

INFS 767
Secure Electronic Commerce
Fall 1999

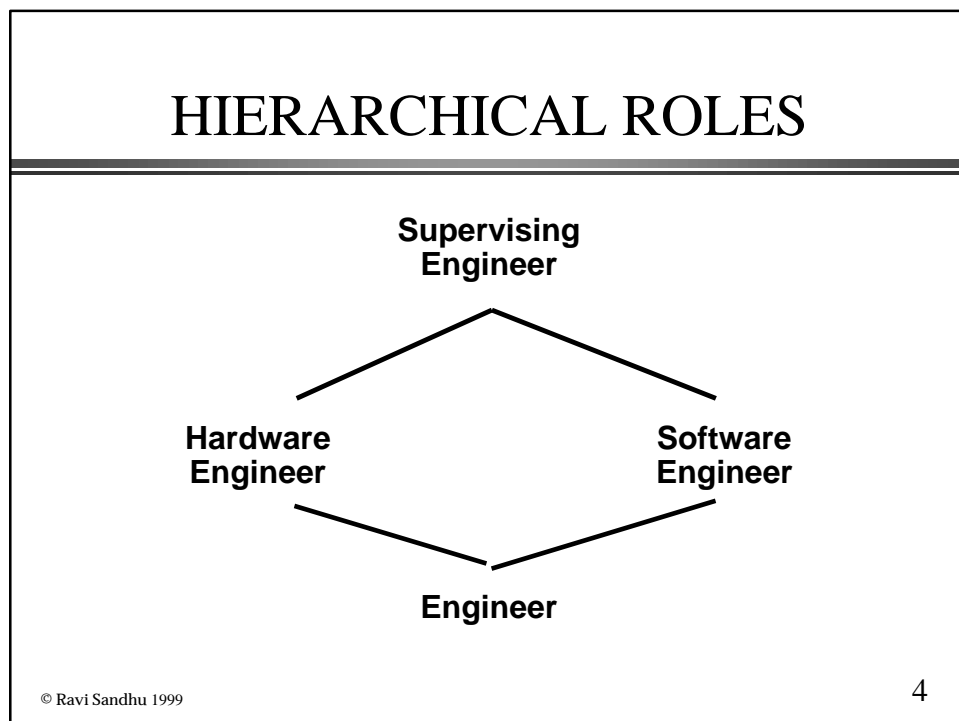
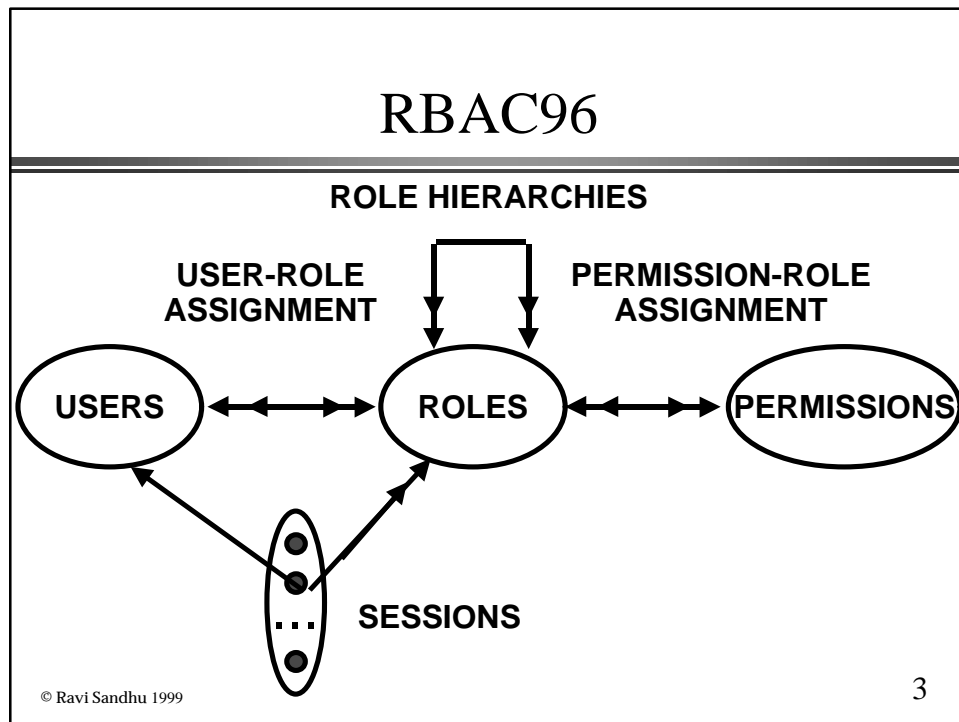
Lecture 4
LBAC in RBAC

