OCEANBASE

OceanBase Introduction

A highly available, scalable and multi-infra Database

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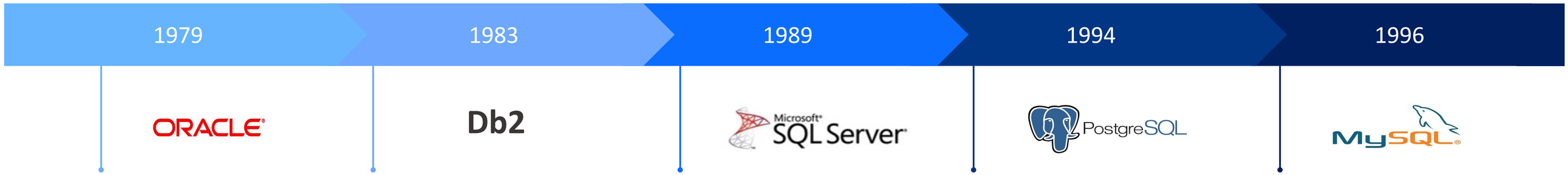
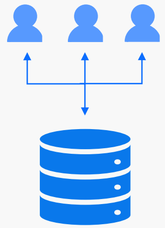
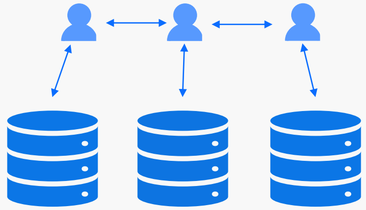
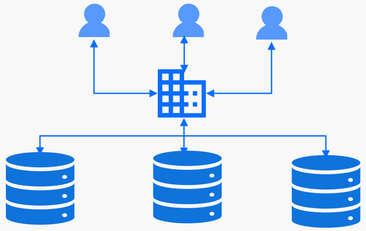
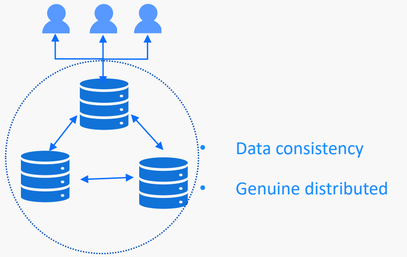
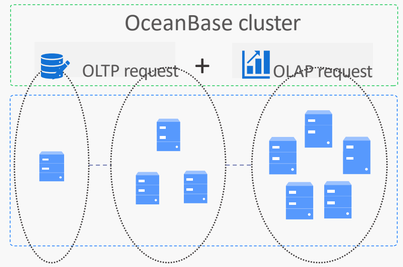
01

Intro to OceanBase

The Ultimate Direction of Distributed Architecture Evolution



Since 1996, there have been no new mainstream OLTP database in the world

Standalone architecture	Distributed architecture with embedded business	Distributed architecture with middleware	Native distributed architecture	Integrated architecture + HTAP
				
1960s	**1990s**	**2000s**	**2010s**	**2020s**
Typical products: Oracle, Db2	Based on traditional standalone architecture, the business layer was responsible for handling distributed transactions.	Typical products: Cobar, MyCAT, DRDS	Typical products: Spanner, OceanBase, TiDB	Typical products: OceanBase

Source: White Paper on Big Data (2018) from CAICT

OceanBase Milestones

Period 1.0
Distributed engine

Period 2.0
Native distributed database

Period 3.0
HTAP Engine

Period 4.0
Integrated architecture, multi-cloud deployment

Distributed KV storage | SQL engine, high availability with multiple replicas | Compatibility, scalability, multi-site disaster recovery | Batch processing, enterprise-level features, HTAP

2010
Product initiation

OceanBase's first customer

淘宝 Taobao

2013
Expansion of scope

Served dozens of eCommerce platforms of Alibaba Group

淘宝 Taobao

TMALL天猫

2014
Core transactions go live

Supported Alipay's core transaction system, handling 10% of Singles' Day transaction volume

Achieved RPO=0 and RTO < 30s for the first time

支付宝

2016
Full business coverage

Launched Alipay's core accounting and payment systems

Supporting a payment peak of **120,000** transactions per second and transaction peak of **175,000** transactions per second

花呗

借呗

余额宝

芝麻信用

网商银行

2017
Multiple financial clients

Completed the final Oracle core replacement for Ant Group's core systems

Nanjing Bank became the first online user

Singles' Day set a peak record of **42 million** transactions per second

四川农信 SICHUAN RURAL CREDIT

南京银行 BANK OF NANJING

顺德农商银行 SHUNDE RURAL COMMERCIAL BANK

2019
Breaks world records

Oracle compatible

Public cloud in service

TPC-C 60.88 million tpmC topped the list.

Singles' Day sets a peak record of 61 million transactions per second

招商证券 China Merchants Securities

常熟农商银行

PICC 中国人民保险

西安银行 BANK OF XI'AN

广东农信 GDRC

苏州银行 BANK OF SUZHOU

天津银行 BANK OF TIANJIN

浙商证券 ZHESHANG SECURITIES

2020
Independent commercialization

TPC-C 7.07 tpmC, breaking its own world record, surpassing Oracle by 23 times

Launches core systems for top customers

中国移动 China Mobile

中国工商银行 INDUSTRIAL AND COMMERCIAL BANK OF CHINA

中国石化 SINOPEC CORP.

中华保险 CHINA INSURANCE

2021
Large-scale expansion

Releasing the HTAP engine

TPC-H 1,526 tpmC topped the list, becoming the only distributed database to top both TPC-C and TPC-H

Community edition released, access to 3 million lines of core code

Piloting overseas customers

江西省人力资源和社会保障厅

交通银行 BANK OF COMMUNICATIONS

DANA

GCash

上投摩根

数字江西

2022
Public cloud released, Expands overseas

Single-server distributed integrated architecture

Public cloud launched, North American site goes live

Listed on AWS Marketplace

中国人寿 CHINA LIFE

太平洋保险 CPIC

平安银行 PING AN BANK

北京银行 BANK OF BEIJING

中国联通 China unicom

国家电网 STATE GRID

中国联合航空 CHINA UNITED

翼支付

easypaisa

Touch 'n GO

2c2p

palmpay

海底捞

POP MART

用友 yonyou

理想

Midea

快手

贝壳

Ctrip 携程

vivo

inkeverse 映宇宙

2023
Integrated product for single-server distribution

Number of customers surpasses 1,000

Ranked No. 1 by market share in the finance industry

Cost-Effective and High Performance SQL Database at Scale

OceanBase is a high-performance, scalable distributed database designed for intensive transaction and real-time operational analytics workloads. It is the #1 Database on Modb DB Ranking, serving more than 1000 customers globally and supports Alipay in all its mission critical workloads.

World #1

- **TPC-C** and **TPC-H** world record
- Achieved **61 Million QPS** during 11.11

> 70% TCO Reduced

- Cutting edge compression technology reduce storage by up to 90%
- Multi-tenancy architecture

RTO <8s

- City-level disaster recovery capability deploy "Five IDCs across Three Cities" and ensures RPO = 0, RTO<30s.
- v4.0 promises RTO <8s

>1000

- Customers including market leaders within Banking, Finance Services, Insurance, Enterprises, Fintech, Digital Natives.

Trusted by over 1,000 brands globally

OCEANBASE

Note: The above are representative clients

Oceanbase Recognized as a Leader in Distributed Database

SOC 2 TYPE II CERTIFIED

ISO/IEC 20000-1:2018. Service Management System

ISO 9001 QUALITY MANAGEMENT SYSTEM

PCI DSS Compliant @SEC

bsi ISO/IEC 27001 Information Security Management CERTIFIED

bsi ISO 22301 Business Continuity Management CERTIFIED

bsi ISO 27018 Personal data in the cloud CERTIFIED

bsi ISO/IEC 27701 Privacy Information Management CERTIFIED

Worldwide Certifications
Oceanbase commitment towards data protection and international guidelines

Global #1 TPC-C Benchmark
2x winner for high performance transactional benchmarks

"Challenger" by Forrester
The Forrester Wave: Translytical Data Platforms Q4 2024 Report

