


**Oracle 9iDB**

**The Foundation for  
the New Business  
Internet**

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**1 architecture, 2 produits**



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**Les 9 clés du succès**



- Disponibilité
- Performance & Scalabilité
- Sécurité
- Plate-forme de Développement
- Manageability
- Gestion de Contenu De l'Internet
- B2C et B2B eBusiness
- Packaging d'applications
- Business Intelligence

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**Disponibilité achevée**

- **Encore plus d'opérations ONLINE**
  - Moins d'arrêts planifiés
- **Precision Database Repair**
  - Moins d'arrêts imprévus
- **Oracle Data Guard**
  - Moins de perte de données
- **Self Service Repair**
  - Moins de travail pour le DBA



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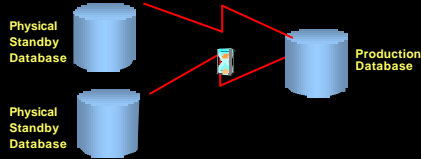
**Moins d'arrêts planifiés**

- **Online Table Re-Definition**
  - Tables: Moved, Re-organize, Partition
  - Columns: Added, Delete Merge
  - Columns: Change Name, Type and Size
- **Online IOT operations**
- **Online Index Rebuild**
- **Quiesce**
  - no non-DBA activities

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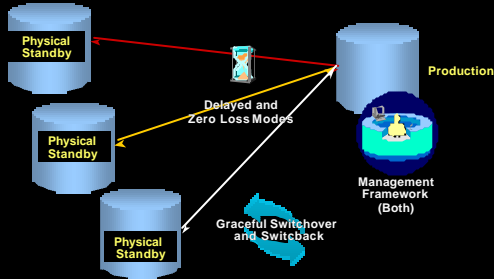
**Oracle 9i Data Guard**

- **Zero-Loss Disaster Protection**
  - Livraison de Logs - synchrone / asynchrone
- **Data Guard Manager / Broker**
  - Outil graphique (OEM) de configuration, monitoring, management



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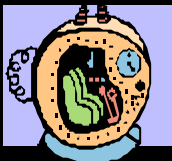
## Data Guard: Delay et Switch



## Precision Database Repair

- Trial Recovery
  - Le process de Recovery by-pass un bloc corrompu. Si d'autres blocs corrompus sont trouvés, on pourra interrompre le processus.
- Block Level Media Recovery
  - Seuls les blocs corrompus sont restitués. La table reste ONLINE.
- Offline Diagnostics (Support)
- Scavenge Changes from Damaged Logs

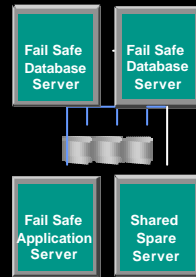
## Self-Service Error Détection



- Corriger soi-même ses erreurs, développeurs ou Utilisateurs
  - Identifier et annuler les erreurs
- Flashback Query
  - Interroger le passé de la database

Create table old\_emp as  
select \* from emp AS OF yesterday;

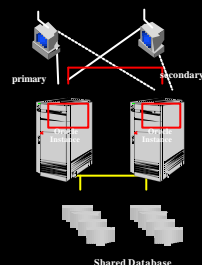
## 4-Node Failsafe Pour Windows



- Oracle Failsafe supporte les configurations à 4 nœuds
  - Meilleur coût Hardware
  - Windows 2000
- Gère la database, mais aussi:
  - Applications 11i, iAS, WebDB, and Forms and Reports Servers

## Oracle Parallel Failsafe

- Un Cluster Actif-Actif OPS spécialement configuré
- Meilleur Failover, reconnections plus rapides
- Totalement intégré à 9iRAC (9i Real Application Cluster)



## ORACLE HA pose ...

	Automated Standby	Flash-button switchover	Zero data loss disaster protection	Delayed Apply Standby	Flashback Query
Oracle8i	Yes	Yes*	Yes**	Yes*	No
Oracle9i	Yes	Yes	Yes	Yes	Yes
IBM DB2	partial	No	No	No	No
Microsoft SQL Server 2000	partial	partial	No	No	No

\* New in Oracle9i Release 3 (8.1.7) \*\* With 3<sup>rd</sup> party

## ... les standards

	Automated Standby	Push-button switchover	Zero data loss disaster protection	Delayed Apply Standby	Flashback Query
Oracle8i	Yes	Yes*	Yes**	Yes*	No
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IBM DB2	partial	No	No	No	No
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\* New in Oracle8i/Release 3 (8.1.7) \*\*with 3<sup>d</sup> party

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## Performance & Scalabilité