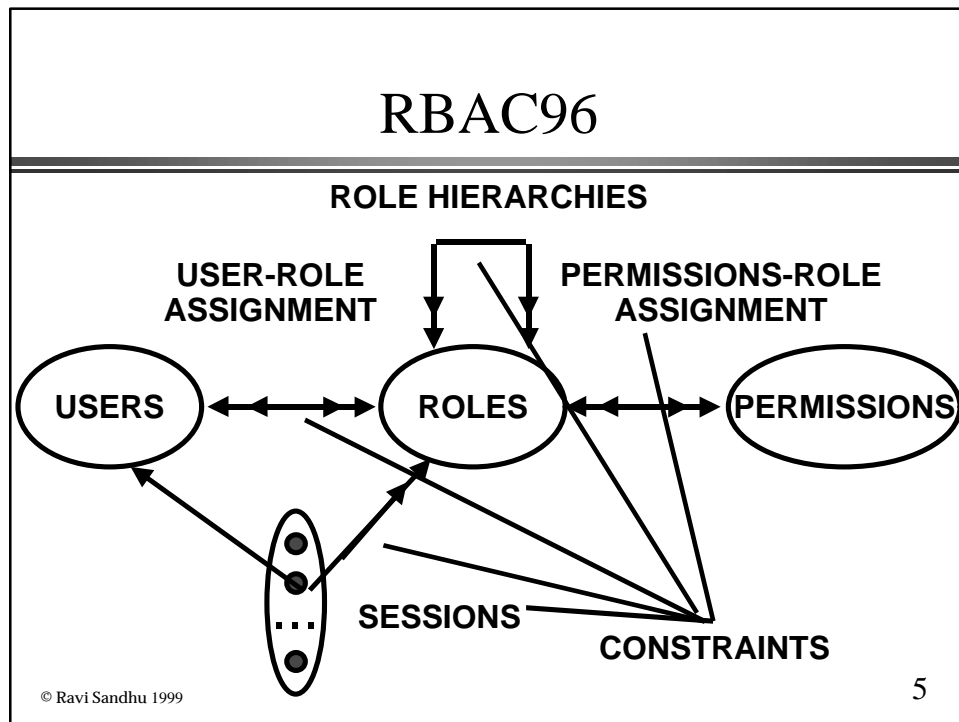
Prof. Ravi Sandhu

OUTLINE

- ◆ RBAC96 model: policy neutral
- ◆ LBAC models: policy full and varied
- ◆ LBAC can be reduced to RBAC96
 - LBAC < RBAC96 ?
- ◆ why bother to do this?

