



Zen

and the art of

Zabbix template design

Whois



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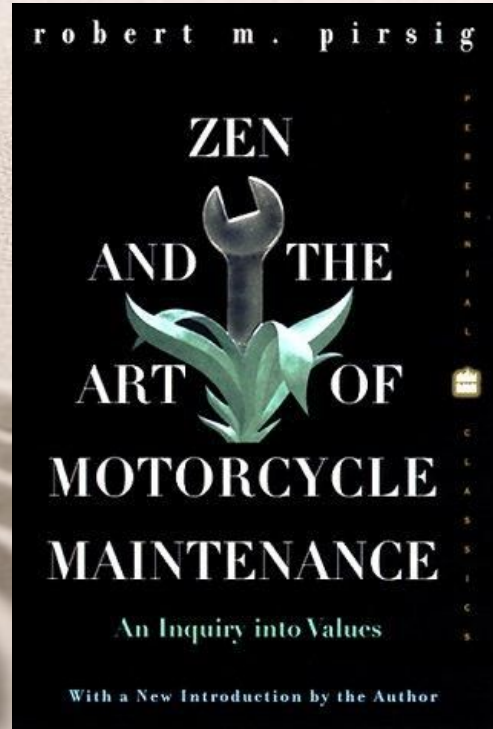
github.com/q1x

#zabbix: q1x





"...it should in no way be associated with that great body of factual information relating to orthodox Zen Buddhist practice. It's not very factual on motorcycles, either."



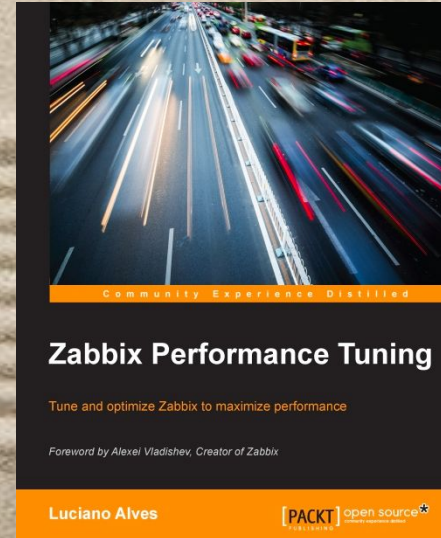
Robert M. Pirsig

A Zen garden background featuring a light brown sand surface. On the left, there are several parallel horizontal ridges. On the right, there are several concentric circular ridges. In the center of these concentric circles is a smooth, dark grey stone.

Quality

Default Templates:

*"Templates that Zabbix SIA sends together with Zabbix are **only for testing**, and they may be for proving concepts; they are **not for use in a production environment**. We'll need to create our own templates based on our needs."*



Luciano Alves

Our template problem





So, what makes a good Zabbix template?

Zabbix.org says:

- *Templates should be modular*
- *Templates should be as universal as reasonably possible*
- *LLD should be used for all supported objects*
- *Consider using user macros for values users might want to finetune*
- *.....*



zabbix.org/wiki/Docs/template_guidelines

A Zen garden with a stone in the center of concentric circles and horizontal lines.

Modularity

Reusability

Flexibility

...do one thing, and do it great!



We need a design pattern!

Design Pattern:

*"In software engineering, a **design pattern** is a general repeatable solution to a commonly occurring problem in software design. A design pattern isn't a finished design that can be transformed directly into code. **It is a description or template for how to solve a problem that can be used in many different situations.**"*



