

Using VMware vFabric Postgres

vFabric Postgres 9.1

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Preface

Using VMware vFabric Postgres provides information about installing and using a VMware vFabric Postgres Standard Edition DBMS.

Intended Audience

This information is intended for anyone who wants to install or use a vFabric Postgres Standard Edition DBMS. The information is written for experienced Windows or Linux system administrators who are familiar with virtual machine technology and datacenter operations.

Related Publications

The vFabric Suite documentation has information about the components of the vFabric suite.

For information about managing vFabric Postgres databases, see the public PostgreSQL documentation at <http://www.postgresql.org/docs/>. Because vFabric Postgres is compatible with PostgreSQL, you can manage vFabric Postgres databases using the information in that documentation.

To access the current versions of VMware documentation, go to <http://www.vmware.com/support/pubs>.

Updated Information

This *Using VMware vFabric Postgres* is updated with each release of the product or when necessary. This update of the document includes additional or revised information about the installation process and the client tools and drivers.

VMware Customizations for Postgres

VMware vFabric Postgres is an ACID-compliant, ANSI-SQL-compliant transactional, relational database designed for the virtual environment and optimized for vSphere. It is based on the Postgres open-source relational database and is compatible with PostgreSQL.

vFabric Postgres databases are managed by a DBMS that consists of a server and a client. VMware supports two versions of vFabric Postgres, vFabric Postgres Standard Edition and vFabric Postgres Standard Edition for Data Director.

**vFabric Postgres
Standard Edition**

Supports all standard Postgres connection tools and interaction methods.

**vFabric Postgres
Standard Edition for
Data Director**

Seamlessly integrates with Data Director and can be managed from the Data Director GUI. You can also use traditional database tools to interact with this version, but some modifications, for example to connection strings, might be required.

This chapter includes the following topics:

- [“vFabric Postgres Enhancements,”](#) on page 9
- [“Deploying vFabric Postgres,”](#) on page 10

vFabric Postgres Enhancements

The VMware vFabric Postgres DBMS includes memory, checksum, and performance features that are not available with an open source Postgres/PostgreSQL DBMS.

**Elastic Database
Memory**

Elastic database memory enables vFabric Postgres to run with graceful performance degradation under heavy over-commitment of memory. vFabric Postgres participates in memory resource management with the guest operating system and the vSphere hypervisor to achieve elastic database memory.

vFabric Postgres monitors requests for memory from the vSphere hypervisor and monitors swap activity within the guest operating system. When the hypervisor or the guest operating system needs more memory, the vFabric Postgres buffer manager shrinks the database buffer pool to make memory available. When more memory becomes available, the buffer manager increases the amount of memory dedicated to the buffer pool.

Elastic database memory is enabled by default in the virtual appliance, but is disabled if you use the RPM files. RPM installation is supported only for the standalone version of vFabric Postgres.

Ease of Tuning on the Appliance

If you deploy the vFabric Postgres appliance or the vFabric Postgres for Data Director appliance, associated vFabric Postgres databases have higher default values than standard Postgres databases for many critical settings, including `shared_buffers`, `checkpoint_segments`, and `wal_buffers`. The higher default values improve out-of-box vFabric Postgres performance with a slight increase in disk space and memory requirements. The result is that users of an embedded vFabric Postgres database can more easily tune the database for their workload.

If you are using vFabric Postgres, and you use the RPM installation, these changes to default values are not made.

Automatic Checksums

By default, vFabric Postgres performs checksums on each write operation to tables or indexes. Performing checksums on each write ensures that when vFabric Postgres retrieves data, that data is clean.

Checkpoint Tuning

vFabric Postgres improves on the Postgres algorithm to make the tuning more dynamic.

In I/O-constrained environments, periods of heavy checkpointing activity often alternate with periods of light checkpoint activity.

By default, vFabric Postgres performs dynamic tuning of checkpoint parameters so that rapid changes in available I/O bandwidth or changes in the database workload reduce the likelihood of database throughput oscillations.

Deploying vFabric Postgres

You can deploy a vFabric Postgres DBMS as a virtual appliance (OVA file) or by using RPM packages.

- You can deploy the virtual appliance to create a virtual machine with the operating system (SLES 11, SP 1 64-bit Linux), a vFabric Postgres server, and a vFabric Postgres client preinstalled. The appliance version of the vFabric Postgres database includes VMware virtualization technology.
- You can use RPM to deploy vFabric Postgres. To use RPM, create a virtual machine and install a supported operating system, as listed on the datasheet. Use `-ivh` commands to install the RPMs. You can use this method to install the vPostgres server and client software.

