ONLINE SEARCHING OF DATABASES : AN AUTOMATIC APPROACH

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Abstract

A technique for automatic logon to Dialog host computer at Palo Alto, California, USA, is described. The software, written in Procomm Script language, helps in connecting to the Gateway Packet Switching Service PAD at New Delhi provided by the Videsh Sanchar Nigam Limited. After connecting to the PAD, the software sends NUI, User No., Password and loads up the search strategy. The software with automatic option selection capability, can be learnt by librarians with minimum effort.

1. Introduction

Due to the continued devaluation of Indian rupee and rising cost of databases and telecommunications, it is necessary to cope up with the resulting problems by adopting novel techniques for searching the databases online. One of the factors which affect the search cost is the manual typing of commands from the keyboard. Besides, accessing the databases through Gateway Packet Switching Service (GPSS) without having leased lines up to local PADs poses connectivity problems, mainly due to the fact that a large number of subscribers are served by only a few ports. For example, in Delhi, only four telephone lines are provided by Videsh Sanchar Nigam Limited (VSNL) for about 150 registered users. The users lose interest when they do not get a clear line even after repetitive manual dialing.

Besides, in the process, they waste their valuable time.

The above factors inspired us to find a solution in providing necessary relief to the user from the process of repetitive dialing and also in using the telephone line effectively after getting the connection. The Script file, written in Procomm Script language, saves time and reduces the telecommunication and search costs besides minimizing the errors (Fig. 1).

2. Procomm Script Language

In India, Procomm software is supplied along with the modem at a nominal price of Rs 500 by various modem manufacturers. Sometimes, it is given free of cost. One of the special features of the Procomm software is its script language. For those who are unfamiliar with script language, these may

Figure 1

```
1:   ;*•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••
2:   ;*                                                                             *
3:   ;*    AUTODIAL.CMD Written by A Kumar & AK Tyagi, July 1991                    *
4:   ;*                                                                             *
5:   ;*                                                                             *
6:   ;*    This script file is written for automatic logging onto ;                *
7:   ;*    Dialog via GPSS (Delhi) and up loading the search strategy              *
8:   ;*                                                                             *
9:   ;*•••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••••
10:  CLEAR                                      47:       TRANSMIT "!"
11:  SET BAUDRATE 1200                          48:       GOTO DPARA
12:  SET DATABITS 7                             49:  ENDIF
13:  SET PARITY EVEN                            50:
14:  SET STOPBITS 1                             51:  DPARA:
15:  EMULATE VT100                              52:       SWITCH S3
16:  LOCATE 4 5                                 53:          CASE "(3712220)"
17:  MESSAGE "Enter file name to save the retrieved   54:             ASSIGN S2 "ATDP0,3712221!"
     data XXXXXXXX.XXX"                          55:             ASSIGN S3 "(3712221)"
18:  LOCATE 4 48                                56:          ENDCASE
19:  GET  S1  12                                57:          CASE "(3712221)"
20:  SWITCH S1                                  58:             ASSIGN S2 "ATDP0,353505!"
21:       CASE "NULL"                           59:             ASSIGN S3 "(353505)"
22:          ASSIGN S1 "PROCOMM.LOG"            60:          ENDCASE
23:       ENDCASE                               61:          CASE "(353505)"
24:  ENDSWITCH                                  62:             ASSIGN S2 "ATDP0,353508!"
25:  CLEAR                                      63:             ASSIGN S3 "(353508)"
26:  TRANSMIT "AT!"                             64:          ENDCASE
27:  PAUSE 1                                    65:          DEFAULT
28:  ASSIGN S2 "ATDP0,3712220!"                 66:             ASSIGN S2 "ATDP0,3712220!"
29:  ASSIGN S3 "(3712220)"                      67:             ASSIGN S3 "(3712220)"
30:  ASSIGN S4 "Press ESC key to abort the session and  68:          ENDCASE
     return to Terminal mode"                    69:  ENDSWITCH
31:  START:                                     70:  GOTO START
32:       TRANSMIT S2                           71:
33:       CLEAR                                 72:  NPARA:
34:       LOCATE 10 16                          73:       WAITFOR "*" 20
35:       MESSAGE "Trying to connect to GPSS"   74:       IF NOT WAITFOR
36:       LOCATE 10 42                          75:          HANGUP
37:       MESSAGE S3                            76:          GOTO DPARA
38:       LOCATE 18 5                           77:       ENDIF
39:       MESSAGE S4                            78:       KFLUSH
40:       LOCATE 23 1                           79:       LOG OPEN S1
41:       RFLUSH                                80:       ISFILE "NETWORK.KEY"
42:       WAITFOR "CONNECT RELIABLE!" 60        81:       IF FAILURE
43:       IF WAITFOR                            82:          CLEAR
44:          GOTO NPARA                         83:          MESSAGE "Network file not found. Press
45:  ELSE                                               RETURN to proceed manually"
46:       HANGUP                                84:          LOG CLOSE
```

