

# **AppExpress Installation Guide**

**Version 3.1**



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# Introduction

The *AppExpress Installation Guide* describes how to install, configure and operate the software.

## Target Audience

This installation guide is geared towards experienced network administrators and Information Technology professionals who have experience installing and configuring Windows operating systems and applications.

## Recommended Technical Knowledge

Following is a list of recommended technical knowledge for making the best use of this guide:

- Working knowledge of Windows Server 2000, 2003.
- Working knowledge of client/server systems and technologies.
- A conceptual understanding of database systems and SQL server.
- Working knowledge and understanding of the Windows registry, including machine profiles, user profiles, and software registry entries.
- Experience in an environment with some automated/centralized networking tool is a major plus (Tivoli, Openview, Unicenter, etc.)
- Understanding of the Apache Tomcat web server.
- Knowledge of network monitoring tools.
- Knowledge of IIS configuration.

## Guide Organization

This guide is organized as follows:

- Chapter 1 - Overview
- Chapter 2 - System Planning and Requirements
- Chapter 3 - Installation Preparation
- Chapter 4 - Database Population
- Chapter 5 - Core Server Installation
- Chapter 6 - Web Server Component Installation
- Chapter 7 - System Configuration
- Chapter 8 - SSL Configuration
- Chapter 9 - Troubleshooting
- Chapter 10 - Maintenance
- Chapter 11 - Uninstalling and Upgrading
- Glossary
- Index

## Typographic Conventions

The following typefaces are used throughout this guide:

<b>Bold text</b>	Names of windows, dialog boxes, menus, commands, buttons, predefined folders, and keyboard keys. Examples: Click on <b>OK</b> . Press <b>Enter</b> . Navigate to the <b>My Documents</b> folder.
<i>italic text</i>	Indicates references to a chapter or section within this guide or other documentation. Also used to emphasize new terms. Example: Refer to the <i>AppExpress User Guide</i> for further information.
> symbol	Sequence in which you should select a menu option. Example: <b>File &gt; New &gt; Document</b> means click on the <b>File</b> menu first, then click on <b>New</b> , and then click on <b>Document</b> .

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1, 2, 3	Numbered items indicate sequential steps in a procedure. Sub steps are indicated with indented bullets. Relevant graphics or screen captures may follow steps.
Screen captures	The screen captures in this guide are examples only. Your software is configured according to your Company's requirements. Therefore, the sample screens used in this guide may not exactly match the user interface on your system.

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The following icons are used throughout this guide:



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A *note* icon identifies information of which you should be aware.

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### CAUTION

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This icon identifies information about actions that might cause problems within the application, with the system or with your data, including data loss.

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## Obtaining Technical Support

Endeavors provides a number of convenient ways to obtain technical support as described below.

### Web Site

Support information is available online on the following Endeavors web site:

<http://support.endeavors.com>

### Email

You can request technical support by sending us email to **support@endeavors.com**. Our support staff will address your email questions in a timely manner.

### Telephone

You can obtain telephone support by calling 1-866-277-9411 Monday through Friday between the hours of 9 a.m. and 5 p.m. Pacific time (PST).

**After Hours Support**

For support outside of regular business hours (Monday through Friday, 9 a.m. to 5 p.m. Pacific time) you can contact Endeavors via email. Email received outside of the hours noted above will be addressed on the next business day.

**Sales**

For sales or related information about AppExpress, visit our web site ([www.endeavors.com](http://www.endeavors.com)), call us at 1-888-624-4457, or send email to [info@endeavors.com](mailto:info@endeavors.com).



## Chapter

# 1

## Overview

AppExpress is an application distribution and streaming technology that provides a cost-effective method to rapidly deploy and manage applications to a large pool of users. It provides core functions for streaming Application Sets to subscribers. Main features are:

1. Patented streaming application technology
2. Anti-piracy protection of application code
3. Usage metrics collection
4. Licensing policies to enforce all application usage
5. Scalability and built-in fail-over support.

## AppExpress Server Components

The AppExpress Server system consists of several servers.

