

AFRL-WS-WP-TM-1998-9001

EXTENDING THE LIBRARY TO THE
DESKTOP

USING GOLDENGATE AT WRIGHT LABORATORY
TECHNICAL LIBRARY



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TECHNICAL INFORMATION DIVISION
AIR FORCE RESEARCH LABORATORY
AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AFB, OH 45433-7411

JUNE 1998

FINAL REPORT FOR 10/01/1995 - 09/30/1996

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE JUN 1998	3. REPORT TYPE AND DATES COVERED FINAL 10/01/1995--09/30/1996	
4. TITLE AND SUBTITLE EXTENDING THE LIBRARY TO THE DESKTOP USING GOLDENGATE AT WRIGHT LABORATORY TECHNICAL LIBRARY			5. FUNDING NUMBERS C PE PR TA WU	
6. AUTHOR(S) THOMAS D. ROHMILLER				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) TECHNICAL INFORMATION DIVISION AIR FORCE RESEARCH LABORATORY AIR FORCE MATERIEL COMMAND WRIGHT-PATTERSON AFB, OH 45433-7411			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) TECHNICAL INFORMATION DIVISION AIR FORCE RESEARCH LABORATORY AIR FORCE MATERIEL COMMAND WRIGHT-PATTERSON AFB, OH 45433-7411			10. SPONSORING/MONITORING AGENCY REPORT NUMBER AFRL-WS-WP-TM-1998-9001	
POC: THOMAS D. ROHMILLER, DET. 1 AFRL/WST (937) 255-5400				
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) THIS PAPER WAS PRESENTED AT THE 40TH MILITARY LIBRARIANS WORKSHOP, ANNAPOLIS, MD, 19-22 NOV 96. DISCUSSES END-USER SEARCHING OF DESKTOP REFERENCE SERVICES, SUCH AS UNCOVER AND GOLDENGATE AT WRIGHT LABORATORY, WRIGHT-PATTERSON AFB, OH. PAPER REVEALS THAT THE NUMBER OF LIBRARIAN ASSISTED REFERENCE SERVICES WAS NOT SIGNIFICANTLY IMPACTED BY END- USER SEARCHING.				
19980630 019				
14. SUBJECT TERMS LIBRARY REFERENCE SERVICES, END-USER SEARCHING, ON-LINE DATABASES, GOLDENGATE			15. NUMBER OF PAGES 10	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT SAR	

Extending the Library to the Desktop: Using GoldenGate at Wright Laboratory Technical Library

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Background and Issues:

Wright Laboratory Technical Library claims in its mission statement that it is committed to cost effective delivery of information sources to its customers, the scientists, engineers, and managers of Wright Laboratory and Aeronautical Systems Center at Wright Patterson Air Force Base. We recognize that there are competitors to our services and, therefore, strive to be the supplier of choice to our clients, even to the extent of supplying end-user options as alternatives to our own mediated library searches. At Wright Laboratory we consider end-user access to be the untrained, unassisted use of commercial databases by laboratory personnel.

As part of our collection development criteria we select services which extend the options of our customers and establish the accounts with those services. For example, the Library established a custom gateway with UnCover Company to enable both end-user searching and document delivery at the desktop. We learned several valuable lessons from this experience which we were able to later apply with GoldenGate. We learned with UnCover how to create a system of accounts to track use and expenses back to organizations. We learned that there is practically no abuse of the accounts to order documents that are not mission related. We learned the special importance which scientists and engineers place on abstracts to judge the relevance of papers. Especially, we learned end-user searching is not for everyone, that a substantial number do not want to be bothered with it, nor should they be.

The Library staff conducted a customer survey in 1990 which made clear that a number of influential scientists and engineers wanted some form of desktop access or end-user search options. Reference Librarians regularly heard similar requests from clients when providing mediated online searches or assisting them with CD ROM products, most frequently in the form of the question "can I do this from my desk?" These comments provided evidence of continued demand for some form end-user search tool. This continued demand for desktop access highlights three issues to consider:

Should we do it?
Can we do it?
What is it worth?

Should We Do It?

