

SAS[®] Activity-Based Management 7.1

Installation, Migration, and Configuration Guide



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Chapter 1 – Using These Instructions

Audience

This document is intended for users who are installing or updating to SAS Activity-Based Management 7.1.

Outline

This document has seven major sections:

- Deployment Options– Chapter 2
- Migrating from Previous Versions – Chapter 3
- Setting Up Users, Groups, and Ports – Chapter 4
- Installing Third-Party Prerequisites – Chapter 5
- Installing SAS Prerequisites – Chapter 6
- Installing SAS Activity-Based Management – Chapter 7
- Post-Installation – Chapter 8

Chapter 2, Deployment Options, explains the common configurations that are supported.

Chapter 3, Migrating from Previous Versions, contains steps for migrating from SAS Activity-Based Management 6.x to 7.1. These steps need to be done before you install the new code.

Chapter 4, Setting Up Users, Groups, and Ports, contains an overview of the users and groups necessary to install SAS Activity-Based Management.

Chapter 5, Installing Third-Party Prerequisites, contains steps for installing prerequisite software that is not supplied by SAS.

Chapter 6, Installing SAS Prerequisites, contains the steps for installing other SAS components on computers other than the SAS Activity-Based Management application server.

Chapter 7, Installing SAS Activity-Based Management, contains the steps successfully installing SAS Activity-Based Management 7.1.

Chapter 8, the Post-Installation, contains steps to create the data sources, perform any desired data migration, and test the installation.

Technical Support

Please visit the SAS Technical Support web site at <http://support.sas.com> for installation updates.

For product documentation please visit the SAS Technical Support Documentation web site <http://support.sas.com/documentation/onlinedoc/abm/index.html>.

Note to the reader:

Words in examples that are enclosed in angle brackets symbols, <...>, are meant to be replaced by information from your system.

For instance, on Windows <SASHOME> should be replaced by the path where you installed SAS. If you installed SAS in Program Files on your D drive, then replace <SASHOME> with d:\Program Files\SAS.

On UNIX <SASHOME> should be replaced by the path where you installed SAS. If you installed the SAS on the /opt path, then replace <SASHOME> with /opt/SAS/.

Likewise, <CONFIGHOME> is the folder name you chose to store your configuration data during SAS installation appended with the configuration level that you are currently using. By default SAS uses the directory C:\SAS\Config\ for Windows. Most users will use Lev1 for the configuration level. Thus a typical value for <CONFIGHOME> is C:\SAS\Config\Lev1.

So, On Windows the text <CONFIGHOME>\Applications typically evaluates to C:\SAS\Config\Lev1\Applications.

On UNIX <CONFIGHOME> should be replaced by the path where your configuration is installed. If you installed the configuration on the /opt path and used a configuration name of Config and Level 1, then replace <CONFIGHOME> with /opt/SAS/Config/Lev1.

Reference Documents

This installation document is not intended to provide a sufficient knowledge of the SAS software installation process to begin installing SAS Activity-Based Management 7.1. The *SAS Deployment Wizard User's Guide* is required reading before you begin. It is available at <http://support.sas.com/documentation/installcenter/92/deploywiz/9.2/user.pdf>

You also need the minimum supported software versions for SAS Activity-Based Management 7.1 in order to ensure that any prerequisites you install are compatible with SAS Activity-Based Management 7.1. Keep this document handy as it will be referenced repeatedly during the installation process. It might be useful to print a copy for quick reference. The *SAS Activity-Based Management 7.1 System Requirements* is available at <http://support.sas.com/documentation/onlinedoc/abm/index.html>.

SAS Activity-Based Management 7.1 might be the first product at your site that requires SAS 9.2. For example, you might be using a 9.1.3-based Metadata Server and Web Report Studio as part of your existing SAS Activity-Based Management 6.x installation. If so, you need to migrate all SAS 9.1.3 components to be used by SAS Activity-Based Management 7.1 to 9.2 Maintenance 3. Please refer to the *SAS Intelligence Platform 9.1.3 to 9.2 Migration Guide* on the Install Center at <http://support.sas.com/documentation/cdl/en/bimig/61696/PDF/default/bimig.pdf>

The *SAS 9.2 Intelligence Platform Installation and Configuration Guide* contains a wealth of information on the general process of installing SAS software. It is available at <http://support.sas.com/documentation/cdl/en/biig/60946/PDF/default/biig.pdf>

Finally, the *SAS Intelligence Platform: System Administration Guide* provides detailed information about managing users and groups. It is available at <http://support.sas.com/documentation/cdl/en/bisag/60945/PDF/default/bisag.pdf>

Release Notes

Don't forget to check <http://support.sas.com/documentation/onlinedoc/abm/index.html> for updated documentation in the form of Release Notes. Release Notes contain late-breaking information on installation, configuration, and defects.

One Final Word before You Begin

Before you begin installing your software, SAS recommends that you disable any antivirus software running on your server while doing the SAS installations. On rare occasions, antivirus software prevents all necessary files and configurations from completing successfully.

Chapter 2 – Deployment Options

SAS Activity-Based Management supports many different server configurations. Deployment architecture is typically chosen based upon the expected workload. First, let's define a few terms to aid with understanding. If you are migrating from the SAS Activity-Based Management 6.x and want to change the deployment architecture please contact technical support.

Application Server – This server hosts the SAS Activity-Based Management mid-tier software. This includes the SAS Activity-Based Management website, web services, database access logic, and the business rules that provide the activity-based management functionality. This server is the “hub” of the SAS Activity-Based Management product. SAS Activity-Based Management clients access this server. This server accesses the Database Server and OLAP Server to provide model data to the clients. Additionally, it also performs calculation tasks on the Calculation Server and creates cubes using the OLAP Server.

Database Server - This sever hosts the database used by SAS Activity-Based Management to store its models. SAS Activity-Based Management 7.1 supports Microsoft SQL Server, MySQL and Oracle databases.

OLAP Server – In general terms, an OLAP server responding to multidimensional query requests from an OLAP viewer such as the one built into SAS Activity-Based Management and SAS Enterprise Guide. SAS Activity-Based Management supports both the SAS OLAP Server and Microsoft SQL Server Analysis Services.

For purposes of installing and configuring SAS Activity-Based Management, we will refer to the *OLAP Server* as the computer where the SAS PROC OLAP runs **or** the computer where Microsoft SQL Server Analysis Services runs -- **not** as the computer that responds to requests from an OLAP viewer, but instead. This slight distinction is necessary because in SAS, cubes can be built on one computer and multidimensional query requests handled by a separate computer where SAS OLAP Server is installed.

In “generic” SAS terminology, this server is typically called a SAS Server. It is so named because the SAS installation process installs the entire Base SAS system on this server along with specific components needed by SAS Activity-Based Management, such as the SAS OLAP Server. However, you may elect to use Microsoft SQL Server Analysis Services (SSAS) for OLAP processing, in which case the *OLAP Server* may not need any SAS software. So for brevity, we'll refer to this logical server as the *OLAP Server*, even though a more appropriate name might be the *OLAP Cube Creation Server*.

Calculation Server – This server hosts the SAS Activity-Based Management calculation engine. It reads models, performs the necessary calculations, and writes the results back to the model database on the Database Server.

Like the *OLAP Server*, this server is typically called a SAS Server or sometimes as a SAS Application Server in installation documentation. So if your deployment is using the SAS OLAP Server for cubes, in actuality you are installing the same software on two different computers – one used for calculation and one used for cube creation. Then during configuration of the SAS Activity-Based Management server, you configure these two servers to separate the two tasks. Of course, you could install the software on a single

computer and configure the SAS Activity-Based Management server to perform both tasks on that one computer.

Metadata Server – Although referred to as the Metadata Server for discussion purposes, this server may host other SAS products or solutions as well. At a minimum, this server hosts the SAS Metadata Server, the SAS Web Infrastructure Platform, and the SAS Foundation Services. These products are part of the SAS Business Intelligence architecture. SAS Activity-Based Management uses it to store information about SAS Activity-Based Management users, perform user authentication, and to share data with other applications, such as SAS Web Report Studio. It is also used by SAS OLAP Server to store cube and security information. Additionally, it centralizes access to SAS Workspace Servers, so they can be shared among SAS Business Intelligence applications

For clarity, this document refers to the five logical servers in italics with their name capitalized to distinguish its usage. For example, this document will use *Calculation Server* when referring to your logical deployment; but will use “calculation server” when referring to a specific computer or server.

Now that you have an understanding of what possible *logical* servers exist, let’s discuss how these logical servers may be installed onto *physical* computers. The SAS Activity-Based Management architecture does not specify how the above five *Servers* map to one or more physical computers. You may choose a deployment topology that best suits your needs. The topologies discussed below are the most common, but do not enumerate all possibilities. Please verify with your SAS consultants the suitability of any of these topologies to your particular needs. In order of smallest expected workload to largest, they are:

Two Computer Deployment

This deployment is suitable for small installations where:

1. The number of SAS Activity-Based Management **Create Models** users and **View Models** users is relatively small.
2. The SAS Activity-Based Management models and their cubes are small.
3. Integration with other applications such as SAS Web Report Studio is not needed.
4. Microsoft SQL Server Analysis Services will be used for OLAP processing.

All server computers will be operating with the Windows operating system.

In this deployment, the two server computers host the Servers in the following manner:

- Server 1: *Application Server*, *Metadata Server*, and *Calculation Server*. If your site already has a SAS Metadata server installed, SAS Activity-Based Management does not need its own. It should share your existing server.
- Server 2: *Database Server* and *OLAP Server*. Alternatively, the *Calculation Server* could be hosted on this computer as well.

Three Computer Deployment

This deployment is suitable for mid-size installations. It suits needs similar to the Two Computer Deployment discussed above, except the models are now large enough or the number of users is large enough that sharing one computer between the *Application Server* and the *Calculation Server*

is no longer practical. This deployment is feasible only if the *Workspace Server* is not heavily used by other SAS applications.

In this deployment, the three server computers host the *Servers* in the following manner:

- Server 1: *Application Server*
- Server 2: *Database Server* and *OLAP Server*
- Server 3: *Metadata Server* and the *Calculation Server*. If your site already has a metadata server installed, SAS Activity-Based Management does not need its own. It should share your existing server.

Four Computer Deployment

This deployment is suited to high-usage installations. It moves the database, OLAP processing, and calculation onto separate computers separate from the web application server.

- Server 1: *Application Server*
- Server 2: *Database Server* and *OLAP Server*
- Server 3: *Calculation Server*
- Server 4: *Metadata Server*. If your site already has a metadata server installed, SAS Activity-Based Management does not need its own. It should share your existing server.

A SAS workspace server should also be installed on the OLAP server if SAS OLAP Server is used to process cubes. This allows the cube creation, cube storage, and cube delivery to be hosted on a single computer.

Five Computer Deployment

This deployment is suited to very high-usage installations. It moves the database, OLAP processing and calculation processing onto computers separate from the Application Server.

- Server 1: *Application Server*
- Server 2: *Database Server*
- Server 3: *OLAP Server*
- Server 4: *Calculation Server*
- Server 5: *Metadata Server*. If your site already has a metadata server installed, SAS Activity-Based Management does not need its own. It should, share your existing server.

Other Deployment Possibilities

These deployment options represent a few possible deployment options. Depending on the number of SAS Activity-Based Management users at your site, the size of your models, and the size of the cubes they generate, other deployment topologies are possible. The key to choosing an appropriate topology is to understand the usage patterns and task loading of the computers in the deployment.

Server Prerequisites

Each of the four logical servers (plus the *Metadata Server*) in an SAS Activity-Based Management deployment has its own specific software prerequisites. Some of these prerequisites are third-party requirements, such as a relational database, and others are SAS requirements, such as a SAS/ACCESS engine for data access. These prerequisites are documented in the *SAS Activity-Based Management 7.1 Systems Requirements*. When *logical* servers are combined into a single *physical* computer, the prerequisites don't need to be duplicated – except where explicitly noted.

Deployment Information

Record the names of the machines for your deployment.

Type of Server	Machine Name	Operating System	Machine Description
<i>Application Server</i>			
<i>Calculation Server</i>			
<i>Database Server</i>			
<i>OLAP Server</i>			
<i>Metadata Server</i>			

Chapter 3 – Migrating from Previous Versions

This chapter is for use by existing SAS Activity-Based Management 6.x customers *or* by existing SAS 9.1.3 customers who are new to SAS Activity-Based Management. If neither of these two criteria describes your site, you may skip this chapter.

If you currently use SAS 9.1.3 or older software then you must update it to SAS 9.2. If you have SAS Activity-Based Management 6.x software, then you will follow the steps in this document to migrate to SAS Activity-Based Management 7.1.

Noteworthy Version Changes from SAS Activity-Based Management 6.4

There are a few important changes in SAS Activity-Based Management 7.1 that will impact users of previous versions of SAS Activity-Based Management:

- SAS Activity-Based Management 7.1 is incompatible with SAS 9.1.3. Any other SAS 9.1.3 products that you have that SAS Activity-Based Management needs, such as a metadata server, must be migrated to 9.2
- SAS Activity-Based Management 7.1 no longer supports Microsoft SQL Server 2000 databases or Microsoft Analysis Services 2000 for OLAP.
- SAS Activity-Based Management 7.1 no longer supports Oracle 10g database.
- Cubes generated with SAS OLAP 9.1.3 are incompatible with SAS OLAP 9.2.

If your SAS Activity-Based Management 6.x installation uses Microsoft SQL Server *or* Microsoft Analysis Services 2000 you must update to the Microsoft SQL Server 2005 or 2008 family of products before beginning installation. See the following sections for more details.

If your SAS Activity-Based Management 6.x installation uses an Oracle 10g database, you must migrate to Oracle 11g before beginning installation. Again, see the following sections for more details.

All SAS OLAP cubes generated with SAS 9.1.3 must be deleted and re-created using SAS OLAP 9.2. The cubes created with SAS OLAP 9.1.3 cannot be migrated or re-used by SAS OLAP 9.2. In order to rebuild the cubes using SAS Activity-Based Management 7.1 you need the fact tables that generated the original cubes. If you no longer have the fact tables, you may regenerate them from their originating SAS Activity-Based Management models.

For detailed version information regarding supported third-party tools, please refer to the *SAS Activity-Based Management 7.1 System Requirements*.

Backing up the System

Before proceeding you must also backup your database. If you are using Microsoft SQL Server, you must backup the OEAdmin and OEModels databases (or the names you chose during installation). If you are using Oracle, you must back up the schema you created for SAS Activity-Based Management 6.x during the installation. Before you backup the databases, verify that no one is using SAS Activity-Based Management on the server that you are upgrading.

Warning: *Database backups are specific to a particular version of SAS Activity-Based Management. Do not restore the current SAS Activity-Based Management databases from a backup created from a previous version. Include the version number in the backup name.*

Now that you have backed up the SAS Activity-Based Management databases, you should also backup the directory that contains the Published Reports that were created by SAS Activity-Based Management users. This folder is located at: <SASHOME>\Activity-Based Management Solution\Enterprise Server\SasSolutions\ABM\Reports\Published. You will restore the contents of this directory to a new location during the Post-Installation steps after installation of SAS Activity-Based Management 7.1 is complete.

Warning: *Failure to back up the contents of the published reports directory will cause the loss of all the published reports created by SAS Activity-Based Management users when the previous version of the product is uninstalled in the next step of the upgrade process.*

You should also back up all of your SAS 9.1.3 data prior to migrating any of the SAS components to 9.2. For more information, please refer to the *SAS Intelligence Platform 9.1.3 to 9.2 Migration Guide*.

Upgrading from SAS OLAP 9.1.3

The cubes created in SAS OLAP 9.1.3 cannot be migrated or ported to SAS OLAP 9.2. SAS OLAP 9.2 introduced numerous enhancements which made converting 9.1.3 cubes to the new format impractical. You must recreate the cubes from your SAS Activity-Based Management models once your SAS Activity-Based Management 7.1 installation is complete and validated. For more information, see “Migrating from SAS OLAP Server 9.1.3” in Appendix D – Third-Party Migration for details.

Upgrading from Microsoft Analysis Services 2000

If you currently use Microsoft Analysis Services 2000 (MSAS) and are updating to SQL Server Analysis Services 2005 or 2008 (SSAS), you cannot migrate your MSAS cubes to SSAS. The existing cubes must be deleted and re-created on SSAS. For more information, see Appendix D – Third-Party Migration for details.

Upgrading from Microsoft SQL Server 2000

Data from Microsoft SQL Server 2000 can be moved to Microsoft SQL Server 2005 or 2008. See “Migrating from SQL Server 2000” in Appendix D – Third-Party Migration for details.

Upgrading from Oracle 10g

There are several ways to upgrade to Oracle 11g if you currently use an older version. Please visit Oracle’s website at <http://www.oracle.com/technology/products/database/oracle11g/upgrade/index.html> for detailed information.

Running the SAS Migration Utility

Follow the instructions in the *SAS Intelligence Platform 9.1.3 to 9.2 Migration Guide* for migrating your existing SAS 9.1.3 Intelligence Platform.

Once you have migrated your SAS Business Intelligence Platform to 9.2, continue with these instructions to complete your installation. Once the software installation is complete, the final step of the installation process will migrate your existing SAS Activity-Based Management 6.x data to the new 7.1 format. This process will be covered in Chapter 8.

Chapter 4 – Setting Up Users, Groups, and Ports

Before you install your software, you must have a user account available to install the SAS software. The following sections explain how to create the necessary user accounts and groups on the operating system as well as setting the permissions for them.

Additionally, you need an understanding of the ports used by SAS Activity-Based Management and its third-party prerequisites.

Warning: *While reading this chapter, please be aware that using “local” users (i.e. users that are defined on a local computer and do not have network or domain authentication, in Windows terminology) for tasks other than software installation can cause many authentication problems when software is deployed on more than one computer. These problems arise because a local user on one computer is “invisible” to software on another – even if the same user accounts are created with identical passwords on each computer. If resources and access privileges on one computer need to be authenticated on another computer, that user must have network authentication.*

The following sections describe the user accounts that SAS and third-party software require, and provide information to help you understand the answers to these questions:

- What are internal and external user accounts?
- What user rights or to what groups must each account be assigned?
- Should I create local or network directory service accounts?

Types of Accounts

There are two types of user accounts to understand when deploying SAS:

- *Internal user accounts* are accounts known only to SAS and are created and authenticated internally in metadata rather than externally via an operating system.
- *External user accounts* are user accounts defined outside of SAS metadata. These accounts are local to a machine or are defined in a network directory service of which the machine is a member, such as LDAP.

Internal Accounts

Internal user accounts are accounts known only to SAS and are created and authenticated internally in metadata rather than externally. SAS identifies internal accounts by appending a special string to the user ID. This special string begins with an “at sign” (@) and contains the characters *sas***pw**. For example: **@sas**pw****. For two of the required user accounts, the SAS Administrator and the SAS Trusted User, the SAS Deployment Wizard prompts you by default to create *internal* user accounts.

You will not need access to these two internal accounts for day-to-day usage of SAS Activity-Based Management. However, you will need them to administer your SAS Activity-Based Management installation.

For more information on internal accounts, see “Understanding the State of Your System” in the *SAS Intelligence Platform: System Administration Guide*.

External Accounts

External user accounts are user accounts defined outside of SAS metadata. These accounts are local to a machine or are defined in a network directory service of which the machine is a member, such as LDAP or a Windows domain. SAS requires certain *external* user accounts for two purposes: installation and running certain SAS server processes. During installation and configuration, the SAS Deployment Wizard must run under an external account with the necessary privileges on the target computer to write SAS program and log files. To run servers such as the stored process server and the pooled workspace server, SAS requires an external user account to be the server process owner. For more information about external user accounts and their purposes, see the *SAS Intelligence Platform: System Administration Guide*.

As you create these external user accounts, record information about them in the table provided. You will need this information when you run the SAS Deployment Wizard to install SAS Activity-Based Management and other SAS software.

Accounts Summary

The key points to remember are: Some discussions that follow in this document refer to internal accounts and some that refer to external accounts. When referring to internal accounts or groups it implicitly means items in a SAS metadata server. When referring to external accounts or groups it implicitly means items in an operating system.

Calculation Server and OLAP Server Accounts

The external accounts and external groups discussed in this chapter must be accessible on the SAS Activity-Based Management *Calculation Server* and, if you are using SAS OLAP Server, on your *OLAP Server* as well.

They are also required on other SAS servers in your deployment, but will not be needed on your database server, nor will they be needed on your OLAP Server if you are using Microsoft SQL Server Analysis Services.

Creating External User Accounts

SAS Activity-Based Management needs an external account for:

- the software installer
- each SAS Activity-Based Management user, or at least one for a First User

Other SAS software also needs an external account to run the SAS Spawnd Servers. However, SAS Activity-Based Management does not use SAS Spawnd Servers, so that account can be ignored for the purposes of installing SAS Activity-Based Management.¹

You may install your SAS software using any operating system account that has sufficient privileges. However, SAS recommends that you use the same user to install all SAS software, all third-party prerequisite software, to uninstall software, and to apply any required software updates.

Please document the account IDs you use in the table below.

¹ Do not confuse the SAS Spawnd Server with the SAS Object Spawner.

Account ⁴	Recommended User ID	Actual User ID
SAS Installer	Windows: <i>my-domain\installer-id</i> ¹	
	UNIX: sas ^{2,3}	

1 On Windows, the user ID should be available in the future to facilitate SAS maintenance.

2 On AIX, make sure that the **User can LOGIN?** setting is set to **true** for the user.

3 On UNIX, do not use root.

4 For information about the user accounts see “Rights Required by External User Accounts for SAS” in *SAS 9.2 Intelligence Platform: Installation and Configuration Guide*.

Operating systems require that you assign certain rights to the external user accounts used to deploy and to run SAS. The following table describes the user rights needed by the required external user accounts to deploy and run SAS.

Account	Operating System	User Rights Needed
SAS Installer	Windows	Administrator rights
	UNIX	Member of a group that is the <i>primary</i> group for the SAS Spawnd Servers account ¹

1 SAS Activity-Based Management does not use any SAS Spawnd Servers accounts. However, other SAS products may. If you do create a spawnd servers account, it must also be a member of a group that is the *primary* group for the SAS Installer account.

On Windows, if you choose how to run your SAS servers using management scripts—instead of running them as Windows services—then the user account that runs the SAS Spawnd Server must meet the following requirements on the Spawnd Server machine:

- be the administrator or a member of the Windows Administrator’s group
- have the following Windows local user rights:
 - **Adjust memory quotas for a process**
 - **Replace a process level token**

When you set up passwords for your SAS system users, SAS recommends that these passwords not have to be reset on first log-on. It is also preferable that the passwords for these accounts do not expire.

Windows

On a Windows 2003 Server, follow these steps if you need to create a local SAS Installer User. If you already have a local account for this purpose or if you plan to use a network account, skip these steps. Otherwise, you need to create this local user on each computer where SAS software will be installed:

1. **Start→Control Panel→Administrative Tools→Computer Management.**
2. Expand the **System Tools**.
3. Expand **Local Users and Groups** and right-click **Users**. Select **New User...**
4. Fill in the user name for the installation user name you chose.
5. Fill in the descriptions (**SAS Installer User**) and password.
6. Deselect **User must change password at next logon**.
7. Select **User cannot change password**.

8. Select **Password never expires**.
9. Click **Create**.
10. Click **Close**.

UNIX

Use the appropriate system utilities to add a user with the following characteristics.

- Add a user (AIX is `mkuser` and Solaris is `useradd`)
- Set its password (`passwd <NewUser>`)
- Set the expiration date to 99999 (AIX is `chuser -a` and Solaris is `usermod`)

SAS First User Account (Optional)

To validate your SAS deployment, you need an external user account that is representative of an SAS Activity-Based Management user. This account must be the temporary process owner when its jobs are run on a standard workspace server. This user is typically an SAS Activity-Based Management user whose account will be used to validate the installation. However, you may optionally create a temporary external account whose sole purpose is validation. If you so choose, the SAS Deployment Wizard can create an internal SAS First User account for you and prompt for the First User's external account's credentials.

Creating External Groups

It is necessary that the proper operating system privileges are granted to users who will run SAS processes. This must be done on each computer where these processes will run. SAS Activity-Based Management users who perform calculations need the ability to launch batch processes on the *Calculation Server* and, if you are using SAS OLAP Server, users who create cubes need the ability to launch batch processes on the *Calculation Server* and the *OLAP Server* as well.

On UNIX and Windows, adding users to a group and then granting that group the proper permissions simplifies managing multiple users.

Full name	Recommended Group ID	Actual Group ID
SAS Server Users	Windows: SAS Server Users	
	UNIX: sas	

Windows

Create a new external group (not a metadata server group) and add each SAS Activity-Based Management user to the group of SAS server users. If you are creating a SAS First User account, add it to this group as well.

Warning: *Failure to add each SAS Activity-Based Management user to the group of SAS server users on the necessary computers will cause calculation and cube generation tasks to fail.*

The steps should be performed on each computer in your deployment where you will install SAS software. For a typical SAS Activity-Based Management installations this means the *Calculation Server* and the *OLAP Server*, if SAS OLAP is used:

1. Open **Start**→**Control Panel**→**Administrative Tools**→**Computer Management**.

2. Expand **Systems Tools**.
3. Expand **Local Users and Groups** and right-click **Groups**. Select **New Group...** to create a new group using the SAS Server Users name you chose. Networked user accounts are needed if the metadata server is on a separate machine from the other SAS Servers.
4. Close **Computer Management**.

Finally, grant **Log on as a batch job** to this group.

1. Bring up the **Local Security Settings** dialog by double-clicking **Administrative Tools**→**Local Security Policy** in the **Control Panel**.
2. Select **Local Policies**→**User Rights Assignment**.
3. Right-click **Log on as a batch job** and select **Properties**.



4. Click **Add User or Group**. The **Log on as batch Properties** dialog displays. Select the **Add User or Group** button.
5. The **Select Users or Groups** dialog displays. The dialog does not search for groups on the local computer by default. Select the **Object Types** button.



6. The **Objects Types** dialog displays. Make sure that the **Groups** check box is selected and click **OK**. Select the **Locations** button. The **Locations** dialog displays.
7. Make sure the your local computer name is selected. The local computer name is usually displayed at the top of the list. Click **OK**.
8. Type your SAS Server Users name in the **Enter the object names to select** entry box. Select **Check Names**. Click **OK** to close the **Select Users or Groups** dialog.
9. Click **OK** to close the **Log on as batch Properties** dialog.

UNIX

If you are installing any SAS software on a UNIX system, you need to create a UNIX group to hold the ID of the SAS Server User. SAS recommends that you name this group **sas**. The system command for creating a group on AIX is `mkgroup` and on Solaris is `groupadd`. The system command to add members is `useradd -G <GroupName> <UserName>`.

Designating Ports

About Ports and Multicast Addresses

You also need to review the set of ports that the SAS servers and third-party servers in your system will use by default. If any of these ports are unavailable in your environment, perhaps due to port conflicts with other software, select an alternate port and record the new port on the following ports pre-installation table.

You also need to plan for designating Internet Protocol (IP) multicast addresses for the all the machines in your SAS deployment. This topic is beyond the scope of installing SAS Activity-Based Management. For more information please see “Setting Up Users, Groups, and Ports” in the *SAS 9.2 Intelligence Platform Installation and Configuration Guide*.

This is not a complete list of the ports used by SAS products. It is a list of the ports that will be used by SAS Activity-Based Management. For more information on ports, please refer to “Designating Ports and Multicast Addresses” in the *SAS 9.2 Intelligence Platform Installation and Configuration Guide*.

Server	Default Port	Actual Port	Machine Name
Application Server (choose one): <ul style="list-style-type: none">JBoss EAPOracle WebLogicIBM WebSphere	8080 7001 9080		
Database Port (choose one): <ul style="list-style-type: none">Microsoft SQL ServerOracleMySQL	1433 ³ 1521 ³ 3306 ³		
OLAP Server Port (choose one): <ul style="list-style-type: none">Microsoft SQL Server Analysis ServicesSAS OLAP Server¹	N/A ⁴ 5451		
SAS Metadata Server	8561		
SAS Workspace Server ²	8591		
SAS Deployment Tester Server	10021		
SAS Activity-Based Management “Operations”	5081		
SAS Activity-Based Management “Windows Service Port”	9050		
SAS Foundation Services ⁵	5091		

¹ This port is for the Workspace server on the *OLAP Server* (if SAS OLAP Server is being used)

² This port is for the Workspace server on the *Calculation Server*

³ This is the default port for the default instance. If you create a named instance, the port may differ

⁴ Microsoft SQL Server Analysis Services does not use a port for creating connections

⁵ This is usually located on the *Metadata Server*

The default port assignment is based upon a clean installation of the product on a computer where there are:

- no other instances of that product installed
- no other versions of that product running
- no other products of a similar nature are running (e.g. web servers)

If any of the above is true, then the default ports may have been reassigned during the installation of the product. Please verify the proper port assignment before continuing with the SAS Activity-Based Management installation.

Warning: *There cannot be any conflicting port assignments on any single computer. SAS port assignments may be duplicated across computers as the connection between components/services on different computers is formed using the computer name and the port number.*

Chapter 5 – Installing Third-Party Prerequisites

This chapter provides an overview for the installation of the third-party software prerequisites that will be needed by the SAS Activity-Based Management installation. These instructions are not intended to replace the OEM instructions for the software, but are instead intended to provide an overview for important options and installation choices that SAS Activity-Based Management relies on for proper operation.

