

ORACLE®

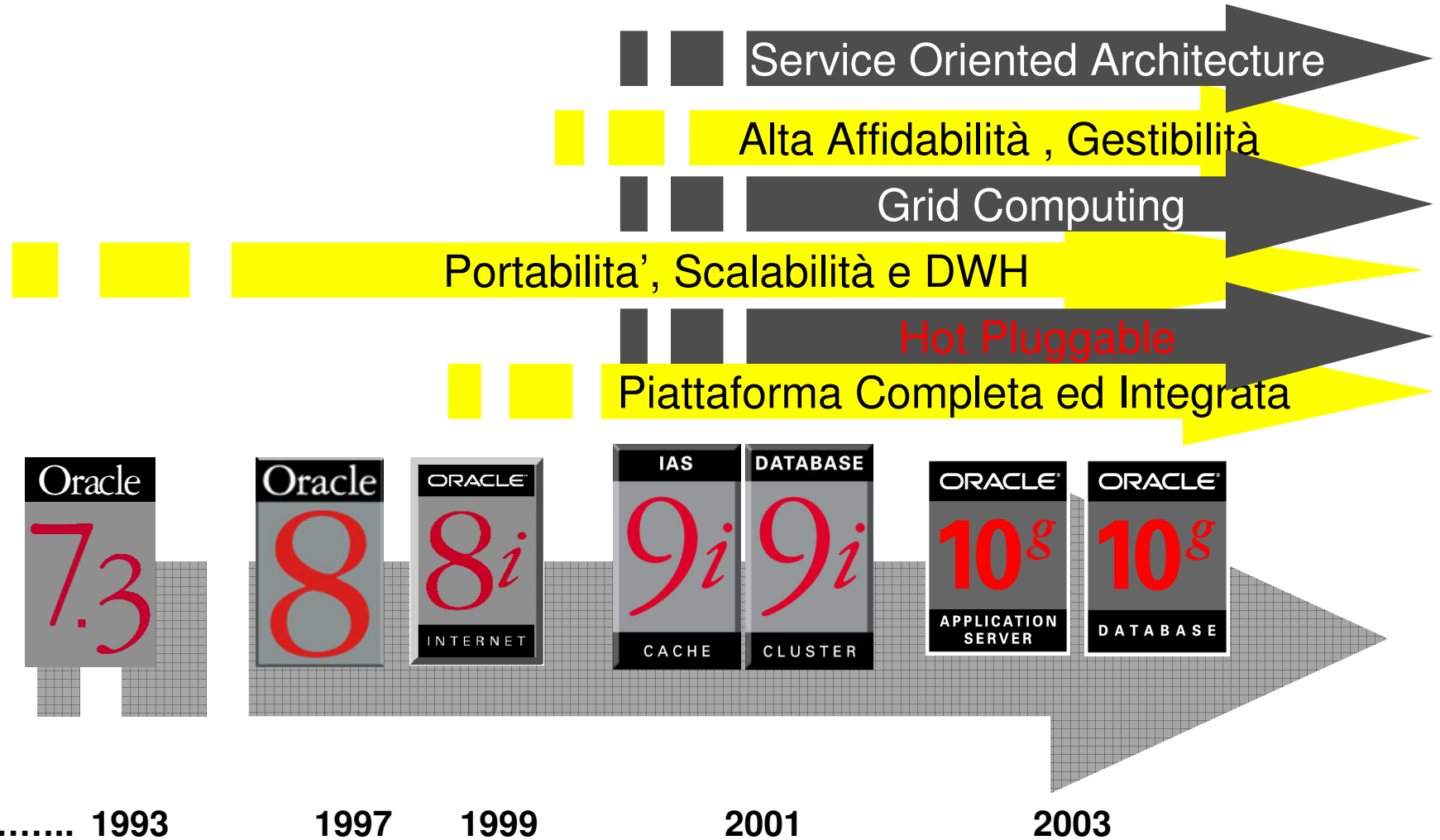


**ORACLE<sup>®</sup>**

**Oracle Technology Strategy**

# Oracle Technology Strategy

*Evoluzione ed innovazione*



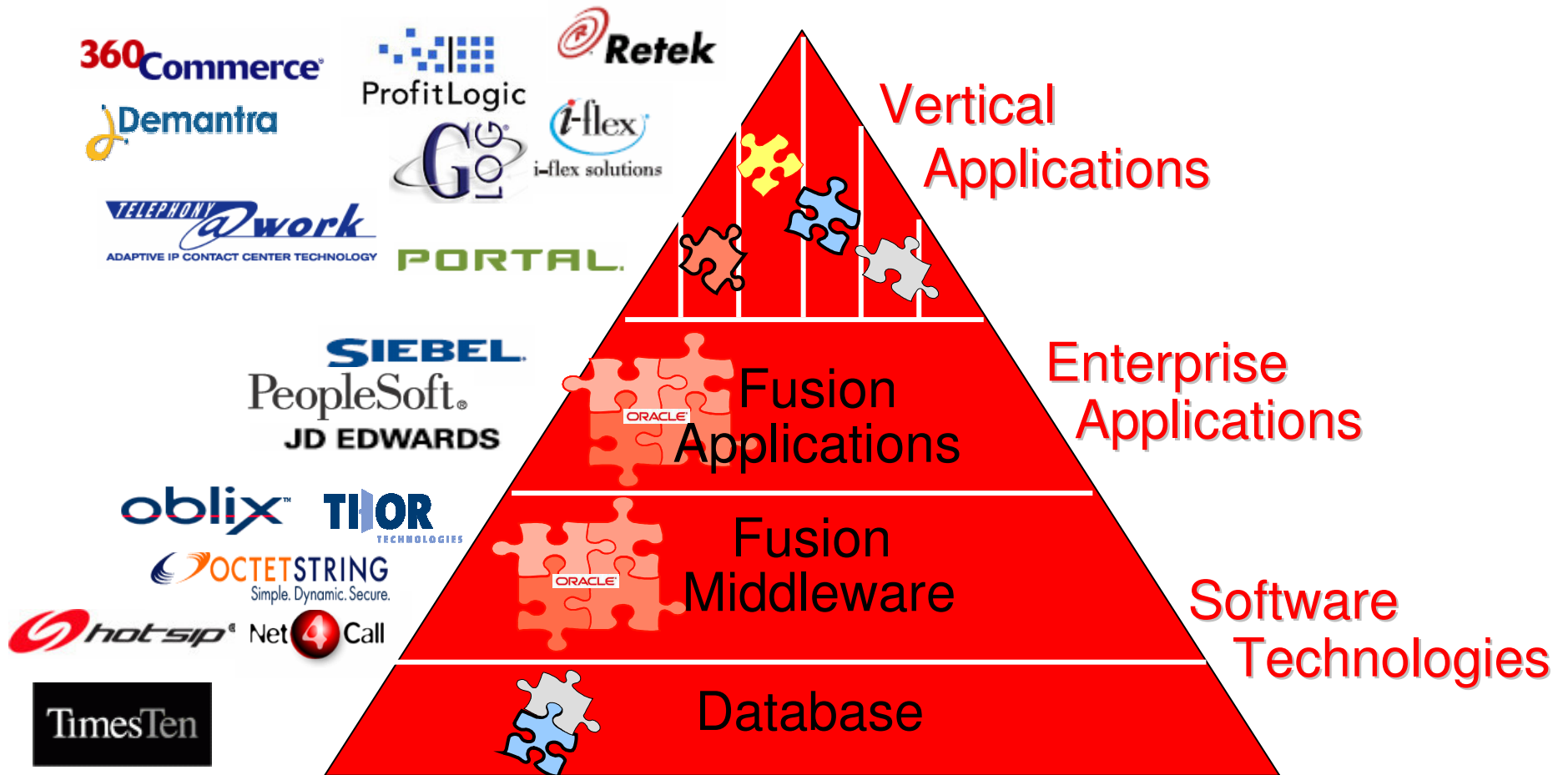


# Oracle 10g: Technology Strategy

*Ridurre la **complessità** e aumentare **l'efficienza** e la **flessibilità** delle infrastrutture IT*

- Piattaforma **completa**, sicura ed integrata
  - Stack completo di componenti per la gestione di ogni tipologia di dato ed applicazione
  - Nativamente integrati
  - Basati su standard e “hot pluggable”
  - Unica infrastruttura per la sicurezza delle applicazioni e dei dati
- Oracle Enterprise **Grid**
  - Ottimizzazione ed efficienza nell'uso delle risorse computazionali
  - Utilizzando applicazioni e i sistemi host esistenti
- **Service Oriented Architecture**
  - Efficienza, flessibilità e rapidità nel disegno delle applicazioni
  - Integrazione delle applicazioni e dei servizi esistenti

# Oracle Strategy & Acquisition



# Fusion Middleware

*Application Platform Suite*

*la soluzione migliore per ambienti Eterogenei*

**HOT PLUGGABLE**

## Development Tools

Eclipse, Borland  
Spring, IntelliJ



## Multi-channel Access

Browsers,  
Wireless, PDAs, RFID..



## Oracle Apps

E-Business Suite  
PeopleSoft  
Siebel  
JDE  
Retek  
Fusion



## System Mgmt

HP Openview  
CA Unicenter  
IBM Tivoli  
BMC



### DEVELOPMENT TOOLS



Modeling,  
Development Tools,  
Frameworks

### COMPOSITION & PROCESS ORCHESTRATION



BPM, ESB, B2B

### INFORMATION AGGREGATION & ANALYSIS



ETL, Hubs, Content Mgmt., BI, BAM

### MANAGEMENT



Systems Management

### ENTERPRISE APPLICATION SERVER



J2EE, WS-\*, Events, Metadata, Registry

### SECURITY



Identity, Services Management

### GRID COMPUTING



Clusters, Resource Management, High Availability

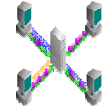
## Other Apps

**SAP**  
Legacy  
ISVs



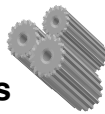
## Partner Systems

RosettaNet, EDI  
Swift, AS2..



