CPC COOPERATIVE PATENT CLASSIFICATION

H04L TRANSMISSION OF DIGITAL INFORMATION, e.g. TELEGRAPHIC COMMUNICATION

(typewriters B41J ; order telegraphs, fire or police telegraphs G08B ; visual telegraphy G08B , G08C ; teleautographic systems G08C ; ciphering or deciphering apparatus per se G09C ; coding, decoding or code conversion, in general H03M ; arrangements common to telegraphic and telephonic communication H04M ; selecting H04Q)

NOTE

This subclass covers transmission of signals having been supplied in digital form and includes data transmission, telegraphic communication and methods or arrangements for monitoring.

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

H04L 12/20	covered by	H04L 29/00
H04L 25/04	"	H04L 25/03
H04L 25/17	"	H03H
H04L 25/18	"	H04L 25/02G1C
H04L 25/28	"	H04L 25/02G1A
H04L 25/30	"	H04L 25/061
H04L 25/32	"	H04L 25/49
H04L 25/34	"	H04L 25/4917
H04L 25/36	"	H04L 25/02A
H04L 25/48	"	H04L 25/49
H04L 25/50	"	H04L 25/02A
H04L 25/52	"	H04L 25/20
H04L 25/54	"	H04L 25/20
H04L 25/56	"	H04L 25/202
H04L 25/58	"	H04L 25/20
H04L 25/60	"	H04L 25/207
H04L 25/62	"	H04L 25/205
H04L 25/64	"	H04L 25/245
H04L 25/66	"	H04L 25/247

H04L 1/00 Arrangements for detecting or preventing errors in the information received

(correcting synchronisation H04L 7/00 ; { for digital computers G06F 11/00 } ; arrangements in the transmission path H04B)

H04L 1/0001 . { Systems modifying transmission characteristics according to link quality, e.g. power backoff (adaptive data allocation for multicarrier modulation H04L 5/0044 ; controlling transmission power for radio systems H04W 52/04) }

H04L 1/0002 . . { by adapting the transmission rate }

H04L 1/0003 . . . { by switching between different modulation schemes }

H04L 1/0004 . . . . { applied to control information }

H04L 1/0005 . . . . { applied to payload information }

H04L 1/0006 . . { by adapting the transmission format }

H04L 1/0007 . . . { by modifying the frame length }

H04L 1/0008 .... { by supplementing frame payload, e.g. with padding bits }
H04L 1/0009 .. { by adapting the channel coding (H04L 1/1812 takes precedence) }
H04L 1/001 ... { applied to control information }
H04L 1/0011 ... { applied to payload information }
H04L 1/0013 ... { Rate matching, e.g. puncturing or repetition of code symbols }
H04L 1/0014 .. { by adapting the source coding }
H04L 1/0015 .. { characterised by the adaptation strategy }
H04L 1/0016 ... { involving special memory structures, e.g. look-up tables }
H04L 1/0017 ... { where the mode-switching is based on Quality of Service requirement }
H04L 1/0018 .... { based on latency requirement }
H04L 1/0019 ... { in which mode-switching is based on a statistical approach }
H04L 1/002 .... { Algorithms with memory of the previous states, e.g. Markovian models }
H04L 1/0021 .... { in which the algorithm uses adaptive thresholds }
H04L 1/0022 ... { in which mode-switching is influenced by the user }
H04L 1/0023 .. { characterised by the signalling }
H04L 1/0025 ... { Transmission of mode-switching indication }
H04L 1/0026 ... { Transmission of channel quality indication }
H04L 1/0027 ... { Scheduling of signalling, e.g. occurrence thereof }
H04L 1/0028 ... { Formatting }
H04L 1/0029 .... { Reduction of the amount of signalling, e.g. retention of useful signalling or differential signalling (power control H04W 52/04) }
H04L 1/003 .... { Adaptive formatting arrangements particular to signalling, e.g. variable amount of bits }
H04L 1/0031 .... { Multiple signaling transmission (H04L 1/1664 ,F15 take precedence) }
H04L 1/0032 ... { Without explicit signalling }
H04L 1/0033 .. { arrangements specific to the transmitter }
H04L 1/0034 ... { where the transmitter decides based on inferences, e.g. use of implicit signalling }
H04L 1/0035 ... { evaluation of received explicit signalling }
H04L 1/0036 .. { arrangements specific to the receiver }
H04L 1/0038 ... { Blind format detection (for detection of modulation format H04L 27/0012) }
H04L 1/0039 ... { other detection of signalling, e.g. detection of TFCI explicit signalling (H04L 1/0046 , H04L 27/0012 and H04L 25/0262 take precedence) }

H04L 1/004 . { by using forward error control (H04L 1/0618 takes precedence; coding, decoding or code conversion, for error detection or correction H03M 13/00) }
H04L 1/0041 .. { Arrangements at the transmitter end }
H04L 1/0042 ... { Encoding specially adapted to other signal generation operation, e.g. in order to reduce transmit distortions, jitter, or to improve signal shape (H04L 1/0067 takes precedence) }
H04L 1/0043 ... { Realisations of complexity reduction techniques, e.g. use of look-up tables }
H04L 1/0044 .... { specially adapted for power saving }
H04L 1/0045 .. { Arrangements at the receiver end }
H04L 1/0046 ... { Code rate detection or code type detection (H04L 1/0038 takes precedence; detection of the data rate H04L 25/0262 ; for packet format H04L 1/0091) }

H04L 1/0047 . . . { Decoding adapted to other signal detection operation (in conjunction with sequence estimation or equalization H04L 25/03286) }

H04L 1/0048 . . . . { in conjunction with detection of multiuser or interfering signals, e.g. iteration between CDMA or MIMO detector and FEC decoder (for spatial equalizer H04L 25/03286) }

H04L 1/005 . . . . { Iterative decoding, including iteration between signal detection and decoding operation }

H04L 1/0051 . . . . . { Stopping criteria }

H04L 1/0052 . . . { Realisations of complexity reduction techniques, e.g. pipelining or use of look-up tables }

H04L 1/0053 . . . . { specially adapted for power saving }

H04L 1/0054 . . . { Maximum-likelihood or sequential decoding, e.g. Viterbi, Fano, ZJ algorithms }

H04L 1/0055 . . . { MAP-decoding }

H04L 1/0056 . . { Systems characterized by the type of code used (H04L 1/08 takes precedence) }

H04L 1/0057 . . . { Block codes (H04L 1/0061 , H04L 1/0064 take precedence) }

H04L 1/0058 . . . . { Block-coded modulation }

H04L 1/0059 . . . { Convolutional codes }

H04L 1/006 . . . . { Trellis-coded modulation }

H04L 1/0061 . . . { Error detection codes }

H04L 1/0063 . . . . { Single parity check }

H04L 1/0064 . . . { Concatenated codes }

H04L 1/0065 . . . . { Serial concatenated codes }

H04L 1/0066 . . . . { Parallel concatenated codes }

H04L 1/0067 . . . { Rate matching (H04L 1/0013 and H04L 1/08 take precedence) }

H04L 1/0068 . . . . { by puncturing }

H04L 1/0069 . . . . . { Puncturing patterns }

H04L 1/007 . . . { Unequal error protection (for format H04L 1/0078 ; for codes per se H03M 13/35) }

H04L 1/0071 . . . { Use of interleaving (interleaving per se H03M 13/27) }

H04L 1/0072 . . { Error control for data other than payload data, e.g. control data }

H04L 1/0073 . . . { Special arrangements for feedback channel }

H04L 1/0075 . . { Transmission of coding parameters to receiver (H04L 1/0023 takes precedence) }

H04L 1/0076 . . { Distributed coding, e.g. network coding, involving channel coding (coding in both space and time H04L 1/0618 ; cooperative diversity H04B 7/022) }

H04L 1/0077 . . . { Cooperative coding }

H04L 1/0078 . { Avoidance of errors by organising the transmitted data in a format specifically designed to deal with errors, e.g. location (forward error control, e.g. FEC, CRC H04L 1/004 ; adaptive formatting H04L 1/0006 ; mappings H04L 27/00) }

H04L 1/0079 . . { Formats for control data (H04L 1/16 takes precedence; training sequences H04L 25/00 and H04L 27/00) }

H04L 1/008 . . . { where the control data relates to payload of a different packet }

H04L 1/0081 . . . { Formats specially adapted to avoid errors in the feedback channel (H04L 1/1607 takes precedence) }

H04L 1/0082 . . . { fields explicitly indicating existence of error in data being transmitted, e.g. so that downstream stations can avoid decoding erroneous packet; relays }
H04L 1/0083 . . { Formatting with frames or packets; Protocol or part of protocol for error control }
H04L 1/0084 . . { Formats for payload data }
H04L 1/0085 . . { Formatting with cells }
H04L 1/0086 . . { Unequal error protection (H04L 27/00 and H04L 1/004 take precedence for layer 1/2 aspects, e.g. bit loading) }
H04L 1/0088 . . . { in control part }
H04L 1/0089 . . . { in payload }
H04L 1/009 . . { arrangements specific to transmitters }
H04L 1/0091 . . { arrangements specific to receivers, e.g. format detection (detection of data rate H04L 25/0262 ; detection of coding rate H04L 1/0046) }

H04L 2001/0092 . Error control systems characterised by the topology of the transmission link
H04L 2001/0093 . . Point-to-multipoint
H04L 2001/0094 . . Bus
H04L 2001/0095 . . Ring
H04L 2001/0096 . . Channel splitting in point-to-point links
H04L 2001/0097 . . Relays

H04L 2001/0098 . Unequal error protection

H04L 1/02 . by diversity reception (in general H04B 7/02)
H04L 1/04 . . using frequency diversity
H04L 1/06 . . using space diversity
H04L 1/0606 . . . { Space-frequency coding }
H04L 1/0612 . . . { Space-time modulation }
H04L 1/0618 . . . { Space-time coding }
H04L 1/0625 . . . . { Transmitter arrangements }
H04L 1/0631 . . . . { Receiver arrangements }
H04L 1/0637 . . . . { Properties of the code }
H04L 1/0643 . . . . . { block codes }
H04L 1/065 . . . . . { by means of convolutional encoding }
H04L 1/0656 . . . . . { Cyclotomic systems, e.g. Bell Labs Layered Space-Time (BLAST) }
H04L 1/0662 . . . . . { Limited orthogonality systems }
H04L 1/0668 . . . . . { Orthogonal systems, e.g. using Alamouti codes }
H04L 1/0675 . . . . { characterised by the signaling }
H04L 1/0681 . . . . . { adapting space time parameters, i.e. modifying the space time matrix }
H04L 1/0687 . . . . . { Full feedback }
H04L 1/0693 . . . . . { Partial feedback, e.g. partial channel state information (CSI) }

H04L 1/08 . by repeating transmission, e.g. Verdan system { (H04L 1/1858 and H04L 1/189 take precedence) }

H04L 1/12 . by using return channel

H04L 2001/125	..	Arrangements for preventing errors in the return channel
H04L 1/14	..	in which the signals are sent back to the transmitter to be checked { echo systems }
H04L 1/16	..	in which the return channel carries supervisory signals, e.g. repetition request signals
H04L 1/1607	...	{ Details of the supervisory signal }
H04L 1/1614	....	{ using bitmaps }
H04L 1/1621	....	{ Group acknowledgement, i.e. the acknowledgement message defining a range of identifiers, e.g. of sequence numbers }
H04L 1/1628	....	{ List acknowledgements, i.e. the acknowledgement message consisting of a list of identifiers, e.g. of sequence numbers (H04L 1/1614 takes precedence) }
H04L 1/1635	....	{ Cumulative acknowledgement, i.e. the acknowledgement message applying to all previous messages }
H04L 1/1642	....	{ Formats specially adapted for sequence numbers }
H04L 1/165	.....	{ Variable formats }
H04L 1/1657	....	{ Implicit acknowledgement of correct or incorrect reception, e.g. with a moving window }
H04L 1/1664	....	{ the supervisory signal being transmitted together with payload signals; piggybacking }
H04L 1/1671	....	{ the supervisory signal being transmitted together with control information }
H04L 1/1678	.....	{ where the control information is for timing, e.g. time stamps }
H04L 1/1685	....	{ the supervisory signal being transmitted in response to a specific request, e.g. to a polling signal }
H04L 1/1692	....	{ Physical properties of the supervisory signal, e.g. acknowledgement by energy bursts }
H04L 1/18	...	Automatic repetition systems, e.g. van Duuren system; { ARQ protocols }
H04L 1/1803	....	{ Stop-and-wait protocols }
H04L 1/1806	....	{ Go-back-N protocols }
H04L 1/1809	....	{ Selective-repeat protocols }
H04L 1/1812	....	{ Hybrid protocols }
H04L 1/1816	.....	{ with retransmission of the same, encoded, message }
H04L 1/1819	.....	{ with retransmission of additional or different redundancy }
H04L 1/1822	....	{ involving configuration of ARQ with parallel processes }
H04L 1/1825	....	{ Adaptation of specific ARQ protocol parameters according to transmission conditions }
H04L 1/1829	....	{ Arrangements specific to the receiver end }
H04L 1/1832	.....	{ Details of sliding window management }
H04L 1/1835	.....	{ Buffer management }
H04L 1/1838	.....	{ for semi-reliable protocols, e.g. for less sensitive applications such as streaming video (buffer level management for video bitstream receiver H04N 21/44004) }
H04L 1/1841	.....	{ Resequencing }
H04L 1/1845	.....	{ Combining techniques, e.g. code combining }
H04L 1/1848	.....	{ Time-out mechanisms }
H04L 1/1851	.....	{ using multiple timers }

H04L 1/1854 ..... { Scheduling and prioritising arrangements }

H04L 1/1858 ..... { Transmission or retransmission of more than one copy of acknowledgement message (repetition in general H04L 1/08) }

H04L 1/1861 ..... { Physical mapping arrangements (for ACK signaling see also H04L 5/0053) }

H04L 1/1864 ..... { ARQ related signaling (H04L 1/1607 takes precedence) }

H04L 1/1867 .... { Arrangements specific to the transmitter end }

H04L 1/187 ..... { Details of sliding window management }

H04L 1/1874 ..... { Buffer management }

H04L 1/1877 ..... { for semi-reliable protocols, e.g. for less sensitive applications like streaming video (buffer level management for video bitstream control arrangements H04N 21/44004) }

H04L 1/188 ..... { Time-out mechanisms }

H04L 1/1883 ..... { using multiple timers }

H04L 1/1887 ..... { Scheduling and prioritising arrangements }

H04L 1/189 ..... { Transmission or retransmission of more than one copy of a message (repetition in general H04L 1/08) }

H04L 1/1893 ..... { Physical mapping arrangements (physical resource mapping in general H04L5) }

H04L 1/1896 ..... { ARQ related signaling }

H04L 1/20 . using signal quality detector

WARNING

see 95C20, G01R 29/02

H04L 1/201 .. { Frame classification, e.g. bad, good or erased (frame indication per se H04L 1/0082) }

H04L 1/203 .. { Details of error rate determination, e.g. BER, FER or WER }

H04L 1/205 .. { jitter monitoring }

H04L 1/206 .. { for modulated signals }

H04L 1/208 .. { involving signal re-encoding }

H04L 1/22 . using redundant apparatus to increase reliability { see G06F 11/08 to G06F 11/20 }

H04L 1/24 . Testing correct operation

H04L 1/241 .. { using pseudo-errors }

H04L 1/242 .. { by comparing a transmitted test signal with a locally generated replica }

H04L 1/243 ... { at the transmitter, using a loop-back }

H04L 1/244 ... { test sequence generators }

H04L 1/245 .. { by using the properties of transmission codes }

H04L 1/246 ... { two-level transmission codes, e.g. binary }

H04L 1/247 ... { three-level transmission codes, e.g. ternary }

H04L 1/248 .. { Distortion measuring systems (measurement of non-linear distortion G01R 23/20 ; measuring characteristics of individual pulses, e.g. deviation from pulse flatness, rise time, duration G01R 29/02) }

H04L 5/00 **Arrangements affording multiple use of the transmission path** (multiplex communication in general H04J ; { orthogonal multiplex systems H04J 11/00 })

H04L 5/0001 . { Arrangements for dividing the transmission path (duplexing H04L 5/14 ; multiplexing of different sources on one path H04J) }

H04L 5/0003 .. { Two-dimensional division (time-code division H04J 11/00 , H04J 13/00 ; for time-space division H04B 7/0413 , H04B 7/0697) }

H04L 5/0005 ... { Time-frequency }

H04L 5/0007 .... { the frequencies being orthogonal e.g. OFDM(A), DMT }

H04L 5/0008 ..... { Wavelet-division }

H04L 5/001 ..... { the frequencies being arranged in component carriers }

H04L 5/0012 ..... { Hopping in multicarrier systems (for frequency hopping in spread spectrum systems H04B 1/713) }

H04L 5/0014 .. { Three-dimensional division (time-code-space division H04B 7/0413 , H04B 7/0697) }

H04L 5/0016 ... { Time-frequency-code }

H04L 5/0017 .... { in which a distinct code is applied, as a temporal sequence, to each frequency }

H04L 5/0019 .... { in which one code is applied, as a temporal sequence, to all frequencies }

H04L 5/0021 .... { in which codes are applied as a frequency-domain sequences, e.g. MC-CDMA }

H04L 5/0023 ... { Time-frequency-space }

H04L 5/0025 .... { Spatial division following the spatial signature of the channel }

H04L 5/0026 .. { Division using four or more dimensions }

H04L 5/0028 .. { Variable division (signaling therefor H04L 5/0092) }

H04L 5/003 . { Arrangements for allocating sub-channels of the transmission path }

H04L 5/0032 .. { Distributed allocation, i.e. involving a plurality of allocating devices, each making partial allocation }

H04L 5/0033 ... { each allocating device acting autonomously, i.e. without negotiation with other allocating devices }

H04L 5/0035 ... { Resource allocation in a cooperative multipoint environment }

H04L 5/0037 .. { Inter-user or inter-terminal allocation }

H04L 5/0039 ... { Frequency-contiguous, i.e. with no allocation of frequencies for one user or terminal between the frequencies allocated to another }

H04L 5/0041 ... { Frequency-non-contiguous }

H04L 5/0042 .. { intra-user or intra-terminal allocation }

H04L 5/0044 .. { allocation of payload }

H04L 5/0046 ... { Determination of how many bits are transmitted on different sub-channels }

H04L 5/0048 .. { Allocation of pilot signals, i.e. of signals known to the receiver }

H04L 5/005 ... { of common pilots, i.e. pilots destined for multiple users or terminals }

H04L 5/0051 ... { of dedicated pilots, i.e. pilots destined for a single user or terminal }

H04L 5/0053 .. { Allocation of signaling, i.e. of overhead other than pilot signals }

H04L 5/0055 ... { Physical resource allocation for ACK/NACK (for physical mapping arrangements in ARQ protocols H04L 1/1861) }

H04L 5/0057 . . . { Physical resource allocation for CQI }
H04L 5/0058 . . { Allocation criteria }
H04L 5/006 . . . { Quality of the received signal, e.g. BER, SNR, water filling }
H04L 5/0062 . . . { Avoidance of ingress interference, e.g. ham radio channels }
H04L 5/0064 . . . { Rate requirement of the data, e.g. scalable bandwidth, data priority }
H04L 5/0066 . . . { Requirements on out-of-channel emissions }
H04L 5/0067 . . . { Allocation algorithms which involve graph matching }
H04L 5/0069 . . . { Allocation based on distance or geographical location (allocation based on terminal or device properties in general, H04W 72/04S2) }
H04L 5/0071 . . . { Allocation based on fairness other than the proportional kind }
H04L 5/0073 . . . { Allocation arrangements that take into account other cell interferences (for intercell interference mitigation or co-ordination in orthogonal multiplex systems H04J 11/005) }
H04L 5/0075 . . . { Allocation using proportional fairness }
H04L 5/0076 . . . { Allocation utility-based }
H04L 5/0078 . . { Timing of allocation }
H04L 5/008 . . . { once only, on installation }
H04L 5/0082 . . . { at predetermined intervals }
H04L 5/0083 . . . . { symbol-by-symbol }
H04L 5/0085 . . . { when channel conditions change }
H04L 5/0087 . . . { when data requirements change }
H04L 5/0089 . . . . { due to addition or removal of users or terminals }

H04L 5/0091 . { Signaling for the administration of the divided path }
H04L 5/0092 . . { Indication of how the channel is divided }
H04L 5/0094 . . { Indication of how sub-channels of the path are allocated }
H04L 5/0096 . . { Indication of changes in allocation }
H04L 5/0098 . . . { Signalling of the activation or deactivation of component carriers, subcarriers or frequency bands }

H04L 5/02 . Channels characterised by the type of signal
H04L 5/023 . . { Multiplexing of multicarrier modulation signals (multicarrier modulation H04L 27/2601) }
H04L 5/026 . . . { using code division }
H04L 5/04 . . the signals being represented by different amplitude or polarities, e.g. quadriplex
H04L 5/06 . . the signals being represented by different frequencies (combined with time-division multiplexing H04L 5/26)
H04L 5/08 . . . each combination of signals in different channels being represented by a fixed frequency { e.g. twinplex; see H04L 27/16 }
H04L 5/10 . . . with dynamo-electric generation of carriers ; with mechanical filters or demodulators
H04L 5/12 . . the signals being represented by different phase modulations of a single carrier

H04L 5/14 . Two-way operation using the same type of signal, i.e. duplex ({ duplex repeaters H04L 25/22 } ; conditioning for two-way transmission in general H04B 3/20 ; { for interconnection between telephone switching centres H04Q 3/00 })

H04L 5/1407 .. { Artificial lines or their setting (for line transmission systems in general H04B 3/40) }
H04L 5/1415 .. { using control lines }
H04L 5/1423 .. { for simultaneous baseband signals }
H04L 5/143 .. { for modulated signals (H04L 5/1469 takes precedence) }
H04L 5/1438 .. { Negotiation of transmission parameters prior to communication (modified according to link quality H04L 1/0001) }
H04L 5/1446 ... { of transmission speed }
H04L 5/1453 ... { of modulation type }
H04L 5/1461 .. { Suppression of signals in the return path, i.e. bidirectional control circuits }
H04L 5/1469 .. { using time-sharing }
H04L 5/1476 ... { operating bitwise }
H04L 5/1484 ... { operating bytewise }
H04L 5/1492 .... { with time compression, e.g. operating according to the ping-pong technique }
H04L 5/16 .. Half-duplex systems ; Simplex-duplex switching ; Transmission of break signals { non automatically inverting the direction of transmission }
H04L 5/18 .. Automatic changing of the traffic direction

H04L 5/20 . using different combinations of lines, e.g. phantom working { (phantom interconnection between telephone switching centres H04M 7/08 ; coupling arrangements therefor H04L 25/0272) }

H04L 5/22 . using time-division multiplexing { in general H04J 3/00 }
H04L 5/225 .. { combined with the use of transition coding (transition coding H04L 25/493) }
H04L 5/24 .. with start-stop synchronous converters
H04L 5/245 ... { with a number of discharge tubes or semiconductor elements which successively connect the different channels to the transmission channels (see: H04L 13/00 to H04L 23/00 , H03K 5/15 , H03K 17/62 , H04J 3/047) }
H04L 5/26 .. combined with the use of different frequencies

H04L 7/00 **Arrangements for synchronising receiver with transmitter** { (synchronisation of electronic time-pieces G04G 7/00 ; synchronisation of generators of electric oscillations or pulses H03L ; synchronising in TV system H04N 5/04 ; regeneration of clock signals for television systems H04N 7/0352) }

H04L 7/0004 . { Initialisation of the receiver (H04L 7/0075 and H04L 7/10 take precedence) }

H04L 7/0008 . { Synchronisation information channels, e.g. clock distribution lines }
H04L 7/0012 .. { by comparing receiver clock with transmitter clock }

H04L 7/0016 . { correction of synchronization errors }
H04L 7/002 .. { correction by interpolation }
H04L 7/0025 ... { interpolation of clock signal }
H04L 7/0029 ... { interpolation of received data signal }
H04L 7/0033 .. { Correction by delay }
H04L 7/0037 ... { Delay of clock signal }

H04L 7/0041 . . . { Delay of data signal }
H04L 7/0045 . . { Correction by a latch cascade }
H04L 7/005 . . { Correction by an elastic buffer }

H04L 7/0054 . { Detection of the synchronisation error by features other than the received signal transition (by means of signal transition H04L 7/033) }
H04L 7/0058 . . { detection of error based on equalizer tap values }
H04L 7/0062 . . { detection of error based on data decision error, e.g. Mueller type detection }
H04L 7/0066 . . { detection of error based on transmission code rule }
H04L 7/007 . . { detection of error based on maximum signal power, e.g. peak value, maximizing autocorrelation }

H04L 7/0075 . { with photonic or optical means }

H04L 7/0079 . { Receiver details }
H04L 7/0083 . . { taking measures against momentary loss of synchronisation, e.g. inhibiting the synchronisation, using idle words or using redundant clocks }
H04L 7/0087 . . { Preprocessing of received signal for synchronisation, e.g. by code conversion, pulse generation or edge detection }

H04L 7/0091 . { Transmitter details }

H04L 7/0095 . { with mechanical means }

H04L 7/02 . Speed or phase control by the received code signals, the signals containing no special synchronisation information { (H04L 7/0075 takes precedence; tuning or selecting resonant circuits H03J ; using the properties of error detecting or correcting codes H04L 7/048) }
H04L 7/027 . . extracting the synchronising or clock signal from the received signal spectrum, e.g. by using a resonant or bandpass circuit
H04L 7/0272 . . . { with squaring loop }
H04L 7/0274 . . . { with Costas loop }
H04L 7/0276 . . . { Self-sustaining, e.g. by tuned delay line and a feedback path to a logical gate }
H04L 7/0278 . . . { Band edge detection }
H04L 7/033 . . using the transitions of the received signal to control the phase of the synchronising-signal-generating means, e.g. using a phase-locked loop
H04L 7/0331 . . . { with a digital phase-locked loop (PLL) processing binay samples, e.g. add/subtract logic for correction of receiver clock (H04L 7/0337 takes precedence) }
H04L 7/0332 . . . { with an integrator-detector }
H04L 7/0334 . . . { Processing of samples having at least three levels, e.g. soft decisions }
H04L 7/0335 . . . . { Gardner detector }
H04L 7/0337 . . . { Selecting between two or more discretely delayed clocks or selecting between two or more discretely delayed received code signals }
H04L 7/0338 . . . . { the correction of the phase error being performed by a feed forward loop }

H04L 7/04 . Speed or phase control by synchronisation signals { (H04L 7/0075 takes precedence) }

H04L 7/041 . . { using special codes as synchronising signal }

H04L 7/042 . . . { Detectors therefor, e.g. correlators, state machines (digital correlators in general G06F 17/15) }

H04L 7/043 . . . { Pseudo-noise (PN) codes variable during transmission (synchronisation of spread spectrum receivers H04B 1/69) }

H04L 7/044 . . . { using a single bit, e.g. start stop bit }

H04L 2007/045 . . . Fill bit or bits, idle words

H04L 7/046 . . . { using a dotting sequence }

H04L 2007/047 . . . using a sine signal or unmodulated carrier

H04L 7/048 . . { using the properties of error detecting or error correcting codes, e.g. parity as synchronisation signal }

H04L 7/06 . . the synchronisation signals differing from the information signals in amplitude, polarity, or frequency { or length }

H04L 7/065 . . . { and superimposed by modulation }

H04L 7/08 . . the synchronisation signals recurring cyclically

H04L 7/10 . . Arrangements for initial synchronisation

NOTE

In group H04L 9/00 to H04L 9/32 , in the absence of an indication to the contrary, an invention is classified in the last appropriate place.

H04L 9/00 { Cryptographic mechanisms or cryptographic } **arrangements for secret or secure communication** { (network architectures or network communication protocols for network security H04L 63/00 or for wireless network security H04W 12/00 ; security arrangements for protecting computers or computer systems against unauthorized activity G06F 21/00) }

NOTE

1. This group covers: 1.1 Cryptographic mechanisms including cryptographic protocols and cryptographic algorithms, whereby a cryptographic protocol is a distributed cryptographic algorithm defined by a sequence of steps precisely specifying the actions required of two or more entities to achieve specific security objectives (e.g. cryptographic protocol for key agreement), and whereby a cryptographic algorithm is specifying the steps followed by a single entity to achieve specific security objectives (e.g. cryptographic algorithm for symmetric key encryption). 1.2 H04L 9/00 focuses on cryptographic mechanisms such as encryption schemes, digital signatures, hash functions, random number generation, key management, said cryptographic mechanisms providing information security such as privacy or confidentiality, data integrity, message authentication, entity authentication, authorization, validation, certification, time-stamping, anonymity, revocation, non-repudiation. 1.3 H04L 9/00 covers also countermeasures against attacks on cryptographic mechanisms. 2. This group does not cover: 2.1 Networking architectures or network communication protocols for securing the traffic flowing through data packet networks and providing secure exchanges among applications communicating through data packet networks, which are covered by H04L 63/00 . Attention is drawn to the Note 1. after group H04L 63/00 2.2 Security arrangements for protecting computers or computer systems

against unauthorised activity, which are covered by G06F 21/00N

H04L 9/001 . { using chaotic signals }

H04L 9/002 . { Countermeasures against attacks on cryptographic mechanisms (network architectures or network communication protocols for protection against malicious traffic H04L 63/1441) }

H04L 9/003 . . { for power analysis, e.g. differential power analysis [DPA] or simple power analysis [SPA] }

H04L 9/004 . . { for fault attacks }

H04L 9/005 . . { for timing attacks }

H04L 9/006 . { involving public key infrastructure [PKI] trust models (network architecture or network communication protocol for supporting authentication of entities using certificates in a packet data network H04L 63/0823) }

H04L 9/007 . . { involving hierarchical structures }

H04L 9/008 . { involving homomorphic encryption }

H04L 9/06 . the encryption apparatus using shift registers or memories for block-wise { or stream } coding, e.g. DES systems { or RC4; Hash functions; Pseudorandom sequence generators }

H04L 9/0606 . . { including means for manipulating block length (H04L 9/0687 takes precedence) }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0618

H04L 9/0612 . . { Countermeasures against differential power analysis }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/003

H04L 9/0618 . . { Block ciphers, i.e. encrypting groups of characters of a plain text message using fixed encryption transformation }

H04L 9/0625 . . . { with splitting of the data block into left and right halves, e.g. Feistel based algorithms, DES, FEAL, IDEA or KASUMI }

H04L 9/0631 . . . { Substitution permutation network [SPN], i.e. cipher composed of a number of stages or rounds each involving linear and nonlinear transformations, e.g. AES algorithms }

H04L 9/0637 . . . { Modes of operation, e.g. cipher block chaining [CBC], electronic codebook [ECB] or Galois/counter mode [GCM] }

H04L 9/0643 . . { Hash functions, e.g. MD5, SHA, HMAC or f9 MAC }

H04L 9/065 . . { Encryption by serially and continuously modifying data stream elements, e.g. stream cipher systems, RC4, SEAL or A5/3 }

H04L 9/0656 . . . { Pseudorandom key sequence combined element-for-element with data sequence, e.g. one-time-pad [OTP] or Vernam's cipher }

H04L 9/0662 . . . . { with particular pseudorandom sequence generator }

H04L 9/0668 . . . . . { producing a non-linear pseudorandom sequence }

H04L 9/0675 . . { including means for processing multiple rounds }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0618

H04L 9/0681 . . . { specifically for Rijndael }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0631

H04L 9/0687 . . . { with splitting of the data block into left and right halves, e.g. Feistel structures }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0625

H04L 9/0693 . . { including variable substitution, permutation, order or number of rounds, controlled by a key and/or the input data }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0618

H04L 9/08 . Key distribution { or management, e.g. generation, sharing or updating, of cryptographic keys or passwords (network architectures or network communication protocols for supporting key management in a packet data network H04L 63/06) }

WARNING

The former subgroup H04L 9/08 was a 2-dot subgroup placed under H04L 9/06 . However since the former subgroup H04L 9/08 comprises both symmetric and asymmetric key distribution the subgroup H04L 9/08 was promoted to one-dot-level, unlike the corresponding IPC subgroup

H04L 9/0802 . . { using a key distribution center, a trusted party or a key server }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0816

H04L 9/0805 . . . { involving a conference key or a group key }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0816

H04L 9/0808 . . { using a control vector }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/088

H04L 9/0811 . . { using Diffie-Hellman key agreement }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0838

H04L 9/0813 . . . { with user authentication or key authentication }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0838

H04L 9/0816 . . { Key establishment, i.e. cryptographic processes or cryptographic protocols whereby a shared secret becomes available to two or more parties, for subsequent use }

H04L 9/0819 . . . { Key transport or distribution, i.e. key establishment techniques where one party creates or otherwise obtains a secret value, and securely transfers it to the other(s) (network architectures or network communication protocols for key distribution in a packet data network H04L 63/062) }

H04L 9/0822 . . . . { using key encryption key }

H04L 9/0825 . . . . { using asymmetric-key encryption or public key infrastructure [PKI } , e.g. key signature or public key certificates]

H04L 9/0827 . . . . [N: involving distinctive intermediate devices or communication paths (network architectures or network communication protocols using different networks H04L 63/18)

H04L 9/083 . . . . { involving central third party, e.g. key distribution center [KDC } or trusted third party [TTP]

H04L 9/0833 . . . . . { involving conference or group key (network architectures or network

communication protocols for key management in group communication in a packet data network H04L 63/065) }

H04L 9/0836 . . . . . { using tree structure or hierarchical structure }

H04L 9/0838 . . . { Key agreement, i.e. key establishment technique in which a shared key is derived by parties as a function of information contributed by, or associated with, each of these (network architectures or network communication protocols for key exchange in a packet data network H04L 63/061) }

H04L 9/0841 . . . . { involving Diffie-Hellman or related key agreement protocols }

H04L 9/0844 . . . . . { with user authentication or key authentication, e.g. ElGamal, MTI, MQV-Menezes-Qu-Vanstone protocol or Diffie-Hellman protocols using implicitly-certified keys }

H04L 9/0847 . . . . { involving identity based encryption [IBE] schemes }

H04L 9/085 . . . { Secret sharing or secret splitting, e.g. threshold schemes }

H04L 9/0852 . . . { Quantum cryptography (transmission systems employing electromagnetic waves other than radio waves, e.g. light, infra-red H04B10; wavelength-division multiplex systems H04J 14/02) } "

H04L 9/0855 . . . . { involving additional nodes, e.g. quantum relays, repeaters, intermediate nodes or remote nodes }

H04L 9/0858 . . . . { Details about key distillation or coding, e.g. reconciliation, error correction, privacy amplification, polarisation coding or phase coding }

H04L 9/0861 . . { Generation of secret information including derivation or calculation of cryptographic keys or passwords }

H04L 9/0863 . . . { involving passwords or one-time passwords (network architectures or network communication protocols for using one-time keys in a packet data network H04L 63/067) }

H04L 9/0866 . . . { involving user or device identifiers, e.g. serial number, physical or biometrical information, DNA, hand-signature or measurable physical characteristics }

H04L 9/0869 . . . { involving random numbers or seeds }

H04L 9/0872 . . . { using geo-location information, e.g. location data, time, relative position or proximity to other entities }

