



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

Vannotea

Adding Security to a Real-time Collaborative Telehealth System

Ronald Schroeter

School of Information Technology & Electrical Engineering

ronalds@itee.uq.edu.au

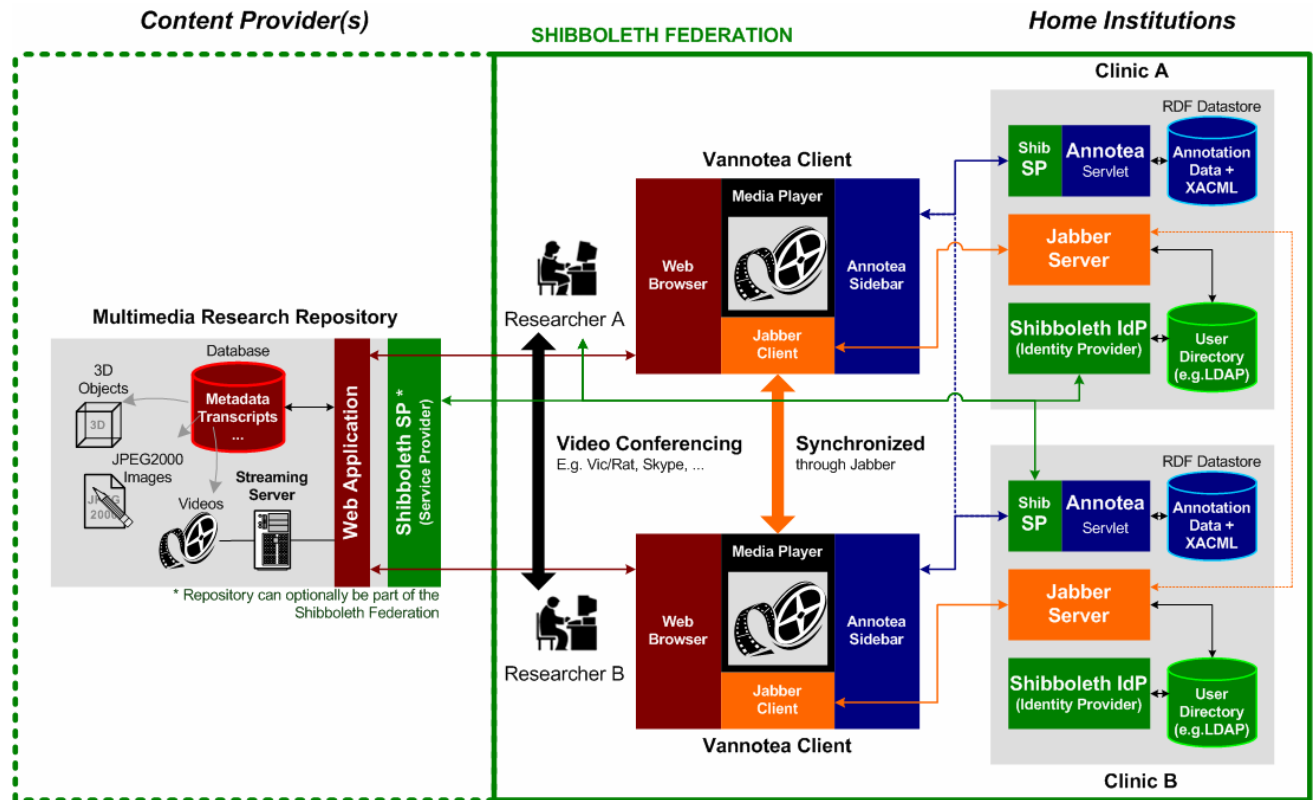
Prof. Jane Hunter, Jonathan Guerin, Imran Khan, Michael Henderson

