AIMMS 4

Release Notes for Win32 Build 4.2

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Contents

Chapter 1

System Requirements

This chapter discusses the system requirements necessary to run the various components of your Win32 Aimms 4 system successfully. When a particular requirement involves the installation of additional system software components, or an update thereof, the (optional) installation of such components will be part of the Aimms installation procedure.

System requirements

1.1 Hardware and operating system requirements

The following list provides the minimum hardware requirements to run your Aimms 4 system.

Hardware requirements

- 1.6 Ghz or higher x86 or x64 processor
- XGA display adapter and monitor
- 1 Gb RAM
- 1 Gb free disk space

Note, however, that performance depends on model size and type and can vary. It can also be affected by the number of other applications that are running concurrently with Aimms. In cases of a (regular) performance drop of either Aimms or other applications you are advised to install sufficiently additional RAM. If you are exceeding the limits of x86, you are advised to move to x64.

The Win32 version of Aimms 4 is designed to run under

Supported Windows versions

- Windows Vista,
- Windows 7,
- Windows 8,
- Windows Server 2008, and
- Windows Server 2012.

Running the Win32 version of AIMMS 4 versions under the 32-bit Windows versions 95/98/ME/2000/NT 4.0/XP is not supported.

1.2 ODBC and OLE DB database connectivity issues

Before you can start using the database connectivity features built into the Win32 version of AIMMS, the following ODBC and OLE DB components need to be installed on your computer:

Database connectivity

- the Microsoft Data Access Components (MDAC) version 2.5 or higher, and
- an ODBC driver for each database from which you wish to retrieve data from within your modeling application through ODBC.
- an OLE DB provider for each database from which you wish to retrieve data from within your modeling application through OLE DB.

This section discusses the compatibility issues between the various available ODBC and OLE DB components and AIMMS 4.

The MDAC components, as well as the Microsoft ODBC Jet drivers (which allow you to connect to, for instance, Microsoft Access databases), and OLE DB providers for the most commonly used databases, are available through the Microsoft web site. Please note that early versions of the Data Access Components (or of the OBDC Jet drivers) may exhibit problems that prevent AIMMS 4 from successfully connecting to certain databases. If you are using the ODBC connection layer, you are therefore strongly advised to install the latest version of the Microsoft Data Access Components.

Microsoft Data Access Components

After you have downloaded the AIMMS 4 installation executable from the AIMMS web site www.aimms.com, you can download the installation executable for the latest Microsoft Data Access Components from the Microsoft web site www.microsoft.com.

Data Access Components installation

If your model needs to retrieve data from an Oracle database, the following information may be relevant to you. The Oracle provided ODBC drivers for Oracle version 7 only support ODBC version 2.0. If you are using Oracle version 7, you should therefore use the Oracle ODBC driver that is distributed with the Microsoft Data Access Components. The Oracle provided ODBC drivers for Oracle versions 8 and higher support OBDC version 3.0, and can therefore use the ODBC 3.0 connection layer. Oracle versions 8 and higher also provides a native OLE DB provider. You can download the installation executables of the most recent version of the ODBC drivers and OLE DB providers for Oracle 8 and higher from the Oracle web site www.oracle.com.

Oracle ODBC drivers and OLE DB providers

We discourage the use of the ODBC drivers and OLE DB providers for Oracle that are distributed with the Microsoft Data Access Components, as these drivers only support a subset of the functionality provided by the native Oracle drivers. In addition, in our internal tests, they appear to have issues with certain ODBC/OLE DB functionalities that are used by AIMMS.

Prefer native Oracle over MDAC drivers

If you are using OLE DB for database connectivity, the following issues apply:

OLE DB issues

- Access stored procedures cannot be called (yet) with the Jet 4.0 OLE DB provider. There is no work around either. Try to replace stored procedures by an AIMMS `DATABASE PROCEDURE`. Access queries, which are not marked as 'stored procedure' by Access, are perfectly well possible through the AIMMS `DATABASE PROCEDURE`.
- Oracle's own OLE DB provider for Oracle generally performs better than Microsoft's OLE DB provider for Oracle.
- Using `long` column types (such as `text` or `ntext`) with SQL Server, may reduce your application's performance dramatically. Therefore (and because those column types hardly make sense in an AIMMS context), try not to use them. If you feel you really need them, it may be a wise choice to specify an ODBC data source for the database tables that contain these columns.
- Using the OLE DB provider for ODBC may result in errors. Try to use the database manufacturers' own OLE DB provider as much as possible to get better performance and more stable behavior.

As AIMMS 3.14 and higher don't offer separate ASCII and Unicode versions anymore, it's important to work with the latest versions of the various ODBC drivers/OLE DB providers for your particular database. Specifically, in order to read and write multi-byte characters from and to MySQL databases, you have to make sure that you are using the Unicode version of MySQL's ODBC driver (i.e. the one without 'ansi' in its installer name, and with 'w' or 'unicode' in it's actual driver name). For SQLite databases, next to using the latest ODBC driver, make sure that you are using the latest version of the database engine itself in order to use multi-byte characters.

