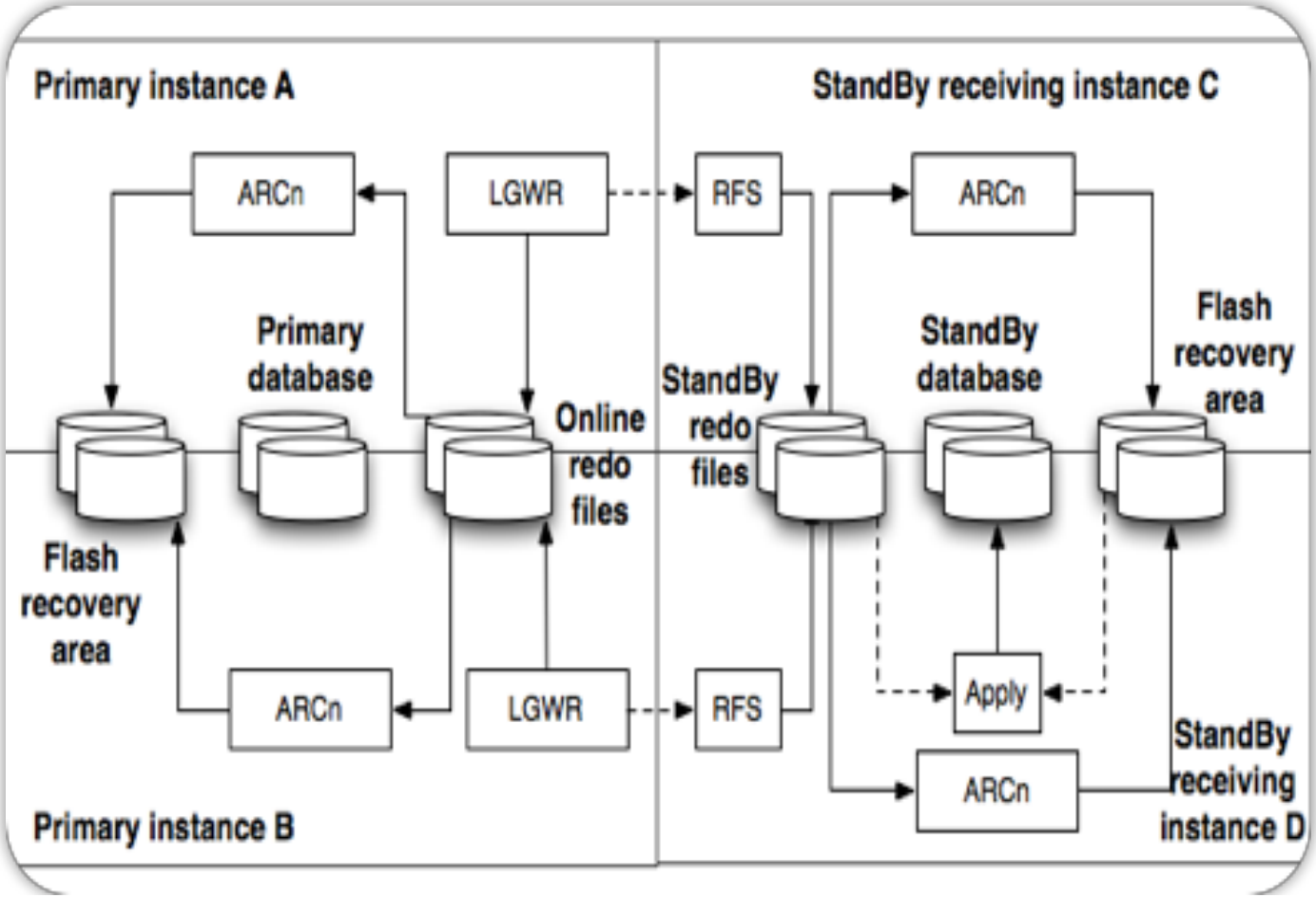
DATABASE
DATA
ENTITY
SERVER
PERFORMANSE
MIRRORING
TYPE
AVAILABILITY
DESIGNER
RELATIONAL
NETWORK
RELATIONSHIP
LAYOUT
OPTIMIZATION
MIGRATION
SYSTEM
QUERY
OBJECT
DBMS
ARCHITECTURE
STORAGE
CONTENT
BUSINESS
DEVELOPER
DESIGN
TABLE
SQL
XML
SOFTWARE
KEY
LANGUAGE
COLLECTION
STRUCTURE
TRANSACTION
CONCEPT
SECURITY
RESTORE
ADMINISTRATION
REPLICATION
RECOVERY
BACKUP
DEVELOPMENT
INDEX

RAC e DataGuard



Administração de bases de dados

- Tarefas de um administrador de sistemas
- Utilizadores
- Segurança e privilégios
- Autenticação
- Utilitários de administração

Administradores de bases de dados

Cada base de dados tem pelo menos um administrador (DBA).

Uma base de dados Oracle é sistema de elevada complexidade

Pode ter muitos utilizadores o administrador pode não ser uma única pessoa.

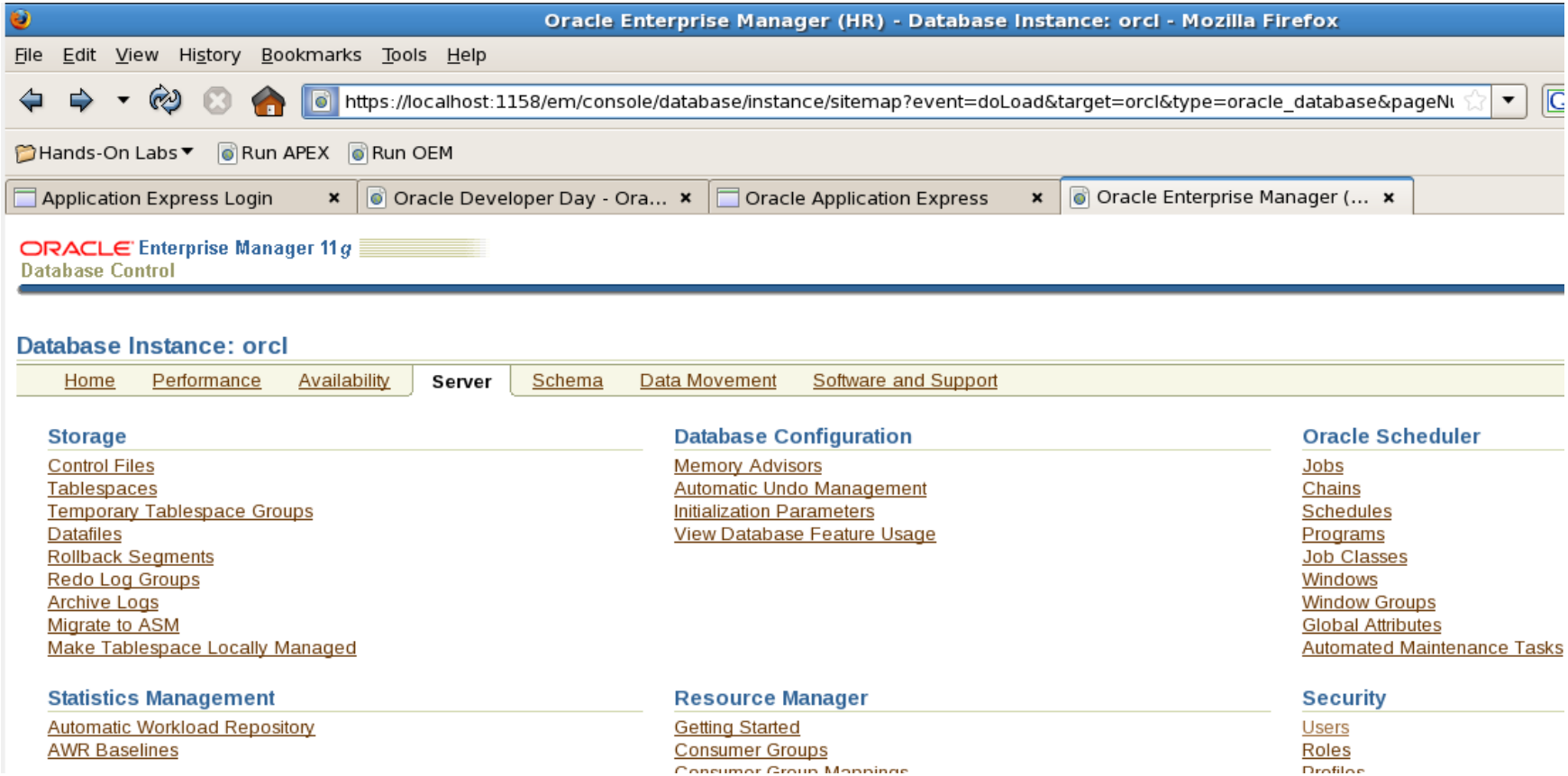
Administradores de bases de dados

- Instalar e actualizar o servidor Oracle e as ferramentas aplicacionais
- Alocar espaço de armazenamento e gerir as necessidades futuras em termos de capacidade de armazenamento
- Criar estruturas para o armazenamento (tablespaces) para serem usadas pelas aplicações desenvolvidas pelos programadores
- Criar objectos ou entidades principais (tabelas, views, índices) para executar eficientemente as aplicações

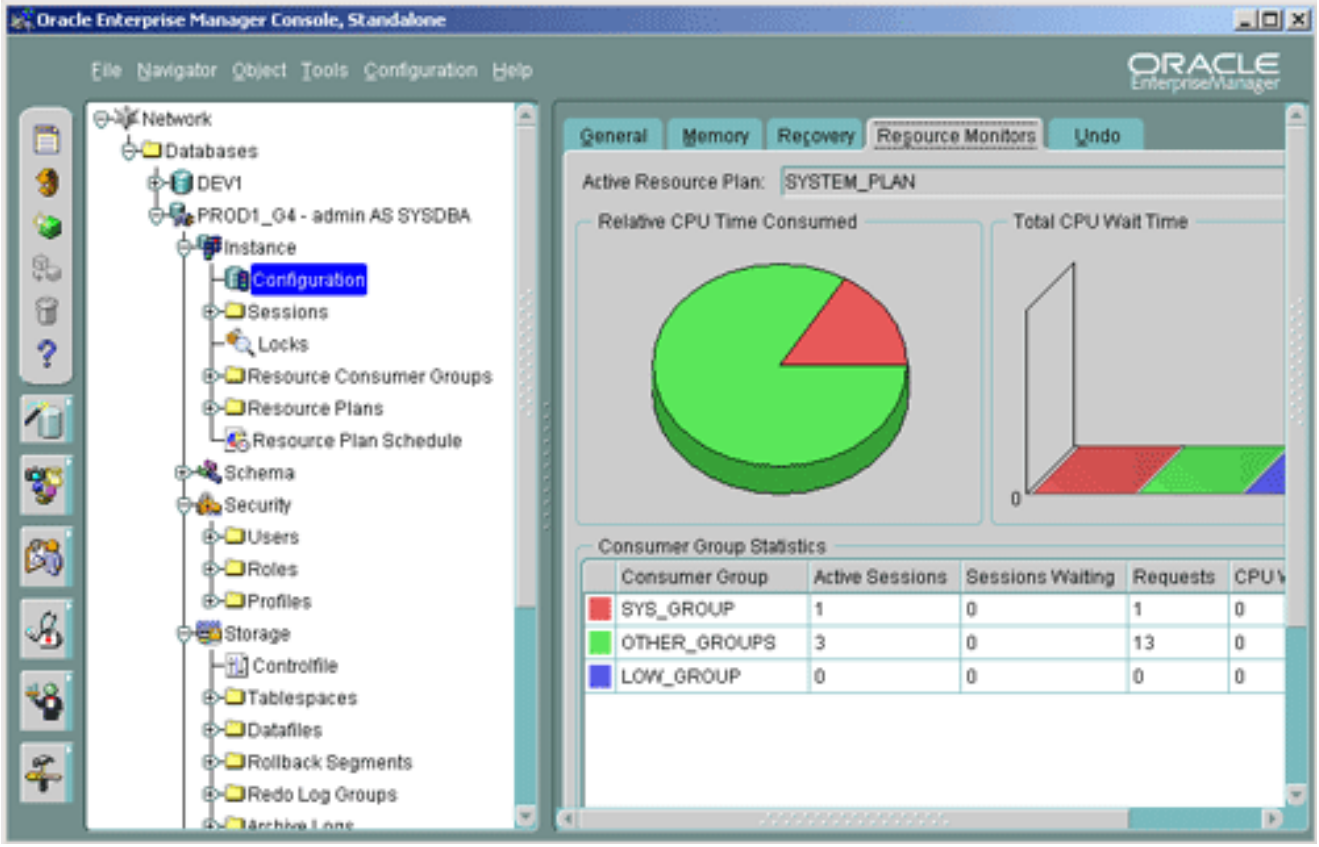
Administradores de bases de dados

- Modificar a estrutura da base de dados a partir da informação enviada pelos programadores
- Gerir utilizadores e segurança do sistema
- Verificar licenças de software Oracle
- Controlar e monitorizar o acesso dos utilizadores à base de dados
- Monitorizar e optimizar a performance da base de dados
- Gerir cópias de segurança e recuperação de informação perdida
- Manter os dados arquivados em suportes auxiliares
- Contactar a Oracle Corporation para pedir suporte técnico.

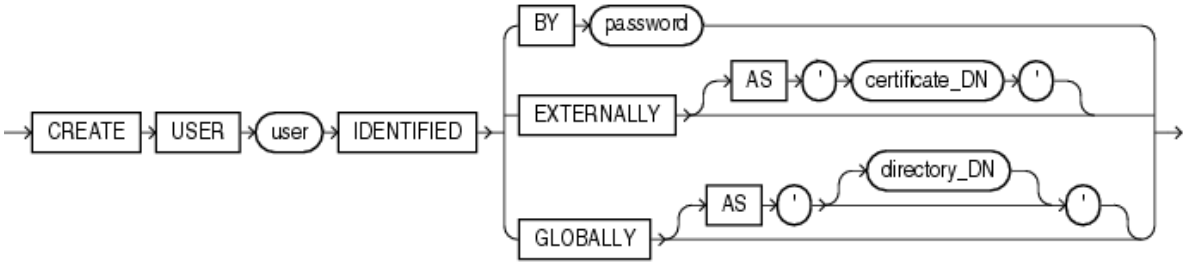
OEM

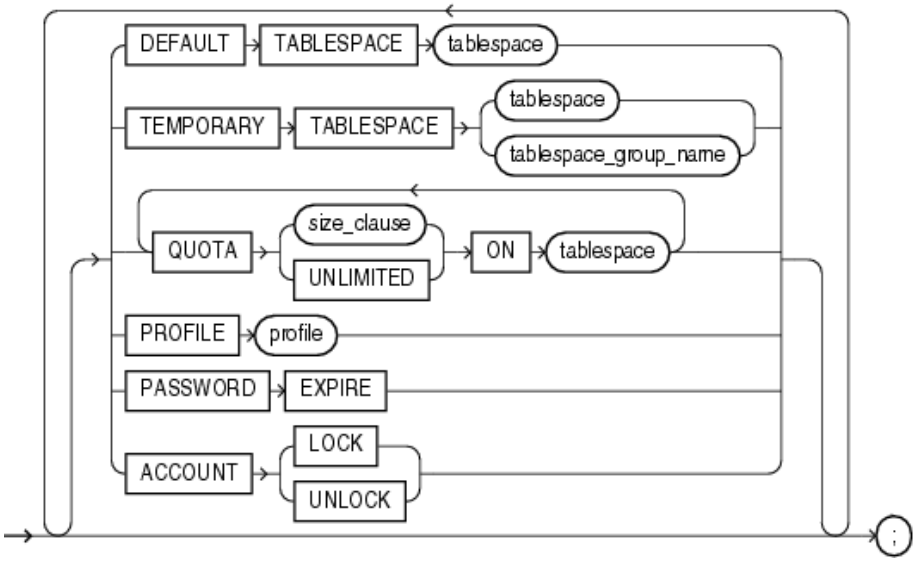

Oracle Enterprise Manager (HR) - Database Instance: orcl - Mozilla Firefox
File Edit View History Bookmarks Tools Help
https://localhost:1158/em/console/database/instance/sitemap?event=doLoad&target=orcl&type=oracle_database&pageN
Hands-On Labs
Run APEX
Run OEM
Application Express Login
Oracle Developer Day - Ora...
Oracle Application Express
Oracle Enterprise Manager (...
ORACLE Enterprise Manager 11g
Database Control
Database Instance: orcl
Home
Performance
Availability
Server
Schema
Data Movement
Software and Support
Storage
Control Files
Tablespaces
Temporary Tablespace Groups
Datafiles
Rollback Segments
Redo Log Groups
Archive Logs
Migrate to ASM
Make Tablespace Locally Managed
Database Configuration
Memory Advisors
Automatic Undo Management
Initialization Parameters
View Database Feature Usage
Oracle Scheduler
Jobs
Chains
Schedules
Programs
Job Classes
Windows
Window Groups
Global Attributes
Automated Maintenance Tasks
Statistics Management
Automatic Workload Repository
AWR Baselines
Resource Manager
Getting Started
Consumer Groups
Security
Users
Roles

OEM


Oracle Enterprise Manager Console, Standalone
File Navigator Object Tools Configuration Help
ORACLE
EnterpriseManager
Network
Databases
DEV1
PROD1_G4 - admin AS SYSDBA
Instance
Configuration
Sessions
Locks
Resource Consumer Groups
Resource Plans
Resource Plan Schedule
Schema
Security
Users
Roles
Profiles
Storage
Controlfile
Tablespaces
Datafiles
Rollback Segments
Redo Log Groups
General
Memory
Recovery
Resource Monitors
Undo
Active Resource Plan:
SYSTEM_PLAN
Relative CPU Time Consumed
Total CPU Wait Time
0
Consumer Group Statistics
Consumer Group
Active Sessions
Sessions Waiting
Requests
SYS_GROUP 1 0 1 0
OTHER_GROUPS 3 0 13 0
LOW_GROUP 0 0 0 0

