

Opensource ICT Solutions

**ZABBIX**

BeNeLux conference 2023

Zabbix in an MSP environment



# Whoami



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Zabbix trainer / Consultant

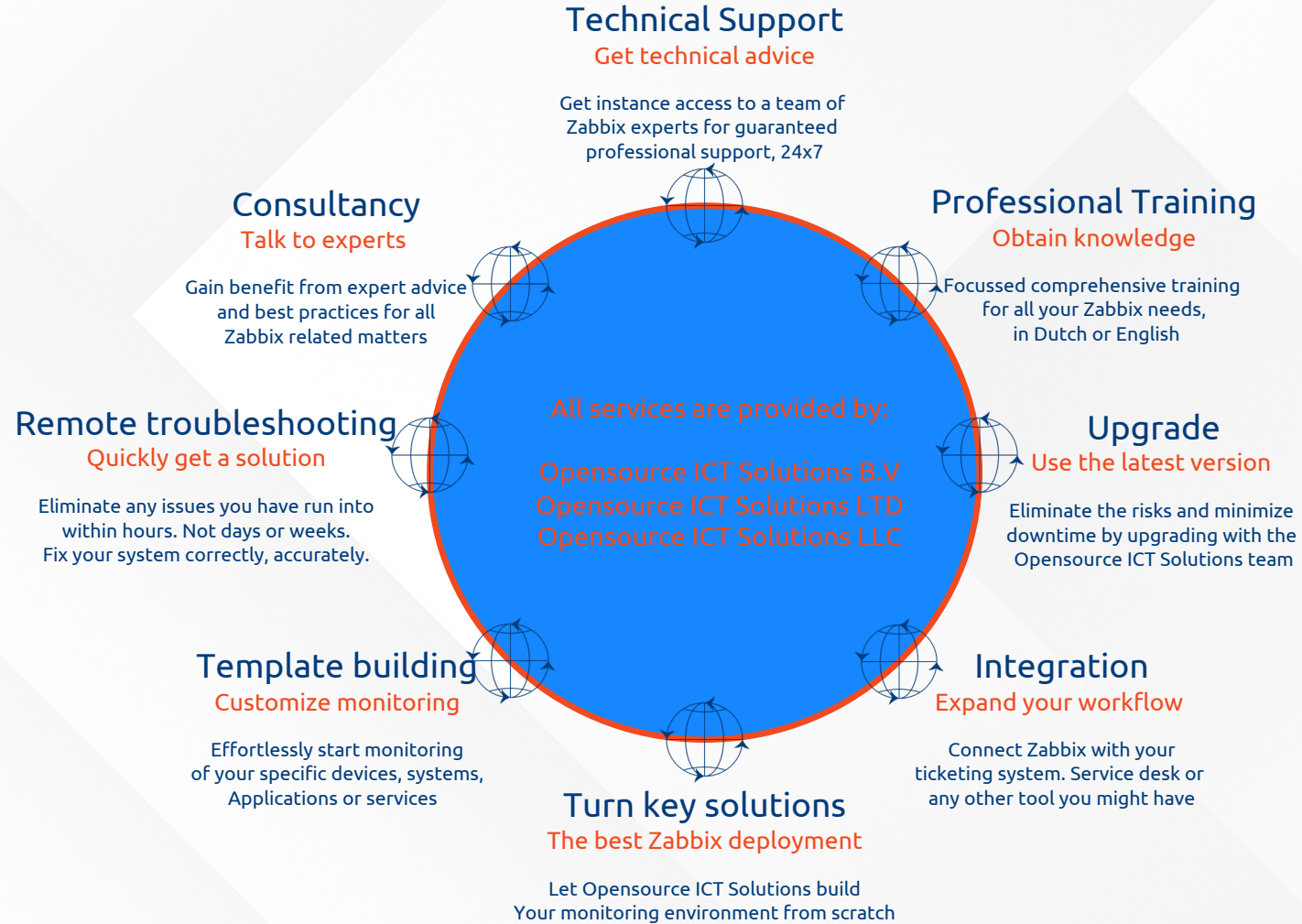


**OpenSource ICT Solutions**

Your Zabbix partner in:

- The Netherlands
- United Kingdom
- United States

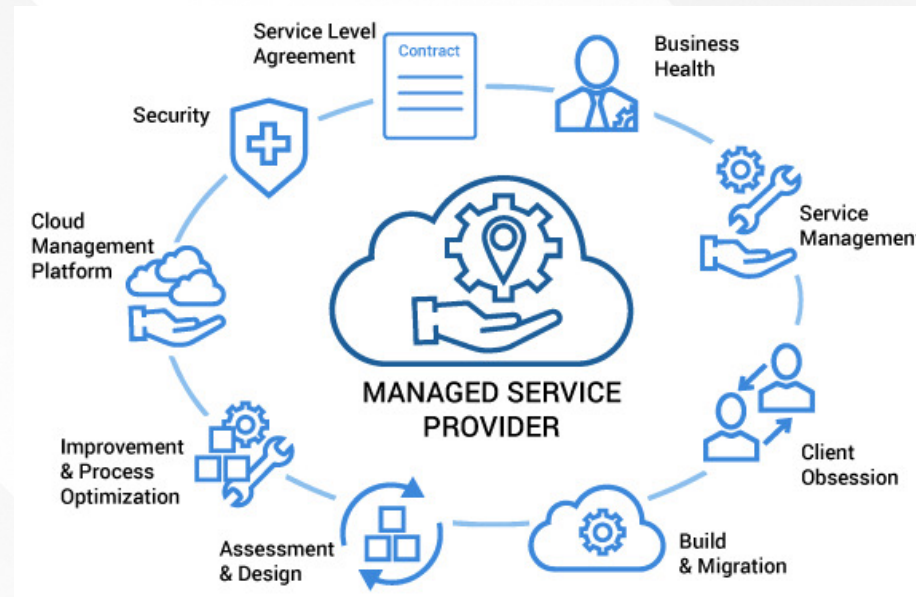




<https://oicts.com>

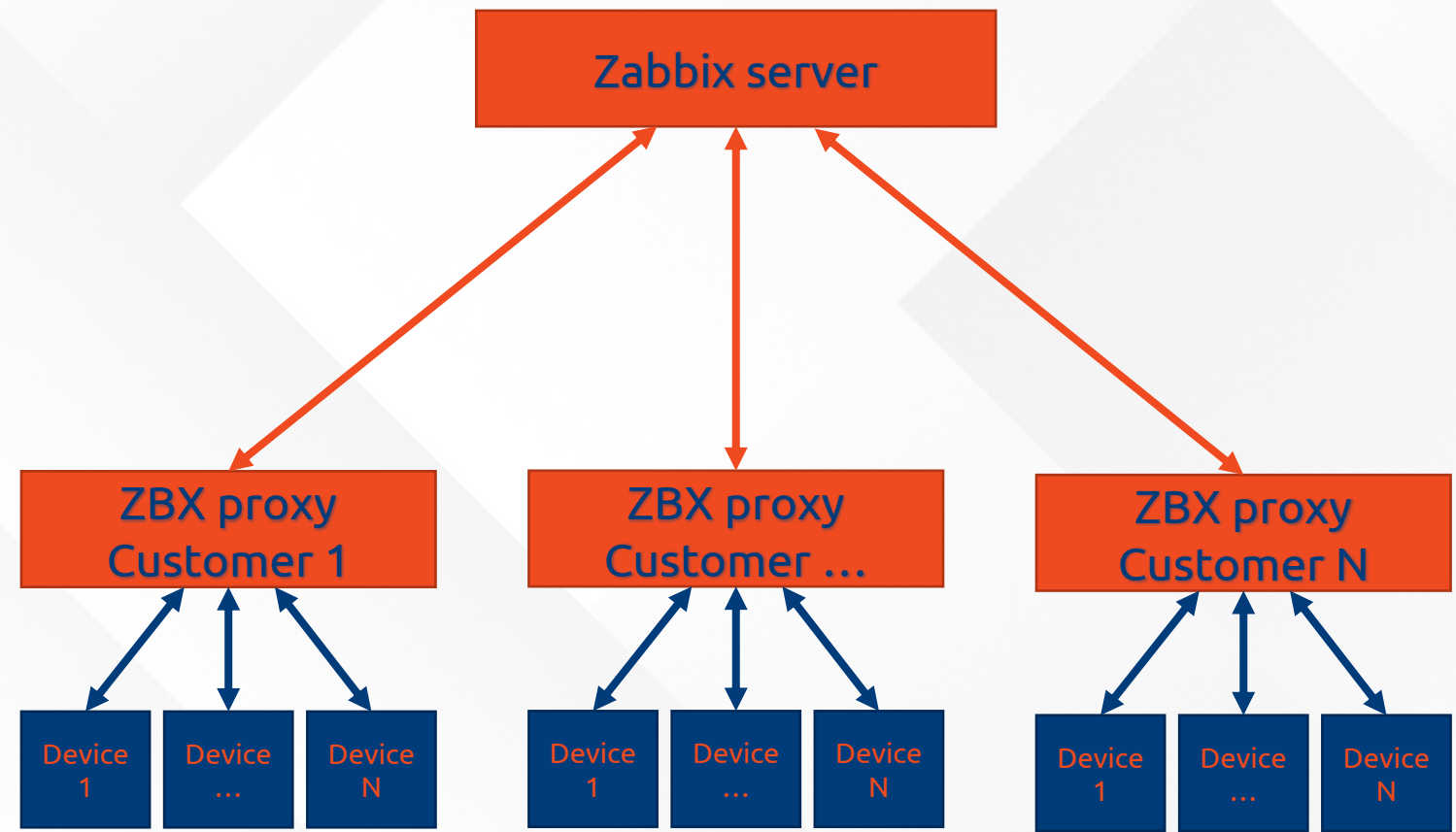
# What are we going to discuss?

- Zabbix in an Managed Services Provider setup





# Typical setup



- Why use Zabbix?
  - Cost effective
  - Flexible
  - Extendable
- Consideration:
  - A single instance (global)
  - Many small ones (one per customer)



- One instance
  - Easy to manage
  - License costs (OS, DB etc)
  - Upgrade: just 1 component (but higher impact)



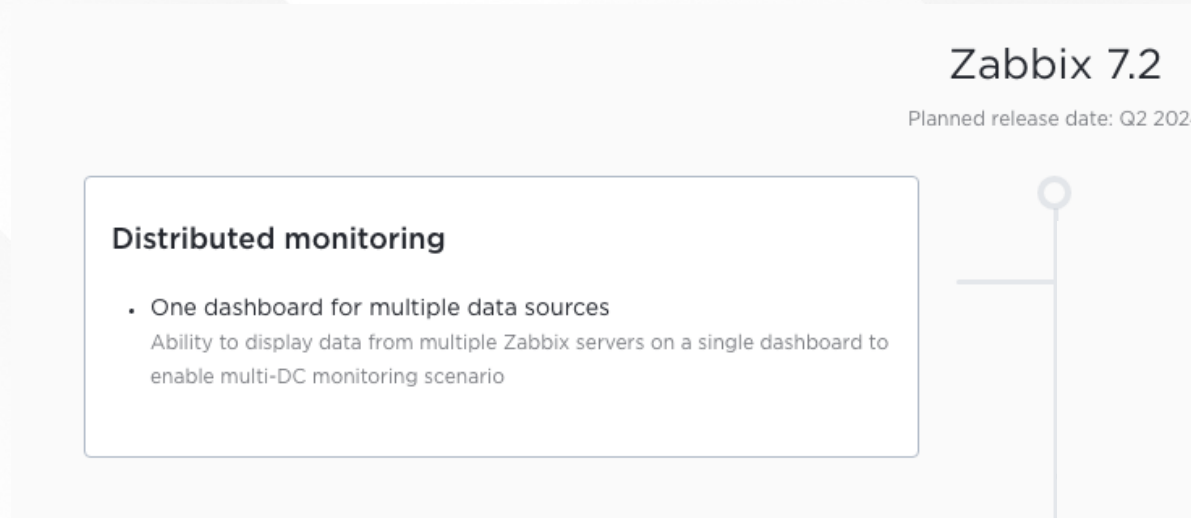
- Many instances
  - Each instance is smaller -> less performance tuning needed
  - Upgrade: many small upgrades, with smaller impact per upgrade





