CONTENTGUARD™

eXtensible rights Markup Language (XrML) 2.0 Specification
Part V: Appendices

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Available formats: HTML and PDF. In case of a discrepancy, the HTML is considered definitive.

NOTE: To enable interactive browsing of the XrML schemas and examples, the XrML Specification and its companion Example Use Cases document use an HTML version that leverages the XML access functionality provided by the W3C Xpath recommendation. For this reason, you need to view these HTML documents with a browser that supports that recommendation (for example, Internet Explorer Version 6.0 or higher). If your browser does not support this functionality, please view the PDF versions of those documents.

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Quick Table of Contents

Part 1: Primer

- 1 About XrML
- 2 XrML Concepts
- 3 Extensibility of the XrML Core
- 4 Conformance

Part II: XrML Core Schema

- 5 Technical Reference

Part III: Standard Extension Schema

- 6 Standard Extensions

Part IV: Content Extension Schema

- 7 About the Content Extension
- 8 Content Extension Data Model
- 9. Content Extension Elements

Part V: Appendices

- A XrML Schemas
- B Glossary
- C Index of Types and Attributes
- D References
- E Acknowledgements

A XrML Schemas

The following files comprise the XrML schemas:

- xrml2core.xsd: The XrML Core schema
- xrml2sx.xsd: The XrML standard extension schema
- xrml2cx.xsd: The XrML content extension schema

B Glossary

Access control

A mechanism for limiting the use of a digital content, resources, or services to authorized users.

Authentication

The process of reliably ensuring the identity of participants in a digital communication session. Participants can be both people and technology components, such as software programs. Authentication is an important element of establishing trust in the digital world.

Authorization

A process for granting permissions to access or use digital content, resources, or services.

Business model

A commonly understood and practiced way that digital resources can be accessed, used, and priced during the resources' life cycles. A business model may be specified by multiple sets of rights and their associated conditions and obligations. Business models express rights for the entire life cycle, which can include distributing, loaning, selling, and using digital resources.

Certificate

See *Digital certificate*.

Certificate authority

A trusted third party who issues and manages digital certificates. Certificate authorities also may verify that digital certificates belong to their proper owners.

Confidentiality

The property that sensitive information is not disclosed to unauthorized individuals, entities, or processes.

Condition

Something that must exist or be fulfilled before a right can be exercised or granted. Examples include temporal constraints, payment, territorial location, exercise limit, and possession of some credentials and other rights.

Configuration rights

A category of rights that govern the addition and removal of system software from highly secure repositories. Examples include install and uninstall.

Constraint

See *Condition.*

Consumer

Any person or entity who uses digital resources. Also see *End user*.

Content

See Digital content.

Content management

The mechanisms, processes, protocols and systems that enable creation, manipulation, search, access, storage, delivery, use, and disposal of content across the content distribution and consumption value chain.

Content user

A person or entity that accesses and uses digital content. The content user can be any party in the life cycle, not just the end user. See *End user*.

Copyright

The legal right granted to an author, composer, playwright, publisher, or distributor to exclusive publication, production, sale, or distribution of a literary, musical, dramatic, or artistic work.

Creator

Any person or entity who originates digital content either through personal creation or by hiring another person to originate such content.

Cryptography

A branch of mathematics that deals with approaches for turning clear text into encrypted text and back. See also *Encryption, Digital signature*.

Derivative work rights

A category of rights that govern the reuse of a digital work, in whole or part, to create a new composite work. Examples include edit, extract, and embed.

Digital certificate

A set of data that unambiguously identifies an entity, contains the entity's public key, is digitally signed by a trusted party, and binds the public key to the entity. In digital content commerce, digital certificates prove the owner's identity, similar to the function that passports play in the physical world.

Digital content

The primary information or data intended to be conveyed by a digital object. It is valuable for distribution and consumption. Digital content excludes metadata that describes various attributes of the digital object. See also *Metadata*.

Digital object

A sequence of bits that incorporates unique numbering, metadata, and digital content. A digital object is the lowest level transactional unit in a digital publishing environment. Content can be described as a collection of one or more digital objects. Digital objects can be arranged in a hierarchy, where some digital objects are the "children" of "parent" objects. Child objects may inherit some of the attributes of their parent object.

Digital resource

A resource that provides the means to identify, locate, and use it in the digital domain. See also *Digital object, Digital work, and Resource.*

Digital right

See *Right.*

***Digital Rights Management* (DRM)**

The technological, legal, and/or social mechanisms, processes, and regulations used to protect the copyrights in digital content.

Digital signature

A non-forgeable transformation of data that enables proof of the source (with non-repudiation) and verification of the integrity of that data. Digital signatures are usually created using a public-key algorithm.

Digital watermark

See *Watermark.*

Digital work

A digital resource that represents the content to which rights and conditions are being applied. A digital work can be of the form of a digital object. See also *Digital object, Digital resource, and Resource.*

Distributor

Any person or entity who provides digital resources directly to consumers or another distributor.

Edit

The right to make changes to a work to create a new work based on the original.

Element

An entity that encapsulates content, properties, attributes, and functions to perform a given task or define a specific process.

