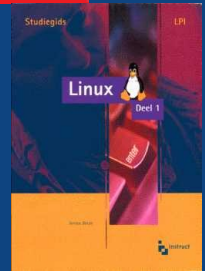
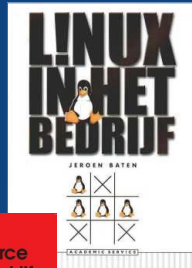


Using Zabbix LLD to save yourself a lot of work!



Who am I?

- Jeroen Baten (English, Spanish: Yerun)
- Job title : IT Solutionist, company: i2rs
- Author of 8 books (2 more in beta)
- Dad of 5 girls
- (former) volunteer fire fighter
- Scouting
- Trainer, teacher (bachelor level university)
- Member of Angrynerds podcast team



What do I do?



- Remote systems management
 - Monitoring
 - Backups
 - Sysadmin stuff
- Consultancy
- Teaching/training (Python, Web, Linux, etc)
- Writing (Books, blogs, articles)

My main project



- LibrePlan
- Web-based project management appl.
- Very cool!

LIBREPLAN

OpenWebPlanning

The screenshot displays the LibrePlan web application interface. The top navigation bar includes tabs for 'Scheduling', 'Resources', 'Administration / Management', 'Reports', and 'My account'. The main content area is titled 'LibrePlan customization' and shows a 'WBS (tasks)' table. The table has columns for 'Scheduling state', 'Code', 'Name', 'Hours', 'Must start after', and 'Deadline'. The tasks listed are:

Scheduling state	Code	Name	Hours	Must start after	Deadline
C		Project Coordination	200		
C		Graphical design	140		
C		Initial Drafts	60		
C		Static prototypes	40		10/12/11
C		Brand deliverables	20		
C		HTML/CSS templates	80		
C		Feature A implementation	70		
C		Feature B implementation	150		
C		Subfeature B.1	40		
C		Subfeature B.2	110		
C		Add functional Testing	60		
C		Quality Assurance	20		

Let me start with apologies first...



Talking the same language... can still cause a culture clash.
With respect to the code of conduct:
Please forgive me where applicable.
(Trick: Dutch people take everything literally!)

WHAT THE BRITISH SAY	WHAT THE BRITISH MEAN	WHAT THE DUTCH UNDERSTAND
<i>With all due respect ...</i>	<i>I think you are wrong.</i>	<i>He is listening to me.</i>
<i>Perhaps you would think about ... I would suggest ...</i>	<i>This is an order. Do it or be prepared to justify yourself.</i>	<i>Think about this idea and do it if you like.</i>
<i>Oh, by the way ...</i>	<i>The following criticism of the purpose of the discussion is ...</i>	<i>This is not very important.</i>
<i>I was a bit disappointed that ...</i>	<i>I am very upset and angry that ...</i>	<i>It doesn't really matter.</i>
<i>Very interesting ...</i>	<i>I don't like it.</i>	<i>They are impressed.</i>
<i>Could you consider some other options?</i>	<i>Your idea is not a good one.</i>	<i>They have not yet decided.</i>
<i>Please think about that some more.</i>	<i>It's a bad idea. Don't do it.</i>	<i>It's a good idea. Keep developing it.</i>
<i>I'm sure it's my fault.</i>	<i>It's not my fault.</i>	<i>It was their fault.</i>
<i>That is an original point of view.</i>	<i>Your idea is stupid.</i>	<i>They like my ideas!</i>

The first reason for this talk



- I get a new client:
 - Former admin used only WebMin
 - 98 Apache ServerAliases
 - 62 Apache ServerNames
 - In 17 config files
 - SSL cert files all over the place
- In short: it's a mess

The second reason for this talk



- I run a server with multiple websites
- Most are WordPress
- They are all separated instances
- How to know when to update/patch
 - WordPress major update
 - Plugin update
 - Theme update

So, what is this LLD stuff?



- LLD = Low Level Discovery
- How does this work?
 - You create a check that returns a JSON array
 - You use the returned values in additional/prototype items and -triggers

Example with WordPress



- Open template:
- Locate “Discovery” and click to open...

