UPGRADING TO 5.0 - BEST PRACTICE AND COMMON PITFALLS.
PREPARING FOR THE UPGRADE

NEW REQUIREMENTS, BACKUPS AND SCHEDULING DOWNTIMES

- Updated requirements for PHP and DB backend
- Backing up your zabbix infrastructure
- Estimating the potential downtime
UPDATED REQUIREMENTS FOR 5.0

- Minimum supported version for PHP is now 7.2 (from 5.4)
- mbedtls (former polarSSL) is no longer supported for encryption.
- Added support of LIBSSH to support newer platforms like RHEL 8
- MySQL 5.5.62-8.0.x (from 5.0.3)
- Oracle 11.2 (from 10g)
- PostgreSQL 9.2.24 (from 8.1)
- Timescale 1.0 or later
- IBM DB2 support dropped
PREPARING FOR THE BACKUP

✔ Check for any OS updates. If the decision is made to apply the updates for stability/performance reasons, apply the updates and give your environment a few days to detect any new potential issues.

✔ The same rule applies for DB backend upgrades and configuration changes.

✔ This helps us to rule out any performance issues/instabilities caused by any of the performed changes which are unrelated to Zabbix itself.
PREPARING FOR THE BACKUP

- Check for any custom solutions used in your Zabbix instance
- For upgrading from versions <= 3.0, partitioning will have to be turned off before proceeding with the upgrade
- Are there any custom modules or patches applied on your instance?
- Are packages available on the underlying OS? Does my policy allow using packages to install Zabbix? Am I able to compile Zabbix or Zabbix packages from source?
BACKING UP YOUR ZABBIX INFRASTRUCTURE

- Perform the Zabbix database backend, server and frontend file backup
- Perform the backup of any custom scripts, modules or any other customizations that are applied to your Zabbix instance
- Back up the configuration files
BACKING UP YOUR ZABBIX CONFIGURATION

# cp -r /usr/lib/zabbix/externalscripts/ /tmp/zabbix_backup
# cp -r /etc/zabbix/ /tmp/zabbix_backup/
# cp -r /etc/httpd/ /tmp/zabbix_backup/
# cp -r /usr/share/zabbix/ /tmp/zabbix_backup/web/
# cp -r /usr/share/doc/zabbix-* /tmp/zabbix_backup/doc/
BACKING UP YOUR DB CONFIGURATION TABLES

ESTIMATING THE DOWNTIME

☑ Check the size of the database

SELECT table_schema AS "<zabbix>",
ROUND(SUM(data_length + index_length) / 1024 / 1024 / 1024, 2) AS "Size in Gb"
FROM information_schema.TABLES
GROUP BY table_schema;
ESTIMATING THE DOWNTIME

✓ Check the size of the database tables

```sql
SELECT table_name, table_rows, data_length, index_length, 
round(((data_length + index_length) / 1024 / 1024 ),2) 
"Size in MB" FROM information_schema.tables WHERE 
table_schema = "zabbix" order by round(((data_length + 
index_length) / 1024 / 1024 ),2) DESC LIMIT 20;
```
ESTIMATING THE DOWNTIME

☑️ Configuration tables usually take a relatively small amount of space

<table>
<thead>
<tr>
<th>table_name</th>
<th>table_rows</th>
<th>data_length</th>
<th>index_length</th>
<th>Size in GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>alerts</td>
<td>2049491</td>
<td>1431306240</td>
<td>324812800</td>
<td>1.64</td>
</tr>
<tr>
<td>items</td>
<td>2199915</td>
<td>1116225536</td>
<td>448479232</td>
<td>1.46</td>
</tr>
<tr>
<td>triggers</td>
<td>1277344</td>
<td>298336256</td>
<td>119996416</td>
<td>0.39</td>
</tr>
<tr>
<td>item_discovery</td>
<td>1921170</td>
<td>245071872</td>
<td>161660928</td>
<td>0.38</td>
</tr>
<tr>
<td>history_text</td>
<td>2623617</td>
<td>187858944</td>
<td>199557120</td>
<td>0.36</td>
</tr>
<tr>
<td>items_applications</td>
<td>2115352</td>
<td>147439616</td>
<td>188497920</td>
<td>0.31</td>
</tr>
<tr>
<td>auditlog</td>
<td>1588337</td>
<td>203145216</td>
<td>71483392</td>
<td>0.26</td>
</tr>
<tr>
<td>trigger_discovery</td>
<td>1057864</td>
<td>63160320</td>
<td>43188224</td>
<td>0.10</td>
</tr>
<tr>
<td>graphs</td>
<td>277365</td>
<td>61440000</td>
<td>42909696</td>
<td>0.10</td>
</tr>
<tr>
<td>functions</td>
<td>723781</td>
<td>41500672</td>
<td>54525952</td>
<td>0.09</td>
</tr>
</tbody>
</table>
ESTIMATING THE DOWNTIME

