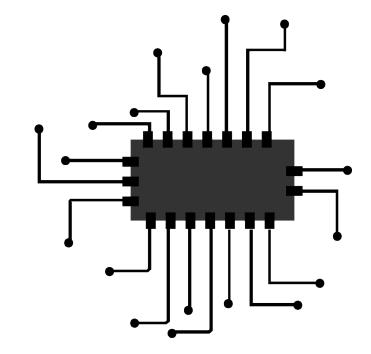
Keeping things structured within Zabbix





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Who am I?



Nathan Liefting Zabbix Consultant / Trainer









- Zabbix support
- Zabbix training
- Zabbix consultancy
- And more...



Zabbix 5 IT Infrastructure Monitoring Cookbook

Explore the new features of Zabbix 5 and leverage them to design, build, and maintain your Zabbix setup

Nathan Liefting | Brian van Baekel

Zabbix 6 IT Infrastructure Monitoring Cookbook

Second Edition

Explore the new features of Zabbix 6 for designing, building, and maintaining your Zabbix setup



https://www.linkedin.com/company/opensource-ict-solutions/

10 October 2022

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Introduction

- Data is the new gold.. But only if you know where to find it.
- Common Zabbix issue: "Monitoring Fatigue" The term used to describe what happens if we do not stucture our monitoring systems correctly and our users 'refuse' to use it as they should.
- The solution? Utilizing best practices and good structure!



1 – The basics

- Host groups
- Host names
- Template groups
- Template names
- Tags
- Business service monitoring

First thing to do after architecture

Stick with what you have

New in 6.2

Changed.. YET AGAIN?

More important than ever before

Tags, tags and some more tags

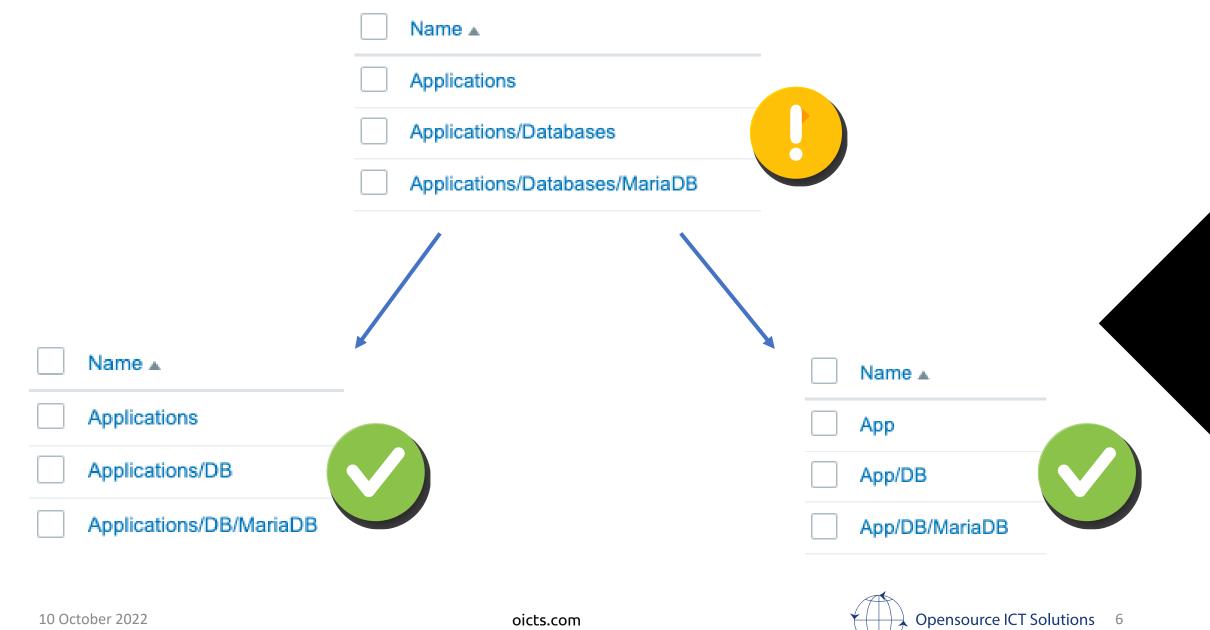


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Name ▲
Applications
Databases
Discovered hosts
Hypervisors
Linux servers
Virtual machines
Zabbix servers

Name 🔺
Applications
Applications/Databases
Applications/Databases/MariaDB
Discovered hosts
Servers/Hardware
Servers/Hypervisors
Servers/OS
Servers/OS/Linux
Servers/OS/Windows
Servers/Virtual machines
Zabbix/Databases
Zabbix/Frontends
Zabbix/Proxies
Zabbix/Servers





