

North American Interlibrary Loan and Document Delivery Project

# **Interlibrary Loan Protocol Implementors Group (IPIG)**

## **Guidelines for ILL Application Developers**

*Version 0.2*

*as of 28 May 1999*

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# IPIG Guidelines for ILL Application Developers

## 1 Introduction

These Guidelines have been prepared as companion documentation to the *ILL Protocol Implementors Group (IPIG) Profile for the ILL Protocol*. The Guidelines are intended to provide background information for the developers of interlibrary loan systems that conform to the IPIG Profile. The Guidelines can be used to establish procedures within interlending communities, for achieving greater levels of intersystem communications.

Although the IPIG Profile should remain static, it is anticipated that the IPIG Guidelines will evolve over time as developers gain experience implementing the ILL Protocol and the IPIG Profile.

The IPIG Guidelines are not an integral part of the IPIG Profile, but have been provided for information only.

Copies of the IPIG Profile for the ILL Protocol and the most current version of the IPIG Guidelines are available at:

<http://www.nlc-bnc.ca/iso/ill/ipigprfl.htm>

For more information on the ISO ILL Protocol and the on-going work of the ILL Protocol Implementors Group, access:

- the Interlibrary Loan Application Standards Maintenance Agency web site

<http://www.nlc-bnc.ca/iso/ill/>

- the IPIG Home Page

<http://www.arl.org/access/naildd/ipig/ipig.shtml>

## 2 References

### 2.1 International Organization for Standardization (ISO) Standards, Profiles

ISO 10160:1997, *Information and Documentation -- Open Systems Interconnection -- Interlibrary Loan Application Service Definition*. Genève: ISO/IEC, 1997.

ISO 10161-1:1997, *Information and Documentation -- Open Systems Interconnection -- Interlibrary Loan Application Protocol Specification -- Part 1: Protocol Specification*. Genève: ISO/IEC, 1997.

ISO 10161-1: 1997 /AM 1, *Information and Documentation -- Interlibrary Loan Application Protocol Specification -- Amendment 1: Support for Use of Object Identifier in "identifier" Parameter of the Extension Data Type*. Available [Online]: <http://www.nlc-bnc.ca/iso/ill/document/standard/16197am1.pdf> [1999, 20 January].

ISO 10161-2:1997, *Information and Documentation -- Open Systems Interconnection -- Interlibrary Loan Application Protocol Specification -- Part 2: Protocol Implementation Conformance Statement (PICS) proforma*, Genève: ISO/IEC, 1997.

### 3 Abbreviations & Acronyms

APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation One
BAS	Barbara A. Shuh, editor of Guidelines
BER	Basic Encoding Rules
CCG	Conforms to the CONTU Guidelines on Photocopying under Interlibrary Loan Arrangements
CCL	Conforms to Copyright Law
EDIFACT	Electronic Data Interchange For Administration, Commerce & Transport
ILL	Interlibrary Loan
ILL ASMA	Interlibrary Loan Application Standards Maintenance Agency
IPIG	ILL Protocol Implementors Group
ISO	International Organization for Standardization
MIME	Multipurpose Internet Mail Extension
NAILDD	North American Interlibrary Loan and Document Delivery Project
SMTP	Simple Mail Transfer Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol

### 4 Roles

[NOTE FROM BAS: I found that I had left this section on the roles in mid-sentence. Think that we need a definition of more "roles" for the Guidelines than just the three "communication" roles identified in the service definition, i.e., roles played by humans or institutions (e.g., borrows, lenders) and the roles played by the library applications sending indications to the ILL PM. NEEDS MORE WORK.]

There are at least three levels of interaction functioning when implementing a system conforming to the IPIG Profile:

- the humans interacting with the system (library staff, patrons, etc.),
- the business application software (such as an ILL Message Management System or a resource sharing system)
- the ILL Protocol Machine, which controls the exchange of interlibrary loan messages between systems.

## 5 General Operational Issues

### 5.1 Overrides

Well-designed ILL applications should permit the operator, in exceptional cases, to override the "state" of an ILL transaction.

-- BAS' notes from IPIG 2/99

### 5.2 Encoding Default Values:

It is optional for an APDU to carry any data parameters where a DEFAULT value has been defined.

If the data parameter is absent, the receiving system can assume that the DEFAULT value is to be applied to the parameter.

--"translated" from a Fay Turner note of Oct. 10, 1990 to IPIP Contractors.

### 5.3 Treat as Protocol Errors:

- receipt of forwarded ILL-REQUEST with the value of forward-flag set to FALSE

### 5.4 Handling Protocol Errors

It is recognized that, due to operational inputting errors, the requester and responder states may become inconsistent (for example, a responder gets a RECEIVED APDU when not in the SHIPPED state because the operator did not record the item being dispatched.)

