System Administrator’s Guide - System Overview

Version 22
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1 System Architecture Overview

ALEPH is a library services agent, providing application services to clients via its APIs (Application Program Interfaces). ALEPH’s architecture is based on a multi-tier, client/server model. Client/Server communication is based on a stateless (self-contained) transaction model. Nonetheless, ALEPH Application Servers keep continuous connections (with time-out) to the database, to ensure high performance.

ALEPH features a flexible database design. Each ALEPH site is composed of seven interrelated, yet separate, units: Authority, Bibliographic, Holdings, Administrative, Interlibrary Loan, Course Reading and a system-wide administration unit. Each database unit can have many occurrences with many-to-many links to the other database units. ALEPH’s database design supports a wide range of database configurations and implementations, including independent installations of different units on different hosts. ALEPH's database design plays a crucial role in the system's scalability potential.

ALEPH’s architecture is based on a scaleable, distributed logic model and relies on an object-oriented design. Two key features of ALEPH’s architecture are:

Multi-tier, Client/Server model - ALEPH is split into logical segments with a clearly defined interface based on message passing. See Figure 1 below.

Modularity - The key notion of the distributed logic design that underlies ALEPH is modularity - both vertical (between tiers) and horizontal (within the tiers). This ensures that the system is easy to maintain and extend, and that new technologies and concepts can be quickly integrated.

ALEPH can be installed on the following platforms:

- SUN SOLARIS
- LINUX REDHAT
- IBM/AIX
- ALPHA UNIX
1.1 ALEPH Server Architecture

Multitier Architecture - OPAC

Figure 1

The ALEPH server is composed of the following tiers:

1.1.1 Presentation Services & Logic

Provides the interface with which the user interacts.

1.1.2 Application Logic

Application Servers tier - A front-end tier which is composed of dedicated servers for each interface. Each application server receives a query from a source client, translates the query to a uniform format and directs it to the relevant Application Service object (API). Once translated, all queries have the same format, regardless of their origin (Z39.50 client, ALEPH client, Web browser or standard character mode terminal).

Application Services tier (APIs) - The heart of ALEPH is the application services tier, composed of sets of APIs. The APIs provide library services for the different clients. For example, a FIND API provides FIND services to all clients after a FIND query is invoked at one of the clients (WWW, Z39.50, Telnet or ALEPH proprietary). As part of its open system architecture, ALEPH includes mechanisms to integrate new APIs as well as to extend the Application Services to other clients or applications. This provides considerable potential for extensibility.
1.1.3 Data Services and Logic

**ALEPH Database Middleware (or I/O Engine)** - This is a high level database management layer. A logical server provides data services to the application services objects. It contains a group of objects which intermediates between the application and the database. The I/O engine translates an application request to a sequence of database commands. In addition, the I/O engine provides SQL enhancement which is required because of the textual, non-formatted nature of library catalog data.

ALEPH's I/O engine also exploits the knowledge that the system has about the DBMS's special characteristics, in order to optimize data updating and retrieval. It is in this logical layer that ALEPH incorporates its experience and know-how of libraries' special data structures and formats.

Having an intermediate level of the I/O Engine between the application and the DBMS ensures maximum flexibility of DBMS logical and physical design.

**ALEPH Database** - The ALEPH database runs under Oracle RDBMS.

1.1.4 Other characteristics of ALEPH’s architecture:

**Network Orientation** - ALEPH's distributed logic is designed to fit into scaleable network configurations. With its Application Servers tier and Database Middleware tier (the I/O engine), ALEPH is suitable for intra-networking and inter-networking. ALEPH not only supports a range of clients access (WWW, Z39.50, ALEPH proprietary and Telnet clients) but also accommodates access to heterogeneous database resources.

Special features are included to overcome the diversity of databases: MATCH to locate remote/external documents, and Multi-FIND to broadcast a search across multiple databases. In addition, ALEPH includes enhanced functionality to support centralized, de-centralized and union catalogs.

**Scalability** - ALEPH's multi-tier, distributed architecture provides a wide range of scalability possibilities: distribution of data across disks/servers, distribution of services across servers or even a multi-server configuration with shared data.
2 ALEPH Unix Logins

The ALEPH server requires the following Unix users:

<table>
<thead>
<tr>
<th>Login</th>
<th>Home Directory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aleph</td>
<td>/exlibris/aleph</td>
<td>ALEPH administrator</td>
</tr>
<tr>
<td>oracle</td>
<td>$ORACLE_HOME</td>
<td>Oracle administrator (DBA)</td>
</tr>
</tbody>
</table>

The person who is in charge of all the libraries, the System Administrator, can log in as aleph, and thus will be able to modify the parameters and data of all libraries.