# Benefits – single pane of glass

- Single server: One view to see them all
- Many servers: “impossible” without custom coding or Grafana
  - But still: consistency is possible/easy



Zabbix 7.2  
Planned release date: Q2 2024

**Distributed monitoring**

- One dashboard for multiple data sources  
Ability to display data from multiple Zabbix servers on a single dashboard to enable multi-DC monitoring scenario

The graphic features a stylized vertical line with a circle at the top, resembling a Zabbix server icon.

- **Uniformal configuration**
  - Templates, naming conventions etc.
- **Uniformal monitoring**
  - When using templates, the monitoring is always consistent between various systems
- **Uniformal alerting**
  - Setup a structure once and Copy/Paste it for every customer



# Benefits – quicker deployments

- Enroll a new customer in minutes rather than days

Home / Product / Download and install Zabbix

- Zabbix Packages
- Zabbix Cloud Images
- Zabbix Containers
- Zabbix Appliance
- Zabbix Sources
- Zabbix Agents

1 Choose your platform

ZABBIX VERSION	OS DISTRIBUTION	OS VERSION	ZABBIX COMPONENT
6.4	Alma Linux	9	Server, Frontend, Agent
6.2	CentOS	8	Proxy
6.0 LTS	Debian	7	Agent
5.0 LTS	Oracle Linux	6	Agent 2
4.0 LTS	Raspberry Pi OS		Java Gateway
	Red Hat Enterprise Linux		
	Rocky Linux		
	SUSE Linux Enterprise Server		
	Ubuntu		
	Ubuntu (arm64)		

[Release Notes 6.4](#)

### New proxy

Proxy Encryption

\* Proxy name

Proxy mode  Active  Passive

Proxy address

Description

### New host

Host IPMI Tags Macros Inventory Encryption Value mapping

\* Host name

Visible name

Templates

\* Host groups

Interfaces No interfaces are defined. [Add](#)

Description

Monitored by proxy

Enabled

# Benefits - automation

- Integration with
  - CMDB?
  - Ticketing?
  - Authentication?
- API calls are available

```
{
  "jsonrpc": "2.0",
  "method": "host.create",
  "params": {
    "host": "Linux server",
    "interfaces": [
      {
        "type": 1,
        "main": 1,
        "useip": 1,
        "ip": "192.168.3.1",
        "dns": "",
        "port": "10050"
      }
    ],
    "groups": [
      {
        "groupid": "50"
      }
    ],
    "tags": [
      {
        "tag": "Host name",
        "value": "Linux server"
      }
    ],
    "templates": [
      {
        "templateid": "20045"
      }
    ],
    "macros": [
      {
        "macro": "${USER_ID}",
        "value": "123321"
      },
      {
        "macro": "${USER_LOCATION}",
        "value": "0:0:0",
        "description": "latitude, longitude and altitude coordinates"
      }
    ],
    "inventory_mode": 0,
    "inventory": {
      "macaddress_a": "01234",
      "macaddress_b": "56768"
    }
  },
  "id": 1
}
```





- Yes, there are drawbacks. Of course there are



- Zabbix down? You are blind.



## This site can't be reached

`zbxmssrv` refused to connect.

Try:

- Checking the connection
- [Checking the proxy and the firewall](#)

ERR\_CONNECTION\_REFUSED

Details

Reload



# Drawbacks - growing

- How to scale your instance?

<input type="checkbox"/>	Time ▾	Severity	Recovery time	Status	Info	Host	Problem
<input type="checkbox"/>	07:52:05	Average		PROBLEM		Zabbix server	⬆ Lack of available memory (<250M of 1.77 GB)
<input type="checkbox"/>	07:49:40	Average		PROBLEM		Zabbix server	Zabbix server: Utilization of icmp pinger processes over 75%
<input type="checkbox"/>	07:37:53	Average		PROBLEM		Zabbix server	Zabbix server: More than 75% used in the configuration cache ?
<input type="checkbox"/>	07:28:09	Average		PROBLEM		Zabbix server	⬆ Load average is too high (per CPU load over 1.5 for 5m) ?

And so it begins...



# Drawbacks - growing

- How many hosts? How many items? Update interval? History storage period? Trends? Expansion?






- What to think about before starting?



- Naming! Of course. Names should be unique in Zabbix

New host ? ×

 **Details ▲** Cannot add host ×

Host with the same name "My awesome Windows host" already exists.