Unicode/UTF8 requirements

1.3 Viewing help files and documentation

The AIMMS User's Guide, the AIMMS Language Reference, the AIMMS Function Reference, and the AIMMS book on Optimization Modeling are available online as Adobe Portable Document Format (PDF) files. In order to view or print PDF documents, Adobe Acrobat Reader version 4.0 or higher needs to be installed on your computer.

AIMMS *documentation*

After you have downloaded the Aimms 4 installation executable from the Aimms web site www.aimms.com, you can download the Acrobat Reader installation executable from the Adobe web site www.adobe.com.

Acrobat Reader installation

Chapter 2

Installation Instructions

This chapter discusses all relevant issues related to the setup of AIMMS on your computer. To install AIMMS on your computer, you can download the setup program for the latest release of AIMMS from the download area of our web site, and run it from your hard disk. Note that in order to run AIMMS properly, AIMMS may require some specific third-party library versions to be installed (e.g. Microsoft Visual Studio runtime library, Microsoft .NET Framework). In the rest of this text, these libraries are called the prerequisites for running AIMMS.

Installation instructions

2.1 Installation instructions

The download area of our web site www.aimms.com provides the AIMMS setup program of the latest AIMMS releases. If you have selected the AIMMS setup program that you want to install, the corresponding prerequisites are included as well.

Obtaining AIMMS from the web

The AIMMS setup program will guide you through the various steps that are necessary to successfully install AIMMS on your computer. The AIMMS setup program requires some prerequisites to be installed. When you install AIMMS from a downloaded package file, the AIMMS setup program automatically takes care of of installing the prerequisites.

The AIMMS setup program

Certain parts of the setup of AIMMS may require administrative privileges. More specifically, you will need administrative privileges for

Administrative privileges required

- the installation of, or updates to, any system components which access areas of the Windows registry in which you have no write access, or which write to the Windows system directory, if write access to that directory has been restricted, and
- the creation of writable directories in the common application directory on your computer where AIMMS will store its license configuration and any files associated with your AIMMS system, if write access to the common application area of your computer has been restricted.

2.2 Solver availability per platform

In Table 2.1 you can find an overview of the solvers that are installed during an AIMMS installation on the several platforms on which AIMMS is supported. Note that it depends on your license whether you can use these solvers.

Solvers in installation

Solver	Version	Win 32	Win 64	Linux 64
AOA		√	√	√
BARON	7.5.3	√	-	-
BARON	12	√	√	-
CBC	2.7.5	√	√	√
CBC	2.8.0	√	√	√
CONOPT	2.071 C	√	-	-
	3.11 B	√	-	-
	3.14 A	√	-	-
	3.14 G	√	-	-
	3.14 M	-	√	-
	3.14 Q	-	-	√
	3.14 V	√	√	√
CPLEX	10.1	√	√	√
	11.2	√	√	√
	12.1	√	√	√
	12.3	√	√	√
	12.4	√	√	√
	12.5	√	√	√
	12.5.1	√	√	√
	12.6	√	√	√
CPOPT	12.2	√	√	√
	12.4	√	√	√
	12.5	√	√	√
	12.6	√	√	√
GUROBI	4.6	√	√	√
	5.0	√	√	√
	5.1	√	√	√
	5.5	√	√	√
	5.6	√	√	√
IPOPT	3.11	√	√	√
KNITRO	6.0	√	√	√
	7.0	√	√	√
	8.0	√	√	√
	8.1	√	√	√
	9.0	√	√	√
MINOS		√	√	√
PATH	4.4a	√	-	-
	4.6	√	-	-
SNOPT	6.1	√	√	√
	7.2	√	√	√
XA	13	√	-	-
	14	√	√	√
	15	√	√	√

Table 2.1: Solvers included in the several types of AIMMS installations

Please note that the following solvers require a computer with a CPU that supports the SSE2 instruction set: GUROBI, CPLEX 12.2 or higher, and CPOPT 12.2 or higher.

SSE2

CBC and IPOPT are open source solvers made available in the Aimms distributable as solver DLL and through COIN-OR (www.coin-or.org) as solver DLL and in source code format. Please check the 'OS Solvers' section in the License Agreement before using these open source solvers with Aimms.

Open Source Solvers

2.3   Aimms licensing

Aimms offers the following two types of licenses:

Aimms *licensing*

- single-user licenses, and
- network licenses.

Each of these two types of licenses are protected in a different manner.

Single-user licenses can be used by a single user on a single computer. To enforce the single-user character, Aimms 4.0 requires that single-user licenses be protected by a nodelock file, which must be activated to match the hardware characteristic of your computer.

Single-user license protection

Nodelock files are stored on the harddisk of your computer, and are, therefore, much less vulnerable to loss. Only if you computer is stolen, or in case of a harddisk crash, you must contact AIMMS before being able to activate your nodelock on a replacement computer. In addition, you need access to the internet to activate or deactivate a nodelock.

Nodelocks

If you have ordered an Aimms network license, no license protection needs to be installed locally on your computer. Instead, you need the host name and port number of the server running the Aimms network license server. For more information about installing the network license server itself, please refer to the documentation of the Aimms network license server.