aleph – The ALEPH administrator (System Administrator and/or System Librarian) uses the aleph account for various online utilities and command line activity. The aleph user has access and control over all the libraries in the system.

oracle – The oracle DBA uses the oracle account for DBA activity outside the scope of online utilities UTIL O - Oracle Management and UTIL A - File Administration and Building.
3 ALEPH Directory Structure

3.1 The aleph Root Directory

An aleph root is composed of three types of directories:

1. ALEPH software
   alephm, aleph, tmp, log

2. Demo libraries
   usm01, usm10, usm20, usm30, usm50, usm60
   uni01, uni10, uni20, uni30, uni50, uni60
   (usm = MARC21, uni=UNIMARC)

3. Node management
   alephe

As part of the installation phase, the alephe directory (node management) is relocated to a different directory (for example u18_1). This directory will normally contain site-specific libraries as well. A sample scheme is given in Figure 3.
This structure supports the ability to upgrade the ALEPH software (under a18_1) without interfering with local customization (under u18_1).

In addition to the core software directories aleph and alephm, the system has directories which include management tables and parameter files pertaining to the specific installation (alephe), and to each of the libraries.

### 3.2 The alephe Directory

The primary directories in the alephe tree are:

- **tab**
  - node management tables
- **www_<type>_<lng>**
  - HTML files for Web OPAC, Web services, Course Reading and others
- **pc_b_<lng>**
  - GUI services
- **scratch**
  - intermediate files and logs
- **apache**
  - conf/htdocs/logs
- **error_<lng>**
  - messages that are displayed to the end user
- **gate**
  - Z39.50 setup
- **unicode**
  - tables which translate from and to Unicode
3.2.1 The Main Configuration File - aleph_start

aleph_start is ALEPH 500’s main configuration file. It contains definitions of ALEPH libraries (abc01, usm01, etc.) and environment variables. It also contains logical assignments (the only place with physical references to ALEPH directories).

aleph_start is in the aleph directory (cd $aleph_root).

In order for changes in aleph_start to take effect, you must exit ALEPH, re-login, and then restart the daemons and servers. Running aleph_shutdown stops all daemons and servers. Running aleph_startup restarts daemons and servers depending on definitions in aleph_start and aleph_start.private.

Following are primary portions of aleph_start:

```bash
setenv ALEPH_VERSION 18
setenv ALEPH_COPY 1
setenv ALEPH_APP_VERSION a${ALEPH_VERSION}_${ALEPH_COPY}
setenv ALEPH_REVISION 01
setenv WWW_SERVER_PORT 499${ALEPH_SUB_PORT}
setenv PC_SERVER_PORT 699${ALEPH_SUB_PORT}
setenv Z39_GATE_PORT 799${ALEPH_SUB_PORT}
setenv HTTPD_PORT 8991
setenv PDS_PORT 8991
setenv Z39_SERVER_PORT 999${ALEPH_SUB_PORT}

setenv usm01_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm10_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm11_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm12_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm14_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm15_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm19_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm40_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm23_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm30_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm50_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm51_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm60_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv usm90_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}

setenv pw_library USR00
setenv z105_library USR00
setenv usr_library USR00
```

Version information

Port definitions

Library definitions

Password library

Messaging library

User library
setenv QUE_STARTUP_LIBS "usm01 usm50"
setenv WORD_STARTUP_LIBS "usm01 usm50"
setenv REQUEST_STARTUP_LIBS "usm50"
setenv ACC_AUT_STARTUP_LIBS "usm01 usm50"
setenv MESSAGE_STARTUP_LIBS "usm01 usm50"

setenv SLNP_STARTUP_LIBS ""
setenv SIP2_STARTUP_LIBS "usm50"
setenv Z39_SERVER_STARTUP Y
setenv Z39_GATE_STARTUP Y
setenv OCLC_SERVER_STARTUP Y
setenv NCIP_SERVER_STARTUP Y

setenv ORACLE_SID aleph1
setenv ORACLE_OWNER oracle
setenv ORACLE_VERSION 11
setenv ORACLE_CONF ${ALEPH_MOUNT}/ora_aleph
setenv NLS_LANG American_America.UTF8
setenv ORACLE_HOME /aleph/app/oracle/product/102
setenv aleph_db $(ORA_HOST).${ORACLE_SID}

setenv aleph_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv alephm_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv alephe_dev ${USER_MOUNT}/u${ALEPH_VERSION}_${ALEPH_COPY}
setenv alephe_synch_dev ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}
setenv aleph_utf /tmp
setenv aleph_product ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}/product
setenv TMPDIR ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}/tmp
setenv LOGDIR ${ALEPH_MOUNT}/a${ALEPH_VERSION}_${ALEPH_COPY}/log

Note: Only lines that are above the following line can be configured:

### End of version and/or platform dependent setting ####

Everything under this line is hard coded.
3.3 Library Structure

Every ALEPH library (xxx01, xxx50, xxx60, etc.) has a separate root directory. The term “library” in ALEPH refers to three things:

- The physical library building with books and other materials
- An Oracle database user with tables of data
- A UNIX directory structure

Here is an example of a standard UNIX directory structure. Under the library root directory there are files and directories.

