

9.1. Monitoring System

Introduction

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1. SNMP and MIBs - Installation and Configuration

To implement the monitoring system, the first step is to install SNMP and MIBs in all the systems to be monitored.

Below is described each system used by each resource in a common island setup:

Resource	O.S.	Suggested hostname
Dom0	Debian 7	vms
LDAP	Debian 7	ldap
Flowvisor	Debian 7	flowvisor
OCF	Debian 8	ocf
OMF	Ubuntu 12.04	omf
NetFPGA1	CentOS 5	netfpga1
NetFPGA2	CentOS 5	netfpga2
NetFPGA3	CentOS 5	netfpga3
VPN Client	Debian 7	vpn



If you have a different setup you have to change this in order to correctly describe your own environment

Download and install the SNMP and MIBs for each one of the systems:

(For Debian systems, is necessary to add the non-free repositories before installation)

Debian systems

```
nano /etc/apt/sources.list
#or
vim /etc/apt/sources.list
```

```
...
deb .... main non-free
deb-src .... main non-free
...
```

Debian-based systems

```
apt-get install snmpd -y
apt-get install snmp-mibs-downloader -y
```

RHEL-based systems

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

To configure the SNMP service in each system, backup and clean the **snmpd.conf** file:

```
cd /etc/snmp
cp snmpd.conf snmpd.conf.ori
cat /dev/null > snmpd.conf
```

And apply the following default configuration:

```
rocommunity FIBRE-BR
syslocation [Institution, City, UF]
syscontact [E-mail]
agentaddress [SERVER_IP]:161
```

- **rocommunity** - This field must be filled with FIBRE's default community, which is FIBRE-BR.
- **syslocation** - This field should be filled with the server's location. Like the institution, the state and the city where the infrastructure is located.
- **syscontact** - This field should be filled with the sysadmin's e-mail.
- **agentaddress** - This field should be completed with the ip address of the FIBRE control network in the system (10.x.0.y), and port 161.

Example for RNP Dom0:

```
rocommunity FIBRE-BR
syslocation RNP, Brasília, DF
syscontact fiBRE-rnp@rt.rnp.br
agentaddress 10.128.0.30:161
```

After finishing the configuration, restart the snmp service:

```
service snmpd restart
```

2. Monitoring Agents - Installation and Configuration

To deploy an advanced monitoring of some essential island resources, a monitoring agent must be installed on them.

Additionally, the current version of the Pronto SW firmware don't support the monitoring agent.

In short, the agent don't need to be installed on the DNS, Perfsonar, and on the Pronto SW.

For each other system, download and install the agent as follows:

Debian 7

```
wget http://repo.zabbix.com/zabbix/3.0/debian/pool/main/z/zabbix-release/zabbix-release_3.0-1+wheezy_all.deb
dpkg -i zabbix-release_3.0-1+wheezy_all.deb
apt-get update
apt-get install -y zabbix-agent
```

Debian 8

```
wget http://repo.zabbix.com/zabbix/3.0/debian/pool/main/z/zabbix-release/zabbix-release_3.0-1+jessie_all.deb
dpkg -i zabbix-release_3.0-1+jessie_all.deb
apt-get update
apt-get install -y zabbix-agent
```

Ubuntu 12.04

```
wget http://repo.zabbix.com/zabbix/2.2/ubuntu/pool/main/z/zabbix-release/zabbix-release_2.2-1+precise_all.deb
sudo dpkg -i zabbix-release_2.2-1+precise_all.deb
sudo apt-get update
sudo apt-get install zabbix-agent
```

CentOS 5+

```
wget http://repo.zabbix.com/zabbix/3.0/rhel/5/i386/zabbix-agent-3.0.4-1.el5.i386.rpm
rpm -ivh zabbix-agent-3.0.4-1.el5.i386.rpm
```

Edit the agent configuration file for each resource system:

```
vim /etc/zabbix/zabbix_agentd.conf

# or:
nano /etc/zabbix/zabbix_agentd.conf
```

And change the according to your environment. The Proxy IP address follow the pattern: 10.[id].0.160:

```
...
Server=10.128.0.150,10.128.0.151,[VMServer IP address],[Proxy IP address]
...
ServerActive=10.128.0.150,10.128.0.151,[VMServer IP address],[Proxy IP address]
...
Hostname=zabbix.noc.fibre.org.br
...
```

Example:

```
Server=10.128.0.150,10.128.0.151,10.136.0.30,10.136.0.160
ServerActive=10.128.0.150,10.128.0.151,10.136.0.30,10.136.0.160
Hostname=zabbix.noc.fibre.org.br
```

