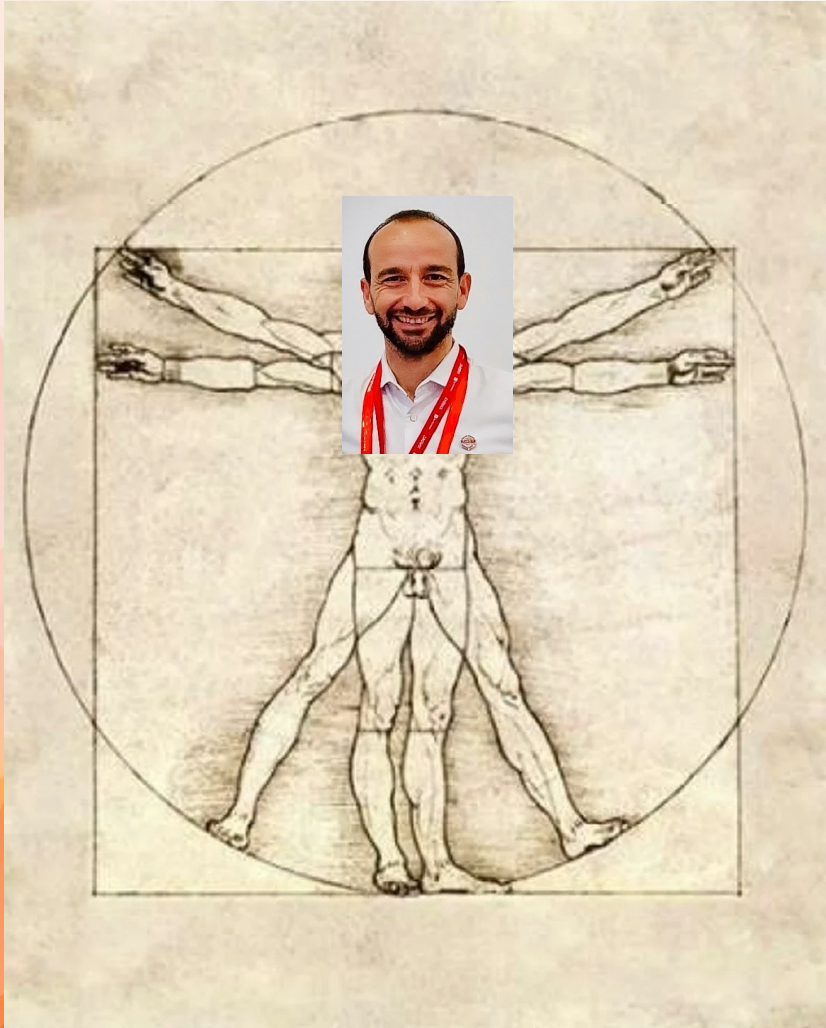


Zabbix usability best practices in multi-user environments



Nicola Mauri

- Security and Monitoring specialist
- Zabbix Certified Trainer at Quadrata
- Using Zabbix since 2011

www.quadrata.it

[ZabbixItalia](#)

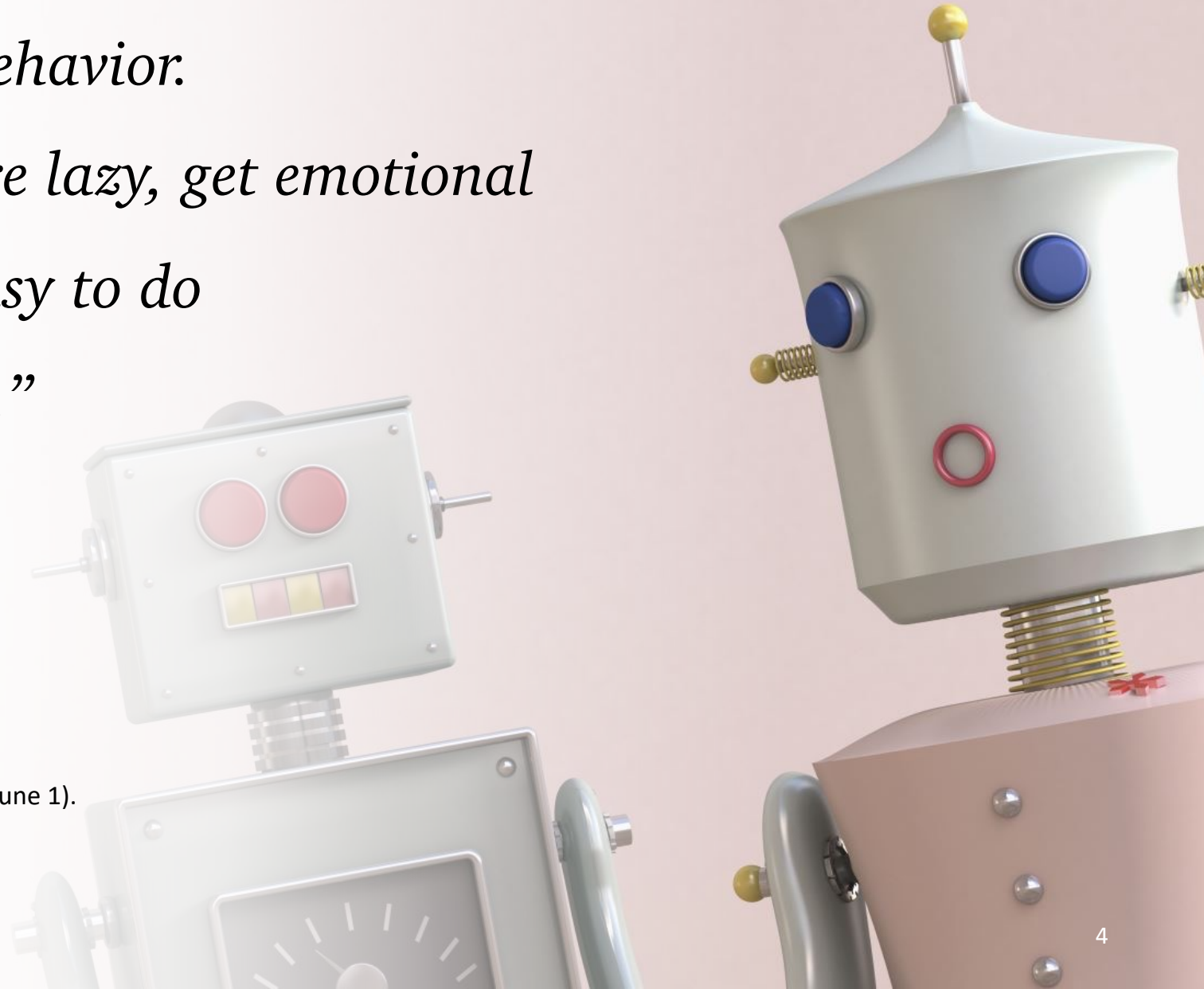




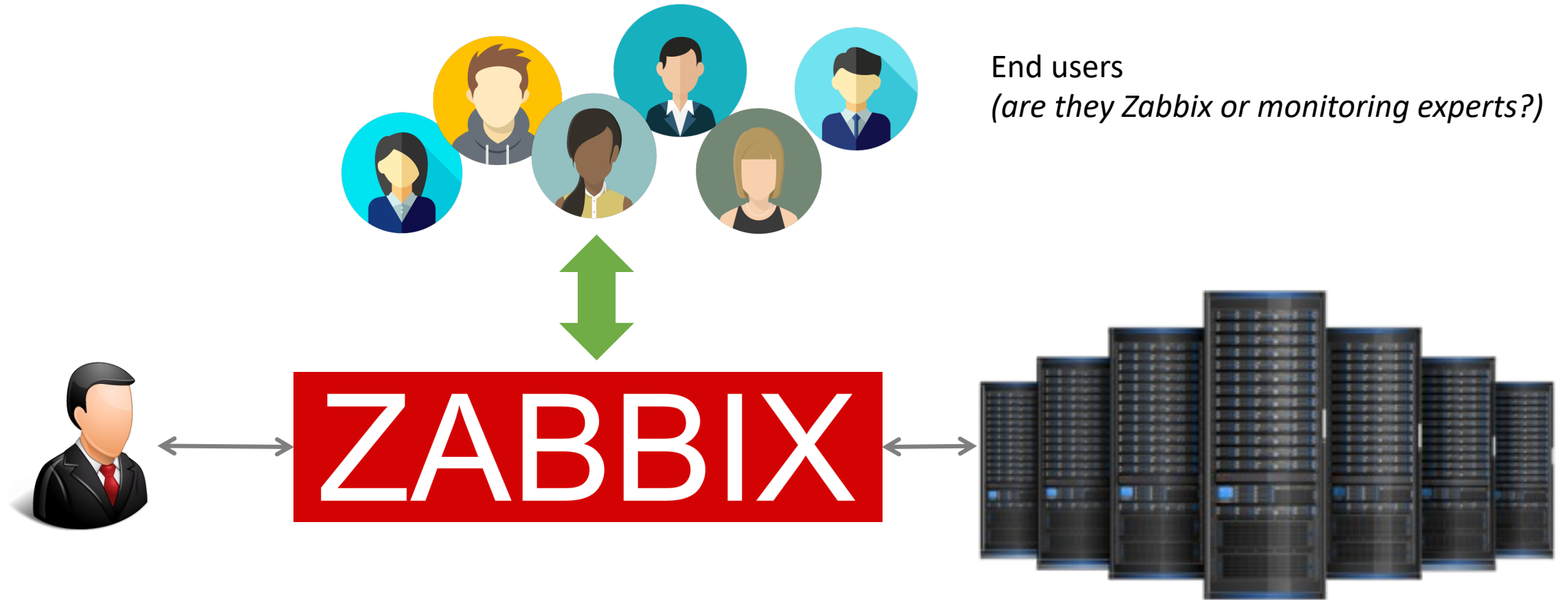
“Usability is about human behavior.

*It recognizes that humans are lazy, get emotional
and prefer things that are easy to do
vs. those that are hard to do.”*

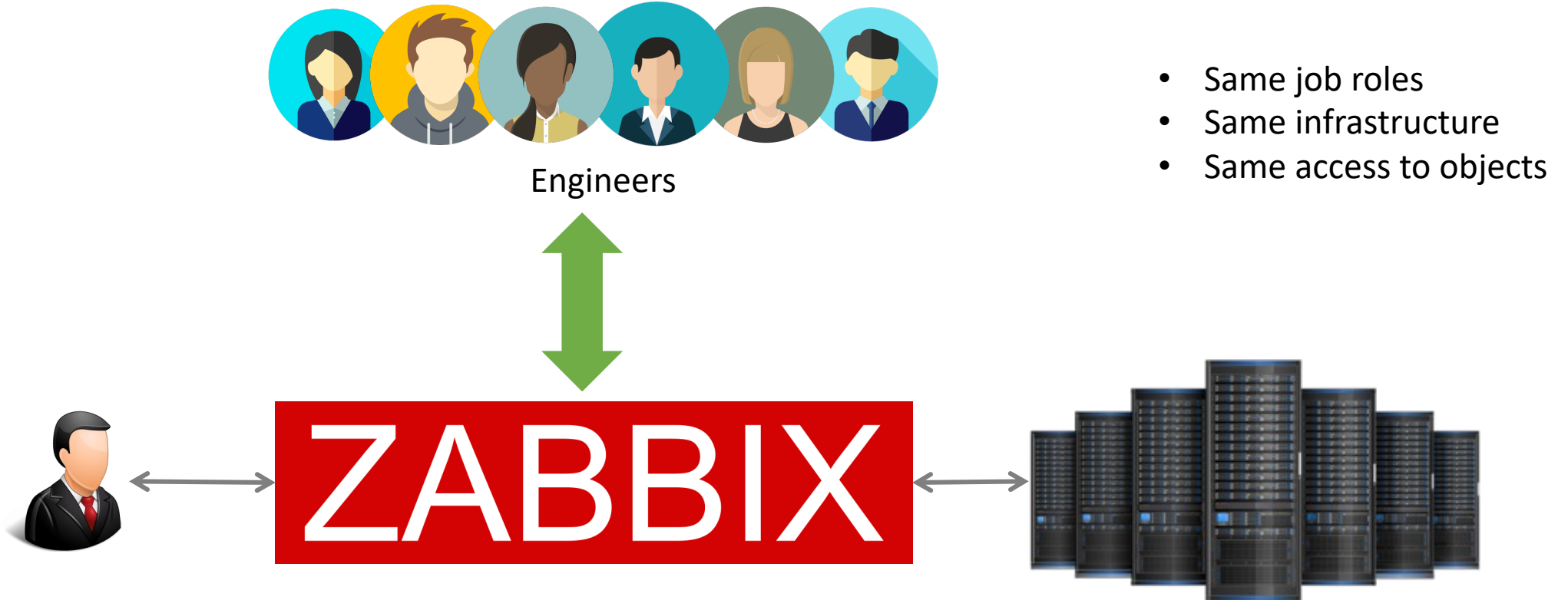
— David McQuillen. Interaction Design Foundation - IxDF. (2016, June 1).
<https://www.interaction-design.org/literature/topics/usability>