Host [IPMI](#) [Tags](#) [Macros](#) [Inventory](#) [Encryption](#) [Value mapping](#)

\* Host name

Visible name

Templates

\* Host groups

Interfaces No interfaces are defined.  
[Add](#)

Description

Monitored by proxy

Enabled

# Considerations Host groups

- Used for logical grouping and permissions

## Host groups

<input type="checkbox"/> Name ▲
<input type="checkbox"/> Windows

<input type="checkbox"/> Name ▲
<input type="checkbox"/> Hess
<input type="checkbox"/> Hess/Linux
<input type="checkbox"/> Hess/Windows

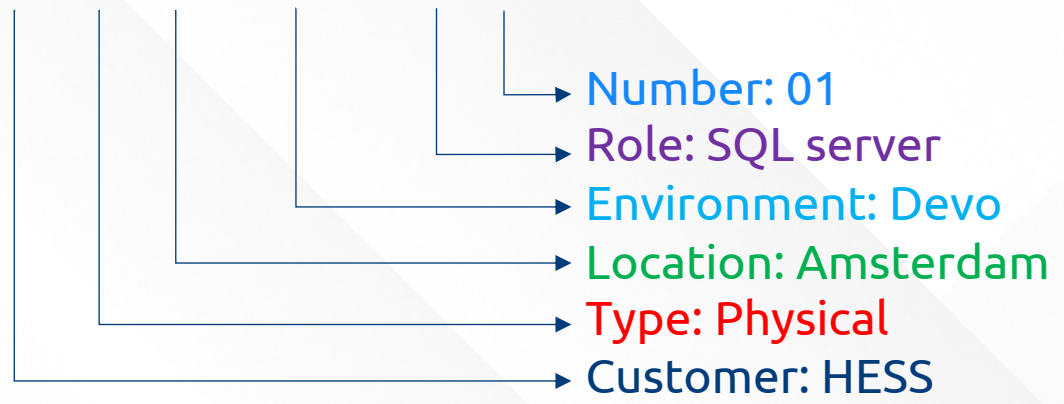
Who    What    Where??

# Considerations – naming - hosts

- Host names, conventions etc

<4 digit customername>-<type><3letter location code>-<env><role><2 digit incrementing number>

HESS-PAMS-DEVO-SQL01



- |              |                  |                     |              |
|--------------|------------------|---------------------|--------------|
| <b>Type:</b> | <b>Location:</b> | <b>Environment:</b> | <b>Role:</b> |
| *Physical    | *AMS             | *Development        | *SQL         |
| *Virtual     | *MID             | *Test               | *DHCP        |
| *Service     | *LON             | *Acceptance         | *WEB         |
| *Website     | *WIL             | *Production         | *LINUX       |
| * ....       | * ....           | *Education          | *LAMP        |
|              |                  |                     | * ....       |



- Templates, naming conventions

- IIS by Zabbix agent active
- Linux by Zabbix agent
- Linux by Zabbix agent active
- Windows by Zabbix agent
- Windows by Zabbix agent active

What

How



# Considerations – naming - actions

- Actions? Of course!

Trigger actions ▾

Name  Status **Any** Enabled Disabled

<input type="checkbox"/> Name ▲	Conditions	Operations
<input type="checkbox"/> Hess/Report Linux problems/All media	Host group equals <i>Hess/Linux</i>	<b>Send message to user groups:</b> Hess/Linux via all media
<input type="checkbox"/> Hess/Report Windows problems/All media	Host group equals <i>Hess/Windows</i>	<b>Send message to user groups:</b> Hess/Windows via all media



Who      What      How

# Considerations – naming – VMware monitoring

- Special love for VMWare host prototypes

Fix?

1) Duplicate templates and add customer name in the host prototype

Interval	Type	Status	Info
1h	Simple check	Enabled	
1h	Simple check	Enabled	
1h	Simple check	Enabled	
1h	Simple check	Enabled	

Cannot create group: group with the same name "(vm)" already exists.  
Cannot create host: host with the same visible name "This\_hurts\_in\_a\_MSP\_FNV" already exists

## Host prototypes

All templates / VMware Discovery list / Discover VMware VMs Item prototypes Trigger prototypes Graph prototypes Host prototypes 1

Host Tags Macros 1 Inventory Encryption

\* Host name

Visible name

Templates

Name	Action
VMware Guest	<a href="#">Unlink</a>

\* Group



# Considerations – naming – VMware monitoring

- Fix 1:
  - Duplicate templates and add customer name in the host prototype

Host prototypes

All templates / VMware Discovery list / Discover VMware VMs Item prototypes Trigger prototypes Graph prototypes Host prototypes 1

Host Tags Macros 1 Inventory Encryption

\* Host name

Visible name


Templates	Name	Action
	VMware Guest	<a href="#">Unlink</a>



# Considerations – naming – VMware monitoring

- Fix 2:
  - Just add an usermacro in the name - that way it should become dynamic!  
Nope....

Host prototypes

 **Details** ▲ Cannot update host prototype

Invalid parameter "/1/host": invalid host name.

All templates / VMware Discovery list / Discover VMware VMs Item prototypes Trigger prototypes Graph prototypes **Host prototypes 1**

Host **Tags** Macros 1 Inventory Encryption

\* Host name

Visible name

Templates	Name	Action
	VMware Guest	<a href="#">Unlink</a>

# Considerations – naming – VMware monitoring

- Fix 2:
  - Just add an usermacro in the name - that way it should become dynamic!  
But “hide” it in a LLD macro 🧐

Host prototypes

All templates / VMware / Discovery list / Discover VMware VMs / Item prototypes / Trigger prototypes / Graph prototypes / Host prototypes 1

Host Tags Macros 1 Inventory Encryption

\* Host name

Visible name

Templates	Name	Action
	VMware Guest	<a href="#">Unlink</a>

Host

Host IPMI Tags Macros 4 Inventory Encryption Value mapping

Host macros Inherited and host macros

Macro	Value	Description
<input type="text" value="{#CUSTOMER}"/>	<input type="text" value="Customer1"/> <input type="button" value="T"/>	<input type="text" value="Add customer name here"/> <a href="#">Remove</a>
<input type="text" value="{#VMWARE.PASSWORD}"/>	<input type="text" value="*****"/> <input type="button" value="🔗"/>	<input type="text" value="VMware service ({#USERNAME}) user password"/> <a href="#">Remove</a>
<input type="text" value="{#VMWARE.URL}"/>	<input type="text" value="*****"/> <input type="button" value="🔗"/>	<input type="text" value="VMware service (vCenter or ESX hypervisor) SDK URL (https://servername/sdk)"/> <a href="#">Remove</a>
<input type="text" value="{#VMWARE.USERNAME}"/>	<input type="text" value="***"/> <input type="button" value="🔗"/>	<input type="text" value="VMware service user name"/> <a href="#">Remove</a>

