



## HyperTerminal Zmodem File Transfer

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The HyperTerminal Zmodem File Transfer protocol provides a simple means of point-to-point serial file transfer. The session initialization dialog includes attributes that allow an interrupted file transfer to be resumed.

This protocol allows the following file transfers:

- Multiple files may be transferred per session.
- File data is transmitted in 1024-byte data blocks.
- Data packets are strung together and acknowledged, only once, at end-of-file.
- Error detection supports checksum error checking.
- An interrupted file transfer can be restarted from the point of interruption.

This protocol uses the following packets.

Packet	Description
<a href="http://msdn.microsoft.com/en-us/library/ms819796.aspx">ZRQINIT Initialization Request Packet</a> [ <a href="http://msdn.microsoft.com/en-us/library/ms819796.aspx">http://msdn.microsoft.com/en-us/library/ms819796.aspx</a> ]	Server initialization request.
<a href="http://msdn.microsoft.com/en-us/library/ms819794.aspx">ZRINIT Initialization Response Packet</a> [ <a href="http://msdn.microsoft.com/en-us/library/ms819794.aspx">http://msdn.microsoft.com/en-us/library/ms819794.aspx</a> ]	Client initialization response.
<a href="http://msdn.microsoft.com/en-us/library/dd424207.aspx">ZFILE File Attribute Packet</a> [ <a href="http://msdn.microsoft.com/en-us/library/dd424207.aspx">http://msdn.microsoft.com/en-us/library/dd424207.aspx</a> ]	Server packet informing the client of file attributes, including the file name.
<a href="http://msdn.microsoft.com/en-us/library/ms819795.aspx">ZRPOS File Start Position Packet</a> [ <a href="http://msdn.microsoft.com/en-us/library/ms819795.aspx">http://msdn.microsoft.com/en-us/library/ms819795.aspx</a> ]	Client packet defining the position in the data file at which the transfer should begin.
<a href="http://msdn.microsoft.com/en-us/library/ms819790.aspx">ZDATA File Data Packet</a> [ <a href="http://msdn.microsoft.com/en-us/library/ms819790.aspx">http://msdn.microsoft.com/en-us/library/ms819790.aspx</a> ]	Server packet containing 1024 bytes of file data.
<a href="http://msdn.microsoft.com/en-us/library/ms819791.aspx">ZEOF End of File Packet</a> [ <a href="http://msdn.microsoft.com/en-us/library/ms819791.aspx">http://msdn.microsoft.com/en-us/library/ms819791.aspx</a> ]	Server packet marking the end of transmission for this file.
<a href="http://msdn.microsoft.com/en-us/library/ms819793.aspx">ZFIN End of Session Packet</a> [ <a href="http://msdn.microsoft.com/en-us/library/ms819793.aspx">http://msdn.microsoft.com/en-us/library/ms819793.aspx</a> ]	Server packet marking the end of the HyperTerminal Zmodem File Transfer session.

The server negotiates file transfer attributes with the client at the start of a file transfer session. The attributes include a means of resuming a previously interrupted file transfer. The server transfers files in a continuous stream of data packets. The client does not acknowledge successful data packets, but sends a single acknowledgement when an end-of-file packet is encountered. If the client detects an incomplete data packet, it aborts the file transfer. If the server presents the same file for transfer, the client indicates the point in the file at which transmission should resume.

To initiate a file transfer from server to client, the server sends the following short ASCII line control character sequence to activate the client receiver:

```
rz<CR>
```

The server follows this sequence with an initialization request packet with a packet type code ZRQINIT (<ZDLE>+ASCII B), for example:

```
<PAD><PAD><ZDLE> 42 30 30 30 30 30 30 30
30 30 30 30 30 30 30 30 <CR> <LF> <XON>
```

**Note** Command codes are listed below.

A client initialization response packet (ZRINIT) indicates that the client is ready to receive a file. It contains the following flag values defining client capabilities and session options:

```
<PAD><PAD><ZDLE> 42 30 31 30 30 30 30 30 32 33 62 65 35 30 <CR><LF>
```

