Sizing SAP Enterprise Portal 6.0

SAP Enterprise Portal 6.0 SP2

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1 Introduction

Sizing is a process for translating business requirements into overall hardware requirements, such as the physical memory, the CPU processing power, and the network capacity needed to implement SAP Enterprise Portal 6.0.

This guide provides initial sizing information for SAP Enterprise Portal 6.0 on WebAS 6.20. It describes the architecture of SAP Enterprise Portal with its most important components, and explains the sizing process in general. In addition, it contains information about the factors that influence portal performance.

In conclusion, it provides examples for sizing the portal, which you can use as a basis for planning your hardware expenditures, according to business application scenarios.

    The sizing information in this guide is not absolute, as it cannot include all possible usage and load patterns for the portal. Use it as guidelines for an initial sizing.

There are currently no sizing figures for Knowledge Management and Collaboration in this guide.

For information about sizing Search and Classification (TREX), refer to *Sizing TREX 6.1* at: **service.sap.com/sizing** → *Media Library* → *Literature.*

1.1 An Overview of SAP Enterprise Portal

SAP Enterprise Portal addresses one of the most pressing problems facing enterprise IT organizations today: how to provide an integrated, single point of access to heterogeneous IT systems. Today's modern IT landscapes typically contain many diverse technologies acquired from different vendors or developed in-house and involve a highly distributed infrastructure based on both open and proprietary protocols and standards.

As part of SAP NetWeaver, SAP Enterprise Portal integrates your back-end systems, and unifies enterprise applications, information, and services from both SAP and non-SAP sources into a coherent interface.

It draws data from a variety of information sources and as such, its technical landscape can be quite large, complex and diverse. This fact makes a thorough sizing analysis significant in scope.

With its role-based content and collaboration tools, SAP Enterprise Portal integrates people, and with its knowledge management of unstructured data, and its unification of structured data, it integrates information.

For its users, the portal provides a window onto information both in their organization and outside it, along with the tools to manage this knowledge, to analyze and interrelate it, and to share and collaborate on the basis of it.

The core technology components that bring this breadth and depth of information to the portal desktop make up its content. The basic unit of this content is the iView: an application that fetches information from any of a variety of sources, such as databases, enterprise applications, file systems, and the Web, returning up-to-the-minute information each time it is launched.

1.2 SAP Enterprise Portal Architecture

SAP Enterprise Portal is platform-independent and operates on both UNIX and Windows operating systems. It is deployed on a component of the SAP Web Application Server, the SAP J2EE engine, which is a proprietary Java application server based on the Java 2 Enterprise Edition (J2EE™) standard.

SAP Enterprise Portal consists of the Portal Platform, Knowledge Management and Collaboration.

The Portal Platform contains:

- **Portal Framework**: Provides components and services for the creation and running of portal content, such as iViews, pages, worksets and roles.

  In addition, the Portal Framework supplies interfaces for working with:

  - **Unification**: Enables the integration of multiple information sources of structured data.

  - **Connector Framework:** Supplies the pipelines of communication between the portal and back-end applications.

  The Portal Framework also supplies a persistence layer – the Portal Content Directory – which runs against a database, such as Oracle or Microsoft SQL, and user management.

  The database, its specific versions and updates have a lesser effect on sizing the portal.

Knowledge Management, which you implement to enable unstructured content management, and sophisticated search and retrieval functionality over unstructured content in disparate information repositories, comprises:

- **Content Management (CM):** With CM, you can author, store, manage, and display documents.
- **Search and Classification (TREX)**: With TREX, you can do intelligent searches and text mining of extensive document sets and structure these sets sensibly using document classification.

Collaboration in SAP Enterprise Portal is a set of tools designed to facilitate cooperation and communication that is both synchronous and asynchronous. It lets portal users create virtual rooms in which they can organize themselves into groups, for example, teams or projects. It also allows portal

users to communicate through interactive online meetings, with instant messaging and application sharing capabilities. Further, it can integrate the email and scheduling services of Groupware.

