Monitoring Cisco Switch With Nagios Core

1. Configure SNMP on Device:

First of all, we need to login to Cisco switch that we want to monitor it with Nagios performance monitoring application and configure SNMP server as the following. We will configure a read-only SNMP community string as “Test-com” along with an ACL name “ACL-SNMP” to allow only a Nagios performance monitoring application server with IP address of 10.0.0.10 to be accessible to this device.

```
# ip access-list standard ACL-SNMP

     permit 10.0.0.10

# snmp-server community Test-com RO ACL-SNMP

# snmp-server location DC

# snmp-server contact netadmin@classroom.com

# ip domain-name classroom.com
```

To test if the SNMP server on Cisco switch is configured properly and working, we need to login to Nagios performance monitoring application server and execute the following `snmpwalk` command. In the following command it is assumed that the IP address of Cisco switch is 10.0.0.1.

```
# snmpwalk -v2c -c Test-com 10.0.0.1
```

2. Download And Test Nagios Plugin

To monitor a Cisco switch with Nagios performance monitoring application, we need two Nagios plugin. The first one is “check_cisco_switch.pl” and the second one is “check_cisco.pl”. You can download it from Nagios Exchange web site or you can download it directly here, check_cisco_switch and check_cisco. After download, you have to copy these two plugin into plugin directory on Nagios performance monitoring application server which is on “`/usr/local/nagios/libexec`“.
We will use a plugin name “check_cisco_switch.pl” to monitor power supply status, fan status, CPU usage, memory usage of a Cisco switch. This plugin is also possible to monitor interface up/down status of Cisco switch, but we will use another plugin name “check_cisco.pl” instead since it provides more comprehensive output such as interface description.

Now let go to directory to "`/usr/local/nagios/libexec`" to test these two plugin, but first we need to install the prerequisite packet to be able to execute this plugin and make it executable.

```
# cd /usr/local/nagios/libexec

# yum -y install perl-Net-SNMP

# chmod +x check_cisco_switch.pl
```

If this step errors, you will need to enable Power-Tools as below

```
#yum config-manager --enable --powertools
```

Now let use plugin name "check_cisco_switch.pl" to monitoring fan status of a Cisco switch.

```
# ./check_cisco_switch.pl -H 10.0.0.1 -C Test-com -t fan

Fans: OK - 1 Fans are running all good | total=1 err=0
```

Now let use plugin name "check_cisco_switch.pl" to monitoring power supply status of a Cisco switch.

```
# ./check_cisco_switch.pl -H 10.100.1.22 -C Test-com -t ps

PS: OK - 1 PS are running all good | total=1 err=0
```

Now let use plugin name "check_cisco_switch.pl" to monitoring CPU usage of a Cisco switch.

```
# ./check_cisco_switch.pl -H 10.0.0.1 -C Test-com -t cpu -w 30 -c 70

Cpu: OK - Cpu Load 5% 5% 6% | cpu_5s=5percent;30;70 cpu_1m=5percent
cpu_5m=6percent
```

Now let use plugin name "check_cisco_switch.pl" to monitoring memory usage of a Cisco switch.

```
# ./check_cisco_switch.pl -H 10.0.0.1-C Test-com -t mem -w 50 -c 40

Memory: OK - Free Memory 83% | memory_total=90MB memory_used=15MB
```

We can also use this plugin to check interface status of a Cisco switch, but it is not provide a comprehensive out like the plugin name "check_cisco.pl" does.

```
#./check_cisco_switch.pl -H 10.0.0.1-C Test-com -t int -i FastEthernet0/1

OK: FastEthernet0/1 -> up | int=1
```

Now, let test to use our second plugin "check_cisco.pl" to monitor the interface status of a Cisco switch since it could provide us a more comprehensive output, but we need to install the prerequisite packet to be able to execute this plugin and make it executable.

```
# yum install -y net-snmp-utils

# chmod +x check_cisco.pl

# ./check_cisco.pl -H 10.100.1.22 -C A@B9aMon -i FastEthernet0/1

Fa0/1 up: ECC800-WAN1, LastChanges: (33570955) 3 days, 21:15:09.55, Traffic
in : 27011460 octets, out: 143756229 octet
```

3. Define Host And Service Groups

It is better to create directories to store our own configuration files as the following.

```
# cd /usr/local/nagios

# mkdir classroom

# cd classroom/

# mkdir commands

# mkdir remotehosts

# mkdir servicegroups

# mkdir hostgroups
```

Then, we need to tell Nagios performance monitoring application configuration file to also read the configuration files from the new directories we created and the restart Nagios performance monitoring application service.

```
# vim /usr/local/nagios/nagios.cfg

cfg_dir=/usr/local/nagios/etc/classroom

# systemctl restart nagios
```

Right now let create a host group name “cisco-switches” for all Cisco switch by going into directory “`/usr/local/nagios/classroom/hostgroups`” and create a file with cfg extension as the following.

```
# cd /usr/local/nagios/classroom/hostgroups
 # vim cisco-switches.cfg

define hostgroup{
  hostgroup_name cisco-switches
  alias Cisco Switches
  }
```

Then, let create some service groups for Cisco switch such as,memory-usage, cpu-usage, device-fan, device-powersupply, and cisco-interfacestatus by going into directory "`/usr/local/nagios/classroom/hostgroups`" and create a file with cfg extension as the following.

```
# cd /usr/local/nagios/classroom/servicegroups

# vim cisco-services.cfg

define servicegroup{

 servicegroup_name memory-usage

 alias Memory Usage

 }

define servicegroup{

 servicegroup_name cpu-usage

 alias CPU Usage

 }

define servicegroup{

 servicegroup_name device-fan

 alias Device Fan

 }

define servicegroup{

 servicegroup_name device-powersupply

 alias Device Power Suply

 }

define servicegroup{

 servicegroup_name cisco-interfacestatus

 alias Cisco Interface Status

 }
```

