# RabbitMQ Cluster

- Clustering Guide — RabbitMQ
- RabbitMQ Learning III: RabbitMQ Clustering and Load Balancing
- How to Set Up the RabbitMQ Cluster on Ubuntu/Debian Linux
- Clustering Guide (vmware.com)
- RabbitMQ ???? (with HAProxy)
- RabbitMQ?????? | guaosi???

For Windows only

- ??? Windwos ??? RabbitMQ Cluster

## A few things to RabbitMQ Cluster

- Classic Queues ????? Cluster ???? node??????????? node ???????? Queues ?????? nodes?????? Quorum Queues?
- Cluster ???? node ?????? peer???????????????????
- Cluster ??? node ???? cookie ?????cookie ???? `/var/lib/rabbitmq/.erlang.cookie` ?
- ?? Cluster ?? ? Node ??????????? 3?5?7???????????????? node ??????? Cluster ?????????????
- ?? Node ???????????? 1 ? Node ????????????????????? 2 ?Node ?????????????????
- Cluster ???????? LAN????? WAN??????? Cluster ??? Node ????????????????????? Node ???????? 60 ??Cluster ???? Network Partition ?????? split-brain (??) ?? ?????????? Cluster ????????????????Clustering and Network Partitions
- ?? Cluster ????????????????Queues?Exchanges?Routing Key???????????
- Node Plugin ???????

## ????

1. tpeeaprmq98 (node01)
2. tpeeaprmq981 (node02)
3. tpeeaprmq982 (node03)

/etc/hosts:

```
10.14.2.51      tpeeaprmq98
10.4.1.33       tpeeaprmq981
10.4.1.34       tpeeaprmq982
```

## ?? RabbitMQ

????????? RabbitMQ ??????

## ?? Cookie ???

?? node ??????? Erlang cookie ?????

???? RabbitMQ ????cookie ??????????????????????????????? `0600` ???? Cluster ???? node ??????? cookit ??

```
scp /var/lib/rabbitmq/.erlang.cookie root@tpeeaprmq981:/var/lib/rabbitmq/
scp /var/lib/rabbitmq/.erlang.cookie root@tpeeaprmq982:/var/lib/rabbitmq/
```

cookie ???

> ❝ ????? `/var/lib/rabbitmq/.erlang.cookie`?

```
rabbitmq-diagnostics erlang_cookie_sources
```

## ?? Cluster

Detach the service of all nodes

???? Cluster ????? node ??????? Cluster?

```
# On Node01
rabbitmq-server -detached

# On Node02
rabbitmq-server -detached

# On Node03
```

```
rabbitmq-server -detached
```

## Verify the cluster status

```
[root@tpeeaprmq98 ~]# rabbitmqctl cluster_status
Cluster status of node rabbit@tpeeaprmq98 ...
Basics

Cluster name: rabbit@tpeeaprmq98

Disk Nodes

rabbit@tpeeaprmq98

Running Nodes

rabbit@tpeeaprmq98

Versions

rabbit@tpeeaprmq98: RabbitMQ 3.10.7 on Erlang 25.0.4

Maintenance status

Node: rabbit@tpeeaprmq98, status: not under maintenance

Alarms

(none)

Network Partitions

(none)

Listeners

Node: rabbit@tpeeaprmq98, interface: [::], port: 15672, protocol: http, purpose: HTTP API
Node: rabbit@tpeeaprmq98, interface: [::], port: 1883, protocol: mqtt, purpose: MQTT
Node: rabbit@tpeeaprmq98, interface: [::], port: 25672, protocol: clustering, purpose: inter-node and CLI tool
communication
```

Node: rabbit@tpeeaprmq98, interface: [::], port: 15690, protocol: amqp, purpose: AMQP 0-9-1 and AMQP 1.0

Feature flags

Flag: classic_mirrored_queue_version, state: enabled
Flag: drop_unroutable_metric, state: disabled
Flag: empty_basic_get_metric, state: disabled
Flag: implicit_default_bindings, state: enabled
Flag: maintenance_mode_status, state: enabled
Flag: quorum_queue, state: enabled
Flag: stream_queue, state: enabled
Flag: user_limits, state: enabled
Flag: virtual_host_metadata, state: enabled

[root@tpeeaprmq981 ~]# rabbitmqctl cluster_status
Cluster status of node rabbit@tpeeaprmq981 ...
Basics

Cluster name: rabbit@tpeeaprmq981

Disk Nodes

rabbit@tpeeaprmq981

Running Nodes

rabbit@tpeeaprmq981

Versions

rabbit@tpeeaprmq981: RabbitMQ 3.10.7 on Erlang 25.0.4

Maintenance status

Node: rabbit@tpeeaprmq981, status: not under maintenance

Alarms

(none)

Network Partitions

(none)

