

THE KANJI TRICK

By Graham L. Cromar

I like that commercial. The one with the guy staring in absolute bewilderment at a cluster of seemingly contradictory parking signs. How many times have I done that? Life seems riddled with such confusion; no less so when an irksome problem drives you into a stack of manuals for the answer to an AS/400 question.

Even in this age of digital retrieval, the manuals are only as good as the search engine, and as any of you are, no doubt, aware from your own experiences, the job of researching an answer can lead to a lot of dead ends and frustration. Into this maelstrom of half-correct conjectures, determination and desperation, we meet an old cliché:

*Magister artis ingenique
largitor venter
(Hunger is the teacher of
arts and the bestower of
invention).*

I present the following case of extreme invention for our collective amusement, inspiration and amazement. If anyone has a better explanation as to why this works, let me know. After all – there’s something to be said for clarity.

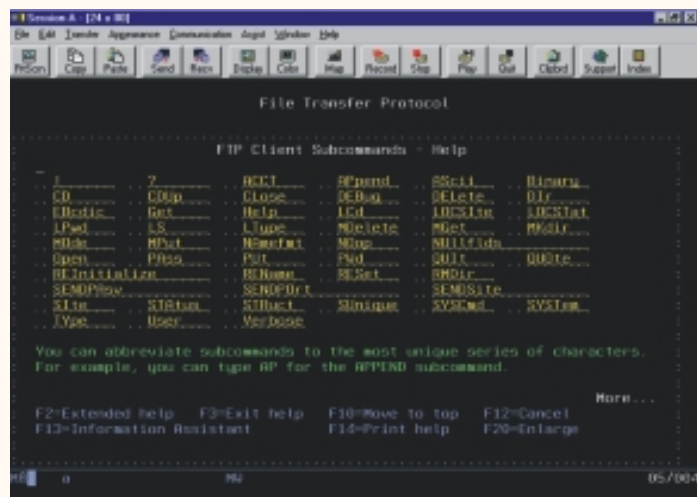


Figure 1: FTP subcommands

The Problem

I was recently confronted with the necessity of moving a flat file with packed fields between an IBM MVS mainframe and a client’s AS400. The problem of FTPing packed fields between systems has always been a bothersome one. If I had been lucky enough to be transferring a file with an external description in the opposite direction, the CPYTOIMPF (copy to import file) would have been an option. Similarly, if both systems had been AS400’s, a binary transfer type would have handled the packed fields. Not so, between the two platforms in question.

In most such cases, IBM’s recommended solution has been to write a program to unpack the fields. I felt compelled to try something else. The mainframe’s internal character representation is IBM EBCDIC. Therefore, I reasoned, it might be possible to find a way to move the packed fields without conversion.

The Solution

Through trial and error, I quickly discovered that neither the BINARY transfer type, nor the EBCDIC transfer type would work. What I didn’t know at the time, and what I found out later from IBM, was that either transfer type would have worked in combination with a transfer mode of

BLOCK. This solution is noted in the *OS/400 TCP/IP Configuration and Reference* with respect to transferring packed fields between AS400’s (inset below). However, I have yet to discover a specific reference to it working for MVS in the printed manuals.

*Title: OS/400 TCP/IP Config. & Ref. V4R4
Document Number: SC41-5420-03
Build Date: 02/24/99 12:49:25
Build Version: 1.3.0*

7.11.2.2 Transferring Files that Contain Packed Decimal Data between AS/400 Systems

There is no support in FTP for converting special numeric formats like packed decimal or zoned decimal. The transfer of packed decimal or zoned decimal data is supported between AS/400 systems when you use either a transfer type of TYPE I (BINARY) or TYPE E (EBCDIC) with a transmission mode of BLOCK; these transfer types send the data as is without any conversion. The results of any other transfer type are unpredictable.

When transferring packed or zoned data in an externally described QSYS.LIB file, the target file should be pre-created in the same manner as the source file. This restriction applies to data containing any special numeric format or when keyed access is required.

When transferring data with a transfer type of binary, the record length of the target file must be the same as the record length of the source file.

Before packed decimal or zoned decimal data can be transferred to or from other system architectures (such as S/390 or UNIX), you must convert the data to printable form.

Undeterred, I next turned to the FTP subcommands help screen. You may view the FTP Client subcommands (Figure 1) by initiating FTP and connecting to the loopback address. Once you are logged in, type a question mark on the command line, move the cursor over the subcommands line and press enter.

The problem of interpreting the packed fields is essentially a character translation issue. This thinking led me to experiment with the CCSID (coded character set identifier) feature of the TYPE subcommand (Figure 2).

After trying a number of combinations, I stumbled upon the following result. As inane as it seems, translating the file into Japanese (IBM EBCDIC Kanji - TYPE F, CCSID=5035) resulted in a faithful transmission of the packed fields!

