Why Traditional Enterprise favor PG as RDBMS

Bruce Momjian

1. Introduction

2. Proprietary Software vs Open Source

3. How Postgres core team management

4. How to make the enterprise open-source

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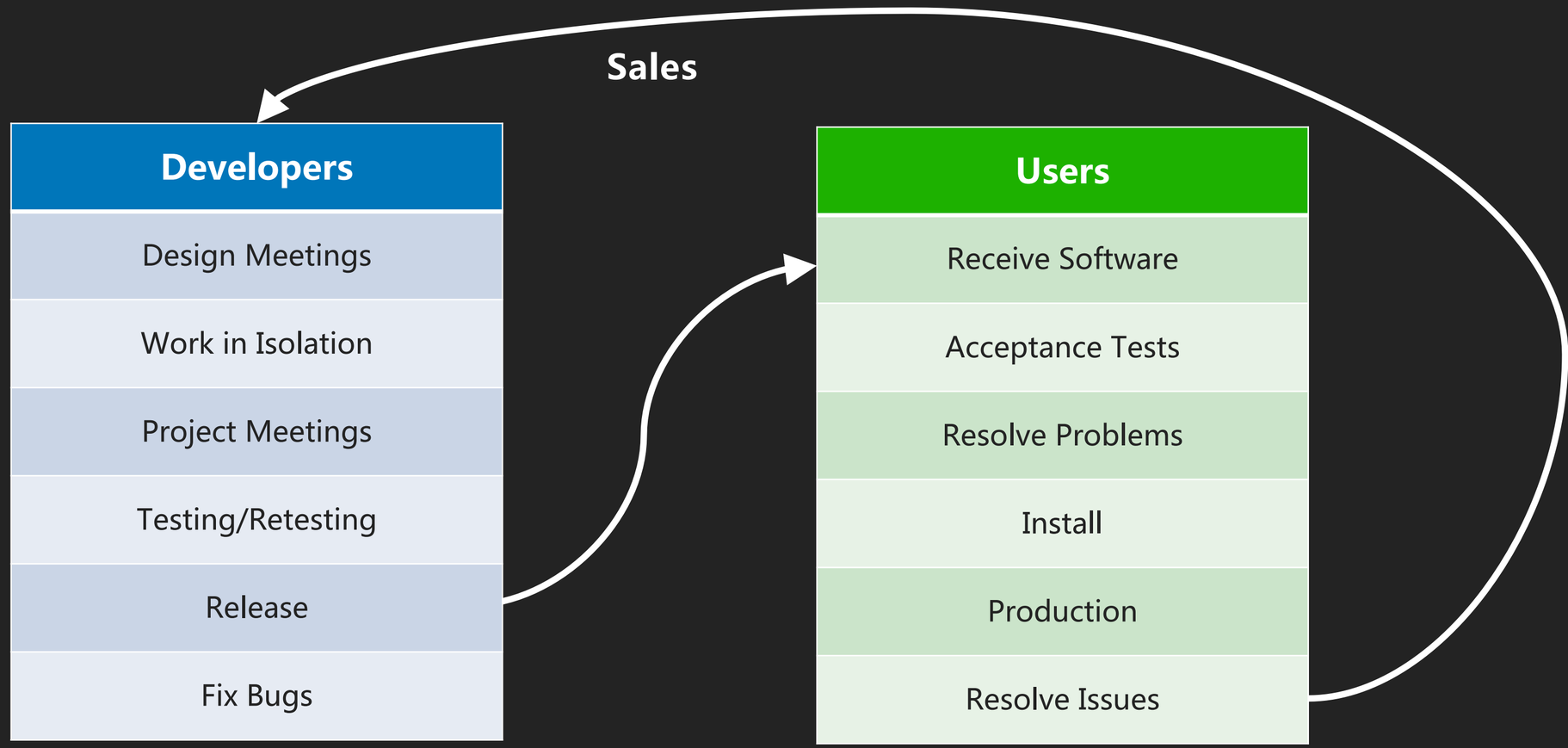
Proprietary Software Life Cycle

