

## Outline for April 14, 2005

1. Schematic Protection Model
  - a. Create operations and attenuation
2. Expressive power
  - a. HRU vs. SPM
  - b. Multiparent joint creates in HRU
  - c. Adding multiparent joint creates to SPM (giving ESPM)
  - d. Simulation of multiparent joint creates by 2-parent joint creates
  - e. Monotonic ESPM, monotonic HRU equivalent
  - f. Safety question in ESPM decidable if acyclic attenuating scheme
3. Comparing Expressive Power of Models
  - a. Graph representation
  - b. Go through 3-parent joint create as simulated by 2-parent joint create
  - c. Correspondence between two schemes in terms of graph representation
  - d. Formal definition of scheme  $A$  simulating scheme  $B$
  - e. Model expressive power
  - f. Result: monotonic 1-parent models less expressive than monotonic multiparent models (so ESPM more expressive than SPM)
4. Typed Access Matrix Model
  - a. Add notion of type for entities—set of types  $T$ , set of subject types  $TS \subseteq T$
  - b. New create rules: specify subject/object type
  - c. In command, child type if something of that type created; otherwise, a parent type
  - d. Show type graph and cycles in it
  - e. Safety decidable for systems with acyclic MTAM schemes

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