



Note

Before using this information and the product it supports, read the information in [Notices](#) on page 31.

This edition applies to version 8.0.7, release 6, modification 1 of IBM Prospect and to all subsequent releases and modifications until otherwise indicated in new editions.

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SERVER SIZING TOOL GUIDE
IBM Prospect 8.0

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Table of Contents

1 About This Documentation	7
Audience	7
Required Skills and Knowledge	7
Document Conventions	8
.....	9
User Publications	9
2 About the Server Sizing Tool	11
Defining Your System Environment	11
3 Server Sizing Tool Setup	13
Location of the Sizing Tool	13
Installing the Sizing Tool	13
4 Using the Server Sizing Tool	15
Before You Begin	15
Entering and Saving Data	16
5 Hardware and Software Requirements	18
Hardware Requirements for the IBM Prospect Server	18
Software Requirements	19
IBM Prospect Server Configuration Examples	19
6 Exporting the Server Sizing Tool Calculations	23
Appendix A:	
Redundant Array of Independent Disks (RAID) Overview	25
Appendix B:	
IBM Prospect File System Sizing and Fault Tolerance	28
Notices	31
Trademarks	33

SERVER SIZING TOOL GUIDE
IBM Prospect 8.0

1 About This Documentation

The *Server Sizing Tool Guide* contains instructions for using the Server Sizing tool for IBM Prospect software.

Because this document includes instructions for sizing your IBM Prospect system, read this guide before reading the *Installation Guide*.

This guide was last updated July 2, 2010.

Please see the current release notes on this product for a list of revision dates for all IBM Prospect publications.

Audience

The Server Sizing tool is a roadmap for system administrators, database administrators, installers, switch engineers, or supervisors who are responsible for setting up and configuring the IBM Prospect platform.

Required Skills and Knowledge

The *Server Sizing Tool Guide* requires that you have the following knowledge:

- Sun Microsystems hardware
- Local area network (LAN) and wide area network (WAN) connectivity
- Sun Microsystems Solaris 8 UNIX® operating system
- Oracle Corporation Oracle9i
- 80x86 based computers
- Microsoft® Windows® operating systems
- Telecommunications equipment
- Your telecommunications network configuration

Document Conventions

This document uses the typographical conventions shown in the following table:

Table 1: General Document Conventions

Format	Examples	Description
ALL UPPERCASE	<ul style="list-style-type: none"> • GPS • NULL • MYWEBSERVER 	Acronyms, device names, logical operators, registry keys, and some data structures.
<u>Underscore</u>	See Document Conventions	For links within a document or to the Internet. Note that TOC and index links are not underscored. Color of text is determined by browser settings.
Bold	<ul style="list-style-type: none"> • Note: The busy hour determiner is... 	Heading text for Notes, Tips, and Warnings.
SMALL CAPS	<ul style="list-style-type: none"> • The STORED SQL dialog box... • ...click VIEW... • In the main GUI window, select the FILE menu, point to NEW, and then select TRAFFIC TEMPLATE. 	Any text that appears on the GUI.
<i>Italic</i>	<ul style="list-style-type: none"> • A <i>busy hour</i> is... • A web server <i>must</i> be installed... • See the <i>User Guide</i> 	New terms, emphasis, and book titles.
Monospace	<ul style="list-style-type: none"> • <code>./wminstall</code> • <code>\$ cd /cdrom/cdrom0</code> • <code>/xml/dict</code> • <code>http://java.sun.com/products/</code> • <code>addmsc.sh</code> • <code>core.spec</code> • Type OK to continue. 	Code text, command line text, paths, scripts, and file names. Text written in the body of a paragraph that the user is expected to enter.
Monospace Bold	<pre>[root] # pkginfo grep -i perl system Perl5 On-Line Manual Pages system Perl 5.6.1 (POD Documenta- tion) system Perl 5.6.1</pre>	For contrast in a code example to show lines the user is expected to enter.
<Mono-space italics>	<code># cd <oracle_setup></code>	Used in code examples: command-line variables that you replace with a real name or value. These are always marked with arrow brackets.
[square bracket]	<code>log-archiver.sh [-i] [-w] [-t]</code>	Used in code examples: indicates options.