1. Innovation
2. Market growth
3. Market saturation
4. *Maximize profit, minimize costs (development, support)*
5. Maintenance mode (no new features, no innovation)
6. End-of-life

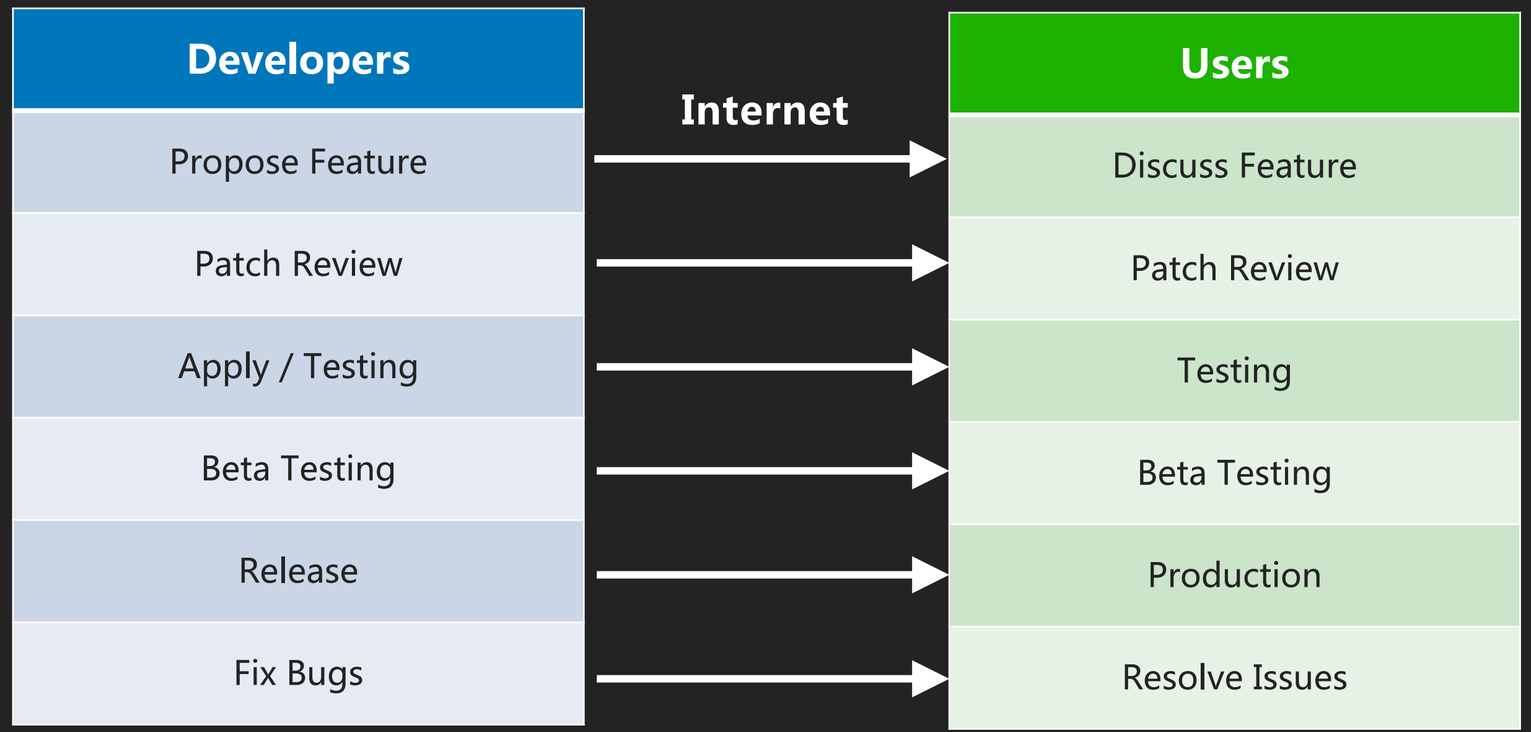
Open Source Software Life Cycle

1. Parity with proprietary software, low cost
2. Market growth
3. *Continue innovation or decline*
4. Source code is always available to continue