The Kanji Trick (for moving packed data between an IBM MVS host and an AS/400 can be summarized as follows:

STRUCT R

(transfer record by record rather than byte stream)

TYPE F

(to change the coded character set id CCSID to IBM Kanji)

Both these commands are necessary to avoid record length and translation problems respectively.

When viewed using the DSPPFM (display physical file member) command, the file transferred to the AS/400 has the same hexadecimal values in the packed fields as were sent from the MVS host. I processed this file through an RPG/400 program that handles this file as an internally defined, input primary file, with the packed fields defined in the i-specs. The program reads these values and updates a database file. The program works perfectly in our test AS400 system.

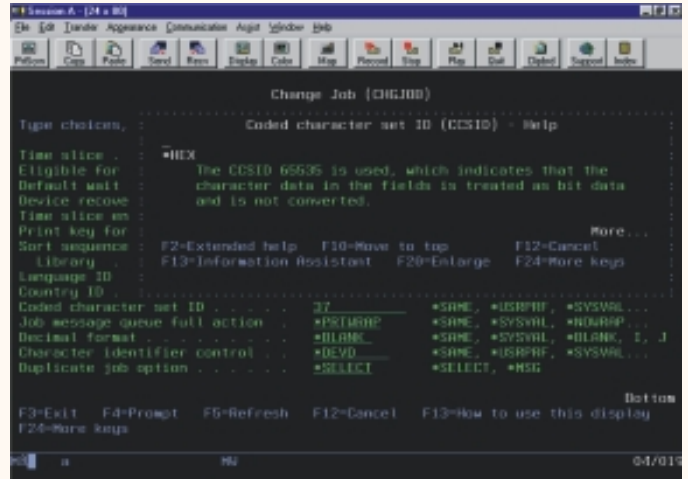


Figure 3 – CHGJOB command, prompted to show help on CCSID (coded character set identifier) values.

Conclusion

I am reminded of a cartoon wherein one scientist is explaining an elaborate flowchart to the other. At a critical point in the logic, just prior to the output, a box appears that reads, “then a miracle occurs”. Not surprisingly, this seems to be a point of great concern. →

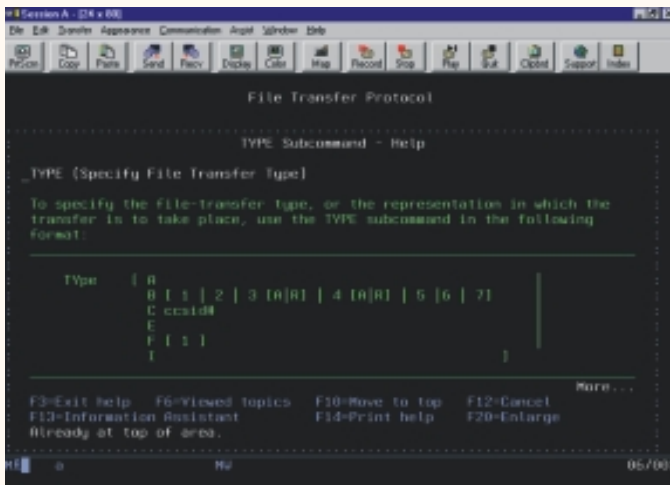


Figure 2 – The FTP TYPE subcommand

Cautionary Note

If the default CCSID setting on your AS400 is not 65535 (no conversion) you will find that some very strange things happen when the file is processed by another job. In my example, the default setting on our test AS400 was CCSID=65535. But, the setting on the production box was CCSID=37 (English).

This led to unexpected results when the RPG program I mentioned processed the file, which the system knew was in Japanese. Specifically, the file’s contents looked fine when viewed using the DSPPFM command, but a debug of the RPG program showed entirely different values in the fields read from the file.

In order to avoid these difficulties it is necessary to do a CHGJOB (change job) command and ensure that the coded character set identifier for the job is set to *HEX (or 65535) for no conversion (Figure 3).

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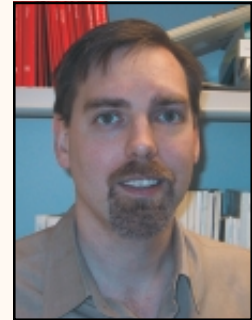


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→ In explanation, I can only imagine a simpler time in the development labs at big blue when the need to create a new hex translation table(s) arose. I can only guess, that neither the MVS nor the AS/400 had existing tables to handle the Japanese language at that time, and that some bright light decided not to duplicate their efforts but, to create one table common to both (all?) platforms. This begs the question as to whether there are other CCSID values that would work. It also suggests that discovering undocumented alternate-language tables common to them may solve other sorts of translation problems between disparate platforms. Anyone out there have a Rosetta stone handy?

The danger in using these solutions, of course, is that there is no guarantee that the tables will remain common in future releases. On the other hand, it's handy to know that such possibilities exist if they can be counted on for the odd "one-off" situation. In this case, there turns out to be a better (read: IBM recommended) solution than the Kanji trick. But, you never know when you might be faced with your next uphill battle. Let this be a lesson: Where there's a will - there's a way! 




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