Oracle® Database

Client Installation Guide

11*g* Release 2 (11.2) for Apple Mac OS X (Intel)

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Oracle Database Client Installation Guide, 11*g* Release 2 (11.2) for Apple Mac OS X (Intel)

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Preface

This guide provides instructions about installing and configuring Oracle Database Client for Apple Mac OS X (Intel)(32-bit) and Apple Mac OS X (Intel)(64-bit).

The preface contains the following topics:

- Audience
- Documentation Accessibility
- Command Syntax
- Accessing Documentation
- Related Documentation
- Typographic Conventions

Audience

This guide is intended for anyone responsible for installing Oracle Database Client 11*g* Release 2 (11.2). Additional platform-specific installation guides for Oracle Database, Oracle Real Application Clusters, Oracle Clusterware, Oracle Database Examples, and Oracle Enterprise Manager Grid Control are available on the relevant installation media.

> **See Also:**
>
> - *Oracle Database Installation Guide* to install Oracle Database using the default settings
> - The Oracle Technology Network (OTN) website for information about supported Application Programming Interfaces (API) at
>
>   http://www.oracle.com/technetwork/index.html

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Command Syntax

UNIX command syntax appears in `monospace` font. The dollar character ($), number sign (#), or percent character (%) are UNIX command prompts. Do not enter them as part of the command. The following command syntax conventions are used in this guide:

Convention	Description

backslash \	A backslash is the UNIX command continuation character. It is used in command examples that are too long to fit on a single line. Enter the command as displayed (with a backslash) or enter it on a single line without a backslash:
	
	`dd if=/dev/rdsk/c0t1d0s6 of=/dev/rst0 bs=10b \`
	`count=10000`

braces { }	Braces indicate required items: `.DEFINE {macro1}`
brackets [ ]	Brackets indicate optional items: `cvtcrt termname [outfile]`
ellipses ...	Ellipses indicate an arbitrary number of similar items: `CHKVAL fieldname value1 value2 ... valueN`
italics	Italic type indicates a variable. Substitute a value for the variable: `library_name`
vertical line |	A vertical line indicates a choice within braces or brackets: `FILE filesize [K|M]`

Accessing Documentation

The documentation for this release includes platform-specific documentation and generic product documentation.

Product Documentation

Product documentation includes information about configuring, using, or administering Oracle products on any platform. The product documentation for Oracle Database 11*g* products is available in both HTML and PDF formats on the Oracle Technology Network (OTN) website:

http://www.oracle.com/technetwork/indexes/documentation/index.html

Related Documentation

The related documentation for Oracle Database 11*g* products includes the following manuals:

- *Oracle Database Installation Guide*
- *Oracle Real Application Clusters Installation Guide*
- *Oracle Grid Infrastructure Installation Guide*

For information about Oracle error messages, see *Oracle Database Error Messages*. Oracle error message documentation is available only in HTML. If you only have access to the Oracle Database 11*g* Release 2 (11.2) Online Documentation Library, then you can browse the error messages by range. Once you find the specific range, use your browser's "find in page" feature to locate the specific message. When connected

to the Internet, you can search for a specific error message using the error message search feature of the Oracle online documentation.

Many books in the documentation set use the sample schemas of the seed database, which is installed by default when you install Oracle. Refer to *Oracle Database Sample Schemas* for information on how these schemas were created and how you can use them yourself.

To download free release notes, installation documentation, white papers, or other collateral, visit the Oracle Technology Network. You must register online before using OTN; registration is free and can be done at:

http://www.oracle.com/technetwork/community/join/index.html

If you have a user name and password for Oracle Technology Network, then you can go directly to the documentation section of the Oracle Technology Network website at:

http://www.oracle.com/technetwork/indexes/documentation/index.html

Typographic Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Overview of Oracle Database Client Installation

This chapter describes the different installation types of Oracle Database Client and issues to consider before you install Oracle Database Client:

- Planning Your Installation
- Installation Considerations
- Oracle Database Client Installation Types
- Oracle Database Client and Oracle Database Interoperability
- Simplified Patching of Timestamp with Time Zone Data Type

Planning Your Installation

The Oracle Database installation process consists of the following phases:

1. **Review the licensing information:** Although the installation media in your media pack contain many Oracle components, you are permitted to use only those components for which you have purchased licenses.