H04L 9/0875 . . . { based on channel impulse response [CIR] }

H04L 9/0877 . . . { using additional device, e.g. trusted platform module [TPM], smartcard, USB or hardware security module [HSM] }

H04L 9/088 . . { Usage controlling of secret information, e.g. techniques for restricting cryptographic keys to pre-authorized uses, different access levels, validity of crypto-period, different key- or password length, or different strong and weak cryptographic algorithms (network architectures or network communication protocols for using time-dependent keys in a packet data network H04L 63/068) }

H04L 9/0883 . . { using quantum cryptography }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0852

H04L 9/0886 . . { using key recovery or key escrow }

WARNING

This subgroup is no longer used for the classification of new documents as

from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/0894

H04L 9/0888 . . { using secret sharing }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/085

H04L 9/0891 . . { Revocation or update of secret information, e.g. encryption key update or rekeying }

H04L 9/0894 . . { Escrow, recovery or storing of secret information, e.g. secret key escrow or cryptographic key storage }

H04L 9/0897 . . . { involving additional devices, e.g. trusted platform module [TPM], smartcard or USB }

H04L 9/10 . with particular housing, physical features or manual controls { (not used; see H04L 9/00) }

H04L 9/12 . Transmitting and receiving encryption devices synchronised or initially set up in a particular manner

H04L 9/14 . using a plurality of keys or algorithms { (network architectures or network communication protocols wherein the sending and receiving network entities apply hybrid encryption, i.e. combination of symmetric and asymmetric encryption H04L 63/045) }

H04L 9/16 . . the keys or algorithms being changed during operation

H04L 9/18 . Encryption by serially and continuously modifying data stream elements, e.g. stream cipher systems

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/065

H04L 9/20 . . Pseudorandom key sequence combined element-for-element with data sequence { not used; see H04L 9/18 }

H04L 9/22 . . . with particular pseudorandom sequence generator

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/065

H04L 9/24 . . . . sequence produced by more than one generator { (not used; see H04L 9/22) }

H04L 9/26 . . . . producing a non-linear pseudorandom sequence

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/065

H04L 9/28 . using particular encryption algorithm

H04L 9/30 . Public key, i.e. encryption algorithm being computationally infeasible to invert or user's encryption keys not requiring secrecy

WARNING

the former H04L 9/30 was a 2-dot subgroup under H04L 9/28 ; however since the subgroup H04L 9/28 is not used the subgroup H04L 9/30 need to be promoted to one-dot-level

H04L 9/3006 . . { underlying computational problems or public-key parameters }

H04L 9/3013 . . . { involving the discrete logarithm problem, e.g. ElGamal or Diffie-Hellman systems }

H04L 9/302 . . . { involving the integer factorization problem, e.g. RSA or quadratic sieve [QS] schemes }

H04L 9/3026 . . . { details relating to polynomials generation, e.g. generation of irreducible polynomials }

H04L 9/3033 . . . { details relating to pseudo-prime or prime number generation, e.g. primality test }

H04L 9/304 . . { based on error correction codes, e.g. McEliece }

H04L 9/3046 . . { based on factoring a large integer, e.g. Rivest-Shamir-Adleman [RSA] }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/302

H04L 9/3053 . . { based on a modular knapsack }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/30 +

H04L 9/306 . . { based on discrete logarithm, e.g. ElGamal }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3013 and/or H04L 9/3066

H04L 9/3066 . . { involving algebraic varieties, e.g. elliptic or hyper-elliptic curves }

H04L 9/3073 . . . { involving pairings, e.g. identity based encryption [IBE], bilinear mappings or bilinear pairings, e.g. Weil or Tate pairing }

H04L 9/308 . . { based on polynomial equations }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3093

H04L 9/3086 . . { based on probabilistic schemes }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/30

H04L 9/3093 . . { involving Lattices or polynomial equations, e.g. NTRU scheme }

H04L 9/32 . including means for verifying the identity or authority of a user of the system { or for message authentication, e.g. authorization, entity authentication, data integrity or data verification, non-repudiation, key authentication or verification of credentials } ({ network architectures or network communication protocols for supporting entities authentication in a packet data network H04L 63/08 ; applying verification of the received information H04L 63/12 ; } computer systems G06F ; coin-freed or like apparatus with coded identity card or credit card G07F 7/08)

H04L 9/3202 . . { involving a third party or a trusted authority }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/321

H04L 9/3205 . . { using a non-public key algorithm }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/32

H04L 9/3207 . . { using zero-knowledge proof }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3218

H04L 9/321 . . { involving a third party or a trusted authority }

H04L 9/3213 . . . { using tickets or tokens, e.g. Kerberos (network architectures or network communication protocols for entities authentication using tickets in a packet data network H04L 63/0807) }

H04L 9/3215 . . { using a plurality of channels (network architectures or network communication

protocols using different networks H04L 63/18) }

H04L 9/3218 . . { using proof of knowledge, e.g. Fiat-Shamir, GQ, Schnorr, ornon-interactive zero-knowledge proofs }

H04L 9/3221 . . . { interactive zero-knowledge proofs }

H04L 9/3223 . . { using hash functions }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3236 + and/or H04L 9/0643

H04L 9/3226 . . { using a predetermined code, e.g. password, passphrase or PIN (network architectures or network communication protocols for supporting authentication of entities using passwords in a packet data network H04L 63/083) }

H04L 9/3228 . . . { One-time or temporary data, i.e. information which is sent for every authentication or authorization, e.g. one-time-password, one-time-token or one-time-key }

H04L 9/3231 . . . { Biological data, e.g. fingerprint, voice or retina (network architectures or network communication protocols for supporting authentication of entities using biometrical features in a packet data network H04L 63/0861) }

H04L 9/3234 . . { involving additional secure or trusted devices, e.g. TPM, smartcard, USB or software token (network architectures or network communication protocols for supporting authentication of entities using an additional device in a packet data network H04L 63/0853) }

H04L 9/3236 . . { using cryptographic hash functions }

H04L 9/3239 . . . { involving non-keyed hash functions, e.g. modification detection codes [MDCs], MD5, SHA or RIPEMD }

H04L 9/3242 . . . { involving keyed hash functions, e.g. message authentication codes [MACs], CBC-MAC or HMAC }

H04L 9/3244 . . { for message authentication (H04L 9/3281 takes precedence) }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/32

H04L 9/3247 . . { involving digital signatures }

H04L 9/3249 . . . { using RSA or related signature schemes, e.g. Rabin scheme }

H04L 9/3252 . . . { using DSA or related signature schemes, e.g. elliptic based signatures, ElGamal or Schnorr schemes }

H04L 9/3255 . . . { using group based signatures, e.g. ring or threshold signatures }

H04L 9/3257 . . . { using blind signatures }

H04L 9/326 . . { involving the concurrent use of a plurality of channels of different nature }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3215

H04L 9/3263 .. { involving certificates, e.g. public key certificate [PKC] or attribute certificate [AC]; Public key infrastructure [PKI] arrangements (network architectures or network communication protocols for supporting authentication of entities using certificates in a packet data network H04L 63/0823) }

H04L 9/3265 ... { using certificate chains, trees or paths; Hierarchical trust model }

H04L 9/3268 ... { using certificate validation, registration, distribution or revocation, e.g. certificate revocation list [CRL] }

H04L 9/3271 .. { using challenge-response }

H04L 9/3273 ... { for mutual authentication (network architectures or network communication protocols for achieving mutual authentication in a packet data network H04L 63/0869) }

H04L 9/3276 ... { involving splitting up or repeating the challenge and/or response }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3271

H04L 9/3278 ... { using physically unclonable functions [PUF] }

H04L 9/3281 .. { using electronic signatures }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3247

H04L 9/3284 ... { using blind signatures }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3257

H04L 9/3286 ... { involving a plurality or a group of signers }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3255

H04L 9/3289 ... { with message recovery }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3247

H04L 9/3292 .... { with partial message recovery }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3247

H04L 9/3294 . . { using time stamps or public key certificates }

WARNING

This subgroup is no longer used for the classification of new documents as from 1.02.2012 and the backlog of this subgroup is being continuously reclassified to H04L 9/3263 + or H04L 9/3297

H04L 9/3297 . . { involving time stamps, e.g. generation of time stamps }

H04L 9/34 . Bits, or blocks of bits, of the telegraphic message being interchanged in time { (for speech signals H04K 1/06) }

H04L 9/36 . with means for detecting characters not meant for transmission

H04L 9/38 . Encryption being effected by mechanical apparatus, e.g. rotating cams, switches, keytape punchers

H04L 12/00 **Data switching networks** (interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units G06F 13/00)

H04L 12/02 . Details

H04L 12/04 . . Switchboards

H04L 12/06 . . Answer-back mechanisms or circuits

H04L 12/08 . . Alloting numbers to messages ; Counting characters, words or messages

H04L 12/10 . . Current supply arrangements

H04L 12/12 . . Arrangements for remote connection or disconnection of substations or of equipment thereof

H04L 12/14 . . { Metering, } charging { or billing } arrangements { specially adapted for data wireline or wireless communications (payment schemes, architectures or protocols per se G06Q20) }

H04L 12/1403 . . . { Architecture for metering, charging or billing }

H04L 12/1407 . . . . { Policy-and-charging control [PCC] architecture }

H04L 12/141 . . . { Indication of costs }

H04L 12/1414 . . . . { in real-time }

H04L 12/1417 . . . . . { Advice of charge with threshold, e.g. user indicating maximum cost }

H04L 12/1421 . . . . { Indication of expected costs }

H04L 12/1425 . . . { involving dedicated fields in the data packet for billing purposes }

H04L 12/1428 . . . { Invoice generation, e.g. customization, lay-out, database processing, algorithms for calculating the bill or formatting invoices as WWW pages (invoicing in general G06Q 30/04) }

H04L 12/1432 . . . { Metric aspects }

H04L 12/1435 . . . . { volume-based }

H04L 12/1439 .... { time-based }
H04L 12/1442 ... { at network operator level }
H04L 12/1446 .... { inter-operator billing }
H04L 12/145 .... { trading network capacity or selecting route based on tariff }
H04L 12/1453 ... { Methods or systems for payment or settlement of the charges for data transmission involving significant interaction with the data transmission network }
H04L 12/1457 .... { using an account }
H04L 12/146 .... { using digital cash }
H04L 12/1464 .... { using a card, such as credit card, prepay card or SIM }
H04L 12/1467 .... { involving prepayment }
H04L 12/1471 .... { splitting of costs }
H04L 12/1475 ..... { the splitting involving a third party }
H04L 12/1478 ..... { the splitting involving only the communication parties }
H04L 12/1482 .... { involving use of telephony infrastructure for billing for the transport of data, e.g. call detail record [CDR] or intelligent network infrastructure }
H04L 12/1485 ... { Tariff-related aspects }
H04L 12/1489 .... { dependent on congestion }
H04L 12/1492 .... { negotiation of tariff }
H04L 12/1496 .... { involving discounts }
H04L 12/16 .. Arrangements for providing special services to substations { contains provisionally no documents }
H04L 12/18 ... for broadcast or conference { , e.g. multicast (multicast or broadcast switches H04L 12/56S3A) }
H04L 12/1804 .... { for stock exchange and similar applications }
H04L 12/1809 .... { for auctioneering devices }
H04L 12/1813 .... { for computer conferences, e.g. chat rooms (protocols for multimedia communication H04L 29/06027 ; signaling and real-time protocols for multimedia conference H04L 29/06414 ; instant messaging H04L 12/581 ; telephonic conference arrangements H04M 3/56 ; television conference systems H04N 7/15) }
H04L 12/1818 ..... { Conference organisation arrangements, e.g. handling schedules, setting up parameters needed by nodes to attend a conference, booking network resources, notifying involved parties }
H04L 12/1822 ..... { Conducting the conference, e.g. admission, detection, selection or grouping of participants, correlating users to one or more conference sessions, prioritising transmission }
H04L 12/1827 ..... { Network arrangements for conference optimisation or adaptation }
H04L 12/1831 ..... { Tracking arrangements for later retrieval, e.g. recording contents, participants activities or behavior, network status }
H04L 12/1836 .... { with heterogeneous network architecture }
H04L 12/184 ..... { with heterogeneous receivers, e.g. layered multicast }
H04L 12/1845 .... { broadcast or multicast in a specific location, e.g. geocast (protocols for adapting network applications to user terminal location H04L 29/08657 ; services specially adapted for wireless communication networks making use of the location of users or terminals H04W 4/02) }
H04L 12/185 .... { with management of multicast group membership }

H04L 12/1854 .... { with non-centralised forwarding system, e.g. chaincast }

H04L 12/1859 .... { adapted to provide push services, e.g. data channels }

H04L 12/1863 .... { comprising mechanisms for improved reliability, e.g. status reports (arrangements for detecting or preventing errors by carrying supervisory signal the return channel H04L 1/16) }

H04L 12/1868 ..... { Measures taken after transmission, e.g. acknowledgments }

H04L 12/1872 ..... { avoiding ACK or NACK implosion }

H04L 12/1877 ..... { Measures taken prior to transmission }

H04L 12/1881 .... { with schedule organisation, e.g. priority, sequence management }

H04L 12/1886 .... { with traffic restrictions for efficiency improvement, e.g. involving subnets or subdomains }

H04L 12/189 .... { in combination with wireless systems (selective distribution or broadcast in wireless communication networks H04W 4/06) }

H04L 12/1895 .... { for short real-time information, e.g. alarms, notifications, alerts, updates }

H04L 12/22 .. Arrangements for preventing the taking of data from a data transmission channel without authorisation (means for verifying the identity or the authority of a user of a secure or secret communication system H04L 9/32)

H04L 12/24 .. Arrangements for maintenance or administration

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/00

H04L 12/2401 ... { involving integration or standardization }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/02

H04L 12/2402 .... { using standardized network management architectures, e.g. TMN [Telecommunication Management network } , UNMA [Unified Network Management Architecture]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0206

H04L 12/2403 .... { using standardized network management protocols, e.g. SNMP [Simple Network Management Protocol } , CMIP [Common Management Interface Protocol]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0213

H04L 12/2404 .... { Multivendor or multistandard integration }

WARNING

WARNING: This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/02 C]

H04L 12/2405 . . . . { Mapping or translation of multiple network management protocols }

WARNING

WARNING: This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0226

H04L 12/2406 . . . . { using object oriented techniques, e.g. CORBA [Common Object Request Broker Architecture for representation of network management data }

WARNING

WARNING: This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0233

H04L 12/2407 . . . . { using relational databases for representation of network management data, e.g. managing via SQL [Structured Query Language }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/024

H04L 12/2408 . . . . { using Internet technology, e.g. a standard Web Browser at the management workstation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0246

H04L 12/2409 . . . { Architectural aspects of network management arrangements }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/04

H04L 12/241 . . . . { Arrangements involving multiple distributed management centers cooperatively managing the network }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/042

H04L 12/2411 . . . . { Arrangements involving a hierarchical management structure }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/044

H04L 12/2412 . . . . { Aspects of network management Agents }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/046

H04L 12/2413 . . . . { Arrangements involving CNM [Customer Network Management }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/18

H04L 12/2414 . . . { involving network analysis }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/14

H04L 12/2415 . . . . { using statistical methods, e.g. distribution tests, or establishing statistical profiles, or calculating probabilities }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/14

H04L 12/2416 . . . . { for automatically determining the actual topology of a network (Topology discovery in routers H04L 12/56C1) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/12

H04L 12/2417 . . . . { Service management, i.e. managing value added network services and related parameters, e.g. SLA [Service Level Agreements } , responsetimes, performance, throughput]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/00

H04L 12/2418 . . . . { involving monitoring of all traffic over a specific network link }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 43/00

H04L 12/2419 . . . { involving management of faults or events or alarms }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/06

H04L 12/242 . . . . { Alarm or event filtering, e.g. for reduction of information }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0604

H04L 12/2421 . . . . { Alarm and event correlation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0631

H04L 12/2422 . . . . { Automatic restoration of network faults }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0654

H04L 12/2423 . . . . { involving Artificial Intelligence algorithms, e.g. expert systems, rule based systems, genetic algorithms }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/16

H04L 12/2424 . . . { Configuration management of network or network elements (management of devices network applications for proprietary or special purpose network

environments H04L 29/08567 ; automatic configuration in wireless networks H04W 24/02) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/08

H04L 12/2425 . . . . Configuration setting of network or network elements]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0803

H04L 12/2426 . . . . . { for initial configuration or provisioning }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0806

H04L 12/2427 . . . . . { Plug-and-play configuration }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0809

H04L 12/2428 . . . . . { Changing of configuration }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0813

H04L 12/2429 . . . . . { due to adaptation, e.g. in response to network events }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0816

H04L 12/243 . . . . . { due to updating or upgrading of network functionality, e.g. firmware (topology update or discovery for routing purposes H04L 12/56C1) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously

reclassified to subgroups of H04L 41/085

H04L 12/2431 . . . . . { Configuration optimization }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0823

H04L 12/2432 . . . . . { for network cost reduction }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0826

H04L 12/2433 . . . . . { for network speed increase }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/083

H04L 12/2434 . . . . . { to reduce network energy consumption }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0833

H04L 12/2435 . . . . . { to enhance reliability, e.g. reduce downtime }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0836

H04L 12/2436 . . . . . { Configuration by copying }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/084

H04L 12/2437 . . . . . { based on generic templates }

WARNING

This subgroup is no longer used for classification as from

01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0843

H04L 12/2438 . . . . . { based on copy from other elements }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0846

H04L 12/2439 . . . . { Bandwidth or capacity management, i.e. automatically increasing or decreasing capacities, e.g. bandwidth on demand }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0896

H04L 12/244 . . . . { Assignment of logical groupings to network elements; Policy based network management or configuration }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0893

H04L 12/2441 . . . . { Keeping track of network configuration }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/085

H04L 12/2442 . . . . . { by actively collecting or retrieving configuration information }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0853

H04L 12/2443 . . . . . { by archiving or backing up configuration information }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/0856

H04L 12/2444 . . . . . { by keeping history of different configuration generations or versions }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0859

H04L 12/2445 . . . . . { by rolling back to previous configuration versions }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0863

H04L 12/2446 . . . . { Checking configuration }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0866

H04L 12/2447 . . . . . { by validating configuration within one network element }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0869

H04L 12/2448 . . . . . { by checking configuration conflicts with other network elements }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0873

H04L 12/2449 . . . . { Aspects of the degree of configuration automation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0876

H04L 12/2451 . . . . . { Manual configuration through operator }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0879

H04L 12/2452 . . . . . { Semiautomatic configuration, e.g. proposals from system }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0883

H04L 12/2453 . . . . . { Fully automatic configuration }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0886

H04L 12/2454 . . . . { Techniques to speed-up the configuration process }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/0889

H04L 12/2455 . . . { Hardware and software tools for network management }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/14 , H04L 41/20 , H04L 41/22 , H04L 41/24 , H04L 41/26

H04L 12/2456 . . . . { for network design, e.g. with integrated simulation and design testing }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/14

H04L 12/2457 . . . . { Network management software packages }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/20

H04L 12/2458 . . . . { using GUI [Graphical User Interface }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/22

H04L 12/2459 . . . . { using dedicated network management hardware }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/24

H04L 12/246 . . . . { using dedicated tools for LAN [Local Area Network } management]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/26

H04L 12/2461 . . . { Security in network management, e.g. restricting network management access (protocols or architecture for network security H04L 29/06551) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/28

H04L 12/2462 . . . { Decision processes by autonomous network management units using voting and bidding }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/30

H04L 12/2463 . . . { Specific management aspects for broadband networks }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/32

H04L 12/2464 . . . { Network service management, ensuring proper service fulfilment according to an agreement or contract between two parties, e.g. between an IT-provider and a customer }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/50

H04L 12/2465 . . . . { Managing SLA [Service Level Agreement } or interaction between SLA and QoS [Quality of Service]]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5003

H04L 12/2466 . . . . . { Defining or negotiating SLA contracts, guarantees or penalties (SLA negotiation in wireless networks H04W 28/24) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/5006

H04L 12/2467 . . . . . { Measuring SLA quality parameters, e.g. against possible contract or guarantee violations (Monitoring performance metrics on a simple network level H04L 12/2634) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/5009

H04L 12/2468 . . . . . { determining service availability }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5012

H04L 12/2469 . . . . . { based on actual status of service availability, e.g. which services are available at this point in time }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5012

H04L 12/247 . . . . . { based statistics of service availability, e.g. in percentage or over a given time }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/5016

H04L 12/2471 . . . . . { determining service performance, i.e. performance on service level, e.g. response time or MTBF [Mean Time Between Failure }]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/5009

H04L 12/2472 . . . . . { Ensuring SLA (flow or congestion control at network level H04L 12/569) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 41/50 B

H04L 12/2473 . . . . . { by giving priorities, e.g. assigning classes of service }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5022

H04L 12/2474 . . . . . { by proactively reacting to service quality change (e.g. degradation or upgrade) by reconfiguration (mere restoration of network faults H04L 12/2422) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5025

H04L 12/2475 . . . . . { Service quality level based billing, e.g. dependent on measured service level customer is charged more or less (general charging or billing for transport of data packets H04L 12/14) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5029

H04L 12/2476 . . . . . { Generating service level reports }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/50 D

H04L 12/2477 . . . . . { Measuring contribution of individual network components to actual service level (alarm or event correlation H04L 12/2421) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5035

H04L 12/2478 . . . . . { Testing of service level quality }

WARNING

This subgroup is no longer used for classification as from

01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5038

H04L 12/2479 . . . . { Service implementation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5041

H04L 12/248 . . . . . { Making service definitions prior to deployment }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5045

H04L 12/2481 . . . . . { Automatic or semi-automatic definitions, e.g. definition templates }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5048

H04L 12/2482 . . . . . { Service on demand, i.e. services are defined and provided in real time as requested by the user }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5051

H04L 12/2483 . . . . . { Automatic provisioning of the service triggered by the service manager, e.g. concrete service implementation by automatic configuration of network components (for initializing configuration, i.e. provisioning of network or devices H04L 12/2425) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5054

H04L 12/2484 . . . . { Service discovery by the Service Manager (automatically determining the actual topology of a network H04L 12/2416 ; topology discovery in routers H04L 12/56C1 ; arrangements for service discovery, e.g. Service Location Protocol (SLP) H04L 29/08648) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to

41/5058

H04L 12/2485 . . . . { Customer care }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/50 J

H04L 12/2486 . . . . . { Customer Relationship Management (for arrangements involving Customer Network Management, i.e. giving the customer access to network management functions H04L 12/2413) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5064

H04L 12/2487 . . . . . { Customer-centric QoS [Quality of Service } measurement]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5067

H04L 12/2488 . . . . . { Filtering out customers affected by service problems }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/507

H04L 12/2489 . . . . . { Handling of Trouble Tickets }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5074

H04L 12/249 . . . . { Managing simple transport services, i.e. providing only network infrastructure }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5077

H04L 12/2491 . . . . { based on type of value added network service under agreement }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/508

H04L 12/2492 . . . . . { wherein the managed service relates to web hosting (web hosting as such H04L 29/0809 , web-browsers G06F 17/30861 , video-hosting H04N 21/2743) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5083

H04L 12/2493 . . . . . { wherein the managed service relates to voice services (protocols for real-time multimedia communications H04L 29/06176 ; management of telephonic communication services H04M 3/22 ; management of VoIP services H04M 7/0081) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5087

H04L 12/2494 . . . . . { wherein the managed service relates to audio / video / TV (protocols for real-time multimedia communications H04L 29/06176 ; interactive television or VoD H04N21) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/509

H04L 12/2495 . . . . . { wherein the managed service relates to messaging (messaging, such as e-mail in packet-switching networks H04L 12/58) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5093

H04L 12/2496 . . . . . { wherein the managed service relates to chat services (conducting a computer conference H04L 12/1822 ; instant messaging H04L 12/581) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5093

H04L 12/2497 . . . . . { wherein the managed service relates to access to distributed or central networked applications }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/5096

H04L 12/2498 . . . . . { wherein the managed service relates to media content delivery over network }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 41/509

H04L 12/26 . . Monitoring arrangements ; Testing arrangements

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 43/00

H04L 12/2602 . . . { Monitoring arrangements }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to subgroups of H04L 43/00

H04L 12/2605 . . . . { involving a reduction of monitoring data }

H04L 12/2607 . . . . . { using sampling of monitoring data, i.e. storing only a selection of packets }

H04L 12/261 . . . . . { using adaptive sampling }

H04L 12/2613 . . . . . { using flow Flow generation }

H04L 12/2615 . . . . . { using filtering (alarm or event filtering H04L 12/242) }

H04L 12/2618 . . . . { processing of captured monitoring data }

H04L 12/2621 . . . . . { for graphical visualization of monitoring data (graphical user interfaces H04L 12/2458) }

H04L 12/2623 . . . . . { Report generation }

H04L 12/2626 . . . . . { for traffic related reporting }

H04L 12/2628 . . . . . { for device related reporting (reporting of sensed information of home appliances H04L 12/2803) }

H04L 12/2631 . . . . . { for time frame related reporting }

H04L 12/2634 . . . . { Monitoring using or based on specific metrics }

H04L 12/2636 . . . . . { based on availability }

H04L 12/2639 . . . . . { based on connectivity }

H04L 12/2642 ..... { based on functioning (monitoring the activity of the application user H04L 29/08675 ; monitoring appliance functionality of home appliances H04L 12/2803) }

H04L 12/2644 ..... { using errors (management of events, faults or alarms H04L 12/2419) }

H04L 12/2647 ..... { using packet loss }

H04L 12/2649 ..... { using one way packet loss }

H04L 12/2652 ..... { using round trip packet loss }

H04L 12/2655 ..... { based on transmission error }

H04L 12/2657 ..... { based on delays }

H04L 12/266 ..... { based on one way delays }

H04L 12/2663 ..... { based on round trip delays }

H04L 12/2665 ..... { based on Jitter }

H04L 12/2668 ..... { based on network utilization }

H04L 12/2671 ..... { based on utilization of link capacity }

H04L 12/2673 ..... { based on throughput }

H04L 12/2676 ..... { based on packet rate }

H04L 12/2678 .... { using active monitoring, e.g. heartbeat protocols, polling, ping, trace-route }

H04L 12/2681 ..... { with adaptive polling, i.e. dynamically adapting the polling rate }

H04L 12/2684 ..... { by adding timestamps to packets }

H04L 12/2686 .... { using dedicated network monitoring probes }

H04L 12/2689 .... { using software, i.e. software packages }

H04L 12/2692 .... { using threshold monitoring }

H04L 12/2694 .... { using protocol analyzers }

H04L 12/2697 ... { Testing equipment; Routine testing }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 43/50

H04L 12/28 . characterised by path configuration, e.g. local area networks (LAN), wide area networks (WAN)

H04L 12/2801 .. { Broadband local area networks }

H04L 12/2803 .. { Home automation networks }

H04L 12/2805 ... { Home Audio Video Interoperability (HAVI) networks }

H04L 12/2807 ... { Exchanging configuration information on appliance services in a home automation network (adress allocation H04L 29/12207 ; arrangements for maintenance or administration involving network analysis for automatically determining the actual topology of a network H04L 12/2416 ; hardware or software tools for network management using graphical user interfaces H04L 12/2458) }

H04L 12/2809 .... { indicating that an appliance service is present in a home automation network (monitoring functionality H04L 12/2642 ; arrangements for service discovery H04L 29/08648) }

H04L 12/281 .... { indicating a format for calling an appliance service function in a home

automation network (protocols for network applications involving the use of web-based technology H04L 29/08099) }

H04L 12/2812 . . . . { describing content present in a home automation network, e.g. audio video content (retrieval from the Internet G06F 17/30 W) }

H04L 12/2814 . . . . { Exchanging control software or macros for controlling appliance services in a home automation network (arrangements for maintenance or administration involving configuration of the network and network elements H04L 12/24 E) }

H04L 12/2816 . . . { Controlling appliance services of a home automation network by calling their functionalities (arrangements in telecontrol or telemetry systems for selectively calling a substation from a main station; in which substation desired apparatus is selected for applying a control signal thereto or for obtaining measured values therefrom H04Q 9/00) }

H04L 12/2818 . . . . { from a device located outside both the home and the home network (access arrangements H04L 12/2856 ; protocols for network applications involving the use of web-based technology for remote control or remote monitoring H04L 29/08099 ; telephonic communication systems adapted for combination with remote control systems H04M 11/00 B; arrangements for transmitting signals characterised by the use of a wireless eletrical link G08C 17/00) }

H04L 12/282 . . . . { based on user interaction within the home (receiver circuitry for displaying additional information being controlled by a remote control apparatus H04N 5/445 R) }

H04L 12/2821 . . . . { Avoiding conflicts related to the use of home appliances (arrangements for network security H04L 29/06 S) }

H04L 12/2823 . . . { Reporting information sensed by appliance or service execution status of appliance services in a home automation network (device-related reporting H04L 1/26M2B2 ; arrangements in telecontrol or telemetry systems for selectively calling a substation from a main station, in which substation desired apparatus is selected for applying a control signal thereto or for obtaining measured values therefrom H04Q 9/00) }

H04L 12/2825 . . . . { Reporting to a device located outside the home and the home network (access arrangements H04L 12/2856 ; protocols for network applications involving the use of web-based technology for remote control or remote monitoring H04L 29/08099 ; telephonic communication systems adapted for combination with telemetering systems H04M 11/00 A) }

H04L 12/2827 . . . . { Reporting to a device within the home network; wherein the reception of the information reported automatically triggers the execution of a home appliance functionality }

H04L 12/2829 . . . . . { involving user profiles according to which the execution of a home appliance functionality is automatically triggered }

H04L 12/283 . . . { Processing of data at an internetworking point of a home automation network }

H04L 12/2832 . . . . { Interconnection of the control functionalities between home networks (single bridge functionality H04L 12/4625) }

H04L 12/2834 . . . . { Switching of information between an external network and a home network (access arrangements H04L 12/2856) }

H04L 12/2836 . . . . { Protocol conversion between an external network and a home network (protocol conversion H04L 29/06 E; adaptation of digital video signals for transport over a specific home network H04N 7/24T6 ; controlling appliance services of a home automation network from a device located outside the home and the home network H04L 12/2818) }

H04L 12/2838 . . . { Distribution of signals within a home automation network, e.g. involving splitting/multiplexing signals to/from different paths (adaptations of television

systems for transmission by electric cable for domestic distribution H04N 7/10 H; hybrid transport H04L 12/64 B; home network arrangements specially adapted for distribution of digital video signals H04N 7/24 N) }

H04L 2012/284 . . . characterised by the type of medium used

H04L 2012/2841 . . . . Wireless

H04L 2012/2843 . . . . Mains power line

H04L 2012/2845 . . . . Telephone line

H04L 2012/2847 . . . characterised by the type of home appliance used

H04L 2012/2849 . . . . Audio/video appliances

H04L 2012/285 . . . . Generic home appliances, e.g. refrigerators

H04L 12/2852 . . { Metropolitan area networks }

H04L 12/2854 . . { Wide area networks, e.g. public data networks }

H04L 12/2856 . . . { Access arrangements, e.g. Internet access (asynchronous transfer mode networks H04L 12/5601 ; broadband local area networks H04L 12/2801 ; optical access or distribution networks H04Q 11/0067 ; access to open networks H04L 12/5691 ; digital subscriber line end-user equipment and bit-level processing of data on a PSTN-based network H04M 11/00 ; home network gateways H04L 12/2834 ; wireless access networks H04W) }

NOTE

(1) This group covers:
- access to a public data network, such as an IP network, for subscribers, i.e. customers of a network service provider, over a wired network.
- communication of generic types of data between end-user equipments, located typically at the subscriber premises, and an access server, which acts as interface between the access network and the public data network.
(2) This group does not cover:
- wireless access networks, which are covered by H04W
- optical distribution networks, which are covered by H04Q 11/0067
- bit-level, or PHY layer, processing of data between digital subscriber line equipments, which is covered by H04M 11/06
- design of DSL, digital subscriber line, modems, which is covered by H04M 11/06
- exchange of data related to functionalities of home network appliances between a home network and an external network, which is covered by H04L 12/28 H
- management of WDM parameters in optical multiplex systems, which is covered by H04J 14/02
- circuit-switched access networks, which are covered by H04M 7/12 H
- access arrangements for providing telephone service in networks other than PSTN/ISDN, which are covered by H04M 7/0066
(3) In this group the following terms or expressions are used with the meaning indicated:
- ATM means Asynchronous Transfer Mode
- LAN means Local Area Network
- BRAS means Broadband Remote Access Server
- DSLAM means Digital Subscriber Line Access Multiplexer
- MSAN means MultiService Access Node
- DSL means Digital Subscriber Line
- IP means Internet Protocol
- WDM means Wavelength Division Multiplexing
- SDH means Synchronous Digital Hierarchy
- OTN means Optical Transport Network
- PSTN means Public Switched Telephone Network

- ISDN means Integrated Services Digital Network
- TDM means Time-Division Multiplexing
- TDMA means Time Division Multiple Access

WARNING

Subgroups of H04L 12/2856 are not complete pending reorganisation. See also H04L 12/5691

H04L 12/2858 .... { Access network architectures }

H04L 12/2859 ..... { Point-to-point connection between the data network and the subscribers (encapsulation H04L 12/4633 ; virtual LANs H04L 12/4641 ; routing of packets H04L 12/5689) }

H04L 12/2861 ..... { Point-to-multipoint connection from the data network to the subscribers }

H04L 12/2863 .... { Arrangements for combining access network resources elements, e.g. channel bonding (multichannel protocols H04L 29/06088 ; routing of packets H04L 12/5689 ; modem pooling H04L 25/14) }

H04L 12/2865 ..... { Logical combinations }

H04L 12/2867 ..... { Physical combinations }

H04L 12/2869 .... { Operational details of access network equipments (admission control or resource allocation in access networks H04L 12/5692) }

H04L 12/287 ..... { Remote access server, e.g. BRAS }

H04L 12/2872 ..... { Termination of subscriber connections }

H04L 12/2874 ..... { Processing of data for distribution to the subscribers }

H04L 12/2876 ..... { Handling of subscriber policies (group policies management H04L 12/244) }

H04L 12/2878 ..... { Access multiplexer, e.g. DSLAM (generic distributed time multiplexers, e.g. TDM/TDMA H04J 3/1694) }

H04L 12/2879 ..... { characterised by the network type on the uplink side, i.e. towards the service provider network }

H04L 12/2881 ..... { IP/Ethernet DSLAM }

H04L 12/2883 ..... { ATM DSLAM }

H04L 12/2885 ..... { Arrangements interfacing with optical systems (optical network equipment H04B 10/00 ; optical multiplexers H04J 14/00) }

H04L 12/2887 ..... { characterised by the offered subscriber services }

H04L 12/2889 ..... { Multiservice, e.g. MSAN }

H04L 12/289 ..... { Single service }

H04L 12/2892 ..... { characterised by the access multiplexer architecture }

H04L 12/2894 ..... { Centralized processing }

H04L 12/2896 ..... { Distributed processing, e.g. on line cards }

H04L 12/2898 ..... { Subscriber equipments (DSL modems H04M 11/062 ; cable modems H04L 12/2801) }

H04L 12/40 .. Bus networks

H04L 12/40006 ... { Architecture of a communication node (intermediate storage or scheduling H04L 12/5694 ; current supply arrangements H04L 12/10) }

