SLOVENSKI STANDARD
SIST ISO 10160:2005

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Informatika in dokumentacija ï Skupina za povezovanje odprtih sistemov ï Definicija aplikacijskih storitev medknjiġniļ ne izposoje

Information and documentation -- Open Systems Interconnection -- Interlibrary Loan Application Service Definition

Information et documentation -- Interconnexion de systèmes ouverts (OSI) -- Définition du service d'application pour les prêts entre bibliothèques

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INTERNATIONAL STANDARD

ISO 10160

Second edition
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Information and documentation — Open Systems Interconnection — Interlibrary Loan Application Service Definition

Information et documentation — Interconnexion de systèmes ouverts (OSI) — Définition du service d'application pour les prêts entre bibliothèques

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Contents

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75% of the member bodies casting a vote.

International Standard ISO 10160 was prepared by Technical Committee ISO/TC 46, *Information and documentation*, Subcommittee SC 4, *Computer applications in information and documentation.*

This second edition cancels and replaces the first edition (ISO 10160:1993), which has been technically revised.

Annexes A, B and C of this International Standard are for information only.

INTRODUCTION

The purpose of the Interlibrary Loan (ILL) standard is to provide a set of Application Layer services which can be used by libraries to perform loan-related activities in an Open Systems Interconnection (OSI) environment, as defined by ISO 7498.

The goal of Opens Systems Interconnection is to allow, with a minimum of technical agreement outside the interconnection standards, the interconnection of information processing systems:

— from different manufacturers;

— under different managements;

— of different levels of complexity; and

— of different technologies.

The ILL service provides capabilities to request the loan of returnable bibliographic items, such as books, or to request non-returnable items, such as photocopies of journal articles. Related procedures, such as loan renewal, item recall, overdue notification, etc. are also supported by this service.

The purpose of the service definition is to define the communications aspects of ILL processing in terms of a set of services provided to a user by an application-service-element (ASE). Performing an ILL-transaction involves a user invoking the services in the prescribed order.

The focus of ILL activity is the bibliographic item, which may be a book, periodical, journal article, microform, etc. The ILL application is concerned with procedures relating to the loan of these items between libraries or to the interchange of copies thereof.

This service definition strives to satisfy a number of objectives, including:

— Control of ILL-transactions. The services must provide a means of controlling the ILL-transaction in terms of constraining allowable actions, exchanging information, tracking a borrowed item, and synchronizing the activity of the two or more sites involved in the ILL-transaction.

— Interworking of Various Systems. The ILL activity will continue to be performed using a combination of manual and automated systems. The ILL service and protocol must recognize this fact and allow systems with varying degrees of automation to be able to interwork, i.e. communicate with each other in a meaningful way.

— Minimizing the Costs of ILL-transactions. The costs associated with an ILL-transaction include both operator costs and communications costs. An ILL protocol should attempt to minimize the costs incurred by implementations conforming to the protocol. This can be done by minimizing the operator intervention required by the protocol implementation, and by minimizing the number of messages sent between the sites involved in an ILL-transaction.

— Reflection of Current ILL Practices. The purpose in defining a protocol is not to introduce a new method for performing an ILL-transaction, but rather to formalize current practices in a way that allows existing systems to communicate with each other in a standardized way, as well as to allow newer automated systems to take full advantage of the protocol's potential. However, it is recognized that this International Standard may not be universally applicable to all existing ILL systems without some modification, due to the wide variation in their capabilities.

There is an inherent trade off in any attempt to reconcile these divergent objectives. For example, minimizing ILL-transaction costs may result in some loss of control over the ILL-transaction. Reducing the number of messages sent lowers the telecommunications cost and also lowers the operator costs as there is less need for the operator to initiate and control the communications operations. However, by reducing the total number of messages, some level of information regarding the ILL-transaction is lost as is the coordination between the requesting and responding libraries. By reducing the total number of stages through which a ILL-transaction must go (i.e. states), the operator interface of an automated system can be made simpler, with an associated reduction in requisite demands on the operator.

The approach taken in this International Standard is to set the mandatory requirements that all open systems must support in order to achieve an acceptable degree of coordination between automated parties to an ILL-transaction. Additional optional features are defined which allow implementors to achieve a greater degree of control if it is desired.

