

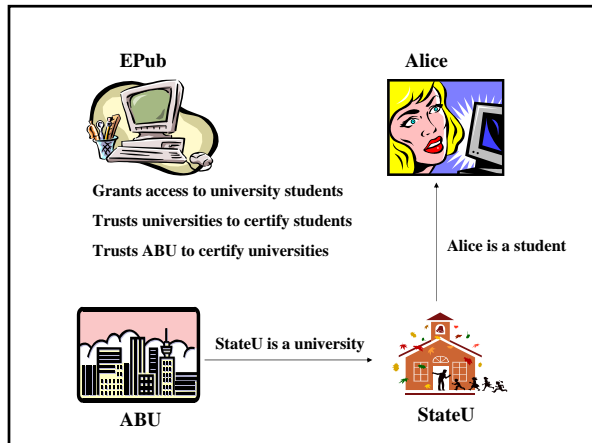
## CS590U Access Control: Theory and Practice

Lecture 9 (September 30<sup>th</sup>)  
Trust Management: Comparing  
Trust Management Languages

## Announcements

- Signup for lectures
- Proposal due on Oct 7

2



## Example $RT_0$ Statements

1.  $\text{StateU.stuID} \leftarrow \text{Alice}$
2.  $\text{ABU.accredited} \leftarrow \text{StateU}$
3.  $\text{EPub.university} \leftarrow \text{ABU.accredited}$
4.  $\text{EPub.student} \leftarrow \text{EPub.university.stuID}$
5.  $\text{EPub.access} \leftarrow \text{EPub.student}$

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 ∩ ACM.member
- Static threshold
  - EPub.access ← (k of [A1, A2, ..., An]).access

8

## Delegation Features (3)

- Dynamic threshold
  - EPub.access ← (k of A.manager).access
- Other SoD
  - A.approval ← A.manager ⊗ A.accountant

9

## Attribute structures (3)

- Constants
  - student
- Fields
  - student(name="Alice", univ="Purdue")
- SPKI Tags
  - (student (name "Alice") (univ "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			

## RT<sub>0</sub>

	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			

## RT<sub>1</sub><sup>CD</sup>

	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