



Extended Compare Option

7.4

User Guide

January 2003

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CONTENTS

Chapter 1:	Extended Compare Option	
	<i>Comparison Types</i>	5
	DATA Comparison	5
	TEXT Comparison	6
	<i>DATA Comparison Logic</i>	6
	Key Synchronization	6
	Physical-Record-Number Synchronization	6
	<i>Which to Use: DATA or TEXT?</i>	7
	<i>Processing Conditions</i>	7
	DATA Compares	7
	DATA and TEXT Compares	9
	<i>Using the Extended Compare Option</i>	10
	Index	13

Contents

EXTENDED COMPARE OPTION



The Extended Compare Option is a separately licensed option of Serena™ StarTool® FDM. To invoke it, you must have installed StarTool FDM with this option as the default compare utility in the @COMPARE parameter. See *COMPAREZ Extended Compare Option* in the *Serena™ StarTool® FDM Installation Guide*.

The Extended Compare Option uses functionality from the Serena™ Comparex® product. It allows you to do simple compares while using StarTool FDM. You can compare two files using either a DATA type or TEXT type compare.

- Use the TEXT type compare for files that do not have fields in fixed positions.
- Use the DATA type compare for specialized compares, such as CSECT to CSECT compares in load modules. The ability to perform DATA type compares is the main advantage of the Extended Compare Option (some other compare utilities only perform TEXT type compares).

With the Extended Compare Option, the only parameter to choose is the type of compare: DATA or TEXT. The other features available with the full Comparex product, such as filters, masks, and key specification, are not included with this option.

COMPARISON TYPES

Extended Compare recognizes two file categories: DATA and TEXT. Each type uses different comparison logic because the method of synchronization differs.

DATA Comparison

Extended Compare defines DATA as any file that contains a known inter-record relationship. These files have bytes and fields in fixed positions on each record.

Extended Compare compares these files record to record, using key synchronization for VSAM-KSDS or ISAM files, and physical-record to physical-record synchronization for other file types.

Typical DATA files are:

- Master files
- Intermediate files

Chapter 1: *Extended Compare Option*

- Transaction files
- Databases
- Load modules

TEXT Comparison

Extended Compare defines TEXT as any file that does not contain inter-record relationships. TEXT files do not have bytes and fields in fixed positions. Rather than pairing records for comparison, TEXT synchronization uses buffers and look-ahead logic to pair blocks and isolate differences.

Typical TEXT files are:

- Program source code
- JCL
- Reports
- Documentation

DATA COMPARISON LOGIC

Under DATA comparison logic, the Extended Compare input processing routines attempt to match records (one record from each input file) to send to the compare routines. The two types of matching are:

- Key synchronization.
- Physical-record-number to physical-record-number (no synchronization).

Key Synchronization

Extended Compare automatically uses key synchronization for VSAM-KSDS and ISAM files when performing a DATA type compare. The defined key in the file is used to pair records to send to the compare routines.

Physical-Record-Number Synchronization

If the SYSUT1 file organization is not VSAM-KSDS or ISAM, Extended Compare uses same-physical-record-number synchronization to pair records to send to the compare routines.

This means that Comparex compares each SYSUT1 record with the same numbered record on SYSUT2. Record number 1 on SYSUT1 is compared to record number 1 on SYSUT2, and record number 1001 on SYSUT1 is compared to record number 1001 on SYSUT2.

If one file is longer than the other, the extra records are sent to the compare routines alone. Under same-physical-record-number synchronization, Extended Compare sends pairs of records to the compare routines unless one file is at end of file. Messages CPX51I and CPX52I show the actual input sequence record number, not the sequence number of records sent to the compare routines.

WHICH TO USE: DATA OR TEXT?

Run a DATA comparison for the following situations:

- VSAM-KSDS or ISAM files (to get key synchronization)
- Databases
- Load modules (to get CSECT to CSECT compares)
- Object code files

If none of these situations apply, then use TEXT. TEXT allows you to maximize the buffering area required for look-ahead logic and minimize the number of records that must match exactly.

Note Extended Compare uses DATA comparison logic when TEXT is not specified, or when it has been nullified because of inconsistencies. When Extended Compare performs DATA comparison logic, it cannot simultaneously perform TEXT comparison logic in the same run; the two comparison logic routines are incompatible.

PROCESSING CONDITIONS

DATA Compares

The following conditions apply only for DATA compares using key synchronization.

File Out of Sequence

While reading records from either SYSUT1 or SYSUT2, if Extended Compare finds that a key is out of sequence, then message CPX36A will be issued once followed by the offending record. For example, if a file contains records with keys 1, 5, 10, 3, and 20 (ascending order assumed); the record with key 3 is flagged as being out-of-synch and will be printed with message CPX36A. Any subsequent out-of-synch records are ignored; only the first violation is flagged.