User Publications

IBM Prospect software provides the following user publications in Adobe® Portable Document Format (PDF) format. The online help is in HTML format.

Table 2: IBM Prospect User Documentation

<i>Document</i>	<i>Description</i>
<i>Administration Guide</i>	Helps an administrator configure and support IBM Prospect core server software to analyze network performance and perform other network or database management tasks.
<i>Administrator's Quick Reference Card</i>	Presents the principal tasks of a IBM Prospect core server administrator in an easy-to-use format.
<i>Expressions Technical Reference</i>	Provides detailed information about expressions used in special calculations for reports.
<i>Installation Guide</i>	Instructions for installing and configuring the IBM Prospect software.
<i>Open Interface API Guide</i>	Describes how the Open Interface tool enhances your access to information about database peg counts and scenarios.
<i>Performance Data Reference</i>	Provides detailed information including entity hierarchies, peg counts, primitive calculations, and forecast expressions specific to your organization.
<i>Release Notes</i>	Provides technology-specific and late-breaking information about a given IBM Prospect release and important details about installation and operation.
<i>Server Preparation Guide</i>	Provides instructions for installing and setting up Solaris and Oracle software before you install IBM Prospect software.
<i>Server Sizing Tool Guide</i>	Helps an administrator use the sizing tool to calculate the system space needed for the IBM Prospect software and database.
<i>User Guide</i>	Provides conceptual information and procedures for using IBM Prospect software for performance and trending analysis.
<i>Web Administration Guide</i>	Helps administrators configure and maintain the IBM Prospect Web server using IBM Prospect administration software and command-line tools.
<i>Web User Guide</i>	Instructions for using the Web user interface for performance analysis.

Viewing the Desktop Client Help Publications

To view the desktop client Help publications, select a guide from the HELP menu of the IBM Prospect graphical user interface or press F1 for context-sensitive Help. To update the Help files, click the HELP menu on the IBM Prospect Explorer, and select UPDATE ALL HELP FILES.

When Help files are updated, they are downloaded automatically from the IBM Prospect server to the IBM Prospect client. A message box notifies you when this download occurs.

Viewing the Publications in PDF

All of the user publications are available in Adobe Portable Document Format (PDF). To open a PDF, you need the Adobe Acrobat Reader. You can download Adobe Acrobat Reader free of charge from the Adobe Web site. For more details about the Acrobat Reader, see the Adobe Web site <http://www.adobe.com/>.

Viewing the Publications in IBM Information Center

All of the IBM Prospect publications, including Release Notes, are available online from the IBM Information Center website as follows:

http://publib.boulder.ibm.com/infocenter/tivihelp/v8r1/index.jsp?topic=/com.ibm.netcool_pm.doc/IBM_Prospect_060308.htm

2 About the Server Sizing Tool

The server sizing tool is designed to streamline the task of determining the minimum resource requirements for the IBM Prospect server.

Adequate hardware resources are critical to your system's performance. When planning your initial hardware configuration for the IBM Prospect server you must first determine your current and future hardware needs by defining your system environment. Then you must identify, size, and purchase the hardware and software required to support it.

Note: If your server supports eight or more switches, contact your customer support representative for custom sizing information. Custom sizing may be required for optimal performance of the IBM Prospect system.

Topics

[Defining Your System Environment](#)
[Related Topics](#)

Defining Your System Environment

Following is a list of variables to consider when defining your system environment.