Multi-user environment

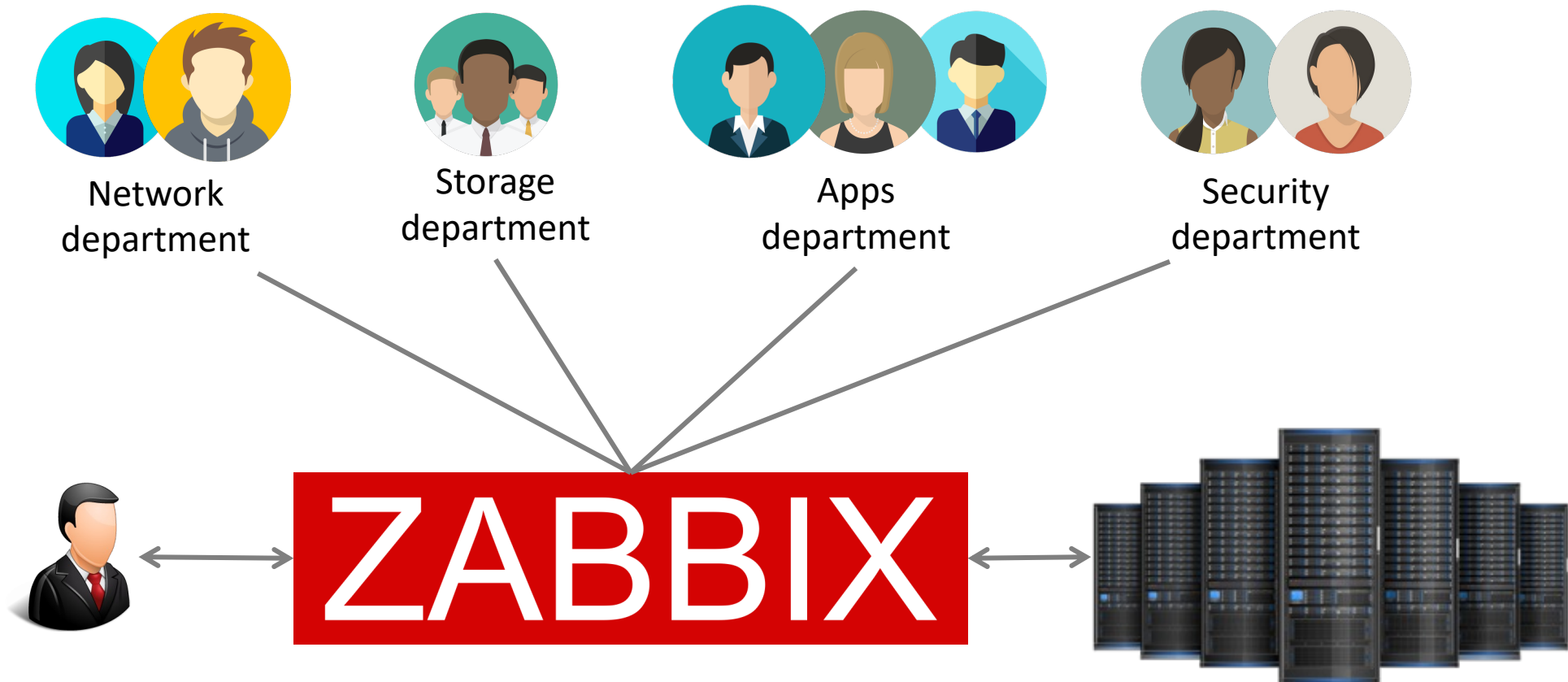


Example 1: Single team

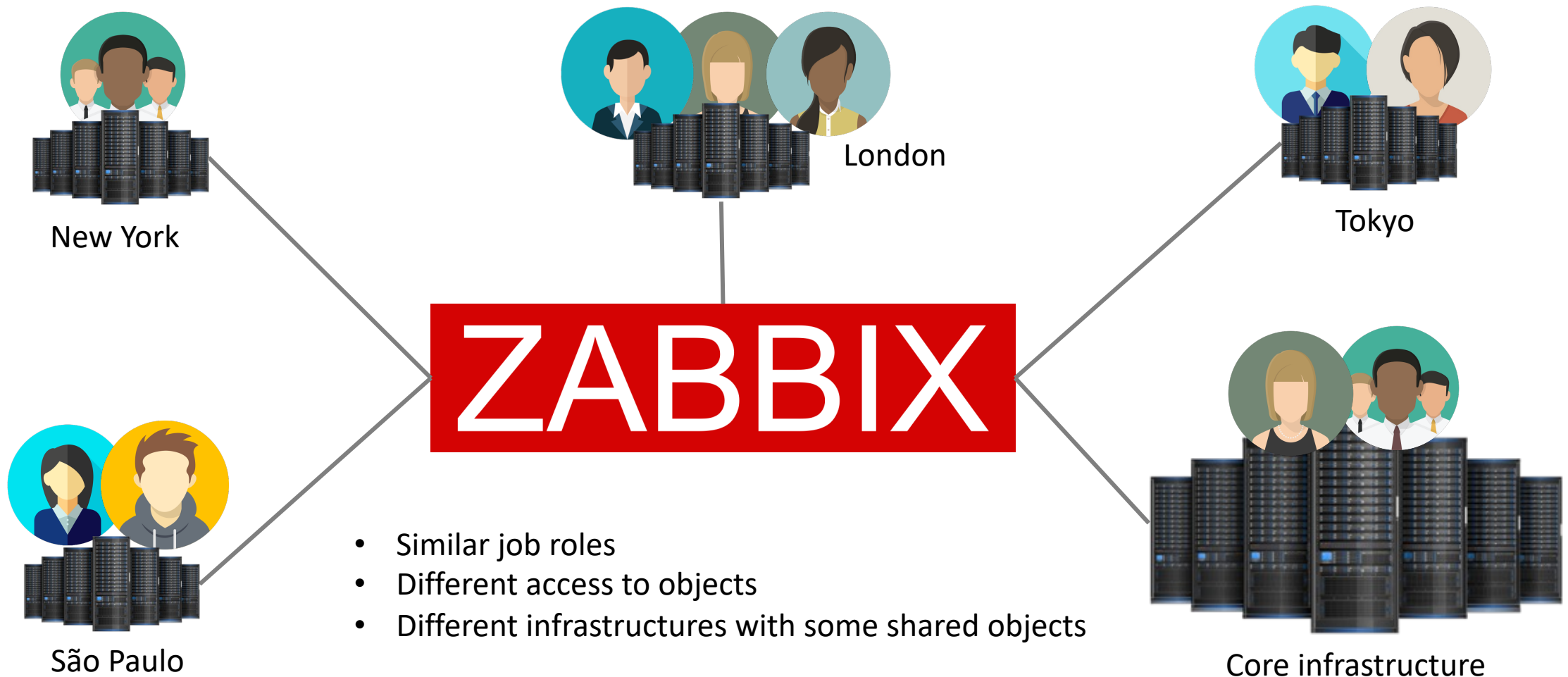


Example 2: Multiple teams

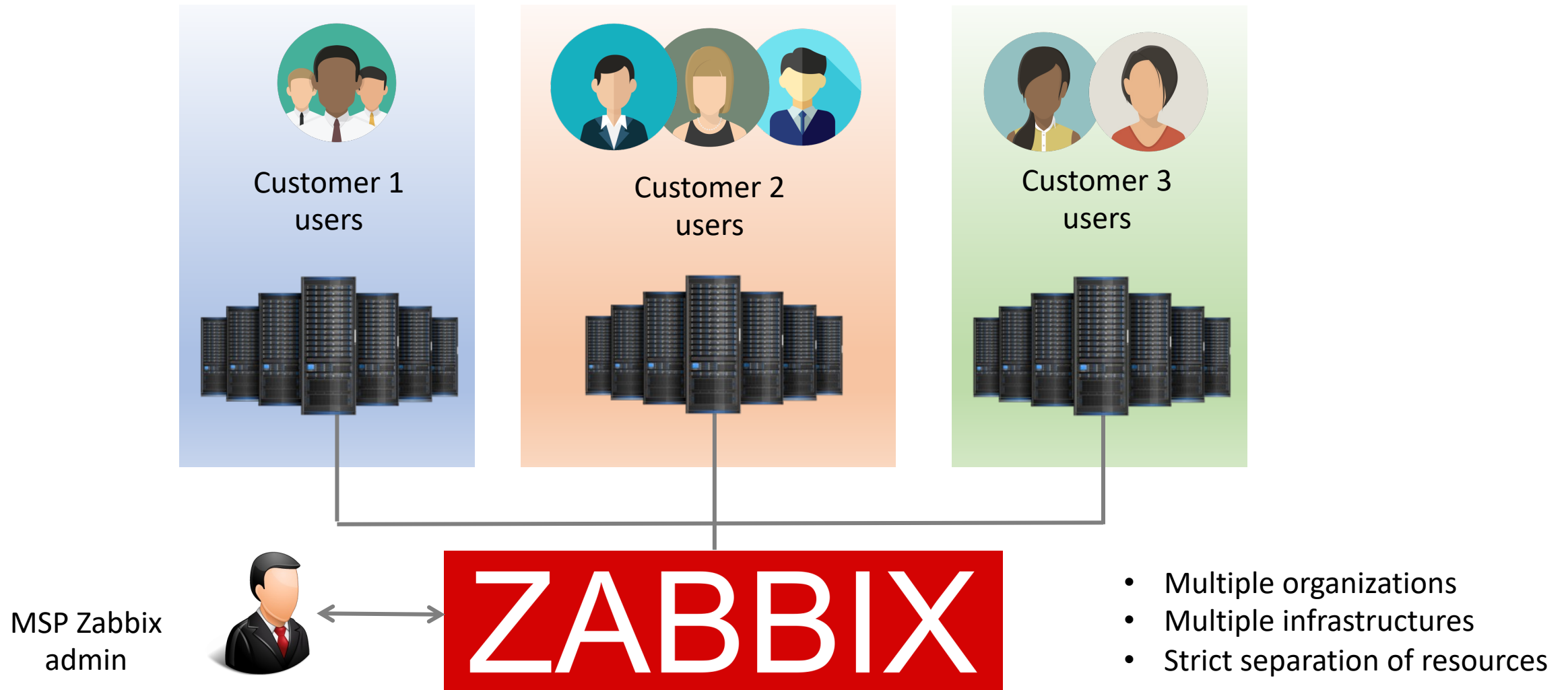
- Different job roles
- Same infrastructure
- Different access to objects



Example 3: Multiple distributed teams



Example 4: Multi-tenancy



What do users want?



