



SAP Infrastructure Platforms

# SAP on Oracle

## Development Update

MAY 2022 | PUBLIC

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# Database **Support** Timelines



# Database Support Timelines

## Oracle Database 12c Release 1

### Extended Support ends in July 2022!

SUPPORT TIMELINE ORACLE DATABASE 12.1.0.2

#### Extra-Charged Extended Support

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Start	1 August 2019
End	31 July 2022 <sup>1</sup>

- Extended support ends 31 July 2022!
- Sustaining Support as of 1 August 2022
  - No more patches nor SBPs
  - No support for new OS versions

<sup>1</sup> CAUTION: All Microsoft Windows platforms ended on 31 July 2021

# Database Support Timelines

## Oracle Database 12c Release 2

### Oracle Database 12.2 End of Support

SUPPORT TIMELINE ORACLE DATABASE 12.2.0.1

#### Limited Error Correction

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Start	1 December 2020
End	31 March 2022

- Limited Error Correction phase has expired
- No Extended Support offered for Oracle 12.2
- Sustaining Support since 1 April 2022!
  - No more patches nor SBPs
  - No support for new OS versions

# Database Support Timelines

## Oracle Database 18c

### Oracle Database 18c End of Support

SUPPORT TIMELINE ORACLE DATABASE 18c

#### Premier Support

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Start	February 2018
End	30 June 2021

- Premier Support phase has expired
- No Extended Support offered for Oracle 18c
- Sustaining Support since 1 August 2021!
  - No more patches nor SBPs
  - No support for new OS versions

# Database Support Timelines

## Oracle Database 19c<sup>1</sup>

### Oracle Database 19c is in Premier Support

SUPPORT TIMELINE ORACLE DATABASE 19c

#### Premier Support

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Start	March 2019
End	30 April 2024

#### Extended Support<sup>2</sup>

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Start	1 May 2024
End	30 April 2027

- Oracle 19c is last release to support Solaris x64!

<sup>1</sup> Oracle 19c is a *Long Term Support Release* <sup>2</sup> at additional costs

## Database Support Timelines

# SAP Certification Roadmap for Oracle Databases 19c and beyond

### SAP certification of a new Oracle database release...

- ...starts with availability on all on-premise OS platforms supported by SAP<sup>1</sup>
- ...is planned within 6 months after the on-premise platform availability
- ...will cover all platforms<sup>2</sup>

For details see

- SAP Note 2606828

#### ORACLE DATABASE AVAILABILITY TIMELINE

Oracle Database Release	Availability by Oracle for On-Premise Platforms	SAP Certification
Oracle Database 19c	June 2019 Release Update (19.3)	December 2019 (19.5)
Oracle Database 23c	TBD	TBD

<sup>1</sup> Linux, Windows, Solaris, AIX, HP-UX <sup>2</sup> Oracle Cloud Infrastructure, Engineered Systems, all on-premise platforms

Upcoming Tenant Architecture

# Beyond Oracle Database 19c



# Upcoming Tenant Architecture

## Beyond Oracle Database 19c

### Non-container architecture no longer available

Oracle Multitenant architecture mandatory

- Non-container database becomes Single Tenant database
- Existing databases must be migrated

### New Installations

- Installer automatically creates Single Tenant

### Existing Installations

- Migration to Single Tenant **must** happen in 19c!
  - Option in SL Tool Set 1.0 SPS 36<sup>1,2</sup>
  - One-step migration within database upgrade not supported
- 19c mandatory stage for any database upgrade beyond

<sup>1</sup> ETA 10 October 2022 <sup>2</sup> Homogeneous migration only, i.e. no Single Instance to RAC, no File System to ASM, and vice versa. Manual migration supported.



# Upcoming Tenant Architecture

## Beyond Oracle Database 19c

### Operating System User Concepts

Switch to Multitenant requires new concept:

- Deprecated user concept “SAP Classic” no longer supported
- Tenant architecture requires SAP user concept “Oracle Standard”
  - Software owner is ‘oracle’

For details see

- SAP Note 1915323

### Licensing

Three tenants included for free

- CAUTION: Oracle Multitenant option is cost-liable
- No Multitenant option required for up to **3** tenants per container database.