It is the application's responsibility to notify the operator before raising a protocol error.

-- from IPIG 2/99: 2.2

### 5.5 Order of Validation Checks

Perform the APDU sequence validation first. If this determines that an APDU is out of sequence, then there is no need to check if the APDU is a repeated APDU.

--Clarification 09

## 6 Data

*The following section provides guidance on specific APDU and data parameters. Section 6.1 covers the common data parameters, such as the System-Id and the Transaction-Id, which are used in every APDU. Sections 6.2 to 6.20 cover other data parameters used by specific APDUs used by Implementations conforming to the IPIG Profile. Within each section, notes are arranged alphabetically by data parameter name*

### 6.1 Common Data Parameters

#### 6.1.1 System-Id.name-of-person-or-institution

The use of the person-name is not recommended.

Developers of applications should be aware of the problems that may be encountered if a name is used without a symbol.

### 6.1.2 Transaction-Id.transaction-qualifier

To help group ILL-REQUESTs for a single end-user request, a well-designed User application might create new transaction-ids for subsequent requests in the same group by changing the transaction-qualifier but keeping the same transaction-group-qualifier.

## 6.2 ILL-Request APDU

### 6.2.1 ILL-REQUEST.copyright-compliance

Copyright laws vary from country to country. In some, the requester is responsible for compliance (and any payment due) whereas in others, the onus is on the supplier.

Provision of copyright compliance information is required if the following two conditions are met:

- if "copy/non-returnable" is supplied as a value for ILL-REQUEST.iLL-service-type,
- if an indication of the specifics of copyright-compliance is required by the country to which the request is being sent (e.g., U.S.) or by the supplier (e.g., British Library).

#### 6.2.1.1 Notes re: Requests between Academic and Public Libraries in the USA

U.S. libraries requesting the ILL-Service-Type *copy/non-returnable* shall:

use the value *CCG* for a request that Conforms to Copyright Guidelines  
or  
use value *CCL* for a request that Conforms to Copyright Law.

NOTE: When using these values to indicate U.S. copyright compliance, precede them with the domain identifier "*US*", separated from the value by a colon, as specified in the IPIG Profile, Clause 7.5.

The value *CCG* is used if one of the following conditions is met:

- the article falls within the "Guideline of Five"
- the Journal title has been ordered
- the journal issue is at the binder
- the journal issue is not on shelf or missing

The value *CCL* is used if one of the following conditions is met:

- the material is in the public domain;
- the request is considered to be a "fair use"
- the requested item becomes the property of the patron and
  - A. the entire work cannot be purchased at a fair price
  - B. the material was published more than 5 years ago
- the requested item is to replace a lost, damaged, or deteriorating copy already owned by the library
- a royalty fee has been/will be paid.

RE: "Guideline of 5"

In each calendar year, a requesting library may:

For periodical titles:

receive five photocopy requests of articles published within five years of the request date

For excerpts from other copyrighted materials:

receive five photocopy requests from works regardless of the publication date

The CONTU Guidelines requires that the requesting library keep records for the current calendar year and the three previous calendar years. So, libraries are keeping records for 1999, and completed records for 1996-1998.

An example of the periodical article and whether it falls within the CONTU guidelines:

A library submits a request on March 15, 1999 for an article published in an issue dated March 16, 1994. The publication date is less than five years from the date of the request so the library needs to count that in as a CCG - if I receive the article.

A library submits a request on March 15, 1999 for an article published in an issue dated March 14, 1994. The publication date is older than five years from the date of the request so the library does not count that as a CCG - The request would be considered as CCL and the library would not keep any records for that request.

**6.2.1.2 Notes re: Requests from or to Commercial Document Suppliers in the USA**

**6.2.1.3 Notes re Requests Sent to the British Library.**

The British Library offers a Copyright Fee Paid service and a Library Privilege (equivalent to Fair Use) service for non-returnable items. These are signified as BL:CFP and BL:LP respectively.

There are complex rules about which users are able to use which service, for instance, the Library Privilege service is not available to any users in the USA. Requests that do not meet the correct criteria for the Library Privilege service and requests with a blank or non-BL conformant copyright-compliance value will either be forced into the Fee Paid service or rejected. Note also that in certain circumstances requests which are BL:LP might also be forced into the Fee paid service. Full details are available in the BL Customer handbooks.

**6.2.2 ILL-REQUEST.cost-info-type.account number**

The account number supplied in an ILL-REQUEST.cost-info-type shall be the one billed if there are charges for the transaction. It shall be interpreted that the existence of an account number in addition to the value of cost-info-type.will-pay-fee=TRUE, (see scenarios above in 6.1.4) means that the Requester is giving permission to deduct the charges from the specified account.

