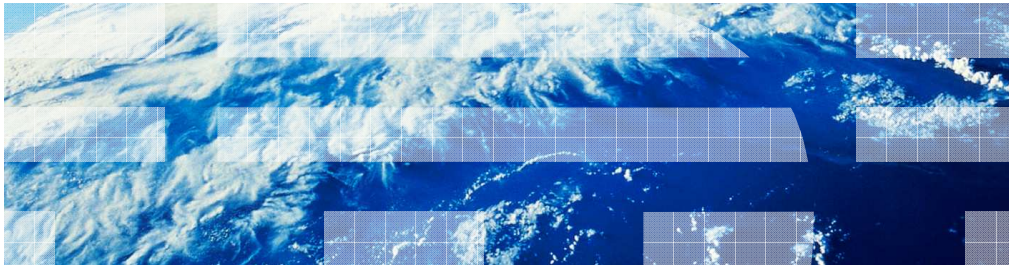


---

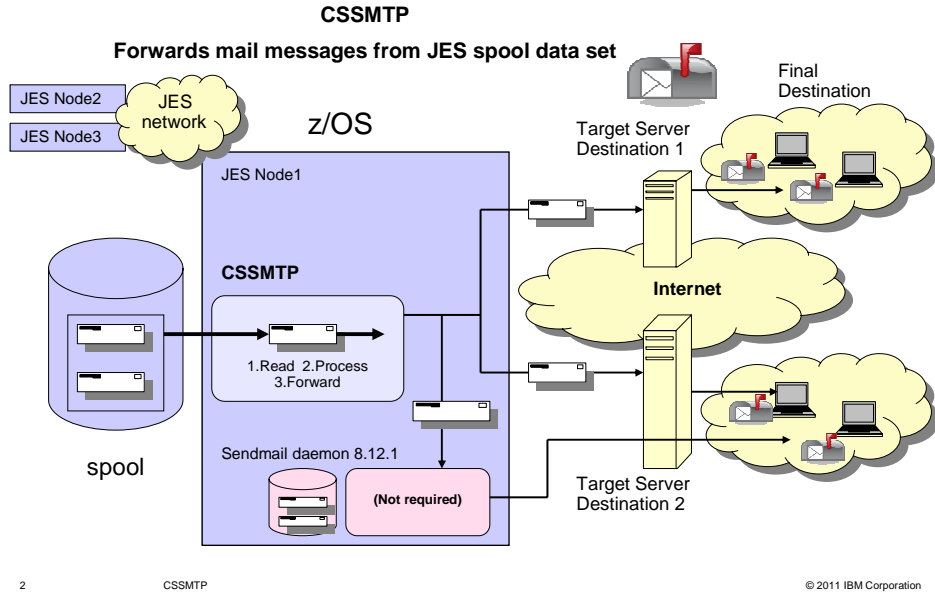
# z/OS Communications Server

## CSSMTP



This presentation describes the updates to CSSMTP in z/OS® V1R13 Communications Server.

## CSSMTP extended retry: introduction



The Communications Server Simple Mail Transfer Protocol (CSSMTP) program accepts mail messages from JES spool files created by user programs, and transmits the messages to other Mail Transfer Agents (or MTAs). These MTAs either forward the mail to another server or deliver the mail to the MTA host. CSSMTP was introduced in z/OS V1R11 Communications Server.

Spool files can contain one or many messages that are read by CSSMTP and transmitted to internet connected target servers. When all of the mail messages in a JES spool file have been processed, then the JES spool file is deleted.

## CSSMTP extended retry: comparison

	Long retry	Extended retry
<b>Configuration</b>	RetryLimit statement	ExtendedRetry statement
<b>Time limit</b>	V1R11: two hours V1R12: five days	Indefinite
<b>Mail retained</b>	In memory	In z/OS UNIX® file system
<b>JES spool file freed during retries?</b>	No	Yes
<b>Flush using</b>	MODIFY FLUSHRETRY	MODIFY FLUSHRETRY,AGE= <i>n</i>

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CSSMTP

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CSSMTP has an existing long-retry mechanism. This slide contrasts the existing long-retry function with the new extended-retry function.