Network licenses

2.3.1   Personal and machine nodelocks

Aimms offers two types of nodelocks:

Two types of nodelocks

- personal nodelocks, and
- machine nodelocks.

If you choose for nodelock protection you are free to choose between a personal or a machine type of nodelock. In this section you will find the characteristics of both types of nodelocks. If you are unsure which type of nodelock

to choose, we recommend that you start with a personal nodelock, as you can change a personal nodelock into a machine nodelock at any time, but not the other way around.

Personal nodelocks are intended for use by a single AIMMS user, who still wishes to have the freedom to use AIMMS on multiple computers, for instance if you want to easily switch between your desktop computer at work, a notebook computer and your home computer. Personal nodelocks have the following characteristics:

Personal nodelock

- Personal nodelocks can be transferred to another computer 3 times per 24 hours. This allows you to take your AIMMS license home in the evening and back to work the next morning without any problems.
- Personal nodelocks have a limited lifetime of 60 days, and should be renewed within that period to extend the lifetime to its full 60-day period. If the nodelock is not renewed within its 60-day lifetime, this does not invalidate your AIMMS license in any way—you only have to renew your nodelock prior to being able to use your AIMMS system again. Note that the renewal process does not require any manual intervention, as AIMMS will try to automatically connect to our internet license database to renew your nodelock once every day you are using AIMMS.
- Both activation and nodelock renewal of personal nodelocks require a working connection to the internet. As a consequence, in the absence of an internet connection you can continue to work uninterrupted for a period of 60 days, before an internet connection is required to renew your nodelock.
- With every activation or nodelock renewal AIMMS will also update your license files if new license files are available (e.g. if your system is in maintenance), and will inform you of any messages that are available for you in our database.
- Because of their volatile nature, AIMMS will replace a personal nodelock without any questions asked in case of loss of or damage to your computer.
- You can switch your personal nodelock to a machine nodelock at any time.

Machine nodelocks are intended for permanent use on a single computer. They are recommended for server applications, and can also be used for personal use if you are sure you will be using AIMMS on a single computer, or do not have internet access. Machine nodelocks have the following characteristics:

Machine nodelock

- Machine nodelocks can be transferred to a replacement computer 3 times per 365 days.
- Machine nodelocks have an unlimited lifetime (unless deactivated).
- Machine nodelocks can be either activated online if your computer is connected to the internet, or offline through the license activation area on the AIMMS website.

- License files will only be retrieved when the machine nodelock is activated, or by explicit request.
- In case of failure, AIMMS will, in principle, only replace machine node-locks on the same computer.
- Once you have chosen for a machine nodelock, it is not possible to switch back to a personal nodelock.

Although a personal nodelock and the software version check on the start page make a regular connection to the internet (the personal nodelock connects to a license database for nodelock renewal and the version check connects to a version database), we do respect your privacy and will not register patterns in your personal usage of the AIMMS software in any way. During activation no personal information will be transferred, only your computer name and some of its hardware characteristics. During deactivation we register the date and time of deactivation to enforce the transfer limit.

Privacy

The connection to our internet license database is implemented as a web service. Thus, if you are able to browse the web, you should also have no trouble activating an AIMMS nodelock. If your computer connects to the internet through a proxy server, AIMMS by default tries to detect and use the proxy settings also used by Microsoft Internet Explorer.

Internet connection and proxy settings

It should be noted that the use of auto-configuration scripts in determining the proxy server will fail if these use any other scripting language than Javascript. This is due to the libraries underlying the SOAP library used by AIMMS to connect to our license server. If you are in this situation, you should manually configure the proxy settings, as described below.

Automatic configuration scripts

If AIMMS does not succeed in automatically detecting the proxy settings that apply in your network environment, AIMMS also allows you to manually set the proxy settings during the activation process. If the online activation process does not succeed directly, AIMMS gives you the option to either continue with an offline activation process, or to manually supply the proxy settings that apply to your network environment through the dialog box illustrated in Figure 2.1. In this dialog box you can choose between

Manual proxy setting

- the *Current User* settings also used by Microsoft Internet Explorer (default),
- the `Local Machine` settings which are stored in the registry, if these are available on your machine, or
- *Custom* proxy settings that you have received from your IT department.

In the latter case, you can also (optionally) provide a user name and password to authenticate with the proxy server. In most cases, however, setting these will not be necessary, and Windows authentication will be sufficient.
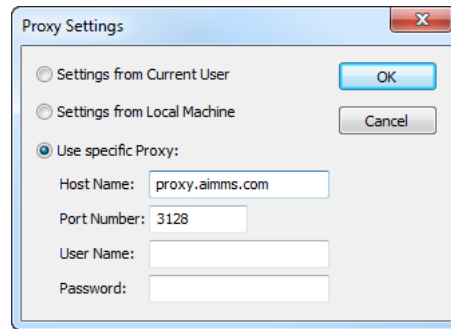
Figure 2.1: The Aimms **Proxy Configuration** dialog box

2.3.2 Installing an Aimms license

When you start up Aimms 4.0 for the first time after installation, Aimms will open the **License Configuration** dialog box illustrated in Figure 2.2. Through

