Papers 9 + 13 Distributed Systems. re Naming, Comm^n/Middleware JMB

2003

a) Uniqueness may be achieved
- large, fixed-length bit-string. May be flat or structured eg host ID, object-at-host ID.
- hierarchy: a name need only be unique in the context of its superior component via which it is resolved.

b) (i) Internet-DNS
hierarchical names, objects at leaves: uc.cl.com.ac.uk ← domains
naively: each domain has a directory via which a name component can be resolved.
optimised: agent resolves whole path to avoid per-component interaction
- replication of directories heavily used
- caching of resolved names + batching of queries + responses.

(ii) object-oriented middleware eg CORBA, Java.
based on synchronous object invocation ⇒ assumes tight coupling (if objects can detach, proxies must be available to interact).
Object references typically have form: creator-ID, object-ID.
"which" "pins down" object at creator.
The creator ID is sufficient to give the host IP address.
A name service may also be provided which allows registration by servers and lookup by potential clients. eg JNDS, CORBA N.S. ANSA Trader etc.

(iii) message-oriented middleware
Names asynchronous communication between loosely coupled components. Names may be topic hierarchies as in pub/sub or queue names as in MQSeries - decoupling sender & receiver.
Name resolution via a middleware service unusual (except in various extensions to O-O-M such as JMS).
Usually have comms-style routing tables in message brokers.

(iv) web-based systems
Names may be flat URIs but more usually we have URN/URLs, based on DNS or IP addresses.
Name resolution is iterative as in (i) above.