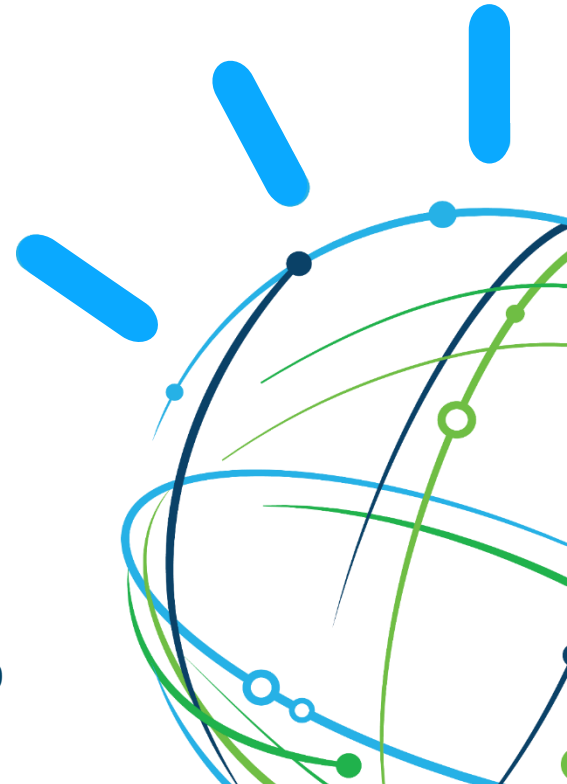


## Oracle on Power : Technology Roadmap Update

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IBM Client Center Montpellier



## Oracle Ecosystem and Market Opportunity

**Oracle is the 2nd WW ISV: ~\$40B revenue, 51% based on SWMA**

~ 420,000 customers including 310,000 Database customers. (others are HW or Apps only)

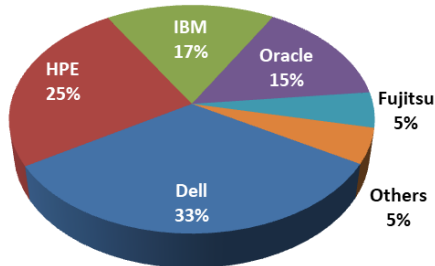
66% of the DB customers run Standard Edition (per socket license on Scale out, Dell HPE)

