

Modernizing Workflow and Data Integration The Future of Data Warehousing

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Speaker Qualifications

- Independent Consultant, and R & D
- Speaker at NYOUG meetings, IOUG, Quest, SEOUC, ECO and Oracle Open World Conferences
- 24 years of IT experience
- 20 years of Oracle experience, 16 as a DBA (v6 thru 11g)
- Grid, Cloud, and High-Availability experience with RAC, Data Guard, Streams AQ/WebSphere MQ and IBM GPFS
- BS Systems Engineering, Universidad del Norte, 1987.
- MS Computer Science, NJIT, 1993
- PhD CIS candidate, NJIT, 1997
- MBA MIS, Montclair State University, 2006
- College Math Professor and former HS Math Teacher Principal.

Objectives



- Provide a clear overview of workflow and data integration future direction driven by Big Data.
- Analyze existing administration and development approaches.
- Introduce Oracle Data Integrator and Oracle Golden Gate 11g R2 featured capabilities.
- Identify strategic advantages and pitfalls on every strategy used.
- Highlight the evolution of existing tools such as Oracle Streams AQ and IBM Websphere MQ.

Business Framework

Concepts



According to the Workflow Management Consortium, **workflow** “represents the **automation of a business process**, in whole or in part, during which documents, information, or tasks are passed from one participant to another for action, according to a set of procedural rules.”

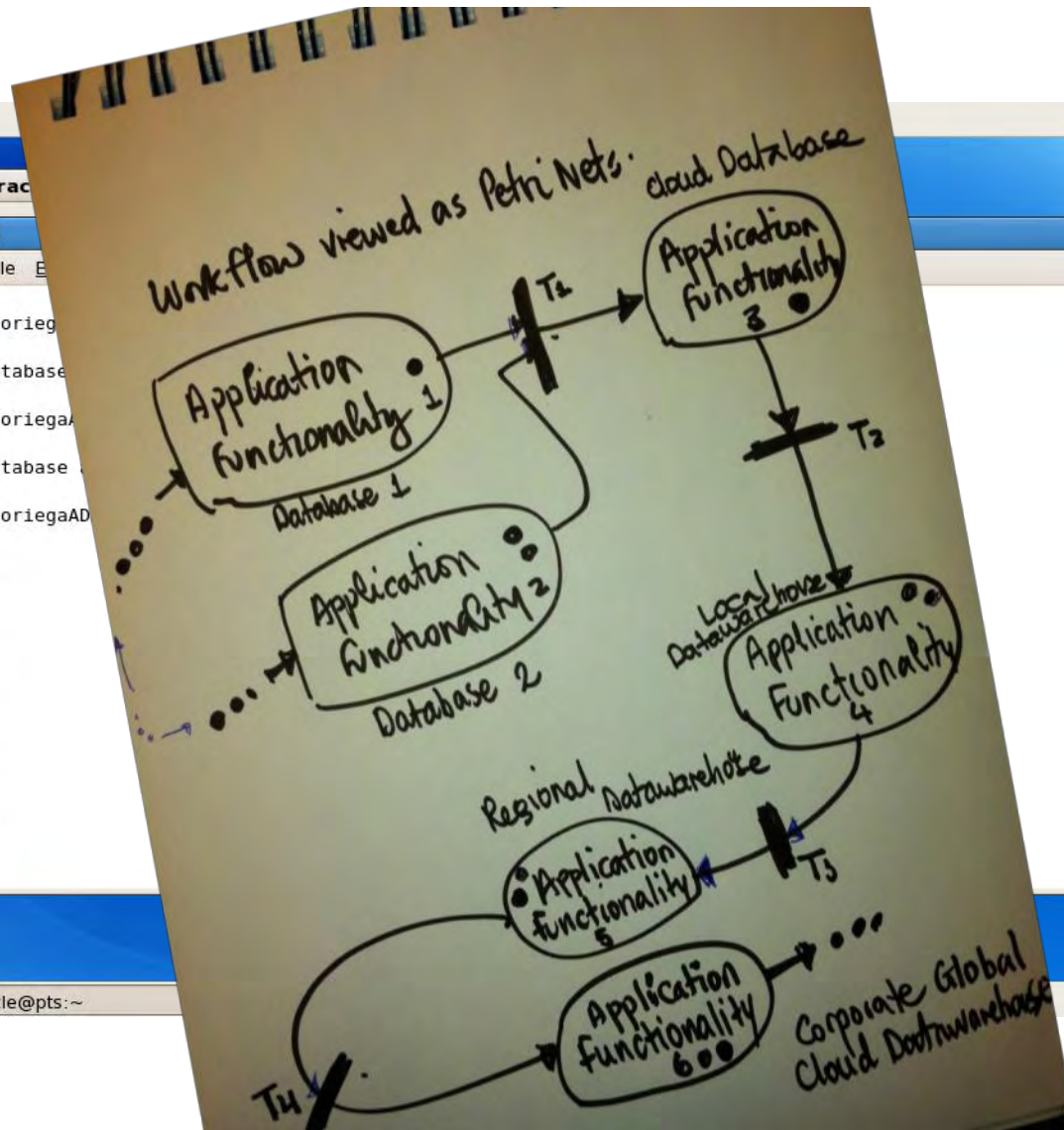
Standards: IDEF2, IDEF3. Beyond static IDEF1X data.

Workflow Viewed as Petri Nets

```

Applications Places System
oracle@pts:/Oracle
File Edit View Terminal Tabs Help
Source Context :
SourceModule      : [er.idlx]
SourceID          : [/home/ecloud@NoriegaADN:/performance/src/app/er/idlx.c]
SourceFunction     : [IDLX_complexDatabase]
SourceLine        : [378]
ThreadBacktrace   : [[11] elements@NoriegaADN:/Oracle_GoldenGate/Database
0x26) [0x840b3f6]]
ceContext*, unsigned int, ...) +0x817) [0x840b3f6]@NoriegaADN:/Oracle_GoldenGate/Database
ceContext*, CMessageFactory::MessageDispatcher]
a36]]
) [0x8144762]]
0x8144cb2]]
c979]]
c1]]

```



Modernization Goals

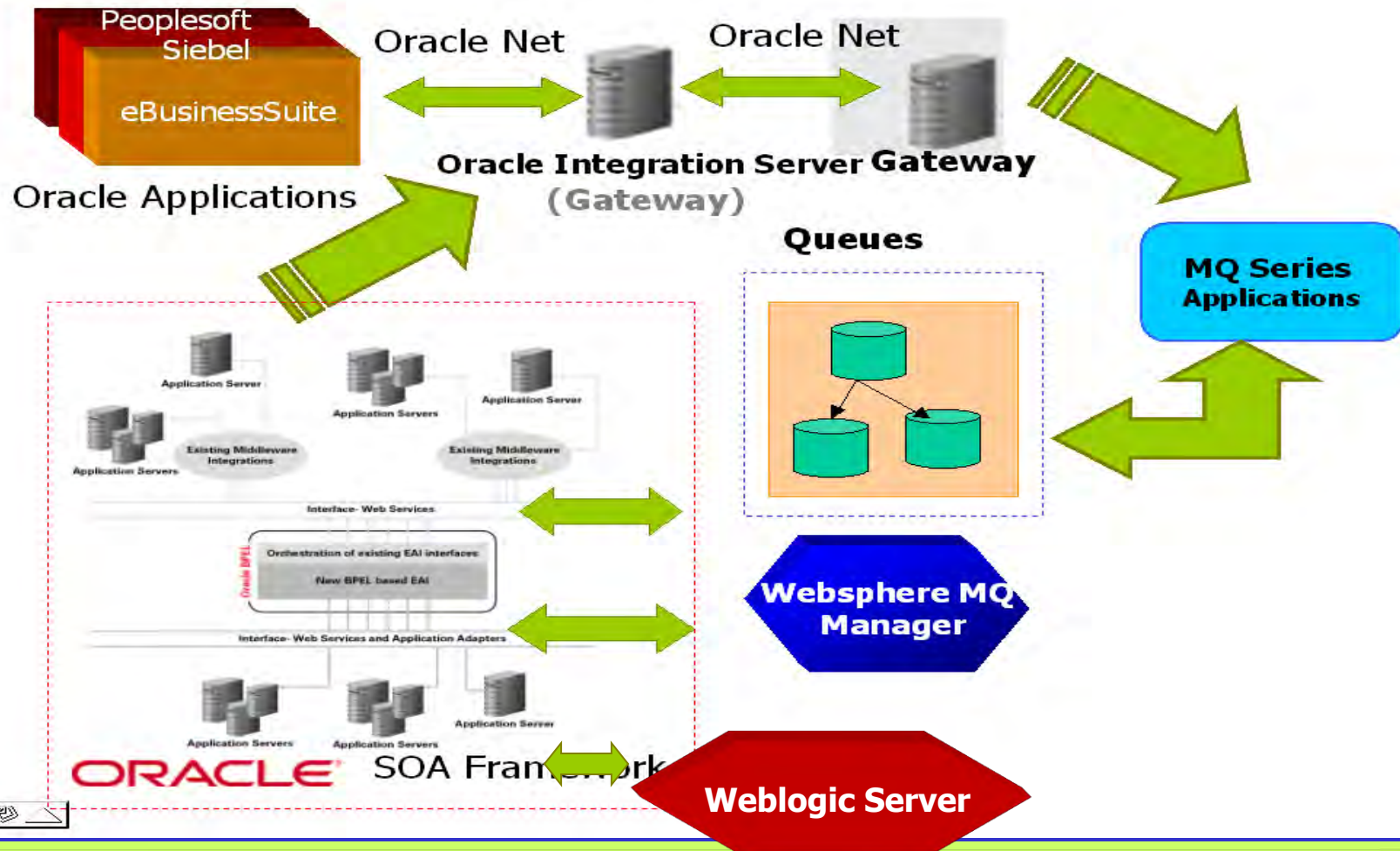
- **Agility:** More results faster, and more accurate.
- **Data Quality:** Improved Data Integrity and Consistency.
- **Enhanced Automation and provisioning.**
- **Improved Quality of Service (QoS).**
- **Optimal middleware architecture integration** (as part of **Oracle AIA**), including integration with virtual environments and other cloud technologies.



Business Models Concepts

- Message Queuing (as in SCM, ERP, CRM)
- Data Replication (Logical Change Record)
- Data Protection
- Data Warehouse Loading
- Event Management and Notification
- Workflow
- Serializable Distributed Processing

MOM Queuing Infrastructure





Workflow in the Cloud

The customization of existing resources are driving cloud computing in a rather transparent way, due to the appropriate usage of file systems, physical, virtual, and hybrid, in alignment with storage networking innovation, clusters, and related topologies and protocols.

Key Decision Criteria

Data security and privacy, since workflow can included archiving data logging possibly proprietary and intelligence information.



Data Integration in the Cloud

The integration of data that is apparently volatile within public, private, and hybrid clouds can actually be simplified by the usage of MapReduce, message queuing and big data connectors models, which enable transparent gateways through the diversity of file system, operating system platforms, DBMS, and storage models.

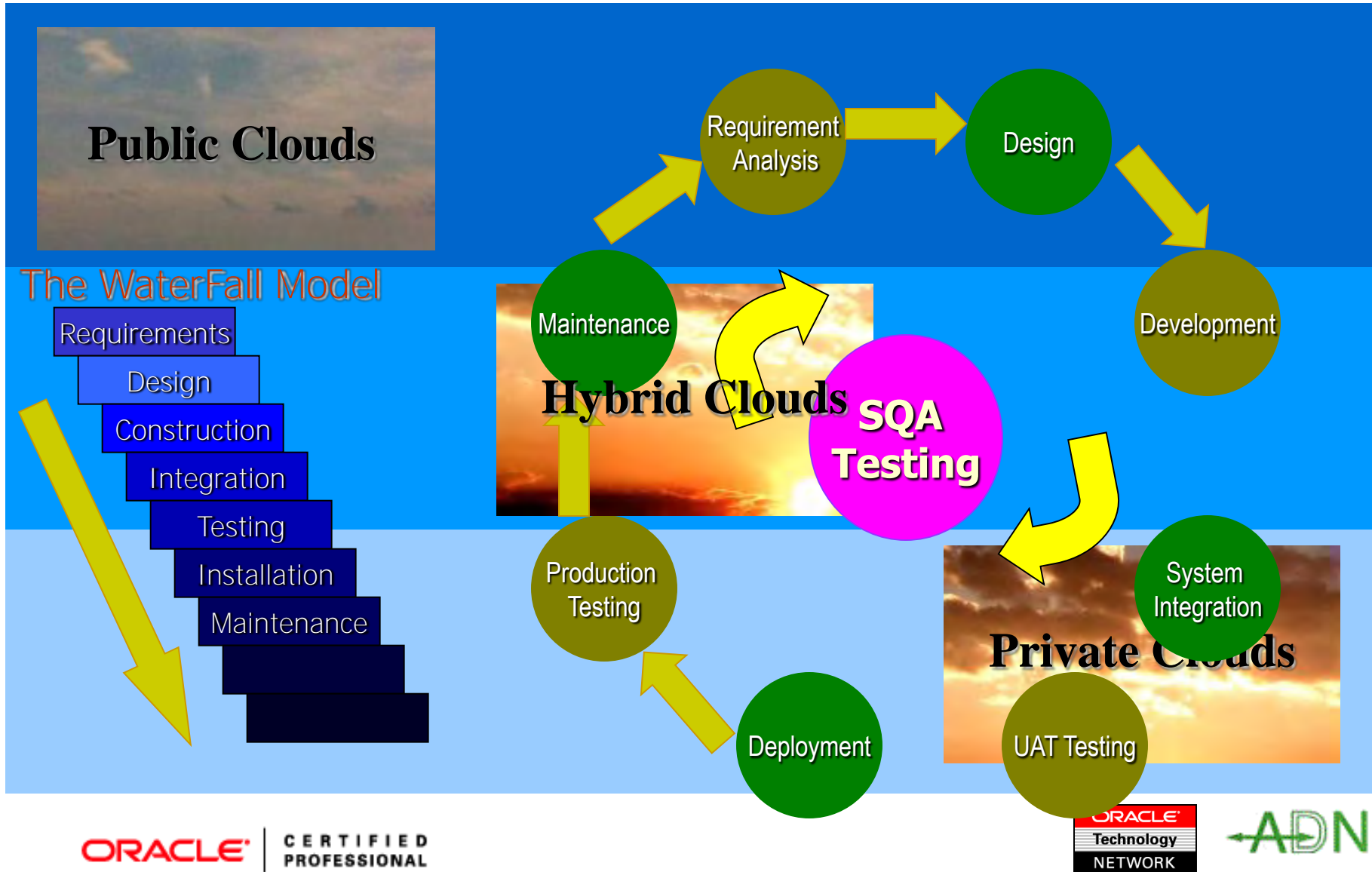
Planning and costs associated with the actual architecture can determine a comprehensive integration model.



