

# UCS Hyperflex Zookeeper服务说明和验证

## 目录

### [简介](#)

### [检查参展商服务状态](#)

### [查询Zookeeper服务](#)

### [实时设置中的Zookeeper日志文件](#)

### [Zookeeper支持捆绑包中的日志文件\(storfs\)](#)

## 简介

本文档介绍ZooKeeper，它本质上是一种将分布式系统集中到分层密钥值存储的服务。它用于为大型分布式系统提供分布式配置服务、同步服务和命名注册。ZooKeeper的架构通过冗余服务支持高可用性。因此，如果第一个ZooKeeper未能应答，客户可以询问另一个ZooKeeper领导。

ZooKeeper节点将数据存储在分层命名空间中，与文件系统或树数据结构非常相似。客户端可以从节点读取数据并写入数据，这样就具有共享配置服务。ZooKeeper可视为一个原子广播系统，通过该系统可以完全订购更新。

ZooKeeper提供以下主要功能：

- 可靠系统 — 系统非常可靠，因为即使节点发生故障，它也能保持工作。
- 简单的架构 — ZooKeeper的架构相当简单；它使用共享的分层命名空间，这有助于进程协调。
- 快速处理 — ZooKeeper对于读取占主导地位的工作负载而言尤其快。
- 可扩展 — 添加节点可以提高ZooKeeper的性能。

在HX中，有以下具体实施：

- 名为“参展者”的服务管理zookeeper启动/关闭。
- HX集群中的进程是到Zookeeper的客户端，并通过tcp端口2181 ex storfs、stmgr等进行通信。
- 具有五个以上节点的系统将独立拥有一些节点。具有五个或更少节点的系统永远不应将节点独立。
- 仲裁所需的最小节点数=  $N/2 + 1$ 。

例如，对于三节点集群 —  $N/2=1.5$ 舍入到 $1 + 1 = 2$ （只能容忍一个节点故障）

例如，对于五节点集群 —  $N/2=2.5$ 舍入到 $2 + 1 = 3$ （只能容忍两个节点故障）

由于您只为ZK集群执行五个节点，因此最多只能容忍集群中任意数量节点的两个节点故障。融合节点也是如此。

## 检查参展商服务状态

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# service exhibitor status
exhibitor start/running, process 4905
```

```
root@help:/var/log/springpath# ps -aux | grep -i exhibitor
root 12519 0.0 0.2 4690592 198892 ? Ssl May19 7:19 exhibitor -cp exhibitor.jar:/etc/exhibitor/ -
Xmx256M -XX:+HeapDumpOnOutOfMemoryError -
XX:HeapDumpPath=/var/log/exhibitor_heap_dump_2019_05_19_22:19:48.hprof -
```

```
Dlog4j.configuration=file:///etc/exhibitor/log4j.properties -
Dsringpath.zkdownscript=/usr/share/springpath/storfs-misc/zkMonitor.sh -
Djava.security.egd=file:/dev/./urandom -jar exhibitor.jar --hostname 10.197.252.100 -c file --
fsconfigdir /etc/exhibitor --port 8180 --listenaddress 10.197.252.100
root@help:/var/log/springpath# pidof exhibitor
12519
```

## 查询Zookeeper服务

Zookeeper有一个四字母命令语法，可用于查询状态、列出连接、znodes数量等。

检查本地节点上的zookeeper状态 — ( ruok ==>您是否正常？. imok==>我正常 )。

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# echo ruok|nc localhost 2181
imok
```

