

Apache Pulsar 上手实战

魏彬 / rockybean

2021年



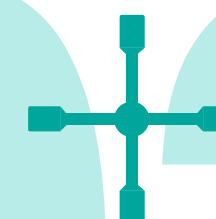


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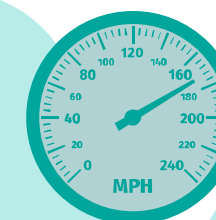
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简介



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个人简介



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01



Apache Pulsar 简介



新一代 云原生 分布式 消息流 平台

Cloud-Native Messaging and Event-Streaming Platform

Apache Pulsar



2003



2010



2012

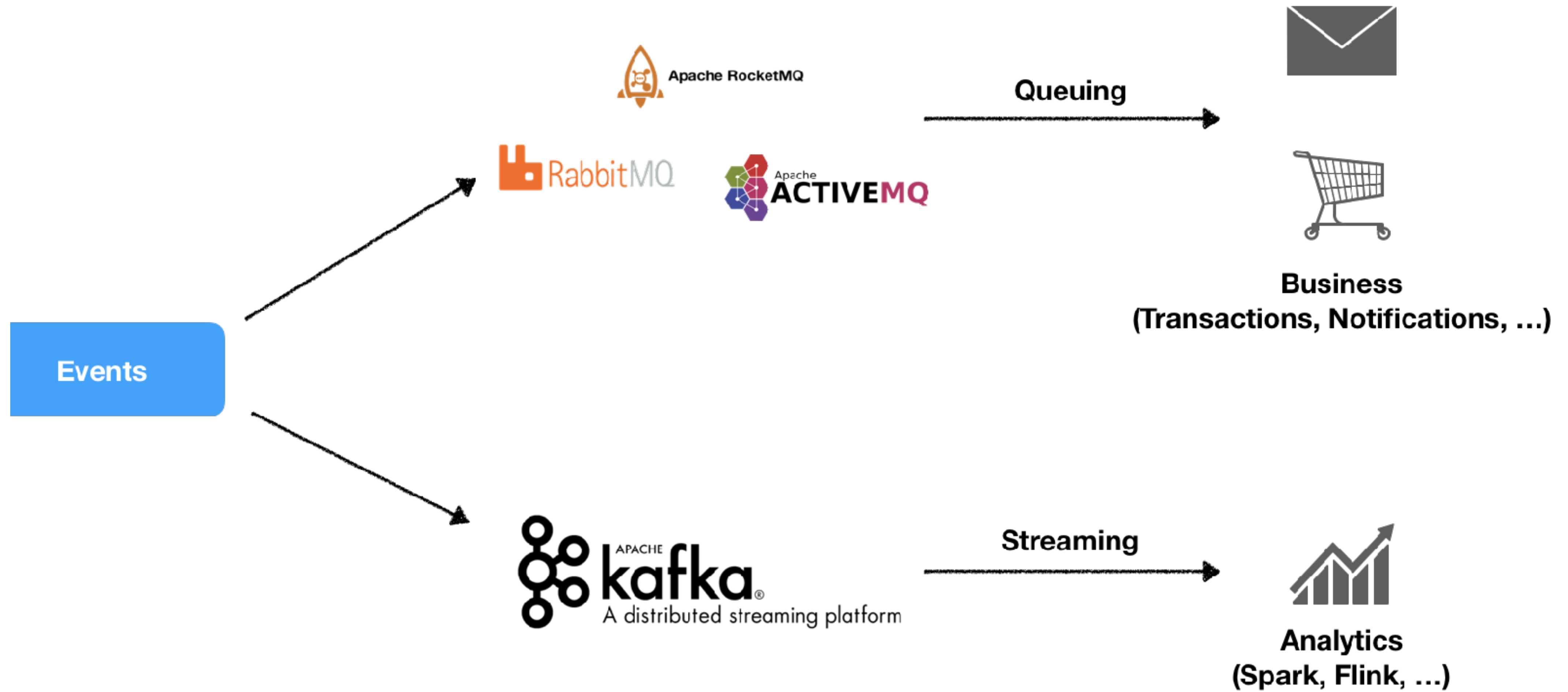
2006



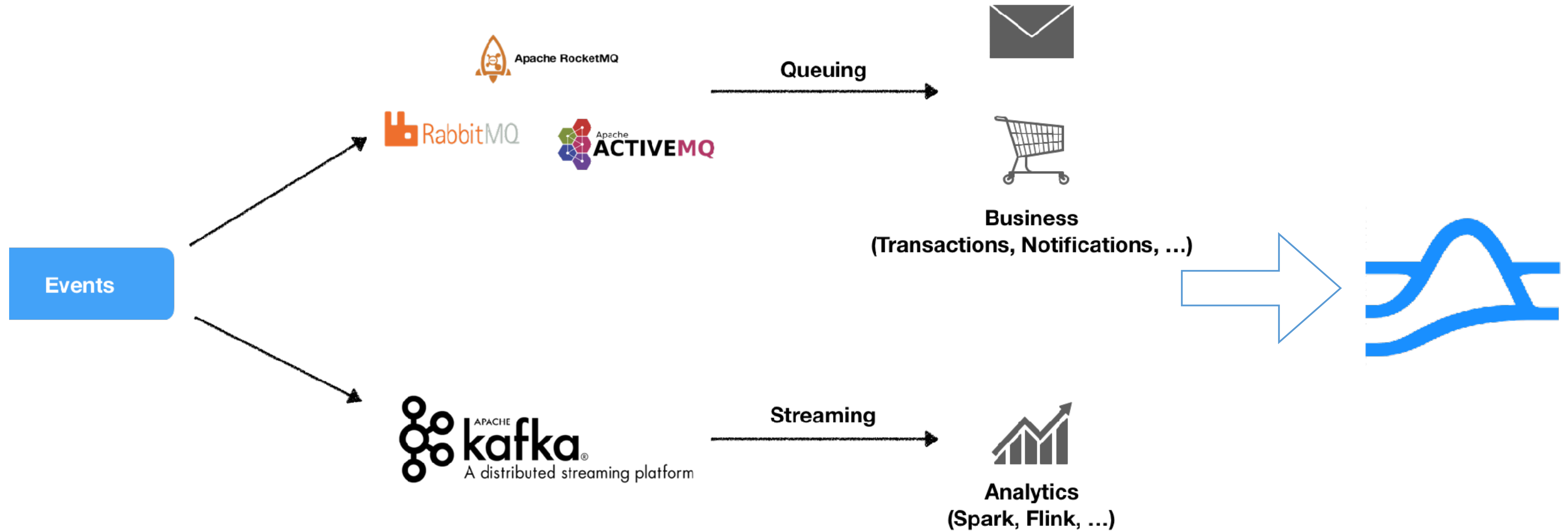
2011



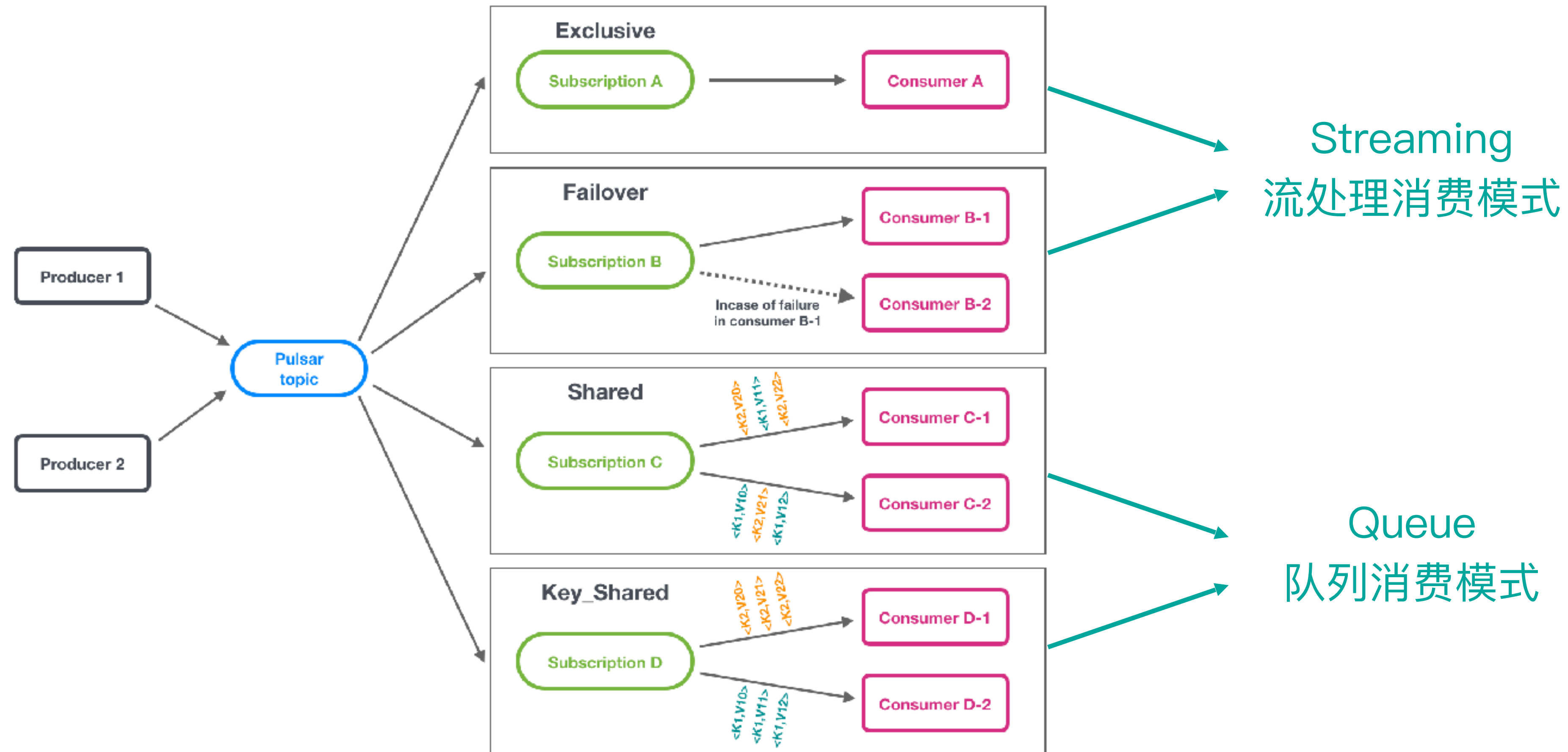
Apache Pulsar



Apache Pulsar



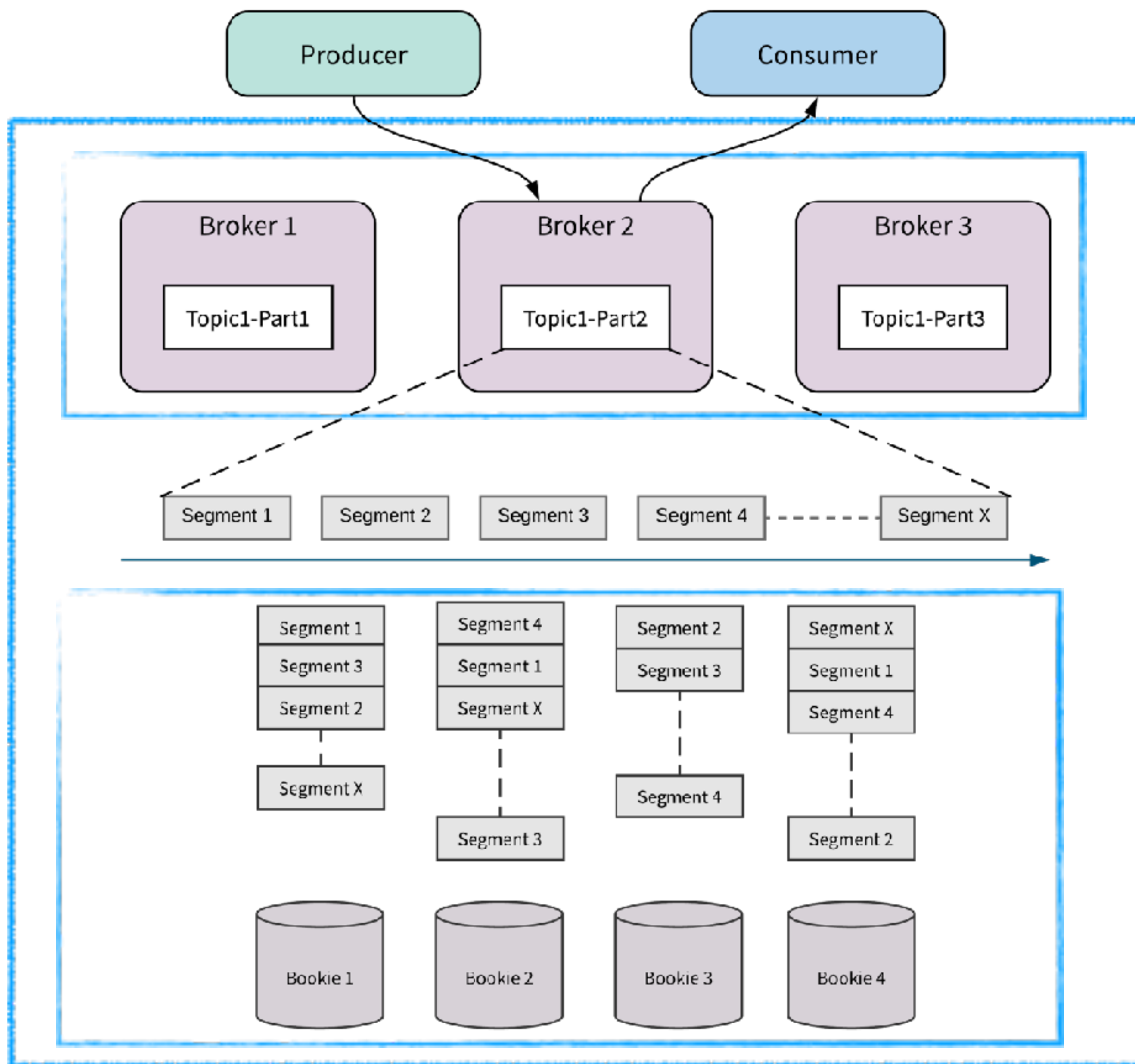
Apache Pulsar



Apache Pulsar 要解决的问题

- 企业需求和数据规模
 - 多租户 - 百万Topics - 低延时 - 持久化 - 跨地域复制
- 解除存储计算耦合
 - 运维痛点：替换机器、服务扩容、数据 rebalance
- 减少文件系统依赖
 - 性能难保障：持久化（fsync）、一致性（ack: all）、多Topic
 - IO不隔离：消费者读Backlog的时候会影响其他生产者和消费者