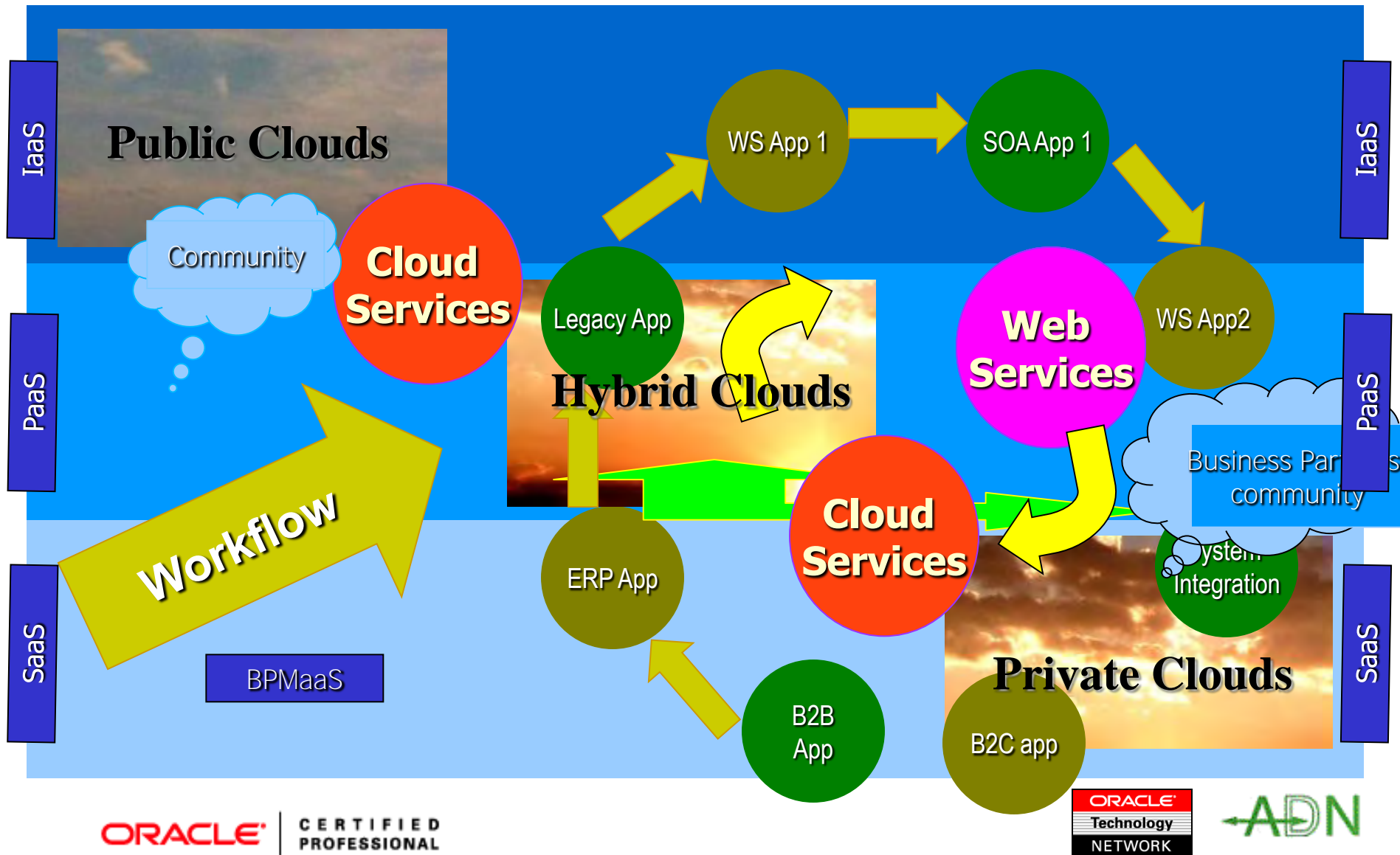
E-Business Process Innovation

- E-Commerce will be highly impacted by the modernization of workflow and data integration.
- B2B and B2C using SaaS, PaaS, and IaaS
- BPMaaS will be in itself a strong component in this modernization

ILCM/SDLC and Cloud Workflow



Cloud Workflow Integration



Technical Framework

Defining Oracle Fusion

From the business perspective, Oracle Fusion Middleware is an umbrella of integrated robust customer-validated software that spans from grid infrastructure to SOA; portals and process managers to database, application infrastructure, content, message queuing, development tools, and business intelligence.

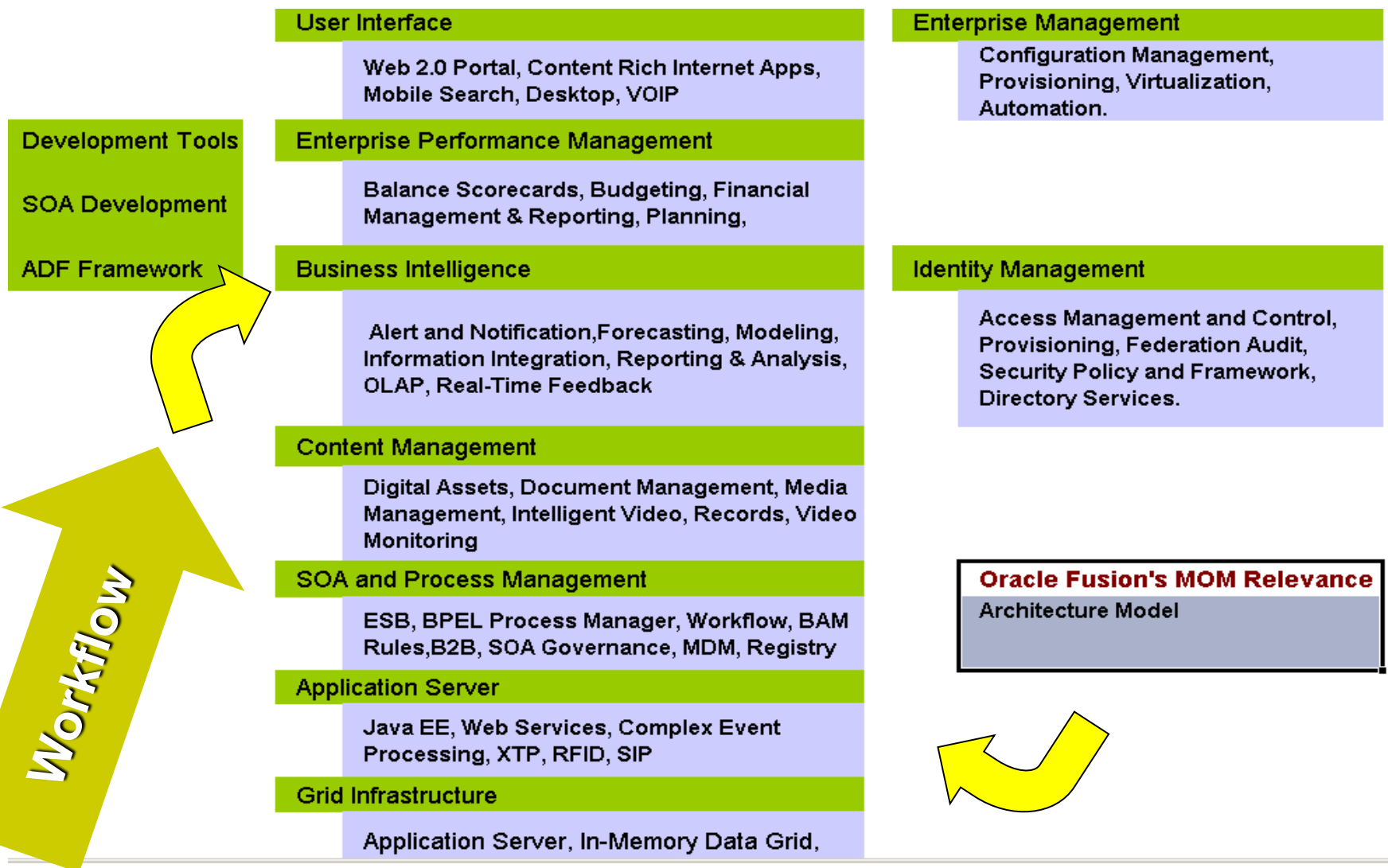
Fusion's MOM Relevance

Oracle Fusion Component	MOM / AQ Relevance
Application Server	High
Business Integration	High
Business Intelligence	High
Business Process Management	Average
Coherence Data Grid Persistence	High
Collaboration Suite	High
Content Management	Average
Corporate Portal Technology	High
Data Integration	High
Enterprise Management (Grid Control)	Very High
Enterprise Service Bus	High
Development Tools	High
Identity Management	High
Middleware for Fast-Growing Companies	High
Oracle Fusion MOM for Applications	Very High
Service Delivery Platform	High
SOA Suite	Very High
Web Services	Very High

Workflow

Data Integration

Oracle Fusion Architecture Model



Technical Concepts

- Queue (FIFO data structure)
- Message Queuing
- Header
- Payload
- Channel
- Port
- Propagation

Technical Concepts

- Producer (enqueueing)
- Consumer (dequeuing)
- Recipient
- Enqueue
- Dequeue

Technical Concepts

- Peer-to-Peer Mode
- Publish/Subscribe Mode
 - Broadcasting
 - Multicasting
- Streams AQ
- Model View Controller
(Message-Driven Beans)

Types of Oracle Queues

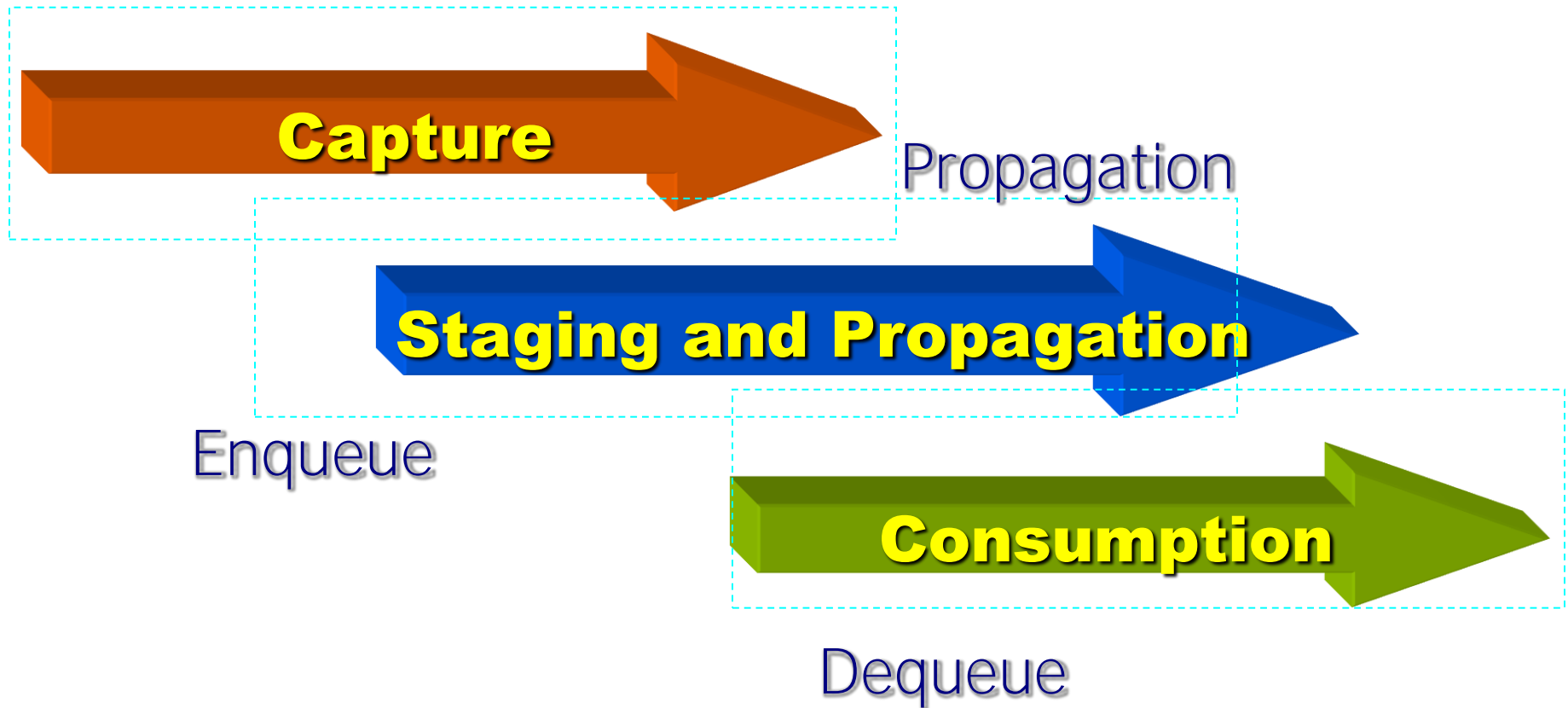
- Based on Producer/Consumer Cardinality
 - Peer-to-Peer (P2P) Mode
 - Publish/Subscribe Mode
- Based on Persistency
 - Persistent
 - Non-Persistent



Oracle Streams AQ

“ An application can enqueue messages that represent events into a queue explicitly, or a Streams capture process can capture database events and encapsulate them into messages called LCRs. These captured messages can be the results of DML or DDL changes. Propagations can propagate messages in a stream through multiple queues. Finally, a user application can dequeue messages explicitly, or a Streams apply process can dequeue messages implicitly. An apply process can reenqueue these messages explicitly into the same queue or a different queue if necessary.”