On the other hand, history*, trend* and events tables tend to rapidly grow in size on large scale instances

<table>
<thead>
<tr>
<th>table_name</th>
<th>table_rows</th>
<th>data_length</th>
<th>index_length</th>
<th>Size in GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>history</td>
<td>2383675122</td>
<td>143353069568</td>
<td>92952838144</td>
<td>220.08</td>
</tr>
<tr>
<td>events</td>
<td>1079791931</td>
<td>68071456768</td>
<td>99840163840</td>
<td>156.38</td>
</tr>
<tr>
<td>trends</td>
<td>1397366123</td>
<td>136157478912</td>
<td>0</td>
<td>126.81</td>
</tr>
<tr>
<td>trends_uint</td>
<td>1114431630</td>
<td>110791983104</td>
<td>0</td>
<td>103.18</td>
</tr>
<tr>
<td>history_uint</td>
<td>415753897</td>
<td>25146097664</td>
<td>16716546048</td>
<td>38.99</td>
</tr>
<tr>
<td>history_str</td>
<td>161111152</td>
<td>11504795648</td>
<td>6574358528</td>
<td>16.84</td>
</tr>
</tbody>
</table>
CLEANING UP THE EVENTS TABLE (1)

- Set Event storage period to 1 day
- Manually execute the housekeeper process until the tables are cleared

```
#zabbix_server -R housekeeper_execute

housekeeper [deleted 20764 hist/trends, 0 items/triggers, 41934 events, 2301 problems, 0 sessions, 0 alarms, 0 audit, 0 records in 0.646578 sec, idle for 1 hour(s)]
```
CLEANING UP THE EVENTS TABLE (2)

- Use a basic for loop to execute DELETE statements with a LIMIT clause
- Can take a long time if the events table has grown extremely large over time

```bash
#!/bin/bash
for i in {1..50}
do
    mysql -uroot -ppassword -e "DELETE FROM zabbix.events where source in (1,2,3) limit 100000;"
done
```

This is a workaround, use only if you’re having issues with the first method!
CLEANING UP THE EVENTS TABLE (3)

✔ Copy events with source 0 (trigger events) to a new table

```sql
create table events_new like events;
insert into events_new select * from events where source=0;
RENAME TABLE events to events_old;
RENAME TABLE events_new TO events;
```

✔ You will have to drop and recreate all of the constraints referencing events on other tables – since they will be linked to the renamed events_old table!

```sql
CONSTRAINT `c_acknowledges_2` FOREIGN KEY (`eventid`) REFERENCES `events_old` (`eventid`) ON DELETE CASCADE
```

This is a workaround, use only if you’re having issues with the first method!

**NO changes to events table when upgrading from 4.0 – 5.0!**
CREATING THE TEMPORARY HISTORY TABLES

```
RENAME TABLE history_text TO history_text_old;
RENAME TABLE history_log TO history_log_old;

CREATE TABLE history_text like history_text_old;
CREATE TABLE history_log like history_log_old;
```

NO changes to history tables when upgrading from 4.0 – 5.0!
EXAMPLE USE CASE

- CentOS 7 with Zabbix 3.0 server, frontend and 3 proxies
- One of the proxies uses Amazon Linux AMI OS
- Zabbix server uses MariaDB 10.2 as the DB backend
- Zabbix Proxies use a mix of MariaDB 5.5 and SQLite
UPGRADE THE SERVER

