EnterpriseDB
The Enterprise PostgreSQL Company

Release Notes

Postgres Plus® Advanced Server

v9 (9.1.2.2)

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I. Release Summary

EnterpriseDB continues to accelerate the pace of its position as the leader in delivering innovative and low cost open source derived database solutions with commercial quality, compatibility, scalability, and

performance in this latest release of Postgres Plus Advanced Server v9.1. The major highlights of this release are:

- integration of all PostgreSQL v9.1 features including synchronous replication and unlogged (in-memory) tables,
- 8th generation of Oracle compatibility featuring partitioning syntax support and virtual private database support,
- performance improvements including faster read times on multi-CPU systems and improved write scalability on multi-core systems (up to 32 cores),
- parallel platform releases for Linux 32 and 64 bit, Windows 32 and 64 bit, Solaris SPARC and x86, and HP-UX

These release notes apply to all supported platforms.

II. PostgreSQL v9.1 Integrated Features

A. PostgreSQL Merge Version

This version of Postgres Plus Advanced Server contains the merge of community PostgreSQL v9.1.2 released December 05, 2011. To read the PostgreSQL release notes visit:

http://www.postgresql.org/docs/9.1/static/release-9-1-1.html

Highlights of the release are listed below.

B. Synchronous Replication

This long sought after feature ensures that a transaction on the master server does not commit until confirmation that the transaction has been successfully applied to the slave server's journal. As a result no data can be lost if the master crashes. For maximum control over your transaction environment, synchronous replication can be controlled on a per session basis – a feature not available in other databases.

C. Unlogged Tables

Unlogged tables (no WAL records are kept for these tables) offer increased performance at the expense of crash safety for this data. For those applications or transaction where this trade-off is acceptable, performance can be improved.

D. Authentication Enhancements

The security configuration file pg_hba.conf now supports host names and suffixes in addition to IP addresses and CIDR values. GSSAPI can now be used to authenticate to servers via SSPI allowing Unix-based GSSAPI clients to do SSPI authentication with Windows servers.

E. Per-Column Collations

Collation is no longer fixed at database creation time. Collation can now be set per column, domain, index, or expression, via the SQL standard COLLATE clause.

F. Foreign Tables Support

Support for SQL/MED continues with foreign table support (read-only) allowing data stored outside the database to be used like native PostgreSQL-stored data. There are a number of foreign data wrappers available including: Oracle, MySQL, ODBC, CouchDB, Redis, CSV (file and file_text_array), twitter, ldap, s3 (files located in Amazon S3), and WWW (web services). To download the wrappers visit:
http://wiki.postgresql.org/wiki/Foreign_data_wrappers

G. K-Nearest-Neighbor Indexing

This allows GiST indexes to quickly return the N closest values in a query with LIMIT. For example:

```
SELECT * FROM places ORDER BY location <-> point '(101,456)' LIMIT 10;
```

finds the ten places closest to a given target point.

H. Serializable Isolation Level

The Serializable isolation level provides the strictest transaction isolation. This level emulates serial transaction execution, as if transactions had been executed one after another, serially, rather than concurrently.

I. Data-Modifying Statements in WITH (Writeable Common Table Expressions)

You can use data-modifying statements (INSERT, UPDATE, or DELETE) in WITH and perform operations with the data returned allowing you to perform several different operations in the same query.

For a complete list of all new features and details on individual features please visit:
http://www.postgresql.org/docs/9.1/static/release-9-1.html

III. New Performance and High Availability Enhancements

This section details new features unique to Postgres Plus Advanced Server including some not yet available in community PostgreSQL.

A. *Improved Read Lock Management (19844, 19845, 19872)*

These enhancements significantly improve performance, especially on read-only workloads and particularly on machines with more CPUs.

B. *Improved Read Lock Management on Itanium platforms (19922)*

This enhancement significantly improves performance on Itanium, especially on read-only workloads. Improvements are more pronounced on machines with more CPUs.

C. *Improved Write Lock Management (20240)*

This enhancement improves write scalability, with improvements more noticeable on large core count machines.

D. *Index Advisor support for Composite Indexes (19288)*

Index Advisor can now recommend the creation of composite indexes where their creation may produce a lower cost than a single index.

E. *xDB Replication Server support for Advanced Server to SQL Server (19163)*

xDB Replication Server can now replicate data from Advanced Server to Microsoft® SQL Server, which now provides bi-directional data-transfer.

F. *Improved crash messaging (19956)*

When a backend crashes, Advanced Server tries to dump out the query string (the first 1024 bytes of the query string). This can greatly simplify debugging those rare but very tricky cases where the database crashes at unpredictable intervals.

IV. New Oracle Compatibility / Capability Features

Remember, you don't have to use Oracle to use many of these features! Some are great enhancements beyond what PostgreSQL offers.

A. *Virtual Private Database (19377)*

Advanced Server now includes the DBMS_RLS built-in package, which enables the implementation of Virtual Private Database and security policies. Access to individual rows can be controlled. A different security policy can be applied depending upon the type of SQL command (INSERT, UPDATE, DELETE, or SELECT). The complete set of supported features is described in the Oracle Compatibility Guide available at: http://www.enterprisedb.com/documentation/english

B. *Partitioning Syntax support (19435)*

CREATE TABLE…PARTITION BY…, ALTER TABLE…ADD PARTITION/SUBPARTITION, DROP, SPLIT AND TRUNCATE are supported along with a number of dictionary views. Now you can use Oracle compatible syntax to create and manage range and list based partition and sub-partitions. Support for Oracle compatible partitioning syntax is described in detail in the Oracle Compatibility Guide available at: http://www.enterprisedb.com/documentation/english

C. New Dictionary Views

Advanced Server now includes the Oracle data dictionary views: ALL_PART_TABLES, ALL_TAB_PARTITIONS, ALL_TAB_SUBPARTITIONS, ALL_PART_KEY_COLUMNS, ALL_SUBPART_KEY_COLUMNS, ALL_POLICIES, DBA_POLICIES, and USER_POLICIES. This brings the total number of Oracle dictionary views to 57.