- Scalabilité Quasi-linéaire avec Real Application Cluster
- Améliorations du Cost Based Optimizer (CBO)
- Améliorations PL/SQL et SQL

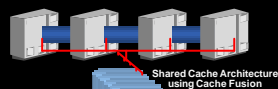


Support de Millions de Users Internet

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## 9i Real Application Clusters

Oracle Cluster Analysis Utility

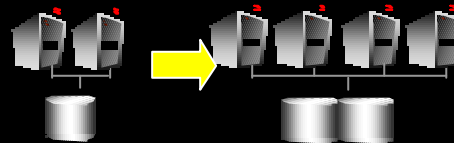


- Cache Fusion complet
  - Contentions read/read, read/write, write/write
- Plus grande rapidité à détecter toutes sortes de pannes
- Intégration avancée dans Enterprise Manager
- Toute application peut s'épanouir dans un cluster**
  - les applications n'ont pas à être apprêtées
- Scalabilité linéaire – Plus de nœuds, plus de performance

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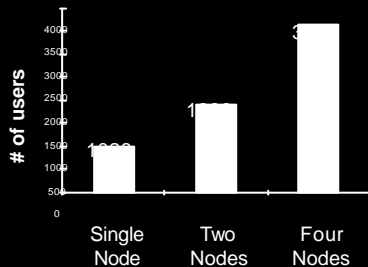
## RAC et la linéarité

- Cluster facilement scalable
  - Ajout rapide de nœuds et de disques
- Architecture indépendante du vendeur
  - Linux, NT, AIX, Solaris, Sun, HP, Compaq



1-20

## RAC et la Performance



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## Oracle Clustered Databases

	Apps supported	Adding Nodes	Adding Storage
Oracle8i Parallel Server	All, with some tuning	minimal tuning no repartition	No interruption, hours
Oracle9i Real Application Clusters	All	NO tuning required, NO repartition.	NO interruption, instant
IBM Shared-nothing	DSS	repartition data (tools)	Repartition data
Microsoft Federated Database	TPC-C	repartition data (manual)	Repartition data, reconfigure cluster

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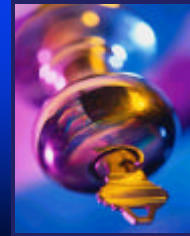
## Performance Accrue SQL et PL

- **Compilation native PL/SQL**
  - 3-4 times faster
- **Table Functions**
- **Resumable Statement**
- **Multi-Table Inserts**
- **Bulk Dynamic SQL**

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## Sécurité

- **Internet Scale Security**
- **SSL & PKI**
- **Enterprise User Security**
- **Virtual Private Database**
- **Fine-grained Auditing**



Support End-to-End Security Infrastructure for Millions of Users

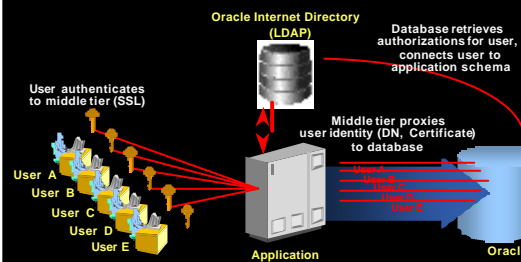
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## Authentification PROXY

- **Proxy Authentication**
  - Permet de connaître l'identité des utilisateurs WEB, limiter les privilèges des serveurs d'applications, et fournir de la comptabilité via l'audit
  - Supporté pour les Clients WEB comme pour les clients Database, permettant toute la souplesse requise par l'implémentation d'une solution de sécurité

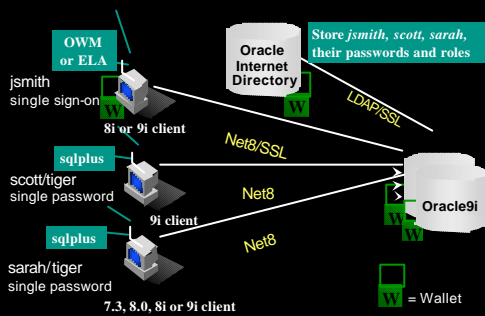
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## Authentification pour le 3-Tier



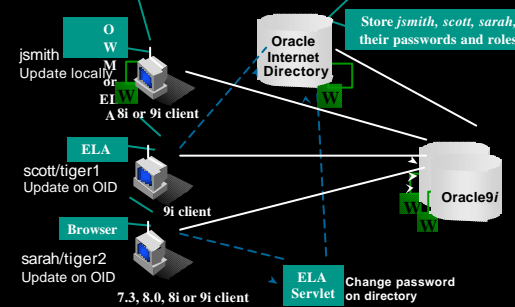
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## Enterprise User Security



