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Abstract

Dopo una breve introduzione sui contenuti delle presentazioni tecniche vengono presentate le nuove funzionalità' della versione 12c e le ultime evoluzioni della versione 12c R2.





Il 6 marzo 2017 e' stata pubblicata la versione Oracle 12c R2 su ambienti on-premise (Linux e Solaris).

E' una "R2". Chi *conosce da tempo* Oracle sa che e' la versione da utilizzare.

La quantita' di innovazione presente in questa nuova release e' notevole.

Abbiamo fatto quindi una serie di scelte sui contenuti e sulla tipologia di questa breve presentazione... conoscere e presentare ogni cosa non sarebbe possibile.

Immodestamente:

Questo webinar presenta tutto quello che un DBA Oracle deve sapere sulla 12c R2!

Il taglio e' "pratico" nel senso che sono presentati prima i concetti...
ma soprattutto i comandi o gli esempi di utilizzo o le modalita' di configurazione.



Evoluzione e nuove funzionalità' in Oracle 12cR2



Ma oltre ai DBA ci sono anche altri **stakeholders** interessati ad Oracle 12cR2...

Il livello di consolidamento ottenibile con questa versione e' cresciuto in modo molto significativo, quasi non immaginabile con le release precedenti. In particolare sul Multitenant sono state introdotte molteplici, nuove ed importanti funzionalità'.

La flessibilità' delle architetture disponibili e la semplicità' della gestione delle "solite" istanze Oracle sono i due punti di maggiore importanza per sfruttare in modo ottimale l'asset database.

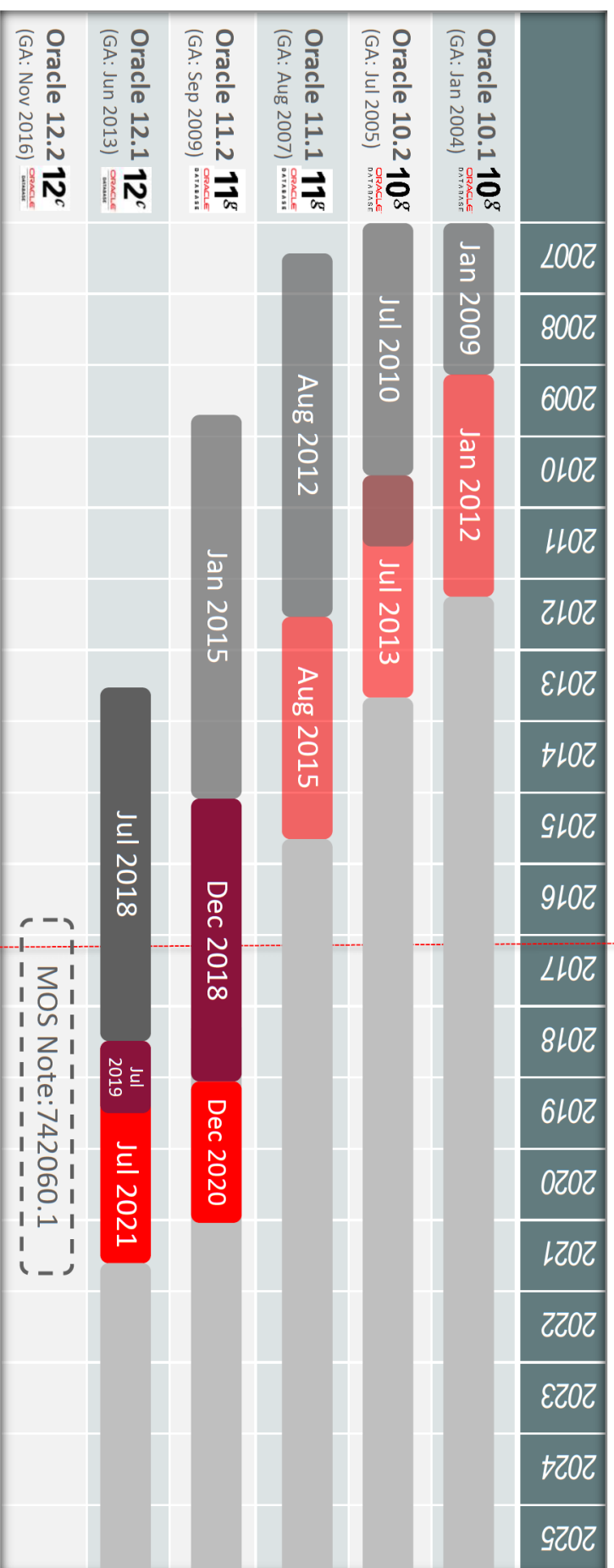
A questo si aggiungono nuove funzionalità' e, non ultimo, un ponte sicuro ed affidabile verso le evoluzioni in Cloud.