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```
85:            EXIT
86:         ELSE
87:            MLOAD "NETWORK.KEY"
88:            GOTO LPARA
89:         ENDIF
90:
91:    LPARA:
92:         MACRO 0
93:    WAITFOR "PLEASE LOGON:A M" 10
94:         IF NOT WAITFOR
95:            MACRO 0
96:            WAITFOR "PLEASE LOGON:ΛM" 10
97:            IF NOT WAITFOR
98:               MACRO 0
99:               WAITFOR "PLEASE LOGON: ΛM" 10
100:              IF NOT WAITFOR
101:                 HANGUP
102:                 CLEAR
103:                 GOTO DPARA
104:              ELSE
105:                 GOTO UPARA
106:              ENDIF
107:           ENDIF
108:        ENDIF
109:
110:   UPARA:
111:        KFLUSH
112:        MACRO 1
113:        WAITFOR "ENTER PASSWORD:ΛM" 10
114:        IF NOT WAITFOR
115:           LOG CLOSE
116:           HANGUP
117:           CLEAR
118:        GOTO DPARA
119:   ELSE
120:        GOTO PPARA
121:   ENDIF
122:
123:   PPARA:
124:        KFLUSH
125:        MACRO 2
126:        WAITFOR "?" 60
127:        IF NOT WAITFOR
128:           LOG CLOSE
129:           HANGUP
130:           CLEAR
131:           GOTO DPARA
132:        ELSE
133:           GOTO DPARA
134:        ENDIF
135:
136:   KPARA:
137:        ISFILE "DIALOG.KEY"
138:        IF FAILURE
139:           CLEAR
140:           MESSAGE "Dialog file not found. Press
                        RETURN to proceed manually"
141:           EXIT
142:        ELSE
143:           GOTO SKPARA
144:        ENDIF
145:
146:   SKPARA:
147:        MLOAD "DIALOG.KEY"
148:        KFLUSH
149:        SET ALARM ON
150:        ALARM 5
151:        MACRO 0
152:        WAITFOR "?"
153:        MACRO 1
154:        WAITFOR "?"
155:        MACRO 2.
156:   WAITFOR "?"
157:        MACRO 3
158:        WAITFOR "?"
159:        MACRO 4
160:   WAITFOR "?"
161:   MACRO 5
162:   WAITFOR "?"
163:   MACRO 6
164:   WAITFOR "?"
165:   MACRO 7
166:   WAITFOR "?"
167:   MACRO
168:   WAITFOR "?"
169:   MACRO 9
170:   WAITFOR "*"
171:   IF WAITFOR
172:           HANGUP
173:           PAUSE 2
174:           LOG CLOSE
175:        ENDIF
176:   EXIT
```

be taken as mini-programs that take care of the control of the functioning of their computer and modem from the point of dialing through the logon process, and also of their automatic movement in an online system from one database to another for

searching, once they entered an information retrieval system such as Dialog. The publishers of Procomm have done a commendable job of making COMMANDS accessible to anyone willing to learn the language.

3. Autodial Commands

Figure 1 gives a complete picture of the commands that a Script file uses. It begins with a few lines of comments. Comments must be started with semicolons. After comments, the first six lines set the terminal speed, parity, etc. Line number 16 positions the cursor on the 4th row and 5th column for the message in line 17. This message asks the user to specify the file name where the retrieved data will be stored on the hard disk. In case the file name is not specified, the key <ENTER> is pressed and the default file name PROCOMM.LOG is assumed. We recommend to rename this file and then delete it after a search is over. Between lines 28 to 30, three variables are defined. In variable S2, the number to be dialed first is defined, preceded by ATDP. If the user wants to change telephone numbers, the Script file is updated by replacing the old file with a new one, using any text editor.

Lines 31 to 49 display some message on the screen and dial the number given in line 28. If no connection is made, lines 51 to 70 are executed which determine the number to be dialled next. The process is repeated until the session is aborted or the connection is established. Modifications can be made wherever necessary in the lines 51 to 70 by replacing the existing telephone numbers with new ones. The digits (ϕ), coming after ATDP are required only when the telephone line is through EPABXd and is not a direct dial up line.