Apache Pulsar 架构



- 存储和计算分离
- 节点对等
- 独立扩展
- 灵活扩容
- 快速容错

Apache Pulsar 特性



Durability

Data replicated and synced to disk



Ordering

Guaranteed ordering



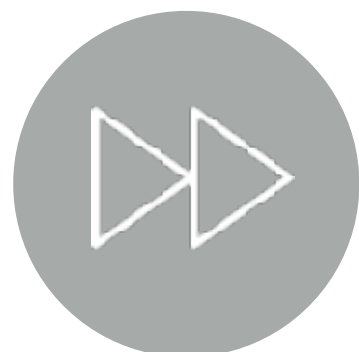
Delivery Guarantees

At least once, at most once and effectively once



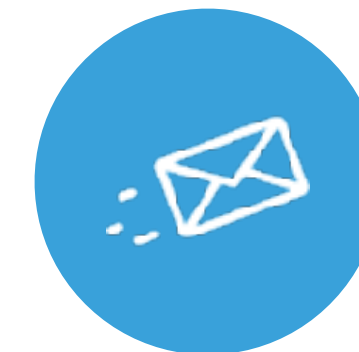
High throughput

Can reach 1.8 M messages/s in a single partition



Low Latency

Low publish latency of 5ms at 99pct



Unified messaging model

Support both Streaming and Queuing



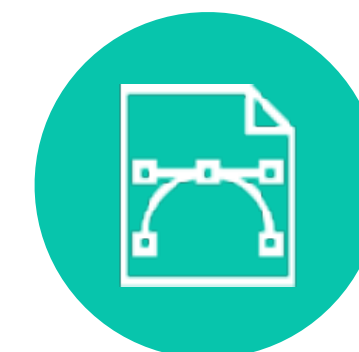
Multi-tenancy

A single cluster can support many tenants and use cases



Geo-replication

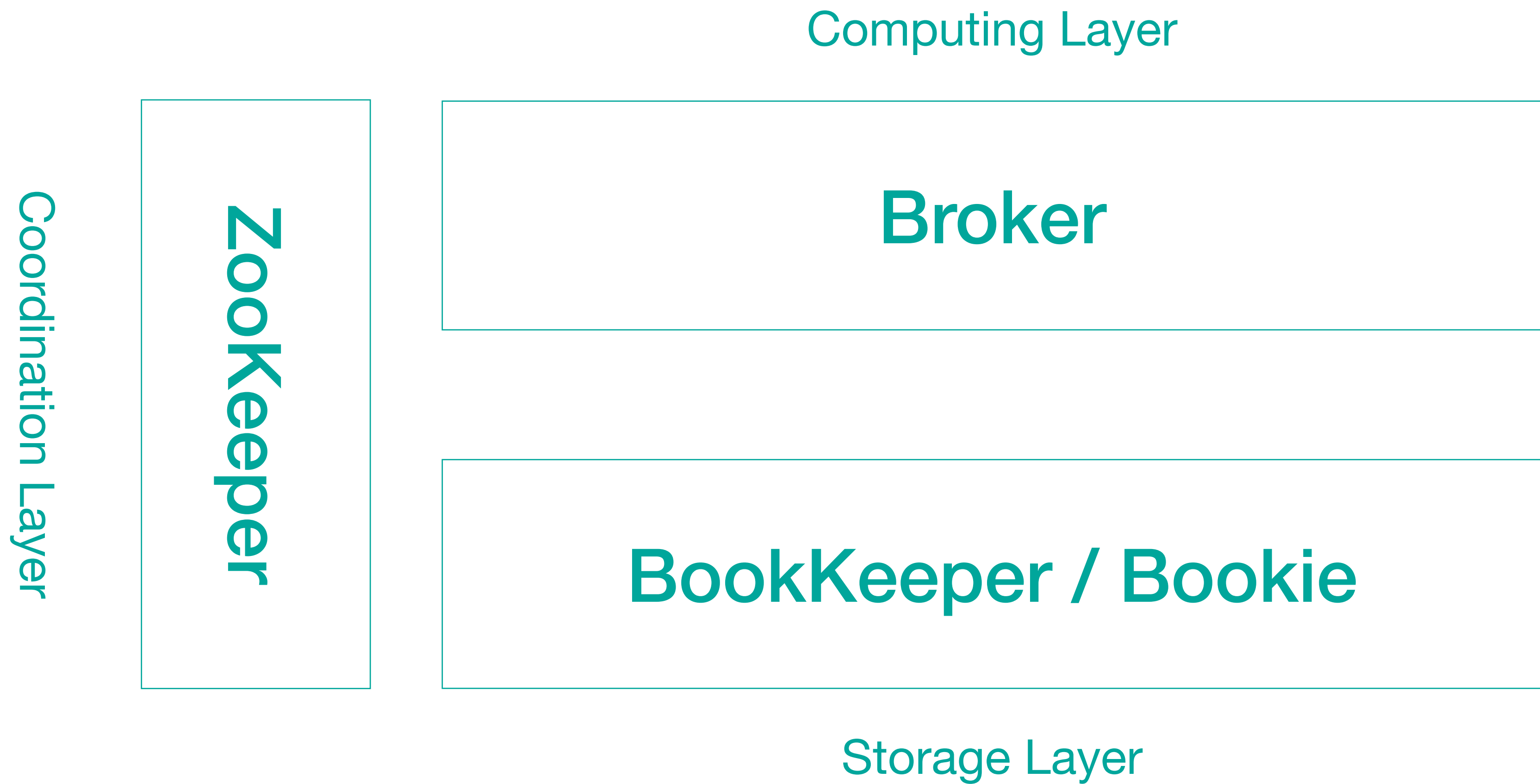
Out of box support for geographically distributed applications



