

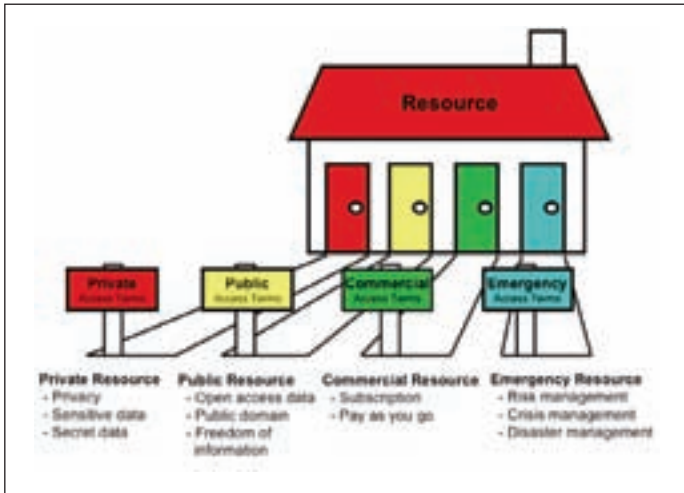


# GEOSPATIAL RIGHTS MANAGEMENT ADVANCES IN THE OGC

OGC'S CTO, CARL REED, INTRODUCES THE GEORM FRAMEWORK FOR ADDRESSING THE COMPLEX ISSUE OF GEOSPATIAL RIGHTS MANAGEMENT

With many technical barriers to information sharing addressed through standardisation of on-line services, the remaining impediments tend to be legal and policy related. To help resolve the legal and policy issues related to geospatial information sharing, a trusted infrastructure for purchasing, managing, and protecting rights to digital content is needed. To enable providers of geospatial content and services to provide offerings in ways that implement the information sharing policies of the providers and their users, the OGC's Geo Rights Management (GeoRM) Domain Working Group is developing a framework of geospatial rights management standards.

Many organizations involved in the production and trading of geodata need to manage their Intellectual Property (IP) assets through the digital distribution value chain (Figure 1). Organizations want to be able to specify, manage, control and track geodata distribution within secure and trusted environments that are also "open" in the sense that the Web is open. That is, Web resources can be protected and secured while at the same time being made discoverable and accessible via open standards such as HTTP, HTML and XML that support the Web's "loose coupling," or "one-to-many" and "many-to-one" model of interoperability. Open standards - such as the Web's standards - are vendor-independent and are typically developed by open



**FIGURE 1.** Standards are necessary to enable organizations to manage access to and protect geospatial assets using conventions similar to those with which we manage access to real world property. (Image courtesy of Ordnance Survey) of Great Britain)

membership standards development organizations.

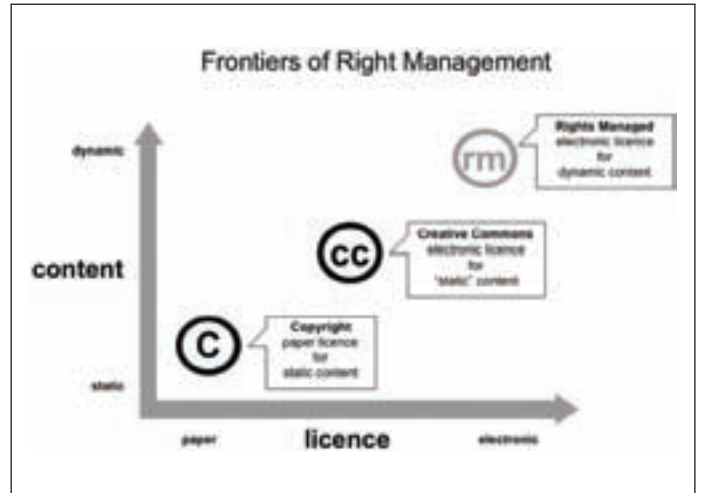
The OGC GeoRM Working Group (WG) started work in 2004. The initial goal was to provide a venue for fact-finding, planning and partnering on privacy, security and access control in commercial and government scenarios. Graham Vowles of the Ordnance Survey was, and still is, the GeoRM Domain Working Group chair, but other countries' public sector data providers and a few private sector data providers have been active from the beginning. The assumption was that standards could provide the key to resolving geospatial rights management issues: develop a policy neutral standards framework that would support the full range of data sharing arrangements and business models. A key requirement was that the standards solutions address data products generated from multiple data sources that have different rights and restrictions but are used in the same value chain.