Managing your Aimms licenses
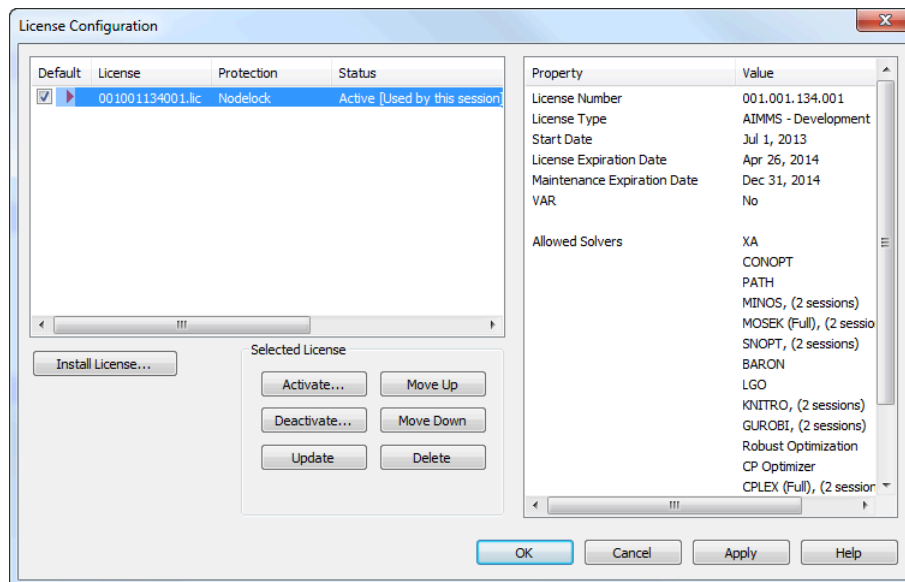
Figure 2.2: The **License Configuration** dialog box

this dialog box you can install new Aimms licenses and manage all Aimms licenses that already have been installed on your computer.

To install a new license, press the **Install License ...** button in the **License Configuration** dialog box. This will start a wizard, that will guide you through

Installing a new license

the license installation procedure step by step. The wizard can help you to install

- existing AIMMS licenses,
- nodelocked licenses,
- network licenses,
- evaluation licenses, and
- student licenses.

To successfully complete the installation of licenses of each type, you should make sure to have the following information available.

To install a single-user AIMMS license that is protected by a nodelock, you need the following information:

Single-user nodelocked licenses

- your AIMMS license number, and
- the associated activation code that you received from AIMMS.

You have the choice to request a personal nodelock or a machine nodelock. A personal nodelock must be requested online, a machine nodelock can be requested online or offline. Refer to Section 2.3.1 for a more detailed introduction to personal and machine nodelocks.

To install an AIMMS network license, you need the following information from your system administrator:

Network licenses

- the name of the AIMMS network license server,
- the port number of the AIMMS network license server, and
- the name of the license profile to which you want to connect (optional).

To install an AIMMS evaluation license you need the following information

Evaluation licenses

- your AIMMS evaluation license number, and
- the associated activation code that you received from AIMMS when requesting an evaluation license.

You must have a working connection to the internet (not necessarily on the machine on which you installed AIMMS) to activate an evaluation license. Evaluation licenses expire 30 days after activation. Note that each evaluation license can be activated only once, and that you can only activate a single evaluation license per AIMMS release on a specific computer, regardless of the number of evaluation licenses you have requested on our web site.

To install an AIMMS student license you need the following information:

Student licenses

- your AIMMS student license number, and
- the associated activation code that you received from the university that purchased the AIMMS Educational Package.

You must have a working connection to the internet to activate a student license. Student licenses expire one month after the end of the current academic year. Student licenses can be activated multiple times.

2.3.3 Managing AIMMS licenses

AIMMS allows you to have multiple AIMMS licenses installed on your computer. You may have multiple licenses installed, for instance, for the following reasons:

Managing multiple AIMMS licenses

- you have requested a trial license for a new AIMMS version which you want to run next to your existing license,
- you have temporarily borrowed or hired an AIMMS license with more capabilities than your regular license,
- your system administrator has created multiple network license profiles, each of which you may want to use to run AIMMS.

In this section we will describe how you can instruct AIMMS which license to use.

In the **License Configuration** dialog box displayed in Figure 2.2, all AIMMS licenses installed on your machine will be displayed in the left pane of the dialog box. The license details of each license are displayed in the right pane of the dialog box. During startup AIMMS will consider all licenses in the left pane of the **License Configuration** dialog box which have the **Default** column checked, and will use the first valid license it finds starting from top to bottom. Using the **Move Up** and **Move Down** buttons you can change the order in which AIMMS will search the list.

Default licenses

Both personal and machine nodelocks can be transferred to other computers. Personal nodelocks can be transferred upto three times a day, allowing you to take your license with you wherever you want. Machine nodelocks can be transferred three times per year, to a computer replacing the computer on which the nodelock is currently installed. To transfer a nodelocked license, you must

Transferring licenses

- deactivate the nodelock on the currently active computer, and
- activate it on the computer to which you want to transfer the license.