Cercheremo quindi di presentare il valore aggiunto della 12cR2 in ogni funzionalità'.





Supported Versions



Premier Support

Waived Extended Support

Paid Extended Support

Sustaining Support



Evoluzione e nuove funzionalita' in Oracle 12cR2



Il 17 marzo per Windows ed il 6 marzo 2017 per Linux e Solaris e' stata rilasciata la 12cR2 on premises.

Dal 5 novembre 2016 e' disponibile la 12cR2 sul Oracle Public Cloud.

Il Premier Support per la 11.2 e' terminato nel gennaio 2015, il waived ES terminera' a fine 2018 e l'ES a fine 2020.

La 12.1.0.2 e' disponibile da Luglio 2014; la 12c R1 e' uscita l'anno precedente.

Le ultime PSU rilasciate erano per la 12c e la 11g R2 [12.1.0.2.170117, 11.2.0.4.161018]. Per le altre releases non vengono piu' rilasciate PSU.

Abbiamo usato l'ordine cronologico inverso...
perche' si farebbe troppo tardi a partire dall'inizio!



Evoluzione e nuove funzionalità' in Oracle 12cR2



Version	Status	Features	Last release	Date (from)	Date (to)
Oracle 12c R2	Production	Online partitioning, Online encryption, DBVault simulation, DBA_INDEX_USAGE, Data Guard automatic deploy, CREATE ANALYTIC VIEW, external and partitioned tables on HDFS, ... For Multitenant: up to 4096 PDB, MAX_PDBS, different character sets, active DG and DG Broker, flashback, hot clone, max_iops, proxy PDB, ... For Cloud: listener multiple redirects, SQLNET.COMPRESSION, sharding option, RMAN cross-platform support, ...	12.2.0.1	2016-11	2021-10 (2024 ES)
Oracle 12c	Production	Oracle Multitenant Option (aka Pluggable DBs): Heat Map Optimizations; Adaptive Query Optimization; RMAN improvements (table restore, standby restore, ...); Availability: transparent failover, Global Data Service; Infrastructure: light-weight grid stack, EM express; ILM (Information lifecycle); SQL: default with sequence, varchar up to 32k, with-PLSQL functions, ... Desupport: <= 9.2 clients, raw devices 12.1.0.2: InMemory Option, SE2, ... Deprecation: Non-CDB architecture	12.1.0.1 12.1.0.2	2013-07 2014-07	2016-08 2018-07 (2021 ES)
Oracle 11g R2	Production	Stable, fast, low TCO; ADVM (ASM Dynamic Volume Manager) and ACFS (ASM Cluster File System), Oracle restart (srvctl), Caging (CPU_COUNT), Hybrid Compression; RAC One Node option, SCAN listener, Omotion; 11.2.0.2 Patch Set is a full release Desupport: raw devices in DBCA, Oracle Ultra Search	11.2.0.1 11.2.0.2 11.2.0.3 11.2.0.4	2009-09 2010-09 2011-09 2013-04	2015-01 (2020 ES)