functionality

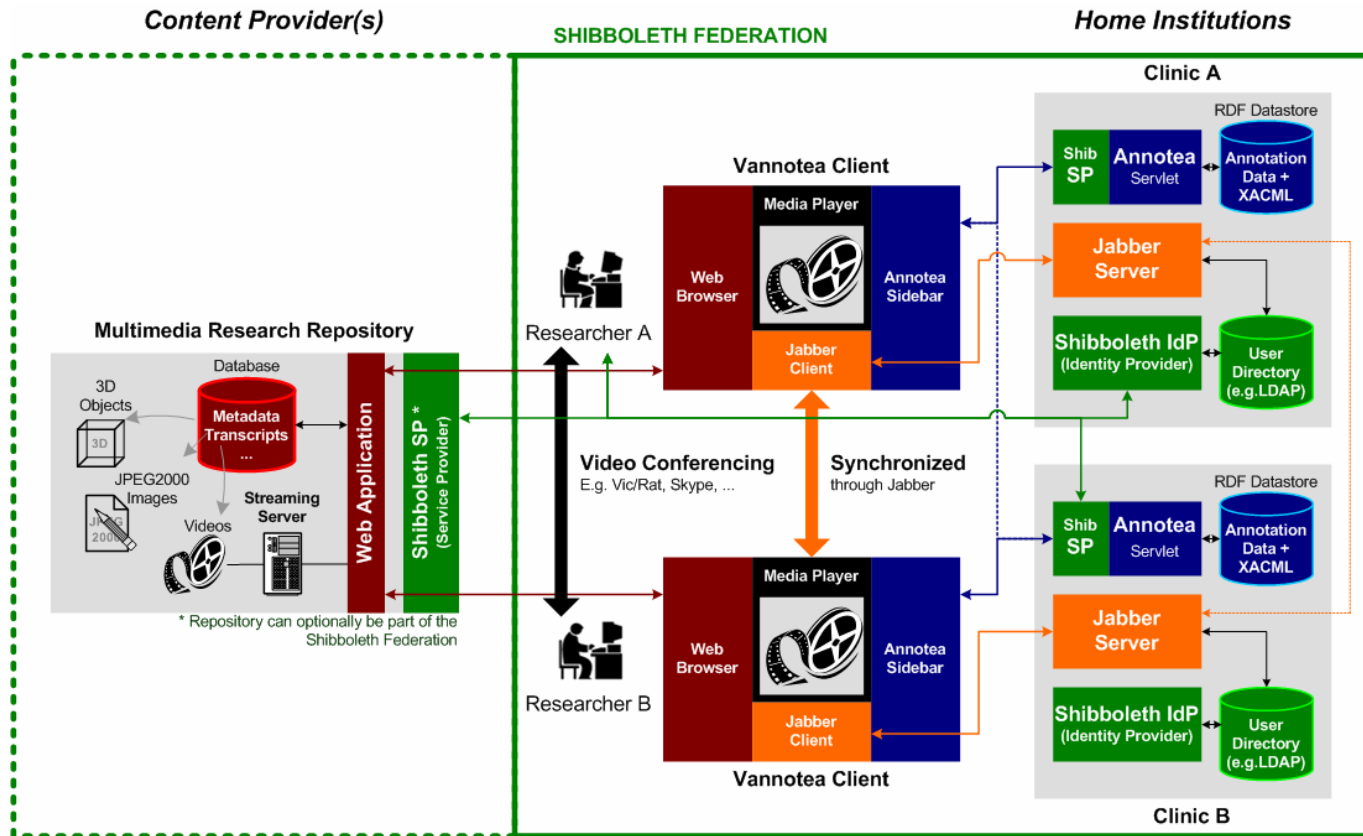
- **browse** ...existing multimedia **repositories** with web front end
- **view** ...various formats of videos, images, 3d objects, web documents, etc.
- **compare** ...by viewing/playing multiple media files/documents simultaneously
- **annotate** ...by highlighting regions and attaching notes, links, local files, etc.
- **search** ...the private, group or public annotation data to retrieve or analyse content
- **secure** ...and share personal notes through **XACML** policies within **Shibboleth**
- **collaborate** ...in real-time through the integrated **Jabber** messaging architecture
- **record** ... event logs and audio/video from conferencing tools (Vic/Rat, Google Talk)
- **play** ...back previously recorded, collaborative discussion sessions