## Application Servers

BEA WebLogic AS     .Net  
IBM WebSphere AS     JBoss



## Databases

Oracle     IBM DB/2  
Sybase     Informix



## TP Monitors, Messaging

Tuxedo     MQ, Sonic  
CICS, IMS     Tibco



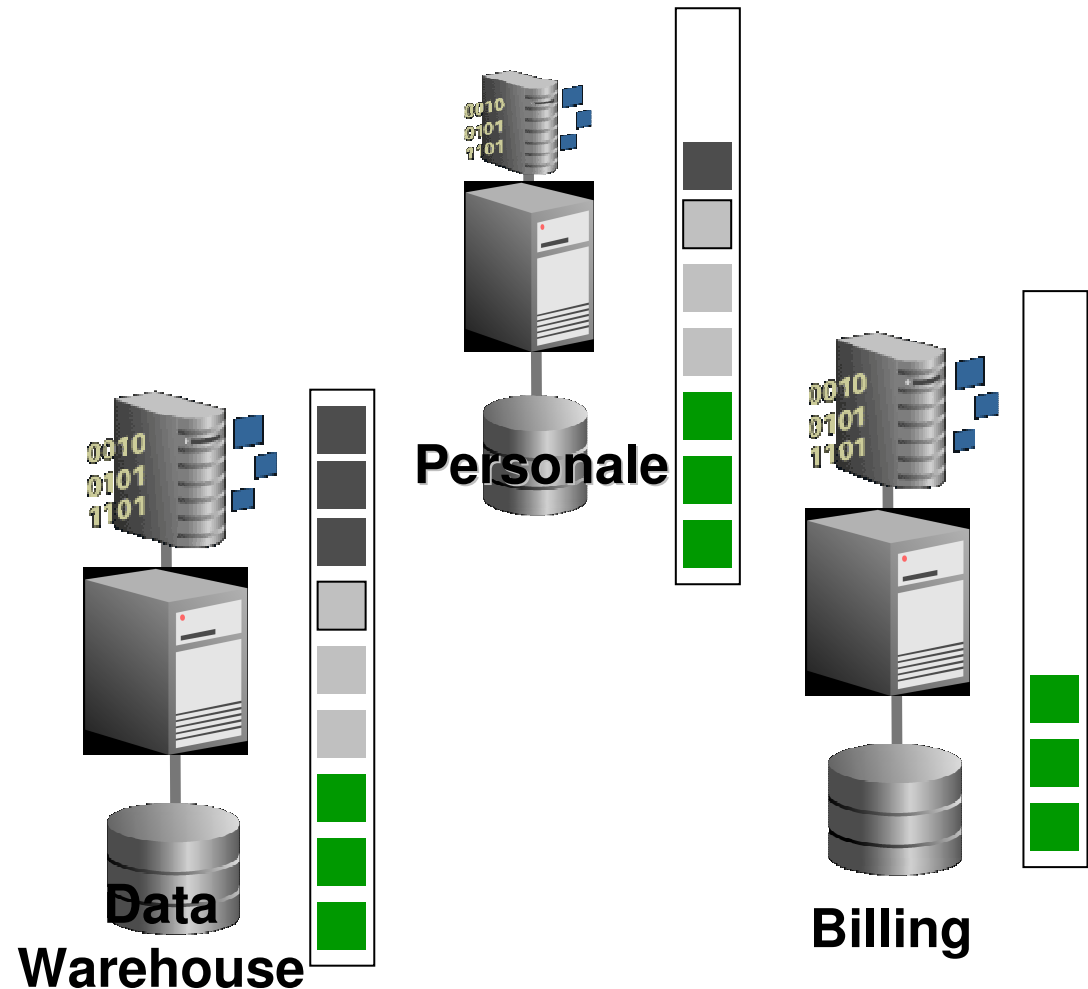
## IM Systems

Microsoft AD  
Sun LDAP



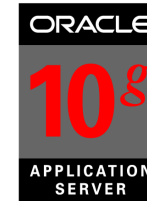
# Il problema: Isole applicative

- **Uso inefficace delle risorse**
  - Risorse sottoutilizzate
  - Configurate per i picchi
  - Alti costi HW/SW
- **Disponibilità limitata**
  - Single Point of Failure
- **Scalabilità limitata**
- **Sicurezza frammentata**
- **Elevati Costi di Gestione**