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Oracle 11g	Sust.:Supp.	Availability enhancements, performance optimization (eg. client cache), native PL/SQL compilation, binary XML Options: Total Recall, Advanced Compression, real application testing (RAT) Desupport: exp, isqlplus, <= 8.1.7 clients	11.1.0.7	2007-08 (Linux)
Oracle 10g R2 (10.2)	Sust.:Supp.	Stable, COMMIT NOWAIT, fully featured Enterprise Manager, Data Pump compression	10.2.0.5	2005
Oracle 10g (10.1)	Sust.:Supp.	sqlplus / as sysdba, Regexp, Flashback tables, "Grid" Desupport: Rule based Optimizer, <= 7.3.4 clients, init parameters	10.1.0.5	2003
Oracle 9i R2 (9.2)	Sust.:Supp.	Very stable, JDK 1.3 in JVM, XML	9.2.0.8	2002
Oracle 9i (9.0.1)	Unsupp.	ETL, RMAN, 9i Data Guard, Parallel DB->RAC, MTS->Shared Server Desupport: CONNECT Internal, SQL*Net, Server Manager, ESTAT/BSTAT more...	9.0.1.5	2001
Oracle 8i	Sust.:Supp.	8.1.7: Very stable, Enterprise Manager, Apache, JSP 8.1.6: Statspack, DBA Studio, PL/SQL SP 8.1.5: DROP COLUMN, temporary table, <i>Internet</i> , iFS, Java Stored Procedures	8.1.7.4	1999
Oracle 8.0	Unsupp.	Partitioning, <i>Object option</i> , object types, Full NLS, SQL3, SQL*Net -> Net8	8.0.6.3	1997
Oracle 7.3	Unsupp.	Very stable, Temporary tablespaces, Bitmap indexes, UTL_FILE package, multithreading, Spatial Option Desupport: SQL*Net v.1, sqldb	7.3.4.5	1996
Oracle 7.2	Unsupp.	Subquery in FROM clause, features x DBA (resizeable datafile, rollback segment shrink)		1995
Oracle 7.1	Unsupp.	Parallel query, Server Manager, Advanced replication		1994
Oracle 7.0	Unsupp.	Stored procedures and triggers, Integrity constraints (enforcement), cost-based optimizer, SQL*Net v.2 with 2PC and MTS Desupport: SQL*Forms v.2.3		1992
Oracle 6.0	Unsupp.	Row level locking, PL-SQL, Integrity constraints (declaration), new architecture (B*Tree, tablespaces, rollback segments, redo logs) (6.2) : Parallel Server Option		1988
Oracle 5.1	Unsupp.	Stable, distributed query		1986

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Client Version	Server Version													
	12.2.0	12.1.0	11.2.0	11.1.0	10.2.0	10.1.0	9.2.0	9.0.1	8.1.7	8.1.6	8.1.5	8.0.6	8.0.5	7.3.4
12.2.0	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No
12.1.0	Yes	Yes	Yes	Was	Was	No	No	No	No	No	No	No	No	No
11.2.0	Yes	Yes	Yes	Was	Was	Was	Was	No	No	No	No	No	No	No
11.1.0	No	Was	Was	Was	Was	Was	Was	No	No	No	No	No	No	No
10.2.0	No	Was	Was	Was	Was	Was	Was	No	Was	No	No	No	No	No
10.1.0	No	No	Was	Was	Was	Was	Was	Was	Was	No	No	No	No	No
9.2.0	No	No	Was	Was	Was	Was	Was	Was	Was	No	No	Was	No	No
9.0.1	No	No	No	No	No	Was	Was	Was	Was	Was	No	Was	No	Was
8.1.7	No	No	No	No	Was	Was	Was	Was	Was	Was	Was	Was	Was	Was
8.1.6	No	No	No	No	No	No	No	Was	Was	Was	Was	Was	Was	Was
8.1.5	No	No	No	No	No	No	No	No	Was	Was	Was	Was	Was	Was
8.0.6	No	No	No	No	No	No	Was	Was	Was	Was	Was	Was	Was	Was
8.0.5	No	No	No	No	No	No	No	No	Was	Was	Was	Was	Was	Was
7.3.4	No	No	No	No	No	No	Was	Was	Was	Was	Was	Was	Was	Was