检查动物饲养员是领导者还是跟随者。

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# echo srvr | nc localhost 2181
Zookeeper version: 3.4.6--1, built on 06/16/2015 22:50 GMT
Latency min/avg/max: 0/0/101
Received: 213128515
Sent: 213164119
Connections: 6
Outstanding: 0
Zxid: 0xa000301d0
Mode: leader
Node count: 17090
```

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# echo stat | nc localhost 2181
Zookeeper version: 3.4.6--1, built on 06/16/2015 22:50 GMT
Clients:
 /192.168.5.161:56128[1] (queued=0,recvd=169146196,sent=169162634)
 /192.168.5.161:38614[1] (queued=0,recvd=186015,sent=186017)
 /192.168.5.164:44412[1] (queued=0,recvd=184398,sent=184399)
 /192.168.5.164:44447[1] (queued=0,recvd=561168,sent=563034)
 /127.0.0.1:60060[0] (queued=0,recvd=1,sent=0)
 /192.168.5.161:58754[1] (queued=0,recvd=39233,sent=39261)
```

```
Latency min/avg/max: 0/0/101
Received: 213109927
Sent: 213145531
Connections: 6
Outstanding: 0
Zxid: 0xa000301d0
Mode: leader
Node count: 17090
```

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# echo mntr | nc localhost 2181
zk_version      3.4.6--1, built on 06/16/2015 22:50 GMT
zk_avg_latency  0
zk_max_latency  101
zk_min_latency  0
zk_packets_received  213148668
zk_packets_sent    213184272
zk_num_alive_connections  6
zk_outstanding_requests  0
zk_server_state   leader
zk_znode_count    17090
```

```
zk_watch_count      4305
zk_ephemerals_count  20
zk_approximate_data_size  1831768
zk_open_file_descriptor_count  43
zk_max_file_descriptor_count  4096
zk_followers        3
zk_synced_followers  3
zk_pending_syncs    0
```

## 检查Zookeeper配置：

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# echo conf | nc localhost 2181
clientPort=2181
dataDir=/var/zookeeper/version-2
dataLogDir=/var/zookeeper/version-2
tickTime=3000
maxClientCnxns=60
minSessionTimeout=6000
maxSessionTimeout=60000
serverId=3
initLimit=10
syncLimit=3
electionAlg=3
electionPort=3888
quorumPort=2888
peerType=0
```

## 实时设置中的Zookeeper日志文件

如果Zookeeper服务中有任何问题，这些日志文件将帮助查找跟踪：

- /var/log/zookeeper/zookeeper\* — 维护归档日志、有用的搜索关键字WARN、ERROR、Goodbye、Leader等。
- /var/log/springpath/zk-\*
- /var/log/springpath/exhibitor.log

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# grep -i leader
/var/log/zookeeper/zookeeper.log*
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,088 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Leader@60] - TCP NoDelay set to: true
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,099 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Leader@358] - LEADING - LEADER ELECTION TOOK - 354
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,120 [myid:3] - INFO [LearnerHandler-
/192.168.5.164:36487:LearnerHandler@522] - Received NEWLEADER-ACK message from 0
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,120 [myid:3] - INFO [LearnerHandler-
/192.168.5.163:43451:LearnerHandler@522] - Received NEWLEADER-ACK message from 1
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,120 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Leader@943] - Have quorum of supporters, sids: [ 0,1,3
]; starting up and setting last processed zxid: 0x100000000
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,272 [myid:3] - INFO
[WorkerReceiver[myid=3]:FastLeaderElection@597] - Notification: 1 (message format version), 3
(n.leader), 0x0 (n.zxid), 0x1 (n.round), LOOKING (n.state), 2 (n.sid), 0x0 (n.peerEpoch) LEADING
(my state)
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,291 [myid:3] - INFO [LearnerHandler-
/192.168.5.162:48778:LearnerHandler@486] - Sending snapshot last zxid of peer is 0x0  zxid of
leader is 0x100000000sent zxid of db as 0x100000000
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:59:26,298 [myid:3] - INFO [LearnerHandler-
/192.168.5.162:48778:LearnerHandler@522] - Received NEWLEADER-ACK message from 2
```

```
root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# grep -i warn
```

**/var/log/zookeeper/zookeeper.log\***

