



**Installation Guide**

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**Adaptive Server<sup>®</sup> Enterprise**

**15.7**

Linux

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# Contents



# Adaptive Server Enterprise Overview

Adaptive Server® Enterprise is based on a client/server model, communicating with its clients over the network via the Tabular Data Stream™ (TDS) protocol. Each client process may execute on one machine and communicate with a database server on the same or a different machine.

Adaptive Server runs as an application on top of an operating system. The hardware that the operating system runs on is completely transparent to Adaptive Server, which sees only the operating system's user interfaces. To enhance performance on multiprocessor systems, configure multiple processes (engines).

Adaptive Server is divided into a DBMS component and a kernel component. The kernel component uses the operating system services for process creation and manipulation, device and file processing, and interprocess communication. The DBMS component manages SQL statement processing, accesses data in a database, and manages different types of server resources.

## Edition Overview

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Sybase® offers various editions of Adaptive Server® Enterprise.

- Enterprise Edition – has no limit on scalability and can run all available options that can be purchased separately.
- Small Business Edition – has limited scalability, and runs a limited set of options that are purchased separately.
- Developer Edition – has limited scalability and includes many of the options that are included in the Enterprise Edition.

See the *Sybase Software Asset Management Users Guide* for information about unlocking editions and optional features.

There is a change to the license quantity used by per-CPU and per-chip license types. Adaptive Server version 15.7 and later checks out the same number of licenses as the number of cores on the machine (or chips, depending on the license type) regardless of any configuration settings. This correction from earlier versions of the server, in which if Adaptive Server was licensed per CPU or CPU chip, the requested license quantity was reduced if the **max online engines** configuration parameter was set to fewer than the number of CPUs on the machine.

The Adaptive Server installer automatically installs the SySAM License Server if you choose the full installation option or enter a served license when it prompts you for the SySAM license key. You can also choose to install the license server using the installer's custom installation option. See the *Sybase Software Asset Management Users Guide* to generate licenses.

## **Determining the Current Edition**

If you already use Adaptive Server, find out what edition you are running with the **sp\_lmconfig** system procedure.

Enter:

```
sp_lmconfig 'edition'
```

Adaptive Server returns a value of EE, SE, or DE based on the edition that is currently running. See the *Reference Manual* for more information about the **sp\_lmconfig** command.

## **Available Options for Adaptive Server**

Sybase offers various optional features for Adaptive Server, such as data compression, partitions, and encrypted columns.

- **Data compression** – Enables compression for regular and large object data, which uses less storage space for the same amount of data, reduces cache memory consumption, and improves performance due to lower I/O demands.
- **Security and directory services** – Provides lightweight directory services and network-based authentication and encryption using SSL and Kerberos.
- **Partitions** – Enables semantic partitioning for table row data.
- **Encrypted columns** – Increases security parameters and allows for addition of datatypes.
- **Tivoli Storage Manager** – Enables the database to back up and restore operations to IBM Tivoli Storage Manager.
- **In-memory database** – Provides zero-disk-footprint in-memory database support that is fully integrated with Adaptive Server for high-performance transactional applications. Provides performance enhancements to disk-resident databases with relaxed durability properties.

Adaptive Server editions and optional features are unlocked by SySAM licenses. See the *Sybase Software Asset Management Users Guide*.

## Server Component Descriptions and Directory Layout

Adaptive Server includes server components that are installed into specific directories.

Product	Description
<b>Adaptive Server</b>	Installed into the ASE-15_0 directory. <ul style="list-style-type: none"> <li>• Adaptive Server – the database server.</li> <li>• Backup Server – an Open Server™-based application that manages all database backup (<b>dump</b>) and restore (<b>load</b>) operations.</li> <li>• XP Server – an Open Server application that manages and executes extended stored procedures (ESPs) from within Adaptive Server.</li> <li>• Job Scheduler – provides a job scheduler for Adaptive Server. Job Scheduler components are located in their own directory at ASE-15_0 / job-scheduler / .</li> </ul>
<b>Software Developer Kit (SDK)</b>	Installed into the OCS-15_0 directory. <ul style="list-style-type: none"> <li>• Open Client (<i>Client Library, dlib</i>)</li> <li>• ESQL/C</li> <li>• ESQL/COBOL</li> <li>• XA</li> <li>• ODBC (Windows, Solaris SPARC, Solaris x64, Linux Power, HP-UX Itanium, IBM AIX) – a driver used to connect to Adaptive Server from ODBC-based applications.</li> <li>• OLEDB (Windows only) – a provider used to connect to Adaptive Server from OLEDB-based applications.</li> <li>• ADO.NET (Windows only) – a provider used to connect to Adaptive Server from .NET based applications.</li> </ul>

Product	Description
<b>shared directory</b>	<p>The shared directory contains components and libraries that are shared by several other components. In earlier versions, this directory was named <code>shared-1_0</code>.</p> <ul style="list-style-type: none"> <li>• Sybase Central 6 – is a Java-based framework used by the system management tools.</li> <li>• Java Runtime Environment (JRE) – is a runtime Java virtual machine used to execute Java-based programs, such as Sybase Central. Adaptive Server includes the JRE. In typical installations, by default, the JRE is fully installed. In custom installations, if you select a component for installation that requires the JRE, the JRE is also automatically selected for installation. It is located in the <code>shared/JRE-6_0 *</code> directory.</li> </ul>
<b>Adaptive Server plug-in</b>	<p>Installed into the <code>SYBASE/shared/sybasecentral6*</code> directory.</p> <hr/> <p><b>Note:</b> Sybase recommends that you use the Sybase Control Center to monitor Adaptive Server instead, as the plug-in does not support any of the new features of Adaptive Server 15.7. See <i>Tools for Managing Adaptive Server Enterprise</i> on page 5.</p>
<b>Language modules</b>	Installed into the <code>locales</code> directory. Provides system messages and date/time formats.
<b>Character sets</b>	Installed into the <code>charsets</code> directory. Provides character sets available for use with Adaptive Server.
<b>Collation sequences</b>	Installed into the <code>collate</code> directory. Provides the collation sequences available for use with Adaptive Server.
<b>Sybase Software Asset Management (SySAM)</b>	Installed into the <code>SYSAM-2_0</code> directory. Provides asset management of Adaptive Servers and optional features.
<b>Web Services</b>	Installed into the <code>WS-15_0</code> directory. An optional product that provides access to Adaptive Server using HTTP/SOAP and WSDL.
<b>Interactive SQL</b>	Interactive SQL is a GUI tool that allows you to execute SQL statements, build scripts, and display data from Adaptive Server. It is installed into the <code>DBISQL</code> directory.
<b>Unified Agent</b>	Unified Agent is a management framework that provides runtime services to manage, monitor, and control distributed Sybase resources. Agents plug into the framework and provide the ability to manage specific components. It is installed into the <code>UA</code> directory <code>UAF-2_0</code> directory.

Product	Description
<b>jutils-3_0 utilities</b>	A collection of Adaptive Server utility programs including <b>ribo</b> , a tool to trace TDS traffic between client program and Adaptive Server.
<b>jConnect™ for JDBC™</b>	Installed into the <code>jConnect-7_0</code> directory. Provides a Java Database Connectivity (JDBC) driver for Adaptive Server.

**Note:** Sybase strongly recommends you install the ECDA DirectConnect option or MainframeConnect™ DirectConnect™ for z/OS, including DirectConnect Manager, into its own directory.

## Tools for Managing Adaptive Server Enterprise

Sybase Control Center is a server application that uses a Web browser-based client to deliver an integrated solution for monitoring and managing Sybase products.

Sybase Control Center provides a single, comprehensive, Web-administration console for real-time performance, status, and availability monitoring of large-scale Sybase enterprise servers. Sybase Control Center combines a modular architecture, a rich client administrative console, agents, common services, and tools for managing and controlling Sybase products. It includes historical monitoring, threshold-based alerts and notifications, alert-based script execution, and intelligent tools for identifying performance and usage trends.

Although the Adaptive Server 15.7 installation includes the Adaptive Server plug-in for Sybase Central (which contains software for managing Sybase servers and its associated servers), Sybase recommends that you use the Sybase Control Center to monitor Adaptive Server, as the plug-in does not support any of the new features of Adaptive Server 15.7.

## PC-Client Product Descriptions and Directory Layout

An Adaptive Server installation includes additional products that are installed into specific directories.

Product	Description
<b>Software Developer Kit (SDK)</b>	Installed into the <code>OCS-15_0</code> directory: <ul style="list-style-type: none"> <li>• Open Client™ (Client Library, dlib)</li> <li>• ESQL/C</li> <li>• ESQL/COBOL</li> <li>• XA</li> <li>• Adaptive Server Enterprise extension module for Python</li> </ul>

Product	Description
<b>DataAccess directory</b>	<ul style="list-style-type: none"> <li>• (Windows and Linux only) ODBC – a driver used to connect to Adaptive Server from ODBC-based applications.</li> <li>• (Windows only) OLEDB – a provider used to connect to Adaptive Server from OLE DB-based applications.</li> <li>• (Windows only) ADO.NET – a provider used to connect to Adaptive Server from .NET based applications.</li> </ul>
<b>Shared directory</b>	<p>The shared directory contains components and libraries that are shared by several other components. In earlier versions, this directory was named <code>Shared</code>.</p> <ul style="list-style-type: none"> <li>• Sybase Central 6 – is a Java-based framework used by the system management tools.</li> <li>• Java Runtime Environment (JRE) – is a runtime Java virtual machine used to execute Java-based programs, such as Sybase Central.</li> </ul>
<b>Adaptive Server Plug-in</b>	<p>Installed into <code>ASEP</code> directory. This plug-in contains the management software for managing Adaptive Server and its associated servers.</p>
<b>Language Modules</b>	<p>Installed into the <code>locales</code> directory. Provides system messages and date/time formats.</p>
<b>Character Sets</b>	<p>Installed into the <code>charsets</code> directory. Provides character sets available for use with Adaptive Server.</p>
<b>jConnect</b>	<p>Installed into the <code>jConnect-7_0</code> directory. Provides a Java Database Connectivity (JDBC) driver for Adaptive Server.</p>
<b>Uninstaller</b>	<p>Installed into the <code>sybuninstall/PCClient</code> directory.</p>
<b>Interactive SQL</b>	<p>Interactive SQL is a GUI tool that allows you to execute SQL statements, build scripts, and display data from Adaptive Server. It is installed into the <code>DBISQL</code> directory.</p>
<b>jutils-3_0 utilities</b>	<p>A collection of Adaptive Server utility programs including <b>ribo</b>, a tool to trace TDS traffic between client program and Adaptive Server.</p>

## **Separately Installable PC-Client Products**

In addition to PC-Client, the PC-Client CD includes several products that install separately.

<b>Product</b>	<b>Description</b>
<b>InfoMaker</b>	A tool for personal data access, management, and reporting, used by both developers and end users. InfoMaker allows you to create InfoMaker presentation-quality reports and powerful queries. It complements client/server business applications and development tools as well as desktop productivity suites.
<b>PowerDesigner Physical Architect</b>	A tool for data modeling, including database design, generation, maintenance, reverse engineering, and documentation for database architects.





# Planning an Adaptive Server Installation

Understand the basics of an Adaptive Server installation.

1. Read the release bulletins for the most current information on the Sybase products you are installing, including the "Special Installation Instructions" sections.
2. Review hardware and system requirements to ensure that your system meets the version-level, RAM, and network protocol requirements for your platform.
3. Read *Determine Whether to Install or Upgrade Adaptive Server* on page 9 to confirm what type of installation to run.

## Determine Whether to Install or Upgrade Adaptive Server

Identify whether to install or upgrade Adaptive Server.

The instructions in this guide differ depending on whether you are installing or upgrading Adaptive Server. Identify that which best fits your scenario:

- No Adaptive Server installed – if you never had Adaptive Server on your machine, perform all of the prerequisite tasks then see the installation instructions.
- Adaptive Server currently installed, running a version earlier than 15.x – is a major—or full—upgrade.
- Adaptive Server currently installed, running version 15.x or later – is a minor upgrade that is performed automatically through a binary overlay, with no manual steps involved.

## Obtaining a License

Before installing your product, choose a SySAM license model, determine the license server information, and obtain license files.

When you purchase SySAM 2-enabled Sybase products, you must generate, download, and deploy SySAM product licenses.

- If you purchased your product from Sybase or an authorized Sybase reseller, go to the secure Sybase Product Download Center (SPDC) at <https://sybase.subscribenet.com> and log in to generate license keys. The license generation process may vary slightly, depending on whether you ordered directly from Sybase or from a Sybase reseller
- If you ordered your product under an SAP® contract and were directed to download from SAP Service Marketplace (SMP), you can use SMP at <http://service.sap.com/licensekeys> to generate license keys for Sybase products that use SySAM 2-based licenses.

## Planning an Adaptive Server Installation

### 1. Choose a SySAM license model:

License Model	Description
Unserviced license model	Licenses are obtained directly from the license file. If you are using an unserved license, save the license file to the machine on which you install the product.
Served license model	A license server manages the allocation of licenses among multiple machines.

### 2. For the served license model, decide whether to use an existing or new license server.

The license server and your product installation need not share the same machine, operating system, or architecture.

### 3. If you choose the served license model:

- Decide whether to use an existing or new license server.  
The license server and your product installation do not need to share the same machine, operating system, or architecture.
- To install on a machine that is running a SySAM 1.0 license server, follow migration instructions in the *SySAM Users Guide* to migrate to the newer SySAM version.

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**Note:** There can be only one instance of a SySAM license server running on a given machine. To set up a SySAM 2 license server on a machine that is already running a SySAM 1.0 license server, migrate the old license server to SySAM 2. A migrated license server can serve licenses for both SySAM 1.0 and SySAM-2-enabled products.

---

### 4. Get your host IDs – when you generate licenses at the Sybase Product Download Center (SPDC) or SAP Service Marketplace (SMP), you must specify the host ID of the machine where the licenses will be deployed. For:

- Unserved licenses – the host ID of the machine where the product will run. If you are running a product with per-CPU or per-chip licensing that supports SySAM sub-capacity and want to run the product in a virtualized environment, see *SySAM Sub-capacity Licensing* in the *SySAM Users Guide*.
- Served licenses – the host ID of the machine where the license server will run.

To use an existing license server, you must know the server host name and port number.

If Sybase assigns any port numbers to you for use with Adaptive Server, exclude these numbers from any port-scanning software you run. Adaptive Server attempts to service each scan as a login attempt, which may lead to poor performance.

### 5. Before installing your product, get license files from SPDC or from SMP using the access information you receive from Sybase or your Sybase reseller.

Log in to SPDC or SMP by using the information in your welcome e-mail message.

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**Note:** If you purchased your Sybase software from a Sybase reseller, you receive a Web key rather than an e-mail message.

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If you plan to use sub-capacity licensing, see the *SySAM Users Guide* for information on how to configure using the **sysamcap** utility.

## SySAM License Server

Make sure that you have installed the required SySAM license server version. Replication Server 15.5 and later include FLEXnet Publisher license server manager, which is platform-specific.

- License server version

You must install the SySAM license server version 2.1 or later. To determine the current license server version, use the **sysam version** command.

---

**Note:** License server version 2.0 and earlier do not include this command.

---

The SySAM license server installer is available in your *ASE\_installer\_image/sysam\_setup* directory. You can also download the latest license server from the SySAM License Server and Utilities Install Web site at <http://www.sybase.com/sysam/server>.

- FLEXnet Publisher version

**Table 1. FLEXnet Publisher Versions Supported on UNIX Platforms**

Platforms	FLEXnet Publisher Version
HP-UX Itanium (64-bit)	11.6
IBM AIX (64-bit)	10.8.5
IBM p-Series (Linux on POWER) (64-bit)	11.5
Red Hat Enterprise Linux (RHEL) (32-bit and 64-bit)	11.5
SuSE Linux Enterprise Server (SLES) (32-bit and 64-bit)	11.5
Sun Solaris SPARC 8, 9, and 10 (64-bit)	11.5
Sun Solaris 10 x86-64 (64-bit)	11.5

If you use a SySAM license server, you must update the SySAM license server to at least version 2.1, which includes the FLEXnet Publisher version 11.6.1 license server components on all platforms, before installing Replication Server 15.7. To check the version of your license server, examine the license server log or execute:

```
cd $SYBASE/SYSAM-2_0/bin
./lmutil lmver lmgrd
```

### **IPv6 Configuration**

Use the **sysam configure** command to choose the version of the license server based on your environment.

Adaptive Server includes IPv4 and IPv6 versions of the SySAM license server software. By default, the installer configures SySAM for IPv4 support.

The IPv4 version of the license server cannot be used properly if you have enabled IPv6 on the license server host. If this is the case, you can:

- Disable IPv6 TCP/IP protocol on the license server host.
- Use another Windows host that does not have IPv6 enabled.
- Use a UNIX host for the license server. You can use the IPv4 version of the license even if both IPv4 and IPv6 are enabled on UNIX.

If you are using the IPv6 version of the license server on a Windows host, you can access this license server only through the IPv6 protocol. Any host with an IPv4 only network stack cannot obtain licenses from this IPv6 license server. To resolve this issue:

- Use a UNIX host for the license server. License servers on UNIX can serve licenses to both IPv4 and IPv6 client hosts.
- Use two separate Windows machines. Set up two license servers on two different hosts in the network; one to serve the IPv4 network and the other one to serve the IPv6 network.

You can use the SySAM script to configure the appropriate version of the license server:

```
sysam configure [IPv6|IPv4]
```

For example, to configure use of the IPv4/IPv6 dual stack binaries, use:

```
sysam configure IPv6
```

### **SySAM Licensing Checkout**

If Adaptive Server was licensed using a per-processor license type in versions earlier than 15.7, the license quantity was determined at start-up.

Adaptive Server periodically checks the number of processors it can use and attempts to check out additional licenses for any increase. Replication Server shuts down after a 30-day grace period expires if additional licenses are not made available within this period.

See the *SySAM Users Guide*.

# System Requirements

Before installing Adaptive Server, ensure that your system is updated with the latest patches and system requirements. Do not use a patch that is earlier than the version suggested for your operating system. Use the patch recommended by the operating system vendor, even if it supersedes the patch listed.

To list all currently installed patches and display the operating system version level, enter:

```
rpm -q -a
```

## *Linux Requirements*

Adaptive Server 15.7 supports Pentium and higher chip sets.

Intel Xeon AMD Opteron systems – require a minimum RAM of 512MB and the following updates:

- Red Hat Enterprise Linux 5.0 update: 5
  - kernel-2.6.18-53.1.13.el5
  - glibc-2.5-18
- SuSE Linux Enterprise Server (SLES) 11
  - kernel-smp-2.6.16.21-0.8
  - glibc-2.4-31.2

IBM pSeries Server with POWER5 CPU systems – require a minimum RAM of 512MB and the following updates:

- Red Hat Enterprise Linux 5.0 update:5
  - kernel-2.6.18-53.1.13.el5
  - glibc-2.5-18
- SuSE Linux Enterprise Server (SLES) 11
  - kernel-smp-2.6.16.21-0.8
  - glibc-2.4-31.2

Required libraries for Linux:

- openmotif-2.3.1-2.el5
- libXp-1.0.0-8.1.el5
- libXt-1.0.2-3.1.fc6
- libXtst-1.0.1-3.1
- libXmu-1.0.2-5
- libXext-1.0.1-2.1
- libSM-1.0.1-3.1
- libICE-1.0.1-2.1

## System Requirements

- libX11-1.0.3-9.el5

Linux 64-bit x64 system memory requirements are:

- Minimum RAM required for Adaptive Server, with default stack size, packet size, and user log cache size – 127 MB
- Minimum RAM per additional user – approximately 324KB
- Default user stack size – 128KB

**Table 2. Linux Disk Space Requirements**

Product	Linux X64 Requirements	Linux X64 PSeries Requirements
Adaptive Server typical installation	921MB	1092MB
Default databases created during installation	306MB	164MB
<b>Total</b>	1071MB	1256MB

Ensure that you have the required operating system patches for the Java Runtime Environment (JRE) version 6.

Information about the required operating system patches is available from the *Java Web site for Linux*.

## Memory Requirements

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Each operating system has a default maximum shared-memory segment. Make sure your operating system is configured to allow the allocation of a shared-memory segment at least as large as the maximum memory value.

The amount of memory Adaptive Server can use on a Linux system is chip-dependent.

# Preparing to Install Adaptive Server

Prepare your system before starting the installation.

1. Ensure that the account used to start the server has read and write permissions over the directory in which you are installing the server. You may need to create nonadministrative logins to install the server into personal directories.
2. Unset the LD\_ASSUME\_KERNEL variable.
3. Review the SySAM licensing procedures and plan your server configuration using the configuration guide for your platform.
4. Create a Sybase account with administrative privileges for consistency and security. This user account could be "sybase" or any other username. Use this account to perform all installation and device-creation tasks.

This user must have permission privileges from the top (or root) of the disk partition or operating system directory down to the specific physical device or operating system file. Maintain consistent ownership and privileges for all files and directories. A single user—the Sybase system administrator with read, write, and execute permissions—should perform all installation, upgrade, and setup tasks.

If you are installing Adaptive Server on more than one computer, create the "sybase" user account on each machine.

