

DISTRIBUTED SYSTEMS

FUNDAMENTAL PROPERTIES

1. concurrent execution of components
2. independent failure modes
components and connections may fail independently
3. transmission delay
4. relativistic time

IMPLICATIONS

2. -> cannot know why there's no reply - failure or congestion
a heartbeat infrastructure can be useful
 4. -> cannot use local timestamps from different places
to order the occurrence of events, *see T1 - T12*
- 1 and 3 -> inconsistent state *see D1 - D20*
replicas of a single object
related changes to different objects
- 1 -> can't wait for quiescence to resolve inconsistencies

Time and event ordering T1-26 and Distributed algorithms D1-20

exam questions still OK

these sections are on fundamental concepts

Middleware M1 - 29

exam questions can become dated

e.g. web services becoming important

e.g. convergence of asynchronous middlewares

message, events, publish/subscribe

Naming N1-22

exam questions still OK

new challenges are mobility and scale of ubiquitous computing

Access Control (Authorisation) A1-22

exam questions still OK

RBAC is more generally accepted for achieving scalability than ten years ago

Storage S1 - 14

the topic is migrating into OS courses - network-based file servers

CFS is of historical interest

New notes - as opposed to incremental evolution of topics - so not in past exam papers

Domain structured, large-scale systems

not covered explicitly before, although touched on in OASIS RBAC

Event-based middleware - case study

EBM now generally accepted as important for ubiquitous computing
- how to integrate it with other parts of systems?

Note that questions need not be just "bookwork" and can ask you to relate
the various parts of the course
e.g. storage and access control
e.g. naming and middleware

Read the questions carefully and answer them.

I prefer structured text to continuous prose e.g. bullet points - with enough explanation
If in doubt ASK - e.g. ambiguity in question.
e.g. 1998: "alternative approaches to creating unique names in DS"
Or write down how you are interpreting the question.
I give credit if there's a genuine mis-reading.