[IPIG 2/99: 2.14.2 notes that some text on account-number is to be included in the Guidelines, but doesn't say what... Might it have to do with decision not to apply special formatting rules for account-number?]

**6.2.3 ILL-REQUEST.cost-info-type.reciprocal-agreement**

The meaning of reciprocal-agreement is purposely left ambiguous as it depends on what the parties agreed to. In principle, the parties could agree to a pre-arranged payment system, in which case the reciprocal-agreement value would have semantics similar to cost-info-type.payment-provided. It is not the intent to limit the semantics of reciprocal-agreement to possibilities other than those already listed. -- note from D.A. MacKinnon, original editor of the ILL application standards.

**6.2.4 Scenarios for Handling Cost-Info-Type**

**6.2.4.1 Scenario 1**

If an ILL-REQUEST includes:  
cost-info-type.account number  
cost-info-type.will-pay-fee = TRUE  
cost-info-type.payment-provided = TRUE

Then infer that the Requester is giving permission to deduct the charges from the account identified.

**6.2.4.2 Scenario 2**

If an ILL-REQUEST includes:  
cost-info-type.account number  
cost-info-type.will-pay-fee = TRUE

cost-info-type.payment-provided = FALSE  
Then infer that the Requester is expecting to receive an invoice.

#### 6.2.4.3 Scenario 3

If an ILL-REQUEST includes:  
cost-info-type.will-pay-fee = TRUE  
cost-info-type.payment-provided = TRUE  
BUT NOT cost-info-type.account-number  
Then infer that the payment of the fee will be made before the terminal state of the transaction is reached, i.e., that a check or a voucher will be enclosed with the return of the loaned item or that payment will be sent under separate cover.

#### 6.2.5 ILL-REQUEST.delivery-service.electronic-address

Note that this parameter is deprecated, according to the IPIG Profile, Clause 7.5, and should not be used.

-- BAS' Notes from IPIG 2/99

#### 6.2.6 ILL-REQUEST.iLL-service-type

Note:

- up to 5 values for iLL-service-type can be enumerated by an operator.
- the list of values for iLL-service-type is in preference order.

The Responding library should limit the services provided to those in the list of values enumerated by the operator in ILL-Request.iLL-service-type.

--Clarification 11

#### 6.2.7 ILL-REQUEST.requester-optional-messages-type

See Clause 8 Optional APDUS for a discussion on the coding of this parameter.

#### 6.2.8 ILL-REQUEST.retry-flag

If the retry-flag is set to TRUE and the same transaction-group-qualifier as that in the original ILL-REQUEST, it could be construed as a signal for the recipient to retrieve pertinent information from the original transaction.

--Note from Dennis MacKinnon, editor of version 1 of the Protocol

#### 6.2.8.1 Identifying an ILL-REQUEST as a retry

To assist implementations conforming to the IPIG Profile in associating incoming ILL-REQUEST retries with existing identifying information (such as the ART Request Number in the BL ART gateway), the ILL-REQUEST retry should include the following data values:

- retry-flag set to TRUE
- requester-id = same as requester-id in original ILL-REQUEST
- Transaction-Id.initial-requester-id = same as initial-requester-id in original ILL-REQUEST
- Transaction-Id.transaction-group-qualifier = same as transaction-group-qualifier in original ILL-REQUEST
- Transaction-Id.transaction-qualifier = data string different from that in the original ILL-REQUEST

Note that the initial-requester-id may be absent, but if present, it must be the same as that supplied as requester-id in the original ILL-REQUEST.

### 6.2.9 ILL-REQUEST.search-type.level-of-service: Abstract Levels of Service

The Abstract Levels of Service have been defined to permit a Requester to communicate the preferences to the Responder without having to know the Responder's actual levels of service.

Use the abstract levels of service codes if:

- the one-character code values representing the service levels used by a Lender are unknown to the Borrower.
- the service levels used by a Lender are known and can be mapped exactly to the abstract levels of service;

When the service levels used by a Lender are known but cannot be mapped exactly to the abstract levels of service, it is recommended that the Requester use the actual levels as defined by the Lender.

When the Responder receives a request with one of the reserved symbols in the level of service field, it should map the requested level of service to one of the local application's actual levels of service. This mapping should be done so the level of service matches the one expected by the Requester as closely as possible. Care must be taken so that the Requester does not receive a more expensive or faster service than requested. This usually means that the level of service received will be exactly as requested or less sophisticated than requested.

Several abstract levels of service may be mapped to one actual level of service.

Costing information is not addressed by the level of service; it is covered by the data parameter **Cost-Info-Type.maximum-cost**.

#### 6.2.9.1 Definitions of Abstract Levels of Service

##### *Handling*

###### When convenient

Handle the request with low priority.

