Reporting
Large Environment
Zabbix Database

CORE IT PROJECT

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Presentation

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Content

1. Reporting Components
2. Reporting Architecture for large environment
3. Reports examples built with Jasper Suite

Summary

Part 1
Components

-> SQLs & Zabbix Database Model

-> APIs

-> Jasper Suite

Part 2
Reporting Architecture

-> Warehouse Database

-> Reporting Architecture

Part 3
Reports

-> Zabbix Configuration Checker

-> Manager Dashboard

-> Yearly Trends

Introduction

-> What are we talking about ?

-> Large Environment

-> Problem

-> Example : Zabbix Configuration Checker

What are we talking about ?

Reporting

→ Extract essential Zabbix information to make better decisions by viewing consolidated data
→ Presentation layer must be sexy

Data WareHouse

→ Consolidate Zabbix data with some enrichment (teams, cmdb infos, ...)
→ Read Only Database <> Zabbix Database

BI

→ retrieve, analyze, transform and report data
→ Jasper Suite (iReport & Jasper Server)

What is a Large Environment ?

- More than 14 000 servers , 1 million items
- Some servers with over 10 000 items
- Some servers with over 10 000 triggers
- More than 100 Zabbix administrators developping Application Templates

The Problem

In such huge environment, Zabbix (through the frontend) gives back too much details and you loose High level visibility (In French, we say « The tree that hides the forest ».

Reporting can help in this area, unfortunately Zabbix has no reporting facility.

→ You have to develop your own Reporting Architecture to get a consolidated view on data.

Example : Zabbix Configuration Checker

- In the following slides, I will take the example of Reports that are dispatched to the teams who are responsible for an application.
- Those teams are in charge of Zabbix templates development, as they are not Zabbix experts, they do mistakes.
- Zabbix configuration Checker help those teams to correct those templates by sending Reports about bad or poor Zabbix Templates configurations.

Part 1
Reporting Components

-> Where is the information to report ?

-> Zabbix database schema

-> SQL vs API

-> BI : Jasper Suite

Where is the Information ?

In Zabbix Database

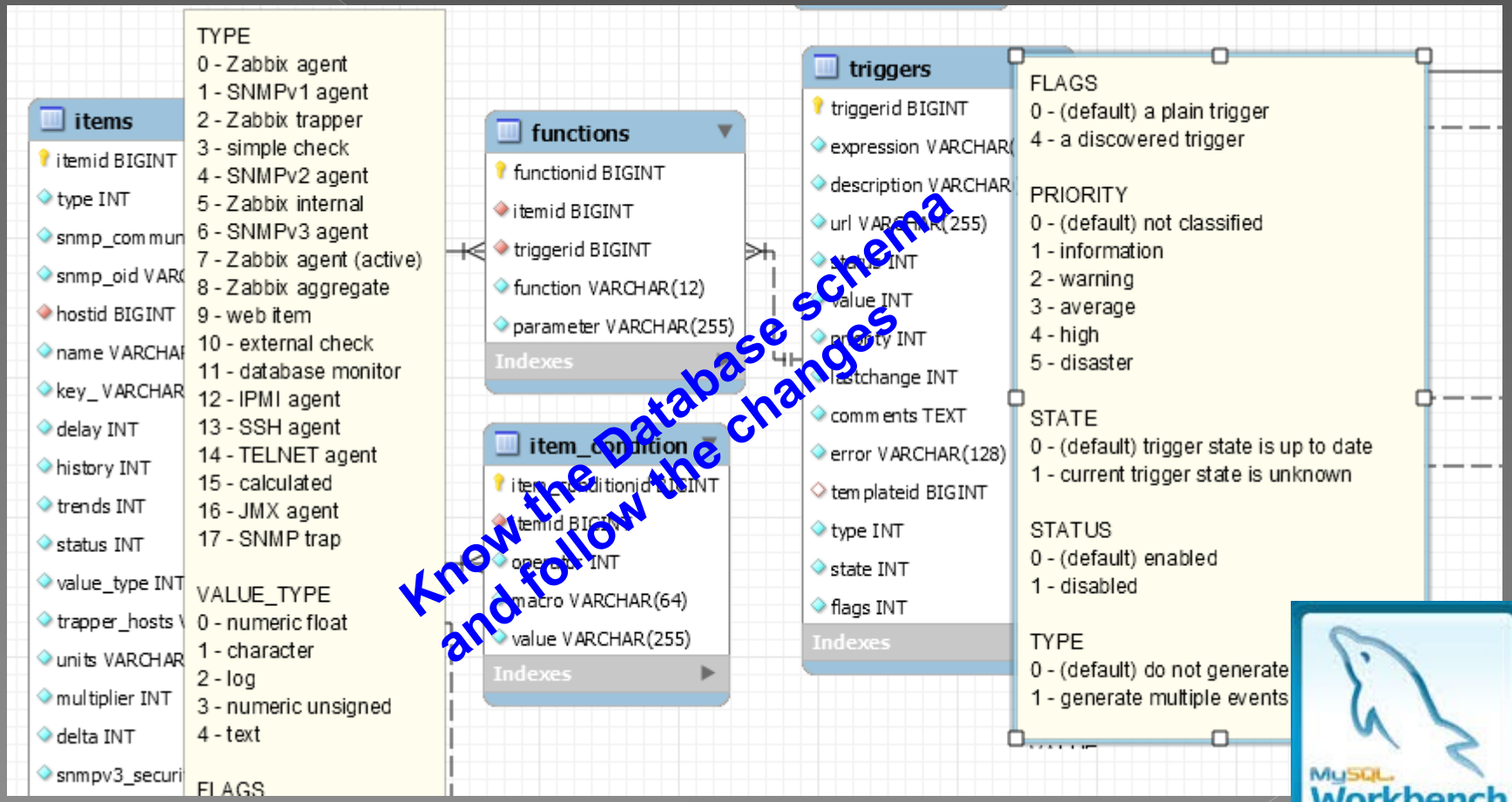
- **Easy ...** *select host from hosts where* **...**

In Cache

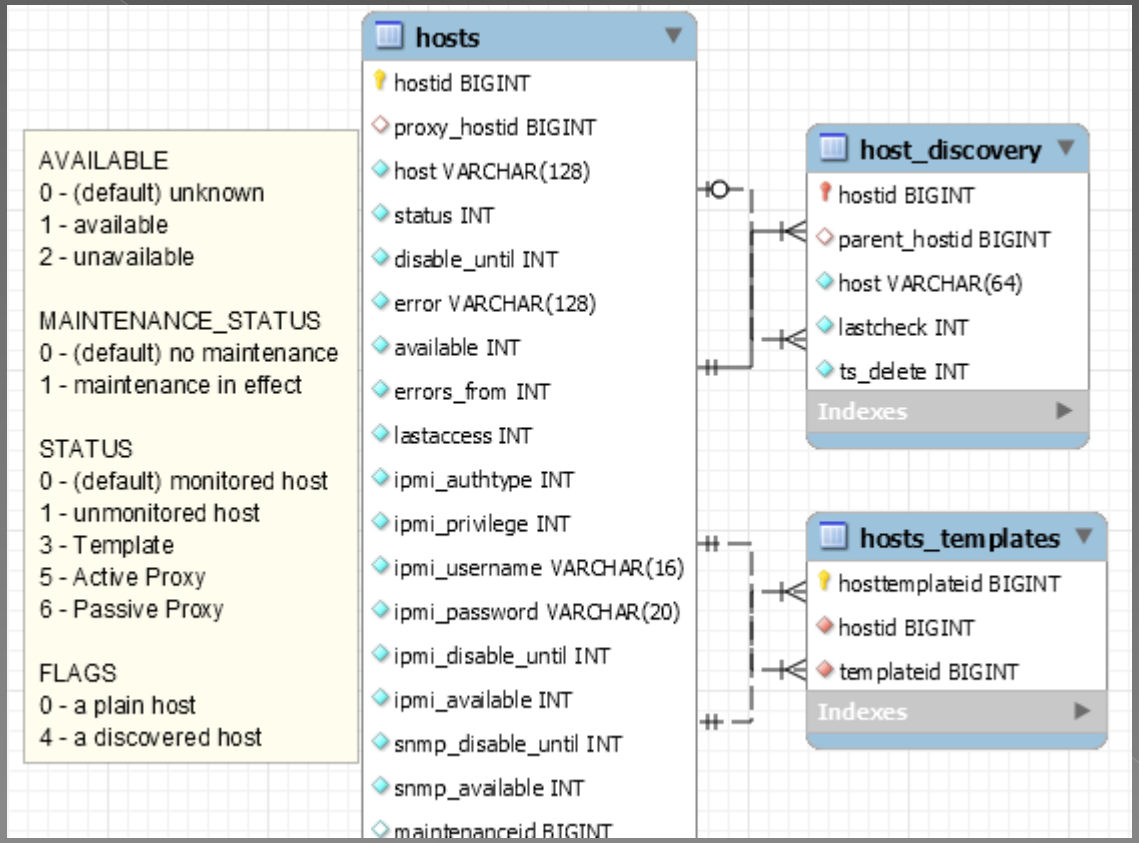
- **Glurps ... APIs ?**

→ Normally Reporting Data are meta data, we do not care about details or data in cache !