- The maximum number of stored busy hours your organization wants to use for any one kind of network entity
- The length of time data of various kinds are stored
- The number of switches in the network
- The number of total sites in the network
- The number of concurrent and total IBM Prospect users
- The complexity of the reports and queries
- The number of automated reports and triggers
- The level of redundancy designed in the system to prevent hardware failure on the server

SERVER SIZING TOOL GUIDE

IBM Prospect 8.0

About the Server Sizing Tool

The sizing tool calculates the minimum requirements for the data hard disk drives (HDDs), RAM, and CPU for the IBM Prospect server. It also calculates the `/u01` file system size on the system disk, file system sizes for the Oracle database directories—`/u02` - `/u06`.

The sizing tool does not calculate disk sizing requirement for RAID technology (1, 0+1, 3, or 5). You need to adjust the minimum required disk space if you want the fault tolerance offered by RAID.

Related Topics

See Appendix A: [Redundant Array of Independent Disks \(RAID\) Overview](#) for a description of RAID technologies and sizing issues.

See Appendix B: [IBM Prospect File System Sizing and Fault Tolerance](#) for a description of the IBM Prospect files systems, including recommendations for fault tolerance.

The next section describes the sizing tool setup, the sizing tool requirements, and how to open the sizing tool.

3 Server Sizing Tool Setup

The sizing tool package consists of two files:

SizingTool.xls
SizingTool.pdf

This chapter tells you where to find the sizing tool for installation and how to install your sizing tool software.

Topics

[Location of the Sizing Tool](#)
[Installing the Sizing Tool](#)

Location of the Sizing Tool

The sizing tool and the documentation are in the following directory:

IBM Prospect Server Preparation CD/Sizing Tool directory

Installing the Sizing Tool

Setting up the sizing tool involves copying your **.xls** file to a Windows-based computer with a Windows 2000, Windows XP, or Windows Vista operating system and with the following software installed:

- Microsoft Office 2007
- Adobe Acrobat Reader 3.0 or later.

To install the sizing tool software

1. Copy the sizing tool to your computer.

For the location of the server sizing tool, see [Location of the Sizing Tool](#) on page 13.

2. In Windows Explorer, double-click the sizing tool file (**SizingTool.xls**). This opens an Excel worksheet and the sizing tool.

SERVER SIZING TOOL GUIDE
IBM Prospect 8.0

Server Sizing Tool Setup

Important: Make sure that you enable macros when Excel opens the worksheet. You must enable macros for the sizing tool to operate properly.

3. Enter your specific data to generate the information required by IBM Prospect software.

The following chapter describes how to enter data in the sizing tool.

4 Using the Server Sizing Tool

Use the server sizing tool to determine the hardware necessary to run IBM Prospect software on your system. You can experiment with several possible scenarios, to see how each variable affects the recommended system size.

Topic

[Before You Begin](#)
[Entering and Saving Data](#)

Before You Begin

You *must* have information about your network and your site planning requirements to successfully complete the data entry portions of the server sizing tool.

Entering and Saving Data

This section of the guide introduces and provides instructions for the server sizing tool.

About the Server Sizing Tool Worksheet

Use the server sizing tool to enter information about your system. A red triangle in the upper right corner of a data cell indicates that a Help pop-up window is available for that cell. You need to enter your specific data into the cells for the NETWORK TOPOLOGY, STORAGE REQUIREMENTS, and YEARLY OVERHEAD categories.

Entering Data into the Server Sizing Tool

Use the following instructions to enter data about your network into the server sizing tool.

Note: The following procedure assumes that you have installed the server sizing tool. If you have not, see [Installing the Sizing Tool](#) on page 13.

To enter data in the server sizing tool

1. Open the server sizing tool. An Excel spreadsheet opens..
2. For each input category, enter the appropriate values in the spreadsheet data cells.
 - **Network Topology** — Enter values that describes the size and configuration of your wireless system. You can enter a numeric value or a formula.
 - **Storage Requirements** — Values entered for this option affects the amount of RAM and disk space required for your system.
 - **Soft Alarm Storage Requirements** — Enter the number of soft alarms per hour that you anticipate and the number of days you want to retain the data. If you want more accurate estimates for your system, contact technical support.
 - **Yearly Overhead** — Enter values that estimates the growth of your system, which in turn affects the future resource requirements of the IBM Prospect server.