NOTE Using RPMs is not supported for vFabric Postgres for Data Director.

Installing vFabric Postgres

Before you install vFabric Postgres, review the requirements and the deployment or installation process.

This chapter includes the following topics:

- [“Installation Overview,”](#) on page 11
- [“System Requirements,”](#) on page 12
- [“Deploying the vFabric Postgres Virtual Appliance,”](#) on page 13
- [“Install vFabric Postgres Using RPM Files,”](#) on page 16

Installation Overview

The vFabric Postgres server and client software is distributed together. You can either deploy an Open Source Virtual Appliance (OVA) file or install a series of RPM packages.

Virtual Appliance Deployment Overview

The process of deploying a vFabric Postgres virtual appliance is similar on the different supported virtualization platforms.

- 1 Install one of the VMware virtualization platforms such as vSphere 5.x, Workstation 8.x, Fusion 4.x, or Player 4.x.

NOTE For a production system, only vSphere 5.x is supported.

- 2 Deploy the virtual appliance.
- 3 Install the client tools.
- 4 Log into the new DBMS using the client software.

RPM Deployment Overview

The process of installing the vFabric Postgres DBMS from RPM packages is discussed in detail below and consists of the following high-level tasks.

NOTE This process is supported only for the standalone version. It is not supported for vFabric Postgres for Data Director.

- 1 Make sure the virtual machine you want to use is running a supported operating systems and meets other requirements.

- 2 Download and install the client, server, and init RPM files in the following order.
 - a client package
 - b server package
 - c init package
- 3 Install the client tools.
- 4 Log into the new DBMS using the client software.

System Requirements

You can deploy the virtual appliance and install the RPM packages on several operating systems.

Supported Platforms for Virtual Appliance Deployment

For the virtual appliance (OVA), several virtualization platforms are supported during development, but support is more limited during production.

Development While you develop your application and run tests, you can deploy the virtual appliance on the latest edition of any VMware virtualization platform, including VMware vSphere 5.x, VMware Workstation 8.x, VMware Fusion 4.x, or VMware Player 4.x.

Production In a production environment, you must install vFabric Postgres on VMware vSphere 5.x.

Resource Requirements

The host where you deploy the OVA, or the virtual machine where you install the RPM files, has the following minimum requirements.

RAM	512 MB
CPUs or vCPUs	1
Disk Space	12 GB

Operating Systems

The vFabric Postgres server software is currently supported on the following operating systems.

Red Hat Linux	RHEL 6.2 (64 bit)
SUSE Linux	SLES 11 SP 1 (64 bit)

Database Clients

The vFabric Postgres product includes custom JDBC, ODBC, and LIBPQ drivers. Drivers and tools are available for the standalone vFabric Postgres Standard Edition and the vFabric Postgres Standard Edition for Data Director.

Database clients for Windows, Linux, and MAC OS X, both 32 bit and 64 bit, are included.

Many community PostgreSQL clients, such as Npgsql, and psycopg2 are also supported in both 32-bit and 64-bit configurations.

Deploying the vFabric Postgres Virtual Appliance

You can deploy the vFabric Postgres virtual appliance on several VMware virtualization platforms. Deployment creates a virtual machine that includes the vFabric Postgres DBMS software.

You can deploy the vFabric Postgres OVA file on VMware vSphere 5.x (required for a production system), VMware Workstation 8.x, VMware Fusion 4.x or VMware Player 4.x.

The following steps assume that you have already downloaded the vFabric Postgres appliance OVA file and extracted the archive to a directory.

Deploy the OVA File on vSphere 5.x

You can deploy the OVA file on vSphere 5.x for use during development or for production environments.

Prerequisites

Download the OVA file from the VMware download site.

NOTE Different OVA files exist for vFabric Postgres Standard Edition and vFabric Postgres Standard Edition for Data Director.

Procedure

- 1 Connect to a vCenter Server with the vSphere Web Client.
- 2 Select an inventory object that is a valid parent object of a virtual machine, such as a datacenter, folder, cluster, resource pool, or host.
- 3 Select **Actions > All vCenter Actions > Deploy OVF Template**.
- 4 If prompted, download the client plug-in.
You have to close all browsers to download the plug-in.
- 5 Specify the source location and click **Next**.
- 6 If prompted, accept the license agreement and wait for the deployment process to complete.
- 7 (Optional) Change the resource allocation for the virtual appliance. The default configuration is as follows.