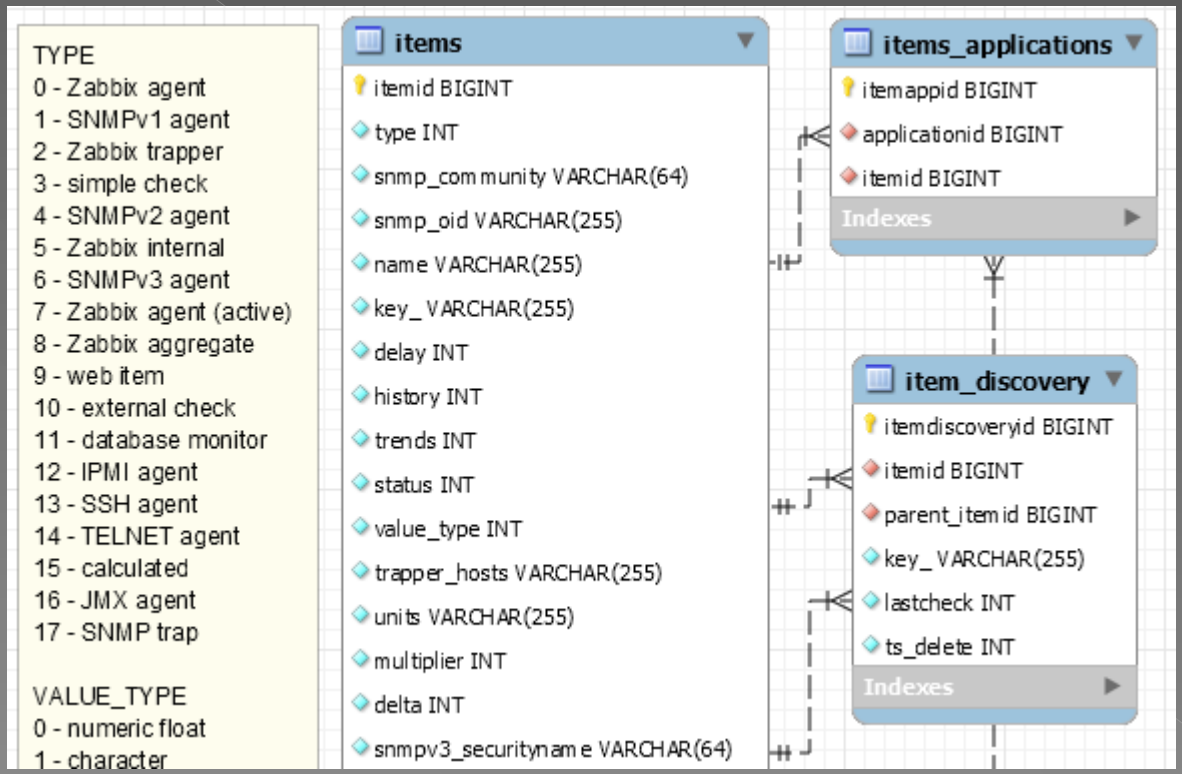
Zabbix Database schema



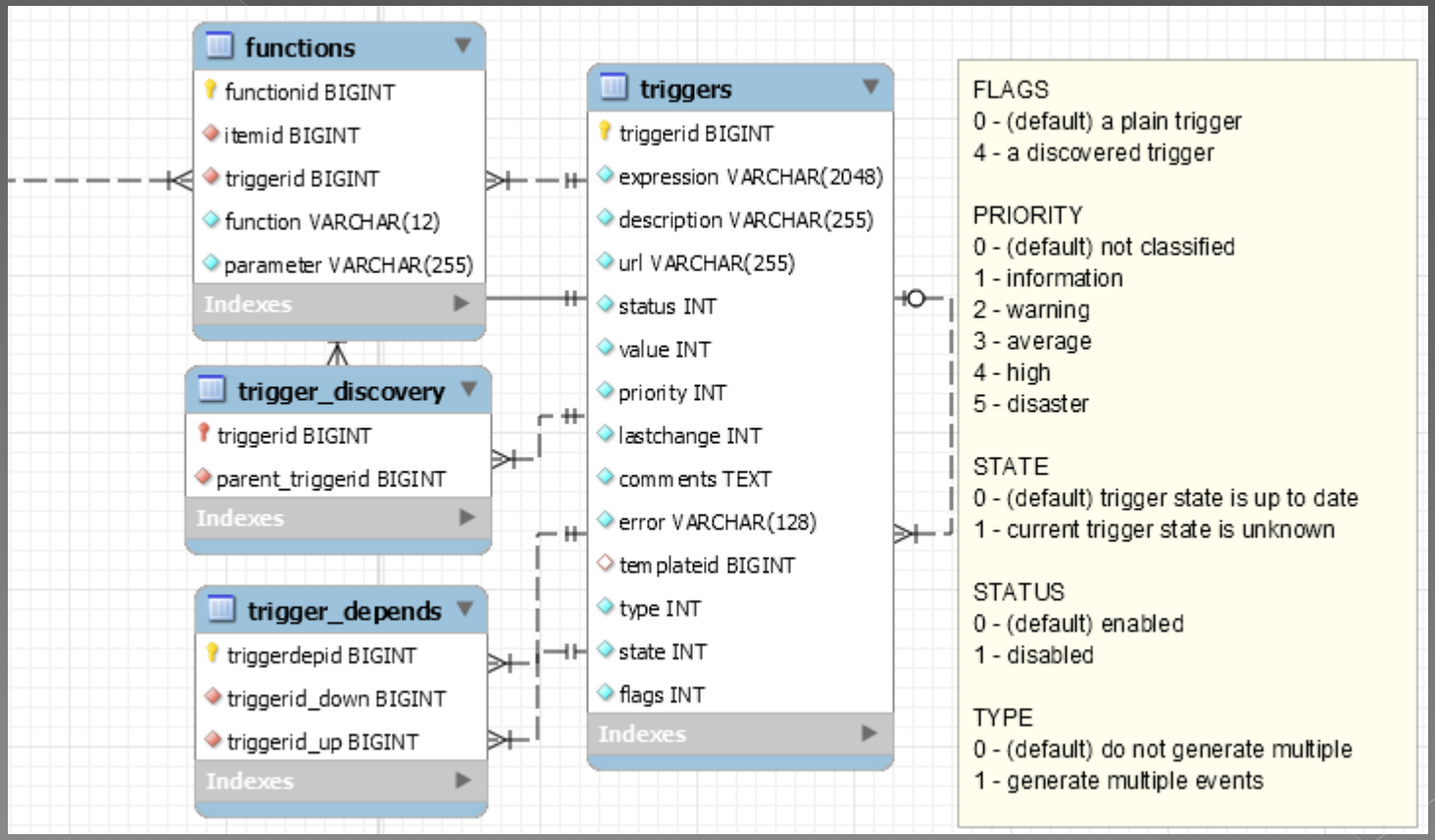
Zabbix Database schema



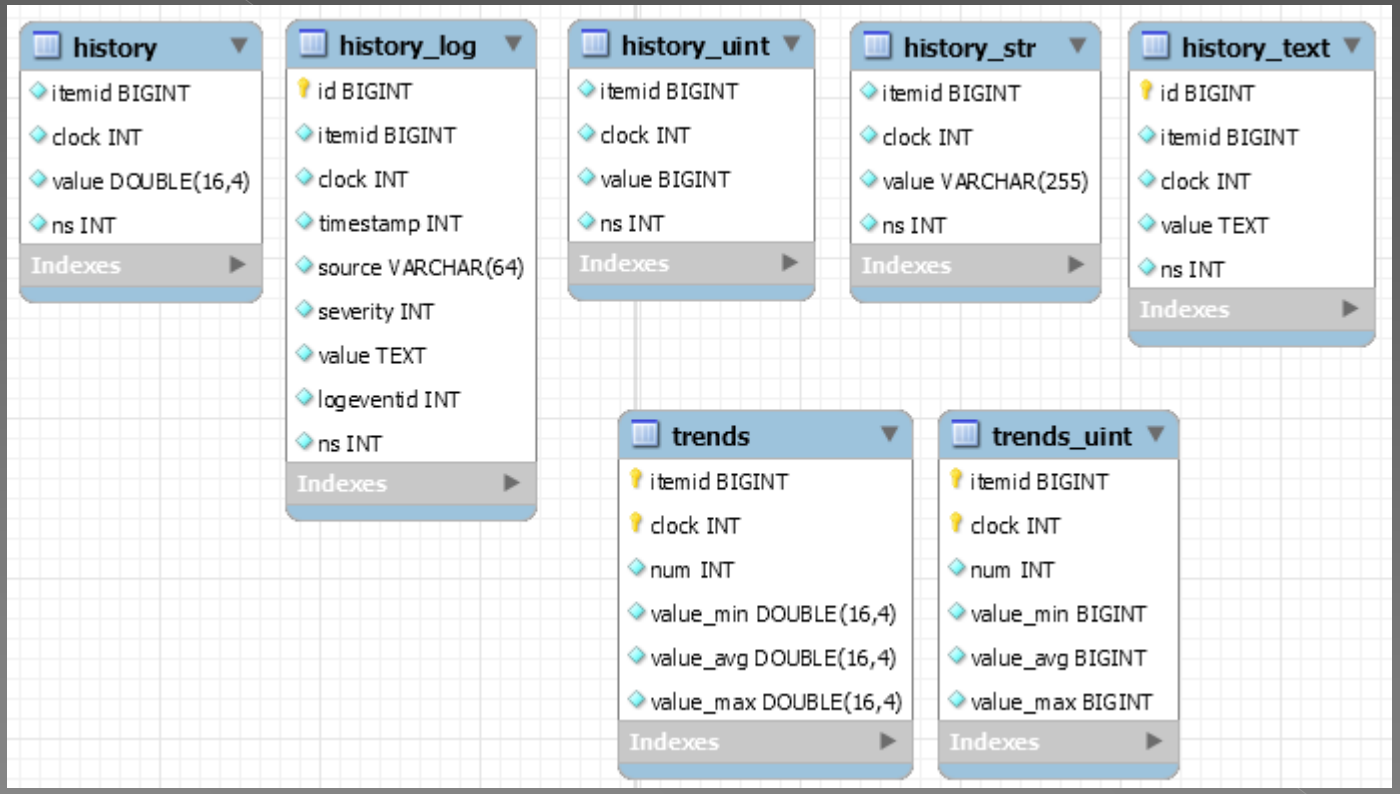
Zabbix Database schema



Zabbix Database schema

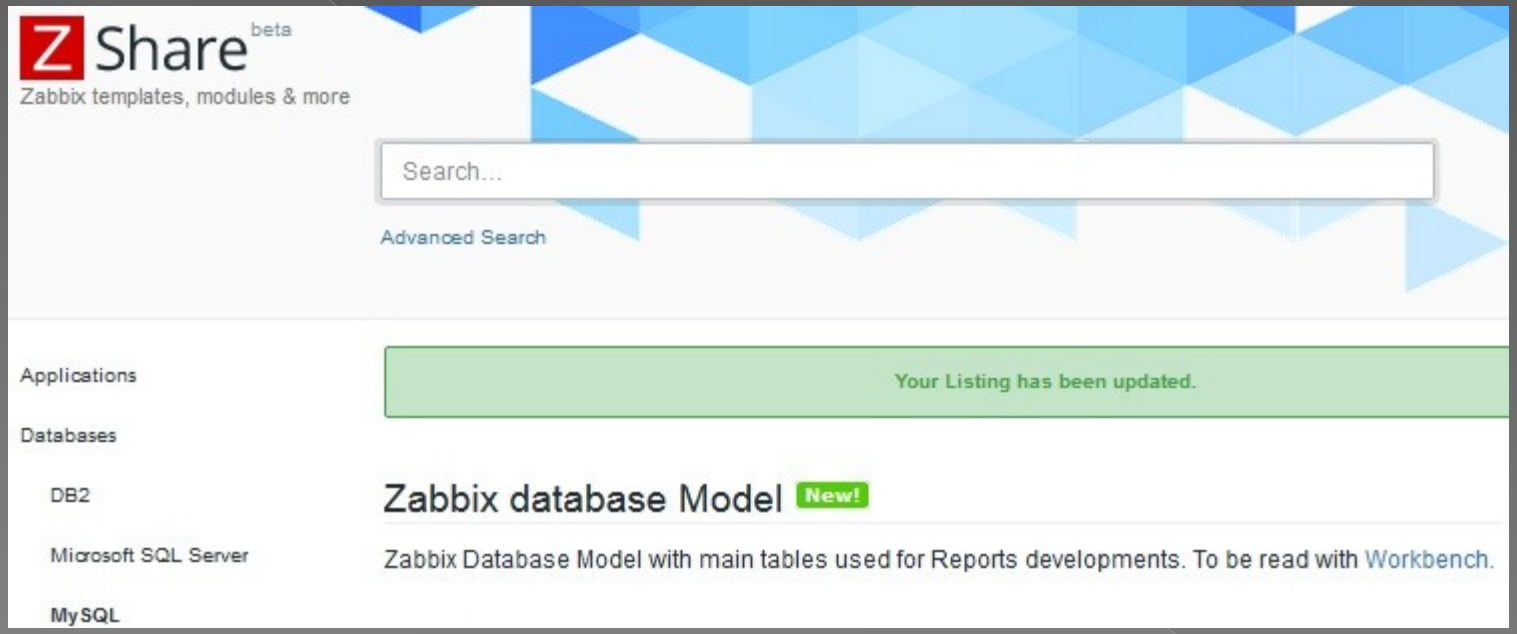


Zabbix Database schema



Nota Bene : No trend.get API

Zabbix Database schema



Download Zabbix Database Model with comments at
https://share.zabbix.com/databases/mysql/zabbix-database-model
Versions 1.8 , 2.0 , 2.2 & 2.4

APIs

```
{
    "jsonrpc": "2.0",
    "method": "host.get",
    "params": {
        "output": "extend",
        "filter": {
            "host": [