**Oracle got ~15% of the installed infrastructure with SUN SPARC/Solaris acquisition**

+ Oracle Engineered Systems (Exadata/Exalogic/ZFS, ... ), only 6,000 servers

**IBM Power Systems run the largest Oracle DD/Apps implementations**

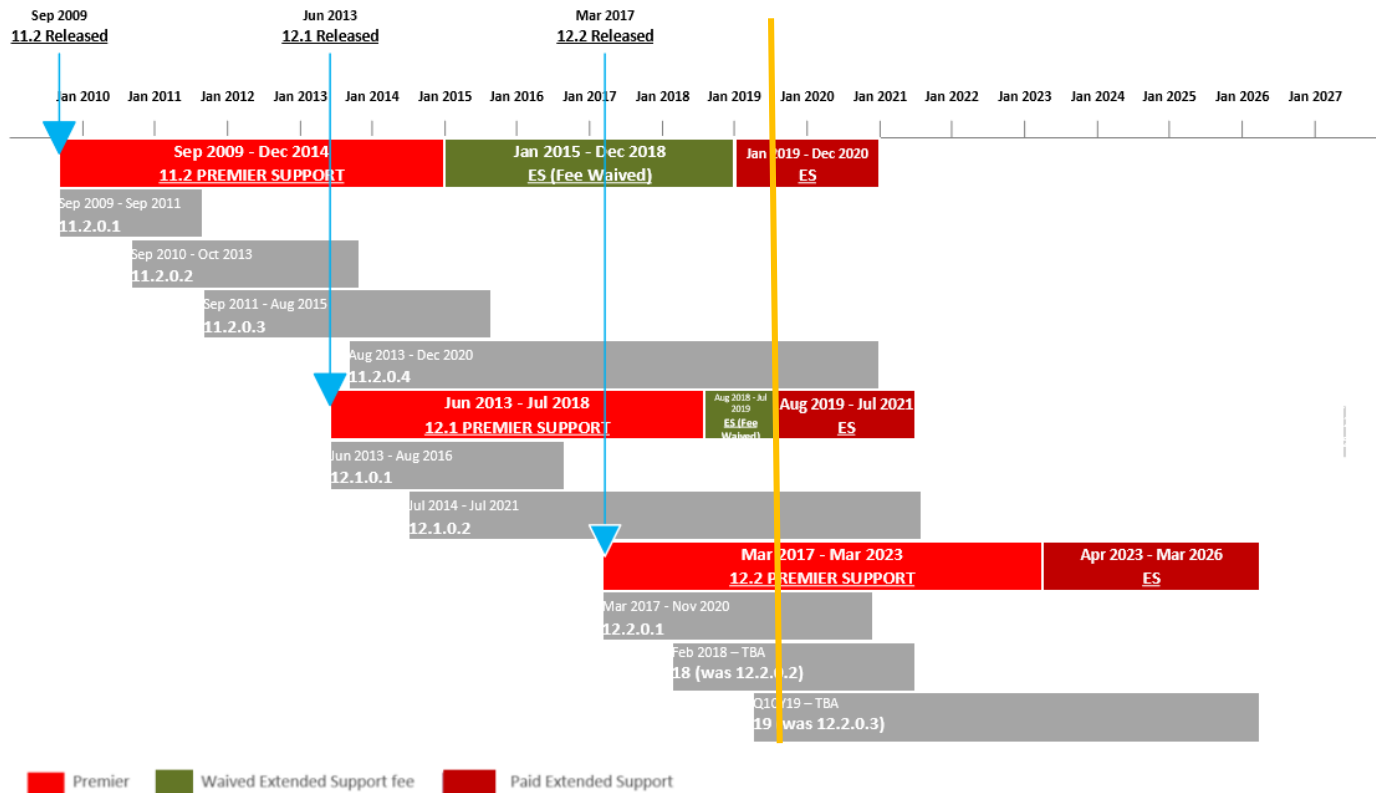
73,000 run on IBM HW, including 25,000 for the Applications



Oracle SW installed Base Share

# Release Schedule of Current Database Releases

Source: Oracle support [Doc ID 742060.1](#)



# Oracle Autonomous Database

## Self-Repairing



### Keeps business up and running

Automated Backup	nightly RMAN Backup on Oracle Cloud
Automated Server Availability	Oracle RAC & Application Continuity
Automated Disaster Recovery	Dataguard + Active Dataguard
Automated Maintenance & Upgrades	Rolling Oracle RAC upgrades + Active Dataguard + Automated Patching
Automated Recovery from Human Errors	Flashback Database
Optimal Database Cloud Infrastructure	Exadata

## Self-Securing



### Protects itself from attacks

Encryption for Data In Motion	industry-standard TLS 1.2 to encrypt data
Encryption for Data At Rest	Oracle Transparent Data Encryption
Automated Separation of Duties	Oracle Database Vault
Database Auditing Configured by default & customizable	Oracle Unified Audit
Reduced opportunity for human error	??
Automated patching, upgrades & maintenance	Oracle RAC (rolling upgrades)

## Self-Driving



### Reduces human labor

1. Provisioning	Provision DB inside Oracle RAC + Active Dataguard configuration
2. Security	Database Vault
3. Management	Automated Patching + AHF
4. Protection	RMAN + RAC + Dataguard
5. Scalability	Adding CPU, nodes & Storage
6. Optimization	Autonomous Datawarehouse & Autonomous Transaction Processing Services