The primary files are:

- **file_list**: Configuration file for Oracle tables, indexes and objects. Refer to the ALEPH 500 System Administration Guide – Oracle for more details.
- **prof_library**: Library logical assignments

The primary directories are:

- **files/**: Export files (XXX01.exportSEQ.tar.Z)
  Dump files (znn.seqaa)
  Batch queue management (alias df1)
- **tab/**: Parameter and configuration tables (alias dt).
- **scratch/**: Scratch directory. Used for intermediate and log files (alias ds).
- **pc_tab/**: Parameter and configuration tables.
- **print/**: Print files (alias dp).
4 Library Utilities

Each library’s database is implemented within Oracle as a separate Oracle user. Each Oracle user owns a set of tables which contains the library’s data.

Each library has access to the ALEPH utilities by activating the util command from the prompt. The UTIL main screen will appear:

<table>
<thead>
<tr>
<th>Library Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. File Administration and Building</td>
</tr>
<tr>
<td>C. Monitor Batch Jobs</td>
</tr>
<tr>
<td>D. Online Store/Restore Administration</td>
</tr>
<tr>
<td>E. Monitor Background Jobs</td>
</tr>
<tr>
<td>F. View Procedures and Files</td>
</tr>
<tr>
<td>G. Tables for Defining Database Structure</td>
</tr>
<tr>
<td>H. Library and Installation Report (Files, Tables and Definitions)</td>
</tr>
<tr>
<td>I. Formatting Data (PC, WWW, Reports)</td>
</tr>
<tr>
<td>J. Web and Server Configuration</td>
</tr>
<tr>
<td>K. ILL Tables</td>
</tr>
<tr>
<td>L. GUI Tables</td>
</tr>
<tr>
<td>M. GUI CATALOGING Tables</td>
</tr>
<tr>
<td>N. Z39.50 Management</td>
</tr>
<tr>
<td>O. ORACLE Management</td>
</tr>
<tr>
<td>P. Unicode Tables</td>
</tr>
<tr>
<td>Q. Data Loading, Import and Export Tables</td>
</tr>
<tr>
<td>R. Multimedia</td>
</tr>
<tr>
<td>S. Statistics</td>
</tr>
<tr>
<td>T. Server Management (Monitor, Stop, Start, Log Files)</td>
</tr>
<tr>
<td>U. Clean Up</td>
</tr>
<tr>
<td>V. Node Management</td>
</tr>
</tbody>
</table>

Please select [exit]:

4.1 UTIL C - Monitor batch jobs

C. Monitor Batch Jobs
   ----------------
   0. Exit Procedure
      1. Check Library Running Process
      2. Start Library Batch Queue
      3. Stop Library Batch Queue
      4. Check Library Lock Status
      5. Lock Library
      6. Unlock Library
      7. Show Queue of Jobs Awaiting Execution
      8. Delete Entry from Queue of Jobs Awaiting Execution
      9. Alter Run Time of Job Awaiting Execution
      10. Display Logfile of a Batch Job
      11. Display Log List of Batch Jobs

Please select [exit]:

ExLibris Aleph
4.2 UTIL X - Clean Up

X. Clean Up
_____________________

0. Exit Procedure
  1. Clean alephe_scratch
  2. Clean data_scratch
  3. Clean data_files
  4. Clean TMPDIR
  5. Clean Server Log Files
  6. Clean apache_media
  7. Clean utf_files Directory
  8. Clean Virtual Library (VIR01)
  9. Clean data_print
 10. Clean ora_media_in/out

Please select [exit]:

These utilities delete scratch files from various directories on the Unix server.

Note: before running the utilities you might need to close ALEPH servers, batch queues and daemons.
5 Servers, Daemons, Batch Jobs and Problem Diagnosis

There are various ALEPH servers and daemons:

- www_server
- PC server
- Z39.50 servers
- OCLC server
- Self-check server (SIP2)
- ue_daemons
- Batch jobs
- NCIP Server
- ILL Server
- SRU Server

Conventional servers’ port numbers are:

- WWW server (Web) 4991
- PC server (GUI) 6991
- Z39.50 server 9991
- Z39.50 gate 7991
- Generic server (OCLC server) 5771
- Self-check server (SIP2) 5331
- NCIP 5991
- ILL Server 5551
- Apache 80
- SRU Server 5661

5.1 UTIL W - Server management (Monitor, Stop, Start, Log files)

The server management utility shows you which servers are running and has dialogues for starting and stopping the servers.

