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	covered by	H04L 25/03
H04L 25/17	covered by	H03H
H04L 25/18	covered by	H04L 25/027
H04L 25/28	covered by	H04L 25/0268
H04L 25/30	covered by	H04L 25/061
H04L 25/32	covered by	H04L 25/49
H04L 25/34	covered by	H04L 25/4917
H04L25/36	covered by	
H04L 25/48	covered by	H04L 25/49
H04L25/50	covered by	H04L 25/05
H04L 25/52	covered by	H04L 25/20
H04L 25/54	covered by	H04L 25/20
H04L 25/56	covered by	H04L 25/202
H04L 25/58	covered by	H04L 25/20
H04L 25/60	covered by	H04L 25/207
H04L 25/62	covered by	H04L 25/205
H04L 25/64	covered by	H04L 25/245
H04L 25/66	covered by	H04L 25/247

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)

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)}

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

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

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

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

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

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

1/0008   . . . . {by supplementing frame payload, e.g. with padding bits}

1/0009   . . {by adapting the channel coding (H04L 1/1812 takes precedence)}

1/001   . . . {applied to control information}

1/0011   . . . {applied to payload information}

1/0013   . . . {Rate matching, e.g. puncturing or repetition of code symbols}

1/0014   . . {by adapting the source coding}

1/0015   . . {characterised by the adaptation strategy}

1/0016   . . . {involving special memory structures, e.g. look-up tables}

1/0017   . . . {where the mode-switching is based on Quality of Service requirement}

1/0018   . . . . {based on latency requirement}

1/0019   . . . {in which mode-switching is based on a statistical approach}

1/002   . . . . {Algorithms with memory of the previous states, e.g. Markovian models}

1/0021   . . . . {in which the algorithm uses adaptive thresholds}

1/0022   . . . {in which mode-switching is influenced by the user}

1/0023   . . {characterised by the signalling}

1/0025   . . . {Transmission of mode-switching indication}

1/0026   . . . {Transmission of channel quality indication}

1/0027   . . . {Scheduling of signalling, e.g. occurrence thereof}

1/0028   . . . {Formatting}

1/0029   . . . . {Reduction of the amount of signalling, e.g. retention of useful signalling or differential signalling (power control H04W 52/04)}

1/003   . . . . {Adaptive formatting arrangements particular to signalling, e.g. variable amount of bits}

1/0031 . . . . {Multiple signaling transmission (H04L 1/1664, F15 take precedence)}

1/0032 . . . {Without explicit signalling}

1/0033 . . {arrangements specific to the transmitter}

1/0034 . . . {where the transmitter decides based on inferences, e.g. use of implicit signalling}

1/0035 . . . {evaluation of received explicit signalling}

1/0036 . . {arrangements specific to the receiver}

1/0038 . . . {Blind format detection (for detection of modulation format H04L 27/0012)}

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)}

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)}

1/0041 . . {Arrangements at the transmitter end}

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)}

1/0043 . . . {Realisations of complexity reduction techniques, e.g. use of look-up tables}

1/0044 . . . . {specially adapted for power saving}

1/0045 . . {Arrangements at the receiver end}

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)}

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

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)}

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

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

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

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

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

1/0055 . . . {MAP-decoding}

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

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

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

1/0059 . . . {Convolutional codes}

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

1/0061 . . . {Error detection codes}

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

1/0064 . . . {Concatenated codes}

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

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

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

1/0068 . . . . {by puncturing}

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

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

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

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

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

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

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)}

1/0077 . . . {Cooperative coding}

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)}

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

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

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

1/0082 . . . {fields explicitly indicating existence of error in data being transmitted, e.g. so that downstream stations can avoid decoding erroneous packet; relays}

1/0083 . . {Formatting with frames or packets; Protocol or part of protocol for error control}

1/0084 . . {Formats for payload data}

1/0085 . . {Formatting with cells}

1/0086 . . {Unequal error protection (H04L 27/00 and H04L 1/004 take precedence for layer 1/2 aspects, e.g. bit loading)}

1/0088 . . . {in control part}

1/0089 . . . {in payload}

1/009 . . {arrangements specific to transmitters}

1/0091 . . {arrangements specific to receivers, e.g. format detection (detection of data rate H04L 25/0262; detection of coding rate H04L 1/0046)}

2001/0092 . {Error control systems characterised by the topology of the transmission link}

2001/0093 . . {Point-to-multipoint}

2001/0094 . . {Bus}

2001/0095 . . {Ring}

2001/0096 . . {Channel splitting in point-to-point links}

2001/0097 . . {Relays}

2001/0098 . {Unequal error protection}

1/02 . by diversity reception (in general H04B 7/02)

1/04 . . using frequency diversity

1/06 . . using space diversity

1/0606 . . . {Space-frequency coding}

1/0612 . . . {Space-time modulation}

1/0618 . . . {Space-time coding}

1/0625 . . . . {Transmitter arrangements}

1/0631 . . . . {Receiver arrangements}

1/0637 . . . . {Properties of the code}

1/0643 . . . . . {block codes}

1/065 . . . . . {by means of convolutional encoding}

1/0656	. . . . .	{Cyclotomic systems, e.g. Bell Labs Layered Space-Time [BLAST]}
1/0662	. . . . .	{Limited orthogonality systems}
1/0668	. . . . .	{Orthogonal systems, e.g. using Alamouti codes}
1/0675	. . . .	{characterised by the signaling}
1/0681	. . . . .	{adapting space time parameters, i.e. modifying the space time matrix}
1/0687	. . . . .	{Full feedback}
1/0693	. . . . .	{Partial feedback, e.g. partial channel state information [CSI]}
1/08	.	by repeating transmission, e.g. Verdan system {(H04L 1/1858 and H04L 1/189 take precedence)}
1/12	.	by using return channel
2001/125	. .	{Arrangements for preventing errors in the return channel}
1/14	. .	in which the signals are sent back to the transmitter to be checked {echo systems}
1/16	. .	in which the return channel carries supervisory signals, e.g. repetition request signals
1/1607	. . .	{Details of the supervisory signal}
1/1614	. . . .	{using bitmaps}
1/1621	. . . .	{Group acknowledgement, i.e. the acknowledgement message defining a range of identifiers, e.g. of sequence numbers}
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)}
1/1635	. . . .	{Cumulative acknowledgement, i.e. the acknowledgement message applying to all previous messages}
1/1642	. . . .	{Formats specially adapted for sequence numbers}
1/165	. . . . .	{Variable formats}
1/1657	. . . .	{Implicit acknowledgement of correct or incorrect reception, e.g. with a moving window}
1/1664	. . . .	{the supervisory signal being transmitted together with payload signals; piggybacking}
1/1671	. . . .	{the supervisory signal being transmitted together with control information}
1/1678	. . . . .	{where the control information is for timing, e.g. time stamps}
1/1685	. . . .	{the supervisory signal being transmitted in response to a specific request, e.g. to a polling signal}
1/1692	. . . .	{Physical properties of the supervisory signal, e.g. acknowledgement by energy bursts}
1/18	. . .	Automatic repetition systems, e.g. van Duuren system; {ARQ protocols}
1/1803	. . . .	{Stop-and-wait protocols}
1/1806	. . . .	{Go-back-N protocols}
1/1809	. . . .	{Selective-repeat protocols}
1/1812	. . . .	{Hybrid protocols}
1/1816	. . . . .	{with retransmission of the same, encoded, message}
1/1819	. . . . .	{with retransmission of additional or different redundancy}
1/1822	. . . .	{involving configuration of ARQ with parallel processes}
1/1825	. . . .	{Adaptation of specific ARQ protocol parameters according to transmission conditions}
1/1829	. . . .	{Arrangements specific to the receiver end}
1/1832	. . . . .	{Details of sliding window management}
1/1835	. . . . .	{Buffer management}
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)}
1/1841	. . . . . .	{Resequencing}
1/1845	. . . . . .	{Combining techniques, e.g. code combining}
1/1848	. . . . .	{Time-out mechanisms}
1/1851	. . . . . .	{using multiple timers}
1/1854	. . . . .	{Scheduling and prioritising arrangements}
1/1858	. . . . .	{Transmission or retransmission of more than one copy of acknowledgement message (repetition in general H04L 1/08)}
1/1861	. . . . .	{Physical mapping arrangements (for ACK signaling see also H04L 5/0053)}
1/1864	. . . . .	{ARQ related signaling (H04L 1/1607 takes precedence)}
1/1867	. . . .	{Arrangements specific to the transmitter end}
1/187	. . . . .	{Details of sliding window management}
1/1874	. . . . .	{Buffer management}
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)}
1/188	. . . . .	{Time-out mechanisms}
1/1883	. . . . . .	{using multiple timers}
1/1887	. . . . .	{Scheduling and prioritising arrangements}
1/189	. . . . .	{Transmission or retransmission of more than one copy of a message (repetition in general H04L 1/08)}
1/1893	. . . . .	{Physical mapping arrangements (physical resource mapping in general H04L 5/00)}
1/1896	. . . . .	{ARQ related signaling}
1/20	.	using signal quality detector

WARNING

    see G01R 29/02

1/201	. .	{Frame classification, e.g. bad, good or erased (frame indication per se H04L 1/0082)}
1/203	. .	{Details of error rate determination, e.g. BER, FER or WER}
1/205	. .	{jitter monitoring}
1/206	. .	{for modulated signals}
1/208	. .	{involving signal re-encoding}
1/22	.	using redundant apparatus to increase reliability {(see G06F 11/08 - G06F 11/20)}
1/24	.	Testing correct operation
1/241	. .	{using pseudo-errors}
1/242	. .	{by comparing a transmitted test signal with a locally generated replica}
1/243	. . .	{at the transmitter, using a loop-back}

1/244	. . . {test sequence generators}
1/245	. . {by using the properties of transmission codes}
1/246	. . . {two-level transmission codes, e.g. binary}
1/247	. . . {three-level transmission codes, e.g. ternary}
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)}

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

5/0001	. {Arrangements for dividing the transmission path (duplexing H04L 5/14; multiplexing of different sources on one path H04J)}
5/0003	. . {Two-dimensional division (time-code division H04J 11/00, H04J 13/00; for time-space division H04B 7/0413, H04B 7/0697)}
5/0005	. . . {Time-frequency}
5/0007	. . . . {the frequencies being orthogonal, e.g. OFDM(A), DMT}
5/0008	. . . . . {Wavelet-division}
5/001	. . . . . {the frequencies being arranged in component carriers}
5/0012	. . . . . {Hopping in multicarrier systems (for frequency hopping in spread spectrum systems H04B 1/713)}
5/0014	. . {Three-dimensional division (time-code-space division H04B 7/0413, H04B 7/0697)}
5/0016	. . . {Time-frequency-code}
5/0017	. . . . {in which a distinct code is applied, as a temporal sequence, to each frequency}
5/0019	. . . . {in which one code is applied, as a temporal sequence, to all frequencies}
5/0021	. . . . {in which codes are applied as a frequency-domain sequences, e.g. MC-CDMA}
5/0023	. . . {Time-frequency-space}
5/0025	. . . . {Spatial division following the spatial signature of the channel}
5/0026	. . {Division using four or more dimensions}
5/0028	. . {Variable division (signaling therefor H04L 5/0092)}
5/003	. {Arrangements for allocating sub-channels of the transmission path}
5/0032	. . {Distributed allocation, i.e. involving a plurality of allocating devices, each making partial allocation}
5/0033	. . . {each allocating device acting autonomously, i.e. without negotiation with other allocating devices}
5/0035	. . . {Resource allocation in a cooperative multipoint environment}
5/0037	. . {Inter-user or inter-terminal allocation}
5/0039	. . . {Frequency-contiguous, i.e. with no allocation of frequencies for one user or terminal between the frequencies allocated to another}
5/0041	. . . {Frequency-non-contiguous}
5/0042	. . {intra-user or intra-terminal allocation}
5/0044	. . {allocation of payload}
5/0046	. . . {Determination of how many bits are transmitted on different sub-channels}

