

Enhanced Access Control for Collaborative Documents

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Introduction

- Computer Supported Cooperative Work (CSCW)
- Security Applications
- Discussion

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CSCW

- Collaborative Development of Documents
 - Text or Diagrams
 - Real-time What You See Is What I See

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CSCW Problem

- Multiple people interacting with the same document can make conflicting changes
- Violate social protocols
- Need system support to help coordinate people
 - Roughly analogous to concurrency control in a database

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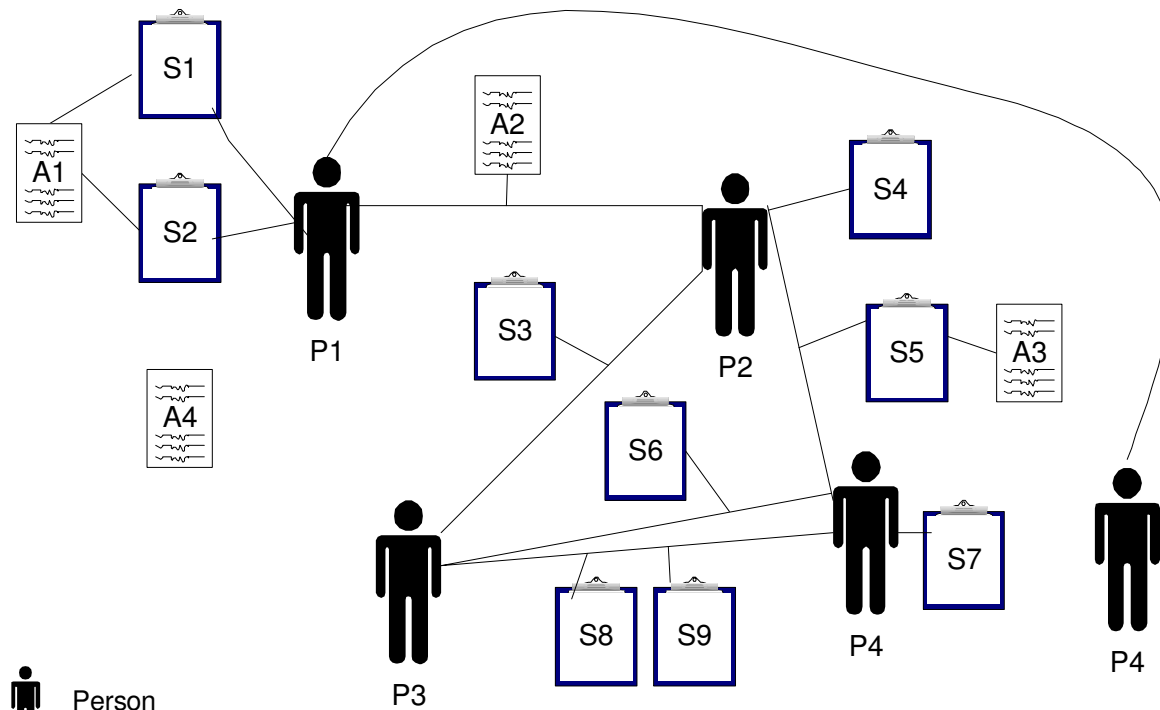
New Approach for Diagrams

- System notifies users when someone acts on a shape someone else is still using
 - Notification can have varied results
- “Still Using” determined by:
 - Incomplete syntax
 - Time, number, area, distance

Asynchronous Support

- Maintain list of shapes acted upon and compare divergent versions
 - Also supports wireless application
- Particularly for syntactic rules, “in use” spans work sessions