W. Server Management (WWW,PC,Z39)
---------------------------------------
0. Exit Procedure
1. Monitor Servers
2. Stop Servers
3. Start Servers
4. View Log File
5. View/Update Global System status

Please select [exit]:

ExLibris Aleph
5.2 Server Logs

The logs of the various servers are written to the $LOGDIR directory.

The log names are prefixed with the server type. For example pc_ser_<port>.

The log files contain statistics and any other input from the servers. They are useful for debugging and analyzing.

When a new server is executed the old log files are renamed with a date/time extension, for example:

Oct 20 12:10 www_server_4991.log.2010.1210

Apache server logs are written to ..../alephe/apache/logs.

5.3 Starting Your Own Server for Testing

When testing or analyzing reproducible problems, it is frequently best to start your own instance of the server rather than use an existing one. (This way the log entries for your transactions are not mixed in with those for other transactions.)

For example:

Web

The syntax for starting your own Web server is:

www_server <server-port> <apache-port> <num-servers> [stdout]

For example:

www_server 4123 80 1 stdout

stdout specifies that you want the server output (log) to be displayed on your display terminal.

To use your own Web server enter the URL

http://<URL>:<server-port>/<type>

In our example, to use the Web OPAC enter

http://<URL>:4123/F

GUI

The syntax for starting your own GUI server is:

pc_server <port number> stdout

For example:
pc_server 6123 stdout

stdout specifies that you want the server output (log) to be displayed on your display terminal.

Specify 6123 as the address in your PC’s ..\Alephcom\Tab\library.ini file, instead of 6991.

5.4 PC Client / PC Server

Configuration of the pc_server is performed using UTIL J/5 Definition of Defaults for PC Server Defaults (pc_server_defaults).

When a problem occurs in the GUI it can be with either the client or the server (the PC server).

Error messages may have been generated by the PC client or they may have been sent from the server. Certain kinds of messages clearly indicate a problem on the PC side. These include: GDI failure; Dr. Watson's; and General Protection Faults (GPF). With such problems, make sure that the GUI client is at the same service pack level as the server you are trying to connect to and make sure that the PC has sufficient free memory and disk space.

Other error messages such as Remote file error (global-xx); Remote service error; or Failed to read reply are passed from the server and indicate a problem on the server.

Here is how the PC and the PC-server interact:

5.5 Connecting

When you start the first GUI module on your PC, if you have not saved your logon identification on the client, the software prompts you for a user name and password. It checks all the servers listed in the ..\Alephcom\Tab\library.ini file. If this user name/password isn't valid on any of the servers it can connect to, the message Password not verified on connectable hosts is displayed. This indicates either that this user name/password is not valid; OR that the address specified in the ..\Alephcom\Tab\library.ini is wrong; OR that the pc_server specified in the library.ini entry is down.

Assuming that the password is verified, you then connect to a library. Select File / Connect from the main menu. The system displays the libraries listed in the module's per_lib.ini file, for example, ..\Circ\Tab\per_lib.ini. When you click on a particular library (or base), the client software goes to the ..\Alephcom\Tab\library.ini file and tries to connect to the IP address specified for this library.

Service Requests
(Note: See the ALEPH Staff User Guide, available from the Ex Libris Documentation Center, for documentation of each GUI module.)
The functions you perform on the PC generate service requests for the PC server. The `pc_com/pc_server` program processes all incoming requests. It checks the license date, user limit, and so on, and passes control to the program specified in the service request. For example, if the service request is `c0511` and the module is `acq`, it passes control to the `pc_acq/pc_acq_c0511` program. Just before doing this it writes an entry to the `pc_server` log:

```
SERVICE:     C0511
MODULE:      Acquisition Services
DESCRIPTION: Invoice Header Information
ACTION:      GET
PROGRAM:     pc_acq_c0511
```

The text for the description comes from the `../alephm/proc/pc_service.dat` file. This file shows all available services. Each service is self-contained. Though the program may call other non-service programs in the course of its processing, it is the PC which initiates each service call.

The `pc_xxx_cnnnn` programs call the `com/service_error_message` routine, passing a specific error number as a parameter, in order to generate text for error messages. The `service_error_message` reads the `../alephe/error_<lng>` file to get the text for this program for the specific error number.