A server ZFILE packet then notifies the client of the file attributes to transfer, including file name, file length, and modification date. The following flag bytes define the file encryption and compression attributes:

```
<PAD><ZDLE> 41 04 00 00 00 01 99 <FILENAME><FILE LENGTH>  
<MODIFICATION DATE><OTHER ATTRIBUTES><XON>
```

The client responds with a ZRPOS packet that includes the start position in the file where data transmission will begin. A non-zero start position allows previously interrupted file transfers to be restarted at the point of interruption. The following is an example of a ZRPOS packet for a new file transmission:

```
<PAD><PAD><ZDLE> 42 30 39 30 30 30 30 30 30 30 30 61 38 37 63 <CR><LF>
```

The server then transfers the file in a continuous stream of ZDATA packets terminated by the following ZCRCE escape sequence:

```
<PAD><ZDLE> 41 0A 00 00 00 00 46 AE <FILE DATA> ... <ZDLE> 68 CB 3A 2A
```

and the following end-of-file (ZEOF) packet:

```
<ZDLE> 41 0B 36 00 00 00 E7 8F
```

The receiving client does not acknowledge server ZDATA packets. If the client detects a ZDATA packet transmission error, it aborts the session by sending five consecutive cancel characters (<CAN>). If there are no ZDATA packet errors, the client acknowledges the ZEOF packet with the following ZRINIT packet to indicate that it is ready to receive the next transfer file, if any:

```
<PAD><PAD><ZDLE> 42 30 31 30 30 30 30 30 32 33 62 65 35 30 <CR><LF>
```

After the last file is transferred, the server marks the end of the session by sending the following ZFIN packet, which is echoed back by the client:

```
<PAD><PAD><ZDLE> 42 30 38 30 30 30 30 30 30 30 30 32 32 64 <CR><LF>
```

The server then terminates the session by sending a short line control character sequence consisting of the following two ASCII O characters:

```
4F 4F
```

The following are HyperTerminal Zmodem File Transfer packet command codes:

Command Code	Description
0x00	ZRQINIT: Request for a receive initialization packet.
0x01	ZRINIT: Receive initialization packet.
0x02	ZSINIT: Send initialization sequence (optional).
0x03	ZACK: Positive acknowledgement (ACK).
0x04	ZFILE: File name from sender.
0x05	ZSKIP: To sender: skip this file.
0x06	ZNAK: Last packet was incomplete.
0x07	ZABORT: Abort batch transfers.
0x08	ZFIN: Finish session.
0x09	ZRPOS: Resume data transmission at this file position.
0x0A	ZDATA: Data packet(s) follow.

0x0B	ZEOF: End of file.
0x0C	ZFERR: Fatal read or write error detected.
0x0D	ZCRC: Request for file CRC and response.
0x0E	ZCHALLENGE: Receiver's challenge.
0x0F	ZCOMPL: Request is complete.
0x10	ZCAN: Other end terminated the session by sending 5 CAN characters.
0x11	ZFREECNT: Request for free bytes on file system.
0x12	ZCOMMAND: Command from sending program.
0x13	ZSTDERR: Output to standard error, data follows.
0x14	ZBADFMT: Data packed format error.
0x15	ZMDM_ACKED: Reserved.
0x16	ZMDM_VIRUS: Error due to virus.
0x17	ZMDM_REFUSE: File was refused, no reason given.
0x18	ZMDM_OLDER: File was refused because it was older.
0x19	ZMDM_INUSE: File is currently in use.
0x1A	ZMDM_CARRIER_LOST: Lost carrier.

For information about the Point-to-Point Protocol, see [RFC 1548: The Point-to-Point Protocol \(PPP\)](http://www.ietf.org/rfc/rfc1548.txt)  
[ <http://www.ietf.org/rfc/rfc1548.txt> ] .