Example



Security Applications

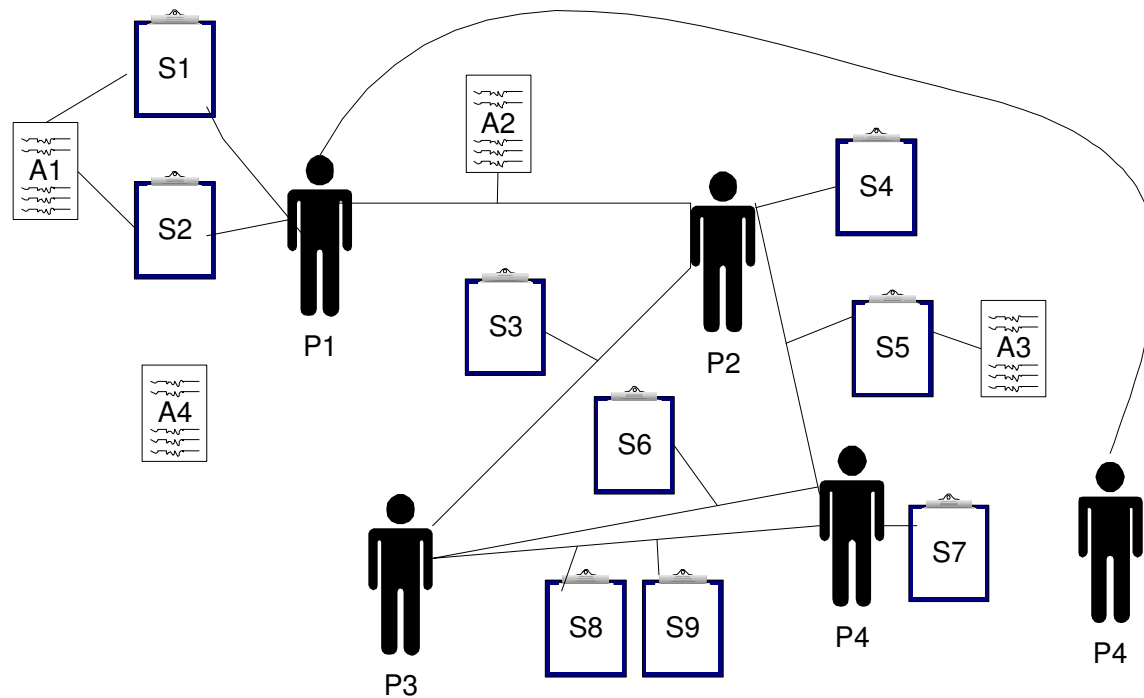
- Confidentiality
 - Diagrams
 - Images
- Integrity

Confidentiality - Diagram

- Use meaningful connections between shapes to supplement or replace traditional access control lists for the data represented by the shapes
- Various levels are supported