NOTE — The mandatory requirements of this International Standard may, however, exceed the capabilities and/or needs of some existing manual or semi-automated ILL systems.

This International Standard is one of a number of related standards supporting the interconnection of library systems. These standards can be used by themselves or in a cooperative manner to support library applications requiring a mixture of communications services. For example, ISO 10163, which supports remote access to bibliographic databases, could be used in conjunction with the ILL protocol to obtain item identification information. The control and management of interactions among such bibliographic applications are outside the scope of this International Standard.

Security and accounting issues as they relate to ILL operations are for further study.

Information and documentation — Open Systems Interconnection — Interlibrary Loan Application Service Definition

1 Scope

This International Standard is an Application Layer standard within the Open Systems Interconnection framework defined by ISO 7498.

This standard defines the services for Interlibrary Loan. These services are provided by the use of the ILL protocol in conjunction with the supporting telecommunications service which may be a store-and-forward messaging service, such as that provided by the MOTIS Standards, ISO 10021-4 etc.; or a direct connection-mode service using ISO 8822 and ISO 8649.

This standard does not specify individual implementations or products, nor does it constrain the implementation of entities and interfaces within a computer system. Computer systems may range from stand-alone workstations to mainframes.

This standard is intended for use by libraries, information utilities such as union catalogue centres, and any other system which processes bibliographic information. These systems may participate in an interlibrary loan transaction in the role of requester (i.e. an initiator of ILL requests), responder (i.e. a provider of bibliographic material or information) and/or intermediary (i.e. an agent that acts on behalf of a requester to find suitable responders). Various interworking topologies are supported, ranging from simple two-party interactions to multi-party interactions.

There is no requirement for conformance to this standard. Conformance is required only for the ILL protocol specification.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revison, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 7498-1: 1994	Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model.
ISO 7498-2:1989	Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 2: Security Architecture.
ISO 7498-3:1989	Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 3: Naming and addressing.
ISO/IEC 7498-4: 1989	Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 4: Management framework.

NOTE - ISO/IEC 7498-1:1994, ISO 7498-2:1989, ISO 7498-3: 1989 and ISO/IEC 7498-4:1989 supersede ISO 7498:1984. However, when this International Standard was under development, the previous edition was valid and this International Standard is therefore based on this edition, which is given below.

ISO 7498:1984	Information Processing Systems - Open Systems Interconnection - Basic Reference Model.
ISO/IEC 10731: 1994	Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services.

NOTE - ISO/IEC 10731:1994 supersedes ISO/TR 8509:1987. However, when this International Standard was under development, ISO/TR 8509 was valid and this International Standard is therefore based on ISO/TR 8509, which is given below.

ISO/TR 8509:1987	Information Processing Systems - Open Systems Interconnection - Service Conventions.
ISO/IEC 10026-1: 1992	Information Technology - Open Systems Interconnection - Distributed Transaction Processing - Part 1: OSI TP model.

ISO 10161-1:1997 Information and Documentation - Open Systems Interconnection - Interlibrary Loan Application Protocol Specification - Part 1: Protocol specification.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 Reference Model Definitions

This International Standard is based on the concepts developed in ISO 7498:1984 and makes use of the following terms found in it. These terms are replicated here as a convenience to the reader.

3.1.1 **application-entity**: The aspects of an application-process pertinent to OSI.

3.1.2 **Application Layer:** The seventh and highest layer in the Reference Model for Open Systems Interconnection (OSI); it serves as the window between correspondent application-processes which are using the OSI to exchange meaningful information.

3.1.3 **application-protocol-data-unit:** A unit of data specified in an application-protocol and consisting of application-protocol-information and possibly application-user-data.

3.1.4 **application-service-element:** That part of an application-entity which provides an OSI environment capability, using underlying services when appropriate.

3.1.5 **(N)-service:** A capability of the (N)-layer and the layers beneath it, which is provided to (N+1)-entities at the boundary between the (N)-layer and the (N+1)-layer.

NOTE — An application-service does not provide a capability to higher layer entities, but rather to application-processes.

3.1.6 **presentation-service:** A capability of the Presentation Layer and the layers beneath it, which is provided to application-entities at the boundary between the Presentation and the Application Layer.