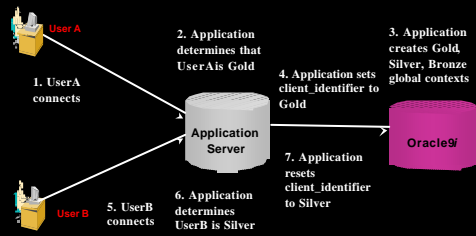
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## Update Passwords



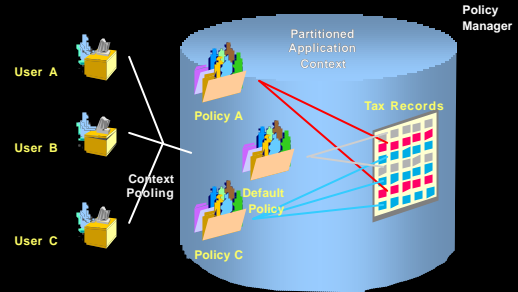
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## Global Application Context



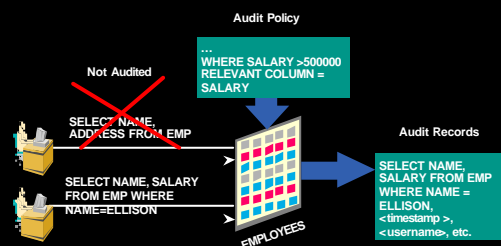
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## Virtual Private Database



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## Fine-Grained Auditing



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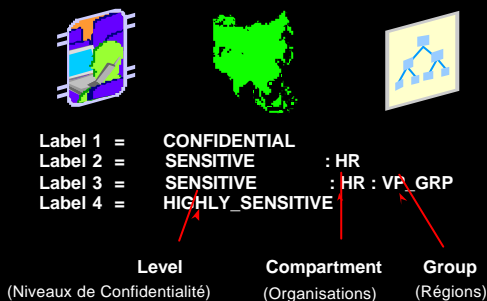
## Label Security - Policy Manager

- Oracle Label Security
  - VPD
  - Contrôle d'accès basé sur des labels
  - Pas de version OS spécifique
- Encryption
  - Support JCA/JCE
  - Support AES

Levels	Compartments	Groups	Labels
Specify the levels contained in this policy. Hit ENTER after entering a numeric value, or changing the short and long forms:			
Short	Long	Numeric	
U	Unclassified	100	
C	Confidential	200	
S	Sensitive	300	
HS	Highly Sensitive	400	

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## Label (Military) Security



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## Oracle 9i

9i Security Themes	Deep Data Protection	Central Control	Internet Security
Selective Encryption			
VPD	x	x	x
NEW! Label Security			
NEW! Fine-grained Auditing			
Proxy Authentication			
NEW! Login Server			
Enterprise User Sec			
PKI Integration			x

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## 9i – Sécurité sans compromis

	Data Encryption	Web single sign-on	Virtual Private Database	Label Security	Fine Grained Auditing
Oracle8i	Yes	Yes	Yes	No	No
Oracle9i	Yes	Yes	Yes	Yes	Yes
IBM DB2	No	No	No	No	No
Microsoft SQL Server 2000	No	No	No	No	No

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## Administrabilité

- La database s'auto-administre
- Fine Grained Resource Management
- Streamline Operational Management, Backup and Recovery
- Tools to simplify and reduce tasks
- End-to-end system management solution

Keep the number of DBA's constant as we scale to Internet Use



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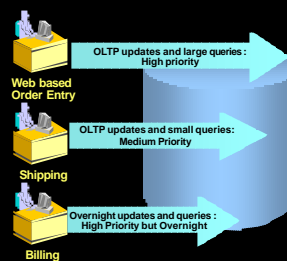
## La base s'auto-administre

- Automatic Undo Management
  - Gestion automatique des segments UNDO
- Oracle Managed Files
  - Auto-Gestion des fichiers de la base
- Auto-Tuning de la mémoire privée
- Calibrage dynamique de la taille des buffer cache et shared pool



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## Automatic Resource Managt



- Nombre maximum de sessions actives
- Estimation du temps SQL
  - Automatic consumer group switching
- Quotas d'Undo pour les consumer groups

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## Exploitation simplifiée

- Paramètres persistants
  - Mise à jour du INIT.ORA évitée
- Resumable Space Allocation
  - Les opérations longues peuvent être interrompues afin de résoudre les problèmes de place disque
- Plans d'exécution cachés
  - Plans stockés pour analyse a posteriori sans réexécution de la requête
- Identification des index non utilisés

