PROFILE FOR THE USE OF Z39.50 ITEM ORDER EXTENDED SERVICE
TO TRANSPORT ILL PROTOCOL APDUS.

(Z39.50/ILL PROFILE 1)

APPROVED TEXT

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1. Purpose

This profile describes the use of the Z39.50 Item Order Extended Service to contain an ILL protocol APDU as defined in the International Standard ISO 10161.

This profile is intended to support the use of the Item Order Extended Service as a mechanism for the transport of ILL protocol messages between two ILL protocol-based systems (instead of or in addition to other transport services, such as X.400 electronic mail). It does not address the sending of an Item Order request containing an ILL-Request APDU or any other ILL APDU to a document ordering system that does not implement the ILL protocol.

Short name: Z39.50/ILL profile 1.

2. Scope

The Z39.50 Extended Services allow servers to offer services in addition to those defined in the base Z39.50 standard. These services are often carried out in a timeframe that extends beyond that of a Z39.50 session, or are used to carry information that is transferred to a server function distinct from the information retrieval services directly related to Z39.50. A number of extended services are defined in an Appendix to Z39.50-1995.

One of the extended services defined is Item Order, which allows a client to submit a request for the supply of a document to be delivered using a communications service different from Z39.50. The service allows a client to identify the item being ordered by reference to a position in a result set, or it allows the client to supply the identification information in an externally defined data structure.

This profile specifies the use of the Item Order extended service to transport messages relating to an ILL transaction as specified in the ILL protocol specification, ISO 10161. ILL APDUs are used to convey information from a "Requester", the person or organization placing the order, to a "Responder", the organization that undertakes to supply or arrange the supply of the document, or *vice versa*. They contain parameters to identify the item requested, the requester and responder, and a third-party "client" for whom the requester is an agent.

They also contain parameters allowing information about the transaction to be maintained, possibly over a long period of time, and parameters allowing all messages relating to the transaction to be correlated with the original request and other messages.

This profile may be used in conjunction with other profiles describing the use of alternative delivery mechanisms for ILL APDUs, such as electronic mail.

A full description of the ILL service model is given in ISO 10160, the ILL Service Definition.

3. Model

ILL is inherently transaction oriented. A request leads to the creation of a transaction, which passes through a number of states until a "terminal state" is reached. Both the requester and the responder maintain information about the current state of the transaction to allow them to respond appropriately to messages relating to the transaction.

The ILL protocol does not specify a transport mechanism for the delivery of ILL APDUs. Individual profiles have been developed describing the use of specific transport services for the delivery of ILL APDUs. This profile describes the use of the Z39.50 Extended Services as such a transport mechanism.

This profile permits both parties to the Item Order Extended Service to use ILL APDUs to transfer messages relating to an ILL transaction.

While it is anticipated that the primary use of this profile will be to permit the transfer of the initiating ILL-Request APDU, this profile explicitly permits any ILL APDU to be transported using Item Order. APDUs originating at the Z39.50 origin (the ILL-Requester) will be carried in the itemRequest parameter of the OriginPartNotToKeep data type of an ESFormat-ItemOrder external. APDUs originating at the Z39.50 target (the ILL-Responder or Intermediary) will be carried in the itemRequest parameter of the TargetPart data type of an ESFormat-ItemOrder external in either the ES-Response APDU or in a TaskPackage record returned as the result of a search of the ES database.

It is expected that use of Item Order to transport ILL APDUs will form part of a protocol-conforming ILL system that also support other transport services to deliver ILL APDUs. There is no requirement in either the ILL protocol or this profile that all APDUs relating to a single ILL transaction be delivered using a single transport service. For example, some APDUs in the processing phase of the transaction, such as the initiating ILL-Request, an ILL-Answer containing a condition and the Conditional-Reply, might be delivered via Item Order, while all subsequent APDUs relating to the transaction might be delivered via electronic mail. This would enable an ILL-Request to be generated as part of a Z39.50 session, with subsequent messsages relating to the transaction being delivered asynchronously.

