

What are the similarities and differences of using PostgreSQL between Japan and Europe?

PGConf.ASIA 2016

K.K.ASHISUTO

Yoko Takase

Who am I?



Yoko Takase

Working for K.K.Ashisuto as a database engineer

Engaging in PostgreSQL since 2009 and

EDB Postgres since 2011

Living in UK for 2.5 years

writing up how database things are in Europe

Agenda

- **PostgreSQL in Europe**
- User Cases in Europe and Japan
- Points of views

Activities for PostgreSQL in Europe

- Develop some main features and popularize PostgreSQL
 - AXLE Project
 - Various events
 - Conference
 - MeetUP



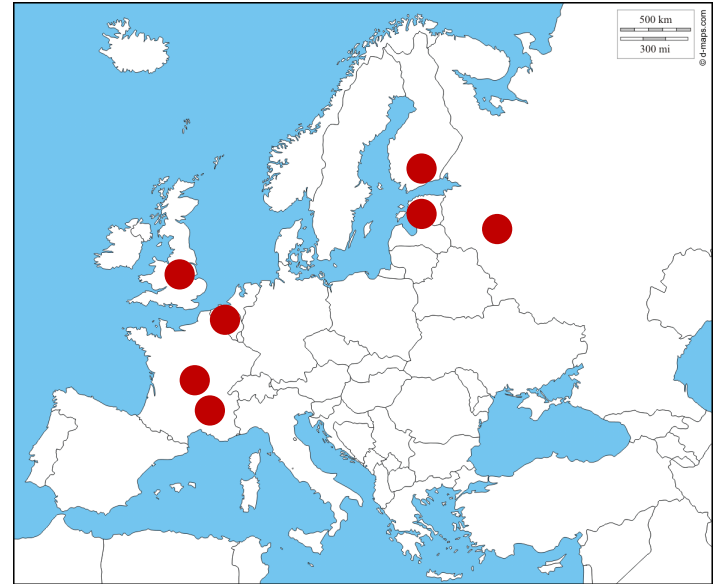
Applying to Big Data

- AXLE Project
(Advanced **A**nalytics for **E**xtrremely **L**arge **E**uropean Databases)
 - Database Size 10TB - 100TB
 - Fast and Highly Secure Business Intelligence
 - Great contribution to major features PostgreSQL 9.5 onward
 - BRIN Index
 - tablesample
 - Bi-Directional Replication
 - Column store/compression(COAST)



PostgreSQL Events in Europe①

- PGDayUK
 - 1Day Event in UK
 - 100 attendees in 2016
 - Fintech user case
- London MeetUp
 - 3 or 4 times in a year



<https://wiki.postgresql.org/wiki/Events>

<http://www.d-maps.com/index.php?lang=en>

PostgreSQL Events in Europe②

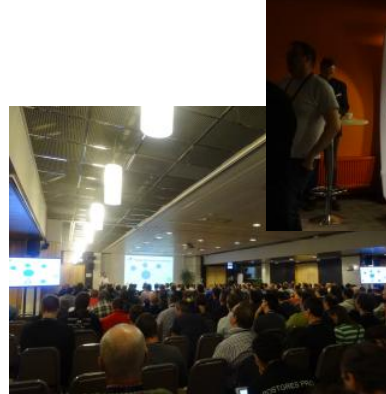
- PostgreSQL Conference Europe
 - Biggest Conference
 - More than 400 attendees in 2016
 - Major developers



**POSTGRES
CONFERENCE EUROPE
2015**



PGCONF.EU 2016



PostgreSQL Events in Europe③

- FOSDEM

(Free Open Source Development European Meeting)

- Event for the Open Source Development (2Days)
- 5,000-6,000 attendees every year
- PostgreSQL, MySQL, Container, etc



Event Reports and Technical News

- Euro IT Journal (Web)
 - <http://www.ashisuto.co.jp/corporate/column/technical-column/>
- ASHISUTO (Magazine)



Agenda

- PostgreSQL in Europe
- **User Cases in Japan and Europe**
- Points of views

User Case in Japan and Europe

- High Availability
- Performance
- Migration
- Management

High Availability



- National Health Management System

Background

- Need to select software under various constraints and tight budget
- Need to **build high availability system in minimum downtime**

