

Как готовить Кафку

чтобы не пригорало

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СКБ Контур

DevOps, Санкт-Петербург, 2019

План

1. Зачем нам Apache Kafka
2. Введение в Кафку
3. Мониторинг кластера (+ тулинг)
4. Управление кластером (+ тулинг)

Зачем нам Apache Kafka

Зачем нам Apache Kafka

- Vostok Hercules

<https://github.com/vostok>

Зачем нам Apache Kafka

- Vostok Hercules

- Логи

<https://github.com/vostok>

Зачем нам Apache Kafka

- Vostok Hercules

- Логи
- Метрики

<https://github.com/vostok>

Зачем нам Apache Kafka

- Vostok Hercules

- Логи
- Метрики
- Трассировки

<https://github.com/vostok>

Зачем нам Apache Kafka

- Vostok Hercules

- Логи
- Метрики
- Трассировки
- Бизнес-события

<https://github.com/vostok>

Зачем нам Apache Kafka

- Vostok Hercules
- Search & Recommendation Systems (SRS)

Зачем нам Apache Kafka

- Vostok Hercules
- Search & Recommendation Systems (SRS)
- Event Bus

Зачем нам Apache Kafka

- Vostok Hercules
- Search & Recommendation Systems (SRS)
- Event Bus
- Stream Processing

Блиц-опрос

Блиц-опрос

Кто использует Apache Kafka?

Блиц-опрос

Кто использует Apache Kafka?

Версия...

< 0.11?

Блиц-опрос

Кто использует Apache Kafka?

Версия...

< 0.11?

0.11.x?

Блиц-опрос

Кто использует Apache Kafka?

Версия...

< 0.11?

0.11.x?

1.x.x?

Блиц-опрос

Кто использует Apache Kafka?

Версия...

< 0.11?

0.11.x?

1.x.x?

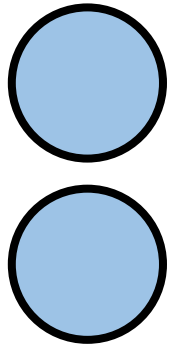
2.x.x?

Введение в Apache Kafka

Введение в Apache Kafka

Kafka Producer

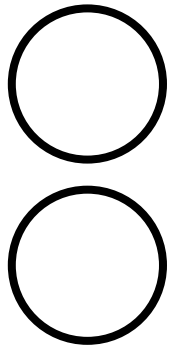
Producer



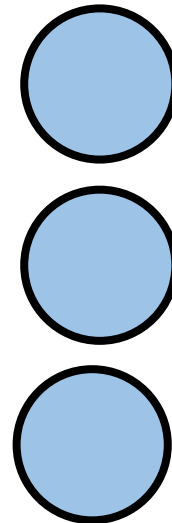
Введение в Apache Kafka

Kafka Consumer

Producer

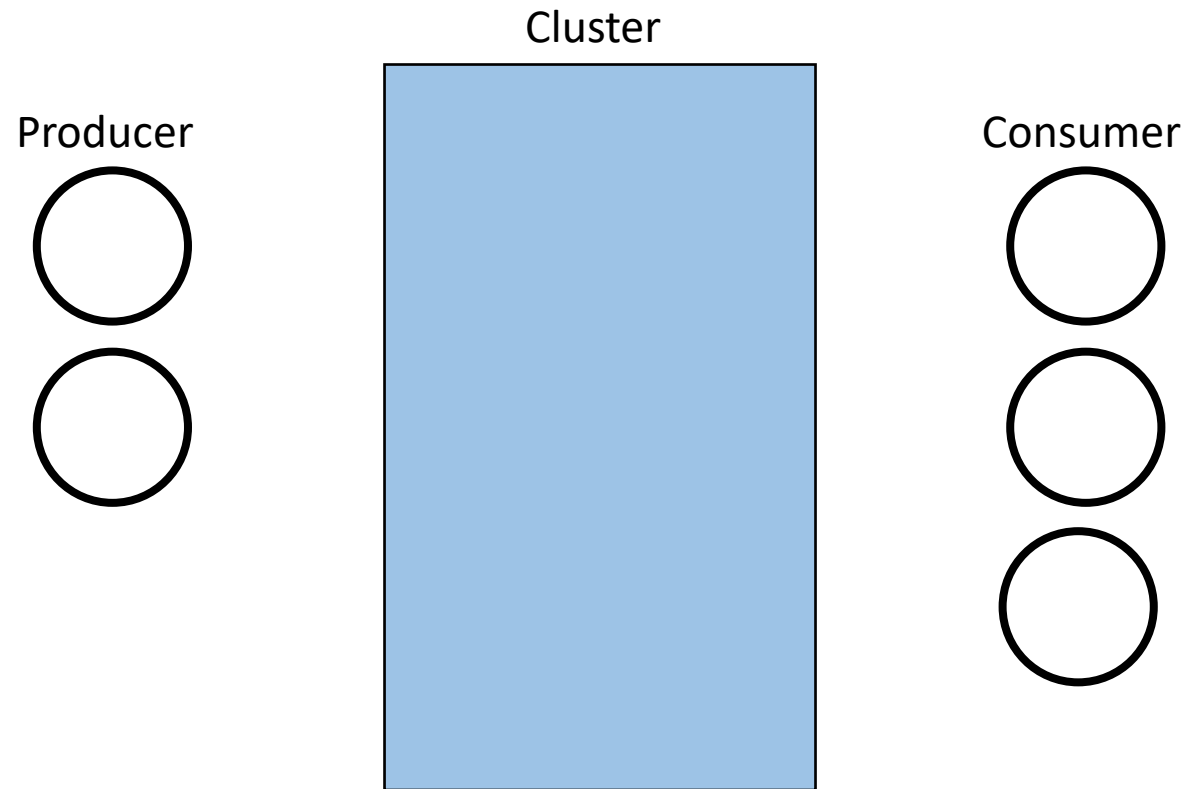


Consumer



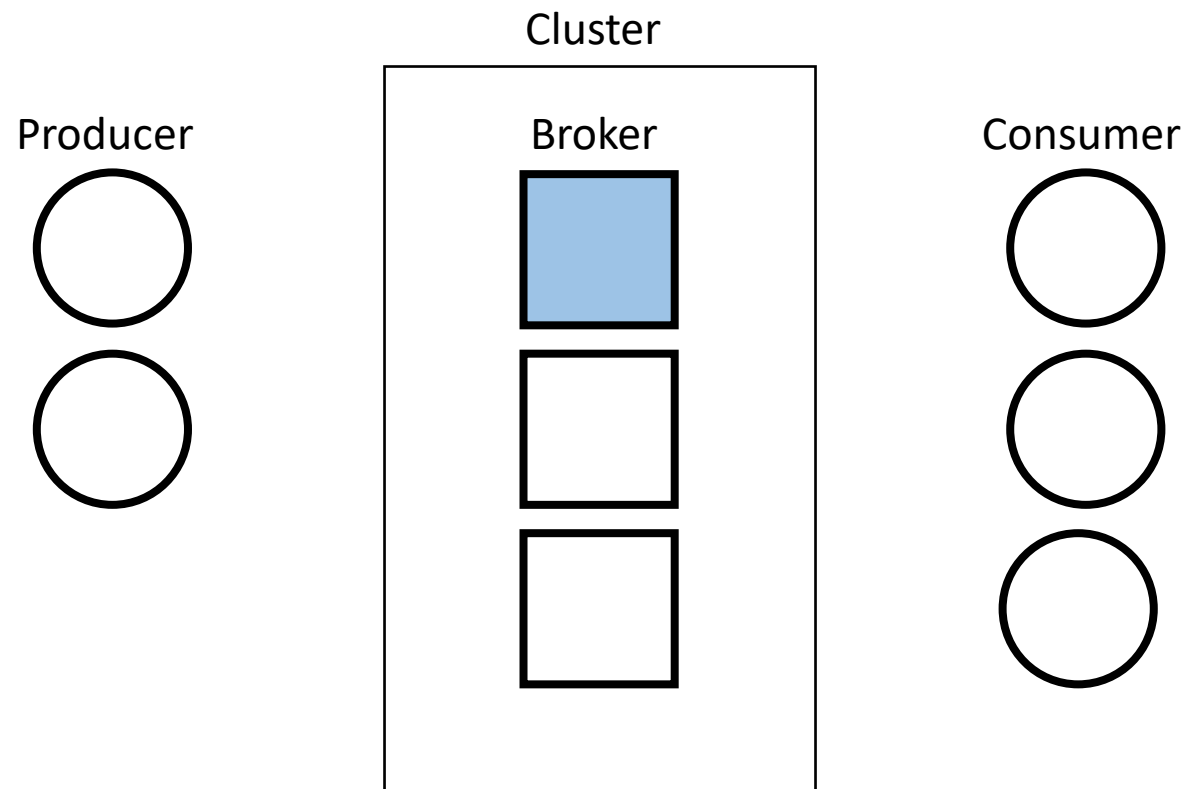
Введение в Apache Kafka

Kafka Cluster

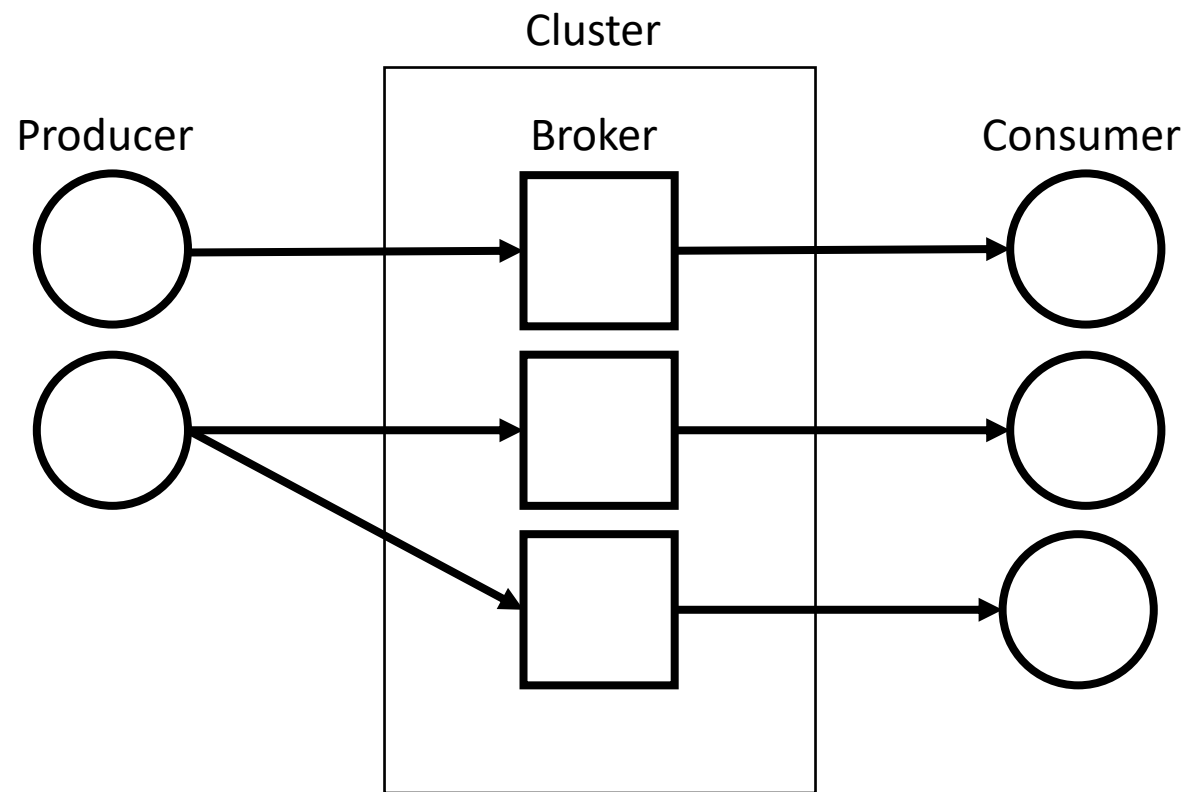


Введение в Apache Kafka

Kafka Broker

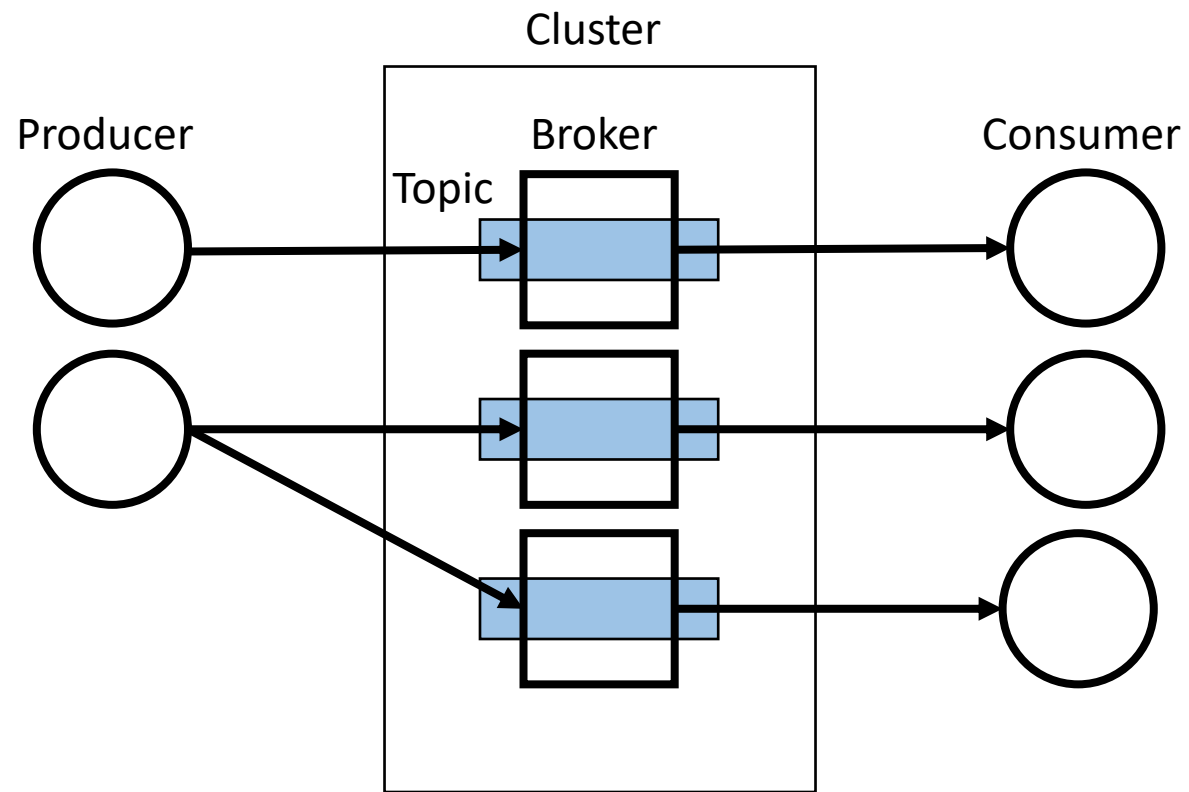


Введение в Apache Kafka



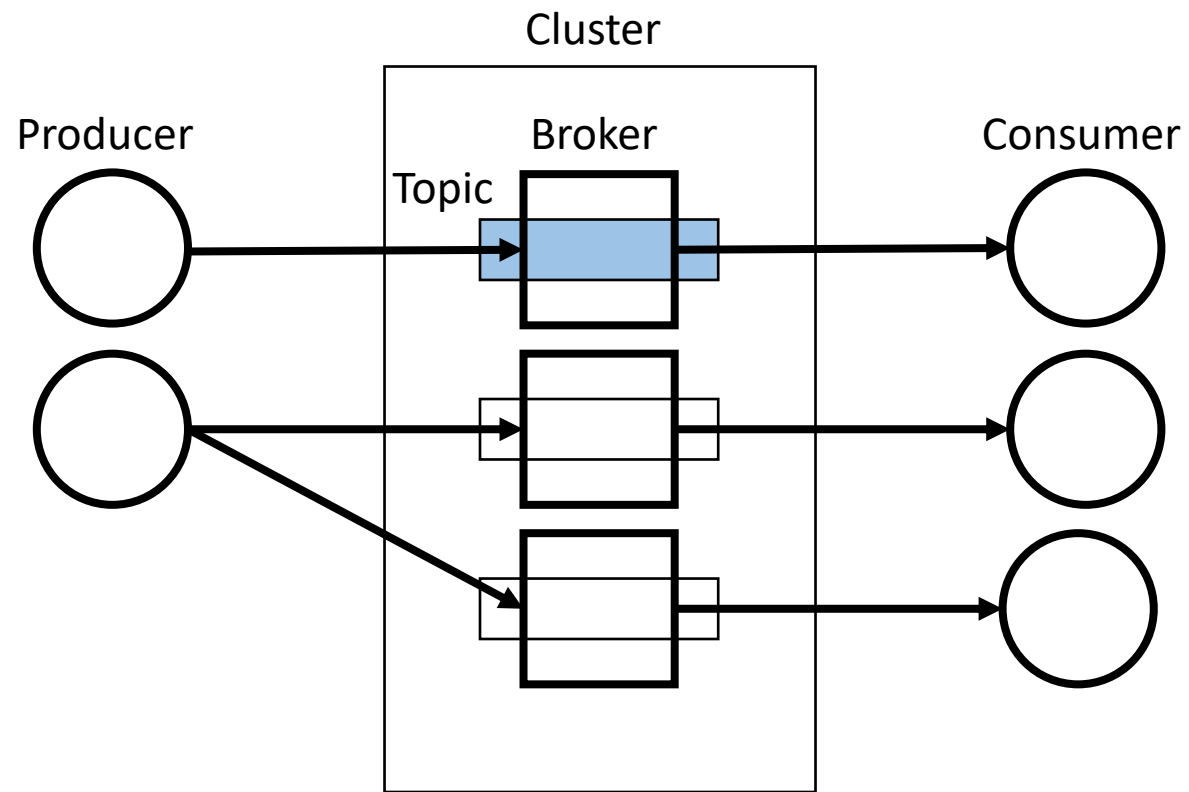
Введение в Apache Kafka

Kafka Topic



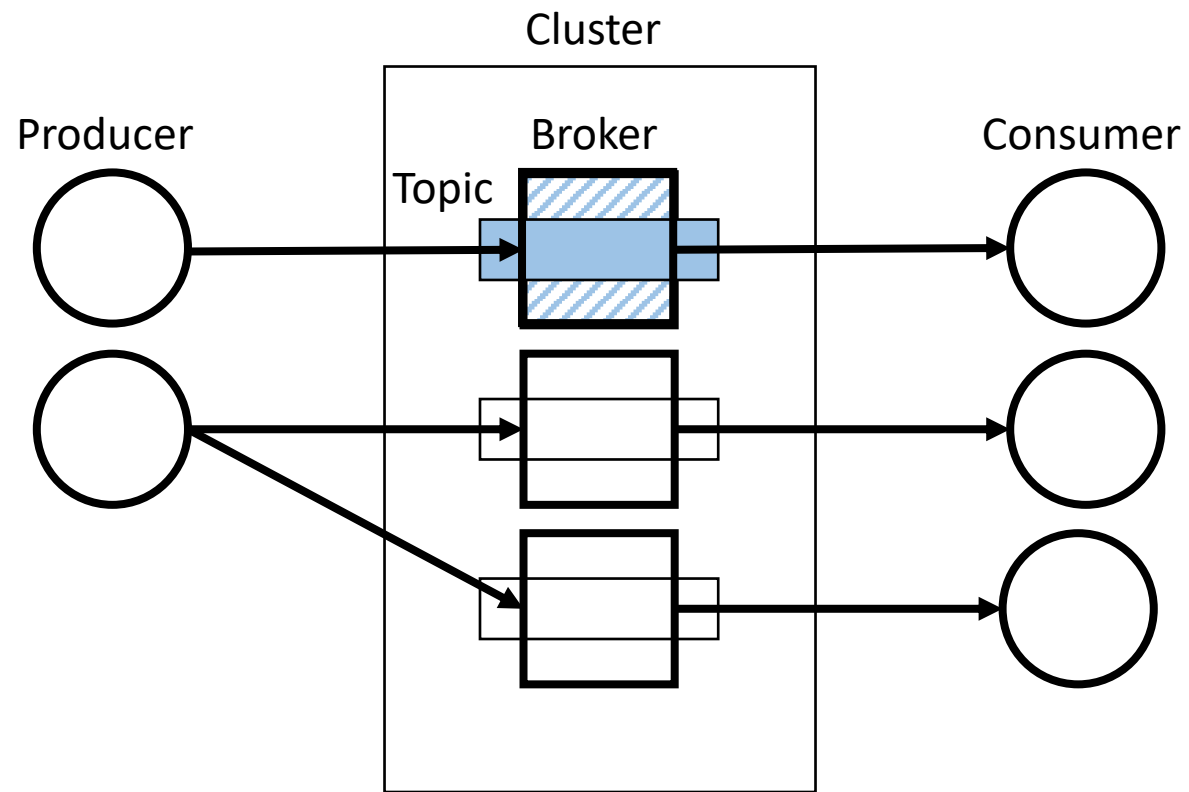
Введение в Apache Kafka

Topic = {Partition}



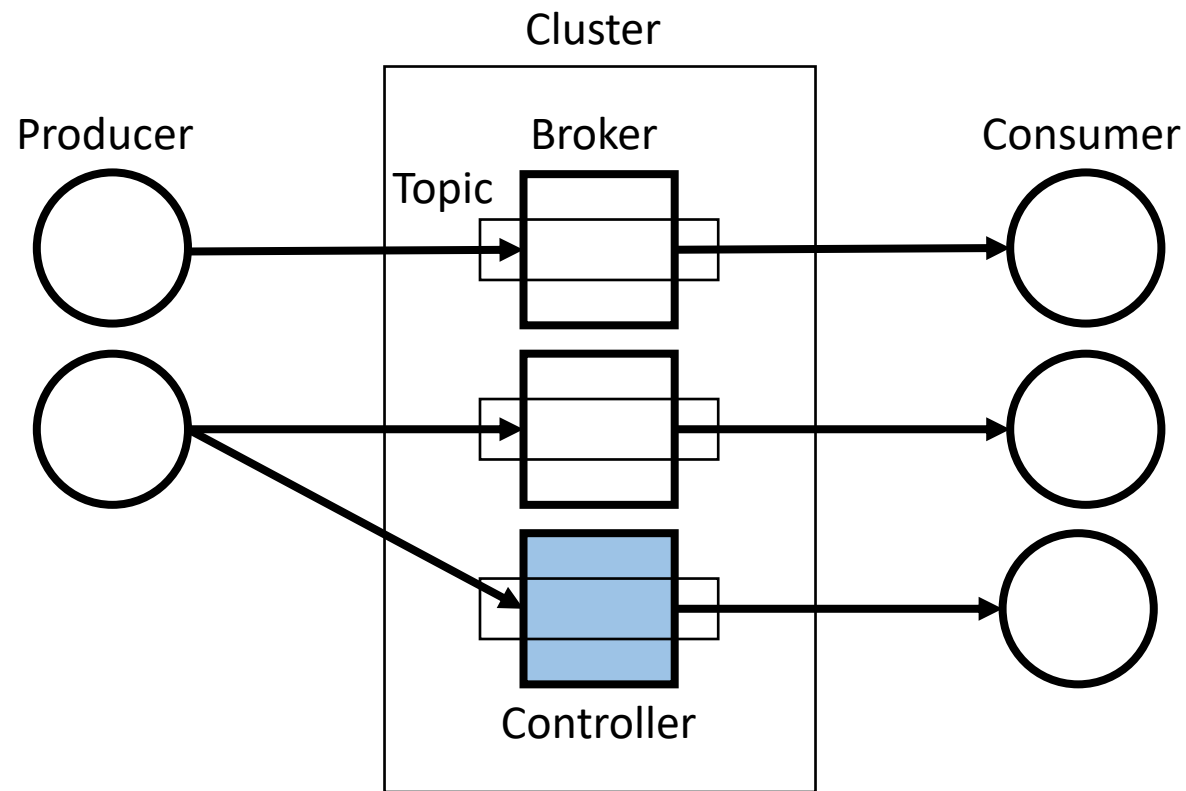
Введение в Apache Kafka

Leader (per Partition)