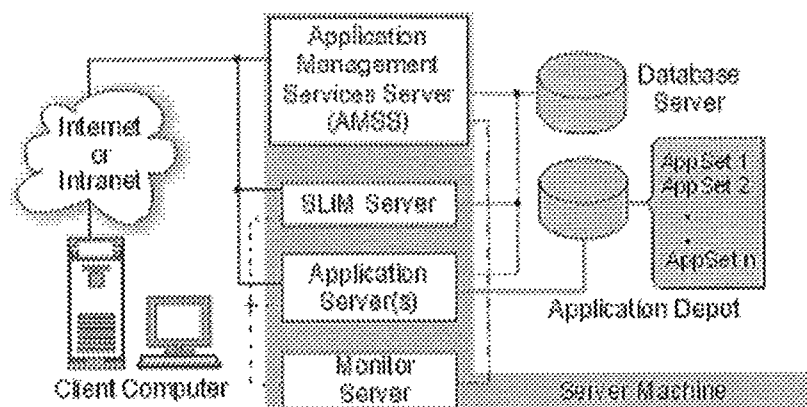


Figure 1-1: AppExpress Server Components

## Management Services Server (Web Server)

The Management Services Server (Web Server) provides distinct and configurable web-based interfaces for the administrator and application subscribers. A default web interface is delivered with AppExpress and is configured to utilize IIS and Tomcat to deliver content.

## Application Server

The application server services end-user application client requests. The Application Server uses most of the available bandwidth in comparison to the rest of the AppExpress Server components.

## SLiM Server

The Software Licensing and Metering server manages subscriber licenses and metering application usage by granting, renewing, and expiring user access tokens. Features include:

- Managing groups, user data, and their subscribed applications.
- Validating the licenses for applications running on client machines.
- Tracking software licenses that are currently in use.

## Monitor Server

The monitor continually watches the SLiM and Application Servers to ensure that they are running properly. The monitor has the ability to start and stop both of these servers, monitor server loads, and is responsible for detecting errors and outages.

## Cache Server

The Cache Server performs application set caching for the Application server. The cache server increases throughput in distributed regions. It is an optional component for administrators to setup.

## Database

The database tracks user information and server resources for a given service provider. All system and user information is stored in the database. This includes system configuration, topology, logs, application set information, application licenses, usage, and user accounts.

## Application Depot

The Application Depot is a file storage area on a network that stores published application sets. This area must be accessible by all of the other AppExpress Server components.

## Application Sets

Application sets are specially packaged applications that can be streamed to an end-user's computer. These application sets are created by a publishing process and contain the application data needed to run on a user's system. For more information, see the *AppExpress Publisher Guide*.

## Security

Security is provided by patented anti-piracy protection and Secure Sockets Layer protocol.

## Patented Anti-Piracy Protection

The patented technologies of AppExpress protect streaming application code from viral attack and in-transit corruption by hackers. It also encrypts streaming transmissions using PKI Certificates and MD5 Digests.

## Secure Sockets Layer

Secure Sockets Layer (SSL) is a protocol that delivers server authentication, data encryption, and message integrity. SSL is a network protocol layer, located directly under the application layer, with responsibility for the management of a secure (encrypted) communication channel between a client and server. SSL uses a private key to encrypt data that are transferred over the SSL connection. With SSL implemented on both a client and a server, your Internet communications are transmitted in encrypted form. You can be confident that the information you send will arrive privately and unaltered to the server you specify (and no other). The AppExpress solution supports SSL to protect against third-party tampering.

## Integrated Windows Authentication

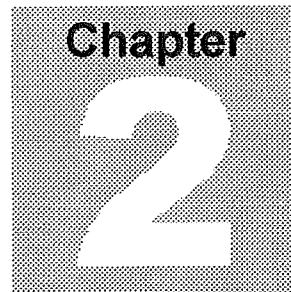
AppExpress is set up to use Integrated Windows Authentication (IWA) with the Active Directory service. This allows AppExpress to authenticate users using the current Windows account that the user is logged into. If using IWA, the client will access the registry to populate information from Windows to connect to the AppExpress server. This option should be used with SSL setup on the server to provide increased security.