   Oracle Support Services does not provide support for components for which licenses have not been purchased.

   > **See Also:** *Oracle Database Licensing Information*

2. **Plan the installation:** This chapter describes the Oracle products that you can install and issues that you must consider before starting the installation.

3. **Complete preinstallation tasks:** Chapter 2 describes preinstallation tasks that you must complete before installing the product.

4. **Install the software:** Chapter 3 describes how to install Oracle Database Client.

5. **Complete postinstallation tasks:** Chapter 4 describes recommended and required postinstallation tasks.

Installation Considerations

This section contains hardware and software certification information that you should consider before deciding to install this product.

The platform-specific hardware and software requirements included in this guide were current when this guide was published. However, because new platforms and operating system software versions might be certified after this guide is published, review the certification matrix on the My Oracle Support website for the most

up-to-date list of certified hardware platforms and operating system versions. The My Oracle Support website is available at the following URL:

https://support.oracle.com/

You must register online before using My Oracle Support. After logging in, from the menu options, select the **Certifications** tab. On the **Certifications** page, use the **Certification Search** options to search by Product, Release, and Platform. You can also search using the **Certification Quick Links** options such as Product Delivery and Lifetime Support.

Oracle Database Client Installation Types

In Oracle Database Client 11*g* Release 2, Instant Client and Instant Client Light are the only supported installation types.

The Instant Client installation type enables you to install only the shared libraries required by Oracle Call Interface (OCI), Oracle C++ Call Interface (OCCI), Pro*C, or Java Database Connectivity (JDBC) OCI applications. This installation type requires much less disk space than the other Oracle Database Client installation types.

> **See Also:** *Oracle Call Interface Programmer's Guide* or *Oracle Database JDBC Developer's Guide* for more information about Instant Client

The Instant Client Light (English) version of Instant Client further reduces the disk space requirements of the client installation. The size of the library has been reduced by removing error message files for languages other than English and leaving only a few supported character set definitions out of around 250.

This Instant Client Light version is geared toward applications that use either US7ASCII, WE8DEC, WE8ISO8859P1, WE8MSWIN1252, or a Unicode character set. There is no restriction on the LANGUAGE and the TERRITORY fields of the NLS_LANG setting, so the Instant Client Light operates with any language and territory settings. Because only English error messages are provided with the Instant Client Light, error messages generated on the client side, such as Net connection errors, are always reported in English, even if NLS_LANG is set to a language other than AMERICAN. Error messages generated by the database side, such as syntax errors in SQL statements, are in the selected language provided the appropriate translated message files are installed in the Oracle home of the database instance.

Instant Client Light supports the following client character sets:

- Single-byte
  - US7ASCII
  - WE8DEC
  - WE8MSWIN1252
  - WE8MSWIN1252
  - WE8ISO8859P1
- Unicode
  - UTF8
  - AL16UTF16
  - AL32UTF8

- Instant Client Light can connect to databases having one of these database character sets:

    - US7ASCII

    - WE8DEC

    - WE8MSWIN1252

    - WE8ISO8859P1

    - WE8EBCDIC37C

    - WE8EBCDIC1047

    - UTF8

    - AL32UTF8

    The advantage of using Instant Client Light is that it has a smaller footprint than the regular Instant Client. The shared libraries, which an application must load, are only 34 MB as opposed to the 110 MB that regular Instant Client uses. Therefore, the applications use less memory.

Oracle Database Client and Oracle Database Interoperability

For information about interoperability between Oracle Database Client and Oracle Database releases, see Note 207303.1 on the My Oracle Support website at the following URL:

https://support.oracle.com/

Simplified Patching of Timestamp with Time Zone Data Type

Starting with Oracle Database 11*g* Release 2 (11.2), the patching process of TIMESTAMP WITH TIMEZONE data type values is simplified.

