# An Architecture for the Interoperability Between Rights Expression Languages Based on XACML

X. Maroñas, E. Rodríguez, J. Delgado

Universitat Politècnica de Catalunya
http://dmag.ac.upc.edu

DMAG
DISTRIBUTED MULTIMEDIA APPLICATIONS GROUP

# Content

- Introduction
- Proposed Architecture
- Interoperability
- Application Scenario
- Conclusions

# Content

- **Introduction**
- Proposed Architecture
- Interoperability
- Application Scenario
- Conclusions

# Introduction

- Objective --> Interoperability
- Rights Expression Languages (RELs)
  - ODRL
  - XACML (Access Control)
- Previous attempts for RELs interoperability
  - Restrictions through profiles
  - Syntactic Interoperability
  - Restricted semantic mapping

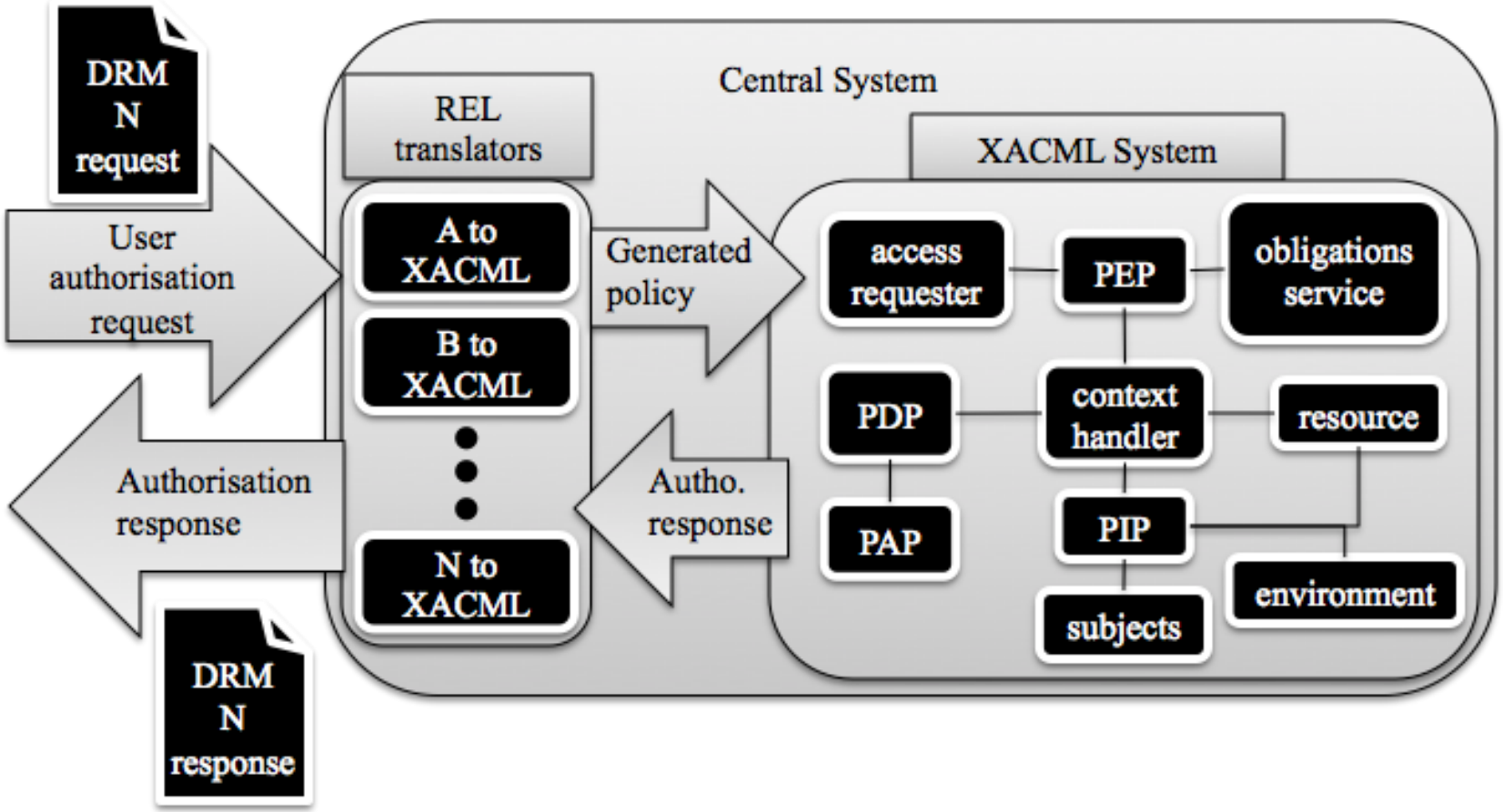
# Introduction

- Interoperability issue:
  - Digital objects are managed in a controlled way by both, DRM and AC (Access Control) systems
  - It is desirable that these types of systems are able to interoperate, to deliver a transparent service to the end-user
  - Definition of a solution that enables users of these systems transparent access and use of protected content, taking into account users' roles and content usage rules

# Content

- Introduction
- **Proposed Architecture**
- Interoperability
- Application Scenario
- Conclusions

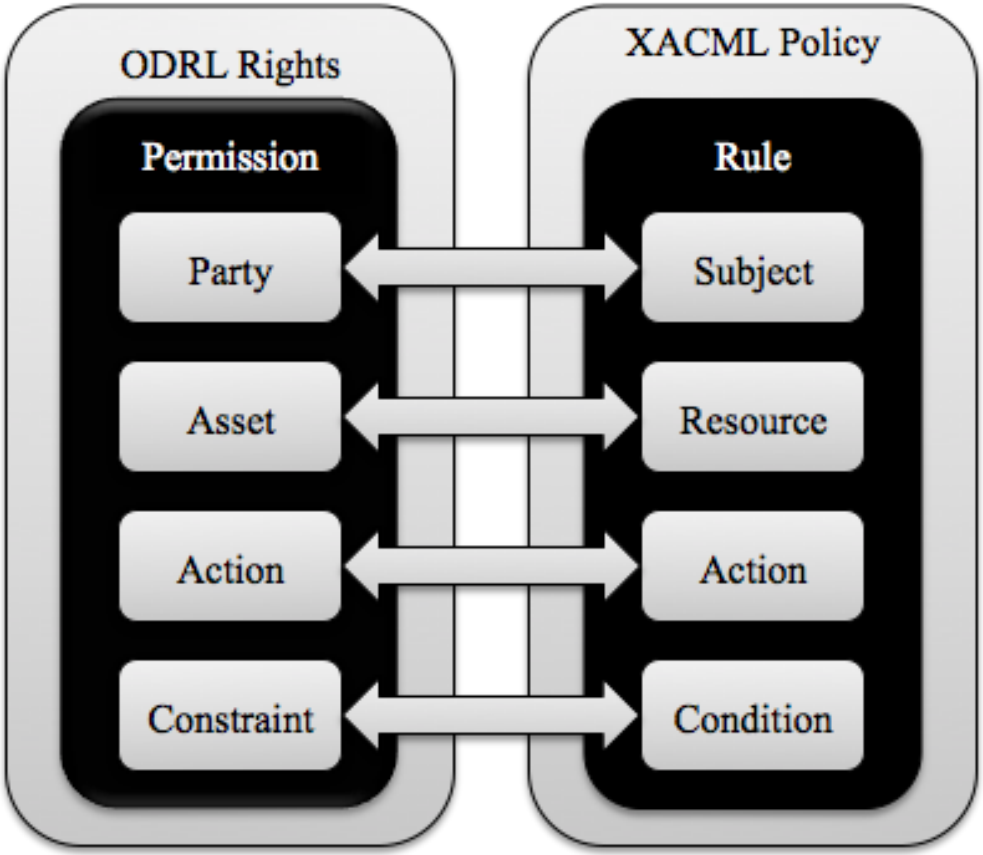
# Proposed Architecture



# Content

- Introduction
- Proposed Architecture
- **Interoperability**
- Application Scenario
- Conclusions