**Available only in the Oracle Cloud ?**

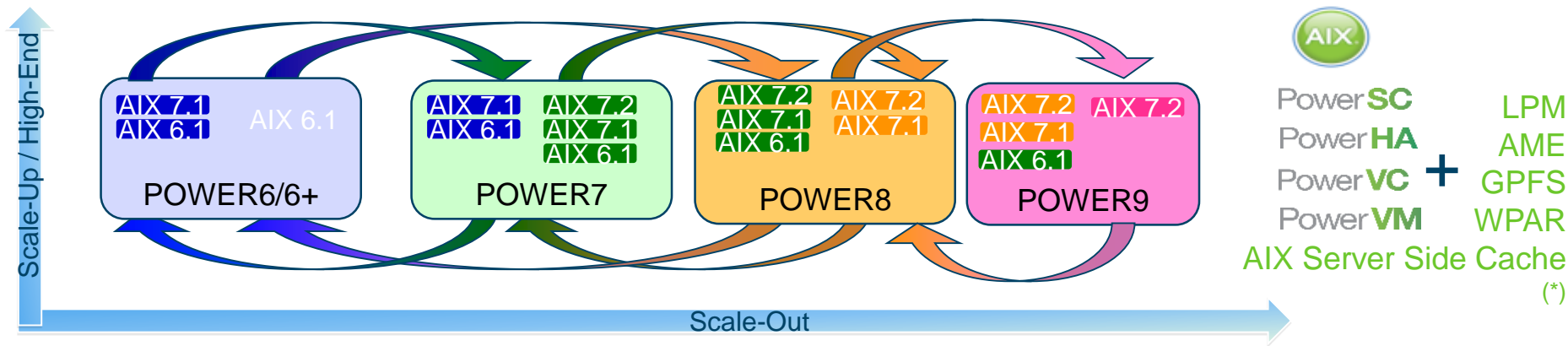
<http://www.oracle.com/us/products/database/autonomous-database-self-repairing-5116047.pdf>

<http://www.oracle.com/us/products/database/autonomous-database-self-securing-5116048.pdf>

<http://www.oracle.com/us/products/database/autonomous-database-self-driving-5116034.pdf>

# IBM Power: Scalability, Flexibility, Ease Migration and strong investment

Oracle Certifies for AIX on PowerVM, all Power servers run the same AIX and Virtualization  
(No support on CS Nutanix models)



Oracle environment can be deployed, migrated, restore on any server and take benefit of SMP scalability

**10<sup>g</sup>**  
ORACLE  
DATABASE

AIX 5.3 / AIX 6.1

ORACLE<sup>®</sup> **11<sup>g</sup>**  
DATABASE

AIX 5.3 / AIX 6.1  
AIX 7.1 / AIX 7.2

ORACLE<sup>®</sup> **12<sup>c</sup>**  
DATABASE

AIX 6.1 / AIX 7.1 / AIX 7.2

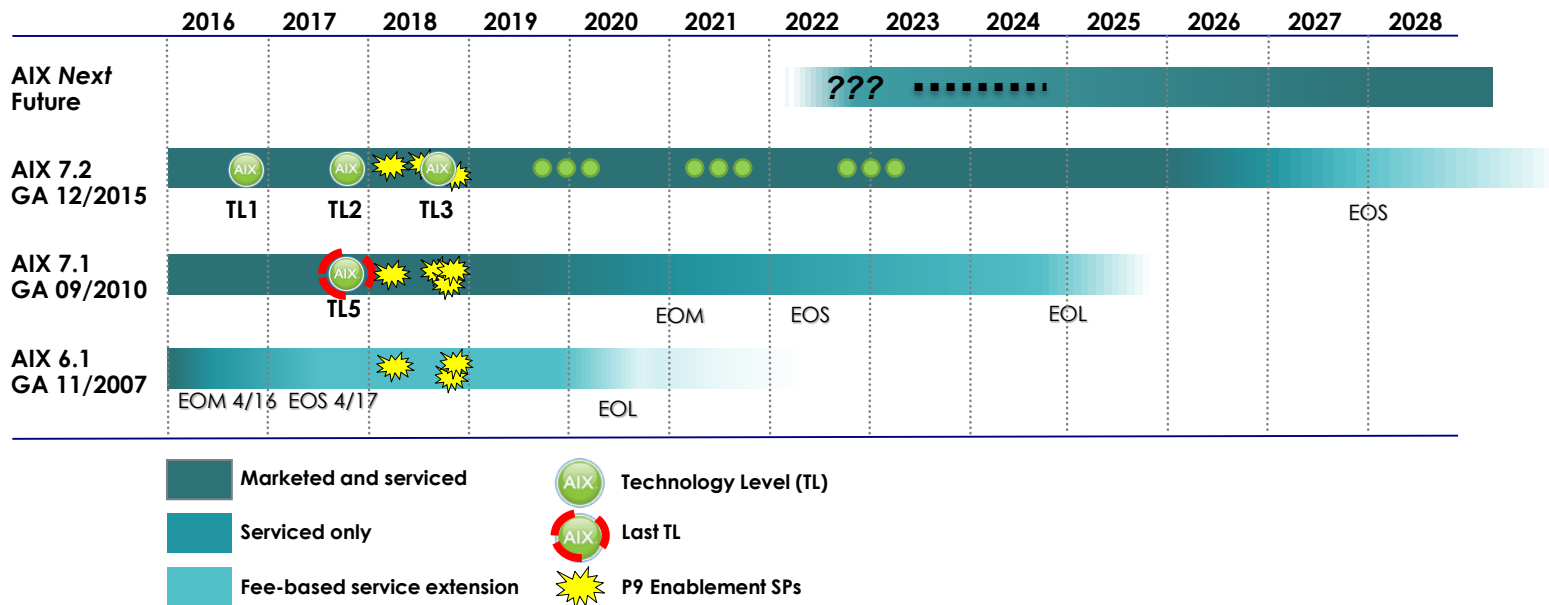
**18<sup>c</sup>** ORACLE<sup>®</sup>  
Database