You can deactivate an active nodelock using the **Deactivate** button in the **License Configuration** dialog box. Deactivation will only succeed if there is no conflict with the transfer limit for the given nodelock type. This makes sure that there will never be a problem activating a deactivated license. After successful deactivation the license will not be removed from the list but be marked as inactive. If the license is not active on any computer, you can reactivate the license through the **Activate** button.

In case you want to activate a nodelock on a computer, but have forgotten to deactivate the nodelock on a computer to which you currently have no access, AIMMS allows you, as a courtesy, to request an emergency nodelock 3 times per 365 days. Emergency nodelocks have a lifetime of 7 days, and during this time you can arrange for someone to deactivate the license on the computer containing the active nodelock. During the activation sequence, AIMMS will automatically ask whether you would like to receive an emergency nodelock when it discovers that the license is active on another computer.

Emergency nodelocks

2.3.4 Location of license files

AIMMS keeps its license and configuration files in the folder

    AIMMS

of the common application area of your computer. On Windows Vista, Windows 7 and Windows 8, this folder is located under `C:\ProgramData`. The `AIMMS` folder contains five subfolders

Location of license files

- `Config`, containing the license and solver configuration files,
- `Licenses`, containing all license files,
- `Nodelocks`, containing all nodelock files installed on your computer,
- `ApplicationKeys`, containing any private/public key pairs that you have generated, and
- `AnyUser`, containing the license configuration files for all users on your computer (see below).

The AIMMS installation makes sure that these subfolders are writable for everyone, allowing you to install and uninstall licenses on your computer.

To prevent tampering with nodelocked licenses, AIMMS keeps track of the location of the nodelock files associated with a license. You should, therefore, not manually move or copy the AIMMS nodelock files as this may invalidate your nodelock.

Do not move nodelock files

You can specify whether the license and solver configuration that AIMMS uses is the same for any user of the machine, or different for each individual user. To prevent problems when running AIMMS as part of a computer service, AIMMS will by default use the same configuration for any user. To modify this behavior, you should edit the file `UserDistinction.cfg` in the common `Config` folder. In the file `UserDistinction.cfg.default`, straightforward directions are given on how to edit it. If no `UserDistinction.cfg` file exists, AIMMS will use the `UserDistinction.cfg.default` file instead. You can use this file as a base for setting up your own configuration.

User specific configuration

In the scenario where all users of the same pc use the same license and solver configuration, the configurations that are modified by a user are stored in the `AnyUser` folder of the `Common` folder.

Any User

In the scenario where each specific user of the pc has its own license and solver configuration, the configurations that are modified by a user are stored in the local application data folder. On Windows Vista, Windows 7 and Windows 8 it is:

Current User

> `C:\Users\<UserName>\AppData\Roaming\AIMMS`

If you have already used AIMMS 3 on your machine, these folders don't end in `AIMMS`, but (still) in `Paragon Decision Technology`.

When AIMMS needs to read the current configuration, it will first look in the (any)user folder as specified by the aforementioned `UserDistinction.cfg` file; if it cannot be found there, it will try to read the configuration from the common application data folder. When saving a modified configuration, AIMMS always writes to the (any)user folder.

Accessing configuration files

Inside the `Config` folder of the (any)user folder, each major AIMMS version (3.6, 3.7, 3.8, ..., 4.0 etc.) will create its own specific subfolder when it needs to write a configuration file. During an attempt to read, AIMMS will first look for the specific file in the folder that matches its own major version number, and otherwise it will subsequently search through the folders of previous versions. In other words, when you upgrade to a new AIMMS version, initially your configuration will be the same as the one you were using for the previous AIMMS version, but if you change something in the configuration, this will only affect the configuration of the AIMMS version you are working with.

Version dependent configurations

If you are using an AIMMS Network License, then your local machine does not need to have any license file installed. The only required file is the license configuration file, that contains the info of where the License Server is located on your LAN. When logging on to the License Server, the licensing info is sent directly from the server to the running AIMMS session, except for some secondary license related files:

Network License Client Files

- the `.SLV` file (containing the default solver configuration), and
- the `.CPX` file (the *CPLEX* license file).

These secondary license files are temporarily copied to the folder `NetworkCache` which is located in the (any)user folder as described above.

You can specify a project dependent solver configuration by placing a solver configuration file with the name 'solvers.slv' in the project directory. AIMMS will first look for this file and if it cannot find it will look for other solver configuration files. See the AIMMS Help for more information.

Project dependent configuration

2.4 OpenSSL license

The separate *RPC* installation file, which you can download in addition to the main AIMMS software, contains the OpenSSL and SSLeay libraries to provide the HTTPS transport for AIMMS web services. The following licenses apply to OpenSSL and SSLeay.

OpenSSL included - in separate RPC installation only

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OpenSSL license

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Chapter 3

Project Conversion Instructions

From time to time the introduction of new features, or modifications to existing features require that your AIMMS projects need a conversion step when you upgrade to a new AIMMS version. Whenever such a conversion is necessary, the conversion steps will be discussed in this chapter.

