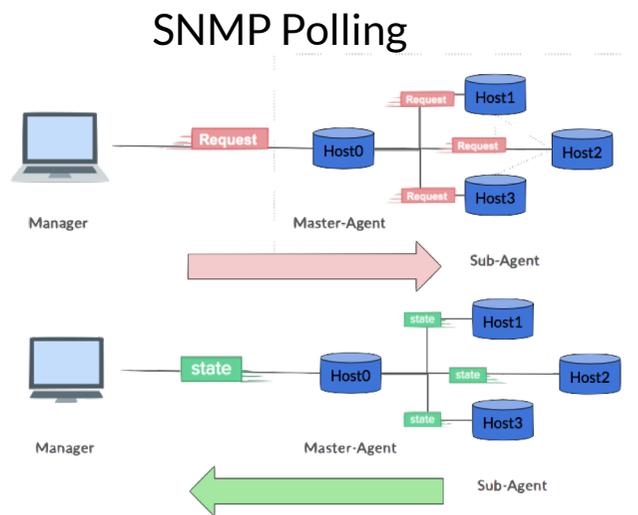




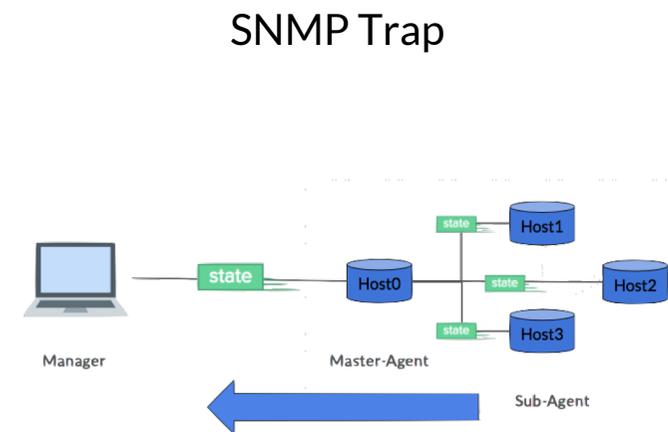
Hands-on: Network Management Challenge

Internet Engineering July 24th 2019
By Teaching Assistant

Monitoring Architecture by SNMP



Manager periodically run 'get' from Agent. Confirm if any troubles occur based on the acquired status info.



Agent sends a notification(trap) to the Manager when an incident/problem occurs on the Agent side.

Lesson:

Pull the state from SNMP Agents



Build Experiment Environment

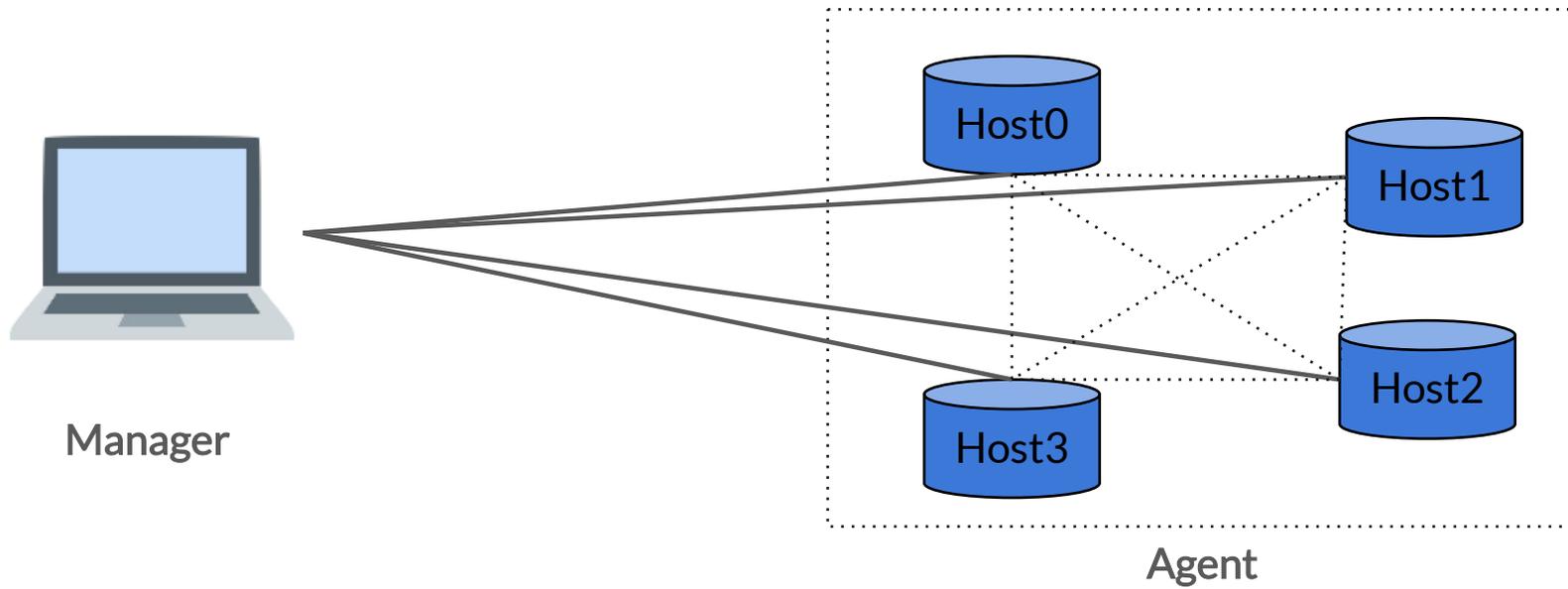
1. Download “makefile”

```
$ curl -O https://iplab.naist.jp/class/2019/materials/hands-on/06/makefile
```

