

# ZABBIX MONITORING DIE VOLLE KONTROLLE



# Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.

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SLAC 2011





# Was ist Zabbix?

Opensource Monitoringlösung

Basierend auf:

Serverdaemon

SQL Datenbank

Webgui

Agent

## Monitoring

Wissen, was passiert.

Wissen, was zu tun ist.



# Was macht Zabbix?

- Daten sammeln (Items)  
Zabbix Agent (Unix, Windows)  
SNMP, IMPI, SSH, Telnet, ODBC
- Daten auswerten (Trigger)
- Daten präsentieren (Graph)
- Aktionen auslösen (Action)  
Mail, SMS, Telefonanruf,  
Kommando lokal und remote

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



# Zabbix installieren

Systemvoraussetzungen Server

- Unix mit gcc
- SQL Datenbank  
MySQL, Postgre SQL, Oracle, DB2
- Webserver mit PHP

Die Installation aus den Quellen gelingt auf allen gängigen Distributionen.

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



# Zabbix konfigurieren

- Konfiguration ausschließlich über Webgui
- Alle Daten werden in DB gespeichert
- Agenten sind „dumm“, alle Steuerung geht vom Server aus
- Minimale Konfig-Datei für Server mit DB Zugangsdaten

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



Zabbix  
Konfigurieren

# Terminologie

## Host:

Wer wird beobachtet?  
IP Adresse, DNS-Name

Host werden in Gruppen  
zusammengefasst.

Template = vorkonfigurierter Host ohne  
Adresse, die eine Konfiguration  
vererben.

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.





# Host anlegen\*:

Host [decix.laxin.de]

Name	<input type="text" value="decix.laxin.de"/>										
Groups	<table><tr><td>In groups</td><td><input type="text" value="External Infrastructure"/></td><td>&lt;&lt;</td><td>&gt;&gt;</td><td>Other groups</td></tr><tr><td></td><td></td><td></td><td></td><td><ul style="list-style-type: none"><li>Discovered Hosts</li><li>ESX Server</li><li>Linux servers</li><li>other Websites</li><li>Semigator External</li><li>Semigator Gateways</li><li>Semigator Mailservers</li><li>Semigator MySQL</li><li>Semigator NAS</li><li>Semigator Server</li></ul></td></tr></table>	In groups	<input type="text" value="External Infrastructure"/>	<<	>>	Other groups					<ul style="list-style-type: none"><li>Discovered Hosts</li><li>ESX Server</li><li>Linux servers</li><li>other Websites</li><li>Semigator External</li><li>Semigator Gateways</li><li>Semigator Mailservers</li><li>Semigator MySQL</li><li>Semigator NAS</li><li>Semigator Server</li></ul>
In groups	<input type="text" value="External Infrastructure"/>	<<	>>	Other groups							
				<ul style="list-style-type: none"><li>Discovered Hosts</li><li>ESX Server</li><li>Linux servers</li><li>other Websites</li><li>Semigator External</li><li>Semigator Gateways</li><li>Semigator Mailservers</li><li>Semigator MySQL</li><li>Semigator NAS</li><li>Semigator Server</li></ul>							
New group	<input type="text"/>										
DNS name	<input type="text" value="decix.laxin.de"/>										
IP address	<input type="text" value="83.141.0.214"/>										
Connect to	<input type="text" value="IP address"/>										
Zabbix agent port	<input type="text" value="10050"/>										
Monitored by proxy	<input type="text" value="(no proxy)"/>										
Status	<input type="text" value="Monitored"/>										
Use IPMI	<input type="checkbox"/>										

Save Clone Full clone Delete Cancel



Zabbix  
Konfigurieren

# Terminologie

## Item:

Was wird beobachtet?

CPU-Auslastung,  
Speicherverbrauch,  
Erreichbarkeit, Festplattenauslastung, etc.

Aus welcher Quelle stammen die  
Daten?