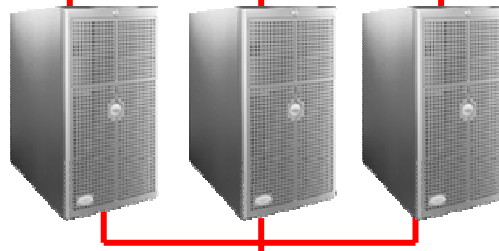


# Oracle Enterprise Grid

Application Server Clusters



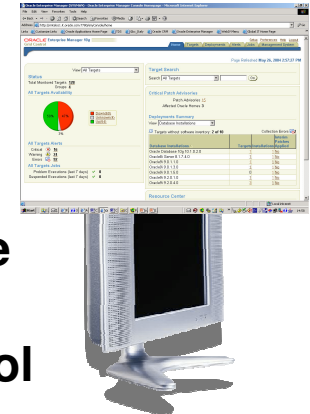
Real Application Cluster



Automatic Storage Management

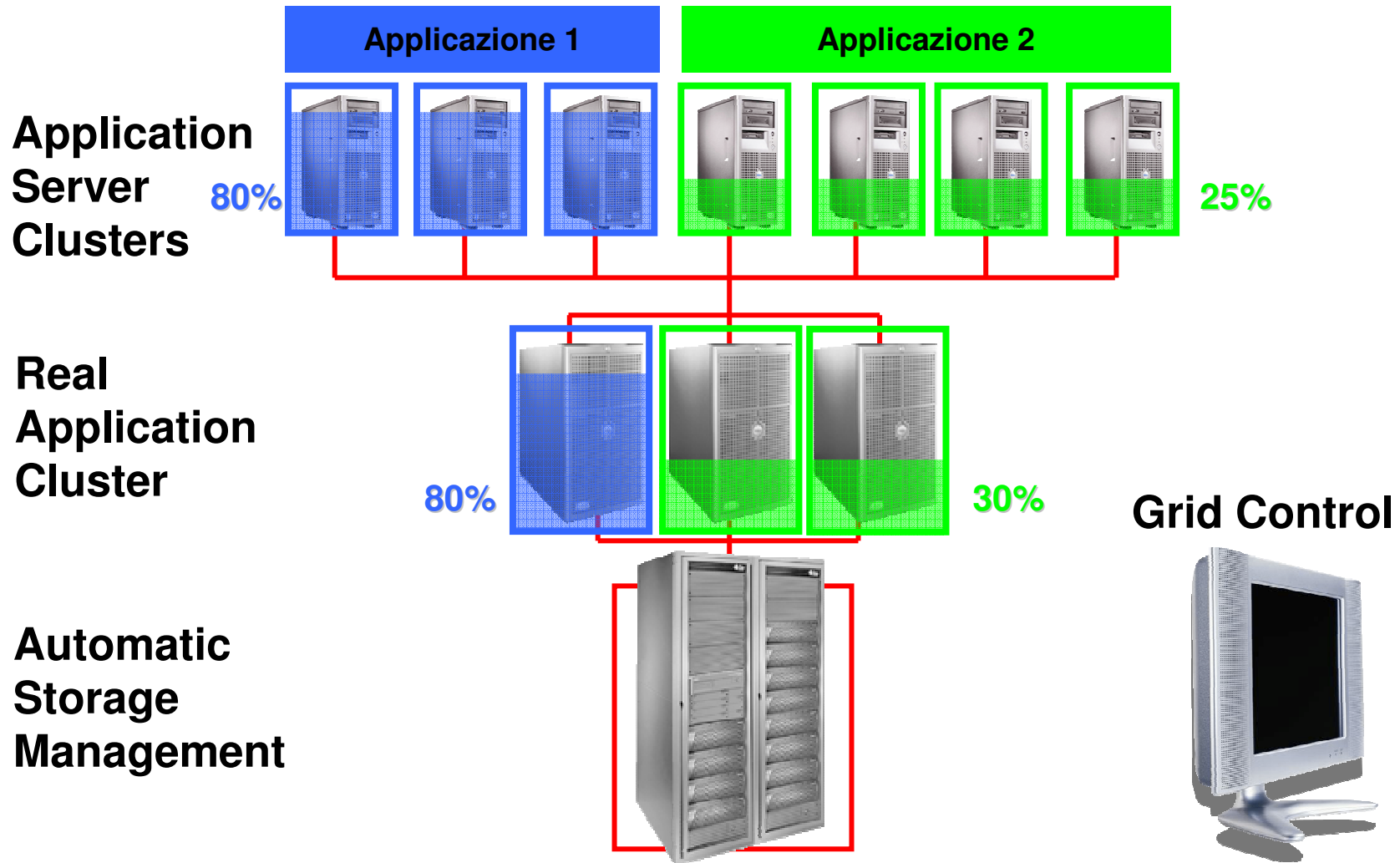


Oracle Enterprise Manager Grid Control

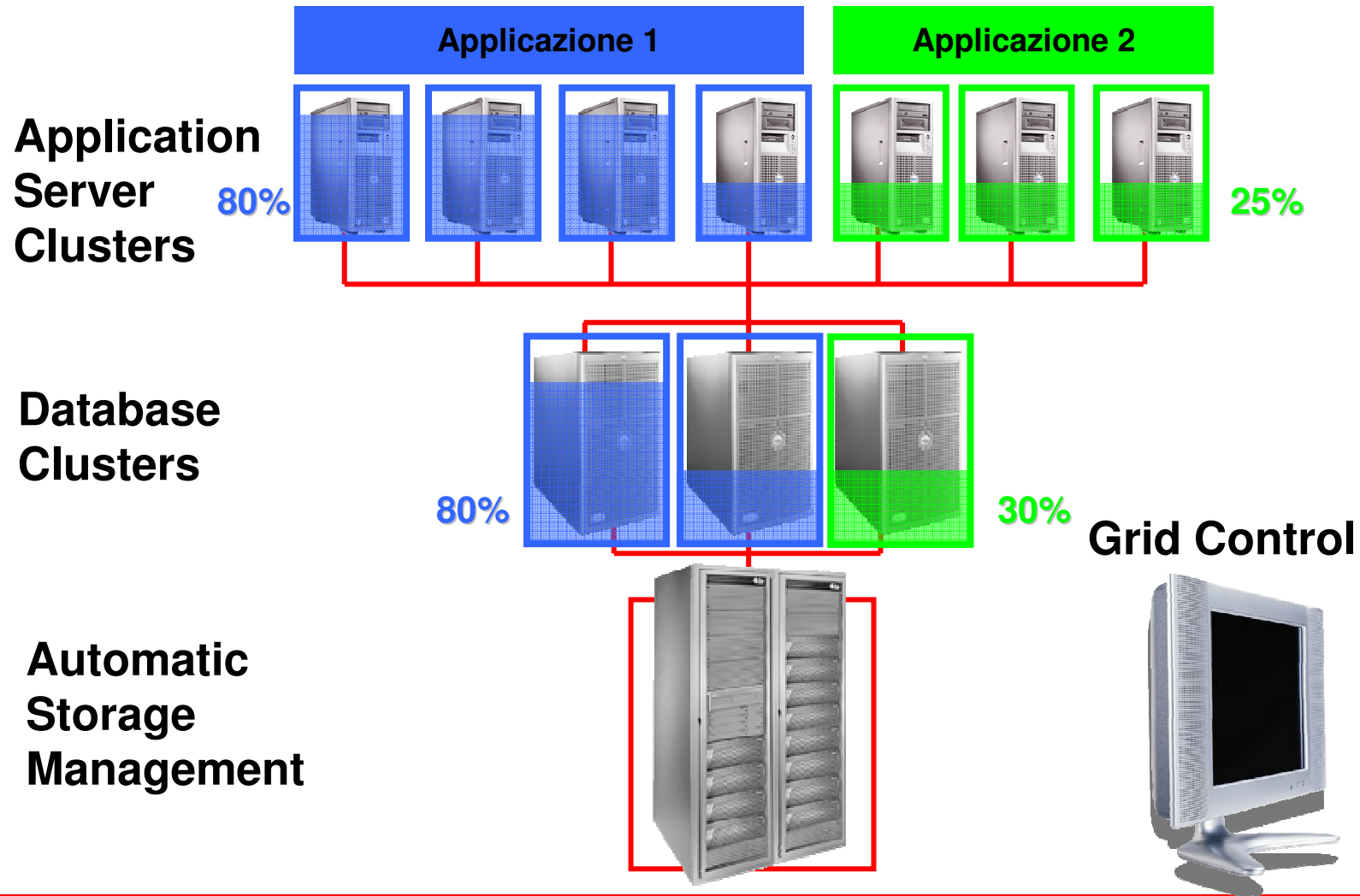




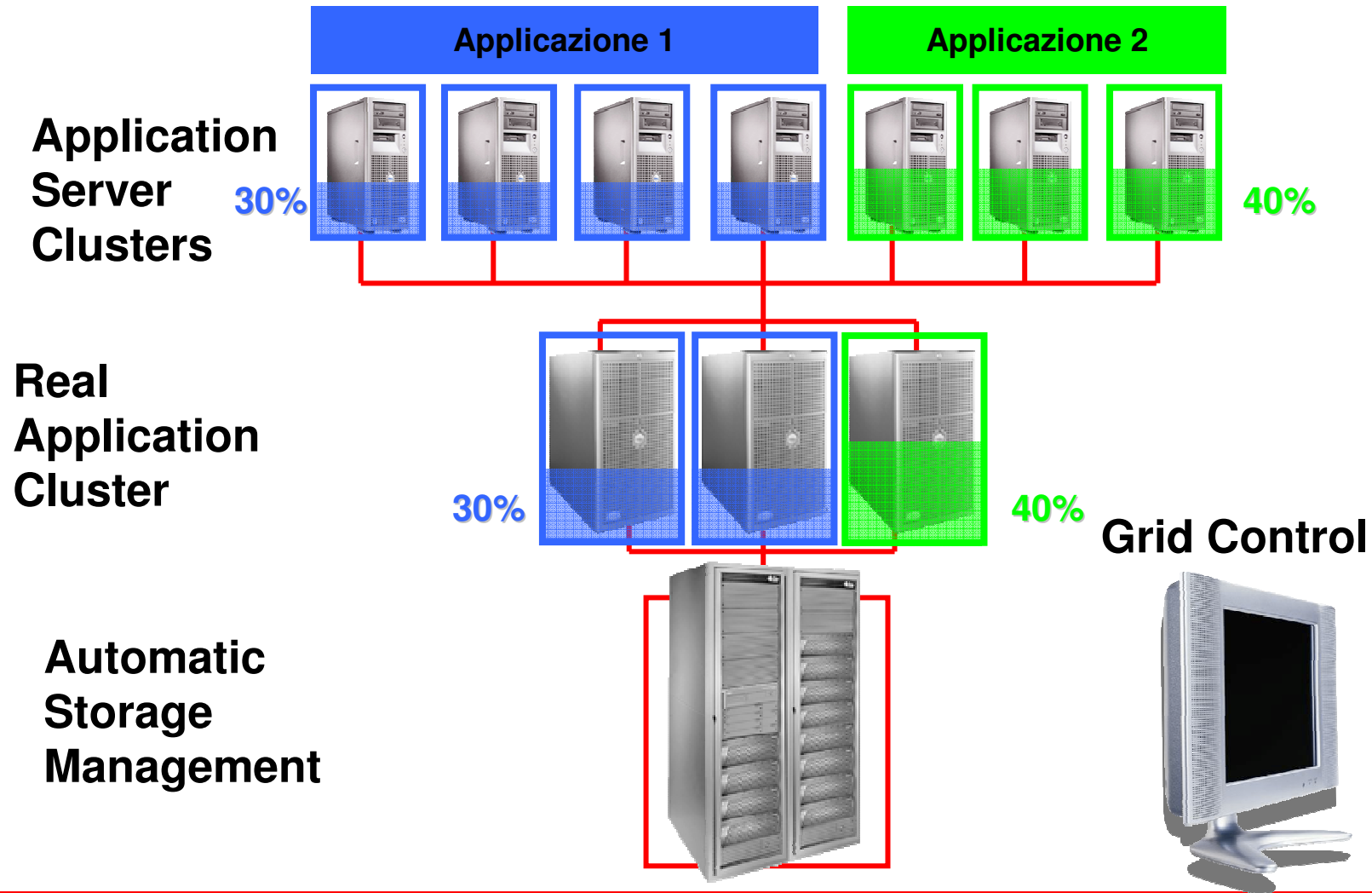
# Oracle Enterprise Grid



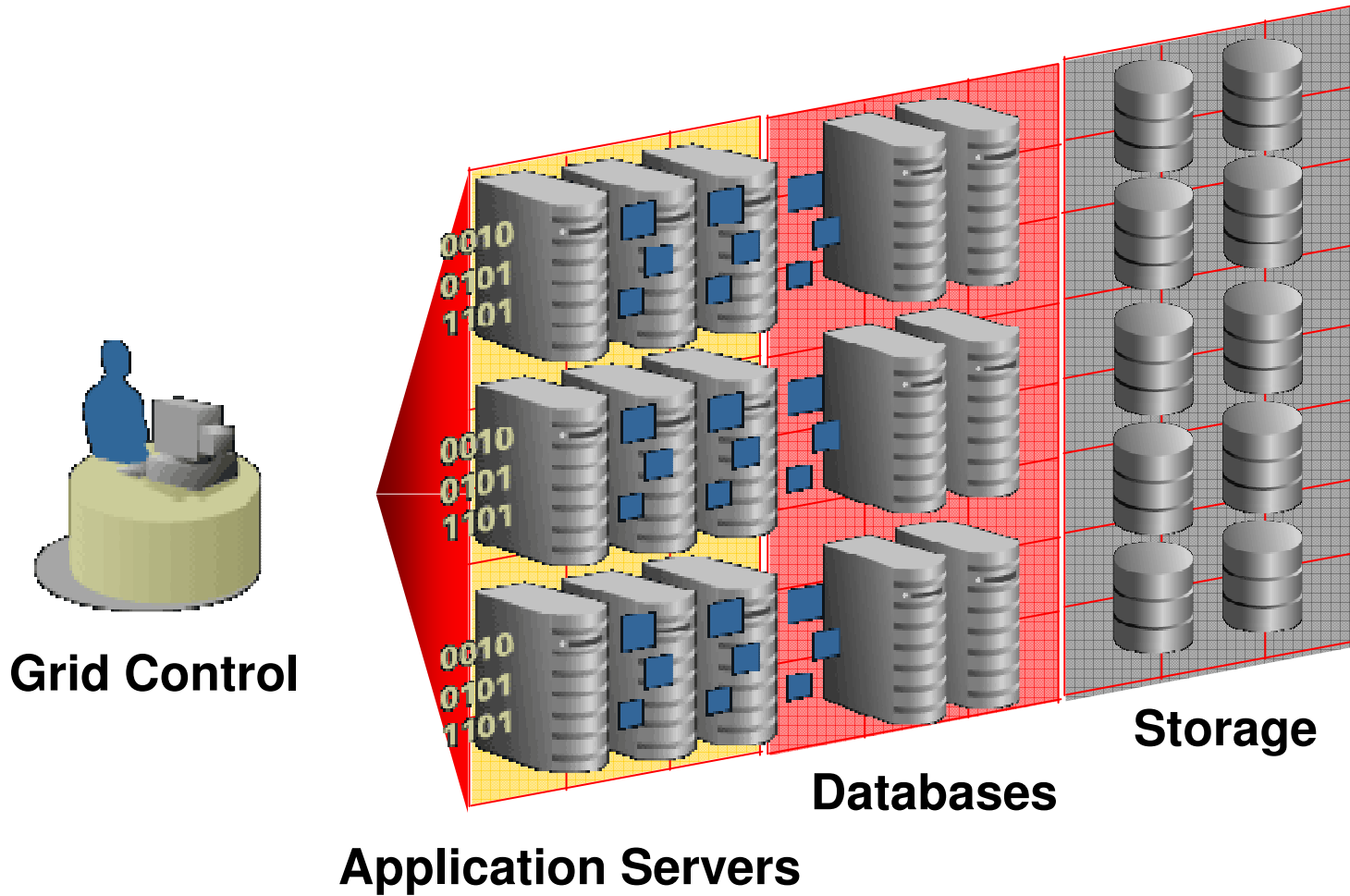
# Oracle Enterprise Grid



# Oracle Enterprise Grid

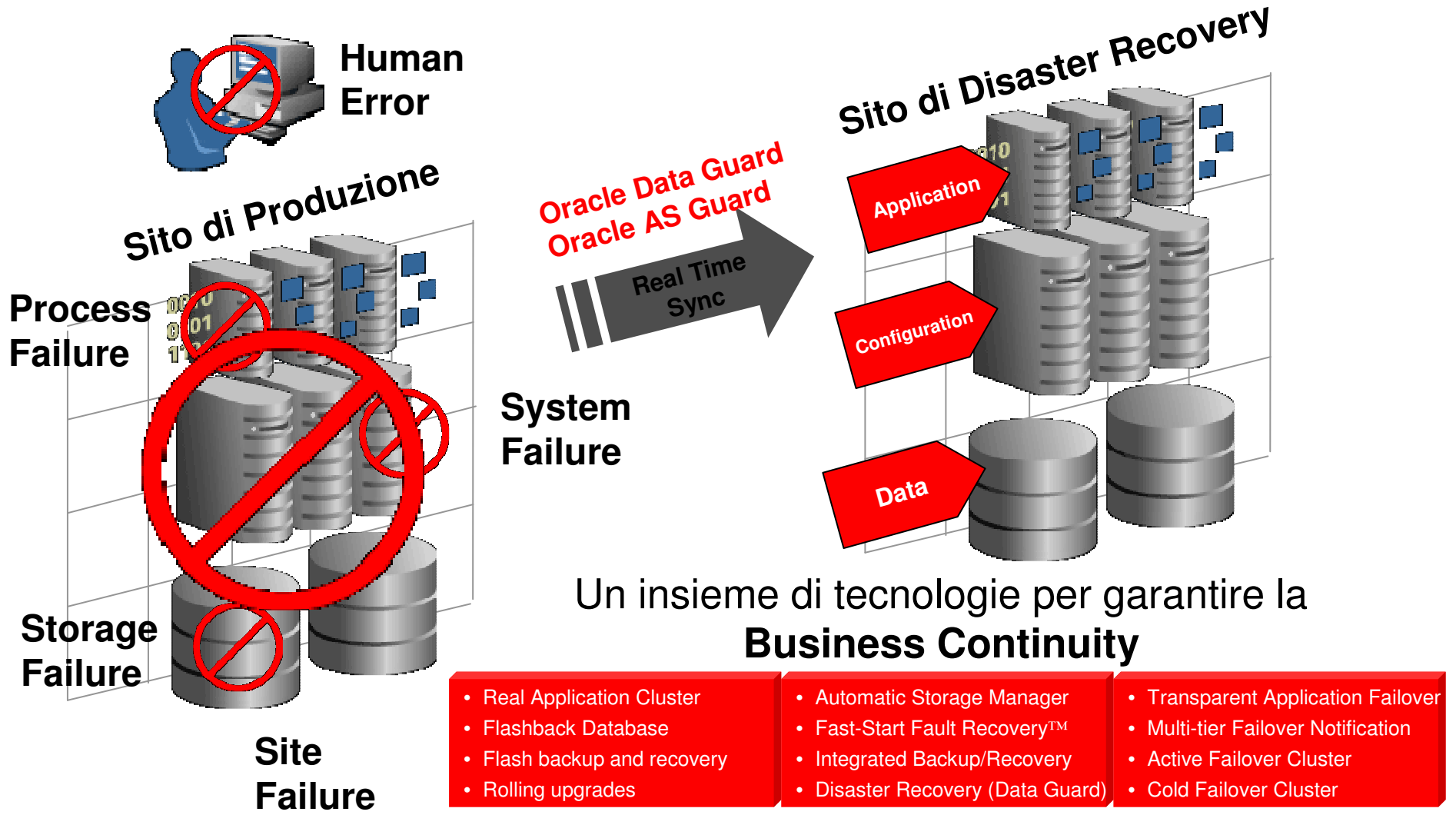


# Oracle Grid Computing



# Business Continuity

*protezione da ogni possibile "guasto"*

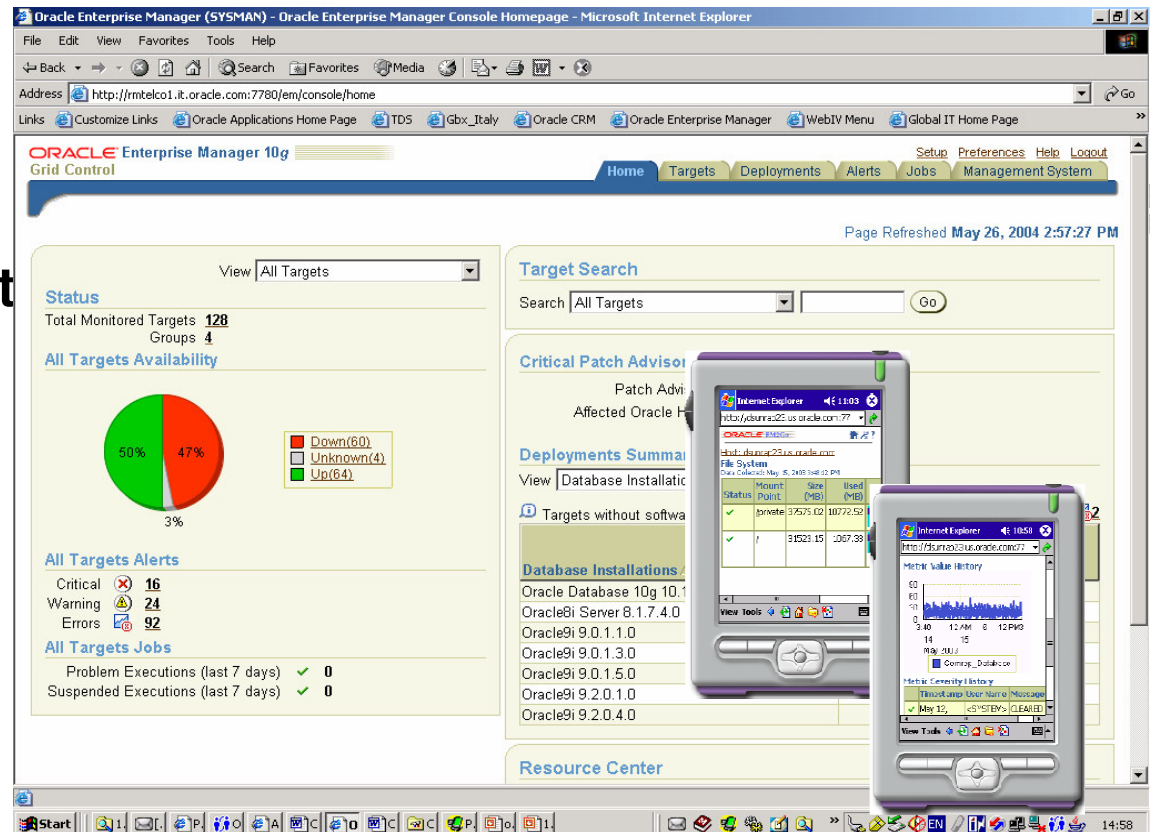


# Oracle Enterprise Manager 10g

## Grid Control

Console Web per il governo dell'intero "Ecosistema"