For example, if there was an error `0101` in `pc_acq_c0511`, the `service_error_message` would read the `../alephe/error_<lng>/pc_acq_c0511` file and find this entry:

```
0101 0005 L Invoice Net Amount must be numeric.
```

(An error message such as `Error 21 Not defined for service C0204 in pc_cat_c0204` indicates that there is no line with text for the `0021` error in the `$aleph_root/error_lng/pc_cat_c0204` file when there should be.)

### 5.6 Analyzing PC Server Problems

There is normally just a single PC server (6991). Multiple logs for this server (for example, `pc_ser_6991`) in a time period when the server was not stopped intentionally (for example, for a backup) indicate a server failure. To get more information than what you see in the `pc_ser_xxxx` file type:

```
pc_server view <port number> <number of lines>
```

For example

```
>>pc_server view 6991 25
```

(The fact that the PC server is stateless means that each transaction is self-contained. The transaction can be caught and simulated without a client.) When you get the number of the problem **IN** transaction, such as `55459 IN`, type:
pc_server check[x] <port number> [<line number>]

For example

```
pc_server check 6991 55459
```

or (if the DATA line you see is truncated and you want to see the rest):

```
pc_server check[x] <port number> [<line number>]
```

For example

```
>>pc_server check[x] 6991 55459
```

Note that in cases where the transaction is performing an update, execution of `pc_server check` will cause the update to be performed again.

**Example:**

The system does not have a catalog package for some reason, that is, `$data_root/pc_tab/catalog/pc_cat.pkc` is missing. When connecting to the **Cataloging** module the error message *Failed to read reply* appears. This means that the server could not handle the abnormal situation. Type:

```
M201>> pc_server view 6991 10
```

and you will see:

```
1132 IN 2710 Mon 21-11-2011 14:44:33 010.001.049.132 010001049132TEST;TEST;default;25b0d562-2b3e-478b-b282-7d57d0d9b9fc;CAT;N; C0201 NEW MAB01GERCITEST 000000
```

This reveals that transaction number 4078 called function C0513 (Acquisition Services).

For more details use:

```
M201>> pc_server view 6991 10
```

and as part of the output you will see:

```
SERVICE : C0201
MODULE   : Catalog Services
DESCRIPTION: Connect and Check Tables Date
ACTION   : NEW
PROGRAM  : pc_cat_c0201
Load: /exlibris/aleph/a20_3/alephe/tab/tab_system_status
check_permission debug mode is on
check_permission CITEST MAB01( ) > - v
```
Now it is obvious that **UTIL M/7 Update Tables Package** should be activated in order to create the catalog package.

**Note:** Even if you cannot understand the error, it is best to catch the transaction and put it aside for further handling by Ex Libris Support. This can be done with the following sequence of commands:

```
ALPH>> cd $LOGDIR
ALPH>> tail -10 pc_ser_6991 > my_transaction_file
```

**Note:**
To use the `pc_servet view` and `pc_server check`, set the "pc_transactions_log" variable to "Y" in "pc_server_defaults".

---

### 5.7 PC Server Configuration (pc_server_defaults)

#### 5.7.1 Max Response Time

If you have a problem with transactions timing out, increasing the `aleph/pc_server_defaults PC_SERVER_MAX_RESPONSE_TIME` value might help.

The only downside is that problematic transactions (transactions which are looping, etc.) may run even longer. So before changing the `PC_SERVER_MAX_RESPONSE_TIME` value, make certain that the problematic transactions are not due to a lack of the appropriate Oracle indexes: compare your `xxxnn` library's `file_list` to the `usmnn`'s `file_list`.

#### 5.7.2 Backend Servers

The `aleph/pc_server_defaults PC_NUM_SERVER` parameter determines how many backend servers are running. The default value is 5.

### 5.8 ue daemons

Certain utilities can be initiated to execute as daemons, constantly checking to see if work needs to be done. These are:

- `ue_01` indexing daemon
- `ue_06` request handling
- `ue_08` update BIB ACC from AUT
- `ue_11` messaging daemon
- `ue_21` Publishing Utility
- `ue_13` OAI Harvester
- `ue_17` ILL Server Daemon
- `ue_19` ILL Automatic Processing
5.9 Batch jobs

(Note: For detailed information on batch jobs which build indexes, please consult the document, How To Run Index Jobs available on the Ex Libris Documentation Center.)

Batch jobs are executed either periodically (daily, weekly, etc.) or on request. They may be initiated via the Services menu in the GUI or the utilities UTIL E/15 Managing Job Daemon and UTIL E/16 Update Daemon Job List.

5.10 Services

Each GUI module has a Services menu. This option lets you submit batch jobs from a menu, choosing the values you want for each parameter. The submission screens which you see are in the ../alephe/pc_b_<lng> directory (unless directed elsewhere in path_convert) and may be modified. As is the case with the www_a_<lng> Web OPAC screens, the system checks first for a suffixed version and then looks for a non-suffixed version.

