

APINI

APINI Installation Guide for UNIX and Windows

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How to use this guide?

This installation guide contains description of the installation procedure for APINI, a Web 2.0 system for project management and collaboration. APINI allows enterprises to shorten delivery times and increase project efficiency as well as improve internal communications and knowledge retention. The order of sections in the guide corresponds to the sequence of steps required to install and configure the applications.

Purpose and scope

The installation guide contains installation and configuration steps required only to **bootstrap** the system. Detailed configuration and fine-tuning instructions as well as usage instructions are provided in the on-line help documentation: administration and user guides.

Notation used

Source code, commands, user-entered data, on-screen messages and user interface elements (menus, choice lists, etc.) are shown using Courier font. In order to improve readability, indentation has been used, for instance:

```
int main() {
    int i = 0;
}
```

! This notation (Information) is used to indicate important information.

⚠* This notation (Warning) is used to flag actions that can lead to loss of data, system malfunction, etc.

ℹ This notation (Hint) is used to indicate additional information.

The following symbols are used to flag information pertaining to a particular type of operating system:



Linux



Oracle
Solaris



Microsoft
Windows



IBM AIX

Intended audience and guide overview

This installation guide is intended for system administrators or other IT personnel responsible for APINI product installation.

The guide consists of the following chapters:

- **Chapter 1, System requirements** describes hardware and software requirements required to run APINI, both on the server and client sides. It also contains information on system sizing.
- **Chapter 2, System installation** describes APINI installation procedure from installing prerequisites to the first run of the system.
- **Chapter 3, System configuration** describes the initial configuration steps required to bootstrap the system such as populating database with startup data. These steps are not required for Windows installer type of installation.
- **Chapter 4, Advanced configuration** describes advanced, post installation configuration options such as enabling SSL support, changing the JRE (Java Runtime Environment) used and others.

For further information, please refer to on-line guides (Administrator Guide and User Guide). The On-line help is available by clicking Help link in APINI user interface.

1 System requirements

Please note that system sizing (calculation of CPU power, RAM, disk space, database type and parameters) is strictly dependent on the amount of the stored data (documents, articles, projects, users, etc.).

In case of doubt, please contact Verax Systems technical support in order to obtain detailed sizing information for your particular needs.

1.1 Hardware and operating system requirements

APINI has been entirely written in the Oracle (Sun) Java programming language. Due to Java's portable nature, APINI runs on most of modern computing systems. The following platforms are regularly tested and are supported by Verax Systems:

- 32 and 64 bit Linux distributions including: SuSE, RedHat Enterprise and Debian using i386 and x64 architectures.
- Oracle (Sun) Solaris 10 and higher on Intel and SPARC hardware.
- IBM AIX 5 and higher on IBM Power Systems (formerly RS/6000 and p Series).
- 32 and 64 bit Microsoft systems including: Windows 2000, XP, Server 2003, Vista and Windows 7.

APINI can be installed in any operating environment supporting Java 1.6 or higher, such as AS/400, FreeBSD, Mac OS X and others. In case of doubt, please contact us to obtain up-to-date information on compatibility with other platforms.

1.1.1 Server side requirements

On the server side, APINI requires 250 MB of disk space for installation and 512 MB of RAM to run. The ballpark database size (required to store system data) can be estimated using the following formula:

$$\text{Size} = 5\text{MB} * \langle \text{number of users} \rangle * \langle \text{years of operation} \rangle$$

WIN

When using the bundled Oracle 10 Express Edition, additional 1.25 GB of disk space is required for Oracle.

1.1.2 Client workstations

Client workstations have to be equipped with a web browser: Internet Explorer 7, Firefox 2, Opera 8, Chrome 5 and higher versions with Adobe Flash plugin version 10 or higher. These are tested and verified on a regular basis. Compatibility with other, less popular browsers (e.g. Safari) is verified periodically. In case of doubt, please contact us to obtain up-to-date information on browser compatibility.

For comfortable work, client workstations should have 60-100 MB of free RAM and Microsoft CPU index of 1.0.

1.1.3 Network

Each computer using APINI must be connected to a TCP/IP network. The server requires a static IP address. It is recommended that the server has a properly configured DNS (Domain Name System) alias resolvable both on the server and the connecting workstations.

- ☛ Under some virtualized environments (e.g. OpenVZ), virtual network interfaces do not have associated MAC addresses. In such cases APINI will not read license file as it is tied to the MAC address. The environment has to be configured in such a way that MAC addresses are set on virtual adapters.

