SYBASE®
An SAP® Company

Users Guide

SySAM 2

DOCUMENT ID: DC00530-01-0220-01
LAST REVISED: June 2012

Sybase, Inc., One Sybase Drive, Dublin, CA 94568.

Contents

Conventions

These style and syntax conventions are used in Sybase® documentation.

- In a sample window display, commands to be entered exactly as shown appear in:
  `this font`
- In a sample window display, words that you should replace with the appropriate value for your installation are shown in:
  `this font`
- In the regular text of this document, the names of files and directories appear in this font: `/usr/u/sybase`
- The names of programs, utilities, procedures, and commands appear in this font: **sqlupgrade**
- Commands for both the C shell and the Bourne shell are provided, when they differ. The initialization file for the C shell is called `.cshrc`. The initialization file for the Bourne shell is called `.profile`. If you are using a different shell, such as the Korn shell, refer to your shell-specific documentation for the correct command syntax.

Table 1. SQL syntax conventions

Key	Definition
command	Command names, command option names, utility names, utility flags, and other keywords are in a bold san-serif font.
variable	Variables, or words that stand for values that you fill in, are in *italic*.
`{ }`	Curly braces indicate that you choose at least one of the enclosed options. Do not include braces in your option.
`[ ]`	Brackets mean choosing one or more of the enclosed options is optional. Do not include brackets in your option.
`( )`	() are to be typed as part of the command.
`|`	The vertical bar means you can select only one of the options shown.
`,`	The comma means you can choose as many of the options shown as you like, separating your choices with commas, which are typed as part of the command.

Getting Started

Sybase® Software Asset Management (SySAM) is the Sybase product licensing and asset management system, which is built on FLEXnet technology from Flexera Software.

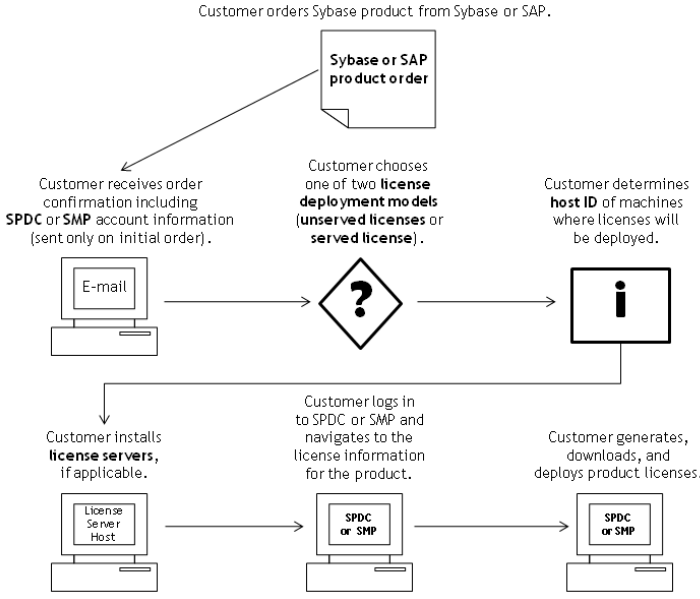
This section includes information about the SySAM licensing system that may be useful when you generate product licenses using the procedures in this document.

Understanding License Generation

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.

Figure 1: SySAM 2 Licensing Process



When you purchase SySAM 2-licensed products from a Sybase reseller, your product package may include a Web key certificate that contains the location of the SPDC Web key login page at *https://sybase.subscribenet.com/webkey* and the activation string to use for the login name.

Determining Your License Deployment Model

Before you generate licenses for SySAM 2-enabled products, determine the license deployment model to use.

There are two license deployment models from which to choose: the served license model or the unserved license model.

When you use the unserved license deployment model, you generate and download a separate license for each machine where the product runs.

Sybase recommends that you use a license server if you run products on more than several machines, as this simplifies and centralizes license administration providing more control over software assets.

After you download the unserved licenses, you can install your Sybase products.

Comparing License Deployment Models

Learn about license deployment models.

Unserved Licenses	Served Licenses
Licenses can be used only on the machine for which the license was generated.	Licenses can be distributed from a network license server to products running on any network machine.
Generate licenses at SPDC or SMP for each machine that will run the product: **1.** Specify the host ID of the machine where the product will run. **2.** Generate a license for that machine. **3.** Save the license to the specified machine. **4.** Repeat steps 1 – 3 for each machine where the product will run.	Generate licenses at SPDC or SMP for products running on multiple machines: **1.** Specify the host ID of the license server. **2.** Specify the number of required licenses. **3.** Save the licenses to the license server host machine.
No license administration is required. However, when new licenses are required for product updates, you must update and deploy each license for each machine where the product update will run.	The license server requires administration. When new licenses are required for product updates, SPDC or SMP lets you update all licenses for a specific license server in a single step.
No license reporting or asset management capabilities are available.	Allows license monitoring and reporting of license use, capacity planning, and asset management using SAMreport.
Installed locally and always available.	Requires a functioning license server and network. If the license server or network fails, you must fix the problem or install an alternate license server before the product grace period expires.
If a machine where the product is running fails, you must regenerate all of its licenses and deploy those licenses to the replacement machines.	If a machine where the product is running fails, you can move the product to a new machine, and it will acquire licenses from the running license server. If the license server host machine fails, use the Manage License Hosts functionality at SPDC or SMP to move its licenses to a new network license server host.
License files are distributed across each machine running a product, and therefore they are difficult to manage and control.	License files are centrally located and managed.
Unserved Standalone Seat (SS) licenses do not allow product use via Remote Desktop Connection or other terminal services clients.	Products can be used via Remote Desktop Connection or other Terminal Services clients, irrespective of the type of license in use.

Fault Tolerance, License Grace, and Redundancy

Sybase products check out licenses on start-up, and perform periodic heartbeat checks to verify that licenses are still available. If a license is unavailable, the product determines whether it can be awarded on grace.

The grace period starts from the time a license was last in use and persists for 30 days for server products and 15 days for tool products. At the end of the grace period, the product performs an orderly shutdown, if running, or fails to start up, unless the license (or a replacement license) becomes available, at which point the cycle continues with the heartbeat, noting the last use of the license.

This tolerance for temporary licensing failure is usually sufficient. However, in certain circumstances, you may choose to use "three-license-server redundancy." For example:

- A grace period is not provided for Sybase Floating License (FL) type licenses.
- Standby copy systems rarely qualify for grace as they are unlikely to have been used within the last 30 days.
- Company policy dictates the use of redundancy.

For three-server redundancy, use three machines that each:

- Run the same version of the SySAM license server.
- Have good intermachine communication.
- Use a separate copy of the same license files.

A product that uses per-processor licensing checks out a license quantity equal to the number of processors it can use, or awards runtime grace if an insufficient quantity is available. If the number of processors is dynamically increased while the product is running and the product is unable to check out additional licenses, runtime grace is also awarded. If the additional licenses are not made available within the runtime grace period the product shuts down. Decreasing the number of processors that a product can use while it is running does not reduce the required license quantity. You must restart the product on the correct number of processors.

Served License Deployment Model

When you choose the served license deployment model, licenses are deployed to one or more SySAM license servers.

After you install the required license servers and generate served licenses, you can install your Sybase products. You can configure the products to obtain licenses from one or more license servers.

License Servers

The license server is a lightweight application that serves licenses to products running on any operating system.

A license server can run on a low-end machine or a machine with spare cycles. For example, a license server running on a Solaris UltraSparc-60 serving 100 different licenses to 200 product instances, used 50MB of memory, 5 minutes of CPU time per week, and 100MB of disk space per year.

To download the license server software and installation instructions, go to the SySAM Standalone License Server Install page at *http://www.sybase.com/sysam/server* and select the download link.

Note: You cannot start the license server until there is at least one served license saved to the `licenses` directory on the license server host machine.

Determining Host IDs

When you generate licenses at SPDC or SMP, you must specify the host ID of the machine where the licenses will be deployed.

- For unserved licenses, specify 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 you want to run the product in a virtualized environment, see *SySAM Sub-capacity Licensing* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* for information about determining the host ID for unserved licenses.
- For served licenses, specify the host ID of the machine where the license server will run.

SPDC or SMP remembers the host information so that you can select the same license server when generating additional licenses.

To determine the host ID of the machine, run the **lmutil** utility from a terminal window or the Windows command prompt. For example:

```
lmutil lmhostid
```

Note: You can download the **lmutil** utility from the Flexera Software Web site at *http://www.globes.com/support/fnp_utilities_download.htm*.

You can also determine the host ID using native operating system commands. See the Frequently Asked Questions topic "What is my Host ID?":

- SPDC: *https://sybase.subscribenet.com/control/sybs/faqs#30-4*
- SMP: *https://websmp208.sap-ag.de/~sapidb/011000358700001006652011E*

See also

- *SySAM Sub-capacity Licensing* on page 23

Determining Host IDs for Machines with Multiple Network Adapters

On some platforms, the host ID is derived from the network adapter address.

If the machine where your product is installed or where the license server is hosted has multiple network adapters, running **lmutil lmhostid** returns one host ID for each network adapter, and returns output similar to this:

```
The FLEXlm host ID of this machine
is ""0013023c8251 0015c507ea90""
Only use ONE from the list of hostids.
```

It is important that you:

- Choose only one host ID to enter during license generation.
- Use the value associated with the primary wired Ethernet adapter.
- Do not use values associated with internal loopback or virtual adapters.

If you cannot determine the host ID using the **lmutil lmhostid** output, use the native operating system commands to get additional details.

Using Alternate Host IDs on Windows

If your Windows machine does not have a network adapter, SySAM allows you to use an alternate host ID based on the hard disk serial number.

1. At a Windows command prompt on the machine where you will deploy your license, enter:

   ```
   lmutil lmhostid -vsn
   ```

   This returns output similar to:

   ```
   The FLEXlm host ID of this machine is
   "DISK_SERIAL_NUM=70ba7a9d"
   ```

2. Use the complete output (`DISK_SERIAL_NUM=70ba7a9d`) for the host ID value requested during license generation.

Knowing the Product License Type

Sybase sells products under different license types, which entitle the customer to different rights of use. For example, whether a product is entitled to be used in production, or standby, or development and test environments.

The license type determines the quantity of licenses required; dictating, for example, whether a license is required for each machine; or for each CPU, or CPU chip; or per terabyte of storage.

For example, a product purchased under the CPU License (CP) type requires one license per CPU on the machine, partition, or resource set where it will run. The same product purchased

under the Server License (SR) type requires a single license for the machine, partition, or resource set.

Your account can have the same product licensed under multiple license types. Make sure you select the correct license type when you generate your SySAM license file.

When you generate licenses, each license type is presented on the License Information screen in bold font. For example:

```
License Type: CPU License (CP)
```

Note: The End User License Agreement for your region, available from the Sybase Software Licenses Web page at *http://www.sybase.com/softwarelicenses*, contains a definition for each license type. It also describes rights of use, such as whether licenses can be used only on a specific machine, partition, or resource set, or can float and whether you need more than one license for use on a specific machine, partition, or resource set. In addition, check the Product Specific License Terms Web page at *http://www.sybase.com/pslt*.

Optional Feature Licenses

Some Sybase applications are offered as base products with optional features that require a separate license.

Customers can mix license types. For example, customers can order Adaptive Server Enterprise under the Server License (SR) license type and order an optional feature (for example, High Availability or Enhanced Full Text Search) under the CPU License (CP) type.

Optional features are licensed only with the base product of the same product edition. For example, if you order Adaptive Server Enterprise, you cannot use a Small Business Edition optional feature license with the Enterprise Edition base product. In addition, the entitled use of the license types must be compatible; for example, both types should allow use in a production environment.

Generating Licenses at SPDC

Before you log in to SPDC and generate licenses, use this information as a reminder of the information you should have available and the tasks that you should have completed.

Table 2. Information Needed Before License Generation

Required Information or Action	License Model		Description
	Served	Unserved	
License deployment model	X	X	Decide whether to use a served or unserved license deployment model. Typically, this is a company-wide decision that is made only once. Therefore, this is one of the most important things to determine before license generation.
Product machine host ID		X	Determine the host ID of the machine, or machine partition where the product will run.
License server – download and install	X		Download and install the SySAM license server before you generate the product's licenses, and before you install the product.
License server host ID	X		Determine the host ID of the machine where the license server will run.
License server host name	X		Determine the host name of the machine where the license server will run.
License server TCP/IP port numbers	X		Determine the port numbers on which the license server will listen for license requests. **Note:** If you do not specify the license server port numbers during license generation, the license server uses the first available ports in the range 27000 to 27009. If a firewall exists between the server and the client machines, fix the license server port numbers to allow access to the ports. See *Access Through a Firewall or VPN* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

See also

- *Access Through a Firewall or VPN* on page 39

Logging in to SPDC and Beginning License Generation

Once you log in to SPDC and begin license generation, complete your product's license generation using the procedure that applies to the license deployment model you chose, either for generating served licenses or for generating unserved licenses.

If your product has been ordered from a Sybase reseller, perform the "Web Key step" instructions, where noted.

1. Go to the SPDC login page at *https://sybase.subscribenet.com*.
   - Go to the SPDC Web Key Registration page at *https://sybase.subscribenet.com/Webkey*.
2. Enter the login ID and password, then click **Login**. If you forget your password, click **Password Finder**. Your password is sent to you in an e-mail message.
   - Enter the authorization string from the Web Key Certificate provided by the reseller when your Sybase product was purchased, then click **Submit Web Key**.