Create user


CREATE
USER
user
IDENTIFIED
BY
password
EXTERNALLY
AS
'
certificate_DN
'
GLOBALLY
AS
'
directory_DN
'


DEFAULT
TABLESPACE
tablespace
TEMPORARY
TABLESPACE
tablespace
tablespace_group_name
QUOTA
size_clause
UNLIMITED
ON
tablespace
PROFILE
profile
PASSWORD
EXPIRE
ACCOUNT
LOCK
UNLOCK
;

PRIVILÉGIOS

PRIVILEGES IN ORACLE ARE OF TWO TYPES	
SYSTEM PRIVILEGES	**OBJECT PRIVILEGES**
In System privilege are more than 100 privileges	All DML are come into object privileges.
CREATE SESSION	SELECT
CREATE TABLE	INSERT
CREATE USER	UPDATE
CREATE VIEW	DELETE
CREATE SEQUENCE	REFERENCES
CREATE PROCEDURE	ALTER
CREATE ROLE etc.	INDEX
	EXECUTE

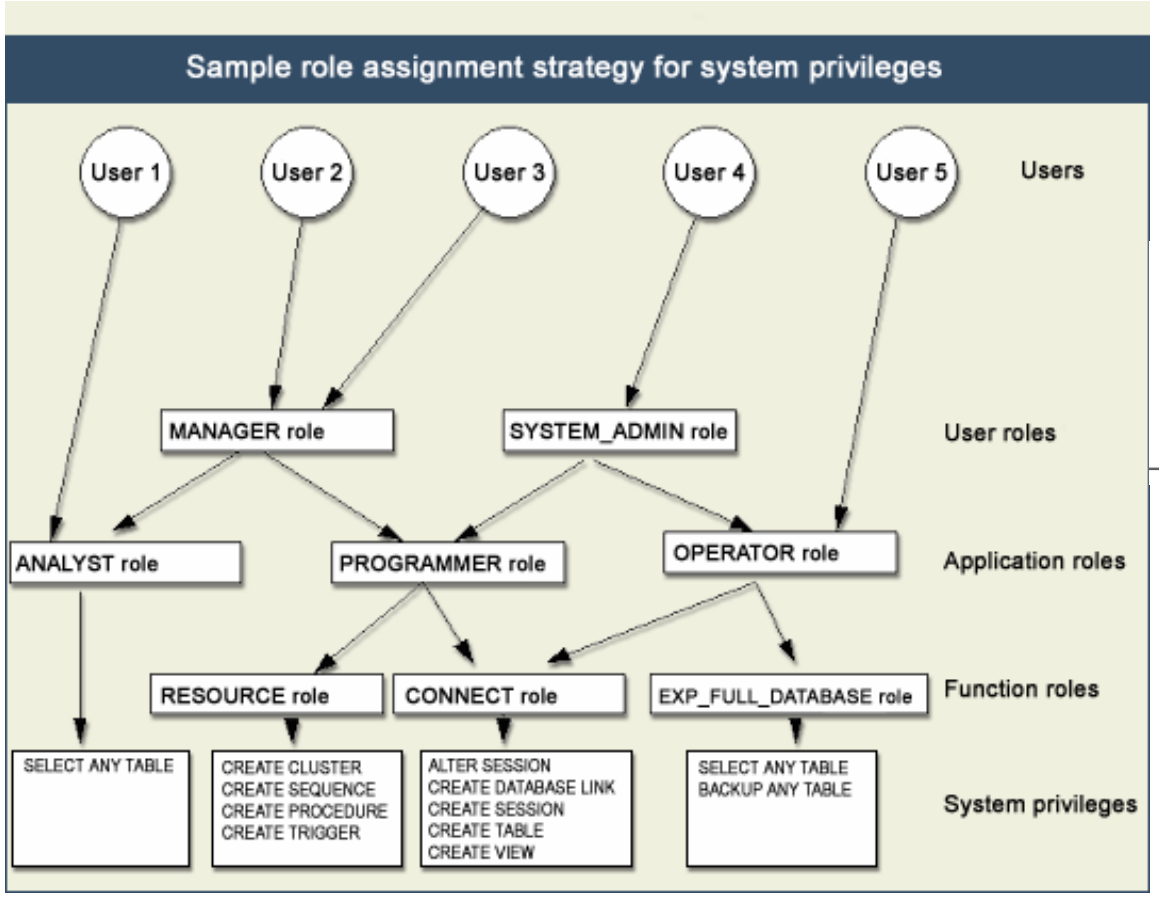
Grant / Revoke

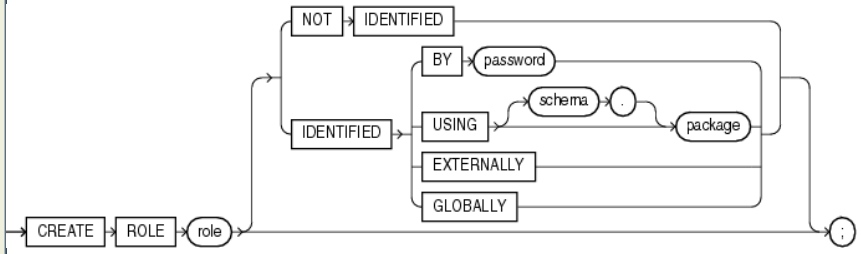
GRANT privileges ON object TO user

REVOKE privileges ON object FROM user

Privilege	Description
SELECT	Ability to perform SELECT statements on the table.
INSERT	Ability to perform INSERT statements on the table.
UPDATE	Ability to perform UPDATE statements on the table.
DELETE	Ability to perform DELETE statements on the table.
REFERENCES	Ability to create a constraint that refers to the table.
ALTER	Ability to perform ALTER TABLE statements to change the table definition.
INDEX	Ability to create an index on the table with the create index statement.
ALL	All privileges on table.

ROLE


Sample role assignment strategy for system privileges
User 1
User 2
User 3
User 4
User 5
Users
MANAGER role
SYSTEM_ADMIN role
User roles
ANALYST role
PROGRAMMER role
OPERATOR role
Application roles
RESOURCE role
CONNECT role
EXP_FULL_DATABASE role
Function roles
SELECT ANY TABLE
CREATE CLUSTER
CREATE SEQUENCE
CREATE PROCEDURE
CREATE TRIGGER
ALTER SESSION
CREATE DATABASE LINK
CREATE SESSION
CREATE TABLE
CREATE VIEW
SELECT ANY TABLE
BACKUP ANY TABLE
System privileges


CREATE
ROLE
role
NOT
IDENTIFIED
IDENTIFIED
BY
password
USING
schema
.
package
EXTERNALLY
GLOBALLY
;

Role - Exemplo

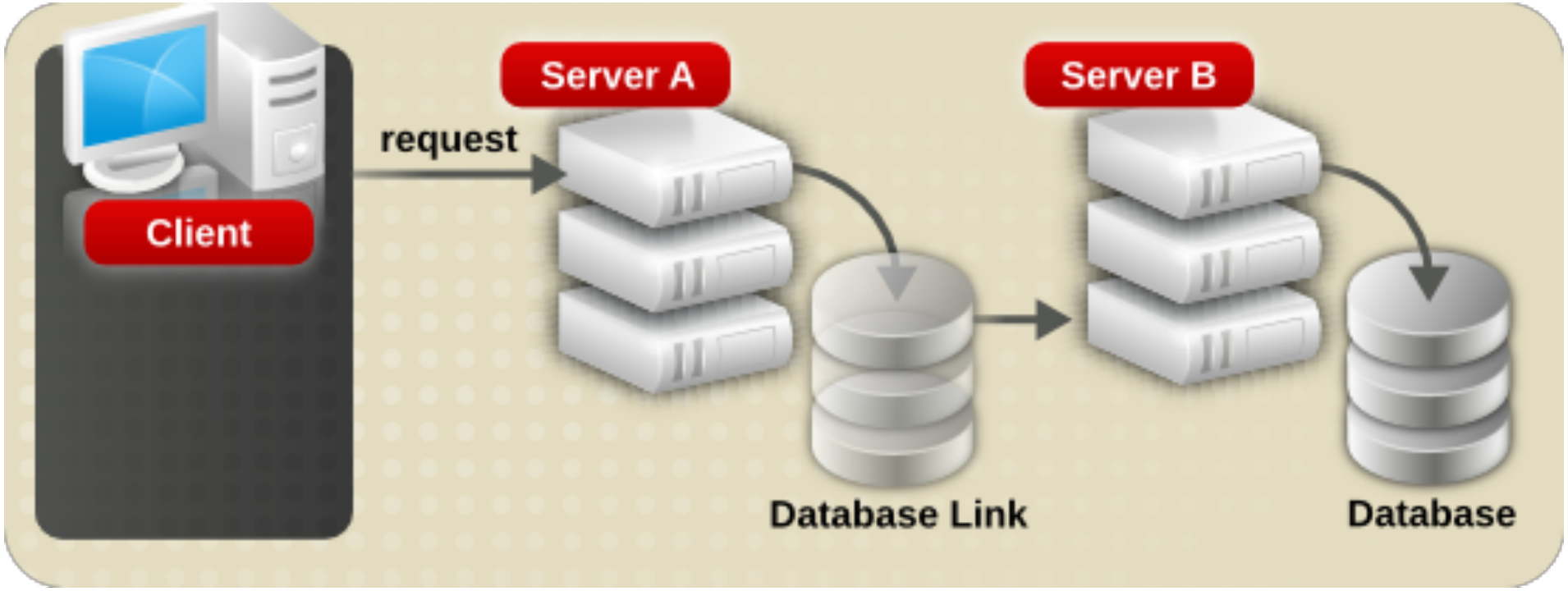
```
SQL> Create role select_data_role;
SQL> Grant select on emp to select_data_role;

SQL> Grant select on dept to select_data_role;

SQL> Grant select on bonus to select_data_role;


SQL> GRANT select_data_role TO Robert;
SQL> REVOKE select_data_role FROM Robert;
```

DBLINK



Cópias de segurança

A frequência das cópias depende:

- Taxa de alteração de dados / transações
- Disponibilidade da base de dados (shutdown para “cold backup”)
- Criticidade dos dados / valor dos dados
- Os “read-only tablespaces” precisam de ser copiados apenas uma vez
- Em modo “archivelog” pode-se copiar uma parte do estado da base de dados aterado durante um período de dias
- Em modo “archivelog” deve-se copiar os “archive log files” para evitar o “congelamento” dos dados

Copias de segurança

- Simule a recuperação dos dados para avaliar a qualidade das cópias de segurança.

- Teste vários cenários,

Métodos para cópias de segurança

- Export/Import - Exports are "logical"database backups in that they extract logical denitions and data from the database to a file.

- Cold or Offline Backups - shut the database down and backup up ALL data, log, and control files.

- Hot or On-line Backups - If the database is available and in ARCHIVELOG mode, set the tablespaces into backup mode and backup their files. Also remember to backup the control files and archived redo log files.

- RMAN Backups - while the database is offline or on-line, use the "rman"utility to backup the database.

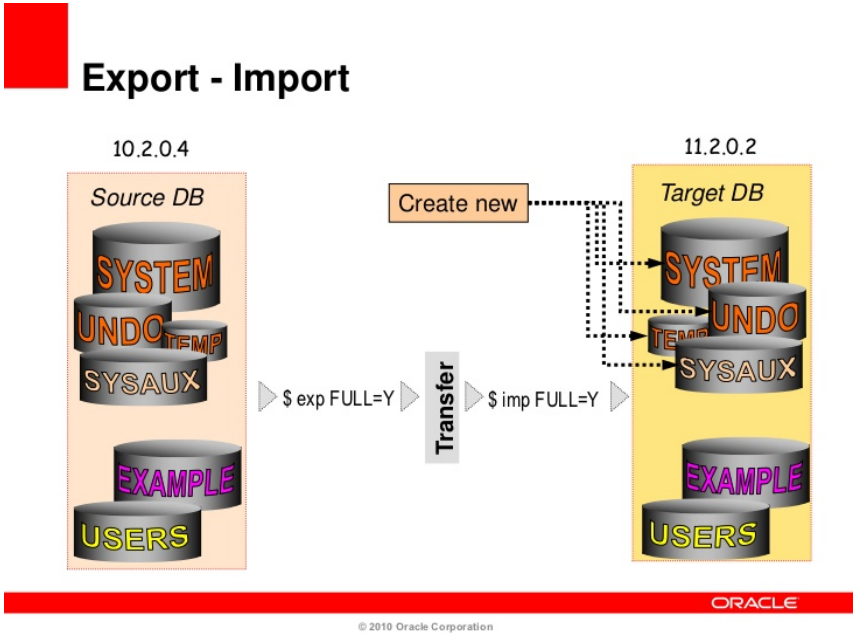
Diferença entre online e offline backup

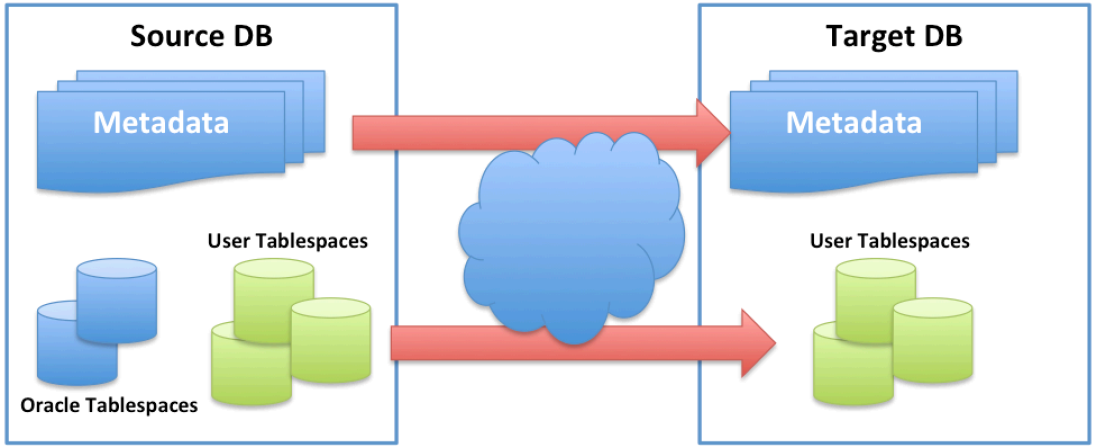
- Disponibilidade da base de dados
- Archive log mode
- Backup mode
- Consistência dos dados
- Comandos Export e Import

Export e import

- Backup and recovery (small databases only, say < +50GB, if bigger, use RMAN instead)
- Move data between Oracle databases on dierent platforms (for example from Solaris to Windows)
- Reorganization of data/ eliminate database fragmentation (export, drop and re-import tables)
- Upgrade databases from extremely old versions of Oracle (when in-place upgrades are not supported by the Database Upgrade Assistant any more)
- Detect database corruption. Ensure that all the data can be read
- Transporting tablespaces between databases

EXP VS IMP


Export - Import
10.2.0.4
11.2.0.2
Source DB
Target DB
Create new
SYSTEM
UNDO
TEMP
SYSAUX
EXAMPLE
USERS
$ exp FULL=Y
Transfer
$ imp FULL=Y
ORACLE
© 2010 Oracle Corporation


Source DB
Metadata
User Tablespaces
Oracle Tablespaces
Target DB
Metadata
User Tablespaces

Export e Import - Exemplos

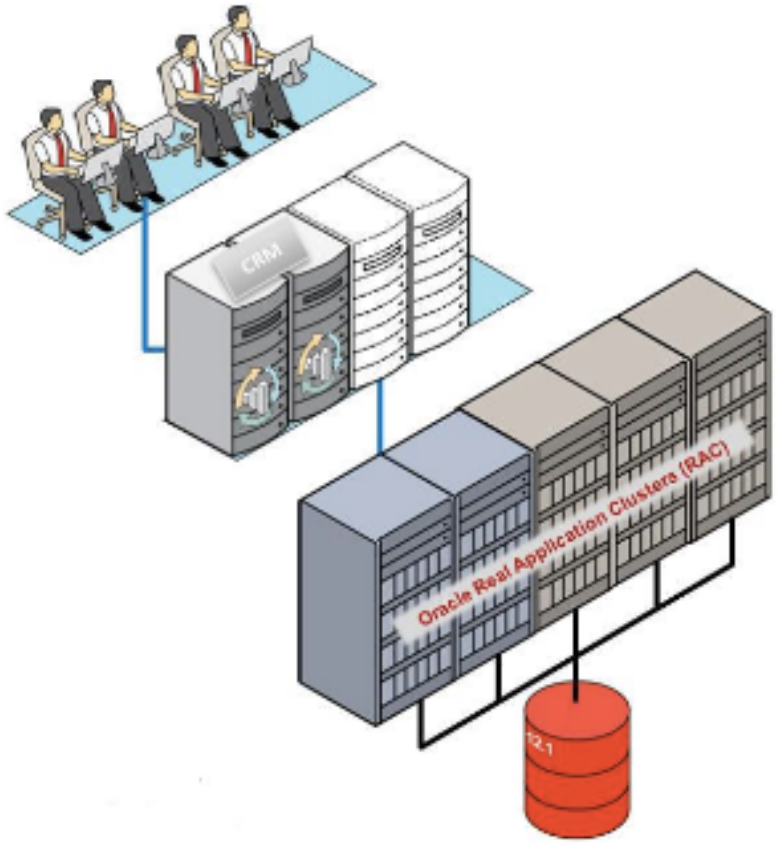
exp scott/tiger le=emp.dmp log=emp.log tables=emp rows=yes indexes=no