1.1.4 Java

APINI is tested on Oracle (Sun) and IBM editions of Java on a regular basis. Compatibility with other, less popular editions (e.g. Open JDK) is verified periodically. Verax Systems recommends using the Oracle version of JRE for APINI production environments.

1.2 Database system

APINI supports MySQL 5 and Oracle 9i and 10g (including the Express Edition), which are tested on a regular basis. APINI can use any database supporting ANSI SQL and JDBC standards. Compatibility with Microsoft SQL Server, DB2 and PostgreSQL is ensured periodically. In case of doubt please contact us to obtain up-to-date information on database and version compatibility.

1.2.1 Recommendations

Both Oracle and MySQL are suitable for production environments. If you do not have a database preference Verax Systems recommends Oracle 10g Express Edition which comes free of charge (see <http://www.oracle.com/technetwork/database/express-edition/overview/index.html>).

1.2.2 Configuring APINI to work with MySQL

Due to license limitations, the MySQL JDBC driver (a.k.a. the Java connector) cannot be distributed with APINI and has to be manually downloaded from the Internet and copied to the APINI installation directory.

The icon consists of the word "WIN" in a green, sans-serif font, enclosed within a rounded rectangular border with a green outline.

The download and installation steps are presented on-screen by the Windows installer.

In order to add MySQL JDBC driver to an existing APINI installation:

1. Stop the APINI server as described in section 3.3.
2. Download the MySQL connector from <http://dev.mysql.com/get/Downloads/Connector-J/mysql-connector-java-5.1.14.zip> from <http://mirror.services.wisc.edu/mysql/> or other mirror listed at <http://www.mysql.com/downloads/connector/j/>

(please download 5.1.14 version, as it has been tested and verified).

3. Unzip the downloaded file and copy the `mysql-connector-java-5.1.14\mysql-connector-java-5.1.14-bin.jar` file to the `<installation directory>\tomcat\webapps\ROOT\WEB-INF\lib` directory.
4. Start the APINI server as described in section 3.3.
5. Configure JDBC connection to desired MySQL server as described in section 3.1.

2 System installation

2.1 Differences between Standard and Express versions

There are no differences in installation procedures between APINI Standard and Express editions.

2.2 Installation types

APINI can be installed using one of the following packages:

- **One-click Windows installer** with bundled Java runtime (JRE), Apache Tomcat application server and Oracle Express Edition (XE) database (another database may be specified during the setup). This type of installation is described in detail in section 2.4.
- A **tar.gz archive** with APINI web application and Apache Tomcat server. Requires an installed Java runtime (1.6 or higher) and a running database server (MySQL, Oracle or other supported system) as prerequisites. This installation is targeted for UNIX and Linux Systems. This type of installation is described in detail in section 2.5.
- **A standalone web application archive (WAR)**. Requires a pre-configured Java Enterprise (J2EE) application server (such as IBM WebSphere, JBOSS, Tomcat or other) and a running database server (MySQL, Oracle or other compatible system) as prerequisites. This type of installation is described in detail in section 2.6.

2.3 Installation logins and passwords

APINI is a complex three-tier application with extensive security mechanisms, requiring a number of logins and passwords to be configured. References to these appear in subsequent sections, therefore it is essential to describe them in more detail:

- **Database administrator login/password.** These define “root” database account such as SYS (Oracle) or root (MySQL) and are required at the installation stage to create and populate the database.
- **Database access login/password.** Due to security reasons APINI should not use the database administrator password in order to communicate with the database. Instead, the installer creates a separate user account (named `apini` by default).
- **APINI administrator login/password.** This is the “root” APINI account, for performing administrative actions, rather than day to day work.
- **APINI master password.** The master password protects configuration changes and is stored in `apini-config.xml` (please refer to section 4.1 for details).

2.4 Windows installer

APINI installer for Windows includes all the components required to run the system including the JRE, Apache Tomcat application server and Oracle Express database server (other supported database server can be selected at installation time).

- ① Installation **must** be performed on a user account with administrative privileges.
- ① The setup language is always **English**, however, once installed, APINI user interface language can be switched as required, depending on the available language packs.