[Add](#)

Template available: <https://github.com/OpenSourceICTSolutions/custom-vmware-template>

# Considerations – naming - dashboards?

- How to work with hundreds of dashboards

The diagram illustrates two different naming conventions for dashboards. The left panel, marked with a red 'X', shows a list of 15 dashboards with generic names: Name, Brian dashboard, Databases MySQL, Global view, Josh, Laura dash, Linux servers, MSSQL databases, Nathan Liefing personal, NGINX, Windows servers, Zabbix server, and Zabbix server health. The right panel, marked with a green checkmark, shows a list of 15 dashboards with hierarchical names: Name, Applications/Databases/MSSQL, Applications/Databases/MySQL, Applications/NGINX, Global view, Personal/Brian, Personal/Josh, Personal/Laura dash, Personal/Nathan Liefing, Servers/Linux, Servers/Windows, Zabbix/Server, and Zabbix/Server health. An arrow points from the left panel to the right panel, indicating a transition from the generic naming to the hierarchical naming.

- Ahhh. The. Most. Important. Ever.





# Permissions – Admin/SuperAdmin rights

- SuperAdmin == Root
- Admin follows permissions(read/read-write) set per usergroup
- User = Readonly permissions as set per usergroup



# Permissions - dashboards

- Who can see what?
- Permissions are fully respected

Customer 1

All dashboards / Customer 1

Host availability

	Available	Not available	Unknown	Total
Zabbix agent	0	0	0	0
SNMP	0	0	0	0
JMX	0	0	0	0
IPMI	0	0	0	0

Map



cust1-agent1: Zabbix agent ping

Up

Customer 1

All dashboards / Customer 1

Host availability

	Available	Not available	Unknown	Total
Zabbix agent	0	0	0	0
SNMP	0	0	0	0
JMX	0	0	0	0
IPMI	0	0	0	0

Map

No permissions to referred object or it does not exist!

Item value

No permissions to referred object or it does not exist!



# Permissions – custom roles

## User roles

\* Name

User type

Access to UI elements

Dashboards

Monitoring  Problems  Latest data  Discovery  
 Hosts  Maps

Services  Services  SLA  SLA report

Inventory  Overview  Hosts

Reports  System information  Triggers top 100  Notifications  
 Scheduled reports  Audit log  
 Availability report  Action log

Data collection  Template groups  Hosts  Discovery  
 Host groups  Maintenance  
 Templates  Event correlation

Alerts  Trigger actions  Autoregistration actions  Scripts  
 Service actions  Internal actions  
 Discovery actions  Media types

Users  User groups  Users  Authentication  
 User roles  API tokens

Administration  General  Housekeeping  Macros  
 Audit log  Proxies  Queue

\* At least one UI element must be checked.

Default access to new UI elements

Access to services

Read-write access to services

Read-write access to services with tag

Read-only access to services

# Permissions - actions

- And actions? How about those?

Super Admin

Customer 1

(Admin, RW on customer1 hostgroup)

The screenshot shows the Zabbix Super Admin interface. On the left is a dark blue sidebar with navigation items: Dashboards, Monitoring, Services, Inventory, Reports, Data collection, Alerts, Actions, Media types, Scripts, Users, and Administration. The main content area is titled 'Trigger actions' and contains a search bar, a 'Name' input field, and a 'Status' dropdown menu with options 'Any', 'Enabled', and 'Disabled'. Below these are 'Apply' and 'Reset' buttons. A table lists three trigger actions:

<input type="checkbox"/>	Name ▲	Conditions	Operations
<input type="checkbox"/>	Customer1/Report Linux problems/All media	Host group equals <i>customer1</i>	Send message to user groups: c
<input type="checkbox"/>	Hess/Report Linux problems/All media	Host group equals <i>Hess/Linux</i>	Send message to user groups: H
<input type="checkbox"/>	Hess/Report Windows problems/All media	Host group equals <i>Hess/Windows</i>	Send message to user groups: H

At the bottom of the table, it shows '0 selected' and buttons for 'Enable', 'Disable', and 'Delete'.

The screenshot shows the Zabbix Customer 1 interface. It has a similar layout to the Super Admin view but with a limited sidebar. The main content area is titled 'Trigger actions' and contains a search bar, a 'Name' input field, and a 'Status' dropdown menu with options 'Any', 'Enabled', and 'Disabled'. Below these are 'Apply' and 'Reset' buttons. A table lists one trigger action:

<input type="checkbox"/>	Name ▲	Conditions	Operations
<input type="checkbox"/>	Customer1/Report Linux problems/All media	Host group equals <i>customer1</i>	Send message to user groups: customer1 via all media

At the bottom of the table, it shows '0 selected' and buttons for 'Enable', 'Disable', and 'Delete'.



- KPI. How is it implemented?

