

Mit Nagios das Netzwerk voll im Griff

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Outline

- ① Einleitung
- ② Struktur
- ③ Konfiguration
- ④ Plugin
- ⑤ Benachrichtigung
- ⑥ Screenshots
- ⑦ Ende

Allgemein

Netzwerkstruktur des Chemnitzer StudentenNetz

- Technik:
 - 6 Server
 - 10 virtuelle Server
 - ca. 80 Switches mit ca. 3700 aktiven Ports
 - zentraler Router
 - 11 W-LAN Accespoints
 - ca. 1800 - 2000 Nutzer (werden nicht geprüft)
- Dienste:
 - SSH
 - Webseite
 - SMTP-Server
 - DNS-Server
 - DHCP-Server
 - Netboot
 - Jabber

Vom Problem zu Nagios

Problem und Lösung

Problem

- Netzwerkinfrastruktur wächst
- Prüfung von Hosts und Diensten wird schwerer
- frühzeitiges finden von Problemen erschwert

Lösung

- automatisierte Überwachung

Nagios

Vorteile

- sehr leicht konfigurierbar
- leicht erweiterbar
- sehr flexibel
- OpenSource
- verschiedene Benachrichtigungsformen
- Konfiguration in Textdateien

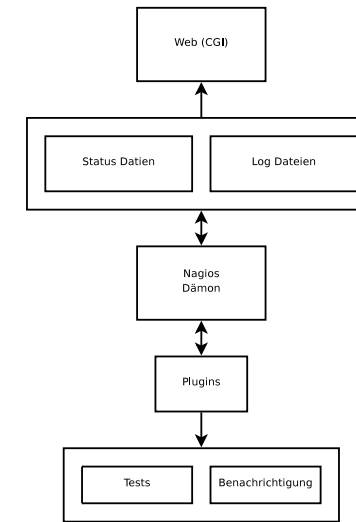
Nachteile

- gewöhnungsbedürftiges Web-Interface
- Konfiguration in Textdateien

Was kann überwacht werden?

- Systeme:
 - Linux/Unix System
 - Windows Systeme
 - Routers, Switches, Hubs
 - Drucker
- Dienste:
 - öffentliche Dienste (SSH, HTTP, SMTP, ...)
 - private Dienste (CPU, RAM Nutzung, Festplattenplatz, ...)

Struktur



Check Arten

aktive Checks

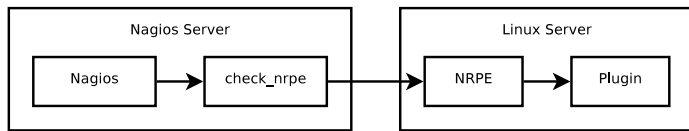
- vom Nagios Daemon ausgelöst
- in regelmässigen Abständen ausgeführt
- Daemon ruft Plugin auf und wertet Rückgabewert aus

passive Checks

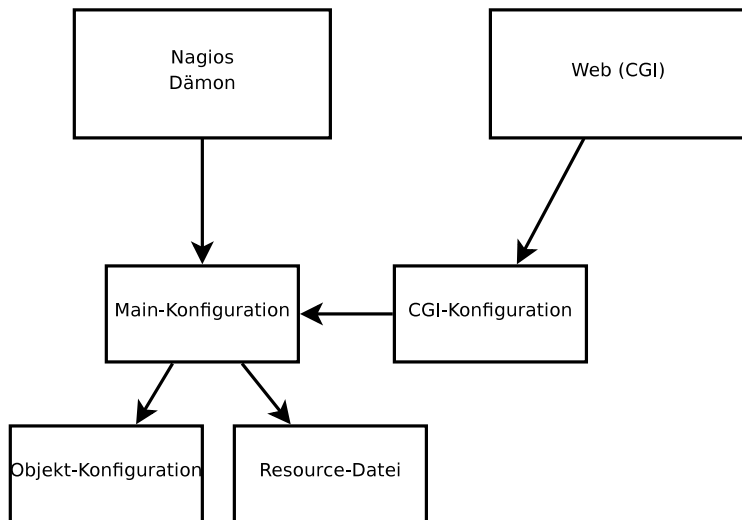
- durch externe Programme durchgeführt
- liefern Status zur weiteren Verarbeitung an Nagios

private Dienste: Linux/Unix

- zwei grundlegende Methoden
- SSH Verbindung:
 - benutzen von verteilten SSH-Keys
 - Plugin: check_by_ssh
 - sehr aufwendig
 - hohe CPU-Auslastung
- NRPE Addon:

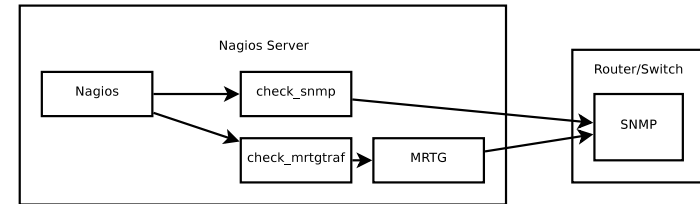


Struktur der Konfiguration



private Dienste: Router/Switch

- per SNMP
- per MRTG



Ordnerstruktur

- lokale Installation in /usr/local/nagios
 - bin - enthält der eigentlichen Nagios Dämon
 - etc - Konfigurationsdateien
 - libexec - Plugins
 - sbin - CGI Skripte
 - share - statische Dateien für die Webseite
 - var - Daten und Log-Dateien
- Paketgebundene Installation

Konfigurationsdateien

- nagios.cfg - die Hauptkonfigurationsdatei

```

1 ...
2 cfg_file=/usr/local/nagios/etc/objects/commands.cfg
3 ...
4 cfg_dir=/usr/local/nagios/etc/servers
5 ...
    
```

- resource.cfg - Pfadangaben, Passwörter

```

1 ...
2 $USER1$=/usr/local/nagios/libexec
3 ...
4 $USER2$=/usr/local/nagios/libexec/eventhandlers
5 ...
    
```

- cgi.cfg - CGI Konfiguration
- objects/ - weitere Objekte, z.B.: Komandos, Server

Konfigurationsdateien objects/

- commands.cfg - Kommandos zum Benachrichtigen und um Tests durchzuführen

```

1 ...
2 # 'notify-host-by-email' command definition
3 define command{
4     command_name    notify-host-by-email
5     command_line    /usr/bin/printf "%b" "***** Nagios *****\nNotification Type:
6                     $NOTIFICATIONTYPE$\nHost: $HOSTNAME$\nState: $HOSTSTATE$\nAddress:
7                     $HOSTADDRESS$\nInfo: $HOSTOUTPUT$\n\nDate/Time: $LONGDATETIME$\n" | /usr/
8                     bin/mail -s "*** $NOTIFICATIONTYPE$ Host Alert: $HOSTNAME$ is $HOSTSTATE$
9                     ***" $CONTACTEMAILS$
10                    }
11 ...
12 # 'check-host-alive' command definition
13 define command{
14     command_name    check-host-alive
15     command_line    $USER1$/check_ping -H $HOSTADDRESS$ -w 3000.0,80% -c 5000.0,100% -
16                     p 5
17                    }
18 ...
    
```

Konfigurationsdateien objects/

- contacts.cfg - Personen die Benachrichtigt werden sollen

```

1 ..
2 define contact{
3     contact_name        hans-muster
4     alias                Hans Muster
5     service_notification_period 24x7
6     host_notification_period 24x7
7     service_notification_options w,u,c,r
8     host_notification_options d,u,r
9     service_notification_commands notify-service-by-mail
10    host_notification_commands notify-host-by-mail
11    email                muster@example.com
12    pager                12345678
13    }
14 ...
15 define contactgroup{
16    contactgroup_name    admins
17    alias                Nagios Administrators
18    members              hans-muster
19    }
20 ...
    
```