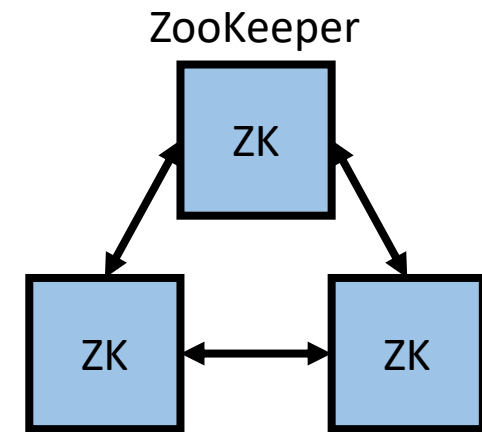
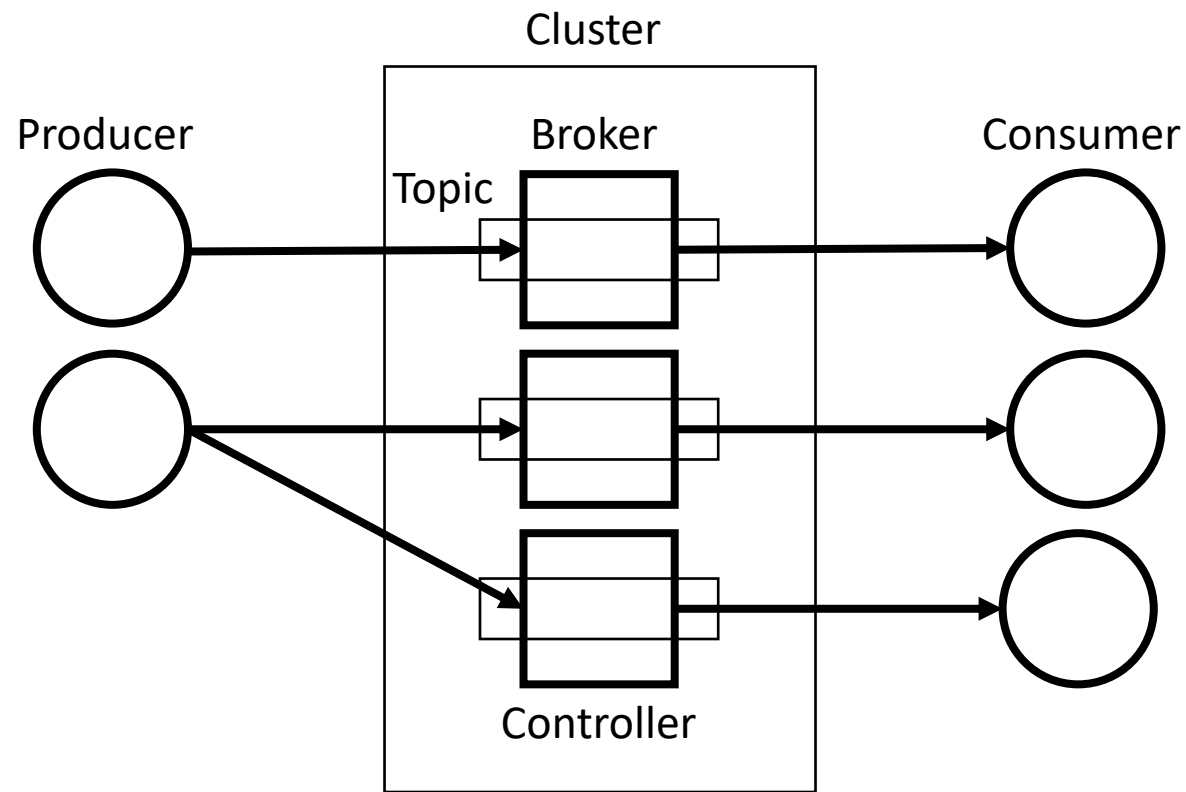
Введение в Apache Kafka

Controller – координирует работу кластера



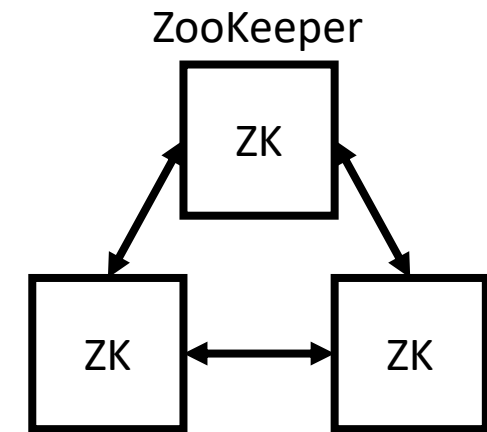
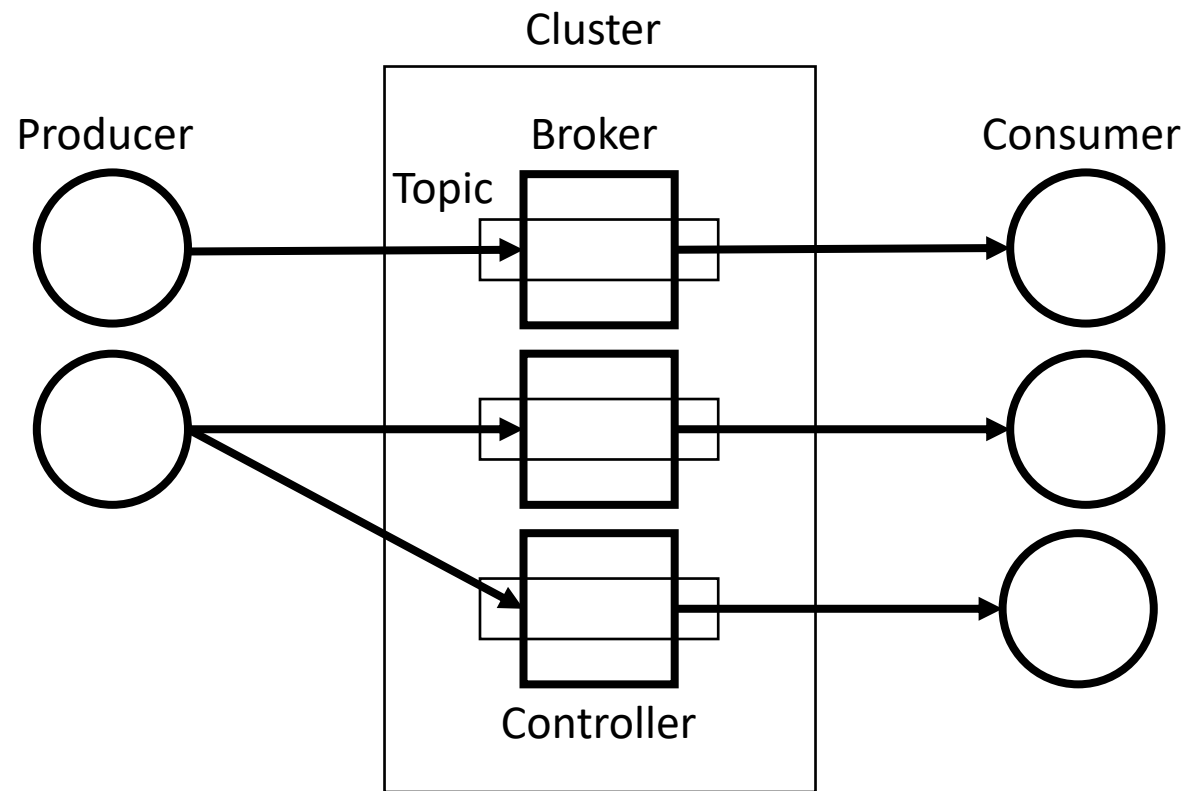
Введение в Apache Kafka

Мета-данные хранятся в ZooKeeper



Введение в Apache Kafka

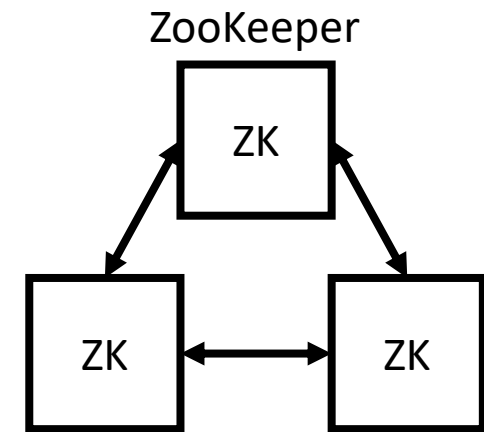
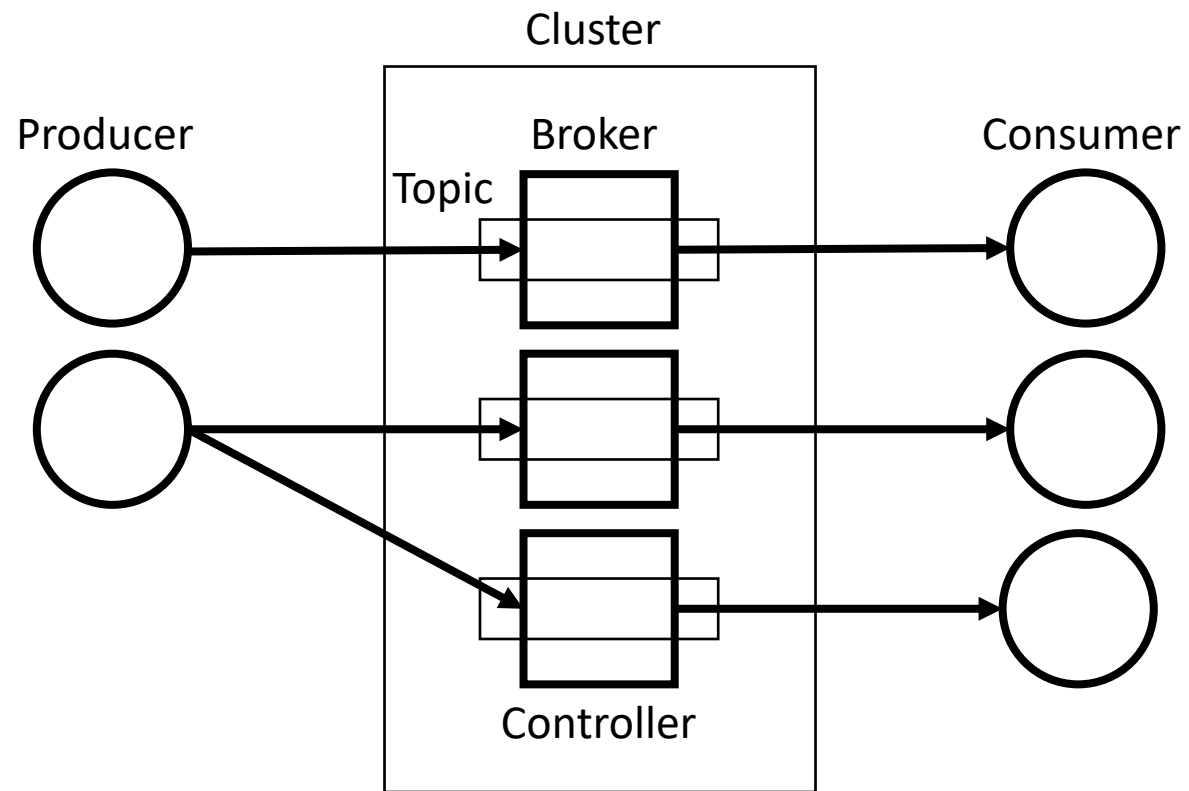
Мета-данные хранятся в ZooKeeper



- Controller election
- Topic (config, partitions, replicas)
- Cluster state (online brokers)

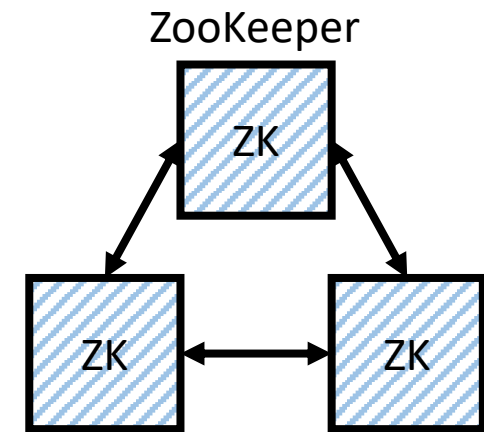
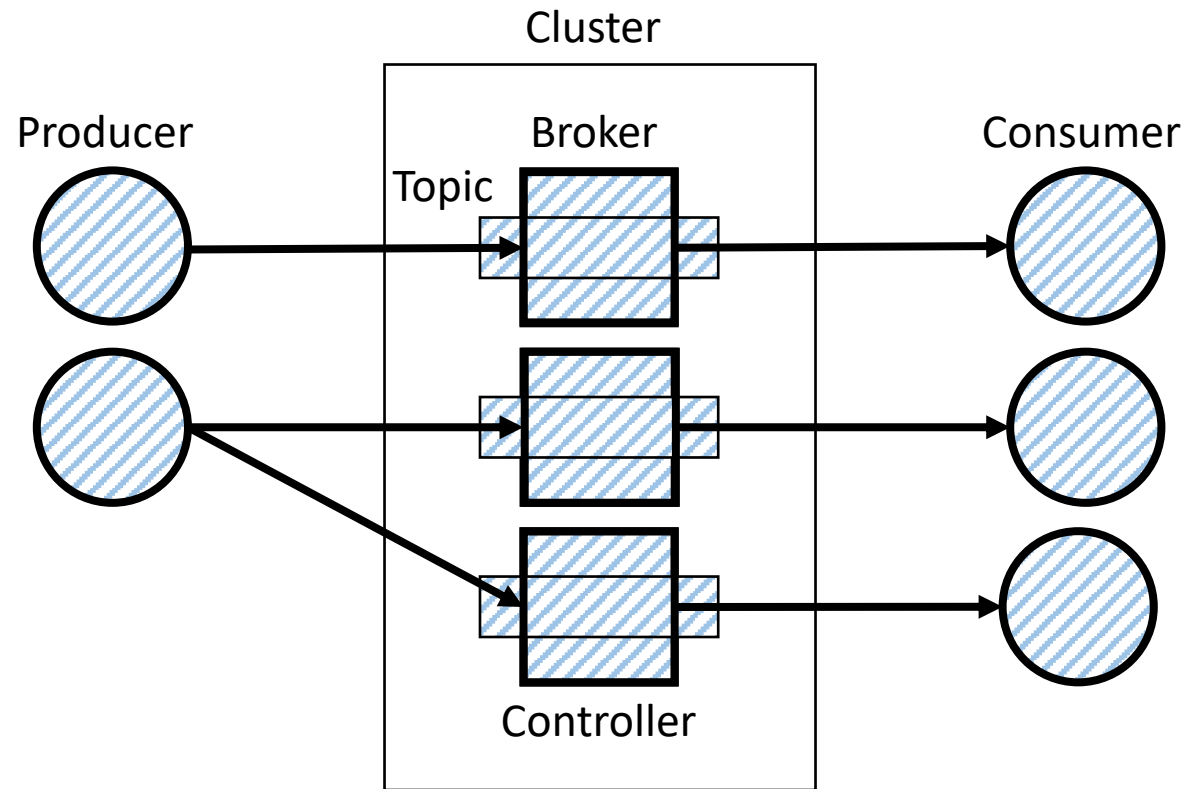
Мониторинг

За какими компонентами нужно следить?



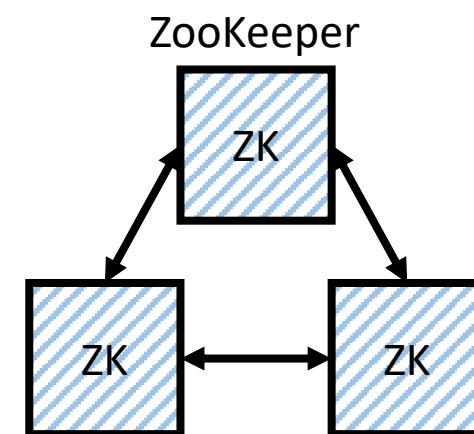
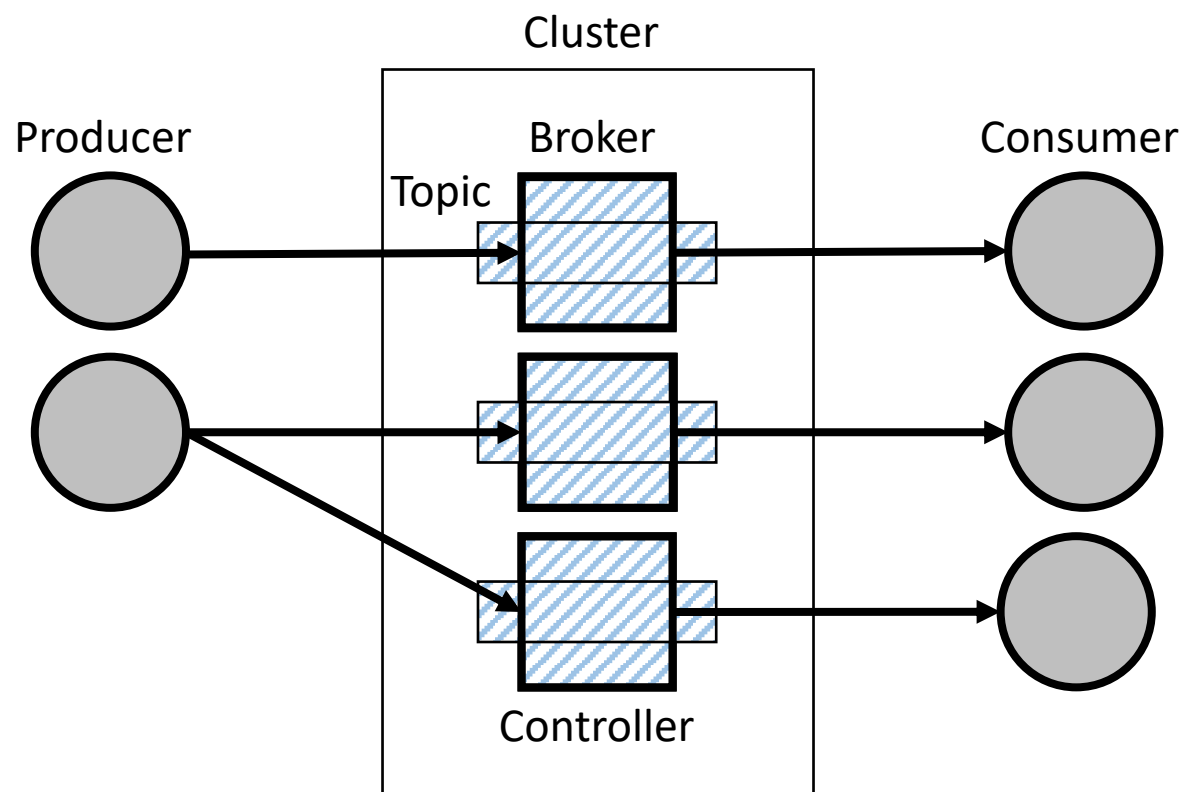
Мониторинг

За какими компонентами нужно следить?