The existing support is configured using the RetryLimit statement, and it has a limit of five days in V1R12. While it is periodically retrying a message, it retains that message in memory and does not free the JES spool file.

The new extended retry support is configured using the ExtendedRetry statement. It allows for unlimited retries, and so it stores unsent messages on disk rather than holding them in memory. Additionally, it frees the JES spool file even while it is periodically retrying the message.

A new option is available on the MODIFY FLUSHRETRY command to cause messages in extended retry state to be processed as undeliverable.

Both forms of retry can be enabled. For example, you can configure CSSMTP to perform long retry for one hour, but then move a message to extended retry for five days. This allows for system resources such as memory and JES spool files to be freed during extended retry.

Both long retry and extended retry will cease retry attempts if a permanent failure reply code (5xx) is received from the target server. Such messages are subject to undeliverable message processing.

The configuration, error reports, SMF records and display commands are updated with information about the extended retry.

The internal CSSMTP health check function is updated to check the state of the z/OS UNIX file system directory.

## CSSMTP extended retry: configuration

```
ExtendedRetry
{
  Age days | 5
  Interval minutes | 30
  MailDirectory /var/cssmtp/extwrtname/mail/
}
```

The extended retry function is enabled using the ExtendedRetry statement. ExtendedRetry is disabled if no ExtendedRetry statement is configured. The statement has these parameters: Age indicates how many days a message should remain in extended retry, measured from the time the message enters extended retry after long retry completes. The default value is five days, and a value of zero results in an unlimited extended retry period. Interval indicates how many minutes to wait between attempts to resend the mail message. The default value is 30 minutes, and a value of zero causes extended retry to be disabled. MailDirectory identifies the z/OS UNIX path in which to store mail messages during extended retry. The default value is based on the external writer name used by the CSSMTP started task.

## CSSMTP extended retry: display

```

10.32.12 MODIFY CSSMTP,DISPLAY,CONFIG
10.32.12 EZD1829I CSSMTP CONFIGURATION: 588
CONFIGFILENAME      : //'USER1.SMTP.CNTL(XYZ) '
. . .
RETRYLIMIT:
COUNT             : 1             INTERVAL      : 15
EXTENDEDRETRY: ACTIVE
AGE                : 4             INTERVAL      : 30
MAILDIRECTORY     : /var/cssmtp/XYZ/mail/
. . .

```

```

10.38.50 MODIFY CSSMTP,DISPLAY,TARGETS
10.38.50 EZD1831I CSSMTP TARGETS: 301
GLOBAL INFORMATION:
MAIL SENT : 4             TOTAL RETRY : 1
DEADLETTER: 0            CURRENT RETRY: 0
UNDELIVER : 0
EXTENDED RETRY:
CURRENT    : 1             TOTAL      : 1
TARGET SERVER 127.0.0.1
. . .

```

The examples on this slide show that the MODIFY DISPLAY,CONFIG command output is updated to reflect extended retry configuration settings; and that the MODIFY DISPLAY,TARGETS command output is updated to report on messages in extended retry.

This information is also reported in appropriate SMF records.