Confidentiality - Diagram

Full Diagram View

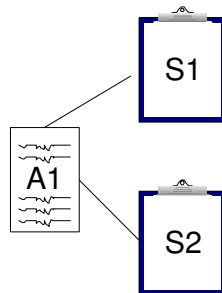


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Confidentiality - Diagram

Direct Connection to document A1



Confidentiality - Diagram

Only people



P1



P2



P3



P4



P4

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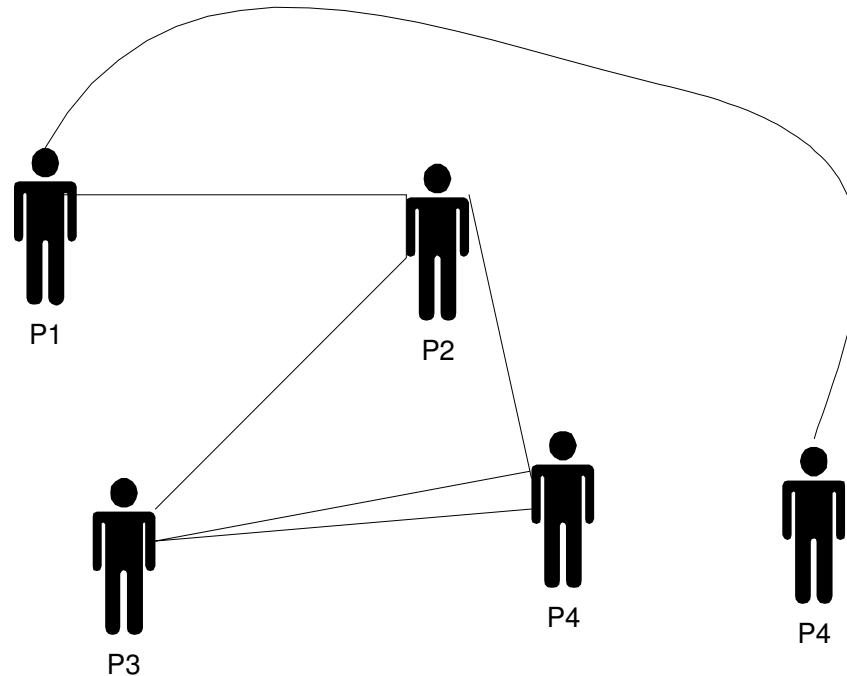
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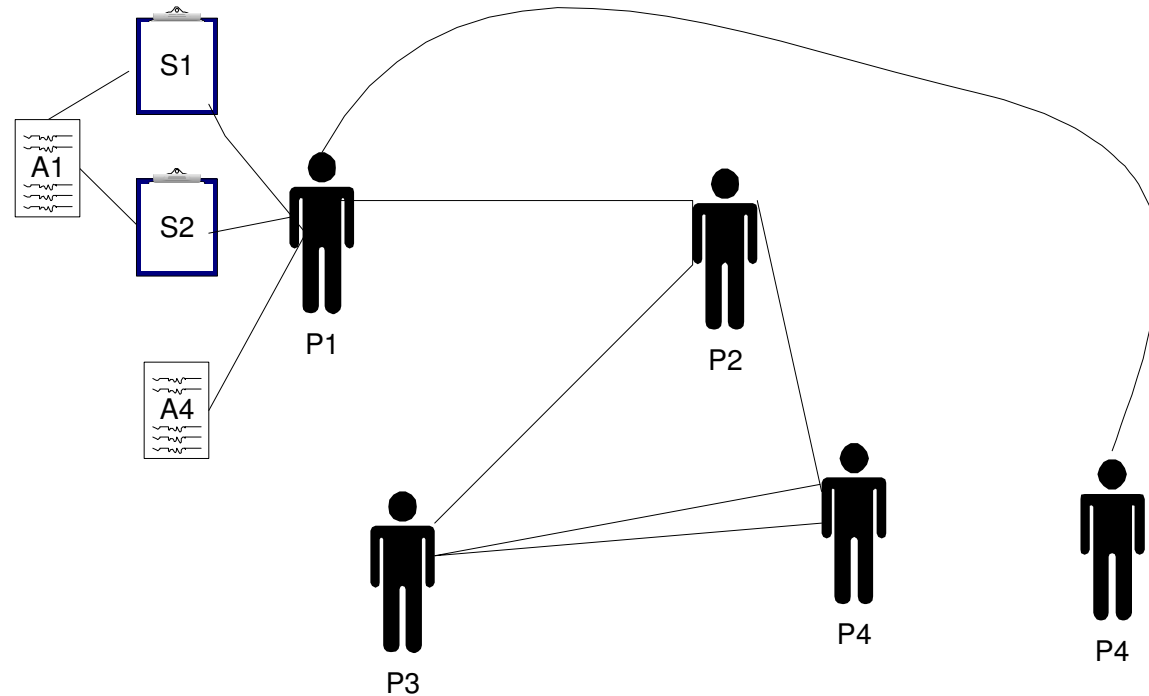
Confidentiality - Diagram