Effectiveness

- Achieve a required level of high availability by **Streaming Replication**
- **170,000 prescriptions** per day

Source : <https://raw.githubusercontent.com/sorsix/pgconfeu2015/master/MojTerminPGConfEU.pdf>



- Online Payment System



Background

- Build the system with a small start
- **Not allowed even ten-odd seconds of API downtime**

Effectiveness

- High Availability by **Streaming Replication and Pacemaker**
- Reduce impact of user transactions by setting statement-level timeout

Source : <https://www.youtube.com/watch?v=Tu-cf-Jki60>

- Replace OracleDB EE RAC to EDB Postgres in all store systems



Background

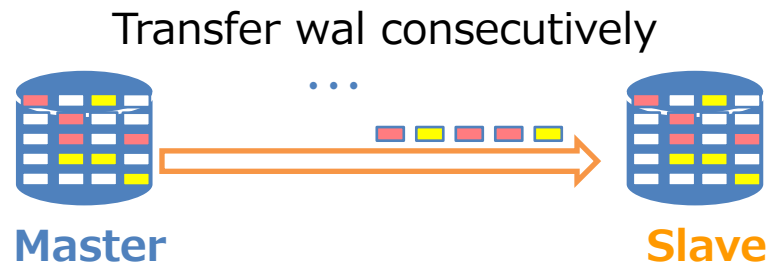
- Reconsider IT cost with system replacement
- Need **same level of high availability as OracleDB EE RAC**
- Performance for thousands of concurrency

Effectiveness

- Sharp cost reduction by subscription licence
- High Availability by **Streaming Replication and pgpool-II**
- Scale-up by multi CPU

Major Technical Features for HA User Case

- Streaming Replication
 - PostgreSQL Standard Replication, implemented since 9.0
- Complementary modules



Product	Explanation
HA Proxy	TCP/HTTP load-balancing proxy http://www.haproxy.org/
pgpool-II	Middleware that works between PostgreSQL servers and a PostgreSQL database client http://www.pgpool.net/mediawiki/jp/
pacemaker	HA Clusterware http://linux-ha.osdn.jp/wp/

Product	Explanation
Patroni	Template to create your own customized, high-availability solution https://github.com/zalando/patroni
Stolon	A cloud native PostgreSQL manager for PostgreSQL high availability https://github.com/sorintlab/stolon
repmgr	A tool suite for managing replication and failover http://repmgr.org/

Performance



- GPS Navigation System with global large market share



Background

- Need **GIS features quality**
- Need **high performance of several hundred thousand requests / sec**

Effectiveness

- Provide **highly precise geographical information** by PostGIS and PostgreSQL
- Achieve **600,000 queries and 15,000 data insertions / sec**

Source : https://wiki.postgresql.org/images/e/e2/Postgresql_at_Tomtom_-_lessons_learned.pdf



- Enterprise Social Networking Service



Background

- Build a system in minimum cost
- Need DBMS with high reliability and stability
- Need **performance for high workload and increasing requests**

Effectiveness

- High Availability by **Streaming Replication**
- Achieve **30,000 requests per sec to Master server**

Source : https://wiki.postgresql.org/images/7/7a/Nguyen_and_Gul_-_PGConf.EU_2016.pdf



- Checking customer shop visit system



Background

- Need **DBMS with high quality and reliability of GIS features**
- Need **enough performance for thousands of concurrency at peak time**

Effectiveness

- **PostGIS, having plenty of operators for geographical information**
- Achieve **3,000 transactions and 16,000 queries/sec**

Source : <https://www.pgecons.org/wp-content/uploads/2013/12/7c14ac1727a38c22295af840fc613321.pdf>

- Energy Management System(EMS)

