**Notes on “Distributed Systems”**

Chapter 1 Notes

Wide Area Networks (WAN)

Distributed System (p. 2): “collection of autonomous computing elements that appears to its users as a single coherent system”

Node (p. 2): computing element

Distribution Transparency (pp. 8 – 14): Ideal that processes and resources should be hidden from end-users/apps.

Access Transparency (pp. 8-9): hide “…differences in data representation and way objects can be accessed.”

Location Transparency (p. 9): physical location hidden

Replication Transparency (pp. 9 - 10): hide the fact that more than one copy of a resource is available in more than one location, or that several processes are operating “so that one can take over when another fails.”

Failure Transparency (p. 10): user/app not notice “that some piece of the system fails to work properly”; system able to automatically recover from failure.

Scalability (pp. 15 – 24)

Size Scalability (pp. 15-16): Computational capacity (CPUs), storage capacity, network limitations [least technically problematic according to p. 23]

Geographic Scalability (pp. 17 – 18): note many existing distributed systems designed for LANs don’t scale effectively due to expectation of synchronous communication

Administrative Scalability (pp. 18 – 19): policies with resource usage, management, security. Distributed systems protect itself against malicious attacks from new domain; new domain protect itself from attacks from the distributed system (? Domain same as location).

Scaling techniques (pp. 20 – 23): scaling up; scaling out – more machines

Application dev. techniques: reduce overall communication, ex. Move part of computation to client processes.

Partitioning and distribution (pp. 21 – 22) (? Need more clarification)