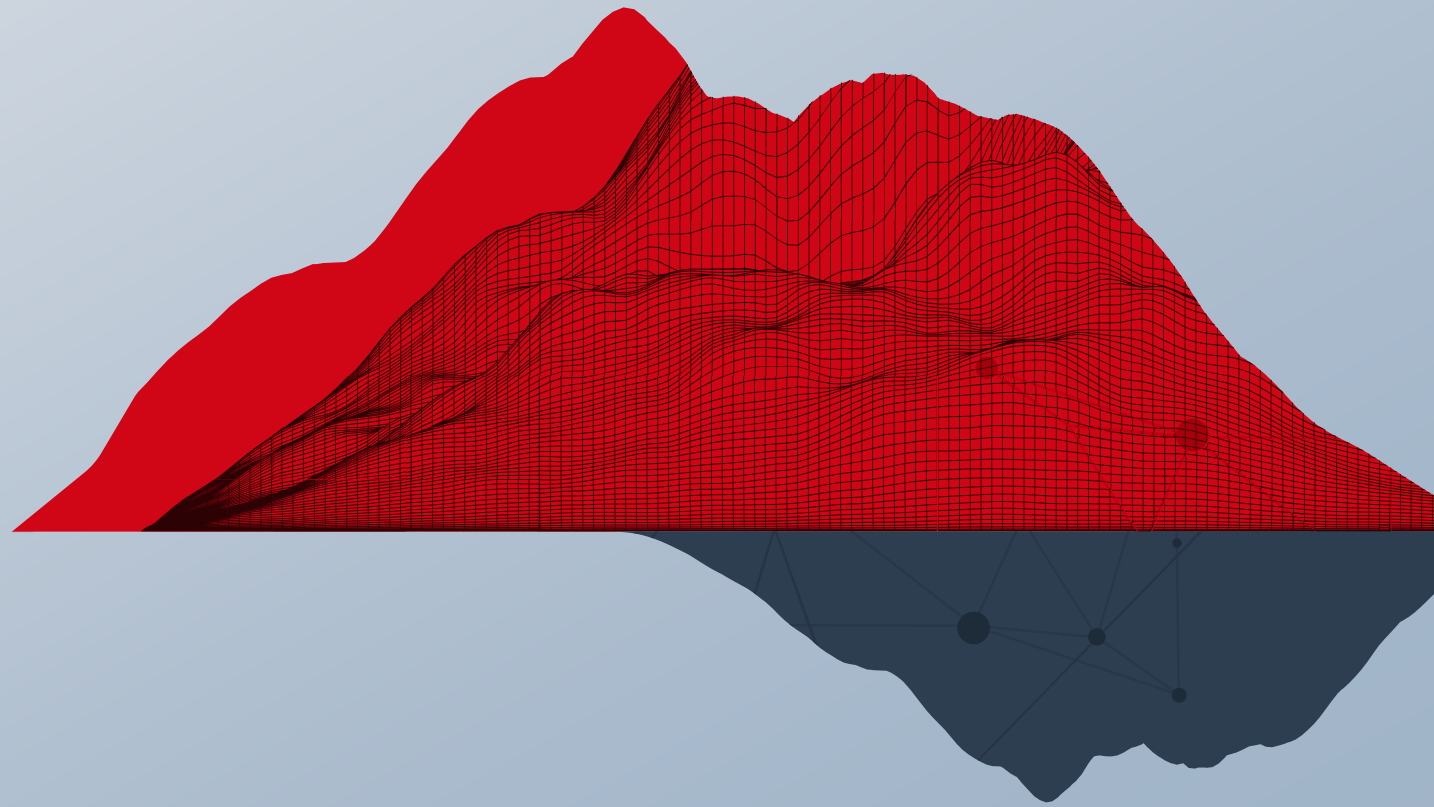
ZABBIX SUMMIT 2023

Latest in database monitoring with Zabbix

ZABBIX 7.0



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Technical Support Engineer, Zabbix, Latvia

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Introduction

Why?

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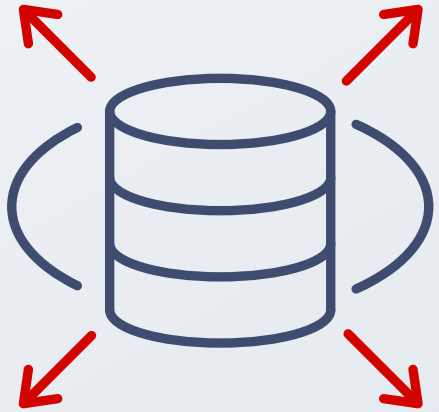
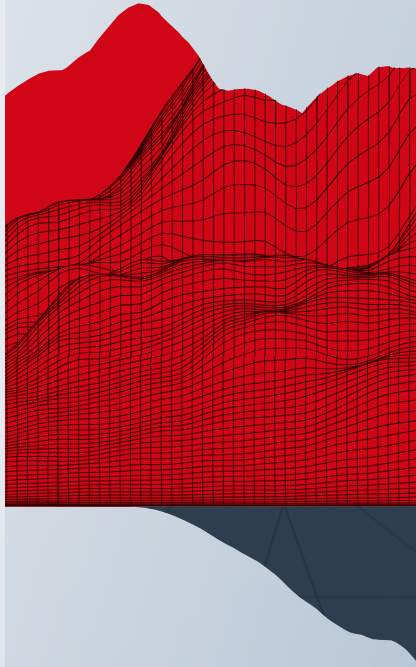
Databases are an integral part of any IT environment

- Performance is crucial
- Availability is crucial
- Additional useful data can be retrieved from it





How?

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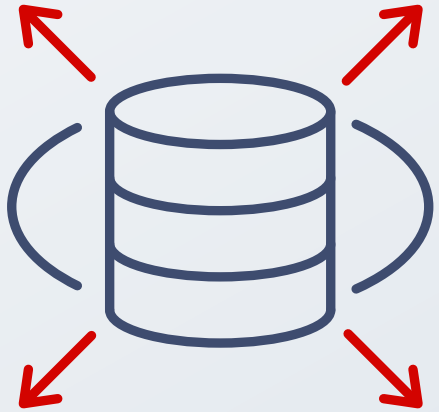
Zabbix provides a variety of approaches for DB monitoring:

- ODBC
- Agent 2
- User parameters



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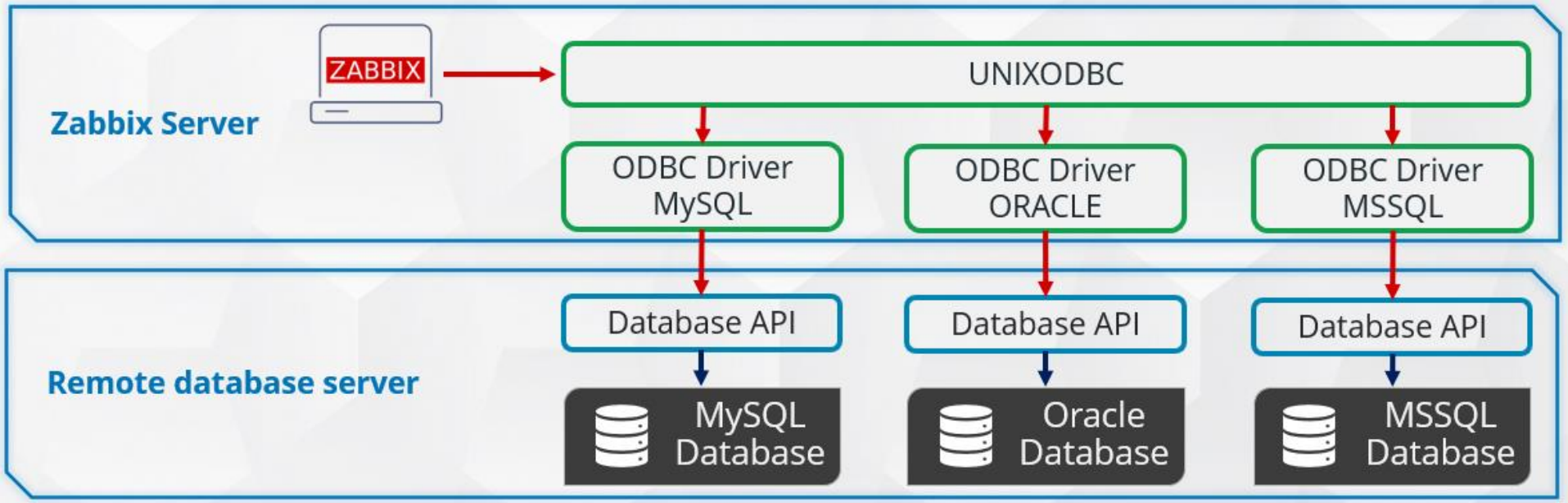
ODBC

ODBC




```
dnf install mysql-connector-odbc
```

https://www.zabbix.com/documentation/6.4/en/manual/config/items/itemtypes/odbc_checks/

ODBC POLLER PROCESS

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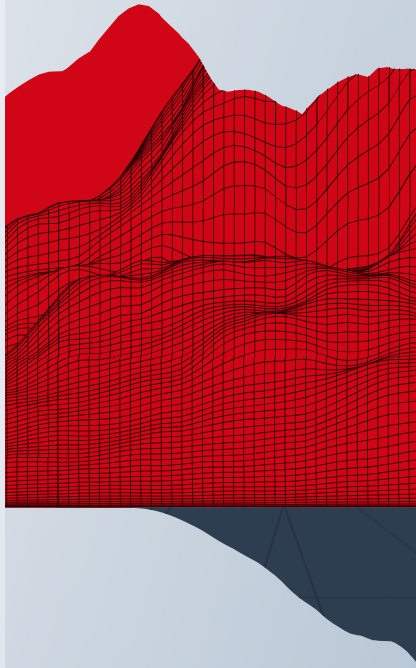
ODBC pollers are responsible for data collection:

- At least one process must be started
- Add more pollers if lots of ODBC checks are used
- The ODBC poller is a single threaded synchronous process

```
## Option: StartODBCPollers
#       Number of pre-forked ODBC poller instances.
#
# Mandatory: no
# Range: 0-1000
# Default:
StartODBCPollers=5
```



ODBC SELECT

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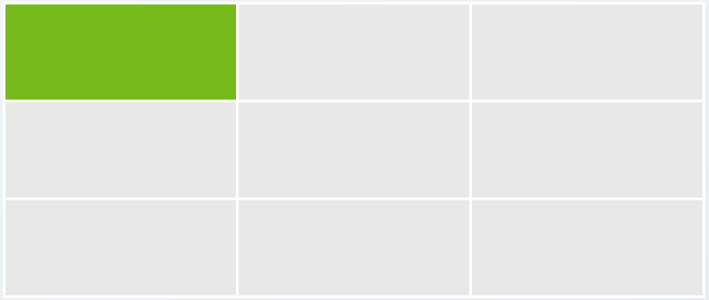
- **db.odbc.select**[<unique description>,<dsn>,<connn string>]
  - ✓ Returns a single value only (first column, first row)



Examples:

```
select count(*) from zabbix.hosts where status in (0,1) and flags
in (0,4);

select amount from recipes where recipeid=45 and
ingredient='carrot';
```

ODBC DISCOVERY (LEGACY)

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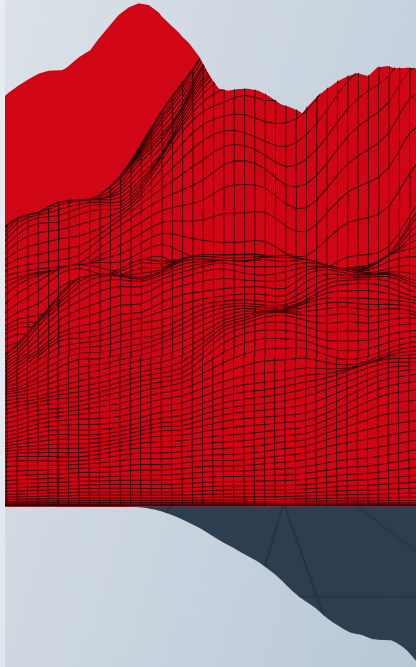
- **db.odbc.discovery**[<unique description>,<dsn>,<connection string>]
  - ✓ Returns LLD ready JSON format including all columns and rows

```
select table_name from information_schema.partitions where
table_schema='zabbix’;
```

```
[
"{#TABLE_NAME}":"acknowledges",
"{#TABLE_NAME}":"actions",
"{#TABLE_NAME}":"alerts",
...]
```

- **db.odbc.select**[table.size.{#TABLE_NAME},<dsn>,<connection string>]

```
select data_length, index_length from
information_schema.partitions where table_name= '
{#TABLE_NAME}';
```



ODBC GET

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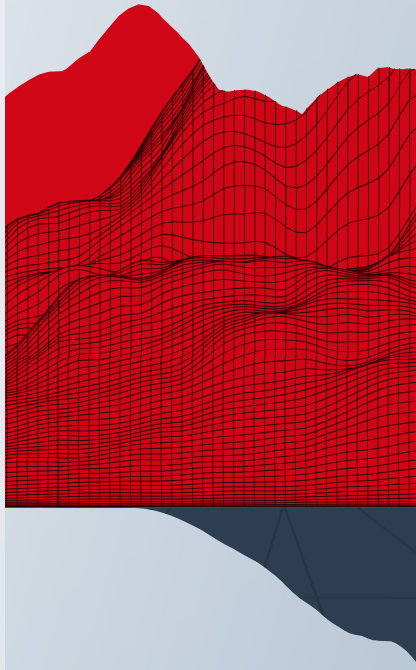
- **db.odbc.get**[raw.data,<dsn>,<connection string>]

```
select customer, round(sum(sum),2) as value from invoices where
due_date < unix_timestamp(now()) and status = 0 group by
customer;
```