User group	Template permission	Host permissions	Problem tag filter													
	* Group name	Server administrators														
User group	Template permission	s Host permissions	Problem tag filter													
	Permissions			Permissions												
		All groups		None												
		Servers/OS × type here to search				Select	Read-write	Read Der	ny None]						
		✓ Include subgroups														
		Add														
				User	group Temp	late permiss	ons Host p	ermissions	Problem tag	g filter						
						Group name	Linux adm	inistrators								
				User	group Templat	te permissions	Host permis	sions Proble	em tag filter							
					F	Permissions	Host group			Permissions						
							All groups			None						
							Servers/OS/L	nux ×				Select	Read-write	Read	Deny	None
							type here to s									
							Include sub	groups								
							Add									
	10 October 20	22				oicts.co	n			``	Ope	nsource l	ICT Solutio	ons	7	

Action	Operations					
	* Name	Send MS T	eams message to DB admins			
	Conditions	Label	Name Action			
		А	Host group equals Applications/DB Remov	/e		
		Add				
Action	Operations 1					
	* Default operation step du	ration 1h				
	Oper	ations Step	s Details	Start in	Duration	Action
		1	Send message to users: Media user: Database administrators via MS Teams	Immediately	Default	Edit Remove
		Add				

Host groups Servers/OS × type here to search Select Monitored by Any Server Proxy Templates type here to search Select Tags And/Or Or	
Proxy Select Templates type here to search Select	
Templates type here to search Select Tags And/Or Or	
Name tag Contains value Remove	
DNS	
IP	
Port	
Apply Reset	

- Configuration | Hosts
- Monitoring | Hosts
- Dashboard widgets

- Monitoring | Problems
- Maps
- Maintenance

- Zabbix API
- And more...



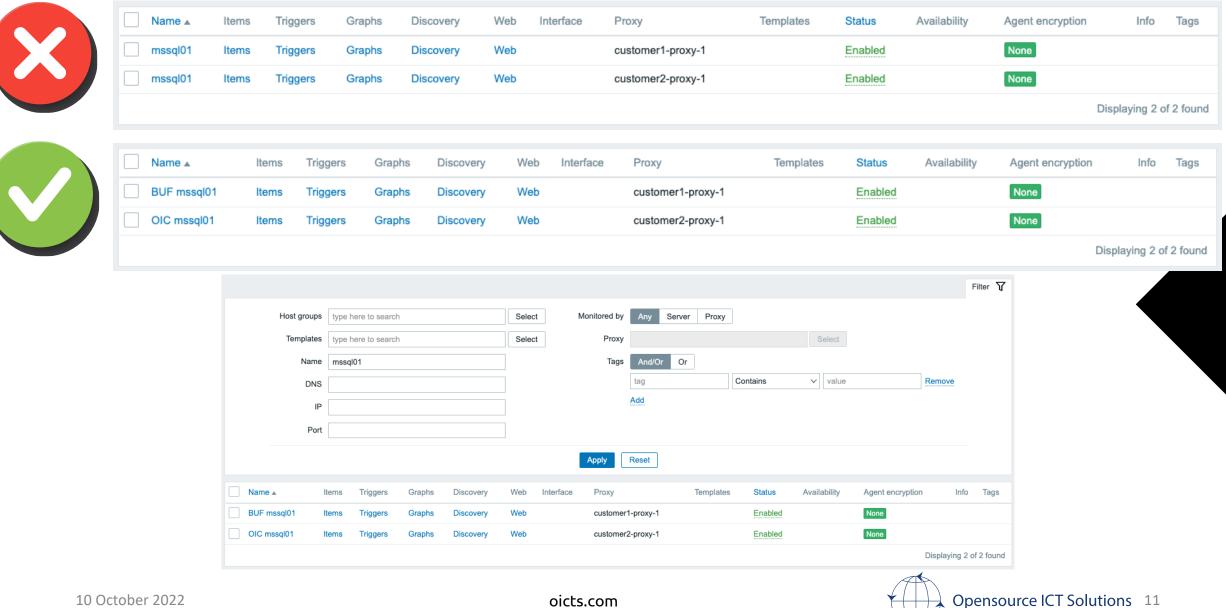
Host names

			Triggers Triggers 69	Graphs Graphs 25	Discovery Discovery 4	Web Web	Interface F 127.0.0.1:10050		Templates Linux by Zabbix agent, Zabbix server health	Status Enabled		Agent encryption None Displaying	Info 1 of 1	_
	Name 🔺	Items	Triggers	Graphs	Discovery		Interface	Proxy	Templates	Status		Agent encryption	Info	Tags
	summit-zbx-01 summit-zbxdb-0						192.168.0.127:10050 192.168.0.126:10050		Linux by Zabbix agent, Zabbix server health Linux by Zabbix agent, MySQL by Zabbix agent	Enabl	ed ZBX	None None Displaying 3		

- Stick with what you know, use the actual hostname of your devices
- Keep it short, keep it descriptive, think of all the Zabbix users.