#1 Data Centre – Financial Technology
PH Tech Excellence Awards 2024

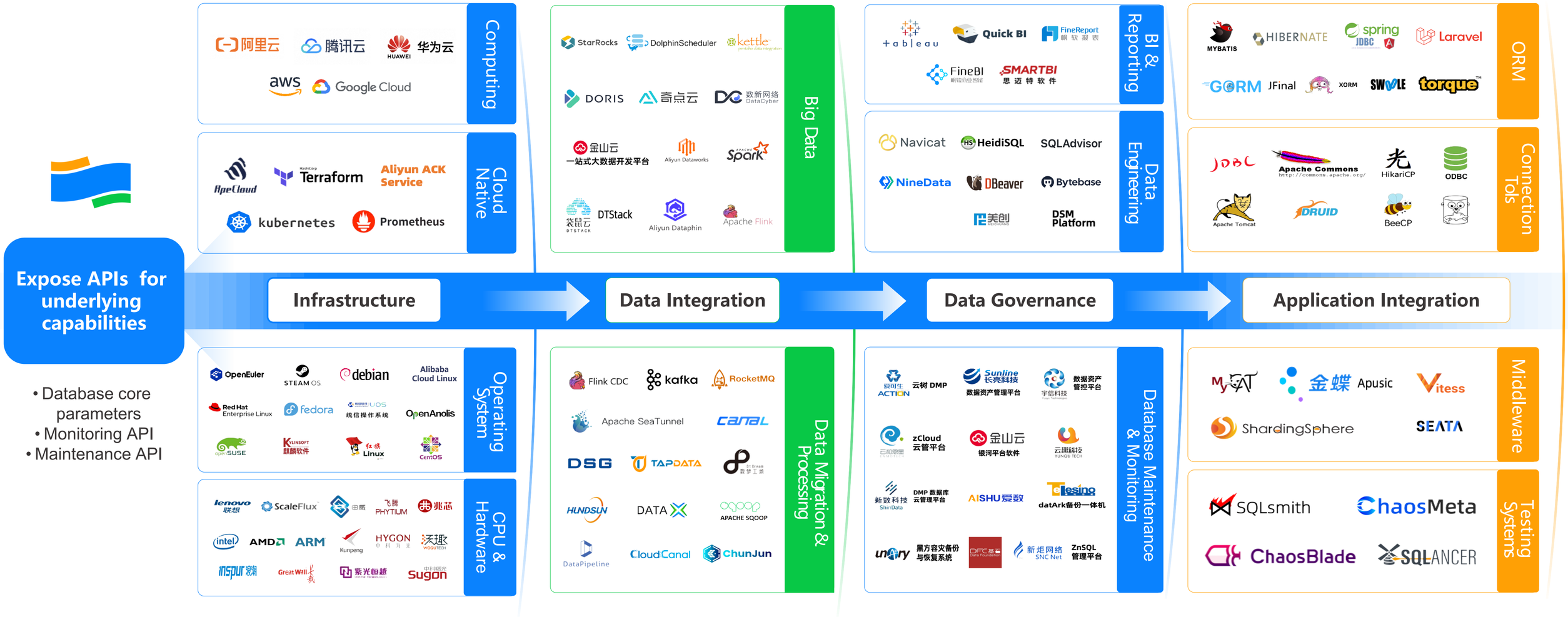
Leader in Distributed DB
IDC Marketscape Award

APAC Customer Choice
Gartner Peer Insights 2023

Honorable Mention CloudDB
2x Award Consecutive Years by Gartner

OceanBase Landscape: Open Technology Ecosystem

Over 750 mainstream products jointly built the open technology ecosystem



A single, resilient and unified database for multiple scenarios

OceanBase Community Edition | OceanBase Enterprise Edition | OB Cloud Database

Tool System

- Developer Center ODC
- Cloud Platform OCP
- Migration Assessment OMA
- Data Migration Services OMS
- Autonomous Diagnostic OAS
- Other 3rd-Party Tools
- ...

OCEANBASE Native Distributed Database

Relational Database

- OLTP
- HTAP

Integrated Solution

- Database Appliance

OceanBase Distributed Kernel

SQL Engine

- Oracle/MySQL
- Lob/GIS/Json/KV
- Parallel Execution
- Vector Engine/ Operator Pushdown

Storage Engine

- KV Engine

Distributed Engine

- Distributed Transactions
- Multiple Replicas
- Redundancy, Disaster Recovery & High Availability

Services and Ecosystem

Ecosystem Products

- TuGraph (Graph Database)
- Time Series Data CeresDB

Professional Services

Technology | On-site | Consulting | Training

Open Ecosystem

Integration | Analysis | Monitoring | Integration

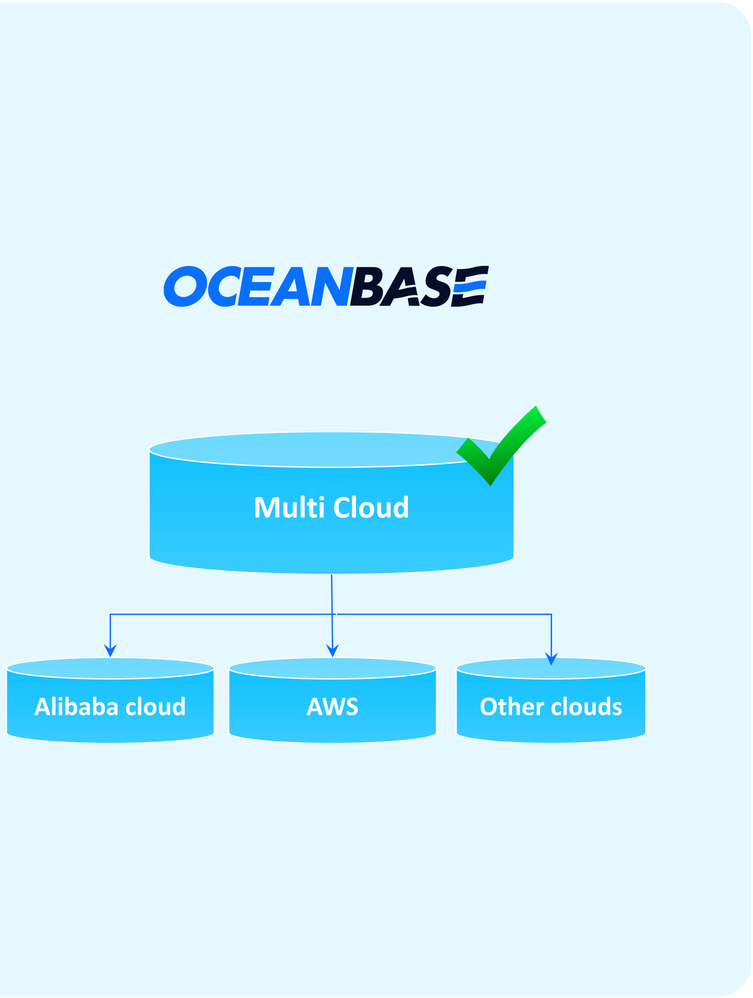
Infrastructure Support

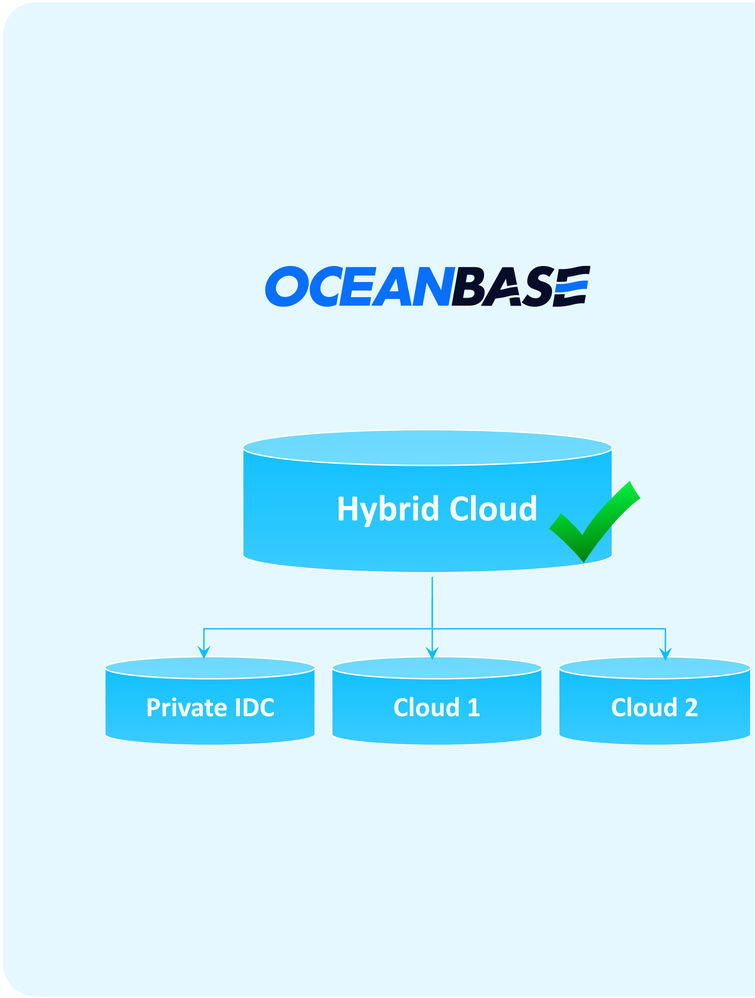
- Private Deployment
- Private Cloud
- Public Cloud
- Hybrid Cloud

02

Key Features

OceanBase @ Multi-Infra： On-Premises / Multi Cloud / Hybrid Cloud





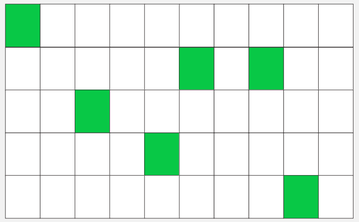
Data&AI Era：Converged Computing Capabilities for Gen-AI