AQ Downstream Model



An application can either use this model or generate a message

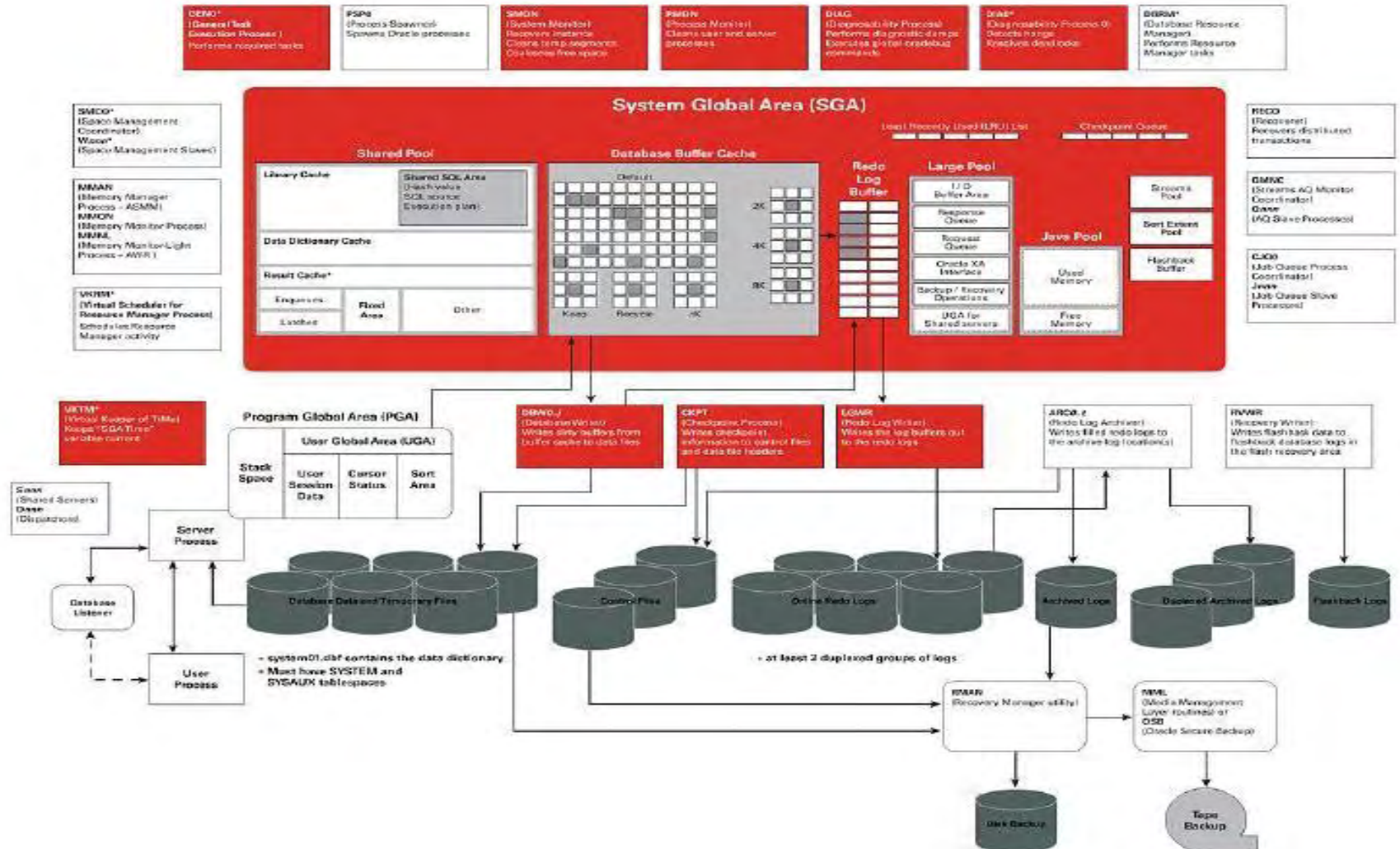
Streams AQ Capabilities

- Automatic Shared Memory Management of the Streams Pool
- Streams Tool in Oracle Enterprise Manager
- Procedures for Starting and Stopping Propagations
- Queue-to-Queue Propagations
- Declarative Rule-Based Transformations
- Commit-Time Queues
- Supplemental Logging Enabled During Preparation for Instantiation
- Configurable Transaction Spill Threshold for Apply Processes
- Conversion of LCRs to and from XML
- Retrying an Error Transaction with a User Procedure
- Enhanced Support for Index-Organized Tables
- Row LCR Execution Enhancements
- Information About Oldest Transaction in V\$STREAMS_APPLY_READER

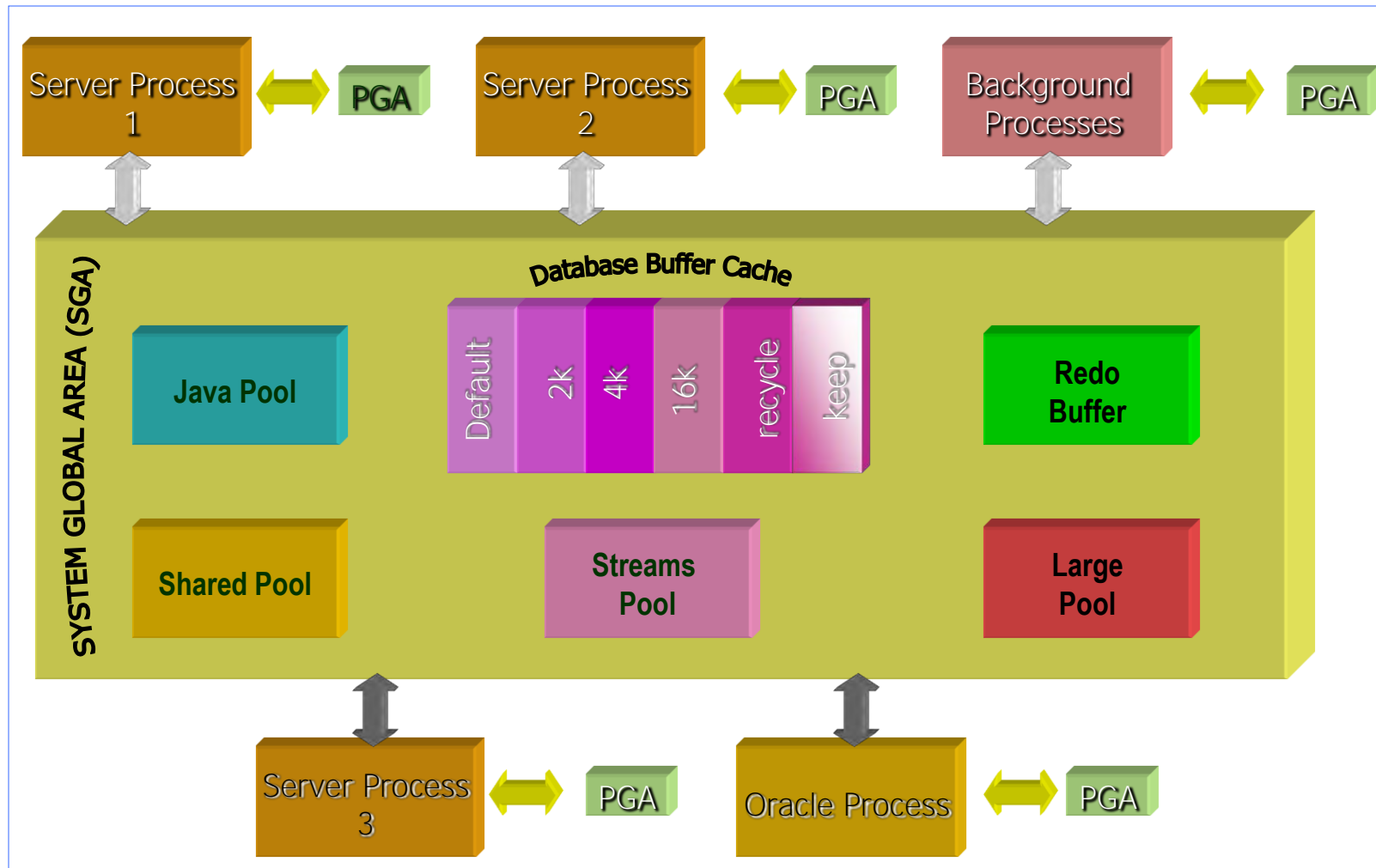
Architectural Considerations

- Oracle integration server
- Agent
- Queue table
- Queuing processes
- Listener configuration
- Database links
- Message-Oriented Middleware (MOM)/EM Cloud Integration

Architectural Considerations



Architectural Considerations





Security Framework

- **Rule-based Security**
 - **Object Level**
 - **Schema**
 - **Global**
- **Virtual Private Database Support**
- **Strategic Resilience Support**
- **Transparent Data Encryption (TDE).**



Security Framework

- Enhancements:
 - Database Vault
 - LDAP Support
 - IDAP
 - XA Support
- Encryption Support via asymmetric authentication (PKI).
- Conjoint TDE and Wallet usage.

Setting the MOM/AQ Environment

- Oracle-based only or third-party, e.g., gateway-based or heterogeneous system involvement
- Transactional or non-transactional queue
- Peer-to-peer or Publish-Subscribe Mode (Broadcasting or Multicasting, i.e., custom recipient)
- Integration with Grid and OAIA.

Planning the AQ Environment

- Propagation-type
(queue-to-queue or queue-to-database link)
- Payload format
- Sending Mechanism
(Producer Application)
- Receiving Mechanism
(Consumer Application).



MOM and AQ Environment

- Model View Controller
 - Data Source, domain, data model
 - Presentation
 - Controller/Mediator
- Payload content management for intelligent rule-based filtering or routing.

Planning the AQ Environment

- Queue browsing without consumption
- Queue consumption and removal
- Queue consumption without payload removal for auditing, non-repudiation, or logging.



System Requirements

- Configuring:
 - Create AQ user and administrator with appropriate privileges, namely, AQ_USER_ROLE and AQ_ADMINISTRATOR_ROLE
 - Database links accordingly
 - Heterogeneous Services, if applicable (involved package and instance configuration)
 - LD_LIBRARY_PATH, PATH

Software Requirements

- Certified OS Platform
- Oracle Streams AQ
- Oracle Streams AQ Gateway
 - Procedural Gateway (Websphere MQ/Tibco)
 - Transparent Gateway (SQL Server)
- Heterogeneous Services Gateway
- Configure Gateway homes with API provided.

Data Dictionary Views

```

anthony@admem>SELECT owner,
2         name,
3         queue_table,
4         queue_type,
5         retention,
6         enqueue_enabled,
7         dequeue_enabled,
8         network_name
9   FROM dba_queues
10  ORDER BY 1,2,3
11  /

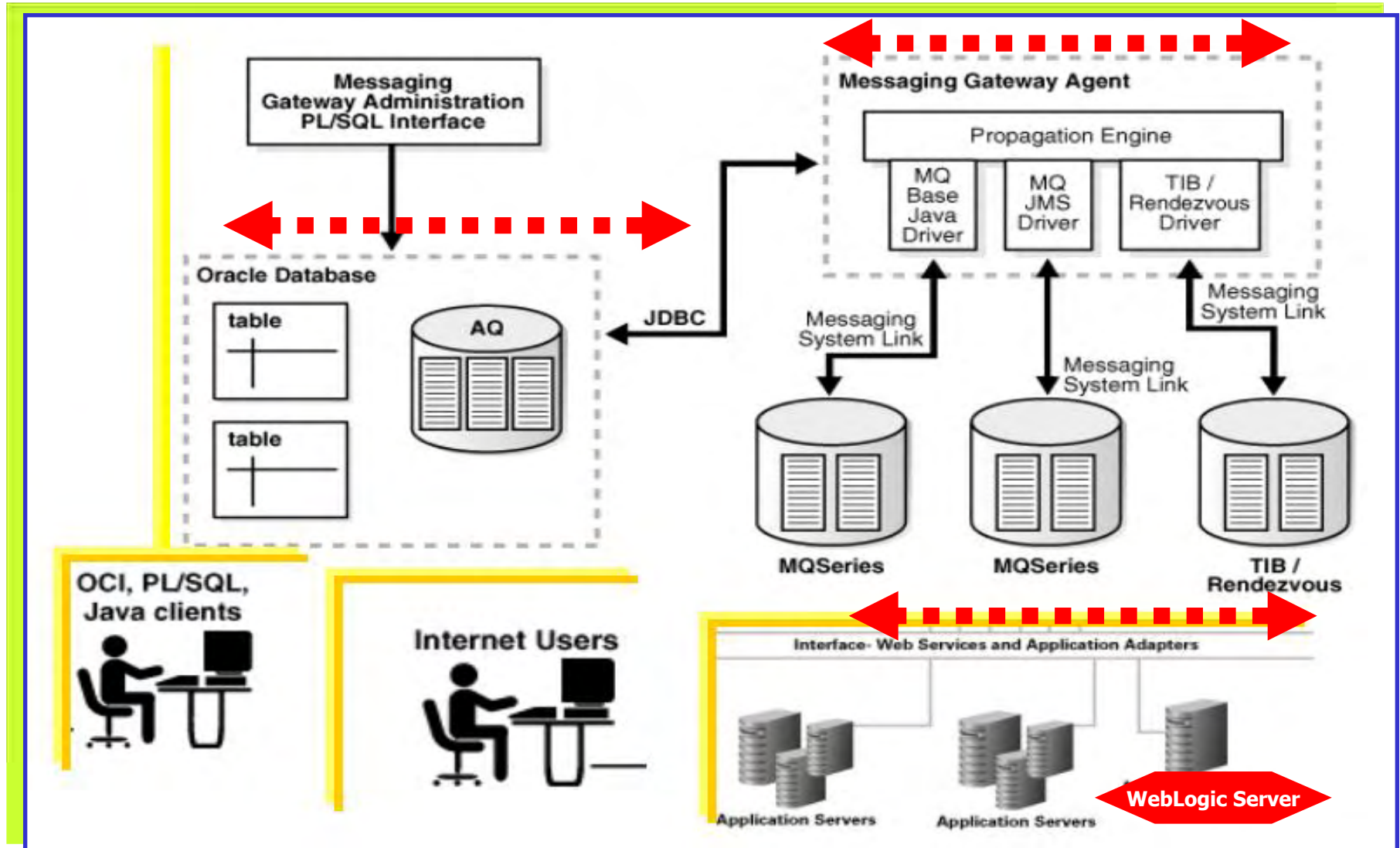
```

OWNER	NAME	QUEUE_TABLE	QUEUE_TYPE	RETENTION

NETWORK_NAME				

SYS	ALERT_QUE	ALERT_QT	NORMAL_QUEUE	0
SYS	AQ\$_ALERT_QT_E	ALERT_QT	EXCEPTION_QUEUE	0
SYS	AQ\$_AQ\$_MEM_MC_E	AQ\$_MEM_MC	EXCEPTION_QUEUE	0
SYS	AQ\$_AQ_EVENT_TABLE_E	AQ_EVENT_TABLE	EXCEPTION_QUEUE	0
SYS	AQ\$_AQ_SRUNTFN_TABLE_E	AQ_SRUNTFN_TABLE	EXCEPTION_QUEUE	0

Heterogeneous Productivity



PL/SQL Supplied Packages

ORACLE10g	ORACLE9i
DBMS_APPLY_ADM	DBMS_AQ
DBMS_AQ	DBMS_AQADM
DBMS_AQADM	DBMS_AQELM
DBMS_AQELM	DBMS_MGWADM
DBMS_AQIN	DBMS_MGWMSG
DBMS_CAPTURE_ADM	DBMS_FLASHBACK
DBMS_FLASHBACK	
DBMS_MGWADM	
DBMS_MGWMSG	
DBMS_PROPAGATION_ADM	
DBMS_STREAMS	
DBMS_STREAMS_ADM	
DBMS_STREAMS_MESSAGING	
DBMS_TRANSFORM	