AIX 6.1 / AIX 7.1 / AIX 7.2

**19<sup>c</sup>** ORACLE<sup>®</sup>  
Database

AIX 7.1 / AIX 7.2

# AIX Release Roadmap View



All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

# AIX Support Matrix

**2019 is end of service for  
POWER5, POWER6, and POWER7 !**

Power Platform	AIX 5.3	AIX 6.1	AIX 7.1	AIX 7.2
POWER4				
POWER5				
POWER6				
POWER7				
POWER8				
POWER9				

Support expired	Supported in P6 Mode	Supported in P8 Mode
Not Supported	Supported in P7 Mode	Supported in Native Mode

1. AIX 5.3 requires full I/O virtualization on POWER8
2. 7.1 Versioned WPARs are an option to run AIX 5.3 env. on P8/P9

## AIX 6.1 (TL9)

- **End of Service: 30 April 2017**
- Extended support until April 2020 (add. fee)
- Extended support for P8 and above until April 2022

## AIX 7.1 Service Pack Support

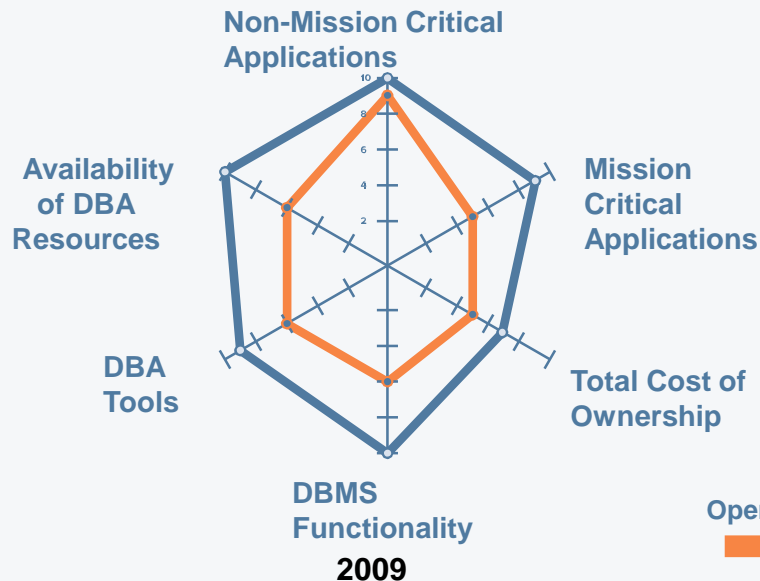
- **AIX 7.1 TL4 End of Service Pack Support– December 31, 2019**
- AIX 7.1 TL5 EoSPS – April 30, 2022

## AIX 7.2 Service Pack Support

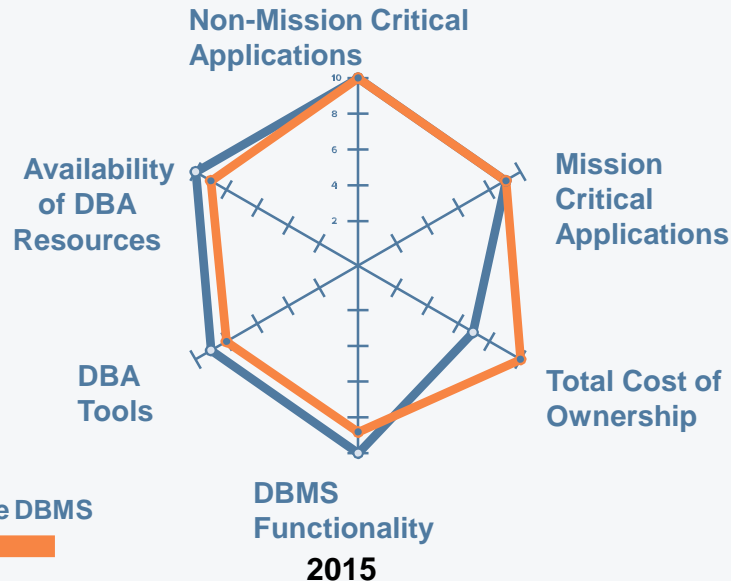
- **AIX 7.2 TL0 EoSPS – December 31, 2018**
- **AIX 7.2 TL1 EoSPS – November 30, 2019**
- **AIX 7.2 TL2 EoSPS – October 31, 2020**

