WINGS™ Request Management Systems

Version 2.1

Pigasus Software, Inc.

Solutions That Solve Problems

Overview

WINGS™ System Overview

Overview

This document is an introduction to the WINGS™ request management system. The purpose of this document is to help people new to the product to understand how messaging and other database updates occur. Experience shows that the initial impression of the very simple user interface overlooks the complexity of automated processing occurring within other layers of the product.

The Appendix contains three illustrations which may help make clearer the terminology and the logistics of the WINGS system.

Basic Design

The WINGS system manages requests for interlibrary loan/document delivery/resource sharing divisions within libraries of all sorts. Whether those requests are processed with or without mediation, whether they are filled by the patron's own library, a library within a consortium, or an "outside" library, document delivery firm, or other information service, is immaterial to the basic architecture of the WINGS system.

All types of requests (returnables, non-returnables, photocopies, document delivery suppliers, purchase, and information/subject) are handled. Extensive time/date stamped statistics are gathered and available for both prepared and ad hoc reporting.

Any type of library can use this request management software. Current WINGS system customers include special, corporate, government, public, and academic libraries.

One design mandate for the WINGS product is to expose to the human user only those requests that need human action. Anything in the database is easily accessible to the staff member, but only those things needing action show up in the work queues. Given that the user interface exposes only those "open" things in normal workflow screens, the library is free to keep as much information in the database as is convenient for reporting without suffering screen clutter and long lists.

The detailed logistics of forming and sending requests and related messages are handled in the background by the Networker module of the WINGS system. State changes happen automatically upon the sending or receiving of a request or message.

Peer to Peer Model

The WINGS system works on the peer-to-peer model, in which both the requesting and supplying institutions are equals and each "owns" its own work and its own version of the request transaction. The Appendix contains a drawing of the peer-to-peer model that may clarify the following description.

It is important to understand that, though the word "request" is used throughout the lifetime of a normal ILL request, there are actually several different entities involved. Understanding this basic fact will help in understanding how the WINGS system (and any other ISO-compliant ILL product) works.

Many people think of a request as a sort of box that is handed off from patron to library to supplier and back along the chain again. In a peer-to-peer system, that is not the case.

When the patron tells his home library (or a potential supplying institution) what he wants, this is the patron's request.

Upon receiving the patron's request, the borrowing/requesting library creates a request record in its database. Further enhancement of that record may or may not occur before the borrowing/requesting library sends a request message to a potential lending/supplying library.

Upon receiving the borrowing/requesting library's request message, the lending/supplying library makes a request record in its database. This request record may or may not be further enhanced during the lifetime of the ILL request.

Further communication between the borrowing/requesting and lending/supplying libraries consists of various messages. Each library updates its own request record as is appropriate depending on the actions each takes. The requested "thing" will eventually be supplied and handled as we normally expect (returnable or non-returnable). Each library will eventually close its own request record in its own database at the appropriate time (for the supplier of a non-returnable, for instance, at the point that the lending/supplying library shipped the item and for the borrowing/requesting library at the point that the non-returnable is received).

This peer-to-peer model is distinctly different from the utility/union database model used by entities like OCLC. In the utility model, the only request record that exists is in the utility's database. The two libraries involved in the transaction do their work essentially within the utility's software (though packages like Clio and Illiad allow the library to keep some information locally while feeding the utility what is required.) The utility acts as an intermediary between the requesting and responding libraries.

Architecture

The WINGS system is built in layers, using well-proven technology, a variety of robust programming languages, a choice between strong and scalable database management systems, and the flexibility and familiarity of a web-based user interface. The Appendix contains a System Environment drawing and a Software Component drawing that further illustrate this section.

Web interface

The web-based human interface is built in ColdFusion, a language that makes normal HTML both quicker to view and quicker to program. The entire user interface is available for customizing both the cosmetic appearance and the exposed functionality.