Мониторинг

За какими компонентами нужно следить?



Мониторинг

Наша инфраструктура для метрик

Мониторинг

Наша инфраструктура для метрик

- Graphite + Grafana

<https://graphiteapp.org>

<https://grafana.com>

Мониторинг

Наша инфраструктура для метрик

- Graphite + Grafana
- Moira

<https://moira.readthedocs.io/>

Мониторинг

Системные ресурсы

Мониторинг

Системные ресурсы

Diamond

<https://diamond.readthedocs.io>

Мониторинг

Системные ресурсы

Diamond

- CPU, Load Average

<https://diamond.readthedocs.io>

Мониторинг

Системные ресурсы

Diamond

- CPU, Load Average
- Memory

<https://diamond.readthedocs.io>

Мониторинг

Системные ресурсы

Diamond

- CPU, Load Average
- Memory
- Disk

<https://diamond.readthedocs.io>

Мониторинг

Системные ресурсы

Diamond

- CPU, Load Average
- Memory
- Disk
- Network IO

<https://diamond.readthedocs.io>

Мониторинг

Java-приложение

Мониторинг

Java-приложение

- Garbage Collection

Мониторинг

Java-приложение

- Garbage Collection
- Heap Usage

Мониторинг

Java-приложение

Мониторинг

Java-приложение

JMX (Java Management Extensions)

<https://jcp.org/en/jsr/detail?id=160>

Мониторинг

Java-приложение

JMX

- Jmxtrans (jmx -> graphite)

<https://www.jmxtrans.org>

Мониторинг

Java-приложение

JMX

- Jmxtrans (jmx -> graphite)
- Jolokia (jmx -> http rest)

<https://jolokia.org>

Мониторинг

Java-приложение

JMX GC-метрики

Мониторинг

Java-приложение

JMX GC-метрики

- G1-Young-Generation

Мониторинг

Java-приложение

JMX GC-метрики

- G1-Young-Generation (count + time)

Мониторинг

Java-приложение

JMX GC-метрики

- G1-Young-Generation (count + time)
- G1-Old-Generation (count + time)

Мониторинг

Java-приложение

JMX GC-метрики

- G1-Young-Generation (count + time)
- G1-Old-Generation (count + time)

А что насчёт Stop-The-World пауз?

Мониторинг

Java-приложение

JVM Opts

-XX:+UseG1GC

Мониторинг

Java-приложение

JVM Opts

-XX:+UseG1GC

-Xloggc:gc.log

Мониторинг

Java-приложение

JVM Opts

-XX:+UseG1GC

-Xloggc:gc.log

-XX:+PrintGCDetails

Мониторинг

Java-приложение

JVM Opts

- XX:+UseG1GC
- Xloggc:gc.log
- XX:+PrintGCDetails
- XX:+PrintGCDateStamps**

Мониторинг

Java-приложение

JVM Opts

- XX:+UseG1GC
- Xloggc:gc.log
- XX:+PrintGCDetails
- XX:+PrintGCDateStamps
- XX:+PrintGCApplicationStoppedTime**

Мониторинг

Java-приложение

gc.log

...

2019-10-10T21:46:43.062+0300: 191860.242:

Total time for which application threads were stopped:

0.0629260 seconds,

Stopping threads took:

0.0003465 seconds

...

Мониторинг

Java-приложение

gc.log

...

2019-10-10T21:46:43.062+0300: 191860.242:

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Java-приложение

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Java-приложение

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Мониторинг

Java-приложение

gc.log

...

2019-10-10T21:46:43.062+0300: 191860.242:

Total time for which application threads were stopped:

0.0629260 seconds,

Stopping threads took:

0.0003465 seconds

...

Это не только STW-паузы!

Мониторинг

Java-приложение

gc.log → Logstash

<https://www.elastic.co/guide/en/logstash/current/plugins-filters-grok.html>

Мониторинг

Java-приложение

gc.log → Logstash → StatsD

<https://github.com/statsd/statsd>

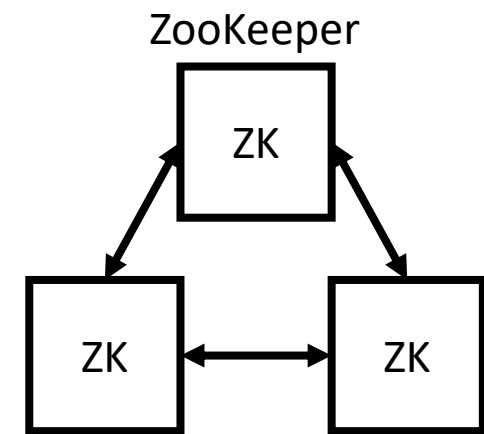
Мониторинг

Java-приложение

gc.log → Logstash → StatsD → Graphite

Мониторинг

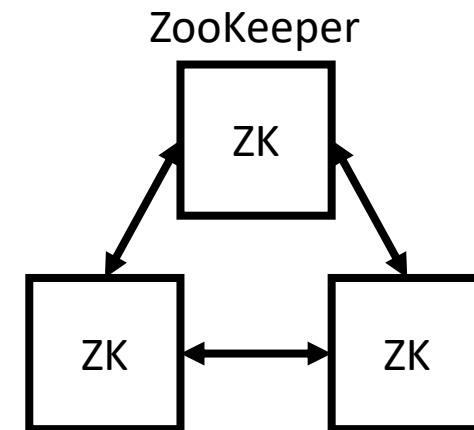
ZooKeeper



Мониторинг

ZooKeeper

Diamond ZookeeperCollector



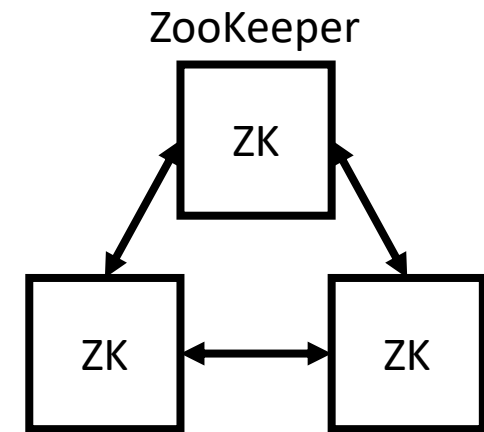
<https://diamond.readthedocs.io/en/latest/collectors/ZookeeperCollector/>

Мониторинг

ZooKeeper

Diamond ZookeeperCollector

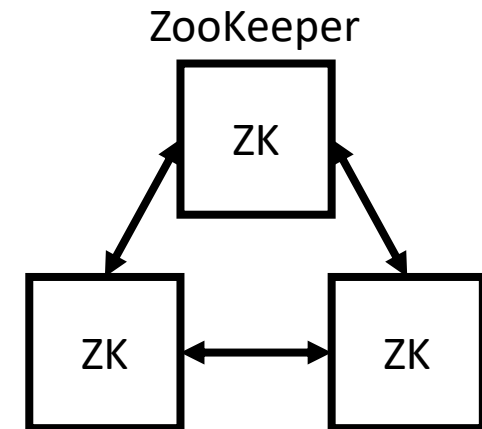
```
echo mntr | nc localhost 2181
```



Мониторинг

ZooKeeper

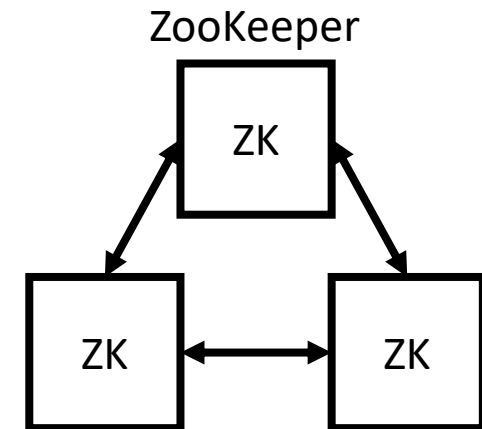
```
zk_avg_latency 0
zk_max_latency 54
zk_min_latency 0
zk_packets_received 42122373
zk_packets_sent 42122373
zk_num_alive_connections 11
zk_outstanding_requests 0
zk_znode_count 3254
zk_watch_count 2
zk_ephemerals_count 17
zk_approximate_data_size 309769
zk_open_file_descriptor_count 43
zk_max_file_descriptor_count 4096
```



Мониторинг

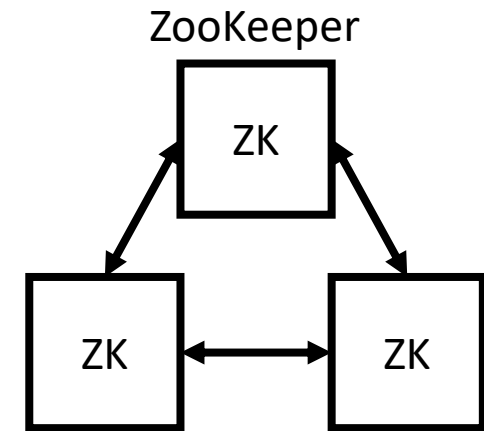
ZooKeeper

```
zk_avg_latency 0
zk_max_latency 54
zk_min_latency 0
zk_packets_received 42122373
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zk_max_file_descriptor_count 4096
```



Мониторинг

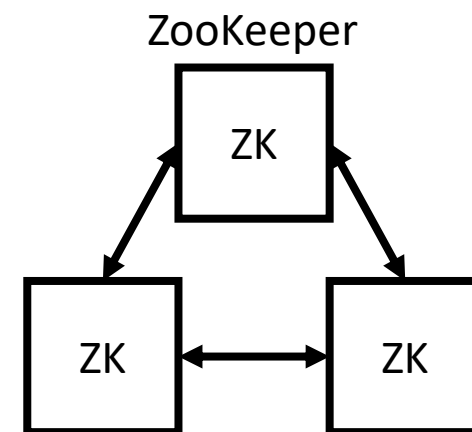
ZooKeeper



zk_version 3.4.9-1757313, built on 08/23/2016 06:50 GMT
zk_server_state follower

Мониторинг

ZooKeeper

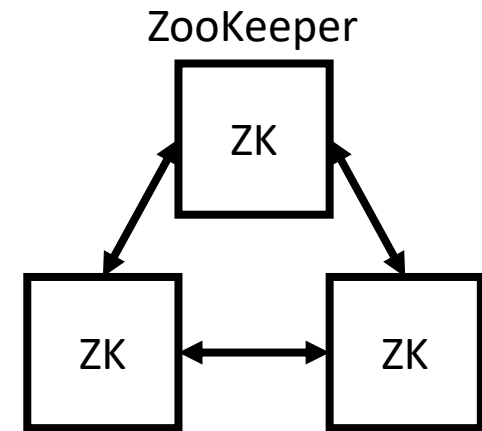


zk_version 3.4.9-1757313, built on 08/23/2016 06:50 GMT
zk_server_state follower

Мониторинг

ZooKeeper

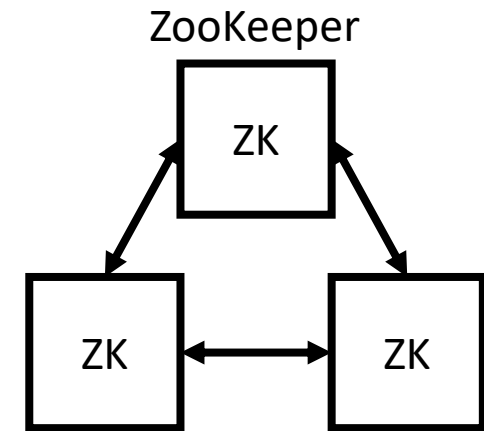
```
zk_server_state leader  
...  
zk_followers 4  
zk_synced_followers 4  
zk_pending_syncs 0
```



Мониторинг

ZooKeeper

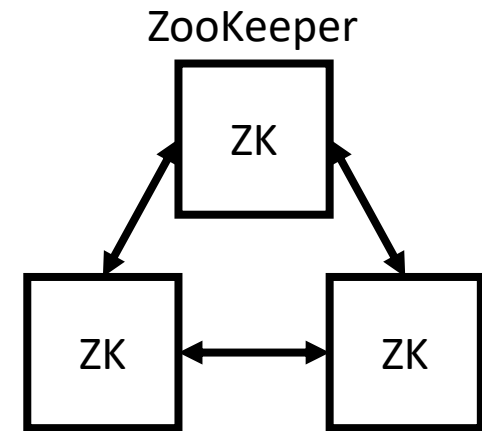
```
zk_server_state leader  
...  
zk_followers 4  
zk_synced_followers 4  
zk_pending_syncs 0
```



Мониторинг

ZooKeeper

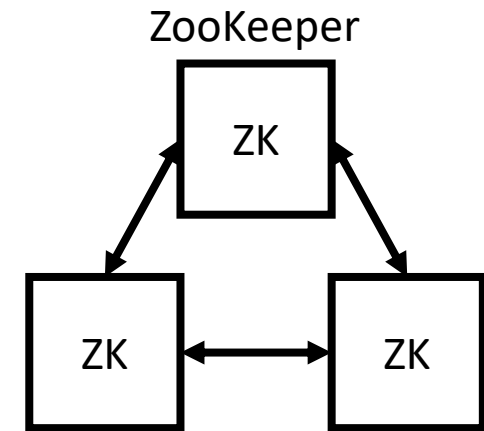
```
zk_server_state leader  
...  
zk_followers 4  
zk_synced_followers 4  
zk_pending_syncs 0
```



Мониторинг

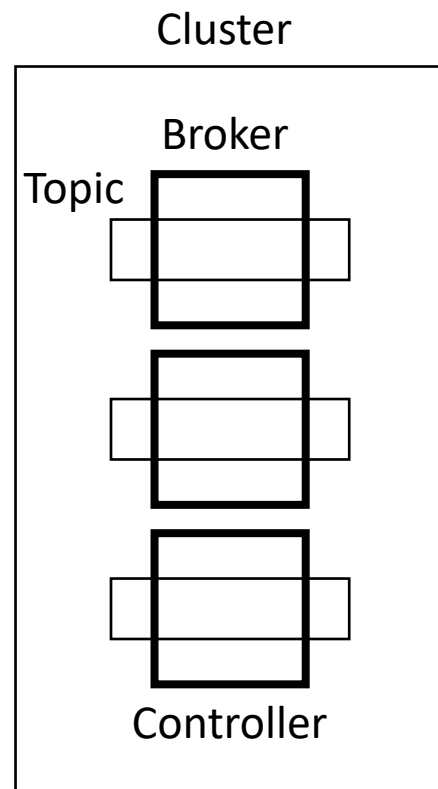
ZooKeeper

```
zk_server_state leader  
...  
zk_followers 4  
zk_synced_followers 4  
zk_pending_syncs 0
```



Мониторинг

Kafka



Мониторинг

Kafka

Метрики

<https://cwiki.apache.org/confluence/display/KAFKA/JMX+Reporters>

Мониторинг

Kafka

Метрики

- JMX

Мониторинг

Kafka

Метрики

- JMX
- KafkaMetricsReporter

Мониторинг

Kafka

Метрики

- JMX

- **KafkaMetricsReporter**

Мониторинг

Kafka

Метрики

- JMX

- **KafkaMetricsReporter**

Kafka Graphite Metrics Reporter

<https://github.com/damienclaveau/kafka-graphite>

Мониторинг

Kafka

Настройка репортера метрик

<https://github.com/damienclaveau/kafka-graphite>

Мониторинг

Kafka

Настройка репортера метрик

- kafka/libs/*.jar

<https://github.com/damienclaveau/kafka-graphite>

Мониторинг

Kafka

Настройка репортера метрик

- kafka/libs/*.jar

kafka-graphite-1.0.4.jar

metrics-graphite-2.2.0.jar

<https://github.com/damienclaveau/kafka-graphite>

Мониторинг

Kafka

Настройка репортера метрик

- kafka/libs/*.jar

- server.properties

Мониторинг

Kafka

Настройка репортера метрик

- kafka/libs/*.jar

- server.properties

```
kafka.metrics.reporters=com.criteo.kafka.KafkaGraphiteMetricsReporter
```

```
kafka.graphite.metrics.reporter.enabled=true
```

```
kafka.graphite.metrics.host=localhost
```

```
kafka.graphite.metrics.port=2003
```


Мониторинг

Kafka

Настройка репортера метрик

- kafka/libs/*.jar

- server.properties

```
kafka.metrics.reporters=com.criteo.kafka.KafkaGraphiteMetricsReporter
```

```
kafka.graphite.metrics.reporter.enabled=true
```

```
kafka.graphite.metrics.host=localhost
```

```
kafka.graphite.metrics.port=2003
```

Мониторинг

Kafka

Настройка репортера метрик

- kafka/libs/*.jar

- server.properties

```
kafka.metrics.reporters=com.criteo.kafka.KafkaGraphiteMetricsReporter
```

```
kafka.graphite.metrics.reporter.enabled=true
```

```
kafka.graphite.metrics.host=localhost
```

```
kafka.graphite.metrics.port=2003
```

Мониторинг

Kafka

Настройка репортера метрик

- kafka/libs/*.jar

- server.properties

```
kafka.metrics.reporters=com.criteo.kafka.KafkaGraphiteMetricsReporter
```

```
kafka.graphite.metrics.reporter.enabled=true
```

```
kafka.graphite.metrics.host=localhost
```

```
kafka.graphite.metrics.port=2003
```

Мониторинг

Kafka

```
MetricName {  
    String name;  
    String group;  
    String description;  
    Map<String, String> tags;  
}
```

Мониторинг

Kafka

```
MetricName {  
    String name;  
    String group;  
    String description;  
    Map<String, String> tags;  
}
```

Мониторинг

Kafka

```
MetricName {  
    String name;  
    String group;  
    String description;  
    Map<String, String> tags;  
}
```

Мониторинг

Kafka

```
MetricName {  
    String name;  
    String group;  
    String description;  
    Map<String, String> tags;  
}
```

Мониторинг

Kafka

tags

```
"topic"      -> "test",  
"partition" -> "0",  
"any"       -> "some.value"
```


Мониторинг

Kafka

tags → sort

```
"any"      -> "some.value",  
"partition" -> "0",  
"topic"    -> "test"
```

Мониторинг

Kafka

tags → sort → replace

```
"any"      -> "some_value",  
"partition" -> "0",  
"topic"    -> "test"
```

Мониторинг

Kafka

tags → sort → replace → join

```
"any.some_value",  
"partition.0",  
"topic.test"
```

Мониторинг

Kafka

tags → sort → replace → join → join

"any.some_value.partition.0.topic.test"

Мониторинг

Kafka

Graphite

prefix.group.any.some_value.partition.0.topic.test.name

Мониторинг

Kafka

Graphite

prefix.group.any.some_value.partition.0.topic.test.name

Мониторинг

Kafka

Graphite

prefix.group.any.some_value.partition.0.topic.test.name

Мониторинг

Kafka

Graphite

prefix.group.any.some_value.partition.0.topic.test.name

Мониторинг

Kafka

Graphite

prefix.group.any.some_value.partition.0.topic.test.name

Мониторинг

Kafka

Graphite

prefix.group.any.some_value.partition.0.topic.test.name

Мониторинг

Kafka

~ 5 000 метрик / брокер

Мониторинг

Kafka

~ 5 000 метрик / брокер

- ТОПИКИ

Мониторинг

Kafka

~ 5 000 метрик / брокер

- топики
- партиции

Мониторинг

Kafka

~ 5 000 метрик / брокер

- топики
- партиции
- брокеры

Мониторинг

Kafka

~ 5 000 метрик / брокер

- топики
- партиции
- брокеры
- ...

Мониторинг

Kafka

Кластер – живи!

Мониторинг

Kafka

Кластер – живи!