Lecture 4: RBAC-LBAC

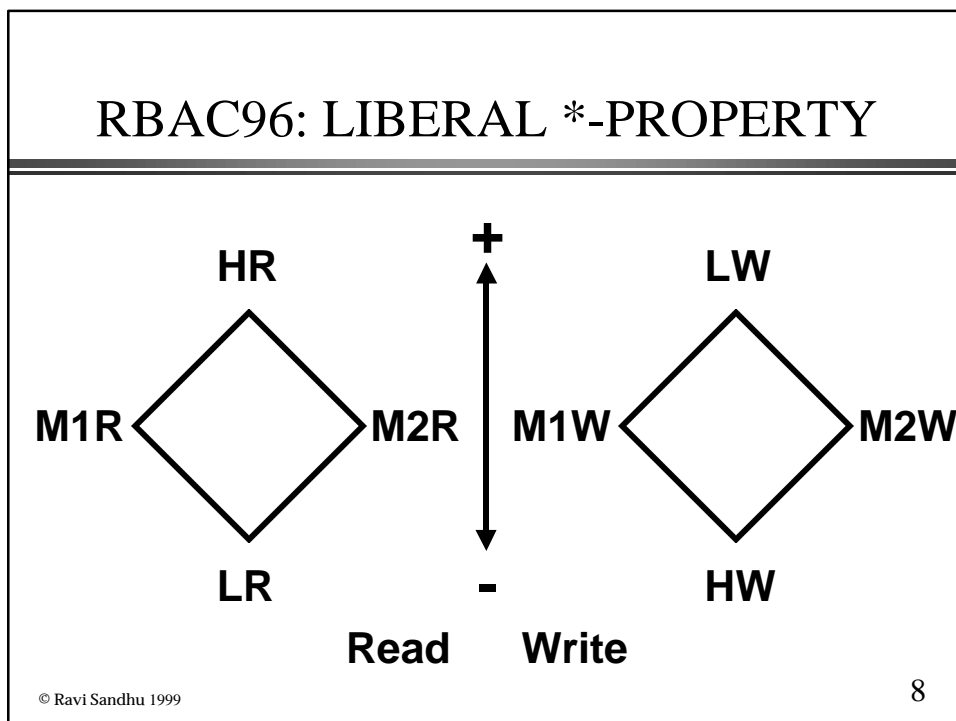
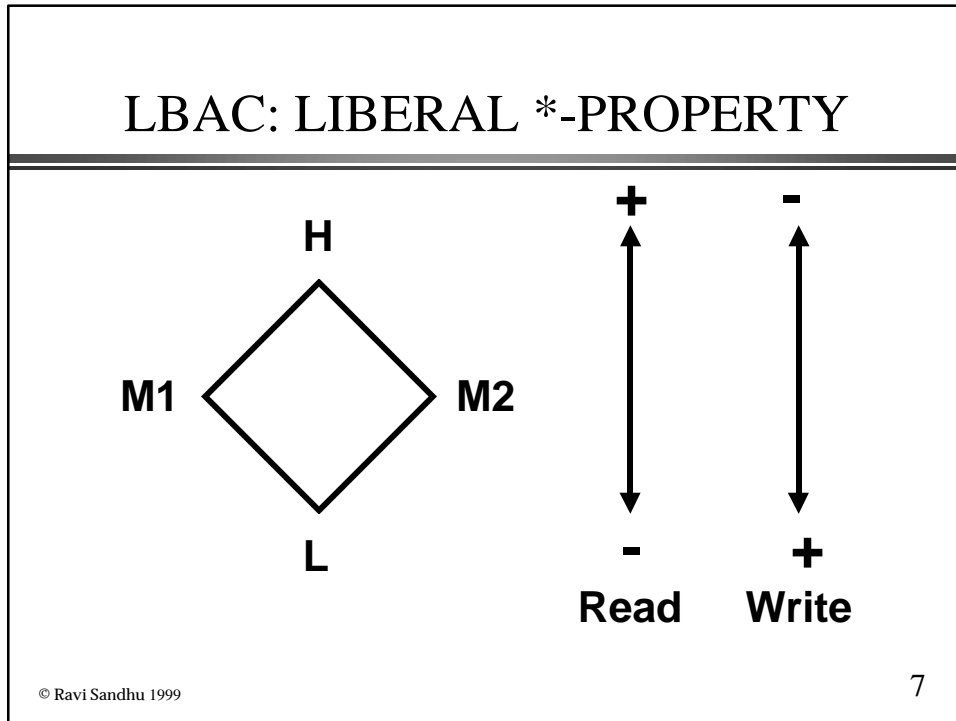




WHAT IS THE POLICY IN RBAC?