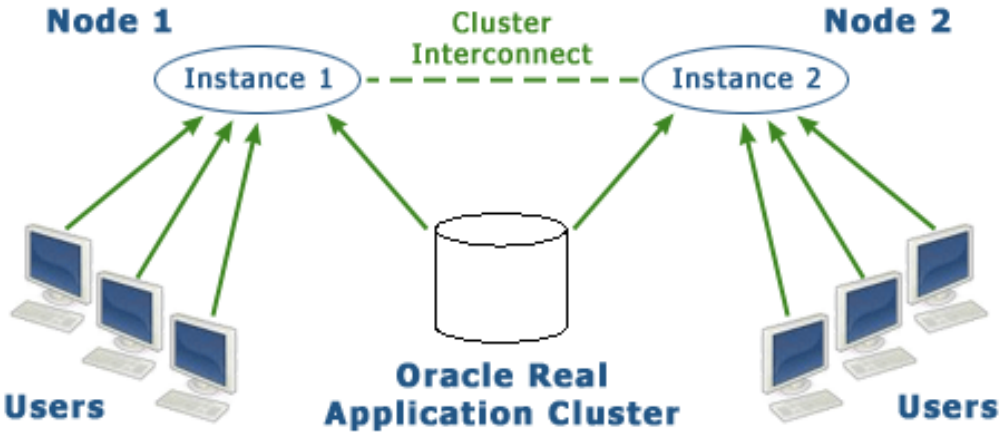
exp scott/tiger le=emp.dmp tables=(emp,dept)

imp scott/tiger le=emp.dmp full=yes

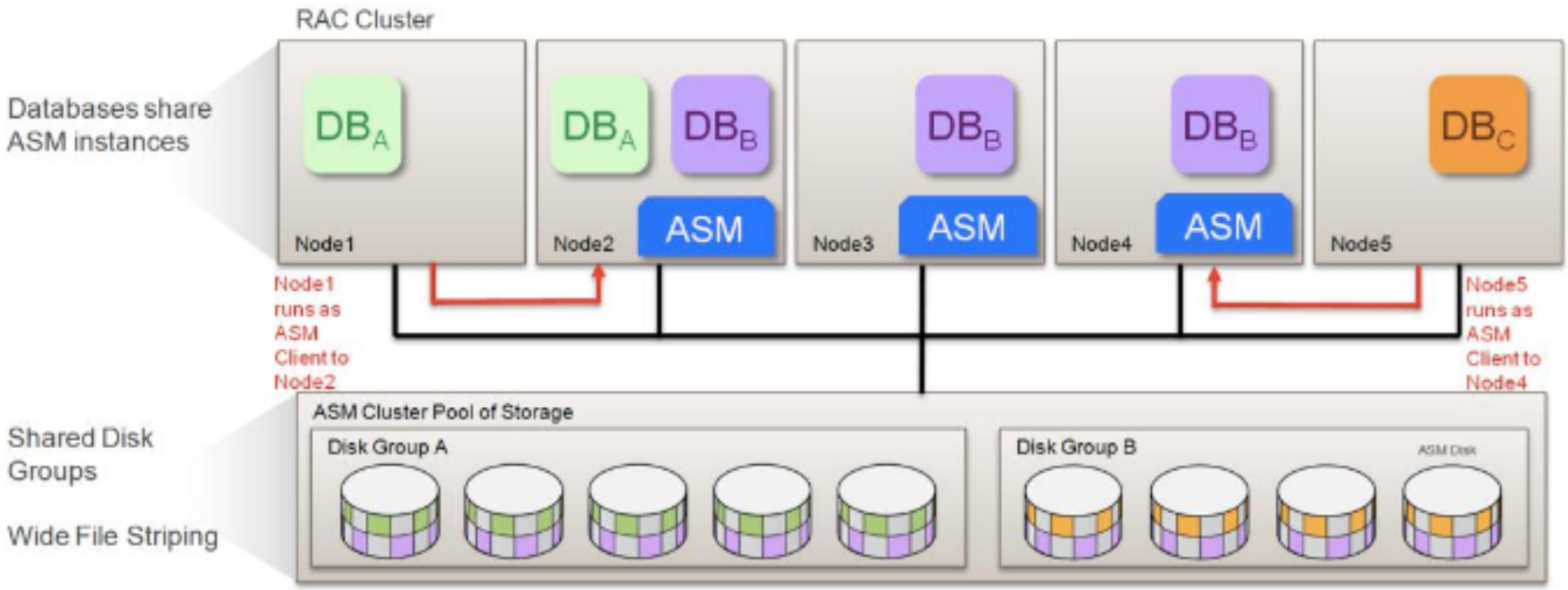
imp scott/tiger le=emp.dmp fromuser=scott touser=scott tables=dept

RAC

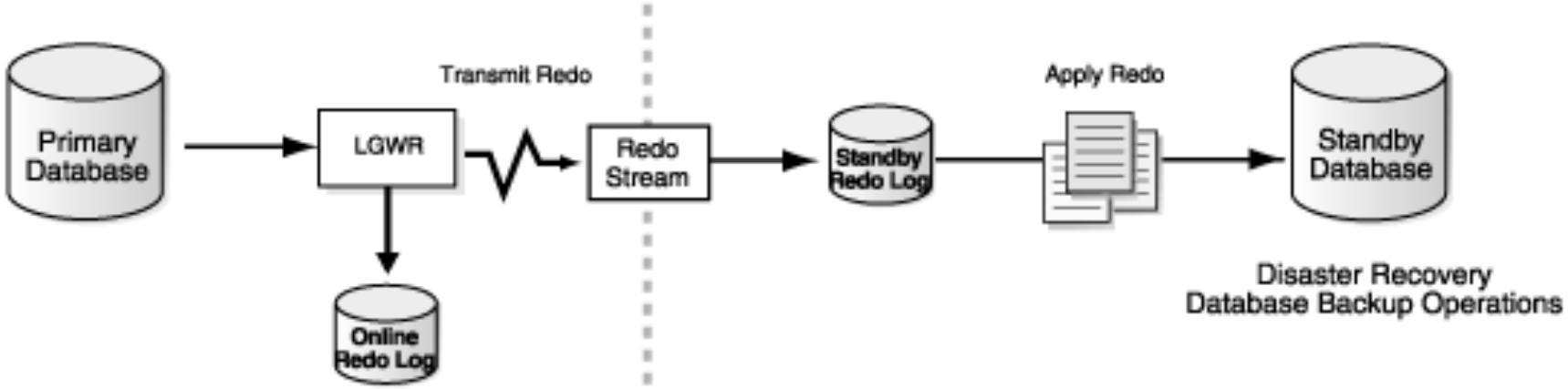

CRM
Oracle Real Application Clusters (RAC)


Node 1
Cluster
Interconnect
Node 2
Instance 1
Instance 2
Users
Oracle Real
Application Cluster
Users

RAC

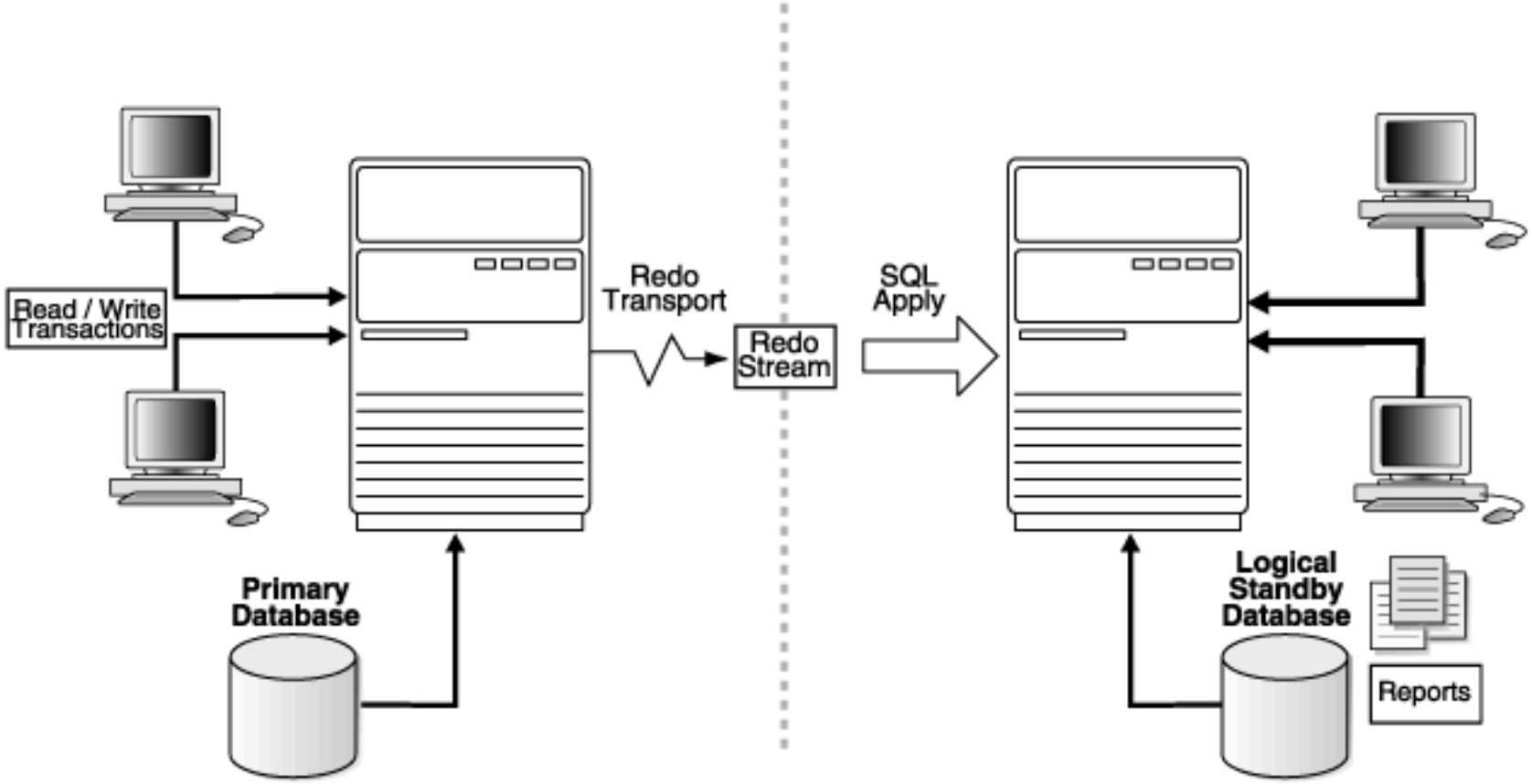

RAC Cluster
Databases share ASM instances
DBA
DBA
DBB
DBB
DBB
DBC
ASM
ASM
ASM
Node1
Node2
Node3
Node4
Node5
Node1 runs as ASM Client to Node2
Node5 runs as ASM Client to Node4
Shared Disk Groups
Wide File Striping
ASM Cluster Pool of Storage
Disk Group A
Disk Group B
ASM Disk

DATAGUARD



Description of "Figure 1-1 Typical Data Guard Configuration"

DATAGUARD



Description of "Figure 1-3 Automatic Updating of a Logical Standby Database"

DATAGUARD OEM

ORACLE Enterprise Manager 10g
Grid Control

Setup | Preferences | Help | Logout

Home | Targets | Deployments | Alerts | Policies | Jobs | Reports

Databases | Hosts | Web Applications | Services | Systems | Groups | All Targets

Host: north.foo.com > Database Instance: North_Sales >

Logged in As SYS

Data Guard

Page Refreshed May 26, 2005 3:05:15 PM EDT

View Data: Real Time: Manual Refresh

Overview

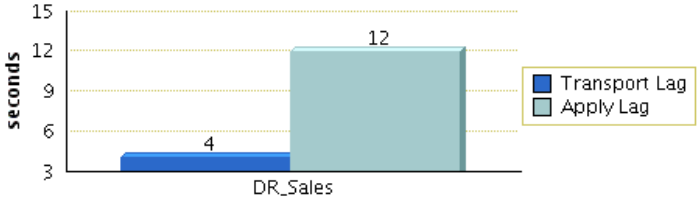
Data Guard Status: ✔ **Normal**
Protection Mode: Maximum Performance
Fast-Start Failover: Disabled

Primary Database

Name: North_Sales
Host: north
Data Guard Status: ✔ Normal
Current Log: 32
Properties: Edit

Standby Progress Summary

The transport lag is the time difference between the primary last update and the standby last received redo. The apply lag is the time difference between the primary last update and the standby last applied redo.



Standby Databases

Add Standby Database

Edit | Remove | Switchover | Failover

Select	Name	Host	Data Guard Status	Role	Last Received Log	Last Applied Log	Estimated Failover Time
⊙	DR_Sales	north	✔ Normal	Physical Standby	31	31	0 seconds

Performance

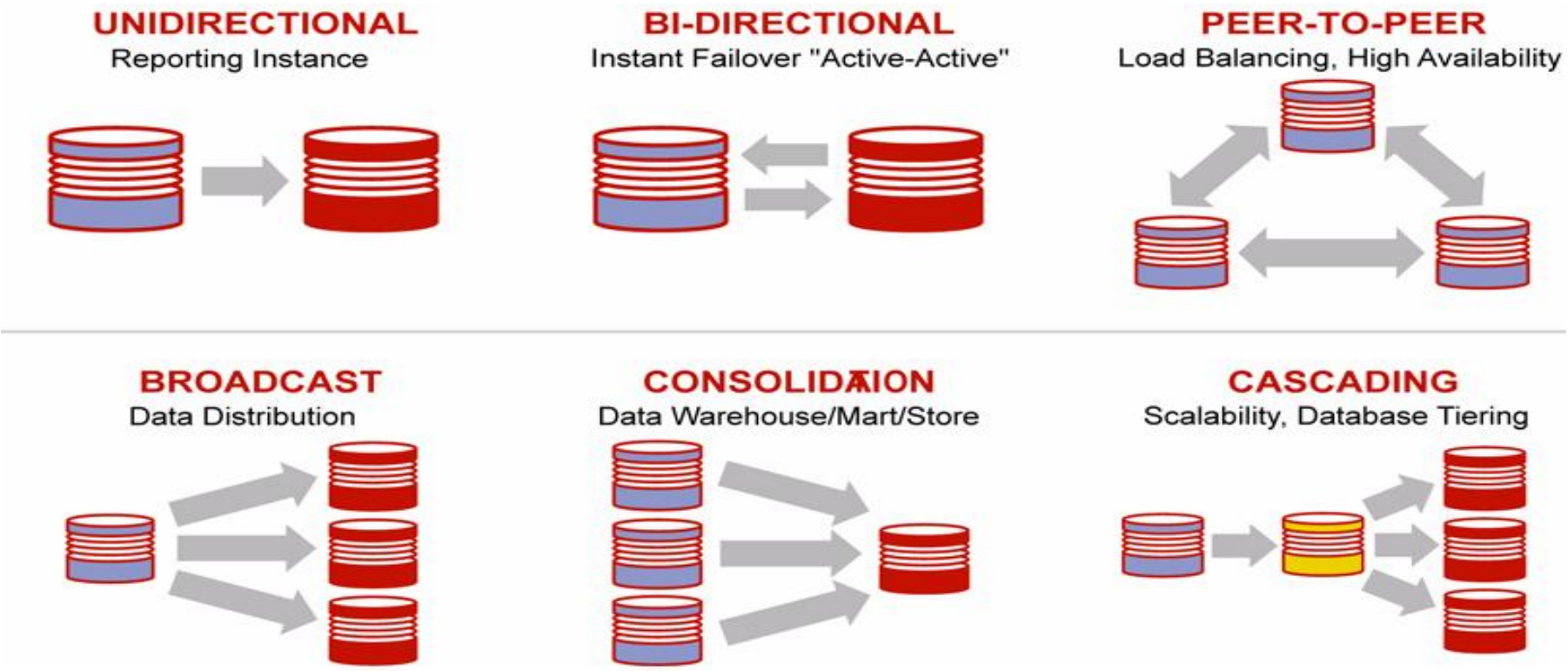
Performance Overview
Log File Details

Additional Administration

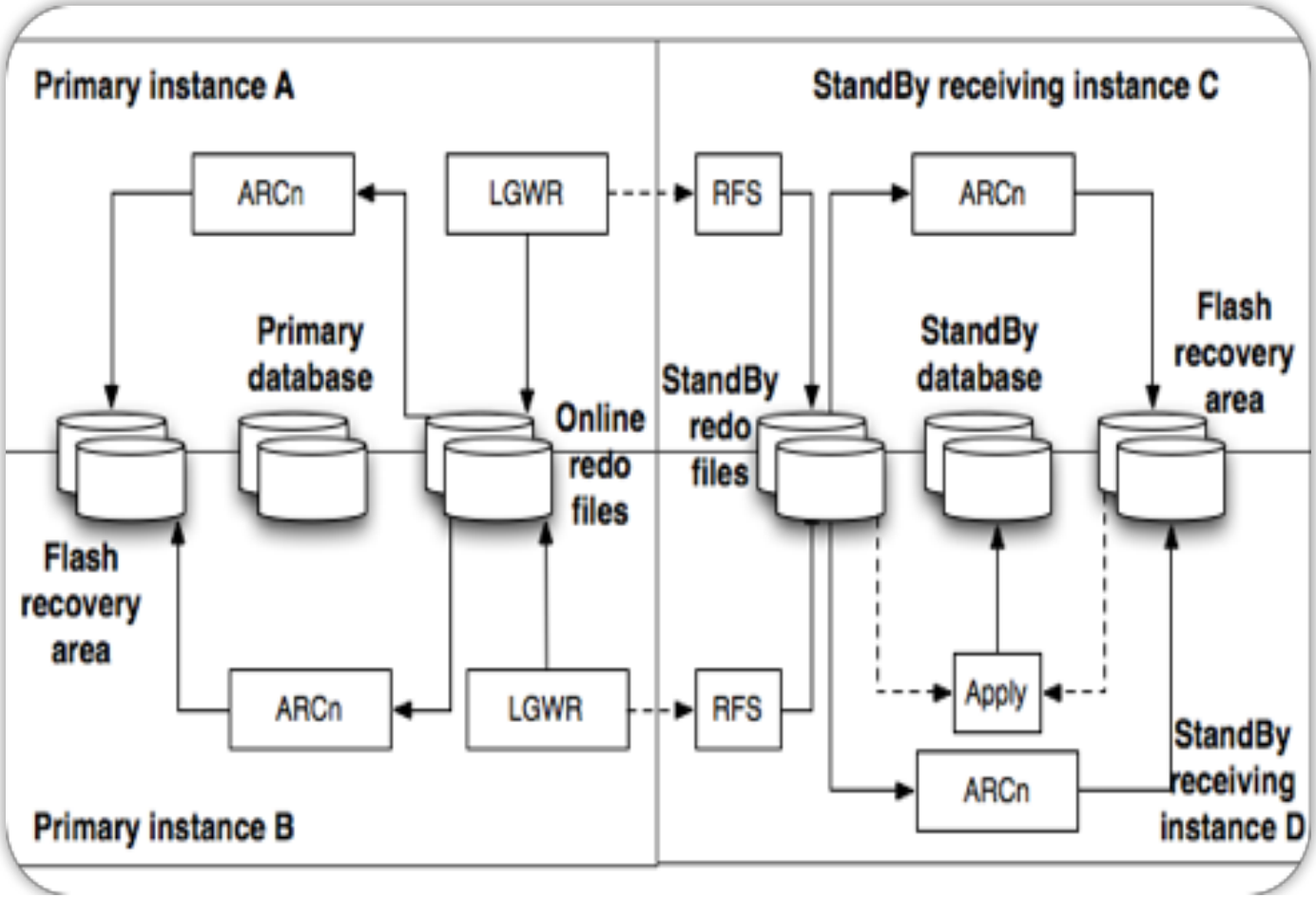
Verify
Remove Data Guard Configuration

Description of "Figure 1-4 Data Guard Overview Page in Oracle Enterprise Manager"