Navigation



Familiarity



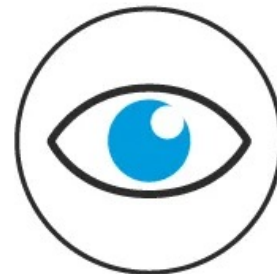
Consistency



Error prevention



Feedback

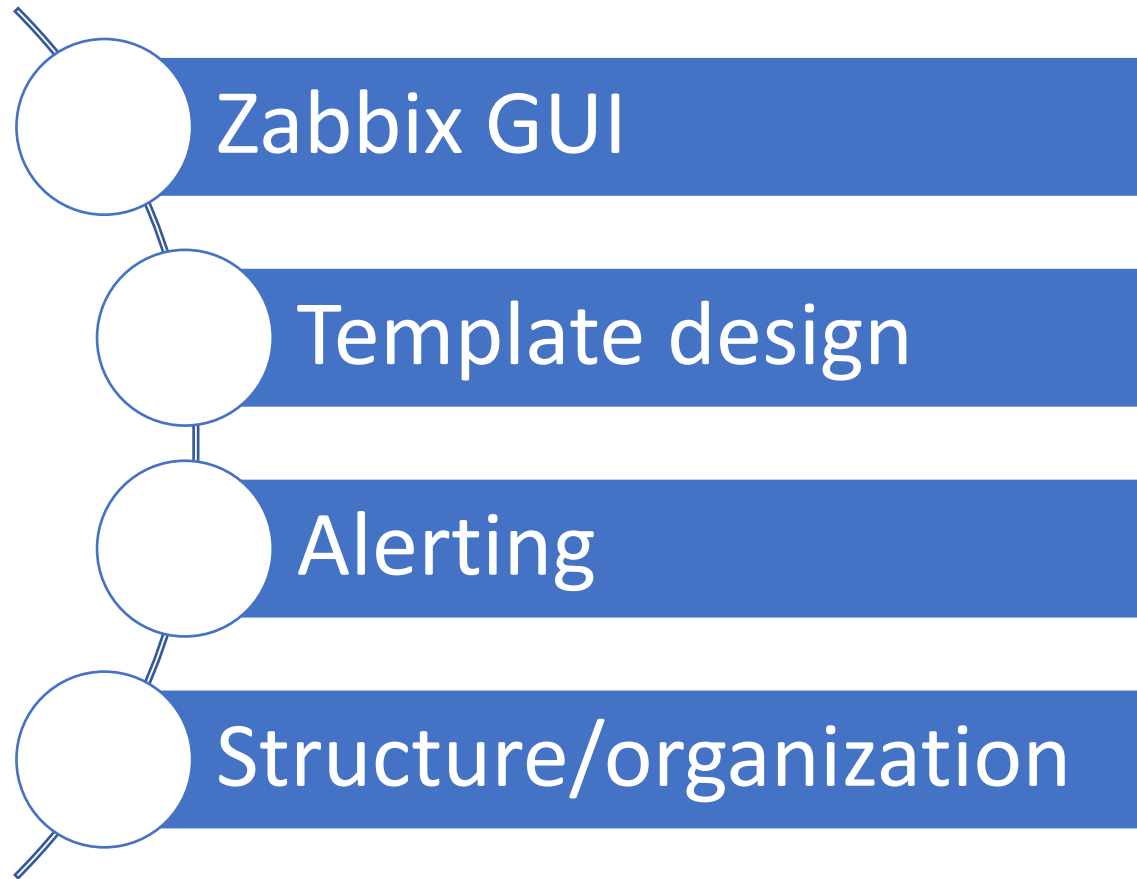


Visual Clarity



**Flexibility &
Efficiency**

Zabbix usability areas



ZABBIX

Developers team



Zabbix admin (you)

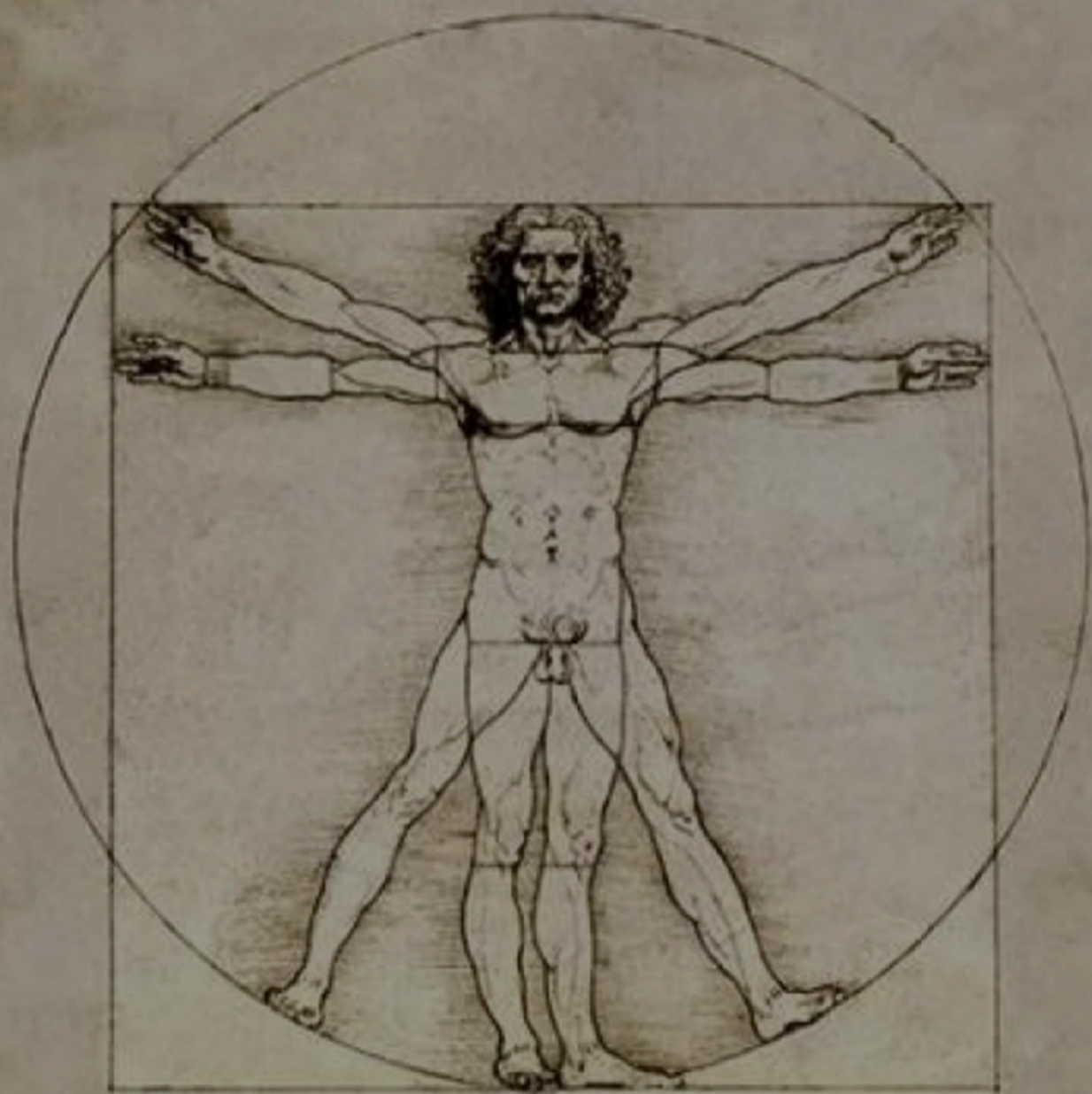


Zabbix admin (you)



Zabbix admin (you)

Zabbix GUI



Zabbix GUI

Usability has improved a lot compared to the first versions

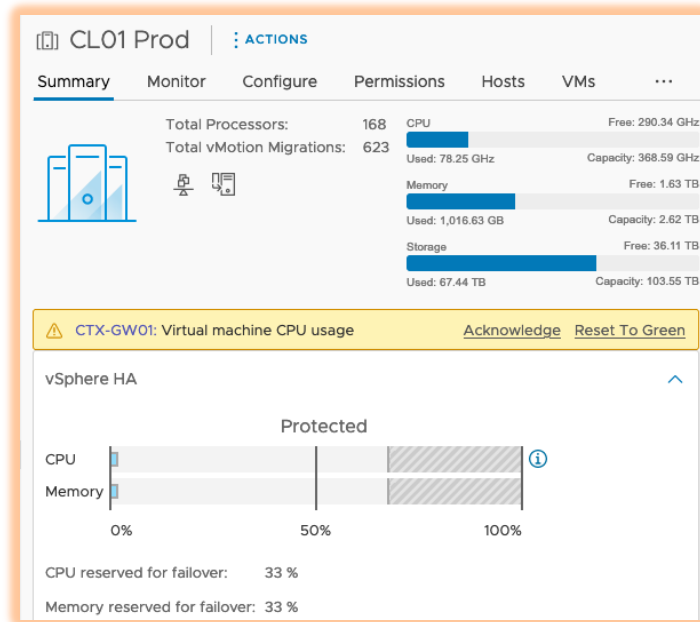


...still Zabbix does not seem suitable for beginners or casual users

Why?

Zabbix GUI usability

- GUI is built upon the internal Zabbix database model
- Items can really contain any kind of information
- Items are displayed regardless of their semantics (data-agnostic)



How the user model might look like

| Host | Name | Last check | Last value |
|---------|--|------------|--------------------|
| vCenter | Cluster CL01 Prod: cluster status | 51s | green (1) |
| vCenter | Cluster CL02 Test NoWinSrv: cluster status | 50s | green (1) |
| vCenter | Datastore esx03 local datastore: Latency read | 36s | 0 |
| vCenter | Datastore esx03 local datastore: Latency write | 7s | 0 |
| vCenter | Datastore esx03 local datastore: Size free % | 3m 38s | 98.7855 % |
| vCenter | Datastore esx03 local datastore: Size total | 3m 9s | 886.25 GB |
| vCenter | Datastore VNX-08: Latency read | 48s | 0 |
| vCenter | Datastore VNX-08: Latency write | 19s | 0 |
| vCenter | Datastore VNX-08: Size free % | 3m 50s | 42.6392 % |
| vCenter | Datastore VNX-08: Size total | 3m 21s | 1023.75 GB |
| vCenter | VMware: Event log | 3s | User VSPHERE.L... |
| vCenter | VMware: Full name | 35m 2s | VMware vCenter ... |
| vCenter | VMware: Version | 35m 1s | 7.0.3 |

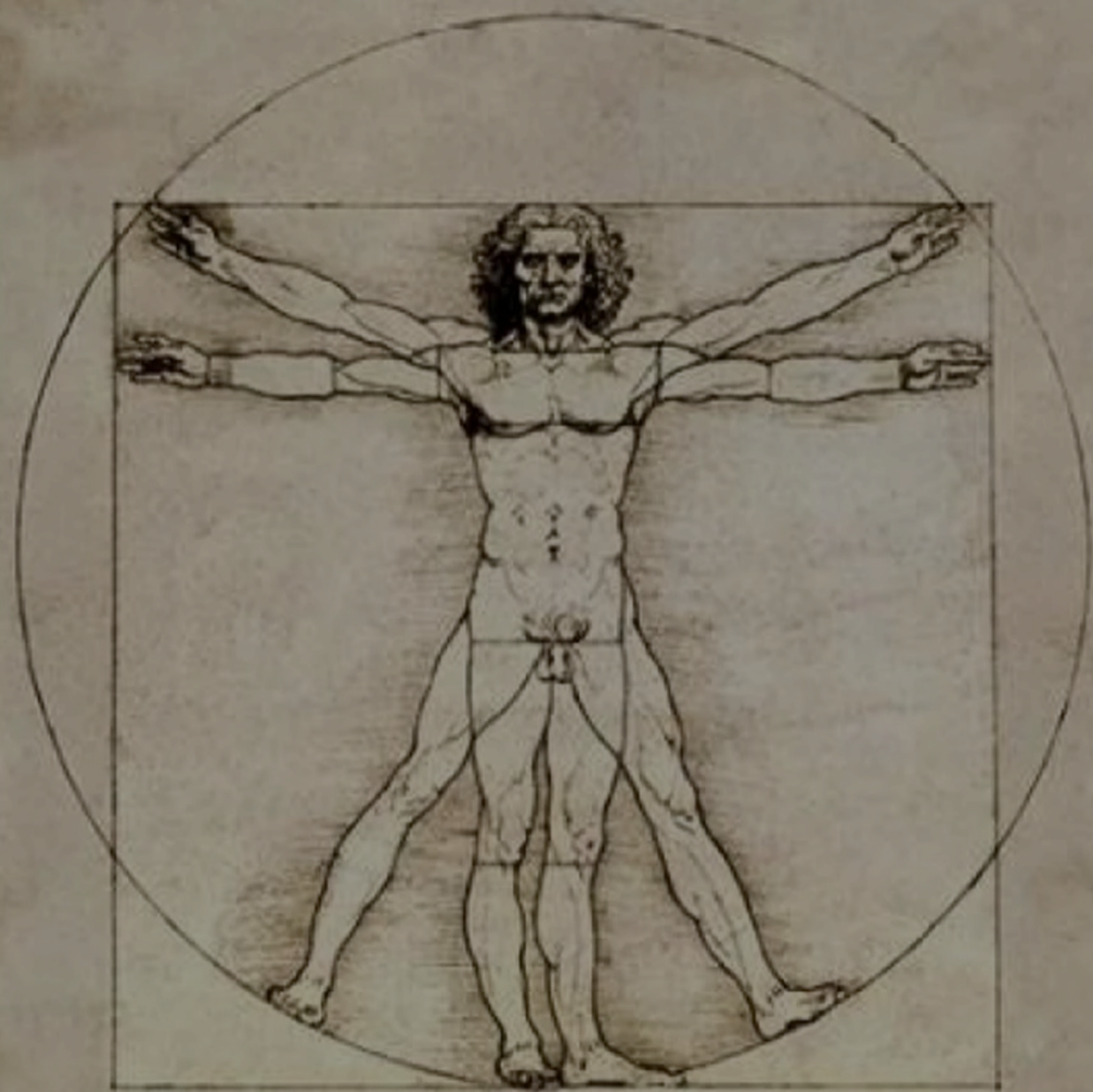
How data is showed in Zabbix

Zabbix does not implement a user-model visualization layer...
Is that a bad thing?