Timestamp	Value
2023-10-06 14:30:23	[{"customer":"ZABBX SIA","value":"5941.75"},{"customer":"ZABBX Brasil","value":"305.4"},{"customer":"ZABBX USA","value":"2554.45"}, {"customer":"ZABBX Japan","value":"14.03"}]
2023-10-06 14:29:23	[{"customer":"ZABBX SIA","value":"5941.75"},{"customer":"ZABBX Brasil","value":"305.4"},{"customer":"ZABBX USA","value":"2554.45"}, {"customer":"ZABBX Japan","value":"14.03"}]
2023-10-06 14:28:23	[{"customer":"ZABBX SIA","value":"5941.75"},{"customer":"ZABBX Brasil","value":"305.4"},{"customer":"ZABBX USA","value":"2554.45"}, {"customer":"ZABBX Japan","value":"14.03"}]



LLD WITH ODBC GET

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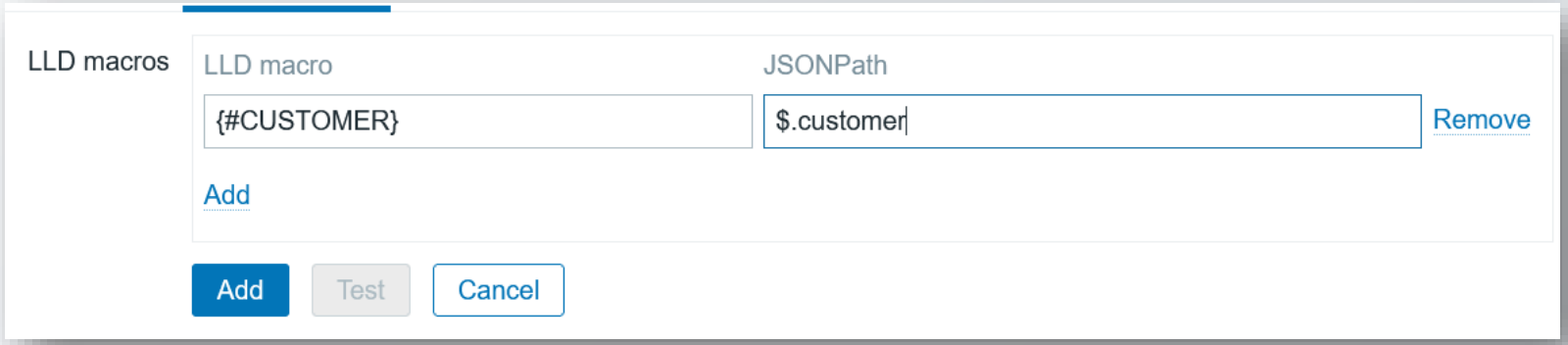
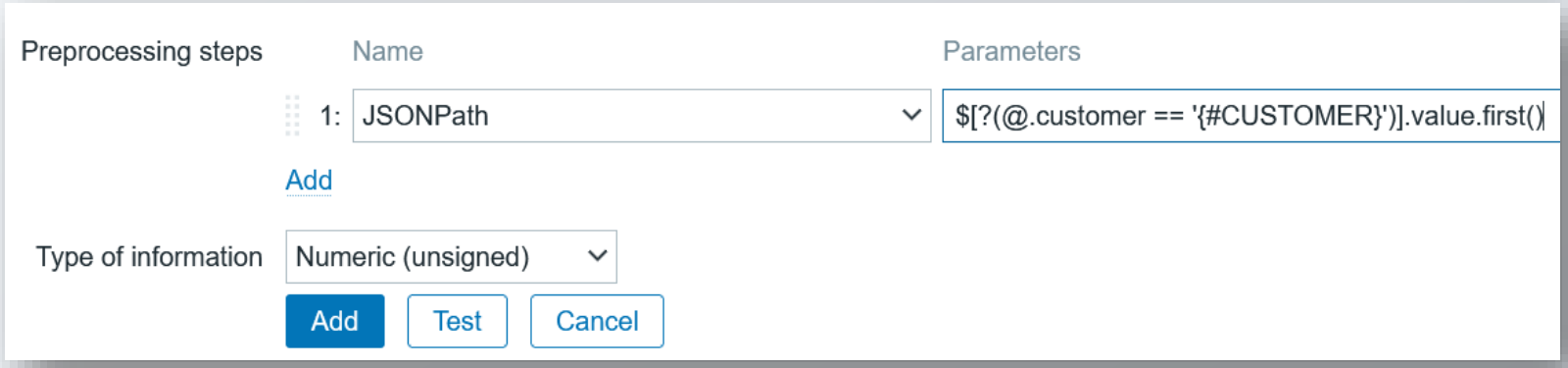
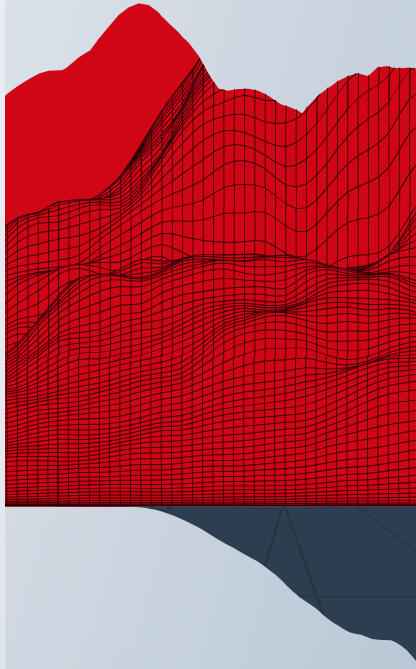
- Discovery rule: Dependent item