Legenda:

Yes – Supportato

Was – Configurazione funzionante ma non piu' supportata

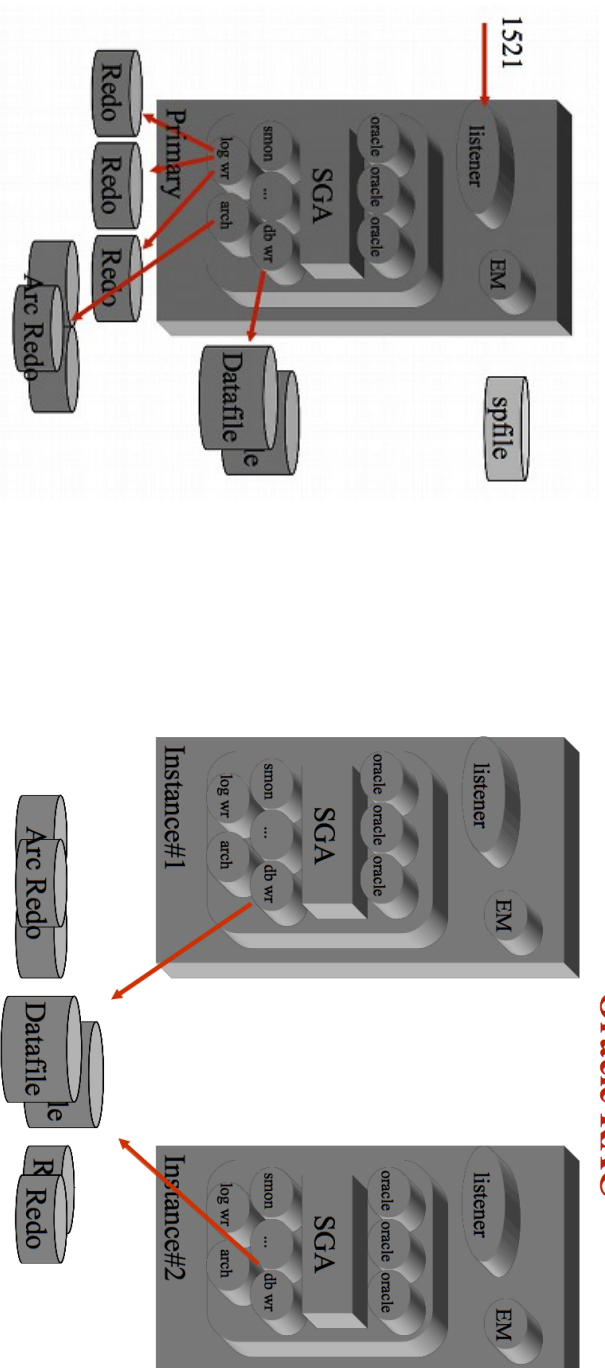
NO – Configurazione non funzionante





L'architettura di Oracle si e' *solo evoluta* nel tempo (almeno a partire dalla 6.0)...

Oracle RAC



Evoluzione e nuove funzionalità' in Oracle 12cR2



Dal punto di vista dell'architettura il numero di processi e' cresciuto da 6 (v. 6.0) a 64 (v. 12.2), ma le logiche di base sono le stesse!

Ma sta per verificarsi un nuovo salto generazionale: l'architettura Multitenant.