# Interoperability



# ODRL to XACML translation (1/4)

- Translation for common elements:
  - Party:

ODRL

```
<o-ex:party>
<o-ex:context>
<o-dd:uid>subjectId</o-dd:uid>
</o-ex:context >
</o-ex:party>
```

XACML

```
<xacml:Subjects>
<xacml:Subject>
<xacml:SubjectMatch MatchId =
"urn:oasis:names:tc:xacml:1.0:function:string-equal">
<xacml:AttributeValue DataType="[…]string">
Subjected </xacml:AttributeValue>
<xacml:SubjectAttributeDesignator AttributeId="…"
DataType="[…]string"/>
</xacml:SubjectMatch>
</xacml:Subject>
</xacml:Subjects>
```

# ODRL to XACML translation (2/4)

- Action:

| ODRL | XACML |
| --- | --- |
| <o-dd:play/> | <xacml:Policy> |
| | <xacml:Actions> |
| | <xacml:Action> |
| | <xacml:ActionMatch MatchId = |
| | "urn:oasis:names:tc:xacml:1.0:function:string-equal"> |
| | <xacml:AttributeValue DataType="[…]string">play</xacml:AttributeValue> |
| | <xacml:ActionAttributeDesignator DataType="[…]#string" AttributeId="urn:oasis:names:tc:xacml:1.0:resource:xpath"/> |
| | </xacml:ActionMatch> |
| | </xacml:Action> |
| | </xacml:Actions> |
| | </xacml:Policy> |

# ODRL to XACML translation (3/4)

- Asset:

| ODRL | XACML |
| --- | --- |
| <o-ex:asset> | <xacml:Resources> |
| <o-ex:context> | <xacml:Resource> |
| <o-dd:uid> | <xacml:ResourceMatch MatchId = |
| resourceId | "urn:oasis:names:tc:xacml:1.0:function:string-equal"> |
| </o-dd:uid> | <xacml:AttributeValue DataType="[…]integer">resourceId</xacml:AttributeValue> |
| </o-ex:context> | <xacml:ResourceAttributeDesignator DataType="[…]#string" AttributeId="urn:oasis:names:tc:xacml:1.0:resource:xpath"/> |
| </o-ex:asset> | </xacml:ResourceMatch> |
| | </xacml:Resource> |
| | </xacml:Resources> |

# ODRL to XACML translation (4/4)

- Constraint:

ODRL

```
<o-ex:constraint>
<o-dd:spatial o-ex:type =
”prism:vocabs/ISO3166/ES”>
</o-ex:constraint>
```