`server.KafkaServer.BrokerState.value`

Мониторинг

Kafka

Кластер – живи!

```
server.KafkaServer.BrokerState.value
```

```
controller.KafkaController.ActiveControllerCount.value
```

Мониторинг

Kafka

Кластер – живи!

```
server.KafkaServer.BrokerState.value
```

```
controller.KafkaController.ActiveControllerCount.value
```

```
controller.KafkaController.OfflinePartitionsCount.value
```

Мониторинг

Kafka

Кластер – живи!

```
server.KafkaServer.BrokerState.value
```

```
controller.KafkaController.ActiveControllerCount.value
```

```
controller.KafkaController.OfflinePartitionsCount.value
```

```
controller.ControllerStats.LeaderElectionRateAndTimeMs.1MinuteRate
```

Мониторинг

Kafka

Реплики

Мониторинг

Kafka

Реплики

`server.ReplicaManager.PartitionCount.value`

Мониторинг

Kafka

Реплики

`server.ReplicaManager.PartitionCount.value`

`server.ReplicaManager.UnderReplicatedPartitions.value`

Мониторинг

Kafka

Реплики

```
server.ReplicaManager.PartitionCount.value
```

```
server.ReplicaManager.UnderReplicatedPartitions.value
```

```
cluster.Partition.*.topic.*.UnderReplicated.value
```


Мониторинг

Kafka

Трафик

Мониторинг

Kafka

Трафик

```
server.BrokerTopicsMetrics.MessagesInPerSec.1MinuteRate  
server.BrokerTopicsMetrics.BytesInPerSec.1MinuteRate  
server.BrokerTopicsMetrics.BytesOutPerSec.1MinuteRate
```

Мониторинг

Kafka

Трафик

```
server.BrokerTopicsMetrics.MessagesInPerSec.1MinuteRate
```

```
server.BrokerTopicsMetrics.BytesInPerSec.1MinuteRate
```

```
server.BrokerTopicsMetrics.BytesOutPerSec.1MinuteRate
```

```
server.BrokerTopicsMetrics.topic.*.MessagesInPerSec.1MinuteRate
```

```
server.BrokerTopicsMetrics.topic.*.BytesInPerSec.1MinuteRate
```

```
server.BrokerTopicsMetrics.topic.*.BytesOutPerSec.1MinuteRate
```

Мониторинг

Kafka

RED (Rate, Errors, Duration)

Мониторинг

Kafka

RED (Rate, Errors, Duration)

```
network.RequestMetrics.error.*.request.Produce.ErrorsPerSec.1MinuteRate  
network.RequestMetrics.error.*.request.Fetch.ErrorsPerSec.1MinuteRate
```

Мониторинг

Kafka

RED (Rate, Errors, Duration)

```
network.RequestMetrics.error.*.request.Produce.ErrorsPerSec.1MinuteRate  
network.RequestMetrics.error.*.request.Fetch.ErrorsPerSec.1MinuteRate
```

Мониторинг

Kafka

RED (Rate, Errors, Duration)

```
network.RequestMetrics.error.*.request.Produce.ErrorsPerSec.1MinuteRate  
network.RequestMetrics.error.*.request.Fetch.ErrorsPerSec.1MinuteRate
```

```
network.RequestMetrics.request.Produce.TotalTimeMs.95percentile  
network.RequestMetrics.request.FetchConsumer.TotalTimeMs.95percentile  
network.RequestMetrics.request.FetchFollower.TotalTimeMs.95percentile
```

kafka/bin/kafka-*.sh

kafka/bin/kafka-*.sh

--bootstrap-server

vs

--broker-list

kafka/bin/kafka-*.sh

--bootstrap-server

vs

--broker-list

vs

--zookeeper

kafka/bin/kafka-*.sh

--bootstrap-server

vs

--broker-list

vs

--zookeeper

[KIP-500: Replace ZooKeeper with a Self-Managed Metadata Quorum](#)

(Accepted)

kafka/bin/kafka-*.sh

МНОГОСЛОВНОСТЬ

kafka/bin/kafka-*.sh

Многословность

- Много параметров

kafka/bin/kafka-*.sh

Многословность

- Много параметров
- Много действий

kafka/bin/kafka-*.sh

Многословность

- Много параметров
- Много действий
- Много JSON

Tools

- Web UI
- Администрирование
- Health Check
- Consumer group lag monitoring

Web UI

Web UI

- Как CLI, но только web

Web UI

- Как CLI, но только web
- Лаконичность команд

Web UI

- Как CLI, но только web
- Лаконичность команд
- Низкий порог входа

Kafka Manager

Web UI

<https://github.com/yahoo/kafka-manager>

Kafka Manager

Web UI

- Поддержка нескольких кластеров

<https://github.com/yahoo/kafka-manager>

Kafka Manager

Web UI

- Поддержка нескольких кластеров
- Статистика по кластерам / брокерам / топикам / партициям

<https://github.com/yahoo/kafka-manager>

Kafka Manager

Web UI

- Поддержка нескольких кластеров
- Статистика по кластерам / брокерам / топикам / партициям
- Создание / удаление / редактирование топиков

<https://github.com/yahoo/kafka-manager>

Kafka Manager

Web UI

- Поддержка нескольких кластеров
- Статистика по кластерам / брокерам / топикам / партициям
- Создание / удаление / редактирование топиков

- Администрирование

Kafka Manager

Web UI

- Поддержка нескольких кластеров
- Статистика по кластерам / брокерам / топикам / партициям
- Создание / удаление / редактирование топиков

- Администрирование
- Consumer group lag monitoring



Cluster Information

Zookeepers

zk1:2181 zk2:2181 zk3:2181

Version

2.2.0

Cluster Summary

Topics

242

Brokers

9



Cluster Information

Zookeepers

zk1:2181 zk2:2181 zk3:2181

Version

2.2.0

Cluster Summary

Topics

242

Brokers

9



Cluster Information

Zookeepers

zk1:2181 zk2:2181 zk3:2181

Version

2.2.0

Cluster Summary

Topics

242

Brokers

9

Broker

← Broker Id 1

Summary

| | |
|---------------------------|--------|
| # of Topics | 117 |
| # of Partitions | 355 |
| # of Partitions as Leader | 122 |
| % of Messages | 10.957 |
| % of Incoming | 10.723 |
| % of Outgoing | 10.566 |

Broker

| Metrics | | | | |
|-----------------------------|------|-------|-------|--------|
| Rate | Mean | 1 min | 5 min | 15 min |
| Messages in /sec | 124k | 131k | 129k | 126k |
| Bytes in /sec | 58m | 62m | 60m | 59m |
| Bytes out /sec | 134m | 141m | 139m | 136m |
| Bytes rejected /sec | 0.00 | 0.00 | 0.00 | 0.00 |
| Failed fetch request /sec | 0.00 | 0.00 | 0.00 | 0.00 |
| Failed produce request /sec | 0.00 | 0.00 | 0.00 | 0.00 |

Topic

| Topic Summary | |
|-----------------------------|-----------------|
| Replication | 3 |
| Number of Partitions | 48 |
| Sum of partition offsets | 514,665,665,677 |
| Total number of Brokers | 9 |
| Number of Brokers for Topic | 9 |
| Preferred Replicas % | 100 |
| Brokers Skewed % | 22 |
| Brokers Leader Skewed % | 0 |
| Brokers Spread % | 100 |
| Under-replicated % | 0 |

Topic

| Topic Summary | |
|-----------------------------|-----------------|
| Replication | 3 |
| Number of Partitions | 48 |
| Sum of partition offsets | 514,665,665,677 |
| Total number of Brokers | 9 |
| Number of Brokers for Topic | 9 |
| Preferred Replicas % | 100 |
| Brokers Skewed % | 22 |
| Brokers Leader Skewed % | 0 |
| Brokers Spread % | 100 |
| Under-replicated % | 0 |

Topic

| Metrics | | | | |
|-----------------------------|------|-------|-------|--------|
| Rate | Mean | 1 min | 5 min | 15 min |
| Messages in /sec | 27k | 52k | 50k | 48k |
| Bytes in /sec | 26m | 49m | 47m | 45m |
| Bytes out /sec | 27m | 46m | 46m | 46m |
| Bytes rejected /sec | 0.00 | 0.00 | 0.00 | 0.00 |
| Failed fetch request /sec | 0.00 | 0.00 | 0.00 | 0.00 |
| Failed produce request /sec | 0.00 | 0.00 | 0.00 | 0.00 |

Topic

Partitions by Broker

| Broker | # of Partitions | # as Leader | Partitions | Skewed? | Leader Skewed? |
|--------|-----------------|-------------|--|---------|----------------|
| 1 | 16 | 5 | (6,7,8,13,14,15,19,20,24,33,34,35,38,40,42,46) | false | false |
| 2 | 17 | 6 | (0,1,2,9,16,17,18,22,23,27,28,29,36,41,43,45,47) | true | false |
| 3 | 15 | 5 | (3,4,5,10,11,12,21,25,26,30,31,32,37,39,44) | false | false |
| 4 | 16 | 5 | (5,6,7,12,13,14,18,19,23,32,33,34,37,39,41,45) | false | false |
| 5 | 16 | 5 | (0,1,8,15,16,17,21,22,26,27,28,35,40,42,44,46) | false | false |

Topic

Partitions by Broker

| Broker | # of Partitions | # as Leader | Partitions | Skewed? | Leader Skewed? |
|--------|-----------------|-------------|--|---------|----------------|
| 1 | 16 | 5 | (6,7,8,13,14,15,19,20,24,33,34,35,38,40,42,46) | false | false |
| 2 | 17 | 6 | (0,1,2,9,16,17,18,22,23,27,28,29,36,41,43,45,47) | true | false |
| 3 | 15 | 5 | (3,4,5,10,11,12,21,25,26,30,31,32,37,39,44) | false | false |
| 4 | 16 | 5 | (5,6,7,12,13,14,18,19,23,32,33,34,37,39,41,45) | false | false |
| 5 | 16 | 5 | (0,1,8,15,16,17,21,22,26,27,28,35,40,42,44,46) | false | false |

Topic

Partition Information

| Partition | Latest Offset | Leader | Replicas | In Sync Replicas | Preferred Leader? | Under Replicated? |
|-----------|----------------|--------|----------|------------------|-------------------|-------------------|
| 0 | 10,722,320,993 | 2 | (2,8,5) | (2,8,5) | true | false |
| 1 | 10,722,310,460 | 9 | (9,5,2) | (9,2,5) | true | false |
| 2 | 10,722,159,195 | 6 | (6,2,9) | (9,2,6) | true | false |
| 3 | 10,722,244,092 | 3 | (3,9,6) | (9,3,6) | true | false |
| 4 | 10,722,226,642 | 7 | (7,6,3) | (3,7,6) | true | false |
| 5 | 10,722,223,157 | 4 | (4,3,7) | (3,4,7) | true | false |
| 6 | 10,722,129,280 | 1 | (1,7,4) | (4,7,1) | true | false |
| 7 | 10,722,198,850 | 8 | (8,4,1) | (8,4,1) | true | false |
| 8 | 10,722,120,015 | 5 | (5,1,8) | (8,5,1) | true | false |

Topic

Partition Information

| Partition | Latest Offset | Leader | Replicas | In Sync Replicas | Preferred Leader? | Under Replicated? |
|-----------|----------------|--------|----------|------------------|-------------------|-------------------|
| 0 | 10,722,320,993 | 2 | (2,8,5) | (2,8,5) | true | false |
| 1 | 10,722,310,460 | 9 | (9,5,2) | (9,2,5) | true | false |
| 2 | 10,722,159,195 | 6 | (6,2,9) | (9,2,6) | true | false |
| 3 | 10,722,244,092 | 3 | (3,9,6) | (9,3,6) | true | false |
| 4 | 10,722,226,642 | 7 | (7,6,3) | (3,7,6) | true | false |
| 5 | 10,722,223,157 | 4 | (4,3,7) | (3,4,7) | true | false |
| 6 | 10,722,129,280 | 1 | (1,7,4) | (4,7,1) | true | false |
| 7 | 10,722,198,850 | 8 | (8,4,1) | (8,4,1) | true | false |
| 8 | 10,722,120,015 | 5 | (5,1,8) | (8,5,1) | true | false |

Kafka Manager

Альтернативные инструменты

Kafka Manager

Альтернативные инструменты

- Kafka Eagle

<https://github.com/smartloli/kafka-eagle>

Kafka Manager

Альтернативные инструменты

- Kafka Eagle
- KafkaHQ

<https://github.com/tchiotludo/kafkahq>

Kafka Manager

Альтернативные инструменты

- Kafka Eagle
- KafkaHQ
- Kafdrop

<https://github.com/HomeAdvisor/Kafdrop>

Администрирование

Администрирование

- Обновление настроек брокера

Администрирование

- Обновление настроек брокера
- Обновление версии

Администрирование

- Обновление настроек брокера
- Обновление версии
- Добавление/удаление брокера

Администрирование

- Обновление настроек брокера
- Обновление версии
- Добавление/удаление брокера
- Добавление/удаление диска

Администрирование

- Обновление настроек брокера
- Обновление версии
- Добавление/удаление брокера
- Добавление/удаление диска
- Балансировка нагрузки

Обновление настроек брокера

Обновление настроек брокера

[KIP-226 - Dynamic Broker Configuration](#) (1.1)

Обновление настроек брокера

[KIP-226 - Dynamic Broker Configuration](#) (1.1)

- read-only
- per-broker
- cluster-wide

Обновление настроек брокера

[KIP-226 - Dynamic Broker Configuration](#) (1.1)

- **read-only**
- per-broker
- cluster-wide

`server.properties`

Обновление настроек брокера

[KIP-226 - Dynamic Broker Configuration](#) (1.1)

- read-only
- **per-broker**
- **cluster-wide**

Динамические настройки (применяются без перезагрузки)

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
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  --add-config k1=v1,k2=v2,k3=v3
```

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```


Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Настройка per-broker для брокера №0

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Настройка `cluster-wide` по умолчанию

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Просмотр значения:

```
--describe
```

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Обновление настроек брокера

```
kafka/bin/kafka-configs \  
  --bootstrap-server localhost:9092 \  
  --entity-type brokers \  
  --entity-name 0 \ или --entity-default \  
  --alter \  
  --add-config k1=v1,k2=v2,k3=v3
```

Удаление настройки:

```
--alter  
--delete-config k1,k2,k3
```

Обновление версии

Обновление версии

`inter.broker.protocol.version=2.0-IV1`

`log.message.format.version=2.0-IV1`

Обновление версии

`inter.broker.protocol.version=2.0-IV1`

`log.message.format.version=2.0-IV1`

1. Добавить настройки в `server.properties`

Обновление версии

```
inter.broker.protocol.version=2.0-IV1  
log.message.format.version=2.0-IV1
```

1. Добавить настройки в server.properties
2. Обновить код

Обновление версии

```
inter.broker.protocol.version=2.0-IV1  
log.message.format.version=2.0-IV1
```

1. Добавить настройки в server.properties
2. Обновить код
3. Kafka Rolling Restart

Обновление версии

`inter.broker.protocol.version=2.3-IV1`

`log.message.format.version=2.0-IV1`

1. Добавить настройки в `server.properties`
2. Обновить код
3. Kafka Rolling Restart
4. Обновить `inter.broker.protocol.version`

Обновление версии

`inter.broker.protocol.version=2.3-IV1`

`log.message.format.version=2.0-IV1`

1. Добавить настройки в `server.properties`
2. Обновить код
3. Kafka Rolling Restart
4. Обновить `inter.broker.protocol.version`
5. Kafka Rolling Restart

Обновление версии

`inter.broker.protocol.version=2.3-IV1`

`log.message.format.version=2.3-IV1`

1. Добавить настройки в `server.properties`
2. Обновить код
3. Kafka Rolling Restart
4. Обновить `inter.broker.protocol.version`
5. Kafka Rolling Restart
6. Обновить `log.message.format.version`

Обновление версии

`inter.broker.protocol.version=2.3-IV1`

`log.message.format.version=2.3-IV1`

1. Добавить настройки в `server.properties`
2. Обновить код
3. Kafka Rolling Restart
4. Обновить `inter.broker.protocol.version`
5. Kafka Rolling Restart
6. Обновить `log.message.format.version`
7. Kafka Rolling Restart

Обновление версии

`inter.broker.protocol.version=2.3-IV1`

`log.message.format.version=2.3-IV1`

1. Добавить настройки в `server.properties`
2. Обновить код
3. **Kafka Rolling Restart**
4. Обновить `inter.broker.protocol.version`
5. **Kafka Rolling Restart**
6. Обновить `log.message.format.version`
7. **Kafka Rolling Restart**

Kafka Rolling Restart

Kafka Rolling Restart

У кого автоматизировано?

Kafka Rolling Restart

Kafka-Utils

<https://github.com/Yelp/kafka-utils>

<https://kafka-utils.readthedocs.io>

Kafka Rolling Restart

Kafka-Utills

```
kafka-rolling-restart \  
  --cluster-type hercules \  
  --cluster-name staging \  
  --check-interval 5 \  
  --check-count 3 \  
  --unhealthy-time-limit 600 \  
  --jolokia-port 8778 \  
  --jolokia-prefix "jolokia/"
```

<https://github.com/Yelp/kafka-utils>

<https://kafka-utils.readthedocs.io>

Kafka Rolling Restart

Kafka-Utills

```
kafka-rolling-restart \  
  --cluster-type hercules \  
  --cluster-name staging \  
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  --check-count 3 \  
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Kafka Rolling Restart

Kafka-Utills

```
kafka-rolling-restart \  
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  --cluster-name staging \  
  --check-interval 5 \  
  --check-count 3 \  
  --unhealthy-time-limit 600 \  
  --jolokia-port 8778 \  
  --jolokia-prefix "jolokia/"
```

<https://github.com/Yelp/kafka-utills>

<https://kafka-utills.readthedocs.io>

Kafka Rolling Restart

Kafka-Utills

```
kafka-rolling-restart \  
  --cluster-type hercules \  
  --cluster-name staging \  
  --check-interval 5 \  
  --check-count 3 \  
  --unhealthy-time-limit 600 \  
  --jolokia-port 8778 \  
  --jolokia-prefix "jolokia/"
```

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Kafka Rolling Restart

Kafka-Utills

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kafka-rolling-restart \  
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  --check-count 3 \  
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  --jolokia-port 8778 \  
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```

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Kafka Rolling Restart

Kafka-Utills

```
kafka-rolling-restart \  
  --cluster-type hercules \  
  --cluster-name staging \  
  --check-interval 5 \  
  --check-count 3 \  
  --unhealthy-time-limit 600 \  
  --jolokia-port 8778 \  
  --jolokia-prefix "jolokia/"
```

<https://github.com/Yelp/kafka-utils>

<https://kafka-utils.readthedocs.io>

Kafka Rolling Restart

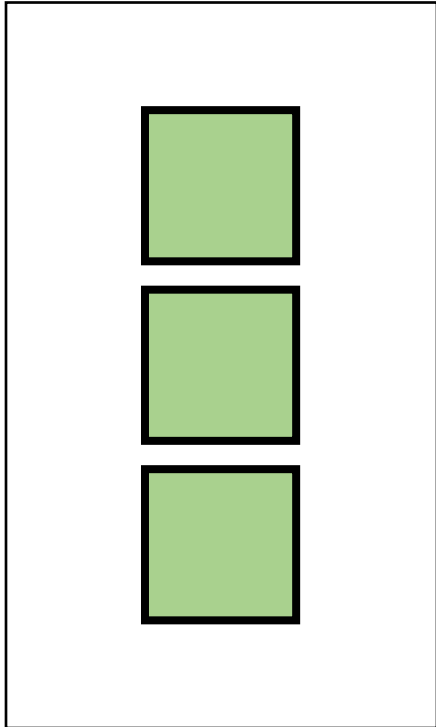
Kafka-Utills

```
kafka-rolling-restart \  
  --cluster-type hercules \  
  --cluster-name staging \  
  --check-interval 5 \  
  --check-count 3 \  
  --unhealthy-time-limit 600 \  
  --jolokia-port 8778 \  
  --jolokia-prefix "jolokia/"
```

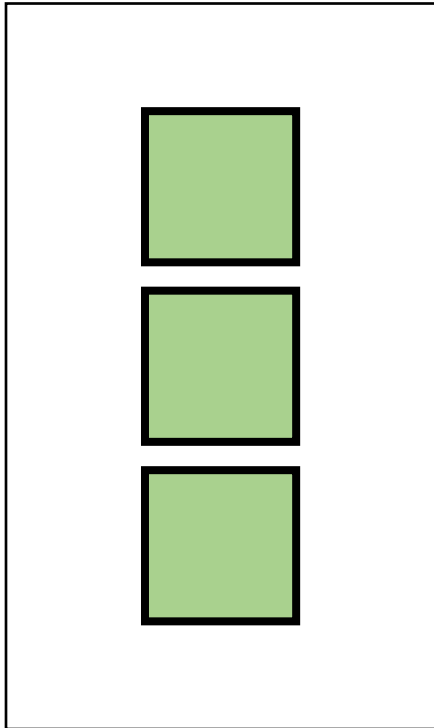
<https://github.com/Yelp/kafka-utils>

<https://kafka-utils.readthedocs.io>

Kafka Rolling Restart



Kafka Rolling Restart



Will restart the following brokers in staging-hercules:

1: hercules-01

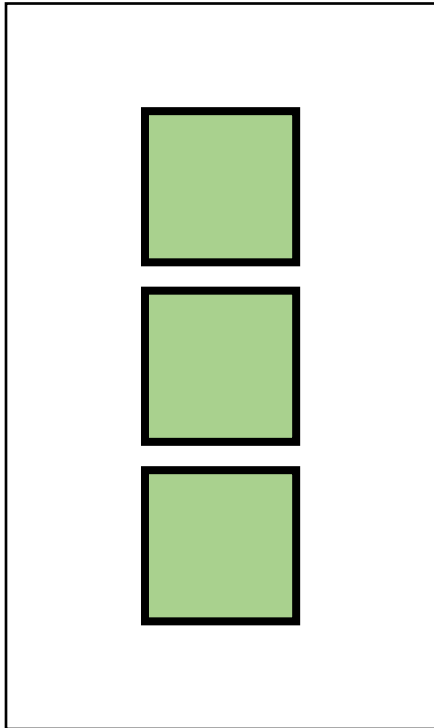
2: hercules-02

3: hercules-03

Do you want to restart these brokers?