PL/SQL Supplied Packages

ORACLE11g	ORACLE11g Updated Packages
DBMS_RULES_ADM	DBMS_ADVISOR
DBMS_APPLY_ADM	DBMS_APPLY_ADM
DBMS_CAPTURE_ADM	DBMS_AQ
DBMS_COMPARISON	DBMS_AQADM
DBMS_STREAMS_ADM	DBMS_CAPTURE_ADM
DBMS_STREAMS_ADM	DBMS_RESOURCE_MANAGER
DBMS_STREAMS_ADVISOR_ADM	DBMS_RLMGR
DBMS_STREAMS_MESSAGING	DBMS_RULES_ADM
DBMS_STREAMS_TABLESPACE_ADM	DBMS_STREAMS_ADM
UTL_SPADV	DBMS_STREAMS_TABLESPACE_ADM

Programmatic Interfaces

Oracle Streams AQ Programmatic Interfaces

Language	Precompiler or Interface Program	Functions Supported	Oracle References
PL/SQL	DBMS_AQADM and DBMS_AQ Packages	Administrative and operational	Oracle Database PL/SQL Packages and Types Reference
C	Oracle Call Interface (OCI)	Operational only	Oracle Call Interface Programmer's Guide
Visual Basic	Oracle Objects for OLE (OO4O)	Operational only	Online help available from Application Development submenu of Oracle installation.
Java (JMS)	oracle.JMS package using JDBC API	Administrative and operational	Oracle Streams Advanced Queuing Java API Reference
AQ XML servlet	Internet Data Access Presentation (IDAP)	Operational only	Oracle 11g Chapter 6, "Internet Access to Oracle Streams AQ"

Streams AQ Supported Datatypes

- * VARCHAR2
- * NVARCHAR2
- * FLOAT
- * NUMBER
- * LONG
- * DATE
- * BINARY_FLOAT
- * BINARY_DOUBLE
- * TIMESTAMP
- * TIMESTAMP WITH TIME ZONE
- * TIMESTAMP WITH LOCAL TIME ZONE
- * INTERVAL YEAR TO MONTH
- * INTERVAL DAY TO SECOND
- * RAW
- * LONG RAW
- * CHAR
- * NCHAR
- * UROWID
- * CLOB with BASICFILE or SECUREFILE storage
- * NCLOB with BASICFILE or SECUREFILE storage
- * BLOB with BASICFILE or SECUREFILE storage
- * XMLType stored as CLOB

Java Supplied Packages

Oracle® Streams Advanced
10g Release 2 (10.2)
B14291-01

[All Classes](#)

Packages

[javax.jms](#)

[oracle.jms](#)

[ExceptionListener](#)

[IllegalStateException](#)

[InvalidClientIDException](#)

[InvalidDestinationException](#)

[InvalidSelectorException](#)

[JMSException](#)

[JMSSecurityException](#)

[MapMessage](#)

[Message](#)

[MessageConsumer](#)

[MessageEOFException](#)

[MessageFormatException](#)

[MessageListener](#)

[MessageNotReadableException](#)

[MessageNotWriteableException](#)

[MessageProducer](#)

[ObjectMessage](#)

[Queue](#)

[QueueBrowser](#)

[QueueConnection](#)

[QueueConnectionFactory](#)

[QueueReceiver](#)

[QueueRequestor](#)

javax.jms **Interface MessageConsumer**

All Known Subinterfaces:

[AQjmsQueueReceiver](#), [AQjmsTopicReceiver](#), [AQjmsTopicSubscriber](#),
[QueueReceiver](#), [TopicReceiver](#), [TopicSubscriber](#)

All Known Implementing Classes:

[AQjmsConsumer](#)

public interface **MessageConsumer**

A client uses a `MessageConsumer` object to receive messages from a destination. A `MessageConsumer` object is created by passing a `Destination` object to a message-consumer creation method supplied by a session.

`MessageConsumer` is the parent interface for all message consumers.

A message consumer can be created with a message selector. A message selector allows the client to restrict the messages delivered to the message consumer to those that match the selector.

A client may either synchronously receive a message consumer's messages or have the consumer asynchronously deliver them as they arrive.

For synchronous receipt, a client can request the next message from a message consumer using one of its `receive` methods. There are several variations of `receive` that allow a client to poll or wait for the next message.

Monitoring Staging

- Message delay
- Message expiration
- Retry delay
- Garbage collection for the queue table
- Retention and Message History
- Cleaning Up Message Queues
- Tracking and Event Journals
- Non-repudiation
- Queue Forwarding

```

enqueue_options DBMS_AQ.enqueue_options_t;
message_properties DBMS_AQ.message_properties_t;
message_handle RAW(16);
message test.message_typ;

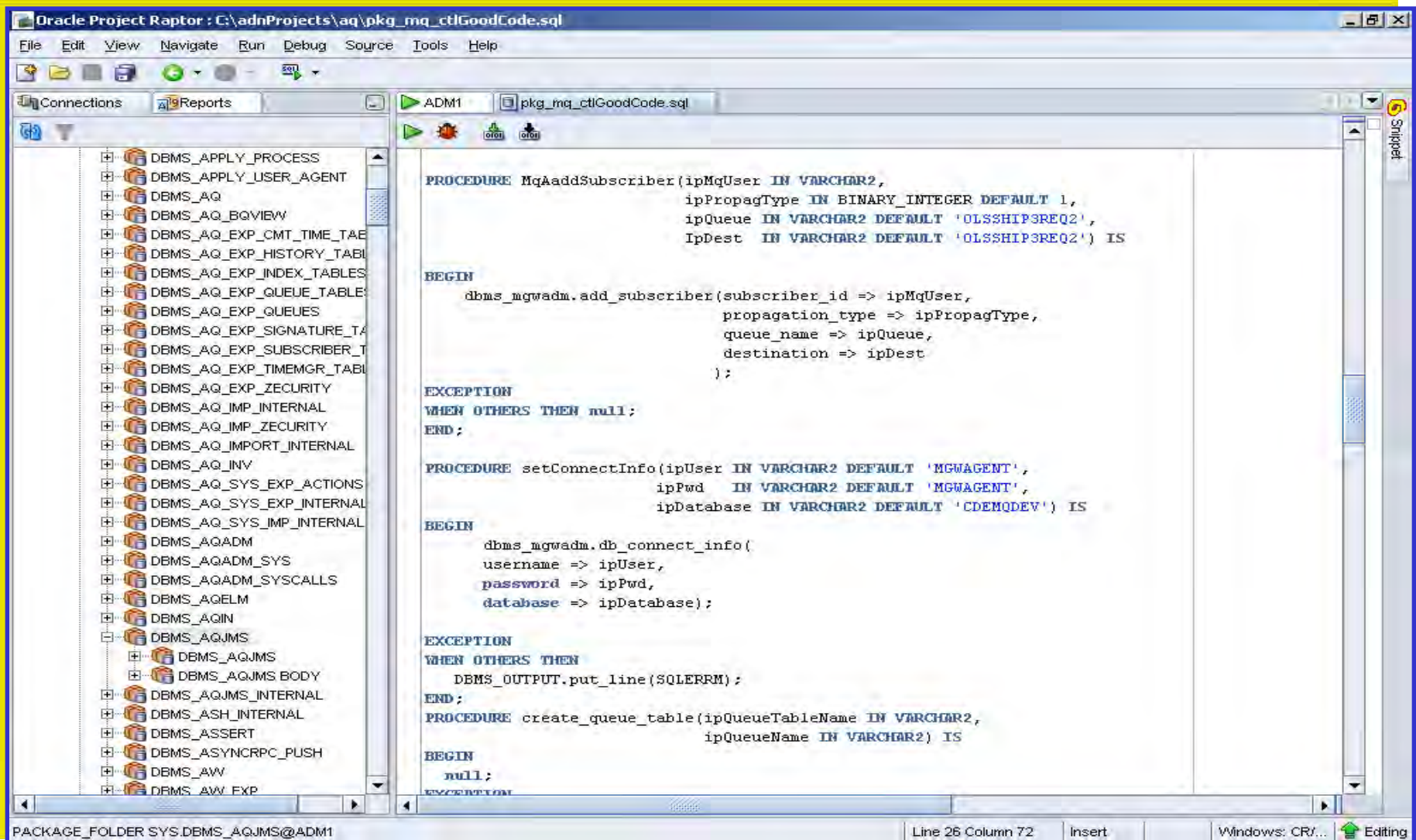
```

```
message := test.message_typ(001, '* MESSAGE 1 *', 'First message to  
adm_queue');
```

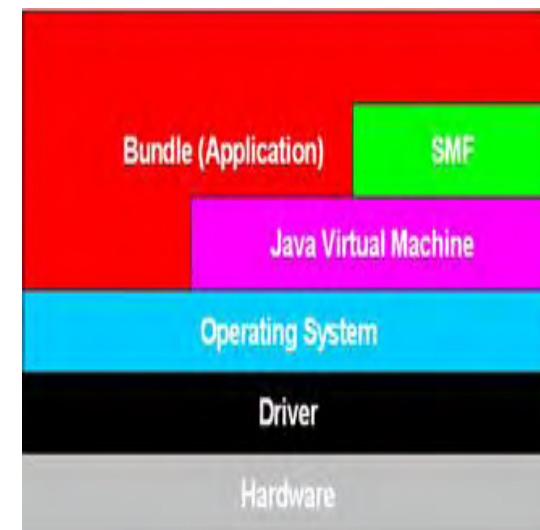
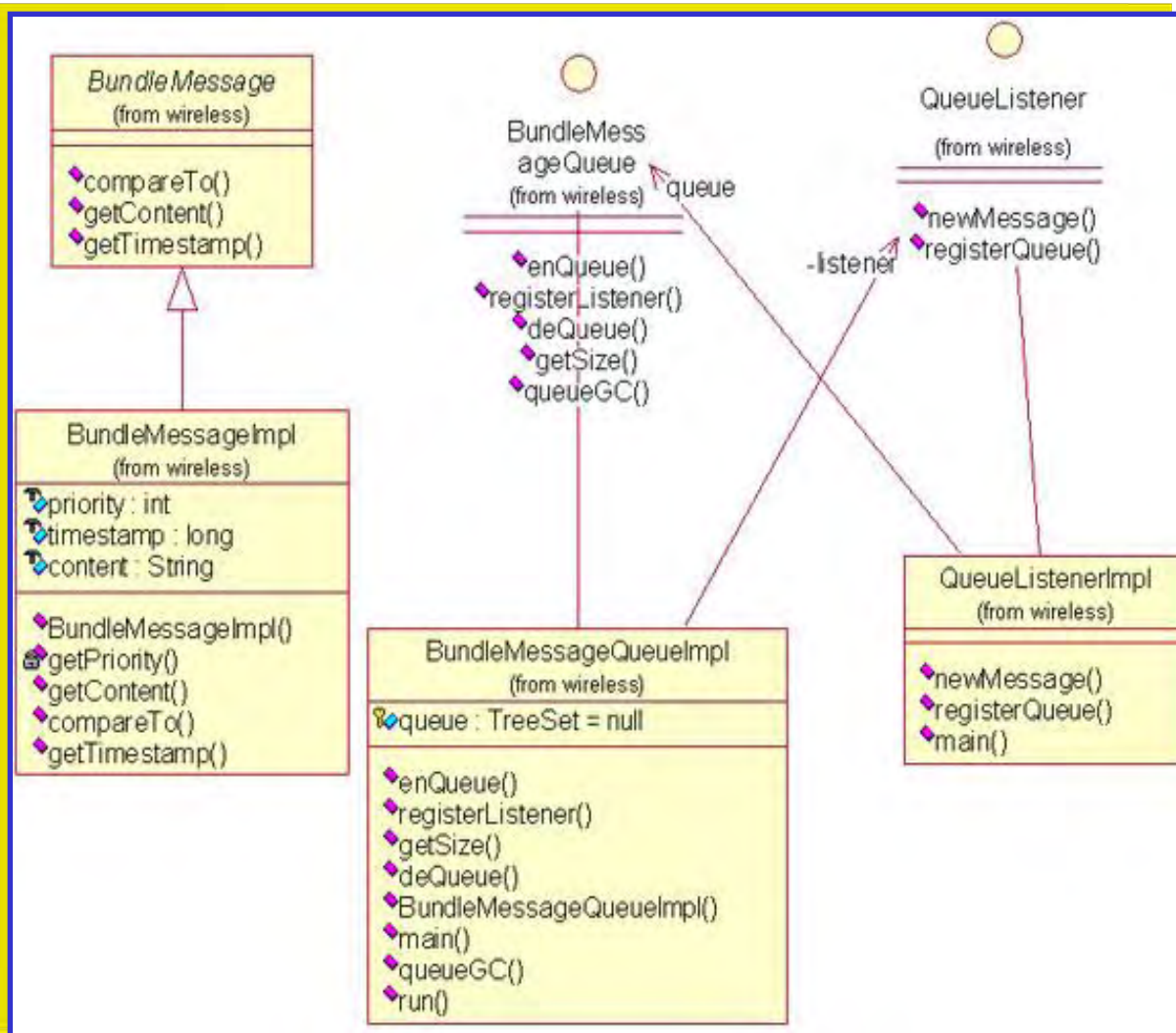
```
DBMS_AQ.ENQUEUE(  
    queue_name           => 'aqadmin.adm_queue',  
    enqueue_options      => enqueue_options,  
    message_properties   => message_properties,  
    payload              => message,  
    msgid                => message_handle  
);
```

END;