   Note: If you do not know your SPDC account login ID and password, or Web Key Certificate authorization string, contact the person who ordered your product.

   - At the Web Key Registration page, enter your account information, then click one of these options:
     - **Submit My Registration Information** – to register your product using your direct account information.
     - **Anonymous Activation** – to activate your product anonymously.
3. Select the product family that includes the product for which you want to generate a license; for example, Adaptive Server Enterprise.
4. Depending on the product family you choose, you may see an additional Product Information page.
   1. Product suites – if your product is included in one or more suites, select the suite that includes your product; for example, ASE Small Business Edition.
   2. Product version and platform – select the product version, name, and operating system that matches your product order.
5. If this is the first time you selected a specific product edition and platform, you must accept the Sybase License Agreement before you are allowed to generate a license for that product.
6. If your product software installation requires a license key (also referred to as the license file), click **License Keys** on the Product Download page.
7. On the License Information page:

1. Select the option button to the left of the product for which to generate a license; for example, "CPU License (CP), ASE Enterprise Edition 15.7 for Sun Solaris SPARC 64-bit."
2. Scroll down and click **Select to Generate**.

8. In the Generate Licenses wizard, choose a license deployment model:

   - **Served license** – go to *Generating Served Licenses* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* to complete the license generation and download process.
   - **Unserved license** – go to *Generating Unserved Licenses* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* to complete the license generation and download process.

   Note: Some Sybase products or license types do not offer a choice of license deployment models and do not display this page. If this is the case, continue through the Generate Licenses wizard to generate your license.

   Click **Next**.

See also

- *Generating Unserved Licenses* on page 13
- *Generating Served Licenses* on page 14

Generating Unserved Licenses

Generate and download an unserved license for your product.

1. Enter the number of machines (up to 10) for which to generate unserved licenses, and click **Next**.
2. Enter:

   - **Node Host ID** – enter the host ID of the machine where the product will be run. If you do not know the host ID, select **What Is My Host ID?** or see *Determining Host IDs* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.
   - **Host Name** – enter the machine host name.

   For some license types, you must enter the number of licenses to generate. If you are unsure of the license quantity, select **How Many Licenses Should I Generate?**.
3. Click **Generate.**
4. When the license has generated, review the information on the View Licenses page, then, if the license information is correct, select one of:
   - If you generated only one license, click **Download License File**.
   - If you generated several licenses, click **Download All Licenses for Host**.

Note: Before you download and save generated licenses, you can select **Print Friendly** to print a paper copy of the license, or **License Overview** to return to the License Information page and generate additional licenses.

- To correct license information before downloading the license, click **License Overview**, select the license to be corrected and click **Check In** to reset the license to its original state. Repeat the license generation process.

5. If you chose to download licenses, when the File Download dialog box opens, click **Save**.
6. Save the generated licenses with a `.lic` file name extension. Although *$SYBASE*`/SYSAM-2_0/licenses` is typically the directory where unserved licenses are located, your product may have a different requirement. See your product installation guide and release bulletin for product-specific information.

Note: If you do not save the license files with a `.lic` extension, SySAM does not recognize the licenses.

Next, install your licensed product using the instructions in the product installation guide and release bulletin.

See also

- *Determining Host IDs* on page 7

Generating Served Licenses

Generate and download a served license for your product.

1. Enter the number of licenses to generate and click **Next** .

   If you are unsure of the license quantity, select **How Many Licenses Should I Generate?**.
2. Select an existing license server host, or enter the host ID, and an optional host name and port number, of a new license server host.

   When completing this step, use these recommendations:

   - If you do not know the license server host ID, select **What Is My host ID?** or see *Determining Host IDs* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.
   - Although the host name is optional, Sybase recommends that you provide the host name to ease future license administration.
   - The port number is optional unless your product configuration is going to use three-server redundancy (see the next bullet item). Any unused port number between 0 and 64000 is valid. On UNIX, choose a port number greater than 1024; most port numbers less than 1024 are privileged port numbers. If you do not specify a TCP/IP port number, a default port between 27000 and 27009 is used.

- To generate a license for a three-server redundant configuration, enter the required information: license server host ID, host name, and port number for all three machines. Enter a port number outside of the 27000 to 27009 range. You must enter the fully qualified domain name (FQDN) as the host name if any client machine requires an FQDN to contact a license server machine.

  Note: You cannot upgrade SySAM 1.0 licenses and use them in a three-server redundant configuration.

3. Click **Generate.**
4. When the license has generated, review the information on the View Licenses page, then, if the license information is correct and you do not need to generate additional licenses, select one of:
   - If you generated only one license, click **Download License File**.
   - If you generated several licenses, click **Download All Licenses for Host**.

     Note: Before you download and save generated licenses, you can select **Print Friendly** to print a paper copy of the license.

   a) To correct license information, click **License Overview**, select the license to be corrected and click **Check In** to reset the license to its original state. Repeat the license generation process, starting with step 1 of this procedure.
   b) To generate additional licenses, click **License Overview** and repeat the generation process for the additional product licenses.
5. When the File Download dialog box opens, click **Save.**
6. Save the license files with a `.lic` file name extension to the `SYSAM-2_0/licenses` directory of the license server installation.

   Warning! If you do not save the license files with a `.lic` extension, SySAM does not recognize the licenses.
7. After you save the license files to the license server, enter on the machine where your license server is running:

   ```
   sysam reread
   ```

   Your new licenses are registered with the license server.

See also

- *Determining Host IDs* on page 7

Regenerating, Renewing, and Rehosting Licenses

Learn when licenses must be regenerated, renewed, and rehosted.

Licenses must be upgraded to the latest versions when:

- Your support contract is renewed. Updated licenses enable you to use the newest versions of the products that become available during your support period.
- A new product version is added to your entitlement.

Licenses need to be rehosted when:

- You entered incorrect machine information when generating the license.
- The host ID of the machine has changed due to a hardware upgrade.
- You transfer products to a new machine.

You can either upgrade or rehost all licenses that were previously generated for a specific host (see *Managing License Hosts* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*), or you can modify individual licenses (see *Modifying Individual Licenses* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*).

See also

- *Managing License Hosts* on page 16
- *Modifying Individual Licenses* on page 16

Managing License Hosts

Learn how to manage licenses of license hosts.

1. Select **Licenses** on the left pane of the SPDC main page, and then select **Manage License Hosts**.
2. Select or search for the existing license host.
3. Select one of these buttons to perform the desired operation on all licenses previously generated for the specified host:
   - **Upgrade All** – upgrades all licenses on the host to their latest versions.
   - **Re-host All** – migrates all licenses to a new host. You provide details on the next screen.
   - **Return All** – returns all licenses to the available licenses pool for future redeployment.

   If you select **Upgrade All** or **Re-host All**, new licenses are sent via e-mail message to your e-mail address, and to any additional e-mail addresses you specify.

Modifying Individual Licenses

Learn about modifying individual licenses.

1. Follow instructions in *Logging in to SPDC and Beginning License Generation* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* through the step for selecting options that identify the license you want to change.
2. On the License Information page, select the desired license order.
3. Select one of:

- **Check in** – returns the license to the available license pool. To rehost the license, follow instructions in *Generating Unserved Licenses* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* or *Generating Served Licenses* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.
- **Upgrade** – upgrades the license to its latest version. Click **Upgrade** to generate a new license file. Download the license file, save it, and deploy it. The **Upgrade** option appears only if newer versions of the license are available.

Note: Each product limits the number of times you can check in and rehost its licenses. If you reach your check-in limit, and the **Check-in** option does not appear, contact your company's designated person in Sybase Technical Support.

See also

- *Logging in to SPDC and Beginning License Generation* on page 12
- *Generating Unserved Licenses* on page 13
- *Generating Served Licenses* on page 14

Generating Licenses at SMP

Before you log in to SMP and generate licenses, use this information as a reminder of the information you should have available and the tasks that you should have completed.

Table 3. Information Needed Before License Generation

Required Information or Action	License Model		Description
	Served	Unserved	
License deployment model	X	X	Decide whether to use a served or unserved license deployment model. Typically, this is a company-wide decision that is made only once. Therefore, this is one of the most important things to determine before license generation.
Product machine host ID		X	Determine the host ID of the machine, or machine partition where the product will run.
License server – download and install	X		Download and install the SySAM license server before you generate the product's licenses, and before you install the product.
License server host ID	X		Determine the host ID of the machine where the license server will run.
License server host name	X		Determine the host name of the machine where the license server will run.
License server TCP/IP port numbers	X		Determine the two port numbers on which the license server will listen for license requests.

Generating License Keys

If you have purchased Sybase products that use SySAM 2-based licenses under SAP contract and are directed to download from SAP Service Marketplace (SMP), you can use SMP to generate license keys.

1. Go to the SAP Marketplace main page at *http://service.sap.com*.
2. Select **SAP Support Portal**.
3. Log in using your SMP credentials.

4. Select **Keys & Requests** > **License Keys**.
5. Follow the instructions in the "How to generate license keys for SAP Sybase products" presentation available under the "Documentation and Helpful Resources" quick access link.

Mobile Licensing

Learn about SySAM mobile licensing.

When a SySAM-enabled product uses unserved license, you can use the product offline, because the licenses and product are installed on the same machine.

However, when a SySAM-enabled product uses served licenses and is disconnected from the license server, you may not be able to work offline. SySAM provides a mobile licensing option that allows you to use served-license products without being connected to a license server.

To use SySAM mobile licensing, you borrow licenses for a specified period of time. You can use the licensed product offline until the borrowed licenses expire.

When borrowed licenses expire, you must reconnect to the network license server and borrow licenses again for the product to work offline. If you do not reborrow licenses before your currently borrowed licenses expire, the product runs only for a runtime grace period, then ceases to function.

Note: Typically, the maximum duration for which you can borrow a license is 30 days.

Using Mobile Licenses

You can borrow mobile licenses by using GUI functionality provided by some products, or by using the **lmutil** licensing utility and **lmborrow**, one of its parameters.

Products generally provide the GUI functionality that allows you to borrow and return SySAM 2 licenses. See your product's documentation to determine if it has this functionality, and if so, how to use it.

Some products automatically borrow licenses whenever they are used, so first check whether licenses are already borrowed on the machine:

```
lmutil lmborrow -status
lmutil - Copyright (c) 1989-2006 Macrovision Europe Ltd. and/or
Macrovision Corporation. All Rights Reserved.
Vendor    Feature      Expiration
------    ---------    -----------------
SYBASE    PD_SHELL     23-Feb-09 16:59
```

Borrowing Licenses Using lmutil lmborrow

Learn how to borrow a license using **lmutil lmborrow**.

1. Shut down the SySAM-enabled products for which you want to borrow licenses.
2. Run the following commands: for each license you want to borrow, where *borrow-end-date* (`dd-mon-yyyy`) is the date on which you want the borrowed license to expire, and

borrow-end-time (optional) is the 24-hour clock time (`hh:mm`) at which you want the borrowed license to expire:

```
lmutil lmborrow SYBASE borrow-end-date [borrow-end-time]
```

For example, to borrow a license that expires at 1 PM (13:00) on August 20th, 2012, enter:

```
lmutil lmborrow SYBASE 20-aug-2012 13:00
```

Note: To continue using a SySAM-enabled served-license product offline, without interruption, you must renew the borrowed license before the license expires.

3. Restart your SySAM-enabled products; licenses are borrowed on the product machine for offline use.
4. Before running any product for which you do not want to borrow licenses, enter:

   ```
   lmutil lmborrow -clear
   ```
5. Disconnect from the network.

To determine the status of a license borrowed for a SySAM-enabled product's offline use, enter:

```
lmutil lmborrow -status
```

Returning a Borrowed License Before It Expires

Learn how to return a borrowed license before it expires.

1. From the product machine, that is using a borrowed license, connect to the network.
2. Shut down your SySAM-enabled Sybase products.
3. Return each borrowed license by entering:

   ```
   lmutil lmborrow -return
   [-c location_of_license_file] name_of_license
   ```

SySAM Sub-capacity Licensing

You can license a physical machine, machine partition, or a resource partition using sub-capacity licensing.

Subject to the terms of your software license agreement and product documentation, you may be able to license a subset of the CPUs available on a physical machine using the SySAM Sub-capacity license functionality. See your software license agreement and product documentation to determine whether SySAM Sub-capacity licensing is allowed and if so, what type of partition or resource allocation technologies are supported.

There are also new and changed definitions you will encounter. See *SySAM Sub-capacity Glossary of Definitions* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

See also

- *SySAM Sub-capacity Glossary of Definitions* on page 27

Configuring SySAM Sub-capacity

Configure SySAM to use a license quantity appropriate to the containment level and to share licenses at the machine, partition, or resource level.

Prerequisites

To configure machine-level licensing on platforms other than AIX logical partitions and HP-UX virtual partitions, run **sysamcap** on the physical machine or control domain for the virtualization technology (such as VMware ESXi/ESX console, the Microsoft Hyper-V host, the Red Hat KVM host, the XEN dom0) as a user with root permissions.