[MaryJ's comment: If cost and/or turnaround time is a concern, Requesters may just want normal, not less than normal.]

###### Normal

Handle the request in turn, in the normal workflow.

###### Priority

Handle the request out of turn, before the normal workflow.

###### Rush

Enter into the request processing work stream without significant delay. Same day service requested. (Same day service is defined as having the item shipped on the day the request arrives if the request is received before a certain, responder specific, time of day. Otherwise it is shipped on the following day.)

###### Express

Enter into the request processing work stream without significant delay. Return material with as little delay as possible.

[MaryJ's comment: This definition is ordered as if faster than "Rush", but this definition doesn't convey the idea of being "faster".]

*Search*

Local

Search local collections for the request.

Extended

Search local collections and those of collaborating partners for the request.

Full

Extend the search as far as needed to locate the request.

The symbols for abstract levels of service are to be interpreted as follows:

Symbol	Handling	Search
<	When convenient	Local
(	Normal	Local
{	Normal	Extended
[	Normal	Full
	Priority	Local
]	Priority	Extended
}	Rush	Local
)	Rush	Extended
>	Express	Local

6.2.10 ILL-REQUEST.third-party-info-type: Permissions

The use of the value *true* for the *permission-to-chain*, and *permission-to partition* components of the **Third-Party-Info-Type** parameter implies certain capabilities in the Requester system.

For example, *permission-to-chain* implies the ability to initiate a chained sub-transaction with another Responder.

--BAS' notes from IPIG 2/99

6.3

6.4 SHIPPED APDU

6.4.1 SHIPPED.client-id

Developers of well-designed Responder applications may wish to consider including the **client-id** data value on any printed reports to be used as insertions into the physical item being shipped by the Responder.

6.4.2 SHIPPED.Responder-Optional-Messages-Type

See Clause 8 **Optional APDUs** for a discussion on the coding of this parameter.

### 6.4.3 SHIPPED.shipped-service-type

Shipped-Service-Type parameter is carried in both the SHIPPED APDU and the RECEIVED APDU. The value of shipped-service-type should be consistent in the SHIPPED and RECEIVED services of a specific transaction. But if it is not, then the application should alert the operator so that some appropriate action can be taken to correct the situation.

-- IPIG 2/99: 2.14.1

## 6.5 ILL-ANSWER APDU

### 6.5.1 ILL-ANSWER.Conditional (Multiple Conditions)

The Protocol allows for several options to communicate that the provision of an item is subject to agreement of multiple conditions.

#### 6.5.1.1 Scenario 1

The Responder initiates a sequence of ILL-ANSWER APDUs, with the value of the results-explanation set to conditional-results, specifying a single condition in each message. Only one ILL-ANSWER APDU is sent at a time, the Responder must wait for the CONDITIONAL-REPLY from the Requester before sending the next one (if the response was affirmative).

The Requester then responds to each condition with a CONDITIONAL-REPLY APDU using the answer parameter to accept or reject the condition identified in the related conditional ILL-ANSWER.

The involvement of human intervention may be reduced or even avoided for the majority of straightforward conditions if Responder and Requester applications are programmed to handle the specified set of conditional answers to be sent by the Responder and the affirmative or negative replies by the Requester. To communicate more than one condition, a sequence of pairs of ILL-ANSWER (conditionals) / CONDITIONAL-REPLY APDUs can be automatically exchanged with the interlending partner.

#### 6.5.1.2 Scenario 2

In operations where there will always be human intervention to interpret multiple conditions, the Responder could send an ILL-ANSWER (Conditional-Results) for the first condition and include an eye-readable note explaining all of the conditions in the parameter, ILL-ANSWER.responder-note. The response given by the Requester in CONDITIONAL-REPLY.answer (i.e., Yes or No) will apply to all conditions. Therefore, the operator must ensure that alternative sets (i.e., choices) of conditions are not proposed.

The Responder initiates an ILL-ANSWER APDU, using the responder-note parameter to specify multiple conditions.

The Requester responds by initiating a CONDITIONAL-REPLY.answer (Y/N) to accept or reject all the conditions.

NOTE: This scenario should not be used with Requester applications programmed to respond automatically. Without any established conventions for parsing the responder-note, the extra conditions carried in a note will be ignored by the automated system, effectually invalidating the response.

[COMMENT FROM BARB: WE NEED MORE DISCUSSION ON THIS. THAT IS, DO WE WANT TO ASSIGN THE VALUE FOR "OTHER" THAT MIKEW HAS SUGGESTED 2 PARAGRAPHS DOWN?

COMMENT FROM MIKEW: THE ABOVE SCENARIO 2 IS NOT A 'SAFE' WAY OF DOING IT - FOR THE REASONS GIVEN IN THE NOTE. THERE IS NO WAY THAT THE RESPONDER CAN BE SURE THAT THE REQUESTER IS NOT PROVIDING AN AUTOMATIC RESPONSE.