A screenshot of the Zabbix web interface showing the 'Templates' page. The page has a navigation bar with 'ZABBIX' and various menu items like 'Monitoring', 'Inventory', 'Reports', 'Configuration', and 'Administration'. Below the navigation bar, there are sub-menus for 'Host groups', 'Templates', 'Hosts', 'Maintenance', 'Actions', 'Event correlation', 'Discovery', and 'Services'. The main content area is titled 'Templates' and includes a search bar, a 'Group' dropdown menu set to 'all', and buttons for 'Create template' and 'Import'. There are also input fields for 'Name' (containing 'i2rs'), 'Tags', and 'Linked templates'. A large red arrow points from the 'Discovery' column header in the table below to the 'Discovery' column of the table row. The table has columns for 'Name', 'Applications', 'Items', 'Triggers', 'Graphs', 'Screens', 'Discovery', 'Web', 'Linked templates', 'Linked to', and 'Tags'. The first row in the table is 'All i2rs web check' with 'Discovery 1' in the 'Discovery' column.

<input type="checkbox"/>	Name ▲	Applications	Items	Triggers	Graphs	Screens	Discovery	Web	Linked templates	Linked to	Tags
<input type="checkbox"/>	All i2rs web check	Applications 2	Items 1	Triggers	Graphs	Screens	Discovery 1	Web		i2rs-odoo-p, www-and-mail-server	

Displaying 1 of 1 found



Good to know:

- A LLD has a name
- A LLD has it's own items and triggers
- But these are “prototypes”!
- Let's open the first LLD by it's name...

The screenshot shows the ZABBIX web interface. The top navigation bar includes 'ZABBIX' and menu items: Monitoring, Inventory, Reports, Configuration, Administration. Below this is a secondary navigation bar with: Host groups, Templates, Hosts, Maintenance, Actions, Event correlation, Discovery, Services. The main content area is titled 'Discovery rules' and includes a 'Create discovery rule' button. A breadcrumb trail reads: All templates / All i2rs web check / Applications 2 / Items 1 / Triggers / Graphs / Screens / Discovery rules 1 / Web scenarios. A table lists the discovery rules:

<input type="checkbox"/>	Name ▲	Items	Triggers	Graphs	Hosts	Key	Interval	Type	Status
<input type="checkbox"/>	LLD wordpress sites on server	Item prototypes 6	Trigger prototypes 3	Graph prototypes	Host prototypes	wp.sites	4h	Zabbix agent	Enabled

Displaying 1 of 1 found

The first step in a LLD



- Getting the data!
- I use the normal agent
- I use a new key “wp.sites” created with userparameter file
- I set interval to 4 hours
- let’s look at the userparameter “wp.sites”

The screenshot shows the Zabbix web interface. The top navigation bar includes 'ZABBIX', 'Monitoring', 'Inventory', 'Reports', 'Configuration', and 'Administration'. Below this is a secondary navigation bar with 'Host groups', 'Templates', 'Hosts', 'Maintenance', 'Actions', 'Event correlation', 'Discovery', and 'Services'. The main content area is titled 'Discovery rules' and shows a breadcrumb trail: 'All templates / All i2rs web check / Discovery list / LLD wordpress sites on server / Item prototypes 6 / Trigger prototypes 3 / Graph prototypes / Host prototypes'. The 'Discovery rule' tab is selected, showing the configuration for 'LLD wordpress sites on server'. The configuration includes: Name: 'LLD wordpress sites on server', Type: 'Zabbix agent', Key: 'wp.sites', Update interval: '4h', and Keep lost resources period: '30d'. A table for 'Custom intervals' is also visible, with one entry: Type: 'Flexible Scheduling', Interval: '50s', Period: '1-7,00:00-24:00', and Action: 'Remove'.

ZABBIX Monitoring Inventory Reports Configuration Administration

Host groups Templates Hosts Maintenance Actions Event correlation Discovery Services

Discovery rules

All templates / All i2rs web check / Discovery list / **LLD wordpress sites on server** / Item prototypes 6 / Trigger prototypes 3 / Graph prototypes / Host prototypes

Discovery rule Preprocessing LLD macros Filters

* Name: LLD wordpress sites on server

Type: Zabbix agent

* Key: wp.sites

* Update interval: 4h

Custom intervals

Type	Interval	Period	Action
Flexible Scheduling	50s	1-7,00:00-24:00	Remove

[Add](#)