## The Database Landscape is changing !!

**Gartner:** Relational OSDBMS has matured and today can be considered as a standard infrastructure choice for a large majority for new enterprise applications.



**Figure 1**  
Relational Open-Source DBMS Maturity  
Evaluation, 2015 Source: Gartner (April  
2015)



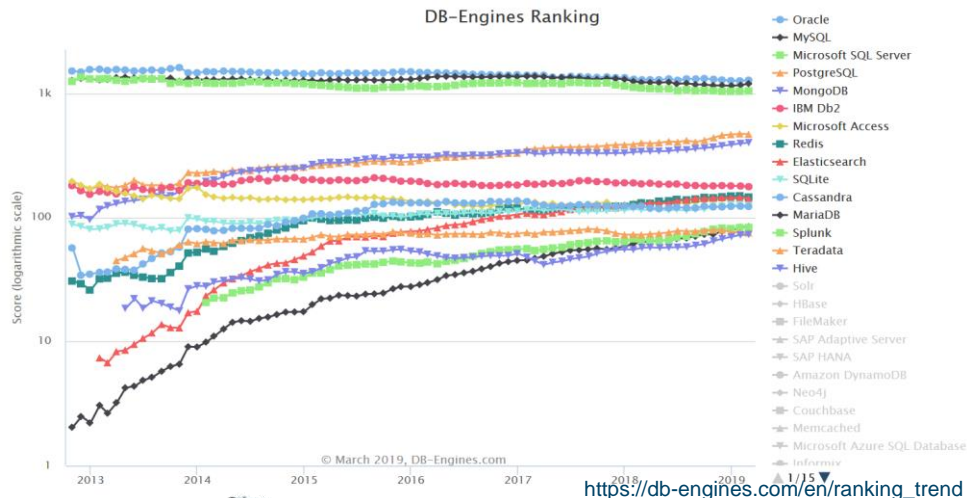
**Figure 2**  
Relational Open-Source DBMS Maturity  
Evaluation, 2015 Source: Gartner (April  
2015)



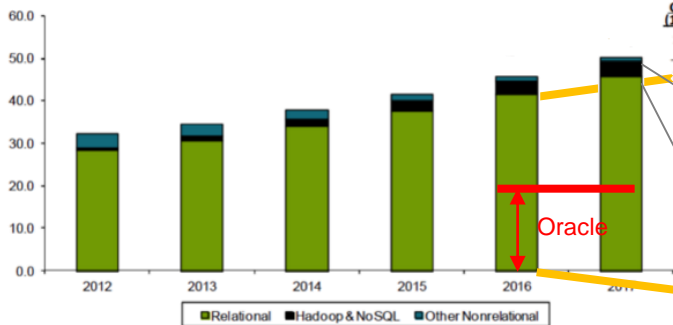
# Database Market Shares & Opportunities

## DB-Engines Ranking - Trend Popularity

- 1/ Oracle
- 2/ MySQL
- 3/ Microsoft SQL Server
- 4/ PostgreSQL
- 5/ MongoDB



## Global Database Market (\$ Billions)



CAGR  
(13-17)