Chapter 1: Extended Compare Option

Duplicate Key on the Same File

If the compare routines find that a set of keys on a record is equal to the set of keys on the previous record from that file, Extended Compare attempts to match this record to a record from the other file. Equal keys, then, cause no problems with synchronization. If only one record for that key exists on the other file, it is paired for comparison to the first record with the duplicate key. The second record with the duplicate key is identified as a key synchronization mismatch. It displays on the difference report after message CPX61I for the records from the SYSUT1 file, or after message CPX62I for the records from the SYSUT2 file.

End of Data on SYSUT1

If file SYSUT1 has come to end of file and file SYSUT2 has not, Extended Compare sends all extra records from file SYSUT2 to the difference report, showing them as extra records with message CPX62I.

End of Data on SYSUT2

If file SYSUT2 has come to end of file and file SYSUT1 has not, Extended Compare sends all extra records from file SYSUT1 to the difference report, showing them as extra records with message CPX61I.

Records Matched on Key

If the compare routines find that a set of keys on a record from file SYSUT1 is equal to a set of keys on a record from file SYSUT2 (the pair was sent to the compare routines synchronized by key), Extended Compare compares the data values in the records.

Records Are Equal

If all bytes in the two records compare equal, Extended Compare bypasses the records. The utility does not send the records to the difference report.

Records Compare Unequal

If the records do not compare equal, or if one record is longer than the other record, Extended Compare sends both records to the difference report, showing the SYSUT1 record with message CPX51I and the SYSUT2 record with message CPX52I.

No Match on Key for SYSUT1

If the key is an ascending key and the compare routines find a set of keys on a record from file SYSUT1 that is lower than the next set of keys on a record from file SYSUT2, Extended Compare sends the SYSUT1 record to the difference report, showing it as a key synchronization mismatch with message CPX61I.

If the key is a descending key and the compare routines find a set of keys on a record from file SYSUT1 that is higher than the next set of keys on a record from file SYSUT2, Extended Compare sends the SYSUT1 record to the difference report, showing it as a key synchronization mismatch with message CPX61I.

No Match on Key for SYSUT2

If the key is an ascending key and the compare routines find a set of keys on a record from file SYSUT2 that is lower than the next set of keys on a record from file SYSUT1, Extended Compare sends the SYSUT2 record to the difference report, showing it as a key synchronization mismatch with message CPX62I.

If the key is a descending key and the compare routines find a set of keys on a record from file SYSUT2 that is higher than the next set of keys on a record from file SYSUT1, Extended Compare sends the SYSUT2 record to the difference report, showing it as a key synchronization mismatch with message CPX62I.

DATA and TEXT Compares

The following conditions apply for both DATA and TEXT type compares.

End of Data on SYSUT1

If file SYSUT1 has come to end of file and file SYSUT2 has not, Extended Compare sends all extra records from file SYSUT2 to the difference report, showing them as extra records with message CPX62I.

End of Data on SYSUT2

If file SYSUT2 has come to end of file and file SYSUT1 has not, Extended Compare sends all extra records from file SYSUT1 to the difference report, showing them as extra records with message CPX61I.

Records Are Equal

If all bytes in the two records compare equal, Extended Compare bypasses the records. The utility does not send the records to the difference report.

Records Compare Unequal

If the records do not compare equal, or if one record is longer than the other record, Extended Compare sends both records to the difference report, showing the SYSUT1 record with message CPX51I and the SYSUT2 record with message CPX52I.

USING THE EXTENDED COMPARE OPTION

To invoke the Extended Compare Option, type COMPARE on the command line of the StarTool FDM Primary Options menu. The Compare Member panel displays:

```
----- COMPARE: Compare Members -----  
OPTION ==>  
  
- DSN=USER07.LIB.PDSE,VOL=SER=TST002 MEM= -----  
Base data set or member ==>  
  on volume ==> (enter if data set is not cataloged)  
Compare data set or member ==>  
  on volume ==> (enter if data set is not cataloged)  
Comparison type override ==> TEXT (DATA or TEXT)
```

The current data set name displays in the DSN field; in this example, USER07.LIB.PDSE. Type the names of the two data sets you want to compare in the Base Data Set and Compare Data Set fields. If they are members in the current data set, it is only necessary to type the member name. Type TEXT or DATA in the Comparison Type field.