Important: *Not all of these prerequisites are required on all servers. Please follow the instructions carefully to minimize installing unnecessary software.*

Before installing the SAS Activity-Based Management software on the Application Server, please verify that the other Servers in your deployment have the proper third-party software prerequisites and SAS software prerequisites installed on them. Please record the following information during the installation process for reference purposes:

- computer names
- newly created user accounts and passwords
- installation directories (for certain items where this is needed later)
- a check-box that the software has been installed

Please verify that you are installing these prerequisites using the proper SAS Installer user that was identified in the previous chapter.

This information is needed to configure the SAS Activity-Based Management server so it can properly communicate with the other servers. Use the tables below to record the information as your installation proceeds:

Application Server – **Machine Name:**

Prerequisite Software	Installed?	Installation Directory
SAS Activity-Based Management Mid-Tier ¹		
Java 2 SDK		
Web Application Server Software		
Database access software ²		
JUnit Software		
.NET ³		

1 To be installed in Chapter 7

2 Either a JDBC driver for SQL Server or Oracle or the MySQL Connector/J for a MySQL database. The Installation Directory is important only if you are using MySQL

3 .NET is only needed if you are using SQL Server Analysis Services for OLAP

Database Server – **Machine Name:**

Prerequisite Software	Installed?	Instance/GDB Name
Relational Database		

OLAP Server (if using SAS OLAP Server ¹) – **Machine Name:**

Prerequisite Software	Installed?
SAS Activity-Based Server Tier ³	
Database access software ²	

1 Includes Base SAS with PROC OLAP, SAS OLAP Server, and Workspace Server

2 An ODBC driver for SQL Server, Oracle, or MySQL database.

3 The full name is SAS Activity-Based Management Data Integration and Enterprise BI Server. This will be installed in Chapter 7. This can also be any existing SAS OLAP Server

OLAP Server (if using SQL Server Analysis Services ¹) – **Machine Name:**

Prerequisite Software	Installed?
SQL Server Analysis Services	
Database Connectivity Tools ¹	

1 Either Microsoft Client Connectivity Tools or Oracle Client Tools

Calculation Server – **Machine Name:**

Prerequisite Software	Installed?
SAS Activity-Based Costing Server ¹	
Database access software ²	
SAS/ACCESS to ODBC	
SAS/ACCESS to Oracle (if using an Oracle database)	
SAS/ACCESS to MySQL (if using a MySQL database)	

1 Includes Base SAS with PROC ABC, SAS/GRAPH, and Workspace Server as key components

2 The Microsoft Client Connectivity Tools for SQL Server; Oracle Client Tools; or an ODBC driver for MySQL.

Metadata Server – **Machine Name:**

Prerequisite Software	Installed?	Internal Account	Password
SAS Metadata Server			
SAS Foundation Services			

These prerequisites must be installed before you install SAS Activity-Based Management or, if they are to be installed on the same computer as SAS Activity-Based Management, they can be installed simultaneously.

User ID for Installations

Make sure you are logged in as the SAS Installer User before proceeding.

Java JDK for Servers

Warning: SAS does not support “mixing” 32 bit SAS software and 64 bit SAS software on 64 bit Windows computers. If you have a 32 bit version of Windows, then install 32 bit software. If you have a 64 bit version of Windows, then install 64 bit software **or** install 32 bit software – but don’t mix the two environments. For example, don’t try to install a 32 bit version of SAS Foundation and a 64 bit Java JDK.

The Java JDK is a required prerequisite for the *Application Server* in your deployment. The version of the Java JDK you need depends on the web applications server you are using. Please refer to the *SAS Activity-Based Management 7.1 System Requirements* for the specific version for your web application server.

Once you have installed the correct JDK and you provide the correct path of this JDK to the SAS Deployment Wizard, no additional configuration should be needed. SAS launches the correct JVM using the full path you provide.

Windows

Install the JDK appropriate for your operating system & web application server.

Warning: The SAS Deployment Wizard prompts for a JRE and a JDK. The **JRE** is used only by the SDW and its configuration utilities. This JRE **must** be a 32 bit JRE if you are installing on a 64 bit version of Windows. The **JDK** is used to run the rest of the SAS software that is installed. When prompted for the JRE, SAS recommends that you select the option to allow the SAS Deployment Wizard to install its own JRE. This ensures the installation and configuration process will complete successfully.

UNIX

Install the JDK appropriate for your operating system & web application server.

The following commands set the `PATH` environment variable on UNIX. These statements can be added to the `.profile` file of the user that is running the installation. Alternatively this can be added to a common profile accessed by the user’s profile.

For example if you installed Java JDK 1.5.0_15 in the `usr` directory, issue the following commands:

```
PATH=$PATH:/usr/jdk1.5.0_15
export PATH
```

Web Application Server

A web application server is a required prerequisite for the *Application Server* in your deployment.

SAS Activity-Based Management 7.1 needs a web application server installed on the *Application Server*. You must pick one of the following web application servers and install it before you install SAS Activity-Based Management 7.1.

- JBoss EAP or
- Oracle WebLogic or
- IBM WebSphere ND

Please note that not all applications servers are supported on all platforms. See the *SAS Activity-Based Management 7.1 Systems Requirements* document for the minimum level of the web

application server for the operating system of your Application server and on which operating systems they are supported.

Verify that the assigned port is available for the particular web server so that it can properly respond to HTTP requests without conflicting with other Web servers. If the assigned port is not available you will need to resolve the conflict by changing one port used by one of the conflicting applications. If you need to change the port, then you will need to make changes in the application manager for the applications that use this web application server.

JBoss EAP

Install JBoss EAP on the computer you identified as the *Application Server* in your deployment. JBoss EAP does not have a traditional installation process. You only need to un-zip/un-tar it into the directory of your choice. You must contact RedHat to obtain a license for this web application server if you do not already own one.

Oracle WebLogic

Install Oracle WebLogic on the machine hosting the SAS Activity-Based Management Server Application. You must contact Oracle to obtain a license for this web application server if you do not already own one.

IBM WebSphere

Install IBM WebSphere on the machine hosting the SAS Activity-Based Management server. You must contact IBM to obtain a license for this web application server if you do not already own one.

After Installing JBoss, WebLogic, or WebSphere

IBM WebSphere 6.1

After installing IBM WebSphere 6.1, you also need to install the IBM Client for Java Messaging Service (JMS) before the web application server is started and before SAS Activity-Based Management 7.1 is installed and configured.

1. Download the IBM Client for JMS from here: <http://www-01.ibm.com/support/docview.wss?uid=swg24012804>
2. Install the IBM Client for JMS on the *Applications Server* using the “jms_jndi_ibm” option. For example:

Windows: `java -jar sabc_install-<BUILD>.jar jms_jndi_ibm c:\jms`

UNIX: `java -jar sabc_install-<BUILD>.jar jms_jndi_ibm /jms`

Where <BUILD> is the build number for the IBM JMS you downloaded. This installs the jars `sabc.jms.jar` and `sabc.jndi.jar` into a `lib` directory beneath `jms` directory.

For more information, see the IBM installation document located on the IBM web site.

All Web Application Servers

After completing the installation of the web application server, it may need additional configuration to optimize its performance. Please read the post installation steps for your web

application server at <http://support.sas.com/resources/thirdpartysupport/index.html>. All the documentation that refers to SAS 9.2 is applicable. However, since SAS 9.2 (TS2M3) adds support for new third-party versions it contains the latest information.

Warning: *You must read and follow the instructions for your web application server. Some of the instructions refer to specific configuration settings required by SAS products; others refer to specific software patches that must be installed on your application server due to specific defects found by SAS; still others refer to optimization techniques to maximize performance for SAS software.*

Warning: *Failure to follow these instructions before proceeding may result in installation failures later during SAS software installation.*

Relational Database

A relational database is a required prerequisite for the *Database Server* in your deployment.

The SAS Activity-Based Management 7.1 Solution needs a relational database to store its data. You need to select one of the following databases and install it.

- Microsoft SQL Server database (for Windows) or
- MySQL database (for Windows and UNIX) or
- Oracle database (for Windows and UNIX)

If you have already installed a database, please verify the port number for the database and record it in the table in the previous chapter.

Use this table to record the installation details for the database.

Database user name	Password	Database/Schema name

Installing Microsoft SQL Server Database

You may skip this section if you are upgrading from a previous version of SAS Activity-Based Management *and* if you are using a version of SQL Server that is supported by SAS Activity-Based Management 7.1. However, you will need the SQL Server user's name, password, and the database name that contains your existing data. Please record this information in the table above. You will need it later when you install SAS Activity-Based Management 7.1 and when you update your database to the SAS Activity-Based Management 7.1 schema format.

Background

Microsoft has changed terminology over the last several releases of SQL Server. In SQL Server 2000, the OLAP server was named Microsoft Analysis Services (MSAS) but in SQL Server 2005 and 2008 it is now called SQL Server Analysis Services (SSAS). This should not be confused with SAS OLAP Server.

Also, in SQL Server 2000 the connectivity drivers (ODBC, OLEDB, etc.) and management console were combined together into the Client Tools installation. In SQL Server 2005 the connectivity tools are part of the renamed Workstation Components installation. In SQL Server 2008 the connectivity tools are a separate installation option and are part of Client Tools Connectivity. The SQL Server Management Studio is part of Workstation Components in SQL Server 2005 and part

of Management Tools in SQL Server 2008. Please keep these changes in mind when installing SQL Server as the names of the required options have changed.

Important: *If you are using Microsoft SQL Server for your database or Microsoft SQL Server Analysis Services for your OLAP processing, your Application Server **must** be on Windows. This is a configuration limitation due to user authentication limitations between UNIX and Windows.*

Install Microsoft SQL Server 2005

Complete the installation steps in “Installing Microsoft SQL Server 2005” in Appendix A.

Install Microsoft SQL Server 2008

Complete the installation steps in “Installing Microsoft SQL Server 2008” in Appendix A.

Configure Microsoft SQL Server (All Versions)

Complete the configurations steps in “Configuring Microsoft SQL Server 2005 and 2008” in Appendix A.

Install Oracle Database

Warning: *The Oracle installer performs a few prerequisite tests. Make sure all tests successfully complete. If any tests fail, refer to the Oracle installation guide for help. This is especially important because depending on your hardware configuration, the Oracle database may require the presence of a Loopback Adapter for proper operation. If the Loopback Adapter is not installed but its presence is required by Oracle, the Oracle database will appear to operate properly most of the time. However, SAS has determined that random failures, typically involving “concurrency” (to quote the Oracle error messages), will occur. The Oracle documentation has instructions for installing the Loopback Adapter on your operating system.*

Complete the installation and configuration steps in “Installing Oracle 11g” in Appendix B.

Install MySQL Database

Install MySQL on the machine you identified as the *Database Server* in your topology. You can download the community edition of their software from the MySQL website at <http://dev.mysql.com/downloads>.

If the MySQL database is not on the web application server computer, you may want to install the MySQL GUI Tools Bundle on the web application server computer for convenience.

Detailed instructions for installing and configuring the MySQL database are available in “Installing MySQL” in Appendix C.

OLAP Server

If you are using SAS OLAP Server, you may skip this section. You will install it in Chapter 6.

If you are using Microsoft SQL Server Analysis Services, you should install it on the computer you have identified as the *OLAP Server* in your SAS Activity-Based Management deployment. If you are using Microsoft SQL Server Analysis Services and your *OLAP Server* and *Database Server*

are deployed on one computer, then you may have already installed the OLAP software. If so, you can skip this section.

Microsoft SQL Server Analysis Services (All Versions)

See “Installing Microsoft SQL Server Analysis Services” in Appendix A.

ODBC Drivers

The *Calculation Server* uses the ODBC drivers to access the database. Likewise, if you are using the SAS OLAP Server to create SAS Activity-Based Management cubes, the *OLAP Server* deployment also uses the ODBC drivers to access the database. If your *Calculation Server* or *OLAP Server* is on a 32 bit operating system you need a 32 bit ODBC driver. If your *Calculation Server* or *OLAP Server* is on a 64 bit operating system you need a 64 bit ODBC driver. This is true regardless of the operating system on your *Database Server*.

If you are using Microsoft SQL Server Analysis Services to create SAS Activity-Based Management cubes, then the *OLAP Server* does not need ODBC drivers, but it does need the Client Connectivity tools for your database.

Important: *SAS recommends installing the ODBC drivers using the Client Connectivity Tools options on your database installation CDs for Microsoft SQL Server and Oracle databases. This guarantees that the Calculation Server, and hence the ODBC drivers, will receive any updates as part of a database update provided by your vendor.*

Important: *Windows distinguishes between 32 bit ODBC drivers and 64 bit ODBC drivers. Windows also distinguishes between 32 bit DSNs and 64 bit DSNs. 32 bit DSNs can only use 32 bit ODBC drivers and 64 bit DSNs can only use 64 bit ODBC drivers.*

Microsoft SQL Server Database

If you need to download the drivers directly, look for the “Microsoft SQL Server Native Client” for SQL Server 2005 at <http://www.microsoft.com/downloads/details.aspx?FamilyID=d09c1d60-a13c-4479-9b91-9e8b9d835cdc&displaylang=en> and for the “Microsoft SQL Server Native Client” for SQL Server 2008 at <http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=b33d2c78-1059-4ce2-b80d-2343c099bcb4>

Oracle Database

If you need to download the ODBC drivers directly, the “Oracle Data Access Components” for Oracle 11g can be found at <http://www.oracle.com/technology/software/tech/windows/odpnet/index.html>.

Important: *If your Calculation Server is installed on a UNIX computer, you may not be able to download ODBC drivers for your Oracle database free of charge. For more information, contact Oracle Technical Support.*

MySQL Database

If you need to download the ODBC drivers directly they can be found at: <http://www.mysql.com/downloads/connector/odbc>.

JUnit for SAS Activity-Based Management Server Diagnostic

JUnit must be installed on the Application Server. SAS Activity-Based Management Server Diagnostic needs access to JUnit 4.0 software to run. It can be installed from the SAS Support web site at <http://support.sas.com/resources/thirdpartysupport/v92m3/othersw.html>. Select the JUnit link at the top of the page and then select the **Download** link. Install it on the *Application Server*.

Required Software for SAS Activity-Based Management Client

The following software is required for each SAS Activity-Based Management client.

Adobe Reader

SAS Activity-Based Management client optionally creates reports in Adobe's Acrobat format. To view these reports you need an Adobe Reader. You can download this from the Adobe website, <http://www.adobe.com/products/reader>.

Microsoft .NET Framework

The Microsoft .NET 2.0 or 3.5 Framework is required by the OLAP viewer portion of the SAS Activity-Based Management client. The .NET 3.5 Framework typically comes preinstalled as part of Windows 7, so a separate installation should not be required.

Tip: The Microsoft .NET Framework 3.5 includes the 2.0 Framework as part of its installation. There is no need to install both.

The Microsoft .NET Framework may be downloaded from <http://www.microsoft.com/downloads>.

Microsoft Internet Explorer

Microsoft Internet Explorer is typically installed as part of the Windows operation system and usually doesn't need to be separately installed.

Important: The SAS Activity Based Management client is a 32 bit application. It runs properly on either 32 bit or 64 bit versions of Windows. However, it uses the 32 bit version of Internet Explorer even when running on a 64 bit version of Windows.

DHTML Editing Control for Microsoft Internet Explorer

If your SAS Activity Based Management client is running on Microsoft Vista or Microsoft Windows 7 operating system, you may need to install the DHTML Editing Control for Applications on your client computer. This control is installed by various Microsoft products including Microsoft Office 2007. However, if you have a new computer with no additional Microsoft software installed you can download the Editing Control from Microsoft's website at

<http://www.microsoft.com/downloads/details.aspx?familyid=b769a4b8-48ed-41a1-8095-5a086d1937cb&displaylang=en>

Important: If your client computer does not contain a properly installed version of this control, you will not be able to view OLAP cubes.

Microsoft XML Core Services

Microsoft XML 6.0 Parser is installed as part of Microsoft Internet Explorer and does not typically need to be installed separately.

If necessary it can be downloaded from

<http://www.microsoft.com/downloads/details.aspx?FamilyId=59914795-60c7-4ebe-828d-f28cb457e6e3&displaylang=en> .

OLEDB for OLAP Drivers

In order for your client computer to properly display OLAP cubes you need a driver to allow it to access OLAP data sources.

If you are using SAS OLAP Server to create cubes, then you need the SAS OLEDB for OLAP 9.2 Maintenance 3 driver. This driver is included as part of the SAS Activity-Based Management Client installation and is not normally installed separately.

If you are using Microsoft SQL Server Analysis Services 2005, then you need the Microsoft OLEDB for OLAP 9.0 driver available from

<http://www.microsoft.com/downloads/details.aspx?FamilyID=536FD7D5-013F-49BC-9FC7-77DEDE4BB075&displaylang=en> .

If you are using Microsoft SQL Server Analysis Services 2008, then you need the Microsoft OLEDB for OLAP 10.0 driver available from

<http://www.microsoft.com/downloads/details.aspx?FamilyId=C6C3E9EF-BA29-4A43-8D69-A2BED18FE73C&displaylang=en> .

Special Combinations

Oracle WebLogic 10.3.3 and Microsoft SQL Server Database

If you use Oracle WebLogic 10.3.3 with SQL Server you will encounter a problem when the SAS Deployment Wizard (SDW) attempts to configure SAS Activity-Based Management. This happens because the Microsoft JDBC driver is not compatible with the Java version required by WebLogic 10.3.3.

To resolve this problem, install Oracle WebLogic 10.3.3 normally on your *Application Server* and install the recommended Microsoft JDBC 2.0 driver as described in *Appendix A* on your *Application Server* as well. Then proceed with installing the SAS Activity-Based Management *Application Server* using the SDW as detailed in Chapter 7. After the configuration of SAS Activity-Based Management completes successfully, you will receive a Java runtime exception of the form “JRE 1.6 is not supported by this driver. Use the sqljdbc4.jar class library, which provides support for JDBC 4.0”. Do not exit the SDW installation. Instead, to resolve this problem you must replace the “sqljdbc.jar” file provided by the Microsoft JDBC 2.0 driver as described in *Appendix A* and located in <CONFIGHOME>\Web\SASDomain\lib with the “sqljdbc4.jar” file that is provided as part of the Microsoft JDBC 3.0 driver provided at <http://www.microsoft.com/downloads/details.aspx?FamilyID=a737000d-68d0-4531-b65d-da0f2a735707&displaylang=en#RelatedDownloads>. The “sqljdbc4.jar” is compatible with the Java 6 JDK required by WebLogic 10.3.3. Once you replace the .jar file, return to the SDW and retry the configuration operation that failed. It should continue and complete successfully.

Warning: You cannot simply install the “sqljdbc4.jar” instead of the “sqljdbc.jar”. This causes its own problem because the “sqljdbc4.jar” is not compatible with the Java 5 JRE required by the SAS configuration process. The process described above allows the “older” JDBC driver to be installed first and used by the SAS configuration process; then replaced with a newer JDBC driver that is compatible with WebLogic 10.3.3.

Oracle WebLogic and MySQL Database

The Oracle WebLogic application server ships with an older MySQL Connector/J version than SAS Activity-Based Management requires. To resolve this problem after WebLogic is installed, delete the file <WEBLOGIC_HOME>\server\lib\mysql-connector-java-commercial-5.0.3-bin.jar. Then make sure you have installed the correct version of the MySQL Connector/J driver and that you specify the location of the correct version to the SAS Deployment Wizard later in this document.

Warning: Unfortunately, since Oracle WebLogic chose to redistribute a version of the MySQL Connector/J jar files in this manner, updating this jar file on your WebLogic installation will impact all products that share this installation. Most other SAS solutions have been validated to use this newer version. However, if you are uncertain about compatibility with other SAS products please contact SAS Technical Support before proceeding.

Windows MySQL Database

The MySQL database needs additional configuration of the Windows computer that hosts it. You must create two registry entries that alter the behavior of the TCP/IP connection. These settings are discussed in greater detail in *Appendix B* of the MySQL instruction manual in the section entitled “Errors, Error Codes, and Common Problems”.

Warning: The following procedure involves modifying the Windows registry. Before you modify the registry, make sure to back it up and make sure that you understand how to restore the registry if a problem occurs. For information about how to back up, restore, and edit the registry, view the following article in the Microsoft Knowledge Base:
<http://support.microsoft.com/kb/256986/EN-US/>.

1. Open the Windows Registry Editor by selecting **Start**→**Run**.... When the **Run** dialog displays, enter **regedit** and click **OK**.
2. Go to **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters**
3. Right-click on the **Parameters** folder and select **New**→**DWORD Value**.
4. Enter the key name **MaxUserPort**. Double-click on the **MaxUserPort** key.
5. The **Edit DWORD Value** dialog displays. Change the **Base** to **Decimal**. Enter 65534 as the **Value Data**. Close the **Edit DWORD Value** dialog by clicking **OK**.
6. Repeat steps 3 through 5 for a key named **TcpTimedWaitDelay** and assign the value 30.
7. Close the Registry Editor by selecting **File**→**Exit**.
8. Reboot the MySQL computer

Without these settings, random errors of the nature, “[MySQL] [ODBC 5.1 Driver] Can't connect to MySQL server on '<MyComputerName>' (10048)” display. The error is caused not by MySQL or the MySQL ODBC driver, but by the behavior of Windows. For performance reasons Windows maintains a connection on a TCP port after it is closed for (by default) 4 minutes. Under heavy load when lots of connections are opened and closed to the

database, the system can hit a limit on the maximum number of connections allowed (even though as far as MySQL is concerned, these connections have been closed).

Microsoft SQL Server Database and Microsoft Analysis Services

If you are using Microsoft SQL Server (2005 and 2008), you may experience unresolved table locking problems in your SQL Server database that prevents SAS Activity-Based Management batch processes from completing. The error states:

```
Transaction (Process ID 58) was deadlocked on lock resources with
another process and has been chosen as the deadlock victim. Rerun
the transaction.
```

This problem most commonly appears when SQL Server is heavily loaded and SAS Activity-Based Management is generating cubes.

To resolve this problem, you need to modify your database transaction isolation level.

1. Launch the **SQL Server Management Studio** from the **Start** menu.
2. Make sure you have selected Database Engine and the computer where your Database Engine is running. Log into **SQL Server Management Studio** using an appropriate administrative account.
3. Open a query window by selecting the **New Query** toolbar button or by selecting **New→ Query with Current Connection** from the **File** menu.
4. Paste the following query into the query window and change the text `<MyAbmDatabaseName>` to be the name of your SAS Activity-Based Management database:

```
ALTER DATABASE <MyAbmDatabaseName> SET READ_COMMITTED_SNAPSHOT ON
```

Choose **Execute**.

Chapter 6 – Installing SAS Prerequisites

After completing *Chapter 5- Installing Third-Party Prerequisites*, you now have all the third-party software prerequisites installed and configured properly on the physical computer, or computers, in your deployment. Your next step is to install your SAS software.

If you are new to installing SAS software, the process involves two components:

- The software to be installed – a SAS Software Depot
- A “Plan file” which describes which SAS software should be installed on which computer. This helps simplify complex installations.

Your SAS software order was delivered with a sample Plan file that is suitable for the deployment information you provided when your software was ordered. If you want to change that deployment, please contact a SAS representative.

As in the previous chapter, please verify that you are installing this software using the proper SAS Installer User that was identified in the previous chapter.

SAS Software

As part of your SAS software purchase, you will receive a *Software Order E-mail* detailing the specific software included in your order, download instructions (or DVDs if requested) and a *SAS Installation Data file* (SID file) to activate your software. You will need this email to continue with the installation. The Software Order E-mail is sent to the SAS Installation Representative at your site. If at any time you cannot find your Software Order E-mail, you should go to the web site <http://support.sas.com/adminservices-SID> to have it re-sent to the SAS Installation Representative at your site. For detailed instructions on the installation process, please refer to the *SAS Deployment Wizard User’s Guide* available on the web at the link below.

During the installation, you will need to have access to the SAS Software Depot and Plan file. Keep these in a location that is accessible to all the machines.

Download your software into the SAS Software Depot using either the SAS Download Manager or install the software from DVDs. For detailed instructions on the SAS Download Manager refer to http://www.sas.com/apps/demosdownloads/esdclient_PROD_sysdep.jsp?packageID=000388

For detailed instructions on the SAS Software Depot, please refer to the quick start document at <http://support.sas.com/documentation/installcenter/92/quickstart/9.2/basic/quickstart.pdf>

For detail instructions of installing the software from Basic DVDs, please refer to the quick start document at http://support.sas.com/documentation/installcenter/92/quickstart/9.2/basic/quickstart_media.pdf

Then install the product from the SAS Software Depot using the SAS Deployment Wizard. For detailed instructions on the SAS Deployment Wizard, please refer to the *SAS Deployment Wizard User’s Guide* at <http://support.sas.com/documentation/installcenter/92/deploywiz/9.2/user.pdf>

Before you continue, please visit our Technical Support website, <http://support.sas.com>, for any additional information. In particular, refer to the *SAS 9.2 Intelligence Platform: Installation and Configuration Guide* at <http://support.sas.com/documentation/cdl/en/biig/60946/PDF/default/biig.pdf>

SAS Software Installation

Please follow the instructions carefully and type your responses accurately. Correctly specifying port numbers, user names, and machine names are critical to ensuring your installation operates properly. A few extra minutes verifying your input can save many hours of debugging a simple typographical error.

Using the SAS Deployment Wizard, install the required SAS software that you identified in Chapters 3 and 4 on the appropriate OLAP and, if you are not using an existing one, *Metadata Server* as well. These two servers may not need to have software installed on them. For example, if you are using Microsoft SQL Server Analysis Services then the *OLAP Server* installation is already complete. The same can be said if your site already has a SAS 9.2 Metadata server installed and configured. It is possible that the only SAS software remaining to install is the *Calculation Server* and the *Application Server*, both of which will be covered in the next chapter. Depending on your deployment, it is also possible that only the *Database Server* installation is complete and all the others are remaining.

Your Plan file will help you efficiently install the SAS software. If your *Calculation Server* will be installed on the same computer as the *Application Server*, a proper Plan file will allow those two to be installed and configured at the same time. Your plan file can also allow you to install the *OLAP Server* and *Metadata Server* at the same time as well.

Warning: *If you have a Plan file that specifies that SAS software should be deployed onto two separate computers, you may be tempted to make one “pass” through the SAS Deployment Wizard and install “Software 1” on computer A and then rerun the SAS Deployment Wizard and install “Software 2” on computer A as well. If you install your software this way make sure you specify different configuration directories for each run of the Deployment Wizard. If you try to co-locate multiple sets of configuration files in a single directory, the configuration data from a subsequent installation may overwrite, and destroy or alter, the configuration data from a previous one. This will result in a non-functioning system.*

During the installation process update the configuration tables in Chapter 4 with port information, user names, etc.

Important Deployment Questions

There are several choices that the SAS Deployment Wizard will offer that impact your entire installation. This section will review those questions and provide guidance to make informed decisions. You may be queried about all of these choices when installing your software or you may encounter none. The queries you encounter depend on the software you are installing and which components are on which computer.

Run as Windows Services (Windows Only)

If you are installing on a Windows operating system, you have the choice to run certain service software as a Windows Service or by manually executing “management scripts”.

There is no performance penalty associated with either choice. The decision really involves how you want to manage your computers. The advantage of Windows Services is that the Windows operating system can automatically stop and restart them when Windows is shut down or restarted. The advantage of management scripts is that you choose when to start them and you have direct access to the start-up parameters (if any) provided by the scripts. However, if you choose to use management scripts, be aware that you must manually stop and start these service tasks yourself when Windows is shut down or restarted. If these tasks are not running the SAS

applications will not run properly. SAS recommends that these tasks be run as Windows Services.

Allow Anonymous Web Access

Allowing Anonymous Web Access is often site-wide security policy at a company. Please check with your IT department about preferred web access policies. If you don't have a specific need to allow anonymous access, SAS recommends that you leave this option disabled.

Automatically Configure Your Web Application Server

SAS Activity-Based Management and other SAS applications use a web application server to host portions of their application. If you choose, the SAS configuration process can automatically configure the applications servers or, you may optionally choose to perform those steps manually after the SAS configuration complete. The steps you need to manually perform are written to the *instructions.html* file that is generated for each computer in your deployment. For typical installations, SAS recommends that the web applications servers be automatically configured.

Configure Multiple Managed Servers

Depending on your deployment you may need multiple web applications servers on one computer. You have the choice to deploy and configure a web applications server for each application that needs one, or you may deploy a single web application server and have the applications share it. Many factors will influence your decision and this discussion is beyond the scope of this document. For more information see the *SAS Intelligence Platform: Web Application Administration Guide*. For typical installations, SAS recommends that you configure multiple managed servers.

SAS Software to Install

The installation instructions for the SAS Metadata Server and the SAS OLAP Server are not covered as part of the SAS Activity-Based Management instructions. Instead, they are covered in the *SAS 9.2 Intelligence Platform Installation and Configuration Guide*. Please refer to that document for more information.