Resource	Value
Memory	512 MB
vCPU	1
Hard Disk 1 - root disk (vmname.vmdk)	2 GB
Hard Disk 2 - data disk (vmname_1.vmdk)	8 GB
Hard Disk 3 - swap disk (vmname_2.vmdk)	1 GB
Hard Disk 4 - diagnostic disk and core disk (vmname_3.vmdk)	1 GB

- 8 Set the network configuration if you want to set a static IP address, or leave the settings blank to have the virtual machine use DHCP.

You can use the network configuration script `/opt/vmware/share/vami/vami_config_net` to change the IP address of the virtual appliance.

- 9 Power on the new virtual machine and log in as root, using the random password that is displayed.

- 10 Change the password with the `/opt/aurora/sbin/setpassword` command.

The command sets the password for the user with user name root and the user with user name postgres on both system and the database.

Deploy the OVA File on VMware Workstation 8.x

You can deploy the OVA file on Workstation 8.x for use during development. For production use, deploy the OVA file on vSphere 5.x.

Prerequisites

Download the OVA file from the VMware download site.

NOTE Different OVA files exist for vFabric Postgres Standard Edition and vFabric Postgres Standard Edition for Data Director.

Procedure

- 1 Connect to a vCenter Server with the vSphere Web Client.
- 2 Select an inventory object that is a valid parent object of a virtual machine, such as a datacenter, folder, cluster, resource pool, or host.
- 3 Select **Actions > All vCenter Actions > Deploy OVF Template**.
- 4 If prompted, download the client plug-in.
You have to close all browsers to download the plug-in.
- 5 Specify the source location and click **Next**.
- 6 Accept the license agreement and wait for the appliance to deploy.
- 7 (Optional) Change the resource allocation for the virtual appliance. The default configuration is as follows.

Resource	Value
Memory	512 MB
vCPU	1
Hard Disk 1 - root disk (vmname.vmdk)	2 GB
Hard Disk 2 - data disk (vmname_1.vmdk)	8 GB
Hard Disk 3 - swap disk (vmname_2.vmdk)	1 GB
Hard Disk 4 - diagnostic disk and core disk (vmname_3.vmdk)	1 GB

- 8 Set the network configuration if you want to set a static IP address, or leave the settings blank to have the virtual machine use DHCP.
You can use the network configuration script `/opt/vmware/share/vami/vami_config_net` to change the IP address of the virtual appliance.
- 9 Power on the new virtual machine and log in as root, using the random password that is displayed.
- 10 Change the password with the `/opt/aurora/sbin/setpassword` command.
The command sets the password for the user with username root user and for the user with user name postgres.

You can now download the client tools and connect to the database from a client.

Deploy the OVA File on VMware Fusion 4.x or VMware Player 4.x

On VMware Fusion or VMware Player, you can convert the OVA file to VMX format and install the appliance using the VMX file. For production use, deploy the OVA file on vSphere 5.x.

Prerequisites

- Download the OVA file from the VMware download site.
- Install ovftool on VMware Fusion or VMware Player.

Procedure

- 1 In a terminal window, type the following command to convert the OVA file to a VMX file.

```
ovftool path/appliance_name-version.ova path/aurora_dbvm-version.vmx
```
- 2 Connect to a vCenter Server with the vSphere Web Client.
- 3 Select an inventory object that is a valid parent object of a virtual machine, such as a datacenter, folder, cluster, resource pool, or host.
- 4 Select **Actions > All vCenter Actions > Deploy OVF Template**.
- 5 If prompted, download the client plug-in.
 You have to close all browsers to download the plug-in.
- 6 Specify the source location and click **Next**.
- 7 Accept the license agreement and wait for the deployment process to complete.
- 8 (Optional) Change the resource allocation for the virtual appliance. The default configuration is as follows.

Resource	Value
Memory	512 MB
vCPU	1
Hard Disk 1 - root disk (vmname.vmdk)	2 GB
Hard Disk 2 - data disk (vmname_1.vmdk)	8 GB
Hard Disk 3 - swap disk (vmname_2.vmdk)	1 GB
Hard Disk 4 - diagnostic disk and core disk (vmname_3.vmdk)	1 GB

- 9 Set the network configuration if you want to set a static IP address, or leave the settings blank to have the virtual machine use DHCP.
 You can use the network configuration script `/opt/vmware/share/vami/vami_config_net` to change the IP address of the virtual appliance.
- 10 Power on the new virtual machine and log in as root, using the random password that is displayed.
- 11 Change the password with the `/opt/aurora/sbin/setpassword` command.
 The command sets the password for the user with username root user and for the user with user name postgres.