> **See Also:** "Oracle Database 11*g* Release 2 (11.2) New Features in Globalization" and "Clients and Servers Operating with Different Versions of Time Zone Files" in *Oracle Database Globalization Support Guide* for information about simplified patching process and how certain clients work with server with different time zone files

2

Oracle Database Client Preinstallation Tasks

This chapter describes the tasks that you must complete before you install Oracle Instant Client. It includes the following information:

- Logging In to the System as root
- Checking the Hardware Requirements
- Checking the Software Requirements

Logging In to the System as root

Before you install the Oracle software, you must complete several tasks as the `root` user. To log in as the `root` user, complete the following procedure:

1. Log in to the system as a user that is a member of the `admin` group.

2. Start a local terminal session (`/Applications/Utilities/Terminal`).

3. If you are not logged in as the `root` user, enter the following command to start a shell session with `root` privileges:

   `$ sudo sh`

4. When prompted, enter your password.

Checking the Hardware Requirements

The system must meet the following minimum hardware requirements for Oracle Database Client 11*g* Release 2:

- Memory Requirements
- System Architecture
- Disk Space Requirements
- Display Requirements
- Recommended Hardware Requirement for SQL Developers

Memory Requirements

The following are the memory requirements for Oracle Database Client 11*g* Release 2 (11.2):

- At least 512 MB of RAM.

To determine the physical RAM size, use System Profiler (`/Applications/Utilities/System Profiler`) or enter the following command:

```
# /usr/sbin/system_profiler SPHardwareDataType | grep Memory
```

If the size of the physical RAM is less than the required size, then you must install more memory before continuing.

- The following table describes the relationship between installed RAM and the configured swap space requirement:

RAM	Swap Space
Up to 512 MB	2 times the size of RAM
Between 513 MB and 726 MB	1.5 times the size of RAM
More than 726 MB	0.75 times the size of RAM

To determine the size of the configured swap space, enter the following command:

```
# df -h
```

> **Note:**
>
> Mac OS X dynamically creates swap files as required in `/private/var/vm` directory. Ensure that you have at least 512 MB of available disk space on the root (`/`) file system to accommodate newly created swap files.

To determine the available RAM and swap space, enter the following command:

```
# free
```

> **IMPORTANT:**
>
> - Oracle recommends that you take multiple values for the available RAM and swap space before finalizing on a value. This is because the available RAM and swap space keep changing depending on the user interactions with the computer.
>
> - Contact your operating system vendor for swap space allocation guidance for your server. The vendor guidelines supersede the swap space requirements listed in this guide.

System Architecture

To determine whether the system architecture can run the software, enter the following command:

```
# uname -p
```

> **Note:** This command displays the processor type. The command
> output must be i386. If you do not see the expected output, then you
> cannot install the software on this system.

Disk Space Requirements

The minimum disk space requirement for software files for Oracle Database Client 11*g*
Release 2 (11.2) is 220 MB.

To determine the amount of free disk space available, enter the following command:

```
# df -h
```

Display Requirements

The minimum display requirement for Oracle Database 11*g* Release 2 (11.2) is a
resolution of 1024 x 768 or higher.

Recommended Hardware Requirement for SQL Developers

The following are the recommended CPU, Memory and Display requirements for SQL
Developer:

Resource	Recommended
Memory	1 GB RAM (recommended), 256 MB RAM (minimum)
Display	65536 colors, set to at least 1024 X 768 resolution

Checking the Software Requirements

Depending on the products that you intend to install, verify that the following
software is installed on the system. The procedure following the table describes how to
verify whether these requirements are addressed.

Item	Requirement
Operating system	The following or later versions of the operating system are supported for Oracle Database 11*g* Release 2 (11.2): ■ Apple Mac OS X Lion 10.7.3 or higher updates Both 32-bit and 64-bit versions of Oracle Database Instant Client 11*g* Release 2 (11.2.0.3) are supported. ■ Apple Mac OS X Mountain Lion 10.8.2 or higher updates Both 32-bit and 64-bit versions of Oracle Database Instant Client 11*g* Release 2 (11.2.0.3) are supported. ■ Apple Mac OS X Mavericks 10.9 or higher updates Both 32-bit and 64-bit versions of Oracle Database Instant Client 11*g* Release 2 (11.2.0.4) are supported.

