CS7012: Management of Networks and Distributed Systems

Dr. Kris McGlinn and Dr. Rob Brennan

Kris.McGlinn@scss.tcd.ie
Rob.Brennan@cs.tcd.ie
Course Objectives

At the end of this course you should be able to:

1. identify key issues encountered in managing networks, applications and Systems

2. apply common techniques and technologies to network & system management problems

3. analyse the future trends in networks and distributed system management
Course Organisation and Philosophy

• 3 lectures/tutorials per week
• One course project to be completed before end of semester
  • Broken into multiple assessments (see later slide)
• Distribution of selected technical research papers (for discussion and presentation in classroom)

IMPORTANT: Lectures/seminars only introduce topics. Students are expected to perform background reading on the major course topics
Administrative Matters

• Lectures:
  – Monday 13:00 @ LB107, Lloyd Building
  – Monday 16:00 @ Joly Theatre, Hamilton Building
  – Thursdays 14:00 @ LB01, Lloyd Building

• Kris.McGlinn@scss.tcd.ie
  • https://www.scss.tcd.ie/~mcglink/lectures/CS7012/

• Rob.brennan@scss.tcd.ie
  • https://www.scss.tcd.ie/~rbrenna/cs7012.html
Course Assessment

70% Examination Paper

• Three questions from five drawn from this course

30% Group Project

• Multiple deliverables assessed – 2 group presentations (1 including demo), software developed, 2 reports
Overview of Syllabus

• Unit 1 - Principles of Network Management - Kris

• Unit 2 - Internet and Telecoms Network Management (SNMP/OSI/TMN/3GPP) - Rob

• Unit 3 - Web Based Enterprise Management (DMTF) - Kris

• Unit 4 – Policy-based and Knowledge-driven Management - Rob

• Unit 5 – Managing Data in Smart, Sustainable Buildings - Kris
Unit 1 - Principles to Network Mgt

• What is Network & Systems Management?
• Why is the Study of Management important?
• What are the current models/approaches?
• What are its ‘Functional Areas’?
• What are the standards?
Unit 2 - Internet Network Management

• The Simple Network Management Protocol
• Structure of Management Information & Management Info. Bases
• How SNMP Operates
• Limitations and Future Developments of SNMP
Unit 2 (cont) - Telecommunication Management - the OSI & 3GPP Approaches

• OSI based Network Management Concepts & Framework
• OSI Management Services & Protocols: CMISE & CMIP
• **GDMO** and the design of Management Information Bases and Managed Objects
• 3GPP Network Management Reference Model and Requirements
• 3GPP Network Management Functional Architecture
• 3GPP Network Resource Models
• **Telecommunications Management Network:**
  – Principles
  – Models
  – Applications
Unit 3 – Web Based Enterprise Management (DMTF)

• What is Enterprise Management?
• What are the drivers in Enterprise Mgt?
• Distributed Enterprise Management
  – Web Based Enterprise Management
  – Common Information Model
Unit 4 Advanced Network Management

• Policy Based Management
• Autonomic Management
• Linked Data and RDF for Network Management
• Ontology-based Network Management
Unit 5– Managing Data in Smart, Sustainable Buildings

• What is Building Information Management/Modelling?
• What are the drivers for BIM and what is its scope?
• What are the most prevalent standards?
  – Industry Foundation Classes
  – Other data models/ontologies
• Future directions for BIM?
  – Knowledge based management and Linked Data