# Infrastructure **as a Service**



# Infrastructure as a Service

## Oracle Cloud Infrastructure Compute

RUN ENTERPRISE WORKLOADS IN THE CLOUD

### Oracle Cloud Infrastructure Compute

is supported with SAP as follows:

- Oracle Database 12.1.0.2<sup>1</sup> and 19c
- All features/options<sup>2</sup> supported for SAP on premise are available with Oracle Cloud Infrastructure
- Oracle Linux 6, 7 and 8<sup>3</sup>

Supported SAP products:

- SAP NetWeaver 7.0X<sup>4</sup>, 7.X<sup>5,6</sup> and products based hereupon
- SAP BusinessObjects BI platform
- SAP SCM APO-liveCache

For details see

- SAP Notes 2474949 and 2520061
- Knowledge Base Article 2650732
- Oracle white paper in SAP community

<sup>1</sup> Minimum SAP Bundle Patch August 2017 <sup>2</sup> except RAC, except ASM <sup>3</sup> Oracle Linux 8 requires UEKR6 <sup>4</sup> AS ABAP only <sup>5</sup> Unicode only

<sup>6</sup> Minimum SAP Host Agent 7.21 patch level 30 for Bare Metal and patch level 35 for Virtual Machine Shapes

# Infrastructure as a Service

## Oracle Cloud Infrastructure Compute

### CERTIFIED VIRTUAL MACHINE SHAPES

Shape	OCPU	Memory	Database Storage	SAPS
VM.Standard2.16	16	240 GB	1 PB Block Storage	21,730
VM.Standard2.8	8	120 GB	1 PB Block Storage	10,865
VM.Standard2.4	4	60 GB	1 PB Block Storage	5,433
VM.Standard2.2	2	30 GB	1 PB Block Storage	2,717
VM.Standard2.1	1	15 GB	1 PB Block Storage	1,359
VM.DenseIO2.16	16	240 GB	12.8 TB NVMe	21,730
VM.DenseIO2.8	8	120 GB	6.4 TB NVMe	10,865

# Infrastructure as a Service

## Oracle Cloud Infrastructure Compute

### CERTIFIED VIRTUAL MACHINE SHAPES (CONTINUED)

Shape	OCPU	Memory	Database Storage	SAPS
VM.Standard.E4.Flex	$33 \leq N \leq 64$	$N * 16$ GB	1 PB Block Storage	$125,630 * N / 64$
VM.Standard.E4.Flex	$2 \leq N \leq 32$	$N * 16$ GB	1 PB Block Storage	$74,930 * N / 32$
VM.Standard.E3.Flex	$33 \leq N \leq 62$	$N * 16$ GB	1 PB Block Storage	$103,720 * N / 62$
VM.Standard.E3.Flex	$2 \leq N \leq 32$	$N * 16$ GB	1 PB Block Storage	$67,280 * N / 32$
VM.Standard.E2.8	8	64 GB	1 PB Block Storage	12,530
VM.Standard.E2.4	4	32 GB	1 PB Block Storage	6,265
VM.Standard.E2.2	2	16 GB	1 PB Block Storage	3,133
VM.Standard.E2.1	1	8 GB	1 TB Block Storage	1,567

# Infrastructure as a Service

## Oracle Cloud Infrastructure Compute

CERTIFIED BARE METAL MACHINE SHAPES <sup>1</sup>

Shape	OCPU	Memory	Database Storage	SAPS
BM.Standard.E4.128	128	2048 GB	1 PB Block Storage	258,650
BM.Standard.E3.128	128	2048 GB	1 PB Block Storage	119,020
BM.StandardIO2.52	52	768 GB	1 PB Block Storage	72,230
BM.DenseIO2.52	52	768 GB	51.2 TB NVMe <sup>2</sup>	72,230

<sup>1</sup> No support for any virtualization technology on Oracle Cloud Infrastructure Bare Metal Compute instances <sup>2</sup> Block Volume Storage (up to 1 PB) can also be used

## Infrastructure as a Service

# Oracle Database Exadata Cloud Service (ExaCS)

### EXADATA DATABASE MACHINE IN THE ORACLE CLOUD

## Oracle Database Exadata Cloud Service

### Support for ExaCS X6 through X8|X8M

- Oracle Database 12.1.0.2 and 19c
- All features/options supported for SAP on premise are available with Oracle ExaCS<sup>1</sup>
  - including RAC
- Oracle Linux 7