* Keep lost resources period: 30d

Userparameter on client



- UserParameter=wp.sites,/usr/local/sbin/generate_list_of_wordpress_sites.sh

Script contents



```
#!/bin/bash
echo "{"
echo "'data': ["
fmt="{\"{#%s}\": %s,\"{#%s}\": %s,\"{#%s}\": %s}"
first=0
for file in $( ls /etc/apache2/sites-enabled/*.conf )
do
  while read -a line
  do
    case ${line[0]} in
      \<VirtualHost)
        vhost=${line[1]:0:(-1)}
        if [[ $vhost == *"80"* ]]; then
          prot="http"
        fi
        if [[ $vhost == *"443"* ]]; then
          prot="https"
        fi
        ;;
      ServerName)
        servername=${line[1]}
        ;;
    esac
  done < $file
done
echo ""
echo "]"
echo "}"
```

```
DocumentRoot)
docroot=${line[1]}
\</VirtualHost\>)
if [[ ${#docroot} -gt 0 ]];
;;then
  if [[ $first -ne 0 ]]; then
    echo ","
  fi
  first=1
  printf "$fmt" HOST "\"${servername}\"" PROTO \
    "\"${prot}\"" DOCROOT "${docroot}"
  printf "\n"
fi
;;
esac
done < $file
done
echo ""
echo "]"
echo "}"
```

Script output



- Macro's: #HOST, #PROTO, #DOCR00T
- These macro's are later used in "LLD item prototypes"

```
{
"data": [
{"#HOST": "angrynerdspodcast.nl", "#PROTO": "http", "#DOCR00T": "/srv/www/default"}
,
{"#HOST": "angrynerdspodcast.nl", "#PROTO": "https", "#DOCR00T":
"/srv/www/http-angrynerdspodcast.nl/wordpress/"}
,
{"#HOST": "www.i2rs.nl", "#PROTO": "http", "#DOCR00T": "/srv/www/http-www.i2rs.nl/wordpress/"}
,
{"#HOST": "www.i2rs.nl", "#PROTO": "https", "#DOCR00T": "/srv/www/http-www.i2rs.nl/wordpress/"}
]
}
```

Item prototype examples



- Check if site in DNS
- Check WP plugins/themes
- Example: wp.updatecli
- Dependent items: wp.update_plugins

ZABBIX Monitoring Inventory Reports Configuration Administration

Host groups Templates **Hosts** Maintenance Actions Event correlation Discovery Services zabbix server

Item prototypes

[All templates](#) / [All i2rs web check](#) / [Discovery list](#) / [LLD wordpress sites on server](#) / **Item prototypes 6** / [Trigger prototypes 3](#) / [Graph prototypes](#) / [Host prototypes](#)

<input type="checkbox"/>	Wizard	Name ▲	Key	Interval	History	Trends	Type	Applications	Create enabled
<input type="checkbox"/>	...	Checking DNS existence of {#HOST}	net.dns.record[,{#HOST},A]	4h	90d		Zabbix agent	Apache	Yes
<input type="checkbox"/>	...	Wordpress update info for {#HOST}: Wordpress plugin update info for {#HOST}	wp.update_plugins[{#HOST}]		90d	365d	Dependent item	Apache	Yes
<input type="checkbox"/>	...	Wordpress update info for {#HOST}: Wordpress theme update info for {#HOST}	wp.update_themes[{#HOST}]		90d	365d	Dependent item	Apache	Yes
<input type="checkbox"/>	...	Wordpress update info for {#HOST}: Wordpress total update info for {#HOST}	wp.update_total[{#HOST}]		90d	365d	Dependent item	Apache	Yes
<input type="checkbox"/>	...	Wordpress update info for {#HOST}	wp.updatecli[#{#DOCROOT}]	4h	90d		Zabbix agent	Apache	Yes
<input type="checkbox"/>	...	Wordpress update info for {#HOST}: Wordpress wordpress update info for {#HOST}	wp.update_wordpress[{#HOST}]		90d	365d	Dependent item	Apache	Yes

Displaying 6 of 6 found



wp.updatecli

- Item key= wp.updatecli[{ #DOCROOT}]
- UserParameter=wp.updatecli[*],php \$1/wp-zabbix.php
- php /srv/www/http-www.i2rs.nl/wordpress/wp-zabbix.php
- Output:

```
{"plugins":3,"themes":0,"wordpress":0,"translations":0,"total":3}
```
- Using this for later dependent items

A screenshot of the Zabbix web interface showing the configuration for an item prototype. The interface has a dark blue header with the Zabbix logo and navigation tabs for Monitoring, Inventory, Reports, and Configuration. Below the header, there are sub-tabs for Host groups, Templates, Hosts, Maintenance, Actions, and Event correlation. The main content area is titled 'Item prototypes' and shows a breadcrumb trail: 'All templates / All i2rs web check / Discovery list / LLD wordpress sites on ser'. The 'Preprocessing' tab is selected, and the configuration form shows the following fields:

- * Name: Wordpress update info for {#HOST}
- Type: Zabbix agent (dropdown menu)
- * Key: wp.updatecli[{#DOCROOT}]
- Type of information: Text (dropdown menu)
- * Update interval: 4h



wp.update_plugins

- Dependent item (depending on wp.updatecli item)
- Needs Preprocessing to find needed value

All templates / All i2rs web check / Discovery list / LLD wordpress sites on server / Item prototypes 6

Item prototype Preprocessing

* Name Wordpress plugin update info for {#HOST}

Type Dependent item

* Key wp.update_plugins[{#HOST}]

* Master item All i2rs web check: Wordpress update info for {#HOST}

Type of information Numeric (unsigned)

All templates / All i2rs web check / Discovery list / LLD wordpress sites on server / Item prototypes 6

Item prototype Preprocessing

Preprocessing steps	Name	Parameters
1:	JSONPath	\$.plugins

Add

Update Clone Delete Cancel

Trigger prototype



Expression:

```
{All i2rs web check:wp.update_wordpress[ {#HOST} ].last()}>0
```

A screenshot of the ZABBIX web interface. The top navigation bar includes 'ZABBIX', 'Monitoring', 'Inventory', 'Reports', 'Configuration', and 'Administration'. Below this is a secondary navigation bar with 'Host groups', 'Templates', 'Hosts', 'Maintenance', 'Actions', 'Event correlation', 'Discovery', and 'Services'. The main content area is titled 'Trigger prototypes' and shows a breadcrumb trail: 'All templates / All i2rs web check / Discovery list / LLD wordpress sites on server'. There are tabs for 'Item prototypes 6', 'Trigger prototypes 3', 'Graph prototypes', and 'Host prototypes'. A table lists three trigger prototypes, each with a checkbox, a severity level (Warning), a name, an operational data field, and an expression.

<input type="checkbox"/>	Severity	Name ▲	Operational data	Expression
<input type="checkbox"/>	Warning	Wordpress needs update for {#HOST}		{All i2rs web check:wp.update_wordpress[{#HOST}].last()}>0
<input type="checkbox"/>	Warning	Wordpress plugins need update for {#HOST}		{All i2rs web check:wp.update_plugins[{#HOST}].last()}>0
<input type="checkbox"/>	Warning	Wordpress themes need update for {#HOST}		{All i2rs web check:wp.update_themes[{#HOST}].last()}>0

Results



- Monitoring->Dashboard

2020-01-15 23:58:19	PROBLEM	www-and-mail-server	Wordpress plugins need update for www.jeroenbaten.nl	1d 15h 39m	No	1
2020-01-15 19:58:26	PROBLEM	www-and-mail-server	Wordpress plugins need update for [REDACTED]	1d 19h 39m	No	1
2020-01-14 03:58:17	PROBLEM	www-and-mail-server	Wordpress plugins need update for www.i2rs.nl	3d 11h 39m	No	1

Results



- Configuration→Hosts→Items
- From LLD item prototypes created items.
- Items can be deleted. LDD will create again

<input type="checkbox"/>	LLD wordpress sites on server: Wordpress update info for www.i2rs.nl: Wordpress total update info for www.i2rs.nl		wp.update_total[www.i2rs.nl]	90d	365d	Dependent item	Apache	Enabled
<input type="checkbox"/>	LLD wordpress sites on server: Wordpress update info for www.i2rs.nl: Wordpress wordpress update info for www.i2rs.nl	Triggers 1	wp.update_wordpress[www.i2rs.nl]	90d	365d	Dependent item	Apache	Enabled
<input type="checkbox"/>	LLD wordpress sites on server: Wordpress update info for www.i2rs.nl: Wordpress theme update info for www.i2rs.nl	Triggers 1	wp.update_themes[www.i2rs.nl]	90d	365d	Dependent item	Apache	Enabled
<input type="checkbox"/>	LLD wordpress sites on server: Wordpress update info for www.i2rs.nl: Wordpress plugin update info for www.i2rs.nl	Triggers 1	wp.update_plugins[www.i2rs.nl]	90d	365d	Dependent item	Apache	Enabled

Results



- Monitoring → Latest data
- (Yes, this is when I made this presentation)

<input type="checkbox"/>	Wordpress plugin update info for ww... wp.update_plugins[www.i2rs.nl]	365d	365d	Dependent i...	2020-01-17 11:58:17	3
<input type="checkbox"/>	Wordpress theme update info for w... wp.update_themes[www.i2rs.nl]	365d	365d	Dependent i...	2020-01-17 11:58:17	0
<input type="checkbox"/>	Wordpress total update info for www... wp.update_total[www.i2rs.nl]	365d	365d	Dependent i...	2020-01-17 11:58:17	3

Since that day...



