Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

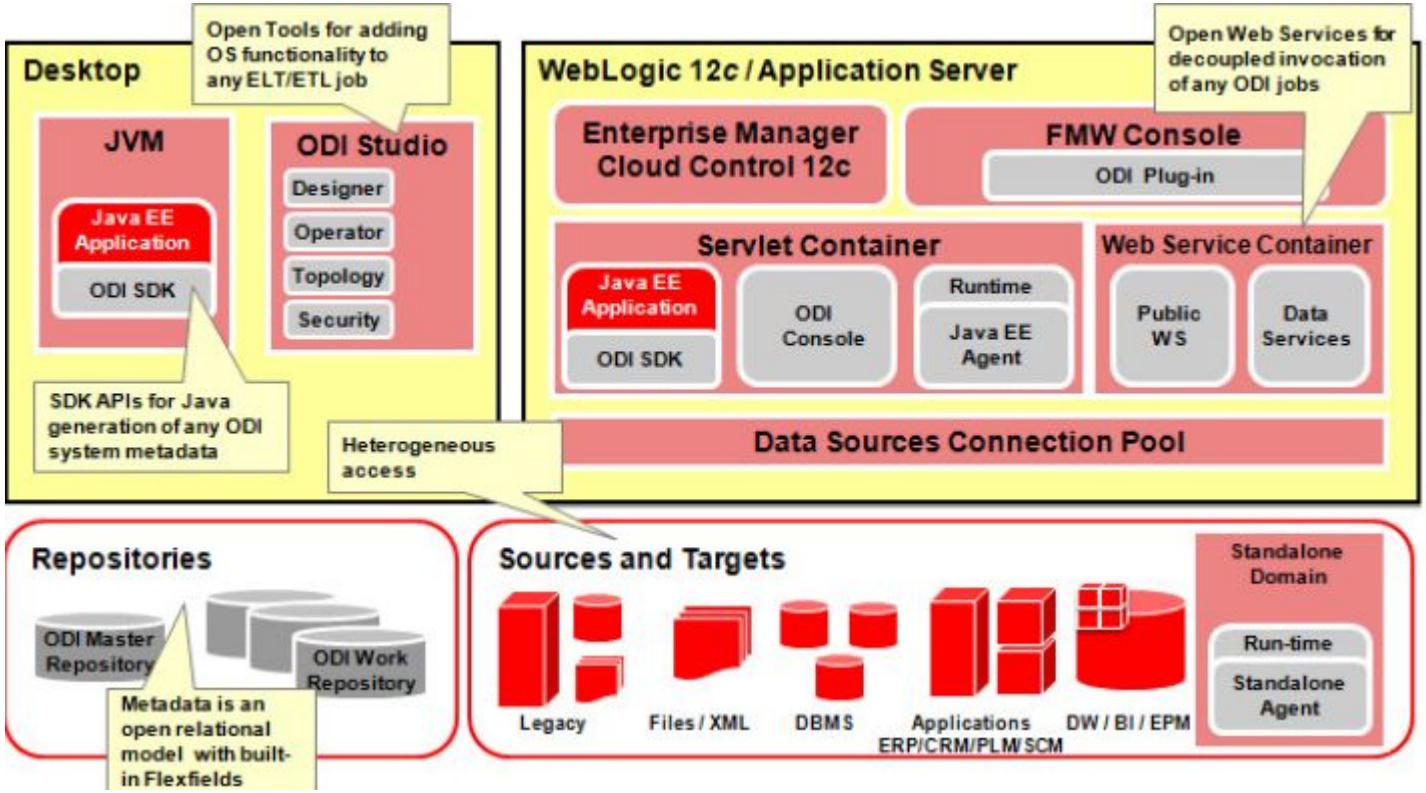
Module 4
Materialized View Processing and Design