NOTE

In this group the following terms or expressions are used with the meaning indicated:
. a bus controller is a microprocessor dedicated to input and output of data by a node on a bus;
. a bus master is a device controlling which node accesses the bus at a particular time;
. a bus guardian is a device monitoring the timing of node accesses on the bus;
. a bus interface enhancer is a hardware or software arrangement managing the bus controller or the bus interface to modify its behaviour or providing a transparent interface to the bus controller

H04L 12/40013 . . . . { Details regarding a bus controller }

H04L 12/40019 . . . . { Details regarding a bus master }

H04L 12/40026 . . . . { Details regarding a bus guardian }

H04L 12/40032 . . . . { Details regarding a bus interface enhancer }

H04L 12/40039 . . . . { Details regarding the setting of the power status of a node according to activity on the bus }

H04L 12/40045 . . . . { Details regarding the feeding of energy to the node from the bus }

H04L 12/40052 . . . { High-speed IEEE 1394 serial bus (bus transfer protocol on a daisy chain bus using an embedded synchronisation G06F 13/426) }

H04L 12/40058 . . . . { Isochronous transmission }

H04L 12/40065 . . . . { Bandwidth and channel allocation (home automation networks H04L 12/28 H; flow control H04L 12/56 D) }

H04L 12/40071 . . . . { Packet processing; Packet format (packet switches H04L 12/56 S; intermediate storage or scheduling H04L 12/56 Q; Adaptation of digital video signals for transport over a specific network H04N 7/24T6) }

H04L 12/40078 . . . . { Bus configuration (home automation networks H04L 12/28 H; Arrangements for maintenance or administration H04L 12/24) }

H04L 12/40084 . . . . { Bus arbitration }

H04L 12/40091 . . . . { Bus bridging (LAN interconnection over a bridge based backbone H04L 12/462 ; single bridge functionality H04L 12/462) }

H04L 12/40097 . . . . { Interconnection with other networks (LAN interconnection over a bridge based backbone H04L 12/462 ; single bridge functionality H04L 12/462) }

H04L 12/40104 . . . . { Security; Encryption; Content protection (arrangements for network security H04L 29/06 S) }

H04L 12/4011 . . . . { Wireless (wireless communication networks H04W) }

H04L 12/40117 . . . . { Interconnection of audio or video/imaging devices (home automation networks H04L 12/28 H; bitstream network arrangements specially adapted for distribution of digital video signals H04N 7/24 N) }

H04L 12/40123 . . . . { Interconnection of computers and peripherals (printer information exchange with computer G06F 3/12 C) }

H04L 12/4013 . . . { Management of data rate on the bus (systems modifying transmission characteristics according to link quality H04L 1/0001 ; negotiation of transmission parameters of transmission speed prior to communication H04L 5/1446 ; adaptive data allocation for multicarrier modulation H04L 27/2608) }

H04L 12/40136 . . . . { Nodes adapting their rate to the physical link properties (LAN switches H04L 12/56S8A) }

H04L 12/40143 . . . { involving priority mechanisms (intermediate storage or scheduling H04L 12/5694 ; hybrid switching fabrics H04L 12/6402 ; time-division multiplex systems H04J 3/00) }

H04L 12/4015 . . . . { by scheduling the transmission of messages at the communication node }

H04L 12/40156 . . . . { by using dedicated slots associated with a priority level }

H04L 12/40163 . . . . { by assigning priority to messages according to a message field }

H04L 12/40169 . . . { Flexible bus arrangements (arrangements for maintenance or administration involving management of faults; events, alarms H04L 12/2419 ; automatic restoration of network faults H04L 12/2422) }

H04L 12/40176 . . . . { involving redundancy (error detection or correction of the data by redundancy in hardware using active fault-masking in interconnections G06F 11/2002 ; error detection or correction of the data by redundancy in hardware using active fault-masking in storage systems using spares or by reconfiguring G06F 11/2053) }

H04L 12/40182 . . . . . { by using a plurality of communication lines }

H04L 12/40189 . . . . . { by using a plurality of bus systems }

H04L 12/40195 . . . . . { by using a plurality of nodes }

H04L 12/40202 . . . . . [N: by using a plurality of master stations]

H04L 2012/40208 . . . characterized by the use of a particular bus standard

NOTE

In this group the following terms or expressions are used with the meaning indicated: . Controller-area network (CAN or CAN-bus) designates a computer network protocol and bus standard developed in 1983 by Intel Corporation and Robert Bosch GmbH to allow microcontrollers and devices to communicate with each other without a host computer; . PROFIBUS (Process Field Bus) designatesa standard for field bus communication in automation technology first implemented in 1989 by BMBF, the german department of education and research; . Modbus designates a serial communications protocol published by Modicon in 1979 for use with its programmable logic controller; . LIN-Bus (Local Interconnect Network) designates a computer networking bus-system released in 1999 used within current automotive network architectures; . FlexRay designates an automotive network communications protocol developed by the FlexRay Consortium; . LON or LonWorks designates a network standard operating on twisted pair or electrical wiring or coaxial cable and used for building automation; . ASI or AS-Interface (Actuator Sensor Interface) designates the simplest of the industrial networking protocols used in programmable logic controller systems

H04L 2012/40215 . . . . Controller Area Network CAN

H04L 2012/40221 . . . . Profibus

H04L 2012/40228 . . . . Modbus

H04L 2012/40234 . . . . Local Interconnect Network LIN

H04L 2012/40241 . . . . Flexray

H04L 2012/40247 . . . . LON

H04L 2012/40254 . . . . Actuator Sensor Interface ASI

H04L 2012/4026 . . . Bus for use in automation systems

H04L 2012/40267 . . . Bus for use in transportation systems

H04L 2012/40273 . . . . the transportation system being a vehicle

H04L 2012/4028 .... the transportation system being an aircraft
H04L 2012/40286 .... the transportation system being a waterborne vessel
H04L 2012/40293 .... the transportation system being a train
H04L 12/403 ... with centralised control, e.g. polling
H04L 12/4035 .... { in which slots of a TDMA packet structure are assigned based on a contention resolution carried out at a master unit (TDM/TDMA multiplex systems per se H04J 3/16 D; hybrid switching systems H04L 12/64) }
H04L 12/407 ... with decentralised control
H04L 12/413 .... with random access, e.g. carrier-sense multiple-access with collision detection (CSMA-CD)
H04L 12/4135 ..... { using bit-wise arbitration }
H04L 12/417 .... with deterministic access, e.g. token passing
H04L 12/42 .. Loop networks
H04L 2012/421 ... Interconnected ring systems
H04L 12/422 ... { Synchronisation for ring networks (Time Division Multiplex ring networks, e.g. SDH/SONET H04J 3/08 A) }
H04L 12/423 ... with centralised control, e.g. polling
H04L 12/427 ... with decentralised control
H04L 12/43 .... with synchronous transmission, e.g. time division multiplex (TDM), slotted rings
H04L 12/433 .... with asynchronous transmission, e.g. token ring, register insertion
H04L 12/437 ... Ring fault isolation or reconfiguration { (for SDH/SONET ring networks H04J 3/085) }
H04L 12/44 .. Star or tree networks
H04L 2012/445 ... with switching in a hub, e.g. ETHERNET switch
H04L 12/46 .. Interconnection of networks
H04L 12/4604 ... { LAN interconnection over a backbone network, e.g. Internet, Frame Relay }
H04L 12/4608 .... { LAN interconnection over ATM networks }
H04L 12/4612 .... { LAN interconnection over narrowband networks, e.g. N-ISDN, PSTN, X.25 }
H04L 12/4616 .... { LAN interconnection over a LAN backbone }
H04L 12/462 .... { LAN interconnection over a bridge based backbone }
H04L 12/4625 ..... { Single bridge functionality, e.g. connection of two networks over a single bridge }
H04L 2012/4629 .... using multilayer switching, e.g. layer 3 switching
H04L 12/4633 ... { Interconnection of networks using encapsulation techniques, e.g. tunneling }
H04L 12/4637 ... { Interconnected ring systems }
H04L 12/4641 ... { Virtual LANs, VLANs, e.g. virtual private networks [VPN } (virtual private networks for security H04L 29/06612 ; routing of packets H04L 12/5689 ; encapsulation techniques H04L 12/4633 ; LAN interconnection over a bridge based backbone H04L 12/462 ; packet switches H04L 12/5696)]

NOTE

(1) This group covers: - a group of hosts with a common set of requirements that communicate as if they were attached to the same broadcast domain, regardless of their physical location. (2) This group does not cover: - group multicasting, which is covered by H04L 12/18 - configuration of switches

supporting VLANs, which is covered by H04L 12/2424 - multiprotocol label switching [MPLS], which is covered by H04L 12/5689 - spanning tree protocol [STP], which is covered by H04L 12/462 - arrangements for network security, which is covered by H04L 29/06612 - encapsulation techniques, which is covered by H04L 12/4633 - access arrangements, which is covered by H04L 12/2856 (3) In this group the following terms or expressions are used with the meaning indicated: - B-Tag means Backbone VLAN Tag - C-Tag means Customer VLAN Tag - GARP means Generic Attribute Registration Protocol - GVRP means GARP VLAN Registration Protocol - I-SID means Service Instance Identifier - MVRP means Multiple VLAN Registration Protocol - PBB means Provider Backbone Bridges - S-Tag means Service VLAN Tag - VLAN means Virtual Local Area Network - VPN means Virtual Private Network - VTP means VLAN Trunking Protocol]

H04L 12/4645 .... { Details on frame tagging (routing of packets H04L 12/5689 ; support for virtual LAN H04L 12/56S8D) }

H04L 12/465 ..... { wherein a single frame includes a plurality of VLAN tags }

H04L 12/4654 ..... { wherein a VLAN tag represents a customer VLAN, e.g. C-Tag }

H04L 12/4658 ..... { wherein a VLAN tag represents a service provider backbone VLAN, e.g. B-Tag, S-Tag }

H04L 12/4662 ..... { wherein a VLAN tag represents a service instance, e.g. I-SID in PBB }

H04L 12/4666 ..... { Operational details on the addition or the stripping of a tag in a frame, e.g. at a provider edge node }

H04L 12/467 .... { Arrangements for supporting untagged frames, e.g. port-based VLANs }

H04L 12/4675 .... { Dynamic sharing of VLAN information amongst network nodes (configuration of the network or of network elements H04L 12/2424) }

H04L 12/4679 ..... { Arrangements for the registration or de-registration of VLAN attribute values, e.g. VLAN identifiers, port VLAN membership }

H04L 12/4683 ..... { characterized by the protocol used }

H04L 12/4687 ..... { MVRP [multiple VLAN registration protocol }]

H04L 12/4691 ..... { GVRP [GARP VLAN registration protocol }]

H04L 12/4695 ..... { VTP [VLAN trunking protocol }]

H04L 12/50 . Circuit switching systems, i.e. systems in which the path is physically permanent during the communication

H04L 12/52 .. using time division techniques (in digital transmission systems H04L 5/22)

H04L 12/525 ... { involving a stored program control }

H04L 12/54 . Store-and-forward switching systems (packet switching systems H04L 12/70)

H04L 12/56 .. { Packet switching systems }

H04L 12/5601 ... { Transfer mode dependent, e.g. ATM }

H04L 12/5602 .... { Bandwidth control in ATM Networks, e.g. leaky bucket }

H04L 2012/5603 .... Access techniques

H04L 2012/5604 ..... Medium of transmission, e.g. fibre, cable, radio

H04L 2012/5605 ..... Fibre

H04L 2012/5606 ..... Metallic

H04L 2012/5607 ..... Radio

H04L 2012/5608	. . . . .	Satellite
H04L 2012/5609	. . . . .	Topology
H04L 2012/561	. . . . .	Star, e.g. cross-connect, concentrator, subscriber group equipment, remote electronics
H04L 2012/5612	. . . . .	Ring
H04L 2012/5613	. . . . .	Bus (including DQDB)
H04L 2012/5614	. . . .	User Network Interface
H04L 2012/5615	. . . . .	Network termination, e.g. NT1, NT2, PBX
H04L 2012/5616	. . . . .	Terminal equipment, e.g. codecs, synch.
H04L 2012/5617	. . . . .	Virtual LANs ; Emulation of LANs
H04L 2012/5618	. . . . .	Bridges, gateways (GW) or interworking units (IWU)
H04L 2012/5619	. . . .	Network Node Interface, e.g. tandem connections, transit switching
H04L 2012/562	. . . . .	Routing
H04L 2012/5621	. . . . .	Virtual private network (VPN) ; Private-network - network-interface (P-NNI)
H04L 2012/5623	. . . . .	Network design, dimensioning, topology or optimisation
H04L 2012/5624	. . . . .	Path aspects, e.g. path bundling
H04L 2012/5625	. . . .	Operations, administration and maintenance (OAM)
H04L 2012/5626	. . . . .	Network management, e.g. Intelligent nets
H04L 2012/5627	. . . . .	Fault tolerance and recovery
H04L 2012/5628	. . . .	Testing
H04L 2012/5629	. . . .	Admission control
H04L 2012/563	. . . . .	Signalling, e.g. protocols, reference model
H04L 2012/5631	. . . . .	Resource management and allocation
H04L 2012/5632	. . . . .	Bandwidth allocation
H04L 2012/5634	. . . . .	In-call negotiation
H04L 2012/5635	. . . . .	Backpressure, e.g. for ABR
H04L 2012/5636	. . . . .	Monitoring or policing, e.g. compliance with allocated rate, corrective actions
H04L 2012/5637	. . . . .	Leaky Buckets
H04L 2012/5638	. . . .	Services, e.g. multimedia, GOS, QOS
H04L 2012/5639	. . . . .	Tariffs or charging
H04L 2012/564	. . . . .	Connection-oriented
H04L 2012/5641	. . . . .	Unicast/point-to-point
H04L 2012/5642	. . . . .	Multicast/broadcast/point-multipoint, e.g. VOD
H04L 2012/5643	. . . . .	Concast/multipoint-to-point
H04L 2012/5645	. . . . .	Connectionless
H04L 2012/5646	. . . . .	Cell characteristics, e.g. loss, delay, jitter, sequence integrity
H04L 2012/5647	. . . . .	Cell loss
H04L 2012/5648	. . . . .	Packet discarding, e.g. EPD, PTD
H04L 2012/5649	. . . . .	Cell delay or jitter
H04L 2012/565	. . . . .	Sequence integrity
H04L 2012/5651	. . . . .	Priority, marking, classes

H04L 2012/5652	. . . . .	Cell construction, e.g. including header, packetisation, depacketisation, assembly, reassembly
H04L 2012/5653	. . . . .	using the ATM adaptation layer (AAL)
H04L 2012/5654	. . . . .	using the AAL1
H04L 2012/5656	. . . . .	using the AAL2
H04L 2012/5657	. . . . .	using the AAL3/4
H04L 2012/5658	. . . . .	using the AAL5
H04L 2012/5659	. . . . .	usint the AALX
H04L 2012/566	. . . . .	using the ATM layer
H04L 2012/5661	. . . . .	Minicells
H04L 2012/5662	. . . . .	Macrocells or frames
H04L 2012/5663	. . . . .	Support of N-ISDN
H04L 2012/5664	. . . . .	Support of Video, e.g. MPEG
H04L 2012/5665	. . . . .	Interaction of ATM with other protocols
H04L 2012/5667	. . . . .	IP over ATM
H04L 2012/5668	. . . . .	Next hop resolution protocol (NHRP)
H04L 2012/5669	. . . . .	Multiprotocol over ATM (MPOA)
H04L 2012/567	. . . . .	Frame Relay over ATM
H04L 2012/5671	. . . . .	Support of voice
H04L 2012/5672	. . . .	Multiplexing, e.g. coding, scrambling
H04L 2012/5673	. . . . .	Coding or scrambling
H04L 2012/5674	. . . . .	Synchronisation, timing recovery or alignment
H04L 2012/5675	. . . . .	Timeslot assignment, e.g. TDMA
H04L 2012/5676	. . . . .	Code Division Multiple Access (CDMA)
H04L 2012/5678	. . . .	Traffic aspects, e.g. arbitration, load balancing, smoothing, buffer management
H04L 2012/5679	. . . . .	Arbitration or scheduling
H04L 2012/568	. . . . .	Load balancing, smoothing or shaping
H04L 2012/5681	. . . . .	Buffer or queue management
H04L 2012/5682	. . . . .	Threshold ; Watermark
H04L 2012/5683	. . . . .	for avoiding head of line blocking
H04L 2012/5684	. . . . .	Characteristics of traffic flows
H04L 2012/5685	. . . .	Addressing issues
H04L 2012/5686	. . . .	Use of neural networks
H04L 2012/5687	. . . .	Security aspects
H04L 12/5689	. . .	{ Routing of packets }
H04L 12/569	. . .	{ Flow control }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 47/10

H04L 12/5691	. . .	{ Access to open networks; Ingress point selection, e.g. ISP selection }

H04L 12/5692 . . . . { Selection among different networks }

H04L 12/5693 . . . { Queue scheduling in packet switching networks }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 47/50

H04L 12/5694 . . . { Queuing arrangements }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 49/90

H04L 12/5695 . . . { Admission control; Resource allocation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 47/70

H04L 12/5696 . . . { Packet switches, e.g. Layer 2 switches, Layer 3 switches, Multilayer switches }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to group H04L 49/00]

H04L 2012/5697 . . . Indexing scheme relating to flow control in packet switching networks

H04L 2012/5698 . . . Indexing scheme relating to packet switching systems

H04L 12/58 . . Message switching systems, { e.g. electronic mail systems }

WARNING

This subgroup and all its subgroups are no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 51/00

H04L 12/5805 . . . { with automatic reactions or user delegation, e.g. automatic replies or chatbot }

H04L 12/581 . . . { Real time or near real time messaging, e.g. instant messaging [IM }]

H04L 12/5815 . . . . { use or manipulation of presence information in messaging (presence management H04L 29/08684) }

H04L 12/582 . . . . { interacting with other applications or services }

H04L 12/5825 . . . { Message adaptation based on network or terminal capabilities }

H04L 12/583 . . . . { with adaptation as to content }

H04L 12/5835 . . . . { with adaptation as to format }

H04L 12/584 . . . { messages including annexed information, e.g. attachments }

H04L 12/5845 . . . { messages including multimedia information (protocols for multimedia communication H04L 29/06176 ; voice messaging in telephonic communication

using automatic or semi-automatic exchanges with non-audio components H04M 3/5307) }

H04L 12/585 . . . { with filtering and selective blocking capabilities }

H04L 12/5855 . . . { with selective forwarding }

H04L 12/586 . . . { including conversation history, e.g. threads }

H04L 12/5865 . . . { messaging using geographical location information (protocols for adapting network applications to user terminal location H04L 29/08657 ; services specially adapted for wireless communication networks making use of the location of users or terminals H04W 4/02) }

H04L 12/587 . . . { with notification on incoming messages }

H04L 12/5875 . . . { with reliability check, e.g. acknowledgments, fault reporting }

H04L 12/588 . . . { messaging within social networks }

H04L 12/5885 . . . { with provisions for tracking the progress of a message }

H04L 12/589 . . . { unified messaging, e.g. interactions between instant messaging [IM } , e-mail or other types of messages such as Converged IP Messaging [CPM]]

H04L 12/5895 . . . { in combination with wireless systems (messaging in wireless communication networks H04W 4/12) }

H04L 12/60 . . . Manual relay systems, e.g. push-button switching

H04L 12/62 . . . . with perforated tape storage

H04L 12/64 . Hybrid switching systems

H04L 12/6402 . . { Hybrid switching fabrics }

H04L 2012/6405 . . . Space

H04L 2012/6408 . . . Shared Medium, e.g. memory, bus, ring

H04L 2012/641 . . . Time switching

H04L 2012/6413 . . . Switch peripheries

H04L 2012/6416 . . . Switch multicast

H04L 12/6418 . . { Hybrid transport }

H04L 2012/6421 . . . Medium of transmission, e.g. fibre, cable, radio, satellite

H04L 2012/6424 . . . Access arrangements

H04L 2012/6427 . . . . Subscriber Access Module ; Concentrator ; Group equipment

H04L 2012/6429 . . . Terminal adapters

H04L 2012/6432 . . . Topology

H04L 2012/6435 . . . . Bus

H04L 2012/6437 . . . . Ring

H04L 2012/644 . . . . Star

H04L 2012/6443 . . . Network Node Interface, e.g. Routing, Path finding

H04L 2012/6445 . . . Admission control

H04L 2012/6448 . . . . Medium Access Control (MAC)

H04L 2012/6451 . . . . . Deterministic, e.g. Token, DQDB

H04L 2012/6454 . . . . . Random, e.g. Ethernet

H04L 2012/6456 . . . . Channel and bandwidth allocation

H04L 2012/6459 . . . . Multiplexing, e.g. TDMA, CDMA

H04L 2012/6462 . . . . Movable boundaries in packets or frames

H04L 2012/6464 . . . Priority
H04L 2012/6467 . . . Information loss recovery, e.g. error correction, prediction
H04L 2012/647 . . . Frame Relay, X.25
H04L 2012/6472 . . . Internet
H04L 2012/6475 . . . N-ISDN, Public Switched Telephone Network (PSTN)
H04L 2012/6478 . . . Digital subscriber line, e.g. DSL, ADSL, HDSL, XDSL, VDSL
H04L 2012/6481 . . . Speech, voice
H04L 2012/6483 . . . Video, e.g. MPEG
H04L 2012/6486 . . . Signalling Protocols
H04L 2012/6489 . . . Buffer Management, Threshold setting, Scheduling, Shaping
H04L 2012/6491 . . . Echo cancellation
H04L 2012/6494 . . . Silence suppression
H04L 2012/6497 . . . Feedback to the source

H04L 12/66 . Arrangements for connecting between networks having differing types of switching systems, e.g. gateways

H04L 13/00 Details of the apparatus or circuits covered by groups H04L 15/00 or H04L 17/00

H04L 13/02 . Details not particular to receiver or transmitter
H04L 13/04 . . Driving mechanisms ; Clutches (in general F16)
H04L 13/06 . . Tape or page guiding or feeding devices
H04L 13/08 . . Intermediate storage means
H04L 13/10 . . Distributors
H04L 13/12 . . . Non-mechanical distributors, e.g. relay distributors
H04L 13/14 . . . . Electronic distributors (in general H03K 17/00)

H04L 13/16 . of transmitters, e.g. code-bars, code-discs

H04L 13/18 . of receivers
H04L 13/182 . . { Printing mechanisms }
H04L 13/184 . . . { Photographic printing and recording }
H04L 13/186 . . { Page printing; tabulating }
H04L 13/188 . . { Projection of the printed matter }

H04L 15/00 Apparatus or local circuits for transmitting or receiving dot-and-dash codes, e.g. Morse code (teaching apparatus therefor G09B ; keyboard switches in general H01H 13/70 , H03K 17/94 ; telegraph tapping keys H01H 21/86 ; coding in connection with keyboards or like devices, in general H03M 11/00)

H04L 15/03 . Keys structurally combined with sound generators

H04L 15/04 . Apparatus or circuits at the transmitting end
H04L 15/06 . . with a restricted number of keys, e.g. separate key for each type of code element
H04L 15/08 . . . with a single key which transmits dots in one position and dashes in a second

position

H04L 15/10 . . . combined with perforating apparatus

H04L 15/12 . . with keyboard co-operating with code-bars

H04L 15/14 . . . combined with perforating apparatus

H04L 15/16 . . with keyboard co-operating with code discs

H04L 15/18 . . Automatic transmitters, e.g. controlled by perforated tape

H04L 15/20 . . . with optical sensing means

H04L 15/22 . . Apparatus or circuits for sending one or a restricted number of signals, e.g. distress signals

H04L 15/24 . Apparatus or circuits at the receiving end

H04L 15/26 . . Operating only on reception of predetermined code signals, e.g. distress signals, party-line call signals

H04L 15/28 . . Code reproducing apparatus

H04L 15/285 . . . { Telegraph sounders; Apparatus for acoustic reception }

H04L 15/30 . . . Writing recorders

H04L 15/32 . . . Perforating recorders

H04L 15/34 . . Apparatus for recording received coded signals after translation, e.g. as type-characters

H04L 17/00 **Apparatus or local circuits for transmitting or receiving codes wherein each character is represented by the same number of equal-length code elements, e.g. Baudot code** (keyboard switches in general H01H 13/70 , H03K 17/94 ; coding in connection with keyboards or like devices, in general H03M 11/00)

H04L 17/02 . Apparatus or circuits at the transmitting end

H04L 17/04 . . with keyboard co-operating with code-bars

H04L 17/06 . . . Contact operating means

H04L 17/08 . . . combined with perforating apparatus

H04L 17/10 . . with keyboard co-operating with code-discs

H04L 17/12 . . Automatic transmitters, e.g. controlled by perforated tape

H04L 17/14 . . . with optical sensing means

H04L 17/16 . Apparatus or circuits at the receiving end

H04L 17/18 . . Code selection mechanisms

H04L 17/20 . . using perforating recorders

H04L 17/22 . . using mechanical translation and type-bar printing

H04L 17/24 . . using mechanical translation and type-head printing, e.g. type-wheel, type-cylinder

H04L 17/26 . . using aggregate motion translation

H04L 17/28 . . using pneumatic or hydraulic translation

H04L 17/30 . . using electric or electronic translation

H04L 19/00 **Apparatus or local circuits for step-by-step systems**

H04L 21/00 **Apparatus or local circuits for mosaic printer telegraph systems**

H04L 21/02 . at the transmitting end

H04L 21/04 . at the receiving end

H04L 23/00 Apparatus or local circuits for systems other than those covered by groups H04L 15/00 to H04L 21/00

H04L 23/02 . adapted for orthogonal signalling

H04L 25/00 Baseband systems

H04L 25/02 . Details (circuits in general for handling pulses H03K ; in line transmission systems in general H04B 3/02) ; { Arrangements for supplying electrical power along data transmission lines (systems for transmitting signals via power distribution lines H04B 3/54) }

H04L 25/0202 . . { Channel estimation }

H04L 25/0204 . . . { of multiple channels }

H04L 25/0206 . . . . { of each channel individually }

H04L 25/0208 . . . . { of the composite channel }

H04L 25/021 . . . { Estimation of channel covariance }

H04L 25/0212 . . . { of impulse response }

H04L 25/0214 . . . . { of a single coefficient }

H04L 25/0216 . . . . { with estimation of channel length }

H04L 25/0218 . . . . { with detection of nulls }

H04L 25/022 . . . { of frequency response }

H04L 25/0222 . . . { Estimation of channel variability, e.g. coherence bandwidth, coherence time, fading frequency }

H04L 25/0224 . . . { using sounding signals }

H04L 25/0226 . . . . { sounding signals per se }

H04L 25/0228 . . . . { with direct estimation from sounding signals }

H04L 25/023 . . . . . { with extension to other symbols }

H04L 25/0232 . . . . . { by interpolation between sounding signals }

H04L 25/0234 . . . . . { by non-linear interpolation }

H04L 25/0236 . . . . . { using estimation of the other symbols }

H04L 25/0238 . . . { using blind estimation }

H04L 25/024 . . . { channel estimation algorithms }

H04L 25/0242 . . . . { using matrix methods }

H04L 25/0244 . . . . . { with inversion }

H04L 25/0246 . . . . . { with factorisation }

H04L 25/0248 . . . . . { Eigen-space methods }

H04L 25/025 . . . . { using least-mean-square (LMS) method }

H04L 25/0252 . . . . { using third or higher order statistics }

H04L 25/0254 . . . . { using neural network algorithms }

H04L 25/0256 . . . . { Channel estimation using minimum mean square error criteria }

H04L 25/0258 .... { Channel estimation using zero-forcing criteria }

H04L 25/026 .. { Arrangements for coupling transmitters, receivers or transceivers to transmission lines; Line drivers (duplexing arrangements H04L 5/14) }

H04L 25/0262 .. { Arrangements for detecting the data rate of an incoming signal }

H04L 25/0264 .. { Arrangements for coupling to transmission lines (duplexing arrangements H04L 5/14) ; line equalisers, line build-out devices H04L 25/03878 }

H04L 25/0266 ... { Arrangements for providing Galvanic isolation, e.g. by means of magnetic or capacitive coupling }

H04L 25/0268 .... { with modulation and subsequent demodulation }

H04L 25/027 .... { specifically for telegraph signals (induction coil interrupters H01H 51/34 dynamo-electric generators H02K) }

H04L 25/0272 ... { Arrangements for coupling to multiple lines, e.g. for differential transmission }

H04L 25/0274 .... { Arrangements for ensuring balanced coupling }

H04L 25/0276 .... { Arrangements for coupling common mode signals }

H04L 25/0278 ... { Arrangements for impedance matching }

H04L 25/028 ... { Arrangements specific to the transmitter end }

H04L 25/0282 .... { Provision for current-mode coupling }

H04L 25/0284 .... { Arrangements to ensure DC-balance }

H04L 25/0286 .... { Provision of wave shaping within the driver (wave shaping per se H04L 25/03834) }

H04L 25/0288 ..... { the shape being matched to the transmission line (pre-equalisation per se H04L 25/03343) }

H04L 25/029 .... { Provision of high-impedance states }

H04L 25/0292 ... { Arrangements specific to the receiver end }

H04L 25/0294 .... { Provision for current-mode coupling }

H04L 25/0296 .... { Arrangements to ensure DC-balance }

H04L 25/0298 ... { Arrangement for terminating transmission lines }

H04L 25/03 .. Shaping networks in transmitter or receiver, e.g. adaptive shaping networks (impedance networks per se H03H) ; { Receiver end arrangements for processing baseband signals }

H04L 25/03006 ... { Arrangements for removing intersymbol interference }

H04L 25/03012 .... { operating in the time domain (H04L 25/03165 , H04L 25/03178 take precedence) }

H04L 25/03019 ..... { adaptive, i.e. capable of adjustment during data reception }

H04L 25/03025 ..... { using a two-tap delay line }

H04L 25/03031 ..... { using only passive components (H04L 25/03025 takes precedence) }

H04L 25/03038 ..... { with a non-recursive structure (H04L 25/03031 takes precedence) }

H04L 25/03044 ..... { using fractionally spaced delay lines or combinations of fractionally integrally spaced taps }

H04L 25/0305 ..... { using blind adaptation }

H04L 25/03057 ..... { with a recursive structure (H04L 25/03031 takes precedence) }

H04L 25/03063 ..... { using fractionally spaced delay lines or combinations of fractionally and integrally spaced taps }

H04L 25/0307 ..... { using blind adaptation }

H04L 25/03076 ..... { not using decision feedback }
H04L 25/03082 ..... { Theoretical aspects of adaptive time domain methods }
H04L 25/03089 ..... { Theory of blind algorithms, recursive or not }
H04L 25/03095 ..... { Theory of fractional equalisers, recursive or not }
H04L 25/03101 ..... { Theory of the Kalman algorithm }
H04L 25/03108 ..... { Theory of recursive equalisers, other than Kalman }
H04L 25/03114 ..... { non-adaptive, i.e. not adjustable, manually adjustable, or adjustable only during the reception of special signals }
H04L 25/03121 ..... { using a two-tap delay line }
H04L 25/03127 ..... { using only passive components (H04L 25/03121 takes precedence) }
H04L 25/03133 ..... { with a non-recursive structure (H04L 25/03127 takes precedence) }
H04L 25/0314 ..... { using fractionally spaced delay lines or combinations of fractionally integrally spaced taps }
H04L 25/03146 ..... { with a recursive structure (H04L 25/03127 takes precedence) }
H04L 25/03152 ..... { Theoretical aspects of non-adaptive time domain methods }
H04L 25/03159 .... { operating in the frequency domain (H04L 25/03165 , H04L 25/03178 take precedence) }
H04L 25/03165 .... { using neural networks }
H04L 25/03171 .... { Arrangements involving maximum a posteriori probability (MAP) detection }

NOTE

This group contains provisionally all documents which deal with turbo equalisation

H04L 25/03178 .... { Arrangements involving sequence estimation techniques }
H04L 25/03184 ..... { Details concerning the metric }
H04L 25/03191 ..... { in which the receiver makes a selection between different metrics }
H04L 25/03197 ..... { methods of calculation involving metrics }
H04L 25/03203 ..... { Trellis search techniques }
H04L 25/0321 ..... { Sorting arrangements therefor }
H04L 25/03216 ..... { using the M-algorithm }
H04L 25/03222 ..... { using the T-algorithm }
H04L 25/03229 ..... { with state-reduction using grouping of states }
H04L 25/03235 ..... { with state-reduction using feedback filtering }
H04L 25/03242 ..... { Methods involving sphere decoding }
H04L 25/03248 ..... { Arrangements for operating in conjunction with other apparatus }

NOTE

This group covers arrangements in which the sequence estimator is specially adapted to provide signals to, or receive signals from, the other apparatus. The group does not cover the mere juxtaposition of elements

H04L 25/03254 ..... { Operation with other circuitry for removing intersymbol interference }
H04L 25/03261 ..... { with impulse-response shortening filters }
H04L 25/03267 ..... { with decision feedback equalisers }
H04L 25/03273 ..... { with carrier recovery circuitry }
H04L 25/0328 ..... { with interference cancellation circuitry (adaptations for interference cancellation within a sequence estimator H04L 25/03305 ; interference related aspects of direct sequence spread spectrum H04B 1/707F ; interference related aspects of frequency hopping spread spectrum H04B 1/713F ; see also H04B 1/10) }
H04L 25/03286 ..... { with channel-decoding circuitry }
H04L 25/03292 ..... { with channel estimation circuitry }
H04L 25/03299 ..... { with noise-whitening circuitry }
H04L 25/03305 ..... { Joint sequence estimation and interference removal (joint detection of several desired signals H04L 25/03331) }
H04L 25/03312 ..... { Arrangements specific to the provision of output signals }
H04L 25/03318 ..... { Provision of soft decisions }
H04L 25/03324 ..... { Provision of tentative decisions }
H04L 25/03331 ..... { Arrangements for the joint estimation of multiple sequences }
H04L 25/03337 ..... { Arrangements involving per-survivor processing }
H04L 25/03343 .... { Arrangements at the transmitter end }
H04L 2025/0335 .... characterised by the type of transmission
H04L 2025/03356 ..... Baseband transmission
H04L 2025/03363 ..... Multilevel (H04L 2025/03369 takes precedence)
H04L 2025/03369 ..... Partial response
H04L 2025/03375 ..... Passband transmission
H04L 2025/03382 ..... Single of vestigal sideband
H04L 2025/03388 ..... ASK
H04L 2025/03394 ..... FSK
H04L 2025/03401 ..... PSK
H04L 2025/03407 ..... Continuous phase
H04L 2025/03414 ..... Multicarrier
H04L 2025/0342 ..... QAM
H04L 2025/03426 ..... transmission using multiple-input and multiple-output channels
H04L 2025/03433 .... characterised by equaliser structure
H04L 2025/03439 ..... Fixed structures
H04L 2025/03445 ..... Time domain
H04L 2025/03452 ..... Systolic arrays
H04L 2025/03458 ..... Lattice
H04L 2025/03464 ..... Neural networks
H04L 2025/03471 ..... Tapped delay lines (T04L25/0B13F1N takes precedence)
H04L 2025/03477 ..... not time-recursive
H04L 2025/03484 ..... time-recursive
H04L 2025/0349 ..... as a feedback filter