- Item type: Dependent item





OFFICIAL ODBC TEMPLATES

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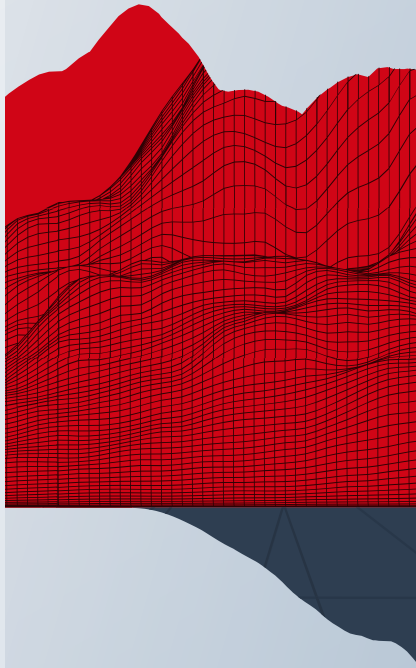
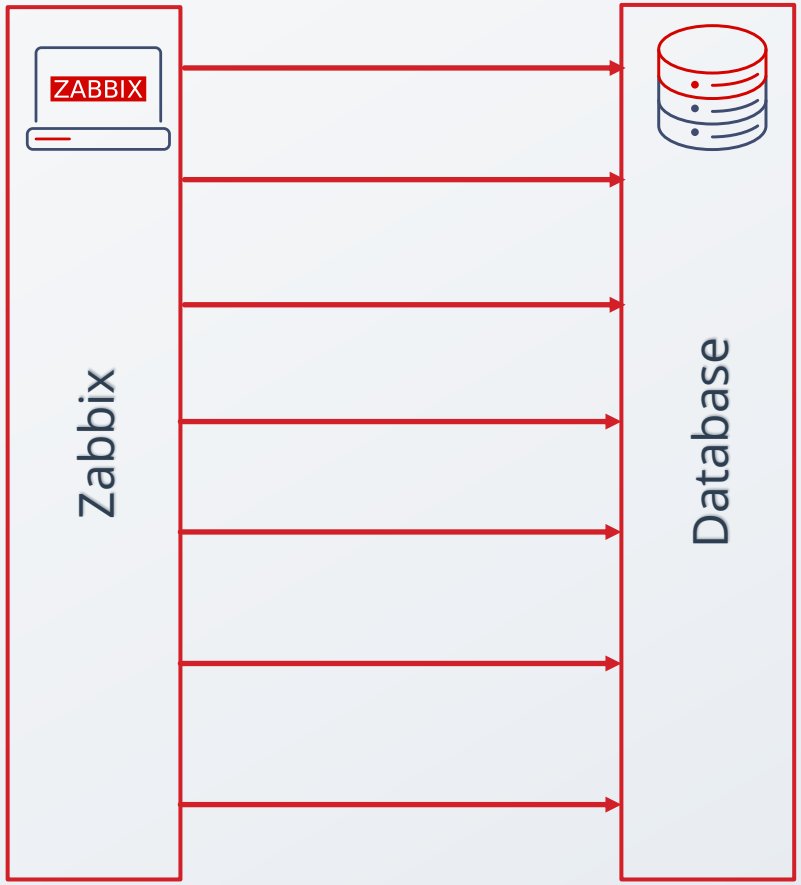
Zabbix offers four official templates out-of-the-box:

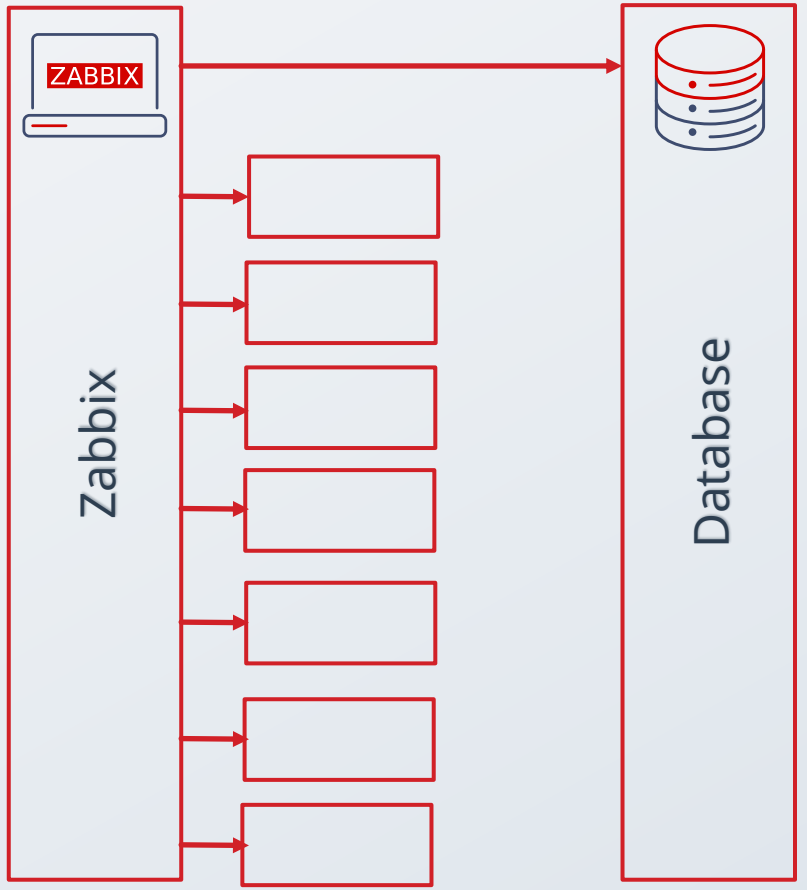
- MSSQL
- MySQL
- Oracle
- PostgreSQL

Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version
MSSQL by ODBC	Hosts	Items 82	Triggers 24	Graphs 17	Dashboards 1	Discovery 7	Web	Zabbix	6.4-0
MySQL by ODBC	Hosts	Items 48	Triggers 11	Graphs 6	Dashboards 1	Discovery 3	Web	Zabbix	6.4-0
Oracle by ODBC	Hosts	Items 68	Triggers 17	Graphs 9	Dashboards 1	Discovery 5	Web	Zabbix	6.4-0
PostgreSQL by ODBC	Hosts	Items 62	Triggers 4	Graphs	Dashboards 1	Discovery 2	Web	Zabbix	6.4-0



ODBC.DISCOVERY VS ODBC.GET





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Agent 2 plugins

AGENT 2 PLUGINS AND TEMPLATES

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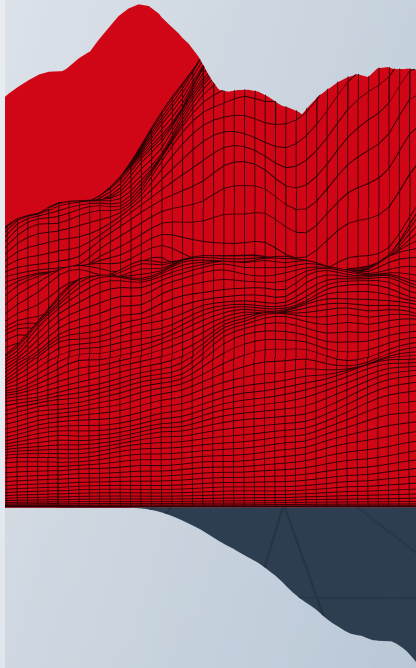
Agent 2 offers plugins for most popular SQL databases:

- Oracle
- MySQL
- PostgreSQL
- MSSQL is coming soon

Agent 2 can monitor NoSQL databases and object stores:

- Redis
- Memcached
- MongoDB
- Ceph



DATABASE PLUGINS

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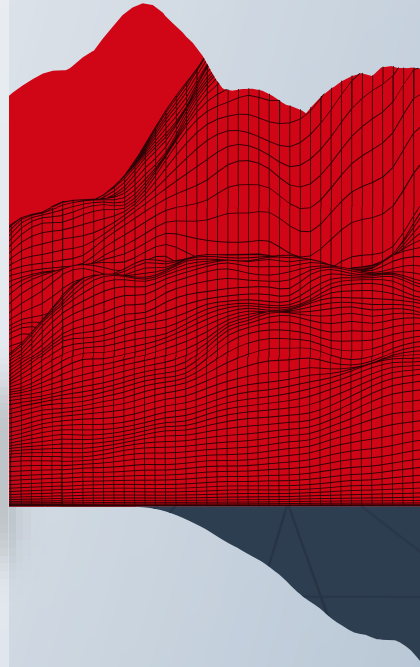
Database monitoring with agent 2 requires a plugin

- Most plugins are built in into agent 2
- Some needs to be installed separately

MongoDB and PostgreSQL plugins are available on Zabbix repo

```
zabbix-agent2-plugin-mongodb-1.2.0-1.el9.x86_64..>
zabbix-agent2-plugin-postgresql-1.2.0-1.el9.x86..>
```



SETTING UP AGENT 2

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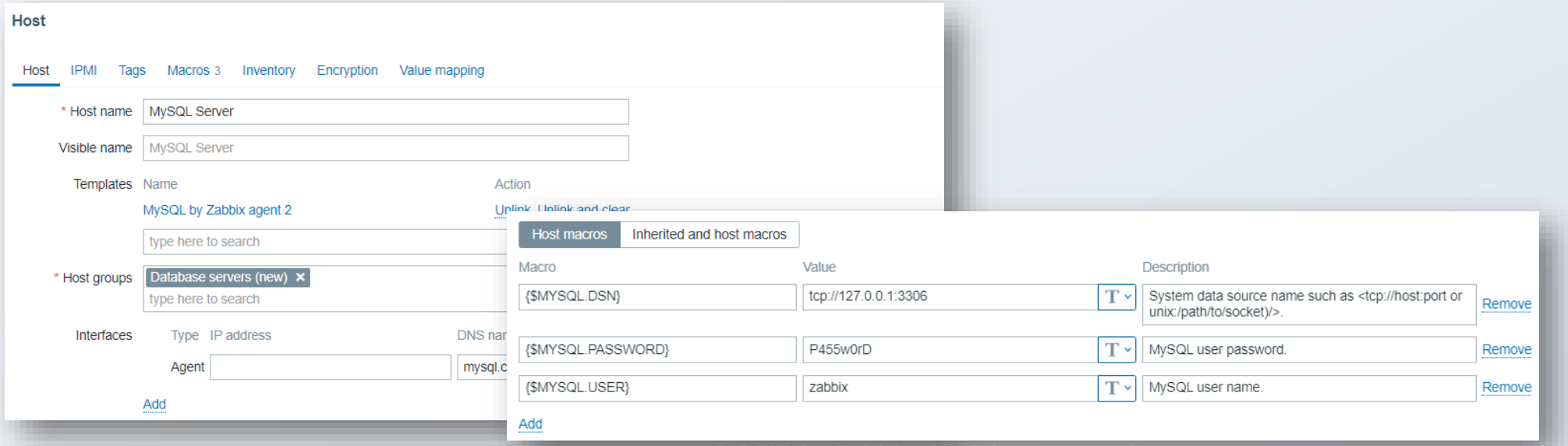
It requires just a few steps to monitor DB with agent 2:

- Install Zabbix agent 2
- Setup up monitoring user on the database
- Create a host with Zabbix agent interface (or use active mode)
- Assign database template and enter some user macro values



TEMPLATE SETTINGS

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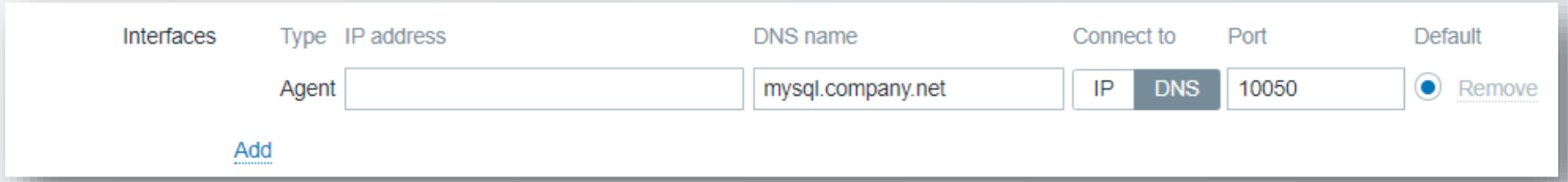
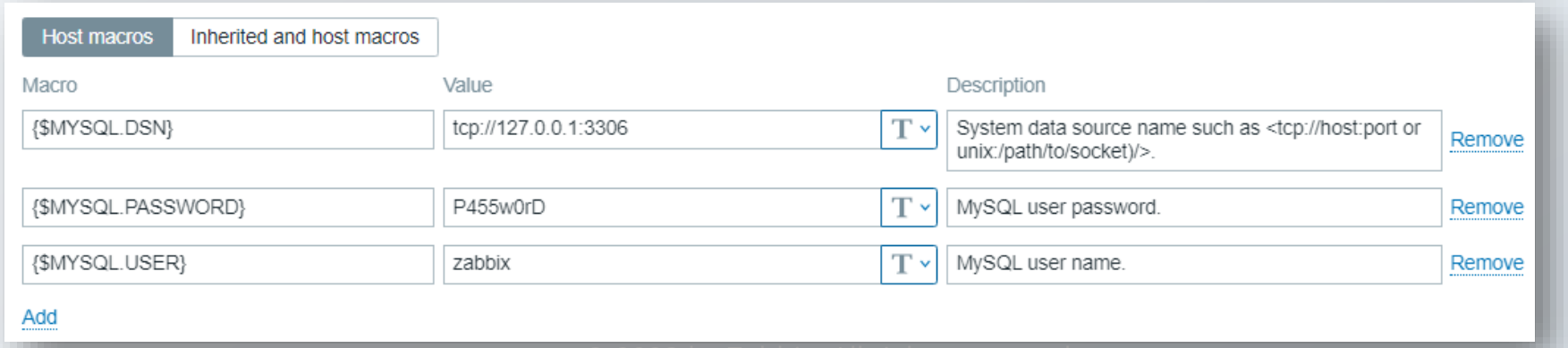
There are separate communication settings for agent and DB

- In the interface field enter details how server connects to the agent
- Database connection parameters are set up using macros





