

Module 3.2

Access Control Models: Alphabet Soup

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Discretionary Access Control (DAC)

1970

Mandatory Access Control (MAC)

1970

**Fixed
policy**



Role Based Access Control (RBAC)

1995



Attribute Based Access Control (ABAC)

2020s (Hopefully)



**Flexible
policy**

Discretionary Access Control (DAC)

1970

Mandatory Access Control (MAC)

1970

**Fixed
policy**



Role Based Access Control (RBAC)

1995



Attribute Based Access Control (ABAC)

Encompasses

Relationship-Based Access Control (ReBAC)

Usage Control (UCON)

Rule-Based, Policy-Based, etc

2020s (Hopefully)

**Flexible
policy**



- (s,o,r) allowed or not?
 - ❖ s: subject (aka actor)
 - ❖ o: object (aka target)
 - ❖ r: right (aka operation)

- (s,o,r,c) allowed or not?
 - ❖ s, o, r: as above
 - ❖ c: context (aka environment)

➤ (s,o,r) allowed or not?

Access decision triple

- ❖ s: subject (aka actor)
- ❖ o: object (aka target)
- ❖ r: right (aka operation)

➤ (s,o,r,c) allowed or not?

Access decision quad

- ❖ s, o, r: as above
- ❖ c: context (aka environment)

➤ (s,o,r) allowed or not?

Access decision triple

- ❖ s: subject (aka actor)
- ❖ o: object (aka target)
- ❖ r: right (aka operation)

➤ (s,o,r,c) allowed or not?

Access decision quad

- ❖ s, o, r: as above
- ❖ c: context (aka environment)

c: beyond Access Matrix
c integrates well with ABAC

- Operational model
 - ❖ specify the decision function for the access decision triple or quad

- Administrative
 - ❖ specify the model's dynamics
 - ❖ dynamics change the system state and modify the outcome of some access decision triple or quads

- Operational model
 - ❖ (s,o,r) ?
 - ❖ authorized iff $r \in [s,o]$ cell of the matrix

- Administrative
 - ❖ specify the semantics of the administrative rights: own, parent etc