H04L 2025/03496 . . . . . as a prediction filter
H04L 2025/03503 . . . . . as a combination of feedback and prediction filters
H04L 2025/03509 . . . . . fractionally spaced (H04L 2025/03515 takes precedence)
H04L 2025/03515 . . . . . irregularly spaced
H04L 2025/03522 . . . . . Frequency domain
H04L 2025/03528 . . . . . Other transform domain
H04L 2025/03535 . . . . . Variable structures
H04L 2025/03541 . . . . . Switching between domains, e.g. between time and frequency
H04L 2025/03547 . . . . . Switching between time domain structures
H04L 2025/03554 . . . . . between neural networks and tapped delay lines
H04L 2025/0356 . . . . . Switching the time direction of equalisation
H04L 2025/03566 . . . . . between different tapped delay line structures
H04L 2025/03573 . . . . . between recursive and non-recursive
H04L 2025/03579 . . . . . Modifying the tap spacing
H04L 2025/03585 . . . . . Modifying the length
H04L 2025/03592 . . . . Adaptation methods
H04L 2025/03598 . . . . . Algorithms
H04L 2025/03605 . . . . . Block algorithms
H04L 2025/03611 . . . . . Iterative algorithms
H04L 2025/03617 . . . . . Time recursive algorithms (T04L25: 03B1 5A3C takes precedence)
H04L 2025/03624 . . . . . Zero-forcing
H04L 2025/0363 . . . . . Feature restoration, e.g. constant modulus
H04L 2025/03636 . . . . . Algorithms using least mean square [LMS]
H04L 2025/03643 . . . . . Order recursive
H04L 2025/03649 . . . . . Algorithms using recursive least square [RLS]
H04L 2025/03656 . . . . . Initialisation
H04L 2025/03662 . . . . . to a fixed value
H04L 2025/03668 . . . . . to the value at the end of a previous adaptation period
H04L 2025/03675 . . . . . Blind algorithms using gradient methods
H04L 2025/03681 . . . . . Control of adaptation
H04L 2025/03687 . . . . . of step size
H04L 2025/03694 . . . . . Stop and go
H04L 2025/037 . . . . . Detection of convergence state
H04L 2025/03707 . . . . . Detection or avoidance of local extrema
H04L 2025/03713 . . . . . Subspace algorithms
H04L 2025/03719 . . . . . Super-exponential
H04L 2025/03726 . . . . . Switching between algorithms
H04L 2025/03732 . . . . . according to the convergence state
H04L 2025/03738 . . . . . Manual adaptation
H04L 2025/03745 . . . . . Timing of adaptation
H04L 2025/03751 . . . . . only once, at installation (T04L25: 03B1 5M takes precedence)

H04L 2025/03757 . . . . . only on the request of a user
H04L 2025/03764 . . . . . only during predefined intervals
H04L 2025/0377 . . . . . during the reception of training signals
H04L 2025/03777 . . . . characterised by the signalling
H04L 2025/03783 . . . . . Details of reference signals
H04L 2025/03789 . . . . . Codes therefore
H04L 2025/03796 . . . . . Location of reference signals
H04L 2025/03802 . . . . . Signalling on the reverse channel
H04L 2025/03808 . . . . . Transmission of equaliser coefficients
H04L 2025/03815 . . . . . Transmission of a training request
H04L 25/03821 . . . . { Inter-carrier interference cancellation [ICI] }
H04L 25/03828 . . . { Arrangements for spectral shaping; Arrangements for providing signals with specified spectral properties (partial response systems H04L 25/497) }
H04L 25/03834 . . . . { using pulse shaping }
H04L 25/0384 . . . . . { Design of pulse shapes (pulse shape for impulse radio H04B 1/7172) }
H04L 25/03847 . . . . . { Shaping by selective switching of amplifying elements }
H04L 25/03853 . . . . . { Shaping by digital methods other than look up tables or up/down converters }
H04L 25/03859 . . . . . { shaping using look up tables for partial waveforms }
H04L 25/03866 . . . . { using scrambling }
H04L 25/03872 . . . . . { Parallel scrambling or descrambling }
H04L 25/03878 . . . { Line equalisers; line build-out devices }
H04L 25/03885 . . . . { adaptive }
H04L 25/03891 . . . { Spatial equalizers (MIMO diversity systems H04B 7/0413) }
H04L 25/03898 . . . . { codebook-based design (selection of codebook or precoding matrix for MIMO diversity systems H04B 7/0456) }
H04L 25/03904 . . . . . { cooperative design, e.g. exchanging of codebook information between base stations }
H04L 25/0391 . . . . . { construction details of matrices }
H04L 25/03917 . . . . . { according to the size of the codebook }
H04L 25/03923 . . . . . { according to the rank }
H04L 25/03929 . . . . . { with layer mapping, e.g. codeword-to layer design (for space-time coding H04L 1/0618) }
H04L 25/03936 . . . . . { multi-resolution codebooks }
H04L 25/03942 . . . . . { switching between different codebooks }
H04L 25/03949 . . . . { equalizer selection or adaptation based on feedback (multiple signaling inclusive of a precoding command for adapting the transmitter H04L 1/0031 ; feedback for transmit diversity systems H04B 7/0619 ; selection of codebook or precoding matrix for MIMO diversity systems H04B 7/0456) }
H04L 25/03955 . . . . . { in combination with downlink estimations, e.g. downlink path losses }
H04L 25/03961 . . . . { design criteria }
H04L 25/03968 . . . . . { mean-square error [MSE] }
H04L 25/03974 . . . . . { throughput maximization }
H04L 25/0398 . . . { Restoration of channel reciprocity }

H04L 25/03987 . . . { Equalisation for sparse channels }

H04L 25/03993 . . . { Noise whitening }

H04L 25/05 . . Electric or magnetic storage of signals before transmitting or retransmitting for changing the transmission rate

H04L 25/06 . . Dc level restoring means ; Bias distortion correction { decision circuits providing symbol by symbol detection (detection of unique words or other known elements H04L 7/00 , H04J 3/0602) }

H04L 25/061 . . . { providing hard decisions only; arrangements for tracking or suppressing unwanted low frequency components, e.g. removal of dc offset (removal of dc offset in coupling arrangements H04L 25/029 , H04L 25/02K9G) }

H04L 25/062 . . . . { Setting decision thresholds using feedforward techniques only }

H04L 25/063 . . . . { Setting decision thresholds using feedback techniques only }

H04L 25/064 . . . . . { Subtraction of the threshold from the signal, which is then compared to a supplementary fixed threshold }

H04L 25/065 . . . . { Binary decisions }

H04L 25/066 . . . . { Multilevel decisions, not including self-organising maps }

H04L 25/067 . . . { providing soft decisions, i.e. decisions together with an estimate of reliability (H04L 25/068 and H04L 25/069 take precedence; sequence estimation techniques H04L 25/03178) }

H04L 25/068 . . . { by sampling faster than the nominal bit rate }

H04L 25/069 . . . { by detecting edges or zero crossings }

H04L 25/08 . . Modifications for reducing interference ; Modifications for reducing effects due to line faults; { Receiver end arrangements for detecting or overcoming line faults }

H04L 25/085 . . . { Arrangements for reducing interference in line transmission systems, e.g. by differential transmission }

H04L 25/10 . . Compensating for variations in line balance { balancing during the coupling of signals H04L 25/0282 }

H04L 25/12 . . Compensating for variations in line impedance { impedance matching in coupling arrangements H04L 25/0278 }

H04L 25/14 . . Channel dividing arrangements { in which a single bit stream is divided between several baseband channels and reassembled at the receiver }

H04L 25/20 . . Repeater circuits ; Relay circuits

H04L 25/202 . . . { using mechanical devices (H04L 25/205 takes precedence) }

H04L 25/205 . . . { using tuning forks or vibrating reeds }

H04L 25/207 . . . { using electromagnetic switches }

H04L 25/22 . . . Repeaters for converting two wires to four wires (in general H04B) ; Repeaters for converting single current to double current

H04L 25/24 . . . Relay circuits using discharge tubes or semiconductor devices { (H04L 25/22 takes precedence) }

H04L 25/242 . . . . { with retiming }

H04L 25/245 . . . . . { for start-stop signals (detection of start or stop bits H04J 3/0602) }

H04L 25/247 . . . . . { for synchronous signals }

H04L 25/26 . . . Circuits with optical sensing means, { i.e. using opto-couplers for isolation }

H04L 25/38 . Synchronous or start-stop systems, e.g. for Baudot code

H04L 25/40 . . Transmitting circuits ; Receiving circuits (repeater circuits, relay circuits { H04L 25/20 })

H04L 25/42 . . . using mechanical distributors

H04L 25/44 . . . using relay distributors

H04L 25/45 . . . using electronic distributors (electronic distributors in general H03K 17/00)

H04L 25/46 . . . using tuning forks or vibrating reeds

H04L 25/49 . . . using code conversion at the transmitter ; using predistortion ; using insertion of idle bits for obtaining a desired frequency spectrum ; using three or more amplitude levels; { Baseband coding techniques specific to data transmission systems (spectral shaping H04L 25/03828) }

H04L 25/4902 . . . . { Pulse width modulation; Pulse position modulation }

H04L 25/4904 . . . . { using self-synchronising codes, e.g. split-phase codes }

H04L 25/4906 . . . . { using binary codes }

H04L 25/4908 . . . . . { using mBnB codes }

H04L 25/491 . . . . . { using 1B2B codes }

H04L 25/4912 . . . . . { using CMI or 2-HDB-3 code }

H04L 25/4915 . . . . . { using pattern inversion or substitution (H04L 25/4908 takes precedence) }

H04L 25/4917 . . . . { using multilevel codes }

H04L 25/4919 . . . . . { using balanced multilevel codes (H04L 25/4927 takes precedence) }

H04L 25/4921 . . . . . { using quadrature encoding, e.g. carrierless amplitude-phase coding }

H04L 25/4923 . . . . . { using ternary codes (H04L 25/4927 takes precedence) }

H04L 25/4925 . . . . . { using balanced bipolar ternary codes }

H04L 25/4927 . . . . . { using levels matched to the quantisation levels of the channel }

H04L 25/493 . . . . by transition coding, i.e. the time-position or direction of a transition being encoded before transmission

H04L 25/497 . . . . by correlative coding, e.g. partial response coding or echo modulation coding { transmitters and receivers for partial response systems (transversal equalizers H04L 25/03 ; partial response continuous phase modulation systems H04L 27/18) }

H04L 25/4975 . . . . . { Correlative coding using Tomlinson precoding, Harashima precoding , Trellis precoding or GPRS }

H04L 27/00 **Modulated-carrier systems** { (code shift keying in combination with frequency multiplexing H04L 5/06 ; simultaneous bidirectional transmission of ac signals H04L 5/143 ; code shift keying H04L 23/02 ; polarisation shift keying H04B 14/008 ; transmission of data during the active part of a television frame H04N 7/025) }

H04L 27/0002 . { analog front ends; means for connecting modulators, demodulators or transceivers to a transmission line (duplex arrangements H04L 5/143) }

H04L 27/0004 . { using wavelets }

H04L 27/0006 . { Assessment of spectral gaps suitable for allocating digitally modulated signals, e.g. for carrier allocation in cognitive radio (for spectrum sharing between different networks H04W 16/14) }

H04L 27/0008 . { arrangements for allowing a transmitter or receiver to use more than one type of modulation (negotiating modulation type for two-way transmission paths H04L 5/1453) }

H04L 27/001 . { using chaotic signals (for secret or secure communication H04L 9/001) }

H04L 27/0012 . { arrangements for identifying the type of modulation }

H04L 27/0014 . { Carrier regulation (of chaotic carriers H04L 27/001 ; for multicarrier receivers H04L 27/2657) }

H04L 2027/0016 . . Stabilisation of local oscillators

H04L 2027/0018 . . Arrangements at the transmitter end

H04L 2027/002 . . . using feedback from a remote receiver

H04L 2027/0022 . . . using the carrier of the associated receiver of a transceiver

H04L 2027/0024 . . at the receiver end

H04L 2027/0026 . . . Correction of carrier offset

H04L 2027/0028 . . . . at passband only

H04L 2027/003 . . . . at baseband only

H04L 2027/0032 . . . . at baseband and passband

H04L 2027/0034 . . . . using hypothesis testing

H04L 2027/0036 . . . . using a recovered symbol clock

H04L 2027/0038 . . . . using an equaliser

H04L 2027/004 . . . . . the equaliser providing control signals

H04L 2027/0042 . . . . . the equaliser providing the offset correction per se

H04L 2027/0044 . . Control loops for carrier regulation

H04L 2027/0046 . . . Open loops

H04L 2027/0048 . . . . Frequency multiplication

H04L 2027/0051 . . . . Harmonic tracking

H04L 2027/0053 . . . Closed loops

H04L 2027/0055 . . . . single phase

H04L 2027/0057 . . . . quadrature phase

H04L 2027/0059 . . . . more than two phases

H04L 2027/0061 . . . . remodulation

H04L 2027/0063 . . . Elements of loops

H04L 2027/0065 . . . . Frequency error detectors (T04L27: 00R7 E3 takes precedence)

H04L 2027/0067 . . . . Phase error detectors

H04L 2027/0069 . . . . Loop filters

H04L 2027/0071 . . . Control of loops

H04L 2027/0073 . . . . Detection of synchronisation state

H04L 2027/0075 . . . . Error weighting

H04L 2027/0077 . . . . . stop and go

H04L 2027/0079 . . . . Switching between loops

H04L 2027/0081 . . . . . between loops of different bandwidths

H04L 2027/0083 . . Signalling arrangements

H04L 2027/0085 . . . with no special signals for synchronisation

H04L 2027/0087 . . . Out-of-band signals, (e.g. pilots)

H04L 2027/0089 . . . In-band signals
H04L 2027/0091 . . . . Continuous signals
H04L 2027/0093 . . . . Intermittant signals
H04L 2027/0095 . . . . . in a preamble or similar structure
H04L 2027/0097 . . . Adaptive synchronisation signals

H04L 27/01 . Equalisers { (baseband equalisers H04L 25/03 ; control of amplification H03G ; in analogue transmission systems H04B 3/04 , H04B 7/005) }

H04L 27/02 . Amplitude-modulated carrier systems, e.g. using on-off keying ; Single sideband or vestigial sideband modulation (H04L 27/32 takes precedence)
H04L 27/04 . . Modulator circuits (in general H03C { H03K 7/02 }) ; Transmitter circuits
H04L 27/06 . . Demodulator circuits (in general H03D { H03K 9/02 }) ; Receiver circuits
H04L 27/063 . . . { Superheterodyne receivers }
H04L 27/066 . . . { Carrier recovery circuits (H04L 27/2271 takes precedence) }
H04L 27/08 . . Amplitude regulation arrangements

H04L 27/10 . Frequency-modulated carrier systems, i.e. using frequency-shift keying (H04L 27/32 takes precedence; { continuous phase systems H04L 27/18 })
H04L 27/103 . . { Chirp modulation (for spread spectrum techniques H04B 1/69 ; for spread spectrum using chirp H04B 2001/6912) }
H04L 27/106 . . { M-ary FSK }
H04L 27/12 . . Modulator circuits (in general H03C { H03K 7/06 }) ; Transmitter circuits { (continuous phase modulation H04L 27/20) }
H04L 27/122 . . . { using digital generation of carrier signals (digital function generators G06F 1/02 , H04L 17/10 ; generating pulses having stepped portions using digital techniques H03K 4/026) }
H04L 27/125 . . . { using a controlled oscillator in an open loop }
H04L 27/127 . . . { using a controlled oscillator in a feedback loop }
H04L 27/14 . . Demodulator circuits (in general H03D { H03K 9/06 }) ; Receiver circuits { (for continuous phase modulation systems H04L 27/22) }
H04L 27/142 . . . { Compensating direct current components occurring during the demodulation and which are caused by mistuning }
H04L 27/144 . . . with demodulation using spectral properties of the received signal, e.g. by using frequency selective- or frequency sensitive elements
H04L 27/148 . . . . using filters, including PLL-type filters
H04L 27/152 . . . . using controlled oscillators, e.g. PLL arrangements
H04L 27/1525 . . . . . { using quadrature demodulation }
H04L 27/156 . . . with demodulation using temporal properties of the received signal, e.g. detecting pulse width
H04L 27/1563 . . . . { using transition or level detection }
H04L 27/1566 . . . . { using synchronous sampling }
H04L 27/16 . . Frequency regulation arrangements

H04L 27/18 . Phase-modulated carrier systems, i.e. using phase-shift keying (H04L 27/32 takes precedence) { includes continuous phase systems }
H04L 27/183 . . { Multiresolution systems }

H04L 27/186 .. { in which the information is carried by both the individual signal points and the subset to which the individual signal points belong, e.g. coset coding or related schemes }

H04L 27/20 .. Modulator circuits (in general H03C { H03K 7/04 }) ; Transmitter circuits

H04L 27/2003 ... { for continuous phase modulation (frequency shift keying H04L 27/10) }

H04L 27/2007 .... { in which the phase change within each symbol period is constrained (coset coding H04L 27/186) }

H04L 27/201 ..... { in which the allowed phase changes vary with time, e.g. multi-h modulation }

H04L 27/2014 ..... { in which the phase changes in a piecewise linear manner during each symbol period, e.g. minimum shift keying, fast frequency shift keying (H04L 27/201 takes precedence) }

H04L 27/2017 ..... { in which the phase changes are non-linear, e.g. generalized and Gaussian minimum shift keying, tamed frequency modulation (H04L 27/201 takes precedence) }

H04L 27/2021 .... { in which the phase change per symbol period is not constrained }

H04L 27/2025 ..... { in which the phase changes in a piecewise linear manner within each symbol period }

H04L 27/2028 ..... { in which the phase changes are non-linear }

H04L 27/2032 ... { for discrete phase modulation, e.g. in which the phase of the carrier is modulated in a nominally instantaneous manner }

H04L 27/2035 .... { using a single or unspecified number of carriers }

H04L 27/2039 ..... { using microwave technology }

H04L 27/2042 ..... { with more than two phase states }

H04L 27/2046 ..... { in which the data are represented by carrier phase }

H04L 27/205 ..... { in which the data are represented by the change in phase of the carrier }

H04L 27/2053 .... { using more than one carrier, e.g. carriers with different phases }

H04L 27/2057 ..... { with a separate carrier for each phase state }

H04L 27/206 ..... { using a pair of orthogonal carriers, e.g. quadrature carriers }

H04L 27/2064 ..... { using microwave technology }

H04L 27/2067 ..... { with more than two phase states (H04L 27/2064 takes precedence) }

H04L 27/2071 ..... { in which the data are represented by the carrier phase, e.g. systems with differential coding }

H04L 27/2075 ..... { in which the data are represented by the change in carrier phase }

H04L 27/2078 ..... { in which the phase change per symbol period is constrained (coset coding H04L 27/186) }

H04L 27/2082 ..... { for offset or staggered quadrature phase shift keying }

H04L 27/2085 ..... { with more than one phase shift per symbol period }

H04L 27/2089 ..... { with unbalanced quadrature channels }

H04L 27/2092 .... { with digital generation of the modulated carrier (does not include the modulation of a digitally generated carrier) }

H04L 27/2096 ... { Arrangements for directly or externally modulating an optical carrier (optical modulation H04B 10/503) }

H04L 27/22 .. Demodulator circuits (in general H03D { H03K 9/04 }) ; Receiver circuits

H04L 27/223 . . . { Demodulation in the optical domain (optical demodulation H04B 10/676) }
H04L 27/227 . . . using coherent demodulation
H04L 27/2271 . . . . { wherein the carrier recovery circuit uses only the demodulated signals }
H04L 27/2272 . . . . . { using phase locked loops (H04L 27/2273 takes precedence) }
H04L 27/2273 . . . . . { associated with quadrature demodulation, e.g. Costas loop }
H04L 27/2275 . . . . { wherein the carrier recovery circuit uses the received modulated signals }
H04L 27/2276 . . . . . { using frequency multiplication or harmonic tracking }
H04L 27/2277 . . . . . { using remodulation }
H04L 27/2278 . . . . . { using correlation techniques, e.g. for spread spectrum signals }
H04L 27/233 . . . using non-coherent demodulation
H04L 27/2331 . . . . { wherein the received signal is demodulated using one or more delayed versions of itself }
H04L 27/2332 . . . . { using a non-coherent carrier }
H04L 27/2334 . . . . { using filters }
H04L 27/2335 . . . . { using temporal properties of the received signal }
H04L 27/2337 . . . . . { using digital techniques to measure the time between zero-crossings }
H04L 27/2338 . . . . { using sampling (H04L 27/2331 to H04L 27/2335 take precedence) }
H04L 27/24 . . Half-wave signalling systems

H04L 27/26 . Systems using multi-frequency codes (H04L 27/32 takes precedence)
H04L 27/2601 . . { Multicarrier modulation systems }
H04L 27/2602 . . . { Signal structure }
H04L 27/2604 . . . . { Multiresolution systems (by means of multiresolution subcarriers H04L 27/183 , H04L 27/3488) }
H04L 27/2605 . . . . { Symbol extensions }
H04L 27/2607 . . . . . { Cyclic extensions }
H04L 27/2608 . . . . { Allocation of payload }
H04L 27/261 . . . . { Details of reference signals (H04L 27/262 takes precedence) }
H04L 27/2611 . . . . . { Distribution thereof }
H04L 27/2613 . . . . . { Structure of the reference signals per se }
H04L 27/2614 . . . { Peak power aspects }
H04L 27/2615 . . . . { Reduction thereof using coding }
H04L 27/2617 . . . . . { using block codes }
H04L 27/2618 . . . . { Reduction thereof using auxiliary subcarriers }
H04L 27/262 . . . . { Reduction thereof by selection of pilot symbols }
H04L 27/2621 . . . . { Reduction thereof using phase offsets between subcarriers }
H04L 27/2623 . . . . { Reduction thereof by clipping }
H04L 27/2624 . . . . . { by soft clipping }
H04L 27/2626 . . . { Arrangements specific to the transmitter }
H04L 27/2627 . . . . { Modulators }
H04L 27/2628 . . . . . { Inverse Fourier transform modulators, e.g. IFFT/IDFT (DFT or FFT computation methods or devices in general G06F 17/141) }
H04L 27/263 . . . . . { modification of IFFT/IDFT modulator for performance improvement }

H04L 27/2631 ..... { with polyphase implementation }
H04L 27/2633 ..... { using partial FFTs }
H04L 27/2634 ..... { IFFT/IDFT in combination with other circuits for modulation (DFT or FFT computation methods or devices in general G06F 17/141) }
H04L 27/2636 ..... { with FFT/DFT, e.g. standard SC-FDMA transmitter or DFT-SOFDM }
H04L 27/2637 ..... { with direct modulation of individual subcarriers }
H04L 27/2639 ..... { Discrete cosine transform modulators }
H04L 27/264 ..... { Filterbank multicarrier (FBMC) }
H04L 27/2642 ..... { Wavelet transform modulators (wavelets in general H04L 27/0004 ; wavelet-division H04L 5/0008) }
H04L 27/2643 ..... { using symbol repetition, e.g. time domain realization of distributed FDMA }
H04L 27/2644 ..... { with oversampling }
H04L 27/2646 .... { using feedback from receiver for adjusting OFDM transmission parameters, e.g. transmission timing or guard interval length }
H04L 27/2647 ... { Arrangements specific to the receiver (equalisation H04L 25/03006 , H04L 27/01) }
H04L 27/2649 .... { Demodulators }
H04L 27/265 ..... { Fourier transform demodulators }
H04L 27/2652 ..... { with polyphase implementation }
H04L 27/2653 ..... { with direct demodulation of individual subcarriers }
H04L 27/2655 .... { Synchronisation arrangements }
H04L 27/2656 ..... { Frame synchronisation }
H04L 27/2657 ..... { Carrier synchronisation }
H04L 27/2659 ..... { Coarse or integer frequency offset determination and synchronisation }
H04L 27/266 ..... { Fine or fractional frequency offset determination and synchronisation }
H04L 27/2662 ..... { Symbol synchronisation }
H04L 27/2663 ..... { Coarse synchronisation, e.g. by correlation }
H04L 27/2665 ..... { Fine synchronisation, e.g. by positioning the FFT window }
H04L 27/2666 ..... { Acquisition of further OFDM parameters, e.g. bandwidth, subcarrier spacing, or guard interval length }
H04L 27/2668 ..... { Details of algorithms }
H04L 27/2669 ..... { characterised by the domain of operation }
H04L 27/2671 ..... { Time domain }
H04L 27/2672 ..... { Frequency domain }
H04L 27/2673 ..... { characterised by synchronisation parameters }
H04L 27/2675 ..... { Pilot or known symbols (structure of pilot symbols H04L 27/2613 ; cell search in orthogonal multiplex systems H04J 11/0069 ; allocation of pilot signals H04L 5/0048) }
H04L 27/2676 ..... { Blind, i.e. without using known symbols }
H04L 27/2678 ..... { using cyclostationarities, e.g. cyclic prefix or postfix }
H04L 27/2679 ..... { Decision-aided }

H04L 27/2681 ..... { characterised by constraints }
H04L 27/2682 ..... { Precision }
H04L 27/2684 ..... { Complexity }
H04L 27/2685 ..... { Speed of convergence }
H04L 27/2686 ..... { Range of frequencies or delays tested }
H04L 27/2688 ..... { Resistance to perturbation, e.g. noise, interference or fading }
H04L 27/2689 ..... { Link with other circuits, i.e. special connections between synchronisation arrangements and other circuits for achieving synchronisation }
H04L 27/2691 ..... { involving interference determination or cancellation (interference mitigation or coordination in orthogonal multiplex systems in general H04J 11/0023) }
H04L 27/2692 ..... { with preamble design, i.e. with negotiation of the synchronisation sequence with transmitter or sequence linked to the algorithm used at the receiver }
H04L 27/2694 ..... { adaptive design }
H04L 27/2695 ..... { with channel estimation, e.g. determination of delay spread, derivative or peak tracking (channel estimation per se H04L 25/0202) }
H04L 27/2697 ... { in combination with other modulation techniques }
H04L 27/2698 .... { double density OFDM/OQAM system, e.g. OFDM/OQAM-IOTA system }
H04L 27/28 .. with simultaneous transmission of different frequencies each representing one code element
H04L 27/30 .. wherein each code element is represented by a combination of frequencies
H04L 27/32 . Carrier systems characterised by combinations of two or more of the types covered by groups H04L 27/02 , H04L 27/10 , H04L 27/18 or H04L 27/26
H04L 27/34 .. Amplitude- and phase-modulated carrier systems, e.g. quadrature-amplitude modulated carrier systems
H04L 27/3405 ... { Modifications of the signal space to increase the efficiency of transmission, e.g. reduction of the bit error rate, bandwidth, or average power }
H04L 27/3411 .... { reducing the peak to average power ratio or the mean power of the constellation; Arrangements for increasing the shape gain of a signal set }
H04L 27/3416 .... { in which the information is carried by both the individual signal points and the subset to which the individual points belong, e.g. using coset coding, lattice coding, or related schemes }
H04L 27/3422 ..... { in which the constellation is not the n - fold Cartesian product of a single underlying two-dimensional constellation }
H04L 27/3427 ..... { in which the constellation is the n - fold Cartesian product of a single underlying two-dimensional constellation }
H04L 27/3433 ..... { using an underlying square constellation }
H04L 27/3438 ..... { using an underlying generalised cross constellation }
H04L 27/3444 .... { by applying a certain rotation to regular constellations }
H04L 27/345 ... { Modifications of the signal space to allow the transmission of additional information }
H04L 27/3455 .... { in order to facilitate carrier recovery at the receiver end, e.g. by transmitting a pilot or by using additional signal points to allow the detection of rotations }
H04L 27/3461 .... { in order to transmit a subchannel }

H04L 27/3466 . . . . . { by providing an alternative to one signal point }

H04L 27/3472 . . . . . { by switching between alternative constellations }

H04L 27/3477 . . . . . { by using the outer points of the constellation or of the constituent two-dimensional constellations }

H04L 27/3483 . . . . . { using a modulation of the constellation points }

H04L 27/3488 . . . { Multiresolution systems }

H04L 27/3494 . . . { using non - square modulating pulses, e.g. using raised cosine pulses; Partial response QAM, i.e. with partial response pulse shaping (QAM over partial response channels H04L 25/497) }

H04L 27/36 . . . Modulator circuits ; Transmitter circuits

H04L 27/361 . . . . { Modulation using a single or unspecified number of carriers, e.g. with separate stages of phase and amplitude modulation }

H04L 27/362 . . . . { Modulation using more than one carrier, e.g. with quadrature carriers, separately amplitude modulated (H04L 27/366 takes precedence) }

H04L 27/363 . . . . . { using non - square modulating pulses, modulators specifically designed for this (transmission of non - square QAM H04L 27/3494) }

H04L 27/364 . . . . . { Arrangements for overcoming imperfections in the modulator, e.g. quadrature error or unbalanced I and Q levels }

H04L 27/365 . . . . { Modulation using digital generation of the modulated carrier (not including modulation of a digitally generated carrier) }

H04L 27/366 . . . . { Arrangements for compensating undesirable properties of the transmission path between the modulator and the demodulator }

H04L 27/367 . . . . . { using predistortion }

H04L 27/368 . . . . . { adaptive predistortion }

H04L 27/38 . . . Demodulator circuits ; Receiver circuits

H04L 27/3809 . . . . { Amplitude regulation arrangements }

H04L 27/3818 . . . . { using coherent demodulation, i.e. using one or more nominally phase synchronous carriers (H04L 27/227 and H04L 27/389 take precedence) }

H04L 27/3827 . . . . . { in which the carrier is recovered using only the demodulated baseband signals }

H04L 27/3836 . . . . . { in which the carrier is recovered using the received modulated signal or the received IF signal, e.g. by detecting a pilot or by frequency multiplication }

H04L 27/3845 . . . . { using non - coherent demodulation, i.e. not using a phase synchronous carrier }

H04L 27/3854 . . . . . { using a non - coherent carrier, including systems with baseband correction for phase or frequency offset }

H04L 27/3863 . . . . . { Compensation for quadrature error in the received signal }

H04L 27/3872 . . . . . { Compensation for phase rotation in the demodulated signal }

H04L 27/3881 . . . . . { using sampling and digital processing, not including digital systems which imitate heterodyne or homodyne demodulation }

H04L 27/389 . . . . { with separate demodulation for the phase and amplitude components }

H04L 29/00 **Arrangements, apparatus, circuits or systems, not covered by a single one of groups H04L 1/00 to H04L 27/00** (interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units G06F 13/00) { contains provisionally no documents }

H04L 29/02 . Communication control (in satellite networks H04B 7/185) ; Communication

processing (H04L 29/12 , H04L 29/14 take precedence) { contains provisionally no documents }

H04L 29/04 . . for plural communication lines { contains provisionally no documents }

H04L 29/06 . . characterised by a protocol

H04L 29/06006 . . . { Protocol performance }

H04L 29/06013 . . . { Protocol definition or specification (protocol conformance testing H04L 1/244 ; specification techniques G06F 9/44G4S) }

H04L 29/0602 . . . { Protocols characterised by their application (H04L 29/08081 takes precedence) }

H04L 29/06027 . . . . { Protocols for multimedia communication }

WARNING

This group is no longer used for the classification of new documents as from April 21, 2008. The backlog of this group is being continuously reclassified to subgroups of H04L 29/06176

H04L 29/06034 . . . . { Protocols for telewriting; Protocols for networked simulations, virtual reality or games }

H04L 29/0604 . . . . { Protocols for data compression (compression in general H03M 7/30) }

H04L 29/06047 . . . . { Protocols for client-server architecture }

H04L 2029/06054 . . . . . Access to distributed or replicated servers, e.g. using brokers

H04L 29/06061 . . . { Notations for structuring of protocol data, e.g. Abstract Syntax Notation One (ASN 1) }

H04L 29/06068 . . . { Protocols for interworking or protocol conversion }

H04L 29/06074 . . . { Streamlined, light-weight or high-speed protocols, e.g. express transfer protocol (XTP), byte stream }

H04L 29/06081 . . . { Protocol engines, e.g. VLSIs, transputer }

H04L 29/06088 . . . { Multichannel or multilink protocols }

H04L 29/06095 . . . { Special adaptations or provisions of the transmission control protocol/internet protocol [TCP/IP } or the user datagram protocol [UDP] (network layer protocol adaptations for supporting mobility, e.g. mobile IP H04W 80/04 ; flow control in data switching networks in general H04L 12/569 ; adapting video multiplex streams to a specific network H04N 21/2381])

H04L 29/06102 . . . . { Implementation details of TCP/IP or UDP/IP stack architecture; specification of modified or new header fields (protocols engines in general H04L 29/06081 ; OSI stack based layering aspects H04L 29/08009 ; protocol header analysis in general H04L 29/0653) }

H04L 29/06108 . . . . . { involving adaptations of sockets based mechanisms (secure socket layer H04L 29/06965) }

H04L 29/06115 . . . . { Adaptation of TCP data exchange control procedures (generic OSI layer 4 protocols, e.g. SCTP H04L 29/08045 ; TCP or UDP flow control procedures H04L 12/56D10 ; error control procedures in general H04L 1/18) }

H04L 29/06122 . . . . { Adaptation or special uses of UDP protocol }

H04L 29/06129 . . . . { involving combined use or selection criteria between TCP and UDP protocols (multi-protocol arrangements in general H04L 29/06163 ; multilink protocols in general H04L 29/06088) }

H04L 29/06136 . . . . { IP fragmentation or TCP segmentation aspects (evaluation of maximum transfer unit H04L 12/56D27 ; assembly or disassembly of packets in

wireless networks H04W 28/065) }

H04L 29/06142 . . . . { Transitional provisions between IPv4 and IPv6 (address translation between IPv4 and IPv6 H04L 29/12358 ; involvement of different protocol versions in wireless network layer protocols, e.g. MIPv4 and MIPv6, H04W 80/045) }

H04L 29/06149 . . . . { Special adaptations of TCP, UDP or IP to match specific link layer protocols, e.g. ATM, SONET or PPP (IP over ATM H04Q 11/0478 ; special adaptation of TCP protocol for wireless media H04W 80/06) }

H04L 29/06156 . . . . { Special adaptations of TCP, UDP or IP for interworking of IP based networks with other networks (protocols for interworking in general H04L 29/06068) }

H04L 29/06163 . . . { Multi-protocol handler, e.g. single device capable of handling multiple protocols }

H04L 29/0617 . . . { Protocols for remote procedure call }

H04L 29/06176 . . . { Arrangements for real-time multimedia communications (data switching systems for broadcast or conference H04L 12/18 ; message switching systems H04L 12/58 ; television systems H04N 7/00 ; interconnection arrangements between switching centres for working between exchanges having different types of switching equipment where the types of switching equipment comprise PSTN/ISDN equipment and equipment of networks other than PSTN/ISDN H04M 7/1205 ; systems providing special services to telephonic subscribers H04M 3/42 ; network applications in general H04L 29/08081) }

