

MetaSolv Solution™ 6.0.12 or higher

Planning Guide

Seventh Edition
September 2010



Copyright and Trademark Information

Copyright © 2010, Oracle. All rights reserved.

The Programs (which include both the software and documentation) contain proprietary information; they are provided under a license agreement containing restrictions on use and disclosure and are also protected by copyright, patent, and other intellectual and industrial property laws. Reverse engineering, disassembly, or decompilation of the Programs, except to the extent required to obtain interoperability with other independently created software or as specified by law, is prohibited.

The information contained in this document is subject to change without notice. If you find any problems in the documentation, please report them to us in writing. This document is not warranted to be error-free. Except as may be expressly permitted in your license agreement for these Programs, no part of these Programs may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose.

If the programs are delivered to the United States Government or anyone licensing or using the Programs on behalf of the United States Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the Programs, including documentation and technical data, shall be subject to the licensing restrictions set forth in the applicable Oracle license agreement, and, to the extent applicable, the additional rights set forth in FAR 52.227-19, Commercial Computer Software--Restricted Rights (June 1987). Oracle USA, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

The Programs are not intended for use in any nuclear, aviation, mass transit, medical, or other inherently dangerous applications. It shall be the licensee's responsibility to take all appropriate fail-safe, backup, redundancy and other measures to ensure the safe use of such applications if the Programs are used for such purposes, and we disclaim liability for any damages caused by such use of the Programs.

Oracle and MetaSolv are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

The Programs may provide links to Web sites and access to content, products, and services from third parties. Oracle is not responsible for the availability of, or any content provided on, third-party Web sites. You bear all risks associated with the use of such content. If you choose to purchase any products or services from a third party, the relationship is directly between you and the third party. Oracle is not responsible for: (a) the quality of third-party products or services; or (b) fulfilling any of the terms of the agreement with the third party, including delivery of products or services and warranty obligations related to purchased products or services. Oracle is not responsible for any loss or damage of any sort that you may incur from dealing with any third party.

Document History

Edition	Date	Reason
First	December 2006	Split off this document from the existing GA document, and re-named GA document 6.0 - 6.0.11.
Second	March 2007	Updated the copyright and trademark information.
Third	June 2007	Updated Copyrights, About this Guide chapter, and customer portal references with Oracle. Added information regarding Itanium to Chapter 3, table 6. Added information regarding product key removal to Chapter 1, figures 3 and 4. Removed references to Field Operations Portal.
Fourth	August 2007	Corrected AIX version 5.3 to be 5.3L.
Fifth	December 2007	Added support for AIX 5.3ML2.
Sixth	August 2008	Changed versions of IE 6 to IE 7 and Acrobat Reader 6.0 to 8.1.2.
Seventh	September 2010	Updated deployment configuration example tables in Appendix A.

Contents

Preface	iii
Audience	iii
Related documentation	iii
1. Preparing For MetaSolv Solution	1
Skills required to set up MetaSolv Solution	1
If you have MetaSolv Solution in test or production	1
General notes	1
How MetaSolv Solution 6.0.2 is different from previous releases	2
How MetaSolv Solution 6.0.3+ is different from 6.0.2	3
Upgrade Path	3
Application Server	3
Database	5
Some helpful terms	5
Setup process	8
Where MetaSolv Solution files reside after installation	9
Planning for third-party software	10
Setting up a test environment	12
2. Environment Planning Considerations	13
Availability and scalability requirements	13
Hardware sizing guidelines	14
Hardware and software configuration	15
Database considerations	15
Application server considerations	15
Client considerations	18
If your plan includes a background processor	18
If your plan includes a Citrix server	19
User authentication	20
Data migration	21
Planning tips	21
3. Minimum Technical Requirements	23
MetaSolv Solution installation components	23
Recommended actions for best performance	24
Database server	24
Application server	26
MetaSolv Solution rich client	30
Background Processor	32
Citrix	33
Location and Routing Gateway client	34
NPA Split Utility client	34
MetaSolv Solution Utilities client	35
Appendix A: Deployment Configuration Examples	37

Small deployment example (100 users)	38
Medium deployment example (300 to 400 users)	40
Large deployment example (1,000 users)	42
Appendix B: Environment Planning Worksheet	45
Environment Profiles	45
Functional Areas	46

Preface

This guide contains information needed to plan for an Oracle Communications MetaSolv Solution installation. It contains technical requirements for hardware and software needed to create an environment for MetaSolv Solution. The guide also provides estimates of equipment needed to run MetaSolv Solution for different size businesses. The estimates are general and are intended as a learning tool. Estimates on equipment and configuration settings cannot be exact because needs vary between MetaSolv Solution installations based on issues such as the number of users, the volume of transactions, whether the application is being used on a WAN, and so on. To ensure you have planned for the appropriate equipment and software, MetaSolv recommends contacting its Professional Services Organization before you proceed with an installation.

This guide includes some information on third-party software products used by MetaSolv Solution. However, this information is limited to information needed to install and perform initial configuration tasks. If you need additional information on a third-party software application, consult the documentation provided by the product's manufacturer.

Audience

This guide is for individuals responsible for installing or maintaining MetaSolv Solution and ensuring the software is operating as required. This guide assumes the installer has an Oracle DBA and WebLogic administrator background, with a working knowledge of Windows 2000 and Java J2EE.

Related documentation

For more information, see the following documents in Oracle Communications MetaSolv Solution documentation set:

- ◆ *Setup Guide*: Describes system requirements and installation procedures for installing MetaSolv Solution.
- ◆ *Administration Guide*: Describes post-installation tasks and administrative tasks such as maintaining user security.
- ◆ *Operational Reports*: Provides an overview on using Operational Reports and Business Objects XI within MetaSolv Solution, and procedures for running reports, updating universes, and simple maintenance. It also includes a detailed description of the purpose

and functionality of each report available in Operational Reports, as well as a Frequently Asked Questions (FAQ) section that addresses key questions regarding the software.

- ◆ *Custom Extensions Developer's Reference*: Describes how to extend the MetaSolv Solution business logic with custom business logic through the use of custom extensions.
- ◆ *CORBA API Developer's Reference*: Describes how MetaSolv Solution APIs work, high-level information about each API, and instructions for using the APIs to perform specific tasks.
- ◆ *XML API Developer's Reference*: Describes how to integrate MetaSolv Solution with other Oracle products, or with external applications, through the use of APIs.
- ◆ *Flow-through Packages Guide*: Describes information and procedures you need to install and work with the flow-through packages provided by Oracle as an example of how to integrate MetaSolv Solution with ASAP for flow-through activation.
- ◆ *Database Change Reference*: Provides information on the database changes for the current MetaSolv Solution release. Database changes for subsequent maintenance releases will be added to this guide as they are released.
- ◆ *Data Selection Tool How-to Guide*: Provides an overview of the Data Selection Tool, and procedures on how it used to migrate the product catalog, equipment specifications, and provisioning plans from one release of your environment to another.

For step-by-step instructions for tasks you perform in MetaSolv Solution, log into the application to see the online Help.

Preparing For MetaSolv Solution

This chapter contains setup information for MetaSolv Solution 6.0.x new and existing customers.

Skills required to set up MetaSolv Solution

For best results installing this software product, MetaSolv Software recommends the following:

- ◆ Database tasks should be done by a database administrator who is familiar with Oracle software.
- ◆ Application server tasks should be done by a systems administrator who is familiar with BEA WebLogic Server.
- ◆ For existing customers, the installation and configuration of the application server software and MetaSolv software should be done by an information technology specialist or another technical individual who is familiar with BEA and MetaSolv Solution.
- ◆ If you are a new customer installing for the first time, MetaSolv Software suggests enlisting its Professional Services Organization to help get the system up and running and to migrate your company data into the database.

Regardless of the platform you plan to use, considerable technical knowledge is required to set up and administer this software product. The application server needs a dedicated administrator who can oversee operations to ensure the system is running at its optimum capacity. This role is separate from that of the Oracle database administrator who maintains the database server and the integrity of the data.

If you have MetaSolv Solution in test or production

This section contains information on tasks you must do or information you must review if you currently have a version of MetaSolv Solution that you plan on moving to the new release.

General notes

- ◆ Because the application server is changing to BEA WebLogic Server, the software upgrade is like a new installation. You must uninstall all MetaSolv Solution software and utilities before you can install the 6.0.2 release.

- ◆ If you use ASR or LSR, you must reinstall them after MetaSolv Solution 6.0.2 is installed.
- ◆ If you use LSR, you must upgrade to LSR 6.4 for MetaSolv Solution 6.0.2.
- ◆ If you currently have open LSR orders, these will be *view only* in MetaSolv Solution 6.0.2. To avoid this problem, you can close any open orders before you move to MetaSolv Solution 6.0.2, or you can upgrade the orders to LSOG 6 before installing MetaSolv Solution 6.0.2.
- ◆ You must migrate some existing data into new database tables to accommodate changes in the software. The MetaSolv Solution 6.0.2 database supports the use of template-based network design.

How MetaSolv Solution 6.0.2 is different from previous releases

- ◆ There is an increased reliance on the application server to manage business processing operations between the client workstation and the database. This is a standard way of operating in an n-tier environment.
- ◆ Previously, the client workstation had a direct connection to the database in addition to the application server connection. This is no longer true. The client workstation can connect to the database only through the application server. If your server fails and you do not have failover ability, the client workstation has no way to complete its work. Some separate utilities (for example, Background Processor) can be set up to function with a direct link to the database, but the core application cannot.

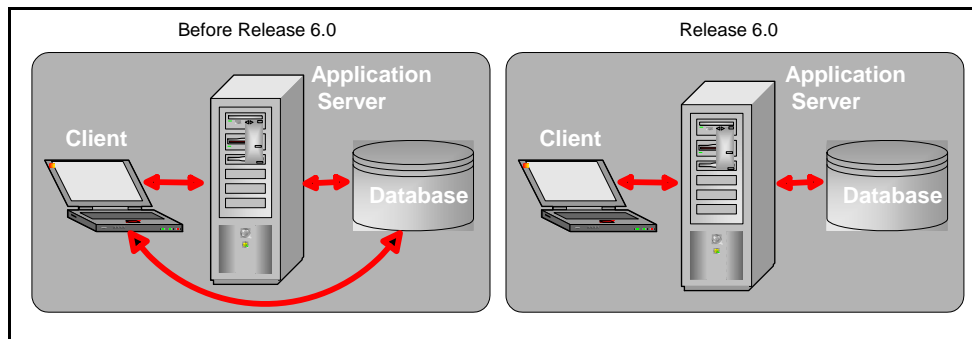


Figure 1: MetaSolv Solution data flow

- ◆ All files are loaded to the application server during the application server installation, including the files that are intended to reside on the client workstation. The client workstation files, which are stored in compressed form, are then downloaded automatically to individual workstations when the user clicks a link on a specified Web page.
- ◆ By default, users are authenticated through the database server. You can have the application server perform this task if you prefer.

How MetaSolv Solution 6.0.3+ is different from 6.0.2

MetaSolv Solution 6.0.2 moved from the Novell ExteNd (Silverstream) application server to BEA WebLogic Server 7 SP4. The 6.0.3 release upgrades the version of BEA Weblogic Server to 8.1 SP3. The 6.0.8 release upgrades the version of BEA WebLogic server to 8.1 SP5.

Upgrade Path

Application Server

The following diagram describes the relationship between MetaSolv Solution releases and application server versions. Note that the picture denotes a product key for M6.0.12. This is applicable for M6.0.12 and M6.0.13, however, starting with M6.0.14 the product key is no longer used.

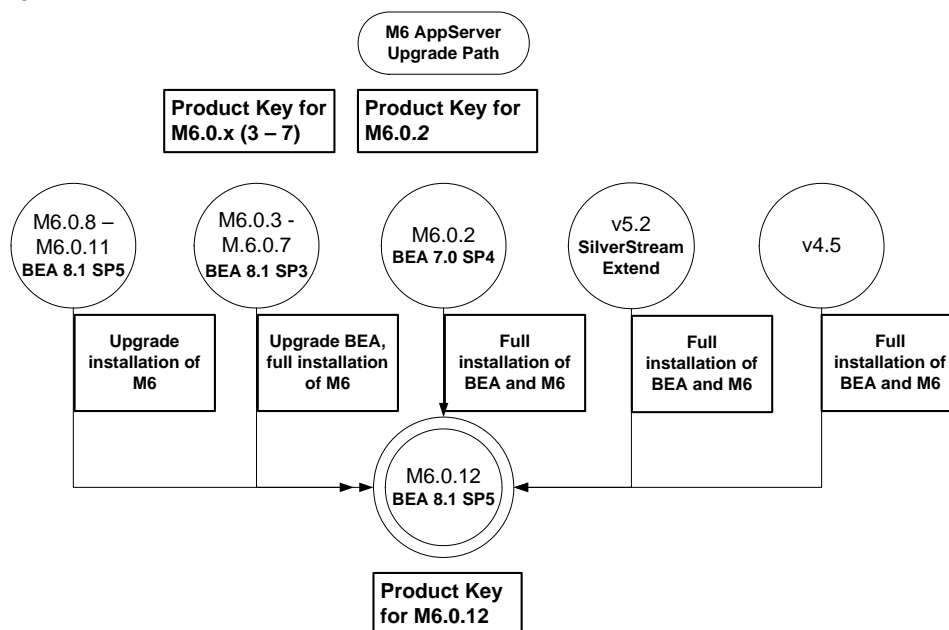


Figure 2: MetaSolv Solution releases and application server versions

The following table describes upgrade path from various releases to the later target releases.

Table 1: Application Server Upgrade Path

Current Release	Path to v.5.x	Path to M6.0.2	Path to M6.0.3 - M6.0.7	Path to M6.0.8-M6.0.11	Path to M6.0.12+
v5.x	E	F	F	F	F
M6.0.2	N/A	E	F	F	F
M6.0.3-M6.0.7	N/A	N/A	E	U/F	U/F
M6.0.8-M6.0.11	N/A	N/A	N/A	E	U
M6.0.12+	N/A	N/A	N/A	N/A	E

E-Fix Upgrade. Choose Upgrade option in MetaSolv application server installer. (Starting with M6.0.14, an E-Fix is called a patch.)

F: Full install. Download BEA with proper service pack for the target release from the Oracle E-Delivery Web site. **Create a brand new BEA domain and perform M6 full install.**

U: Upgrade. Download BEA upgrade version with proper service pack for the target release from the Oracle E-Delivery Web site. **Upgrade existing BEA domain and perform M6 full install.**

N/A: Not applicable. No path.

Please see target release Setup Guide for actual install or upgrade processes.

Database

The following figure shows the upgrade path for the MetaSolv Solution database. Note that the picture denotes a product key for M6.0.12. This is applicable for M6.0.12 and M6.0.13, however, starting with M6.0.14 the product key is no longer used.

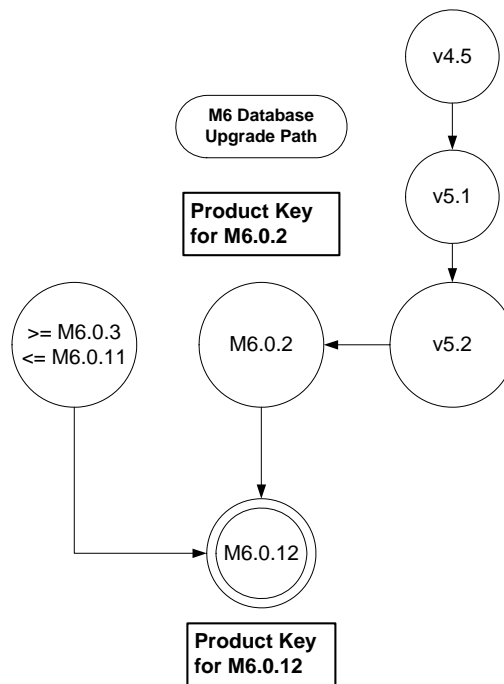


Figure 3: MetaSolv Solution database upgrade path

Please see target release Setup Guide for the actual process.

Some helpful terms

The following terms are used throughout this guide. They are basic terms necessary for the discussion of deploying an application intended for use over a network by many users.

Application server

In a 3-tier client-server environment, the application server performs the business logic processing between the user's machine (first tier) and the database management system (third tier). A simple example is shown in [Figure 4](#).

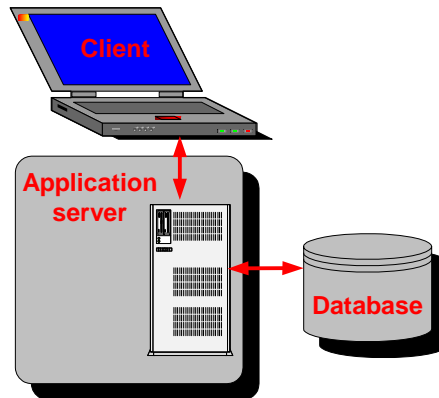


Figure 4: Application server

Third-party software is used to handle the interaction between the client, MetaSolv Solution, and the database. In the case of MetaSolv Solution, the third-party application server software is BEA WebLogic Server.

The MetaSolv Solution business logic, designed to work with the WebLogic server software, is loaded on the same machine and connections are established between the two to allow the exchange of data. Connections are also made between the application server software and the database. The following list shows the benefits of using an application server approach:

- ◆ Processing tasks are moved from the client workstations to the application server machine, which saves resources.
- ◆ More users can be supported, and you can set up your system so processing continues if a server fails.
- ◆ Delay between the application and the database server is minimized, increasing the efficiency for processing requests.
- ◆ Finite resources like database connections are managed in a more structured manner.

WebLogic domain

A domain is a group of application servers managed as a single unit. The domain contains at least one instance of WebLogic Server. If multiple server instances exist in the domain, one instance is designated as the administrative server, and the rest become managed servers. Managed servers are controlled from the administrative server console.

WebLogic administrative server

The administrative server allows you to manage other servers in a domain. This server has a console that allows you to shut down and start up other servers, monitor the environment, and manage activities like security and transaction processing.

WebLogic managed server

A managed server is under the control of the administration server.

WebLogic clustering

A cluster is part of a domain dedicated to some specific processing duty (for example, MetaSolv Solution processing). A cluster is not the same as a domain but is a subset of a domain. A cluster generally includes several server instances, and the servers work together as if they were one application. A single cluster or multiple clusters can exist in a domain, but you cannot spread a cluster across more than one domain. One advantage of clusters is their scalability; you can increase the number of servers in a cluster to handle increased processing needs. Clusters also give you high availability, which means if one server fails, another replaces it without the loss of data.

Client

The client is the user workstation linked to MetaSolv Solution so that a user can interact with the system to carry out tasks. Some application code is loaded to the client to allow the execution of some MetaSolv Solution graphical features and other processing tasks.

J2EE

J2EE is a standard for developing Java applications for a thin-client, multitiered environment. The conventions found in J2EE help ensure applications are developed in such a way that communications are simplified between Java applications.

Machine

The name of the physical machine that hosts an application server.

Setup process

MetaSolv Solution contains three discrete software installation processes: database, application server, and client. The installation is completed in the following order:

1. Database installation

This release is supported on both Oracle 9i and Oracle 10G.

2. Application server installation

The application server installation requires the most planning. You must decide which domain option you want for your installation and configure the application servers for the most benefit in terms of failover, high availability, and scalability. Based on business and environment requirements, you should evaluate both hardware and software options for implementing your choice of the following domain options:

- ◆ Single server
- ◆ Administration server with managed servers
- ◆ Administration server with managed servers in a cluster

You must determine which of these options applies to your business needs and meets the most secure operational failover requirements.

MetaSolv does not recommend the single server solution because it does not provide continuation of service if the server fails. There is no mechanism in this option to prevent the loss of data or service.

For information on each of these options, see the documentation at:

<http://www.oracle.com/technetwork/middleware/weblogic/overview/index.html>

3. Client installation

The client files are bundled with the application server files. These files can be loaded to client workstations from the application server automatically using a tool called the zero admin client (ZAC). The ZAC provides the ability to distribute the installation of the client over the network. Updates to the client files can also be distributed using this tool. A manual installation script is also provided.

Where MetaSolv Solution files reside after installation

In a MetaSolv Solution installation, application files are divided among the following locations:

- ◆ **Application server**—MetaSolv Solution software that controls business logic and processing is loaded to a designated machine or machines. This software is designed to work with the BEA WebLogic server software and improve the speed and efficiency of the information flow between the client workstation and the MetaSolv Solution database.
- ◆ **Client workstation**—The files loaded to the client workstation include executable files that allow the operation of MetaSolv Solution for the user interface and INI files that configure the software. Initially, these files are loaded onto the application server in a compressed format. Then, the files are distributed to the client workstation through an automated process called ZAC.
- ◆ **Citrix server (optional)**—If you are using a Citrix server, the client workstation files are loaded onto the Citrix server, and the client workstations use a Citrix browser to interact with MetaSolv Solution.

Figure 5 shows a simple MetaSolv Solution configuration.

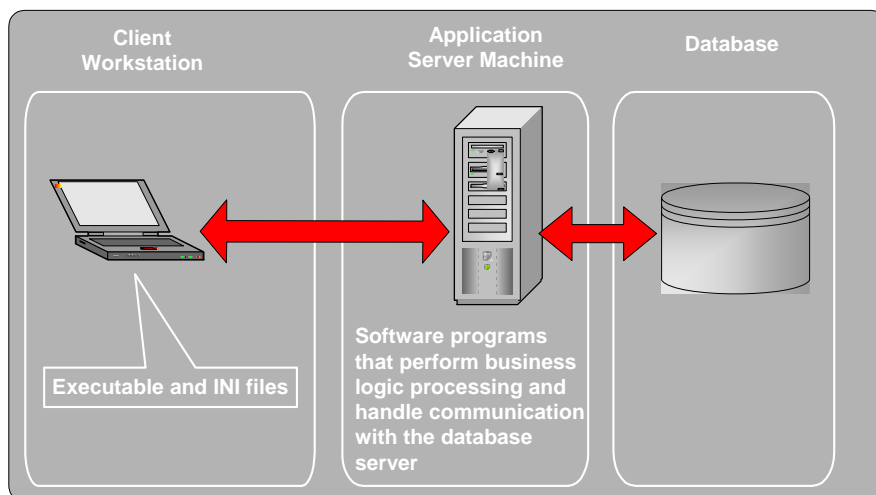


Figure 5: Simple MetaSolv Solution configuration, showing where files are loaded

A Citrix server can be used to increase efficiency between the client workstation and the application server. In this configuration, the client workstation files are loaded to the Citrix server and a browser allows the user to access and use the application files on the Citrix server. The Citrix configuration is a good solution in cases where a wide area network (WAN) is used and users must communicate with the application server and database over great distances.

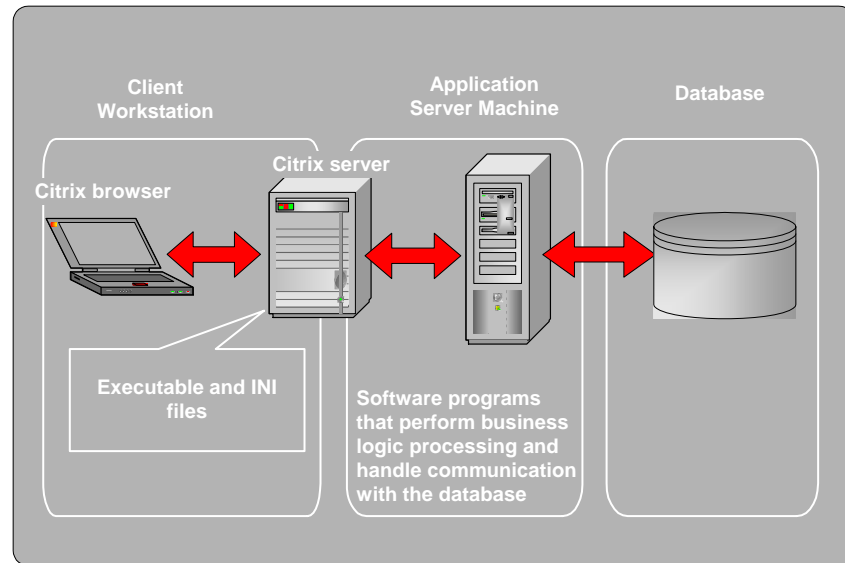


Figure 6: A MetaSolv Solution configuration, showing the Citrix server

Planning for third-party software

MetaSolv Software classifies third-party software in the following ways:

- ◆ *Certified*—MetaSolv Software, Inc. has performed an appropriate testing cycle on the indicated platforms—specific to the third-party software, releases, and configurations indicated—and has confirmed the releases and configurations have no adverse effects on MetaSolv Solution.
- ◆ *Supported*—MetaSolv Software, Inc. has reviewed the available information supplied by the third-party vendors and, based upon the vendor's claims to support specific platforms, configurations, and releases, has agreed to provide support for those platforms, configurations, and releases. If a problem is subsequently found in MetaSolv Solution that is related to the use of a specific platform, configuration, or release supported by the third-party vendor and there are no acceptable workarounds, MetaSolv Software, Inc. will treat the issue within the scope of our typical production support process. However, support for issues related to platforms or configurations that are not certified by MetaSolv may be limited by MetaSolv's available hardware environment and resource expertise.

Table 2 lists third-party software versions that can be used with MetaSolv Solution 6.0.12+ and 6.0.3 and indicates which are certified and supported. Some software is provided by MetaSolv Solution at no cost to the customer, while some is provided at a nominal cost, and some must be purchased by customers from third-party software vendors. See [Chapter 3, “Minimum Technical Requirements”](#) for a complete list and details of technical requirements.

Table 2: Third-party software for MetaSolv Solution 6.0.12 or higher

Certified software versions	Additional supported software versions	Req?
Database server		
Oracle Enterprise Edition 9.2.0.3 Oracle Enterprise Edition 10.2.0.2	Oracle Enterprise Edition 9.2.0+ Oracle Enterprise Edition 10.2.0.2+	Yes
Application server		
Oracle Client 9.2.0.3 (not required starting at release 6.0.5)		Yes
Solaris 10 (on a SPARC machine) HP-UX 11.0 AIX 5.2 or 5.3L (releases 6.0.6 or higher) Windows 2000 Server SP4 Windows 2003 Server (releases 6.0.7 and higher)	Solaris 9 (on a SPARC machine) HP-UX 11i AIX 5.3ML2 (releases 6.0.6 or higher)	Yes
BEA WebLogic Server 8.1 SP3 (releases 6.0.3–6.0.7)* BEA WebLogic Server 8.1 SP5 (releases 6.0.8 or higher)*		Yes
jBroker 4.1 *		Yes
Workstation client		
Internet Explorer 7.0 ***	Internet Explorer 6.0 SP1+	Yes
Windows 2000 Professional SP4 Windows XP Professional SP1a (release 6.0.3) Windows XP Professional SP2 (releases 6.0.4 and higher)		Yes
Adobe Acrobat Reader 8.1.2	Adobe Acrobat Reader 6.0, 7.0.	Yes
Citrix Presentation Server 3.0, 32 bit	Citrix Presentation Server 4.0, 32 bit or Windows 2003 Server with Terminal Services	No
Oracle Enterprise Edition 10.2.0.1	***Oracle Enterprise Edition 10.2.0.1+	No
Business Objects 5.1.5	Business Objects 6.0+	No

* This mark indicates software available through the MetaSolv Software Web site for use with MetaSolv Solution or software installed as part of MetaSolv Solution. The version of BEA WebLogic Server available with MetaSolv Solution is limited to use with MetaSolv Solution. Customers can choose to get this product directly from BEA if more functionality is desired.

**Only required if using Location and Routing Gateway, NPA Split Utility, or MetaSolv Solution Utilities.

***To use IE 7.0, update the registry settings. For more details, refer Setup Guides.

Setting up a test environment

Before you move MetaSolv Solution into production, you should run it in a test environment to ensure you understand how it works and to resolve any issues before you commit the application to your production machines. This document and other MetaSolv Solution documents explain how to set up for a production environment, but you can set up your test environment with some variations. The failover requirements are not as strict for a test environment as they are for production.

For example, you can run MetaSolv Solution 6.0.x and MetaSolv Solution 5.2 on the same test machine. You must keep each application separate and ensure that ports used for http communication, name services, and logging are unique for each instance. The Oracle client (tnsnames.ora) must be configured to connect to the appropriate database for each instance.

On UNIX, use separate users for each instance and set necessary configuration settings for each user. On Windows, you might need to alter some start scripts to ensure the correct paths are set for environment variables such as PATH, CLASSPATH, TNS.ADMIN, and so on.

To achieve optimum application server performance for individual business needs, load and performance testing in a test environment that represents your true production environment is required. The test environment should mimic how you use your production system, including the transaction mix, number of users, hardware and software infrastructures, database, network usage, and all other relevant factors. Setting up a test environment will allow you to determine the optimal application server settings that you should implement in your production environment for:

- ◆ Connection pool sizing
- ◆ Execute thread sizing
- ◆ Java memory management

Environment Planning Considerations

This chapter describes considerations for MetaSolv Solution components and provides tips on how to set up for the most efficient use of the application.

Availability and scalability requirements

Business requirements for availability, scalability, and capacity planning have important impacts on planning. This is especially true for hardware sizing, hardware and software configuration, and software use.

Availability—Refers to a software system’s ability to service users. A system possesses 100 percent availability if it can service a request within a defined period of time for every single user request. In practice, 100 percent availability is difficult to achieve.

Scalability—Refers to the degree to which a system can maintain acceptable response times, availability, and other performance metrics as the load on the system increases. A system is infinitely scalable if the amount of work the system completes per second increases linearly as the amount of computer resources available increases. Infinite scalability allows MetaSolv Solution to serve an ever-increasing population of users simply by increasing the computer resources available to it.

MetaSolv Solution provides high availability using the BEA WebLogic platform. BEA WebLogic offers service continuity in the event of a single server failure within a cluster by allowing you to configure multiple servers as members of a single distributed server set. If one server instance within the cluster fails, then other instances of the same distributed server set provide uninterrupted service.

For information on installing and deploying MetaSolv Solution as a multi-server or server cluster configuration, see the *MetaSolv Solution Setup Guide*. For supplemental information on configuring and using server clusters, see the BEA online documentation at:

<http://www.oracle.com/technetwork/middleware/weblogic/overview/index.html>

With MetaSolv Solution, you can manage a single network inventory using multiple application servers. The optimal number of servers that can be supported in a multiserver configuration depends on a number of interrelated conditions, including the size of the database, power of the database server machine, and number of database connections required. Conditions vary for each deployment. In a multiserver environment, all MetaSolv Solution servers share a single Oracle (logical) database, with each server interacting with the database

concurrently. Oracle's transaction facilities maintain consistency of the data within the inventory as the database receives multiple concurrent updates from different MetaSolv Solution servers.

Hardware sizing guidelines

You must know how many application servers to set up and the hardware needed to support your deployment of MetaSolv Solution 6.0.2. A good guideline for capacity planning is for every two CPUs and every 100 MHz of speed, the system can support nine (9) users. For additional information on hardware and software planning, see [Chapter 3, “Minimum Technical Requirements”](#) in this guide.

The following sections contain MetaSolv Software's recommendations for medium and large hardware configurations, based on 100, 500 and 1000 concurrent users. Note that the N+1 industry practice is used in the configurations.

Follow the *BEA WebLogic Application Server and Cluster Installation and Configuration* guides to set up the deployment environment.

Hardware and software configuration

Read the following sections for information on installing MetaSolv Solution components.

Database considerations

If your current release is earlier than 5.2

You must currently be on the 5.2 release to upgrade to 6.0.2. If you have a release older than 5.2, you must upgrade to 5.2 before you can upgrade to the 6.0.2 database. See the *Upgrade Matrix* published for upgrading to the 5.2 release, located on the Oracle E-Delivery Web site.

Active/passive server configuration

MetaSolv Solution 6.0.x supports only an active/passive database server configuration. In an active/passive configuration, an active cluster node performs processing while a second passive node is held in reserve to take over processing if the first fails. This configuration provides faster failover response than traditional standby methods because the passive node is available immediately to take over processing. For more information on active/passive support, see Oracle documentation at:

<http://www.oracle.com>

Application server considerations

Connection pooling

One of the architecture changes introduced in this release is the use of connection pooling. *Connection pools* are a group of ready-to-use connections between an application server and the database dedicated to an application like MetaSolv Solution. The connection pool creates the specified number of database connections when the application server starts up. By establishing connections at start-up and keeping them ready for an application to use, the connection pool eliminates the overhead of creating a database connection for each client request. Connections are returned to the connection pool when they are freed from use by the application.

Managing connection pools effectively can increase the efficiency of an application, especially if clustered servers are used. Therefore, as part of your environment planning, you should determine the best configuration for managing the connection pools. One factor is the size of the load (the number of concurrent users). A general rule is to provide a connection for each concurrent user you estimate will use the application so no user waits for a connection. Another general rule is that the number of application server connection pools should be 10 to 20 percent of the number of potential users.

For assistance in determining how to size and set up connection pooling, see the BEA WebLogic server documentation at <http://edocs.BEA.com>.

Should you cluster?

Single server architecture is not recommended for MetaSolv Solution. There is no backup strategy if the server fails, and the result could be a loss of data and operational functionality. In addition, the architecture is not scalable. If your business needs increase, it is difficult to add more client workstations and increase the throughput of the system.

A more efficient way to deploy MetaSolv Solution 6.0.x is to cluster application servers. There are four basic ways to cluster application servers:

- ◆ BEA proxy server with clustered servers on a single host

MetaSolv Software does not recommend the single proxy solution.

- ◆ BEA proxy server with clustered servers on multiple hosts
- ◆ External load balancer with clustered servers on a single host

For an external load balancer solution, the question of failover support depends on the vendor solution. A deployment architecture that clusters all servers on one host is not recommended because hardware failure can cause an outage and nullify the benefits of clustering.

- ◆ External load balancer with clustered servers on multiple hosts (recommended)

You can use external load balancers and place some application servers on the same host machine and some on different hosts. The configuration of session replication prevents the drawback of the single host approach.

Figure 7 shows a 4-node cluster with eight servers and failover load balancers..

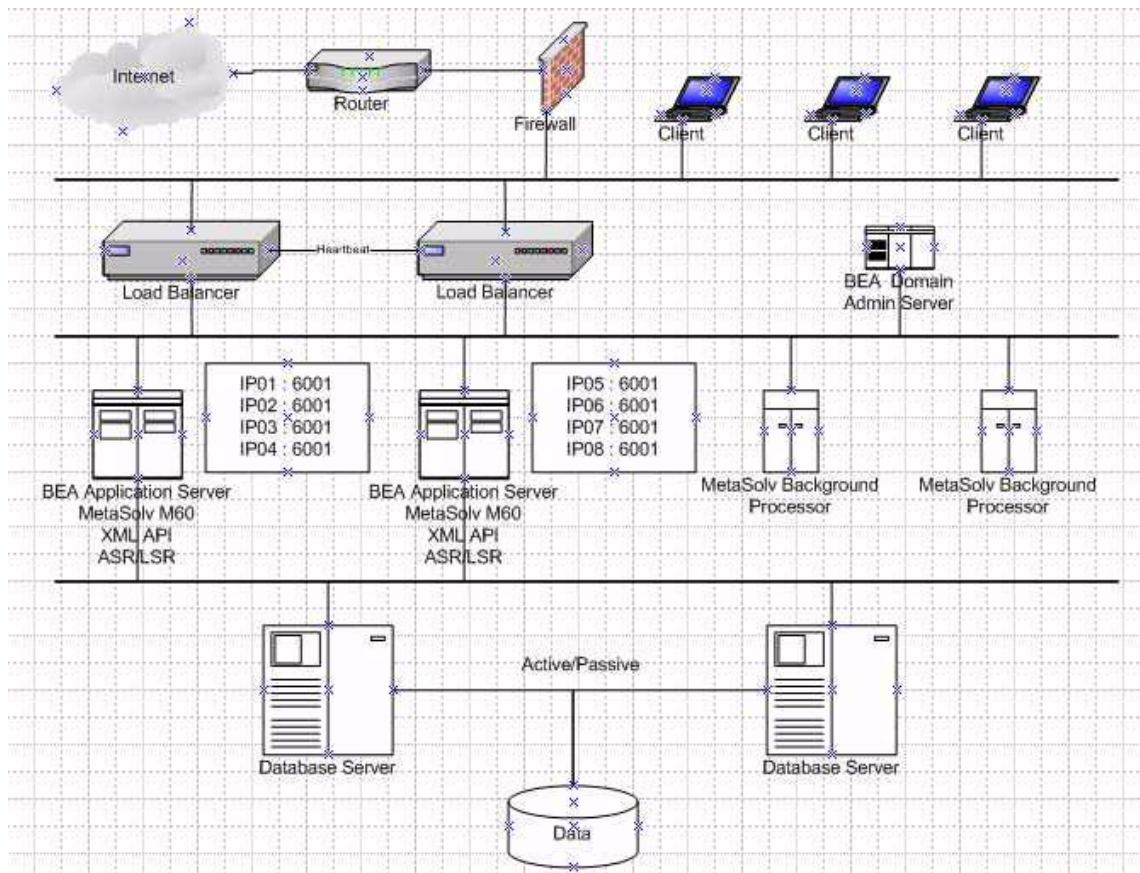


Figure 7: Server cluster with load balancing

Recommendations for load balancing

- ◆ When the number of CPUs on an application server is > 2, some sort of proxy solution is required. MetaSolv recommends an external load balancer in this instance.
- ◆ If you have more than 250 concurrent users, MetaSolv recommends using an external load balancer to ensure system performance and response time.
- ◆ If you do choose a BEA proxy solution, MetaSolv recommends placing the proxy server on a separate machine. You should note that the BEA proxy server in this case becomes a single point of failure.
- ◆ If you do choose a BEA proxy solution, MetaSolv recommends placing the proxy server on a separate machine. You should note that the BEA proxy server in this case becomes a single point of failure.

Client considerations

Client software includes utilities as well as the core client application. The utilities are not required to run the MetaSolv Solution core application on a workstation. Instead, the utilities allow specific tasks to be completed that are in addition to core responsibilities. You can choose to install these applications on a single workstation where they can be easily accessed, or you can allow any user to install them on the same client machine used for the core application.

If you are not using a Citrix server, which handles processing of many users efficiently, you should consider increasing the processing power of hardware dedicated to the client workstation. The technical requirements listed for the MetaSolv Solution rich client provide minimums. For maximum efficiency, consider your company's needs and increase the processing levels of the hardware requirements if necessary.

The following client software can be loaded on a separate machine from the core application:

- ◆ Location and Routing Gateway
- ◆ NPA Split Utility
- ◆ MetaSolv Solution Utilities

If you choose to run these software applications on a machine separate from a core client workstation, you must install the Oracle client on the machine to allow the applications to communicate with the database server.

If your plan includes a background processor

The MetaSolv Solution Background Processor is a separate product that provides functionality similar to a mainframe VMS job queue or a print queue. The Background Processor consists of three applications that can be distributed between a remote server and a system administrator's workstation. The individual applications are:

- ◆ Job Master (JMASTER.EXE)
- ◆ Job Worker (JWKR.EXE)
- ◆ Job Manager (JMANAGER.EXE)

The Background Processor also includes a job queue, which is a table in the MetaSolv Solution database. When users send jobs—such as group assignment—to the background, the jobs go into the job queue database table. Job Master checks the queue periodically. When it finds a job, Job Master initiates a Job Worker and gives it the ID of the job to be processed. Job Manager acts as a window on the job queue that lets you manipulate the queue.

MetaSolv recommends running the background processor on a separate server, but the application can also be run on the client workstation. The number of background tasks handled by the background processor should be considered before you set it up in either configuration. If the Background processor will handle a high volume of tasks, it is more efficient to put it on a separate server. You must load the Oracle client on the machine so that the Background

Processor can communicate with the database server. See [Chapter 3, “Minimum Technical Requirements”](#) for complete information on the background processor’s technical requirements.

If your plan includes a Citrix server

Citrix and Windows 2003 with Terminal Services allow you to install MetaSolv Solution in one place and have all the clients access the software. It’s like having a virtual server. You install the application as you would on a server, but it behaves as if you installed on the client. A Citrix server setup resolves performance issues that you get when you install MetaSolv Solution on a server and have everyone access through a shortcut. Citrix Terminal Services also resolve logistical issues of installing on individual clients.

Microsoft Windows 2003 Server with Terminal Services is an operating system that allows multiple, simultaneous clients access to sessions in a server environment. Each session is a private, protected memory space in which users can run applications.

Citrix is server-based software that extends the reach of Terminal Server by providing:

- ◆ A wider range of clients and protocols
- ◆ Enterprise-scale management tools
- ◆ Integration of local and remote resources with bandwidth independent performance

Configuration

MetaSolv Solution must be in the same domain as the APIs, database, and clients.

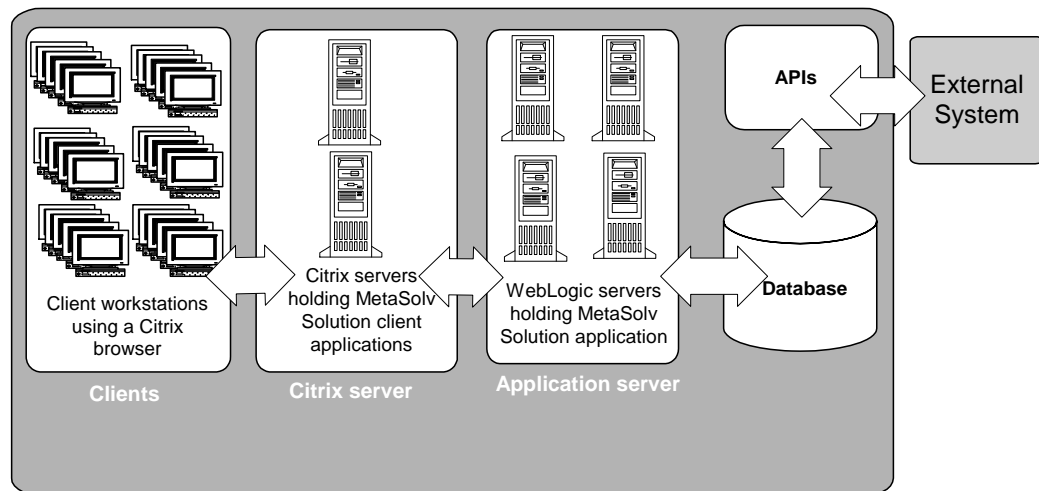


Figure 8: Citrix / MetaSolv Solution configuration

Be sure to use the following Citrix configuration with MetaSolv Solution:

- ◆ The Citrix server version must be Server Presentation 3.0.
- ◆ Setup a default printer. For printer driver compatibility, contact your Citrix customer service representative.
- ◆ Setup the WTSUPRN file so any printer the clients can use maps to the HP LaserJet 3 driver.
- ◆ If using gateways, modify the MetaSolv Solution registry entry under APICLIENT so the %SYSTEMROOT% in the path name gets hard coded to the correct drive letter and path.
- ◆ There are references to "C:\temp" made during the installation and placed in the registry. Although this process works most of the time, it could be an issue in some installations. Contact MetaSolv Software Consulting for more information.

Security

Use the Citrix application execution shell (App) to write execution scripts that:

- ◆ Copy standardized INI files containing default settings to user directories before starting an application. Perform application-related cleanup after the application closes.
- ◆ Keep hackers from modifying execution parameters (for example, working directory or execution directory).

For more information on Citrix security and the App shell, see the Citrix product documentation.

Performance and Tuning

The following information refers to Citrix MetaFrame Version 1.8. The performance and tuning information is subject to change with new Citrix MetaFrame patches and releases.

- ◆ Allow no more than 50 users per box.
- ◆ Allow between 3 and 5 MetaSolv power users (3 power users = 30 regular users; 5 power users = 50 regular users).
- ◆ An example of a box running MetaSolv Solution is a P3 Zeon® with 1.25 GB of RAM at 500 MHz.
- ◆ Put all the servers on one sub net and hard code the server names into Citrix. Do not use the Citrix browser because it has difficulty browsing across networks.
- ◆ Require all users to have mandatory profiles that are hardcoded and unchangeable.

User authentication

Before this release, users were authenticated by the database server at logon. The database server is still the default for user authentication, but now you can choose to have the application server take over this task if you want. See the MetaSolv Solution Setup Guide for more information.

Data migration

Changes in MetaSolv Solution make the migration of data to new tables in the 6.0.2 database a possibility for some customers. See the following list for details on when migration is required or optional.

- ◆ Network element migration —This migration is optional because you can use MetaSolv Solution 6.0.x without migrating network element data. However, if you complete this migration, you receive enhanced functionality such as the ability to group multiple pieces of equipment into one logical representation.
- ◆ Broadband migration—This migration is required for customers who are currently using the Broadband Network Design module to design and provision ATM/Frame Relay and DSL. If you are not currently using the Broadband module (either because you have never used it or you have already completed the migration), you do not need to do this migration. This migration takes the networks designed using the Broadband module and makes them available on the network design canvas so you can use the template-based functionality.

If you are moving to 6.0.x from a pre-6.0 release, it may be necessary for you to perform a data migration. The Broadband module available before 6.0 has been discontinued, and customers who use the Broadband module must migrate data to use MetaSolv's Network Templates, which replaces the Broadband functionality. Two tools are available to assist with the migration effort:

- ◆ Pre-Migration Analysis Tool (PMAT)—This tool can be run against your pre-6.0 database to determine the number of circuits that must be converted. This tool is located on the Oracle E-Delivery Web site.
- ◆ Next-Generation Migration Tool—This tool automates the process of migrating network elements, a required step for migrating circuits, and the broadband circuit conversion. This tool is part of MetaSolv Solution Utilities.

The *MetaSolv Solution 6.0 Migration Guide* can be found on the Oracle E-Delivery Web site.

Planning tips

- ◆ Your production application server and database server should be two different physical servers for the following reasons:
 - Two systems on the same machine can lead to performance issues and prevent both from operating at their optimum capacity.
 - If hardware issues are encountered, you must rebuild both the database and the application server before production activity is restored.
 - It is difficult to diagnose performance and network problems when both are on the same machine.
- ◆ All client traffic, with the exception of client utilities, is now routed through the application server. Therefore, to ensure continuous availability, MetaSolv strongly recommends an environment that has a minimum of two production application servers.

This configuration enables you to implement failover and load balancing functionality. See the “[Hardware sizing guidelines](#)” on page 14 for additional details based on users and transactions.

- ◆ For nonproduction environments like training, testing, or development, it is possible to place multiple application servers on one physical server. This will reduce the overall cost of maintaining the MetaSolv Solution environment.
- ◆ Consider the application server environment in your normal production maintenance plan. It should be customized, tuned, backed up, and monitored on a regular basis to ensure optimal performance. Make plans to archive logs and re-evaluate your configuration on an ongoing basis. If you leave the system running without oversight and maintenance, you won’t get the best performance the system is capable of giving.
- ◆ The MetaSolv Solution client contains some functionality that is subject to network delays when run across a WAN. Where possible, end users should be located near the database and application servers.
- ◆ MetaSolv systems can operate over a LAN or WAN network. The software initiates a significant amount of network traffic between the database server, the application server, and the Oracle client. In a LAN configuration, 100 MB delivers the best performance. If a WAN implementation is necessary, consider using a Citrix Terminal Server solution to reduce the amount of data being transmitted to and from the client.
- ◆ To reduce latency in a WAN environment, deploy the database server, application server, and Citrix Terminal Server on the same LAN segment. This arrangement is necessary in a WAN configuration.
- ◆ Separate the Oracle database files from the operating system files. Place Oracle program files and Oracle archive log files on different disks.
- ◆ Do not allocate so much memory to Oracle and other applications that the operating system has to perform memory/disk swapping or paging. A good rule is to not allocate over half the amount of the machine’s available physical memory.
- ◆ Limit the database server to database-only use. If the operating system is being taxed by other resources, Oracle runs slowly no matter how well tuned your instance is.
- ◆ For production, run only one instance of Oracle per machine. The more instances running on a machine, the harder it is to tune the instance with system resources.

Minimum Technical Requirements

The technical requirements listed in this section refers only to *certified* software that MetaSolv has tested against MetaSolv Solution and its components. For information on software or a software version that may be supported but not certified by MetaSolv, see [Table 2](#) on page 11.

This chapter provides the minimum MetaSolv Solution hardware and software requirements. Due to the change from a two-tier to a multi-tier architecture, MetaSolv has recommendations for performance. See “[Appendix A: Deployment Configuration Examples](#)” on page 37 or information on deploying to small, medium, and large environments for the application server and the database server.

Because each business differs in factors like size, use of the application, and performance desired, each installation of MetaSolv Solution has different hardware and software requirements. For each piece of hardware listed in the requirements, the estimated number of users the hardware can support is listed.

Before you make hardware decisions, consult with MetaSolv’s Professional Services Organization to ensure you have the right equipment and software to achieve the system performance required for your business needs.

For a complete list of third-party software used with MetaSolv Solution, including which software releases are supported or certified, see “[Planning for third-party software](#)” on page 10.

MetaSolv Solution installation components

The following table identifies the software components of the MetaSolv Solution environment. The table specifies which components are required and which are optional.

Table 3: MetaSolv Solution components

Component	Required or Optional	Dependency
Database Server	Required	
Application Server	Required	

Table 3: MetaSolv Solution components

Component	Required or Optional	Dependency
MetaSolv Solution Rich Client	Optional	
Background Processor	Optional	
Citrix	Optional	
Location and Routing Gateway	Optional	
NPA Split Utility	Optional	
MetaSolv Solution Utilities	Required	

Recommended actions for best performance

Every MetaSolv Solution environment is different. The environment is affected by the product functionality being used, mix of transactions, API usage, hardware capacity, network speed and capacity, how the servers are tuned, and so on. For best results using each software component, MetaSolv recommends that you take the following actions:

- ◆ Stay abreast of de-support notices on products referenced in this section to ensure your software environment is fully supported.
- ◆ To upgrade outside the supported versions, contact MetaSolv Global Customer Care to determine available options. Recommendations may include migrating to a newer version of MetaSolv Solution.

Database server

The database server can be a Windows- or UNIX-based machine with the ability to support Oracle. The only MetaSolv Solution application code that runs on this server are stored procedures contained in the database. The following list provides more information on the MetaSolv Solution database server.

Storage: A high performance, fault tolerant disk subsystem should be used.

Fault tolerance: Fault tolerance is important when provisioning the database server. If this server fails, the MetaSolv Solution software cannot function. There are several commercial clustering solutions available for Oracle servers. MetaSolv suggests customers work with Oracle and their hardware vendor to implement a clustering solution.

Scalability: Scalability is achieved through the use of a server with multiple and/or faster processors.

Software requirements:

Operating system: Solaris 9 or 10 (on a SPARC machine), Windows 2000 SP4

Database: Oracle Enterprise Edition 9.2.0.3 or 10.2.0.2

Sizing for existing customers: For sizing information that includes examples for small, medium, and large deployments, see [“Appendix A: Deployment Configuration Examples”](#).

Additional information:

- ◆ Because disk sizing is approximate, adjust sizing based on your data requirements.
- ◆ MetaSolv Solution is certified to work with Oracle's Dictionary Managed Storage.
- ◆ Required tablespaces are DATA and INDEXES, which can be either Dictionary or Locally Managed. These are required as default tablespaces for creating new objects.
- ◆ This release of MetaSolv Solution is certified to work with the version of Oracle Enterprise Edition listed. Customers should work with Oracle to determine the recommended patch level for the intended platform/version combination. The following initialization parameters are required for databases running Oracle 9.2.0 or 10.2.0.2. Note that the OPTIMIZER_FEATURES_ENABLE parameter is set to 9.2.0 for both Oracle 9.2.0 and for Oracle 10.2.0.2.

```
_b_tree_bitmap_plans = false  
07_DICTIONARY_ACCESSIBILITY=TRUE  
OPTIMIZER_FEATURES_ENABLE=9.2.0  
optimizer_mode=CHOOSE
```

Application server

Description: The MetaSolv application server supports the MetaSolv Solution application code running in the middle tier. Clients connect to the application server using HTTP or IIOP (both over TCP/IP), and the server connects to the database server using JDBC connection pools. The MetaSolv Solution APIs also run on the server and make direct JDBC connections to the database. The application server is compliant with OMG CORBA 2.4 and J2EE 1.3 specifications.

Fault Tolerance: Fault tolerance is provided by clustering multiple application servers together. Because the application server is a critical component, MetaSolv recommends multiple application servers be implemented in a clustered configuration in a production environment. BEA WebLogic software provides clustering mechanisms, although other load balancing/high availability solutions may be used. MetaSolv recommends the application server(s) and database server(s) run on separate machines in a production environment.

Scalability: Scalability is achieved by running multiple application server processes or using more powerful servers. Performance levels in the application server tier is heavily dependent on tuning the environment and configuring to optimize communication between the database, application server, and client. The sizing numbers shown in this section provide a general guideline for determining hardware requirements. Customers should follow installation and configuration guidelines available from the application server vendor.

Software: The following tables show the component software required by each platform that MetaSolv Solution supports for release 6.0.12 or higher.

Table 4: Component software for MetaSolv Solution 6.0.12 or higher by platform

		Platform			
Component software		Microsoft	Sun	HP	AIX
	Operating system	Windows 2000 Server SP4	Solaris 9 (on a SPARC machine)	HP-UX 11.0 (on a PA-RISC machine)	AIX 5.2 and 5.3L (on a POWER5 machine)
		Windows 2003 (releases 6.0.7 or higher)	Solaris 10 (on a SPARC machine)	HP-UX 11.23 (on an Itanium machine. 64 bit and 64 bit JAVA supported)	AIX 5.3ML2 (on a POWER5 machine)
	Application server	BEA WebLogic Server 8.1 SP5 (releases 6.0.8 and higher)	BEA WebLogic Server 8.1 SP5 (releases 6.0.8 and higher)	BEA WebLogic Server 8.1 SP5 (releases 6.0.8 and higher)	BEA WebLogic Server 8.1 SP5 (releases 6.0.8 and higher)
				ASR and LSR not supported on Itanium.	ASR and LSR not supported on AIX.
	ORB	JBroker 4.1	JBroker 4.1	JBroker 4.1 JBroker not supported on Itanium	JBroker not supported
	Network	HTTP and IIOP over TCP/IP	HTTP and IIOP over TCP/IP	HTTP and IIOP over TCP/IP	HTTP and IIOP over TCP/IP

Sizing: The following table shows machine specifications for all platforms measured by the number of concurrent users. Based on a mixed scenario benchmark, throughput data was provided.

Table 5: Machine size by number of users

Size and usage requirement	Nonclustered nonredundant environment	
Number of concurrent users	40	
Number of orders per day	1,500	
Circuit assignment	180	
Number of trouble tickets	1,000	
Reliability/availability	98%	
Machine	CPU	Memory
Application server (MetaSolv Solution only)	2 x 1 GHz	2 GB
Application server (MetaSolv Solution with XML API option)	4 x 1 GHz	4 GB

Additional information:

- ◆ This release of MetaSolv Solution is certified to run with BEA WebLogic Server as specified in the previous software table.
- ◆ Sizing of the application server should be based on the expected maximum number of requests, or concurrent transactions, sent to the application server at the same time. This number is considerably less than the number of clients using the application server, typically 15-20 percent of the total number of users logged on to the system. For more specific sizing and configuration guidelines, see the *MetaSolv Solution Setup Guide*.
- ◆ More servers may be employed in a software- or hardware-based cluster. This approach provides more redundancy and reduced impact if a server in the cluster fails. However, the dispatcher functionality should be run on multiple servers to ensure redundancy.
- ◆ MetaSolv does not support running the application server on Citrix.
- ◆ If you plan to use an external load balancing mechanism, it must support sticky sessions, and it cannot modify WebLogic cookies. In addition, the network configuration needs to support requests from the application server to the load balancer.
- ◆ The application server must be able to obtain graphics settings from the host to provide printing and graphics functionality in the application. MetaSolv does not endorse or certify functionality of the third-party packages. For UNIX host machines running in a

headless configuration (without a console monitor), one of the following options must be implemented:

- ♦ Enable xhost to allow remote connections to the console (execute "xhost" as root user).
- ♦ Install a graphics card in the host machine.
- ♦ Install and configure PJA library. For additional information, see:
<http://www.eteks.com>
- ♦ Install and configure XVFB, 'X Virtual Frame Buffer.' For additional information, see:
<http://www.xfree86.org>
- ♦ MetaSolv favors the use of UNIX platforms due to the ease of implementation and administration of the system.

MetaSolv Solution rich client

Description: This client has the client-side code loaded on the machine. Some portions of the rich client functionality are executed by the MetaSolv application server. This is referred to as *thin client* functionality, and it requires the Internet Explorer to be loaded on the client. Different components of the application make differing demands on the client. This should be taken into account when determining the hardware requirements for the MetaSolv Solution rich clients. The different types of rich clients include:

- ◆ *End user with PERT chart and PVC:* These components use graphics to display PERT charts and permanent virtual circuits. A larger monitor with higher resolution and color depth is recommended.
- ◆ *End user:* A basic end user not using any of the components listed. A less powerful machine is required for this usage.