You can now download client tools and connect to the database from a client.

Install vFabric Postgres Using RPM Files

If you want to install vFabric Postgres on a new or existing virtual machine, you can use RPM files.

Different editions of the vFabric Postgres server software are supported on different operating systems. See the datasheet for the version you intend to use for information.

Prerequisites

- Create a new virtual machine running a supported operating system, or log in to a virtual machine where one of these operating systems is currently running.
- Verify that you have access to the Internet to perform the installation.
- If you install 32-bit binaries on a 64-bit system, install compatibility libraries as well. On RHEL6, use `yum install glibc.i686 nss-softokn-freebl.i686`.

Procedure

- 1 Download at a minimum the following files from the VMware download site.

- `VMware-vPostgres-client-9.1.6.0-XXXXXX.x86_64.rpm`
- `VMware-vPostgres-9.1.6.0-XXXXXX.x86_64.rpm`
- `VMware-vPostgres-server-init-9.1.6.0-XXXXXX.x86_64.rpm`

Optional components, 32-bit client RPMs, and client tools for Windows, Macintosh, ODBC, and JDBC are also available on the download site.

- 2 Install each of the RPM files using the `rpm -ivh` command, in the order shown below.

You can install all files at once with a single command.

```
>rpm -ivh V
VMware-vPostgres-client-9.1.6.0-XXXXXX.x86_64.rpm
VMware-vPostgres-9.1.6.0-XXXXXX.x86_64.rpm
VMware-vPostgres-server-init-9.1.6.0-XXXXXX.x86_64.rpm
```

After the files have been installed, a database instance is in the `/var/vmware/vpostgres/current/pgdata` directory. The user name for the database is `postgres`. A user with the name `postgres` has become available in your operating system.

- 3 Log in to the database with the 60 day license key and set the password manually.

You can set the password for the database user with username `postgres`, and for the operating system user with user name `postgres`. These two users are not the same.

- 4 (Optional) To connect to the database from the local host as the database user with username `postgres`, set the password, as in the following example.

```
[root@rhel-6-64-esx41 ~]# /opt/vmware/vpostgres/current/bin/psql -U postgres
psql.bin (9.2.0)
Type "help" for help.
postgres=# alter user postgres password 'mypassword';
ALTER ROLE
postgres=#
```

- 5 To set the password for the operating system user with user name `postgres`, log in as root and set the password as follows.

```
$passwd postgres
```


vFabric Postgres Client Tools and Libraries

3

You can use vFabric Postgres client tools on Windows or Linux to print configuration parameters and to back up and restore vFabric Postgres databases. The command line front end to PostgreSQL, `psql`, is also included.

NOTE Different client tools and libraries are available for vFabric Postgres and for vFabric Postgres for Data Director. Go to the correct download location to download the tools and libraries you need.

This chapter includes the following topics:

- [“Overview of Tools and Libraries,”](#) on page 17
- [“Client Tool Packages and Drivers,”](#) on page 18
- [“Install the Client Tools Package,”](#) on page 19
- [“Add an x86 vFabric Postgres ODBC Data Source on Windows,”](#) on page 20
- [“Relink Your Application with vFabric Postgres libpq,”](#) on page 20

Overview of Tools and Libraries

The vFabric Postgres client tools are based on the Postgres client database tools and are customized for vFabric Postgres. The tools support common configuration commands. The libraries include several APIs and the ODBC driver for PostgreSQL.

Separate download packages are available for vFabric Postgres and for vFabric Postgres for Data Director.

Versions for Linux x86, 32 bit and 64 bit, for Windows x86, 32 bit and 64 bit, and for Mac-OS are available.

Linux The Linux RPM includes ODBC drivers for vFabric Postgres. The Linux ODBC driver requires unixODBC-2.3.1 or greater.

Windows The vFabric Postgres client tool installer package for Windows includes ODBC and JDBC drivers for vFabric Postgres

The following vFabric Postgres client database tools are included in the vFabric Postgres client tools packages.

Table 3-1. vFabric Postgres Client Tools

Tool	Description
<code>pg_config</code>	Prints the current vFabric Postgres installation's configuration parameters.
<code>pg_dump</code>	Backs up vFabric Postgres databases
<code>pg_restore</code>	Restores vFabric Postgres databases from archives created by <code>pg_dump</code> .
<code>psql</code>	Command line based front end to PostgreSQL.

The vFabric Postgres client tools ship with the following libraries.