Data Access: Exact Match（SQL/NoSQL） + Approximate Match (Vector Search)

OLTP/OLAP-SQL Query

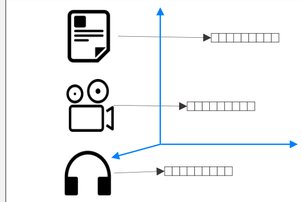
- Transactional
- Analytical
- Materialized view
- Unified with no latency

NoSQL-Query



- HBase-API
- Redis-API
- JSON-API

Vector Search

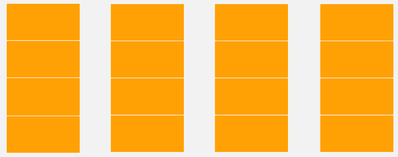


- Image search
- Text Matching
- Audio Search

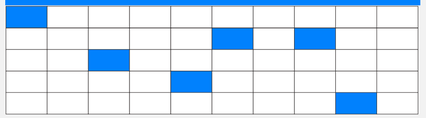
Data Mode: Multi-Mode

Row based

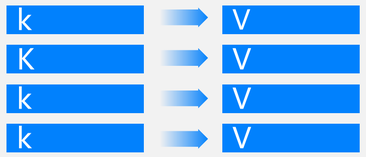
Column based



Wide Column



KV



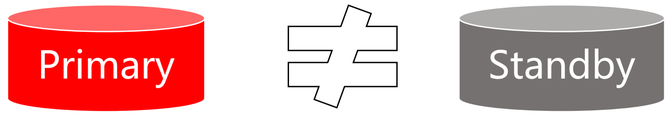
Document

Spatial

Storage: Structured & Unstructured Data

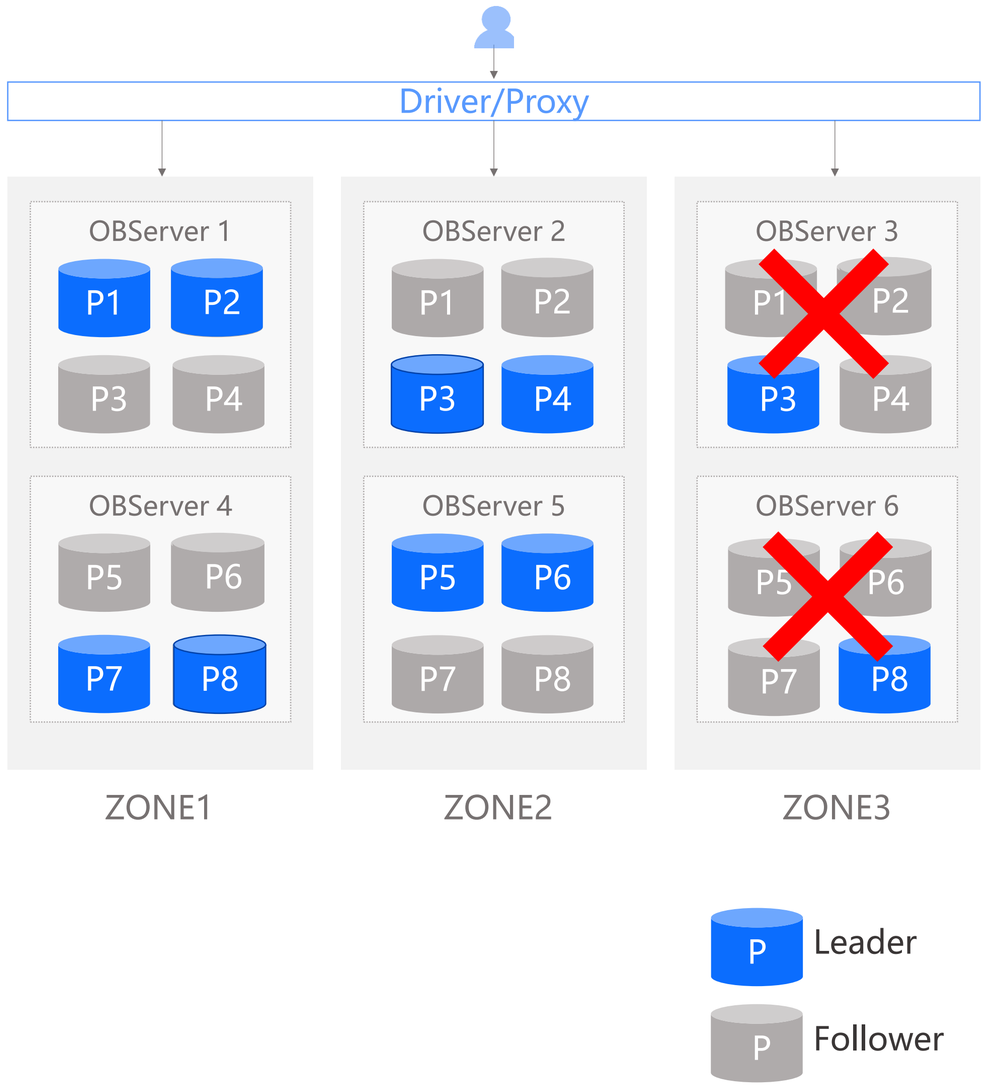
Block Storage(EBS/Local SSD) → Object Storage(OSS/S3)

OceanBase Key Feature: High Availability



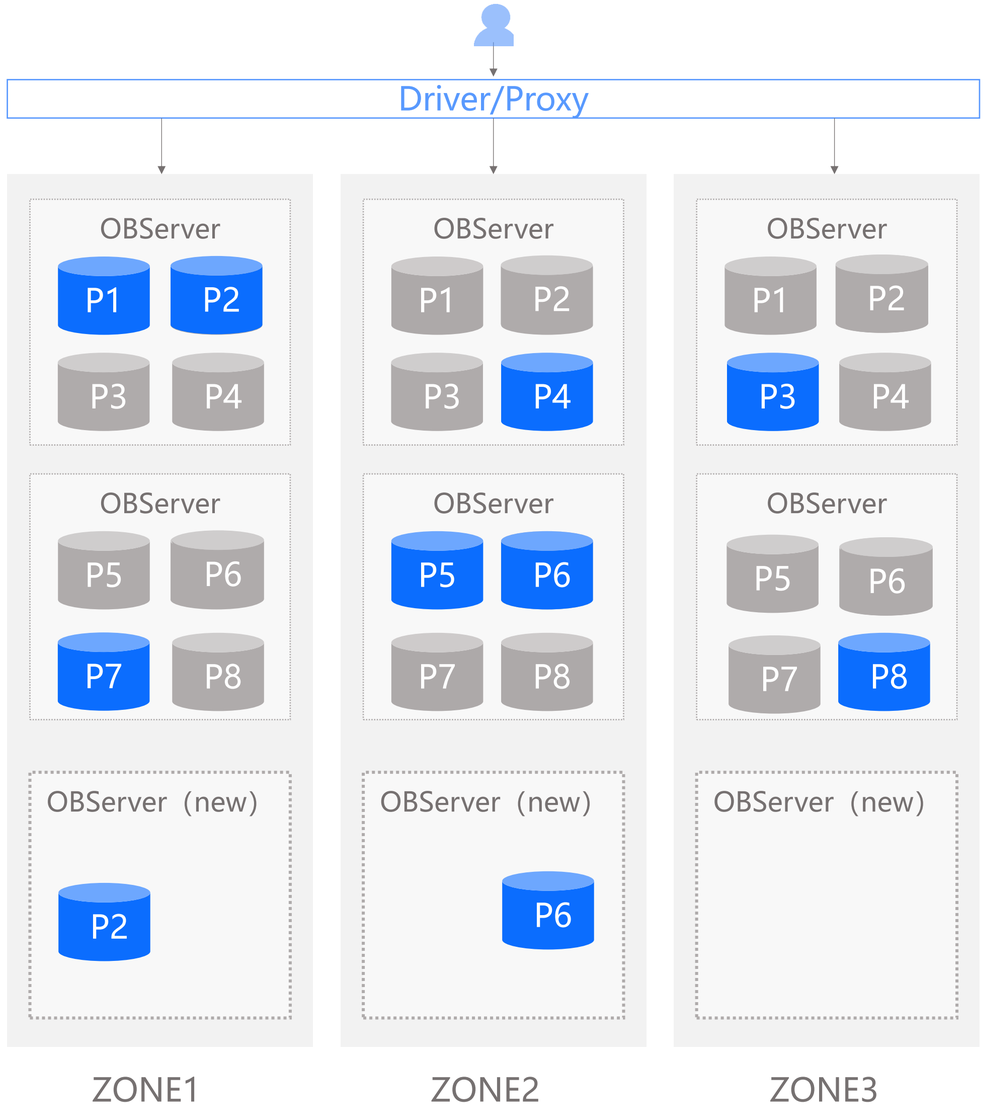
Monolithic database

- Data Loss: Cannot guarantee consistency in case of failure
- FO cost: High maintenance cost for cold stand-by