```
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:46:30,354 [myid:] - WARN  
[main:QuorumPeerMain@113] - Either no config or no quorum defined in config, running in  
standalone mode  
/var/log/zookeeper/zookeeper.log.7:2016-10-14 22:52:55,238 [myid:] - WARN  
[main:QuorumPeerMain@113] - Either no config or no quorum defined in config, running in  
standalone mode
```

**root@SpringpathControllerMSH7NHXRFL:/var/log/zookeeper# grep -i goodbye**

**/var/log/zookeeper/zookeeper.log\***

```
/var/log/zookeeper/zookeeper.log.1:2017-01-23 03:55:50,429 [myid:3] - WARN [LearnerHandler-  
/192.168.5.163:44118:LearnerHandler@646] - ***** GOODBYE /192.168.5.163:44118 *****  
/var/log/zookeeper/zookeeper.log.1:2017-01-24 23:30:14,956 [myid:3] - WARN [LearnerHandler-  
/192.168.5.164:44720:LearnerHandler@646] - ***** GOODBYE /192.168.5.164:44720 *****  
/var/log/zookeeper/zookeeper.log.3:2016-12-01 23:45:22,510 [myid:3] - WARN [LearnerHandler-  
/192.168.5.164:44051:LearnerHandler@646] - ***** GOODBYE /192.168.5.164:44051 *****  
/var/log/zookeeper/zookeeper.log.3:2016-12-08 00:36:37,752 [myid:3] - WARN [LearnerHandler-  
/192.168.5.162:46577:LearnerHandler@646] - ***** GOODBYE /192.168.5.162:46577 *****  
/var/log/zookeeper/zookeeper.log.4:2016-11-22 23:45:30,957 [myid:3] - WARN [LearnerHandler-  
/192.168.5.163:49016:LearnerHandler@646] - ***** GOODBYE /192.168.5.163:49016 *****  
/var/log/zookeeper/zookeeper.log.4:2016-11-23 00:03:59,397 [myid:3] - WARN [LearnerHandler-  
/192.168.5.164:45952:LearnerHandler@646] - ***** GOODBYE /192.168.5.164:45952 *****  
/var/log/zookeeper/zookeeper.log.4:2016-12-01 22:51:00,538 [myid:3] - WARN [LearnerHandler-  
/192.168.5.163:45284:LearnerHandler@646] - ***** GOODBYE /192.168.5.163:45284 *****  
/var/log/zookeeper/zookeeper.log.5:2016-11-10 23:39:47,477 [myid:3] - WARN [LearnerHandler-  
/192.168.5.163:43576:LearnerHandler@646] - ***** GOODBYE /192.168.5.163:43576 *****  
/var/log/zookeeper/zookeeper.log.5:2016-11-11 00:49:39,782 [myid:3] - WARN [LearnerHandler-  
/192.168.5.164:35219:LearnerHandler@646] - ***** GOODBYE /192.168.5.164:35219 *****
```

**一些示例日志 — Zookeeper日志记录选举**