3.2 Application Layer Structure Definitions

This International Standard makes use of the following terms defined in ISO/IEC 9545:1989.

3.2.1 **application-association:** A cooperative relationship between two application-entity-invocations for the purpose of communication of information and co-ordination of their joint operation. This relationship is formed by the exchange of application-protocol-control-information using the Presentation Service.

3.2.2 **application-context:** A set of rules shared in common by two application-entity-invocations governing their behavior in order to enable their cooperative operation.

NOTE — An application-context is a shared conceptual schema for the universe of discourse for communication.

3.2.3 **application-context-definition:** The description of an application-context.

3.2.4 **application-entity-invocation:** A specific utilization of part or all of the capabilities of a given application-entity in support of the communications requirements of an application-process-invocation.

3.2.5 **application-process-invocation:** A specific utilization of part or all of the capabilities of a given application-process in support of a specific occasion of information processing.

3.3 Service Conventions Definitions

This International Standard makes use of the following terms defined in ISO/TR 8509:1987.

3.3.1 **indication primitive:** A representation of an interaction in which a service-provider either:

a. indicates that it has, on its own initiative, invoked some procedure; or

b. indicates that a procedure has been invoked by the service-user at the peer service-access-point.

3.3.2 **non-confirmed service:** A distinct part of the total (N)-service which does not result in an explicit confirmation from the service-provider to the initiating service-user.

3.3.3 **provider-initiated service:** A distinct part of the total (N)-service which is initiated by the service-provider rather than the service-user.

3.3.4 **request primitive:** A representation of an interaction in which a service-user invokes some procedure.

3.3.5 **service primitive:** An abstract, implementation-independent representation of an interaction between service-user and the service-provider.

3.3.6 **service-provider:** An abstract of the totality of those entities which provide a service to peer service-users.

3.3.7 **service-user:** An entity in a single open system that makes use of a service.

3.4 ILL Definitions

3.4.1 bibliographic item: A monograph, serial, microform, film, video recording, sound recording or other item of information held by a library or some organization. A bibliographic item may assume different forms, e.g., a book may be printed on paper or represented electronically.

3.4.2 chained ILL-transaction: An ILL-transaction involving three or more parties, i.e. a requester, a responder and one or more intermediaries, where each intermediary acts as a relay for all ILL messages.

3.4.3 electronic delivery: Delivery of an electronic representation of a requested item via a telecommunication-based service.

3.4.4 final-responder: The institution which supplies a requested item. This term is used when it is necessary to distinguish between the responder of an ILL-transaction and the responder of an ILL-sub-transaction.

3.4.5 ILL-transaction: A single, complete instance of the whole ILL cycle, including all of the actions, service primitives, and messages involved from the initial ILL-REQUEST until the cycle is concluded, as with the return of the requested material.

3.4.6 ILL-transaction group: A set of related ILL-transactions initiated by the same requester.

3.4.7 ILL-transaction state: The information which describes the current processing status of an ILL-transaction; it is the combination of the requester state, the responder state and the states of all intermediaries involved in an ILL-transaction.

3.4.8 initial-requester: Person or institution which initiates an ILL-transaction; this term is used when it is necessary to distinguish between the requester of an ILL-transaction and the requester of an ILL-sub-transaction.

3.4.9 intermediary: A responder which either forwards a request to another library or institution for processing, or initiates chained or partitioned sub-transactions with other responders.

3.4.10 item: (see bibliographic item, clause 3.4.1)

3.4.11 parameter: A functionally related group of one or more data elements.

3.4.12 partitioned ILL-transaction: An ILL-transaction involving three parties, i.e. a requester, a responder and an intermediary, where the intermediary acts as a relay of ILL messages during the processing phase, and where the requester and responder interact directly during the tracking phase.

3.4.13 processing phase: That phase of an ILL-transaction up to and including shipment of a requested item.

3.4.14 requester: The party which has generated an ILL-REQUEST.

3.4.15 responder: The party which has received an ILL-REQUEST.

3.4.16 simple ILL-transaction: An ILL-transaction involving only two active parties, a requester and responder.

3.4.17 sub-transaction: A part of an ILL-transaction involving interactions between an intermediary and a responder or another intermediary.

