[Interoperable] Digital Rights Management for Geospatial Web Services

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Agenda

- DRM: Introduction

- DRM vs. GeoDRM

- GeoDRM Reference Model

- Looking ahead: Implementations

Digital Rights Management: Introduction

- **At minimum, DRM provides the following:**
  - Governance
  - Secure association of usage rules with information
  - Persistent protection
- **Trendy & very disputed technology**
  - Promises a lot to service providers
  - Fears of inappropriate limitations of usage
  - Hard to agree on usage policies
  - A lot of technologies & standards

Digital Rights Management: Definition

- **"Digital"**
  - The material over which the rights exist
- **"Rights"**
  - Intellectual property rights linked to the material
- **"Management"**
  - Defining a policy and enforcing it. Making sure that the rights are respected

Traditional DRM
[as opposed to Geospatial DRM]

- Digital:
  - Music, Video
- Rights:
  - Play, Copy
- Management:
  - Policies usually involve only two actors (B2C): Owner, User
  - Static products, use "as is"
  - Enforcement usually accomplished by packaging

Geospatial DRM (GeoDRM)

- Digital:
  - Geospatial information (ex. Maps)
  - Not always sold as one product
- Rights:
  - View, Copy
  - Transformation, Edit, Combine
- Management:
  - Policies include several actors (B2B)
    - Longer value add chains
  - Usage
    - Combine different sources of information
    - Information is processed before usage

Open Geospatial Consortium: GeoDRM Reference Model

- **Open Geospatial Consortium**
  - Non-profit, international, voluntary consensus standards organization
  - Leading the development of standards for geospatial and location based services
  - http://www.opengeospatial.org
- **GeoDRM Reference Model**
  - Based on the ISO RM-ODP
  - Conceptual model for digital rights management of geospatial resources
  - Metadata model for expressing rights
  - Requirements for DRM systems in order to enforce the rights
  - Relation to the broader DRM context

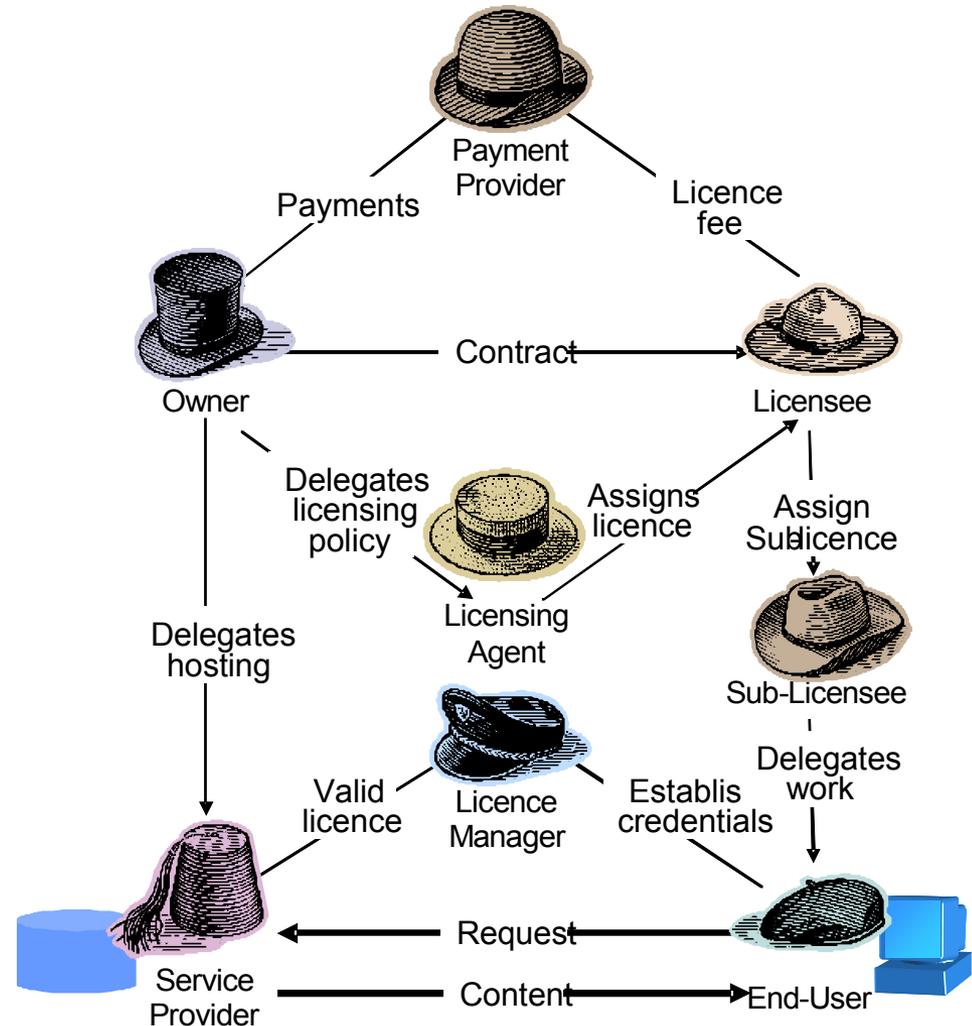# Enterprise Viewpoint

Geo-License

- Extents
  - Rights
  - Space
  - Time
- Expression
  - Legal
  - Human readable
  - Formal

