19CSE311 - COMPUTER SECURITY UNIT-2- PART 3
Access Control Matrix

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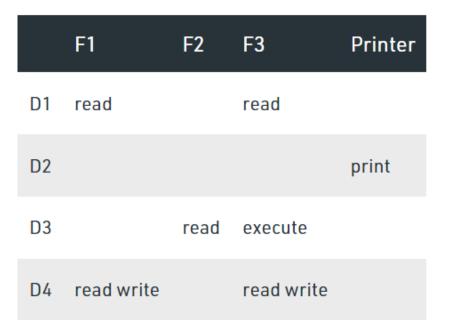
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What is Access Control Matrix?

- Access Matrix is a security model of protection state in computer system.
- It is represented as a matrix.
- Access matrix is used to define the rights of each process executing in the domain with respect to each object.
- The rows of matrix represent domains and columns represent objects.
- Each cell of matrix represents set of access rights which are given to the processes of domain means each entry(i, j) defines the set of operations that a process executing in domain D_i can invoke on object O_j.

	F1	F2	F3	Printer
D1	read		read	
D2				print
D3		read	execute	
D4	read write		read write	

- there are four domains and four objects- three files(F1, F2, F3) and one printer.
- A process executing in D1 can read files F1 and F3.
- A process executing in domain D4 has same rights as D1 but it can also write on files.
- Printer can be accessed by only one process executing in domain D2.
- The mechanism of access matrix consists of many policies and semantic properties.
- We must ensure that a process executing in domain D_i can access only those objects that are specified in row i.

- Association between the domain and processes can be either static or dynamic.
- Access matrix provides an mechanism for defining the control for this association between domain and processes.
- When we switch a process from one domain to another, we execute a switch operation on an object(the domain).
- We can control domain switching by including domains among the objects of the access matrix.
- Processes should be able to switch from one domain (D_i) to another domain (D_j) if and only is a switch right is given to access(i, j).
- According to the matrix shown below: a process executing in domain D2 can switch to domain D3 and D4. A process executing in domain D4 can switch to domain D1 and process executing in domain D1 can switch to domain D2.

object domain	F_1	F_2	F_3	laser printer	D_1	D_2	D_3	D_4
D_1	read		read			switch		
D_2				print			switch	switch
D_3		read	execute					
D_4	read write		read write		switch			