3.4.18 supplier: The party that has supplied the requested item. It need not be the same as the final-responder.

3.4.19 terminal state: A state from which no transition to another state can be made, e.g.:

When a photocopy is provided, SHIPPED is the terminal state for the responder, RECEIVED is the terminal state for the requester.
CANCELLED is a terminal state for both the requester and responder.

3.4.20 tracking phase: That phase of an ILL-transaction after shipment and receipt of a returnable item, including renewals, overdues and item return.

3.4.21 user: (see service-user, clause 3.3.7)

4 Abbreviations

ACID - Atomicity, consistency, isolation & durability

ASE - Application-service-element

ASO - Application service object

ILL - Interlibrary loan

MOTIS - Message Oriented Text Interchange System

OSI - Open systems interconnection

5 Conventions

This International Standard uses the conventions defined in ISO/TR 8509.

6 Service Model

6.1 Service-user and Service-provider

The ILL application is modelled as a distributed collection of application-processes, each of which is located in a separate real open system, e.g. a library system.

Within each application-process, there are two types of functions: local processing functions; and communications-related functions, i.e. OSI-related functions. The local processing functions deal with such activities as database manipulation, report generation, etc.; these are outside the scope of this International Standard. Within each system, those aspects of the application-process which are pertinent to OSI are called the application-entity. Each application-entity in turn includes one or more application-service-elements (ASEs), one of which is the ILL ASE. These ASEs provide communications-related services to the service-user. To do this they engage in protocol exchanges with peer application-entities in other systems and they take advantage of supporting services within the Application Layer and the layers below it.

Relationships with other ASEs are defined as part of an application-context-definition. This is outside the scope of this International Standard.

The set of all ILL ASEs, supporting ASEs and the lower layer services across all systems together form the ILL service-provider.

6.1.1 Roles of the Service-user

A service-user involved in ILL activity takes on one of three roles: requester, responder or intermediary.

The requester generates ILL requests.

The responder receives ILL requests and is the potential supplier of requested items.

The intermediary is a responder which does not itself satisfy an ILL request and which passes the request to another responder on behalf of the requester.

The actual supplier of requested items is normally a responder; however, the service model allows for institutions that do not receive ILL requests, as defined in this International Standard, to supply the requested items. For example, an institution that supports only postal and telephone ILL requests may have another institution that supports electronic ILL requests act as a responder on its behalf.

6.2 ILL-transaction

An ILL-transaction is a single, complete instance of the whole ILL cycle, including all of the actions, service primitives, and messages involved from the initial ILL-REQUEST until the cycle is concluded, as with the return of the requested material. The term "ILL-transaction" is used in this International Standard in its most general sense, and does not imply an atomic unit of work with the ACID properties of atomicity, consistency, isolation and durability, as applied to transactions in the OSI transaction processing model (ISO 10026-1).

ILL-transactions may overlap in time, i.e. multiple ILL-transactions may be processed concurrently by a given open system.

An ILL-transaction may be initiated only by a requester.

A sub-transaction refers to the set of communications activity involving an intermediary and a responder or another intermediary, and is related to an ILL-transaction initiated by a requester. A sub-transaction is not, in itself, an actual ILL-transaction.

A sub-transaction may be initiated only by an intermediary.

When an ILL-transaction involves three or more parties, the initial-requester is the party that generated the initial ILL-REQUEST. The final-responder is the last recipient of an ILL-REQUEST for that ILL-transaction.

Individual ILL-transactions may be related to each other, for example a succession of attempts by a requester to contact different responders directly. Such ILL-transactions form an ILL-transaction group. It is at the discretion of the initiator to determine whether such ILL-transactions are to be related explicitly through the ILL-transaction identifier; such grouping of ILL-transactions may be done, for example, to provide a historical record of the related steps associated with an interlibrary loan.

Each ILL-transaction has a unique ILL-transaction identifier that is used to identify the state and other descriptive information maintained by ILL-application-entities for that ILL-transaction. The ILL-transaction identifier has the following components:

initial-requester-id: identification of the requester who initiated the ILL-transaction;

ILL-transaction-group-qualifier: distinguishes a group of ILL-transactions from all other active ILL-transaction groups associated with the initial-requester;

ILL-transaction-qualifier: distinguishes an ILL-transaction from all other ILL-transactions within an ILL-transaction group.

