An Exploration of Distributed Systems

CSE 486: Distributed Systems

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Introduction

This is an exploration of distributed systems.

It is not exhaustive, or even particularly broad.

All of these systems are real, and source available.

Have a look!
Tahoe-LAFS

Tahoe-LAFS is a distributed storage layer.

- Capability-based
- Fault-tolerant
- Resilient to compromised servers
- Uses sophisticated cryptographic techniques
IPFS

IPFS is a distributed peer-to-peer network.

- Many protocols!
- Uses content addressing
- Blob storage and filesystem overlays
- Name services
- Uses Kademlia!
etcd is a distributed key-value store.

- Guarantees consistency
- Provides pub-sub-like semantics
- Consensus using Raft!
CockroachDB

CockroachDB provides distributed SQL transactions.

- Failure-tolerant via replication and quorum
- Provides serializable distributed transactions
- Uses gossip and Raft!
**Syncthing**

*Syncthing* provides distributed replication of files.

- Allows concurrent access
- Survives disconnected operation and failures
- Has conflict resolution for concurrent writes
Plan 9 from Bell Labs is an operating system.

- Designed for distributed operation
- Separates computation and storage
- Implements filesystem access via message passing
- Provides many services as files
- Maintained as 9front
Additional Topics

- Careers
- What we didn’t talk about
- ???
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