Zabbix Agent, SNMP, IPMI, SSH, ODBC, externe  
Skripte auf Agent oder Server

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



## Item "Simple Ping : ICMP Ping"



Host	Simple Ping	Select
Description	ICMP Ping	
Type	Simple check	
Key	lcmpping[,3,,,10]	Select
Type of information	Numeric (unsigned)	
Data type	Decimal	
Units		
Use custom multiplier	<input type="checkbox"/> 0	
Update interval (in sec)	90	
Flexible intervals (sec)	No flexible intervals	
New flexible interval	Delay 50 Period 1-7,00:00-23:59	
	Add	
Keep history (in days)	90	Clear history
Keep trends (in days)	365	
Status	Active	
Store value	As is	
Show value	As is	<a href="#">show value mappings</a>
New application		
Applications	-None- Simple Ping	

Item  
anlegen

\*

Save

Clone

Delete

Cancel

Werte  
der  
Items:  
\*

ITEMS				
		Group <input type="text" value="all"/>	Host <input type="text" value="all"/>	
		Filter		
		Show items with description like <input type="text"/>		
		Filter	Reset	
Host	Description	Last check	Last value	Change
dev.semigator.int	<b>Linux Base Information</b> (8 Items)			
	CPU IDLE AVG5	08 Jun 2010 20:40:34	99.855922	-0.01
	CPU IOWait AVG5	08 Jun 2010 20:40:35	0.000000	-
	CPU load AVG5	08 Jun 2010 20:40:33	0.030000	+0.01
	CPU User AVG5	08 Jun 2010 20:40:37	0.050255	-0
	Free disk on / (percent)	08 Jun 2010 20:40:39	78.356553	-0
	Free disk on /var (percent)	08 Jun 2010 20:40:40	82.712075	-0.01
	Net Usage eth0 IN	08 Jun 2010 09:31:45	56.76 b	-23.50
	Net Usage eth0 OUT	08 Jun 2010 09:32:21	50.87 b	-33.92
dev.semigator.int	<b>System Base Information</b> (4 Items)			
	Agent Ping	08 Jun 2010 20:40:07	1	-
	Local Time	08 Jun 2010 09:30:09	1275982209.000000	+360
	Packet Loss	08 Jun 2010 20:40:09	0.000000	-
	Ping Check	08 Jun 2010 20:40:31	1	-
exchange.semigator.int	<b>Exchange</b> (1 Items)			
	Exchange Process Running	08 Jun 2010 20:40:14	1	-
exchange.semigator.int	<b>System Base Information</b> (4 Items)			
	Agent Ping	08 Jun 2010 20:39:52	1	-
	Local Time	08 Jun 2010 09:28:54	1275982134.000000	+360
	Packet Loss	08 Jun 2010 20:39:54	0.000000	-
	Ping Check	08 Jun 2010 20:40:09	1	-
exchange.semigator.int	<b>Windows Base Information</b> (2 Items)			
	CPU Load	08 Jun 2010 20:40:16	0.383333	-2.55
	Free Disk C: Percent	08 Jun 2010 09:29:18	14.386481	-0.01
gate1.semigator.de	<b>Base Checks</b> (1 Items)			
gate1.semigator.de	<b>Postfix</b> (1 Items)			
gate1.semigator.int	<b>Linux Base Information</b> (8 Items)			
	CPU IDLE AVG5	08 Jun 2010 20:40:13	99.842197	+0.10
	CPU IOWait AVG5	08 Jun 2010 20:40:18	0.000000	-
	CPU load AVG5	08 Jun 2010 20:39:53	0.000000	-
	CPU User AVG5	08 Jun 2010 20:40:23	0.067155	-0.03

Zabbix  
Konfigurieren

# Terminologie

## Trigger:

Daten der Items auswerten

Daten der Items berechnen

Durchschnitt, Summe etc.

Sollwerte definieren und mit Istwerten  
vergleichen

Trigger kennt nur den Status TRUE oder  
FALSE.

## Monitoring

Wissen, was passiert.

Wissen, was zu tun ist.





# Trigger anlegen:

The image shows a web application interface for configuring a trigger. The main window is titled "Trigger" and contains the following fields:

- Name:
- Expression (Toggle input method):
- The trigger depends on: No dependencies defined
- New dependency:
- Event generation: Normal
- Severity: Not classified
- Comments:
- URL:
- Disabled:

At the bottom right of the "Trigger" window are "Save" and "Cancel" buttons.