Host names



Host names

Host IPMI Tags Macros Inventory Encryption Value mapping

* Host name	summit-zbx-01
Visible name	summit-zbx-01



Host IPMI Tags Macros Inventory Encryption Value mapping





Host IPMI Tags Macros Inventory Encryption Value mapping

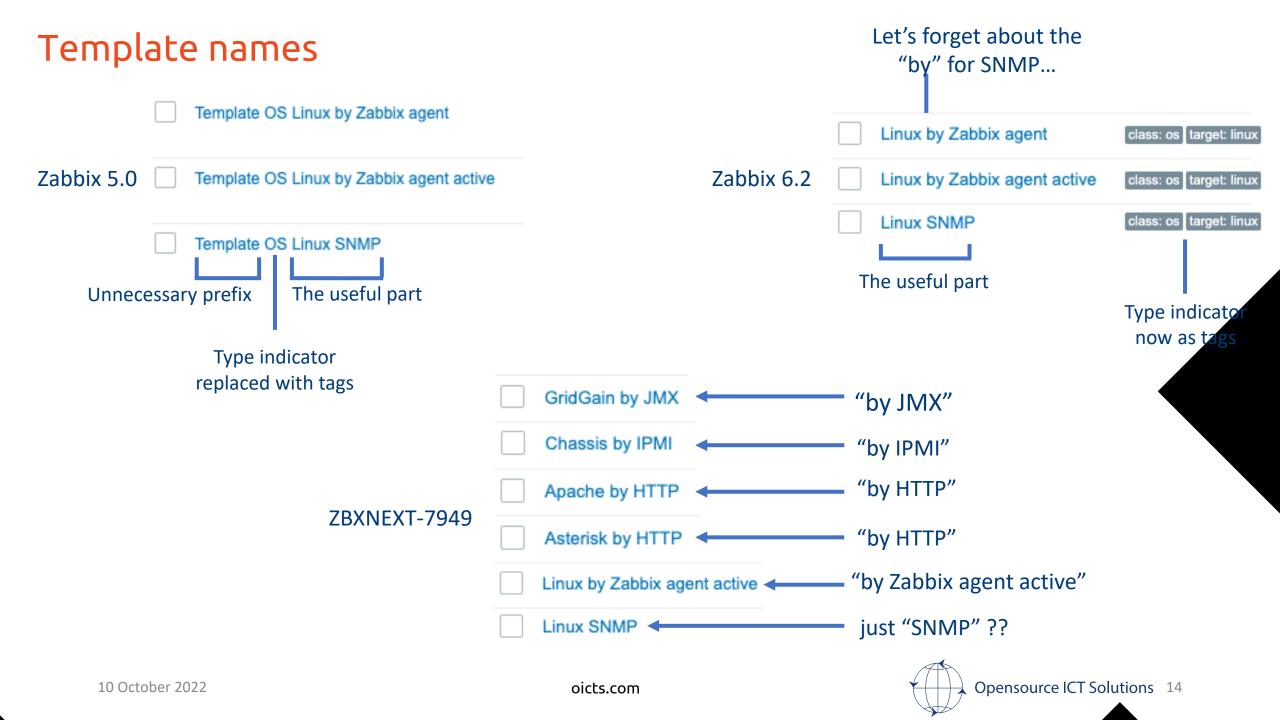
	* Host na	me summit	-zbx-01			
	Visible na	me Zabbix	server			
Host	IPMI Tags	Macros	Inventory	Encryption	Value mapping	
	* Host name	summit-zbx	-01			
	Visible name	konferencë	-zbx-01			

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Template groups

- Zabbix 6.2!
- Already have subgroups
- Add more levels if required
- Useful for permissions
- Keep the name short and descriptive
- No more confusion with host groups