- Yes, from users' perspective
- No, because this makes Zabbix so... universal: by not sticking to a particular use case or data model, we can virtually use it in any usage scenarios.
So, the question is:

**How can I improve usability
in my specific scenario?**

Template design best practices



Tip #1: Add semantics to your templates

- Spend some time to properly define:

- item names
- trigger names
- descriptions
- tags
- value maps

| Severity | Info | Host | Problem | |
|----------|------|-------------|--|---|
| Average | | SRVLINUX-14 | The script has failed | ✗ |
| Average | | SRVLINUX-14 | MySQL: the job 'backup.sql' has failed | ✓ |

- Adopt official Zabbix templates guidelines

💡 <https://www.zabbix.com/documentation/guidelines/>

- Create some **host dashboards**: users will love them!



Template-specific custom widgets

Example of Host-centric view

Widgets require host to be linked to a specific template and expect specific item keys

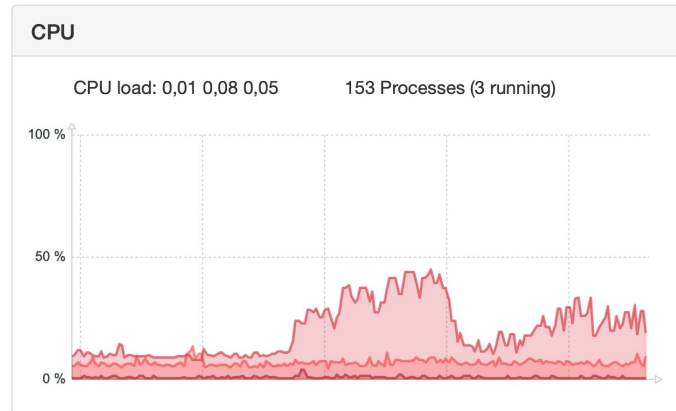
ZABBIX << >>

Search

- Dashboards
- Monitoring
- Services
- Inventory
- Reports
- Data collection
- Alerts
- Users
- Administration
- Support
- Integrations
- Help
- User settings
- Sign out

Information

| | |
|--------------------|------------------------|
| Hostname | SRV-LINUX-01 |
| Interface | 192.168.40.1:10050 |
| Description | A sample host |
| System hostname | server1.intranet.local |
| System description | Linux server1 5.4.0-73 |
| OS | Ubuntu Linux 20.04 |
| CPU | 2 |



Filesystems

| Name | Total | Used | Utilization |
|-------|-------|--------|-------------|
| / | 20 GB | 7.3 GB | 36,5 % |
| /var | 5 GB | 1.6 GB | 32 % |
| /home | 10 GB | 9.2 GB | 92 % |

Status

Availability: **ZBX** SNMP JMX IPMI

Maintenance: Yes

Uptime: 127 days, 05:26:36

Problems: **4** **2** **16** **38**

Memory

| | |
|------------------|---------|
| Total memory | 8192 MB |
| Available memory | 718 MB |

93%

Swap space

| | |
|----------------------|---------|
| Total swap space | 4096 MB |
| Available swap space | 2700 MB |

32%

Network interfaces

| Name | Bits received | Bits sent | Errors Out | Errors In | Discard Out | Discard In | Oper Status |
|--------|---------------|-----------|------------|-----------|-------------|------------|-------------|
| ens160 | 18.5 M | 1.3 M | 0 | 1 | 0 | 0 | Up |
| eth0 | 30 k | 621 k | 0 | 0 | 7 | 0 | Up |

Zabbix 7.0 host dashboards

Any type of widget can now be used

A Top-item widget is still missing (ZBXNEXT-4036)

Host information

| Hostname | Address | OS | Architecture | System name | Agent version | Agent status |
|--------------|-----------|-------------------------|--------------|-------------|---------------|-------------------|
| SRVLINUX-014 | 127.0.0.1 | Linux version 6.1.0-... | aarch64 | homeberry | 7.0.0beta1 | not available (0) |

Problems

| Time | Recovery time | Status | Info | Host | Problem • Severity | Duration | Update | Actions |
|-------------|---------------|---------|------|--------------|---|------------|--------|---------|
| 07:08:26 PM | | PROBLEM | | SRVLINUX-014 | Linux: Zabbix agent is not available (for 3m) | 1m 32s | Update | 1 |
| 02:43:54 AM | | PROBLEM | | SRVLINUX-014 | Linux: Operating system description has changed | 16h 26m 4s | Update | |

CPU utilization

42.77 %

CPU time

2024-02-07 06:51:41 PM

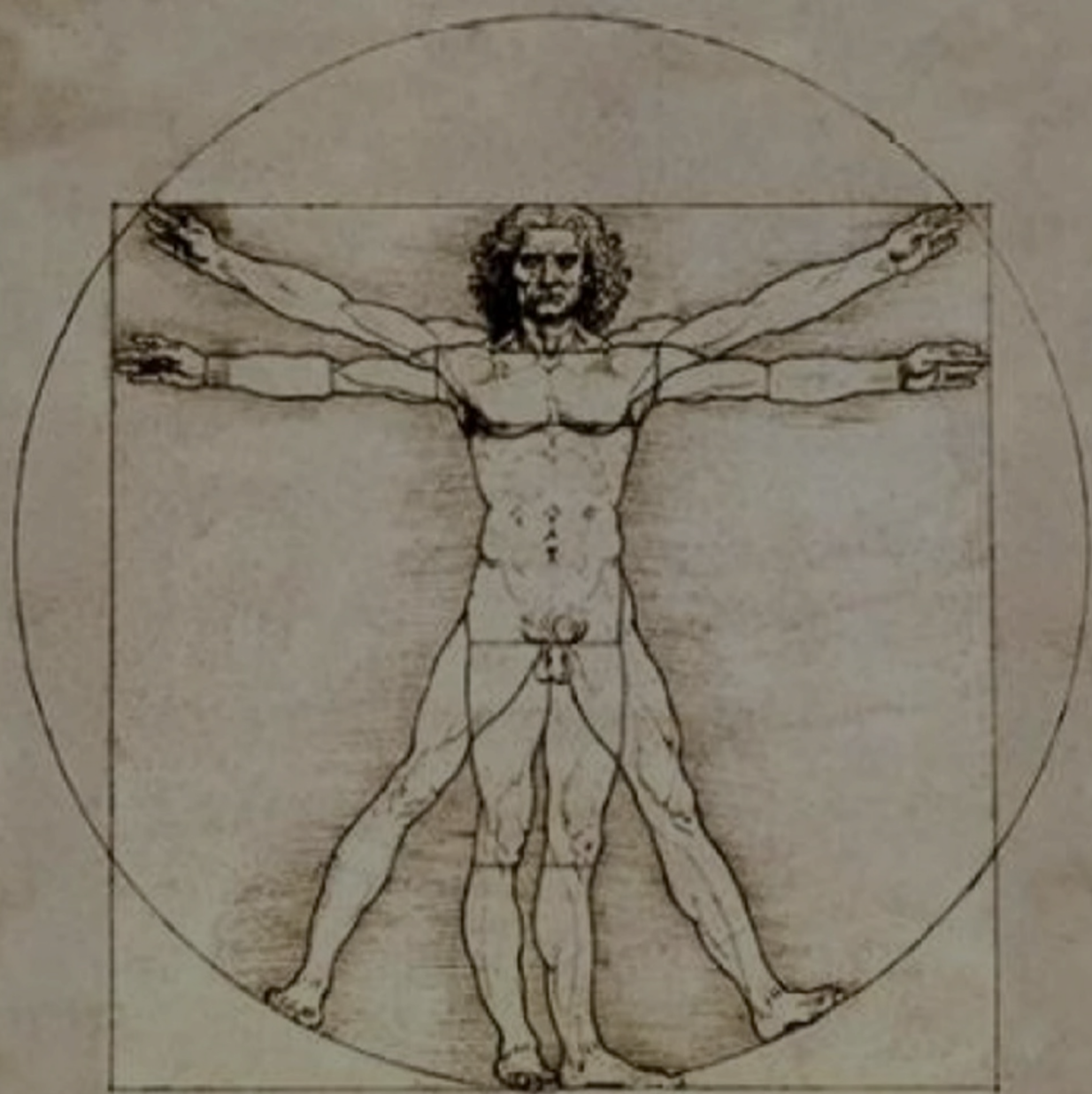
- SRVLINUX-014: Linux: CPU guest nice time: 0 %
- SRVLINUX-014: Linux: CPU guest time: 0 %
- SRVLINUX-014: Linux: CPU idle time: 59.9354 %
- SRVLINUX-014: Linux: CPU interrupt time: 0 %
- SRVLINUX-014: Linux: CPU iowait time: 0.09646 %
- SRVLINUX-014: Linux: CPU nice time: 0 %
- SRVLINUX-014: Linux: CPU softirq time: 0.1175 %
- SRVLINUX-014: Linux: CPU steal time: 0 %
- SRVLINUX-014: Linux: CPU system time: 23.3971 %
- SRVLINUX-014: Linux: CPU user time: 14.9912 %