Konfigurationsdateien objects/

- localhost.cfg - Checks für Localhost
- printer.cfg - Checks für Drucker
- switch.cfg - Services und Hosts der Switches/Router
- templates.cfg - Templates für Hosts und Services

```

1 ...
2 define host{
3     name                linux-server
4     use                  generic-host
5     check_period        24x7
6     check_interval      5
7     retry_interval      1
8     max_check_attempts  10
9     check_command        check-host-alive
10    notification_period  24x7
11    notification_interval 120
12    notification_options d,u,r
13    contact_groups       admins
14    hostgroups            servers-ping, ssh-servers
15    register              0
16    }
17 ...
    
```

Beispiel Konfiguration

Konfigurationsdateien objects/

- timeperiods.cfg

```

1  ...
2  define timeperiod{
3      timeperiod_name 24x7
4      alias            24 Hours A Day, 7 Days A Week
5      sunday           00:00-24:00
6      monday           00:00-24:00
7      tuesday          00:00-24:00
8      wednesday        00:00-24:00
9      thursday         00:00-24:00
10     friday            00:00-24:00
11     saturday          00:00-24:00
12 }
13 ...
    
```

- windows.cfg - Services und Hosts der Windows-Server

Beispiel Konfiguration

Konfigurationsdateien servers/

- test-server.cfg (selbst angelegt)

```

1  ...
2  define host {
3      host_name        test-server
4      alias            Test Server
5      address          12.34.56.78
6      parents          test-router
7      use              linux-server
8      hostgroups       +dns-servers
9  }
10 ...
    
```

Beispiel Konfiguration

Konfigurationsdateien objects/

- servers.cfg - Services und Hostgroups für Server (selbst angelegt)

```

1  ...
2  define hostgroup {
3      hostgroup_name  servers-ping
4      alias            Pingable servers
5  }
6  ...
7  define service{
8      hostgroup_name    servers-ping
9      service_description PING
10     check_command     check_ping!100.0,20%!500.0,60%
11     use                generic-service
12     process_perf_data  1
13 }
14 ...
    
```

Allgemein

Plugin-Aufbau

- Plugin Struktur recht einfach aufgebaut
- Voraussetzung:
 - ausführbar
 - bestimmten Rückgabewert
 - mindestens eine Zeile auf STDOUT ausgeben

Rückgabewert	Service Status	Host Status
0	OK	UP
1	WARNING	UP or DOWN/UNREACHABLE
2	CRITICAL	DOWN/UNREACHABLE
3	UNKNOWN	DOWN/UNREACHABLE

Erstellen des Plugins

- Plugin muss standardmäßig in Verzeichnis libexec/
- Beispiel: md5sum_test.sh

```

1  #!/bin/sh
2
3  HOSTNAME=$1
4  FILE=$2
5  MD5SUM_ORIG=$3
6
7  MD5SUM=$(wget -q -O "-" "http://$HOSTNAME$FILE" | md5sum | awk '{print $1}')
8
9  if [ "$MD5SUM" = "$MD5SUM_ORIG" ]; then
10     echo "MD5SUM:␣$MD5SUM"
11     exit 0
12 else
13     echo "MD5SUM:␣none"
14     exit 2
15 fi
    
```

vordefinierte Macros

- gekennzeichnet durch \$MACRO_NAME\$
- werden durch Nagios durch den entsprechenden Wert ersetzt
- Beispiel:

```

1  define service{
2  check_command      check_something!5!10
3  ...
4  }
5  define command {
6  command_name check_something
7  command_line ./something -a $ARG1$ -b $ARG2$
8  }
    
```

- Ergebnis:

./something -a 5 -b 10

Erstellen des Plugins

- Neues Kommando in der Datei commands.cfg anlegen
- Beispiel:

```

1  define command {
2  command_name md5sum_test
3  command_line $USER1$/md5sum_test.sh $HOSTADDRESS$ $ARG1$ $ARG2$
4  }
    
```