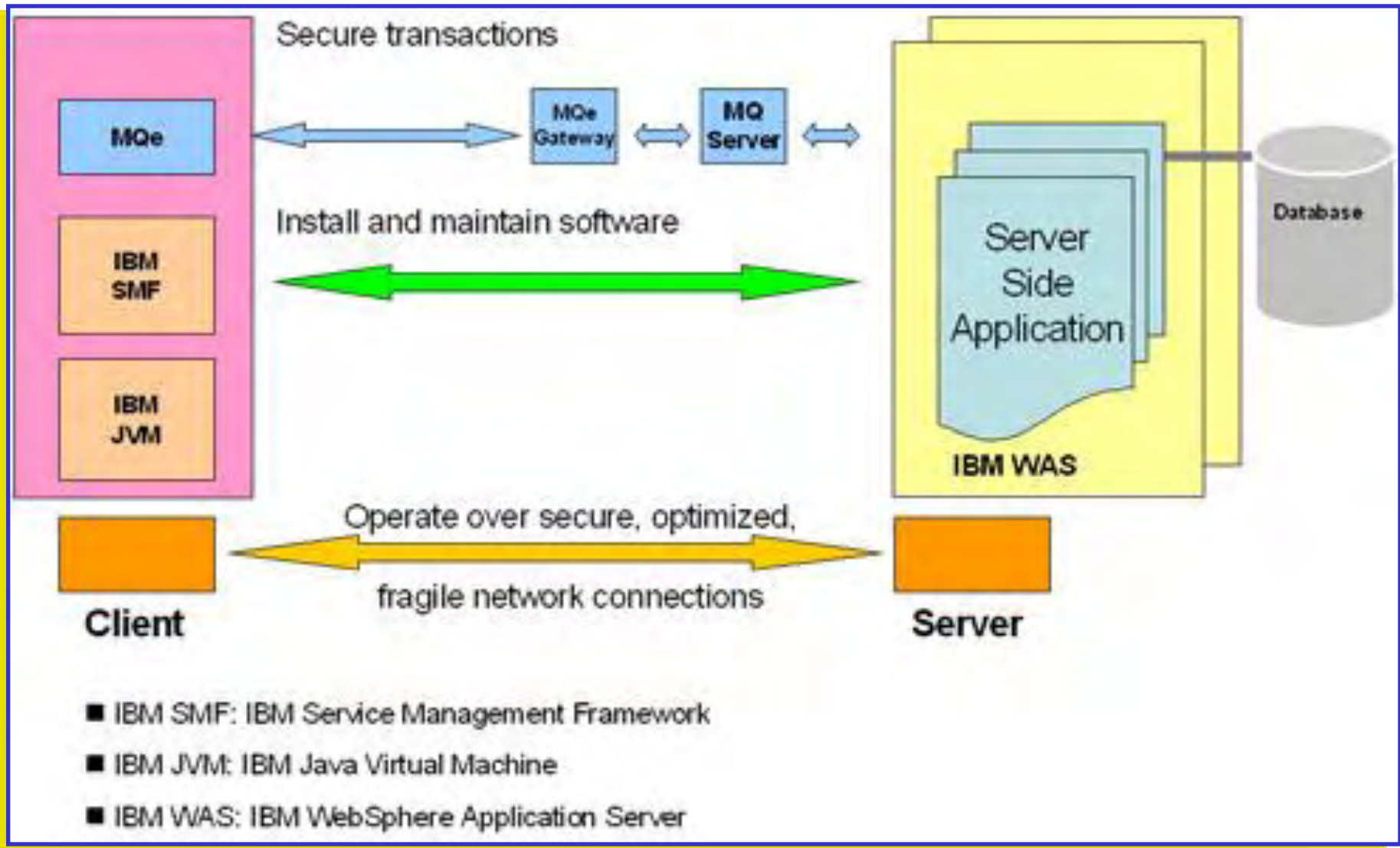
Programming AQ



Using AQ with MQ



Using AQ with Websphere MQ



Using AQ with MQ

```

DECLARE
  l_options      sys.mgw_properties;
  l_prop         sys.mgw_mqseries_properties;
  l_qtype_in     VARCHAR2(12) := 'INBOUND';
  l_qtype_out    VARCHAR2(12) := 'OUTBOUND';
BEGIN
  l_options := sys.mgw_properties(sys.mgw_property('MQ_SendExit','CDEMQDEVSendExit'));
  l_prop := sys.mgw_mqseries_properties.construct();
  l_prop.max_connections :=1;
  l_prop.queue_manager      := 'MQ_NYCMGW_A7';
  l_prop.hostname           := 'researchportal.adncorp.com';
  l_prop.port               := 1724;
  l_prop.channel            := 'OLSS.HIPAA1.UPDATE';
  l_prop.username           := 'WEBMQUAT';
  l_prop.password           := NULL;
  l_prop.inbound_log_queue  := funGetQueueName(l_qtype_in);
  l_prop.outbound_log_queue := funGetQueueName(l_qtype_out);
  DBMS_MGWADM.CREATE_MSGSYSTEM_LINK(
                                LINKNAME => 'MQS_CDEMQUAT',
                                PROPERTIES => l_prop,
                                OPTIONS => l_options
                                );
  DBMS_MGWADM.REGISTER_FOREIGN_QUEUE(NAME => 'OLSS.HIPAA1.UPDATE.REQUESTQ2',
                                     LINKNAME => 'MQS_IPC_LINK1',
                                     PROVIDER_QUEUE => 'OLSS.HIPAA1.UPDATE.REQUESTQ2',
                                     OPTIONS => MGW_PROPERTIES(MGW_PROPERTY('MQ_openOptions', '1724'),
                                     COMMENT => 'Websphere MQ Series Test on OLSS.HIPAA1.UPDATE.REQUESTQ2'
                                     );
EXCEPTION WHEN OTHERS THEN
  DBMS_OUTPUT.put_line(SQLERRM);
END;

```

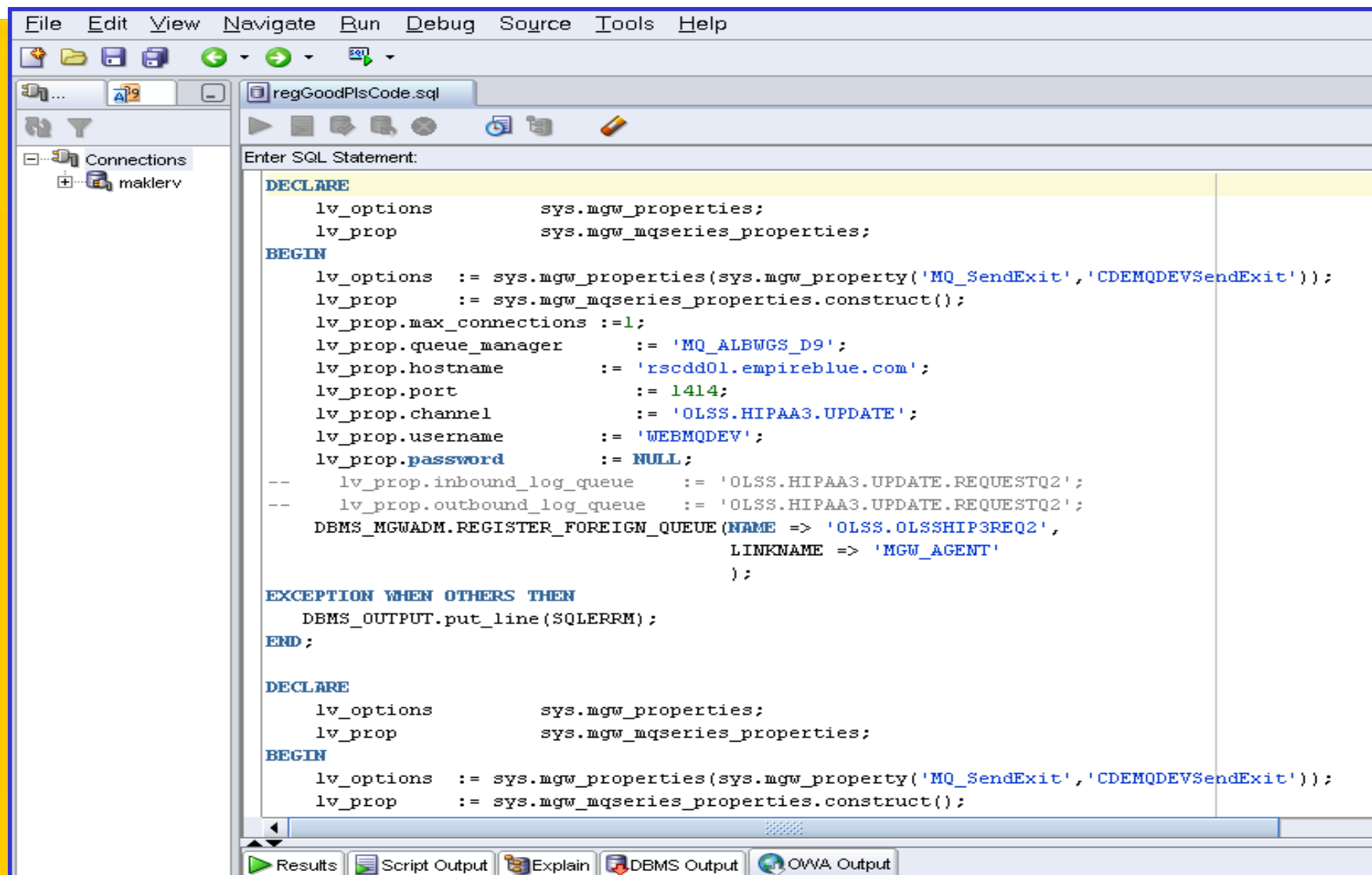
Using AQ with MQ

```

DECLARE
  lv_options      sys.mgw_properties;
  lv_prop         sys.mgw_mqseries_properties;
BEGIN
  lv_options := sys.mgw_properties(sys.mgw_property('MQ_SendExit','ADNMQDEVSendExit'));
  lv_prop := sys.mgw_mqseries_properties.construct();
  lv_prop.max_connections := 1;
  lv_prop.queue_manager := 'MQ_NYCGW_A10';
  lv_prop.hostname := 'portal.adncorp.com';
  lv_prop.port := 1414;
  lv_prop.channel := 'MQIIH.ADN1.UPDATE';
  lv_prop.username := 'WEBMQADN';
  lv_prop.password := NULL;
  DBMS_MGWADM.CREATE_MSGSYSTEM_LINK(LINKNAME => 'MQS_IPC_LINK1',
                                    PROPERTIES => lv_prop,
                                    OPTIONS => lv_options
                                   );
  DBMS_MGWADM.REGISTER_FOREIGN_QUEUE(NAME => 'MQIIH_ADN1_UPDATE_REQUESTQ2',
                                    LINKNAME => 'MQS_IPC_LINK1',
                                    PROVIDER_QUEUE => 'MQIIH.ADN1.UPDATE.REQUESTQ2',
                                    OPTIONS => MGW_PROPERTIES(MGW_PROPERTY('MQ_openOptions', '1414'),
                                    COMMENT => 'MQ Series Test on MQIIH.ADN1.UPDATE.REQUESTQ2'
                                   );
EXCEPTION WHEN OTHERS THEN
  DBMS_OUTPUT.put_line(SQLERRM);
END;

```


Using AQ with Websphere MQ



```
File Edit View Navigate Run Debug Source Tools Help

regGoodPlsCode.sql

Enter SQL Statement:

DECLARE
    lv_options          sys.mgw_properties;
    lv_prop             sys.mgw_mqseries_properties;
BEGIN
    lv_options := sys.mgw_properties(sys.mgw_property('MQ_SendExit','CDEMQDEVSendExit'));
    lv_prop := sys.mgw_mqseries_properties.construct();
    lv_prop.max_connections := 1;
    lv_prop.queue_manager := 'MQ_ALBWGS_D9';
    lv_prop.hostname := 'rscdd01.empireblue.com';
    lv_prop.port := 1414;
    lv_prop.channel := 'OLSS.HIPAA3.UPDATE';
    lv_prop.username := 'WEBMQDEV';
    lv_prop.password := NULL;
    -- lv_prop.inbound_log_queue := 'OLSS.HIPAA3.UPDATE.REQUESTQ2';
    -- lv_prop.outbound_log_queue := 'OLSS.HIPAA3.UPDATE.REQUESTQ2';
    DBMS_MGWADM.REGISTER_FOREIGN_QUEUE(NAME => 'OLSS.OLSSHIP3REQ2',
                                       LINKNAME => 'MGW_AGENT'
                                       );
EXCEPTION WHEN OTHERS THEN
    DBMS_OUTPUT.put_line(SQLERRM);
END;

DECLARE
    lv_options          sys.mgw_properties;
    lv_prop             sys.mgw_mqseries_properties;
BEGIN
    lv_options := sys.mgw_properties(sys.mgw_property('MQ_SendExit','CDEMQDEVSendExit'));
    lv_prop := sys.mgw_mqseries_properties.construct();
```

Using Database and Grid Control


Database Instance: [adm1](#) > Streams

Logged in As [ADMINISTRATOR](#)

Streams


[Overview](#) [Capture](#) [Propagation](#) [Apply](#) [Messaging](#)

Search

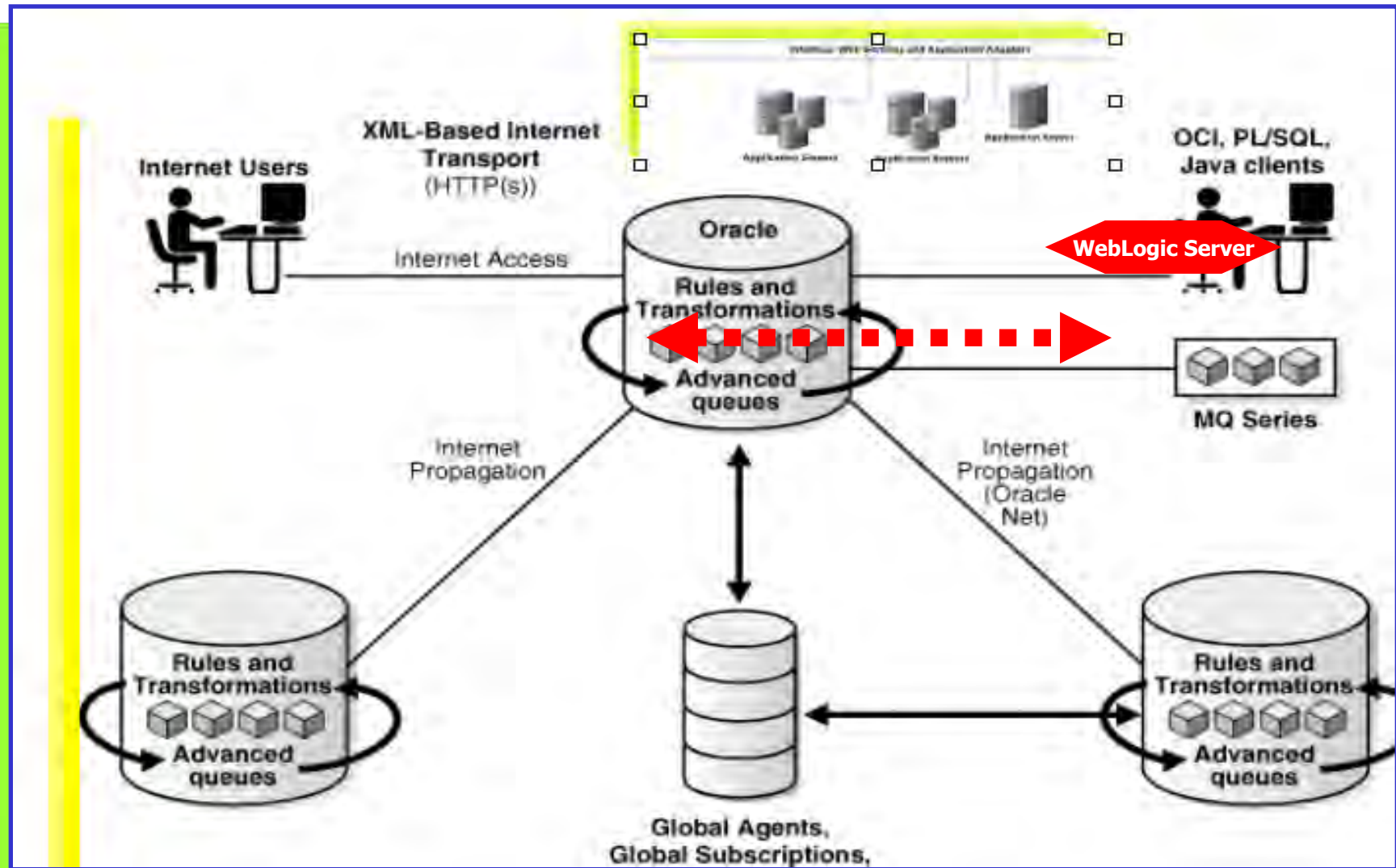
Schema 
Queue Name

[Go](#)

By default, the search returns all uppercase matches beginning with the string you entered. To run an exact or case-sensitive match, double quote the string.