D. HEXTORAW() and RAWTOHEX() functions support (19299)

These two functions are now supported as demonstrated below:

```
CREATE OR REPLACE FUNCTION hextoraw(c varchar2) RETURN raw AS
BEGIN
  RETURN pg_catalog.decode(c, 'hex');
END;

CREATE OR REPLACE FUNCTION rawtohex(r raw) RETURN varchar2 AS
BEGIN
  RETURN pg_catalog.encode(r, 'hex');
END;
```

E. ORDERED Optimizer Hint support (19281,17252)

The ORDERED hint informs the query optimizer not to decide it's own ordering of how to join tables in the FROM clause and instead use the exact order as given in the FROM clause. It is used in cases where you know your table data well don't want the optimizer to make a mistake. It also saves parsing time since the optimizer doesn't need to determine the join order.

F. OCIBreak and OCIReset() function support (19059)

These functions provide the ability to establish a server connection in blocking or non-blocking modes.

G. Ref Cursor as OUT param support (19737 & 18950)

Ref-cursor are now supported as out parameter of function/procedure in OCL library. You can also call a procedure/function with ref-cursor as out parameter from PHP using OCL.

H. WHEN condition clause support for CREATE TRIGGER (1051, 19779)

The following type of statement is now supported:

```
edb=# CREATE or REPLACE trigger tri
```

```
edb=# before insert or update or delete on t
edb=# for each row
edb=# when (new.n=1) begin  raise_application_error(-20111,'error');
edb=# end;
```

I. WHENEVER SQLERROR support (16559)

The following syntax is now supported in Advanced Server for trapping and handling SQL errors:

```
WHENEVER SQLERROR {EXIT [SUCCESS | FAILURE | n | variable | :BindVariable]
[COMMIT | ROLLBACK] |CONTINUE [COMMIT | ROLLBACK | NONE]}
```

V. Enterprise Module Updates

A. Postgres Studio is replaced with Postgres Enterprise Manager Client (19702)

The PEM client contains all the database administration functionality available in Postgres Studio both of which are built upon pgAdmin.

B. Client Connectors

1. JDBC

    The version of the Postgres Plus Advanced Server v9.1 JDBC connector is based on pgJDBC 9.0-801 . Two versions are available, one built against JDK 1.4 (edb-jdbc14.jar) and one built against JDK 1.6 (edb-jdbc16.jar).

    This component is optionally installed with StackBuilder Plus and it works in all supported environments.

2. ODBC

    The version of the Postgres Plus Advanced Server v9.1 ODBC connector is based on psqlODBC 9.00.0200.

    This component is optionally installed with StackBuilder Plus and it works in all supported environments.

3. .NET

    The version of the Postgres Plus Advanced Server v9.1 .NET connector is based on Npgsql 2.0.11.

    This component is optionally installed with StackBuilder Plus and it works in the Windows supported environments.

C. pgpool-II

The Postgres Plus Advanced Server installer now includes and installs pgpool II v3.1.0. pgpool-II is middleware that works between PostgreSQL database servers and PostgreSQL database clients. It

provides the following enterprise scaling features: connection pooling, replication, load balancing and connection limitations.

This component is optionally installed with StackBuilder Plus and works in all supported environments except the Windows platform.

D. Slony

The version of Slony shipped as part of Postgres Plus Advanced Server v9.1 is: v2.1.0 and contains the following changes:

- Implicit WAIT FOR
- Support for adding tables in bulk
- Support for replicating TRUNCATE
- Health checks at startup
- Performance improvement in cases of large backlog
- Monitoring thread to provide better monitoring data

For a complete list of bug fixes and more details, please visit: `http://www.slony.info/`

This component is optionally installed with StackBuilder Plus and it works in all supported environments.

E. PostGIS

The version of PostGIS shipped in StackBuilder Plus is: v1.5.3. This component is optionally installed with StackBuilder Plus and it works in all supported environments.

F. PL/Java

The version of PL/Java shipped as part of Postgres Plus Advanced Server v9.1 is: v1.4.3. This component is installed with the database server and it works in the Linux, Windows, and HP-UX environments.

G. PL/Python

Python has been added as an available packaged procedural language in Advanced Server and was built against ActivePython v2.7.1. This component is installed with the database server and it works in all supported environments.

H. pgSNMPd

The version of pgSNMPd shipped as part of Postgres Plus Advanced Server v9.1 is: v1.0. This component is installed with the database server and it works in the Linux and HP-UX environments.

I. iCache (Infinite Cache)

The version of iCache shipped as part of Postgres Plus Advanced Server v9.1 is based on memcached v1.4.5.   This component is optionally installed with StackBuilder Plus and it works in all supported environments except the Windows platforms.

J. pgAgent

The version of pgAgent shipped as part of Postgres Plus Advanced Server v9.1 is 3.0.2. This component is optionally installed with StackBuilder Plus and it works in all supported environments.

K. PgBouncer

The version of PgBouncer shipped as part of Postgres Plus Advanced Server v9.1 is 1.3.3. This component is optionally installed with StackBuilder Plus and it works in all supported environments.

