LoT-RBAC: A Location and Time-based RBAC Model

Suroop Mohan Chandran and J.B.D. Joshi (2005)

Outline

- Introduction and Related Work
- LoT-RBAC
  - Location Context Model
  - LoT-RBAC Expressions
- Future Work

Introduction

- Problem: More and more people are dependent on mobiles today. There is a need for location and time-based access control to resources.

- Approach: In this paper, they propose a a location and time based RBAC model to address this problem. They also separate location context of users, roles, and permissions.

Related Work in LoT-RBAC

- GTRBAC (Joshi)
  - Pro: Time Context
  - Con: No Location Context
- GEO-RBAC (Bertino)
  - Pro: Spatial Context
  - Con: No Separation of Duty mentioned
- Environment RBAC (Convington)
  - Pro: Environment is very broad context
  - Con: No formal semantics provided

Location Context Model

- Location Context Model
  - Physical Location (PLOC)
    - Pittsburgh, SIS Building, Ambulance1
  - Logical Location (LLOC)
    - City, School Building, Vehicle
  - Relative Location
    - (PLOC/LLOC, direction, units)
      - 10 miles around School Building
      - 3 miles around Ambulance1 (Could be moving)

  - Location Hierarchy (Hybrid of LLOC/PLOC)
    - Example on next slide

Location Hierarchy Example
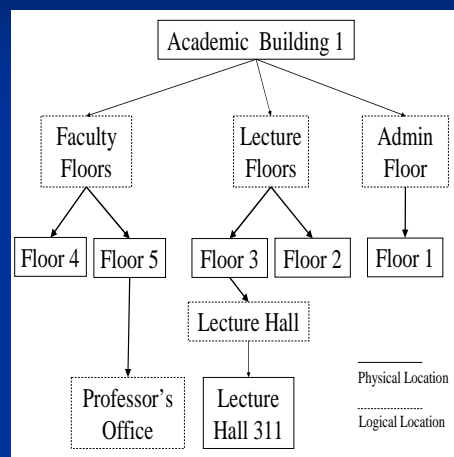
LoT-RBAC Expressions

- Location and Time Constraints on
  - User-Role Assignment
    - User and Role Location could be different!
  - Role Enablement
  - Role-Permission Assignment
    - Role and Permission Location could be different!

- Role Activation Constraints
  - Total Duration (per role, per user-role)
  - Max Duration (per role, per user-role)

LoT-RBAC Expressions

- Cardinality Constraints on Role Activation
  - Total # of Activations (per role, per user-role)
  - Max # of Con. Activations (per role, per user-role)

- Triggers
- Constraint Enabling
- Run-time Requests (Admin, User Activation)

Project Add-ons

- User and Permission enablement
- Enablement History (supports new cardinality and duration constraints)
- Location and Time-based Separation of Duty

Future Work

- Location Privacy
- Separation of Duty and Cardinality
- Integrate with Trust Framework

Thank you
and any questions?