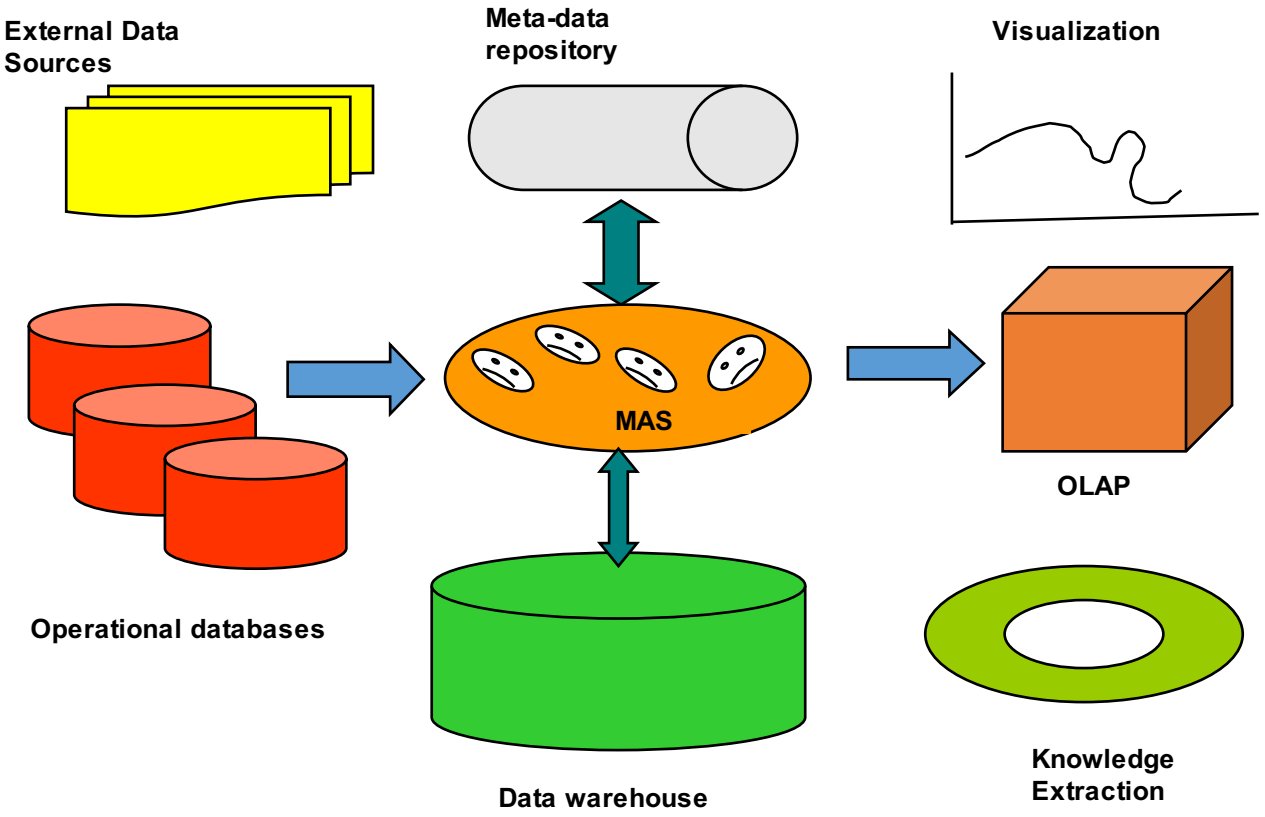
TOPOLOGIAS


UNIDIRECTIONAL
Reporting Instance
BI-DIRECTIONAL
Instant Failover "Active-Active"
PEER-TO-PEER
Load Balancing, High Availability
BROADCAST
Data Distribution
CONSOLIDATION
Data Warehouse/Mart/Store
CASCADING
Scalability, Database Tiering