In order to install APINI for Windows:

1. Copy the installation files to a temporary directory (e.g. the one specified by the environment variable `%TEMP%`) and run the following command:

WIN

`apini-1.4.4-windows-installer.exe`

2. Since the installer requires administrator privileges to run, on Windows Vista and higher a security message is displayed. Allow the installer to run by clicking the **Yes** button.
3. Once the package is verified by the installer, the welcome dialog is shown. Start the installation process by clicking **Next**.
4. Read and accept the end-user license agreement and click **Next**.
5. Register your name and company and click **Next**.
6. Specify target path where APINI is to be installed (the default directory is `C:\Program Files\Verax Systems\APINI`) and click **Next**.

① On 64 bit systems **Program Files (x86)** is used instead of **Program Files** as the target installation directory.

7. Select the database type to be used:

Bundled Oracle Express (default) – this option will install the bundled Oracle 10g Express and configure it to work with APINI: create SYS user, create APINI database user and prepare APINI database schema.

Already existing Oracle or MySQL – this option allows installing APINI to work with an already existing database. Please note that at the time of installation, the database must be accessible and database access login for APINI must already have been created.

Skip database configuration – this option should be used if APINI database is to be specified manually after the installation. If this option is selected, the configuration must be completed manually as described in section 3.1.

Select the database type and click **Next** to proceed with the installation.

The text below describes installation with the bundled Oracle Express:

1. If an existing copy of Oracle Express is found on your system, the installer will recommend using it. In order to do so, the SYS password must be provided before proceeding.
2. Provide and confirm the SYS account password and update Oracle installation parameters (Oracle management HTTP port, database listener port and transaction server port) are required and Click **Next**.
3. Provide and confirm APINI database user login and password. These credentials will be used by APINI server in order to access the Oracle Express database. The account will be created by the installer. Click **Next** to proceed. At this stage, the Oracle installation will take place (it may take a few minutes to complete).

The text below describes installation steps with an already existing database:

1. Select database connection properties in the dialog box and click **Next**.
 2. The installer will attempt to establish a database connection using the credentials provided. The connection must be tested to be working before proceeding.
- ❶ Due to a limitation of the installer technology used, the database selection dialog box allows only for selection of MySQL and Oracle databases. In order to use a different supported database (please refer to section 1.2 for details), the **Skip database configuration** option must be used.

The text below describes installation steps when no database is selected and its configuration is to be completed after the installation:

1. Provide master password (see section 2.3 for details) and click **Next**.

Once the database has been configured, the subsequent installation steps are as follows:

8. Provide username and password for the APINI administrator account and click **Next**.
 - ① In this case, the master password (see section 2.3) is set to the same value as the APINI administrator password.
9. Provide the TCP port for APINI, server as DNS name (preferably) or IP address (the installer will automatically attempt to resolve and suggest the DNS name) and click **Next**. At this stage experienced system administrators may want to change other Apache Tomcat parameters (click the **Restore defaults** button to revert to default port values). The installer checks if the specified ports are free. The installer configures APINI to use the standard HTTP protocol. For a secure HTTPS configuration steps please refer to section 4.4.
10. Provide Windows program group (default APINI) and click **Next** to begin the installation.

Once the installation has been completed the system is up and running – please click on the APINI Tray Monitor icon to log into APINI.

2.4.1 APINI Application Server service and Tray Monitor

The Windows installer creates **APINI Application Server** Windows service to automatically start and manage the Apache Tomcat Server running APINI. The service can be managed by the **APINI Tray Monitor** tool. The tray monitor starts automatically and displays the application server status in the Windows system tray, located near the clock:



Right-clicking on the Tray Monitor icon displays a menu with the following options:

- **Start APINI application server** – starts the APINI application server,
- **Stop APINI application server** – stops the APINI application server,
- **Log in** – launches the browser and opens the APINI home page (same as double clicking on the icon),
- **Configuration** – launches the browser and opens the APINI configuration page.
- **View application (APINI) log file** – displays the APINI log file (this option is typically used for troubleshooting and support purposes).
- **View latest Tomcat server log file** – displays the latest Tomcat server log file (this option is typically used for troubleshooting and support purposes).
- **Exit** – Turns off the APINI Tray Monitor (it does **not** shut the APINI application server down). The Tray Monitor can be restarted from the Windows Start Menu APINI group.

The APINI Application Server runs as a Windows service and once installed, it can be managed by launching "Services" from the Windows Control Panel → Administrative Tools or typing "Services.msc" in the Run command on Start menu.