Select	Queue Name 	Queue Table Name	Schema	Type
<input checked="" type="radio"/>	ALERT_QUE	ALERT_QT	SYS	Normal Queue
<input type="radio"/>	AQ\$_ALERT_QT_E	ALERT_QT	SYS	Exception Queue
<input type="radio"/>	AQ\$_AQ\$_MEM_MC_E	AQ\$_MEM_MC	SYS	Exception Queue
<input type="radio"/>	AQ\$_AQ_EVENT_TABLE_E	AQ_EVENT_TABLE	SYS	Exception Queue
<input type="radio"/>	AQ\$_AQ_SRVNTFN_TABLE_E	AQ_SRVNTFN_TABLE	SYS	Exception Queue
<input type="radio"/>	AQ\$_DEF\$_AQCALL_E	DEF\$_AQCALL	SYSTEM	Exception

Advanced Strategies



Advanced Strategies

- Information Dissemination Techniques
 - Queue Forwarding.
 - Apply Forwarding.

Advanced Strategies

- 1:N Replication/Multi-propagation Architecture
 - One source queue can propagate to multiple destination queues.
 - Useful for High-Availability and Load Balancing.

Advanced Strategies

- N:N Replication Infrastructure
 - Normally using several queues and databases, involving transactional, transformational and non-repudiation queues.
 - Usually, involving bidirectional information dissemination using inbox and outbox message propagation.



Advanced Strategies

- Hub-and-Spoke Propagation Architecture
 - One source queue can propagate to a hub, usually in a transactional or transformational fashion, which then propagates to multiple destination queues, thus minimizing overhead.



Advanced Strategies

- OCI- and Precompiler-based Custom Implementation
- RAC-Support (best strategy for the large enterprise)
- Message Priority

Managing Encryption

- Asymmetric authentication via PKI
 - The producer application encrypts the message payload prior to enqueueing.
 - The consumer application knows the key and decrypts the message.
- Transparent Data Encryption (TDE), using also Oracle wallet.
- Encryption can be congruent with payload transformation.

AQ Background Processes

Acronym	Process Name	Description	Required for basic DB operation	Started by default	New in 11g
QMNC	AQ Coordinator Process	Monitors message queues. Spawns Qnnn slave processes.	No	Yes	No
Qnnn	AQ Server Class Process	Processes messages in the Streams AQ queue. Spawned by QMNC.	No	Yes	No



Industries of Application

- Financial Sector
 - Banking
 - Trading
- E-Business (SCM, e.g., B2B transactions)
- E-Business (CRM, e.g., Order Entry)
- Direct Marketing
- Media and communications



Related Technologies

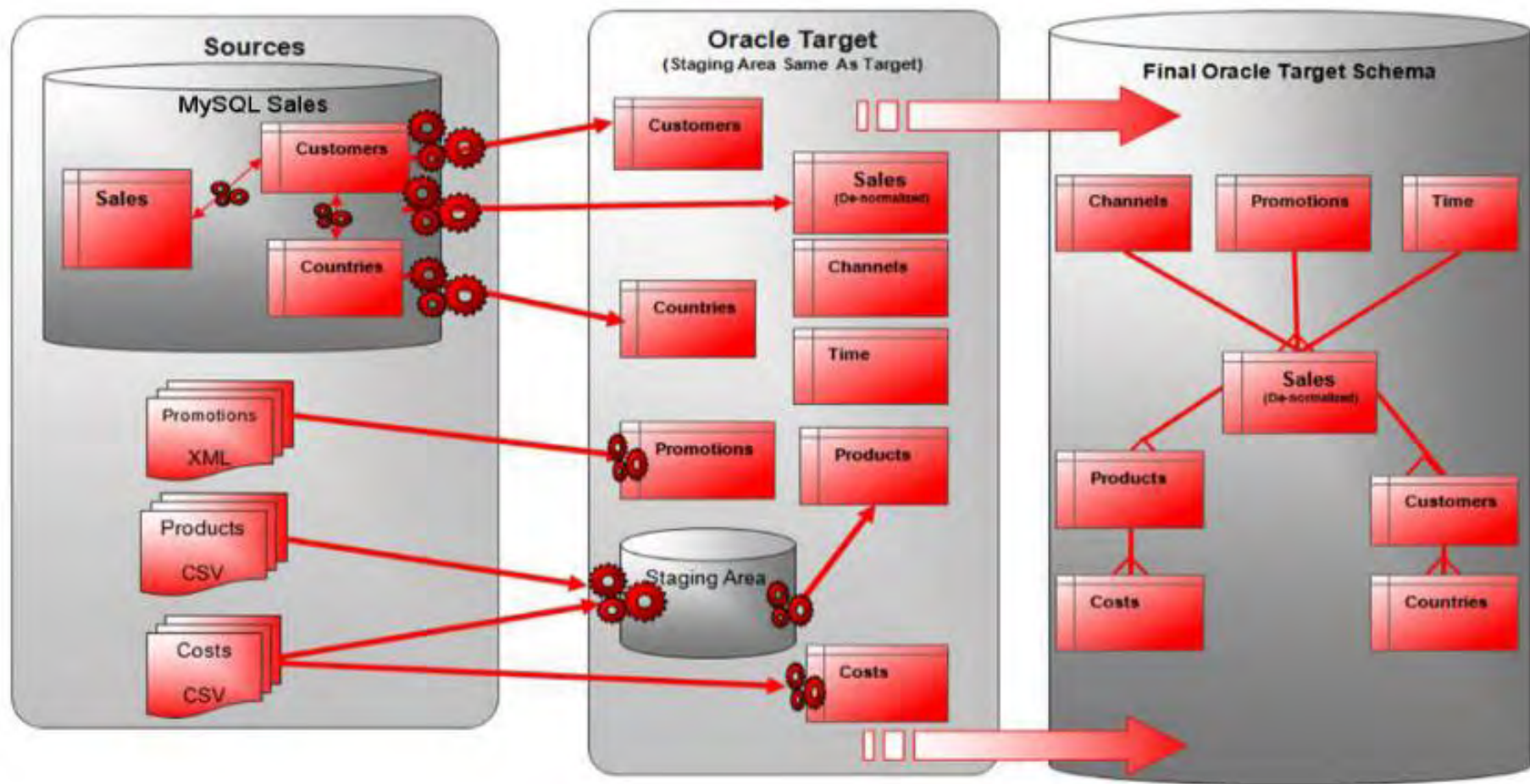
- Agile
- ADF
- SOA
- Web Services Security and Transaction
- Oracle Streams
- Oracle Data Integration
- Oracle Advanced Replication
- RPC



HS Data Warehousing

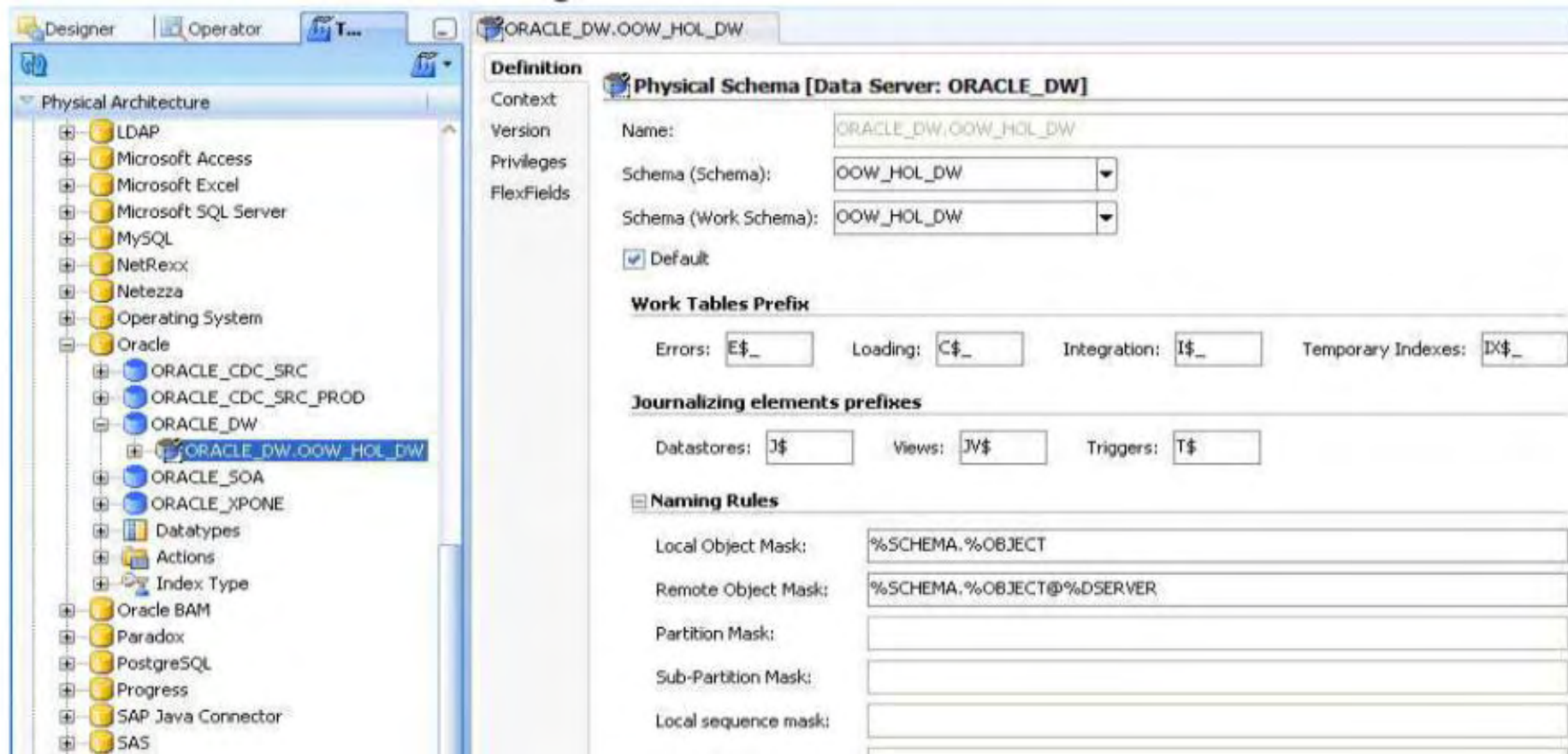
- ETL vs. E-LT
- ETL
 - Row-by-row processing
- E-LT
 - Bulk load and transformation
 - Load and transformation order as needed.