 Name A Templates Templates/Applications Templates/Cloud Templates/Databases Templates/Modules Templates/Modules 107 	Templates Templates/Applications Templates/Cloud Templates/Cloud Templates/Databases Templates/Modules		
Templates/Applications 62 Templates/Cloud 1 Templates/Databases 19 Templates/Modules 62	Templates/Applications 62 Templates/Cloud 1 Templates/Databases 19 Templates/Modules 62 Templates/Network devices 107	Name 🔺	
Templates/Cloud 1 Templates/Databases 19 Templates/Modules 62	Templates/Cloud1Templates/Databases19Templates/Modules62	Templates	
Templates/Databases 19 Templates/Modules 62	 Templates/Databases Templates/Modules Templates/Network devices 107 	Templates/Applications	62
Templates/Modules 62	Templates/Modules 62	Templates/Cloud	1
	Templates/Network devices 107	Templates/Databases	19
Templates/Network devices 107		Templates/Modules	62
	Templates/Operating systems 13	Templates/Network devices	107
Templates/Power 11		Templates/SAN	6
	Templates/SAN 6	Templates/Server hardware	22
Templates/SAN 6		Templates/Telephony	1
Templates/SAN 6 Templates/Server hardware 22	Templates/Server hardware 22	Templates/Video surveillance	1
Templates/SAN 6 Templates/Server hardware 22 Templates/Telephony 1	Templates/Server hardware 22		



Template names

Templates	es Tags 2 Macros 28 Value mapping 4								
	* Template name Linux by Zabbix agent								
	Visible name	Linux by Zabbix agent							
	Templates	type here to search	Select						
	* Template groups	Templates/Operating systems ×	Select						
		type here to search							
Templates	Tags 2 Macros 28	Value mapping 4							
	* Template name	OICTS Linux by Zabbix agent							
	Visible name	OICTS Linux by Zabbix agent							
	Templates	type here to search	Select						

* Template groups Templates/Operating systems × Templates/OICTS (new) × Select type here to search





How To

Tags in Zabbix 6.0 LTS – Usage, subfilters and guidelines

By Andrey Biba — February 18, 2022

https://blog.zabbix.com/tags-in-zabbix-6-0-lts-usage-subfilters-and-guidelines/19565/



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Tags: Templates

Name 🔺	Tags
TP-LINK SNMP	class: network target: tp-link
Ubiquiti AirOS SNMP	class: network target: airos target: ubiquiti
VMWare SD-WAN VeloCloud by HTTP	class: network target: vmware-sd-wa
Windows by Zabbix agent	class: os target: windows
Windows by Zabbix agent active	class: os target: windows
Windows SNMP	class: os target: windows
ZYXEL AAM1212-51 IES-612 SNMP	class: network target: aam1212-51 target: dslam target: zyxel

class: What are we monitoring? 'Network equipment', 'Operating systems', 'Hardware', 'a Database'?

target: What is the Vendor, Type or indicator of which kind of equipment we are monitoring.



Tags: Items

	Name 🔺	Кеу	Tags
•••	Available memory	vm.memory.size[available]	component: memory
•••	Available memory in %	vm.memory.size[pavailable]	component: memory
•••	Checksum of /etc/passwd	vfs.file.cksum[/etc/passwd,sha256]	component: environment
•••	Context switches per second	system.cpu.switches	component: cpu
•••	Free swap space in %	system.swap.size[,pfree]	component: memory component: storage
•••	Host name of Zabbix agent running	agent.hostname	component: system

component: "a part or element of a larger whole, especially a part of a computer, machine or vehicle."



Tags: Items

Template: Linux by Zabbix agent

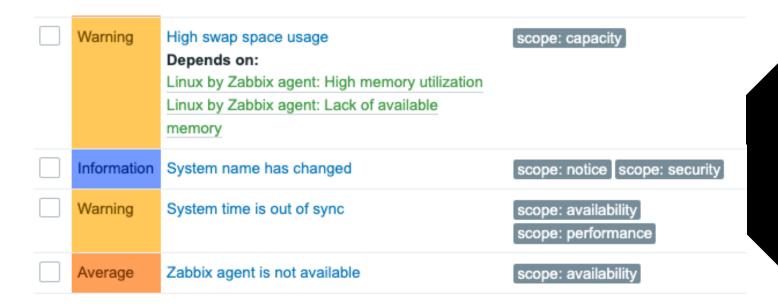
•••	Network interface discovery: Interface ens192: Bits received	net.if.in["ens192"]	component: network interface: ens192
•••	Network interface discovery: Interface ens192: Bits sent	net.if.out["ens192"]	component: network interface: ens192
•••	Network interface discovery: Interface ens192: Inbound packets discarded	net.if.in["ens192",dropped]	component: network interface: ens192
•••	Network interface discovery: Interface Io: Bits received	net.if.in["lo"]	component: network interface: lo
•••	Network interface discovery: Interface Io: Bits sent	net.if.out["lo"]	component: network interface: lo
•••	Network interface discovery: Interface Io: Inbound packets discarded	net.if.in["lo",dropped]	component: network interface: lo



Tags: Triggers

Template: Linux by Zabbix agent

scope : availability
scope : performance
scope : notice
scope : security
scope : capacity