There are many places where the Deployment Wizard will ask for a computer name. Unless specifically asked for an abbreviated name, please provide a fully-qualified name. Fully qualified names are usually of the form: **<MyComputerName>.<MyCompanyName>.com** or perhaps **<MyComputerName>.<MyRegion>.<MyCompanyName>.org**. One example would be: **server1.eur.webcomputers.com**. Abbreviated, or short, names are usually a simple name such as **<MyComputerName>** or simply **server1**. These names should not be prefixed with forward or backward slashes. Please consult with your internal computer support staff if you are uncertain about the proper format for your installation.

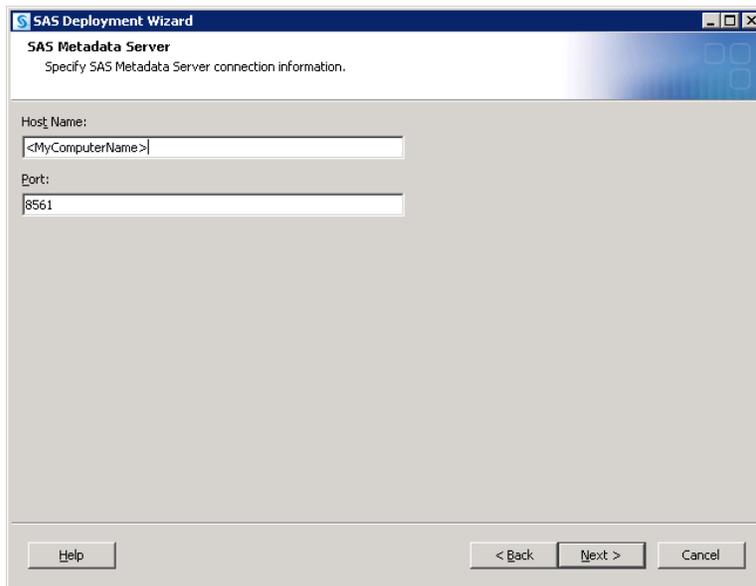
Warning: *SAS Activity-Based Management 7.1 does not support Pooled Workspace Servers. When configuring a SAS OLAP Server or the calculation server for SAS Activity-Based Management, please choose a regular, non-pooled, workspace server.*

Metadata Server

The computer you have designated as the *Metadata Server* is the first computer you should install, configure and have running. It will be used to store and share information about all the other computers on which you install SAS software.

If you already have a functioning SAS 9.2 Metadata Server that you want SAS Activity-Based Management to share, you may skip installing another.

Please record the Metadata Server information you choose while installing the SAS Metadata Server. You will enter this information in the **Host Name:** and **Port:** options on the **SAS Metadata Server** wizard page while installing SAS Activity-Based Management. The **SAS Metadata Server** wizard page looks like this:



The screenshot shows a window titled "SAS Deployment Wizard" with a sub-header "SAS Metadata Server" and the instruction "Specify SAS Metadata Server connection information." Below this, there are two input fields: "Host Name:" with a text box containing "<MyComputerName>" and "Port:" with a text box containing "8561". At the bottom of the window, there are three buttons: "Help", "< Back", and "Next >" (with a right-pointing arrow), and a "Cancel" button.

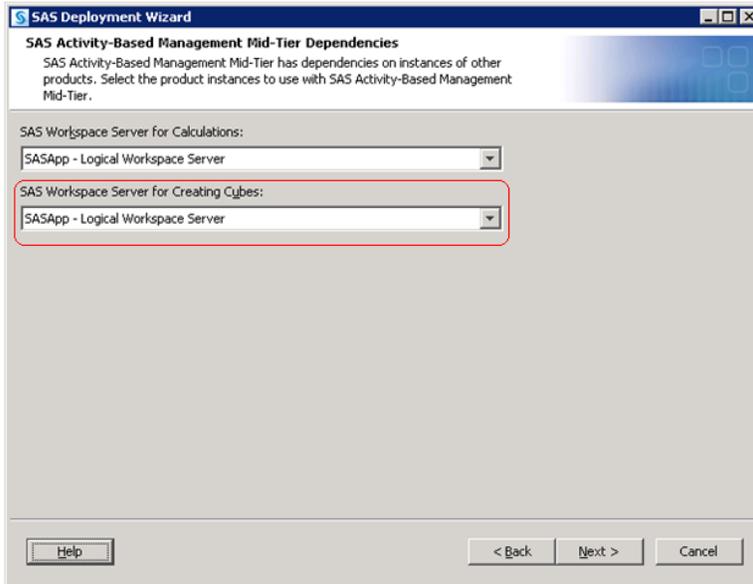
OLAP Server

Important: *If you are using SAS OLAP Server and you already have one installed, you may choose to share it with SAS Activity-Based Management or you may choose to install another instance on a separate computer for exclusive use by SAS Activity-Based Management. Unless prohibited by your product license, you may choose the deployment that best suits your needs.*

If you already have a functioning SAS 9.2 OLAP Server that you want SAS Activity-Based Management to use or if you are using Microsoft SQL Server Analysis Services for cube processing, you may skip installing another. For more information on the SAS OLAP Server, please refer to its documentation at

<http://support.sas.com/documentation/onlinedoc/olap/index.html>

Record the Logical Workspace Server Name you choose while installing the SAS OLAP Server. You will provide this name in the **SAS Workspace Server for Creating Cubes** option on the **SAS Activity-Based Management Mid-Tier Dependencies** wizard dialog:



The SAS Activity-Based Management configuration creates the **ABM Library** in the SAS Metadata Server. This library uses the DSN definition on the *OLAP Server* to connect to the SAS Activity-Based Management database. If the *OLAP Server* and *Calculate Server* are hosted on the same computer, they will share the DSN. If they are hosted on separate computers, each computer needs an identical DSN definition. For more information on DSNs, see “Creating Data Sources” in Chapter 8.



Chapter 7 – Installing SAS Activity-Based Management

This chapter will guide you through the installation of SAS Activity-Based Management 7.1 server on the computer you identified as the *Applications Server* in your deployment. Please refer to Chapter 1 for a review. The SAS Activity-Based Management installation assumes that you either:

- Have all the other servers in your SAS Activity-Based Management deployment installed and properly running *or*
- The other servers in your SAS Activity-Based Management deployment that are not yet installed will be installed on the same computer as your SAS Activity-Based Management Application Server. In other words, you are going to install them now.

Important: *Certain hot fixes may cause problems with the operation of SAS Activity-Based Management. Please contact SAS Technical Support before applying any SAS hot fixes or service packs not explicitly mentioned in this document.*

The following sections guide you through the important SAS Deployment Wizard dialogs for installing SAS Activity-Based Management. Some wizard dialogs may ask for the same information at different points in the installation. This is unavoidable since each of the dialogs is intended for a server, mid-tier, or client computer. If your Plan file installs several components on a single computer, then all the configuration steps for each component are displayed – even if some of the information is redundant.

Installing on UNIX

The SAS Deployment Wizard that is used to install SAS Activity-Based Management is an X window application. If you are installing from a personal computer, you need to set up the display to your personal computer. For example:

```
DISPLAY=<yourcomputer_absolute_address>:0.0
export DISPLAY
```

Interactive Prompting Levels

Shortly after you begin running the SAS Deployment Wizard to interactively install and initially configure SAS, you will be asked to choose between three wizard prompting levels:

- **Express** - displays the minimum number of dialog boxes to complete the configuration
- **Typical** - displays the basic set of dialog boxes to complete the configuration
- **Custom** - displays all the dialog boxes to complete the configuration

The following table lists the configuration options and the prompt level in which they display for SAS Activity-Based Management only. Depending on your configuration, you might see differences for the prompt level in which a particular option displays.

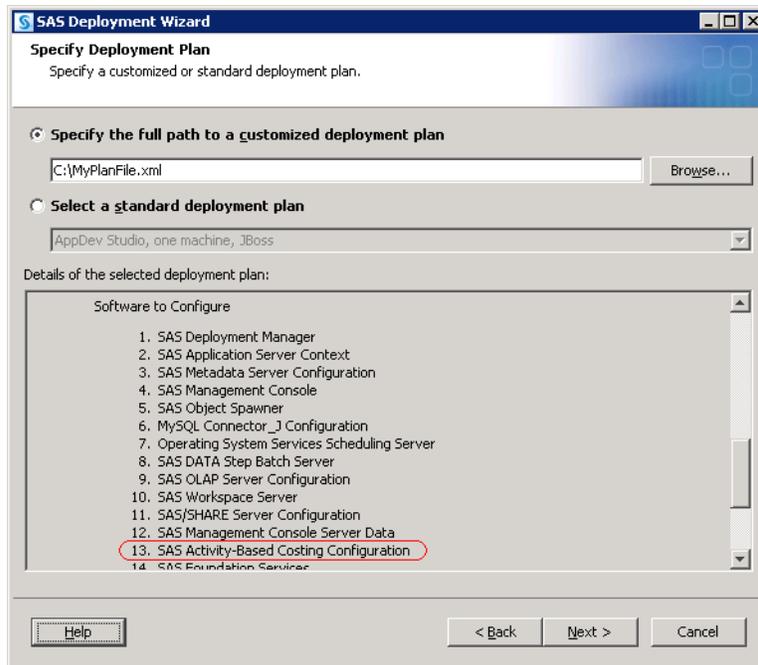
Important: *Your deployment will encounter more configuration options than these. The configuration options you encounter depend on which SAS products are identified in your deployment plan, and when performing multiple computer deployments, on which computer you are installing software.*

Option in the SAS Deployment Wizard	Express	Typical	Custom
OLAP Server Options	X	X	X
Contributions Server Options			X
Workspace Server for Cube and Calculations	X	X	X
Operations Port	X	X	X
Database Options	X	X	X
Database Connectivity and Upgrade Options	X	X	X
JUnit and SAS Environments Options	X	X	X
ODBC and Database Server Options	X	X	X

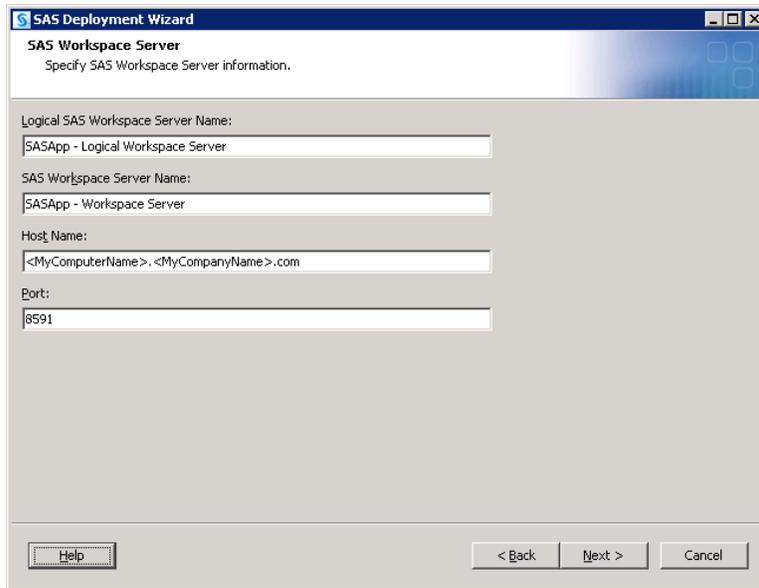
The only SAS Activity-Based Management choice that is not available for the **Express** prompting mode is the option to deploy the Contributions Server. The Contributions option is set to disabled during **Express** and **Typical** installation.

Installing the SAS Activity-Based Management Calculation Server

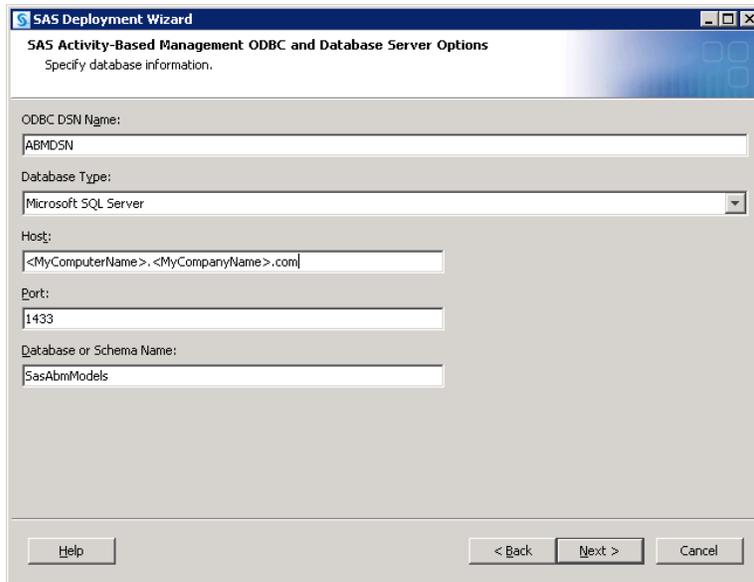
Launch the SAS Deployment Wizard and choose your Plan file. Then choose the computer from your Plan file that will host the *Calculation Server*. Verify the presence of “SAS Activity-Based Costing Configuration” in the *Software to Configure* subsection of the *Details of the selected deployment plan*: list box in the Deployment Wizard. This ensures that the SAS Activity-Based Management calculation process will be configured properly on this computer for use by the SAS Activity-Based Management server.



Before you configure the SAS Activity-Based Management *Calculation Server*, you will configure the Logical Workspace Server that will execute the SAS Activity-Based Management calculation process. The Logical SAS Workspace Server Name you provide is the one you should choose when later prompted when you configure the *Application Server*.



When you reach the *Calculation Server* configuration step, the **SAS Activity-Based Management ODBC and Database Server Options** wizard dialog opens:



ODBC DSN Name: Specifies the Data Source Name (DSN) that the *Calculation Server* uses to connect to the SAS Activity-Based Management relational database you choose. By default, the Deployment Wizard suggests a default name that includes your configuration level name. You may change the name to any legally acceptable name you want. Legal characters for this name are operating system dependent.

Important: *The Calculation Server needs the appropriate ODBC driver installed on it to communicate to the relational database you chose. This driver is operating system dependent. Depending on your deployment, you may have, for example, a Calculation Server on Windows and a Database Server on UNIX. Thus, a specific Windows driver to communicate with the UNIX-based database is needed. These drivers are not supplied by SAS.*

For more information on DSNs, see “Creating Data Sources” in Chapter 8.

Database Type: Specifies the relational database you want to use. Choices are: Microsoft SQL Server, Oracle, and MySQL. The available choices are not filtered according to operating system. For example, if you are installing on UNIX, then Microsoft SQL Server is still available in the list even though it is not a legitimate choice. Please refer to *SAS Activity-Based Management 7.1 System Requirements* for supported deployment options and specific version requirements.

Host: Specifies the fully-qualified name of the computer where your database is hosted.

Port: Specifies the port number your database is configured to communicate on. See “Designating Ports” in Chapter 4 for more information.

Database or Schema Name: This is the database name inside your relational database. For SQL Server it is the database name; for Oracle it is the global database name; for MySQL it is the schema name. SAS recommends the name **sasabmmodels**. You should enter the name you recorded when you set up your database.

These are the only Deployment Wizard configuration options that are specific to the SAS Activity-Based Management *Calculation Server*.

Installing the SAS Activity-Based Management Application Server

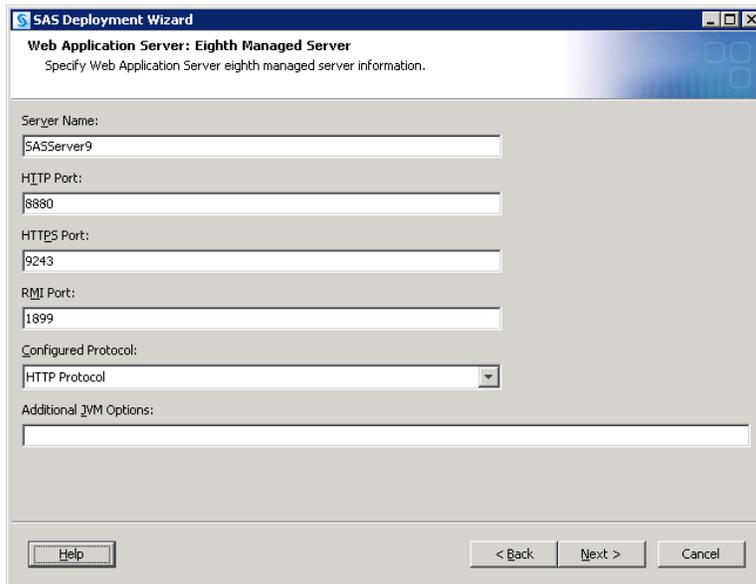
If necessary, launch the SAS Deployment Wizard and choose your Plan file. Then choose the computer from your plan file that will host the *Application Server*. Verify the presence of “SAS Activity-Based Management Mid-Tier” in the *Software to Configure* subsection of the *Details of the selected deployment plan*: list box.



Many deployment wizard dialogs will open as you proceed through the installation process. When you reach the portion of the wizard where you configure the application server, there will be as few as zero to as many as seven application servers to configure before you reach the **Web Application Server: Eighth Managed Server** dialog page. The actual number you encounter depends on how many products you are installing with your Plan file.

If you did not select **Multiple Managed Servers** on the **Web Application Server: Multiple Managed Server** dialog, then all the applications that need a web application server on this computer will share a single instance. In this case, this wizard dialog will be named **Web Application Server: Managed Server**.

The **Eighth Managed Server** dialog page is the application server for SAS Activity-Based Management.



The screenshot shows a window titled "SAS Deployment Wizard" with a sub-header "Web Application Server: Eighth Managed Server". Below the sub-header is the instruction "Specify Web Application Server eighth managed server information." The dialog contains several input fields: "Server Name:" with the value "SASServer9"; "HTTP Port:" with the value "8880"; "HTTPS Port:" with the value "9243"; "RMI Port:" with the value "1899"; and "Configured Protocol:" with a dropdown menu set to "HTTP Protocol". There is also an empty "Additional JVM Options:" field. At the bottom, there are three buttons: "Help", "< Back", and "Next >" (disabled), and a "Cancel" button.

Server Name: Specifies the server name that will appear when this instance of the web application server runs. If you are installing on Windows and selected **Run as Windows Services** on the Windows Options dialog, the service name appears in the Windows **Services** dialog as:

- "JBoss - <MyName>" for JBoss web application server
- "Oracle WebLogic NodeManager - <MyName>" for WebLogic web application server
- "IBM WebSphere Application Server V7 - <MyName>" for WebSphere web application server. IBM WebSphere may also create additional services depending on which options you chose during its installation.

The default value for <MyName> is **SASServer9** if you are configuring **Multiple Managed Servers**. If you are not configuring **Multiple Managed Servers**, the name defaults to **SASServer1**.

HTTP Port: Specifies the port for the web application server to use for HTTP communication.

HTTPS Port: Specifies the port for the web application server to use for HTTPS communication. If you do not configure the web application server to use HTTPS secure communication, this port is unused by SAS Activity-Based Management. If you are interested in using an HTTPS connection, please refer to your web application server documentation for configuring HTTPS with a certified certificate for your site.

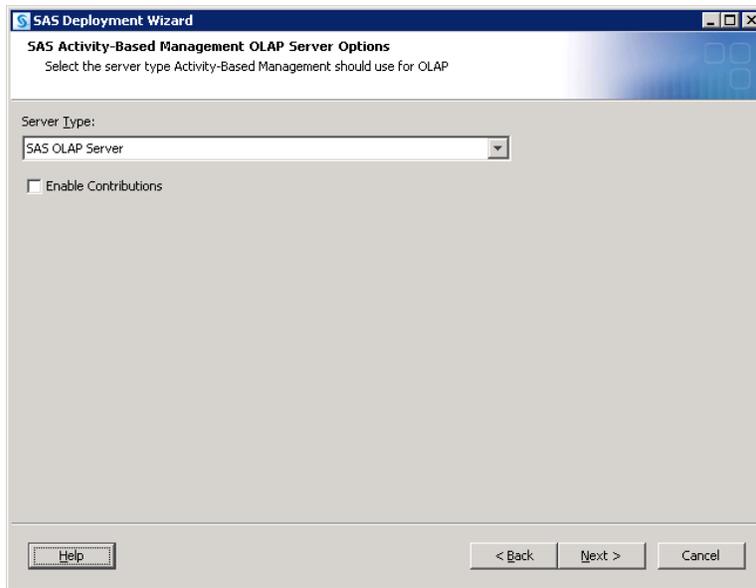
RMI Port: Specifies the port to use for Java-based RMI communication. This option is unused by SAS Activity-Based Management.

Configured Protocol: Specifies which protocol to use when client applications attach. Choices are **HTTP Protocol** or **HTTPS Protocol**. If you chose **Express** or **Typical** prompting modes this option is not displayed and is set to **HTTP Protocol**.

Additional JVM Options: Specifies any additional parameters you want to pass to the Java Virtual Machine the runs inside this web application server. See your web application server documentation for more information. No additional parameters are passed by default. If you chose **Express** or **Typical** prompting modes this option is not displayed and provides no additional JVM parameters.

Important: *If you did not select **Multiple Managed Servers on the Web Application Server: Multiple Managed Server** dialog, then all applications that share this web application server instance also share these settings. So, although SAS Activity-Based Management may not use, for example, the **RMI Port** option other applications may.*

When you reach the *Application Server* configuration step, the **SAS Activity-Based Management OLAP Server Options** wizard dialog opens:



Server Type: Specifies the OLAP server you want to use. This choice is operating system dependent. Your choices are: SAS OLAP Server and Microsoft SQL Server Analysis Services. Please refer to *SAS Activity-Based Management 7.1 System Requirements* for specific limitations and version requirements. You can choose SAS OLAP Server for use with any database supported by SAS Activity-Based Management. Microsoft SQL Server Analysis Services is only supported for Microsoft SQL Server and Oracle databases. MySQL is not supported and will not operate properly.

Enable Contributions: Specifies whether to configure the SAS Activity-Based Management Contributions functionality. By default, this option is “off.” If you chose **Express** or **Typical** prompting modes this option is not displayed and is “off.”

The next wizard dialog conditionally displays. It is the **SAS Activity-Based Management: Microsoft SQL Server Analysis Services** dialog:

The screenshot shows a window titled "SAS Deployment Wizard" with a subtitle "SAS Activity-Based Management: Microsoft SQL Server Anal...". Below the subtitle is the instruction "Specify the details of the SQL Server Analysis Services installation." The dialog contains several input fields: "Host:" with a text box containing "[MyComputerName]. <MyCompanyName>.com \<InstanceName>"; "User ID:" with a text box containing "<MyDomain>\<UserName>"; "Password:" with a masked text box containing "*****"; "Confirm password:" with a masked text box containing "*****"; and "Authentication Domain:" with a text box containing "DefaultAuth". At the bottom, there are three buttons: "Help", "< Back", "Next >", and "Cancel".

This page only displays if you chose Microsoft SQL Server Analysis Services on the **SAS Activity-Based Management OLAP Server Options** dialog

Host: Specifies the fully qualified name of the computer hosting SQL Server Analysis Services. If you defined a Default Instance, the \<InstanceName> qualifier should be omitted. Otherwise, specify the instance name.

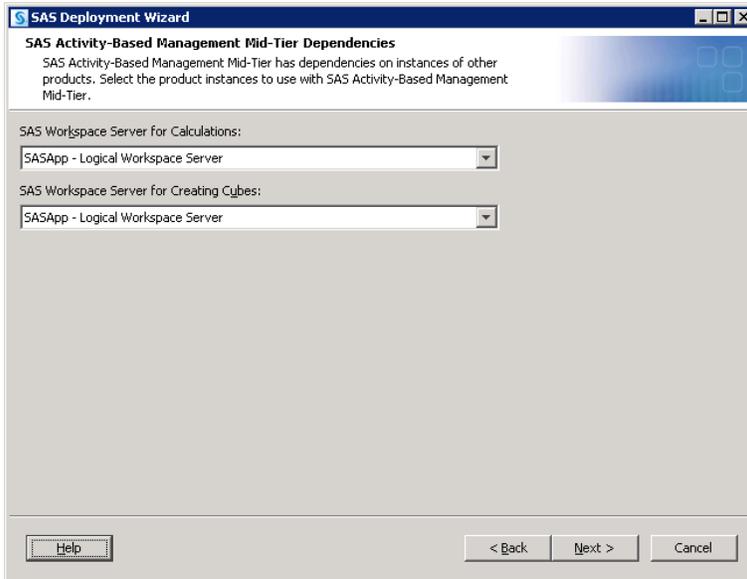
User ID: Specifies a domain account ID that has sufficient privileges to create, delete, and change permissions on cubes. If your deployment has the Microsoft SQL Server Analysis Services installed on the same computer as the SAS Activity-Based Management **Application Server**, then this can be a local user. If you specify a local user, then <MyDomain> is replaced by the short computer name. The cube creation process on Microsoft SQL Server Analysis Services will run as this user.

Password: Specifies the Analysis Services user's password.

Confirm Password: Verifies the Analysis Services user's password.

Authentication Domain: Specifies which authentication account to use for SAS Activity-Based Management users when creating and updating permissions on SAS Activity-Based Management created cubes.

The next wizard dialog conditionally displays. It is the **SAS Activity-Based Management Mid-Tier Dependencies** dialog:

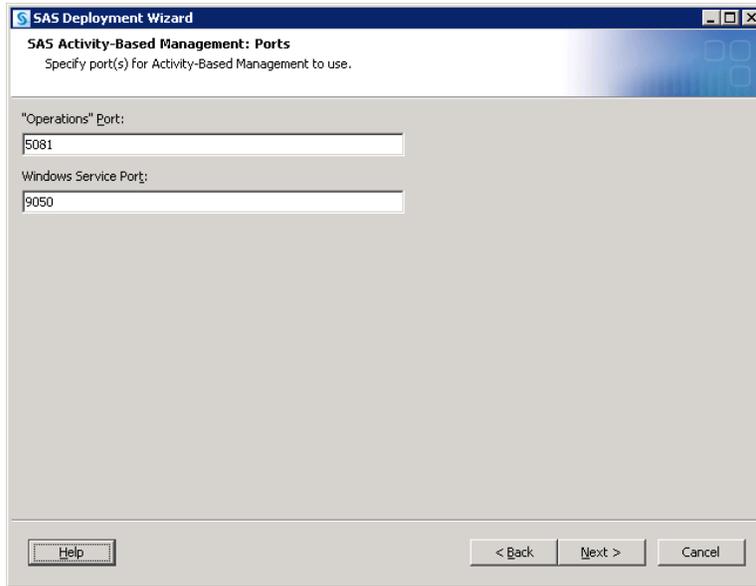


This page only displays if you have already installed, configured, and have running an operational SAS Metadata server. It queries the Metadata server to discover other Logical Workspace Servers that have been deployed. For example, this allows SAS Activity-Based Management to launch a calculation process on another computer. If you do not have an operational SAS Metadata server, then the choices offered by this wizard page are not needed because there are no other Logical Workspace Servers. Hence, this (these) process(es) run on the current computer.

SAS Workspace Server for Calculations: Specifies which Logical Workspace Server to use for executing the SAS Activity-Based Management calculations.

SAS Workspace Server for Creating Cubes: This option conditionally displays if you chose **SAS OLAP Server** on the **SAS Activity-Based Management OLAP Server Options** page. It specifies which Logical Workspace Server to use to running the SAS Activity-Based Management SAS OLAP cube building processes.

The next configuration step is the **SAS Activity-Based Management: Ports** wizard page:

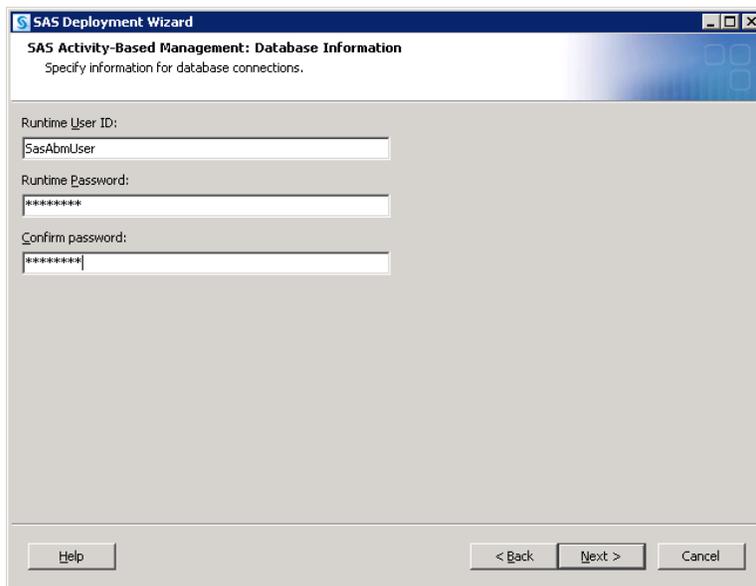


The screenshot shows the 'SAS Activity-Based Management: Ports' page of the SAS Deployment Wizard. The window title is 'SAS Deployment Wizard'. The page title is 'SAS Activity-Based Management: Ports' with the instruction 'Specify port(s) for Activity-Based Management to use.' There are two input fields: 'Operations Port:' with the value '5081' and 'Windows Service Port:' with the value '9050'. At the bottom, there are buttons for 'Help', '< Back', 'Next >', and 'Cancel'.