1. Run

```
$ make
```

Experiment Architecture



Example : the Object Name

SNMP has tree-structured database called MIB.

This time, we'll see the number of ICMP packets which didn't send.
Therefore, we use MIB Tree called *IP MIB* which is defined by [RFC 4293](#).

Regarding to [page. 83](#) of RFC 4293, its object name is *icmpStatsOutErrors*.

```
icmpStatsOutErrors OBJECT-TYPE
    SYNTAX          Counter32
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The number of ICMP messages that this entity did not send
        due to problems discovered within ICMP, such as a lack of
        buffers. This value should not include errors discovered
        outside the ICMP layer, such as the inability of IP to route
        the resultant datagram. In some implementations, there may
        be no types of error that contribute to this counter's
        value."
    ::= { icmpStatsEntry 5 }
```



Translation MIB into OID

SNMP uses *Object Identifier* (OID) to identify MIB nodes.

To get OID of it, use `snmptranslate`.

The syntax is as follows:

```
$ snmptranslate -On -IR <OID>
```

Here we go, attach Manager.

```
$ docker attach Manager
```

```
$ snmptranslate -On -IR icmpStatsOutErrors.ipv4
```

We got the OID is `.1.3.6.1.2.1.5.29.1.5.1`

Pull the status from Agent

To show the contents of OID, use `snmpwalk`.

This time, we get the status on Host0.

SNMP Version

The default is 3 but it needs authorization.
Therefore, we set 2c.

SNMP Community

Target Host

```
$ snmpwalk -v 2c -c public Host0 .1.3.6.1.2.1.5.29.1.5.1
```

```
IP-MIB::icmpStatsOutErrors.ipv4 = Counter32: 0
```

We got to know the number of ICMP packets which didn't send is zero.



Experiment : The number of request packets

Let's check whether the output is increase if we create no route packets.

1. Attach Manager

```
$ docker attach Manager
```

2. Translate MIB into OID

```
$ snmptranslate -On -IR icmpStatsOutErrors.ipv4
```

3. Check the current status

```
$ snmpwalk -v 2c -c public Host0 .1.3.6.1.2.1.5.29.1.5.1
```

4. Open Another Shell, and ping to non routed host after attaching Host0

```
$ ping 10.0.0.0 -c 3
```

5. Check the same status from manager

```
$ snmpwalk -v 2c -c public Host0 .1.3.6.1.2.1.5.29.1.5.1
```



Work : Pull the status from each Hosts

The following MIBs are defined as *MIB-II* at [RFC1213](#).

- Hostname (MIB : sysName)
- Information of the host machine (MIB : sysDescr)
- Number of interface (MIB : ifNumber)
- Number of loss response packets (MIB : ifOutDiscards)
- Operation status of interface (MIB : ifOperStatus)