It is not the intention of this profile to establish a historical record of an ILL transaction in the Z39.50 extended services database, since conforming ILL systems will already maintain such records themselves. There is no requirement in this profile that the Z39.50 target place or maintain any ILL APDUs in the extended services database if alternative message delivery mechanisms are available to the ILL partners. ILL APDUs that are placed in the extended services database may be deleted by the target at any time. However, a well-behaved target system will ensure that a task package containing an ILL APDU remains in the database until either:

- it has been retrieved by the origin;

- it is superseded by a new ILL APDU reflecting a new state of the transaction; or

- the transaction has reached a terminal state.

It is possible in this model that a single APDU may be delivered several times, each via a different transport mechanism. The state tables in the ILL protocol fully accommodate the receipt of such repeated and out-of-sequence APDUs.

To allow an origin to retrieve records from the Extended Services database, a target that intends to deliver ILL APDUs via this mechanism must supply a target reference in the task package parameter that is returned in the ESResponse ADPU for the initial ILL-Request that establishes the transaction. All APDUs that are delivered via the Extended Services database will be retrievable using this target reference. In this circumstance, the target must also support searching the ES database via the PackageName and UserId supplied by the origin in the original request that initiated the transaction. This is to allow the origin to search on known information to retrieve a task package containing the target reference to be used for subsequent searches.

With one exception, it is assumed that the Item Order APDU will contain an ILL APDU containing all the information required by the current state of the ILL transaction. The single exception is that an ILL-Request APDU may omit the contents of the item-id parameter if the Item Order contains a resultSetItem parameter that completely identifies the item to be supplied.

It is assumed that use of Item Order for the transport of ILL protocol APDUs will take place within well-known communities in which there are either formal or informal *a priori* agreements governing the use of the ILL protocol and that these agreements allow Z39.50 Item Order to be used as the transport mechanism for an ILL APDU. The data contents required in the APDU will be adequately covered by these agreements and are not addressed further here. Any parameters required by such agreements take precedence over requirements expressed in this document. One example of an informal agreement would be a national or regional ILL code of practice.

The operational model assumes that once an Extended Services Item Order request has been successfully processed by the Z39.50 target, it passes beyond the control of that Z39.50 target (i.e. the request has been passed to a separate, independent application). Z39.50 Item Order, therefore, contains no mechanism to delete or alter the contents of an ILL APDU once the target indicates that the operationStatus is "accepted" or "done". In particular, deleting the task package from the Extended Services database does not necessarily cancel the Item Order. At the same time, however, an operationStatus of "accepted" does not imply that the Item Order has been (or will be) filled, merely that the order has been successfully transferred to the ILL application.

Some targets will be able to obtain (either dynamically or through periodic updates) status

information from the ILL system. These targets may return status information in the form of an ILL protocol Status-Or-Error-Report APDU contained within the statusOrErrorReport parameter of the target part choice of the taskPackage parameter of either an Extended Services Response APDU or a record with the Extended Services Task Package syntax that is returned as the result of a search.

Note, however, that it is syntactically valid for a Status-Or-Error-Report APDU to be contained in the itemRequest parameter.

4. Definitions

This profile makes use of the following terms as defined in the ILL Service Definition, ISO 10160:

Intermediary

Processing phase

Requester

Responder

Tracking phase

5. References

ISO 10160 : 1993	Information and Documentation - Open Systems Interconnection - Interlibrary Loan Service Definition
ISO 10161 : 1993	Information and Documentation - Open Systems Interconnection - Interlibrary Loan Protocol Specification
ANSI Z39.50 - 1995	Information Retrieval: Application Service Definition and Protocol Specification
ISO 8825 : 1992	Information Technology - Open Systems Interconnection - Basic Encoding Rules for Abstract Syntax Notation 1

6. Abbreviations

APDU   Application Protocol Data Unit

ASN.1   Abstract Syntax Notation 1

BER   Basic Encoding Rules for ASN.1

ILL   Interlibrary Loan

7. Profile Requirements

7.1 Encoding

The ILL protocol permits two forms of encoding for its APDUs: encoding using the Basic Encoding Rules (BER) for ASN.1 as specified in ISO 8825; or encoding using the UN EDIFACT encoding specified in Annex B of the ILL protocol standard.