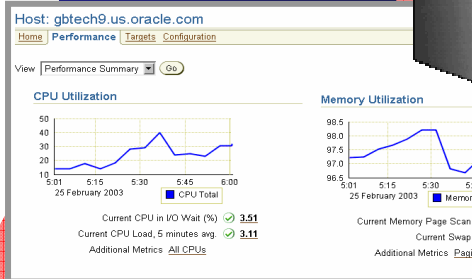
- Monitoring
- Diagnostic
- Tuning
- Configuration Management
- Application Service Level Management



# Facilità di Gestione

Multi Tool di System Mgmt – Una Sola Console

## Host and Hardware



## Database

State

Active Sessions	19
SQL Response Time (%)	<b>83.87</b> (compared to baseline)
Bad SQL	<b>11</b>
Top SQL Report	238
Duplicate SQL	<b>738</b>
Latest Alert Log Entry	No ORA- errors

## Appl. Server

Application Server: ias902.dlsun1641.us.oracle.com

View | Top Applications by Average Servlet/JSP Processing Time

Name	OC4J Instance	Total Processing Time (seconds)	Average Servlet/JSP Processing Time (seconds)	Servlet/JSP Requests Processed	Servlet Process Time (sec)
hrapp	home	167.28	12.69	11	11
default	home	562.77	0.17	3,235	5

## Administration Monitoring Provisioning Security

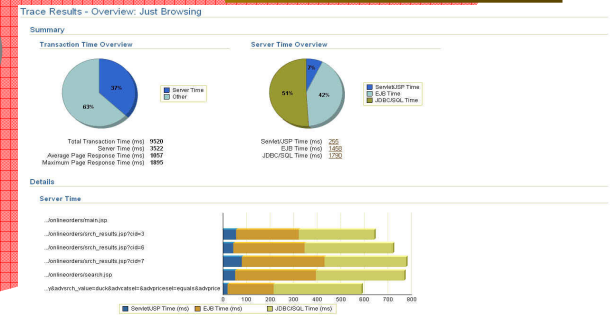
Enterprise Manager

## Network and Load Balancer

Alerts

Metric	Transaction	Severity
Packets Dropped (%)	mail.us.oracle.com	<b>X</b>
Status	mail.us.oracle.com	<b>X</b>

## Applications



## Storage

Qtrees (ordered by Used (%))

Status	Name	Volume	Total(GB)	Used(GB)	Used (%)
<b>X</b>	slot3	db04	60.0	58.82	98.03
<b>X</b>	edw_top	apptop04	250.0	231.48	92.59
<b>!</b>	local_backup	backup04	250.0	219.68	87.87
<b>!</b>	opn_top	apptop04	350.0	298.85	85.39
<b>✓</b>	slot1	db04	60.0	48.51	80.85
<b>✓</b>	slot2	db04	60.0	47.92	79.87
<b>✓</b>	slot4	db04	60.0	47.65	79.41
<b>✓</b>	arubackup	backup04	100.0	62.67	62.67
<b>✓</b>	ap981sun	apptop04	50.0	26.3	52.61