Listeners

Node: rabbit@tpeeaprmq981, interface: [::], port: 15672, protocol: http, purpose: HTTP API
Node: rabbit@tpeeaprmq981, interface: [::], port: 1883, protocol: mqtt, purpose: MQTT
Node: rabbit@tpeeaprmq981, interface: [::], port: 25672, protocol: clustering, purpose: inter-node and CLI tool communication
Node: rabbit@tpeeaprmq981, interface: [::], port: 15690, protocol: amqp, purpose: AMQP 0-9-1 and AMQP 1.0

Feature flags

Flag: classic_mirrored_queue_version, state: enabled
Flag: drop_unroutable_metric, state: enabled
Flag: empty_basic_get_metric, state: enabled
Flag: implicit_default_bindings, state: enabled
Flag: maintenance_mode_status, state: enabled
Flag: quorum_queue, state: enabled
Flag: stream_queue, state: enabled
Flag: user_limits, state: enabled
Flag: virtual_host_metadata, state: enabled

[root@tpeeaprmq982 ~]# rabbitmqctl cluster_status
Cluster status of node rabbit@tpeeaprmq982 ...
Basics

Cluster name: rabbit@tpeeaprmq982

Disk Nodes

rabbit@tpeeaprmq982

Running Nodes

rabbit@tpeeaprmq982

Versions

```
rabbit@tpeeaprmq982: RabbitMQ 3.10.7 on Erlang 25.0.4

Maintenance status

Node: rabbit@tpeeaprmq982, status: not under maintenance

Alarms

(none)

Network Partitions

(none)

Listeners

Node: rabbit@tpeeaprmq982, interface: [::], port: 15672, protocol: http, purpose: HTTP API
Node: rabbit@tpeeaprmq982, interface: [::], port: 1883, protocol: mqtt, purpose: MQTT
Node: rabbit@tpeeaprmq982, interface: [::], port: 25672, protocol: clustering, purpose: inter-node and CLI tool communication
Node: rabbit@tpeeaprmq982, interface: [::], port: 15690, protocol: amqp, purpose: AMQP 0-9-1 and AMQP 1.0

Feature flags

Flag: classic_mirrored_queue_version, state: enabled
Flag: drop_unroutable_metric, state: enabled
Flag: empty_basic_get_metric, state: enabled
Flag: implicit_default_bindings, state: enabled
Flag: maintenance_mode_status, state: enabled
Flag: quorum_queue, state: enabled
Flag: stream_queue, state: enabled
Flag: user_limits, state: enabled
Flag: virtual_host_metadata, state: enabled
```

## Creating a Cluster

## ? node02 ? node03 ??? node01?

```
# On Node02
rabbitmqctl stop_app
```

```
rabbitmqctl reset
rabbitmqctl join_cluster rabbit@tpeeaprmq98
rabbitmqctl start_app

# On Node03
rabbitmqctl stop_app
rabbitmqctl reset
rabbitmqctl join_cluster rabbit@tpeeaprmq98
rabbitmqctl start_app
```

?? cluster ???????????????

```
[root@tpeeaprmq981 ~]# rabbitmqctl join_cluster rabbit@tpeeaprmq98
Clustering node rabbit@tpeeaprmq981 with rabbit@tpeeaprmq98

15:10:18.438 [warning] Feature flags: the previous instance of this node must have failed to write the
`feature_flags` file at `/var/lib/rabbitmq/mnesia/rabbit@tpeeaprmq981-feature_flags`:

15:10:18.438 [warning] Feature flags:   - list of previously disabled feature flags now marked as such:
[:maintenance_mode_status]

15:10:18.561 [warning] Feature flags: the previous instance of this node must have failed to write the
`feature_flags` file at `/var/lib/rabbitmq/mnesia/rabbit@tpeeaprmq981-feature_flags`:

15:10:18.561 [warning] Feature flags:   - list of previously enabled feature flags now marked as such:
[:maintenance_mode_status]

15:10:18.598 [error] Failed to create a tracked connection table for node :rabbit@tpeeaprmq981:
{:node_not_running, :rabbit@tpeeaprmq981}

15:10:18.598 [error] Failed to create a per-vhost tracked connection table for node :rabbit@tpeeaprmq981:
{:node_not_running, :rabbit@tpeeaprmq981}

15:10:18.599 [error] Failed to create a per-user tracked connection table for node :rabbit@tpeeaprmq981:
{:node_not_running, :rabbit@tpeeaprmq981}
```