**Service** [?] [x]

Service **Tags** Child services

\* Name

Parent services

Problem tags

Name	Operation	Value	Action
<input type="text" value="customer"/>	<input type="text" value="Equals"/>	<input type="text" value="customer1"/>	<a href="#">Remove</a>

[Add](#)

\* Sort order (0->999)

Status calculation rule ⓘ

Description

Created at

Advanced configuration

Default access to new UI elements

**Access to services**

Read-write access to services

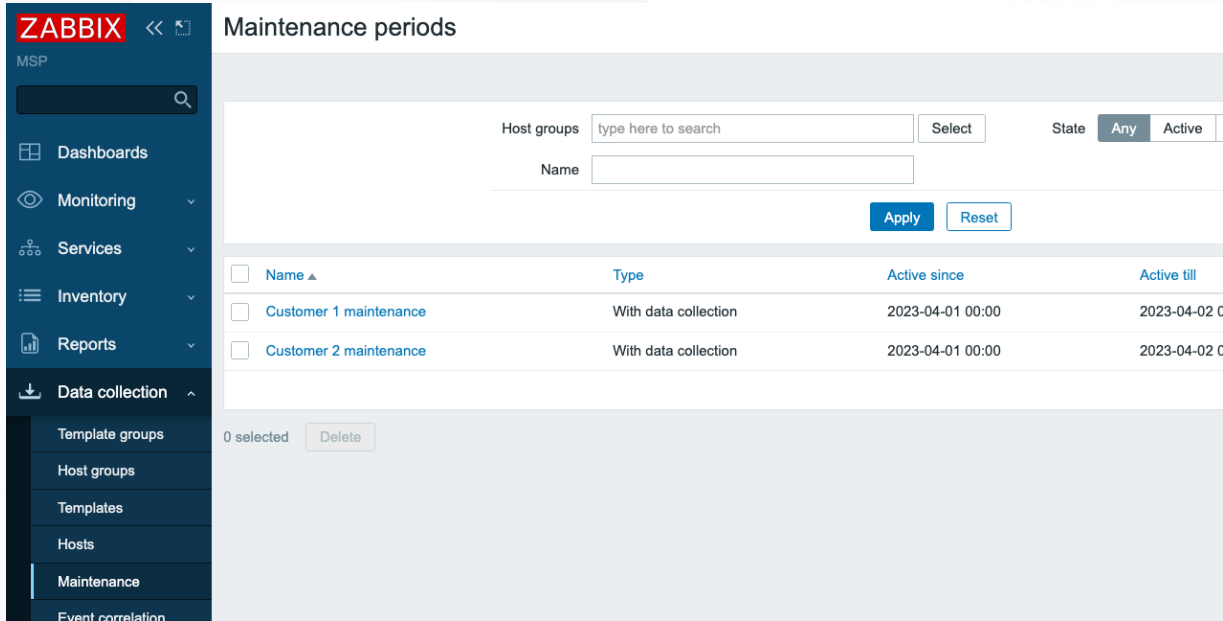
Read-write access to services with tag

Read-only access to services

# Permissions - Maintenance

- Equally important.

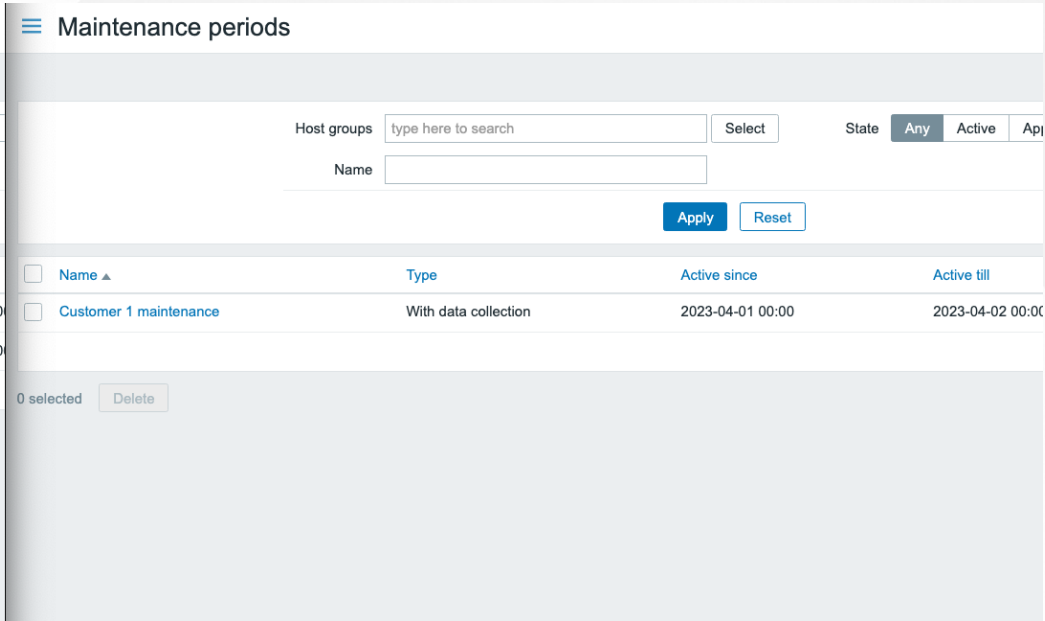
Super Admin



The screenshot shows the Zabbix web interface for a Super Admin. The left sidebar contains navigation items: ZABBIX, MSP, Dashboards, Monitoring, Services, Inventory, Reports, Data collection, Template groups, Host groups, Templates, Hosts, Maintenance, and Event correlation. The main content area is titled "Maintenance periods" and includes search filters for Host groups, Name, and State (Any, Active). Below the filters is a table with columns: Name, Type, Active since, and Active till. The table lists two maintenance periods: "Customer 1 maintenance" and "Customer 2 maintenance", both with the type "With data collection" and active from 2023-04-01 00:00 to 2023-04-02 00:00. At the bottom, there is a "0 selected" status and a "Delete" button.

Name	Type	Active since	Active till
Customer 1 maintenance	With data collection	2023-04-01 00:00	2023-04-02 00:00
Customer 2 maintenance	With data collection	2023-04-01 00:00	2023-04-02 00:00

Customer 1  
(Admin, RW on customer1 hostgroup)



The screenshot shows the Zabbix web interface for a user with "Admin, RW on customer1 hostgroup" permissions. The interface is similar to the Super Admin view, but the table only displays "Customer 1 maintenance". The "Customer 2 maintenance" entry is not visible. The "0 selected" status and "Delete" button are also present at the bottom.

