



# **Collaborative Technologies and Enterprise Middleware:**

**A View of the Next Few Years**

**A Day in the Life of Jean Blue**

OOPS! After the break, we will have

## Session 2D: Middleware – Authentication

(instead of having Session 2C twice).

Chair: Michael Gettes, Duke University, USA

2d1: *Shibboleth Interoperability with the Athens Access Management System*

Lyn Norris, EduServ, United Kingdom

2d2: *U.S. Federal eAuthentication and Higher Education*

Peter Alterman, Federal PKI Steering Committee, USA

2d3: *Efforts to Establish Electronic Identities for Swedish Universities*

Torbjörn Wiberg, Umeå University, Sweden



# Agenda

- Collaboration Technologies
- Enterprise Middleware
- A Day in the Life of Jean Blue, biologist
  - A morning of research
  - An afternoon of education
  - A night of personal life
- What might go wrong
  - If we fail
  - If we succeed



# Collaborative Technologies

- **Communication**
  - Email, Desktop video, Audio on appliances
- **Computation**
  - Grids, Peer-to-peer, Smart Dust
- **Coordination**
  - Scheduling, calendaring
- **Commerce**
  - Credential exchange in B2B and B2C

# Enterprises

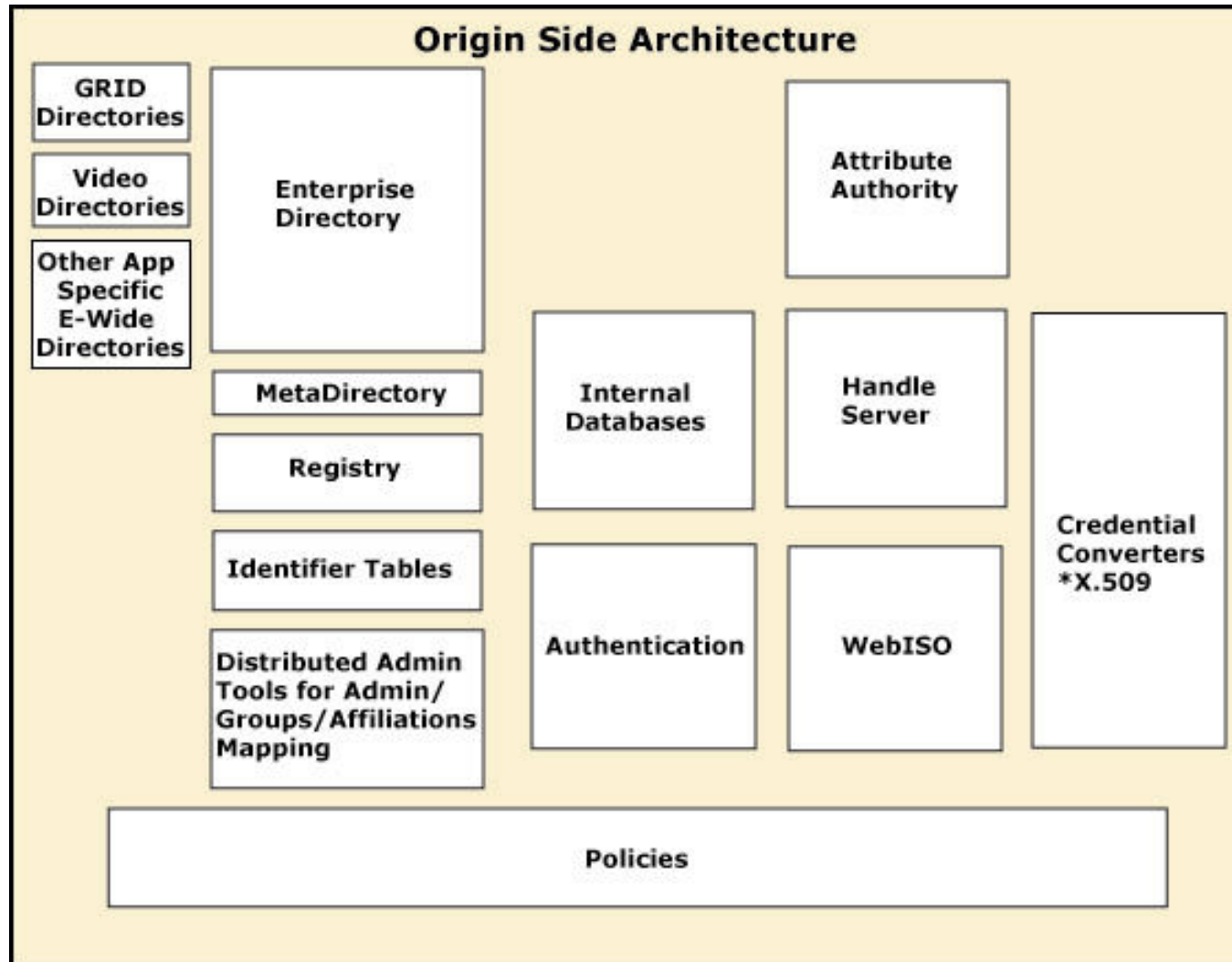
- Organizations that, as part of your belonging, help you manage your information and access in an electronic world
- We may use three or so enterprises...
  - Work – your university or your corporation
  - Home – a service provider offering consumer services
  - Personal – a second service provider for extra privacy and security