Kafka Rolling Restart

`--no-confirm`



Will restart the following brokers in staging-hercules:

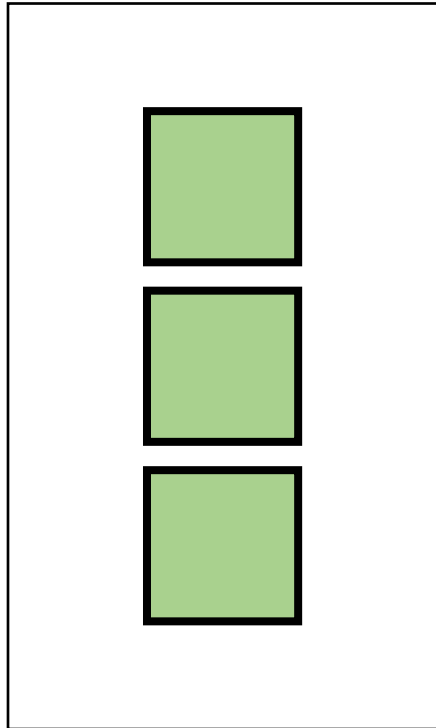
1: hercules-01

2: hercules-02

3: hercules-03

Do you want to restart these brokers?

Kafka Rolling Restart



Will restart the following brokers in staging-hercules:

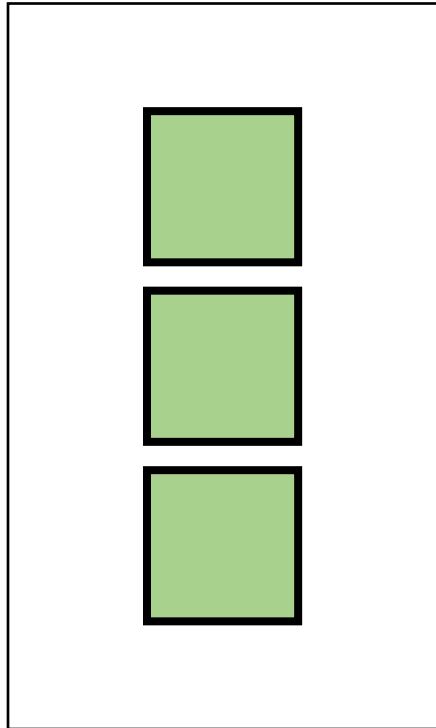
1: hercules-01

2: hercules-02

3: hercules-03

Do you want to restart these brokers? yes

Kafka Rolling Restart



Will restart the following brokers in staging-hercules:

1: hercules-01

2: hercules-02

3: hercules-03

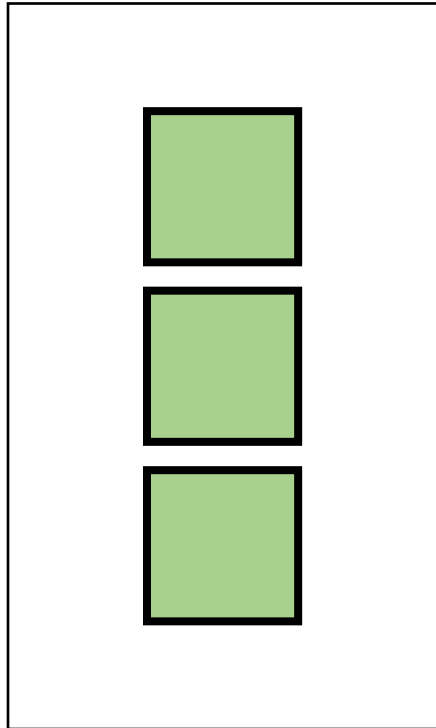
Do you want to restart these brokers? yes

Execute restart

Under replicated partitions: 0, missing brokers: 0 (1/1)

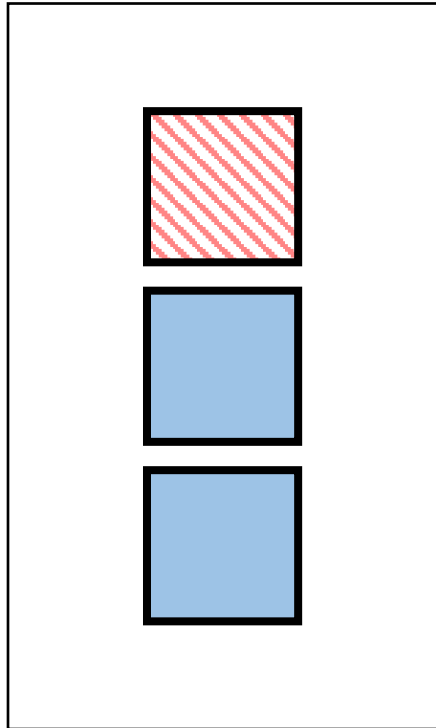
The cluster is stable

Kafka Rolling Restart



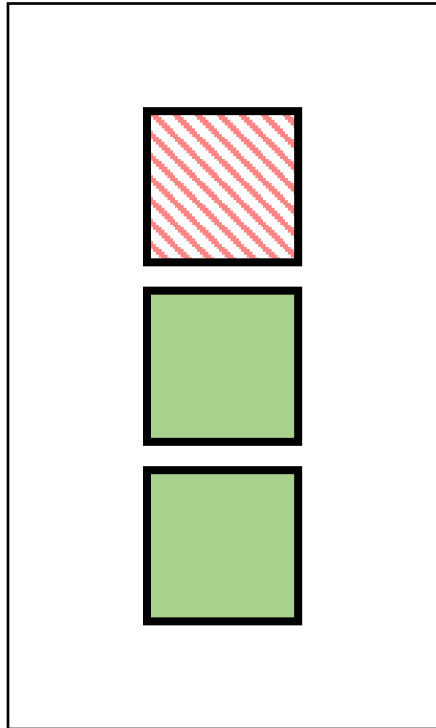
...
Stopping hercules-01 (1/3)

Kafka Rolling Restart



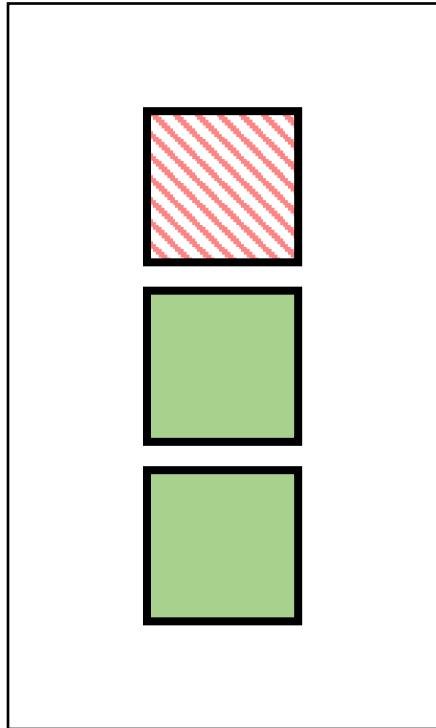
...
Stopping hercules-01 (1/3)

Kafka Rolling Restart



...
Stopping hercules-01 (1/3)

Kafka Rolling Restart

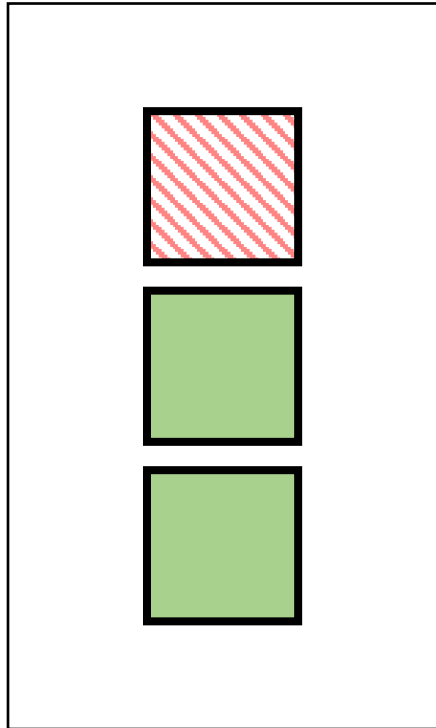


...

Stopping hercules-01 (1/3)

Starting hercules-01 (1/3)

Kafka Rolling Restart



...

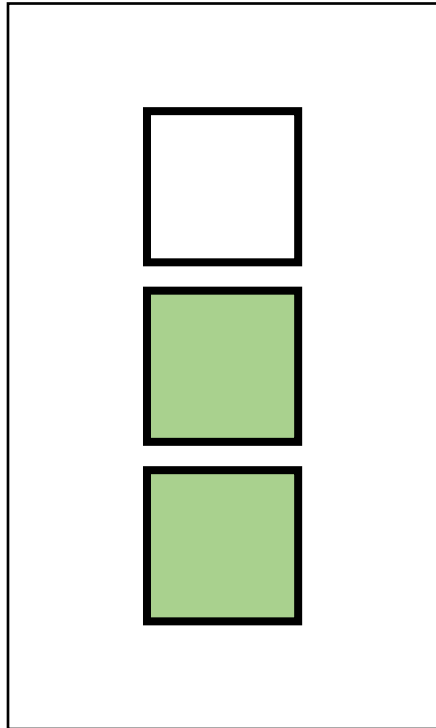
Stopping hercules-01 (1/3)

Starting hercules-01 (1/3)

Broker hercules-01 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Kafka Rolling Restart



...

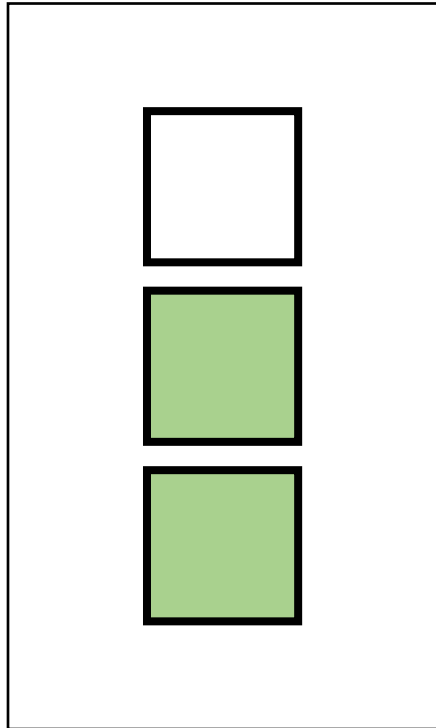
Stopping hercules-01 (1/3)

Starting hercules-01 (1/3)

Broker hercules-01 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Kafka Rolling Restart



...

Stopping hercules-01 (1/3)

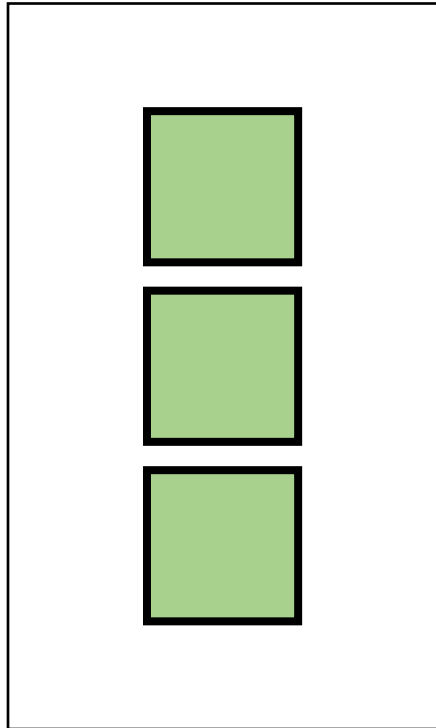
Starting hercules-01 (1/3)

Broker hercules-01 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Kafka Rolling Restart



...

Stopping hercules-01 (1/3)

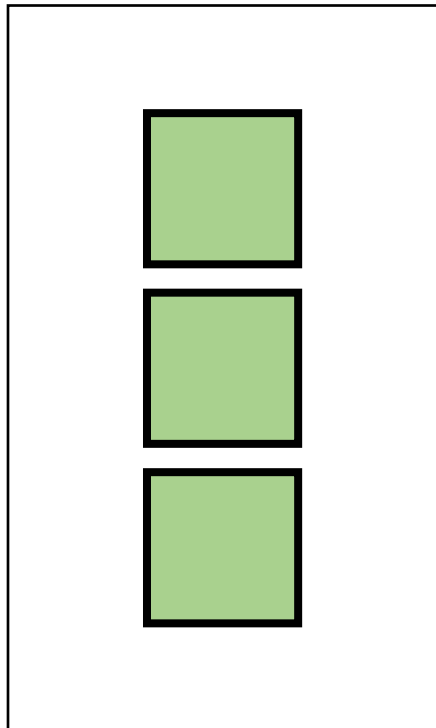
Starting hercules-01 (1/3)

Broker hercules-01 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Kafka Rolling Restart



...

Stopping hercules-01 (1/3)

Starting hercules-01 (1/3)

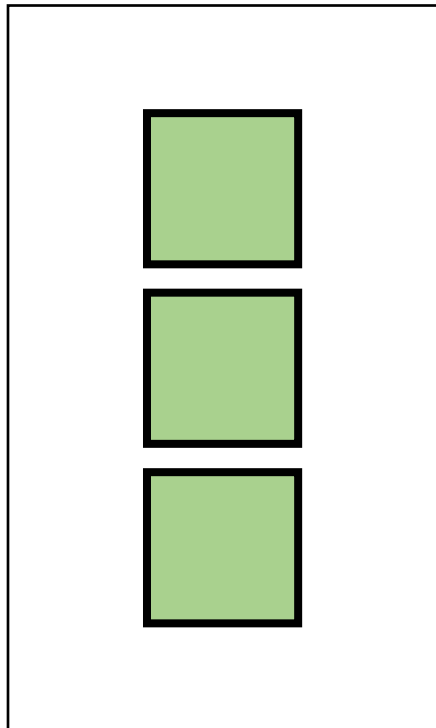
Broker hercules-01 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Under replicated partitions: 0, missing brokers: 0 (1/3)

Kafka Rolling Restart



...

Stopping hercules-01 (1/3)

Starting hercules-01 (1/3)

Broker hercules-01 is down: ...

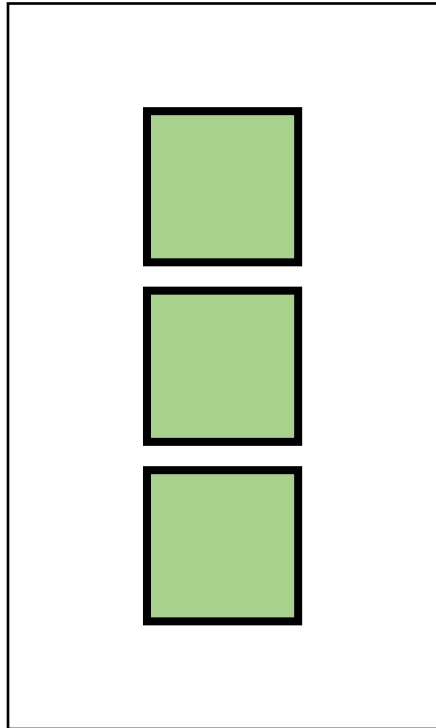
Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Under replicated partitions: 0, missing brokers: 0 (1/3)

Under replicated partitions: 0, missing brokers: 0 (2/3)

Kafka Rolling Restart



...

Stopping hercules-01 (1/3)

Starting hercules-01 (1/3)

Broker hercules-01 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

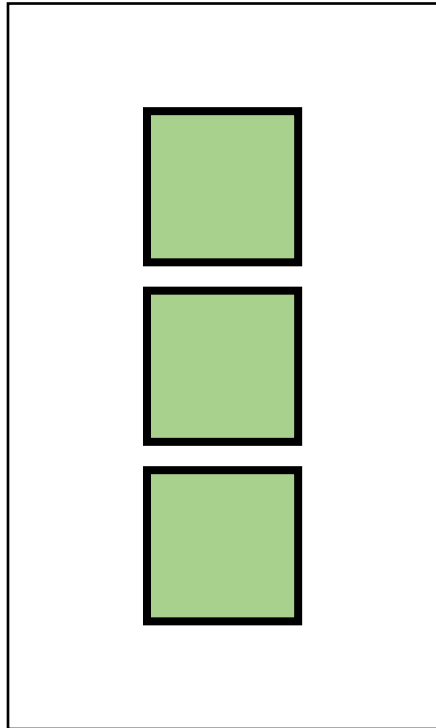
Under replicated partitions: 0, missing brokers: 0 (1/3)

Under replicated partitions: 0, missing brokers: 0 (2/3)

Under replicated partitions: 0, missing brokers: 0 (3/3)

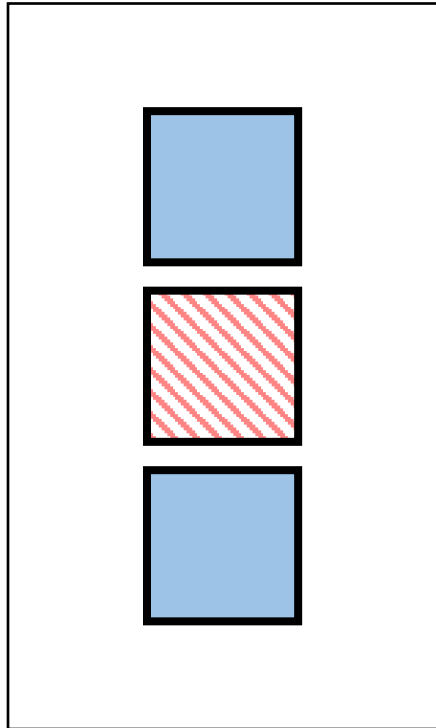
The cluster is stable

Kafka Rolling Restart



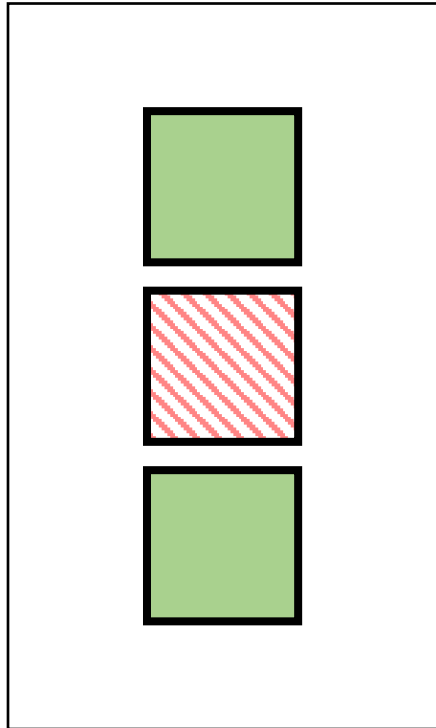
...
Stopping hercules-02 (2/3)

Kafka Rolling Restart



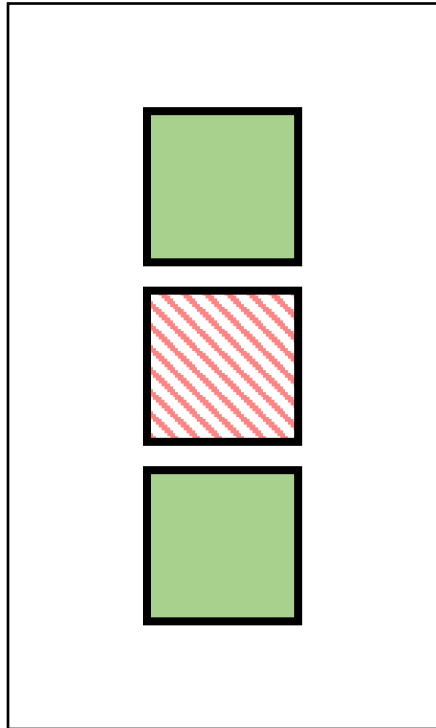
...
Stopping hercules-02 (2/3)

Kafka Rolling Restart



...
Stopping hercules-02 (2/3)

Kafka Rolling Restart

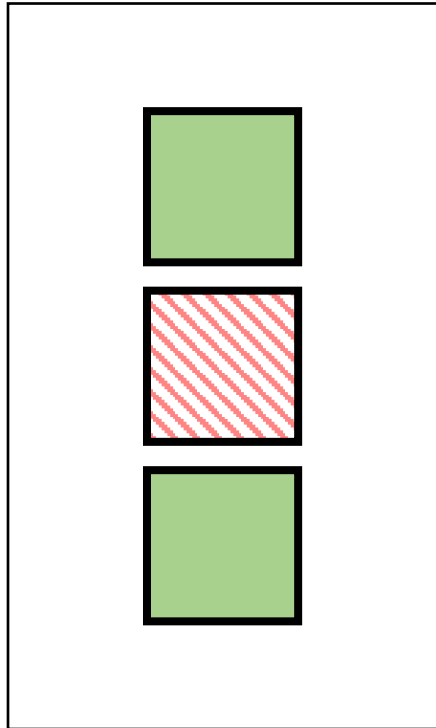


...