Tags: Together

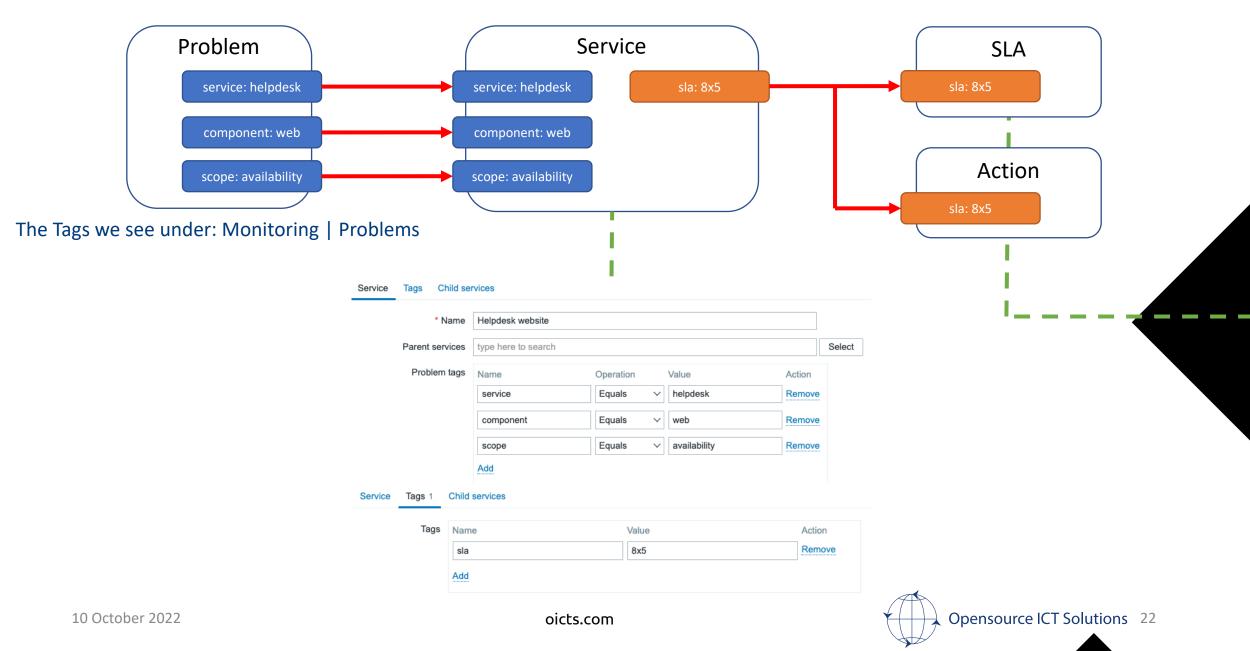
Host tags: Groups certain hosts together as well as provide information A "service:" tag might be applied to inform about the services running on this host.

Template tags: Groups specific templates together as well as provide information
 Item tags: Groups specific items together as well as provide information
 Trigger tags: Provides information about the triggers purpose

Severity	Host	Problem	Tags
Average	summit-zbxdb-01	Zabbix agent is not available (for 3m)	class: os component: system scope: availability target: linux
Average	summit-zbx-01	Interface ens192: Link down	class: os component: network interface: ens192 scope: availability target: linux

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Business Service Monitoring



Business Service Monitoring

	Config	ured Service:		
Name	Status	Root cause	Created at Tags	
Helpdesk website	ок		2022-08-30 sla: 8x5	
SLA Excluded do	Service SLA:		Service Action:	
* Name	SLA 8x5			
* SLO	99.5 %			
Reporting period				
Time zone		Action Operations		
Schedule	24x7 Custom			
	Sunday 8:00-17:00,	Nan	me Report Helpdesk SLA to email	
		The state but		
	✓ Monday 09:00-17:30	Type of calculation		A-11-5
	 ✓ Monday 09:00-17:30 ✓ Tuesday 09:00-17:30 	Type of calculation Condition		Action <u>Remove</u>
			Label Name A Service equals Helpdesk website B Value of tag s/a equals 8x5	
	✓ Tuesday 09:00-17:30		A Service equals Helpdesk website	Remove
	✓ Tuesday 09:00-17:30 ✓ Wednesday 09:00-17:30		Label Name A Service equals Helpdesk website B Value of tag s/a equals 8x5	Remove
	✓ Tuesday 09:00-17:30 ✓ Wednesday 09:00-17:30 ✓ Thursday 09:00-17:30		Label Name A Service equals Helpdesk website B Value of tag s/a equals 8x5	Remove
* Effective date	✓ Tuesday 09:00-17:30 ✓ Wednesday 09:00-17:30 ✓ Thursday 09:00-17:30 ✓ Friday 09:00-17:30 Saturday 8:00-17:00,		Label Name A Service equals Helpdesk website B Value of tag s/a equals 8x5	Remove
* Effective date * Service tags	✓ Tuesday 09:00-17:30 ✓ Wednesday 09:00-17:30 ✓ Thursday 09:00-17:30 ✓ Friday 09:00-17:30 Saturday 8:00-17:00, 2022-08-30 [11] Name Operation Value	Action	Label Name A Service equals Helpdesk website B Value of tag s/a equals 8x5	Remove
	✓ Tuesday 09:00-17:30 ✓ Wednesday 09:00-17:30 ✓ Thursday 09:00-17:30 ✓ Friday 09:00-17:30 Saturday 8:00-17:00, 2022-08-30 ::::	Condition	Label Name A Service equals Helpdesk website B Value of tag s/a equals 8x5	Remove