2.5 Archive based installation

WIN

The archive based installation is for Unix systems only. For Microsoft Windows, please use the Windows Installer as described in section 2.4.

2.5.1 Prerequisites

The following items should be checked before the installation:

- The amount of available disk space (refer to section 1.1.1 for information on the required disk space) on the installation drive.
- Availability of target TCP port on the server (typically 80 or other if non-default setting is to be used).
- Availability of the database server (refer to section 1.2 for the list of supported database systems).

2.5.2 Starting the installation

In order to install APINI, copy the installation files to a temporary directory (for instance `/tmp`) and invoke the following command from the directory:

```
chmod +x install.bin
```

Next run the installation script:

```
LINUX ./install.bin
```

```
SOLARIS ./install.bin
```

```
AIX ./install.bin
```

Please follow the on-screen instructions. The installation process consists of the following steps:

- Target directory selection (by default `/usr/local/apini` for Linux and `/opt/apini` for Solaris and AIX).
- Acceptance of the License Agreement.
- Discovery and selection of the Java Runtime Environment to be used (it can be changed after the installation in the `java.conf` file – refer to section 4.1 for details).
- TCP connection port selection. The default value is 8080. Availability of the port will be checked by the installer, however, if another application is using the selected port and is not running at installation time, the conflict will not be detected.
- The final stage of installation is adding startup scripts to `/etc/init.d` for runlevels 3, 4, 5 on Linux and runlevel 3 on Solaris and AIX.

2.5.3 Validating the installation

In order to check if the installation succeeded, run APINI from the command line as presented below:

```
LINUX /etc/init.d/apinid start
```

```
SOLARIS /etc/init.d/apinid start
```

```
AIX /etc/rc.d/init.d/apinid start
```

Once the server startup has completed (it can take even up to a few minutes on slow systems), point the browser to the APINI server URL (e.g. <http://localhost:8080>). If the APINI configuration page is displayed, the installation was successful and

database settings can be configured as provided in section 2.6. If possible, test APINI startup after a reboot.

2.5.4 Managing runlevels

2.5.4.1 Linux

In order to change APINI startup at boot (or runlevel change) time, use the `chkconfig` command.

① All the subsequent commands should be run in the root account context.

In order to deactivate automatic startup of APINI at runlevel 3, run:

```
chkconfig --level 3 apinid off
```

In order to disable APINI completely, use the following command:

```
chkconfig --level 345 apinid off
```

In order to re-enable APINI startup at boot time (for levels 3, 4, 5), run:

```
chkconfig --level 345 apinid on
```

Runlevels at which APINI is running can be checked using:

```
chkconfig --list apinid
```

2.5.4.2 Other UNIX systems

On other UNIX systems and on Linux versions that do not support the `chkconfig` command (see section 2.5.4.1), runlevel configuration for APINI is changed using the startup scripts as shown below (the examples demonstrate how to remove and add APINI to 3):

Remove:

LINUX `rm /etc/rc3.d/S77apinid`

SOLARIS `rm /etc/rc3.d/S77apinid`

AIX `rm /etc/rc.d/rc3.d/S77apinid`

Add:

LINUX `ln -s /etc/init.d/apinid /etc/rc3.d/S77apinid`

SOLARIS `ln -s /etc/init.d/apinid /etc/rc3.d/S77apinid`

AIX `ln -s /etc/rc.d/init.d/apinid /etc/rc.d/rc3.d/S77apinid`

2.6 WAR-based installation

Please refer to your application server's manual on installation of APINI from a WAR file.

2.6.1 Application file name changes

On many popular application servers (e.g. Apache Tomcat), the downloaded APINI WAR file (e.g. `apini-1.4.4.war`) must be renamed to `ROOT.war` in order to run in the server's root context.

2.6.2 Encoding

APINI requires UTF-8 encoding on the HTTP connection be configured. For instance, on Apache Tomcat, all the connectors must have the following line specified:

```
<Connector URIEncoding="UTF-8" . . . .
```

Please refer to your application server manual for encoding configuration details.

2.6.3 First login

Upon the first application run, the `ApiniConfig` (see section 4.1 for details) directory will be created with the default configuration files, embedded in the WAR file. The first attempt to log into the application will bring up the APINI database configuration screen.

- ① The default master password value is 'master'.

2.6.4 Deployment on IBM WebSphere

APINI can run on an IBM WebSphere application server on Windows, IBM AIX and IBM AS/400. The following subsequent sections describe installation and configuration procedures related to the WebSphere environment.