This profile requires that ILL APDUs used in Item Order requests and task packages are encoded using the Basic Encoding Rules. EDIFACT encoding of ILL APDUs is not supported by this profile.

7.2 ILL APDUs required to be supported

An Extended Services Item Order request may contain any requester-originated ILL APDU as an external data type in the itemRequest parameter of OriginPartNotToKeep. This profile does not allow any other external data type to be present in this parameter.

An Extended Services Item Order response may contain any responder- or intermediary-originated ILL APDU as an external data type in the itemRequest parameter of the TargetPart data type of an ItemOrder taskPackage carried in the external taskPackage parameter of the ExtendedServicesResponse. Any such APDU may also be carried in the equivalent parameter in a record with RecordSyntax-ESTaskPackage record syntax retrieved through a search of the extended services database. This profile does not allow any other external data type to be present in this parameter.

A single itemRequest parameter may contain only a single ILL APDU.

7.3 ES APDU parameters

The ES APDU need contain no parameters other than "function", "packageType" and "taskSpecificParameters" and "waitAction". Other parameters, if present, are used only for control information in the ES database. Information from these parameters is NOT passed to any ordering or requesting application.

Note that modifying the task package or deleting it in a subsequent APDU cannot be assumed to modify or cancel the Item Order request.

The Item Order extended service requires no correlation between successive APDUs relating to a single transaction, since ILL APDUs carry their own transaction identifier. Each message forms an independent, and logically unrelated, ES request. However, since this profile permits a target to use the ES database as a transport mechanism for delivery of ILL APDUs from the responder to the requester, any target that does so should provide the requester with a targetReference for the transaction to enable the requester to search for new messages via the TargetReference attribute of the ext-1 attribute set.

7.4 Origin Parameters

7.4.1 *ExtendedServicesRequest APDU parameters*

Parameter	Requirement
referenceId	Optional
function	Mandatory. Only Create need be supported. It is assumed that an ILL APDU, once created, moves beyond the control of the target and that any modification or deletion will have no effect on the item order itself.
packageType	Mandatory. Value must be {Z39-50-extendedService Item Order}
packageName	Optional. Mandatory if the origin wishes subsequently to search the Extended Services database to discover a target reference with which other messages relating to this transaction may be retrieved
userId	Optional. Mandatory if the origin wishes subsequently to search the Extended Services database to discover a target reference with which other messages relating to this transaction may be retrieved
retentionTime	Optional. Target may ignore.
permissions	Optional
description	Optional. Target may ignore.
taskSpecificParameters	Mandatory. Must contain an ESFormat-ItemOrder object. See 7.4.2.
waitAction	Mandatory. Target need not support any value of waitAction, and should return the appropriate diagnostic if it does not support the value requested. Targets supporting the values "wait" and "waitIfPossible" undertake only to wait until the request has been passed to the order fulfillment service, although they may wait until a status has been received from the order fulfillment service.
elements	Optional for the origin. Target may ignore.
otherInfo	Outside the scope of this profile.