VI. Tools Support

A. Postgres Enterprise Manager (PEM) Client

The PEM client can be used stand-alone as a database administration and management tool as well as the client for the Postgres Enterprise Manager monitoring system. The administration and management features of PEM are designed to answer the needs of all users, from writing simple SQL queries to developing complex databases. The graphical interface supports all PostgreSQL features and makes administration easy. The application also includes a syntax highlighting SQL editor, a server-side code editor, an SQL/batch/shell job scheduling agent, support for the Slony-I replication engine and much more. Server connection may be made using TCP/IP or Unix Domain Sockets (on *nix platforms), and may be SSL encrypted for security. No additional drivers are required to communicate with the database server.

PEM is optionally installed by StackBuilder Plus and runs natively in the Linux, Windows and Mac environments. Install PEM into one of these environments to access the database server installed on Solaris or HP-UX environments.

B. EDB*Plus

EDB*Plus is Postgres Plus Advanced Server Oracle like command line tool for communicating with the database server. It is similar to Oracle's SQL*Plus and understands most SQL*Plus commands. It also supports spooling, running scripts using @, set commands, column formatting, etc. and can define variables in login.sql.

The utility is installed by the Postgres Plus Advanced Server meta-installer and runs natively in all supported environments.

C. EDB*Loader

EDB*Loader is a high speed bulk data loader with parallel processing capabilities.

The utility is installed by the Postgres Plus Advanced Server meta-installer and runs natively in all supported environments.

D. EDB*Wrap

The EDB*Wrap utility protects proprietary source code and programs (functions, stored procedures, triggers, and packages) from unauthorized scrutiny. The EDB*Wrap program translates a file that contains SPL or PL/pgSQL source code (the plaintext) into a file that contains the same code in a form that is nearly impossible to read. Once you have the obfuscated form of the code, you can send that code to the PostgreSQL server and the server will store those programs in obfuscated form.

EDB*Wrap is installed as a feature of the database server and works in all environments.

E. pgAgent

pgAgent allows authorized users to schedule jobs consisting of one or more SQL or shell/batch steps. Common uses include scheduled tasks such as archiving old records from a table, vacuuming certain tables, or performing application-oriented operations such as batch posting daily transactions to accounts.

The utility is installed by the Postgres Plus Advanced Server meta-installer and runs natively in all supported environments.

F. Postgres Enterprise Manager

Postgres Enterprise Manager was designed for DBAs and large database installations. Its distributed architecture manages all your PostgreSQL instances on your in-house hardware, on-premise VMs, or in 3rd party cloud environments. Monitoring agents send host and Postgres data to a centralized enterprise management server that is accessible from multiple GUI Client consoles. Performance monitoring dashboards provide customized metrics for Memory, I/O, Storage, Object Activity, Operating System, and System Waits each with its own graphs, data, and alerts to exception conditions.

Enterprise Manager is optionally installed with StackBuilder Plus and can monitor Advanced Server in all supported environments.

G. Update Monitor

Update Monitor eases your installation and maintenance burden for the database server, enterprise modules and other components by notifying you when updates to any components you have installed are available and assists you in downloading and installing them.

Update Monitor is installed with StackBuilder Plus and runs in the Linux, Windows and Solaris environments. To use Update Monitor on HP-UX, install it on a supported environment to receive Alerts and download component installers.

H. xDB Replication Server

xDB Replication Server provides easy data replication between multiple Postgres Plus Advanced Server databases as well as bi-direction replication with Oracle and Microsoft SQL Server.

The utility is optionally installed by the Postgres Plus Advanced Server meta-installer and runs natively in all supported environments.

The replication support matrix for xDB is noted in the table below:

Source \ Target	Oracle	Microsoft SQL Server 2005/2008	PostgreSQL	Postgres Plus Advanced Server (Oracle mode)	Postgres Plus Advanced Server (PostgreSQL mode)
Oracle	No	No	Yes	Yes	Yes
Microsoft SQL Server	No	No	Yes	Yes	Yes
PostgreSQL	No	Yes	Yes	Yes	Yes
Postgres Plus Advanced Server (Oracle mode)	Yes	Yes	No	Yes	No
Postgres Plus Advanced Server (PostgreSQL mode)	No	Yes	Yes	Yes	Yes

I. Index Advisor

Feed your poorly running SQL statements into the Index Advisor on Postgres Plus Advanced Server and it analyzes each statement and makes recommendations on new indexes that should be created to help performance including composite indexes.

The utility is installed by the Postgres Plus Advanced Server meta-installer and runs natively in all supported environments.

J. SQL Profiler

The developer's friend to find, troubleshoot, and optimize slow running SQL fast! Provides on-demand or scheduled traces that can be sorted, filtered and saved by users and by database. Integration with Index Advisor allows quick recommendations on new indexes to speed up problem queries.

The utility is installed by the Postgres Plus Advanced Server meta-installer and runs natively in all supported environments.

K. SQL/Protect

SQL/Protect allows a database administrator to protect databases from a variety of SQL injection attacks (unauthorized relations, utility commands, SQL tautology, and unbounded DML). SQL/Protect provides a DBA-managed layer of security in addition to normal database programming policies by screening incoming queries for common SQL injection profiles. In addition, SQL/Protect can also be taught to accept learned 'friendly' queries and reject unfamiliar data request patterns.

SQL/Protect is installed by the Postgres Plus Advanced Server meta-installer and runs in all supported environments.