5. Log in to the machine as the Sybase user.

Maintain consistent ownership and privileges for all files and directories. A single user—the Sybase system administrator with read, write, and execute permissions—should perform all installation, upgrade, and setup tasks.

6. If you have enabled the Java in the database feature, create the `sybpcidb` database and disable the feature during the installation. See *Managing Java in the Database During Installations and Upgrades* on page 17.
  7. Decide where to install Adaptive Server:
    - Make sure there is sufficient disk space and temporary directory space available.
    - Ensure that there are no spaces in the path name of the directory.
  8. Decide whether you want licensing events to trigger e-mail alerts, and the severity of the events that generate e-mail messages.
- If you choose to have e-mail notifications for license events, know your:
- SMTP server host name
  - Port number for an SMTP server

---

**Note:** If Sybase assigns any port numbers to you for use with Adaptive Server, make sure to exclude these numbers from any port-scanning software you run. Adaptive

## Preparing to Install Adaptive Server

Server attempts to service each scan as a login attempt, which could lead to poor performance.

---

- E-mail return address
- Recipients of the notifications
- Severity level of an event that triggers mail. Your choices are:
  - None
  - Informational
  - Warning
  - Error

### 9. Verify that your network software is configured.

Sybase software uses network software even if Adaptive Server and Sybase client applications are installed on a machine that is not connected to a network.

If you are having connection problems, or to verify your network configuration, ping the host.

### 10. Adjust the shared memory for your operating system.

## Adjusting the Operating System Shared Memory Parameters

---

Adjust shared memory segments if Adaptive Server cannot obtain large memory as a single segment or if Backup Server stripes fail due to insufficient segments.

Depending on the number and types of devices used for backup (**dump**) and recovery (**load**), you may need to adjust the shared memory segment parameter in the operating system configuration file to accommodate concurrent Backup Server processes. There are six default shared memory segments available for process attachments.

If any reconfiguration through **sp\_configure** requires additional memory, Adaptive Server allocates shared memory segments after start-up. To account for these additional segments, allocate the maximum memory available to Adaptive Server by using the **allocate max shared memory** configuration parameter. See the *System Administration Guide*.

1. The operating system shared memory default, for most Linux releases is 32MB. The minimum required by Adaptive Server is 64MB for default Server with 2K pages. A higher value is required if you plan to increase Adaptive Server's **total memory**. Set the stack size to **unlimited** to avoid shared memory attachment problems. Set this using **ulimit -s unlimited** on Bourne Shell, or **limit stacksize unlimited** on C-Shell.
2. Use the **sysctl(8)** method to check and adjust the operating system shared memory parameter:

To check the current shared memory size, enter:

```
# /sbin/sysctl kernel.shmmax
```



To adjust the shared memory size at runtime, enter the following, where *nnn* is 1073741824 for 1GB of shared memory:

```
# /sbin/sysctl -w kernel.shmmax=nnn
```

---

**Note:** The default operating system shared memory for some older Linux releases is 32MB. The minimum required by Adaptive Server is 64MB for a default server with 2K pages. A higher value is required if you plan to increase the Adaptive Server **total memory**.

---

3. To guarantee that the minimum operating shared value is applied every time the system is started, edit the `/etc/sysctl.conf` file.
4. On Linux RHEL Update 4.0 and greater, Adaptive Server version 15.x running on multiple engines requires the security feature Exec-Shield to be disabled. To disable Exec-Shield:
  - a) Add the following lines in `/etc/sysctl.conf`:

```
kernel.exec-shield=0
kernel.exec-shield-randomize=0
```

On RHEL Update 5.0

```
kernel.exec-shield=0
kernel.randomize_va_space=0
```

- b) As super user (root), for the action to take effect, enter:

```
/sbin/sysctl -P
```

For additional information, see *the Red Hat Web site*.

## Managing Java in the Database During Installations and Upgrades

---

If you have enabled the Java in the database feature, create the `sybpcidb` database before installing or upgrading to Adaptive Server version 15.7.

If you plan to use **sqlupgrade** utility to upgrade from a pre-15.0.x Adaptive Server, do not disable the Java in the database feature. The **sqlupgrade** utility automatically disables, then re-enables, the feature.

1. Create the `sybpcidb` database. The `sybpcidb` database stores configuration information for the pluggable component interface (PCI) and all pluggable component adapter (PCA) components. This database is used by the `installpcidb` script. For example:

```
1> disk init
2> name = "sybpcidb_dev",
3> physname = "${SYBASE}/data/sybpcidb_dev.dat",
4> size = '24MB'
5> go
1> create database sybpcidb on sybpcidb_dev = 24
2> go
```

## Preparing to Install Adaptive Server

The device and database sizes depend on the Adaptive Server page size:

- 2K page size – 24MB
- 4K page size – 48MB
- 8K page size – 96MB
- 16K page size – 192MB

### 2. Disable the Java in the database feature:

```
1> sp_configure 'enable java', 0
2> go
```

---

**Note:** If you are upgrading from a pre 15.0.x server, do not disable Java in the database feature. **sqlupgrade** automatically disables this feature before an upgrade and re-enables the feature after an upgrade.

---

### 3. Reenable the feature after you have successfully installed or upgraded to Adaptive Server 15.7:

```
1> sp_configure 'enable java', 1
2> go
```

# Adaptive Server Installation

Install Adaptive Server.

The installer creates the target directory (if it does not yet exist) and installs the selected components into that directory.

---

**Note:** Adaptive Server Enterprise 15.7 includes new major versions of Adaptive Server and many of the supporting components. Installing Adaptive Server version 15.7 into the same directory with existing products should not impact the existing products. However, installing other products on top of Adaptive Server version 15.7 may result in one or more products not working correctly.

Sybase strongly recommends that you install Adaptive Server version 15.7 into its own directory if possible. If you must install other products into the same directory, install Adaptive Server version 15.7 last.

---

At the end of the installation, you can verify the product installation. You may need to perform additional configuration procedures before using some products.

## Installing Adaptive Server in GUI Mode

---

Use GUI mode to install Adaptive Server and related products for use.

### Prerequisites

Shut down all programs before running the installer.

### Task

1. Insert the Adaptive Server installation media in the appropriate drive, or download and extract the Adaptive Server installation image from the Sybase Product Download Center (SPDC) or the SAP Service Marketplace (SMP).
2. Mount the disk:

```
mount -v "cdrfs" -r <device> /cdrom
```
3. Launch the installer:

```
/cdrom/setup.bin
```
4. Select the language.
5. On the Welcome screen, click **Next**.
6. Accept the default directory or enter a new path, then click **Next**.

If you see a **Choose Update Installation** pane, this means you have an earlier version of the server, and you need to perform an upgrade rather than a new installation. See *Adaptive Server Upgrades* on page 43.

7. Choose the type of installation to be performed.
  - **Typical**
  - **Full**
  - **Custom** – if you choose this, you see the Products and Features Selection window. Select the products to install. The installer installs unselected items if your selections are dependent on them.
8. Select the software license type for the Adaptive Server suite:
  - **Install licensed copy of Adaptive Server Suite**
  - **Install Free Developer Edition of Adaptive Server Suite**
  - **Install Express Edition of Adaptive Server Suite**
  - **Evaluate Adaptive Server Suite which is valid for 30 days from the installation date**
9. Choose the most appropriate region, read the license terms, then click **I agree**. Click **Next**.
10. (Licensed copy of Adaptive Server Suite only) Specify the license type:
  - Enter a license file. If it is a served license key, you are prompted to set up the license server.
  - Use an existing license server
  - Proceed without specifying license information for the duration of 30 days from the installation date.
11. (Licensed copy of Adaptive Server Suite only) Specify product edition:
  - **Enterprise Edition**
  - **Small Business Edition**
  - **Developer Edition**
  - **Unknown** – select this if you are unsure about the license type.

---

**Note:** Choosing **Unknown** prevents you from being able to select **Optimize Adaptive Server**, later in the installation process.

---

Depending on the edition, you can also select the license type under which the product is licensed.

12. (Licensed copy of Adaptive Server Suite only) To configure your server to send e-mail notifications about license management events that require attention, provide:
  - SMTP server host name
  - SMTP server port number
  - E-mail return address

- Recipient e-mail addresses
- Message severity that triggers e-mail messages

In the summary window, click **Next**.

13. Verify the installation type and that you have enough disk space for the installation. Click **Next**.

The installation status window displays the result of the installation process.

## **Minimally Configuring Adaptive Server in GUI Mode**

---

Use GUI mode to minimally configure Adaptive Server and related products for use.

1. If you installed the Adaptive Server plug-in, select **enable** or **disable** to remember the Adaptive Server password, then click **Next**.
2. Depending on the products you have installed, you may be prompted to configure new servers. Select the servers you want to configure. Unselect any items you do not want to configure now:

- **Configure a new Adaptive Server**
- **Configure a new Backup Server** – see the *System Administration Guide*.
- **Configure a new XP Server** – see the *Transact-SQL® Users Guide*.
- **Configure Job Scheduler** – see the *Job Scheduler Users Guide*.
- **Enable Self Management**
- **Configure Web Services** – see *Web Services Users Guide*.
- **Configure an Unified Agent** – see *Unified Agent and Agent Management Console*.

Click **Next**.

3. Enter your custom Adaptive Server configuration information:
  - Adaptive Server name
  - Port number
  - Error log – name and location of the error log file.
  - Application type:
    - (Default) MIXED – both OLTP and DSS.
    - OLTP – online transaction Processing generally consists of smaller, less complex transactions.
    - DSS – decision-support systems generally have less update activity with large complex queries.
  - Page size:
    - 2KB
    - (Default) 4KB
    - 8KB

- 16KB

---

**Note:** The default page size selection changed to 4KB in Adaptive Server version 15.5. The default in earlier versions was 2KB. If you plan to load database dumps from an Adaptive Server with a page size that is not 4KB, enter the page size to match the database dump.

---

- Language
- Character set
- Sort order
- Optimize Adaptive Server configuration – if you select this option, you must also provide this information:
  - Available physical memory for Adaptive Server – the value is 80 percent of sum of combined physical memory and OS shared memory.
  - Available CPU for Adaptive Server – the value is 80 percent of the physical CPU, with a minimum of 1.

---

**Note:** If the value specified is larger than the available resource for allocation to the server, the optimize configuration may fail, causing the server to not start.

---

- Create sample databases – create or install sample databases. Make sure you calculate the additional space for your master device.

After customizing your Adaptive Server configuration, click **Next** to record the input fields.

#### 4. You see the second custom configuration window.

- Master device – name of master device and the path where it should be located.
- Master device size – the default options are:
  - 2KB page size – 30MB
  - 4KB page size – 60MB
  - 8KB page size – 120MB
  - 16KB page size – 240MB
- Master database size – the default options are:
  - 2KB page size – 13MB
  - 4KB page size – 26MB
  - 8KB page size – 52MB
  - 16KB page size – 104MB
- System procedure device path
- System procedure device and database size – the default is 172MB.
- System device path
- System device size – the default options are:
  - 2KB page size server – 3MB
  - 4KB page size server – 6MB

- 8KB page size server – 12MB
- 16KB page size server – 24MB
- System database size – the default options are:
  - 2KB page size server – 3MB
  - 4KB page size server – 6MB
  - 8KB page size server – 12MB
  - 16KB page size server – 24MB
- Temporary database device
- Temporary database device size:
  - 2KB page size server – 100MB
  - 4KB page size server – 100MB
  - 8KB page size server – 100MB
  - 16KB page size server – 100MB
- Temporary database size:
  - 2KB page size server – 100MB
  - 4KB page size server – 100MB
  - 8KB page size server – 100MB
  - 16KB page size server – 100MB
- Enable PCI in Adaptive Server – if you select this option, provide this additional information:
  - PCI device
  - PCI device size
  - PCI database size – PCI device and PCI database size are the same:
    - 2KB page size server – 24MB
    - 4KB page size server – 48MB
    - 8KB page size server – 96MB
    - 16KB page size server – 192MB

After customizing your Adaptive Server configuration, click **Next** to record the input fields.

**5.** Enter the Backup Server information:

- Backup Server name
- Port number
- Error log

Click **Next**.

**6.** Enter the XP Server configuration information:

- Port number
- Error log

Click **Next**.

7. Enter Job Scheduler information:

- Job Scheduler
- Agent name
- Port number
- Management device
- Management device size – the default is 75MB
- Management database size – the default is 75MB

Click **Next**.

8. Custom-configure self management:

- Self management user name
- Self management password

---

**Note:** If you choose the default user name "sa," you cannot enter the password. The "sa" default password is null.

---

9. Custom-configure Web Service:

- Producer HTTP Port Number
- Producer HTTPS Port Number
- Producer Host Name
- Certificate Password
- Confirm Certificate Password
- Keystore Password
- Confirm Keystore Password
- Producer Log File
- Consumer Port Number
- Consumer Log File

10. Choose a Self-Discovery Service Adapter to configure:

- UDP Adapter
- JINI Adapter – if you select this, enter:
  - JINI host name
  - JINI port number
  - JINI heart beat period

11. Security Login Modules – choose the security login modules for the Unified Agent, then click **Enable**:

- **Simple Login Module** – a dialog asks you to change the user name and password
- **Adaptive Server Login Module**
- **Unix Proxy Login Module**

12. Verify that the values that appear in the Configure New Servers Summary window are correct, then click **Next**. You see the Configure Server Progress window



You may see the restart window, which reminds you to either log out or restart your machine to complete the installation process.

13. In the Installation Complete window, click **Done**.

Adaptive Server and related products have been successfully installed, and minimally configured for use. See *Installing Sample Databases* on page 38, to begin experimenting with your servers, or see the *System Administration Guide* for more advanced topics.

If you encounter any errors, see the *Troubleshooting Guide*.

## Creating a Response File for Unattended Adaptive Server Installations

---

By saving installation configuration information into a response file during the initial GUI installation, you can perform subsequent installations of Adaptive Server using a silent—or "unattended"—method.

---

**Note:** Adaptive Server version 15.7 uses a rearchitected installation program that is incompatible with response files generated for versions 15.0.3 and earlier. Do not use response files from these earlier versions; create a new one from a 15.7 installation instead.

---

To create a response file when installing in GUI or console mode, specify the **-r** command line argument. The **-r** argument records your responses to the installation wizard prompts and creates a response file when the InstallAnywhere wizard exits. The response file is a text file that you can edit to change any responses prior to using it in any subsequent installations. A sample response file exists at *installer image/sample\_response.txt*.

Create a response file during GUI installation by specifying the **-r** command-line argument, and, optionally, specifying the name of your response file:

```
setup.bin -r response_file_nameWhere:
```

- **-r** – specifies the command line argument
- (Optional) *response\_file\_name* – is the absolute path of the file into the installation information is stored, such as `/tmp/responsefile.txt`.

---

**Note:** The directory path you specify must already exist.

---

## Installing Adaptive Server from the Command Line

---

Choose command line installation if you are developing custom installation scripts, or you prefer a nonwindowing interface.

1. At the command line, enter:

```
setup.bin -i console
```

The installation program starts.

2. If the installation program launches automatically, select **Cancel** to stop the GUI installation, then launch the setup program from a terminal or console.

The flow of the installation is identical to a regular GUI installation, except that the display is written to a terminal window and responses are entered using the keyboard.

---

## Installing Adaptive Server in Unattended, Silent Mode

---

If you have more than one installation of Adaptive Server to perform, you can, after running the installer in GUI mode and recording the responses into a response file, edit the file to customize the responses. You can then use that response file to answer the installer when you run the installer in silent mode.

### Prerequisites

Use `setup.bin -r responseFileName` to generate a installation response file during a console or GUI installation.

### Task

Run the following, where *responseFileName* is the absolute path of the file name containing the installation options you chose:

```
setup.bin -f responseFileName -i silent  
-DAGREE_TO_SYBASE_LICENSE=true -DRUN_SILENT=true
```

---

**Note:** You must agree to the Sybase License Agreement when installing in silent mode. You can either:

- Include the option `-DAGREE_TO_SYBASE_LICENSE=true` in the command line argument.
- Edit the response file to include the property `AGREE_TO_SYBASE_LICENSE=true`.

---

Except for the absence of the GUI screens, all actions of InstallAnywhere are the same, and the result of an installation in silent mode is exactly the same as one done in GUI mode with the same responses.

---

## Installer Changes from Adaptive Server 12.5.4 to Adaptive Server 15.7

---

The directory structures for Adaptive Server installations differ depending on version.

**Table 3. Directory Changes for UNIX Platforms**

<b>Component</b>	<b>12.5.4 Location</b>	<b>15.0.2 Location</b>	<b>15.0.3 Location</b>	<b>15.5 and 15.7 Locations</b>
Adaptive Server	\$SYBASE/ ASE-12_5	\$SYBASE/ ASE-15_0	\$SYBASE/ ASE-15_0	\$SYBASE/ ASE-15_0
Shared directory	\$SYBASE/ shared	\$SYBASE/ shared	\$SYBASE/ shared	\$SYBASE/ shared
Sybase Central	\$SYBASE/ shared/syb- central43	\$SYBASE/ shared/syb- central43	\$SYBASE/ shared/syb- central600	\$SYBASE/ shared/syb- central600
JRE	\$SYBASE/ shared/ jre142	\$SYBASE/ shared/ jre142_*	\$SYBASE/ shared/ JRE-6_0*	\$SYBASE/ shared/ JRE-6_0*
Shared JAR file	\$SYBASE/ shared/lib			
locales	\$SYBASE/lo- cales	\$SYBASE/lo- cales	\$SYBASE/lo- cales and \$SYBASE/ ASE-15_0/ locales	\$SYBASE/lo- cales and \$SYBASE/ ASE-15_0/ locales
Connectivity	\$SYBASE/ OCS-12_5	\$SYBASE/ OCS-15_0	\$SYBASE/ OCS-15_0	\$SYBASE/ OCS-15_0
Web Service	\$SYBASE/ WS-12_5	\$SYBASE/ WS-15_0	\$SYBASE/ WS-15_0	\$SYBASE/ WS-15_0
Replicator	\$SYBASE/ RPL-12_5	\$SYBASE/ RPL-15_0	\$SYBASE/ RPL-15_0	
SySAM	\$SYBASE/SY- SAM-1_0	\$SYBASE/SY- SAM-2_0	\$SYBASE/SY- SAM-2_0	\$SYBASE/SY- SAM-2_0
Job Scheduler	\$SYBASE/ JS-12_5	\$SYBASE/ ASE-15_0/ jobschedu- ler	\$SYBASE/ ASE-15_0/ jobschedu- ler	\$SYBASE/ ASE-15_0/ jobschedu- ler
Unified Agent		\$SYBASE/ UAF-2_0	\$SYBASE/ UAF-2_0	\$SYBASE/ UAF-2_5



# Installation of Version 15.7 Over an Existing 15.x Adaptive Server

Use a binary overlay to install Adaptive Server 15.7 over an existing version 15.x.

If you have enabled the Java in the database feature, create the `sybpcidb` database and disable the feature during the installation. See *Managing Java in the Database During Installations and Upgrades* on page 17.

## Determining the Adaptive Server Version

---

Verify that your current version of Adaptive Server is not earlier than 15.x before using the binary overlay.

If your server is at a 15.x version level, you can begin installing Adaptive Server 15.7.

1. Verify that your version of Adaptive Server you have is version 15.x:

- If your server is running:

```
1> select @@version
2> go
```

- If your server is not running:

```
$SYBASE/$SYBASE_ASE/bin/dataserver -v
```

2. Source environment variables before executing **dataserver -v**.

If the result shows that the Adaptive Server is lower than version 15.x, you cannot use the binary overlay, but use an upgrade method instead. See *Adaptive Server Upgrades* on page 43.

## Backing Up Adaptive Server

---

Installing Adaptive Server version 15.7 overwrites the current Adaptive Server software. Before installing, verify that your databases are error free, and back up the Sybase directory.

1. To ensure that your database is error free, run **dbcc checkdb**, **dbcc checkcatalog** and **dbcc checkstorage** before loading any new Adaptive Server binaries, including the master database. If the **dbcc** commands reveal problems, check the *Error Messages and Troubleshooting Guide* for actions necessary to fix the problem. If the error is not listed in the manual, call Sybase Technical Support.

## Installation of Version 15.7 Over an Existing 15.x Adaptive Server

2. After you have verified that your database is error free, back up your \$SYBASE directory in case you need to roll back to the original version of the software.
3. Adaptive Server provides the **uninstmsgs.ebf** script for backing up `sysmessages` before upgrading to 15.5. Use it to back up `sysmessages` before running **instmsgs.ebf**.

## Installing Adaptive Server Using Binary Overlay

Use InstallShield to install Adaptive Server version 15.7 on top of an Adaptive Server that is no earlier than version 15.x.

1. From your SYBASE directory, shut down the servers that are using the binaries,
2. Use InstallShield to load the new software from the CD or DVD.  
Navigate to the CD or DVD drive and enter `./setup.bin`.
3. Install Adaptive Server 15.7 into the existing \$SYBASE installation path.

---

**Note:** Once files are loaded into your \$SYBASE directory, select not to configure the new server, and click **Continue** to finish the installation.

---

4. Restart Adaptive Server:  
`$SYBASE/$SYBASE_ASE/install/startserver [-f RUN_server_name file]`
5. Run **select @@version**. The server should now be at version 15.7.
6. In Adaptive Server version 15.7, several changes have been made to the system stored procedures and many new error messages have been added. After performing a binary overlay, you must perform the postinstallation tasks before running **installmaster** or `instmsgs.ebf`.

