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Using J-ISIS in a Local Network

1. Introduction

J-ISIS uses TCP/IP protocol to communicate between computers. TCP/IP like most computer protocols, merely provides basic mechanisms used to transfer data. In particular TCP/IP allows a programmer to establish communication between two application programs and to pass data back and forth. Thus, we say that TCP/IP provides peer-to-peer communication. The peer applications can execute on the same machine or on different machines. In practice, one organizational method dominates the use of TCP/IP to such an extent that almost all applications use it. The method is known as the client-server paradigm. In fact, client-server interaction has become so fundamental in peer-to-peer networking systems that it forms the basis for most computer communication.

The client-server model solves the *rendez-vous* problem by asserting that in any pair of communicating applications, one side must start execution and wait (indefinitely) for the other side to contact it.

Because TCP/IP does not provide any mechanisms that automatically create running programs when a message arrives, a program must be waiting to accept communication before any request arrive.

Thus, to ensure that computers are ready to communicate, most system administrators arrange to have communication programs start automatically whenever the operating system boots. Each program runs forever, waiting for the next request to arrive for the service it offers.

TCP/IP was chosen because it allows different computers, with different operating systems, hardware architectures, different local area network mechanisms, all around the world to interoperate seamlessly.

Designing Applications For A Distributed Environment

The goal of distributed computing is to provide an environment that hides the geographic location of computers and services and makes them appear to be local.

The TCP/IP protocol suite includes many application protocols, and new application protocols appear daily. In fact, whenever a programmer devises a distributed program that uses TCP/IP to communicate, the programmer has invented a new application protocol. And this is the case for J-ISIS.

J-ISIS is a message-oriented system, as its name implies, it uses discrete messages to communicate with TCP/IP protocol, much as individuals in a corporation use email to communicate and corroborate. The client creates a message, and sends it to the server, which accepts the message. At this point, the first phase of the conversation is complete, with no expectations left on either side. The recipient can respond, or not, depending on what request was coded in the message (get record with MFN for example).

Concurrency

Users at multiple computers may choose to access a given service at the same time. When they do, each user expects to receive a response without delay. To provide quick response and handle many requests, a computer system that supplies an application service must use *concurrent processing*. That is, the provider cannot keep a new user waiting while it handles requests for the previous user. Instead, the software must process more than one request at a time.

J-ISIS uses multithreading to achieve concurrency. It uses a single thread to listen on port 1111, and farming out each actual request/connection received to a separate thread as the requests come in.
Any time a record can be modified by more than one user in a single moment, synchronization issues arise. The first user that open a record for updating locks the record an no other users will be allowed to update this record until the 1st user editing process is finished.

The Demo Environment

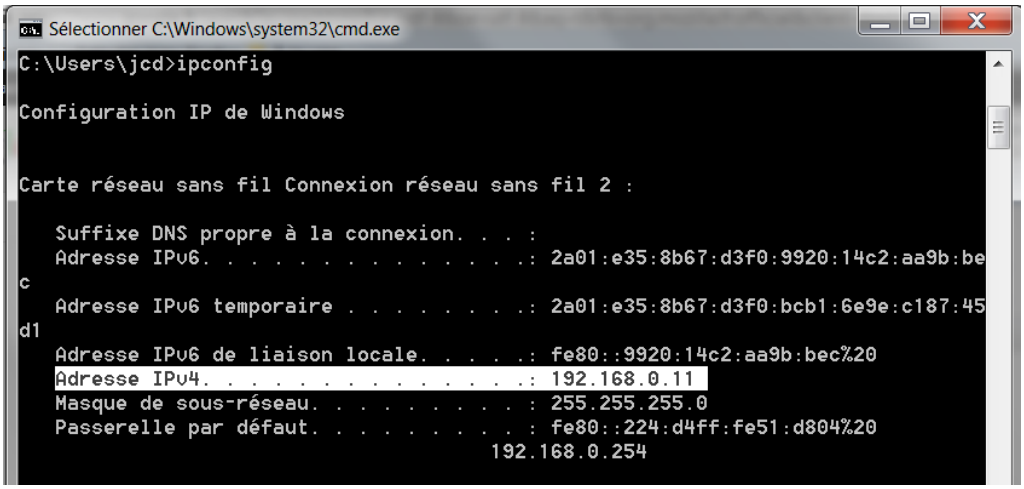
A home Wifi network has been used to produce the following screen shots and to test J-ISIS TCP/IP network communication.

2. Starting J-ISIS Database Server for Network Use

When you start J-ISIS on a machine, you start a J-ISIS client and a J-ISIS database server with a default host name and listening port equal respectively to *localhost* and *1111*. This setting allows the client and server applications to communicate on the same machine. Now if you want to access the J-ISIS Database server from a different machine, you need to find out what is the host name or IP address of the server machine.

a) Finding out the Server IP address

You may find out the IP address of the server machine. **ipconfig** (***i****nternet* ***p****rotocol* ***config****uration*) in Microsoft Windows is a console application that displays all current TCP/IP network configuration values and can modify Dynamic Host Configuration Protocol DHCP and Domain Name System DNS settings.

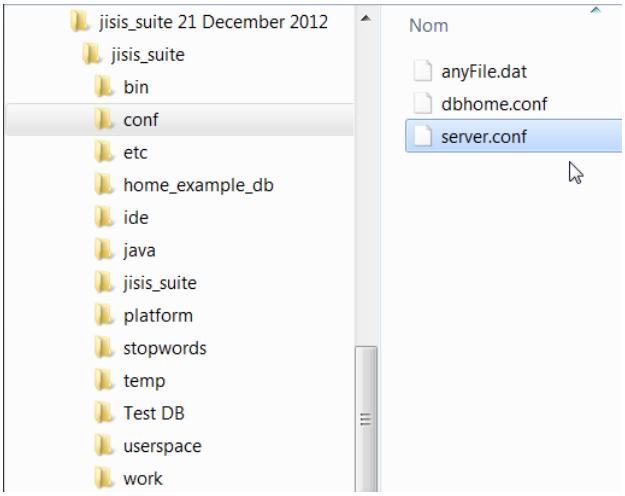


b) Changing the `server.conf` file

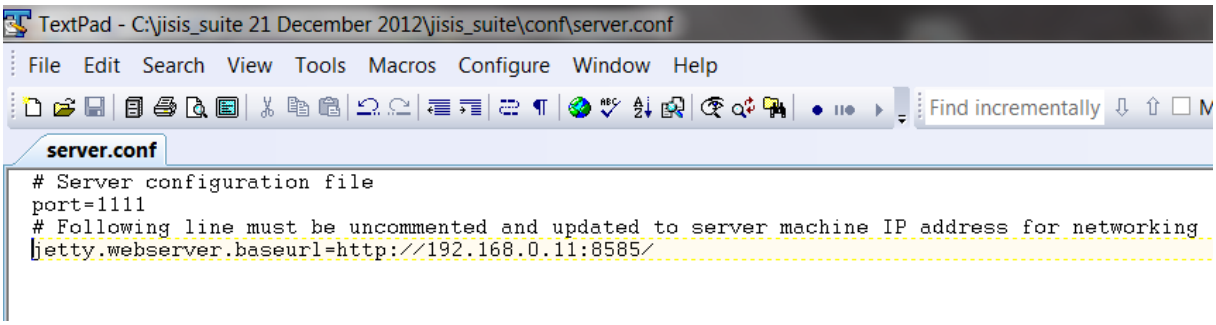
You will need to change the server.conf file by removing the comment character and updating the IP address of the line:

```
#jetty.webserver.baseurl=http://192.168.0.11:8585/
```

This will allow the embedded J-ISIS Web server to serve static contents and documents.

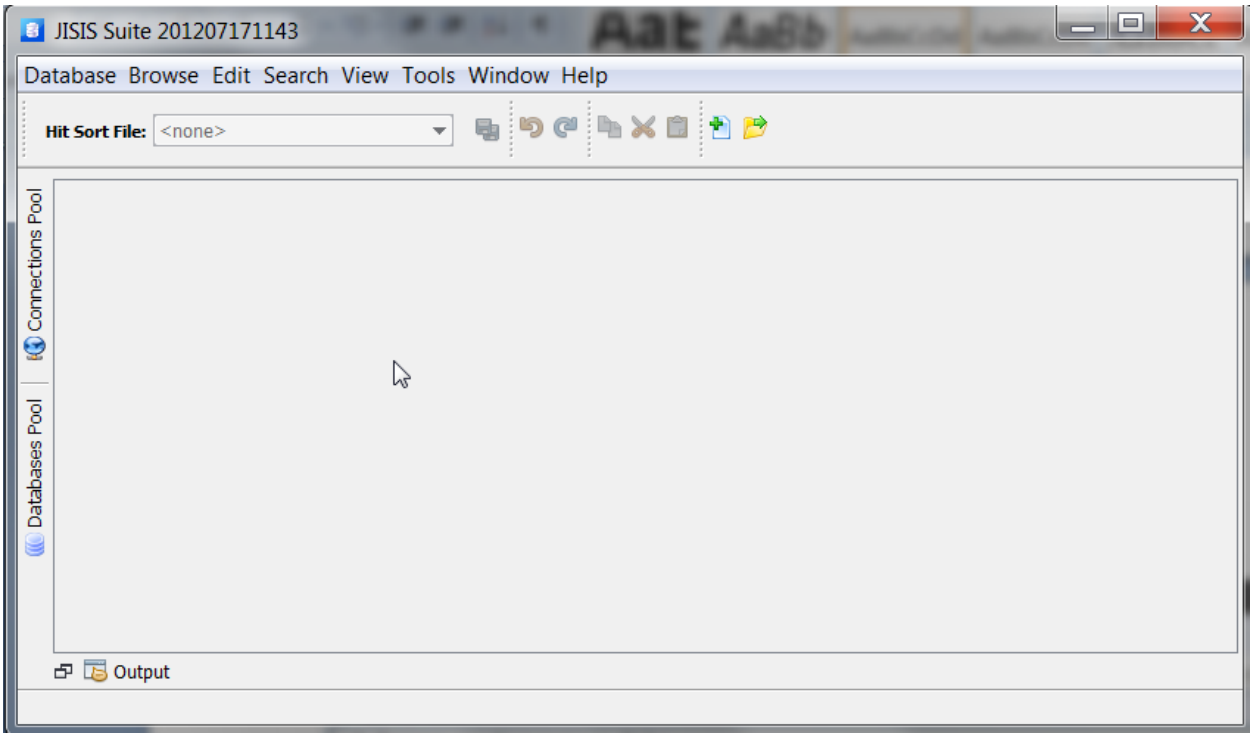


The sever.conf file is modified as follow and saved.



c) Running J-ISIS data base server

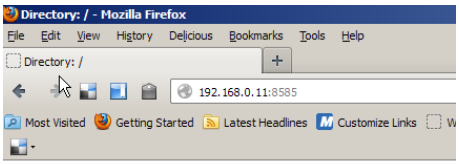
J-ISIS is started by double-clicking on jisis_suite64 because the machine operating is Windows 7.



