

Sizing SAP BusinessObjects Planning and Consolidation 10.1, version for the Microsoft platform



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Documentation in the SAP Service Marketplace

You can find this documentation at the following address: <http://service.sap.com/sizing>.

Typographic Conventions

Type Style	Description
<i>Example</i>	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Textual cross-references to other documents.
Example	Emphasized words or expressions.
EXAMPLE	Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE.
Example	Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
Example	Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example>	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
EXAMPLE	Keys on the keyboard, for example, F2 or ENTER.

Document History

Version	Date	Change
1.0	2015-07-21	Initial release
1.1	2015-09-09	Changed product name from "SAP Business Planning and Consolidation" to "SAP BusinessObjects Planning and Consolidation".

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1 Introduction

SAP BusinessObjects Planning and Consolidation, version for the Microsoft platform (called SAP BPC MS SQL), is a robust planning and consolidation application designed to meet organizational budgeting, planning, consolidation and reporting requirements. It supports a wide array of top-down and bottom-up financial planning needs, as well as consolidation processes that ensure a smooth and timely financial close, all using a single application. Through the implementation and utilization of SAP BusinessObjects Planning and Consolidation, organizations are empowered to meet increasingly stringent regulations, effectively plan strategies and tactics, and obtain the information necessary to gain important insights.

This document is prepared for version 10.1 customers. All measurements and testing were done using version 10.1. However, both 10.1 and 10.0 share core components and the only difference between the two versions is the Web Client. Therefore, this sizing guide is also applicable to version 10.0.

1.1 Functions of SAP BusinessObjects Planning and Consolidation

SAP BusinessObjects Planning and Consolidation enables organizational planning and consolidation processes. The application helps improve planning and consolidation frequency, accuracy, and effectiveness, reduce budget-cycle times and costs, and increase user confidence in the validity of financial results. The primary capabilities of SAP BusinessObjects Planning and Consolidation include:

Planning:

- Budgeting
- Planning
- Forecasting
- Business Process Flows

Consolidation:

- Financial Consolidation
- Intercompany Reconciliation
- Journals
- Financial Closing
- Reporting

1.2 Architecture of SAP BusinessObjects Planning and Consolidation

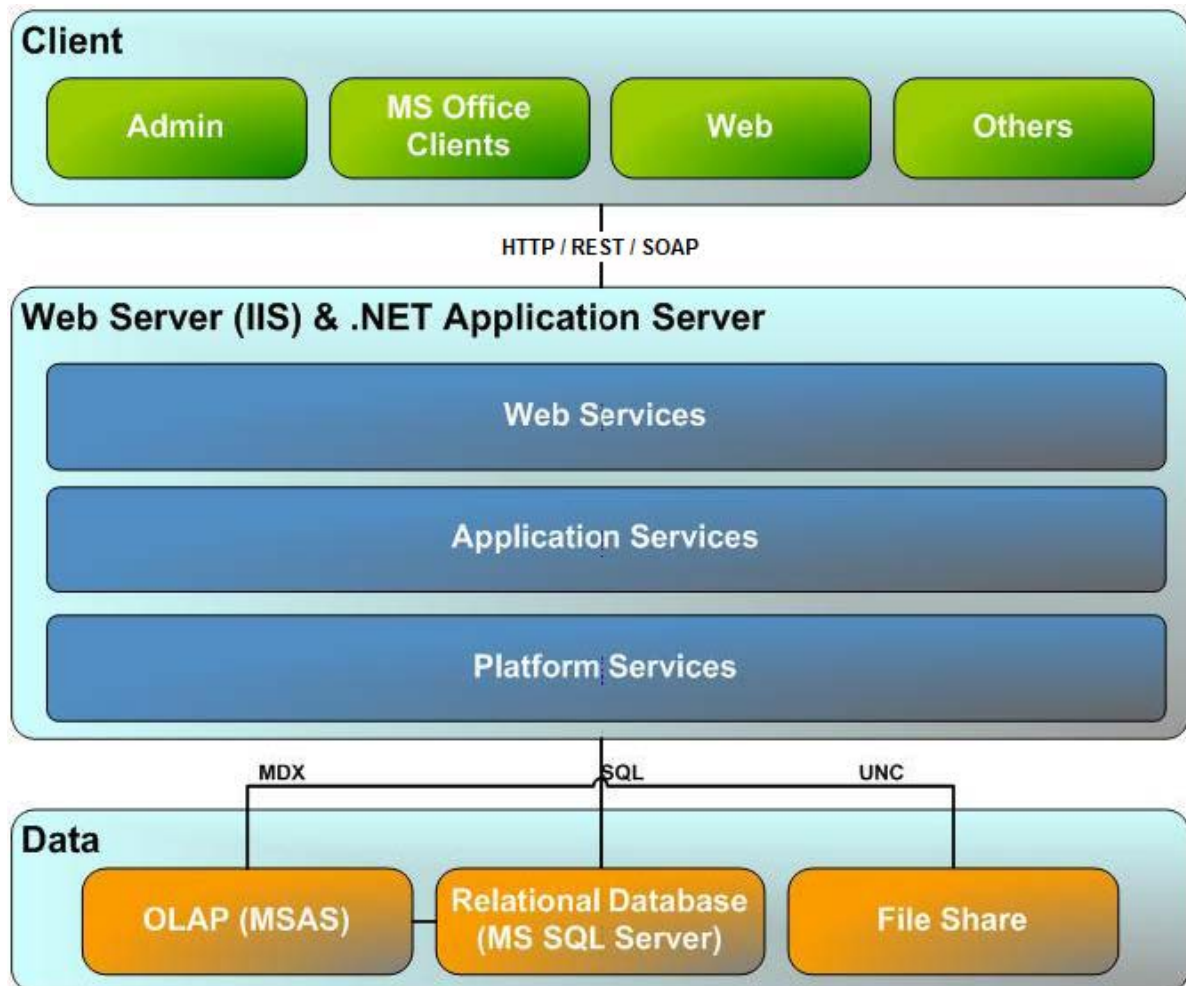
SAP BusinessObjects Planning and Consolidation, version for the Microsoft platform runs on Microsoft SQL 2012 or 2012 R2.