Task

1. Obtain the SYBASE_SAM_CAPACITY environment variable for the containment level you are licensing.
   a) To get machine-level information, enter:
      ```
      sysamcap MACHINE
      ```
   b) To get partition-level information, enter:
      ```
      sysamcap PARTITION
      ```
   c) To get resource-set-level information, enter:
      ```
      sysamcap RESOURCESET
      ```

2. Set the SYBASE_SAM_CAPACITY environment variable to the value reported by **sysamcap.**
3. Start your sub-capacity-enabled Sybase product.

sysamcap Utility

Use the **sysamcap** utility to configure sub-capacity licensing for the containment level (machine, partition, or resource set) and optionally, the name or ID of the resource set.

Run **sysamcap** and set the **SYBASE_SAM_CAPACITY** environment variable to the value it reports prior to running your product.

Syntax

```
sysamcap capacity-level [resource_set_name] [-q] [-v]
```

Parameters

- **capacity-level –** designates the containment level to be licensed:
  - **MACHINE** – the complete physical machine.
  - **PARTITION** – a sub-capacity partition of your machine.
  - **RESOURCESET** – a sub-capacity partition governed by a resource set.
    - *resource_set_name* (optional) – set this parameter to indicate the resource set that will govern the product. The product is always be licensed based on the resource set it is actually governed by so this parameter is only to aid administration or to allow the product to verify that it is running under the intended resource set.

      On Solaris and HP-UX, the *resource_set_name* is the PSET ID obtained when creating the processor resource set via the **psrset** command, or equivalent.

      On AIX, the *resource_set_name* is the name specified to **mkrset**, or equivalent.
  - **DEFAULT** – default configuration settings. SySAM uses the default license check pre-sub-capacity-support mechanism to check for licenses. Sub-capacity functionality is not available under the default setting.
- **-v –** verbose output contains diagnostic messages.
- **-q –** quiet mode reports only the environment variable.

Examples

- **Licensing a machine to allow any number of VMware virtual machines –**

  1. Enable ESXi server tech support mode and log in to the VMware ESXi console with root privileges.

     Note: You must use the Linux version of **sysamcap**.

2. Run **sysamcap**, specifying machine-wide licensing:

   ```
   sysamcap MACHINE
   ```

   Example output:

   ```
   Set the following environment variable prior to starting the
   product. This only needs to be done once for each instance of
   the product that will run.

   SYBASE_SAM_CAPACITY=MACHINE:FC2F63B3C5C2F2770A2

   Using this configuration licensing will be based on 32 logical
   processor(s), 16 processor core(s) and 2 processor chip(s).

   Sybase recommends use of a SySAM License Server, but if you wish
   to generate un-served licenses for using the product within
   this environment then you will need to specify the following
   host-id when generating licenses at the Sybase Product Download
   Center.

   MACHINE-ID=782bcb2f04e3
   ```

   Note: Starting with version 2.2.0.9, **sysamcap MACHINE** reports the real MAC address. In earlier versions, the command reported the VMWare MAC address. Therefore, the host ID for unserved shared-capacity (**sysamcap MACHINE**) licenses for VMware ESX virtual machines may have changed. Existing licenses continue to work but you must check in and regenerate the licenses at SPDC for any VMs added after the SYBASE_SAM_CAPACITY environment variable was last generated. Check the host ID reported by **sysamcap MACHINE** against the HOSTID field in the unserved license to determine whether the license needs to be regenerated.

3. Log in to a VMware VM to set the **SYBASE_SAM_CAPACITY** environment variable to the value report by **sysamcap** and to run the product. Use the mechanism appropriate for the operating system that the VM is running.

   On a VM running Windows XP:

   1. Right-click **My Computer**, and then click **Properties** > **Advanced** > **Environment variables** > **System variables** > **New**.
   2. In the Variable name field, enter the value: SYBASE_SAM_CAPACITY.
   3. In the Variable value field enter the value reported by **sysamcap**, for this example:

      ```
      MACHINE:FC2F63B3C5C2F2770A2
      ```

   4. Click **OK**.

   On a VM running Linux/UNIX and using a Korn shell:

   1. Set the environment variable:

      ```
      export SYBASE_SAM_CAPACITY=MACHINE:FC2F63B3C5C2F2770A2
      ```

4. Start the product.

Note: Repeat these steps to run the product on a VM that was created after running **sysamcap**.

- **Licensing an individual logical partition such as AIX LPAR, HP vPar, HP Integrity Virtual Machine, Microsoft Hyper-V, Red Hat KVM, Solaris LDOM, VMware VM, and Xen domU –**

  1. Log in to the machine partition, for example, using an xterm running the Korn shell.
  2. Run **sysamcap**, specifying partition-wide licensing:

     ```
     sysamcap PARTITION
     ```

     Example output:

     ```
     Set the following environment variable prior to starting the
     product. This only needs to be done once for each instance
     of the product that will run.

     SYBASE_SAM_CAPACITY=PARTITION

     Using this configuration, licensing is based on 4 logical
     processors, 1 processor core and 1 processor chip.

     Sybase recommends using a SySAM License Server; however, to
     generate an unserved licenses for your SySAM sub-capacity-
     enabled product you must specify the following type of  host-id
     when generating licenses at the Sybase Product Download Center.

     PARTITION-ID=83f828fb
     ```
  3. Set the environment variable:

     ```
     export SYBASE_SAM_CAPACITY=PARTITION
     ```
  4. Start the product.

- **Licensing a Solaris container –**

  1. Log in to the container, for example, using an xterm running the Korn shell.
  2. If desired, determine the name of the resource set by which the product will be governed.
  3. Run **sysamcap**, specifying resource set licensing and optionally the desired *resource_set_name*, for example, using PSET 1:

     ```
     sysamcap RESOURCESET 1
     ```

     Example output:

     ```
     Set the following environment variable prior to starting the
     product. This only needs to be done once for each instance of
     the product that will run.

     SYBASE_SAM_CAPACITY=RESOURCESET,1:8C348011FAC4836A6C

     Using this configuration licensing will be based on 2 logical
     processor(s), 2 processor core(s) and 1 processor chip(s).

     Sybase recommends use of a SySAM License Server, but if you wish
     to generate un-served licenses for using the product within
     this environment then you will need to specify the following
     host-id when generating licenses at the Sybase Product Download
     ```

```
Center.

RESOURCESET-ID=2179c53d-737f-11dc-b683-8b3cbe475233-PSET-1
```

4. Set the environment variable:
   ```
   export SYBASE_SAM_CAPACITY=RESOURCESET,1:8C348011FAC4836A6C
   ```
5. Start the product.

Note: Refer to your product documentation to determine the sub-capacity technologies you can use.

SySAM Sub-capacity Glossary of Definitions

Definitions for SySAM 2.2 sub-capacity licensing.

- Host-ID — identifier that locks a license to a specific host or virtual environment. SySAM 2 uses the default **FLEXlm** host-ID identifiers. With SySAM 2.2, the host-ID used for unserved licenses can be the default **FLEXlm** host-ID, the machine-ID, the partition-ID, or the resourceset-ID, depending upon your configuration.
- Machine-wide licensing — licenses a physical machine.
- Partition-wide licensing — licenses only a partition.
- Resource-wide licensing — licenses only a specific resource.
- Machine-ID — identifier for a specific physical machine. You can split the machine into multiple partitions.
- Machine partition — a logically separate system within a physical machine, typically using its own operating system rather than a partitioning of a machine's resources. A machine partition can be a virtual machine (VM), AIX Logical Partition (LPAR), HP-UX Virtual Partition (vPar), or Solaris Logical Domain (LDOM). The term "machine partition" refers to a separate logical system (typically using its own operating system) rather than to partitioning of a machine's resources.
- Resource partition — a sub-capacity operating environment within a physical machine that limits the processing capacity for an application, such as a Solaris Container, an AIX WPAR, or an HP Secure Resource Partition.
- Partition-ID — identifier for a specific machine partition.
- Resource-set-ID — identifier for a specific processor resource-set.
- License quantity — the number of licenses needed for a particular containment level.
- Containment level — a particular division of a machine such as a partition or resource set.

Administering License Servers

Learn about tasks necessary for license server administration and information about license server tools and functions.

Understanding the SySAM Directory Structure

SySAM files are installed in the `SYSAM-2_0` directory.

The `SYSAM-2_0` directory contains these default subdirectories and files:

Subdirectory name	Subdirectory files	Description
`bin`	`sysam`	Wrapper script to manage the license server
	`lmgrd`	License server manager daemon
	`SYBASE`	Sybase vendor daemon
	`lmutil`	Licensing Utility program (from Flexera)
	`lmtools.exe` (Windows only)	GUI License Utility program (from Flexera)
	`installs.exe` (Windows only)	Program used internally to install the SySAM Windows service that automatically starts the license server
	`cpuinfo`	Utility program that reports the processor counts for the machine, or for the specified containment level if the SYBASE_SAM_CAPACITY environment variable is set
	`sysamcap`	Utility program used to configure sub-capacity licensing
`licenses`	`*.lic`	License files
	`SYBASE.opt`	License server options file
`log`	`SYBASE.log`	License server debug log
	`SYBASE.rl`	License server report log

You can install SySAM network license servers on any of the following platforms, and "serve" licenses to products running on any platform:

- HP-UX Itanium 64-bit
- HP-UX PA-RISC 64-bit
- IBM AIX 64-bit
- Linux on POWER 64-bit
- Linux x86 32-bit
- Linux x86-64 64-bit
- Solaris SPARC 32-bit
- Solaris SPARC 64-bit
- Solaris x64 64-bit
- Windows x86 32-bit
- Windows x64 64-bit

Installing the SySAM License Server

Learn how to install the license server.

1. Choose a license server host.
2. Download the standalone license server software and installation instructions from the SySAM server Web site at *http://www.sybase.com/sysam/server*.
3. Use the license server installation instructions to install.
4. Generate, download, and deploy product licenses.

See also

- *Generating Licenses at SPDC* on page 11
- *Generating Licenses at SMP* on page 19

Starting and Stopping License Servers

When you start or stop license servers, keep these requirements in mind.

1. When you start and stop a license server, you must execute the commands on the machine where the license server is installed.

   You cannot start a license server until at least one served license is installed in the `licenses` directory of the license server installation.

   Note: Sybase recommends that you generate and install served licenses before you install Sybase products.

2. You can have only one SySAM license server running on any one machine.
3. Some Sybase products use SySAM 1.0. You cannot run a SySAM 1.0 and a SySAM 2.0 license server on the same machine. However, you can serve SySAM 1.0 licenses from a SySAM 2.0 license server.

See also

- *Generating Licenses at SPDC* on page 11
- *Generating Licenses at SMP* on page 19
- *Migrating a SySAM 1 License Server to SySAM 2* on page 63

Manually Starting and Stopping License Servers

Learn how to manually start and stop a license server.

To stop a license server, issue this command on the machine where the license server is installed:

```
sysam stop
```

To start a license server, issue this command on the machine where the license server is installed:

```
sysam start
```

Note: On UNIX machines, Sybase recommends that you use the “sybase” user for license server installation and administration. If you have root permissions, switch to a specific user account by entering:

```
su sybase -c "sysam start"
```

Starting and Stopping SySAM as an Automatic Service

When you install a license server on Windows platforms, it is automatically configured to start as a system start-up service.

On UNIX machines, you must configure SySAM to start as a service after you complete the license server installation.

See also

- *Running a License Server Automatically on UNIX Systems* on page 67

Determining License Server Version and Status

You can determine license server version and status by using the **sysam status** command. You can determine the versions of **lmgrd** and SYBASE vendor daemon by using the **-v** option.

1. To determine the status of the license server, execute this command on the machine where the license server is installed:

   ```
   sysam status
   ```

   The output from this command states whether the license server is running and lists the license files that the license server is using.
2. To determine the license manager daemon version, enter:

   ```
   lmgrd -v
   ```
3. To determine the Sybase vendor daemon version, enter:

   ```
   SYBASE -v
   ```

   The version of your license manager daemon must be greater than or equal to the version of your Sybase vendor daemon.

Monitoring License Use

To determine the status of a specific license server, establish which licenses are available, and where licenses are currently being used, use the **sysam status** command.
Run this command on the license server host machine:

```
sysam status -a
```

You can also run this same command on a machine where SySAM-enabled products are running, to determine the status of all license servers used by the licensed products on that machine, and to verify that the license servers are referenced correctly in the product license file.

Registering New and Updated License Files

To update multiple licenses at once, use **Manage License Hosts** at SPDC or SMP.

1. Generate your new licenses in SPDC or SMP and save them to the `licenses` directory
2. On the machine on which your license server is running, enter:

   ```
   sysam reread
   ```

   Your new licenses are registered with the license server.

Managing the License Server Debug Log

By default, all license server status and error messages are written to the debug log file SYBASE.log in the log directory.

SYBASE.log is used to diagnose issues with the license server. For information on messages written to this log file, see *The Debug Log File* in the *FLEXnet Licensing End User Guide.*

Over time, the debug log file can become large and the value of older messages decreases. Sybase recommends that you periodically truncate the debug log file.

1. On the license server machine, enter:
   ```
   lmutil lmswitch -c license_directory_location SYBASE tmp.log
   ```
2. Delete or archive SYBASE.log.
3. To return to using SYBASE.log, enter:
   ```
   lmutil lmswitch -c license_directory_location SYBASE SYBASE.log
   ```
4. Delete the temporary file tmp.log.

Controlling License Use with the SySAM Options File

The options file (SYBASE.opt, in the licenses directory) allows license administrators to control various licensing operating parameters and to designate users of specific licenses.