THEY MIGHT HAVE CHANGED THEIR BEHAVIOUR OVERNIGHT. SO USE OF THIS SCENARIO AS DESCRIBED IS NOT AN APPROACH THAT SHOULD BE ENDORSED BY THE IPIG PROFILE.

HOWEVER MAKING THE (FIRST) CONDITION IN THE ILL-ANSWER APDU 'OTHER' COULD BE DEFINED BY THE PROFILE AS MEANING 'HUMAN INTERVENTION REQUIRED TO CONSIDER THE CONDITIONS LISTED IN THE NOTE FIELD'. THE APPLICATION SHOULD RECOGNISE THIS AND NOT MAKE AN AUTOMATIC RESPONSE ('OTHER' WON'T BE IN ITS LIST) BUT PRESENT THE NOTE TO THE USER FOR DECISION. THIS WOULD THEN BE A SAFE WAY OF DOING IT. INDEED IT WOULD THEN BE POSSIBLE TO HAVE AN AUTOMATED METHOD NORMALLY BUT USING THIS APPROACH WHEN THERE WERE EXCEPTIONAL CIRCUMSTANCES.

SO I RECOMMEND REWORDING THIS SCENARIO TO REQUIRE 'OTHER' AS THE FIRST CONDITION, ETC, AND DEFINING THE EXPECTED BEHAVIOUR.]

#### 6.5.1.3 Scenario 3

The Responder initiates a MESSAGE APDU to describe multiple conditions in a note parameter.

The Requester can then respond to the multiple conditions by initiating another MESSAGE APDU in response.

This scenario might be useful if there are conditions that cannot be easily negotiated by either of the first two options, or could be used as an interim step to negotiate terms before the Responder sends the conditional ILL-ANSWER APDU described in Scenario 1 or 2.

#### 6.5.1.4 Scenario 4

In practical terms, the Responder may find it most expeditious to communicate offline (e.g., by phone, fax, or e-mail) with the Requester to resolve multiple conditions before initiating a conditional ILL-ANSWER APDU as described in Scenario 1 or 2.

#### 6.5.2 ILL-ANSWER.Transaction-Results.retry: Using *retry* When Insufficient Details Provided

If a potential Responder receives an ILL-REQUEST with an Item-id with insufficient details to identify correctly the requested Item, the User acting as a potential Responder should initiate an ILL-ANSWER APDU with the value of "*retry*" assigned to the **Transaction-Results** parameter and the value "*not-found-as-cited*" assigned to the **Results-explanation.Retry-results** parameter.

This transaction is terminated.

[MaryJ. asks "Why is this "retry" rather than "conditional" or a simple "no" - Retry assumes the requester will come back, which is often not the case with nfc (i.e., "not-found-as-cited" responses.)"]

If the Requester wishes to retry after finding additional information, the subsequent ILL-REQUEST shall be submitted as a new transaction within the same transaction group, that is, with the same transaction-group-qualifier.

#### 6.5.3 ILL-ANSWER.Responder-Optional-Messages-Type

See Clause 8 **Optional APDUs** for a discussion on the coding of this parameter.

#### 6.5.4 ILL-ANSWER.Estimate-Results.cost-estimate

Because of the diverse nature of the information provided in this parameter (as illustrated in the list of examples below), the cost-estimate is simply a free text human-readable field.

- \$5.00 plus \$0.10/page
- \$7.50 for 1-20 pages, plus \$0.20/page thereafter
- 1 loan coupon
- \$10 loan fee plus postage/FedEx/UPS shipping charges
- \$15 plus \$10 rush processing fee
- \$10 search fee plus \$15 loan fee
- \$10, prepayment required
- 3 IFLA vouchers
- \$10 IFM
- pls reimburse postage

#### 6.5.5 ILL-ANSWER.Will-Supply-Results.supply-date

Note that **supply-date** is the only occurrence of ISO-date in the ASN.1 coding for the ILL protocol which is not IMPLICIT. Although there is a lack of symmetry with other occurrences of ISO-Date (which all are IMPLICIT ISO-Date), this single occurrence of a non-implicit ISO-Date is not a defect.

-- Clarification 05

### 6.6 CONDITIONAL-REPLY APDU

### 6.7 CANCEL APDU

### 6.8 CANCEL-REPLY APDU

Although the operational decision on whether to wait for a positive Cancel-Reply from one partner before initiating a request with another partner is outside the bounds of the protocol, well-designed Requester applications should encourage the operator to wait until the affirmative CANCEL-REPLY from a lending partner has been received before initiating a second ILL-REQUEST to be sent to another potential lender.