Example:

Increase the value of the **Days of Traffic Data**, to see the effect this has on the **Total (Disk + SWAP)** = results.

3. To support Oracle Auto-extend feature's initial, next, and maximum size options, fields \$7, \$8, and \$9 have been added to the table space lines. They are processed as follows:
 - **Isize** — initial size in MB. This is used as the initial size for each file within the tablespace. A default of 100MB is used if this is not specified.
 - **Nsize** — next size in MB. This is used as the next size for each file within the tablespace. A default of 100MB is used if this is not specified.
 - **Msize** — maximum size in MB. This is used as the maximum size for each file created. If this is not specified the total estimated size for the tablespace is blocked based on a graduated scale.

Note: The fields \$7, \$8 and \$9 are optional. The AUTOEXTEND can be used regardless of these new fields. It is only the values (i.e., sizes) that change.

4. To create the `results.txt` file, click WRITE INSTALL FILE. This results in the following:
 - Saves the master worksheet as `SizingTool.xls`.
 - Creates the `results.txt` file, which is used later in the installation process. For more information, see [Exporting the Server Sizing Tool Calculations](#). To save more than one possible configuration, rename both the `SizingTool.xls` and `results.txt` files, then run the calculations a second time. If these files already exist, the save operation replaces them. The `results.txt` file is saved to the Windows root directory.

5 Hardware and Software Requirements

This chapter describes the IBM Prospect hardware and software requirements and sizing considerations to use after obtaining the results from the sizing tool.

Topics

[Hardware Requirements for the IBM Prospect Server](#)
[Software Requirements](#)

Hardware Requirements for the IBM Prospect Server

After you have saved the sizing tool worksheet, use it to configure your IBM Prospect system. You must note the minimum sizing requirements specified for the IBM Prospect server to properly size your hardware; however, you must also calculate any site-specific needs when you calculate the server size and resource requirements.

Minimum peripheral requirements are described in the *Server Preparation Guide*.

Minimum Hardware Requirements for the Prospect Server

The following table lists the minimum hardware required for the Prospect server.

Table 3: Minimum Hardware Requirements for the Prospect Server

<i>Minimum Hardware</i>
Sun Enterprise 2 workgroup server.
285,671 MB of disk space (does not include mirroring). Larger disks impact performance. The amount required is affected by the subscriber growth rate, peg count growth rate, years to look ahead, and all the tablespace.
2,048 MB of total RAM. Prospect runs in a minimal configuration with 512 MB of RAM.

Table 3: Minimum Hardware Requirements for the Prospect Server (Continued)

Minimum Hardware
4,096 MB swap size. For smaller configurations, 2 X RAM is the minimal amount needed. Vallent recommends 3 X RAM for larger configurations.
Six 300-megahertz (MHz) central processing units (CPUs). The number of CPUs is affected by the number of simultaneous users and MSCs.
One 9.2-GB Small Computer System Interface (SCSI) primary HDD.
Disk space (Disk + SWAP) = 282.98 GB (for Prospect database requirements only). This size is required after formatting disk.
Equivalent of five 9.2-GB SCSI data HDDs, or the amount calculated by the Prospect sizing tool.

Software Requirements

Refer to the *Server Preparation Guide* for software required by IBM Prospect.

IBM Prospect Server Configuration Examples

After you have saved the sizing tool worksheet, use it to configure your IBM Prospect system. You must note the minimum sizing requirements specified for the IBM Prospect server to properly size your hardware; however, you must also calculate any site-specific needs when you calculate the server size and resource requirements.

This section covers the following topics:

The sizing tool was used to create the three hardware configuration examples described in the table below. Use the sizing tool to perform your own configuration calculations.