Stopping hercules-02 (2/3)

Starting hercules-02 (2/3)

Kafka Rolling Restart



...

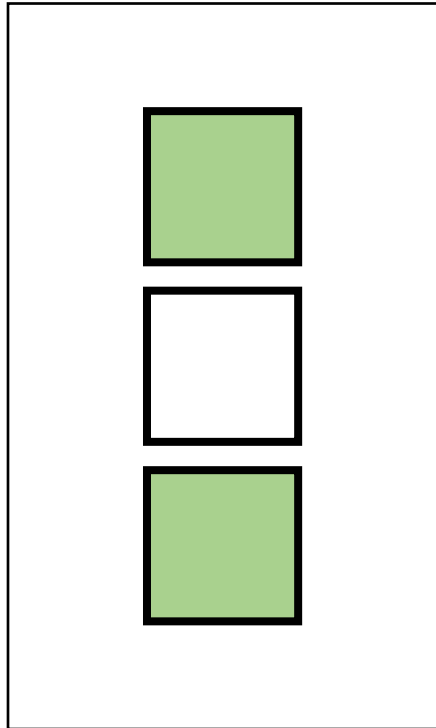
Stopping hercules-02 (2/3)

Starting hercules-02 (2/3)

Broker hercules-02 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Kafka Rolling Restart



...

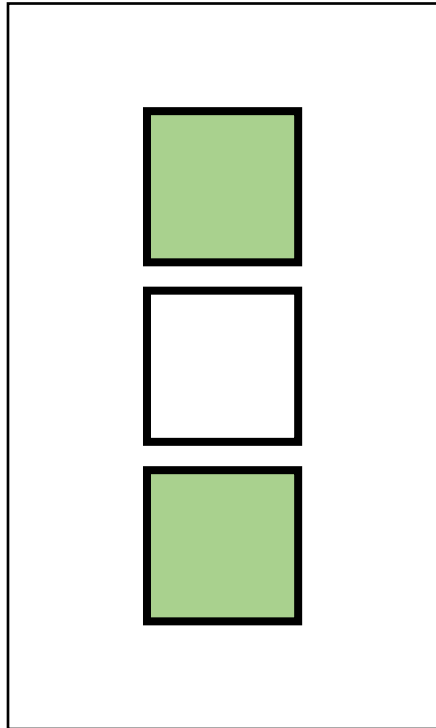
Stopping hercules-02 (2/3)

Starting hercules-02 (2/3)

Broker hercules-02 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Kafka Rolling Restart



...

Stopping hercules-02 (2/3)

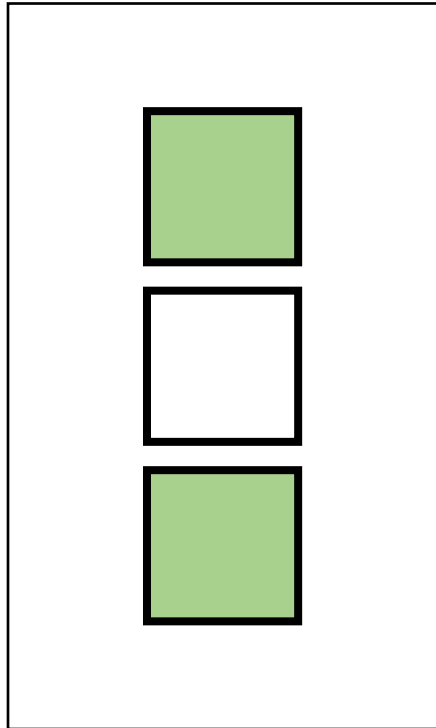
Starting hercules-02 (2/3)

Broker hercules-02 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Kafka Rolling Restart



...

Stopping hercules-02 (2/3)

Starting hercules-02 (2/3)

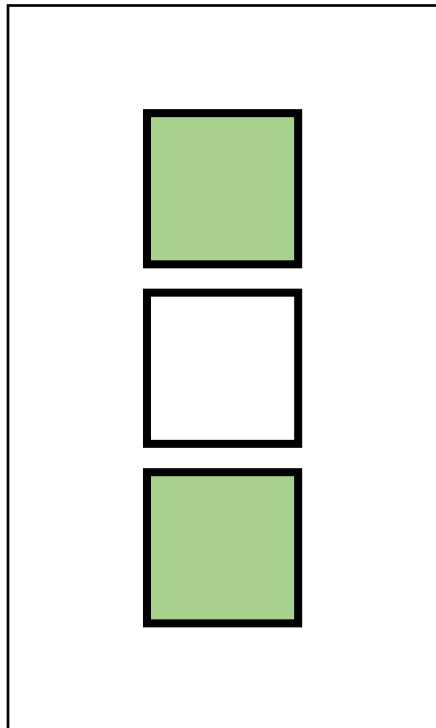
Broker hercules-02 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Kafka Rolling Restart



...

Stopping hercules-02 (2/3)

Starting hercules-02 (2/3)

Broker hercules-02 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

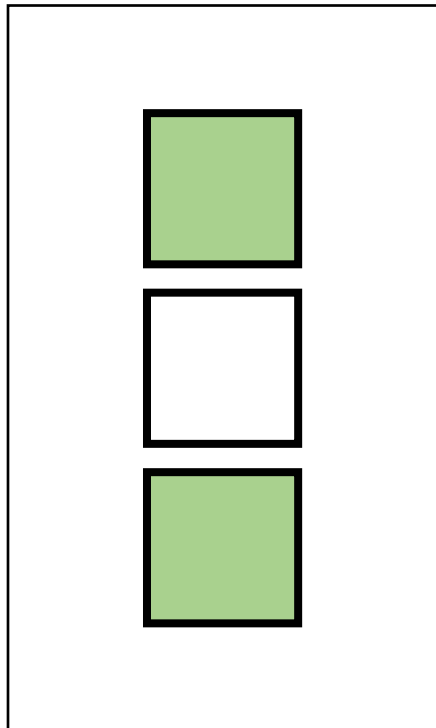
Under replicated partitions: 45, missing brokers: 0 (0/3)

...

Under replicated partitions: xx, missing brokers: 0 (0/3)

Kafka Rolling Restart

`--unhealthy-time-limit 600`



...

Stopping hercules-02 (2/3)

Starting hercules-02 (2/3)

Broker hercules-02 is down: ...

Under replicated partitions: 45, missing brokers: 1 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

Under replicated partitions: 45, missing brokers: 0 (0/3)

...

Under replicated partitions: xx, missing brokers: 0 (0/3)

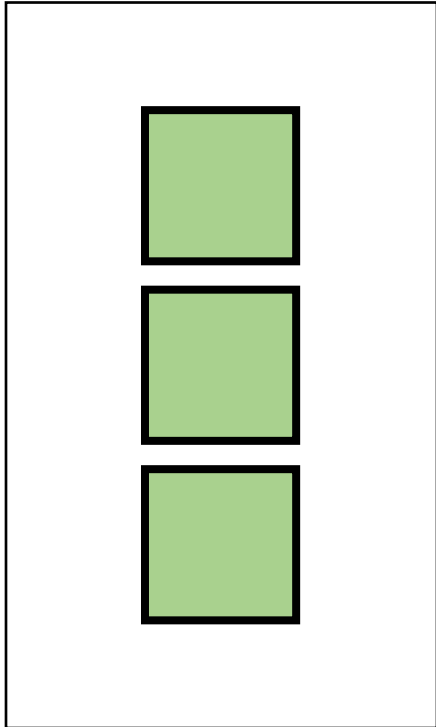
Kafka Rolling Restart

```
kafka-rolling-restart \  
  --cluster-type hercules \  
  --cluster-name staging \  
  --skip 2
```

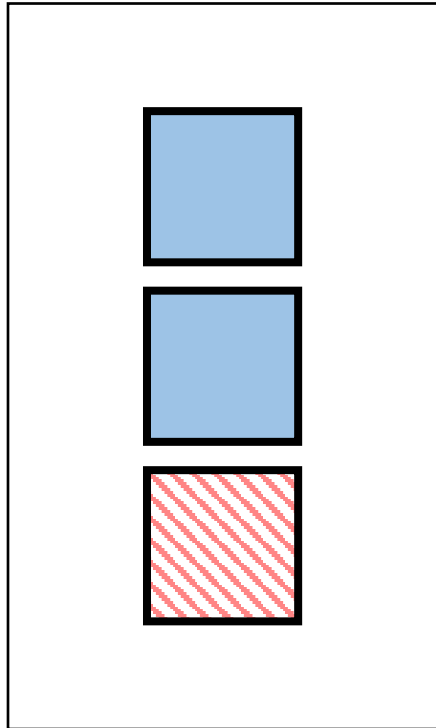
Kafka Rolling Restart

```
kafka-rolling-restart \  
  --cluster-type hercules \  
  --cluster-name staging \  
  --skip 2
```

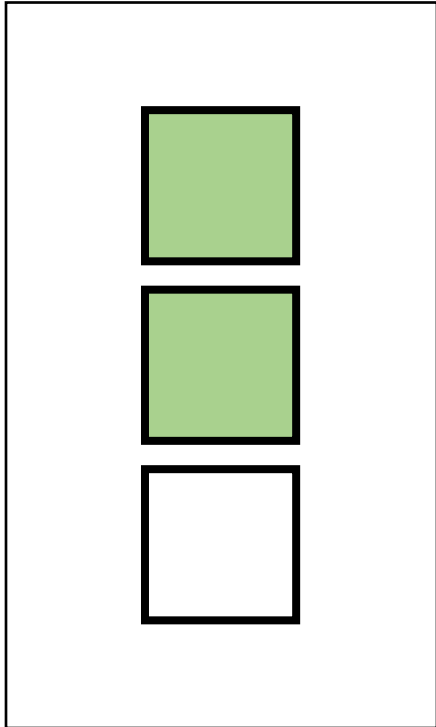
Kafka Rolling Restart



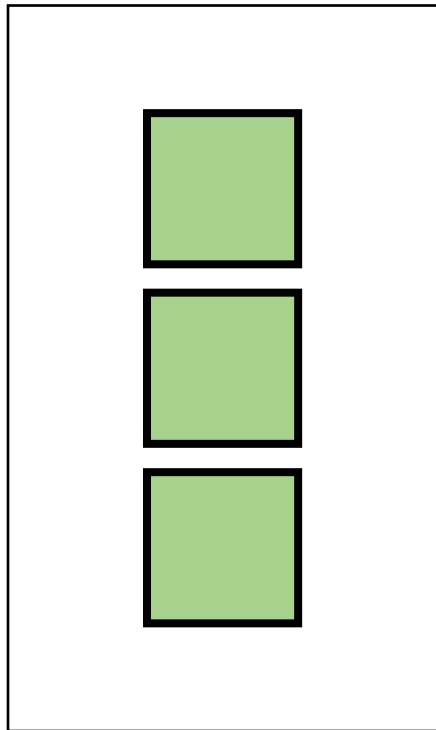
Kafka Rolling Restart



Kafka Rolling Restart



Kafka Rolling Restart



Распределение партиций по брокерам

Распределение партиций по брокерам

- Нет автораспределения партиций на нового Брокера

Распределение партиций по брокерам

- Нет автораспределения партиций на нового Брокера
- Нет стандартной процедуры по выведению Брокера из кластера

Распределение партиций по брокерам

- Нет автораспределения партиций на нового Брокера
- Нет стандартной процедуры по выведению Брокера из кластера

- Изменение Replication Factor топика – частный случай partition reassignment

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```


Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \
```

```
--zookeeper localhost:2181 \
```

```
--reassignment-json-file reassignment.json \
```

```
--execute
```

```
{ "version": 1,  
  "partitions": [  
    { "topic": "test", "partition" : 42, "replicas": [1, 2, 3] },  
    ...  
  ]  
}
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

```
{ "version": 1,  
  "partitions": [  
    { "topic": "test", "partition" : 42, "replicas": [1, 2, 3] },  
    ...  
  ]  
}
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

```
{ "version": 1,  
  "partitions": [  
    { "topic": "test", "partition" : 42, "replicas": [1, 2, 3] },  
    ...  
  ]  
}
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

```
{ "version": 1,  
  "partitions": [  
    { "topic": "test", "partition" : 42, "replicas": [1, 2, 3] },  
    ...  
  ]  
}
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \
```

```
--zookeeper localhost:2181 \
```

```
--reassignment-json-file reassignment.json \
```

```
--execute
```

```
{ "version": 1,
```

```
  "partitions": [
```

```
    { "topic": "test", "partition" : 42, "replicas": [1, 2, 3] },
```

```
    ...
```

```
  ]
```

```
}
```

Preferred leader – первый брокер в списке реплик

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

```
--verify
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --topics-to-move-json-file topics.json \  
  --generate \  
  --broker-list 1,2,3
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --topics-to-move-json-file topics.json \  
  --generate \  
  --broker-list 1,2,3
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --topics-to-move-json-file topics.json \  
  --generate \  
  --broker-list 1,2,3
```

```
{ "version": 1,  
  "topics": [  
    { "topic": "test" },  
    ...  
  ]  
}
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --topics-to-move-json-file topics.json \  
  --generate \  
  --broker-list 1,2,3
```

```
{ "version": 1,  
  "topics": [  
    { "topic": "test" },  
    ...  
  ]  
}
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --topics-to-move-json-file topics.json \  
  --generate \  
  --broker-list 1,2,3
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --topics-to-move-json-file topics.json \  
  --generate  
  --broker-list 1,2,3
```


Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute  
  --timeout 10000
```

Время на инициацию процесса распределения

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute  
  --timeout 10000
```

Время на инициацию процесса распределения

Распределение – фоновый процесс

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute  
  --throttle 100000000
```

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute  
  --throttle 100000000
```

- -verify после завершения распределения удалит
настройки троттлинга

Распределение партиций по брокерам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute \  
  --throttle 100000000
```

--verify после завершения распределения удалит
настройки троттлинга

... ЛЮБЫЕ!

Kafka Manager

Clusters / hercules-staging / Topics / test

← test

Topic Summary

| | |
|-----------------------------|-----|
| Replication | 3 |
| Number of Partitions | 3 |
| Sum of partition offsets | 0 |
| Total number of Brokers | 9 |
| Number of Brokers for Topic | 5 |
| Preferred Replicas % | 100 |
| Brokers Skewed % | 20 |
| Brokers Leader Skewed % | 0 |

Operations

Delete Topic

Reassign Partitions

Generate Partition Assignments

Add Partitions

Update Config

Manual Partition Assignments

Partitions by Broker

| Broker | # of Partitions | # as Leader | Partitions | Skewed? |
|--------|-----------------|-------------|------------|---------|
| 1 | 1 | 1 | (0) | false |
| 2 | 2 | 0 | (1,2) | false |

Kafka Manager

Clusters / hercules-staging / Topics / test

+ test

Topic Summary

| | |
|-----------------------------|-----|
| Replication | 3 |
| Number of Partitions | 3 |
| Sum of partition offsets | 0 |
| Total number of Brokers | 9 |
| Number of Brokers for Topic | 5 |
| Preferred Replicas % | 100 |
| Brokers Skewed % | 20 |
| Brokers Leader Skewed % | 0 |

Operations

Delete Topic

Reassign Partitions

Generate Partition Assignments

Add Partitions

Update Config

Manual Partition Assignments

Partitions by Broker

| Broker | # of Partitions | # as Leader | Partitions | Skewed? |
|--------|-----------------|-------------|------------|---------|
| 1 | 1 | 1 | (0) | false |
| 2 | 2 | 0 | (1,2) | false |



Kafka Manager

[Clusters](#) / [hercules-staging](#) / [Topics](#) / test

← Confirm Assignment

Choose brokers to reassign topic **test** to:

Brokers

Replication

Select All

Select None

Replication factor (optional)

- 1 - hercules-01
- 2 - hercules-02
- 3 - hercules-03
- 4 - hercules-04
- 5 - hercules-05
- 6 - hercules-06

Cancel

Generate Partition Assignments

Yikes! No generated assignment found for topic test

Kafka Manager

← Manual Partition Assignments

Save Partition Assignment

Type to filter topics

test

Partition 2



Replica 0: Broker 5



Replica 1: Broker 2



Replica 2: Broker 9



Partition 1



Replica 0: Broker 8



Replica 1: Broker 5



Replica 2: Broker 2



Partition 0



Replica 0: Broker 1



Replica 1: Broker 8



Replica 2: Broker 5



Распределение партиций по брокерам

Альтернативные инструменты

Распределение партиций по брокерам

Альтернативные инструменты

- Kafka Tools

<https://github.com/linkedin/kafka-tools>

Распределение партиций по брокерам

Альтернативные инструменты

- Kafka Tools
- Kafka Utils

<https://github.com/Yelp/kafka-utils>

Распределение партиций по брокерам

Альтернативные инструменты

- Kafka Tools
- Kafka Utils
- Kafka Kit

<https://github.com/DataDog/kafka-kit>

Распределение партиций по брокерам

Альтернативные инструменты

- Kafka Tools
- Kafka Utils
- Kafka Kit

...

Перемещение 파티ций по дискам

Перемещение 파티ций по дискам

- Нет автораспределения партиций по новым дискам

Перемещение партиций по дискам

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[KIP-113: Support replicas movement between log directories](#) (1.1)

Перемещение партиций по дискам

- Нет автораспределения партиций по новым дискам

[KIP-113: Support replicas movement between log directories](#) (1.1)

- Равномерное распределение партиций **по количеству**

Перемещение партиций по дискам

- Нет автораспределения партиций по новым дискам

[KIP-113: Support replicas movement between log directories](#) (1.1)

- Равномерное распределение партиций **по количеству**

[KIP-178: Size-based log directory selection strategy](#) (discuss)

Перемещение партиций по дискам

```
kafka/bin/kafka-reassign-partitions \  
  --zookeeper localhost:2181 \  
  --reassignment-json-file reassignment.json \  
  --execute
```

```
{ "version": 1,  
  "partitions": [  
    { "topic": "test", "partition" : 42, "replicas": [1, 2, 3]  
      }, ...  
  ]  
}
```

Перемещение партиций по дискам

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kafka/bin/kafka-reassign-partitions \  
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  --reassignment-json-file reassignment.json \  
  --execute  
  --broker-list 1,2,3  
  
{ "version": 1,  
  "partitions": [  
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    }, ...  
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{ "version": 1,  
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    { "topic": "test", "partition" : 42, "replicas": [1, 2, 3],  
      "log_dirs": [ "/s1/data", "/s2/data", "/s3/data" ]  
    }, ...  
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```

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Перемещение 파티ций по дискам

Что может пойти не так?

Перемещение 파티ций по дискам

Что может пойти не так?

- 100% утилизация диска

Перемещение партиций по дискам

Что может пойти не так?

- 100% утилизация диска

```
num.replica.alter.log.dirs.threads
```

Перемещение партиций по дискам

Что может пойти не так?

- 100% утилизация диска

- <https://issues.apache.org/jira/browse/KAFKA-9087>

Перемещение партиций по дискам

Что может пойти не так?

- 100% утилизация диска
- <https://issues.apache.org/jira/browse/KAFKA-9087>
- Разные диски и структура – к беде

Preferred Leader Election

Preferred Leader Election

```
auto.leader.rebalance.enable=true  
leader.imbalance.check.interval.seconds=300  
leader.imbalance.per.broker.percentage=10
```

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leader.imbalance.check.interval.seconds=300  
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```

Read-only настройки

Preferred Leader Election

```
kafka/bin/kafka-preferred-replica-election \  
  --bootstrap-server localhost:9092 \  
  --path-to-json-file partitions.json
```

Preferred Leader Election

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    ...  
  ]  
}
```

Preferred Leader Election

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    { "topic": "test", "partition" : 42 },  
    ...  
  ]  
}
```

Preferred Leader Election

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kafka/bin/kafka-preferred-replica-election \  
  --bootstrap-server localhost:9092 \  
  --path-to-json-file partitions.json
```

```
{  
  "partitions": [  
    { "topic": "test", "partition" : 42 },  
    ...  
  ]  
}
```

Preferred Leader Election

```
kafka/bin/kafka-preferred-replica-election \  
  --bootstrap-server localhost:9092 \  
  --
```

Без `--path-to-json-file`

команда распространяется на все партиции кластера

Kafka Manager



Kafka Manager

prod

Cluster ▾

Brokers

Topic ▾

Preferred Replica Election

Reassign Partitions

Consumers

[Clusters](#) / [prod](#) / Preferred Replica Election

Preferred Replica Election

Run Preferred Replica Election

Last Request Info

Submitted: 2019-09-29T17:24:12.022Z

Completed: 2019-09-29T17:24:12.022Z

Health Check

Health Check

- Кластер работает?

Health Check

- Кластер работает?
- Брокер работает?