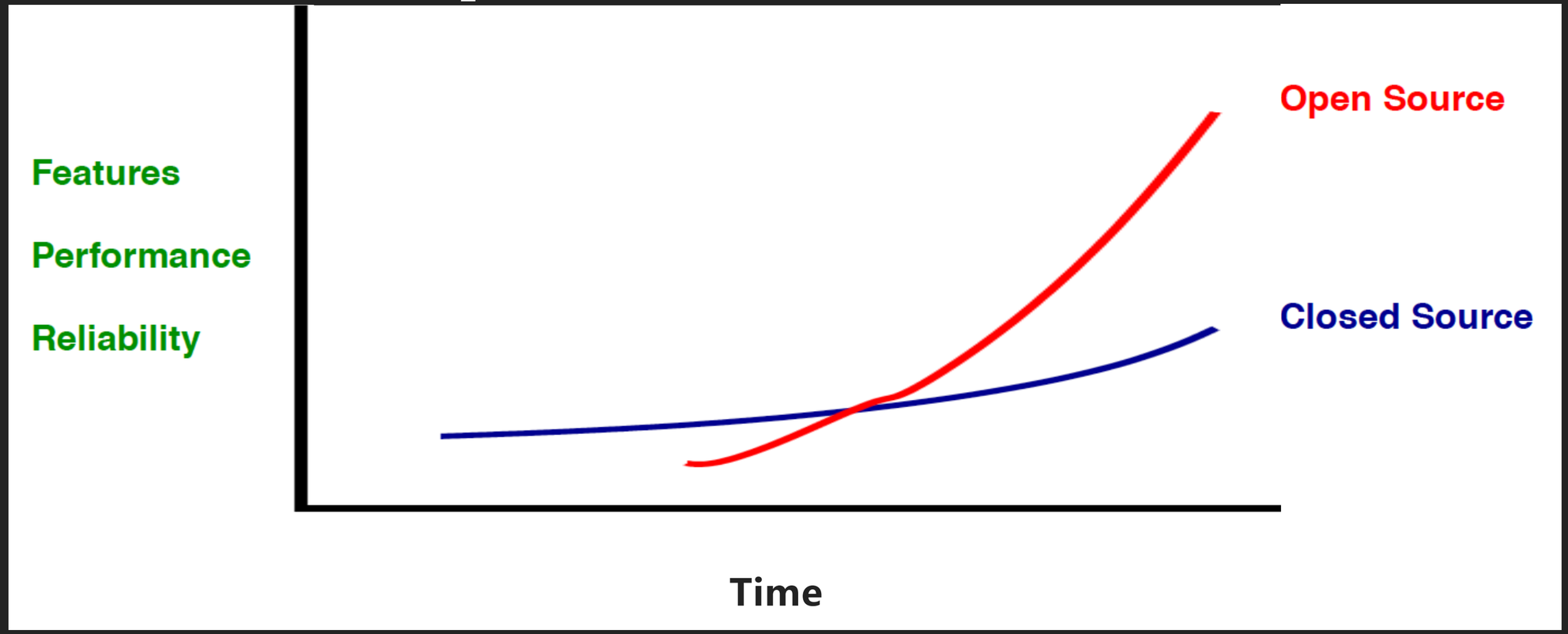
Proprietary Development Flow



Open Source Development Flow



Rise of Open Source



Linux attained feature parity with

1. AIX
2. HP-UX
3. Solaris

and then going on to innovate beyond them.