NOTE

[N: Notes (1) This group covers: • only communications which fulfil the following two conditions: 1. they are based on packet data; 2. there is real-time or pseudo-real-time temporal association between source and destination, or source and network, or destination and network; • provided that the above two conditions are met, this group covers arrangements relating to 1. the transmission of the multimedia data itself, 2. the user-to-user, user-to-network, inter-network or intra-network signalling supporting: a. the establishment of a session for the subsequent transmission of the multimedia data, or b. the maintenance of the session or c. the application services available to the user during the session (unless explicitly excluded in certain cases). (2) This group does not cover: • non-real-time multimedia file transfer, which is covered by H04L 29/08117 . • multimedia store or forward messaging as in e-mail, MMS or the like, which is covered by H04L 12/58 • analogue multimedia streaming, as in analogue television systems, which is covered by H04N 7/00 and H04N 5/00 • bit streaming, i.e. not packet-based, as in ISDN which is covered by H04Q 11/04 • instant messaging, which is covered by H04L 12/581 • any other multimodal data communications which do not meet the conditions of being packet-based and real-time or pseudo-real-time. (3) In this group the following terms or expressions are used with the meaning indicated: • H.323 means International Telecommunication Union Recommendation no. 323, series H, entitled "Packet-based multimedia communications systems" • IP means Internet Protocol • IMS means IP Multimedia Subsystem • ISDN means Integrated Services Digital Network • MGC means Media Gateway Control/Controller • MGCP means Media Gateway Control Protocol • MMS means Multimedia Messaging Service • PBX means Private Branch Exchange • PSTN means Public Switched Telephone Network • QoS means Quality of Service • RTP means Real Time Protocol • RTCP means Real Time Control Protocol • SIP means Session Intiation Protocol • SPAM means unsolicited electronic mail • SPIT means SPAM Prevention in IP Telephony] [N: WARNING [Group H04L 29/06176 or subgroups are not

complete pending reorganisation. See also H04L 29/06027]

H04L 29/06183 .... { Signalling, control or architecture (selecting or control in telephonic networks H04Q 3/00 ; data network management H04L 12/24 ; data network testing or monitoring H04L 12/26) }

H04L 29/0619 ..... { Signalling or session protocols }

H04L 29/06197 ..... { SIP (Session Initiation Protocol) }

H04L 29/06204 ..... { H.323 }

H04L 29/0621 ..... { Network architectures, gateways, control or user entities }

H04L 29/06217 ..... { IMS (IP multimedia subsystem) (wireless communication networks H04W) }

H04L 29/06224 ..... { Gateways (protocols for interworking or protocol conversion H04L 29/06068 ; interconnection between PSTN/ISDN networks and networks other than PSTN/ISDN H04M 7/1205 ; arrangements for connecting between networks having differing types of switching systems H04L 12/66) }

H04L 29/06231 ..... { Media gateways }

H04L 29/06238 ..... { at the edge }

H04L 29/06244 ..... { in the network }

H04L 29/06251 ..... { Signalling gateways }

H04L 29/06258 ..... { at the edge }

H04L 29/06265 ..... { in the network }

H04L 29/06272 ..... { MGC (media gateway control) , MGCP or Megaco (decomposed PSTN/ISDN-IP gateways H04M 7/1255) }

H04L 29/06278 ..... { Call controllers; Call servers }

H04L 29/06285 ..... { Proxies, e.g. SIP proxies }

H04L 29/06292 ..... { Arrangements providing PBX functionality, e.g. IP PBX (circuit switched PBXs H04M 3/42314 ; PBX networks H04M 7/009) }

H04L 29/06299 ..... { for multi-site }

H04L 29/06306 ..... { End-user terminal functionality (substation equipment for use by subscribers H04M 1/00 ; terminal profiles H04L 29/08927 ; terminal emulation H04L 29/08126 ; adaptation for terminals with limited resources or for terminal portability H04L 29/08108) }

H04L 29/06312 ..... { Application servers (systems providing special services to telephonic subscribers H04M 3/42) }

H04L 29/06319 ..... { Session control }

H04L 29/06326 ..... { Setup (connection or session management in network applications H04L 29/08576 ; arrangements for peer-to-peer networking in network applications H04L 29/08306 ; negotiation of communication capabilities H04L 29/06537) }

H04L 29/06333 ..... { Registration (arrangements for addressing or naming in data networks H04L 29/12009) }

H04L 29/0634 ..... { Screening (arrangements for screening incoming telephone calls H04M 3/436 ; arrangements for network security H04L 29/06551) }

H04L 29/06346 ..... { of unsolicited session attempts, e.g. SPIT (SPAM prevention in IP telephony) (message switching systems H04L 12/58) }

H04L 29/06353 ..... { In-session procedures }

H04L 29/0636 ..... { session scope modification }

H04L 29/06367 ..... { by adding or removing media }

H04L 29/06374 ..... { by adding or removing participants }

H04L 29/0638 ..... { Features, e.g. call-forwarding or call hold (systems providing special services to telephonic subscribers H04M 3/42) }

H04L 29/06387 .... { Services or applications (systems providing special services to telephonic subscribers H04M 3/42 ; contact center services H04M 3/51 ; information services comprising voice H04M 3/487) }

H04L 29/06394 ..... { Services involving a main real time session and one or more additional parallel sessions (multichannel or multilink protocols H04L 29/06088 ; services and arrangements where telephone services are combined with data services H04M 7/0024) }

H04L 29/06401 ..... { where at least one of the additional parallel sessions is real time or time sensitive, e.g. white board sharing, collaboration, spawning of a subconference (telewriting, virtual reality or network gaming H04L 29/06034) }

H04L 29/06408 ..... { where none of the additional parallel sessions is real time or time sensitive, e.g. downloading a file in a parallel FTP session, initiating an email, combinational services (file transfer H04L 29/08117 ; WEB based applications H04L 29/0809 ; message switching systems H04L 12/58 ; instant messaging H04L 12/581) }

H04L 29/06414 ..... { Arrangements for multiparty communication e.g. conference (television conferencing systems H04N 7/15 ; telephonic conference systems H04M 3/56 ; data switching systems for broadcast or conference H04L 12/18) }

H04L 29/06421 ..... { with central floor control }

H04L 29/06428 ..... { with distributed floor control }

H04L 29/06435 ..... { without floor control }

H04L 29/06442 ..... { "Push-to-X" services (Push-to-Talk services in wireless networks H04W 4/025) }

H04L 29/06448 ..... { Services related to one way streaming }

H04L 29/06455 ..... { Multicast or broadcast (data switching systems for broadcast or conference H04L 12/18 ; television systems in general H04N 5/00 , H04N 7/00 ; arrangements for broadcast or distribution combined with broadcast H04H 20/00 ; arrangements for broadcast applications with a direct linkage of broadcast information H04H 60/00 ; arrangements for push based network services H04L 29/08693) }

H04L 29/06462 ..... { Content on demand (television systems using two way working H04N 7/173) }

H04L 29/06469 ..... { Control of source by destination, e.g. user controlling streaming rate of server (television systems using two way working H04N 7/173) }

H04L 29/06476 .... { Media handling, encoding, streaming or conversion }

H04L 29/06482 ..... { Media manipulation, adaptation or conversion (transmission of television signals using pulse code modulation H04N 7/24 ; adaptation for terminals or networks with limited resources or for terminal portability H04L 29/08108 ; data reduction or adaptation H04L 29/08792 ; network application being adapted for the location of the user terminal H04L 29/08657) }

H04L 29/06489 ..... { at the source }

H04L 29/06496 ..... { at the destination }

H04L 29/06503 ..... { intermediate }

H04L 29/0651 ..... { Stream encoding details (transmission of television signals using pulse code modulation H04N 7/24 ; protocols for data compression H04L 29/0604 ; header parsing or analysis H04L 29/0653) }

H04L 29/06517 ..... { Streaming protocols, e.g. RTP, RTCP }

H04L 29/06523 .... { Quality of Service (QoS) aspects (arrangements for scheduling or organising the servicing of requests whereby quality of service or priority requirements are taken into account H04L 29/08954 ; adaptation for terminals and/or networks with limited resources or for terminal portability H04L 29/08108 ; data reduction and/or adaptation H04L 29/08792 ; network application is adapted for the location of the user terminal H04L 29/08657) }

H04L 29/0653 ... { Header parsing and analysis }

H04L 29/06537 ... { Negotiation of communication capabilities }

H04L 29/06544 ... { Special purpose or proprietary protocols or architectures (H04L 29/08558 takes precedence) }

H04L 29/06551 ... { Arrangements for network security (security arrangements for protecting computers or computer systems against unauthorised activity G06F 21/00 ; arrangements for secret or secure communication H04L 9/00 ; security arrangements specially adapted for wireless communication networks H04W 12/00) }

H04L 29/06557 .... { Separating internal and external traffic, e.g. firewalls }

H04L 29/06564 ..... { Architectural arrangements, e.g. perimeter networks, demilitarized zones }

H04L 29/06571 ..... { Distributed architectures }

H04L 29/06578 ..... { Filtering policies }

H04L 29/06585 ..... { Filtering by address, protocol, port number or service, e.g. IP-address, URL }

H04L 29/06591 ..... { Filtering by information in the payload }

H04L 29/06598 ..... { Stateful filtering }

H04L 29/06605 ..... { Rule management }

H04L 29/06612 ..... { Virtual private networks }

H04L 29/06619 ..... { Proxies }

H04L 29/06625 ..... { Firewall traversal, e.g. tunnelling, creating pinholes }

H04L 29/06632 .... { Protecting information from access by third parties }

H04L 29/06639 ..... { Protecting a party's identity, e.g. anonymous }

H04L 29/06646 ..... { during transmission, i.e. identity only known to the other party or parties involved in the communication }

H04L 29/06653 ..... { Anonymous communication, i.e. identity not known to any party at all }

H04L 29/06659 ..... { Protecting the content, e.g. encryption }

H04L 29/06666 ..... { using symmetric encryption, i.e. same key used for encryption and decryption }

H04L 29/06673 ..... { using asymmetric encryption, i.e. different keys for encryption and decryption }

H04L 29/0668 ..... { using hybrid encryption, i.e. combination of symmetric and asymmetric encryption }

H04L 29/06687 ..... { using dynamic encryption, e.g. stream encryption }

H04L 29/06693 ..... { Re-encryption }

H04L 29/067 ..... { Hardware and software architectures for enhanced packet encryption processing }
H04L 29/06707 .... { Key management }
H04L 29/06714 ..... { Key exchange, e.g. in peer-to-peer networks }
H04L 29/06721 ..... { Key distribution, e.g. centrally by trusted party }
H04L 29/06727 ..... { Hierarchical key distribution, e.g. by multi-tier trusted parties }
H04L 29/06734 ..... { for group communications }
H04L 29/06741 ..... { One-time keys }
H04L 29/06748 ..... { Time-dependent keys, e.g. periodically changing keys }
H04L 29/06755 .... { Authentication mechanisms }
H04L 29/06761 ..... { Tickets, e.g. Kerberos }
H04L 29/06768 ..... { Single-sign-on }
H04L 29/06775 ..... { Certificates }
H04L 29/06782 ..... { Passwords }
H04L 29/06789 ..... { One-time-passwords }
H04L 29/06795 ..... { Time-dependent-passwords, e.g. periodically changing passwords }
H04L 29/06802 ..... { using an additional device, e.g. smartcard, SIM }
H04L 29/06809 ..... { using biometrical features, e.g. fingerprint, retina-scan }
H04L 29/06816 ..... { Mutual authentication }
H04L 29/06823 .... { Access control }
H04L 29/06829 ..... { Access control lists (ACL) }
H04L 29/06836 ..... { User profiles }
H04L 29/06843 ..... { Grouping of users }
H04L 29/0685 ..... { Multiple levels of security }
H04L 29/06857 .... { Verifying the information received }
H04L 29/06863 ..... { Checking the content, e.g. message integrity }
H04L 29/0687 ..... { Checking the source, e.g. non-repudiation }
H04L 29/06877 .... { Detection of malicious traffic; protection against malicious traffic }
H04L 29/06884 ..... { Monitoring network traffic }
H04L 29/06891 ..... { Event detection }
H04L 29/06897 ..... { Traffic logging }
H04L 29/06904 ..... { Vulnerability analysis }
H04L 29/06911 ..... { Countermeasures against attacks }
H04L 29/06918 ..... { Viruses; Trojans; Worms }
H04L 29/06925 ..... { Denial of Service }
H04L 29/06931 ..... { Session hijacking, e.g. TCP sequence number attacks }
H04L 29/06938 ..... { Session spying, e.g. eavesdropping }
H04L 29/06945 .... { Security features implemented at a particular protocol layer }
H04L 29/06952 ..... { at the data link layer, e.g. SILS, EAP }
H04L 29/06959 ..... { at the network layer, e.g. IPSec AH, ESP }
H04L 29/06965 ..... { at the transport layer, e.g. SSL, TLS }
H04L 29/06972 ..... { above the transport layer, e.g. https, JAVA }

H04L 29/06979 .... { using a different network or path for securing the traffic }

H04L 29/06986 .... { Security management; Security policies in general (filtering policies H04L 29/06578) }

H04L 29/06993 ... { Timer mechanisms used in protocols }

H04L 29/08 ... Transmission control procedure, e.g. data link level control procedure

H04L 29/08009 .... { Open systems interconnection (OSI) architecture, e.g. layering, entities, standards; Interface between layers; Software aspects }

H04L 29/08018 ..... { Physical layer, i.e. layer one }

H04L 29/08027 ..... { Data link layer, i.e. layer two, e.g. HDLC }

H04L 29/08036 ..... { Network layer, i.e. layer three, e.g. X.25 }

H04L 29/08045 ..... { Transport layer, i.e. layer four }

H04L 29/08054 ..... { Session layer, i.e. layer five }

H04L 29/08063 ..... { Presentation layer, i.e. layer six }

H04L 29/08072 ..... { Application layer, i.e. layer seven (not used) } { WARNING: from 01.01.2006 onwards, documents relating to the application layer, and in particular to protocols for network applications are classified in H04L 29/08081 and subgroups. All documents previously classified in 29/08A7 are reclassified in these groups }

H04L 29/08081 .... { Protocols for network applications (message switching systems H04L 12/58 ; protocols for multimedia communication H04L 29/06027 ; protocols for telewriting H04L 29/06034) }

H04L 29/0809 ..... { involving the use of web-based technology, e.g. Hyper Text Transfer Protocol (HTTP), (information retrieval from the Internet G06F 17/30861) }

H04L 29/08099 ..... { for remote control or remote monitoring (Network management using Internet technology H04L 12/2408 ; Network monitoring H04L 12/2602) }

H04L 29/08108 ..... { adapted for terminals or networks with limited resources and for terminal portability, e.g. Wireless Application Protocol (WAP) (services or facilities specially adapted for wireless communciation networks H04W 4/00) }

H04L 29/08117 ..... { adapted for file transfer, e.g. File Transfer Protocol (FTP) }

H04L 29/08126 ..... { adapted for terminal emulation, e.g. telnet (protocols for telewriting or protocols for networked simulations, virtual reality or games H04L 29/06034) }

H04L 29/08135 ..... { in which application tasks are distributed across nodes in the network (multiprogramming arrangements G06F 9/46) }

H04L 29/08144 ..... { Network arrangements or communication protocol arrangements for accessing one among a plurality of replicated servers, e.g. load balancing (rebalancing the processing load in a distributed system G06F 9/5083 ; arrangements for peer-to-peer networking H04L 29/08306 ; wireless network traffic load balancing H04W 28/08 ; network load balancing, traffic engineering H04L 12/56D2B ; video servers using load balancing strategies H04N 21/23103) [M1111 }

NOTE

In this group and its subgroups, the term "servers" includes non-dedicated servers, such as peer nodes in a peer-to-peer architecture

H04L 29/08153 ..... { Server selection in load balancing (allocation of processing resources to service a request in a distributed system G06F 9/5027) }

H04L 29/08162 ..... { with static server selection, e.g. the same server being selected for a specific client (allocation of processing resources considering data affinity G06F 9/5033) }

H04L 29/08171 ..... { based on parameters of servers, e.g. available memory or workload (allocation of processing resources considering the load G06F 9/505) }

H04L 29/0818 ..... { based on network conditions }

H04L 29/08189 ..... { based on compliance of requirements or conditions with available server resources }

H04L 29/08198 ..... { based on the content of a request }

H04L 29/08207 ..... { based on round robin mechanisms }

H04L 29/08216 ..... { based on random server selection }

H04L 29/08225 ..... { based on locations of client and servers }

H04L 29/08234 ..... { based on other criteria, e.g., hash applied to IP address, specific algorithms or cost }

H04L 29/08243 ..... { Dynamic adaptation of server selection criteria for load balancing }

H04L 29/08252 ..... { Persistence of sessions during load balancing }

H04L 29/08261 ..... { Collection and organization of data related to the state of servers by a load balancer }

H04L 29/0827 ..... { Controlling of the operation of servers by a load balancer, e.g. adding or removing servers that serve requests }

H04L 29/08279 ..... { Reaction to server failures by a load balancer }

H04L 29/08288 ..... { Load balancing of requests to servers for services different from user content provisioning, e.g. load balancing to DNS servers or firewalls (internet service provider selection H04L 12/5691) }

H04L 29/08297 ..... { Load balancing arrangements to avoid a single path through a load balancer }

H04L 29/08306 ..... { Arrangements for peer-to-peer networking [P2P } ; functionalities, architectural details or applications of P2P networks (provisions for file transfer, upload, download H04L 29/08117 ; provisions for accessing replicated servers H04L 29/08144 ; security provisions H04L 29/06551 ; addressing provisions H04L 29/12009 ; scheduling provisions H04L 29/08945 ; presence management provisions H04L 29/08684 ; multimedia provisions H04L 29/06176 ; information retrieval provisions, file indexing, file systems G06F 17/30 ; wireless interfaces between terminal devices H04W 92/18 ; small scale hierarchical wireless network topologies H04W 84/10 ; peer-to-peer connection between video clients H04N 21/632 ; peer-to-peer connection between video game machines A63F 13/12)]

H04L 29/08315 ..... { involving topology management mechanisms }

H04L 29/08324 ..... { Group management mechanisms }

H04L 29/08333 ..... { Joining mechanisms }

H04L 29/08342 ..... { Departure and maintenance mechanisms (counter-measures to a fault H04L 29/14) }

H04L 29/08351 ..... { Group master selection mechanisms }

H04L 29/0836 ..... { with pre-configuration of logical or physical connections

with a determined number of other peers }

H04L 29/08369 ..... { involving connection limits (involving dynamic management of active down/uploading connections H04L 29/08495) }

H04L 29/08378 ..... { involving pre-assessment of levels of reputation of peers }

H04L 29/08387 ..... { Inter-group management mechanisms, e.g. splitting, merging or interconnection of groups }

H04L 29/08396 ..... { involving resource based peer discovery mechanisms (access to replicated servers H04L 29/08144 ; arrangements for service discovery H04L 29/08648 ; topology discovery for routing H04L 12/56C1) }

H04L 29/08405 ..... { Discovery through centralizing entities }

H04L 29/08414 ..... { Discovery involving distributed pre-established resource-based relationships among peers; e.g. based on DHTs (pre-configuration of logical or physical connections H04L 29/0836) }

H04L 29/08423 ..... { Discovery involving direct consultation/announcement among potential requesting and potential source peers }

H04L 29/08432 ..... { with limitation/expansion of the discovery scope }

H04L 29/08441 ..... { Discovery involving ranked list compilation of candidate peers }

H04L 29/0845 ..... { involving resource distribution mechanisms (routing over an overlay routing layer H04L 12/56C128) }

H04L 29/08459 ..... { Resource dissemination mechanisms and resource keeping policies for optimal resource availability in the overlay network }

H04L 29/08468 ..... { Resource delivery mechanisms }

H04L 29/08477 ..... { characterized by resources being split in blocks or fragments }

H04L 29/08486 ..... { involving incentive schemes }

H04L 29/08495 ..... { involving dynamic management of active down/uploading connections }

H04L 29/08504 ..... { involving cross functional aspects }

H04L 29/08513 ..... { Hierarchical topologies }

H04L 29/08522 ..... { Interfacing with client/server systems and between P2P systems }

H04L 29/08531 ..... { Some peer nodes performing special functions }

H04L 29/0854 ..... { Arrangements for replication or mirroring of data, e.g. data synchronisation between network nodes and/or user terminals }

H04L 29/08549 ..... { Arrangements and networking functions for distributed storage of data in a network, e.g. Storage Area Networks (SAN), Network Attached Storage (NAS) }

H04L 29/08558 ..... { adapted for proprietary or special purpose networking environments, e.g. medical networks, sensor networks, networks in a car (digital computing or data processing equipment or methods, specially adapted for specific applications G06F 19/00 ; home automation networks H04L 12/28 H; total factory control characterised by the network communication G05B 19/418 N; games involving transmission A63F 13/12) }

H04L 29/08567 ..... { involving the management of devices over a network (network

management H04L 12/24 ; device management using web-based technology H04L 29/08099) }

H04L 29/08576 . . . . . { Arrangements for session management (real-time session management for multimedia connections H04L 29/06176 ; negotiation of communication capabilities H04L 29/06537 ; packet switching or routing H04L 12/56 ; connection management in wireless networks, e.g. connection set-up, manipulation or release H04W 76/00 ; session management for telephonic communication and services H04M 7/00 ; intertask communications in multiprogramming arrangements G06F 9/54) }

NOTE

This group covers session signaling at higher OSI layers to support networked applications.

H04L 29/08585 . . . . . { provided for setup of an application session }

H04L 29/08594 . . . . . { provided for managing session state for stateless protocols, e.g. HTTP; Signalling a session state; State transitions; Keeping-state mechanisms }

H04L 29/08603 . . . . . { provided for session termination, e.g., event controlled end of session }

H04L 29/08612 . . . . . { provided for avoiding end of session (e.g. keep-alive, heartbeats, resumption message, wake-up for inactive or interrupted session) }

H04L 29/08621 . . . . . { markers provided for unambiguous identification of a particular session, e.g. session identifier, session cookie or URL-encoding (verifying the identity or authority of a user or a system, ID-based authentication H04L 9/32 ; ID-based key exchange H04L 9/08) }

H04L 29/0863 . . . . . { provided for signalling methods or particular messages providing extensions to IETF, ITU, ETSI or 3GPP protocols, e.g. additional proprietary messages, standard messages enhanced by additional header fields or standard messages being used for purposes other than originally intended }

H04L 29/08639 . . . . . { provided for migration or transfer of sessions }

H04L 29/08648 . . . . . { Arrangements for service discovery, e.g. Service Location Protocol (SLP) (address allocation to terminals or nodes connected to a network H04L 29/12 A) }

H04L 29/08657 . . . . . { in which the network application is adapted for the location of the user terminal (services specially adpated for wireless communication networks making use of the location of users or terminals H04W 4/02) }

H04L 29/08666 . . . . . { involving third party service providers (e-commerce G06Q 30/00) }

H04L 29/08675 . . . . . { Arrangements for tracking the activity of the application user (monitoring arrangements in general H04L 12/26 M; e-ommerce G06Q 30/00) }

H04L 29/08684 . . . . . { Arrangements for presence management (instant messaging H04L 12/58 B) }

H04L 29/08693 . . . . . { Arrangements for push based network services (broadcast and multicast push services H04L 12/1859) }

H04L 29/08702 . . . . . { involving intermediate processing or storage in the network, e.g. proxy (billing provisions H04L 12/14 ; network management provisions H04L 12/24 ; monitoring provisions H04L 12/2602 ; multimedia network architectures; gateways and control entities H04L 29/0621 ; multimedia handling; encoding and conversion H04L 29/06476 ; security provisions H04L 29/06551 ; addressing provisions H04L 29/12009) }

WARNING

The subgroups H04L 29/08711 , H04L 29/08738 to H04L 29/08783 , and H04L 29/08801 to H04L 29/08855 are not complete pending reorganisation. See also H04L 29/0872 , H04L 29/08729 and H04L 29/08792)

H04L 29/08711 . . . . . { Arrangements for adding application control or application functional data, e.g. adding metadata }

H04L 29/0872 . . . . . m { Arrangements for brokering (protocols for client-server architecture H04L 29/06047 ; negotiation of communication capabilities H04L 29/06537 ; e-commerce G06Q 30/00) }

WARNING

This group is no longer used for the classification of new documents as from December 1, 2009. The backlog of this group is being continuously reclassified to the subgroups H04L 29/08711 to H04L 29/08909

H04L 29/08729 . . . . . { Arrangements for intermediate storage, e.g. caching (browsing optimisation of access to content G06F 17/30902) }

WARNING

This group is no longer used for the classification of new documents as from December 1, 2009. The backlog of this group is being continuously reclassified to the subgroups H04L 29/08711 to H04L 29/08909

H04L 29/08738 . . . . . { Arrangements for data redirection (load balancing H04L 29/08144 ; access network selection H04L 12/28P1A ; routing path selection H04L 12/5689 ; context based routing H04L 29/08972 ; addressing aspects H04L 29/12009) }

H04L 29/08747 . . . . . { Arrangements for evaluation of intercepted application data aiming at enhancement of application control }

H04L 29/08756 . . . . . { Arrangements for conversion or adaptation of application content or format (H04L 29/08783 takes precedence; protocol conversion H04L 29/06068) }

H04L 29/08765 . . . . . { Arrangements for grouping or aggregating service requests, e.g. for unified processing of service requests }

H04L 29/08774 . . . . . { Arrangements for integrating service provisioning from a plurality of service providers }

H04L 29/08783 . . . . . { Arrangements for reducing the amount or size of exchanged application data (protocols for header compression H04L 29/0604 ; optimizing visualization of content G06F 17/30905 ; digital video compression H04N 7/26) }

H04L 29/08792 . . . . . { Arrangements for data reduction and/or adaptation (protocols for data compression H04L 29/0604 ; optimising the visualization of

content G06F 17/30905 ; digital video signal compression H04N 7/26) }

WARNING

This group is no longer used for the classification of new documents as from December 1, 2009. The backlog of this group is being continuously reclassified to the subgroups H04L 29/08711 to H04L 29/08909

H04L 29/08801	. . . . .	{ Arrangements for storing temporarily data at an intermediate stage, e.g. caching (browsing optimization of access to content by caching G06F 17/30902) }
H04L 29/0881	. . . . .	{ involving pre-fetching or pre-delivering data }
H04L 29/08819	. . . . .	{ involving policies or rules for updating, deleting or replacing the stored data }
H04L 29/08828	. . . . .	{ involving storage of data provided by user terminals, i.e. reverse caching }
H04L 29/08837	. . . . .	{ Arrangements for providing operational support to end devices when they are unavailable, e.g. being off-line; off-loading of end devices (counter-measures to a fault H04L 29/14) }
H04L 29/08846	. . . . .	{ Arrangements to globally emulate or virtualize the functionalities of an end device (H04L 29/08837 takes precedence) }
H04L 29/08855	. . . . .	{ Architectural aspects }
H04L 29/08864	. . . . .	{ Implementation details of a single intermediate entity }
H04L 29/08873	. . . . .	{ Pairs of interprocessing entities at each side of the network, e.g. split proxies }
H04L 29/08882	. . . . .	{ Distributed intermediate devices, i.e. intermediate device interaction with other intermediate devices on the same level }
H04L 29/08891	. . . . .	{ Hierarchically arranged intermediate devices, e.g. hierarchical caching }
H04L 29/089	. . . . .	{ where the intermediate processing is functionally located closer to the data consumer application, e.g. in same machine, in same home or in same subnetwork }
H04L 29/08909	. . . . .	{ where the intermediate processing is functionally located closer to the data provider application, e.g. reverse proxies; in same machine, in same cluster or subnetwork }
H04L 29/08918	. . . . .	{ involving profiles }
H04L 29/08927	. . . . .	{ Terminal profiles }
H04L 29/08936	. . . . .	{ User profiles }
H04L 29/08945	. . . . .	{ Arrangements for scheduling and organising the servicing of requests, e.g. requests for data transmissions involving the analysis and optimisation of the requires network resources (broadcast or conference with schedule organisation H04L 12/18 S) }
H04L 29/08954	. . . . .	{ whereby quality of service and priority requirements are taken into account }
H04L 29/08963	. . . . .	{ whereby a time schedule is established for servicing the requests }
H04L 29/08972	. . . . .	{ whereby the routing of a service request to a node providing the service depends on the content and context of the request, e.g. profile, connectivity status }
H04L 29/08981	. . . . .	{ involving the movement of software and/or configuration parameters,

e.g. applets, (programme loading or initiating G06F 9/445) }

H04L 29/0899 . . . . . { involving the display to the application user of network conditions affecting the network application (graphical user interfaces for network management H04L 12/2458 ; terminal emulation H04L 29/08126) }

H04L 29/10 . . characterised by an interface, e.g. the interface between the data link level and the physical level { contains provisionally no documents }

H04L 29/12 . characterised by the data terminal { contains provisionally no documents }

H04L 29/12009 . . { Arrangements for addressing and naming in data networks }

NOTE

(1) H04L 61/00 covers aspects of data networks, excluding pure telephone solutions (H04M 7/00) or addressing within a device, e.g. process, memory etc. (G06F 13/42 or G06F 12/00) . (2) Aspects relating to switching and routing are classified in H04L 12/56 . (3) Main aspects covered by this groups are: address resolution; directories and name-to-address resolution; allocation of addresses; conversion of addresses; logical names and non-standard use of addresses

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/00

H04L 29/12018 . . . { Mapping of addresses of different types; address resolution }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/10

H04L 29/12028 . . . . { across network layers, e.g. resolution of network layer into physical layer addresses, Address Resolution Protocol (ARP) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/103

H04L 29/12037 . . . . { across networks, e.g. mapping telephone numbers to data network addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/106

H04L 29/12047 . . . { Directories; name-to-address mapping (telephone directories in user terminals H04M 1/27) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The

backlog of this subgroup is being continuously reclassified to H04L 61/15

H04L 29/12056 . . . . { involving standard directories and standard directory access protocols }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1505

H04L 29/12066 . . . . . { using Domain Name System (DNS) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1511

H04L 29/12075 . . . . . { using Open Systems Interconnection Directories, i.e. X.500 }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1517

H04L 29/12084 . . . . . { using Lightweight Directory Access Protocol (LDAP) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1523

H04L 29/12094 . . . . . { using Voice over IP (VoIP) directories, e.g. Session Initiation Protocol (SIP) registrar or H.323 gatekeeper }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1529

H04L 29/12103 . . . . { using an address exchange platform which sets up a session between two nodes, e.g. Rendezvous server (H04L 29/12094 takes precedence for address exchange for Voice over IP) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1535

H04L 29/12113 . . . . { for service discovery (network applications for service discovery H04L 29/08648) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1541

H04L 29/12122 . . . . { for personal communications, i.e. using a personal identifier }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1547

H04L 29/12132 . . . . { Mechanisms for table lookup, also between directories; Directory data structures; Synchronization of directories (information retrieval in file systems G06F 17/30067 ; information retrieval in structured data stores G06F 17/30286) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1552

H04L 29/12141 . . . . { Object oriented directories, e.g. CORBA name server }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1558

H04L 29/1215 . . . . { Directories for electronic mail or instant messaging (message switching systems per se H04L 12/58) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1564

H04L 29/1216 . . . . { Directories for hybrid networks, e.g. including also telephone numbers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/157

H04L 29/12169 . . . . { Metadirectories, i.e. all encompassing global directory which interfaces to various underlying directories }

WARNING

This subgroup is no longer used for classification as from 01.05.2012.