Project conversion

3.1 Conversion of projects developed in AIMMS 3.13 and before

AIMMS 3.13 and previous releases came in two flavors: a single- and a double-byte flavor for handling strings and file IO. These flavors were also called the ASCII and Unicode flavors of AIMMS. The ASCII flavor was targeted at locales where an ASCII based code page was customary, such as the Americas and Europe. The Unicode flavor was targeted at locales where Unicode was customary to handle a large number of characters, such as Asia. The important distinction between the two flavors was the character encoding used for files. Character encodings are briefly explained on Page 18 in the Language Reference. Making this distinction between the flavors, led to the following problems:

Unifying AIMMS *flavors*

- A first problem was that converting a project from one flavor to the other was cumbersome.
- A second problem was that on the Linux platform, only the ASCII flavor was available.
- A third problem was that exchanging of files between projects of different flavors was cumbersome.
- A fourth problem was that the input of two files with different (but ASCII-based) encodings was very cumbersome.

AIMMS 3.14 and higher are designed to overcome these problems by no longer making a distinction between the ASCII and Unicode flavor of AIMMS, by allowing Unicode input on Linux, and by selecting character encodings on a per file basis.

In order to convert AIMMS projects developed by either of the flavors of AIMMS 3.13 and older, such that the converted project will operate similar to the original one, AIMMS 3.14 and higher will set a variety of options in the converted project. These option settings are conservative; they are geared towards compatibility and not towards the use of UTF8. UTF8 is the encoding preferred for the exchange of files between different locales. In order to take advantage of the encoding capabilities of AIMMS 3.14 and higher, and the ease offered by the UTF8 encoding for the exchange of files between different locales, these option settings warrant some consideration:

Option settings created during conversion

- **aim_character_encoding** Input (`.aim`) files are both read in and written out using this encoding. It will be set based on your current locale. We suggest to convert your `.aim` files, if any, to UTF8 and then reset this option to UTF8.
- **ascii_case_character_encoding** The encoding used to decode strings in case files created by the ASCII flavor of AIMMS 3.13 and older. It will be set based on your current locale. We suggest to keep this option as set, as new case files are marked as using UTF8 encoding and thus immune against any change of locale.
- **default_input_character_encoding** The encoding used by the statement `read from file` and other statements that input text files, except for `.aim` files. It will be set based on your current locale. The best setting of this option depends on the developments in the deployment environment. We suggest to switch to using UTF8 encoding for the exchange of files. Note that a `FILE` has an encoding attribute that permits the selection of encoding to be used on a per file basis.
- **default_output_character_encoding** The encoding used during the statements PUT and `write to file` and other statements that output text files, except for `.aim` files. It will be set based on your current locale for converted ASCII projects and to UTF-16LE for converted Unicode projects. The best setting of this option depends on the developments in the deployment environment. We suggest to switch to using UTF8 encoding for the exchange of files. Note that a `FILE` has an encoding attribute that permits the selection of encoding to be used on a per file basis.
- **external_string_character_encoding** The encoding used to pass string parameters in external function calls. It will be set to the current locale for converted ASCII projects and to UTF-16LE for converted Unicode projects.
- **external_dll_aimms_reference** This option is an indicator whether string communication of existing external libraries linked against libaimms.dll of AIMMS 3.13 is based on `char` or `wchar_t` characters.

Note that when a file has a byte order mark at the beginning, this byte order mark overrides the encoding used.

AIMMS 3.14 and higher support both the multi-byte API, whereby the API functions are suffixed with an A, and the wide char API, whereby the API functions are suffixed with a W. See also the Language Reference, page . For external functions and procedures calling back to AIMMS, which C++ character type is used, can be indicated by the option `external_dll_aimms_reference`. Otherwise, this needs to be indicated by rebuilding your executable. In other words, we have the following situation:

External executable building not converted

- Existing executables (`.exe` files), linked against `libaimms.dll`, will need to be rebuilt, with linking against `libaimms3.dll`.
- Existing dynamic link libraries (`.dll` files), linked against `libaimms.dll` can be reused by AIMMS 3.14 and higher; you do not need to adapt your external libraries. However, if you do adapt the source code of your library and want to rebuild it, you will now need to link it against `libaimms3.dll`.

3.2 Conversion of AIMMS 3 projects to AIMMS 4

The most important changes in AIMMS 4.0 compared to AIMMS 3.x are:

Changes in AIMMS 4.0

- The main entry point to your project is a `.aimms` file (instead of a `.prj` file)
- There is a strict separation between a "developer project" and an "end user project".
- In a developer project, (almost) all files that define the project are saved in a readable text based format.
- Creating an end-user project, is an explicit step from within the developer project.
- VAR licensing no longer exists.
- Existing AIMMS 3.x projects must be converted first.

Below these changes are described in more detail.

In AIMMS 4 you open a project by selecting a `.aimms` file. This file contains references to the location of the main project (comparable to the `.prj` file in AIMMS 3), and all libraries that make up your project (the `.libprj` files in AIMMS 3). The main project is now located in a separate sub folder of the folder where the `.aimms` file is located. So the structure and location of the main project is now comparable to the library projects.