LOCAL ZABBIX AGENT 2

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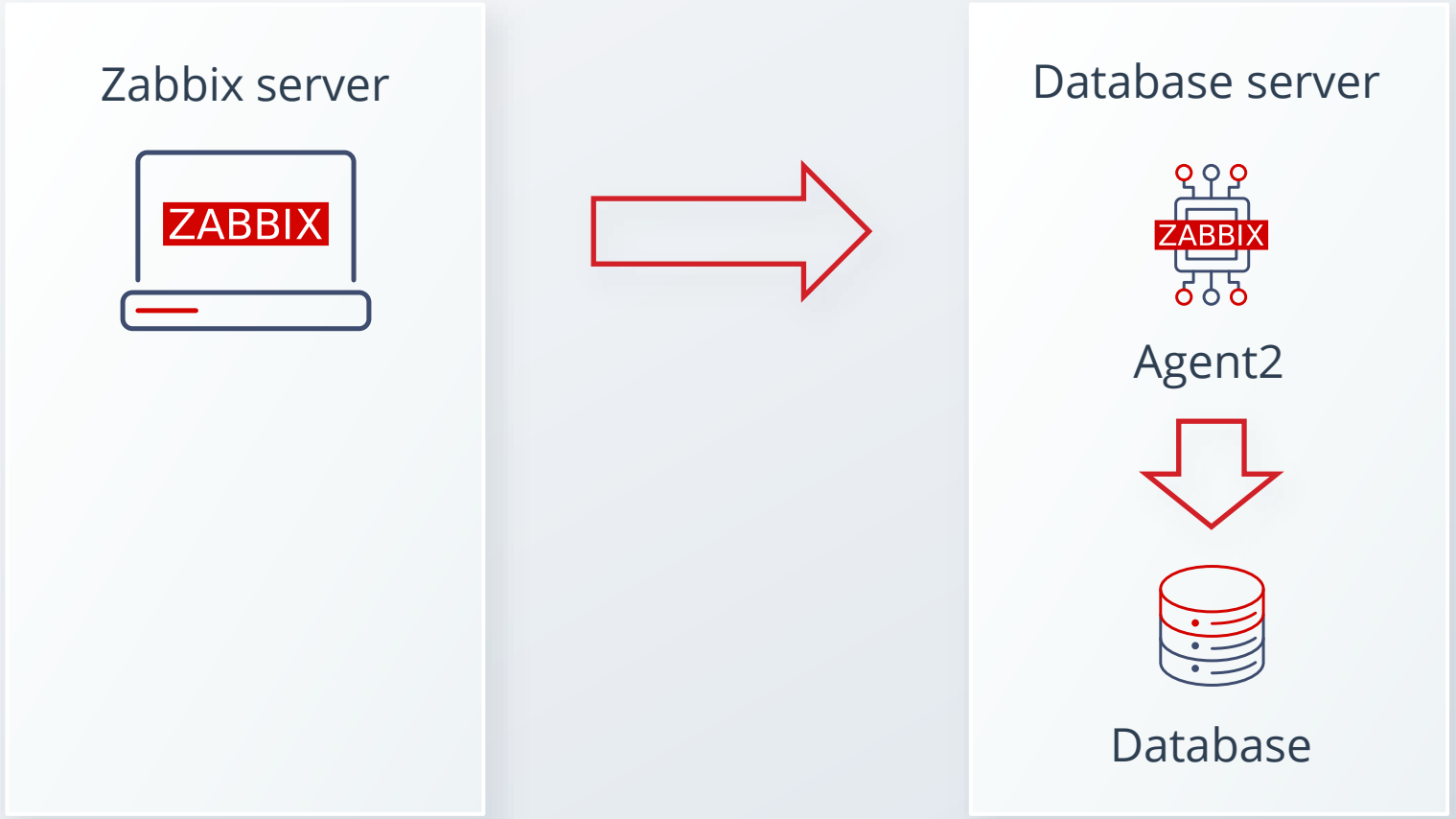
Zabbix agent can be installed locally on database server



REMOTE ZABBIX AGENT 2

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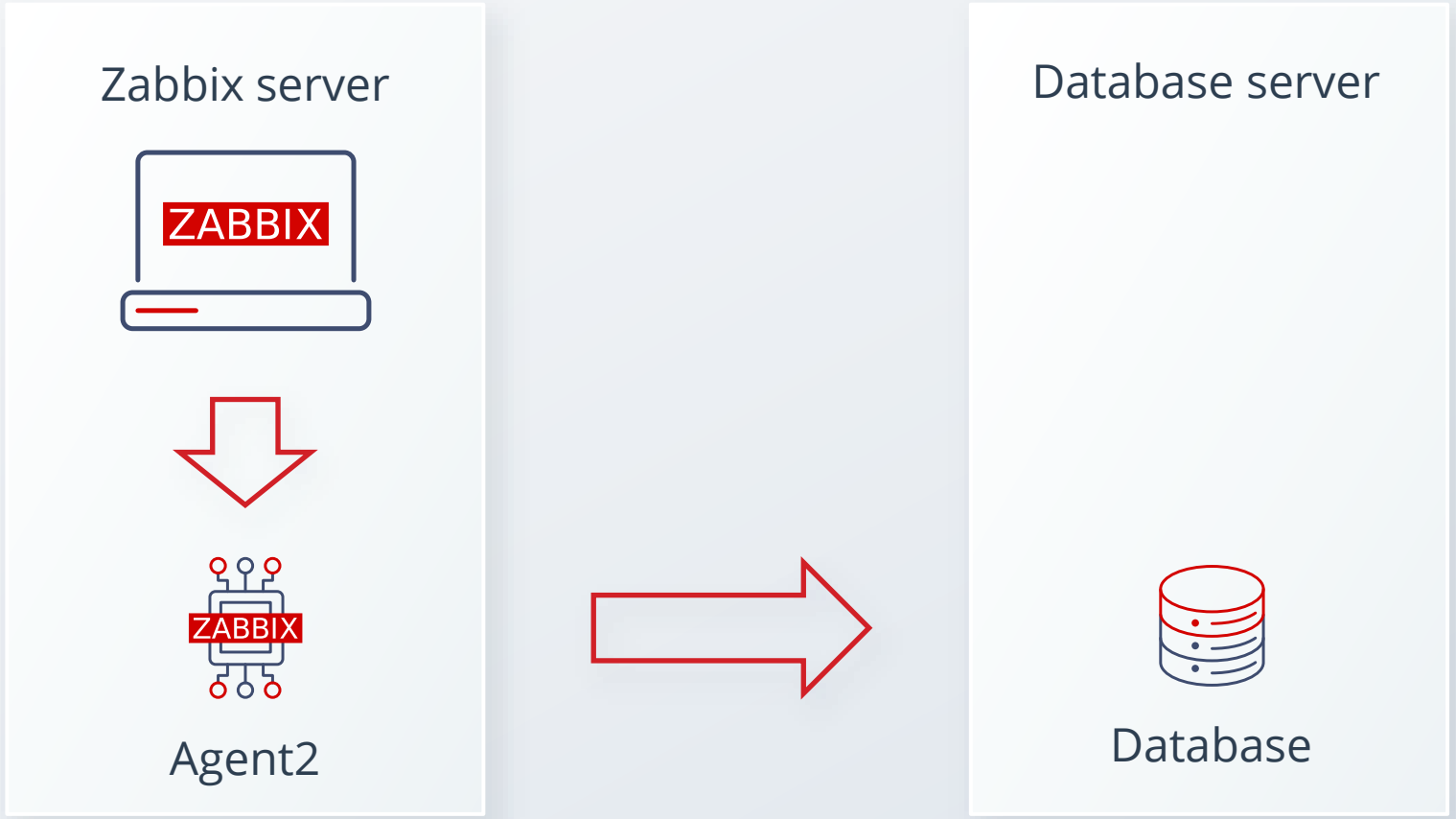
Zabbix agent can connect to database over the network