In case the connection is established, the line 73 instructs the program to wait for 20 s for "*" (PAD prompt). If "*" is received within the specified time limit, the line 79 will open a file for downloading information. The next ten lines determine whether the file NETWORK.KEY (where the NUI, user

number and passsword are stored) exists in current directory or not. If the file exists, then these three are transmitted (lines 91 to 125). In case of any failure in transmission or when the NUI, user number and password are not accepted by the host/PAD, the control is passed on to line 51 and the next available number is tried.

After transmitting the password successfully, the Script waits up to 60 s for Dialog prompt "?". The moment Dialog prompt is received, the Script checks the DIALOG.KEY file where the Dialog commands and search strategy are stored. If it is not found, further execution of commands is terminated and the Script returns to terminal mode, and one can continue the session manually.

The DIALOG.KEY file can be changed by pressing ALT-M key from the terminal mode or the Help Screen. A window will appear listing the current key assignments (Fig. 2). To revise an assignment the key "R" is pressed, followed by the key to assign

Figure 2

KEYBOARD MACROS

ALT-0	SET COST SHORT!
ALT-1	SET SELECT SHORT!
ALT-2	B 213!
ALT-3	LIMIT ALL/ENG!
ALT-4	SET U1 T1, AU, JN, PY!
ALT-5	SET U2 T1, AU?JN, PY, LH!
ALT-6	SET U3 T3, AU, JN, PY, AB, DE, ID!
ALT-7	S online( )information( )retrieval!
ALT-8	T S1/03/1-2!
ALT-9	LOGOFF!

R: Revise   L: Load   S: Save   C: Clear   ESC: Exit

(ALT-0 through ALT-9). A group of macros thus created is saved on to disk by using the "S" option. When Procomm prompts for a file name, the name of the file is given for saving the macro. The use of a file extension '.KEY' helps in distinguishing the nature of contents. In case the file name is not

DIALOG.KEY, it must be changed in lines 137 and 147.

In case the file specified by the user in line 137 is found on the disk, line 149 sounds alarm five times to alert the user about the beginning of the database search. The subsequent 20 statements of the program wait for the prompts to be sent by the host system and for answering them with proper responses.

Finally, when the program ends, the Script closes the logged file and returns to the terminal mode. In case the search strategy requires more than 10 macros, one can have more than one .KEY files. These can be loaded in the same way as DIALOG.KEY and macros can be transmitted after inserting requisite lines between lines 169 and 170.

4. Search Example

The result of the search conducted on Dialog System through GPSS (Delhi PAD) using Script file AUTODIAL.CMD, is given in Appendix 'A'. Only one search statement macro 6 was used in this example to keep the cost of the experiment to a bare minimum (Fig. 2). Besides, some other search parameters, such as Set Cost Short, Limitall/Eng, Set Select Short, are to be set before the actual search begins. However, in actual case as many macro files can be created as the situation demands.

5. Conclusion

The success of this method depends on the efficacy and efficiency of the search strategy. However, in case of zero results in response to the search statements executed, the Script file· should be terminated by pressing ESC key.

· Acknowledgements

Bibliography

1. Dykhuis, Randy. Procomm Plus and OCLC's EPIC: Part one. *Computers in Libraries,* 1991, **11**(2), 38-39.

2. Dykhuis, Randy. Procomm Plus and OCLC's EPIC: Part two. *Computers in Libraries,* 1991, **11**(3), 23-25.

