

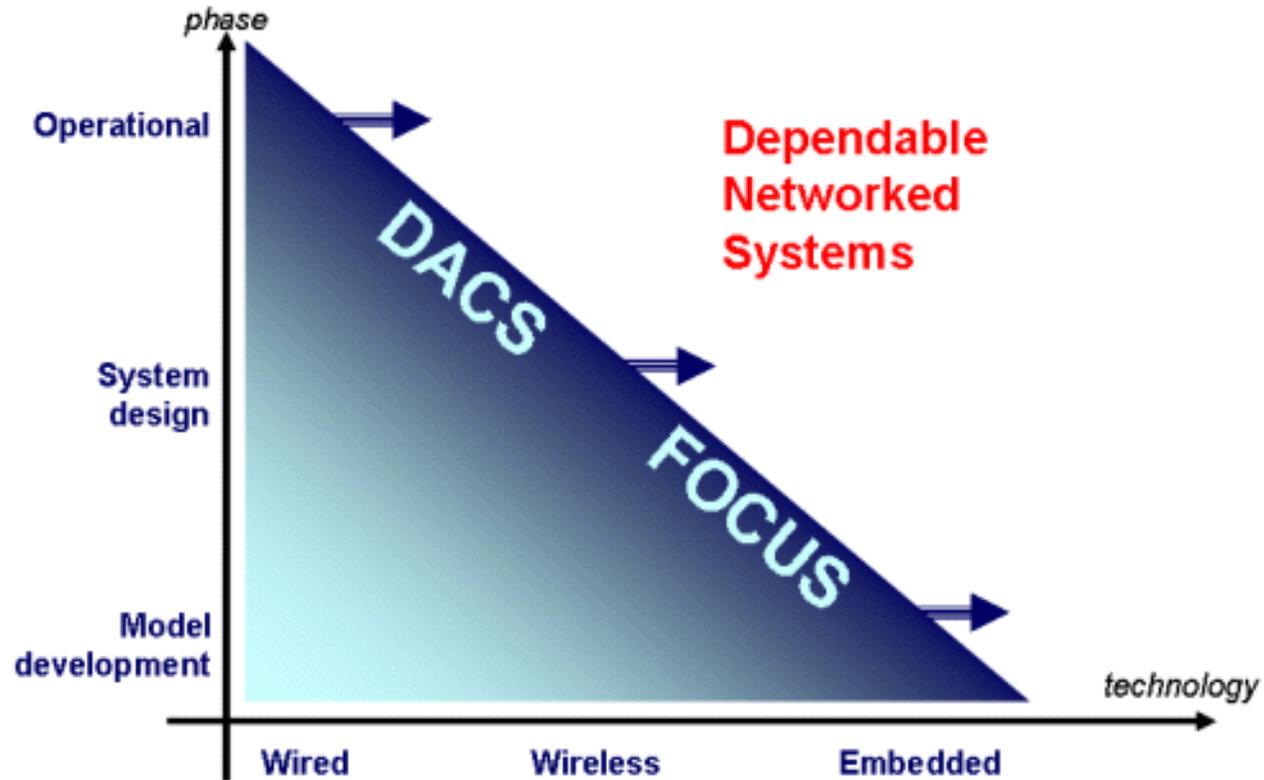
# INTERNET MANAGEMENT AND MEASUREMENT

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DESIGN AND ANALYSIS OF COMMUNICATION SYSTEMS (DACS) GROUP  
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# ABOUT DACS



# PURPOSE OF THIS COURSE

## THE PURPOSE OF THIS COURSE IS TO GET AN UNDERSTANDING OF:

- WHICH MANAGEMENT INFORMATION EXISTS WITHIN THE INTERNET
  - WHO DEFINES THIS INFORMATION
- THE SYNTAX IN WHICH THIS INFORMATION IS DESCRIBED
  - THE PROTOCOLS THAT ALLOW THIS INFORMATION TO BE MONITORED / MODIFIED
- HOW TO MEASURE THE FLOW OF INTERNET DATA

