initMAX

ZABBIX PREMIUM PARTNER

ZABBIX CERTIFIED TRAINER

Webinar

High availability for Zabbix Server and Proxy 7.0

all our microphones are muted

ask your questions in Q&A, not in the Chat

use Chat for discussion, networking or applause

High availability for Zabbix Server and Proxy 7.0

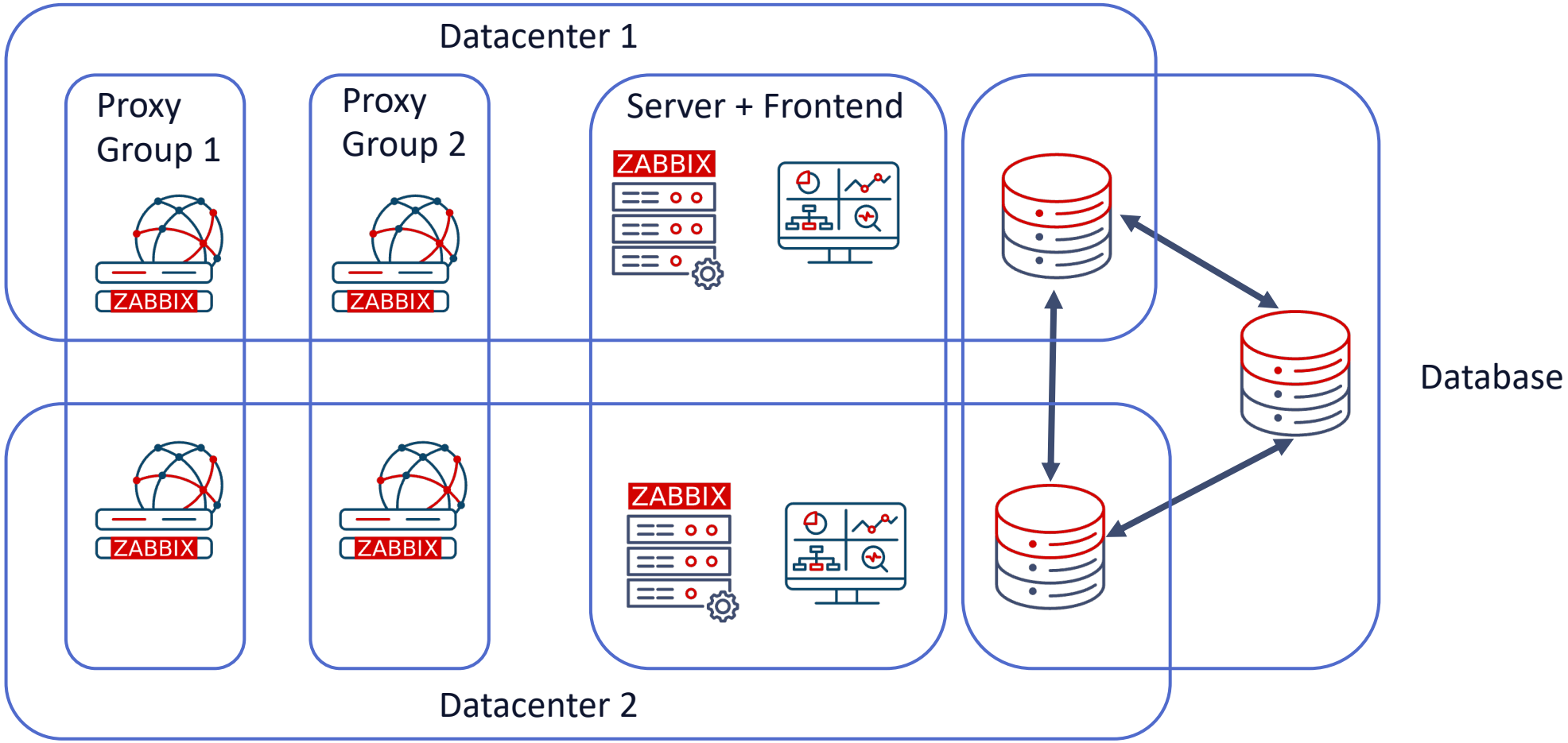
initMAX

Zabbix 7.0

- Zabbix Server High Availability
- Zabbix Proxy High Availability and Load Balancing
- Zabbix Proxy Memory Buffer

