BUILD ZABBIX SERVER HA CLUSTER IN 10 MINUTES

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WHY ZABBIX NEEDS HIGH AVAILABILITY
WHAT IS HIGH AVAILABILITY?

High availability (HA) is the ability of a system to operate continuously without failing for a designated period of time.

- **A single point of failure** is a component that would cause the whole system to fail if it fails.
- **Redundancy** enables a backup component to take over for a failed one.
- Failures must be visible and systems have **built-in automation** to handle the failure on their own.
Zabbix server without HA is a single point of failure

If Zabbix server fails for some reason, no notifications will be sent
02

HOW TO CHOOSE HA FOR ZABBIX
WHICH HA SOLUTION TO CHOOSE?

- It is possible to use 3rd party HA solutions for Zabbix
- Most of them require specific knowledge for a proper set up
- Some service providers may charge additional costs for HA setup
WHAT CAN GO WRONG WITH HA?

- If HA is not properly implemented, failover may not happen when needed.
- A split-brain scenario with two active nodes at once may be even worse.
- Other unexpected scenarios like STONITH of both nodes can happen.
ZABBIX OFFERS NATIVE HA SOLUTION

- Easy to set up using Zabbix documentation
- Does not require expertise in HA architecture
- Officially supported by Zabbix
- Uses Zabbix database to check node status
HOW ZABBIX CLUSTER WORKS
STARTING ZABBIX IN A CLUSTER MODE

- To start Zabbix server in HA mode, new configuration parameters were added
- Edit Zabbix configuration file (usually located at /etc/zabbix/zabbix_server.conf)
  - **HANodeName** to specify the name of Zabbix cluster node
  - **NodeAddress** to specify the address of cluster node
- Restart all Zabbix cluster nodes after making changes to configuration files
- **HANodeName** specifies the name of the node

- Without **HANodeName** specified, Zabbix server will start in a standalone mode

## Option: **HANodeName**

- The high availability cluster node name.
- When empty server is working in standalone mode.

**HANodeName=zbx-node1**
ZABBIX HA NODE ADDRESS

- Additionally, NodeAddress parameter must be specified for each node
- NodeAddress must match IP or FQDN name of Zabbix server node
- This parameter will be used by Zabbix frontend to connect to active node

```yaml
## Option: NodeAddress
#       IP or hostname to define how frontend should connect to the server.
#       Format: <address>[:port]
NodeAddress=node1.example.com
```
Zabbix frontend will autodetect the active node

- Frontend reads settings from the nodes table in Zabbix database
- Node address of the active node is used as the Zabbix server address
- Zabbix server address and port must be undefined in the frontend configuration

```
// Uncomment and set to desired values to override Zabbix hostname/IP and port.
// $ZBX_SERVER                  = '';
// $ZBX_SERVER_PORT             = '';`
```
PUTTING IT ALL TOGETHER

zbx-node1
node1.example.com

zbx-node2
node2.example.com
Zabbix has 3 statuses for HA node

- Active: only one node can be active at a time
- Standby: multiple nodes can be in a standby mode
- Shutdown: a node was previously detected, but is shut down now

There is one more status for unavailable nodes

- Unreachable: a node was previously detected, but was lost without a shutdown
On every node a special process called HA Manager is started.

This is the only active Zabbix process on standby nodes started after the main process.

All other Zabbix processes will be started when failover happens.

```
ps ax | grep zabbix_server
39177 ? S 0:00 /usr/sbin/zabbix_server -c /etc/zabbix/zabbix_server.conf
39179 ? S 0:00 /usr/sbin/zabbix_server: ha manager
```
## ZABBIX HA NODE STATUS

Status of all HA cluster nodes is displayed on Zabbix frontend.