Our focus



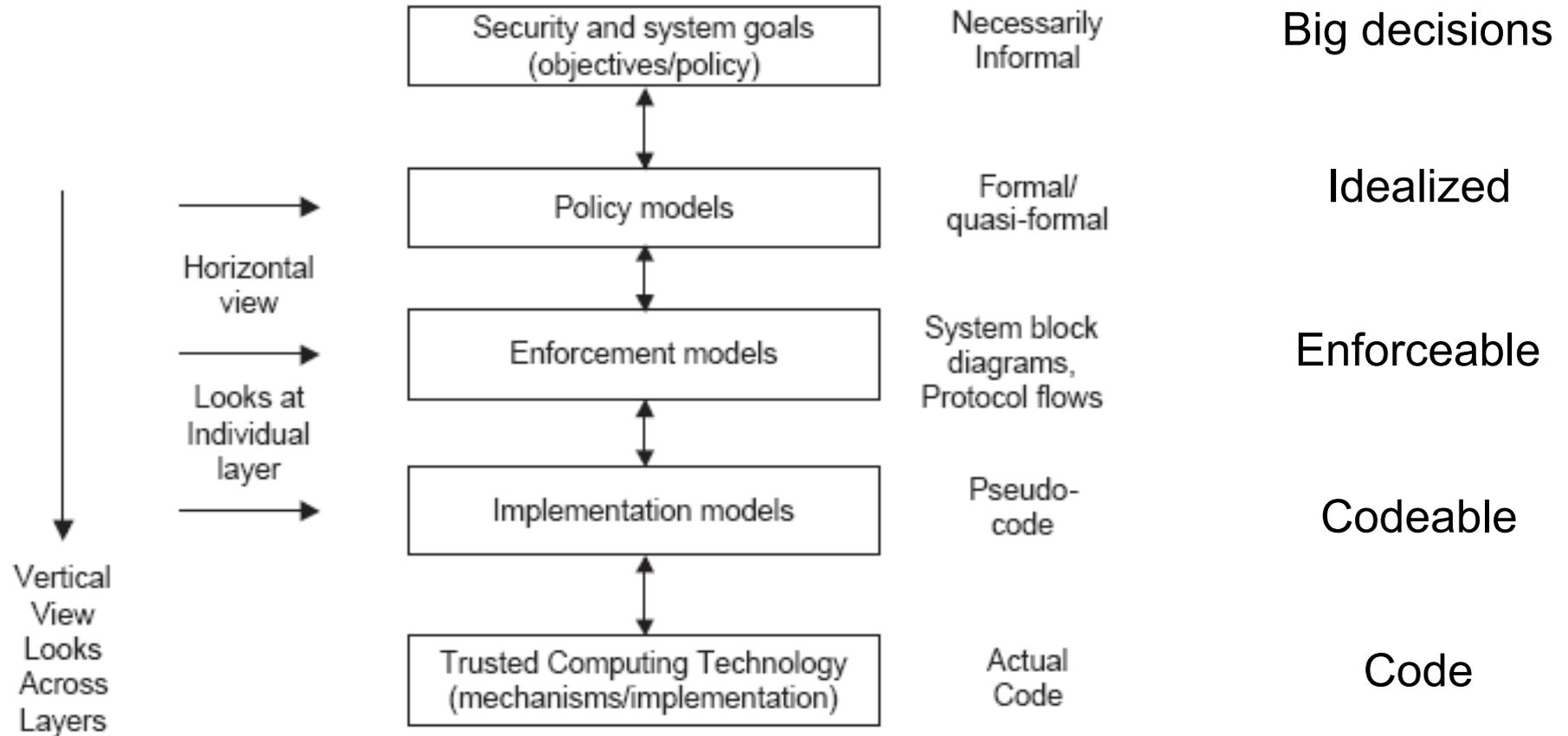
- Operational model
 - ❖ specify the decision function for the access decision triple or quad

