

CS290i - Lecture 10

Server Monitoring

Scalable Internet Services and Systems, Winter 2002

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SNMP

- UDP request/response
 - ◆ Management console sends request packet
 - ◆ Network device sends response packet
- Packets
 - ◆ Version, Community
 - ◆ Message type
 - ▮ GET-REQUEST, GET-NEXT-REQUEST, SET, GET_RESPONSE, TRAP
 - ◆ Request-Id, Error status & index
 - ◆ Data
 - ▮ Pairs of Object IDs and Values
- Variables to GET/SET
 - ◆ Strings and integers
 - ◆ MIB - Management information base
 - ▮ Hierarchy of names
- Example:
 - ◆ snmpwalk switch1.corp.expertcity.com public .1.3.6.1.2.1

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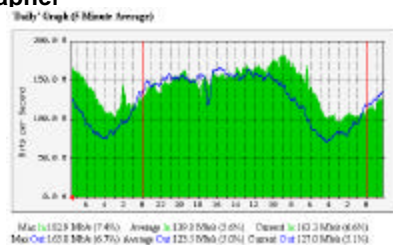
MRTG

■ Multi Router Traffic Grapher

- Monitor network links

■ Operation

- Runs every few minutes
 - ◆ (5 typ.)
- Fetches link stats
 - ◆ Typ via SNMP
- Round-robin database
 - ◆ Last day, every 5 minutes
 - ◆ Last week, every 30 minutes
 - ◆ Last month, every 2 hours
 - ◆ Last year, every day
- Generates GIFs/PNGs for each router, each period
 - ◆ Plus web page to tie images together



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RRDtool

■ Round-Robin-Database

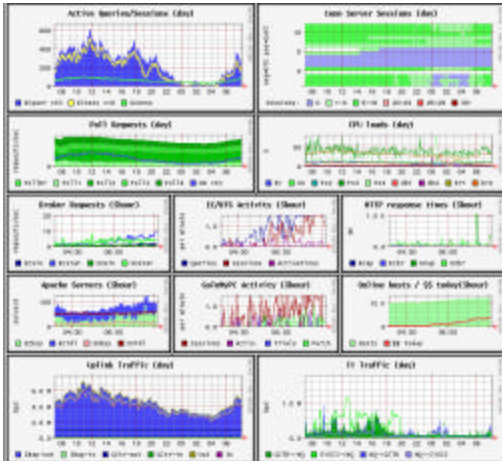
- Round-robin database
 - ◆ Last day, every 5 minutes
 - ◆ Last week, every 30 minutes
 - ◆ Last month, every 2 hours
 - ◆ Last year, every day
- Consolidate
 - ◆ Average, min, max

■ URLs

- MRTG: <http://ee-staff.ethz.ch/~oetiker/webtools/mrtg/>
- RRDTool: <http://ee-staff.ethz.ch/~oetiker/webtools/rrdtool/>
- Cricket: <http://cricket.sourceforge.net/>

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RRDtool example



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Traceroute

- **Goal**
 - Determine route from "here" to "there"
- **Trick**
 - Send packets with limited TTL
 - Either ICMP or UDP
 - Wait for ICMP time exceeded or no such port response
- **Caveats**
 - Non-symmetric routes
 - Slow router CPUs
- **Traceroute.org**

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Commercial products

- **Some names:**
 - HP OpenView
 - CA Unicenter
 - IBM Tivoli
- **Features**
 - Discovery of nodes
 - GUI display of network, nodes, etc...
 - MIB browsers
 - Data gathering, alerts, stats, planning, etc...
 - Email alerts, trouble tickets, run programs
 - ...

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