L. Migration Toolkit

The Migration Toolkit provides fast, flexible and customized database migration from Oracle, SQL Server, Sybase, and MySQL to PostgreSQL and Postgres Plus Advanced Server in online and offline modes. It is a powerful tool for moving schema, tables, constraints, data, stored procedures, triggers, and additional objects from other databases to Postgres Plus Advanced Server automatically.

The utility is installed by the Postgres Plus Advanced Server meta-installer and runs natively in all supported environments.

VII. Security

Postgres Plus Advanced Server is the most secure open source based database out-of-the-box. This latest version of Advanced Server continues to build upon that solid foundation (see Virtual Private Database feature above). In addition Advanced Server also bundles SQL/Protect.

A. SQL/Protect – Protection against SQL Injection Attacks

SQL/Protect is an add-on security module from EnterpriseDB installed with Postgres Plus Advanced Server.

While Advanced Server is well known for being the most secure open source based database, there is one source of attack against any database that is not easily protected against in a centralized and standardized fashion; the wide variety of SQL code in client applications that accesses a database. These attacks hitch a ride on the back of SQL commands to compromise or damage data. Preventing SQL/Injection is normally left up to the skills of the individual application developer, which can vary

greatly between people and the projects they work on, and be compromised by tight schedules and commercial delivery pressures.

SQL/Protect adds a standardized, quick to setup, and easy to use security layer on the database server that guards against SQL Injection attacks and is managed by DBAs. It provides a consistent approach against a standardized set of attack vectors and works for any application.

SQL/Protect is an optionally installed module that adds an additional layer of security underneath the normal database security policies by examining inbound queries and stopping common SQL Injection profiles. SQL/Protect examines queries for the following types of attack vectors:

- Unauthorized Relations

- Utility Commands

- SQL Tautology

- Unbounded DML

See the SQL/Protect documentation in the Postgres Plus Advanced Server Guide for more information at: http://www.enterprisedb.com/documentation/english

VIII. Installers

A. Installer Technology

The Advanced Server meta-installer utilizes BitRock installer technology and provides the following features:

- common installer technology for all platforms

- silent install option typically used by ISVs

- install options for users with limited privileges (e.g. non-root Linux users and non-administrator Windows users)

B. StackBuilder Plus

Advanced Server is distributed with StackBuilder Plus, which provides a wide array of complimentary components to the core database server. StackBuilder Plus also provides Update Monitor to notify you when packages you have installed have updates and helps you download and install the updates.

StackBuilder Plus is offered as an option to run at the end of your Advanced Server installation. Some of the highlight components in StackBuilder Plus include:

1. Update Monitor

Update Monitor will notify you when new updates are available for any component you have installed including the database server, and any StackBuilder Plus modules. You can then start StackBuilder Plus to download the component, read its release notes and install it. Advanced Server v9.1 will receive automatic notifications of updates from EnterpriseDB using Update Manager installed in your desktop system tray (you will see the blue elephant icon).

2. Postgres Enterprise Manager

Postgres Enterprise Manager was designed for DBAs and large database installations. Its distributed architecture manages all your PostgreSQL instances on your in-house hardware, on-premise VMs, or in 3rd party cloud environments. Monitoring agents send host and Postgres data to a centralized enterprise management server that is accessible from multiple GUI Client consoles. Performance monitoring dashboards provide customized metrics for Memory, I/O, Storage, Object Activity, Operating System, and System Waits each with its own graphs, data, and alerts to exception conditions.

3. PostgreSQL Community components

In addition to EnterpriseDB components there are also a number of community and 3rd party packages included in StackBuilder Plus. Run it and see what it has to offer.

C. *Product Keys for Localized Language Installations*

If you wish to install Advanced Server in localized Japanese, Korean, Traditional Chinese, Simplified Chinese, or a Central American or South American language you will need to enter a *Product Key* when the installer executes. Product keys can be obtained from distributors in each country as follows:

Locale Code	Country Locale	Distributor	Contact	Contact Email
ja_jp	Japanese	EDB - Japan	Yuji Fujita	yuji.fujita@enterprisedb.com
ja_jp	Japanese	COMTEC Inc.	Hiroaki Tanaka	htanaka@ct-net.co.jp
ja_jp	Japanese	SIOS Technology, Inc	Noriko Daitoku	tdaitoku@sios.com
ja_jp	Japanese	K.K. Ashisuto	Yoko Takase	edb_sal@ashisuto.co.jp
ja_jp	Japanese	SRA OSS, Inc. Japan	Kazuhiko Hamada	edb@sraoss.co.jp
ja_jp	Japanese	FUJITSU Social Science Laboratory Limited	Atsushi Ogasawara	ssl-info@cs.jp.fujitsu.com
zh_tw	Chinese Taiwan (ROC)	EDB - Japan	Yuji Fujita	yuji.fujita@enterprisedb.com
zh_cn	Chinese (PRC)	EDB - Japan	Yuji Fujita	yuji.fujita@enterprisedb.com
zh_hk	Chinese (Hong Kong S.A.R)	EDB - Japan	Yuji Fujita	yuji.fujita@enterprisedb.com

