

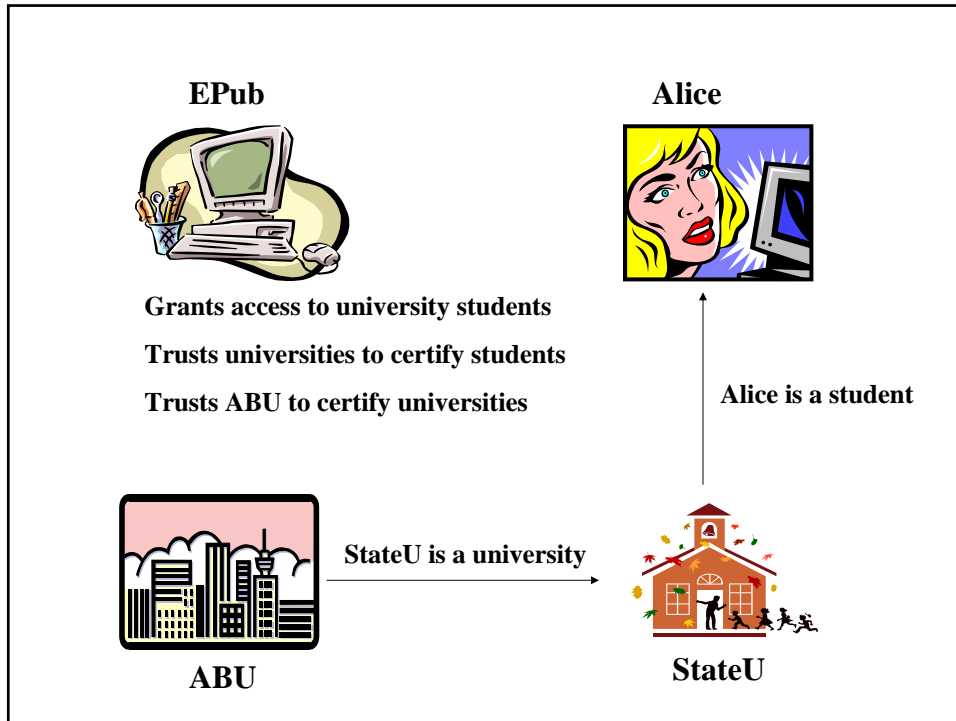
CS590U
Access Control: Theory and Practice

Lecture 9 (September 30th)
Trust Management: Comparing
Trust Management Languages



Announcements

- Signup for lectures
- Proposal due on Oct 7



Example RT_0 Statements

1. `StateU.stuID ← Alice`
2. `ABU.accredited ← StateU`
3. `EPub.university ← ABU.accredited`
4. `EPub.student ← EPub.university.stuID`
5. `EPub.access ← EPub.student`

Together, the five statements prove that Alice is entitled to access

4



Finishing Coverage of RT

- See slides 30 to 45 of lecture 8

5



Features of TM Languages

- TM Language = Delegation structures + Attribute structures

6



Delegation Features (1)

- Simple attribute assignment
StateU.stuID ← Alice
- Delegation of attribute authority
StateU.stuID ← COE.stuID
- Attribute inferencing
EPub.access ← EPub.student

7



Delegation Features (2)

- Attribute-based delegation
 - **EPub.student** ← EPub.university.stuID
- Controlled delegation (conjunction)
 - **EPub.access** ←
EPub.student \cap ACM.member
- Static threshold
 - **EPub.access** ← (k of [A1, A2, ..., An]).access

8



Delegation Features (3)

- Dynamic threshold
 - $\text{EPub.access} \leftarrow (\text{k of A.manager}).\text{access}$
- Other SoD
 - $\text{A.approval} \leftarrow \text{A.manager} \otimes \text{A.accountant}$

9



Attribute structures (3)

- Constants
 - student
- Fields
 - $\text{student}(\text{name}=\text{"Alice"}, \text{univ}=\text{"Purdue"})$
- SPKI Tags
 - $(\text{student}(\text{name} \text{"Alice"}) (\text{univ} \text{"Purdue"}))$
- Constraints

10

KeyNote

	Constant	Tags	Constraints
Simple Member	?	?	?
Simple Delegation	Yes	Yes	Yes
Attr Infer			
Attr-based Delegation			
Controlled delegation			
Static threshold	Yes	Yes	Yes
Dynamic threshold			
Other SoD			

SPKI 5-tuples

	Constant	Tags	Constraints
Simple Member	Yes	Yes	
Simple Delegation	Yes	Yes	
Attr Infer			
Attr-based Delegation			
Controlled delegation			
Static threshold	Yes	Yes	
Dynamic threshold			
Other SoD			

SDSI

	Constant	Tags	Constraints
Simple Member	Yes		
Simple Delegation	Yes		
Attr Infer	Yes		
Attr-based Delegation	Yes		
Controlled delegation			
Static threshold			
Dynamic threshold			
Other SoD			

SPKI/SDSI

	Constant	Tags	Constraints
Simple Member	Yes	Yes	
Simple Delegation	Yes	Yes	
Attr Infer	Yes	Partial	
Attr-based Delegation	Yes	Partial	
Controlled delegation			
Static threshold	Partial	Partial	
Dynamic threshold			
Other SoD			

RT₀

	Constant	Tags	Constraints
Simple Member	Yes		
Simple Delegation	Yes		
Attr Infer	Yes		
Attr-based Delegation	Yes		
Controlled delegation	Yes		
Static threshold			
Dynamic threshold			
Other SoD			

RT₁^{CD}

	Constant	Tags	Constraints
Simple Member	Yes	Yes	Yes
Simple Delegation	Yes	Yes	Yes
Attr Infer	Yes	Yes	Yes
Attr-based Delegation	Yes	Yes	Yes
Controlled delegation	Yes	Yes	Yes
Static threshold	Yes	Yes	Yes
Dynamic threshold	Yes	Yes	Yes
Other SoD	Yes	Yes	Yes



Issues in Trust Management

- Expressive power
 - delegation features + attribute structures
- Semantic foundation
- Vocabulary
- Distributed deduction
- Policy analysis
- Trust negotiation