Overlaid on the "Trigger" window is a "Condition" window from Mozilla Firefox. The address bar shows the URL: [https://monitoring.semigator.de/popup\\_trepr.php?dstfrm=config\\_trigger](https://monitoring.semigator.de/popup_trepr.php?dstfrm=config_trigger). The "Condition" window has a dropdown menu for "Function" with the following options:

- Last value = N
- Average value for period of T times > N
- Average value for period of T times = N
- Average value for period of T times NOT N
- Difference between MAX and MIN value of T times < N
- Difference between MAX and MIN value of T times > N
- Difference between MAX and MIN value of T times = N
- Difference between MAX and MIN value of T times NOT N
- Difference between last and previous value of T times < N.
- Difference between last and previous value of T times > N.
- Difference between last and previous value of T times = N.
- Difference between last and previous value of T times NOT N.
- Number of successfully retrieved values V for period of time T < N.
- Number of successfully retrieved values V for period of time T > N.
- Number of successfully retrieved values V for period of time T = N.
- Number of successfully retrieved values V for period of time T NOT N.
- N = X, where X is 1 - if last and previous values differs, 0 - otherwise.
- N NOT X, where X is 1 - if last and previous values differs, 0 - otherwise.
- Last value < N
- Last value > N
- Last value = N

Zabbix  
Konfigurieren

# Terminologie

## Template:

Templates = fertige Konfiguration bestehend aus Items und Triggern. Hosts können zu beliebig vielen Templates hinzugefügt werden. Der Großteil der Konfiguration wird über Templates realisiert.

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



# Template Übersicht

<input type="checkbox"/> <b>Templates</b> ▲	<b>Applications</b>	<b>Items</b>	<b>Triggers</b>	<b>Graphs</b>	<b>Linked templates</b>	<b>Linked to</b>
<input type="checkbox"/> <a href="#">Semiqator agentless</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (1)	<a href="#">Triggers</a> (1)	<a href="#">Graphs</a> (0)	-	<a href="#">gate1.semiqator.de</a> , <a href="#">gate2.semiqator.de</a> , <a href="#">postamt.semiqator.de</a> , <a href="#">wi.semiqator.de</a>
<input type="checkbox"/> <a href="#">Semiqator Base</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (4)	<a href="#">Triggers</a> (2)	<a href="#">Graphs</a> (0)	-	<a href="#">dev.semiqator.int</a> , <a href="#">exchange.semiqator.int</a> , <a href="#">gate1.semiqator.int</a> , <a href="#">gate2.semiqator.int</a> , <a href="#">sql03.semiqator.int</a> , <a href="#">syslog.semiqator.int</a> , <a href="#">web01.semiqator.int</a>
<input type="checkbox"/> <a href="#">Semiqator Exchange</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (1)	<a href="#">Triggers</a> (0)	<a href="#">Graphs</a> (0)	-	<a href="#">exchange.semiqator.int</a>
<input type="checkbox"/> <a href="#">Semiqator Linux Base</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (9)	<a href="#">Triggers</a> (0)	<a href="#">Graphs</a> (0)	-	<a href="#">dev.semiqator.int</a> , <a href="#">gate1.semiqator.int</a> , <a href="#">gate2.semiqator.int</a> , <a href="#">monitoring.semiqator.de</a> , <a href="#">office.semiqator.int</a> , <a href="#">sql03.semiqator.int</a> , <a href="#">syslog.semiqator.int</a> , <a href="#">web01.semiqator.int</a>
<input type="checkbox"/> <a href="#">Semiqator MySQL</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (3)	<a href="#">Triggers</a> (0)	<a href="#">Graphs</a> (0)	-	<a href="#">sql03.semiqator.int</a>
<input type="checkbox"/> <a href="#">Semiqator Postfix</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (4)	<a href="#">Triggers</a> (0)	<a href="#">Graphs</a> (0)	-	<a href="#">gate1.semiqator.int</a> , <a href="#">gate2.semiqator.int</a> , <a href="#">office.semiqator.int</a> , <a href="#">web01.semiqator.int</a>
<input type="checkbox"/> <a href="#">Semiqator Windows Base</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (3)	<a href="#">Triggers</a> (0)	<a href="#">Graphs</a> (0)	-	<a href="#">exchange.semiqator.int</a>
<input type="checkbox"/> <a href="#">SMTP Server</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (0)	<a href="#">Triggers</a> (0)	<a href="#">Graphs</a> (0)	-	<a href="#">exchange.semiqator.int</a> , <a href="#">gate1.semiqator.de</a> , <a href="#">gate2.semiqator.de</a>
<input type="checkbox"/> <a href="#">Website</a>	<a href="#">Applications</a> (1)	<a href="#">Items</a> (1)	<a href="#">Triggers</a> (1)	<a href="#">Graphs</a> (0)	-	<a href="#">pv2.semiqator.de</a> , <a href="#">vtiger.semiqator.com</a> , <a href="#">www.semiqator.de</a>