Postgres nearing feature parity with

1. Oracle
2. DB2
3. SQL Server
4. Sybase
5. Informix

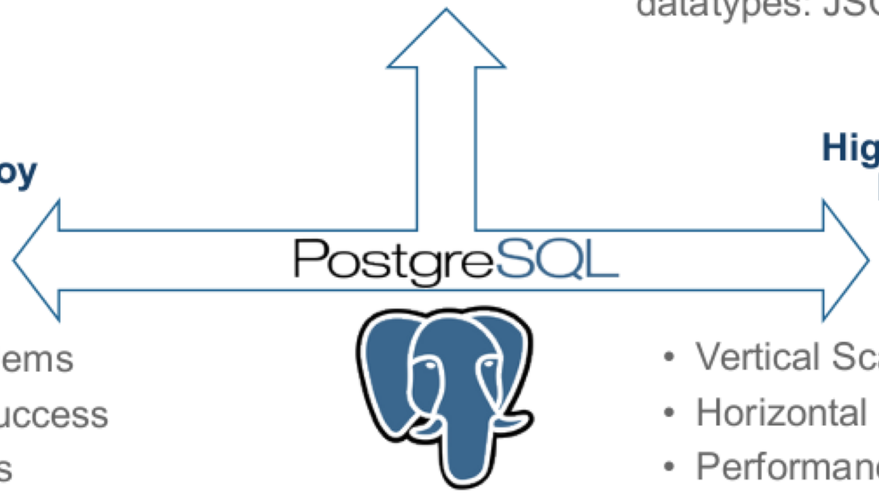
and then going on to innovate beyond them.

New WorkloadsPlatforms (Big Data/Cloud)

- Liasons with other communities
- FDW for common no-SQL DB's
- Continue to evolve new datatypes: JSON, XML, HStore

Easy to use / deploy

High-end Enterprise Requirements



- Diagnosing Problems
- Configuring for success
- Still easier installs
- Tighter integration with frameworks
- Integration with other data stores
- Very simple in the cloud

- Vertical Scale (parallel query)
- Horizontal Scale
- Performance Diagnostics
- Incremental Backup
- Integration with other data stores
- Zero down time upgrades

Keith Alsheimer, EnterpriseDB

When Does Software Die?

1. Proprietary software dies when the owner of the source code can no longer profit from it.
2. It declines long before death due to profit maximization.
3. Open source cannot die in the same way.
4. Open source remains active while it serves a purpose.
5. It can always be resurrected if useful.
6. Postgres was given new life in 1996.

Ideas Don't Die

1. Ideas don't die, as long as they are shared.
2. Ideas are shared, as long as they are useful.
3. Postgres will live, as long as it is useful.

Advantages of Open Source

1. Competitive features, innovation
2. Freedom from vendor lock-in
3. Quality of solutions
4. Ability to customize and fix
5. *Cost down*
6. Speed application development
7. Reduce development costs
8. Interoperability
9. Breadth of solutions

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Development Process

1. Involve everyone
2. Find each person's motivator
3. Reach out to individuals
4. Harvest the strength of the team
5. There is always someone smarter than you
6. Produce work people can be proud of

Clean Code

1. People can't work on the code if they can’ t easily understand it
2. You aren't paying people to work, so make it as easy and interesting as possible
3. Produce quality documentation

Manage the Team

1. Lead by example, not from authority
2. See value in other people's opinions
3. Accept failure gracefully
4. Seek consensus
5. Don't be ruled by deadlines

Postgres Extendability

Extension feature:

1. PostGIS, PG-Strom(GPU)
2. PL/Java, PL/PHP, PL/Python, PL/R (10+)
3. JSON Type, Range Types
4. FDW to MySQL, Oracle, Excel (100+)
5. Full Text Search

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Derived database:

1. EnterpriseDB (Oracle compatibility)
2. Greenplum (MPP OLAP)
3. Citus (Sharding)
4. AgenGraph (Graph Model)
5. PipelineDB (Streaming SQL)