- Zero data loss
  Consensus protocol based on Multi-Paxos
- Unattended HA
  Highly available when minority of nodes fails
  RPO = 0, RTO <8s
- Rolling Upgrade
  Symmetric nodes
  all replicas are active
  Easy for maintenance

OceanBase Key Feature: Transparent Scalability



- Data automatically rebalanced to different IDC and Cloud VPC
- Application-unaware, no need for data sharding refactoring
- Supports online scale down

During 11.11 every year, more than PB size data in Alipay can be elastic scale to Cloud IDC in few hours. And this process can be completed by 2-3 DBAs

OceanBase Key Feature: High Performance

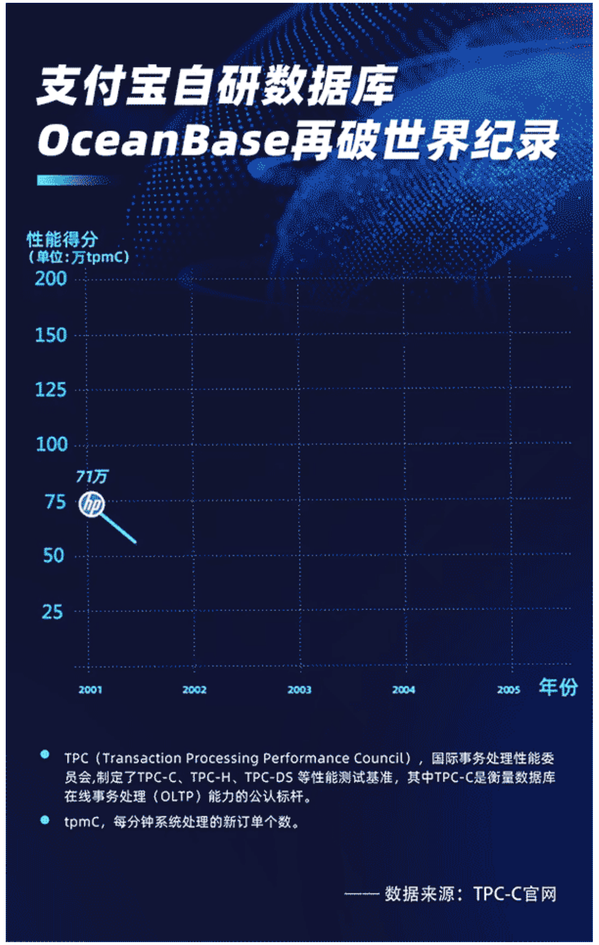
TPC Transaction Processing Performance Council

- TPC-C official world record 2020 (20 times tpmc than Oracle)
- TPC-H official world record in 2021 (30TB data size Analyze)

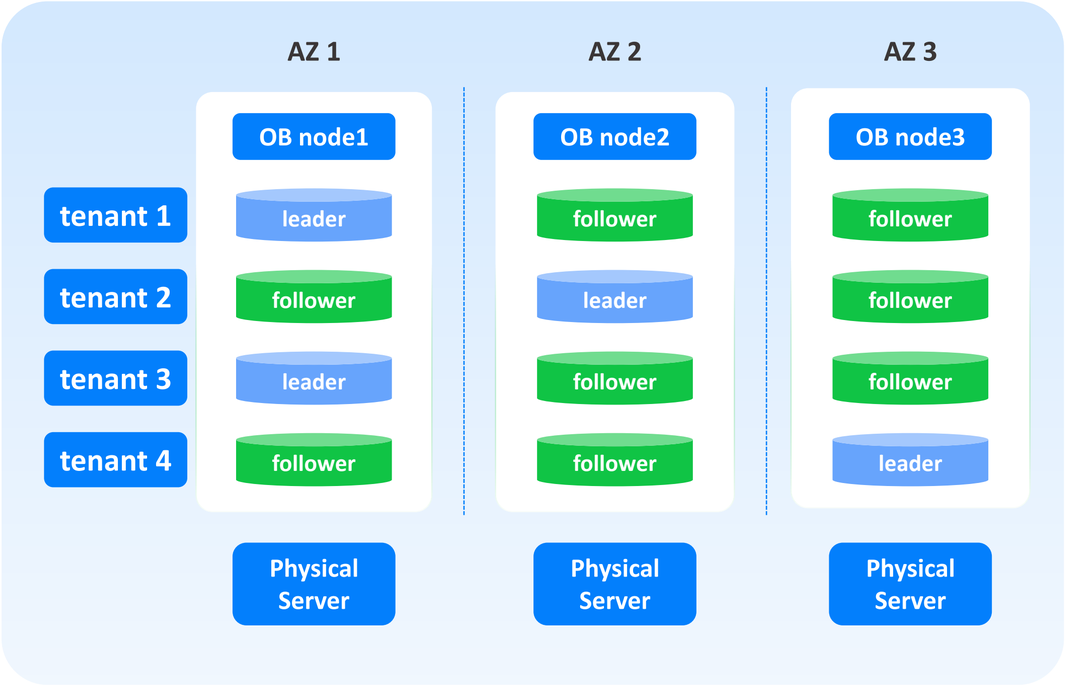
Hardware Vendor	System	tpmC	Price/tpmC	Watts/KtpmC	System Availability
ANT FINANCIAL	Alibaba Cloud Elastic Compute Service Cluster	707,351,007	3.98 CNY	NR	06/08/20
ANT FINANCIAL	Alibaba Cloud Elastic Compute Service Cluster	60,880,800	6.25 CNY	NR	10/02/19
ORACLE	SPARC SuperCluster with T3-4 Servers	30,249,688	1.01 USD	NR	06/01/11
IBM	IBM Power 780 Server Model 9179-MHB	10,366,254	1.38 USD	NR	10/13/10
ORACLE	SPARC T5-8 Server	8,552,523	.55 USD	NR	09/25/13
ORACLE	Sun SPARC Enterprise T5440 Server Cluster	7,646,486	2.36 USD	NR	03/19/10

30,000 GB Results

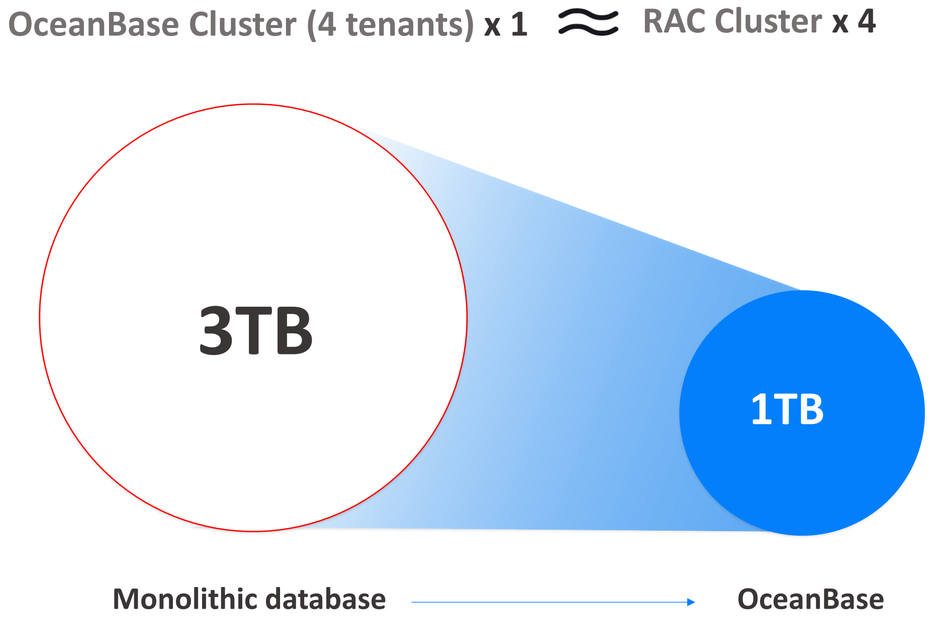
Rank	Company	System	QphH	Price/kQphH	Watts/KQphH	System Availability	Database	Operating System	Date Submitted	Cluster
1	OCEANBASE	Cloud OceanBase	15,265,305	4,542.13 CNY	NR	07/31/21	OceanBase V3.2	Alibaba Cloud Linux Server 2.19	05/19/21	Y
2	Hewlett Packard Enterprise	HPE Superdome Flex 280 Server	1,446,701	744.13 USD	NR	03/25/21	Microsoft SQL Server 2019 Enterprise Edition 64 bit	Red Hat Enterprise Linux 8.2	03/25/21	N
3	CISCO	Cisco UCS C480 M5 Server	1,278,277	936.73 USD	NR	11/04/19	Microsoft SQL Server 2019 Enterprise Edition 64 bit	Red Hat Enterprise Linux 8	11/01/19	N



