COnstant Data Availability (CODA)

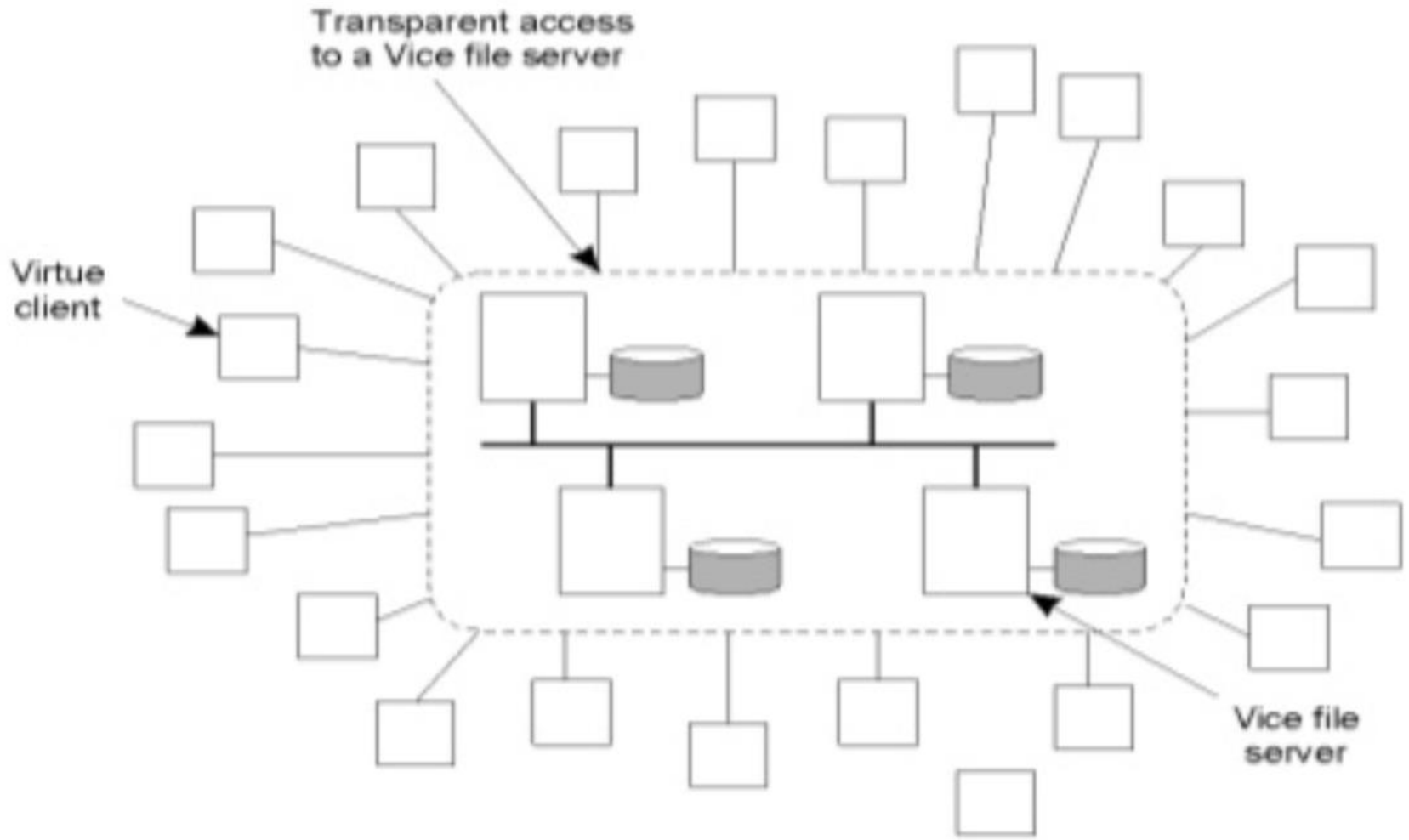
Coda is a distributed file system developed as a research project at Carnegie Mellon University since 1987 under the direction of Mahadev Satyanarayanan. It descended directly from an older version of Andrew File System (AFS-2) and offers many similar features.

Why is Coda promising and potentially very important?

