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eJournals

Delivery Service:

an email to

Internet

experiment

Introduction

The acquisition of scientific literature by institutions in developing countries constitutes a serious problem that impairs the advancement of science. An obvious consequence is the decreasing ability of these countries to overcome their economic problems, and to launch themselves into the competitive world of today in which success depends strongly on technological development, which is in turn strongly linked to the advancement of science.

With the advent of electronic journals accessible via the Internet, the scientist, in order to compete, needs the latest literature on her/his desktop in the shortest possible time. Thus, the same old problem has taken a different turn. This may be seen as a threefold problem:

- not enough bandwidth to download scientific material in a reasonable time, without spending the whole day in front of the computer, which I refer to as a lack of real connectivity;
- lack of the necessary hardware to make the connection;
- lack of funds to pay for the connection.

The first of these issues, lack of connectivity, is hard to overcome. Many funding agencies and the like will tell us that real connectivity exists, and it is true that banks, and commerce in general, including cybercafés, often have very fast connections. But what about universities and research institutions? Even in a country such as Argentina, which could be considered to be on the 'good' side of the digital divide, I recently lost my patience trying to use telnet at a well-known institution, while connection was fast for someone using a paid modem in the same building.

To my knowledge there has been no real world-wide effort to study the extent of connectivity at universities and research

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ABSTRACT: The eJournals Delivery Service (eJDS) allows scientists based in institutions in developing countries with slow access to the Internet due to very low bandwidth or extreme economic problems, to retrieve online articles from well-known journals, using offline browsing with email. This pioneering experiment, run by the Abdus Salam International Centre for Theoretical Physics in collaboration with Academic Press, American Physical Society, and World Scientific, started in Jan. 2002.



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institutions in developing countries, except for a few cases and with a specific purpose. If such a study were done we might have a better idea of the research potential of those institutions.

The second two problems are socio-economic in character and it is beyond our remit to influence their solution. While such problems need to be solved by the individual countries concerned, the service we describe below makes journals available to scientists now so that they can avoid their science lagging hopelessly behind while waiting for broader socioeconomic solutions.

There are many other excellent initiatives directed at solving this problem, which we cannot do justice to in the space of this article. We therefore concentrate on describing the eJournals Delivery Service (eJDS).

This new project, launched by the International Centre for Theoretical Physics (ICTP), is directed mainly at the physics community. It tries to mitigate the problem of access to electronic literature by minimizing the time of Internet connection, which in turn minimizes the costs. The ICTP was created in 1964 by Abdus Salam, Nobel laureate in physics. Its mission is to enhance science in developing countries. To achieve this, the ICTP uses different modalities: conferences, workshops, schools, training courses, special agreements with institutions in developing countries, fellowships for scientists to visit the Centre, postdoctoral fellowships, etc., as well as distribution of scientific literature. Providing scientists with literature supports their ongoing research, and helps to minimize the problem right at the source. Our everyday contact with scientists from developing countries allows us to acquire a realistic idea of what working in a developing country is really like. And, more importantly, we get immediate feedback as to the practicality of a given project.

There is a wide spectrum of scenarios across these countries, which in the worst case means it is impossible to download documents from the Internet because of a simple economic problem: not being able to afford the connection. This point must be emphasized: it is the reality in many parts of the globe where scientists struggle to

achieve results. We must not forget this situation if we really mean to find an answer to the problem. We do not foresee a quick solution but it is the task of the ICTP to find alternative ways for these scientists to access the necessary scientific literature in an affordable and honourable way, whenever possible.

eJDS: an experiment in email to online literature

We at ICTP are starting a new project, the eJDS, which, if successful, will alleviate the problem and will contribute positively to bridging the digital divide. *eJDS is intended to provide individual scientists with online scientific articles, which they can search for and/or download using only email, and allows them to follow hyperlinks as if they were surfing the web via a live Internet connection.*

The key factor of this programme rests on delicate arrangements with some important publishers, such as Academic Press, American Physical Society, and World Scientific, who, being very sensitive to the problem, are eager to find solutions to facilitate access to their online journals in economically remote areas. The eJDS is quite appealing to these players: it will contribute to science in developing countries while, at the same time, it will not jeopardize publishing revenues. The targeted individuals will come only from those institutions that cannot afford the subscription prices. The experiment has been undertaken only with those journals to which ICTP already subscribes.

Description of the eJDS

The programme is open only to scientists from institutions in developing countries. Applicants will only be accepted after satisfying certain requirements from the participating publishing companies. The publishers may put restrictions on which journals a user may access. Once this step is completed, successful applicants will be informed by email of the further steps required to complete the one-time subscription to the eJDS.

For normal utilization of the eJDS, the user sends an email to the eJournals server requesting a given web page (journal site).