Health Check

- Кластер работает?
- Брокер работает?
- Какова задержка между чтением и записью?

Health Check

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Тестовые сообщения

Health Check

- Кластер работает?
- Брокер работает?
- Какова задержка между чтением и записью?

Тестовые сообщения

Producer → Kafka → Consumer

Health Check

- Кластер работает?
- Брокер работает?
- Какова задержка между чтением и записью?

Тестовые сообщения

Producer → Kafka → Consumer

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- Кластер работает?
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Тестовые сообщения

Producer → **Kafka** → Consumer

Health Check

- Кластер работает?
- Брокер работает?
- Какова задержка между чтением и записью?

Тестовые сообщения

Producer → Kafka → **Consumer**

Kafka Monitor

Health Check

<https://github.com/linkedin/kafka-monitor>

Kafka Monitor

Health Check

- End-to-End latency

<https://github.com/linkedin/kafka-monitor>

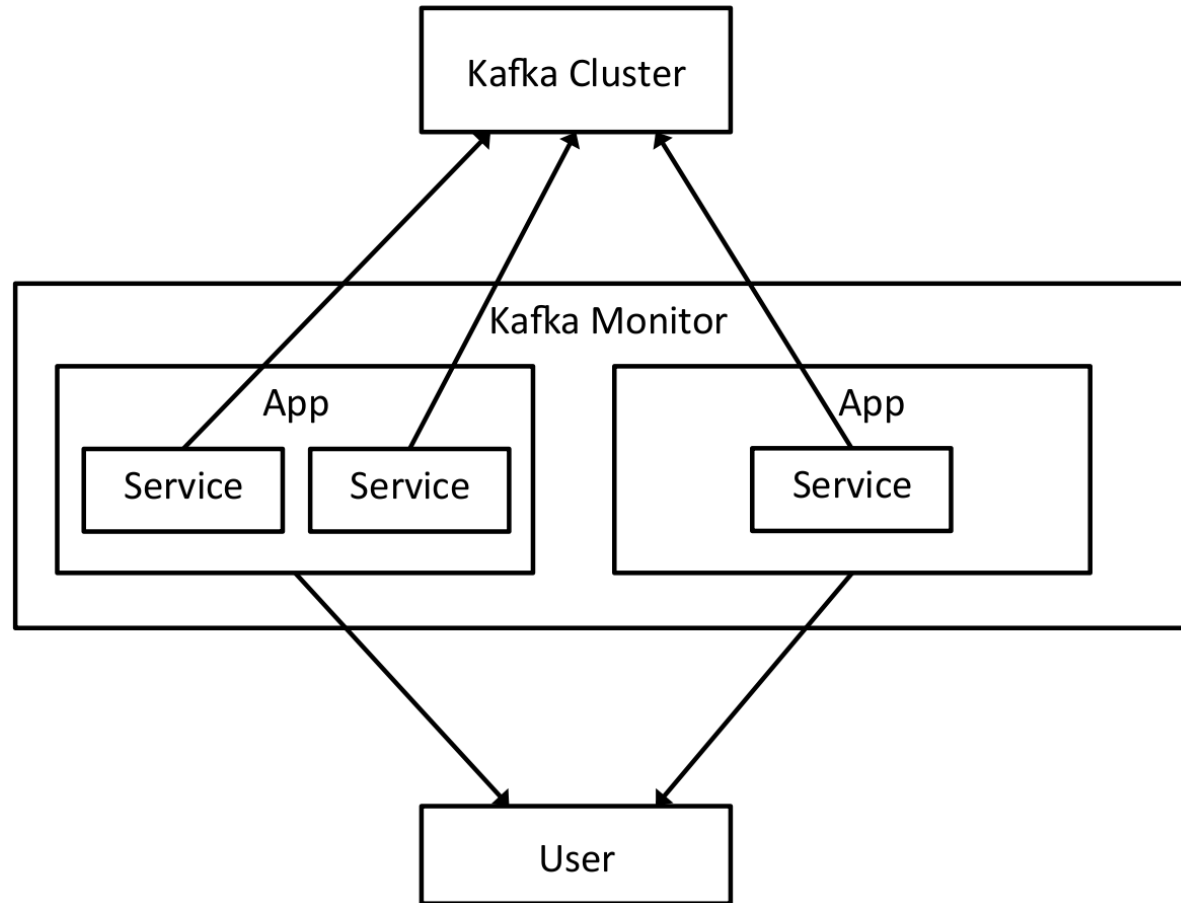
Kafka Monitor

Health Check

- End-to-End latency
- Kafka availability

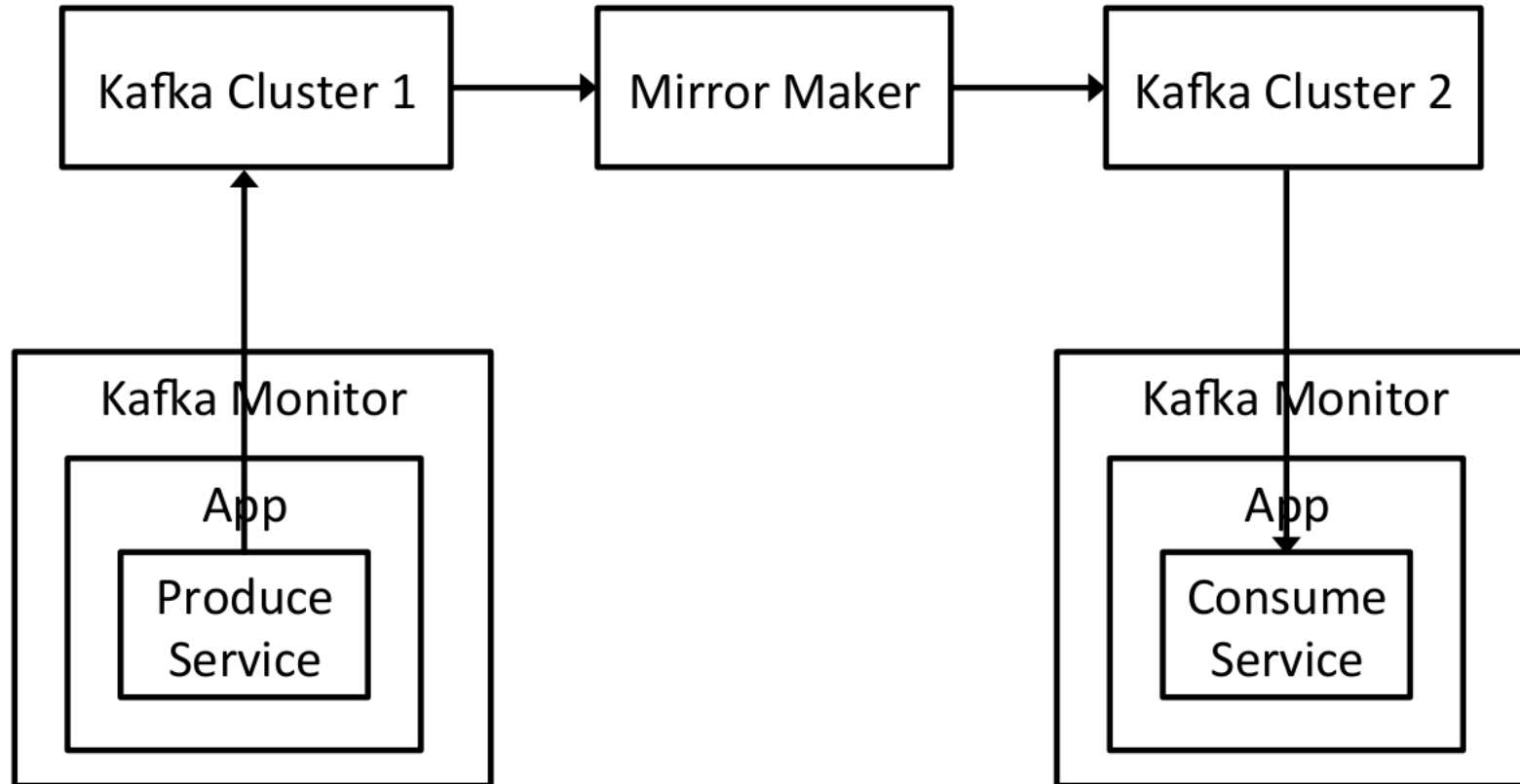
<https://github.com/linkedin/kafka-monitor>

Kafka Monitor



<https://github.com/linkedin/kafka-monitor/wiki/Design-Overview>

Kafka Monitor



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Kafka Monitor

Альтернативные инструменты

Kafka Monitor

Альтернативные инструменты

- Kafka Health Check

<https://github.com/andreas-schroeder/kafka-health-check>

Consumer Group Lag Monitoring

Consumer Group Lag Monitoring

Topic = {0, 1, 2}

partition 0

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|

partition 1

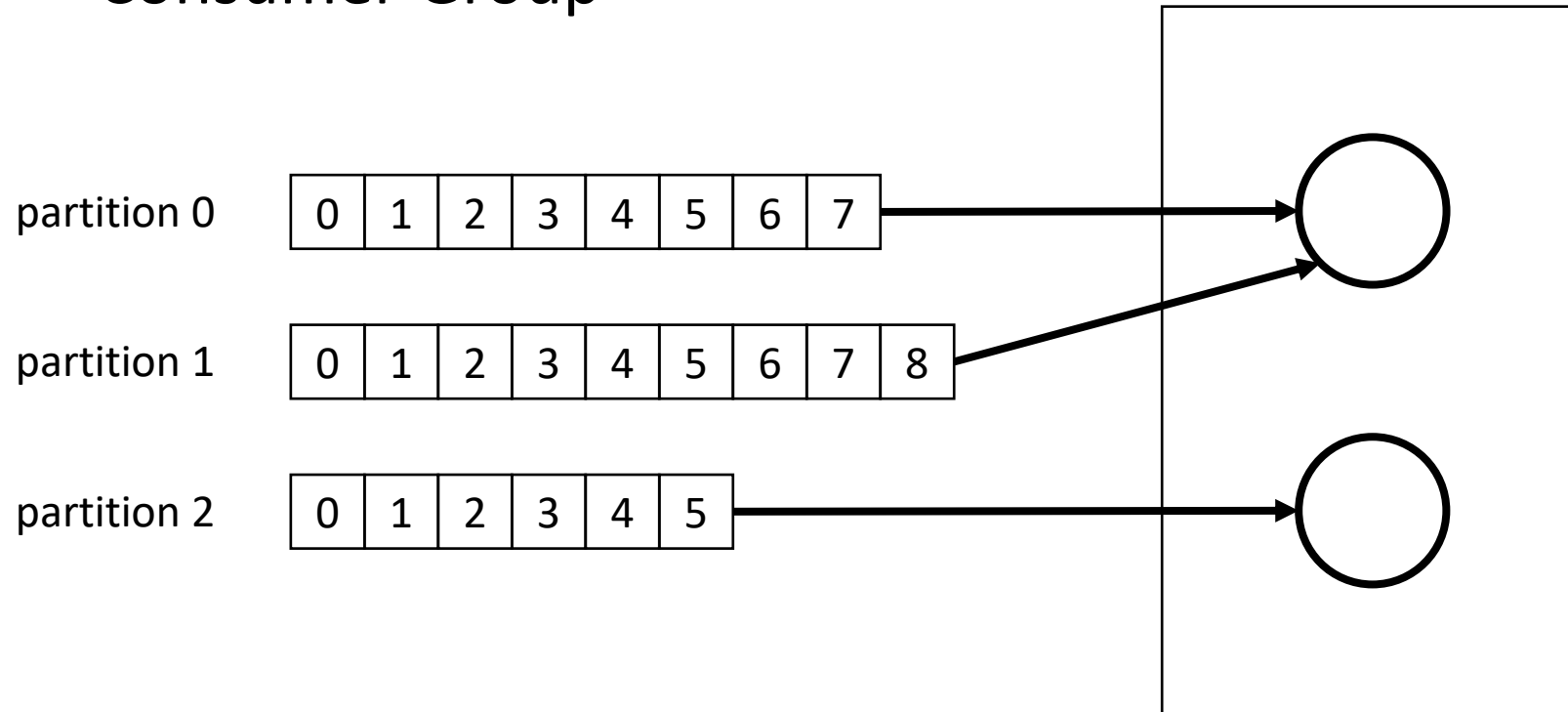
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|