# Postinstallation Tasks

After you install the server, set it up.

The Adaptive Server installation includes directories containing sample client library applications. These sample programs are included for training purposes only and are not intended to be installed in a production environment.

If you are setting up a production environment, remove these directories:

- \$SYBASE/OCS-15\_0/sample
- \$SYBASE/DataAccess/ODBC/samples
- \$SYBASE/jConnect-7\_0/sample2
- \$SYBASE/jConnect-7\_0/classes/sample2
- \$SYBASE/ASE-15\_0/sample
- \$SYBASE/WS-15\_0/samples

## Verifying that Servers are Running

---

Verify the servers are running.

### Prerequisites

Before starting the server, make sure you have stopped, then started the services related to the server.

### Task

If you have already started the server, do not run the command a second time. Running it more than once can cause problems.

## Verifying Your Connection to the Servers

---

Verify your connection to the servers.

Use **isql** to perform a quick test:

- At the command prompt, enter the following, where *server\_name* is the Adaptive Server name:

```
isql -Usa -P<password or leave it blank> -Sserver_name
```

---

**Warning!** The first time you log in to Adaptive Server, there is a default "sa" user name with all of the privileges but no password. After logging in for the first time, Sybase strongly advises you to change the system administrator's password.

---

## Postinstallation Tasks

You see the **isql** prompt if the login is successful.

- At the **isql** prompt, enter:

```
1> select @@version
2> go
```

The output should show Adaptive Server at version 15.7.

If you encounter errors, see the *Troubleshooting Guide*.

## PC-Client Installation

---

The PC-Client installer contains client applications and utilities you can use to access the Adaptive Server to execute queries or manage the server. It also contains the Sybase Open Client/ Open Server™ Software Developers Kit, which you can use to develop applications that access the server, and ODBC, OLE DB, and ADO.NET clients.

Client applications, such as Sybase Central and Open Client, access Adaptive Server.

The Sybase PC-Client CD includes the Software Developer's Kit (SDK) for Windows platforms, consisting of:

- Embedded SQL™
  - Embedded SQL™/C (ESQL/C)
  - Embedded SQL/Cobol (ESQL/Cobol)
- XA-Library™ – XA Interface Library for ASE Distributed Transaction Manager
- Adaptive Server Enterprise extension module for Python
- Additional connectivity language modules
- Open Client™ (CT-Library, DB-Library™)
- Microsoft Cluster Server Resource Type for ASE
- Interactive SQL
- Sybase Central™
- ASE ADO.NET Data Provider
- ASE OLE DB Provider by Sybase
- ASE ODBC Driver by Sybase
- ASE plug-in
- QPTune
- jConnect™ 7.0 for JDBC
- SySAM License Utilities
- DBISQL
- SDC Administration Utility



## System Requirements for Clients

Check the system requirements for the machine on which you plan to install the PC-Client.

Type	Requirement
Product	PC-Client
Hardware	P4 1.0GHz
Operating system	Windows Server 2008 R2, Windows Vista, Windows 7, Windows XP
Suggested minimum RAM	512MB

**Note:** If you are using ODBC, OLE DB, or ADO.NET drivers, make sure that Microsoft .NET Framework 2.0 Service Pack 1 is installed on your Windows machine. To confirm that it is installed, select **Control Panel > Add or Remove Programs** and verify that .NET Framework appears in the list of currently installed programs.

## Installing the Client

The PC-Client CD contains several components that are each packaged with their own installer. When you insert the PC-Client CD, a menu program launches automatically. The menu program presents the list of components that can be installed from the CD and allows you to install them one at a time. Before installing any products, review the `readme.txt` file, which contains a brief description of each of the products, lists dependencies, and contains any last-minute instructions or changes.

The PC-Client CD contains 32-bit and 64-bit SDK. It installs 32-bit SDK on 32-bit OS; and 64-bit SDK on 64-bit OS.

1. Verify that your computer has sufficient disk space for each product.
2. If you are unloading components, log in using an account with administrator privileges.
3. Close any open applications or utilities to free memory and system resources.
4. Go to **Start > Run** to start the installation program, and enter the following, where *X* is the directory into which you have copied the PC-Client installation files:  
`X:\autorun.exe`
5. Select **Client Components 15.7**. You see the Welcome window.
6. Select a country, agree to the licensing terms.
7. Enter the directory path. If you specify a destination that contains an earlier version of the server, you see **Choose Update Installation**, and you can select the features to update.
8. Only if you are installing a new server, choose the type of installation:

<b>Typical Install</b>	Installs the default components that most users need.
------------------------	---

<b>Full Install</b>	Installs every component on the CD.
<b>Custom Install</b>	Allows you to select the components to install. Certain components are automatically installed if they are required to run other selected components. If you select <b>Custom Install</b> , specify the components to install.

9. The Summary window displays every component to be installed by the installer, the required disk space, and the available disk space.
10. If the target directory does not have enough free space, the available space appears in red. Click **Previous** to return to the previous window and change your selections, or **Cancel** to quit the installer.

**Creating a Response File for Unattended Adaptive Server Installations**

By saving installation configuration information into a response file during the initial GUI installation, you can perform subsequent installations of Adaptive Server using a silent—or "unattended"—method.

---

**Note:** Adaptive Server version 15.7 uses a rearchitected installation program that is incompatible with response files generated for versions 15.0.3 and earlier. Do not use response files from these earlier versions; create a new one from a 15.7 installation instead.

---

To create a response file when installing in GUI or console mode, specify the **-r** command line argument. The **-r** argument records your responses to the installation wizard prompts and creates a response file when the InstallAnywhere wizard exits. The response file is a text file that you can edit to change any responses prior to using it in any subsequent installations. A sample response file exists at *installer image/sample\_response.txt*.

Create a response file during GUI installation by specifying the **-r** command-line argument, and, optionally, specifying the name of your response file:

`setup.bin -r response_file_name`Where:

- **-r** – specifies the command line argument
- (Optional) *response\_file\_name* – is the absolute path of the file into the installation information is stored, such as `/tmp/responsefile.txt`.

---

**Note:** The directory path you specify must already exist.

---

**Installing the Client in Unattended, Silent Mode**

After running the installer in GUI mode and recording the responses into a response file, edit the file to customize the responses.

To install in unattended, silent mode, run:

```
setupConsole.exe -f responseFileName -i silent
-DAGREE_TO_SYBASE_LICENSE=true
```

where *responseFileName* is the absolute path of the file name containing the installation options you chose.

Agree to the Sybase License Agreement when installing in silent mode by either:

- Including this text in the command-line argument: -  
DAGREE\_TO\_SYBASE\_LICENSE=true, or
- Editing the response file to include the property  
AGREE\_TO\_SYBASE\_LICENSE=true

The only difference when you install the client in silent mode is the absence of the GUI screens. All actions and responses are the same as using InstallAnywhere.

---

**Warning!** Sybase recommends that you use the `setupConsole.exe` executable, which runs in the foreground when you are running a silent installation. The normal `setup.exe` executable runs in the background, giving you the impression that the installation has terminated, and results in additional installation attempts using the silent installation. Multiple installations at the same time may corrupt the Windows Registry and lead to a failure to restart the operating system.

---

## Getting Started After Installing

After installing Adaptive Server, Sybase Central, and the Java Runtime Environment, test the installation and network connections. Adaptive Server communicates with other Adaptive Servers, Open Server applications (such as Backup Server), and client software on your network. Clients can talk to one or more servers, and servers can communicate with other servers by remote procedure calls.

For Sybase products to interact with one another, each product must know where the others reside on the network. Sybase stores this information in the `interfaces` file on Windows or in a Lightweight Directory Access Protocol (LDAP) server.

1. Select **Start > Programs > Sybase > Sybase Central 6.0.0**.
2. Select **Tools > Connect** from the Sybase Central menu bar to activate an Adaptive Server login window.
3. Log in using the default user ID, "sa," without a password. If you have changed the password, use the new password.
4. Select the Adaptive Server to which you want to connect.
5. To disconnect from a server, select **Tools > Disconnect**, or right-click the connected server icon and select **Disconnect**.
6. Exit Sybase Central.

### Configuring `libtcl.cfg` for LDAP

Use the `libtcl.cfg` file to specify an LDAP server name, port number, DIT base, user name, and password to connect to an LDAP server.

When an LDAP server is specified in the `libtcl.cfg` file, the server information is accessible only from the LDAP server. Adaptive Server ignores the `interfaces` file. Open Client and Open Server applications that use the `-i` option at start-up override the

## Postinstallation Tasks

`libtcl.cfg` file and use the `interfaces` file. See the Adaptive Server configuration guide for your platform for more information.

1. Configure the `libtcl.cfg` file to use directory services—use any standard ASCII text editor to:
  - Remove the semicolon (;) comment markers from the beginning of the LDAP URL lines in the `libtcl.cfg` file under the `[ DIRECTORY ]` entry.
  - Add the LDAP URL under the `[ DIRECTORY ]` entry. See the *Configuration Guide* for supported LDAP URL values.

In its simplest form on 32-bit LDAP drivers, the `libtcl.cfg` file is in this format:

```
[ DIRECTORY ]
ldap=libsybdldap.dll
```

---

**Warning!** Ensure that the LDAP URL is on a single line.

---

```
ldap=libsybdldap.dll
ldap://host:port/ditbase??scope??
bindname=username?password
```

For example (entry shown on multiple lines only for readability):

```
[ DIRECTORY ]
ldap=libsybdldap.dll
ldap://huey:11389/dc=sybase,dc=com??one??
bindname=cn=Manager,dc=sybase,dc=com?secret
```

---

**Note:** On Windows x64, the `.dll` file is called `libsybdldap64.dll`.

---

2. Verify that the appropriate environment variable points to the required third-party libraries. The Netscape LDAP SDK libraries are in `%SYBASE%\%SYBASE_OCS%\dll`.

The Windows `PATH` environment variable must include this directory.

### **Adding a Server to the Directory Service**

Use the `dsedit` directory service editor utility to add a server to the directory service.

1. From Windows, select **Start > Programs > Sybase > Connectivity > Open Client Directory Service Editor**.
2. Select **LDAP** from the list of servers, and click **OK**.
3. Click **Add New Server Entry**.
4. Enter:
  - Server name – this is required.
  - (Optional) Security mechanism – there is a list of security mechanism OIDs in `%SYBASE%\ini\objectid.dat`.
5. Click **Add New Network Transport**:

1. Select the transport type
2. Enter the host name
3. Enter the port number
6. Click **OK** twice to exit the **dsedit** utility.

## Uninstalling PC-Client

Choose one of two methods to remove PC-Client from a Windows machine.

Actions performed by the installer are removed during an uninstallation process. Files, or registry entries created after installation are not removed and must be manually removed when the installation process has finished.

To uninstall PC-Client from a Windows machine:

- Run:  

```
%SYBASE%\sybuninstall\PCClient\uninstall.exe
```
- Use **Control Panel > Add or Remove Programs**.

## Setting the System Administrator Password

A user account called "sa" is created for the Sybase system administrator when you install the Sybase software. A user logged in as "sa" can use any database on Adaptive Server, including *master*, with full privileges.

Immediately after a new installation, there is no password on the "sa" account. The initial default value for the password is NULL. In a production environment, the Sybase system administrator should always use a non-default password. The Sybase system administrator should log in to Adaptive Server as "sa" and set a password:

The Sybase system administrator should log in to Adaptive Server as "sa" and set a password:

```
$SYBASE/$SYBASE_OCS/bin/isql -Usa -P -Sserver_name
1> sp_password null, new_password
2> go
```

where:

- **null** – is the default password.
- *new\_password* – is the password that you are assigning to the "sa" account.

For the greatest security, Sybase recommends that you create a password of at least six characters, with a combination of letters and numbers.

## Installing Sample Databases

---

The sample databases contain fictitious information and are intended to help you learn how to use Adaptive Server.

---

**Note:** The sample databases are intended for training purposes only. Do not install them in an Adaptive Server production environment.

---

- `installpubs2` – installs the `pubs2` sample database. This database contains data that represents a publishing operation. Use this database to test your server connections and to learn Transact-SQL. Most of the examples in the Adaptive Server documentation query the `pubs2` database.
- `installpubs3` – installs the `pubs3` sample database. This updated version of `pubs2` uses referential integrity. In addition, its tables are slightly different than the tables used in `pubs2`. Where noted, the Adaptive Server documentation uses the `pubs3` database in its examples.
- `installpix2` – installs the `image` data that is used with the `pubs2` database.

---

**Note:** The `master` device size should be at least 30MB to install the full `pubs2` database, including the `image` data.

Run the `installpix2` script after you run `installpubs2`.

---

## Default Devices for Sample Databases

---

The Adaptive Server installation includes scripts for installing the `us_english` sample database, foreign language sample databases, and the `image` data associated with the US English `pubs2` sample database.

These scripts are located in `$SYBASE/SYBASE_ASE/scripts`.

If you have not used `sp_diskdefault` to change the status of the `master` device or to specify another default device, the scripts install the sample databases on the `master` device. Sybase recommends you do not use this configuration because it uses valuable space that is best used for system tables. Each sample database requires 3MB on a 2K server, and multiples of 3MB on a 4K, 6K, 8K, and 16K server on your database device.

Use a text editor to edit the script, if necessary, to specify a default device other than the `master` device, or use `sp_diskdefault`. See `sp_diskdefault` in *Reference Manual: Procedures*.

## **Running the Database Scripts**

Learn how to run the database scripts.

---

**Note:** The image data requires 10MB—there are six pictures, two each in the PICT, TIFF, and Sun raster file formats. Run `installpix2` script only to use or test the image datatype. Sybase does not supply any tools for displaying image data. You must use appropriate window graphics tools to display the images after you have extracted them from the database.

---

For more information about running these scripts, see the *Configuration Guide*.

1. Start Adaptive Server.
2. Make a copy of the original `installpubs2` and `installpubs3` scripts. Be sure you can access the copies, in case you have problems with the edited scripts.
3. Use a text editor to edit the script, if necessary, to specify a default device other than the master device, or use `sp_diskdefault`.
4. Go to the Adaptive Server scripts directory, at `$SYBASE/$SYBASE_ASE/scripts`, to run the scripts.
5. Use `isql` to log in to Adaptive Server and run the script:

```
isql -Usa -P*****-Sserver_name -iscript_name
```

where:

- `server_name` – represents the destination server for the database.
- `script_name` – is the full path to and file name of the script to run.

For example, to install `pubs2` on a server named VIOLIN, enter:

```
isql -Usa -P***** -SVIOLIN -i $SYBASE/$SYBASE_ASE/scripts/
installpubs2
```

6. Install the **image** data associated with `pubs2`:

```
isql -Usa -Ppassword -Sservername
-i$SYBASE/$SYBASE_ASE/scripts/installpix2
```

The `pubs3` database does not use image data.

## **Installing the `interpubs` Database**

`interpubs` is similar to the `pubs2` database, and contains French and German data.

### **Prerequisites**

Make a copy of the original `installintpubs` script. Be sure you can access this copy, in case you experience problems with the edited script.

### **Task**

The `interpubs` database contains 8-bit characters and is available for use at Adaptive Server installations using the ISO 8859-1 (`iso_1`), ISO 8859-15 (`iso_15`), Roman 8, or

## Postinstallation Tasks

Roman9 (for HP-UX) character set. To display the French and German data correctly, you must set up your terminal to display 8-bit characters.

1. Be sure `iso_1`, `iso_15`, `Roman8`, `Roman 9`, or `UTF-8` is installed as the default character set or as an additional character set.
2. Determine the type (raw partition, logical volume, operating system file, and so on) and location of the device where you will be storing the `interpubs` database. You will need to provide this information later.
3. Use a text editor to edit the script, if necessary, specify a default device other than the master device, or use `sp_diskdefault`.
4. Execute the script, using the `-J` flag to ensure that the database is installed with the correct character set:

```
isql -Usa -Ppassword -Sservername -Jiso_1 \  
-i $SYBASE/$SYBASE_ASE/scripts/iso_1/installintpubs
```

## Installing the `jpubs` Database

Learn how to install the `jpubs` database.

---

**Note:** If you installed the Japanese Language Module with your server, the `scripts` file contains the `install jpubs` script for installing the `jpubs` database. `jpubs` is a database similar to `pubs2` that contains Japanese data. `install jpubs` uses the `EUC-JIS (eucjis)`, `UTF-8 (utf8)`, or the `Shift-JIS (sjis)` character sets.

---

1. Set your terminal to display 8-bit characters.
2. Verify that either the `EUC-JIS`, `Shift-JIS`, or the `UTF-8` character set is installed as the Adaptive Server default character set or as an additional character set.
3. Determine the type (raw partition, logical volume, operating system file, and so on) and location of the device where you will be storing the `jpubs` database. You will need to provide this information later.
4. Make a copy of the original `install jpubs` script. Be sure that you can access this copy, in case you experience problems with the edited script.
5. Use a text editor to edit the script, if necessary, to specify a default device other than the master device, or use `sp_diskdefault`.
6. Execute the `install jpubs` script, using the `-J` flag to ensure that the database is installed with the correct character set:

```
isql -Usa -Ppassword -Sservername -Jeucjis \  
-i $SYBASE/$SYBASE_ASE/scripts/eucjis/installjpubs
```

```
isql -Usa -Ppassword -Sservername -Jeucjis \  
-i %SYBASE%\%SYBASE_ASE%\scripts\eucjis\installjpubs
```

or:

```
isql -Usa -Ppassword -Sservername -Jsjis \  
-i $SYBASE/$SYBASE_ASE/scripts/sjis/installjpubs
```



```
isql -Usa -Ppassword -Sservername -Jsjis \  
-i %SYBASE%\%SYBASE_ASE%\scripts\sjis\installjpubs
```

For more information on the **-J** option in **isql**, see the *Utility Guide*.

## **Maintaining Sample Databases**

The sample databases contain a guest user option that allows authorized users to access the database. Guest users have a wide range of privileges, including permissions to **select**, **insert**, **update**, and **delete** user tables.

The sample databases contain a guest user option that allows authorized users to access the database. Guest users have a wide range of privileges, including permissions to **select**, **insert**, **update**, and **delete** user tables. Sybase recommends that you remove the "guest" user option from user databases in production systems. For more information about the guest user and a list of guest permissions, see the *System Administration Guide*.

1. If possible, and if space allows, give each new user a clean copy of the sample databases so that each user is not confused by other users' changes.
2. If space is a problem, instruct users to issue the **begin transaction** command before updating a sample database.
3. After users have finished updating one of the sample databases, instruct them to issue the **rollback transaction** command to undo the changes.



# Adaptive Server Upgrades

You can upgrade to Adaptive Server 15.7 from Adaptive Server versions 15.0 through 15.0.3, with the exception of versions 15.0.1 and 15.0.3 of the Cluster Edition.

You can upgrade to this version of Adaptive Server from:

- Adaptive Server 15.0 through 15.0.3 (but not the 15.0.1 or 15.0.3 of the Cluster Edition) – to install version 15.7 on top of an earlier 15.x version, see *Installing Adaptive Server Using Binary Overlay* on page 30.
- Adaptive Server 12.5.x – to upgrade from Adaptive Server 12.5.4 or earlier, execute the upgrade sequence from the same node on which the database resides.

You can upgrade from a 32-bit version to a 64-bit version, but you can neither upgrade nor move from a 64-bit to a 32-bit:

You cannot upgrade to this version of Adaptive Server from:

- Adaptive Server version 12.5.3a
- Adaptive Server version 12.0.x or earlier – Sybase recommends that you first upgrade to version 12.5.4 before upgrading to version 15.7

If your server has replicated databases, consult the *Replication Server Configuration Guide* before starting the preupgrade tasks.

Only upgrades to and from the same page size are supported. Use **sybmigrate** to re-create the schema and load data from one page size to another. See the *Utility Guide* for information about **sybmigrate**.

Adaptive Server version 15.7 includes both new and changed system catalogs that may affect your existing applications. See the *Adaptive Server Enterprise New Feature Guide* for a complete list.

Sybase recommends that you do not use the new features offered in Adaptive Server version 15.7 until you are committed to staying with 15.7.

## Upgrade Considerations for Component Integration Services

---

If you have both a local and a remote server running on an Adaptive Server version 15.x and are upgrading both of them to version 15.7, upgrade the local server first. If you only plan to upgrade one server but not the other, upgrade the local server.

Sybase does not certify that Component Integration Services running on earlier versions of Adaptive Server can connect to later versions. You may encounter errors if an earlier version

of Adaptive Server maps a proxy table to a later version and the remote table uses functionality not available in the earlier version.

Sybase certifies that each version of Adaptive Server connects to earlier releases through Component Integration Services. Component Integration Services is tested and certified to connect to earlier versions of Adaptive Server.

## Preparing to Upgrade

---

Before you upgrade, run the **preupgrade** utility. You must have system administrator privileges to perform an upgrade.

If your server is at a 15.x level, do not use the **sqlupgrade** or **sqlupgraderes** upgrade utilities.

Each new server version contains features that introduce parameters, commands, reserved words, and so on. **preupgrade** prepares the old server for upgrade by making sure all necessary directories and settings are correct for the upgrade. When running **preupgrade**, manually stop and start the server. You need not start the server before running the **sqlupgrade** upgrade utility; the utility starts the server when needed.