## Fault Tolerance

All of the AppExpress main components are scalable and fault tolerant. This is important in data centers where high availability, high user scalability (tens of thousands of users), very large datasets (gigabyte-size applications) are required. In these environments, AppExpress can be configured with load balancing switches (e.g. Cisco™ Local Director, Foundry Networks™ Server Iron, Lucent™ Technologies Web Switch) to route and balance multiple SLiM and Web Servers.

Using the load balance switch with the Application Server will usually result in more efficient load balancing than the client. There needs to be at least two of each server component for proper load balancing and fail-over.

All of the components are required to connect to a database, preferably configured using DB clustering which provides both scaling and fault tolerant benefits. The database should be replicated to a fail-over system and backed up nightly.



## System Planning and Requirements

This chapter provides the procedures and information you need to plan the size and configuration of your AppExpress System and lists hardware and software requirements. The total size of the appsets (the packaged applications) and the number of users that will access the system will determine the capacity requirements for the system.

Once you have determined your server capacity requirements you can procure the appropriate hardware and software.

To plan your system configuration you must do the following:

- Determine the total size of the combined applications to be served.
- Determine how many users will be on the system.
- Use the application totals and user totals to determine the server machines required.

## Step 1: Determining Application Totals

An appset is an application after it has been published for use with AppExpress. Each appset is generally the same size as the original application. Table 2-1 shows appset sizes for many common applications. To determine the total size of the appsets., select the appsets you are going to use in Table 2-1 and then total them up. For appsets not listed, contact Endeavors.

**Table 2-1: Typical Appset File sizes**

Product	Vendor	Size (KB)
3DS Max 7	AutoDesk	496179
Acrobat Reader 4	Adobe	12,869
AIM 5.2	America Online	11817
AutoCAD 2004	AutoDesk	178,886
Dreamweaver MX	Macromedia	83015
MicroStation 8	Bentley	244557
Office XP	Microsoft	202738
Paintshop Pro	JAS	39330
Perforce 2000	Perforce Software	3961
Photoshop 6	Adobe	98,121
Project 2000	Microsoft	73457
RealAudio Basic	Real	12257
SIM Unleashed	Maxis	1412944
Unigraphics NX	EDS	430077
Visio 2003	Microsoft	153,380
WinZip 8	WinZip Computing	25885
WordPerfect 11	Corel	189,091

**Example:** If you were planning to use *Project*, *Visio* and *Dreamweaver*, your total size would be  $73,457 + 153,380 + 83,015$  for a total appsize of 309,852.

## Step 2: Estimating the Number of Users

Each server supports a specific range of users active on the system at a given time. Table 2-2 shows the number of users and total app sizes and the servers required to meet capacity requirements. The capacities are based on load testing and are certified. For further details, contact Endeavors. The capacities indicated are based on average user connections with no impact to system performance. You should estimate how many users on average will be connected over a given time period and then refer to Table 2-2 to determine how many servers you will need.

**Example:** You have a total of 25,000 employees and know that 80 % could be using AppExpress at a given time. This means that your number of users for Table 2-2 is 20,000.

**Table 2-2: Server Requirements Planning Table**

Actual Users at a Given Time	Required Physical Servers
0 - 10,000	1
10,001 - 20,000	2
20,001 - 40,000	4
40,001 - 80,000	8
80,001 - 160,000	16




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Servers can serve a maximum of 10 GB of application data, which will require 2GB RAM per server.

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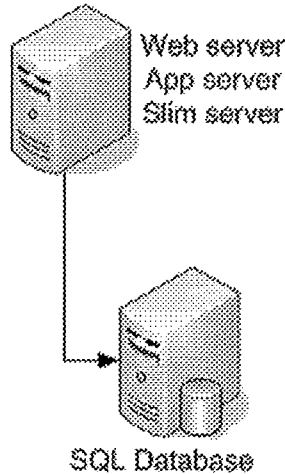
All components must be connected to a database, preferably configured using database clustering, which provides both scaling and fault tolerance. Without a cluster, the database should be replicated to a fail-over system and backed up nightly.