- ◆ **RBAC is policy neutral**
 - **Role hierarchies facilitate security management**
 - **Constraints facilitate non-discretionary policies**

Lecture 4: RBAC-LBAC



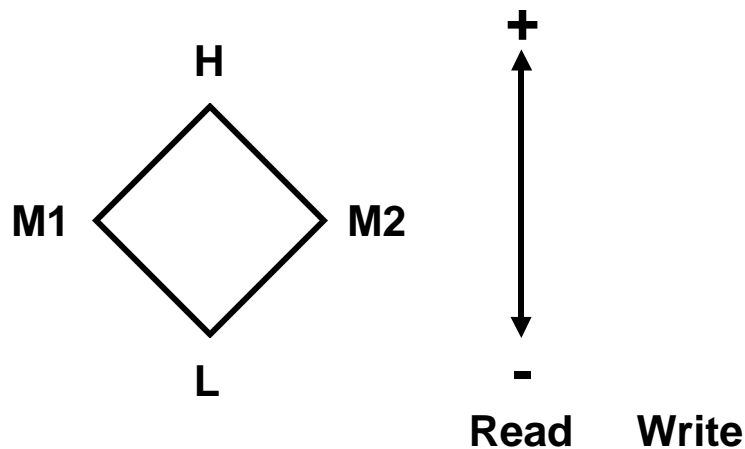
RBAC96: LIBERAL *-PROPERTY

- ◆ **user** \in **xR**, user has clearance **x**
 user \in **LW**, independent of clearance
- ◆ **Need constraints**
 - **session** \in **xR** iff **session** \in **xW**
 - read can be assigned only to **xR** roles
 - write can be assigned only to **xW** roles
 - **(O,read)** assigned to **xR** iff
 (O,write) assigned to **xW**

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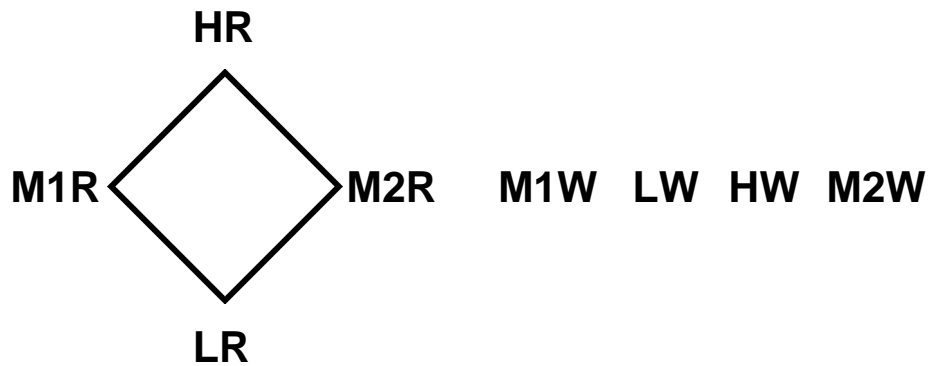
LBAC: STRICT *-PROPERTY