4. Define Nagios Commands

To use two plugins above, we need to define commands and call the plugin to use. Let define the following command to monitor power supply status, fan status, CPU usage, memory usage of a Cisco switch

```
# cd /usr/local/nagios/classroom/commands

# vim check_cisco_switch.cfg

define command{

 command_name check_cisco_switch

 command_line $USER1$/check_cisco_switch.pl -H $HOSTADDRESS$ -C $ARG1$ -t
$ARG2$ -w $ARG3$ -c $ARG4$

 }

define command{

 command_name check_cisco_int

 command_line $USER1$/check_cisco.pl -H $HOSTADDRESS$ -C $ARG1$ -i $ARG2$

 }

#
```

5. Define Hosts And Services

After defining host group, service groups, and Nagios performance monitoring application commands, right now we can define one host of Cisco switch to test. In this test switch we will monitor host down/up status, and some services such ping, CPU usage, memory usage, and the interface up/down status of two interfaces, F0/1 and F0/2.

```
# cd /usr/local/nagios/classroom/remotehosts

# vim test-switch01.cfg

define host{

 use generic-switch

 host_name Test-Switch01

 alias Test-Switch01

 notes Access Switch

 address 10.0.0.1

 hostgroups cisco-switches

 }

define service{

 use generic-service

 host_name Test-Switch01

 service_description PING

 check_command check_ping!200.0,20%!600.0,60%

 check_interval 5

 retry_interval 1

 }

define service{

 use generic-service

 host_name Test-Switch01
```

```
 service_description Memory Usage
 check_command check_cisco_switch!Test-com!mem!50!40
 servicegroups memory-usage
 }
define service{
 use generic-service
 host_name Test-Switch01
 service_description CPU Usage
 check_command check_cisco_switch!Test-com!cpu!60!70
 servicegroups cpu-usage
 }
define service{
 use generic-service
 host_name Test-Switch01
 service_description Device Fan
 check_command check_cisco_switch!Test-com!fan
 servicegroups device-fan
 }
define service{
 use generic-service
 host_name Test-Switch01
 service_description Device Power Suply
 check_command check_cisco_switch!Test-com!ps
 servicegroups device-powersupply
 }
```

```
define service{
 use generic-service
 host_name Test-Switch01
 service_description Port Fa0/1
 check_command check_cisco_int!Test-com!Fa0/1
 servicegroups cisco-interfacestatus
 }
define service{
 use generic-service
 host_name Test-Switch01
 service_description Port Fa0/2
 check_command check_cisco_int!Test-com!Fa0/2
 servicegroups cisco-interfacestatus
 }
```

After that, we need to restart Nagios performance monitoring application services with the following command.

```
# systemctl restart nagios
```

Go to the web interface of Nagios Core and we should see one host name “Test-Switch01” and some services as the following.

Host	Service	Status	Last Check	Duration	Attempt	Status Information
Test-Switch01	CPU Usage	OK	07-24-2017 17:28:43	0d 0h 28m 4s	1/3	Cpu: OK - Cpu Load 12% 6% 5%
	Device Fan	OK	07-24-2017 17:28:51	0d 0h 27m 47s	1/3	Fans: OK - 1 Fans are running all good
	Device Power Suply	OK	07-24-2017 17:31:06	0d 0h 6m 17s	1/3	PS: OK - 1 PS are running all good
	Memory Usage	OK	07-24-2017 17:33:15	0d 0h 43m 29s	1/3	Memory: OK - Free Memory 83%
	PING	OK	07-24-2017 17:32:05	0d 1h 29m 43s	1/3	PING OK - Packet loss = 0%, RTA = 2.65 ms
	Port Fa0/1	OK	07-24-2017 17:34:41	0d 0h 12m 3s	1/3	Fa0/1 up: ECC800-WAN1, LastChanges: (33570955) 3 days, 21:15:09.55, Traffic in : 27097918 octets, out: 144304019 octets
	Port Fa0/2	OK	07-24-2017 17:36:31	0d 0h 0m 11s	1/3	Fa0/2 up: ECC800-WAN2, LastChanges: (33570955) 3 days, 21:15:09.55, Traffic in : 237440 octets, out: 132452672 octets

To see the host groups, from Nagios performance monitoring application web interface navigate to “Host Groups” tap and the following is the list of host groups.

Service Overview For All Host Groups

Cisco Switches (cisco-switches)

Host	Status	Services	Actions
Test-Switch01	UP	2 OK	

Linux Servers (linux-servers)

Host	Status	Services	Actions
localhost	UP	8 OK	

To see the service groups, from Nagios performance monitoring application web interface navigate to “Service Groups” tap and the following is the list of service groups.

Service Overview For All Service Groups

Cisco Interface Status (cisco-interfacestatus)

Host	Status	Services	Actions
Test-Switch01	UP	1 OK	

CPU Usage (cpu-usage)

Host	Status	Services	Actions
Test-Switch01	UP	1 OK	

Device Fan (device-fan)

Host	Status	Services	Actions
Test-Switch01	UP	1 OK	

Device Power Suply (device-powersuply)

Host	Status	Services	Actions
Test-Switch01	UP	1 OK	

Memory Usage (memory-usage)

Host	Status	Services	Actions
Test-Switch01	UP	1 OK	