This section covers the following topics:

- [Using Spindles](#)
- [Using Striping](#)
- [Logical Units and Logical Unit Numbers](#)
- [Network Sizing Examples](#)
- [Network Requirements](#)
- [Testing your Network](#)

SERVER SIZING TOOL GUIDE
IBM Prospect 8.0

Hardware and Software Requirements

Table 4: IBM Prospect Server Platform Examples

Database Size	Recommended Server	CPUs	RAM	Internal System HDD	Number of 9.2GB Data Spindles	RAID Level
Small	Sun Enterprise 420	2 - 300 MHz	1792 MB	1-9.2 GB	19	0 +1
Medium	Sun Enterprise 450	2 - 300 MHz	5376 MB	1-9.2 GB	2	0 +1 and/or 5
Large	Sun Enterprise 4500	4 - 400 MHz	11264 MB	1-9.2 GB	58	0 +1, and/or 5

Note: It is recommended that you use a RAID 1 (mirroring) configuration for the system disk. This requires two 9.2-GB drives.

- For small and medium configurations, the number of 9.2-GB data spindles as shown in Table 13 are the amount required if you use RAID level 0 +1, which is double the number needed if you do *not* use RAID 0 +1.
- The number of spindles shown for a large configuration is the amount required if you use RAID 5. This number represents 25 percent more spindles than you would need without RAID.
- RAID levels 0, 1, 0 +1, 3 and 5 are compatible with IBM Prospect databases.

Using Spindles

The following table uses 9.2-GB spindles as an example. However, unless you process large amounts of data and need to use spindles that are 9.2 GB or larger, it is advisable to use several smaller (4.5-GB) spindles rather than a few large ones.

Table 5: Network Sizing Examples

Size	Total MSCs	Total BSCs	Total Cells
Small	1	2	290
Medium	4	10	1300
Large	10	23	3110

Using Striping

If you use RAID 0, 0 + 1, 3, or 5, you use striping, which allows data to write across all the spindles in a LUN at the same time. Striping overcomes the 12.5 MB/sec read/write rates inherent in each spindle. By having several smaller spindles rather than a few large spindles you

can enhance your input and output. Also, in the event of disk failure, the restoration process of smaller disks is much quicker because there is less data to restore.

The example shown in the section [Network Sizing Examples](#) is based on the use of three RAID controllers (software or hardware). If you are using Fast/Wide SCSI-2, the maximum throughput for each controller is 40 MB/sec. Without additional controllers, your maximum throughput would still be 40 MB/sec, regardless of the number of spindles.

Logical Units and Logical Unit Numbers

There are two types of logical units (LUs), and logical unit numbers (LUNs):

1. LUs for RAID use disk-array configurations. These logical units are virtual disks that comprise many individual physical disks.
2. LUNs refer to SCSI addresses used to configure devices. This document discusses logical units as they pertain to RAID *only*, not logical unit numbers that pertain to SCSI addresses.

Network Sizing Examples

The table below compares the data transfer rates for 36 GB of storage using spindles of different sizes, and striping (RAID 0) where there are at least two spindles.

The examples in the table below are based on the parameters listed in the section [IBM Prospect Server Configuration Examples](#) on page 19.

To calculate your minimum IBM Prospect server resource needs, enter your data in the sizing tool to obtain your site-specific sizing data.

Table 6: Comparison of Disk Requirements for 36 GB Storage

Formatted Spindle Size (GB)	Number of Spindles	Approx. Storage Space (GB)	Read/Write Rate in MB/s, (I/O)
4.5	8	36	100
9.1	4	36	50
18.2	2	36	25
36.4	1	36	12.5

Network Requirements

The IBM Prospect network typically consists of a high-speed wide area network (WAN), and local area network (LAN) connection between the IBM Prospect server and the IBM Prospect clients.

- A 10 Base-T network interface card is adequate for smaller configurations.
- Use (at a minimum) a high speed 100 Base-T network interface card connected to a high-speed network for larger configurations.