OceanBase Key Feature: Cost Effectiveness



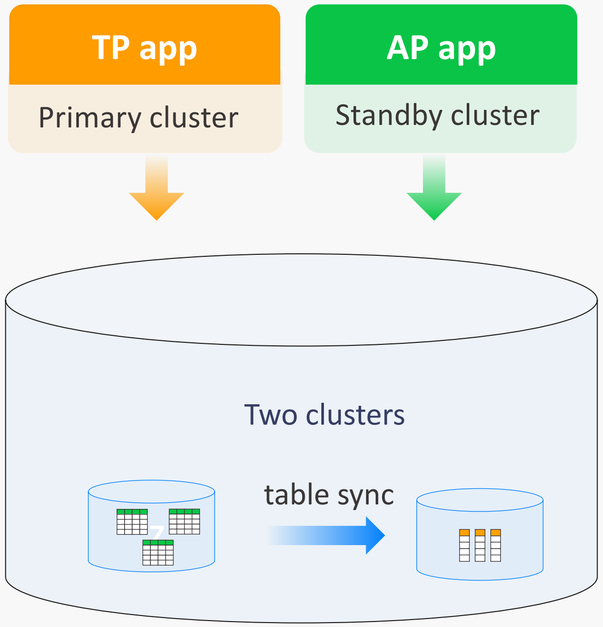
- Multi-tenancy (CPU/Mem resource isolated)
- Max resource utilization
- Instance on-demand configuration (effective immediately)
- Read-write separation on follower node



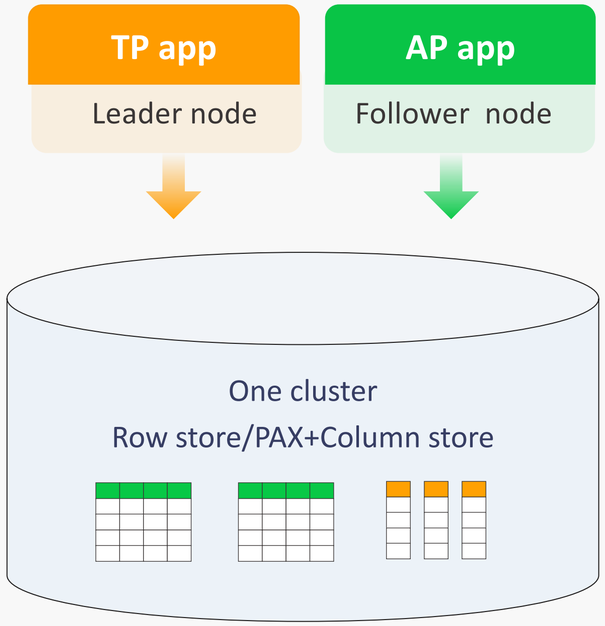
- Storage saves 70%+ on OceanBase
- High compression ratio/Storage encoding engine
- No performance trade off

OceanBase Key Features: HTAP(Transactional + Analytical Load)

One unified system for both TP & AP



- High cost, low cost-effectiveness
- Significant latency and data inconsistency between primary and standby clusters



- Low cost, high cost-effectiveness
- Millisecond-level latency and consistency between leader and follower nodes

HTAP in one OceanBase cluster(MPP x PX engine)

HTAP Integration

Provide services for real-time data warehouse scenarios

- Used as a classic database, no need to distinguish OLTP/AP, saving additional construction cost
- OLAP can be achieved through different types of OB data replica, which far exceeds heterogeneous data replication solutions in terms of real-time and efficiency

OceanBase Key Feature: Highly Compatible with Oracle/MySQL

OceanBase @ Oracle-mode

•95% compatible with Oracle

- **Data types:** char, varchar2, number, date, timestamp, blob, clob, binary_float, binary_double, raw and other 21 basic data types
- **Common SQL statement:** select, update, insert, delete, merge, etc.
- **Data objects:** triggers, views, DBLink (OB to OB), foreign keys, constraints, sequences, custom functions
- **Stored procedures:** support common functions, system packages
- ***Built-in functions (105/131), dictionary views (40/414)***
- **Analysis functions:** CTE, window functions ,hierarchical queries, pivot, grouping sets/rollup
- **Oracle-compatible security features** such as permission control, auditing, encryption, etc.
- OceanBase's current Oracle-compatible model is mainly based on Oracle 11.2

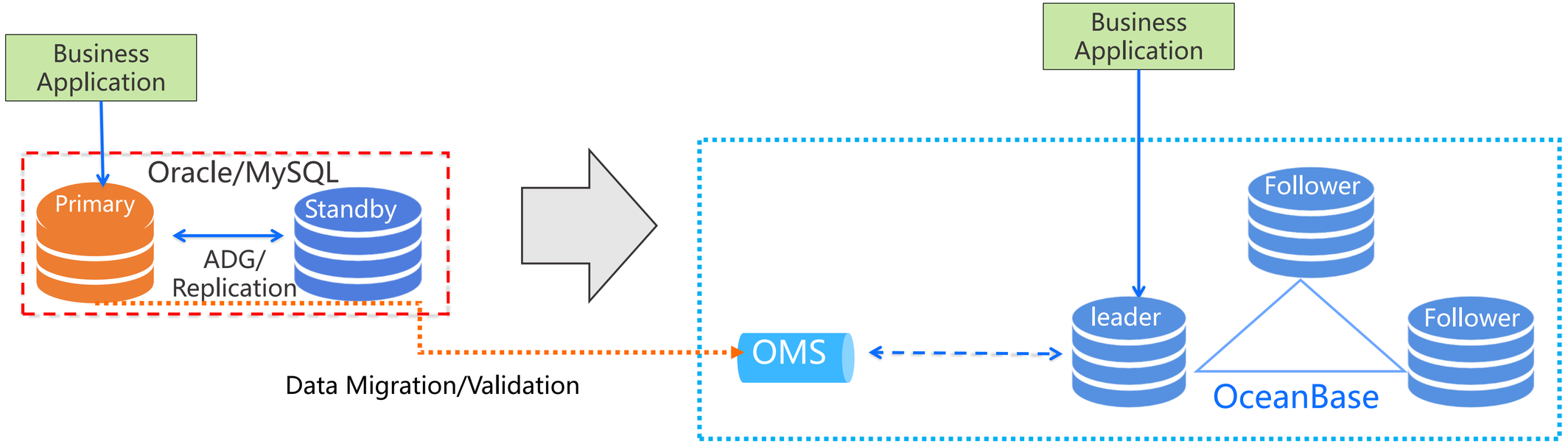
OceanBae @ MySQL-mode

•99%+ compatible with MySQL

- **Data types:** char, varchar, number, timestamp, blob, text, and most other basic data types
- **Common SQL statement:** select, update, insert, delete, multi-table DML, etc.
- **Data objects:** views, custom functions
- **Most of the built-in functions**, information_schema
- **Analysis functions:** window functions, etc.
- All privilege management capabilities, secondary partitioning, updatable views

How to conduct Seamless Migration?

Mock OceanBase cluster as a standby instance of Oracle/MySQL using OMS



Oracle/MySQL to OceanBase Migration Steps

Step 1: Use OMA tool to assess the migration effort;
Step 2: Use OMS tool to perform data migration from Oracle/MySQL to OceanBase;
Step 3: Data validation and incremental data replication both included in OMS project;
Step 4: During cutover, switch the user traffic from Oracle/MySQL to OceanBase;
Step 5: (If needed) one-click lossless rollback solution via reverse data sync replication.

03

Success Stories

Digital Transformation and Upgrades

4 Key Benefits

Cost-Effectiveness

Reduces storage costs by 70%-90%

Multi-level Scaling

Support vertical, horizontal, and tenant-level scalability

Hybrid Cloud Deployment

Support private cloud, hybrid cloud, and public cloud

Real-time Analysis

One engine supports both OLTP and OLAP

6 Application Scenarios

Reduce Database Costs

Customers aim to minimize database costs, optimize resource utilization, and enhance overall organizational efficiency.

Advantage: Advanced compression, public cloud, native multi-tenancy, auto-scaling, and more.

Unified Infrastructure Management

Supports large-scale multi-infrastructure deployments, simplifying underlying technology complexity and avoiding vendor lock-in.

Advantage: Compatible with AWS, Tencent Cloud, and other major cloud providers, 24/7 professional maintenance, flexible MaaS and DBaaS management modes.

Overcoming Sharding Performance Bottleneck

Distributed database capabilities effectively address performance issues during rapid business expansion and significant data growth, eliminating the need for sharding and its associated challenges.

Advantage: Supports distributed transactions, eliminates single points of failure enables smooth scaling and automatic load balancing, with applications unaware of the underlying architecture.

Managing Traffic Peaks

Cloud services offer rapid scaling capabilities, enabling quick responses to sudden traffic peaks like promotions or product launches. This ensures seamless scaling and high scalability to meet business demands.