- Neuen Service in der Datei server.cfg anlegen
- Beispiel:

```

1  define service {
2  use generic-service
3  host_name test-server
4  service_description MD5SUM Test
5  check_command md5sum_test!/lit-banner-2008.jpg!97121
6  f38355f64fff92d2e719fa22033
7  }
    
```

eigene Macros

- in Definition mit mit führendem Unterstrich gekennzeichnet
- Zugriff mit:
 - \$_HOSTvarname\$
 - \$_SERVICEvarname\$
 - \$_CONTACTvarname\$
- Beispiel:

```

1  define host{
2  host_name server
3  _MACADDRESS 00:01:02:03:04:05
4  ...
5  }
6  define command {
7  command_name check_something
8  command_line ./something -m $_HOSTMACADDRESS$
9  }
    
```

- Ergebnis:

./something -m 00:01:02:03:04:05

- Funktionsweise fast wie Plugin
- externem Programm wird zuzsendende Nachricht übergeben
- E-Mail
- SMS
- Anruf
- Pager
- Jabber
- IRC
- Elektroschocker ;-)

- zum Versand der SMS einfach Datei in /var/spool/sms/outgoing/ anlegen
- Format der SMS-Datei:

```
1 To: 1234567
2
3 Test SMS
```

Datei: /libexec/send_sms.sh

```
1 #!/bin/bash
2
3 NUMBER=$1
4 MESSAGE=$2
5
6
7 FILE="/var/spool/sms/outgoing/"$(echo "$MESSAGE-$NUMBER"$(date) | md5sum - | awk '{print $1}')."
8   sms"
9
10 echo "To: $NUMBER" > $FILE
11 echo " " >> $FILE
12 echo $MESSAGE >> $FILE
13 chmod a+rw $FILE
```

Datei: /etc/objects/commands.cfg

```
1 define command{
2   command_name notify-service-by-sms
3   command_line $USER1$/send_sms.sh $CONTACTPAGER$ '$NOTIFICATIONTYPE$: $HOSTNAME$:
4     $SERVICEDESC$ is $SERVICESTATE$ ($SERVICEOUTPUT$)'
5 }
6
7 define command{
8   command_name notify-host-by-sms
9   command_line $USER1$/send_sms.sh $CONTACTPAGER$ '$NOTIFICATIONTYPE$: $HOSTNAME$ is
10    $HOSTSTATE$ ($HOSTOUTPUT$)'
```

Einleitung 000 Struktur 00000 Konfiguration 000000000 Plugin 00000 Benachrichtigung 00000 Screenshots 000 Ende 00

Versand von SMS

Personen konfigurieren

Einleitung 000 Struktur 00000 Konfiguration 000000000 Plugin 00000 Benachrichtigung 00000 Screenshots 000 Ende 00

Versand von SMS

Demo SMS

Datei: /etc/objects/contacts.cfg

```

1 define contact{
2     contact_name      hans-muster
3     alias              Hans Muster
4     service_notification_period 24x7
5     host_notification_period 24x7
6     service_notification_options w,u,c,r
7     host_notification_options d,u,r
8     service_notification_commands notify-service-by-mail, notify-service-by-sms
9     host_notification_commands notify-host-by-mail, notify-host-by-sms
10    email              muster@example.com
11    pager              12345678
12 }

```

- RECOVERY: test-server is UP (PING OK - Packet loss = 0%, RTA = 0.88 ms)
- PROBLEM: test-server is DOWN (CRITICAL - Host Unreachable (12.34.56.78))

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Einleitung 000 Struktur 00000 Konfiguration 000000000 Plugin 00000 Benachrichtigung 00000 Screenshots 000 Ende 00

Bilder aus dem CSN

Host-Übersicht

Einleitung 000 Struktur 00000 Konfiguration 000000000 Plugin 00000 Benachrichtigung 00000 Screenshots 000 Ende 00