# Enterprise Middleware

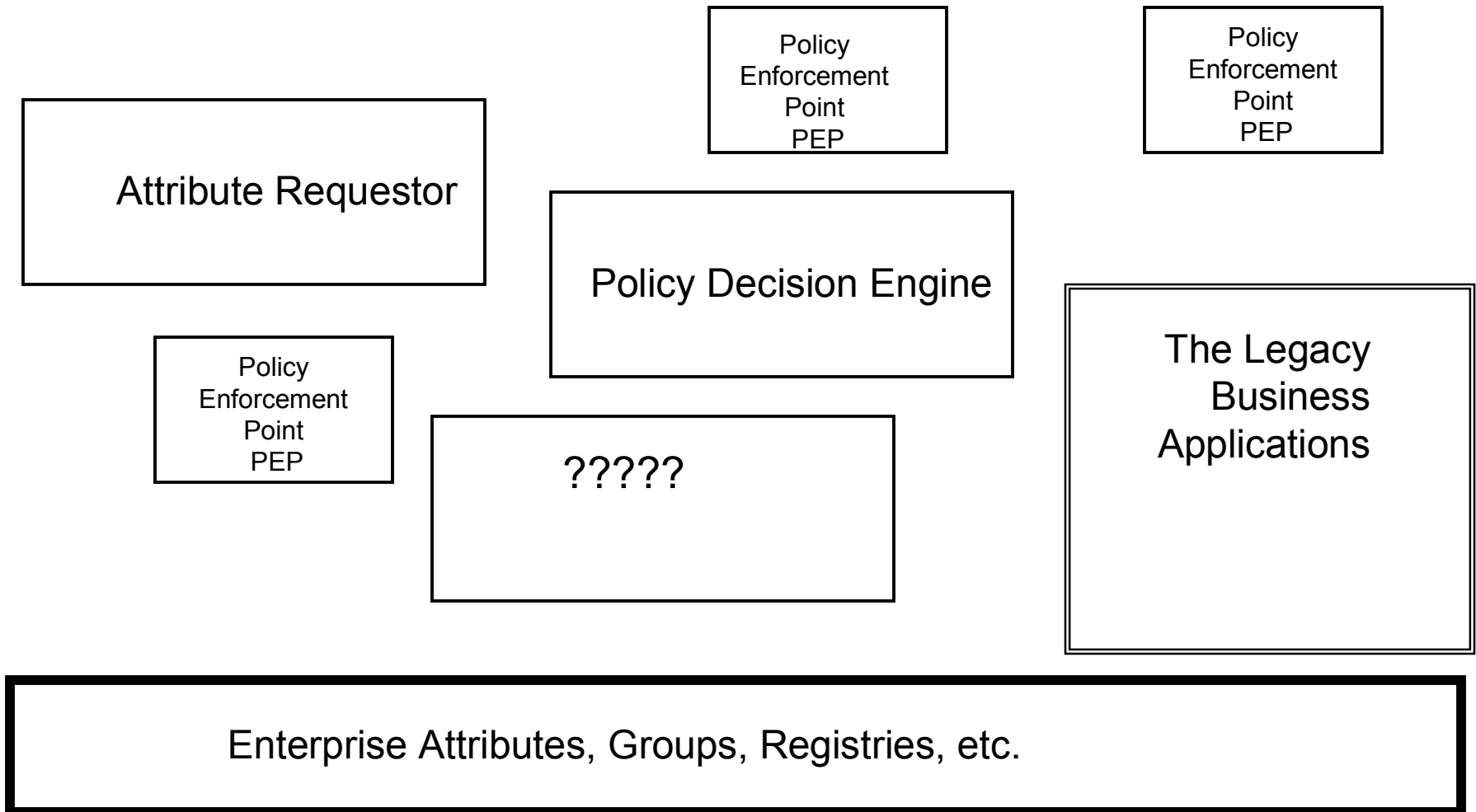
- Identity Services – converting real identities to electronic identities
- Authentication – verifying an electronic identity
- Directories – containing the attributes of identity and systems
- Authorization – deciding what actions an identity is permitted to do