Patrons may use any web browser, including Lynx. Staff members must use either Netscape or IE, version 4 or higher because of the extensive use of JavaScript in the staff user interface.

The user interface encourages horizontal navigation with hot links as well as a menu-type home page of main options to let the staff member move around the product easily, following the workflow thread as needed rather than a menu hierarchy.

Database

The database of WINGS requests resides either in a Microsoft SQL Server 7 or an Oracle8i database. Microsoft MSDE is another choice for those libraries needing a low-cost, small-scale alternative.

Sentinel

Between the database and the user interface lies the Sentinel, which manages all data updates. The Sentinel protects the database integrity. Should customizing the user interface break anything, the data in the database is never corrupted. The Sentinel is written in encrypted ColdFusion.

Networker

The Networker, the communications layer of the WINGS system, is written in C++. The task of this layer is to manage the communication into and out of the WINGS request database, using either of its native communication protocols - the Extended Request Protocol or ISO 10161, depending on the needs of the partner to which the message is being addressed.

Ventriloquists

The WINGS system also uses ventriloquists for communication in those instances in which neither native protocol is appropriate. Ventriloquists are small programs, usually written in Perl, which translate from some proprietary format into the Extended Request Protocol (for incoming ventriloquists) or from the Extended Request Protocol to the proprietary format (for outgoing ventriloquists). Some generally-useful WINGS ventriloquists include the GSM (generic script message used in Canada), email, print ALA form, and Infotrieve request format.

QUEST Holdings

Staff have a need to check item-level information, such as local call number, shelf status, and availability. The WINGS system provides QUEST™ Holdings links for that purpose.

QUEST Holdings allow staff members to look into any of a variety of web-based catalogs and other resources to verify circ status and call number. A single mouse click is all it takes.

The borrowing side will normally have a QUEST Holdings link to its own catalog, as well as having QUEST Holdings links to several of its favorite partners (or consortium) catalogs. These links allow the staff to confirm whether the borrowing library owns the requested item itself and, if so, whether to borrow it anyway and to determine which of several potential suppliers might be the best choice for that particular request.

The lending side will normally have a QUEST Holdings link to its own catalog, for the purpose of verifying local call number and availability when deciding whether or not to fill a particular request.

FLASH Importers

Patrons have a need to import bibliographic information as requests without having to rekey the data. FLASH™ Importers are the answer to that need.

The FLASH Importers let patrons bring citation information in from a variety of sources, including MEDLINE, Pro-Cite, MELVYL, OVID, and SilverPlatter WebSPIRS. More importers are developed as customers request them. These importers follow normal patron practice of saving records, with the automated addition of bringing those saved records into the WINGS system as fully developed WINGS requests. This method removes the need for keying, making for more accurate requests.

Web searching

The WINGS system is designed to sit behind the library's own web catalog. A patron or staff member would search for a title in the library's own catalog and related resources. Upon finding the desired title, the user would press a button saying "request this" which causes the information on that title to be pulled into the WINGS system as a new request. The next screen the patron sees is a WINGS screen asking for conditions (maximum cost, pickup location, etc.). From that point on, the patron is inside the WINGS system.

Request Life Cycle

Let's start with looking at all the "requests" involved in a typical ILL or resource sharing transaction.

The patron tells the library what he wants. Upon receiving the patron's message the WINGS system automatically creates a Borrowing Request record in its request database. Whether or not the staff mediates the request, a borrowing request message will go out to a potential lender/supplier. Upon receiving a borrowing request message, the lending library's WINGS system creates a Lending Request record in its request database.

Further messaging between the WINGS borrowing system and the WINGS lending system cause status updates and other behavior within each of the WINGS request databases. (Please realize that the WINGS system updates its own request database regardless of the type of system sending it automated requests and related messages).

The WINGS request will be closed at the time appropriate to the role (for a borrower, upon returning a returnable or upon receiving a nonreturnable and for a lender upon receiving back a returnable or upon shipping a nonreturnable).

