

NILDE Technical Description

The NILDE (Network for Inter-Library Document Exchange) system is a web-based Inter-Library Loan (ILL) software for libraries and end-users. It allows libraries to manage the entire workflow of ILL activities, both borrowing and lending, through the provision of synthetic and analytical statistics, ILL performance indicators “fill-rate” and “turn-around time”, and support for secure electronic delivery of documents.

NILDE is currently used by more than 750 Italian university, public research and medical libraries and 18,000 end-users.

NILDE was conceived in 2001 by the Library of Italian National Research Council’s (CNR) Bologna Research Area in the framework of the CNR BiblioMIME project. Since then, it has been used by a growing community of libraries which has stimulated the continuous development of innovative features to improve the ILL service, on the base of sharing good practices, tools and common policies.

NILDE web site is: <https://nilde.bo.cnr.it>

1. NILDE Software Modules

The following functionalities are made available to each library:

- Borrowing and Lending Modules to send and receive ILL requests to/from libraries and end-users
- History and Statistics Modules, providing syntetic and detailed reports on the document requests carried out between libraries and performance indicators such as “fill-rate” and “turnaround time”
- End-user Reference Manager and Library User Manager Modules to support the communication between end-users and library
- SEDD (Secure Electronic Document Delivery) Module, based on an digital HardCopy Module for the transformation of PDF-text documents into images
- Multilingual user interface (currently available in English, Italian, French and Spanish)
- NISO OpenURL 1.0 compliance for linking with the most important bibliographic databases and link resolvers (PubMed, Scopus, Web of Science, Ex Libris SFX, Ebsco Linksource etc.)
- Z39.50 and MARC XML compliance for dynamic searching the Italian union catalogs
- Shibboleth 2 compliance to support Single SignOn (SSO) and institutional authentication (NILDE is partner of the Italian IDEM federation)

2. NILDE System Requirements

NILDE runs on a Debian 6 (Squeeze) Linux server with Apache2 Web Server and MySQL 5 database. NILDE's software source code is written using PHP 5, Javascript and Java 1.7 and also uses:

- 1.1. Prototype 1.6.1 [www.prototypejs.org] as AJAX framework
- 1.2. Script.aculo.us 1.8.1 [<http://script.aculo.us>] for some graphic dynamic effects.
- 1.3. The web graphic interface uses XHTML and CSS 2.

The NILDE server also needs the following packages, freely available on official Debian repositories, used to implement the Z39.50 protocol:

- 1.4. PHP Pear package
- 1.5. File_Marc 0.6.2 CPAN Module (used for reading MARC files through the Z39.50 protocol)
- 1.6. YAZ package (used for connection with Z39.50 catalogs)
- 1.7. PDFOne (for Java) TM v5.0.0.123 is used within the digital HardCopy Module (under Gnostice [http://www.gnostice.com/PDFOne_Java.asp] Professional License)

3. NILDE Secure Electronic Document Delivery (SEDD), including the Digital HardCopy Module

NILDE allows a library to send a requested document to another library in a secure way via Internet (using the NILDE SEDD built-in Module), or fax or surface mail, or using another SEDD system (e.g., like Ariel). In these latter cases (fax, surface mail, Ariel delivery) NILDE just keeps the database updated and sends an informative e-mail to the requesting library, without performing any other action.

In case the lending library has the license to, and chooses electronic delivery, NILDE performs SEDD by the means of a file-uploading/Web-server which accepts the following file-formats only: *PDF, JPG, JPEG, GIF, TIFF, TIF, BMP, PNG*. The operator selects the digital document from a web form and sends it to the recipient. NILDE saves the file in a web-server disk space, processes it through the digital HardCopy procedure (which is performed on all PDF files), then makes available the digital document to the requesting library by the means of the NILDE user-interface. The requesting library needs to authenticate into the NILDE system to view the received document and to print it; the document file will be immediately destroyed from the NILDE server, after printing it. In anycase, it will be removed from the NILDE server after 7 days (unless the requestig library has printed it before).