## Step 3: Determining Required Machines

Choose the number of servers required according to the number of users. The basic configuration is a 2-server installation. Refer to Table 2-1. Although various server configurations can be created, we recommend that you set up a basic and scalable topology as described in this chapter. For non-standard configurations please contact support (See “Obtaining Technical Support” on page 3.)

As more capacity is required, you add servers. Each new server is installed the same way. When you need to expand or downsize the system, you can dynamically and transparently add and remove all servers.

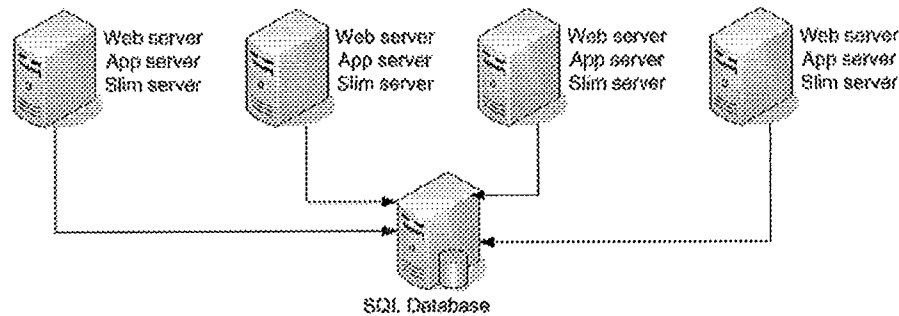
**Example 1:** Let’s say you have a user size of 10,000 and your total apps size is 2 GB, then from the table you will see that you require 1 server. Refer to Figure 2-1.



**Figure 2-1: One plus One Database Topology**



**Example 2:** If your user base stays the same, and for example your appset size increases to 38GB, then reading from the table you will see that you need 4 servers. See Figure 2-2.



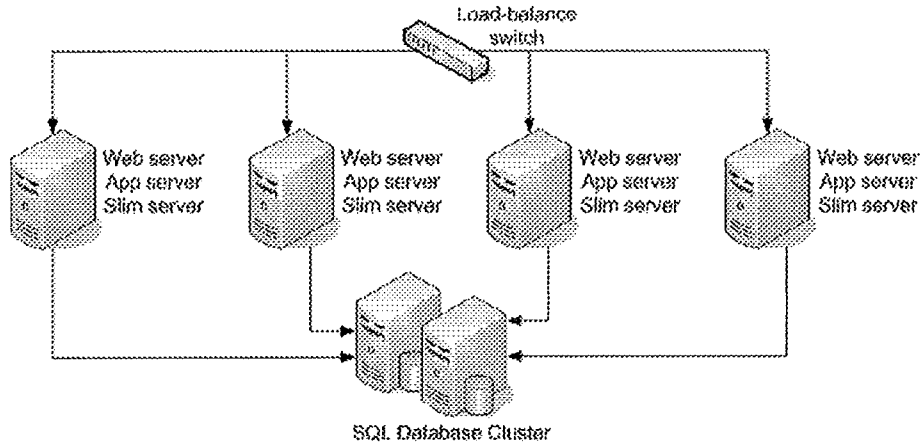
**Figure 2-2: Four plus One Database Topology**

The configuration shown in Figure 2-2 could handle 10,000 users.

## Load Balancing Requirements

Major AppExpress components are scalable and fault tolerant. The Application and SLiM servers have built-in load detection mechanisms. When the primary server can no longer service request because of load or outages, then the Client will use another server configured within the system.

This is important in data centers where high availability, high user scalability (tens of thousands of users), very large datasets (gigabyte-size applications) are required. In High-Capacity environments, configure the system with a load balancing switch (e.g. Cisco™ Local Director, Foundry Networks™ Server Iron, Lucent™ Technologies Web Switch) to route and balance multiple servers. Although the Application and SLiM servers have built-in load detection, a load balance switch results in more efficient load balancing and supplies true fail-over. Refer to Figure 2-3



**Figure 2-3: Four Plus One Database Topology with Load Balancing**



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For load balancing, the Web servers require persistent binding or sticky load balancing to maintain the session states.