The following figure illustrates the components of SAP Enterprise Portal:

Components of SAP Enterprise Portal
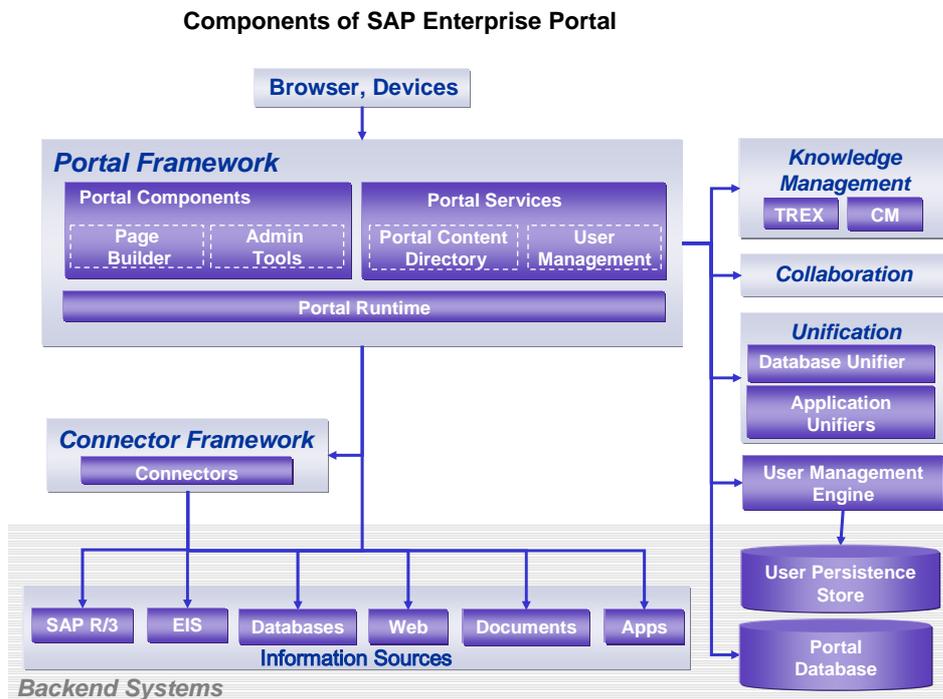
2   The Sizing Approach

Generally, hardware requirements are determined by the use of the central components of an application, such as, requests to a particular service, the upload of documents, the caching of URLs, and many more.

These activities have to be translated into actual hardware requirements, such as, disk space, CPU power, memory and network bandwidth.

In its scalability and sizing-oriented performance measurements, SAP tries to bring together business processes with the most utilized components of a software solution by defining "*application benchmark tests*".

These tests consist of load testing scripts for business processes. While some tests are used internally, others have become SAP standard application benchmarks. For more information about SAP standard application benchmarks, refer to www.sap.com/benchmark.

The advantages of the test cases are that:

- They can be repeated
- They represent real-world applications and activities to which people can relate and understand

From the measurement, SAP derives sizing guidelines to help customers get an initial understanding of their hardware requirements.

However, sizing is best done using the customers' data, and therefore should take place more than once in an implementation project.

Beyond the scope of sizing is the actual server landscape, such as, the server distribution, or the allocation of a few fast CPUs.

2.1 Sizing Methods

One of the methods used in sizing, is the calculation of the load created by users on a referenced hardware configuration.

Users have different working patterns, which can create very different load patterns on the portal, as such, it is more difficult to estimate the amount of load these users will generate, working in one or two applications only.

On the other hand, customers can easily determine the number of concurrent active users. For the sizing of the portal, users are categorized according to their activity patterns: low, medium or high.

Categories of Users	Portal Usage Patterns
Low Intensity	Users that occasionally perform certain activities in the portal.
	For example, users who view their Time Management data once a month, and then logout, after accepting the report.
	The average think time is about one–step interaction with the portal server in 10 minutes.
	Some user actions take place in the back-end system, and not in the portal server.
	Experience shows that there are a large number of low intensity users.
Medium Intensity	Users who perform some regular activities in the portal, such as providing details of purchase orders.
	The average think time is about one–step interaction with the portal server in 6 minutes.
	Some user actions take place in the back-end system, and not in the portal server.
High Intensity	Users who perform most of their activities in the portal.
	For example, users who obtain details about customer issues, contact the responsible persons, update information about individual issues, and then send replies to customers.
	The average think time is about one–step interaction with the portal server in 0.5 minutes
	Some user actions take place in the back-end system, and not in the portal server.

After obtaining information about their users, customers can generate initial sizing information using SAP's online sizing tool, the Quick Sizer which is available at: **service.sap.com/quicksizing**

The Quick Sizer tool calculates the sizing and hardware configuration based on customer input. It provides an estimated hardware requirement to match the business needs of the portal users.

> As CPU consumption is highly dependent on the chosen platform, SAP created SAPS – a hardware-independent unit used to describe the CPU-related performance characteristics of a given hardware configuration.
> For more information about SAPS, see **www.sap.com/benchmark** -> **SAPS**

2.2 Performing Sizing Measurements

For the portal, it is recommended that you perform expert sizing, which involves measuring the loads of different iViews, business processes, and the behavior of portal users, to get the performance numbers. These measurements are preferably done in a customer test system.