At Wright Laboratory we consider this first item to be a non-issue. As long as we in the library profession dealt only with printed indexes, card catalogs and were content to allow

clients to expend their time finding information sources, we did not trouble ourselves with the question of end-user searching. Of course they did it! And we showed them, from third grade on, how to use *Readers' Guide* and the card catalog. What has remained constant over the last twenty years, even as we changed to electronic reference sources is our responsibility as librarians to use the tools of our trade and provide the best resources we can to enable people to identify information sources. Electronic sources are tools, and we exercise our professional judgement in making these tools, as we do any other information source we control, accessible to end-users through purchase, subscription or licensing.

Can We Do It?

Alternative Solutions:

End-user access in pre-electronic days was relatively common and non-controversial. Today it is relatively simple when using public access catalogs or single license CD ROMs in the library. Extending database access to end-users at their desktops requires a technological solution. Both CD ROM and online technology alternatives exist to accomplish this feat.

The CD ROM alternative at first held out great promise. CD ROM costs are predictable as annual subscriptions which enable unlimited searching at a fixed price. CD ROM products are designed for end users. Their search interfaces are often graphical or menu driven leading users to the content with little training. Unfortunately prices rise steeply for the multiple user or network licenses required to extend their use outside the library. Additionally, Wright Patterson AFB contained several incompatible networks and network operating systems. The hardware and software costs required to overcome this incompatibility and the costs for the servers and the number of CD ROM drives needed to mount all the necessary disks, together with the network license fees for the databases, made this unfeasible. Further consideration of CD ROMs revealed their limitations in coverage. If implemented, the Library would make available only four databases, *INSPEC* from UMI ProQuest, and the DIALOG Ondisc versions of *Aerospace Database*, *NTIS*, and *Ei Compendex Plus*. These four provided only five to ten years of coverage with quarterly updates.

Online databases, in contrast, provided a greater depth and breadth of coverage. The hundreds of commercially available databases have twenty to thirty years coverage and are updated monthly, weekly, or more frequently depending on the database. Internet access to DIALOG via telnet eliminated the problem of networked CD ROMs, and the library had no responsibility for database maintenance. Of course, there remained the serious barriers of command language searching and unpredictable costs.

Enablers for GoldenGate

Wright Laboratory Technical Library staff began investigating solutions to these problems of end-user desktop access. We talked with DIALOG about its end-user menu products and discussed creating one of our own in conjunction with a DIALOG partner, Applied Research Technology. In the meantime two other developments which would have an

impact on our decision were proceeding independently.

The first development occurred as DIALOG created new pricing plans which Fedlink extended to its membership. Custom Master Plan pricing enables a predictable price for online searching of the most demanded databases. In return for a 15% increase over the previous year's total DIALOG search expense, the Library received a flat rate subscription for unlimited use of the DIALOG databases. DIALOG, of course, is not completely altruistic and the plan calls for future prices to be based on current usage. To continue in the plan beyond the first year, the library agrees in subsequent years to split the difference between the prepaid subscription price and the value of online use. For example, suppose a fiscal year 1995 DIALOG bill of \$87,000. To participate in Custom Pricing, the Library would pay \$100,000 in fiscal 1996 ($1.15 \times \$87,000 = \$100,000$). If during the year the library used \$150,000 of DIALOG services this use is covered by the previously fixed \$100,000. To participate again in fiscal 1997, though, the library must now pay \$125,000 ($(\$150,000 - 100,000) \cdot .5 + \$100,000$). However, if the library decides not to continue in the program it reverts to standard pay-as-you-go pricing.

The second enabler was Defense Technical Information Center's (DTIC) development of GoldenGate software. Wright Laboratory Technical Library is biased toward commercial software solutions in order to avoid not only initial development charges but also the expense of updating, maintaining, and documenting programs. DTIC was offering a product which apparently provided the functionality we required at minimal cost. The initial outlay was \$200 per DTIC gateway account and \$50 for each copy of the GoldenGate client.

GoldenGate provides a common graphical interface to search DTIC's own DROLS and WUIS databases as well as those from commercial sources such as DIALOG, ORBIT, and CD Plus. The client software connects to the server across the internet using standard protocols, which eliminated any additional hardware expenses for the Library. Security features required for DROLS access required the Library to establish a series of accounts and passwords which in turn map to DIALOG accounts. The result is a system similar to our UnCover accounts which enable the Library to track expenses to each of the technical directorates. When a representative of DTIC arrived at Wright Laboratory Technical Library to brief on GoldenGate development, we knew we had found our solution.