Oracle Data Integration



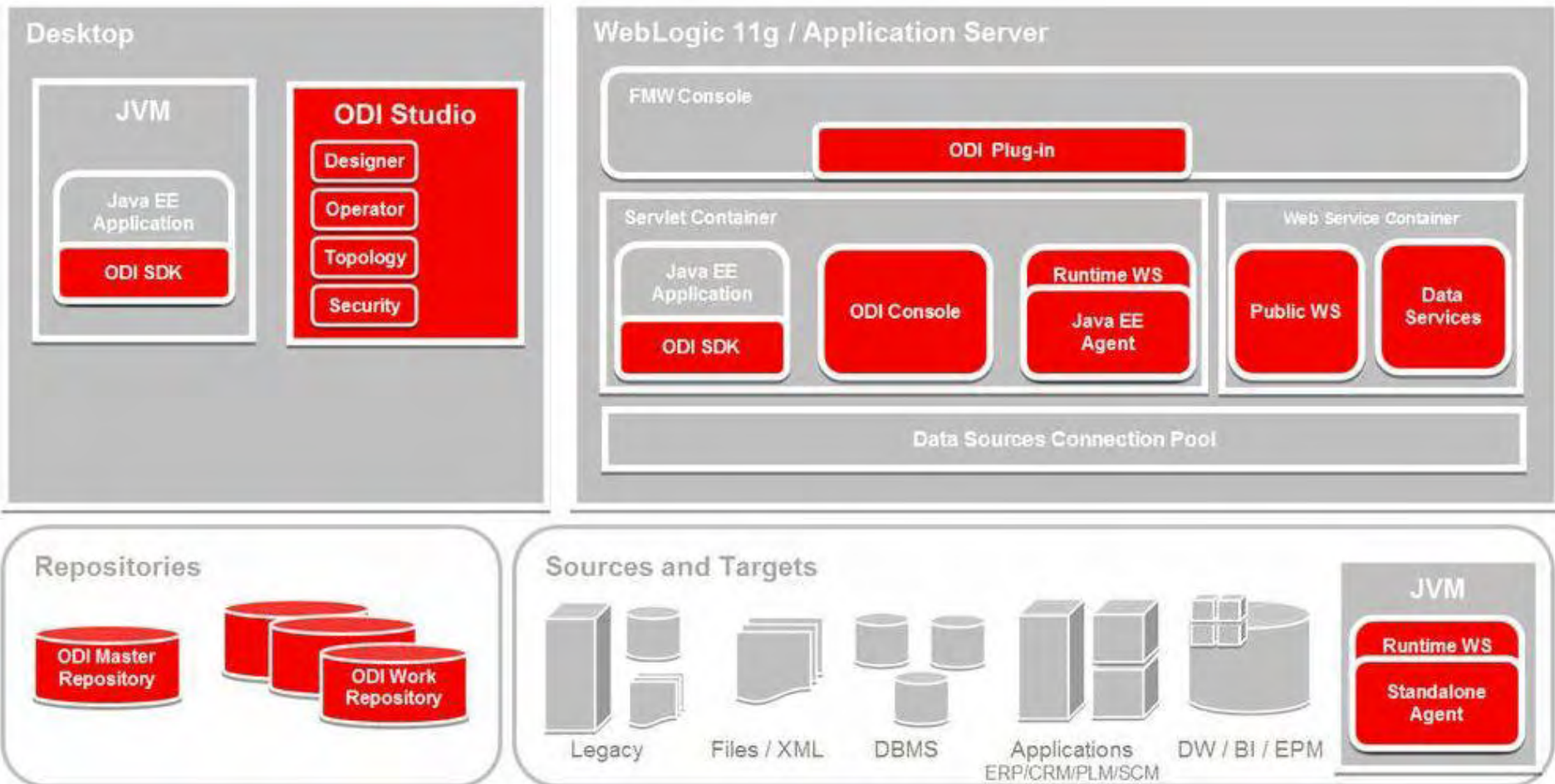
ODI Basic Model

Oracle Data Integrator



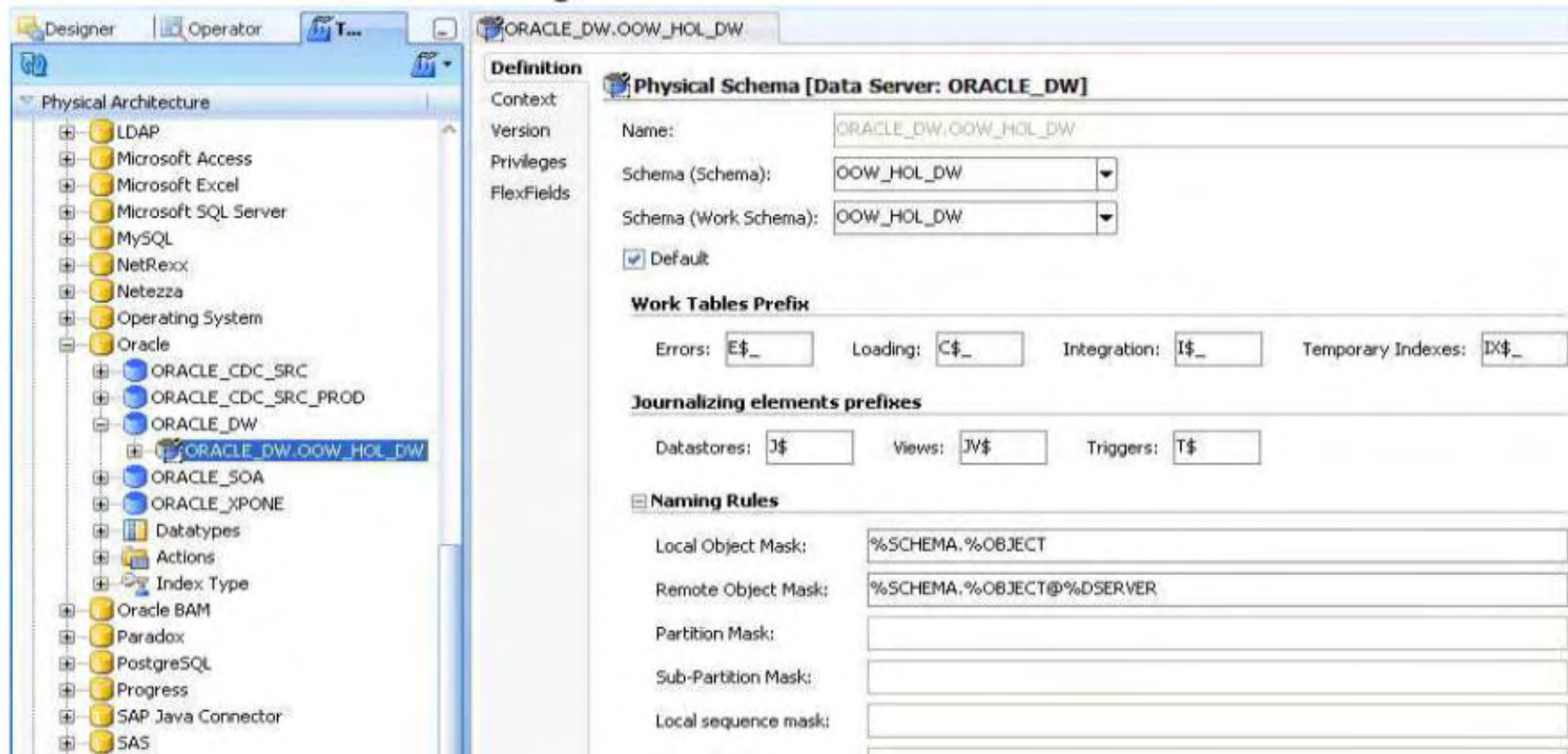
ODI Studio Physical Architecture

ODI Workspace



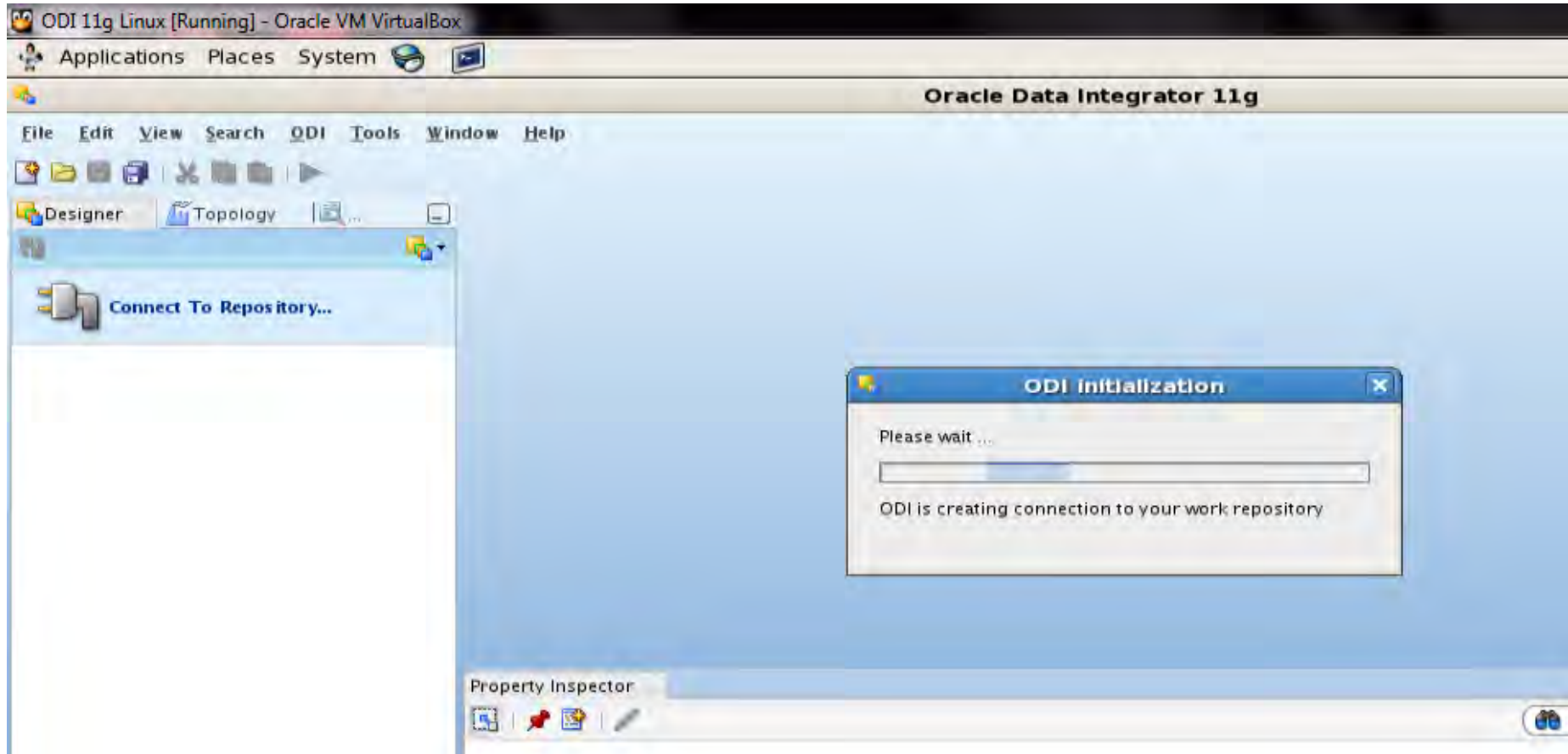
ODI Workspace and Architecture

Oracle Data Integrator

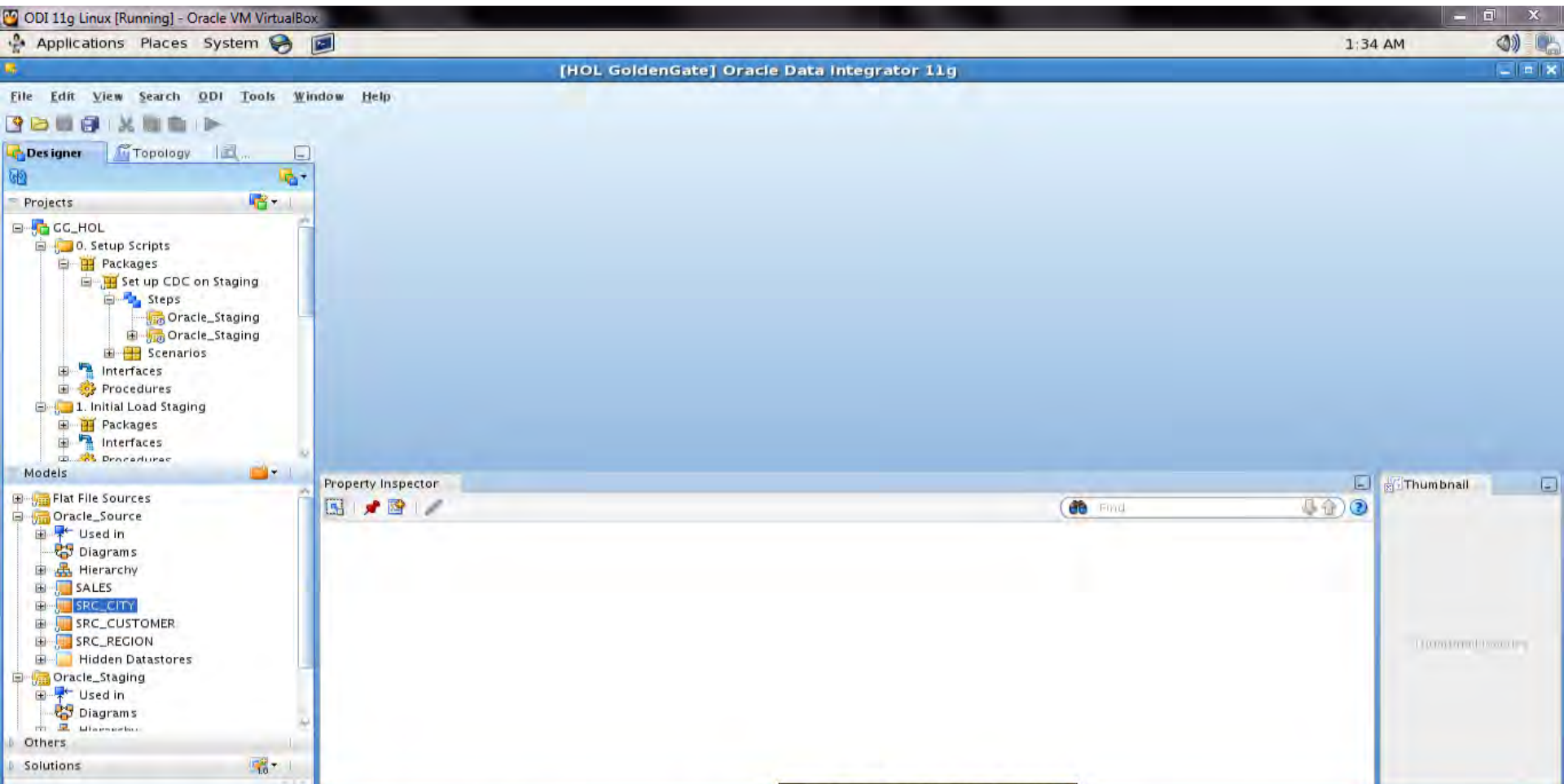


ODI Studio Physical Architecture

Oracle Data Integrator



Oracle Data Integrator



ODI Studio Designer

Oracle Golden Gate: Features

Integrated Capture

Enabling customers to efficiently capture changed data in high-volume and high-throughput implementations.

Oracle Advanced Compression Support

▶ Permitting the capture and delivery of compressed objects within Oracle Database 11g and Oracle Exadata environments, an important feature for virtual and cloud environments.

Oracle Golden Gate: Features

Best in class performance new features:

- **More Powerful Conflict Detection and Resolution**, enabling faster conflict resolution.
- **Increased Security**, support for the Federal Information Protection Standard (FIPS) and Blowfish encryption algorithms enabling secure data movement across systems and regions.
- **Increased support for business-critical and heterogeneous systems**, including multi-byte Unicode Support.
- **Expanded Platform Support:** Provides support for capture from, and delivery to, IBM DB2 on iSeries and enhanced support for MySQL, Microsoft SQL Server, Sybase, Teradata, and IBM DB2 z/OS.
- **Expanded management capabilities** via its Plug-In for Oracle Enterprise Manager 12c.