License users are identified by their user name, host name, display, IP address, or the user-defined project defined by the LM_PROJECT environment variable.

License administrators can use the options file to:

- Control license use – for example, the following options file content restricts the use of the Sybase Database Expert product, controlled by the ASE_SDBE license, to users tom, sam, and alice:
  ```
  GROUP dbe_group tom sam alice
  INCLUDE ASE_SDBE GROUP dbe_group
  ```
- Reserve licenses – for example, this line in the options file reserves a Sybase SQL Expert license with the licensed feature ASE_SXP for user joe:
  ```
  RESERVE 1 ASE_SXP USER joe
  ```

  Note: For products with more than one edition, and more than one license type, you can use the VENDOR_STRING that appears on the INCREMENT or UPGRADE line of the license to identify a specific license.

  For example, to reserve a license for the Enterprise Edition of Adaptive Server® Enterprise (license package ASE_EE, and license attributes SORT=100;PE=EE;LT=SR) to be used on the machines *payrollsvr* and *accountsvr*, enter:

```
HOST_GROUP ase_ee_hosts payrollsvr accountsvr
RESERVE 1 ASE_EE:VENDOR_STRING=SORT=100;PE=EE;LT=SR HOST
payrollsvr
RESERVE 1 ASE_EE:VENDOR_STRING=SORT=100;PE=EE;LT=SR HOST
accountsvr
```

Note: Reserving a license for multiple hosts requires each host to have a separate RESERVE line in the options file. If the reservation was made solely for the HOST_GROUP above, then two licenses are reserved, but any machine in the host group can use all of the reserved licenses.

- Restrict the number of available licenses – for example, to prevent accidental use of overdraft licenses for Adaptive Server Enterprise, add the following line to the options file:

  ```
  MAX_OVERDRAFT ASE_CORE 0
  ```

  If overdraft licensing is subsequently needed, you can modify or remove the line from the options file.

  Note: Consider carefully the use of an overdraft license since you need to agree to purchase these licenses within 30 days.

- Enable report and debug log files – the default `SYBASE.opt` options file in the license server's `licenses` directory sets the location of the license server debug log and report log files, and specifies that the license server should append the files (rather than create a new file) each time the license server is started.

  The default `SYBASE.opt` file contains two lines similar to this, where `REPORTLOG` and `DEBUGLOG` are the log type, the `+` (plus sign character) indicates to append log file entries, and `SYBASE.rl` and `SYBASE.log` specify each log file's path.

  ```
  REPORTLOG +/opt/sybase/SYSAM-2_0/log/SYBASE.rl
  DEBUGLOG +/opt/sybase/SYSAM-2_0/log/SYBASE.log
  ```

  Use this syntax for the log file entries in the options file:

  ```
  [DEBUGLOG | REPORTLOG] [+] log_path
  ```

See *The Options File* in the *FLEXnet Licensing End User Guide* for a list of option key words, syntax, and descriptions.

The license server reads the options file and obeys its directives at start-up or, if it is already running, when you issue **sysam reread**.

Enabling License Usage Reporting

Asset management reporting capabilities require a report log. You can enable the license server to write license usage information into a report log file.

All Sybase product installations automatically create an options file with REPORTLOG enabled. However, if for some reason the REPORTLOG is not automatically enabled, use this procedure:

1. In the `licenses` directory, open the options file, `SYBASE.opt`.
2. Edit the options file to include the REPORTLOG directive, which you can place anywhere in the options file where *file_name* is the absolute file name of the report log file:
   ```
   REPORTLOG +file_name
   ```
   Note: Sybase recommends that you precede the *file_name* with a plus sign (+) to append logging entries, otherwise, the file is overwritten each time the daemon starts.
3. The license server reads the options file and obeys its directives at start-up or, if it is already running, when you issue the `sysam reread` command.

   Note: Over time, the report log can become large, so Sybase recommends that you periodically use the **lmutil lmnewlog** to rotate and archive the log.
4. To move the existing report log details to a new file, enter:
   ```
   lmutil lmnewlog -c license_directory_location SYBASE new_log_file
   ```
   This is typically done on a quarterly or yearly basis, to provide report logs for use with SAMreport. For example, at the end of 2012 move all report log information to a suitably named file:
   ```
   lmutil lmnewlog -c ../licenses SYBASE ../log/SYBASE-2012.rl
   ```

For more information on **lmnewlog**, see the *FLEXnet Licensing End User Guide*.

SySAM Utilities

The licensing utility program, **lmutil**, includes the options for managing licensing activities.

Utility	Description
lmborrow	Supports license borrowing.
lmdiag	Diagnoses license checkout problems.
lmdown	Shuts down selected license daemons.
lmhostid	Reports the system host identifier for the machine on which the command is run.
lminstall	(Not supported by Sybase)Converts license files to different formats.
lmnewlog	Moves the existing report log information to a new file name and starts a new report log file with the existing file name.
lmpath	Allows direct control over license file path settings. Sybase recommends that you place all license files in the license directory rather than scattering them and modifying the license server's search path.
lmremove	Releases the failed license to the pool of free licenses. If a Sybase product is still using the license, the product obtains the license again during its next heartbeat.

Utility	Description
lmreread	Directs the license daemon to reread the license file and to start any new vendor daemons.
lmstat	Displays the license server system status.
lmswitch	Tells the license server to start writing to a new debug log file. When you restart the license server, it uses the debug log file specified in the options file, so you must ensure the old log is renamed to avoid appending to it.
lmswitchr	Switches the report log to a new file name. Sybase recommends that you use **lmnewlog** to archive the report log instead.
lmver	Reports the FLEXnet Licensing version of a library or binary file.

Using SySAM Utilities

Learn how to see a list of optional parameters of SySAM utilities.

Sybase does not support the functionality of these optional parameters. For more information on the **lmutil** utilities, see *License Administration Tools* in the *FLEXnet Licensing End-User Guide*.

1. To see a full list, enter:
   ```
   lmutil -help
   ```
2. To see a list of parameters for **lmborrow**, enter:
   ```
   lmutil lmborrow -help
   ```

Note: In addition, the **sysam** script, also located in the `bin` directory, provides a wrapper for the most frequently used FLEXnet utilities. To display the help text, which provides complete instructions, enter:

```
sysam help
```

Configuring SySAM for Redundancy

Configure SySAM for redundancy by setting up a three-server redundant cluster or by specifying multiple license servers.

A three-server redundant cluster only provides redundancy. Using multiple license servers provides redundancy and load balancing.

Configuring a Three-Server Redundancy Cluster

Configure SySAM for redundancy by setting up a three-server redundant cluster.

Prerequisites

The three machines hosting a license server should:

- Have excellent communications.
- Maintain identical copies of the license files, the **lmgrd** binary, and the SYBASE binary locally rather than on a file server. If you do not do this, you lose the advantages of having redundant servers, since the file server holding these files becomes a single point of failure.

Task

A three-server redundancy is functional when any two of the three license server systems are running. Three-server redundancy only provides failover protection; it does not provide load balancing.

1. Copy the license file to the `licenses` directory of each of the three servers. Each line contains the name of the server, its host ID, and the port number on which it will listen. For example:

   ```
   SERVER server_1 0123ABCD 27010
   SERVER server_2 0456DCBA 27010
   SERVER server_3 07890147 27010
   ```

   The selection order for the master server is determined by the order in which you specify the servers at SPDC or SMP and can be seen by the order of the servers in the resultant license file. The same license file must be used by each license server and is headed with a SERVER line for each server.
2. SySAM-enabled products must be informed to obtain licenses from a three-server redundant cluster so that they can fail over to the new master server if the current master becomes unavailable. Set this up in one of these ways:

   - Sybase recommends that the license file used by the product is headed with three SERVER lines. The header must be identical to that of the license files on each server, with the exception that the host ID field can be set to ANY. The following license file enables a product to use the three-server redundant cluster shown in the example above:

     ```
     SERVER server_1 ANY 27010
     SERVER server_2 ANY 27010
     SERVER server_3 ANY 27010
     USE_SERVER
     ```
   - Alternatively, set the SYBASE_LICENSE_FILE or LM_LICENSE_FILE environment variables to a comma-separated list of port@hostname values to specify the three-server redundant cluster. For the example above, set the environment variable to:

```
27010@server_1,27010@server_2,27010@server_3
```

Note: If the machine where the product is running must use a fully qualified domain name (FQDN) to contact any license server in the cluster, you must specify the FQDN in the environment variable and also when generating the license at SPDC or SMP.

Using Multiple License Servers

Configure SySAM-enabled products to obtain licenses from multiple license servers for load balancing or redundancy.

Note: This setup is limited by the number of unused licenses, including overdrafts, remaining on each license server. This means that you must purchase enough licenses so that each license server has sufficient licenses to service any product instance that may request one.

Set this up in one of two ways:

- Sybase recommends that you create a license file that includes the two lines below. Create one of these files for each license server, where *host* is the host name for the license server and *port* is the port number on which the license server is listening. You need not specify the port number if the license server is listening on a port in the default port number range (27000 to 27009).

  ```
  SERVER host ANY [port]
  USE_SERVER
  ```

  For example, to have the product look for licenses from one of three servers named: *nyc*, *bos*, and *sfo*, create three files in the default licenses directory of the product as:

  ```
  # nyc.lic
  SERVER nyc ANY 29733
  USE_SERVER

  # bos.lic
  SERVER bos ANY 29722
  USE_SERVER

  # sfo.lic
  SERVER sfo ANY
  USE_SERVER
  ```

  When using such license files, the product loads the files using the directory sort order, so name the files according the preference of license servers to be used. For example, `1_bos.lic`, `2_nyc.lic`, `3_sfo.lic` .
- Alternatively, set the SYBASE_LICENSE_FILE or LM_LICENSE_FILE environment variables to a list of [port]@hostname values to specify each license server, where the port number is omitted if the license server is using the default port number range. Separate each license server with a colon on UNIX platforms and a semicolon on Windows platforms. For the example above, from a UNIX C shell, enter:

  ```
  setenv SYBASE_LICENSE_FILE 29722@bos:29733@nyc:@sfo
  ```

  On Windows platforms, enter:

```
set SYBASE_LICENSE_FILE=29722@bos;29733@nyc;@sfo
```

Access Through a Firewall or VPN

SySAM license server listens on two TCP/IP ports for incoming license requests. Therefore, any firewall or VPN policies must be set up to allow access to both ports.

The SySAM license server consists of two processes: the license manager daemon (**lmgrd**) and the vendor daemon (SYBASE).

Fix the ports by specifying their port numbers in the license files on the SySAM license server. For example, to force **lmgrd** to listen on port 27010 and the SYBASE vendor daemon to listen on port 27011, the license file header should have:

```
SERVER keyserver 1D1D1D1D  27010
VENDOR SYBASE PORT=27011
```

A SySAM 2-enabled product only needs to know the port where **lmgrd** is listening. The product connects to **lmgrd** on that port and will then be told which port to use to connect to the SYBASE vendor daemon. This means that the product's local license file just needs to contain:

```
SERVER keyserver ANY 27010
USE_SERVER
```

When generating licenses at SPDC, you can specify the license server port to fix the port for **lmgrd**. Edit the license file to specify the SYBASE vendor daemon port.

When generating licenses at SMP, you can specify both ports. The port for **lmgrd** is specified as **License Server Port 1**, and the SYBASE vendor daemon port as **License Server Port 2**. For three-server-redundant configurations, you can only specify the SYBASE vendor daemon port for the primary license server; same value is used for the secondary and tertiary license servers.

Note: You can specify any unused port number between 0 and 64000. On UNIX, choose a port number greater than 1024 as most port numbers less than 1024 are privileged port numbers. Do not specify a number in the range 27000 to 27009 for **License Server Port 2**, as ports in this range are used by the **lmgrd** process when no port is specified for **License Server Port 1**.

Troubleshooting SySAM Errors

Troubleshoot the most common SySAM errors.

See your Sybase product documentation for product-specific information. See the **SySAM FAQ** at *http://www.sybase.com/sysam* for the most recent troubleshooting information.

If a license problem occurs, solve the problem as quickly as possible. Products that cannot acquire a valid license during installation may still install or run under grace. If you do not solve the problem or acquire a valid license before the grace period expires, the product stops functioning.

Where to Find License Error Information

Typically, server products list problems in an error log, and optionally allow you to configure e-mail notifications.

GUI tool products generally show messages in a status window. Additionally, some products may support a command or menu option, such as **Help** > **About** to display the current license status.

If you use served licenses, and license servers, all license server status and error messages are written to the `SYBASE.log` debug file, which is located, by default, in the `log` subdirectory.

Problems and Solutions

If the product does not install or does not function after installation, contact SySAM Technical Support.