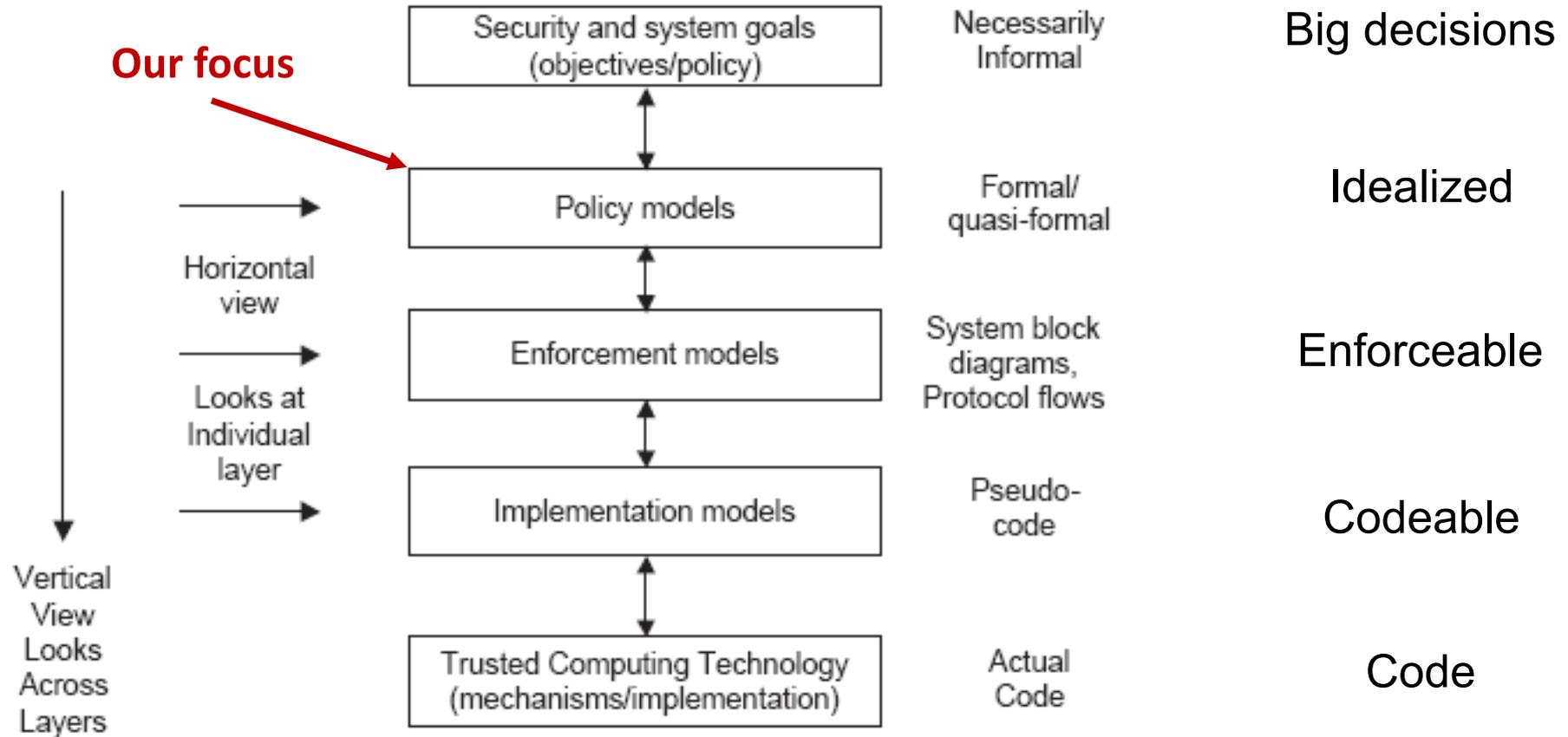
- Administrative
 - ❖ specify the model's dynamics
 - ❖ dynamics change the system state and modify the outcome of some access decision triple or quads

Mix and Match

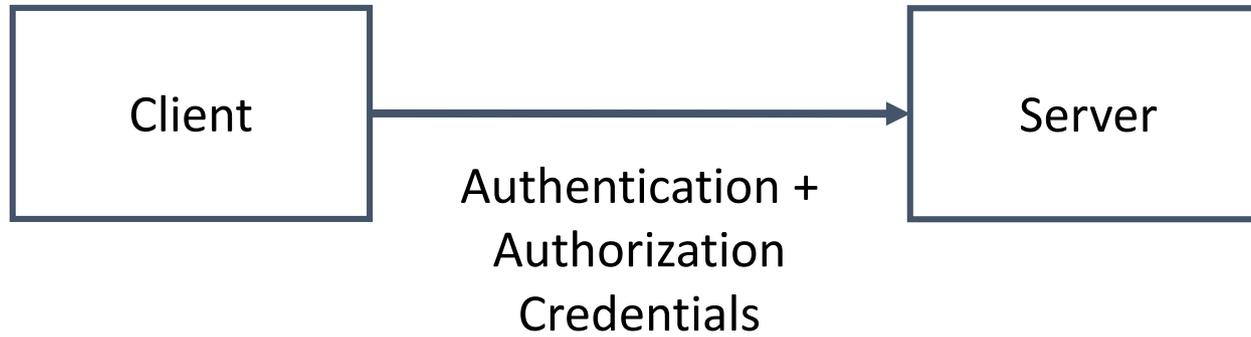
- Operational model **MAC, RBAC, ABAC**
 - ❖ specify the decision function for the access decision triple or quad

- Administrative **DAC, RBAC, ABAC**
 - ❖ specify the model's dynamics
 - ❖ dynamics change the system state and modify the outcome of some access decision triple or quads





**PUSH
MODEL**



**PULL
MODEL**