- 2 Also very important
 - Item names

A good item name makes the item easy to find.

• Trigger names

Short, descriptive and immediately hinting at what to do or look for.

• Low Level Discovery (LLD)

Completely based on structure

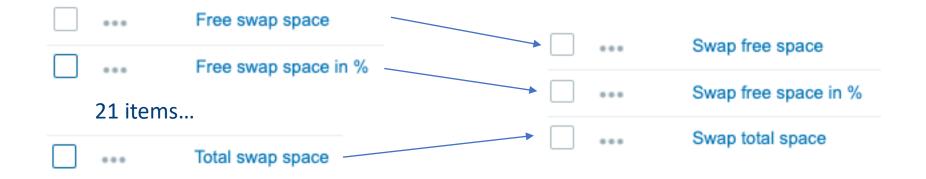


Item names

item name	Available memory
✓ item name	Available memory in %
item name	Checksum of /etc/passwd
item name	Context switches per second
✓ item name	CPU nice time
✓ item name	CPU utilization
item name	Free swap space
item name	Free swap space in %
✓ item name	Guest CPU nice time
✓ item name	Guest CPU time
item name	Host name of Zabbix agent running
✓ item name	Idle CPU time
item name	Interface ens192: Bits received
item name	Interface Io: Outbound packets with errors
item name	Interface Io: Speed
item name	Interrupt CPU time
item name	Interrupts per second
item name	Iowait CPU time 🔎

item name right	Checksum of /etc/passwd
item name right	Context switches per second
✓ item name right	CPU count
✓ item name right	CPU guest nice time
✓ item name right	CPU guest time
✓ item name right	CPU idle time
✓ item name right	CPU interrupt time
✓ item name right	CPU iowait time
✓ item name right	CPU load average (1m avg)
✓ item name right	CPU load average (5m avg)
✓ item name right	CPU load average (15m avg)
✓ item name right	CPU nice time
✓ item name right	CPU softirq time
✓ item name right	CPU steal time
✓ item name right	CPU system time
✓ item name right	CPU user time
✓ item name right	CPU utilization

Item names





Item names



- Reading is the enemy of layer 8
- Even one word can mean a difference
- Thus: Short names == Less issues

....

Version of Zabbix agent running



...

Zabbix agent version





Trigger names

• What is wrong?

Average Zabbix agent is not available (for {\$AGENT.TIMEOUT})

> Average The Zabbix agent has been unavailable for 5 minutes on {HOST.HOST}

• • Where did it go wrong?

Time 💌 🗌	Severity	Recovery time	Status	Info	Host	Problem	Duration	Ack	Actions	a Tags	
10:16:09	Average		PROBLEM	1	summit-linux-02	Zabbix agent is not available (for 3m)	30s	No	• ¹ →	class:	os component: system scope: availability
Time 🔻 🗌	Severity	Recovery time	Status	Info	Host	Problem	C	Duration	Ack	Actions	Tags

• How am I fixing it?