## CSSMTP extended retry: flushing messages in extended retry

```

11.02.17 F CSSMTP,D,TAR
11.02.17 EZD1831I CSSMTP TARGETS: 089
GLOBAL INFORMATION:
MAIL SENT : 4                TOTAL RETRY : 1
DEADLETTER: 0                CURRENT RETRY: 0
UNDELIVER : 1
EXTENDED RETRY:
CURRENT   : 2                TOTAL      : 2

11.02.32 F CSSMTP,FLUSHRETRY,AGE=1
11.02.32 EZD1834I CSSMTP MODIFY COMMAND ACCEPTED
11.02.32 EZD1823I CSSMTP MODIFY FLUSHRETRY,AGE=1 COMMAND COMPLETED
11.02.47 F CSSMTP,D,TAR
11.02.47 EZD1831I CSSMTP TARGETS: 133
GLOBAL INFORMATION:
MAIL SENT : 4                TOTAL RETRY : 1
DEADLETTER: 1                CURRENT RETRY: 0
UNDELIVER : 2
EXTENDED RETRY:
CURRENT   : 1                TOTAL      : 1

```

This slide demonstrates the use of the `MODIFY FLUSHRETRY,AGE=n` command. This command causes all messages in extended retry which are older than the indicated age to be flushed. In this case, two messages were in extended retry before issuing the `FLUSHRETRY` command. After the command was issued, one message remains in extended retry and the undelivered messages count has increased. From this you can see that one of the messages in extended retry was older than one day, and the other was not.

## CSSMTP extended retry: things to think about

- Coordinate ExtendedRetry with RetryLimit
- File system
  - Adequate space
  - Separation

If you choose to enable extended retry, you should consider lowering your RetryLimit retry period. This will allow for system resources to be freed earlier.

Take care when choosing your extended retry mail directory. Ensure that you have adequate space for the mail messages you expect to have in extended retry. You should plan to reserve at least double the amount of space in your file system for the size and number of mail messages you expect to have in extended retry. CSSMTP monitors the extended retry file system for sufficient space and issues warning messages when the file system exceeds 75% full. You can avoid these messages if you add an extra third when you estimate the space needed in your file system. If the space on your file system becomes constrained, you can use the `MODIFY FLUSHRETRY,AGE=n` command to selectively purge some messages from extended retry.

CSSMTP terminates if there is an error writing a message to the extended-retry directory.

Additionally, you should consider allocating the extended-retry directory as a separate file system. This will prevent other system activities from interfering with the extended-retry function. In particular, you should consider allocating the extended-retry directory as a separate file system from your dead-letter directory. There is no automatic deletion of dead-letter mail.

## CSSMTP enhancements: support additional code pages

```
.-Translate IBM-1047-----.  
>>+-----+-----<<  
'-Translate code_page_identifer--'
```

```
CSSMTP_CODEPAGE_CONFIG=code_page_identifier
```

```
MODIFY CSSMTP,DISPLAY,CONFIG  
EZD1829I CSSMTP CONFIGURATION: 588  
CONFIGFILENAME      : //'USER1.SMTP.CNTL(XYZ)'  
  
CONFIG CODEPAGE     : IBM-037  
TRANSLATE           : 273  
START OPTION TCPNAME : N/A          IPV6 ENABLED   : YES  
EXTWRRTNAME        : XYZ           HOST NAME      : VIC000
```

Before V1R13, z/OS Communications Server CSSMTP supported a limited set of code pages.

Beginning in V1R13, z/OS Communications Server CSSMTP supports a wider set of code pages for both the TRANSLATE statement in the CSSMTP configuration and the CSSMTP\_CODEPAGE\_CONFIG environment variable. The TRANSLATE statement governs the code page used for JES spool mail messages, and the CSSMTP\_CODEPAGE\_CONFIG environment variable governs the code page used for the CSSMTP configuration files.

The code page you choose is reflected on the CSSMTP MODIFY DISPLAY,CONFIG output.



## CSSMTP enhancements: additional code page rules

- Code page must be defined to Unicode Services
  - User-defined code pages known to Unicode Services are supported
  - Numeric code pages (1047) and named pages (IBM-1047) are supported
- Code page must be an EBCDIC code page
- Code page must have translation tables for both
  - IBM-1047 (EBCDIC)
  - ISO-8859-1 (ASCII)
- Code page must support round-trip translation to both
  - IBM-1047 (EBCDIC)
  - ISO-8859-1 (ASCII)
- The carriage return and line feed characters used to end the lines of commands and mail messages must translate properly to ISO-8859-1

This slide lists the rules that a code page must satisfy in order to be used by CSSMTP. If a code page does not match all of these rules, CSSMTP will reject its use.