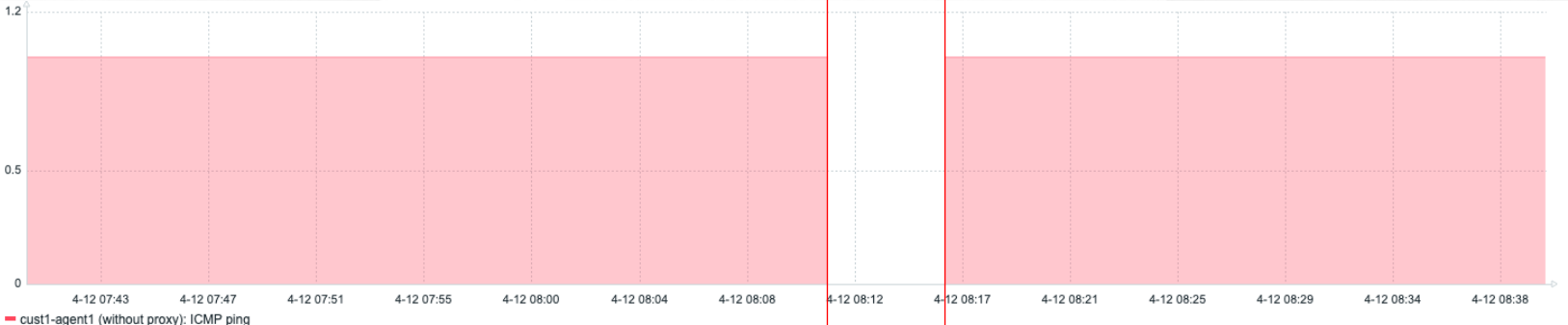
Name	Type	Active since	Active till
Customer 1 maintenance	With data collection	2023-04-01 00:00	2023-04-02 00:00

- Yes, it is possible to use Zabbix in a MSP environment, permission wise
- NO do not make your customers SuperAdmin, ever.
- Provision them as 'User' and only upon request as 'Admin' to their own groups.



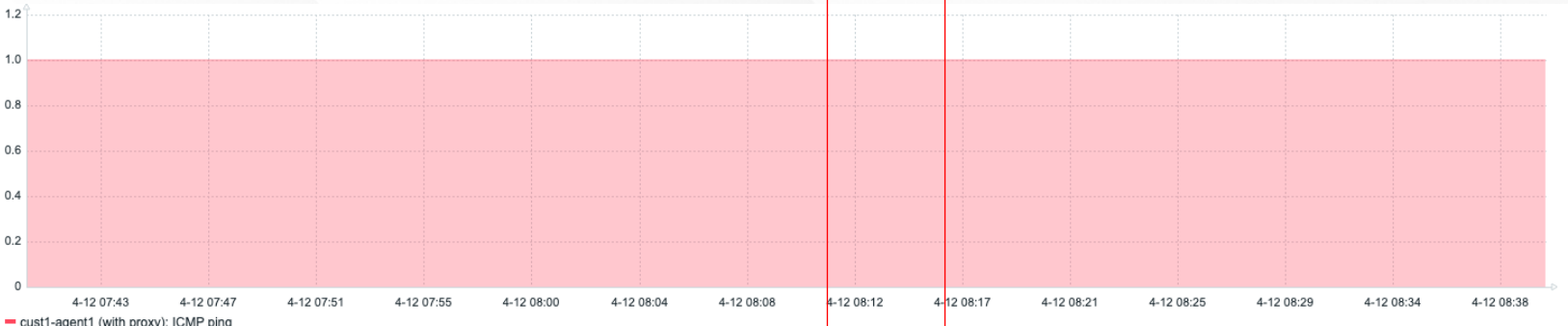
- What happens when the Zabbix server is unavailable?