Advantage: Shared-nothing architecture, transparent horizontal scaling, multi-server auto-scaling, temporary scaling, and serverless product capabilities.

Enhancing Business Availability

Critical businesses require high database availability to ensure business continuity and reduce pressure on high availability guarantees.

Advantage: Paxos algorithm, tolerates data center-level failures, RPO=0, RTO<8s, supports online DDL, multi-data center/single data center/dual data center multi-copy disaster recovery solution.

Resolving MySQL Analysis Limitations

MySQL's analysis capabilities are limited. HTAP capabilities eliminate the need for additional synchronization links, reducing costs and enhancing real-time analysis efficiency.

Advantage: HTAP enables data for transaction processing and real-time analysis, supporting vectorized engines to address slow SQL issues.

Cases of Digital Transformation and Upgrade

理想

Leading Intelligent Manufacturing System

Integrating Li-MOS and warehouse management systems with OceanBase, including car and autonomous driving systems, on the OB Cloud enhances stability in intelligent manufacturing and safety in autonomous driving.

Car Cloud Business Achieves Cross-Cloud Active-Active	Improve Li-MOS Production Line Continuity	Reduce Database Failures by 80%

携程旅行

High Availability Upgrade To Accommodate Massive Data

Upgrading from **MySQL to OceanBase** for **horizontal scalability**, strong consistency, high availability, and reduced operational costs.

Average **Read Performance** Improved by 2x	Average **Write Performance** Improved by 3x	Saved **Storage Resources** by 2/3

海底捞

Next-Gen Distributed Membership Systems Database

Key membership and inventory management systems migrate to the OB Cloud significantly reduce costs, increase efficiency, and more effectively manage traffic peaks.

Stable Support for Surge in Holiday Demand	**HTAP Boosts Real-Time** Analysis Computing Power by 45%	Overall **Database Cost** Savings of 50%

贝壳 让家更美好

Digital Service Platform for Residential Industries

Upgrading from HBase to OceanBase for higher performance and stability at lower costs in real-time fact and dimension table scenarios.

Performance Improved by 3-4x	50% Hardware Cost Savings	Significant Reduction in Operations and Maintenance Costs

POP MART

Next-Gen Distributed Vending Systems Database

Core vending system migrate to the OB Cloud for a smoother user experience

Tenant-Level Scalability Reduces Scalability Time by 90%	Cluster-Level Scalability Easily Handles Surge During Promotions	System Continuity Reaches 99.999% During Promotions and New Product Launches

洋葱集团 ONION GLOBAL

Global Data Achieves Cross-Cloud Integration

Product, order, user, and warehouse management systems migrate to the OB Cloud for real-time synchronization, integration, and analysis of data across multiple infrastructures and regions.

Zero Data Loss in Extreme Data Centers	Real-Time Analysis Performance Increased by Over 200%	Greatly Improved Operations Efficiency

Improving Disaster Recovery for ICBC: City-level Resilience with 3 IDCs across 2 Cities

中国工商银行 INDUSTRIAL AND COMMERCIAL BANK OF CHINA

Business Challenges

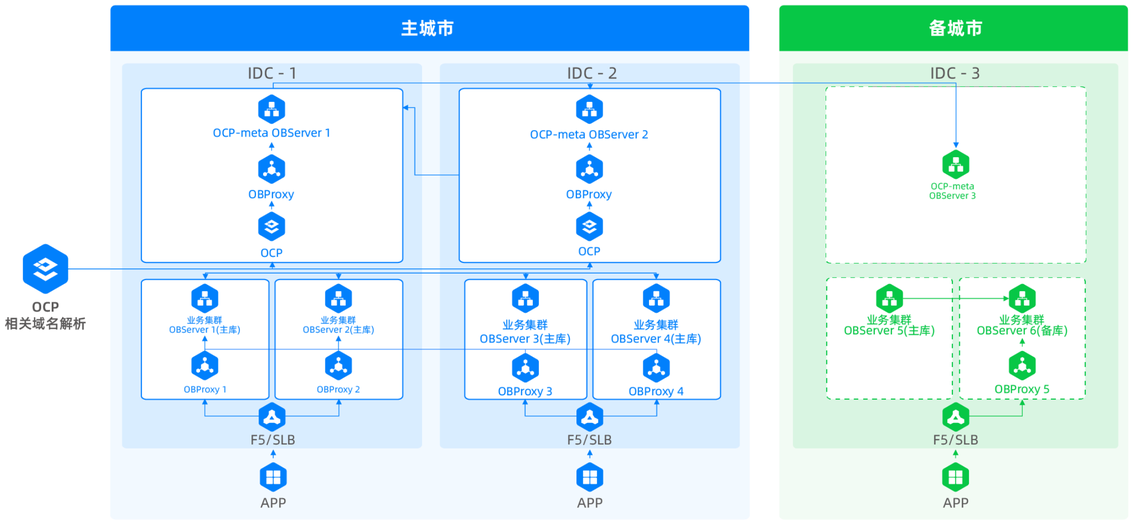
- **High Disaster Recovery Standards:** Supporting trillions in corporate assets, the wealth management business required uninterrupted 24/7 service and Level 5 disaster recovery capabilities.
- **Costly Infrastructure**: Reliant on traditional large servers and closed DB2 database architecture, the original systems incurred high costs for disaster recovery setup.
- **Resource Inefficiency**: Increasing business concurrency highlighted the issue of insufficient database processing capacity. The standby cold backup room remained unused, leading to low resource utilization.

Customer Benefits

- **Enhanced Disaster Recovery:** Achieve database dual-active set up in the same city, with remote RPO=0. Attain data center-level disaster recovery with RPO=0 and RTO<30s, meeting Level 5 disaster recovery standards for ICBC and ensuring 24/7 service requirements.
- **Cost-Effectiveness**: Improve high availability, provide strong continuity for business, and support trillions in fund transactions. The system transitioned from large mainframes to ARM servers, using locally manufactured servers, operating systems, and self-developed distributed databases. The transformation to distributed systems maintains system performance and stability while reducing overall investment costs.
- **Increased Server Resource Utilization**: Achieve a 75% database server resource utilization rate, enabling easy horizontal scaling to increase cluster computing resources and improve processing capacity when system processing encounters bottlenecks.

Solution

- **3 IDCs Across 2 Cities**: OceanBase supports multiple data copies, synchronizing nodes through the Paxos protocol for high availability clusters and multi-site disaster recovery. ICBC's setup includes a distributed cluster of 3 IDCs across 2 cities deployed in a "five-replica + a primary/backup" model.
- **Large Cluster Mode for Automatic Recovery**: The cluster centrally manages and schedules all server resources, dynamically calculating and scheduling business loads on the most idle and reasonable servers in real time. The fault management service automatically diagnoses faulty servers, schedules transactions to healthy servers for execution, ensures strong consistency of global transactions, and requires no manual intervention.



Substantial reduction
In hardware costs

75%
Server Utilization Rate

Level 5 Disaster Recovery
Finance Industry Disaster Recovery Standards

GCash：Overhauling Distributed Architecture for National Wallet App

Business Challenges

- **High operational costs:** With GCash's daily transaction volume in the millions, the original database's 10% monthly data volume growth required CPU upgrades for storage expansion, leading to resource waste and high storage costs.
- **Business continuity risks**: Issues in the original database's architecture design become apparent as data accumulated, especially in critical business links, increasing GCash's business continuity risks.
- **Poor user experience**: GCash's transaction system must handle high-concurrency scenarios for smooth user transactions. Delays as small as 1 millisecond in SQL requests could cause poor user experiences, highlighting the system's sensitivity to high-concurrency requests and the potential for instability.

Solution

- **Data migration and compression:** OceanBase developed a tailored data migration solution, leveraging Ant Group's SRE team's best practices. This solution uses OMS to automate reducing source permissions, aligning incremental data, and reestablishing connections on the target end. OceanBase's LSM-Tree-based compression technology helps GCash compress massive data without loss.
- **Architecture reorganization**: OceanBase cloud supports multitenancy, allowing GCash to create about 10 clusters to accommodate hundreds of legacy MySQL instances as tenants. Core and general business systems are hosted in separate clusters, ensuring that issues in one cluster only affect 10% of the database system.
- **A 3-zone high availability architecture**: OceanBase's architecture ensures business continuity if a failure occurs in any single zone, preventing data transaction loss. After the upgrade, the number of connections to a single-node of Oceanbase Cloud is approximately 5-8x that of MySQL, supporting larger traffic fluctuations.

Customer Benefits

- **Storage space and cost savings:** GCash smoothly migrated hundreds of databases to OceanBase without downtime, reducing the single database storage space to 1/10 of the original, achieving 70% savings in data storage space and 40% savings in database costs.
- **Improved O&M efficiency**: OceanBase aggregated the previous hundreds of instances into just over 10 clusters, reducing data nodes by 80% and significantly simplifying O&M. OCP supports online DDL operations and intelligent diagnostics based on the Oceanbase kernel, greatly improving DBA O&M efficiency.
- **Multi-zone financial-grade disaster recovery**: GCash's three-zone high availability architecture ensures business continuity without interruption if any single data center fails. RPO=0 and RTO <30 seconds, giving GCash multi-availability zone financial-grade disaster recovery capabilities. The system uses data encryption to protect data security, with a less than 5% performance degradation.