# MATERIAL

## BOOK

William Stallings: SNMP, SNMPv2, SNMPv3, RMON 1 & 2;  
Addison Wesley, ISBN 0-201-48534-6

- PODCAST / REAL MEDIA PRESENTATIONS  
<http://www.simpleweb.org/tutorials/video/>

- SLIDES

<http://www.simpleweb.org/tutorials/slides.html>

- EXERCISES

<http://www.simpleweb.org/tutorials/exercises.html>

- TELETOP WEBSITE

# COURSE ORGANIZATION

## COURSE CONSISTS OF THREE ELEMENTS:

- FIVE LECTURES IN CLASS ROOM
- TWO LECTURES AS SELF STUDY
  - SEVEN EXERCISES

## CLASS ROOM LECTURES

DATE	LOCATION	TOPIC
21 APRIL	LA A128	INTRODUCTION
28 APRIL	LA A128	SIMPLE NETWORK MANAGEMENT PROTOCOL (GUEST LECTURE)
26 MAY	LA A128	SNMPv3, DISTRIBUTED MANAGEMENT
2 JUNE	LA A128	INTERNET MEASUREMENTS (NETFLOW) - RAMIN SADRE
9 JUNE	LA A128	NEW APPROACHES: WEB-SERVICES FOR MANAGEMENT
16 JUNE	LA A128	BACK-UP DATE / MAY NOT BE NEEDED

**NOTE: NO LECTURE ON 12 & 19 MAY**

# SELF STUDY LECTURES

DATE DONE	TOPIC
28 APRIL	STRUCTURE OF MANAGEMENT INFORMATION
12 MAY	MANAGEMENT INFORMATION BASES

## MATERIAL:

- PODCASTS

<http://www.simpleweb.org/tutorials/video/>

- BOOK OF STALLINGS

William Stallings: SNMP, SNMPv2, SNMPv3, RMON 1 & 2;  
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## EXERCISES:

EXERCISE	READY	TOPIC	WEIGHT
1	28 APRIL	STRUCTURE OF MANAGEMENT INFORMATION	10%
2	12 MAY	MANAGEMENT INFORMATION BASES	10%
3	19 MAY	ASN.1 DECODING OF A SNMP PACKET	10%
4	26 MAY	INSTALLING A SNMP AGENT	10%
5	2 JUNE	SNMP: COMPARISON VERSION 1, 2 AND 3	15%
6	1-5 JUNE	EXPERIMENT WITH MANAGEMENT APPLICATIONS	
	12 JUNE	REPORT OF EXPERIMENT	15%
7	21 JUNE	WRITE AN AGENT EXTENSION <b>OR</b> WRITE A SHORT PAPER	30%

- EXERCISE 1, 2, 3 & 5: TO BE PERFORMED AS INDIVIDUALS
- EXERCISE 4, 6 & 7: TO BE PERFORMED IN GROUPS OF TWO STUDENTS
  - FIRST FIVE EXERCISES: SAME FOR ALL
  - LAST TWO EXERCISES: DIFFERENT FOR ALL GROUPS
- SUBMISSION OF RESULTS VIA TELETOP (DEADLINES: 8:00)

