



# Principles of messaging

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The initial LCC Project Plan contained a description of the Rights Data Supply Chain which defined the three principle roles (Data Source, Exchange and User) played by parties dealing with rights information in the Digital Identifier Network.

The LCC Messaging workstream has been concerned with the type and content of messages which are sent and received by parties playing those roles across that network. The workstream was established to answer one question: *who needs to send what to whom, when and how* in a multi-media environment. Part of the workstream's task was therefore to elaborate these flows and to specify the elements of a standardised communication layer.

This document includes the description of the **Rights Data Supply Chain** (section 1), an analysis of the **Information flows** (section 2) which move along it and which therefore require a messaging architecture, and generic **Message requirements** (section 3 which may be used to specify message formats, message exchange protocols and choreographies).

Of course, many content domains already have means to identify entities of interest, to describe rights to such entities, and to communicate them. There is no intent to replace any of these: instead, the LCC has come together to augment these by identifying gaps to be filled and working on infrastructure for cross-domain content and rights communication. A non-exhaustive list of existing message schemas or suites is given in the document *The Multimedia Identifier Network: Identifiers and Schemas* (PDF).

## 1 The Rights Data Supply Chain

Figure 1 illustrates the roles (Source, Exchange and User) in the Rights Data Supply Chain. Note that the supply chain described here is for *data* flows, not necessarily for the rights themselves. Parties who are involved in rights data flows are not necessarily rightsholders but may be acting on behalf of rightsholders. The roles are:

### 1.1 Source

A Source (or "Data Source") is a creator or repository of rights data, and from whom data may be obtained.

In general terms, a Source may "store" data in any form: at one extreme, an author may have information in his head, and only commit it to readable form when declaring it somewhere, but they may still be an authoritative Source of whom queries may be made; and at the other extreme an aggregator such as a major publisher or collecting society may store detailed data about millions of Creations.

For automated processing, of course, data must be stored in Sources according to **schemas** (such as in databases) of one kind or other so that it can be queried and exported systematically.

### 1.2 User

A User of the Rights Data Supply Chain is a party who seeks information about rights, or to acquire rights, or who is reporting the usage of Rights directly or indirectly to Rightsholders.

### 1.3 Exchange

An Exchange (or "Rights Data Exchange") is the transactional customer-facing interface between Sources and Users which enable Users to access rights services. An Exchange may aggregate data itself (thereby becoming a Source), or may point Users to Sources, or route queries and data between multiple Users and Sources. An Exchange typically plays a "hub" role to connect many Users to many Sources (and therefore to Rightsholders).

Exchanges may be automated services or may make use of people dealing personally with queries or negotiations, or any combination of these.