4 CPUs

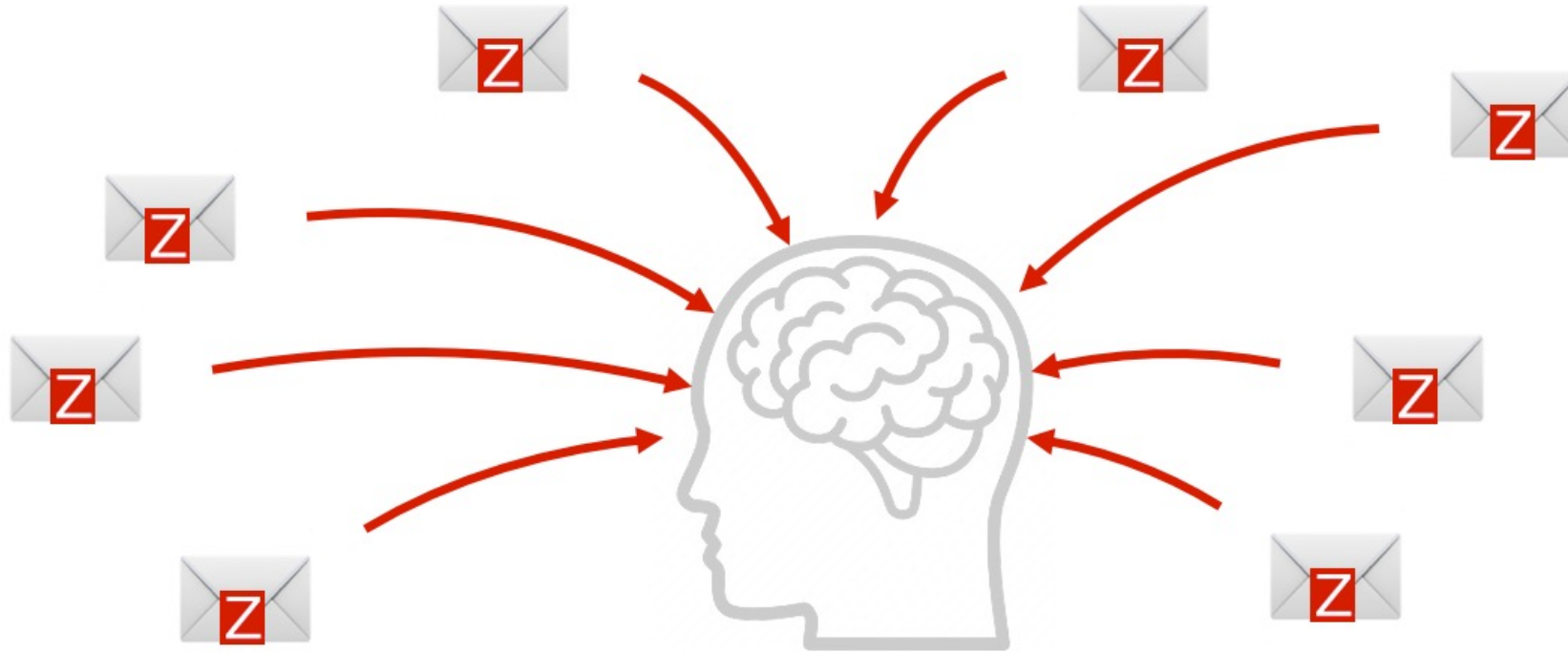
Memory utilization

20 %

Alert
best practices



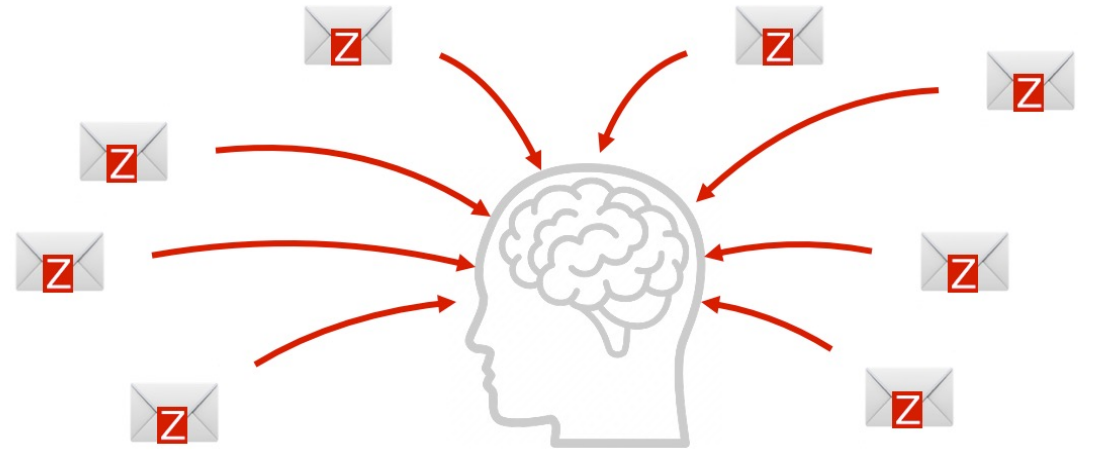
Tip #1: Do not flood your users



Flapping alarms, alert floods and false positives
will reduce user trust in the monitoring system

Tip #1: Do not flood your users

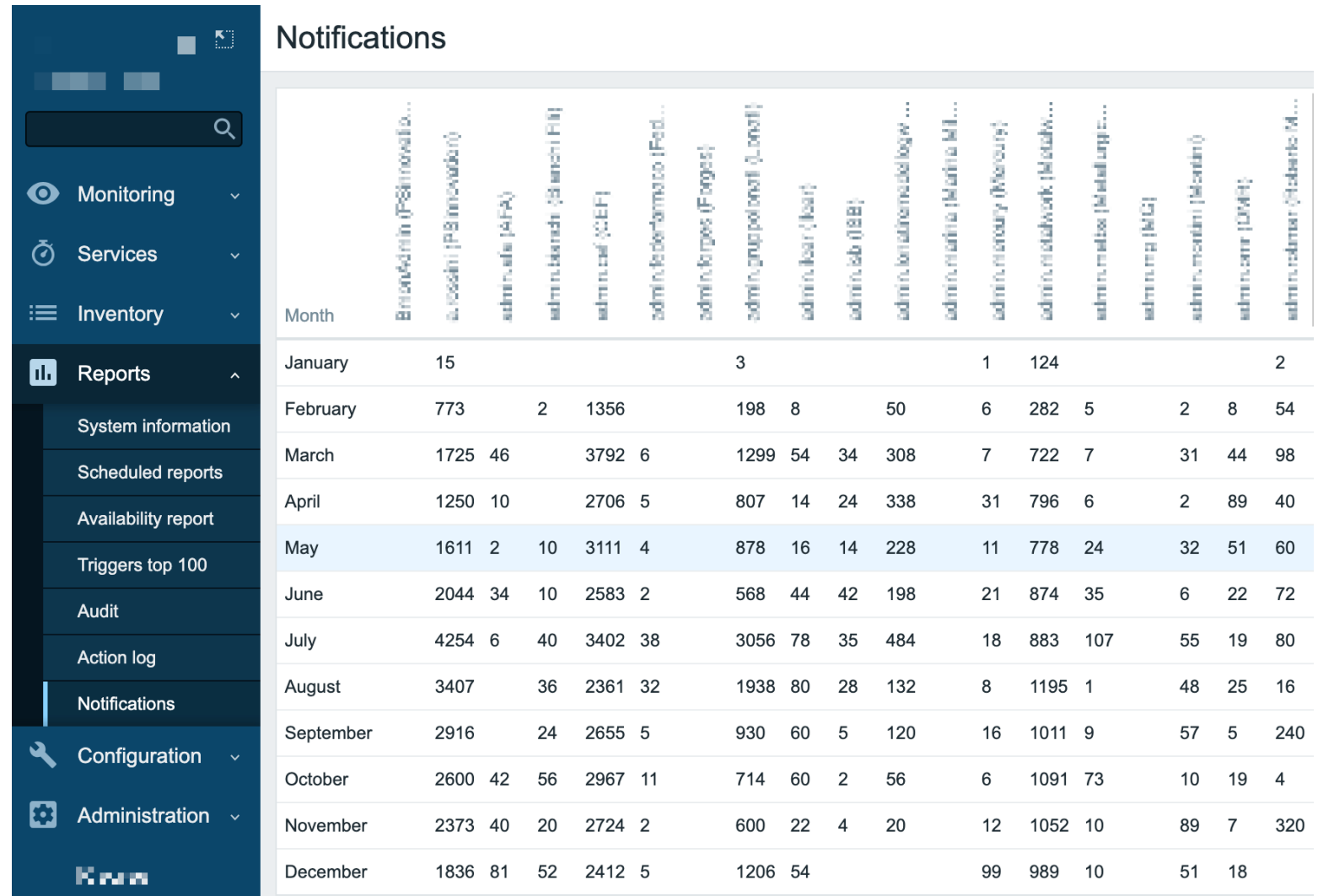
1. Fix false positives
2. Fix too-sensitive triggers
3. Set a delay for action operations
4. Send only actionable alerts
5. Send only to concerned users



*See also: Fighting alert fatigue
by Rihards Olups (Zabbix Summit 2023)*

Tip #1: Do not flood your users

- Stay in control of number of alerts/user/day



The screenshot displays the Zabbix web interface. On the left is a dark blue sidebar menu with options: Monitoring, Services, Inventory, Reports (expanded), Configuration, and Administration. The Reports menu includes System information, Scheduled reports, Availability report, Triggers top 100, Audit, Action log, and Notifications. The main content area shows a 'Notifications' table with columns for months and various user identifiers. The table data is as follows:

| Month | BravoAdmin (P88innovatio...) | Accessin (P88innovatio...) | admin.uia (AFA) | admin.banadin (Banadin P14) | admin.uaf (AUF) | admin.federarmino (Fed...) | admin.forges (Forges) | admin.guopobonoff (L...) | admin.ilar (Icar) | admin.lab (LAB) | admin.lonadamedel loge... | admin.martino (Martino M1...) | admin.mercury (Mercury) | admin.mistalvok (Mistalv...) | admin.melbox (Melbox app...) | admin.mig (MIG) | admin.morandini (Morandini) | admin.sann (SANN) | admin.relman (Relman M...) |
|-----------|------------------------------|----------------------------|-----------------|-----------------------------|-----------------|----------------------------|-----------------------|--------------------------|-------------------|-----------------|---------------------------|-------------------------------|-------------------------|------------------------------|------------------------------|-----------------|-----------------------------|-------------------|----------------------------|
| January | 15 | | | | | | 3 | | | | | 1 | 124 | | | | | | 2 |
| February | 773 | | 2 | 1356 | | | 198 | 8 | | 50 | | 6 | 282 | 5 | | | 2 | 8 | 54 |
| March | 1725 | 46 | | 3792 | 6 | | 1299 | 54 | 34 | 308 | | 7 | 722 | 7 | | | 31 | 44 | 98 |
| April | 1250 | 10 | | 2706 | 5 | | 807 | 14 | 24 | 338 | | 31 | 796 | 6 | | | 2 | 89 | 40 |
| May | 1611 | 2 | 10 | 3111 | 4 | | 878 | 16 | 14 | 228 | | 11 | 778 | 24 | | | 32 | 51 | 60 |
| June | 2044 | 34 | 10 | 2583 | 2 | | 568 | 44 | 42 | 198 | | 21 | 874 | 35 | | | 6 | 22 | 72 |
| July | 4254 | 6 | 40 | 3402 | 38 | | 3056 | 78 | 35 | 484 | | 18 | 883 | 107 | | | 55 | 19 | 80 |
| August | 3407 | | 36 | 2361 | 32 | | 1938 | 80 | 28 | 132 | | 8 | 1195 | 1 | | | 48 | 25 | 16 |
| September | 2916 | | 24 | 2655 | 5 | | 930 | 60 | 5 | 120 | | 16 | 1011 | 9 | | | 57 | 5 | 240 |
| October | 2600 | 42 | 56 | 2967 | 11 | | 714 | 60 | 2 | 56 | | 6 | 1091 | 73 | | | 10 | 19 | 4 |
| November | 2373 | 40 | 20 | 2724 | 2 | | 600 | 22 | 4 | 20 | | 12 | 1052 | 10 | | | 89 | 7 | 320 |
| December | 1836 | 81 | 52 | 2412 | 5 | | 1206 | 54 | | | | 99 | 989 | 10 | | | 51 | 18 | |

Alert content

- Default message templates are just a starting point


Message template

Message type

Subject

Message

Problem: Zabbix agent is not available (for 3m)


 **monitor**
a me ▾

Problem started at 15:01:45 on 2024.02.05
Problem name: Linux: Zabbix agent is not available (for 3m)
Host: SRVHOST14
Severity: Average
Operational data: not available (0)
Original problem ID: 1002

A good alert message

- Complete
 - includes all information to understand the problem and take action
- Easy to read
 - uses formatting to quickly get the facts
 - avoids Zabbix terminology
- Compact
 - does not include irrelevant data
 - omits field labels when unneeded
 - especially on mobile devices

Tip #2: Add formatting

! SRVHOST14: Linux: Zabbix agent is not available (for 3m) 

! Average PROBLEM

Linux: Zabbix agent is not available (for 3m)


For passive only agents, host availability is used with 3m as time threshold.