This is not an easy task. As shown in Figure 2, the field of rights management is evolving, taking us into new frontiers. We are all familiar with the long-used © (copyright) symbol. As shown in figure 2, with today's dynamic content presented via electronic media, rights management is becoming more complicated. GeoRM standards must address a wide range of inescapable real world requirements that are not addressed by simple permissive/restrictive, open/closed approaches. The standards must make it possible to provide data under different terms for different circumstances. Figure 3 shows the unavoidable complexity of the requirement set.

Organizations must have the ability to license resources whether the resources are charged for or not. Thus the GeoRM Domain Working Group adheres to clear separation between licensing and pricing models. Their intention is to create a system that can accommodate all data sharing agreements: creative commons models, public library models, emergency access, purchases, licenses, control of derivative products, and so on.

Participation in the GeoRM Domain Working Group enables government, private sector, NGO and university members to introduce requirements and ideas as the GeoRM standards are developed and reviewed. Participation also enables members to become acquainted with the other organizations that are involved and to understand as soon as possible the details and implications of the emerging standards for purposes of planning and product development.

The OGC membership have worked collaboratively over the last twelve years to develop open and freely available interface and encoding standards. OGC standards introduce multimedia data about places, including text references and sensor and video data, into the domain of geospatial searches and geospatial processing.



**FIGURE 2.** The evolution of rights management. (Image courtesy of Ordnance Survey, developed as part of the ORCHESTRA Project.)

OGC GeoRM interface and encoding standards will work with other OGC standards relevant to any of these technologies and application scenarios.

The GeoRM Domain Working Group first developed the Geospatial Digital Rights Management Reference Model (GeoDRM RM), an abstract specification for the management of digital rights in the area of geospatial data and services. The GeoDRM RM defines specific requirements for managing IP rights by controlling geodata distribution and use. These are complex and must accommodate factors such as:















- The "business" of the organization (i.e., the motivations of commercial, public-sector, and academic organizations to make their geodata available)
- The type of data and media formats (e.g., physical, electronic, text, graphic, audio, video, vector, raster, observation, etc.)
- The content distribution channels (e.g., size of content, network bandwidth, types of end devices)
- The types and granularity of intellectual property rights to be managed and the contractual obligations for its use (e.g., unlimited distribution, license to use, license to reuse parts, limited distribution, sensitive/classified, etc).

The GeoDRM RM has been approved by the OGC membership, who are now using the GeoDRM RM to develop OpenGIS® interface and encoding standards that will enable diverse systems to participate in transactions involving data, services and intellectual property protection. The GeoRM Domain Working Group seeks to provide a trusted infrastructure for purchasing, managing and protecting rights to digital content, while exploiting mainstream DRM approaches, technologies and standards wherever possible.

### Status of the GeoRM

Often before a draft OGC standard is completed and adopted by the OGC membership, it is made available on the OGC's public website as a "Discussion Paper" intended to attract comments and suggestions from the public. Two GeoRM Discussion Papers are currently available:

- "Access Control & Terms of Use (ToU) 'Click-through' IPR Management 1.0.0, whose editor is Roland M. Wagner, demonstrates a number of functional capabilities related to rights management (Terms-of-Use, Authentication, content services) that need to be described and chained.
- "Geographic information - Rights expression language for geographic information - Part xx: GeoREL 0.9.0" whose editor is John Herring, extends the rights expression language (REL) to encompass the concerns of holders of geographic data and service resources to equally ensure their protection. This allows