5/0048	. . {Allocation of pilot signals, i.e. of signals known to the receiver}
5/005	. . . {of common pilots, i.e. pilots destined for multiple users or terminals}
5/0051	. . . {of dedicated pilots, i.e. pilots destined for a single user or terminal}
5/0053	. . {Allocation of signaling, i.e. of overhead other than pilot signals}
5/0055	. . . {Physical resource allocation for ACK/NACK (for physical mapping arrangements in ARQ protocols H04L 1/1861)}
5/0057	. . . {Physical resource allocation for CQI}
5/0058	. . {Allocation criteria}
5/006	. . . {Quality of the received signal, e.g. BER, SNR, water filling}
5/0062	. . . {Avoidance of ingress interference, e.g. ham radio channels}
5/0064	. . . {Rate requirement of the data, e.g. scalable bandwidth, data priority}
5/0066	. . . {Requirements on out-of-channel emissions}
5/0067	. . . {Allocation algorithms which involve graph matching}
5/0069	. . . {Allocation based on distance or geographical location (allocation based on terminal or device properties in general, H04W 72/048)}
5/0071	. . . {Allocation based on fairness other than the proportional kind}
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)}
5/0075	. . . {Allocation using proportional fairness}
5/0076	. . . {Allocation utility-based}
5/0078	. . {Timing of allocation}
5/008	. . . {once only, on installation}
5/0082	. . . {at predetermined intervals}
5/0083	. . . . {symbol-by-symbol}
5/0085	. . . {when channel conditions change}
5/0087	. . . {when data requirements change}
5/0089	. . . . {due to addition or removal of users or terminals}
5/0091	. {Signaling for the administration of the divided path}
5/0092	. . {Indication of how the channel is divided}
5/0094	. . {Indication of how sub-channels of the path are allocated}
5/0096	. . {Indication of changes in allocation}
5/0098	. . . {Signalling of the activation or deactivation of component carriers, subcarriers or frequency bands}
5/02	. Channels characterised by the type of signal
5/023	. . {Multiplexing of multicarrier modulation signals (multicarrier modulation H04L 27/2601)}
5/026	. . . {using code division}
5/04	. . the signals being represented by different amplitude or polarities, e.g. quadriplex
5/06	. . the signals being represented by different frequencies (combined with time-division multiplexing H04L 5/26)
5/08	. . . each combination of signals in different channels being represented by a fixed frequency {(, e.g. twinplex; see H04L 27/16)}
5/10	. . . with dynamo-electric generation of carriers; with mechanical filters or demodulators

5/12	. . the signals being represented by different phase modulations of a single carrier
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})
5/1407	. . {Artificial lines or their setting (for line transmission systems in general H04B 3/40)}
5/1415	. . {using control lines}
5/1423	. . {for simultaneous baseband signals}
5/143	. . {for modulated signals (H04L 5/1469 takes precedence)}
5/1438	. . {Negotiation of transmission parameters prior to communication (modified according to link quality H04L 1/0001)}
5/1446	. . . {of transmission speed}
5/1453	. . . {of modulation type}
5/1461	. . {Suppression of signals in the return path, i.e. bidirectional control circuits}
5/1469	. . {using time-sharing}
5/1476	. . . {operating bitwise}
5/1484	. . . {operating bytewise}
5/1492	. . . . {with time compression, e.g. operating according to the ping-pong technique}
5/16	. . Half-duplex systems; Simplex-duplex switching; Transmission of break signals {non automatically inverting the direction of transmission}
5/18	. . Automatic changing of the traffic direction
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)}
5/22	. using time-division multiplexing {(in general H04J 3/00)}
5/225	. . {combined with the use of transition coding (transition coding H04L 25/493)}
5/24	. . with start-stop synchronous converters
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 - H04L 23/00, H03K 5/15, H03K 17/62, H04J 3/047)}
5/26	. . combined with the use of different frequencies
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)}
7/0004	. {Initialisation of the receiver (H04L 7/0075 and H04L 7/10 take precedence)}
7/0008	. {Synchronisation information channels, e.g. clock distribution lines}
7/0012	. . {by comparing receiver clock with transmitter clock}
7/0016	. {correction of synchronization errors}
7/002	. . {correction by interpolation}
7/0025	. . . {interpolation of clock signal}
7/0029	. . . {interpolation of received data signal}
7/0033	. . {Correction by delay}
7/0037	. . . {Delay of clock signal}
7/0041	. . . {Delay of data signal}
7/0045	. . {Correction by a latch cascade}
7/005	. . {Correction by an elastic buffer}
7/0054	. {Detection of the synchronisation error by features other than the received signal transition (by means of signal transition H04L 7/033)}
7/0058	. . {detection of error based on equalizer tap values}
7/0062	. . {detection of error based on data decision error, e.g. Mueller type detection}
7/0066	. . {detection of error based on transmission code rule}
7/007	. . {detection of error based on maximum signal power, e.g. peak value, maximizing autocorrelation}
7/0075	. {with photonic or optical means}
7/0079	. {Receiver details}
7/0083	. . {taking measures against momentary loss of synchronisation, e.g. inhibiting the synchronisation, using idle words or using redundant clocks}
7/0087	. . {Preprocessing of received signal for synchronisation, e.g. by code conversion, pulse generation or edge detection}
7/0091	. {Transmitter details}
7/0095	. {with mechanical means}
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)}
7/027	. . extracting the synchronising or clock signal from the received signal spectrum, e.g. by using a resonant or bandpass circuit
7/0272	. . . {with squaring loop}
7/0274	. . . {with Costas loop}
7/0276	. . . {Self-sustaining, e.g. by tuned delay line and a feedback path to a logical gate}
7/0278	. . . {Band edge detection}
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
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)}
7/0332	. . . {with an integrator-detector}
7/0334	. . . {Processing of samples having at least three levels, e.g. soft decisions}
7/0335	. . . . {Gardner detector}
7/0337	. . . {Selecting between two or more discretely delayed clocks or selecting between two or more discretely delayed received code signals}
7/0338	. . . . {the correction of the phase error being performed by a feed forward loop}
7/04	. Speed or phase control by synchronisation signals {(H04L 7/0075 takes precedence)}
7/041	. . {using special codes as synchronising signal}
7/042	. . . {Detectors therefor, e.g. correlators, state machines (digital correlators in general G06F 17/15)}
7/043	. . . {Pseudo-noise [PN] codes variable during transmission (synchronisation of spread spectrum receivers H04B 1/69)}

7/044	. . .	{using a single bit, e.g. start stop bit}
2007/045	. . .	{Fill bit or bits, idle words}
7/046	. . .	{using a dotting sequence}
2007/047	. . .	{using a sine signal or unmodulated carrier}
7/048	. .	{using the properties of error detecting or error correcting codes, e.g. parity as synchronisation signal}
7/06	. .	the synchronisation signals differing from the information signals in amplitude, polarity, or frequency {or length}
7/065	. . .	{and superimposed by modulation}
7/08	. .	the synchronisation signals recurring cyclically
7/10	. .	Arrangements for initial synchronisation

NOTE

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

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)**}**

NOTES

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 21/00

9/001	.	{using chaotic signals}
9/002	.	{Countermeasures against attacks on cryptographic mechanisms (network architectures or network communication protocols for protection against malicious traffic H04L 63/1441)}
9/003	. .	{for power analysis, e.g. differential power analysis [DPA] or simple power analysis [SPA]}
9/004	. .	{for fault attacks}
9/005	. .	{for timing attacks}
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)}
9/007	. .	{involving hierarchical structures}
9/008	.	{involving homomorphic encryption}
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}
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

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

9/0618	. .	{Block ciphers, i.e. encrypting groups of characters of a plain text message using fixed encryption transformation}
9/0625	. . .	{with splitting of the data block into left and right halves, e.g. Feistel based algorithms, DES, FEAL, IDEA or KASUMI}
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}
9/0637	. . .	{Modes of operation, e.g. cipher block chaining [CBC], electronic codebook [ECB] or Galois/counter mode [GCM]}
9/0643	. .	{Hash functions, e.g. MD5, SHA, HMAC or f9 MAC}
9/065	. .	{Encryption by serially and continuously modifying data stream elements, e.g. stream cipher systems, RC4, SEAL or A5/3}
9/0656	. . .	{Pseudorandom key sequence combined element-for-element with data sequence, e.g. one-time-pad [OTP] or Vernam's cipher}

9/0662	. . . .	{with particular pseudorandom sequence generator}
9/0668	. . . . .	{producing a non-linear pseudorandom sequence}
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

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

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

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

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

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

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

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

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

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

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}
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)}
9/0822	. . . .	{using key encryption key}
9/0825	. . . .	{using asymmetric-key encryption or public key infrastructure [PKI], e.g. key signature or public key certificates}
9/0827	. . . .	{involving distinctive intermediate devices or communication paths (network architectures or network communication protocols using different networks H04L 63/18)}
9/083	. . . .	{involving central third party, e.g. key distribution center [KDC] or trusted third party [TTP]}
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)}
9/0836	. . . . . .	{using tree structure or hierarchical structure}

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)}
9/0841	. . . .	{involving Diffie-Hellman or related key agreement protocols}
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}
9/0847	. . . .	{involving identity based encryption [IBE] schemes}
9/085	. . .	{Secret sharing or secret splitting, e.g. threshold schemes}
9/0852	. . .	{Quantum cryptography (transmission systems employing electromagnetic waves other than radio waves, e.g. light, infra-red H04B 10/00; wavelength-division multiplex systems H04J 14/02)}
9/0855	. . . .	{involving additional nodes, e.g. quantum relays, repeaters, intermediate nodes or remote nodes}
9/0858	. . . .	{Details about key distillation or coding, e.g. reconciliation, error correction, privacy amplification, polarisation coding or phase coding}
9/0861	. .	{Generation of secret information including derivation or calculation of cryptographic keys or passwords}
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)}
9/0866	. . .	{involving user or device identifiers, e.g. serial number, physical or biometrical information, DNA, hand-signature or measurable physical characteristics}
9/0869	. . .	{involving random numbers or seeds}
9/0872	. . .	{using geo-location information, e.g. location data, time, relative position or proximity to other entities}
9/0875	. . .	{based on channel impulse response [CIR]}
9/0877	. . .	{using additional device, e.g. trusted platform module [TPM], smartcard, USB or hardware security module [HSM]}
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)}

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

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

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

9/0891	. .	{Revocation or update of secret information, e.g. encryption key update or rekeying}
9/0894	. .	{Escrow, recovery or storing of secret information, e.g. secret key escrow or cryptographic key storage}
9/0897	. . .	{involving additional devices, e.g. trusted platform module [TPM], smartcard or USB}
9/10	.	with particular housing, physical features or manual controls {(not used; see H04L 9/00)}
9/12	.	Transmitting and receiving encryption devices synchronised or initially set up in a particular manner
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)}
9/16	. .	the keys or algorithms being changed during operation
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

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

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

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

9/28   . using particular encryption algorithm

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

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

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

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

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

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

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

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

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 +

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

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

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

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

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

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

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)

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

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

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

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

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)}

9/3215   . . {using a plurality of channels (network architectures or network communication protocols using different networks H04L 63/18)}

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

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

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)}
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}
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)}
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)}
9/3236	. .	{using cryptographic hash functions}
9/3239	. . .	{involving non-keyed hash functions, e.g. modification detection codes [MDCs], MD5, SHA or RIPEMD}
9/3242	. . .	{involving keyed hash functions, e.g. message authentication codes [MACs], CBC-MAC or HMAC}
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

9/3247	. .	{involving digital signatures}
9/3249	. . .	{using RSA or related signature schemes, e.g. Rabin scheme}
9/3252	. . .	{using DSA or related signature schemes, e.g. elliptic based signatures, ElGamal or Schnorr schemes}
9/3255	. . .	{using group based signatures, e.g. ring or threshold signatures}
9/3257	. . .	{using blind signatures}
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