Background

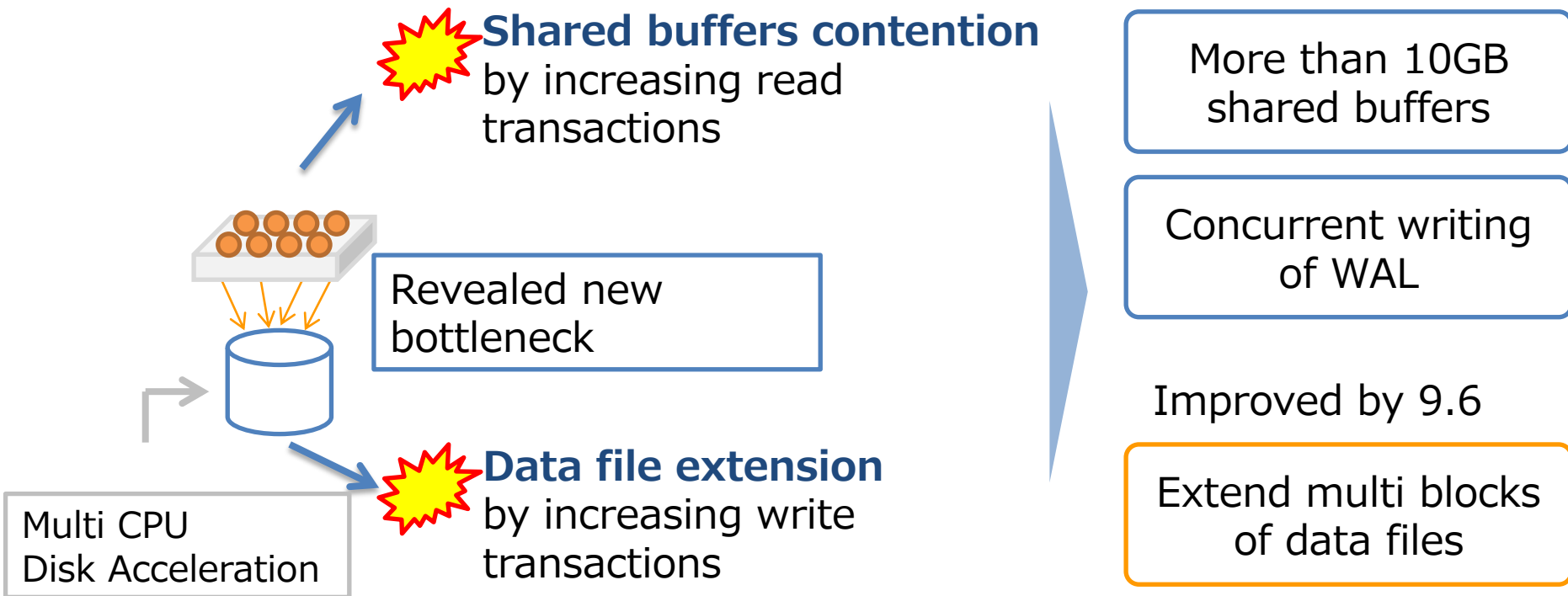
- Need reliability and availability for IoT System
- **Scale up** and liscence style **for the growth of business**
- Need technical support for enterprise service

Effectiveness

- **1,3 million sensor data per day**
- Flexible scale up and scale out
- 24h365d support for enterprise system

Major Technical Features for Performance User Case

- Improvement of performance features as DBMS



Migration

- Migrate OracleDB EE of stock management system for 13 distribution centers to EDB Postgres



Background

- Place stock management system to virtual environment and need to reduce reduce license cost of OracleDB on virtual environment
- Need **DBMS to use OracleDB application and skills efficiently**

Effectiveness

- Succeed 90% cost reduction of license and support
- **smooth migration by OracleDB compatibility**

Source : https://www.ashisuto.co.jp/case/industry/retail/edb_coopnet.pdf



- Migrate OracleDB EE of ISP account management system to EDB Postgres



Background

- **Keep using current OracleDB applications**
- **No stress to OracleDB engineers** by learning new DBMS technology

Effectiveness

- **Change only connection statements of program** due to compatibility of SQL and procedures
- **No need of specific technical training** to OracleDB engineers due to similar interfaces

- Migrate OracleDB EE of EDI System, used by 300 companies to EDB Postgres



Background

- Rework IT cost due to reaching maximum number of companies, using system
- Need to reduce reduce license cost of OracleDB on virtual environment
- **Minimum cost for rewriting application**

Effectiveness

- **98% of SQL compatibility** in 30,000 steps of program
- **Smooth migration** by EDB Migration Toolkit