### Supported SAP products (Database only):

- SAP NetWeaver 7.0X<sup>2</sup>, 7.X<sup>3,4</sup> and products based hereupon
- SAP BusinessObjects BI platform 4.2 and above

### For details see

- SAP Note 2614028
- Oracle white paper in SAP Community

<sup>1</sup> Minimum ExaCS 17.4.2.2 <sup>2</sup> AS ABAP only <sup>3</sup> Unicode only <sup>4</sup> Minimum SAP Host Agent 7.21 Patch Level 35

## Infrastructure as a Service

# Oracle Database Exadata Cloud Service (ExaCS)

### SUPPORTED ORACLE EXA-CS SHAPES AND MACHINE TYPES (EXCERPT)

Shape	# Cores per Node	Memory	Database Storage	SAPS
Exadata.X8M/Half Rack X8M	16 ≤ <i>N</i> ≤ 200	5,560 GB	299 TB on Storage Servers	298,600 * <i>N</i> / 200
Exadata.X8M/Quarter Rack X8M	8 ≤ <i>N</i> ≤ 100	2,780 GB	149 TB on Storage Servers	149,300 * <i>N</i> / 100
Exadata.X8M (Base)	8 ≤ <i>N</i> ≤ 48	720 GB	74.6 TB on Storage Servers	149,300 * <i>N</i> / 48
Exadata.Half3.200/Half Rack X8-2	16 ≤ <i>N</i> ≤ 200	2,880 GB	299 TB on Storage Servers	274,700 * <i>N</i> / 200
Exadata.Quarter3.100/Quarter Rack X8-2	10 ≤ <i>N</i> ≤ 100	1,440 GB	149 TB on Storage Servers	137,350 * <i>N</i> / 100
Exadata.Base.48/Eighth Rack X8-2	8 ≤ <i>N</i> ≤ 48	720 GB	74.6 TB on Storage Servers	65,928 * <i>N</i> / 48
Exadata.Half2.184/Half Rack X7-2	16 ≤ <i>N</i> ≤ 184	2,880 GB	212 TB on Storage Servers	209,080 * <i>N</i> / 184
Exadata.Quarter2.92/Quarter Rack X7-2	8 ≤ <i>N</i> ≤ 92	1,440 GB	106 TB on Storage Servers	115,315 * <i>N</i> / 92
Exadata.Base.48/Eighth Rack X7-2	8 ≤ <i>N</i> ≤ 48	720 GB	74.6 TB on Storage Servers	60,164 * <i>N</i> / 48
Exadata.Quarter1.84/Quarter Rack X6-2	22 ≤ <i>N</i> ≤ 84	720 GB	84 TB on Storage Servers	119,700 * <i>N</i> / 84



## Infrastructure as a Service

# Oracle Database Exadata Cloud@Customer (ExaCC)

### EXADATA CLOUD SERVICE IN CUSTOMER DATA CENTER

## Oracle Database Exadata Cloud@Customer

### Support for ExaCC X8M Gen 2<sup>1</sup> and X9M<sup>2</sup>

- Oracle Database 12.1.0.2 and 19c
- All features/options supported for SAP on premise are available with Oracle ExaCC<sup>3</sup>
  - including RAC
- Oracle Linux 7

### Supported SAP products (Database only):

- SAP NetWeaver 7.0X<sup>4</sup>, 7.X<sup>5,6</sup> and products based hereupon
- SAP BusinessObjects BI platform 4.2 and above

### For details see

- SAP Note 2956661
- Oracle white paper in SAP Community

<sup>1</sup> No support for ExaCC X6, X7, X8 and X8M Gen 1 <sup>2</sup> Oracle 19c only <sup>3</sup> Minimum ExaCC 19.4.3.3.0 <sup>4</sup> AS ABAP only

<sup>5</sup> No non-Unicode SAP instance on ExaCC nor on Oracle Linux <sup>6</sup> Minimum SAP Host Agent 7.21 Patch Level 35