The backlog of this subgroup is being continuously reclassified to H04L 61/15 I

H04L 29/12179 . . . . { containing identifiers of data entities on a computer, e.g. file names }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1582

H04L 29/12188 . . . . { containing mobile subscriber information, e.g. Home Subscriber Server (HSS) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/1588

H04L 29/12198 . . . . { Address books, i.e. directories containing contact information about correspondents, e.g. on a user device (directories providing the best way to reach a correspondent H04L 29/12122) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/15 L

H04L 29/12207 . . . { Address allocation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/20

H04L 29/12216 . . . . { Internet Protocol (IP) addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2007

H04L 29/12226 . . . . . { using the Dynamic Host Configuration Protocol (DHCP) or variants }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2015

H04L 29/12235 . . . . . { using the Bootstrap Protocol (BOOTP) or variants }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2023

H04L 29/12245 . . . . . { using an authentication, authorization and accounting [AAA } protocol, e.g. remote authentication dial-in user service [RADIUS] or diameter (authentication mechanisms H04L 29/06755)]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/203

H04L 29/12254 . . . . { for local use, e.g. on Local Area Networks (LAN) or on Universal Serial Bus (USB) networks (bus addresses inside a computer G06F 13/42) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2038

H04L 29/12264 . . . . { involving the solving of address allocation conflicts; involving testing of addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/20 C

H04L 29/12273 . . . . { involving timing and renewal aspects }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2053

H04L 29/12283 . . . . { involving aspects of pools of addresses, e.g. assignment of different pools of addresses to different Dynamic Host Configuration Protocol (DHCP) servers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2061

H04L 29/12292 . . . . { for group-, multicast- and broadcast-communication }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2069

H04L 29/12301 . . . . { involving update or notification mechanisms, e.g. update of a Domain Name Server with Dynamic Host Configuration Protocol (DHCP) assigned addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2076

H04L 29/12311 . . . . { involving portability aspects (mobility data transfer in wireless communication networks H04W 8/26 ; mobile IP, network layer protocols in wireless communication networks H04W 80/04) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2084

H04L 29/1232 . . . . { by self assignment, e.g. pick address randomly and test if already in use }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2092

H04L 29/1233 . . . { Mapping of addresses of the same type; Address translation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/25

H04L 29/12339 . . . . { Internet Protocol (IP) address translation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/25 A

H04L 29/12349 . . . . . { Translating between special types of IP addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2507

H04L 29/12358 . . . . . { between different IP versions }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/251

H04L 29/12367 . . . . . { between local and global IP addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2514

H04L 29/12377 . . . . . { involving port numbers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2517

H04L 29/12386 . . . . . { Special translation architecture, different from a single Network Address Translation (NAT) server }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2521

H04L 29/12396 . . . . . { Translation at a client }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2525

H04L 29/12405 . . . . . { Translation at a proxy }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2528

H04L 29/12415 . . . . . { Clique of NAT servers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2532

H04L 29/12424 . . . . . { Multiple local networks, e.g. resolving potential IP address conflicts }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2535

H04L 29/12433 . . . . . { for hiding addresses or keeping them anonymous }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2539

H04L 29/12443 . . . . . { involving dual-stack hosts }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2542

H04L 29/12452 . . . . . { Mechanisms for avoiding unnecessary translation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2546

H04L 29/12462 . . . . . { Map-table maintenance and indexing }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/255

H04L 29/12471 . . . . . { Binding renewal aspects; Keep-alive messages }

H04L 29/12481 . . . . . { Translation policies and rules }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2557

H04L 29/1249 . . . . . { NAT-Traversal }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously

reclassified to H04L 61/256

H04L 29/125 . . . . . { for a higher-layer protocol, e.g. for SIP }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2564

H04L 29/12509 . . . . . { for reachability, e.g. inquiring the address of a correspondent behind a NAT server }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2567

H04L 29/12518 . . . . . { for identification, e.g. for authentication, for billing }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2571

H04L 29/12528 . . . . . { using address mapping retrieval, e.g. Simple Traversal of UDP through NATs (STUN) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2575

H04L 29/12537 . . . . . { transparent to the NAT server }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2578

H04L 29/12547 . . . . . { through control of the NAT server, e.g. using Universal Plug and Play (UPnP) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2582

H04L 29/12556 . . . . . { through Application Level Gateway (ALG) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2585

H04L 29/12566 . . . . . { over a relay server, e.g. traversal using relay NAT [TURN }]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2589

H04L 29/12575 . . . . . { involving tunneling or encapsulation (protecting information from access by third parties H04L 29/06632) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/2592

H04L 29/12584 . . . . { Non-IP address translation }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/25 B

H04L 29/12594 . . . { Arrangements for managing names, e.g. use of aliases or nicknames (retrieval from the Internet by using information identifiers, e.g. URLs G06F 17/30876 ; name-to-address mapping H04L 29/12047) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/30

H04L 29/12603 . . . . { Mechanisms for avoiding name conflicts }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3005

H04L 29/12613 . . . . { Name conversion }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/301

H04L 29/12622 . . . . { Name registration, generation or assignment }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3015

H04L 29/12632 . . . . . { Administrative registration, e.g. for domain names at internet corporation for assigned names and numbers [ICANN } (data processing for administration G06Q 10/00)]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/302

H04L 29/12641 . . . . . { Domain name generation or assignment }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3025

H04L 29/1265 . . . . { Name structure }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/303

H04L 29/1266 . . . . . { containing non-Latin characters, e.g. Chinese domain names }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3035

H04L 29/12669 . . . . . { containing protocol addresses or telephone numbers (address type involved H04L 29/1283) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/304

H04L 29/12679 . . . . . { containing wildcard characters }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously

reclassified to H04L 61/3045

H04L 29/12688 . . . . . { containing special prefixes }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/305

H04L 29/12698 . . . . . { containing special suffixes }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3055

H04L 29/12707 . . . . { Name types }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/306

H04L 29/12716 . . . . . { Application layer names, e.g. buddy name, unstructured name chosen by a user or home appliance name }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3065

H04L 29/12726 . . . . . { E-mail addresses (message switching systems H04L 12/58) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/307

H04L 29/12735 . . . . . { Access point names [APN } , i.e. name of a gateway GPRS support node [GGSN] connecting a mobile user to a packet data network [PDN]]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3075

H04L 29/12745 . . . . . { Telephone URI }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/308

H04L 29/12754 . . . . . { Session initiation protocol [SIP } URI]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3085

H04L 29/12764 . . . . . { Globally routable user-agent URI [GRUU } for SIP]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/309

H04L 29/12773 . . . . . { IP multimedia private identity [IMPI } or IP multimedia public identity [IMPU]]

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/3095

H04L 29/12783 . . . { involving non-standard use of addresses for implementing network functionalities, e.g. coding subscription information within the address, functional addressing, i.e. assigning an address to a function }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/35

H04L 29/12792 . . . { Details }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/60

H04L 29/12801 . . . . { about the structures and formats of addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6004

H04L 29/12811 . . . . { Caching of addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6009

H04L 29/1282 . . . . { Proxying of addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6013

H04L 29/1283 . . . . { about address types }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6018

H04L 29/12839 . . . . . { Layer 2 addresses, e.g. Medium Access Control (MAC) addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6022

H04L 29/12849 . . . . . { Control Area Network (CAN) identifiers (vehicle networks B60R 16/0315) }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6027

H04L 29/12858 . . . . . { Small Computer System Interface (SCSI) addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6031

H04L 29/12867 . . . . . { IEEE1394 (FireWire) identification numbers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6036

H04L 29/12877 . . . . . { Asynchronous Transfer Mode (ATM) addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/604

H04L 29/12886 . . . . . { Fibre channel identifiers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6045

H04L 29/12896 . . . . . { Telephone numbers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/605

H04L 29/12905 . . . . . { International Mobile Subscriber Identity (IMSI) numbers }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6054

H04L 29/12915 . . . . . { Internet Protocol version 6 (IPv6) addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6059

H04L 29/12924 . . . . . { Transport layer addresses, e.g. aspects of Transmission Control Protocol (TCP) or User Datagram Protocol (UDP) ports }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6063

H04L 29/12933 . . . . { IP addresses subnets }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6068

H04L 29/12943 . . . . { Short addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/60 G

H04L 29/12952 . . . . { Multiple interfaces, e.g. multihomed nodes }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6077

H04L 29/12962 . . . . { involving addresses for wireless personal area networks and wireless sensor networks, e.g. Zigbee addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6081

H04L 29/12971 . . . . { involving dual-stack hosts, e.g. in IPv4/IPv6 networks }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6086

H04L 29/12981 . . . . { involving geographic information, e.g. room number }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/609

H04L 29/1299 . . . . { involving masks or ranges of addresses }

WARNING

This subgroup is no longer used for classification as from 01.05.2012. The backlog of this subgroup is being continuously reclassified to H04L 61/6095

H04L 29/14 . Counter-measures to a fault

H04L 41/00 { Arrangements for maintenance or administration or management of packet switching networks } { WARNINGGroups H04L 41/00 - H04L 41/5096 do not correspond to former or current IPC groups.Concordance CPC : IPC for these groups is as follows:- H04L 41/00 - H04L 41/5096 : H04L 12/24 }

H04L 41/02 . { involving integration or standardization }

H04L 41/0206 .. { using standardized network management architectures, e.g. telecommunication management network [TMN] or unified network management architecture [UNMA] }

H04L 41/0213 .. { using standardized network management protocols, e.g. simple network management protocol [SNMP] or common management interface protocol [CMIP] }

H04L 41/022 .. { Multivendor or multistandard integration }

H04L 41/0226 .. { Mapping or translation of multiple network management protocols }

H04L 41/0233 .. { using object oriented techniques, e.g. common object request broker architecture [CORBA] for representation of network management data }

H04L 41/024 .. { using relational databases for representation of network management data, e.g. managing via structured query language [SQL] (information retrieval in structured data stores G06F 17/30286) }

H04L 41/0246 .. { exchanging or transporting network management information using Internet , e.g. aspects relating to embedding network management web servers in network elements, web service for network management purposes, aspects related to Internet applications or services or web-based protocols, simple object access protocol [SOAP] (web-based network application protocols H04L 67/02 ; web-based network application protocols for remote control of end-devices or monitoring of remote application data H04L 67/025 ; proprietary application protocols for remote control of end-devices in special networking environments H04L 67/125 ; retrieval from the Internet G06F 17/30861) }

H04L 41/0253 ... { involving a browser or web-pages for accessing management information (graphical user interface for network management H04L 41/22) }

H04L 41/026 ... { involving e-messaging for transporting management information, e.g. email, instant messaging or chat }

H04L 41/0266 ... { involving management internet meta-data, objects or commands, e.g. by using mark-up language }

H04L 41/0273 ... [N: involving the use of web services for network management, e.g. SOAP

H04L 41/028 .... { for synchronization between service call and response }

H04L 41/0286 .... { for search or classification or discovery of web services providing management functionalities (network applications and protocols for service discovery H04L 67/16) }

H04L 41/0293 .... { for accessing web services by means of a binding identification of the management service or element (aspects of naming and addressing in general H04L 61/00) }

H04L 41/04 . { Architectural aspects of network management arrangements }

H04L 41/042 .. { Arrangements involving multiple distributed management centers cooperatively managing the network }

H04L 41/044 .. { Arrangements involving a hierarchical management structure }

H04L 41/046 .. { Aspects of network management agents }

H04L 41/048 ... { mobile agents }

H04L 41/06 . { involving management of faults or events or alarms }

H04L 41/0604 .. { Alarm or event filtering, e.g. for reduction of information }

H04L 41/0609 ... { based on severity or priority }

H04L 41/0613 ... { based on the type or category of the network elements }

H04L 41/0618 ... { based on the physical or logical position }

H04L 41/0622 ... { based on time }

H04L 41/0627 . . . { by acting on the notification or alarm source }
H04L 41/0631 . . { Alarm or event or notifications correlation; Root cause analysis }
H04L 41/0636 . . . { based on a decision tree analysis }
H04L 41/064 . . . { involving time analysis }
H04L 41/0645 . . . { by additionally acting on or stimulating the network after receiving notifications }
H04L 41/065 . . . { involving logical or physical relationship, e.g. grouping and hierarchies }
H04L 41/0654 . . { Network fault recovery (backup route selection H04L 12/56C104 ; route fault recovery H04L 12/56C108 ; techniques for recovering from a failure of a protocol instance or entity H04L 69/40) }
H04L 41/0659 . . . { by isolating the faulty entity }
H04L 41/0663 . . . . { involving offline failover planning }
H04L 41/0668 . . . { selecting new candidate element }
H04L 41/0672 . . . { by re-configuring the faulty entity }
H04L 41/0677 . . { localization of fault position }
H04L 41/0681 . . { involving configuration of triggering conditions }
H04L 41/0686 . . { involving notification enrichment }
H04L 41/069 . . { involving storage or log of alarms or notifications or post-processing thereof }
H04L 41/0695 . . { involving fault of the network management or monitoring system }

H04L 41/08 . { Configuration management of network or network elements (proprietary application protocols for remote control of end-devices in special networking environments H04L 67/125 ; automatic configuration specially adapted for wireless networks H04W 24/02) }
H04L 41/0803 . . { Configuration setting of network or network elements (communication protocols supporting networked applications involving the movement of software or networked applications configuration parameters H04L 67/34) }
H04L 41/0806 . . . { for initial configuration or provisioning }
H04L 41/0809 . . . . { Plug-and-play configuration }
H04L 41/0813 . . . { Changing of configuration }
H04L 41/0816 . . . . { due to adaptation, e.g. in response to network events }
H04L 41/082 . . . . { due to updating or upgrading of network functionality, e.g. firmware (topology update or discovery for routing purposes H04L 12/56C1) }
H04L 41/0823 . . . { Configuration optimization }
H04L 41/0826 . . . . { for network cost reduction }
H04L 41/083 . . . . { for network speed increase }
H04L 41/0833 . . . . { to reduce network energy consumption }
H04L 41/0836 . . . . { to enhance reliability, e.g. reduce downtime }
H04L 41/084 . . . { Configuration by copying }
H04L 41/0843 . . . . { based on generic templates }
H04L 41/0846 . . . . { based on copy from other elements }
H04L 41/085 . . { Keeping track of network configuration }
H04L 41/0853 . . . { by actively collecting or retrieving configuration information }
H04L 41/0856 . . . { by archiving or backing up configuration information }
H04L 41/0859 . . . { by keeping history of different configuration generations or versions }

H04L 41/0863 . . . { by rolling back to previous configuration versions }
H04L 41/0866 . . { Checking configuration }
H04L 41/0869 . . . { by validating configuration within one network element }
H04L 41/0873 . . . { by checking configuration conflicts with other network elements }
H04L 41/0876 . . { Aspects of the degree of configuration automation }
H04L 41/0879 . . . { Manual configuration through operator }
H04L 41/0883 . . . { Semiautomatic configuration, e.g. proposals from system }
H04L 41/0886 . . . { Fully automatic configuration }
H04L 41/0889 . . { Techniques to speed-up the configuration process }
H04L 41/0893 . . { Assignment of logical groupings to network elements; Policy based network management or configuration }
H04L 41/0896 . . { Bandwidth or capacity management, i.e. automatically increasing or decreasing capacities, e.g. bandwidth on demand (reallocation of resources, renegotiation of resources, e.g. in-call H04L 12/56R5) }

H04L 41/12 . { network topology discovery or management (topology discovery for routing H04L 12/56C1) }

H04L 41/14 . { involving network analysis or design, e.g. simulation, network model or planning (network monitoring H04L 43/00) }
H04L 41/142 . . { using statistical or mathematical methods }
H04L 41/145 . . { involving simulating, designing, planning or modelling of a network }
H04L 41/147 . . { for prediction of network behaviour }

H04L 41/16 . { Network management using artificial intelligence }

H04L 41/18 . { Arrangements involving CNM [Customer Network Management] }

H04L 41/20 . { Network management software packages }

H04L 41/22 . { using GUI [Graphical User Interface] }

H04L 41/24 . { using dedicated network management hardware }

H04L 41/26 . { using dedicated tools for LAN [Local Area Network] management }

H04L 41/28 . { Security in network management, e.g. restricting network management access (network architectures or network communication protocols for network security H04L 63/00 ; cryptographic mechanisms or cryptographic arrangements for secret or secure communication H04L 9/00 ; network architectures or network communication protocols for wireless network security H04W 12/00 ; security arrangements for protecting computers or computer systems against unauthorised activity G06F 21/00) }

H04L 41/30 . { Decision processes by autonomous network management units using voting and bidding }

H04L 41/32 . { Specific management aspects for broadband networks }

H04L 41/50 . { Network service management, i.e. ensuring proper service fulfillment according to an agreement or contract between two parties, e.g. between an IT-provider and a customer }

H04L 41/5003 .. { Managing service level agreement [SLA] or interaction between SLA and quality of service [QoS] }

H04L 41/5006 ... { Defining or negotiating SLA contracts, guarantees or penalties (SLA negotiation in wireless networks H04W 28/24) }

H04L 41/5009 ... { Determining service level performance, e.g. measuring SLA quality parameters, determining contract or guarantee violations, response time or mean time between failure [MTBF] (monitoring performance metrics on a simple network level H04L 43/08) }

H04L 41/5012 .... { determining service availability, e.g. which services are available at a certain point in time }

H04L 41/5016 ..... { based on statistics of service availability, e.g. in percentage or over a given time }

H04L 41/5019 .. { Ensuring SLA (flow or congestion control at network level H04L 12/569) }

H04L 41/5022 ... { by giving priorities, e.g. assigning classes of service }

H04L 41/5025 ... { by proactively reacting to service quality change, e.g. degradation or upgrade, by reconfiguration (mere recovery after a network faults H04L 41/0654) }

H04L 41/5029 .. { Service quality level based billing, e.g. dependent on measured service level customer is charged more or less (general charging or billing for transport of data packets H04L 12/14) }

H04L 41/5032 .. { Generating service level reports }

H04L 41/5035 .. { Measuring contribution of individual network components to actual service level (alarm or event correlation H04L 41/0631) }

H04L 41/5038 .. { Testing of service level quality, e.g. simulating service usage }

H04L 41/5041 .. { Service implementation }

H04L 41/5045 ... { Making service definitions prior to deployment }

H04L 41/5048 ... { Automatic or semi-automatic definitions, e.g. definition templates }

H04L 41/5051 ... { Service on demand, i.e. services are defined and provided in real time as requested by the user }

H04L 41/5054 ... [N: Automatic provisioning of the service triggered by the service manager, e.g. concrete service implementation by automatic configuration of network components (for initializing configuration, i.e. provisioning of network or devices H04L 41/0806)

H04L 41/5058 .. { Service discovery by the service manager (automatically determining the actual topology of a network H04L 41/12 ; topology discovery for routing H04L 12/56C1 ; arrangements for service discovery, e.g. service location protocol H04L 67/16) }

H04L 41/5061 .. { Customer care }

H04L 41/5064 ... { Customer relationship management (arrangements involving customer network management, i.e. giving the customer access to network management functions H04L 41/18) }

H04L 41/5067 ... { Customer-centric quality of service [QoS] measurement }

H04L 41/507 ... { Filtering out customers affected by service problems }

H04L 41/5074 ... { Handling of trouble tickets }

H04L 41/5077 .. { wherein the managed service relates to simple transport services, i.e. providing only network infrastructure }

H04L 41/508 .. { based on type of value added network service under agreement }

H04L 41/5083 ... { wherein the managed service relates to web hosting (web-based network application protocols H04L 67/02 ; web site content organization and management G06F 17/3089 ; video-hosting H04N 21/2743) }

H04L 41/5087 ... { wherein the managed service relates to voice services (protocols for

real-time multimedia communications H04L 65/00 ; management of telephonic communication services H04M 3/22 ; management of VoIP services H04M 7/0081) }

H04L 41/509 . . . { wherein the managed service relates to media content delivery, e.g. audio / video / TV (protocols for real-time multimedia communications H04L 65/00 ; interactive television or VoD H04N21) }

H04L 41/5093 . . . { wherein the managed service relates to messaging or chat services (messaging, such as e-mail in packet-switching networks H04L 12/58 ; conducting a computer conference H04L 12/1822 ; instant messaging H04L 12/581) }

H04L 41/5096 . . . { wherein the managed service relates to distributed or central networked applications (management of file systems G06F 17/30067 ; management of structured data stores G06F 17/30286) }

H04L 43/00 { Arrangements for monitoring or testing packet switching networks (networking arrangements or communications protocols for supporting networked applications for tracking the activity of the application user H04L 67/22 ; monitoring of computing systems G06F 11/30 ; monitoring of computer activity G06F 11/34) } { WARNINGGroups H04L 43/00 - H04L 43/50 do not correspond to former or current IPC groups.Concordance CPC : IPC for these groups is as follows:- H04L 43/00 - H04L 43/50 : H04L 12/26 }

H04L 43/02 . { involving a reduction of monitoring data }

H04L 43/022 . . { using sampling of monitoring data, i.e. storing only a selection of packets }

H04L 43/024 . . . { using adaptive sampling }

H04L 43/026 . . { using flow generation }

H04L 43/028 . . { using filtering (alarm or event filtering H04L 41/0604) }

H04L 43/04 . { Processing of captured monitoring data }

H04L 43/045 . . { for graphical visualization of monitoring data (graphical user interfaces H04L 41/22 ; display of network or application conditions affecting the network application to the application user H04L 67/36 ; visual indication of the functioning of a computing machine G06F 11/32) }

H04L 43/06 . { Report generation }

H04L 43/062 . . { for traffic related reporting }

H04L 43/065 . . { for device related reporting (reporting of sensed information of home appliances H04L 12/2803) }

H04L 43/067 . . { for time frame related reporting }

H04L 43/08 . { Monitoring based on specific metrics }

H04L 43/0805 . . { Availability }

H04L 43/0811 . . . { Connectivity }

H04L 43/0817 . . . { functioning (networked applications tracking the activity of users H04L 67/22 ; monitoring appliance functionality of home appliances H04L 12/2803) }

H04L 43/0823 . . { Errors (management of events, faults or alarms in networks or network elements H04L 41/06) }

H04L 43/0829 . . . { Packet loss }

H04L 43/0835 . . . . { One way packet loss }

H04L 43/0841 . . . . { Round trip packet loss }

H04L 43/0847 . . . { Transmission error }
H04L 43/0852 . . { Delays }
H04L 43/0858 . . . { One way delays }
H04L 43/0864 . . . { Round trip delays }
H04L 43/087 . . . { Jitter }
H04L 43/0876 . . { Network utilization }
H04L 43/0882 . . . { Utilization of link capacity }
H04L 43/0888 . . . { Throughput }
H04L 43/0894 . . . { Packet rate }

H04L 43/10 . { using active monitoring, e.g. heartbeat protocols, polling, ping, trace-route }
H04L 43/103 . . { with adaptive polling, i.e. dynamically adapting the polling rate }
H04L 43/106 . . { by adding timestamps to packets }

H04L 43/12 . { using dedicated network monitoring probes }

H04L 43/14 . { using software, i.e. software packages (network security related monitoring H04L 63/1408) }

H04L 43/16 . { using threshold monitoring }

H04L 43/18 . { using protocol analyzers }

H04L 43/50 . { Testing arrangements }

H04L 45/00 { Routing or path finding of packets in data switching networks (specially adapted for wireless routing H04W 40/00) } { WARNING Groups H04L 45/00 - H04L 45/74 do not correspond to former or current IPC groups. Concordance CPC : IPC for this groups is as follows: - H04L 45/00 - 45/74 : H04L 12/56 }

H04L 45/02 . { Topology update or discovery (topology discovery for network management H04L 41/12 ; LAN interconnection over a backbone network H04L 12/4604 ; node-based peer discovery mechanisms in peer-to-peer networks H04L 67/1061) }
H04L 45/021 . . { Routing table update consistency, e.g. epoch number }
H04L 45/023 . . { Delayed use of routing table update }
H04L 45/025 . . { Updating only a limited number of routers, e.g. fish-eye update }
H04L 45/026 . . { Details of "hello" or keep-alive messages }
H04L 45/028 . . { Dynamic adaptation of the update interval, e.g. event-triggered update }

H04L 45/04 . { Interdomain routing, e.g. hierarchical routing }

H04L 45/06 . { Deflection routing, e.g. hot-potato routing }

H04L 45/08 . { Learning-based routing, e.g. neural networks }

H04L 45/10 . { Routing in connection-oriented networks, e.g. X.25, ATM }

H04L 45/12 . { Shortest path evaluation }

H04L 45/121 . . [N: Minimizing delay
H04L 45/122 . . { Minimizing distance, e.g. ? number of hops }
H04L 45/123 . . { Evaluation of link metrics (techniques for monitoring network metrics H04L 43/08) }
H04L 45/124 . . { using a combination of metrics }
H04L 45/125 . . { based on throughput or bandwidth }
H04L 45/126 . . { minimizing geographical or physical path length }
H04L 45/127 . . { based on intermediate node capabilities }
H04L 45/128 . . { for finding disjoint paths }
H04L 45/1283 . . . { with disjoint links }
H04L 45/1287 . . . { with disjoint nodes }

H04L 45/14 . { Routing performance; Theoretical aspects }

H04L 45/16 . { Multipoint routing (arrangements for multicast or broadcast in data networks H04L 12/18) }

H04L 45/18 . { Loop free }

H04L 45/20 . { Hop count for routing purposes, e.g. TTL }

H04L 45/22 . { Alternate routing }

H04L 45/24 . { Multipath }
H04L 45/245 . . { Link aggregation, e.g. trunking }

H04L 45/26 . { Route discovery packet }

H04L 45/28 . { Route fault recovery (network fault recovery H04L 41/0654) }

H04L 45/30 . { Special provisions for routing multiclass traffic }
H04L 45/302 . . { Route determination based on requested QoS }
H04L 45/304 . . { Route determination for signaling traffic }
H04L 45/306 . . { Route determination based on the nature of the carried application (communications protocols whereby the routing of a service request to a node providing the service depends on the content or context of the request, e.g. profile, connectivity status H04L 67/327) }
H04L 45/3065 . . . { for real time traffic }
H04L 45/308 . . { Route determination based on user's profile, e.g. premium users }

H04L 45/32 . { Flooding (denial of service attacks H04L 63/1458) }

H04L 45/34 . { Source routing }

H04L 45/36 . { Backward learning }

H04L 45/38 . { Flow based routing }

H04L 45/40 . { Wormhole routing }

H04L 45/42 . { Centralized routing }

H04L 45/44 . { Distributed routing }

H04L 45/46 . { Cluster building }

H04L 45/48 . { Routing tree calculation }

H04L 45/50 . { using label swapping, e.g. multi-protocol label switch [MPLS] }
H04L 45/502 . . { Frame based }
H04L 45/505 . . { Cell based }
H04L 45/507 . . { Label distribution }

H04L 45/52 . { Multiprotocol routers }

H04L 45/54 . { Organization of routing tables }

H04L 45/56 . { Routing software }
H04L 45/563 . . { Software download or update (software deployment in general G06F 8/60) }
H04L 45/566 . . { Routing instructions carried by the data packet, e.g. active networks }

H04L 45/58 . { Association of routers }
H04L 45/583 . . { Stackable routers }
H04L 45/586 . . { Virtual routers }

H04L 45/60 . { Router architecture }

H04L 45/62 . { Wavelength based (optical switching H04Q 11/0062) }

H04L 45/64 . { using an overlay routing layer (Peer-to-Peer networks H04L 67/104) }

H04L 45/66 . { Layer 2 routing, e.g. in Ethernet based MAN`s }

H04L 45/68 . { Pseudowire emulation, e.g. IETF WG PWE3 }

H04L 45/70 . { Routing based on monitoring results (techniques for monitoring network metrics H04L 43/08) }

H04L 45/72 . { Routing based on the source address }

H04L 45/74 . { Address processing for routing }
H04L 45/741 . . { Routing in networks with a plurality of addressing schemes, e.g. IPv4 and IPv6 }
H04L 45/742 . . { Route cache and its operation }
H04L 45/745 . . { Address table lookup or address filtering }
H04L 45/7453 . . . { using hashing }
H04L 45/7457 . . . { using content-addressable memories (CAM) }
H04L 45/748 . . . { Longest matching prefix }

H04L 47/00 { Traffic regulation in packet switching networks (arrangements for detecting or

correcting errors in the information received H04L 1/00) }

NOTE

This group covers:1. Flow control or congestion control
2. Queue scheduling 3. Admission control or resource allocation

WARNING

Groups H04L 47/00 -47/82J do not correspond to former or current IPC groups.
Concordance CPC : IPC for this groups is as follows:
- H04L 47/00 - 47/82J : H04L 12/56

H04L 47/10	.	{ Flow control or congestion control }
H04L 47/11	. .	{ Congestion identification }
H04L 47/115	. . .	{ using a dedicated packet }
H04L 47/12	. .	{ Congestion avoidance or recovery }
H04L 47/122	. . .	{ Diverting traffic away from congested spots }
H04L 47/125	. . .	{ Load balancing, e.g. traffic engineering (load balancing among servers H04L 67/1002) }
H04L 47/127	. . .	{ Congestion prediction }
H04L 47/13	. .	{ in a LAN segment, e.g. ring or bus }
H04L 47/135	. . .	{ by jamming the transmission media }
H04L 47/14	. .	{ in wireless networks }
H04L 47/15	. .	{ in relation to multipoint traffic (arrangements for broadcast or multicast in data networks H04L 12/18) }
H04L 47/16	. .	{ in connection oriented networks, e.g. frame relay }
H04L 47/17	. .	{ Hop by hop }
H04L 47/18	. .	{ End to end }
H04L 47/19	. .	{ at layers above network layer (general aspects of TCP H04L 69/16 ; network arrangements for networked applications for scheduling or organising the servicing of application requests H04L 67/32) }
H04L 47/193	. . .	{ at transport layer, e.g. TCP related }
H04L 47/196	. . .	{ Integration of transport layer protocols, e.g. TCP and UDP }
H04L 47/20	. .	{ Policing }
H04L 47/21	. .	{ using leaky bucket }
H04L 47/215	. . .	{ Token bucket }
H04L 47/22	. .	{ Traffic shaping }
H04L 47/225	. . .	{ Determination of shaping rate, e.g. using a moving window }
H04L 47/23	. .	{ Bit dropping }
H04L 47/24	. .	{ depending on the type of traffic, e.g. priority or quality of service [QoS] (Network arrangements for networked applications for scheduling or organising the servicing of application requests whereby quality of service or priority requirements are taken into account H04L 67/322) }
H04L 47/2408	. . .	{ Different services, e.g. type of service [ToS] }

H04L 47/2416 . . . { Real time traffic (arrangements for real-time multimedia communications H04L 65/00) }
H04L 47/2425 . . . { Service specification, e.g. SLA (general aspects of SLA management H04L 12/2417) }
H04L 47/2433 . . . . { Allocation of priorities to traffic types }
H04L 47/2441 . . . { Flow classification }
H04L 47/245 . . . { using preemption }
H04L 47/2458 . . . { Modification of priorities while in transit }
H04L 47/2466 . . . { Modification of handling priority for control packets, e.g. for ACK or signaling packets }
H04L 47/2475 . . . { Application aware }
H04L 47/2483 . . . { Flow identification }
H04L 47/2491 . . . { Mapping QoS requirements between different networks }
H04L 47/25 . . { Rate modification upon detection by the source of changing network conditions }
H04L 47/26 . . { Explicit feedback to the source, e.g. choke packet }
H04L 47/263 . . . { Source rate modification after feedback }
H04L 47/266 . . . . { Stopping or restarting the source, e.g. X-on or X-off }
H04L 47/27 . . { Window size evaluation or update, e.g. using information derived from ACK packets }
H04L 47/28 . . { using time considerations }
H04L 47/283 . . . { Network and process delay, e.g. jitter or round trip time [RTT] }
H04L 47/286 . . . { Time to live }
H04L 47/29 . . { Using a combination of thresholds }
H04L 47/30 . . { using information about buffer occupancy at either end or transit nodes }
H04L 47/31 . . { Tagging of packets, e.g. discard eligibility [DE] bit }
H04L 47/32 . . { Packet discarding or delaying }
H04L 47/323 . . . { Discarding or blocking control packets, e.g. ACK packets }
H04L 47/326 . . . { With random discard, e.g. random early discard [RED] }
H04L 47/33 . . { Forward notification }
H04L 47/34 . . { Sequence integrity e.g. sequence numbers }
H04L 47/35 . . { Embedded flow control information in regular packets, e.g. Piggybacking }
H04L 47/36 . . { Evaluation of the packet size, e.g. maximum transfer unit [MTU] }
H04L 47/365 . . . { Dynamic adaptation of the packet size }
H04L 47/37 . . { Slow start }
H04L 47/38 . . { Adapting coding or compression rate }
H04L 47/39 . . { Credit based }
H04L 47/40 . . { Using splitted connections, e.g. IP spoofing }
H04L 47/41 . . { Actions on aggregated flows or links }

H04L 47/50 . { Queue scheduling }
H04L 47/52 . . { Bandwidth attribution to queues }
H04L 47/521 . . . { Static queue service slot or fixed bandwidth allocation }
H04L 47/522 . . . { Dynamic queue service slot or variable bandwidth allocation }
H04L 47/524 . . . . { Queue skipping }

H04L 47/525 . . . { Redistribution of residual bandwidth }
H04L 47/527 . . . { Quantum based scheduling, e.g. credit or deficit based scheduling or token bank }
H04L 47/528 . . . { Minimum bandwidth guarantee }
H04L 47/54 . . { Loss aware scheduling }
H04L 47/56 . . { Delay aware scheduling }
H04L 47/562 . . . { Attaching a time tag to queues }
H04L 47/564 . . . { Attaching a deadline to packets, e.g. earliest due date first }
H04L 47/566 . . . . { Deadline varies as a function of time spent in the queue }
H04L 47/568 . . . { Calendar queues or timing rings }
H04L 47/58 . . { Changing or combining different scheduling modes, e.g. multimode scheduling }
H04L 47/60 . . { Hierarchical scheduling }
H04L 47/62 . . { General aspects }
H04L 47/6205 . . . { Arrangements for avoiding head of line blocking }
H04L 47/621 . . . { Individual queue per connection or flow, e.g. per VC }
H04L 47/6215 . . . { Individual queue per QOS, rate or priority }
H04L 47/622 . . . { Queue service order }
H04L 47/6225 . . . . { fixed service order, e.g. Round Robin }
H04L 47/623 . . . . { weighted service order (H04L 47/201 , H04L 47/202 , H04L 47/203 take precedence) }
H04L 47/6235 . . . . { variable service order }
H04L 47/624 . . . { Altering the ordering of packets in an individual queue }
H04L 47/6245 . . . { Modifications to standard FIFO or LIFO }
H04L 47/625 . . . { Other criteria for service slot or service order }
H04L 47/6255 . . . . { queue load conditions, e.g. longest queue first }
H04L 47/626 . . . . { channel conditions }
H04L 47/6265 . . . . { past bandwidth allocation }
H04L 47/627 . . . . { policing }
H04L 47/6275 . . . . { priority }
H04L 47/628 . . . . { packet size, e.g. shortest packet first }
H04L 47/6285 . . . { Provisions for avoiding starvation of low priority queues }
H04L 47/629 . . . { Fair share of resources, e.g. WFQ }
H04L 47/6295 . . . { Multiple queues per individual QOS, connection, flow or priority }

H04L 47/70 . { Admission control or resource allocation (medium access in wavelength-division multiplex systems H04J 14/0227) }
H04L 47/72 . . { Reservation actions }
H04L 47/722 . . . { at the end terminals, e.g. buffer space }
H04L 47/724 . . . { involving intermediate nodes, e.g. RSVP }
H04L 47/726 . . . { over a plurality of alternate paths, e.g. for load balancing }
H04L 47/728 . . . . { for backup paths }
H04L 47/74 . . { Reactions to resource unavailability }
H04L 47/741 . . . { Holding a request until resources become available }

H04L 47/743 . . . { Reaction at the end points }
H04L 47/745 . . . { Reaction in network }
H04L 47/746 . . . { Reaction triggered by a failure }
H04L 47/748 . . . { Negotiation of resources, e.g. modification of a request }
H04L 47/76 . . { Reallocation of resources, renegotiation of resources, e.g. in-call }
H04L 47/762 . . . { triggered by the network }
H04L 47/765 . . . { triggered by the end-points }
H04L 47/767 . . . . { after changing the attachment point, e.g. after hand-off }
H04L 47/78 . . { Resource allocation architecture }
H04L 47/781 . . . { Centralized allocation of resource }
H04L 47/782 . . . { Hierarchical allocation of resource, e.g. involving a hierarchy of local and centralized entities }
H04L 47/783 . . . { Distributed allocation of resources, e.g. bandwidth brokers }
H04L 47/785 . . . . { Involving several network domains, e.g. multilateral agreements }
H04L 47/786 . . . . . { Mapping reservation between domains }
H04L 47/787 . . . . { Bandwidth trade among domains }
H04L 47/788 . . . { Autonomous allocation of resources }
H04L 47/80 . . { Actions related to the nature of the flow or the user }
H04L 47/801 . . . { Real time traffic }
H04L 47/803 . . . { Application aware }
H04L 47/805 . . . { QOS or priority aware }
H04L 47/806 . . . { Broadcast or multicast traffic }
H04L 47/808 . . . { User-type aware }
H04L 47/82 . . { Miscellaneous aspects }
H04L 47/821 . . . { Prioritising resource allocation or reservation requests }
H04L 47/822 . . . { Collecting or measuring resource availability data }
H04L 47/823 . . . { Prediction of resource usage }
H04L 47/824 . . . { Applicable to portable or mobile terminals }
H04L 47/825 . . . { Involving tunnels, e.g. MPLS }
H04L 47/826 . . . { Involving periods of time }
H04L 47/827 . . . { Aggregation of resource allocation or reservation requests }
H04L 47/828 . . . { Allocation of resources per group of connections, e.g. per group of users }
H04L 47/829 . . . { Topology based }

H04L 49/00 { Packet switching elements (selecting arrangements for multiplex arrangements using optical switching H04Q 11/0001) }

WARNING

Groups H04L 49/00 - H04L 49/9057 do not correspond to former or current IPC groups. Concordance CPC : IPC for these groups is as follows: -
H04L 49/00 - H04L 49/9057 : H04L 12/56

H04L 49/10 . { Switching fabric construction }

H04L 49/101 .. { Crossbar or matrix }
H04L 49/102 .. { using shared medium, e.g. bus or ring }
H04L 49/103 .. { using shared central buffer, shared memory, e.g. time switching }
H04L 49/104 .. { ATM switching fabrics }
H04L 49/105 ... { ATM switching elements }
H04L 49/106 .... { using space switching , e.g. crossbar or matrix }
H04L 49/107 .... { using shared medium }
H04L 49/108 .... { using shared central buffer }
H04L 49/109 .. { integrated on microchip, e.g. switch-on-chip }

H04L 49/15 . { Interconnection of switching modules }
H04L 49/1507 .. { Distribute and route fabrics, e.g. sorting-routing or Batcher-Banyan }
H04L 49/1515 .. { Non-blocking multistage, e.g. Clos }
H04L 49/1523 ... { Parallel switch fabric planes }
H04L 49/153 .... { ATM switching fabrics having parallel switch planes }
H04L 49/1538 ..... { Cell slicing }
H04L 49/1546 ... { Pipelined operation }
H04L 49/1553 .. { Interconnection of ATM switching modules, e.g. ATM switching fabrics }
H04L 49/1561 ... { Distribute and route fabrics, e.g. Batcher-Banyan }
H04L 49/1569 ... { Clos switching fabrics }
H04L 49/1576 ... { Crossbar or matrix }
H04L 49/1584 ... { Full Mesh, e.g. knockout }
H04L 49/1592 ... { Perfect Shuffle }