☑️ Create temporary history tables!
☑️ Install the updated packages, clean the repository cache and perform the upgrade!

```
# rpm -Uvh https://repo.zabbix.com/zabbix/5.0/rhel/7/x86_64/zabbix-release-5.0-1.el7.noarch.rpm
# yum clean all
# yum -y upgrade zabbix-server-mysql zabbix-agent
```
# UPGRADE THE FRONTEND

- Install the Zabbix 5.0 repository and the CentOS SCL repository

```bash
#rpm -Uvh https://repo.zabbix.com/zabbix/5.0/rhel/7/x86_64/zabbix-release-5.0-1.el7.noarch.rpm
#yum clean all
#yum -y install centos-release-scl
```

- Enable the frontend repo

```bash
#vi /etc/yum.repos.d/zabbix.repo

[zabbix-frontend]
enabled=1
```
UPGRADE THE FRONTEND

- Reinstall the web server with the apache configuration
- Make sure that you have backed up your php and web server configuration!

```
#yum remove zabbix-web-3.*
#yum -y install zabbix-web-mysql-scl zabbix-apache-conf-scl
```
Change the default php configuration

php_value[max_execution_time] = 300
php_value[memory_limit] = 128M
php_value[post_max_size] = 16M
php_value[upload_max_filesize] = 2M
php_value[max_input_time] = 300
php_value[max_input_vars] = 10000
php_value[date.timezone] = Europe/Riga
IMPORT BACK THE OLD HISTORY DATA

```sql
insert into history_log select
itemid, clock, timestamp, source, severity, value, logeventid, ns from
history_log_old;

insert into history_text select itemid, clock, value, ns from history_text_old;
```

✔ Can be done with the Zabbix server process running
UPGRADE THE PROXIES (1)

- Upgrade the CentOS proxies

#rpm -Uvh https://repo.zabbix.com/zabbix/5.0/rhel/7/x86_64/zabbix-release-5.0-1.el7.noarch.rpm
#yum clean all
#yum -y upgrade zabbix-proxy-mysql

- Since the proxy uses MariaDB backend DB, the database schema upgrade process is performed automatically on the Zabbix proxy startup.
UPGRADE THE PROXIES (1)

For SQLite3 – remove the DB file and it will be recreated after the upgrade.

19892:20200626:160201.397 Zabbix does not support SQLite3 database upgrade.
Proxy runs on the Amazon Linux AMI which uses CentOS 6 packages

No server or proxy Zabbix 5.0 packages are available for CentOS 6

What is the best course of action?

Compile the Zabbix proxy from source

Bring up a new VM with the up to date supported OS and install the proxy from official packages
UPGRADE OR REPLACE THE AGENTS

- Remember, that agents are backwards compatible!
- In 5.0 you have an option to choose between the GO agent or the C agent

```bash
#yum install zabbix-agent
#yum install zabbix-agent2
```
TO DO POST UPGRADE

ENABLING THE FULL POTENTIAL OF THE 5.0
- Verifying the instance integrity
- Performance and configuration tuning
- Implementing the new features
CHECK FOR ANY ERROR MESSAGES - LOGS

3801:20200130:144010.260 [Z3005] query failed: [1025] Error on rename of './zabbix/items' to './zabbix/#sql2-caf-2f' (errno: 152) [alter table items drop foreign key c_items_1]
3801:20200130:144010.260 database upgrade failed

☑ Any errors and issues encountered during the upgrade process will be logged to the Zabbix server log file.
☑ You need to fix the issues and restart the server for the upgrade to continue!
☑ Most of the time these are caused by implementing custom changes on Zabbix DB tables
CHECK FOR ANY **ERROR MESSAGES - LOGS**

6448:20200625:175048.726 Zabbix supports only "utf8_bin" collation. Database "zabbix" has default collation "utf8_general_ci"

6448:20200625:175048.734 character set name or collation name that is not supported by Zabbix found in 29 column(s) of database "zabbix"

☑️ The log file will point out the DB schema component which needs to have its collation changed. E.g. – database default collation or column collation (ZBX-17357)
CHECK FOR ANY ERROR MESSAGES - LOGS

