How Zhaopin built its Event Center using Apache Pulsar

Penghui Li
Sijie Guo
Zhaopin.com is the biggest online recruitment service provider in China

Zhaopin.com provides job seekers a comprehensive resume service, latest employment, and career development related information, as well as in-depth online job search for positions throughout China.

Zhaopin.com provides professional HR services to over 2.2 million clients and its average daily page views are over 68 million.
Who are we

Penghui Li

– Tech lead of infrastructure team at zhaopin.com
– 5+ years of experiences developing message queues and microservices
– Apache Pulsar Committer
Who are we

Sijie Guo

– Apache Pulsar Committer & PMC Member
– Apache BookKeeper Committer & PMC Member
– Interested in technologies around Event Streaming
– Worked for Twitter and Yahoo before
1. Why building an Event Center
2. Why Apache Pulsar
3. Apache Pulsar at Zhaopin
4. Streaming Platform
5. Zhaopin’s contributions to Apache Pulsar
Why building an Event Center

Data Silos --> Unified Platform
Data Silos

Pain Points

- High Maintenance Cost
- Extremely hard to share data cross teams
- Inconsistency between data silos
- Doesn’t Scale
- No consistent SLA
Data Silos

Pain Points

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Unification – MQService

Problems Solved:

• Simplified Operations
• Scale-out Service
• High availability

Problems Unsolved:

• Keep messages for longer period
• Data rewind
• Order Guarantee
Unification – MQService

Online Services
MQService

Data Processing
Kafka
Why Building an Event Center

Better consumption parallelism

Better order guarantee
Why Building an Event Center

RabbitMQ is better for work queue use cases, more consumers can increase consumption. Kafka need more partitions to increase consumption.

We used RabbitMQ a lot for work queue use cases.
Why Building an Event Center

Kafka integrates well with the data processing ecosystem (Flink, Spark), and provides high throughput.

We used Kafka a lot for data processing.
Why Building an Event Center

But

The cost of operating two different message systems is high
Data sits at two different silos

We need a unified platform to handle both scenarios
Why Apache Pulsar

Pulsar == Messaging + Storage
What is Apache Pulsar

“Flexible Pub/Sub messaging backed by durable log/stream storage”
Apache Pulsar – Multi Tenancy

Pulsar cluster

Property-1 (Data serving)
- Namespace-1 (Microservice)
  - Topic-1 (Customer authentication)

Property-2 (Marketing)
- Namespace-1 (ETL)
  - Topic-1 (Location resolution)
- Namespace-2 (Campaigns)
  - Topic-2 (Demographic classification)

Property-3 (Product safety)
- Namespace-1 (ETL)
  - Topic-1 (Budgeted spend)
- Namespace-2 (Fraud detection)
  - Topic-1 (Risk classification)
  - Topic-2 (User clustering)
  - Topic-1 (Account history)
Apache Pulsar – Queue + Streaming

Pulsar topic

**Exclusive**
- Subscription A
  - Consumer A

**Failover**
- Subscription C
  - Consumer C-1
  - Consumer C-2
  - In case of failure in Consumer C-1

**Shared**
- Subscription B
  - Consumer B-1
  - Consumer B-2

**Streaming**

**Queuing**
Apache Pulsar – Cloud Native

Layered Architecture

- Independent Scalability
- Instant Failure Recovery
- Balance-free on cluster expansions
Why Apache Pulsar

1. Pulsar provides a better abstraction of consumption patterns
2. Pulsar provides better fault tolerance and consistency options
3. Pulsar uses a scalable storage system (Apache Bookkeeper)
4. Hierarchical topic management and resource isolation

Perfect match with our requirement.
Apache Pulsar at Zhaopin

20+ core services, 6 billions msgs/day
Unification – Apache Pulsar

Problem Solved:

• No Data Silos
• Queue + Streaming
• Disaster Recovery
• Infinite Message Storage (via Tiered Storage)
• Data rewinding
Milestones

- **POC**
  - **2018/07**

- **Pulsar on Production**
  - **2018/09**

- **Pulsar based Event Center**
  - **2018/10**
  - 1 billion msgs/day

- **Win the best innovative platform award at Zhaopin**
  - **2018/11**

- **3 billion msgs/day**
  - **2018/12**

- **6 billion msgs/day**
  - **2019/02**
Core Metrics

50+ Namespaces

3000+ Topics

6+ billion Messages per day

3TB Storage per day

20+ Core Services
System Metrics

Write 100K+/s  Read 200K+/s  Network In 190MB+/s  Network Out 550MB+/s  Latency 99.5% < 5ms
Pulsar at Zhaopin

1. One copy of data, single source-of-truth.
2. Don’t worry about data consistency between RabbitMQ and Kafka
3. Multi-tenancy makes topic management easier
4. Strong data durability allows us to stop worrying about message loss
Streaming Platform

Beyond an Event Center
Streaming Platform

- Flink
- Pulsar SQL
- Hive

Steaming Layer
- Pulsar

Tiered Storage
- S3
- HDFS
- OSS
Stream to Stream

Table → Table
Stream → Table
Table → Stream
Stream → Stream
Stream → Stream
Unified Data Processing

Hive

Topic

Topic

Topic

Topic

Stream Processing
Contribute to Apache Pulsar
Zhaopin’s Contributions to Pulsar

Client interceptors

We use this feature to track message between producer and consumers

Dead Letter Topic

Time partitioned message tracker

Service url provider

We use this feature to dynamically switching traffic

Hive Pulsar integration

Muti–version Schema and more…
Thank you