system architecture

- browse
- view
- compare
- annotate
- search
- secure
- collaborate
- record
- play



system architecture



advantages

- ...over application sharing (e.g. VNC):
 - video quality much higher
 - collaboration more flexible
 - access control applied to each user and content individually
 - session recordings and annotations are content independent - storing only references
 - high-quality content can be pre-loaded supporting low bandwidths

user interface - demo

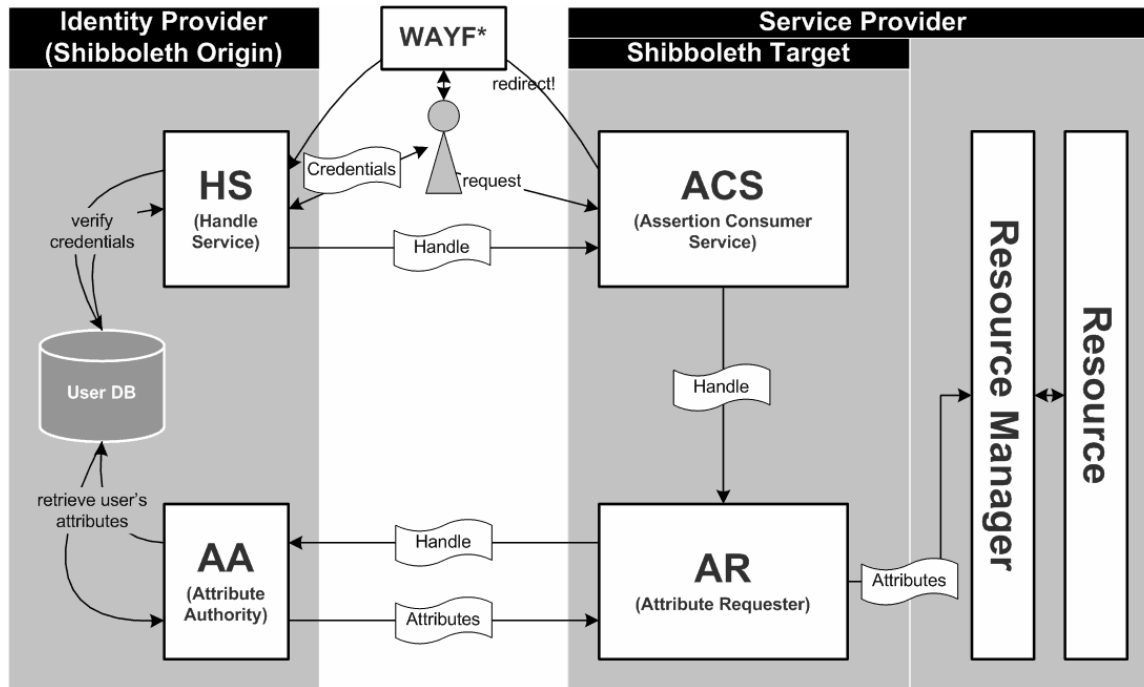
The screenshot displays the Vannotea2006 application window. The interface is divided into several sections:

- Media Browser:** Located on the left, it shows a search bar and a list of "Current Movies" including "Arterial Coronary Off-Pump Bypass (EndoACAB)", "Endoscopic Atraumatic Cor Bypass (EndoACAB)", "Aortic Valve-Sparing Operation with Aortic Root Aneurysm using Prostheses for Anatomical Resection of Sinuses of Valsalva", "Repair of Anomalous Left Coronary Artery (ALCAPA) in Infancy", "Axillary Cannulation: Anterior Approach", and "Off-Pump CABG in Dextrocardia".
- Video Player:** The central area contains two video windows. The left window shows a diagram of the heart with the text "Resection of aortic root aneurysm including sinuses" and "Dissection of coronary arteries". The right window shows a live surgical video of a heart procedure.
- Annotations:** A sidebar on the right lists annotations such as "The Final result", "Sewing the dacron graft to the annulus of the Valve sparing method", "The reimplantation procedure explained", "Lowering the graft into place", "Re-attaching the coronary arteries", and "The Valsava Prothesis".
- Timeline:** An "Annotea Timeline" at the bottom shows a sequence of events with markers for "JaneHunter", "rgonalds", "MichaelHenderson", and "JonnoGuerin".
- Diagram:** A detailed anatomical diagram of the heart is shown in the bottom right, with a caption: "Sutures are placed just below the aortic..."

