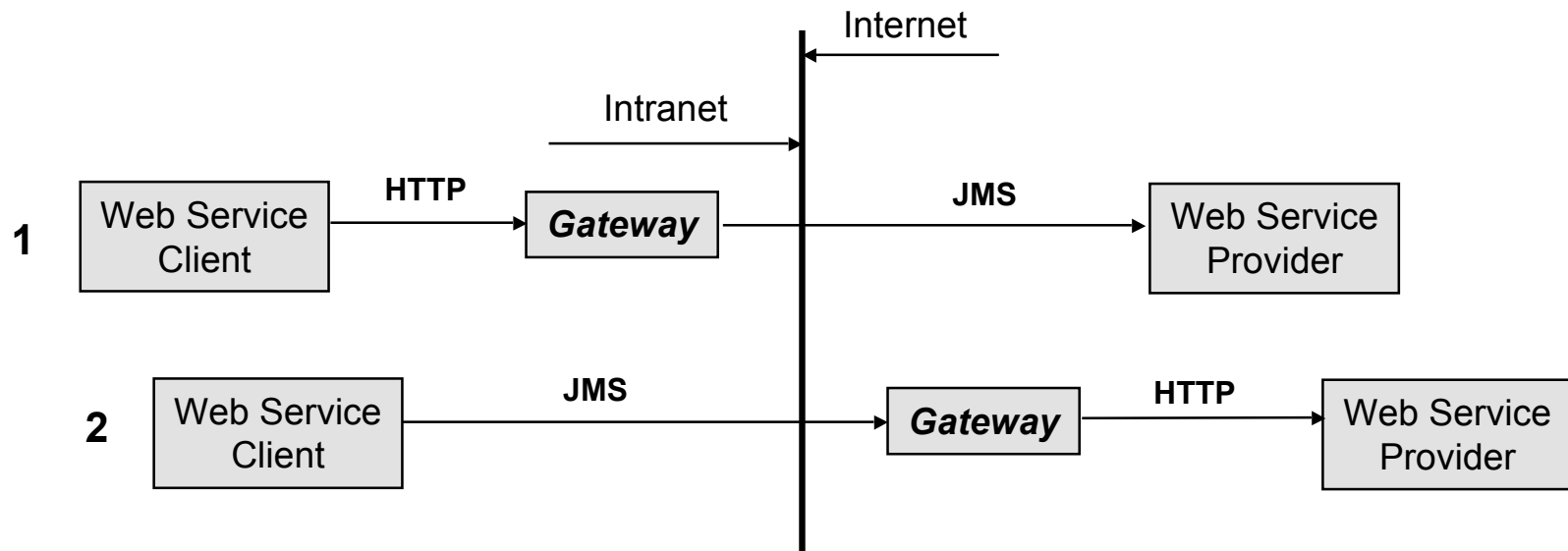
- The purpose is to allow access to external web services only to specific web service clients making a request from within the corporate intranet
  - Step1: The client (within the corporate intranet's boundaries) posts a request to an external web service
  - Step2: The Gateway intercepts the request, applies security policies (e.g., authentication, authorization), and forwards the request to the web service
  - Step3: The web service returns a response
  - Step4: The Gateway intercepts the response, applies security policies, and forwards the response to the client

# Mapping Credentials Using Gateway and Server-Side Agent



- The web service client and the web service provider don't support the same type of credentials
  - Step1: The client makes a web service request using basic credentials ("marcc")
  - Step2: The Gateway intercepts and authenticates the request
  - Step3: Upon successful authentication, the Gateway inserts a SAML assertion in a WS-Security header that it posts to the web service provider as part of a SOAP message
  - Step4: The Agent validates the SAML assertion and passes the request to the web service
  - Step5: The web service returns a response intercepted by the Agent for security
  - Step6: The Agent returns the response to the web service client directly or via the Gateway