From Clarification 04

### 6.9 RECEIVED APDU

#### 6.9.1 RECEIVED.shipped-service-type

The **shipped-service-type** parameter is carried in both the SHIPPED APDU and the RECEIVED APDU, and the value assigned to the parameter in both these services of a specific transaction should be consistent.

It is suggested that the Requester application, prior to transmitting the RECEIVED APDU to the Responder, verify that value assigned to the shipped-service type in the RECEIVED APDU by the operator is consistent with the value of shipped-service-type assigned in the SHIPPED APDU. This would avoid the transmission of possible operator errors. A well-designed responder application would inform the operator that the shipped-service-type varies, but no message of the error would be sent to the other party in the transaction.

-- IPIG 2/99: 2.14.1 + BAS' notes

## 6.10 RECALL APDU

## 6.11 RETURNED APDU

## 6.12 CHECKED-IN APDU

## 6.13 OVERDUE APDU

## 6.14 RENEW APDU

## 6.15 RENEW-ANSWER APDU

## 6.16 LOST APDU

If the item cannot be delivered, then the parties can agree that the ILL transaction be terminated probably by one of the parties sending a LOST APDU.

## 6.17 DAMAGED APDU

## 6.18 MESSAGE APDU

To inform the lender of any problems in the delivery of a requested item, the borrowing operator could send a MESSAGE APDU, and include an explanation of the problem in a Note, or communicate in some other way.

The mechanism handling the delivery of a requested item is outside the scope of the ILL protocol. So there is nothing currently specified in the protocol that can specifically handle the situations described. And there is no protocol way to rescind the SHIPPED message. To inform the lender of any problems, the borrower could send a MESSAGE APDU, and include an explanation of the problem in a Note, or communicate in some other way. Once the delivery problem has been resolved and the item successfully received, the ILL transaction can proceed. If the item cannot be delivered, then the parties can agree that the ILL transaction be terminated probably by one of the parties sending a LOST APDU.

Even though the item received is not the correct bibliographic item, the borrower should issue a request to the Requester application to change the ILL protocol state to RECEIVED. This protocol state indicates that "An item associated with this transaction-id has been received."

According to the Interlibrary Loan Application Service Definition (ISO 10160:1997) Section 6.4 and Interlibrary Loan Application Protocol Specification (ISO 10161-1:1997) Section 7.2.1, the local system enters the RECEIVED ILL-transaction state when an item is received from the responder.

The mechanism to resolve the delivery (and receipt) of a wrong item is outside the scope of the ILL protocol. The requester needs to communicate with the responder by some means. While the Requester ILL-transaction is in the RECEIVED state, the borrower can initiate a Status-or-Error-Report message, using the "note" parameter to inform the lender that the wrong item had been received. The two parties would then have to continue communications to reach agreement on the resolution of the problem.

If the item received was damaged or incomplete, the borrower can initiate a DAMAGED APDU to notify the lender that the item has been damaged.

### 6.18.1 MESSAGE.note

Use the MESSAGE APDU to communicate any miscellaneous information requiring human intervention, rather than the "note" parameter in the STATUS-QUERY APDU.

## 6.19 STATUS-QUERY APDU

### 6.19.1 STATUS-QUERY.note

In an automated environment, the STATUS-QUERY may be processed automatically, without human intervention. Rather than using the "note" parameter in the STATUS-QUERY APDU. Use instead, the MESSAGE APDU to communicate any miscellaneous information that may require human reaction.

## 6.20 STATUS-OR-ERROR-REPORT APDU

If the flawed APDU is in a condition such that it is possible to determine to whom to send the response, the communications partner receiving a flawed APDU is encouraged to return a Status-Or-Error-Report as a courtesy.

--Clarification 06

### 6.20.1 STATUS-OR-ERROR-REPORT.history-report.most-recent-service-note

NOTE: The State Machine requires, as a history variable, a most-recent-service- note. With the exception of Status-Query/Status-Or-Error-Report pairs, it is always the note from the most recent service. This note is returned as part of the Status-Or-Error-Report.

Although this note may give the querying party no new information, this is done because the most-recent-service-note may contain pertinent information. This is especially useful in those pathological cases where an APDU initiated by either party in the transaction has been lost.

--Clarification 14

## 6.21 EXPIRED APDU

## 7 External Objects

## 8 Optional APDUs

### 8.1.1 Coding Requester-Optional-Messages-Type and Responder-Optional-Messages-Type

In both the **Requester-Optional-Messages-Type** and the **Responder-Optional-Messages-Type**, the parameter includes indication of optional messages that the application is capable of supplying the specified APDU, according to the role being played (Requester or Responder). Also included in these parameters is the indication whether the application requires or desires the receipt of optional messages that may be supplied by the ILL partner.