# **DETAILED OVERVIEW**

# CLASS ROOM LECTURE 1

ON APRIL 21, 2009

- STALLINGS CHAPTERS 1, 2 & 4
- PODCASTS: MANAGEMENT STANDARDS + INTRODUCTION TO SNMP

EXAMPLES OF MANAGEMENT INFORMATION

DIFFERENT APPROACHES TO MANAGEMENT

- AD-HOC APPROACHES
- STANDARD APPROACHES

SNMP

- BASIC OPERATION
  - HISTORY
  - STANDARDS
    - GOALS

# SELF STUDY LECTURE 1

DONE BEFORE APRIL 28, 2009

- STALLINGS CHAPTERS 5 & 11
- PODCAST: SMI

## STRUCTURE OF MANAGEMENT INFORMATION

- SCALARS
- TABLES
- ROW CREATION
- TEXTUAL CONVENTIONS

# EXERCISE 1

DONE BEFORE APRIL 28, 2009

SMI

USE SMIV2 TO  
DEFINE AND VALIDATE A SIMPLE MIB MODULE

# CLASS ROOM LECTURE 2

ON APRIL 28, 2009

- STALLINGS CHAPTERS 7, 11 & 12

## SIMPLE NETWORK MANAGEMENT PROTOCOL

- SNMPV1
- PROXIES
- MESSAGE ENCODING
- SNMPV2

# SELF STUDY LECTURE 2

DONE BEFORE MAY 12, 2009

- STALLINGS CHAPTERS 6 & 13
- PODCAST: INTRODUCTION TO MIBs, MIB-II

## MANAGEMENT INFORMATION BASES

### MIBS

### MIB-II

- SNMPv2 MIB
  - IF MIB
  - IP MIB

## **EXERCISE 2**

DONE BEFORE MAY 12, 2009

MIBs

RETRIEVE SPECIFIC MIB VALUES

## **EXERCISE 3**

DONE BEFORE MAY 19, 2009

ASN.1

DECODE A SNMP MESSAGE

## EXERCISE 4

DONE BEFORE MAY 26, 2009

### INSTALL AN SNMP AGENT

OTHER STUDENTS SHOULD BE INFORMED ABOUT AGENT DETAILS:

- IP NUMBER
- PORT NUMBER
- COMMUNITY STRING
- SECURITY NAME
- SECURITY KEYS

AGENTS SHOULD CONTINUE RUNNING UNTIL JUNE 5

- AGENTS WILL BE USED IN EXERCISE 6
- YOUR AGENT WILL BE USED BY ALL OTHER STUDENTS

# CLASS ROOM LECTURE 3

ON MAY 26, 2009

- STALLINGS CHAPTERS 15, 16 & 17

## SNMPv3

- DESIGN DECISIONS
  - ARCHITECTURE
- SNMP MESSAGE STRUCTURE
  - SECURE COMMUNICATION
    - ACCESS CONTROL
      - RFCS

## DISTRIBUTED MANAGEMENT

- DISMAN

## **EXERCISE 5**

DONE BEFORE JUNE 2, 2009

### SIMPLE NETWORK MANAGEMENT PROTOCOL

PERFORM SNMP OPERATIONS ON A DEMO MIB

COMPARE THE RESULTS FOR:

- SNMPv1
- SNMPv2
- SNMPv3

# CLASS ROOM LECTURE 4

ON JUNE 2, 2009  
BY RAMIN SADRE

- STUDY MATERIAL: SLIDES

## INTERNET MEASUREMENTS

- ACTIVE VERSUS PASSIVE MEASUREMENTS
  - MEASUREMENT LOCATION
    - MEASUREMENT TOOLS
- MEASUREMENT RESULTS: EXAMPLES

# CLASS ROOM LECTURE 5

ON JUNE 9, 2009

- STUDY MATERIAL: SLIDES

## NEW DEVELOPMENTS

- WEB SERVICES BASED MANAGEMENT
  - NETCONF

## **EXERCISE 6**

PREPARE BEFORE JUNE 1, 2009

RUN BETWEEN JUNE 1 - 5, 2009

REPORT READY: JUNE 12, 2009

### **MANAGEMENT AND MEASUREMENT**

MEASURE HOW YOUR SNMP AGENT IS USED  
MONITOR OTHER SNMP AGENTS  
(USING TOOLS LIKE MRTG/CACTI/NAGIOS OR ZENOSS)

# **CLASS ROOM LECTURE 6**

ON JUNE 16, 2009

BACK-UP DATE  
LECTURE ONLY IF NEEDED  
INSTEAD OF ONE OF THE EARLIER DATES

## **EXERCISE 7**

PERFORM ONE OF THE FOLLOWING EXERCISES:

1) WRITE A SNMP MANAGEMENT EXTENSION

YOU MAY SELECT YOURSELF WHICH OBJECTS YOU WILL IMPLEMENT

DONE BEFORE JUNE 21, 2009

2) PERFORM A LITERATURE STUDY

AND WRITE A PAPER ON THAT TOPIC

DONE BEFORE JUNE 21, 2009