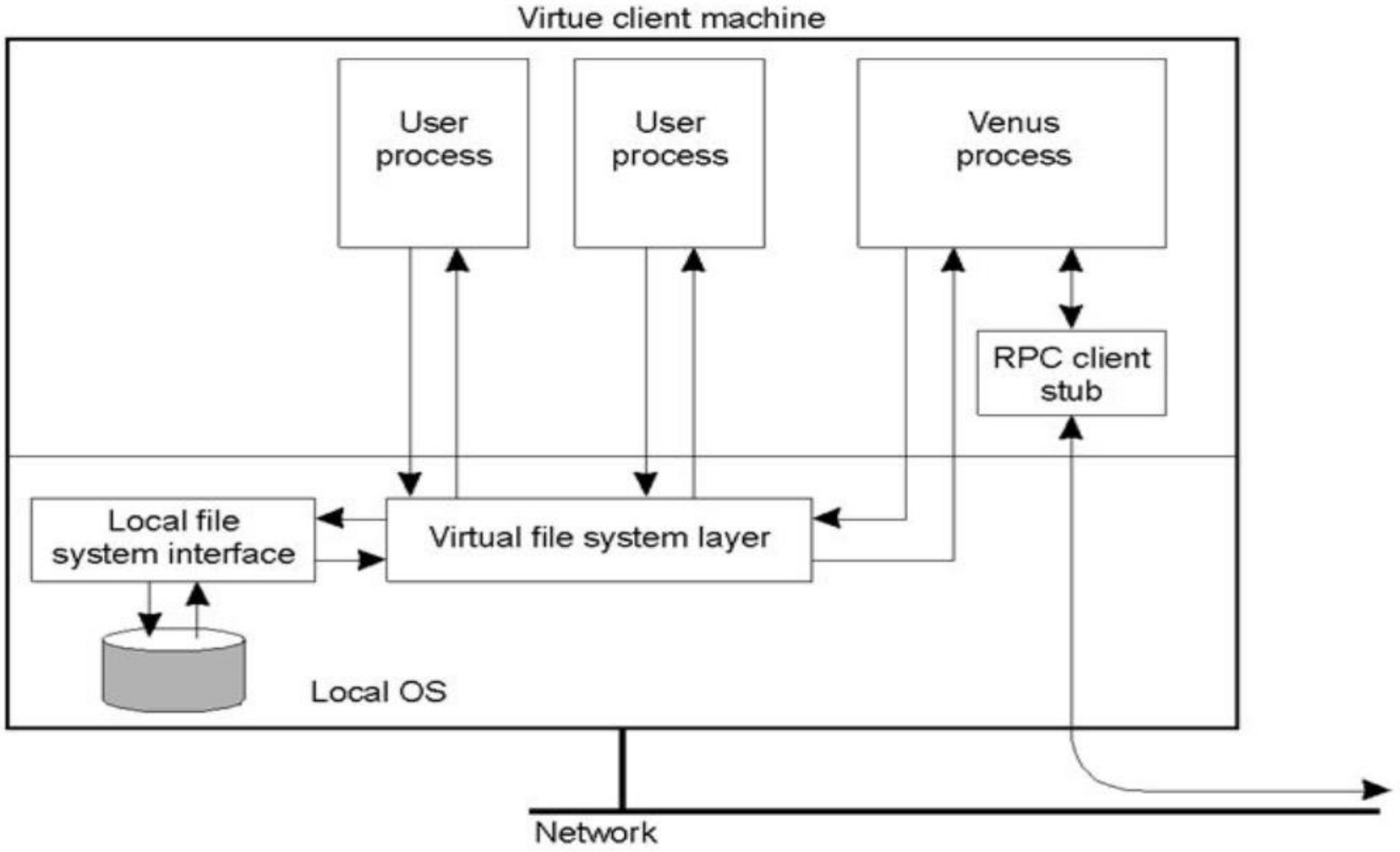
Coda is a distributed file system with its origin in AFS2. It has many features that are very desirable for network file systems.