Error	Possible Causes	Solution
Installation Warning: Cannot Find a Valid License	You may not have the required licenses installed. If there are installed licenses, the licenses may be incorrect for the product or feature you are trying to install.	See *Installing for the First Time* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

Error	Possible Causes	Solution
Updating an Existing Installation	If you are updating an existing installation, make sure your license authorizes you to install the update. See *Installing Product Updates, EBFs, and Support Renewal* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*. If your license does not allow you to perform the update, the product may not be usable.	If you are installing an update that is authorized by the license, see the solution for *Product Cannot Checkout a License and Starts in Grace Period* error below before you proceed with the update.
License Server Executables and Scripts not Installed	When you installed your product, the license server was not installed. Some product installations offer the option to install a license server; however when available, this option is not selected, by default, for installation. You may need to explicitly install a license server. See your product's installation guide and release bulletin to determine if the product installer offers this option.	Depending on the options provided by your Sybase product's installation wizard, use one of the following solutions: • If your product offers this option, use the instructions in your product's installation guide to install the license server. • If your product does not include the option to install a license server, go to *http://www.sybase.com/sysam* and click **Download the SySAM Standalone License Server – Free!**.
License Server Does not Start	See *Possible Causes of a License Server Failure* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.	Go to SPDC or SMP, generate a valid served license for your product, and copy it into the `licenses` directory on the machine where the license server is installed.

Error	Possible Causes	Solution
License Server Does not Recognize the License Files	• The license was generated for a different machine or generated using an incorrect host ID. • The license has been altered. You cannot change any information in a generated license. • If the host ID for your platform is based on the network adapter identification, the most common problem occurs when you have used an ID associated with the address of a virtual network adaptor.	• Verify that the host ID recorded in the license file matches the host ID of the actual machine for which the license was issued. If the host IDs do not match, go to SPDC or SMP, check in the license, then regenerate the license with the correct host ID. • If your license is being created by typing from a paper copy, verify whether errors occurred when the license information was entered. You can also download a new copy of the activated license from SPDC or SMP. • If the host ID for your platform is based on a network adapter, verify that the ID you are using is associated with a valid NIC and that the ID is not associated with loopback or virtual adapters. If the ID you are using is associated with a removable network adapter, verify that the adapter is actually attached to the computer.
Linux virtual machine does not appear to be part of the Microsoft Hyper-V host.	`/usr/sbin/dmidecode` in Linux virtual machine cannot read from `/dev/mem`.	Log in to Linux virtual machine as root, then execute **chmod 4555 /usr/sbin/dmidecode**.

Error	Possible Causes	Solution

Product Does not Start, License Checkout Error	• You have not generated and deployed the valid licenses for the product requesting licenses.
	• The required license does not exist and the product does not award a license on grace.
	• The product is configured to use the wrong edition or license type.
	• You have the wrong host ID for an unserved license.
	• When multiple product editions include optional features, the features are offered as separately licensed items for each edition. Licensed optional features work only with the licensed base product of the same edition. For example, if you order Adaptive Server Enterprise, you cannot use a Small Business Edition optional feature license with an Enterprise Edition base product.
	• You are using an unserved Standalone Seat (SS) type license on a terminal server.
	• The license is for a different operating system.
	• The license is a Floating License (FL) but is currently in use elsewhere.
		At a command prompt or in a terminal window, execute the following commands, where *feature_name* is the name of the feature for which SySAM failed to check out a license:
		`sysam diag feature_name`
		If the SySAM script is unavailable, enter:
		`lmutil lmdiag -c license_directory_location feature_name`
		Go to SPDC or SMP and generate your product's required licenses. If you are trying to use a separately licensable optional feature you must have a license for both the base product and the option, and if the product has more than one edition, the edition of the base product and option must be the same.
		If you generated an invalid license, check in the license at SPDC or SMP, and regenerate the license with the correct information.

Error	Possible Causes	Solution
Product Cannot Check Out a License and Starts in Grace Period	To help you determine the possible causes when your product cannot check out a license, execute the following command from the `SYSAM-2_0/bin` directory, at a Windows command prompt or in a UNIX system terminal window, where *feature_name* is the name of the feature license that could not be checked out. `sysam diag feature_name` If the command output says that no licenses are available for checkout, this may be due to one of the reasons below, which are separated into served and unserved license deployment model causes and solutions.	See *Served License Deployment Models* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* or *Unserved License Deployment Models* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.
Product Continues to Run in Grace Period After Fixing a License Problem	The license status has not yet been updated. When the product periodically performs license checks, the license status is not immediately updated.	Wait up to 6 hours for server products, and up to 1.5 hours for tool products.
Product Cannot Find Licenses for Optional Features	You either have not installed the license for the optional feature, or the license exists, but cannot be checked out.	See *Solution for Problem: Product Cannot Find Licenses for Optional Features* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

Error	Possible Causes	Solution
Product Obtains the Wrong License	These locations are searched, in the order specified, until a suitable license is found. When a license directory is specified, license files in that directory are loaded in the directory sort order. When a product looks for a license, it looks in: • The locations that represent the values set for the SYBASE_LICENSE_FILE and LM_LICENSE_FILE variables. Sybase does not advocate using environmental variables and recommends that all licenses be located centrally in the expected licenses directory. • All files with a `.lic` extension in the licenses directory. This location is product specific, though typically the directory is `$SYBASE/SYSAM-2_0/licenses`. The first license that matches the feature name, version, edition, and license type filter is used; however, this license may not be the intended license your product requested.	• Configure your product to choose a license for a specific edition and license type. • If you are using served licenses, use the options file to ensure that the correct license is used.
License checkout problems with unserved license	See *Unserved License Deployment Models* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.	
License checkout problems with served license	See *Served License Deployment Models* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.	

See also

- *Possible Causes of a License Server Failure* on page 47
- *Installing Product Updates, EBFs, and Support Renewal* on page 69

- *Generating Licenses at SPDC* on page 11
- *Generating Licenses at SMP* on page 19
- *Unserved License Deployment Models* on page 49
- *Served License Deployment Models* on page 51
- *Installing for the First Time* on page 47
- *Solution for Problem: Product Cannot Find License for Optional Features* on page 49

Installing for the First Time

The installer or product cannot find a valid license and issues a warning.

1. If the installation fails, go to SPDC or SMP to generate and install the required valid licenses, then restart the installation.
2. Verify that you have generated and deployed the correct license. The error message should indicate what the problem is:
   - An incorrect host ID for unserved licenses
   - An incorrect license server reference file, or the license server is not running on the machine and listening on the specified port
   - A license generated for a specific product edition and license type, but the product is configured to use a different product edition and license type.
   - Using Standalone Seat (SS) unserved licenses on a terminal server
   - Check the `SYBASE.log` file to make sure the license server has started.
3. Ignore the warning. If the product continues to install under grace, complete the installation. Generate and install the required SySAM licenses before the grace period expires.

See also

- *Generating Licenses at SPDC* on page 11
- *Generating Licenses at SMP* on page 19

Possible Causes of a License Server Failure

The most common reason for a license server failing to start is that no served licenses are installed on the license server.

There must be at least one served license in the `licenses` directory for the license server to start. When you install a new license server, there are, by default, no served licenses in the `licenses` directory. Generate and deploy a served license to this directory.

Additional reasons for a license server failing to start include:

- Using an unserved license with a license server – the license activated from SPDC or SMP is an unserved license. Examine the license files. Served licenses always start with a

SERVER header. If you do not see a line starting with SERVER , you are using an unserved license that does not work with the license server.

- The license server port number is already in use – if you are using a specific port number for the license, that port number may already be in use. Use `netstat -a` to verify that the port number is free. If not, reassign the port or use a different port number for the license server.
- Mismatch between the host name in the license file and the actual host name – the host name is recorded next to the SERVER keyword. If it does not match the actual host name, correct the host name in the license file or set the value next to the SERVER to `this_host` which is a keyword that works with any host name.
- Header mismatch – when you have multiple license files, each one must have the same header, host name, port, and so on.
- The licenses on one machine were generated for a different machine – examine the host ID recorded next to the value in the license file host name in the SERVER header. It must match the host ID for the machine on which the license server will run.

Problem Starting SySAM License Server

SySAM license server may not start on a Windows host due to Internet Protocol mismatch issue.

When starting the SySAM license server, you may see this error:

```
lmgrd is not running: Cannot connect to license server
system. (-15,570:10035 "WinSock: Operation would block")
```

SySAM license server version 2.2 and later contains separate executables for Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) environments. You can choose the version of the license server based on your environment using **sysam configure**. By default, the IPv4 version of the license server is configured for use.

The IPv4 version of the license server cannot be used properly, if you have enabled IPv6 on the license server host. Then, 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.

The IPv6 version of the license server on a Windows host can be accessed only through IPv6 protocol. Any host with an IPv4 only network stack cannot obtain licenses from this IPv6 license server. To workaround, you can:

- Use a UNIX host for the license server. License servers on UNIX can serve licenses to both IPv4 and IPv6 client hosts.
- If you must use a Windows host for the license server and have both IPv4 and IPv6 clients to the license server, set up two license servers, one serving the IPv4 network and the other serving the IPv6 network.

Note: Support for IPv6 is built into the latest versions of Microsoft Windows, and is available as part of service pack updates for earlier Windows releases. See *http://technet.microsoft.com/en-us/network/bb530961.aspx*.

Solution for Problem: Product Cannot Find License for Optional Features

If a license for the optional feature exists, but cannot be checked out by the product, perform these diagnostic tasks to determine the specific problem.

To ensure that the license for the optional feature exists and can be checked out from the machine where the product is running, execute:

```
sysam diag feature_name
```

Compare the feature and the license to:

- Verify that the optional feature is for the same edition of the feature's base product.
- (Products and features that support active and standby licensing only) Verify that the active or standby flags match for the base product license and the optional feature license.
- Compare the product and optional feature editions, and active and standby status, then verify that the available license matches.

See *Sybase License Attributes* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

If any of the above items do not match, go to SPDC or SMP to generate and download the correct licenses or adjust product configuration.

See also

- *Sybase License Attributes* on page 73
- *Generating Licenses at SPDC* on page 11
- *Generating Licenses at SMP* on page 19

Unserved License Deployment Models

Learn about license checkout problems with unserved licenses.

Possible Causes	Solutions
The license for the product or feature you are using is not in the local `licenses` directory. The local license directory is product-specific, and the license must be deployed to the correct location for the product. Typically this directory is `$SYBASE/SYSAM-2_0/licenses`.	Generate the required unserved licenses from SPDC or SMP and deploy them.

Possible Causes	Solutions
Your product's license may have been activated with the incorrect host ID for the machine on which you are running the product.	**1.** Check the license back in to SPDC or SMP. **2.** Regenerate the license at SPDC or SMP with the correct host ID. **3.** Install the license to the local machine where you are running your instance of the SySAM 2-enabled Sybase product.
The available licenses are for a different operating system or architecture than the machine on which you are running your product feature.	Obtain a license for the correct platform from SPDC. **1.** Check the license back in to SPDC. **2.** Generate a license for the correct platform, or install the product on the correct platform. **3.** Deploy a license to the local machine where you are running your instance of the Sybase product. **Note:** Licenses generated from SMP are platform-independent.
You are running your SySAM 2-enabled program in a terminal services (TS) environment with an unserved Standalone Seat (SS) license.	Set up served licenses for a terminal server environment: **1.** Log in to SPDC or SMP and check in your old license. **2.** Generate served licenses and deploy them to a license server. **3.** Configure the product to obtain licenses from the license server.

Possible Causes	Solutions
If the output from running `sysam diag` *`feature_name`* states that a license for your product or feature is available for checkout, you still may be unable to check out the license because your product has been configured as a specific edition or with a specific license type. For example, the product is configured to look for an Adaptive Server® Enterprise, Enterprise Edition license, but only an Adaptive Server Enterprise, Developer Edition license is available; or, the product is configured to use a Server License (SR) license type, but only a CPU License (CP) is available. Another incompatibility may occur if your product has several editions, and you are trying to run a separately licensed feature from one edition with the base product of a different edition. You can run an Enterprise Edition base product only with an Enterprise Edition separately-licensed feature; you cannot run a Developer Edition feature with an Enterprise Edition base product.	If the problem is incompatible editions or license types, reconfigure your product, or go to SPDC or SMP and check in the incorrect license and regenerate a license for the correct edition or license type.

See also

- *Generating Licenses at SPDC* on page 11
- *Generating Licenses at SMP* on page 19

Served License Deployment Models

Learn about license checkout problems for served licenses.

Possible Cause	Solution
The license server may not be running.	Verify that the license server is running by entering this command from the `bin` directory on the license server host: `sysam status` If the license server is not running, restart it.

Possible Cause	Solution
The license server is running, but does not contain the desired license.	Enter the following command to determine if the license server is trying to grant a license for the licensed feature you are trying to use, where *feature_name* is the name of the separately licensed product feature for which the license server failed to check out a license: `sysam status -f feature_name` If the license is generated for one edition or license type, and the product configured to use another, go to SPDC or SMP and generate the correct licenses for your product or feature.
All licenses may be in use; that is no licenses are available for checkout.	If the output from `sysam status -f feature_name` indicates that there are no available licenses: • Go to SPDC or SMP and generate additional licenses; or, • If the product is using Floating License (FL) type licenses, you can shut down other instances of the product or feature you are using, running on other machines, to free licenses. See *Controlling License Use with the SySAM Options File* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

Possible Cause	Solution

Cannot connect to the license server	Ensure that the client can connect to both TCP/IP ports used by the license server. If there is a firewall, fix the ports used by both **lmgrd** and the SYBASE vendor daemon (the license server's constituent processes), and set up the firewall or VPN policies to allow access to both ports. The license server's SYBASE.log file shows the port numbers to be fixed:.
	`19:04:47 (lmgrd) lmgrd tcp-port 27010`
	`19:04:47 (lmgrd) Starting vendor daemons ...`
	`19:04:47 (lmgrd) Starting vendor daemon at port 27011`
	You can telnet from the client machine to check that the ports can be accessed:
	`telnet keyserver 27010`
	`telnet keyserver 27011`
	See *Access Through A Firewall or VPN* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

See also

- *Generating Licenses at SPDC* on page 11
- *Generating Licenses at SMP* on page 19
- *Access Through a Firewall or VPN* on page 39
- *Controlling License Use with the SySAM Options File* on page 33

Contacting SySAM Technical Support

If you cannot resolve a SySAM problem, contact Sybase Technical Support for licenses generated from SPDC, or visit SMP if your license was generated from SMP. Have available as much information about your system, and the conditions leading to the problem, as possible.