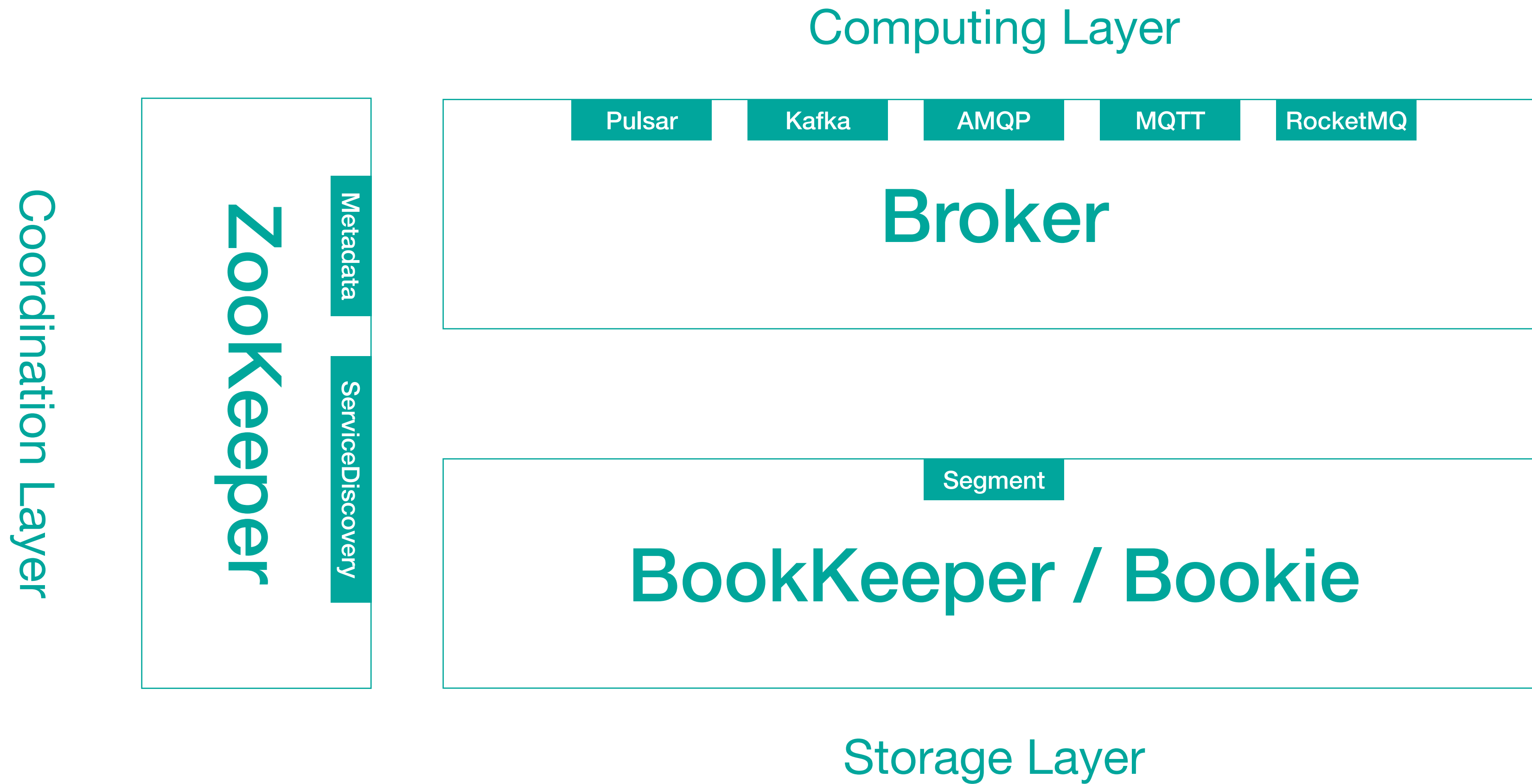
Highly scalable & available

Can support millions of topics

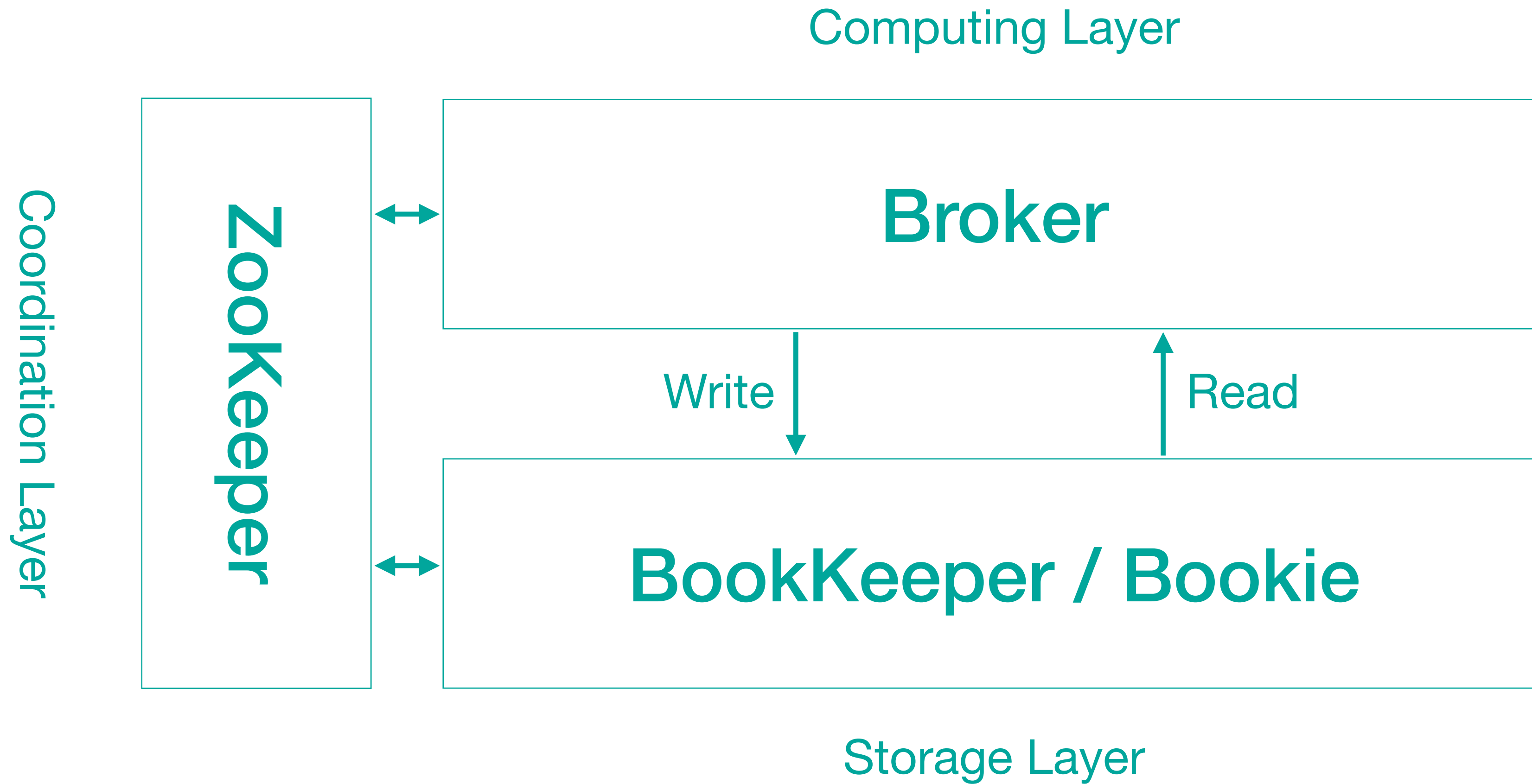
Apache Pulsar 核心组件



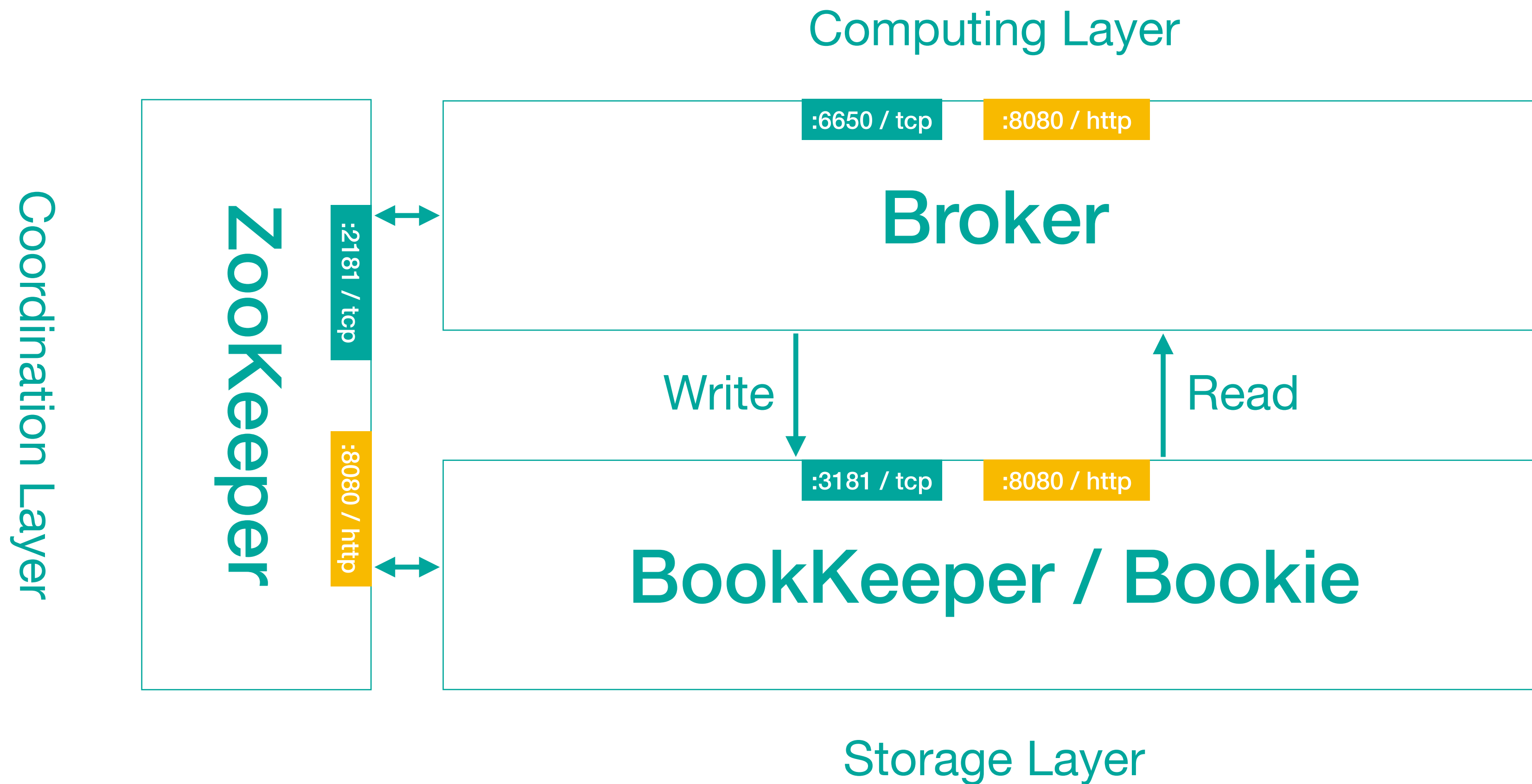
Apache Pulsar 核心组件



Apache Pulsar 组件的网络流向



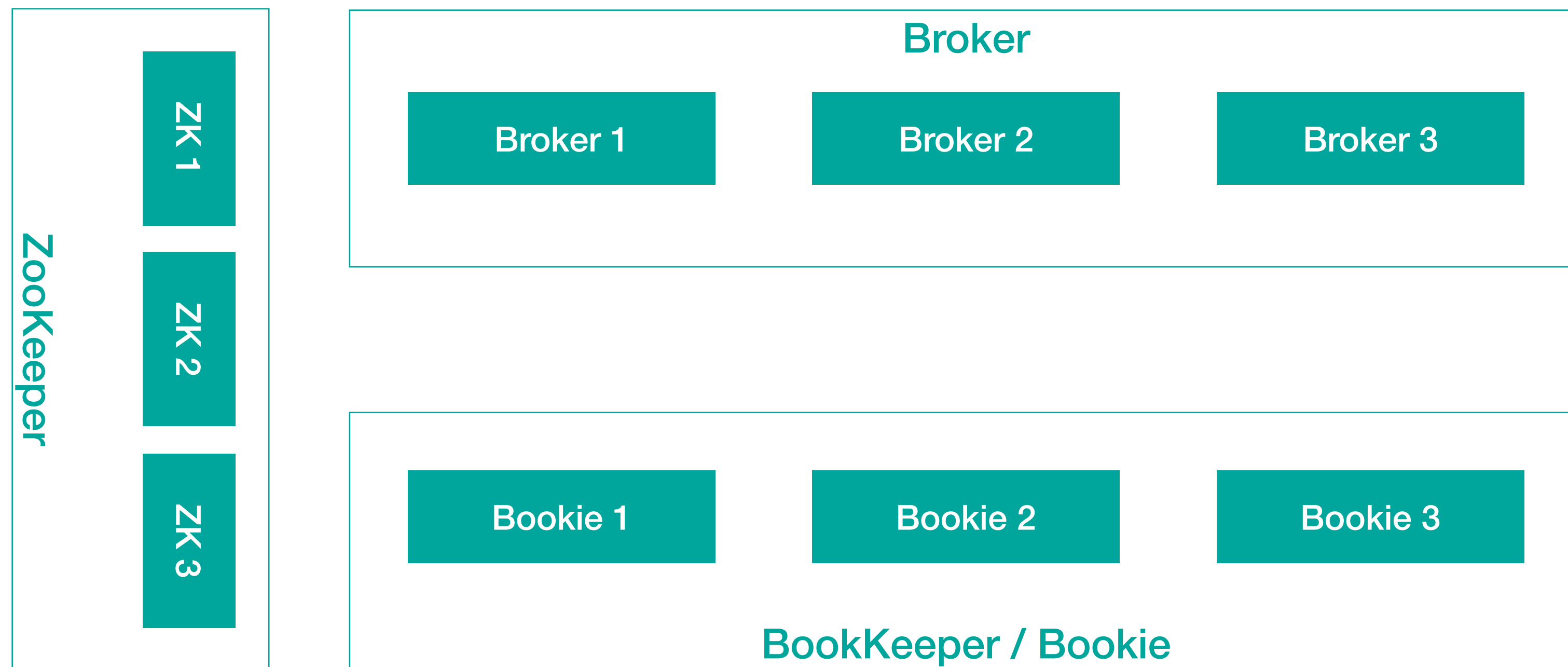
Apache Pulsar 组件的端口



tcp 端口主要用于组件间内部通信以及 client 访问

http 端口主要用于提供 rest api 和 暴露 prometheus 的 metrics

Apache Pulsar 组件 分布式



02



上手



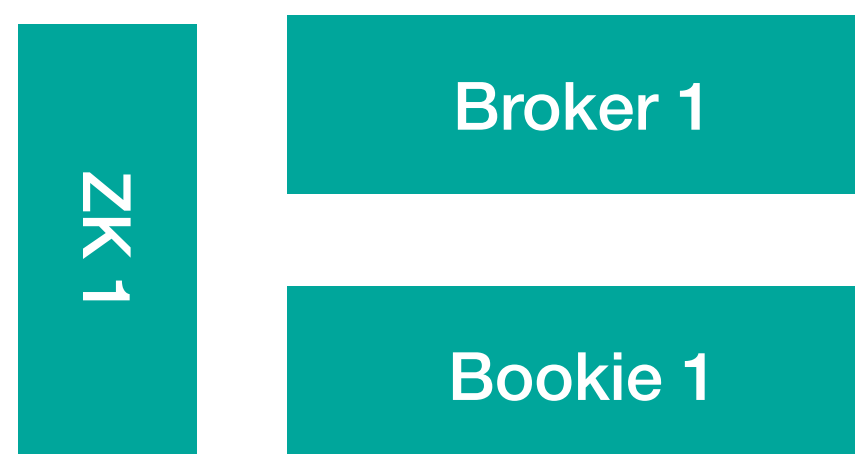
下载地址

- <https://pulsar.apache.org/en/download/>
- Mirror
 - <https://mirrors.tuna.tsinghua.edu.cn/apache/pulsar/>

Standalone

Standalone 本地开发推荐模式

`bin/pulsar standalone`
`bin/pulsar-daemon standalone`



• <https://pulsar.apache.org/docs/en/standalone/>

Demo

常用命令

```
bin/pulsar-admin clusters list
```

```
bin/pulsar-admin brokers list test
```

```