3. Clancy, Stephen. How to download and use Procomm communications software with power performance and price. *Online,* 1988, **12**(1), 97-114.

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*N-3106900803   **APPENDIX 'A'**

COM

DIALOG INFORMATION SERVICES
PLEASE LOGON:
* * * * * * * * HHHHHHHH SSSSSSSS? * * * * * * * *
ENTER PASSWORD:
* * * * * * * * HHHHHHHH SSSSSSSS? * * * * * * * *

Welcome to Dialog
Dialog level 27.06.06B

Last logoff: 07jul91 23:44:19
Logon file001 10jul91 04:32:16

File 1:ERIC 66-91/JUN.

    Set Items Description
?SET COST SHORT
COST = SHORT.
?SET SELECT SHORT
SELECT response set to SHORT
?B 213
            10Jul91 04:32:48 User039870 Session B265.1
      $0.27 Estimated cost File1
      $0.27 Estimated cost this search
      $0.27 Estimated total session cost 0.009 Hrs.

File 213:ONTAP INSPEC
        (COPR. IEE 1990)

    Set Items Description

?LIMITALL/ENG
>>>LIMITALL started
?SET U1 TI,AU,JN,PY
User Defined Format 1 is set to TI AU JN PY.
      Type/Display Estimated Cost: $ 0.00 – (File 213).
?SET U2 TI,AU,JN,PY,LA
User Defined Format 2 is set to TI AU JN PY LA.
      Type/Display Estimated Cost: $ 0.00 – (File 213).
?SET U3 TI,AU,JN,PY,AB,DE,ID
User Defined Format 3 is set to TI AU JN PY DE ID.
      Type/Display Estimated Cost: $ 0.00 – (File 213).
?s online () information () retrieval
      S1   6 ONLINE () INFORMATION () RETRIEVAL
?T S1/U3/1-2
1/U3/1
Title: Multiple attribute decision making and on-line information systems
      Author (s) : O'Shaughnessy, M.P.; Coskuntuna, S.; Kantro, E.
      Editor (s) : Salvendy, G.
      Publication Date: 1987
    Abstract: Describes two studies undertaken as part of a research program designed to
investigate the human decision making process. The decision process is modelled in terms of

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information processing theory. Preliminary results support such a model of decision making, and point to important issues to consider in the development of online information retrieval systems.

Descriptors: human factors; information retrieval systems; information theory; psychology; user interfaces

Identifiers: multiple attribute decision making; psychology; human decision making process; information processing theory; online information retrieval systems

1/U3/2
Title: A question-answering system for the French Yellow pages
    Author (s): Herman, P.; Sabah, G.; Vilnat, A.
    Journal: Computational Intelligence
    Publication Date: May 1988
    Abstract: Describes a dialogue-based system which is intended as an intelligent natural language interface to the French Yellow Pages. The authors do not assume that the user knows how the Yellow pages are organized, and they paraphrase his request, if necessary, so as to better search for the desired information. It is assumed that the reason the user is online is to find addresses and phone numbers of suppliers. There are three basic modules used in the system: parser, dialogue manager, and generator. The first two exist (and are constantly being extended), while the generation module is still only a set of functional specifications.

Descriptors: expert systems; information retrieval systems; interactive systems; natural language; telecommunications computing; user interfaces

Identifiers: online information retrieval; question-answering system; French Yellow Pages; dialogue-based system; intelligent natural language interface; parser; dialogue manager; generation module.
?logoff
          10Jul91 04:33:53 User039870 Session B265.2
    $0.50 Estimated cost File213
    $0.50 Estimated cost this search
    $0.77 Estimated total session cost 0.042 Hrs.
Logoff: level 27.06.06 B 04:33:53

PAD CLR

*

OK