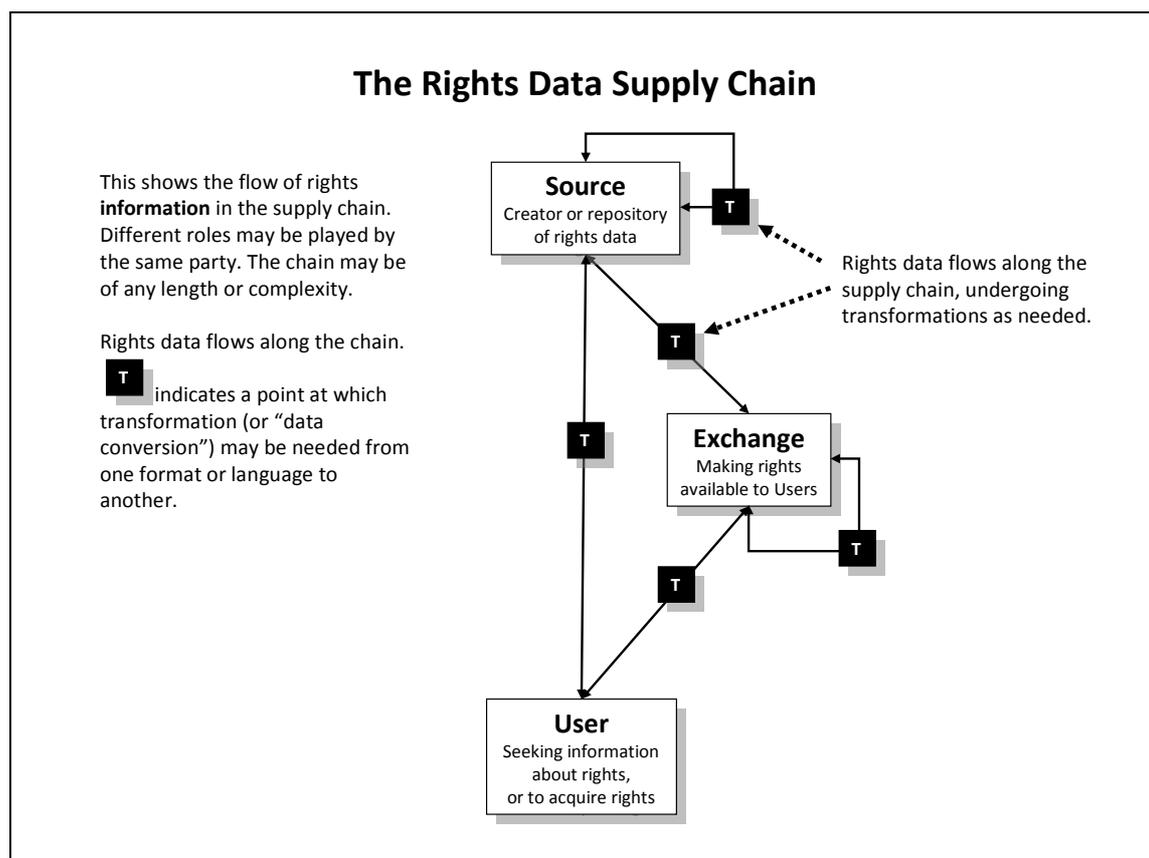


Figure 1 — The Rights Data Supply Chain, as defined by the LCC

In this model the roles of Source, Exchange and User may be played by the same party or parties and a data supply chain may be of any length or complexity (that is, data may flow from Source to Source or Exchange to Exchange as well as between parties playing different roles).

The infrastructure needed for the Rights Data Supply Chain can be seen to have several layers:

- the Parties playing different roles (Sources, Exchanges and/or Users);
- the data which flows through the chain (analysed in the LCC Rights Reference Model<sup>1</sup>, and expressed as much as possible in the form of resolvable identifiers<sup>2</sup>; and
- The communication layer that connects them – standardised identification, metadata and messaging – between Data Sources and Exchanges which provides the “glue” to hold the entire network together<sup>3</sup>.

## 1.4 Types of data

The data content of messages may cover any data referenced in the LCC Rights Reference Model (RRM), including details of Parties and Creations, RightsAssignments (including all kinds of licenses, requests, offers and policies), statements of Rights themselves to any level of complexity of constraints and conditions, Assertions and details of RightsConflicts. The RRM therefore provides a detailed abstract data model from which specific message types may be designed or transformed.

## 2 Information flows

**Error! Reference source not found.** shows the content of types of messages that are exchanged between parties within the Rights Data Supply Chain.

While LCC is focussed on the **automation** of the supply chain, this applies only where appropriate and possible. There will always be points, especially with higher-value rights transactions, where automation is inappropriate or impossible because human interchange is needed.

As mentioned above, LCC does not propose replacing existing message flows. Instead LCC focuses on (a) encouraging the filling of **gaps** in the existing network and (b) supporting **interoperability** in situations where players from different domains, which each with its own way to communicate content and rights information, need to communicate with one another — and thus, where there is a need for translating information from one schema or form of expression to another.

