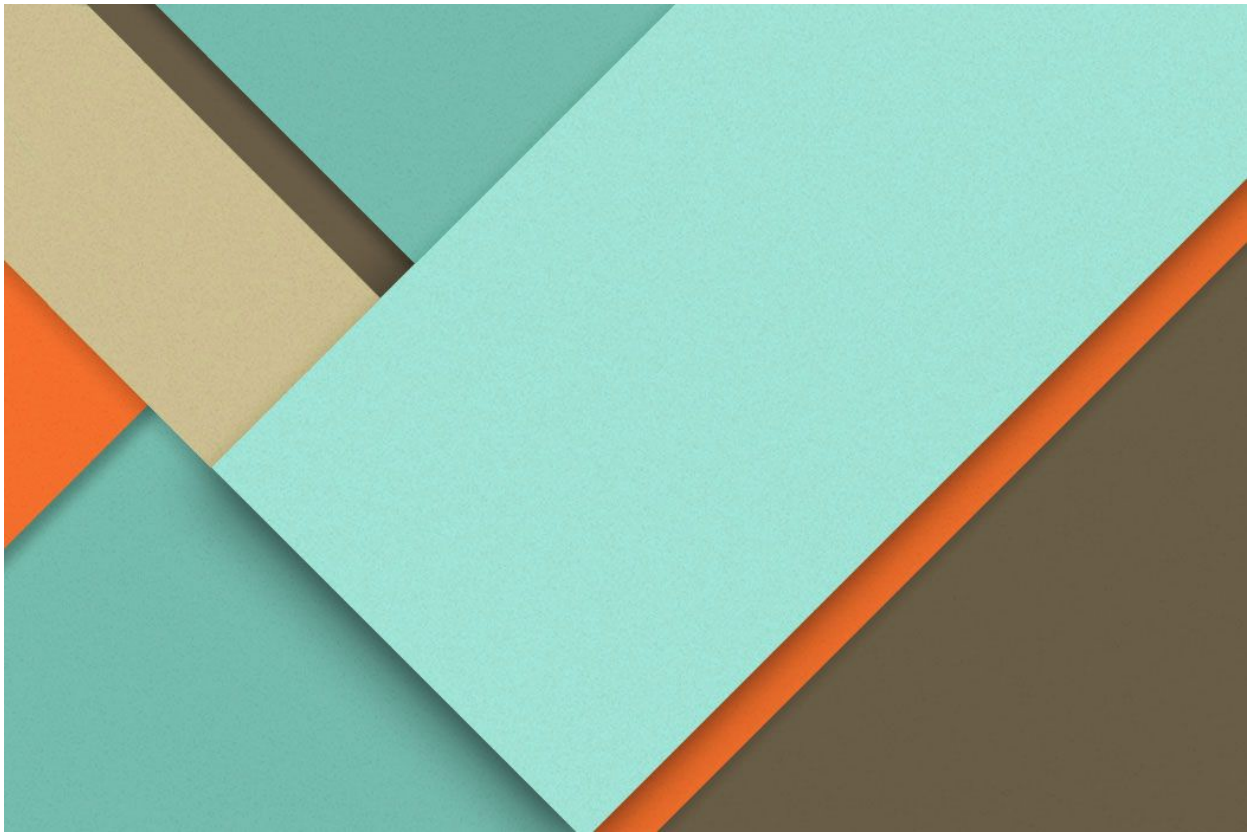

Distributed Directory Service

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Overview

The project aims to realize a distributed directory service. We aim to deploy a subset of the functionality described in the OSI LDAP standard, but hope to get down the exact implementation working according to our own terms.

User Features

We plan to implement the following user features for the three user categories:

Query Scopes Supported:
- Object (object itself)

- Local (children)

- Subtree

Query Filters Supported:

- Attribute = Value

- Attribute present

1. **Directory Admins:**
    I. Be able to specify and modify directory schema.
    II. Manage access controls over the directory data.
2. **Publishers:**
    I. Modify existing data.
    II. Add entries.
    III. Delete entries.
3. **Subscribers:**
    I. Can search for objects within the scope with specified filters.

System Features

We expect the following system features out of our service:

1. **Fault Model:**

    One crash fault tolerance

2. **Consistency Model:**

    Sequential consistency for reads, writes, and schema updates

Design Questions

1. Where to store complete directory:

CHOSEN OPTION: Distribute tree data over multiple nodes.

2. How to divide tree:

CHOSEN OPTION: Tree partition is fixed.

3. How to connect nodes:

CHOSEN OPTION: Network connections are static.

4. How to reroute requests:

CHOSEN OPTION:

Referrals to get to DSA containing base object.

Chaining to collect answers from children nodes.

5. Who detects the fault?

CHOSEN OPTION: Local neighbours.

6. How many replicas?

CHOSEN OPTION: Two replicas - one master, one shadow for each data

7. How to maintain data consistency?

CHOSEN OPTION:

Reads can go to any node.

Writes go to master.

Shadow takes over as master if master dies.