XACML

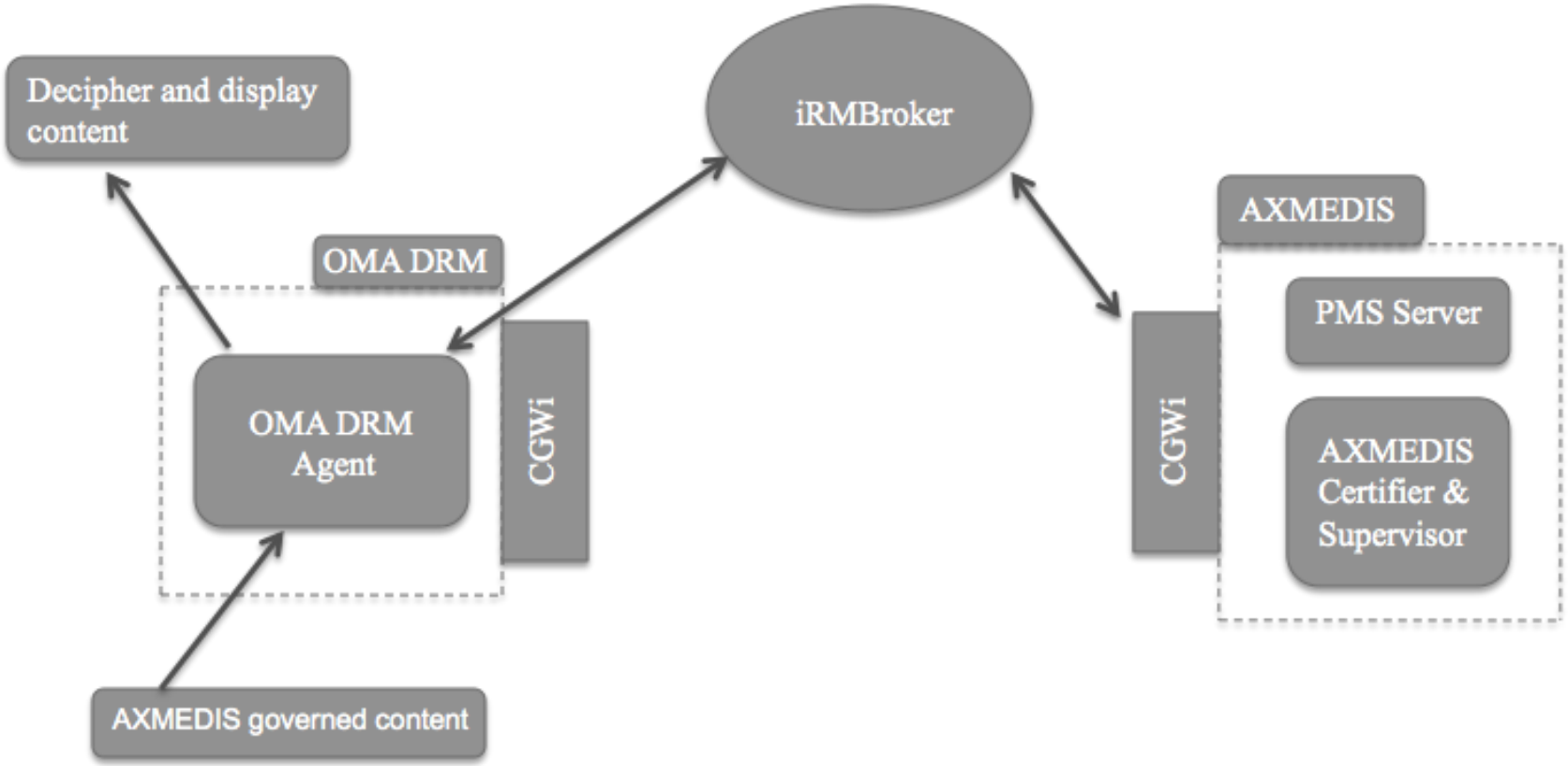
```
<xacml:Condition>
<xacml:Apply FunctionId =
"urn:oasis:names:tc:xacml:1.0:function:string-equal">
<xacml:AttributeSelector DataType="[…]#string"
RequestContextPath = "//xacml-context:Resource/xacml-
context:ResourceContent/location/country"/>
<xacml:AttributeValue DataType="[…]#string">
ES</xacml:AttributeValue>
</xacml:Apply>
</xacml:Condition>
```

# Content

- Introduction
- Proposed Architecture
- Interoperability
- **Application Scenarios**
- Conclusions