H04L 49/20 . { Support for services or operations }
H04L 49/201 .. { Multicast or broadcast }
H04L 49/203 ... { ATM switching fabrics with multicast or broadcast capabilities }
H04L 49/205 .. { Quality of Service based }
H04L 49/206 ... { Real Time traffic }
H04L 49/208 .. { Port mirroring }

H04L 49/25 . { Routing or path finding through a switch fabric }
H04L 49/251 .. { Cut-through or wormhole routing }
H04L 49/252 .. { Store and forward routing }
H04L 49/253 .. { Connections establishment or release between ports }
H04L 49/254 ... { Centralized controller, i.e. arbitration or scheduling }
H04L 49/255 ... { Control mechanisms for ATM switching fabrics }
H04L 49/256 .. { Routing or path finding in ATM switching fabrics }
H04L 49/257 ... { Cut-through or wormhole routing }
H04L 49/258 ... { Grouping }

H04L 49/30 . { Peripheral units, e.g. input or output ports }
H04L 49/3009 .. { Header conversion, routing tables or routing tags }
H04L 49/3018 .. { Input queuing }

H04L 49/3027 .. { Output queuing }
H04L 49/3036 .. { Shared queuing }
H04L 49/3045 .. { Virtual queuing }
H04L 49/3054 .. { Auto-negotiation, e.g. access control between switch gigabit interface connector [GBIC] and link }
H04L 49/3063 .. { Pipelined operation }
H04L 49/3072 .. { Packet splitting }
H04L 49/3081 .. { ATM peripheral units, e.g. policing, insertion or extraction }
H04L 49/309 ... { Header conversion, routing tables or routing tags }

H04L 49/35 . { Application specific switches }
H04L 49/351 .. { LAN switches, e.g. ethernet switches }
H04L 49/352 ... { Gigabit ethernet switching [GBPS] }
H04L 49/353 .. { Support for fire wire switches, i.e. according to IEEE 1394 }
H04L 49/354 .. { Support for virtual LAN, VLAN tagging or multiple registration e.g. according to IEEE 802.1q }
H04L 49/355 .. { Application aware switches, e.g. HTTP }
H04L 49/356 .. { Storage area network switches }
H04L 49/357 ... { Fibre channel switches }
H04L 49/358 ... { Infiniband Switches }

H04L 49/40 . { Physical details, e.g. power supply, mechanical construction or backplane }
H04L 49/405 .. { Physical details, e.g. power supply, mechanical construction or backplane of ATM switches }

H04L 49/45 . { Provisions for supporting expansion }
H04L 49/455 .. { Provisions for supporting expansion in ATM switches }

H04L 49/50 . { Overload detection; Overload protection }
H04L 49/501 .. { Overload detection }
H04L 49/503 ... { Policing }
H04L 49/505 .. { Corrective Measures, e.g. backpressure }
H04L 49/506 ... { Backpressure }
H04L 49/508 ... { Head of Line Blocking Avoidance }

H04L 49/55 . { Error prevention, detection or correction }
H04L 49/552 .. { Error prevention, e.g. sequence integrity of packets redundant connections through the switch fabric }
H04L 49/555 .. { Error detection }
H04L 49/557 .. { Error correction, e.g. fault recovery or fault tolerance }

H04L 49/60 . { Hybrid or multiprotocol packet, ATM or frame switches }
H04L 49/602 .. { Multilayer or multiprotocol switching, e.g. IP switching }
H04L 49/604 .. { Hybrid IP/Ethernet switches }
H04L 49/606 .. { Hybrid ATM switches, e.g. ATM&STM, ATM&Frame Relay or ATM&IP }
H04L 49/608 .. { ATM switches adapted to switch variable length packets, e.g. IP packets }

H04L 49/65 . { Fast packet switch re-configuration }

H04L 49/70 . { Virtual switches }

H04L 49/90 . { Queuing arrangements }
H04L 49/9005 . . { Dynamic buffer space allocation }
H04L 49/901 . . { Storage descriptor, e.g. read or write pointers }
H04L 49/9015 . . . { for supporting a linked list }
H04L 49/9021 . . { Plurality of buffers per packet }
H04L 49/9026 . . { Single buffer per packet }
H04L 49/9031 . . { Wraparound memory, e.g. overrun or underrun detection }
H04L 49/9036 . . { Common buffer combined with individual queues }
H04L 49/9042 . . { Separate storage for different parts of the packet, e.g. header and payload }
H04L 49/9047 . . { Buffer pool }
H04L 49/9052 . . . { with buffers of different sizes }
H04L 49/9057 . . { Arrangements for supporting packet reassembly or resequencing }
H04L 49/9063 . . { Intermediate storage in different physical parts of a node or terminal }
H04L 49/9068 . . . { in the network interface card }
H04L 49/9073 . . . . { Early interruption upon arrival of a fraction of a packet }
H04L 49/9078 . . . { using an external memory or storage device }
H04L 49/9084 . . { Reactions to storage capacity overflow }
H04L 49/9089 . . . { replacing packets in a storage arrangement, e.g. pushout }
H04L 49/9094 . . { Arrangements for simultaneous transmit and receive, e.g. simultaneous reading/writing from/to the storage element }

H04L 51/00 { Arrangements for user-to-user messaging in packet-switching networks, e.g. e-mail or instant messages }

WARNING

Groups H04L 51/00 - H04L 51/38 do not correspond to former or current IPC groups.
Concordance CPC : IPC for these groups is as follows:
- H04L 51/00 - H04L 51/38 : H04L 12/58

H04L 51/02 . { with automatic reactions or user delegation, e.g. automatic replies or chatbot }

H04L 51/04 . { Real-time or near real-time messaging, e.g. instant messaging [IM] (network arrangements or protocols for real-time communications H04L 65/00) }
H04L 51/043 . . [N: use or manipulation of presence information in messaging (presence management H04L 67/24)
H04L 51/046 . . { interacting with other applications or services }

H04L 51/06 . { Message adaptation based on network or terminal capabilities (networked arrangements for intermediate processing of conversion or adaptation of application content or format H04L 67/2823) }

H04L 51/063 . . { with adaptation of content }

H04L 51/066 . . { with adaptation of format }

H04L 51/08 . { Messages including annexed information, e.g. attachments }

H04L 51/10 . { Messages including multimedia information (network arrangements or protocols for real-time communication H04L 65/00 ; voice messaging in telephonic communication using automatic or semi-automatic exchanges with non-audio components H04M 3/5307) }

H04L 51/12 . { with filtering and selective blocking capabilities }

H04L 51/14 . { with selective forwarding }

H04L 51/16 . { including conversation history, e.g. threads }

H04L 51/18 . { Messages including commands or codes to be executed either at an intermediate node or at the recipient to perform message-related actions (computer aided management of electronic mail G06Q 10/10 ; networked applications for remote control or remote monitoring of the application H04L 67/025 ; networked applications involving the movement of software or configuration parameters H04L 67/34) }

H04L 51/20 . [N: Messaging using geographical location information (protocols for adapting network applications to user terminal location H04L 67/18 ; services specially adapted for wireless communication networks making use of the location of users or terminals H04W 4/02)

H04L 51/22 . { Mailbox-related details (computer aided management of electronic mail G06Q 10/10) }

H04L 51/24 . { with notification on incoming messages }

H04L 51/26 . { Prioritized messaging (networked applications for intermediate processing whereby quality of service or priority requirements are taken into account H04L 67/322) }

H04L 51/28 . { Details regarding addressing issues (arrangements and protocols for addressing and naming H04L 61/00) }

H04L 51/30 . { with reliability check, e.g. acknowledgments or fault reporting }

H04L 51/32 . { Messaging within social networks }

H04L 51/34 . { with provisions for tracking the progress of a message }

H04L 51/36 . [N: Unified messaging, e.g. interactions between instant messaging, e-mail or other types of messages such as converged IP messaging [CPM]

H04L 51/38 . { in combination with wireless systems (mobile application service signalling using messaging, e.g. SMS, H04W 4/12) }

H04L 61/00 { Network arrangements or network protocols for addressing or naming }

NOTE

This group does not cover:
Aspects relating to switching or routing which are classified in H04L 12/56 .Aspects relating to configuration management of data networks or network elements in general which are classified in H04L 12/24 E.Aspects of addressing in telephony which are classified in H04M 7/00 .Aspects of addressing within devices, e.g. process or memory, which are classified in G06F 13/42 or G06F 12/00 .

WARNING

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Groups H04L 61/00 - H04L 61/6095 do not correspond to former
or current IPC groups.
Concordance CPC : IPC for these groups is as follows:
- H04L 61/00 - 61/60L : H04L 29/12
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H04L 61/10 . { Mapping of addresses of different types; Address resolution }

H04L 61/103 . . { across network layers, e.g. resolution of network layer into physical layer addresses or address resolution protocol [ARP] }

H04L 61/106 . . { across networks, e.g. mapping telephone numbers to data network addresses }

H04L 61/15 . { Directories; Name-to-address mapping (telephone directories in user terminals H04M 1/27) }

H04L 61/1505 . . { involving standard directories or standard directory access protocols }

H04L 61/1511 . . . { using domain name system [DNS] }

H04L 61/1517 . . . { using open systems interconnection [OSI] directories, i.e. X.500 }

H04L 61/1523 . . . { using lightweight directory access protocol [LDAP] }

H04L 61/1529 . . . { using voice over internet protocol [VoIP] directories, e.g. session initiation protocol [SIP] registrar or H.323 gatekeeper (SIP for real-time communications H04L 65/1006) }

H04L 61/1535 . . { using an address exchange platform which sets up a session between two nodes, e.g. "rendezvous" server (address exchange for voice over internet protocol [VoIP] H04L 61/1529) }

H04L 61/1541 . . { for service discovery (network applications for service discovery H04L 67/16 ; discovery of network devices in wireless communication networks H04W 8/005) }

H04L 61/1547 . . { for personal communications, i.e. using a personal identifier }

H04L 61/1552 . . { Mechanisms for table lookup, e.g. between directories; Directory data structures; Synchronization of directories (information retrieval in file systems G06F 17/30067 ; information retrieval in structured data stores G06F 17/30286) }

H04L 61/1558 . . { Object oriented directories, e.g. common object request broker architecture [CORBA] name server }

H04L 61/1564 . . { Directories for electronic mail or instant messaging (message switching systems per se H04L 12/58) }

H04L 61/157 . . { Directories for hybrid networks, e.g. including telephone numbers }

H04L 61/1576 . . { Metadirectories, i.e. all encompassing global directory which interfaces to various underlying directories }

H04L 61/1582 . . { containing identifiers of data entities on a computer, e.g. file names }

H04L 61/1588 . . { containing mobile subscriber information, e.g. home subscriber server [HSS] }

H04L 61/1594 . . { Address books, i.e. directories containing contact information about correspondents, e.g. on a user device (directories providing the best way to reach a correspondent H04L 61/1547) }

H04L 61/20 . { Address allocation (configuration management of network or network elements H04L 12/2424) }

H04L 61/2007 . . { internet protocol [IP] addresses }

H04L 61/2015 . . . { using the dynamic host configuration protocol [DHCP] or variants }

H04L 61/2023 . . . { using the bootstrap protocol [BOOTP] or variants }

H04L 61/203 . . . { using an authentication, authorization and accounting [AAA] protocol, e.g. remote authentication dial-in user service [RADIUS] or diameter (supporting authentication of entities communicating through a packet data network H04L 63/08 ; cryptographic mechanisms or cryptographic arrangements for entity authentication H04L 9/32) }

H04L 61/2038 . . { for local use, e.g. on local area networks [LAN] or on universal serial bus [USB] networks (bus addresses inside a computer G06F 13/42) }

H04L 61/2046 . . { involving the solving of address allocation conflicts or involving testing of addresses }

H04L 61/2053 . . { involving timing or renewal aspects }

H04L 61/2061 . . { involving aspects of pools of addresses, e.g. assignment of different pools of addresses to different dynamic host configuration protocol [DHCP] servers }

H04L 61/2069 . . { for group-, multicast- and broadcast-communication (broadcast or conference H04L 12/18) }

H04L 61/2076 . . { involving update or notification mechanisms, e.g. update of a domain name server with dynamic host configuration protocol [DHCP] assigned addresses }

H04L 61/2084 . . { involving portability aspects (network addressing or numbering for mobility support H04W 8/26 ; wireless network layer protocols, e.g. mobile IP H04W 80/04) }

H04L 61/2092 . . { by self assignment, e.g. pick address randomly and test if already in use }

H04L 61/25 . { mapping of addresses of the same type; address translation (arrangements for maintenance or administration involving network analysis H04L 12/2414) }

H04L 61/2503 . . { Internet protocol [IP] address translation }

H04L 61/2507 . . . { translating between special types of IP addresses }

H04L 61/251 . . . . { between different IP versions }

H04L 61/2514 . . . . { between local and global IP addresses }

H04L 61/2517 . . . . { involving port numbers }

H04L 61/2521 . . . { Special translation architecture, i.e. being different from a single network address translation [NAT] server }

H04L 61/2525 . . . . { Translation at a client }

H04L 61/2528 . . . . { Translation at a proxy }

H04L 61/2532 . . . . { Clique of NAT servers }

H04L 61/2535 . . . . { Multiple local networks, e.g. resolving potential IP address conflicts }

H04L 61/2539 . . . { for hiding addresses or keeping them anonymous }

H04L 61/2542 . . . { involving dual-stack hosts }

H04L 61/2546 . . . { Mechanisms for avoiding unnecessary translation }

H04L 61/255 . . . { Map-table maintenance and indexing }

H04L 61/2553 .... { Binding renewal aspects; Keep-alive messages }
H04L 61/2557 ... { Translation policies and rules }
H04L 61/256 ... { Network address translation [NAT] traversal }
H04L 61/2564 .... { for a higher-layer protocol, e.g. for session initiation protocol [SIP] (SIP for real-time communications H04L 65/1006) }
H04L 61/2567 .... { for reachability, e.g. inquiring the address of a correspondent behind a NAT server }
H04L 61/2571 .... { for identification, e.g. for authentication or billing (charging arrangements H04L 12/14) }
H04L 61/2575 .... { using address mapping retrieval, e.g. simple traversal of user datagram protocol through NAT [STUN] }
H04L 61/2578 .... { transparent to the NAT server }
H04L 61/2582 .... { through control of the NAT server, e.g. using universal plug and play [UPnP] }
H04L 61/2585 .... { through application level gateway [ALG] }
H04L 61/2589 .... { over a relay server, e.g. traversal using relay NAT [TURN] }
H04L 61/2592 .... { involving tunnelling or encapsulation (protecting information from access by third parties H04L 63/04) }
H04L 61/2596 .. { Non - internet protocol [IP] address translation }

H04L 61/30 . { Arrangements for managing names, e.g. use of aliases or nicknames (retrieval from the Internet by using information identifiers, e.g. uniform resource locators [URLs] G06F 17/30876 ; name-to-address mapping H04L 61/15) }
H04L 61/3005 .. { Mechanisms for avoiding name conflicts }
H04L 61/301 .. { Name conversion }
H04L 61/3015 .. { Name registration, generation or assignment }
H04L 61/302 ... { Administrative registration, e.g. for domain names at internet corporation for assigned names and numbers [ICANN] (data processing specially adapted for administration or management G06Q 10/00) }
H04L 61/3025 ... { Domain name generation or assignment }
H04L 61/303 .. { Name structure }
H04L 61/3035 ... { containing non-Latin characters, e.g. Chinese domain names }
H04L 61/304 ... { containing protocol addresses or telephone numbers (address type involved H04L 61/6018) }
H04L 61/3045 ... { containing wildcard characters }
H04L 61/305 ... { containing special prefixes }
H04L 61/3055 ... { containing special suffixes }
H04L 61/306 .. { Name types }
H04L 61/3065 ... { Application layer names, e.g. buddy name, unstructured name chosen by a user or home appliance name }
H04L 61/307 ... { E-mail addresses (message switching systems H04L 12/58) }
H04L 61/3075 ... { Access point names [APN], i.e. name of a gateway general packet radio service support node [GGSN] connecting a mobile user to a packet data network [PDN] }
H04L 61/308 ... { Telephone uniform resource identifier [URI] }
H04L 61/3085 ... { Session initiation protocol [SIP] uniform resource identifier [URI] }
H04L 61/309 ... { Globally routable user-agent [GRUU] uniform resource identifier [URI] for the

session initiation protocol [SIP] }

H04L 61/3095 . . . { Internet protocol multimedia private identity [IMPI] or internet protocol multimedia public identity [IMPU] }

H04L 61/35 . { involving non-standard use of addresses for implementing network functionalities, e.g. coding subscription information within the address or functional addressing, i.e. assigning an address to a function }

H04L 61/60 . { Details }

H04L 61/6004 . . { Structures or formats of addresses }

H04L 61/6009 . . { Caching of addresses (caching data temporarily at an intermediate stage in general H04L 67/2842) }

H04L 61/6013 . . { Proxying of addresses }

H04L 61/6018 . . { Address types }

H04L 61/6022 . . . { Layer 2 addresses, e.g. medium access control [MAC] addresses }

H04L 61/6027 . . . { Control area network [CAN] identifiers (vehicle networks B60R 16/0315) }

H04L 61/6031 . . . { Small computer system interface [SCSI] addresses }

H04L 61/6036 . . . { IEEE1394 identification numbers }

H04L 61/604 . . . { Asynchronous transfer mode [ATM] addresses }

H04L 61/6045 . . . { Fibre channel identifiers }

H04L 61/605 . . . { Telephone numbers }

H04L 61/6054 . . . { International mobile subscriber identity [IMSI] numbers }

H04L 61/6059 . . . { Internet protocol version 6 [IPv6] addresses }

H04L 61/6063 . . . { Transport layer addresses, e.g. aspects of transmission control protocol [TCP] or user datagram protocol [UDP] ports (TCP/IP or UDP protocol aspects or techniques H04L 69/16) }

H04L 61/6068 . . { Internet protocol [IP] addresses subnets }

H04L 61/6072 . . { Short addresses }

H04L 61/6077 . . { Multiple interfaces, e.g. multihomed nodes }

H04L 61/6081 . . { involving addresses for wireless personal area networks and wireless sensor networks, e.g. Zigbee addresses (network addressing or numbering for mobility support H04W 8/26) }

H04L 61/6086 . . { involving dual-stack hosts, e.g. in internet protocol version 4 [IPv4]/ internet protocol version 6 [IPv6] networks (implementation details of transmission control protocol [TCP]/internet protocol [IP] or user datagram protocol [UDP]/internet protocol [IP] stack architecture H04L 69/161) }

H04L 61/609 . . { involving geographic information, e.g. room number }

H04L 61/6095 . . { involving masks or ranges of addresses }

H04L 63/00 { Network architectures or network communication protocols for network security (cryptographic mechanisms or cryptographic arrangements for secret or secure communication H04L 9/00 ; network architectures or network communication protocols for wireless network security H04W 12/00 ; security arrangements for protecting computers or computer systems against unauthorised activity G06F 21/00) }

WARNING

[N: WARNING Groups H04L 63/00 - H04L 63/20 do not correspond to former or

current IPC groups. Concordance CPC : IPC for these groups is as follows: - H04L 63/00 - H04L 63/20 : H04L 29/06

H04L 63/02 . { for separating internal from external traffic, e.g. firewalls }

H04L 63/0209 .. { Architectural arrangements, e.g. perimeter networks or demilitarized zones }

H04L 63/0218 ... { Distributed architectures, e.g. distributed firewalls }

H04L 63/0227 .. { Filtering policies (mail message filtering H04L 12/585) }

H04L 63/0236 ... { Filtering by address, protocol, port number or service, e.g. IP-address or URL }

H04L 63/0245 ... { Filtering by information in the payload }

H04L 63/0254 ... { Stateful filtering }

H04L 63/0263 ... { Rule management }

H04L 63/0272 .. { Virtual private networks }

H04L 63/0281 .. { Proxies }

H04L 63/029 .. { Firewall traversal, e.g. tunnelling or, creating pinholes }

H04L 63/04 . { for providing a confidential data exchange among entities communicating through data packet networks }

H04L 63/0407 .. { wherein the identity of one or more communicating identities is hidden (cryptographic mechanisms or cryptographic arrangements for anonymous credentials or for identity based cryptographic systems H04L 9/00) }

H04L 63/0414 ... { during transmission, i.e. party's identity is protected against eavesdropping, e.g. by using temporary identifiers, but is known to the other party or parties involved in the communication }

H04L 63/0421 ... { Anonymous communication, i.e. the party's identifiers are hidden from the other party or parties, e.g. using an anonymizer }

H04L 63/0428 .. { wherein the data content is protected e.g. by encrypting or encapsulating the payload }

H04L 63/0435 ... { wherein the sending and receiving network entities apply symmetric encryption, i.e. same key used for encryption and decryption (cryptographic mechanisms or cryptographic arrangements for symmetric key encryption H04L 9/06) }

H04L 63/0442 ... { wherein the sending and receiving network entities apply asymmetric encryption, i.e. different keys for encryption and decryption (cryptographic mechanisms or cryptographic arrangements for public-key encryption H04L 9/30) }

H04L 63/045 ... { wherein the sending and receiving network entities apply hybrid encryption, i.e. combination of symmetric and asymmetric encryption (cryptographic mechanisms or cryptographic arrangements using a plurality of keys or algorithms H0L9/14) }

H04L 63/0457 ... { wherein the sending and receiving network entities apply dynamic encryption, e.g. stream encryption (cryptographic mechanisms or cryptographic arrangements for stream encryption H04L 9/065) }

H04L 63/0464 ... { using hop-by-hop encryption, i.e. wherein an intermediate entity decrypts the information and re-encrypts it before forwarding it }

H04L 63/0471 ... { applying encryption by an intermediary, e.g. receiving clear information at the intermediary and encrypting the received information at the intermediary before

forwarding }

H04L 63/0478 . . . { applying multiple layers of encryption, e.g. nested tunnels or encrypting the content with a first key and then with at least a second key (cryptographic mechanisms or cryptographic arrangements using a plurality of keys or algorithms H04L 9/14) }

H04L 63/0485 . . . { Networking architectures for enhanced packet encryption processing, e.g. offloading of IPsec packet processing or efficient security association look-up }

H04L 63/0492 . . . { by using a location-limited connection, e.g. near-field communication or limited proximity of entities }

H04L 63/06 . { for supporting key management in a packet data network (cryptographic mechanisms or cryptographic arrangements for key management H04L 9/08) }

H04L 63/061 . . { for key exchange, e.g. in peer-to-peer networks (cryptographic mechanisms or cryptographic arrangements for key agreement H04L 9/0838) }

H04L 63/062 . . { for key distribution, e.g. centrally by trusted party (cryptographic mechanisms or cryptographic arrangements for key distribution involving a central third party H04L 9/0819) }

H04L 63/064 . . . { Hierarchical key distribution, e.g. by multi-tier trusted parties }

H04L 63/065 . . { for group communications (cryptographic mechanisms or cryptographic arrangements for key management involving conference or group key H04L 9/0833) }

H04L 63/067 . . { using one-time keys (cryptographic mechanisms or cryptographic arrangements for generation of one-time passwords H04L 9/0863) }

H04L 63/068 . . { using time-dependent keys, e.g. periodically changing keys (cryptographic mechanisms or cryptographic arrangements for controlling usage of secret information H04L 9/088) }

H04L 63/08 . { for supporting authentication of entities communicating through a packet data network (cryptographic mechanisms or cryptographic arrangements for entity authentication H04L 9/32) }

H04L 63/0807 . . { using tickets, e.g. Kerberos (cryptographic mechanisms or cryptographic arrangements for entity authentication using tickets or tokens H04L 9/3213) }

H04L 63/0815 . . { providing single-sign-on or federations }

H04L 63/0823 . . { using certificates (cryptographic mechanisms or cryptographic arrangements for entity authentication involving certificates H04L 9/3263) }

H04L 63/083 . . { using passwords (cryptographic mechanisms or cryptographic arrangements for entity authentication using a predetermined code H04L 9/3226) }

H04L 63/0838 . . . { using one-time-passwords }

H04L 63/0846 . . . { using time-dependent-passwords, e.g. periodically changing passwords }

H04L 63/0853 . . { using an additional device, e.g. smartcard, SIM or a different communication terminal (cryptographic mechanisms or cryptographic arrangements for entity authentication involving additional secure or trusted devices H04L 9/3234) }

H04L 63/0861 . . { using biometrical features, e.g. fingerprint, retina-scan (cryptographic mechanisms or cryptographic arrangements for entity authentication using biological data H04L 9/3231) }

H04L 63/0869 . . { for achieving mutual authentication (cryptographic mechanisms or cryptographic arrangements for mutual authentication H04L 9/3273) }

H04L 63/0876 . . { based on the identity of the terminal or configuration, e.g. MAC address, hardware or software configuration or device fingerprint }

H04L 63/0884 . . { by delegation of authentication, e.g. a proxy authenticates an entity to be authenticated on behalf of this entity vis-?-vis an authentication entity }

H04L 63/0892 . . { by using authentication-authorization-accounting [AAA] servers or protocols }

H04L 63/10 . { for controlling access to network resources (restricting network management access H04L 12/2461) }

H04L 63/101 . . { Access control lists (ACL) }

H04L 63/102 . . { Entity profiles }

H04L 63/104 . . { Grouping of entities }

H04L 63/105 . . { Multiple levels of security }

H04L 63/107 . . { wherein the security policies are location-dependent, e.g. entities privileges depend on current location or allowing specific operations only from locally connected terminals }

H04L 63/108 . . { when the policy decisions are valid for a limited amount of time }

H04L 63/12 . { Applying verification of the received information (cryptographic mechanisms or cryptographic arrangements for data integrity or data verification H04L 9/32) }

H04L 63/123 . . { received data contents, e.g. message integrity }

H04L 63/126 . . { the source of the received data }

H04L 63/14 . { for detecting or protecting against malicious traffic }

H04L 63/1408 . . { by monitoring network traffic (monitoring network traffic per se H04L 12/2602) }

H04L 63/1416 . . . { Event detection, e.g. attack signature detection }

H04L 63/1425 . . . { Traffic logging, e.g. anomaly detection }

H04L 63/1433 . . { Vulnerability analysis }

H04L 63/1441 . . { Countermeasures against malicious traffic (countermeasures against attacks on cryptographic mechanisms H04L 9/002) }

H04L 63/145 . . . { the attack involving the propagation of malware through the network, e.g. viruses, trojans or worms }

H04L 63/1458 . . . { Denial of Service }

H04L 63/1466 . . . { Active attacks involving interception, injection, modification, spoofing of data unit addresses, e.g. hijacking, packet injection or TCP sequence number attacks }

H04L 63/1475 . . . { Passive attacks, e.g. eavesdropping or listening without modification of the traffic monitored }

H04L 63/1483 . . . { service impersonation, e.g. phishing, pharming or web spoofing (detection of rogue wireless access points H04W 12/12) }

H04L 63/1491 . . . { using deception as countermeasure, e.g. honeypots, honeynets, decoys or entrapment }

H04L 63/16 . { Implementing security features at a particular protocol layer }

H04L 63/162 . . { at the data link layer }

H04L 63/164 . . { at the network layer }

H04L 63/166 . . { at the transport layer }

H04L 63/168 . . { above the transport layer }

H04L 63/18 . { using different networks or paths for security, e.g. using out of band channels (cryptographic mechanisms or cryptographic arrangements for key distribution involving distinctive intermediate devices or communication paths H04L 9/0827 ; cryptographic mechanisms or cryptographic arrangements for authentication using a

plurality of channels H04L 9/3215) }

H04L 63/20 . { for managing network security; network security policies in general (filtering policies H04L 63/0227) }

H04L 63/205 . . { involving negotiation or determination of the one or more network security mechanisms to be used, e.g. by negotiation between the client and the server or between peers or by selection according to the capabilities of the entities involved (negotiation of communication capabilities H04L 69/24) }

H04L 63/30 . { for supporting lawful interception, monitoring or retaining of communications or communication related information (circuit switched telephony call monitoring H04M 3/2281) }

H04L 63/302 . . { gathering intelligence information for situation awareness or reconnaissance }

H04L 63/304 . . { intercepting circuit switched data communications (lawful interception of wireless network communications H04W 12/02) }

H04L 63/306 . . { intercepting packet switched data communications, e.g. Web, Internet or IMS communications }

H04L 63/308 . . { retaining data, e.g. retaining successful, unsuccessful communication attempts, internet access, or e-mail, internet telephony, intercept related information or call content }

H04L 65/00 { Network arrangements or protocols for real-time communications (computer conference H04L 12/1813 ; real time or near real time messaging in message switching systems e.g. instant messaging H04L 12/581 ; television systems H04N 7/00 ; selective video distribution H04N21; interconnection arrangements between switching centres for working between exchanges having different types of switching equipment where the types of switching equipment comprise PSTN/ISDN equipment and equipment of networks other than PSTN/ISDN H04M 7/1205 ; systems providing special services to telephonic subscribers H04M 3/42 ; network applications in general H04L 67/00) }

NOTE

WARNING

Groups H04L 65/00 - H04L 65/80 do not correspond to former or current IPC groups. Concordance CPC : IPC for these groups is as follows: - H04L 65/00 - H04L 65/80 : H04L 29/06] Notes 1. This group covers: - only communications which fulfill the following two conditions: i. they are based on packet data; ii. there is real-time or pseudo-real-time temporal association between source and destination, or source and network, or destination and network; - provided that the above two conditions are met, this group covers arrangements relating to a. the transmission of the multimedia data itself, b. the user-to-user, user-to-network, inter-network or intra-network signalling supporting: b1. the establishment of a session for the subsequent transmission of the multimedia data, or b2. the maintenance of the session or b3. the application services available to the user during the session (unless explicitly excluded in certain cases). 2. This group does not cover: - non-real-time multimedia file transfer, which is covered by H04L 67/06 - multimedia store or forward messaging as in e-mail, MMS or the like, which is covered by H04L 12/58 - analogue video streaming, as in analogue television systems, which is covered by H04N 7/00 - selective distribution of MPEG elementary or transport streams, containing video and additional data, which is covered by H04N 21/00 - bit streaming, i.e. not packet-based, as in ISDN which is covered by H04Q 11/40 - instant messaging, which is covered by H04L 12/581 - any other multimodal data communications which do not meet the conditions of

being packet-based and real-time or pseudo-real-time - flow control in packet switching networks, which is covered by H04L 12/56 D. 3. In this group the following terms or expressions are used with the meaning indicated: - H.323 means International Telecommunication Union Recommendation no. 323, series H, entitled "Packet-based multimedia communications systems" - IP means Internet Protocol - IMS means IP Multimedia Subsystem - ISDN means Integrated Services Digital Network - MGC means Media Gateway Control/Controller - MGCP means Media Gateway Control Protocol - MMS means Multimedia Messaging Service - PBX means Private Branch Exchange - PSTN means Public Switched Telephone Network - QoS means Quality of Service - RTP means Real Time Protocol - RTCP means Real Time Control Protocol - RTSP means Real Time Streaming Protocol. - SIP means Session Initiation Protocol - SPAM means unsolicited electronic mail - SPIT means SPAM Prevention in IP Telephony]

H04L 65/10 . { Signalling, control or architecture (selecting or control in telephonic networks H04Q 3/00 ; data network management H04L 12/24 ; data network testing or monitoring H04L 12/26 ; admission control or resource reservation in packet switching networks H04L 12/5695 ; control signalling related to video distribution H04N 21/63) }

H04L 65/1003 .. { Signalling or session protocols }

H04L 65/1006 ... { SIP }

H04L 65/1009 ... { H.323 }

H04L 65/1013 .. { Network architectures, gateways, control or user entities }

H04L 65/1016 ... { IMS (wireless communication networks H04W) }

H04L 65/102 ... { Gateways (arrangements for connecting between networks having differing types of switching systems, e.g. gateways H04L 12/66) }

H04L 65/1023 .... { Media gateways }

H04L 65/1026 ..... { at the edge }

H04L 65/103 ..... { in the network }

H04L 65/1033 .... { Signalling gateways }

H04L 65/1036 ..... { at the edge }

H04L 65/104 ..... { at the edge }

H04L 65/1043 ... { MGC, MGCP or Megaco (decomposed PSTN/ISDN-IP gateways H04M 7/1255) }

H04L 65/1046 ... { Call controllers; Call servers }

H04L 65/105 ... { Proxies, e.g. SIP proxies }

H04L 65/1053 ... { Arrangements providing PBX functionality, e.g. IP PBX (circuit switched PBXs H04M 3/42314 ; PBX networks H04M 7/009) }

H04L 65/1056 .... { for multi-site }

H04L 65/1059 ... { End-user terminal functionality (substation equipment for use by subscribers H04M 1/00 ; terminal profiles H04L 67/303 ; terminal emulation H04L 67/08 ; adaptation for terminals with limited resources or for terminal portability H04L 67/04 ; management of video client characteristics H04N 21/258 , H04N 21/4516) }

H04L 65/1063 ... { Application servers (systems providing special services to telephonic subscribers H04M 3/42) }

H04L 65/1066 .. { Session control (conducting a computer conference e.g. admission, detection,

selection or grouping of participants, correlating users to one or more conference session or prioritising transmission H04L 12/1822 ; admission control/resource reservation in packet switching networks H04L 12/5695) }

H04L 65/1069 . . . { Setup (computer conference organisation arrangements, e.g. handling schedules, setting up parameters needed by nodes to attend a conference, booking network resources or notifying involved parties H04L 12/1818 ; session management in network applications H04L 67/14 ; arrangements for peer-to-peer networking in network applications H04L 67/104 ; negotiation of communication capabilities H04L 69/24 ; admission control or resource reservation in packet switching networks H04L 12/5695) }

H04L 65/1073 . . . { Registration (arrangements for addressing or naming in data networks H04L 61/00) }

H04L 65/1076 . . . { Screening (arrangements for screening incoming telephone calls H04M 3/436 ; arrangements for network security H04L63) }

H04L 65/1079 . . . . { of unsolicited session attempts, e.g. SPIT (message switching systems, e.g. electronic mail systems, with filtering and selective blocking capabilities H04L 12/585) }

H04L 65/1083 . . . { In-session procedures (computer conferences, network arrangements for conference optimisation or adaptation H04L 12/1827 ; reactions to resource unavailability in packet switching networks H04L 12/56R3 ; reallocation or renegotiation of resources in packet switching networks H04L 12/56R5) }

H04L 65/1086 . . . . { session scope modification }

H04L 65/1089 . . . . . { by adding or removing media }

H04L 65/1093 . . . . . { by adding or removing participants }

H04L 65/1096 . . . { Features, e.g. call-forwarding or call hold (systems providing special services to telephonic subscribers H04M 3/42) }

H04L 65/40 . { Services or applications (systems providing special services to telephonic subscribers H04M 3/42 ; contact center services H04M 3/51 ; information services comprising voice H04M 3/487 ; network service management for ensuring proper service fulfilment H04L 12/2464) }