# Template und Items Übersicht

<input type="checkbox"/>	Log	Description ▲	Triggers	Key	Interval	History	Trends	Type	Status
<input type="checkbox"/>		<a href="#">Semiqator Base:Agent Ping</a>	<a href="#">Triggers</a> (1)	agent.ping	60	30	60	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:CPU IDLE AVG5</a>	<a href="#">Triggers</a> (0)	system.cpu.util[,idle,avg5]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:CPU IOWait AVG5</a>	<a href="#">Triggers</a> (0)	system.cpu.util[,iowait,avg5]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:CPU KERNEL AVG5</a>	<a href="#">Triggers</a> (0)	system.cpu.util[,kernel,avg5]	90	90	365	Zabbix agent	<a href="#">Not supported</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:CPU load AVG5</a>	<a href="#">Triggers</a> (0)	system.cpu.load[,avg5]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:CPU User AVG5</a>	<a href="#">Triggers</a> (0)	system.cpu.util[,user,avg5]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:Free disk on / (percent)</a>	<a href="#">Triggers</a> (0)	vfs.fs.size[/,pfree]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:Free disk on /var (percent)</a>	<a href="#">Triggers</a> (0)	vfs.fs.size[/var,pfree]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Base:Local Time</a>	<a href="#">Triggers</a> (0)	system.localtime	360	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Mails bounced per 5min</a>	<a href="#">Triggers</a> (0)	mysql.exec[bounced_mails]	300	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Mails deferred per 5min</a>	<a href="#">Triggers</a> (0)	mysql.exec[deferred_mails]	300	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Mails sent per 5min</a>	<a href="#">Triggers</a> (0)	mysql.exec[sent_mails]	300	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator MySQL:mysqld up and running</a>	<a href="#">Triggers</a> (0)	proc.num[mysqld]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator MySQL:mysql ping</a>	<a href="#">Triggers</a> (0)	mysql.ping	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:Net Usage eth0 IN</a>	<a href="#">Triggers</a> (0)	net.if.in[eth0]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Linux Base:Net Usage eth0 OUT</a>	<a href="#">Triggers</a> (0)	net.if.out[eth0]	90	90	365	Zabbix agent	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Base:Packet Loss</a>	<a href="#">Triggers</a> (0)	icmppingloss	60	30	60	Simple check	<a href="#">Active</a>
<input type="checkbox"/>		<a href="#">Semiqator Base:Ping Check</a>	<a href="#">Triggers</a> (1)	icmpping	60	30	60	Simple check	<a href="#">Active</a>



Zabbix  
Konfigurieren

# Terminologie

## Action:

Aktion in Abhängigkeit von einem Trigger auslösen.