You can minimize J-ISIS, and the J-ISIS database server will run forever, waiting on port 1111 for client requests to arrive and to serve.

Client Side

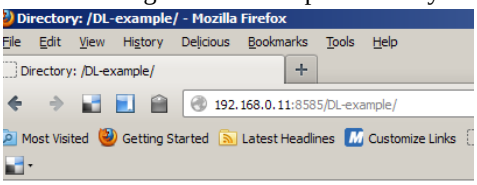
If the J-ISIS server machine has an IP address 192.168.0.11, you can connect to the J-ISIS embedded Web server on this machine by typing 192.168.0.11:8585 in your Web browser, which is Mozilla Firefox in this example:



Directory: /

ASFAEX/	4096 bytes	May 16, 2012 6:09:36 PM
DL-example/	0 bytes	Nov 24, 2012 6:13:20 PM
ICOMOS/	0 bytes	Dec 27, 2010 10:30:04 AM
ISA/	0 bytes	Dec 27, 2010 10:30:02 AM
LIBCAT/	0 bytes	Dec 27, 2010 10:30:02 AM
PATR/	4096 bytes	Sep 18, 2012 9:37:36 AM
UFITAX/	0 bytes	Dec 12, 2012 3:09:44 PM
cds/	4096 bytes	Dec 27, 2010 10:30:06 AM
epidoc/	0 bytes	Dec 27, 2010 10:30:06 AM

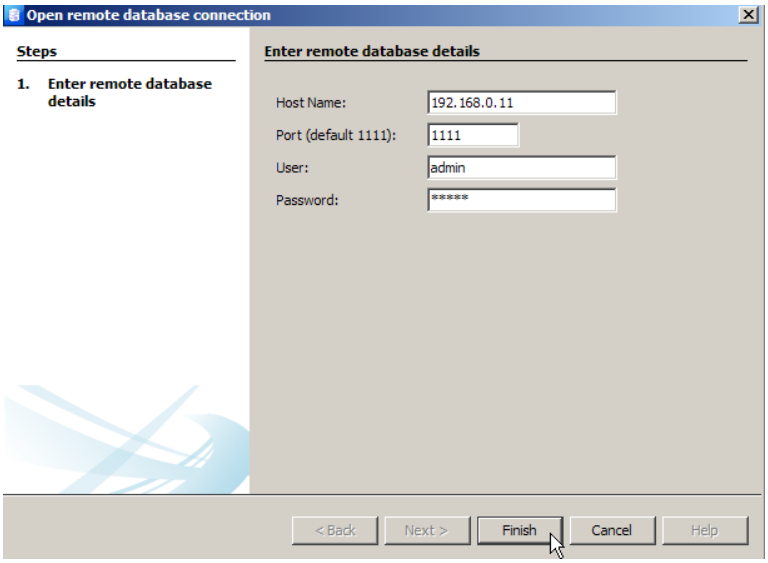
And selecting the DL-example directory will display the data base folders as follow:



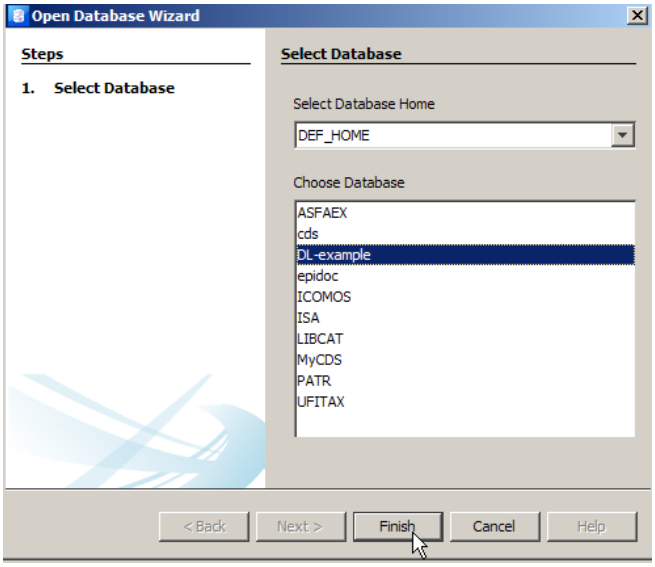
Directory: /DL-example/

Parent Directory		
conf/	0 bytes	Nov 24, 2012 6:13:20 PM
css/	0 bytes	Nov 24, 2012 6:13:20 PM
i.dbc	0 bytes	Nov 24, 2012 6:13:20 PM
idata/	0 bytes	Dec 8, 2012 2:52:24 PM
idocs/	0 bytes	Nov 24, 2012 6:19:30 PM
ifdt/	0 bytes	Nov 24, 2012 6:13:20 PM
ifst/	0 bytes	Nov 24, 2012 6:13:20 PM
igroovy/	0 bytes	Nov 24, 2012 6:13:20 PM
images/	0 bytes	Nov 24, 2012 6:13:20 PM
indexes/	0 bytes	Nov 24, 2012 6:13:20 PM
ipft/	0 bytes	Nov 24, 2012 6:13:20 PM
itmp/	0 bytes	Nov 24, 2012 6:13:20 PM
iwks/	0 bytes	Nov 24, 2012 6:13:20 PM
jscripts/	0 bytes	Nov 24, 2012 6:13:20 PM
util/	0 bytes	Nov 24, 2012 6:13:20 PM

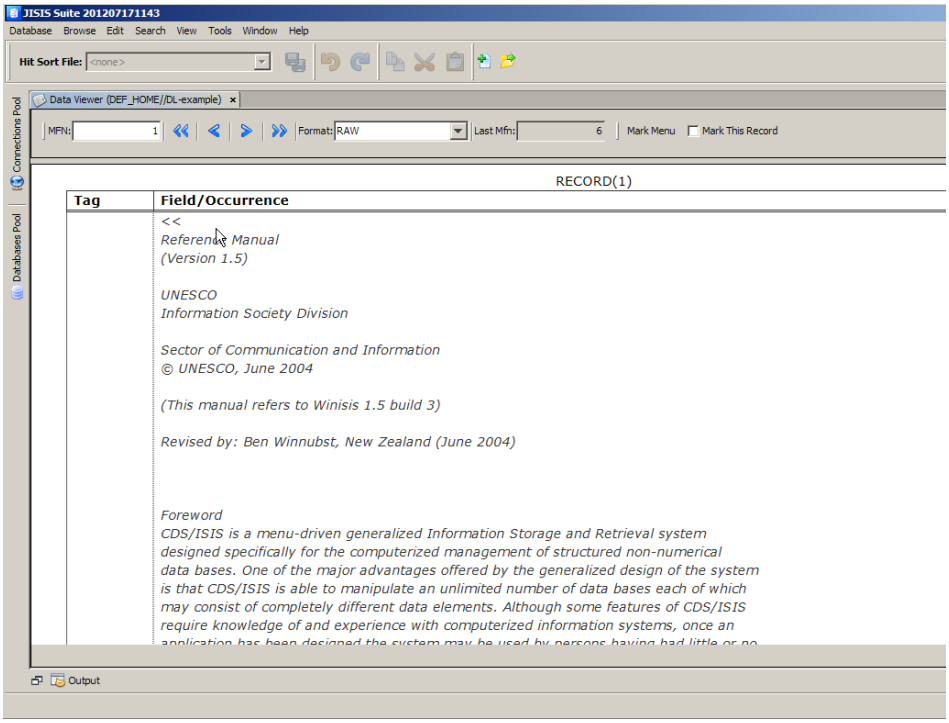
Then on the client machine we can connect to the server by entering the server IP address:

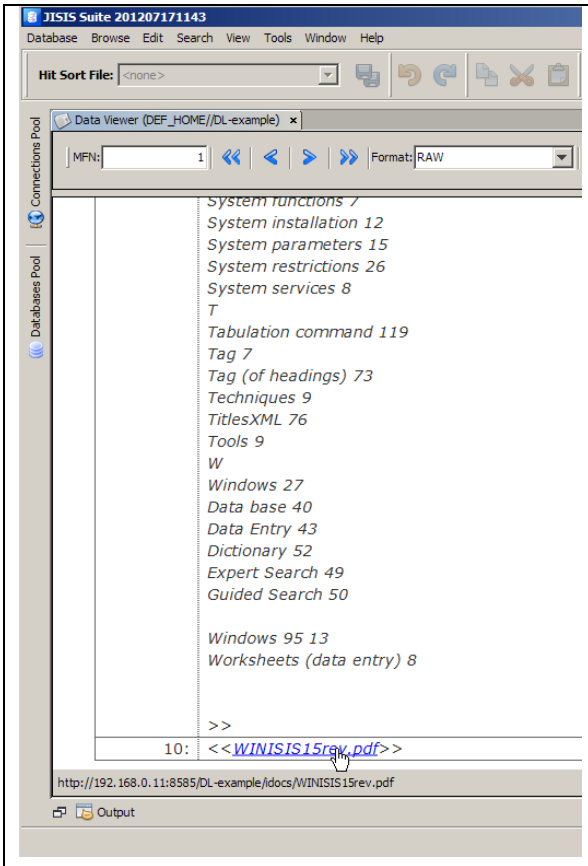


The list of databases stored on the server computer is displayed when selecting “Open Database…”



Selecting DL-example and clicking on Browse->Data Viewer displays the 1rst record from database DL-example hosted on the machine with IP address 192.168.0.11 that runs a J-ISIS database server listening on port 1111.