Encryption

The process of scrambling unprotected information (sometimes called clear text or plain text) to produce protected information, or cipher text.

End user

Any person or entity that consumes a digital resources.

eXtensible Markup Language (XML)

A standard for markup of data and text. XML provides a simpler, yet more powerful capability than its predecessor, HyperText Markup Language (HTML).

eXtensible rights Markup Language (XrML^{tm})

A rights expression language written in XML for specifying rights, conditions, and obligations associated with all or a part of a digital resources and for implementing interoperable DRM systems. XrML is developed and currently owned by ContentGuard, Inc.

File management rights

A category of rights that govern access to directory and file information when two repositories are connected. File management rights control how directory information of one repository can be accessed from another. They also control creation and restoration of backup copies.

Grant

An element that conveys to a principal the right to use a resource subject to certain conditions.

Granted right

A right that has been transferred from its owner or distributor to someone else.

Identification

A piece of data or process that enables recognition of a digital representation of a person or entity.

Integrity

The property that sensitive data has not been modified or deleted in an unauthorized and undetected manner.

Intellectual property

Something owned or possessed that is a product of the human mind (for example, works protected under copyright law and inventions protected by patent law).

Intellectual property management and protection

MPEG term for *Digital Rights Management (DRM)*.

Intent

A user's desire to access or use a digital content.

Interoperability

The condition achieved when two or more technical systems can exchange information directly in a way that is satisfactory for the users of the systems. In DRM systems, this typically involves content file formats and DRM components, but may include other functions such as financial clearing.

Issued right

A right that is made available by its owner or distributor for granting or transferring to someone else.

Key

A string of bits, characters, or words used along with a cryptographic algorithm to scramble or unscramble a message.

Meta Right

A right about other rights. Examples include issue, obtain, delegate, revoke, and possess property.

License

A container of the grants that convey to principals the rights to use resources subject to certain conditions.

Life cycle

The entire time period of a resource's existence. It includes all phases across the distribution and consumption value chain, such as creation, manipulation, search, access, storage, delivery, use, and disposal.

Metadata

Data about data. Metadata can describe such elements as the creator (such as an author biography) and the content (such as the number of pages or chapter titles).

Obligation

A course of action that a person or entity must perform when exercising a granted right, such as usage tracking and content watermarking.

Principal

An encapsulation of the identification of an entity involved in the granting or exercise of rights.

Publisher

Any person or entity who accepts content from creators, aids in the editing process, creates and distributes metadata, and produces finished, publication-ready content.

Render rights

A category of rights that govern the creation of representations of a digital work outside of the control of trusted systems. Examples include play, print, and export.

Repository

A system that can hold digital resources, such as personal systems, on-line storefront systems, library systems, and archive systems.

Resource

The object to which a principal may be granted rights. A resource can be a digital work (such as an e-book, an audio or video file, or an image), a service (such as an email service, or B2B transaction service), or even a piece of information that can be owned by a principal (such as a name or an email address).

Right

A privilege that someone may claim or that is due to them, which makes them entitled to make copies of, distribute, or perform all or part of a published or recorded work for a certain extended period of time. In XrML , it is the "verb" that a principal can be granted to exercise against some resource under some condition. Typically, a right specifies an action (or activity) or a class of actions that a principal may perform on or using the associated resource. See also *Copyright, Granted right, Issued right, Meta right, and Usage right*.

Rights expression

A digital string, file, or document written in a rights expression language to describe rights, conditions, and obligations associated with a digital content or a component of digital content.

Rights Expression Language (REL)

Within a DRM system, the statements and grammar that can be used to describe rights, conditions, and obligations associated with a digital resource.

Rights holder

Any person or entity who owns or has been licensed the intellectual property rights for the digital content. Examples include authors, consumers, creators, rights management service providers, media distributors, performers, producers, publishers, retailers, telecom companies, and trusted third parties.

Rights specification

See *Rights expression*.

Rights specification language

See *Rights expression language*.

Service provider

Any person or entity who provides a service that enables or provides one or more activities in the digital resource life cycle.

Superdistribution

A publishing business model in which multiple parties of the content value chain distribute content with rights and compensation controlled by prior agreement and enforced by DRM systems. In a typical example, consumers of digital content can pass that content on to associates who must then pay the rights holder(s) to acquire access to the content.

Technology provider

Any person or entity who provides either software or hardware that enables the secure distribution of digital content and protects the intellectual property rights of the rights holder. Examples include hardware vendors and software vendors.

Transport rights

A category of rights that govern the creation and movement of persistent copies of a work under the control of trusted repositories. Examples include copy, transfer, and loan.

Trust Infrastructure

The technology and processes used to make system components trustworthy. Trusted system components are known with confidence to perform a range of functions in a specified way. For example, a trusted reading device may only allow an ebook to be printed if the ebook's rights specification allows printing.

Trusted system

A system whose behaviors can be expected. In DRM, trusted systems (or repositories) are systems that can hold digital resources and which can be trusted to honor the rights, conditions, and fees specified for those resources. See also *Repository*.