sourcemaking.com/design_patterns

Roles & Profiles



puppet



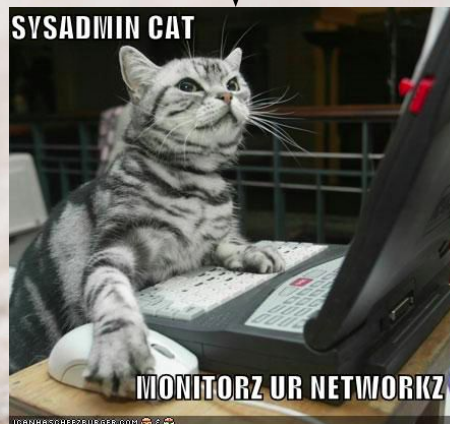
www.craigdunn.org/2012/05/239/



Role based Zabbix templates



\$organisation

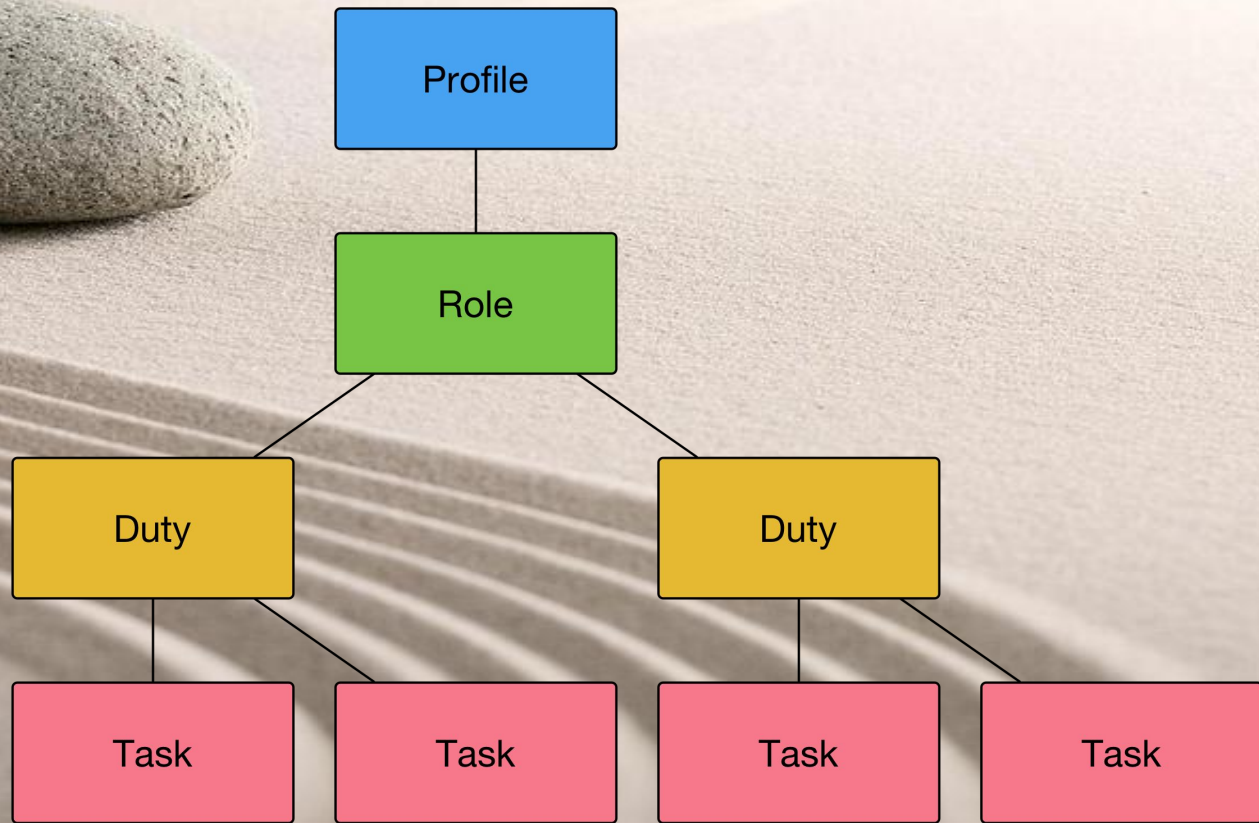


Keep infra up