Major Technical Features for Migration User Case

- Use OracleDB applications efficiently
 - Can create stored procedures and packages
 - Support OracleDB specific SQL and PL/SQL syntax

Supported Major Objects		SQL,PL/SQL	
Tables (with partitions)	Procedures	Outer join(+)	PL/SQL syntax
Indexes(B*tree)	Packages	Set operators(minus)	Commit / rollback in stored procedures
Constraints	Triggers	Concatenated NULL and empty string	OracleDB specific function(nvl)
Views	Synonyms	ROWNUM	OracleDB built-in packages
Sequences	Database Links	No alias for sub-query in FROM clause	SQL Hint
Functions	Materialized Views		

Management



- Largest online fashion website in Europe



Background

- Need to achieve required performance
- **Efficient DB maintenance and monitoring**

Effectiveness

- **Shorten the duration time of DB backup and migration** by distributing data into several servers
- Develop unique performance monitoring tool **PGObserver**

Source : https://docs.google.com/presentation/d/1gJL93iGNxbo9B2Y2sVnWVQfPBGllEjtoZlp6UitUwXM/present?ueb=true#slide=id.g11d1f2970_01



- Enterprise Social Networking Service



Background

- Need to use DBMS with reliability and stability
- Need **plenty of tools for DB management**

Effectiveness

- Good use of **OSS modules, Barman and pgBadger**
- Develop **own tool for monitoring replication lag**

Source : https://wiki.postgresql.org/images/7/7a/Nguyen_and_Gul_-_PGConf.EU_2016.pdf

- MosP, Domestic Open Source Attendance System

Background



- Need DBMS with high reliability and stability
- **Reduce time for checking the bottleneck of performance issues**

Effectiveness

- **Regularly monitoring** of DB Server by EDB Postgres Enterprise Manager(PEM)
- **Suggestions for improving performance** by PEM components, Index Advisor and SQL Profile

Source : https://www.ashisuto.co.jp/case/industry/information/___icsFiles/afieldfile/2016/03/03/EDB_ashisuto_160205-2.pdf

Major Technical Features for Management User Case

- Tools for Management monitoring and SQL analysis

Product	Explanation
pgAdmin	Management tool https://www.pgadmin.org/
EDB Postgres Enterprise Manager	Management and monitoring tool http://www.enterprisedb.com/products/postgres-enterprise-manager
PGObserver	Monitoring tool http://zalando.github.io/PGObserver/
pg_statsinfo	Utility of monitoring statistics and the activity http://pgstatsinfo.projects.pgfoundry.org/index_ja.html
pgBadger	Log analysis report https://github.com/dalibo/pgbadger

- Tools for Maintenance

Product	Explanation
EDB Backup and Recovery Tool	simple and easy tool for Backup and Recovery http://www.enterprisedb.com/edb-backup-and-recovery-tool
Barman	Administration tool for disaster recovery http://www.pgbarman.org/
pgcompact	A tool to reduce bloat for tables and indexes https://github.com/grayhemp/pgtoolkit#pgcompact

Agenda

- PostgreSQL in Europe
- User Cases in Europe and Japan
- **Points of view**

Similarities

- Increasing the number of high reliability and performance system using PostgreSQL
 - Streaming Replication
 - Basic performance
- PostgreSQL : new system
- EDB Postgres : system replacement

It is widely recognized PostgreSQL sufficient features as standard DBMS

Right DBMS
in the right place

Differences

- tools
 - Europe
 - Widely use plenty of OSS tools for PostgreSQL
 - Develop and manage specific tools for their own system
 - Japan
 - Limited using PostgreSQL features and major OSS tools