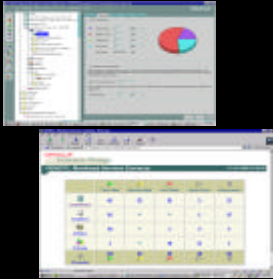
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## Recovery et Backup

- Mean Time to Recover
  - Contrôle du temps de Recovery
- Default backup configuration
  - Simplification de RMAN
- Policy based recovery window
  - Sauvegarde automatique des Archived Logs
- Resumeable backups and restores

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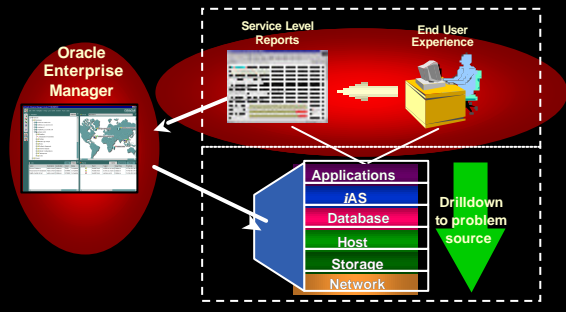
## Des outils pour simplifier



- Résolution de problèmes
- Documentation 9i intégrée
- Analyse d'impact pour index
  - virtual index
- 100% Browser

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## Reporting Business-level



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## Productivité IT maximum

	Advice Driven Diagnostics	Enterprise view (Apps, DB, AS, etc) with drill down	Business Impact Reporting	Predictive Admin. Impact Reporting	Resource Mgmt for Large Number of Users
Oracle8i	partial	partial	partial	No	Partial
Oracle9i	Yes	Yes	Yes	Yes	Yes
IBM DB2	No	No	No	No	Yes
Microsoft SQL Server 2000	No	No	No	No	No

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## Business Intelligence

- Scalabilité, Performance et Administrabilité
  - Une plate-forme complète pour la Business Intelligence:
    - ETL, Analyses intégrées et Capacités de personnalisation
- Scaleable, Internet-ready business intelligence platform



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## LIST PARTITIONING

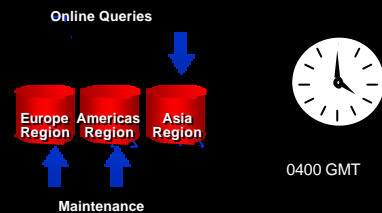
- Gestion des Valeurs discrètes
  - Géographie, catégorie, ...
- Bénéfice: un meilleur contrôle de la répartition des données

```
CREATE TABLE sales_by_region
(...)
PARTITION BY LIST (state)
( PARTITION q1_northwest VALUES ('OR', 'WA'),
  PARTITION q1_southwest VALUES ('AZ', 'UT', 'NM'),
  PARTITION q1_northeast VALUES ('NY', 'VM', 'NJ'),
```

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## LIST Partitioning

Bénéfices identiques au RANGE partitioning: mais les données sont regroupées explicitement en fonction des contraintes du Business



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## Bitmap Join Index

- Index de jointure en mode Bitmap
  - Plus efficace que les vues matérialisées
  - Très adaptés aux STAR schémas sur de très grosses tables

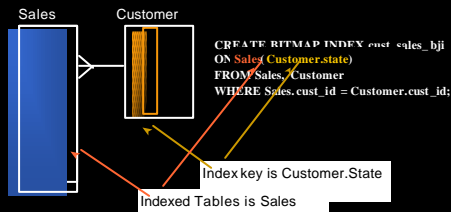


### Example Query

```
SELECT SUM(Sales.dollar_amount)
FROM Sales, Customer
WHERE Sales.cust_id = Customer.cust_id
AND Customer.state = 'Oregon';
```

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## Bitmap Join indexes

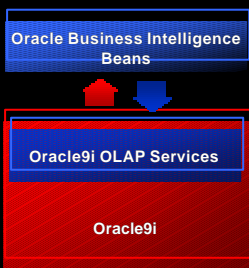


```
CREATE BITMAP INDEX cust_sales_bji
ON Sales (Customer.state)
FROM Sales, Customer
WHERE Sales.cust_id = Customer.cust_id;
```

Only the index and Sales table are used to evaluate the query  
No join of Customer table is needed.