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<sup>1</sup> See the document *The LCC Rights Reference Model*

<sup>2</sup> See the document *LCC Principles of Identification*

<sup>3</sup> These different aspects are covered by different LCC workstreams.

Figure 2 shows how different types of message feature in the Rights Data Supply Chain. The content of these message types is generic across all media and Creation types, although the detail is of course highly variable.

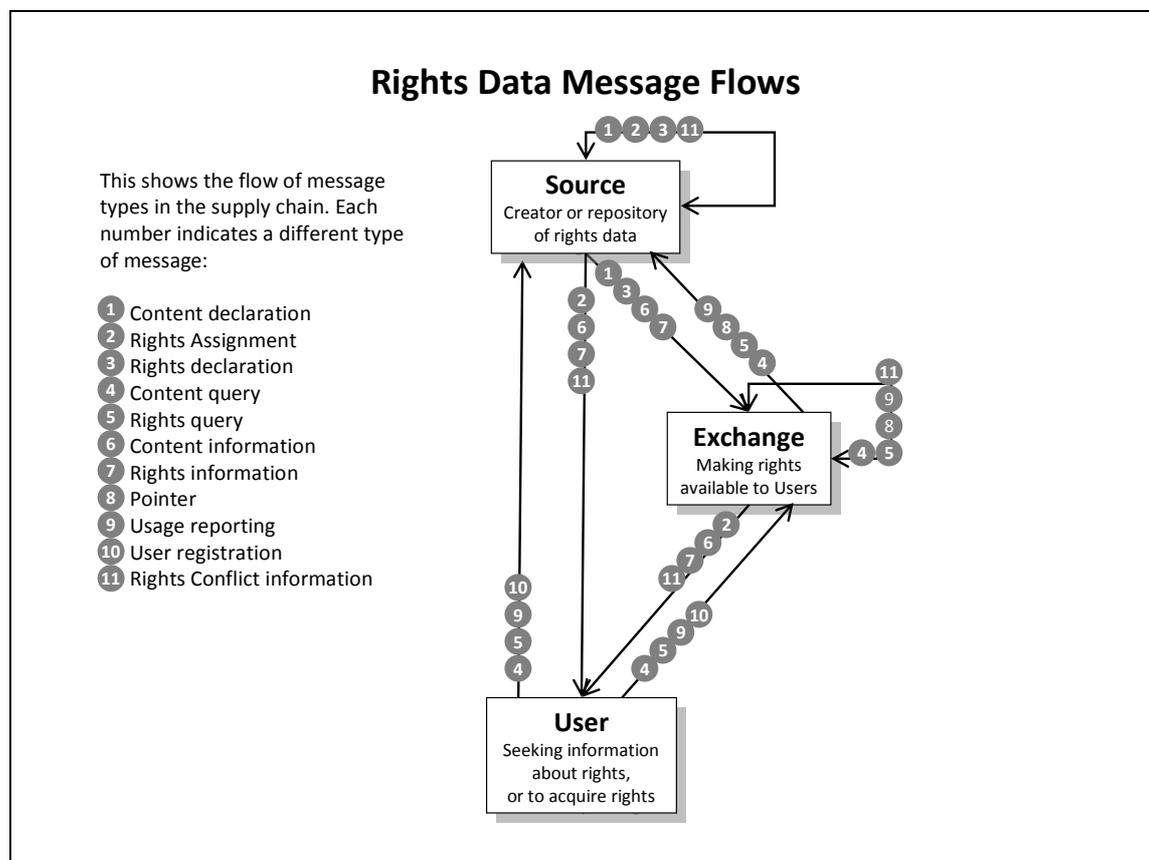


Figure 2 —Rights Data Messages in the Supply Chain

The messages depicted in **Error! Reference source not found.** may be described as follows:

**1. Content declaration<sup>4</sup>**

A Source provides information about the content to another Source or an Exchange. This may be at any point in the chain, in any form and at any level of detail. For example:

- a. A Creator (the "primary Source") registering information with a publisher, agent, aggregator, society or service
- b. A publisher or other "secondary Source" passing data to another secondary Source or Exchange.