## Infrastructure as a Service

# Oracle Database Exadata Cloud@Customer (ExaCC)

### SUPPORTED ORACLE EXA-CC SHAPES AND MACHINE TYPES

Shape	# Cores per Node	Memory	Database Storage
ExadataCC.FullX9M.496	16 ≤ <i>N</i> ≤ 496	11,120 GB	769 TB on Storage Servers
ExadataCC.HalfX9M.248	8 ≤ <i>N</i> ≤ 248	5,560 GB	384 TB on Storage Servers
ExadataCC.QuarterX9M.124	4 ≤ <i>N</i> ≤ 124	2,780 GB	192 TB on Storage Servers
ExadataCC.BaseX9M.48	4 ≤ <i>N</i> ≤ 48	656 GB	74 TB on Storage Servers
ExadataCC.FullX8M.400	32 ≤ <i>N</i> ≤ 400	11,120 GB	598 TB on Storage Servers
ExadataCC.HalfX8M.200	16 ≤ <i>N</i> ≤ 200	5,560 GB	299 TB on Storage Servers
ExadataCC.QuarterX8M.100	8 ≤ <i>N</i> ≤ 100	2,780 GB	149 TB on Storage Servers
ExadataCC.BaseX8M.48	8 ≤ <i>N</i> ≤ 48	656 GB	74 TB on Storage Servers

# Infrastructure as a Service

## Microsoft Azure

### Microsoft Azure

is supported with SAP as follows:

- Oracle Database 12.1.0.2 and 19c
- Single Instance only (no RAC)

Supported operating system versions:<sup>1</sup>

- Microsoft Windows Server
  - 2008 R2 Service Pack 1
  - 2012 and 2012 R2
  - 2016 and 2019
- Oracle Linux 7 and 8
  - Including Oracle ASM support

For details see

- SAP Notes 1928533 and 2039619

<sup>1</sup> No Oracle 19c on Windows Server 2008 R2 SP1, 2012 [R1] and Oracle Linux 7. Windows Server 2016 and 2019 are Oracle 19c only

# Infrastructure as a Service

## Amazon Web Services (AWS)

### Amazon Web Services

are supported with SAP as follows:

- Oracle Database 12.1.0.2 and 19c
- Oracle Linux 6.4 or higher<sup>1,2</sup>
- Unicode only
- Amazon Web Services EC2 only
  - No support for AWS RDS
- Single Instance only (no RAC)

For details see

- SAP Notes 2358420 and 1656099

<sup>1</sup> Amazon Machine Image (AMI) must be based on Oracle Linux 6.4 or later <sup>2</sup> Oracle 19c requires Oracle Linux 8

# Engineered **Systems**



# Engineered Systems

## **Exadata & Exalogic**

### CLUSTERED DATABASE AND STORAGE SERVER

#### **Oracle Exadata Database Machine**

Support for X2-2|8 through X9M-2|8

- X9M certified for SAP in October 2021

For details see

- SAP Note 1590515
- Oracle Exadata white paper in SAP Community

### CLUSTERED APPLICATION SERVER

#### **Oracle Exalogic**

Support for X2-2 through X5-2

- Only in combination with Exadata

For details see

- SAP Note 1617188

# Engineered Systems

## **SPARC Clusters**

GENERAL PURPOSE ENGINEERED SYSTEM

### **Oracle SPARC SuperCluster**

Support for T4-4, T5-8, M6-32, M7 and M8

For details see

- SAP Notes 1693680

SMALL-SCALE, GENERAL PURPOSE ENGINEERED SYSTEM

### **Oracle SPARC MiniCluster**

Support for S7-2

For details see

- SAP Note 2384855

Engineered Systems

## Database Appliance (ODA) & Private Cloud Appliance (OPCA)

TWO-NODE CLUSTERED DATABASE SERVER

### Oracle Database Appliance

Support for V1, X3-2 through X8-2

- X8 certified for SAP in October 2020

For details see

- SAP Notes 2290084, 2388511, 2664704 and 2929109
- Oracle ODA white papers in SAP Community

ENGINEERED SYSTEM DESIGNED FOR VIRTUALIZATION

### Oracle Private Cloud Appliance

Support for X3-2 through X8-2

- X8 certified for SAP in October 2020

For details see

- SAP Note 2052912



# Oracle **Multitenant**



# Oracle Multitenant Certification

## Oracle Multitenant

Certified for SAP since February 2017

### Minimum Requirements:

- Oracle Database 12c Release 12.1.0.2<sup>1</sup>
- SAP NetWeaver 7.40 with kernel 7.45<sup>2</sup> patch 210
- SWPM 1.0 SP19, SUM 1.0 SP19<sup>3</sup>
- BR\*Tools 7.40 Patch 30
- SAP notes to apply