Patron Interface

Patrons can come into the WINGS system through their library's own web catalog. Configuring this capability is done during the initial setup of a WINGS system. The WINGS system also includes the "templates" for a patron to fill out when a desired item cannot be located in an online resource.

Patrons can do four things: enter new requests, view the status of their own requests, import requests, and cancel their own requests (to the workflow point where canceling makes sense).

Enter New Requests

A typical scenario is to come into the system after finding a title in the web-based catalog and pressing the "ILL" button. The first screen will challenge for a username and password along with letting the patron set conditions (maximum cost, pickup location, need-by date) and to fill in other information in a free text note.

Upon hitting the "Submit Request" button, the patron has the opportunity to confirm the information.

The Networker and Sentinel come into play when the patron presses the final "OK" button. At that point, the Sentinel checks the data and formats it into a Request and a Citation record (much the way that MARC Bib and Holdings records are associated). The Request holds the details related to this particular patron's request. The Citation holds the bibliographic information for the title.

In addition, an association is made to the Patron record, statistics are started, and a time/date stamped log entry is made. The next point that a human will be involved is when (and if) a staff member reviews the request and selects a potential supplier.

Viewing One's Own Requests

If the patron wants to view his own requests, he must provide identifying information (log in) and then select the option to view his own requests. What results is a list of requests placed by that patron over the last *x* weeks (a time limit configured by the library). Included in this display are current status, supplying library, when shipped, and other notes. The patron may resort the list. The library may choose to customize the screen, displaying more, less, or different information about the requests.

Canceling One's Own Requests

Another capability exposed on the View Own Requests screen is the ability to cancel requests that have not reached the point of shipping.

There is a check box next to any request not already shipped by the supplier. Checking the box and pressing the "Cancel" button will cancel the checked requests. The library can choose whether or not to let patrons cancel requests by customizing the screen to include or exclude the checkboxes and the "Cancel" button.

When the patron chooses to cancel certain selected requests, the Sentinel receives the list to be canceled and does the required updating of the database. In essence, the Sentinel tells the Networker that a Cancel message needs to be sent for each of the selected requests.

The Networker then does the work of identifying the trading partner (if any) for each of the canceled requests and sending the canceled message to those partners in whatever format each partner requires (ISO, ERP, email, etc.).

Importing Requests

Patrons may also choose to import requests they have saved while searching various databases, such as Ovid, Medline, WebSPirs, etc.

After logging in, the patron may press the Import button, identify the file to import, select conditions to apply to the imported requests, and press the OK button. The WINGS system, through the Sentinel and the Networker, does the work of creating complete Request and Citation records from the imported files. A confirmation screen lists the new requests for the patron.

Staff Interface

There are two staff interfaces: one for the borrowing role and one for the lending role. In both cases, there is a home base screen that lists the main areas in which staff can act. Most staff time will be spent in the work queues area.

Several generalized points about the Staff interfaces:

- ⌘ Most of the real work is done in the background by the Networker, the Sentinel, the ventriloquists, and the importers. The staff member is involved in a "steering" role - to give the software its marching orders, so to speak, and to be involved in those relatively rare instances when only one human being talking to another can mediate an unusual situation.
- ⌘ Every action is time-date stamped and logged.
- ⌘ Any message needing to be sent will be handled by the Networker, which determines the communication format (ISO, ERP, OCLC, ventriloquist) appropriate to the selected partner and packages up the appropriate data in the appropriate message and sends it via the appropriate communications method (TCP/IP, email, etc.). ALL these details are managed in the background. The staff person does not see them.
- ⌘ Setting up a trading partner is a crucial part of the proper operation of a WINGS system. In the trading partner record are the details of communication format to use, the computer address to which to send things, whether or not this is an OCLC partner suitable for inclusion in lending strings, and space for human-readable policy and other contact information.
- ⌘ Any updating, creating, or deleting of data requested in the user interface is managed by the Sentinel, out of sight of the staff interface.
- ⌘ Any status changes occur as the direct result of sending or receiving messages. Although the staff member CAN manually change state on a request, it is highly unusual to do so. Manual state changes do not call the suite of interacting table changes and updates that normally occur as a result during automated state changes.
- ⌘ Importing requests is handled by the Networker, which creates trading partner records for partners currently unknown to the WINGS system. The staff has the power to edit those automatically-created partners as needed.
- ⌘ Automated rules are run by the Rule Runner (a portion of the Networker). Such automated rules include those that manage Expiry timers and Overdue states. Other rules might filter requests that can be processed without human mediation.
- ⌘ Configuring a WINGS system includes making many operational choices, such as how often the Networker runs and whether or not to export patron information with requests. Configuration also involves setting up the QUEST Holdings links desired and the ventriloquists that the library will be using. Initial population of tables of pickup locations, patron types, etc, also come under initial configuration. The WINGS system comes with 30 days of support for configuration issues.

Borrowing

We will cover a few typical scenarios. There is a wealth of possibility in the user interface. We will cover here only a few of those "mainline" workflow issues in the typical life span of a request.

Log in

Log in to the staff interface, using the username and pass phrase provided to you. Select "Borrowing Tasks".

Home Base

This brings up the "Borrowing Home Base", a list of main types of tasks available to the staff person. Most staff will work in the "Work Queues" selection, which call up lists of requests based on their current state. This is where normal request life span work is done.

The "Requests" choice is for searching requests, editing specific known requests, creating new requests, and viewing the table of Borrower/Lender request numbers.

The "Citations" choice is for searching citations and for editing specific known citations.

The "Reports" choice brings up a list of "canned" reports to run in real time, supplying the date range desired. More reports can be added to this list. Existing reports can be replaced by others the library may wish to write.

The "Patrons" choice is for searching for patrons, editing specific known patrons, and creating new patrons.

The "Trading Partners" choice is for searching for trading partners, creating new trading partners, and editing specific known trading partners.

The "Tiers" choice is for building and naming new tiers. These new tiers become part of the library of pre-built tiers that can be assigned to requests. Tiers are lender strings on steroids - they can include as many other tiers or trading partners as you wish, and can mix OCLC and non-OCLC partners within the same tier. They can be round-robin or sequential in behavior.

The "Financial Records" choice is for searching the financial records in a variety of ways.

The "View Log" choice is for selecting the latest *x* entries from the log for viewing. This is normally a choice used in debugging or analyzing workflow. Normal staff would rarely if ever select this choice.

The "Logout" link allows the staff member to log out of the WINGS system.

The "Lender Home Base" link brings up the Lender Home Base screen. Staff members can transfer from Borrowing to Lending roles by following the links to the Home Base of choice.

Mediate New Request(s)

A typical scenario is to go to the "Work Queues", select the "New Requests" queue, and to mediate those requests. Select some requests, and click the "Approve" button. At this point, you can select a single partner, a pre-built tier of partners, or some combination of those as the potential supplier(s) to whom this request will be sent.

Upon submitting the result, the Networker and the Sentinel take over, creating the records required to track the progress of the request through the list of potential lenders, and sending the request message off to the first potential lender on the list.

The staff interface lets the user know what has happened, and to what list of partners the request(s) will be sent, and allows the staff person to return to the home page for another task.

Edit a Request

Go to the "Work Queues" choice, select any of the queues, and follow the hotlink on the "Edit" column for any particular request. This will get you to the Edit Request screen for that particular request. You could also get there by selecting the "Requests" choice on the Home Base, then searching for titles beginning with T, for instance, and following the request ID link from "Edit" column of the resulting list.

The Edit Request screen is the longest and most complex of all screens in the staff interface. At the top, there are two buttons, each of which will open a special-purpose screen: one to print a set of labels for this request on the Dymo Label Printer and one to print a "cover sheet" for this request. The cover sheet is useful as a packing slip or as a pickup slip on the borrowing side. On the lending side, it is most useful as a packing slip.