# Oracle Security Strategy

## “Protected Enterprise”



**Proteggere i dati nel punto in cui risiedono e dove transitano**

**Data Privacy, Integrity, Availability**

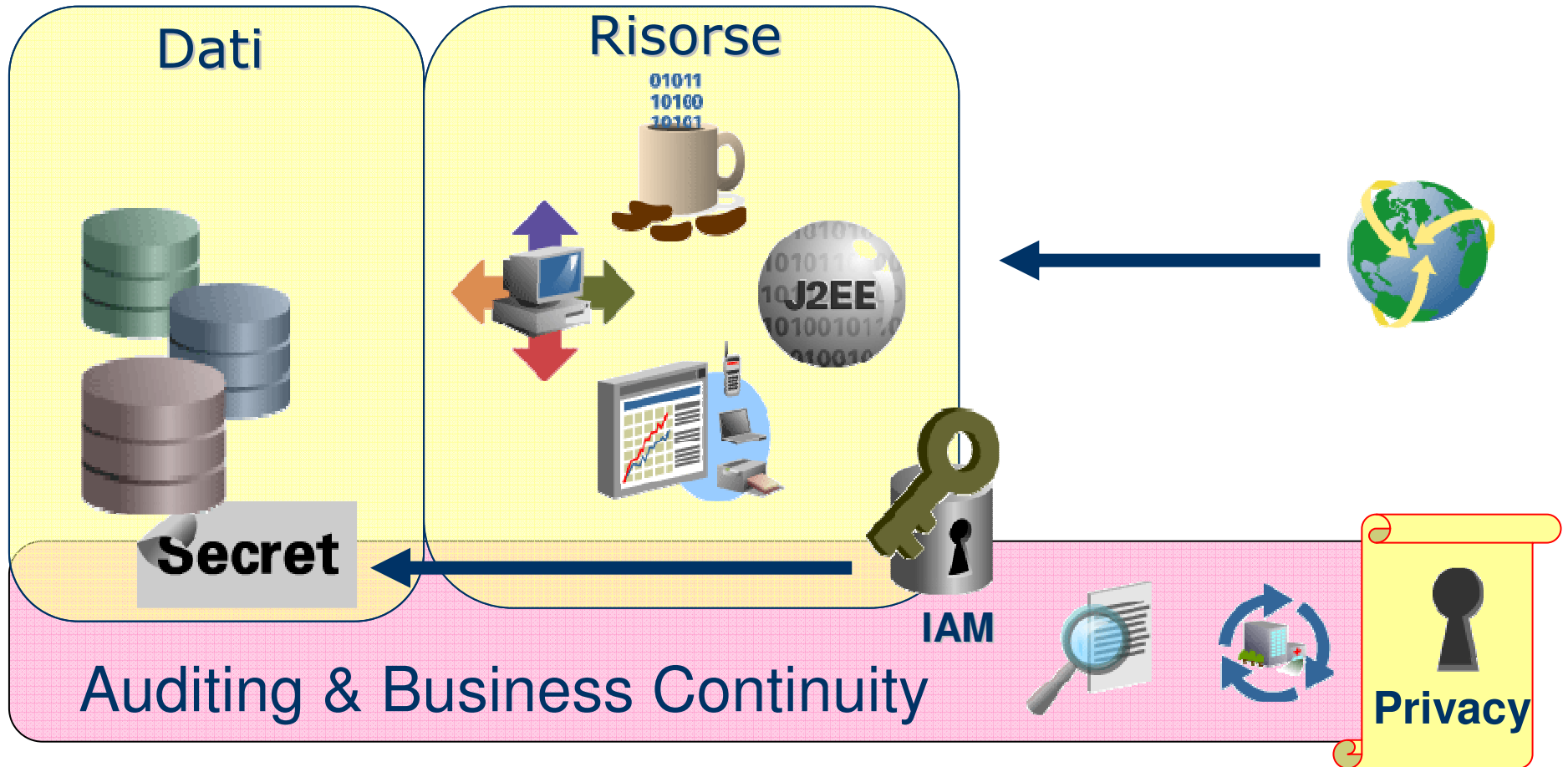


**Governare le modalità di accesso alle informazioni ed ai servizi**

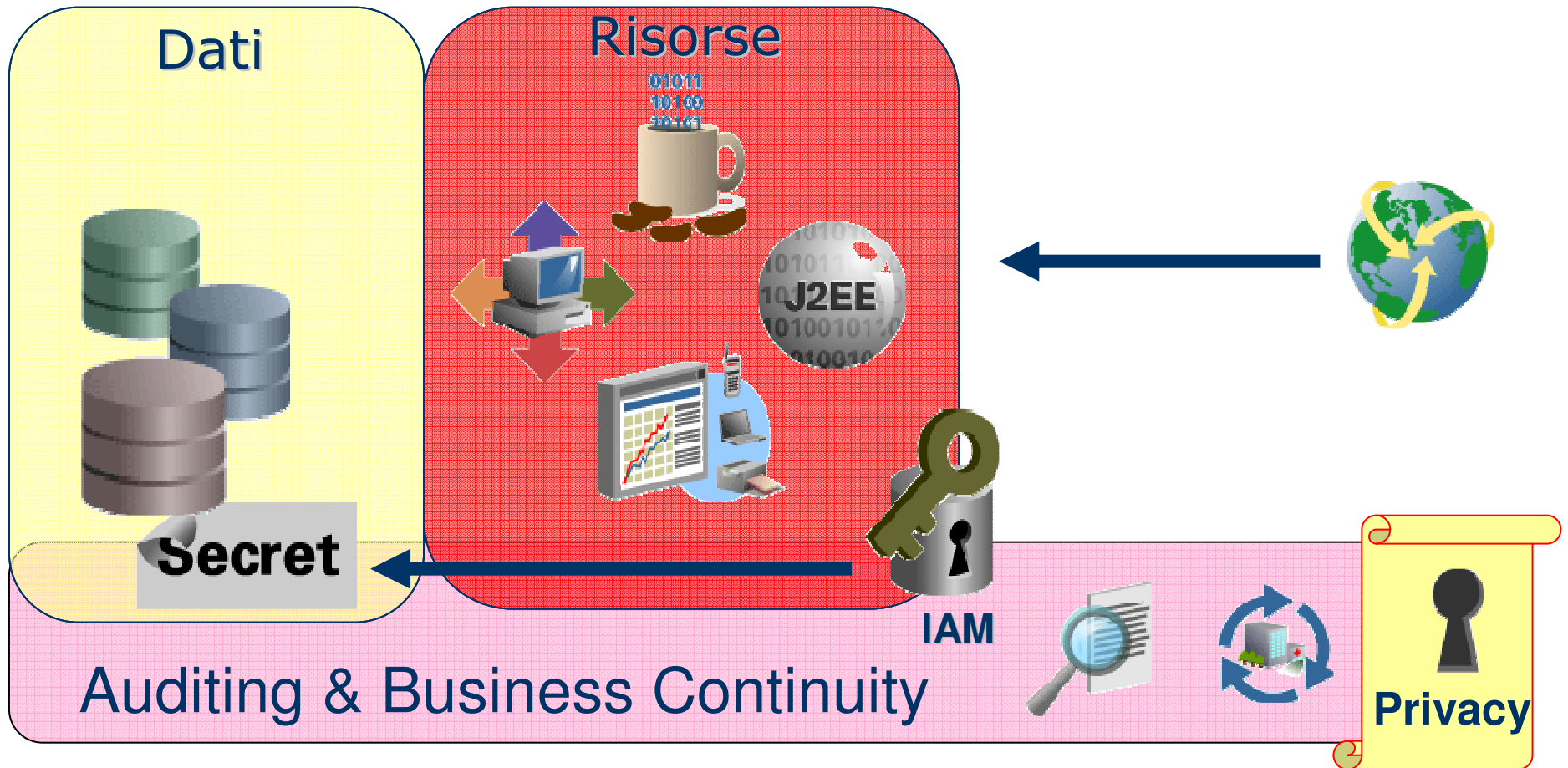
**Identity & Access Management**



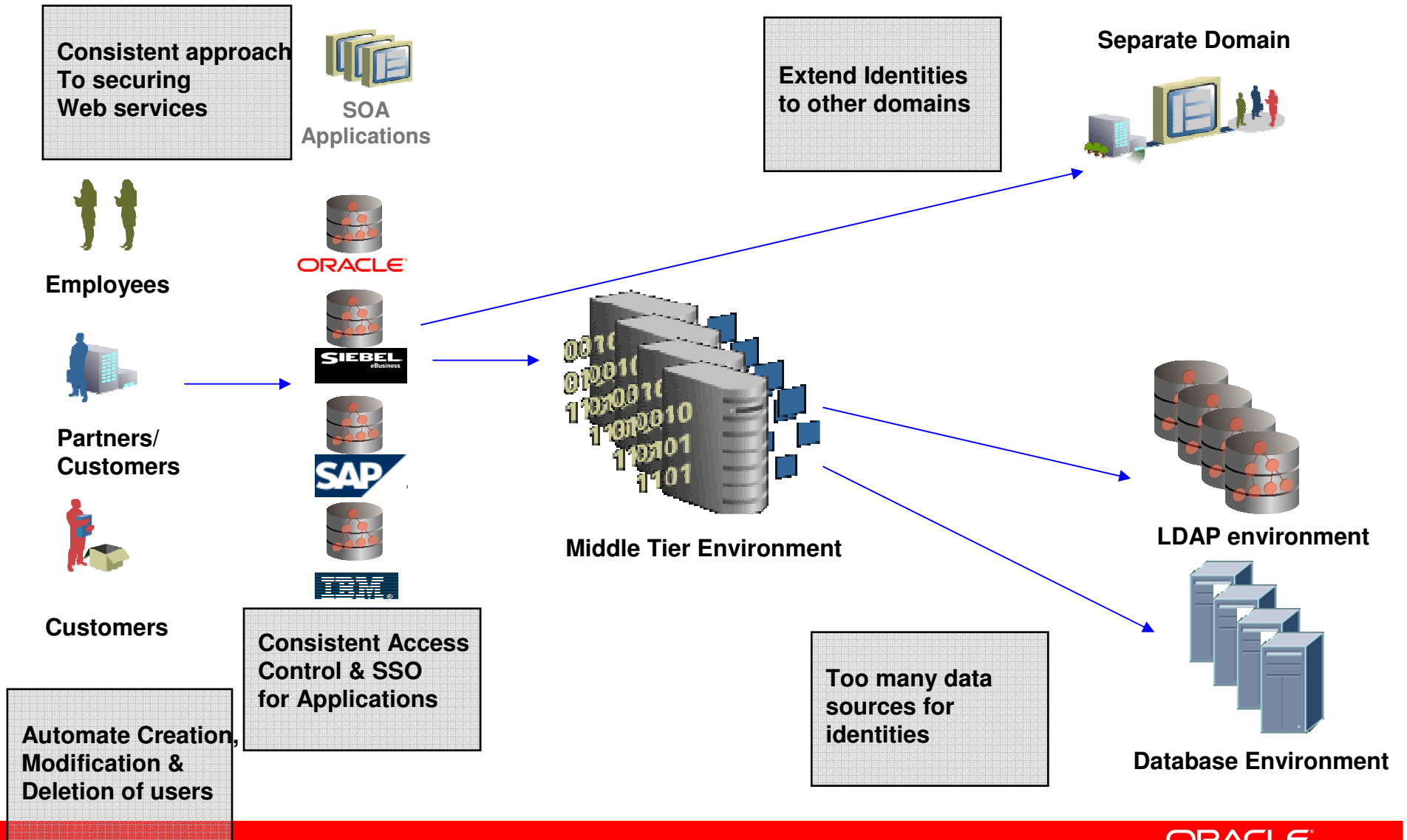
# La sicurezza per Oracle



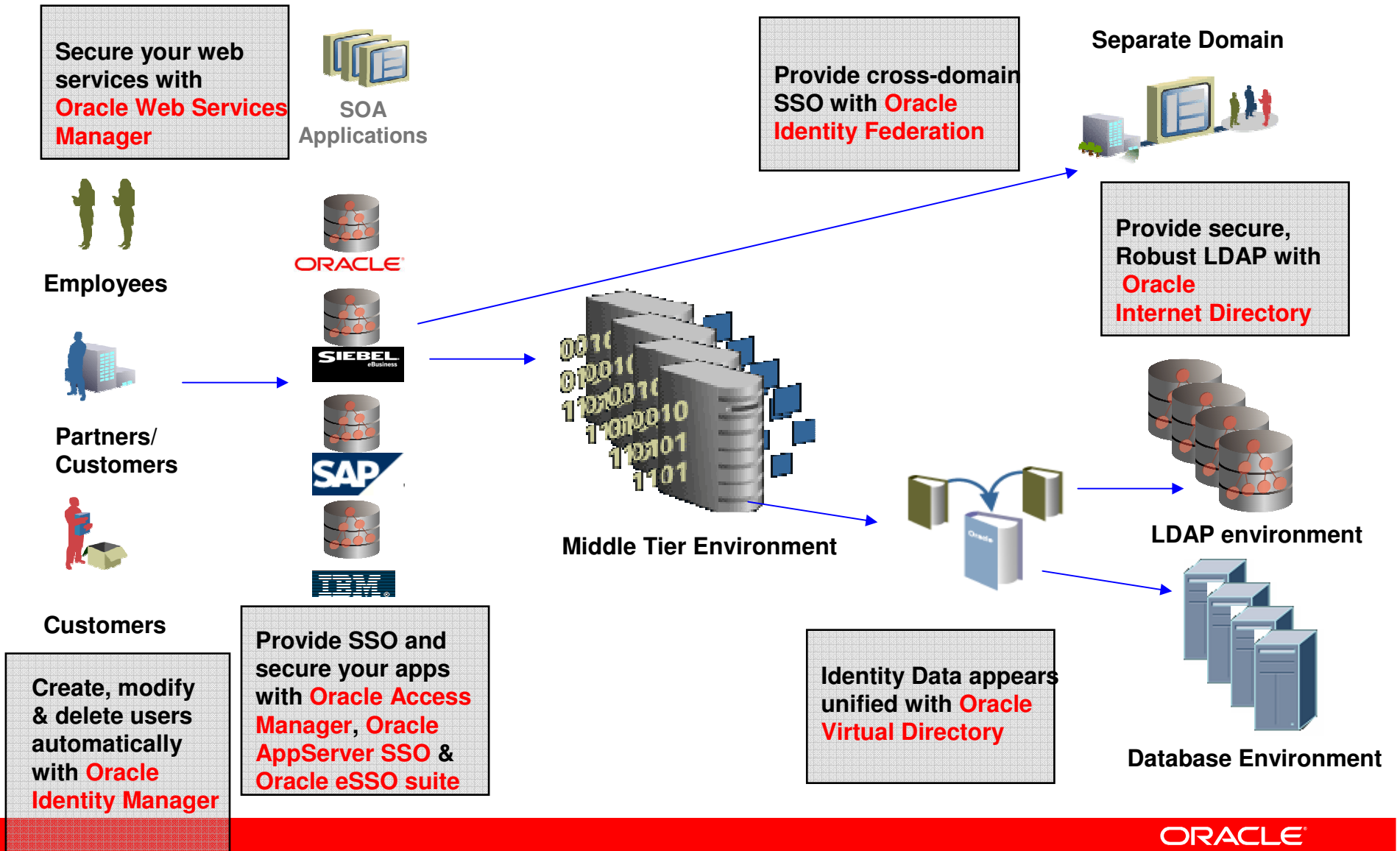
# La sicurezza per Oracle



# Challenges to Managing Identities



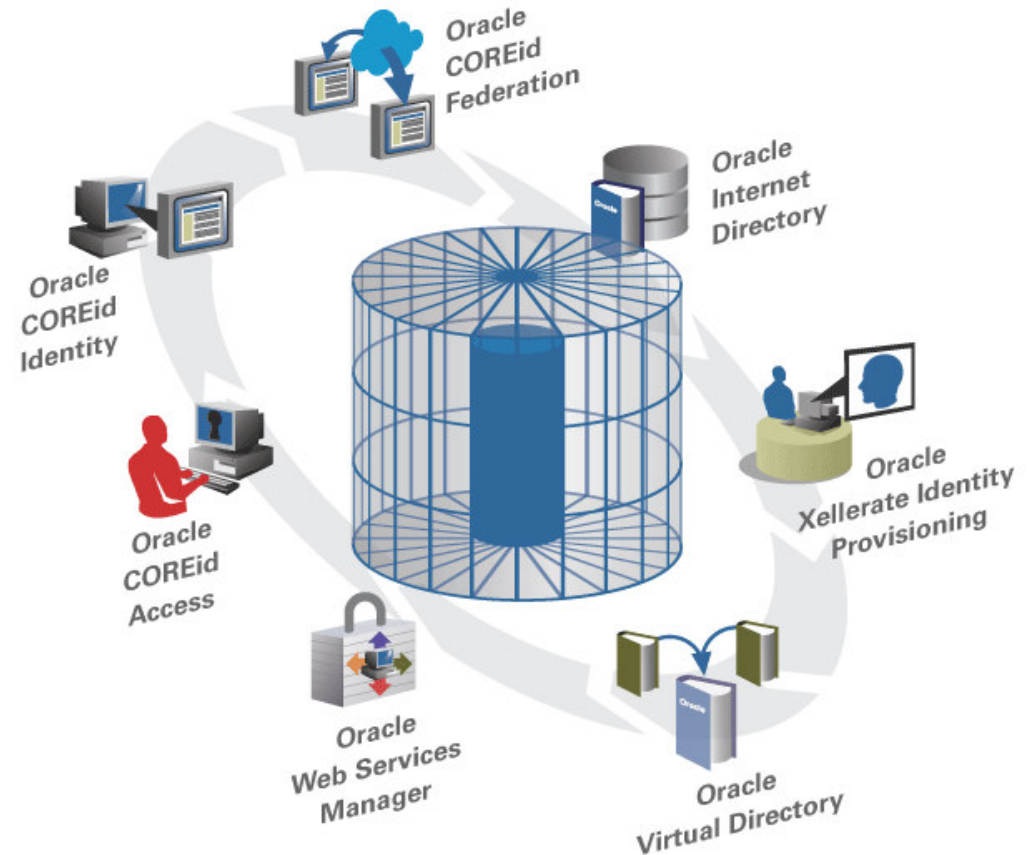
# Oracle IdM



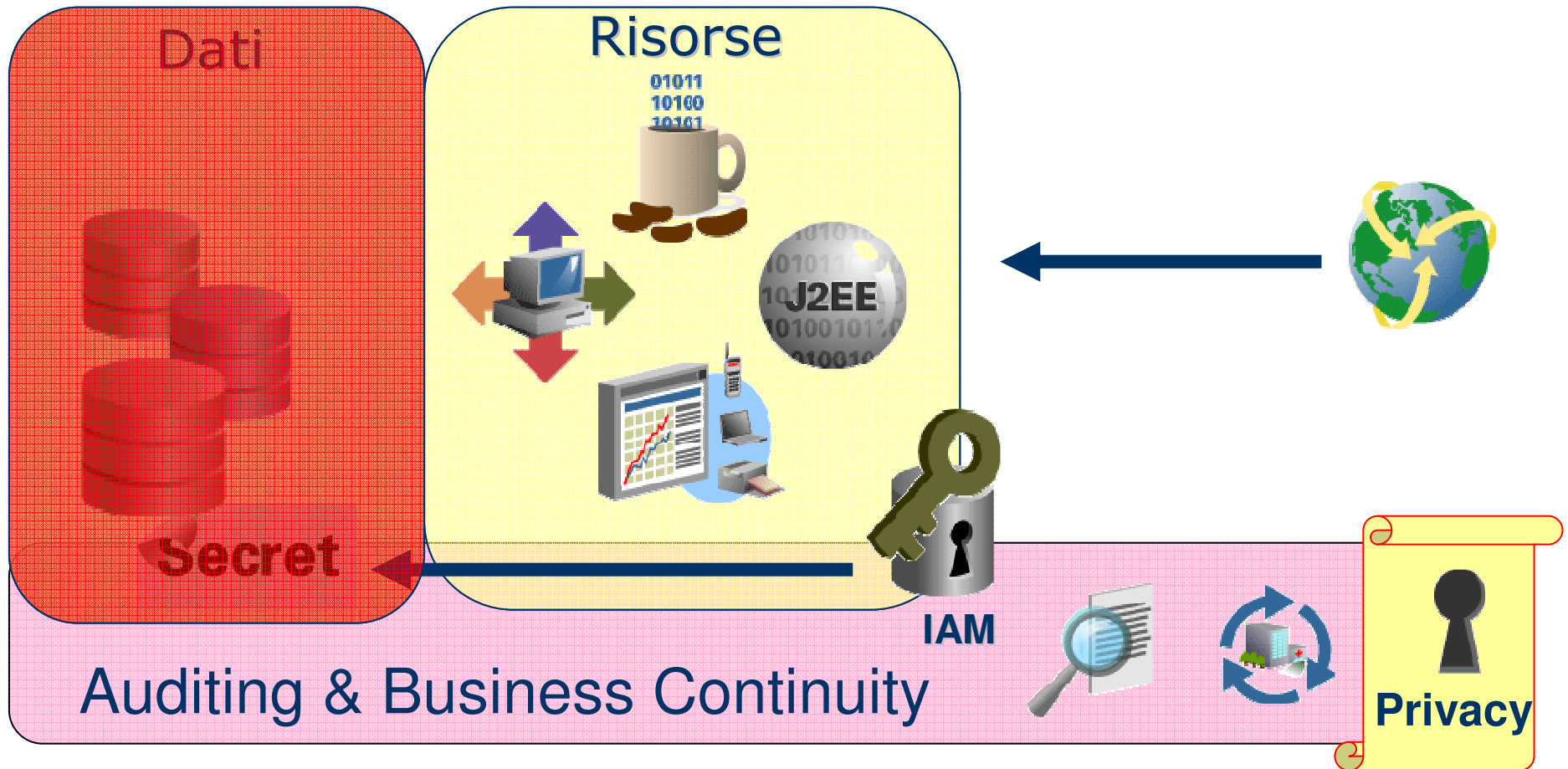
# Oracle Identity Management Suite

*Completa copertura funzionale*

- **Access Control**
  - Enterprise Single Sign-On
  - Identity Federation
  - Web Access Control
  - Web Services Security
- **Identity Administration**
  - User, Role Management
- **Identity Provisioning**
  - User Provisioning
  - Identity Reconciliation
  - Password synchronization
- **Identity Infrastructure**
  - Virtual Directory
  - Directory

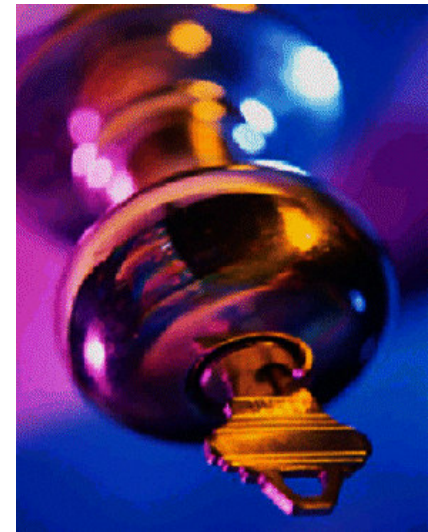


# La sicurezza per Oracle



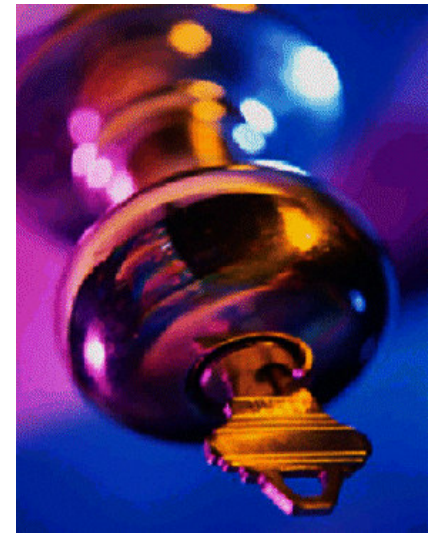
# Cosa usare per proteggere l'informazione:

- Le informazioni sono **filtrate** in funzione di chi le utilizza
  - Virtual Private Database
  - Label Security
  - Database Vault
- Le informazioni sono **cifrate**
  - Nel database tramite il DBMS\_CRYPTO
  - Sul Canale con Advanced Security Option
- **Auditing**
  - Fine Grained Auditing (FGA)
  - Audit Vault (fine 2006)



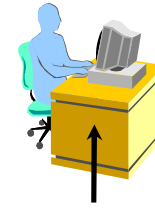
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# Oracle Label Security