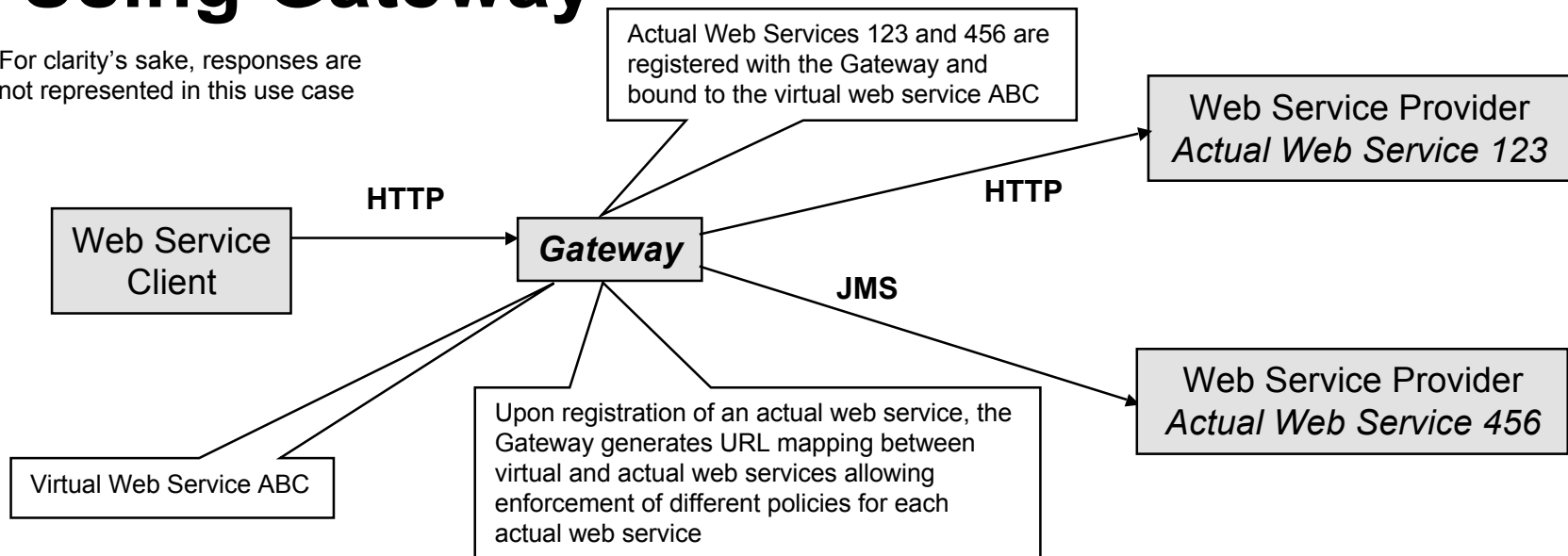
# Mediating Heterogeneous Protocols Using Gateway



- The web service client and the web service provider don't support the same protocol
  - In case 1, the Gateway resides within the Intranet and translates an outgoing HTTP request into JMS
  - In case 2, the Gateway resides outside the Intranet and provides access to HTTP-based web services from JMS-based requests

# Virtualizing Web Services Using Gateway

**Note:** For clarity's sake, responses are not represented in this use case



- The OWSM Gateway provides web services virtualization
  - Actual web services are bound to a virtual service (the Gateway)
  - Users first access the virtual web service and based on their roles, users may access selected actual web services
  - The transport protocol can also be virtualized, for example, all users access a virtual web service through one protocol (e.g., HTTP) and the virtual service can pass the request to an actual web service using a different protocol (e.g., JMS)
  - Users can create multiple versions of a virtual web service and redirect an older version of the virtual web service to a new version



# Roadmap

- Current Release: Oracle SOA Suite 10.1.3.1 (Available from October 2006)
  - OWSM is a full-fledged component of the Oracle SOA Suite
    - Oracle unified installer
    - OWSM also available as a standalone product
  - Leverages OC4J for high availability and quality of service
  - Globalization (I18N and L12N)
  - WSIL support
  - Oracle Enterprise Management (EM) look and feel
  - Support for additional encryption algorithm
  - Standards update (WS-Security / SAML)




## Roadmap (Cont'd)

- Oracle SOA Suite 11g (2007)
  - Provide an end-to-end, application-centric SOA solution for the enterprise by fully integrating best-of-breed components
  - Provide a common, standards-based policy / agreement definition and policy attachment environment for the Oracle SOA suite based on OWSM's Policy Manager (WS-Policy model)
  - Provide a single user interface and common management point across the Oracle SOA Suite based on Oracle Enterprise Management (EM)
  - Provide a consolidated gateway including security, connectivity, routing, and transformation functionality





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