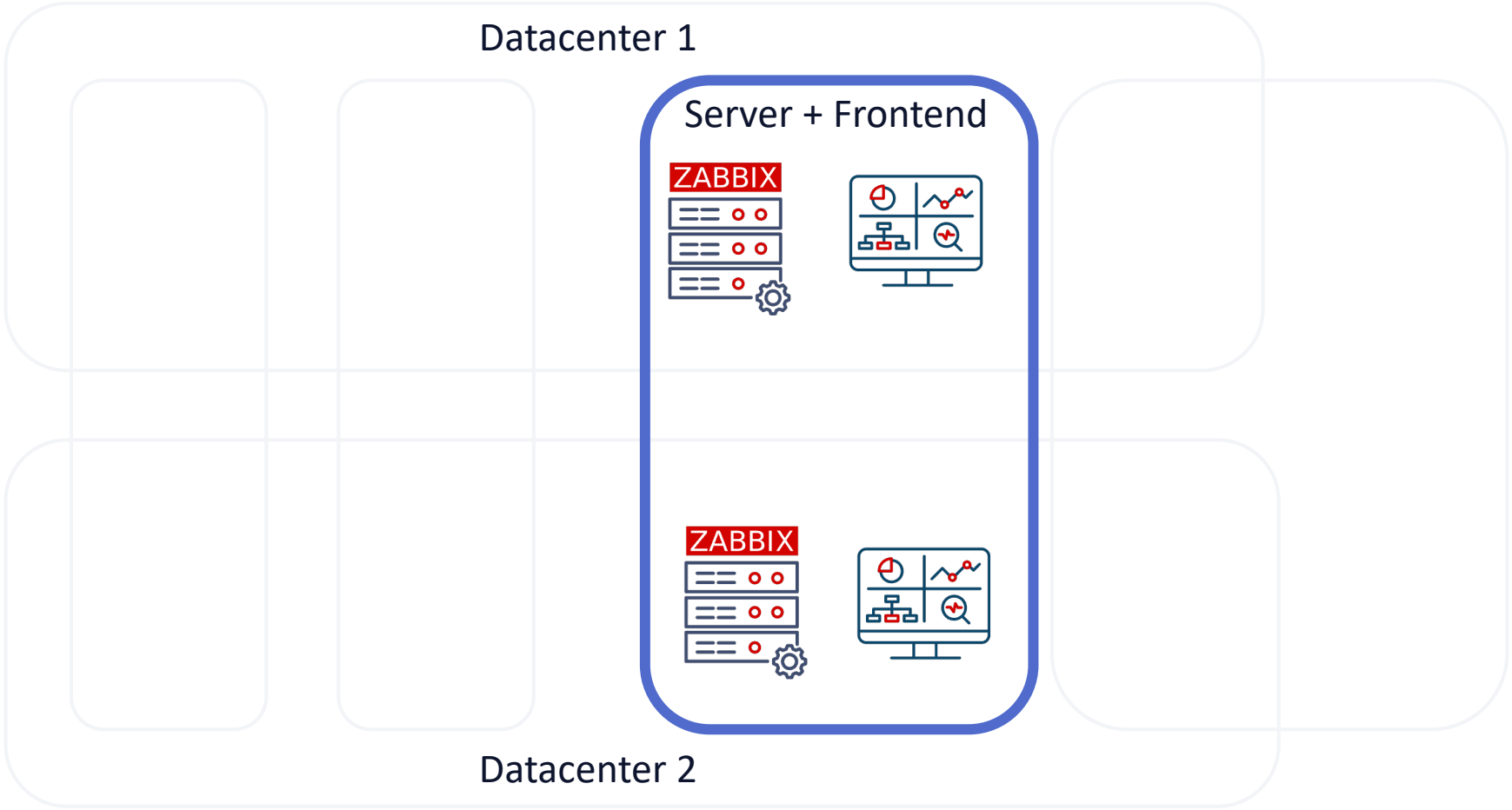
initMAX

Zabbix HA configuration



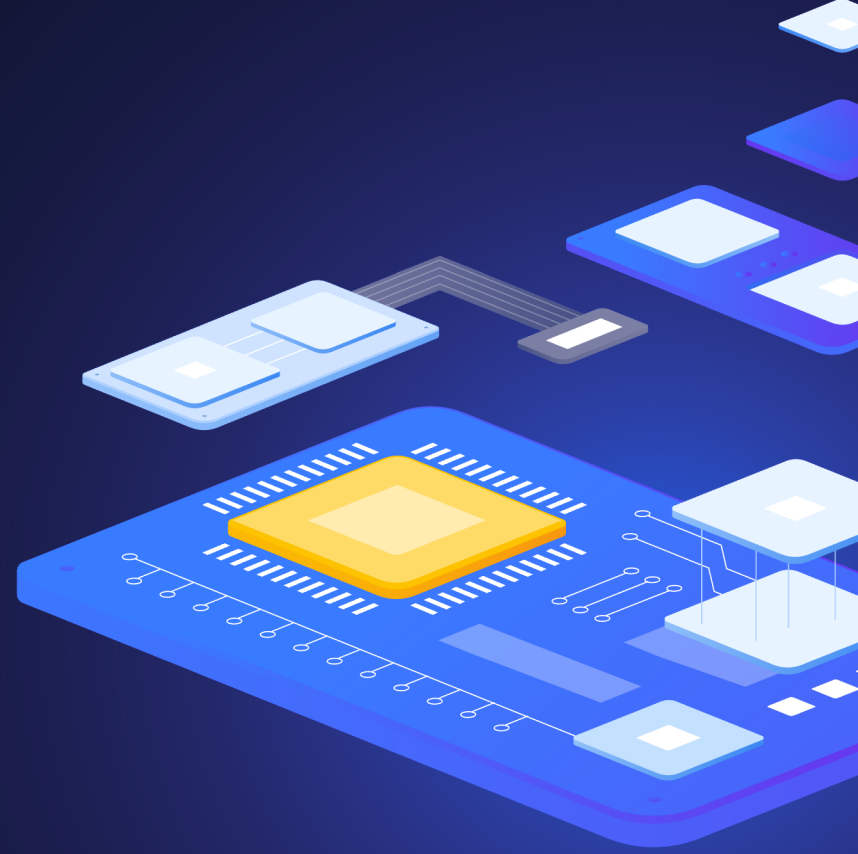
initMAX

Zabbix HA configuration



1

Server high availability



initMAX

Native High Availability (HA) solution:

Advantages:

- Easy to set up using Zabbix documentation
- Does not require expertise in HA architecture
- Officially supported by Zabbix
- Uses the Zabbix database to check the node status

Disadvantages:

- Only „Active – Passive“ mode

High availability for Zabbix Server and Proxy 7.0

initMAX

Native High Availability (HA) solution:

All the Zabbix server nodes will connect to a database to send a heartbeat:

- Only the active node will collect values, detect problems, and perform writes to the database
- Standby nodes will constantly watch the status of the active node

All the frontend server nodes will connect to:

- The same database server
- Only the active Zabbix server node

initMAX

Zabbix Server HA setup

HANodeName specifies the name of the node:

- Must be unique for each node
- When not specified, Zabbix server will start in standalone mode

```
## Option: HANodeName
#       The high availability cluster node name.
#       When empty server is working in standalone mode.
HANodeName=zbxha01
```

NodeAddress must match the IP or FQDN name of the Zabbix server node:

- This parameter will be used by Zabbix frontend to connect to the active node
- Without this parameter, frontend will be unable to display status, queue, etc.

```
## Option: NodeAddress
#       IP or hostname to define how frontend should connect to the server.
#       Format: <address>[:port]
NodeAddress=10.1.1.31
```

initMAX

Zabbix Server HA setup

Frontend configuration – autodetection of active node

- Settings must be undefined

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

ha_nodeid table in zabbix database

```
zabbix=# select * from ha_node;
         ha_nodeid         |  name   |  address   | port  | lastaccess | status |       ha_sessionid
---------------------------+---------+------------+-------+------------+--------+---------------------------
 cm2apfcic0001o2iych7ctvix | zbxha02 | 10.1.1.32 | 10051 | 1729012543 |      0 | cm2apfce90000o0iyfp7lq3sx
 cm2apb91v00013eixhzz1qvg4 | zbxha01 | 10.1.1.31 | 10051 | 1729012551 |      3 | cm2apb8y900003dixchvf1brh
(2 rows)
```

initMAX

Zabbix Server HA setup

- Zabbix has four statuses for an HA node:
- Active 3 only one node can be active at a time
- Standby 0 multiple nodes can be in standby mode
- Stopped 1 a node was previously detected, but now is shut down
- Unavailable 2 a node was previously detected, but was lost without a shutdown

High availability cluster	Enabled	Fail-over delay: 1 minute	
Name	**Address**	**Last access**	**Status**
zbxha01	10.1.1.31:10051	2s	Active
zbxha02	10.1.1.32:10051	1s	Standby

initMAX

Zabbix Server HA setup

Add new node to HA

- Configure /etc/zabbix/zabbix_server.conf
- Start zabbix_server process

```
HANodeName=zbxha01
NodeAddress=10.1.1.31
```

Remove Node from HA (Runtime commands can be executed only on active node)

```
root@zbxha01:~# zabbix_server -R ha_remove_node=zbxha02
Removed node "zbxha02" with ID "cm2apfcic0001o2iych7ctvix"
```

HA Status (Runtime commands can be executed only on active node)

```
root@zbxha01:~# zabbix_server -R ha_status
Failover delay: 60 seconds
Cluster status:
   #  ID                        Name                      Address                   Status     LastAccess
   1. cm2apb91v00013eixhzz1qvg4 zbxha01                   10.1.1.31:10051           active      4s
   2. cm2bsblpf0001g1iy9k1misid zbxha02                   10.1.1.32:10051           standby     3s
```

initMAX

Zabbix Server HA setup

- Failover delay (Runtime commands can be executed only on active node)

```
root@zbxha01:~# zabbix_server -R ha_set_failover_delay=2m
HA failover delay set to 120 seconds
```

Processes:

- ha_manager process

```
16128 ?        S      0:00 /usr/sbin/zabbix_server -c /etc/zabbix/zabbix_server.conf
16129 ?        S      0:00 /usr/sbin/zabbix_server: ha manager
```

- Active Node:

```
17767 ?        S      0:02 /usr/sbin/zabbix_server -c /etc/zabbix/zabbix_server.conf
17768 ?        S      0:05 /usr/sbin/zabbix_server: ha manager
18438 ?        S      0:00 /usr/sbin/zabbix_server: service manager #1 [processed 0 events, updated 0 event
tags, deleted 0 problems, synced 0 service updates, idle 5.020298 sec during 5.020452 sec]
18439 ?        S      0:14 /usr/sbin/zabbix_server: configuration syncer
18440 ?        S      0:00 /usr/sbin/zabbix_server: alert manager #1
18441 ?        S      0:00 /usr/sbin/zabbix_server: alerter #1 started
.....
```

initMAX

Zabbix Agent configuration

Zabbix passive agent mode requires all the nodes to be written in the Server parameter

- Cluster nodes are specified on a **comma-separated** list

```
Server=10.1.1.31,10.1.1.32,10.1.1.165
```

Zabbix active agent requires cluster nodes to be specified in the ServerActive parameter

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

```
ServerActive=10.1.1.31;10.1.1.32,10.1.1.165
```

initMAX

Zabbix Proxy configuration

Zabbix passive proxy mode requires all the nodes to be written in the Server parameter