For details see

- SAP Note 2336881

### Required licenses:

- Oracle Multitenant comes at a cost for both Oracle direct and SAP ASFU customers
  - No license required when using up to 3 PDBs per CDB<sup>4</sup>
- Oracle Full Use customers need to purchase:
  - Oracle Multitenant Option
- SAP ASFU customers need to purchase:
  - SAP “Oracle Multitenant License Package”

<sup>1</sup> plus specific SAP Database Bundle Patch <sup>2</sup> Unicode only <sup>3</sup> Contained in Software Logistics (SL) Tool Set 1.0 SP19 <sup>4</sup> not for Oracle 12

# Oracle Multitenant Restrictions

## Oracle Multitenant with SAP

is subject to the following restrictions:

- Unix: User concept “Oracle Standard” only
- No mix of OLTP and OLAP PDBs in same CDB

For details see

- SAP Note 2336881

Restrictions planned to be lifted:

- No RAC support. SI/FS and SI/ASM only
- Limited support for Engineered Systems:
  - SI/ASM only
- No support for
  - Windows Cluster
  - Transparent Data Encryption (TDE)
- Limitations regarding SAP Host Agent

# Oracle Database **In-Memory**



# Oracle Database In-Memory Certification

## Oracle Database In-Memory

Certified for SAP since 30 June 2015

### Minimum Requirements

- Oracle Database 12c Release 12.1.0.2<sup>1</sup>
  - including RAC 12c and Engineered Systems
- SAP NW 7.X with kernel 7.21\_EXT
  - DDIC < 7.40 SP12 has limited IM support

For details see

- SAP Note 2178980
- Oracle In-Memory whitepaper in SAP Community

### SAP Products Support

- Business Suite based on SAP NetWeaver
  - ERP, CRM, SRM, SCM, BW, PI, ...
  - Industry solutions
- Check SAP Product Availability Matrix (PAM) for full list

<sup>1</sup> with June 2015 SAP Bundle Patch (Unix) or Database Bundle Patch 12.1.0.2.6 (Windows)

# Oracle Database In-Memory

## Two Approaches

### APPROACH 1

#### Using the Database In-Memory Advisor

##### Situation

- Tables/partitions recommended/suitable for In-Memory are yet unknown

##### Action<sup>1</sup>

- Run IM Advisor for recommendations
  - Adjusted to SAP specifications
- Relies on 2–3 days of Automatic Workload Repository (AWR) data

### APPROACH 2

#### Object candidates for In-Memory are known

##### Situation

- Reports with long running queries processing large amounts of data have already been identified

##### Action<sup>1</sup>

- Put these tables/partitions in IM column store
- Use SAP\_IM\_ADV package<sup>2</sup> for proper column store sizing

<sup>1</sup> See Oracle In-Memory white paper in SAP Community for detailed procedure <sup>2</sup> included in SAP Bundle Patch

# Oracle Database In-Memory Conventions

## Index Design

Changes to SAP standard<sup>1</sup> index design are not allowed:

- No dropping
- No setting invisible or unusable

## Individual Columns

All columns of SAP standard tables must be loaded into In-Memory column store

- No loading of individual columns
- No exclusion of individual columns

## Database Buffer Cache

Reducing buffer cache size in favor of IM column store is not allowed

- Always use additional memory for IM

## SAP BW Aggregates

Dropping all aggregates from an existing BW system is not recommended

- Aggregates are designed for providing good throughput in concurrent user environments

<sup>1</sup> Custom indices in customer namespace are not affected, changes are allowed

# Oracle Database In-Memory Licenses

**Oracle Database In-Memory** requires the following licenses:

- Oracle Full Use customers:
  - Oracle Database In-Memory Option
- SAP ASFU customers:
  - SAP “Oracle In-Memory License Package”See SAP price list for details
- 16 GB of In-Memory Column Store are free!<sup>1,2</sup>

**Oracle Database In-Memory Advisor** requires the following licenses:

- Oracle Full Use customers:
  - Oracle Tuning Pack
  - Oracle Diagnostics Pack
- These packs are included in SAP ASFU license

<sup>1</sup> i.e. no In-Memory license required for both Oracle Full Use and SAP ASFU customers <sup>2</sup> Oracle Database 19.8 or higher