H04L 65/4007 . . { Services involving a main real-time session and one or more additional parallel sessions (real time messaging, e.g. instant messaging, interacting with other applications or services H04L 12/582 ; multichannel or multilink protocols H04L 69/14 ; services and arrangements where telephone services are combined with data services H04M 7/0024) }

H04L 65/4015 . . . { where at least one of the additional parallel sessions is real time or time sensitive, e.g. white board sharing, collaboration or spawning of a subconference (telewriting, virtual reality or network gaming H04L 67/38) }

H04L 65/4023 . . . { where none of the additional parallel sessions is real time or time sensitive, e.g. downloading a file in a parallel FTP session, initiating an email or combinational services (file transfer H04L 67/06 ; WEB based applications H04L 67/02 ; message switching systems H04L 12/58 ; instant messaging H04L 12/581) }

H04L 65/403 . . { Arrangements for multiparty communication, e.g. conference (television conferencing systems H04N 7/15 ; telephonic conference systems H04M 3/56 ; data switching systems for computer conference H04L 12/1813) }

H04L 65/4038 . . . { with central floor control (data switching systems for conducting a computer conference, e.g. admission, detection, selection or grouping of participants H04L 12/1822) }

H04L 65/4046 . . . { with distributed floor control }

H04L 65/4053 . . . { without floor control }

H04L 65/4061 . . { "Push-to-X" services (push-to-talk services in wireless networks H04W 4/10 ;

connection management, e.g. connection set-up, manipulation or release for push-to-talk or push-on-call services in wireless communication networks H04W 76/08A) }

H04L 65/4069 . . { Services related to one way streaming }

H04L 65/4076 . . . { Multicast or broadcast (data switching systems for broadcast or conference H04L 12/18 ; analog television systems in general H04N 7/00 ; creating video channels for a dedicated end-user group H04N 21/2668 ; arrangements for broadcast or distribution combined with broadcast H04H 20/00 ; arrangements for broadcast applications with a direct linkage of broadcast information H04H 60/00 ; arrangements for push based network services H04L 67/26) }

H04L 65/4084 . . . { Content on demand (analog television systems using two way working H04N 7/173 ; end-user applications for requesting content, additional data or services H04N 21/472) }

H04L 65/4092 . . . { Control of source by destination, e.g. user controlling streaming rate of server (explicit feedback from the destination to the source to modify data rate for flow control or congestion control in packet switching networks, e.g. choke packet H04L 12/56D17 ; end-to-end flow control in packet switching networks H04L 12/56D8 ; analog television systems using two way working H04N 7/173 ; control signals to video servers issued by video clients H04N 21/6377) }

H04L 65/60 . { Media handling, encoding, streaming or conversion }

H04L 65/601 . . { Media manipulation, adaptation or conversion (transmission of television signals using pulse code modulation H04N 7/24 ; adaptation for terminals or networks with limited resources or for terminal portability H04L 67/04 ; involving interrnediate processing or storage in the network H04L 67/28 ; network application being adapted for the location of the user terminal H04L 67/18 ; computer conferences, network arrangements for conference optimisation or adaptation H04L 12/1827 ; message switching systems, e.g. electronic mail systems, with message adaptation based on network or terminal capabilities H04L 12/5825 ; flow control or congestion control in packet switching networks H04L 12/569) }

H04L 65/602 . . . { at the source (reformatting of video signals in video distribution servers H04N 21/2343 ; reformatting of additional data in video distribution servers H04N 21/2355) }

H04L 65/604 . . . { at the destination (reformatting of video signals in video clients H04N 21/4402 ; reformatting of additional data in video clients H04N 21/4355) }

H04L 65/605 . . . { intermediate }

H04L 65/607 . . { Stream encoding details (interfacing the downstream path of a video distribution network H04N 21/238 , H04N 21/438 ; controlling the complexity of a video stream H04N 21/2662 , H04N 21/4621 , H04N 21/64792 ; protocols for data compression H04L 69/04 ; header parsing or analysis H04L 69/22) }

H04L 65/608 . . { Streaming protocols, e.g. RTP or RTCP }

H04L 65/80 . { QoS aspects (traffic-type related flow control in packet switching networks, e.g. priorities or QoS H04L 12/56D15 ; admission control/resource reservation in packet switching networks based on QoS or priority awareness H04L 12/56R9C , monitoring arrangements, testing arrangements, with monitoring of QoS metrics H04L 12/2634 ; arrangements for scheduling or organising the servicing of requests whereby quality of service or priority requirements are taken into account H04L 67/322 ; network service management, ensuring proper service fulfillment according to an agreement or contract between two parties, e.g. between an IT-provider and a customer H04L 12/2464 ; adaptation for terminals or networks with limited resources, or for terminal portability H04L 67/04 ; reducing the amount or size of exchanged application data H04L 67/28L ; network application adapted for the location of the user terminal H04L 67/18 ; monitoring of the downstream path of a video distribution network H04N 21/2402 , H04N 21/44209) }

H04L 67/00 { Network-specific arrangements or communication protocols supporting networked applications (message switching systems H04L 51/00 ; network management protocols H04L 41/00 ; routing or path finding of packets in data switching networks H04L 45/00 ; protocols for real-time multimedia communication H04L 65/00 ; information retrieval G06F 17/30 ; services or facilities specially adapted for wireless communication networks H04W 4/00 ; network structures or processes for video distribution between server and client or between remote clients H04N 21/00 ; exchange systems providing special services or facilities to subscribers involving telephonic communications H04M 3/42 ; distributed information systems G06F 9/00 , G06F 17/00 ; lower layer network functionalities which support application layer provisions H04L 12/00) }

NOTE

This group covers: (1) Networking arrangements or communication protocols to support networked applications which occur at the abstract network layers 5 to 7 of the OSI layer model. The higher layers constitute the interface between the network and the computer applications that use the network to communicate. (2) Network-specific aspects of client-server applications as well as of networking arrangements supporting networked/distributed applications, e.g. data transport, scheduling. This group also covers specific networked application layer protocols, e.g. FTP, WAP, HTTP. This group does not cover: (1) Distributed applications which are network-agnostic, i.e. distributed information systems for which the network functions are transparent. These field are covered, e.g. by G06F 9/00 , G06F 17/00 . Data switching network provisions in general and the lower layer network functionalities which support application layer provisions are covered by H04L 12/00]

WARNING

Groups H04L 67/00 - H04L 67/42 do not correspond to former or current IPC groups. Concordance CPC : IPC for these groups is as follows: - H04L 67/00 - H04L 67/36 : H04L 29/08 - H04L 67/38 - H04L 67/42 : H04L 29/06]

H04L 67/02 . { involving the use of web-based technology, e.g. hyper text transfer protocol [HTTP] (information retrieval from the Internet G06F 17/30861) }

H04L 67/025 . . { for remote control or remote monitoring of the application (management of end-device applications over a special purpose or proprietor network H04L 67/125 ; network management using Internet technology H04L 12/2408 ; network monitoring H04L 12/2602) }

H04L 67/04 . { adapted for terminals or networks with limited resources or for terminal portability, e.g. wireless application protocol [WAP] (services or facilities specially adapted for wireless communication networks H04W4) }

H04L 67/06 . { adapted for file transfer, e.g. file transfer protocol [FTP] }

H04L 67/08 . { adapted for terminal emulation, e.g. telnet (protocols for telewriting or protocols for networked simulations, virtual reality or games H04L 67/38 ; emulation or software simulation G06F 9/455) }

H04L 67/10 . { in which an application is distributed across nodes in the network (multiprogramming arrangements G06F 9/46) }

H04L 67/1002 .. [N: for accessing one among a plurality of replicated servers, e.g. load balancing (arrangements or protocols for peer-to-peer networking H04L 67/104 ; protocols for client-server architectures H04L 67/42 ; allocation of processing resources to service requests in a distributed system G06F 9/5027 ; rebalancing the processing load in a distributed system G06F 9/5083 ; wireless network traffic load balancing H04W 28/08 ; network load balancing, traffic engineering H04L 12/56D2B ; video servers using load balancing strategies H04N 21/23103 ; error detection or correction of the data by redundancy in hardware G06F 11/16)

H04L 67/1004 ... { Server selection in load balancing }

H04L 67/1006 .... { with static server selection, e.g. the same server being selected for a specific client (allocation of processing resources considering data affinity G06F 9/5033) }

H04L 67/1008 .... { based on parameters of servers, e.g. available memory or workload (allocation of processing resources to a machine considering the load G06F 9/505) }

H04L 67/101 .... { based on network conditions }

H04L 67/1012 .... { based on compliance of requirements or conditions with available server resources }

H04L 67/1014 .... { based on the content of a request }

H04L 67/1017 .... { based on a round robin mechanism }

H04L 67/1019 .... { based on random server selection }

H04L 67/1021 .... { based on client or server locations }

H04L 67/1023 .... { based on other criteria, e.g. hash applied to IP address, specific algorithms or cost }

H04L 67/1025 ... { dynamic adaptation of the criteria on which the server selection is based }

H04L 67/1027 ... { Persistence of sessions during load balancing }

H04L 67/1029 ... { using data related to the state of servers by a load balancer (server selection based on server parameters H04L 67/1008 ; performance measurement for load balancing G06F 11/3433 ; information retrieval in structured data stores G06F 17/30286) }

H04L 67/1031 ... { Controlling of the operation of servers by a load balancer, e.g. adding or removing servers that serve requests }

H04L 67/1034 ... { Reaction to server failures by a load balancer (techniques for recovering from a failure of a protocol instance or entity H04L 69/40 ; departure or maintenance mechanisms in Peer-to-Peer networks H04L 67/1048 ; intermediate processing providing operational support to end devices by emulation or by off-loading in the network H04L 67/2861 ; network fault restoration H04L 12/2422 ; error detection or correction of the data by redundancy in hardware G06F 11/16 ; failing over workload from one server to another one G06F 11/202) }

H04L 67/1036 ... { Load balancing of requests to servers for services different from user content provisioning, e.g. load balancing to DNS servers or firewalls (internet service provider selection H04L 12/5691) }

H04L 67/1038 ... { Load balancing arrangements to avoid a single path through a load balancer }

H04L 67/104 .. { for peer-to-peer [P2P] networking; Functionalities or architectural details of P2P networks (file transfer, upload, download H04L 67/06 ; accessing replicated servers H04L 67/1002 ; presence management H04L 67/24 ; scheduling provisions H04L 67/32 ; real-time communications H04L 65/00 ; information retrieval using distributed database systems G06F 17/30283 ; small scale hierarchical wireless network topologies H04W 84/10 ; wireless interfaces between terminal devices H04W 92/18 ; P2P connections between video clients H04N 21/632 ; P2P

connections between video game machines A63F 13/12) }

H04L 67/1042 . . . { involving topology management mechanisms }

H04L 67/1044 . . . . { Group management mechanisms (user group management in wireless communication networks H04W 4/08 ; management of multicast group membership H04L 12/185 ; reconfiguring of node membership in a computing system to eliminate errors G06F 11/1425) }

H04L 67/1046 . . . . . { Joining mechanisms }

H04L 67/1048 . . . . . { Departure or maintenance mechanisms (methods for recovering from a failure of a protocol instance or entity H04L 69/40 ; intermediate processing providing operational support to end devices by emulation or by off-loading in the network H04L 67/2861 ; reactions to server failures by a load balancer H04L 67/1034 ; error detection or correction of the data by redundancy in operation G06F 11/14) }

H04L 67/1051 . . . . . { Group master selection mechanisms }

H04L 67/1053 . . . . . { with pre-configuration of logical or physical connections with a determined number of other peers }

H04L 67/1055 . . . . . { involving connection limits (involving dynamic management of active down- or uploading connections H04L 67/1085) }

H04L 67/1057 . . . . . { involving pre-assessment of levels of reputation of peers }

H04L 67/1059 . . . . { Inter-group management mechanisms, e.g. splitting, merging or interconnection of groups }

H04L 67/1061 . . . { involving node-based peer discovery mechanisms (access to replicated servers H04L 67/1002 ; service discovery H04L 67/16 ; topology discovery for routing H04L 45/02 ; information retrieval in distributed file systems G06F 17/30067 ; information retrieval in structured data stores, indexing, querying G06F 17/30286) }

H04L 67/1063 . . . . { Discovery through centralizing entities }

H04L 67/1065 . . . . { Discovery involving distributed pre-established resource-based relationships among peers, e.g. based on distributed hash tables [DHT] (pre-configuration of logical or physical connections H04L 67/1053) }

H04L 67/1068 . . . . { Discovery involving direct consultation or announcement among potential requesting and potential source peers }

H04L 67/107 . . . . . { with limitation or expansion of the discovery scope }

H04L 67/1072 . . . . { Discovery involving ranked list compilation of candidate peers }

H04L 67/1074 . . . { for supporting resource transmission mechanisms (routing over an overlay routing layer H04L 45/64 ; file transfer H04L 67/06) }

H04L 67/1076 . . . . { Resource dissemination mechanisms or network resource keeping policies for optimal resource availability in the overlay network }

H04L 67/1078 . . . . { Resource delivery mechanisms }

H04L 67/108 . . . . . { characterized by resources being split in blocks or fragments }

H04L 67/1082 . . . . . { involving incentive schemes }

H04L 67/1085 . . . . . { involving dynamic management of active down- or uploading connections }

H04L 67/1087 . . . { involving cross functional networking aspects }

H04L 67/1089 . . . . { Hierarchical topologies }

H04L 67/1091 . . . . { Interfacing with client-server systems or between P2P systems }

H04L 67/1093 . . . . { Some peer nodes performing special functions }

H04L 67/1095 . . { for supporting replication or mirroring of data, e.g. scheduling or transport for data synchronisation between network nodes or user terminals or syncML (

synchronisation in information retrieval in file systems G06F 17/30067 ; synchronisation in structured data stores G07F 17/30S ; mass storage redundancy by mirroring for error detection or correction of data G06F 11/2056) }

H04L 67/1097 . . { for distributed storage of data in a network, e.g. network file system [NFS], transport mechanisms for storage area networks [SAN] or network attached storage [NAS] (temporary storage of data at an intermediate stage H04L 67/2842 ; dedicated interfaces to storage systems G06F 3/0601) }

H04L 67/12 . { adapted for proprietary or special purpose networking environments, e.g. medical networks, sensor networks, networks in a car or remote metering networks (digital computing or data processing equipment or methods, specially adapted for specific applications in healthcare or life sciences G06F 19/00 ; home automation networks H04L 12/2803 ; total factory control characterised by the network communication G05B 19/4185 ; games involving transmission systems A63F 13/12) }

H04L 67/125 . . { involving the control of end-device applications over a network (end-device control or monitoring using web-based technology H04L 67/025 ; network management of network elements H04L 12/24) }

H04L 67/14 . { for session management (session control for real-time communications H04L 65/1066 ; session initiation protocol H04L 65/1006 ; negotiation of communication capabilities H04L 69/24 ; computer conference arrangements H04L 12/1813 ; connection management in wireless networks H04W 76/00 ; session management for telephonic communication and services H04M 7/00 ; intertask communications in multiprogramming arrangements G06F 9/54) }

H04L 67/141 . . { provided for setup of an application session (session setup for real-time communications H04L 65/1069) }

H04L 67/142 . . { provided for managing session state for stateless protocols; Signalling a session state; State transitions; Keeping-state mechanisms }

H04L 67/143 . . { provided for session termination, e.g., event controlled end of session }

H04L 67/145 . . . { provided for avoiding end of session, e.g. keep-alive, heartbeats, resumption message, wake-up for inactive or interrupted session }

H04L 67/146 . . { Markers provided for unambiguous identification of a particular session, e.g. session identifier, session cookie or URL-encoding (IP multimedia subsystem H04L 65/1016 ; cryptographic mechanisms for verifying the identity or authority of a user or a system, ID based authentication H04L 9/32 ; cryptographic mechanisms for ID based key exchange H04L 9/08) }

H04L 67/147 . . { provided for signalling methods or particular messages providing extensions to IETF, ITU, ETSI or 3GPP protocols, e.g., additional proprietary messages, standard messages enhanced by additional header fields or standard messages being used for purposes other than originally intended }

H04L 67/148 . . { provided for migration or transfer of sessions (in-session procedures in real-time communications H04L 65/1083 ; control or signalling for completing the hand-off in wireless networks H04W 36/0005) }

H04L 67/16 . { Service discovery or service management, e.g. service location protocol [SLP] or Web services (address allocation to terminals or nodes connected to a network H04L 61/30 ; mobile application services specially adapted for wireless communication networks H04W 4/00 ; network service management for ensuring proper service fulfilment according to an agreement or contract between two parties H04L 12/2464) }

H04L 67/18 . { in which the network application is adapted for the location of the user terminal (wireless application services making use of the location of users or terminals H04W 4/02 takes precedence; location based Web retrieval G06F 17/3087) }

H04L 67/20 . { involving third party service providers (e-commerce G06Q 30/00) }

H04L 67/22 . { Tracking the activity of the user (recording of computer activity G06F 11/34 ; network monitoring arrangements H04L 12/2602 ; e-commerce G06Q 30/00) }

H04L 67/24 . { Presence management (use and manipulation of presence information in instant messaging H04L 12/5815) }

H04L 67/26 . { Push based network services (broadcast or multicast push services H04L 12/1859) }

H04L 67/28 . { for the provision of proxy services, e.g. intermediate processing or storage in the network (network management provisions H04L 12/24 ; network monitoring provisions H04L 12/2602 ; media manipulation, adaptation or conversion in real-time communications H04L 65/601 ; protocol conversion H04L 69/08 ; proxies for network security H04L 63/0281) }

H04L 67/2804 . . { for adding application control or application functional data, e.g. adding metadata }

H04L 67/2809 . . { for brokering (negotiation of communication capabilities H04L 69/24 ; e-commerce G06Q 30/00) }

H04L 67/2814 . . { for data redirection (load balancing of replicated servers H04L 67/1002 ; access network selection H04L 12/28P1A ; routing or path finding of packets H04L 45/00 ; content or context based routing H04L 67/327 ; network addressing or naming provisions H04L 61/00) }

H04L 67/2819 . . { Enhancement of application control based on intercepted application data }

H04L 67/2823 . . { for conversion or adaptation of application content or format (protocol conversion H04L 69/08 ; media manipulation, adaptation or conversion in real-time communications H04L 65/601 ; message adaptation based on network or terminal capabilities H04L 12/5825 ; optimising visualization of content for web browsing G06F 17/30905) }

H04L 67/2828 . . . { for reducing the amount or size of exchanged application data (protocols for data compression H04L 69/04 ; digital video compression H04N 7/26) }

H04L 67/2833 . . { for grouping or aggregating service requests, e.g. for unified processing of service requests (networking arrangements or communication protocols for scheduling or organising the servicing of application requests H04L 67/32) }

H04L 67/2838 . . { for integrating service provisioning from a plurality of service providers (web site content organization and management G06F 17/3089) }

H04L 67/2842 . . { for storing data temporarily at an intermediate stage, e.g. caching (distributed storage of data in a network H04L 67/1097 ; browsing optimization of access to content by caching G06F 17/30902 ; addressing of a cache within a hierarchically structured memory system G06F 12/0802 ; disk caching G06F 12/0866) }

H04L 67/2847 . . . { involving pre-fetching or pre-delivering data based on network characteristics (cache prefetching within a hierarchical structured memory system G06F 12/0862) }

H04L 67/2852 . . . { involving policies or rules for updating, deleting or replacing the stored data based on network characteristics (replacement control in memory systems G06F 12/12) }

H04L 67/2857 . . . { involving storage of data provided by user terminals, i.e. reverse caching }

H04L 67/2861 . . { for providing operational support to end devices by emulation, e.g. when they are unavailable, or by off-loading in the network (techniques for recovering from a failure of a protocol instance or entity H04L 69/40 ; reactions to server failures by a load balancer H04L 67/1034 ; departure or maintenance mechanisms in peer-to-peer networks H04L 67/1048 ; terminal emulation H04L 67/08 ; disconnected operation in file systems G06F 17/30067 ; emulation or software simulation G06F 9/455 ; input/output emulation function for peripheral devices G06F 13/105) }

H04L 67/2866 . . { Architectural aspects }

H04L 67/2871 . . . { Implementation details of a single intermediate entity }

H04L 67/2876 . . . { Pairs of interprocessing entities at each side of the network, e.g. split proxies }

H04L 67/288 . . . { Distributed intermediate devices, i.e. intermediate device interaction with other intermediate devices on the same level }

H04L 67/2885 . . . { Hierarchically arranged intermediate devices, e.g. hierarchical caching }

H04L 67/289 . . . { where the intermediate processing is functionally located closer to the data consumer application, e.g. in same machine, in same home or in same subnetwork }

H04L 67/2895 . . . { where the intermediate processing is functionally located closer to the data provider application, e.g. reverse proxies; in same machine, in same cluster or subnetwork }

H04L 67/30 . { involving profiles }

H04L 67/303 . . { Terminal profiles }

H04L 67/306 . . { User profiles (configuring for programme initiating G06F 9/44505 ; information retrieval by personalized querying G06F 17/30867) }

H04L 67/32 . { for scheduling or organising the servicing of application requests, e.g. requests for application data transmissions involving the analysis and optimisation of the required network resources (intermediate grouping or aggregating of service requests H04L 67/2833 ; broadcast or conference with schedule organisation H04L 12/1881 ; computer conference arrangements H04L 12/1813 ; network service management, ensuring proper service fulfilment according to an agreement or contract between two parties H04L 12/2464) }

H04L 67/322 . . { whereby quality of service [QoS] or priority requirements are taken into account (QoS aspects in real-time communications H04L 65/80 ; monitoring of QoS metrics H04L 12/2634) }

H04L 67/325 . . { whereby a time schedule is established for servicing the requests }

H04L 67/327 . . { whereby the routing of a service request to a node providing the service depends on the content or context of the request, e.g. profile, connectivity status, payload or application type }

H04L 67/34 . { involving the movement of software or configuration parameters (programme loading or initiating G06F 9/445 ; remote booting G06F 9/4416 ; configuration management of network or network elements H04L 12/2424) }

H04L 67/36 . { involving the display of network or application conditions affecting the network application to the application user (graphical user interfaces for network management H04L 12/2458) }

H04L 67/38 . { Protocols for telewriting; Protocols for networked simulations, virtual reality or games (games using an electronically generated display A63F 13/00 ; remote windowing or X-Windows G06F 9/4445) }

H04L 67/40 . { Protocols for remote procedure calls [RPC] (remote procedure calls G06F 9/547) }

H04L 67/42 . { Protocols for client-server architectures (access to replicated servers H04L 67/1002) }

H04L 69/00 { Application independent communication protocol aspects or techniques in packet data networks (interconnection arrangements between CPUs, memories, or peripherals within a single computer G06F 13/00 ; data switching networks H04L12; flow control H04L 12/569 ; routing of packets H04L 12/5689 ; network management H04L 12/24 ; network monitoring or testing H04L 12/26 ; network topologies, i.e. networks characterized by the path configuration, media access control H04L 12/28 ; intermediate storage or scheduling H04L 12/5694 ; packet switches and switching fabrics H04L 12/5696 ; message switching systems, e.g. email, H04L 12/58 ; broadcast or multicast H04L 12/18 ; hybrid switching systems H04L 12/64 ; gateways H04L 12/66 ; networks specially adapted for wireless communication H04W ; transmission systems H04B) }

WARNING

Groups H04L 69/00 - H04L 69/40 do not correspond to former or current IPC groups. Concordance CPC : IPC for these groups is as follows: - H04L 69/00 - H04L 69/28 : H04L 29/06 - H04L 69/30 - H04L 69/329 : H04L 29/08 - H04L 69/40 : H04L 29/14]

H04L 69/02 . { Protocol performance }

H04L 69/03 . { Protocol definition or specification (protocol conformance testing H04L 1/244 ; specification techniques G06F 9/44G4S) }

H04L 69/04 . { Protocols for data compression (compression in general H03M 7/30 ; reduction of the amount or size of exchanged application data at an intermediate network processing stage H04L 67/2828 ; optimizing, e.g. header compression, information sizing in wireless communication networks H04W 28/06) }

H04L 69/06 . { Notations for structuring of protocol data, e.g. abstract syntax notation one [ASN.1] }

H04L 69/08 . { Protocols for interworking or protocol conversion (arrangements for connecting between networks having differing types of switching systems, e.g. gateways, H04L 12/66 ; network management protocols conversion H04L 12/2405) }

H04L 69/10 . { Streamlined, light-weight or high-speed protocols, e.g. express transfer protocol [XTP] or byte stream }

H04L 69/12 . { Protocol engines, e.g. VLSIs or transputers }

H04L 69/14 . { Multichannel or multilink protocols }

H04L 69/16 . { Transmission control protocol/internet protocol [TCP/IP] or user datagram protocol [UDP] (transport layer addressing aspects H04L 61/6063 ; network layer protocol adaptations for supporting mobility, e.g. mobile IP, H04W 80/04 ; flow control or congestion control in data switching networks H04L 12/569 ; adapting video multiplex

streams to a specific network H04N 21/2381 ; special adaptations of TCP, UDP or IP for interworking of IP based networks with other networks H04L 69/169) }

H04L 69/161 . . { Implementation details of TCP/IP or UDP/IP stack architecture; Specification of modified or new header fields (protocols engines in general H04L 69/12 ; OSI stack based layering aspects H04L 69/32 ; protocol header analysis in general H04L 69/22 ; addressing aspects in multiple interfaces involving dual-stack hosts H04L 61/6086) }

H04L 69/162 . . . { involving adaptations of sockets based mechanisms (secure socket layer H04L 63/168) }

H04L 69/163 . . { Adaptation of TCP data exchange control procedures (generic OSI layer 4 protocols, e.g. SCTP H04L 69/326 ; TCP or UDP flow control procedures H04L 12/56D10 ; error control procedures in general H04L 1/18) }

H04L 69/164 . . { Adaptation or special uses of UDP protocol }

H04L 69/165 . . { involving combined use or selection criteria between TCP and UDP protocols (multi-protocol arrangements in general H04L 69/18 ; multilink protocols in general H04L 69/14) }

H04L 69/166 . . { IP fragmentation or TCP segmentation aspects (evaluation of maximum transfer unit [MTU] H04L 12/56D27 ; assembly or disassembly of packets in wireless networks H04W 28/065) }

H04L 69/167 . . { Transitional provisions between IPv4 and IPv6 (address translation between IPv4 and IPv6 H04L 61/251 ; involvement of different protocol versions in wireless network layer protocols, e.g. MIPv4 and MIPv6 H04W 80/045) }

H04L 69/168 . . { Special adaptations of TCP, UDP or IP to match specific link layer protocols, e.g. ATM, SONET or PPP (IP over ATM H04L 12/56A18P1 ; special adaptation of TCP protocol for wireless media H04W 80/06) }

H04L 69/169 . . { Special adaptations of TCP, UDP or IP for interworking of IP based networks with other networks (protocols for interworking in general H04L 69/08) }

H04L 69/18 . { Multi-protocol handler, e.g. single device capable of handling multiple protocols (multilayer or multiprotocol switches H04L 12/56S14E) }

H04L 69/22 . { Header parsing or analysis (traffic monitoring by flow aggregation or filtering H04L 12/2605 ; flow identification in packet switching networks H04L 12/56D15J) }

H04L 69/24 . { Negotiation of communication capabilities }

H04L 69/26 . { Special purpose or proprietary protocols or architectures (network applications for proprietary or special purpose networking environments H04L 67/12) }

H04L 69/28 . { Timer mechanisms used in protocols }

H04L 69/30 . { Definitions, standards or architectural aspects of layered protocol stacks }

H04L 69/32 . . { High level architectural aspects of 7-layer open systems interconnection [OSI] type protocol stacks }

H04L 69/321 . . . { Aspects of inter-layer communication protocols or service data unit [SDU] definitions; Interfaces between layers }

H04L 69/322 . . . { Aspects of intra-layer communication protocols among peer entities or protocol data unit [PDU] definitions }

H04L 69/323 . . . . { in the physical layer, i.e. layer one (arrangements for detecting or preventing errors in the information received H04L 1/00 ; baseband systems H04L 25/00 ; modulated-carrier systems H04L 27/00) }

H04L 69/324 . . . . { in the data link layer, i.e. layer two, e.g. HDLC (arrangements for detecting or preventing errors in the information received H04L 1/00 ; bus networks H04L 12/40) }

H04L 69/325 . . . . { in the network layer, i.e. layer three, e.g. X.25 (packet switching systems, packet routing H04L 12/5689 ; TCP/IP H04L 69/16) }

H04L 69/326 . . . . { in the transport layer, i.e. layer four (TCP/IP H04L 69/16 ; streaming protocols, e.g. RTP, H04L 65/608) }

H04L 69/327 . . . . { in the session layer, i.e. layer five (session initiation protocol H04L 65/1006 ; session control in real time communications H04L 65/1066 ; arrangements for session management H04L 67/14) }

H04L 69/328 . . . . { in the presentation layer, i.e. layer six (graphical user interfaces G06F 3/048 ; terminal emulation, e.g. telnet, H04L 67/08) }

H04L 69/329 . . . . { in the application layer, i.e. layer seven (network arrangements or network communication protocols for networked applications H04L 67/00 ; digital computing or data processing equipment or methods, specially adapted for specific applications G06F 19/00 ; data processing systems and methods specially adapted for administrative, commercial, financial or managerial purposes G06Q) }

H04L 69/40 . { Techniques for recovering from a failure of a protocol instance or entity, e.g. failover routines, service redundancy protocols, protocol state redundancy or protocol service redirection in case of a failure or disaster recovery (reactions to failures of replicated servers by a load balancer H04L 67/1034 ; departure or maintenance mechanisms in peer-to-peer networks H04L 67/1048 ; intermediate processing of operational support to end devices when they are unavailable, H04L 67/2861 ; network fault management H04L 12/2419 ; route fault recovery in network routing H04L 12/56C108 ; fault recovery in packet switches H04L 12/56S12C) }

H04L 2201/00 **Algorithms used for the adjustment of time-domain equalizers**

H04L 2201/02 . minimizing an error signal, e.g. least squares, minimum square error

H04L 2201/04 . zero-forcing

H04L 2201/06 . using the output of a maximum likelihood decoder (Viterbi detector)

H04L 2201/08 . Algorithms not covered by groups T04L 200:02 to T04L 200:06

H04L 2203/00 **Characteristics of phase shift key signals**

H04L 2203/02 . differential

H04L 2203/04 . continuous phase

H04L 2209/00 { Additional information or applications relating to cryptographic mechanisms or cryptographic arrangements for secret or secure communication H04L 9/00 }

H04L 2209/04 . { Masking or blinding }

H04L 2209/043 . . { of tables, e.g. lookup, substitution or mapping }

H04L 2209/046 . . { of operations, operands or results of the operations }

H04L 2209/08 . { Randomization, e.g. dummy operations or using noise }

H04L 2209/12 . { Details relating to cryptographic hardware or logic circuitry }
H04L 2209/122 . . { Hardware reduction or efficient architectures }
H04L 2209/125 . . { Parallelization or pipelining, e.g. for accelerating processing of cryptographic operations }
H04L 2209/127 . . { Trusted platform modules [TPM] }

H04L 2209/16 . { Obfuscation or hiding, e.g. involving white box }

H04L 2209/20 . { Manipulating the length of blocks of bits, e.g. padding or block truncation }

H04L 2209/24 . { Key scheduling, i.e. generating round keys or sub-keys for block encryption }

H04L 2209/26 . { Testing cryptographic entity, e.g. testing integrity of encryption key or encryption algorithm }

H04L 2209/30 . { Compression, e.g. Merkle-Damgard construction }

H04L 2209/34 . { Encoding or coding, e.g. Huffman coding or error correction }

H04L 2209/38 . { Chaining, e.g. hash chain or certificate chain }

H04L 2209/42 . { Anonymization, e.g. involving pseudonyms }

H04L 2209/46 . { Secure multiparty computation, e.g. millionaire problem }
H04L 2209/463 . . { Electronic voting }
H04L 2209/466 . . { Electronic auction }

H04L 2209/50 . { Oblivious transfer }

H04L 2209/56 . { Financial cryptography, e.g. electronic payment or e-cash }

H04L 2209/60 . { Digital content management, e.g. content distribution }
H04L 2209/601 . . { Broadcast encryption }
H04L 2209/603 . . { Digital right managament (DRM) }
H04L 2209/605 . . { Copy protection }
H04L 2209/606 . . { Traitor tracing }
H04L 2209/608 . . { Watermarking }

H04L 2209/64 . { Self-signed certificates }

H04L 2209/68 . { Special signature format, e.g. XML format }

H04L 2209/72 . { Signcrypting, i.e. digital signing and encrypting simultaneously }

H04L 2209/76 . { Proxy, i.e. using intermediary entity to perform cryptographic operations (network architectures or network communication protocols using hop-by-hop encryption H04L 63/0464) }

H04L 2209/80 . { Wireless (network architectures or network communication protocols for wireless network security H04W 12/00) }

H04L 2209/805 . . { Lightweight hardware, e.g. radio-frequency identification [RFID] or sensor }

H04L 2209/84 . { Vehicles }

H04L 2209/88 . { Medical equipments }

H04L 2212/00 { Details not provided for in other groups of this subclass }

H04L 2212/002 . { Packet embedding }

H04L 2212/0025 . . Encapsulation of packets

H04L 2463/00 **Additional details relating to network architectures or network communication protocols for network security covered by H04L 63/00**

H04L 2463/041 . using an encryption or decryption engine integrated in transmitted data

H04L 2463/061 . applying further key derivation, e.g. deriving traffic keys from a pair-wise master key (cryptographic mechanisms or cryptographic arrangements for generation of secret information including derivation or calculation of cryptographic keys or passwords H04L 9/0861)

H04L 2463/062 . applying encryption of the keys (cryptographic mechanisms or cryptographic arrangements for key distribution using key encryption key H04L 9/0822)

H04L 2463/081 . applying self-generating credentials, e.g. instead of receiving credentials from an authority or from another peer, the credentials are generated at the entity itself (cryptographic mechanisms or cryptographic arrangements for generation of secret information including derivation or calculation of cryptographic keys or passwords H04L 9/0861)

H04L 2463/082 . applying multi-factor authentication (cryptographic mechanisms or cryptographic arrangements including means for verifying the identity or authority of a user of the system or for message authentication H04L 9/32)

H04L 2463/101 . applying security measures for digital rights management (data processing systems or methods, specially adapted for commerce, e.g. marketing, shopping, billing, auctions or e-commerce G06Q 30/00)

H04L 2463/102 . applying security measure for e-commerce (data processing systems or methods, specially adapted for e-commerce G06Q 30/00)

H04L 2463/103 . applying security measure for protecting copy right (protecting software against unauthorised usage in a vending or licensing environment, e.g. protection the software providers copyright G06F 21/10 ; data processing systems or methods, specially adapted for payment schemes, architectures or protocols G06Q 20/00 ; secrecy systems or subscription systems H04N 7/16)

H04L 2463/121 . Timestamp (cryptographic mechanisms or cryptographic arrangements involving time stamps H04L 9/3297)

H04L 2463/141 . Denial of service attacks against endpoints in a network

H04L 2463/142 . Denial of service attacks against network infrastructure

H04L 2463/143 . Denial of service attacks involving systematic or selective dropping of packets

H04L 2463/144 . Detection or countermeasures against botnets

H04L 2463/145 . Detection or countermeasures against cache poisoning

H04L 2463/146 . Tracing the source of attacks