Lab 1

Distributed Software Systems – Prof. Paolo Ciancarini

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Distributed file storage system

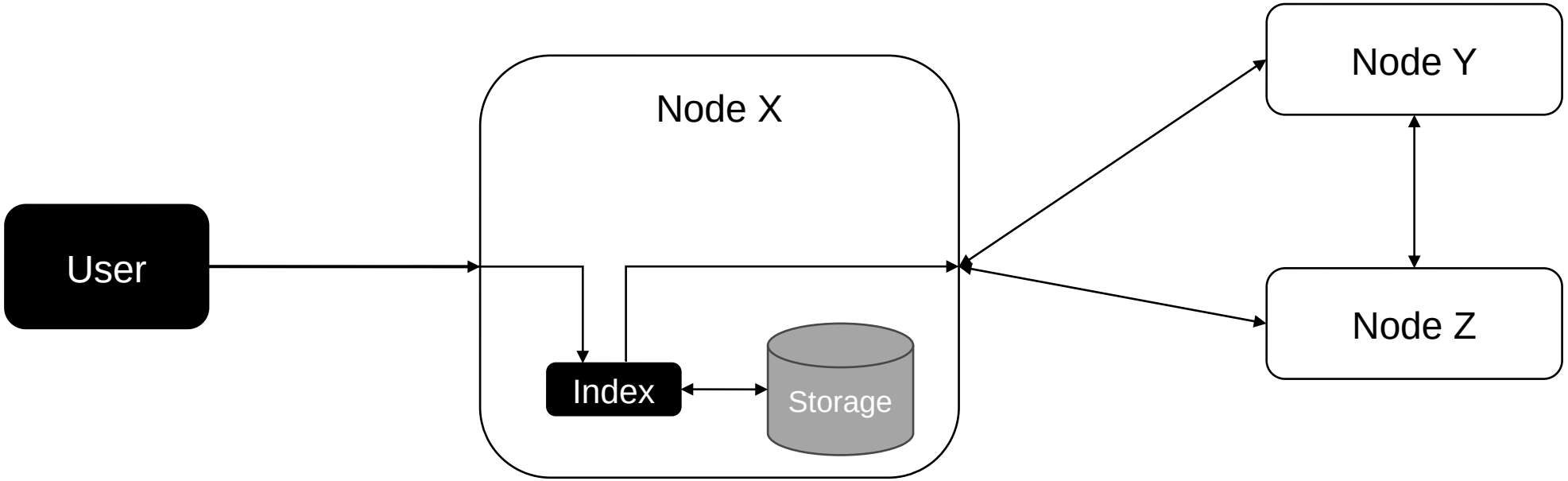
- Requirements:
  - Creation of nested directories
  - Navigation through the directories
  - Uploading and downloading files given a path

- Goal: location transparency users should not be able to see which physical machine files are actually stored in.

Ensuring location transparency

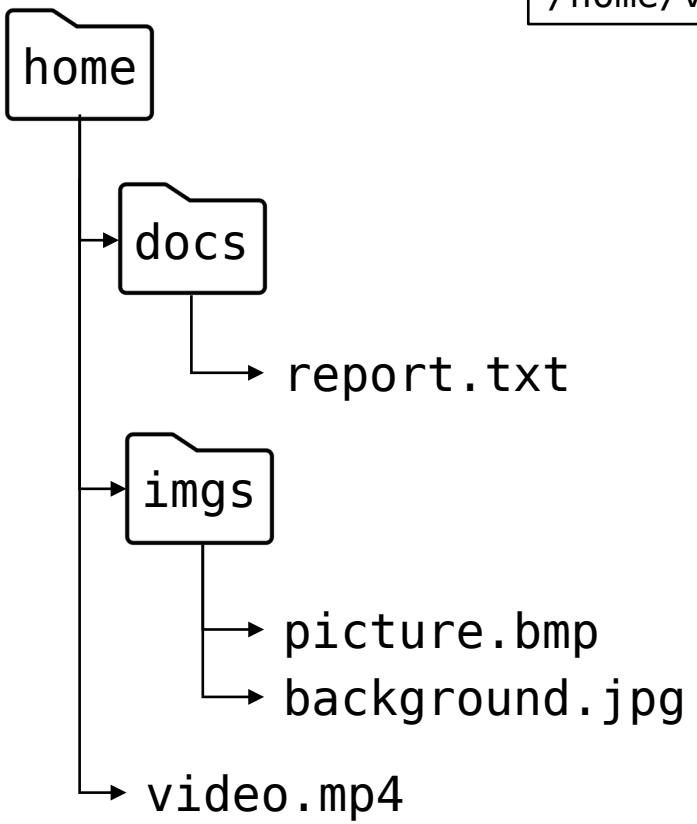
The system keeps an index, sahred among all nodes, which maps every file name (path + name in user's namespace) to its physical location in the system (node + path + name).

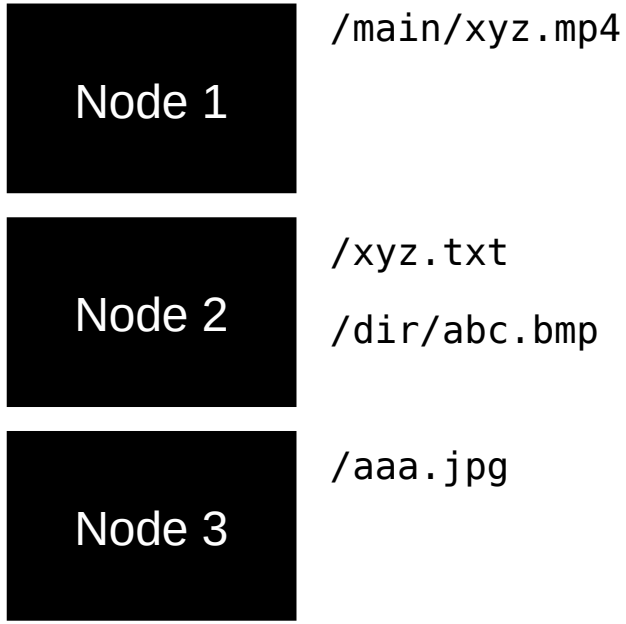
In this way, a user can interact with the FS as if it were entirely located on a single, local machine, unaware of the actual position of resources.



Mapping names

Index
/home/docs/report.txt → node2@/xyz.txt
/home/imgs/picture.bmp → node2@/dir/abc.bmp
/home/imgs/background.jpg → node3@/aaa.jpg
/home/video.mp4 → node1@/main/xyz.mp4





Possible issues

- Shared index
  - Requires extensive communications between nodes
  - May lead to issues when increasing the # of nodes
- Performance issues when files are on remote nodes
  - Could be solved by moving files accessed frequently to nearby nodes