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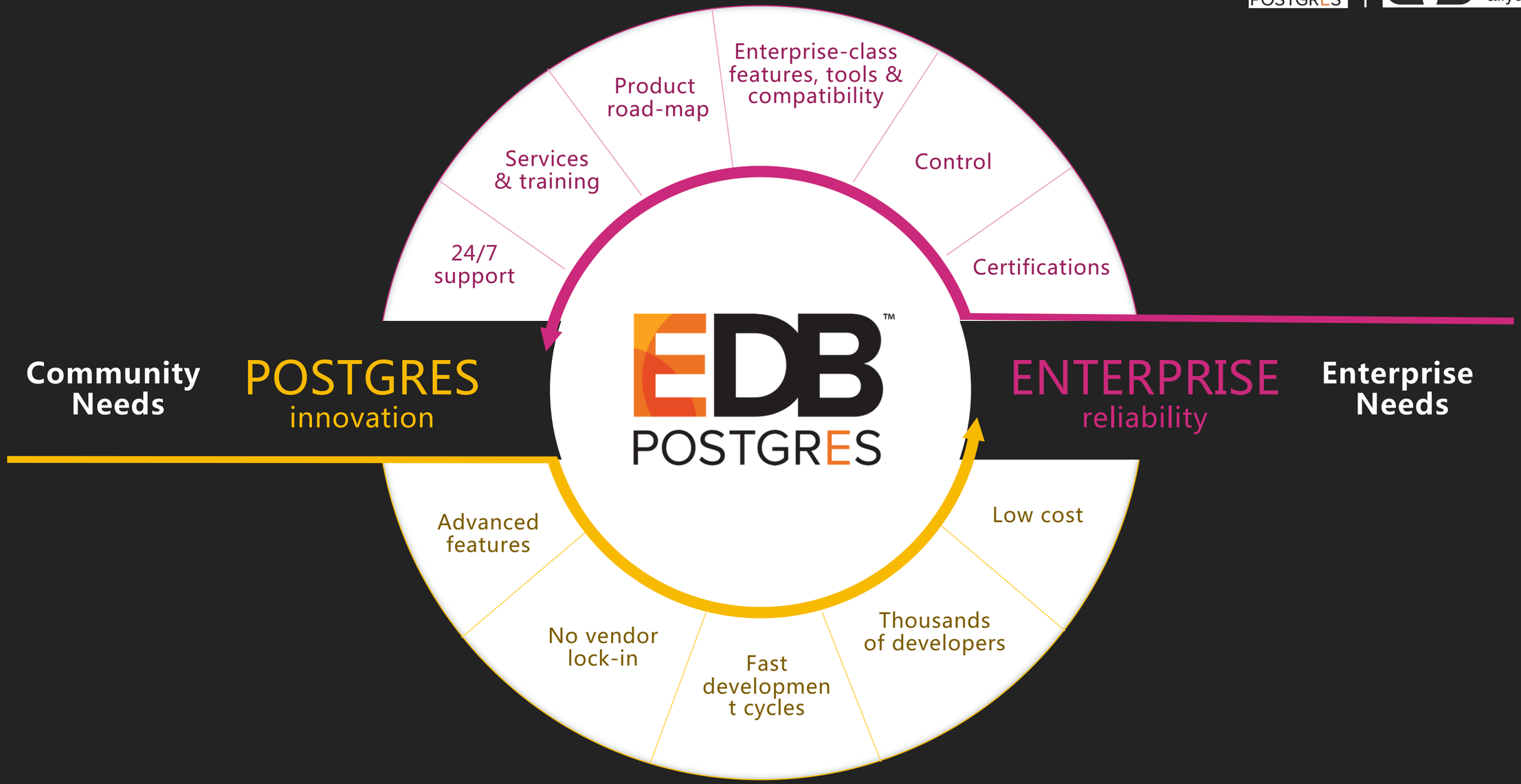
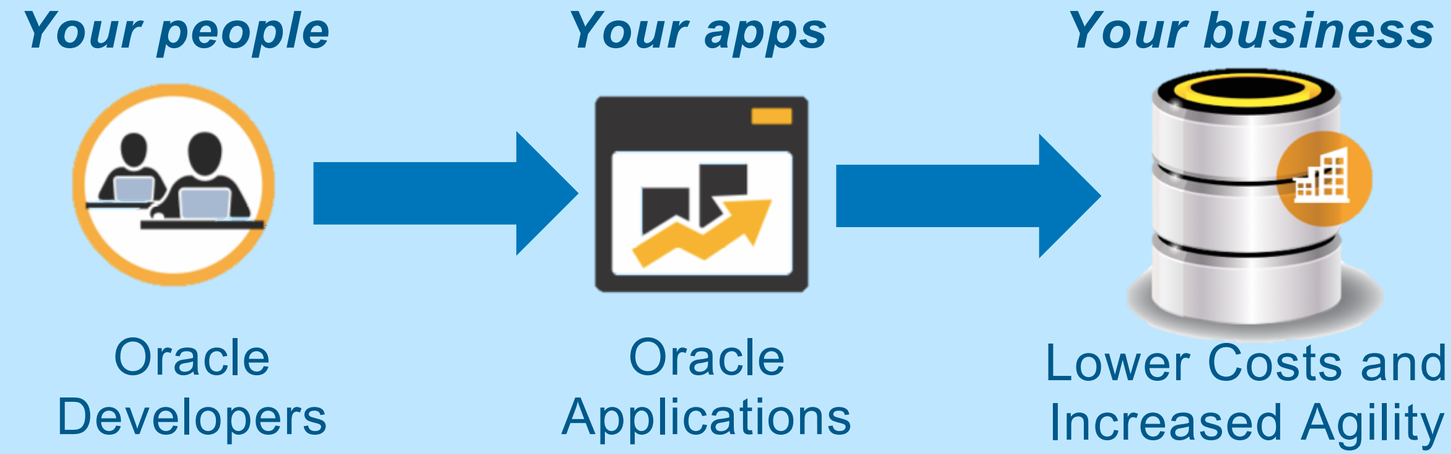