“Operations” Port: Specifies the port used by the SAS Activity-Based Management mid-tier to communicate with all SAS Activity-Based Management “operations”. These are long running processes such as importing model data, creating a report, or performing a model calculation.

Windows Service Port: This option conditionally displays if you chose Microsoft SQL Server Analysis Services on the **SAS Activity-Based Management OLAP Server Options** dialog. This option is used by the SAS Activity-Based Management mid-tier to communicate with the OLAP cube creation processes. It is *not* used to communicate with Microsoft SQL Server Analysis Services directly.

The next configuration step is the **SAS Activity-Based Management: Database Information** wizard dialog (part 1):



The screenshot shows the 'SAS Activity-Based Management: Database Information' page of the SAS Deployment Wizard. The window title is 'SAS Deployment Wizard'. The page title is 'SAS Activity-Based Management: Database Information' with the instruction 'Specify information for database connections.' There are three input fields: 'Runtime User ID:' with the value 'SasAbmUser', 'Runtime Password:' with '*****', and 'Confirm password:' with '*****'. At the bottom, there are buttons for 'Help', '< Back', 'Next >', and 'Cancel'.

Runtime User ID: Specifies the database login account for the SAS Activity-Based Management software to use when accessing the database. This is the database login name from your existing

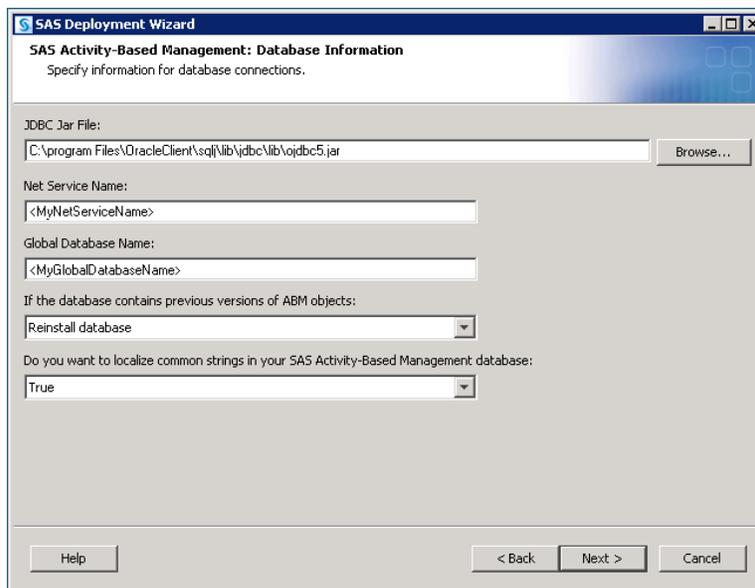
SAS Activity-Based Management database or the database login from your new database installation.

Runtime Password: Specifies the database user’s password.

Confirm Password: A password entry text box to verify the password in the **Runtime Password** option.

Important: *The databases were installed and configured in Chapter 5. The database and user information you provide is necessary for configuration to complete successfully. This information is used to attach to the database and create initial tables or to update the existing tables to the latest schema. If this information is incorrect, this process will not successfully complete.*

The next configuration step is the **SAS Activity-Based Management: Database Information** wizard dialog (part 2):



JDBC Jar File: Specifies the location of the JDBC driver’s jar file for the database you have selected. This JDBC driver is used by the SAS Activity-Based Management mid-tier to communicate with the database. For Microsoft SQL Server and Oracle databases, this is the jar file you installed in Appendix A and Appendix B, respectively. For a MySQL database, this is the jar file for the MySQL Connector/J you installed in Appendix C.

Net Service Name: This option conditionally displays if you are using an Oracle database and you have chosen to use Microsoft SQL Server Analysis Services for OLAP. Specifies the Net Service Name you have designated in your Oracle database for SAS Activity-Based Management. You created this Net Service in Appendix B.

Global Database Name: This option conditionally displays if you are using an Oracle database. Specifies the Global Database Name you have designated in your Oracle database for SAS Activity-Based Management. You created this Net Service in Appendix B.

If the database contains previous...: Specifies the action to perform if the database you have provided already contains SAS Activity-Based Management models. The two choices are:

- Upgrade existing database

- Reinstall database

The selection “Upgrade existing database” will examine the version number of SAS Activity-Based Management schema in your database and will perform the necessary steps to update it to SAS Activity-Based Management 7.1 format. This option is valid for any SAS Activity-Based Management version 6.x (i.e. 6.0 through 6.4). If the existing schema is up to date, no action will be taken.

The selection “Reinstall database” will erase the contents of the existing database and re-creates a new, empty database. This selection will destroy all existing data. This selection resets the database to a new state as though there was no previous SAS Activity-Based Management data present. No further warnings will be given when the database contents are erased.

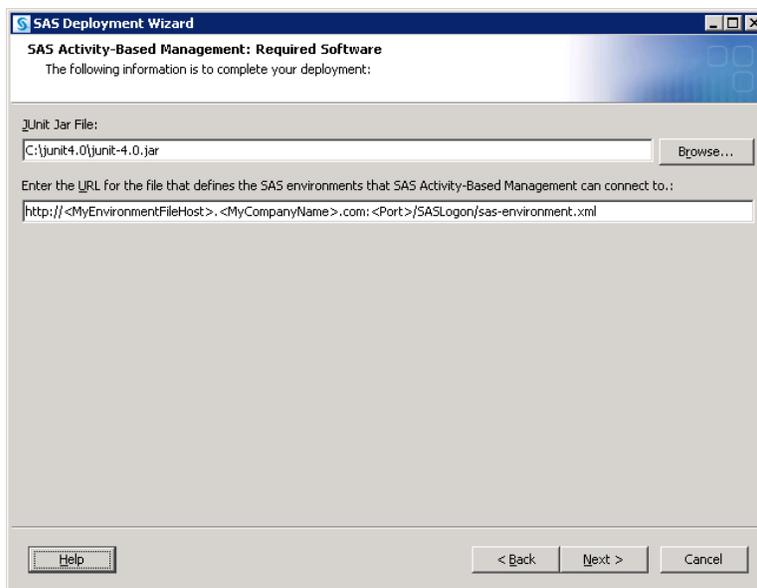
Warning: *This selection will destroy existing data in your database. Once this choice is made and the wizard proceeds to the next steps, no additional warnings or confirmations will appear.*

See Chapter 8 – SAS Activity-Based Management Migration Utility for more information.

Do you want to localize...: Specifies whether to localize the names of objects in the SAS Activity-Based Management database. If you select “True” the objects names in the database will be localized using the locale setting of your SAS Metadata server. If you select “False” the database object names will remain in English.

Warning: *If you are upgrading from a previous version of SAS Activity-Based Management and you selected the option “Upgrade existing database”, then you should make the same choice here that you made when installing the previous version of SAS Activity-Based Management. If you don’t make the same choice, then Saved OLAP Views may not operate properly in SAS Activity-Based Management 7.1. This happens because the saved OLAP Views included localized names in portions of their content.*

The next configuration step is the **SAS Activity-Based Management: Required Software** wizard dialog:



JUnit Jar File: Specifies the jar file used by the SAS Activity-Based Management Diagnostics application.

Enter the URL for the file...: Specifies the SAS environments file to use for the SAS Activity-Based Management Diagnostics application. The Diagnostics application uses the environments file to locate other computers in your SAS installation. The sas-environment.xml file is located on the computer where the SAS Web Infrastructure Platform (WIP) was installed. This is typically your SAS Metadata Server. The port number specifies the port the web application server is configured to use. See “Designating Ports” in Chapter 4 for more the default port values for the supported web application servers.

Errors

If any errors are found during configuration you have the opportunity to fix them and **Retry** the operation before continuing.

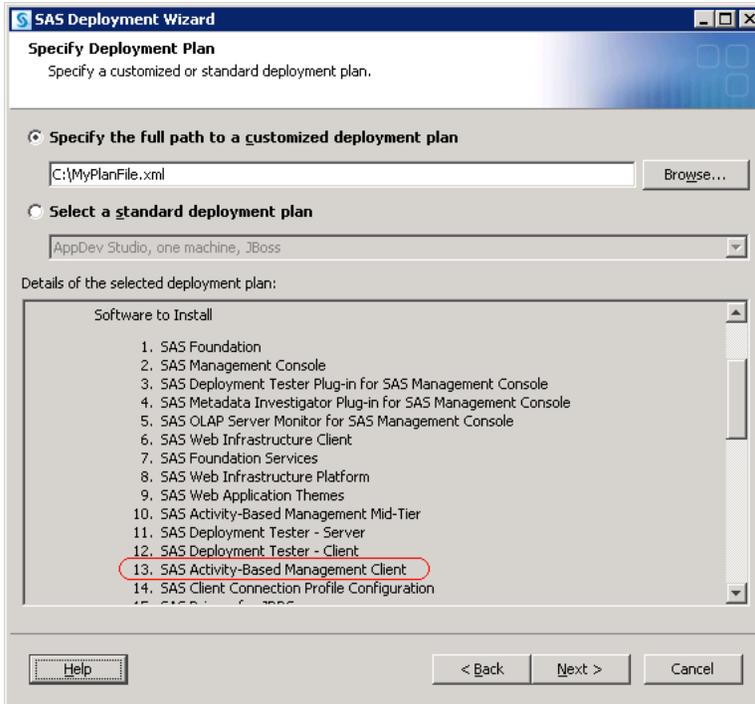
You can see the context of the error by examining the **Deployment in Progress** status dialog. Each successfully installed/configured item will have a green check mark next to it. If any error dialogs are displayed during the installation or configuration process, click the link in the dialog to view the log file. Examine the log file for errors by searching for the word “error”. The most recent errors or warnings appear at the end of the log file. Examine each error for meaningful content. The most common error during SAS Activity-Based Management configuration is a failure to attach to your database or the **sasabmmodels** database/schema within. If this problem occurs, log into your database management console and verify the database user, the **sasabmmodels** database/schema and its permissions. Then click **Retry** on the error dialog.

You must resolve any errors before continuing. Failure to do so will result in either an incomplete installation or an incomplete configuration.

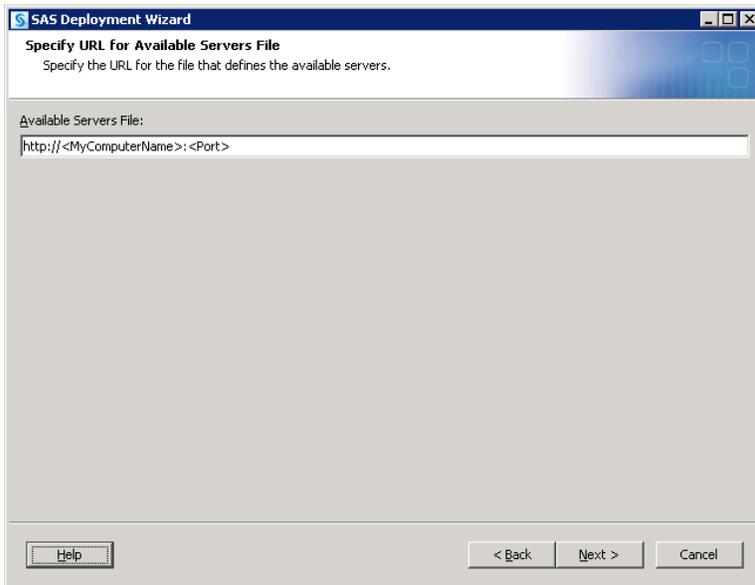
Installing the SAS Activity-Based Management Client

Note: *As with all SAS client products, the SAS Activity-Based Management client will automatically be installed with SAS/SECURE. However, since the SAS Activity-Based Management client uses HTTP or HTTPS communication with the server, it does not need SAS/SECURE, so you may choose to not install it. However, if you are using other SAS client products, such as the SAS Management Console, you should install it.*

If necessary, launch the SAS Deployment Wizard, and choose your Plan file. Then choose the computer from your plan file that will host your client applications. Verify the presence of “SAS Activity-Based Management Client” in the *Software to Install* subsection of the *Details of the selected deployment plan*: list box.



Depending on the other software you are installing on your client computers, many wizard dialogs will open. For the SAS Activity-Based Management client, the only configuration step that is important is the **Specify URL for Available Servers File** wizard dialog:



Available Servers File: Specifies the SAS environments file used by the SAS Activity-Based Management client application (and any other SAS clients that you install on this computer). The client application uses the environments file to locate other computers in your SAS installation. For most installations, <MyComputerName> is the computer that hosts your metadata server and the default port is dependent on the web application server you are using:

- JBoss EAP : 8080
- Oracle WebLogic : 7001
- IBM WebSphere : 9080

Chapter 8 – Post-Installation

After installation and configuration, these post-installation steps verify the folder permissions, add SAS Activity-Based Management users, and test the installation. Make sure you have restarted all the server computers before you begin.

Validating the Installation

After completing your installation, you should review and follow the steps in the *instructions.html* file that was automatically generated as part of your installation. A link to this file is provided on the last page of the SAS Deployment Wizard.

Several of the steps in the *instructions.html* file refer to the detailed instructions provided in this chapter. You may skip ahead to the necessary sections in this chapter to complete those steps, if necessary.

Allocating Memory for the Java Virtual Machine

When SAS Activity-Based Management is configured, a default amount of memory is reserved for the Java Virtual Machine (JVM) for use by SAS Activity-Based Management “operations”. If this setting is too large, the JVM might consume more RAM than necessary (and hence reduce the amount of memory available for other tasks on that computer) and if it is too small some SAS Activity-Based Management tasks may fail due to lack of memory.

In particular, importing large models via XML or staging tables may fail due to insufficient heap space. These problems can be resolved by increasing the heap size used by SAS Activity-Based Management “operations” on the *Application Server*. The option is in the “OperationConfig.properties” file located in the

<CONFIGHOME>\Applications\SASActivityBasedManagement7.1\config directory. You need to specify a larger `Xmx` value in the line “OutOfProcessJavaOptions=-server|-Xms256m|-Xmx1024m”. SAS suggests trying a value of 2048 for `Xmx` if you are on a 64 bit operating system and a value of 1500 if you are on a 32 bit operating system. Larger values may be needed for very large models.

Many SAS Activity-Based Management installations will not need to change `Xmx`. Users of small- and medium-sized models (fewer than 25,000 accounts and 100,000 assignments) should find the default value sufficient.

Managing External Users

Depending on your deployment choices you may have two, and perhaps three, places to manage SAS Activity-Based Management users and their permissions:

- the internal users in the SAS Activity-Based Management User’s group in the SAS Metadata Server
- the “published reports” directory
- the “SAS OLAP server” cube directory (if using SAS OLAP Server)

You can manage access in two ways. You can simply add and remove individual users to these locations or you can create operating system groups. Provide those groups required privileges to the correct locations and add users to those groups. If you create domain, or network groups, you

can manage users from a single location. If you have many SAS Activity-Based Management users, managing them individually may become problematic and error prone. For example, if a new user is not granted appropriate privileges on the “published reports” directory, then he/she will receive an error when trying to view a report. These types of access control problems can be difficult to diagnose in complex deployments.

This document provides instructions for managing users as individually. If you want to manage users via groups, the process is similar except you first create a group for each unique access criteria. Then perform the same steps with the group.

Creating Data Source Names (DSNs)

SAS Activity-Based Management uses a DSN on the *Calculation Server* so the calculation engine can locate your SAS Activity-Based Management database.

Important: *Windows distinguishes between 32 bit ODBC drivers and 64 bit ODBC drivers. Windows also distinguishes between 32 bit DSNs and 64 bit DSNs which use ODBC drivers. 32 bit DSNs can only use 32 bit ODBC drivers and 64 bit DSNs can only use 64 bit ODBC drivers.*

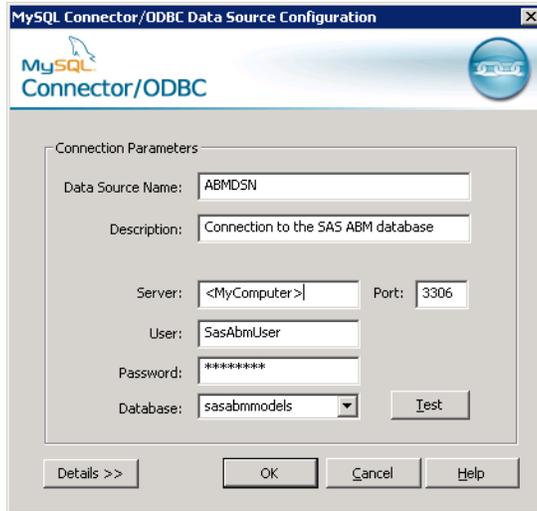
32 Bit Windows

Microsoft SQL Server

1. Open **Administrative Tools**→**Data Sources** in the **Control Panel**.
2. Select the **System DSN** tab. If a DSN exists with the data source name you entered in the SAS Deployment Wizard, delete it by selecting the DSN name in the list and choosing **Remove**. Now create a new DSN by selecting the **Add...** button.
3. Select the driver name that is appropriate for your database from the list box. For Microsoft SQL Server choose **SQL Native Client** (if you are using SQL Server 2005), or **SQL Server Native Client 10.0** (if you are using SQL Server 2008). Select **Finish** to create the connection.
4. Enter the data source name you entered in the SAS Deployment Wizard in the **Name** field. Enter a description of this data source into the **Description** field. SAS suggests “Connection to the SAS ABM database”. Select the computer, instance name, and port hosting your database from the **Which SQL Server do you want...** list. The name is typically entered as <ComputerName>, <Port>. If you are attaching to a Named Instance of SQL Server, you do not need to specify the instance name. Since each instance of SQL Server on a computer must be mapped to a unique port, the computer name and port number are sufficient to fully specify which instance of SQL Server to connect to. Select **Next**.
5. Choose **SQL Server Authentication** and enter the database username and password you provided to the SAS Deployment Wizard for accessing the SAS Activity-Based Management database. Select **Next**.
6. Accept the default values for the next wizard dialog and select **Next**.
7. Accept the default values for the last wizard dialog and select **Finish**.
8. Select **Test Data Source** to verify connectivity. Click **OK** when the connection is verified. Click **OK** to complete creation of the DSN.

MySQL

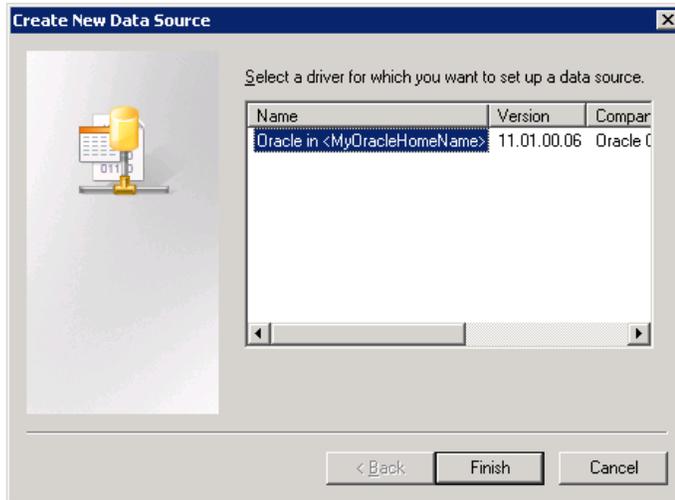
1. Open the **Control Panel**. Open **Administrative Tools**→**Data Sources**.
2. Select the **System DSN** tab. If a DSN exists with the data source name you entered in the SAS Deployment Wizard, edit it by selecting the DSN name in the list and choosing **Configure**. If an appropriately named DSN does not already exist, create a new one by selecting the **Add...** button.
3. Select the driver name that is appropriate for your database from the list box. For MySQL choose **MySQL ODBC 5.1 Driver**. Select **Finish** to create the connection.
4. The **MySQL Connector/ODBC** dialog displays.



5. Enter the DSN name you provided the SDW for SAS Activity-Based Management. Enter a description of this data source into the **Description** field. SAS suggests “Connection to the SAS ABM database”. Enter the **Server** name and **Port** for your database. Enter the **User**, **Password**, and SAS Activity-Based Management models **Database** information as well. Refer to the table you created in Chapter 4 for port information.
6. Select **Test** to verify the information you entered enables a successful connection to the SAS Activity-Based Management database. Click **OK** to complete creation of the DSN.

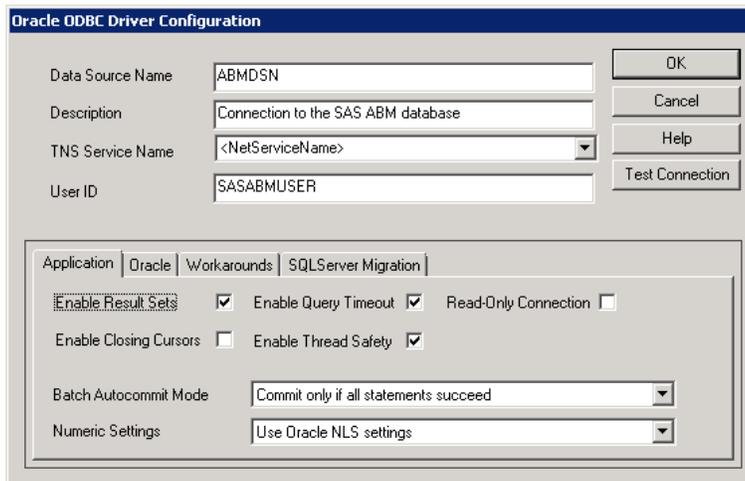
Oracle

1. Open the **Control Panel**. Open **Administrative Tools**→**Data Sources**.
2. Select the **System DSN** tab. If a DSN exists with the data source name you entered in the SAS Deployment Wizard, edit it by selecting the DSN name in the list and choosing **Configure**. If an appropriately named DSN does not already exist, create a new one by selecting the **Add...** button.
3. Select the driver name that is appropriate for your database from the list box. For Oracle choose **Oracle in <MyOracleHomeName>** where <MyOracleHomeName> is the home name you provided when you installed the Oracle database. Select **Finish** to create the connection.



4. The **Oracle ODBC Driver Connection** dialog displays. Enter the **Data Source Name** you supplied to the SAS Deployment Wizard. Enter a description of this data source into the **Description** field. SAS suggests “Connection to the SAS ABM database”. Enter the Net Service Name you created as detailed in the section “Oracle Net Configuration” in Appendix B. Enter the SAS Activity-Based Management user/schema you created as part of your Oracle database installation into the **User ID** field. Refer to the table you created in Chapter 4 for more information. Click **Test Connection** to verify the configuration. Click **OK** when complete.

Important: *The Data Source Name you use must match the Net Service Name. This is necessary because the SAS Activity-Based Management calculation engine uses both database connection mechanisms to load data into the Oracle database. It assumes the Net Service Name is the same as the DSN name.*



64 Bit Windows

The steps to create a DSN on a 64 bit Windows computer are identical to those on a 32 bit Windows computer. Please follow the instructions in the previous section.

You also need a 32 bit DSN that attaches to the same data source if you want to use Base SAS to persist the query results from the SAS Activity-Based Management Contributions viewer. The 32 bit DSN functionality is hidden in 64 bit Windows by default. You can launch it by typing

<WindowsDir>\SysWOW64\odbcad32.exe into the **Start→Run...** command box. Follow the same steps listed above to create the 32 bit DSN.

UNIX

See your operating system instruction manual for exact steps. For reference, SAS provides a document for general use of ODBC connections with SAS. It is available at <http://support.sas.com/techsup/technote/ts685.pdf>.

For Solaris users, help is available on Oracle's website at <http://developers.sun.com/asp/howto/createdsn.html>.

Important: *If you use the DataDirect ODBC drivers, make sure you set EnableNcharSupport to 1 when creating the DSN for Oracle on UNIX. SAS has not validated the DataDirect ODBC drivers on Windows for Oracle, so it is unknown if this option applies there as well.*

Persisting Results from the Contributions Viewer

SAS Activity-Based Management has an optionally installable feature referred to as the Contributions Viewer. This option is installed if you selected the **Enable Contributions** checkbox during installation. If you did not select this option or if you do not plan on using Base SAS to persist Contributions results, you may skip to the next section.

In order to persist Contributions results, the SAS Activity-Based Management calculation engine on the *Calculation Server* must be able to invoke, or call into, the Contributions program code. To enable this, you must perform these two steps:

1. Copy the five Java files "sas.solutions.abm.contributions.jar", and "sas.solutions.abm.contributions.nls.jar", "commons-logging.jar", "sas antlr.jar", and "log4j.jar", which can be found on the *Application Server*, into a suitable directory on the *Calculation Server*.
2. Add these five files onto the end of your existing, if any, Java CLASSPATH using the wildcard syntax "*".

Windows:

- a) Open the System dialog box via **Start→Control Panel→System**.
- b) Open the **Advanced Tab** and click **Environment Variables**.
- c) Under **System Variables**, highlight **CLASSPATH** and click **Edit**. If **CLASSPATH** does not exist, click **New**. Enter the path to the directory you place the .jar files with a "*" appended at the end. If you placed the .jar files in the directory C:\SAS\ABM, then enter the path as C:\SAS\ABM*. If there is existing path information in the **CLASSPATH**, append a semicolon to the end before adding your path.
- d) Click **OK** for each of the windows opened.

UNIX:

The following commands set the PATH environment variable on UNIX. These statements can be added to the .profile file of the user that is running the installation. Alternatively this can be added to a common profile accessed by the user's profile.

For example, if you placed the .jar files in the directory /SAS/ABM, then enter the path as /SAS/ABM/* when executing the following commands:

```
CLASSPATH=$CLASSPATH:/SAS/ABM/*
export CLASSPATH
```

Note: SAS has found that the “wildcard” syntax for specifying files on the Java `CLASSPATH` doesn’t work on all systems. If it doesn’t work on yours, you can specify the files individually separated by a semicolon on Windows systems or by a colon on UNIX systems.

Finally, in order to persist the Contributions results via Base SAS, a 32 bit DSN named **ABMDSN** must be defined. This value cannot be changed. If you have already defined another DSN for used by the SAS Activity-Based Management *Application Server* whose name differs, SAS recommends that you create a duplicate one with the **ABMDSN** name.

Setting the Locale of the Calculation Server

SAS 9.2 has a defect in several international locales that directly impacts SAS Activity-Based Management 7.1. This defect causes the “decimal” separator in numbers to be handled improperly. For example, in some locales a number with the value of one hundred and two-tenths might be written as “100,2” or possibly as “100 2”. In the locales affected by this defect, this number is interpreted as one thousand and two. Not all locales that use a comma or non-breaking space as a decimal separator have this defect. This defect causes gross numerical errors in the calculation results. You can work around this error by changing the working locale of the workspace server that launches the SAS Activity-Based Management calculation process to U.S. English, which is not affected. The locales that are known to have this defect are: Swedish, Brazilian-Portuguese, and possibly French. The locales that do **not** have this defect are: U.S. English, Simplified Chinese, Traditional Chinese, Japanese, Korean, and German.

If your locale is not affected, you may skip the rest of this section. If your locale is affected or if you are not sure, you can perform the following steps to change the locale of the workspace server on your *Calculation Server* to U.S. English on both Windows and UNIX computers.

1. Locate the “WorkspaceServer_usermods” file on your *Calculation Server*. This file has a `.bat` extension on Windows computers and a `.sh` extension on UNIX computers. This file can be found in `<CONFIGHOME>\SASApp\WorkspaceServer`.
2. By default this file will have the following entry, “Set USERMODS_OPTIONS=” without any options defined. Add the U.S. English locale to this workspace server by appending “/LOCALE en_US” to the end of the line so it reads “Set USERMODS_OPTIONS=/LOCALE en_US”
3. Save your changes to the “WorkspaceServer_usermods” file.
4. Finally, you need to restart the Object Spawner on the *Calculation Server* so the changes you just made can take effect.
 - a. If your *Calculation Server* is UNIX-based or if it is Windows-based and you chose not to run the system processes as services, then you should restart the Object Spawner process. You can do this by running these scripts :

```
Windows: <CONFIGHOME>\ObjectSpawner\ObjectSpawner.bat -restart
UNIX:    <CONFIGHOME>/ObjectSpawner/ObjectSpawner.sh -restart
```
 - b. If your *Calculation Server* is Windows-based and the systems processes are running as services, then you need to restart the SAS workspace service Object Spawner. The Windows Services dialog is located at: **Control Panel**→**Administrative**

Tools→**Services**. Select the service named "SAS [Config-Lev1] Object Spawner", click the right mouse button and select **Restart**.

The Oracle Bulk Data Loader

This section applies to installations using the Oracle database. Other database users may skip this section.

The *Calculation Server* uses the Oracle bulk data loader to improve performance when loading and saving data from an Oracle database. Two changes are needed for the *Calculation Server* to properly access the Oracle bulk data loader:

1. The Oracle bulk data loader, named **sqlldr.exe** on Windows systems and **sqlldr** on UNIX systems, must be in the PATH environment so the SAS Activity-Based Management calculation process can properly invoke it.
2. Additionally, the Oracle bulk data loader needs a "scratch pad" directory to write its temporary files. To do this, perform the following steps:
 - a. You need to allow shell/script commands to be issued as part of the SAS Workspace Server initialization. Edit the ObjectSpawner file below and add `-allowxcmd` option to the end of the startup command.