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## Determining Bandwidth Requirements

Once you determine how many users you have and the total of the appsets, you can determine the bandwidth requirements for the system. The AppExpress Servers deliver large amounts of data only when an appset is initially activated. Much smaller amounts of data are delivered when the client device requests additional application functionality.

For more information on bandwidth requirements and calculations using various factors, refer to the *Client/Server Performance: Technical Report* available on the Endeavors Web site. Samples of bandwidth are provided in Table 2-3.

**Table 2-3: Bandwidth Requirements Planning Table**

Total Appset Size	Bandwidth (Mbps)
500 MB	1.4
1 GB	2.8
5 GB	14.2
10 GB	28.4



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The bandwidth requirements in Table 2-3 assumes 1000 users and 1 server.

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## Determining Cache Server Requirements

A cache server can boost performance if there are users in various geographic regions. For example, if the main office is in New York and a branch office is in Los Angeles, a cache server can be set-up in L.A. Figure 2-4 shows a configuration with a cache server. Each cache server can handle 10,000 concurrent users and there are no restriction on application sizes.

1. Calculate the number of cache servers required based on regional metropolitan areas being served.

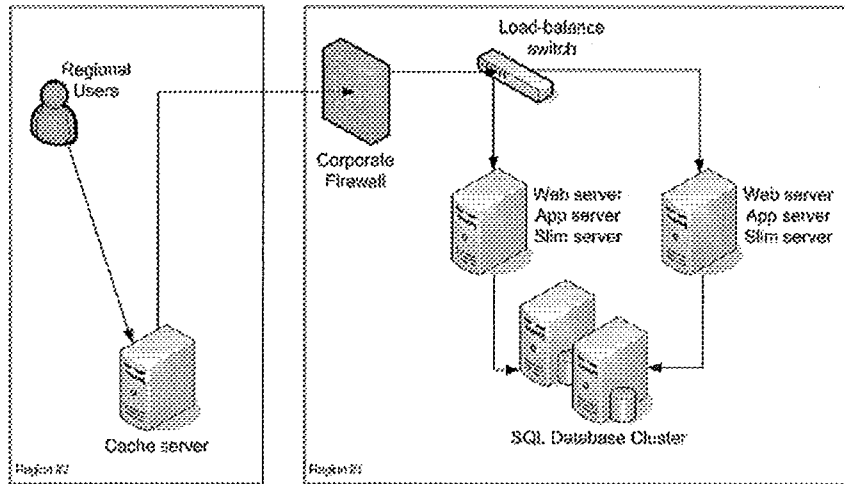


Figure 2-4: Cache Server Configuration

## Increasing System Capacity

To determine if your system needs to be expanded, you can monitor the following statistics.

- Bandwidth
- CPU
- Memory available
- Network through-put

To upsize or downsize the system, all server components can be dynamically and transparently added and removed. For fault-tolerant systems you can do this without interrupting existing and active end users. To increase the capacity of the system, add another server machine as necessary. This should be done if the number of users has surpassed the planned capacity or the system performance has reached an 80% threshold.

## Hardware Requirements

Each machine must meet or exceed the minimum system requirements in Figure 2-4.

**Table 2-4: Server Hardware Requirements**

Category	Minimum Requirement	Recommended
CPU	733 MHz CPU	1 GHz dual CPU or higher
RAM	512 MB	1 GB or higher
Disk space	10 GB + AppSets size (if applicable)	20 GB (RAID) + AppSets size (if applicable)
Network Interface Card (NIC)	100 Mbps	100 Mbps/1 Gbps



Note that these requirements are not absolute because application sizes vary. For estimation purposes, 1 appset is equivalent to 1 GB of disk space. The actual minimum disk space required on your unique system should be determined by an Endeavors representative.