- is freely available under a liberal license
- disconnected operation for mobile computing
- high performance through client side persistent caching
- server replication
- continued operation during partial network failures in server network
- good scalability
- well defined semantics of sharing, even in the presence of network failures

CODA Architecture



Client Architecture



Two Modes of Operation:

Client Caching
Server Replication

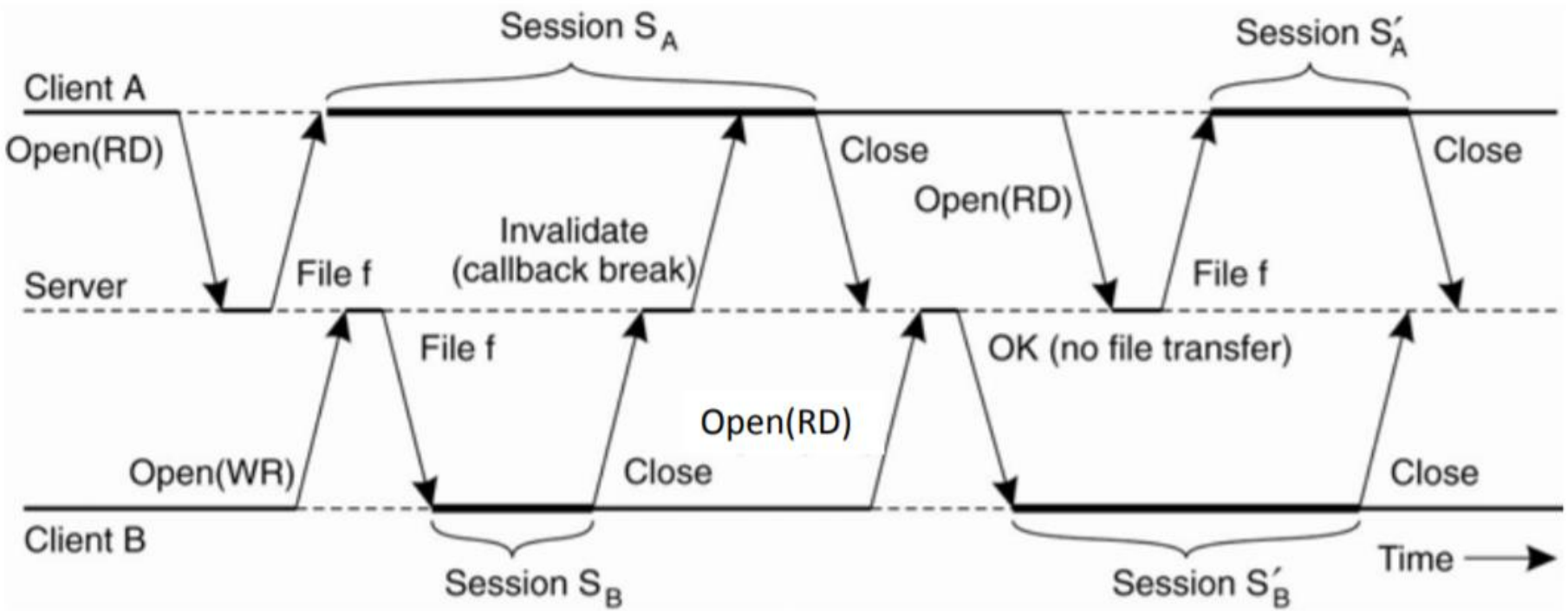
Client Caching:

- to achieve high level of fault tolerance
- for less dependency on the availability of Servers
- entire copy of the resource/file is cached

Leads to Cache Coherence (Describe how?)

Cache Coherence is dealt with the help of Call Back Messages (Explain how)

- Call Back Promise
- Call Back Break



The use of local copies when opening a session in Coda.