Windows:

```
<CONFIGHOME>\ObjectSpawner\ObjectSpawner.bat
```

There are two locations to perform the edits: Shortly after the **:start** and **:restart** labels. There are two lines that contain the **sassvcstart.exe** command within these labels. Add the `-allowxcmd` option to the end of the two lines in the above file.

UNIX:

```
<CONFIGHOME>/ObjectSpawner/ObjectSpawner.sh
```

There is one location to perform the edit: Shortly after the **start2_tag** label. There is a line that begins with `nohup $COMMAND`. Add the `-allowxcmd` option immediately before the first redirection command, `'>'` in that line. The text `$CONFIGDIR/logconfig.xml` typically appears right before the proper redirection command in the above file.

- b. Add the following code to the "appserver_autoexec_usermods.sas" file located at `<CONFIGHOME>\SASApp` on Windows or `<CONFIGHOME>/SASApp` on UNIX. Replace the reference to `<MYTEMPDIR>` with a directory on your computer that has adequate temporary disk storage for the Oracle temporary files. Note that on Windows, the `cd` command can only change directories; it cannot also change the disk drive. If you need to change to the D: disk drive, for example, you will need to add a separate system call using `call system ('D:');`

Windows:

```
/* don't wait for exit command */
option NOXWAIT;

/* Change working directory */
data _null_;
    /* replace <MYTEMPDIR> with new working directory */
```

```

    call system ('cd <MYTEMPDIR>');
run;

```

UNIX:

```

/* Change working directory */
data _null_;
    /* replace <MYTEMPDIR> with new working directory */
    call system ('cd <MYTEMPDIR>');
run;

```

Restart the Object Spawner as outlined in the previous section in Step 4.

Additional Configuration Steps for Web Application Servers

WebSphere 6.1

After installing WebSphere 6.1 in Chapter 5, you now must complete the configuration of the SAS Activity-Based Management to use the IBM Client for Java Messaging Service (JMS).

1. On the *Application Server*, modify the file “OperationConfig.properties” to include the full path to the JMS client jars, `sibc.jms.jar` and `sibc.jndi.jar`. The “OperationConfig.properties” file is located at `<CONFIGHOME>\Applications\SASActivityBasedManagement7.1\config\` on Windows and at `<CONFIGHOME>/Applications/SASActivityBasedManagement7.1/config/` on UNIX. The path to the JMS jars is specified by modifying the value for the `-Dsas.app.class.path` property within the value of the main property `OutOfProcessJavaOptions`. The entries can be appended to the existing JDBC jar path entry using either ‘;’ or ‘:’ depending on whether your *Application Server* is a Windows or UNIX computer, respectively. Note that for both Windows and UNIX the directory paths use a forward slash, ‘/’, as their separator. For example:

Windows: `-Dsas.app.class.path=
<JDBC_JAR_PATH>;c:/jms/lib/sibc.jms.jar;c:/jms/lib/sibc.jndi.jar`

UNIX: `-Dsas.app.class.path=
<JDBC_JAR_PATH>:/jms/lib/sibc.jms.jar:/jms/lib/sibc.jndi.jar`

Where `<JDBC_JAR_PATH>` is the current value of the `-Dsas.app.class.path` property.

2. Restart the WebSphere 6.1 web application server. See the “Instructions.html” file that was generated as part of your installation for detailed instructions on how to do this. It is located at:

Windows: `<CONFIGHOME>\Documents`

UNIX: `<CONFIGHOME>/Documents`

You may want to delay restarting the web application server if the next section applies to you. That way you only need to restart it once.

Importing and Exporting Model Data

SAS Activity-Based Management can import and export model data from or to any data source for which you have a JDBC driver, ODBC driver, or for which you have a SAS/ACCESS engine.

If you want to use a JDBC driver *and* the database you want to “write data to” or “read data from” is not the same type as your SAS Activity-Based Management database, then you need to configure a JDBC driver for each unique database.

For example, if you are using Microsoft SQL Server for your SAS Activity-Based Management database and you want access data that resides in an Oracle database, then you must configure an Oracle JDBC driver. If your SAS Activity-Based Management database and all the data you need to access are in Microsoft SQL Server, or accessible via SAS/ACCESS, then you may skip the remainder of this section.

To configure SAS Activity-Based Management to access data in an additional database, perform the following steps on your *Application Server*:

1. Obtain a JDBC driver for your data source. The sections entitled “JDBC Driver” in Appendix A, Appendix B, and Appendix C explain how to obtain a suitable driver for SQL Server 2005 & 2008, Oracle 11g, and MySQL 5, respectively. JDBC drivers for other databases can be obtained from the database vendor.
2. Copy the **.jar** file, or files, for the JDBC driver into the JDK “extension” directory. If your *Application Server* is on Windows, the extension directory is located in the `\jre\lib\ext` directory under the JDK installation directory. This is typically located at `C:\Program Files\Java\jdk1.5.0_15\jre\lib\ext`. Other operating systems are similar.
3. Add the JDBC jar name, or names, at the end of the SAS Activity-Based Management configuration file “`sas.abm.outproc.java.ext.config`”. This file is located at `<CONFIGHOME>\Applications\SASActivityBasedManagement7.1\config`. Save the updated `.config` file.
4. Restart the web application server. See the “Instructions.html” file that was generated as part of your installation for detailed instructions on how to do this. It is located at:

Windows: `<CONFIGHOME>\Documents`

UNIX: `<CONFIGHOME>/Documents`

Warning: Do not needlessly copy a JDBC driver that duplicates the one you use for the SAS Activity-Based Management database. Doing so will cause the web application server to load the `.jar` file twice which will result in class loading errors and an inoperable installation.

Microsoft Office

SAS Activity-Based Management supports importing and exporting data from and to Microsoft Office applications if your *Application Server* is on Windows. As noted above, to perform these tasks you need the proper data access drivers. For Microsoft Office, you need the Office ODBC drivers that are compatible with the version of Microsoft Office you are using. Please note that there are 32 bit and 64 bit versions of these drivers, so install the version that is appropriate for your *Application Server*.

The drivers for Office 2007 products are available from Microsoft here:

<http://www.microsoft.com/downloads/details.aspx?familyid=7554f536-8c28-4598-9b72-ef94e038c891&displaylang=en>

The drivers for Office 2010 products are available from Microsoft here:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=C06B8369-60DD-4B64-A44B-84B371EDE16D&displaylang=en>

Additionally, you must ensure that the network path between the *Application Server* where the export runs, and the folder to which you are exporting is visible and has **write** privileges. On some installations it may be necessary to run the SAS Activity-Based Management web application server under a network account (such as <MyDomain>\<UserName>) and then ensure that account name can access the export destination folder.

OLAP Permissions

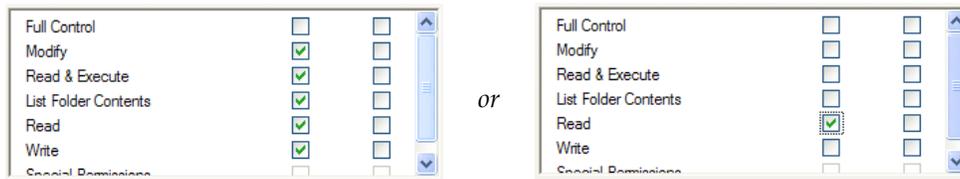
SAS OLAP Server

SAS OLAP Server uses operating system authentication to manage access to cubes. In this respect, SAS manages cubes in the same manner it manages reports. Thus, SAS requires that each user of SAS Activity-Based Management have proper access to the directory where SAS OLAP cubes are created. Any user who wants to create or delete OLAP cubes must have sufficient privileges on that folder and cube file to perform that operation. Any user who wants to view cubes must have **read** privileges on that cube. These access privileges are granted by the host operating system and are not managed by the SAS metadata server.

Tip Using operating system groups can simplify user management.

Windows

1. Open **Windows Explorer** on the SAS Activity-Based Management *OLAP Server* and browse to the directory where SAS OLAP cubes are created at: <CONFIGHOME>\AppData\SASActivityBasedManagement7.1\cubes. Create this directory if it does not already exist.
2. Right-click on the *cubes* directory and select **Properties...**
3. The **cubes Properties** dialog displays. Select the **Security** tab.
4. Make sure each SAS Activity-Based Management user who creates cubes has **Modify**, **Read**, and **Write** access to the directory. When you select **Modify**, the **Read & Execute** and **List Folder Contents** privileges are also selected. Also make sure each SAS Activity-Based Management user who views cubes has **Read** access to the directory.



5. Finally, each user who creates SAS OLAP cubes must have **Log on as a batch job** permission. However, this was already set up in Chapter 4 when you set up the SAS Server Users group.

UNIX

1. Navigate to the directory where SAS OLAP cubes are created on the SAS Activity-Based Management *OLAP Server* at: <CONFIGHOME>/

AppData/SASActivityBasedManagement7.1/cubes. Create this directory if it does not already exist.

2. Make sure each SAS Activity-Based Management user who creates cubes has **Read**, **Write**, and **Execute** access to the directory. Also make sure each SAS Activity-Based Management user who views cubes has **Read** access to the directory
3. Each user who creates SAS OLAP cubes must be part of the SAS Servers Users group. However, this was already set up in Chapter 4 when you set up the SAS Server Users group.
4. Execute the following command to change permission on the directory: `chmod 771 <CONFIGHOME>/AppData/SASActivityBasedManagement7.1/cubes.`
5. Finally, the default security for files created is 755 or lower, so add `umask 771` in the `.sh` file that launches the SAS Workspace Server on your *OLAP Server* so that files created in the `cubes` folder will have the proper permissions.

Microsoft SQL Server Analysis Services

Microsoft SQL Server Analysis Services uses internal mechanisms to manage access to cubes. There are no additional installation or configuration steps to perform to manage permissions.

Microsoft changed the behavior of the SQL Server Analysis Services interface between the SSAS 2005 and SSAS 2008 versions. In order for SAS Activity-Based Management to properly communicate with both versions, it uses a configuration files named “ABMServer.exe.config” and “sas.activitybasedmanagementsvr.service.exe.config” to refer to the proper SSAS interface. If you are using SSAS 2008, the files function properly. If you are using SSAS 2005, you must rename the files so SAS Activity-Based Management will refer to SSAS 2005.

Using SSAS 2005?	Using SSAS 2008?	Need to Rename the Configuration file?
N	Y	N
Y	N	Y

To rename these files, perform the following steps:

1. Open **Windows Explorer** on the SAS Activity-Based Management *Application Server* and browse to the directory
`<SASHOME>\SASActivityBasedManagementServer\7.1\bin.`
2. Locate the two files above and change their extension to `.sav`.

Windows Services

This section explain how to launch your SAS Activity-Based Management service process if you did not select **Run as Windows Services** and are instead launching them manually or using management scripts to run them. This section only applies to Windows installations using Microsoft SQL Server Analysis Services for OLAP.

If you are using Microsoft SQL Server Analysis Services, there is a ABMServer process that marshals communication between the Java-based process on the *Application Server* and the .NET-based processes on the *OLAP Server* (which in this specific case is a Windows computer using Microsoft SQL Server Analysis Services). Since you elected not to run this process as a service, you must run it under a user account. The user that runs the ABMServer process must have

sufficient privileges to impersonate the cube creation user you provided in **SAS Activity-Based Management: Microsoft SQL Server Analysis Services** wizard dialog on your *OLAP Server*. This typically means that the user must be a member of the **Power Users** group on the *Application Server*.

You need to manually restart this process each time you reboot the *Application Server* or whenever you log out of the *Application Server*. To launch the ABMServer process manually:

1. Open **Windows Explorer** on the SAS Activity-Based Management *Application Server* and browse to the folder at: <SASHOME>\SASActivityBasedManagementServer\7.1\bin directory.
2. To launch it, right-click on **ABMServer.exe** and select **Run as...**
3. You can either run it as the **Current user** if the user has sufficient privileges or you may choose **The following user** and specify a user name and password. Click **OK**.
4. Do not log off the computer. If you do, this process will stop running and your SAS Activity-Based Management server will not properly create cubes.

Migrating From SAS Activity-Based Management 6.x

This section explains how to migrate data from previous versions of SAS Activity-Based Management to the current schema in SAS Activity-Based Management 7.1. If you are new to SAS Activity-Based Management, you can skip this section.

Important: *Make sure you have backed up your data before proceeding!*

The SAS Activity-Based Management migration is installed on the SAS Activity-Based Management *Application Server* at

<SASHOME>\SASActivityBasedManagementServer\7.1\bin\dbupgrade.exe, along with the necessary support files and database scripts. In addition to the database update program and its components, the computer that runs the upgrade program also needs:

- the client connectivity tools for your database
- an installed copy of the SAS Metadata Console

It needs these two components to communicate with your database and to connect to the SAS Metadata Server to migrate your SAS Activity-Based Management 6.x users and roles to their new counterparts in the SAS Metadata Server.

Important: *The dbupgrade.exe utility only runs on Windows computers with .NET 2.0 or .NET 3.5 installed. Although it is installed as part of the Application Server, it does not need to run from that server. It may run from any server that can access your SAS Activity-Based Management database. If you need to manually move the dbupgrade.exe to a Windows computer, please contact SAS for more information.*

Database

This upgrade utility automatically updates any version 6.x database to the current version. If you have an SAS Activity-Based Management database that is older than 6.0, please contact SAS Technical Support for help migrating your data.

SAS Activity-Based Management 6.x used two databases whose default names were OEAdmin and OEModels for SQL Server or a single OEModels database for Oracle.

At this point in the installation and configuration process, you have a SQL Server 2005, SQL Server 2008, or Oracle 11g installation that contains your SAS Activity-Based Management data from a previous version.

The database migration utility reads the SAS Activity-Based Management database and performs these actions:

1. Updates the existing 6.x tables to the 7.1 format. It does not change the name or password of your databases.
2. Converts SQL Server installations to use a single database. OEAdmin is no longer needed.
3. Moves all existing SAS Activity-Based Management 6.4 users to the selected metadata server and adds them to the necessary groups so they can continued accessing SAS Activity-Based Management 7.1 functionality as they did in SAS Activity-Based Management 6.4.
4. Moves any existing SAS Activity-Based Management 6.4 roles to the selected metadata server as groups along with the users who are members.

Microsoft SQL Server and Oracle Databases

Specify the target SAS Metadata Server. This is where the user data discussed above will be created. After entering the metadata server connection information, verify the information by selecting the **Connect** button. If an error occurs, verify your connection information and try again.

Machine: Specifies the server name of your metadata server.

Port: Specifies the port number that your metadata server is configured. Port 8561 is the default value.

User: An internal metadata server user with administrative privileges. This user name will be of the form <MyAdminName>@saspw. For example, a typical default internal administrative user is **sasadm@saspw**.

Password: Specifies the administrative user's password.

Repository: Specifies the repository where the new SAS Activity-Based Management user data will be created. Unless there is a specific need, this should be set to Foundation.

AuthDomain: Specifies the authentication domain. The default value is DefaultAuth and is typically used.

Microsoft SQL Server

Type: Specifies the database type. Choose SQL Server.

Machine: Specifies the computer hosting the SQL Server database.

User: Specifies either a SQL Server database user account or a system user's account. If a system user's account is provided, it will typically be a domain user. If the migration utility is run on the same computer as the database is installed, it may be a local account. The user must have the **db_owner** privilege for both the OEAdmin and OEModels databases. This user can be the SQL Server database user you created for the SAS Activity-Based Management application to access the database.

Password: Specifies the database or system user's password.

Log in using my current credentials: If selected, this migration utility will use the account name and password of the current Windows user. When selected, the User and Password entry fields will be disabled.

Admin Database: The name of your SAS Activity-Based Management admin database. This is typically OEAdmin.

Model Database: The name of your SAS Activity-Based Management models database. This is typically OEModels.

Oracle

Type: Specifies the database type. Choose Oracle.

Alias: Specifies the alias to use to connect to the Oracle database. If you are running the SAS Activity-Based Management Database Upgrade Utility on your *Database Server*, then you already created this Net Service (Alias) in Appendix B.

User: Specifies a user (or schema) to connect to the SAS Activity-Based Management database. This user can be the Oracle schema you created for the SAS Activity-Based Management application to access the database. This user must have equivalent access privileges to properly perform its tasks. See “Create the SAS Activity-Based Management User” in Appendix B for more information.

Password: Specifies the password for the provided Alias.

Published Reports

In Chapter 3 you backed up your existing published reports. In SAS Activity-Based Management 6.x the published reports were stored in a directory on the *Application Server*. In SAS Activity-Based Management 7.1 they are still stored on the *Application Server*, but they are now in a different directory. They are now located in:

Windows: <CONFIGHOME>\Applications\SASActivityBasedManagement7.1\publish

UNIX: <CONFIGHOME>/Applications/SASActivityBasedManagement7.1/publish

Please copy the published reports from their backup location into the folder specified above. Also follow the instructions in “Publish Reports Permissions” to properly set access privileges.

Users

The upgrade utility creates three roles and three groups. The three roles correspond to the three capabilities available in SAS Activity-Based Management 6.x. They are:

- Activity-Based Management: Administration
- Activity-Based Management: Create Models
- Activity-Based Management: View Models

These three roles have the equivalent SAS Activity-Based Management 7.1 capabilities added to them. Additionally, three groups are created as well. They are:

- Activity-Based Management Administrators
- Activity-Based Management Modelers
- Activity-Based Management Viewers

The three roles are added to the three corresponding groups as well as each SAS Activity-Based Management 6.x user.

Finally, each of the new groups is added to the group “Activity-Based Management Users”. And the “Activity-Based Management Modelers” group is also added to the “Activity-Based Management Cube Creators” group as well. The last two steps ensure that the migrated users can run SAS Activity-Based Management 7.1 and the users who create cubes will be able to do so. Once SAS Activity-Based Management installation and configuration is complete, the existing 6.x users can continue using 7.1.

Important: *You must also ensure that the external user accounts for these automatically created internal users meet the additional requirements needed for SAS users as detailed in Chapter 4, and also the requirements in the sections “OLAP Permissions” and “Published Reports”*

Permissions” in this chapter. These additional steps ensure that the automatically created users have the proper local computer privileges to perform their SAS Activity-Based Management tasks.

Recalculating Models

SAS Activity-Based Management 7.1 added a new feature which allows users to control the order that accounts appear in the SAS Activity-Based Management client application and in OLAP cubes. However, this new feature requires the presences of additional data in the fact tables.

Of course, the fact tables from previous versions of SAS Activity-Based Management don’t have this required data. So, the *dbupgrade* utility marks the **Calculate Status** of all period/scenario combinations in all models migrated to 7.1 as “Not calculated”. This is necessary because the required additional data is generated during the calculation process.

Period	Scenario	Status	Calculate Status
2008 Q1	Actual	Not published	Not calculated
2008 Q1	Plan	Not published	Not calculated

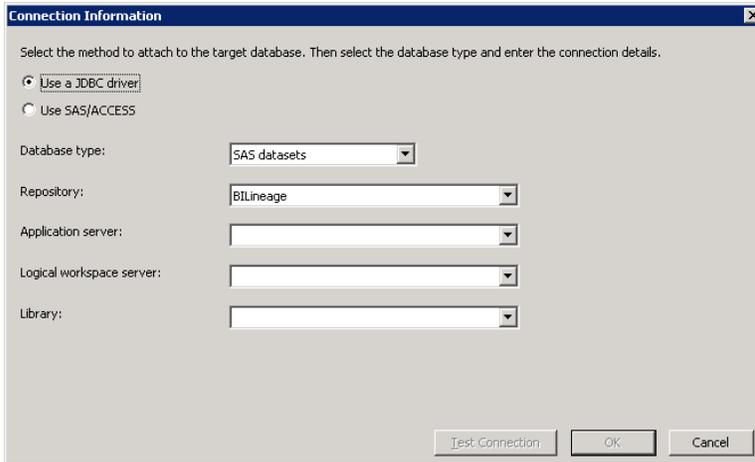
You can still view your current calculation results without re-calculating. You can also view your current OLAP cubes without re-calculating or re-building your cubes, if you used SQL Server Analysis Services 2005 for OLAP processing in SAS Activity-Based Management 6.x. However, if you want to rebuild only the cube or re-create the fact tables, SAS Activity-Based Management will also perform a calculation.

Tip: *The fact table generation algorithm in SAS Activity-Based Management 7.1 is more efficient than the one in prior versions when creating Multi-Stage Contributions. It produces equivalent results and identical OLAP cubes, but can often do so with fewer, sometime substantially fewer, rows in the fact table. This is especially true if you are running the SAS Activity-Based Management Calculation Server on a 64 bit operating system. These improvements usually translate into smaller fact tables, decreased fact table creation times, and decreased cube building times.*

Data Import and Export Configurations

SAS Activity-Based Management 7.1 has a Java-based mid-tier; SAS Activity-Based Management 6.x had a C++/C#-based mid-tier. Due to this change, SAS Activity-Based Management 7.1 primarily uses JDBC connections to data sources where SAS Activity-Based Management 6.x used ODBC data sources.

The Model Data Import configurations, Model Data Export configurations, and Report Data Export configurations all need to have their data sources re-created. You can update the data source by opening each configuration, hence launching the appropriate wizard, and re-attaching to your data source using one of the several available methods.



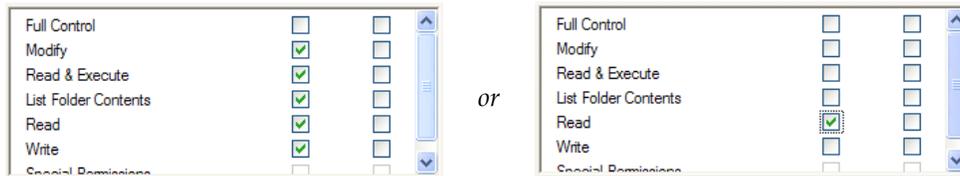
For more information about the available options when creating data sources, see the topic “Connect to a Database” in the SAS Activity-Based Management 7.1 online Help.

Published Reports Permissions

SAS requires that each user of SAS Activity-Based Management have proper access to the publish directory. Any user who wants to create or delete published reports must have sufficient privileges on that directory and report file to perform that operation. Any user who wants to read published reports must have **read** privileges on that report. These access privileges are granted by the host operating system and are not managed by the SAS metadata server.

Windows

1. Open **Windows Explorer** on the SAS Activity-Based Management *Application Server* and browse to the published reports folder at:
`<CONFIGHOME>\Applications\SASActivityBasedManagement7.1\publish`
2. Make sure the `publish` folder is visible in the left-hand pane. Right-click on it and select **Properties...**
3. Select the **Security** tab.
4. Make sure each SAS Activity-Based Management user who creates published reports has **Modify, Read, and Write** access to the directory. When you select **Modify, Read & Execute** and **List Folder Contents** are also selected. Also make sure each SAS Activity-Based Management user who reads published reports has **Read** access to the directory.



UNIX

1. Navigate to the directory where published reports are created on the SAS Activity-Based Management *Application Server* at:
`<CONFIGHOME>/Applications/SASActivityBasedManagement7.1/publish.`

2. Create a sub-directory inside the `SASActivityBasedManagement7.1` directory named `publish` if one does not already exist.
3. Make sure each SAS Activity-Based Management user who publishes reports has **Read**, **Write**, and **Execute** access to the directory. Also make sure each SAS Activity-Based Management user who views published reports has **Read** access to the directory
4. Each user who publishes reports must be part of the SAS Servers Users group. However, this was already set up in Chapter 4 when you set up the SAS Server Users group.
5. Execute the following command to change permission on the directory: `chmod 771 <CONFIGHOME>/applications/SASActivityBasedManagement7.1/publish`.
6. Finally, the default security for files created is 755 or lower, so add a `umask 771` command in the `.sh` file that launches the SAS Workspace Server on your *Calculation Server* so that files created in the `publish` folder will have the proper permissions.

Creating SAS Activity-Based Management Users

Each SAS Activity-Based Management user needs an account in the SAS Metadata server. Before you run SAS Activity-Based Management, you will need to create at least one SAS Activity-Based Management user. You may add just one user for now, or you may want to add all users. For information on adding users please see the *SAS 9.2 Intelligence Platform Installation and Configuration Guide*.

Now that you have at least one SAS Activity-Based Management user created in the Metadata server, we can create the necessary group(s) and role(s) to manage the users who are authorized to run SAS Activity-Based Management. Each authorized user does not necessarily have the same feature access privileges, or *capabilities*, in SAS Activity-Based Management. Each user who wants to run SAS Activity-Based Management needs three items in the SAS Metadata server:

1. needs an internal user account (on the Metadata server)
2. must belong to a role which provides at least one SAS Activity-Based Management capability
3. must belong to the “Activity-Based Management Users” group

We will start by creating a role for the users who have full access to the model building features of SAS Activity-Based Management, the **Create Models** capability. For more information on user capabilities, see “User Capabilities and Groups” in the SAS Activity-Based Management client Help.

Tip: *If you aren't ready to add your SAS Activity-Based Management users to the Metadata Server yet, you may use your SAS First User account instead.*

Configuration-Created Metadata

The SAS Activity-Based Management configuration process creates two groups and one library by default in the SAS Metadata server. They are:

1. The “Activity-Based Management Users” group
2. The “Activity-Based Management Cube Creators” group
3. The “ABM Library”

The first group, “Activity-Based Management Users” contains either directly as users or indirectly via other groups, all the users who are authorized to use the SAS Activity-Based Management product.

The second group, “Activity-Based Management Cube Creators”, contains either directly as users or indirectly via other groups, all the users who will create SAS OLAP Server cubes. Users who have the **Create Models** and **Create Cubes** capabilities must belong to this group. If you are not using SAS OLAP Server to create your cubes, you may ignore this group.

Finally, the “ABM Library” in the **Data Library Manager** is used by the SAS OLAP Server to store information about your cubes.

Creating an Activity-Based Management Role

1. Open the SAS Management Console using a SAS administrative user.
2. Click on the **Plug-ins** tab at the top and select the **Foundation** repository.
3. Expand **Environment Management** folder. If there is not a role named “Activity-Based Management: Create Models” present, create one.
 - a. Right mouse click on the **User Manager** and select **New→Role**.
 - b. Add a **Name** for the role. SAS recommends “ABM: Create Models” with a **Display Name** of “Activity-Based Management: Create Models”.
4. Select the **Capabilities** tab and expand the **Activity-Based Mgmt 7.1** folder
5. Check the **Create Models** capability.
6. Click on **OK** to save the role.

Creating an Activity-Based Management Group

Now create a group to hold all the users who will have the SAS Activity-Based Management Create Models capability.

1. Open the SAS Management Console using a SAS administrative user if it is not already open.
2. Click on the **Plug-ins** tab at the top and select the **Foundation** repository.
3. Expand **Environment Management** folder. If there is not a group named “Activity-Based Management Modelers” present or one you want to use, create one.
 - a. Right mouse click on the **User Manager** and select **New→Group**.
 - b. Add a **Name** for the role. SAS recommends “ABM Modelers” with a **Display Name** of “Activity-Based Management Modelers”.
4. Add the “Activity-Based Management: Create Models” role to this group, if necessary.
 - a. Select the **Groups and Roles** tab.
 - b. Add the “Activity-Based Management: Create Models” role by moving it from the **Available Groups and Roles** left-hand list to the **Member of** right-hand list.
5. Now add the SAS Activity-Based Management users to this group that you want to have this set of capabilities.
 - a. Select the **Members** tab.

- b. Add the desired users to this group by moving them from the **Available Identities** left-hand list to the **Current Members** right-hand list.
6. Click **OK** to save the group.

Adding a Group to the Activity-Based Management Users Group

1. Open the SAS Management Console using a SAS administrative user if it is not already open.
2. Click on the **Plug-ins** tab at the top and select the **Foundation** repository.
3. Expand **Environment Management** folder.
4. Select the **User Manager** folder.
5. Select the group “Activity-Based Management Users” and view its properties.
6. Select the **Members** tab
7. Add the “Activity-Based Management Modelers” group to this group as you did in Step 4 in the previous section.
8. Click on **OK** to save the group.

To summarize: To allow users to run SAS Activity-Based Management and assign their capabilities (i.e. access to features with SAS Activity-Based Management) we performed four steps:

1. You created a role with the desired capability or capabilities.
2. You created a group and added the new role to it so all the users in that group will have access to those capabilities.
3. You added all the SAS Activity-Based Management users you want to have that set of capabilities to the group.
4. You added that group to the “Activity-Based Management Users” group so they can run the SAS Activity-Based Management software.

If this deployment is using SAS OLAP Server to create cubes, you should also add the “Activity-Based Management: Create Models” group to the predefined “Activity-Based Management Cube Creators” group so they can build SAS OLAP cubes.

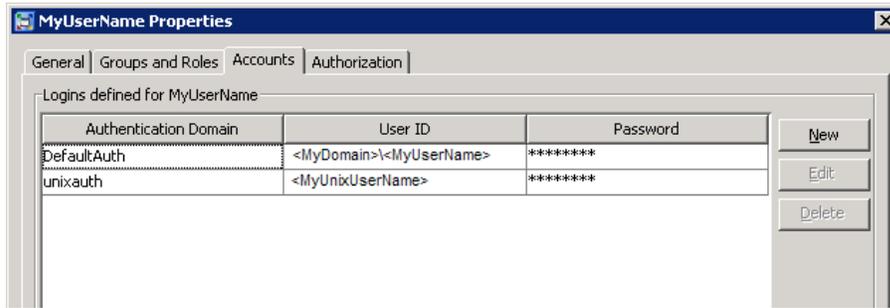
Similarly you can create other groups and roles to manage different roles and the users who use them.