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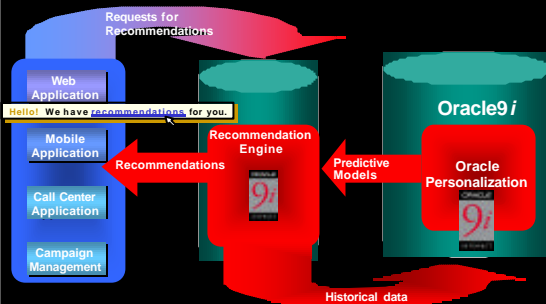
## Plate-forme d'analyse



- RAD
  - Développement rapide d'applications analytiques
- OEM
- Java OLAP API
  - Fonctions d'analyse prédictive
- Stockage scalable
  - Metadata intégrées
  - Summary management
  - Fonctions analytiques SQL

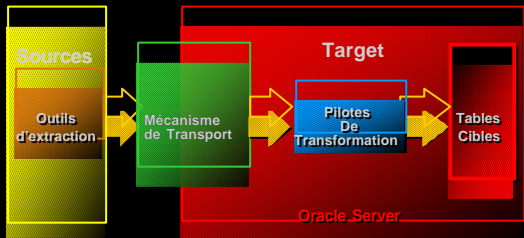
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## Oracle 9i Personalisation



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## Processus ETL Oracle



- Flux de données scalable
- Moteur de transformation haute performance
- Facile à construire et à administrer

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## ETL : Extraction / Loading

- Flexible Extraction from Multiple Sources
  - Tablespace Transportable
    - Différentes tailles de blocs
  - Read-only External Table
    - Source Externe lue par un bloc PL/SQ

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## ETL : Transformation

- Transformation scalable
  - Table Functions
    - Parallel, incremental, pipelined bulk transformation of multiple rows
    - Suppression de la Staging Table intermédiaire
  - MERGE / UPSERT
    - 1 seule instruction pour la mise à jour
  - Multi-table insert
    - Mise à jour de N table via 1 seule instruction

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## ETL : Gestion des erreurs

- Resumable Statement
  - Reprendre l'ordre là où il s'est planté, par exemple le CREATE INDEX ...

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## INSERT Multi-Tables

```
INSERT FIRST
WHEN order_total > 10000 THEN
  INTO priority_handling VALUES (id)
WHEN order_total > 5000 THEN
  INTO special_handling VALUES (id)
WHEN total > 3000 THEN
  INTO privilege_handling VALUES (id)
ELSE
  INTO regular_handling VALUES (id)
SELECT order_total, order_id id
FROM orders;
```

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## MERGE / UPSERT

```
MERGE INTO customer C
USING cust_src S
ON (c.customer_id = s.src_customer_id)
WHEN MATCHED THEN
  UPDATE SET c.cust_address =
    s.cust_address
WHEN NOT MATCHED THEN
  INSERT ( Customer_id, cust_first_name,...)
  VALUES (src_customer_id,
    src_first_name,...);
```

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## EXTERNAL TABLE

```
CREATE table employees_ext (employee_id NUMBER,
first_name Char(30), last_name CHAR(30),
ORGANIZATION EXTERNAL
(DEFAULT DIRECTORY delta_dir
ACCESS PARAMETERS
(RECORDS DELIMITED BY NEWLINE
FIELDS TERMINATED BY ','
(enum INTEGER(2), Fname CHAR(11), Lname CHAR(18),
...))
LOCATION ('/employee/delete_emp1.txt',
'/employee/delete_emp2.txt')
PARALLEL;
```

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## TABLE FUNCTION

```
CREATE OR REPLACE FUNCTION emp_stage_fn
(p ref_cur_type) RETURN emp_tab_typ
PIPELINED
PARALLEL_ENABLE( PARTITION p BY ANY) IS
PRAGMA AUTONOMOUS_TRANSACTION;
BEGIN
FOR rec IN p LOOP
...
PIPE ROW (rec);
END LOOP;
RETURN;
END;
```

```
SELECT * FROM
TABLE (emp_stage_fn
(cursor(SELECT * FROM
employees_src)));
```

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## Compétition ?

	Integrated OLAP	Partitioning	Bitmap Join Indexes	Real-time Personalization	Scaleable Data Pipelining
Oracle8i	partial	Hash, Range Range-Hash	No	No	partial
Oracle9i	Yes	+ List	Yes	Yes	Yes
IBM DB2	Yes	Range (OS/390) Hash (Others)	No	No	No
Microsoft SQL Server 2000	No (separate repository)	No	No	No	No

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## Gestion de Contenu

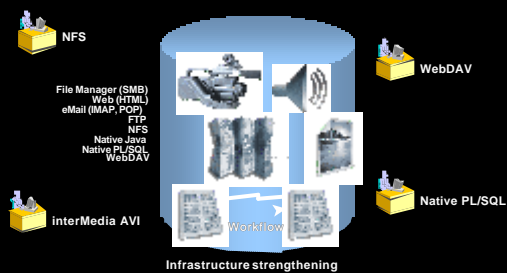
- Stockage et Gestion de tout type de contenu
- Indexation et Recherche efficace de tout type de contenu
- Syndication de contenu pour applications Internet



