SNMP 网管实验

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实验内容

1. 学习SNMP简单网络管理协议工具的使用
2. 了解SNMP网络管理基本操作

步骤

一，了解Net-SNMP工具包的使用方式

我们使用server-01为例

二，获取路由器开机时间

```
cisco@server-01:~$ snmptranslate -Ib -Of Time
.iso.org.dod.internet.mgmt.mib-2.system.sysUpTime
cisco@server-01:~$ snmpwalk -v 2c -c SnmpTest 192.168.2.1 system.sysUpTime
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (128951922) 14 days, 22:11:59.22
cisco@server-01:~$ snmptranslate -Ib -Of Interface
```

我们可以看出，这个机器做实验14天之前开机的。

三，获得路由器所有接口并给出相应的流量信息，并获取interface f0/0的所有相关消息

我们受限需要查找接口在MIB树种的名称，查到以后，我们使用snmpwalk。snmpwalk 用于自动运行多个 GETNEXT 请求。 SNMP GETNEXT 请求用于查询已启用的设备并从该设备获取数据。 它允许用户将请求链接在一起，而不必为子树中的每个 OID 或节点输入唯一的命令。 这使我们能够从每个连接的节点收集信息。

```
cisco@server-01:~$ snmptranslate -Ib -Of Interface
.iso.org.dod.internet.mgmt.mib-2.interfaces
cisco@server-01:~$ snmpwalk -v 2c -c SnmpTest 192.168.2.1 interfaces>snmp.tmp
cisco@server-01:~$ more snmp.tmp
IF-MIB::ifNumber.0 = INTEGER: 9
IF-MIB::ifIndex.1 = INTEGER: 1
IF-MIB::ifIndex.2 = INTEGER: 2
IF-MIB::ifIndex.3 = INTEGER: 3
IF-MIB::ifIndex.4 = INTEGER: 4
IF-MIB::ifIndex.5 = INTEGER: 5
IF-MIB::ifIndex.6 = INTEGER: 6
IF-MIB::ifIndex.8 = INTEGER: 8
IF-MIB::ifIndex.9 = INTEGER: 9
IF-MIB::ifIndex.10 = INTEGER: 10
IF-MIB::ifDescr.1 = STRING: FastEthernet0/0
IF-MIB::ifDescr.2 = STRING: FastEthernet0/1
IF-MIB::ifDescr.3 = STRING: FastEthernet2/0
IF-MIB::ifDescr.4 = STRING: FastEthernet2/1
IF-MIB::ifDescr.5 = STRING: FastEthernet3/0
IF-MIB::ifDescr.6 = STRING: FastEthernet3/1
```

```
IF-MIB::ifAdminStatus.9 = INTEGER: up(1)
IF-MIB::ifAdminStatus.10 = INTEGER: up(1)
IF-MIB::ifOperStatus.1 = INTEGER: up(1)
IF-MIB::ifOperStatus.2 = INTEGER: down(2)
IF-MIB::ifOperStatus.3 = INTEGER: up(1)
IF-MIB::ifOperStatus.4 = INTEGER: down(2)
IF-MIB::ifOperStatus.5 = INTEGER: up(1)
IF-MIB::ifOperStatus.6 = INTEGER: down(2)
IF-MIB::ifOperStatus.8 = INTEGER: up(1)
IF-MIB::ifOperStatus.9 = INTEGER: up(1)
IF-MIB::ifOperStatus.10 = INTEGER: up(1)
```

```
IF-MIB::ifInOctets.1 = Counter32: 574202332
IF-MIB::ifInOctets.2 = Counter32: 0
IF-MIB::ifInOctets.3 = Counter32: 15706132
IF-MIB::ifInOctets.4 = Counter32: 0
IF-MIB::ifInOctets.5 = Counter32: 202445281
IF-MIB::ifInOctets.6 = Counter32: 0
IF-MIB::ifInOctets.8 = Counter32: 0
IF-MIB::ifInOctets.9 = Counter32: 0
IF-MIB::ifInOctets.10 = Counter32: 0
```

```
IF-MIB::ifOutOctets.1 = Counter32: 189577497
IF-MIB::ifOutOctets.2 = Counter32: 0
IF-MIB::ifOutOctets.3 = Counter32: 15726414
IF-MIB::ifOutOctets.4 = Counter32: 0
IF-MIB::ifOutOctets.5 = Counter32: 601935700
IF-MIB::ifOutOctets.6 = Counter32: 0
IF-MIB::ifOutOctets.8 = Counter32: 0
IF-MIB::ifOutOctets.9 = Counter32: 0
IF-MIB::ifOutOctets.10 = Counter32: 0
```

然后我们可以用grep获取interface f0/0的所有相关信息

```
cisco@server-01:~$ snmpwalk -v 2c -c SnmpTest 192.168.2.1 interfaces | grep ".1 ="
IF-MIB::ifIndex.1 = INTEGER: 1
IF-MIB::ifDescr.1 = STRING: FastEthernet0/0
IF-MIB::ifType.1 = INTEGER: ethernetCsmacd(6)
IF-MIB::ifMtu.1 = INTEGER: 1500
IF-MIB::ifSpeed.1 = Gauge32: 100000000
IF-MIB::ifPhysAddress.1 = STRING: ca:0:d:84:0:8
IF-MIB::ifAdminStatus.1 = INTEGER: up(1)
IF-MIB::ifOperStatus.1 = INTEGER: up(1)
IF-MIB::ifLastChange.1 = Timeticks: (2020) 0:00:20.20
IF-MIB::ifInOctets.1 = Counter32: 574264781
IF-MIB::ifInUcastPkts.1 = Counter32: 446450
IF-MIB::ifInNUcastPkts.1 = Counter32: 2
IF-MIB::ifInDiscards.1 = Counter32: 0
IF-MIB::ifInErrors.1 = Counter32: 0
IF-MIB::ifInUnknownProtos.1 = Counter32: 0
IF-MIB::ifOutOctets.1 = Counter32: 189643070
IF-MIB::ifOutUcastPkts.1 = Counter32: 461534
IF-MIB::ifOutNUcastPkts.1 = Counter32: 23638
IF-MIB::ifOutDiscards.1 = Counter32: 0
IF-MIB::ifOutErrors.1 = Counter32: 0
IF-MIB::ifOutQLen.1 = Gauge32: 0
IF-MIB::ifSpecific.1 = OID: SNMPv2-SMI::zeroDotZero
```