- Delegation
  - Smaller extents
- Chaining
  - Owner
  - Licensing agent
  - Licensee
  - …
  - End-User

Computational Viewpoint

- Roles within the DRM System
- One entity could have several roles

Payment Provider

Payments

Licence fee

Owner

Contract

Licensee

Delegates licensing policy

Assigns licence

Assign Sub-licence

Licensing Agent

Sub-Licensee

Delegates hosting

Valid licence

Licence Manager

Establis credentials

Delegates work

Service Provider

Request

End-User

Content

Information Viewpoint

Rights

- Use
- View/Display/Print
- Combine/Merge
- Extract/Copy
- Spatial Transform
- Derive Resource
- Edit/Adapt
- Modify
- Derive Graphic
- Encode
- Execute

Meta-Rights

- License
- Sublicense

Conditions

- Properties
- Spatial
- Temporal
- Layer
- Implementation
- Meta-Rights
- Side effects

Looking ahead: Implementation

DRM Components

- Data   ⬅   *Bitmap Images/GML*

- Policy languages   ⬅   *ISO REL/ODRL/XrML/...*

- DRM Framework
  - Distribution   ⬅   *OGC Web Services/SOAP*
    - Access Control   ⬅   *XACML*
  - Enforcement
    - Encryption   ⬅   *XMLDS/XMLENC/WSS/...*
    - Identity & Authentication
      - Users / Devices   ⬅   *X509/SAML/...*
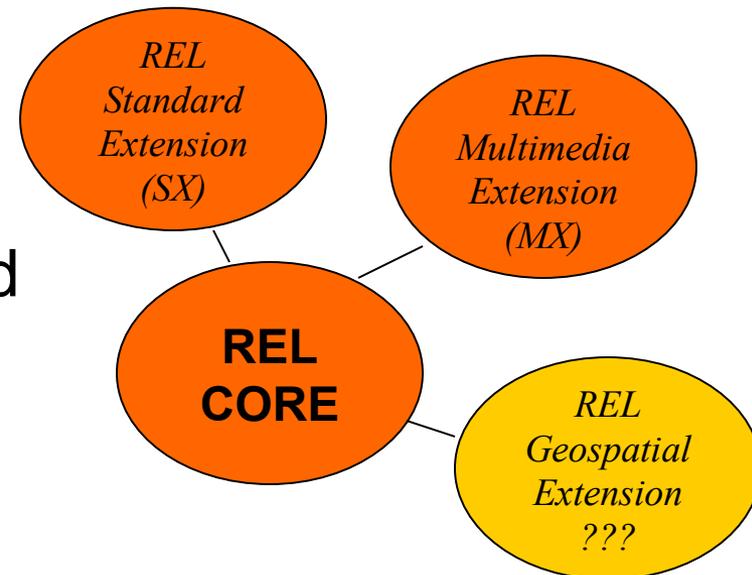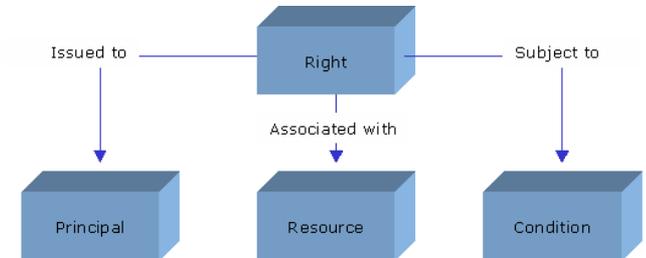   - Data   ⬅   *URL/URN/...*

Policy languages: ISO REL

- **Facts**
  - Part of the MPEG-21 initiative
  - ISO/IEC 21000-5:2004: Rights Expression Language
  - Based on XrML
- **Issues**
  - Not exactly an open standard
  - Needs to be extended
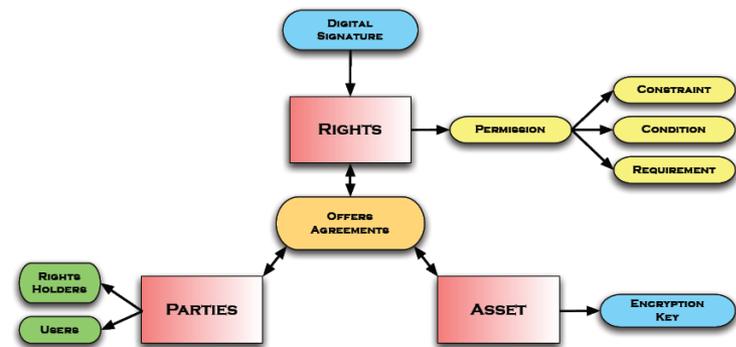 - OASIS WS-Security Profile

Policy Languages: ODRL

- **Facts**
  - Open Digital Rights Language
  - Specifications are freely available
  - Profiles
    - Open Mobile Alliance
    - Creative Commons

- **Issues**
  - DRM "Patent War"
  - Needs to be extended

DRM Framework

- **Distribution** ⬅️ • *Support for DRM Content*
  - • *SOAP/REL*
  - • *HTTP GET / POST - ?*

  - **Access Control** ⬅️ • *GeoXACML*
    - •*Extension of XACML 1.0*

- **Enforcement**
  - **Encryption** ⬅️
  - **Identity & Authentication** •*Profiles / Best Practices are required*
    - **Users / Devices** ⬅️
    - **Data** ⬅️

Thank you!

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