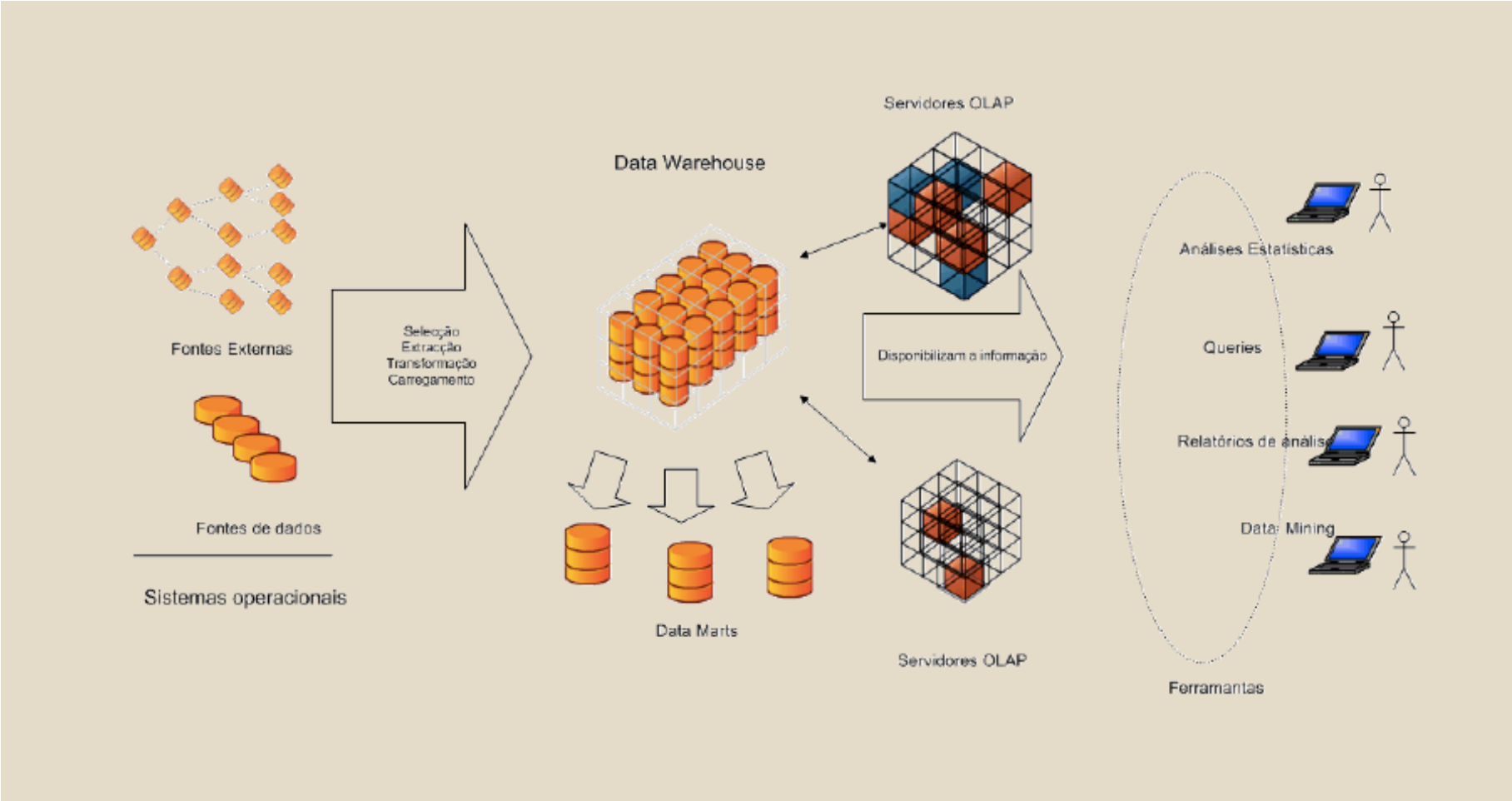
RAC e DataGuard



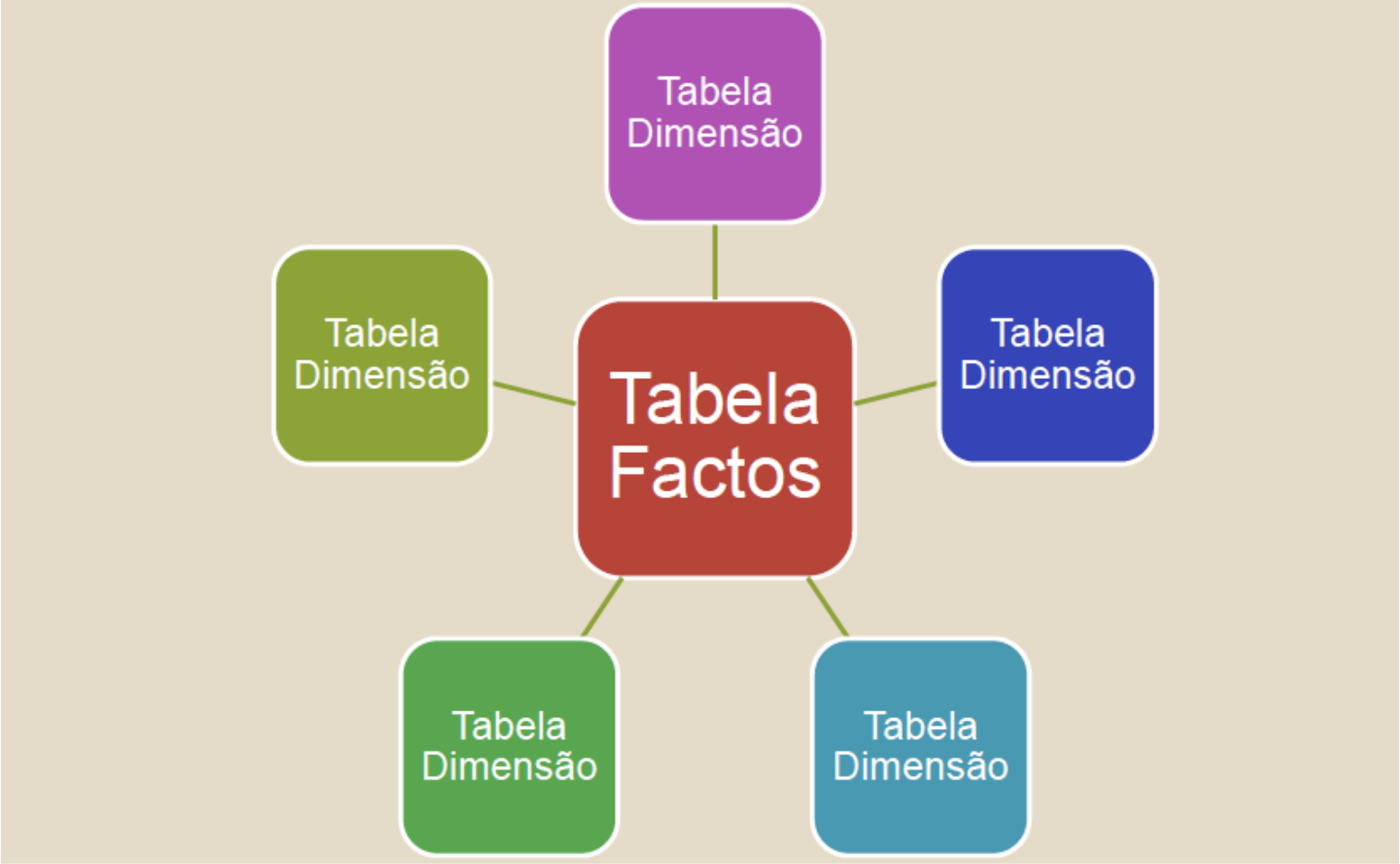
Data warehousing



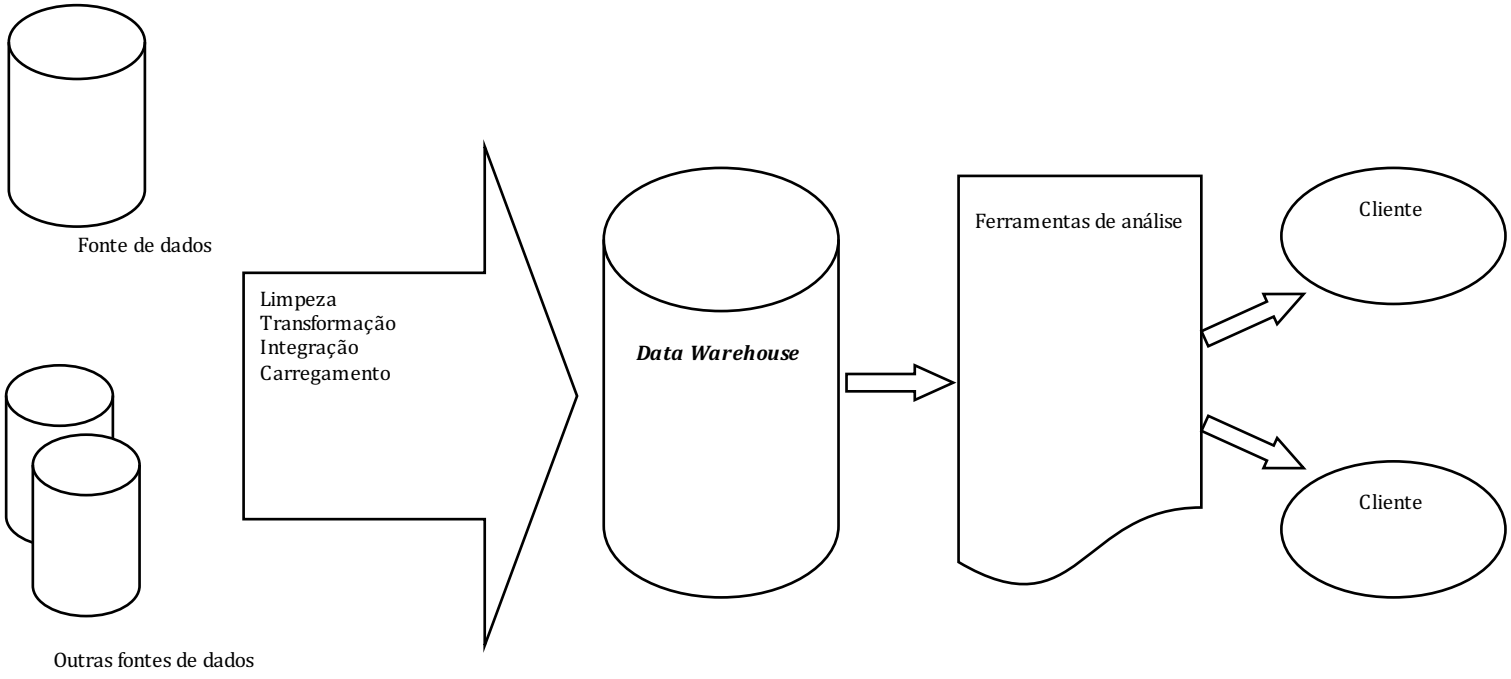
Data warehousing



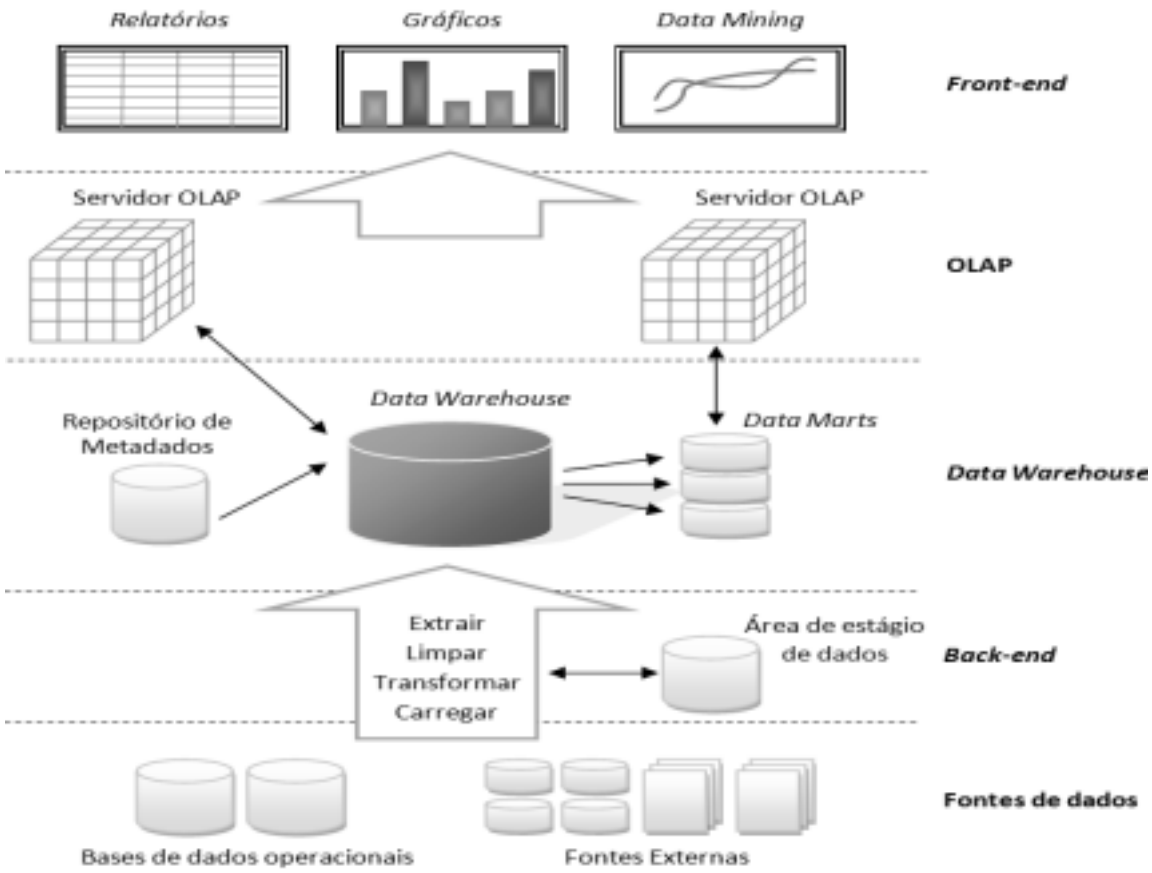
Data Warehousing



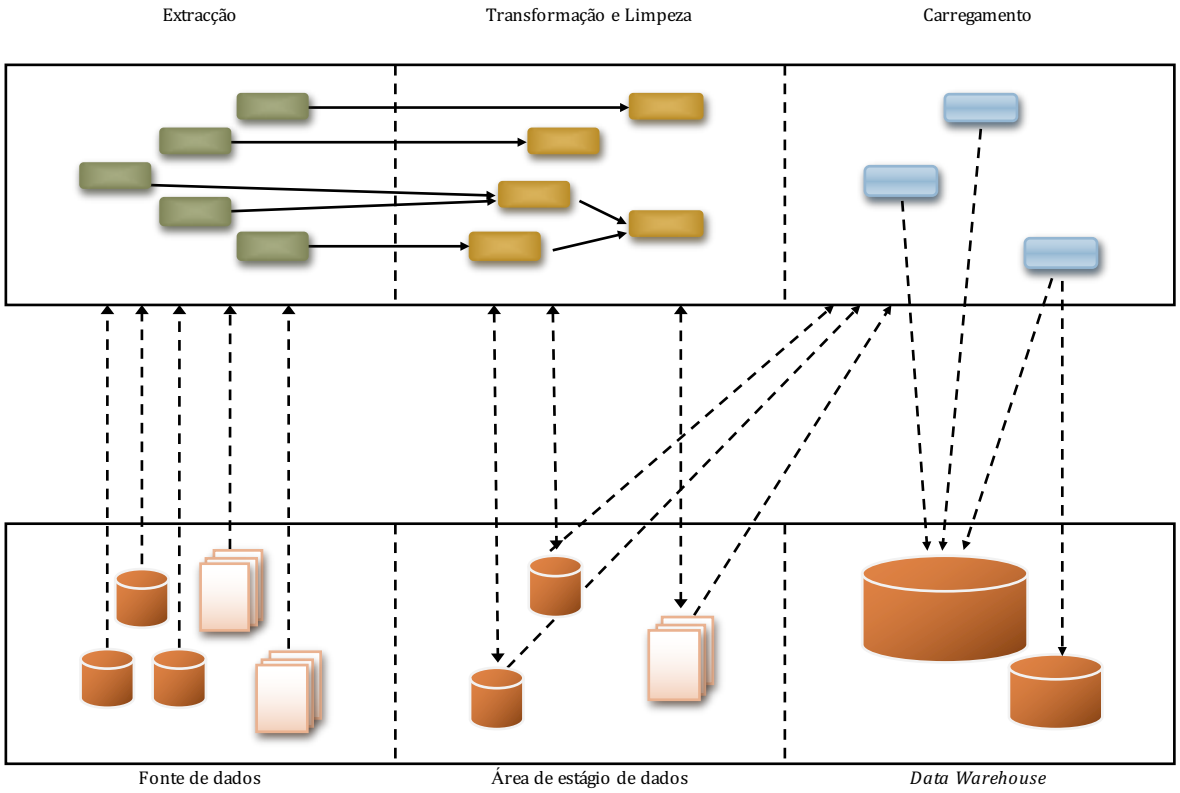
Data Warehousing vs BD



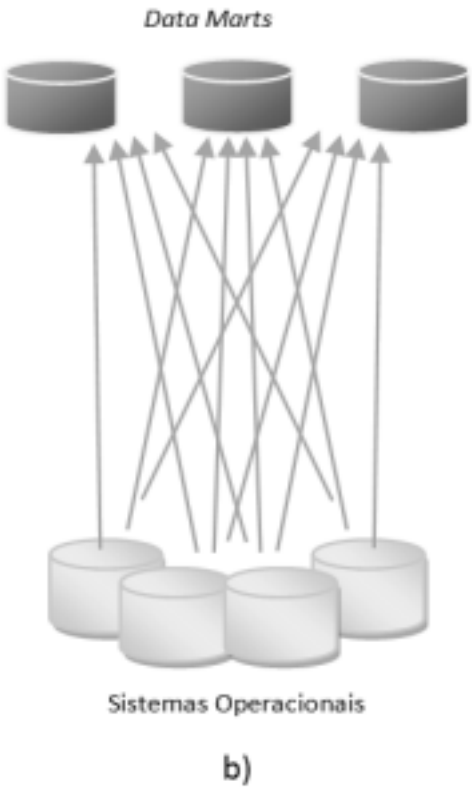
Arquitectura típica do DW



Processo ETL



Data Marts


Data Marts
Sistemas Operacionais
b)

Data Marts
Data Warehouse
Sistemas Operacionais
a)

Sistemas Multiagente

Definem um novo conceito de computação e inteligência.

- *SMA* é um novo paradigma na área da computação, baseado em novas formas de demonstração de teoremas; i.e., a computação baseada em agentes é uma revolução na análise e no desenvolvimento de software, simplificando a complexidade, a distribuição e a interactividade.

- Os Agentes são um foco de intenso interesse em muitas disciplinas das *Ciências de Computação*, sendo usados em várias aplicações, em sistemas pequenos até sistemas grandes, abertos, complexos e críticos.

Propriedades dos SMA

- *autonomia*;
- *reactividade;*
- *pro-actividade*;
- comportamento *social;*
- *etc…*

Estas propriedades têm facilitado a monitorização do comportamento dos agentes com impacto significativo no processo de aquisição de conhecimento e validação.

SMA são ferramentas poderosas para a resolução de problemas, em particular porque estes articulam com bases de dados, bases de conhecimento, sistemas de "datawarehouse" e extracção de conhecimento, ajudando o processo de integrar, difundir e arquivar informação (e.g., registos médicos).

Datawarehousing

- As organizações analisam data correntes e históricos para identificar padrões e suportar estratégias de negócio.

- A análise é complexa e interactiva e considera volumes elevados de dados integrados a partir de fontes variadas.

- A diferença entre OLAP (On-Line Analytic Processing) e OLTP (On-line Transaction Processing) é que a actualização da informação é substituída por interrogações frequentemente longas.

3 Áreas Complementares

- Data Warehousing: consolida dados a partir de muitas fontes num repositório mais vasto, considera o carregamento de dados, a sincronização periódica entre réplicas e a integração semântica.

- OLAP: Interrogações complexas em SQL e “views”; interrogações baseadas em operações do tipo folha de cálculo e visualização multidimensional dos dados; Interrogações interractivas e em tempo real.

- Data Mining: procura exploratória de tendências interessantes e de anomalias.

Datawarehouse

- Dados integrados que medem períodos de tempo longos;
- Adição frequente de informação sumária;
- Volume medido em gigabytes ou até terabytes;
- Melhoria dos tempos de resposta interactiva para perguntas complexas;
- Não é habitual fazer "updates" ad hoc.

Datawarehouse

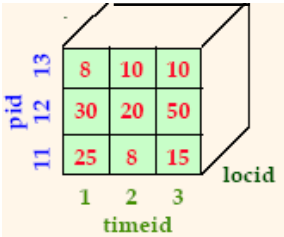
- Integração semântica: quando são processados dados de fontes múltiplas devem-se eliminar erros, e.g., moedas diferentes, esquemas, ….

- Fontes heterogéneas: os dados devem ser acedidos a partir de formatos de dados e repositórios variados (as potencialidades da replicação podem ser exploradas aqui).

- Integração, Actualização e Eliminação: os dados integrados devem ser periodicamente actualizados e os dados obsoletos devem ser eliminados.

- Gestão de meta-dados: devem ser guardados os parâmetros sobre a fonte da informação e os tempos de carregamento, assim como outros parâmetros relevantes sobre os dados.

Vista tri-dimensional



Locid = 1

pid	timeid	locid	vendas
11	1	1	25
11	2	1	8
11	3	1	15
12	1	1	30
12	2	1	20
12	3	1	50
13	1	1	8
13	2	1	10
13	3	1	10
11	1	2	35

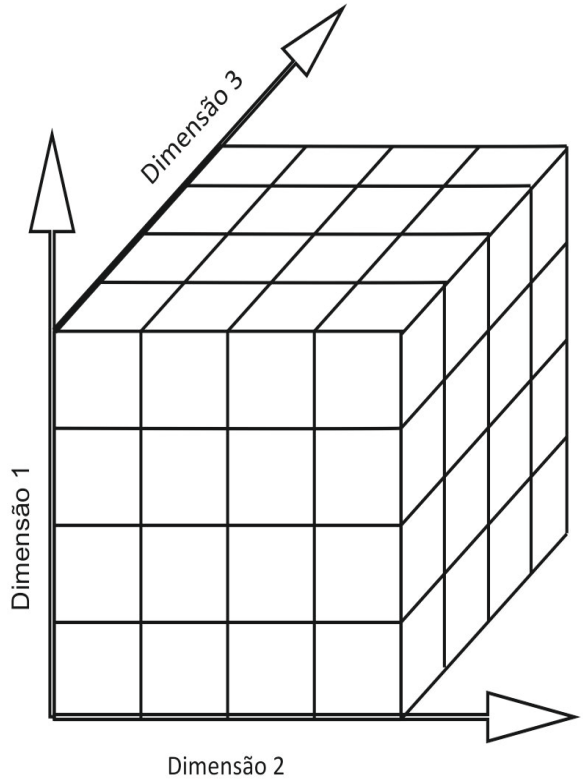
Comparação com SQL

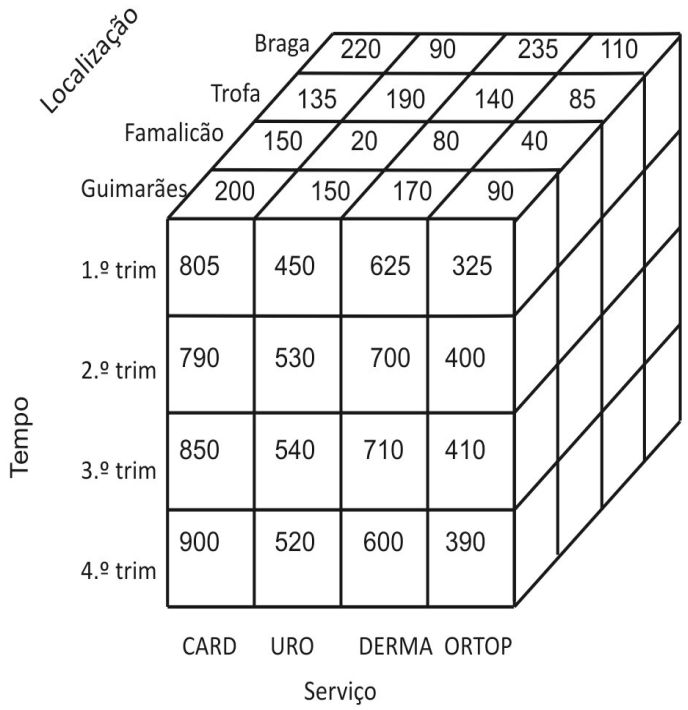
SELECT SUM(S.sales) FROM Sales S, Times T, Locations LWHERE S.timeid=T.timeid AND S.timeid=L.timeid GROUP BY T.year, L.state

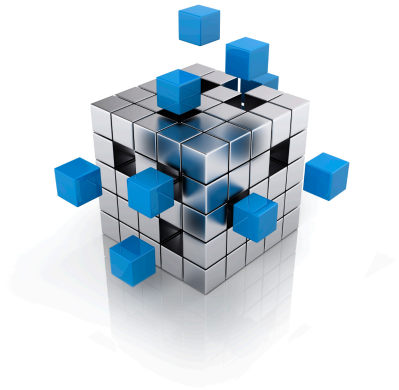
SELECT SUM(S.sales) FROM Sales S, Times T WHERE S.timeid=T.timeid GROUP BY T.year

SELECT SUM(S.sales) FROM Sales S, Location L WHERE S.timeid=L.timeid GROUP BY L.state

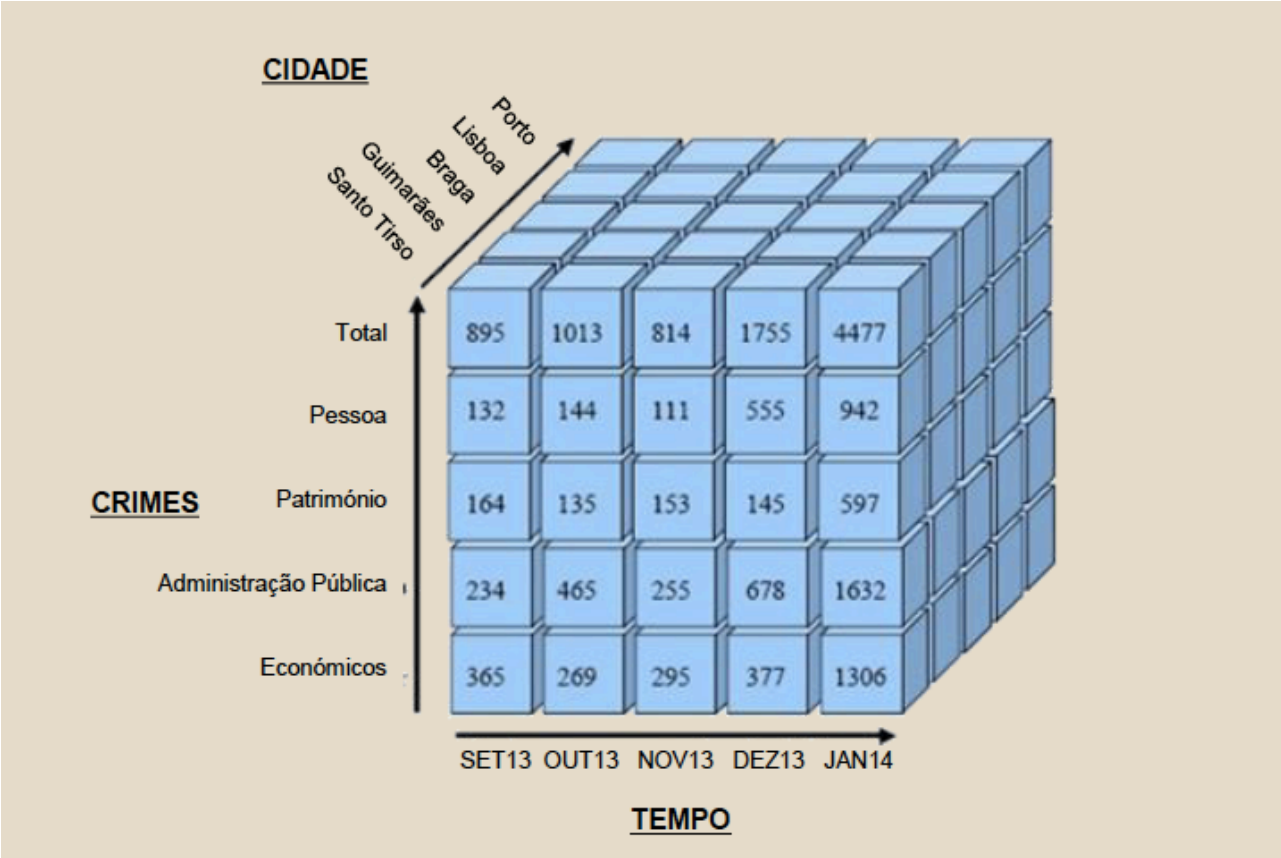
Cubos

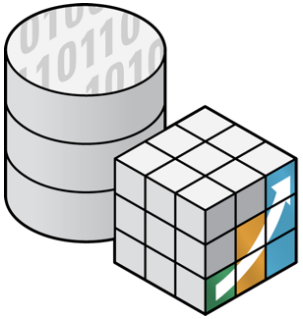

Dimensão 3
Dimensão 1
Dimensão 2


Localização
Braga 220 90 235 110
Trofa 135 190 140 85
Famalicão 150 20 80 40
Guimarães 200 150 170 90
Tempo
1.º trim 805 450 625 325
2.º trim 790 530 700 400
3.º trim 850 540 710 410
4.º trim 900 520 600 390
CARD URO DERMA ORTOP
Serviço