When you submit the job from a particular window, the system calls the corresponding program to process the service. If errors are found in the parameters, an error message will be displayed. Otherwise the message Job submitted to queue will be displayed.

The job will then be placed in the batch queue of the library for which it was submitted. If the library's batch queue is running, then the job will be executed and will show up under UTIL C/1 Check Library Running Process as being executed.

The job will appear in UTIL C/1 Check Library Running Process with its parameters. In this example the batch service is cir-51 Overdue and Lost Billing Summary Letter:

```
aleph 31696 59116 43 18:24:25 pts/12 0:00 csh -f /exlibris/aleph/a18_1/aleph/proc/p_cir_51
EXU50,ovrdustaf,N,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,14,00,Y,Y,N,0,4,0,0
```

The p_cir_51 component is the procedure which is being executed. The procedures are in the aleph/proc directory. ../aleph/proc/p_cir_51 executes three different programs:

```
cobrun b_cir_51_a
cobrun b_cir_51_b
cobrun b_cir_51_e
```

Print templates are stored in usm01/form_<lng>. All formats are taken from XSL files.

Any printed output produced by the batch job will be in the library's print directory (for example, ../usm50/print). The name of the output file is controlled by the Output File value on the submission screen. The log of the job will appear in the
../alephe/scratch directory under the name of the process (in our example, usm50_p_cir_51.00138).

For more information on forms, see the document Customizing Printouts (XML and XSL) - 17.pdf and the Printing chapter in the ALEPH Staff User’s Guide available on the Ex Libris Documentation Center.

For detailed information on batch jobs which build indexes, see the document, How To Run Index Jobs available on the Ex Libris Documentation Center.

5.11 Job List
Jobs which need to be run on a periodical basis can be placed in the job_list file. Use UTIL E/15 Managing Job Daemon and UTIL E/16 Update Daemon Job List.

5.12 cron Jobs
"cron jobs" are similar in principle to the ALEPH job_list described in the preceding section, except that their control and maintenance are outside of ALEPH.

5.13 www_server (Public)
The WWW server for Web OPAC is accessed via http://<URL>/F. For example: http://ram11:8991/F.
The Web OPAC is an interface for accessing and searching an ALEPH 500 online catalog via the HTTP Internet standard. The Web OPAC allows a patron either to enter the system as a guest user, or to sign in, thereby activating his customized profile.

UTIL J - Web and Server Configuration is used for several www_server configurations. This includes messages to Web OPAC users (www_f_heading); sort types for display in Web OPAC (www_f_sort_heading); and definitions for server defaults (www_server.conf).

The Web OPAC screens are in the ./alephe/www_f_eng directory. See List of Web OPAC HTML Files for a description of each file and Web OPAC Screens – Structure and Customization explains how to customize the screens. These documents are available on the Ex Libris Documentation Center.

5.14 www_server (Staff)
The WWW server Staff Menu is accessed via the address http://<URL>/S. For example, http://ram11:8991/S:
OPAC – Access to the ALEPH 500 online catalog.

Ex Libris Documentation Center - a link to the Ex Libris Documentation Center.

Utilities – Utilities that are used to view/update the Chinese dictionary (the dictionary is used for translation for filing and for word breaking) and to view/update Synonym groups (Synonym groups are optional for word indexing).

5.15 Z39.50 Servers

UTIL N - Z39.50 Management is used for Z39.50 gate and server configuration. See the Z39.50 documentation available on the Ex Libris Documentation Center.

5.16 OCLC Servers

OCLC records can be dynamically loaded into ALEPH from a PC connected to OCLC with the OCLC Passport, OCLC CatME or OCLC Connexion software. Please consult the document, How To Load OCLC Records into ALEPH available on the Ex Libris Documentation Center.

5.17 SIP2 Server (3M Standard Interchange Protocol)

This protocol provides a standard interface between a library's Automated Circulation System (ACS) and library automation devices.

Self-check systems enable library patrons to borrow and return materials without the assistance of library staff, usually by means of scanning the barcodes on the item and on the patron's library card.

See the document, How To Set Up a SIP2 Server for Self-Check Systems available on the Ex Libris Documentation Center.
5.18 NCIP Server (NISO Circulation Interchange Protocol)

This standard defines a protocol that is limited to the exchange of messages between and among computer-based applications to enable them to:

- Perform the functions necessary to lend and borrow items.
- Provide controlled access to electronic resources.
- Facilitate co-operative management of these functions.


