SNMP-Based MBone Management

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DVMRP MIB changes

Previously, read-only access to configuration and statistics

Additional desired features:

- Remote configuration
- Routing table size monitoring
- Restart mechanism

DVMRP MIB changes (cont.)

Vif Table: phyint/tunnel configuration info, packet/byte counts

- **Read/write/create access allows remote configuration of tunnels and phyints.**
- **Tunnels can be added, deleted, modified.**
- **Phyints can only be modified.**

DVMRP MIB changes (cont.)

Boundary Table: scoped boundary configuration

- **Add, delete boundaries**

AltNet Table (new): alternate subnet configuration

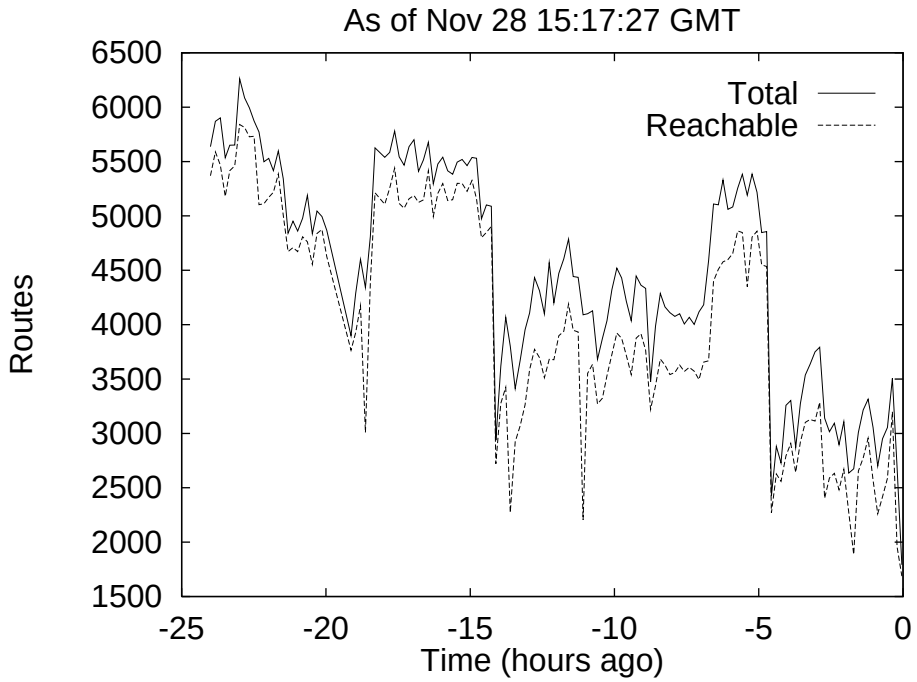
- **List, add, delete altnets**

Generation ID: unique instance identifier

- **Modify to restart multicast routing**

DVMRP MIB changes (cont.)

New gauges: total routes, reachable routes



Implementation status

Combined mrouted/snmpd (CMU SNMPv2) daemons

Implements IGMP, Multicast, DVMRP MIBs

Sets are persistent (saved to mrouted.conf)

Co-existence with other SNMP daemons:

- First try port 161, then port 9161

Security for remote configuration:

- Private community strings in /etc/snmpd.private

Platforms: SunOS, FreeBSD, others?

SNMP tools/utilities

Mstat

- **Display SNMP tables**
- **List groups, statistics**
- **List all sources for a group, statistics**

MRtree

- **Show actual (S,G) subtree, statistics**

MView

- **GUI front end to mtrace, mstat, mtree, etc.**
- **Monitor packet/byte counts, rates at tunnel endpoints over domain, etc.**

Dynamic Admin. Boundaries

Problem:

- **Host X sends 400 kbps video with TTL 255**
- **Non-pruning routers pull packets**
- **Single channel disrupts everything**

Solution:

- **Removing non-pruning routers is only partial solution**
- **Local *Policy* - "we will not fwd packets for offending groups (sources) across link Y"**

Dynamic Admin. Boundaries (cont.)

Details:

- **Daemon polls mrouted to monitor tunnel**
- **When traffic rate passes threshold (e.g. 400kbps),**
  - **look for offending group/source in kernel table**
- **If found, instantiate boundary**
- **Prune gets sent upstream**
  - **- protects downstream *and* upstream links**
- **Daemon can remove boundary:**
  - **a) when (S,G) entry no longer exists in kernel table**
  - **b) after a timeout**

Dynamic Admin. Boundaries (cont.)

Advantages:

- **No rate limits when no problem exists**
- **Local control protects global MBone and local domain**
- **Pruning means no wasted bandwidth**
- **No modifications to snmp-mrouted**
- **Rules contained only in daemon**
  - **easy to modify without affecting router**
- **Single daemon can monitor multiple routers**

Caveat: set traffic threshold high enough to be "unreasonable"