Exercise-4

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Question-2

Consider Multics procedures p and q. Procedure p is running and needs to invoke procedure q. Procedure q's access bracket is (5, 8) and its call bracket is (8, 11). Assume that q's access control list gives p full (read, write, append, and execute) rights to q. In which ring(s) must p execute for the following to happen? Justify your answer.

a) p can invoke q, but a ring-crossing fault occurs.
b) p can invoke q provided that a valid gate is used as an entry point.
c) p cannot invoke q.
d) p can invoke q without any ring-crossing fault occurring, but not necessarily through a valid gate.

A. Here,

q's can access bracket (x1, x2) = (5, 8)
given call bracket (c1, c2) = (8, 11)

From the above explanation, below are values of individuals

x1 = 5
x2 = 8

c1 = 8
c2 = 11

rings = r
if a call bracket is present, c1 = x2.
Remaining Multics procedure p and q is (x1, x2, x3). Here c2 = x3 = 11.

a) p can invoke q, but a ring – crossing fault occurs: **P must initialize in r < 5.**
b) p can invoke q provided that a valid gate is used as an entry point: **p should execute in between rings greater than 8 and less than or equal to 11 (8 < r ≤ 11).**
c) p cannot invoke q: **Observed if r > 11**.
d) p can invoke q without any ring-crossing fault occurring, but not necessarily through a valid gate: **p should execute in middle of rings greater than or equal to 5 and less than or equal to 8 (5≤ r ≤ 8**).