                "Zabbix server",
                "Linux server"
            ]
        }
    },

    "auth": "038e1d7b1735c6a5436ee9eae095879e",
    "id": 1
}
```

Ignore the Zabbix Database schema … some APIs are missing ie trend.get

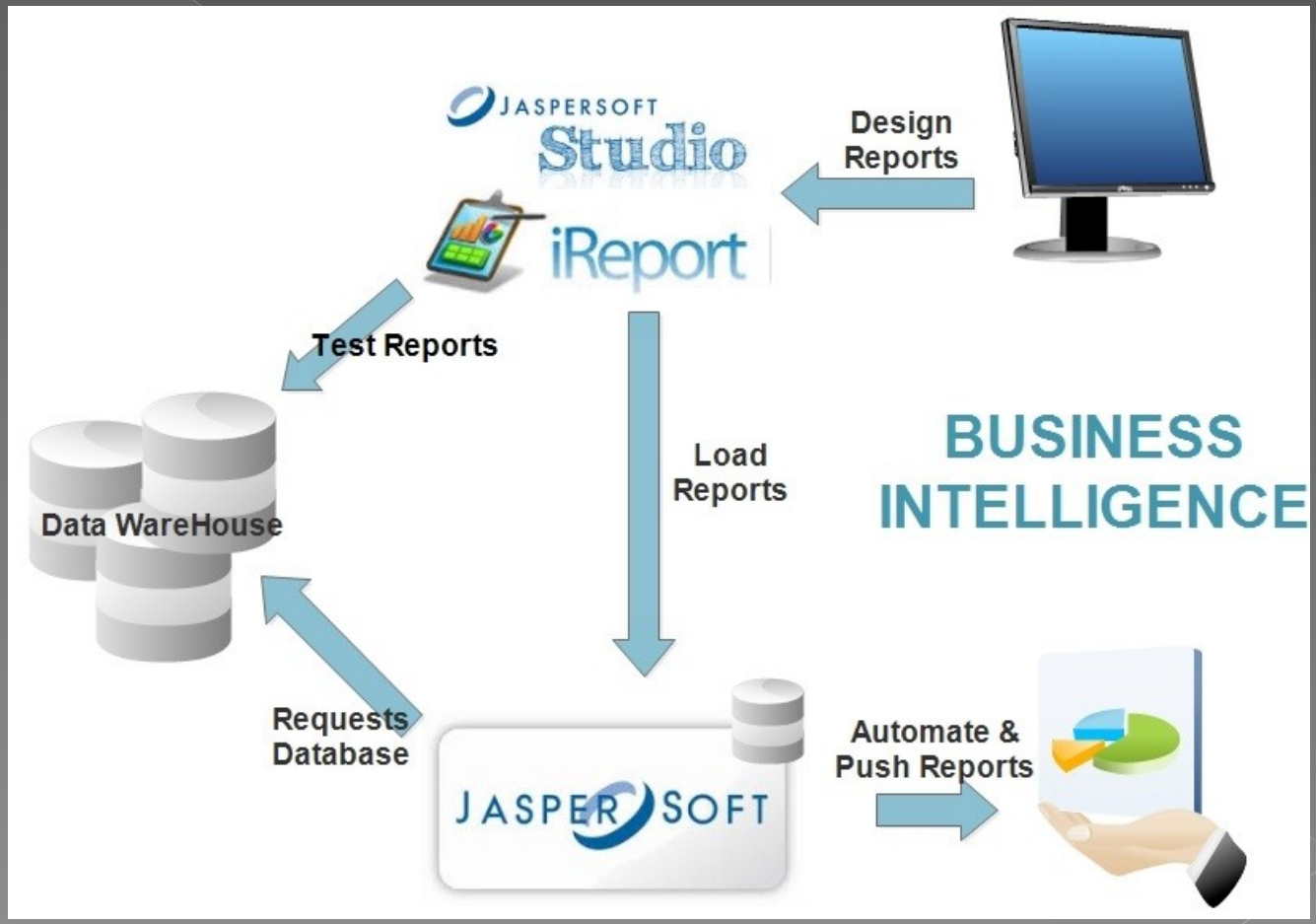
API vs SQL

Normally API requests are safe and are compatible with Zabbix Database schema, but in Large environment they are slow ... for example triggers table size could be about 1Gb.

That's why, most of the time I prefer SQL requests on a Zabbix replicated Database, thus there no IOs generated on Zabbix Production Platform.

It implies you know and follow Zabbix Database Schema changes.