从这些信息，我们可以看出来这个机器的很多信息。比如

1. IfIndex - 每个接口的唯一值，范围在 1 到此设备上存在的网络接口总数之间
2. IfDescr -通常标识接口的制造商、产品和硬件接口版本的文本字符串
3. IfType - 接口的接口类型的数字表示
4. IfAdminStatus - 接口的期望状态，其中 1 代表 up 状态
5. 等等

四，获取路由起的路由表，并确定网络拓扑

用snmptranslate来获取路由表在MIB树中的名称，在用snmpwalk获取路由表

```
cisco@server-01:~$ snmptranslate -Of -Ib routetable
.iso.org.dod.internet.mgmt.mib-2.ip.ipRouteTable
cisco@server-01:~$ snmpwalk -v 2c -c SnmpTest 192.168.2.1 ip.ipRouteTable
RFC1213-MIB::ipRouteDest.1.0.0.0 = IpAddress: 1.0.0.0
RFC1213-MIB::ipRouteDest.2.0.0.0 = IpAddress: 2.0.0.0
RFC1213-MIB::ipRouteDest.3.0.0.0 = IpAddress: 3.0.0.0
RFC1213-MIB::ipRouteDest.192.168.1.4 = IpAddress: 192.168.1.4
RFC1213-MIB::ipRouteDest.192.168.1.8 = IpAddress: 192.168.1.8
RFC1213-MIB::ipRouteDest.192.168.2.0 = IpAddress: 192.168.2.0
RFC1213-MIB::ipRouteDest.192.168.3.0 = IpAddress: 192.168.3.0
RFC1213-MIB::ipRouteDest.192.168.4.0 = IpAddress: 192.168.4.0
RFC1213-MIB::ipRouteIfIndex.1.0.0.0 = INTEGER: 10
RFC1213-MIB::ipRouteIfIndex.2.0.0.0 = INTEGER: 5
```

用grep来过滤输出

```
cisco@server-01:~$ snmpwalk -v 2c -c SnmpTest 192.168.3.1 ip.ipRouteTable | grep "Next"
RFC1213-MIB::ipRouteNextHop.1.0.0.0 = IpAddress: 192.168.1.6
RFC1213-MIB::ipRouteNextHop.2.0.0.0 = IpAddress: 2.2.2.2
RFC1213-MIB::ipRouteNextHop.3.0.0.0 = IpAddress: 192.168.1.6
RFC1213-MIB::ipRouteNextHop.192.168.1.4 = IpAddress: 192.168.1.5
RFC1213-MIB::ipRouteNextHop.192.168.1.8 = IpAddress: 192.168.1.6
RFC1213-MIB::ipRouteNextHop.192.168.2.0 = IpAddress: 192.168.1.6
RFC1213-MIB::ipRouteNextHop.192.168.3.0 = IpAddress: 192.168.3.1
RFC1213-MIB::ipRouteNextHop.192.168.4.0 = IpAddress: 192.168.1.6
cisco@server-01:~$ snmpwalk -v 2c -c SnmpTest 192.168.2.1 ip.ipRouteTable | grep "Next"
RFC1213-MIB::ipRouteNextHop.1.0.0.0 = IpAddress: 1.1.1.1
RFC1213-MIB::ipRouteNextHop.2.0.0.0 = IpAddress: 192.168.1.10
RFC1213-MIB::ipRouteNextHop.3.0.0.0 = IpAddress: 192.168.1.10
RFC1213-MIB::ipRouteNextHop.192.168.1.4 = IpAddress: 192.168.1.10
RFC1213-MIB::ipRouteNextHop.192.168.1.8 = IpAddress: 192.168.1.9
RFC1213-MIB::ipRouteNextHop.192.168.2.0 = IpAddress: 192.168.2.1
RFC1213-MIB::ipRouteNextHop.192.168.3.0 = IpAddress: 192.168.1.10
RFC1213-MIB::ipRouteNextHop.192.168.4.0 = IpAddress: 192.168.1.10
cisco@server-01:~$ snmpwalk -v 2c -c SnmpTest 192.168.4.1 ip.ipRouteTable | grep "Next"
RFC1213-MIB::ipRouteNextHop.1.0.0.0 = IpAddress: 192.168.1.9
RFC1213-MIB::ipRouteNextHop.2.0.0.0 = IpAddress: 192.168.1.5
RFC1213-MIB::ipRouteNextHop.3.0.0.0 = IpAddress: 3.3.3.3
RFC1213-MIB::ipRouteNextHop.192.168.1.4 = IpAddress: 192.168.1.6
RFC1213-MIB::ipRouteNextHop.192.168.1.8 = IpAddress: 192.168.1.10
RFC1213-MIB::ipRouteNextHop.192.168.2.0 = IpAddress: 192.168.1.9
RFC1213-MIB::ipRouteNextHop.192.168.3.0 = IpAddress: 192.168.1.5
RFC1213-MIB::ipRouteNextHop.192.168.4.0 = IpAddress: 192.168.4.1
```

根据以上的信息，我们可以得到拓扑图，和上个实验基本是一样的