

Network Working Group
Internet-Draft
Expires: January 12, 2004

S. Lehtinen
SSH Communications Security Corp
D. Moffat
Sun Microsystems
July 14, 2003

SSH Protocol Assigned Numbers
draft-ietf-secsh-assignednumbers-02.txt

Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of [Section 10 of RFC2026](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at <http://www.ietf.org/ietf/lid-abstracts.txt>.

The list of Internet-Draft Shadow Directories can be accessed at <http://www.ietf.org/shadow.html>.

This Internet-Draft will expire on January 12, 2004.

Copyright Notice

Copyright (C) The Internet Society (2003). All Rights Reserved.

Abstract

This document defines the initial state of the IANA assigned numbers for the SSH protocol as defined in [[SSH-ARCH](#)], [[SSH-TRANS](#)], [[SSH-CONNECT](#)], [[SSH-USERAUTH](#)]. This document does not define any new protocols or any number ranges not already defined in the above referenced documents. It is intended only for initialization of the IANA databases referenced in those documents.

Internet-Draft

SSH Protocol Assigned Numbers

July 2003

Table of Contents

1.	Message Numbers	3
1.1	Disconnect Codes	4
2.	Service Names	5
2.1	Authentication Method Names	5
2.2	Connection Protocol Assigned Names	6
2.2.1	Connection Protocol Channel Types	6
2.2.2	Connection Protocol Global Request Names	6
2.2.3	Connection Protocol Channel Request Names	6
3.	Key Exchange Method Names	7
4.	Assigned Algorithm Names	7
4.1	Encryption Algorithm Names	7
4.2	MAC Algorithm Names	8
4.3	Public Key Algorithm Names	8
	References	8
	Authors' Addresses	9
	Full Copyright Statement	10

1. Message Numbers

The Message Number is an 8-bit value, which describes the payload of a packet.

Protocol packets have message numbers in the range 1 to 255. These numbers have been allocated as follows in [[SSH-ARCH](#)]:

Transport layer protocol:

1 to 19	Transport layer generic (e.g. disconnect, ignore, debug, etc.)
20 to 29	Algorithm negotiation
30 to 49	Key exchange method specific (numbers can be reused for different authentication methods)

User authentication protocol:

50 to 59	User authentication generic
60 to 79	User authentication method specific (numbers can be reused for different authentication methods)

Connection protocol:

80 to 89	Connection protocol generic
90 to 127	Channel related messages

Reserved for client protocols:

128 to 191 Reserved

Local extensions:

192 to 255 Local extensions

Requests for assignments of new message numbers must be accompanied by an RFC which describes the new packet type. If the RFC is not on the standards-track (i.e. it is an informational or experimental RFC), it must be explicitly reviewed and approved by the IESG before the RFC is published and the message number is assigned.

Message ID -----	Value -----	Reference -----
SSH_MSG_DISCONNECT	1	[SSH-TRANS]
SSH_MSG_IGNORE	2	[SSH-TRANS]
SSH_MSG_UNIMPLEMENTED	3	[SSH-TRANS]
SSH_MSG_DEBUG	4	[SSH-TRANS]

SSH_MSG_SERVICE_REQUEST	5	[SSH-TRANS]
SSH_MSG_SERVICE_ACCEPT	6	[SSH-TRANS]
SSH_MSG_KEXINIT	20	[SSH-TRANS]
SSH_MSG_NEWKEYS	21	[SSH-TRANS]
SSH_MSG_KEXDH_INIT	30	[SSH-TRANS]
SSH_MSG_KEXDH_REPLY	31	[SSH-TRANS]
SSH_MSG_USERAUTH_REQUEST	50	[SSH-USERAUTH]
SSH_MSG_USERAUTH_FAILURE	51	[SSH-USERAUTH]
SSH_MSG_USERAUTH_SUCCESS	52	[SSH-USERAUTH]
SSH_MSG_USERAUTH_BANNER	53	[SSH-USERAUTH]
SSH_MSG_USERAUTH_PK_OK	60	[SSH-USERAUTH]
SSH_MSG_GLOBAL_REQUEST	80	[SSH-CONNECT]
SSH_MSG_REQUEST_SUCCESS	81	[SSH-CONNECT]
SSH_MSG_REQUEST_FAILURE	82	[SSH-CONNECT]
SSH_MSG_CHANNEL_OPEN	90	[SSH-CONNECT]
SSH_MSG_CHANNEL_OPEN_CONFIRMATION	91	[SSH-CONNECT]
SSH_MSG_CHANNEL_OPEN_FAILURE	92	[SSH-CONNECT]
SSH_MSG_CHANNEL_WINDOW_ADJUST	93	[SSH-CONNECT]
SSH_MSG_CHANNEL_DATA	94	[SSH-CONNECT]
SSH_MSG_CHANNEL_EXTENDED_DATA	95	[SSH-CONNECT]
SSH_MSG_CHANNEL_EOF	96	[SSH-CONNECT]
SSH_MSG_CHANNEL_CLOSE	97	[SSH-CONNECT]
SSH_MSG_CHANNEL_REQUEST	98	[SSH-CONNECT]
SSH_MSG_CHANNEL_SUCCESS	99	[SSH-CONNECT]
SSH_MSG_CHANNEL_FAILURE	100	[SSH-CONNECT]

1.1 Disconnect Codes

The Disconnect code is an 8-bit value, which describes the disconnect reason. Requests for assignments of new disconnect codes must be accompanied by an RFC which describes the new disconnect reason code.

