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Session Channel Break Extension
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Status of this Memo

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Abstract

The Session Channel Break Extension provides a means to send a BREAK signal [2] over an SSH terminal session [5].

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1. Introduction

The SSH session channel provides a mechanism for the client-user to interactively enter commands and receive output from a remote host while taking advantage of the SSH transport's privacy and integrity features. SSH is increasingly being used to replace telnet for terminal access applications.

A common application of the telnet protocol is the "Console Server" [2] whereby a telnet NVT can be connected to a physical RS-232/V.24 asynchronous port, making the telnet NVT appear as a locally attached terminal to that port, and making that physical port appear as a network addressable device. A number of major computer equipment vendors provide high level administrative functions through an asynchronous serial port and generally expect the attached terminal to be capable of send a BREAK signal.

A BREAK signal is defined as the TxD signal being held in a SPACE ("0") state for a time greater than a whole character time. In practice, a BREAK signal is typically 250 to 500 ms in length.

The telnet protocol furnishes a means to send a "BREAK" signal, which RFC0854 defines as a "a signal outside the USASCII set which is currently given local meaning within many systems." [1] Console Server vendors interpret the TELNET BREAK signal as a physical BREAK signal, which can then allow access to the full range of adminisrative functions available on an asynchronous serial console port.

The lack of a similar facility in the SSH session channel has forced users to continue the use of telnet for the "Console Server" function.

2. The Break Request

The following following channel specific request can be sent to request that the remote host perform a BREAK operation.

byte	SSH_MSG_CHANNEL_REQUEST
uint32	recipient channel
string	"break"
boolean	want_reply
uint32	break-length in milliseconds

If the BREAK length cannot be controlled by the application receiving this request, the BREAK length parameter SHOULD be ignored and the default BREAK signal length of the chipset or underlying chipset driver SHOULD be sent.

If the application receiving this request can control the BREAK-length, the following suggestions are made regarding BREAK duration. If a BREAK duration request of greater than 3000ms is received, it SHOULD be processed as a 3000ms BREAK, in order to prevent an unreasonably long BREAK request causing the port to become unavailable for as long as 49.7 days while executing the BREAK. Applications that require a longer BREAK may choose to ignore this requirement. If BREAK duration request of less than 500ms, is requested a BREAK of 500ms SHOULD be sent since most devices will recognize a BREAK of that length. In the event that an application needs a shorter BREAK, this suggestion can be ignored. If the BREAK-length parameter is 0, the BREAK SHOULD be sent as 500ms or the default BREAK signal length of the chipset or underlying chipset driver.

If the SSH connection does not terminate on a physical serial port, the BREAK indication SHOULD be handled in an implementation-defined manner consistent with the general use of BREAK as an attention/ interrupt signal; for instance, a service processor could use some other out-of-band facility to get the attention of a system it manages.

In a case where an SSH connection cascades to another connection, the BREAK SHOULD be passed along the cascaded connection. For example, a telnet session from an SSH shell should carry along an SSH initiated BREAK and an SSH client initited from a telnet connection SHOULD pass a BREAK indication from the telnet connection.

If the want_reply boolean is set, the server MUST reply using SSH_MSG_CHANNEL_SUCCESS or SSH_MSG_CHANNEL_FAILURE [5] messages. If a BREAK of any kind was preformed, SSH_MSG_CHANNEL_SUCCESS MUST be sent. If no BREAK was preformed, SSH_MSG_CHANNEL_FAILURE MUST be

sent.

This operation SHOULD be supported by any general purpose SSH client.

3. Security Considerations

Many computer systems treat serial consoles as local and secured, and interpret a BREAK signal as an instruction to halt execution of the operating system or to enter priviliged configuration modes. Because of this, extra care should be taken to ensure that SSH access to BREAK-enabled ports are limited to users with appropriate priviliges to execute such functions. Alternatively, support for the BREAK facility MAY be imlemented configurable or a per port or per server basis.

Implementations that literally intepret the BREAK length parameter without imposing the suggested BREAK time limit may cause a denial of service to or unexpected results from attached devices receiving the very long BREAK signal.

4. References

4.1 Normative References

[1] Postel, J. and J. Reynolds, "Telnet Protocol Specification", STD 8, RFC 854, May 1983.

4.2 Informative References

[2] Harris, D., "Greater Scroll of Console Knowledge", March 2004.

[3] Rinne, T., Ylonen, T., Kivinen, T. and S. Lehtinen, "SSH Protocol Architecture", draft-ietf-secsh-architecture-15 (work in progress), October 2003.

[4] Rinne, T., Ylonen, T., Kivinen, T., Saarinen, M. and S. Lehtinen, "SSH Transport Layer Protocol", draft-ietf-secsh-transport-17 (work in progress), October 2003.

[5] Rinne, T., Ylonen, T., Kivinen, T. and S. Lehtinen, "SSH Connection Protocol", draft-ietf-secsh-connect-18 (work in progress), October 2003.

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