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)}
9/3265	. . .	{using certificate chains, trees or paths; Hierarchical trust model}
9/3268	. . .	{using certificate validation, registration, distribution or revocation, e.g. certificate revocation list [CRL]}
9/3271	. .	{using challenge-response}
9/3273	. . .	{for mutual authentication (network architectures or network communication protocols for achieving mutual authentication in a packet data network H04L 63/0869)}
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

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

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

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

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

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

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

9/3297	. .	{involving time stamps, e.g. generation of time stamps}
9/34	.	Bits, or blocks of bits, of the telegraphic message being interchanged in time {(for speech signals H04K 1/06)}
9/36	.	with means for detecting characters not meant for transmission
9/38	.	Encryption being effected by mechanical apparatus, e.g. rotating cams, switches, keytape punchers
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)
12/02	.	Details
12/04	. .	Switchboards
12/06	. .	Answer-back mechanisms or circuits
12/08	. .	Alloting numbers to messages; Counting characters, words or messages
12/10	. .	Current supply arrangements
12/12	. .	Arrangements for remote connection or disconnection of substations or of equipment thereof
12/14	. .	{Metering,} charging {or billing} arrangements {specially adapted for data wireline or wireless communications (payment schemes, architectures or protocols per se G06Q 20/00)}
12/1403	. . .	{Architecture for metering, charging or billing}
12/1407	. . . .	{Policy-and-charging control [PCC] architecture}
12/141	. . .	{Indication of costs}
12/1414	. . . .	{in real-time}
12/1417	. . . . .	{Advice of charge with threshold, e.g. user indicating maximum cost}
12/1421	. . . .	{Indication of expected costs}
12/1425	. . .	{involving dedicated fields in the data packet for billing purposes}
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)}
12/1432	. . .	{Metric aspects}
12/1435	. . . .	{volume-based}
12/1439	. . . .	{time-based}
12/1442	. . . .	{at network operator level}
12/1446	. . . .	{inter-operator billing}
12/145	. . . .	{trading network capacity or selecting route based on tariff}
12/1453	. . .	{Methods or systems for payment or settlement of the charges for data transmission involving significant interaction with the data transmission network}
12/1457	. . . .	{using an account}
12/146	. . . .	{using digital cash}
12/1464	. . . .	{using a card, such as credit card, prepay card or SIM}
12/1467	. . . .	{involving prepayment}
12/1471	. . . .	{splitting of costs}
12/1475	. . . . .	{the splitting involving a third party}
12/1478	. . . . .	{the splitting involving only the communication parties}
12/1482	. . . .	{involving use of telephony infrastructure for billing for the transport of data, e.g. call detail record [CDR] or intelligent network infrastructure}
12/1485	. . .	{Tariff-related aspects}
12/1489	. . . .	{dependent on congestion}
12/1492	. . . .	{negotiation of tariff}
12/1496	. . . .	{involving discounts}
12/16	. .	Arrangements for providing special services to substations {contains provisionally no documents}
12/18	. .	for broadcast or conference {, e.g. multicast (multicast or broadcast switches H04L 49/201)}
12/1804	. . . .	{for stock exchange and similar applications}
12/1809	. . . .	{for auctioneering devices}
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)}
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}
12/1822	. . . . .	{Conducting the conference, e.g. admission, detection, selection or grouping of participants, correlating users to one or more conference sessions, prioritising transmission}
12/1827	. . . . .	{Network arrangements for conference optimisation or adaptation}
12/1831	. . . . .	{Tracking arrangements for later retrieval, e.g. recording contents, participants activities or behavior, network status}
12/1836	. . . .	{with heterogeneous network architecture}
12/184	. . . . .	{with heterogeneous receivers, e.g. layered multicast}
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)}

12/185	. . . .	{with management of multicast group membership}
12/1854	. . . .	{with non-centralised forwarding system, e.g. chaincast}
12/1859	. . . .	{adapted to provide push services, e.g. data channels}
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)}
12/1868	. . . . .	{Measures taken after transmission, e.g. acknowledgments}
12/1872	. . . . . .	{avoiding ACK or NACK implosion}
12/1877	. . . . .	{Measures taken prior to transmission}
12/1881	. . . .	{with schedule organisation, e.g. priority, sequence management}
12/1886	. . . .	{with traffic restrictions for efficiency improvement, e.g. involving subnets or subdomains}
12/189	. . . .	{in combination with wireless systems (selective distribution or broadcast in wireless communication networks H04W 4/06)}
12/1895	. . . .	{for short real-time information, e.g. alarms, notifications, alerts, updates}
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)
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

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

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

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

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

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 41/022

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

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

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

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

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

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

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

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

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

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

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

12/2416 . . . . {for automatically determining the actual topology of a network (Topology discovery in routers H04L 45/02)}

WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

12/243 . . . . . . {due to updating or upgrading of network functionality, e.g. firmware (topology update or discovery for routing purposes H04L 45/02)}

> **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 41/085

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 41/5019

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

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

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

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 41/5032

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

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

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

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

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

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

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

12/2484 . . . . {Service discovery by the Service Manager (automatically determining the actual topology of a network H04L 12/2416; topology discovery in routers H04L 45/02; 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 H04L 41/5058

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 41/5061

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

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

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

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

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

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

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

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

12/2494 . . . . . {wherein the managed service relates to audio / video / TV (protocols for real-time multimedia communications H04L 29/06176; interactive television or VoD H04N 21/00)}

> **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 41/509

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

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

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

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

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

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

12/2605	. . . .	{involving a reduction of monitoring data}
12/2607	. . . . .	{using sampling of monitoring data, i.e. storing only a selection of packets}
12/261	. . . . . .	{using adaptive sampling}
12/2613	. . . . .	{using flow Flow generation}
12/2615	. . . . .	{using filtering (alarm or event filtering H04L 12/242)}
12/2618	. . . .	{processing of captured monitoring data}
12/2621	. . . . .	{for graphical visualization of monitoring data (graphical user interfaces H04L 12/2458)}
12/2623	. . . . .	{Report generation}
12/2626	. . . . . .	{for traffic related reporting}
12/2628	. . . . . .	{for device related reporting (reporting of sensed information of home appliances H04L 12/2803)}
12/2631	. . . . . .	{for time frame related reporting}

12/2634	. . . .	{Monitoring using or based on specific metrics}
12/2636	. . . . .	{based on availability}
12/2639	. . . . . .	{based on connectivity}
12/2642	. . . . . .	{based on functioning (monitoring the activity of the application user H04L 29/08675; monitoring appliance functionality of home appliances H04L 12/2803)}
12/2644	. . . . .	{using errors (management of events, faults or alarms H04L 12/2419)}
12/2647	. . . . . .	{using packet loss}
12/2649	. . . .	{using one way packet loss}
12/2652	. . . .	{using round trip packet loss}
12/2655	. . . . . .	{based on transmission error}
12/2657	. . . . .	{based on delays}
12/266	. . . . . .	{based on one way delays}
12/2663	. . . . . .	{based on round trip delays}
12/2665	. . . . . .	{based on Jitter}
12/2668	. . . . .	{based on network utilization}
12/2671	. . . . . .	{based on utilization of link capacity}
12/2673	. . . . . .	{based on throughput}
12/2676	. . . . . .	{based on packet rate}
12/2678	. . . .	{using active monitoring, e.g. heartbeat protocols, polling, ping, trace-route}
12/2681	. . . . .	{with adaptive polling, i.e. dynamically adapting the polling rate}
12/2684	. . . . .	{by adding timestamps to packets}
12/2686	. . . .	{using dedicated network monitoring probes}
12/2689	. . . .	{using software, i.e. software packages}
12/2692	. . . .	{using threshold monitoring}
12/2694	. . . .	{using protocol analyzers}
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

12/28	.	characterised by path configuration, e.g. local area networks [LAN], wide area networks [WAN]
12/2801	. .	{Broadband local area networks}
12/2803	. .	{Home automation networks}
12/2805	. . .	{Home Audio Video Interoperability [HAVI] networks}
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)}
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)}

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 <u>H04L 29/08099</u>)}
12/2812	. . . .	{describing content present in a home automation network, e.g. audio video content (retrieval from the Internet <u>G06F 17/30861</u>)}
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 <u>H04L 12/2424</u>)}
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 <u>H04Q 9/00</u>)}
12/2818	. . . .	{from a device located outside both the home and the home network (access arrangements <u>H04L 12/2856</u>; protocols for network applications involving the use of web-based technology for remote control or remote monitoring <u>H04L 29/08099</u>; telephonic communication systems adapted for combination with remote control systems <u>H04M 11/007</u>; arrangements for transmitting signals characterised by the use of a wireless eletrical link <u>G08C 17/00</u>)}
12/282	. . . .	{based on user interaction within the home (receiver circuitry for displaying additional information being controlled by a remote control apparatus <u>H04N 5/44582</u>)}
12/2821	. . . .	{Avoiding conflicts related to the use of home appliances (arrangements for network security <u>H04L 29/06551</u>)}
12/2823	. . .	{Reporting information sensed by appliance or service execution status of appliance services in a home automation network (device-related reporting <u>H04L 43/065</u>; 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 <u>H04Q 9/00</u>)}
12/2825	. . . .	{Reporting to a device located outside the home and the home network (access arrangements <u>H04L 12/2856</u>; protocols for network applications involving the use of web-based technology for remote control or remote monitoring <u>H04L 29/08099</u>; telephonic communication systems adapted for combination with telemetering systems <u>H04M 11/002</u>)}
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}
12/2829	. . . . .	{involving user profiles according to which the execution of a home appliance functionality is automatically triggered}
12/283	. . .	{Processing of data at an internetworking point of a home automation network}
12/2832	. . . .	{Interconnection of the control functionalities between home networks (single bridge functionality <u>H04L 12/4625</u>)}
12/2834	. . . .	{Switching of information between an external network and a home network (access arrangements <u>H04L 12/2856</u>)}
12/2836	. . . .	{Protocol conversion between an external network and a home network (protocol conversion <u>H04L 29/06068</u>; adaptation of digital video signals for transport over a specific home network <u>H04N 7/24</u>; controlling appliance services of a home automation network from a device located outside the home and the home network <u>H04L 12/2818</u>)}
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 <u>H04N 7/106</u>; hybrid transport <u>H04L 12/6418</u>; home network arrangements specially adapted for distribution of digital video signals <u>H04N 7/24</u>)}
2012/284	. . .	{characterised by the type of medium used}
2012/2841	. . . .	{Wireless}
2012/2843	. . . .	{Mains power line}
2012/2845	. . . .	{Telephone line}
2012/2847	. . .	{characterised by the type of home appliance used}
2012/2849	. . . .	{Audio/video appliances}
2012/285	. . . .	{Generic home appliances, e.g. refrigerators}
12/2852	. .	{Metropolitan area networks}
12/2854	. .	{Wide area networks, e.g. public data networks}
12/2856	. . .	{Access arrangements, e.g. Internet access (asynchronous transfer mode networks <u>H04L 12/5601</u>; broadband local area networks <u>H04L 12/2801</u>; optical access or distribution networks <u>H04Q 11/0067</u>; access to open networks <u>H04L 12/5691</u>; digital subscriber line end-user equipment and bit-level processing of data on a PSTN-based network <u>H04M 11/00</u>; home network gateways <u>H04L 12/2834</u>; wireless access networks <u>H04W</u>)}

NOTES

1. This group <u>covers</u>:
   – 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 <u>does not cover</u>:
   – wireless access networks, which are covered by <u>H04W</u>

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(continued)

– 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 12/2803
– management of WDM parameters in optical multiplex systems, which is covered by H04J 14/02
– circuit-switched access networks, which are covered by H04M 7/1205
– 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

12/2858 . . . . {Access network architectures}
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)}
12/2861 . . . . . {Point-to-multipoint connection from the data network to the subscribers}