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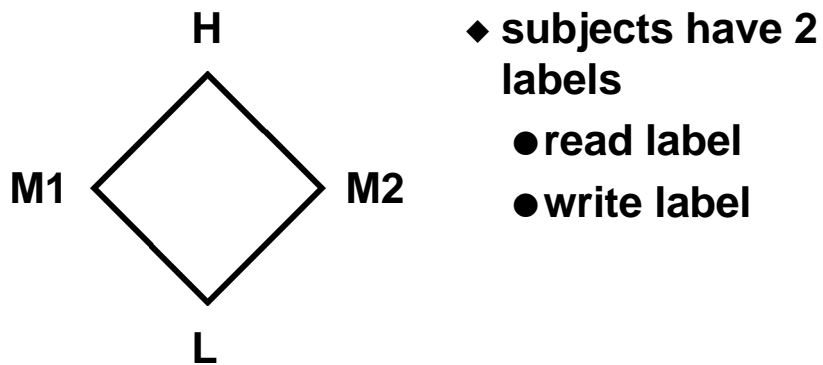
RBAC96: STRICT *-PROPERTY



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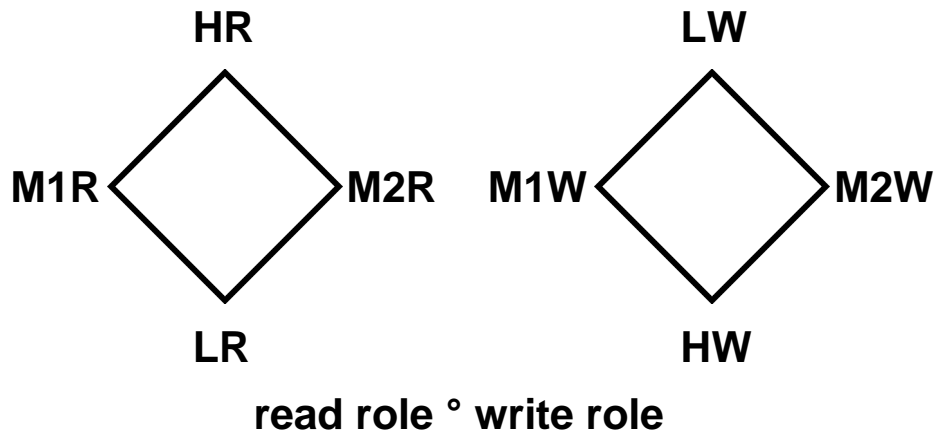
LBAC: WRITE RANGE



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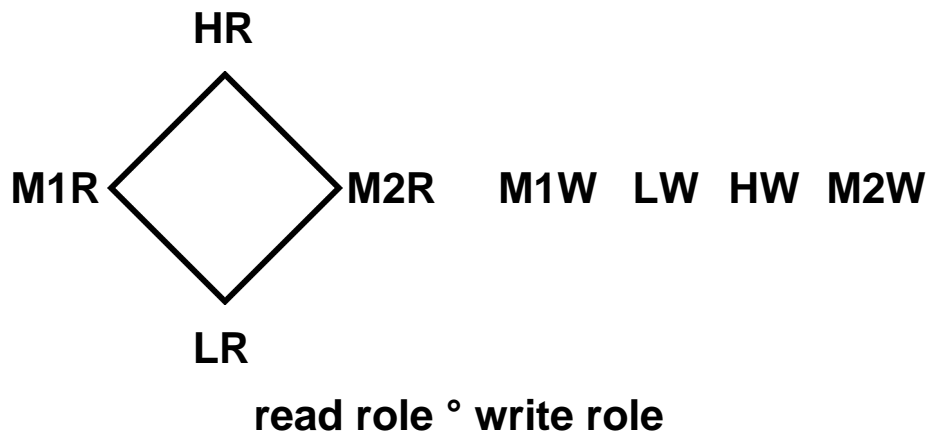
RBAC96: WRITE RANGE
LIBERAL *-PROPERTY



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RBAC96: WRITE RANGE
STRICT *-PROPERTY