	<b>Attribution</b>	You let others copy, distribute, display, and perform your copyrighted work — and derivative works based upon it — but only if they give credit the way you request		<b>Protected</b>	You let others use your copyrighted work subject to additional constraints — which may be enforced using a technical protection measure
	<b>Non-commercial</b>	You let others copy, distribute, display, and perform your work — and derivative works based upon it — but for non-commercial purposes only		<b>Identity</b>	is established electronically
	<b>No Derivative Works</b>	You let others copy, distribute, display, and perform only verbatim copies of your work, not derivative works based upon it		<b>Click-through</b>	agree to terms and conditions
	<b>Share Alike</b>	You allow others to distribute derivative works only under a license identical to the license that governs your work		<b>Temporal</b>	for a specified period of time
	<b>Non-disclosure</b>	You let others use your copyrighted work — on the condition that the work or any derived work is not disclosed to a third party		<b>Geographic</b>	for a specified geographic area
	<b>Commercial</b>	You let others use your copyrighted work for commercial purposes— and may expect financial compensation		<b>Trial access</b>	access limited for trial purposes
	<b>Emergency</b>	You let others use your copyrighted work for emergency purposes		<b>Encrypted</b>	content is digitally encrypted

**FIGURE 3.** Many issues need to be addressed in the digital “locks and keys” of a rights management services architecture. (Image courtesy of Ordnance Survey, developed as part of the ORCHESTRA Project.) ]

the geographic information market to operate with minimal constraints derived from need for the protection of intellectual property.

Note that rights management and security management are distinct topics. The OGC Technical Committee has separated these topics, and the Technical Committee’s Security WG is addressing topics such as authentication and authorization to access. In the ORCHESTRA implementation described below, the authentication and authorisation functions are clearly separated from the GeoRM function.

### GeoRM in ORCHESTRA

ORCHESTRA (Open Architecture and Spatial Data Infrastructure for Risk Management) ([www.eu-orchestra.org/](http://www.eu-orchestra.org/)) is a European Integrated Project funded by FP6’s IST Programme. Its objective is to design and

develop a service-oriented architecture based on standards that enable interoperability and help improve the efficiency in Risk and Crisis Management (RCM) activities. In RCM, there is a critical need for online services that support different content sharing policies and business models. A recent ORCHESTRA demonstration showed several scenarios in which various providers and users of data used implementations of GeoRM services - based on the GeoDRM RM - to manage the rights associated with data and online processing services.

As described in the book, “ORCHESTRA - An Open Service Architecture for Risk Management”, [1] one of the scenarios involves a landslide that has interrupted the flow of vehicle traffic in the road network in the French-Italian border. Use cases include: a hazard expert finding routes cut by the landslide; a regional authority finding alternative routes after the route was cut; a

motorway company calculating losses of revenue; a road transport company calculating the cost of route unavailability; and a citizen finding maps of alternative routes.

Each task involves the use of certain data and services made available by providers to users under certain conditions. These operations and transactions take place in a Web computing environment that supports “service chaining,” the invocation of Web services by other Web services. The chained Web services demonstrated in ORCHESTRA include rights management services as well as a wide range of geoprocessing services.

Through this introduction in ORCHESTRA, GeoRM has gained important exposure. ORCHESTRA is currently collaborating with nearly twenty on-going projects and initiatives, including projects not funded by the EC and projects outside Europe. Some of the results of ORCHESTRA are being used as input to the INSPIRE (through its Drafting Teams) and GMES initiatives.

### References:

[1] ORCHESTRA contacts: [www.eu-orchestra.org/contact.shtml](http://www.eu-orchestra.org/contact.shtml) and “ORCHESTRA - an open service architecture for risk management” (ISBN 978-3-00-024284-7), available as a PDF at [www.eu-orchestra.org/documents.shtml](http://www.eu-orchestra.org/documents.shtml).

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GeoRM received its first major prototype and public exposure in ORCHESTRA. The ORCHESTRA findings have been documented by the ORCHESTRA Consortium [1]