Disconnect code	Value	Reference
-----	-----	-----
SSH_DISCONNECT_HOST_NOT_ALLOWED_TO_CONNECT	1	[SSH-TRANS]
SSH_DISCONNECT_PROTOCOL_ERROR	2	[SSH-TRANS]
SSH_DISCONNECT_KEY_EXCHANGE_FAILED	3	[SSH-TRANS]
SSH_DISCONNECT_RESERVED	4	[SSH-TRANS]
SSH_DISCONNECT_MAC_ERROR	5	[SSH-TRANS]
SSH_DISCONNECT_COMPRESSION_ERROR	6	[SSH-TRANS]
SSH_DISCONNECT_SERVICE_NOT_AVAILABLE	7	[SSH-TRANS]
SSH_DISCONNECT_PROTOCOL_VERSION_NOT_SUPPORTED	8	[SSH-TRANS]
SSH_DISCONNECT_HOST_KEY_NOT_VERIFIABLE	9	[SSH-TRANS]
SSH_DISCONNECT_CONNECTION_LOST	10	[SSH-TRANS]
SSH_DISCONNECT_BY_APPLICATION	11	[SSH-TRANS]

SSH_DISCONNECT_TOO_MANY_CONNECTIONS	12	[SSH-TRANS]
SSH_DISCONNECT_AUTH_CANCELLED_BY_USER	13	[SSH-TRANS]
SSH_DISCONNECT_NO_MORE_AUTH_METHODS_AVAILABLE	14	[SSH-TRANS]
SSH_DISCONNECT_ILLEGAL_USER_NAME	15	[SSH-TRANS]

2. Service Names

The Service Name is used to describe a protocol layer. These names MUST be printable US-ASCII strings, and MUST NOT contain the characters at-sign ('@'), comma (','), or whitespace or control characters (ASCII codes 32 or less). Names are case-sensitive, and MUST NOT be longer than 64 characters.

Requests for assignments of new service names must be accompanied by an RFC which describes the interpretation for the service name. If the RFC is not on the standards-track (i.e. it is an informational or experimental RFC), it must be explicitly reviewed and approved by the IESG before the RFC is published and the service name is assigned.

Service name -----	Reference -----
ssh-userauth	[SSH-USERAUTH]
ssh-connection	[SSH-CONNECT]

2.1 Authentication Method Names

The Authentication Method Name is used to describe an authentication method for the "ssh-userauth" service [[SSH-USERAUTH](#)]. These names MUST be printable US-ASCII strings, and MUST NOT contain the characters at-sign ('@'), comma (','), or whitespace or control characters (ASCII codes 32 or less). Names are case-sensitive, and MUST NOT be longer than 64 characters.

Requests for assignments of new authentication method names must be accompanied by an RFC which describes the interpretation for the authentication method.

Method name -----	Reference -----
publickey	[SSH-USERAUTH , Section 4]
password	[SSH-USERAUTH , Section 5]
hostbased	[SSH-USERAUTH , Section 6]
none	[SSH-USERAUTH , Section 2.3]

2.2 Connection Protocol Assigned Names

The following request and type names MUST be printable US-ASCII strings, and MUST NOT contain the characters at-sign ('@'), comma (','), or whitespace or control characters (ASCII codes 32 or less). Names are case-sensitive, and MUST NOT be longer than 64 characters.

Requests for assignments of new assigned names must be accompanied by an RFC which describes the interpretation for the type or request.

2.2.1 Connection Protocol Channel Types

Channel type	Reference
-----	-----
session	[SSH-CONNECT, Section 4.1]
x11	[SSH-CONNECT, Section 4.3.2]
forwarded-tcpip	[SSH-CONNECT, Section 5.2]
direct-tcpip	[SSH-CONNECT, Section 5.2]

2.2.2 Connection Protocol Global Request Names

Request type	Reference
-----	-----
tcpip-forward	[SSH-CONNECT, Section 5.1]
cancel-tcpip-forward	[SSH-CONNECT, Section 5.1]

2.2.3 Connection Protocol Channel Request Names

Request type	Reference
-----	-----
pty-req	[SSH-CONNECT, Section 4.2]
x11-req	[SSH-CONNECT, Section 4.3.1]
env	[SSH-CONNECT, Section 4.4]
shell	[SSH-CONNECT, Section 4.5]
exec	[SSH-CONNECT, Section 4.5]
subsystem	[SSH-CONNECT, Section 4.5]
window-change	[SSH-CONNECT, Section 4.7]
xon-xoff	[SSH-CONNECT, Section 4.8]
signal	[SSH-CONNECT, Section 4.9]
exit-status	[SSH-CONNECT, Section 4.10]
exit-signal	[SSH-CONNECT, Section 4.10]

3. Key Exchange Method Names

The Key Exchange Method Name describes a key-exchange method for the protocol [[SSH-TRANS](#)]. The names MUST be printable US-ASCII strings, and MUST NOT contain the characters at-sign ('@'), comma (','), or whitespace or control characters (ASCII codes 32 or less). Names are case-sensitive, and MUST NOT be longer than 64

characters.