Tip: SAS recommends that roles contain an **active** name. For example: “Activity-Based Management: View Models”, or “Activity-Based Management: Administration”. The product name should prefix the active name with a colon separator. This helps manage the diverse products, capabilities, and users in your SAS Metadata Server by partitioning them logically. Additionally, SAS recommends that groups contain a user’s activity. For example, “Activity-Based Management Administrators” without a colon separator.

Setting Up Metadata Users for Mixed Architecture Environments

If you use both Windows and UNIX servers in your SAS Activity-Based Management deployment, then you need to ensure that the SAS Activity-Based Management users have logins

for both machines. The authentication domains are defined when you create the servers in metadata.



Validating the SAS Activity-Based Management Solution

SAS Activity-Based Management 7.1 ships with a two diagnostics utilities. One is installed with the client and the other is installed on the SAS Activity-Based Management mid-tier.

Client Diagnostics

The client diagnostic application is available on the **Start** menu at **All Programs**→**SAS**→**SAS Activity-Based Management 7.1**→**Tools**→**SAS Activity-Based Management Client Diagnostic**. The client diagnostic tool validates many aspects of the SAS Activity-Based Management client installation. Verify that all tests pass successfully. These validation suites execute very quickly and take only a few seconds to run.

The client diagnostic application also provides a System Information report that provides deployment and version information. The System Information report must run as an authorized SAS Activity-Based Management users. You will be prompted to login when you run the report.

Server Diagnostics

Start the server diagnostics from the **Start** menu at **All Programs**→**SAS**→**SAS Activity-Based Management** →**Tools**→**Diagnostic 7.1** in Windows or an executable named <SASHOME>/SASActivityBasedManagementServer/7.1/ServerDiagnostic on UNIX. On UNIX, the Activity-Based Management Server Diagnostics is an X window application. If you are running from a personal computer, you need to set up the display to the computer. An example of this is:

```
DISPLAY=<your_machine_absolute_address>:0.0
export DISPLAY
```

The diagnostics utility does two types of things. It verifies on the machine that it is running that the correct code and permission are defined. And additionally it communicates with the web server to determine if the permissions are set up correctly for SAS Activity-Based Management.

If you have problems invoking the diagnostics, you should open the ServerDiagnostic.ini file. It is located in the folder above the diagnostic executable folder as follows:

Windows: <SASHOME>\SASActivityBasedManagementServer\7.1

UNIX: <SASHOME>/SASActivityBasedManagementServer/7.1

Check for the following lines:

1. `JavaArgs_4=-Dsas.app.class.path="<fully qualified name of junit.jar>"`

If the name is not specified, then supply it with the fully qualified name of the junit.jar

2. `JavaArgs_9=-Denv.definition.location="< fully qualified name of the SAS-environment file>"`

If the name is not specified or the diagnostics say it cannot find the xml file, then supply the fully qualified name of the sas-environment.xml file. It is usually located in

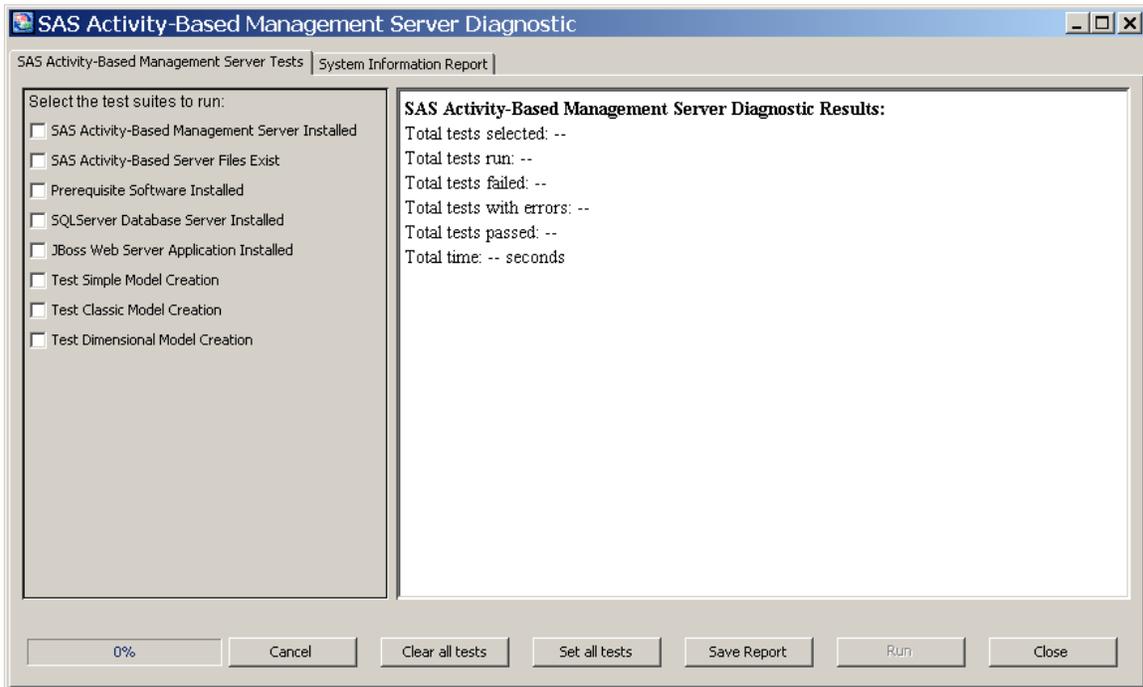
`<CONFIGHOME>\Web\Common`

You can update the following line to create a log:

`applogloc=launcher.log`

The following picture shows the first dialog of the diagnostic utility.

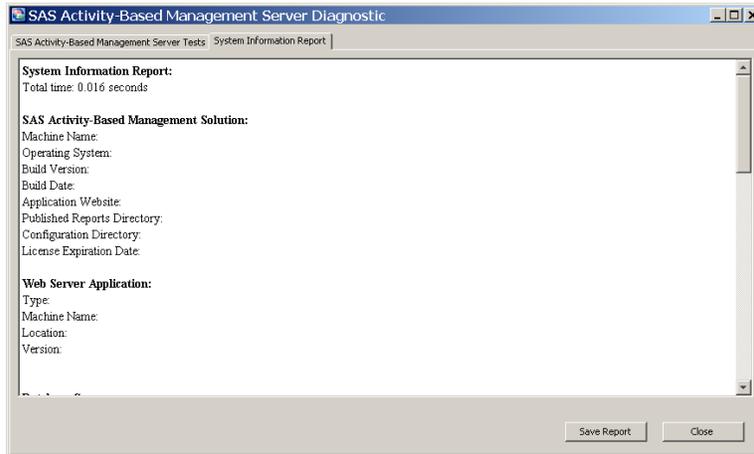
The diagnostics will prompt you for a modeler login and other details. If your servers are of mixed architecture, then you must fully qualify the name of the metadata server.



You may select the specific tests you want to run using the check boxes or enable all tests using the **Set all tests** button at the bottom of the window.

The log can be saved to the local machine. The file names are displayed in the window after the report is saved. On Windows the default location for this log is C:\Documents and Settings\\SAS\SAS Activity-Based Management Diagnostic\7.1. On UNIX the default location for this log is /SAS/SAS Activity-Based Management Diagnostic/7.1.

The second tab displays information about your system.



Appendix A – Installing Microsoft SQL Server

Installing Microsoft SQL Server 2005

When installing Microsoft SQL Server 2005 you may choose the default values with a few notable exceptions that are documented below.

Verifying an Existing Version

If you already have SQL Server 2005 installed. Verify that the correct version and service pack is installed.

1. Launch the **SQL Server Management Studio** from the **Start** menu.
2. Make sure you have selected Database Engine and the computer where your Database Engine is running. Log into **SQL Server Management Studio** using an appropriate administrative account.
3. Open a query window by selecting the **New Query** toolbar button or by selecting **New→ Query with Current Connection** from the **File** menu.
4. Paste the following query into the query window:

```
SELECT SERVERPROPERTY('productversion'), SERVERPROPERTY  
('productlevel'), SERVERPROPERTY ('edition')
```

Choose **Execute**.

5. The version number should appear similar to 2005.90.4035 or 9.00. 4035.06 depending on how you installed SQL Server 2005 and how SP3 was added. The key point is that the numerical version should be 4035 or higher. This signifies Service Pack 3 or newer.

Warning: *The version of the database engine cannot be checked using the **About** dialog. The version reported in the **About** dialog is the client software version, not the database engine version.*

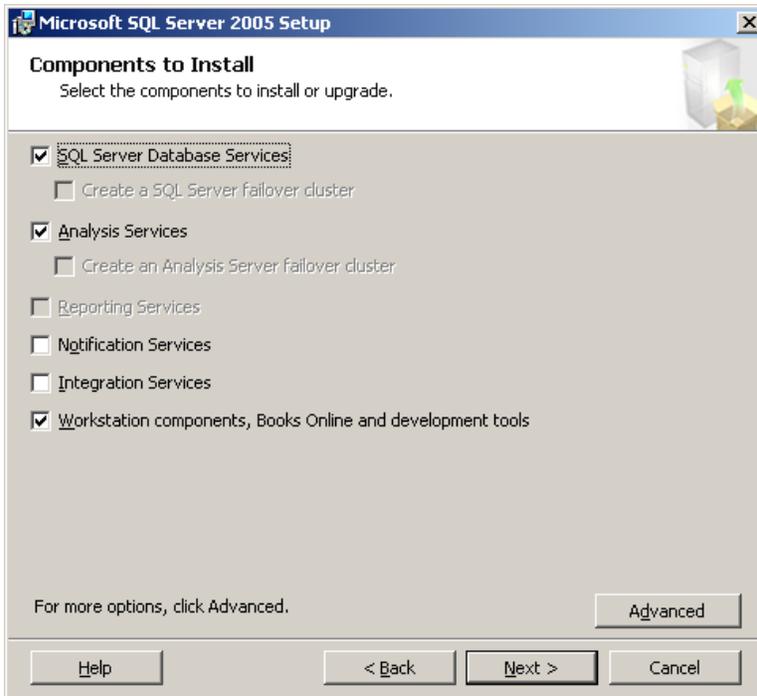
Installation

Begin installing SQL Server by launching **setup.exe**, usually contained in the root of the DVD.

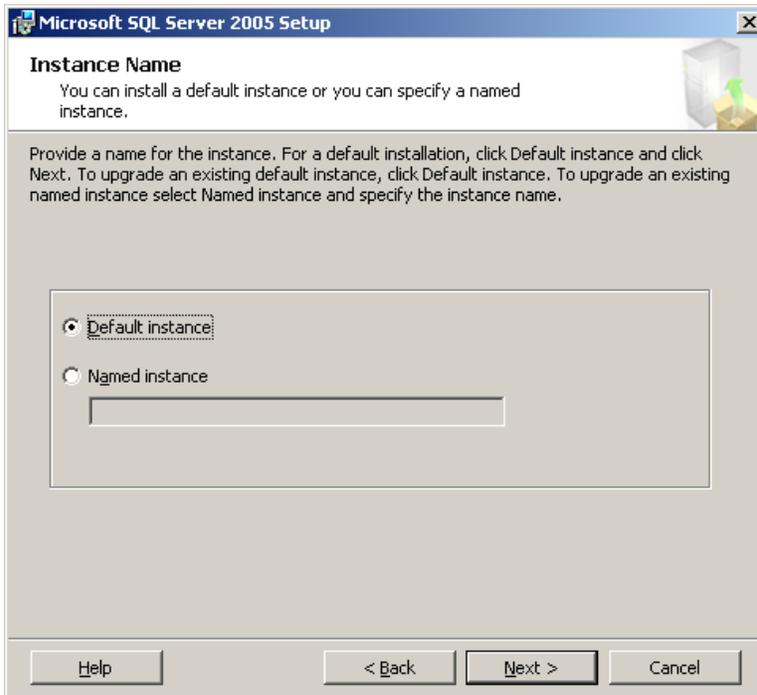
The minimum features SAS Activity-Based Management requires on the *Database Server* are:

- SQL Server Database Services
- Analysis Services (if you are using SQL Server Analysis Services for OLAP and if your *Database Server* and *OLAP Server* are on the same computer).
- Workstation Components

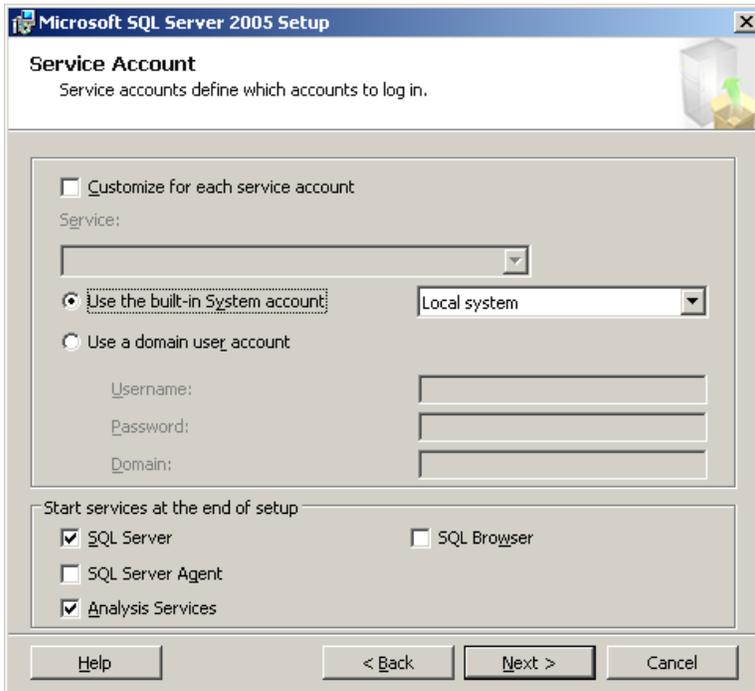
Additionally, SAS recommends installing the Workstation Components on the *Application Server*. This allows users to administer the database engine remotely from the *Application Server*.



You can make this the default SQL Server database instance on this computer or you may create a named instance. SAS Activity-Based Management works properly with SQL Server installed either way. If you choose to create a Named Instance, SAS recommends the name **AbmSqlInstance**.



Select **Use the built-in System account** with **Local system** for the service accounts wizard dialog.

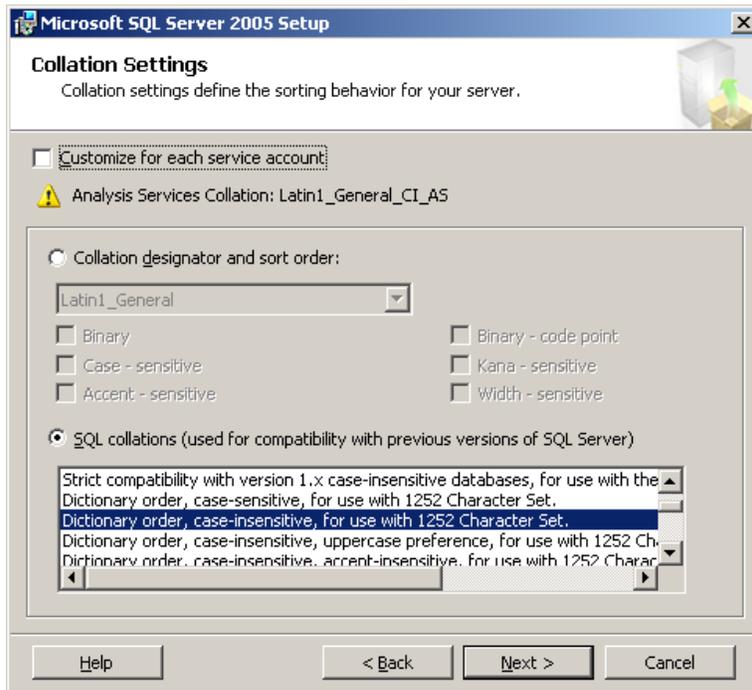


Select **Mixed Mode Authentication** and enter a password for the local **sa** account



Select a default collation sequence for this SQL Server installation. The default collation sequence for SQL Server is "Dictionary order, case insensitive..." is acceptable for North American installations. Regardless of which collation sequence you choose, you *must* choose a case insensitive collation. This

is important because SAS Activity-Based Management does not distinguish between MyAccountName, MYACCOUNTNAME, and myaccountname.



Installing Microsoft SQL Server 2008

When installing Microsoft SQL Server 2008 you may choose the default values with a few notable exceptions that are documented below.

Verification of an Existing Version

If you already have SQL Server 2008 installed. Verify that the correct version and service pack is installed.

1. Launch the **SQL Server Management Studio** from the **Start** menu.
2. Make sure you have selected Database Engine and the computer where your Database Engine is running. Log into **SQL Server Management Studio** using an appropriate administrative account.
3. Open a query window by selecting the **New Query** toolbar button or by selecting **New→ Query with Current Connection** from the **File** menu.
4. Paste the following query into the query window:

```
SELECT SERVERPROPERTY('productversion'), SERVERPROPERTY  
('productlevel'), SERVERPROPERTY ('edition')
```

And choose **Execute**.

5. The version number should appear similar to 2007.100.2531.0 or 10.0. 2531.22 depending on how you installed SQL Server 2008 and how SP1 was added. The key point is that the numerical version should be 2531 or higher. This signifies Service Pack 1 or newer.

Warning: *The version of the database engine cannot be checked using the **About** dialog in SQL Server Management Studio. The version reported in the **About** dialog is the client software version, not the database engine version.*

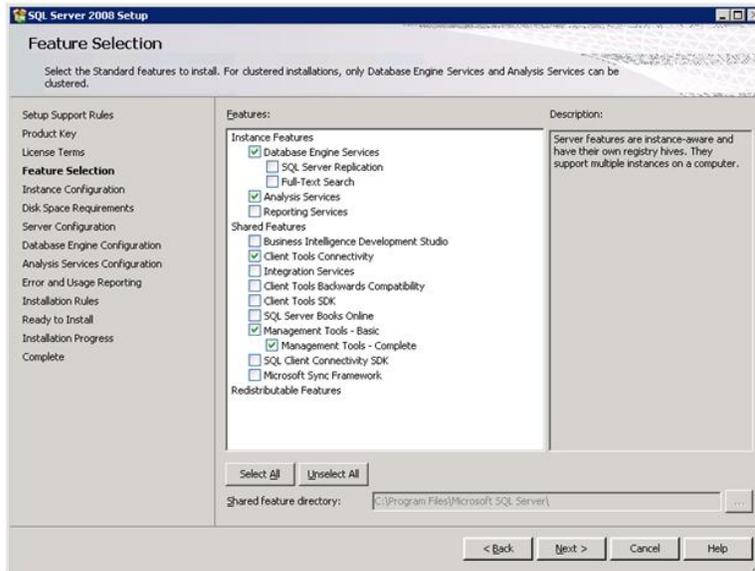
Installation

Begin installing SQL Server by launching **setup.exe**, usually contained in the root of the DVD.

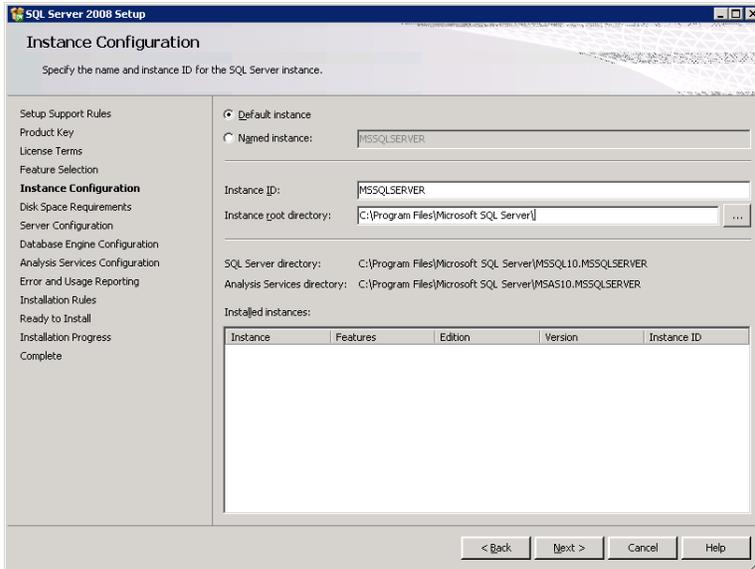
The minimum features SAS Activity-Based Management requires on the *Database Server* are:

- SQL Server Database Services
- Analysis Services (if you are using SQL Server Analysis Services for OLAP and if your *Database Server* and *OLAP Server* are on the same computer).
- Client Tools Connectivity
- Workstation Components

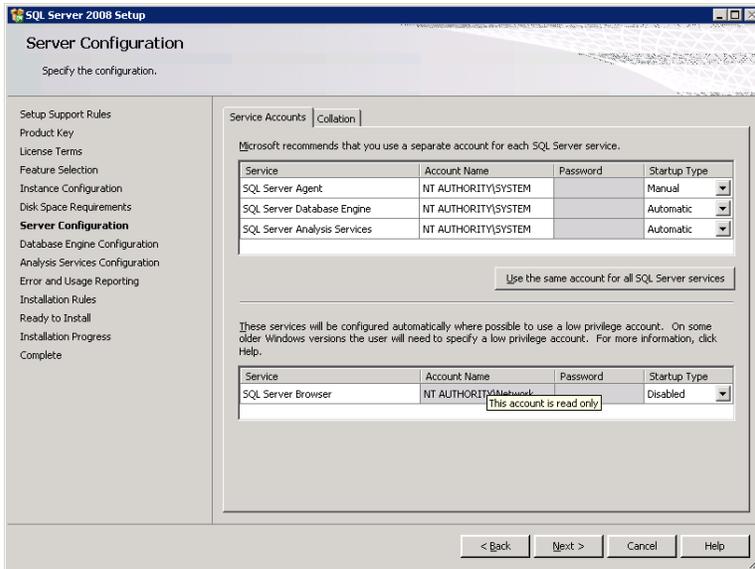
Additionally, SAS recommends installing the Workstation Components on the *Application Server*. This allows users to administer the database engine remotely from the *Application Server*.



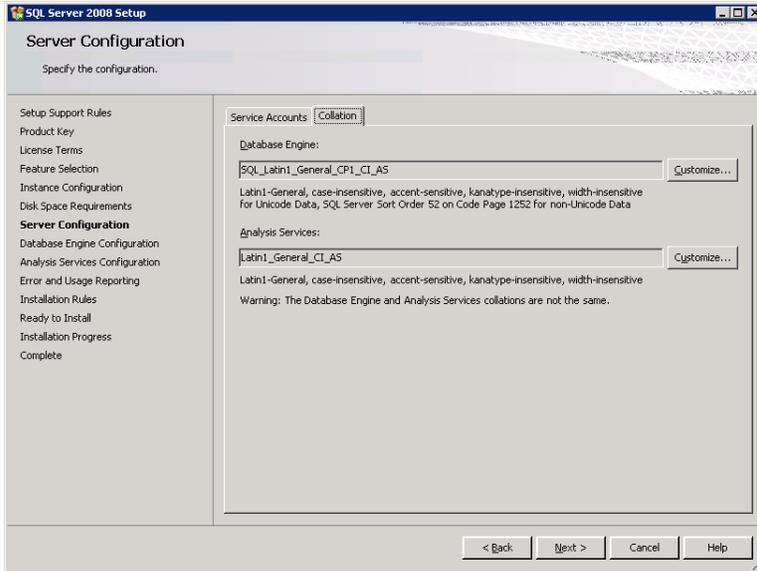
You can make this the default SQL Server database instance on this computer or you may create a named instance. SAS Activity-Based Management works properly with SQL Server installed either way. If you choose to create a Named Instance, SAS recommends the name **AbmSqlInstance**.



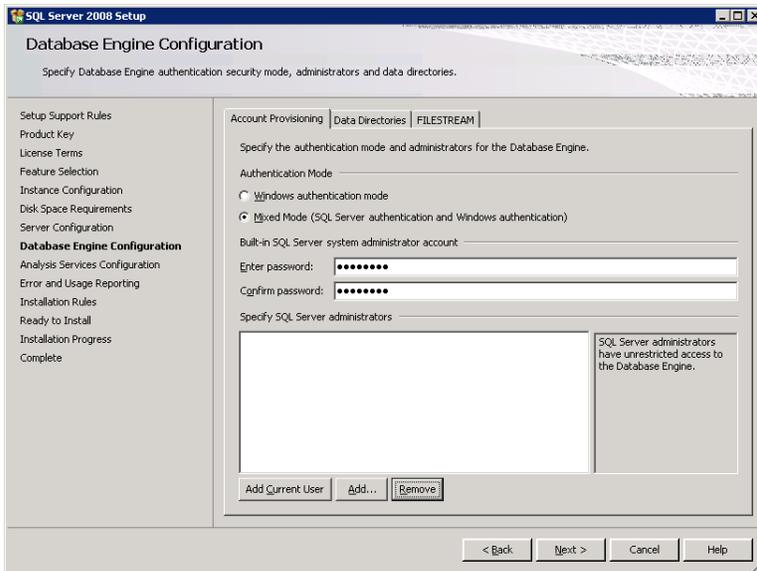
Select **NT Authority\System** for the services and provide password for the Service Accounts tab on the Server Configuration wizard dialog.



Select a default collation sequence for this SQL Server installation. The default collation sequence for SQL Server is “SQL_Latin1_General_CI_AS” is acceptable for North American installations. Regardless of which collation sequence you choose, you *must* choose a case insensitive collation. This is important because SAS Activity-Based Management does not distinguish between MyAccountName, MYACCOUNTNAME, and myaccountname.



Select **Mixed Mode Authentication** and enter a password for the local **system administrator** account



Installing Microsoft SQL Server Analysis Services

Installation

Only Analysis Services is required.

Configuration

Additionally, it is necessary that the *Database Server* can resolve the *OLAP Server's* name, and vice-versa. This is necessary for the communication between the two computers to be handled properly and for the SQL Server Management Studio to communicate properly with the SQL Server instance running on the *Database Server*. The most common difficulty arises when the *Database Server* and the *OLAP Server* are in different domains. Either the two servers need to be able to authenticate each other or authentication needs to be turned off. If this is necessary, follow the following steps:

1. Open **Administrative Tools** in the **Control Panel**.
2. Open **Component Services**.
3. Select **Component Services**→**Computers**→**My Computer**, right-click, and choose **Properties**.
4. On the **MSDTC** tab choose the button labeled **Security Configuration**.
5. Select the option under **Transaction Manager Communication** that is appropriate for your installation. You may need to select the option labeled **No Authentication Required**.

Configuring Microsoft SQL Server 2005 and 2008

JDBC Driver

The Microsoft SQL Server JDBC Driver 2.0 driver works properly with both SQL Server 2005 and SQL Server 2008 and is suitable for use with all supported web application servers except Oracle WebLogic 10.3.3 (see below) and is available from the Microsoft website at <http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=99b21b65-e98f-4a61-b811-19912601fdc9>.

Note: If you are using Microsoft SQL Server with Oracle WebLogic 10.3.3, you will later need to install a newer JDBC driver after the SAS installation and configuration process is complete. See the section entitled *Oracle WebLogic 10.3.3 and Microsoft SQL Server Database* in Chapter 5.

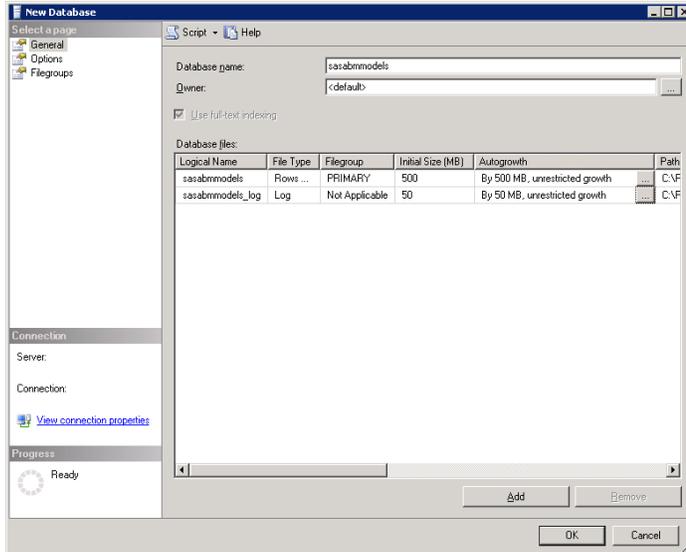
Create the SAS Activity-Based Management User

If this is a new installation of SAS Activity-Based Management, you will create a Microsoft SQL Server database and a user that will execute queries generated by SAS Activity-Based Management. You will also assign the appropriate access privileges for this user to the new database that will contain the SAS Activity-Based Management data.

You need to create a SQL Server Database and an Administrator User id.