The following series of figures taken from GoldenGate screens illustrate some of its features. The log on screen (figure 1) shows the ability to connect across the internet or, at the user's option, via a modem. Most importantly, it shows the need to enter an account and password. At Wright Laboratory each technical directorate has a separate account which is tied to both a DIALOG account and password and a DROLS account. The library maintains control over all these accounts and may sever the connection between GoldenGate and DIALOG if necessary. To control password distribution, the Library created "Passports" containing the logon account name and password for a directorate. Each passport is bar coded and circulated using the Library's integrated library system to track password holders. In addition, access to DROLS requires a

separate password also controlled by the Library, which DTIC changes quarterly for security reasons. Passport holders must come to the Library in person to receive the new DTIC passwords.

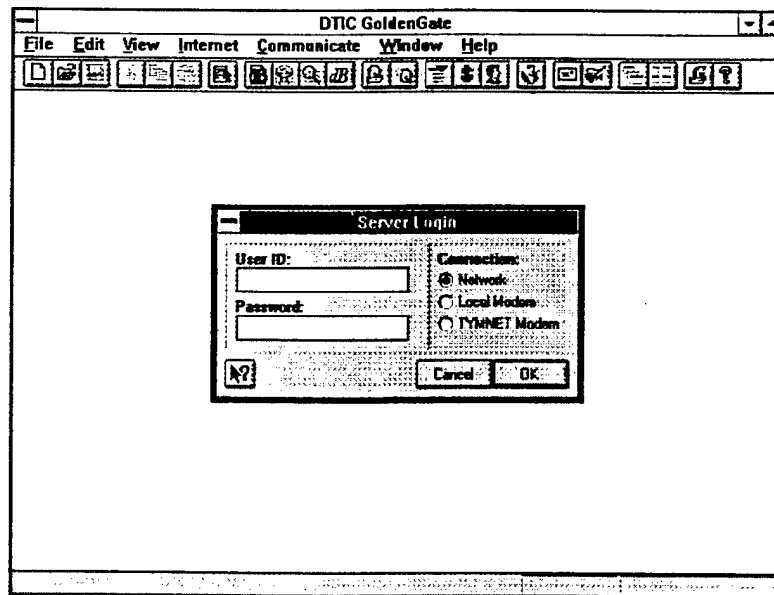


Figure 1. GoldenGate login screen

Once connected to the server, GoldenGate displays a list of available databases (figure 2) for selection. Since this is a Windows interface, one only needs to point and click to select a database to examine it or open it for a search. The databases to be displayed can be controlled in the preferences screen as part of the Edit menu. The full list contains over 80 DIALOG databases whose field structure DTIC could map to a common search command set.

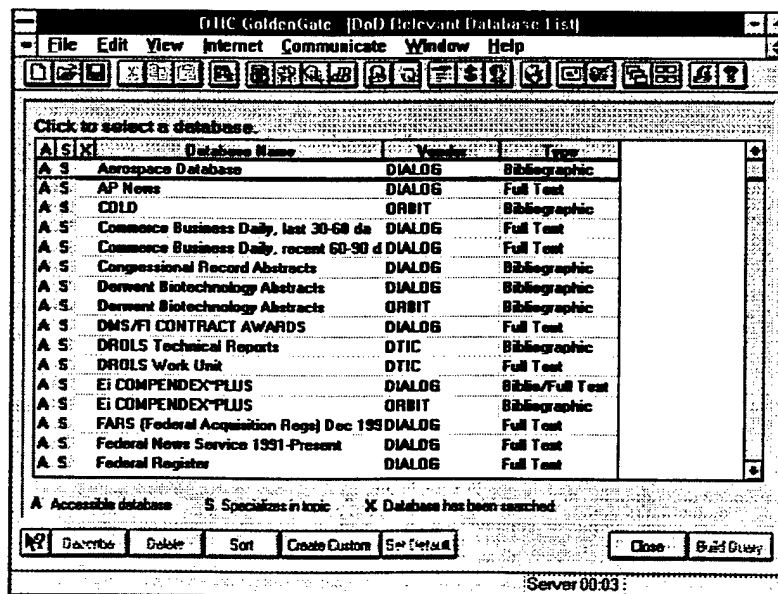


Figure 2. Database selection screen

Opening a database will display the search screen (figure 3) which is common to both DTIC and commercial databases. Each block on the screen accepts words or phrases in either the full record (DIALOG's basic index) or limited to specific fields.