- If you are upgrading from:
  - Version 12.5.3 with cache bindings on **sybssystemdb** – drop the cache bindings for **sybssystemdb** that are bound to a user-defined cache before you run **preupgrade**.
  - Earlier than version 15.x but later than 12.5.3 – from the Adaptive Server 15.7 installation directory, perform the preupgrade checks on the old server using the **preupgrade** utility, located at `$SYBASE/ASE-15_0/upgrade`.
  - Manually drop objects before you execute procedures for the first time. The first time you run the server after an upgrade, the server internally rebuilds procedures from the text in `syscomments`. The procedure may not execute properly if it contains code that drops, then re-creates, an existing object.

## Performing Preupgrade Tasks

---

To ensure a successful upgrade, review and perform the preupgrade tasks as necessary. Depending on the old server configuration, you may not need to perform all preupgrade tasks.

### Prerequisites

If you are upgrading Adaptive Server:

- You need the master and system procedures files to upgrade the server. By default, the master (`master.dat`) and system procedures device (`sybsystemprocs.dat`) files are installed in the `$SYBASE/data` directory.

- The previously installed version of the server must be running. If you are upgrading Backup Server, Historical Server, or XP Server, those servers must not be running.

### Task

1. Shut down earlier versions of Adaptive Server.
2. Install Adaptive Server 15.7 into a separate directory than the earlier version installed on your system.
3. Check system and upgrade requirements.
4. Ensure that the directory to which your TEMP environment variable points exists. The installation program uses this directory to write files temporarily during the installation, which it locates through the TEMP environment variable.
5. Verify the name and location of the `runserver` file, as well as that you renamed it to `RUN_servername`, where *servername* is the name of the old server, as it appears in the `interfaces` file.

The default `RUN_servername` file for a server SYBASE is called `RUN_SYBASE`. If the `RUN_servername` file for your current server is named differently, use the actual name of your server during the upgrade process.

6. Verify that the text of all stored procedures you upgrade is available in *syscomments* by either:
  - Reinstalling the procedures with text, or,
  - Removing and reinstalling the procedures after the upgrade.

This step can allow you to inspect the stored procedures for any hidden or unwanted text.

7. Set the '**allow password downgrade**' password policy option to 1 to ensure that passwords are encrypted with both the old and new algorithms, in case you need to downgrade to an earlier version of Adaptive Server.
8. Make sure reserved words use quoted identifiers.
9. Verify that users are logged off.
10. Use `dbcc` to check for database integrity.
11. Back up databases.
12. Dump the transaction log.
13. Verify that `master` is the default database for the "sa" user.
14. Prepare the database and devices for upgrade using the **preupgrade** utility:
  - a) Create a `sybssystemdb` database if it does not already exist.
  - b) Disable auditing by running `sp_configure 'auditing', 0`
  - c) Disable Job Scheduler.

## Adaptive Server Upgrades

- d) Obtain the current audit settings for the pre-15.7 Adaptive Server using **sp\_displayaudit**; you use this saved information to re-enable auditing after you complete the installation. See *Reenabling Auditing* on page 58.
- e) Disable disk mirroring.
- f) Verify that your SYBASE environment variable points to the location of the new server software files you just installed.

Set the OLDSYBASE, OLDSYBASE\_ASE, and OLDSYBASE\_OCS environment variables to the location of the server you are upgrading, to avoid having to type this path when you run **sqlupgrade**.

Fix any problems that **preupgrade** utility reports.

You can safely ignore any warnings Adaptive Server issues about configuration parameters not being set to the default, as these are only for your information.

15. Ensure that the procedure cache size is at least 150 percent of the default procedure cache size, or between 53,248 and 2,147,483,647 2K pages.
16. Copy these files from earlier versions of the server to their corresponding Adaptive Server 15.x installation locations:
  - \$SYBASE/interfaces
  - \$SYBASE/\$SYBASE\_ASE/servername.cfg – where *servername* is your server name.
  - \$SYBASE/\$SYBASE\_OCS/config/libtcl.cfg
  - \$SYBASE/SYSAM-2\_0/licenses/license.lic
17. If you have enabled the Java in the database feature, create the sybpcidb database and disable the feature during the installation.
18. Set the environment variables by sourcing the SYBASE.[csh, sh, env] file.

---

**Warning!** Do not run the environment variable script more than once.

---

19. Set the OLDSYBASE\_ASE variable to the SYBASE\_ASE appropriate to your older server. If you are upgrading from 12.5 for example, it should be ASE-12\_5.

If upgrading from Adaptive Server 12.5:

```
setenv OLDSYBASE <old_$SYBASE_directory>
setenv OLDSYBASE_ASE ASE-12_5
```

This is required if you are using the **sqlupgraderes** utility to perform your upgrade.

Sybase recommends you also set the OLDSYBASE, and OLDSYBASE\_OCS environment variables to point to the old installation of Adaptive Server, so the upgrade utility automatically populates input fields with the correct information as you upgrade.

## **System Table and Stored Procedure Changes During Upgrade**

Drop and re-create `syscomments` to include the new and changed tables.

If you deleted text from the `syscomments` system table, drop and then re-create the stored procedures to again add the text. Sybase recommends that you use the `sp_hidetext` stored procedure to hide text, rather than deleting text.

If you modified any system stored procedures without altering their names, back them up before you upgrade Adaptive Server. The upgrade process overwrites these modified procedures with default versions.

## **Reserved Words**

Reserved words are pieces of SQL syntax that have special meaning when used as part of a command.

Transact-SQL does not allow words that are part of command syntax to be used as identifiers, unless they are enclosed in quotation marks. If you are upgrading Adaptive Server, you see errors when you run queries, stored procedures, or applications that use these identifiers in your user databases that match new reserved words.

---

**Note:** Before performing your upgrade, use `sp_renamedb` to change the name of any user database that is a reserved word.

---

If you change an object name, change applications and stored procedures that refer to that object. Conflicts between object names do not prevent the upgrade process from completing. However, applications that refer to conflicting object names may not work after the upgrade. Rename all objects that use reserved words.

As part of the preupgrade process, you can have `sqlupgrade`, `sqlupgraderes`, or `preupgrade` perform a reserved-word check for you. See the *Reference Manual* for a complete list of reserved words.

## **Running a Reserved Word Check**

Run the reserved word check on the old Adaptive Server.

Even if you plan to use `sqlupgraderes` to upgrade Adaptive Server noninteractively, you can still first run the interactive `sqlupgrade` utility to perform reserved word checks and other potential upgrade eligibility problems, and then continue with the upgrade if no problems are found.

Both `sqlupgrade` and `sqlupgraderes` automatically install new reserved words and the `sp_checkreswords` system procedure, which detects and displays identifiers in your existing databases that conflict with reserved words in the new database. You can use `sp_checkreswords` at any time while performing preupgrade tasks.

---

**Note:** Do not use an older version of **sp\_checkreswords** to check for reserved words, as it does not contain the most current list of reserved words.

---

1. Checking for reserved words generates a list of identifiers that conflict with reserved words, and the owners of those identifiers, in the file `$$SYBASE/$$SYBASE_ASE/init/logs/sqlupgrademMDD.nnn`. Review this file to determine which identifiers to change.
2. The Server Config utility installs **sp\_checkreswords** and checks the reserved words during the upgrade. Server Config does not display the names or locations of identifiers that conflict with reserved words; only the number of conflicts.

### **Addressing Reserved Words Conflicts**

Change any database names that are reserved words.

1. Use **sp\_dboption** to set the database to single-user mode, and then run **sp\_renamedb**, specifying the new name.
2. If other identifiers are reserved words, you can use:
  - **sp\_rename** to change the name of the object, before or after the upgrade.
  - Quoted identifiers.
  - Brackets around the identifier. For example:

```
create table [table] ( [int] int, [another int] int )
```
3. Run **sp\_checkreswords** in `master` and in each user database to display the names and locations of conflicting identifiers.

See *Reference Manual: Procedures* for information about **sp\_dboption**, **sp\_rename**, and **sp\_checkreswords**.

### **Quoted Identifiers**

To avoid reserved word conflicts, all users on the server must invoke the **quoted\_identifier** option in all stored procedures and queries that include the reserved words.

To invoke the **quoted\_identifier** option of the **set** command in procedures and queries that include the reserved words, enclose the reserved words which are identifiers in double quotation marks. The **set quoted\_identifier** option tells Adaptive Server to treat any character string enclosed in double quotation marks as an identifier.

## **Preparing the Database and Devices**

Before starting the upgrade process, confirm that you have enough space for the upgrade to succeed.

1. Double the size of the largest catalog that you are going to upgrade, then add approximately 10 percent to calculate the free space required for the upgrade to succeed. For example, if you have a large number of stored procedures or compiled object in any database, the **syscomments** and **sysprocedures** system tables require additional space.



Sybase recommends that you use the **preupgrade** utility, since it scans the system catalogs and performs this calculation automatically.

2. If you are:

- Not using two-phase commit or distributed transaction management (DTM) applications – create a `sybssystemdb` with a minimum of 4MB if it does not already exist.
- Using two-phase commit or DTM, either:
  - Create a minimum-sized `sybssystemdb` for upgrade and expand it later, or
  - Create a `sybssystemdb` of 5 to 20MB, depending on your expected usage. Approximately 25 percent of the database should be data storage, and 75 percent should be log storage.

3. If it does not already exist, create the `sybssystemdb` database. Servers that use a 2K logical page size require a `sybssystemdb` that is at least 4MB. Servers that use a larger logical page size require a `sybssystemdb` that is at least as large as the `model` database:

```
1> create database sybssystemdb on default = '4M'
2> go
1> use sybssystemdb
2> go
1> sp_create_syscoordinations
2> go
```

Adaptive Server uses this database for tracking transactions and during recovery. It is also used by applications using two-phase commit and DTM.

4. Verify that the `sybssystemdb` database is large enough. For an upgrade, the default size for **sybssystemdb** is 124MB, or enough free space to accommodate the existing `sybssystemdb` database, and the largest catalog that is to be upgraded, plus 10 percent for logging upgrade changes. You may need more space if you are adding user-defined stored procedures.
5. If you use Java in the database, the **preupgrade** utility detects that you set **sp\_configure "enable java"** to 1, and requests that you enable PCI and configure **sybpcidb** before you upgrade the server.
6. Increase the default database size:

- a) Use **alter database** to increase the size of the master database.

For example:

```
1> alter database tempdb on master=x
2> go
1> alter database model on master=x
2> go
```

where *x* is the megabytes of space you are adding.

Repeat this process for each temporary and `model` databases, making sure that `model` is at no point in the process larger than `tempdb`.

- b) Use **sp\_helpdb** to verify the size of each system database you increase in size.

- c) Use **sp\_configure** to update the values as indicated by the **preupgrade** utility. This example updates the number of locks available for all users on Adaptive Server to 6,000:

```
sp_configure "number of locks", 6000
```

### The sybprocsdev device

Sybase system procedures are stored in the `sybssystemprocs` database, which is stored in the `sysprocsdev` device. You may need to increase the size of `sysprocsdev` before upgrading Adaptive Server.

Verify that the `sybssystemprocs` database is large enough. For an upgrade, the recommended minimum size is the larger of 140MB, or enough free space to accommodate the existing `sybssystemprocs` database, and the largest catalog that is to be upgraded, plus an additional 10 percent of the largest catalog's size. The additional 10 percent is for logging upgrade changes.

You may need more space if you are adding user-defined stored procedures.

If your `sybssystemprocs` database does not meet these requirements and you have enough room on the device to expand the database to the required size, use the **alter database** command to increase the database size.

Use **sp\_helpdb** to determine the size of the `sybssystemprocs` database:

```
1> sp_helpdb sybssystemprocs
2> go
```

Use **sp\_helpdevice** to determine the size of the `sysprocsdev` device:

```
1> sp_helpdevice sysprocdev
2> go
```

If the `db_size` setting is less than the required minimum, increase the size of `sysprocdev`.

### Increasing the Size of the sybssystemprocs Database

Create a new database with sufficient space if your current `sybssystemprocs` database does not have the minimum space required for an upgrade.

#### **Prerequisites**

If you do not have a current backup of your old database, create one now.

#### **Task**

Although you can drop the old database and device and create a new `sysprocsdev` device, Sybase recommends that you leave the old database and device alone and add a new device large enough to hold the additional memory, and alter the `sybssystemprocs` onto the new device.

1. In `isql`, use **alter database** to increase the size of the `sybssystemprocs` database. For example:

```

1> use master
2> go
1> alter database sybssystemprocs on sysprocsdev=40
2> go

```

In this example, "sysprocsdev" is the logical name of the existing system procedures device, and 40 is the number of megabytes of space to add. If the system procedures device is too small, you may receive a message similar to the following when you try to increase the size of the sybssystemprocs database:

```

Could not find enough space on disks to extend
database sybssystemprocs

```

If there is space available on another device, expand sybssystemprocs to a second device, or initialize another device that is large enough.

2. Verify that Adaptive Server has allocated more space to sybssystemprocs:

```

1> sp_helpdb sybssystemprocs
2> go

```

When the database is large enough to accommodate the increased size of sybssystemprocs, continue with the other preupgrade tasks.

### **Increasing Device and Database Capacity for System Procedures**

If you cannot fit the enlarged *sybssystemprocs* database on the system procedures device, increase the size of the device and create a new database.

This procedure involves dropping the database. For more information on **drop database**, see the *Reference Manual*.

---

**Warning!** This procedure removes all stored procedures you have created at your site. Before you begin, save your local stored procedures using the **defncopy** utility. See the *Utility Guide*.

---

1. Determine which device(s) you must remove:

```

select d.name, d.phyname
from sysdevices d, sysusages u
where u.vstart between d.low and d.high
and u.dbid = db_id("sybssystemprocs")
and d.status & 2 = 2
and not exists (select vstart
                from sysusages u2
                where u2.dbid != u.dbid
                and u2.vstart between d.low and d.high)

```

where:

- *d.name* – is the list of devices to remove from sysdevices.
- *d.phyname* – is the list of files to remove from your computer.

The **not exists** clause in this query excludes devices that are used by sybssystemprocs and other databases.

Make a note of the names of the devices to use in the following steps.

---

**Warning!** Do not remove any device that is in use by a database other than `sybsystemprocs`, or you will destroy that database.

---

### 2. Drop `sybsystemprocs`:

```
1> use master
2> go
1> drop database sybsystemprocs
2> go
```

---

**Note:** In versions of Adaptive Server Enterprise earlier than 15.x, use `sysdevices` to determine which device has a low through high virtual page range that includes the `vstart` from step 2.

In version 15.x, select the `vdevno` from `sysusages` matching the `dbid` retrieved in step 1.

---

### 3. Remove the device(s):

```
1> sp_configure "allow updates", 1
2> go
1> delete sysdevices
    where name in ("devname1", "devname2", ...)
2> go
1> sp_configure "allow updates", 0
2> go
```

The **where** clause contains the list of device names returned by the query in step 1.

---

**Note:** Each device name must have quotes. For example, "devname1", "devname2", and so on.

---

If any of the named devices are OS files rather than raw partitions, use the appropriate OS commands to remove those files.

### 4. Remove all files for the list of `d.phyname` that were returned.

---

**Note:** File names cannot be complete path names. If you use relative paths, they are relative to the directory from which your server was started.

---

### 5. Find another existing device that meets the requirements for additional free space, or use a **disk init** command similar to the following to create an additional device for `sybsystemprocs`, where `/sybase/work/` is the full, absolute path to your system procedures device:

```
1> use master
2> go

1> disk init
2> name = "sysprocsdev",
3> physname = "/sybase/work/sysproc.dat",
4> size = 51200
5> go
```

---

**Note:** Server versions 12.0.x and later accept, but do not require "vdevno=number". In versions earlier than 12.0.x, the number for **vdevno** must be available. For information about determining whether **vdevno** is available, see the *System Administration Guide*.

---

The size you provide should be the number of megabytes of space needed for the device, multiplied by 512. **disk init** requires the size to be specified in 2K pages. In this example, the size is 112MB (112 x 512 = 57344). For more information on **disk init**, see the *Reference Manual: Commands*.

6. Create a sybserverprocs database of the appropriate size on that device, for example:

```
1> create database sybserverprocs on sysprocsdev = 112
2> go
```

7. Run the **installmaster** script in the old server installation directory. Enter:

```
isql -Usa -Ppassword -Sserver_name -i$SYBASE/ASE-15_0/scripts/
installmaster
```

## Upgrade to Adaptive Server 15.7

---

After you successfully run the **preupgrade** utility, you are ready to upgrade Adaptive Server.

### Upgrading Interactively Using sqlupgrade

Use the interactive **sqlupgrade** tool to upgrade Adaptive Server using an X-Windows or Motif GUI.

#### Prerequisites

Set the OLDSYBASE\_ASE variable to the SYBASE\_ASE appropriate to your older server. If you are upgrading from 12.5 for example, it should be ASE-12\_5.

Sybase recommends you also set the OLDSYBASE, and OLDSYBASE\_OCS environment variables to point to the old installation of Adaptive Server, so the upgrade utility automatically populates input fields with the correct information as you upgrade.

Source SYBASE.csh before running **sqlupgrade** if you have not already so.

Make sure your old server is running. If the server you are upgrading is not running, **sqlupgrade** prompts you to start the server.

#### Task

1. Enter: \$SYBASE/\$SYBASE\_ASE/bin/sqlupgrade
2. Verify that you have backed up databases, devices, and so on, and click **Next**.
3. Click **OK**.

## Adaptive Server Upgrades

4. Enter the name of the old Sybase directory and the old Adaptive Server directory, then click **OK**.
5. From the list of server names, select the server you want to upgrade, and click **OK**.
6. Enter the password for the system administrator (SA) login, then click **OK**.
7. Specify an upgrade option, then click **OK**. **sqlupgrade** then performs the upgrade eligibility test to verify that your current server meets the requirements for upgrading to the new version.

If your current server fails the upgrade eligibility test, fix the problem based on the information from the results of the test.

8. Click **OK** to upgrade your server.

You see the **Status Output** window, which shows the completion status and informational messages about the upgrade process.

---

**Warning!** Do not interrupt the upgrade, connect to Adaptive Server, or run any stored procedures while the upgrade is in progress.

---

You can also check the progress of the upgrade by viewing the **sqlupgrade** log in `$$SYBASE/$SYBASE_ASE/init/logs/sqlupgrademmdd.nnn`, where:

- *MM* – is the month.
- *DD* – is the date.
- *NNN* – is a three-digit number identifying the **srvbuild** server upgrade session.

After all pre-upgrade checks are successful, **sqlupgrade** shuts the old server down, then starts the new Adaptive Server **dataserver** binary on the old master device.

When the upgrade succeeds, you can:

- Click **OK** to specify another server to upgrade, or
- Exit **sqlupgrade**, and go to *Post-upgrade tasks* on page 56.

The upgrade process:

- Creates the `RUN_servername` file, which contains the information required to restart the server
- Runs the `installmasterscript` to create system procedures

To verify that the upgrade was successful, log in to the server and run:

- **select @@version** – Adaptive Server should return 15.7.
- **sp\_configure "upgrade version"** – Adaptive Server should return 15000.

## Upgrading Noninteractively Using sqlupgraderes

You can upgrade Adaptive Server without the graphical user interface (GUI), in noninteractive mode by using values from a resource file that defines the attributes for the server to be upgraded.

1. Edit the sample resource file included in your Adaptive Server distribution in `$SYBASE/$SYBASE_ASE/init/sample_resource_files`. Use a text editor to edit the resource file as described in Alternative Installation Methods.
2. Run the **sqlupgraderes** utility. This utility creates a new file containing the values you specified for the upgrade session, and writes it to the `sqlupgradeMMDD.NNN-server_name.rs` file in `$SYBASE/$SYBASE_ASE/init/logs/`.

where:

- *server\_name* – is the server you are upgrading.
- *MM* – is the month.
- *DD* – is the date.
- *NNN* – is a three-digit number identifying the **srvbuild** session.

If the resource file you are modifying was created by **sqlupgrade**, the prefix of the attribute name may vary. **sqlupgraderes** ignores this prefix when processing the resource file.

Attribute	Default Value [other options]
sybinit.release_directory	<code>\$SYBASE [path = _name_of_old_release]</code>
sybinit.product	sqlsrv
sqlsrv.server_name	<i>server_name</i>
sqlsrv.new_config	No
sqlsrv.sa_login	<i>current_login</i>
sqlsrv.sa_password	<i>current_password</i>
sqlsrv.do_upgrade	Yes
sqlsrv.do_reserved_word_check	Yes

All attributes are required, and all values are case-sensitive.

3. To execute **sqlupgraderes**, enter the following at the UNIX prompt, where *resource\_file* specifies the resource file containing the attributes that describe the server to upgrade:
 

```
$SYBASE/$SYBASE_ASE/bin/sqlupgraderes -r resource_file
```

## Manually Upgrading to Adaptive Server

You can upgrade manually without using a wizard or utility.

To upgrade Adaptive Server manually, use the **upgrade** executable located in the `$SYBASE/ASE-15_7/upgrade/`.