Testing your Network

You should test your network connection each time you configure a network interface card (on the IBM Prospect server and client). To test the network connection to your LAN, send a **ping** command to another node on the LAN by using a known IP address or, if enabled, a Domain Name System (DNS) address. For example,

```
$ ping 255.255.254.17  
$ ping device_name
```

If you do not get a response that indicates a connection was made, check your network connection, network settings, and hardware.

6 Exporting the Server Sizing Tool Calculations

This chapter provides the following:

- Description of the `results.txt` file
- Location of the instructions for copying and loading the `results.txt` file
- Reviewing the *IBM Prospect Installation Guide*

The sizing tool generates a file called `results.txt` that includes parameters which determine the sizing and structure of the database instance.

After you have installed the Solaris operating system, you must copy the `results.txt` file to the `/tmp` directory on the IBM Prospect server before the program can configure your database sizing results.

The instructions for copying and loading the `results.txt` file are in the *Server Preparation Guide*, which is located on the IBM Prospect Server Preparation CD-ROM. The file name is `ServerPrep.pdf`. Follow the instructions in the *Server Preparation Guide* to set up the third-party software required by IBM Prospect software.

After setting up the hardware according to the instructions in the *Server Preparation Guide*, you can begin the IBM Prospect installation procedures. Open the `InstallGuide.pdf` file, and review the *Installation Guide* before you begin the IBM Prospect installation procedures.

SERVER SIZING TOOL GUIDE
IBM Prospect 8.0

Exporting the Server Sizing Tool Calculations

Appendix A: Redundant Array of Independent Disks (RAID) Overview

IBM Prospect is compatible with all RAID technologies. Your choice of RAID technology (if any) depends on your particular needs and the balance among performance, cost and fault tolerance. The types of RAID that are included with Sun StorEdge RAID Manager, are RAID 0, 1, 0+1, 3, and 5. The characteristics of each of these technologies are described below.

Raid 0

RAID 0 is not a true RAID technology, since it does not provide fault tolerance. RAID 0 simply combines drives to create a larger virtual drive or logical unit (LUN). However, RAID 0 uses a technology called striping which allows data to be written to several spindles concurrently, dramatically enhancing input/output (I/O) when there are several disks in a LUN. However since RAID 0 does not have redundancy, if any drive in the LUN fails, the data stored on the LUN becomes lost.

Raid 1

RAID 1 uses pairs of drives to create a copy, or mirror, of every bit written to the pair. If a drive should fail, the system automatically uses the remaining member of the pair to recover the lost data. Although RAID 1 halves the amount of usable space available within a RAID set, it provides the highest performance for both reads and writes.

Raid 0 +1

RAID 0+1 combines RAID 0 and RAID 1 technologies. Unlike RAID 1 where drives are paired, RAID 0+1 mirrors sets of drives in a LUN. This allows the I/O to be enhanced and provides the greatest level of protection. RAID 0+1 offers the best features of RAID 0 and RAID 1, providing speed, virtual drive management, and complete protection from drive failure.

RAID 0 is fast and inexpensive, but it lacks redundancy, so it is not fault tolerant. RAID 1 is fast and highly reliable, but that comes at a cost, you must use twice as many disk drives than would

be needed if RAID 1 were not used. However there are other RAID configurations that are less expensive and are highly reliable, although the performance is not as good as RAID 0 +1. These configurations are RAID 3 and RAID 5.

RAID 3 and RAID 5 use the concept of parity to provide redundancy in the RAID volume. In simplest terms, parity can be thought of as a binary checksum, a single bit of information that tells you if all the other bits are correct.

Raid 3

RAID 3, like RAID 0, uses striping, however, RAID 3 incorporates fault tolerance by adding parity, which is written to a single parity disk. This is the primary problem with RAID 3 is that the parity drive becomes the bottleneck in the system during write activity.