- Cluster nodes are specified on a **comma-separated** list

```
Server=10.1.1.31,10.1.1.32
```

Zabbix active proxy requires cluster nodes to be specified in the Server parameter

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

```
Server=10.1.1.31;10.1.1.32
```

initMAX

Zabbix Server HA behavior

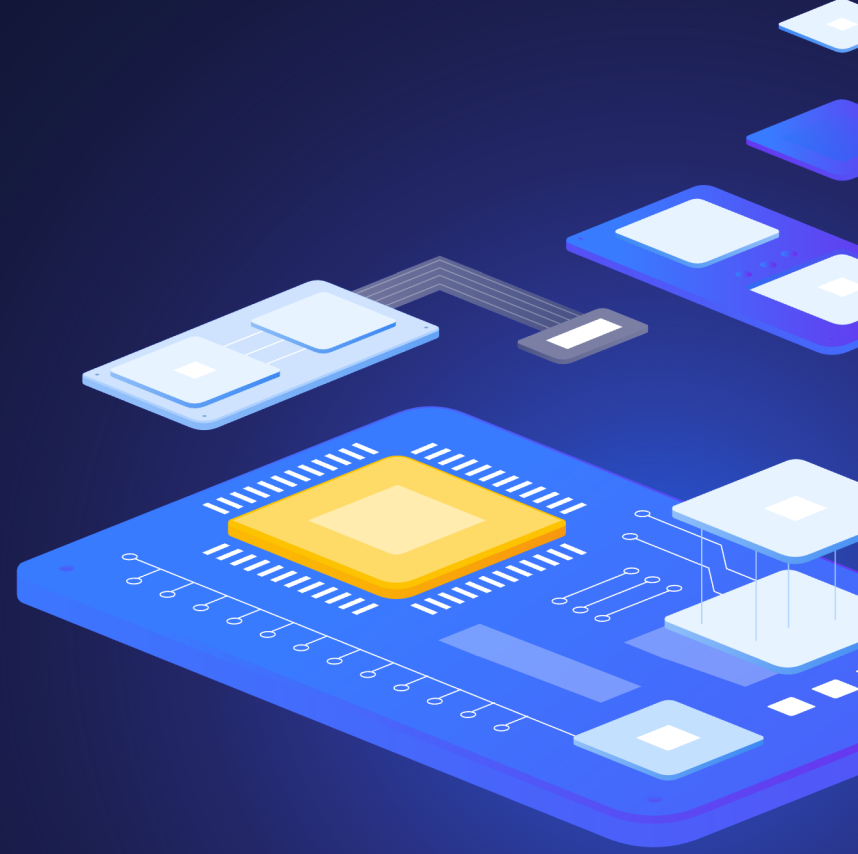
Zabbix HA only supports automatic failover:

- Zabbix server restart initiates automatic failover to another node
- All the nodes report their status and check the active node status every 5 seconds
- After shutting down, the active node changes its status to 1 (stopped)
- The standby node, which first detects the lost node, takes over

If the active node is lost and does not respond in time:

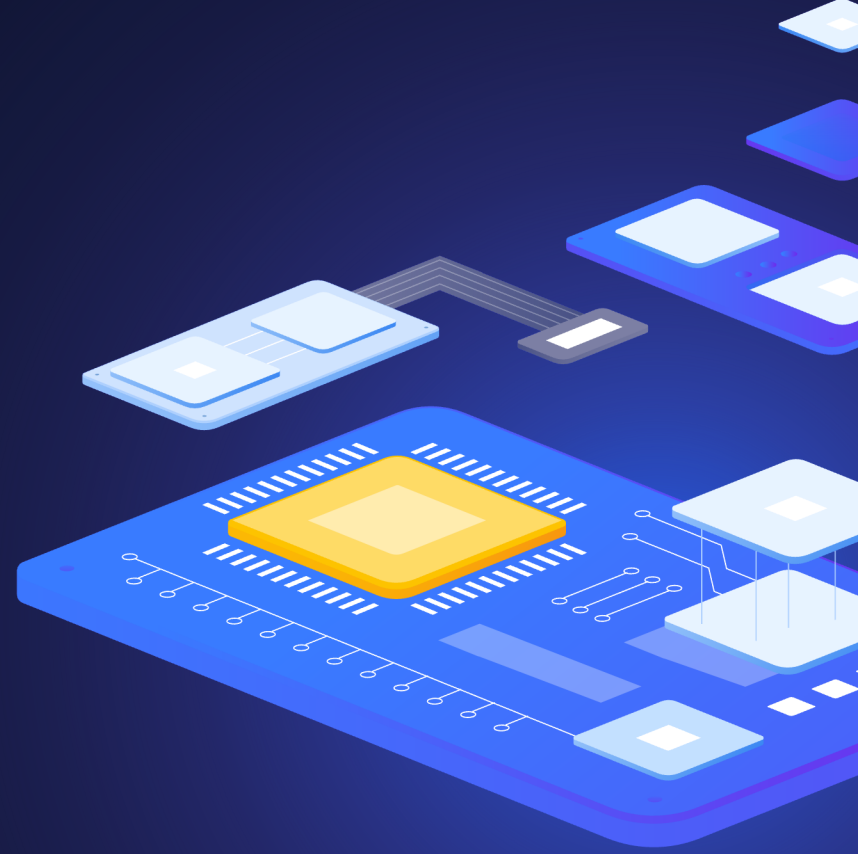
- It does not update the heartbeat in the ha_status table
- All the other nodes report their status and check the active node status every 5 seconds
- The clock keeps on ticking until it reaches the failover delay (1 minute by default)
- The standby node, which first detects the lost node, takes over