First, CSSMTP uses Unicode Services to manage code pages, so the code page must be defined to Unicode Services. You can use user-defined code pages, and numeric code page names are now supported.

Second, you must use an EBCDIC code page.

Finally, your code page must support translation to ASCII and EBCDIC, and must support round-trip translation to both ASCII and EBCDIC. In particular, carriage return and line feed characters must translate properly to ASCII for network transmission.



## CSSMTP enhancements: known supported code pages

IBM-037	IBM-273	IBM-277	IBM-278	IBM-280	IBM-281	IBM-282
IBM-284	IBM-285	IBM-297	IBM-500	IBM-871	IBM-1047	IBM-1140
IBM-1141	IBM-1142	IBM-1143	IBM-1144	IBM-1145	IBM-1146	IBM-1147
IBM-1148	IBM-1149	4133	4369	4370	4371	4373
4374	4376	4378	4380	4381	4393	4596
4967	5143	8229	8692	12788	16421	16884
20517	20980	24613	25076	29172	32805	33268
41460	45556	49652	53748	61696	61711	61712

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CSSMTP

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The code pages listed on this slide were tested for use with the TRANSLATE statement and the CSSMTP\_CODEPAGE\_CONFIG environment variable. Code pages with “IBM” prefix were also tested using their numeric names.

This is not an exclusive list; in particular, you can define your own code pages to Unicode Services for use with CSSMTP. Refer to *z/OS Unicode Services: User's Guide and Reference* for instructions on defining your own code page.

## CSSMTP enhancements: JES syntax error limit

```
.-JESSyntaxErrLimit 5-----.  
>>-+-----+-----><  
'-JESSyntaxErrLimit count-'
```

- Errors include
  - Unknown SMTP commands
  - Missing SMTP commands
  - SMTP commands out of sequence
  - Missing or extra parameters
- Errors do not include malformed recipient addresses

```
MODIFY CSSMTP,DISPLAY,CONFIG  
EZD1829I CSSMTP CONFIGURATION: 514  
CONFIGFILENAME      : //'USER1.SMTP.CNTL(XYZ)'  
.  
.  
JESSYNTAXERRLIMIT  : 5
```

Before V1R13, CSSMTP stopped processing a JES spool file if it encountered five SMTP syntax errors and generated an error report. Syntax errors include unknown commands, missing commands, commands out of sequence and missing or extra parameters on commands. (Note that a malformed recipient address on an RCPT command is treated as an undeliverable message rather than a syntax error.)

Beginning in V1R13, you can configure the limit of SMTP syntax errors in a JES spool file using the JESSyntaxErrLimit statement. The default value remains five errors. You might configure a higher limit if you are willing to tolerate more errors and the extra overhead of processing erroneous JES spool files. You can code a value up to 999. A value of zero means unlimited errors are tolerated.

The configured error limit is displayed on the CSSMTP MODIFY DISPLAY,CONFIG command output.



## CSSMTP enhancements: diagnosing JES syntax error limit

- Syntax errors are caused from the submission of spool files containing incorrect SMTP commands or incorrect command sequences
- A copy of the spool files (with just the commands and headers) can be useful for problem determination

Spool files must follow the syntax for SMTP protocol as described by RFC 2821 and RFC 2822. Note that if a syntax error occurs, CSSMTP can generate an error report reporting the problem detected in the spool file. Review the Report and BadSpoolDisp statements associated with the CSSMTP configuration file in the *z/OS Communications Server: IP Configuration Reference*. Also you can review the CSSMTP job log file to see log messages regarding the syntax errors and when they occurred in the spool file.



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