ko_kr	Korean	Daou Tech, Inc.	K.I Lee	kilee@daou.co.kr
es_ar	Argentina - Spanish	Genup-IT	Max Garcia	mgarcia@genup-it.com
pt_br	Brazil - Portuguese	Tecnisys	Rogerio Carvalho	rogerio.carvalho@tecnisys.com.br
es_bo	Bolivia - Spanish	CommIT	Oxiel Contreras	oxiel.contreras@commit.com.bo
Es_bo	Bolivia - Spanish	iTEAM	Marco Orellana	marco.orellana@iteam.com.bo
es_cl	Chile - Spanish	SEIS, SA	Hector Barrios	hector.barrios@seissoft.cl
es_co	Colombia - Spanish	Tayronaweb	Rafael Cortez	rafael.cortes@tayronaweb.com
es_ec	Ecuador - Spanish	Fugu Ecuador	Fernando Calderon	ac@fugu.ec
es_gt	Guatemala - Spanish	Systemshause Westfalia	Esteban Calderon	esteban.calderon@westfalia-it.com
es_hn	Honduras - Spanish	Systemshause Westfalia	Esteban Calderon	esteban.calderon@westfalia-it.com
es_mx	Mexico - Spanish	TEAM	Claudia Garcia	cgarcia@teamnet.com.mx
es_ni	Nicaragua - Spanish	Systemshause Westfalia	Esteban Calderon	esteban.calderon@westfalia-it.com
es_pe	Peru - Spanish	Software Libre Andino	Diego Francia	dfrancia@softwarelibreandino.com
es_py	Paraguay - Spanish	Smartechpy	Charles Charotti	ccharotti@gmail.com
es_sv	El Salvador - Spanish	Systemshause Westfalia	Esteban Calderon	esteban.calderon@westfalia-it.com
es_uy	Uruguay - Spanish	Ideasoft	Enrique Tucci	etucci@ideasoft.biz
es_ve	Venezuela - Spanish	HIA Technology de Venezuela	Ernesto Lozano	elozano@hiatechnology.com.ve

This list of distributors possessing installation product keys is also available at:

http://www.enterprisedb.com/product-keys

IX. Internationalization / Localization

Features from v9.0 and prior versions are localized in Postgres Plus Advanced Server v9.1 into the following languages:

- Japanese

- Korean

- Simplified Chinese

- Traditional Chinese

Translations for new v9.1 features is under review.

X. Service Pack Maintenance

Over 300 maintenance items (bug fixes and enhancements) have been added to the release. Some of the more interesting ones are noted below:

A. *Installers*

1. Applied checks in unattended mode to throw error if serverport, xdb ports and pgbouncer port are the same. (18184)

2. The Database Server installer now throws an error if the service account is owned by root. (19607)

3. The meta installer when run in text mode no longer offers to launch StackBuilder Plus. (19206)

4. Installation via runAsAdmin fails in unattended mode. runAsAdmin was failing in unattended mode on Windows platforms where the password policy was enforced and the default password 'enterprisedb' was conflicting with the policy. (19857)

B. *Database Server*

1. Speed up various collection type operations, like EXTEND and TRIM, by avoiding excessive copying of the values. Prior to this fix, various collection methods i.e. EXTEND and TRIM weren't performing optimally. (19649)

2. When triggers were disabled using ALTER TABLE, EDB*Loader with direct=true still aborted. Now in direct load, we allow loading to proceed if there are triggers on the table, as long as they're all disabled. (20006)

3. Allow current_timestamp and localtimestamp function in remote insert/update queries. This was previously throwing an error since the value sent over to remote node was not accepted by the remote database server. This was achieved by Bind timestamp values as SQLT_TIMESTAMPTZ when sending them to a remote Oracle server. This is more robust, as the remote server knows what data type we're sending, and can handle conversions correctly. (18784)

4. Change the precedence of ** operator to be the same as the ^ operator. (19324)

5. Correctly return the number of rows affected by an update over OCI dblink. (20002)

6. Add HP-UX support to Dynatune. The dynamic tuning module in PPAS (dynatune) needed changes to perform dynamic tuning on HPUX platform. (18671)

7. Dynatune doesn't adapt to Solaris per-zone locked memory limits, If we're running in a Solaris zone, we now get the SHMMAX value from the zone. (19240)

8. Non super users weren't able to set Oracle-compatibility GUC variables nls_length_semantics, query_rewrite_integrity and query_rewrite_enabled. This has been fixed. (19904)

9. In the bytea-version of instr() function, the byteas were treated like multi-byte characters if the database encoding was a multi-byte encoding, so the positions returned and passed as argument were wrong. This has been fixed. (19606)

10. Use text/binary format correctly for OUT-parameters, when there's a mixture of IN and OUT parameters and text and binary formats. (19928)There was an issue connecting to the database server from a Perl client in the HP-UX environment. This has been fixed by using _HPUX_ALT_XOPEN_SOCKET_API on HP-UX, if available. This maps the socket-related functions to the X/Open variants in libc, allowing libpq and the server to be freely linked with other libraries and binaries that use either BSD or X/Open socket. (19642)

11. In to_date(), FM mode should not imply FX. (19628) pg_upgrade tried to install the pg_upgrade support module into "postgres" database in the new database, but that doesn't exist when the cluster is initialized in Redwood-compatibility mode. Use template1 instead.

12. Set year correctly with four-digit year with 'rrrr' format when used with to_date function. (19630)

13. Ignore SP format modifier in to_date(...) and to_char(date, ...) to be compatible with Oracle. (19627)

14. Hierarchical queries were taking more time to run on HPUX compared to other platforms. This due to an issue with PG TRY/CATCH block which has been addressed. (19734)

15. Invoking DELETE method on a nested collection for the first time on a empty collection and then invoking EXTEND method for insertion was causing a subscript beyond count error. This has been addressed by setting the collection logical size to 0 when DELETE is called on the collection for the first time. (19672)

16. Fix DynaTune shared memory calculation on HP-UX. (19674)

17. EDB*Loader crashes on Solaris if date is supplied without date format. This has been fixed. (19611)

18. Support double-quotes in datemask in edbldr control file. (19516)

19. Out parameter handling with stored procedures was causing a memory leak, the leak is only noticeable when an SPL procedure/function with OUT parameter is invoked inside a big loop. This issue has been fixed. (19605)

20. Fixed ecpg syntax for CONNECT and IDENTIFIED. Those are both keywords in the main parser in Advanced Server, but not in PostgreSQL.