Bilder aus dem CSN

Host-Ansicht

Host	Service	Status	Time	Duration	Info	Output
ap-63-kl	PING	CRITICAL	11-07-2008 21:54:49	30d 21h 47m 53s	1/3	PING CRITICAL - Packet loss = 100%
ap-63-kr	PING	OK	11-07-2008 21:57:42	30d 21h 53m 0s	1/3	PING OK - Packet loss = 0%, RTA = 0.74 ms
ap-64-kl	PING	OK	11-07-2008 21:54:49	30d 21h 47m 46s	1/3	PING OK - Packet loss = 0%, RTA = 0.62 ms
ap-64-kr	PING	OK	11-07-2008 21:57:49	30d 21h 52m 53s	1/3	PING OK - Packet loss = 0%, RTA = 0.62 ms
ap-70-kl	PING	OK	11-07-2008 21:54:49	30d 21h 47m 39s	1/3	PING OK - Packet loss = 0%, RTA = 0.77 ms
ap-72-2	PING	OK	11-07-2008 21:57:59	30d 21h 52m 46s	1/3	PING OK - Packet loss = 0%, RTA = 2.51 ms
asnar4	PING	OK	11-07-2008 21:54:49	30d 21h 47m 32s	1/3	PING OK - Packet loss = 0%, RTA = 0.11 ms
	SSH	OK	11-07-2008 21:58:03	31d 6h 32m 39s	1/3	SSH OK - OpenSSH_4.7p1 Debian-Subuntul.2 (protocol 2.0)
chartarbox	PING	OK	11-07-2008 21:56:49	30d 21h 47m 25s	1/3	PING OK - Packet loss = 0%, RTA = 0.80 ms
	SSH	OK	11-07-2008 21:58:11	31d 6h 32m 32s	1/3	SSH OK - OpenSSH_4.3p2 Debian-9 (protocol 2.0)
cm-jab3	PING	OK	11-07-2008 22:02:02	0d 4h 32m 54s	1/3	PING OK - Packet loss = 0%, RTA = 0.57 ms
	SSH	OK	11-07-2008 22:02:38	0d 4h 32m 38s	1/3	SSH OK - OpenSSH_4.7p1 Debian-Subuntul.2 (protocol 2.0)
cm-server	DNS	OK	11-07-2008 21:56:49	3d 9h 52m 15s	1/3	DNS OK 0.030 seconds response time from csn-server.csn.tu-chemnitz.de
	HTTP	OK	11-07-2008 21:59:49	0d 1h 36m 7s	1/3	HTTP OK - HTTP/1.1 301 Moved Permanently - 0.002 second response time
	DNS	OK	11-07-2008 21:56:49	30d 21h 47m 11s	1/3	PING OK - Packet loss = 0%, RTA = 1.30 ms
	SMTP	OK	11-07-2008 22:03:49	3d 2h 50m 32s	1/3	SMTP OK - 0.013 sec. response time
	SSH	OK	11-07-2008 21:56:49	29d 4h 31m 2s	1/3	SSH OK - OpenSSH_4.3p2 Debian-9etch3 (protocol 1.99)
vermagd	PING	CRITICAL	11-07-2008 21:58:31	30d 21h 52m 11s	1/3	CRITICAL - Host Unreachable (hermodr.csn.tu-chemnitz.de)
	SSH	CRITICAL	11-07-2008 21:56:49	31d 6h 36m 57s	1/3	No route to host
labber	PING	OK	11-07-2008 21:58:38	30d 21h 52m 5s	1/3	PING OK - Packet loss = 0%, RTA = 0.27 ms
	SSH	OK	11-07-2008 21:56:49	31d 6h 36m 50s	1/3	SSH OK - OpenSSH_4.7p1 Debian-Subuntul.2 (protocol 2.0)
localhost	Current Load	OK	11-07-2008 22:03:11	31d 6h 31m 59s	1/4	OK - load average: 0.00, 0.00, 0.00
	Current Users	OK	11-07-2008 22:03:02	31d 6h 36m 43s	1/4	USERS OK - 6 users currently logged in
	HTTP	OK	11-07-2008 22:03:18	30d 22h 41m 51s	1/4	HTTP OK - HTTP/1.0 200 OK - 3832 bytes in 0.002 seconds
	PING	OK	11-07-2008 21:56:49	30d 21h 46m 36s	1/3	PING OK - Packet loss = 0%, RTA = 0.12 ms
	Root Partition	OK	11-07-2008 22:03:09	3d 10h 46m 59s	1/4	DISK OK - free space: 7.96 MB (96% inode=89%)
	SSH	OK	11-07-2008 21:56:49	31d 6h 36m 39s	1/3	SSH OK - OpenSSH_4.7p1 Debian-Subuntul.2 (protocol 2.0)
	Total Processes	OK	11-07-2008 22:03:24	31d 6h 36m 22s	1/4	PROCS OK - 22 processes with STATE = RZSDT
mbr-33	PING	OK	11-07-2008 21:59:42	30d 21h 51m 30s	1/3	PING OK - Packet loss = 0%, RTA = 1.33 ms