5.19 Interlibrary Loan Server (ILL Server)

The Interlibrary Loan Server is a server that participates in handling ISO ILL transactions. It is essential for handling ILL processes that support ISO 10160 and 10161 standards via the ILL module.

The ILL Server performs three major tasks in the process of handling an ISO ILL transaction:

1. Receiving the ILL APDUs (Application Protocol Data Units) and decoding them.
2. Storing the packets received by the local server, as indexed documents in the ILLSV library.
3. Logging APDUs sent from the local server. This is also done in the ILLSV library.

The ILL Server is the link between the ILL module and the communications system by which the ILL APDUs are delivered, translating protocol packets into library documents.

5.19.1 Running the ILL Server

The ILL Server is managed in the same manner as other servers, such as the PC Server and the WWW Server, using **UTIL W Server Management**. In each procedure, the ILL Server is listed under **Other Server**.
5.19.2 The ILLSV Library

Once ISO ILL APDUs have been received and decoded they are written as documents into a library named ILLSV. This library stores the packets received by the local server as indexed documents.

There are two types of fields in the record:

1. Fields with a numeric tag – These are the bibliographic fields expanded from the APDU.
   
   **Example:** 245 L $$aSpiders of Britain

2. Fields with the ILL tag. These fields are the exact fields of the APDU. They always have a subfield a with the name of the tag in the APDU, and a subfield b with the value.
   
   **Example:** ILL L $$aIllRequest.ClientId.ClientName$$bABEP

Records logged in the ILL Server that have a 466 field with a subfield a value of LOG, are APDUs sent from the local server. For example:

466 L $$aLOG$$bREQUEST$$c20031026

All other records are APDUs received from other servers.

5.20 SRU Server

SRU (Search/Retrieve via URL [http://www.loc.gov/standards/sru/](http://www.loc.gov/standards/sru/)) is a standard search protocol for Internet search queries, utilizing CQL (Common Query Language), a standard query syntax for representing queries.

An SRU request is a HTTP URL. It consists of a base URL and a search part, separated by a question mark. The search part consists of parameters separated by an ampersand, each with structure "key=value".

For example, consider the SRU request:

http://localhost:5661/usm01?version=1.1&operation=searchRetrieve&query=dinosaur

The base URL is:

http://localhost:5661/usm01 and the search part is:

version=1.1&operation=searchRetrieve&query=dinosaur.

The response to an SRU request is an XML document.
5.21 Apache

5.21.1 Configuration
Apache configuration files are placed in the $alephe_root/apache/conf directory. The main apache configuration file is:
-rw-r--r-- 1 aleph exlibris 9454 May 31 10:46 httpd.conf

The Apache SSL configuration file is:
-rw-r--r-- 1 aleph exlibris 5177 May 8 10:57 ssl.conf

5.21.2 Start/Stop
Use the scripts below to start and stop Apache.

5.21.3 Startup:
   cd $alephe_root/apache/bin
   ./apachectl start

5.21.4 Shutdown:
   cd $alephe_root/apache/bin
   ./apachectl stop

Note:
Customers running Apache as root must use the `./apachectl_auto` command, placed in the same $alephe_root/apache/bin directory, instead of apachectl start.

5.21.5 Monitoring
Use the Unix `ps` command with the following flags:
- For Linux:
  `ps -efw | grep http | grep aleph`
- For SUN or AIX:
  `ps -ef | grep http | grep aleph`

The output of this command displays several http processes:

```
aleph  18401  11964  0 Jun08         00:00:00
/exlibris/aleph/a21_1/product/local/apache/bin/httpd -d
/exlibris/aleph/u21_1/alephe/apache
aleph  19052  11964  0 Jun08         00:00:00
/exlibris/aleph/a21_1/product/local/apache/bin/httpd -d
/exlibris/aleph/u21_1/alephe/apache
```

5.21.6 Log files
Apache log files are placed in the $alephe_root/apache/logs directory. The Apache access log file can be updated by any connection to apache:

```
$alephe_root/apache/logs /access_log
```

Apache SSL access log:

```
$alephe_root/apache/logs /access_log_ssl
```

The Apache error log file is updated by apache start or stop or if any error occurs while apache is running:

```
$alephe_root/apache/logs /error_log
```

Apache SSL error log:

```
$alephe_root/apache/logs /error_log_ssl
```
The Apache PID file contains a process ID for the currently running apache. This file exists only when apache is up and running; it is removed by apache shutdown and created again by apache startup:
$alephe_root/apache/logs / httpd.pid

6 Automatic Startup/Shutdown of All Aleph Components

The mechanism for the automatic start up and shut down of all Aleph components is implemented with the initial Aleph installation.

The automatic startup/shutdown mechanism is activated by the
/etc/init.d/exlibris script with links created in special OS directories.