```
2017-01-22 23:47:29,427 [myid:3] - INFO [Thread-2:QuorumCnxManager$Listener@504] - My election  
bind port: /192.168.5.161:3888  
2017-01-22 23:47:29,435 [myid:3] - INFO  
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:QuorumPeer@714] - LOOKING  
2017-01-22 23:47:29,438 [myid:3] - INFO  
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:FastLeaderElection@815] - New election. My id = 3,  
proposed zxid=0x9000a6b4d  
2017-01-22 23:47:29,443 [myid:3] - INFO [WorkerReceiver[myid=3]:FastLeaderElection@597] -  
Notification: 1 (message format version), 2 (n.leader), 0x800055ea0 (n.zxid), 0x1 (n.round),  
FOLLOWING (n.state), 0 (n.sid), 0x9 (n.peerEpoch) LOOKING (my state)  
2017-01-22 23:47:29,444 [myid:3] - INFO [WorkerReceiver[myid=3]:FastLeaderElection@597] -  
Notification: 1 (message format version), 2 (n.leader), 0x800055ea0 (n.zxid), 0x1 (n.round),  
FOLLOWING (n.state), 1 (n.sid), 0x9 (n.peerEpoch) LOOKING (my state)  
2017-01-22 23:47:29,444 [myid:3] - INFO [WorkerReceiver[myid=3]:FastLeaderElection@597] -  
Notification: 1 (message format version), 3 (n.leader), 0x9000a6b4d (n.zxid), 0x1 (n.round),  
LOOKING (n.state), 3 (n.sid), 0x9 (n.peerEpoch) LOOKING (my state)  
2017-01-22 23:47:29,444 [myid:3] - INFO [WorkerReceiver[myid=3]:FastLeaderElection@597] -  
Notification: 1 (message format version), 2 (n.leader), 0x800055ea0 (n.zxid), 0x1 (n.round),  
FOLLOWING (n.state), 1 (n.sid), 0x9 (n.peerEpoch) LOOKING (my state)  
2017-01-22 23:47:29,445 [myid:3] - INFO [WorkerReceiver[myid=3]:FastLeaderElection@597] -  
Notification: 1 (message format version), 2 (n.leader), 0x800055ea0 (n.zxid), 0x1 (n.round),  
LEADING (n.state), 2 (n.sid), 0x9 (n.peerEpoch) LOOKING (my state)  
2017-01-22 23:47:29,445 [myid:3] - INFO [WorkerReceiver[myid=3]:FastLeaderElection@597] -  
Notification: 1 (message format version), 2 (n.leader), 0x800055ea0 (n.zxid), 0x1 (n.round),  
FOLLOWING (n.state), 0 (n.sid), 0x9 (n.peerEpoch) LOOKING (my state)  
2017-01-22 23:47:29,446 [myid:3] - INFO  
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:QuorumPeer@784] - FOLLOWING  
2017-01-22 23:47:29,449 [myid:3] - INFO [QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Learner@86] -  
TCP NoDelay set to: true  
2017-01-22 23:47:29,449 [myid:3] - INFO [WorkerReceiver[myid=3]:FastLeaderElection@597] -  
Notification: 1 (message format version), 2 (n.leader), 0x800055ea0 (n.zxid), 0x1 (n.round),
```

```
LEADING (n.state), 2 (n.sid), 0x9 (n.peerEpoch) FOLLOWING (my state)
2017-01-22 23:47:29,660 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:zookeeper.version=3.4.6--1, built on 06/16/2015 22:50 GMT
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:host.name=SpringpathControllerMSH7NHXRFL
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:java.version=1.7.0_79
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:java.vendor=Oracle Corporation
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:java.home=/usr/lib/jvm/java-7-openjdk-amd64/jre
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:java.class.path=/usr/share/zookeeper/bin/./build/classes:/usr/share/zookeeper/bin/./build/lib/*.jar:/usr/share/zookeeper/bin/./lib/slf4j-log4j12-1.6.1.jar:/usr/share/zookeeper/bin/./lib/slf4j-api-1.6.1.jar:/usr/share/zookeeper/bin/./lib/netty-3.7.0.Final.jar:/usr/share/zookeeper/bin/./lib/log4j-1.2.16.jar:/usr/share/zookeeper/bin/./lib/jline-0.9.94.jar:/usr/share/zookeeper/bin/./zookeeper-3.4.6.jar:/usr/share/zookeeper/bin/./src/java/lib/*.jar:/usr/share/zookeeper/bin/./conf:
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:java.library.path=/usr/java/packages/lib/amd64:/usr/lib/x86_64-linux-gnu/jni:/lib/x86_64-linux-gnu:/usr/lib/x86_64-linux-gnu:/usr/lib/jni:/lib:/usr/lib
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server
environment:java.io.tmpdir=/tmp
2017-01-22 23:47:29,661 [myid:3] - INFO
[QuorumPeer[myid=3]/0:0:0:0:0:0:0:0:2181:Environment@100] - Server environment:java.compiler=
```

## LEADER ELECTION TOOK

```
root@SpringpathControllerMSH7NHXRFL:/var/log/springpath# cat zk-debug-storfs.log
```