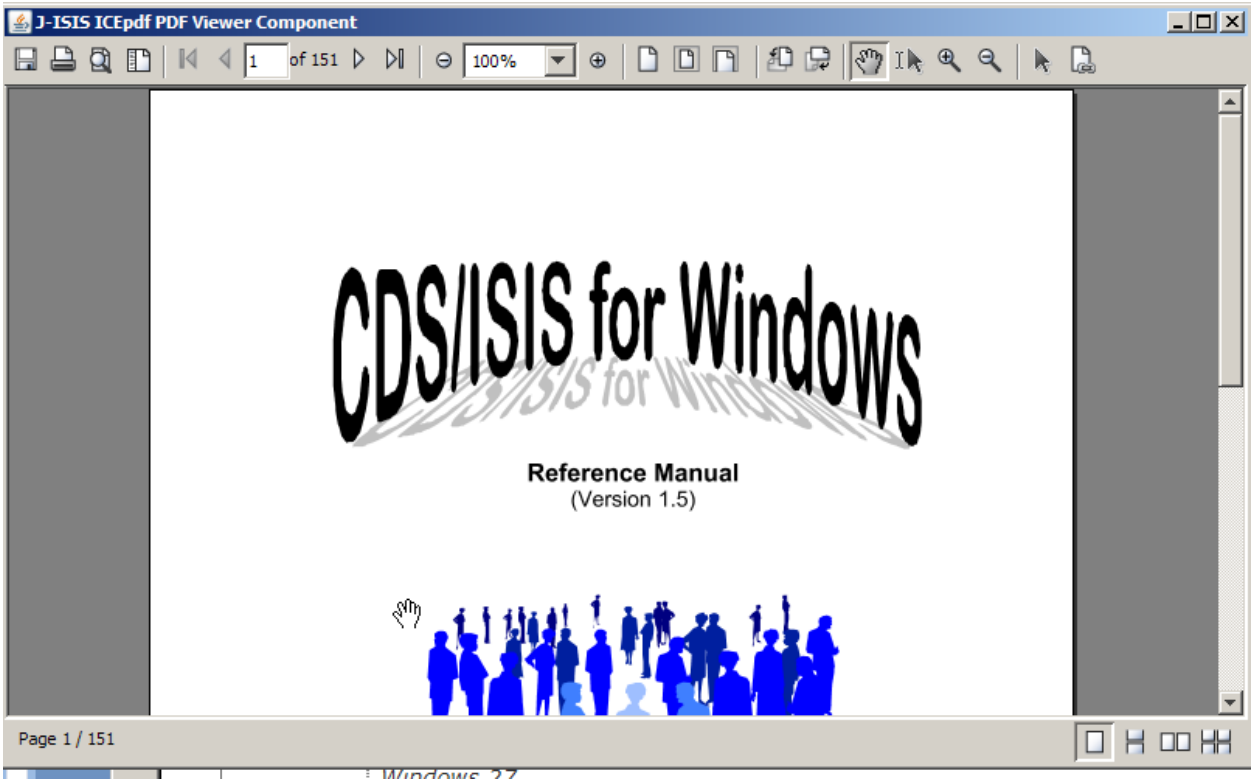
Scrolling down to the second occurrence. This occurrence displays the link to the resource which is a pdf document.

Please note the url which is displayed in the left bottom corner when you put the mouse cursor on the document:

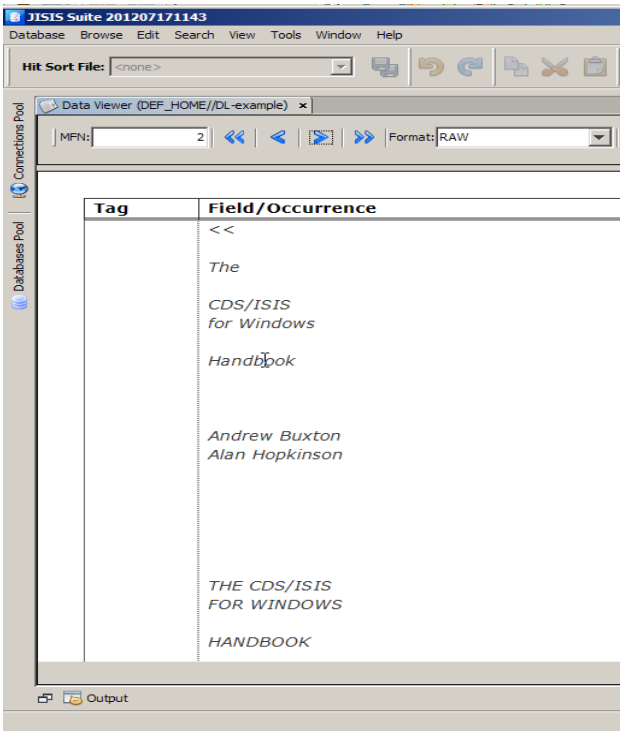
http://192.168.0.11:8585/idocs/WINISIS15rev.pdf

which is the url of the server machine.

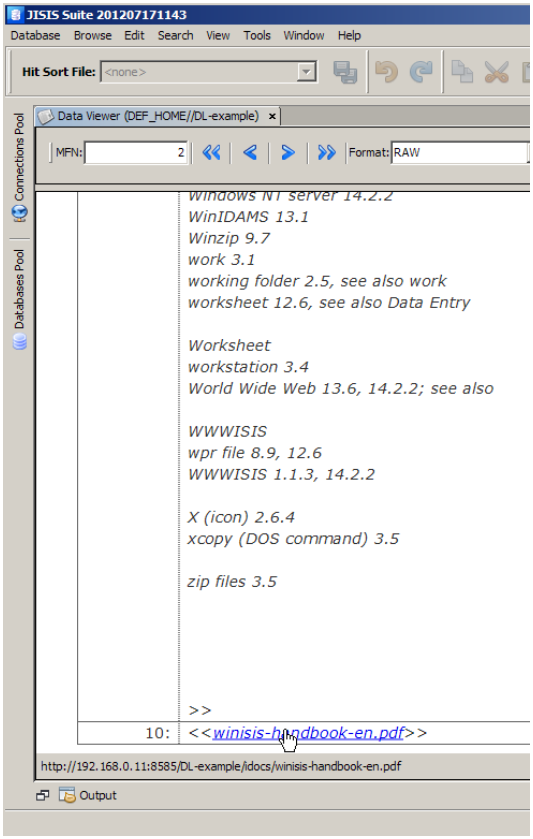
Clicking on the link will open the pdf viewer with the document.