Specify the value "*requires*" if your application is unable to continue with the transaction if the specified APDU is not received.

Specify the value "*desires*" if your application is able to act on the APDU, but the transaction can continue without receipt of the specified APDU.

Specify the value "*neither*" if there is no impact on the application whether or not the specified APDU is received.

Note that it is never improper Protocol behaviour to send any APDU.

### Background

ISO 10161 defines several APDUs as being optional to transmit. That is, when the service is invoked, the corresponding APDU does not necessarily need to be sent; only the state change is recorded in the

protocol machine receiving the "request" service primitive . The other party to the transaction does not receive a corresponding service indication because the APDU is not sent. The state table mechanisms for robustness in the face of lost messages allows the transaction to be synchronized at a later stage. Because sending these messages is optional, it is in principle permissible not to implement support for the APDUs in a protocol implementation.

The standard does, however, require the services themselves to be supported as appropriate. All implementations must support the Shipped service, to the extent of enabling the SHIPPED.request or SHIPPED.indication (depending on their role) service primitive to be invoked. Similarly, all implementations must support the RECEIVED service. All implementations that support requests for returnable items must also support the RETURNED and CHECKED-IN services.

Members of the IPIG have agreed that, notwithstanding the optionality of these messages, they must be supported by all IPIG conformant implementations. This means that, if the service is invoked by the application that uses the ILL protocol machine, the corresponding message will be sent if the ILL partner has indicated that it is *required* or *desired*. An implementation may choose always to send the message.

The protocol includes parameters in several APDUs to allow implementations to inform partners of their level of support for the optional messages. These are the **requester-optional-messages** parameter in ILL-REQUEST and the **responder-optional-messages** parameter in ILL-ANSWER and SHIPPED. It might seem that, with mandatory support for the optional messages, these parameters would become moot in the IPIG profile, but this is not, in fact, true. These parameters are part of the service request primitive invoked by the user application; they are not supplied by the protocol machine. They therefore reflect (possibly dynamic) conditions in the user application rather than static information the protocol machine has as to what services and messages have been implemented. Thus, a user application might be aware that, because of operational policy, the CHECKED-IN service will never be invoked. It could therefore set the value of **can-send-checked-in** to *false* in all SHIPPED.request service primitives, even though the protocol machine is capable of sending the message when the service is invoked.

As another example, a user application might on occasion ask that items be delivered directly to patrons and on other occasions might ask that items be delivered to the ILL office for subsequent routing. In the first circumstance, it is unlikely that the patron will have the ability or desire to inform the ILL office that the item has been received, and the RECEIVED service will not be invoked for the request. In the latter circumstance, the ILL office will be able to invoke the RECEIVED service for the request. In this example, the user application may well find it useful to dynamically set the value of **can-send-received** to *false* for the first kind of request and to *true* for the second, even though the protocol machine is capable of sending the APDU and will send it if the service is invoked.

Application developers should also be aware that, even when a message indicates that the communicating party can send an optional APDU, the service that leads to the sending of the message might not be invoked by the other user application. Operator error or local policy or other circumstances might lead to the situation in which, even though the user application fully permits the service to be invoked, the service is not, for either a single transaction, or for some or all transactions emanating from that party. This suggests that application developers cannot rely on the value of **can-send-~**, and should not assume that a value of *requires* for an optional message will ensure that the optional message will be sent.

It would therefore be prudent for application developers to ensure that their systems are not dependent of receiving certain APDUs even when they are *required*; such defensive implementation suggests that developers should assume that *desired* may well be the most that can be achieved in operational ILL environments.

## 9 Supporting Services

### 9.1 Note to Installers re: Use of Internet Mail:

Be sure that the appropriate mechanism is established for each local installation to communicate with their ILL system.

When using Internet Mail, one cannot dictate the encoding used by the mail transport mechanisms, as they will choose what is optimal or appropriate for their circumstances. The encoding may even be changed back and forth along the mail route. So the email transport mechanism is expected to handle being sent binary and to send binary back. If this mechanism is not already there, it should be built in to the infrastructure for the application under development.

-- from IPIG 2/99: 2.6.1 and BAS' notes

[Need examples of From and Sender here in Guidelines]

### 9.2 Handling escape sequences

Escape sequences should not be used with data parameters where the characters used have been assigned explicit values. This applies to the following parameters:

- level-of-service
- ISO-Date
- ISO-Time
- ISBN
- ISSN

--from BAS' notes for IPIG 2/99

## 10 Interaction with Legacy Systems

### 10.1 Interaction with OCLC

### 10.2 Interaction with British Library's ARP/Sending Requests to BL

#### 10.2.1 Requesting Translations from BL: Use of {1 0 10161 7 2} Item-Language Translation

It should be noted that the British Library will only accept certain combinations within Item-Language-Translation. For example a specification of an 'original in any language' would probably be rejected by the BL - as would several other combinations - as these are not supported within the operational service. This would result in an ILL-Answer:Unfilled with reason-unfilled-'not found as cited'. But this is not helpful to the requester in this situation. So perhaps it would be helpful for there to be an explanation added to the responder-note?