shibboleth

- Federated Identity Management
- authentication and authorization infrastructure
- trust (public key cryptography)
- virtual organisations
- Single Sign On (SSO)
- OASIS SAML implementation
- preserves user privacy

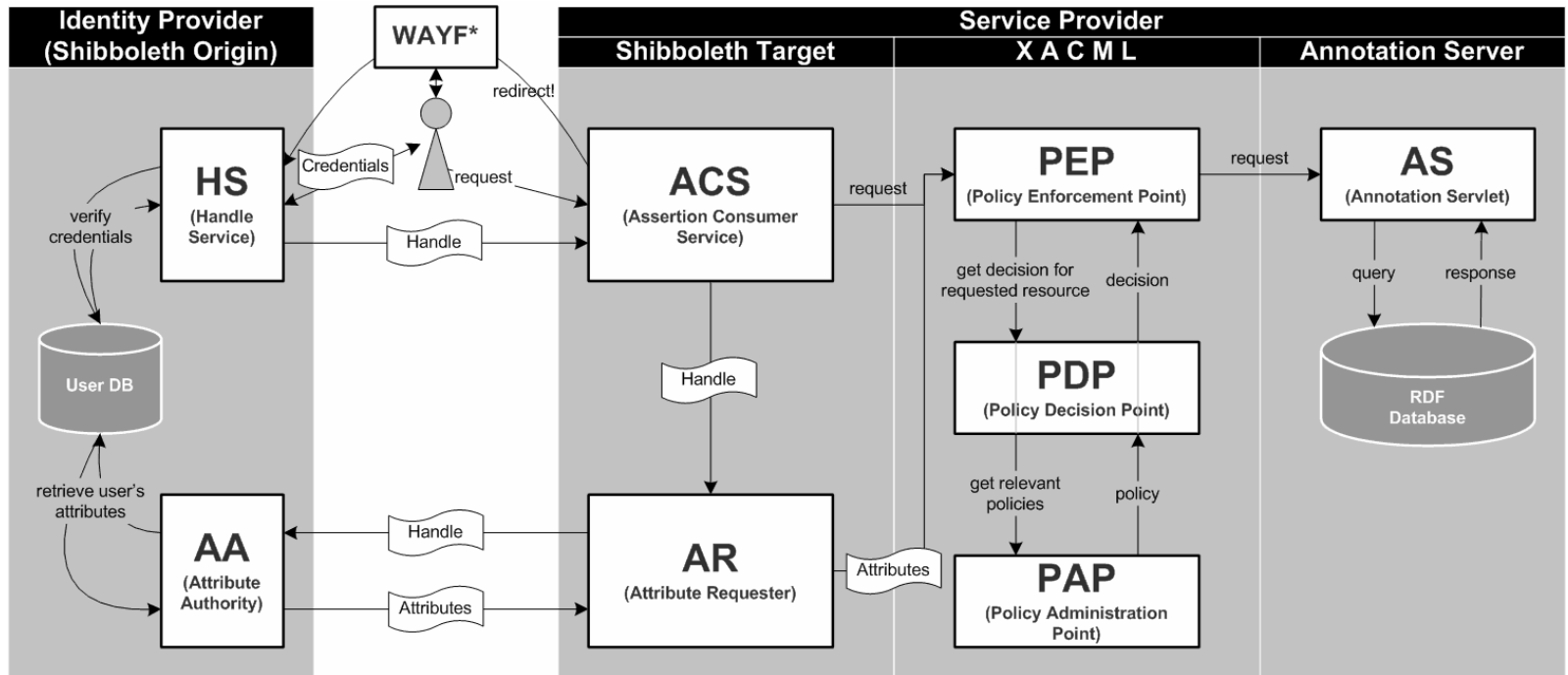
shibboleth



XACML

- eXtensible Access Control Markup Language
- OASIS standard
- expressive way to describe:
who (subject) can **do what** (action)
with **which resource** ?
- Problem: for this to work within medical domain, we need a standardised (ldap) schema to describe actors and roles: medMid, AAMC, “medPerson” (<http://middleware.internet2.edu/medmid>)