Demo



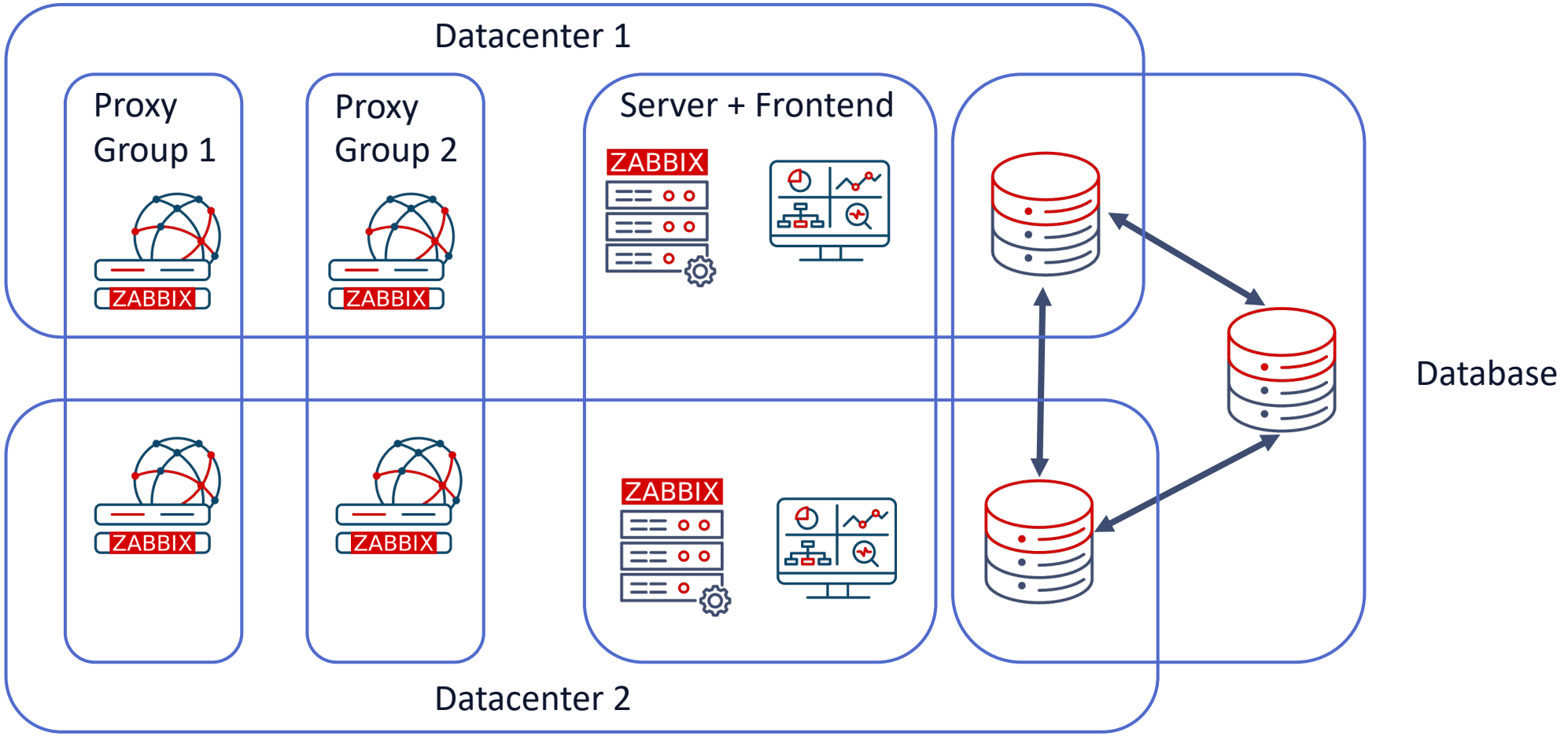
2

Proxy high availability and load balancing



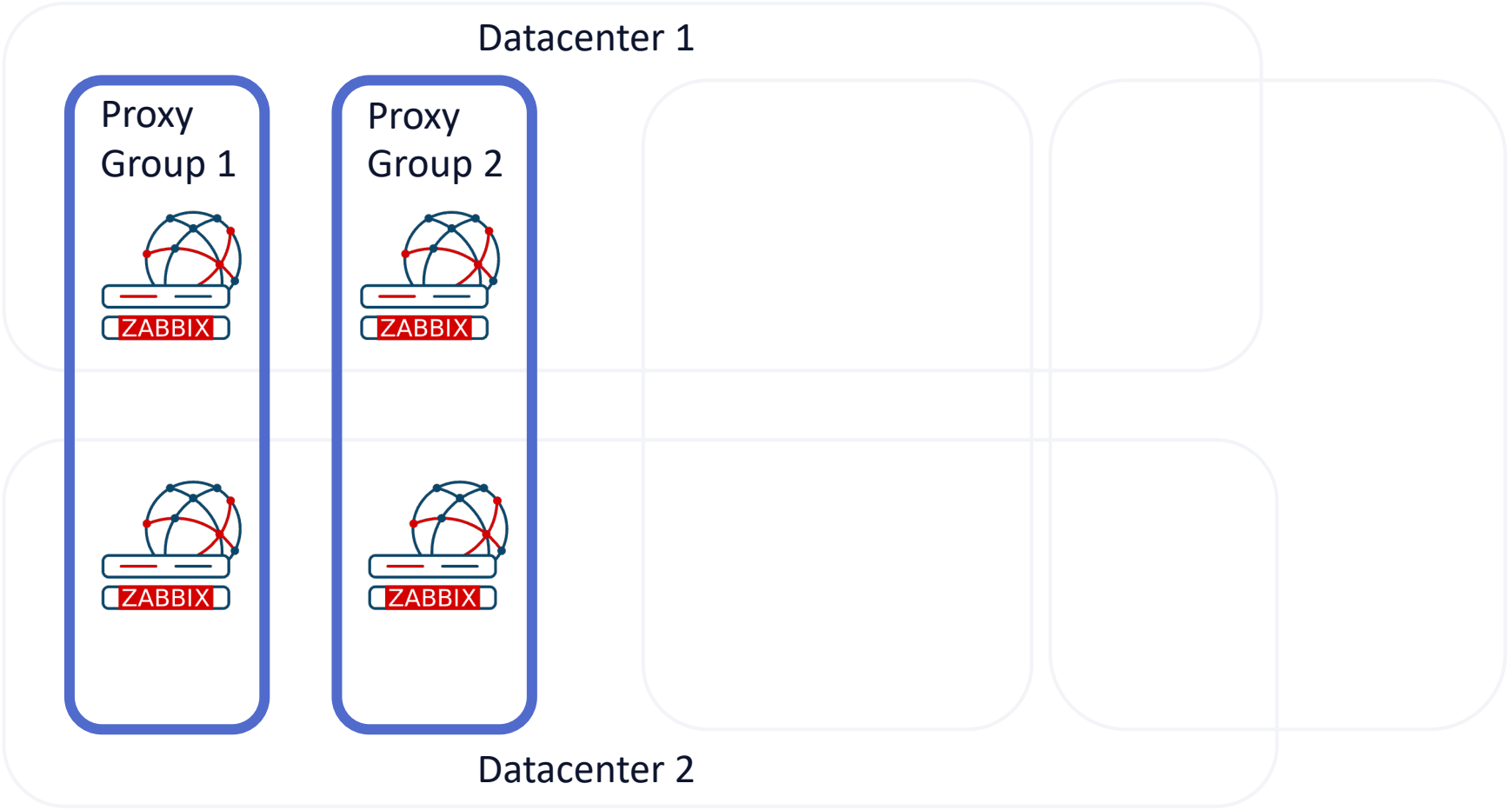
initMAX

Zabbix HA configuration



initMAX

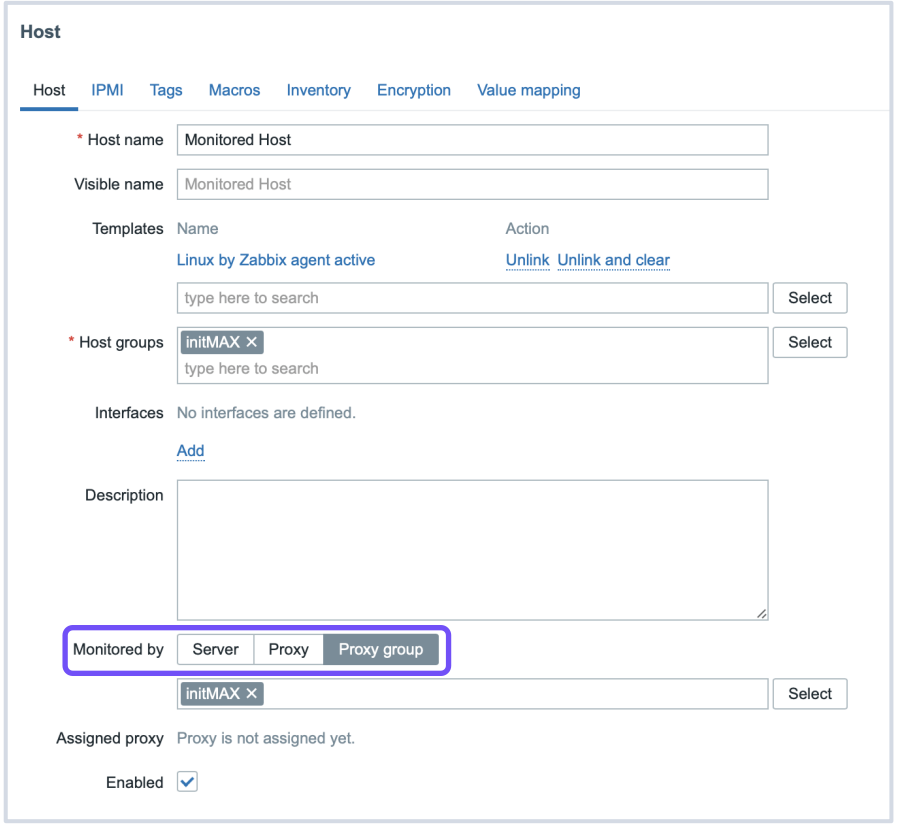
Zabbix HA configuration



initMAX

Proxy groups

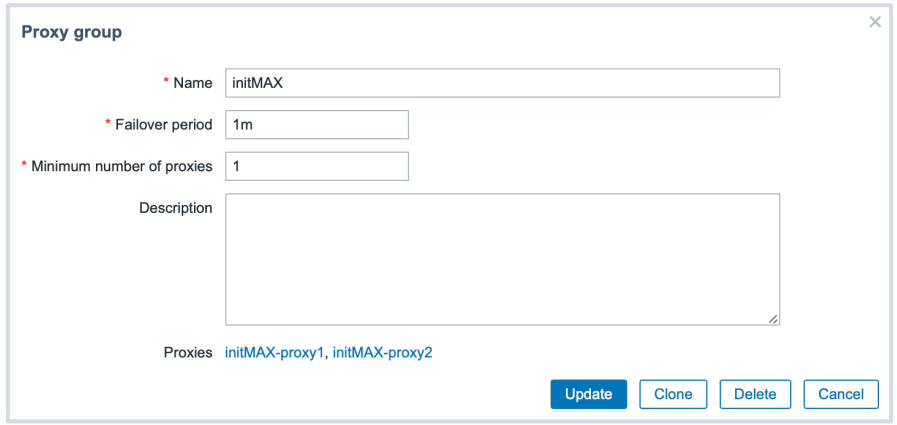