# Oracle **Advanced Data Optimization**



# Oracle Advanced Data Optimization Certification

## Oracle Advanced Data Optimization

Certified for SAP since 31 December 2015

### Minimum Requirements and Limitations:

- Oracle Database 12c Release 12.1.0.2<sup>1</sup>
- SAP NetWeaver 7.40 SP12, 7.50 SP2
- Oracle Hybrid Columnar Compression (HCC):
  - only in combination with ADO
  - limited to row level locking

### For details see

- SAP Note 2254866
- Oracle ILM/ADO white paper in SAP Community

### Required licenses:

- Oracle Full Use customers need to purchase:
  - Oracle Advanced Compression Option (ACO)
- This option is included in SAP ASFU license

<sup>1</sup> with May 2016 SBP for Unix/Windows Patch Bundle 1608

SAP NW Business Intelligence

# Flat InfoCubes



# SAP NW Business Intelligence

## Recent Optimizations

### Overview

Recent optimizations in SAP NetWeaver Business Intelligence:

- Flat InfoCubes
  - Standard InfoCubes  
SAP Note 2335159, 7.40 SP15, 7.50 SP04
  - Semantically Partitioned Objects (SPOs)  
SAP Note 2711358, 7.40 SP22, 7.50 SP15
  - MassConversion  
SAP Note 2523154, 7.40 SP18, 7.50 SP10
- FEMS PushDown
  - SAP Note 2816467, 7.50 SP15
  - Flat Cubes
  - DataStore Objects (DSOs)
- In-Memory Dynamic Scans (18c)  
SAP Note 2335159, 7.40 SP15, 7.50 SP04

— ALL THESE OPTIMIZATIONS ARE BASED ON ORACLE DATABASE IN-MEMORY —

# SAP NW Business Intelligence

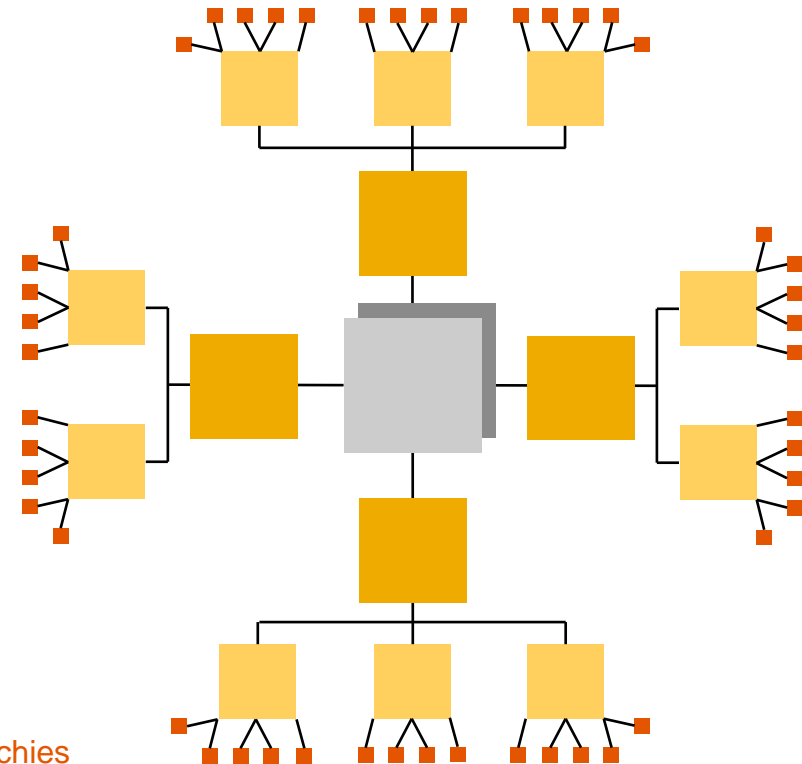
## Classic InfoCubes

### Classic InfoCubes follow SAP proprietary, extended Star schema

Optimized for row-based, classic RDBMS

- 2 fact tables
  - E fact table: Read-optimized partitioning
  - F fact table: Write/Delete-optimized partitioning
- Dimension tables
  - as grouping sets of characteristics
- Shared master tables