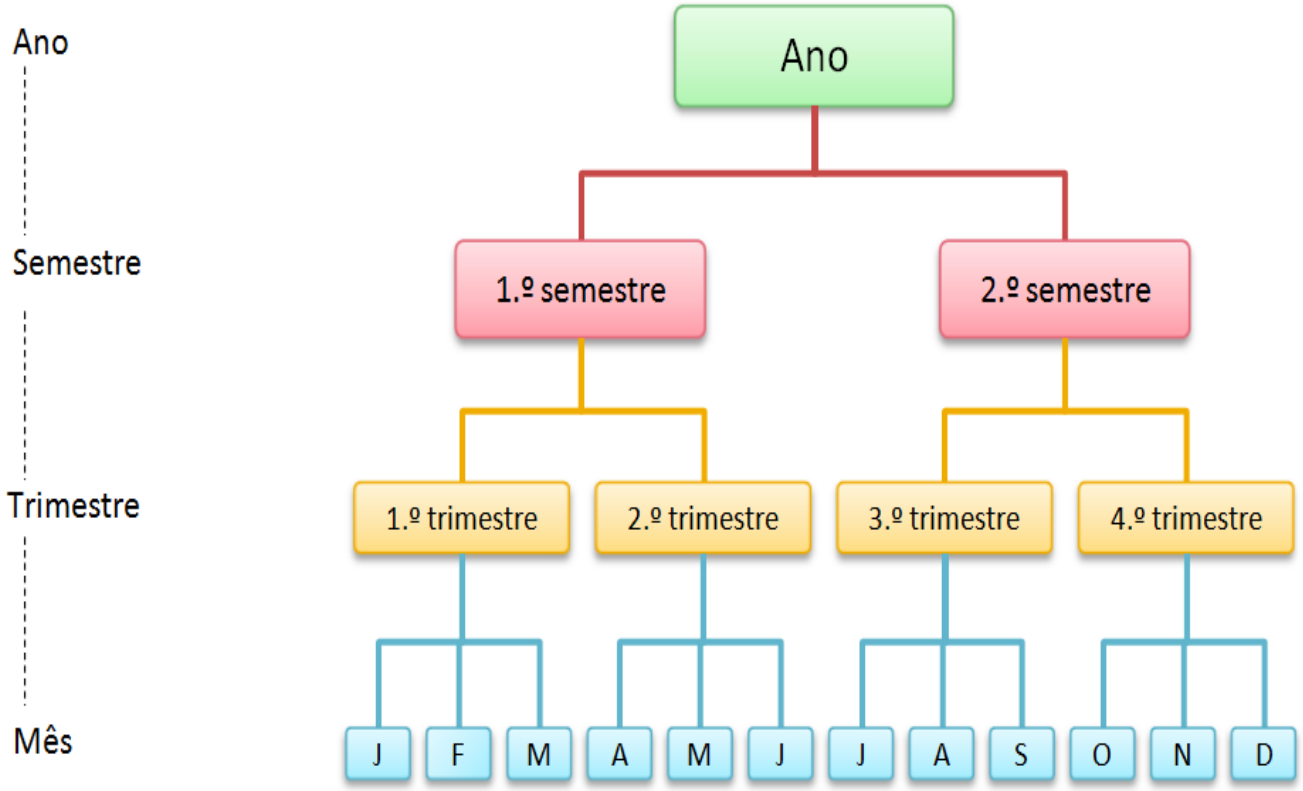


Cubo

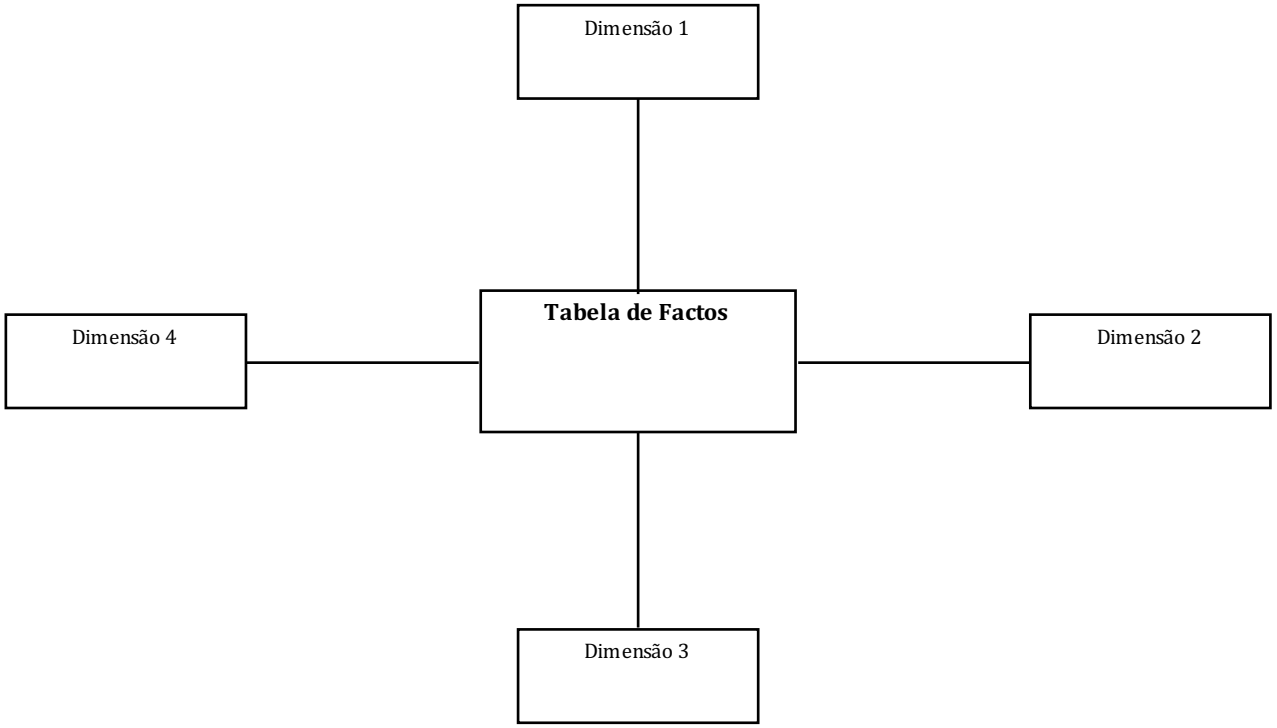

CIDADE
Porto
Lisboa
Braga
Guimarães
Santo Tirso
CRIMES
Total
Pessoa
Património
Administração Pública
Económicos
895 1013 814 1755 4477
132 144 111 555 942
164 135 153 145 597
234 465 255 678 1632
365 269 295 377 1306
SET13 OUT13 NOV13 DEZ13 JAN14
TEMPO