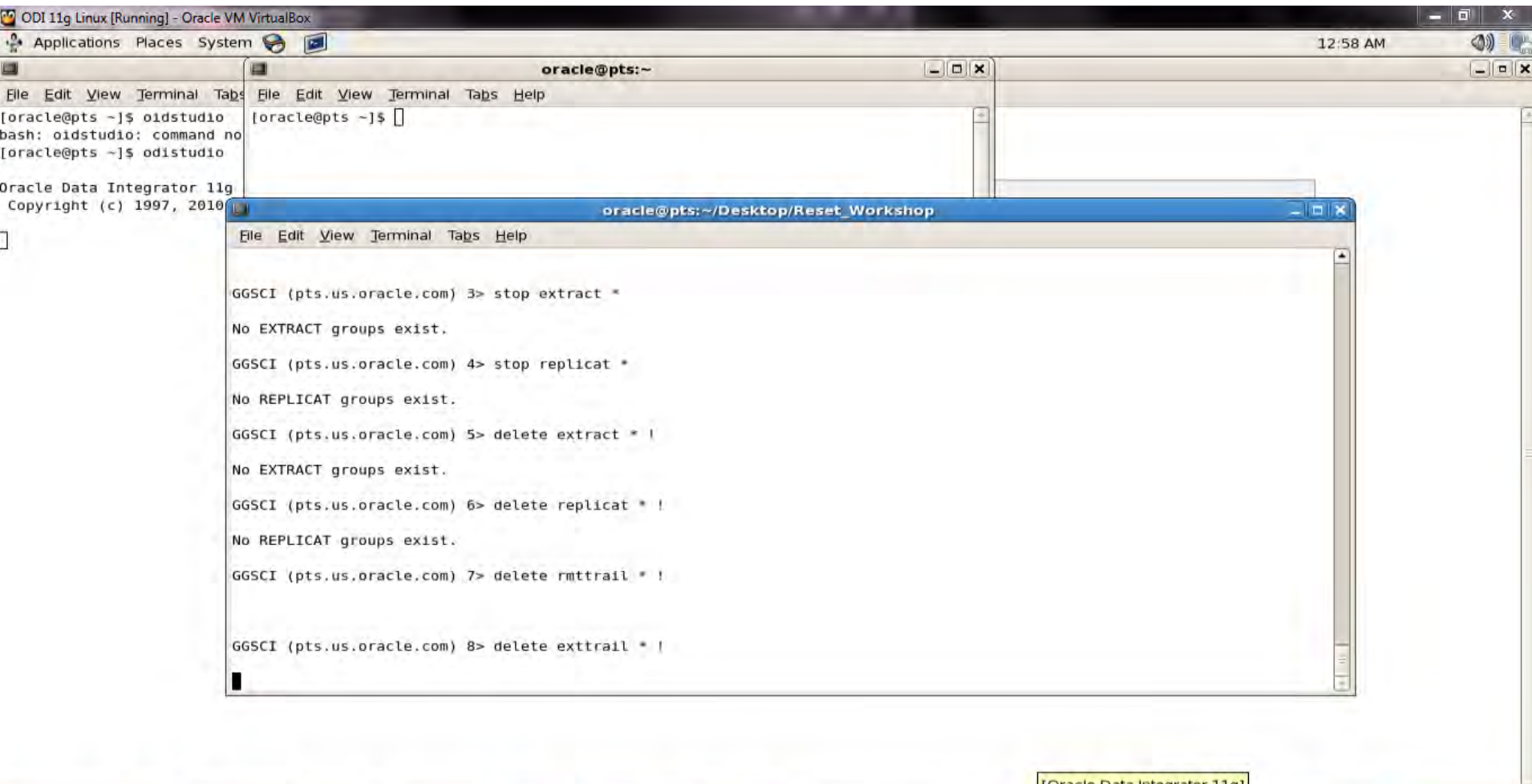


Datamarting with ODI and OGG

The conjoint usage of Oracle Data Integrator and Oracle Golden Gate provides a major data integration model, whose impact and benefit on business intelligence are rather unlimited. Some of the most important areas of application involve, namely:

- Business Intelligence Analytics
- Data Mining
- Forecasting
- Cloud Virtualization resource management, including support for VMWare Server and Oracle Virtual Box.

Oracle Golden Gate



The screenshot shows a virtual machine environment with a terminal window titled 'oracle@pts:~'. The terminal displays the following commands and output:

```
[oracle@pts ~]$ oidstudio
bash: oidstudio: command not found
[oracle@pts ~]$ odistudio

Oracle Data Integrator 11g
Copyright (c) 1997, 2010

[oracle@pts:~/Desktop/Reset_Workshop]$
GGSCI (pts.us.oracle.com) 3> stop extract *
No EXTRACT groups exist.
GGSCI (pts.us.oracle.com) 4> stop replicat *
No REPLICAT groups exist.
GGSCI (pts.us.oracle.com) 5> delete extract * !
No EXTRACT groups exist.
GGSCI (pts.us.oracle.com) 6> delete replicat * !
No REPLICAT groups exist.
GGSCI (pts.us.oracle.com) 7> delete rmttrail * !
GGSCI (pts.us.oracle.com) 8> delete exttrail * !
```

OGG Extract Process

Oracle Golden Gate



```
[oracle@pts Oracle_GoldenGate]$ ggsci
```

```
Oracle GoldenGate Command Interpreter for Oracle
```

```
Version 11.1.1.0.0 Build 078
```

```
Linux, x86, 32bit (optimized), Oracle 10 on Jul 28 2010 13:24:18
```

```
Copyright (C) 1995, 2010, Oracle and/or its affiliates. All rights reserved.
```

```
GGSCI (pts.us.oracle.com) 1> start rmastr
```

```
REPLICAT RMASTR is already running.
```

```
GGSCI (pts.us.oracle.com) 2> start emastr
```

```
Sending START request to MANAGER ...
```

```
EXTRACT EMASTR starting
```

```
GGSCI (pts.us.oracle.com) 3> █
```

OGG Replication Process

Oracle Golden Gate

GGSCI Command Summary:

Object:	Command:
SUBDIRS	CREATE
EXTRACT	INFO, KILL, LAG, SEND, STATUS, START, STATS, STOP
EXTTRAIL	ADD, ALTER, CLEANUP, DELETE, INFO, KILL, LAG, SEND, START, STATS, STATUS, STOP
GGSEVT	ADD, ALTER, DELETE, INFO
MANAGER	VIEW
MARKER	INFO, SEND, START, STOP, STATUS
PARAMS	INFO
REPLICAT	EDIT, VIEW
REPORT	ADD, ALTER, CLEANUP, DELETE, INFO, KILL, LAG, SEND, START, STATS, STATUS, STOP
RMTTRAIL	VIEW
TRACETABLE	ADD, ALTER, DELETE, INFO
TRANDATA	ADD, DELETE, INFO
CHECKPOINTTABLE	ADD, DELETE, CLEANUP, INFO

Commands without an object:

(Database)	DBLOGIN, LIST TABLES, ENCRYPT PASSWORD
(DDL)	DUMPDDL
(Miscellaneous)	FC, HELP, HISTORY, INFO ALL, OBEY, SET EDITOR, SHELL, SHOW, VERSIONS, ! (note: you must type the word COMMAND after the ! to display the ! help topic.)

i.e.: GGSCI (sys1)> help ! command

OGG Command Summary

Oracle Golden Gate



```
GGSCI (pts.us.oracle.com) 5> HELP ADD REPLICAT
```

ADD REPLICAT

Use ADD REPLICAT to create a Replicat group. Unless SPECIALRUN is specified, ADD REPLICAT creates checkpoints so that processing continuity is maintained from run to run. Before creating a Replicat group, review the Oracle GoldenGate Windows and UNIX Administrator's Guide.

The Oracle GoldenGate GGSCI command interface fully supports up to 300 concurrent Extract and Replicat groups per instance of Oracle GoldenGate Manager. At the supported level, all groups can be controlled and viewed in full with GGSCI commands such as the INFO and STATUS commands. Beyond the supported level, group information is not displayed and errors can occur. Oracle GoldenGate recommends keeping the number of Extract and Replicat groups (combined) at 300 or below in order to manage your environment effectively.

Syntax:

```
ADD REPLICAT <group name>
{
, SPECIALRUN |
, EXTFILE <full path name> |
, EXTTRAIL <full path name>
```

OGG ADD REPLICAT Command

Oracle Golden Gate

```
Source Context :
SourceModule   : [er.idlx]
SourceID       : [/home/eclo...
]/perforce/src/app/er/idlx.c]
SourceFunction  : [IDLX_comple
SourceLine     : [378]
ThreadBacktrace : [11] element
                : [/Oracle_Gol
0x26) [0x840b3f6]]
                : [/Oracle_Gol
ceContext*, unsigned int, ...) +0x817) [0
                : [/Oracle_Gol
ceContext*, CMessageFactory::MessageDispe
                : [/Oracle_Gol
a36]]
                : [/Oracle_Gol
) [0x8144762]]
                : [/Oracle_Gol
0x8144cb2]]
                : [/Oracle_Gol
c979]]
                : [/Oracle_Gol
                : [/Oracle_Gol
                : [/lib/libc.so
                : [/Oracle_Gol
c1]]
```

```
@NoriegaADNSQL> ALTER DATABASE ADD SUPPLEMENTAL LOG DATA;
Database altered.
@NoriegaADNSQL> ALTER DATABASE ADD SUPPLEMENTAL LOG DATA (PRIMARY KEY) COLUMNS;
Database altered.
@NoriegaADNSQL>
```

OGG and Oracle database

Key Recommendations

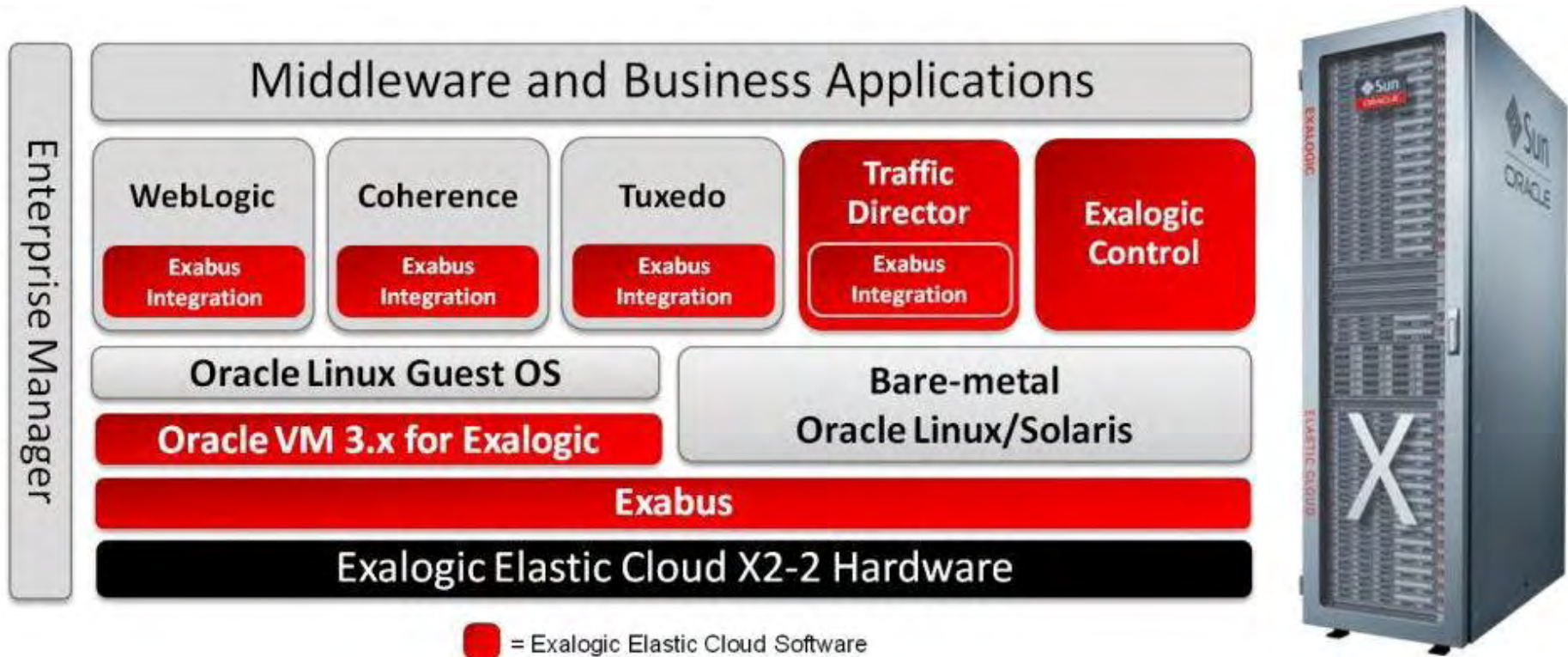
Category	Feature	AQ	ODI	OGG	ODI-OGG	AQ-ODI-OGG
USER'S SKILLS	Programming Skills	Recommended				Recommended
	Admin Skills		Recommended	Recommended	Recommended	
DATA CENTER SIZE	Large Data Center and Cloud	Recommended			Recommended	
	Midsize IT environments	Recommended	Recommended	Recommended	Recommended	
WORK-FLOW TYPE	Big Data from Social Media	Recommended	Recommended		Recommended	Recommended
	Transactional	Recommended			Recommended	Recommended
	Archiving and Logging	Recommended	Recommended	Recommended	Recommended	Recommended
	Mail and Document Management	Recommended				Recommended
	Data Type Requirements	Recommended				Recommended

IT Convergence



Oracle Database Appliance

IT Convergence



Oracle Exalogic Elastic Cloud

IT Convergence



	Database Machine X2-8 and X2-2 Full Rack	Database Machine X2-2 Half Rack	Database Machine X2-2 Quarter Rack
Exadata Smart Flash Cache	5.3 TB	2.6 TB	1.1 TB
Raw Disk Capacity			
• High Performance SAS	100 TB	50 TB	21 TB
• High Capacity SAS	336 TB	168 TB	72 TB
Useable Capacity			
• High Performance SAS	Up to 45 TB	Up to 22.5 TB	Up to 9.25 TB
• High Capacity SAS (without data compression)	150 TB	75 TB	31.5 TB

Exadata Machine Capacity



Future Expectations

1. Define an integration model and underlying infrastructure topology
2. Define the set of data sources and data capture methods
3. Define the staging and propagation methods, including channels and workflow buses and baselines, if any is relevant
4. Predict model changes and relevant analytics for best integration

- Who
- Where
- When
- Extent
- How
- How much

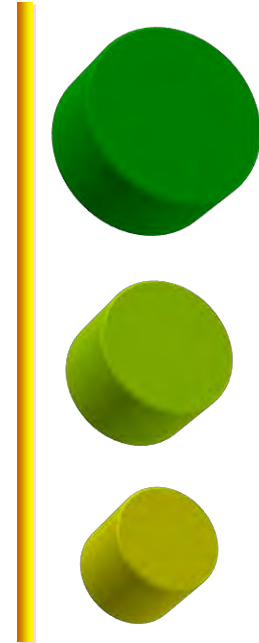




Future Expectations

5. Provide a consumption model that is transparent to the cloud platform, operating systems, physical and virtual database environments, file systems, and even storage networking technologies involved. This model should support any of SaaS, PaaS, IaaS cloud paradigms.
6. Establish the collaboration, coordination, and enterprise management control models.
7. Maintain a secure big data workflow and integration model with a solid quality of service (QoS) and quality assurance (QA) approach.

Demonstration





Concluding Remarks

- Workflow and big data integration innovation and modernization convey the implementation of an agile business process model using ETL and E-LT for faster processing in a sustainable fashion through its life cycle.
- The the Streams AQ message queuing paradigm can be integrated with tools such as Oracle Data Integrator and Oracle Golden Gate for successful workflow and big data integration, but it can also be surpassed due to increasing Big Data requirements from social media, mobile applications, web and cloud services.

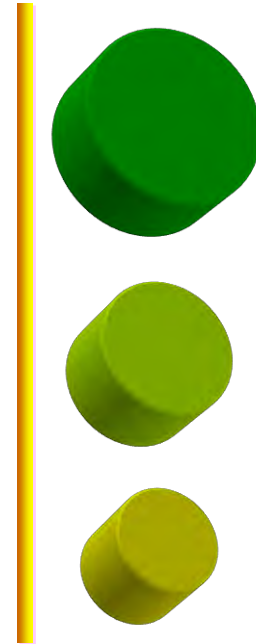
Questions and Answers

ODI

OGG

MOM

AQ



Thank you!

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 - » <http://noriegaaoracleexpert.blogspot.com>
- anthonydnoriega@gmail.com