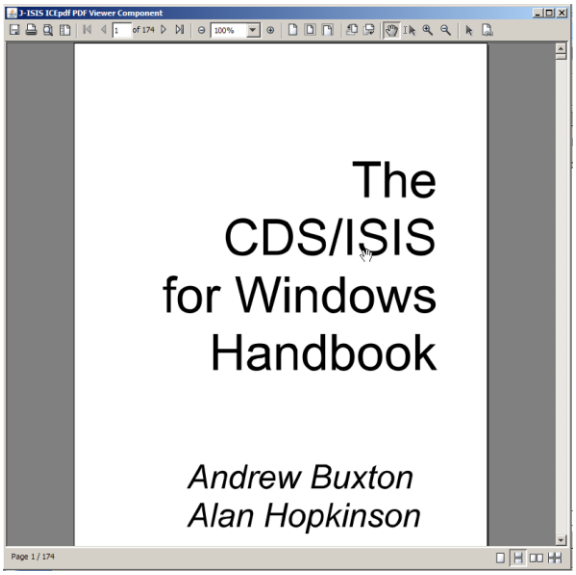
Moving to record with MFN 2



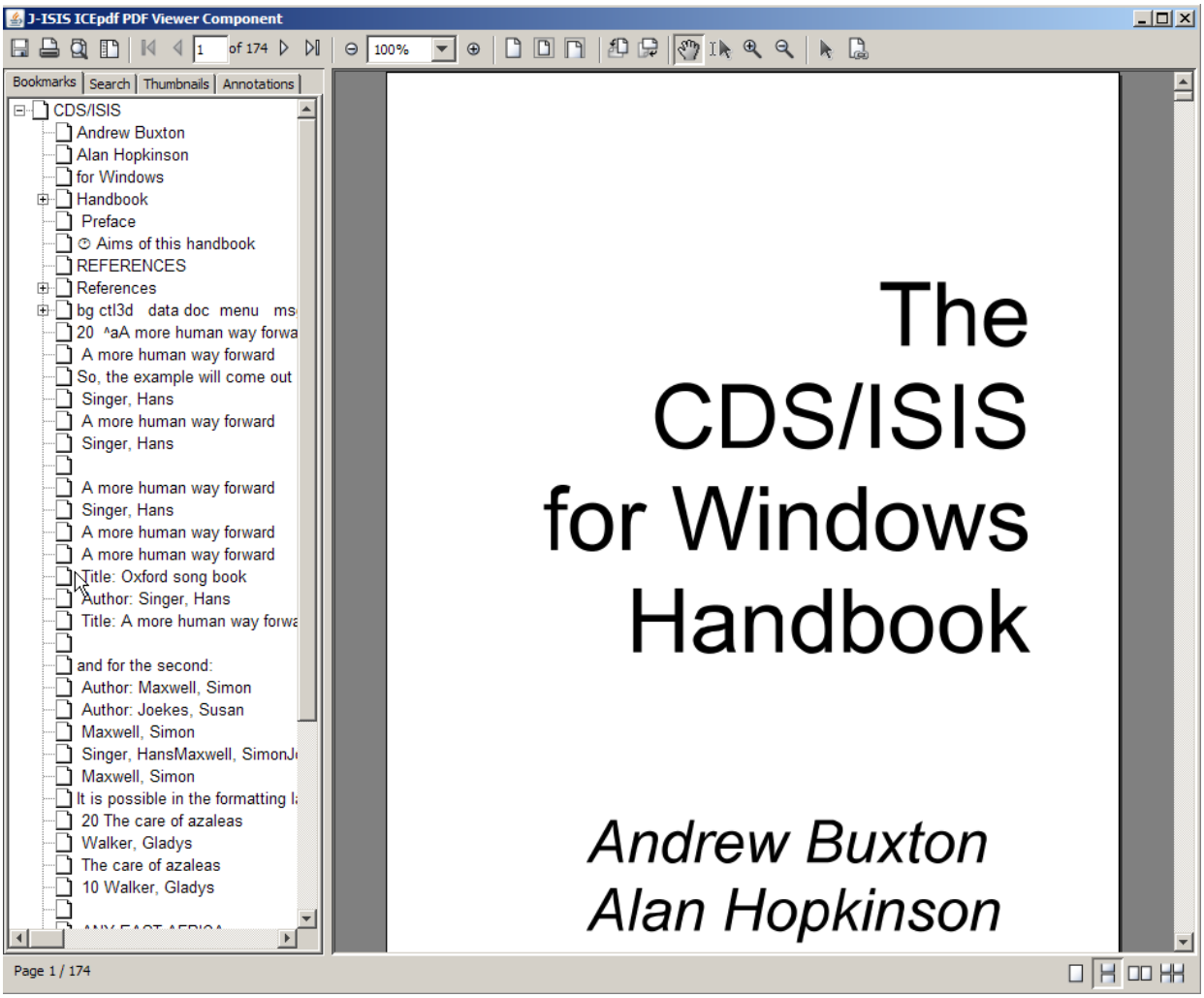
Scrolling down



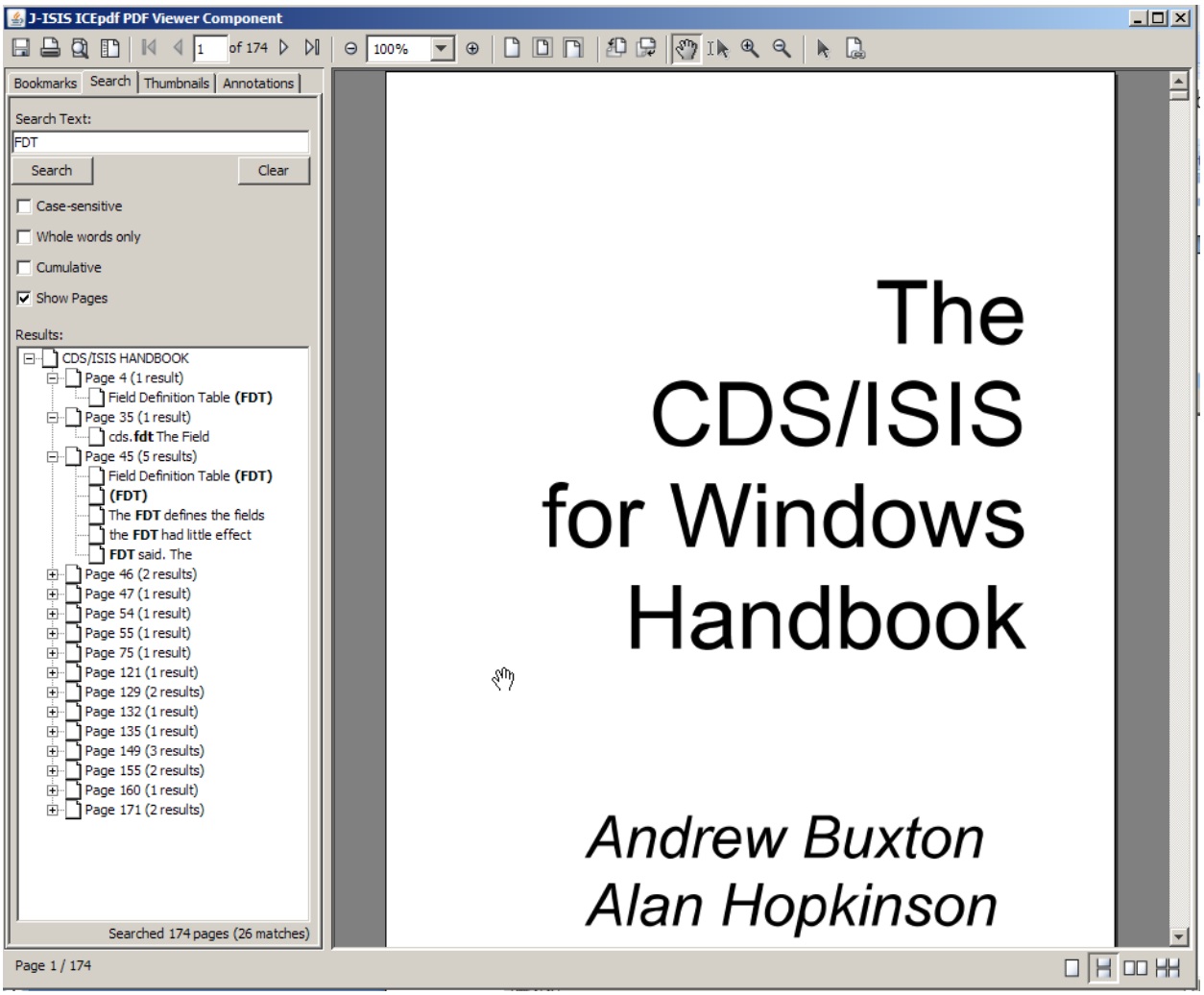
And clicking on the document link will open the J-ISIS embedded pdf viewer

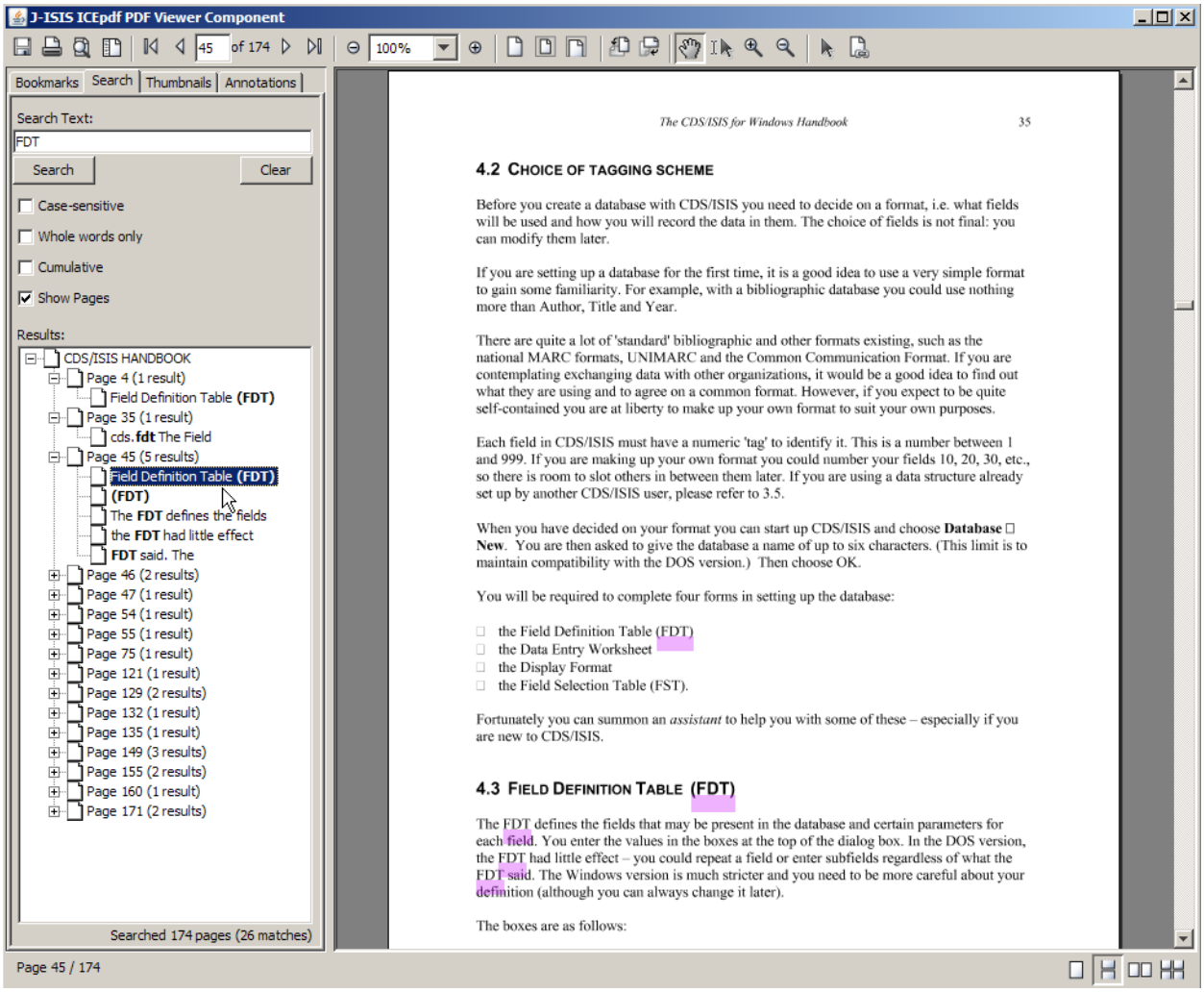


Clicking on the “Show/Hide Utility Pane” button will display the pdf viewer as follow:



Searching for FDT




J-ISIS ICEpdf PDF Viewer Component
45 of 174
100%
Bookmarks
Search
Thumbnails
Annotations
Search Text:
FDT
Search
Clear
Case-sensitive
Whole words only
Cumulative
Show Pages
Results:
CDS/ISIS HANDBOOK
Page 4 (1 result)
Field Definition Table (FDT)
Page 35 (1 result)
cds.fdt The Field
Page 45 (5 results)
Field Definition Table (FDT)
(FDT)
The FDT defines the fields
the FDT had little effect
FDT said. The
Page 46 (2 results)
Page 47 (1 result)
Page 54 (1 result)
Page 55 (1 result)
Page 75 (1 result)
Page 121 (1 result)
Page 129 (2 results)
Page 132 (1 result)
Page 135 (1 result)
Page 149 (3 results)
Page 155 (2 results)
Page 160 (1 result)
Page 171 (2 results)
Searched 174 pages (26 matches)
The CDS/ISIS for Windows Handbook 35
4.2 CHOICE OF TAGGING SCHEME
Before you create a database with CDS/ISIS you need to decide on a format, i.e. what fields will be used and how you will record the data in them. The choice of fields is not final: you can modify them later.
If you are setting up a database for the first time, it is a good idea to use a very simple format to gain some familiarity. For example, with a bibliographic database you could use nothing more than Author, Title and Year.
There are quite a lot of 'standard' bibliographic and other formats existing, such as the national MARC formats, UNIMARC and the Common Communication Format. If you are contemplating exchanging data with other organizations, it would be a good idea to find out what they are using and to agree on a common format. However, if you expect to be quite self-contained you are at liberty to make up your own format to suit your own purposes.
Each field in CDS/ISIS must have a numeric 'tag' to identify it. This is a number between 1 and 999. If you are making up your own format you could number your fields 10, 20, 30, etc., so there is room to slot others in between them later. If you are using a data structure already set up by another CDS/ISIS user, please refer to 3.5.
When you have decided on your format you can start up CDS/ISIS and choose Database New. You are then asked to give the database a name of up to six characters. (This limit is to maintain compatibility with the DOS version.) Then choose OK.
You will be required to complete four forms in setting up the database:
the Field Definition Table (FDT)
the Data Entry Worksheet
the Display Format
the Field Selection Table (FST).
Fortunately you can summon an assistant to help you with some of these – especially if you are new to CDS/ISIS.
4.3 FIELD DEFINITION TABLE (FDT)
The FDT defines the fields that may be present in the database and certain parameters for each field. You enter the values in the boxes at the top of the dialog box. In the DOS version, the FDT had little effect – you could repeat a field or enter subfields regardless of what the FDT said. The Windows version is much stricter and you need to be more careful about your definition (although you can always change it later).
The boxes are as follows:
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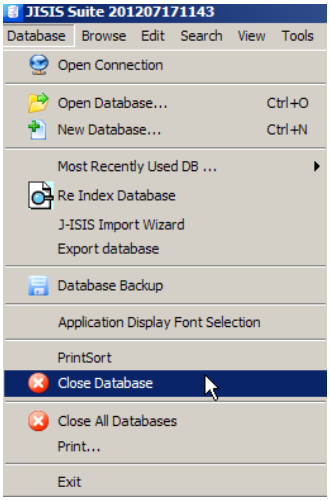
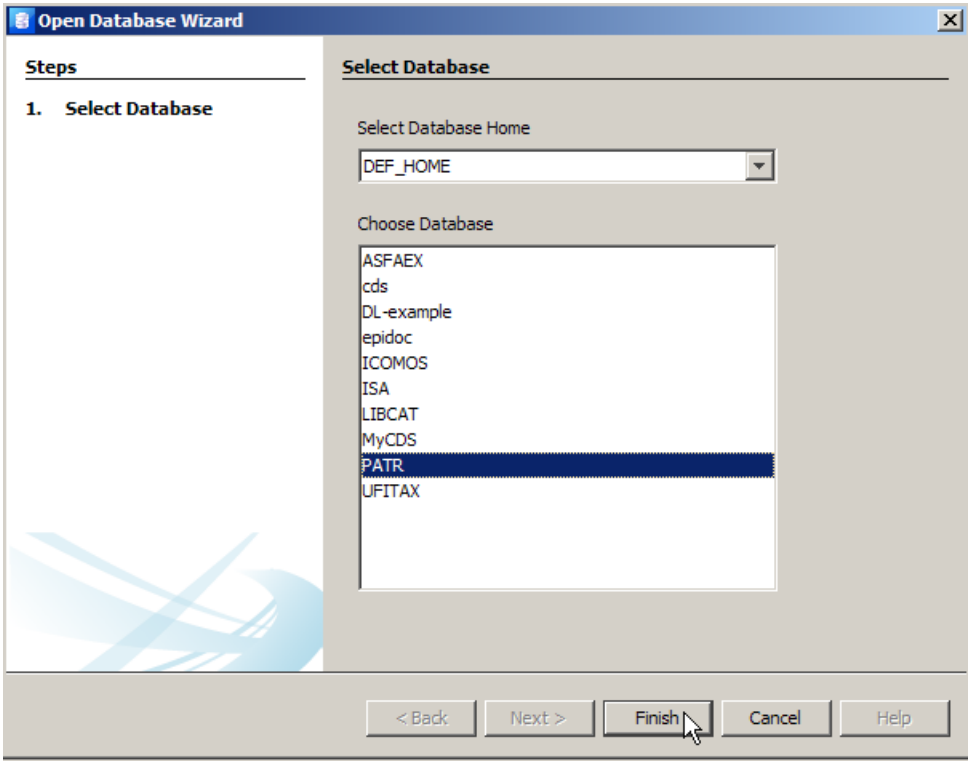
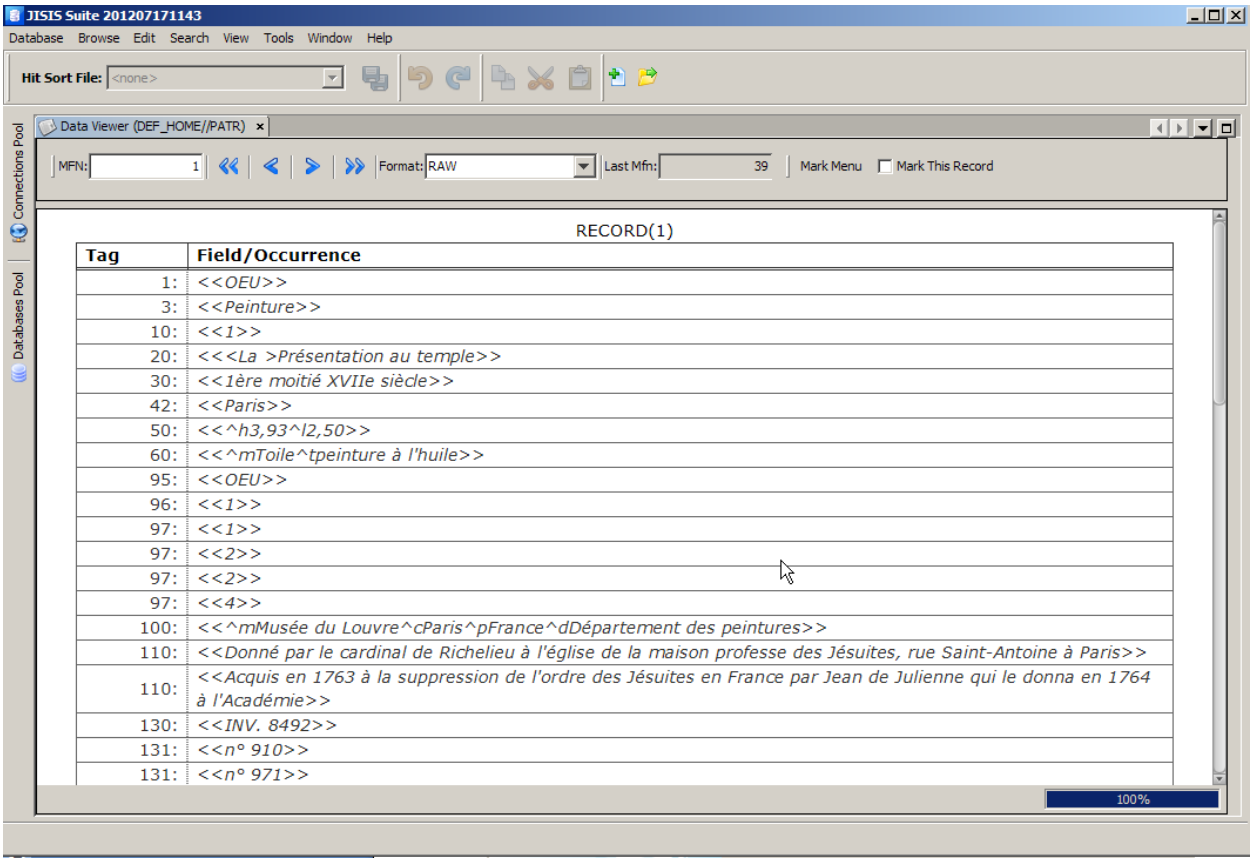
Now we close the DL-example database