Table 3-2. vFabric Postgres Client Tool Libraries

Library	Description
libpq.so (Linux) or libpq.dll (Windows)	The C API to PostgreSQL. Libpq is the underlying engine for several PostgreSQL APIs such as those written for C++, Perl, Python, Tcl, and ECPG.
psqlodbcw.so (Linux) or psqlodbc35w.dll (Windows)	The ODBC driver for PostgreSQL.

The vFabric Postgres client tool libraries are customized for use with vFabric Postgres databases, but you can use the standard Postgres libraries. To ensure that you link with the vFabric Postgres libraries, do one of the following.

- If you want to keep the standard Postgres libraries on your system, ensure that your `LD_LIBRARY_PATH` environment variable specifies the location of the vFabric Postgres libraries first.
- If you do not want to keep the standard Postgres libraries, remove them and ensure that your `LD_LIBRARY_PATH` environment variable points to the location of the vFabric Postgres libraries on your system.

Client Tool Packages and Drivers

You can download client tool packages for Windows and Linux from the VMware download site. After you download the tools, you can use the drivers included in the packages.

Packages

If you plan to write code, and you plan on compiling an application to link with `libpq`, download both the client package and the development package.

You can download the client tool package for your platform from the VMware download site. Be sure to download the appropriate package for your environment.

vFabric Postgres <http://vmware.com/go/download-vfabric-postgres>

vFabric Postgres for Data Director <http://www.vmware.com/go/download-datadirector>

You can download tools and drivers for Windows, Linux, Java, or Macintosh.

Drivers

The vFabric Postgres client tools package includes a JDBC driver and an ODBC driver customized for vFabric Postgres. Use the vFabric Postgres JDBC or ODBC drivers, not the standard Postgres drivers, to connect to Data Director.

JDBC Driver After installation, you can find the JDBC driver in the following locations.

Microsoft Windows `C:\Program Files\VMware\vPostgres\9.1\JDBC`

Linux `/opt/vmware/vpostgres/current/JDBC`

The `Samples` directory contains a simple Java example and README file that show how to connect to Data Director using JDBC.

For example, if your application uses the JDBC driver to access a database, and you install the application as `/usr/local/lib/myapp.jar` and the PostgreSQL JDBC driver as `/usr/local/pgsql/share/java/postgresql.jar`, you run the application as follows.

```
export
CLASSPATH=/usr/local/lib/myapp.jar:/usr/local/pgsql/share/java/postgresql.jar:. java MyApp
```

ODBC Driver

The vFabric Postgres installation process installs the vFabric Postgres ODBC driver. You can verify the Windows ODBC driver installation as follows.

- 1 Select **Start > Administrative Tools > Data Sources (ODBC)**.
- 2 Click the Drivers tab.
- 3 Verify that the VMware vFabric Postgres ODBC driver appears in the list of installed ODBC drivers.

Install the Client Tools Package

You can install the vFabric Postgres Client Tools on Windows or Linux systems. The package includes drivers customized for vFabric Postgres. You can install only the base package, or install the development RPMs as well.

Prerequisites

- Download the package.
- If you are using vFabric Postgres for Data Director, verify that the Data Director ESXi host is running.

Procedure

- 1 Install the package.

Operating System	Installation Process
Linux	Install the RPM files by running the following command. <pre>rpm -ivh pathToClientRpms</pre> <i>pathToClientRpms</i> is the full pathname of the RPM package location on your system. The default installed location is <code>/opt/vmware/vpostgres/9.1</code> . Use <code>-Uvh</code> instead of <code>-ivh</code> if you perform an upgrade.
Windows	<ol style="list-style-type: none"> a Double-click the installer to start the installer. b Accept the license agreement and confirm the install location. Installation proceeds. The default installed location is <code>\Program Files\VMware\vPostgres\9.1\</code> . If you install the x86 vFabric Postgres client tools on a Windows 64-bit system, the Windows installer places the client tools in <code>\Program Files (x86)\VMware\vPostgres\9.1\</code> .
Macintosh	Run or rerun the installer. You can double-click the PKG file to start the installer GUI or install from the command line by running the following command. <pre># sudo installer -pkg /path/to/VMware-vPostgres-client-....pkg -target /</pre>

- 2 Ensure that your `PATH` environment variable includes the location of the vFabric Postgres client tools, for example `C:\Program Files\VMware\vPostgres\9.1\bin`.

What to do next

If you install both the x86 and the 64 bit vFabric Postgres client tools on a 64-bit Windows system, see [“Add an x86 vFabric Postgres ODBC Data Source on Windows,”](#) on page 20.