Data: not available (0)

Started: 2s ago, 2024.02.05 14:35:45

Tags: class:os, component:system, scope:availability, target:linux

URL:

✓ SRVHOST14: Linux: Zabbix agent is not available (for 3m) 

✓ Average RESOLVED

Linux: Zabbix agent is not available (for 3m)

Recovered after 8m 0s, at 2024.02.05 15:09:45

Current data: available (1)

Tags: class:os, component:system, scope:availability, target:linux

URL:

EventID: 1002

- [Ref: https://github.com/devolabs/zabbix-email-templates](https://github.com/devolabs/zabbix-email-templates)

Tip #3: Add useful information

- Use macros
- Use Trigger description to tell user:
 1. why the trigger fired
 2. what the user should do or verify
 3. when the trigger will recover
 4. if a manual close is needed

The screenshot shows a Zabbix alert page for 'SRVHOST14: No connections from Zabbix proxy'. The page includes a header with navigation arrows, a user profile 'a', and a host name placeholder '{HOST.NAME}'. A red 'ALERT' banner is followed by the trigger name and description placeholder '{TRIGGER.DESRIPTION}'. The main text explains the issue and provides a list of actions. A 'Proxy last access' field shows a timestamp with a placeholder for the item name and value. Below this are links for 'Update problem', 'Latest data', 'Graph', and 'Host inventory', with a placeholder for event tags. The 'Host' section lists details for 'SRVHOST14' at '10.0.15.2', including its groups, type, hardware, OS, location, and contact. A placeholder for the host group name is shown above the host details, and a placeholder for inventory items is shown to the right.

SRVHOST14: No connections from Zabbix proxy

{HOST.NAME}

ALERT

SRVHOST14
No connections from Zabbix proxy

{TRIGGER.DESRIPTION}

Zabbix server has not received data from this proxy in the last 10 minutes. A connectivity or power issue could have hit the remote site. What to do now?

- Please verify connectivity and power supply on SRVHOST14
- Make sure the zabbix-proxy service is started
- Make sure that its IP address is not blocked by firewalls

Proxy last access = 2023.02.03 08:35:31

{ITEM.NAME}
{ITEM.VALUE}

Problem tags: AlertNetwork, Application:Zabbix proxy Severity: High. Started 10m ago.

[Update problem](#) [Latest data](#) [Graph](#) [Host inventory](#)

{EVENT.TAGS}

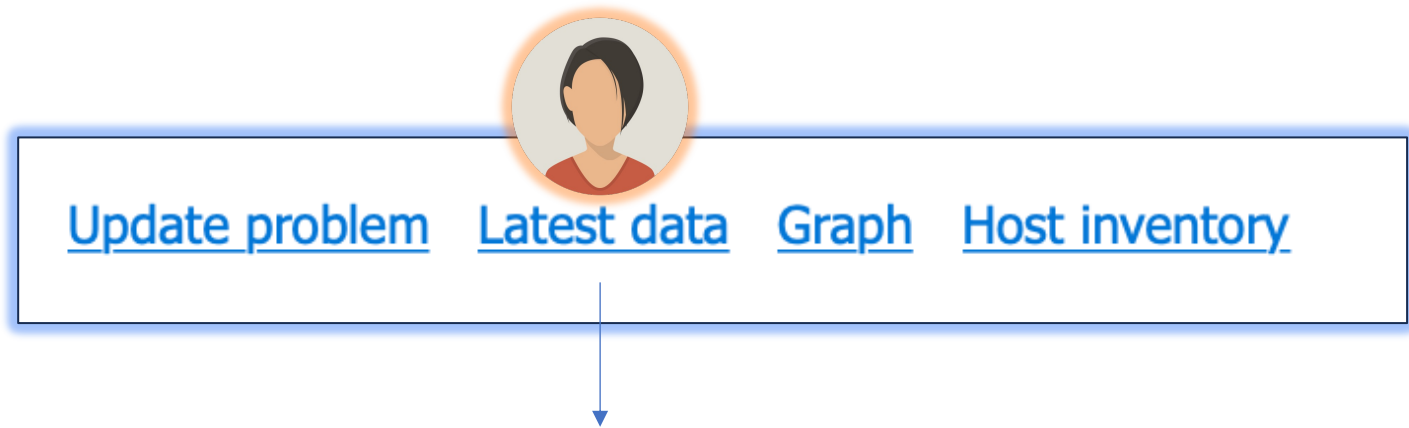
Host

{TRIGGER.HOSTGROUP.NAME}

Name: **SRVHOST14**
Address: **10.0.15.2**
Descr:
Groups: **Zabbix proxies, Branches/Europe/London**
Type: **Linux host**
Hardware: **VM-1521**
OS: **Linux 3.10.0-1160.24.1.el7.x86_64 #1 SMP Thu Apr 8 19:51:47 UTC 2021 x86_64**
Serial num:
Location: **King's Cross Data Center**
Contact: **Bruce Warrol +44 772 123456**
Notes:

{INVENTORY.*}

Tip #4: Make alerts more interactive by using links



`/zabbix/history.php?action=showlatest&itemids[]={ITEM.ID}`

WEB: CPU user time (avg1)

| Timestamp | CPU user time (avg1) |
|---------------------|----------------------|
| 2024-02-05 17:54:47 | 3.6906 |
| 2024-02-05 17:53:47 | 3.4261 |
| 2024-02-05 17:52:47 | 3.8341 |
| 2024-02-05 17:51:47 | 5.1977 |
| 2024-02-05 17:50:47 | 4.4641 |
| 2024-02-05 17:49:47 | 3.9434 |
| 2024-02-05 17:48:47 | 4.4236 |
| 2024-02-05 17:47:47 | 4.3498 |
| 2024-02-05 17:46:47 | 5.3588 |
| 2024-02-05 17:45:47 | 5.3911 |
| 2024-02-05 17:44:47 | 5.517 |
| 2024-02-05 17:43:47 | 5.0674 |

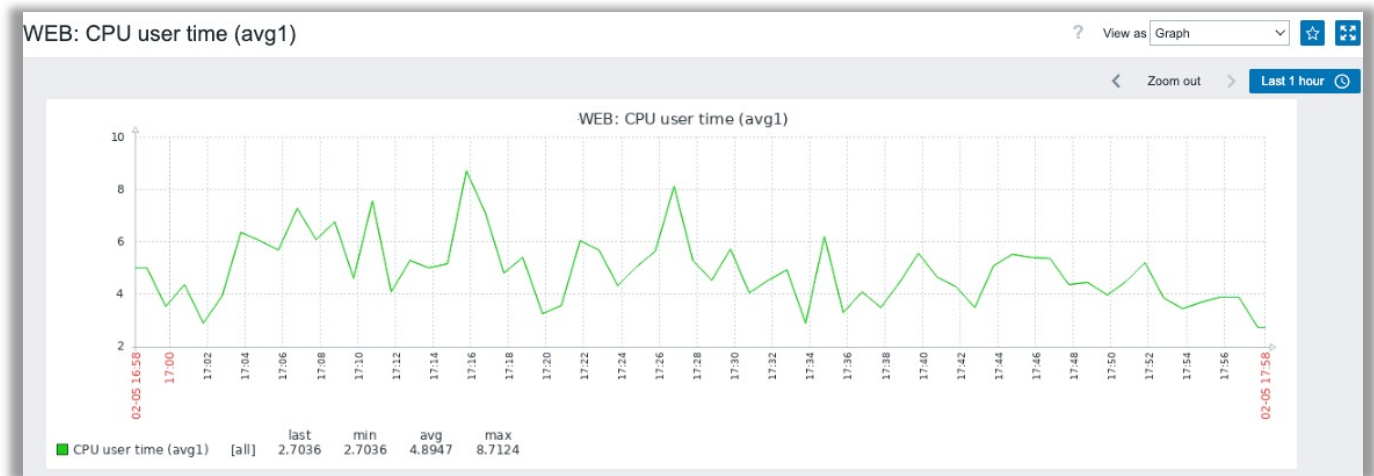
Tip #4: Make alerts more interactive by using links



[Update problem](#) [Latest data](#) [Graph](#) [Host inventory](#)



`history.php?action=showgraph&period=25920&itemids[]={ITEM.ID}`



Tip #4: Make alerts more interactive by using links



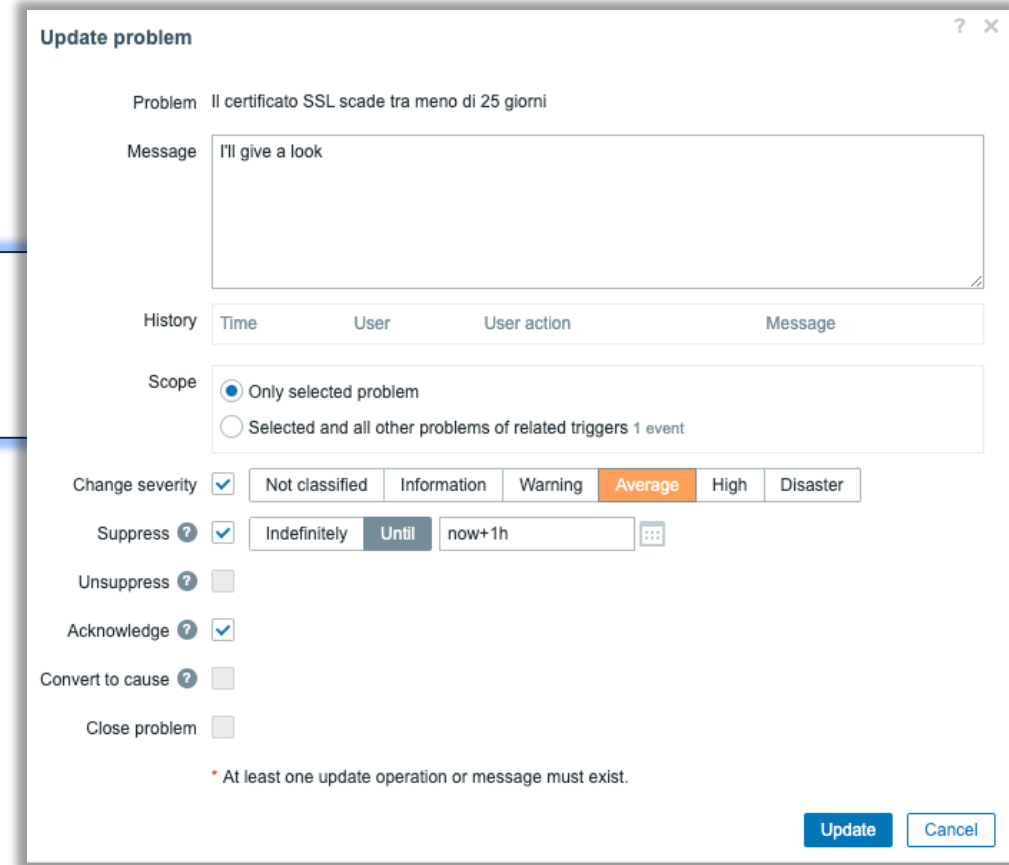
[Update problem](#) [Latest data](#) [Graph](#) [Host inventory](#)

`/zabbix/zabbix.php?action=popup&popup_action=acknowledge.edit&eventids[]={EVENT.ID}`

Update operations

Details

Notify all involved



Update problem

Problem: Il certificato SSL scade tra meno di 25 giorni

Message: I'll give a look

| Time | User | User action | Message |
|------|------|-------------|---------|
|------|------|-------------|---------|

Scope: Only selected problem Selected and all other problems of related triggers 1 event

Change severity: Not classified Information Warning Average High Disaster

Suppress: Indefinitely Until

Unsuppress:

Acknowledge:

Convert to cause:

Close problem:

* At least one update operation or message must exist.