To report a SySAM problem at SMP, go to *https://service.sap.com/support*, select **Help + Support**, then **Report a Product Error**.

Typical information for an unserved license:

- The Sybase product name, version, edition (if any)
- Optional product features that are enabled

- The product error log or debug log output (if the product produces one), or a screenshot or copy of error message text if not
- The SySAM 2-enabled product or feature licenses saved in the `$SYBASE/SYSAM-2_0/licenses` directory, which is on your local machine or in the product-specific license location

Typical information for a served license:

- The output from:
  ```
  sysam diag feature_name
  ```
- The license server software version
- The license server debug log file
- The licenses that are saved in the `licenses` subdirectory of the `SYSAM-2_0` directory on the license server host machine

Common SySAM Deployment Scenarios

Learn about some typical license server deployment scenarios and suggestions for a SySAM setup that best serves each scenario. You can mix and match the suggested configurations with other variations, to best suit your needs.

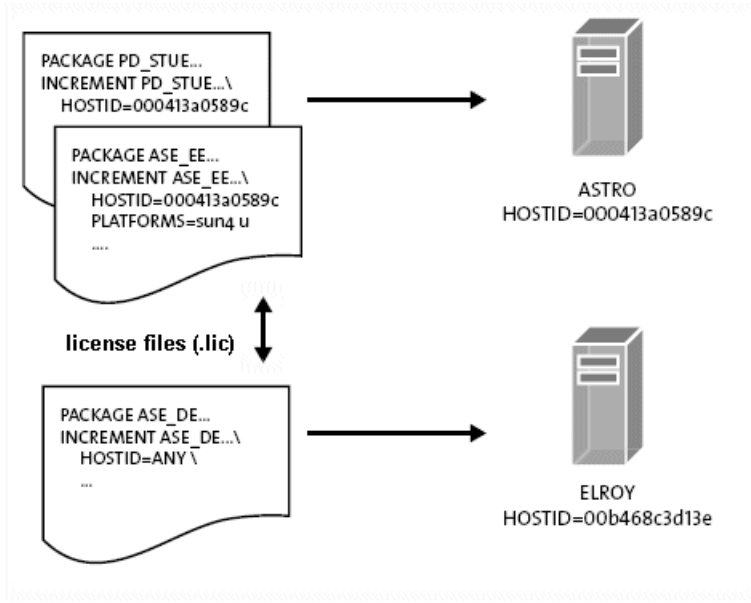
Small Environment, Unserved Licenses

This deployment scenario uses an unserved license deployment model that works best in:

- Very small environments using only a few license files that require little management
- Hosts that are isolated (or need to be isolated) from one network to another; for example, secure networks, and so on
- Secure environments, where communication between hosts is limited or restricted; for example, all ports are blocked, or specific ports are not allowed to be opened on a host
- Occasionally connected systems, such as laptops or handheld devices (however, see *Using Mobile Licenses* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* for more information about this scenario)

The easiest setup for this environment is to use unserved licenses, which have a simple initial setup and require little, if any, ongoing monitoring.

Figure 2: Small Unserved License Configuration



The "Small Unserved License Configuration" figure illustrates a simple unserved license architecture with two hosts: ASTRO and ELROY.

Each license file is installed locally on the same machine that runs the SySAM 2-enabled products that use that specific license file. The license can be used only on the machine on which it is installed. In each license file representation, the license file HOSTID matches the unique license host identification for the machine on which the associated licensed product is installed.

To get this information, run **lmutil hostid** from the `$SYBASE/SYSAM-2_0/bin` directory, on each machine for which you want to determine the host ID.

When you log in to the SPDC or SMP to generate licenses, enter the correct host ID for the machine where the product will run.

When using an unserved license, remember:

- The unserved license is valid only on the machine for which it was generated. The license is node-locked to the host where your SySAM 2-enabled product is installed, and the license activates products only on that host. You cannot copy the license file to another machine and use it to run another instance of a Sybase product.
- The unserved license deployment model does not use a license server. When you start a Sybase product, it looks for a local license file. Because the SAMreport gathers information from the license server report log, unserved license deployment models have

no reporting capability, which can make it difficult to do capacity planning or license reconciliation.

- You must manage unserved licenses, regardless of the architecture in which they are implemented. Most licenses have a version that usually coincides with the end of your annual support agreement with Sybase.

  To download and apply Sybase product updates and patches, when you renew your product support, you must update your SySAM licenses to reflect that fact. Renewing support and updating the corresponding license files on a few hosts is not difficult, but trying to update 100 or 1,000 hosts would be a formidable task.

  Note: A good rule to follow is that once you have more than 10 hosts, it is probably better to move to a served license deployment model, which allows you to update all licenses in one step.

See also

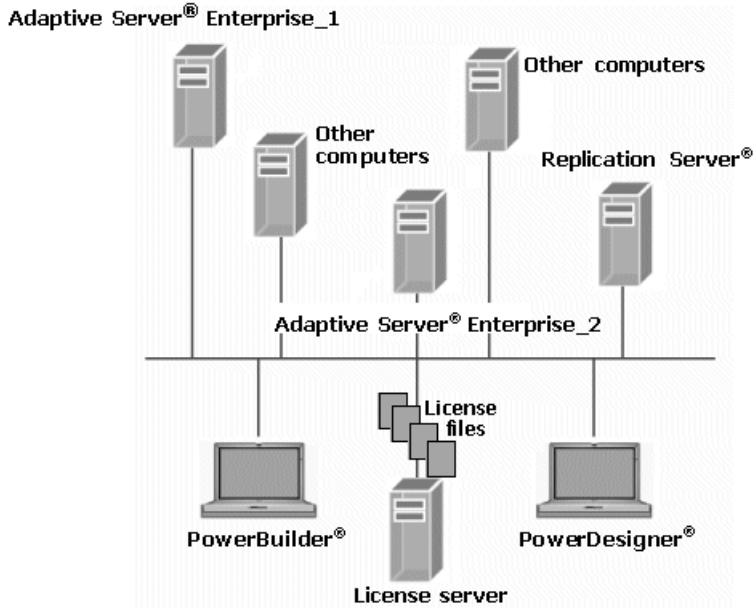
- *Using Mobile Licenses* on page 21

Single Site with Multiple Products, Served Licenses

This deployment scenario assumes you have one site, running multiple Sybase products, that requires asset management capabilities.

Typically, a served license with one license server that serves all Sybase licenses works most efficiently in such an environment. The overhead of maintaining the license server is compensated by the asset management functionality and a reduction in ongoing license maintenance because of the license server.

Figure 3: Single-Site Served License Configuration



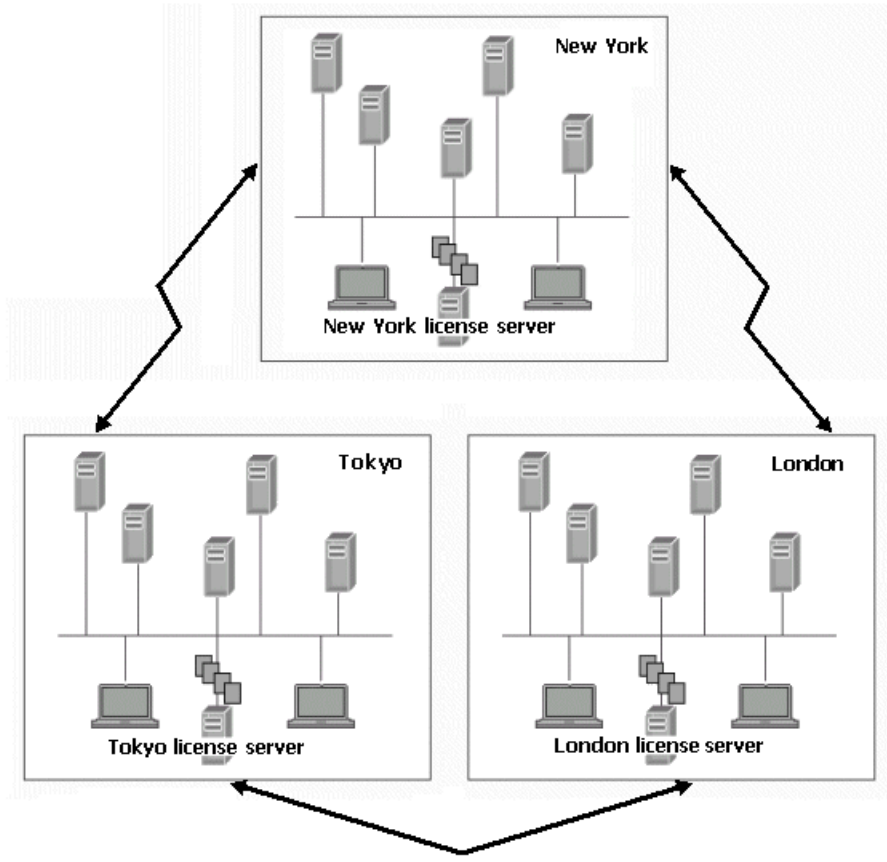
The "Single-Site Served License Configuration" figure shows one license server that is set up to grant SySAM licenses to all Sybase products in use. Each instance of a Sybase product contacts the license server to acquire a license.

You can set up the license server on a separate host machine, but because the license server uses few resources, it can typically be hosted on an existing machine.

Multiple Sites with Security Considerations and Remote Users

This deployment scenario has multiple sites, each with multiple Sybase products, with a license server at each site. This removes the dependency on network availability and latency, and can provide load balancing.

Figure 4: Multiple Sites and License Servers



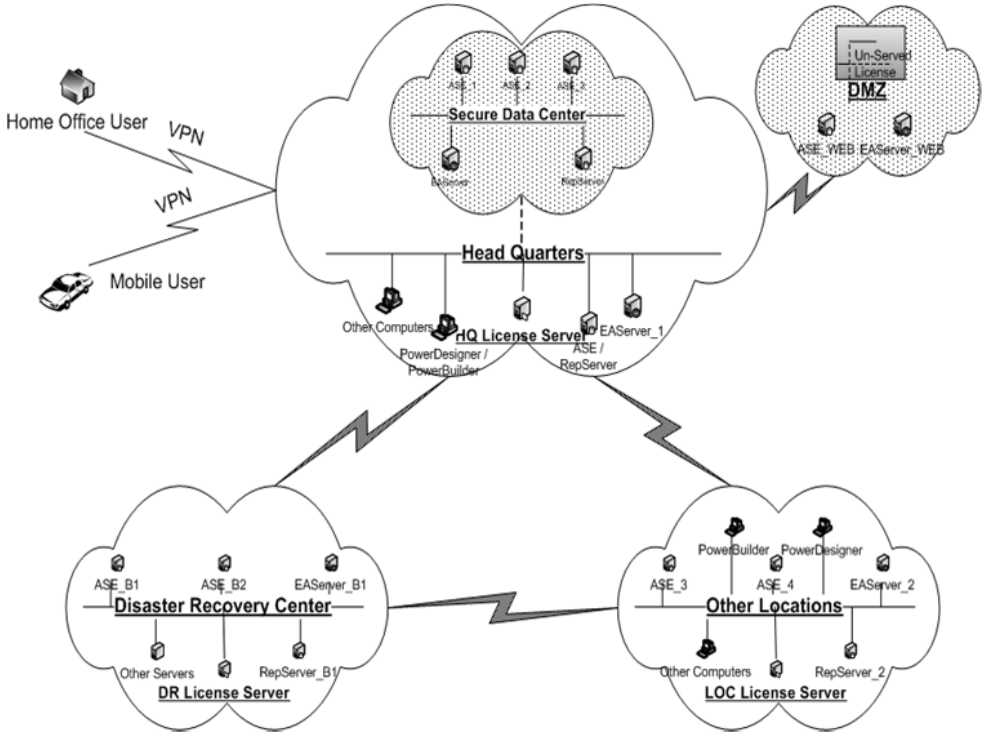
The "Multiple Sites and License Servers" figure illustrates an organization with major sites in New York, London, and Tokyo. Each site uses multiple instances of multiple Sybase products. A license server is installed at each site and individual product instances acquire licenses from the license server at that site.

You can configure the products to find remote license servers if the required license cannot be found on the site license server, or if the site license server is not running. To share a limited number of floating licenses across all sites while using the site license server for other licenses, set up those floating licenses on the license server where floating licenses are likely to be used frequently. At the other sites, you can set up license search paths. The redundancy provided by this configuration is limited to the number of unused licenses, including any overdraft licenses that remain on each license server.

You can also consider alternate configurations: if the network communication between two sites is extremely reliable with minimal latency, you can share a license server between two sites. Smaller remote sites can share a license server with a larger site that provides the most reliable network connection, even though the larger site may not be the closest site geographically.