If you are developing a custom application, relink with `libpq`. See [“Relink Your Application with vFabric Postgres `libpq`”](#) on page 20.

Add an x86 vFabric Postgres ODBC Data Source on Windows

If you install both the x86 and the 64-bit vFabric Postgres client tools on the same 64-bit Windows system, you must explicitly add an x86 ODBC data source.

Prerequisites

Install the x86 and the 64-bit vFabric Postgres client tools.

Procedure

- 1 In Windows Explorer, go to `C:\Windows\SysWOW64\`.
- 2 Double-click `odbcad32.exe`.
- 3 Select the System DSN tab and click **Add**.
- 4 Click the VMware vFabric Postgres Unicode 32bit data source.
- 5 Click **Finish**.

Relink Your Application with vFabric Postgres `libpq`

If you want to use an existing Postgres application with vFabric Postgres, you can relink the application.

Because vFabric Postgres `libpq.so` is dynamically linked with `libssl`, the static `ld` linker does not recognize the `rpath` of `$ORIGIN`. You can relink to specify the `rpath`.

Prerequisites

Install the vFabric Postgres client tools. You can relink without installing the development RPMs.

Procedure

- ◆ Relink with vFabric Postgres based on your operating system.

Operating System	Relinking Process						
Linux	<p>a See <code>/opt/vmware/vpostgres/current/share/libpq-doc/README.vpostgres-libpq</code>.</p> <p>b Override the dynamic library search path by adding <code>/opt/vmware/vpostgres/current/lib-public</code> to <code>LD_LIBRARY_PATH</code>.</p> <pre># export LD_LIBRARY_PATH=/opt/vmware/vpostgres/current/lib-public # mypgapp</pre> <p>- or -</p> <p>c Relink using the vFabric Postgres libpq.</p> <pre># gcc -o t t.c -L/opt/vmware/vpostgres/current/lib -Wl,'-rpath=/opt/vmware/vpostgres/current/lib' -lpq</pre>						
Windows	<p>Copy libpq and other libraries to the directory of the application binaries and relink.</p> <p>By default , the libraries and header files are in the following locations.</p> <table border="0"> <tr> <td>Development libraries</td> <td>C:\Program Files\VMware\vPostgres\9.1\dev</td> </tr> <tr> <td>libpgport.lib and libpq.lib libraries</td> <td>C:\Program Files\VMware\vPostgres\9.1\dev\lib</td> </tr> <tr> <td>libpq header files</td> <td>C:\Program Files\VMware\vPostgres\9.1\dev\include</td> </tr> </table>	Development libraries	C:\Program Files\VMware\vPostgres\9.1\dev	libpgport.lib and libpq.lib libraries	C:\Program Files\VMware\vPostgres\9.1\dev\lib	libpq header files	C:\Program Files\VMware\vPostgres\9.1\dev\include
Development libraries	C:\Program Files\VMware\vPostgres\9.1\dev						
libpgport.lib and libpq.lib libraries	C:\Program Files\VMware\vPostgres\9.1\dev\lib						
libpq header files	C:\Program Files\VMware\vPostgres\9.1\dev\include						
Mac OS X	<p>Perform one of the following tasks.</p> <ul style="list-style-type: none"> ■ Override the dynamic library search path by adding the <code>/opt/vmware/vpostgres/9.1/lib</code> to the <code>DYLD_LIBRARY_PATH</code> environment variable, as follows: <pre># export DYLD_LIBRARY_PATH=/opt/vmware/vpostgres/9.1/lib # mypgapp</pre> ■ Relink using the vFabric Postgres libpq library during compilation. Relinking requires the Xcode developer toolset. For example, to embed the full path of <code>libpq.dylib</code> in the executable binary <code>mypgapp</code>, run this command. <pre># gcc -o mypgapp mypgapp.c -L/opt/vmware/vpostgres/9.1/lib -lpq</pre> ■ Relink using the vFabric Postgres libpq after compilation. Relinking requires the Xcode developer toolset. <p>NOTE This changes the binary to use vPostgres libpq</p> <pre># install_name_tool -change "/usr/lib/libpq.5.dylib" "/opt/vmware/vpostgres/9.1/lib/libpq.5.dylib" mypgapp</pre> <p>To confirm which library is linked, run this command.</p> <pre># otool -L mypgapp</pre> 						

Managing vFabric Postgres

After you have installed the vFabric Postgres DBMS and the client tools, you can perform a variety of management tasks.