# Pieces of an enterprise middleware



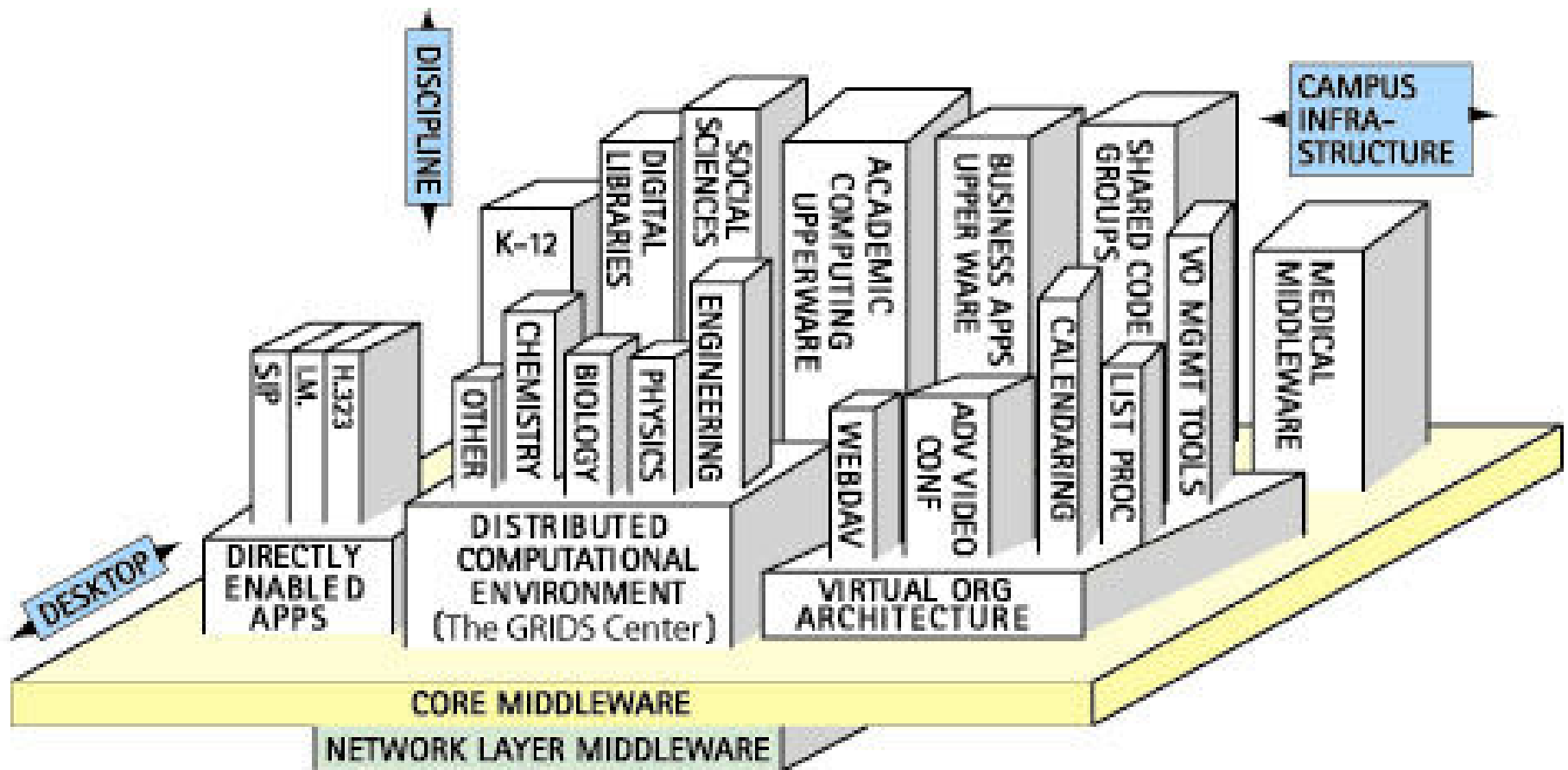


# More pieces of an enterprise architecture





# Enterprise middleware and applications





# Federations of Enterprises

- An interrealm approach – enterprises are realms, and they mutually join into federations to conduct business.
- For the consumer marketplace, users subscribe to commercial service offerings to interact with business federations; enterprises that might offer consumer services include desktop OS's (Microsoft), ISP's (AOL), Telecoms (Nokia, telco's), consumer product vendors (Ford, United Airlines) and banks (Chase).

# Emergent Federations

- SecuritiesHub – 8 large banks to share research reports among customers
- Swiss R&E Federation – national universities using Shibboleth
- InCommon – universities
- Club Roadkill – experimental testbed
- Liberty Alliance, Federated .NET, Shibboleth, PAPI are among the tech drivers...

# Clusters of Federations

- Federations of similar interests or communities.
- Share metadata, attribute standards
- May have dissimilar trust and policy issues
- Clusters of federations may resemble groups of NRENs, perhaps with different participants

# Welcome Jean Blue

- A biologist at the Center for Medical Paramecium
- Teaches graduate classes at the University
- Treats paramecium at a clinic
- Single, available...

# Jean Blue





# A Morning of Research

- Checking on their Grid computation
- Updating the collaboration site
- Videoconferencing with peers
- Looking at the research journals
- Refereeing a paper

# Collaborative research tools

- Signed email
- Middleware-enabled videoconferencing
- Convertible credentials
  - Local becomes global
- Authenticated and authorized use of resources
  - Local and virtual permissions
  - Privacy as required
    - as a reader
    - as a referee
    - as an editor



## Updating the collaborative web site

- Local login to enterprise
- Establish rights on the collaborative site
- Upload and edit; leave an audit trail
- Revisit web site as an anonymous user
- Revisit web site as a graduate student



## Middleware-enabled video

- Automatic resource discovery
- Authentication/announcement to target
- Authorization to use bandwidth