- Proxy groups are introduced to support LB and HA logic
  - Hosts can be monitored by a proxy group or a single proxy

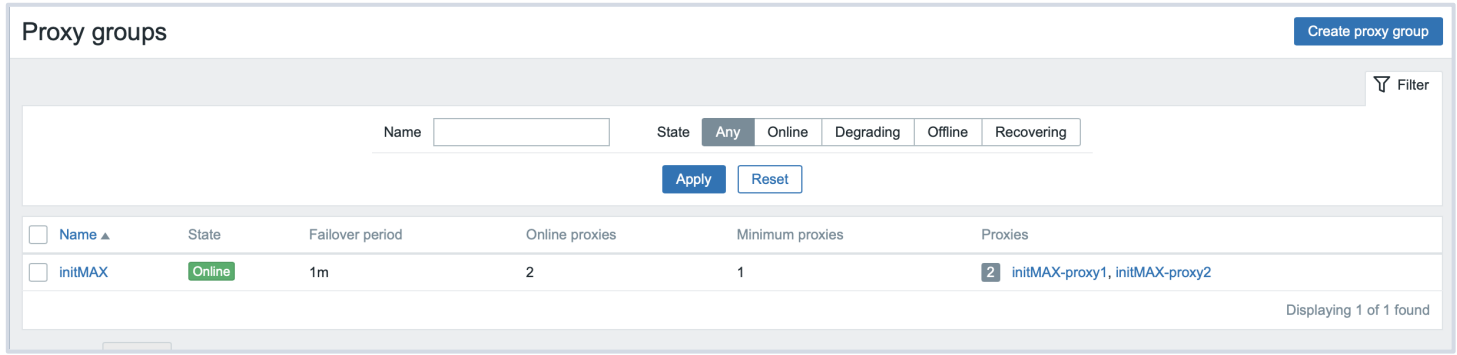


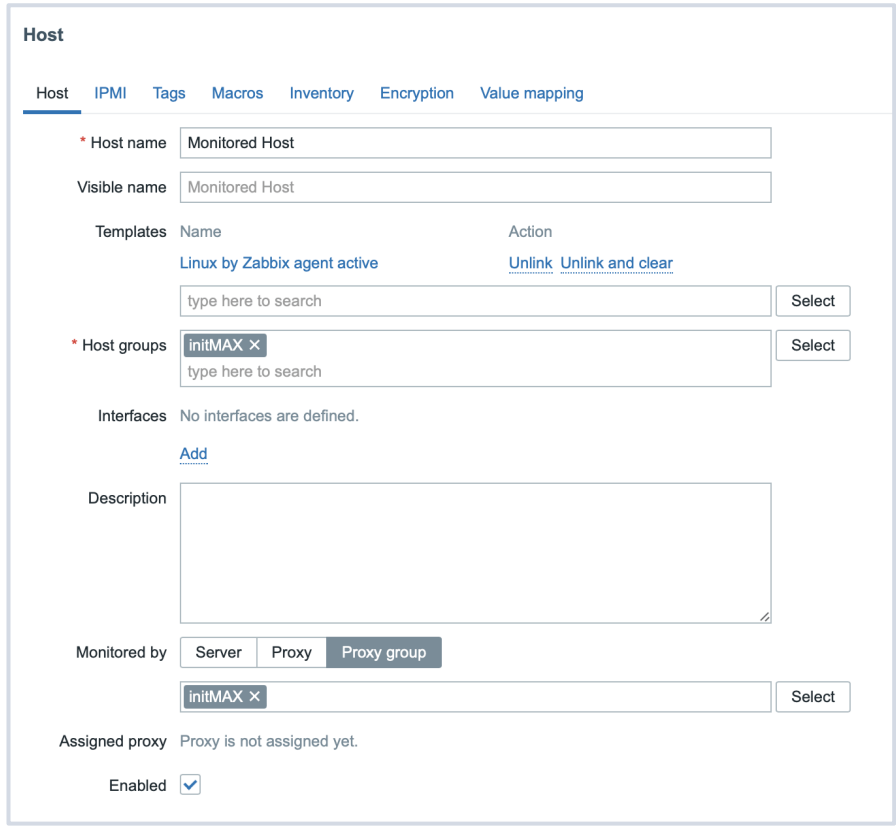
initMAX

Proxy groups

- Proxy groups are introduced to support LB and HA logic
  - Hosts can be monitored by a proxy group or a single proxy