bin/pulsar-admin topics list public/default
```

```
bin/pulsar-client produce my-topic --messages "hello-pulsar"
```

```
bin/pulsar-client consume my-topic -s "first-subscription"
```

- <https://pulsar.apache.org/docs/en/reference-cli-tools/>
- <https://pulsar.apache.org/docs/en/admin-api-overview/>

Cluster



Cluster

- 推荐使用 docker 运行

• <https://pulsar.apache.org/docs/en/deploy-bare-metal/>

• <https://github.com/apache/pulsar/tree/master/docker-compose/kitchen-sink>

03



监控运维工具

运维工具 Pulsar Manager

The screenshot displays the Pulsar Manager web interface. The breadcrumb navigation at the top reads: Management / Tenants / Namespaces / Namespace Details. The current cluster is 'beijing-cluster-1' and the user is 'Admin'. The 'Tenant' dropdown is set to 'public' and the 'Namespace' dropdown is set to 'technical-engineering'. The 'TOPICS' tab is selected, showing a table with metrics: In Rate (0.00), Out Rate (0.00), In Throughput (0 Bytes), and Out Throughput (0 Bytes). Below this, the 'Bundles' section is active, showing a table for the 'beijing-cluster'. The table has two columns: 'Bundle' and 'Operation'. There are four bundles listed, each with a range of offsets. For each bundle, the 'Operation' column contains three buttons: '< Split', 'Unload', and 'Clear Backlog'.

In Rate	Out Rate	In Throughput	Out Throughput
0.00	0.00	0 Bytes	0 Bytes

Bundles

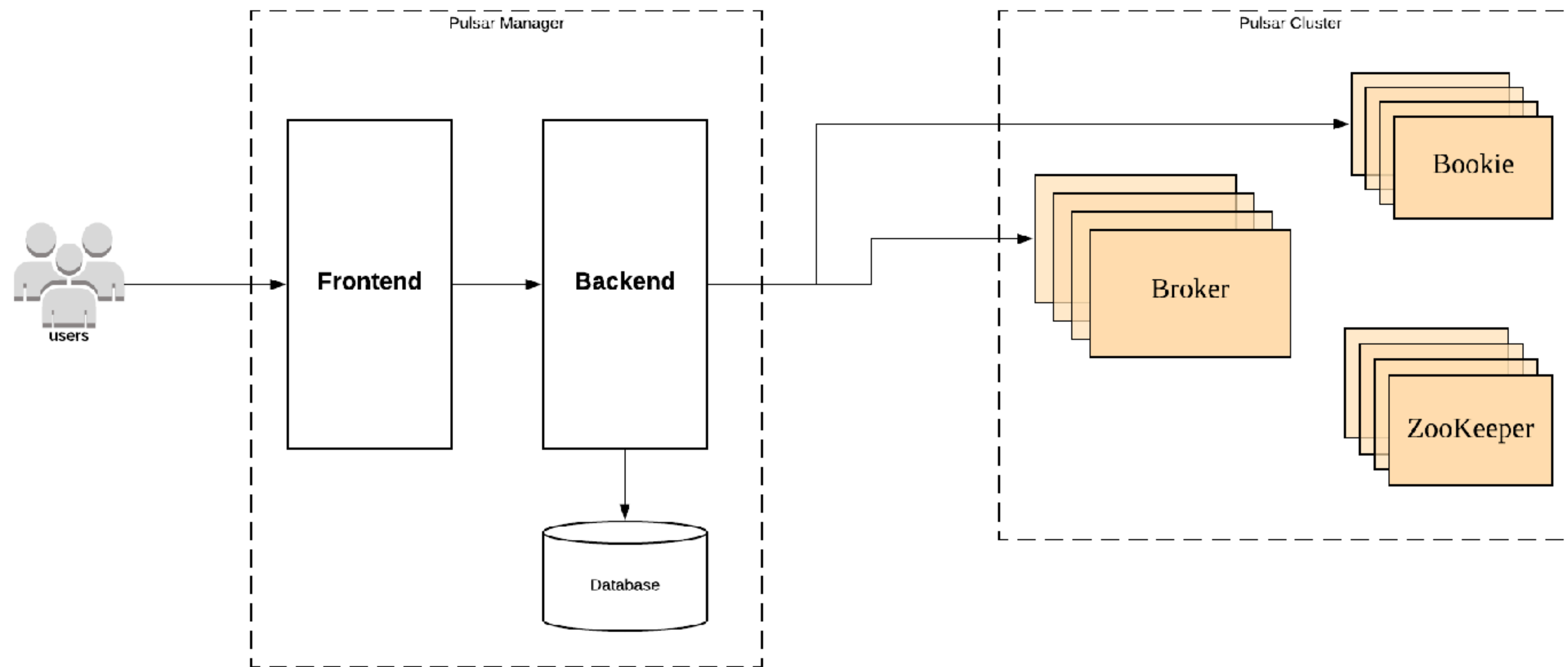
beijing-cluster

Unload All Clear All Backlog

Bundle	Operation
0x00000000_0x40000000	< Split Unload Clear Backlog
0x40000000_0x80000000	< Split Unload Clear Backlog
0x80000000_0xc0000000	< Split Unload Clear Backlog
0xc0000000_0xffffffff	< Split Unload Clear Backlog