6448:20200625:175048.735 database is not upgraded to use double precision values

- Upgrade the history tables – Float64 support ([ZBXNEXT-5691](#))
CHECK FOR ANY ERROR MESSAGES - 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>localhost:10051</td>
</tr>
<tr>
<td>Number of hosts (enabled/disabled/templates)</td>
<td>138</td>
<td>7 / 0 / 131</td>
</tr>
<tr>
<td>Number of items (enabled/disabled/not supported)</td>
<td>122</td>
<td>117 / 0 / 5</td>
</tr>
<tr>
<td>Number of triggers (enabled/disabled [problem/ok])</td>
<td>61</td>
<td>61 / 0 [3 / 58]</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>2.64</td>
<td></td>
</tr>
</tbody>
</table>

- Incorrect default charset for Zabbix database: "latin1" instead "UTF8".
- Database history tables upgraded: No

- Fix the collation for the corresponding DB schema component (ZBX-17357)
- Upgrade the history tables – Float64 support (ZBXNEXT-5691)
TEST YOUR **SCRIPTS AND INTEGRATIONS**

- Confirm that all of your global scripts and alert scripts are working
- Verify that your existing integrations are properly sending out notifications
TEST YOUR SCRIPTS AND INTEGRATIONS

Make sure that your script based items are receiving data

Test item

Get value from host ☑️

Host address

Port

Proxy (no proxy)

Value 1001

Time now

Previous value

Prev. time

End of line sequence LF CRLF

Result Result converted to Numeric (unsigned) 1001

Get value and test Cancel
VERIFY PERFORMANCE AND CONFIGURATION

☑ Confirm that there’s no significant queue increase post-upgrade
☑ Make sure that Zabbix server and proxy performance graphs are not showing any performance anomalies
☑ Check for any slow queries or unexpected error message in the server or proxy log files

<table>
<thead>
<tr>
<th>Proxy</th>
<th>5 seconds</th>
<th>10 seconds</th>
<th>30 seconds</th>
<th>1 minute</th>
<th>5 minutes</th>
<th>More than 10 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berlin proxy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Riga proxy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>78</td>
<td>0</td>
</tr>
<tr>
<td>Server</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Total: 3
OPTIMIZE THE DATA COLLECTION LOGIC

✔️ Apply the new preprocessing rules such as throttling or data validation
✔️ Modify existing items to use the new features, such as ODBC connection string
✔️ Double check your API scripts – some changes were made to API syntax! (For example – details property is now required for SNMP interface type. Might break legacy host.create scripts)
SWITCH FROM SCRIPTS TO WEBHUCKS

✔️ Many new webhook integrations added starting from 4.2
✔️ Official integrations developed and maintained by Zabbix
✔️ No more need for external scripting – just import the XML file and you’re good to go!

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Status</th>
<th>Used in actions</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discord</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>Email</td>
<td>Enabled</td>
<td></td>
<td>SMTP server: &quot;mail.example.com&quot;, SMTP helo: &quot;example.com&quot;, SMTP email: &quot;<a href="mailto:zabbix@example.com">zabbix@example.com</a>&quot;</td>
</tr>
<tr>
<td>Email (HTML)</td>
<td>Email</td>
<td>Enabled</td>
<td></td>
<td>SMTP server: &quot;mail.example.com&quot;, SMTP helo: &quot;example.com&quot;, SMTP email: &quot;<a href="mailto:zabbix@example.com">zabbix@example.com</a>&quot;</td>
</tr>
<tr>
<td>Jira</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jira ServiceDesk</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jira with CustomFields</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mattermost</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS Teams</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oppenpipe</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTRIS</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PagerDuty</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pushover</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redmine</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ServiceNow</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIGNAL4</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slack</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMS</td>
<td>SMS</td>
<td>Enabled</td>
<td></td>
<td>GSM modem: &quot;idevi660&quot;</td>
</tr>
<tr>
<td>Telegram</td>
<td>Webhook</td>
<td>Enabled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IMPLEMENT THE ADDED SECURITY FEATURES

- Communication with the Zabbix database backend can now be encrypted
- Mask your macros!
- Migrate to out of the box SAML support
联系我们

Zabbix 中国致力于为国内用户提供培训、咨询、以及其他的专业技术支持。也为国内的用户搭建交流学习的平台。

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THANK YOU!