- Across H.323, SIP, AG, VRVS
- Privacy

# An afternoon of teaching and administration





## An afternoon of education

- Adding research results to class
- Booking travel to Terena 2008
- Instant messaging
- Virtual office hours
- Evaluating a resume
- Managing the new lab assistants
- Shared calendaring

# Collaborative tools in education

- Signed email
- Middleware-enables videoconferencing
- Roles
- Privacy enabled educational services
- Enterprise-enabled federated P2P
- Local associations
- Digital rights management



# Enterprise, federated P2P

- Authentication of clients to enterprise
- Authorization
- Efficient resource discovery
- File sharing with accountability

# Managing the lab assistants

- Setting their roles into the appropriate directories
- Automating feeds from systems of record
- Signing transactions into the systems of records
- Setting calendar permissions

# An evening of life







## An evening of life

- Booking a restaurant
- Voting in local surveys
- Single and available



# Collaborative tools in life

- Signed email
- Chat sessions
- Attribute management services
- Hip routers



## Single, available

- Chat with privacy protections and authentication
- Voting in local surveys
- Progressive disclosure services

# Key concepts

- Role-based access controls
- Layering for scaling – federations, enterprises and virtual organizations
- Privacy – from whom
- Presence
- Diagnostics
- Trust



# What could go wrong? ...how we could fail

- A single vendor wins
- A marketplace does not get established
- Users don't care about privacy or security
- Federations prove costly and difficult
- Inter-federation issues do not get solved
- International issues prove intractable



## What could go wrong ...if we succeed

- Erosion of privacy
  - Difficulty      Exposure      Rubber squeeze toys
- Lost time in the management of collaboration
  - Modalities      Complexities      Global issues
- Identity tampering
- Effects on the quality of life

# Issues and turtles

- The Bertrand Russell turtle
  - will the layers get to be too much
  - will the complexity be manageable by users
- The Edward Oppenheimer turtle
  - do the necessary damage carefully