**Test on ACPT**

**Objective:**

This test on ACPT aims to check if the verification function of ACPT can work well on simple policy, policy with conflicts, and inheritance-based policy.

**Basic Setup:**

Sujects: Group\_One ( Student\_A, Student\_B), Group\_Two ( Student\_A, Student\_C), RA (Undergradute\_RA, Graduate\_RA)

Resource: File (File\_One, File\_Two), Grade (grade\_Und, grade\_Gra)

Action: DefaultAction (read, write)

Inheritance: Beneficiary (Student\_B) ---> Inherited Values (Graduate\_RA)

**Policy:**

1. Group\_One Policy

Group\_One: Student\_A#File: File\_One->Permit

Group\_One: Student\_B#File: File\_One->Permit

Group\_Two: Student\_A#File: File\_Two->Deny

Group\_One: Student\_B#File: File\_Two->Deny

2. Group\_Two Policy

Group\_Two: Student\_A#File: File\_Two->Permit

Group\_Two: Student\_C#File: File\_Two->Permit

Group\_Two: Student\_A#File: File\_One->Deny

Group\_Two: Student\_C#File: File\_One->Deny

3. RA Policy

RA: Graduate\_RA#Grade: grade\_Gra->Permit

**Properties and Verification Results:**

**Property 1**. SPEC (Group\_One = Student\_A) & (File = File\_One) -> decision = Permit

SPEC (Group\_One = Student\_B) & (File = File\_One) -> decision = Deny

**Result:** specification AG (((Group\_One = Student\_A & File = File\_One) & Group\_Two = dummy) -> AF decision = Permit) IN ABAC\_Group\_One\_Policy is true

specification AG (((Group\_One = Student\_B & File = File\_One) & Group\_Two = dummy) -> AF decision = Deny) IN ABAC\_Group\_One\_Policy is false

**Property 2**. SPEC (Group\_One = Student\_A) & (Group\_Two = Student\_A) & (File = File\_One) -> decision = Permit

SPEC (Group\_One = Student\_A) & (Group\_Two = Student\_A) & (File = File\_One) -> decision = Deny

**Result:** specification AG (((Group\_One = Student\_A & Group\_Two = Student\_A) & File = File\_One) -> AF decision = Permit) IN ABAC\_Group\_One\_Policy is true

pecification AG (((Group\_One = Student\_A & Group\_Two = Student\_A) & File = File\_One) -> AF decision = Deny) IN ABAC\_Group\_One\_Policy is false

specification AG (((Group\_One = Student\_A & Group\_Two = Student\_A) & File = File\_One) -> AF decision = Permit) IN ABAC\_Group\_Two\_Policy is false

specification AG (((Group\_One = Student\_A & Group\_Two = Student\_A) & File = File\_One) -> AF decision = Deny) IN ABAC\_Group\_Two\_Policy is true

**Property 3**. SPEC (Group\_One = Student\_B) & (Grade = grade\_Gra) -> decision = Permit [Group\_One, Grade, MLSDefaultAction]

SPEC (Group\_One = Student\_B) & (Grade = grade\_Gra) -> decision = Deny [Group\_One, Grade, MLSDefaultAction]

**Result**: specification AG (((((Group\_One = Student\_B & Grade = grade\_Gra) & Group\_Two = dummy) & RA = dummy) & File = dummy) -> AF decision = Permit) IN ABAC\_RAPolicy is true

specification AG (((((Group\_One = Student\_B & Grade = grade\_Gra) & Group\_Two = dummy) & RA = dummy) & File = dummy) -> AF decision = Deny) IN ABAC\_RAPolicy is false

**Conclusion**:

From the first two results, we can see that the verification function of ACPT works well not only for simple policies, but also for complex properties in which conflicts exist. From the third result, we can see that ACPT also works well for inherited policy.