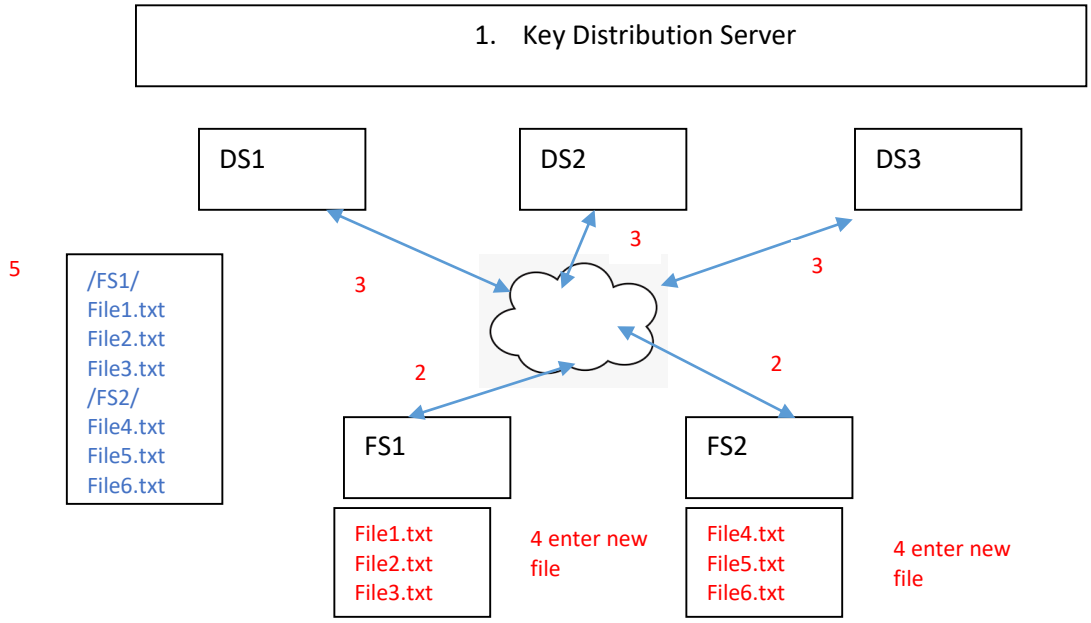
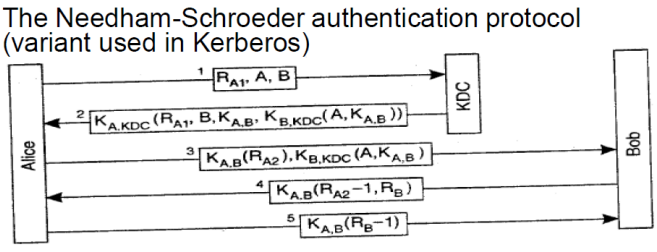
Distributed System 2020

Secure RPC File System



Purpose of this assignment is to design a secure file system which allows distributed system nodes DSi to access the remote files stored on the remote file servers FSi in a secure manner using RPCs. It will familiarize you with RPC, File system and security issues in Distributed System.

1. Let all the file servers FSi and the distributed nodes DSi be assigned unique ids and share symmetric keys with a Key Distribution Server (KDC).
2. Let the File servers register with the KDC for the files that they store.
3. When the Distributed nodes register with the KDC to get their session keys, they must authenticate with the servers to generate session key using the symmetric key mutual authentication protocol. DSis start with mounting the for the known FSis as shown in the figure 5. They must mutually authenticate with the file server and get the files which they display in folder for the file server. The mutual authentication protocol suggested is the Needham-Schroeder protocol.



4. To enter a new file to the distributed file system FSi must register the file. The file creation must be communicated over RPC to all other DSis as a folder entry seen on the shell.

5. The DSis provide users a shell prompt to be able to type the file commands. using the program must get a terminal window on their screens. Using which they should be able to use the different file commands:
   i) Pwd – list the present working directory
   ii) ls – list the contents of the file
   iii) cp - copy one file to another in the same folder
   iv) cat – display contents of the file
6. All above commands must work using RPC, and provide results to the distributed node using RPC only
7. Each time the user on the Distributed node terminal types a command, it could encrypt the parameters using the session key $K_{A,B}$ and then send the RPC information.

Marks Distribution (100) will be mapped to 20 later.

1. Design document and review Sep 30, 2020 -20
2. File server registration and setup – 10
3. Distributed node registration and authentication with servers to mount files on a shell – 10
4. Each of the commands listed above using RPC– 5 marks each (40)
   i. Pwd – list the present working directory
   ii. ls – list the contents of the file
   iii. cp - copy one file to another in the same folder
   iv. cat – display contents of the file
5. Demo (20)