The ILL-transaction identifier of each sub-transaction has the following additional component, which is unique within, and only within, the scope of a single intermediary:

sub-transaction-qualifier: distinguishes this sub-transaction from all other sub-transactions within an ILL-transaction initiated by the intermediary.

6.3 ILL-transaction Types and Topologies

There are three types of ILL-transactions: simple, chained and partitioned.

6.3.1 Simple ILL-transaction

A simple ILL-transaction involves two active parties, the requester and responder. In its most basic manifestation, the requester and responder interact in a point-to-point manner, as illustrated in Figure 1.

All ILL-transactions initiated by a requester begin as simple ILL-transactions. A requester may, however, indicate as part of the ILL-request that the responder has permission to change the ILL-transaction-type to chained or partitioned. If the responder does change the type, this responder then becomes an intermediary.

When a responder is unable to respond successfully to a request, it may supply a list of potential responders to assist the requester.

6.3.2 Chained ILL-transaction

A chained ILL-transaction involves at least three parties: the requester, the responder and one or more intermediaries. An ILL-request is passed from one intermediary (to another intermediary) to the responder in a chain, with each intermediary acting as a relay for all ILL messages. There is no direct interaction between the requester and responder.

The interactions between the requester and the first intermediary define the main ILL-transaction. The set of interactions between an intermediary and the responder constitute a sub-transaction, as do the interactions between each pair of intervening intermediaries. Figure 2 (a) illustrates a chained ILL-transaction with two intermediaries (and hence two sub-transactions).

If a sub-transaction results in non-fulfillment of the ILL request, the intermediary may initiate a new sub-transaction to another responder. The intermediary may try several potential responders in turn. This leads to a star ILL-transaction topology with the intermediary as the hub, as illustrated in Figure 2 (b).

The responder may supply a list of potential responders to the intermediary to assist it in making a selection.

The requested item could be delivered directly to the requester or client, or to one of the intermediaries who would then be responsible for delivering it to the requester or client.

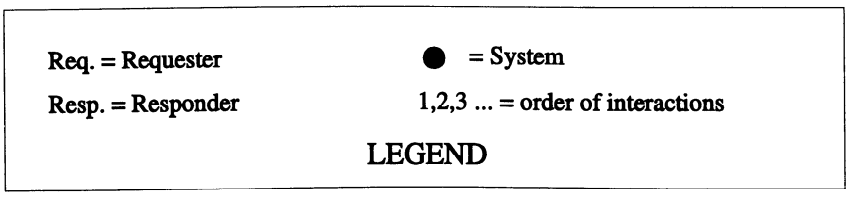
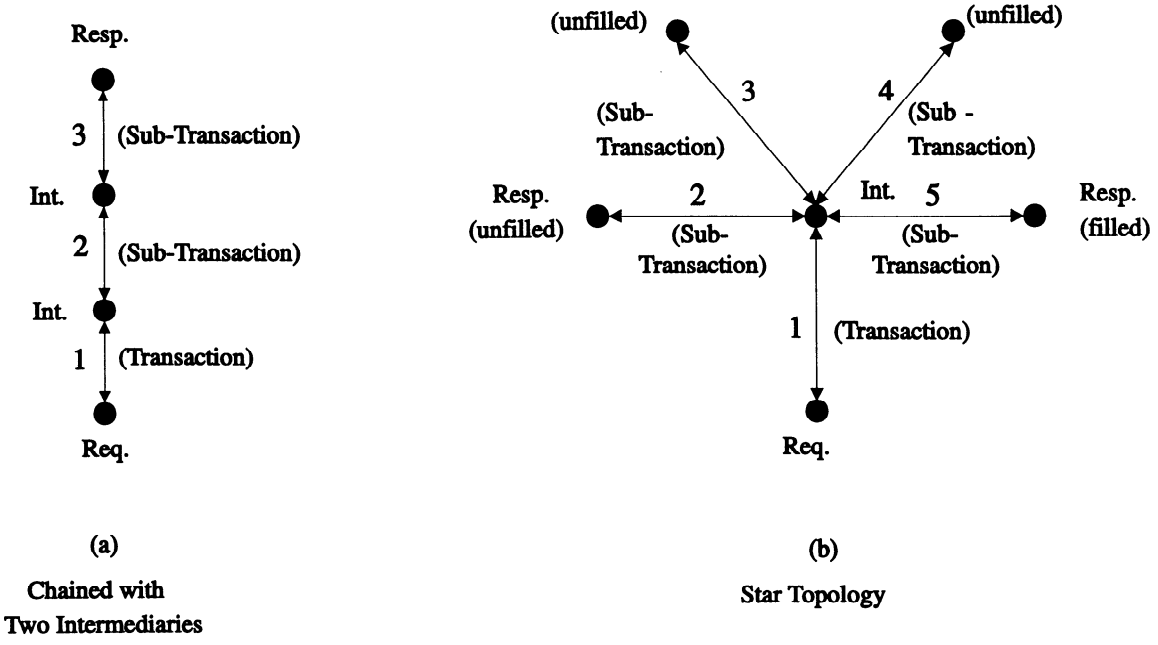