21. The optimizer hints weren't handled for some nodes. It was throwing an "unrecognized path type" error. The hints feature has been updated to handle more node types that can appear in the plan. (19348)

22. Database links have been refactored to use the PostgreSQL foreign data wrapper (FDW) API. (18863)

23. Fix sys_stats on Solaris. (19275)

24. dblink_ora_copy function was taking long time to fetch rows from the remote oracle instance. Rows are now fetched in bulk based on memory instead of one at a time improving performance. (19340)

25. Dependency tracking wasn't being done when a package variable was used as a default value by another object. This was yielding a cache lookup failure error when the referenced object was accessed after the package had been dropped. This issue has been fixed. (19121)

26. DBMS_PROFILER start_profiler() does not return run number. This has been fixed. (19139)

27. Not able to stop the profiler if a function/procedure that was being profiled has been dropped. This has been fixed. (19129) DBMS_PROFILER is not showing the value 'Trigger' in the unit_type column. This has been fixed. (19103)

28. We now allow the USING and INTO features to be used with bulk collect. This was throwing an error previously. (19039)

29. SPL functions with both OUT parameters and a return type wasn't being dumped correctly. This has been fixed. (19083)

30. An error was raised if trying to drop a user with permission on a package. This has been fixed by marking the package dependency correctly. (18969)

31. Fixed a crash in edb_bulkload. (19024)

32. Trying to reference a package variable inside another package with package.var%type notation was causing an error. This has been fixed, now package can reference other package variables with %type notation. (18901)

33. A very large FOR loop with an INSERT statement was causing an out of memory error. This has been fixed. (18935)

34. Enable sys_stats module for HP-UX. (18234)

35. Using the localtimestamp function in a remote dblink query was throwing an error. This has been fixed by backing them with real functions instead of mapping to now() in the grammar. (18208)

36. The database server was crashing when the FOR loop counter was referenced with "LOOP_COUNTER.*" in the body of FOR loop statement. This has been fixed. (18742)

37. Include the number of rows skipped by a BEFORE trigger in the number printed at the end of a edbldr copy-mode load. This is to avoid confusion when loading into a partitioned table, where all the rows will be skipped by BEFORE trigger, which inserts them to the right partitions instead. (17552) Index advisor does not work with queries containing hints. This has been fixed. (18536)

C. EDB*Plus

1. The CASE construct results in a compilation error. The issue has been fixed. (19323)

2. A script file path with a space character is not processed. The issue has been fixed. (19933)

D. Client Connectors

1. EDB-ODBC driver throws an error if a SQL statement is not terminated with a semi-colon using the DataDirect odbc manager. This issue has been fixed. (19948)

2. CREATE DATABASE LINK fails with CURRENT_USER option in libpq. The user can use current_user syntax with database links allowing the use of the current session username / password for establishing a database connection. (19964)

E. Migration Studio

1. The Migration Studio GUI is available at: http://www.enterprisedb.com/downloads/add-on-components-bundles

F. Migration Toolkit

1. Existing private synonyms are not replaced by migrated ones. This issue is fixed. (20189)

2. MTK help has been updated for Synonyms. (20178)

3. DDL and DML migration from PostgreSQL and Advanced Server to Microsoft SQL Server (19162)

4. An offline data migration option has been added that creates all the SQL necessary to migrate data that can be run at a later time. (12240)

5. The migration of enum types for MySQL is now supported. (19745)

G. xDB Replication Server

1. xDB Replication Server is now supported on the following platforms Linux32/64, Windows 32/46, Solaris SPARC/x86 and HP-UX.

2. The replication source-target product combinations are represented in the table below:

3. xDB Replication Server can now replicate data from PostgreSQL or Postgres Plus Advanced Server to Microsoft® SQL Server, providing bi-directional data-transfer. (19163)

4. The data replication for Update/Delete transaction fails if a PostgreSQL or Postgres Plus Advanced Server table column name length exceeds 23 characters. (19991)

5. The skipCheckConst option in xdb_subserver.conf has the wrong default value of true. It is now false. (20046)

XI. Documentation Updates

A. *Postgres Plus Advanced Server Installation Guide*

To view the documentation, please visit: http://www.enterprisedb.com/products-services-training/products/documentation

B. *Updated Documentation*

For the latest versions of the following guides, please visit:
http://www.enterprisedb.com/documentation

- Postgres Plus Advanced Server Guide

  o New section added for detailing Advanced Server, PostgreSQL and Performance related parameters

- New guide titled 'Postgres Plus Advanced Server ECPGPlus Guide' (Embedded SQL in C)

- Postgres Plus Advanced Server Performance and Scalability Guide

  o New section on other performance features

- Postgres Plus Advanced Server Oracle Compatibility Developers Guide

  o Multiple updates for the new features added

- xDB Replication Server Guide

  o Updates for PostgreSQL and Advanced Server replication to Microsoft SQL Server

- Postgres Plus Migration Guide

  o Updates unifying all migration documentation and added sections for migrating from MySQL to and Microsoft SQL Server to PostgreSQL/Advanced Server.