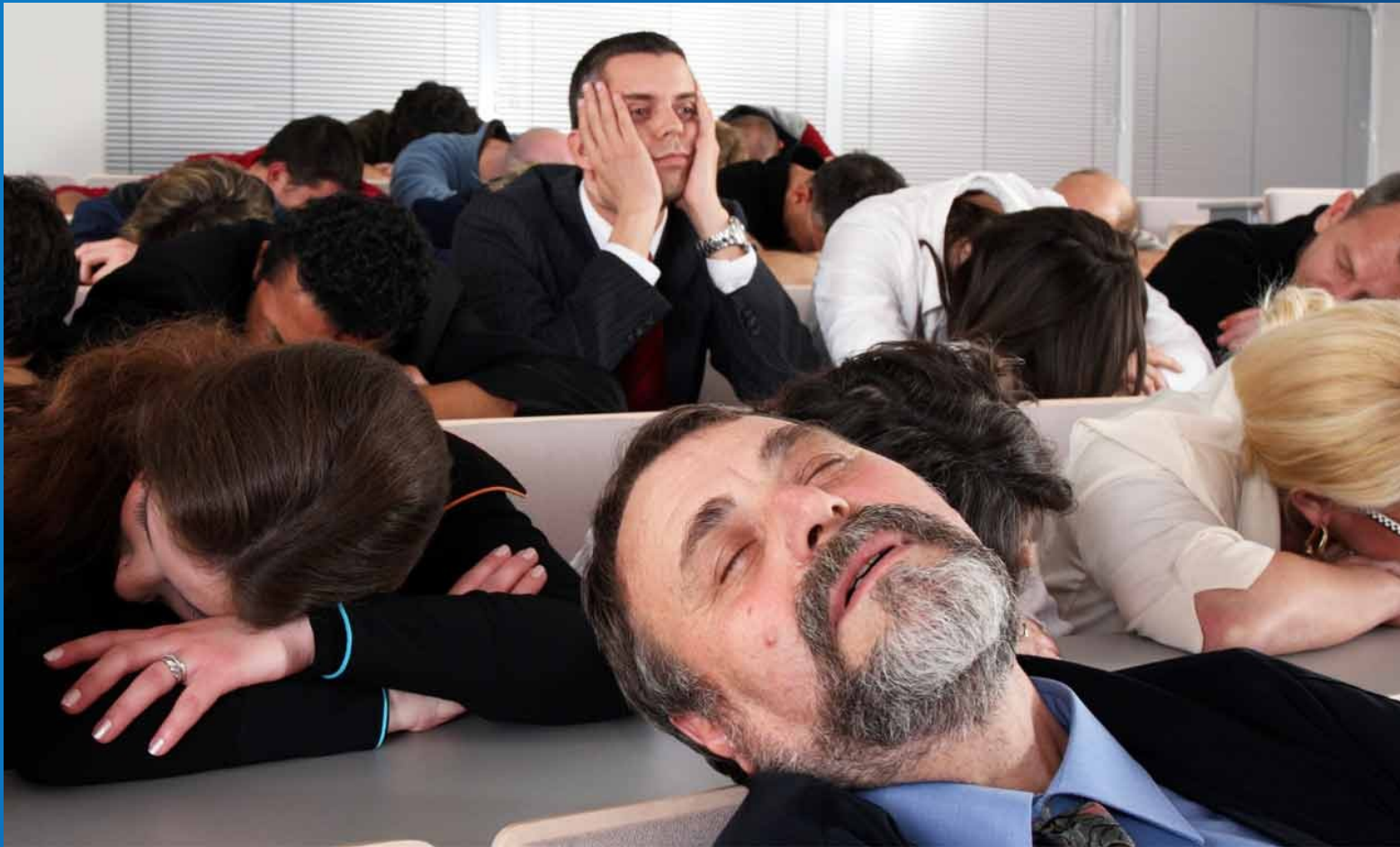
- I solved the client case with the crappy Apache config to monitor all their sites.
- Keep track of remaining lifetime of SSL certs for that client
- Keep track of remaining lifetime of SSL certs for my own sites
- New brain rule: how can I make this into a LDD?

Tools you (really!) need



- Zabbix (duh)
- The “jq” program to check JSON output

Thank you for your attention



Questions for me?: jeroen@i2rs.nl