1. Open the SQL Server Management Studio program on the *Database Server*.
2. Right-click on **Databases** and select **New Database**. The recommended database name is **sasabmmodels**. The database initial size/autogrow settings and the transaction log initial

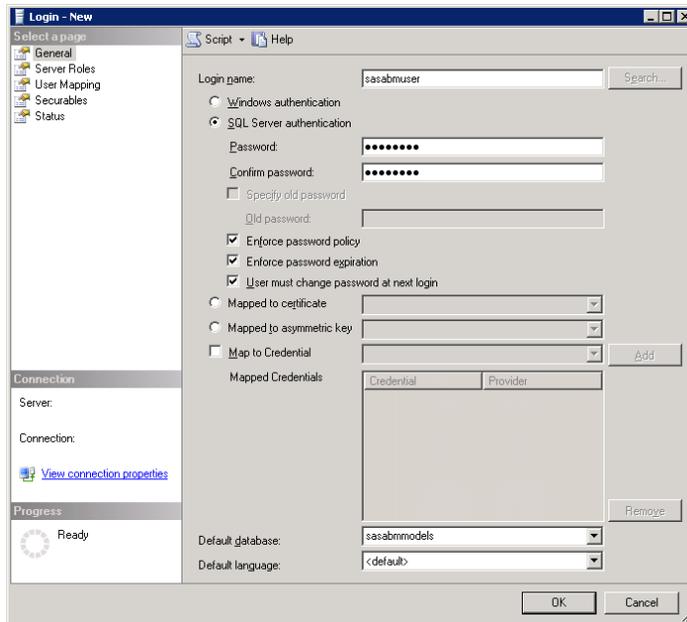
size/autogrow settings have default values that are very small and will hamper performance. The default settings should be changed to suit your expected data volumes. This **sasabmmodels** database has an initial size of 500MB and an autogrow size of 500MB. The transaction log has an initial size of 50MB and an autogrow size of 50MB. These settings are appropriate for small- to medium-size data volumes.



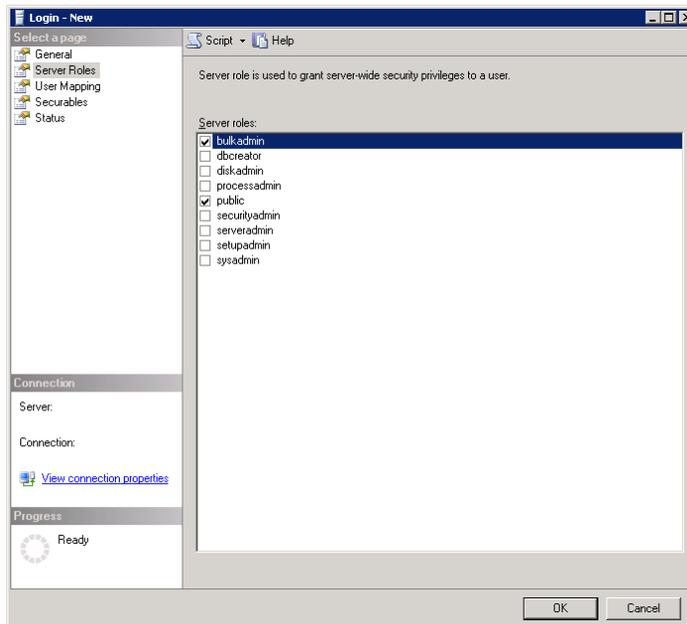
3. Click **OK** to create the **sasabmmodels** database.

To create the database Administrator account:

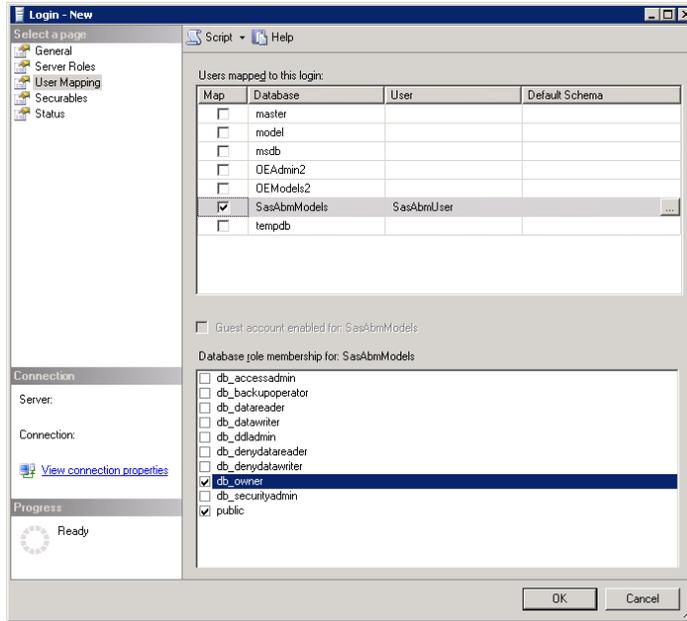
1. Expand the **Security** folder. Right-click on **Logins** and choose **New Login**.
2. Enter the user name in the **Login Name** edit field. SAS recommends **sasabmuser**.
3. Choose **SQL Server Authentication** and enter a **Password**. Choose a password that adheres to your company's password naming policy.
4. Select **sasabmmodels** for the **Default database**.



5. Select **Server Roles** in the upper left-hand pane. Select **Bulk Admin** from the list of server roles in the right-hand pane.



6. Select **User Mapping** from the upper left-hand pane. Select the check box for **sasabmmodels** in list of models in the upper right-hand pane. Select the check box for **db_owner** in the list of database roles in the lower right-hand pane.



7. Click **OK** to create the new user and its database assignments.

Environment Variables

You need to create an environmental variable `BCP_HOME` on the *Application Server* computer to point to `bcpx.exe` which was installed as part of the SQL Server Workstation Components (or Management Tools as they are called in SQL Server 2008). For example, follow these steps if you installed the client tools at `C:\Program Files\Microsoft SQL Server\`.

- Open the System dialog box via **Start**→**Control Panel**→**System**.
- Open the **Advanced Tab** and click **Environment Variables**.
- Under **System Variables**, highlight **BCP_HOME** and click **Edit**. If **BCP_HOME** does not exist, click **New**. Enter the path to the client tools, normally `C:\Program Files\Microsoft SQL Server\90\Tools\bin\` for SQL Server 2005.
- Click **OK** for each of the windows opened.

Important: *If you have any open DOS prompts, please close and re-open them to pick up environment changes. Type in the DOS `set` command without any parameters and verify the setting for `BCP_HOME`. If it is still not set then reboot the system.*

Also, record the database name, database user name, password, and the configured port in the table at the top of Chapter 5.

Appendix B – Installing Oracle 11g

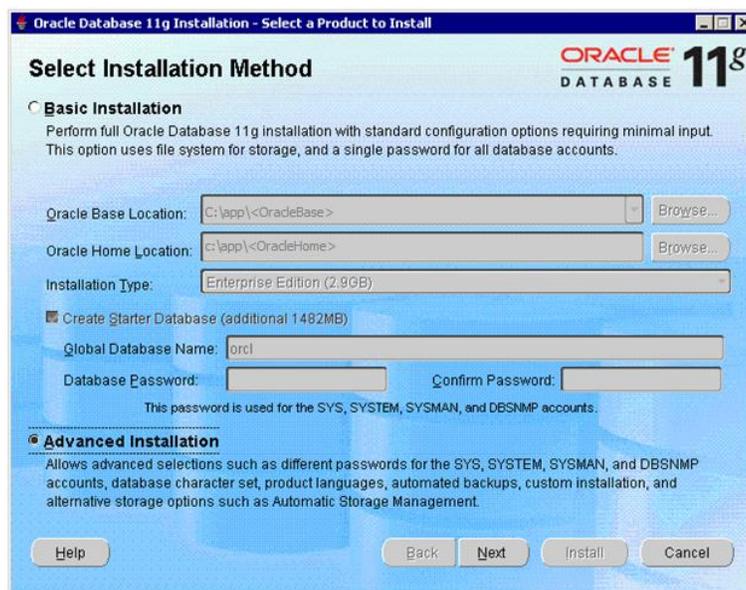
These instructions are intended for installing Oracle 11g on Windows. Oracle 11g installation on UNIX may vary due to operating system differences. These instructions, particularly the Oracle Net Configuration portions, do not state that this is the only way to create a working Oracle 11g installation with SAS Activity-Based Management. Instead, they provide a sample of the installation choices that SAS used to install Oracle 11g. The choices that are mandatory are specifically noted. Oracle databases have numerous configuration options which can be tuned to maximize performance in different environments and for different usage patterns. Unless you are an experienced Oracle administrator, SAS recommends that you do not stray from the following recommendations. Doing so may result in a non-working or partially-working installation.

Warning: *SAS validated the following installation and configuration options for Oracle 11g. Many other options are available for an Oracle deployment.*

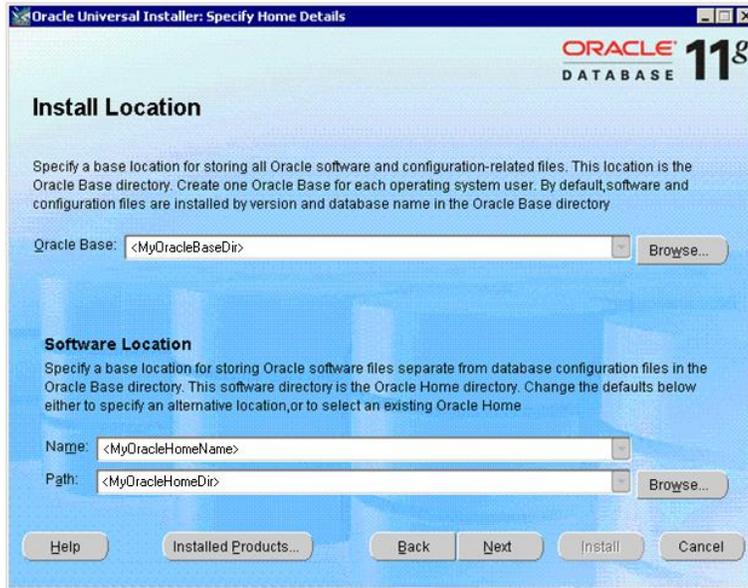
Installing Oracle on Windows

Begin installing Oracle 11g by double-clicking on the **setup.exe** to begin the installation process.

1. Select the **Advanced Installation** option and click **Next**.



2. Choose the **Installation Type** based upon your need. Click **Next**.
3. The Install Location dialog displays. This dialog determines the **Oracle Base** location (the installation path), and the **Oracle Home** name and path. These locations are important and will be referred to often in Oracle's documentation. The <MyOracleHomeName> is important for SAS Activity-Based Management because it determines how the Oracle data sources appear in the Windows **ODBC Data Source Administrator** dialog. The <MyOracleHomeDir> is used later in the configuration process to create the **ORACLE_HOME** environment variable to locate the Oracle bulk load utility. Click **Next**.

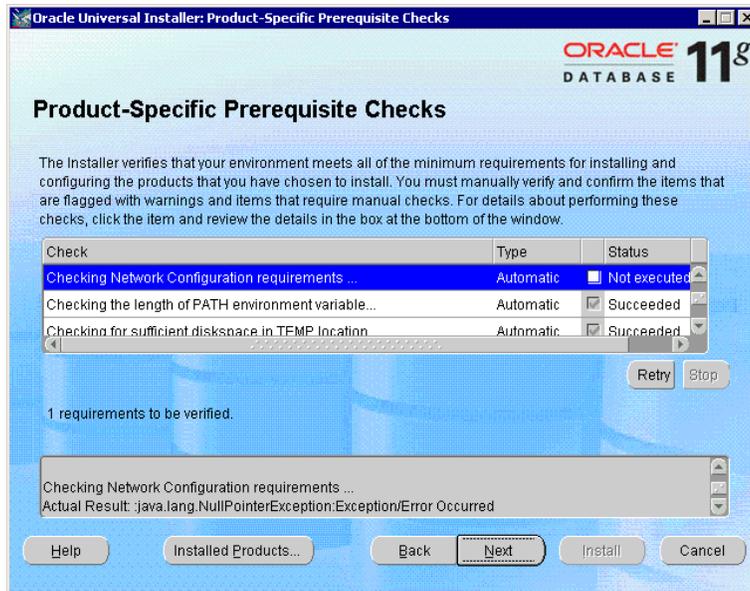


4. Verify that all the **Product-Specific Prerequisite Checks** are marked **Succeeded**. These checks are very important. Pay close attention to any warnings or errors and correct them before proceeding. Also verify that there are “0 requirements to be verified.”

Warning: *The Oracle installer performs a few prerequisite tests. Make sure all tests successfully complete. If any tests fail, refer to the Oracle installation guide for help. This is especially important because depending on your hardware configuration, the Oracle database may require the presence of a Loopback Adapter for proper operation. If the Loopback Adapter is not installed but its presence is required by Oracle, the Oracle database will appear to operate properly most of the time. However, SAS has determined that random failures, typically involving “concurrency” (to quote the Oracle error messages), will occur. The Oracle documentation has instructions for installing the Loopback Adapter on your operating system.*

In particular, the Oracle prerequisite checks might identify a problem with the DHCP configuration of your host Computer. The error displays as:

```
Checking Network Configuration requirements...
Actual Result: :java.lang.NullPointerException:Exception/Error Occurred
```



Oracle supports systems with DHCP-assigned IP addresses, but you may need to perform additional configuration steps on your computer before proceeding. You may need to install a loopback adapter and configure it to be the primary network adapter. Search for the string “DHCP” in the *Oracle Database Installation Guide* for more details on installing the Oracle on systems configured with DHCP.

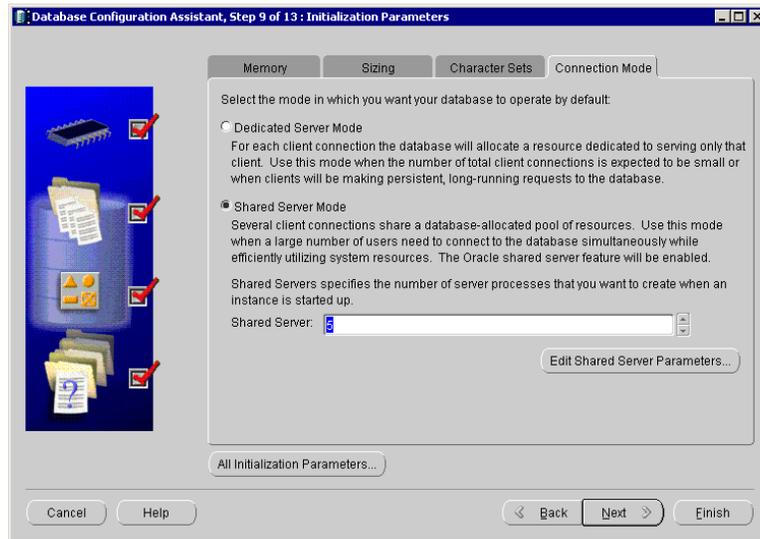
Click **Next** if all the tests succeed. Otherwise, cancel the installation and resolve the problems before proceeding.

5. Select **Create a Database**. Click **Next**.
6. Select **Advanced** database configuration. Click **Next**.
7. Click **Install** to begin installing the Oracle database engine. A progress dialog displays.
8. A **Database Configuration Assistant** wizard displays. The first wizard step might display behind the main wizard dialog. Select **General Purpose or Transaction Processing**. Click **Next**.
9. Choose a Global Database Name (GDB) and a SID for your database. The standard Oracle convention for the formatting the GDB name is <SID>.<MyDomain> where <SID> is the name you gave the SID. Click **Next**.
10. Select **Configure Enterprise Manager**. SAS recommends you also choose to **Configure Database Control for local management**. Click **Next**.
11. Choose a password for the administrative account. Click **Next**.
12. Select the **Storage Management** option that suits your installation. Click **Next**.
13. Select the location for database files. Click **Next**.
14. Select the recovery options for the database. Click **Next**.
15. Uncheck the **Sample Schemas** option unless you want them for reference. Click **Next**.
16. The next wizard page dialog has 4 tabs. Click on the **Sizing** tab. Make sure the number of **Processes** is large enough to service the expected work load from the SAS Activity-Based

Management users. An estimated number of processes is difficult to gauge. The Oracle database may divide large queries into multiple smaller ones that execute in parallel – with each sub-query consuming a process. Thus, the number of needed processes is not directly tied to user load or query load. The default value is typically 150.

Click on the **Character Sets** tab. Select **Use Unicode**.

Click on the **Connection Mode** tab. Select **Shared Server Mode** to avoid concurrency problems, and pick the appropriate number of server processes. The proper value depends on the capability of your computer. If you select **Dedicated Server Mode**, you have to register the database (SID) with Oracle listener after installing to avoid concurrency problems. SAS recommends **Shared Server Mode**. Click **Next**.



Warning: SAS has encountered intermittent failures relating to “concurrency” problems when the **Dedicated Server Mode** is selected. If your deployment requires the **Dedicated Server Mode**, please follow the instructions in the Oracle Database Installation Guide for registering the database SID. This appears to resolve the problems. SAS Activity-Based Management will generate errors during certain multi-user operations if the database SID is not registered.

17. Select keep the enhanced security settings. Click **Next**.
18. SAS recommends selecting the **Enable automatic maintenance tasks** option. You may change this option if required for your deployment. Click **Next**.
19. Click **Next** on the **Database Storage** dialog.
20. Click **Finish** on the **Database Creation** dialog. A confirmation dialog displays. Click **OK** if you are satisfied with your selections.
21. Click **Exit** when the **Database Configuration Assistant** dialog displays.

22. Click **Exit** when the Oracle **End of Installation** dialog displays.



Configuring Oracle

JDBC Driver

The JDBC driver for Oracle 11g is included as part of the Oracle Client installation. The Oracle installation process puts it at `<OracleClientDirectory>\sqlj\lib\jdbc\lib\ojdbc5.jar` on Windows systems. This driver is needed on the *Application Server*. SAS recommends the Oracle Client be installed on the *Application Server* to provide this driver. If necessary, this driver can be downloaded directly from Oracle's website at http://www.oracle.com/technology/software/tech/java/sqlj_jdbc/index.html.

Important: SAS recommends installing the JDBC drivers using the Client Tools options on your Oracle installation CDs. This guarantees that the Application, and hence the JDBC drivers, will receive any updates as part of a database update provided by your vendor. Additionally, the Application Server uses the Oracle SQL*Loader (bulk loader) to improve performance for the data import process. The bulk loader is also part of the Client Tools installation.

Environment Variables

Windows

You need to create an environmental variable ORACLE_HOME on the *Application Server* to point to the client tools installation directory. The client tools will be installed at `<MyOracleHomeDir>`. For most deployments where the client tools are installed this will be the `client_1` directory. If only the database engine is installed, and not the client tools, the location will be the `db_1` directory. For example follow these steps if you installed the client tools at `C:\Oracle\product\11.1.0\client_1`.

1. Bring up the System dialog box via **Start**→**Control Panel**→**System**.

2. Open the **Advanced Tab** and click **Environment Variables**.
3. Under **System Variables**, highlight **ORACLE_HOME** and click **Edit**. If **ORACLE_HOME** does not exist, click **New**. Enter the path to the client tools, normally `C:\Oracle\product\11.1.0\client_1`.
4. Click **OK** for each of the windows opened.

See the discussion of **Oracle Home** in “Installing Oracle 11g” earlier in this section.

Important: Please close and reopen DOS prompts to pick up environment changes. Issue the set command without any parameters and check for **ORACLE_HOME**. If it is still not set then reboot the system.

UNIX

The following commands set the **ORACLE_HOME** environment variable on UNIX. These statements can be added to the .profile file of the user that is running the installation. Alternatively this can be added to a common profile accessed by the user’s profile.

For example if you installed Oracle in the **usr** directory, issue the following commands:

```
ORACLE_HOME=/usr/Oracle
export ORACLE_HOME
```

Create the TableSpace

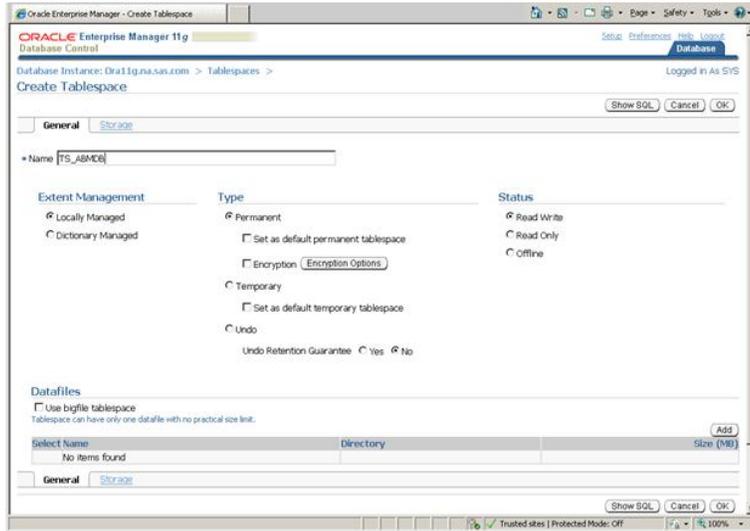
The TableSpace is the file where your data is stored in your database. SAS recommends that you create a tablespace for SAS Activity-Based Management that is not shared with other applications. To create a tablespace in Oracle 11g, run Database Control for the SID you created. It is available on the **Start** menu under your Oracle installation. In the screen image below, “Database Control – Ora11g” is highlighted. Ora11g is the SID.



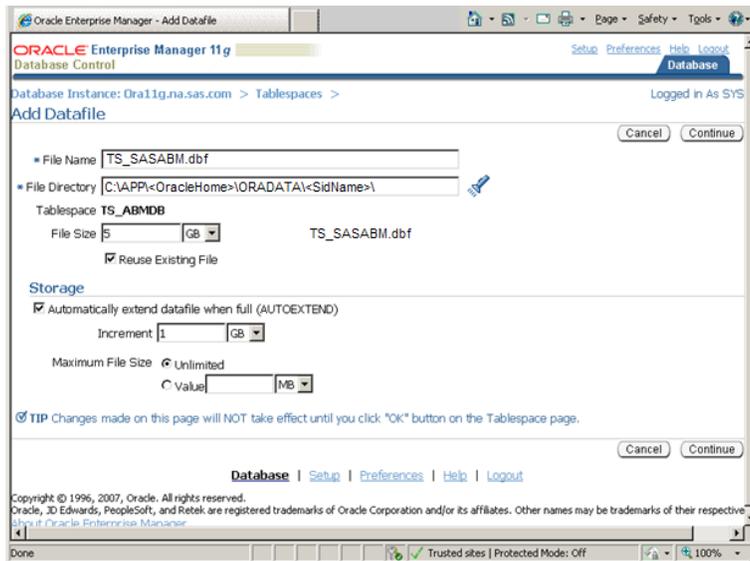
Tip: The Oracle Database Control is a web application in Oracle 11g. Depending on the security settings of your web browser, you may not be able to access the Oracle web page. If you encounter difficulties, go to the **Security** tab on **Tools**→**Internet Options** and add the Oracle web site to the list of trusted sites.

1. Log in to the Database Control application using the administrative user and password you created in the previous section.
2. Click on the **Server** tab.
3. Under the **Storage** subsection, click on **TableSpace**.
4. Click **Create**. It is on the right-hand side of the screen.

5. Enter a name for your tablespace. SAS suggests **TS_SASABM**. Accept the other default values. Click on the **Add** button to add this new tablespace.



6. Enter a name for the tablespace file. SAS suggest using the tablespace name with a suffix of **.dbf** (which is standard for tablespace file names in Oracle). Set the initial file size and increment size for your deployment. Click **Continue**.

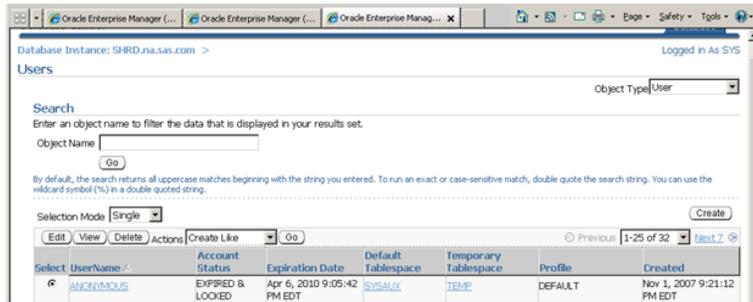


7. The tablespace creation is complete. Click **OK**.

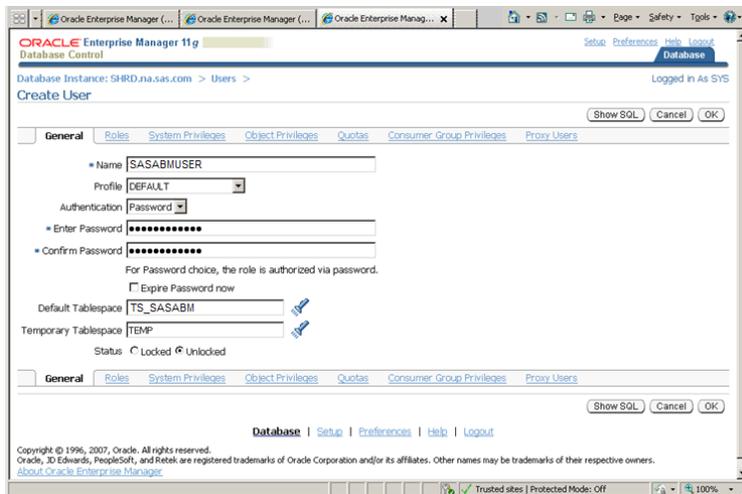
Create the SAS Activity-Based Management User

1. Select **Users** from the **Security** subsection of the **Server** tab.

2. Click **Create**. It is on the right-hand side of the screen.



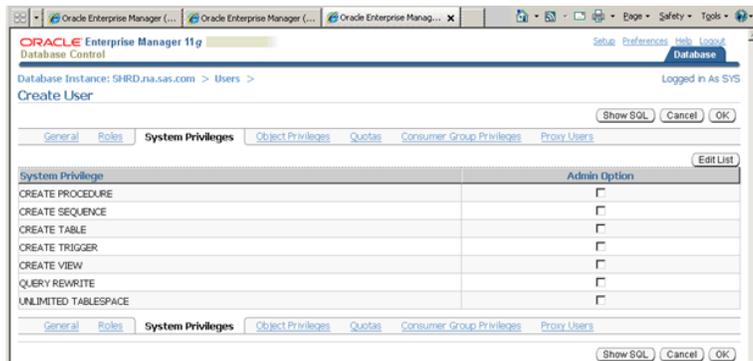
3. Enter the new name of the database user who will access the TS_SASABM tablespace. SAS recommends **SASABMUSER**. Enter a password for this user. Make sure the default tablespace is TS_SASABM, or the name you chose when the tablespace was created, and the TEMP tablespace for temporary work.



4. Select the **System Privileges** tab. Click **Edit List**. Add the following seven privileges to the **Selected System Privileges** list: **Create Procedure, Create Sequence, Create table, Create Trigger, Create View, Query Rewrite, and Unlimited Tablespace**. Click **OK**.



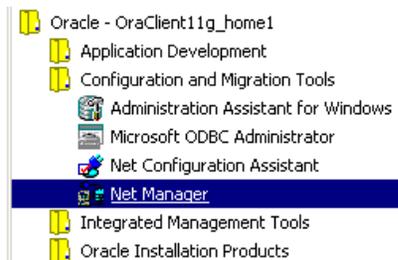
5. The user creation is complete. Click **OK**.



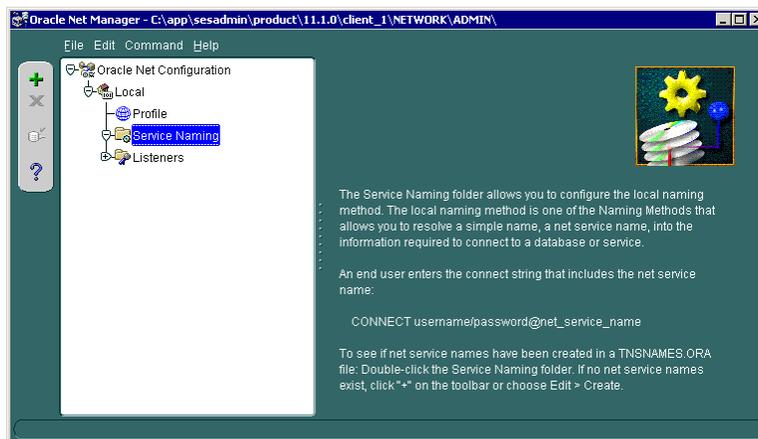
Oracle Net Configuration

You need to create identical Oracle Net Service Names (Alias) on the following computers: *Application Server*, *Calculation Server*, and the computer where you run the SAS Activity-Based Management Database Upgrade Utility. If two or more of these logical computers map to a single physical computer, then the computer only needs a single Net Configuration.

Oracle uses aliases to facilitate communication with the Oracle database. The **Oracle Net Manager** utility is used to create aliases. It is available on the **Start** menu under your Oracle installation.