Analyzing the results of these measurements enables you to determine the amount of resources consumed by different categories of users, business processes and portal components.

3 Factors that Influence Sizing

A wide range of factors influences the sizing of SAP Enterprise Portal. What follows is an overview of these factors.

3.1 Portal Content

A significant factor that influences sizing is the portal content. Content consists of the data for presenting a portal application, page, or iView, as well as the data from a data source, or a back-end system.

After users log on to the portal, they see the portal desktop, which contains the pages and iViews assigned to them for their business operations.

To understand how iViews are loaded in the portal, you must familiarize yourself with the various areas and elements loaded at runtime in the portal desktop.

The following figure illustrates content in the portal desktop:
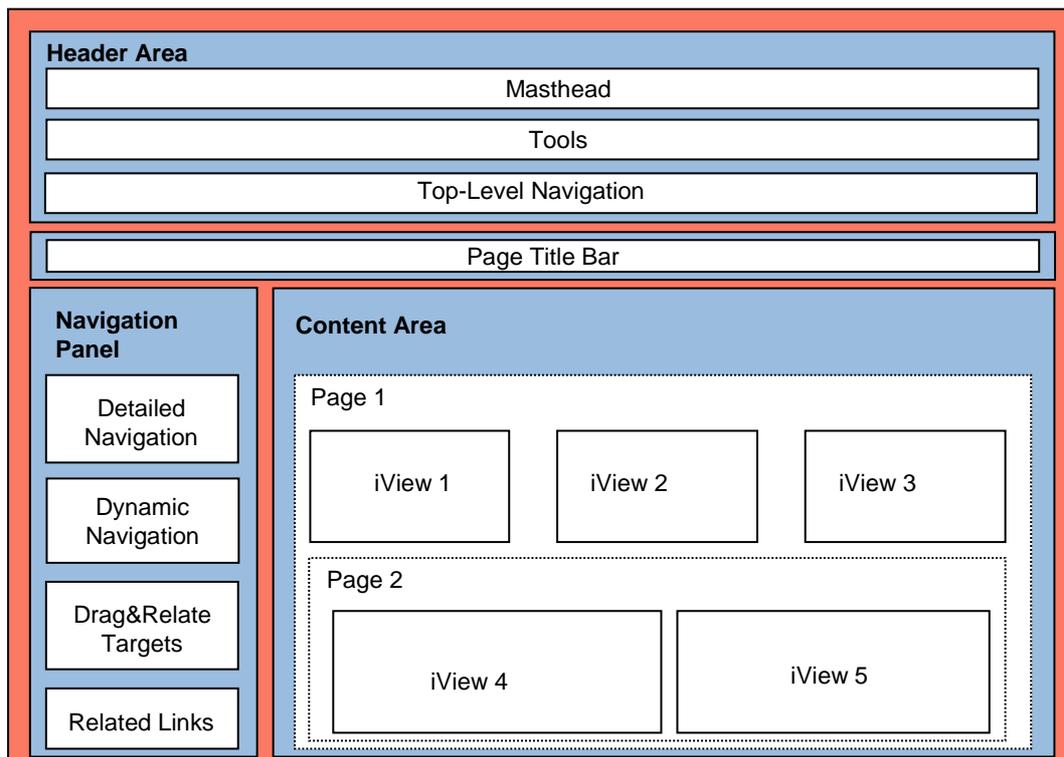
Portal Desktop

The portal desktop consists of a framework page that contains iViews and pages that display content:

- **Header Area**

  The number of tabs in the Top-Level Navigation (TLN) affects sizing. The tabs are loaded once, when the user logs on. From then on, they remain available until the browser is closed.

  Initial portal content can take longer to load when there are too many tabs in the TLN, as each tab invokes a round-trip to the portal server and back to the client.

  In addition, navigating from one tab to another causes content to load, possibly invoking a round-trip to the portal server and back to the client.

  The settings for an iView or a page, such as its cache properties, can prevent further round-trips if the content to be loaded is already available in the client's cache.

  For more information on iView cache settings, refer to "Caching and Isolation Properties of a Page and an iView" on page 7.

- **Navigation Panel**

  The number of nodes in this area has a strong influence on performance, because each of these nodes is rendered at runtime.

  Each node may contain a number of items, such as folders. Each folder can contain roles, pages and iViews.

  The panel can take longer to display if it contains many items.

- **Content Area:**

  - The more iViews displayed in the Content Area, the longer it takes to render the information.