This setup is an extension to the multiple site case explained above. It also addresses additional considerations including security within your network, remote users, and DMZs. This setup uses a mix of license models and servers to meet your needs. Individual components of this deployment can be applied to any of the other deployment scenarios.

Figure 5: Complex, Multiple-Site Installations



The "Complex, Multiple-Site Installations" figure depicts a multiple-site deployment with multiple product setup with additional security requirements. In this example:

- The Headquarters network includes both development and production installations.
- The production installations are set up within a secure subnet within the network.
- The database and application servers that serve the Web are set up in the DMZ.
- Home office and mobile users access the software remotely through VPN.
- There is a disaster recovery center at a remote location.
- There are other secondary sites for the organization.

This example uses a single license server for Headquarters, which serves the development, production, and remote users' needs. While the license server is shared for development and production needs, available licenses can be demarcated based on intended deployment.

- The production subnet security policies are relaxed to allow connections to the license server host and port.
- The VPN policies allow connection to license server host and ports.

If your security policies do not permit the production subnet to access a license server outside the subnet, you must set up a separate license server inside the subnet.

Note: Use a fixed port for the license manager, **lmgrd**, and SYBASE vendor demon in such situations. Firewall and VPN policies must accommodate both **lmgrd** and SYBASE port numbers. This means that SERVER lines and VENDOR lines in all license files must specify the port numbers chosen for the license manager and SYBASE daemon processes. For example, a license server running on machine server_1 with the license manager daemon, **lmgrd**, listening on port 27001 and the SYBASE vendor daemon listening on port 27100 should use a license file headed with the following two lines:

```
SERVER server_1 ANY 27001
VENDOR SYBASE PORT=27100
```

Unserved licenses are set up on the DMZ to serve licenses to product instances using the Web. This reduces the need to set up another license server or open up additional traffic through the firewall.

Sybase recommends that you use a separate license server for your disaster recovery site. This ensures availability of the license server in case of a major catastrophe at the primary site.

If your disaster recovery setup includes cold-standby servers, you must set up the license servers in a three-server redundant cluster. This reduces the possibility of a license server being unavailable when a cold-standby server is attempting to come online. Such redundancy for license servers is typically not needed unless you are using cold-standby systems.

Each secondary or remote site can have its own license server.

Migrating a SySAM 1 License Server to SySAM 2

A SySAM 2 license server can grant licenses to both SySAM 1 and SySAM 2-enabled products.

Note: There can be only one instance of a SySAM license server running on any given machine.

1. Shut down the SySAM 1 license server.
2. Install a SySAM 2 license server on the same host using the same port number that was used for the SySAM 2 license server.

   Note: Download and install a standalone SySAM 2 license server and utilities for select operating systems from the SySAM server Web site at *http://www.sybase.com/sysam/server*. The download site also includes a link to the license server installation instructions.
3. (UNIX platforms only) Configure the new license server to start and stop as part of the system start-up and shutdown, or replace `SySAM 1` references with `SySAM 2` in any start-up scripts that were used for the SySAM 2 license server.
4. Copy the SySAM 1 license file—`license.dat`—to the license server `SYSAM-2_0/licenses` directory as `license.lic`. SySAM 1 licenses are usually contained in one `license.dat` file, located in the `SYSAM-1_0/licenses` directory.

   Because the SySAM 2 license server uses the same port as the old SySAM 1 license server port, you need not edit the license file header to change the port number, which identifies the port where the license server listens for license requests from SySAM-enabled products.
5. Install any new licenses in the `SYSAM-2_0/licenses` directory on the license server host.
6. Start the migrated license server, or issue the **sysam reread** command for the migrated license server to use any new licenses.

   Note: When the migrated license server starts, it reads every file with a `.lic` extension; and does not read any with an extension other than `.lic`.

After you complete the license server migration, the SySAM 2 license server grants licenses for both SySAM 1 and SySAM 2-enabled products.

Consolidating Multiple License Servers

If you have multiple SySAM 1 license servers, you may want to consolidate the license servers into one SySAM 2 license server.

See *Getting Started* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* for information on selecting the appropriate configuration for your environment.

1. Select the host machine on which to consolidate license servers.
2. If the selected host already runs a SySAM 1 license server, migrate to a SySAM 2 license server. See *Migrating a SySAM 1 License Server to SySAM 2* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

   Otherwise, install the SySAM 2 license server using the standalone license server installer and installation instructions that you can download from SySAM server Web site at *http://www.sybase.com/sysam/server*.
3. (UNIX platforms only) Configure the SySAM 2 license server to start and stop as part of the system start-up and shutdown. If the host had a SySAM 1 license server configured to start automatically, replace the `SySAM 1` references with `SySAM 2` in system start-up directories and in any start-up scripts that were used for the SySAM 1 license server.
4. Collect all licenses that were being served from the individual license servers and deploy them to the new consolidated SySAM 2 license server:
   a) Create one new license file with a `.lic` file name extension. Save it to the license server `SYSAM-2_0/licenses` directory, then use a text editor to open the file.
   b) Use a text editor to open each SySAM 1 license file, remove the license header (the first three lines that start with `SERVER`, `VENDOR`, and `USE_SERVER`), and copy the remaining contents to the new license file (with the `.lic` extension) on the consolidated license server host. Repeat for every SySAM 1 license file.
5. Continuing in a text editor, add the following header to the new consolidated license file, where *port* is the port number on which the license server will listen for license requests from SySAM-enabled products:

   ```
   SERVER this_host ANY port
   VENDOR SYBASE
   USE_SERVER
   ```

   If you do not specify a port number in the header, the license server uses a default port in the 27000 through 27009 range.
6. Save the consolidated license file (`license.lic`), which now has all SySAM 1 license file contents and the updated header, to the license server `SYSAM-2_0/licenses` directory.
7. Start the consolidate license server.

8. Delete the old licenses from the retired SySAM 1 license servers and point the SySAM-enabled products that used the old license servers to the new consolidated license server:
   - On each SySAM 1-enabled product host, use a text editor to open the `license.dat` file and replace the contents with the following two lines, where *server_host* is the host name of the consolidated license server, and *port* is the port number on which the license server will listen:

     ```
     SERVER server_host ANY port
     USE_SERVER
     ```

     Note: Do not specify the *port* if the consolidated license server will be using the default port numbers and you did not specify the port in the header of the new license server file in step 6.
   - Save each updated `license.dat` file to its original location.
9. Shut down, uninstall, or remove all other SySAM 1 license servers.

See also

- *Getting Started* on page 3

Running a License Server Automatically on UNIX Systems

Learn how to run the license server automatically on UNIX systems (specifically, Solaris, Red Hat Linux, IBM, and HP).

Setting Up License Servers to Run as a Service

To run a UNIX license server as an automatic service on machines running UNIX systems:

1. Use an account with root privileges to log in to the machine where the SySAM 2 license server is installed.
2. Create a script for the system to use during start-up and shutdown, using the following example for reference. The purpose of the script is to avoid running the license server with root privileges, which are not required.

   The example script assumes that the license manager (**lmgrd**) is run as the user sybase, and is installed in the `/opt/sybase` directory. If necessary, change these parameters to match your installation.

```
#!/bin/sh
#
SYBUSER=sybase
SYBASE=/opt/sybase
SYSAM=$SYBASE/SYSAM-2_0
case "$1" in
      'start')
            su $SYBUSER -c "echo `date` starting lmgrd
>> $SYSAM/log/boot.log"
            nohup su $SYBUSER -c "umask 022;
   $SYSAM/bin/sysam start >> $SYBASE/log/boot.log"
            ;;       'stop')
            su $SYBUSER -c "echo `date` stopping lmgrd
>> $SYSAM/log/boot.log"
            su $SYBUSER -c "$SYSAM/bin/sysam stop -q
>> $SYSAM/log/boot.log"
            ;;
       *)
           echo "Usage: $0 { start | stop }"
           exit 1
           ;;
esac
exit 0
```

3. Save the script with a file name and in a directory that is appropriate for your operating system.

- Solaris – `/etc/init.d/sysam.boot`
- Red Hat Linux and IBM – `/etc/rc.d/init.d/sysam.boot`
- HP – `/sbin/init.d/sysam.boot`

4. Change the script's read, write, and execute permissions, owner, and group. For example, if the script is stored as `/etc/init.d/sysam.boot`, enter:

```
chmod 744 /etc/init.d/sysam.boot
chown root /etc/init.d/sysam.boot
chgrp sys /etc/init.d/sysam.boot
```

5. Create an appropriately named link that can be used to start the SySAM 2 license manager when the license server starts (typically, *S* + *run number* + *script name*):

   - Solaris –

     ```
     ln -s /etc/init.d/sysam.boot /etc/rc3.d/S70sysam
     ```

   - Red Hat Linux and IBM –

     ```
     ln -s /etc/rc.d/init.d/sysam.boot /etc/rc.d/rc3.d/S70sysam
     ```

   - HP –

     ```
     ln -s /sbin/init.d/sysam.boot /sbin/rc3.d/S070sysam
     ```

   Choose a run number (*70* in the example) that is higher than any required SySAM 2 subsystems (such as networking services), and lower than the run number of any SySAM-enabled products.

6. Create an appropriately named link that can be used to stop the SySAM 2 license manager when the license server shuts down (typically, *K* + *run number* + *script name*). Choose a run number (02 in the example) that is lower than any required SySAM 2 subsystems (such as networking services), and higher than the run number of any SySAM-enabled products.

   - Solaris –

     ```
     ln -s /etc/init.d/sysam.boot /etc/rc2.d/K02sysam
     ```

   - Red Hat Linux and IBM –

     ```
     ln -s /etc/rc.d/init.d/sysam.boot /etc/rc.d/rc2.d/K02sysam
     ```

   - HP –

     ```
     ln -s /sbin/init.d/sysam.boot /sbin/rc2.d/K002sysam
     ```

Installing Product Updates, EBFs, and Support Renewal

When product updates are made available, the licenses are encoded with information about the duration of the support plan. This information is stored in the license file and is referred to as "date-based versioning."

Working with Date-Based Versioning

Learn about licenses for products that use date-based versioning.

When you generate a license for a product that uses date-based versioning, the license version is created with the date that is the later of:

- The license purchase date
- The date the customer's support plan ends

For example, two customers are named Acme and Backme. Each customer purchases version 3.0 of ProductX on January 1st, 2005. However, Backme also purchases support for the product until the end of 2005. The licenses generated for Acme and Backme have different versions:

For Acme:

```
INCREMENT ProductX SYBASE 2005.01010 ...\       NOTICE="Acme" …
```

For Backme:

```
INCREMENT ProductX SYBASE 2005.12310 ...\       NOTICE="Backme" …
MP=365…
```

Acme can use any version of ProductX built before January 1st, 2005. Backme can similarly use any version of ProductX built before January 1st, 2005 but can also use any maintenance releases or EBFs for ProductX built before December 31st, 2005.

ProductX uses its build date as the version when requesting licenses, so an EBF built on March 19th, 2005 requests a license version greater or equal to `2005.0319`. This request is satisfied by the license generated by Backme. Acme does not have a valid license for this request.

If Backme renews their support contract for ProductX until the end of 2006, they must generate and deploy new licenses with the new end-of-support date. These licenses differ from those seen previously because they are an upgrade of the license from the old version to the new version. Such licenses look similar to:

```
UPGRADE ProductX SYBASE 2005.12310 2006.12310 ...
```

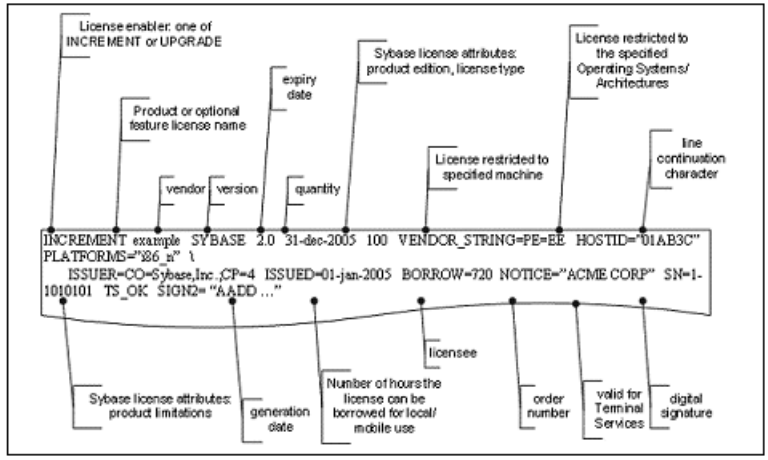
Note: The `UPGRADE` line is exactly the same as an `INCREMENT` line with the exception that the version of the license to be upgraded precedes the license version field.

License File Content Overview

Learn about the content of the license file.

Each `INCREMENT` or `UPGRADE` line in a license file represents a license for a product or a licensable option of a product. This figure has an `INCREMENT` line showing fields used by Sybase product licenses:

Figure 6: License Content



For information on the feature name used by each product and its optional features, see the SySAM information on the Sybase Web site at *http://www.sybase.com/sysam*.

Served and unserved licenses differ in that an unserved license always has uncounted quantity and always contains a Host ID field.

Served License

A served license file begins with `SERVER` and `VENDOR` lines, followed by the `INCREMENT` and `UPGRADE` lines.