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)}
12/2865 . . . . . {Logical combinations}
12/2867 . . . . . {Physical combinations}
12/2869 . . . . {Operational details of access network equipments (admission control or resource allocation in access networks H04L 12/5692)}
12/287 . . . . . {Remote access server, e.g. BRAS}
12/2872 . . . . . . {Termination of subscriber connections}
12/2874 . . . . . . {Processing of data for distribution to the subscribers}
12/2876 . . . . . . {Handling of subscriber policies (group policies management H04L 12/244)}
12/2878 . . . . . {Access multiplexer, e.g. DSLAM (generic distributed time multiplexers, e.g. TDM/TDMA H04J 3/1694)}
12/2879 . . . . . . {characterised by the network type on the uplink side, i.e. towards the service provider network}
12/2881 . . . . {IP/Ethernet DSLAM}
12/2883 . . . . {ATM DSLAM}
12/2885 . . . . {Arrangements interfacing with optical systems (optical network equipment H04B 10/00; optical multiplexers H04J 14/00)}
12/2887 . . . . . . {characterised by the offered subscriber services}
12/2889 . . . . {Multiservice, e.g. MSAN}
12/289 . . . . {Single service}
12/2892 . . . . . . {characterised by the access multiplexer architecture}
12/2894 . . . . {Centralized processing}
12/2896 . . . . {Distributed processing, e.g. on line cards}
12/2898 . . . . {Subscriber equipments (DSL modems H04M 11/062; cable modems H04L 12/2801)}
12/40 . . Bus networks
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

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its behaviour or providing a transparent interface to the bus controller

12/40013	. . . {Details regarding a bus controller}
12/40019	. . . {Details regarding a bus master}
12/40026	. . . {Details regarding a bus guardian}
12/40032	. . . {Details regarding a bus interface enhancer}
12/40039	. . . {Details regarding the setting of the power status of a node according to activity on the bus}
12/40045	. . . {Details regarding the feeding of energy to the node from the bus}
12/40052	. . . {High-speed IEEE 1394 serial bus (bus transfer protocol on a daisy chain bus using an embedded synchronisation G06F 13/426)}
12/40058	. . . {Isochronous transmission}
12/40065	. . . {Bandwidth and channel allocation (home automation networks H04L 12/2803; flow control H04L 12/569)}
12/40071	. . . {Packet processing; Packet format (packet switches H04L 12/5696; intermediate storage or scheduling H04L 12/5694; Adaptation of digital video signals for transport over a specific network H04N 21/2381, H04N 21/4363, H04N 21/4381)}
12/40078	. . . {Bus configuration (home automation networks H04L 12/2803; Arrangements for maintenance or administration H04L 12/24)}
12/40084	. . . {Bus arbitration}
12/40091	. . . {Bus bridging (LAN interconnection over a bridge based backbone H04L 12/462; single bridge functionality H04L 12/462)}
12/40097	. . . {Interconnection with other networks (LAN interconnection over a bridge based backbone H04L 12/462; single bridge functionality H04L 12/462)}
12/40104	. . . {Security; Encryption; Content protection (arrangements for network security H04L 29/06551)}
12/4011	. . . {Wireless (wireless communication networks H04W)}
12/40117	. . . {Interconnection of audio or video/imaging devices (home automation networks H04L 12/2803; bitstream network arrangements specially adapted for distribution of digital video signals H04N 7/24)}
12/40123	. . . {Interconnection of computers and peripherals (printer information exchange with computer G06F 3/1293)}
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)}
12/40136	. . . {Nodes adapting their rate to the physical link properties (LAN switches H04L 49/351)}
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)}
12/4015	. . . . {by scheduling the transmission of messages at the communication node}
12/40156	. . . . {by using dedicated slots associated with a priority level}
12/40163	. . . . {by assigning priority to messages according to a message field}
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)}
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)}
12/40182	. . . . . {by using a plurality of communication lines}
12/40189	. . . . . {by using a plurality of bus systems}
12/40195	. . . . . {by using a plurality of nodes}
12/40202	. . . . . {by using a plurality of master stations}
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

2012/40215	. . . . {Controller Area Network CAN}

2012/40221	. . .	{Profibus}
2012/40228	. . .	{Modbus}
2012/40234	. . .	{Local Interconnect Network LIN}
2012/40241	. . .	{Flexray}
2012/40247	. . .	{LON}
2012/40254	. . .	{Actuator Sensor Interface ASI}
2012/4026	. . .	{Bus for use in automation systems}
2012/40267	. . .	{Bus for use in transportation systems}
2012/40273	. . . .	{the transportation system being a vehicle}
2012/4028	. . . .	{the transportation system being an aircraft}
2012/40286	. . . .	{the transportation system being a waterborne vessel}
2012/40293	. . . .	{the transportation system being a train}
12/403	. . .	with centralised control, e.g. polling
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 3/1694; hybrid switching systems H04L 12/64)}
12/407	. . .	with decentralised control
12/413	. . . .	with random access, e.g. carrier-sense multiple-access with collision detection (CSMA-CD)
12/4135	. . . . .	{using bit-wise arbitration}
12/417	. . . .	with deterministic access, e.g. token passing
12/42	. .	Loop networks
2012/421	. . .	{Interconnected ring systems}
12/422	. . .	{Synchronisation for ring networks (Time Division Multiplex ring networks, e.g. SDH/SONET H04J 3/085)}
12/423	. . .	with centralised control, e.g. polling
12/427	. . .	with decentralised control
12/43	. . . .	with synchronous transmission, e.g. time division multiplex [TDM], slotted rings
12/433	. . . .	with asynchronous transmission, e.g. token ring, register insertion
12/437	. . .	Ring fault isolation or reconfiguration {(for SDH/SONET ring networks H04J 3/085)}
12/44	. .	Star or tree networks
2012/445	. . .	{with switching in a hub, e.g. ETHERNET switch}
12/46	. .	Interconnection of networks
12/4604	. . .	{LAN interconnection over a backbone network, e.g. Internet, Frame Relay}
12/4608	. . . .	{LAN interconnection over ATM networks}
12/4612	. . . .	{LAN interconnection over narrowband networks, e.g. N-ISDN, PSTN, X.25}
12/4616	. . . .	{LAN interconnection over a LAN backbone}
12/462	. . . .	{LAN interconnection over a bridge based backbone}
12/4625	. . . . .	{Single bridge functionality, e.g. connection of two networks over a single bridge}
2012/4629	. . . .	{using multilayer switching, e.g. layer 3 switching}
12/4633	. . .	{Interconnection of networks using encapsulation techniques, e.g. tunneling}
12/4637	. . .	{Interconnected ring systems}

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)}

NOTES

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

12/4645	. . . .	{Details on frame tagging (routing of packets H04L 12/5689; support for virtual LAN H04L 49/354)}
12/465	. . . . .	{wherein a single frame includes a plurality of VLAN tags}
12/4654	. . . . . .	{wherein a VLAN tag represents a customer VLAN, e.g. C-Tag}
12/4658	. . . . . .	{wherein a VLAN tag represents a service provider backbone VLAN, e.g. B-Tag, S-Tag}
12/4662	. . . . . .	{wherein a VLAN tag represents a service instance, e.g. I-SID in PBB}
12/4666	. . . . .	{Operational details on the addition or the stripping of a tag in a frame, e.g. at a provider edge node}

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12/467	. . . .	{Arrangements for supporting untagged frames, e.g. port-based VLANs}
12/4675	. . . .	{Dynamic sharing of VLAN information amongst network nodes (configuration of the network or of network elements H04L 12/2424)}
12/4679	. . . . .	{Arrangements for the registration or de-registration of VLAN attribute values, e.g. VLAN identifiers, port VLAN membership}
12/4683	. . . . .	{characterized by the protocol used}
12/4687	. . . . . .	{MVRP [multiple VLAN registration protocol]}
12/4691	. . . . . .	{GVRP [GARP VLAN registration protocol]}
12/4695	. . . . . .	{VTP [VLAN trunking protocol]}
12/50	.	Circuit switching systems, i.e. systems in which the path is physically permanent during the communication
12/52	. .	using time division techniques (in digital transmission systems H04L 5/22)
12/525	. . .	{involving a stored program control}
12/54	.	Store-and-forward switching systems (packet switching systems H04L 12/56)
12/56	. .	{Packet switching systems}
12/5601	. . .	{Transfer mode dependent, e.g. ATM}
12/5602	. . . .	{Bandwidth control in ATM Networks, e.g. leaky bucket}
2012/5603	. . . .	{Access techniques}
2012/5604	. . . . .	{Medium of transmission, e.g. fibre, cable, radio}
2012/5605	. . . . . .	{Fibre}
2012/5606	. . . . . .	{Metallic}
2012/5607	. . . . . .	{Radio}
2012/5608	. . . . . .	{Satellite}
2012/5609	. . . . .	{Topology}
2012/561	. . . . . .	{Star, e.g. cross-connect, concentrator, subscriber group equipment, remote electronics}
2012/5612	. . . . . .	{Ring}
2012/5613	. . . . . .	{Bus (including DQDB)}
2012/5614	. . . .	{User Network Interface}
2012/5615	. . . . .	{Network termination, e.g. NT1, NT2, PBX}
2012/5616	. . . . .	{Terminal equipment, e.g. codecs, synch.}
2012/5617	. . . . .	{Virtual LANs; Emulation of LANs}
2012/5618	. . . . .	{Bridges, gateways [GW] or interworking units [IWU]}
2012/5619	. . . .	{Network Node Interface, e.g. tandem connections, transit switching}
2012/562	. . . . .	{Routing}
2012/5621	. . . . .	{Virtual private network [VPN]; Private-network - network-interface (P-NNI)}
2012/5623	. . . . .	{Network design, dimensioning, topology or optimisation}
2012/5624	. . . . .	{Path aspects, e.g. path bundling}
2012/5625	. . . .	{Operations, administration and maintenance [OAM]}
2012/5626	. . . . .	{Network management, e.g. Intelligent nets}
2012/5627	. . . . .	{Fault tolerance and recovery}
2012/5628	. . . .	{Testing}
2012/5629	. . . .	{Admission control}
2012/563	. . . . .	{Signalling, e.g. protocols, reference model}
2012/5631	. . . . .	{Resource management and allocation}
2012/5632	. . . . . .	{Bandwidth allocation}
2012/5634	. . . .	{In-call negotiation}
2012/5635	. . . .	{Backpressure, e.g. for ABR}
2012/5636	. . . . . .	{Monitoring or policing, e.g. compliance with allocated rate, corrective actions}
2012/5637	. . . .	{Leaky Buckets}
2012/5638	. . . .	{Services, e.g. multimedia, GOS, QOS}
2012/5639	. . . . .	{Tariffs or charging}
2012/564	. . . . .	{Connection-oriented}
2012/5641	. . . . . .	{Unicast/point-to-point}
2012/5642	. . . . . .	{Multicast/broadcast/point-multipoint, e.g. VOD}
2012/5643	. . . . . .	{Concast/multipoint-to-point}
2012/5645	. . . . .	{Connectionless}
2012/5646	. . . . .	{Cell characteristics, e.g. loss, delay, jitter, sequence integrity}
2012/5647	. . . . . .	{Cell loss}
2012/5648	. . . .	{Packet discarding, e.g. EPD, PTD}
2012/5649	. . . . . .	{Cell delay or jitter}
2012/565	. . . . . .	{Sequence integrity}
2012/5651	. . . . . .	{Priority, marking, classes}
2012/5652	. . . . . .	{Cell construction, e.g. including header, packetisation, depacketisation, assembly, reassembly}
2012/5653	. . . .	{using the ATM adaptation layer [AAL]}
2012/5654	. . . .	{using the AAL1}
2012/5656	. . . .	{using the AAL2}
2012/5657	. . . .	{using the AAL3/4}
2012/5658	. . . .	{using the AAL5}
2012/5659	. . . .	{usint the AALX}
2012/566	. . . .	{using the ATM layer}
2012/5661	. . . .	{Minicells}
2012/5662	. . . .	{Macrocells or frames}
2012/5663	. . . . .	{Support of N-ISDN}
2012/5664	. . . . .	{Support of Video, e.g. MPEG}
2012/5665	. . . . .	{Interaction of ATM with other protocols}
2012/5667	. . . . . .	{IP over ATM}
2012/5668	. . . . . .	{Next hop resolution protocol [NHRP]}
2012/5669	. . . . . .	{Multiprotocol over ATM [MPOA]}
2012/567	. . . . . .	{Frame Relay over ATM}
2012/5671	. . . . .	{Support of voice}
2012/5672	. . . .	{Multiplexing, e.g. coding, scrambling}
2012/5673	. . . . .	{Coding or scrambling}
2012/5674	. . . . .	{Synchronisation, timing recovery or alignment}
2012/5675	. . . . .	{Timeslot assignment, e.g. TDMA}
2012/5676	. . . . .	{Code Division Multiple Access [CDMA]}
2012/5678	. . . .	{Traffic aspects, e.g. arbitration, load balancing, smoothing, buffer management}
2012/5679	. . . . .	{Arbitration or scheduling}
2012/568	. . . . .	{Load balancing, smoothing or shaping}
2012/5681	. . . . .	{Buffer or queue management}
2012/5682	. . . . . .	{Threshold; Watermark}
2012/5683	. . . . . .	{for avoiding head of line blocking}
2012/5684	. . . . .	{Characteristics of traffic flows}
2012/5685	. . . .	{Addressing issues}