1. Shut down the pre-15.x server.
2. Copy the server entry from the old `interfaces` file to the new `interfaces` file.
3. Copy the `server_name.cfg` file from old directory to the new `$SYBASE` directory.
4. Start the 15.7 server with the old `master` device from the old server.
5. Run **upgrade**. If problems occur, fix them, and re-run the upgrade process.
6. Reinstall the Sybase-supplied stored procedures to prevent any errors caused from changes to the system catalogs.

## Postupgrade Tasks

After you have upgraded, make sure your new Adaptive Server is up and running.

**Note:** The upgrade process does not cause any changes in existing statistics, so you need not run **update statistics** on any tables after the upgrade. If you are upgrading from Adaptive Server version 15.x, however, restart the server to make the statistics available.

1. If you upgraded from Adaptive Server version 12.5.2 or earlier, run **dbcc checkcatalog** with the **fix** option to ensure there are no issues with OAM pages:

```
dbcc checkcatalog (database_name, fix)
```

2. Install new system stored procedures before starting any application activities:

```
isql -Usa -Psa_password -Sserver_name  
-i$SYBASE/$SYBASE_ASE/scripts/script_name -ooutput_file
```

The output of the script is saved in `output_file`. See *How Compiled Objects are Handled When Upgrading Adaptive Server* on page 71 if you are using **dbcc upgrade\_object** to upgrade compiled objects such as check constraints, rules, triggers, and views.

3. Run the scripts for different options or licensed features:
  - **installcommit** – if you use two-phase commit or distributed transactions, re-run **installcommit** to restore:
    - **sp\_start\_xact**
    - **sp\_abort\_xact**
    - **sp\_remove\_xact**
    - **sp\_stat\_xact**
    - **sp\_scan\_xact**



- **sp\_probe\_xact**
  - **installsecurity** – if you used auditing in your earlier installation.
  - **installhasvss** – if you enabled high-availability functionality, and are using this feature in this installation.
  - **installmsgsvss** – if you enabled real-time messaging functionality, and you are using this feature in this installation.
  - **installpcidb** – if you enabled the Java in the database feature in your earlier installation.
  - **installjsdb** – if you enabled Job Scheduler in your earlier installation.
4. If you have any system stored procedures that you had saved from before the upgrade (because you had modified them without altering their names), reload them now.

## Running the instmsgs.ebf Script

Run message-related scripts after upgrading from an Adaptive Server version 15.0.x to version 15.7.

1. If you upgraded from Adaptive Server version 15.0.x, run **uninstmsgs.ebf**:

```
isql -Usa -Ppassword -w1000 -iuninstmsgs.ebf -orestoremsgs.ebf
```

This safeguards your modified messages in the master database before you install the default version 15.7 messages.

2. Regardless of the Adaptive Server version you upgraded from, run the **instmsgs.ebf**:

```
isql -Usa -Ppassword -iinstmsgs.ebf
```

---

**Note:** To undo **instmsgs.ebf** changes, run this script once you have downgraded to the version from which you upgraded:

```
isql -S -Usa -P restore_msgs.ebf
```

---

3. If you use localized files, install any localized language using **langinstall**, **sqlloc**, or **syconfig**.

If you run **instmsgs.ebf** after installing the 15.7 localized message, this script may delete some new messages.

## Restoring Functionality in Adaptive Server After Upgrading

Restore functionality in the server after an upgrade.

1. If you changed any configuration parameters before upgrading, use **sp\_configure** to set them back to their earlier values.
2. Use **sp\_dboption** to reset any database options you disabled before upgrading.
3. Before you use the upgraded server, verify that all scripts developed at your site point to Adaptive Server 15.7.
4. Verify procedure cache allocation. The size should be the same as before upgrading, unless the original size was smaller than the default value.

5. Check the procedure cache requirements. Stored procedures, triggers, and other compiled objects require much more memory to run in Adaptive Server 15.7.

Use **sp\_configure** to increase the **procedure cache size** during runtime, and **sp\_configure verify** to verify any changes you make to the configuration file without having to restart Adaptive Server:

```
sp_configure "configuration file", 0, "verify",  
"full_path_to_file"
```

See *Reference Manual: Procedures* and the *Performance and Tuning Guide* for details about **sp\_configure** and **sp\_sysmon**, and the *System Administration Guide* for information on configuring memory.

6. Verify data cache allocation.

The server ensures that all data cache sizes remain the same after upgrading. Adaptive Server treats this size as an absolute value of 8MB and sets it in the `config` file. Versions earlier than 12.5 defined the size as all the memory left after allocating memory for other configurations, procedures, and user-defined named caches.

During the upgrade process, the server ensures that the default data cache size remains the same. Therefore, during the preupgrade process, the size of the default data cache is obtained and written to the configuration file as an absolute value, not as a default. This enables the server to have the same default data cache size as before the upgrade. If this size is less than the default size of 8MB, the server allocates a default data cache of 8MB.

7. If you unmirrored devices, remirror them using the **disk remirror** command.
8. If you used compiled objects, see *How Compiled Objects are Handled When Upgrading Adaptive Server* on page 71.
9. If you used two-phase commit in the earlier version of Adaptive Server, run the script to install the two-phase commit tables:

```
isql -Usa -Psa_password -Sserver_name  
-i$SYBASE/$SYBASE_ASE/scripts/installcommit
```

Run this script only if you use two-phase commit.

## Reenabling Auditing

If the server you upgraded from was configured for auditing, reenabling auditing in the upgraded server.

1. Enter:

```
sp_configure 'auditing', 1
```

2. Reenable auditing for all system stored procedures for which auditing was enabled before the upgrade.
  - a) Use the output of **sp\_displayaudit** recorded during preupgrade to help determine the system stored procedures for which auditing was enabled.

- b) Reenter the audit options using **sp\_audit**. For example, if you had enabled stored procedure auditing for **sp\_addlogin** stored procedure in your server before upgrade, run:

```
sp_audit "exec_procedure", "all", "sp_addlogin", "on"
```

### **Updating Threshold Procedures for Audit Segments**

An update is required for threshold procedures used to archive audit segments.

If your installation used a threshold procedure, similar to this, to archive the *sysaudits* table:

```
INSERT MyPre15SysAuditHistoryTable SELECT * FROM
sysaudits_0n
```

Where *n* corresponds to the *sysaudits* table number 1–8 and *MyPre15SysAuditHistoryTable* is a table defined prior to Adaptive Server version 15.7, then you must alter *MyPre15SysAuditHistoryTable* to add a *nodeid* column using:

```
alter table MyPre15SysAuditHistoryTable
add nodeid tinyint NULL
```

See the *Reference Manual: Tables* for system tables *sysaudits01* through *sysaudits08* for further details about the *sysaudits* tables.

## **Reenabling Replication Server After the Dataserver Upgrade**

If you disabled replication before the upgrade, you must reenabling replication.

1. Remove older formatted log records from your database.
2. Use the **dump tran** command to dump the database and transaction logs to remove the older format log records from your database. This prevents Replication Agent™ and other log readers from accessing the pre-upgrade portion of the transaction logs.

```
1> use master
2> go
1> dump database sales to dumpdev
2> go
1> dump transaction sales with truncate_only
2> go
```

3. Reenable replication.

### **Restoring Replication on Replicate Databases**

Restore replication if you have upgraded a destination-only dataserver in a replication system. If the replicate database is also a source for replication, follow the steps in Restoring Replication on Primary Databases.

Perform these steps for each replicate database and Replication Server System Database (RSSD).

1. Start Adaptive Server if it is not already running.

2. Log in to the Adaptive Server.
3. If you have zeroed out the locator for the database, go to the next step. Otherwise, stop Replication Server, then run:

```
1> use RSSD
2> go
1> rs_zerolrm dataserwer, database
2> go
```

4. Restart the Replication Servers.
5. Resume the DSI connections that were suspended before the upgrade by executing the following Replication Server command for each suspended database:

```
1> resume connection to dataserwer.database
2> go
```

The replication system is now ready for Adaptive Server 15.7, and applications can resume.

If you installed any Sybase client products, such as Open Client, use the **dsedit** utility to edit your `interfaces` file and to specify the servers to which you want to connect.

For more information about establishing client/server connections, see *Installing Sybase PC-Client Products* or the *Open Client Configuration Guide*.

### **Restoring Replication on Primary Databases**

Follow the steps in this section if you have upgraded a source database, or primary database, in a Replication Server system, or the destination database is also a source for other Replication Servers.

1. If you have zeroed out the locator for the database, go to the next step. Otherwise, stop Replication Server, then run:

```
1> use RSSD_name
2> go
1> rs_zerolrm dataserwer, database
2> go
```

2. Log in to each replicated primary, and replicated RSSD and issue:

```
1> use database
2> go
```

```
1> dbcc settrunc ('lrm', 'valid')
2> go
```

3. Restart the Replication Server.
4. If the database is also used as an RSSD, resume the Replication Server connection to the RSSD by issuing the following command to the Replication Server specifying the same string that was specified during the **'hibernate\_on'** command:

```
1> sysadmin hibernate_off, 'Replication Server'
2> go
```

5. Log in to the Replication Server, and resume the Log Transfer connection for each replicated primary and each replicated RSSD:

```
1> resume log transfer from server.database
2> go
```

If this is a replicated RSSD, you must log in to the replicate Replication Server.

6. If you are using Rep Agent, log in to the Adaptive Server and restart the Rep Agent:

```
1> use database
2> go
1> sp_start_rep_agent database
2> go
```

7. If you are using the Log Transaction Manager, restart it.

## Migrating from 32-Bit to 64-Bit Versions on Different Computers

---

There are three ways to migrate data on different computers.

### Prerequisites

To migrate Adaptive Server from the 32-bit to the 64-bit version, first install and configure the 64-bit operating system.

- Use **dump** and **load**.
- Use the **bcp** bulk copy utility.
- Replace the binary.

### Migrating Data Using a Dump and Load Method

---

Migrate data using a dump and load method to migrate data from a 32-bit to a 64-bit Adaptive Server version.

1. In the 32-bit Adaptive Server, run **dbcc** checks (**checkdb**, **checkalloc**, **checkcatalog** and **checkstorage**) on all databases in the 32-bit Adaptive Server to ensure they are error-free.
2. Create a 64-bit Adaptive Server in a new directory.
3. Create devices and databases to match those in the 32-bit server. Make sure that the *sysusages* mapping is correct.

---

**Note:** Allow 10 percent additional space for the *sybsystemprocs* database.

---

4. Dump the databases from the 32-bit server.
5. Load the databases to the 64-bit server.
6. If you have partitioned tables, update partition statistics.
7. Run **dbcc** checks on the 64-bit server to ensure they run cleanly.

For information on upgrading compiled objects, see *Finding Compiled Object Errors Before Production* on page 72.

### Using bcp to Migrate Data

If you use DDL scripts to create devices, databases, tables, rules, stored procedures, triggers, and views, you can use **bcp** to migrate data from a 32-bit Adaptive Server to a 64-bit Adaptive Server.

If you do not have DDL scripts, use the **ddlgen** utility to re-create the schema for the Adaptive Server you are about to upgrade. See the *Utility Guide*.

1. In the 32-bit Adaptive Server, run **dbcc** checks (**checkdb**, **checkalloc**, **checkcatalog** and **checkstorage**) on all databases in the 32-bit Adaptive Server to ensure they are error-free.
2. Use **bcp** to extract all the data from all the tables in the databases.
3. Create a new 64-bit Adaptive Server in a new directory.
4. Create devices, databases, and tables.
5. Use **bcp** to bulk copy data into tables.
6. Re-create all views, triggers, and stored procedures.
7. Run **dbcc** checks on the 64-bit server and make sure they run cleanly.

### Migrating Data by Replacing the Binary

Migrate data from a 32-bit server to a 64-bit server by replacing the binary.

1. In the 32-bit Adaptive Server, run **dbcc** checks (**checkdb**, **checkalloc**, **checkcatalog** and **checkstorage**) on all databases in the 32-bit Adaptive Server to ensure they are error-free.
2. Copy the files for the 64-bit Adaptive Server into a new directory.
3. Shut down the 32-bit server.
4. Copy the `interfaces` file and the configuration file from the 32-bit `$SYBASE` directory to the 64-bit `$SYBASE` directory.
5. Copy the 32-bit `$SYBASE/$SYBASE_ASE/install/RUN_server` file to the equivalent 64-bit `$SYBASE/$SYBASE_ASE/install` directory.
6. Edit the `RUN_server` file to reflect the new location of the `interfaces`, configuration, and log files.
7. Remove all references to the 32-bit `$SYBASE` directories from your `$PATH` definition.
8. Change to the 64-bit `$SYBASE` directory and source the `SYBASE.csh` script (C shell).
9. Change to the 64-bit `$SYBASE/$SYBASE_ASE/install` directory and execute:  

```
startserver -f RUN_server
```
10. After the 64-bit server starts, run **installmaster**, **installmodel**, and **instmsgses.ebf**.
11. If you used `dbccdb` for **dbcc checkstorage**, run `installdbccdb`. This re-creates tables in the `dbccdb`. This may cause you to lose data.

12. Drop and re-create the compiled objects, such as stored procedures, triggers, views, and defaults.
13. If you have partitioned tables, update partition statistics.
14. Run **dbcc** again on all databases to verify that they run cleanly.





# Adaptive Server Components and Related Products

After you finish upgrading Adaptive Server, upgrade its components and related products.

Refer to *Using Sybase Failover in a High Availability System* for instructions on how to upgrade an Adaptive Server configured with high availability.

## Upgrading Job Scheduler

---

After upgrading to a new Adaptive Server, upgrade Job Scheduler.

**Note:** You must have `$SYBASE/$SYBASE_OCS/bin` directory in `$PATH` so the `isql` executable is accessible. Use `isql` to perform all the steps in this task.

---

1. Copy the directory services entry for JSAGENT (or jsagent) from the old server to the new server.

2. Make sure the new server is running.

3. Stop the Job Scheduler:

```
1> sybmgmtdb..sp_sjobcontrol @name=NULL, @option="stop_js"
2> go
```

4. Ensure that at least 9000 locks are configured. If the number of locks on the server is fewer than 9000, increase the number of locks:

```
1> sp_configure "number of locks", 9000
2> go
```

5. Upgrade the internal Job Scheduler SQL code using:

```
1> use sybmgmtdb
2> go
1> dbcc upgrade_object
2> go
```

6. Restart Adaptive Server.

7. (Optional) Add more log space. Some 64-bit platforms require additional space for the sybmgmtdb log:

```
1> use master
2> go
1> alter database sybmgmtdb LOG on sybmgmtdev=20
2> go
```

8. To upgrade sybmgmtdb, run the `installjsdb` script that is included and save the output to a file:

```
isql -Usa -Psa_password -Sservername -n -i$SYBASE/$SYBASE_ASE/
scripts/installjsdb
-ooutput_file
```

---

**Note:** When upgrading from Adaptive Server version 12.5.x to 15.5 and later, increase the size of `sybmgmtdb` from 50MB to 90MB.

---

9. Enable Job Scheduler to start when Adaptive Server starts:

```
sp_configure "enable job scheduler", 1
```

10. To start Job Scheduler from `isql`, enter:

```
sybmgmtdb..sp_sjobcontrol @name=NULL, @option="start_js"  
go
```

## Upgrading Job Scheduler Templates

After upgrading to the new server, upgrade the templates and jobs created by Job Scheduler

---

**Note:** Several changes impact the Job Scheduler templates. These changes make some templates incompatible with earlier versions of the server. The current templates are version 3.0 in the XML files.

---

1. Disable Job Scheduler.
2. Update any environment variables, scripts, or applications that refer to the Job Scheduler directory path. The Job Scheduler directory has been renamed and moved beneath the `ASE-15_0` directory. The new location is `$$SYBASE%\$SYBASE_ASE/jobscheduler`.

Directories below `jobscheduler` remain the same.

3. Copy files from the `jobscheduler` directory to the new `ASE-15_0` directory. If you are installing the new server directories over the old server directories, the installer automatically moves your files to the new `jobscheduler` directory.
4. If you modified Sybase-supplied templates, stored procedures, or XML documents, do not overlay the new templates with your modified versions. If you do, you lose the enhancements provided by the revised templates. Carefully merge your template changes into the Sybase template files, or better yet, rename your modified templates.

---

**Note:** If you modify Sybase-supplied templates, save the changes under new names and in new files.

---

5. You may need to make minor modifications to jobs you created from 2.0 or earlier templates. In some templates, parameters changed from `varchar(5)` to `int`. The following table lists the templates that changed in version 2.1 and the changes you must make to the SQL code in the jobs created from the templates.

**Table 4. Changed Job Scheduler Templates**

<b>Template</b>	<b>Modified Files</b>	<b>Datatype for &lt;parameter&gt; Changed from varchar(5) to int</b>
<b>dump database</b>	SybBackupDbToDiskTemplate.xml jst_dump_databases	<b>@use_srvr_name</b>
<b>dump database log</b>	SybBackupLogToDiskTemplate.xml jst_dump_log	<b>@truncate_flag</b> and <b>@use_srvr_name</b>
<b>update statistics</b>	SybUpdateStatsTemplate.xml jst_update_statistics	<b>@index_flag</b>
<b>rebuild indexes</b>	SybRebuildIndexTemplate.xml jst_reorg_rebuild_indexes	<b>@dump_flag</b>
<b>rebuild table</b>	SybRebuildTableTemplate.xml jst_reorg_rebuild_tables	<b>@dump_flag</b>
<b>reclaim indexes</b>	SybReclaimIndexTemplate.xml jst_reclaim_index_spac	<b>@dump_flag</b>
<b>reclaim tables</b>	SybReclaimTableTemplate.xml jst_reclaim_table_space	<b>@resume_flag</b>

6. Some Job Scheduler templates have been modified to support the new server functionality. These changes are related to new parameters for specifying a partition name, or a data change value for the new server commands that added these options. If you have jobs created from any of the enhanced templates, modify the SQL of the jobs for the 15.5 servers.

If you have a job scheduled to run on a pre-15.5 server and you need it to also run on 15.5 servers, leave the existing job alone and create a new job for 15.5 servers, as the job commands are different.

You need not modify jobs you run on pre-15.5 servers. The following table lists the templates that changed in version 3.0 and the changes you must make to jobs created from them.

**Note:** All templates listed below, except Delete Statistics, are incompatible with pre-15.0.1 servers. Do not use them to create jobs that are scheduled on pre-15.0.1 servers; you must use the 2.1 or 2.2 versions for pre-15.0.1 servers.

**Table 5. Modified Job Scheduler Templates**

Template	Modified File	Change Description	Job Modifications
<b>delete statistics</b>	SybDeleteStatisticsTemplate.xml jst_delete_statistics	Added <b>@ptn_name</b> as third parameter.	Optional.
<b>update statistics</b>	SybUpdateStatisticsTemplate.xml jst_update_statistics	Added <b>@ptn_name</b> as fifth parameter and <b>@datachg_threshold</b> as the 10th parameter and added reference.	Required. Include values (or NULL) for new parameters.
<b>rebuild indexes</b>	SybRebuildIndexTemplate.xml jst_reorg_rebuild_indexes	Added <b>@ndx_ptn_name</b> as third parameter.	Required. Include value (or NULL) for new parameter.
<b>reclaim indexes</b>	SybReclaimIndexTemplate.xml jst_reclaim_index_space	Added <b>@ptn_name</b> as third parameter.	Required. Include value (or NULL) for new parameter.
<b>reclaim tables</b>	SybReclaimTableTemplate.xml jst_reclaim_table_space	Added <b>@ptn_name</b> as second parameter.	Required. Include value (or NULL) for new parameter.
<b>multiple</b>	jst_get_free_space, jst_get_use_dspace	Replace <b>reserved_pgs</b> and <b>data_pgs</b> with <b>reserved_pages</b> and <b>data_pages</b> .	No impact on job SQL.

7. Install the template stored procedures and and move them to the Job Scheduler template stored procedure directory. For example:

```
cd $SYBASE/$SYBASE_ASE/jobscheduler/Templates/sprocs
```

- a) Run the stored procedure installation script for each server being upgraded:

```
installTemplateProcs <servername> <username> <password>
```

---

**Note:** Upgrade template stored procedures on all Job Scheduler servers and target servers that are upgraded to Adaptive Server version 15.5. Do not install them on pre-15.5 servers.

---

8. Install the template XML documents. Move to the JS template XML directory. For example:

```
cd $SYBASE/$SYBASE_ASE/jobscheduler/Templates/xml
```

- a) Run the XML installation script on 15.0.1 servers with Job Scheduler installed:

```
installTemplateXml servername machinename serverport
username password [language_code]
```

Use "en" for the *language\_code* or omit the parameter completely, as "en" is the default.

---

**Note:** Upgrade template XML on all Job Scheduler servers upgraded to Adaptive Server version 15.0.1. Do not install them on pre-15.0.1 servers or servers where Job Scheduler is not installed.

---

## Upgrading Java in the Database

---

You must run **installpcidb** script if the Java in the database functionality is currently enabled. This script creates tables and stored procedures in the **sybpcidb** database.

1. Using **isql**, run the **installpcidb** script that is included with the release. Save the output to an operating system file.

```
isql -Usa -P<sa_password> -S<server_name>
-i$SYBASE/$SYBASE_ASE/scripts/installpcidb -o<output_file>
```

2. Enable the Java in the database functionality:

```
1> sp_configure 'enable pci', 1
2> go
1> sp_configure 'enable java', 1
2> go
```

You may need to increase '**max memory**' to enable these parameters. Restart the server for changes to take effect. You can configure the maximum size of the PCI Bridge memory pool through the '**pci memory size**' configuration parameter. For more information, see *Java in Adaptive Server Enterprise for 15.7*.