7.4.2 *ESFormat-ItemOrder parameters*

Parameter	Requirement
esRequest	Mandatory
toKeep	Optional. See 7.4.3
notToKeep	Mandatory. See 7.4.4
taskPackage	Not sent by origin
originPart	-
targetPart	-

7.4.3 *OriginPartToKeep parameters*

Parameter	Requirement
supplDescription	Excluded from this profile to avoid amibiguity with the supplementary-Item-Description parameter in the ILL APDU; use supplementary-Item-Description in the ILL APDU instead.
contact	Optional. Target may ignore.
name	Optional
phone	Optional
email	Optional
addlBilling	Optional. Should only be sent if origin knows that the target requires this information. A target may invoke access control using prompt-1 to obtain additional billing information if required.
paymentMethod	Optional
customerReference	Optional
customerPONumber	Optional

7.4.4 *OriginPartNotToKeep parameters*

Parameter	Requirement
resultSetItem	Optional, but may be present in conjunction with an ILL-Request APDU only. If the item identification in the ILL-Request APDU conflicts with the item identification implied by resultSetItem, the identification in resultSetItem takes precedence.
itemRequest	Mandatory. Must contain an ILL APDU valid for the current state of the ILL transaction.

7.5 Target parameters

7.5.1 *ExtendedServicesResponse APDU parameters*

Parameter	Requirement
referenceId	Mandatory if request contained one.
operationStatus	Mandatory. A value "done" implies that the ILL APDU has been successfully passed to the target's ILL system; a value "accepted" implies that the ILL APDU has not yet been passed to the ILL system; a value "failure" implies that the ILL APDU could not be passed to the ILL system.
diagnostics	Mandatory if operationStatus = "failure".
taskPackage	Optional
otherInfo	Outside the scope of this profile.

7.5.2 *Task Package parameters*

Parameter	Requirement
packageType	Mandatory. Value must be {Z39-50-extendedService Item Order}.
packageName	Optional
userId	Optional
retentionTime	Optional. If present indicates how long the task package will be maintained in the ES database. Must not be used to indicate how long a supplied item may be retained by the requester.
permissions	Optional
description	Optional

Parameter	Requirement
targetReference	Optional. Required if the target intends to make other ILL APDUs relating to the transaction available in the ES database. In this case, the target must also support searching the ES database on the values for package name and user id supplied by the origin.
creationDateTime	Optional
taskStatus	Mandatory. Values are to be interpreted as follows: • "pending" - ILL-Request APDU has not yet been processed by ILL system • "active" - ILL-Request APDU has been processed by ILL system and transaction has not reached a terminal state • "complete" - the ILL transaction has reached a terminal state • "aborted" - an ILL protocol or system error has occurred such that the ILL transaction cannot be created, or has been forced into a terminal state.
packageDiagnostics	Optional
taskSpecificParameters	Mandatory. Must contain an ESFormat-ItemOrder object. See 7.5.2.

7.5.3 ESFormat-ItemOrder parameters

Parameter	Requirement
esRequest	Not sent by target
toKeep	-
notToKeep	-
taskPackage	Mandatory
originPart	Optional
targetPart	Mandatory. Must contain either an itemRequest or statusOrErrorReport.

7.5.4 TargetPart parameters

Parameter	Requirement
itemRequest	Optional. If present must contain an ILL APDU valid for the current state of the ILL transaction.
statusOrErrorReport	Optional. If present must contain an ILL-Status-Or-Error-Report APDU.
auxiliaryStatus	Excluded from this profile.

7.6 ILL APDU parameters

All ILL APDU parameters may be included, as appropriate for the current state of the ILL transaction and for the ILL environment in which the transaction takes place.

Since the operational model of this profile resembles a store-and-forward environment, Requester-Id and Responder-Id are mandatory to be sent in all APDUs when using this profile.

All mandatory ILL protocol parameters must be sent. Exceptionally, this profile specifies that the mandatory item-Id parameter may be empty (i.e. have a length of 0) in any APDU if:

1. the required item is fully identified by the contents of the resultSetItem parameter of the ItemOrder; and

2. the result set still exists as a transient result set (i.e. item-ID may be empty in the original ILL-Request and in all subsequent ILL APDUs relating to the transaction that are transferred in the same Z-Association).