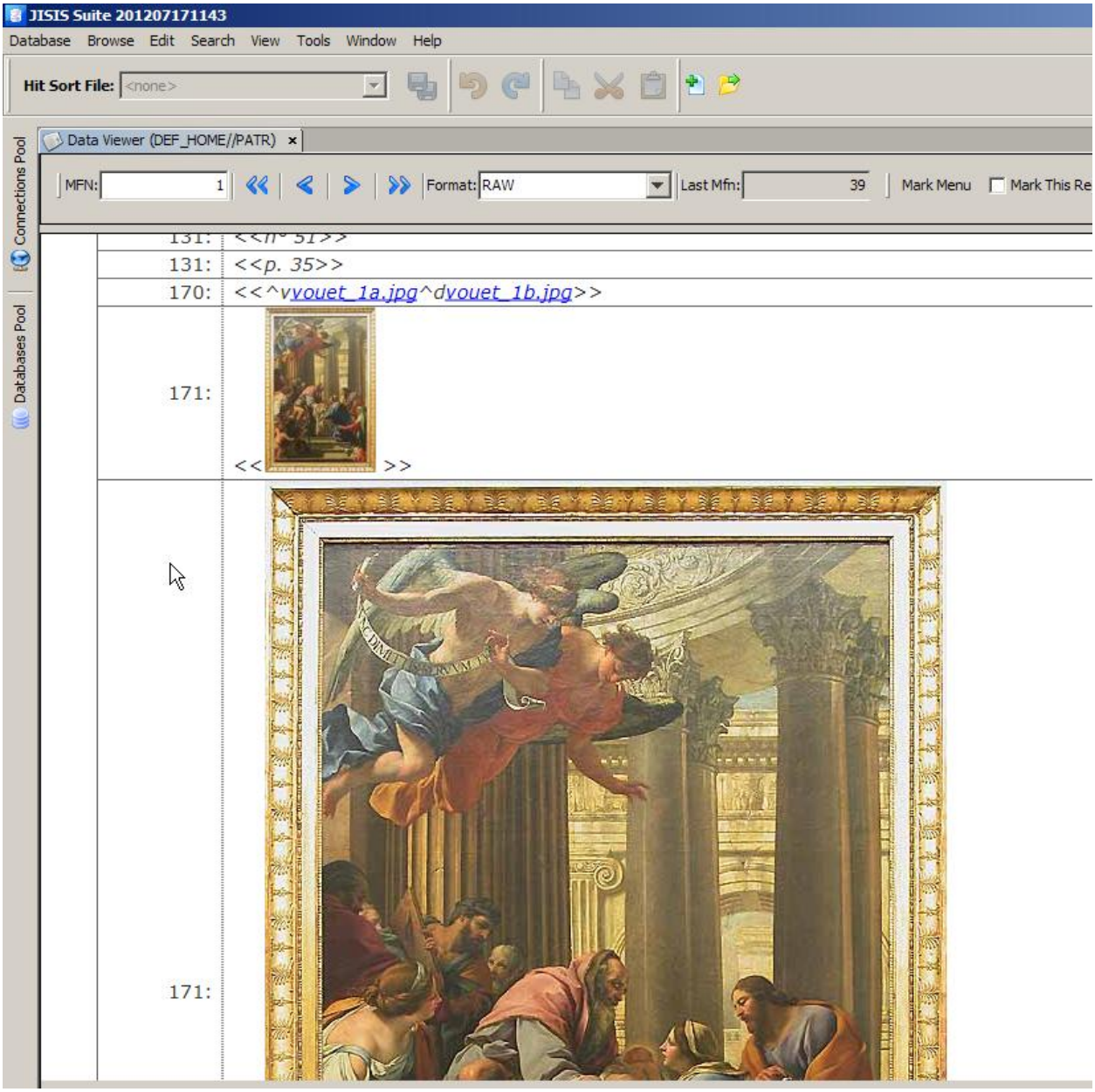


Network Access To PATR Database With Images

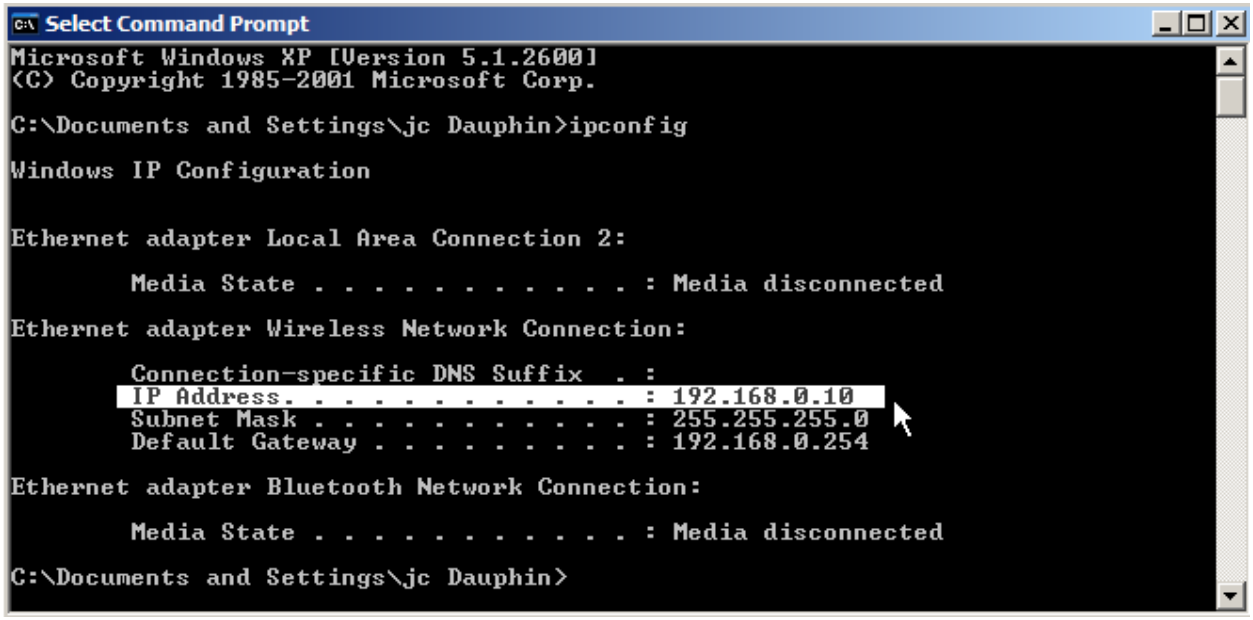
And we select the PATR database




JISIS Suite 201207171143
Database Browse Edit Search View Tools Window Help
Hit Sort File: <none>
Connections Pool
Databases Pool
Data Viewer (DEF_HOME//PATR)
MFN: 1
Format: RAW
Last Mfn: 39
Mark Menu
Mark This Record
RECORD(1)
Tag
Field/Occurrence
1: <<OEU>>
3: <<Peinture>>
10: <<1>>
20: <<<La >Présentation au temple>>
30: <<1ère moitié XVIIe siècle>>
42: <<Paris>>
50: <<^h3,93^l2,50>>
60: <<^mToile^tpeinture à l'huile>>
95: <<OEU>>
96: <<1>>
97: <<1>>
97: <<2>>
97: <<2>>
97: <<4>>
100: <<^mMusée du Louvre^cParis^pFrance^dDépartement des peintures>>
110: <<Donné par le cardinal de Richelieu à l'église de la maison professe des Jésuites, rue Saint-Antoine à Paris>>
110: <<Acquis en 1763 à la suppression de l'ordre des Jésuites en France par Jean de Julienne qui le donna en 1764 à l'Académie>>
130: <<INV. 8492>>
131: <<n° 910>>
131: <<n° 971>>
100%


JISIS Suite 201207171143
Database Browse Edit Search View Tools Window Help
Hit Sort File: <none>
Data Viewer (DEF_HOME//PATR)
MFN: 1
Format: RAW
Last Mfn: 39
Mark Menu
Mark This Re
Connections Pool
Databases Pool
131: <<n° 51>>
131: <<p. 35>>
170: <<^vvouet_1a.jpg^dvouet_1b.jpg>>
171:
<< >>
171:

Please note the url which is displayed in the left bottom corner when you put the mouse cursor on the document:
http://192.168.0.11:8585/PATR/images/vouet_1a.jpg
which is the image url of the server machine
Checking out the IP address of the client computer:



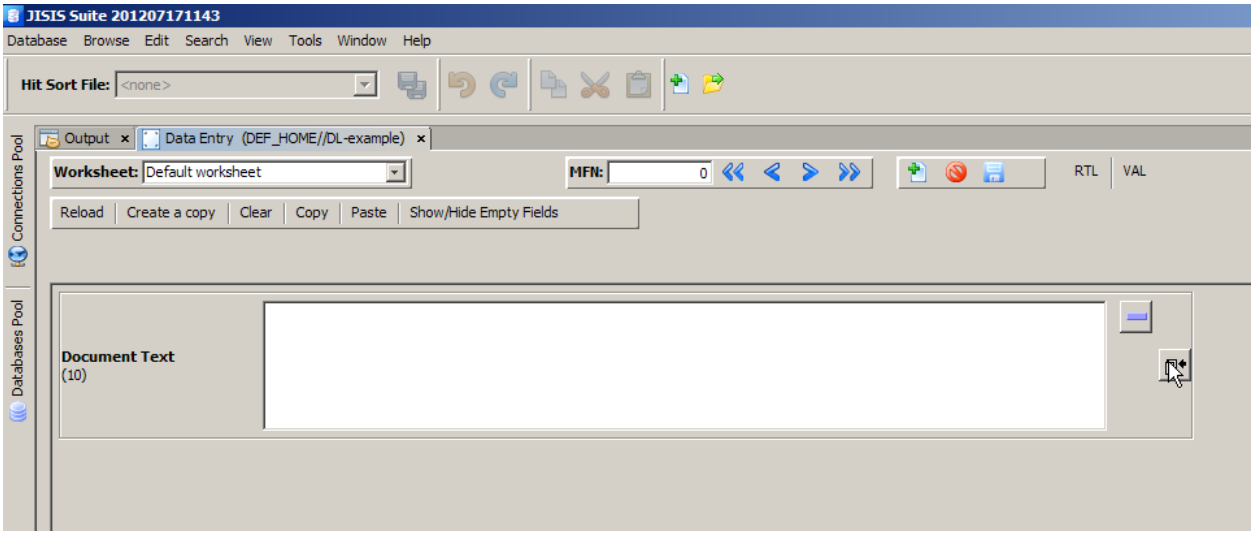
Clicking on the image link opens a separate window with the image:

If we now consider the 2nd image:

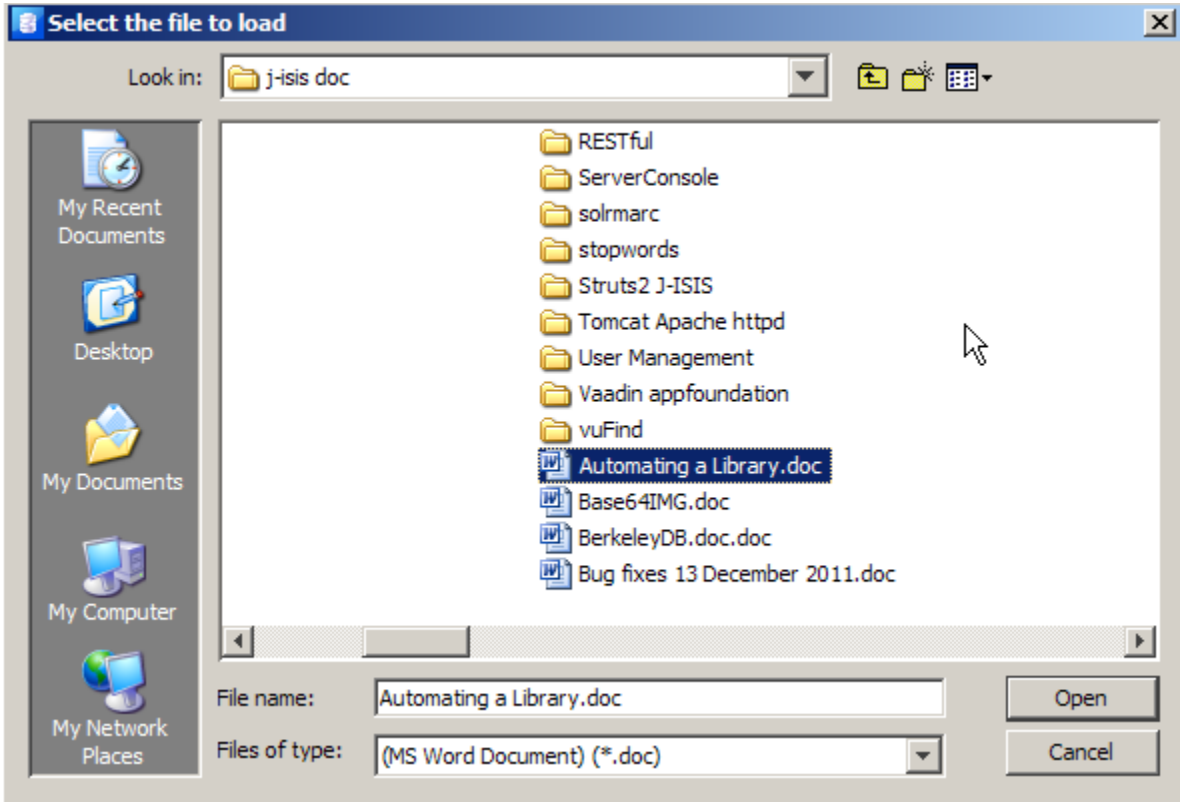
Clicking on the image link opens a separate window with the image:

Network Data Entry

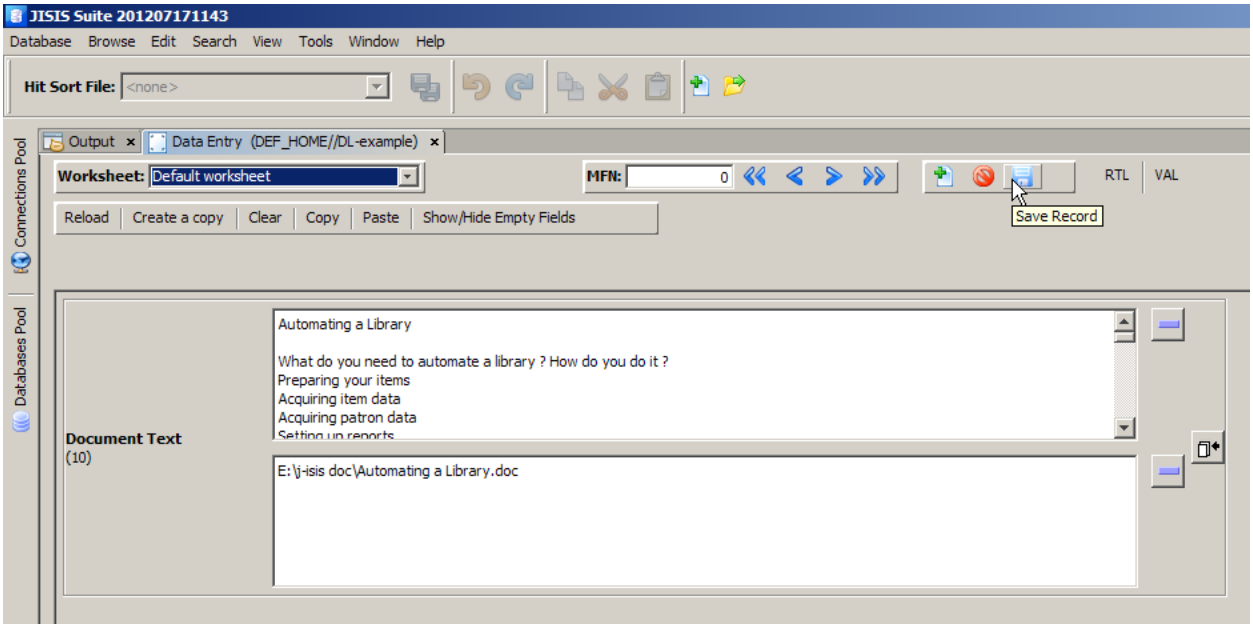
We close the PATR database and open again the DL-example. After clicking on "Data Entry" the following screen is displayed:



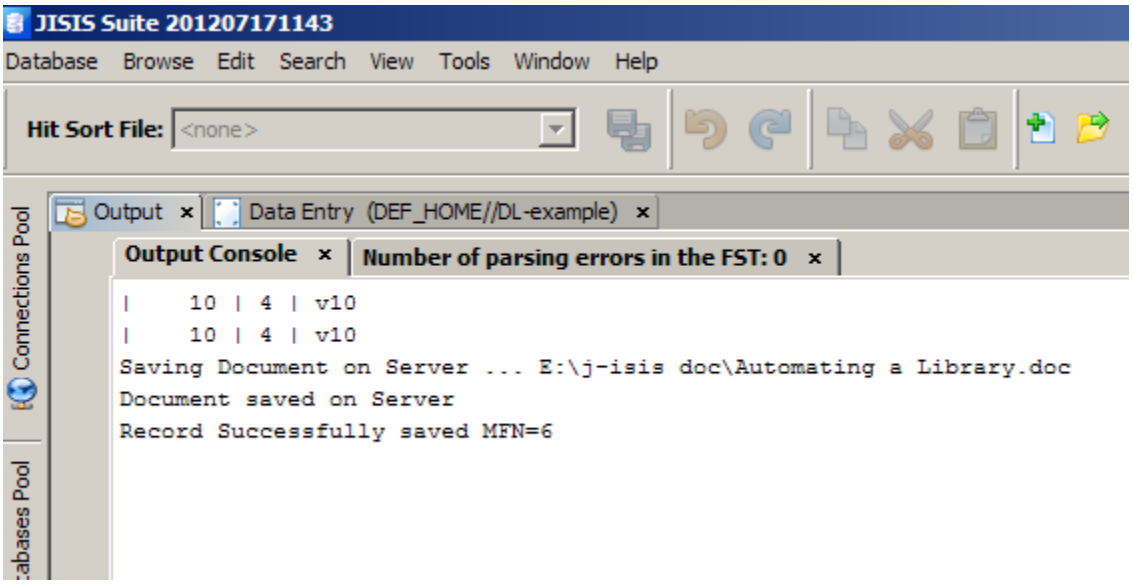
The DL-example database contains a single DOC field intended for Digital Library input. Clicking on the right most button will open a file selection dialog. In this example we select a Word doc document after changing the file type.