partition 2

| | | | | | |
|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|

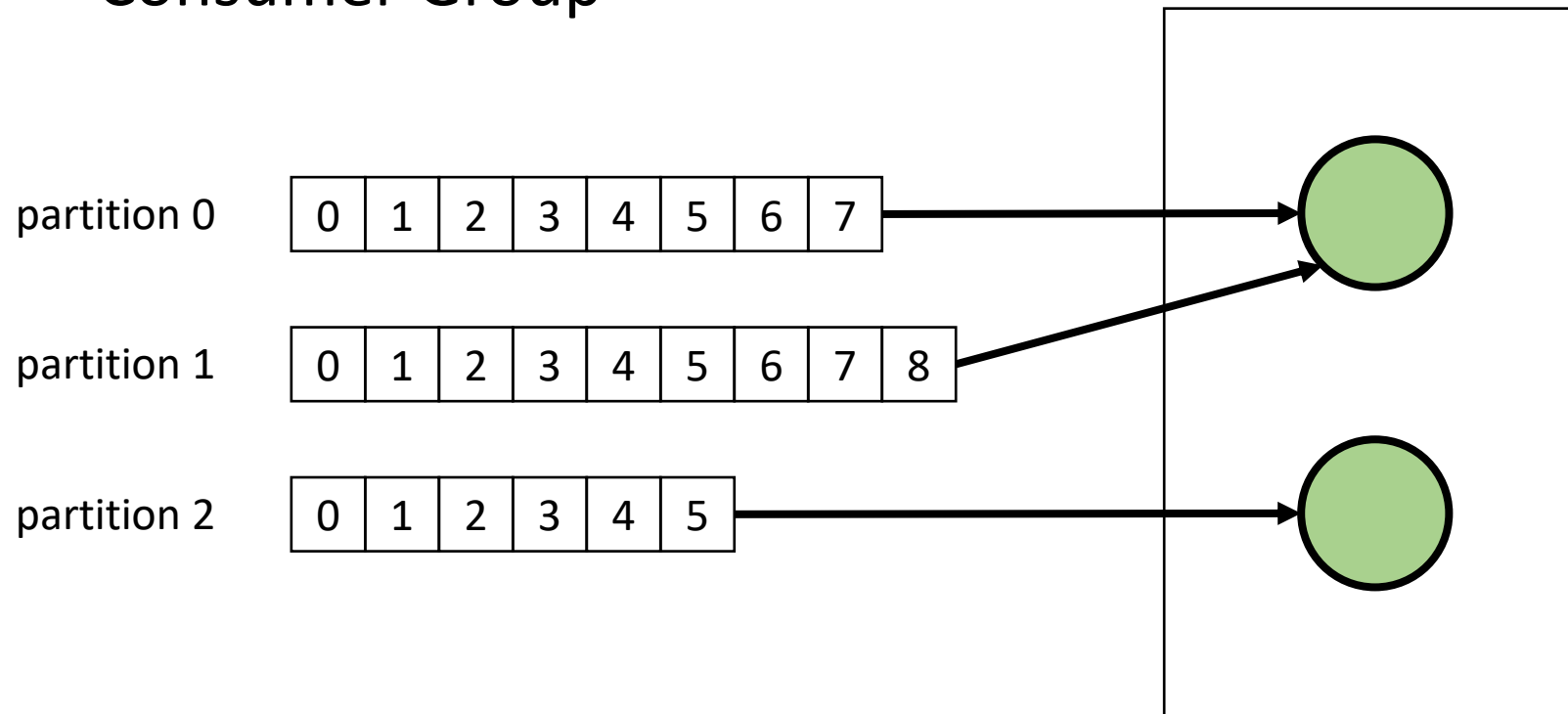
Consumer Group Lag Monitoring

Consumer Group



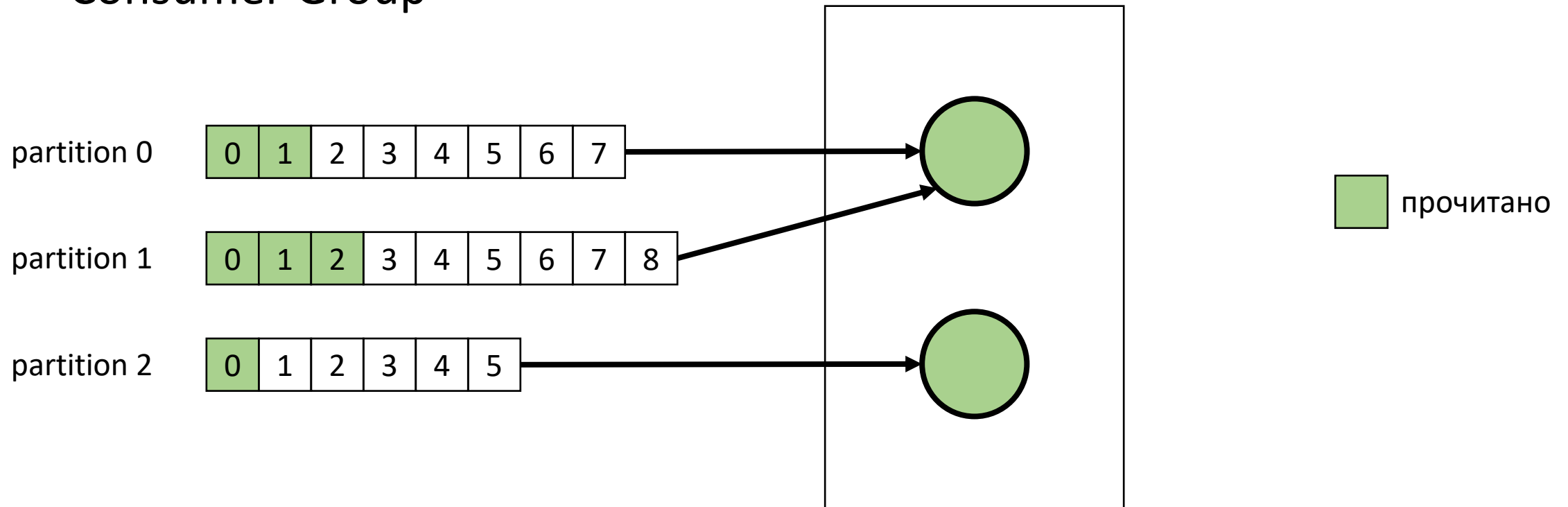
Consumer Group Lag Monitoring

Consumer Group



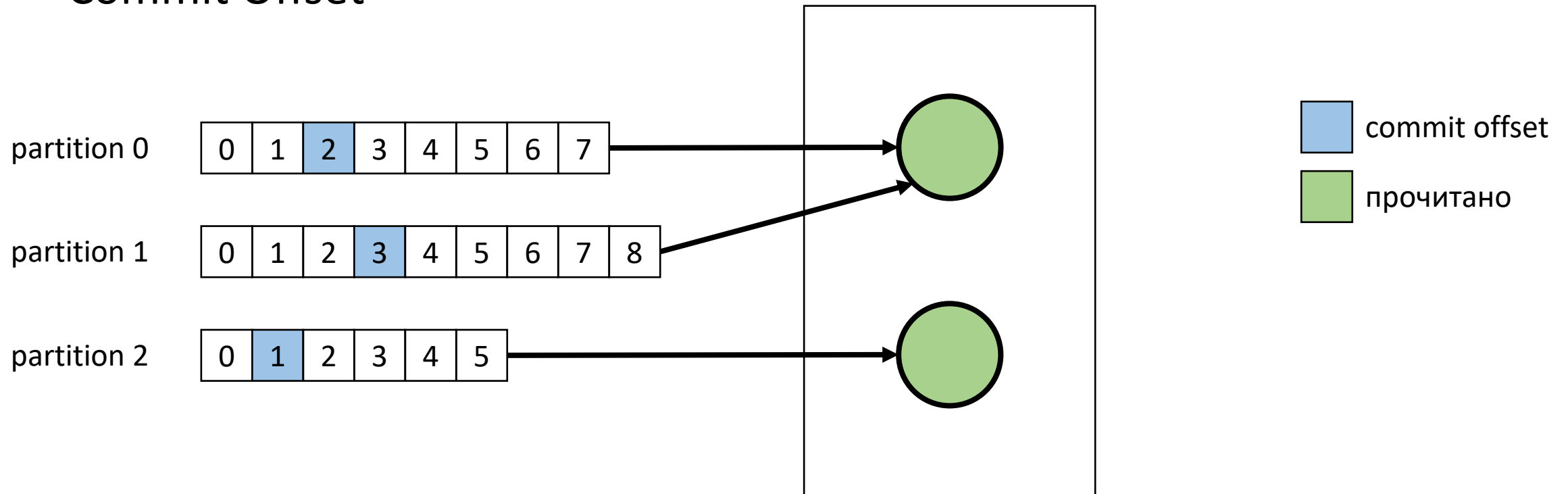
Consumer Group Lag Monitoring

Consumer Group

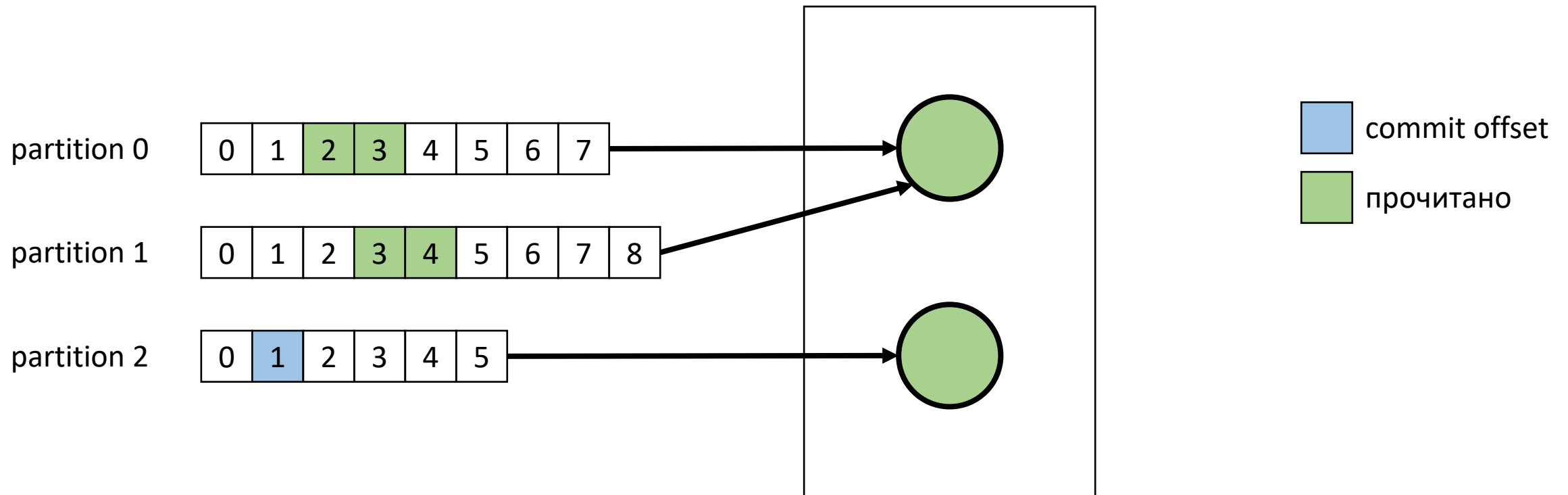


Consumer Group Lag Monitoring

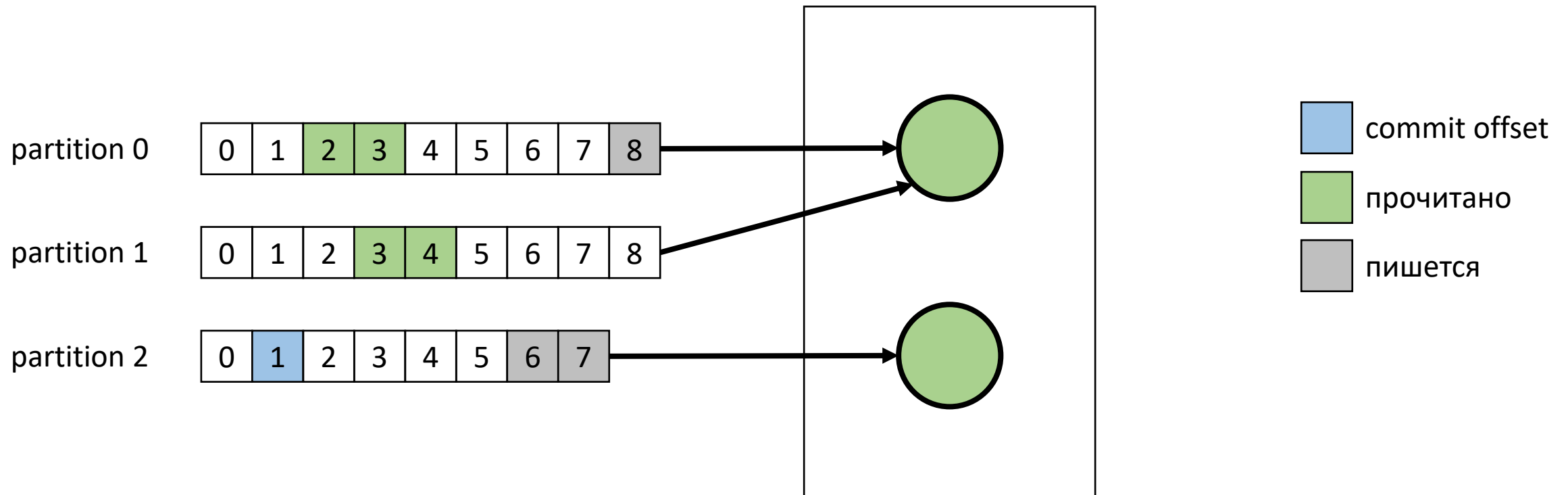
Commit Offset



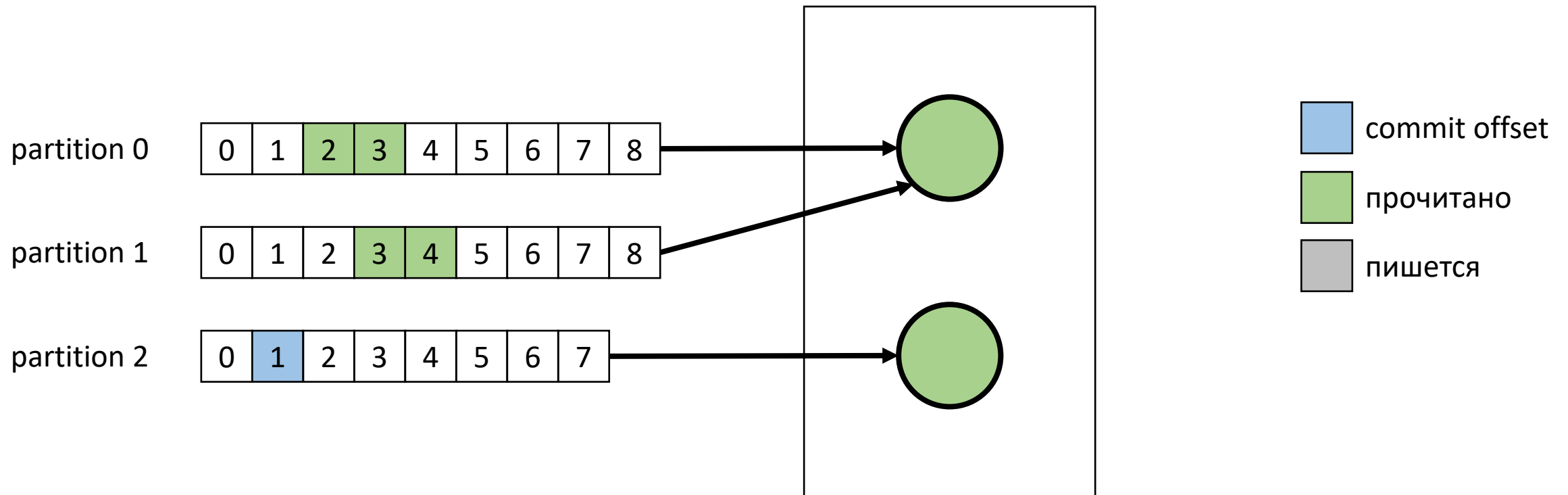
Consumer Group Lag Monitoring



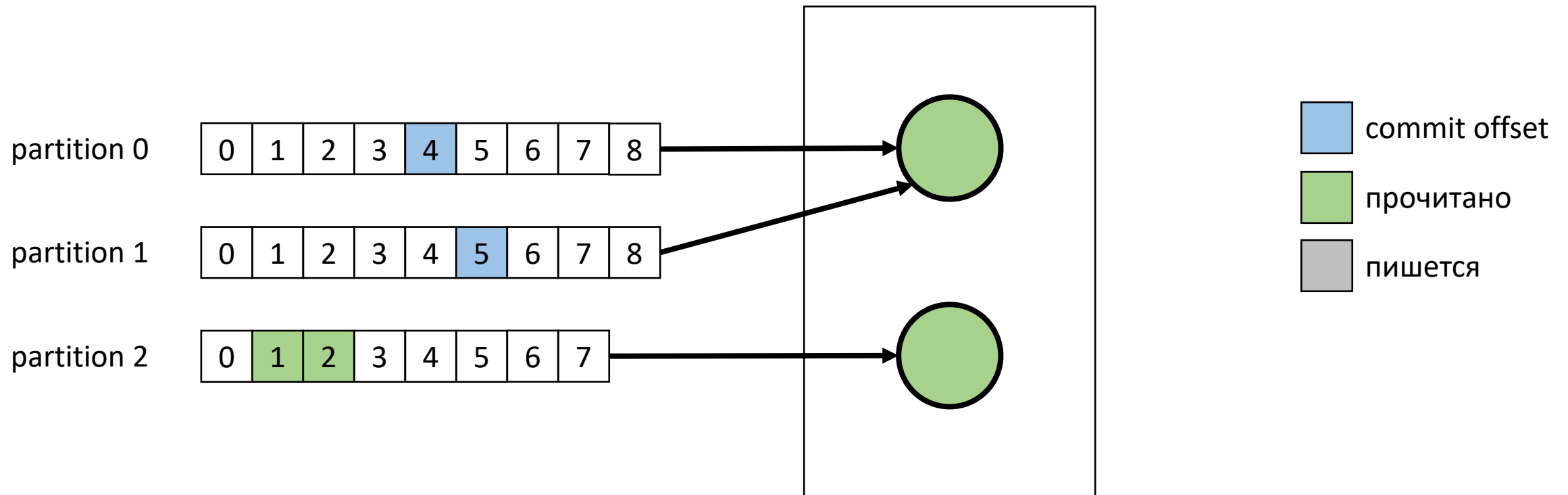
Consumer Group Lag Monitoring



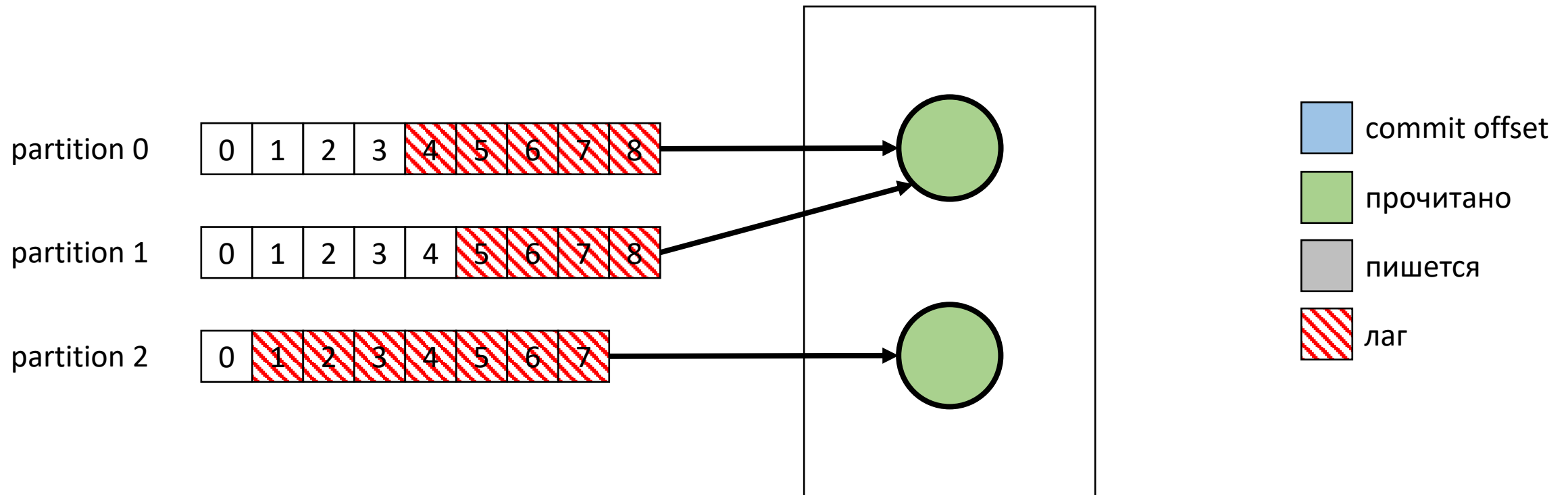
Consumer Group Lag Monitoring



Consumer Group Lag Monitoring



Consumer Group Lag Monitoring



Consumer Group Lag Monitoring

Consumer Group Lag Monitoring

- Как быстро Consumer читает?

Consumer Group Lag Monitoring

- Как быстро Consumer читает?
- Успевает ли Consumer читать за Producer?

Consumer Group Lag Monitoring

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Есть метрики в клиенте (KafkaConsumer)...

Consumer Group Lag Monitoring

- Как быстро Consumer читает?
- Успевает ли Consumer читать за Producer?

Есть метрики в клиенте (KafkaConsumer)...

Но что делать, если консьюмер
упал / тормозит / не может прочитать из Кафки?

Consumer Group Lag Monitoring

`kafka/bin/kafka-consumer-groups.sh`

Consumer Group Lag Monitoring

```
kafka/bin/kafka-consumer-groups.sh
```

```
kafka/bin/kafka-consumer-groups \  
  --bootstrap-server localhost:9092 \  
  --describe \  
  --group consumer_group
```


Consumer Group Lag Monitoring

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  --describe \  
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```

| TOPIC | PARTITION | CURRENT-OFFSET | LOG-END-OFFSET | LAG | CONSUMER-ID | ... |
|-------------------|-----------|----------------|----------------|-----|------------------------|-----|
| <i>topic_name</i> | 0 | 4019845 | 4019864 | 19 | consumer-1-1d284bca... | ... |
| <i>topic_name</i> | 1 | 4312697 | 4312705 | 8 | consumer-1-2074f5ff... | ... |
| <i>topic_name</i> | 2 | 2487942 | 2488243 | 301 | consumer-1-664371c4... | ... |

Consumer Group Lag Monitoring

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Consumer Group Lag Monitoring

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kafka/bin/kafka-consumer-groups.sh
```

```
kafka/bin/kafka-consumer-groups \  
  --bootstrap-server localhost:9092 \  
  --describe \  
  --group consumer_group | \  
awk \  
  -v date="$(date +%s)" \  
  '{ SUM += $5} END { print "consumer_group.Lag " SUM " " date }' | \  
nc localhost 2003
```

Consumer Group Lag Monitoring

```
kafka/bin/kafka-consumer-groups.sh
```

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kafka/bin/kafka-consumer-groups \  
  --bootstrap-server localhost:9092 \  
  --describe \  
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Consumer Group Lag Monitoring

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  -v date="$(date +%s)" \  
  '{ SUM += $5} END { print "consumer_group.Lag " SUM " " date }' | \  
nc localhost 2003
```

Kafka Manager



Kafka Manager

prod

Cluster ▾

Brokers

Topic ▾

Preferred Replica Election

Reassign Partitions

Consumers

[Clusters](#) / [prod](#) / [Consumers](#) / hercules.sink.graphite.metrics_final

← hercules.sink.graphite.metrics_final

Consumed Topic Information

| Topic | Partitions Covered % | Total Lag |
|-------------------------------|----------------------|-----------|
| metrics_final | 100 | -346 |

Kafka Manager



Kafka Manager

prod

Cluster ▾

Brokers

Topic ▾

Preferred Replica Election

Reassign Partitions

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[Clusters](#) / [prod](#) / [Consumers](#) / hercules.sink.graphite.metrics_final

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|-------------------------------|----------------------|-----------|
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Kafka Manager



Kafka Manager

prod

Cluster ▾

Brokers

Topic ▾

Preferred Replica Election

Reassign Partitions

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[Clusters](#) / [prod](#) / [Consumers](#) / hercules.sink.graphite.metrics_final

← hercules.sink.graphite.metrics_final

Consumed Topic Information

| Topic | Partitions Covered % | Total Lag |
|-------------------------------|----------------------|-----------|
| metrics_final | 100 | -346 |

Kafka Manager

Topic Summary

| | |
|---|------|
| Total Lag | -342 |
| % of Partitions assigned to a consumer instance | 100 |

metrics_final

| Partition | LogSize | Consumer Offset | Lag | Consumer Instance Own |
|-----------|------------|-----------------|-----|-------------------------|
| 0 | 23,227,917 | 23,227,918 | -1 | consumer-1-4fe85175-c34 |
| 1 | 23,232,348 | 23,232,352 | -4 | consumer-1-4fe85175-c34 |
| 2 | 23,229,374 | 23,229,380 | -6 | consumer-1-4fe85175-c34 |

Kafka Manager

Topic Summary

Total Lag

-342

% of Partitions assigned to a consumer instance

100

metrics_final

| Partition | LogSize | Consumer Offset | Lag | Consumer Instance Own |
|-----------|------------|-----------------|-----|-------------------------|
| 0 | 23,227,917 | 23,227,918 | -1 | consumer-1-4fe85175-c34 |
| 1 | 23,232,348 | 23,232,352 | -4 | consumer-1-4fe85175-c34 |
| 2 | 23,229,374 | 23,229,380 | -6 | consumer-1-4fe85175-c34 |

Kafka Manager

Topic Summary

| | |
|---|------|
| Total Lag | -342 |
| % of Partitions assigned to a consumer instance | 100 |

metrics_final

| Partition | LogSize | Consumer Offset | Lag | Consumer Instance Own |
|-----------|------------|-----------------|-----|-------------------------|
| 0 | 23,227,917 | 23,227,918 | -1 | consumer-1-4fe85175-c34 |
| 1 | 23,232,348 | 23,232,352 | -4 | consumer-1-4fe85175-c34 |
| 2 | 23,229,374 | 23,229,380 | -6 | consumer-1-4fe85175-c34 |

Burrow

Consumer Group Lag Monitoring

<https://github.com/linkedin/Burrow>

Burrow

Consumer Group Lag Monitoring

- HTTP REST API

<https://github.com/linkedin/Burrow>

Burrow

Consumer Group Lag Monitoring

- HTTP REST API
- Time-window анализ для определения статуса Consumer Group

<https://github.com/linkedin/Burrow>

Burrow

Consumer Group Lag Monitoring

- HTTP REST API
- Time-window анализ для определения статуса Consumer Group
- Уведомления (E-Mail, HTTP)

<https://github.com/linkedin/Burrow>

Burrow

Метрики

Burrow

Метрики

- Prometheus exporter

https://github.com/jirwin/burrow_exporter

Burrow

Метрики

- Prometheus exporter
- Graphite exporter

<https://github.com/rgannu/burrow-graphite>

Burrow

Метрики

- Prometheus exporter
- Graphite exporter

UI

<https://github.com/linkedin/Burrow/wiki/Associated-Projects>

Burrow

Альтернативные инструменты

Burrow

Альтернативные инструменты

- Remora

<https://github.com/zalando-incubator/remora>

Burrow

Альтернативные инструменты

- Remora
- Kafka Offset Monitor

<https://github.com/quantifind/KafkaOffsetMonitor>

<https://github.com/Morningstar/kafka-offset-monitor>

Выводы

- Стандартный тулинг

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- Стандартный тулинг
- Yahoo Kafka Manager <https://github.com/yahoo/kafka-manager>


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- Стандартный тулинг
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- Yelp Kafka Utils (kafka-rolling-restart) <https://github.com/Yelp/kafka-utils>

Выводы

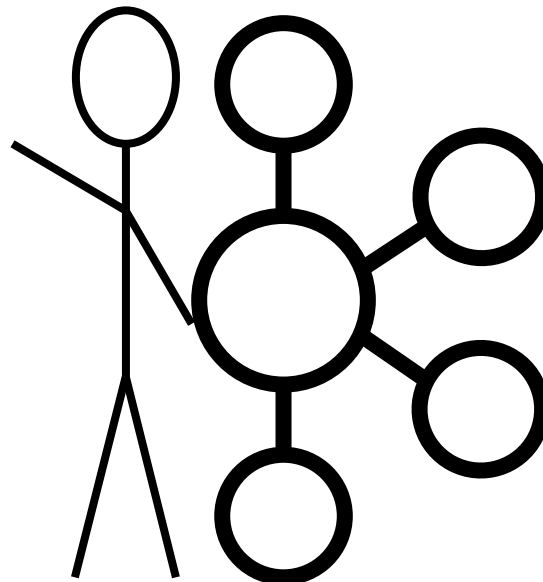
- Стандартный тулинг
- Yahoo Kafka Manager <https://github.com/yahoo/kafka-manager>
- Yelp Kafka Utils (kafka-rolling-restart) <https://github.com/Yelp/kafka-utils>
- LinkedIn Burrow <https://github.com/linkedin/Burrow>
- LinkedIn Kafka Monitor <https://github.com/linkedin/kafka-monitor>

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Пасхалка

Не бывает брокера с номером **0** 😊

Cruise Control + Cruise Control UI

- Мониторинг состояния брокеров, топиков и партиций
- Продвинутая балансировка нагрузки
- Детектирование аномалий
- Автоматизация добавления/удаления брокеров

<https://github.com/linkedin/cruise-control>

<https://github.com/linkedin/cruise-control-ui>