Figure 3. GoldenGate search screen

Following conventional practice, synonyms, Boolean OR relationships, are listed down each block and relations between sets, AND or NOT, are listed across. After entering the search terms in their proper relationships, the user clicks the Search button in the lower right corner, and GoldenGate translates the request to the specific database search command language. The client software displays the resulting titles in a highlight grid (figure 4) from which one can select a full display (figure 5) for viewing or saving to a file.

No.	Title
1	The interaction between secondary flow and film cooling in a turbine nozzle
2	Alleviation of buffet on a Wells air turbine blade using a hybrid active/passive control device
3	Dynamic stall occurrence on a horizontal axis wind turbine blade
4	Effect of periodic wake passing on film effectiveness of inclined discrete cooling holes around the leading edge
5	A computational study of supersonic impulse cascade performance
6	Effect of velocity and temperature distribution at the hole exit on film cooling of turbine blades
7	Leading edge film cooling effects on turbine blade heat transfer
8	Evaluation of high pressure turbine blade coatings on an LM2500 rainbow rotor
9	Measurement and visualization of three-dimensional flows in a linear turbine cascade
10	Influence of leading-edge geometry on profile losses in turbines at off-design incidence - Experiment

Figure 4. Highlight grid showing titles

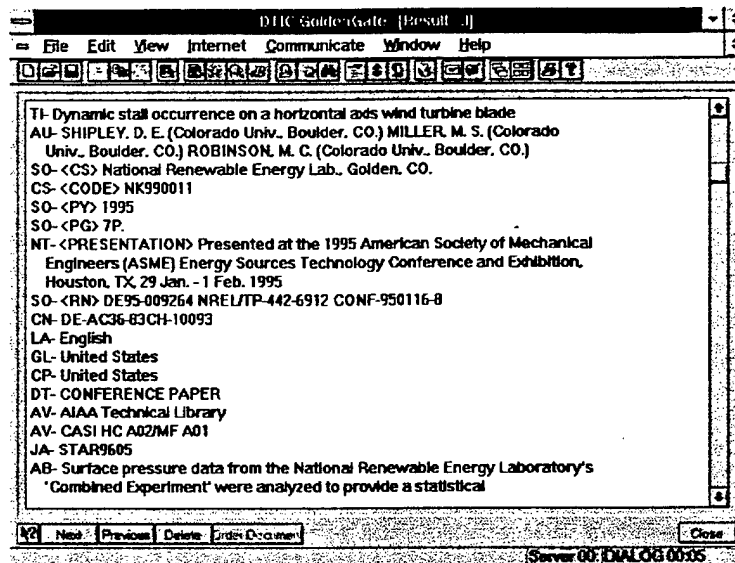


Figure 5. Full display window

What Is It Worth?

In special libraries, more so than in academic or public libraries, librarians are paid to do information gathering, organizing and distributing. It is our job, our profession, and we do it better than anyone as will be demonstrated. This has always been so, even before the advent of electronic sources, but more apparently true since that time when real dollar costs became associated with the time and efficiency of literature searching. This leads to the third issue, what is it worth?

End-user searching, especially extended to the desktop, is an expensive option. At Wright Laboratory, that portion of our budget which pays for online services comes from the technical directorates through charge backs. The customers pay for this option and their willingness to pay a premium for it is a measure of the value they place on this service.

Cost Controls:

Our CD ROM usage led us to confidently estimate that the Library could pay the increased DIALOG charges using funds reprogrammed from CD ROM subscriptions. We implemented GoldenGate service in October 1995 initially limiting its use to within the Library in order to become familiar with the product. We recommended it to in-house end-users in lieu of CD ROM products, to begin weaning them from the familiar CD ROMs, test the product with real customers, and generate interest in desktop access. Finally, in January 1996, we released GoldenGate client software to people to use at their desktop. In February 1996, Fedlink sent us the first statements for the fiscal year containing the DIALOG detailed invoices. These statements revealed how greatly costs exceeded our expectations and why that occurred.