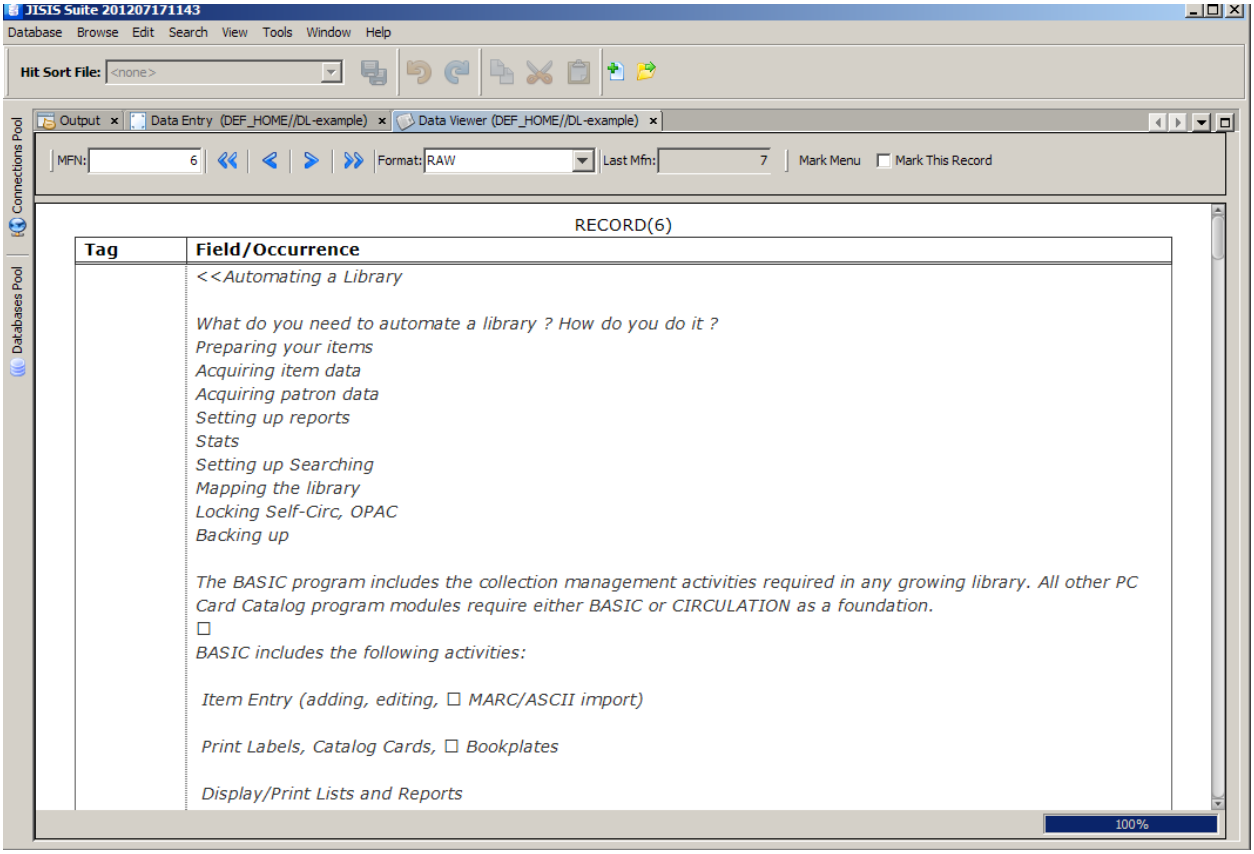
The plain text content of the document is extracted and stored in the 1st occurrence of the field, and the initial url is stored in the second occurrence.



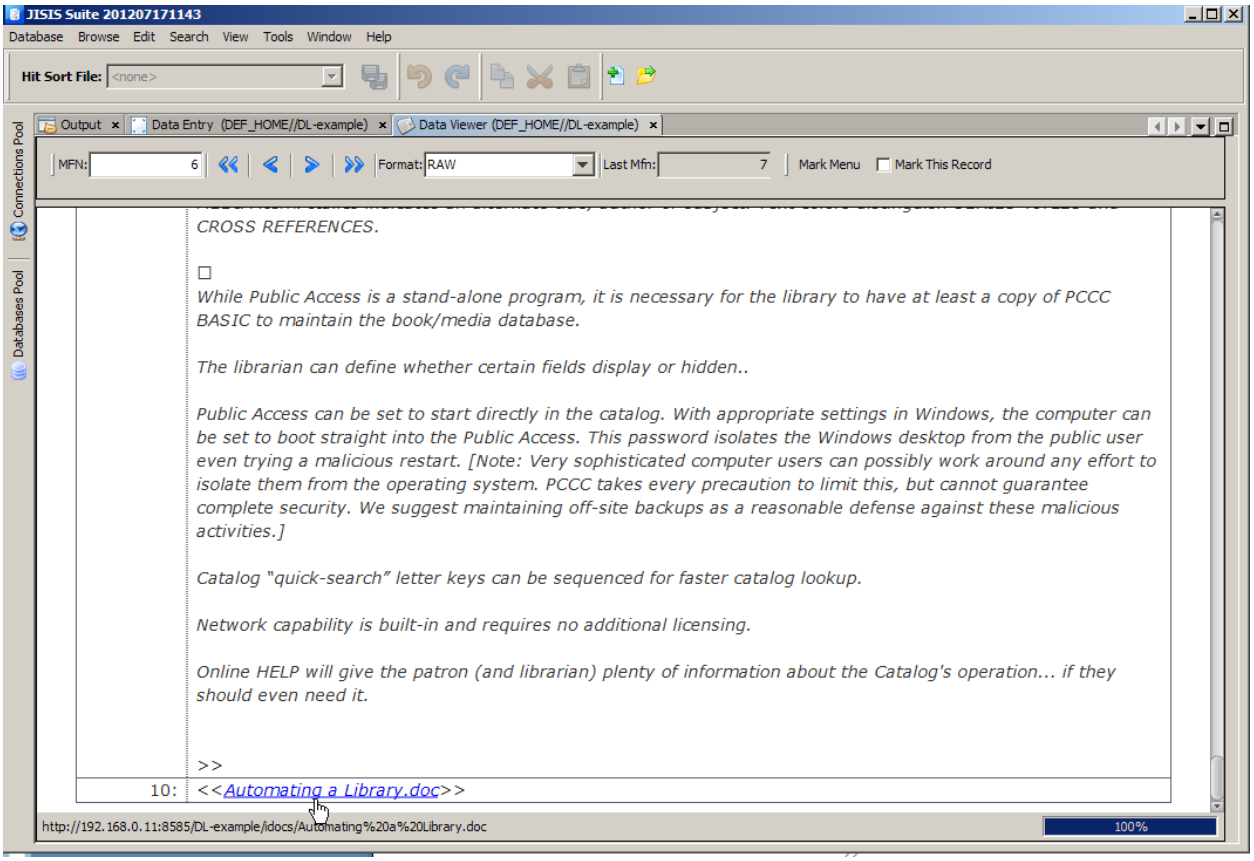
Clicking on the Save (diskette) button will save the document on the server side and change the initial url to reflect the server side url.



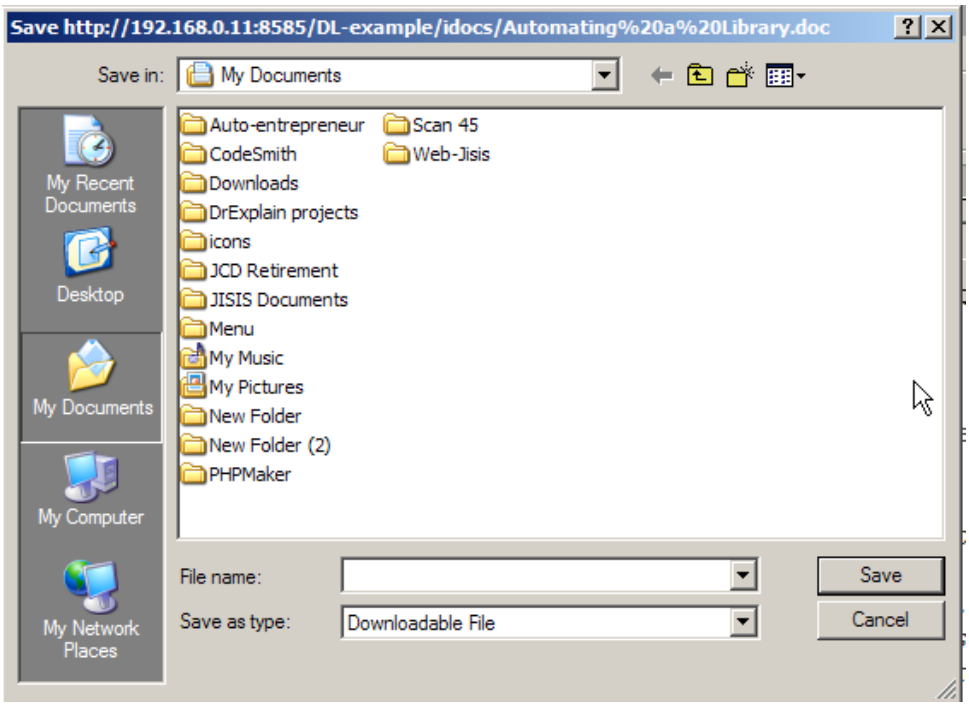
We can now look at this new record in the Data Viewer:



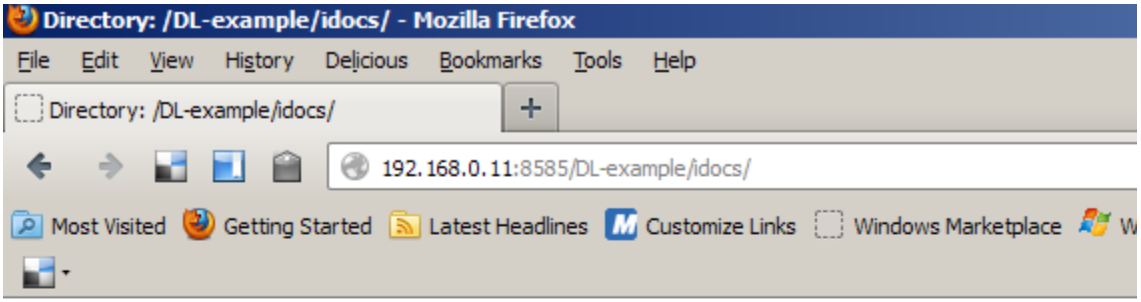
Scrolling down to the 2nd occurrence will display the server link, and moving the mouse cursor over this link will display the server url:



Clicking on the link will open a file save dialog to download the document.



It's quite easy to check that the document was well copied on the server computer by looking at the database `/idocs` directory content.



Directory: /DL-example/idocs/

Parent Directory		
Automating a Library.doc	204288 bytes	Dec 22, 2012 4:03:31 PM
CISIS-FormatLanguage4-en.pdf	381710 bytes	Nov 24, 2012 6:19:30 PM
MARC Record Guide.pdf	168199 bytes	Nov 24, 2012 6:17:14 PM
Marc 21.pdf	155862 bytes	Nov 24, 2012 6:17:50 PM
WINISIS15rev.pdf	1484239 bytes	Nov 24, 2012 6:14:16 PM
winisis-handbook-en.pdf	845775 bytes	Nov 24, 2012 6:16:12 PM