Lesson 5: Oracle Tools for Data Integration

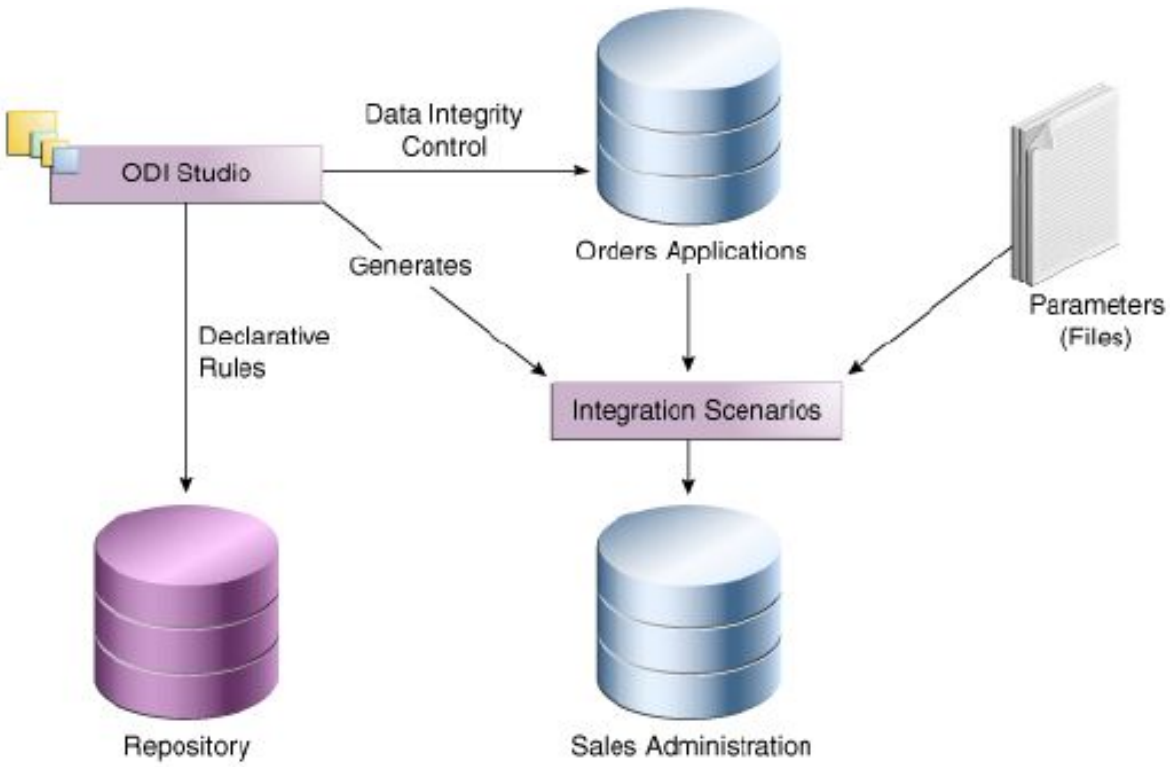
Lesson Objectives

- Discuss major features of the Oracle Data Integrator
- Provide scenarios for using the multiple table INSERT and MERGE statements
- Explain examples of multiple table INSERT statements and MERGE statements