BI : Jasper Suite



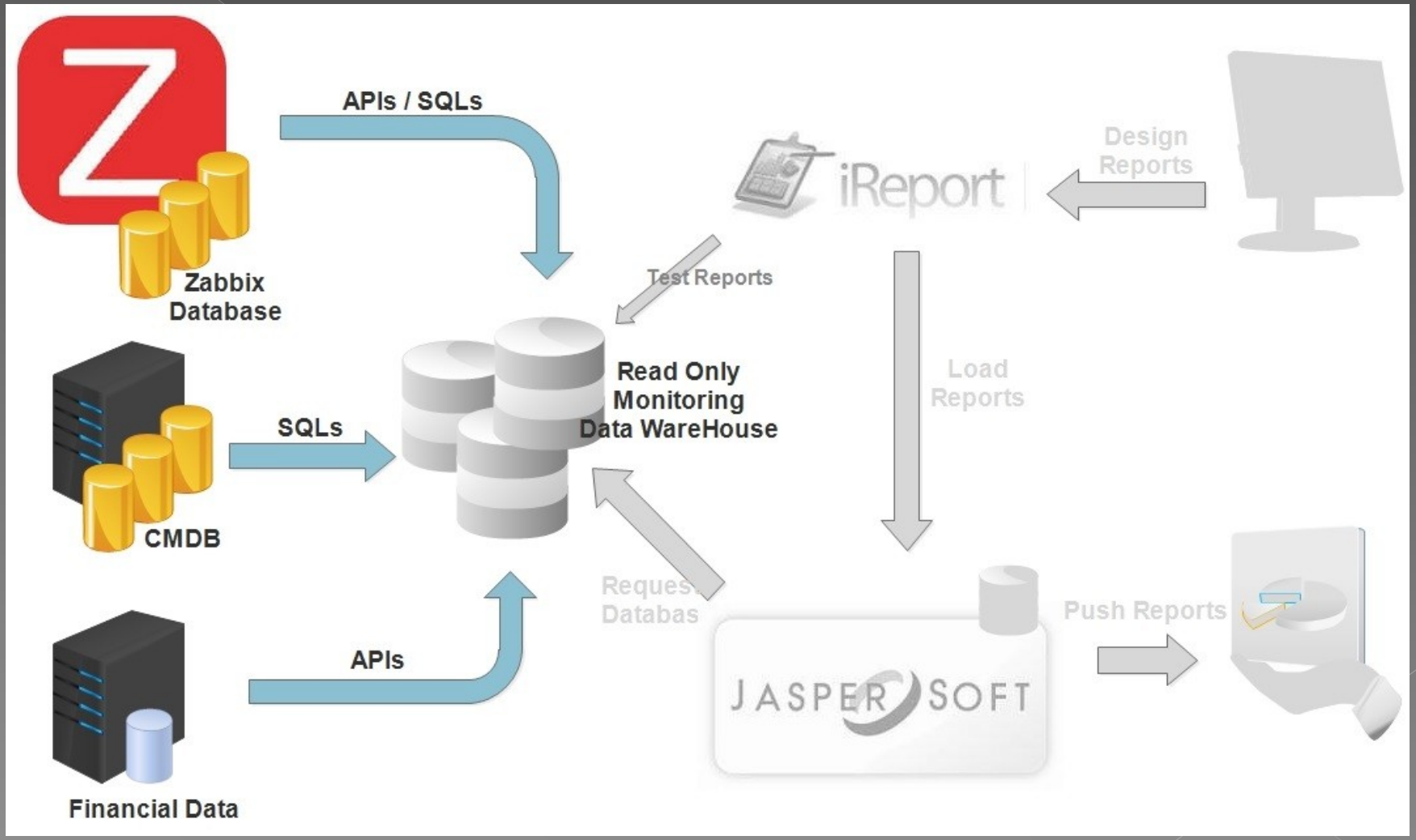
Part 2
Reporting Architecture

-> Monitoring Data WareHouse

-> iReport / JasperStudio

-> Jasper Server

Building DataWareHouse



Building DataWareHouse
Zabbix Configuration Checker

```
+-----------------------------------+
| Tables_in_zabbix_warehouse
+-----------------------------------+
| agent_unavailable
| bad_nomenclatures
| distrib_by_environment
| distrib_by_hostgroup
| distrib_by_os
| distrib_by_regularity
| distrib_by_status
| hosts_low_discovery_items
| hosts_low_discovery_triggers
| hosts_per_template
| hosts_with_not_templated_items
| hosts_with_numerous_events
| hosts_with_numerous_events_type_log
| hosts_with_old_triggers
| hosts_with_unsupported
| hosts_without_triggers
| items_log_without_skip_parameter
| teams
| templates_with_low_disc_regularity
| web_with_low_regularity
……..
```

```
mysql> show create table distrib_by_regularity;
+--------------------------+-----------------------------------------
| Table                    | Create Table
+--------------------------+-----------------------------------------
  distrib_by_regularity
  CREATE TABLE `distrib_by_regularity` (
  `team` varchar(64) COLLATE utf8_bin NOT NULL DEFAULT '',
  `number` int(11) NOT NULL DEFAULT '0',
  `regularity` int(11) NOT NULL DEFAULT '0'
) ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE=utf8_bin
```

Building DataWareHouse
Zabbix Configuration Checker

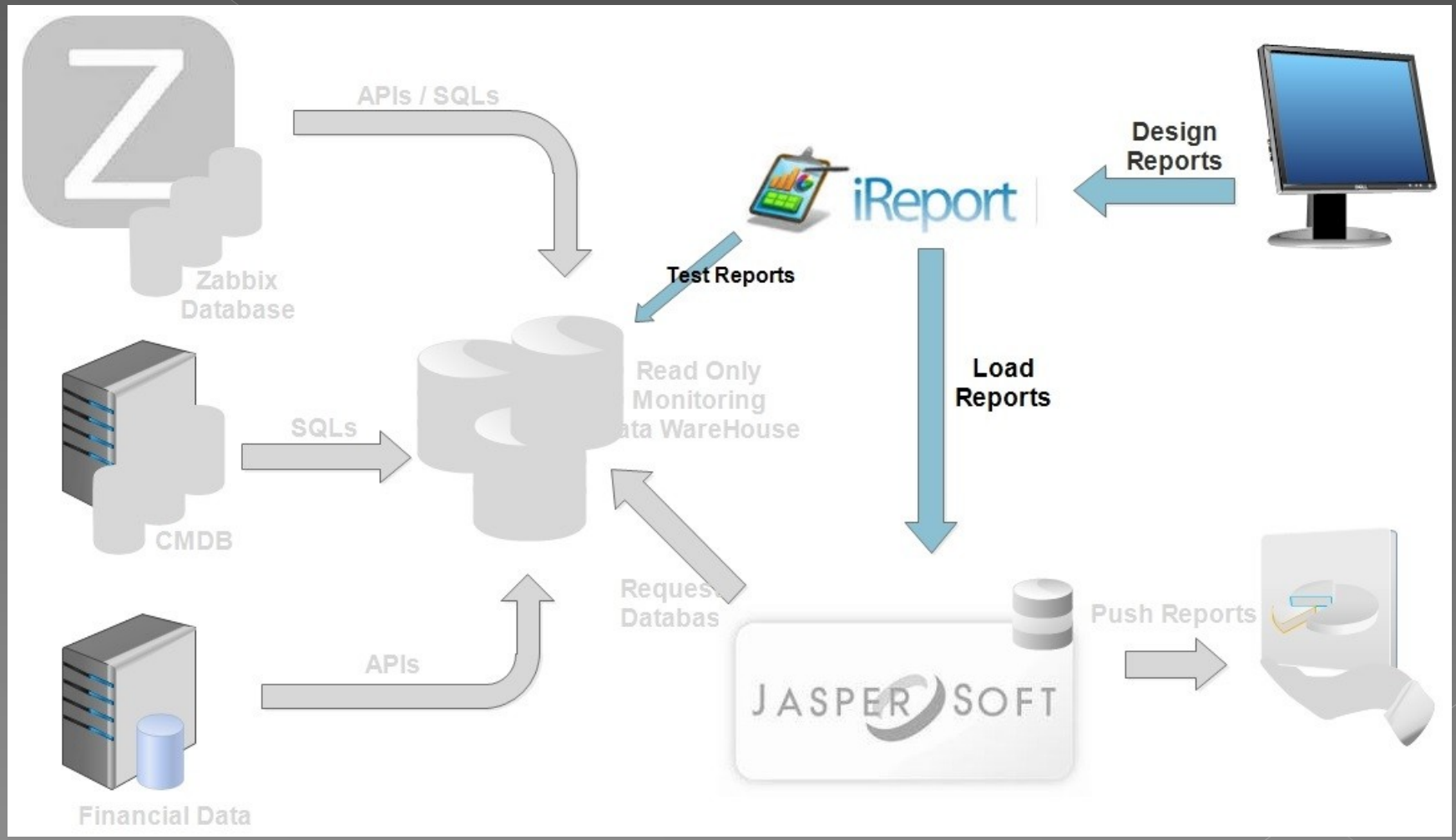
```php
//function reload_distrib_by_regularity($zbx_db_host, $zbx_db_name, $zbx_db_user, $zbx_db_pass
function reload_distrib_by_regularity() {

    global $query_distrib_by_regularity, $zbx_db_host, $zbx_db_name, $zbx_db_user, $zbx_db_pas

    // truncate local table
    $query="truncate distrib_by_regularity;";
    my_query_db( $loc_db_host, $loc_db_user, $loc_db_pass, $loc_db_name, $query, false);

    // select from zabbix
    $query = "$query_distrib_by_regularity";
    my_query_db( $zbx_db_host, $zbx_db_user, $zbx_db_pass, $zbx_db_name, $query, false);
    $result = mysql_query($query);

    // insert into local
    $link=my_connect( $loc_db_host, $loc_db_user, $loc_db_pass, FALSE);
    while ($row = mysql_fetch_array($result, MYSQL_ASSOC)) {
        $TEAM = $row['TEAM'];
        $NUMBER = $row['NUMBER'];
        $REGULARITY = $row['REGULARITY'];
        $s_query = "insert into ".$loc_db_name.".distrib_by_regularity (team,number,regularity
        $s_result = mysql_query($s_query);
```

$query_distrib_by_regularity = "select substring(i.name,5,3) as TEAM,
i.delay as REGULARITY, count(*) as NUMBER from items i INNER JOIN hosts h ON (i.hostid = h.hostid) where ….