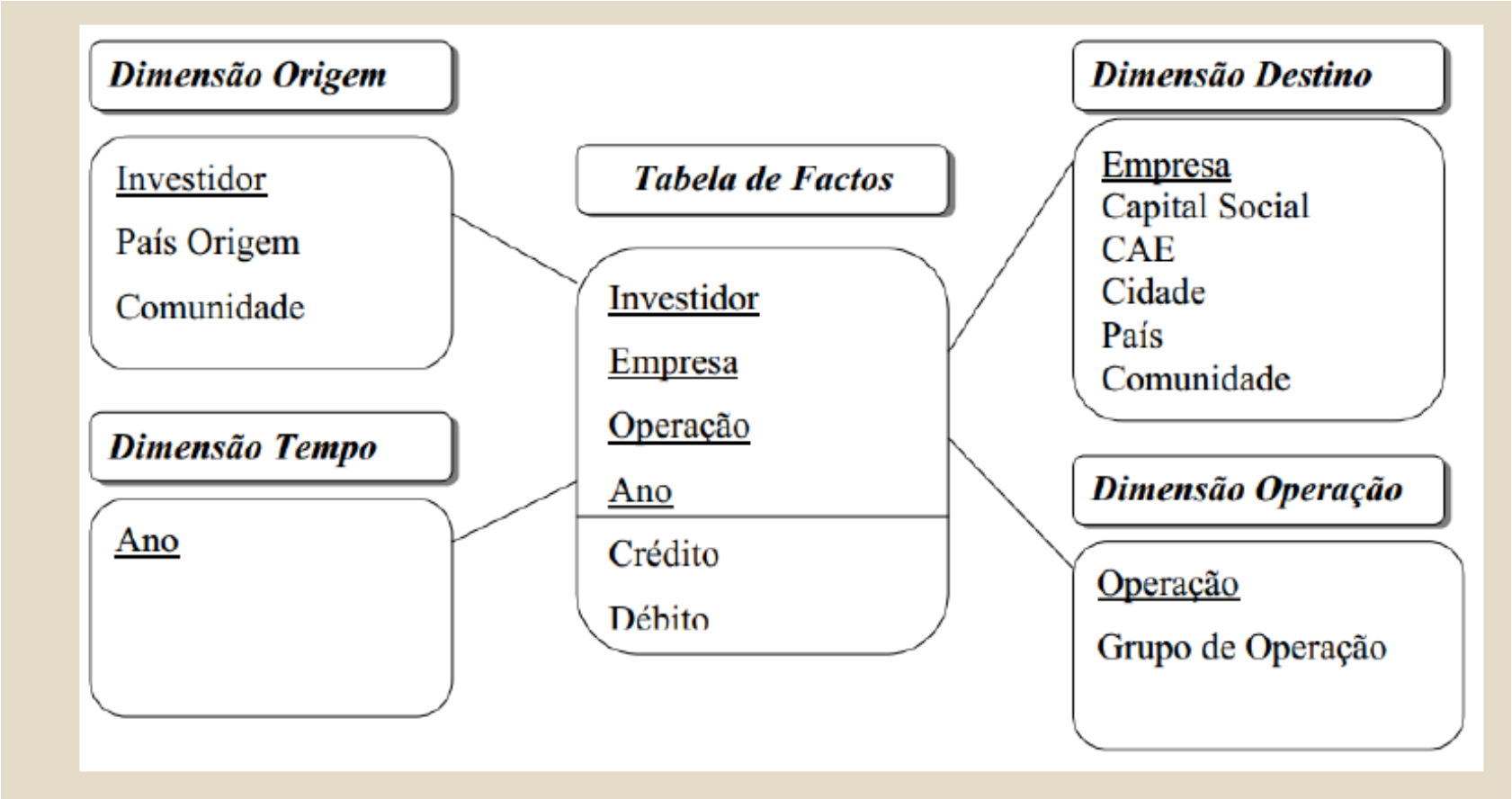
Hierarquia da dimensão tempo



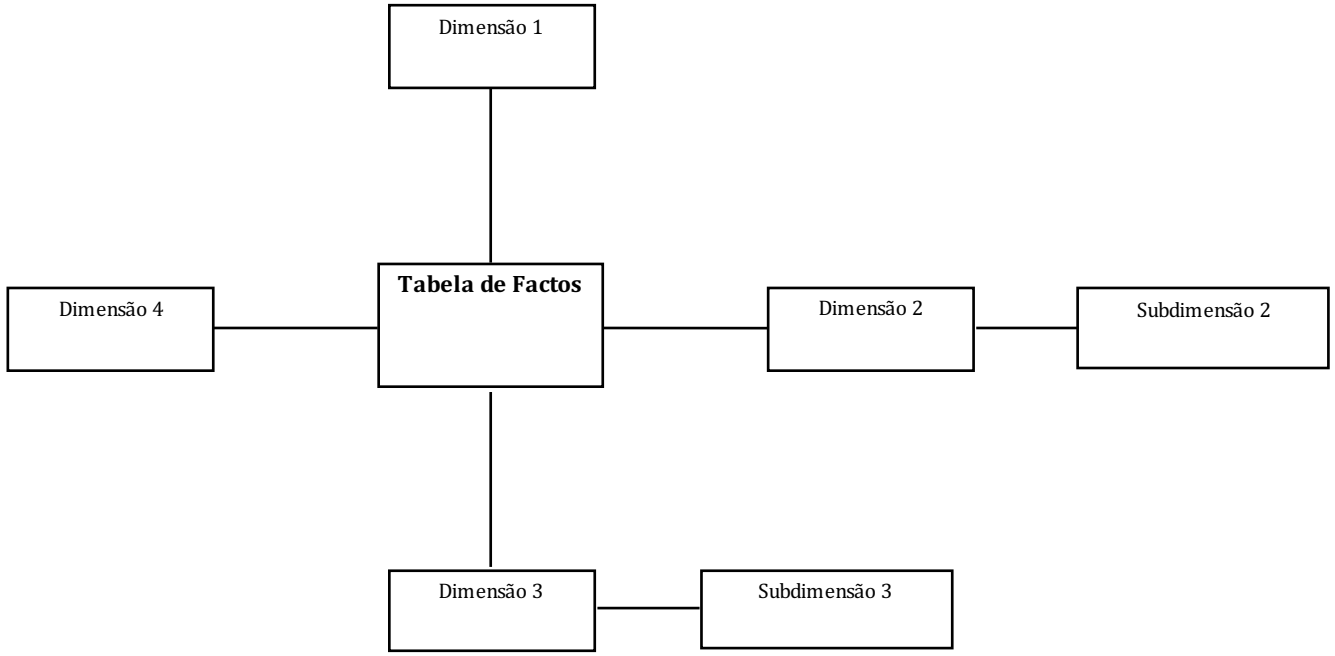
Esquema em estrela



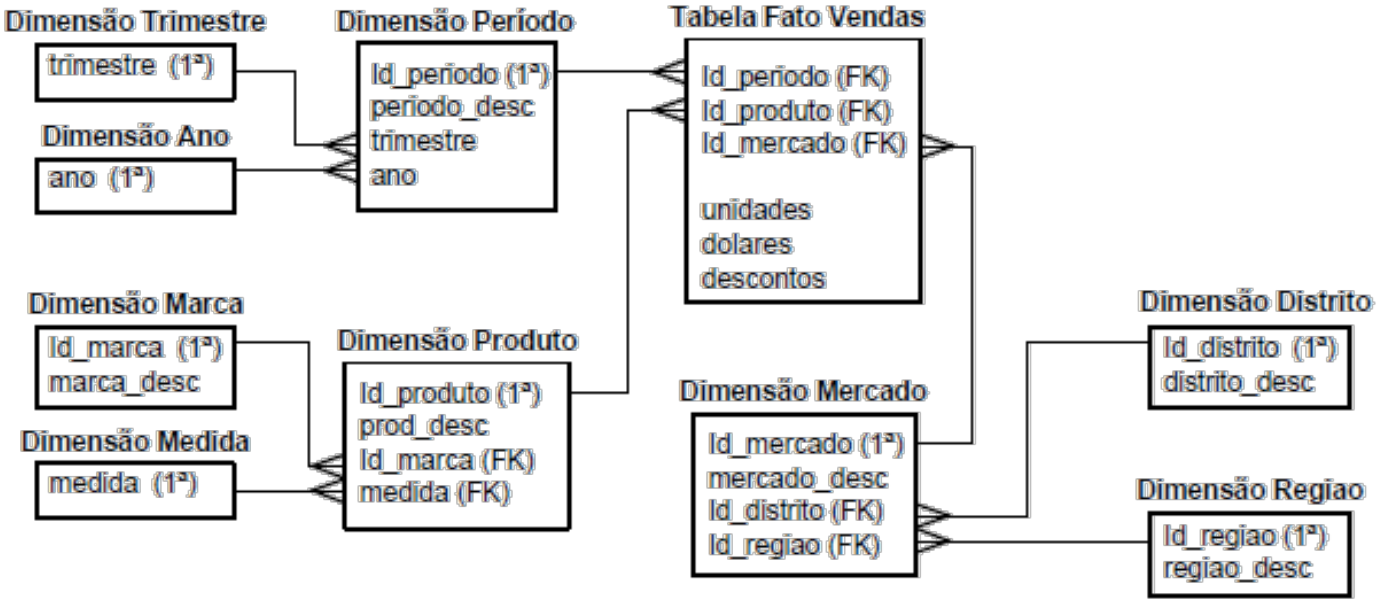
Esquema em Estrela



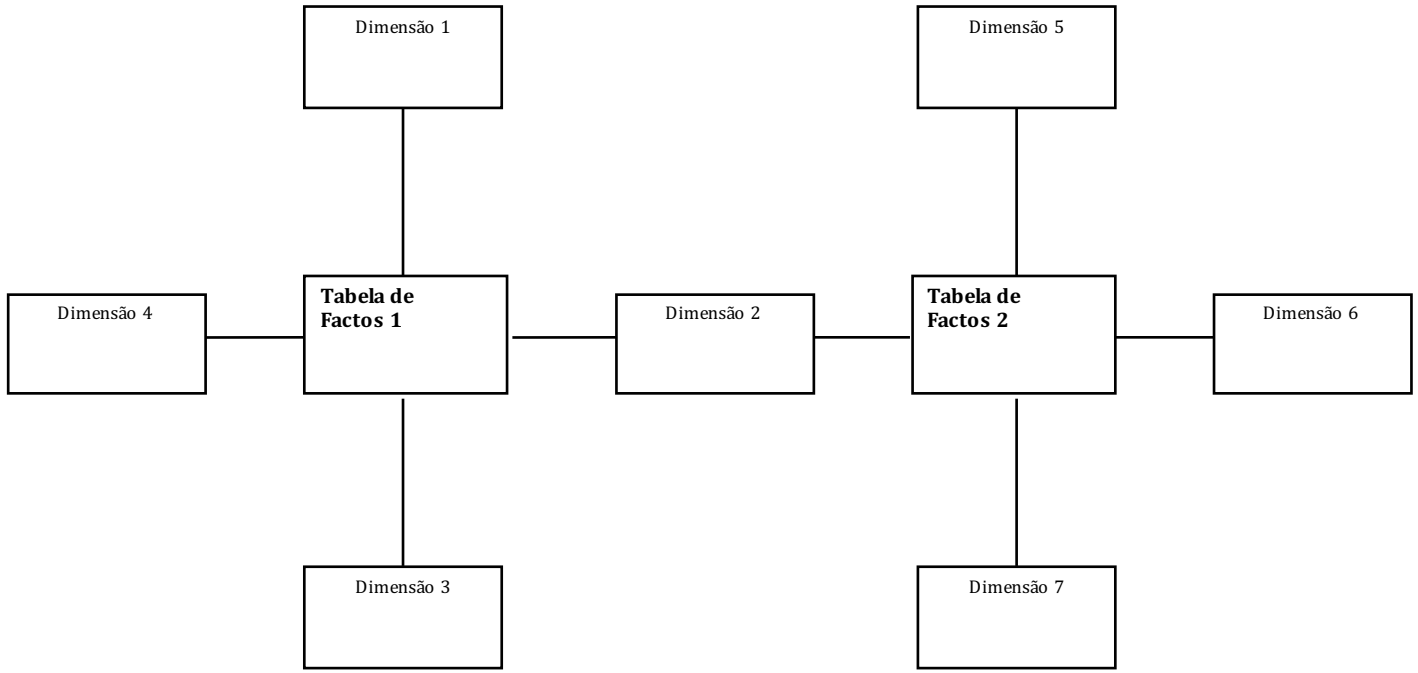
Esquema em floco de neve



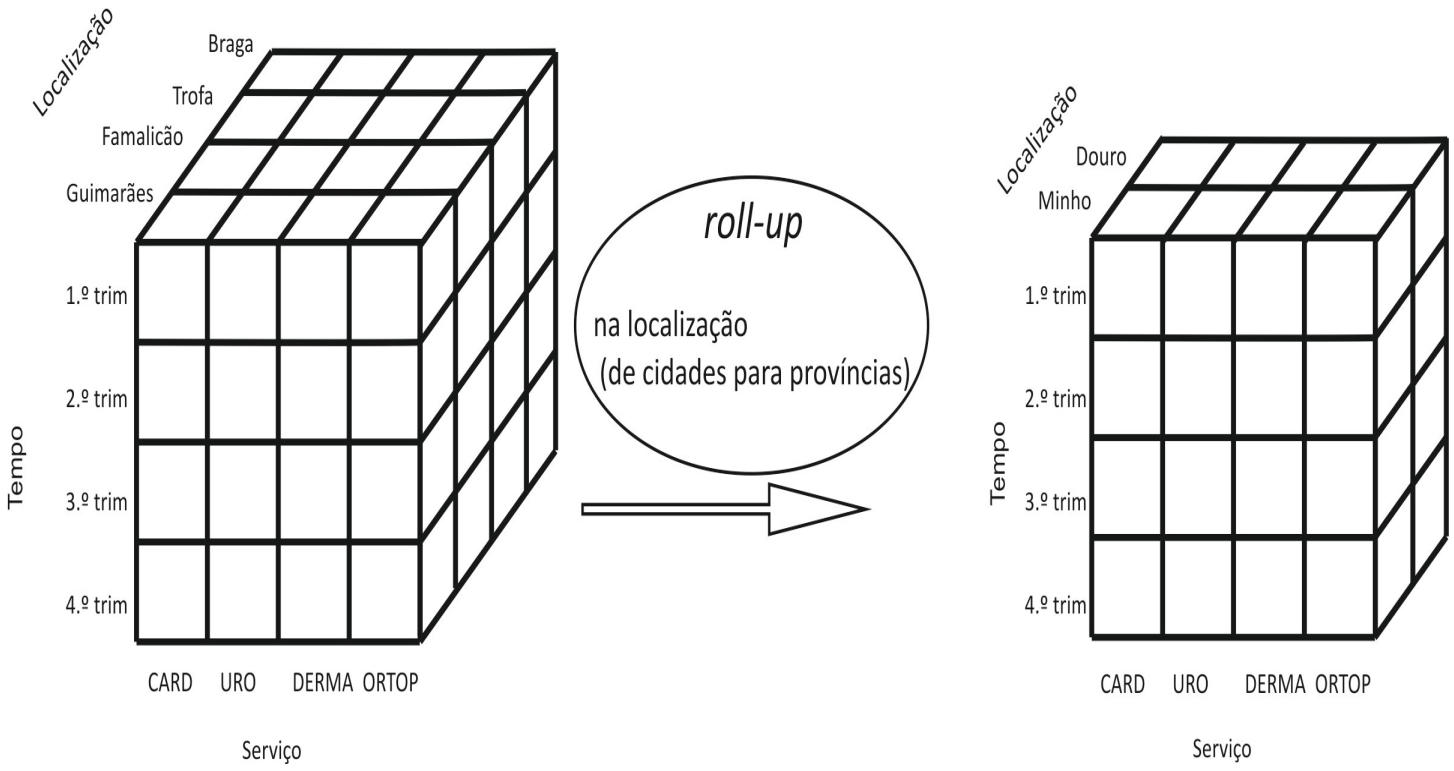
Floco de neve



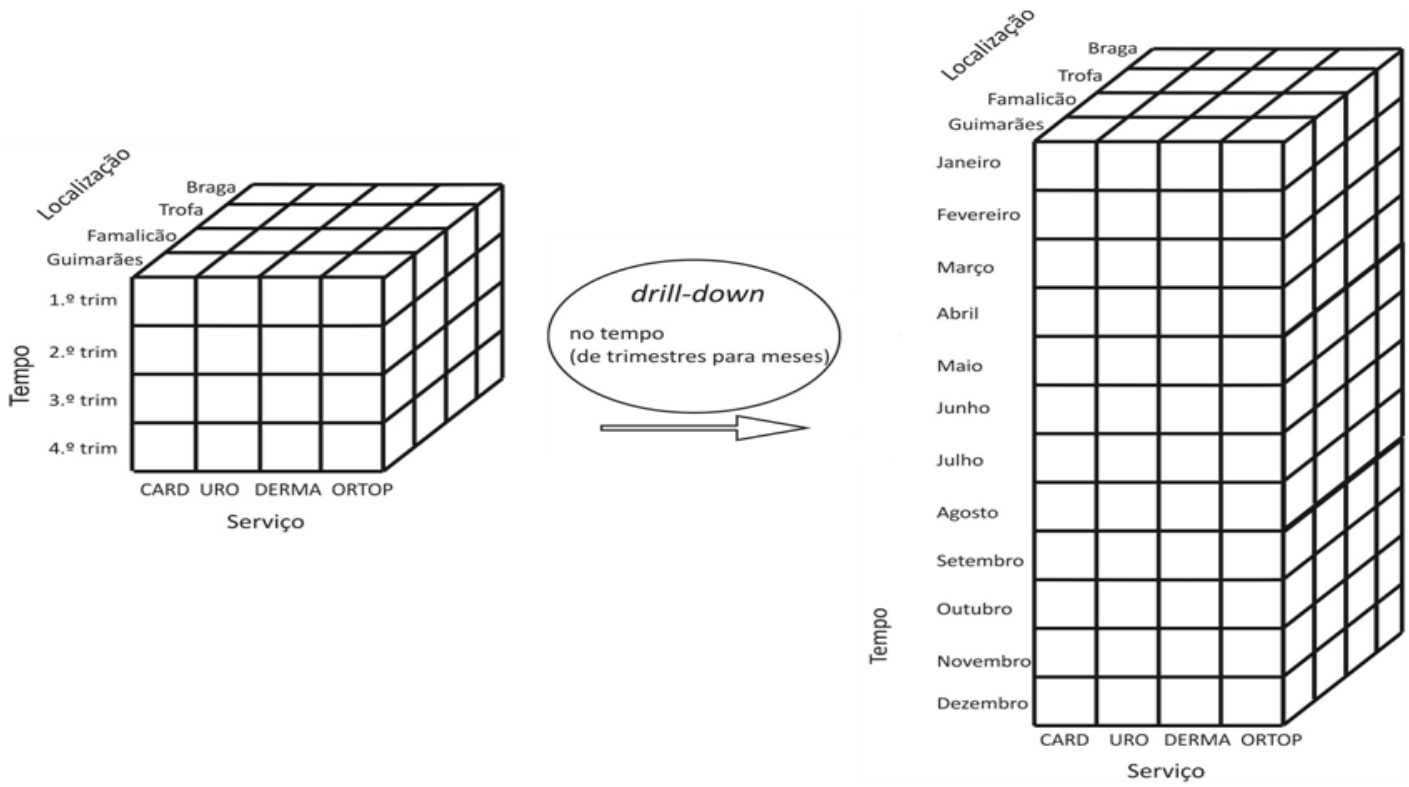
Esquema em constelação



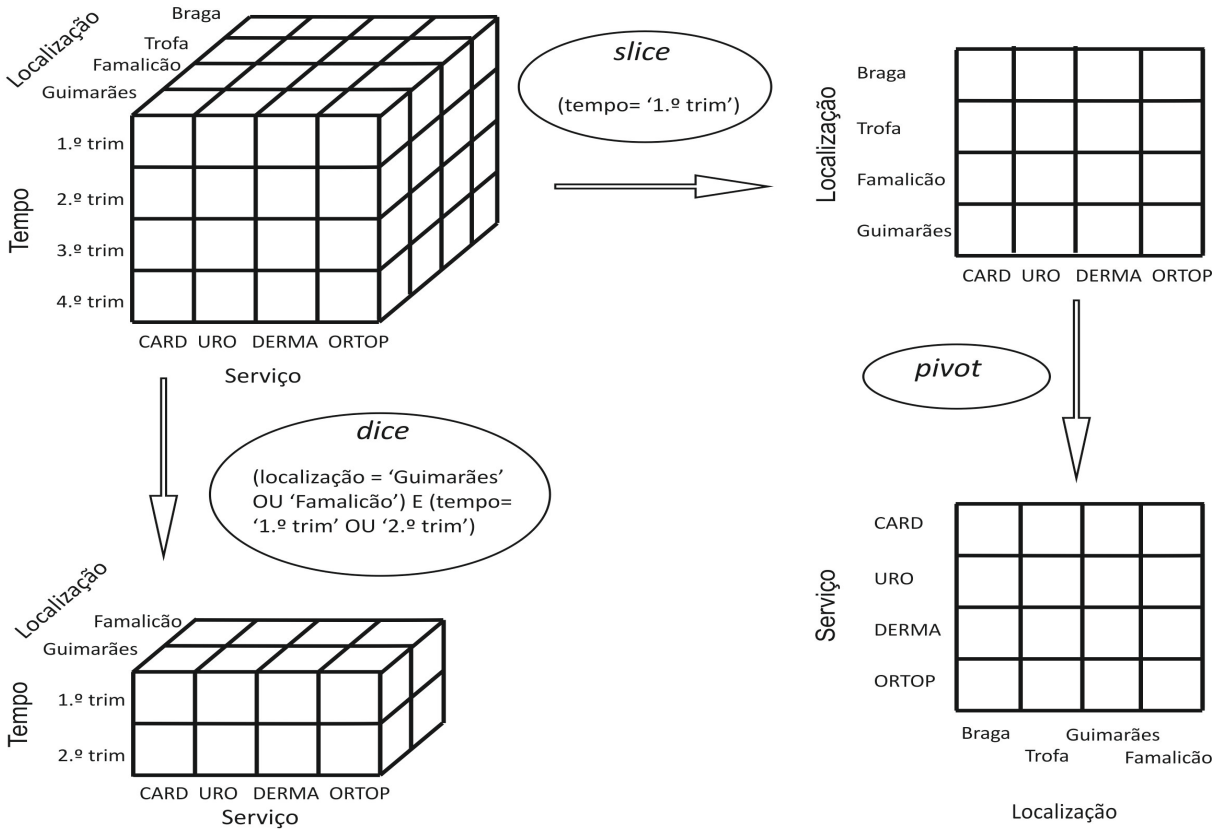
Operações OLAP – Roll-Up



Drill-down


Localização
Braga
Trofa
Famalicão
Guimarães
1.º trim
2.º trim
3.º trim
4.º trim
Tempo
CARD URO DERMA ORTOP
Serviço
drill-down
no tempo
(de trimestres para meses)
Localização
Braga
Trofa
Famalicão
Guimarães
Janeiro
Fevereiro
Março
Abril
Maio
Junho
Julho
Agosto
Setembro
Outubro
Novembro
Dezembro
Tempo
CARD URO DERMA ORTOP
Serviço

Slide, Dice and Pivot



Business Intelligence

Actividades de **obtenção e armazenamento de dados**

+

ferramentas de análise

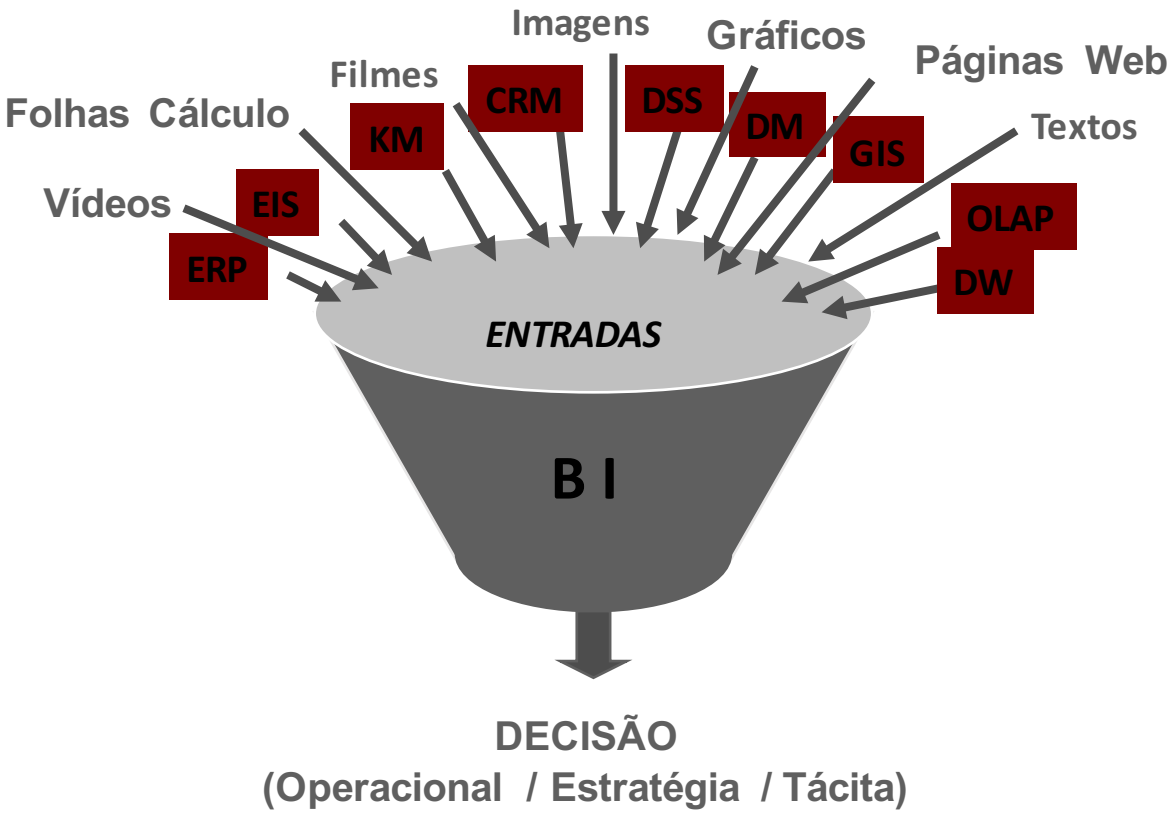
informação complexa e competitiva

suporte da **gestão**, do **planeamento** e da **decisão**

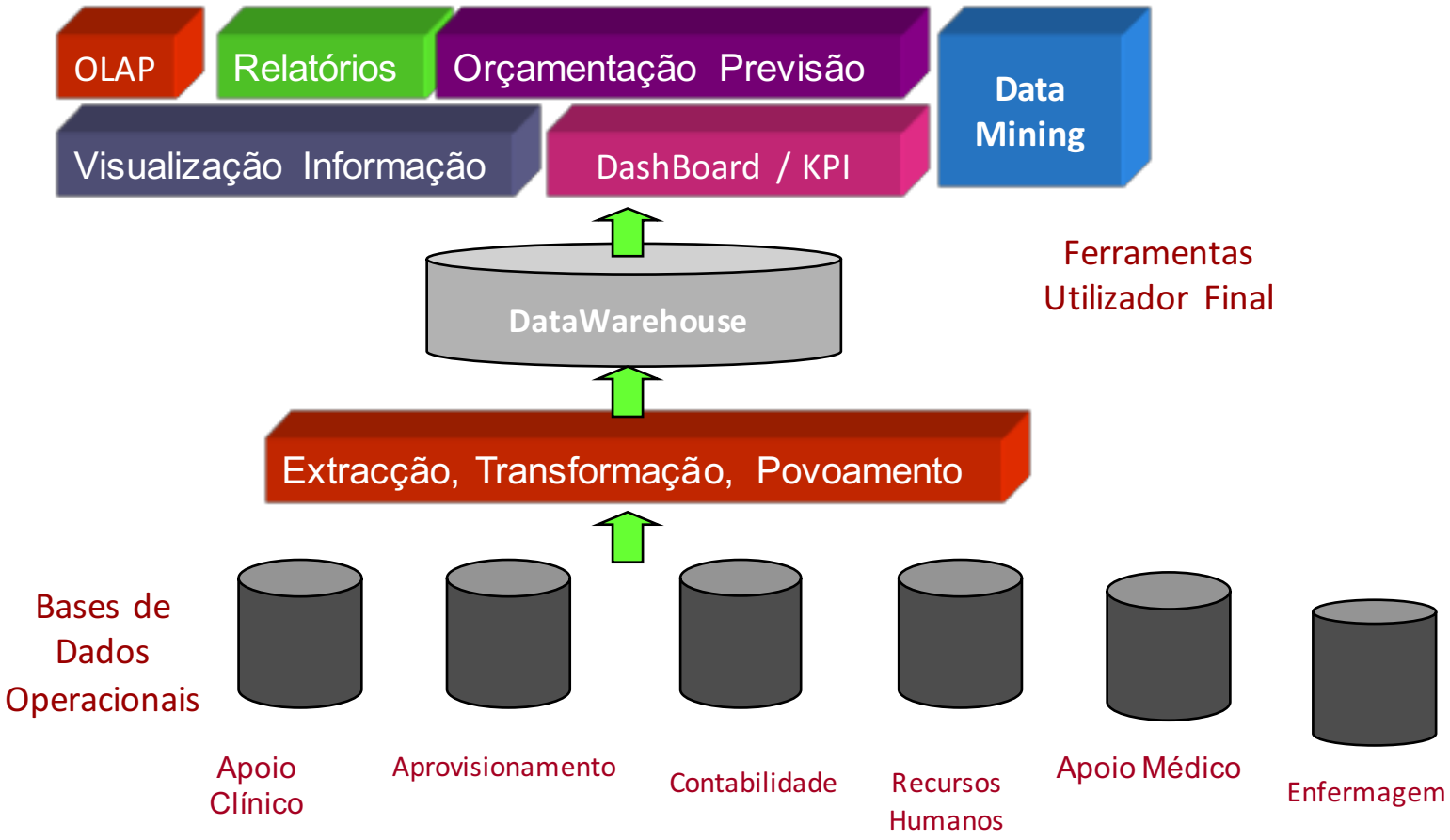
BI

Business Intelligence
Knowledge
Analytics
Data Mining
Data Warehousing
KPI
OLAP
Data Quality
Reporting
Scorecards
Dashboards