Consolidate all Internet Content in Oracle Databases

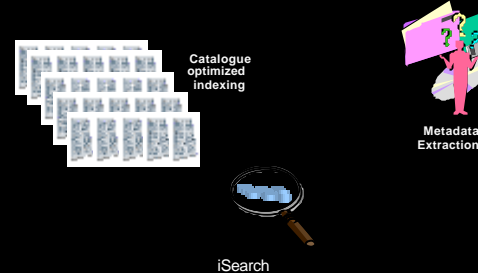
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## Internet File System



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## Recherche et Indexation



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## Oracle iSearch – Pour Intranets

### Indexation WEB de contenu dans la base

- Support de sources multiples de données
  - Sites Web, Databases, Operating system files
  - Données indexées par Oracle Text
- Détection des modifications et re-synchronisation planifiée
- Outil graphique pour Users et Administrateurs
- API PL/SQL de Développement
  - Exécuter les recherches, obtenir les résultats, enregistrer les moteurs de recherche, et fournir de l'aide

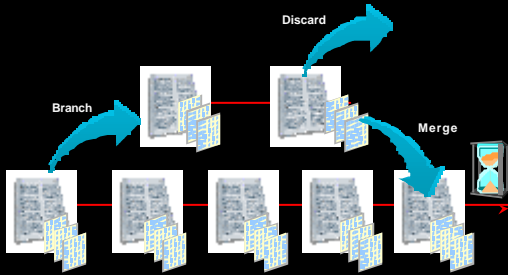
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## INTERMEDIA Image Search

- Etude de ressemblance d'images
  - Attributs: **Color, shape, texture, location**
  - Implémenté en C pour les performances
  - Images en Base, fichiers ou sur des URLs
- APIs Java Standard
  - Java Advanced Imaging (JAI) API
  - Java Media Framework (JMF) API
  - Servlets and JSPs for Internet Apps

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## Oracle WorkSpace



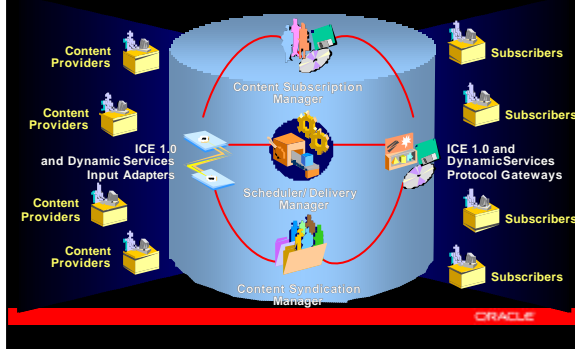
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## Améliorations SPATIALES

- **Java API**
  - Basé sur l'Open GIS standard
- **XML APIs pour Services de Localisation**
  - Geocode, Map, Traffic, Driving Directions, Yellow Page Search
- **Partitioning**
  - Les tables spatiales peuvent utiliser le partitionnement RANGE
  - Ainsi que les index SPATIAL
- **Améliorations de l'assistant SPATIAL**

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## Syndication de contenu



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## En avance sur la musique

	Audio, Video, Spatial	Content Syndication	DB Web Crawling
Oracle8i	Yes	No	No
Oracle9i	Yes	Yes	Yes
IBM DB2	Separate Product	No	EIP
Microsoft SQL Server 2000	No	No	No

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## Packaging d'Applications

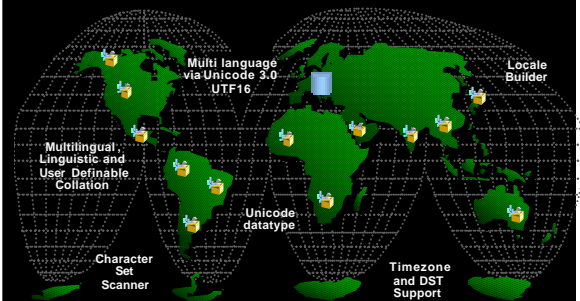
- **Globalization - Expanding eBusiness to the World Market**
- **Providing tactical development features required by ISVs**



Provide the best platform to develop, deploy and host Packaged Applications

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## Globalisation – Marché Mondial



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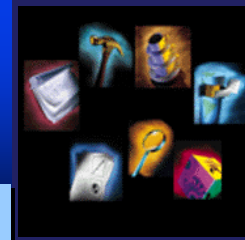
## Qui globalise ?