- Postgres Plus ODBC Guide

  o Updated for an enhancement that adds the property dbms_name which returns values in addition to 'EnterpriseDB'.

- pgpool-II

  o a Readme file has been added detailing key features

C. PDF Documentation

Please note that PDF versions of all documentation are available to Postgres Plus Advanced Server subscription holders by logging into the EnterpriseDB website and accessing the customer portal at: http://www.enterprisedb.com/support

XII. Upgrade Paths

A. How To Upgrade from v9.0 to v9.1

You can use pg_upgrade to upgrade from PPAS 9.0 to 9.1. pg_upgrade allows you to update your installation in a matter of minutes for most users without the downtime and additional planning that used to be required when using the traditional dump and restore method.

Usage details for pg_upgrade can be found in the Postgres Plus Advanced Server Installation Guide available on the EnterpriseDB web site at: http://www.enterprisedb.com/documentation/english

Alternatively, you can use the normal dump and restore routines as described in Section B below.

B. How To Upgrde Versions previous to v8.4 to v9.1

Follow the dump and restore routines outlined for upgrades between major releases of PostgreSQL (where the number after the first dot changes) posted in the documentation pages at: http://www.enterprisedb.com/products-services-training/products/documentation

C. Known Incompatibilities for v9.x

Version 9.1 contains a number of changes that may affect compatibility with previous releases. The known incompatibilities are:

1. Strings

   Change the default value of standard_conforming_strings to ON. By default, backslashes are now ordinary characters in string literals, not escape characters. This change removes a long-standing incompatibility with the SQL standard. escape_string_warning has produced warnings about this usage for years. E'' strings are the proper way to embed backslash escapes in strings and are unaffected by this change. WARNING: This change can break applications that are not expecting it and do their own string escaping according to the old rules. The consequences could be as severe as introducing SQL-injection security holes. Be sure to test applications that are exposed to untrusted input, to ensure that they correctly handle single quotes and backslashes in text strings.

2. Casting

   Disallow function-style and attribute-style data type casts for composite types. For example, disallow composite_value.text and text(composite_value). Unintentional uses of this syntax have frequently resulted in bug reports; although it was not a bug, it seems better to go back to rejecting

such expressions. The CAST and :: syntaxes are still available for use when a cast of an entire composite value is actually intended.

Tighten casting checks for domains based on arrays. When a domain is based on an array type, it is allowed to "look through" the domain type to access the array elements, including subscripting the domain value to fetch or assign an element. Assignment to an element of such a domain value, for instance via UPDATE ... SET domaincol[5] = ..., will now result in rechecking the domain type's constraints, whereas before the checks were skipped.

3. Arrays

Change string_to_array() to return an empty array for a zero-length string. Previously this returned a null value.

Change string_to_array() so a NULL separator splits the string into characters. Previously this returned a null value.

4. Object Modification

Fix improper checks for before/after triggers. Triggers can now be fired in three cases: BEFORE, AFTER, or INSTEAD OF some action. Trigger function authors should verify that their logic behaves sanely in all three cases.

Require superuser or CREATEROLE permissions in order to set comments on roles.

5. Server Settings

Change pg_last_xlog_receive_location() so it never moves backwards. Previously, the value of pg_last_xlog_receive_location() could move backward when streaming replication is restarted.

Have logging of replication connections honor log_connections. Previously, replication connections were always logged.

6. PL/pgSQL Server-Side Language

Change PL/pgSQL's RAISE command without parameters to be catchable by the attached exception block. Previously RAISE in a code block was always scoped to an attached exception block, so it was uncatchable at the same scope.

Adjust PL/pgSQL's error line numbering code to be consistent with other PLs. Previously, PL/pgSQL would ignore (not count) an empty line at the start of the function body. Since this was inconsistent with all other languages, the special case was removed.

Make PL/pgSQL complain about conflicting IN and OUT parameter names. Formerly, the collision was not detected, and the name would just silently refer to only the OUT parameter.

Type modifiers of PL/pgSQL variables are now visible to the SQL parser. A type modifier (such as a varchar length limit) attached to a PL/pgSQL variable was formerly enforced during assignments,

but was ignored for all other purposes. Such variables will now behave more like table columns declared with the same modifier. This is not expected to make any visible difference in most cases, but it could result in subtle changes for some SQL commands issued by PL/pgSQL functions.

7. Contrib

    All contrib modules are now installed with CREATE EXTENSION rather than by manually invoking their SQL scripts. To update an existing database containing the 9.0 version of a contrib module, use CREATE EXTENSION ... FROM unpackaged to wrap the existing contrib module's objects into an extension. When updating from a pre-9.0 version, drop the contrib module's objects using its old uninstall script, then use CREATE EXTENSION.

8. Other Incompatibilities

    Make pg_stat_reset() reset all database-level statistics. Some pg_stat_database counters were not being reset.

    Fix some information_schema.triggers column names to match the new SQL-standard names.

    Treat ECPG cursor names as case-insensitive.

XIII.   Platform Support

Postgres Plus Advanced Server v9.1 is supported on the following platforms:

1. CentOS 6.x and 5.x for 32/64 bit
2. RHEL 6.x and 5.x for 32/64 bit
3. SLES 11.x for 32/64 bit
4. Ubuntu 10.4 LTS for 32/64 bit
5. Windows Servers: 2008 R1 for 32/64 bit, 2008 R2 64 bit, 2003
6. Sun Solaris v10 for SPARC 64 and x86-64 (v11 support will follow in 2012 Q1/2
7. HP-UX v11

The following platforms are commonly used in our labs by our development and testing groups. These platforms are not supported in a production environment.

