

IPDS Error Recovery -- Contents

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IPDS Error Recovery Overview

When driving an IPDS printer, Infoprint Manager sends page and resource data to the printer. The printer reports status and errors back to Infoprint Manager. The printer status information is in the form of station counters representing progress of pages sent to the device through the printer microcode and the physical printing mechanism. Station counters report the number of pages and the number of copies of pages proceeding through each point in the printer.

Infoprint Manager requests printer status information (an acknowledgement request) after sending each job. The acknowledgement response contains the latest values of all the printer station counters. Once all pending jobs have been processed, Infoprint Manager polls the printer periodically until all the pages of each job have been stacked.

The actual destination object **ack-interval** attribute is configurable and defines how often Infoprint Manager requests updated station counters from the printer while processing a particular job. The value for this attribute is specified in terms of pages and can be from 1 to 9999; the default value is 100 pages. For a 360 page job, an **ack-interval** setting of 100 pages means that Infoprint Manager will send an acknowledgement request to the printer after sending pages 100, 200, 300, and 360.

The printer responds to an acknowledgement request and returns station counters when all of the pages up to that point have been processed. This does not necessarily mean that all of those pages have printed or are stacked. The acknowledgement response from the printer after the 100th page will show that 100 pages have been processed (received). The printer may report, however, that only 10 pages have stacked.

The **ack-interval** value affects printing performance and the currency of job status information. A small **ack-interval** value causes increased communication and processing and can cause a reduction in printer throughput. A small **ack-interval** value will, however, increase the frequency that job attributes such as **current-page-printing**, **job-copies-completed**, **media-sheets-completed**, and **pages-completed** are updated. A small **ack-interval** value will also enable the Infoprint Manager software to have more recent station counters than it would with a large **ack-interval** value.

Errors reported from the printer can be grouped into the following categories:

- [Data Stream Errors](#)
- [Insufficient Memory in the Printer](#)
- [Intervention Required Conditions](#)
- [Unrecoverable Problems](#)

IPDS Error Recovery: Data Stream Errors

For data stream errors, the job may continue printing or the job may be terminated, depending on the severity of the error. There are hundreds of specific data stream errors. If one data stream error is defined for the error, Infoprint Manager directs the printer to continue processing the page and take an alternate exception action.

When a data stream error occurs, messages are produced describing the problem and the recovery actions performed. The messages report details about the error and include the page number where the error occurred. After Infoprint Manager receives a data stream error from the printer and produces a message, it uses station counters returned from the printer to continue printing without skipping or reprinting any pages.

Reporting of some data stream errors (using undefined code points in a font or printing outside of the valid printable area) can be controlled with job attributes. This allows the job submitter to decide whether or not error messages or printer error marks should be generated when the following type of errors are encountered:

- [Job continues printing](#)
- [Job is terminated; no pages print](#)
- [Job is terminated; some pages print](#)

Data Stream Error Example 1 (Job Continues Printing):

If page three of a 10 page document attempts to print outside the valid printable area (an error) and the submitter specified (data-fidelity-problem-reported=all), the following occurs:

1. Pages 1-2 and 4-10 in the document print normally.
2. For page three, the printer prints only the data that is inside the valid printable area. In addition, a printer error marker (PEM) is printed on the page where the print data extends outside the valid printable area.
3. After all 10 pages have printed, a set of messages is printed:

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| 0420-094: | The following messages were generated for file /info/afp/baddata with Job ID 123. This file printed on the Infoprint destination ip60, which is a 3160 destination. |
| 0420-484: | The destination reported that an attempt was made to print outside of the valid printable area. |
| 0420-249: | Infoprint received IPDS exception X'08C1..00', action code X'01' from the destination. |
| 0420-098: | The error occurred while printing page 3 of copy 1 of this print job. |
| 0420-254: | The destination reported an error that caused Infoprint to stop processing the page. |

Data stream error example 2 (job is terminated, no pages print):

If a document is submitted and it requests a specific form definition which does not exist, the following occurs:

1. The document does not print. However, auxiliary sheets such as the start sheet (header) and end sheet (trailer) page, if requested, do print.
2. A message page will print with the following messages:

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| 0420-094: | The following messages were generated for file /info/afp/testfdef with Job ID 456 on the Infoprint destination ip60, which is a 3160 destination. |
| 0420-128: | ERROR: Infoprint cannot find or cannot access the FORMDEF resource named F1BAD. |
| 0420-060: | The error occurred with the object type page with token name PAGE0001. |
| 0420-060: | The error occurred with the object type document with token name ASCII. |
| 0420-098: | The error occurred while printing page 1 of copy 1 of this print job. |

Data stream error example 3 (job is terminated; some pages print):

If page five of a 10 page document requests a font (C0D0GT15) which cannot be located, the following occurs:

1. Pages one through four print; page five does not print. Printing of the document ends; pages six through 10 also do not print.
2. A message page will print with the following messages:

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| 0420-094: | The following messages were generated for file /info/afp/long.list3820 with Job ID 1234567890 printed on the Infoprint destination psf4317, which is a 4317 destination. |
| 0423-284: | Infoprint mapped the FGID, GCSGID, width, vertical size combination: 230, 0, 96, C0D0GT15. The FGID.GRD mapping file specified that this mapping be performed. |
| 0423-291: | Map Coded Font (MCF) structured field could not be processed because Infoprint could not find font character set C0D0GT15. Attempted resolution/type(s): 300-pel Font Fidelity 300-pel. CONTINUE. Destination supported resolution/type(s): 300-pel. |
| 0420-060: | The error occurred with the object type Active Environment Group with token name 1. |
| 0420-060: | The error occurred with the object type page with token name 1. |
| 0420-060: | The error occurred with the object type document with token name LONG. |
| 0420-098: | The error occurred while printing page 1 of copy 1 of this print job. |
| 0423-302: | The font reference in the MCF1 structured field, repeating group number 1, with sequence number 1 at file offset 118, could not be processed successfully. Additional error and diagnostic messages will follow. |
| 0420-729: | The error occurred in file /info/afp/long.list3820. The structured field in error was the EAG field with code X'D3A9C9' and sequence number 1 located at file offset 250. |

IPDS Error Recovery: Insufficient Memory in the Printer

In some cases, a printer may not have sufficient storage to process the data or resources required for a page. When this occurs, Infoprint Manager responds by deleting resources in the printer which are not required for the page and then tries to print the page again. Frequently, this recovery will allow the page to print successfully. If the printer still reports that there is insufficient storage to process the page, the job is terminated and a message is produced indicating that the page and its associated resources are too complex.

Insufficient Memory in the Printer Example :

A 30 page document is submitted. Each page of the document references several complex page segments.

1. Infoprint Manager sends pages for the document to the printer.

Before each page is sent, Infoprint Manager downloads page segments that are required by the page.

2. The printer reports an insufficient memory error to Infoprint Manager (for page 23).

Infoprint Manager deletes all the page segments (and any other resources) previously downloaded to the printer. All of the printer memory available for resources should now be free. Infoprint Manager then attempts to load only the page segments required for page 23. Because unnecessary page segments have been removed from printer memory, all of the page segments for page 23 can be successfully downloaded into the printer. No messages are reported to the server and no message pages are printed.

3. All 30 pages of the job print successfully.

IPDS Error Recovery: Intervention Required Conditions

A printer may experience intervention required conditions that are not related to the data stream or complexity of the data. These conditions cause printing to stop. Some intervention required conditions are handled directly by some printers and are not reported back to Infoprint Manager. In these cases, Infoprint Manager continues to send data to the printer.

Example:

If a paper jam occurs while the printer is printing page 223 of a 1000 page document, the following occurs:

1. As soon as the paper jam occurs, printing stops and the destination (printer) object changes to **red**.
 - A message is sent to the operator:
 - 0420-466: The destination reported a paper jam; clear the jam.
2. The actual destination (printer) object's destination-state changes to "needs key operator".
 - Infoprint Manager waits until the paper jam has been cleared.
3. The operator then clears the paper jam, according to the printer jam recovery procedure. Some damaged pages are usually discarded as part of this procedure.
4. Once the printer jam is cleared, the destination (printer) object is no longer red. Using station counters from the printer, Infoprint Manager repositions to the correct page and continues printing the document.
5. At the end of the document, a message page is printed which contains the following:
 - 0420-094: The following messages were generated for file /info/paperjam with Job ID 787. This file printed on the Infoprint destination ip32, which is a 4332 destination.
 - 0420-467: A paper jam occurred in the destination while printing this job. Inspect the output to determine if it is complete and that all printed pages are acceptable.

IPDS Error Recovery: Unrecoverable Problems

Unrecoverable problems cause the Infoprint Manager software or printer software to stop functioning or prevent them from communicating with each other. Examples of unrecoverable errors include: server system crash, software core dump, printer abort, power failure, or severe network problems.

These errors prevent the Infoprint Manager software from obtaining current station counter status information from the printer. In these cases, Infoprint Manager cannot determine how many pages and which jobs printed since the last set of valid station counters were received. Infoprint Manager considers a job complete only when all pages are reported by the printer as stacked. In most cases, some pages for one or more jobs will print between the time Infoprint Manager last received a printer acknowledgment and the time the unrecoverable error occurs.

Those jobs, because they are considered incomplete, will normally start printing from the beginning when the problem is resolved and both the Infoprint Manager software and the printer are operating and communicating again.

However, if the submitter or operator does not want the job to start printing from the beginning, there is a way to modify where printing starts for the documents in these jobs. The document object **page-select** attribute can be modified before the job is processed again. This attribute allows the submitter to specify a page range (first to last) for each document in a job. This way, the submitter or operator can control which pages are printed after the problem is resolved.

Depending on the type of error and the network configuration, some errors may not be reported to Infoprint Manager immediately. In these cases, an operator can issue a **pdshutdown** command to the actual destination object. This command works without any attempts to communicate with the printer. Infoprint Manager will checkpoint the job that was partially stacked at the printer and use the station counters from the last valid acknowledgment to determine which page of which job to checkpoint. A small **ack-interval** value will make it possible to checkpoint using a more recent set of station counters than would be available with a large **ack-interval** value. The job can be resumed later from that checkpoint.

Some unrecoverable errors are reported immediately to the Infoprint Manager software and the actual destination object (printer) is disabled. When this occurs, the **pdshutdown** command cannot be issued and therefore no checkpoint can be taken. Infoprint Manager does not perform automatic checkpointing.

Unrecoverable Problem Example:

If the printer power is turned off while page 201 of a 300 page job is printing, the following occurs:

1. The destination (printer) object becomes disabled and the icon changes to **black**.
2. The job object changes to the **pending** state.
3. Later, the printer power is restored.
4. The operator must enable the destination (printer) object.
5. Jobs start printing on the printer in the order they have been scheduled.

All 300 pages of the job that was printing during the power failure print again.