NOTE If you are using the vFabric Data Director version of vFabric Postgres, you perform most of your management tasks from the Data Director GUI. This includes creating, monitoring, and managing vFabric Postgres databases, and managing license keys for production system. See *vFabric Data Director Administrator and User Guide*.

This chapter includes the following topics:

- [“Add a License Key,”](#) on page 23
- [“Import Postgres or vFabric Postgres Databases,”](#) on page 24
- [“Restarting the vFabric Postgres Service,”](#) on page 24
- [“Connection to a vFabric Postgres Database,”](#) on page 25
- [“Accounts and Services,”](#) on page 25
- [“Using Perl and Python Language Extensions,”](#) on page 26
- [“Troubleshooting Guidelines,”](#) on page 27

Add a License Key

The vFabric Postgres database supports using a serial number in a file that you create in the virtual machine (local license) and validating the license by communicating with the vFabric Suite license server (server-based license).

You can install a local vFabric Postgres serial number in the guest operating system of the virtual machine or virtual appliance.

Procedure

- 1 Log in as the root user.
- 2 Use your valid license key to create the `/etc/opt/vmware/vfabric/vf.vpg-serial-numbers.txt` file, as in the following example.

```
# echo "XXXXX-XXXXX-XXXXX-XXXXX-XXXXX [quantity=1, expiration=Permanent ]"  
>> /etc/opt/vmware/vfabric/vf.vpg-serial-numbers.txt
```

- 3 Change the group and file permissions.

```
# chgrp vfabric /etc/opt/vmware/vfabric/vf.vpg-serial-numbers.txt  
# chmod 640 /etc/opt/vmware/vfabric/vf.vpg-serial-numbers.txt
```

If vFabric Postgres does not find this file, it will attempt to use the vFabric license server. If the license server does not respond, the vFabric Postgres server uses the remainder of the evaluation license if one exists.

See the vFabric Suite 5.1 documentation for more information about vFabric licenses.

Import Postgres or vFabric Postgres Databases

If you cannot use an existing Postgres or vPostgres database from vFabric Postgres or vFabric Postgres for Data Director, you can dump the database and import or restore it.

You might not be able to use a Postgres database from vFabric Postgres or vFabric Postgres for Data Director, a database created from vFabric Postgres in Data Director, or a database created in Data Director from the standalone version of vFabric Postgres. You might also have problems if a new major version of vFabric Postgres has been released.

If this happens, you can export the database to text format by using either the `pg_dumpall` or the `pg_dump` utility, as follows.

pg_dumpall Dumps every object for all databases. You can load the resulting dump into the vFabric Postgres appliance or a virtual machine on which the vFabric Postgres RPMs have been installed with the `psql` command. You cannot use this command with vFabric Postgres for Data Director.

pg_dump Supports a granular dump based on schemas or tables and includes a custom format. You can load into all versions of vFabric Postgres.

Procedure

- 1 Decide whether you want to use `pg_dumpall` or `pg_dump`.
- 2 Use each command with the correct corresponding restore option.

```
pg_dumpall > mydump.sql
psql -d postgres -f mydump.sql

pg_dump -Fc -d mydb > mydbdump.dmp
dropdb mydb
pg_restore -C -d postgres mydbdump.dmp
```

Restarting the vFabric Postgres Service

Stop and restart the vFabric Postgres service when you modify the service configuration. You can stop and start the service on the virtual appliance or on the virtual machine (RPM installation).

Stop and Start the Service on the Appliance

Stop and start the service on the appliance if you change the configuration.

If you installed the vFabric Postgres database service as an appliance, use the following commands to stop and then restart the service. For the appliance service, these commands also stop and start the VMware HA (high availability) monitor process that makes sure the database process is up and running.

Procedure

- 1 Change the configuration.
- 2 Stop the service.


```
$service aurora_mon stop
```
- 3 Restart the service.


```
$service aurora_mon start
```


Stop and Start the RPM Service

Stop and start the service of your RPM installation if you change the configuration.

If you installed the vFabric Postgres service using RPM files, the service is running within your virtual machine. When you stop and start the service on the virtual machine, the vFabric Postgres service does not include the VMware High Availability monitor feature.

Procedure

- 1 Change the configuration.
- 2 Stop the service.

```
$service vpostgres stop
```
- 3 Restart the service.

```
$service vpostgres start
```

Connection to a vFabric Postgres Database

Connecting to a vFabric Postgres database that is not integrated with Data Director is the same as connecting to a standard Postgres database.

Accounts and Services

When you deploy the vFabric Postgres DBMS, two users are created. When the vFabric Postgres server is running, it includes services that accept remote connections.