AGENT 2 DB TEMPLATES

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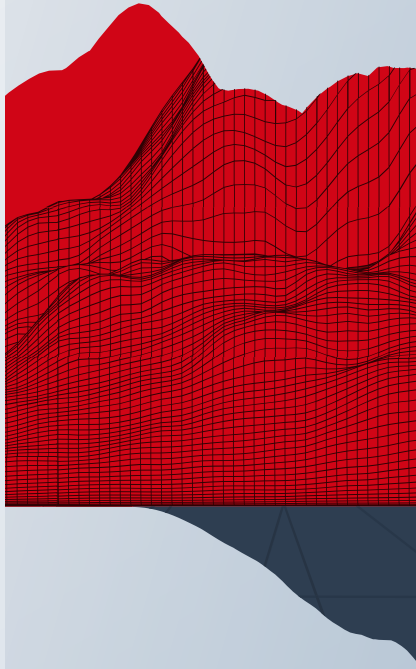
Agent 2 DB templates are modern and based on dependent items

- Master item collects all item values at once
- Dependent items extract data from the master item

•••	MySQL: Get status variables	mysql.get_status_variables["{$MYSQL.DSN}","{$MYSQL.USER}","{$MYSQL.PASSWORD}"]	1m	0		Zabbix agent
•••	MySQL: Get status variables: MySQL: InnoDB buffer pool pages free	mysql.innodb_buffer_pool_pages_free		7d	365d	Dependent item
•••	MySQL: Get status variables: MySQL: InnoDB buffer pool pages total	mysql.innodb_buffer_pool_pages_total		7d	365d	Dependent item
•••	MySQL: Get status variables: MySQL: InnoDB buffer pool read requests	mysql.innodb_buffer_pool_read_requests		7d	365d	Dependent item
•••	MySQL: Get status variables: MySQL: InnoDB buffer pool read requests per second	mysql.innodb_buffer_pool_read_requests.rate		7d	365d	Dependent item
•••	MySQL: Get status variables: MySQL: InnoDB buffer pool reads	mysql.innodb_buffer_pool_reads		7d	365d	Dependent item



MONITORED METRICS

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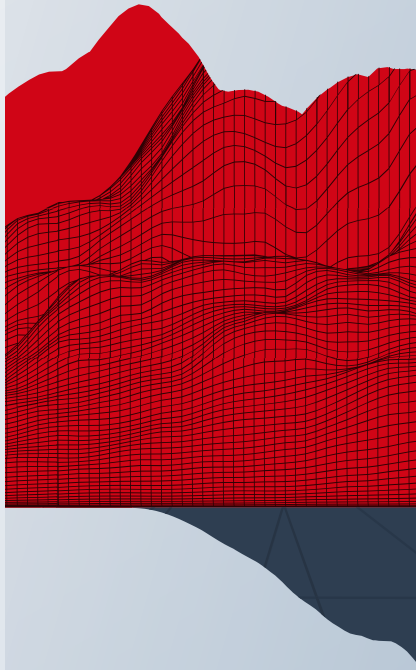
Dbstat: Number temp bytes per second	58s	0 b
Dbstat: Number temp files per second	58s	0
Dbstat: Roll backed transactions per second	58s	0
Dbstat: Rows deleted per second	58s	0
Dbstat: Rows fetched per second	58s	0.8921
Dbstat: Rows inserted per second	58s	0
Dbstat: Rows returned per second	58s	59.048
Dbstat: Rows updated per second	58s	0
DB [postgresdb]: Backends connected	57s	1
DB [postgresdb]: Bloating tables	7s	0
DB [postgresdb]: Blocks hit per second	57s	1.4643
DB [postgresdb]: Checksum failures	57s	0
DB [postgresdb]: Commits per second	57s	0.05049
DB [postgresdb]: Database age	9s	13
DB [postgresdb]: Database size	5s	7.32 MB
DB [postgresdb]: Detected conflicts per second	57s	0
DB [postgresdb]: Detected deadlocks per second	57s	0



Agent 2 plugins and custom queries

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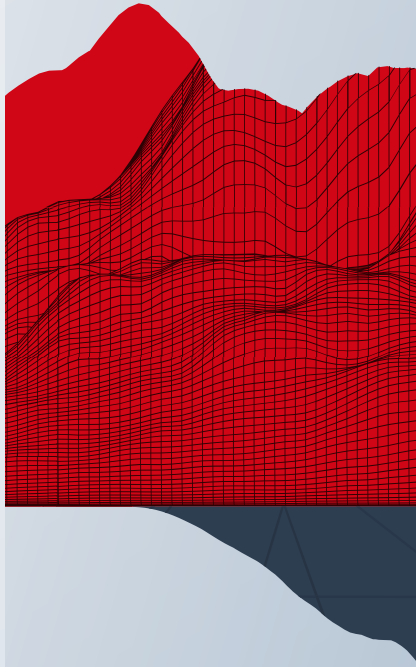
mysql.custom.query[connString,<user>,<password>,queryName,<args...>]

oracle.custom.query[connString,<user>,<password>,<service>,queryName,<args...>]

pgsql.custom.query[uri,<username>,<password>,queryName,<args...>]

- Returns JSON objects, that can be used in LLD, dependent items etc



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Other methods

User parameters

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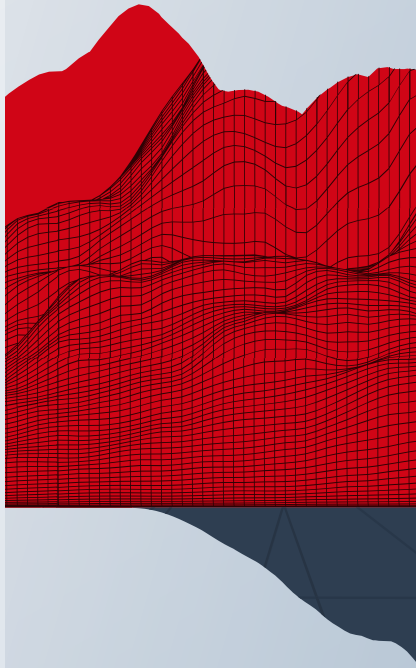
- Custom user parameters
  - ✓ UserParameter=mysql.ping[*], mysqladmin -h"$1" -P"$2" ping
  - ✓ UserParameter=mysql.get_status_variables[*], mysql -h"$1" -P"$2" -sNX -e "show global status"
  - ✓ UserParameter=mysql.version[*], mysqladmin -s -h"$1" -P"$2" version
  - ✓ UserParameter=mysql.db.discovery[*], mysql -h"$1" -P"$2" -sN -e "show databases"
  - ✓ UserParameter=mysql.dbsize[*], mysql -h"$1" -P"$2" -sN -e "SELECT COALESCE(SUM(DATA_LENGTH + INDEX_LENGTH),0) FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_SCHEMA='$3'»
  - ✓ UserParameter=mysql.replication.discovery[*], mysql -h"$1" -P"$2" -sNX -e "show slave status"
  - ✓ UserParameter=mysql.slave_status[*], mysql -h"$1" -P"$2" -sNX -e "show slave status"