Trusted third party

An intermediary or additional party to a transaction who has been granted authority by one or more of the other parties to the transaction to perform certain functions such as certification, registration, encryption, security, credit card clearance, rights clearance, transaction reporting, and so on.

Usage right

A right that someone is entitled to access, duplicate, modify, distribute, consume, and dispose of all or part of a resource. Examples include play, print, edit, extract, embed, copy, loan, transfer, read, write, execute, and delete. See also *Copyright, Granted right, Offered right, and Right.*

User

An individual or a process (subject) operating on behalf of the individual, accessing a cryptographic module in order to obtain cryptographic services.

Work

The content to which rights and conditions are being applied. See also *Content*.

Watermark

A cryptographic technique for protecting digital content by placing a pattern of bits in the content in way that it is invisible to the consumer but can be read by special programs. A wide variety of information, including owner's identity and consumer's identity, can be contained in the digital watermark. A digital watermark does not encrypt the digital content, but it does make it possible for the source of the content to be determined.

Acronymns

The following acronyms and abbreviations apply within this document.

Acronym	Definition
AES	Advanced Encryption Standard. See http://csrc.nist.gov/encryption/aes/
API	Application Program Interface.
CA	Certificate Authority

CfP	Call for Proposals
DOI	Digital Object Identifier. See http://www.doi.org/
DRM	Digital Rights Management. Used interchangeably with IPMP.
FIPS	Federal Information Processing Standard
INDECS	INteroperability of Data in E-Commerce Systems. See http://www.indecs.org/
IP	Intellectual Property
IPMP	Intellectual Property Management and Protection
ISAN	International Standard Audiovisual Number.
ISBN	International Standard Numbering System.
ISRC	International Standard Recording Code.
ISO	International Standardization Organization
ISSN	International Standard Serial Number.
NIST	National Institute of Standards and Technology
ONIX	Online Information exchange. See http://www.editeur.org/
RDF	Resource Description Framework. See http://www.w3.org/RDF/
URI	Uniform Resource Identifiers. See http://www.w3.org/Addressing/
URL	Uniform Resource Locator. This may be in DNS form, or a pointer within an MPEG-4 stream name scope
XML	eXtensible Markup Language (XML) is a subset of SGML (ISO standard). Commonly viewed as the successor to HTML, it provides a base schema for different specialized languages to be developed, typically for web-specific applications.
XrML	[4] eXtensible rights Markup Language. An XML-based open language for rights policy specification, developed by ContentGuard

C Index of Types and Attributes

A	I	R
aba	initialNumberOfUses	rate (markup)
accessFolderInfo	install	rate (paymentFlat)
AccountPayable	inventory	rate (paymentMetered)
AllConditions	Issue	rate (paymentPerInterval)
allowPrePay	issuer	rate (paymentPerUse)
AllPrincipals		read
(any)	K	region
approval		renderer
	KeyHolder	Resource
B		ResourcePatternAbstract
	L	restore
backup		revocable
bestPriceUnder	License	RightPatternAbstract
by	LicenseGroup	RevocationFreshness
	loan	Revoke
C	location (callForPrice)	Right

	location (territory)	
callForPrice	locator	S
Cash		
city	M	securityLevel
commonName		SeekApproval
communicationFailurePolicy	manageFolder	ServiceReference
Condition	markup	simpleDigitalWorkMetadata
ConditionPatternAbstract	max	source
copy	metadata	start
copyright	min	state
count		StatefulCondition
country	N	stateReference
creator		StateReferenceValuePattern
	name	street
D	notMoreThan	string
	notLessThan	
DelegationControl		T
delete	O	
description		Territory
destination	object	title (digitalWork)
DigitalResource	Obtain	title (License)
digitalWork	owner	to
dnsName		TrackQuery
domain	P	TrackReport
duration		transfer
	Parameters	TrustedPrincipal
E	parts	
	paid	U
edit	paidThrough	
emailName	PatternFromLicensePart	UDDI
embed	paymentAbstract	uninstall
EncryptedContent	paymentFlat	url

encryptedGrant	paymentMetered	
encryptedGrantGroup	paymentPerInterval	V
encryptedLicense	paymentPerUse	
Everyone	paymentRecord	validFor
execute	paymentService	ValidityInterval
ExerciseLimit	per (paymentMetered)	ValidityIntervalFloating
ExistsRight	per (paymentPerInterval)	validityTimeMetered
export	period	ValidityTimePeriodic
extract	periodCount	validUntil
	phase (ValidityTimePeriodic)	value (securityLevel)
F	phase (paymentMetered)	value
	play	verify
Fee	PossessProperty	
feeForResource	postalCode	W
forAll (Grant)	prepaidUsesRemaining	
forAll (GrantGroup)	PrerequisiteRight	watermark
	Principal	WatermarkToken
G	principal (destination)	write
	principal (helper)	WSDL
Grant	principal (renderer)	
GrantGroup	principal (source)	X
GrantGroupPattern	PrincipalPatternAbstract	
GrantPattern	print	x509subjectName
	publicationDate	x509SubjectNamePattern
H	publisher	XmlExpression
		XmlPatternAbstract
helper	Q	
	quantum	

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