Requests for assignment of new key-exchange method names must be accompanied by a reference to a standards-track or Informational RFC which describes this method.

Method name -----	Reference -----
diffie-hellman-group1-sha1	[SSH-TRANS, Section 4.5]

4. Assigned Algorithm Names

The following identifiers (names) MUST be printable US-ASCII strings, and MUST NOT contain the characters at-sign ('@'), comma (','), or whitespace or control characters (ASCII codes 32 or less). Names are case-sensitive, and MUST NOT be longer than 64 characters.

Requests for assignment of new algorithm names must be accompanied by a reference to a standards-track or Informational RFC or a reference to published cryptographic literature which describes the algorithm.

4.1 Encryption Algorithm Names

Cipher name -----	Reference -----
3des-cbc	[SSH-TRANS, Section 4.3]
blowfish-cbc	[SSH-TRANS, Section 4.3]
twofish256-cbc	[SSH-TRANS, Section 4.3]
twofish-cbc	[SSH-TRANS, Section 4.3]
twofish192-cbc	[SSH-TRANS, Section 4.3]
twofish128-cbc	[SSH-TRANS, Section 4.3]
aes256-cbc	[SSH-TRANS, Section 4.3]
aes192-cbc	[SSH-TRANS, Section 4.3]
aes128-cbc	[SSH-TRANS, Section 4.3]
serpent256-cbc	[SSH-TRANS, Section 4.3]
serpent192-cbc	[SSH-TRANS, Section 4.3]
serpent128-cbc	[SSH-TRANS, Section 4.3]
arcfour	[SSH-TRANS, Section 4.3]

idea-cbc	[SSH-TRANS, Section 4.3]
cast128-cbc	[SSH-TRANS, Section 4.3]
none	[SSH-TRANS, Section 4.3]
des-cbc	[FIPS-46-3] HISTORIC; See page 4 of [FIPS 46-3]

4.2 MAC Algorithm Names

MAC name	Reference
-----	-----
hmac-sha1	[SSH-TRANS, Section 4.4]
hmac-sha1-96	[SSH-TRANS, Section 4.4]
hmac-md5	[SSH-TRANS, Section 4.4]
hmac-md5-96	[SSH-TRANS, Section 4.4]
none	[SSH-TRANS, Section 4.4]

4.3 Public Key Algorithm Names

Algorithm name	Reference
-----	-----
ssh-dss	[SSH-TRANS, Section 4.6]
ssh-rsa	[SSH-TRANS, Section 4.6]
x509v3-sign-rsa	[SSH-TRANS, Section 4.6]
x509v3-sign-dss	[SSH-TRANS, Section 4.6]
spki-sign-rsa	[SSH-TRANS, Section 4.6]
spki-sign-dss	[SSH-TRANS, Section 4.6]
pgp-sign-rsa	[SSH-TRANS, Section 4.6]
pgp-sign-dss	[SSH-TRANS, Section 4.6]

References

- [SSH-ARCH] Ylonen, T., "SSH Protocol Architecture", I-D [draft-ietf-architecture-14.txt](#), July 2003.
- [SSH-TRANS] Ylonen, T., "SSH Transport Layer Protocol", I-D [draft-ietf-transport-16.txt](#), July 2003.
- [SSH-USERAUTH] Ylonen, T., "SSH Authentication Protocol", I-D [draft-ietf-userauth-17.txt](#), July 2003.
- [SSH-CONNECT] Ylonen, T., "SSH Connection Protocol", I-D [draft-ietf-connect-17.txt](#), July 2003.
- [SSH-NUMBERS] Lehtinen, S. and D. Moffat, "SSH Protocol Assigned Numbers", I-D [draft-ietf-secsh-assignednumbers-](#)

Internet-Draft

SSH Protocol Assigned Numbers

July 2003

03.txt, July 2003.

[FIPS-46-3]

U.S. Dept. of Commerce, ., "FIPS PUB 46-3, Data Encryption Standard (DES)", October 1999.

Authors' Addresses

Sami Lehtinen
SSH Communications Security Corp
Fredrikinkatu 42
HELSINKI FIN-00100
Finland

E-Mail: sjl@ssh.com

Darren J Moffat
Sun Microsystems
901 San Antonio Road
Palo Alto 94303
USA

E-Mail: Darren.Moffat@Sun.COM

Internet-Draft

SSH Protocol Assigned Numbers

July 2003

Full Copyright Statement

Copyright (C) The Internet Society (2003). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Acknowledgement

Funding for the RFC Editor function is currently provided by the Internet Society.

Lehtinen & Moffat

Expires January 12, 2004

[Page 10]