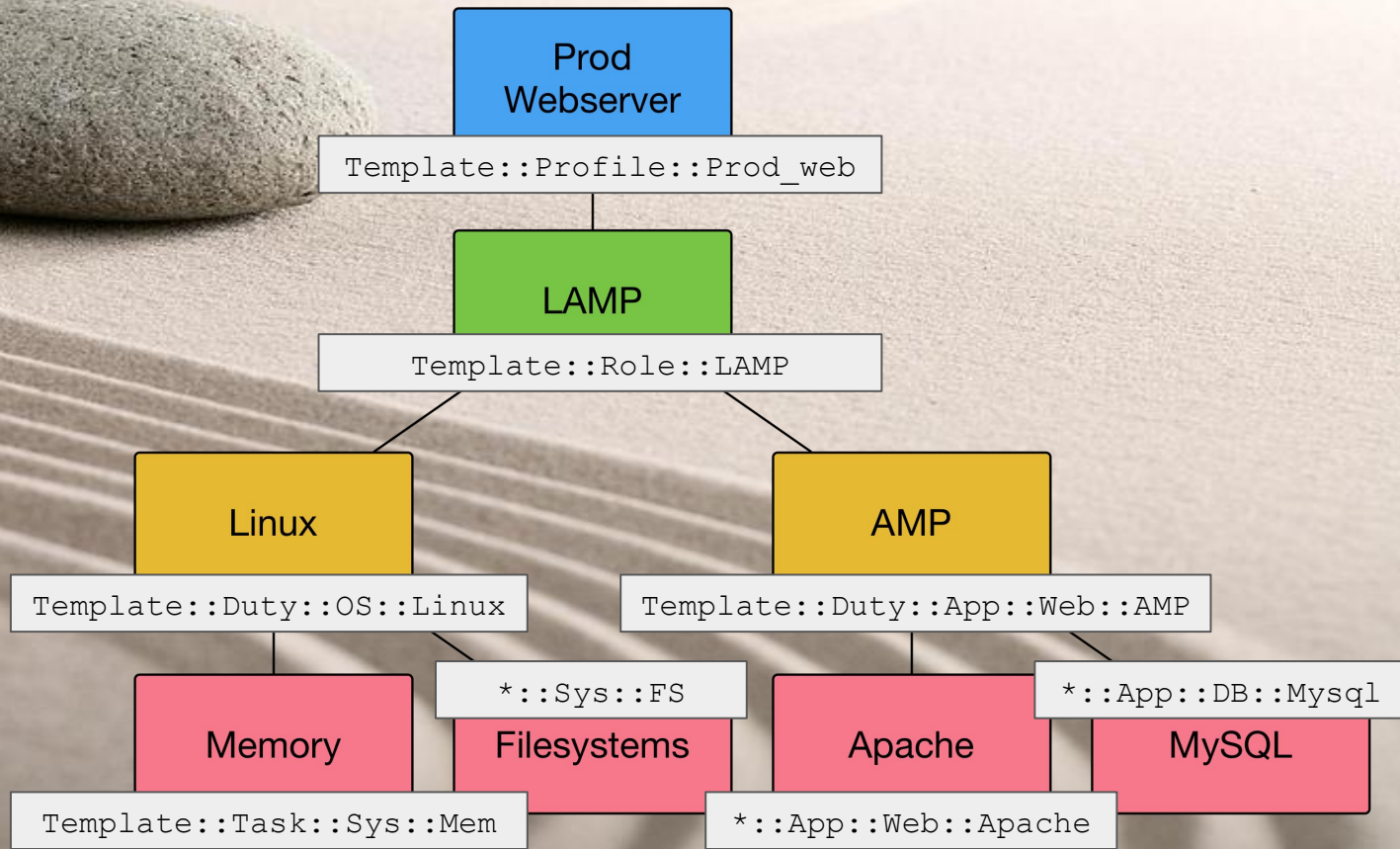


Monitoring

Report to \$boss



github.com/q1x/zabbix-templates-30/wiki/Template-Hierarchy



github.com/q1x/zabbix-templates-30/wiki/Template-Hierarchy

Example: Macros

```
Template::Task::Availability:Ping
```

Template ICMP Ping:

Name ▲	Triggers	Key
ICMP loss	<u>Triggers</u> 1	icmppingloss
ICMP ping	<u>Triggers</u> 1	icmpping
ICMP response time	<u>Triggers</u> 1	icmppingsec

Template::Task::Availability:Ping:

Name ▲	Triggers	Key
Ping: loss (%)	<u>Triggers</u> 1	icmppingloss[{HOST.CONN},{\$_PING_PACKETS: <u>LOSS</u> },{\$_PING_INTERVAL: <u>LOSS</u> },{\$_PING_SIZE: <u>LOSS</u> },{\$_PING_TIMEOUT: <u>LOSS</u> }]
Ping: response	<u>Triggers</u> 1	icmpping[{HOST.CONN},{\$_PING_PACKETS: <u>PING</u> },{\$_PING_INTERVAL: <u>PING</u> },{\$_PING_SIZE: <u>PING</u> },{\$_PING_TIMEOUT: <u>PING</u> }]
Ping: response time (s)	<u>Triggers</u> 1	icmppingsec[{HOST.CONN},{\$_PING_PACKETS: <u>SEC</u> },{\$_PING_INTERVAL: <u>SEC</u> },{\$_PING_SIZE: <u>SEC</u> },{\$_PING_TIMEOUT: <u>SEC</u> }]

Example: Macros

Template::Task::Availability:Ping

Default macro values:

Macro		Value	
<code>{\$_PING_INTERVAL}</code>	⇒	500	Remove
<code>{\$_PING_PACKETS}</code>	⇒	3	Remove
<code>{\$_PING_SIZE}</code>	⇒	56	Remove

Override macros:

<code>{\$_PING_INTERVAL}</code>	⇒	500	Change ← Template::Task::Availability::Ping: "500"
<code>{\$_PING_PACKETS}</code>	⇒	3	Change ← Template::Task::Availability::Ping: "3"
<code>{\$_PING_SIZE}</code>	⇒	56	Change ← Template::Task::Availability::Ping: "56"

Example: Macros

Template::Task::Availability:Ping

Override macro for a single item:

Macro		Value
<code>{\$_PING_SIZE:LOSS}</code>	⇒	100

Ping: loss (%)

`icmppingloss[ftp.nluug.nl,3,500,100,1000]`

Ping: response

`icmpping[ftp.nluug.nl,3,500,56,1000]`

Example: Macros

Template::Task::Availability:Ping

Triggers:

Severity ▾	Name	Expression
Average	Ping: {HOST.NAME} is not responding to requests	<code>{t_task_availability_ping:icmping[{HOST.CONN},{\$_PING_PACKETS:PING},{\$_PING_INTERVAL:PING},{\$_PING_SIZE:PING},{\$_PING_TIMEOUT:PING}].max({\$_PING_TIME:PING})}=0</code>
Warning	Ping: response time is too high on {HOST.NAME} Depends on: Template::Task::Availability::Ping: Ping: {HOST.NAME} is not responding to requests	<code>{t_task_availability_ping:icmpingsec[{HOST.CONN},{\$_PING_PACKETS:SEC},{\$_PING_INTERVAL:SEC},{\$_PING_SIZE:SEC},{\$_PING_TIMEOUT:SEC}].avg({\$_PING_TIME:SEC})}>{\$_PING_THRESH_SEC}</code>
Warning	Ping: loss is too high on {HOST.NAME} Depends on: Template::Task::Availability::Ping: Ping: {HOST.NAME} is not responding to requests	<code>{t_task_availability_ping:icmpingloss[{HOST.CONN},{\$_PING_PACKETS:LOSS},{\$_PING_INTERVAL:LOSS},{\$_PING_SIZE:LOSS},{\$_PING_TIMEOUT:LOSS}].min({\$_PING_TIME:LOSS})}>{\$_PING_THRESH_LOSS}</code>