2.6.4.1 Installation

Administrative Tasks in WebSphere environment can be performed in a management console called Integrated Solutions Console (ISC). It is available through a web browser at `http://server:9060/ibm/console/` (where "server" is the address of the destination server). In order to install APINI, perform the following steps:

1. Log into the ISC.
2. Go to the **Application** tab and choose **Install New Application**.
3. Enter the path to the APINI .war file (either local or remote).
4. Set **Context root**. The context root is a part of the URL identifying application on the WebSphere server. When the recommended value ("apini") is specified, the URL of the system is `http://localhost:9080/apini`. Click **Next** to continue.
5. Set the application name. The name is used internally by WebSphere, the recommended value is `apini`. Click **Next** to continue.
6. Choose the destination where the application will be installed (nodes, node agents and cells, etc.) depending on your local configuration. Click **Next** to continue.
7. Leave the suggested values in the **Configure mapping of virtual hosts for web modules** window. Click **Next** to continue.
8. The installation summary is displayed. Confirm with the **Finish** and **Save** buttons (do not exit the ISC yet). The application is ready to be started at this stage.

2.6.4.2 Starting APINI

In order to verify the APINI installation, start the server as follows:

1. Log into the ISC.
2. Go to the **Applications** menu, select **Enterprise Applications**, select APINI and press **Run**. At this stage APINI is being started.
3. After a while (APINI startup on WebSphere can take about 2-3 minutes) try to log in to the APINI URL, for instance `http://localhost:9080/apini`.
4. Configure the database connection as described in section 2.6.

2.7 Upgrades

In order to upgrade APINI (regardless of the installation type), perform the following steps:

1. Stop the application server.
2. Make a backup of the database and `ApiniConfig` (see section 4.1 for details) directory for the application instance being upgraded.
3. Re-install the application in the same directory (via installer or by copying the `.WAR` file).
4. Start the application server.

3 System configuration

3.1 Changing database settings

WIN

The Windows Installer automatically creates a working database configuration, unless the **Skip database configuration** option has been chosen at installation time.

In order to configure the APINI database connection (and optionally, create initial data), perform the following steps:

1. Launch a web browser and point it to the following URL: `http://<server>:<port>/config.do` (where server is the server's IP address or DNS name and port indicates APINI TCP port for HTTP connections). The configuration screen appears.
2. Enter the configuration protection password (so-called master password, the default value is `master`). More information about the main password can be found in section 3.2.
3. Provide database connection details including username and password for the connection.
4. Provide username and password for the APINI administrator. If a previously used database is selected, uncheck the `Do not populate database` option.
5. Click `save` to accept changes. Once the button is clicked, the connection to the database is established and the initial data is populated.

3.2 Changing master password

WIN

The Windows Installer sets the master password during the installation process.

The master password (protecting changes to the APINI database settings) is stored in the `apini-config.xml` file (refer to section 4.1 for more information) in the following line as plain text:

```
<entry key="apini.masterPassword">master</entry>
```

In order to change the password, edit the file and provide the value as required.

3.3 Starting, stopping and restarting APINI

In order to manage the status of the APINI service (or daemon on UNIX), use the Control Panel (Windows) or `/etc/init.d/apinid` script (UNIX). The example below provides instructions on how to restart the APINI application server:

LINUX

```
/etc/init.d/apinid restart
```

SOLARIS

```
/etc/init.d/apinid restart
```

AIX

```
/etc/rc.d/init.d/apinid restart
```

WIN

Start APINI Tray Monitor (refer to section 2.4.1 for details).

Right-Click on the tray icon to display the pull-down menu.

Select Stop APINI Application Server.

Repeat the same steps and select Start APINI Application Server.

4 Advanced configuration

This chapter describes advanced configuration aspects of APINI, such as configuration files, JRE considerations, SSL support and others.

4.1 Configuration file directory

All APINI configuration files are listed in the table below (APINI_HOME is the directory where the system has been installed):

| File | Contains |
|---|---|
| <code><app server dir> \ApiniConfig\webapps\<<instance name>\</code> | Instance specific files including configuration, knowledge base media files and others. |
| <code><app server dir> \ApiniConfig\webapps\<<instance name>\apini-config.xml</code> | APINI parameters changed by using <code>http://<server>:<port>/config.do</code> (refer to section 3.1 for details). |
| <code><install dir>\start.sh</code> | Application server startup script (used only on UNIX systems). |

4.2 Changing the Java Runtime Environment used

Changing the JRE used by APINI may be helpful during testing JRE updates, various JRE versions or migration from 32- to 64-bit environments. The procedure for changing the JRE used is different under UNIX and Windows, as described in the following sections.