	Transparent Cluster Support	Globalization	Stored Outline Editing
Oracle8i	No	Limited	No
Oracle9i	Yes	Yes	Yes
IBM DB2	No	Limited	No
Microsoft SQL Server 2000	No	Limited	No

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## Plate-forme de développement

- Enhanced Objects
- Java Enhancements
- XML support
- Dynamic Services
- SQL and PL/SQL improvements

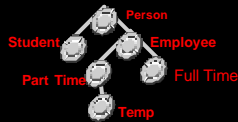


Create the most complete platform for developing eBusiness applications

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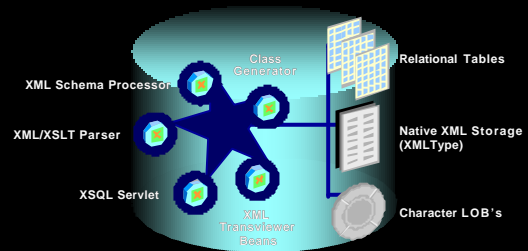
## Oracle 9i et l'objet

- Héritage
- Evolution de Type
- Type Collection Multi niveaux
- Améliorations Classes d'accès Java



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## XML dans la base



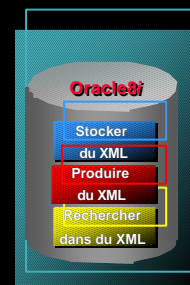
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## Kit de développement 9i XML

- XDKs : Java, JavaBeans, C, C++ et PL/SQL
- XML Schema Processors
  - Support des datatypes simple et complexe
- Support de DOM 2 et SAX
- Processeurs XSL
  - Plus de Performance, moins de ressources
- Un Datatype XML
  - Support Xpath, extract() ...
- URI-Ref Datatypes
  - URIType, DBURIType, HTTPURIType

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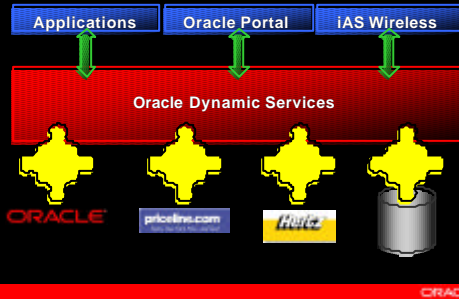
## XML 9i et SQL-XPath



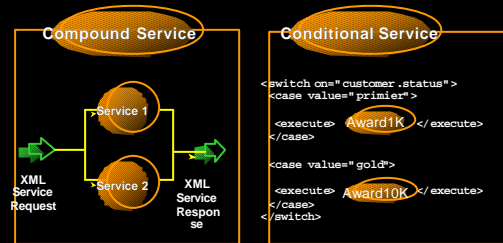
```
CREATE TABLE warehouses
(
  warehouse_id NUMBER(3),
  warehouse_spec SYS.XMLTYPE,
  warehouse_name VARCHAR2(35),
  location_id NUMBER(4)
);
SELECT
  w.warehouse_spec.extract('/Warehouse/Building/text()').getStringVal() "Building"
FROM warehouses w ;
```

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## Services Dynamiques



## Dynamic Services, Exemple



## Améliorations PL/SQL

- Toutes les fonctionnalités SQL disponibles en PL/SQL
- Support de la programmation Objet
- Compilation Native PL/SQL
- Table Functions
- Instruction CASE en PL/SQL

## Améliorations SQL

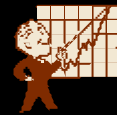
- Jointures ANSI
  - Support SQL1999
- Expressions Case
  - Programmation + facile
- Datetime
  - with TimeZone and DST support
- Long to LOB conversion
  - Les API traiteront LONG et BLOB de façon identiquer

```
SELECT l.city,
       c.country_id,
       c.country_name
FROM locations l
LEFT OUTER JOIN
countries c
ON (c.country_id =
    l.country_id);
```

## Quel est l'objet ?

	Object Support	Java Support	XML Support	Native Computers
Oracle8i	partial	Yes	partial	No
Oracle9i	Yes	Yes	Yes	Yes
IBM DB2	Limited	No J2EE JVM Outside	No Native XML Type	No
Microsoft SQL Server 2000	No	No	YES	No

## 9i SQL Analytique



- Oracle9i augmente la puissance des fonctions analytiques déjà disponibles en 8i:
  - Pourcentage inverse
  - Ranking What-if rank et distribution
  - FIRST/LAST aggregate functions
  - WIDTH\_BUCKET
  - Grouping sets

