Management of Computer Networks CS 158B

Assignment #2: SNMP

SNMP Programming Project

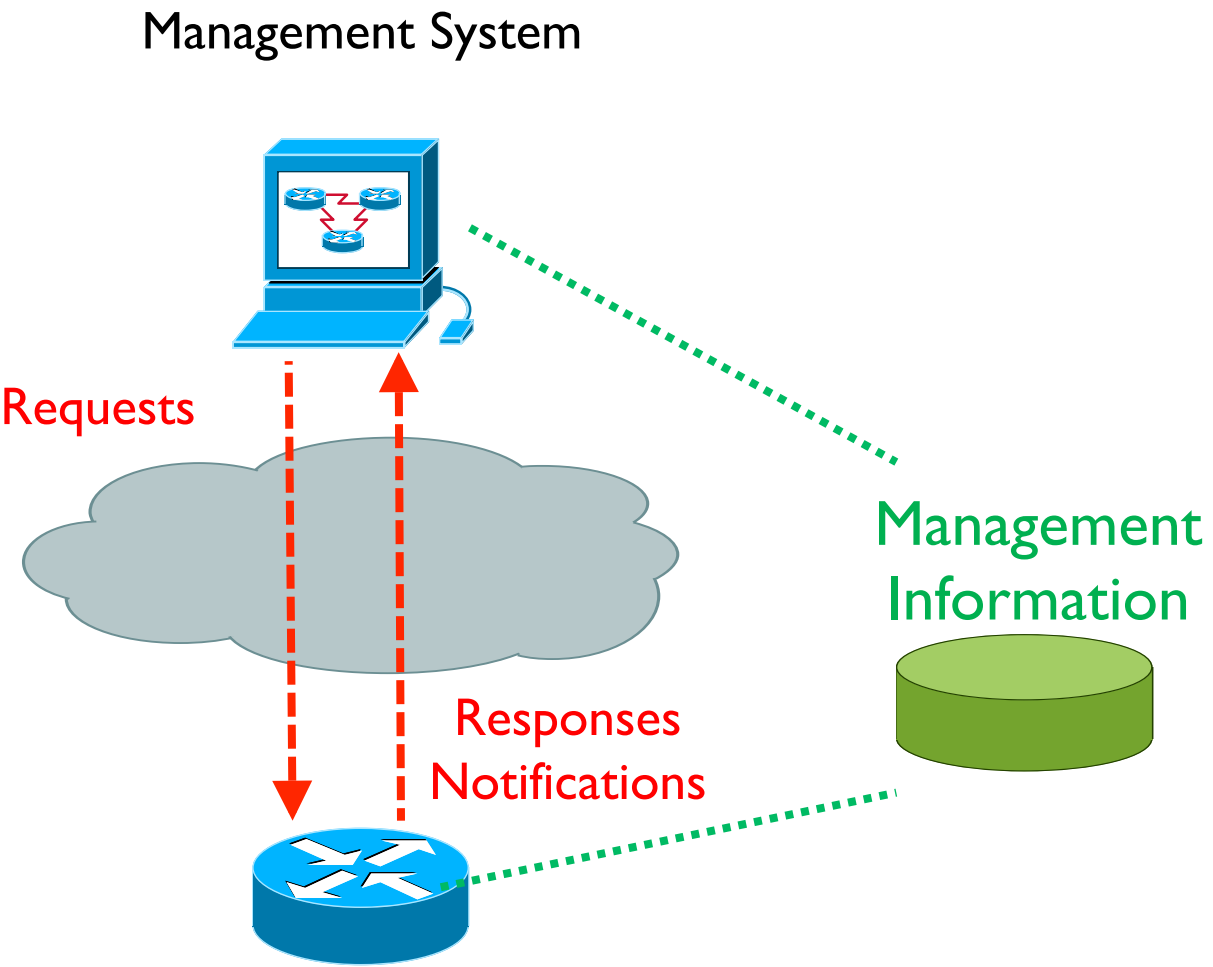
- Deliverables: code and report
- Individually or teaming up with another student
- Grade weight: 30%

The Problem

- The goal of this project is to design and implement a program that monitors the traffic in a device.
- Specifically, you must
  1. Discover the device interfaces
  2. Discover what devices they are connected to (at the IP level)
  3. Monitor the traffic on the device interfaces