The application has three tiers:

Client tier: Runs the web application, Microsoft Office (including Microsoft Excel, Microsoft Word, and Microsoft PowerPoint), or SAP BusinessObjects Planning and Consolidation Administration (a standalone Microsoft .NET client application)

Application Server tier: Performs user authentications, reporting, and logic using an SOA architecture

Database tier: Can be subdivided between the Database Service and the OLAP Service



Graphic 1: Architecture of SAP BusinessObjects Planning and Consolidation

1.2.1 Server Components of SAP BusinessObjects Planning and Consolidation, version for the Microsoft platform

To help you understand the different configurations, the following are the components used by SAP BusinessObjects Planning and Consolidation. For more information about hardware requirements and underlying software requirements, see the Installation Guide and Master Guide for the release on the SAP Help Portal at <http://help.sap.com/bopacms101>.

Database Tier

- Supports Microsoft SQL 2012 or 2012 R2
- Microsoft SQL Server must be Enterprise Edition for Analysis Services
- Full support of 64-bit architecture
- Common processing
- All reads of data
- All write-back of data
- Metadata read/write
- OLAP engine and calculations
- File storage read/write
- Storage location for all application files
- Book repository
- Report and input templates
- Unstructured data
- Conversion and transformation files

Application Server

- Full support of 64-bit architecture
- Common processing
- Script logic, calculations, and MDX parsing
- Parameter-driven logic
- Data Manager loads and ETL (Extraction, Transformation and Load)
- Data tables to XML conversions and vice versa
- Microsoft IIS
- Supports all SOA (Service Oriented Architecture)
- Collection of services
- Performs user authentication
- Common processing
- Send and receive data between client and database tier
- Rendering of system reports
- Live reports rendering
- SOAP processing and conversion of data formats
- Hosts ZFP (Zero Footprint - browser-based client)

Client Tier

The SAP BusinessObjects Planning and Consolidation client has two main components:

Web client using the Microsoft Internet Explorer browser and Mozilla Firefox

- SAP UI5
- SAP BusinessObjects Planning and Consolidation Web user interface

SAP BusinessObjects Planning and Consolidation add-in to Microsoft Office, which is part of the EPM add-in

1.3 Factors that Influence Performance

The following factors can influence the performance of SAP BusinessObjects Planning and Consolidation on Microsoft SQL Server:

CPU Sizing

Complexity of script logic and formulas used in, for example, calculations or planning

Complexity of consolidation logic

Complexity of member access rules

Complexity of report or input form design (the size of the report, if MDX query is required)

RAM Sizing

Active concurrent users in the system

Active concurrent data manager jobs

Disk Sizing

Data volume of master data

Data volume in model(s)

Data volume per query or volume of operations transporting data

Data volume of Write-Back (WB) fact table per each Lite Optimization Model

* We recommend a Lite Optimization when the WB table exceeds 80,000 rows in general condition.