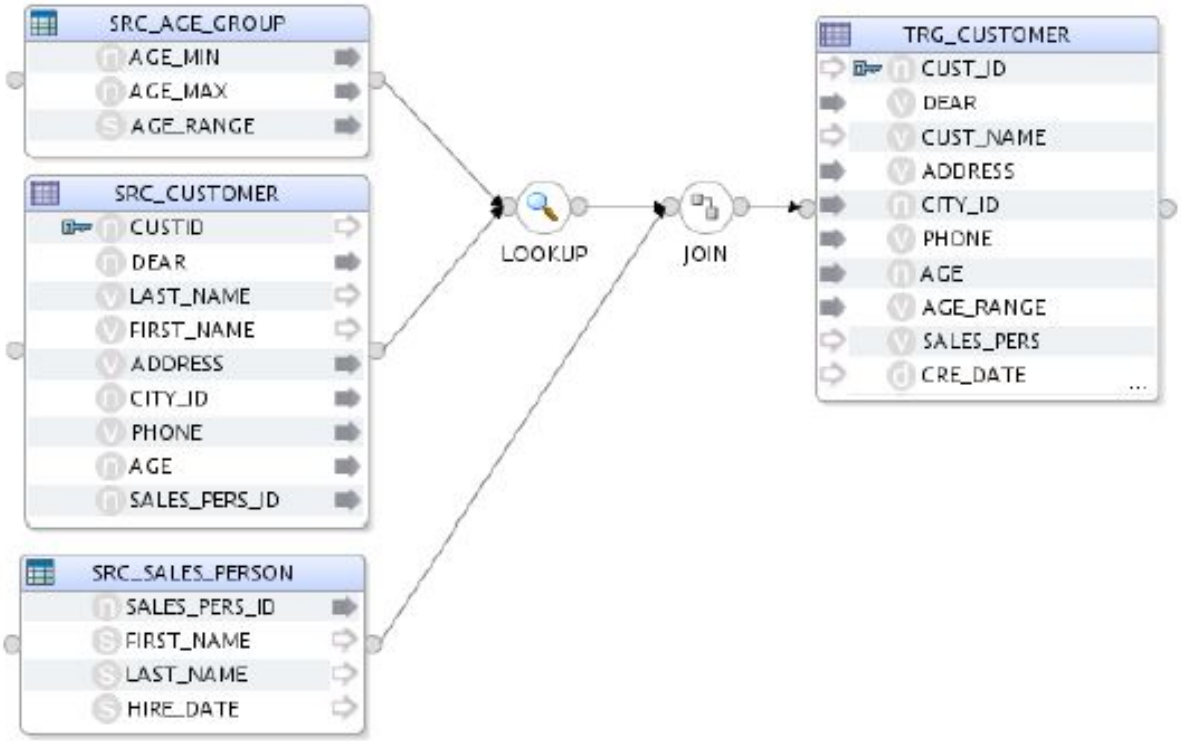
Oracle Data Integrator Components



ODI Project Example



ODI Mapping Specification

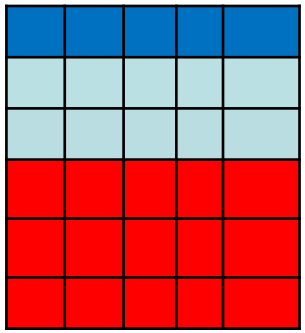


MERGE Statement

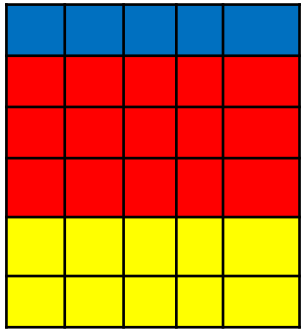
- Useful in data integration processes
- Conditionally update or insert rows using a single SQL statement
  - Insert if no match
  - Update if match
- Improved productivity and performance
- Part of SQL standard since SQL:2003

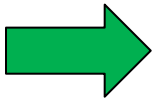
MERGE Statement Structure

Source Table

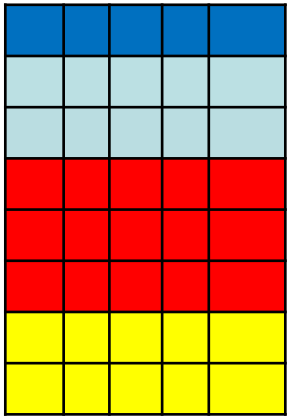


Target Table





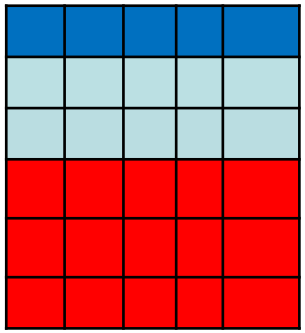
Target Table
(after Merge)



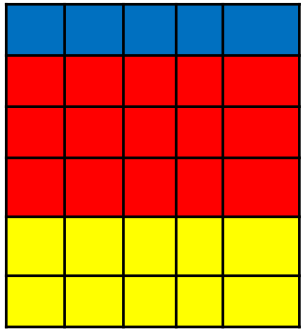
```
MERGE INTO <Target_Table>
USING <Source_Table>
ON <join_condition>
WHEN MATCHED THEN
  UPDATE SET …
WHEN NOT MATCHED THEN
  INSERT …
```