Only people and connections



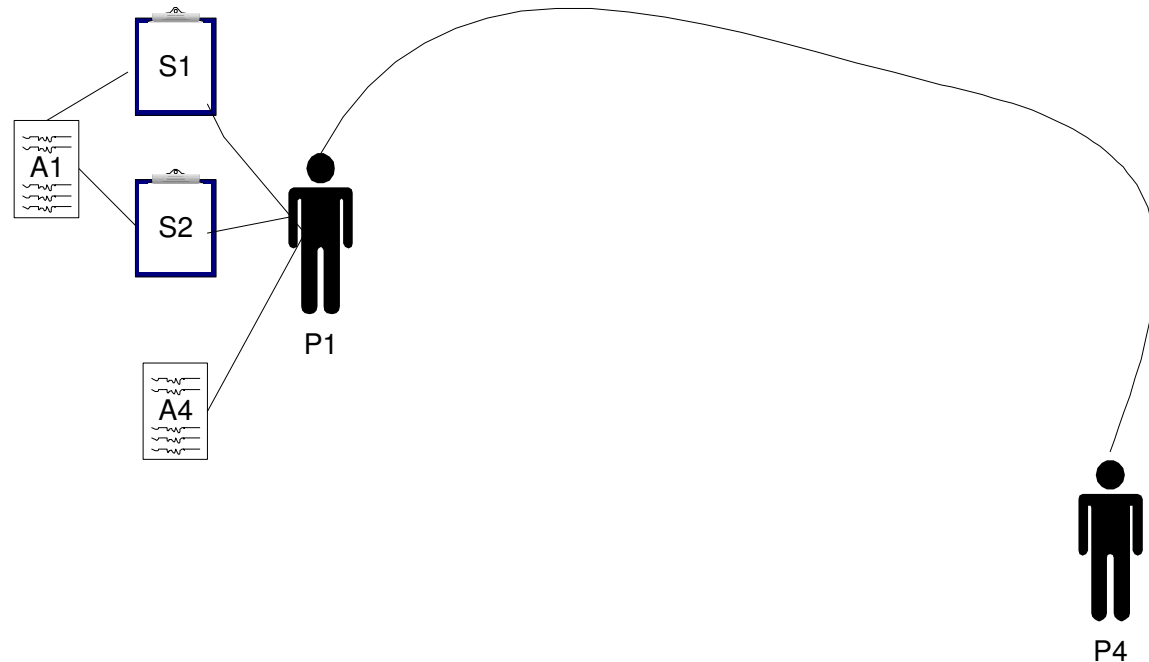
Confidentiality - Diagram

Add A4 and see other items connected to same shape (P1) (with people and connections)