initMAX

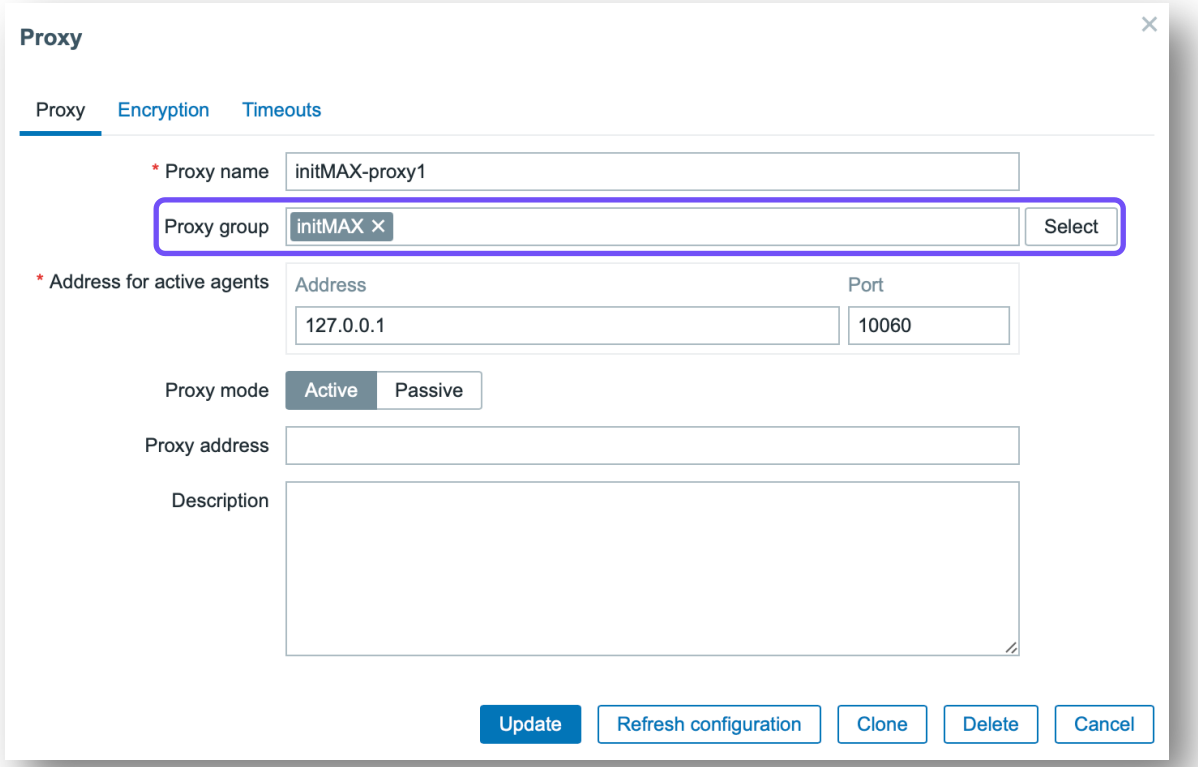
Proxy groups

- More about proxy groups:
  - Failover period is used to decide when a proxy is online/offline
  - A minimal number of online proxies can be configured for a proxy group to be online
  - Proxies of older versions (and hosts assigned to them) will be excluded from host rebalancing
  - If a proxy group is offline (less than minimum number of proxies online), hosts assigned to that group will stop being monitored

initMAX

Proxy groups

- Proxies are assigned to proxy groups using the proxy configuration form:



initMAX

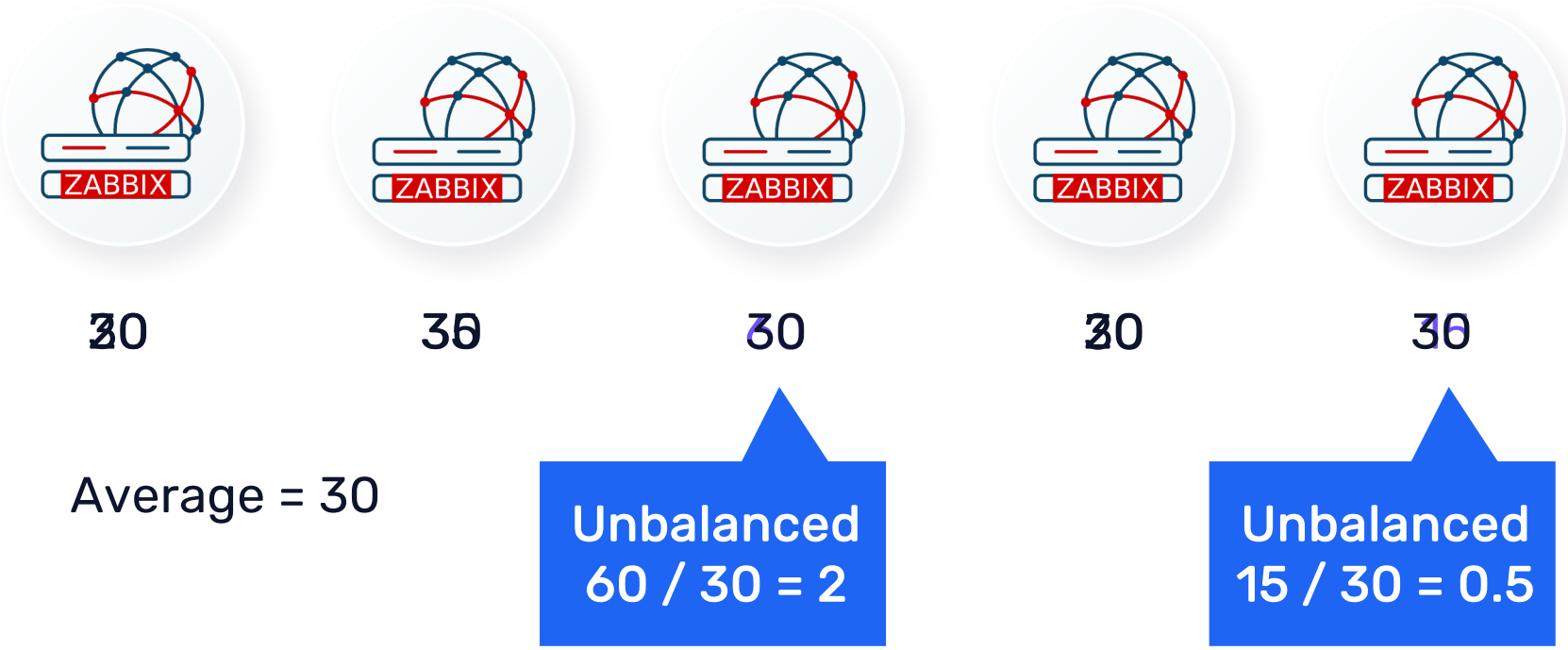
Proxy groups

- Hosts are rebalanced if the following conditions are met:
  - The number of hosts assigned to a proxy differs from the average by twice or more
  - Difference is not less than 10 hosts
  - Hosts exceeding the average are unassigned from proxies
  - The unassigned hosts are then assigned to proxies with fewer hosts

initMAX

Proxy groups

- Proxy rebalancing example:



initMAX

Proxy groups

- When a new proxy is added, the group is automatically rebalanced
  - New average is calculated
  - Excess hosts are unassigned
  - Unassigned hosts are reassigned between proxies

initMAX

Zabbix Agent

- Agents need to be configured to accept connections from proxies in a proxy group:
  - For active agent mode, ServerActive needs to contain the IP of at least one (preferably multiple) proxy node groups
  - For passive agent mode, Server parameter needs to include IP addresses of all proxy nodes in a proxy group

```
# zabbix_proxy.log
2594:20240620:082058.199 cannot send list of active checks to „initMaxProxy01": host „initMAX_srv" is monitored by another proxy
```

initMAX

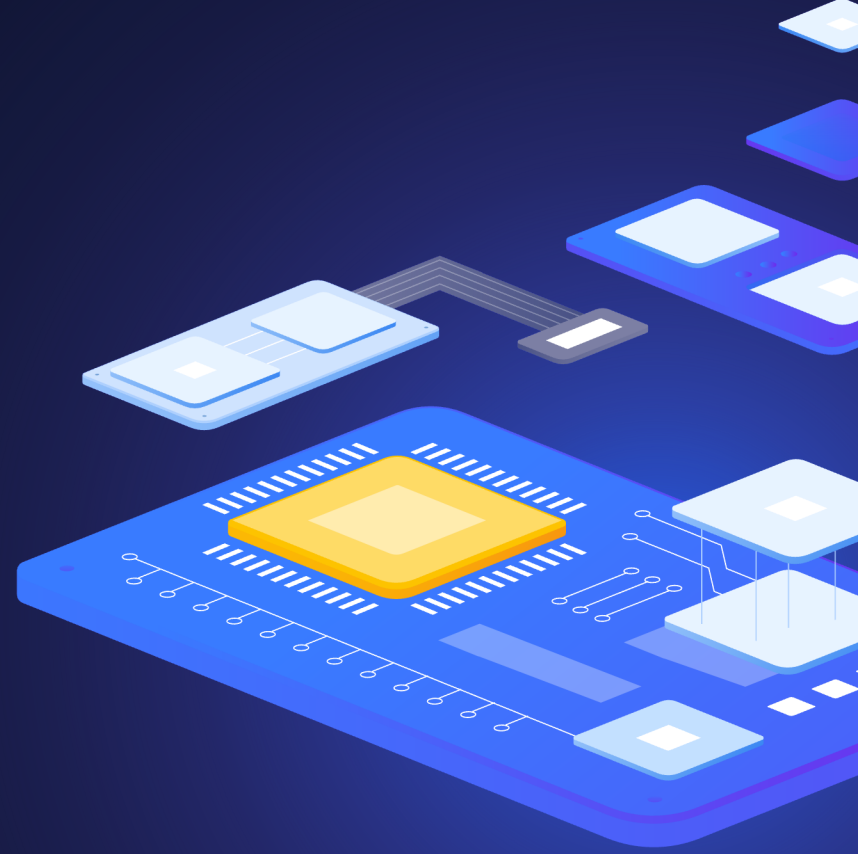
API changes

- Proxy group object
  - New object with create, get, update and delete methods
  - Host object creation

monitored_by	integer	Source that is used to monitor the host. Possible values: 0 - *(default)* Zabbix server; 1 - Proxy; 2 - Proxy group.
proxyid	ID	ID of the proxy that is used to monitor the host. Property behavior: - *required* if `monitored_by` is set to "Proxy"
proxy_groupid	ID	ID of the proxy group that is used to monitor the host. Property behavior: - *required* if `monitored_by` is set to "Proxy group"