In the following example, two assembler source members are compared using a TEXT type compare:

```
----- COMPARE: Compare Members -----  
OPTION ==>  
  
- DSN=USER07.LIB.PDSE,VOL=SER=TST002 MEM= -----  
Base data set or member ==> LIB.PDSE(@SERVICE)  
  on volume ==> (enter if data set is not cataloged)  
Compare data set or member ==> LIB.PDSE740(@SERVICE)  
  on volume ==> (enter if data set is not cataloged)  
Comparison type override ==> TEXT (DATA or TEXT)
```

After pressing Enter, the system runs the comparison and displays a report with the results:

```

C O M P A R E X (MVS - 8.3.0 - 2000/123)                WEDNESDAY MAY 15, 2002 (2002/135)

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CPX00I - TEXT=.      BUFF=1024 MBRHDR=COND, KILLECHO
C O M P A R E X (MVS - 8.3.0 - 2000/123)      ISPFPRO2    WEDNESDAY MAY 15, 2002 (2002/135)
10:59:12 PAGE 2
SYSUT1=USER07.LIB.PDSE(@SERVICE),SYSUT2=USER07.LIB.PDSE740(@SERVICE)
+++++++<+...++++1+...++++2+...++++3+...++++4+...++++5+...++++6+...++++7+>...++++8+...+++++
D      CLI   UCBVOLI-UCBOB(R1),C' ' *20 Blank volume name?      81140144    DIF O N E    8139 +
D      BE    EXCPOP19                *20 Yes, branch          81140244    DIF O N E    8140 +
D      CLI   UCBTYP-ucbob+2(R1),X'20' *20 DASD DEVICE?        81140344    DIF O N E    8141 +
D      BNE   EXCPOP19                *20 No, branch           81141044    DIF O N E    8142 +
D      **20  TM   FLAGSXX,FCOPYUCB     TESTUCB TO COPY THE UCB?  81150044    DIF O N E    8143 +
D      **20  BNO  EXCPOP19              NO, BRANCH             81160044    DIF O N E    8144 +
-----3-----1-----2-----3-----4-----5-----6-----7-----8-----
I      TM   FLAGSXX,FCOPYUCB     TESTUCB TO COPY THE UCB?  81150016    DIF T W O    8139 +
I      BNO  EXCPOP19              NO, BRANCH             81160016    DIF T W O    8140 +
+++++++<+...++++1+...++++2+...++++3+...++++4+...++++5+...++++6+...++++7+>...++++8+...+++++

CPX71I - END OF TEXT ON FILE SYSUT1
CPX72I - END OF TEXT ON FILE SYSUT2
CPX75I - RECORDS PROCESSED: SYSUT1(8758)/SYSUT2(8754),DIFFERENCES(2,4,0)
EXPLANATION - 2 RECORDS DIFFER THAT SYNCHRONIZED TOGETHER
              4 RECORDS WERE CONSIDERED INSERTED ON SYSUT1
              0 RECORDS WERE CONSIDERED INSERTED ON SYSUT2
CPX80I - TIME OF DAY AT END OF JOB: 10:59:12 - CONDITION CODE ON EXIT: 4

```

The report is this example shows:

- The two files compared:
 - SYSUT1 - USER07.LIB.PDSE
 - SYSUT2 - USER07.LIB.PDSE740
- Record differences. The right side of the report shows the physical record number (8139, 8140 . . .) and the statements *DIF O N E* (for SYSUT1) and *DIF T W O* (for SYSUT2).
 - The D in column 1 indicates the records on SYSUT1 that were either not on SYSUT2, or they synchronized but were different. In this example, the first four records displayed were not on SYSUT2; the fifth and sixth records synchronized but were different.
 - The I in column 1 indicates the records on SYSUT2 that synchronized with records on SYSUT1 but were different.

This correlates with the summary EXPLANATION messages at the bottom of the report.

INDEX

C

CPX36A 7
CPX51I 7–9
CPX52I 7–9
CPX61I 8–9
CPX62I 8–9

D

difference report 11
duplicate key 8

E

extra
records 7

F

files
out of sequence 7

I

invoking the Extended Compare
Option 10

K

key
ascending 8–9
descending 9
duplicate 8
equal 8
no match on for
SYSUT1 8
SYSUT2 9
records matched on 8
synchronization 6
mismatch 8–9

M

matching
physical-record to physical-record
6
synchronization
key 6
messages
CPX36A 7
CPX51I 7–9
CPX52I 7–9
CPX61I 8–9
CPX62I 8–9

O

out of sequence
files 7

P

physical-record to physical-record 6
physical-record-number
synchronization 6

R

records
compare
equal 8–9
unequal 9
extra 7–9
matched on key 8
reports
difference 11

S

starting the Extended Compare
Option 10
synchronization
key 6
physical-record-number 6
SYSUT1
end of data 8–9
no match on key for 8

SYSUT2

end of data 8–9
no match on key for 9

U

unequal
compare 8