Figure 1 - Simple Transaction



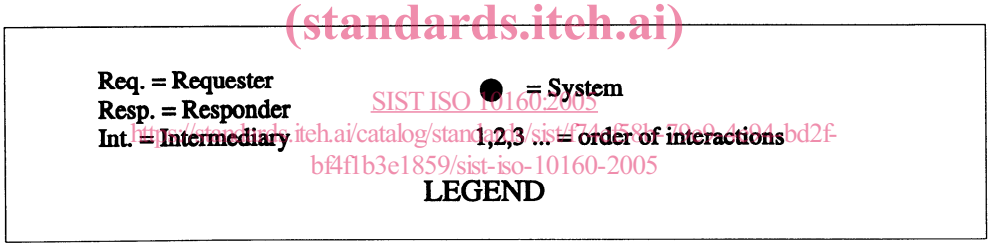


Figure 2 - Chained Transactions

The requester can allow or prohibit chaining and can specify, if desired, a list of potential responders to which a request might be chained. It can also supply a list of responders which have already been tried, so that unnecessary duplication of ILL requests does not occur.

6.3.3 Partitioned ILL-transaction

A partitioned ILL-transaction involves at least three parties: the requester; the responder; and one or more intermediaries. An ILL-request is passed from the intermediary to the responder who responds to the intermediary, who then responds to the requester. After the desired item has been shipped and the requester has received notification that it has been shipped, all further interactions take place directly between the requester and responder; the intermediary no longer participates in the ILL-transaction. Figure 3 illustrates a partitioned ILL-transaction.

Partitioned ILL-transactions are useful in situations where the intermediary acts as an agent of the requester to find a suitable responder but has no interest in participating any further in an ILL-transaction. This is typical of some union catalogue facilities.

A partitioned ILL-transaction is divided into two phases. The first phase, the "processing phase", consists of interactions between the requester and the responder via the intermediary or intermediaries. During this phase, the sets of interactions between intermediaries and between the intermediary and a responder constitute sub-transactions. The second phase of the main ILL-transaction, the "tracking phase", consists of the direct interactions between the requester and responder. It is used for monitoring the progress of the loaned item, including recalls, renewals, overdues, etc. ILL-transaction phases are described more fully in clause 6.4.5.