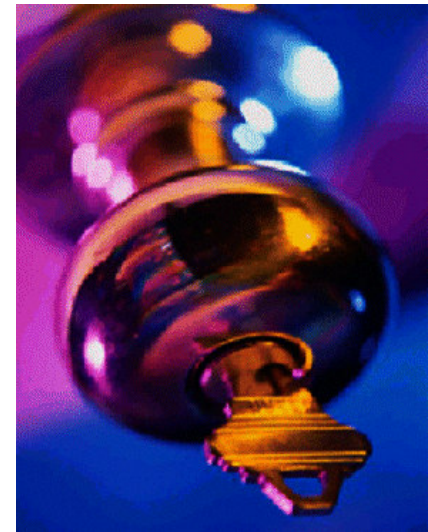
## Application Table

Store ID	Revenue	Department	Sensitivity Label	
AX703	10200.34	Finance	Sensitive : ACME	OK
B789C	18020.34	Engineering	Sensitive : WIDGET	X
JFS845	15045.23	Legal	Highly Sensitive: ACME	X
SF78SD	21004.45	HR	Unclassified: ACME	OK

E' usato dal DB un accesso discrezionale per mediare i privilegi (select, insert, delete, update) in base all'identità dell'utente o del gruppo di cui lo stesso fa parte

# Cosa usare per proteggere l'informazione:

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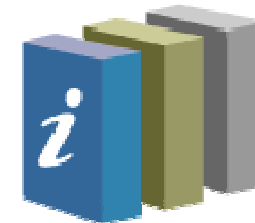


# Problemi di sicurezza comuni

- Come posso evitare che DBA veda dati sensibili come ad esempio i dati della carta di credito ?
- Come posso impedire l'accesso ai dati attraverso applicazioni non idonee ?
- Come posso prevenire modifiche non autorizzate al mio database ?



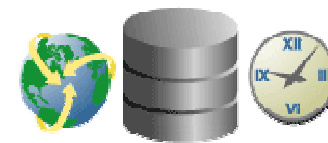
Ad-Hoc Query  
On Financial Data



Applications



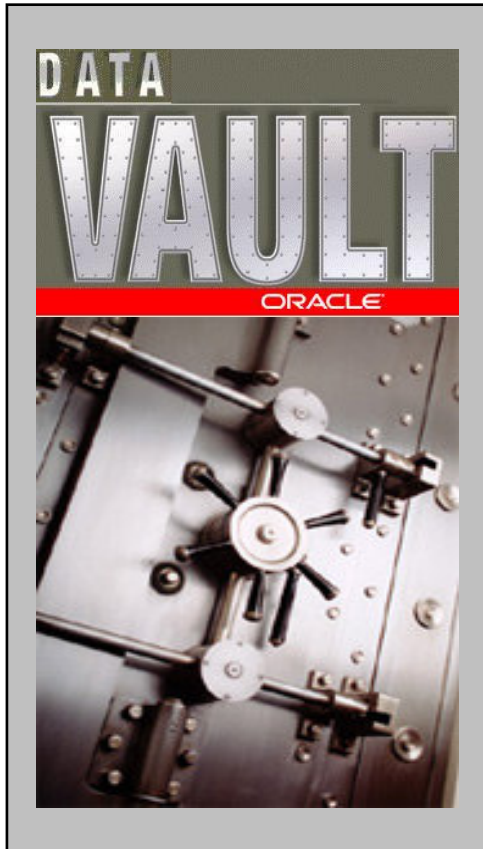
Ad-Hoc Query  
Tool



Remote DBA  
Services

# Oracle Database Vault

Incrementa la capacità delle aziende di proteggere i dati sensibili

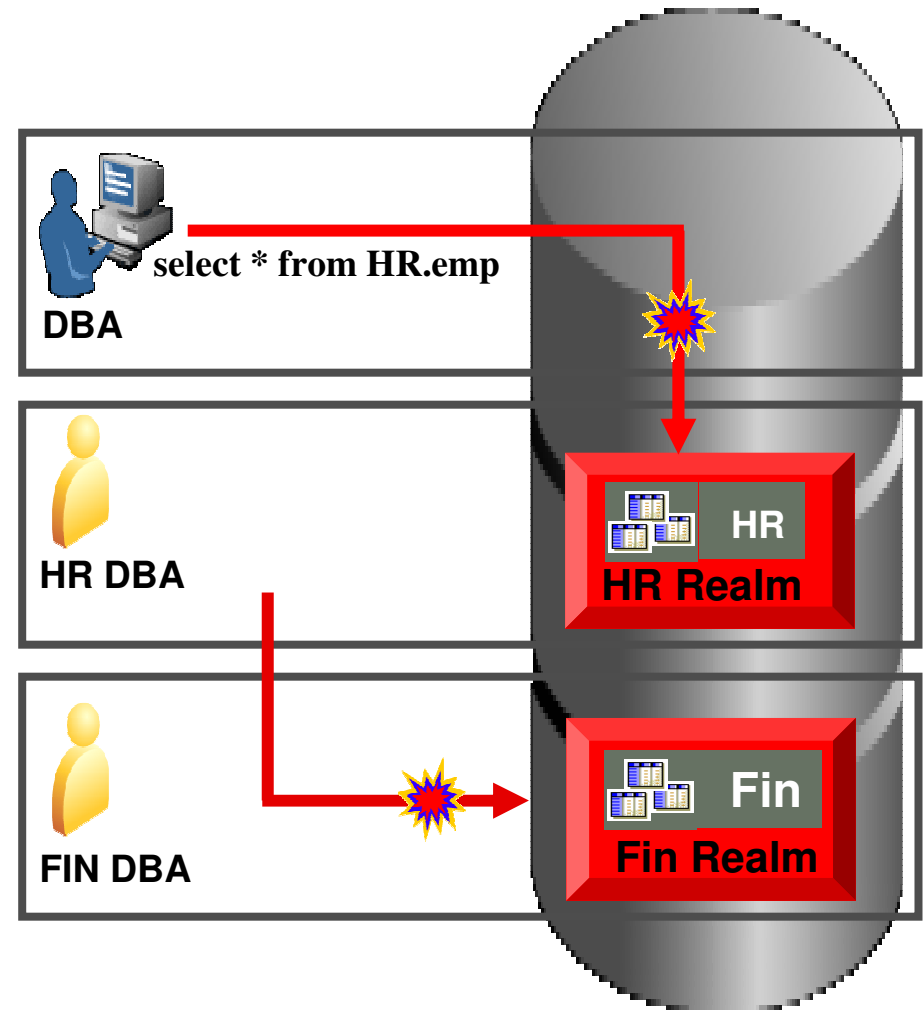


Data Vault introduce diversi e nuovi concetti di sicurezza:

- **Realms** (domini): diviene facile confinare utenti privilegiati (DBA) all'interno di schema specifici permettendo la separazione dei ruoli
  - Creazione del "HR DBA" o "Financials DBA"
- **Factors** estende il controllo degli accessi oltre la semplice definizione di utenti e ruoli
- **Rules** controllo dell'accesso al database in base a fattori ambientali
  - Tempo, locazione, indirizzo IP...