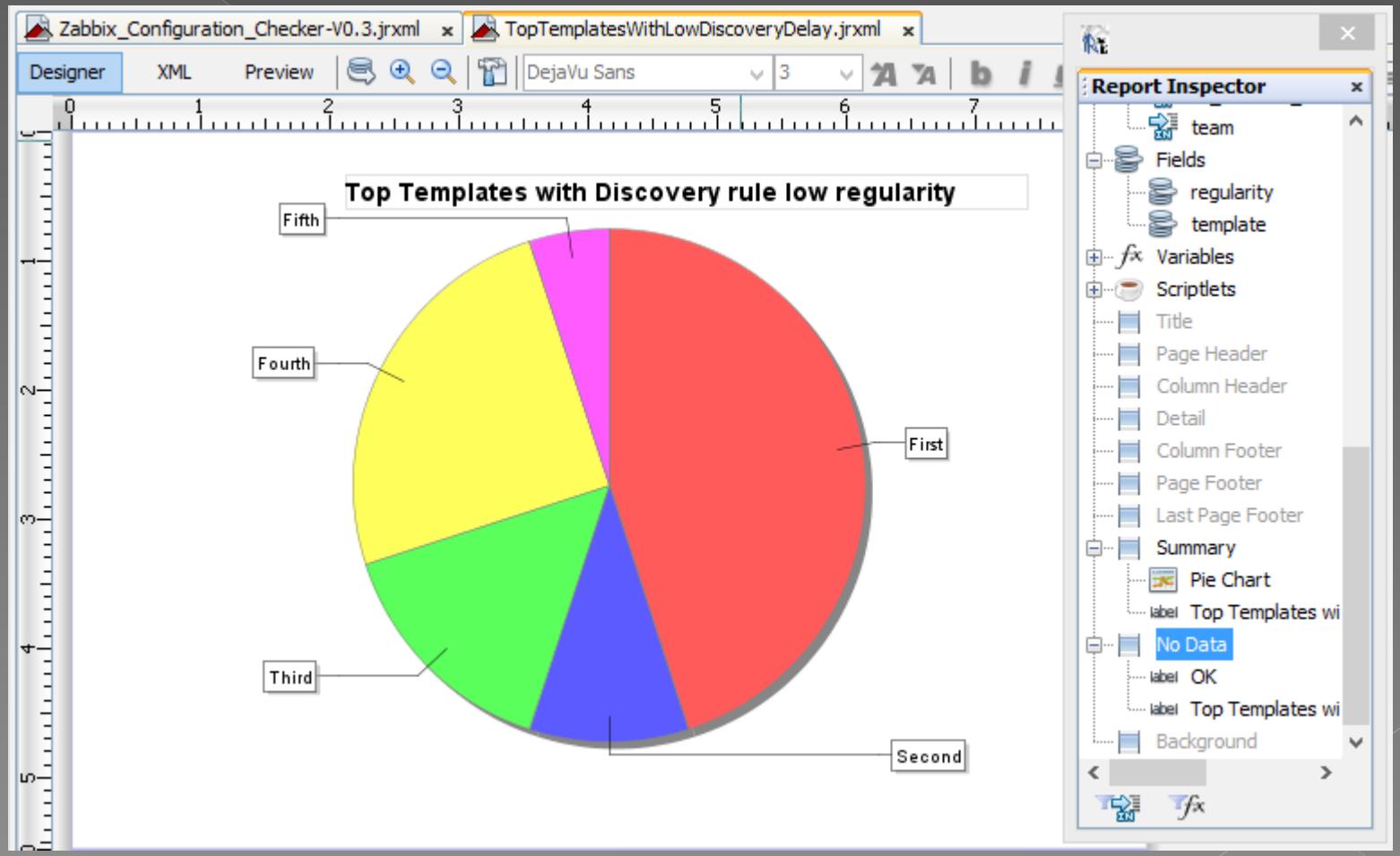
Enrich DataWareHouse
Zabbix Configuration Checker

```
////////////////////////////////////////////////
// Get infos from cmdb database & Load into WareHouse
function reload_local_cmdb($cmdb_db_host, $cmdb_db_name, $cmdb_db_user, $cmdb_db_pass, $loc_db_h
    global $cmdb_db_host, $cmdb_db_name, $cmdb_db_user, $cmdb_db_pass, $loc_db_host, $loc_db_nam

    // Reload local from cmdb database & table host_inventory
    sybase_min_server_severity(11);
    $sy_link=sy_connect( $cmdb_db_host, $cmdb_db_user, $cmdb_db_pass,$cmdb_db_name,FALSE);
    sybase_select_db($cmdb_db_name,$sy_link);

    // Check if machine is physical (with or without material_parent) or virtual/logical
    $q_query = "select id_machine,id_material,machine_parent from machine where name_machine lik
        $q_result = sybase_query($q_query);
        if (!$q_result) {
            logappend("Error: Invalid query: $q_query.\n",1);
                    //die("Invalid query: $q_query ");
            return;
        }
        $q_row = sybase_fetch_array($q_result);
        $q_id_machine = mysql_escape_string($q_row['id_machine']);
        $q_id_material = mysql_escape_string($q_row['id_material']);
        $q_machine_parent = mysql_escape_string($q_row['machine_parent']);
```