4.2.1 UNIX

Under UNIX, edit the `java.conf` file, set the value to point to the new JRE and **restart** the APINI server as described in section 3.3.

4.2.2 Windows

For installations created with the Windows Installer, the JRE change procedure is as follows:

1. Open `<installation directory>\tomcat\bin\APINIService.bat` file (it is a slightly modified version of the standard Apache Tomcat service file) and modify the `PC_JVM` variable as required (please note that this variable appears twice in the file).
2. **Restart** the APINI server as described in section 3.3.

① Please note that the change does not affect the Tray Monitor application (described in section 2.4.1) as it always uses the bundled JRE.

4.3 Changing JRE parameters

JRE parameter changes, such as the amount of allocated memory, are mainly required during performance optimization and fine tuning. The procedure for changing JRE parameters for APINI is different for UNIX and Windows systems, as described in the subsequent sections.

! Please familiarize yourself with JRE parameters and their meanings before making any changes. Relevant documentation is available at <http://java.sun.com/javase/downloads/index.jsp#docs>.

4.3.1 UNIX

Under UNIX, the JRE parameters are listed in the `start.sh` file responsible for launching the APINI server. The default settings are:

- Minimum stack size 32 MB (`Xms`).

- Maximum stack size of 512 MB (parameter `xmX`).

In order to change the JRE parameters, edit the `start.sh` file and restart the APINI server as described in section 3.3.

4.3.2 Windows

Under Windows, the parameters are located in the `<installation directory>\tomcat\bin\APINIService.bat` at the end of file. Please refer to instructions in the file for details.

4.4 Enabling SSL support

SSL (and HTTPS) are responsible for encrypting transmission between APINI server and client browsers, thus securing the data sent over the network. Data security becomes an issue when the server must be accessed over the Internet or a wide area, unsecure network. In these cases, SSL support should be enabled as described in the subsequent sections.

4.4.1 Generating a SSL key

In order to start using SSL, a key must be generated first. It can be generated by the `keytool` utility available in the Java Development Kit (JDK). The JDK can be downloaded from: <http://java.sun.com/javase/downloads/index.jsp>.

In order to generate a SSL key, run the following command:

```
keytool -keystore keystore -alias apini -genkey -keyalg RSA
```

Once generated, the key is stored in a file named `keystore`.

4.4.2 Generating a certificate for a SSL key

The generated key can be used immediately without a certificate as described in section 4.4.3. In this case, when connecting to APINI, the browser will display a security exception (key signature not trusted); however the data shall be encrypted.

In order to sign the key by a trusted certificate authority, generate a certificate request:

```
keytool -certreq -alias apini -keystore keystore -file apini.csr
```

This file should be sent to the selected certification center, which will send back an electronic file containing the signature key. To sign a pre-generated key, copy the obtained file to a directory where the key is located, and run the following command:

```
keytool -keystore keystore -import -alias apini -file apini.crt -trustcacerts
```

4.4.3 Installing a SSL key

Please refer to your application server manual for information on how to install the SSL key.

4.5 Tuning the database server

The subsequent sections assume that the database server has already been installed – they only contain information on database instance creation, configuration, fine-tuning, sizing, etc. and not the database system installation itself. In order to install the database server, follow your vendor’s instructions.

4.5.1 MySQL

4.5.1.1 Server parameters

To ensure optimum APINI performance on MySQL, Verax Systems recommends setting the server parameters in the `my.cnf` file as follows:

```
[mysqld]
default-storage-engine = innodb
datadir=/var/lib/mysql
socket=/var/lib/mysql/mysql.sock
max_connections=600
max_user_connections=60
max_allowed_packet=128M
max_connect_errors=100
thread_concurrency=4
interactive_timeout=60
wait_timeout=300
connect_timeout=10
query_cache_limit=16M
query_cache_size=64M
query_cache_type=1
thread_cache_size=256
table_cache=512
join_buffer=8M
key_buffer=256M
record_buffer=16M
sort_buffer_size=16M
read_buffer_size=16M
mysam_sort_buffer_size=64M
```

The APINI database should be created in the InnoDB mode (rather than MyISAM mode). In order to check support for InnoDB, log into the MySQL server (using the command `mysql-u root-p`) and type the following command:

```
SHOW VARIABLES LIKE 'have_innodb';
```

If `| have_innodb | YES |` is shown, the InnoDB engine is enabled. If InnoDB is missing, upgrade or install a new, up-to-date copy of MySQL.