Without proxy

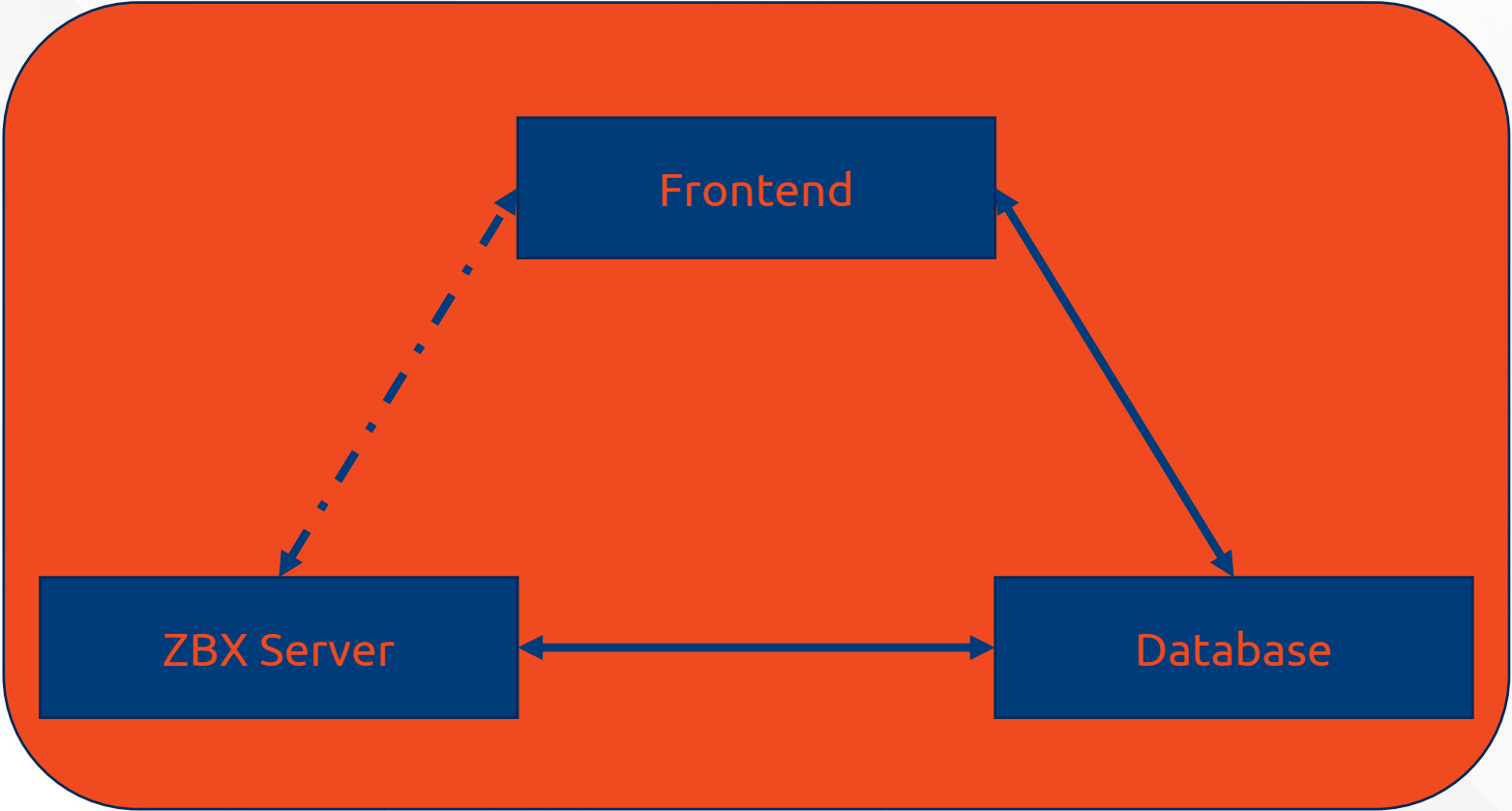


Zabbix server down

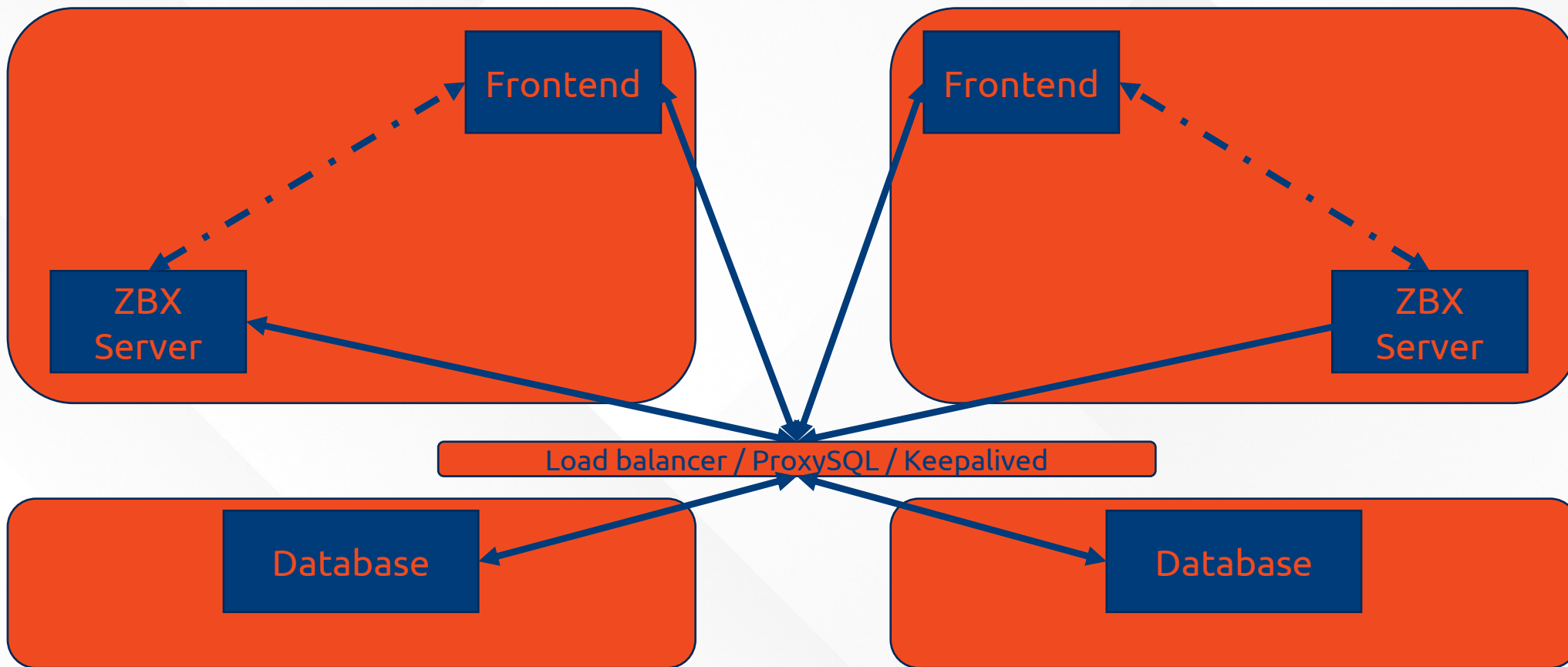
With proxy







# HA setups



# Upgrades

- Zabbix <6.4:
  - Upgrade Server + Proxies at “the same time” due to incompatibility
  - Agents can be done later
- Zabbix >6.4:
  - Upgrade Server
  - Upgrade Proxy (can be done at convenient moment)
  - Upgrade agent

Proxies

Name  Mode **Any** Active Pass

<input type="checkbox"/> Name ▲	Mode	Encryption	Version	Last seen (age)
<input type="checkbox"/> Los Angeles proxy	Active	None	6.0.2	1s
<input type="checkbox"/> QA environment proxy	Active	None	5.0.30	2s
<input type="checkbox"/> Riga proxy	Active	None	6.4.0	2s



- Zabbix in a MSP environment? Yes!
- But a few considerations must be taken in account before building the environment





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Lets see if there are any questions!