💡 Enable update notifications to improve engagement and collaboration

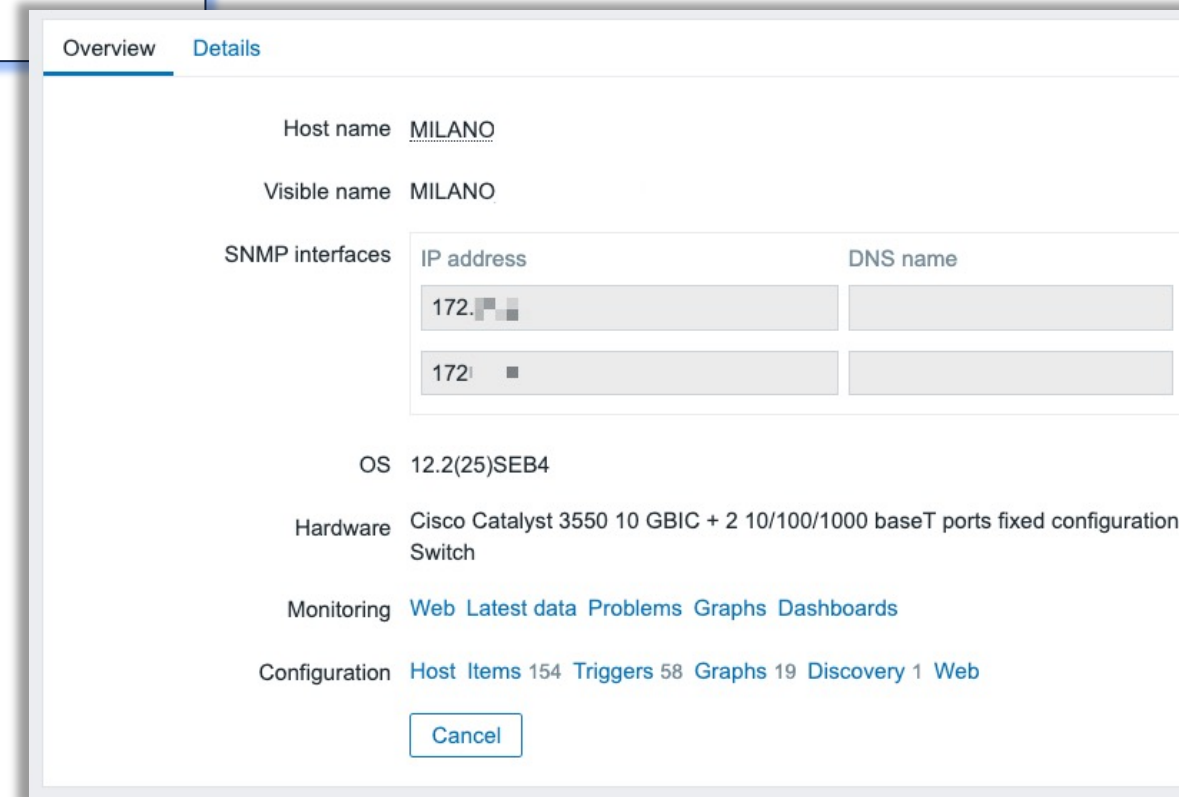
Tip #5: Make alerts more interactive by using links



[Update problem](#) [Latest data](#) [Graph](#) [Host inventory](#)



```
hostinventories.php?hostid={HOST.ID}
```

A screenshot of the Zabbix web interface showing the 'Details' tab for a host named 'MILANO'. The page includes fields for 'Host name' and 'Visible name', both set to 'MILANO'. Below this is a table for 'SNMP interfaces' with columns for 'IP address' and 'DNS name'. The first row shows '172.17.0.1' and an empty field. The second row shows '172.17.0.2' and an empty field. Further down, there are fields for 'OS' (12.2(25)SEB4) and 'Hardware' (Cisco Catalyst 3550 10 GBIC + 2 10/100/1000 baseT ports fixed configuration Switch). At the bottom, there are navigation links for 'Monitoring' (Web, Latest data, Problems, Graphs, Dashboards) and 'Configuration' (Host, Items 154, Triggers 58, Graphs 19, Discovery 1, Web). A 'Cancel' button is located at the bottom right of the details panel.

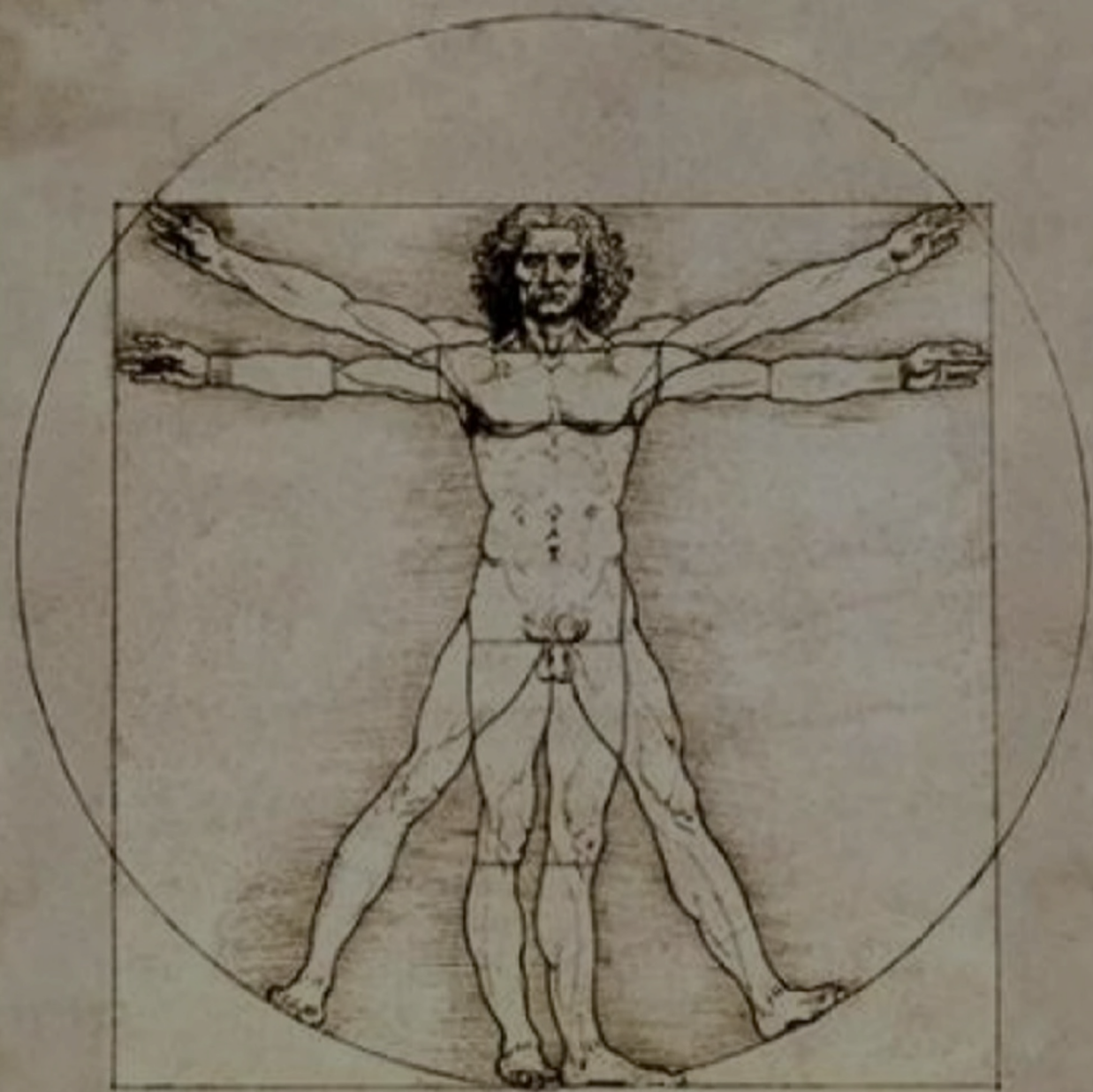
Other useful links for your alerts

- **Event details:** `tr_events.php?triggerid={TRIGGER.ID}&eventid={EVENT.ID}`
- **Host problems:** `zabbix.php?action=problem.view&hostids%5B0%5D={HOST.ID}`
- **Host dashboards:** `zabbix.php?action=host.dashboard.view&hostid={HOST.ID}`
- **Host configuration:** `zabbix.php?action=host.edit&hostid={HOST.ID}`
- **Search:** `zabbix.php?action=search&search={HOST.HOST}`



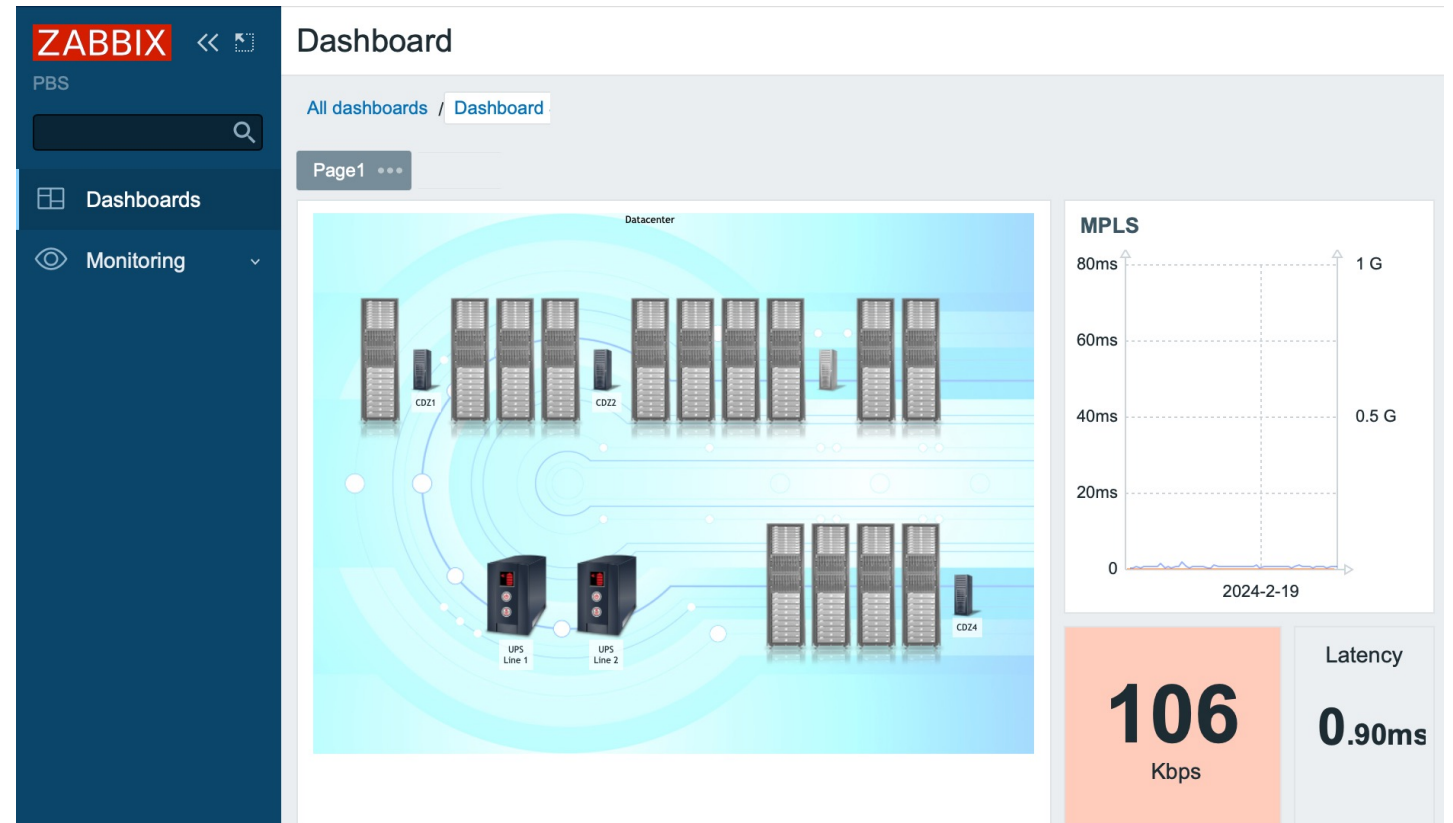
💡 *URLs may change with Zabbix updates: use web server Rewrite rules to define permalinks*

Structure and
organizational
best practices



Tip #1: Keep your users focused

- Use **Permissions** to natively filter hosts and events
- Use custom **Roles** to hide menu entries for a distraction-free interface
- Use **Maps** to help non-IT staff



Tip #2: Keep your users informed


- Users expect a predictable and consistent behaviour
- Inform users about **changes** to monitoring environment:
 - New hosts
 - New discovered entities (LLD)
 - New triggers
 - New thresholds
- Inform users about monitoring service **status**:
 - Zabbix service scheduled downtimes
 - Zabbix service incidents

Tip #2: Keep your users informed

- Do I need to setup an external contact system?
- No, use Zabbix itself to show notices and notify users through their preferred media