## Enabling Java in the Database in a High Availability System

You can use the Java in the database feature on a system that also uses high availability.

Drop high availability companionship before installing the **sybpcidb**, and re-establish companionship afterwards.

Java in the database feature must be either enabled or disabled on both nodes of the high availability system.

## Upgrading Backup Server

---

You can upgrade Backup Server after you upgrade Adaptive Server. The procedures for upgrading Backup Server are similar. XP Server does not have a formal upgrade process.

1. If you are upgrading during the initial server installation, select:
  - **Upgrade Existing Servers** from the drop-down menu when the installer prompts Build
  - **Upgrade Adaptive Server and Backup Servers.**

This launches the **sqlupgrade** utility. Click **OK**.

2. If you are upgrading after the initial installation, start the **sqlupgrade** utility from the command line. Enter:

```
$SYBASE/$SYBASE_ASE/bin/sqlupgrade
```
3. Click **OK** when you see a warning message.
4. Enter the old Sybase directory and the old Adaptive Server directory.
5. Select the server to upgrade, and click **OK**.
6. Enter the system administrator password, and click **OK**.
7. When the upgrade is complete, you see Done in the Status Output window. Click **OK**.
8. In the **sqlupgrade** window, either upgrade another server, or click **Exit** to leave the utility.

## Upgrading Databases Using Dump and Load

---

When you upgrade Adaptive Server, you can also upgrade databases and transaction logs from versions of Adaptive Server as early as 12.5 using the **dump** and **load** commands.

Some issues of which you should be aware:

- The upgrade process requires space for copying data and logging changes to the system tables. If the source database in the dump was full, the upgrade process might fail. You can use **alter database** to extend the free space in the event of insufficient-space errors.
- After reloading an older dump, run **sp\_checkreswords** from the new installation on the loaded database to check for reserved words.

## How Compiled Objects are Handled When Upgrading Adaptive Server

---

Adaptive Server upgrades compiled objects based on their source text.

Compiled objects include:

- Check constraints
- Defaults
- Rules
- Stored procedures (including extended stored procedures)
- Triggers
- Views

The source text for each compiled object is stored in the `syscomments` table, unless it has been manually deleted. The upgrade process verifies the existence of the source text in `syscomments`. However, compiled objects are not actually upgraded until they are invoked.

For example, if you have a user-defined stored procedure named `list_proc`, the presence of its source text is verified when you upgrade. The first time `list_proc` is invoked after the upgrade, Adaptive Server detects that the `list_proc` compiled object has not been upgraded. Adaptive Server recompiles `list_proc`, based on the source text in `syscomments`. The newly compiled object is then executed.

Upgraded objects retain the same object ID and permissions.

You do not receive any notification if the compiled objects in your database dump are missing source text. After loading a database dump, run `sp_checksourc` to verify the existence of the source text for all compiled objects in the database. Then, you can allow the compiled objects to be upgraded as they are executed, or you can run `dbcc upgrade_object` to find potential problems and upgrade objects manually.

Compiled objects for which the source text was hidden using `sp_hidetext` are upgraded in the same manner as objects for which the source text is not hidden.

For information on `sp_checksourc` and `sp_hidetext`, see *Reference Manual: Procedures*.

---

**Note:** If you are upgrading from a 32-bit to a 64-bit Adaptive Server, the size of each 64-bit compiled object in the `sysprocedures` table in each database increases by approximately 55 percent when the object is upgraded. The pre-upgrade process calculates the exact size; increase your upgraded database size accordingly.

---

To ensure that compiled objects have been upgraded successfully before they are invoked, upgrade them manually using the `dbcc upgrade_object` command.

## Finding Compiled Object Errors Before Production

Use **dbcc upgrade\_object** to identify potential problem areas that may require manual changes to achieve the correct behavior.

After reviewing the errors and potential problem areas, and fixing those that need to be changed, use **dbcc upgrade\_object** to upgrade compiled objects manually instead of waiting for the server to upgrade the objects automatically.

Problem	Description	Solution
Missing, truncated, or corrupted source text	If the source text in <code>syscomments</code> has been deleted, truncated, or otherwise corrupted, <b>dbcc upgrade_object</b> may report syntax errors.	If: <ul style="list-style-type: none"> <li>The source text was not hidden – use <b>sp_helptext</b> to verify the completeness of the source text.</li> <li>Truncation or other corruption has occurred – drop and re-create the compiled object.</li> </ul>
Temporary table references	If a compiled object, such as a stored procedure or trigger refers to a temporary table ( <code>#temp table_name</code> ) that was created outside the body of the object, the upgrade fails, and <b>dbcc upgrade_object</b> returns an error.	Create the temporary table exactly as expected by the compiled object, then execute <b>dbcc upgrade_object</b> again. Do not do this if the compiled object is upgraded automatically when it is invoked.
Reserved word errors	For example, suppose you load a database dump from Adaptive Server 11.5 into Adaptive Server 15.0 and the dump contains a stored procedure that uses the word "lock." When you run <b>dbcc upgrade_object</b> on that stored procedure, the command returns an error because, although "lock" was not reserved in version 11.5, it became a reserved word in version 11.9.2. Change the stored procedure and any related tables before they are used in a production environment.	Either manually change the object name or use quotes around the object name, and issue the command <b>set quoted identifiers on</b> . Then drop and re-create the compiled object.

### Quoted Identifier Errors

Quoted identifiers are not the same as literals enclosed in double quotes. The latter do not require you to perform any special action before the upgrade.

**dbcc upgrade\_object** returns a quoted identifier error if:



- The compiled object was created in a pre-11.9.2 version with quoted identifiers active (**set quoted identifiers on**).
- Quoted identifiers are not active (**set quoted identifiers off**) in the current session.

For compiled objects created in version 11.9.2 or later, the upgrade process automatically activates or deactivates quoted identifiers as appropriate.

1. Activate quoted identifiers before running **dbcc upgrade\_object**.

When quoted identifiers are active, use single quotes instead of double quotes around quoted **dbcc upgrade\_object** keywords.

2. If quoted identifier errors occur, use the **set** command to activate **quoted identifiers**, and then run **dbcc upgrade\_object** to upgrade the object.

### Potential Problem Areas With select \*

The result of a **select \*** clause in a stored procedure, trigger, or view that was created in a version of Adaptive Server earlier than 11.9.3 may be different from what you expect.

If **dbcc upgrade\_object** finds a **select \*** clause in the outermost query block of a stored procedure, it returns an error, and does not upgrade the object.

For example, consider these stored procedures:

```
create procedure myproc as
  select * from employees
go
```

```
create procedure yourproc as
  if exists (select * from employees)
    print "Found one!"
go
```

**dbcc upgrade\_object** returns an error on **myproc** because **myproc** includes a statement with a **select \*** clause in the outermost query block. This procedure is not upgraded.

**dbcc upgrade\_object** does not return an error on **yourproc** because the **select \*** clause occurs in a subquery. This procedure is upgraded.

For more information about **dbcc upgrade\_object**, see *dbcc* in *Reference Manual: Commands*.

### Determining Whether to Change select \* in Views

Determine whether columns have been added to or deleted from the table since the view was created.

Perform these queries when **dbcc upgrade\_object** reports the existence of **select \*** in a view.

1. Compare the output of **syscolumns** for the original view to the output of the table.

In this example, you have the following statement:

```
create view all_emps as select * from employees
```

---

**Warning!** Do not execute a **select \*** statement from the view. Doing so upgrades the view and overwrites the information about the original column information in `syscolumns`.

---

2. Before upgrading the `all_emps` view, use these queries to determine the number of columns in the original view and the number of columns in the updated table:

```
select name from syscolumns
  where id = object_id("all_emps")
select name from syscolumns
  where id = object_id("employees")
```

3. Compare the output of the two queries by running **sp\_help** on both the view and the tables that comprise the view.

This comparison works only for views, not for other compiled objects. To determine whether **select \*** statements in other compiled objects need to be revised, review the source text of each compiled object.

If the table contains more columns than the view, retain the pre-upgrade results of the **select \*** statement. Change the **select \*** statement to a **select** statement with specific column names.

4. If the view was created from multiple tables, check the columns in all tables that comprise the view and rewrite the **select** statement if necessary.

# SuSE Raw Device Administration

Administer raw disk partitions in the `/etc/raw` file, which is a plain text file containing comments and examples for possible configurations:

```
# /etc/raw
#
# sample configuration to bind raw devices
# to block devices
#
# The format of this file is:
# raw<N>:<blockdev>
#
# example:
# -----
# raw1:hdb1
#
# this means: bind /dev/raw/raw1 to /dev/hdb1
#
# ...
raw1:sda7
raw2:sda8
raw3:sda9
```

Once you have created them, bind the raw devices by starting them with the script `/etc/init.d/raw`:

```
# cd /etc/init.d
# sh raw start
bind /dev/raw/raw1 to /dev/sdb1... done
bind /dev/raw/raw2 to /dev/sdb2... done
bind /dev/raw/raw3 to /dev/sdb3... done
...
```

Use the **chkconfig(8)** utility to guarantee that the raw device binding occurs during any restart:

```
# /sbin/chkconfig raw on
```



# Raw Partitions on Linux

You can create and mount database devices on raw bound devices for raw disk I/O. Raw disk I/O enables direct memory access from your address space to the physical sectors on the disk while omitting needless memory copy operations from the user address space to the kernel buffers.

Raw disk I/O assumes that logical and physical IO are simultaneous, and writes are guaranteed to flush to the disk when the system **write** call returns. When preparing a raw partition device, follow these guidelines:

- Do not initialize a database device on the partition that contains your Sybase installation software. Doing so destroys all existing files on that partition.
- A raw partition designated for use by Sybase cannot be mounted for use by the operating system for any other purpose, such as for file systems or swap space.
- After a Sybase configuration utility or the **disk init** command has initialized a portion of a partition as a database device, the entire partition cannot be used for any other purpose. Any space left on the partition beyond the size specified for the device can be reused with the **disk resize** command.
- To avoid any possibility of using a partition that contains the partition map, do not use cylinder 0.
- Place the database device on a character device, because the server recovery system needs unbuffered system IO.
- To determine whether a device is a block device or a character device run:

```
ls -l <device path>
```

## Choosing a Raw Partition

---

Select a raw partition on which to create and mount database devices.

1. Determine which raw partitions are available.
2. Determine the sizes of the raw partitions.
3. From the list of available raw partitions, select a raw partition for each device.
4. Verify with the operating system administrator that the partition you have chosen is available.
5. Make sure the "sybase" user has read and write privileges to the raw partition.

---

**Note:** For more information on choosing a raw partition, see your operating system documentation.

---

## Examples for Creating Raw Partitions

---

Specific system administration is required before you can enable and use raw devices. The available tools to configure devices depend on the distribution configuration.

You must allocate physical disk space in partitions on the disks where you want to set up raw devices. The physical IO subsystem can be on either SCSI or EIDE devices.

---

**Note:** You can create partitions with the Linux default **fdisk(8)** utility. You must have "root" privileges to use the command **fdisk**. See the **fdisk(8)** man pages for a complete description of the command.

---

This example shows how to set up partitions as raw devices, on four SCSI disks in the system—sda, sdb, sdc, and sdd.

1. Start **fdisk** on `/dev/sdd`:

```
# fdisk /dev/sdd
```

The system returns:

```
The number of cylinders for this disk is set to 8683
....
Command (m for help):
```

2. Enter **p** to print the current partition layout. The output is:

```
Disk /dev/sdd: 64 heads, 32 sectors, 8683 cylinders
Units = cylinders of 2048 * 512 bytes
Device Boot Start End Blocks Id System
/dev/sdd1 1 7499 7678960 83 Linux
/dev/sdd2 7500 8012 525312 82 Linux swap
/dev/sdd4 8013 8683 687104 5 Extended
```

This example shows the extended partition (sdd4) has 687104 free blocks, starting from 8013 and ending at 8683. You can assign the remaining partitions later. This example assigns an additional partition for raw bound disk I/O:

1. Use the **n** command to create a new partition, and enter **l** at this prompt for "logical":

```
Command (m for help): n
Command action
l logical (5 or over)
p primary partition (1-4)
```

2. Accept the default by pressing **Enter** when you see:

```
First cylinder (8013-8683, default 8013):
```

3. Accept the default by pressing **Enter** again, when you see:

```
Last cylinder or +size or +sizeM or +sizeK
(8013-8683, default 8683): 8269
```

4. Use the **t** command, enter **5** at this prompt:

```
Partition number (1-8): 5
```

5. Enter 60 at this prompt:

```
Hex code (type L to list codes): 60
```

The output is:

```
Changed system type of partition 5 to 60 (Unknown)
```

6. Repeat steps 1–5 to create four partitions for raw device I/O.
7. Verify the setup using **p** to print the full partition table before writing it out. Make sure that there are no overlapping partitions and the type for the unassigned partitions is Unknown type 60.

You can now write this partition table to disk and quit the **fdisk(8)** utility.

## Red Hat Raw Device Administration

Red Hat Enterprise Linux is fully equipped with the tools to set up raw devices and administer them during a system start-up. Set up a Red Hat Enterprise Linux system to administer partitions using the `/etc/sysconfig/rawdevices` file.

This is a plain text file that contains comments and examples for possible configurations:

```
# raw device bindings
# format: rawdev major minor
#         rawdev blockdev
# example: /dev/raw/raw1 /dev/sda1
#          /dev/raw/raw2 8 5
/dev/raw/raw1 /dev/sdd1
/dev/raw/raw2 /dev/sdd2
/dev/raw/raw3 /dev/sdd3
/dev/raw/raw4 /dev/sdd4
```

Once you have created the raw devices, bind them by starting them from `/etc/rc.d/init.d/rawdevices`.

```
[root@legolas init.d]# cd /etc/rc.d/init.d
[root@legolas init.d]# sh rawdevices start
Assigning devices:
/dev/raw/raw1 --> /dev/sdd5
    /dev/raw/raw1:    bound to major 3, minor 5
/dev/raw/raw2 --> /dev/sdd6
    /dev/raw/raw2:    bound to major 3, minor 6
/dev/raw/raw3 --> /dev/sdd7
    /dev/raw/raw3:    bound to major 3, minor 7
/dev/raw/raw4 --> /dev/sdd8
    /dev/raw/raw4:    bound to major 3, minor 8
done
```

To guarantee that the raw device binding occurs during any restart, use:

```
# /sbin/chkconfig rawdevices on
```

## Accessing Raw Devices from the Server

---

After you create partitions and bind the devices for raw disk I/O, Adaptive Server can use them.

### Prerequisites

Confirm that you have root privileges to execute the `raw -qa` command on your system, or else you see a message such as:

```
Cannot open master raw device '/dev/rawctl'  
(Permission denied)
```

### Task

If Adaptive Server is running as user "sybase," then apply read, write, and owner permissions to the `/dev/raw/raw#` device entries and the raw bound control device `/dev/rawctl`. See the **chown(1)**, **chgrp(1)**, and **chmod(1)** commands to apply correct permissions.

1. Verify your settings by querying the device binding with the **raw** command:

```
# raw -qa
```

You should see:

```
/dev/raw/raw1: bound to major 3, minor 5  
/dev/raw/raw2: bound to major 3, minor 6  
/dev/raw/raw3: bound to major 3, minor 7  
/dev/raw/raw4: bound to major 3, minor 8
```

2. Using the raw devices, Adaptive Server and the installation and configuration utility, **srvbuild**, detect and present size automatically. Enter the absolute path to the raw device when creating devices such as `master`, `sybsystemprocs`, `sybtempdb`.



# Adaptive Server Downgrades

An Adaptive Server that has been upgraded to 15.7 requires specific tasks before it can be downgraded, due to the introduction of new features.

Even if you have not used any of the new features in Adaptive Server 15.7, the upgraded server adds columns to system tables. This means you must use **sp\_downgrade** to perform the downgrade.

The **sp\_downgrade** procedure requires `sybase_ts_role`, and you must have `sa_role` or `sso_role` permissions. See *sp\_downgrade* in *Reference Manual: Procedures*.

There are additional steps to perform if you are using encryption or replicated databases.

## Preparing to Downgrade Adaptive Server

---

Prepare your system before starting the downgrade.

Before you begin downgrading Adaptive Server, perform these steps for the features or configurations you enabled in Adaptive Server 15.7.

- If the logical page size for your Adaptive Server is larger than 8192 bytes and you have configured any databases to allow wide data-only-locked rows, turn the option off:

```
sp_configure @dbname, 'allow wide dol rows', false
```

Before you downgrade Adaptive Server, verify that no wide DOL rows exist in any table in these databases. Adaptive Server cannot find them, and thus does not warn you about their existence. When you then downgrade to a version that is earlier than 15.7, Adaptive Server treats these as corrupt.

This does not occur if your logical page size is 8192 bytes or smaller.

- If you have configured any database to use either row or page compression, turn it off:  

```
alter database @dbname set compression none
```
- If any database has non-zero, in-row large object (LOB) lengths, set it to zero:  

```
alter database @dbname set inrow_lob_length = 0
```
- If any table is configured to use compression, turn it off:  

```
alter table @tablename set compression = none  
reorg rebuild @tablename
```
- If any table uses LOB compression or uses in-row LOBs:
  - a) Copy the data from that table to a new table
  - b) Drop the original table
- If any table was altered to include nonmaterialized columns, convert those columns to standard columns:

## Adaptive Server Downgrades

```
reorg rebuild @tablename
```

- If there are any holes in the log from previous **alter database log off** commands, remove the holes by using **alter database log on** to extend the log.

If you do not perform this before the downgrade, **sp\_downgrade** displays an error message similar to:

```
Error: Database 'dbname' contains num hidden pages that have to be filled.  
Please, use alter database log on command to extend the log num pages.
```

You can extend the log on whatever device you prefer, as long as you specify the number of indicated pages as being at least as large as the *num* value.

## Downgrading from Adaptive Server 15.7

---

Use **sp\_downgrade** to downgrade Adaptive Server 15.7 to an earlier version.

### Prerequisites

1. Save the current auditing settings for the 15.7 Adaptive Server by saving the output of the **sp\_displayaudit** system procedure in all system and user databases where any auditing options have been turned on:

```
1> sp_displayaudit  
2> go
```

2. Back up all of your databases and the \$SYBASE release area.

### Task

Downgrade from Adaptive Server 15.7 to an Adaptive Server 15.0, 15.0.1, 15.0.2, 15.0.3, or 15.5. Downgrading to versions of Adaptive Server earlier than 15.0 is not supported.

Downgrade from Adaptive Server Cluster Edition version 15.7 to Adaptive Server Cluster Edition 15.0.1.5.

1. Start the 15.7 server in single-user mode using **dataserver -m** to guarantee that no other user can access Adaptive Server while you are going through the downgrade steps. See the *Utility Guide* for more details on starting the server in single-user mode. If you do not do this, Adaptive Server displays the following when you run **sp\_downgrade**:

```
You cannot run sp_downgrade; server must be in single-user mode.  
Try restarting the server using the -m option.
```

2. Make sure Adaptive Server 15.7 is prepared for downgrade by executing this command from the master database:

```
sp_downgrade 'prepare', @toversion='version'
```

The format for the value of *version* does not need periods, so these are all valid: "15.5", "155", "15.0", "150", "15.0.1", "1501", "15.0.2", "1502", "15.0.3", "1503". The version you enter should be the Adaptive Server version to which you want to downgrade.

---

**Note:** If you have used the 15.0.2 features for encrypted columns and you are downgrading to:

- Adaptive Server 15.0 or 15.0 ESD #1 – specify the version as "15.0."
  - Adaptive Server 15.0, 15.0 ESD #2, 15.0.1, or a 15.0.1 ESD – specify the version parameter as "15.0.1."
  - Adaptive Server 15.0.2 or a 15.0.2 ESD – specify the version parameter as "15.0.2."
- 

**sp\_downgrade 'prepare'** validates the readiness of Adaptive Server 15.7 for downgrade. It may print messages regarding manual changes required before the downgrade can be completed. Repeat this step, correcting any errors reported, and make sure you understand the implications of all warnings before proceeding.

### 3. Execute:

```
sp_downgrade 'downgrade', @toversion='version', @override=1
```

Use the same version number as in step 2. Once this command completes successfully there can be no more activity on the 15.7 server. Run **checkpoint** and immediately shut down the 15.7 server.

### 4. Copy the RUN\_SERVER file to the release area for the version you are downgrading to. Modify the file to use the **dataserver** binary of the version to which you are downgrading, using **-e**, **-c**, and **-M** option point to the old server.

For example, if you are downgrading to 15.0.2, change 15.7-related information to 15.0.2-related information. From the SYBASE directory:

```
/work_dirs/sybase/ase1502/ASE-15_0/bin/dataserver\  
-s old_server_name\  
-d downgraded_master_device\  
-e old_server_log_file\  
-c old_server_config_file\  
-M /work_dirs/sybase/ase1502\  

```

### 5. Restart the old server using the modified RUN\_SERVER file. Ensure that the environment variable points to the old server release such as \$SYBASE, \$SYBASE\_ASE, or \$SYBASE\_OCS.