**2. Rights Assignment**

A RightsAssignment is made through

<sup>4</sup> The term "declaration" is used here in preference to "registration" to avoid confusion with the "legal registration" of copyright which exists in some territories. LCC takes no view on the subject of such legal obligations.

- a. the making of a license or rights delegation agreement between two or more parties; or
- b. The issuing of a policy by a party which confers or restricts rights

### **3. Rights declaration**

A Source (typically either a Rightsholder or their agent) provides information about rights in an item(s) of content to another Source or Exchange.

### **4. Content query**

A User seeking content information makes a query of a Source or an Exchange. The content may be known beforehand, or may be discovered through a search engine using any search criteria (for example, searches for songs about Christmas Eve or images of Red Admiral butterflies).

The Exchange may (a) have the information available directly from its own aggregation (in which case it acts as a Source); (b) forward the query to another Exchange or Source(s) with a known interest in the content, or (c) carry out a federated search of Source(s). The query may therefore go through two or more stages.

### **5. Rights query**

A User seeking rights information about an item(s) of content makes a query of a Source or an Exchange. The Exchange may (a) have the information available directly from its own aggregation (in which case it acts as a Source); (b) forward the query to another Exchange or Source(s) with a known interest in the content, or (c) carry out a federated search of Source(s). The query may therefore go through two or more stages. Rights queries may be "bundled" with content queries (see 4).

### **6. Content information**

Information about an item(s) of content is provided to a User (typically in response to a content query) from a Source, either directly or via an Exchange.

### **7. Rights information**

Information about rights in an item(s) of content is provided to a User (typically in response to a rights query) from a Source either directly or via an Exchange. Rights information may be "bundled" with content information (see flow 6).

### **8. Pointer**

An Exchange may provide to a User information (a "pointer") on where to find requested rights or content data.

### **9. Usage reporting**

A user that has used an item of content may wish or be required to inform a Source or Exchange about how the content was exploited. Typically such usage reporting may relate to, or be accompanied by, settlement of any (potentially financial) obligations.

## 10. User registration

Any Source or Exchange may want to limit access to its data to appropriate users. User registration messages enable this process to be handled.<sup>5</sup>

## 11. Dispute/data problem alert

In any complex network of databases it is likely that data inconsistencies occur. In order to resolve these an appropriate mechanism to signal such issues to relevant parties is required. Note that such disputes may also cover infringements or rights violations as well as reports of content misuse.

It is, of course, possible to combine messages into “compound messages” such as a combination of content and rights queries or content and rights information messages.

## 3 Messaging requirements

The Linked Content Coalition has no plans to develop a complete messaging solution as many content domains already have such systems in place and there is little sense in disrupting these supply chains. However, for cross-domain communication (or for communication within domains where suitable communication standards are lacking), it is possible to document generic requirements that may be used, at a later stage, to specify message formats, message exchange protocols and choreographies.

These *generic requirements* are documented below.

### 3.1 Identification

3.1.1 All messages should be uniquely identified.

3.1.2 All parties sending or receiving messages should be uniquely identified.

3.1.3 All pieces of content referred to in messages should be uniquely identified.

Please refer to *LCC Principles of Identification* for details on identification.

### 3.2 Content

3.2.1 The content of each message should be mappable unambiguously to the Rights Reference Model.

### 3.3 Security and non-repudiation

3.3.1 Security and non-repudiation of system messages should be implemented in a consistent way such that it promotes trust among the participating parties.

3.3.2 It should be possible for messages to be secure and protected against unauthorised access.

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<sup>5</sup> There are likely to be more than one message required for the process of User registration.

- 3.3.3 It must be possible for the message to carry authentication information so that the recipient knows with whom it is dealing.
- 3.3.4 Non-repudiation<sup>6</sup> must be supported such that neither sending nor receiving of messages can be refuted.