Accounts Created During Installation

When you deploy the vFabric Postgres DBMS, a user named root and a user named postgres are created .

root user	The root user can log into the appliance from the guest console using the same random password as the postgres user. Remote ssh logins are disabled for root. Database access is also disabled for root.
postgres user	The postgres user is a database administrator account. This user can log into the appliance from the guest console, log in remotely using ssh, or connect to the database service on port 5432. The initial password for the postgres user is randomly generated and displayed on the guest console. Use the <code>/opt/aurora/sbin/set_password</code> command to change the password for the postgres user.

Services that Accept Remote Connections

The following vFabric Postgres services accept remote connections by default.

Table 4-1. vFabric Postgres Services that Accept Remote Connections

Service	Port
Postgres service	5432
SSH service	22

Table 4-1. vFabric Postgres Services that Accept Remote Connections (Continued)

Service	Port
VAMI (Virtual Appliance Management Infrastructure) Web Management UI. You can connect to port 5480 via https to update or reconfigure the appliance.	5480 (appliance only)
VAMI SFCB broker	5488 and 5489

Using Perl and Python Language Extensions

You can use vFabric Postgres with the PL/Perl and PL/Python language extensions. You must make sure you are using the correct versions of the language and the operating system.

PL/Python and vFabric Postgres

The PL/Python vFabric Postgres extension is supported with the following Python versions and Linux distributions.

Python version	You must install the Python 2.6.x RPM on your system. You cannot use the extension with earlier versions of Python (2.5.x) or with later versions of Python (2.7.x, 3.x).
Linux version	The RHEL 6 and SLES 11 SP1 distributions provide the Python 2.6 RPM and are supported for the PL/Python vFabric Postgres extension. RHEL 5.x does not provide Python 2.6 RPM. The PL/Python vFabric Postgres extension is not supported on RHEL 5.x.

PL/Perl and vFabric Postgres

The PL/Perl vFabric Postgres extension is supported with the following Python versions and Linux distributions.

Perl version	You must install the Perl 5.10.x RPM on your system. You cannot use the extension with earlier versions of Perl (5.8.x) or with later versions of Perl (5.12.x, 5.14.x).
Linux version	The RHEL 6 and SLES 11 SP1 distributions provide Perl 5.10.x RPMs and are supported for the PL/Perl vFabric Postgres extension. RHEL 5.x does not provide the RPMs. The PL/Perl vFabric Postgres extension is not supported on RHEL 5.x.

On supported Linux distributions (RHEL 6 and SLES 11 SP1), the `VMware-vPostgres-server-extensions` RPM, which contains the PL/Perl extension, includes an `install-time` scriptlet that attempts to locate the `libperl.so` shared library on the system by looking in the following locations. The scriptlet looks for the Perl binary in the following locations.

- 1 `libperl.so` path as defined by the Perl binary, where the scriptlet looks for the Perl binary in the following locations.
 - a `PATH` variable
 - b RPM location database
 - c `/usr/bin`
- 2 `libperl.so` under `/usr/lib64`
- 3 `libperl.so` under `/usr/lib`

The scriptlet creates a soft link to `libperl.so` under `/opt/vmware/vpostgres/9.1/lib`. If the script cannot find `libperl.so` on the system, a warning is printed during RPM installation and the PL/Perl vFabric Postgres extension might not work properly.

Troubleshooting Guidelines

Use the options listed in this section to analyze connection or performance problems.

Client Cannot Connect

If your client cannot connect to the vFabric Postgres appliance or to a vFabric Postgres server installed using RPMs, follow these steps to troubleshoot the issue.

- 1 Ping the server IP from your client.
- 2 Verify that Postgres 9.1 is running by running the following command on the command line.

```
ps ax | grep postgres
```
- 3 Try to connect a local PostgreSQL client to the vFabric Postgres server.
- 4 Review the logs in `/var/vmware/vpostgres/current/pgdata/pg_log`

Database Transactions Per Second Less Than Expected

If the database transactions per seconds are less than expected, follow these steps to troubleshoot the issue.

- 1 Make sure your PGDATA VMDK is on a high-performance datastore.
- 2 Look for missing indexes in your SQL queries.
- 3 Analyze concurrent queries for conflicts.
- 4 Increase the number of vCPUs and/or memory.
- 5 As a last resort, turn off `synchronous_commit` in `var/vmware/vpostgres/current/pgdata/postgresql.conf` and restart the appliance. Monitor for performance changes. See the Postgres documentation for details.

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