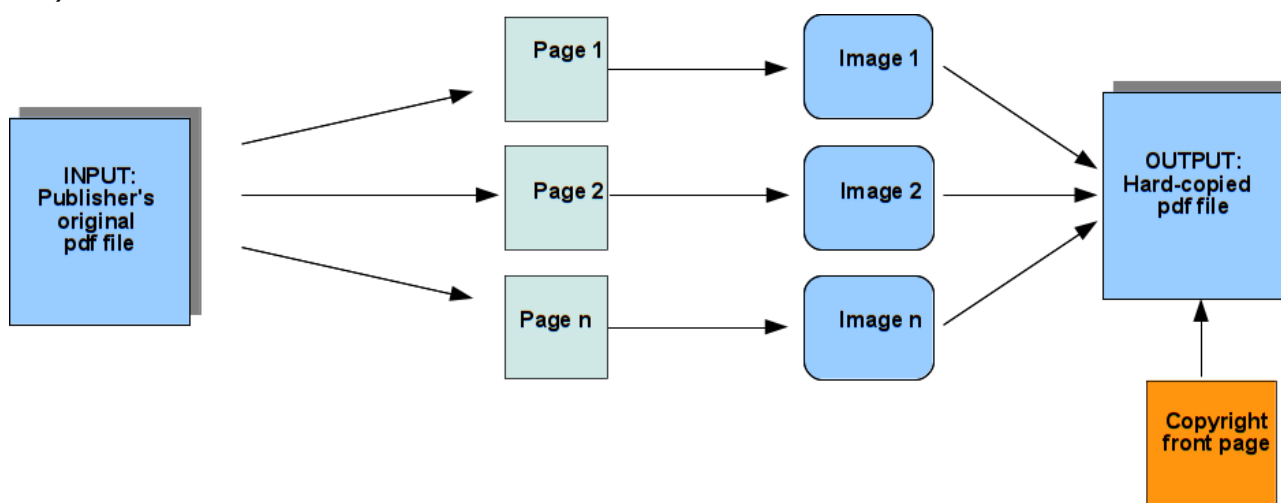
3.1 NILDE digital HardCopy Module

The NILDE digital HardCopy is a software module which is part of the SEDD Module. It processes PDF files only.

In fact, many publishers which allow for SEDD of their electronic material, do not allow to perform it on original PDF files, but only on the printed copy of them. This is to guarantee that a copy used for ILL is a real 'image-copy' that has lost all the peculiar PDF's capabilities on electronic text, such as text search and retrieval, text selection-copy-and-paste, etc... (we call the publisher's original file 'the text PDF'). In this case, the manual operations a librarian has to perform are: to print the PDF; to digitize the printed copy by the means of a scanner, so obtaining a new PDF-image file; to use for SEDD the PDF-image file (we call it 'the hard-copied PDF').

The NILDE digital HardCopy module emulates those manual operations, implementing a three-steps process:

1. The first step extracts each single page from the text-PDF (INPUT file) and transforms it in a PNG image file, using the Gnostice PdfOne for Java software library¹. In such a way all the page contents (text, images, etc..) are combined to obtain a single rasterized image, having a fixed resolution of 200 dpi (this is an acceptable compromise between printing/reading quality and the image file size). This also should guarantee that the final document which is sent to the requesting library is not a "perfect" digital copy of the original PDF file, since it has a lower quality.
2. The second step combines all the obtained PNG image files into a new PDF file (OUTPUT file).



¹About the Gnostice PDFOne (for Java)™ v5.0.0.123:

Currently the NILDE digital HardCopy module uses a trial version of the PDFOne library, which has been tested and evaluated by the NILDE software development team for several months. The test highlighted very good performances in 90% of cases, and some problems in the PDF to image conversion process, which have been reported to Gnostice developers, in order to be solved in their next software release.

3. Finally, a “copyright” front page is added to the OUTPUT file, containing the bibliographic data, the ILL transaction information (such as the borrowing and lending libraries, and dates), and a copyright notice. In the future, we plan to add the publisher's license information.

Such a “digital” HardCopy process, implemented by NILDE, is equivalent to the three-steps manual operations previously mentioned:

- a) publisher's PDF print,
- b) scanner acquisition of the printed pages,
- c) creation of a new 'hard-copied' PDF from the scanned images.

Digital HardCopy limits:

Max input file size: 15 MB

Max output file size: 30 MB (output file size is always bigger than the input file, depending on the quantity of its text characters and images).

In case the output file size exceeds the limit, or software errors occur during the output file creation, the requesting library will be notified about the impossibility of receiving the document through NILDE SEDD, and will be invited to request it again specifying a different way of delivery, such as surface mail or fax.

Synthesis of NILDE SEDD characteristics

Sending (Lending) library:

Allowed file formats : PDF, JPG, JPEG, GIF, TIFF, TIF, BMP, PNG

Maximum file size: 15 MB

Receiving (Borrowing) library:

Access to file: via NILDE authentication (username and password)

Allowed operations on the received file: View and Print

Received file format: graphic only– PDFs are transformed in PDF-image files

Image resolution: 200 dpi (it is usually lower than the original)

Maximum file size: 30 MB

File is removed from the NILDE server after 7 days, or immediately after the library has printed it

Copyright notice: YES

Two sample INPUT and OUTPUT files are attached to this document, to demonstrate the NILDE digital HardCopy.

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