



CS5030

Architectures of Software Systems

Learning objectives

- On completing this lecture and associated reading, you should
 - Be aware of the different types of architectures associated with software systems

Recap: software artefacts

- [Business plan]
- Requirements specification
- Software architecture specification
- Software design documents
- Software
- Tests
- ...
- Artefacts specific to development process (for eg, agile)

Types of architecture – other than CS

- Buildings
- Vehicles
- Landscape
- Golf courses
- ...

Types of architecture – within CS

- Network
- Operating system
- Computer
- Enterprise
- System
- Technology / infrastructure
- Application
- **Software**
- Information
- ...

Scope of architecture

- Depends on scale of context
 - Domain
 - Organisation
 - Application
- May include different aspects
 - Software, hardware, processes, policies, standards, ...
 - Specified from different perspectives

Enterprise architecture

- A coherent whole of principles, methods and models that are used in the design and realisation of an enterprise's organisational structure, business processes, information systems, and infrastructure

[Lankhorst, 2017]

- Architecture across a (potentially large) enterprise
- Long term strategies driven by business vision and desired outcomes
- Organisation-wide policies and standards
 - Apply to multiple systems

Infrastructure architecture

- Structure and behaviour of the technology infrastructure of an enterprise or system
- Includes hardware configurations, infrastructure applications that run on hardware, protocols and networks that connect applications and hardware components
 - Development and deployment
- Concerns: resilience, performance, etc

Software architecture

- The fundamental organization of a system embodied in its components, their relationships to each other and to the environment and the principles guiding its design and evolution

[IEEE 1471 - 2000]

- Structure or structures of the system, which comprise software elements, the externally visible properties of these elements, and the relationships among them

[Bass, Clements & Kazman]

Application architecture

- Architecture as applied to an application
 - An application is a social construction
 - A body of code that's seen by developers as a single unit
 - A group of functionality that business customers see as a single unit
 - An initiative that those with the money see as a single budget
- [\[Martin Fowler\]](#)
- Therefore, the size of an application may vary

System architecture

- Holistic architecture of a specific system
- Includes software architecture as well as hardware and communication concerns

Information architecture

- Logical and physical data models
- Concerns:
 - data storage, management and maintenance

Key points

- There are many types of architecture associated with computer systems and software
- The scope of an architecture depends on the scale of its context
- Each type of architecture will include different aspects of a system