### **3.4 User Registration**

- 3.4.1 If there are components of the LCC ecosystem that provide access to resources based on the identity or class of a user, such systems must support user registration.

### **3.5 Automated and manual information exchange**

- 3.5.1 It should be possible for all messages to be sent/received in an automated fashion.
- 3.5.2 It should be possible for all messages to be sent interactively, e.g. by using a web form that is being replied to as part of a choreography.

### **3.6 Choreographies**

- 3.6.1 It should be possible to group messages into “conversations”. For instance a user may ask an Exchange for rights information for a specific content item and is replied to by the Exchange after forwarding the reply to a specific Source. All of these messages may need to be linked together.

### **3.7 Timely responses**

- 3.7.1 Replies to request messages need to be timely.

### **3.8 Embedding information into content**

- 3.8.1 Information about content can be communicated throughout the content supply chain by embedding the data into the content and/or by sending content and metadata in separately. Both approaches have their benefits and drawbacks and it is essential to recognise these when developing a specific messaging system.

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<sup>6</sup> Non-repudiation refers to a state of affairs where the purported maker of a statement will not be able to successfully challenge the validity of the statement or contract. The term is often seen in a legal setting wherein the authenticity of a signature is being challenged. In such an instance, the authenticity is being "repudiated" (Source: Wikipedia, 2012-11-14).

## Appendix: existing message examples

Many content domains already have messaging systems in place; this section lists one domain's supply chain messages, those of the music industry, as an example. Further information exchange mechanisms are currently being developed for the music industry, including some using shared and accessible databases. Other domains have, of course, similar sets of messages.

*Table 1 — Selected Messages in use in the music supply chain<sup>7</sup>*

Name of the main message standard	Message Type	Governing Body	Comment
Release Notification Message Suite Standard (ERN)	1, 2, 3, 6	DDEX <sup>8</sup>	Widely used XML-formatted standard to allow record companies to inform distribution partners about the content that may be distributed to end-users. Also used by record companies to mandate music-licensing companies to represent them in certain areas. This standard is supported by protocol and choreography standards also defined by DDEX.
Sales Reporting Message Suite Standard (DSR)	6, 9	DDEX	Widely used in its XML format (also available as a flat-file variant) to report usages of music products to various rights holders. These standards are also supported by protocol and choreography standards. Sales/usage reports are sometimes used to inform recipients about the content that has been sold/used.
Musical Works Licensing Message Suite Standard (MWL)	5, 6, 7	DDEX	XML-formatted standard that allow users of content to request licences to use musical works from a licensor and fir the licensor to grant such licences (or not) as well as to revoke licences granted. This standard is also supported by protocol and choreography standards.
Music Licensing Companies Message Suite and Choreography Standard (MLC)	1, 2, 3, 6, 9	DDEX	XML-formatted standard that allow music licensing companies to exchange information regarding repertoire and revenue amongst each other. The standard includes protocol and choreography provisions.
Common Works Registration (CWR)	1	CISAC <sup>9</sup>	Flat-file format used for communicating musical work information from music publishers to music rights societies.
Common Royalty Distribution (CRD)	9	CISAC	Flat-file format used for communicating royalty fees generated for the usage of musical work from music rights societies to musical work licensors

<sup>7</sup> In some instances the "main" standard is supported by auxiliary standards. One such example is DDEX where, for instance, a message exchange protocol standard is used as a common way to communicate DDEX messages and is, therefore specified in a separate standard. Thus the table only lists the name of the main standard. The message type in the second column makes reference to the numbered list on page 4.

<sup>8</sup> Digital Data Exchange, see <http://ddex.net>

<sup>9</sup> Confederation Internationale des Sociétés d'Auteurs et Compositeurs (International Confederation of Societies of Authors and Composers), see <http://cisac.org>