2012/5686	. . . .	{Use of neural networks}
2012/5687	. . . .	{Security aspects}
12/5689	. . .	{Routing of packets}
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

12/5691	. . .	{Access to open networks; Ingress point selection, e.g. ISP selection}
12/5692	. . . .	{Selection among different networks}
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

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

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

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

2012/5697	. . .	{Indexing scheme relating to flow control in packet switching networks}
2012/5698	. . .	{Indexing scheme relating to packet switching systems}
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

12/5805	. . .	{with automatic reactions or user delegation, e.g. automatic replies or chatbot}
12/581	. . .	{Real time or near real time messaging, e.g. instant messaging [IM]}
12/5815	. . . .	{use or manipulation of presence information in messaging (presence management H04L 29/08684)}
12/582	. . . .	{interacting with other applications or services}
12/5825	. . .	{Message adaptation based on network or terminal capabilities}
12/583	. . . .	{with adaptation as to content}
12/5835	. . . .	{with adaptation as to format}
12/584	. . .	{messages including annexed information, e.g. attachments}
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)}
12/585	. . .	{with filtering and selective blocking capabilities}
12/5855	. . .	{with selective forwarding}
12/586	. . .	{including conversation history, e.g. threads}
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)}
12/587	. . .	{with notification on incoming messages}
12/5875	. . .	{with reliability check, e.g. acknowledgments, fault reporting}
12/588	. . .	{messaging within social networks}
12/5885	. . .	{with provisions for tracking the progress of a message}
12/589	. . .	{unified messaging, e.g. interactions between instant messaging [IM], e-mail or other types of messages such as Converged IP Messaging [CPM]}
12/5895	. . .	{in combination with wireless systems (messaging in wireless communication networks H04W 4/12)}
12/60	. . .	Manual relay systems, e.g. push-button switching
12/62	. . . .	with perforated tape storage
12/64	.	Hybrid switching systems
12/6402	. .	{Hybrid switching fabrics}
2012/6405	. . .	{Space}
2012/6408	. . .	{Shared Medium, e.g. memory, bus, ring}
2012/641	. . .	{Time switching}
2012/6413	. . .	{Switch peripheries}
2012/6416	. . .	{Switch multicast}
12/6418	. .	{Hybrid transport}
2012/6421	. . .	{Medium of transmission, e.g. fibre, cable, radio, satellite}
2012/6424	. . .	{Access arrangements}
2012/6427	. . . .	{Subscriber Access Module; Concentrator; Group equipment}
2012/6429	. . .	{Terminal adapters}
2012/6432	. . .	{Topology}
2012/6435	. . . .	{Bus}
2012/6437	. . . .	{Ring}
2012/644	. . . .	{Star}
2012/6443	. . .	{Network Node Interface, e.g. Routing, Path finding}

2012/6445	. . . .	{Admission control}
2012/6448	. . . .	{Medium Access Control [MAC]}
2012/6451	. . . . .	{Deterministic, e.g. Token, DQDB}
2012/6454	. . . . .	{Random, e.g. Ethernet}
2012/6456	. . . .	{Channel and bandwidth allocation}
2012/6459	. . . .	{Multiplexing, e.g. TDMA, CDMA}
2012/6462	. . . .	{Movable boundaries in packets or frames}
2012/6464	. . .	{Priority}
2012/6467	. . .	{Information loss recovery, e.g. error correction, prediction}
2012/647	. . .	{Frame Relay, X.25}
2012/6472	. . .	{Internet}
2012/6475	. . .	{N-ISDN, Public Switched Telephone Network [PSTN]}
2012/6478	. . .	{Digital subscriber line, e.g. DSL, ADSL, HDSL, XDSL, VDSL}
2012/6481	. . .	{Speech, voice}
2012/6483	. . .	{Video, e.g. MPEG}
2012/6486	. . .	{Signalling Protocols}
2012/6489	. . .	{Buffer Management, Threshold setting, Scheduling, Shaping}
2012/6491	. . .	{Echo cancellation}
2012/6494	. . .	{Silence suppression}
2012/6497	. . .	{Feedback to the source}
12/66	.	Arrangements for connecting between networks having differing types of switching systems, e.g. gateways

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

13/02	.	Details not particular to receiver or transmitter
13/04	. .	Driving mechanisms; Clutches (in general F16)
13/06	. .	Tape or page guiding or feeding devices
13/08	. .	Intermediate storage means
13/10	. .	Distributors
13/12	. . .	Non-mechanical distributors, e.g. relay distributors
13/14	. . . .	Electronic distributors (in general H03K 17/00)
13/16	.	of transmitters, e.g. code-bars, code-discs
13/18	.	of receivers
13/182	. .	{Printing mechanisms}
13/184	. . .	{Photographic printing and recording}
13/186	. .	{Page printing; tabulating}
13/188	. .	{Projection of the printed matter}

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)

15/03	.	Keys structurally combined with sound generators
15/04	.	Apparatus or circuits at the transmitting end
15/06	. .	with a restricted number of keys, e.g. separate key for each type of code element
15/08	. .	with a single key which transmits dots in one position and dashes in a second position
15/10	. . .	combined with perforating apparatus
15/12	. .	with keyboard co-operating with code-bars
15/14	. . .	combined with perforating apparatus
15/16	. .	with keyboard co-operating with code discs
15/18	. .	Automatic transmitters, e.g. controlled by perforated tape

15/20	. . .	with optical sensing means
15/22	. .	Apparatus or circuits for sending one or a restricted number of signals, e.g. distress signals
15/24	.	Apparatus or circuits at the receiving end
15/26	. .	Operating only on reception of predetermined code signals, e.g. distress signals, party-line call signals
15/28	. .	Code reproducing apparatus
15/285	. . .	{Telegraph sounders; Apparatus for acoustic reception}
15/30	. . .	Writing recorders
15/32	. . .	Perforating recorders
15/34	. .	Apparatus for recording received coded signals after translation, e.g. as type-characters

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)

17/02	.	Apparatus or circuits at the transmitting end
17/04	. .	with keyboard co-operating with code-bars
17/06	. . .	Contact operating means
17/08	. . .	combined with perforating apparatus
17/10	. .	with keyboard co-operating with code-discs
17/12	. .	Automatic transmitters, e.g. controlled by perforated tape
17/14	. . .	with optical sensing means
17/16	.	Apparatus or circuits at the receiving end
17/18	. .	Code selection mechanisms
17/20	. .	using perforating recorders
17/22	. .	using mechanical translation and type-bar printing
17/24	. .	using mechanical translation and type-head printing, e.g. type-wheel, type-cylinder
17/26	. .	using aggregate motion translation
17/28	. .	using pneumatic or hydraulic translation
17/30	. .	using electric or electronic translation

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

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

21/02	.	at the transmitting end
21/04	.	at the receiving end

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

23/02	.	adapted for orthogonal signalling

25/00   **Baseband systems**

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)}
25/0202	. .	{Channel estimation}
25/0204	. . .	{of multiple channels}
25/0206	. . . .	{of each channel individually}
25/0208	. . . .	{of the composite channel}
25/021	. . .	{Estimation of channel covariance}
25/0212	. . .	{of impulse response}

25/0214	. . . .	{of a single coefficient}
25/0216	. . . .	{with estimation of channel length}
25/0218	. . . .	{with detection of nulls}
25/022	. . .	{of frequency response}
25/0222	. . .	{Estimation of channel variability, e.g. coherence bandwidth, coherence time, fading frequency}
25/0224	. . .	{using sounding signals}
25/0226	. . . .	{sounding signals per se}
25/0228	. . . .	{with direct estimation from sounding signals}
25/023	. . . . .	{with extension to other symbols}
25/0232	. . . . . .	{by interpolation between sounding signals}
25/0234	. . . .	{by non-linear interpolation}
25/0236	. . . . . .	{using estimation of the other symbols}
25/0238	. . .	{using blind estimation}
25/024	. . .	{channel estimation algorithms}
25/0242	. . . .	{using matrix methods}
25/0244	. . . . .	{with inversion}
25/0246	. . . . .	{with factorisation}
25/0248	. . . . .	{Eigen-space methods}
25/025	. . . .	{using least-mean-square [LMS] method}
25/0252	. . . .	{using third or higher order statistics}
25/0254	. . . .	{using neural network algorithms}
25/0256	. . . .	{Channel estimation using minimum mean square error criteria}
25/0258	. . . .	{Channel estimation using zero-forcing criteria}
25/026	. .	{Arrangements for coupling transmitters, receivers or transceivers to transmission lines; Line drivers (duplexing arrangements H04L 5/14)}
25/0262	. .	{Arrangements for detecting the data rate of an incoming signal}
25/0264	. .	{Arrangements for coupling to transmission lines (duplexing arrangements H04L 5/14; line equalisers, line build-out devices H04L 25/03878)}
25/0266	. . .	{Arrangements for providing Galvanic isolation, e.g. by means of magnetic or capacitive coupling}
25/0268	. . . .	{with modulation and subsequent demodulation}
25/027	. . . .	{specifically for telegraph signals (induction coil interrupters H01H 51/34 dynamo-electric generators H02K)}
25/0272	. . .	{Arrangements for coupling to multiple lines, e.g. for differential transmission}
25/0274	. . . .	{Arrangements for ensuring balanced coupling}
25/0276	. . . .	{Arrangements for coupling common mode signals}
25/0278	. . .	{Arrangements for impedance matching}
25/028	. . .	{Arrangements specific to the transmitter end}
25/0282	. . . .	{Provision for current-mode coupling}
25/0284	. . . .	{Arrangements to ensure DC-balance}
25/0286	. . . .	{Provision of wave shaping within the driver (wave shaping per se H04L 25/03834)}
25/0288	. . . . .	{the shape being matched to the transmission line (pre-equalisation per se H04L 25/03343)}
25/029	. . . .	{Provision of high-impedance states}
25/0292	. . .	{Arrangements specific to the receiver end}
25/0294	. . . .	{Provision for current-mode coupling}
25/0296	. . . .	{Arrangements to ensure DC-balance}
25/0298	. . .	{Arrangement for terminating transmission lines}
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}
25/03006	. . .	{Arrangements for removing intersymbol interference}
25/03012	. . . .	{operating in the time domain (H04L 25/03165, H04L 25/03178 take precedence)}
25/03019	. . . . .	{adaptive, i.e. capable of adjustment during data reception}
25/03025	. . . . . .	{using a two-tap delay line}
25/03031	. . . . . .	{using only passive components (H04L 25/03025 takes precedence)}
25/03038	. . . . . .	{with a non-recursive structure (H04L 25/03031 takes precedence)}
25/03044	. . . .	{using fractionally spaced delay lines or combinations of fractionally integrally spaced taps}
25/0305	. . . .	{using blind adaptation}
25/03057	. . . . . .	{with a recursive structure (H04L 25/03031 takes precedence)}
25/03063	. . . .	{using fractionally spaced delay lines or combinations of fractionally and integrally spaced taps}
25/0307	. . . .	{using blind adaptation}
25/03076	. . . . . .	{not using decision feedback}
25/03082	. . . . . .	{Theoretical aspects of adaptive time domain methods}
25/03089	. . . .	{Theory of blind algorithms, recursive or not}
25/03095	. . . .	{Theory of fractional equalisers, recursive or not}
25/03101	. . . .	{Theory of the Kalman algorithm}
25/03108	. . . .	{Theory of recursive equalisers, other than Kalman}
25/03114	. . . . .	{non-adaptive, i.e. not adjustable, manually adjustable, or adjustable only during the reception of special signals}
25/03121	. . . . . .	{using a two-tap delay line}
25/03127	. . . . . .	{using only passive components (H04L 25/03121 takes precedence)}
25/03133	. . . . . .	{with a non-recursive structure (H04L 25/03127 takes precedence)}
25/0314	. . . .	{using fractionally spaced delay lines or combinations of fractionally integrally spaced taps}
25/03146	. . . . . .	{with a recursive structure (H04L 25/03127 takes precedence)}
25/03152	. . . . . .	{Theoretical aspects of non-adaptive time domain methods}
25/03159	. . . .	{operating in the frequency domain (H04L 25/03165, H04L 25/03178 take precedence)}
25/03165	. . . .	{using neural networks}