Item	Requirement
Tools	■ Xcode 4.3.1 or later
	■ GNU C compiler (gcc) version 4.2.1 or later
	This version of gcc is included in Xcode 4.3.1 or later.
	■ JDK 1.6.0_29 or later for Apple Mac OS X Lion and Apple Mac OS X Mountain Lion
	JDK 1.6.0_65 or later for Apple Mac OS X Mavericks
Pro*C/C++, Oracle Call Interface, Oracle C++ Call Interface	The version of the GNU C and C++ compiler listed previously is supported for use with these products.
Oracle JDBC/OCI Drivers	You must use JDBC-OCI 1.6.0 or later versions with the JNDI extension.

To ensure that the system meets these requirements:

1. To determine the operating system version, enter the following command:

   ```
   # sw_vers
   ```

   The output of this command must be similar to the following:

   ```
   ProductName:    Mac OS X
   ProductVersion: 10.7.4
   BuildVersion:   11D50
   ```

   > **Note:** Only the versions listed in the previous table are supported. Do not install the software on other versions of Apple Mac OS X.

2. To determine if the required version of gcc is installed, enter the following command:

   ```
   # gcc -v
   ```

   This command returns output similar to the following:

   ```
   Using built-in specs.
   Target: i686-apple-darwin11
   Configured with: /private/var/tmp/11vmgcc42/11vmgcc42-2336.9~22/src/configure
   --disable-checking --enable-werror
   --prefix=/Applications/Xcode.app/Contents/Developer/usr/llvm-gcc-4.2
   --mandir=/share/man --enable-languages=c,objc,c++,obj-c++
   --program-prefix=llvm- --program-transform-name=/^[cg][^.-]*$/s/$/-4.2/
   --with-slibdir=/usr/lib --build=i686-apple-darwin11
   --enable-llvm=/private/var/tmp/llvmgcc42/llvmgcc42-2336.9~22/dst-llvmCore/Devel
   oper/usr/local --program-prefix=i686-apple-darwin11- --host=x86_
   64-apple-darwin11 --target=i686-apple-darwin11
   --with-gxx-include-dir=/usr/include/c++/4.2.1
   Thread model: posix
   gcc version 4.2.1 (Based on Apple Inc. build 5658) (LLVM build 2336.9.00)
   ```

   If the required version (including the date and build number) or a later version is not installed, then download and install Xcode 4.3.1 or later. You can download this software from the Apple Developer Connection website:

   https://developer.apple.com/

3. To determine if the correct version of Xcode is installed, enter the following command:

```
# /usr/bin/xcodebuild -version
```

This commands returns output similar to the following:

```
Xcode 5.0.2
Build version 5A3005
```

If the required version (including the date and build number) or a later version is not installed, then download and install Xcode 4.3.1 or later. You can download this software from the Apple Developer Connection website:

https://developer.apple.com/

Instant Client Light Requirements

In addition to the requirements described in the preceding section, if you plan to use Instant Client Light, then the applications must use the following languages and character sets:

- **Language:** Any language that is supported by Oracle
- **Territory:** Any territory that is supported by Oracle
- **Character sets:**
  - Single byte
    * US7ASCII
    * WE8DEC
    * WE8MSWIN1252
    * WE8ISO8859P1
  - Unicode
    * UTF8
    * AL16UTF16
    * AL32UTF8

    Instant Client Light can connect to databases having one of the following database character sets:

    * US7ASCII
    * WE8DEC
    * WE8MSWIN1252
    * WE8ISO8859P1
    * WE8EBCDIC37C
    * WE8EBCDIC1047
    * UTF8
    * AL32UTF8

Instant Client Light can also operate with the OCI Environment handles created in the OCI_UTF16 mode.

The language, territory, and character sets are determined by the `NLS_LANG` environment variable.

> **Note:** Ensure that you set the `NLS_LANG` environment variable to the required character set before you run Oracle Database Instant Client.