2 Sizing Fundamentals and Terminology

SAP provides general sizing information on the SAP Service Marketplace. For the purpose of this guide, we assume that you are familiar with sizing fundamentals. You can find more information at <http://service.sap.com/sizing> → Sizing Guidelines → General Sizing Procedures.

This section explains the most important sizing terms, as these terms are used extensively in this document.

Sizing

Sizing means determining the hardware requirements of an SAP application, such as the network bandwidth, physical memory, CPU processing power, and I/O capacity. The size of the hardware and database is influenced by both business aspects and technological aspects. This means that the number of users using the various application components and the data load they put on the server must be taken into account.

Benchmarking

Sizing information can be determined using SAP Standard Application Benchmarks and scalability tests (www.sap.com/benchmark). Released for technology partners, benchmarks provide basic sizing recommendations to customers by placing a substantial load upon a system during the testing of new hardware, system software components, and relational database management systems (RDBMS). All performance data relevant to the system, user, and business applications are monitored during a benchmark run and can be used to compare platforms.

SAPS

The SAP Application Performance Standard (SAPS) is a hardware-independent unit that describes the performance of a system configuration in the SAP environment. It is derived from the Sales and Distribution (SD) Benchmark, where 100 SAPS is defined as the computing power to handle 2,000 fully business processed order line items per hour. For more information about SAPS, see <http://www.sap.com/benchmark> → Measuring in SAPS.

Initial Sizing

Initial sizing refers to the sizing approach that provides statements about platform-independent requirements of the hardware resources necessary for representative, standard delivery SAP applications. The initial sizing guidelines assume optimal system parameter settings, standard business scenarios, and so on.

Expert Sizing

This term refers to a sizing exercise where customer-specific data is analyzed and used to put more detail on the sizing result. The main objective is to determine the resource consumption of customized content and applications (not SAP standard delivery) by comprehensive measurements. For more information, see <http://service.sap.com/sizing> → Sizing Guidelines → General Sizing Procedures → Expert Sizing.

Configuration and System Landscaping

Hardware resource and optimal system configuration greatly depend on the requirements of the customer-specific project. This includes the implementation of distribution, security, and high availability solutions by different approaches using various third-party tools. In the case of high availability through redundant resources, for example, the final resource requirements must be adjusted accordingly.

There are some "best practices" that may be valid for a specific combination of operating system and database. To provide guidance, SAP created the NetWeaver configuration guides (<http://service.sap.com/instguides> → SAP NetWeaver).

3 Initial Sizing for SAP BusinessObjects Planning and Consolidation

3.1 Assumptions

The following assumptions were used in tests that determined this sizing approach:

- Simple access rules defined: five dimensions are set as secure dimensions, and simple member access rules are defined on these dimensions
- 3,500 records (large size) sent to the server per scenario for planning write-back
- 500 records (medium size) sent to the server per scenario for planning write-back
- 1,595 records retrieved per query
- Users writing data using planning features performed a follow-up action (query, write-back) for approximately 10 minutes for a medium scenario and 20 minutes for a large scenario after executing the write-back
- Users running queries performed a follow-up action (query, write-back) approximately five minutes after executing the write-back
- Imported 10,000 records using SAP BusinessObjects Planning and Consolidation Data Manager once per scenario
- Frequency of the Lite Optimization for the cube (model): every 2 minutes

The following table provides an overview of the scenarios used:

Category	Test Cases (Percentage of Concurrent Users)	Number of Records	Total Number of Concurrent Users	Fact Table Size (Number of Rows)
Small	Send large data (19%)	3,500	100	10 million
	Send medium data (30%)	500		
	Retrieve data (50%)	10,359		
	Import data (1%)	10,000		
Medium	Send large data (19%)	3,500	200	50 million
	Send medium data (30%)	500		
	Retrieve data (50%)	10,359		
	Import data (1%)	10,000		
Large	Send large data (19%)	3,500	500	100 million
	Send medium data (30%)	500		
	Retrieve data (50%)	10,359		

Category	Test Cases (Percentage of Concurrent Users)	Number of Records	Total Number of Concurrent Users	Fact Table Size (Number of Rows)
	Import data (1%)	10,000		

Please contact SAP if your implementation does not fit these categories.