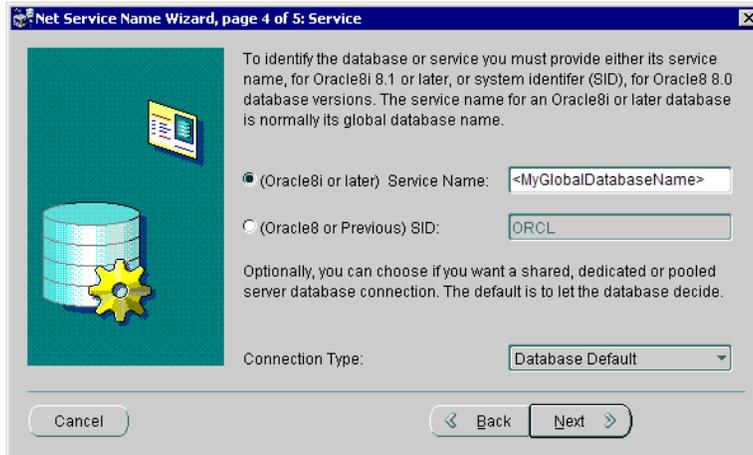
1. When the **Net Manager** displays, expand the **Local** node in the left-hand pane.
2. Click on **Profile**. The allowed connection methods display in the right-hand pane. Verify the **Methods** tab is selected. Verify that TNSNAMES and EZCONNECT are displayed in the **Selected Methods** list box.
3. Expand **Service Naming**. Click the green plus sign or select **Edit**→**Create**.



- The **Net Service Name Wizard** displays. Enter a name for your Net Service. SAS recommends the name ABMDSN. You must choose a name that is the same as the DSN name you will create in Chapter 8. This is necessary because the SAS Activity-Based Management calculation engine uses both a DSN and a Net Service Name to load data into the Oracle database. It assumes the Net Service Name is the same as the DSN name. Click **Next**.

Note: Oracle documentation sometimes refers to the Net Service name as a Net Configuration name or an Alias name.

- Page 2 of the wizard displays. Verify **TCP/IP (Internet Protocol)** is selected. Click **Next**.
- Page 3 of the wizard displays. Enter the **Host Name** where the Oracle database is installed and the **Port Number** it is configured to use. Click **Next**.
- Page 4 of the wizard displays. SAS recommends that the **Service Name** option be used. The SID option is for backward compatibility. In the **Service Name** option, enter the Global Database Name you used in Step 9 in the “Installation” section. This is your <MyGlobalDatabaseName>. You may use the SID option when the Oracle database is on UNIX but it is not recommended for use on Windows. Click **Next**.



- Page 5 of the wizard displays. Click the **Test...** button to verify the connection.
- The **Connection Test** dialog displays. You may need to click **Change User...** before selecting the **Test** button depending on which login you used when you created the Global Database Name. When you click the Test button, you should see the message “The connection test was successful.” Click **Close**.
- You are taken back to Page 5 of the wizard. Click **Finish**.
- You must save the alias you just created by selecting **File**→**Save Network Configuration** before you exit the application. The Net Configuration is complete.

Verify the port that your Oracle database installation is configured to use. Update the Database Server table at the beginning of Chapter 5 with the correct information.

Appendix C - Installing MySQL

These instructions are intended for installing the MySQL database on Windows. MySQL installation on UNIX may vary due to operating system differences. These instructions have been verified by SAS to work with SAS Activity-Based Management and other SAS solutions, such as SAS Financial Management, that support MySQL as a relational database. SAS Activity-Based Management 7.1 supports MySQL primarily to simplify software deployments where multiple SAS solutions share a MySQL database installation.

If your site is installing only SAS Activity-Based Management, SAS recommends the better-performing Microsoft SQL Server and Oracle 11g relational databases since they both provide a “bulk-data loader” utility which improves performance with SAS Activity-Based Management.

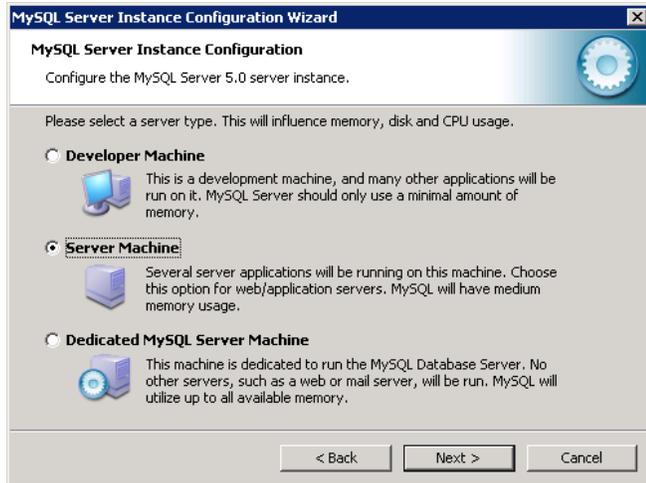
Installing MySQL on Windows

Verify that the version of MySQL that you want to use is compatible with SAS Activity-Based Management 7.1. This information is provided in the *SAS Activity-Based Management 7.1 System Requirements*.

Begin installing MySQL by extracting **setup.exe** from the MySQL zip file. Double-click on the **setup.exe** to begin the installation process.

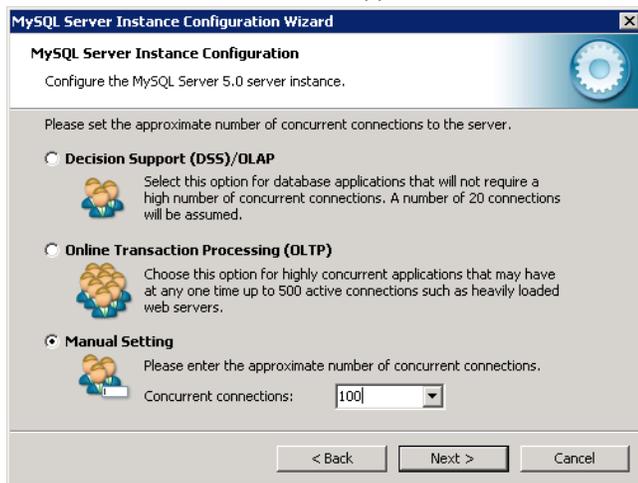
1. Click **Next** until the **Setup Type** dialog appears. SAS Activity-Based Management requires the configuration steps of the **Custom** installation. Click **Next**.
2. The **Custom Setup** dialog displays. On Windows, change the installation directory to `C:\MySQL` or another directory of your choice. Click **Next**.
Note: The path to the MySQL database installation should not contain spaces.
3. The summary dialog displays. Click **Install**.
4. Click **Next** until the **Wizard Completed** dialog appears. Select the **Configure the MySQL Server now** option and click **Finish**.
5. The **Configuration Type** wizard displays. Click **Next**.
6. The **MySQL Server Instance Configuration** dialog appears. Select **Detailed Configuration**. Click **Next**.

- The **Server Type** dialog displays. Select either **Server Machine** or **Dedicated MySQL Server Machine** depending on your expected usage. As noted in the wizard, you should only select **Dedicated MySQL Server Machine** if no other applications will be run on your *Database Server*. Click **Next**.



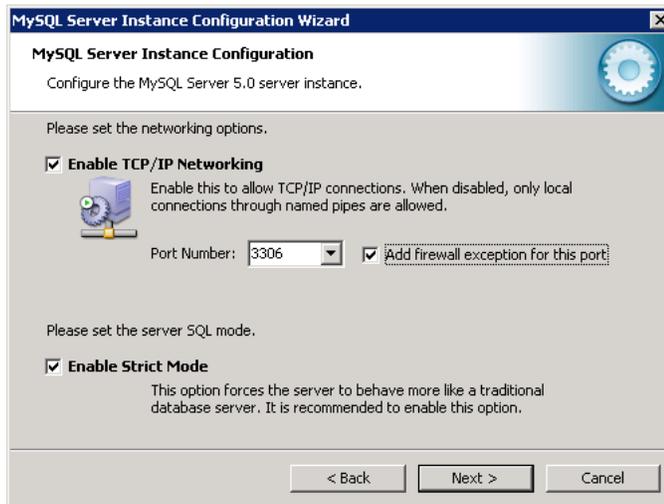
- The **Database Usage** dialog displays. Select **Transactional Database Only**. Click **Next**.
- The **InnoDB Tablespace Settings** dialog displays. Accept the default values unless you need to change to another location. Click **Next**.
- The **Concurrent Connections** dialog displays. Select the Manual Setting option. A typical SAS Activity-Based Management user needs about 5 connections at most for all their activities (viewing model, performing a calculation, creating a cube, etc.). More connections for each user are necessary if you expect users to multi-task with several models simultaneously. For 10 simultaneous SAS Activity-Based Management users, 50 connections is sufficient with 100 allowing a buffer. Click **Next**.

Note: *Other SAS solutions can share this MySQL database instance. Since they often service a larger number of users than SAS Activity-Based Management typically does, SAS recommends that the number of connections be increased to 300 if this database will be shared with other applications.*



11. The **Networking Options** dialog displays. Select the **Enable TCP/IP Networking** option. SAS Activity-Based Management communicates to databases using TCP/IP only. The default **Port Number** may be changed if necessary for your installation. Select the **Add Firewall exception for this port**. For Windows installations, this opens the specified port in the Microsoft firewall (if used) so MySQL will receive connection attempts made from other computers. If you use third-party firewalls or an antivirus program that includes a firewall, you will have to configure those firewalls to allow MySQL to receive connections yourself. Select **Enable Strict Mode**. Click **Next**.

Warning: Making this "exception" in Window's firewall opens a port on your computer. If your computer is connected to a network or the Internet, other computers will be able to connect to your MySQL server.



12. The **Default Character set** dialog displays. Select the **Best Support for Multilingualism** option. SAS Activity-Based Management requires a UTF-8 character set on the host database. Click **Next**.
13. If you are installing on a Windows computer, the **Windows Options** dialog displays. If you are running on UNIX, please proceed to the next step. Select the **Include Bin Directory...** option. Accept the other default selections. Click **Next**.



14. Enter a password for the `root` account. Select the **Enable root access from remote machines** option. Click **Next**.
15. Click **Execute**.

Note: You may receive a connection error dialog (Error Nr: 2003: Can't connect to the MySQL server on localhost [10061].) Retry until the condition clears.

If the configuration fails on the "Start Service" step on Windows, perform the following steps:

- a. At the Configuration Wizard prompt, click the **Back** button.
- b. On the previous screen, click the **Next** button.
- c. From a command prompt, enter:

```
net stop MySQL
sc delete MySQL
net start
```

This stops the MySQL service, deletes the service, and displays a list of active services so you can verify the MySQL service is not present.

- d. Click **Execute** again and the service should start successfully.

Installing MySQL GUI Tools

Install a version of the MySQL GUI Tools that is compatible with the MySQL database engine you installed. Please note that the required version of the database engine may differ between 32-bit and 64-bit versions of Windows or which version of UNIX your are using.

Configuring MySQL

JDBC Driver

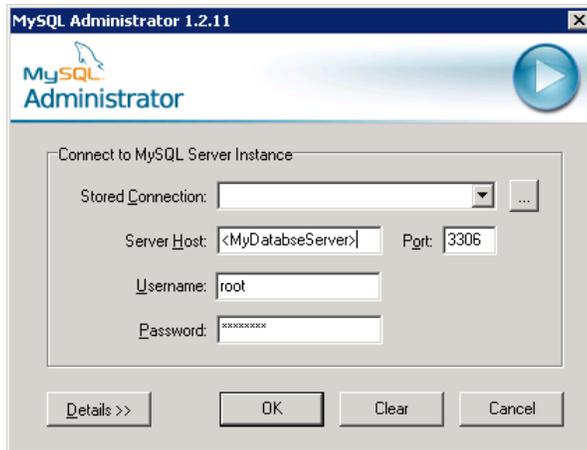
Simply copy or unzip as necessary the required Connector/J file to a suitable directory on the *Application Server*. No other installation or configuration steps are necessary.

Create the SAS Activity-Based Management Database and User

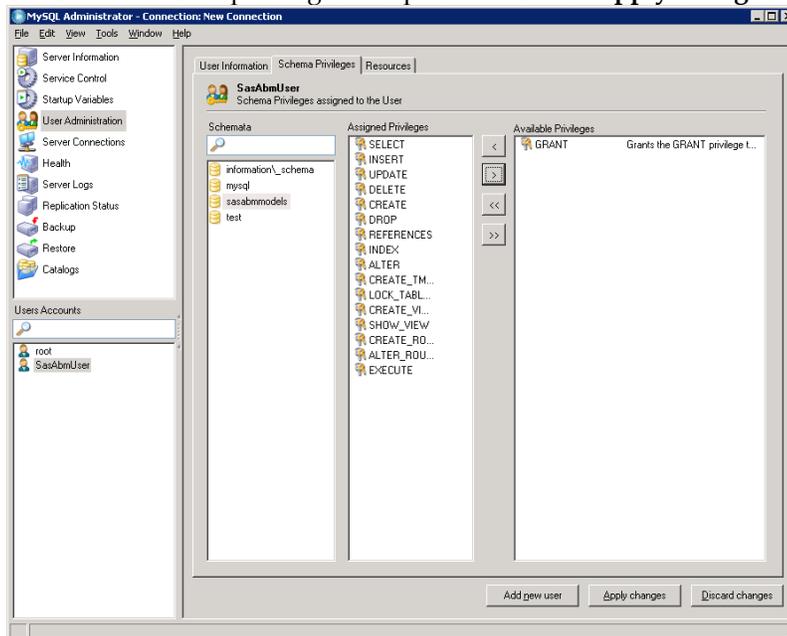
1. To secure your database, grant full control to `<InstallDrive>:\MySQL` and its subdirectories to Administrators only.
2. If other SAS solutions will share the MySQL instance, grant **READ**, **EXECUTE** and **MODIFY** access to the "Everyone" group for the `<InstallDrive>:\MySQL\bin` directory. After you finish the installation and configuration of SAS products, you will restrict the permissions. Make sure these permissions are inherited by the subdirectories and files.

Note: Step 2 is unnecessary if the MySQL database instance is to be used by SAS Activity-Based Management only.

3. Next, create the schema that SAS Activity-Based Management will store its data in. Select **All Programs**→**MySQL**→**MySQL Administrator** from the **Start** menu.
4. Enter the connection information for your MySQL database. Enter the name of the computer where you installed the MySQL database engine in the **Server Host** field. Enter **root** as the **Username** and the **Password** you provided earlier in the MySQL installation process. If you altered the default **Port** for MySQL, you will need to edit that value as well.



5. The MySQL Administrator displays. Select **Catalogs** from the left-hand pane. A new pane displays below the existing left-hand pane.
6. Right-click in open space in the bottom pane and choose **Create New Schema**. The **Create new Schema** dialog displays. Enter the schema name you want for SAS Activity-Based Management. SAS recommends **sasabmmodels**. Click **OK**.
7. Now create a user to access that database. In the top left-hand pane select **User Administration**. The right-hand pane displays user information.
8. Click **Add new user** at the bottom of the right-hand pane. Enter a database user name to access the **sasabmmodels** schema. SAS recommends **sasabmuser**. Enter a password. Enter any other user information that is important for your installation. Click **Apply changes**.
9. Select the **Schema Privileges** tab. Select **sasabmmodels** from the list of available schemas. Select all the listed privileges except **Grant**. Select **Apply changes**.



10. Exit the MySQL Administrator by selecting **File**→**Close**.

Troubleshooting

If you attempt to connect to this MySQL instance using a MySQL Administrator on another computer and it fails with the following message it is likely that you do not have the proper port open on the computer hosting the MySQL database engine.



Verify the port that your MySQL database installation is configured to use and update the database port information in the table in the previous chapter.

Appendix D – Third-Party Migration

The majority of SAS Activity-Based Management 6.x users are currently using either SAS OLAP 9.1.3 or Microsoft Analysis Services 2000 for cube creation. If you have already migrated to SQL Server Analysis Services 2005 as part of your SAS Activity-Based Management 6.4.2 upgrade, you may skip this entire Appendix.

Migrating from SAS OLAP Server 9.1.3

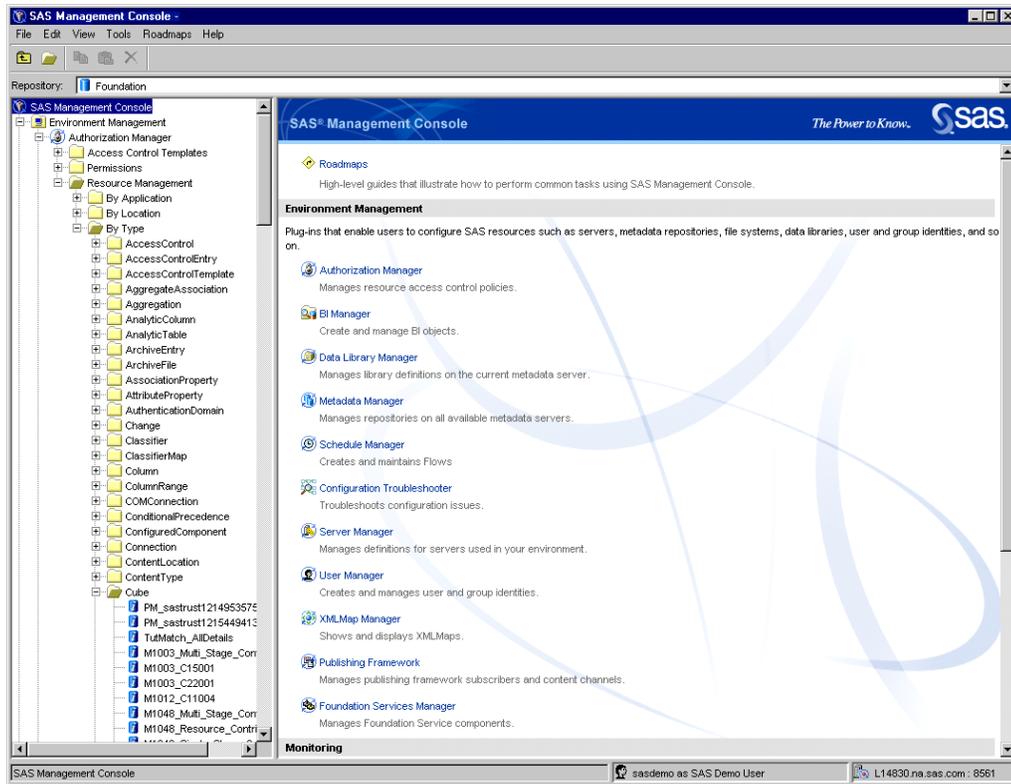
If you did not use SAS OLAP Server to build your cubes with SAS Activity-Based Management 6.x, you can skip this section.

When SAS Activity-Based Management built cubes with SAS OLAP Server 9.1.3, it created two types of data. The first is the operating system file representing the physical cubes themselves and the second is the metadata content about these cubes in the SAS Metadata Server.

Deleting SAS OLAP Metadata

The cubes and information maps created by the SAS OLAP Server are located in the 9.1.3 SAS Metadata Console with other cubes.

1. Open the 9.1.3 **SAS Metadata Console** application.
2. Select the **Foundation** repository on the **Repository:** droplist.
3. Expand the **Environment Management** folder.
4. Expand the **Authorization Manager** folder.
5. Expand the **Resource Management** folder.
6. Expand the **By Type** folder.
7. Expand the **Cube** folder.



8. All the cubes created by SAS Activity-Based Management will have a name of the form: MXXXX_<SomeName> where XXXX is a number between 1000 and 9999.
9. You should delete all these using the following steps: Open a Base SAS session by selecting **All Programs**→**SAS**→**SAS 9.2**.
10. Paste the following code into the Editor window. Replace the items in angle brackets with information applicable for your deployment. Select the **Submit** button to execute the code. Repeat for each SAS Activity-Based Management cube that is defined in your metadata.

```
PROC OLAP cube=<MyCubeName> DELETE;
METASVR host="<MyMetadataServer>" port=8561 protocol=bridge userid="<MyAdminUser>"
    pw="<MyAdminPassword>"
    repository="Foundation"
    olap_schema="<MyOlapSchemaName>";
RUN;
```

Where:

- <MyCubeName> is the name of each cube listed in the metadata server.
- <MyMetadataServer> is the name of the computer hosting your SAS metadata server.
- <MyAdmin...> is the administrative user name and password you provided to the SAS Activity-Based Management 6.x configuration utility.
- <MyOlapSchemaName> is the schema name you provided to the SAS Activity-Based Management 6.x configuration utility.

11. This process also deletes the physical cube, if it exists, so you may skip the next section.

Deleting SAS OLAP Cubes

The OLAP cubes are stored as files on the operating system. Simply deleting the files will delete the cubes. The cubes are stored in the directory you specified when you selected the SAS OLAP Server in the SAS Activity-Based Management 6.x **Server Configuration** utility.

Rebuilding SAS OLAP Cubes

After completing the SAS Activity-Based Management installation you may rebuild the SAS OLAP Server cubes using SAS Activity-Based Management 7.1.

Migrating from SQL Server 2000

SAS recommends that users who want to upgrade to a newer version of SQL Server and who must do this with a single database computer follow the following steps:

- Backup you existing SQL Server data
- Detach the databases to be migrated and save the generated tables
- Uninstall the existing SQL Server version
- Install the new SQL Server version
- Re-attach the saved tables
- Update your 6.x databases to the 7.1 format/schema (see Chapter 8)

This procedure is documented at Microsoft's website at: <http://support.microsoft.com/kb/224071>.

Tip: Before installing the new version of SQL Server SAS recommends that a new operating system disk image be installed with the latest service packs. This ensures the smoothest possible migration.

Migrating From Microsoft Analysis Services 2000

Based on tests at SAS, Microsoft's tool for migrating Microsoft Analysis Services 2000 (MSAS) cubes to a Microsoft SQL Server Analysis Services 2005/2008 (SSAS) OLAP server may encounter numerous problems from which there is no recovery. Since the time spent on this process is very large (processing the cubes on MSAS 2000, migrating the cubes to SSAS 2005/2008, and then reprocessing the cubes on SSAS) and may not be successful, SAS does not recommend this and **does not** support the Microsoft cube migration process for SAS Activity-Based Management.

In order to leave the existing MSAS 2000 cubes on the SAS Activity-Based Management 6.x database and not migrate them to SSAS 2005/2008, you do not need to perform any additional steps. The steps outlined in the previous section "Migrating from SQL Server 2000" will only migrate the SAS Activity-Based Management model data – not any of the Microsoft cubes. If you installed a "clean" version of SSAS 2005/2008 for use by SAS Activity-Based Management 7.1, it will not have any of your old cubes present.

SAS recommends that the MSAS 2000 cubes not be migrated to SSAS; instead they should be rebuilt natively in the SSAS environment using SAS Activity-Based Management 7.1.

If your installation of SAS Activity-Based Management contains a large number of cubes or a small number of very large cubes, you may find that they exceed the capacity of a 32 bit version of SSAS –

even though they fit comfortably in a 32 bit version of MSAS. There are at least three steps to take to mitigate this problem:

- Enable the Microsoft “3GB mode”
- Optimize the configuration settings of your SSAS instance
- Use a 64 bit version of SSAS

The first step, enabling the “3GB mode” may be necessary because it appears that SSAS uses system memory resources less efficiently than MSAS. Enabling the “3GB mode” increases the system memory available to SSAS from 2GB to 3GB. In situations where SSAS is managing many cubes or large cubes, enabling this option often increases performance and capacity.

Secondly, optimizing your SSAS settings may also be necessary. When installed, SSAS uses default settings for how much memory to reserve for its use, how it performs aggregations, etc. Many of these settings can be customized to increase performance or capacity on your particular hardware configuration.

Finally, switching to a 64 bit version of SSAS (and SQL Server as well) that runs on a 64 bit operating system may also improve performance. This happens because 64 bit applications can access more than the 4GB of memory that limits 32 bit applications. Please be aware however, that simply installing a 64 bit version of the software on your existing hardware might not produce noticeable performance or capacity gains. This happens because both 32 and 64 bit version of SSAS initialize many settings based upon your hardware configuration. Without any custom configuration, both versions may create the same default settings that produce identical, or nearly so, behavior on the same hardware.

For more information on all these topics, please refer to the Microsoft document *SQL Server 2005 Analysis Services Performance Guide* at <http://download.microsoft.com/download/8/5/e/85eea4fa-b3bb-4426-97d0-7f7151b2011c/SSAS2005PerfGuide.doc> and *SQL Server 2008 Analysis Services Performance Guide* at <http://msdn.microsoft.com/en-us/library/dd542635.aspx>. The chapter “Increasing Available Memory” is particularly useful.

Migrating Cubes

At this point in the migration process, you have cleaned up the physical cubes and, if using SAS OLAP, any of the metadata for those cubes as well.

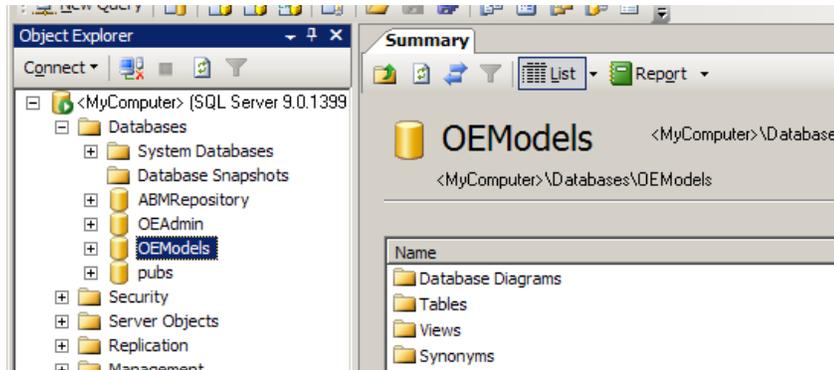
However, SAS Activity-Based Management also stores a small amount of data about the cubes as well so it can display which cubes are available for viewing. This data also needs to be removed. Unfortunately, this step is not performed automatically as part of the database upgrade process in Chapter 8. Instead, you must manually run two queries from your database management application.

Tip: When you re-create your cubes using SAS Activity-Based Management 7.1, your saved OLAP Views will automatically access the new cubes.

Microsoft SQL Server 2000

1. Launch the **SQL Server Management Studio** application from the **Start** menu.
2. Log in using your SAS Activity-Based Management database credentials. Make sure that the **Server type** option is set to **Database engine**. The log in user can be the SQL Server database user you created for SAS Activity-Based Management 6.x to access the database.

- Expand the root folder. Expand the **Databases** folder as well.
- Select the OEModels folder or the folder representing the name you gave the SAS Activity-Based Management 6.x models database.



- Right-click the OEModels folder and select **New Query**. The right-hand side of the **SQL Server Management Studio** application becomes a query entry window.
- Paste the following two queries into the query window and select the **Execute** button on the toolbar or **Query** menu:

```
delete from WorkspaceNode where Objectid in (select id from
WorkspaceObject where Type = 34);
delete from WorkspaceObject where Type = 34;
```

- Close the **SQL Server Management Studio** application. You do not need to save the temporary queries you entered.

Oracle 10g

- There are several Oracle tools you can use to execute the queries. These instructions represent one possible way. Launch the **Oracle SQL Developer** application.
- Either expand the proper connection in the left-hand pane, if you have already one to your SAS Activity-Based Management 6.x models schema, or create a new connection if necessary. Once you have a proper connection opened, the top-right pane in the **Oracle SQL Developer** application is the query window.
- Paste the following two queries into the query window and select the **Run script** button on the toolbar:

```
delete from WorkspaceNode where Objectid in (select id from
WorkspaceObject where Type = 3
delete from WorkspaceObject where Type = 34
```

- Close the **Oracle SQL Developer** application.

Appendix E – Debug Configuration Guide

This appendix deals with changing logging properties. This is an advanced topic and is typically used with the guidance of SAS Technical Support to monitor your SAS Activity-Based Management installation.

Logging

SAS Activity-Based Management 7.1 provides logging for the server applications as well as the server diagnostic.

Server Logging

The web logging is controlled by the **SASActivityBasedManagement-log4j.xml** file in the configuration directory you chose.

Windows: <CONFIGHOME>\Web\Common\LogConfig

UNIX: <CONFIGHOME>/Web/Common/LogConfig

The log named **SASActivityBasedManagement7.1.log** resides in the configuration directory you chose.

Windows: <CONFIGHOME>\Web\Logs

UNIX: <CONFIGHOME>/Web/Logs

“Out of Process” Logging

The SAS Activity-Based Management operations that execute outside the application server’s JVM (model import, model export, and calculation/cube generation) create log files. Logging is controlled by the **AbmOutProcOperationLog4j.properties** file located at:

Windows: <CONFIGHOME>\Applications\SASActivityBasedManagement7.1\config

UNIX: <CONFIGHOME>/Applications/SASActivityBasedManagement7.1/config

The log file that is produced is named <TypeOfOperation>_GUID.log, where <TypeOfOperation> is **DataImport**, **DataExport**, and **Algo** for import, export, and calculation/cube generation respectively. The GUID is a unique ID generated internally to identify each instance of an operation.

Server Diagnostic Logging

The server diagnostic logging is controlled by the **log4j.properties** file located in the directory:

Windows: <SASHOME>\SASActivityBasedManagementServer\7.1\diagnostic

UNIX: <SASHOME>/SASActivityBasedManagementServer/7.1/diagnostic

It is initially set to warn. The log will go into the same directory and be named **sas.solutions.abm.server.diagnostic.log**.

If you are a Windows Vista user, you will need to change the `log4j.appender.file.File` parameter to include a directory outside of the Program Files directory. Update the line:

```
log4j.appender.file.File=C:\<MyDirectory>\sas.solutions.abm.server.diagnostics.log
```




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