3

Installing and Removing Oracle Database Client

The Oracle Database Client software is available on Oracle Technology Network website. This chapter describes the following sections:

- Downloading and Installing the Oracle Database Client Software
- Removing the Oracle Database Client Software

Downloading and Installing the Oracle Database Client Software

Download and install Oracle Database Client 11*g* Release 2 by completing the following steps:

1. Download the Instant Client for Mac OS X (Intel) (32-bit and 64-bit) package from the Instant Client Downloads page on Oracle Technology Network at

   `http://www.oracle.com/technetwork/index.html`

2. Create a directory on your computer, for example, `instantclient`. Choose a directory to install the Oracle Instant Client and unzip the downloaded zip file in that directory. The unzipped file creates the `instantclient_11_2` directory.

3. Set the `DYLD_LIBRARY_PATH` and the `NLS_LANG` environment variables to the full path of the `instantclient_11_2` directory. For example, if you unzipped the Instant Client zip file in the `/bin/oracle` directory, then set the `DYLD_LIBRARY_PATH` environment variable to `/bin/oracle/instantclient_11_2`.

   Refer to "Instant Client Light Requirements" for information about setting the `NLS_LANG` environment variable to the required character set.

   This completes the installation of Oracle Database Client. To connect to the Oracle Database server, run your client from the Oracle Database Instant Client environment.

Removing the Oracle Database Client Software

To remove the Oracle Database Client software, delete the `instantclient_11_2` directory.

4

Oracle Database Client Postinstallation Tasks

This chapter describes how to complete postinstallation tasks after you have installed the Oracle Database Client software. It includes information about the following topics:

- Required Postinstallation Tasks
- Recommended Postinstallation Tasks
- Required Product-Specific Postinstallation Tasks

You must perform the tasks listed in "Required Postinstallation Tasks" on page 4-1. Oracle recommends that you perform the tasks listed in "Recommended Postinstallation Tasks" on page 4-2 after all installations.

If you install and intend to use any of the products listed in "Required Product-Specific Postinstallation Tasks" on page 4-4, then you must perform the tasks listed in the product-specific subsections.

Required Postinstallation Tasks

You must perform the tasks described in the following sections after completing an installation:

- Updating Instant Client
- Connecting with Instant Client

Updating Instant Client

To update Instant Client:

1. Download Instant Client from Oracle Technology Network:

   http://www.oracle.com/technetwork/database/features/instant-client/index-097480.html

2. If you want to place the files in the existing directory, then ensure that the directory is empty.

   If you want to place the files into a different directory (and remove the previous files), ensure that you update the DYLD_LIBRARY_PATH environment variable setting to reflect the new location.

> **Note:** A restriction on Instant Client or Instant Client Light is that you cannot perform patch upgrades using the `opatch` utility because the Instant Client installation does not create an inventory, which the patch upgrade process must access for patch upgrades. The absence of an inventory also means that the installed intern patch reporting and conflict detection before a patch attempt are not possible.

Connecting with Instant Client

If you installed the Instant Client installation type, you can configure users' environments to enable dynamically linked client applications to connect to a database as follows:

1. Set the appropriate shared library path environment variable for the platform to specify the directory that contains the Instant Client libraries. For example, if your Instant Client is located in the `/bin/oracle/instantclient_11_2` directory, then set the `DYLD_LIBRARY_PATH` environment variable to this directory.

2. Use one of the following methods to specify database connection information for the client application:

   - Specify a SQL connect URL string using the following format:

     `//host:port/service_name`

     For example:

     `//shobeen:1521/sales_us`

   - Set the `TNS_ADMIN` environment variable to specify the location of the `tnsnames.ora` file and specify a service name from that file.

   - Set the `TNS_ADMIN` and the `TWO_TASK` environment variables to specify a service name from the `tnsnames.ora` file.

     > **Note:** It is not required that you specify the `ORACLE_HOME` environment variable.

Recommended Postinstallation Tasks

Oracle recommends that you perform the tasks described in the following sections after completing an installation:

- Connecting Instant Client or Instant Client Light to an Oracle Database
- Setting the NLS_LANG Environment Variable

Connecting Instant Client or Instant Client Light to an Oracle Database

Before you can connect Instant Client (including Instant Client Light) to an Oracle database, ensure that the `DYLD_LIBRARY_PATH` environment variable specifies the directory that contains the Instant Client libraries.