25/03171 . . . . {Arrangements involving maximum a posteriori probability [MAP] detection}

NOTE

This group contains provisionally all documents which deal with turbo equalisation

25/03178 . . . . {Arrangements involving sequence estimation techniques}

25/03184 . . . . . {Details concerning the metric}

25/03191 . . . . . . {in which the receiver makes a selection between different metrics}

25/03197 . . . . . . {methods of calculation involving metrics}

25/03203 . . . . . {Trellis search techniques}

25/0321 . . . . . . {Sorting arrangements therefor}

25/03216 . . . . . . {using the M-algorithm}

25/03222 . . . . . . {using the T-algorithm}

25/03229 . . . . . . {with state-reduction using grouping of states}

25/03235 . . . . . . {with state-reduction using feedback filtering}

25/03242 . . . . . . {Methods involving sphere decoding}

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

25/03254 . . . . . . {Operation with other circuitry for removing intersymbol interference}

25/03261 . . . . {with impulse-response shortening filters}

25/03267 . . . . {with decision feedback equalisers}

25/03273 . . . . . . {with carrier recovery circuitry}

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 1/7097; interference related aspects of frequency hopping spread spectrum H04B 1/715; see also H04B 1/10)}

25/03286 . . . . . . {with channel-decoding circuitry}

25/03292 . . . . . . {with channel estimation circuitry}

25/03299 . . . . . . {with noise-whitening circuitry}

25/03305 . . . . . {Joint sequence estimation and interference removal (joint detection of several desired signals H04L 25/03331)}

25/03312 . . . . . {Arrangements specific to the provision of output signals}

25/03318 . . . . . . {Provision of soft decisions}

25/03324 . . . . . . {Provision of tentative decisions}

25/03331 . . . . . {Arrangements for the joint estimation of multiple sequences}

25/03337 . . . . . {Arrangements involving per-survivor processing}

25/03343 . . . . {Arrangements at the transmitter end}

2025/0335 . . . . {characterised by the type of transmission}

2025/03356 . . . . . {Baseband transmission}

2025/03363 . . . . . . {Multilevel (H04L 2025/03369 takes precedence)}

2025/03369 . . . . . . {Partial response}

2025/03375 . . . . . {Passband transmission}

2025/03382 . . . . . . {Single of vestigal sideband}

2025/03388 . . . . . . {ASK}

2025/03394 . . . . . . {FSK}

2025/03401 . . . . . . {PSK}

2025/03407 . . . . {Continuous phase}

2025/03414 . . . . . . {Multicarrier}

2025/0342 . . . . . . {QAM}

2025/03426 . . . . {transmission using multiple-input and multiple-output channels}

2025/03433 . . . . {characterised by equaliser structure}

2025/03439 . . . . . {Fixed structures}

2025/03445 . . . . . . {Time domain}

2025/03452 . . . . {Systolic arrays}

2025/03458 . . . . {Lattice}

2025/03464 . . . . {Neural networks}

2025/03471 . . . . {Tapped delay lines (H04L 2025/03464 takes precedence)}

2025/03477 . . . . {not time-recursive}

2025/03484 . . . . {time-recursive}

2025/0349 . . . . {as a feedback filter}

2025/03496 . . . . {as a prediction filter}

2025/03503 . . . . {as a combination of feedback and prediction filters}

2025/03509 . . . . {fractionally spaced (H04L 2025/03515 takes precedence)}

2025/03515 . . . . {irregularly spaced}

2025/03522 . . . . . . {Frequency domain}

2025/03528 . . . . . . {Other transform domain}

2025/03535 . . . . . {Variable structures}

2025/03541 . . . . . . {Switching between domains, e.g. between time and frequency}

2025/03547 . . . . . . {Switching between time domain structures}

2025/03554 . . . . {between neural networks and tapped delay lines}

2025/0356 . . . . . . {Switching the time direction of equalisation}

2025/03566 . . . . . . {between different tapped delay line structures}

2025/03573 . . . . {between recursive and non-recursive}

2025/03579 . . . . {Modifying the tap spacing}

2025/03585 . . . . {Modifying the length}

2025/03592 . . . . {Adaptation methods}

2025/03598 . . . . . {Algorithms}

2025/03605 . . . . . . {Block algorithms}

2025/03611 . . . . . . {Iterative algorithms}

2025/03617 . . . . . . {Time recursive algorithms (H04L 2025/03643 takes precedence)}

2025/03624 . . . . {Zero-forcing}

2025/0363 . . . . {Feature restoration, e.g. constant modulus}

2025/03636 . . . . . . {Algorithms using least mean square [LMS]}

2025/03643	. . . .	{Order recursive}
2025/03649	. . . .	{Algorithms using recursive least square [RLS]}
2025/03656	. . . .	{Initialisation}
2025/03662	. . . .	{to a fixed value}
2025/03668	. . . .	{to the value at the end of a previous adaptation period}
2025/03675	. . . . . .	{Blind algorithms using gradient methods}
2025/03681	. . . . . .	{Control of adaptation}
2025/03687	. . . .	{of step size}
2025/03694	. . . .	{Stop and go}
2025/037	. . . . . .	{Detection of convergence state}
2025/03707	. . . . . .	{Detection or avoidance of local extrema}
2025/03713	. . . . . .	{Subspace algorithms}
2025/03719	. . . . . .	{Super-exponential}
2025/03726	. . . . .	{Switching between algorithms}
2025/03732	. . . . . .	{according to the convergence state}
2025/03738	. . . . .	{Manual adaptation}
2025/03745	. . . . .	{Timing of adaptation}
2025/03751	. . . . . .	{only once, at installation (H04L 2025/03738 takes precedence)}
2025/03757	. . . . . .	{only on the request of a user}
2025/03764	. . . . . .	{only during predefined intervals}
2025/0377	. . . .	{during the reception of training signals}
2025/03777	. . . .	{characterised by the signalling}
2025/03783	. . . . .	{Details of reference signals}
2025/03789	. . . . . .	{Codes therefore}
2025/03796	. . . . . .	{Location of reference signals}
2025/03802	. . . . .	{Signalling on the reverse channel}
2025/03808	. . . . . .	{Transmission of equaliser coefficients}
2025/03815	. . . . . .	{Transmission of a training request}
25/03821	. . . .	{Inter-carrier interference cancellation [ICI]}
25/03828	. . .	{Arrangements for spectral shaping; Arrangements for providing signals with specified spectral properties (partial response systems H04L 25/497)}
25/03834	. . . .	{using pulse shaping}
25/0384	. . . .	{Design of pulse shapes (pulse shape for impulse radio H04B 1/7172)}
25/03847	. . . .	{Shaping by selective switching of amplifying elements}
25/03853	. . . .	{Shaping by digital methods other than look up tables or up/down converters}
25/03859	. . . .	{shaping using look up tables for partial waveforms}
25/03866	. . . .	{using scrambling}
25/03872	. . . . .	{Parallel scrambling or descrambling}
25/03878	. . .	{Line equalisers; line build-out devices}
25/03885	. . . .	{adaptive}
25/03891	. . .	{Spatial equalizers (MIMO diversity systems H04B 7/0413)}
25/03898	. . . .	{codebook-based design (selection of codebook or precoding matrix for MIMO diversity systems H04B 7/0456)}
25/03904	. . . . .	{cooperative design, e.g. exchanging of codebook information between base stations}
25/0391	. . . . .	{construction details of matrices}
25/03917	. . . . . .	{according to the size of the codebook}
25/03923	. . . . . .	{according to the rank}

25/03929	. . . . .	{with layer mapping, e.g. codeword-to layer design (for space-time coding H04L 1/0618)}
25/03936	. . . . .	{multi-resolution codebooks}
25/03942	. . . . .	{switching between different codebooks}
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)}
25/03955	. . . . .	{in combination with downlink estimations, e.g. downlink path losses}
25/03961	. . . .	{design criteria}
25/03968	. . . . .	{mean-square error [MSE]}
25/03974	. . . . .	{throughput maximization}
25/0398	. . .	{Restoration of channel reciprocity}
25/03987	. . .	{Equalisation for sparse channels}
25/03993	. . .	{Noise whitening}
25/05	. .	Electric or magnetic storage of signals before transmitting or retransmitting for changing the transmission rate
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)}
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 25/0296)}
25/062	. . . .	{Setting decision thresholds using feedforward techniques only}
25/063	. . . .	{Setting decision thresholds using feedback techniques only}
25/064	. . . . .	{Subtraction of the threshold from the signal, which is then compared to a supplementary fixed threshold}
25/065	. . . .	{Binary decisions}
25/066	. . . .	{Multilevel decisions, not including self-organising maps}
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)}
25/068	. . .	{by sampling faster than the nominal bit rate}
25/069	. . .	{by detecting edges or zero crossings}
25/08	. .	Modifications for reducing interference; Modifications for reducing effects due to line faults; {Receiver end arrangements for detecting or overcoming line faults}
25/085	. . .	{Arrangements for reducing interference in line transmission systems, e.g. by differential transmission}
25/10	. .	Compensating for variations in line balance {(balancing during the coupling of signals H04L 25/0282)}
25/12	. .	Compensating for variations in line impedance {(impedance matching in coupling arrangements H04L 25/0278)}