For example:

```
SERVER license_server_host 0123ABCD
VENDOR SYBASE
INCREMENT prodeg SYBASE 2.0 31-dec-2005 1 \
      PLATFORMS="i86_n" ISSUED=01-jan-2005 \
      BORROW=720 NOTICE="ACME CORP" SN=1-1010 \
      TS_OK SIGN2= "AADD..."
```

The SERVER line contains the host ID (0123ABCD) of the license server machine (*license_server_host*), and the digital signature of the INCREMENT line is encoded using that host ID, so this license can be served only from that machine. The INCREMENT line does not contain a host ID, so the license can be served to any machine that can access this license server.

The served license example above shows one license to run one copy of version 2.0 or lower of the prodeg product on the Windows operating system (i86_n) until December 31st, 2005. The product can be used on any machine and the license can be borrowed from the license server for 720 hours of mobile use at a time.

Unserved License

An unserved license file contains an INCREMENT line only.

For example:

```
INCREMENT prodeg SYBASE 2.0 31-dec-2005 uncounted \
      HOSTID=0BABE1 PLATFORMS="i86_n" \
      ISSUED=01-jan-2005 NOTICE="ACME CORP" \
      SN=1-1 SIGN2= "AADD..."
```

The unserved example above shows a license to run version 2.0 or lower of the prodeg product on the Windows machine until December 31, 2005. The product can be run only on a machine with a host identifier of 0BABE1. The machine containing the correct host identifier cannot be a terminal server, because there is no TS_OK field.

Two special host ID values which are also used are HOSTID=ANY, and HOSTID=DEMO which signify that the product can run on any machine and no host identifier checks are performed

License Packages

Sybase groups some licensable options into packages to reflect alternate product bundling or simply for ease of license deployment.

For example:

```
PACKAGE PD_STUE SYBASE COMPONENTS="PD_SHELL \
      PD_CDM PD_PDM PD_OOM \
      PD_ILM PD_BPM PD_RQM PD_FRM PD_XSM PD_RMG" \
      ISSUED=01-jan-2004 SIGN2="13BD ……."
INCREMENT PD_STUE SYBASE 12.00000 permanent 2 ……
```

In the example above, two version 12.0 licenses are provided for all of the PowerDesigner components in the PD_STUE package.

Sybase License Attributes

SySAM-enabled products may specify license attributes in the VENDOR_STRING and ISSUER fields to identify certain properties of the license, such as product edition, type of license and any limitations imposed (such as maximum disk space or memory to be used).

For example:

```
INCREMENT ASE_EE SYBASE 2000.12310 permanent \
     1 HOSTID=0123ABCD \
     VENDOR_STRING=PE=EE;LT=CP \
     PLATFORMS="hp700_u hp64_u" \
     ISSUER="CO=Sybase, Inc.;V=15.0;AS=S;MP=365;CP=2"\
     ISSUED=31-dec-2000 BORROW=720 NOTICE="ACME Corp" \
     SN=500500065-2021 TS_OK SIGN2="18E7 B0E8 EEBB \
     E760 253C 0709 1287 F128 6871 4C28 0204 8F5D \
     D6C9 7998 A2DF 1CA1 EDE6 D98C 526E D8D9 F64E \
A836 9781 AC6F F360 2FCE 03B9 3702 A626 BF95
```

The example above signifies that the license type is a per-CPU license (LT=CP), and that the product is Adaptive Server, with a product edition of Enterprise Edition (PE=EE), and license for standby use (AS=S). The license can be used to run a machine with a maximum of 2 CPUs (CP=2), and was purchased with a maintenance contract of one year (MP=365).

Warning! You must understand licensing concepts to correctly license your product.

One significant difference between the ASE_EE license shown above and the prodeg license example in *Unserved Licenses* in the *Sybase Software Asset Management (SySAM) 2 Users Guide* is the value of the license version field. The prodeg license version matched the version of the product to be licensed. Both had a value of 2.0. The ASE_EE license version is actually a date value, 2000.12310, or December 31st, 2000. This is because the Adaptive Server product uses "date-based versioning" and requests licenses based on its build date rather than its version number. See *Installing Product Updates, EBFs, and Support Renewal* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.

See also

- *Installing Product Updates, EBFs, and Support Renewal* on page 69
- *Unserved License* on page 72

A Three-server Redundancy License

A three-server redundancy license file begins with three SERVER lines, and a VENDOR line, followed by the INCREMENT and UPGRADE lines.

For example:

```
SERVER license_server_host_1 0123ABCD 27010
SERVER license_server_host_2 0456DCBA 27010
SERVER license_server_host_3 07890147 27010
VENDOR SYBASE

INCREMENT prodeg SYBASE 2.0 31-dec-2005 1 \
      PLATFORMS="i86_n" ISSUED=01-jan-2005 \
      BORROW=720 NOTICE="ACME CORP" SN=1-1010 \
      TS_OK SIGN2= "AADD …."
```

The three-server redundancy license is the same as a normal server license, except the three server lines indicate that three servers have been set up for redundancy. License files must be identical on all three servers.

Using SAMreport for Asset Management

SAMreport 3.6 is a standalone SySAM asset management utility that generates reports by gathering information from license server report logs. You can download SAMreport 3.6 from the SySAM Sybase EBFs/Maintenance Web site. The download package includes the software, the SAMreport installation instructions for the selected platform, a cover letter, and the license file.

Table 4. Report Types

Report type	Report name	Report description
Summary	Usage Over Time	A line graph that shows the maximum number of licenses in use over a period of time.
	High Water Mark	A line graph that shows the maximum number of licenses used during a specified time period
	Summary Bar Chart	Compares license use across users and features, based on calculations made in the Usage Summary report.
	Usage Efficiency	Lists the amount of time each successive license was in use for a specified product.
	Usage Summary	Text output that summarizes usage statistics for each SySAM licensed product.
Raw	Raw	Lists individual license use events, rather than a license use summary. In general, a Raw report provides one line of data for every license checkout, listed in chronological order of check-in.
Server	Server Coverage	Documents the time during which the license server was issuing licenses.

Accessing Report Log Files

SAMreport must have access to the report logs created by the SySAM license server for which you want the report. You must manually copy these reports to the appropriate directory or provide remote access to them.

The report logs are enabled when the license server is installed.

Appendix A of the *SAMreport Users Guide* discusses how to manage report logs, including scripts, to automate log collection.

SAMreport Documentation

The SAMreport utility includes user and demo guides.

- *SAMreport Users Guide* (Flexera) – provides instructions for using SAMreport 3.6. After you install SAMreport, you can access the guide in PDF (`samreport \v3.6\machind\doc\SAMreportUsersGuide.pdf`) or in HTML (`samreport\v3.6\htmlman\index.html`).
- *SAMreport Demo Guide* (Flexera) – provides generic instructions to help you learn about SAMreport 3.6 features. After you install SAMreport, you can access this guide in PDF (`samreport\v3.6\machind\doc\SAMreportDemoGuide.pdf`) or in HTML (`samreport\v3.6\htmlman\index.html`).

The SAMreport documentation, *SAMreport Users Guide* (Flexera), is also available in PDF on the SySAM Web site *http://www.sybase.com/sysam*.

System Requirements

Learn about SAMreport 3.6 requirements.

Item	Requirement
Platforms	UNIX: • Intel Linux Red Hat version 7 x86 • Solaris SPARC version 5.7 or later, 32- or 64-bit • HP-UX PA-RISC version 11 and later, 64-bit • IBM AIX version 5.1, 64-bit Windows: • Windows x86, 32-bit
Memory	128MB of physical memory. Running with less than 128MB of memory can impact performance on large reports.
Java Runtime Environment (JRE)	JRE version 1.4.x. Each platform is certified on a specific minor version of JRE 1.4. See *Java Runtime Environment Requirements* in the *Sybase Software Asset Management (SySAM) 2 Users Guide*.
Display	800 x 600 pixels or greater

Before you install and use SAMreport, keep in mind:

- To use the SAMreport utility, your SySAM 2-enabled Sybase product licenses must use the served license model and you must have a SySAM license server installed.
- The SAMreport download packages for Windows and UNIX platforms include the appropriate JRE. Before you run the SAMreport installer or program, verify that the Java executable is included in your PATH variable and points to the appropriate JRE version for your platform.
- Installation does not require special administrator permissions.

  However, if you install SAMreport on Windows platforms (NT/2000/XP/2003), the **Start | Programs** menu will not contain a SAMreport option unless you install the software using the Administrator role.

  To start SAMreport in this situation, open the Windows Explorer, go to the SAMreport installation directory, right-click `report.exe` and select Run.
- If you use an X-server to display SAMreport output files on a machine different from where SAMreport is running, both machines must have JRE version 1.4.x installed, including any operating system patches.
- Do not use an X-emulator to display SAMreport output files on a Windows machine.

See also

- *Java Runtime Environment Requirements* on page 77

Java Runtime Environment Requirements

To operate properly, the SAMreport installation and runtime programs require you to have a specific version of the Java Runtime Environment (JRE) installed.

Each platform is certified on a specific minor version of JRE 1.4:

Platform	JRE version required
(NT, 2000, XP, 2003)	1.4.2_04
Intel Linux Red Hat	1.4.1_03
Sun Solaris SPARC	1.4.2_04
HP-UX PA-RISC	1.4.1_05
IBM AIX	1.4.1

Warning! If you do not have the JRE installed, or if the installed JRE is not the version required by SAMreport on your platform, install the correct JRE version and any operating system patches required by the JRE.

The SAMreport installation instructions (included in the SAMreport package download) include links to platform-specific JRE versions and operating system patches.

Accessing the SAMreport Software

Learn how to access the SAMreport software.

1. Go to the Sybase Web site at *http://www.sybase.com* and select **Support | Downloads | EBFs/Maintenance**.
2. If you are prompted for your login information, enter your user name and password and click **Login** (for existing Sybase accounts), or create a new Sybase account (free) by following the "Register now!" link.
3. At the Software Downloads page, select SySAM from the Products list. The next page lists SySAM downloads that are available for various platforms.
4. Select the SAMreport download for your platform.
5. Agree to the Sybase End User License Agreement (EULA) and Export Control Restrictions and click **Continue**.

   The next page contains the SAMreport downloadable files, which include:

   - SAMreport installation instructions
   - Java Runtime Environment (JRE) installation program
   - SAMreport installation program
   - SAMreport license file
   - A copy of the cover letter
6. Click **Info** to display the cover letter contents, and follow the instructions to download the files to a temporary directory.
7. In the temporary directory that contains the downloaded SAMreport files, open the installation instructions (`install_unix.htm` or `install_win.htm`) and follow the steps to install SAMreport.

Error Messages

Learn about common error messages you may encounter with SySAM.

Message Description	Message Example

Message 131252 is an informational message that is reported when a license is obtained.	`Checked out license for quantity feature (license_version / license_expiry /license_identifier)`
	For example:
	`Checked out license for 1 ASE_CORE (2005.1231/permanent/1343 09DD 6920 420A).`

Warning message 131251 appears if you have exceeded the number of available licenses and have obtained a license on overdraft.	`The total number of available licenses for feature has been exceeded by overdraft_amount and license usage is now in overdraft.`
	For example:
	`The total number of available licenses for ASE_CORE has been exceeded by 1 and license usage is now in overdraft.`

Warning message 131254 appears when a license cannot be obtained and is issued on grace.	Installation Grace:
	`Checked out grace license for 1 ASE_CORE (2005.0425) will expire Thu May 25 16:11:31 2009.`
	Note: In the above example, the highlighted version 2005.0425 is the version requested by the product, *not* the *license_version*, because no license has been obtained.
	Runtime Grace:
	`Checked out graced license for 1 ASE_CORE (2008.0831/permanent/ 1A37 58B3 72B4 7546) will expire Mon Sep 01 00:00:00 2008.`
	Support Time Grace (does not Expire):
	`Checked out support-graced license for 1 ASE_CORE (2008.0831/ permanent/1A37 58B3 72B4 7546).`

Message Description	Message Example

Warning message 131274 notifies you of the consequences of a grace period or license expiration when the license is for the product itself.	`WARNING: product will shut down on expiry_date, unless a suitable feature license is obtained before that date.`
	For example:
	`WARNING: ASE will shut down on Wed May 24 17:02:39:2009, unless a suitable ASE_CORE license is obtained before that date.`

Warning message 131275 notifies you of the consequences of a grace period or license expiration when the license is for a product feature.	`WARNING: product functionality that requires the feature license will be disabled on expiry_date, unless a suitable feature license is obtained before that date.`
	For example:
	`WARNING: ASE functionality that requires the ASE_ENCRYPTION license will be disabled on Wed May 24 17:02:39:2009, unless a suitable feature license is obtained before that date.`

Warning message 131250 indicates that you are functioning in a grace period and that your license will expire.	`License for feature will expire license_expiry_date.`
	For example:
	`License for ASE_CORE will expire Wed May 24 17:02:39:2009.`

Error message 131231 indicates that your product cannot obtain a license and the grace period has expired.	`License for feature could not be checked out within the grace period and has now expired.`
	For example:
	`License for ASE_CORE could not be checked out within the grace period and has now expired.`

Message Description	Message Example

Error message 131239 indicates the cause of a failure, and is followed by additional details.	`Failed to obtain quantity license(s) for feature feature from License Server host.`
	
	If the license server is not known, a general message is given:
	`Failed to obtain quantity license(s) for feature feature from license files or servers.`

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.

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.

Index

L

M

O

P

R

S

T

U

V

W