2

Proxy memory buffer



initMAX

New proxy buffer modes

- Zabbix 7.0 will introduce new proxy buffer modes:
  - Disk — Current behavior
  - Memory — Data stored only in shared memory
  - Hybrid — Buffer works in memory mode with DB as backup (Default now)

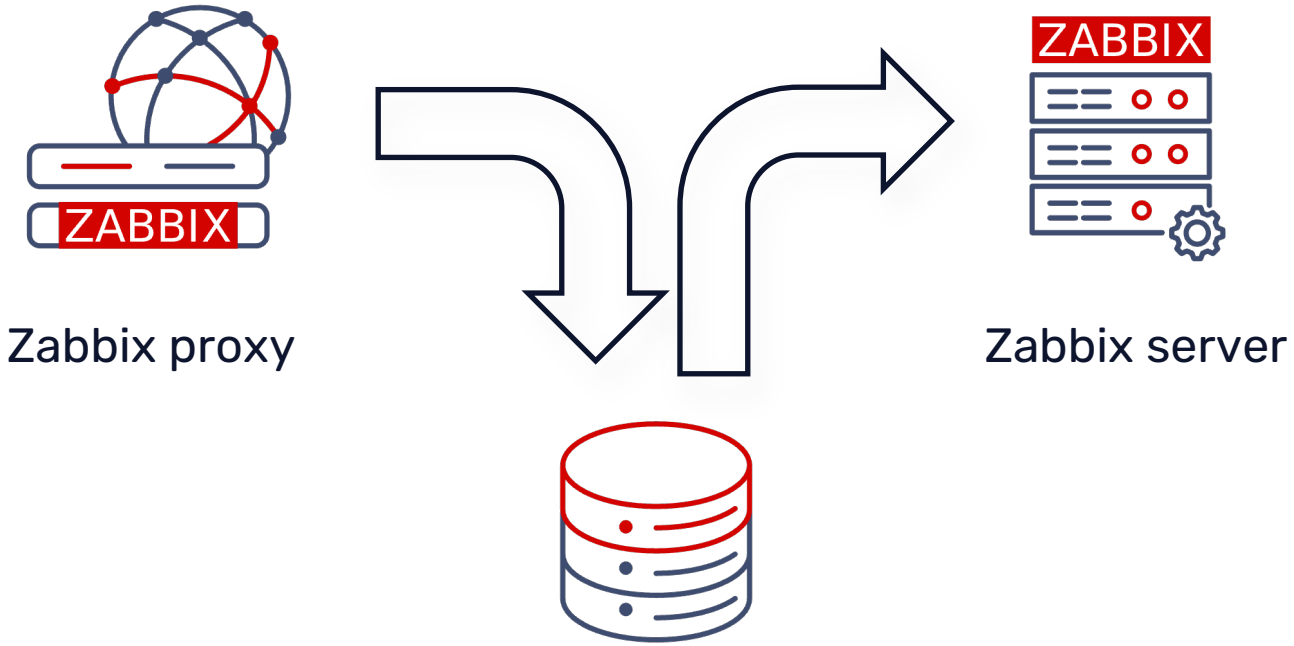
```
### Option: ProxyBufferMode
#     Specifies history, discovery and auto registration data storage
mechanism:
#     disk    - data are stored in database and uploaded from database
#     memory  - data are stored in memory and uploaded from memory.
#     hybrid  - the proxy buffer normally works like in memory mode until it
#               runs out of memory or the oldest record exceeds the configured
age
# Default:
# ProxyBufferMode=disk

ProxyBufferMode=hybrid
```

initMAX

Disk mode

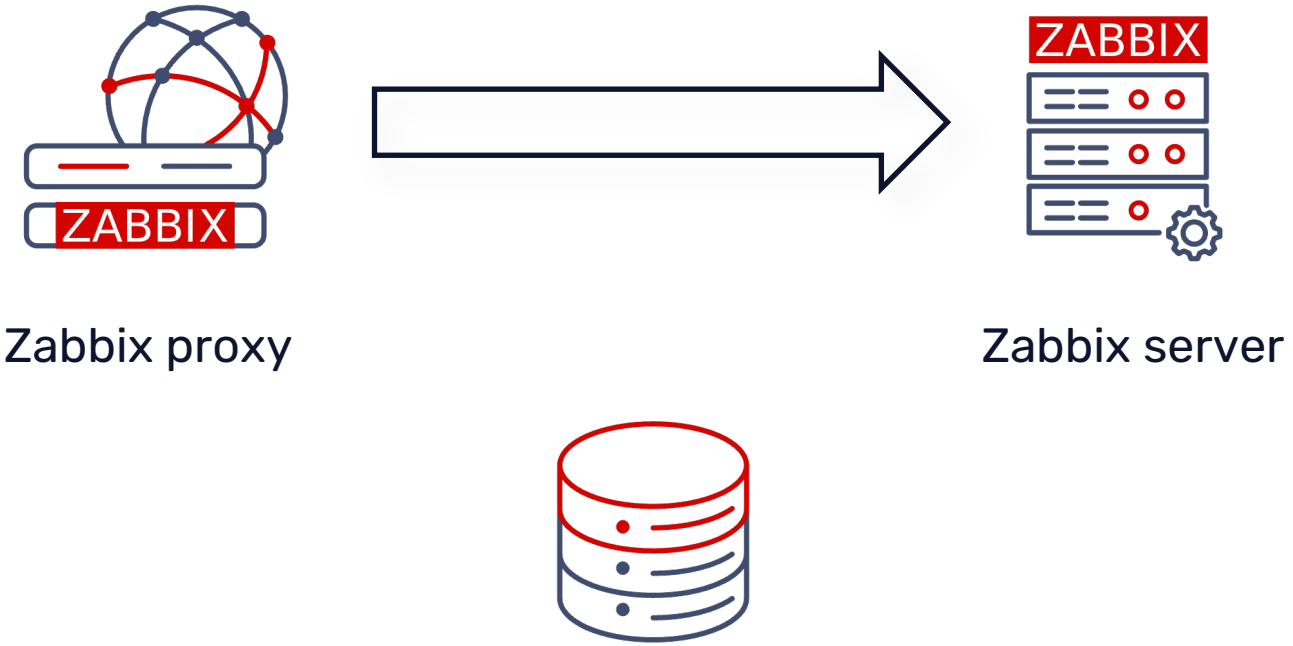
- Each value collected by Zabbix proxy goes through a database:
  - Database (MySQL, Postgres, or SQLITE) required on each proxy
  - This may cause a bottleneck on large proxies



