

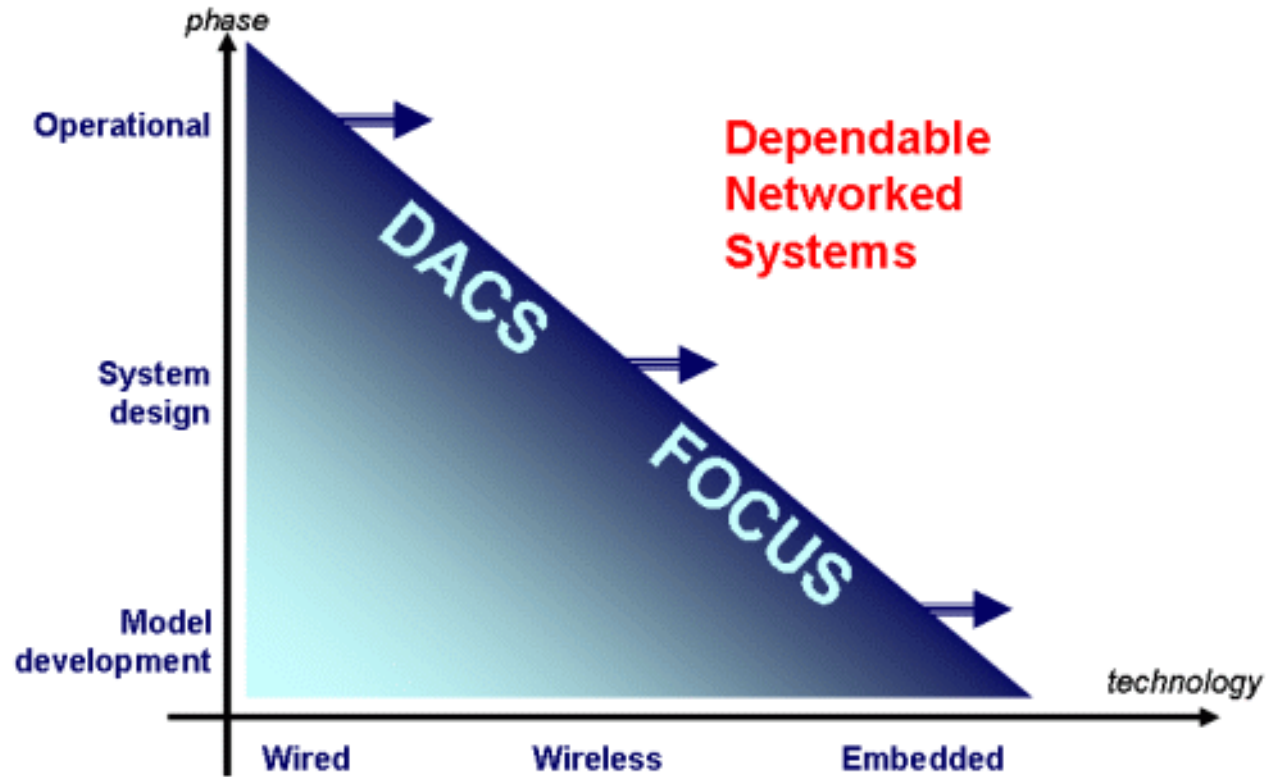
INTERNET MANAGEMENT AND MEASUREMENT

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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:

- SIX LECTURES IN CLASS ROOM
- TWO LECTURES AS SELF STUDY
 - EXERCISES

CLASS ROOM LECTURES

DATE	LOCATION	TOPIC
16 APRIL	CU B103	INTRODUCTION
23 APRIL	CU B103	SIMPLE NETWORK MANAGEMENT PROTOCOL (GUEST LECTURE)
7 MAY	CU B103	SNMPv3, DISTRIBUTED MANAGEMENT
14 MAY	CU B103	NEW APPROACHES: WEB-SERVICES FOR MANAGEMENT
21 MAY	CU B103	INTERNET MEASUREMENTS (NETFLOW)
28 MAY	CU B103	GUEST LECTURE - GIJS V.D. BROEK - SNMP PERIODICITY