.aimms instead of .prj

In AIMMS 3.x the same collection of files were used for both the developer and the end user. The license type of the AIMMS system, in combination with VAR license info that could be found, determined whether a project was opened in developer mode or end-user mode.

End-user projects in AIMMS 3.x

When developing an AIMMS project in AIMMS 4.0, all files are present in a readable format on your disk. When the project is ready to be deployed as an end-user version, you need to explicitly create the end-user project from within the developer IDE. The resulting end-user project is stored as a combination of packed, binary and encrypted files. An end-user project can no longer be accessed in developer mode.

End-user projects in AIMMS 4.0

When working on a developer project, all files are stored in a text-based format. The model is stored in a newly defined `.ams` syntax which replaces the `.amb` and `.aim` files present in AIMMS 3.x. Most of the other files that define the project are stored in an `.xml` format in specific files and folders underneath the folder where the `.aimms` file is located. AIMMS 4.0 does not (yet) provide a formal XML schema of the XML format used in the various files.

Text-based files

During an AIMMS session, AIMMS does not register that files are being changed by programs outside of AIMMS. So to make sure that your external edits are picked up and/or not overwritten by AIMMS the best practice is to exit AIMMS, make the changes, and restart AIMMS. This also holds for source control systems like Git, Subversion or Team Foundation Server. If you want to commit, retrieve, push, pull, checkout, merge, etc., make sure to exit AIMMS first.

Editing outside of AIMMS

While working in a developer project, you might notice the folder `.edited` appearing on disk. This folder is used by AIMMS to store files that have been modified by actions in the IDE. Similar as with AIMMS 3, the actual files are only changed when you select the **File-Save All** menu. During the **File-Save All** command, the files located in the `.edited` folder will overwrite their corresponding actual files.

The `.edited` folder

Through the **File-Export End-User Project** in the developer project, you can create an `.aimmspack` file of your current developer project, that can be used in an end-user version of AIMMS. Note that there is no longer an export feature to distribute the developer project itself. If you want to share your developer project with others, you must zip the files and folders on disk yourself. Or better: make sure that your project is stored in a version control system like Git, Subversion, or Team Foundation Server, and use the version control system to give others access to the development sources of your project.

Creating an end-user project

The files in an AIMMS 4 end-user project are now always encrypted (using an AES cipher library), and instead of the rather complicated VAR licensing scheme of AIMMS 3.x, you now only have three choices for who is allowed to run (and thus internally decrypt) the project:

Stronger encryption, no more VAR licenses

1. Standard encryption: everybody with an AIMMS version can run your project, but has no access to the sources.

2. Encryption using a password, used in the encryption key: if you do not know the password it is impossible to decrypt and run the project.
3. Encryption using public and private key pairs; the project is encrypted for each public key that the developer provides, the end-user needs to provide one of the corresponding private key to decrypt and run the project.

In all three situations there is an optional additional check on the AIMMS license range for which the project is intended to be used.

End-users can either generate a public-private key pair themselves, and use it to run multiple end-user projects. Alternatively, you can generate multiple public-private key pairs, and use the private keys as application licenses you can distribute to your end-users along with the end-user project.

Application license

If you open an existing AIMMS 3.x project in AIMMS 4, you will be prompted to convert the project. The converted projected will be placed at a location next to the original project, so the original project will not change by this operation. During the conversion, all pages are opened and then re-saved in the new XML format.

Converting an existing project

During this operation AIMMS might encounter problems with identifiers that are (no longer) present in the current version of the model, or with names of set elements that are explicitly mentioned in a page but that are not part of the initial data. In most cases, AIMMS will convert the page even if there is some missing or unrecognized content. A log file is generated, which could help you to check some of the "problem" pages.

Checking for errors

It is recommended that the original project does not have pages and/or templates with the red ! exclamation mark in the page tree (!P). This usually already indicates that some identifiers are missing. You can use your latest AIMMS 3.x version to fix these pages marked with !: just open them, correct things where possible and then save the page again. After the conversion is completed, AIMMS will automatically open the newly converted project.

Fixing problems in AIMMS 3 project

3.2.1 Data management changes in AIMMS 4.0

AIMMS 4.0 by default uses a different data management scheme than AIMMS 3.14 and earlier. The prime difference is that in AIMMS 4.0 each case file is stored in a separate .data file and AIMMS can access each case via an associated URL, whilst in AIMMS 3.x multiple cases are stored in a single data manager files with extension .dat, where only AIMMS can access the cases in the selected data manager file.

Advantages of the data management style via disk files and folders over the data management style via single data manager file are:

Advantages

- Cases can be communicated between co-workers by simply copying files; no need anymore for the export case and import case steps to compare cases that were developed in distinct data manager files,
- Security of data can be handled at the operating system level, and
- Improved integration with the AIMMS PRO deployment platform since the case files can be stored centrally on the PRO server.

Although AIMMS 4.0 still supports data management via single data manager file, we encourage you to leverage the above mentioned advantages by converting your projects to using data management style via disk files and folders. The change in data management style affects three portions of your application:

Why convert?

1. the project,
2. the data, and
3. the model.