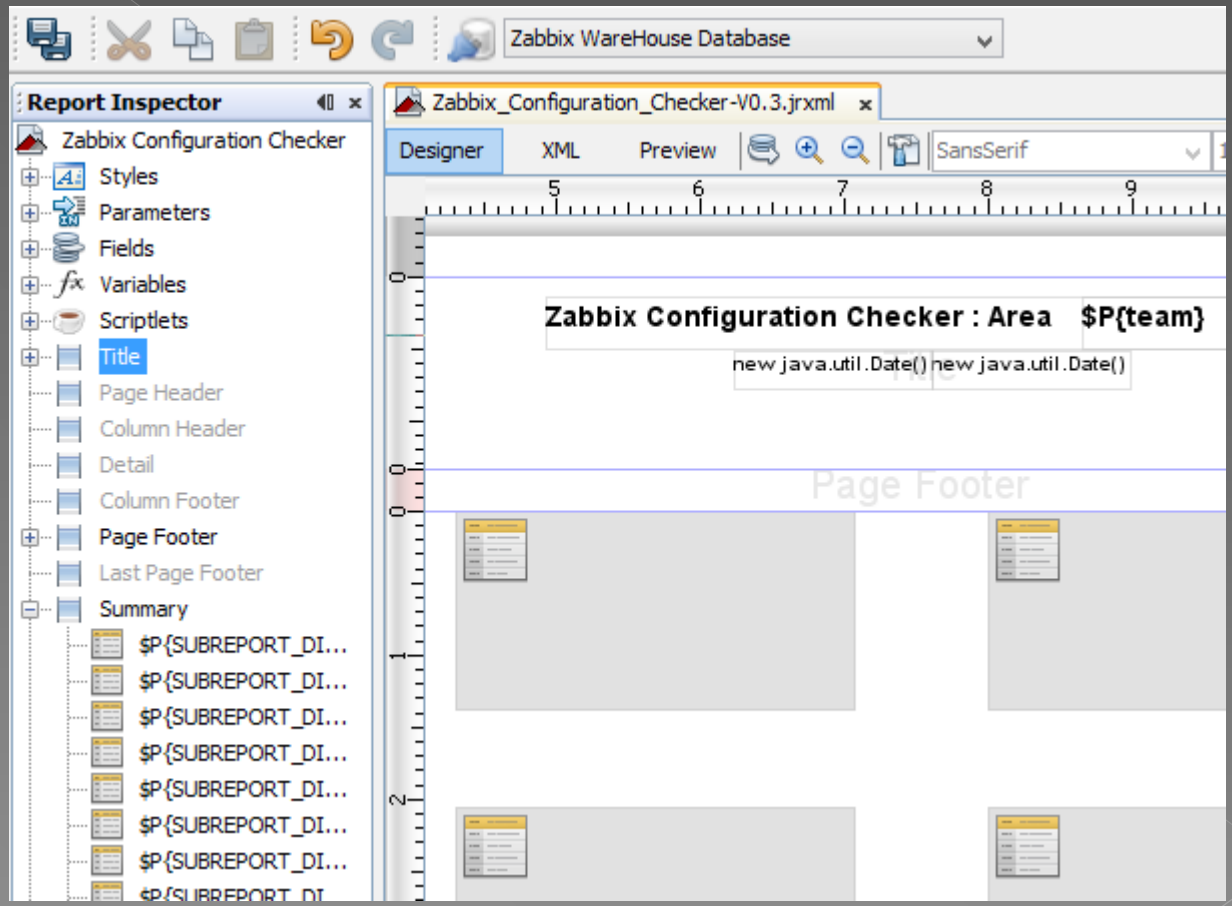
iReport / JasperStudio



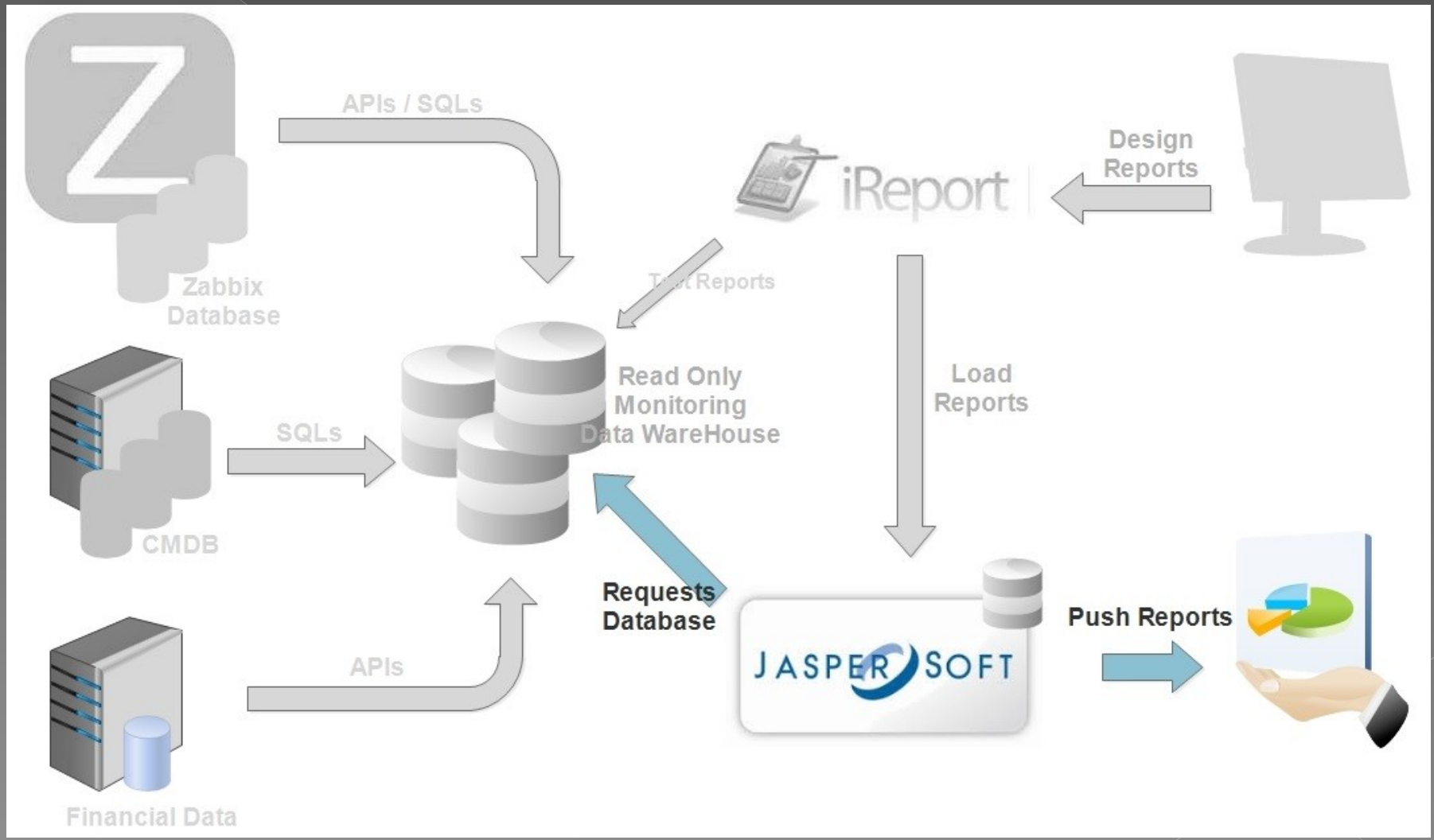
iReport / JasperStudio Subreports



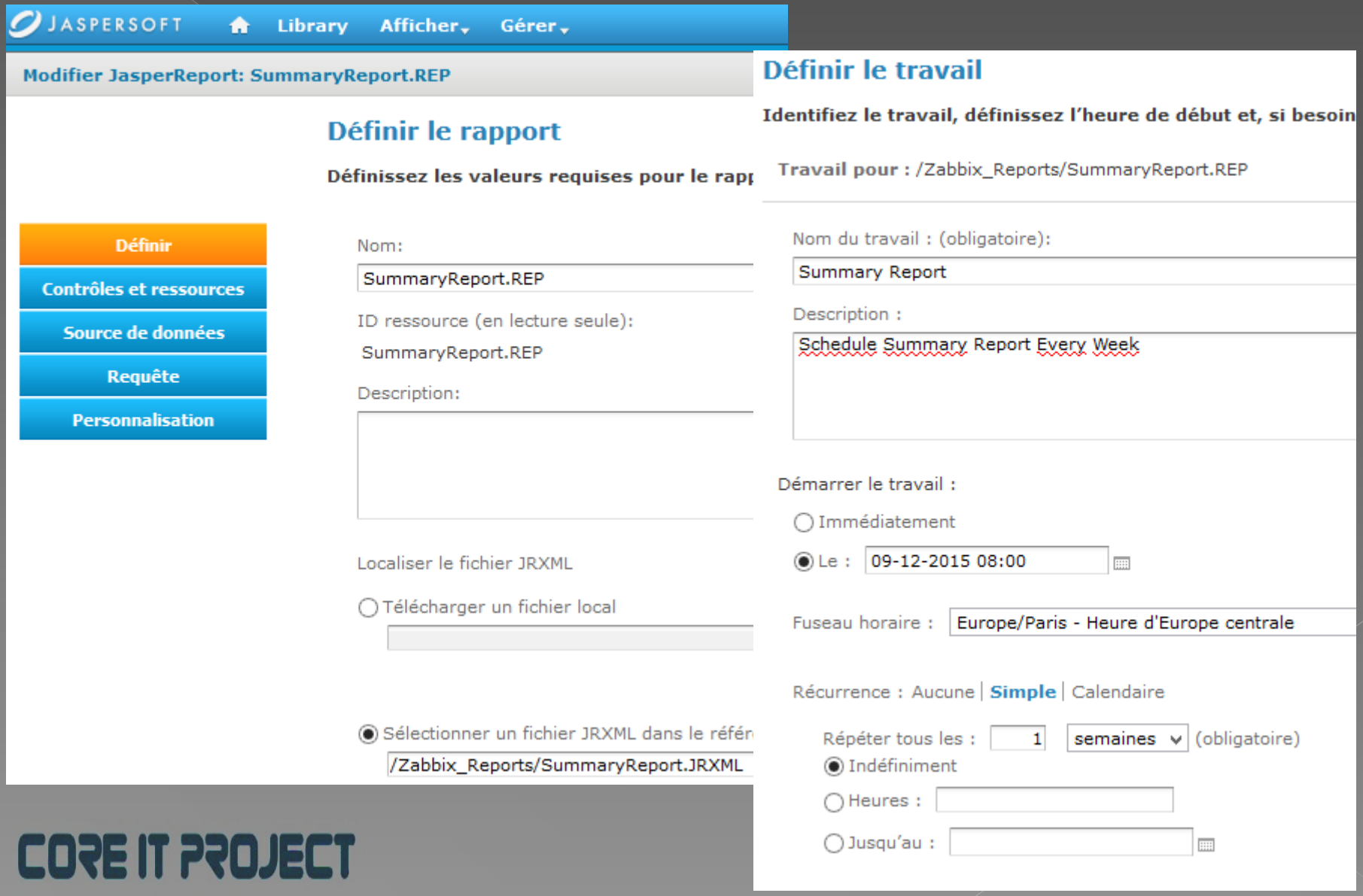
iReport / JasperStudio Reports



Jasper Server



Jasper Server



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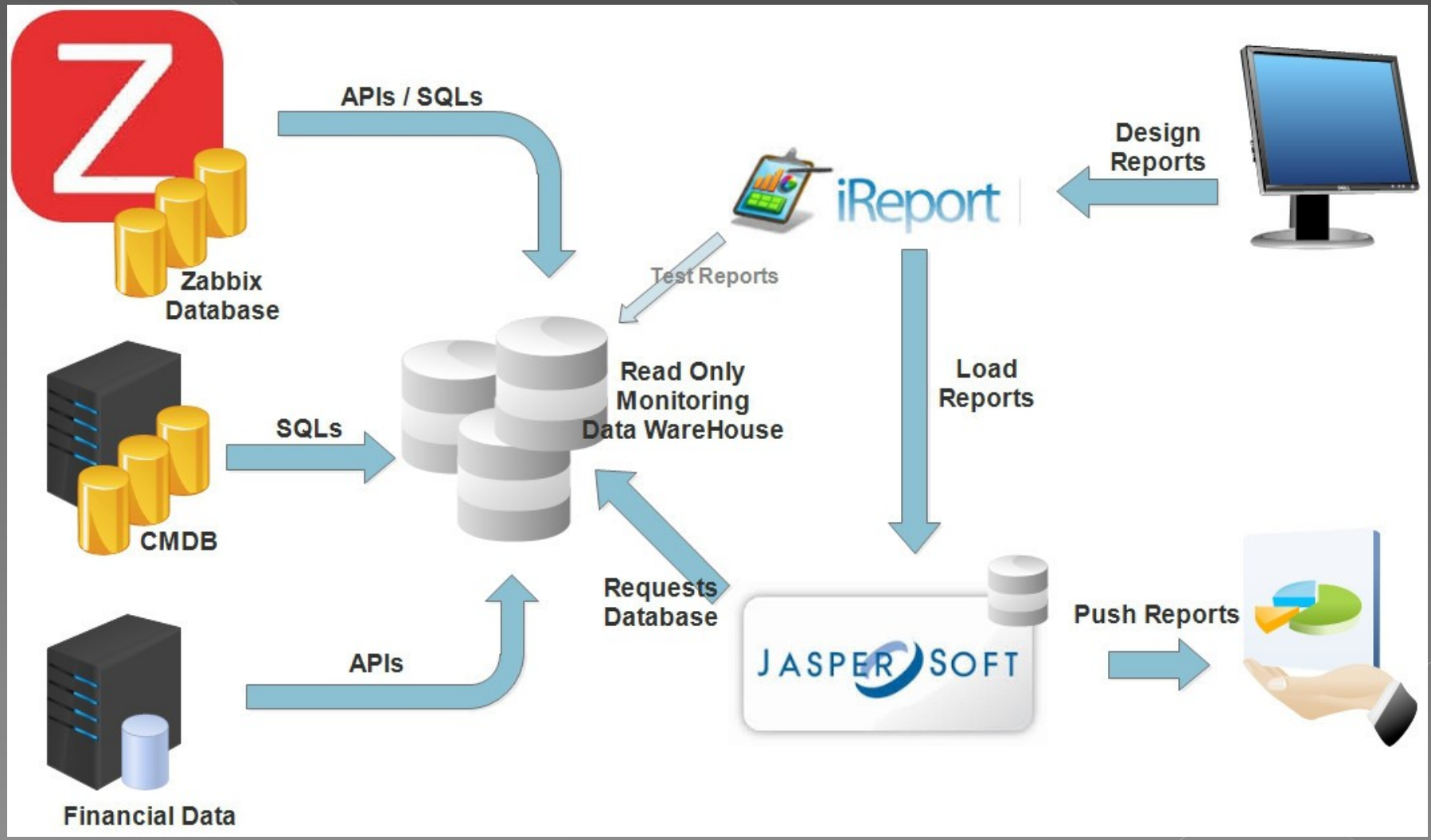
Final Reporting Architecture



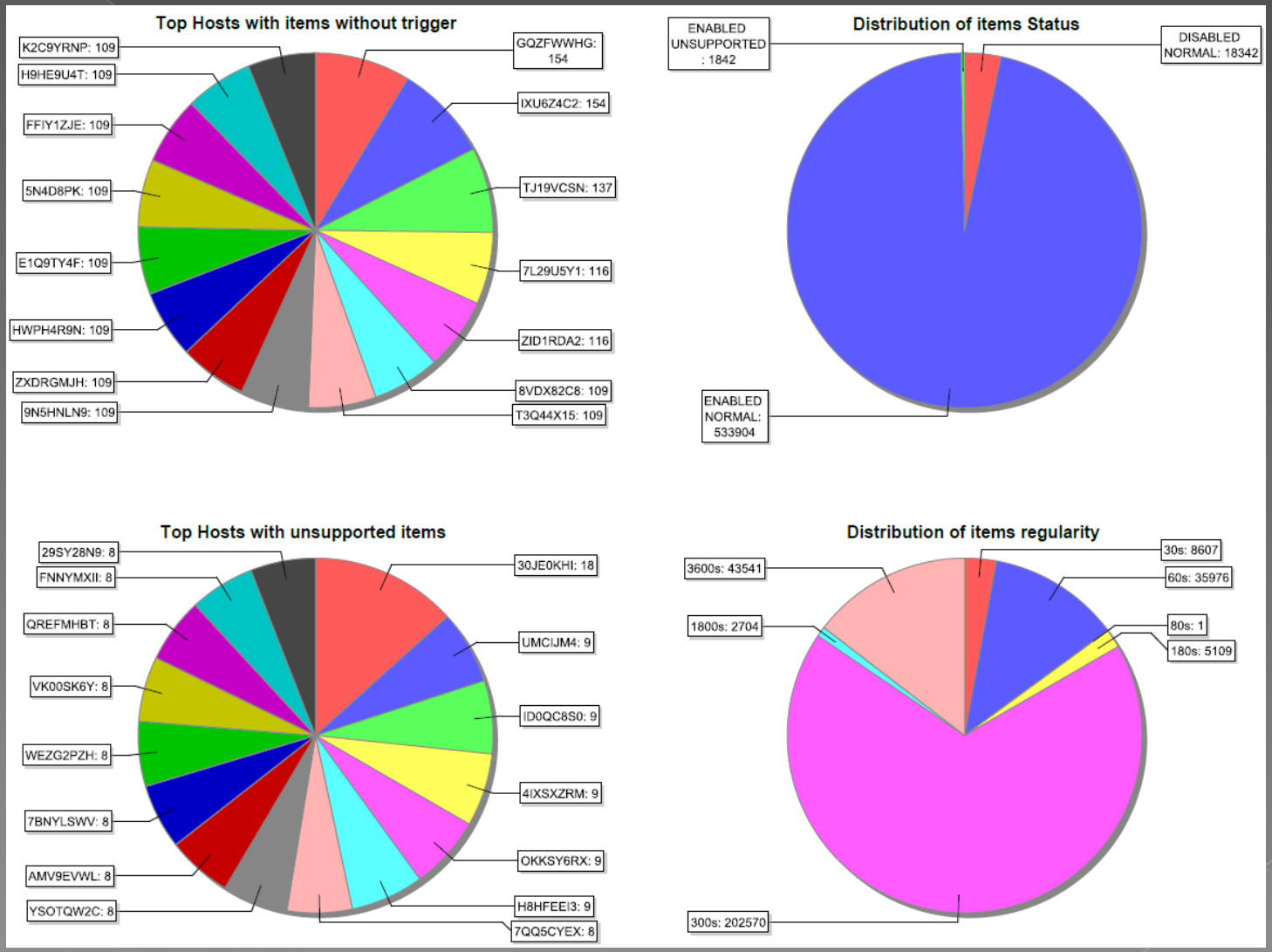
Part 3
Reports

-> Zabbix Configuration Checker

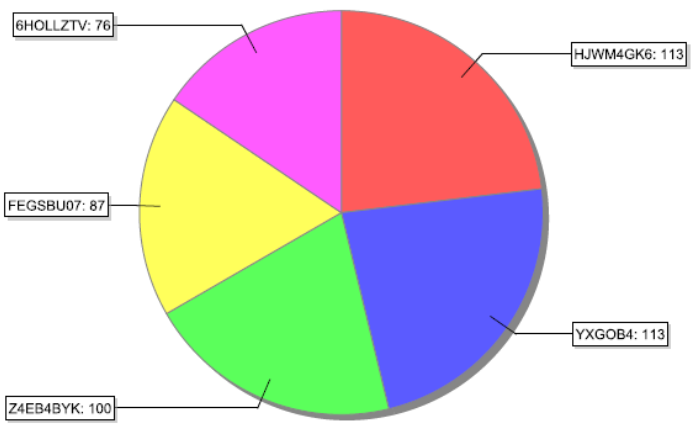
-> Summary Report

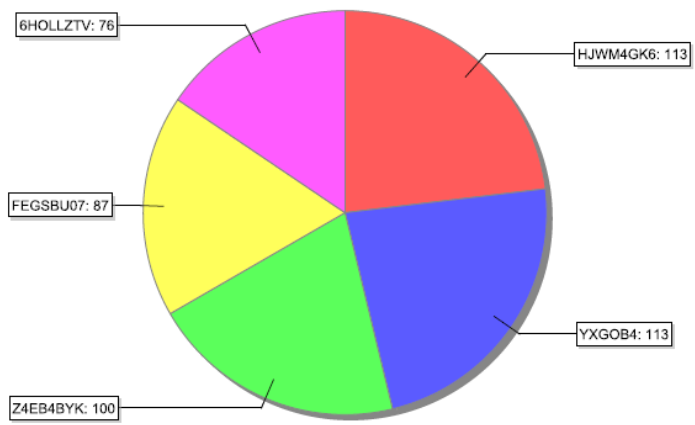
-> Yearly Trends

Zabbix Configuration Checker



Zabbix Configuration Checker





Templates with type log items without skip parameter

TP_UNIXA	eventlog[Application,,"Error","MYSQL677",]
TP_UNIXA	log["/opt/jre45/log/events.log","backwards"]
TP_UNIXA	log["/opt/jre45/log/events.log","not loaded due to errors"]
TP_UNIXA	log["/opt/jre45/log/events.log","unchanged"]
TP_UNIXA	eventlog[Mozart_8,,Critical,,3322]
TP_UNIXA	eventlog[Mozart_8,,Warning,,3317]
TP_UNIXA	log[/opt/observer/instance_YU/log/bus_data.log,"ERROR|error|Error"]
TP_UNIXA	log[/opt/observer/instance_YU/log/bus_ft.log,"ERROR|error|Error"]
TP_UNIXA	log[/opt/observer/instance_YU/log/bus_sup.log,"ERROR|error|Error"]
TP_UNIXA	log[/opt/observer/instance_YU/log/HawkAgent.log,"ERROR|error|Error"]
TP_UNIXA	log[/opt/observer/instance_YU/log/msghma.log,"ERROR|error|Error"]
TP_UNIXA	eventlog[Application,,"Error",Main_Monitor,,]
TP_UNIXA	log[/var/adm/messages,HPUX_T,,100]
TP_UNIXA	eventlog[CommercialLicence,,,,,,]
TP_UNIXA	Oracle_10G_Alertlog[{#DBHOST},{#INSTANCE}]