  - Whether the portal or a back-end system renders iViews can affect performance. For example, the SAP Internet Transaction Server (ITS) renders a Web GUI transaction with almost no load except for parsing the link to SAP ITS and caching the content. On the other hand, portal rendering of iViews at runtime can potentially result in greater workload, depending on the size and complexity of the content.

3.1.1   Caching and Isolation Properties of a Page and an iView

Each iView or page in the portal has its own content-loading scheme, influenced by its caching and isolation settings. These settings determine the use of system resources and therefore have an impact on sizing:

- **Isolation methods**: This property has an impact on how an iView or page uses resources, as it determines how the iView, or page and its content are incorporated into a portal page and rendered at runtime. The following are the isolation method properties for pages and iViews:

  - URL isolation:

    An iView with URL isolation is loaded into an iFrame in the page.

    The portal first loads the page, and then loads the iView. This action involves an additional round-trip.
    The rendering of iViews with URL isolation can result in larger workload, depending on the size and complexity of the content.

  - Embedded isolation:

    An iView with embedded isolation is loaded together with the page.

    Technically, the iView and its content are part of the HTML table for rendering the page. Therefore, the content of the iView, the iView itself, and the page are delivered in the same round-trip, which can result in larger workload subject to the size of its content.

    User actions in an iView with embedded isolation causes the entire page to re-load from the server. This causes all iViews on the page to re-load regardless of their isolation method.

  - Pumped isolation:

    An iView with Pumped Isolation is located in an iFrame, and its content is loaded in the same round-trip as the page.

- **Cache settings**: Caching stores the most recently accessed iView and its content for a pre-determined period of time, either in the client's browser or in the server.

  Afterwards, whenever the same iView is launched, the portal first checks the cache instead of going to the data source. If the cache has not expired, its content is displayed.

  Caching reduces the number of round-trips and the round-trip time, thus resulting in less bandwidth consumption.

  If caching takes place in the client's browser, the workload on the portal is reduced, however, caching in the portal server affects the performance of the available system resources.

For more information about isolation methods and cache setting for iViews, go to:
help.sap.com/nw04 → *Release '04* → *SAP NetWeaver* → *People Integration* → *Portal* → *Administration Guide* → *Content Administration* → *Portal Pages* → *Portal Page at Runtime*.

3.2   Portal Users

The number and activity of users working in the portal at a given time represent key considerations in a sizing analysis.

- **Number of concurrent users and their distribution**

  For portal sizing, the total number of possible (or named) users is misleading. For example, if you have 10,000 named users in different time zones, it is very unlikely that all 10,000 named users work in tandem. Therefore, you should only consider the number of active users when sizing.

  Active users are those who interact with the system in a defined period of time and consume system resources. For example, an active user may have an average number of 10 navigations per minute, though not every user interaction step causes load on the portal server.

- **User Actions**

  Typically, an enterprise has some users who work with the portal intensively, and others that work with it less intensively.

  It is necessary to categorize and define a think time for each category of users as they may have different working patterns depending on their operations in the portal.

  For sizing, you need to categorize your users based on their level of activity in the portal. For the definition of categories of users, see "The Sizing Approach" on page 4.

The actions of portal users are significant in sizing the portal. Each time a portal user navigates from one object to another, a round-trip from the client to the server and back to the client may be initiated.

Of significance to sizing are the number of round-trips and the size of content that is generated due to the actions of users. For sizing purposes, user actions can be divided as follows:

- **Navigation actions**: These actions result in the re-loading of portal content. Of interest to sizing is the source of the content to be re-loaded: from the portal server or from the browser cache of the client.

- **Content actions**: These are actions performed within some content that causes data to load; for example, when a user submits a form or selects a link within an iView.
  Such actions do not trigger navigation; rather they provide functionality to the user and can have an impact on the use of resources.

  Some user actions take place in the back-end system, and not in the portal server.

4 Examples of Sizing SAP Enterprise Portal 6.0

This section provides examples of sizing SAP Enterprise Portal based on two business scenarios that are contained in standard portal business packages:

▪ Business Package for Employee Self-Service (ESS): ESS is a lightweight scenario from mySAP ERP Human Resources.

It provides a number of iViews that allow employees to create, display and change their own data, such as vacation, department, name, address in a backend system, the SAP R/3. This business package is widely in use and known to many customers.

▪ Business Package for mySAP CRM: Business Productivity Pack. This business package provides a medium-weight scenario from mySAP CRM.

It provides a number of iViews that display sales information from Business Intelligence (BW) and Customer Relations Management (CRM) systems for employees in Sales, Marketing, and Service, who need access to data and information to make the correct decision quickly and effectively at all times.

This example replicates a complex, yet easy-to-understand scenario. This business package is also referred to as People-Centric CRM (PCC).