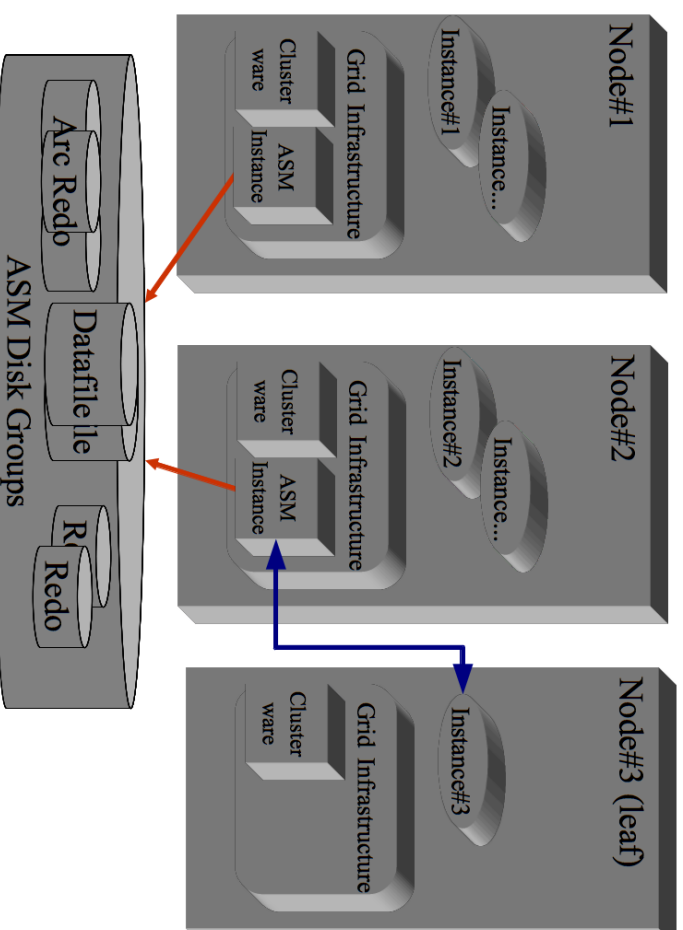
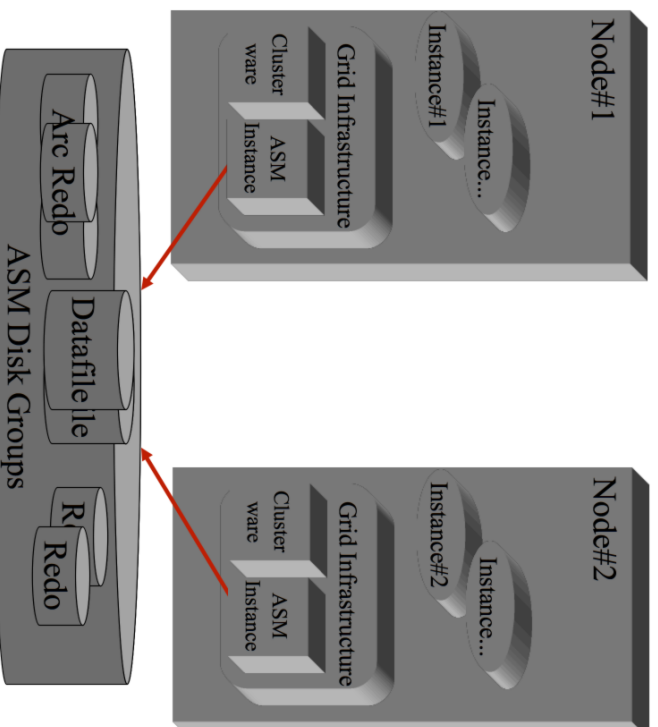
E' cosi' importante che merita un capitolo a parte...

Quindi ora vediamo le altre innovazioni ed evoluzioni della 12c!





La componente Grid in 12c puo' utilizzare la configurazione **Flex**





Il vecchio, caro, ROWNUM, sostituito con il **fetch**:

```
select *
  from scott.emp
 order by sal desc
 fetch first 5 rows only;

select *
  from orders
 order by id
 offset 10 rows fetch next 5 rows only;
```



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L'**Heat Map** e' semplice da utilizzare.