Aktionen =

- Email senden
- Lokales Kommando ausführen
- Remote Kommando ausführen

*In vielen Fällen reicht eine Standardaktion: „Send Notification if Trigger is true“*

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



# Aktion Mail senden

**Action**

Name

Event source

Enable escalations

Default subject

Default message

Recovery message

Status

**Action conditions**

Conditions (A)  Trigger value = "PROBLEM"

**Action operations**

<input type="checkbox"/>	Details	Action
<input type="checkbox"/>	Send message to Group "Zabbix administrators"	<input type="button" value="Edit"/>

**Edit operation**

Operation type

Send message to

Send only to

Default message

# Aktion Telefonkette

**Action**

Name:

Event source:

Enable escalations:

Period (seconds):  [min 60]

Default subject:

Default message:

Recovery message:

Status:

**Action conditions**

Type of calculation:  (A) and (B) and (C) and (D)

Conditions:

- (A)  Trigger value = "PROBLEM"
- (B)  Maintenance status not in "maintenance"
- (C)  Trigger severity >= "Disaster"
- (D)  Host group <> "Low Prio"

**Action operations**

<input type="checkbox"/>	Steps	Details	Period (sec)	Delay	Action
<input type="checkbox"/>	1 - 0	Send message to User "Hotline"	Default	Immediately	<input type="button" value="Edit"/>
<input type="checkbox"/>	2	Send message to User "david.:"	Default	3m	<input type="button" value="Edit"/>
<input type="checkbox"/>	3	Send message to User "michael.:"	Default	6m	<input type="button" value="Edit"/>
<input type="checkbox"/>	4	Send message to User "andreas.f.:"	Default	9m	<input type="button" value="Edit"/>
<input type="checkbox"/>	5	Send message to User "dominik.:"	Default	12m	<input type="button" value="Edit"/>
<input type="checkbox"/>	6	Send message to User "thorsten.kramm"	Default	15m	<input type="button" value="Edit"/>
<input type="checkbox"/>	7 - 0	Send message to User "Hotline"	Default	18m	<input type="button" value="Edit"/>
<input type="checkbox"/>	8 - 0	Send message to User "david.:"	Default	21m	<input type="button" value="Edit"/>

**Edit operation**

From:

Step: To:  [0-Infinity]

Period:  [min 60, 0-Default]

Operation type:

Send message to:

Send only to:

User medias:

Default message:

Conditions: (A)  Event acknowledged = "Not Ack"

Zabbix  
Konfigurieren

## Alarmieren

- Schwellwerte so einstellen, dass Fehlalarme vermieden werden.
- Trigger in Abhängigkeit setzen

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.





# Abhängige Trigger

**Trigger "Pingcheck faild 3Times"** ?

Name

Expression ([Toggle input method](#))

The trigger depends on No dependencies defined

New dependency

Event generation  ▼

Severity  ▼

**Trigger** ?

Name

Expression ([Toggle input method](#))

The trigger depends on  Pingcheck faild 3Times

New dependency

Event generation  ▼

Severity  ▼

Zabbix  
Konfigurieren

# Alarmieren

SMS Versenden:  
Einfach z.B. über Sipgate-API  
Sicherer über USB UMTS-Stick

Zabbix Benutzer steuern selbst, wann  
sie wie alarmiert werden.

# Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



# SMS Alarm hinzufügen

The image shows the Zabbix user configuration interface for the user "thorsten.kramm". The main page contains various settings for the user, including alias, name, surname, password, user type, groups, language, theme, auto-login, auto-logout, refresh rate, rows per page, and URL after login. At the bottom, there is a table for media configurations.

Overlaid on the main page is a "New media" dialog box from Mozilla Firefox. The dialog box is titled "Media - Mozilla Firefox" and shows the URL "https://monitoring.semigator.de/popup\_m". The "New media" section contains the following fields and options:

- Type: SMS Sippgate
- Send to: 0049151236598
- When active: 1-7,00:00-23:59
- Use if severity:  Not classified,  Information,  Warning,  Average,  High,  Disaster
- Status: Enabled

The dialog box has "Add" and "Cancel" buttons at the bottom right. The main page has "Add" and "Delete selected" buttons for the media table.

Media	Send to	When active	Severity	Status	Action	
<input type="checkbox"/>	Email	kramm@semigator.de	1-7,00:00-23:59;	NIWAHD	Enabled	Edit

Wahres Wissen ist Wissen,  
das auf die Ursachen zurückgeht.

Francis Bacon

## Monitoring

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Zabbix  
Konfigurieren

# Visualisieren

- Werte von Items in Graphen abbilden
- Mehrere Graphen zu Screen gruppieren
- Graphen können auch über Template konfiguriert werden.