The main portion of the Edit Request screen displays information about this request, including information about the patron who requested it, processing dates of interest, the bibliographic information (which must be edited in the associated Citation record), the QUEST Holdings links through which staff can search availability of the requested title at various institutions, the details of the request itself, a copyright section (if the requested item is of the request type photocopy or document delivery), conditions relating to the request, trading partner data related to the request (including a button for checking the progress of a request through its automated routing process), notes, local fields, and a selection of actions one could take on that request. These actions, with the exception of "Save Changes", are the same actions one can take from the "list" screen produced in a work queue. At the very bottom of the screen is the history of this request, as represented by excerpts from the log.

Add a note to the Notes box and press "Save Changes". You will receive feedback that the request was updated (the Sentinel does the actual update) and be given the opportunity to return to the "Home Base" or to the top of the "Requests" section.

Receive a Requested Item

There are at least two choices here. One is to go to the "Home Base", select "Work Queues", and bring up the "Items Expected" (supplier has sent you a "Will Send") or "Items Shipped" (supplier has sent you a "Shipped") queue. From the resulting list, select the request matching the item in hand.

The other choice is to go to the "Home Base", select the "Requests" section, and search for requests by title OR (if the borrower's request number is on the packing slip - and it will be if it came from a WINGS system) search by request number. If working from a list screen, check the check box for the desired request.

Press the "Receive" button. You will get a feedback screen telling you that the Received message will be sent to the trading partner. The Sentinel and Networker handle the database update, including an automated state change on the request, and the sending of the required message to the trading partner.

As a staff person, you need only handle the physical logistics of getting the item to the pickup location and notifying the patron.

In a future release, automated email will be sent to the patron upon the state change that accompanies an item being received.

If the received item is a nonreturnable, the appropriate state changes to a terminal closed state will occur. If the received item is a returnable, then the state changes to "Local Control" so that the eventual return of the item can be tracked.

Check In from Local Control

An item is in "Local Control" (meaning that it is in the hands of the patron) from the time it is "Received" until it is "Checked In". The WINGS system tracks the requested item until its ultimate return to the supplier, but it does not duplicate the library's own circulation system.

Go to the "Home Base", select "Work Queues", select "Items Locally Checked Out". In this queue you will be working with items that have been returned by the patron and need to be sent back to the supplier. Select the request matching the item in hand from the list. Press the "Check In" button. You will get a feedback screen detailing what will happen. The Sentinel and Networker take charge of database updates and message sending to the supplier.

Return Item

To actually ship the item to the supplier, go to "Home Base", select "Work Queues", go to the "Waiting to Return" queue, select the desired requests from the list, and press "Return". You will get a shipping screen allowing entry of shipping method. Should you want to add charges to the request at this point, there is a button taking you to the "Charges" screen. Pressing the "OK" button on this Shipped screen sends a Shipped message to the supplier.

Lending

We will cover a few typical scenarios. There is a wealth of possibility in the user interface. We will cover here only a few of those "mainline" workflow issues in the typical life span of a request.

Log in

Log in to the staff interface, using the username and pass phrase provided to you, if you are not already logged in as a staff member. Select "Lending Tasks".

Home Base

This brings up the "Lending Home Base", a list of main types of tasks available to the staff person. Most staff will work in the "Work Queues" selection, which call up lists of requests based on their current state. This is where normal request life span work is done.

The "Requests" choice is for printing pick lists, searching requests, editing specific known requests, creating new requests, and viewing the table of Borrower/Lender request numbers.

The "Citations" choice is for searching citations and for editing specific known citations.

The "Reports" choice brings up a list of "canned" reports to run in real time, supplying the date range desired. More reports can be added to this list. Existing reports can be replaced by others the library may wish to write.