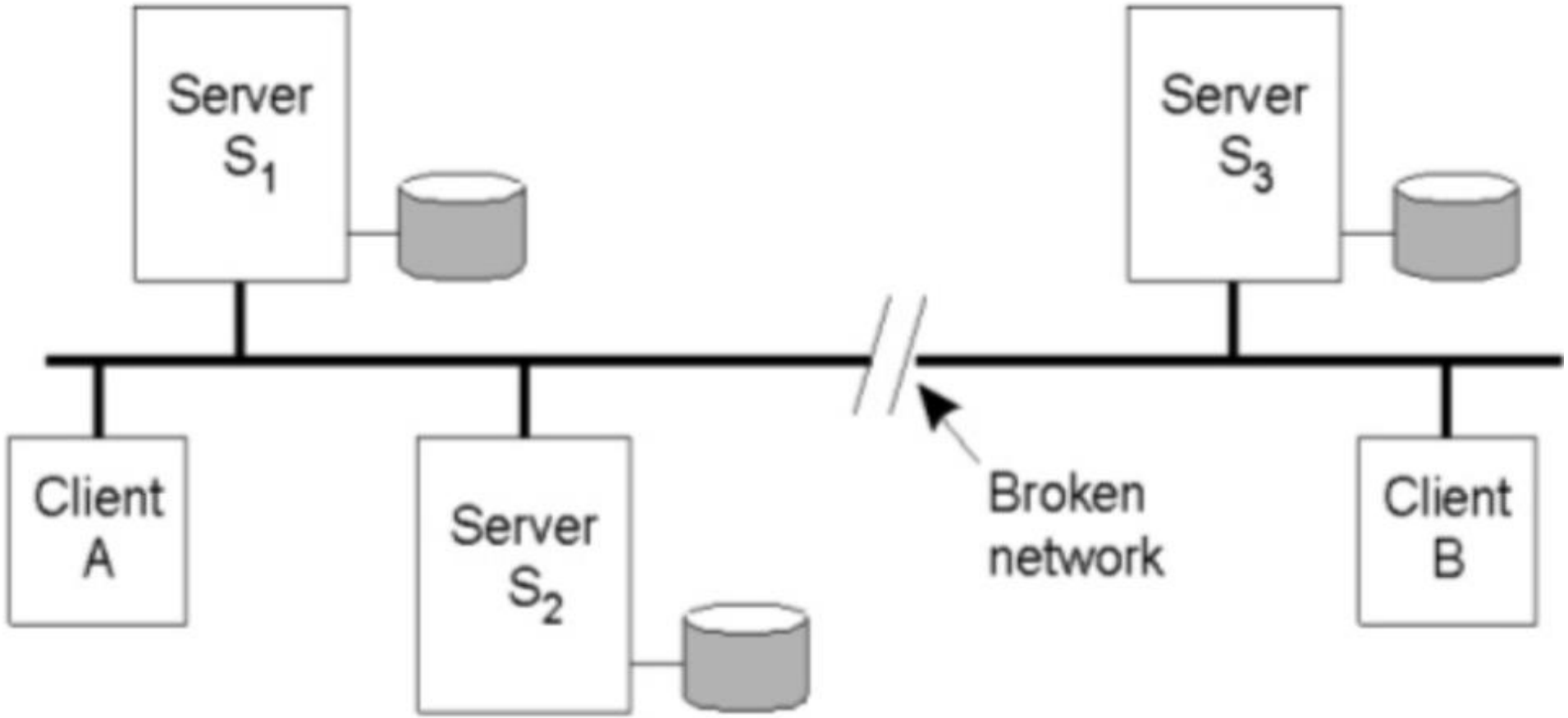
Server Replication:

CODA allows file server to be replicated.
Unit of replication is known as volume.
The collection of servers that have a copy of the volume are known as that Volume's Volume Storage Group (VSG).

Quest. What is the need of server replication?

When closing a session on an updated file the client needs to transfer it in parallel to each member in Accessible Volume Storage Group (AVSG) of the volume.

SERVER REPLICATION



Quest. What if the client cant reach all the members that have a copy of that resource?

Leads to Server Replication Coherence
Coda Version Vectors (CVV) comes to rescue. (Explain how)

Assignment 2

1. Define CODA. Discuss the client caching and server replication in case of CODA.
2. With respect to CODA explain:
    i) CoDA Architecture
    ii) Client Architecture
3. Explain and discuss the two modes of operation of CODA.
4. What is cache coherence problem? How does client caching lead to cache coherence problem?
5. Explain the significance of server replication? What if the client cant reach all the members that have a copy of the resource required?