```
2017-01-22 23:47:18,702:5866(0x7fd1f7ef5700):ZOO_INFO@check_events@1760: initiated connection to server [192.168.5.163:2181]
2017-01-22 23:47:18,704:5866(0x7fd1f7ef5700):ZOO_INFO@check_events@1807: session establishment complete on server [192.168.5.163:2181], sessionId=0x159165ff6310005, negotiated timeout=17001
2017-01-22 23:47:18,704:5866(0x7fd1f76f4700):ZOO_INFO@process_completions@2170: Calling a watcher for node s], type = s
2017-01-23 01:50:16,809:5866(0x7fd1f7ef5700):ZOO_ERROR@handle_socket_error_msg@1778: Socket [192.168.5.163:2181] zk retcode=-4, errno=112(Host is down): failed while receiving a server response
2017-01-23 01:50:16,818:5866(0x7fd1f76f4700):ZOO_INFO@process_completions@2170: Calling a watcher for node s], type = s
2017-01-23 01:50:16,818:5866(0x7fd1f7ef5700):ZOO_INFO@check_events@1760: initiated connection to server [192.168.5.164:2181]
2017-01-23 01:50:16,818:5866(0x7fd1f7ef5700):ZOO_ERROR@handle_socket_error_msg@1778: Socket [192.168.5.164:2181] zk retcode=-4, errno=112(Host is down): failed while receiving a server response
2017-01-23 01:50:17,819:5866(0x7fd1f7ef5700):ZOO_ERROR@handle_socket_error_msg@1740: Socket [192.168.5.162:2181] zk retcode=-4, errno=115(Operation now in progress): poll refused to accept
```

read/write from the client

```
root@help:/var/log/springpath# cat zkEvents.log
```

```
INFO:ZkEvents:Send changes to listeners
INFO:EventDB:Received message{"timestamp": 1559200009008, "description": "Cluster policy compliance is satisfied", "id": "ClusterPolicyComplianceSatisfiedEvent"}
DEBUG:kazoo.client:Received EVENT: Watch(type=3, state=3, path=u'/zkEvents/lastModificationTime')
DEBUG:kazoo.client:Sending request(xid=42): GetData(path='/zkEvents/lastModificationTime', watcher=
```

**Cluster is healthy**

```
root@SpringpathControllerPZTMTRSH7K:/var/log/springpath# tail exhibitor.log
```

```
05-20 05:28:52.223 INFO org.mortbay.log - Started SocketConnector@10.197.252.99:8180
05-20 05:29:20.106 INFO com.netflix.exhibitor.core.activity.ActivityLog - State: down
05-20 05:29:20.106 INFO com.netflix.exhibitor.core.activity.ActivityLog - Attempting to stop instance
05-20 05:29:20.106 INFO com.netflix.exhibitor.core.activity.ActivityLog - Attempting to start/restart ZooKeeper
05-20 05:29:20.328 INFO com.netflix.exhibitor.core.activity.ActivityLog - jps didn't find instance - assuming ZK is not running
05-20 05:29:20.347 INFO com.netflix.exhibitor.core.activity.ActivityLog - Process started via: /usr/share/zookeeper/bin/zkServer.sh
05-20 05:29:20.353 ERROR com.netflix.exhibitor.core.activity.ActivityLog - ZooKeeper Server: ZooKeeper JMX enabled by default
05-20 05:29:20.353 ERROR com.netflix.exhibitor.core.activity.ActivityLog - ZooKeeper Server: Using config: /usr/share/zookeeper/bin/./conf/zoo.cfg
05-20 05:29:21.366 INFO com.netflix.exhibitor.core.activity.ActivityLog - ZooKeeper Server: Starting zookeeper ... STARTED
05-20 05:29:50.128 INFO com.netflix.exhibitor.core.activity.ActivityLog - State: serving
```

## Zookeeper支持捆绑包中的日志文件(storfs)

在支持捆绑包中，以下是需要查看的重要文件：

zookeeper.log	/var/log/zookeeper
zk-storfs.log	/var/log/springpath
echo_stat_ nc_localhost_2181.out	under cmds_output