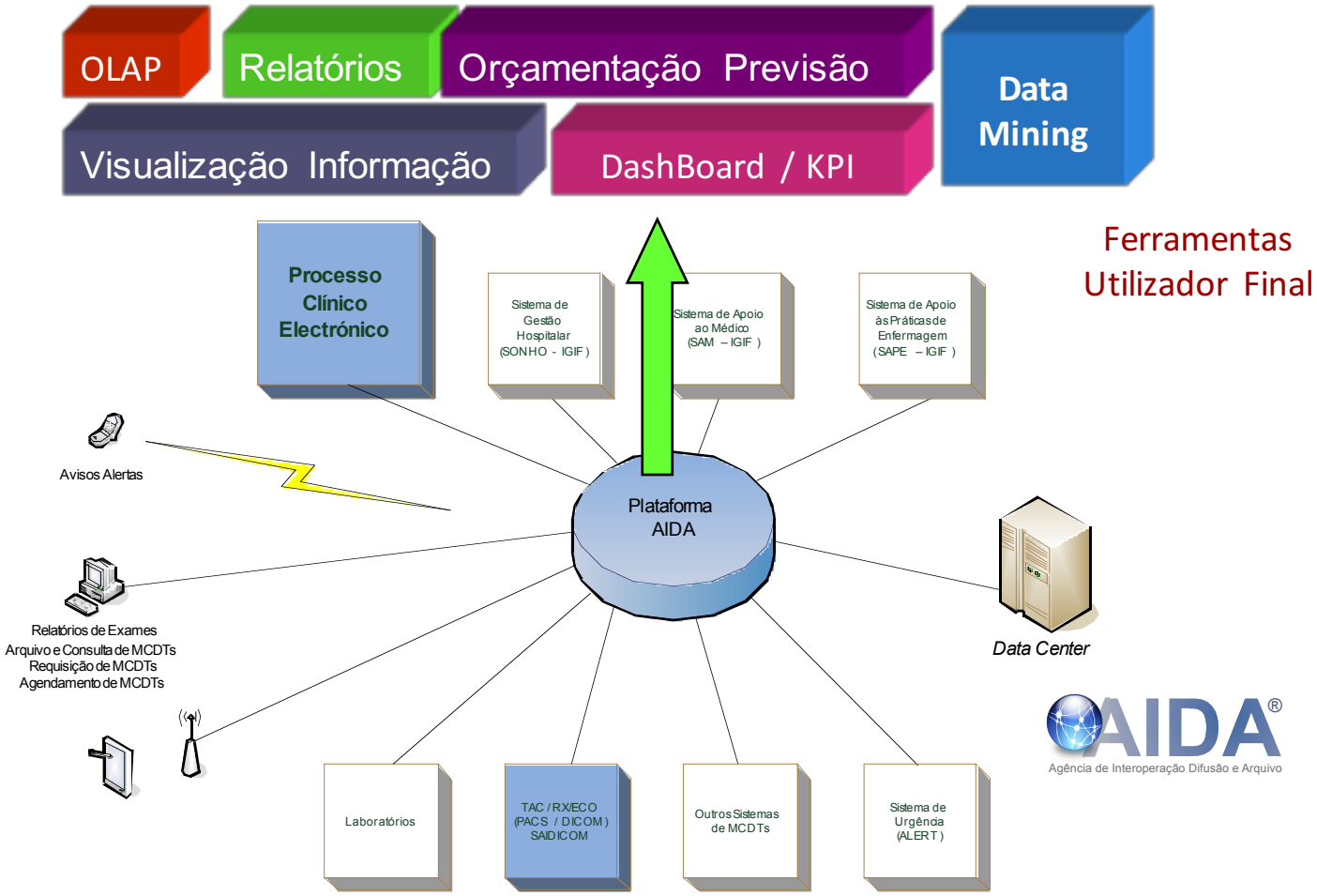
Como se faz o BI?



Como se processa o BI?



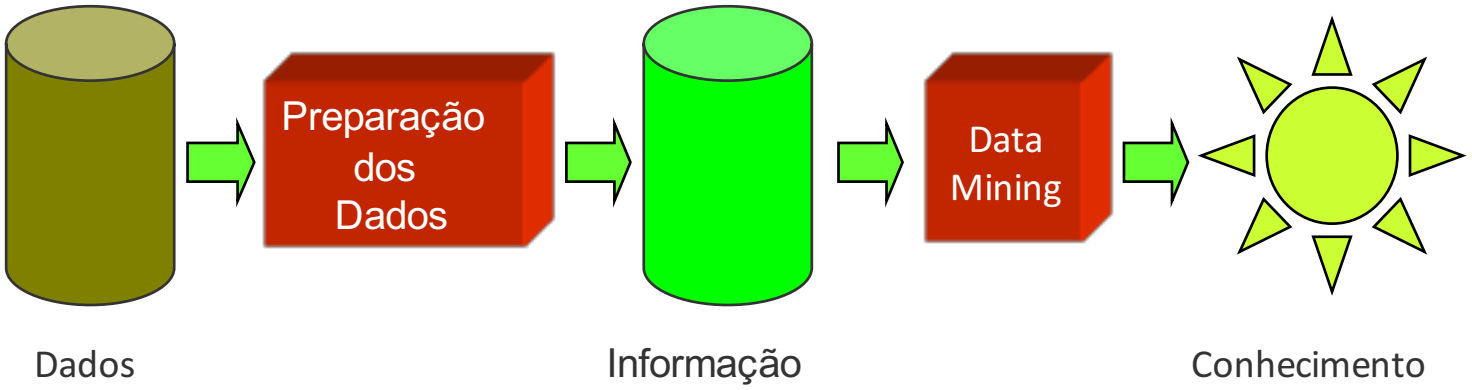
BI



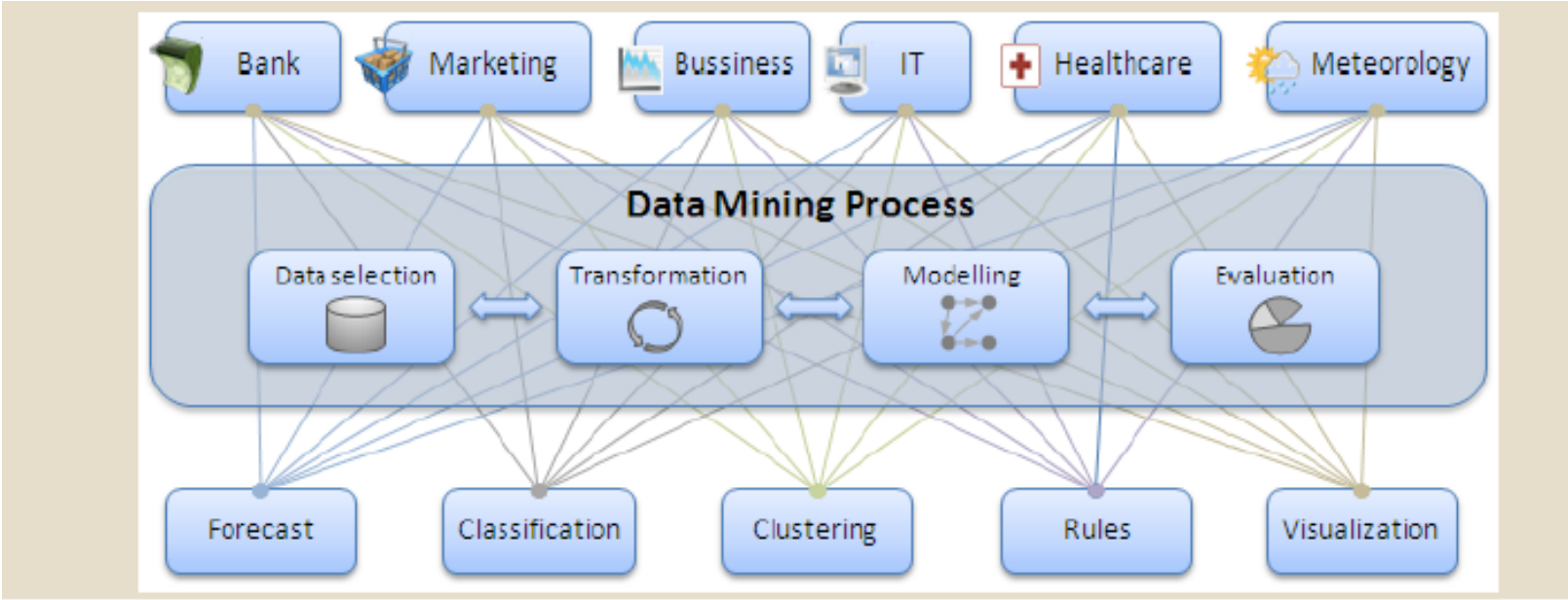
Ferramentas Utilizador Final

AIDA®
Agência de Interoperação Difusão e Arquivo

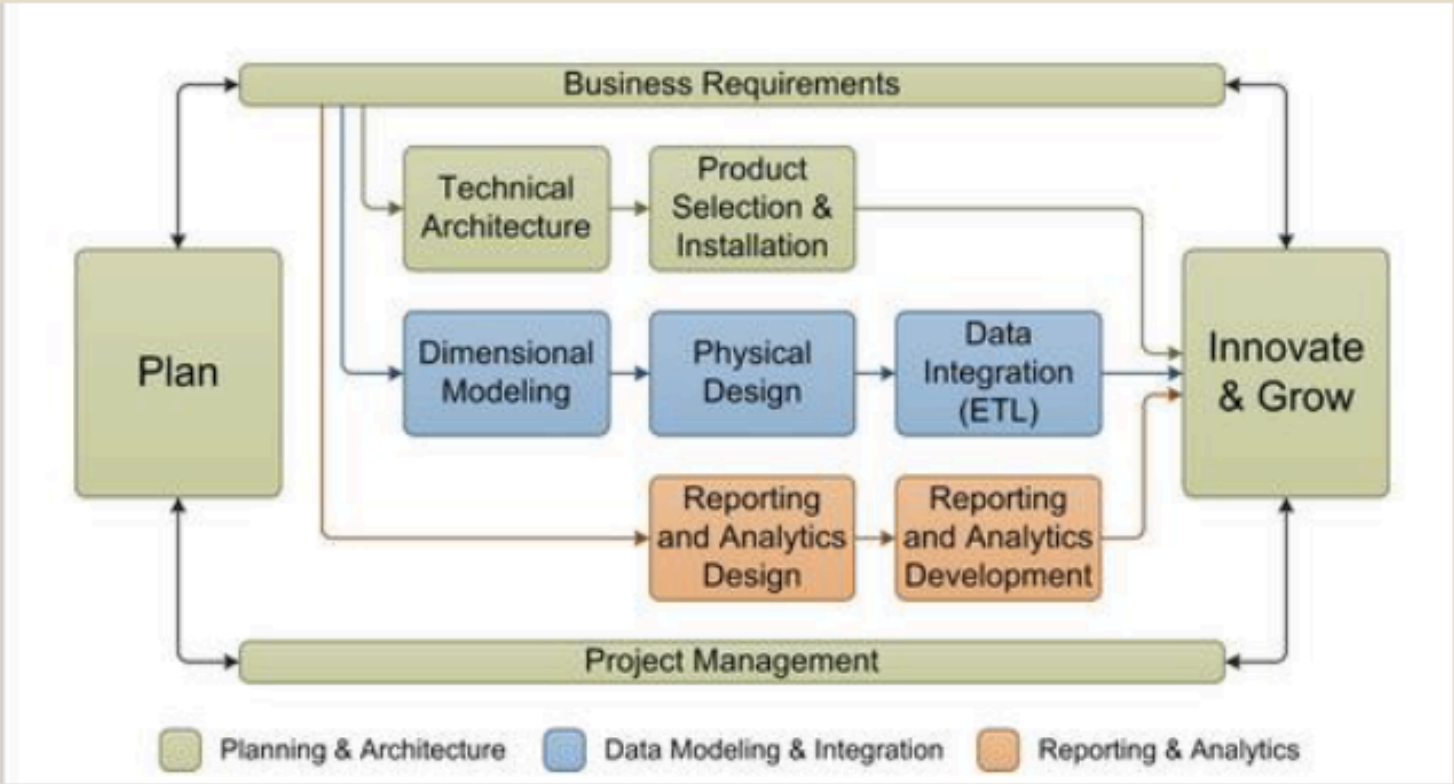
Como Extrair o Conhecimento?



DATA MINING


Bank
Marketing
Bussiness
IT
Healthcare
Meteorology
Data Mining Process
Data selection
Transformation
Modelling
Evaluation
Forecast
Classification
Clustering
Rules
Visualization

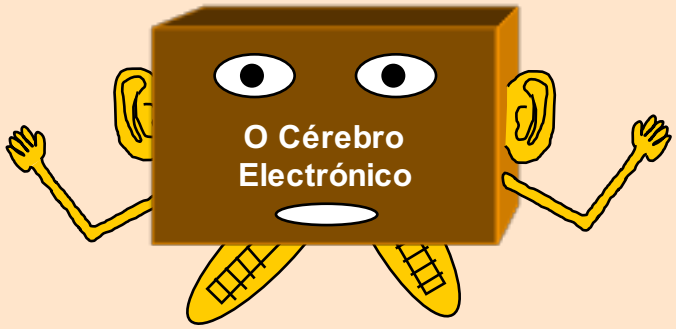
Metodologia de Kimball



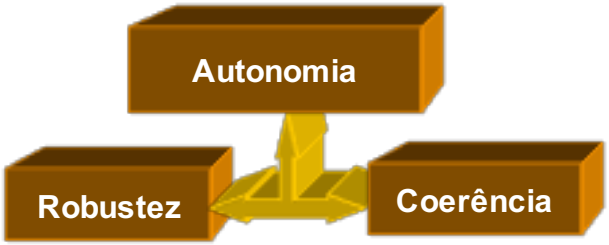
Resolução de Problemas

Evolução verificada nos processos de resolução de problemas e em sistemas inteligentes.

O Paradigma Computacional Tradicional

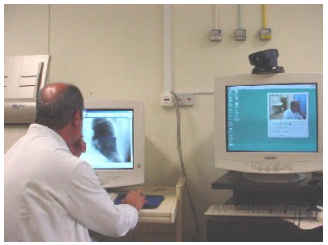


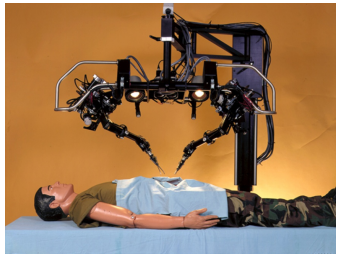
O Paradigma Emergente: Sistemas Inteligentes Embebidos



Inteligência Ambiente

- Interfaces amigáveis / inteligentes
- Interacção Homem-Máquina
- Serviços mais eficientes
- Segurança



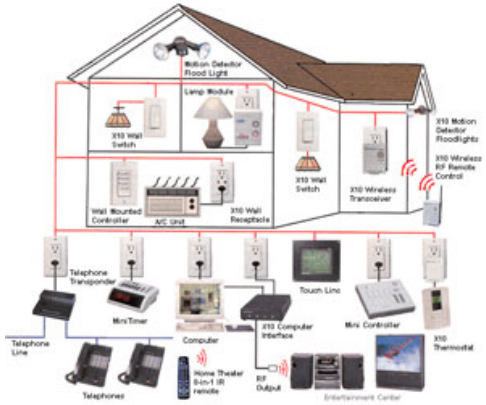


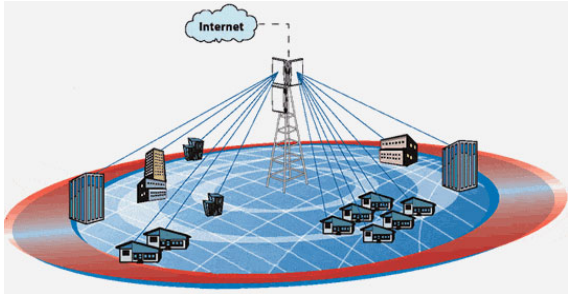
Inteligência Ambiente

Computação úbiqua

Comunicação úbiqua

Interfaces inteligentes





Características

- Sistemas integrados, móveis, distribuídos
- Comunicação espontânea (pro-actividade)
- Interfaces não convencionais, adaptáveis
- Natureza heterogénea

Novos desafios

- Lidar com o Envelhecimento da população
- Lidar com a Falta de recursos
- Assistência / supervisão remota através da interligação de organizações virtuais
- Oferta de serviços (saúde, entretenimento, educação) sem deslocalização e dentro do contexto habitual