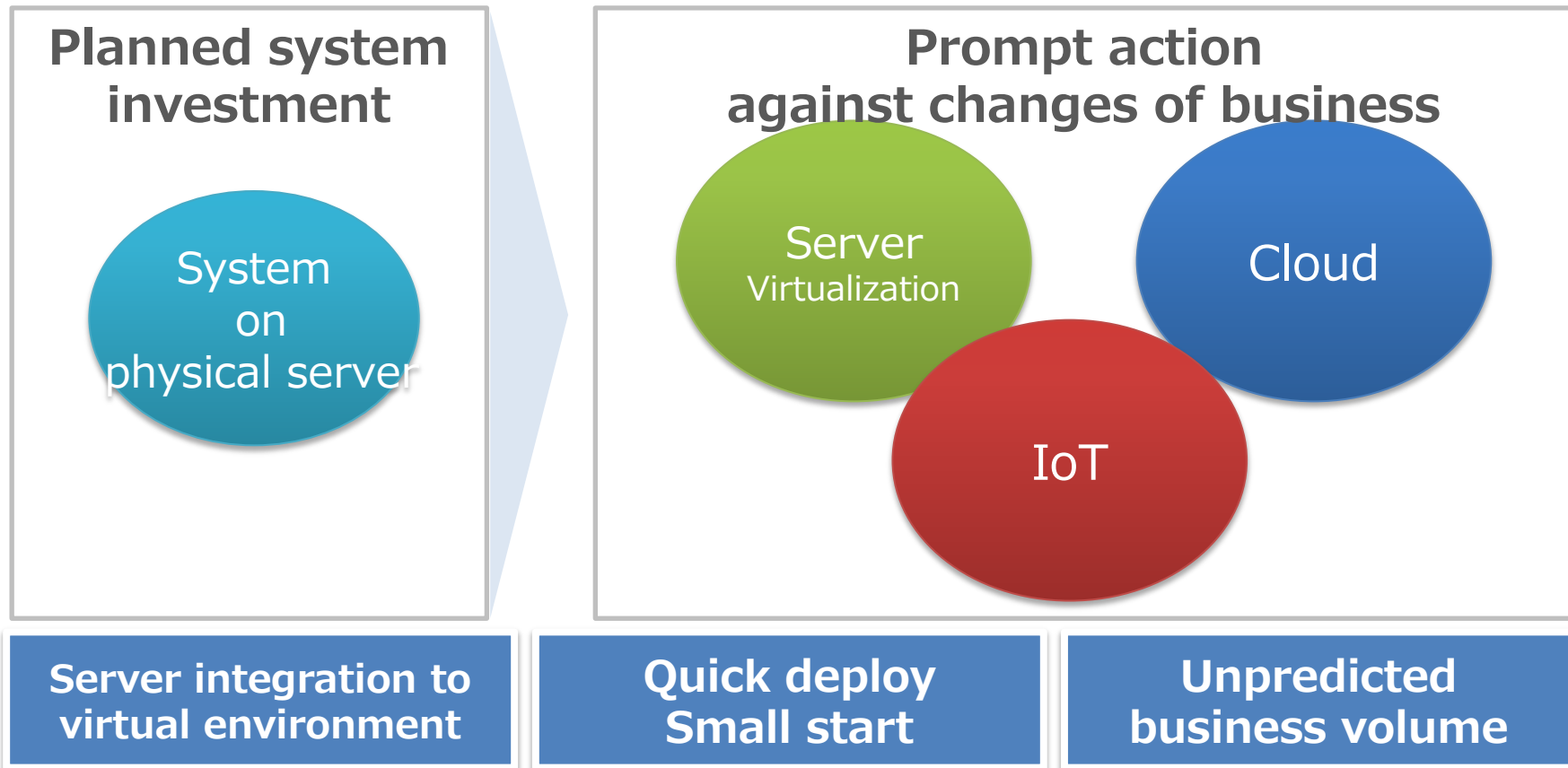


It may be said that this is because of difference of IT structure.

The number of general private companies using PostgreSQL has been increasing.

The more information you get, the more widely you can use OSS.

Utilization of OSS(Postgres) accelerates offensive IT



Efforts to utilize OSS(Postgres)

Making the most of information in conference

- PGConf.ASIA

PostgreSQL

- Sufficient features as standard DBMS



New



Replace



EDB Postgres

- Efficiently utilization of OracleDB application and skills



PostgreSQL communities in Japan

- Japan PostgreSQL User Group(JPUG)
- PostgreSQL Enterprise Consortium(PGECons)

アシスト

「お客様」の「最高」のために

- ※The names of companies and products written in this document are trademarks of each company or registered trademarks.
- ※Oracle and Java are the registered trademarks of Oracle Corporation, and its subordinate or subsidiary companies in USA and other countries.