# Database Vault impedisce che...

- Database DBA veda i dati HR  
**Compliance e protezione da attacchi interni**
- HR DBA veda i dati del Finance  
**Elimina i rischi di sicurezza della server consolidation**



# Oracle Database Vault

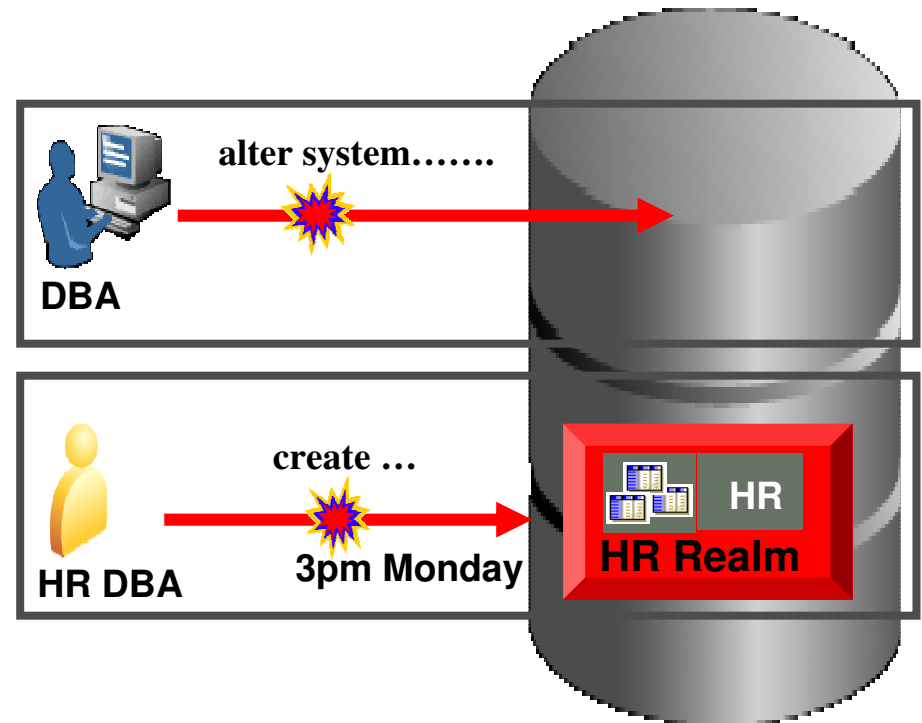
## *Rules & Multi-factor Authorization*

- Database DBA esegue “*alter system*”

**Controllo basato su indirizzo IP**

- HR DBA tenti di eseguire modifiche durante la produzione

**Controllo basato su data ed ora**



# Oracle Database Vault Reports

Database Instance: orcl

[Administration](#) **[Database Vault Reports](#)** [General Security Reports](#) [Monitor](#)

Use this screen to run reports about potential Database Vault configuration issues and Database Vault audit events.

Run Report

[Expand All](#) | [Collapse All](#)

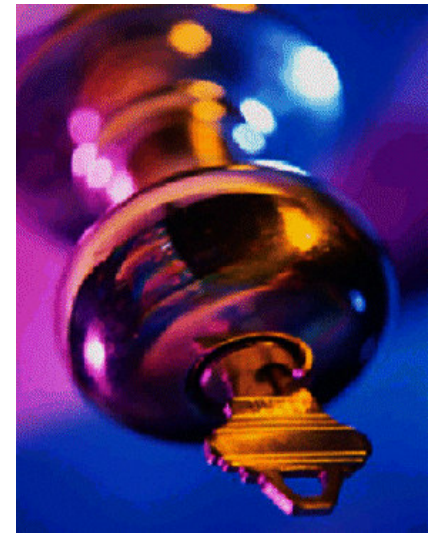
Select	Focus	Report Title
<input type="radio"/>		▼ Reports
<input type="radio"/>	<input checked="" type="checkbox"/>	▼ Database Vault Configuration Issues Reports
<input checked="" type="radio"/>		Command Rule Configuration Issues
<input type="radio"/>		Factor Configuration Issues
<input type="radio"/>		Factors Without Identities
<input type="radio"/>		Identity Configuration Issues
<input type="radio"/>		Realm Authorization Configuration Issues
<input type="radio"/>		Rule Set Configuration Issues
<input type="radio"/>		Secure Application Configuration Issues
<input type="radio"/>	<input checked="" type="checkbox"/>	▼ Database Vault Auditing Reports
<input type="radio"/>		Realm Audit
<input type="radio"/>		Command Rule Audit
<input type="radio"/>		Factor Audit

## Database Vault Reporting

- Over 3 dozen security reports for compliance
- Audit violation attempts
- Realm, Rule and Factor Reports
- System and Public Privileges

# Cosa usare per proteggere l'informazione:

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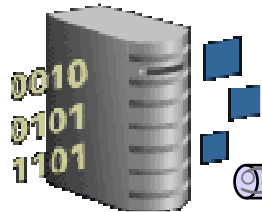




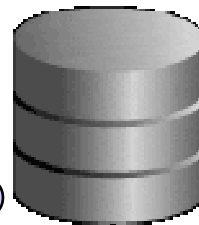
# Oracle Advanced Security

## *Network encryption and data integrity*

**Application**



**Data**



**Cifratura e  
Data Integrity  
(Modification,  
Disruption, Replay)**

- Cifratura di tutte le comunicazioni da e verso il database
  - RC4 (40, 56, 128, 256 bits)
  - DES (40 and 56 bits)
  - 3DES (2 and 3 keys)
  - AES (128, 192, and 256 bits)
- Data integrity con checksums
  - MD5
  - SHA-1
- Certificata FIPS 140-1 Level 2
- Trasparente alle applicazioni

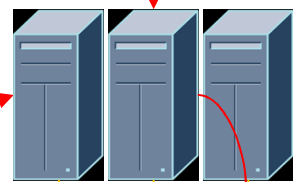
# Oracle Advanced Security

## Transparent Data Encryption



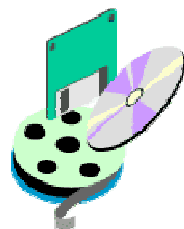
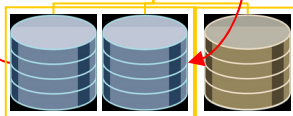
Application

ASO  
Network  
Encryption



Data  
Decrypted  
Through  
SQL Interface

Data  
Written  
To Disk  
Encrypted



Data Encrypted  
On Backup Files

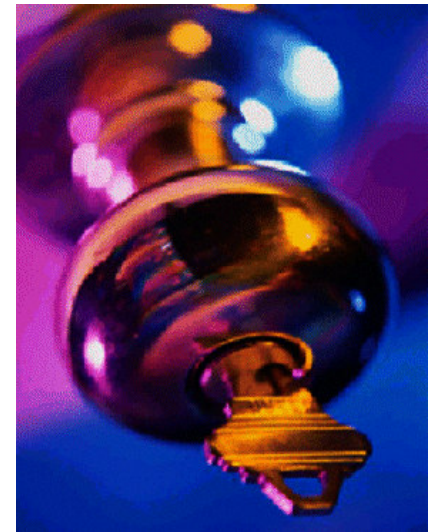
- Transparent Data Encryption
  - Gestione delle Chiavi di cifratura
  - Supporto per Data Privacy e Regulatory Compliance
- Store automatico di Username and Password in Wallet
  - Protect username and password on command line for batch jobs
- Trasparente alle applicazioni

Rossi	18031	☉♦♦♠□
Bianchi	14220	♠♠&●
Verdi	17170	&♦♠♠■
Belli	12029	♦♦■♠♠
Rossini	18029	&○♠♠♠
Vieri	17045	□♠♠♠♠
Marra	12032	□♦♠♠♠♦

```
alter table credit_rating
modify (person_id encrypt)
```

# Cosa usare per proteggere l'informazione:

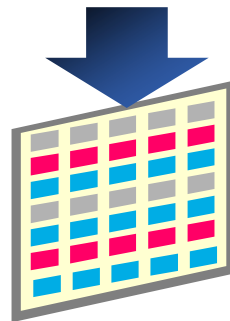
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  - **Fine Grained Auditing (FGA)**
  - Audit Vault (fine 2006)



# Fine Grained Auditing

- Fine Grained Auditing (FGA)
  - Controllo granulare sulle insert, update e select
  - Controlla l'accesso ai dati in base al loro contenuto
  - Può far scattare procedure

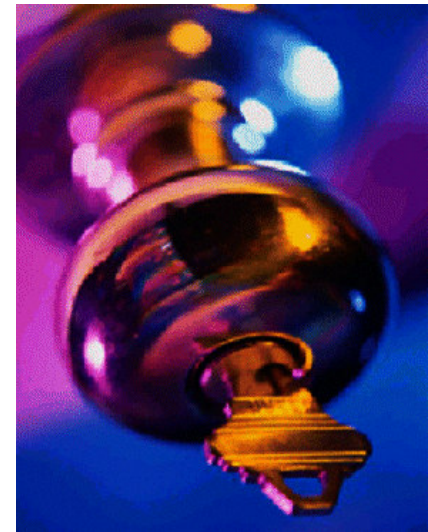
**User Queries...**  
Select name, salary  
from emp  
where...



**Audit Record Shows...**  
Select name, salary  
from emp  
where name = 'KING',  
<timestamp>,  
<username>

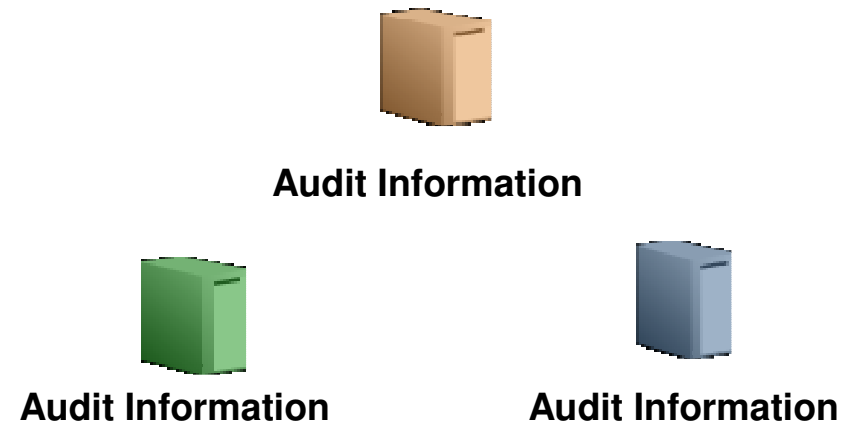
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# Audit Information Resides In Silos

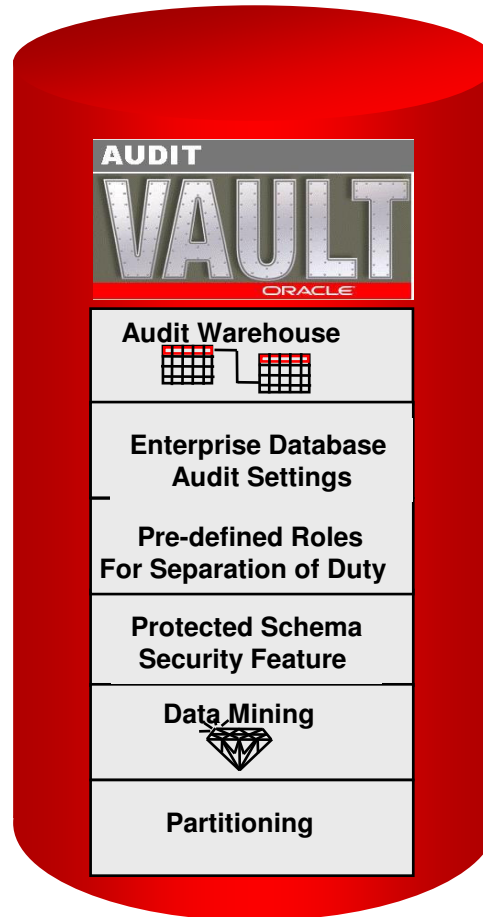
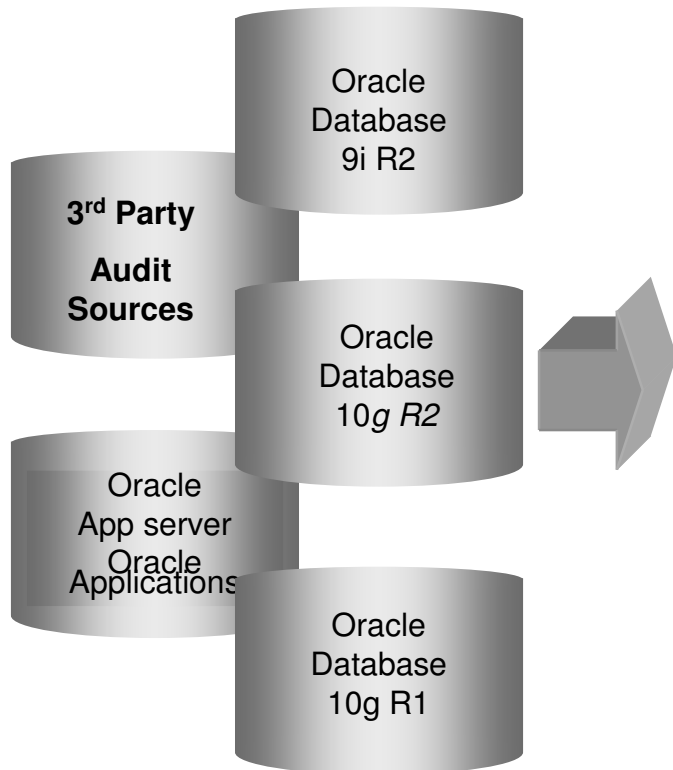
- Valuable only if you can pull audit data all together from multiple databases / sources
- Valuable only if you can protect audit data
- Valuable only if you can generate reports