Save the changes and exit the editor;

Delete a config file that will be substituted:

```
rm -f /etc/zabbix/zabbix_agentd.d/userparameter_mysql.conf
```

Download the "etc-zabbix.tar.gz" file from the <ftp://repo.fibre.org.br/Monitoring/> to the /etc/zabbix/ folder on the agent host and extract it:

```
cd /etc/zabbix/  
wget ftp://repo.fibre.org.br/Monitoring/etc-zabbix.tar.gz  
tar -zxvf etc-zabbix.tar.gz
```

For the OCF VM only, is necessary to create a read-only user in the MySQL database:

```
mysql -u root -p  
[mysql password]  
  
create database zabbix character set utf8 collate utf8_bin;  
  
grant SELECT on zabbix.* to zabbix@localhost identified by 'zabbixpw';  
  
SELECT User,Host FROM mysql.user;  
  
quit;
```

Finally, and for all nodes, restart the monitoring agent service and enable startup on system initialization:

```
/etc/init.d/zabbix-agent restart  
  
# or:  
  
service zabbix-agent restart  
  
# For CentOS systems:  
  
chkconfig zabbix-agent on  
  
# For Debian systems:  
  
systemctl enable zabbix-agent  
systemctl start zabbix-agent
```

3. Local Proxy - Installation and Configuration

For this installation, use the template zproxy-template.tar.gz available at this address: <ftp://repo.fibre.org.br/>

Download it where Xen creates its VMs.

Where does the hypervisor creates its VMs?

To verify where the hypervisor is creating its VMs, verify this file: /etc/xen-tools/xen-tools.conf.

The value of the variable **dir** is the destiny where the VMs are being created.

```
cd (directory)/domains  
wget ftp://repo.fibre.org.br/ServiceTemplates/zproxy-template170124.tar.gz
```



Due to the Island's firewall constraints, it might be necessary to use the internal address to download. In case of need use this address:
<ftp://10.128.0.30/>

And extract it's contents:

```
tar xzf zproxy-template170124.tar.gz
```

And access the directory.

```
cd zproxy.template
```



Changing directory name

It might be interesting to change the directory name for this pattern: **zprozy.institution.fibre.org.br**

Example: zproxy.**cpqd**.fibre.org.br

After that it's necessary to rename and edit and rename this file: **zproxy.template**

```
vim zproxy.template.fibre.org.br.cfg
```

It's necessary to edit the following lines:

The variable disk refers where the VM's disk is located. Below is an example of configuration:

```
disk = [  
'file:/data/vm_storage/domains/zproxy.rnp.fibre.org.br/disk.img,xvda2,w',  
'file:/data/vm_storage/domains/zproxy.rnp.fibre.org.br/swap.img,xvda1,w',  
]
```

Also it's necessary to configure the network, the vif variable is responsible for this task.



Control Bridge name

Pay attention to the name of your control bridge, also it's necessary to change the mac address.

Example of configuration:

```
vif = [ 'ip=10.136.0.160,mac=00:00:0a:00:00:33,bridge=br_control' ]
```



It's a good practice to use this pattern for MAC address generation:

MAC address:

00:00:**XX**:00:00:**YY**

Where **XX** stands for the Island's ID and **YY** stands for the service IP, both in hexadecimal form

The next step of editing the file it's to change the name of the VM.

Edit this line:

```
name = 'zproxy.template.fibre.org.br'
```

This edition consists in just replace template to the name of the institution.

Example:

```
name = 'zproxy.rnp.fibre.org.br'
```

After editing, move and rename it to /etc/xen:

```
mv zproxy.template.fibre.org.br.cfg /etc/xen/zproxy.rnp.fibre.org.br.cfg
```

And create a symbolic link at the directory called auto:

```
cd /etc/xen/auto  
ln -s ../zproxy.rnp.fibre.org.br.cfg
```

The next step is to access the console of the VM:

```
xm create -c (name of the vm)
```

To start using the VM use the following credentials:



VM credentials

Login: root

Password: zproxy

4. Related Documents

Below are the documents related to the monitoring solution chosen for the FIBRE NOC Monitoring:

[FIBRE 2016-05 - Avaliação Ferramentas de Gerência v1.0.pdf](#)

[FIBRE 2016-06 - Novo Monitoramento v1.0.pdf](#)

[FIBRE 2017-02 - FIBRE Monitoramento v1.0.pdf](#)