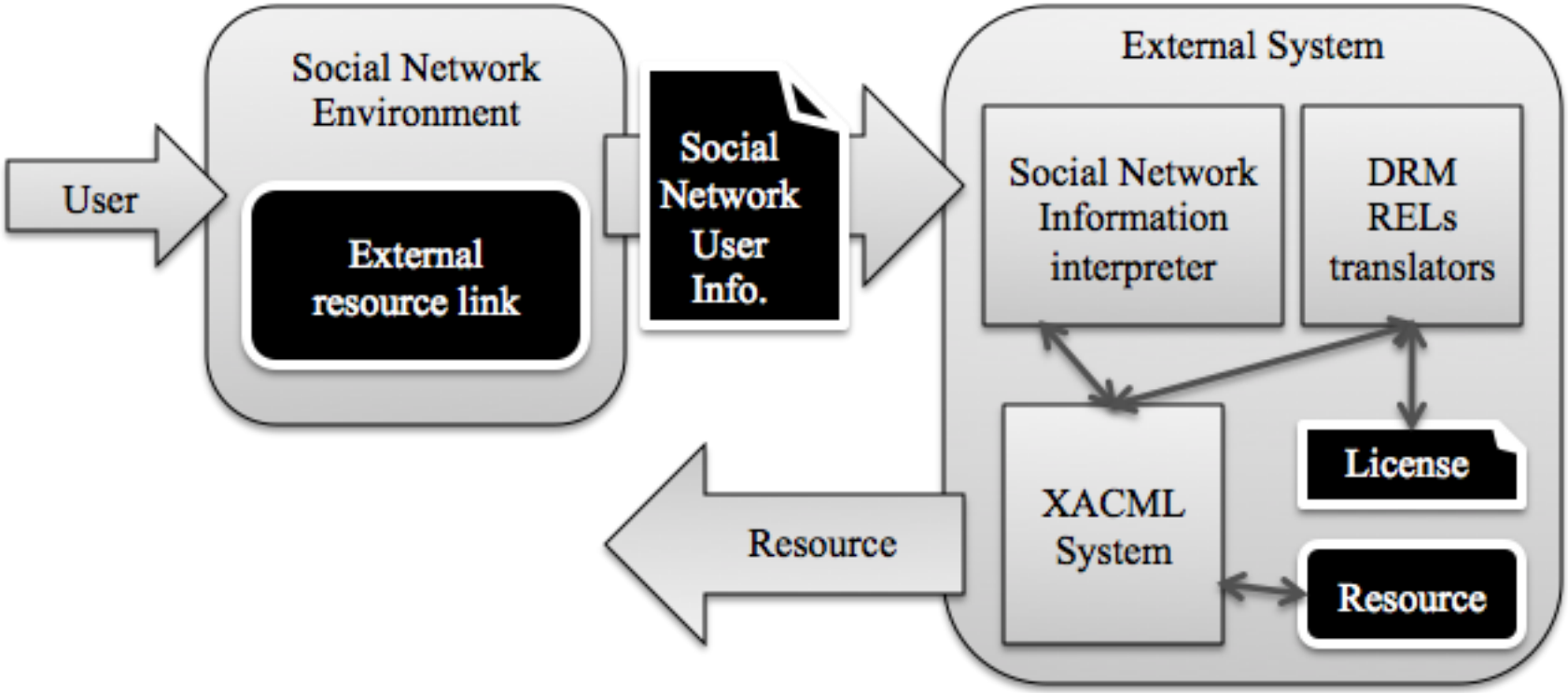
# Application Scenarios (1/2)

- VISNET-II Video Surveillance scenario



# Application Scenarios (2/2)

- Social Network scenario



# Application Scenarios (2/2)

DEMO

(clic here to see the demo)

# Content

- Introduction
- Proposed Architecture
- Interoperability
- Application Scenario
- **Conclusions**

# Conclusions

- Use of XACML to provide interoperability between RELs
- An architecture based on translators and a XACML system
- Example presented in Virtual Collaboration and Social Network scenarios
- Advantages of this solution:
  - A system that can manage digital object from different DRM or AC systems
  - Achieve interoperability between different Rights Expression Languages without loosing information

# An Architecture for the Interoperability Between Rights Expression Languages Based on XACML

X. Maroñas, E. Rodríguez, J. Delgado

Universitat Politècnica de Catalunya
http://dmag.ac.upc.edu

DMAG
DISTRIBUTED MULTIMEDIA APPLICATIONS GROUP