facts  
dimensions  
characteristics  
attributes + hierarchies



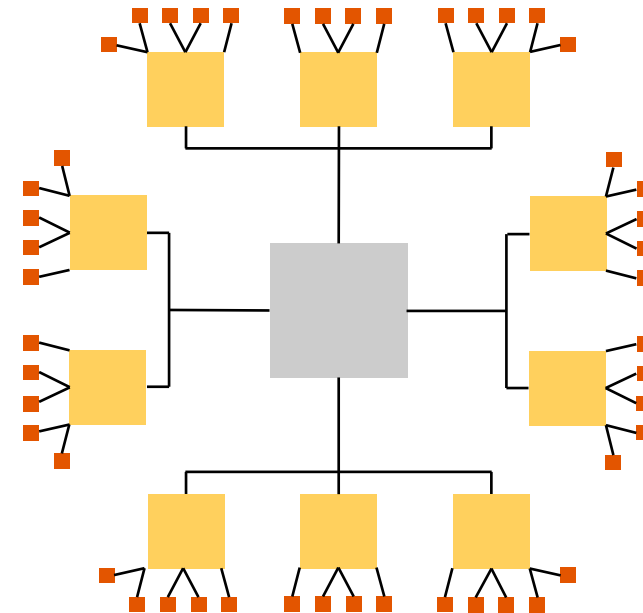
# SAP NW Business Intelligence

## Flat InfoCubes

### Flat InfoCubes are simplification of classic schema

Optimized for columnar and hybrid RDBMS

- 1 fact table
  - Write/Delete no longer harms read performance
    - No separation into E and F fact tables
  - Two-dimensionally partitioned using sub-partitioning
- No dimension tables<sup>1</sup>
  - Dimensions become pure meta data
  - Obsolete need to look-up/create DIMIDs strongly boosts update performance
- Much higher query and load performance
  - Due to In-Memory technology
  - Less joins; no indices on fact table



facts  
characteristics  
attributes + hierarchies

<sup>1</sup> SAP package dimension remains

# SAP NW Business Intelligence

## Flat InfoCubes with SAP on Oracle

**Available from SAP NW Business Intelligence 7.40**

Relies on Oracle Database In-Memory technology

- Supported from:
  - SAP NW BI 7.40 SP15
  - SAP NW BI 7.50 SP04
- Oracle Database 12c Release 1 (12.1.0.2)<sup>1</sup> and higher
- Oracle Database In-Memory mandatory
- Automatic mass conversion available
- Support for Semantically Partitioned Objects (SPOs)

For details see

- SAP Notes 2335159, 2523154 and 2711358

<sup>1</sup> requires May 2016 SAP Bundle Patch for Oracle Database, or higher

# SAP NW Business Intelligence

## Flat InfoCubes: Real Customer Scenario

Data Volume: **9,000,000** Rows

### STAR SCHEMA

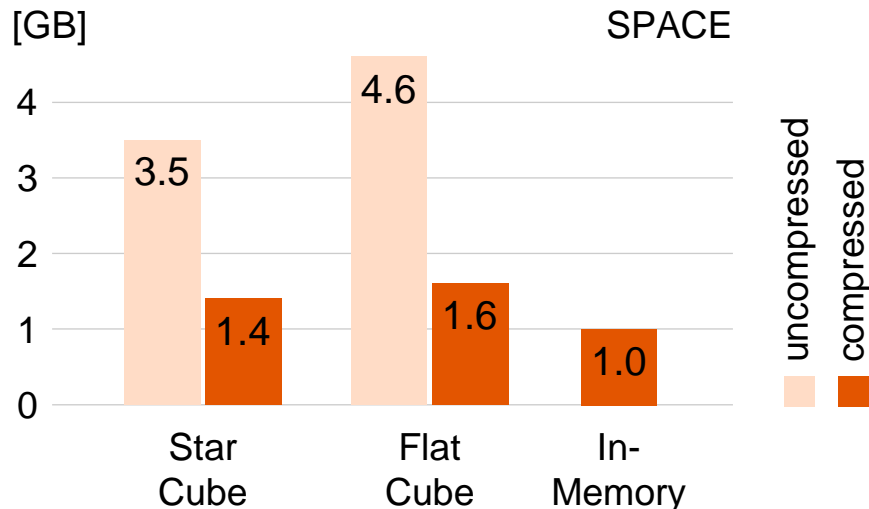
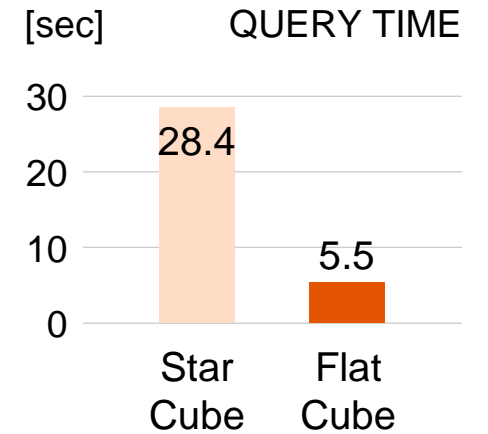
- 12** Dimensions
- 129** Measurements
- 11** Join Dimensions