Ma la sua potenza sara' sfruttarla per una politica di ILM (Information Lifecycle Management) integrata con l'ADO (Automatic Data Optimization) e l'Advanced Compression Option

```
ALTER SYSTEM SET HEAT_MAP = ON;  
  
select *  
  from DBA_HEATMAP_TOP_OBJECTS;  
  
ALTER TABLE fatture_attive ILM ADD POLICY  
COMPRESS FOR ARCHIVE HIGH SEGMENT  
AFTER 12 MONTHS OF NO ACCESS;  
ALTER TABLE fatture_passive ILM ADD POLICY  
TIER TO tbs_tier3 SEGMENT  
AFTER 6 MONTHS OF LOW ACCESS;
```



Evoluzione e nuove funzionalità' in Oracle 12cR2



In-Memory Option: come attivarla. Usarla e' banale, lo fa qualsiasi SELECT!

```
SQL> alter system set inmemory_size=8G scope=spfile;  
SQL> shutdown immediate  
SQL> startup  
  
SQL> alter table MyImportantTable inmemory;
```





Diverse nuove funzionalità' sul partitioning tra cui: **Online partitioning**

```
ALTER TABLE t1 MODIFY
PARTITION BY RANGE (amount) INTERVAL (100)
( PARTITION P1 VALUES LESS THAN (300) ,
  PARTITION P2 VALUES LESS THAN (700) )
ONLINE
UPDATE INDEXES
( IDX01_AMOUNT LOCAL
  PARTITION IP1 VALUES LESS THAN (MAXVALUE) ) ;
```



Evoluzione e nuove funzionalità in Oracle 12cR2



L'Encryption (**TDE**) può essere utilizzato sul singolo campo o su un intero tablespace.
La conversione di un tablespace però richiedeva fosse messo in READ ONLY, ora con la 12cR2:

```
alter tablespace USERS  
ENCRYPTION online using 'AES256' ENCRYPT  
FILE_NAME_CONVERT = ('users.dbf', 'users_enc.dbf');
```





Il Database Vault può essere utilizzato in Simulation Mode:

```
BEGIN
DBMS_MACADM.CREATE_REALM(
  realm_name      => 'HR Apps',
  description     => 'Realm to protect the HR realm',
  enabled         => DBMS_MACUTI.G_SIMULATION,
  audit_options  => DBMS_MACUTI.G_REALM_AUDIT_FAIL,
  realm_type     => 1,
  realm_scope    => DBMS_MACUTI.G_SCOPE_LOCAL);
END;
/

SELECT USERNAME, COMMAND, SQLTEXT, VIOLATION_TYPE
FROM DBA_DV_SIMULATION_LOG
WHERE REALM_NAME = "HR_APPS";
```





Utilizzo degli indici (vista **DBA_INDEX_USAGE**):

```
select *  
from DBA_INDEX_USAGE  
where TOTAL_ACCESS_COUNT=0;
```





Sharding Option: architettura shared nothing con il supporto completo dell'SQL e delle transazioni

```
ALTER SESSION ENABLE SHARD DDL;  
  
CREATE SHARDED TABLE Customers  
( CustNo      NUMBER NOT NULL,  
  Name        VARCHAR2 (50)  
  , Address   VARCHAR2 (250)  
  , CONSTRAINT rootpk PRIMARY KEY (CustNo) )  
PARTITION BY CONSISTENT HASH (CustNo)  
PARTITIONS AUTO  
TABLESPACE SET ts1;
```



Evoluzione e nuove funzionalita' in Oracle 12cR2



Molte altre evoluzioni della 12c (vale per tutti e tre i rilasci della 12c) non si vedono ma ci sono!

Ad esempio l'**ottimizzatore** e' ancora migliorato, le statistiche vengono raccolte con maggior frequenza e con snapshot "piu' leggeri", molti limiti sono stati aumentati (eg. varchar fino a 32K), la **compressione** e' sempre piu' evoluta, ...

Per chiudere con un'immagine del nuovo **Enterprise Manager**:

