Infor Ming.le - LN UI Plugin 11.1

Sizing Guide

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Contents

About this guide

This document provides performance guidelines, deployment and sizing information to implement Infor Ming.le™ with the Infor LN UI plugin. The information provided in this document is based on Infor LN UI 11.1.

This sizing guide is targeted for Windows deployments using the Tomcat web server.

Intended audience

This sizing guide is intended for Infor consultants, partners and customers who are responsible for implementing Infor LN UI. This document contains information that can help system administrators to optimize the performance of their Infor LN UI environment.

Related documentation

Please refer to these documents for more information:

Document Title	Document number
Infor LN UI Administration Guide	U9790B US
Infor LN UI Difference Study	P3669B US
Infor Ming.le-LN Plug-in User Guide (LN UI)	U9791B US

Abbreviations and terminology

This table shows the abbreviations and terminology that are used in this document:

Abbreviation	Description
Named or licensed user	A user who can potentially log on to the Infor application
Connected or logged-on user	A user who is logged on to the Infor application
Active or concurrent user	A connected user who is actively using the Infor application
2-Tier Server	System that contains both the application server and database server
3-Tier Application Server	System that runs the bshell (Virtual Machine) and the database driver
3-Tier Database Server	System running the database
JVM	Java Virtual Machine
Infor Labs PBC	Performance and Benchmark Center. This department is responsible for this sizing guide
ION	Integrated Open Network platform
IFS	Infor Federation Services
ADFS	Active Directory Federation Services
IWA	Integrated Windows Authentication
STS	Security Token Service
Tomcat	Web server and Java Servlet Engine, delivered together with Infor LN UI

Contacting Infor

If you have questions about Infor products, go to the Infor Xtreme Support portal at www.infor.com/inforxtreme.

If we update this document after the product release, we will post the new version on this Web site. We recommend that you check this Web site periodically for updated documentation.

If you have comments about Infor documentation, contact documentation@infor.com.

Chapter 1 Introduction

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Infor LN UI 11.1

Infor LN UI is the HTML5 compliant browser-based user interface for Infor LN 10.3 and higher. LN UI consists of these components:

- A Web application that facilitates access to LN applications. This is the main component of LN UI.
- A Web application dedicated to the administration of the LN UI deployment.

The Infor LN UI plugin requires Infor LN and Enterprise Server 10.3 or higher. The Infor LN plugin runs in a page in Infor Ming.le™.

The Infor LN UI 11.x is the successor of the Infor Web UI 10.x product which contained a Java based Swing UI.

Please refer to the related documents section for more information on the product.

Differences with previous Infor Web UI releases

This list shows important deployment differences:

- LN UI does not require any client side java plugin. An HTML5-capable browser is sufficient. For supported browsers, see the Infor LN UI Administration Guide (U9790).
- LN UI is supported on a wider range of client operating systems. For supported client operating systems, see the Infor LN UI Administration Guide (U9790).
- LN UI only supports Infor LN 10.3 and higher. Baan IV, Baan 5, and older LN versions are not supported.
- LN UI is only supported in combination with Infor Ming.le™. Classic mode Web UI and standalone mode is not supported.
- LN UI does not support Fujitsu Workflow.
- LN UI does not support old style Web UI homepages.
- LN UI only supports report preview (print to display) in PDF format, not in HTML format.
- LN UI does not support integration with LN Report Viewer.
- LN UI does not support Java Web Start mode.

- LN UI does not support local printing (printers connected to the client) through BWPRINT. Local printing is only supported through the browser PDF viewer plugin. Therefore bar code printing is not possible through LN UI.
- LN UI supports only the Infor UX3 UI skin.
- LN UI does not support the ODM and ECM Infor LN document integration packages.
- LN UI does not support Silverlight-based Workbench sessions when using Chrome or the Safari browser.

LN UI authentication methods

LN UI supports these authentication methods:

- Single sign-on based on Integrated Windows Authentication (IWA). This authentication mode is only available when the LN UI Web server is deployed on a Windows OS.
- Single sign-on based on IFS/ADFS authentication.
- For testing purposes, only LN application authentication is supported.

Chapter 2 Deployment scenarios

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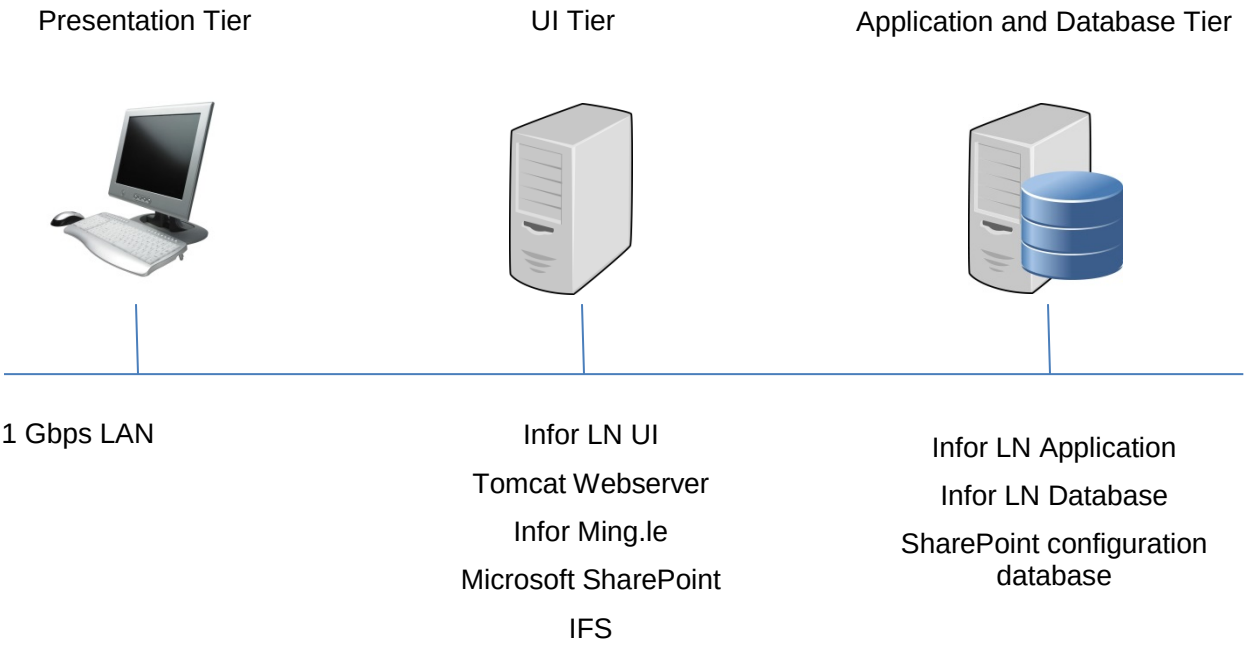
Infor LN UI can be deployed in several different scenarios. The scenario that you choose depends on your performance, security, and functional requirements. Infor LN UI runs as a plugin in Infor Ming.le. It is therefore mandatory to install Infor Ming.le.

These scenarios are described:

- Typical deployment
- Large deployment
- Deployment using a separate HTTP server

Typical deployment

This diagram shows a typical Infor LN UI deployment including Infor Ming.le and Infor LN. In this scenario the UI server components (Ming.le and LN UI) are stored in the UI tier, and the LN application and database components are stored on another tier.

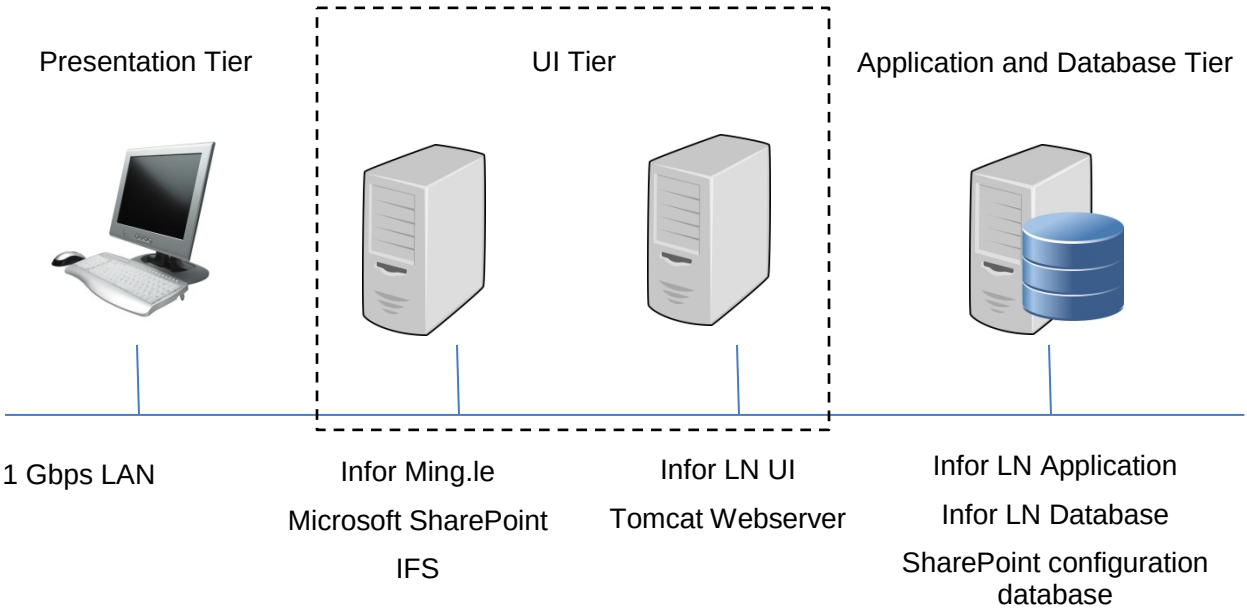


For small installations that have a maximum of 50 users, you can install Infor LN, Infor Ming.le, and Infor LN UI on the same server. For larger deployments, we recommend a separate UI server for these reasons:

- Separate servers can be better tuned for their specific task.
- If Infor LN and Infor LN UI are installed on the same server, the overall performance may be reduced for all users. The latency for the UI and Infor LN backend are stacked. If the server becomes saturated, the response time can be longer with a single server scenario than with a multiple server scenario.
- A separate Web server is better for security.

Typical deployment with separate Infor Ming.le server

When multiple Infor applications are running in Infor Ming.le, you can run Infor Ming.le on a different server than the other Infor applications, such as Infor LN UI, as shown in this diagram:



Location of the SharePoint configuration database

You can store the SharePoint configuration database (Microsoft SQL Server only) either on the Ming.le server or on the database server that is used for the Infor LN application. The advantages of using a central database server include fewer licenses and more options for high availability.

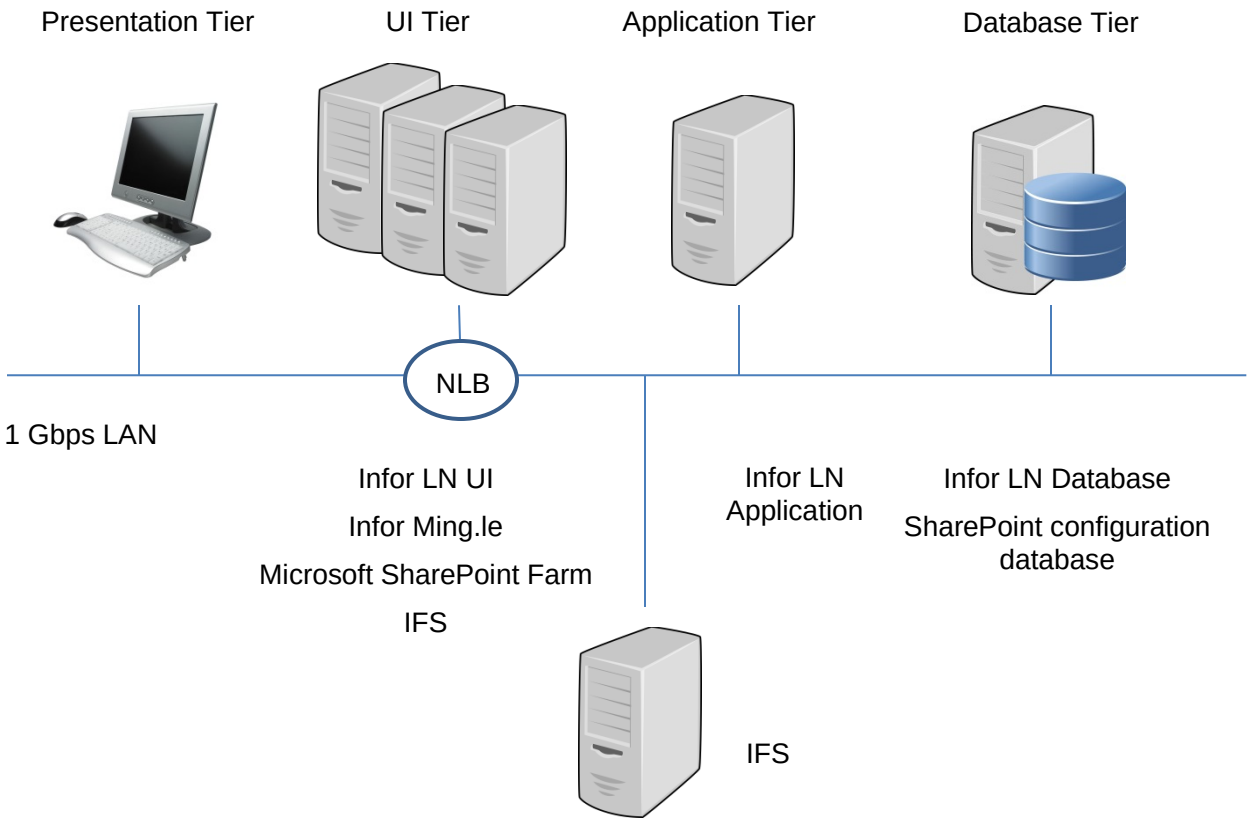
From a performance perspective, the load on the SharePoint configuration database is low; therefore, there is no effect on the CPU sizing of the Infor LN server.

Make sure to install the SharePoint database in a separate SQL Server instance to avoid any conflicts with the LN database instance, for example on the collation settings.

The SharePoint configuration database instance does require memory. We recommend that you reserve 2GB of internal memory on the server that will host this database.

Large deployment

In a large deployment a separate database server is used to store both the Infor LN database and the SharePoint configuration database. Optionally a scale-out scenario with a network load balancer (NLB) can balance the load over multiple servers in a SharePoint server farm. This diagram shows a large deployment scenario:



Notes:

- IFS is installed on a separate server; you can have only one instance of IFS.
- There can only be one instance of SharePoint configuration DB.
- You can run the Infor LN UI servers in a load-balanced environment or run these servers independently. However, constraints exist when running them in a load-balancing scenario. For further information, see *Infor Web UI- Deployment in a High-available Environment* (B0072 US).

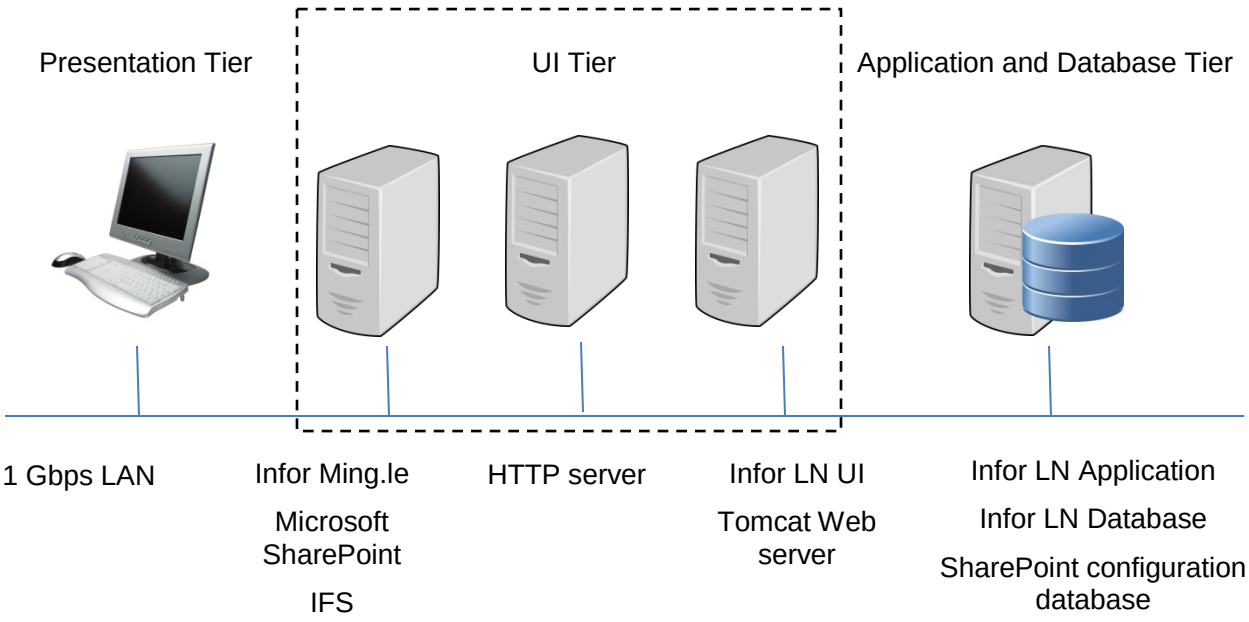
Separate HTTP server for Infor LN UI

You can deploy a separate HTTP server instead of using the embedded HTTP server in Tomcat.

A separate HTTP server improves security and provides more flexibility and functionality, for example, load balancing. For larger installations, Apache performs better than Tomcat because Apache runs native rather than within a JVM.

This diagram shows a deployment scenario that has an Infor Ming.le server, a separate HTTP server, and LN UI application web server.

For smaller configurations, you can install the HTTP server and the LN UI application server on the same physical server.



Chapter 3 Client requirements

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This chapter provides the client requirements for the software and hardware stack on which Infor LN UI 11.1 runs on.

Notes:

- LN UI does not require any client side java plugin. An HTML5-capable browser is sufficient. For supported browsers, see below.
- LN UI is only supported in combination with Infor Ming.le™. Classic mode and standalone mode are not supported.

Supported browsers

This table shows the browsers that are supported by LN UI:

Client	Supported browsers
Windows client	Microsoft Internet Explorer 10 in Desktop style
	Microsoft Internet Explorer 10 in Metro style, but with limitations
	Firefox 20.x and higher
	Chrome version 26.x and higher
Mac OS clients	Safari
Linux clients	Firefox 20.x and higher

Note: LN UI does not support Silverlight-based Workbench sessions when using Chrome or the Safari browser.

Hardware requirements

This section provides the hardware requirements for the Infor LN UI client system.

CPU

Delays on user actions in the GUI have a direct relationship with CPU speed and power. We recommend that you use at least a dual core CPU with an individual core speed of 2.2 GHz or faster.

Memory

The memory requirement for Infor Ming.le and the Infor LN UI client is 1 GB. This amount does not include memory that is required by the operating system or other applications. For expert LN users or users that use additional Infor client applications in Infor Ming.le, the memory requirement is 2 GB.

Minimum memory sizes include operating system, but excluding memory for other applications.

	Minimum internal memory size for desktop or notebook	Additional memory on existing desktop or notebook
Infor Ming.le + Infor LN UI plugin	2 GB	1 GB
Expert users or users with additional Infor client plugins	3 GB	2 GB

Caching

Browser caching reduces the amount of data that must be downloaded from the Web server, which reduces response times and network load. The use of caching is more important in WAN networks with lower bandwidths and higher latency.

Static (unchanging) content of the Infor LN UI application is automatically being cached in the client browser. Due to the use of caching subsequent logins will be faster.

Compression

Infor LN UI can be configured to compress both static and dynamic content being transferred over the network to the client. Compression has a small CPU overhead, but increases the performance and capacity of the network. The use of compression is more important in WAN networks with lower bandwidths and higher latencies.

With compression enabled the amount of data sent to the client is reduced with 50-70%.

Antivirus setting

Virus scanner settings can slow down the startup of Infor LN UI on the client. If the startup is slow, disable the **Scan within compressed files** option in the virus scanner on the client.

Browser performance

The Infor LN UI client performance depends on the java script handling of the browser. Because the latest browser version typically handles java scripts better than earlier versions, we recommend that you use the latest version of your selected browser.

During testing, the java script handling in Internet Explorer was less efficient compared to other browsers.

Chapter 4 Server requirements

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This chapter provides the hardware and software requirements for the Infor LN UI. The requirements in this section are based on the systems that were used during the benchmarks.

Software requirements

Please consult the product documentation for the latest product requirements.

Web server support

Infor LN UI web server is a java based application and is supported in these web servers:

Product	Supported versions
Web server	Apache Tomcat 6.x or 7.x IBM WebSphere 8.5

Java Runtime Environment (JRE)

For the Infor LN UI web server, we recommend that you run J2SE version 1.7 with the latest update, 64-bit version. With a 64-bit JVM, you can allocate more memory, which enables scaling to a higher numbers of users.

Using a 32-bit JVM is not recommended.

Multiple JVMs

If Infor LN UI is used without customizations, the estimated number of concurrent users that can run on one 64-bit JVM is at least 1,000.

For high-end scaling (> 1,000 concurrent users), we recommend that you install multiple JVMs. If one JVM becomes saturated, the scalability improves when the work is distributed across multiple JVMs.

Hardware requirements

This section provides the hardware requirements for the Infor Ming.le Foundation and Infor LN UI web server system.

Benchmarks were carried out with Tomcat 7 using Java SE Development Kit 1.7 64-bit on the Windows 2008R2 x64 platform. The benchmark executed 1,000 highly active concurrent users and generated an average web server load of almost 550 hits per second.

CPU requirements

This table shows the minimum CPU requirements for Infor Ming.le and Infor LN UI:

Component	Concurrent users per CPU core
Infor Ming.le Foundation with Infor LN Web UI Excluding Social Space and ION task users	250

Important notes:

- The minimum required core speed is 2.0 GHz.
- We recommend a minimum of 2 CPU cores (or virtual CPUs) for each server or virtual machine hosting the web server.
- Ming.le is based on Microsoft SharePoint. The minimum requirement for a server hosting Microsoft SharePoint is 4 CPU cores (or virtual CPUs).
- These requirements exclude CPU requirements for other applications.
- Social Space and ION Task users are not included, these must be sized separately.

Memory requirements

This table shows the minimum memory requirements for Infor Ming.le with Infor LN UI.

Number of concurrent users	OS	Ming.le	SharePoint DB	JVM base	JVM per user	Total (rounded)
Up to 1,000 users	1 GB	2 GB	2 GB	2 GB	1 MB / user	8 GB
Up to 2,000 users	2 GB	4 GB	2 GB	2 * 2 GB (multiple JVM)	1 MB / user	16 GB

Important notes:

- These requirements exclude memory for other applications.
- Ming.le is based on Microsoft SharePoint. For a server hosting Microsoft SharePoint, the minimum amount of memory is 8 GB.
- For Infor LN UI, we recommend that you reserve at least 2 GB of memory for the JVM memory heap.
- Ming.le Social Space and ION task users are not included, these must be sized separately.
- Infor recommends a maximum of 1,000 concurrent users per JVM. For larger deployments it is recommended to configure additional JVMs.

Disk requirements

These are the IO requirements for Infor Ming.le and Infor LN UI:

- Minimum of 100 GB disk space
- IOPS: 300 per 1,000 concurrent users

10 GB initial disk space is sufficient for SQL Server. However, we recommend that you also plan accordingly for future growth. Refer to appendix B for information about tuning guidelines for SQL Server.

Typical deployment

The next table shows an overview of the server requirements based on the typical deployment scenario described in chapter 2. This configuration has sufficient capacity to support up to 500 highly active concurrent Infor LN UI users. For larger installations we recommend using the large deployment scenario.

The requirements do not include Social Space and ION Task users, these users must be sized separately.

UI server

Installed products	CPU	Internal memory	Disk IOPS	Network
Microsoft Windows 2008 R2 Microsoft SharePoint 2010 Including IFS Infor Ming.le Foundation Infor LN UI 11.1	4 Processor cores 2.0 GHz or better	Minimum 8 GB	300	1 Gbps LAN

Large deployment

This section provides an overview of the web server requirements for Infor Ming.le, Infor LN UI, and IFS based on the large deployment scenario described in chapter 2. The number of CPU cores and the amount of memory depends on the number of concurrent users. The minimal configuration is sufficient to support up to 1,000 concurrent users. When you add more users, you must adjust the CPU and memory size accordingly.

The requirements do not include Social Space and ION Task users, these users must be sized separately.

Ming.le server

This table shows the hardware requirements for the Infor Ming.le server:

Installed products	CPU	Internal memory	Disk IOPS	Network
Microsoft Windows 2008 R2 Microsoft SharePoint 2010 Infor Ming.le Foundation	4 Processor cores 2.0 GHz or better	Minimum 8 GB	100	1 Gbps LAN

LN UI server

This table shows the hardware requirements for the Infor LN UI server:

Installed products	CPU	Internal memory	Disk IOPS	Network
Microsoft Windows 2008 R2 Infor LN UI 11.1	4 Processor cores 2.0 GHz or better	Minimum 4 GB	200	1 Gbps LAN

IFS server

This table shows the hardware requirements for the IFS/ADFS server:

Installed products	CPU	Internal memory	Disk IOPS	Network
Microsoft Windows 2008 R2 IFS/ADFS	2 Processor cores 2.0 GHz or better	Minimum 4 GB	-	1 Gbps LAN

Virtualization

We recommend that you use the latest version of VMware ESXi/vSphere, Citrix XenServer or Microsoft Hyper-V for virtualization.

If you have a virtualized environment, the number of CPU cores can be replaced with the number of virtual CPUs with a minimum of 2 vCPUs.

More information

For more detailed sizing and deployment information, see the documents that are listed in the related documents section at the beginning of this guide.

See Infor Xtreme solution 22881401 for performance-related information on Infor LN.

Chapter 5 Network requirements

5

This chapter provides sizing information about the network requirements for Infor Ming.le and Infor LN UI. These network requirements are described:

- Network requirements between the client and the Infor LN UI Web server
- Network requirements between the Web server and the Infor LN application server

The network requirements for Infor LN UI in a thin client environment are provided in a separate document. See *Infor Web UI - Sizing and Deployment for a Thin Client Solution* (B0067 US).

Network requirements between the client and Web server

This section provides the network requirements for the Infor Ming.le and Infor LN UI server.

Product	Average network load per user
Infor Ming.le Foundation with Infor LN Web UI Excluding Social Space and ION task users	15 kbps With compression of static and dynamic content enabled.

LAN connection

The minimal network requirement between the client and the Web server over a Local Area Network (LAN) is 10 Mbps switched or dedicated, recommended is 100 Mbps.

WAN connection

Wide Area Network (WAN) is an extranet, internet connection, or both. Because of the larger latency of the lines, WAN performance is always slower than LAN performance.

For WAN network connections, these factors affect user performance:

- Speed/bandwidth of the link, mostly expressed in kilobits per second (Kbps) or megabits per second (Mbps).

- Latency of the link, mostly expressed in milliseconds (msec). Latency is the time that it takes to complete a roundtrip from the client to the Web server and back to the client.
- Quality of the link in terms of packets lost, disconnects, and retransmits.

Latency for a link is caused by these factors:

- Network topology that consists of switches, routers, gateways, congestion, and medium delay (satellite link). These factors delay the network packets.
- Speed or bandwidth versus the amount of traffic. Roundtrips take longer with slow speed or small bandwidth links than they do on fast speed or high bandwidth links.

Example

This example shows the number of Infor LN UI users that can run on a T1 1.544 Mbps 150 ms link:

Line speed:	1.544 * 1024 = 1581 Kbps
Keep 25% spare bandwidth:	1581 - 25% = 1185 Kbps
Total concurrent users:	1265 Kbps / 15 Kbps = 84 users

Login performance

The login performance of Infor LN UI depends on whether the browser cache is filled. After the browser cache is filled, subsequent logins are much faster.

During login, data is transferred to the client, which can affect the performance of other users that have low bandwidth WAN connections.

It is recommended to enable static and dynamic compression in the web server to reduce the amount of data being sent over the network. Please refer to the *compression* paragraph in this chapter for more information.

Compression

Infor LN UI automatically compresses the dynamic network traffic between the Web server and the client. This compression adds a small amount of CPU overhead to the Web server and to the client browser. Compression reduces the network traffic between the Infor LN UI Web server and Infor LN UI client by 50-70%.

The web server can be configured to compress static content as well. This gives a performance improvement during the login of the application. Please refer to *Appendix A* for more information.

The bandwidth figures shown in this chapter are based on using both static and dynamic compression.

System message

Infor LN UI regularly checks for Administrator system messages. Administrators can set a system message that has important information for the users. If you do not use this functionality, you can disable the check for system messages to save roundtrips. You can also increase the polling interval. You can disable or change this check in the Infor LN environments section of the Infor LN UI Admin console. If you disable this check, the performance slightly increases, especially on a WAN connection.

VPN connection

You can run the Infor LN UI client over a VPN connection on the Internet. Because the Internet does not have guaranteed bandwidth, the performance depends on the connection speed of your provider and the quality of the Internet connection. For these reasons, we recommend that you do not use an office-to-office connection via VPN over the Internet.

Network requirements between Web server and Infor LN server

Because of the large amount of network traffic between the Infor LN UI server and the Infor LN application/database server, Infor LN UI is not supported for installations where the Infor LN UI Web server is remotely located (WAN connection) from the Infor LN application/database server.

All servers should have a 1 Gbps LAN bandwidth and the latency between web servers, application servers, and database servers should be less than 1ms.

Appendix A Tuning the Infor LN UI web server

A

Tomcat

This section provides the Tomcat settings that improve the Infor LN UI server performance.

Tuning number of threads

The Tomcat maxThreads parameter determines the maximum number of simultaneous requests that can be handled. By default, this attribute is 200. Every user will use 1 thread. The minSpareThreads parameter can be set to 10% of the maxThreads parameter. To change these parameters, edit the server.xml in this directory:

Web UI installation directory\apache-tomcat-*version*\conf directory

For example an installation up to 1,000 concurrent users:

```
<Connector connectionTimeout="20000" port="8312" minSpareThreads="100" maxThreads="1000" protocol="HTTP/1.1" redirectPort=""/>
```

Enabling static content compression

By enabling static content compression the size of the data transferred to the client is reduced. It is recommended to enable this in the Tomcat server.xml file:

```
<Connector connectionTimeout="20000" port="8312" minSpareThreads="100" maxThreads="1000" protocol="HTTP/1.1" compression="on" compressableMimeType="text/html,text/xml,text/plain,application/javascript,text/css" useSendfile="false" redirectPort=""/>
```

Tuning the Java Virtual Machine

For optimal performance, we recommend that you install the 64-bit Oracle JVM and run the JVM in server mode. A 64 bit JVM runs by default in server mode which improves performance.

The Infor LN UI installation includes the JRE1.7. You can download the latest version of the Oracle JRE or JDK 1.7 from http://java.oracle.com.

The AggressiveHeap option enables high performance settings in the Oracle JVM, this optimizes CPU usage of the Infor LN UI web server.

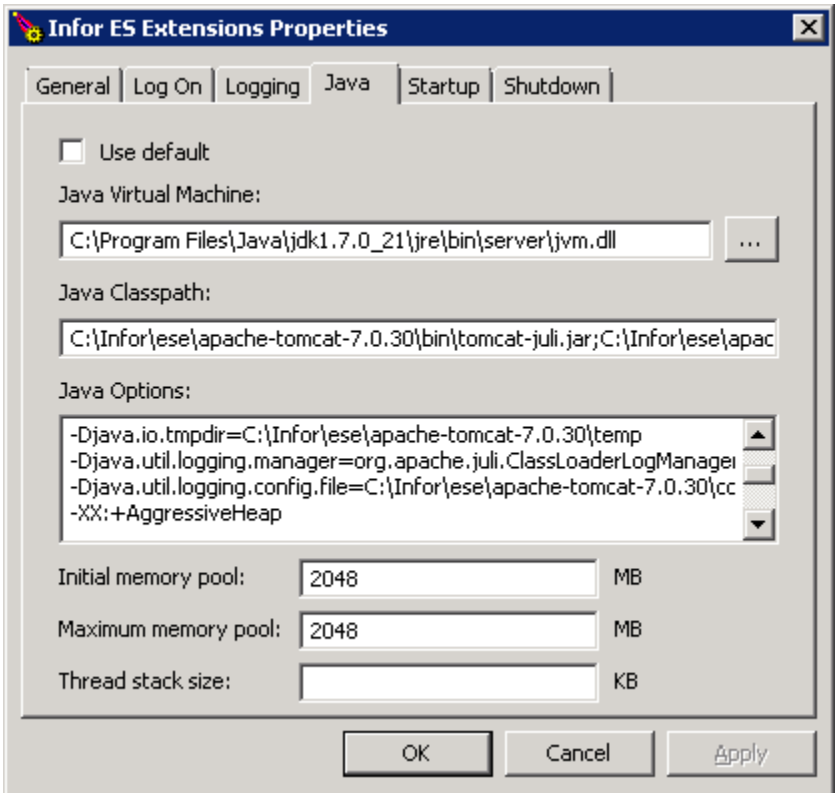
The recommended parameter settings for the JVM are:

Concurrent Infor LN UI users	JVM settings
Up to 1,000 concurrent users	-XX:+AggressiveHeap -Xms2048M -Xmx2048m
> 1,000 concurrent users	-XX:+AggressiveHeap –Xms4096M –Xmx4096m

Windows service configuration steps

To use the JVM server mode and increase the memory settings:

1. Start a command prompt.
2. Navigate to the *Web UI installation directory*\apache-tomcat-*version*\bin directory. For example, C:\Infor\LN\ese\apache-tomcat-7.0.30\bin.
3. Run this command: tomcat7w.exe //ES/InforEserverExtensions.
4. The Infor ES Extensions Properties screen is displayed.
5. Click the **Java** tab.
6. Make sure the JVM server dll is used as shown in this window:



7 Set the initial memory pool to **2048 MB** and the maximum memory pool to **2048 MB**.

8 Add the Java option: -XX:+AggressiveHeap

9 Restart the Infor LN UI Tomcat service.

Appendix B Tuning Microsoft SharePoint 2010

B

This chapter describes tuning guidelines for Microsoft SharePoint 2010.

Microsoft SharePoint 2010

SQL Server options

Before you deploy SharePoint Server, you must configure SQL Server settings:

- Do not enable auto-create statistics on a SQL Server database where SharePoint Server is installed. SharePoint Server configures the required settings during installation and upgrade. Auto-create statistics can significantly change the execution plan of a query from one instance of SQL Server to another instance of SQL Server. Therefore, to provide consistent support for all customers, SharePoint Server provides coded hints for queries as needed to provide the best performance across all scenarios.
- To ensure optimal performance, we strongly recommend that you set **max degree of parallelism (MAXDOP)** to **1** on SQL Server instances that host SharePoint Server 2010 databases.

Database configuration

For large SharePoint implementations, follow these best practices when you plan and configure your database:

- Make sure to install the SharePoint database in a separate SQL Server instance to avoid any conflicts with the LN database instance, for example on the collation settings.
- SharePoint Server 2010 performance can be significantly impeded by insufficient disk I/O for tempdb. To avoid this issue, allocate dedicated disks for tempdb. For high workloads, the average read operation or the average write operation requires more than 10 ms. To ease the bottleneck, either split the files across multiple disks or use faster disks.
- For best performance, place the tempdb on a RAID 10 array. The number of tempdb data files should equal the number of CPU cores. Set the tempdb data files at an equal size. For this purpose, count dual core processors as two CPUs. Count each processor that supports hyper-threading as a single CPU.

- Consult your storage hardware vendor for information about how to configure all logs and the search databases for write optimization for your particular storage solution.
- Use multiple data files for content databases.
- Only create files in the primary file group for the database.
- Distribute the files across separate disks.
- The number of data files should be less than or equal to the number of core CPUs. Count dual core processors as two CPUs for this purpose. Count each processor that supports hyper-threading as a single CPU.
- Create data files of equal size.