Two problems became immediately apparent. First, the default display format in GoldenGate was an expensive custom format option and second, this was exacerbated by the fact that end-users tend to browse large numbers of citations before selecting

abstracts. GoldenGate's default display shows authors and titles, DIALOG format 2. The price per citation ranged from \$1.15 to \$1.45 in the databases most commonly searched by Wright Laboratory personnel, the same price as a full record including abstracts. The invoice sheets show for each search session the database searched, the time online, and the number of prints or displays by format. Comparing the browsed hits (formats 2 and 6) with abstracts captured (format 5) gives a measure of precision for each search. End-users tended to browse an average of four citations for each one selected for full display. In a few extreme cases, the end-users viewed over 600 records before selecting fewer than ten abstracts. In each case, the price per displayed record is the same.

Immediately upon discovering these problems, the librarians acted to correct them. First, we contacted DTIC and requested a change in the software installation default display format to show titles only. This is equivalent to DIALOG format 6, a free display which had the additional benefit of displaying more of each title. DTIC complied with this request immediately, and within hours of our request, placed a new client on the server for us to download locally. Second, we began an end-user training program to teach users to search databases rather than simply browse large numbers of citations for a relevant few.

End-users evidently do not think as librarians do in terms of precision and recall while searching databases. Browsing large numbers of citations reassures them that they missed nothing in their search. To address this problem the Library staff developed a one hour training program that is mandatory for release of an end-user account password. The course emphasizes two key points. First, end-user searching is but one option in finding information. Librarians are always available to conduct mediated searches or assist end-users in selecting databases or constructing search strategies. Second, let the computer do the work in searching the database. We emphasize writing out the search beforehand in order to focus on the real topic and relationships among concepts instead of merely stringing key words together. Most of our customers are familiar with Boolean logic and immediately grasp the significance of this step. We suggest as a general guide a top range of 30-40 hits as being a well constructed search and stress that it is always possible to modify searches to make them broader by adding synonyms or removing "and" statements.

Immediately, costs of end-user searches began to go down to more acceptable levels. This was largely the result of "free" display formats. The ratio of abstracts to titles rose, but not dramatically, and remains about 20%. A comparison with mediated searches in the DIALOG databases shows the relative cost efficiencies. End-users performed 35% of the total searches and incurred 55% of the total usage costs (table 1).

Table 1. FY96 DIALOG searches at Wright Laboratory Technical Library

Type of Searcher	DIALOG Searches	% Searches	Cost	% Cost	Cost per Search
Librarian	1253	65	\$64,772	45	\$52
End-Users	686	35	\$78,134	55	\$114

Conclusions:

Having first dispensed with the question of should we offer end-user searching, the Librarians moved quickly to the real problems of how to do it and whether it is worth the expense. GoldenGate software enabled Wright Laboratory Technical Library to fill a customer-expressed desire for desktop end-user searching. The Library adopted a commercial product, GoldenGate, and avoided development costs required to create a user friendly search client of its own design. Knight-Ridder DIALOG's timely introduction of a flat rate pricing plan for its commercial databases provided a low risk means to implement end-user searching. The result is desktop access to current commercial and DTIC databases as an effective alternative to networked CD ROMs.

End-user searching is a rather inefficient option to locating information but so was end-user searching of a printed *Readers' Guide* or *Engineering Index*. It is also realistic to recognize that end-users will seek information through whatever means are available to them. At Wright Laboratory we take it as our responsibility to provide quality means, whether print or electronic, through some form of preselection of information sources. We act on the premise that end-user database searching supplements mediated searches, and it is easy to measure its popularity. In fiscal year 1996, there were nearly 700 searches of DIALOG using GoldenGate and over 6,000 connections to UnCover. At the same time, the number of librarian mediated searches also grew slightly.

To answer the question "is it worth it," perhaps it is best to think in terms of diminishing returns. Given that the number of mediated searches at least remained constant is evidence that these 700 GoldenGate searches probably would not have occurred otherwise. These additional searches were 35% of the total literature searches of the DIALOG databases, and about 25% of the total library searches when including STN and LEXIS-NEXIS. That represents a 33% growth in knowledge not otherwise obtained. This knowledge came at a higher price per unit, but a price willingly borne by the technical directorates who fund the Library's online accounts and who value knowledge over ignorance.