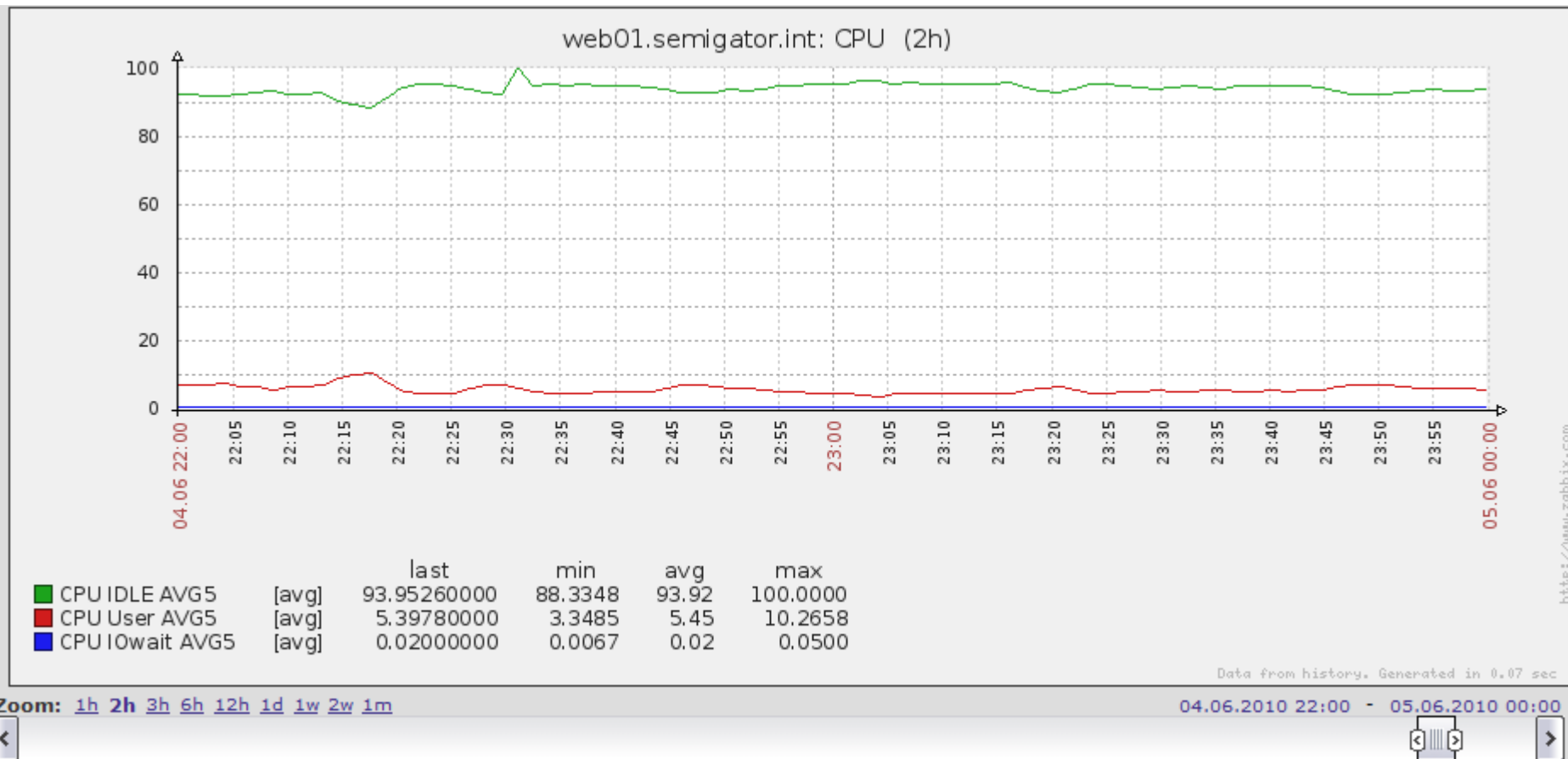
# Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.