• <https://github.com/apache/pulsar-manager>

运维工具 Pulsar Manager



• <https://github.com/apache/pulsar-manager>

运维工具 Pulsar Manager

```
tar zxvf apache-pulsar-manager-0.2.0-bin.tar.gz
cd pulsar-manager
tar xvf pulsar-manager.tar
mv dist pulsar-manager/ui
cd pulsar-manager
bin/pulsar-manager
```

application.properties

- **bookie.enable=true**
- **pulsar.peek.message=true**

bkvm.conf

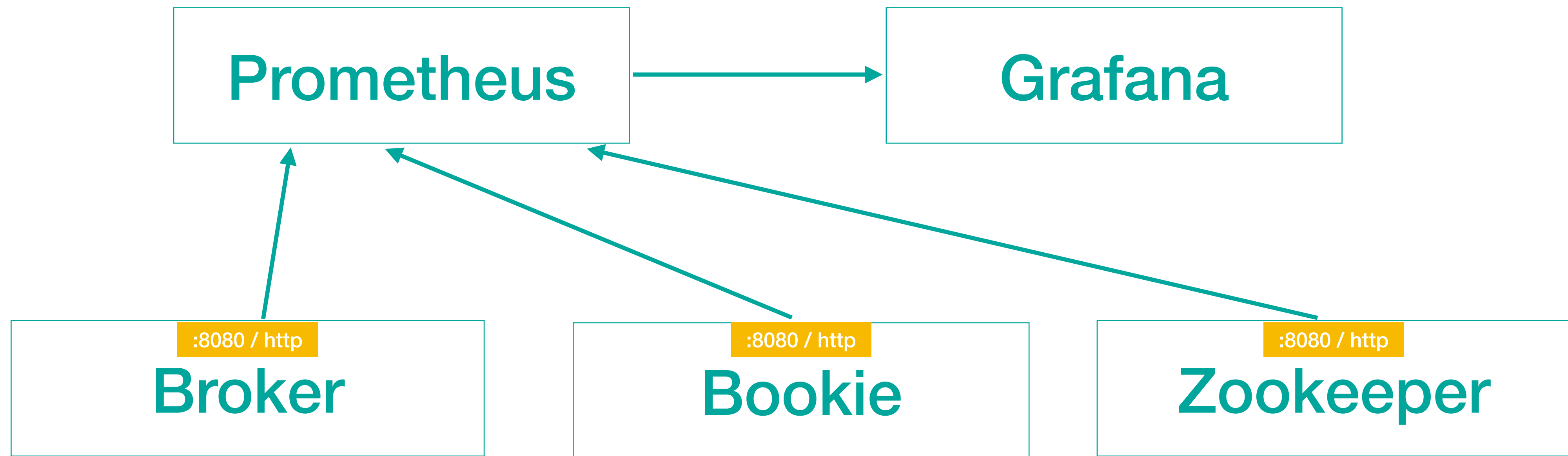
- **bookie.enable=true**

运维工具 Pulsar Manager

```
CSRF_TOKEN=$(curl http://localhost:7750/pulsar-manager/csrf-token)
curl \
  -H 'X-XSRF-TOKEN: $CSRF_TOKEN' \
  -H 'Cookie: XSRF-TOKEN=$CSRF_TOKEN;' \
  -H "Content-Type: application/json" \
  -X PUT http://localhost:7750/pulsar-manager/users/superuser \
  -d '{"name": "admin", "password": "apache pulsar", "description":  
"test", "email": "username@test.org"}'
```

- <http://localhost:7750/ui/index.html>
- admin/apache pulsar
- <http://localhost:7750/bkvm/>
- admin/admin

■ 监控工具 Prometheus&Grafana



• <https://github.com/streamnative/apache-pulsar-grafana-dashboard/>

Prometheus Config

scrape_configs:

- job_name: "proxy"

honor_labels: true # don't overwrite job &

instance labels

static_configs:

- targets:

- '127.0.0.1:8080'

- job_name: "broker"

honor_labels: true # don't overwrite job &

instance labels

static_configs:

- targets:

- '127.0.0.1:8080'

- job_name: "bookie"

honor_labels: true # don't overwrite job &

instance labels

static_configs:

- targets:

- '127.0.0.1:8080'

- job_name: "zookeeper"

honor_labels: true

static_configs:

- targets:

- '127.0.0.1:8080'

