Assignment-3

Team Project

In operating systems with discretionary access control, a user can specify who else can read, write, or execute her files. Suppose Carter creates a program foo, and he wants Dan to be able to execute foo but neither read foo nor write to it. Also, Carter wishes to grant read, write, and execute privileges to Jan. Assume that Dan and Jan have user ids dan and Jan, respectively. Formalize the above description and formally justify why Jan's request to execute foo should be granted.

Ans: From the question we understood that

Carter creates a program foo, and he wants Dan to be able to execute foo but neither read foo nor write to it.

And he wants to grant read, write, and execute privileges to Jan.

We should justify Jan's request to execute foo

In general, protection schemes involving access-control lists require the following components:

->Access policy: The guard or reference monitor recognizes the jurisdiction of some controlling authority to decide who is allowed what access to the protected object

authority controls (subject controls (access right, object)

Carter controls< dan controls(execute,foo)> >Access policy for dan

Carter controls< jan controls (read, write, execute, foo)> ->Access policy jan

->ACL ⇒ authority () Trust assumption

ACL ➔Carter

ACL says < jan controls (execute, foo)> Simplification of ACL

Jan's request to execute foo should be granted because Carter wants to permit dan only to execute program foo but not read, write so if they are any errors while execution, he can't modify it and Carter gives read, write, and execute permission for program foo. As jan can read and write the program foo giving permission for execute foo is good idea as he can execute the program foo without any errors as he can modify it.

->Access request:

subject says (access right, object)

jan says ->jan request

Carter creates a program foo. So, Carter is the one who can gives read, write, execute permission of program foo to dan, jan.

Carter controls<foo>

Carter wants to give dan execute foo but neither he read foo nor write to it and grants jan read, write, and execute foo.