DISTRIBUTED FILE SYSTEMS (DFS)

DISTRIBUTED FILE SYSTEMS

- Including

1. Introduction
2. File Service Architecture
3. Case Study: Sun NFS

1. Introduction

1. Characteristics of file system
2. Distributed File system requirements

2. File service architecture

- providing access to files is obtained by structuring the file service as **three components:**

  1. Flat file service

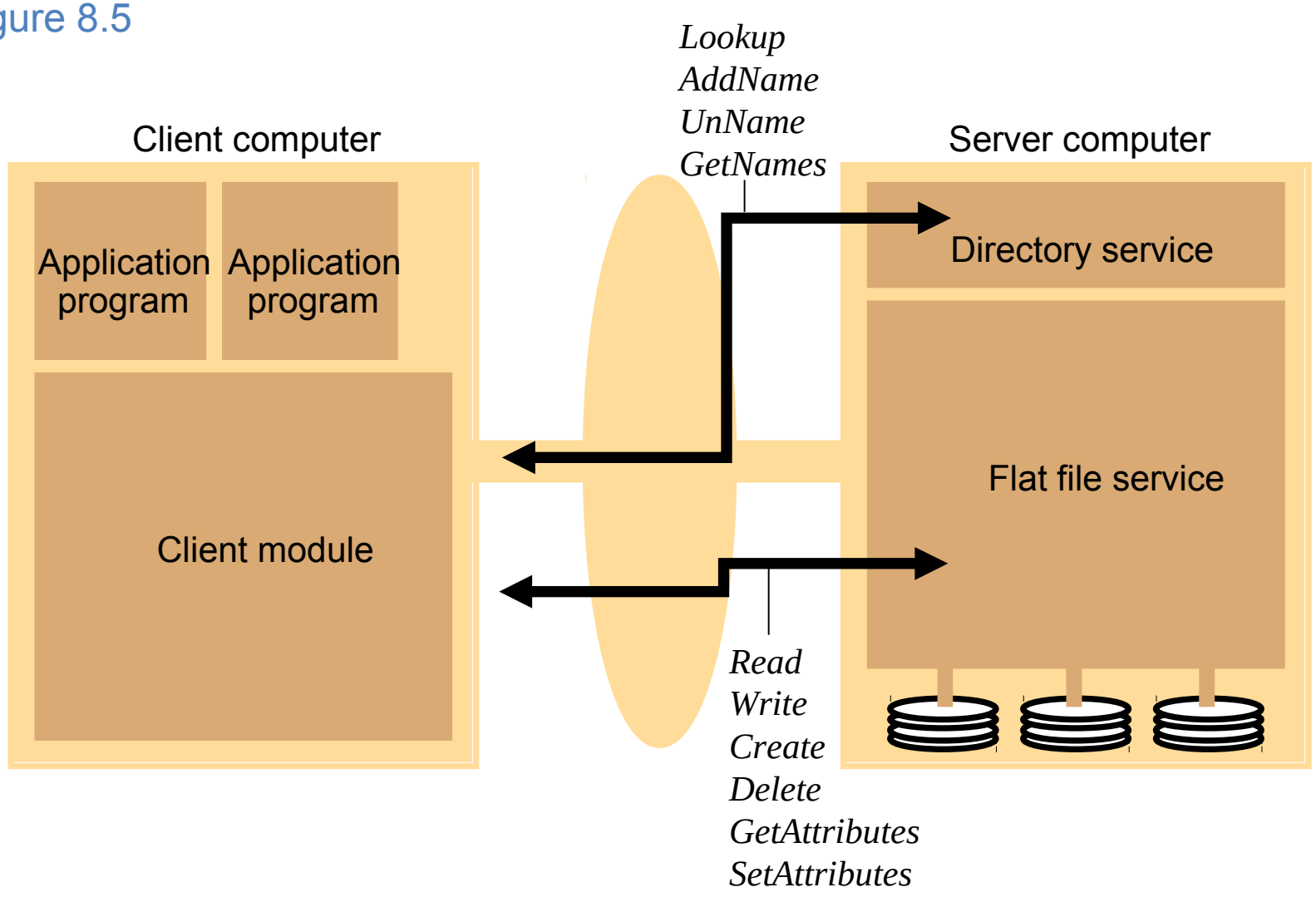
  2. Directory service

  3. Client module.

- The relevant modules and their relationship is shown in Figure

File Service Architecture

Figure 8.5



- Responsibilities of various modules can be defined as follows:

1. Flat file service

- Concerned with the **implementation of operations** on the contents of file.

- **Unique File Identifiers (UFIDs) are used to refer to files** in all requests for flat file service operations.

Flat file service operations

1. *Read*
2. *Write*
3. *Create*
4. *Delete*
5. *GetAttributes*
6. *SetAttributes*

1. ***Read(FileId, i, n)*** *:*

   Reads a sequence of up to n items from a file starting at item *i*.

2. ***Write(FileId, i, Data)*** :

Write a sequence of *Data* to a file, starting at item *i*.

3. ***Create()*** ***:***

Creates a new file of length0 and delivers a UFID for it.

4. ***Delete(FileId)*** :Removes the file from the file store.

5. ***GetAttributes(FileId)*** : Returns the file attributes for the file.

6. ***SetAttributes(FileId, Attr)*** :Sets the file attributes.

2. Directory service

- **Provides mapping between text names for the files** and **their UFIDs**.
- Clients may obtain the UFID of a file by quoting its text name to directory service.
- Directory service supports functions **to add new files to directories.**

Directory service operations

1. *Lookup*
2. *AddName*
3. *UnName*
4. *GetNames*

Directory service operations

1. ***Lookup****(Dir, Name)* :

   Locates the text name in the directory and returns the relevant UFID.

   If *Name* is **not** in the directory, throws an exception.

2. ***AddName(Dir, Name, File)*** *:*If *Name* is not in the directory, adds(*Name*,*File*) to the directory and updates the file's attribute record.

- If *Name* is already in the directory: throws an exception.

3. ***UnName(Dir, Name)*** :If *Name* is in the directory, the entry containing *Name* is removed from the directory.

- If *Name* is **not** in the directory: throws an exception.

4. ***GetNames(Dir, Pattern):***Returns all the text names in the directory that match the regular expression *Pattern*.

3. Client module

- It runs on each computer and provides integrated service (flat file and directory) as a single API to application programs.
- It holds information about the network locations of flat-file and directory server processes.

Access control

- In distributed implementations, **access rights checks** have to be performed **at the server** .

Hierarchic file system

- A hierarchic file system consists of a number of directories arranged in a tree structure.

File Group

- A file group is a collection of files that can be located on any server.

Thank You