Other collection methods

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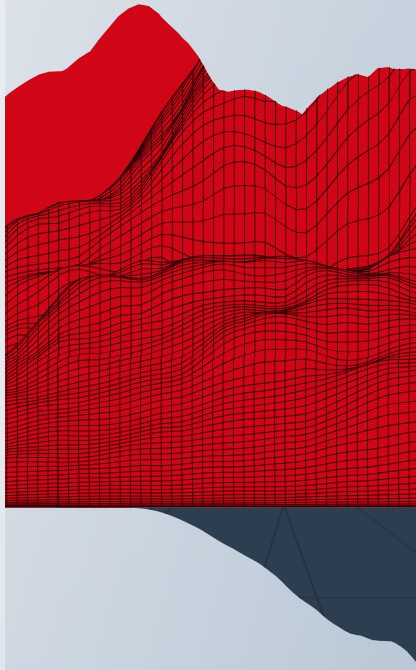
- cassandra_jmx
- clickhouse_http
- cockroachdb_http
- gridgain_jmx
- ignite_jmx
- influxdb_http
- tidb_http
- Prometheus exporters

- https://git.zabbix.com/projects/ZBX/repos/zabbix/browse/templates/db



Additional useful data from DB's

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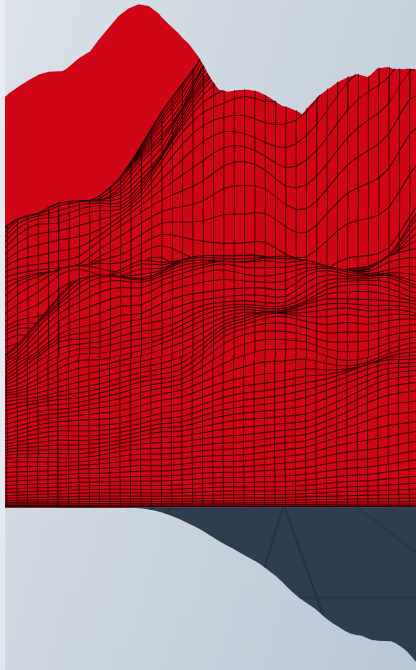
- Invoices sent from data in DB
- Process sometimes freezes
- select count() from invoices where sent=0
- last(/DBHost/unsent.mails)>10
- Remote command: net stop mailsender && net start mailsender



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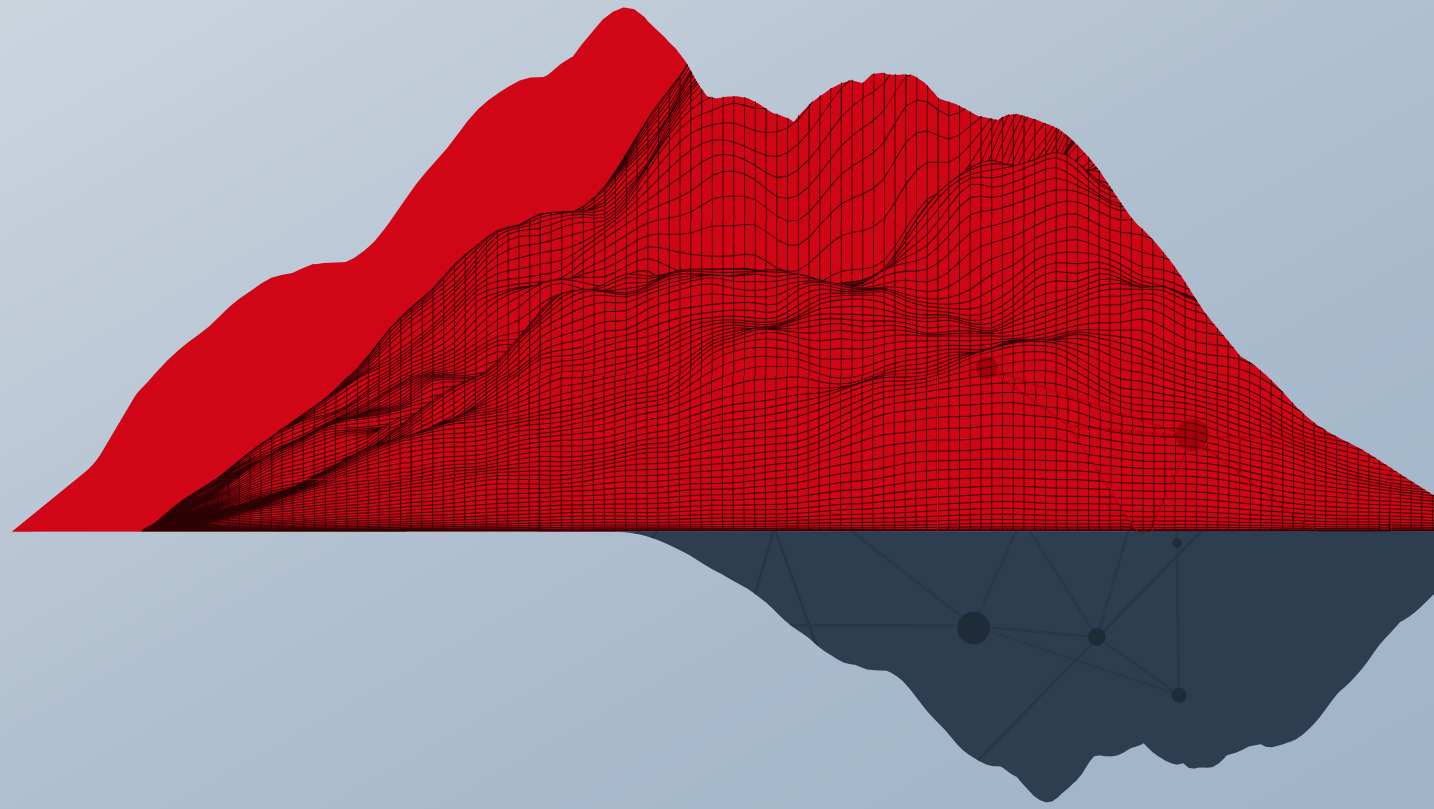
Thank You!



Edgars Melveris

Technical support engineer