Community Needs
POSTGRES
innovation
EDB™
POSTGRES
ENTERPRISE
reliability
Enterprise Needs
Product road-map
Enterprise-class features, tools & compatibility
Control
Certifications
24/7 support
Services & training
Advanced features
No vendor lock-in
Fast developmen t cycles
Thousands of developers
Low cost

Contributions to community

from PostgreSQL community			EDB contributions to PostgreSQL	*from EDB Development*		
			v10			
• Logical Replication • Declarative Table Partitioning	• Quorum Commit for Synchronous Replication	• SCRAM-SHA-256 authentication	**•Parallel Query index, bitmap scans & merge joins •Durable Hash indexes •postgres_fdw push down of joins and aggregates •Trigger transition tables**	• Re-direct Audit Log Records to syslog • EDB Clone	Schema • Automatic cache pre-warm • Customizabl	e WAL Segment Size
			v9.6			
• Avoid repetitive autovacuum • Full-text	search for phrases • Support for remote joins,	sorts, and updates in postgres_fdw	**• Parallel sequential scans, joins, and aggregates • Synchronous replication support for 2+ standbys**	• Advance queuing • Nested sub-procedures • Partitioned	table performance enhancements • EDBLDR enhancements	• More Oracle compatibility feature
			v9.5			
• Block Range Indexes (BRIN) • UPSERT • Row Level	Security • Schema creation for FDW • Grouping	Sets, ROLLUP and CUBE • More JSON functions	**•Performance: sorting, in-memory hash, concurrency locking •Parallelism Infrastructure**	• Password profiles: User password management	• Improved performance under high concurrency	

from PostgreSQL core	EDB contributions to PostgreSQL core	*from EDB Development*
• Logical Decoding for Scalability • JSONB Data Type • JSONB Indexing • Expanded JSON functions • Delayed Application of Replication • 3x Faster GIN indexes • Support for Linux Huge Pages	**v9.4** •pg_prewarm •ALTER SYSTEM •Concurrently updatable Materialized Views •Mongo FDW & MySQL FDW	• CPU & I/O Resource Management • SQL Aggregation with CUBE, ROLLUP and GROUPING SETS • Comprehensive UTL_HTTP Package • Hash Partitioned Tables • Connect By_Root Operator for hierarchical queries • SQL/Protect Logging to DB Table • EDB*Loader Improved Error handling
• 64 bit LOBs up to 4TB in size • Custom backgroun d workers • Writable Foreign Data Wrappers	**v9.3** •Materialized Views	• Partition Read Improvemen ts over 75x • Support for 1000s of Partitions • Partition write improvement s over 400x
• Cascaded streaming replication • JSON support, Range Types	**v9.2** •MySQL Foreign Data Wrappers for SQL/MED	• Table() function support for nested tables • INSERT APPEND hint • EDB Postgres Multi- master Replication • Expanded Object Type support
• Synchronous replication • Serializable Snapshot Isolation • In-memory (unlogged) tables • Writeable Common Table Expressions	**v9.1** •Index-only scans (covering indexes) •Linear read scalability to 64 cores	• Row Level Security • Declarative Partitioning syntax
• Deferrable unique constraints and Exclusion constraints • Streaming replication • Windows 64 bit Support • Hot standby	**v9.0** •No restore In-place version upgrades	• VARRAY support • SQL Profiler • Index Advisor • Parallel Bulk Data Load