The InnoDB should be the default engine (APINI creates its tables in the default engine mode). In order to check if InnoDB is the default engine, invoke the following command from the MySQL prompt:

```
SHOW ENGINES;
```

InnoDB should be marked as the default engine.

4.5.1.2 Creating the database

In order to create a database instance for APINI, log into the server (using the command `mysql-u root-p`) and run the following command:

```
create database apini;
```

For security reasons, create a new user named 'apini' and grant all rights on the database (this is to avoid specifying root credentials while setting the APINI database parameters):

```
GRANT ALL PRIVILEGES ON apini.* TO 'apini'@'localhost' IDENTIFIED  
BY 'some_pass' WITH GRANT OPTION;  
FLUSH PRIVILEGES;
```

- ❶ If the database is not on the same server as APINI, replace localhost IP address of the server.
- ❶ Replace 'some_pass' in the command above with a password corresponding to your local security policy.

4.5.2 Oracle

4.5.2.1 Creating an APINI database

Verax Systems recommends using Database Configuration Assistant (DBCA) for creating new APINI databases in the Oracle environment. Under UNIX systems, DBCA can be

started with the `dbca` command. Under Windows, select the **Start** menu, **Programs** then click **Oracle** and select **Configuration and Migration Tools**. A menu with Database Configuration Assistant should appear. Click on the **DBCA** icon to launch the tool.

Once the DBCA is started, perform the following steps to create the APINI database:

1. Click **Next** at the welcome screen to begin.
2. Select **Create a database** and click **Next** to navigate to the screen with database templates.
3. Select **General Purpose** and click **Next**.
4. Set the **SID** and **Global Database Name** to `Apini` and click **Next**.
5. Turn the options **Configure the Database with Enterprise Manager** and **Enable daily backup** on.
6. Set time at which the backup is to be made (for example 2:00 a.m.). Enter correct login and password for **OS Username** and **Password** fields specifying a user with database access rights. Under Windows, it will usually be a user with administrator rights. Under UNIX, it will be most likely be the `oracle` user. Click **Next** to continue.
7. Provide administrative account passwords for the database. Enter a single password for all accounts (default) or set a different password to each of the administrative accounts by selecting **Use Different Passwords**. Click **Next** to continue.
8. Select a data storage mechanism. The recommended method is **File system**. Confirm selection with **Next**.

9. Select a directory for the database. It is recommended to choose **Use Common Location for All Database Files** and select the **db_1** subdirectory located underneath Oracle home. Click **Next** to continue.
10. Leave database recovery settings intact and confirm with the **Next** button.
11. Skip creation of sample schemas confirm with the **Next** button.
12. Set the value of **Unicode (AL32UTF8)** in the **Character Sets** tab and select English as the **Default Language**. Click **Next** to continue.
13. Leave parameters of the database storage intact and confirm with the **Next** button.
14. If all settings entered in the steps above are correct, a **Create Database** option appears on the screen. In order to create the database, click **Finish** and confirm with **OK**.
15. The database is created after about 20-40 minutes (depending on the server hardware). Once the database is created, the global database name, SID and address of the Oracle Enterprise Manager are displayed. **Please make a note** of this information and leave the DBCA by pressing the **Exit** button.
16. In order to start the newly created database at boot time, it is necessary to specify **y** in the file **/etc/oratab** in configuration database line (UNIX systems). Under Windows, use the Oracle Administration Assistant for Windows in the menu **Start/Programs/Oracle - database name/Configuration and Migration Tools**. Select the APINI database by right-clicking and:
 - a. Select **Startup/Shutdown Options**,
 - b. Go to the **Oracle NT Service** tab,

- c. Choose **Automatic** in **Oracle Service Startup Type** and confirm by pressing **OK**.

After creating the database schema, create a user named 'apini' through Oracle Enterprise Manager web-console or using **sqlplus** from the command line as described in sections 4.5.2.2 and 4.5.2.3 below.

Please note the following information is required at a later time to configure APINI database access:

- SID of the database (point 4 above),
- Login and password for user with database administrator rights (point 7 above),
- The URL for Oracle Enterprise Manager (point 15 above).