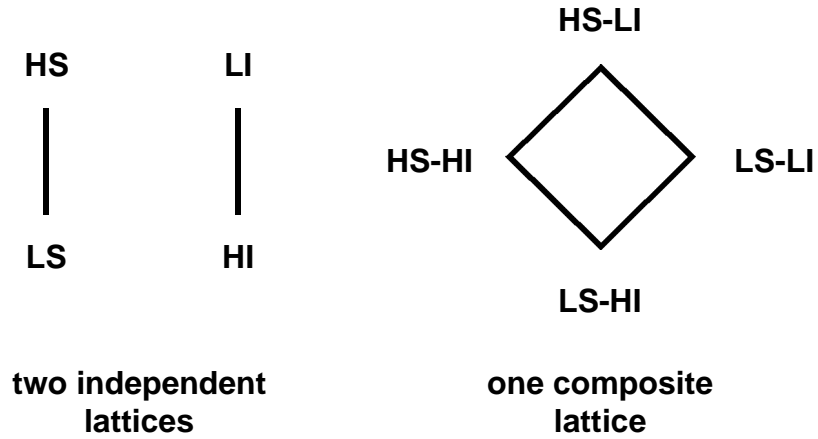


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Lecture 4: RBAC-LBAC

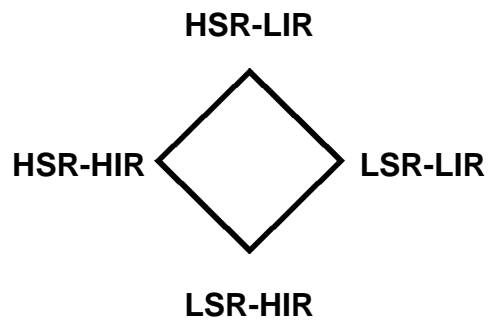
LBAC: CONFIDENTIALITY AND INTEGRITY



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RBAC96: CONFIDENTIALITY AND INTEGRITY READ ROLES

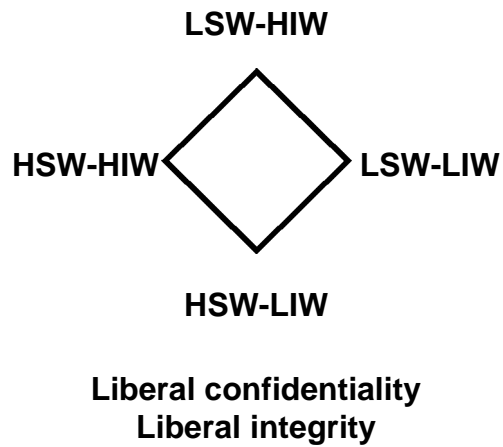


Same for all cases

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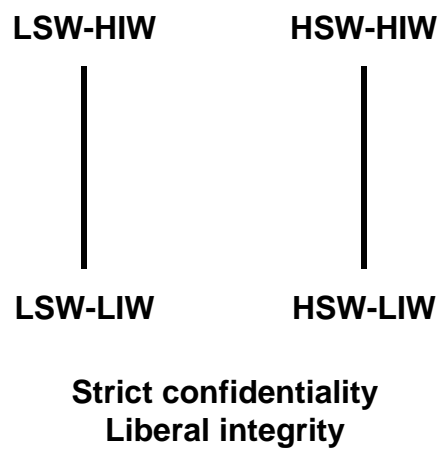
RBAC96: CONFIDENTIALITY AND INTEGRITY WRITE ROLES



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RBAC96: CONFIDENTIALITY AND INTEGRITY WRITE ROLES



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RBAC96: CONFIDENTIALITY AND INTEGRITY WRITE ROLES

LSW-HIW HSW-HIW LSW-LIW HSW-LIW

Strict confidentiality
Strict integrity

SUMMARY

- ◆ **policy-neutral RBAC96 can accommodate policy-full LBAC in all its variations**
- ◆ **LBAC variations are modeled by**
 - adjusting role hierarchy
 - adjusting constraints

COVERT CHANNELS

- ◆ are a problem for LBAC
- ◆ remain a problem for RBAC but
 - they don't get any worse
 - same techniques can be adapted
 - who cares about them anyway