For example, if the shared libraries for Instant Client or Instant Client Light (if you have installed Instant Client Light) are in the `/bin/oracle/instantclient_11_2` directory, then set the `DYLD_LIBRARY_PATH` environment variable to the following path:

`/bin/oracle/instantclient_11_2`

After checking the `DYLD_LIBRARY_PATH` environment variable, you can use any of the following methods to specify Oracle Database connection information for client applications:

- Specifying a Connection by Using the Easy Connect Naming Method
- Specifying a Connection Using an Empty Connect String and TWO_TASK

Specifying a Connection by Using the Easy Connect Naming Method

You can specify a connection address to an Oracle Database directly from a client application, without having to configure a `tnsnames` setting for the Instant Client. This method is convenient as you do not have to create and manage a `tnsnames.ora` file. However, the application users must specify the host name and port number when they want to log in to the application.

For example, if you run SQL*Plus on the client computer and want to connect to the `sales_us` database, which is located on a server whose host name is `shobeen` and port number is `1521`, then you can log in as follows:

```
sqlplus system/admin@//shobeen:1521/sales_us
```

Similarly, in the application code, you can use Oracle Call Interface net naming methods to create the Instant Client-to-Oracle Database connection. For example, the following formats in the `OCIServerAttach()` call specify the connection information:

- Specify a SQL connect URL string using the following format:

  ```
  //host[:port][/service_name]
  ```

  For example:

  ```
  //shobeen:1521/sales_us
  ```

- Alternatively, you can specify the SQL connect information as an Oracle Net keyword-value pair. For example:

  ```
  "(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp) (HOST=shobeen) (PORT=1521))
  (CONNECT_DATA=(SERVICE_NAME=sales_us)))"
  ```

> **See Also:** *Oracle Call Interface Programmer's Guide* for more information on using Oracle Call Interface Instant Client

Specifying a Connection Using an Empty Connect String and TWO_TASK

You can set the connect string to an empty connect string (""), and then set the `TWO_TASK` environment variable to one of the following values:

- A direct address, as described under "Specifying a Connection by Using the Easy Connect Naming Method" on page 4-3
- Oracle Net keyword-value pair
- A `tnsnames.ora` entry and `TNS_ADMIN` is set to the location of `tnsnames.ora`
- A `tnsnames.ora` entry and the following:
  - `tnsnames.ora` file located in `$ORACLE_HOME/network/admin`
  - The `ORACLE_HOME` environment variable set to this Oracle home

This method allows the applications to specify internally a connection string if the application code itself uses an empty connection string. The benefit of an empty connect string is that the application itself does not have to specify the `tnsnames.ora`

entry. Instead, when a user starts the application, the location of the database is determined by a script or the environment, depending on where you have set the `TWO_TASK` environment variable. The disadvantage of using empty strings is that you must configure this additional information in order for the application to connect to the database.

Setting the NLS_LANG Environment Variable

`NLS_LANG` is an environment variable that specifies the locale behavior for Oracle software. This variable sets the language and territory used by the client application and the database user session. It also declares the character set of the client, which is the character set of data entered or displayed by an Oracle client program, such as SQL*Plus.

> **Note:** The character set of the data displayed is determined by the environment of the operating system, such as keyboard driver and fonts in use. The `NLS_LANG` character set should match the operating system.

Refer to the "Setting Up a Globalization Support Environment" section in *Oracle Database Globalization Support Guide* for information about Globalization Support.

Required Product-Specific Postinstallation Tasks

The following sections describe postinstallation tasks that you must perform if you install and intend to use Oracle Precompliers:

> **Note:** You must perform postinstallation tasks only for products that you intend to use.

Configuring Oracle Precompilers

This section describes postinstallation tasks for Pro*C/C++.

Configuring Pro*C/C++

Verify that the `PATH` environment variable setting includes the directory that contains the C compiler executable. The default directory for the `gcc` compiler executable is `/usr/bin`.

> **See Also:** *Pro*C/C++ Programmer's Guide* for more information about setting environment variables

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