Storage: Disk requirements are minimal. No persistent user data is stored.

Fault Tolerance: No special requirements are needed. Should any client fail, a user may resume work on any client machine.

Scalability: A faster processor in the client machine will improve performance. Increased memory often has a significant improvement on desktop performance, especially if multiple applications are used simultaneously. Additional clients may be added as needed, and the servers may need to be scaled to handle the additional load, as noted in each of the server descriptions. Specific sizing recommendations are shown below.

Software:

Operating System: Windows 2000 Professional SP4
or Windows XP Professional SP1a for version 6.0.3
or Windows XP Professional SP2 for version 6.0.4 or higher

Network: HTTP/HTTPS

Database client: N/A

Browser: Internet Explorer 7.0

Reader: Adobe Acrobat Reader 8.1.2

Sizing (client machine):

CPU: 900 MHz Pentium III (minimum)
2.6 GHz Pentium III (recommended for Inventory Management users)

Memory: 512 MB

Monitor: 17 inches

Colors: True color (24 bit)

Resolution: 1024 x 768

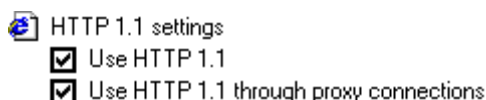
Disk: 0.5 GB

Additional information:

- ◆ MetaSolv supports Windows XP Professional or Windows 2000 Professional operating systems on the client. Earlier versions of Windows are not supported due to insufficient system resources to run MetaSolv Solution.
- ◆ Although Windows 2000 is supported on the client, there is a known issue when using a Windows 2000 print server. The MetaSolv Solution software provides the option to print multiple page documents as a single job or with each page as a separate job. There is no visible difference, but if printing to a fax device, the single job option is more efficient. However, the single job option causes the paper orientation to be ignored.
- ◆ CPU and memory requirements assume other applications will be running on the client machine. Client hardware configuration will impact general performance of MetaSolv Solution client applications. If the client hardware has only the minimum configuration, processes may take significantly longer to run than they would on a machine with the higher recommended configuration. For example:
 - ◆ A large search for connections can take 30 seconds longer.
 - ◆ Creating connections can take 5 to 10 seconds longer.
 - ◆ The AutoBuild SONET function can take twice as long.

Customers need to determine optimal requirements based on how MetaSolv Solution is used in their business.

- ◆ Only the Small Fonts setting for Font Size in the Display Properties is supported.
- ◆ The Text Size setting in the browser must be set to Medium.
- ◆ The following settings need to be enabled on the Advanced tab of Internet Options.



Background Processor

Description: The Background Processor performs tasks in the background while MetaSolv Solution is working. It accepts requests to perform tasks that users do not want to wait on. Users place tasks in a queue, which is held in a database table. The Background Processor monitors this table and pulls requests from it. Results are available to users through another table. There is no direct communication between the users and the Background Processor. The Background Processor runs the same code as the end user clients, but it does not have an interactive user interface.

Storage: Disk requirements are minimal. No persistent user data is stored.

Fault Tolerance: Fault tolerance is achieved through the use of multiple machines. Each machine can process the same work queue, and in the case of a failure, the surviving machine continues processing the work queue.

Scalability: Scalability is achieved through the use of multiple machines (horizontal scaling) or the use of more powerful servers.

Software:

Operating system: Windows 2000 Server SP4, Windows 2000 Professional SP4, or Windows XP Professional SP1a

Database: N/A

Network: HTTP/HTTPS

Sizing:

Table 6: Background Processor sizing requirements

Number of concurrent background jobs	CPU	Memory	Disk
0-10	900 MHz Pentium III (minimum) 2.6 GHz Pentium III (recommended for Inventory Management users)	512 MB	0.5 GB

Additional information:

- ◆ Hardware sizing is not directly affected by the number of users. User behavior affects the load placed upon these servers and subsequent hardware requirements.

Citrix

Description: Citrix executes the MetaSolv Solution client software for the end user, transmits screen updates to a thin client, and receives mouse and keyboard data from the thin client. Use of Citrix is recommended for any customer with end users running across a WAN. Citrix minimizes the response time delays caused by network latency. Other benefits include ease of software distribution, reduction of WAN bandwidth requirements, and reduced client specifications.

Storage: Disk requirements are minimal. No persistent user data is stored.

Fault Tolerance: Fault tolerance is achieved through the use of multiple machines in a farm. Citrix provides the capability to direct client requests to one of many servers in a farm.

Scalability: Scalability is achieved through the use of multiple machines (horizontal scaling), or the use of more powerful servers. Generally, better results are obtained by limiting the server size to two CPUs.

Software:

OS: Citrix Presentation Server 3.0

Database: N/A

Network: CA/RDP over TCP/IP

Colors: The color setting depends on the operating system you use.

Note: For Windows 2003 with Terminal Services, use 16-bit color. The 24-bit color selection does not work with Windows 2003. MetaSolv Solution is not certified for use with Windows 2003 with Terminal Services, but it does support the use of this product.

Sizing: For information on sizing a Citrix configuration, see the Citrix documentation or contact Citrix Systems, Inc.

Additional information:

- ◆ This release of MetaSolv Solution is certified to work with the versions of Oracle specified for the Database Server. Customers should work with Oracle to determine Oracle's recommended patch level for their platform and version combination.
- ◆ This software runs on Windows platforms only. Other platforms are not supported.
- ◆ Citrix is optional.

Location and Routing Gateway client

Description: This is one of three optional peripheral applications that require client machines to execute special activities.

Software:

Operating system: Windows 2000 Professional SP4 or Windows XP Professional SP1a

Network: Oracle 9.2.0.3 client or Oracle 10.2.0.1 client

Browser: Internet Explorer 7.0

Sizing (client machine):

CPU: Pentium III

Memory: 512 MB

Monitor: 17 to 21 inches

Colors: 256

Resolution: 1024 x 768

Disk: 0.5 GB

NPA Split Utility client

Description: This is one of three optional peripheral applications that require client machines to execute special activities.

Software:

Operating system: Windows 2000 Professional SP4 or Windows XP Professional SP1a

Network: Oracle 9.2.0.3 client or Oracle 10.2.0.1 client

Browser: Internet Explorer 7.0

Sizing (client machine):

CPU: Pentium III

Memory: 512 MB

Monitor: 17 to 21 inches

Colors: 256

Resolution: 1024 x 768

Disk: 0.5 GB

MetaSolv Solution Utilities client

Description: This is one of three optional peripheral applications that require client PCs to execute special activities. The MetaSolv Solution Utilities client allows you to do various maintenance and setup activities for MetaSolv Solution.

Software:

Operating system: Windows 2000 Professional SP4 or Windows XP Professional SP1a

Network: Oracle 9.2.0.3 client or Oracle 10.2.0.1 client

Browser: Internet Explorer 7.0

Sizing (client machine):

CPU: Pentium III

Memory: 512 MB

Monitor: 17 to 21 inches

Colors: 256

Resolution: 1024 x 768

Disk: 0.5 GB

A

Appendix A: Deployment Configuration Examples

This appendix contains examples of three deployment configurations:

- ◆ Small (100 users)
- ◆ Medium (300 to 400 users)
- ◆ Large (1000 users)

The hardware proposed for each deployment size is based on the equation for calculating capacity presented in “[Hardware sizing guidelines](#)” on page 14.

The examples presented here are based on the number of concurrent users, which is only one criteria used to determine hardware sizing. The examples are general and are intended as a learning tool. Estimates on equipment and configuration settings cannot be exact because needs vary between MetaSolv Solution installations based on issues such as the number of users, the volume of transactions, whether the application is being used on a WAN, and so on. To ensure that you have planned for the appropriate equipment and software, MetaSolv recommends that you contact its Professional Services Organization before you proceed with an installation.

When assessing your business situation to estimate hardware needs, you should consider a combination of factors such as API transactions and the type and number of transactions being processed, then adjust accordingly.

Small deployment example (100 users)

Deployment description

The following table shows the size assumptions made for this deployment example.

Table 7: Size assumptions for a small deployment

Size and usage requirement	Nonclustered nonredundant environment	Clustered redundant environment
Number of concurrent users	100	100
Number of orders per day	8,000	8,000
Circuit assignment	700	700
Number of trouble tickets	4,000	4,000
Reliability/availability	98%	99.5%

Hardware configuration

Table 8: Example small deployment hardware configuration

Machine	Nonclustered nonredundant environment	Clustered redundant environment
Client machine (one per user)	PC-based machine (2.6+ GHz; 512 MB+ RAM)	PC-based machine (2.6+ GHz; 512 MB+ RAM)
Administration server machine	N/A	You can use the Weblogic application server machine (below) to handle the administration server as well. No additional hardware is needed.
WebLogic application server machine	1 Sun M3000 ♦ 1 Dual CORE Processor @ 2.75 GHz ♦ 8 GB RAM, 2 X 146 GB Disk	2 Sun M3000 ♦ 1 Dual CORE Processor @ 2.75 GHz ♦ 8 GB RAM, 2 X 146 GB Disk

Table 8: Example small deployment hardware configuration

Machine	Nonclustered nonredundant environment	Clustered redundant environment
External load balancers	N/A	***2 load balancers Customer's choice Example: F5 BIG-IP LTM 3600
Database server (Oracle) machine	1 Sun M3000 ◆ 1 Quad CORE Processor @ 2.75 GHz ◆ 8 GB RAM, 2 X 146 GB Disk -- or -- 1 Sun T5120 ◆ 1 Quad CORE Processor @ 1.2 GHz (32 threads) ◆ 8 GB RAM, 2 X 146 GB Disk	2 Sun M3000 (Active/Passive) ◆ 1 Quad CORE Processor @ 2.75 GHz ◆ 8 GB RAM, 2 X 146 GB Disk -- or -- 2 Sun T5120 ◆ 1 Quad CORE Processor @ 1.2 GHz (32 threads) ◆ 8 GB RAM, 2 X 146 GB Disk
Background Processor machine	1 PC-based machine ◆ 2 CPUs @ 2.8+ GHz ◆ 2 GB RAM	2 PC-based machines ◆ 2 CPUs @ 2.8+ GHz ◆ 2 GB RAM

*Clustering with nonredundancy doesn't apply here. BEA recommends one BEA application server per 2 CPUs.

**Only one BEA Application Server will reside on each machine.

***Access BEA requirements for hardware load balancer. See:

http://download.oracle.com/docs/cd/E13222_01/wls/docs81/cluster/load_balancing.html#1026240Change

For a configuration example using BIG-IP LTM as hardware load balancer, see:

<http://www.f5.com/pdf/deployment-guides/f5-weblogic10-dg.pdf>

Medium deployment example (300 to 400 users)

Deployment description

Table 9: Size assumptions for a medium deployment

Size and usage requirement	Clustered nonredundant environment	Clustered redundant environment
Number of concurrent users	300-400	300-400
Number of orders per day	30,000	30,000
Circuit assignment	3,000	3,000
Number of trouble tickets	16,000	16,000
Reliability/availability	99.5%	99.9%

Hardware configuration

Table 10: Example medium deployment hardware configuration

Machine	Clustered nonredundant environment	Clustered redundant environment
Client machine (one per user)	PC-based machine (2.6+ GHz; 512 MB+ RAM)	PC-based machine (2.6+ GHz; 512 MB+ RAM)
Administration server machine	N/A	You can use the Weblogic application server machine (below) to handle the administration server as well. No additional hardware is needed.
WebLogic application server machine	1 Sun M3000 <ul style="list-style-type: none"> ◆ 1 Quad CORE Processor @ 2.75 GHz ◆ 16 GB RAM, 2 X 146 GB Disk 	2 Sun M3000 <ul style="list-style-type: none"> ◆ 1 Quad CORE Processor @ 2.75 GHz ◆ 16 GB RAM, 2 X 146 GB Disk

Machine	Clustered nonredundant environment	Clustered redundant environment
External load balancers	*** 1 load balancer Customer's choice Example: F5 BIG-IP LTM 3600	***2 load balancers Customer's choice Example: F5 BIG-IP LTM 3600
Database server (Oracle) machine	1 Sun M3000 <ul style="list-style-type: none"> ◆ 1 Quad CORE Processor @ 2.75 GHz ◆ 32 GB RAM, 2 X 146 GB Disk -- or -- 1 Sun T5120 <ul style="list-style-type: none"> ◆ 1 8 CORE Processor @ 1.4 GHz (64 threads) ◆ 32 GB RAM, 2 X 146 GB Disk 	2 Sun M3000 (Active/Passive) <ul style="list-style-type: none"> ◆ 1 Quad CORE Processor @ 2.75 GHz ◆ 32 GB RAM, 2 X 146 GB Disk -- or -- 2 Sun T5120 <ul style="list-style-type: none"> ◆ 1 8 CORE Processor @ 1.4 GHz (64 threads) ◆ 32 GB RAM, 2 X 146 GB Disk
Background Processor machine	1 PC-based machine <ul style="list-style-type: none"> ◆ 2 CPUs @ 2.8+ GHz ◆ 2 GB RAM 	2 PC-based machines <ul style="list-style-type: none"> ◆ 2 CPUs @ 2.8+ GHz ◆ 2 GB RAM

*For better performance and reliability, a clustered environment is recommended for medium-sized customers.

**The recommendation is for four BEA application server processes to run on each machine.

***Access BEA requirements for hardware load balancer. See:

http://download.oracle.com/docs/cd/E13222_01/wls/docs81/cluster/load_balancing.html#1026240Change

For a configuration example using BIG-IP LTM as hardware load balancer, see:

<http://www.f5.com/pdf/deployment-guides/f5-weblogic10-dg.pdf>

Large deployment example (1,000 users)

Deployment description

Table 11: Size assumptions for a large deployment

Size and usage requirement	Clustered nonredundant environment	Clustered redundant environment
Number of concurrent users	1,000	1,000
Number of orders per day	100,000	100,000
Circuit assignment	7,200	7,200
Number of trouble tickets	42,000	42,000
Reliability/availability	99.5%	99.9%

Hardware recommendations

Table 12: Example large deployment hardware configuration

Machine	Clustered nonredundant environment	Clustered redundant environment
Client machine (one per user)	PC-based machine (2.6+ GHz; 512 MB+ RAM)	PC-based machine (2.6+ GHz; 512 MB+ RAM)
Administration server machine	N/A	You can use the Weblogic application server machine (below) to handle the administration server as well. No additional hardware is needed.
WebLogic application server machine	1 Sun M4000 <ul style="list-style-type: none"> ◆ 4 Quad CORE Processor @ 2.53 GHz ◆ 64 GB RAM, 2 X 146 GB Disk 	2 Sun M4000 <ul style="list-style-type: none"> ◆ 4 Quad CORE Processor @ 2.53 GHz ◆ 64 GB RAM, 2 X 146 GB Disk

Machine	Clustered nonredundant environment	Clustered redundant environment
External load balancers	***1 load balancer Customer's choice Example: F5 BIG-IP LTM 3600	***2 load balancers Customer's choice Example: F5 BIG-IP LTM 3600
Database server (Oracle) machine	1 Sun M4000 <ul style="list-style-type: none"> ◆ 4 Quad CORE Processor @ 2.75 GHz ◆ 64 GB RAM, 2 X 146 GB Disk -- or -- 1 Sun T5120 <ul style="list-style-type: none"> ◆ 2 8 CORE Processor @ 1.4 GHz (128 threads) ◆ 64 GB RAM, 2 X 146 GB Disk 	2 Sun M4000 (Active/Passive) <ul style="list-style-type: none"> ◆ 4 Quad CORE Processor @ 2.75 GHz ◆ 64 GB RAM, 2 X 146 GB Disk -- or -- 2 Sun T5120 <ul style="list-style-type: none"> ◆ 2 8 CORE Processor @ 1.4 GHz (128 threads) ◆ 64 GB RAM, 2 X 146 GB Disk
Background Processor machine	1 PC-based machines <ul style="list-style-type: none"> ◆ 2 CPUs @ 2.8+ GHz ◆ 2 GB RAM 	2 PC-based machines <ul style="list-style-type: none"> ◆ 2 CPUs @ 2.8+ GHz ◆ 2 GB RAM

*For better performance and reliability, a clustered environment is recommended for large-sized customers.

**The recommendation is for eight BEA application server processes to run on each machine.

***Access BEA requirements for hardware load balancer. See:

http://download.oracle.com/docs/cd/E13222_01/wls/docs81/cluster/load_balancing.html#1026240Change

For a configuration example using BIG-IP LTM as hardware load balancer, see:

<http://www.f5.com/pdf/deployment-guides/f5-weblogic10-dg.pdf>

B

Appendix B: Environment Planning Worksheet

This appendix contains worksheets to use in your environment planning.

Environment Profiles

Use the following table to write down your hardware and software specifications, e.g. disk size, type, processor speed, and OS type/version.

Environment and Purpose	AppServer(s)	DB Server(s)	Background Processor	Citrix Server	Max Concurrent Users
Current Environment					
Test					
Production					
Production					
Anticipated M6 Environment					
Test					
Development					
Production					

The M6 application server is BEA WebLogic Server instead of Novell eXtend Server. Because we provided eXtend in the past, we are making WLS available to you at no additional charge. This license enables you to use WLS with Oracle products (test, production, etc.), however, it does not extend to development use. As an alternative, you get the WLS license directly from BEA or use an existing appropriate enterprise or other license obtained from another source. The use of a license from an alternative source is provided directly through that license.

Where do you intend to obtain your BEA WLS license from? (Oracle or another source?)

Functional Areas

Rank the following areas of the application, with 10 being most heavily used and 0 being not used at all. If there is a specific function not listed that is particularly high use or important to your process, add it to the list.

Functional Area	Level of Use (0-10)
PSR	
ASR	
ISR	
LSR	
USO	
ASR to PSR Mapping	
LSR to PSR Mapping	
Product Catalog	
Customer Management	
Trouble Management	
Work Management	
PERT Chart	
Rules and Behaviors	
Equipment Specificaitons	
Equipment Installation	
Maps	
Auto Design	
Path Analysis	
IP Address Management	
TN Administration	
Group Assign	

Functional Area	Level of Use (0-10)
Reconciliation	
Engineering Work Order (EWO)	
LERG	
NPA/NXX Split Utility	
Background Processor	
Custom Attributes	
APIs (list which ones)	
Diversity Module	
SONET Module	
SONET AutoBuild	
Broadband Design Module (non-template ATM/FR and DSL)	
DLS Module (non-template)	
VPN Module (non-template)	
Network Design Canvas (general templates and graphical design)	
ATM/FR Technology Module (template based)	
DLC Technology Module (template based)	
DSL Technology Module (template based)	
Ethernet Technology Module (template based)	
Fiber Based Broadband Delivery Module (template based)	
IP Technology Module (template based)	

Functional Area	Level of Use (0-10)
MPLS Technology Module (template based)	
Optical/TDM Technology Module (template based)	