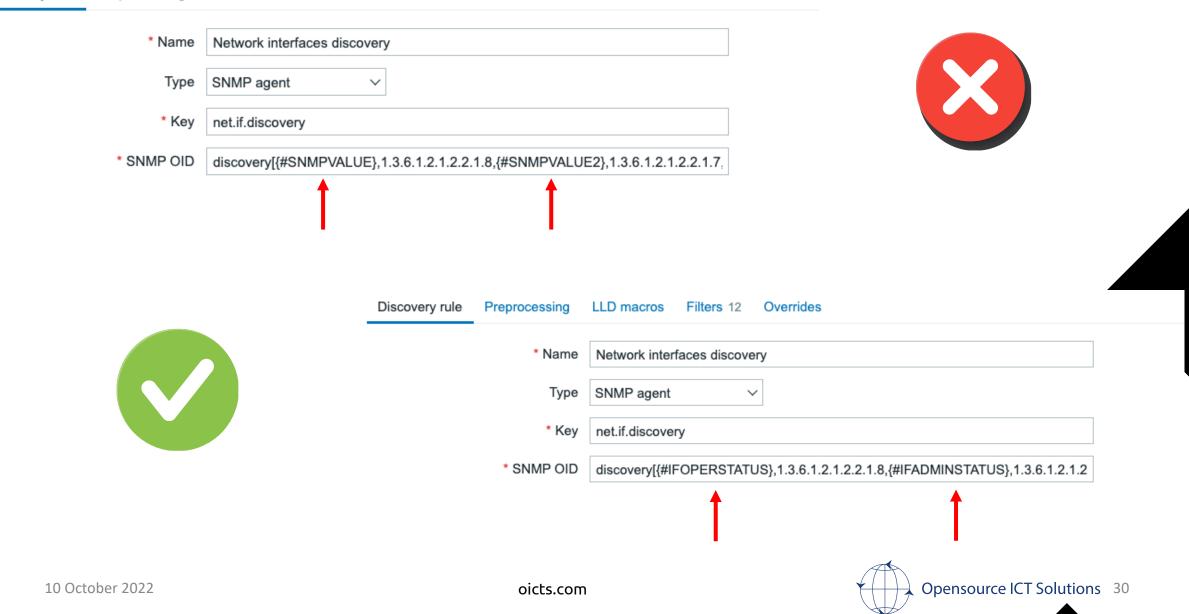
Trigger names

• How am I fixing it?

Description	For active agents, no {\$AGENT.NODATA_1	data() with agent.ping is TIMEOUT} as time thres	s used with shold.				
	Average	PROBLEM	summit-linux-01	Zabbix agent is not available (for 3m)		4m 17s <u>No</u> <mark>1</mark> → class: o	sc
					For passive only agents, host a	availability is used with 3m as time threshold	×.
URL	https://COMPA	NY.atlassian.net	/wiki/agent_una	vailable			
Aver	age	PROBLEM	summit-linux-01 2	Zabbix agent is not available (for 3m) 📝			
					TRIGGER		·
					Configuration		
					LINKS		
					Trigger URL		
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Low Level Discovery (LLD)

Discovery rule Preprocessing LLD macros Filters 12 Overrides



Low Level Discovery (LLD)

All templates	/ Linux SNMP Discovery list / Network interfaces discovery
	Name 🔺
•••	Interface {#IFNAME}({#IFALIAS}): Bits received
•••	Interface {#IFNAME}({#IFALIAS}): Bits sent
•••	Interface {#IFNAME}({#IFALIAS}): Inbound packets discarded
•••	Interface {#IFNAME}({#IFALIAS}): Inbound packets with errors
•••	Interface {#IFNAME}({#IFALIAS}): Interface type
•••	Interface {#IFNAME}({#IFALIAS}): Operational status
•••	Interface {#IFNAME}({#IFALIAS}): Outbound packets discarded
•••	Interface {#IFNAME}({#IFALIAS}): Outbound packets with errors
	Interface {#IFNAME}({#IFALIAS}): Speed

•••	Network interfaces discovery: Interface ens192(): Bits received
•••	Network interfaces discovery: Interface ens192(): Bits sent
•••	Network interfaces discovery: Interface ens192(): Inbound packets discarded
•••	Network interfaces discovery: Interface ens192(): Inbound packets with errors
•••	Network interfaces discovery: Interface ens192(): Interface type
•••	Network interfaces discovery: Interface ens192(): Operational status
•••	Network interfaces discovery: Interface ens192(): Outbound packets discarded
•••	Network interfaces discovery: Interface ens192(): Outbound packets with errors
•••	Network interfaces discovery: Interface ens192(): Speed
•••	Network interfaces discovery: Interface Io(): Bits received
•••	Network interfaces discovery: Interface Io(): Bits received Network interfaces discovery: Interface Io(): Bits sent
••••	Network interfaces discovery: Interface Io(): Bits sent
· ···	Network interfaces discovery: Interface Io(): Bits sent Network interfaces discovery: Interface Io(): Inbound packets discarded
· ···	Network interfaces discovery: Interface Io(): Bits sent Network interfaces discovery: Interface Io(): Inbound packets discarded Network interfaces discovery: Interface Io(): Inbound packets with errors
	Network interfaces discovery: Interface Io(): Bits sent Network interfaces discovery: Interface Io(): Inbound packets discarded Network interfaces discovery: Interface Io(): Inbound packets with errors Network interfaces discovery: Interface Io(): Inbound packets with errors Network interfaces discovery: Interface Io(): Inbound packets with errors
	Network interfaces discovery: Interface Io(): Bits sent Network interfaces discovery: Interface Io(): Inbound packets discarded Network interfaces discovery: Interface Io(): Inbound packets with errors Network interfaces discovery: Interface Io(): Interface type Network interfaces discovery: Interface Io(): Operational status