*it will
contribute to
science in
developing
countries*

the **abdus salam** international centre for theoretical physics

UNESCO
 IAEA

Founded in 1964 by Abdus Salam (Nobel Laureate), the **abdus salam** ictp operates under the aegis of two United Nations Agencies: UNESCO and IAEA and is regularised by a seat agreement with the Government of Italy which provides the major part of the Centre's funding. One of the main aims of the **abdus salam** ictp is to foster the growth of advanced studies and research in the developing countries.

NOTICE REGARDING WEB ACCESS

Scientists Database *** ACTIVITIES *** *** SCIENCE & RESEARCH **

Phone Book / This , Next Week
 E-mail / Scientific Calendar: 2001 Research Groups

Associate Members 2002 new ICTP/SISSA Master's Programme
 Search ICTP Web / Dipl. Programme updated
 Exit to WWW 2001 2002 and Historical
(new dynamic versions of the
calendars
archives, from the Agenda
Document Server tool)
 Activities Info (smr numbers)
 Meeting of Dirac Medallists
ICTP Scientific Publications
ICTP Awards

*** COOPERATION *** *** INFORMATION ***

Office of External Activities Welcome 2001
ICTP- TWAS Donation Monthly Highlights
 Associate & Federation News from ICTP Magazine
Schemes Job Opportunities
 Training & Research in Italian On Campus: Art Gallery - Tours
Labs
 Call for Proposals new
 Sesame Project

*** RESEARCH SUPPORT * *** RELATED LINKS ***
* * Physics in Africa
 Library Mathematics on the Web
 Computers & Networks PhysNet

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WWW4MAIL OPTIONS:

Click here to Get Selected Document(s) for LINKS only. Click to reset all selections.

Check this to get Postscript version of all selected WEB document(s).

Check this to get only information on all selected WEB Document(s).

Enter maximum size of reply(s) from WWW4MAIL in bytes only (307200 max).

Enter file part(s) to retrieve, (examples: 1, 2 6-10) [leave empty to get all parts].

Extra Options:

Figure 1 View of the web page of the Abdus Salam International Centre for Theoretical Physics viewed as received via www4mail.

The content of the web page is sent back to the user as an HTML attachment (modified) or in the body of an email message. Transmitting web documents (such as the journal index) as attachments allows the user to reuse these, saving bandwidth, and thus allowing further searches. Users can then working offline with a local browser, and select specific articles or document(s); their selection is sent back to the eJournals server via email. Figure 1 shows how a given web page appears. It is stripped of all frills. Only the text is left and all clickable items will have a checkbox attached. Articles are selected by checking a box. After ticking the boxes, the page is submitted using the 'go', or 'submit' button if it exists, or the 'Get Selected Documents' button at the bottom of the page, as seen in Figure 1. Once successful, the user will receive the new web document or the final article, again as an HTML, Postscript or PDF attachment. Non-HTML attachments may require the user to have extra software (e.g. Acrobat reader for PDF) installed to facilitate viewing. The complete description of the programme and its usage can be found at www.ictp.trieste.it/ejournals/.¹

What drives the eJDS?

The eJournals server is driven by the www4-mail.² It is a private server and only answers or replies to emails from approved users, i.e. those who have passed the selection process described in the previous section.

www4mail is an application-level gateway software licensed under the GNU Public License, developed at the ICTP by E. Canessa and E. Onime. It acts as a bridge between email and Hypertext Transfer Protocol (HTTP) protocols. A key idea in implementing www4mail was to preserve the layout of the original web pages as much as possible. As a result the emphasis is on how to transport HTTP/HTML requests via email. The final presentation/viewing of retrieved web documents is left to a web browser working in offline mode on the end-user's terminal. The www4mail service, and the software behind it, provides vital and equal access to the wealth of web

information to Internet users in countries where full connectivity is not widespread or is expensive. www4mail can handle cookies, redirections, refresh, frames, etc. It also preserves dynamic web content such as language, style, and scripts, etc. www4mail is an example of an information technology that can bring benefits to individuals and communities world-wide. The primary goal of the www4mail project is to provide researchers/scientists in developing countries with a means to access scientific databases, scientific preprint repositories, and other web-based information. The project's prospects for success lie in its abilities to meet the demands of an ever more sophisticated and complex operating environment and of more specific content delivery as exemplified by the eJDS.

Conclusions

This paper has briefly described a new service to scientists in developing countries, who encounter serious difficulties in retrieving the necessary references for their work. The eJDS uses email to Internet techniques. The project started with the co-operation of three publishing companies, and we definitely hope that other companies will join us in this effort.

Acknowledgements

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Notes

1. Additional information may be obtained by emailing ejds-info@ictp.trieste.it, or faxing ICTP/TWAS Donation Programme: +39 040 2240633.
2. More information on www4mail is available from the website: www4mail.org.

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*the emphasis is
on how to
transport
HTTP/HTML
requests via
email*