8. Fedora 16.x 32/64 bit
9. openSuSE 12.x for 32/64 bit
10. Ubuntu 11.10 for 32/64 bit
11. Windows 7 32/64
12. Windows Vista 32/64

Postgres Plus Advanced Server supports many Linux distributions in addition to those listed. To inquire if your operating system is supported contact us by:

- Email: sales-us@enterprisedb.com or sales-intl@enterprisedb.com

- Phone: +1-781-357-3390 or 1-877-377-4352

- Web: http://www.enterprisedb.com/general-inquiry-form

XIV. System Requirements

Minimum hardware requirements for running Postgres Plus Advanced Server are:

- 600 MHz processor

- 512 MB of RAM

- 512 MB of HDD plus space for your data

XV. Known Issues

A. Installers (Meta-installer and StackBuilder Plus)

1. Stackbuilder Plus exits abruptly during download on Centos 6.1 - 32 bit (20390). The workaround is to install redhat-lsb using the command below:

    yum install redhat-lsb

2. Solaris 11 SPARC Database server installation failure (20569)

    This issue comes up if the enterprisedb (or postgres user for pg mode) user account already exists on the Solaris 11 server with an invalid home directory. The work-around is to ensure that an 'enterprisedb' account does not exist. If it does exist, then it must have a valid home directory.

3. Solaris 11 x86 Installation fails (20570)

    This issue will come up if the user tries to install somewhere under "/home" and the "enterprisedb" (or postgres user for pg mode) user does not exist prior to the installation. The work-around is for the user to install at some location other than under "/home" OR manually create the "enterprisedb" user (or postgres user for pg mode).

4. Solaris 11 x86: StackBuilder Plus installation fails on Solaris 11 (20436). To resolve the issue, do the following prior to installation as the system root user:

    a) check if medialib package is installed (command will display nothing if not installed)

    pkginfo -l | grep -i medialib

if not installed, run following command:-

pkg install library/medialib

b) check if libXevie X11 library is installed (command will display nothing if not installed)

pkg search -l -H -o pkg.name libXevie.so

if not installed, run following command:-

pkg install x11/library/libxevie

5. Solaris 11: component services do not start after installation (20435). To correct this error, perform the following prior to installation as the system root user:

pkg install compatibility/ucb

6. HP-UX: StackBuilder Plus in some cases does not display in localized characters on the HP-UX platform (20458).

7. HP-UX: No Installation in GUI mode (19542)

The Postgres Plus Advanced Server installer does not run in the graphical mode. To install the database server use the command line mode. The simplest and most straight-forward install in this manner can be accomplished by issuing the following command:

`./ppasmeta-9.0.4.16-hpux.run`

For more details on using the command line mode see the Installation Guide for Postgres Plus available here:

http://www.enterprisedb.com/products-services-
training/products/documentation

B. *Update Monitor Support (19874)*

The Update Monitor is not yet supported in an HP-UX environment.

C. *DB Server:*

1. Ordered hints do not work with Oracle style JOIN syntax (20440). The current implementation of ORDERED HINT does not order the relations in expected order when we have Oracle style JOINs in where clause.

2. Not able to delete HEXTORAW value from oracle table via database link. (20160)

D. *Migration Toolkit:*

1. n/a

E. *Postgres Enterprise Manager:*

1. The Server Configuration menu option is disabled in Windows installations (20198). The workaround is to… (what where and how??)

2. Unable to open PEM HELP URL if browser not already open (20447). Before requesting help in PEM, make sure your browser is already open.

3. Unable to launch EDB-PSQL console from PEM client (20144, 20384). The PSQL console makes use of xterm which is not installed in the standard location on RHEL6.0 64 bit systems. The workaround is to install xterm (i.e. yum install xterm).

4. Incorrect folder permissions (20362). The user can give the following command as root to correct the permissions of the directories created by the PEM Client:

    find /opt/PostgresPlus/9.1AS/client -type d -exec chmod 755 {} \;

F. Slony

The following Slony v2.0.6 components for have not yet been published for Windows operating environments: Slony Tools and Logshipper. The core replication capabilities are functional. (18568)

Slony "Tools" facilitates using Perl based scripts for the configuration of a Slony cluster. Their absence does not prevent the use of Slony, as one can utilize shell scripts to invoke Slonik commands to configure a Slony cluster . However, in case one prefers using Perl scripts it'll not be possible on Windows. As a work-around one can use *nix system to utilize Perl scripts generation.

The "Log Shipper" is an optional component provided to facilitate the application of Slony offline "log" archive files on a target (offline/isolated) Slony subscriber node. However, one can directly (without using Log Shipper utility) apply the Slony offline "log" files as a work-around. The advantage Log Shipper provides is the automation of the process such that one can skip transactional events for one or more tables from the given log files using Log Shipper options. Otherwise one has to write a custom script to perform such tasks.

Also the internal functionality of slevent is absent and results in formatting problems for message events related with the Slon Windows service and should be treated as a known bug.

G. sepgsql support

sepgsql is a loadable module that supports label-based mandatory access control (MAC) based on SELinux security policy and is not enabled in Postgres Plus Advanced Server. For added security you might consider an alternate approach to policy based security in the database using the new Virtual Private Database features introduced in this release.

XVI. How to Report Problems

To report any issues you are having please contact EnterpriseDB's technical support staff:

- Email: support@enterprisedb.com

- Phone: +1-732-331-1320 or 1-800-235-5891 (US Only)