# Graph



Zabbix  
Konfigurieren

# Informieren

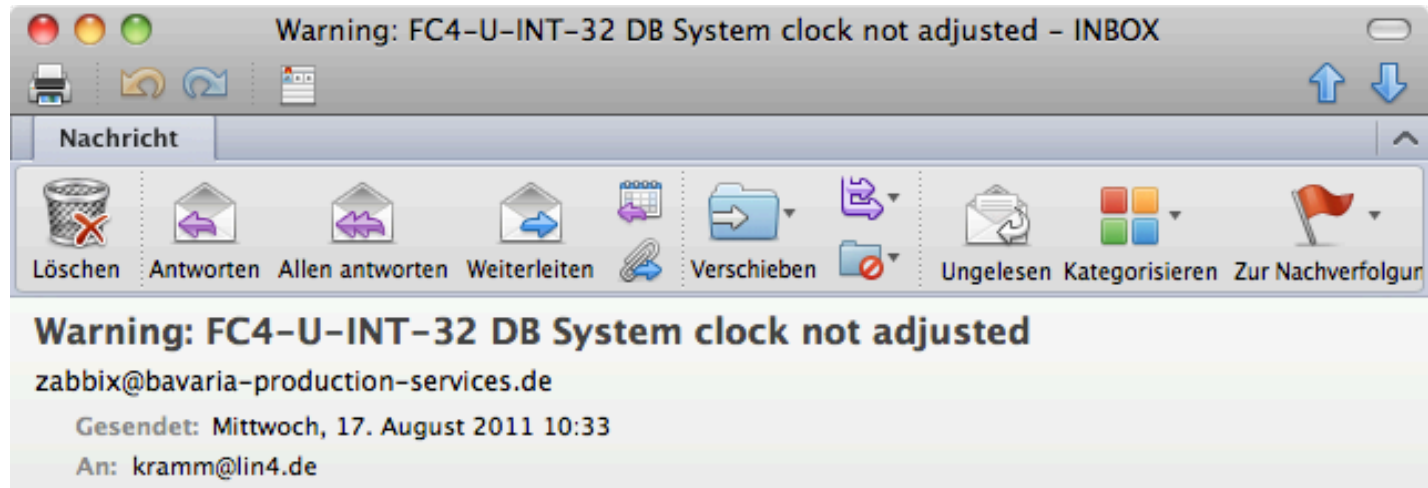
- Zu jedem Trigger kann ein Link zu einem Wiki oder Notfallhandbuch hinterlegt werden
- Über Platzhalter in den Mailtexten können aber auch Suchen nach Triggern in Dokumentationen ausgelöst werden  
`wiki.doku.de?search={TRIGGER_NAME}`

# Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



# Alarm per Mail



```
Severity: Warning
Host: FC4-U-INT-32 DB
IP: 10.70.101.32
Problem: System clock not adjusted
Item: System Time
Last value: 2011.08.17 10:25:54
Proxy :
```

```
=====
Hints:
Adjust the clock.
Use ntp.
```

# Sonst noch was?

- Webseitenüberwachung inkl. Klickstrecken und POST-Requests
- Client Simulation für gängige Protokolle
- Ausgabe von Triggerstatus kann leicht aus der DB oder der API abgelesen werden

## Monitoring

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Wissen, was zu tun ist.



# Sonst noch was?

- Zabbix Proxy für Netzwerksegmente, DMZ, Intranet etc.
- Syslog mit Datenbank sinnvolle Ergänzung (Application und KPI Monitoring)

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.





# Dokumentation

- Viele Tutorials für Einsteiger und Profis unter

<http://lab4.org/wiki>

# Monitoring

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Wissen, was zu tun ist.



# Support

DV Lösungen Schreiner GmbH

- Zabbix-Installationen aller Größen
- Einrichtung Monitoring für Linux und Windows
- Entwicklung von kundenspezifischen Checks
- Beratung
- Worry-Free Zabbix Appliance
- Outsourcing von Monitoring

[www.dvloesungen.de](http://www.dvloesungen.de)

# Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.



Wissen nennen wir jenen  
kleinen Teil  
der Ungewissheit,  
den wir geordnet und  
klassifiziert haben.

Ambrose Bierce

## Monitoring

Wissen, was passiert.  
Wissen, was zu tun ist.