---

**Note:** When downgrading to a 15.0 or a 15.0.1 server, you can reset user passwords by setting **sp\_passwordpolicy 'allow password downgrade'** to **0**. User passwords are reset and print on the console. Be sure to save the output of **sp\_downgrade 'downgrade', <version>** into a file, so the passwords are not lost. To regenerate the sa password, restart the downgraded server with **-psa**. See *sp\_passwordpolicy* in *Reference Manual: Procedures*.

---

### 6. Run any post-downgrade scripts that may be applicable to your site.

If you have not used any 15.7 functionality, this completes the primary downgrade process.

## Additional Considerations for New Features Used

Additional downgrade steps may be necessary due to Adaptive Server 15.7 features that are not available in the Adaptive Server version to which you are downgrading.

In general, no additional steps are required when you are returning to an Adaptive Server version in which the feature was already available.

Returning to 15.0.2 ESD #3 is easier than downgrading to other versions, because this version can handle a number of error conditions that may arise as a result of downgrading.

If you return to a pre-15.0.2 ESD #3 version of Adaptive Server, no error handling is provided. Using the new features can result in inexplicable behavior, including misleading error messages and stack traces, unless you are uninstall all usages of the new features reported by `sp_downgrade`.

Feature	Considerations
<b>Wide, variable-length data-only-locked (DOL) rows</b>	<p>You cannot downgrade versions that contain wide, variable-length DOL rows to versions that do not support the feature.</p> <p>Use the <code>dol_downgrade_check</code> function to determine if a database includes tables with wide, variable-length DOL rows. See Reference Manual: Basics for information about <code>dol_downgrade_check</code>.</p> <hr/> <p><b>Note:</b> If you:</p> <ol style="list-style-type: none"> <li>1. Disable the <b>allow wide dol rows</b> database option before performing a database or transaction log dump</li> <li>2. Load these database dumps onto an earlier version of Adaptive Server.</li> </ol> <p>Data returned from queries on the wide rows may be incorrect, or queries might fail because the earlier version of Adaptive Server perceives the data rows as corrupt.</p>
<b>Java in Adaptive Server</b>	<ul style="list-style-type: none"> <li>• User classes compiled by a Java version later than 1.2 do not work in pre-15.0.3 Adaptive Server versions.</li> <li>• Earlier versions of Adaptive Server ignore the <b>enable pci</b> parameter; you can remove it.</li> <li>• <b>sybpcidb</b> is not used by Adaptive Server versions earlier than 15.0.3, and may be dropped.</li> </ul>
<b>sp_addserver with <i>filter</i> parameter</b>	<p>If you have any entries in <code>sys.servers . srvnetname</code> column that are longer than 32 bytes, delete these entries before downgrading, and add them back after downgrading.</p>

Feature	Considerations
<b>Unicode non-characters</b>	<p>If you used <b>sp_configure</b> to enable functionality group or permissive Unicode in Adaptive Server 15.7 and also stored Unicode noncharacters (that is, u+FFFF or u+FFFE) in a database, you may see a conversion error after you downgrade to a version earlier 15.7 when Adaptive Server retrieves the data and triggers a character set conversion.</p> <p>To avoid such errors, search for and remove those characters from the system.</p>
<b>Disabled varbinary truncation</b>	<p>If you used <b>sp_configure</b> to turn on the <code>disable varbinary truncation</code> configuration in Adaptive Server 15.7, the <code>varbinary</code> data stored in the system may have trailing zeros. When you downgrade to a version earlier than 15.7, these trailing zeros are not removed and become part of the <b>select</b> output. This does not affect query results involving comparisons.</p>
<b>Sharable inline default</b>	<p>If you used <b>sp_configure</b> to enable the <b>sharable inline default</b> setting in Adaptive Server 15.7 and downgrade to a version earlier than 15.7, running the <b>ddlgen</b> utility to generate data-definition language can cause Adaptive Server to generate extra <b>create default</b> statements. You can remove such statements before using the output to create new schema.</p>

## Restoring Original Messages After a Downgrade

---

You can restore the original messages for the earlier version of Adaptive Server after you perform a downgrade.

Run this script after downgrading the server:

```
isql -Usa -Psa_password -irestoremsgs.ebf
```

## Downgrading Job Scheduler

---

If you are downgrading to Adaptive Server versions 15.0 or 15.0.1, run **installjsdb** script from the earlier version.

### 1. Disable Job Scheduler:

```
1> sp_configure "enable job scheduler", 0
2> go
1> sybmgmtdb..sp_sjobcontrol @name=NULL, @option="stop_js"
2> go
```

### 2. Follow the downgrade steps for your platform.

### 3. After downgrading, enter this command from the earlier version of Adaptive Server:

```
isql -Usa -Psa_password -Sservername
-i$SYBASE/$SYBASE_ASE/scripts/installjsdb
```

---

**Note:** The directory with the **isql** executable (`$SYBASE_OCS/bin`) must be in your path.

---

4. Enable Job Scheduler:

```
sp_configure "enable job scheduler", 1
```

5. To start Job Scheduler, either restart the server, or enter:

```
1> use sybmgmtdb
2> go
1> sp_sjobcontrol @name=NULL, @option="start_js"
2> go
```

---

## Downgrading an Adaptive Server that Uses Encryption

---

Perform these steps to downgrade an Adaptive Server versions 15.7 and later if you enabled 256-bit key encryption keys.

1. Set the **downgrade\_kek\_size** configuration option to true. This means you must change the key encryption key size to 128 bits.
2. Run **sp\_downgrade** to find all column encryption keys (CEKs) and key copies that are protected by master keys or by dual control.

3. Drop dual control for each CEK:

```
alter encryption key keyname
    [with passwd password
    modify encryption
    with no dual_control
```

4. Use **drop encryption key** to drop user and login password-protected key copies.
5. Create a system encryption password for each database that has master keys:

```
sp_encryption system_encr_passwd, <password>
```

6. Re-encrypt each CEK with the master key:

```
alter encryption key keyname
    with passwd master key
    modify encryption
    with passwd system_encr_passwd
```

---

**Note:** The key owner must perform the re-encryption for each CEK, or else the key ownership changes.

---

7. Re-encrypt all base keys that are protected by user passwords:

```
alter encryption key keyname
    with passwd old_password
    modify encryption
    with passwd new_password
```

---

**Note:** The key owner must perform the re-encryption for each base key, or else the key ownership changes.

---

## Downgrade Considerations for Adaptive Server with Replicated Databases

---

Special considerations exist for downgrading Adaptive Server version 15.7 that uses replicated databases,

If the server you are downgrading from has replicated databases and SQL replication has been enabled, you must follow different procedures depending upon the version of Adaptive Server you are downgrading to.

If your replication system is using RepAgent and you are downgrading to a 15.0.2 ESD #3 or later, there are no additional steps required. Adaptive Server 15.0.2 ESD #3 can keep the data synchronized.

If you are not using RepAgent, consult the specific documentation for the product you are using to replicate data.

If you downgrade to a version earlier than 15.0.2 ESD #3, Sybase recommends that you use the standard documented procedure to downgrade an Adaptive Server with replicated databases.

The standard procedure to downgrade Adaptive Server with replicated databases consists of ensuring that all replicated data in the primary database transaction log has been successfully transferred to the standby or replicate database. Once RepAgent is started again after the downgrade process, you must ensure that it does not read logs written with version 15.7:

1. Suspend transaction processing and replication activities.
2. Drain the transaction logs for primary databases.
3. Disable the secondary truncation point.

## Post-Downgrade Tasks for Adaptive Server

---

After you perform the basic downgrade steps, finish the process by handling residual tasks.

1. Installing system stored procedures of the old version drops auditing information about system stored procedures. Use the output of **sp\_displayaudit** recorded during predowngrade to help determine the system stored procedures for which auditing was enabled. Reenter the audit options using **sp\_audit**. For example, **sp\_addlogin** was audited in your server before upgrading, run this command to reenale auditing on **sp\_addlogin**:

```
sp_audit "exec_procedure", "all", "sp_addlogin", "on"
```

After you run `installmaster`, `installmodel`, `installcommit`, `installsecurity`, `installhasvss`, `installjsdb`, and `installmsgsvss` on your downgraded server, return system stored procedures to their earlier form. New

## Adaptive Server Downgrades

stored procedures introduced in releases subsequent to the downgraded server are not removed.

---

**Warning!** Attempts to execute new stored procedures against an older binary have unpredictable results.

---

2. During the upgrade to Adaptive Server 15.7 you should have created a `restore_msgs.ebf` file. Run this script now to restore your messages back to the version from which you upgraded:

```
isql -Usa -P <sa_password> -S <server_name> -i  
<restore_msgs.ebf>
```

---

**Note:** If you upgraded from a 15.0 or 15.0.1 release and are reverting back to the 15.0 or 15.0.1 release, then you must only run `instmsgs.ebf` file from the relevant release.

---

3. The on-disk structures of stored procedures, triggers, and views may contain statement identity tokens, datatypes, and object references that are not understood by the earlier Adaptive Server versions. You must drop all compiled objects that use features introduced into Adaptive Server subsequent to the release to which you are downgrading.
4. If during the upgrade process you ran the **update all statistics** on `syslogins`, you must **delete statistics** for `syslogins` and re-create them.  
**spt\_values** are dropped and re-created when you run **installmaster** from the release area you downgraded to. Any new types are eliminated from this table.
5. Running **installmaster** from the release area of the server to which you downgraded removes configuration parameters that belong to 15.7, by deleting `sysconfigures` rows for configuration parameters that do not exist in `syscurconfigs`. After running **installmaster**, the error messages no longer appear when you start the server.

If you start a downgraded server using the 15.7 configuration file, the new options generate an Unknown parameter message. The unknown options are reported the first time you restart the server. You can ignore these messages; the configuration file is rewritten without the unknown options.



# Uninstalling Adaptive Server

Run the uninstaller to remove Adaptive Server.

## Prerequisites

You must shut down all servers before uninstalling Adaptive Server.

## Task

---

**Note:** The uninstallation process reverses only those actions originally performed by the installer, leaving intact any files or registry entries you created after the installation. You remove these after you complete the uninstallation.

---

1. Execute the uninstall program:

```
$SYBASE/sybuninstall/ASESuite/uninstall
```

2. Click **Next** in the Uninstall Welcome window.
3. Choose one of the following, then click **Next**:
  - Complete Uninstall – uninstalls everything originally installed by the installer.
  - Uninstall Specific Features – displays a list of features. If any unselected products/components are dependent on features selected for uninstall, you can still proceed with the uninstall but dependent features are not uninstalled.

You see a window indicating that the uninstallation process is being performed. There is no progress bar.

---

**Note:** You may need to confirm the deletion of some files that have been modified since installation.

---

4. When you see the final window, click **Done** to exit the uninstallation program.

## Removing an Existing Adaptive Server

---

Learn how to remove an existing Adaptive Server.

1. From \$SYBASE, enter:

```
rm servername.*
```

2. Change to \$SYBASE/\$SYBASE\_ASE/install and run the following commands:

```
rm RUN_servername.*
rm servername.*
```

3. Edit \$SYBASE/interfaces, to remove all references to the Adaptive Server.

## Uninstalling Adaptive Server

4. Remove any operating system files for existing database devices.

# Troubleshoot SySAM

If SySAM errors are not addressed in a timely fashion, Adaptive Server may cease to function.

There may be more recent information published in the *SySAM Asset Management Users Guide* online at the *SySAM FAQ*. If your Sybase product cannot find a required license, it continues to operate in grace mode, if a grace period is available. Determine the license status of your product using the output from **sp\_lmconfig** command. The `Status` column shows graced for any license that is operating within a grace period.

Typically, you have 30 days during which to resolve any SySAM-related issues. When a license is awarded under grace, the Sybase product error log entry and optional e-mail message include the date and time when the grace period expires. In addition, you can execute **sp\_lmconfig** to determine the expiration date.

All SySAM-related errors are printed in your Sybase product error log and are prefixed with "kernel SySAM. " For example:

```
<timestamp> kernel SySAM: Failed to obtain 1 license(s)
for ASE_CORE feature from license file(s) or server(s).
```

If e-mail alerts are configured, recipients receive an e-mail whenever a SySAM event occurs.

You can always check the current state of SySAM licenses in your Sybase product using the **sp\_lmconfig** command. The output shows the current SySAM configuration and the status of each license.

If you are using a served license model, the license server's debug log, located in the `log` directory, provides information about any license checkout issues.

The Sybase product log includes information about licenses awarded under grace mode. If e-mail notifications are set up for a severity of "warning," e-mail messages are sent for this event. Warnings in the Adaptive Server error log and e-mail messages are repeated while the license is under grace mode.

## Troubleshooting SySAM

Identify and troubleshoot SySAM issues.

Description	Action
<p>Cannot find license type during the Adaptive Server installation.</p>	<p>The Adaptive Server installation program displays only the most commonly used license types. If you are using a legacy license or a new license type, your license may not be listed.</p> <p>If you do not find the license type you need, select <b>Unknown</b> and complete the installation. After the installation is complete, use <b>sp_lmconfig</b> to change the license type. See the <i>Reference Manual:Procedures</i> for <b>sp_lmconfig</b> usage information.</p> <hr/> <p><b>Note:</b> If you set the license type value to <b>Unknown</b>, Adaptive Server uses the first available license. If you have licenses for more than one type, Adaptive Server may pick the incorrect license. Set the correct license type.</p> <hr/> <p>See <i>If the Installation Program Cannot Find a Suitable License</i> on page 95 if you select a served license model that the program cannot find.</p>
<p>The license server executables and scripts are not installed.</p>	<p>The <code>sysam</code> wrapper script and the executables for the license server (<b>Imgrd</b> and <b>SYBASE</b>) are not installed or found in the <code>SYSAM-2_0 bin</code> directory.</p> <p>By default, the license server component is not selected for installation. To install the license server, choose the custom installation option and select the license server component.</p> <p>Alternatively, download a standalone SySAM license server installation program from <a href="http://www.sybase.com/products/allproductsa-z/sysam">http://www.sybase.com/products/allproductsa-z/sysam</a>.</p>

Description	Action
<p>The license server does not start.</p>	<p>For a license server to start, there must be at least one served license in the <code>licenses</code> directory. When you install a new license server, there are no served licenses in the <code>licenses</code> directory and the license server does not start until you activate a license from the Sybase Product Download Center (SPDC) or SAP Service Marketplace (SMP) and copy it into the <code>licenses</code> directory.</p> <p>Other causes for license server not to start include:</p> <ul style="list-style-type: none"> <li>• The license activated from SPDC or SMP was an unserved license. Examine the license files. Served licenses always start with a <code>SERVER</code> header. If you do not see this header, you are using an unserved license, which does not work with the license server.</li> <li>• If you are using a specific port number for the license, that port number may already be in use. Use <code>netstat -a</code> to verify that the port number is free. If not, free the port or use a different port number for the license server.</li> <li>• The host name recorded in the <code>SERVER</code> header does not match the actual host name. The host name is recorded next to the <code>SERVER</code> keyword. If it does not match, correct the host name in the license file or set it to <code>"this_host"</code>, which is a keyword that works with any host name.</li> <li>• The licenses copied may be activated for a different machine. The host ID next to the host name in the <code>SERVER</code> header must match the host ID for the machine where the license server is running.</li> </ul>
<p>The license server does not recognize the license files.</p>	<p>If the license server refuses to serve the licenses, it may be because:</p> <ul style="list-style-type: none"> <li>• The license was activated for a different machine or activated using an incorrect host ID. Compare the host ID recorded in the license with the host ID assigned to the machine. If they do not match, check in and regenerate the license with the correct host ID.</li> <li>• The license has been altered. If the license is being created by typing from a paper copy, verify if there are any errors entering the license. You can also download a new copy of the activated license from SPDC or SMP.</li> </ul> <p>If the host ID for your platform is based on the network adapter identification, verify that you have used an ID associated with a valid NIC. IDs associated with loopback adapters are invalid. If the ID associated with a removable network adapter has been used, ensure that the adapter is attached to the computer.</p>
<p>Adaptive Server does not start, and generates a license checkout failure error.</p>	<p>If Adaptive Server cannot check out the required license, it determines whether the license can be issued in grace mode. If a grace period cannot be given, the license is not granted. If the base license for Adaptive Server (<code>ASE_CORE</code>) has been running in a grace period, and the issue is not fixed by the end of the grace period, Adaptive Server fails to start.</p> <p>See "Adaptive Server cannot check out a license and starts with graced license instead."</p>

Description	Action
<p>Adaptive Server shows graced licenses even after the issue has been fixed.</p>	<p>Adaptive Server periodically performs license checks, and the license status is not immediately updated. It is updated only after the next heartbeat cycle is completed, which may take a few hours.</p>
<p>Adaptive Server cannot find license for an optional feature, even though the license exists.</p>	<p>Execute <code>sysam diag feature_name</code> to ensure that the license for the optional feature exists and can be checked out from the machine where Adaptive Server is running. If the feature exists, but cannot be checked out from Adaptive Server, this could be because:</p> <ul style="list-style-type: none"> <li>• The optional feature is for a different edition.</li> <li>• The status field in the license, which indicates whether a license is active or not, does not match between Adaptive Server and the optional feature.</li> </ul> <p>Execute <code>sp_lmconfig</code> to determine the edition, and active and standby (that is, inactive) configuration values. The information is located in the Property Name/Property Value table. The edition value is in the PE row and active and standby value is in the AS row.</p> <p>The values of PE and AS for the Adaptive Server must match the values of the <code>VENDOR_STRING</code> and <code>ISSUER</code> fields for the optional feature license. Some features, such as high availability (<code>ASE_HA</code>), are not offered with standby pricing, so there is no "AS=A   S" flag in the license for this feature. This field is not considered when searching for a license without active and standby capability.</p>
<p>Adaptive Server does not start with the expected edition or license type.</p>	<p>If the <b>edition</b> and <b>license type</b> configuration parameters are not set, Adaptive Server uses the first available <code>ASE_CORE</code> license. If you have multiple <code>ASE_CORE</code> licenses with different editions and license types, the license that is the first available depends on many factors, such as license file directory sort order, available licenses on the license server, and so on.</p> <p>Sybase recommends that you set the <b>edition</b> and <b>license type</b> configuration parameters. When these parameters are set, you are assured that Adaptive Server starts with that configuration. If a matching license is unavailable, Adaptive Server starts under grace (if available) to allow you to resolve the licensing issue.</p>

Description	Action
<p>Adaptive Server picks an incorrect license.</p>	<p>Adaptive Server looks for licenses in these locations:</p> <ul style="list-style-type: none"> <li>• Any saved values in the <code>registry</code> on Windows platforms, or the <code>.flexlmrc</code> file on UNIX platforms. Use <code>lmpath -status</code> to view the saved values.</li> <li>• The values set for <code>SYBASE_LICENSE_FILE</code> and <code>LM_LICENSE_FILE</code> environment variables.</li> <li>• All license files (any file with a <code>.lic</code> extension) in the licenses directory under the <code>SYSAM-2_0</code> directory.</li> </ul> <p>All of the above locations are searched in the order specified until a suitable license is found. When a directory is specified, license files in that directory are loaded in the directory sort order.</p> <p>The first license that matches the feature name, version, edition, and license type filter is used. This license may not be what you were expecting to use. Adjust the above locations to control this.</p>

## If the Installation Program Cannot Find a Suitable License

If you select a served license model, the installer checks for a license with the selected edition and license type. You see a warning message if no suitable license is available.

If you are performing a new Adaptive Server installation or upgrading an existing Adaptive Server version 12.5.x or earlier, proceed with the installation. Adaptive Server provides a 30-day grace period to resolve licensing issues. Once the installation is complete, debug the license checkout failure. See "Adaptive Server cannot check out a license and starts with graced license instead" in *Troubleshooting SySAM* on page 92.

If you are upgrading an existing Adaptive Server version 15.0 or later, Adaptive Server may not start after the upgrade if you do not have a suitable license. Exit the installation program and see if the existing Adaptive Server can check out licenses. If it cannot, troubleshoot this issue and then proceed with the upgrade.

If the existing Adaptive Server can check out licenses, verify that the license you are using authorizes the update you are applying. This can be determined using the date-based version of your license file and the date this update was released. You must have a license with a date-based version that is later than or equal to the date the update was released. Adaptive Server provides a grace period for updating the licenses after support is renewed.

Determine the date-based version of the license from the *Version* column of the output from `sp_lmconfig`, by looking at the license checkout message in the Adaptive Server error log, or by examining the license itself. See *Anatomy of a License* in the *Sybase Software Asset Management Users Guide*.

Determine the Adaptive Server release date by looking at the version string, cover letter, or download link for the Sybase Product Download Center (SPDC) or SAP Service Marketplace (SMP). The release date is also posted in the error message.

You can download an updated license from SPDC or SMP, if your support has been paid for the date the update was released. If your support has not been paid, you are not authorized to install an update.

See *Working with Date-Based Versioning* and *Getting and Using your Licenses* in the *Sybase Software Asset Management Users Guide*.

## If Adaptive Server Cannot Check Out a License and Starts Using a License Under a Grace Period

---

There are several reasons why Adaptive Server cannot check out a license.

### Prerequisites

Execute the `sysam diag feature_name` command from the `SYSAM-2_0 bin` directory, where `feature_name` is the SySAM feature name for Adaptive Server or the optional feature that is in grace mode. The feature name is printed in the Adaptive Server error log and in the optional e-mail notifications.