Several "Importer" choices allow the staff member to explicitly load incoming requests from various types of sources.

The "Financial Records" choice is for searching the financial records in a variety of ways.

The "Trading Partners" choice is for searching for trading partners, creating new trading partners, and editing specific known trading partners.

The "View Log" choice is for selecting the latest *x* entries from the log for viewing. This is normally a choice used in debugging or analyzing workflow. You would most likely select this choice rarely, if ever.

The "Logout" link allows the staff member to log out of the WINGS system.

The "Borrower Home Base" link brings up the Borrowing Home Base screen. Staff members can transfer from Borrowing to Lending roles by following the link from one Home Base to the other.

Handle New Requests

From Lender Home Base, select "Work Queues", select "New Requests", and select the request(s) you wish to handle by checking the check boxes.

If these are requests you want to simply reject without further investigation, press the "Will Not Send" button. A feedback screen tells you that the appropriate message will be sent to each of the partners for each of the selected requests. The Sentinel and Networker manage the database updates, including the automatic state change, and the composition and sending of the Will Not Send message.

Another option in managing new requests would be to print a pick list for the retrieval of items from the shelves. To print a pick list, either start at the Lender Home Base, select "Requests", and select "Pick Lists" OR press the "Produce Pick Lists" button from the "list" screen of new requests.

For any request where the staff member wants to do some editing or investigation before deciding whether to fill it, follow the request ID hotlink in the "Edit" column of the New Requests list screen. In the Edit Request screen that comes up, the staff member can use the QUEST Holdings to ascertain shelf availability and call number from the local catalog, as well as edit most fields in both the request and the citation.

Set Conditions

To set conditions for a particular request, check the checkbox for that request, and press the "Set Conditions" button at the foot of the screen. At this point, you have a new screen allowing you to select one or more conditions. Upon submitting this screen, the Networker will send the conditions to the borrowing library, which can either accept or decline those conditions. If any condition is declined, the request is rejected automatically.

Staff members can view requests in the process of conditions acceptance by selecting the "Conditions Pending" choice from the "Work Queues" screen.

Fill a Request

A supplying library can send a "Will Send" message specifying some future date on which the requested material will be sent. Or the supplying library can simply ship the material, which sends a “Shipped” message to the borrowing library. The lender can add charges at the point of shipping. These charges are communicated to the borrower in the “Shipped” message.

Ship an Item

The shipping screen allows for entry of charges, as well as for entry of details about the shipment, including carrier, number of pages (for photocopies), and due date (for returnables).

Upon submission of the shipping screen, the Sentinel and Networker manage the database updates, including automatic state change, and the formation and sending of the shipped message to each of the partners for the request(s) involved.

For a returnable, the appropriate state change to wait for the item to be returned is made. For a nonreturnable, the appropriate closing of the request with associated state change and statistical entries occurs.

Receive a Returned Item

To receive a returned item, go to the “Work Queues”, select the “Return Expected” queue, and find the desired request on the resulting list. Check the check box(es) for the appropriate request(s) and press the “Receive” button. A feedback screen appears. The Sentinel and Networker handle the database updates, including the automatic state change, and the composition and sending of the Received message to the borrowing library(ies) involved.

