SED Lectures 11
Introduction to Software Architecture

Objectives
To understand the main elements of software architecture and its role in software design. To explain three classical software architecture styles: pipe and filter, repository and layered system.

Key Points
• The software architecture of a system describes the organisation of the overall system
• SW architecture addresses questions of gross organisation and global control structure; protocols for communication, synchronisation and data access; the assignment of functionality to design elements; physical distribution of elements; composition of design elements; scaling and performance; selection among design alternatives
• SW architectures are described by a graph in which the nodes represent components of the system, and the arcs represent the connectors between them, together with constraints on the organisation of components and connectors.
• Over the years, software developers have identified a number of common architectural patterns. In these 2 lectures we shall study 3 of these: pipe and filter, repository and layered system
• During system design major policy decisions must be taken regarding concurrency, HW/SW mapping, persistent data management, access control, software control mechanism, and boundary conditions

Core reading

Bruegge & Dutuoit, 6.3.5 Architectural styles, 7.4 system design activities

Sommerville (7th ed) 11 Architectural design

Pressman (5th ed) 14.3 Architectural styles

(both Pressman and Sommerville provide good background reading covering a number of different SW architectures which are not covered in SED lectures)