Recipe: *Zabbix user bulletin*

- *1 host*
- *1 trapper item*
- *1 trigger*
- *1 dashboard*
- *1 trigger action*



Zabbix users' bulletin /1

- Create a host with a trapper item
- Send your message using zabbix_sender:

```
# CONTENT=$(cat announce.txt)
  SCHEDULED SYSTEM DOWNTIME - 29 Feb 2024
  Dear User,
  Please be advised that Zabbix service will be unavailable from 01:00am to 05:30am on February
  29th, 2024. This period of downtime will be scheduled for necessary updates to be applied to
  the monitoring servers.
  We apologise for the inconvenience that this may cause. Kindly inform the IT Service Desk (at
  ext. 1234) of any concerns that you may have about the planned outage.
  Best regards,
  The Zabbix internal Team
  (+39) 011 123456
  zabbix-team@acme-ltd.com

# zabbix_sender -z zbxsrv -s "Zabbix users bulletin" -k zabbix.bulletin -o "$CONTENT"
```

Zabbix users' bulletin /2

- Create a trigger
 - Name: {ITEM.VALUE}
 - Expression: lenght() $>$ 0
 - Multiple problem generation
 - Allow manual close

The screenshot shows the Zabbix web interface for configuring a trigger. The breadcrumb navigation at the top reads: All hosts / Zabbix users bulletin Enabled Items 1 Triggers 1 Graphs Discovery rules Web scenarios. The 'Triggers' tab is active, and the 'Trigger' sub-tab is selected. The configuration form includes the following fields and options:

- Name:** {ITEM.VALUE}
- Event name:** {ITEM.VALUE}
- Operational data:** (empty text box)
- Severity:** Not classified, Information (selected), Warning, Average, High, Disaster
- Expression:** length(last(/Zabbix users bulletin/zabbix.users.bulletin)) $>$ 0 (with an 'Add' button to the right)
- Expression constructor:** (link)
- OK event generation:** Expression, Recovery expression, None
- PROBLEM event generation mode:** Single, Multiple (selected)
- Allow manual close:**

Zabbix users' bulletin /3

- Create a dashboard

The screenshot shows a Zabbix dashboard titled "Zabbix users bulletin". It features a breadcrumb trail "All dashboards / Zabbix users bulletin" and a section for "Current announcement for Zabbix users". The announcements are presented in a table with columns for Time, Info, Host, Problem • Severity, and Duration.

| Time ▼ | Info | Host | Problem • Severity | Duration |
|----------|------|-----------------------|---|----------|
| 23:52:08 | • | Zabbix users bulletin | SCHEDULED SYSTEM DOWNTIME - 29 Feb 2024 Dear User, Please be advised that Zabbix service will be unavailable from 01:00am to 05:30am on February 29th, 2024. This period of downtime will be scheduled for necessary updates to be applied to the monitoring servers. We apologise for the inconvenience that this may cause. Kindly inform the IT Service Desk (at ext. 1234) of any concerns that you may have about the planned outage. Best regards, The Zabbix internal Team (+39) 011 123456 zabbix-team@acme-ltd.com | 1m 44s |
| 23:51:56 | • | Zabbix users bulletin | SERVICE DEGRADED - Tokyo headquarters Several connectivity issues have been reported on some Zabbix proxies. We are currently investigating the problem. Please be aware that some monitoring data could be delayed for some minutes. You'll find further information under the Update column, as soon as they will be available. Thanks for your cooperation. Mike Triggers The Zabbix Team | 1m 56s |

Zabbix users' bulletin /4

- Create a trigger action

Operation details

Operation

Steps - (0 - infinitely)

Step duration (0 - use action default)

* At least one user or user group must be selected.

Send to user groups
type here to search

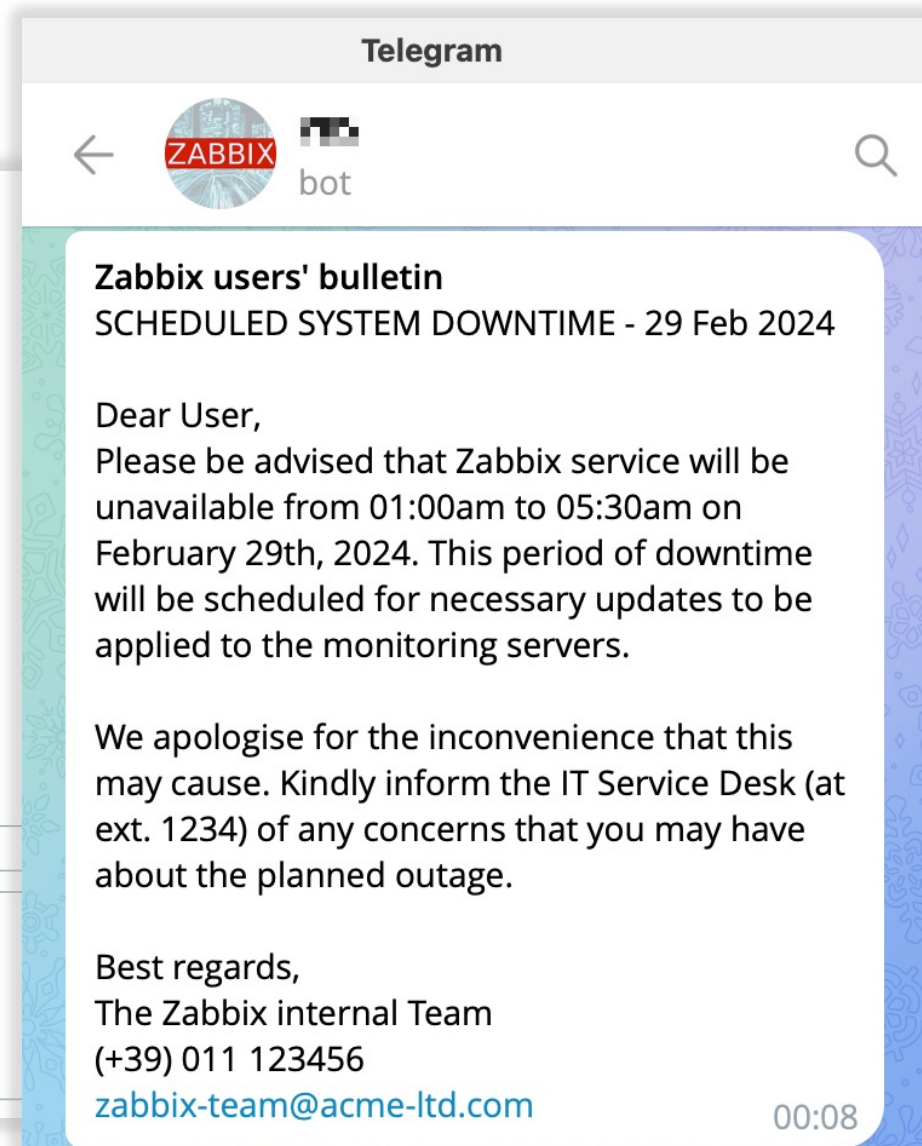
Send to users

Send only to

Custom message

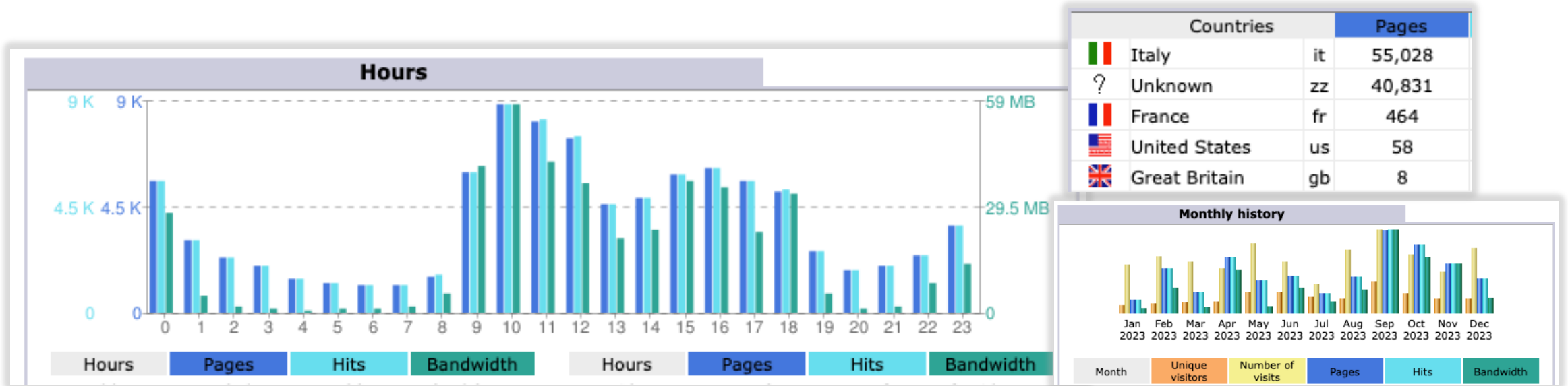
Subject

Message



Tip #3: Analyze your users' behaviour

- Audit does not track visualization activity but...
- Frontend access logs can be analyzed (awstats, GoAccess, ...) to gather useful insights and detect HTTP errors



Tip #4: Training! Training! Training!

ZABBIX

- The software
- The features



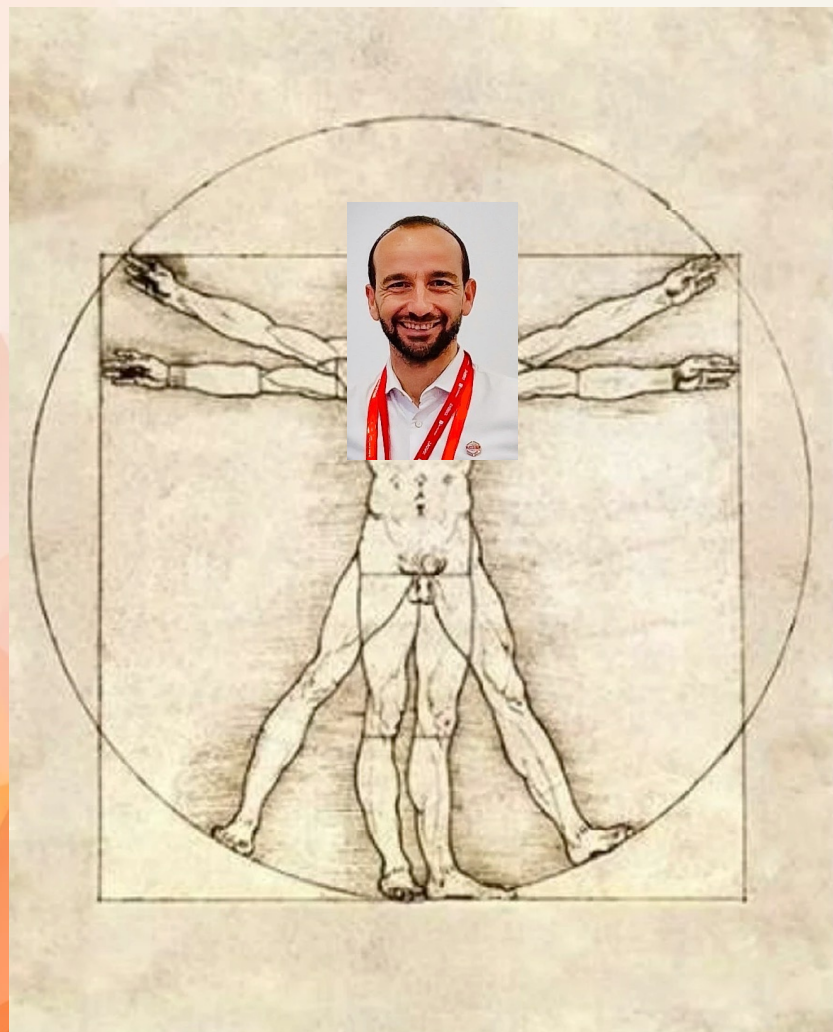
Your implementation

- Templates logic
- Hostgroups structure
- Tags structure
- Escalation workflow
- Discovery behaviour

Zabbix Official Training

ZCU ZCS, ZCE, ZCP

Internal training
& Documentation



Thanks!

www.quadrata.it

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