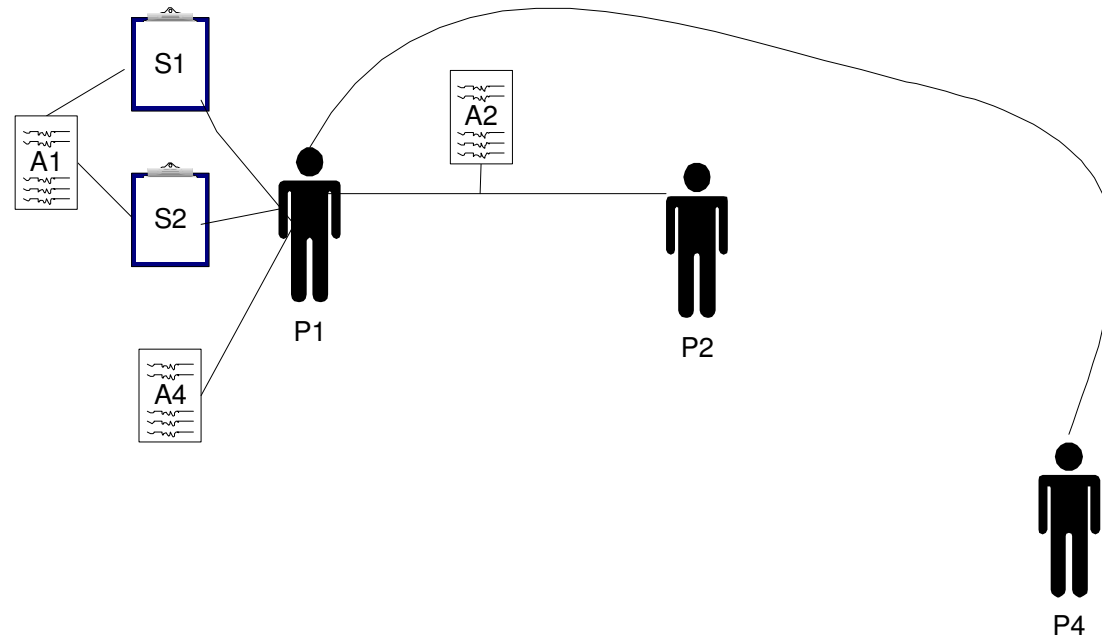
Confidentiality - Diagram

Add A4 and see other items directly connected to same shape (P1)



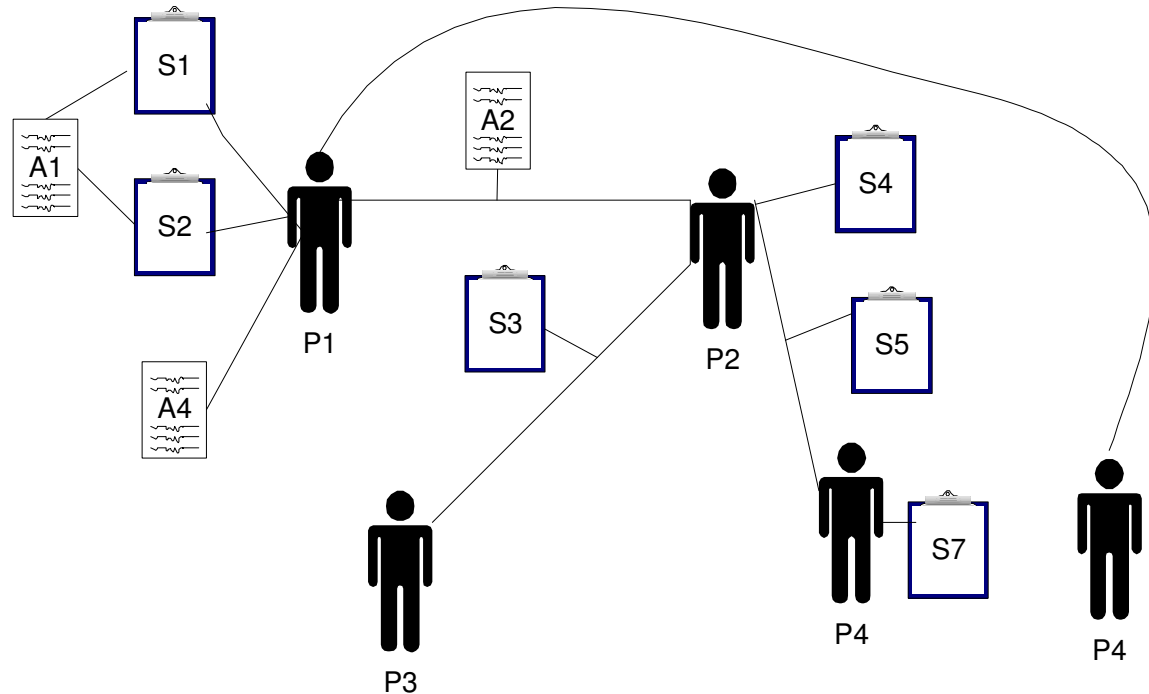
Confidentiality - Diagram

Add A4 and see other items connected to same shape (P1) and 1 connection



Confidentiality - Diagram

Add A4 and see other items connected to same shape (P1) and 2 connections



Confidentiality - Image

- Visible and hidden features on map
- Annotations
 - Hidden annotations on image
 - Become visible after annotating same object
 - Could notify even if hidden

Integrity

- Coordination control can maintain history of actions taken
 - audit trail
- Explicit or implicit interest areas
 - Notification of shared interest
 - Notification of intrusion (trip wire)

Future Directions

- Graphical evaluation of minimally different queries?
- Other realistic examples?