70%
Data storage space saved

80%
Reduction in data nodes improve operational efficiency

40%
Savings in database resources

POP MART: Next-Gen Distributed Checkout System Database

POP MART

Business Challenges

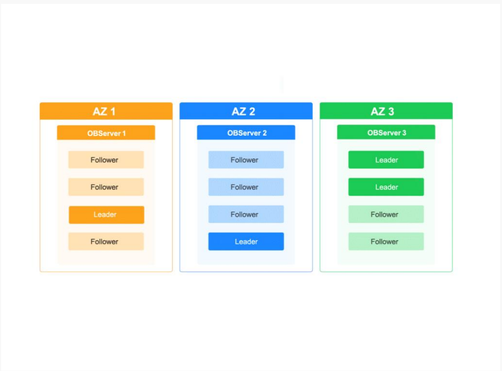
- **Difficulty handling traffic peaks:** POP MART's product releases caused sudden surges in business traffic due to popularity. Estimating capacity was challenging, leading to over-provisioning and operational pressure, requiring upgrades and adjustments during the early hours of each day.
- **Complexity in cluster scaling**: POP MART's database needed flexible scaling to adjust for traffic changes. However, traditional databases like MySQL required changing server specifications, impacting the business.
- **Managing multiple database instances**: POP MART's various businesses required numerous database instances, leading to uneven resource utilization and cost challenges.

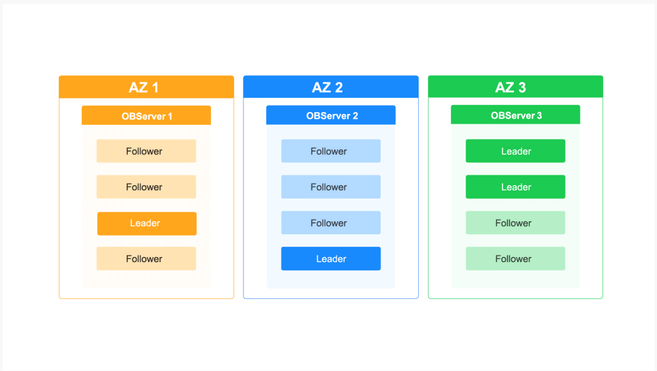
Customer Benefits

- **Tenant-level scalability**: POP MART can adjust tenant specifications to handle most small business traffic peaks. Scaling for core business tenants takes effect in seconds, reducing scaling time by 90% without additional costs and ensuring application performance.
- **Cluster-level scalability**: POP MART achieves vertical and horizontal scaling by adjusting server specifications and quantities, ensuring system continuity during traffic spikes with 99.999% uptime during flash sales.
- **Improved operational efficiency**: Consolidating dozens of database instances into three OceanBase clusters has significantly improved POP MART's operations team efficiency. Operations personnel can adjust tenant CPU cores and memory sizes anytime, smoothly increasing the maximum TPS for the entire tenant.

Multi-Level Scalability Solution

OceanBase supports triple-level scalability: tenant-level, server specification-level, and server quantity-level. With flexible strategies at these levels, POP MART's operations team can effectively and cost-efficiently address traffic spikes of any size.





90% reduction
In time required for scaling

Hundredfold Traffic
Cluster-Level scalability to cope with Flash Sales

99.999%
System Continuity During New Product Launches

Customer Stories: GCash E-Wallet System

Customer Benefits

- After migrated to OB, with highly compressed storage, **customer storage decreased by 70%+.**
- OceanBase on cloud with 3 AZ high availability architecture, providing **IDC-grade disaster tolerance**
- 100 + applications and 200 + MySQL instances are migrated to 10 OB clusters.
- After migration to OB, the TCO of database is **reduced by more than 30% on average.**

Customer Stories: DANA E-Wallet system

Hybrid cloud deployment enables DANA to make business breakthroughs

Introduction

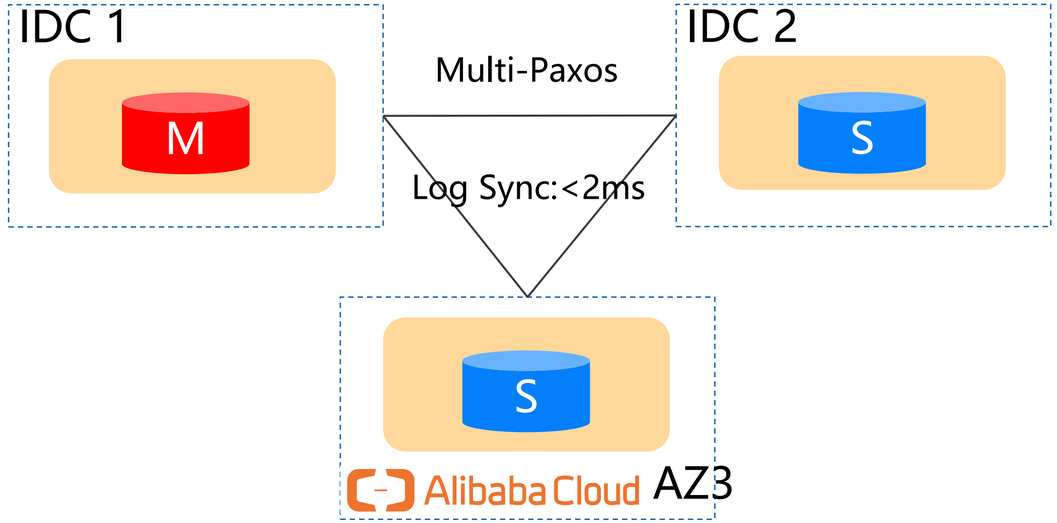
DANA is one of the leading wallet providers in Indonesia. DANA provides digital payment and financial services to more than 50 million users of BBM, the second largest chat tool in Indonesia.

Benefits

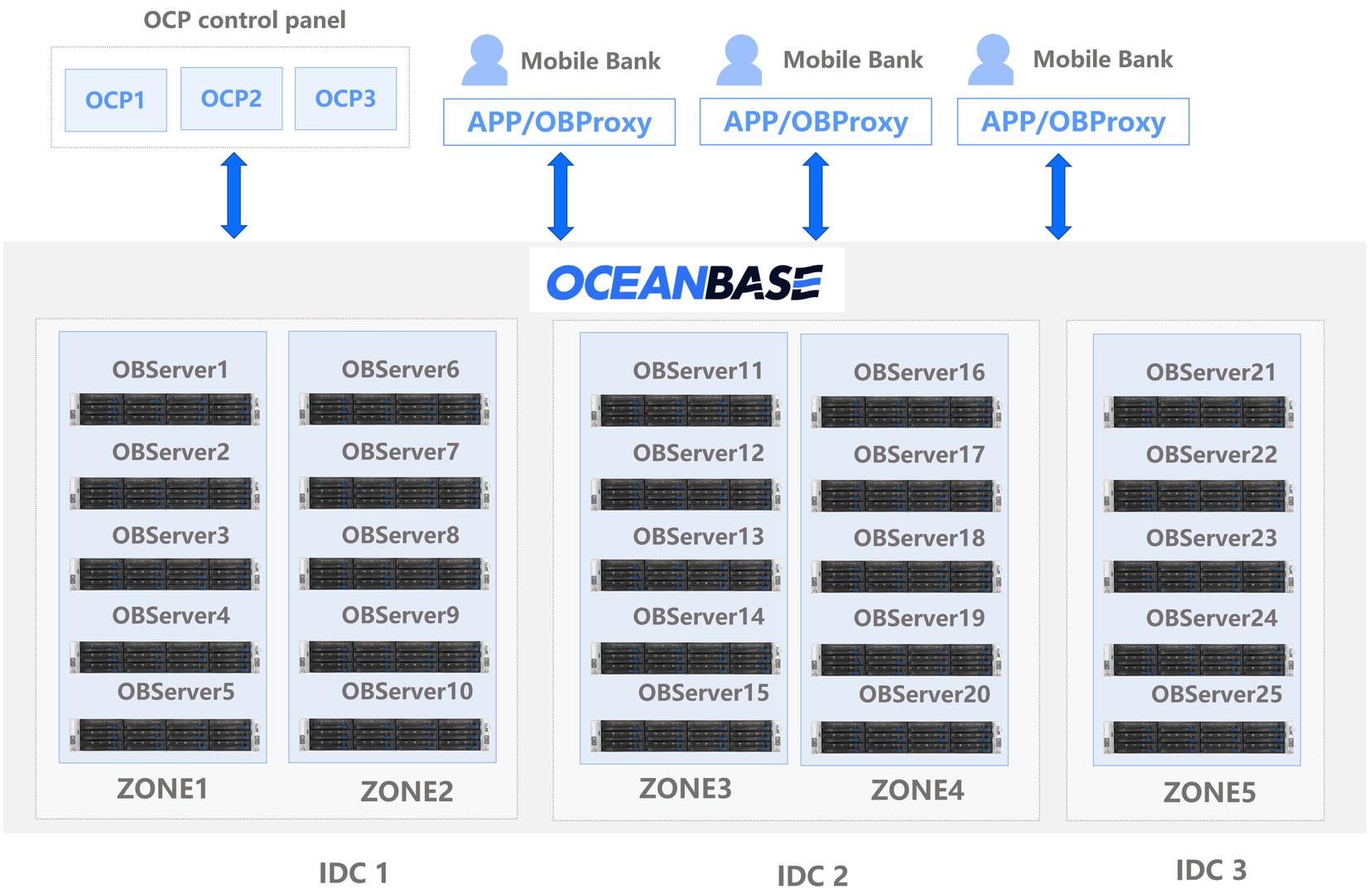
0	99.99%	0
DB failure	Service availability	Data loss