### System information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zabbix server is running</td>
<td>Yes</td>
<td>zbx-node1:10051</td>
</tr>
<tr>
<td>Number of hosts (enabled/disabled)</td>
<td>1</td>
<td>1 / 0</td>
</tr>
<tr>
<td>Number of templates</td>
<td>288</td>
<td></td>
</tr>
<tr>
<td>Number of items (enabled/disabled/not supported)</td>
<td>97</td>
<td>85 / 0 / 9</td>
</tr>
<tr>
<td>Number of triggers (enabled/disabled [problem/ok])</td>
<td>55</td>
<td>55 / 0 [1 / 54]</td>
</tr>
<tr>
<td>Number of users (online)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Required server performance, new values per second</td>
<td>1.42</td>
<td></td>
</tr>
<tr>
<td>High availability cluster</td>
<td>Enabled</td>
<td>Fall-over delay: 1 minute</td>
</tr>
</tbody>
</table>

### Name | Address | Last access | Status
---|---------|-------------|-------
```
| zbx-node1 | zbx-node1:10051 | 5s | Active |
| zbx-node3 | zbx-node3:10051 | 3s | Stopped |
| zbx-node2 | zbx-node2:10051 | 4s | Standby |
```
SWITCHING ZABBIX HA NODE

- Zabbix will failover to another node automatically on active node stop
- There must be at least one node in standby status

```
systemctl stop zabbix-server
```
HOW A FAILOVER WORKS?

- All nodes report their status every 5 seconds
  - When a node shuts down the standby node which first detects the lost node will take over

- If the node is lost and will not respond in time
  - The clock will keep on ticking until it reaches the failover delay (1 minute by default)
  - When the failover delay is over one of the standby nodes will take over
It is possible to adjust failover delay using `ha_set_failover_delay` runtime command

- supported range is from 10 seconds to 15 minutes

```bash
# zabbix_server -R ha_set_failover_delay=5m
zabbix_server: command sent successfully
```

Nodes can be removed using `ha_remove_node` runtime command

```bash
# zabbix_server -R ha_remove_node=3
zabbix_server: command sent successfully
```
CONNECTING AGENTS AND PROXIES
WHAT ABOUT ZABBIX AGENTS?

- Zabbix agent requires all nodes to be written in the configuration file
- Nodes are specified in a comma-separated list

### Option: Server

# List of comma delimited IP addresses or DNS names of Zabbix
# Incoming connections will be accepted only from the hosts listed here.

Server=zbx-node01,zbx-node02
Zabbix agent requires **all nodes** to be written in ServerActive section of the configuration file.

Cluster nodes need to be **separated by a semicolon**.

### Option: ServerActive
```
# List of comma delimited IP addresses or DNS names pairs of clusters of Zabbix servers for active checks.
# Cluster nodes need to be separated by semicolon.
ServerActive=zbx-node01;zbx-node02
```
WHAT ABOUT ZABBIX PROXIES?

Award Zabbix proxy in **passive mode** must accept connections from all Zabbix cluster nodes

### Option: Server

# List of comma delimited IP addresses or DNS names of Zabbix server.
# Incoming connections will be accepted only from the addresses listed here.
**Server**=`zbx-node01,zbx-node02`

Award Zabbix proxy in **active mode** must connect to all Zabbix server cluster nodes

- A semicolon must be used to separate node names

### Option: Server

# IP address or DNS name (address:port) or cluster (address:port;address2:port) of
# Zabbix server to get configuration data from and send data to.
# Cluster nodes need to be separated by semicolon.
**Server**=`zbx-node01;zbx-node02`
SETTING UP ZABBIX HA CLUSTER

- Start Zabbix server in HA mode on all nodes (specify node name and address)
- Comment out $ZBX_SERVER in $ZBX_SERVER_PORT in frontend configuration
- Specify Server and ServerActive parameters for all Zabbix agents
- Specify Server parameter for all Zabbix proxies
- Configure other network devices for HA environment
- Enjoy!
You are welcome to participate in our Zabbix summit HA workshop

Attend the Zabbix certified professional course to get more experience with Zabbix HA cluster
Thank you!