### FLAT SCHEMA

- 46** Key Values
- 129** Measurements
- 1** Join Dimension

Query:

- Many result columns
- 3 attribute tables



### In-Memory Flat Cube

Query Characteristics:

- The more data,...
- The less number of result columns,...
- The more joins,...
- The more complex the predicates,...

...the higher the improvement!



# SAP NW Business Intelligence

## FEMS PushDown

### What is FEMS (Form Element Selection)?

Converts a row-based database result into a cell-formatted (“spread sheet-like”) BI client result

- Existing Problem:
  - Time and I/O consuming processing on standard InfoCubes and DSOs in database
  - Large amount of data transferred between database and BW application servers
  - Complex and time consuming processing of large dataset within BW application server
- New Solution with PushDown:
  - Perform all required processing and formatting on Flat InfoCubes and DSOs within Database In-Memory

Performance Improvement: **10x** for BW FEMS queries

## Oracle Database 18c In-Memory Dynamic Scans

### In-Memory Dynamic Scans

Parallelization of in-memory scan using light-weight threads

- Number of active threads controlled by resource manager
- Efficient utilization of CPU resources to maximize in-memory scan performance

Performance Improvement: **2x–3x** for BW queries using In-Memory

Performance

# ABAP Core Data Services



Performance

## Change in Paradigm

Application server's purpose is to relieve the database server, but:  
Today the database server is no longer the critical resource!

NEW PARADIGM:

### Data-Centric Approach

Push calculations/business logic from the application server down to the database server.

- Eliminates data traffic...
- ...and allows for local data access optimization

**„Bring the Algorithm  
to the Data“**

Performance

## ABAP Core Data Services (CDS)

### ABAP Core Data Services

Dynamic, database-side objects, comprising...

- Views
- Views with parameters
  - eq. database table functions
- Scalar functions

and implementing simple to most complex business logic

AVAILABLE FROM SAP NETWEAVER 7.40 SP8  
EXTENDED IN SAP NETWEAVER 7.50 | AS ABAP 7.51

Examples:

- Functions:
  - CONCAT, REPLACE, SUBSTRING, LPAD
  - UNIT\_CONVERSION
  - CURRENCY\_CONVERSION
- Global Temporary Tables<sup>1</sup>
- Session Variables<sup>1</sup>
- Time<sup>1</sup> and Timezone<sup>2</sup> Functions
- ...

SEE THE ABAP DOCUMENTATION FOR A FULL LIST OF  
CDS FUNCTIONALITY

<sup>1</sup> as of SAP NetWeaver 7.50 <sup>2</sup> as of AS ABAP 7.51

# Miscellaneous Topics



# Software Provisioning Manager

## Encrypted Tablespaces

### Encrypted Tablespaces in Software Provisioning Manager

Creation of encrypted tablespaces during database installation is now integrated in SWPM

ENCRYPTED TABLESPACES SWPM INTEGRATION

Version	Supported Tablespaces	Release to Customer (RTC)
SL Tool Set 1.0 SPS 28	SAP User Tablespaces + SYSTEM, SYSAUX, UNDO, PSAPTEMP	20 January 2020

- Mandatory for SAP deployments in Oracle Cloud
- Oracle 18c and higher

For details see

- SAP Note 2485122

## Social Media

# SAP on Oracle Community

## SAP on Oracle Community Page

Find news, discussions and resources related to SAP on Oracle at

[go.sap.com/community/topic/oracle.html](https://go.sap.com/community/topic/oracle.html)

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### SAP on Oracle

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One of the database systems SAP runs on is Oracle database. The SAP on Oracle community page provides you with news and information about running SAP on Oracle RDBMS. Setting up and running a SAP system on Oracle database touches on many different topics as SAP integrates many features Oracle offers. The SAP on Oracle community page helps you stay up-to-date, make the right decisions and implement your solutions while setting up or maintaining your SAP on Oracle systems landscape.

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