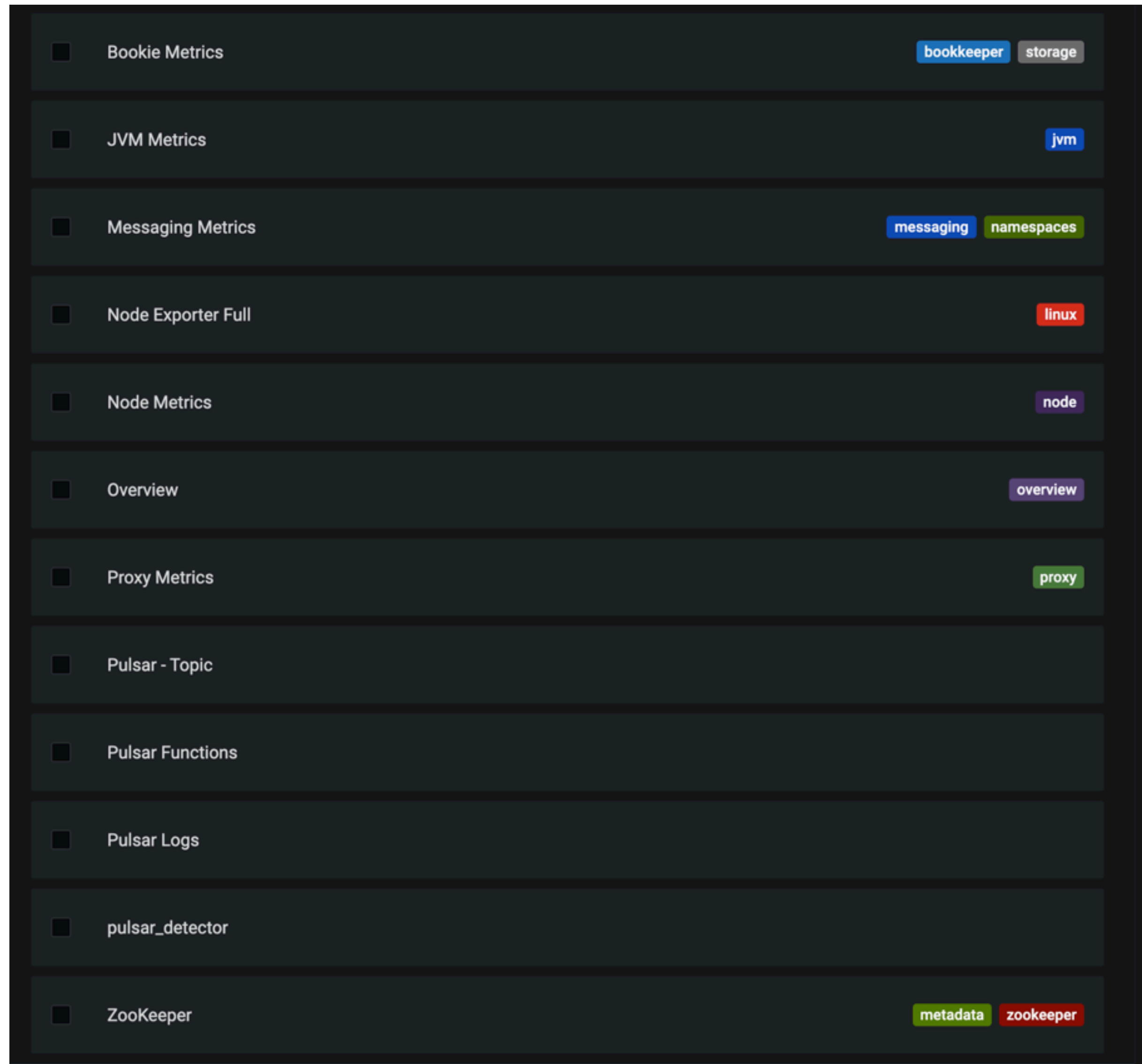
监控工具 Prometheus&Grafana

localhost:9090/targets					
Prometheus Alerts Graph Status ▾ Help					
Targets					
All Unhealthy					
bookie (1/1 up) show less					
Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://172.20.2.39:8080/metrics	UP	instance="172.20.2.39:8080" job="bookie"	9.61s ago	54.96ms	
broker (1/1 up) show less					
Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://172.20.2.39:8080/metrics	UP	instance="172.20.2.39:8080" job="broker"	3.97s ago	11.16ms	
proxy (1/1 up) show less					
Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://172.20.2.39:8080/metrics	UP	instance="172.20.2.39:8080" job="proxy"	833ms ago	8.65ms	
zookeeper (1/1 up) show less					
Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://172.20.2.39:8080/metrics	UP	instance="172.20.2.39:8080" job="zookeeper"	1.277s ago	9.042ms	

监控工具 Prometheus&Grafana



■ 监控工具 Prometheus&Grafana



■ 监控工具 Prometheus&Grafana

```
./scripts/generate_dashboards.sh 127.0.0.1:9090 pulsar 127.0.0.1:9090  
127.0.0.1:9090 loki_source
```

```
ls ./target
```

• <https://github.com/streamnative/apache-pulsar-grafana-dashboard/>

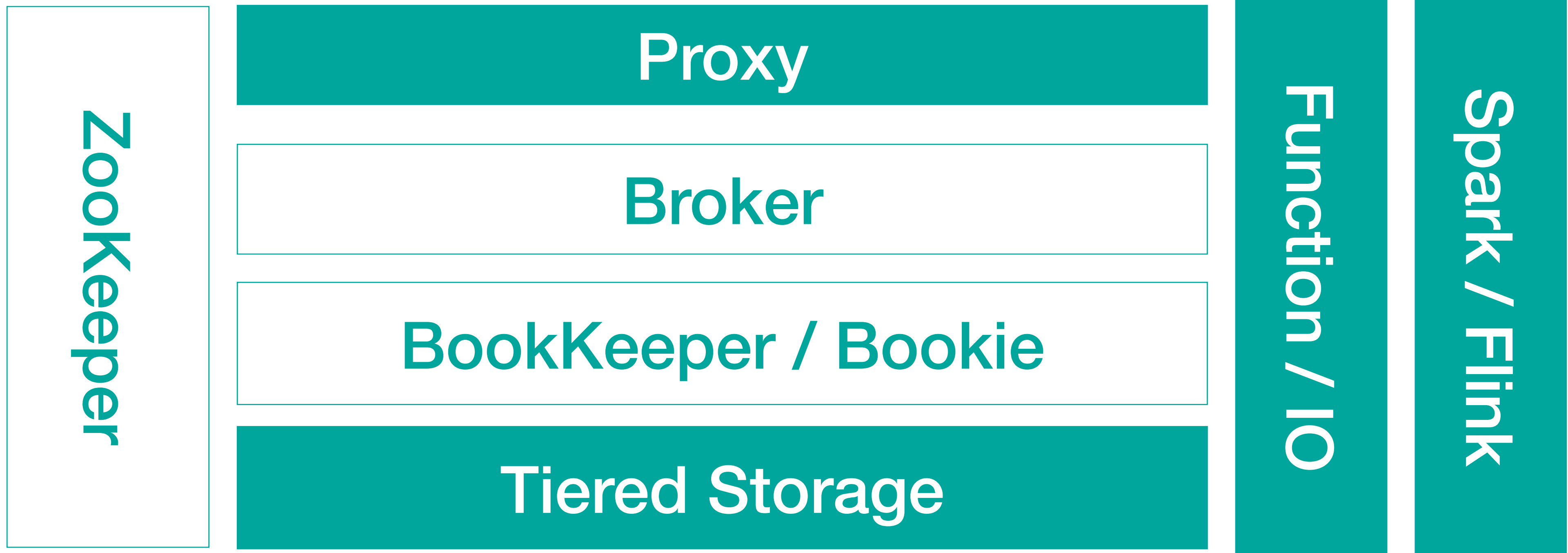
Perf 压力测试

```
bin/pulsar-perf produce -r 100 -n 2 -s 1024 test-perf
```

```
bin/pulsar-perf consume test-perf
```

Demo

Apache Pulsar 组件



Apache Pulsar 入门资料

- TGIP CN

- <https://github.com/streamnative/tgip-cn>

- Bilibili

- <https://space.bilibili.com/391380821>

- 微信公众号 Apache Pulsar - 从入门到实践合集

- <https://mp.weixin.qq.com/s/l5KuwGw30-C9bpCgK08vDQ>

- 官方文档

- <https://pulsar.apache.org/docs>

- <https://bookkeeper.apache.org/docs/latest/>

- 样例

- <https://github.com/streamnative/examples>

- https://github.com/streamnative/psat_exercise_code

Q&A