Macros:

<code>{\$_PING_THRESH_LOSS}</code>	⇒	20
<code>{\$_PING_THRESH_SEC}</code>	⇒	0.15
<code>{\$_PING_TIME}</code>	⇒	5m

Example: Macros

Template::Task::Availability:Ping

Triggers status:

Warning	OK	2016-09-07 12:20:04	22h 56m 23s	Yes	ftp.nluug.nl	↓ Ping: loss is too high on ftp.nluug.nl {ftp.nluug.nl:icmpingloss[ftp.nluug.nl,3,500,100,1000].min(5m)}>20	Show
Warning	OK	2016-09-07 12:20:03	22h 56m 24s	Yes	ftp.nluug.nl	↓ Ping: response time is too high on ftp.nluug.nl {ftp.nluug.nl:icmpingsec[ftp.nluug.nl,3,500,56,1000].avg(5m)}>0.15	Show
Average	OK	2016-09-07 12:20:03	22h 56m 24s	Yes	ftp.nluug.nl	↑ Ping: ftp.nluug.nl is not responding to requests {ftp.nluug.nl:icmping[ftp.nluug.nl,3,500,56,1000].max(5m)}=0	Show

Trigger description:

Description	The number of ping packets lost in transit to this host is too high (<u>>20% in 5m</u>). This could be due to a faulty or flapping link or CPU load on the monitored host.
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Example: Macros

Calculated item:

Template::Task::Availability:Ping

Name

Type

Key

Formula

Type of information

Units

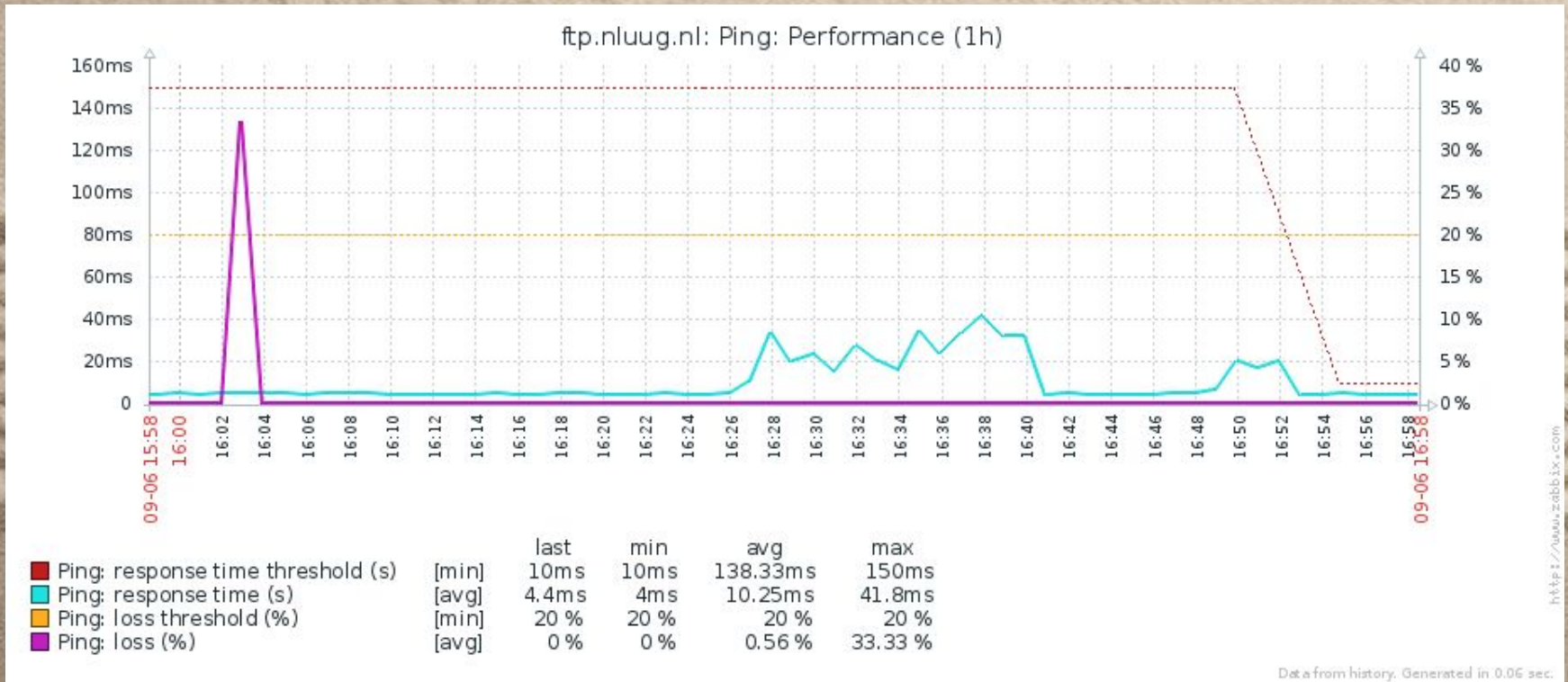
Use custom multiplier ☐

Update interval (in sec)

Example: Macros

Graph:

Template::Task::Availability:Ping



Example: LLD

Template::Task::Sys::Filesystem

Discovery rule:

Name

Type

Key

Update interval (in sec)

Keep lost resources period (in days)

Example: LLD

Template::Task::Sys::Filesystem

Discovery filter:

Type of calculation A and B

Filters	Label	Macro	Regular expression	Action
	A	{#FSNAME}	matches {\$_L_FS_DISCOVERY_NAME}	Remove
	B	{#FSTYPE}	matches {\$_L_FS_DISCOVERY_TYPE}	Remove
Add				

Filter by usermacro:

Macro	Value	
{\$_L_FS_DISCOVERY_NAME}	⇒ .*	Remove
{\$_L_FS_DISCOVERY_TYPE}	⇒ ^(btrfs ext2 ext3 ext4 jfs reiser xfs ffs ufs jfs jfi	Remove

Example: LLD

Template::Task::Sys::Filesystem

Host screen with prototypes:

Resource

Graph prototype

Max columns

Width

Height

Horizontal align

Vertical align

Column span

Row span

Example: LLD

Template::Task::Sys::Filesystem

Host screen with prototypes:

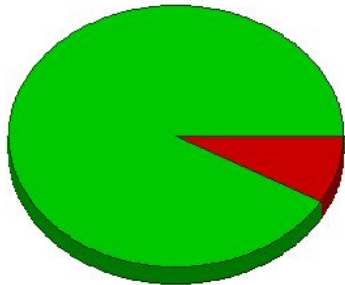
Filesystems: usage on **localhost**

Filesystems: usage  

Filter 

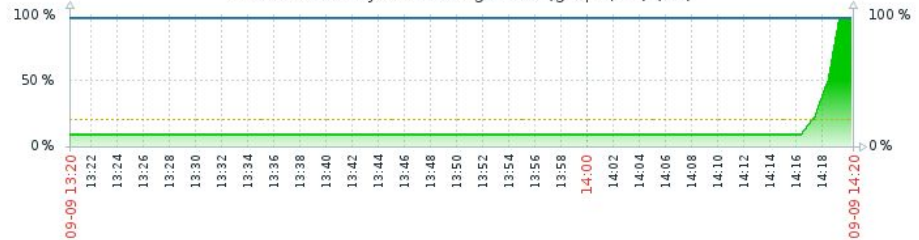
localhost: Filesystem: usage on / (pie) (1h)

■ Value: 39.34 GB (100%)
■ Value: 36.07 GB (91.68%)



■ Filesystem: disk space on / (total; B) [last]
■ Filesystem: disk space on / (free; B) [last]

localhost: Filesystem: usage on / (graph; %) (1h)



■ Filesystem: disk space on / (free; %)	[avg]	95.71 %	min	7.14 %	avg	10.87 %	max	95.71 %
■ Filesystem: threshold for / (free space; %)	[min]	20 %		20 %		20 %		20 %
■ Filesystem: inodes on / (free; %)	[avg]	97.24 %		97.24 %		97.24 %		97.24 %
■ Filesystem: threshold for / (free inodes; %)	[min]	20 %		20 %		20 %		20 %

Data from history. Generated in 0.05 sec.