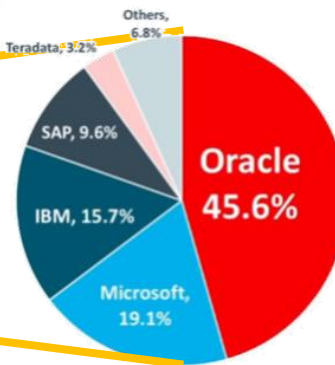
10%

-23%

36%

11%

**Revenue :**  
MySQL : 1 000M\$  
MongoDB : 500M\$



**Oracle**  
**1# Database Leader**

# PostgreSQL Oracle Compatibility layer

## What if...

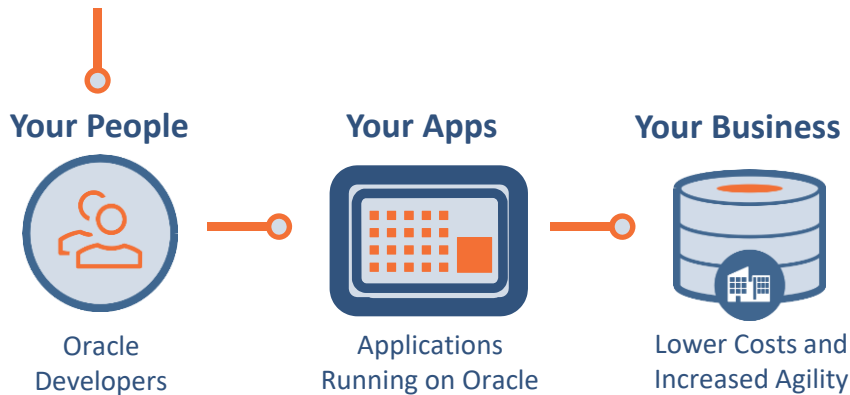
*...you could use your Oracle® skills without using Oracle?*

*...you could keep your investments in PL/SQL and not use Oracle?*

*...you could do both and save money ?*



Compatible with:



**=> Ask your PostgreSQL professional an oracle compatibility & migration assessment!**

# Oracle vs EnterpriseDB cost comparisons



	Oracle Enterprise Edition	EDB Postgres Advanced Server
License Fee Per Core	(32 cores) (Power processor)	(32 cores) (Power processor)
Database	\$47,500	included in subscription
Partitioning	\$11,500	Included
Data Guard	\$11,500	Included
Diagnostics	\$5,000	Included
Total License Fee per Core	\$75,500	included in subscription
Total License Fee per Server (CapEx)	\$2,416,000	\$0
Annual support/subscription cost per core	22% of License Fee	\$1,750 per core
Annual Support/Maintenance per Server (OpEx)	\$531,520	\$56,000
Total 3 Year License and Support Cost	\$4,010,560	\$168,000

No CAPEX • Annual OPEX reduction **90%** • 3 YR TCO cost savings **96%**

# POWER9 Systems family – run PostgreSQL everywhere !



**Power S922LC**  
**Power AC922**  
For Cloud / Cluster  
Artificial Intelligence

Small cores



KVM



**Power L92x**  
1-2 sockets, 2U

**Power S9xx**  
1-2 sockets, 2U-4U

**Power E9xx**  
4-8 sockets  
Enterprise

Big cores



PowerVM



IFLs

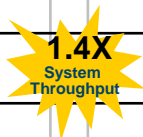


# Reduce Open DB Cloud operating costs with Power L922 Server running EnterpriseDB Postgres Advanced Server 10

## 2.4X price-performance leadership over tested Intel Xeon SP Gold 6148 servers



<b>EDB POSTGRES</b>	<b>IBM Power L922</b> (20-core, 256GB, 4 LPARs)	<b>Intel Xeon SP based</b> 2-socket server (40-core, 256GB, 4 VMs)
<b>Server price</b> <sup>2,3,4</sup> -3-year warranty	<b>\$27,480</b>	<b>\$29,247</b>
<b>Solution Cost</b> <sup>2,3,4</sup> -Server + RHEL OS + Virtualization + EDB Annual Subscription @ \$1,750 per core/yr (3yrs)	<b>\$144,557</b>	<b>\$243,166</b>
<b>EDB pgbench</b> <sup>1</sup> System Transactions per Second	<b>853,709 tps</b>	<b>611,118 tps</b>
<b>TPS/\$</b>	<b>5.9 tps/\$</b>	<b>2.5 tps/\$</b>



