

Lecture 12

Planning with middleware services

Individual middleware services

- Distributed applications can benefit of services such as
 - Remote execution, server activation
 - Discovery, directory or P2P
 - Event notification
 - Mobility management
 - Content adaptation
 - Context-awareness
- Supporting architecture
- Set of protocols

WHY, WHERE, WHEN, HOW?

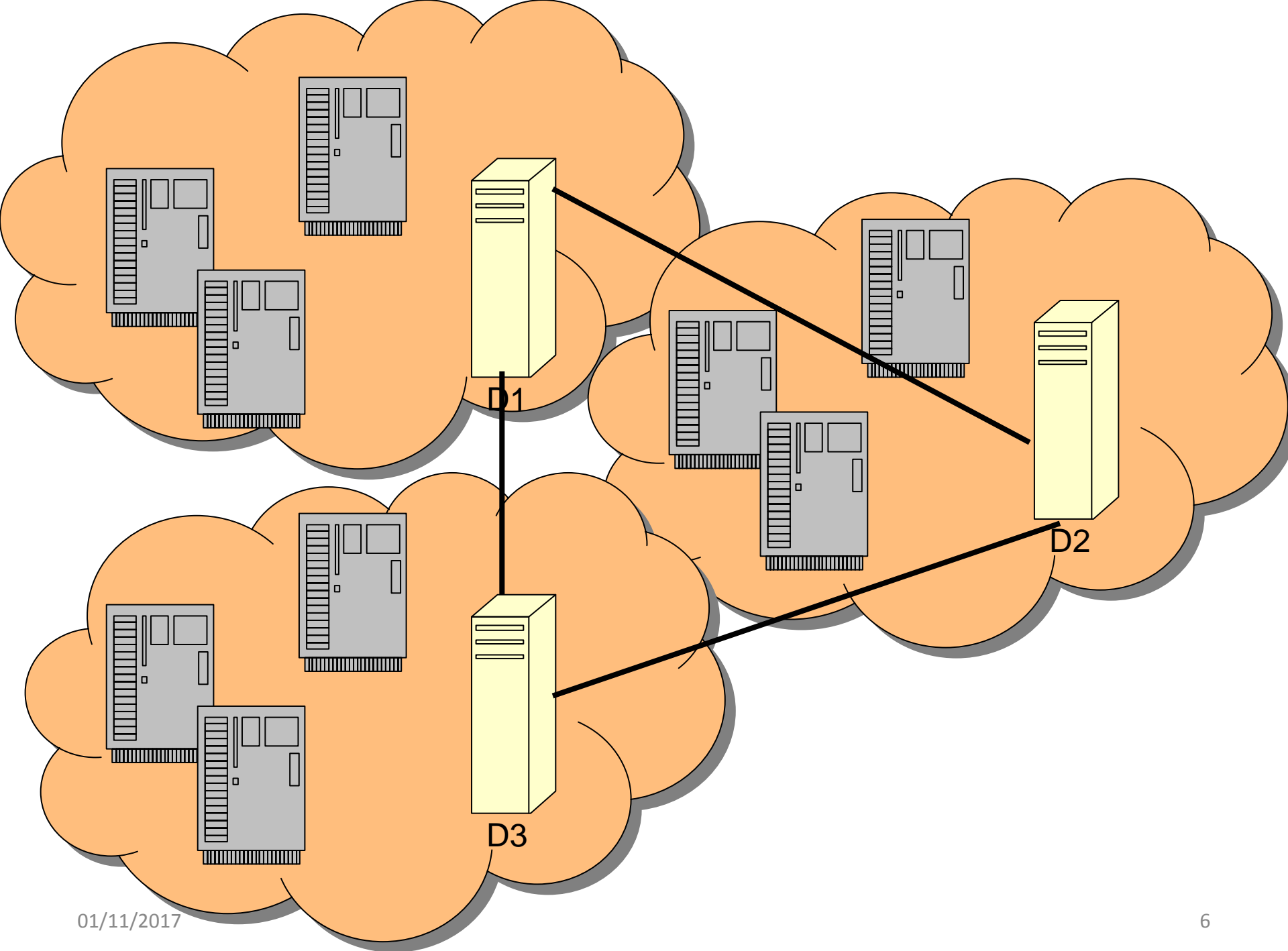
- WHY?
 - to solve one or several problems – transparency, inter-operability
- WHERE
 - software layer between the applications and the network, generally in a distributed manner
- WHEN
 - at run-time
- HOW
 - dedicated software system made of one or several middleware services

Performance goals

- Achieve the best functional goal
- Minimum execution time/minimum overhead
- Minimum resource consumption (energy is very important)
- Robustness
- Reliable
- Scalable

Use case 1

- Let's consider a large organisation with several server sites networked. As the set of services on offer changes during the time, middleware for service discovery and remote execution is required.
- Solution: directory-based or P2P.
- Directory-based allows for federation creation; P2P is on the local network.
- Another benefit: use log files to keep evidence of all actions.
- Security and service provisioning can be better controlled with a centralised solution.



Protocols

1. Identify/discover the service discovery (server and client).
2. Join/register service offer in the directory.
3. Leave/un-register the service.
4. Lookup the directory for a service.
5. Use the remote service.
6. Lease allocation and renewal.
7. Service event notification.

Evaluation

- Achieving functionality?
- System cost/overhead?
- Is the system robust? If not, how can it become robust?
- Is the system reliable (no errors!)?
- Is the system scalable?

Use case 2

- Let's consider a small organisation with one site that may include mobile devices. As the set of services on offer changes during the time, middleware for service discovery and remote execution is required.
- A P2P solution looks more appropriate.
- Broadcasting offer messages periodically.
- Opportunities for the control of the offer window.
- More appropriate for mobile, short-lived services.