initMAX

Memory mode

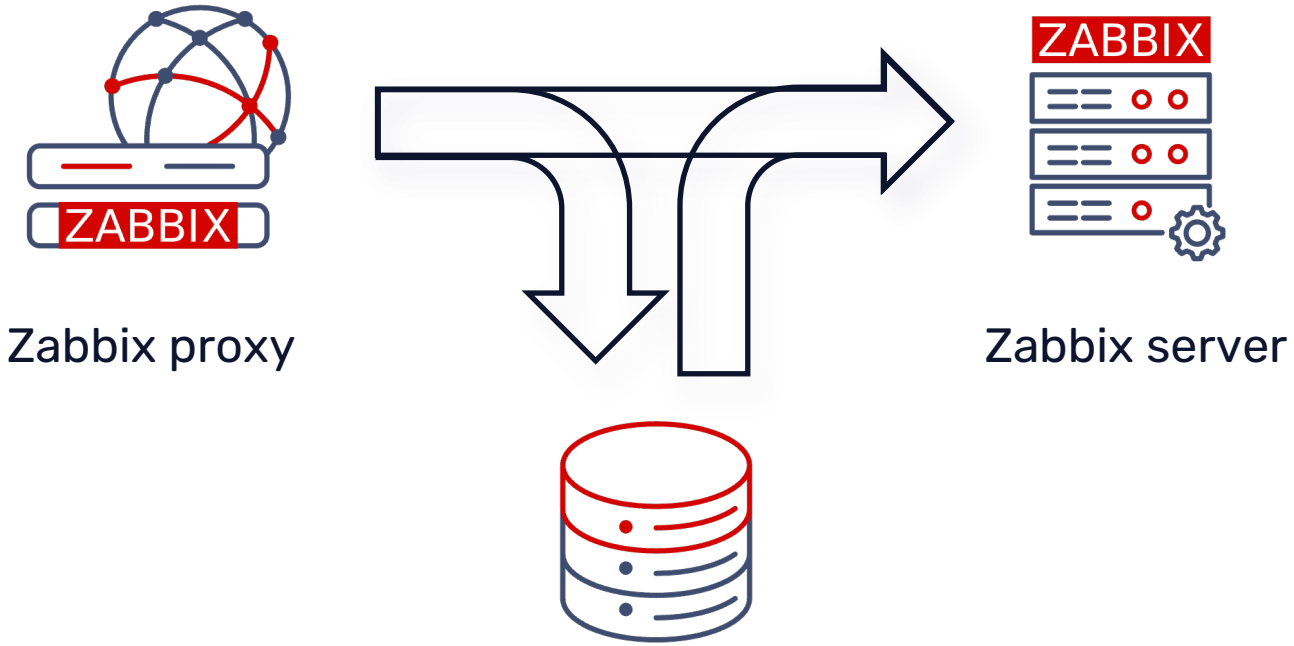
- Data is sent to Zabbix server directly:
  - The history data is being stored in shared memory and uploaded from it
  - If buffer runs out of memory the old data will be discarded



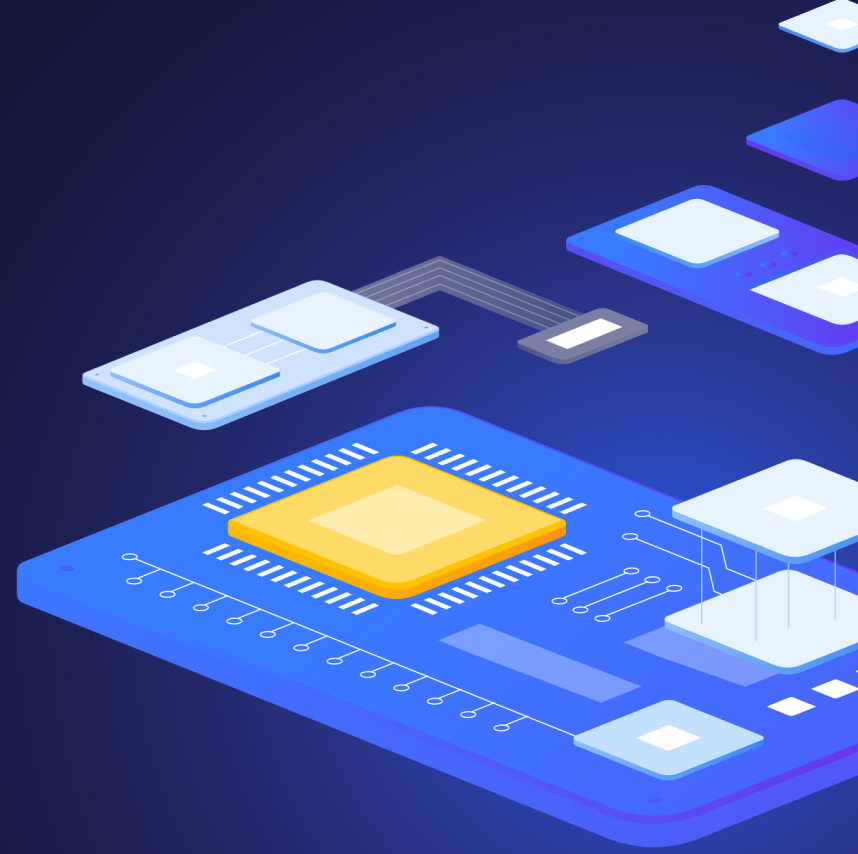
initMAX

Hybrid mode

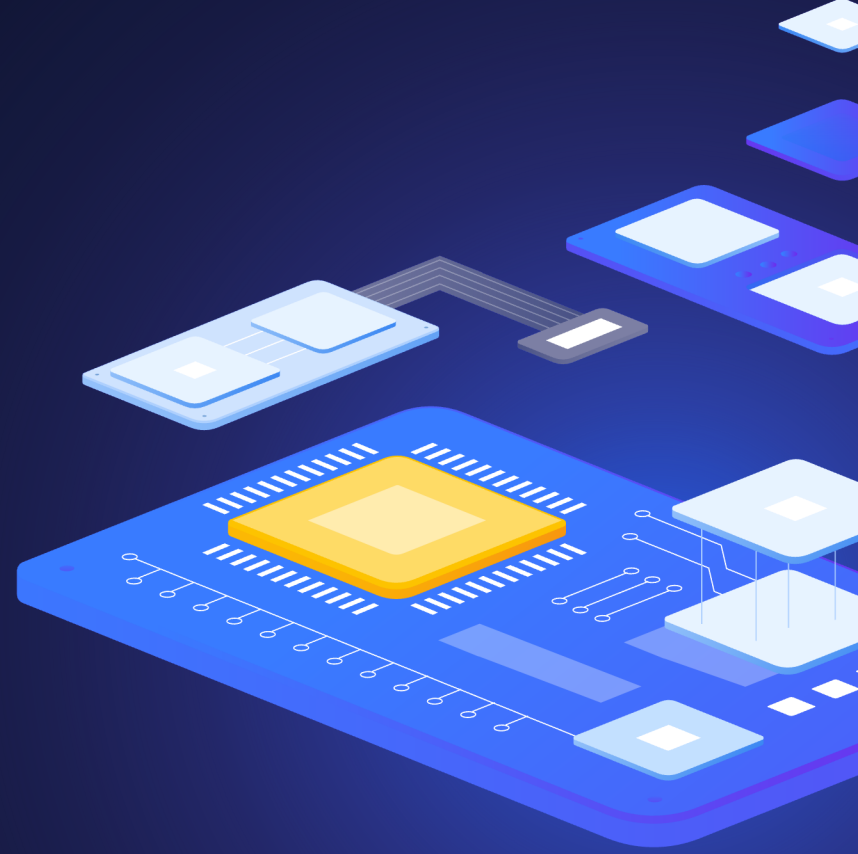
- Data is sent to the Zabbix server directly:
  - Buffer normally works like in the memory mode
  - The buffer is flushed in database if buffer does not have enough space



Demo



Questions?



initMAX

Contact us:

Phone:	+420 800 244 442
Web:	https://www.initmax.cz
Email:	tomas.hermanek@initmax.cz
LinkedIn:	https://www.linkedin.com/company/initmax
Twitter:	https://twitter.com/initmax
Tomáš Heřmánek:	+420 732 447 184