# Oracle Audit Vault

Specialized Warehouse for Audit Data

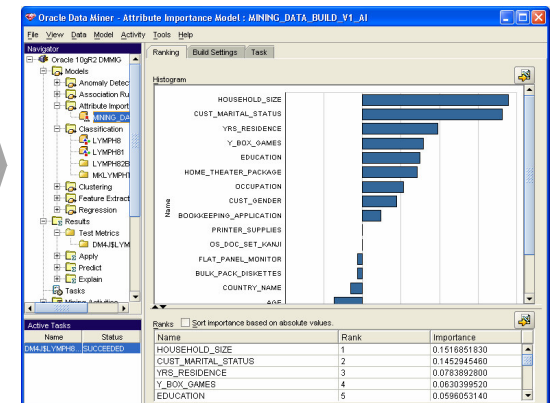
## Enterprise Audit Sources



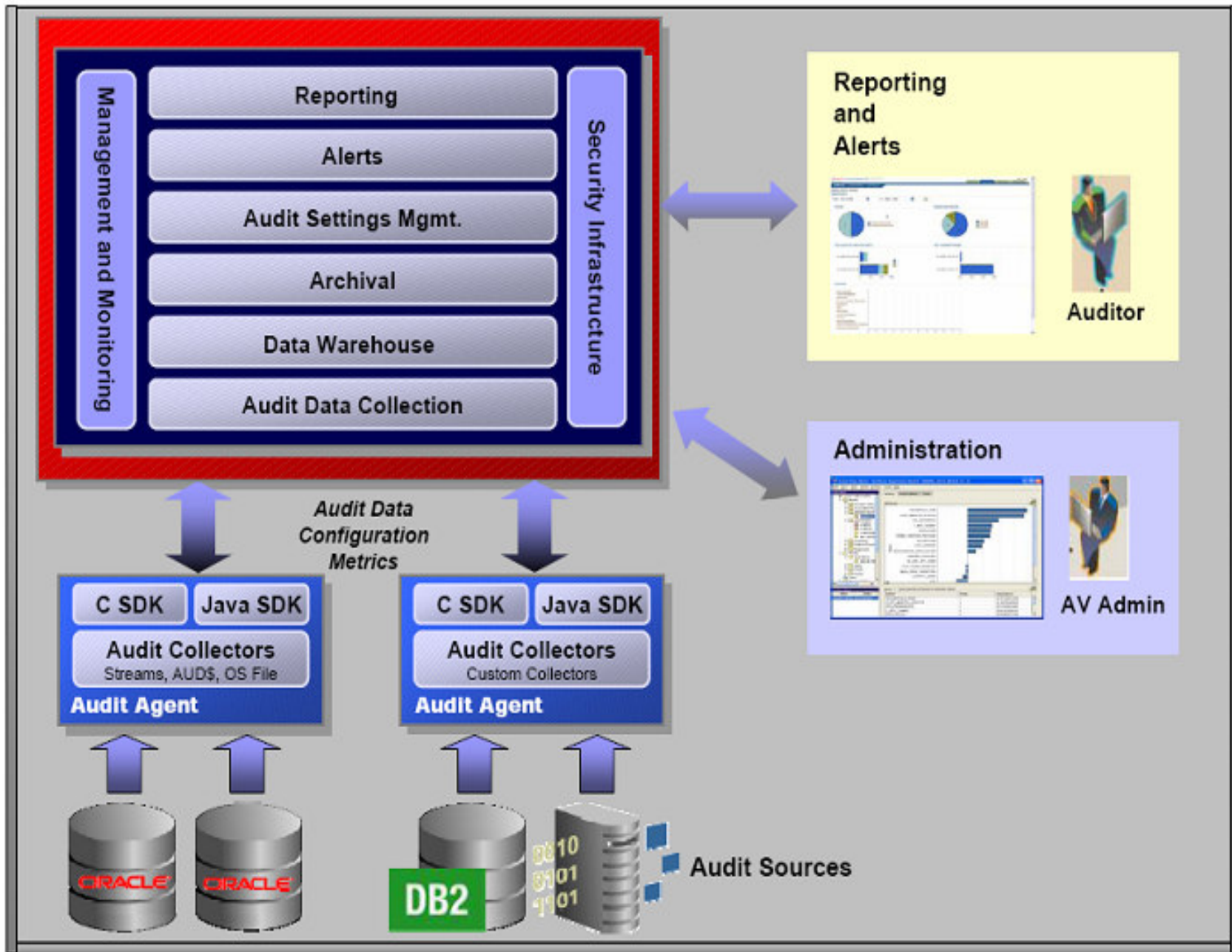
Customer Reports

Partner Reports

## Oracle Reports



# Audit Vault - Architecture

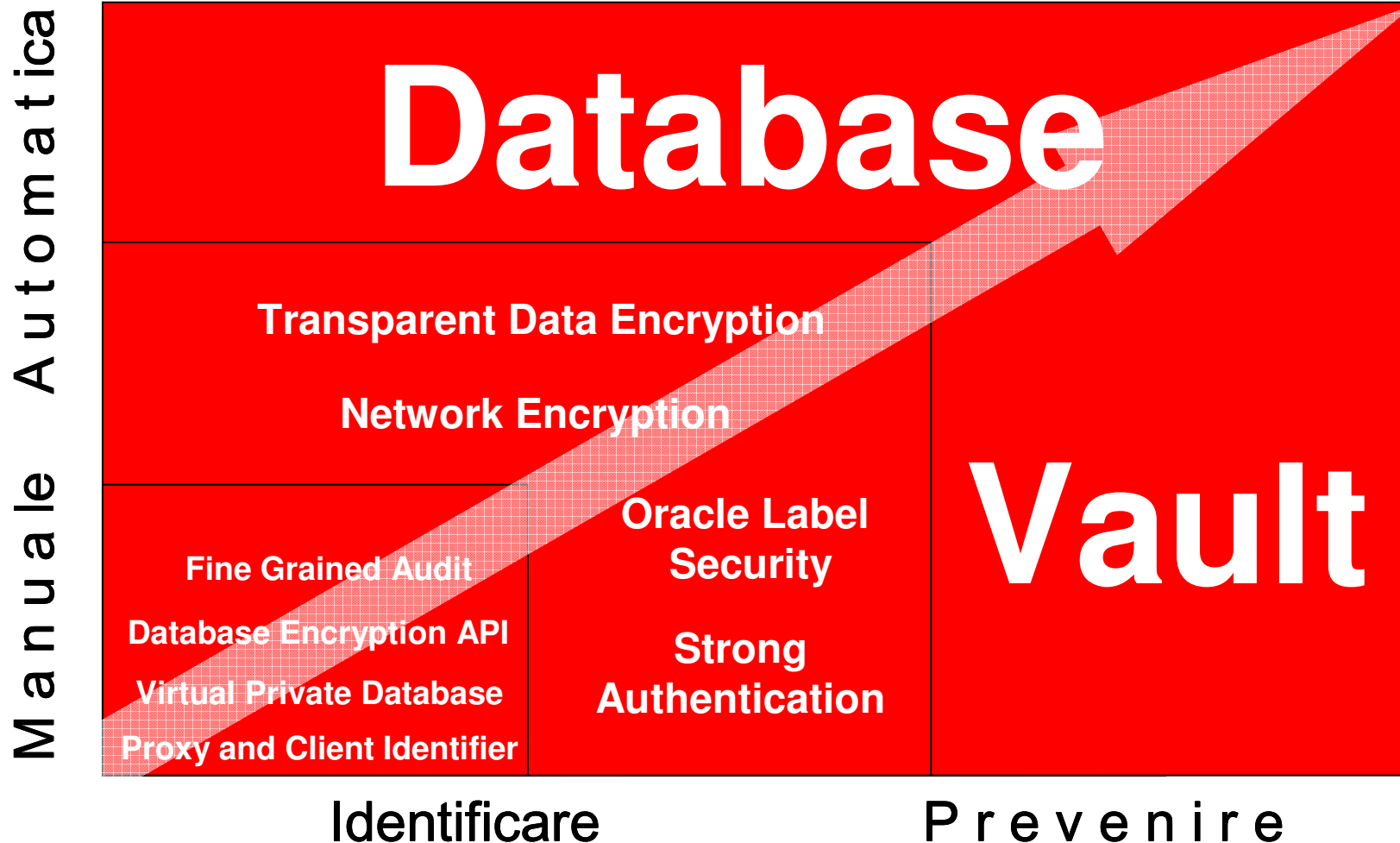




# Technology Map

<b>Oracle Database 10g Release 2</b>	<i>Regulatory Compliance</i>	<i>Protect Privacy</i>	<i>Internal threat</i>	<i>Database Consolidation</i>	<i>Configuration And Audit</i>
<b>Database Vault</b>	●	●	●	●	●
<b>Transparent Data Encryption</b>	●	●	●	●	
<b>Network Encryption</b>	●	●	●		
<b>Strong Authentication</b>	●	●			
<b>Label Security</b>	●	●		●	
<b>Virtual Private Database</b>	●	●	●	●	
<b>Enterprise User Security</b>	●		●	●	●
<b>Fine Grained Auditing</b>	●		●		●
<b>EM Enterprise Security Advisor</b>	●		●	●	●

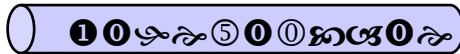
# Automated Preventive Controls



# Oracle Database Security



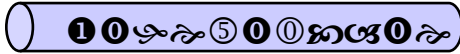
Application



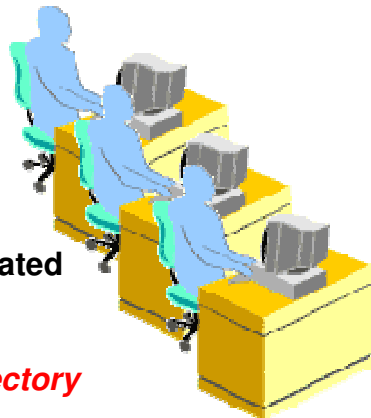
Network Encryption with **Advance Security Option** Protects Data in Motion



Application



Database Identity Management Integrated with Provisioning Frameworks  
**Oracle Internet Directory**



**PROTECTED Enterprise**



Separation of Duties with **Database Vault** Protects Against Insider Threats

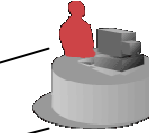


KING	18031	♦ ✕ ☠ ☹
SCOTT	14220	☒ ☞ ✕ ☹
SMITH	17170	☒ ☞ ☹ ☹

Database Columns Transparently Encrypted with **Advance Security Option** Protects Data at Rest



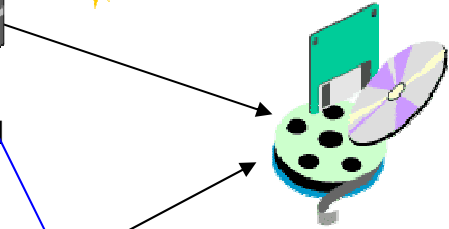
KING	18031	♦ ✕ ☠ ☹
SCOTT	14220	☒ ☞ ✕ ☹
SMITH	17170	☒ ☞ ☹ ☹



Operational DBA

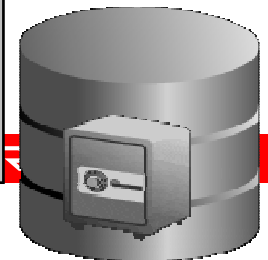
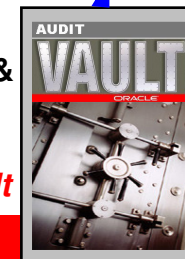
Alter table ....

Select ssn from cust;



Backups of Database and Flat Files Encrypted on Tapes with **Oracle Secure Backup**

Consolidation & Reporting of Audit Data with **Audit Vault**




Database Vault	Operational DBA	Data DBA / Manager
Select SSN from cust;	X	✓
Alter system.. Alter table ....	✓	X

\* Example roles and privs



*O* & *A*



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