**2.8X**  
per core  
performance

**40%**  
Lower solution  
costs

**2.4X**  
Better Price-performance

1. Based on IBM internal testing of multiple VM images running pgbench benchmark at scale factor of 300, 20 GB buffer size. Results valid as of 4/19/18. and conducted under laboratory condition with speculative execution controls to mitigate user-to-kernel and user-to-user side-channel attacks on both systems, individual result can vary based on workload size, use of storage subsystems & other conditions.
2. IBM Power L922 (2x10-core/2.9 GHz/256 GB memory) 2 x 300GB SATA 7.2K rpm LFF HDD, 10 Gb two-port, 1 x 16gbps FCA, EDB Postgres Advanced Server 10, RHEL 7.5 with PowerVM (4 partitions@5-cores each),
3. Competitive stack: 2-socket Intel Xeon Skylake Gold 6148 (2x20-core/2.4 GHz/256 GB memory), 2 x 300GB HDD, 1 Gb two-port, 1 x 16gbps FCA, EDB Postgres Advanced Server 10, RHEL 7.5, KVM (4 VMs@10-cores each)
4. Pricing is based on Power L922 pricing, EDB <https://webcms.enterprisedb.com/products/subscriptions>, and publicly available x86 pricing.

## BIG DATA Analytics like never before SQREAM DB ON IBM POWER9



Sqream DB on IBM POWER9 takes advantage of POWER9's industry-exclusive CPU-to-GPU high speed NVIDIA NVLink interface to offer increased throughput performance both for data loading and SQL query execution.

*"SQream DB is designed for multi-core processors such as POWER9 with its strong and robust multi-core architecture,"*

Ami Gal, CEO of SQream.

Oct 2018

<https://sqream.com/sqream-db-on-power9/>

*Data stores increase exponentially, and does the need to process more data while reducing complexity and footprint. This joint effort with IBM provides users with a super-charged combination of IBM's powerful processor and SQream's DB data warehouse for unparalleled speed, performance and scale, while enabling significantly improved analytics.*

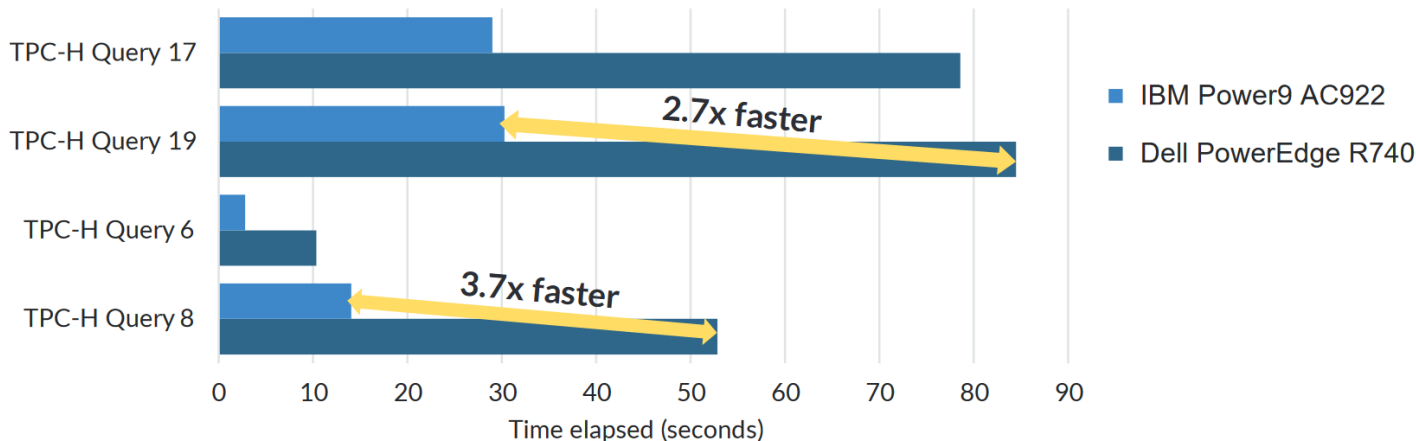
**For retailers, insurance companies, telecoms, banks ... and all industries IT transformation**

## SQREAM DB on POWER9: 4X faster queries, 2X faster Load

<https://info.sqream.com/hubfs/pdf/SQream%20DB%20for%20Power%20Systems.pdf>

On the NVLink-enabled Power9 architecture, the TPC-H derived benchmark results are dramatic. Complex queries are about 4x faster, and load time is almost 2x faster, with no changes or tuning.

### SQream DB performance - IBM Power9 vs Intel Xeon (Skylake)



The IBM Power9 with NVLink provides faster queries and faster load times than a similar priced and configured Intel x86-64 based server. The already excellent cost-performance of SQream DB gets even better.