Issue a Recall

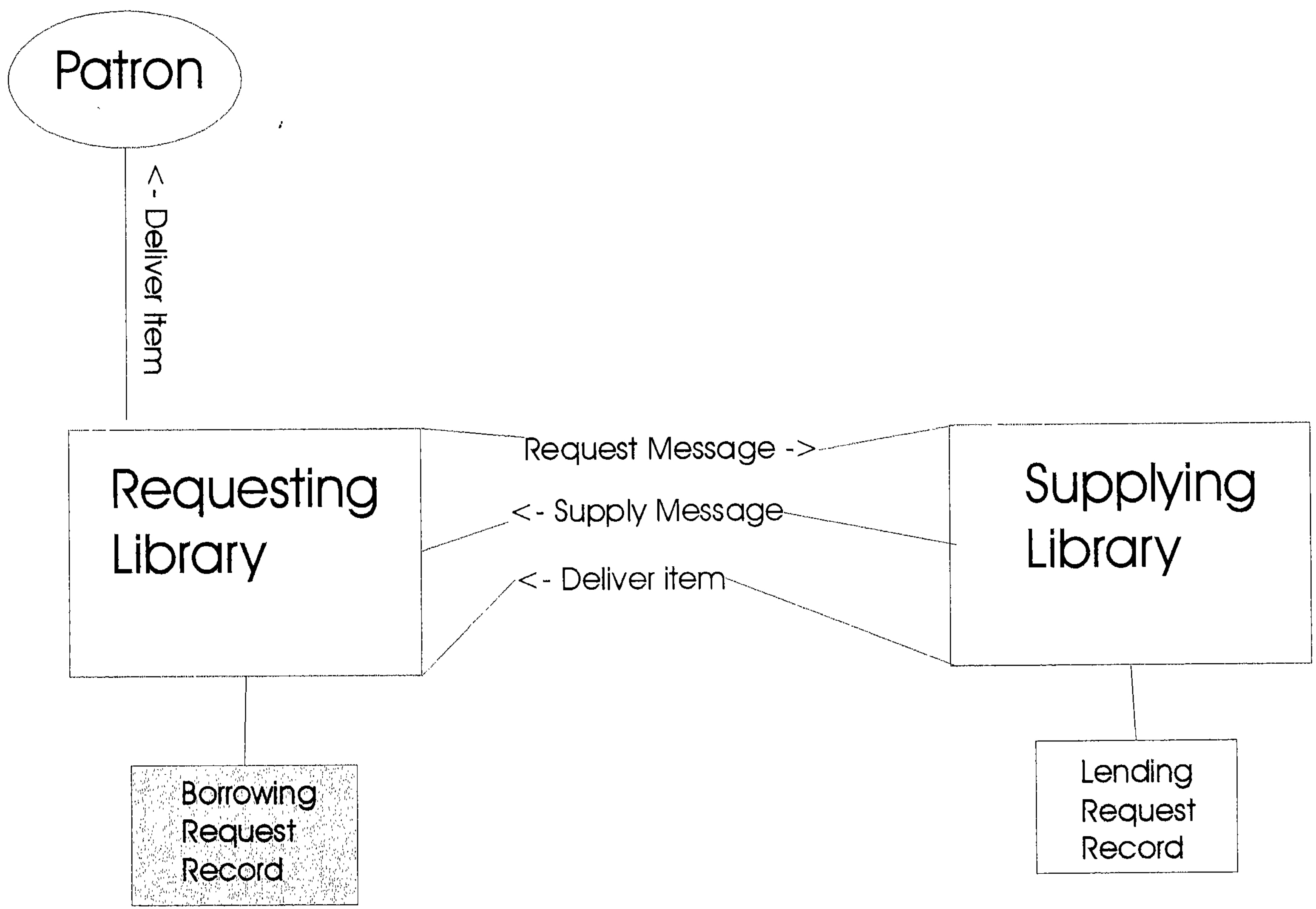
To issue a recall, locate the desired request by searching under the “Requests” option on the “Lender Home Base” OR by selecting the “Filled” choice from the “Work Queues” screen. Upon locating the request, select it by checking the check box and then press the “Other Responses” button. Press the “Recall” button. A feedback screen appears telling you what happened. The Sentinel and Networker manage the database updates, including the automatic state change, and the composition and sending of the Recall message to the borrowing library(ies) involved.