Low Level Discovery (LLD)

Severity	Value	Name 🔺	Operational data
Information	ОК	Network interfaces discovery: Interface ens192(): Ethernet has changed to lower speed than it was before Depends on: summit-zbx-01 snmp: Interface ens192(): Link down	Current reported speed: {ITEM.LASTVALUE1}
Warning	OK	Network interfaces discovery: Interface ens192(): High ban dwidth usage Depends on: summit-zbx-01 snmp: Interface ens192(): Link down	In: {ITEM.LASTVALUE1}, out: {ITEM.LASTVALUE3}, speed: {ITEM.LASTVALUE2}
Warning	ОК	Network interfaces discovery: Interface ens192(): High erro r rate Depends on: summit-zbx-01 snmp: Interface ens192(): Link down	errors in: {ITEM.LASTVALUE1}, errors out: {ITEM.LASTVALUE2}
Warning	ок	EtherLike-MIB Discovery: Interface ens192(): In half-duplex mode	
Average	ок	Network interfaces discovery: Interface ens192(): Link dow n	Current state: {ITEM.LASTVALUE1}
Information	ОК	Network interfaces discovery: Interface Io(): Ethernet has c hanged to lower speed than it was before Depends on: summit-zbx-01 snmp: Interface Io(): Link down	Current reported speed: {ITEM.LASTVALUE1}
Warning	ок	Network interfaces discovery: Interface Io(): High bandwidt h usage Depends on: summit-zbx-01 snmp: Interface Io(): Link down	In: {ITEM.LASTVALUE1}, out: {ITEM.LASTVALUE3}, speed: {ITEM.LASTVALUE2}
Warning	ок	Network interfaces discovery: Interface Io(): High error rate Depends on: summit-zbx-01 snmp: Interface Io(): Link down	errors in: {ITEM.LASTVALUE1}, errors out: {ITEM.LASTVALUE2}
Average	ок	Network interfaces discovery: Interface Io(): Link down	Current state: {ITEM.LASTVALUE1}

3 – What's in a name

• Dashboards

• Maps

• Actions

Often times we see too many of them, in an unorganized list

Easy to access from dashboards but we still need a good structure

It's all in the name, helping our Zabbix admins find thing easily



Dashbo	ards	
	Dashboards	
	Name ▲ Brian dashboard	
	Databases MySQL Global view	
	Josh Laura dash	
	Linux servers MSSQL databases	
	Nathan Liefting personal NGINX	
	Windows servers Zabbix server	
	Zabbix server health	
	0 selected Delete	

Da	shboards	
- u		
	Name 🔺	
	Applications/Databases/MSSQL	
	Applications/Databases/MySQL	
	Applications/NGINX	
	Global view	
	Personal/Brian	
	Personal/Josh	
	Personal/Laura dash	
	Personal/Nathan Liefting	
	Servers/Linux	
	Servers/Windows	
	Zabbix/Server	
	Zabbix/Server health	
sele	ected Delete	
	Opensource ICT Solutions	34

Maps

Maps

Name 🔺	Width	Height	Actions	
Applications/Databases/MSSQL	800	600	Properties Constructor	
Network/Overview	800	600	Properties Constructor	
Network/Routers	800	600	Properties Constructor	
Network/Switches	800	600	Properties Constructor	
Network/Zabbix local	680	200	Properties Constructor	
Personal/Brian	800	600	Properties Constructor	
Personal/Laura	800	600	Properties Constructor	
Personal/Nathan	800	600	Properties Constructor	
Servers/Linux	800	600	Properties Constructor	
Servers/Windows	800	600	Properties Constructor	
				Displaying 10 of 10 found

0 selected Export \lor Delete



?

Create map

Import

Trigger actions ~

Name 🔺

All media/Report problems to Zabbix administrators

Command/Fix VMWare issue through API

Mail/MSSQL to dba@company.com group

Mail/Windows to windows@company.com group

MS Teams/Linux to Linux Engineers group

0 selected Enable

Disable Delete





To conclude

Host groups/Template groups: Use clear names, abbreviate correctly and most importantly use subgroups

Host names: Stick with the actual device hostnames where possible

Template names: Follow the structure and clone the defaults to templates you want to use

Tags: The new tag policy is a great improvement, use it and add your own detailed tags to it

Business Service Monitoring: Keep in mind that there's two different tags + use the new tag policy to make things easy

Item/Trigger names: Short, descriptive, use prefixes

Low Level Discovery:

Dashboards/Maps/Actions: A good stolen idea is a good implementation. Stick with what we know from host/groups