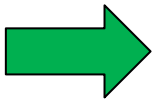

MERGE Statement Example

SSCustomerChanges

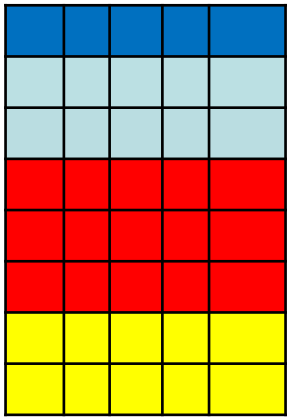


SSCustomer





SSCustomer
(after Merge)

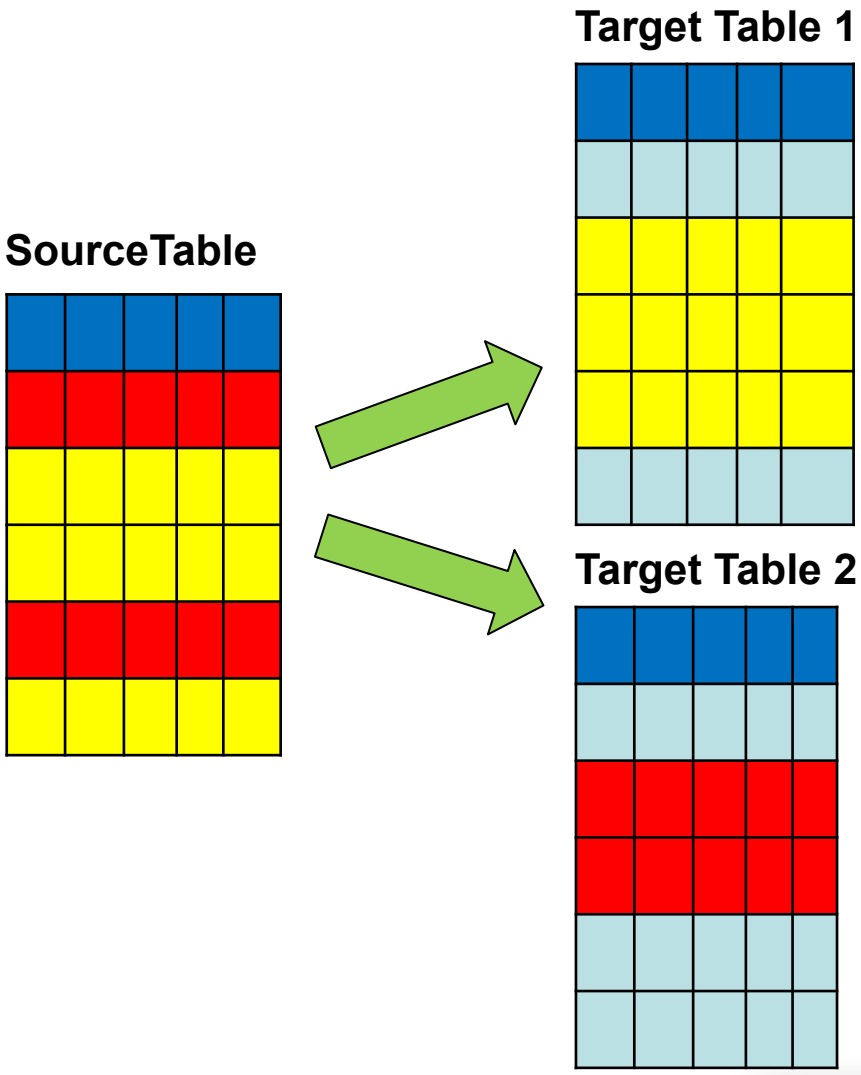


```
MERGE INTO SSCustomer Target
USING SSCustomerChanges Source
ON (Target.CustId = Source.CustId)
WHEN MATCHED THEN
 UPDATE SET
 Target.CustName = Source.CustName,
  …
 Target.CustNation = Source.CustNation
WHEN NOT MATCHED THEN
 INSERT (Target.CustId, … )
 VALUES (Source.CustId, … );
```