shibboleth + xacml



applications

- remote teaching of new surgical procedures
- remote diagnosis
- remote consultation
- sharing of opinions between a team of clinicians within clinical trials

evaluation

- **ACRRM** (Australian College of Rural and Remote Medicine)
 - media enriched remote teaching/tutoring/discussions
- **Tele-Derm**
 - de-identified cases in form of images and videos are uploaded for assessment by a dermatologist and discussion with other GPs
- **Cancer Grid (UK eScience)**
 - collaborative infrastructure for cancer clinical trials

more information

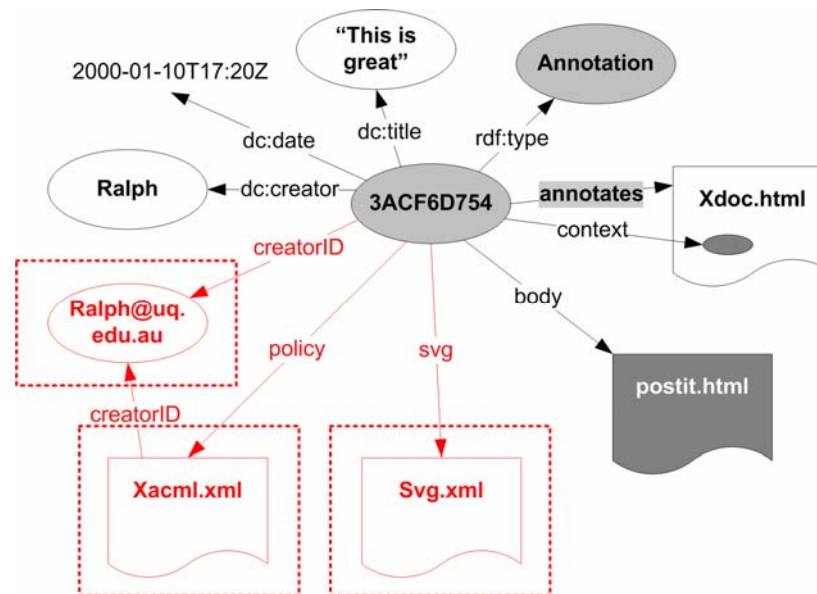
www.itee.uq.edu.au/~ereseach/projects/vannotea/

or

ronalds@itee.uq.edu.au

annotea

- W3C – part of Semantic Web Initiative
- builds on HTTP, RDF and XPointer



annotation and policy creation

Updating Existing Annotation

Title: Re-attaching the coronary arteries

Type: Explanation

Rank:

Language: en English

Server: http://maenad.itee.uq.edu.au/Annotea/A

Body Policy

Plain Text URL File Semantic

Small holes are produced in the aorta graft for the coronary ostia
coronary arteries are re-attached through the small holes

Update Cancel

Creating 'Inter-Hospital Policy'

Server: http://maenad.itee.uq.edu.au/Annotea/AnnoteaServlet

- Inter-Hospital Policy (ronalds)
 - GROUPS
 - University Hospital Doctor
 - RULES
 - READ is Permitted
 - LIST is Permitted
 - READPOLICY is Permitted
 - University Hospital Student
 - Metro Hospital Doctor
 - Metro Administrative Staff

	Attribute	Function	Value	Issuer
<input checked="" type="checkbox"/>	mediPersonAffiliation	string-equal	doctor	hospital.uni.edu.au
<input type="checkbox"/>	mediPersonOrgDN	anyURI-e...	cardio.hospital.u...	hospital.uni.edu.au

Create Cancel