If you use a RAID 3 volume for general random read activity, your write operations for the data are spread over a number of physical drives. However, any write to any data drive requires a write to the parity drive. For write-intensive applications, the parity drive cannot keep up, and the whole RAID set slows down as requests to write to the parity drive back up.

For this reason, RAID 3 is a good storage choice for low-write, high-read applications like data warehouses and archived static data. It may take longer than usual to write the data to the RAID 3 set, but once written, reads are quick. Because such archives tend to be large, the cost savings between RAID 3 and RAID 1 for similar storage can be significant.

Never use RAID 3 for general-purpose storage unless you have large amounts of cache in the disk controller. In these controllers, all writes are staged to cache and the I/O is acknowledged as complete to the host system. The controller then writes the data to the drives while the system proceeds to the next operation. Even with these controllers, RAID 3 may not be your best choice. The parity drive can fail faster than the others, due to its increased level of activity compared to the data drives.

Raid 5

RAID 5 is operationally identical to RAID 3: several blocks in a stripe share a common parity block. The parity block is written whenever any block in the stripe is written, and the parity data is used to reconstruct blocks read from a failed drive.

The big difference between RAID 3 and RAID 5 is that RAID 5 distributes the parity blocks throughout all the drives, using an algorithm to decide where a particular stripe's parity block resides within the drive array.

Except for eliminating the parity drive problem, RAID 5 has some of the same problems as RAID 3; slow writes, sensitivity to I/O block sizes, and potentially lengthy rebuilds of degraded RAID sets. In spite of this, RAID 5 is a viable, economical redundant storage solution, especially when the individual drives are coupled by a caching controller that can mitigate some of the write latency inherent with RAID 5.

Considerations When Using RAID 3 or RAID 5

RAID 3 and RAID 5 configurations are particularly sensitive to disk controller loading. RAID 3 and RAID 5 can suffer significant performance problems, since all the drives in the set are driven by a single disk controller. Although the number of I/Os initiated to the RAID set would not be enough to exceed the I/O of a single drive, they can often overwhelm the controller, which must manage all the I/O requests to all of the drives.

For this reason, drives combined to form a RAID set should be managed by separate controllers. When you use multiple controllers, the system initiates multiple I/Os and then distributes the I/Os to individual drives, thus preventing any one controller from becoming saturated. When you are deciding which RAID 5 system to buy, give very close attention to the internal controller architecture behind the RAID controller. If all the drives in a single RAID set are on the same device chain on a single controller, you will have performance problems with larger databases.

Appendix B: IBM Prospect File System Sizing and Fault Tolerance

The IBM Prospect Server Sizing tool provides you with the minimum file system sizing, based on your network's configuration and size. However, it is important to understand what each file system is used for in order to customize the configuration to match your system specifications.

/u01

The `/u01` file system is on the server system disk. Oracle and IBM Prospect software are installed in `/u01/apps/oracle` and `/u01/apps/WatchMark`, respectively. The input/output (I/O) throughput for this file system is not a critical factor, and the file space required is relatively small compared to the IBM Prospect data files. A single 9.2-GB spindle should be adequate for the system disk unless you plan to accumulate large log files on this disk.

Although not required, it is advisable to have two system disks of the same size so that they can be configured using RAID 1, or 0 +1.

/u02

The IBM Prospect redo logs are stored on the `/u02` file system. IBM Prospect uses these logs to perform instance recoveries if data is lost or corrupted. IBM Prospect uses three logs, each approximately 30 - 40 MB in size. Normally, this file system has short sequential writes and periodic long sequential reads. Because the redo logs are written for each committed change to the database, they can become bottlenecks. To minimize potential I/O problems, `/u02` can be assigned to its own spindle, or in larger databases, its own LUN.