- If you are using a **served** model and **diag** shows no license available to check out:
  - Verify that the license server is running and can be reached from the machine you are using. Use `"sysam status"` to verify that you can access the license server. If you cannot access the license server, verify that the license server is running.
  - If the license server is running, use `"sysam status -f feature_name"` to determine whether the license server is serving a license for the given feature. If not, obtain the correct licenses from the Sybase Product Download Center (SPDC) or SAP Service Marketplace (SMP).
  - All licenses on the license server may be in use. If `"sysam status -f feature_name"` indicates that no licenses are available, obtain additional licenses or shut down existing instances of Adaptive Server.
- If you are using an **unserved** model and **diag** shows no license available to check out:
  - The license for the given feature may not be copied in the local `licenses` directory. Obtain the correct licenses from SPDC or SMP, and copy them to the local `licenses` directory.
  - The license may have been activated for a different machine or activated with incorrect host ID. Check in and reactivate the license with the correct host ID.
  - The available licenses are for a different operating system or architecture. Obtain license for the correct platform from SPDC or SMP.



- If you are running in a terminal server environment, you cannot use unserved licenses. Set up served licenses for a terminal server environment.
- The available license may not authorize this version of Adaptive Server. For information about date-based versioning, see the *SySAM Users Guide*.
- If the **diag** command shows the license for the given feature is available for checkout, this may be because the product edition or license type does not match the requirement. If the **edition** and **license type** configuration parameters are set, Adaptive Server uses only the license that matches these settings:
  - a) Run **sp\_lmconfig** to see the configured values.
  - b) Check the **VENDOR\_STRING** attribute of the licenses to verify that a matching license exists.

If a matching license does not exist, obtain a suitable license from SPDC or SMP, or adjust the Adaptive Server configuration.

If Adaptive Server cannot start because the grace period expired, examine the `servername.properties` file located in the `ASE-15_0/sysam` directory under your SYBASE directory for values. These values are stored in two lines that start with `PE=` and `LT=`. These lines are present only if the configuration is set.

## E-Mail Notifications

---

Use **sp\_lmconfig** to configure e-mail notification. To view the current notification status and configuration, execute **sp\_lmconfig** without any parameters.

To enable e-mail notifications, set the **smtp host**, **smtp port**, **email sender**, **email recipients**, and **email severity** properties.

To change the severity that triggers e-mail notification, set the **email severity** property to: "ERROR", "WARNING", "INFORMATIONAL", or "NONE".

To change the list of e-mail recipients, set the **email recipients** property to a comma-separated list of e-mail addresses. E-mail addresses can include anything that is capable of receiving SMTP messages.

## Before You Contact Sybase Technical Support

---

Get information about your situation before you call Sybase Technical Support about SySAM-related issues.

- The Adaptive Server error log.
  - `$(SYBASE)/ASE-15_0/install/<servername>.log`
- If Adaptive Server does not start, the server's properties file:
  - `$(SYBASE)/ASE-15_0/sysam/<servername>.properties`

## Troubleshoot SySAM

*servername* must correspond to the name of the Adaptive Server that does not start.

- The license files saved in the `SYSAM-2_0/licenses` directory on the machine running Adaptive Server.
- The value of `SYBASE_LICENSE_FILE` and `LM_LICENSE_FILE` environment variables.
- Output from `lmutil lmpath -status` command. `lmutil` is located in the `bin` directory under the `SYSAM-2_0/bin` folder.
- If you are using a served license model:
  - The licenses saved in the `SYBASE/SYSAM-2_0/licenses` directory of the license server.
  - The license server log file in the `SYBASE/SYSAM-2_0/log` directory.

# Troubleshoot the Server

Determine the cause of problems and apply the recommended solution.

To determine the cause of an error, first look in the log file of the utility being used, to identify the task the utility was performing when it failed. Then check the server error log.

This table lists possible causes and solutions for common problems that you might encounter during a first-time installation or upgrade. If you continue to have problems, retry the installation or upgrade.

If the installation program or **srvbuild** unexpectedly quits, or if you cannot correct the problem, see the *Error Messages and Troubleshooting Guide*.

Problem	Solution
The installation program cannot start Adaptive Server.	<ul style="list-style-type: none"> <li>• Make sure you meet RAM requirements. If you have the required RAM, remove, then reinstall all applications to the hard drive and restart the installation.</li> <li>• After Adaptive Server is installed, there should be 25MB of free disk space left in the disk drive. Adaptive Server needs approximately 18MB for creating shared memory files.</li> <li>• Verify that you are logged in as system administrator. You must log in as an administrator to start Adaptive Server.</li> <li>• Shut down Monitor Server before restarting Adaptive Server.</li> <li>• Adaptive Server may not start if it cannot find a SySAM license and if the grace period has expired. Check the Adaptive Server error log for the cause of the license checkout failure and fix the issues.</li> </ul>
After upgrading Adaptive Server, <b>srvbuild</b> does not run.	Exit and restart <b>srvbuild</b> .
The installation program cannot connect to the upgraded Adaptive Server	Exit and restart <b>srvbuild</b> .

## Error Logs for Installation Utilities

The information in the error logs helps determine the reason and possible solution for a problem with the installation.

### *Locations of Error Logs for Installation-Related Utilities*

Utility	Default Location and File Name
<b>InstallAnywhere</b>	\$SYBASE/log/ASE_Suite.log
<b>srvbuildres</b>	<p>\$SYBASE/\$SYBASE_ASE/init/logs/srvbuildMMDD.NNN</p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>MM</i> – is the month.</li> <li>• <i>DD</i> – is the date.</li> <li>• <i>NNN</i> – is a three-digit number identifying the <b>srvbuild</b> session.</li> </ul>
<b>sqlupgraderes</b>	<ul style="list-style-type: none"> <li>• \$SYBASE/\$SYBASE_ASE/init/logs/sqlupgradeMMDD.NNN</li> <li>• \$SYBASE/\$SYBASE_ASE/upgrade/upgrade.NNN – is a temporary file created by the upgrade process</li> </ul>

## Error Logs for Sybase Servers

The information in the error logs helps to determine the reason and possible solution for an error message.

### *Locations and File Names of Error Logs for Sybase Servers*

Server	Default Location and File Name
<b>Adaptive Server</b>	\$SYBASE/\$SYBASE_ASE/install/servername.log
<b>Backup Server</b>	\$SYBASE/\$SYBASE_ASE/install/servername.log
<b>Monitor Server</b>	\$SYBASE/\$SYBASE_ASE/install/servername.log
<b>XP Server</b>	\$SYBASE/\$SYBASE_ASE/install/servername.log

## Troubleshooting Common Installation Problems

Identify the cause of installation problems and apply the recommended solutions.

Problem	Resolution
<p><b>Cannot use X-Windows</b></p>	<p>If the setup and configuration utilities do not show correctly, you may need to adjust the resolution on your monitor.</p> <p>To change to a smaller font size, issue the following UNIX commands:</p> <pre data-bbox="413 510 1180 760"> % cd \$SYBASE/ASE-15_0 % chmod +w xappdefaults % cd xappdefaults % chmod +w * % foreach i(*) ? cat \$i   sed -e "s/140/100/g"   sed -e "s/^#D/D/g"   sed -e "s/^#S/S/g" &gt; p ? mv p \$i ? end % </pre> <p>The installation utilities will now use approximately 25 percent less window space.</p>
<p><b>Cannot eject the CD or DVD from the drive</b></p>	<p>If you cannot eject the CD from the drive, check:</p> <ul data-bbox="413 923 1189 1048" style="list-style-type: none"> <li>• To see whether the CD drive path is the current directory (<b>pwd</b>) in a UNIX terminal window. If it is, change (<b>cd</b>) to another directory.</li> <li>• For <b>sybhelp</b> processes. If these processes exist, kill them using the UNIX <b>kill</b> command.</li> </ul>
<p><b>DISPLAY environment variable not set correctly</b></p>	<p>To correct the problem, enter the following command at the UNIX prompt of the <i>remote</i> machine, where <i>host_name</i> is the name of the machine on which you want the installer to appear (that is, on your <i>local</i> machine).</p> <p>For C shell:</p> <pre data-bbox="413 1236 1180 1260">setenv DISPLAY host_name:0.0</pre> <p>For Bourne shell:</p> <pre data-bbox="413 1322 1180 1347">DISPLAY=host_name:0.0; export DISPLAY</pre>

Problem	Resolution
<p><b>Client not authorized to connect to server</b></p>	<p>This error message means the remote machine does not have permission to display the user interface on the local machine where you start working:</p> <pre>Xlib: connection to "host_name" refused by server Xlib: Client is not authorized to connect to Server xhost: unable to open display "host_name"</pre> <p>To correct the problem:</p> <ol style="list-style-type: none"> <li>1. Enter the following command at the UNIX prompt of your <i>local</i> machine, where <i>remote_machine</i> is the machine on which you are running the installer: <pre>xhost +remote_machine</pre> </li> <li>2. Restart the installer.</li> </ol>
<p><b>Address already in use</b></p>	<p>To correct the problem, enter a different port number on the <b>srvbuild</b> window. The command <b>netstat -a</b> produces a list of port numbers in use.</p>
<p><b>Adaptive Server fails to start</b></p>	<p>The shared memory of the operating system may not be set high enough. Adjust the shared memory value. Restart the installation or upgrade process.</p>
<p><b>The Installer fails to start</b></p>	<p>If the installer does not start, restart it using the debug mode, set the environment variable <b>LAX_DEBUG</b> to true before running the installer.</p>
<p><b>Cannot start XP Server</b></p>	<p>You may receive the following message from XP Server when it is invoked by <b>xp_cmdshell</b> or some other extended stored procedure:</p> <pre>Msg 11018, Level 16, State 1: Procedure "xp_cmdshell", Line 2: XP Server must be up for ESP to execute. (return status = -6)</pre> <p>Verify that there is an XP Server entry in the Adaptive Server <i>sys.servers</i> table. If you created XP Server in a different <b>srvbuild</b> session than Adaptive Server and you did not specify a related Adaptive Server, <b>srvbuild</b> cannot update the <i>sys.servers</i> table. Verify that the XP server exists in the interfaces file or LDAP server.</p> <p>Use <b>sp_addserver</b> to add an entry to the <i>sys.servers</i> table.</p>
<p><b>Troubleshooting Resource File Installations</b></p>	<p>If you encounter problems during the build, configuration, or upgrade process while using the <b>srvbuild[res]</b>, <b>sqlloc[res]</b>, or <b>sqlupgrade[res]</b>, it may be that these utilities did not allow enough time for Adaptive Server to shut down properly. Set the <b>SYBSHUTWAIT</b> environment variable to force the utilities to wait for Adaptive Server to shut down. For example, this command forces the utility to wait for two minutes to allow Adaptive Server to shut down before proceeding with the next task:</p> <pre>% setenv SYBSHUTWAIT 120</pre>

## Stopping Adaptive Server After a Failure

If the installation or upgrade session fails after you start Adaptive Server for any reason, use the **shutdown** command.

1. Log on as "sa".
2. Shut down Adaptive Server using the **shutdown with nowait** command. Using the **with nowait** option stops the Adaptive Server immediately, without waiting for currently executing SQL statements to finish:

```
1> shutdown with nowait
2> go
```

3. If the installation or upgrade session fails after you start Adaptive Server, try using Sybase Central to shut down the server. If Sybase Central cannot shut down the server, use the **shutdown** command.

## Recovering from a Failed Installation

If the installation fails, you see error messages.

Review the error messages and your Adaptive Server error log to determine the cause of the installation failure.

### If the Installation Quits While You Are Configuring Adaptive Server

Learn what to do if the installation suddenly quits.

1. View the contents of the log file generated by Adaptive Server.
2. Take any suggested actions to correct the problem.
3. If the installation fails after the installation program:
  - Created any operating system files, such as the master device or system procedures device files – delete those files.
  - Starts the Adaptive Server that you are attempting to install – shut down that server.
4. Use Server Config to restart the configuration.

## If Adaptive Server Fails the Preupgrade Eligibility Test

Examine the log file to determine why Adaptive Server was not eligible for an upgrade.

If Adaptive Server fails the pre-upgrade test, Server Configuration displays:

```
Server SERVER_NAME failed preupgrade eligibility test.
See log for more information.
```

1. From the Upgrade window, select **Exit**.
2. Examine the log file created in the `$SYBASE/$SYBASE_ASE/init/logs` directory to find out why Adaptive Server failed the pre-upgrade eligibility test.

After you resolve any problems, shut down Adaptive Server and use **sqlupgrade** to complete the upgrade session.

## When an Upgrade Fails

---

If the upgrade process fails, the installation program displays error messages.

Once you start Adaptive Server on the new version, you cannot start Adaptive Server on the earlier version. Attempts to do so result in having to restore from backups.

## If You Can Identify the Cause of the Upgrade Failure

If the error logs or messages clearly indicate the cause of failure, and you do not believe your databases have been damaged, you can attempt to fix the problem and re-run the upgrade immediately.

1. Exit the **sqlupgrade** program.
2. Perform the necessary actions to fix the problem.

For example, if the error log indicates that the upgrade failed because your existing databases do not contain enough space, use the **alter database** command to increase the available space.

3. If needed, shut down Adaptive Server.

Shutting down the server enables the installation program to start the server and re-run the upgrade session.

4. Start **sqlupgrade** again.
5. Select **Upgrade Adaptive Server**, and proceed with the upgrade.

## Restoring Databases After a Failed Upgrade

You may need to restore your databases due to a failed upgrade.

- If you think the upgrade failure or its cause may have damaged your databases, restore the databases from backups. For information on restoring databases, see the *System Administration Guide*.
- If you are concerned about the possible corruption of your databases, exit **Server Config**, but do not attempt to restart the upgrade session until you have restored the databases from backup. After restoration is complete, retry the upgrade.

## Recovering from a Failed Upgrade

Issues with upgrades could be due to a failure to upgrade an individual database, or a failure to complete configuration changes after all databases have been upgraded.

Use the output from the upgrade utility to correct the problem that caused the failure.



- If the upgrade failed because the process ran out of some resource, such as data or log space, locks, or auxiliary scan descriptors, add space to the database using the **alter database** command.

You may also correct other resource failures by changing the server's configuration using the **sp\_configure** stored procedure.

- If an upgrade failure leaves a database offline, and the failure can be corrected only by making data changes in the database, you can gain access to the failed database by using **isql** or a similar program to connect to the affected server as user "sa" and issuing this command:

```
dbcc traceon(990)
```

Having set this trace flag, user "sa" can now use the offline database and make the necessary changes to correct the upgrade failure.

---

**Note:** This trace flag grants access only to user "sa"; "sa\_role" does not work. If you have disabled the "sa" login, reenable it to get access using this method.

---

To restart a server that has not successfully upgraded, use:

```
online database failed_db_name
```

The server restarts that database's upgrade from the point of failure.

- If the failure occurs after all databases have been upgraded, or if a failure somehow causes the upgrade utility to fail, manually re-run the utility. After you diagnose and correct the failure, run the upgrade utility:

```
$$SYBASE/$SYBASE_ASE/upgrade/upgrade
```

When restarted in this way, the upgrade process says it is "verifying" the upgrade rather than "starting" it, but it makes all the same checks as for the original upgrade.

- To verify that a database has upgraded successfully, check any database's upgrade status using the **online database** command. If any upgrade is required for a database, this command performs it. You may also use a procedure such as this to check all databases at a given installation:

```
declare @dbname varchar(255)
select @dbname = min(name)
from master..sysdatabases
while @dbname is not null
begin
online database @dbname
select @dbname = min(name)
from master..sysdatabases
where name > @dbname
end
```

- Reinstall system stored procedures using the scripts from the new version:

```
isql -Usa -Ppassword -i $$SYBASE/$SYBASE_ASE/scripts/installmaster
```

---

**Note:** When a server fails during an upgrade process, it attempts to upgrade the databases when it restarts. When the installation is fully recovered, re-run the upgrade utility to

ensure that all post-upgrade configuration work is done. Then reinstall the system stored procedures.

---

- During the upgrade process, the log may become too full due to recorded catalog changes. If so, log in to the new server using **isql**, and issue:

```
isql> dump tran dbname with truncate_only
```

- a) If **truncate\_only** indicates that it could not truncate the log, retry the command as **no\_log** instead.
  - b) If this does not truncate the log successfully, use the **alter database** command to extend the database as explained below.
- In some cases, pre-upgrade space estimations are insufficient for the data copy phase of upgrade. You see a message that there is insufficient space in the system segment for the upgrade. When this happens, the upgrade process stops responding, waiting for space to be provided. To increase the size of the database, log in to the new server using **isql**, and use **alter database**:

```
isql> alter database dbname on device_name = "2m"
```

**alter database** allows you to specify the size to alter the database with the unit specifier "m", or "M".

---

**Note:** There are certain upgrade failures from which the server cannot recover. For example, attempts to upgrade system tables to version 15.x are quite sensitive to failures at certain points during the required changes. If you encounter such a failure, restore the failed database from backup. To prevent the upgrade from failing again, correct the problem that caused the original failure before issuing the **online database** command for that database. These catastrophic failures are nearly always caused by running out of resources, as described above, which then causes a failure to undo the aborted transaction.

---

## If You Cannot Identify the Cause of an Upgrade Failure

Your attempts to upgrade may continue to fail.

1. If attempts to upgrade continue to fail, check the error log file to identify where and where the upgrade failed.

By default, the log file is located in `$$SYBASE/$$SYBASE_ASE/install/<servername>.log`.

2. Contact Sybase Technical Support with the information.

# Obtaining Help and Additional Information

Use the Sybase Getting Started CD, Product Documentation site, and online help to learn more about this product release.

- The Getting Started CD (or download) – contains release bulletins and installation guides in PDF format, and may contain other documents or updated information.
- Product Documentation at <http://sybooks.sybase.com/> – is an online version of Sybase documentation that you can access using a standard Web browser. You can browse documents online, or download them as PDFs. In addition to product documentation, the Web site also has links to EBFs/Maintenance, Technical Documents, Case Management, Solved Cases, Community Forums/Newsgroups, and other resources.
- Online help in the product, if available.

To read or print PDF documents, you need Adobe Acrobat Reader, which is available as a free download from the *Adobe* Web site.

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**Note:** A more recent release bulletin, with critical product or document information added after the product release, may be available from the Product Documentation Web site.

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## Technical Support

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Get support for Sybase products.

If your organization has purchased a support contract for this product, then one or more of your colleagues is designated as an authorized support contact. If you have any questions, or if you need assistance during the installation process, ask a designated person to contact Sybase Technical Support or the Sybase subsidiary in your area.

## Downloading Sybase EBFs and Maintenance Reports

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Get EBFs and maintenance reports from the Sybase Web site or the SAP® Service Marketplace (SMP). The location you use depends on how you purchased the product.

- If you purchased the product directly from Sybase or from an authorized Sybase reseller:
  - a) Point your Web browser to <http://www.sybase.com/support>.
  - b) Select **Support > EBFs/Maintenance**.
  - c) If prompted, enter your MySybase user name and password.
  - d) (Optional) Select a filter, a time frame, or both, and click **Go**.
  - e) Select a product.

## Obtaining Help and Additional Information

Padlock icons indicate that you do not have download authorization for certain EBF/Maintenance releases because you are not registered as an authorized support contact. If you have not registered, but have valid information provided by your Sybase representative or through your support contract, click **My Account** to add the “Technical Support Contact” role to your MySybase profile.

- f) Click the **Info** icon to display the EBF/Maintenance report, or click the product description to download the software.
- If you ordered your Sybase product under an SAP contract:
  - a) Point your browser to <http://service.sap.com/swdc>.
  - b) Select **Search for Software Downloads** and enter the name of your product. Click **Search**.

## Sybase Product and Component Certifications

Certification reports verify Sybase product performance on a particular platform.

To find the latest information about certifications:

- For partner product certifications, go to [http://www.sybase.com/detail\\_list?id=9784](http://www.sybase.com/detail_list?id=9784)
- For platform certifications, go to <http://certification.sybase.com/ucr/search.do>

## Creating a MySybase Profile

MySybase is a free service that allows you to create a personalized view of Sybase Web pages.

1. Go to <http://www.sybase.com/mysybase>.
2. Click **Register Now**.

## Accessibility Features

Accessibility ensures access to electronic information for all users, including those with disabilities.

Documentation for Sybase products is available in an HTML version that is designed for accessibility.

Vision impaired users can navigate through the online document with an adaptive technology such as a screen reader, or view it with a screen enlarger.

Sybase HTML documentation has been tested for compliance with accessibility requirements of Section 508 of the U.S Rehabilitation Act. Documents that comply with Section 508 generally also meet non-U.S. accessibility guidelines, such as the World Wide Web Consortium (W3C) guidelines for Web sites.

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**Note:** You may need to configure your accessibility tool for optimal use. Some screen readers pronounce text based on its case; for example, they pronounce ALL UPPERCASE TEXT as initials, and MixedCase Text as words. You might find it helpful to configure your tool to announce syntax conventions. Consult the documentation for your tool.

---

For information about how Sybase supports accessibility, see the Sybase Accessibility site: <http://www.sybase.com/products/accessibility>. The site includes links to information about Section 508 and W3C standards.

You may find additional information about accessibility features in the product documentation.

## Obtaining Help and Additional Information

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