Enterprise needs: Compatibility for Oracle®



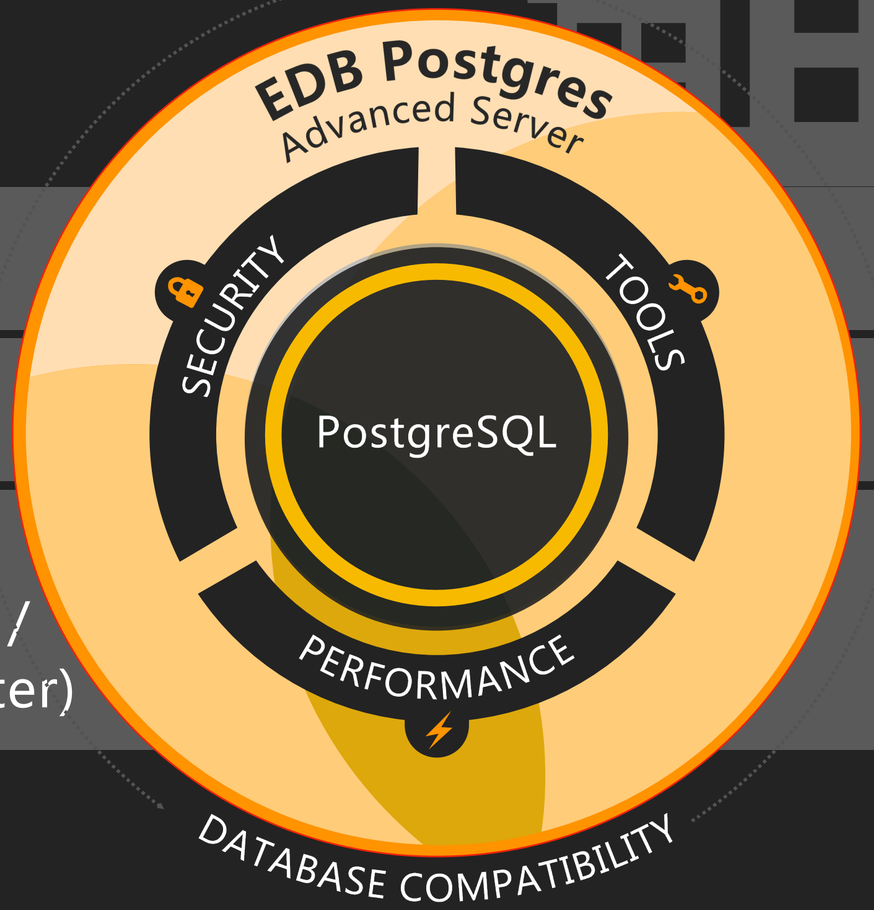
- Deploy new applications on EDB Postgres instead of Oracle
- No need to retrain Oracle DBAs and developers
- Support for PL/SQL language and OCI interoperability
- Replication for easy sharing of data

Enterprise needs: not just compatibiliy

Security: VPD / SQL Injection protection…

Tools: PEM / Migration / Replication

Performance: Resource Manager / Hints
SQL Profiler / Bulk Data Load (2x faster) /
Partitioning (400x writes & 76x read faster)



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