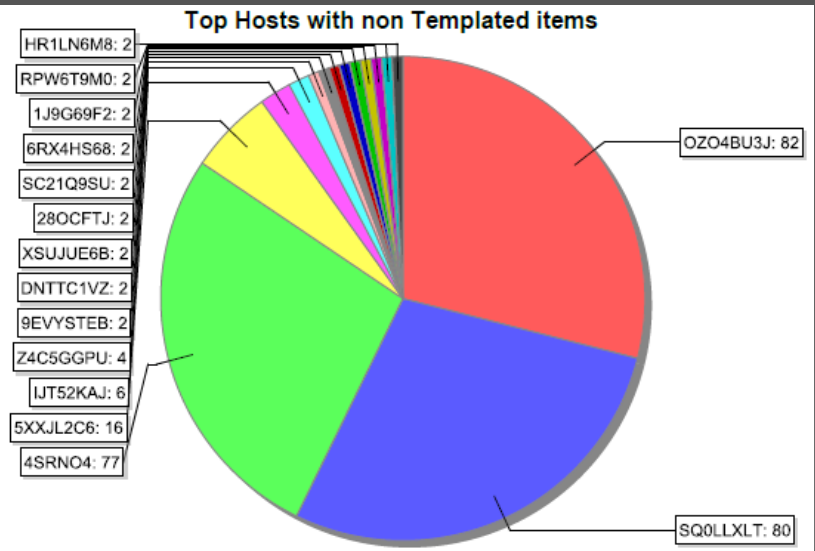
Unavailable Zabbix Agents

Host	Group
17JT65Y0	prod-unix
6L4IYXHB	prod-unix
BKLZUXV9	prod-unix
CFVS3Q57	prod-unix
DKHFC5HN	prod-unix
DUT8F3ZB	prod-unix
I9F42MMZ	prod-unix
ID0O21P2	prod-unix
MKN8033W	prod-unix
PA259IL2	prod-unix
RK99706J	prod-unix
RVS0H2NO	prod-unix
SR2RAYNZ	prod-unix
SY4EEHYZ	prod-unix

Zabbix Configuration Checker

Top Scenarii with low regularity

OK



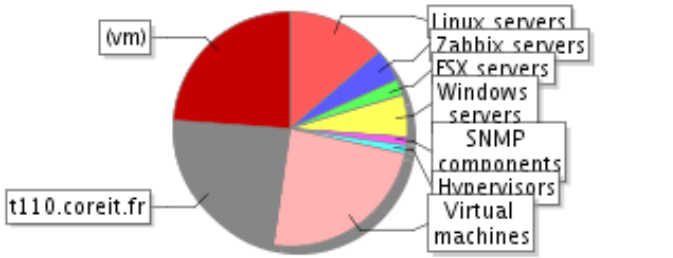
Top older triggers

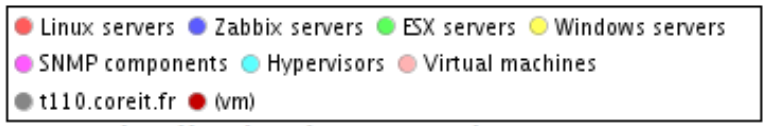
06/02/13 22:25	HD7N92X	TP_UNIXA hpux_soft_657.status
06/02/13 22:27	IHL7YWH	TP_UNIXA hpux_soft_657.status
05/04/13 11:38	41JCQEJ6	TRIG.DSS.DEV.sxd_frt.indisponible
05/04/13 11:38	Z26BSPV0	TRIG.DSS.DEV.sxd_frt.indisponible
05/04/13 16:40	49M3B1W2	TP_UNIXS.CentralLogFlood.EventLog.ERROR
05/04/13 16:45	EGSC2YB	TP_UNIXS.CentralLogFlood.EventLog.ERROR
05/04/13 16:45	DNV4NLRR	TP_UNIXS.CentralLogFlood.EventLog.ERROR

Summary Report

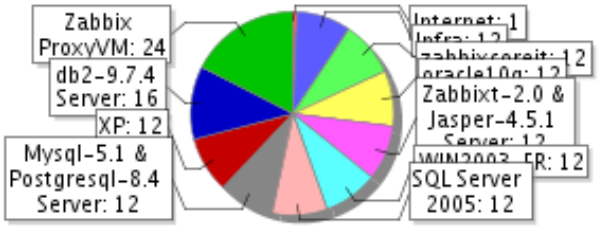
Summary Report

25/08/2015 21:43





Distribution by Operating System



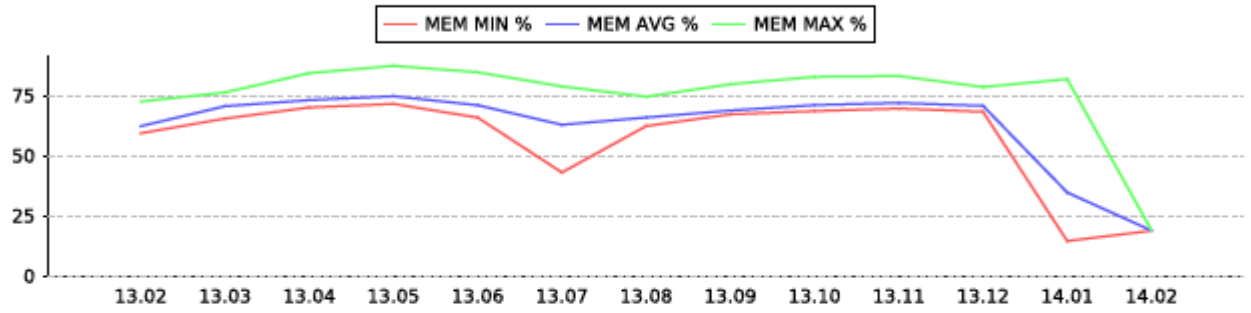
Last Week Top Talkers

HOST	Current ALARMs	SINCE	SEVERITY	ITEM
Mysql-5.1 & Postgresql-8.4 Server	MYSQL Instance {$MYSQL_INSTANCE_NAME} -	09/07/15 20:12	HIGH	Instance {$MYSQL_INSTANCE_NAME} - Check
Mysql-5.1 & Postgresql-8.4 Server	MYSQL Instance db_zabbix - Connection error	09/07/15 20:12	HIGH	Instance db_zabbix - Check connection
db2-9.7.4 Server	DB2 Instance {$DB2_INSTANCE_NAME} - databas	24/08/15 02:07	HIGH	Instance db2_db2inst1 - Database
db2-9.7.4 Server	DB2 database {$DB2_DATABASE_NAME} - No	24/08/15 02:07	HIGH	Database {$DB2_DATABASE_NAME} - Timestamp
Zabbix ProxyVM	No data from Zabbix Proxy	25/08/15 02:17	HIGH	CPU $2 %
zabbix01	Proxy {$PROXY_NAME1} last access > 130s	20/07/15 15:03	HIGH	Zabbix Proxy {$PROXY_NAME1} Last Access
Mysql-5.1 & Postgresql-8.4 Server	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping
db2-9.7.4 Server	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping
Infra	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping
SQL Server 2005	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping
oracle10g	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping
Zabbix ProxyVM	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping
WIN2003-FR	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping
XP	Zabbix agent on {HOSTNAME} is unreachable for	25/08/15 04:07	WARNING	Agent ping

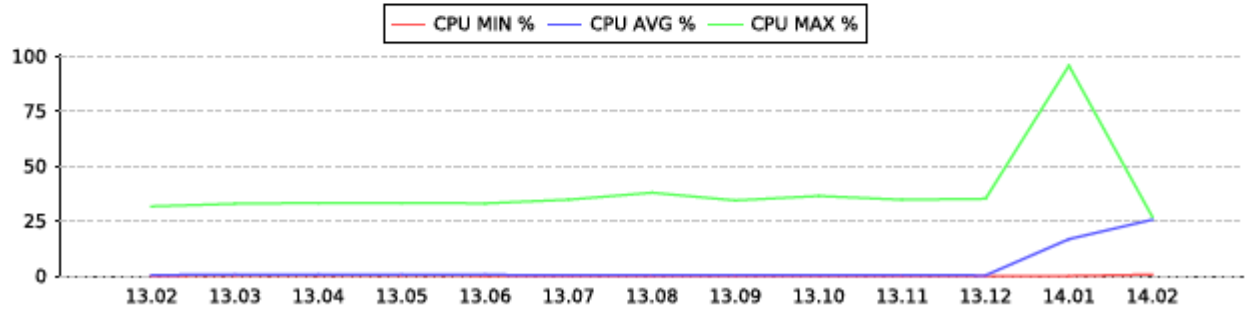
Yearly Trends

[redacted] Year Trends

CPU & Memory



MIN_YEAR	AVG_YEAR	MAX_YEAR
14,69	66,55	87,51



MIN_YEAR	AVG_YEAR	MAX_YEAR
0,06	2,09	95,84

Merci pour votre attention !

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Questions?

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