Service Information

Last Updated: Fri Nov 7 22:07:42 CET 2008
 Updated every 90 seconds
 Nagios® 3.0.3 - www.nagios.org
 Logged in as nagiosadmin

Service State Information

Current Status: **OK** (for 1d 9h 55m 1s)
 Status Information: DNS OK: 0.030 seconds response time. returns
 csn-server.csn.tu-chemnitz.de.

Performance Data: time=0.030121s;0.000000

Current Attempt: 1/3 (HARD state)
 Last Check Time: 11-07-2008 22:06:49
 Check Type: ACTIVE
 Check Latency / Duration: 0.047 / 0.041 seconds
 Next Scheduled Check: 11-07-2008 22:16:49
 Last State Change: 11-06-2008 12:12:41
 Last Notification: N/A (notification 0)
 Is This Service Flapping? **N/A** (0.00% state change)
 In Scheduled Downtime? **NO**
 Last Update: 11-07-2008 22:07:37 (0d 0h 0m 5s ago)

Service Commands

- ✗ Disable active checks for this service
- ⌛ Re-schedule the next check of this service
- 📄 Submit passive check result for this service
- ✗ Stop accepting passive checks for this service
- ✗ Stop checking over this service
- ✗ Disable notifications for this service
- ✗ Send custom service notification
- ✗ Schedule downtime for this service
- ✗ Disable event handler for this service
- ✗ Disable flap detection for this service

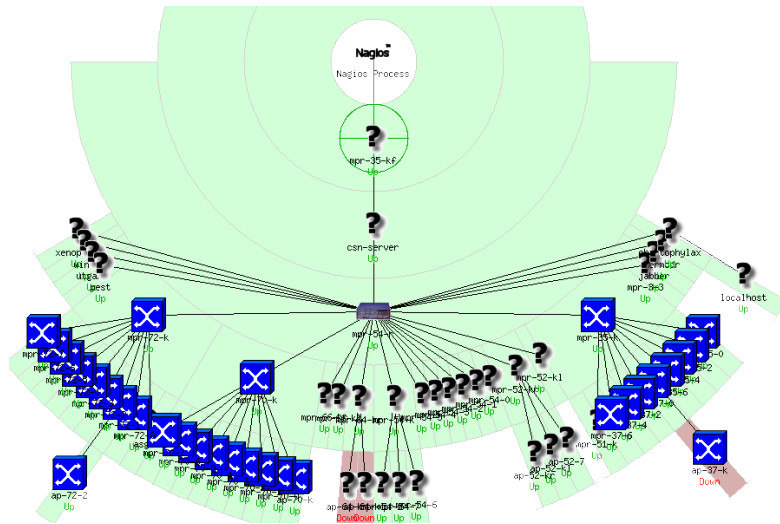
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Mit Nagios das Netzwerk voll im Griff

Status-Map



Fragen

Fragen?

weitere Informationen

- <http://www.nagios.org/>
- <http://nagiosplug.sourceforge.net/>
- <http://www.nagiosexchange.org/>
- <http://nagioswiki.org/>
- <http://smstools3.kekekasvi.com/>
- <http://www.dinotools.de/>