[MIKE WHEATLEY SUGGESTED THAT SOME TEXT, SIMILAR TO THE ABOVE, BE ADDED TO THE CLARIFICATION TO COVER USE OF THE EXTERNAL OBJECT ITEM-LANGUAGE-TRANSLATION WHILE SENDING REQUESTS TO BL. I COUNTERED WITH A SUGGESTION THAT, IF IT IS PUT ANYWHERE, IT SHOULD BE THE GUIDELINES, IN A SECTION ON SENDING ILL REQUESTS TO THE BRITISH LIBRARY. TO ME, THIS IS INFORMATION TO BE USED BY THE END-USERS OF THE SYSTEM, WHO SHOULD NOT BE EXPECTED TO READ THE CLARIFICATION DOCUMENTS ON THE ILL ASMA SITE. BUT WILL THEY BE READING THE GUIDELINES FOR IMPLEMENTORS?]

TO ME, THIS TYPE OF DETAIL IS GETTING INTO THE LEVEL OF A "POLICY DIRECTORY", AND I QUESTION THAT WE SHOULD START ADDING THIS LEVEL OF LOCAL DETAIL IN THIS DOCUMENT. THE LEVEL OF DETAIL

FOR U.S. COPYRIGHT-COMPLIANCE CURRENTLY CARRIED IN 6.2.1.1 IS ALSO CONCERNS ME. SO I'D LIKE SOME INPUT FROM IMPLEMENTORS ON THE SCOPE OF THESE GUIDELINES. --BARB]

### 10.3 Interaction with RLG's RLIN ILL

## 10.4 Interaction with Version 1 Protocol Implementations

### 10.4.1 Interaction

Although interaction with version 1 of the ILL Protocol Specification (ISO 10161:1993) is outside the scope of the IPIG Profile, there are a substantial number of version 1 implementations of the ILL Protocol in Canada which can, through the use of a conversion gateway or "Transponder", interoperate with the newer implementations conforming to the IPIG Profile. The Canada Institute for Scientific and Technical Information (CISTI) maintains the Transponder, based on software written by The Library Corporation (TLC). To function successfully, the TLC software must work in conjunction with additional programming written by CISTI. This enrichment programming adds APDU-Delivery-Info to version 1 APDUs, and EDIFACT control segments to version 2 APDUs.

### 10.4.2 Use of Transponder

As a gateway, the Transponder passes messages between version 1 ILL applications transmitting Internet e-mail messages encoded in EDIFACT and version 2 ILL applications transmitting ILL messages encoded in BER using direct transfer over TCP. The Transponder does not keep any record of the APDUs passing through it. Within the Transponder, enrichment programming assigns address information from a table built by CISTI.

The Transponder:

- allows intercommunication between EDIFACT and BER implementations of the ILL Protocol.
- accepts and emits BER/EDIFACT/Base64 wrapped BER
- uses the **APDU-Delivery-Info {1 0 10161 13 3}**

**APDU-Delivery-Info {1 0 10161 13 3}** is an extension which must be used with all ILL APDUs. It contains three **APDU-Delivery-Parameters**, which are identical lists of identification/delivery elements: *sender-info*, *recipient-info* and *transponder-info*.

In order to communicate successfully in the presence of a Transponder, applications should behave as follows:

- (1) If *transponder-info* is not present in APDU-Delivery-Info, the *sender-info* element determines the return APDU delivery-address. The *recipient-info* \*should\* be the Application's own address.
- (2) If *transponder-info* is present in APDU-Delivery-Info.

**When a version 2 site sends a message via the transponder to a version 1 site:**  
*transponder-info* determines the destination of the APDU.

**When a version 1 site sends a message via the transponder to a version 2 site:**  
*transponder-info* determines the source [and thus the return delivery info] of the APDU.

**System address for Transponder:** 132.246.80.20 and Port #: 1611

To register to use the Transponder, and to obtain additional information, contact Wanda Nowosielski at CISTI.

phone: (613)993-3940

email: wanda.nowosielski@nrc.ca

## **11 Support for Out-of-Scope Parameters**

Implementations supporting services or parameters that are out-of-scope of the IPIG Profile (such as Forward or Forward-Notification services) should make available document explaining their use of these services or parameters, possibly by completing relevant parts of the PICS proforma. Any documentation should include details of the parameters used in the APDU.

-- IPIG 2/99 2.1

## **Annex A. Register of Copyright Domains**

British Library	BL
United States of America	US