The type of RAID to choose for this file system depends on the size of your database. If the IBM Prospect Server Sizing tool indicates that this file size does not require more than one spindle, you can choose to have a fault-tolerant configuration that uses RAID 1. This requires an additional spindle of the same size. Alternatively, you can choose not to use RAID if fault tolerance is not an issue. RAID 5 is not recommended for `/u02` as RAID 5 does not provide sufficient write bandwidth for Oracle redo logs.

/u03

Oracle's rollback table space segments are stored in the /u03 file system. Oracle uses rollback segments to maintain read consistency between concurrent sessions. As data is changed by a session, the old values are stored in this table space so that other sessions can see the old values before the new values are committed. Because this table space is often accessed simultaneously with the data table space, it is kept on a separate spindle or LUN to reduce contention among I/O resources.

In smaller configurations, it is possible for /u03 to share spindles or LUNs with /u05 (temporary table space).

The type of RAID you choose for this file system depends on the size of your database and your need for fault tolerance. If you want fault tolerance for smaller databases, you should consider using RAID 0 +1. If fault tolerance is not an issue, you should use RAID 0 to improve your I/O. If you have a large database, want fault tolerance, and do not want to use twice as many spindles than you would need without RAID mirroring, you might consider using RAID 5. RAID 5 uses parity (rather than mirroring) for redundancy and requires one extra drive to store this parity information.

/u04

The IBM Prospect database is stored in the /u04 file system. It contains all the traffic cpfail `user` document data. It is the largest file system and has the highest I/O throughput requirements. If your database is large, the /u04 file system should be assigned to its own LUN or spindles. It is highly advisable that you include fault tolerance with this file system, using RAID 0 +1 for high performance or RAID 5 for lower costs.

/u05

The temporary table space is stored in the /u05 file system. These table spaces are used for storage of temporary results that are too large to be held in memory. This file system has I/O characteristics that are similar to the /u03 file system. For this reason, you could share spindles or LUNs with these two file systems. To ensure adequate I/O, the file systems should, at a minimum, be striped. However, unless fault tolerance is not an issue, you should use RAID 0 +1 for high performance or RAID 5 for lower costs. Additionally, if this file system becomes larger than four spindles, you should assign another LUN with another controller for each set of four spindles used for this file system. (Ultra Wide SCSI has a throughput of 40 MB per second, the spindles have a throughput of 12.5 MB/sec, striping more than four spindles on a single SCSI controller connection does not enhance I/O.)

/u06

The archived redo files are stored on the /u06 file system. These are copies of the redo logs from the /u02 file system, allowing IBM Prospect to perform point-in-time recoveries from some types of back ups.

Important: If fault tolerance is an issue, you should choose RAID 0 + 1 for smaller databases and if the total number of spindles is an issue, choose RAID 5 for larger databases. Even if fault tolerance is not an issue, you should use RAID 0 to enhance your I/O.

For further details and considerations using the various RAID technologies with the /u06 file system, see Appendix A: [Redundant Array of Independent Disks \(RAID\) Overview](#).

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SERVER SIZING TOOL GUIDE
IBM Prospect 8.0

Index

A

audience7

D

DNS22

documentation

 font usage8

 typographical conventions8

 user9

 viewing HTML Help10

 viewing PDF10

domain name system22

E

enhance I/O21

exporting server sizing tool calculations ..23

F

font usage

 documentation8

H

hardware

 peripherals18

help popup16

HTML Help format10

L

LUNs21

M

minimum peripheral requirements

 client19

 server19

N

network requirements21

network sizing examples20

P

PDF format10

peripherals18

ping command22

publications

 user9

R

RAID 025

RAID 0+125

RAID 125

RAID 326

RAID 526

RAID controllers27

red triangles16

required skills and knowledge7

S

sizing tool requirements15

software requirements13, 19

striping20

Sun Enterprise 2 workgroup server18

T

testing a network connection22

typographical conventions8

U

user publications9

using RAID 3 or RAID 527

SERVER SIZING TOOL GUIDE
IBM Prospect 8.0

SERVER SIZING TOOL GUIDE
IBM Prospect 8.0



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