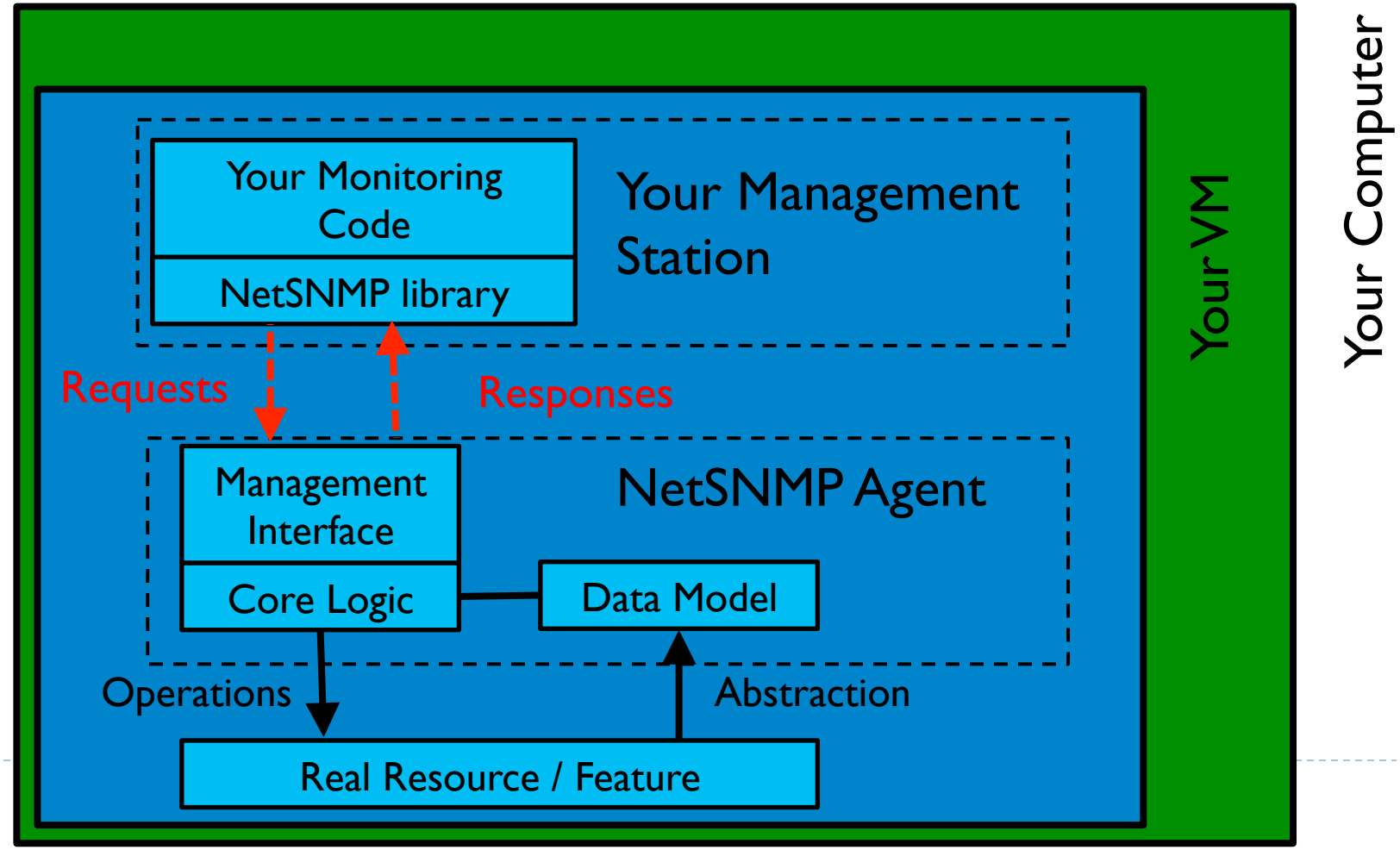
Overview

Network Management Protocol



The Setup: an Option

- Run the agent and management station on your computer in a VM



Input

- Time interval between samples
- Number of samples to take
- IP address of the agent
- Community

Output

- The output must contain
  - Device interfaces
  - Device IP neighbors
  - Traffic on each interface
- The output must be user-friendly, i.e., easy-to-read
- What follows is an example. You do not need to use it as a template

Output (2)