The following table provides an overview of sizing recommendations based on the number of users, access rules, and the size of the cube (model):

- Number of named users in the target environment: 902
- Number of data access rules for the cube (model): 1,573
- Cube (model) structure: 11 dimensions + 1 measure dimension

Dimension ID	Type	Secured	Members	Hierarchies	Levels
DIM1	Entity	Yes	1,842	2	10
DIM2	User defined	Yes	672	1	3
DIM3	User defined	Yes	108	1	5
DIM4	Time	Yes	108	1	3
DIM5	Category	Yes	14	1	1
DIM6	Account	No	1,314	1	11
DIM7	Intercompany	No	1,233	1	2
DIM8	User defined	No	60	1	4
DIM9	User defined	No	35	1	2
DIM10	Data Source	No	22	1	4
DIM11	Reporting Currency	No	3	1	1

3.2 Sizing Guidelines

3.2.1 SAPS Requirements (Small)

Test Cases	BusinessObjects Planning and Consolidation Server	Microsoft SQL Server	Microsoft SSAS server
Retrieve data	1.75 SAPS * concurrent users	7.00 SAPS * concurrent users	40.41 SAPS * concurrent users
Send data - medium	2.45 SAPS * concurrent users	63.00 SAPS * concurrent users	5.56 SAPS * concurrent users
Send data - large	10.02 SAPS * concurrent users	65.02 SAPS * concurrent users	6.71 SAPS * concurrent users
Import data	6.00 SAPS * concurrent users	91.00 SAPS * concurrent users	8.81 SAPS * concurrent users

3.2.2 SAPS Requirements (Medium)

Test Cases	BusinessObjects Planning and Consolidation Server	Microsoft SQL Server	Microsoft SSAS server
Retrieve data	1.75 SAPS * concurrent users	7.00 SAPS * concurrent users	70.01 SAPS * concurrent users
Send data - medium	2.45 SAPS * concurrent users	65.87 SAPS * concurrent users	5.65 SAPS * concurrent users
Send data - large	10.02 SAPS * concurrent users	70.76 SAPS * concurrent users	7.01 SAPS * concurrent users
Import data	6.00 SAPS * concurrent users	93.00 SAPS * concurrent users	8.95 SAPS * concurrent users

3.2.3 SAPS Requirements (Large)

Test Cases	BusinessObjects Planning and Consolidation Server	Microsoft SQL Server	Microsoft SSAS server
Retrieve data	1.75 SAPS * concurrent users	7.00 SAPS * concurrent users	101.98 SAPS * concurrent users
Send data - medium	2.45 SAPS * concurrent users	71.28 SAPS * concurrent users	5.78 SAPS * concurrent users
Send data - large	10.02 SAPS * concurrent users	73.54 SAPS * concurrent users	7.01 SAPS * concurrent users
Import data	6.00 SAPS * concurrent users	105.27 SAPS * concurrent users	9.06 SAPS * concurrent users

3.2.4 Processing Dimension Requirements

Category	Number of Concurrent Users	BusinessObjects Planning and Consolidation Server(s)		Microsoft SQL Server		Microsoft SSAS Server	
		CPU requirements	Memory requirements	CPU requirements	Memory requirements	CPU requirements	Memory requirements
Processing Dimension	N/A	17.5 SAPS	0.4 GB RAM	98 SAPS	13.4 GB RAM	3.51 SAPS	0.9 GB RAM

3.2.5 RAM Requirements (All categories)

Test Cases	BusinessObjects Planning and Consolidation Server(1)	Microsoft SQL Server(2)	Microsoft SSAS Server(3)
Any	7 MB * concurrent users	8GB (SQL Server usage) + 4 GB (plan cache) + 5 GB (metadata) + (estimated inserted rows * 3.69 * 10 ⁻⁷)	(Fact table estimated rows * 1.5 * 10 ⁻⁵) / 1024

- (1) 1GB of memory should be added for the OS and 100MB should be added per Microsoft .NET application
- (2) 1GB of memory should be added for the OS
- (3) 1GB of memory should be added for the OS

3.2.6 T-Shirt Sizing Table

Considering the user distribution defined in our assumptions for each sizing type, the final T-Shirt sizing table is the following:

Number of Concurrent Users		BusinessObjects Planning and Consolidation Server(s)		Microsoft SQL Server		Microsoft SSAS Server	
		CPU requirements	Memory requirements	CPU requirements	Memory requirements	CPU requirements	Memory requirements
Small	100	357 SAPS	0.7 GB RAM	3,484 SAPS	18 GB RAM	2,354 SAPS	0.7 GB RAM
Medium	200	714 SAPS	1.5 GB RAM	7,427 SAPS	24 GB RAM	7,624 SAPS	0.9 GB RAM
Large	500	1,785 SAPS	3.5 GB RAM	24,453 SAPS	27 GB RAM	27,074 SAPS	1 GB RAM

* processing dimension: Entity dimension, # of members is 1,842

3.2.7 Example: of How to Use the Guidelines

Required implementation:

- Concurrent users: 100
- Number of dimension process while users are connected: 1
- Estimated inserted rows: 2,000,000
- Estimated fact table rows: 10,000,000

Parameters to be used for the sizing calculation:

- BPC MS Implementation: Small (100 concurrent users)
- Concurrent user profiles distribution:
 - 50 Retrieve data
 - 30 Send data – medium
 - 18 Send data – large
 - 2 Import data

Other tasks execution:

- 1 Process dimension

SAPS calculation:

Test Cases (Small)	BusinessObjects Planning and Consolidation Server	Microsoft SQL Server	Microsoft SSAS server
Retrieve data	1.75 SAPS * 50	17 SAPS * 50	40.41 SAPS * 50
Send data - medium	2.45 SAPS * 30	63.00 SAPS * 30	5.56 SAPS * 30
Send data - large	10.02 SAPS * 18	65.02 SAPS * 18	6.71 SAPS * 18
Import data	6 SAPS * 2	91.0 SAPS * 2	8.81 SAPS * 2
Process dimension	17.5 SAPS * 1	98 SAPS * 1	3.51 SAPS * 1
Total	370.86 SAPS	4191 SAPS	2284 SAPS

RAM calculation:

Implementation	BusinessObjects Planning and Consolidation Server	Microsoft SQL Server	Microsoft SSAS Server
Small	1GB + 100MB + 7.5 MB * 100 concurrent users	1GB + 8GB + 4 GB (plan cache) + 5 GB (metadata) + (2000000 * 3.69 * 10 ⁻⁷)	(10000000 * 1.5 * 10 ⁻⁵) / 1024

Implementation	BusinessObjects Planning and Consolidation Server	Microsoft SQL Server	Microsoft SSAS Server
Total	1.85 GB RAM	18 GB RAM	0.7 GB RAM

SQL database size estimation:

To calculate the estimated size of BPC MS database, you should consider:

- o 10 GB of disk space for MS SQL Server system tables
- o 20 GB of disk space for BPC MS Metadata tables

Use the following formula to estimate the size of the fact table:

$$\text{Fact table size (bytes)} = \frac{8192 \times \text{NbRows}}{\text{Rounddown}[\frac{8096}{(29 + 84 \times \text{NbDim})}]}$$

Where NbRows is the target number of fact table rows

And NbDim is the number of dimensions

All details on how you can estimate a SQL table size can be found at [http://msdn.microsoft.com/en-us/library/aa933068\(v=sql.80\).aspx](http://msdn.microsoft.com/en-us/library/aa933068(v=sql.80).aspx).

File Server size estimation:

The size of the file server is dependent on usage and management. For example, the data file for import is usually large, but if it remains undeleted after import, it will use lots of disk space. Except for the data file, other content is not so large. "EnvironmentShell" is an example environment and its size is about 10MB.

File Server Contents and estimated file size:

Dimension Members Sheet (10 - 100KB) and XML and CSV for server side caching (3KB)

Reports (100-150KB)

Input Schedule (100-150KB)

Book (max 100MB per each book file)

Documents (max 100MB per each document file)

Logic Script File (pre-installed logic file 20KB per Model, user script each 10-50KB)

Data Manager Package (pre-installed packages total 500KB per Model, user package each 5-50KB)

Data Manager Data File (no limitation on size)

Data Manager Transformation file (pre-installed conversion file 140KB per model, user conversion file each 20KB)

Data Manager Conversion file (pre-installed conversion file 20KB per model, user conversion file each 20KB)

Example:

23 dimension total: 100KB * 23 + 3KB * 23 = approx. 2.3 MB

100 reports total: 150KB * 100 = approx. 15MB

100 Input schedules total: 150KB * 100 = approx. 15MB

Total Books file = approx. 10MB

Total documents file = approx. 10MB

(10 user logic script 10*50KB + pre-installed logic script file 20KB) * 5 models = approx. 2.5MB

(10 user data manager packages file 10* 50KB + Pre-installed Data Manager Package files 500KB) * 5 models = approx. 5MB

Total data file 100MB

(10 user data manager transformation file 5 * 20KB + Pre-installed Data Manager Transformation files 140KB) * 5 models = approx. 1MB

(10 user data manager conversion file 2 * 20KB + Pre-installed Data Manager Conversion files 20KB) * 5 models = approx. 300KB

Total: 161MB

4 Comments and Feedback

Your feedback is appreciated. Please email any comments to Kim, Kyoungsoon at kyoungsoon.kim@sap.com. Thank you in advance.