25/14	. .	Channel dividing arrangements {in which a single bit stream is divided between several baseband channels and reassembled at the receiver}
25/20	. .	Repeater circuits; Relay circuits
25/202	. . .	{using mechanical devices (H04L 25/205 takes precedence)}
25/205	. . .	{using tuning forks or vibrating reeds}
25/207	. . .	{using electromagnetic switches}
25/22	. . .	Repeaters for converting two wires to four wires (in general H04B); Repeaters for converting single current to double current
25/24	. . .	Relay circuits using discharge tubes or semiconductor devices {(H04L 25/22 takes precedence)}
25/242	. . . .	{with retiming}
25/245	. . . . .	{for start-stop signals (detection of start or stop bits H04J 3/0602)}
25/247	. . . . .	{for synchronous signals}
25/26	. . .	Circuits with optical sensing means, {i.e. using opto-couplers for isolation}
25/38	.	Synchronous or start-stop systems, e.g. for Baudot code
25/40	. .	Transmitting circuits; Receiving circuits (repeater circuits, relay circuits {H04L 25/20})
25/42	. . .	using mechanical distributors
25/44	. . .	using relay distributors
25/45	. . .	using electronic distributors (electronic distributors in general H03K 17/00)
25/46	. . .	using tuning forks or vibrating reeds
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)}
25/4902	. . . .	{Pulse width modulation; Pulse position modulation}
25/4904	. . . .	{using self-synchronising codes, e.g. split-phase codes}
25/4906	. . . .	{using binary codes}
25/4908	. . . . .	{using mBnB codes}
25/491	. . . . . .	{using 1B2B codes}
25/4912	. . . .	{using CMI or 2-HDB-3 code}
25/4915	. . . . .	{using pattern inversion or substitution (H04L 25/4908 takes precedence)}
25/4917	. . . .	{using multilevel codes}
25/4919	. . . . .	{using balanced multilevel codes (H04L 25/4927 takes precedence)}
25/4921	. . . . . .	{using quadrature encoding, e.g. carrierless amplitude-phase coding}
25/4923	. . . . .	{using ternary codes (H04L 25/4927 takes precedence)}
25/4925	. . . . . .	{using balanced bipolar ternary codes}
25/4927	. . . . .	{using levels matched to the quantisation levels of the channel}
25/493	. . . .	by transition coding, i.e. the time-position or direction of a transition being encoded before transmission
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)}

25/4975	. . . . .	{Correlative coding using Tomlinson precoding, Harashima precoding, Trellis precoding or GPRS}
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)}
27/0002	.	{analog front ends; means for connecting modulators, demodulators or transceivers to a transmission line (duplex arrangements H04L 5/143)}
27/0004	.	{using wavelets}
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)}
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)}
27/001	.	{using chaotic signals (for secret or secure communication H04L 9/001)}
27/0012	.	{arrangements for identifying the type of modulation}
27/0014	.	{Carrier regulation (of chaotic carriers H04L 27/001; for multicarrier receivers H04L 27/2657)}
2027/0016	. .	{Stabilisation of local oscillators}
2027/0018	. .	{Arrangements at the transmitter end}
2027/002	. . .	{using feedback from a remote receiver}
2027/0022	. . .	{using the carrier of the associated receiver of a transceiver}
2027/0024	. .	{at the receiver end}
2027/0026	. . .	{Correction of carrier offset}
2027/0028	. . . .	{at passband only}
2027/003	. . . .	{at baseband only}
2027/0032	. . . .	{at baseband and passband}
2027/0034	. . . .	{using hypothesis testing}
2027/0036	. . . .	{using a recovered symbol clock}
2027/0038	. . . .	{using an equaliser}
2027/004	. . . . .	{the equaliser providing control signals}
2027/0042	. . . . .	{the equaliser providing the offset correction per se}
2027/0044	. .	{Control loops for carrier regulation}
2027/0046	. . .	{Open loops}
2027/0048	. . . .	{Frequency multiplication}
2027/0051	. . . .	{Harmonic tracking}
2027/0053	. . .	{Closed loops}
2027/0055	. . . .	{single phase}
2027/0057	. . . .	{quadrature phase}
2027/0059	. . . .	{more than two phases}
2027/0061	. . . .	{remodulation}
2027/0063	. . .	{Elements of loops}
2027/0065	. . . .	{Frequency error detectors (H04L 2027/0067 takes precedence)}
2027/0067	. . . .	{Phase error detectors}
2027/0069	. . . .	{Loop filters}
2027/0071	. . .	{Control of loops}
2027/0073	. . . .	{Detection of synchronisation state}
2027/0075	. . . .	{Error weighting}

2027/0077	. . . . .	{stop and go}
2027/0079	. . . .	{Switching between loops}
2027/0081	. . . . .	{between loops of different bandwidths}
2027/0083	. .	{Signalling arrangements}
2027/0085	. . .	{with no special signals for synchronisation}
2027/0087	. . .	{Out-of-band signals, (e.g. pilots)}
2027/0089	. . .	{In-band signals}
2027/0091	. . . .	{Continuous signals}
2027/0093	. . . .	{Intermittant signals}
2027/0095	. . . . .	{in a preamble or similar structure}
2027/0097	. . .	{Adaptive synchronisation signals}

27/01 . Equalisers {(baseband equalisers H04L 25/03; control of amplification H03G; in analogue transmission systems H04B 3/04, H04B 7/005)}

27/02 . Amplitude-modulated carrier systems, e.g. using on-off keying; Single sideband or vestigial sideband modulation (H04L 27/32 takes precedence)

27/04 . . Modulator circuits (in general H03C {H03K 7/02}); Transmitter circuits

27/06 . . Demodulator circuits (in general H03D {H03K 9/02}); Receiver circuits

27/063 . . . {Superheterodyne receivers}

27/066 . . . {Carrier recovery circuits (H04L 27/2271 takes precedence)}

27/08 . . Amplitude regulation arrangements

27/10 . Frequency-modulated carrier systems, i.e. using frequency-shift keying (H04L 27/32 takes precedence; {continuous phase systems H04L 27/18})

27/103 . . {Chirp modulation (for spread spectrum techniques H04B 1/69; for spread spectrum using chirp H04B 2001/6912)}

27/106 . . {M-ary FSK}

27/12 . . Modulator circuits (in general H03C {H03K 7/06}); Transmitter circuits {(continuous phase modulation H04L 27/20)}

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)}

27/125 . . . {using a controlled oscillator in an open loop}

27/127 . . . {using a controlled oscillator in a feedback loop}

27/14 . . Demodulator circuits (in general H03D {H03K 9/06}); Receiver circuits {(for continuous phase modulation systems H04L 27/22)}

27/142 . . . {Compensating direct current components occurring during the demodulation and which are caused by mistuning}

27/144 . . . with demodulation using spectral properties of the received signal, e.g. by using frequency selective- or frequency sensitive elements

27/148 . . . . using filters, including PLL-type filters

27/152 . . . . using controlled oscillators, e.g. PLL arrangements

27/1525 . . . . . {using quadrature demodulation}

27/156 . . . with demodulation using temporal properties of the received signal, e.g. detecting pulse width

27/1563 . . . . {using transition or level detection}

27/1566 . . . . {using synchronous sampling}

27/16 . . Frequency regulation arrangements

27/18 . Phase-modulated carrier systems, i.e. using phase-shift keying (H04L 27/32 takes precedence) {includes continuous phase systems}

27/183 . . {Multiresolution systems}

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}

27/20 . . Modulator circuits (in general H03C {H03K 7/04}); Transmitter circuits

27/2003 . . . {for continuous phase modulation (frequency shift keying H04L 27/10)}

27/2007 . . . . {in which the phase change within each symbol period is constrained (coset coding H04L 27/186)}

27/201 . . . . . {in which the allowed phase changes vary with time, e.g. multi-h modulation}

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)}

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)}

27/2021 . . . . {in which the phase change per symbol period is not constrained}

27/2025 . . . . . {in which the phase changes in a piecewise linear manner within each symbol period}

27/2028 . . . . . {in which the phase changes are non-linear}

27/2032 . . . {for discrete phase modulation, e.g. in which the phase of the carrier is modulated in a nominally instantaneous manner}

27/2035 . . . . {using a single or unspecified number of carriers}

27/2039 . . . . . {using microwave technology}

27/2042 . . . . . {with more than two phase states}

27/2046 . . . . . . {in which the data are represented by carrier phase}

27/205 . . . . . . {in which the data are represented by the change in phase of the carrier}

27/2053 . . . . {using more than one carrier, e.g. carriers with different phases}

27/2057 . . . . . {with a separate carrier for each phase state}

27/206 . . . . . {using a pair of orthogonal carriers, e.g. quadrature carriers}

27/2064 . . . . . . {using microwave technology}

27/2067 . . . . . . {with more than two phase states (H04L 27/2064 takes precedence)}

27/2071 . . . . {in which the data are represented by the carrier phase, e.g. systems with differential coding}

27/2075 . . . . {in which the data are represented by the change in carrier phase}

27/2078 . . . . {in which the phase change per symbol period is constrained (coset coding H04L 27/186)}

27/2082 . . . . {for offset or staggered quadrature phase shift keying}

27/2085 . . . . {with more than one phase shift per symbol period}

27/2089	. . . . . .	{with unbalanced quadrature channels}
27/2092	. . . .	{with digital generation of the modulated carrier (does not include the modulation of a digitally generated carrier)}
27/2096	. . .	{Arrangements for directly or externally modulating an optical carrier (optical modulation H04B 10/503)}
27/22	. .	Demodulator circuits (in general H03D {H03K 9/04}); Receiver circuits
27/223	. . .	{Demodulation in the optical domain (optical demodulation H04B 10/676)}
27/227	. . .	using coherent demodulation
27/2271	. . . .	{wherein the carrier recovery circuit uses only the demodulated signals}
27/2272	. . . . .	{using phase locked loops (H04L 27/2273 takes precedence)}
27/2273	. . . . .	{associated with quadrature demodulation, e.g. Costas loop}
27/2275	. . . .	{wherein the carrier recovery circuit uses the received modulated signals}
27/2276	. . . . .	{using frequency multiplication or harmonic tracking}
27/2277	. . . . .	{using remodulation}
27/2278	. . . . .	{using correlation techniques, e.g. for spread spectrum signals}
27/233	. . .	using non-coherent demodulation
27/2331	. . . .	{wherein the received signal is demodulated using one or more delayed versions of itself}
27/2332	. . . .	{using a non-coherent carrier}
27/2334	. . . .	{using filters}
27/2335	. . . .	{using temporal properties of the received signal}
27/2337	. . . . .	{using digital techniques to measure the time between zero-crossings}
27/2338	. . . .	{using sampling (H04L 27/2331 - H04L 27/2335 take precedence)}
27/24	. .	Half-wave signalling systems
27/26	.	Systems using multi-frequency codes (H04L 27/32 takes precedence)
27/2601	. .	{Multicarrier modulation systems}
27/2602	. . .	{Signal structure}
27/2604	. . . .	{Multiresolution systems (by means of multiresolution subcarriers H04L 27/183, H04L 27/3488)}
27/2605	. . . .	{Symbol extensions}
27/2607	. . . . .	{Cyclic extensions}
27/2608	. . . .	{Allocation of payload}
27/261	. . . .	{Details of reference signals (H04L 27/262 takes precedence)}
27/2611	. . . . .	{Distribution thereof}
27/2613	. . . . .	{Structure of the reference signals per se}
27/2614	. . .	{Peak power aspects}
27/2615	. . . .	{Reduction thereof using coding}
27/2617	. . . . .	{using block codes}
27/2618	. . . .	{Reduction thereof using auxiliary subcarriers}
27/262	. . . .	{Reduction thereof by selection of pilot symbols}
27/2621	. . . .	{Reduction thereof using phase offsets between subcarriers}
27/2623	. . . .	{Reduction thereof by clipping}