Multiple Table INSERT Statement

- Useful in data integration processes
- Partitioning
  - Unconditional for partitioning by columns
  - Conditional for partitioning by rows
- Improved performance and productivity
- Oracle proprietary extension

Multiple Table INSERT Structure




```
INSERT [ ALL | FIRST ]
[WHEN <condition> THEN]
INTO <Target_Table1> …
[WHEN <condition> THEN]
INTO <Target_Table2> …
[ELSE]
INTO <Target_TableN> …
SELECT … FROM <Source_Table>;
```


Unconditional INSERT ALL Example

ProductSale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	QTR1	QTR2	QTR3	QTR4
101	Television	Electronics	500	4000	200	3000
102	Laptop	Electronics	400	7000	34	567
103	Mobile	Electronics	879	56473	44	100
104	Fiction	Books	500	4000	444	235
105	Literature	Books	8000	760	500	200

```
INSERT ALL
INTO QTR1Sale  VALUES
(Product_ID,ProductName,ProductCategory,Qtr1
)
INTO QTR2Sale  VALUES
(Product_ID,ProductName,ProductCategory,Qtr2
)
INTO QTR3Sale  VALUES
(Product_ID,ProductName,ProductCategory,Qtr3
)
INTO QTR4Sale  VALUES
(Product_ID,ProductName,ProductCateg
)
SELECT * FROM PRODUCTSALE;
```

Qtr1Sale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	QTR1
101	Television	Electronics	500
102	Laptop	Electronics	400
103	Mobile	Electronics	879
104	Fiction	Books	500
105	Literature	Books	8000

Qtr2Sale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	QTR2
101	Television	Electronics	4000
102	Laptop	Electronics	7000
103	Mobile	Electronics	56473
104	Fiction	Books	4000
105	Literature	Books	760

Qtr3Sale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	QTR3
101	Television	Electronics	200
102	Laptop	Electronics	34
103	Mobile	Electronics	44
104	Fiction	Books	444
105	Literature	Books	500

Qtr4Sale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	QTR4
101	Television	Electronics	3000
102	Laptop	Electronics	567
103	Mobile	Electronics	100
104	Fiction	Books	235
105	Literature	Books	200

Conditional INSERT FIRST Example

ProductSale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	QTR1	QTR2	QTR3	QTR4
101	Television	Electronics	500	4000	200	3000
102	Laptop	Electronics	400	7000	34	567
103	Mobile	Electronics	879	56473	44	100
104	Fiction	Books	500	4000	444	235
105	Literature	Books	8000	760	500	200
106	Horror	Movies	400	3000	200	245
107	Action	Movies	350	5000	489	2000
108	Thriller	Movies	3090	50	300	450
109	Family Drama	Movies	6000	300	450	200

ElectronicsSale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	TOTALSALES
101	Television	Electronics	7700
102	Laptop	Electronics	8001
103	Mobile	Electronics	57496

BooksSale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	TOTALSALES
106	Horror	Movies	3845
107	Action	Movies	7839
108	Thriller	Movies	3890
109	Family Drama	Movies	6950

MoviesSale

PRODUCT_ID	PRODUCTNAME	PRODUCTCATEGORY	TOTALSALES
104	Fiction	Books	5179
105	Literature	Books	9460

```
INSERT FIRST
WHEN (ProductCategory = 'Electronics') THEN
INTO ElectronicsSale  VALUES
(Product_ID,ProductName,ProductCategory,(Qtr1+Qtr2+Qtr3+Qtr4)
)
WHEN (ProductCategory = 'Movies') THEN
INTO MoviesSale  VALUES
(Product_ID,ProductName,ProductCategory,(Qtr1+Qtr2+Qtr3+Qtr4)
)
WHEN (ProductCategory = 'Books') THEN
INTO BooksSale VALUES
(Product_ID,ProductName,ProductCa                +Qtr2+Qtr3+Qtr4)
)
SELECT * FROM PRODUCTSALE;
```


Summary

- ELT architecture with optimization advantages
- Comprehensive tool for data integration
- SQL standard MERGE statement
- Oracle proprietary multiple table INSERT statement