Verify the cluster status

?? node ? Cluster ??????????? Cluster name ???????? node name?

```
[root@tpeeaprmq98 ~]# rabbitmqctl cluster_status
Cluster status of node rabbit@tpeeaprmq98 ...
Basics

Cluster name: rabbit@tpeeaprmq98

Disk Nodes

rabbit@tpeeaprmq98
rabbit@tpeeaprmq981
rabbit@tpeeaprmq982

Running Nodes

rabbit@tpeeaprmq98
rabbit@tpeeaprmq981
rabbit@tpeeaprmq982

Versions

rabbit@tpeeaprmq98: RabbitMQ 3.10.7 on Erlang 25.0.4
rabbit@tpeeaprmq981: RabbitMQ 3.10.7 on Erlang 25.0.4
rabbit@tpeeaprmq982: RabbitMQ 3.10.7 on Erlang 25.0.4

Maintenance status

Node: rabbit@tpeeaprmq98, status: not under maintenance
Node: rabbit@tpeeaprmq981, status: not under maintenance
Node: rabbit@tpeeaprmq982, status: not under maintenance

Alarms

(none)

Network Partitions

(none)

Listeners
```

```
Node: rabbit@tpeeaprmq98, interface: [::], port: 15672, protocol: http, purpose: HTTP API
Node: rabbit@tpeeaprmq98, interface: [::], port: 1883, protocol: mqtt, purpose: MQTT
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Node: rabbit@tpeeaprmq98, interface: [::], port: 15690, protocol: amqp, purpose: AMQP 0-9-1 and AMQP 1.0
Node: rabbit@tpeeaprmq981, interface: [::], port: 15672, protocol: http, purpose: HTTP API
Node: rabbit@tpeeaprmq981, interface: [::], port: 1883, protocol: mqtt, purpose: MQTT
Node: rabbit@tpeeaprmq981, interface: [::], port: 25672, protocol: clustering, purpose: inter-node and CLI tool communication
Node: rabbit@tpeeaprmq981, interface: [::], port: 15690, protocol: amqp, purpose: AMQP 0-9-1 and AMQP 1.0
Node: rabbit@tpeeaprmq982, interface: [::], port: 15672, protocol: http, purpose: HTTP API
Node: rabbit@tpeeaprmq982, interface: [::], port: 1883, protocol: mqtt, purpose: MQTT
Node: rabbit@tpeeaprmq982, interface: [::], port: 25672, protocol: clustering, purpose: inter-node and CLI tool communication
Node: rabbit@tpeeaprmq982, interface: [::], port: 15690, protocol: amqp, purpose: AMQP 0-9-1 and AMQP 1.0

Feature flags

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Flag: quorum_queue, state: enabled
Flag: stream_queue, state: enabled
Flag: user_limits, state: enabled
Flag: virtual_host_metadata, state: enabled
```

# Node ??

??????**????**????????????????????????????????? Cluster???? Cluster ?????????

```
systemctl disable rabbitmq-server
```

?? Node

```
# Recommend using systemd
systemctl stop rabbitmq-server
systemctl start rabbitmq-server
```

```
# Using rabbitmqctl + systemd
rabbitmqctl stop
systemctl start rabbitmq-server

# Using rabbitmqctl
# Stop the node
rabbitmqctl stop
# Satrt the node
rabbitmq-server -detached
# Verify if the node is awaiting schema table sync
rabbitmq-diagnostics check_running

# Forcing node boot
rabbitmqctl force_boot
```

### ??? Node

> “ NOTE: ??? Cluster ????????Queues?Exchange ???????????? Node?

```
# Find out the path of Erlang Cookie file
rabbitmq-diagnostics erlang_cookie_sources
# Copy Cookie from one node of the cluster
scp /var/lib/rabbitmq/.erlang.cookie root@<new-node>:/var/lib/rabbitmq/

# Join a new node into the cluster rabbit@tpeeaprmq98
rabbitmqctl stop_app
rabbitmqctl reset
rabbitmqctl join_cluster <cluster-name>
rabbitmqctl start_app
# Alternatively, you can join it as RAM node by following command
rabbitmqctl join_cluster <cluster-name>  --ram
```

### ?? Node

>

> NOTE: Node ?? Cluster ???? Node ???????Queues?Exchange ????????????

```
# 正常卸載 node
# 在要卸載的 node 執行
rabbitmqctl stop_app
rabbitmqctl reset
rabbitmqctl start_app
rabbitmqctl cluster_status

# 強制移除 node
# 在 Cluster 的其他 node 執行
rabbitmqctl forget_cluster_node <node-name>
```

# Rebalance the queues across node

??? quorum queue ???? node ???????????????? node??????????? **Leader node**????? **Follower node**?

Queue ???????? Leader node ??????? Leader node ???????????? Follower nodes ?????????? Leader node?

??? quorum queue ? Leader node ??????????? node ???????????????? node?

- After restarting a node
- After joining a node

> NOTE: ?? queue ??? Leader node ??? Web-UI ???
>
> queue ? Leader Node ? Channel Node ???????????????

```
rabbitmq-queues rebalance all
rabbitmq-queues rebalance "all" --vhost-pattern "itp_server" --queue-pattern ".*"
```

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