In order to smoothen the conversion to the new data management style, for each portion, the steps to be taken are described in a small paragraph.

Set the option `data management style` to `disk files and folders`. This option can be found via the AIMMS menu **Settings–Project Options...** in the option category **Project–Data manager**. Once set, you will be asked to save your project and restart AIMMS.

Converting the project

Once the project is converted, you and your end users will want to convert the existing data stored in data manager files. This can be done by opening each of these data manager files via the AIMMS menu **File–Open Data File...** dialog as shown in Figure 3.1. This dialog will lead you through the conversion of multiple cases in a data manager file into separate .data files.
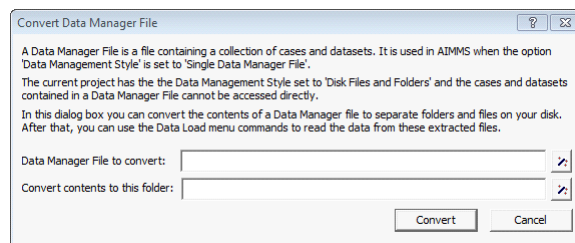
Converting the data manager files

Figure 3.1: The **Convert Data Manager File** dialog box

In the model, the intrinsic functions referenced in the following sections of the Function Reference

Necessary changes to the model

- Case functions (using single data manager file)
- Dataset functions
- Data manager functions

can no longer be used.

When such a function is executed, it will issue an error message with a suggestion for rewriting it. For example, executing `CaseNew` will result in the error message:

Error messages in unconverted models

> *If the option "Data management style" is set to "Disk files and folders", the procedure CaseNew is not valid. Please refer to the alternative procedure: CaseCommandNew.*

The different data management styles are documented in different books:

Documentation

- Documentation on the data management style via disk files and folders can be found in the Aimms 4.0 User's Guide, Chapter 16 "Case Management".
- Documentation on the data management style via single data manager file, can be found in the Aimms 3.14 corresponding chapter.

Chapter 4

Getting Support

This chapter discusses the procedures that apply when you encounter problems in AIMMS. Please refer to the list of known and reported issues at the end of this chapter to verify whether a problem which you wish to report has already been reported before.

Getting support

4.1 Reporting a problem

When you encounter a problem in AIMMS, AIMMS will investigate the problem, and if applicable provide a fix for it. AIMMS always provides this service if your AIMMS version is the latest functional AIMMS release. In all other cases, you are only eligible to obtain a fixed release if your AIMMS license is in maintenance. Any problem fix will always be performed on the latest functional AIMMS release only, and may require that you upgrade your AIMMS system to that version.

Problem fixing

Whenever you encounter a problem, AIMMS needs the following information to process the problem.

Reporting a problem

- **Computer information**
  - Brand and model
  - Operating system and version number
    (including any installed Service Packs)
  - CPU type and speed
  - Amount of installed RAM
  - MDAC and ODBC/OLE DB driver versions if the problem is database-related
- **AIMMS information**
  - License number (**Tools-License-License Configuration** menu)
  - AIMMS build number (**Help-About AIMMS** menu)
- **Problem details**
  - A detailed description of the problem
  - The type of the problem
    * Crash
    * Incorrect functionality
    * Cosmetic

         ∗ Feature request
      – The severity of the problem
         ∗ Crash
         ∗ No work around available
         ∗ Work around available
         ∗ Cosmetic
- **Reproducibility** (if applicable)
      – A description of the steps required to reproduce the problem
      – A copy of your project files along with any other files used by your project, if such is necessary to reproduce the problem

You should e-mail your problem report containing the above information to Support@aimms.com. Upon receipt, AIMMS will investigate your report and notify you of its status, as well as the actions that will be undertaken to fix the problem. You will be notified when an AIMMS version will be released, in which the problem is fixed.

Problem processing

Support requests other than bug reports will, in principle, only be dealt with at our regular consulting fee. This is especially true for when you request us to provide extensive modeling support. If you are new to AIMMS, and need some quick pointers to help you tackle a particular modeling problem, we may decide to honor such requests at our discretion. When you send support requests to our e-mail account Support@aimms.com, please always include your AIMMS license number.

Modeling support

Reports collected via the AIMMS Error Report Service are actively used by AIMMS to continuously improve the quality and reliability of AIMMS. This service is automatically called when a severe/fatal error appears. You can read why you should report these errors at Why Report Errors. You can read what information is collected by the AIMMS Error Report Service and what we do with this information at Data Collection Policy.

Automatic Error Reporting

4.2 Known and reported issues

At this moment there are no known incompatibilities between the AIMMS software and documentation.

Known issues

Chapter 5

Release Notes

From AIMMS 4.1 onwards, we only publish the release notes on our website. You can find these at http://www.aimms.com/aimms-release-notes. The release notes contain the following for each release:

Release notes

- the build number of the release,
- the release date, and
- a description of the changes and the issues resolved in the release.

What's new in AIMMS 4.1

From AIMMS 4.1 onwards, we will only publish this "What's New" section on our website. It can be found at the following location:

http://www.aimms.com/downloads/aimms/new-features/