Information about the two scenarios as standard application benchmarks is available at:
www.sap.com/benchmark

4.1 Lightweight Scenario: Business Package for Employee Self-Service (ESS)

4.1.1 Assumptions

Consider the number of logons per hour, and the number of user interaction steps. In addition, take into account the number of tabs in the top-level navigation (TLN); this affects the required CPU resources at logon.

- 40 tabs in the top-level navigation

  Each tab in the TLN provides a separate business process and users navigate from one tab to another.

  You must size each navigation performed by the user. For sizing, navigation is invoked when the user chooses a tab in the TLN.

- One ESS iView per page

  A selected tab in the TLN loads a page and an ESS iView, in which users perform some activity before navigating to another tab.

- CPU calculation is aimed at 65% CPU utilization1, in order to accommodate other resources

- Disk size has no significant influence

4.1.2 Formulas

For CPU consumption, use the following formulas and then use the higher value for sizing:

1. Logon: `number of logons per hour * 0.08 SAPS`

2. User Navigation: `Highest number of TLNs per hour * 0.04 SAPS`
   Number of TLNs per hour, refers to the number times that the tabs in the TLN are opened by users, within an hour.

   Not every click constitutes load on the portal. When accessing a back-end system, the portal only serves as a frame: the load is entirely on the back-end.

- Calculate both results and take the one with the higher value.

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[1] For detailed information, refer to the document, "Background: Sizing mySAP Business Solutions" at http://service.sap.com/sizing.

3. For memory, you can use the following rule of thumb:
    - 1.5 GB per CPU

The following table summarizes the calculation for sizing the portal using ESS:

Sum of all TLN steps by all users	Equivalent number of concurrent users[2]	Portal	
		CPU in SAPS[3]	Memory in GB
Up to 1,000	10	70	1.5
5,000	50	350	1.5
10,000	100	700	1.5
50,000	500	3,500	6.0 – 8.0

4.2 Medium-Weight scenario: CRM Sales Representative

In this scenario, sales representatives invoke iViews that display sales information from the Business Intelligence (BW) and CRM systems, such as sales activities, customer contacts and detailed account of deals.

4.2.1 Assumptions

Consider the number of logons per hour, and the number of user interaction steps. In addition, take into account the number of tabs in the top-level navigation (TLN). This affects the consumption of CPU resources at logon.

- 30 tabs in the top-level navigation, using the CRM role "Sales Representative"

    The roles of a user are loaded in the TLN once the user logons onto the portal. Optionally, you can size the load created at logon separately, as the number of tabs in the TLN is directly related to the roles of the user.

- Two to four iViews per page
    a. BW iViews that create load on the Portal's iView Server Cache
    b. CRM iViews, which retrieve CRM content via JCo connections
    c. BSP applications, as external services
- CPU calculation is aimed at 65% CPU utilization[4], in order to accommodate other resources
- Disk size has no significant influence

4.2.2 Formulas

For CPU consumption, use the following formulas and then use the higher value for sizing:

1. Logon: `number of logons per hour * 0.09 SAPS`

2. User navigation: `number of TLNs per hour * 0.07 SAPS`
   Number of TLNs per hour, refers to the number times that the tabs in the TLN are opened by users, within an hour.
    - Calculate both results and take the higher one.

3. For memory, you can use the following rule of thumb:
    - 1.5 GB per CPU

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[2] Assuming each user makes 100 clicks per hour, this is equal to a think time of 30 seconds where the activities of the user are categorized as medium to high intensity.

[3] Depending on the architecture and clock frequency of a processor (CPU), you can obtain SAPS values between the range of 800 - 1100.

[4] For detailed information, refer to the document "Background: Sizing mySAP business solutions" at http://service.sap.com/sizing.

The following table summarizes the calculation for sizing the portal using People-Centric CRM (PCC):

Sum of all TLN steps by all users	Equivalent number of concurrent users[2]	Portal	
		CPU in SAPS[3]	Memory in GB
Up to 1,000	10	100	1.5
5,000	50	500	1.5
10,000	100	1,500	3.0
50,000	500	4,500	7.0 - 9.0

5 Conclusion

The information and examples in this guide are preliminary information for sizing SAP Enterprise Portal 6.0 on WebAS 6.20.

The portal sizing algorithms are based on general assumptions regarding usage and click-behavior. Therefore, SAP recommends performing a customer-specific sizing analysis.

Also, keep in mind that sizing is an iterative process that must be continually verified in the course of an implementation project.

6 Comments and Feedback

Send your comments and feedback about sizing the portal to Carsten Boennen, carsten.boennen@sap.com.