- For Red Hat Linux OS:
  lrwxrwxrwx 1 root root 18 Jan 4 2010 /etc/rc0.d/K10exlibris -> ../.init.d/exlibris*
lrwxrwxrwx 1 root root 18 Jan 4 2010 /etc/rc1.d/K10exlibris -> ../.init.d/exlibris*
lrwxrwxrwx 1 root root 18 Jan 4 2010 /etc/rc2.d/S98exlibris -> ../.init.d/exlibris*
lrwxrwxrwx 1 root root 18 Jan 4 2010 /etc/rc3.d/S98exlibris -> ../.init.d/exlibris*
lrwxrwxrwx 1 root root 18 Jan 4 2010 /etc/rc4.d/S98exlibris -> ../.init.d/exlibris*
lrwxrwxrwx 1 root root 18 Jan 4 2010 /etc/rc5.d/S98exlibris -> ../.init.d/exlibris*
lrwxrwxrwx 1 root root 18 Jan 4 2010 /etc/rc6.d/K10exlibris -> ../.init.d/exlibris*

- For SUN Solaris OS:
  lrwxrwxrwx 1 root root 20 Sep 8 2010 /etc/rc0.d/K10exlibris -> /etc/init.d/exlibris*
lrwxrwxrwx 1 root root 20 Sep 8 2010 /etc/rc2.d/S96exlibris -> /etc/init.d/exlibris*

Note:
All files and links in the server root directories are created automatically during the initial Aleph installation and should not be changed or removed.

The tool performs a startup/shutdown of each Aleph component placed in the
/exlibris/startup directory and contains the following components:
- init.dat – the configuration file
- start_stop – the startup/shutdown tool

6.1 Startup Configuration

Perform any changes necessary for maintenance of startup and shutdown Aleph components in the /exlibris/startup/init.dat configuration file only. We highly recommend that you save a side backup of this file before making any changes.

The following is the structure of the init.dat file:

# oracle
Y:oracle:oracle:/exlibris/app/oracle/product/1122
This file contains setup definitions for the startup/shutdown of each component (Oracle DB and listener, apache, and Aleph application services) in the relevant section. The setup includes the following fields:

- Activate or not startup/shutdown mechanism of the component
- Component name
- Owner (Unix user name)
- Placement
- Startup routine name (for apache and application only)
- Shutdown routine name (for apache and application only)

In the example above, the setup values for Aleph are the following:

<table>
<thead>
<tr>
<th>Activate or not startup/shutdown mechanism for the component</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component name</td>
<td>aleph</td>
</tr>
<tr>
<td>Owner (Unix user name)</td>
<td>aleph</td>
</tr>
<tr>
<td>Configuration placement</td>
<td>exlibris/aleph/u21_1</td>
</tr>
<tr>
<td>Startup routine name (for apache and application only)</td>
<td>aleph_startup</td>
</tr>
<tr>
<td>Shutdown routine name (for apache and application only)</td>
<td>aleph_shutdown</td>
</tr>
</tbody>
</table>

To exclude one or more component (Oracle DB and listener, apache, and Aleph application services) from the automatic startup/shutdown mechanism, edit the /exlibris/startup/init.dat file.

The following is an additional example of two Aleph copies installed on the same server, when only copy 1 should activate automatically:

```
# oracle
Y:oracle:oracle:/exlibris/app/oracle/product/1122

# apache
Y:apache:aleph:httpd:/exlibris/aleph/u21_1:../a21_1:apachectl_auto:apachectl
N:apache:aleph:httpd:/exlibris/aleph/u21_2:../a21_2:apachectl_auto:apachectl

# aleph
Y:aleph:aleph:/exlibris/aleph/u21_1:aleph_startup:aleph_shutdown
N:aleph:aleph:/exlibris/aleph/u21_2:aleph_startup:aleph_shutdown
```

6.2 Manual Startup/Shutdown

Manual startup/shutdown for all components can be done using the mechanism described above.

Connect as root user:
su - root

To activate the shutdown command:
   cd /exlibris/startup
   ./start_stop stop
Wait until all components are shut down and perform relevant maintenance.

To activate the startup command:
   cd /exlibris/startup
   ./start_stop start
Wait until all components start up and check the application.

To start up or shutting down each component separately, refer to the following documents:
- Oracle – Refer to the UTIL O/1/1 and UTIL O 2/2 sections of the Aleph System Administration Guide.

The following is the correct order for starting up all components:
1. Oracle
2. Apache
3. Application
Be sure that each component is up and running before proceeding with the next one.

The following is the correct order for shutting down of all components:
1. Application
2. Apache
3. Oracle
Be sure that each component is down before proceeding with the next one.