Data from history. Generated in 0.10 sec.

<http://www.zabbix.com>

Example: template linkage

Template::Role::ZabbixProxy

Duty template:

Linked templates		Name	Action
		Template::Task::App::DB::Mysql	Unlink Unlink and clear
		Template::Task::App::DB::Mysql_perf	Unlink Unlink and clear
		Template::Task::Service::Mysql	Unlink Unlink and clear

Role template:

Linked templates		Name	Action
		Template::Duty::App::DB::Mysql	Unlink Unlink and clear
		Template::Duty::App::Mon::ZabbixAgent	Unlink Unlink and clear
		Template::Duty::App::Mon::ZabbixProxy	Unlink Unlink and clear
		Template::Duty::OS::Linux	Unlink Unlink and clear
		Template::Task::Availability::Ping	Unlink Unlink and clear

Example: template linkage

Template::Role::ZabbixProxy

Macro inheritance:

Template macros

Inherited and template macros

Macro	Effective value	Template value	Global value (configure)
{\$_MYSQL_PORT}	⇒ 3306	Change ← Template::Task::Service::Mysql: "3306"	
{\$_PING_INTERVAL}	⇒ 500	Change ← Template::Task::Availability::Ping: "500"	
{\$_PING_PACKETS}	⇒ 3	Change ← Template::Task::Availability::Ping: "3"	
{\$_PING_SIZE}	⇒ 56	Change ← Template::Task::Availability::Ping: "56"	
{\$_PING_TIMEOUT}	⇒ 1000	Change ← Template::Task::Availability::Ping: "1000"	
{\$_ZBX_AGENT_PROC}	⇒ zabbix_agentd	Change ← Template::Task::App::Mon::ZabbixAgent: "za..."	
{\$T_MYSQL_PERF_THRESH}	⇒ 1	Change ← Template::Task::Service::Mysql: "1"	
{\$T_MYSQL_PERF_TIME}	⇒ 5m	Change ← Template::Task::Service::Mysql: "5m"	
{\$T_MYSQL_STATE_TIME}	⇒ #3	Change ← Template::Task::Service::Mysql: "#3"	

Example: template linkage

Template::Role::ZabbixProxy

Template::Profile::*::ZabbixProxy:

Linked templates

Name

Action

Template::Role::Servers::ZabbixProxy

[Unlink](#) [Unlink and clear](#)

Example: template linkage

Template::Role::ZabbixProxy

Differentiate between environments:

All templates / Template::Profile::Prod::ZabbixProxy Applications 8 Items 52 Triggers 32 Graphs 14 Screens Discovery rules 1

Template Linked templates **Macros**

Template macros Inherited and template macros

Macro	Value	
{T_ZBX_PING_THRESH}	⇒ 2m	Remove

All templates / Template::Profile::Test::ZabbixProxy Applications 8 Items 52 Triggers 32 Graphs 14 Screens 4 Discovery rules 1

Template Linked templates **Macros**

Template macros Inherited and template macros

Macro	Value	
{T_ZBX_PING_THRESH}	⇒ 10m	Remove



Where can I find more info?

Role based template project



github.com/q1x/zabbix-templates-30/



How to improve this concept further?

Open Issues:

- ZBXNEXT-3370/ZBX-11178
Export dependencies between child templates
- ZBXNEXT-2957
Ability to mask macros in the frontend
- ZBXNEXT-1675
Add macros support for update intervals



support.zabbix.com

A Zen garden scene featuring a grey stone in the center of concentric circles in the sand, with horizontal lines to the left.

Questions?