NOTE: NO LECTURE ON 30 APRIL, 4 & 11 JUNE

SELF STUDY LECTURES

TOPIC
STRUCTURE OF MANAGEMENT INFORMATION
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	22 APRIL	STRUCTURE OF MANAGEMENT INFORMATION	10%
2	6 MAY	MANAGEMENT INFORMATION BASES	10%
3	13 MAY	SNMP: COMPARISON VERSION 1, 2 AND 3	10%
4	20 MAY	ASN.1 DECODING OF A SNMP PACKET	10%
5	27 MAY	INSTALLING A SNMP AGENT	15%
6	9 & 25 JUNE	EXPERIMENT WITH MANAGEMENT APPLICATIONS	15%
7	4 JUNE / 25 JUNE	WRITE AN AGENT EXTENSION OR WRITE A SHORT PAPER	30%

- EXERCISE 1..4: TO BE PERFORMED AS INDIVIDUALS
- EXERCISE 5, 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: 24:00)

DETAILED OVERVIEW

CLASS ROOM LECTURE 1

ON APRIL 16, 2008

- 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 23, 2008

- STALLINGS CHAPTERS 5 & 11
- PODCAST: SMI

STRUCTURE OF MANAGEMENT INFORMATION

- SCALARS
- TABLES
- ROW CREATION
- TEXTUAL CONVENTIONS

EXERCISE 1

DONE BEFORE APRIL 23, 2008

SMI

USE SMIV2 TO
DEFINE AND VALIDATE A SIMPLE MIB MODULE

CLASS ROOM LECTURE 2

ON APRIL 23, 2008

- STALLINGS CHAPTERS 7, 11 & 12

SIMPLE NETWORK MANAGEMENT PROTOCOL

- SNMPV1
- PROXIES
- MESSAGE ENCODING
- SNMPV2

SELF STUDY LECTURE 2

DONE BEFORE MAY 7, 2008

- 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 7, 2008

MIBs

RETRIEVE SPECIFIC MIB VALUES

CLASS ROOM LECTURE 3

ON MAY 7, 2008

- STALLINGS CHAPTERS 15, 16 & 17

SNMPv3

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

DISTRIBUTED MANAGEMENT

- DISMAN

EXERCISE 3

DONE BEFORE MAY 14, 2008

SIMPLE NETWORK MANAGEMENT PROTOCOL

PERFORM SNMP OPERATIONS ON A DEMO MIB

COMPARE THE RESULTS FOR:

- SNMPv1
- SNMPv2
- SNMPv3

CLASS ROOM LECTURE 4

ON MAY 14, 2008

- STUDY MATERIAL: SLIDES

NEW DEVELOPMENTS

- WEB SERVICES BASED MANAGEMENT
 - NETCONF

EXERCISE 4

DONE BEFORE MAY 21, 2008

ASN.1

DECODE A SNMP MESSAGE

CLASS ROOM LECTURE 5

ON MAY 21, 2008

- STUDY MATERIAL: SLIDES

INTERNET MEASUREMENTS

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

EXERCISE 5

DONE BEFORE MAY 28, 2008

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 13

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

CLASS ROOM LECTURE 6

ON MAY 28, 2008

- STUDY MATERIAL: SLIDES

GUEST LECTURE: GIJS V.D. BROEK

- PERIODICITY OF SNMP TRAFFIC

EXERCISE 6

PREPARE BEFORE JUNE 4, 2008

RUN BETWEEN JUNE 9 - 14, 2008

MANAGEMENT AND MEASUREMENT

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

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 4, 2008

2) PERFORM A LITERATURE STUDY

AND WRITE A PAPER ON THAT TOPIC

DONE BEFORE JUNE 25, 2008