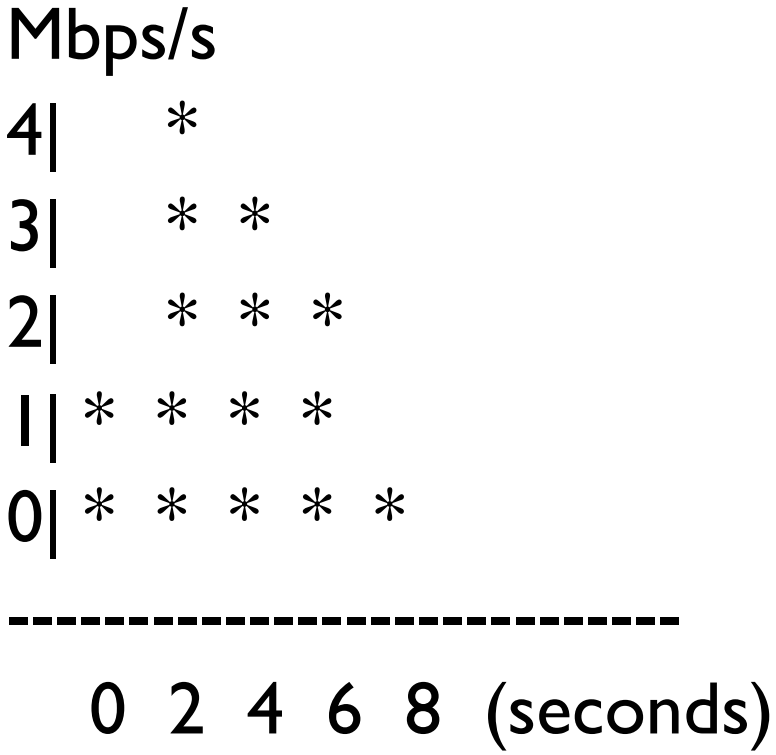
INTERFACES

Number	IP
1	192.168.3.2
2	192.168.32.1
3	local loop

NEIGHBORS

Interface	Neighbor
1	192.168.3.1
1	192.168.3.3
1	192.168.3.4

Output (3)



Programming

- Language: C
- Net-snmp suite
  - Programs for performing SNMP operations,
  - An extensive library to build SNMP managers
  - An SNMP agent that can be extended
- Important Remarks
  - Your code can not use external applications nor expect data from them; it must be self-sufficient.
  - It must be fully written in C and no scripts can be used.

Net-snmp

- Well-known SNMP utilities and libraries
- Includes several components
  - Programs for performing SNMP operations
    - Use them to troubleshoot and debug
    - Useful to check the origin of the problems you may face when fetching data from the SNMP agent
    - These tools are **only for debugging purposes**. **You may not use them in your deliverable.**
  - Extensive library to build SNMP managers
    - Although the library API is very large, you only need a small subset of it.
  - SNMP agent that can be extended

The Steps to your Project

1. **Install net-snmp in your device**
   - Download it from the website: http://net-snmp.sourceforge.net/
   - Run the agent
   - Test the agent with the commands in the suite
   - Compile and run the code example
2. **Find out the objects you will** need to gather from the routers so that you can discover the routers in the network and the traffic.
   - You may use only objects included in the MIB-II.
3. **Learn how to use the library** and the net-snmp applications.
   - the documentation only covers the basics.
4. **Discover the interface** in the device
5. **Discover the IP neighbors**
6. The program computes and presents **the traffic** on each interface periodically.

Grading

- Factors
  - Choice of the MIB-II variables used,
  - Software design,
  - How the polling of the data is implemented,
  - How the data is presented (how easy-to-read, user-friendly the output is)
- Your code will be tested
  - Provide documentation on how to test it

Submission

- 11/9 (Wednesday)
- Via e-mail
- 1 tar file containing
  - C code (must be commented)
  - Document
    - Functional Specification
    - Design Specification
    - Testing
- Name the tar file using your names
  - Include your names in the code and the document

Extra credit

- Goal: analyze the accuracy of the traffic estimation your program provides
- Deliverable
  - Additional section in the document
  - Describe design for analysis
  - Describe analysis results
- Extra credit
  - A satisfactory analysis will be an additional 3 points (out of 30, i.e., 10%) in the programming project grade
  - That is, an additional 3% in the final grade