Challenges

- Increase database capacity along with rapid business growth
- MySQL architecture cannot guarantee data consistency upon failure



Customer Stories: ****(Asia) Mobile Banking



Customer Benefits

- 5-replica OB architecture. IDC1 and IDC2 can carry 95% of business traffic
- ZONE 5 in IDC3 for small business. **Exactly matches the current ICBC (Asia) Oracle use case.**
- When single zone or cross-zone failure occurs in each IDC business operations will not be affected.
- IDC3 provides NFS services for the storage of backup sets and data recovery in extreme cases.
- When IDC1 and IDC2 all failing, IDC3 can take over business traffic, the overall architecture is highly available.

Customer Stories: **Ant Bank in Singapore**

ANT BANK

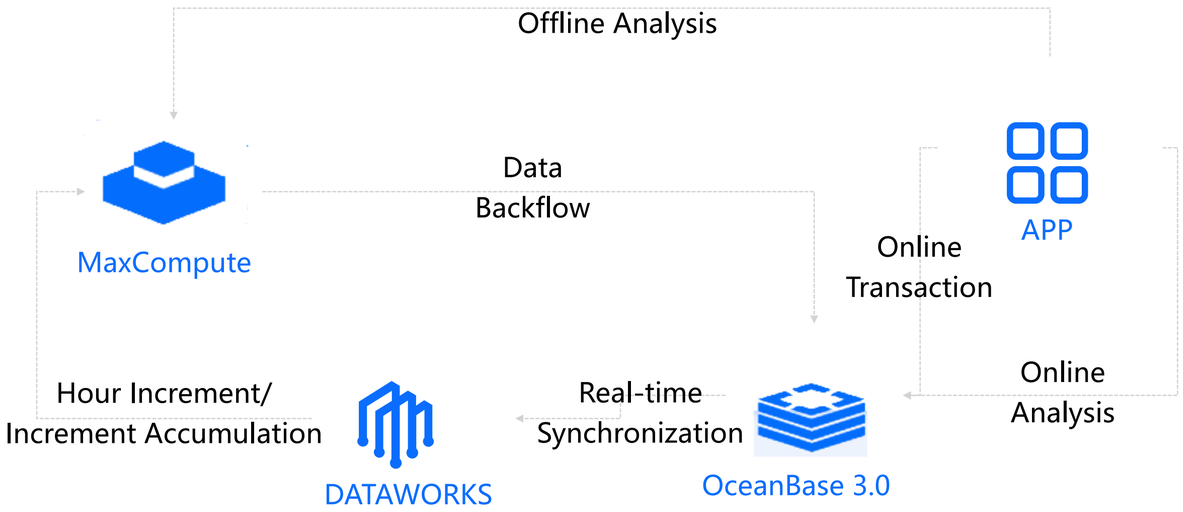
Efficient operation and maintenance management of large cluster can be achieved by the flexible deployment mode and multi-tenant architecture of OceanBase.

Business Challenges

- Private deployment leads to huge human input and time costs in station construction.
- The separation of TP+AP tech stack increases data security risks.
- A large amount of projects increase operation and maintenance costs.

Solutions

- The out-of-the-box OceanBase cloud services shorten the deployment cycle and reduce operational and maintenance costs. The OB 3.0 HTAP engine optimizes the overall database link architecture and unifies the tech stack.

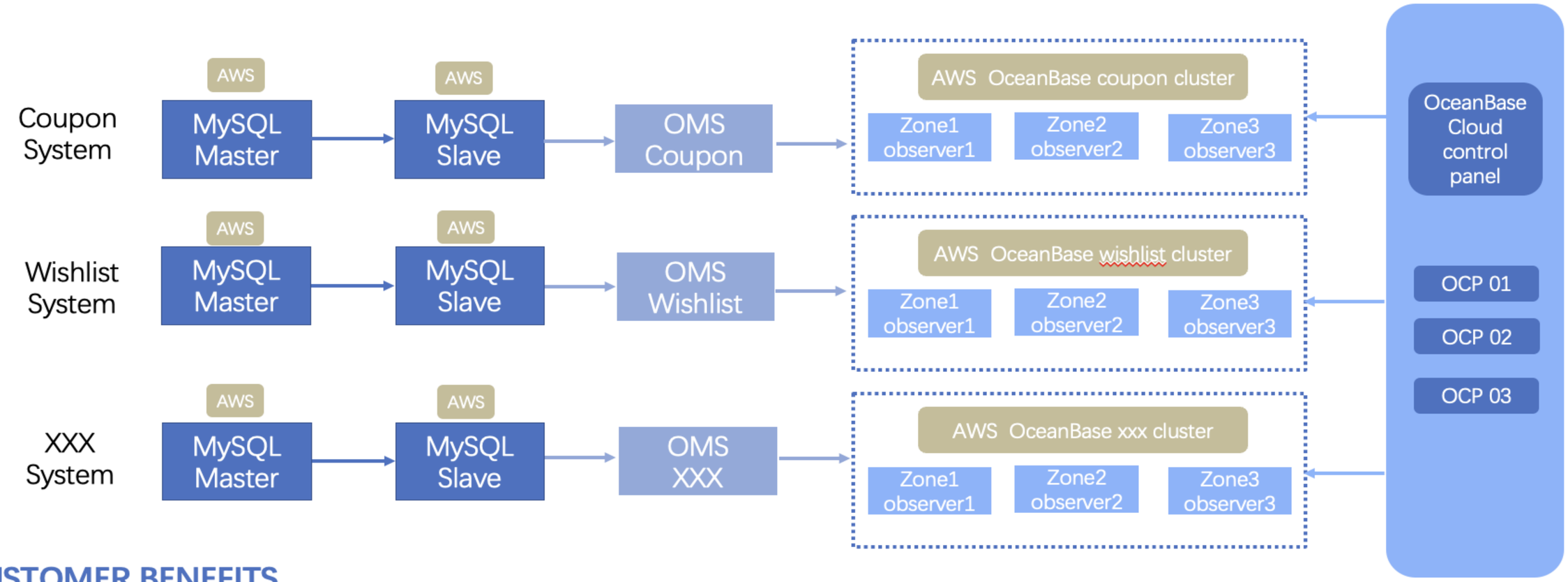


Public Cloud | Increase Efficiency Reduce Costs | HTAP

Benefits to Customers

- OceanBase’s SaaS-based replication capabilities speed up station construction.
- Loosely-coupled distributed architecture can be applied to different business needs, so customers don’t have to change their habits.
- OceanBase’s real-time analysis capabilities improve the efficiency and accuracy of online verification and control capital risks.

Customer Stories: ** Cross-border e-commerce system



CUSTOMER BENEFITS

Massive business data growth	Online business with high concurrency	Completely solved issues of business impact caused by AWS EBS IO periodic stalls	OCP providing complete intelligent maintenance product	Multi-cloud deployment: AWS + Alibaba Cloud Cloud IAAS resource max utilization

Takeaways: Why OceanBase?

- **High Performance:** **61M qps** in Double 11;TPCC/TPCH benchmark **world record in 2020.**

  Easy to Scale; MPP architecture with parallel engine.
- **Unattended HA:** Automatic disaster recovery in **8s, Multi-Active** in 3+ data centers.
- **Zero data loss:** **No data loss** when in disaster recovery
- **Cost Effective:** **30%+ cost optimization** comparing with Oracle/MySQL for the same scale.
- **High Compatibility:** **Less than 5%* application change required on** Oracle/MySQL
- **Smooth Migration:** **Easily migrate** various kinds of database to OceanBase using OMS Tool.
- **Battle-tested:**

  * Support **Alibaba Double 11** shopping event over the past 10+ years,
  * OceanBase has been widely used in core systems of various industries.
  * Well proved in **Bank& Insurance, Transportation and Government** customers.

*5% is based on the statistics of previous use cases. Migration may involve application modification depends on customer actual use case

Thank you!