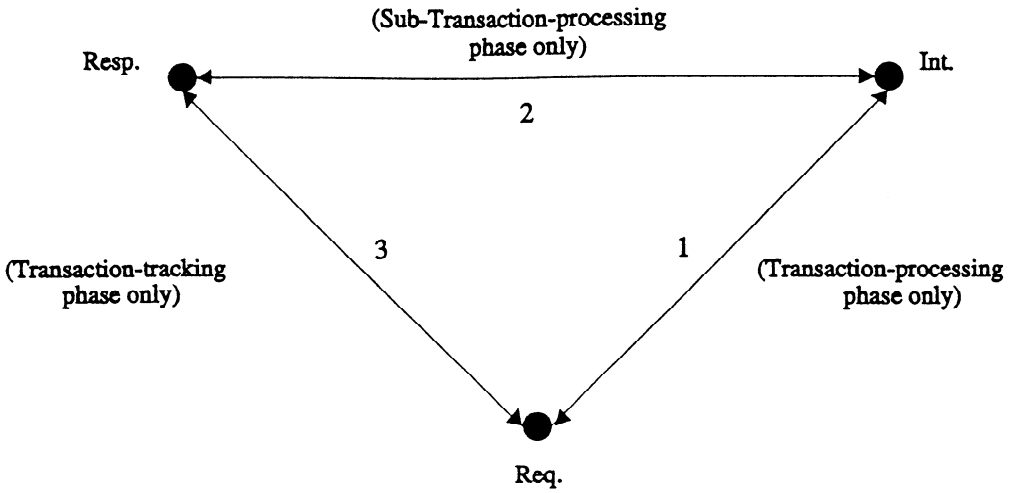


Figure 3 - Partitioned Transaction

The requested item could be delivered directly to the requester or client, or to the intermediary who would then be responsible for delivering it to the requester or client.

The requester can allow or prohibit partitioning and can specify, if desired, a list of potential responders to which a request might be sent. It can also supply a list of responders which have already been tried, so that unnecessary duplication of ILL requests does not occur.

When a responder is unable to respond successfully to a request, it may supply a list of potential responders to assist the requester.

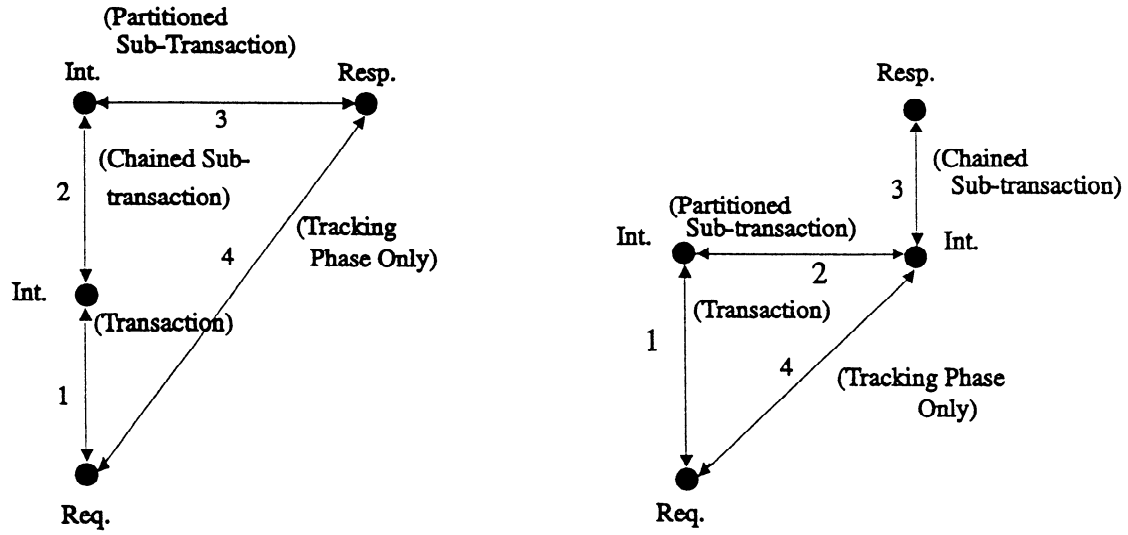
Partitioning and chaining may be mixed within the same ILL-transaction, as illustrated in Figure 4.

Note that when partitioning occurs after chaining, as shown in Figure 4 (a), it overrides chaining, the effect being the same as multiple instances of partitioning. However, if chaining follows partitioning, then the chaining effect is preserved.

6.3.4 Distinct ILL-transactions

The preceding descriptions of chained and partitioned ILL-transactions imply that the intermediary plays only a relay role during the tracking phase, i.e. it does not invoke any services such as OVERDUE on its own initiative.