## Révision SQL 8i ???



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## Inverse Percentile

Example: Find the discrete value closest to the 50th percentile of costs per channel of distribution for the month of November, 1999.

```
SELECT c.channel_desc, avg(s.cost),
percentile_disc(0.5) WITHIN GROUP
(ORDER BY s.cost desc) PERCENTILE_50
FROM sales s, channels c
WHERE c.channel_id = s.channel_id
AND time_id BETWEEN '01-NOV-1999'
AND '30-NOV-1999'
GROUP BY c.channel_desc;
```

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## What-if Ranking

Example: A new worker is hired at a salary of \$10,000, where does his salary rank compared to the salaries per department?

```
SELECT department_id, ROUND(AVG(salary)),
RANK(10000) WITHIN GROUP
(ORDER BY salary DESC) RANK,
DENSE_RANK(10000) WITHIN GROUP
(ORDER BY salary DESC) DR
FROM employees
GROUP BY department_id;
```

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## FIRST & LAST aggregats

Example: Per manager, determine the salary with the lowest commission and the salary with the highest commission.

```
SELECT manager_id,
MIN(salary) KEEP (DENSE_RANK FIRST ORDER BY
commission_pct) AS low_comm,
MAX(salary) KEEP (DENSE_RANK LAST ORDER BY
commission_pct) AS high_comm
FROM employees
WHERE commission_pct IS NOT NULL
GROUP BY manager_id;
```

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## Histogrammes - Buckets

```
SELECT last_name, salary,
WIDTH_BUCKET(salary,3000,13000,5)
AS sal_hist
FROM employees;
```

LAST_NAME	SALARY	SAL_HIST
King	24000	6
Kochhar	17000	6
De Haan	17000	6
Hunold	9000	4
Ernst	6000	2

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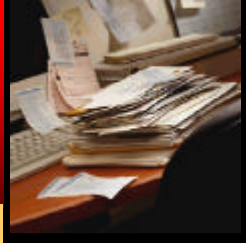
## Grouping Sets

```
SELECT time_id, channel_id, prod_id,
ROUND(SUM(cost)) AS cost
FROM sales
WHERE
(time_id = '01-DEC-1999' or
time_id = '02-DEC-1999')
AND prod_id IN (10, 20, 45)
GROUP BY GROUPING SETS
((time_id, channel_id, prod_id),
(time_id, channel_id),
(channel_id, prod_id))
```

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## Infrastructure d'intégration B2B

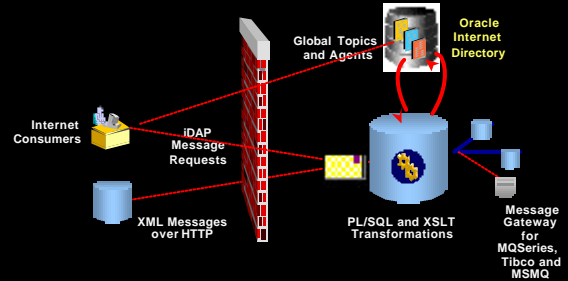
- Support de millions de messages/heure dans les formats standards de l'industrie
- Amélioration dans les environnements distribués



Support millions of transactions/hour

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## Des millions de messages heure



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## Evolutions AQ

- **Accès INTERNET**
  - Tout Client (Non-Oracle) peut accéder aux files de messages dans la base via Internet
- **Propagation HTTP**
  - Propagation HTTP entre 2 files d'attente
  - Messages au format LDAP / XML
- **Intégration LDAP**
  - Point unique d'administration
  - Les Queues peuvent être créées dans le serveur
  - Les clients LDAP peuvent être notifiés d'un message

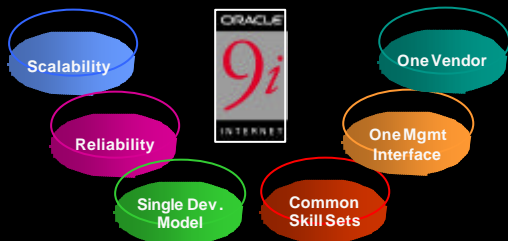
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## Environnements Distribués

- **Advanced Replication**
  - Support de l'Objet
  - Multi-tier, updatable materialized views
  - Fast refresh des vues matérielles N-N (mode subqueries)
  - Reduced quiesce
- **Oracle Transparent Gateways**
  - Support du Result set pour les procédures stockées
  - Support des selects et updates par delta des LONGs et LOBs
  - Support du type date-time
  - Support de l'agent Multi-threadé

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## Oracle 9i élimine le chaos



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## Q&A



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