Appendix

Peer to Peer Model

WINGS System Environment

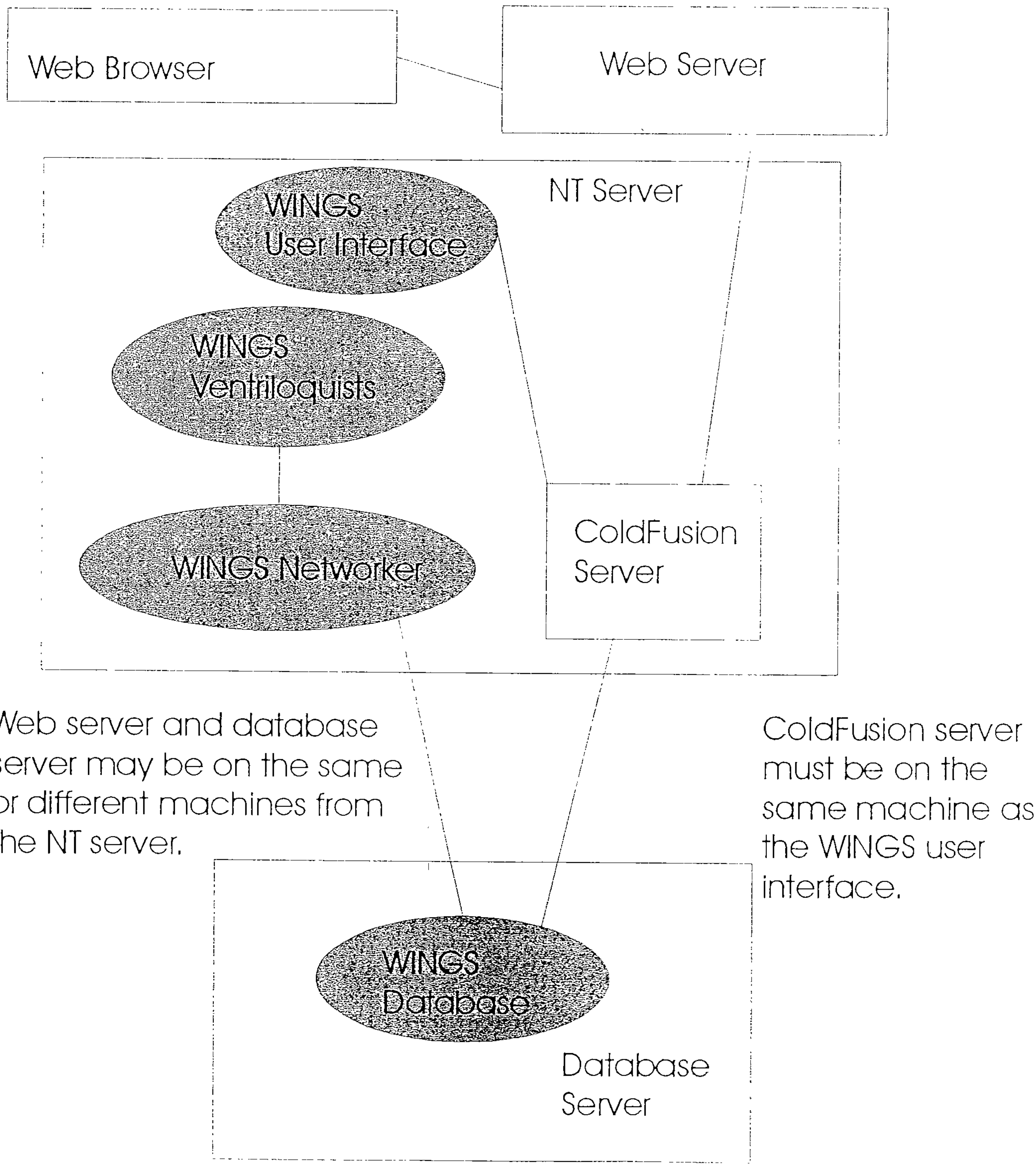
Wings Software Components



Peer to Peer Request Model - Non-Returnable Item

WINGS™ System Environment

The web browser is on the user's computer.



The WINGS™ System Software Components