The ILL service model also allows a potential intermediary to instead play an active role during the processing phase of ILL-transactions, and exert control over all phases of an ILL-transaction by establishing distinct ILL-transactions for its interactions with the requester and with the responder. A system which receives an ILL-request may act as a final responder (from the viewpoint of the initial requester), and act as an initial requester in a second transaction which it initiates with the final responder. These distinct transactions are not required to share any common identification and need not proceed in a synchronized fashion. All linkage between events on one ILL-transaction and events on the other is at the discretion and under the control of the dual-role system. This permits the



(a) Chained then Partitioned

b) Partitioned then Chained

Req. = Requester
Resp. = Responder
Int. = Intermediary

● = System
1,2,3 ... = order of interactions

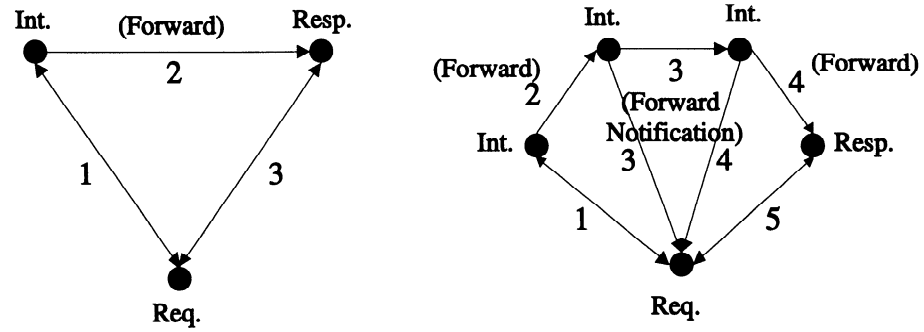
LEGEND

Figure 4 - Mix of Chaining and Partitioning

dual-role system, for example, to initiate an OVERDUE request without having received an OVERDUE indication from the responder.
The one constraint on the use of distinct ILL-transactions is that all items supplied by a final-responder must be shipped and returned via the dual-role system. This ensures that the dual-role system is able to track the progress of the two ILL-transactions and can reach terminal states.
This style of operation, since it involves two distinct simple ILL-transactions, has no protocol implications, and is not described further in this International Standard.

6.3.5 Forwarding

A variation of the simple ILL-transaction involves an intermediary who forwards an ILL request to a responder and then ceases to participate actively in the ILL-transaction. The responder receiving the forwarded request responds directly to the requester. The intermediary notifies the requester when forwarding occurs. Figure 5 (a) shows the simplest case of forwarding involving only one intermediary. Figure 5 (b) shows the case where multiple instances of forwarding occur.
The requester can allow or prohibit forwarding and can specify, if desired, a list of potential responders to which a request might be forwarded. It can also supply a list of responders which have already been tried, so that unnecessary duplication of ILL requests does not occur.
When a responder is unable to respond successfully to a request, it may supply a list of potential responders to assist the requester.



(a)
One Instance of Forwarding

(b)
Multiple Instances of Forwarding

Req. = Requester
Resp. = Responder
Int. = Intermediary

● = System

1,2,3 ... = order of interactions

LEGEND

Figure 5 - Simple Transaction with Forwarding

Chaining and forwarding may be mixed within the same ILL-transaction, as illustrated in Figure 6 (a) and (b).

Partitioning and forwarding also may be mixed within the same ILL-transaction, as illustrated in Figure 7 (a) and (b).

6.3.6 Referrals

When an ILL request is unfilled, the requester may choose to refer the request to another responder, as illustrated in Figure 8. Each request referral is considered to be a separate ILL-transaction which is part of the same ILL-transaction group.

As an implementation consideration, this request referral could be performed manually or automatically.

6.3.7 Retries

When an ILL request is unfilled with a reason such as RETRY, ESTIMATE or LOCATIONS-PROVIDED, the ILL-transaction or sub-transaction terminates. The requester or intermediary may choose to retry the original request at an appropriate time or to look elsewhere. If the original request is repeated, it carries an indication that this is a retry. The retry is a new transaction or sub-transaction which should form part of the same ILL-transaction group as the original request.

For the initial requester, a retry is a new ILL-transaction and so the ILL-transaction-qualifier must be different from that used in the original request but the ILL-transaction-group-qualifier must be the same (to enable the responder or intermediary to relate the retry to the previous ILL-transaction).

For an intermediary a retry is a new sub-transaction and so the sub-transaction-qualifier must be different from that used in the previous request, but both the ILL-transaction-group-qualifier and the ILL-transaction-qualifier must be the same (to enable the responder or next intermediary to relate the retry to the previous sub-transaction).