Once the database has been created, a new user account should be created for APINI.

4.5.2.2 Creating a user from the Oracle Enterprise Manager

In order to create a user schema using the Oracle Enterprise Manager (EM), perform the following steps:

In order to create the user schema:

1. Point a web browser to the EM URL. The EM address is: **<server IP address>:<port number from portlist.ini>/em**, for instance **192.168.1.1:1158/em**.
2. Log in as **SYSDBA** with **Connect As SYSDBA** option.
3. Go to the **Administration** tab and select **Users**.
4. Go to the **Actions** window, select **Create Like** and confirm by clicking the **GO** button. A new user creation wizard appears.
5. Specify the required fields. It is recommended to set **Default Tablespace** to **USERS** and **Temporary Tablespace** to **TEMP**.

6. Go to the **ROLES** bookmark. Use **Edit List** to enable management of the user rights. The new user should be given **CONNECT** and **RESOURCE** roles.
7. Apply changes. Upon success, the following message is displayed:
The object has been created successfully.

4.5.2.3 Creating a user from the command line (SQL Plus)

Under UNIX, log in using an account with administrative rights (usually oracle). Under Windows, log in as administrator and open the console window (**cmd**).

Set **ORACLE_SID** environment variable to point to the APINI database, for example:

```
LINUX export ORACLE_SID=apini
echo $ORACLE_SID
```

```
WIN set ORACLE_SID=apini
echo %ORACLE_SID%
```

Start the SQL Plus tool with the following command at the prompt (the command is identical for UNIX and Windows):

```
sqlplus "/as sysdba"
```

In order to create a new user, issue the following command at the SQL Plus command prompt (please modify the password):

```
create user apini identified by password;
```

Grant required rights:

```
grant connect to apini;
grant resource to apini;
```

Make changes effective and exit SQL Plus:

```
commit;
exit
```

4.5.3 Microsoft SQL Server

APINI supports Microsoft SQL Server 2000 and higher, both in the standard and Express versions (the latter with restriction of maximum 4GB of data and SQL Server installed on the same host as the APINI application server).

In order to create a new APINI database using the Microsoft SQL Server, please follow the instructions in sections 4.5.3.1 (standard edition) or 4.5.3.2 (express edition).

4.5.3.1 Standard edition

In order to create a new database, use the SQL Server Enterprise Manager tool. It is installed with the SQL Server and can be accessed from the following menu: **Start/Programs/Microsoft SQL Server/Enterprise Manager**.

Once the Enterprise Manager is started, take the following steps:

1. Expand the **Microsoft SQL Servers** tree on the left side, then **SQL Server Group** and finally, select a destination server for the APINI database.
2. Right-click on the destination server and select **New Database** from the pop-up menu.
3. Enter the name of the database to be created (e.g. apini).
4. Go to the **Options** tab and change the **Collation** parameter value as desired (most likely English). It is recommended to leave other parameters unchanged.
5. Approve build of the database with the **OK** button.
6. Once the new database has been created, use **File/Exit** to close the Enterprise Manager.

4.5.3.2 Express edition

In order to create a new database on the Express edition of the Microsoft SQL Server, use the Microsoft SQL Server Management Studio Express (MSE) tool. It can be downloaded from:

<http://www.microsoft.com/downloads/details.aspx?familyid=C243A5AE-4BD1-4E3D-94B8-5A0F62BF7796&displaylang=en>

After the installation, the MSE can be run from:

Start/Programs/Microsoft SQL Server/SQL Server Management Studio Express.

The steps required to create the new database are exactly the same as for the standard SQL Server Enterprise Manager (described in section 4.5.3.1).

4.5.4 DB2

DB2 databases are created using the DB2 Control Center tool (DB2CC). Under Windows, DB2CC can be started from:

Start/Program Files/DB2 for Win NT/Control Center.

Under UNIX systems, the corresponding command is **db2cc**.

① DB2CC is a graphical tool and requires a UNIX X Window Manager to run.

Please follow the following steps in order to create the APINI database under DB2:

1. Start DB2CC as described above.
2. Right-click on **All Databases** tab and select **Create Database** from the popup menu. A **Database creation wizard** appears in a new window.
3. Populate the database name and alias (e.g. apini) and directory path where the new database is to be stored.
4. Approve by clicking the **OK** button. The database is created in a few moments.

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