27/2624	. . . . .	{by soft clipping}
27/2626	. . .	{Arrangements specific to the transmitter}
27/2627	. . . .	{Modulators}
27/2628	. . . . .	{Inverse Fourier transform modulators, e.g. IFFT/IDFT (DFT or FFT computation methods or devices in general G06F 17/141)}
27/263	. . . . . .	{modification of IFFT/IDFT modulator for performance improvement}
27/2631	. . . . . .	{with polyphase implementation}
27/2633	. . . . . .	{using partial FFTs}
27/2634	. . . . .	{IFFT/IDFT in combination with other circuits for modulation (DFT or FFT computation methods or devices in general G06F 17/141)}
27/2636	. . . . .	{with FFT/DFT, e.g. standard SC-FDMA transmitter or DFT-SOFDM}
27/2637	. . . . .	{with direct modulation of individual subcarriers}
27/2639	. . . . .	{Discrete cosine transform modulators}
27/264	. . . . .	{Filterbank multicarrier [FBMC]}
27/2642	. . . . .	{Wavelet transform modulators (wavelets in general H04L 27/0004; wavelet-division H04L 5/0008)}
27/2643	. . . . .	{using symbol repetition, e.g. time domain realization of distributed FDMA}
27/2644	. . . . .	{with oversampling}
27/2646	. . . .	{using feedback from receiver for adjusting OFDM transmission parameters, e.g. transmission timing or guard interval length}
27/2647	. . .	{Arrangements specific to the receiver (equalisation H04L 25/03006, H04L 27/01)}
27/2649	. . . .	{Demodulators}
27/265	. . . . .	{Fourier transform demodulators}
27/2652	. . . . . .	{with polyphase implementation}
27/2653	. . . . .	{with direct demodulation of individual subcarriers}
27/2655	. . . .	{Synchronisation arrangements}
27/2656	. . . . .	{Frame synchronisation}
27/2657	. . . . .	{Carrier synchronisation}
27/2659	. . . . . .	{Coarse or integer frequency offset determination and synchronisation}
27/266	. . . . . .	{Fine or fractional frequency offset determination and synchronisation}
27/2662	. . . . .	{Symbol synchronisation}
27/2663	. . . . . .	{Coarse synchronisation, e.g. by correlation}
27/2665	. . . . . .	{Fine synchronisation, e.g. by positioning the FFT window}
27/2666	. . . . .	{Acquisition of further OFDM parameters, e.g. bandwidth, subcarrier spacing, or guard interval length}
27/2668	. . . . .	{Details of algorithms}
27/2669	. . . . . .	{characterised by the domain of operation}
27/2671	. . . .	{Time domain}
27/2672	. . . .	{Frequency domain}
27/2673	. . . . . .	{characterised by synchronisation parameters}
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)}

27/2676	. . . . {Blind, i.e. without using known symbols}
27/2678	. . . . {using cyclostationarities, e.g. cyclic prefix or postfix}
27/2679	. . . . {Decision-aided}
27/2681	. . . . . . {characterised by constraints}
27/2682	. . . . . . {Precision}
27/2684	. . . . . . {Complexity}
27/2685	. . . . . . {Speed of convergence}
27/2686	. . . . . . {Range of frequencies or delays tested}
27/2688	. . . . . . {Resistance to perturbation, e.g. noise, interference or fading}
27/2689	. . . . . {Link with other circuits, i.e. special connections between synchronisation arrangements and other circuits for achieving synchronisation}
27/2691	. . . . . . {involving interference determination or cancellation (interference mitigation or coordination in orthogonal multiplex systems in general H04J 11/0023)}
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}
27/2694	. . . . {adaptive design}
27/2695	. . . . . {with channel estimation, e.g. determination of delay spread, derivative or peak tracking (channel estimation per se H04L 25/0202)}
27/2697	. . . {in combination with other modulation techniques}
27/2698	. . . . {double density OFDM/OQAM system, e.g. OFDM/OQAM-IOTA system}
27/28	. . with simultaneous transmission of different frequencies each representing one code element
27/30	. . wherein each code element is represented by a combination of frequencies
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
27/34	. . Amplitude- and phase-modulated carrier systems, e.g. quadrature-amplitude modulated carrier systems
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}
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}
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}
27/3422	. . . . . {in which the constellation is not the n - fold Cartesian product of a single underlying two-dimensional constellation}
27/3427	. . . . . {in which the constellation is the n - fold Cartesian product of a single underlying two-dimensional constellation}

27/3433	. . . . . . {using an underlying square constellation}
27/3438	. . . . . . {using an underlying generalised cross constellation}
27/3444	. . . . {by applying a certain rotation to regular constellations}
27/345	. . . {Modifications of the signal space to allow the transmission of additional information}
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}
27/3461	. . . . {in order to transmit a subchannel}
27/3466	. . . . {by providing an alternative to one signal point}
27/3472	. . . . {by switching between alternative constellations}
27/3477	. . . . {by using the outer points of the constellation or of the constituent two-dimensional constellations}
27/3483	. . . . {using a modulation of the constellation points}
27/3488	. . . {Multiresolution systems}
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)}
27/36	. . . Modulator circuits; Transmitter circuits
27/361	. . . . {Modulation using a single or unspecified number of carriers, e.g. with separate stages of phase and amplitude modulation}
27/362	. . . . {Modulation using more than one carrier, e.g. with quadrature carriers, separately amplitude modulated (H04L 27/366 takes precedence)}
27/363	. . . . . {using non - square modulating pulses, modulators specifically designed for this (transmission of non - square QAM H04L 27/3494)}
27/364	. . . . . {Arrangements for overcoming imperfections in the modulator, e.g. quadrature error or unbalanced I and Q levels}
27/365	. . . . {Modulation using digital generation of the modulated carrier (not including modulation of a digitally generated carrier)}
27/366	. . . . {Arrangements for compensating undesirable properties of the transmission path between the modulator and the demodulator}
27/367	. . . . . {using predistortion}
27/368	. . . . . . {adaptive predistortion}
27/38	. . . Demodulator circuits; Receiver circuits
27/3809	. . . . {Amplitude regulation arrangements}
27/3818	. . . . {using coherent demodulation, i.e. using one or more nominally phase synchronous carriers (H04L 27/227 and H04L 27/389 take precedence)}
27/3827	. . . . . {in which the carrier is recovered using only the demodulated baseband signals}
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}

27/3845	. . . .	{using non - coherent demodulation, i.e. not using a phase synchronous carrier}
27/3854	. . . . .	{using a non - coherent carrier, including systems with baseband correction for phase or frequency offset}
27/3863	. . . . . .	{Compensation for quadrature error in the received signal}
27/3872	. . . . . .	{Compensation for phase rotation in the demodulated signal}
27/3881	. . . . .	{using sampling and digital processing, not including digital systems which imitate heterodyne or homodyne demodulation}
27/389	. . . .	{with separate demodulation for the phase and amplitude components}
29/00		**Arrangements, apparatus, circuits or systems, not covered by a single one of groups H04L 1/00 - 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}**
29/02	.	Communication control (in satellite networks H04B 7/185); Communication processing (H04L 29/12, H04L 29/14 take precedence) {contains provisionally no documents}
29/04	. .	for plural communication lines {contains provisionally no documents}
29/06	. .	characterised by a protocol
29/06006	. . .	{Protocol performance}
29/06013	. . .	{Protocol definition or specification (protocol conformance testing H04L 1/244)}
29/0602	. . .	{Protocols characterised by their application (H04L 29/08081 takes precedence)}
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

29/06034	. . . .	{Protocols for telewriting; Protocols for networked simulations, virtual reality or games}
29/0604	. . . .	{Protocols for data compression (compression in general H03M 7/30)}
29/06047	. . . .	{Protocols for client-server architecture}
2029/06054	. . . . .	{Access to distributed or replicated servers, e.g. using brokers}
29/06061	. . .	{Notations for structuring of protocol data, e.g. Abstract Syntax Notation One (ASN 1)}
29/06068	. . .	{Protocols for interworking or protocol conversion}
29/06074	. . .	{Streamlined, light-weight or high-speed protocols, e.g. express transfer protocol [XTP], byte stream}
29/06081	. . .	{Protocol engines, e.g. VLSIs, transputer}
29/06088	. . .	{Multichannel or multilink protocols}

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)}
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)}
29/06108	. . . . .	{involving adaptations of sockets based mechanisms (secure socket layer H04L 29/06965)}
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 47/19; error control procedures in general H04L 1/18)}
29/06122	. . . .	{Adaptation or special uses of UDP protocol}
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)}
29/06136	. . . .	{IP fragmentation or TCP segmentation aspects (evaluation of maximum transfer unit H04L 47/36; assembly or disassembly of packets in wireless networks H04W 28/065)}
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)}
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)}
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)}
29/06163	. . .	{Multi-protocol handler, e.g. single device capable of handling multiple protocols}
29/0617	. . .	{Protocols for remote procedure call}

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)}

NOTES

1. [N: 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

WARNING

Group H04L 29/06176 or subgroups are not complete pending reorganisation. See also H04L 29/06027

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)}

29/0619 • • • • • {Signalling or session protocols}

29/06197 • • • • • • {SIP [Session Initiation Protocol]}

29/06204 • • • • • • {H.323}

29/0621 • • • • • {Network architectures, gateways, control or user entities}

29/06217 • • • • • • {IMS [IP multimedia subsystem] (wireless communication networks H04W)}

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)}

29/06231 • • • • • • • {Media gateways}

29/06238 • • • • • • • • {at the edge}

29/06244 • • • • • • • • {in the network}

29/06251 • • • • • • • {Signalling gateways}

29/06258 • • • • • • • • {at the edge}

29/06265 • • • • • • • • {in the network}

29/06272 • • • • • • {MGC [media gateway control], MGCP or Megaco (decomposed PSTN/ISDN-IP gateways H04M 7/1255)}

29/06278 • • • • • • {Call controllers; Call servers}

29/06285 • • • • • • {Proxies, e.g. SIP proxies}

29/06292 • • • • • • {Arrangements providing PBX functionality, e.g. IP PBX (circuit switched PBXs H04M 3/42314; PBX networks H04M 7/009)}

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)}
29/06312	. . . . .	{Application servers (systems providing special services to telephonic subscribers H04M 3/42)}
29/06319	. . . . .	{Session control}
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)}
29/06333	. . . . .	{Registration (arrangements for addressing or naming in data networks H04L 29/12009)}
29/0634	. . . . .	{Screening (arrangements for screening incoming telephone calls H04M 3/436; arrangements for network security H04L 29/06551)}
29/06346	. . . . . .	{of unsolicited session attempts, e.g. SPIT [SPAM prevention in IP telephony] (message switching systems H04L 12/58)}
29/06353	. . . . .	{In-session procedures}
29/0636	. . . . . .	{session scope modification}
29/06367	. . . .	{by adding or removing media}
29/06374	. . . .	{by adding or removing participants}
29/0638	. . . . .	{Features, e.g. call-forwarding or call hold (systems providing special services to telephonic subscribers H04M 3/42)}
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)}
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)}
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)}
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)}
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)}
29/06421	. . . . .	{with central floor control}
29/06428	. . . . .	{with distributed floor control}
29/06435	. . . . .	{without floor control}
29/06442	. . . .	{"Push-to-X" services (Push-to-Talk services in wireless networks H04W 4/025)}
29/06448	. . . .	{Services related to one way streaming}
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)}
29/06462	. . . . .	{Content on demand (television systems using two way working H04N 7/173)}
29/06469	. . . . .	{Control of source by destination, e.g. user controlling streaming rate of server (television systems using two way working H04N 7/173)}
29/06476	. . .	{Media handling, encoding, streaming or conversion}
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)}
29/06489	. . . . .	{at the source}
29/06496	. . . . .	{at the destination}
29/06503	. . . . .	{intermediate}
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)}
29/06517	. . . .	{Streaming protocols, e.g. RTP, RTCP}

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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)}
29/0653	. . .	{Header parsing and analysis}
29/06537	. . .	{Negotiation of communication capabilities}
29/06544	. . .	{Special purpose or proprietary protocols or architectures (H04L 29/08558 takes precedence)}
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)}
29/06557	. . . .	{Separating internal and external traffic, e.g. firewalls}
29/06564	. . . . .	{Architectural arrangements, e.g. perimeter networks, demilitarized zones}
29/06571	. . . . . .	{Distributed architectures}
29/06578	. . . . .	{Filtering policies}
29/06585	. . . . . .	{Filtering by address, protocol, port number or service, e.g. IP-address, URL}
29/06591	. . . . . .	{Filtering by information in the payload}
29/06598	. . . . . .	{Stateful filtering}
29/06605	. . . . . .	{Rule management}
29/06612	. . . . .	{Virtual private networks}
29/06619	. . . . .	{Proxies}
29/06625	. . . . .	{Firewall traversal, e.g. tunnelling, creating pinholes}
29/06632	. . . .	{Protecting information from access by third parties}
29/06639	. . . . .	{Protecting a party's identity, e.g. anonymous}
29/06646	. . . . . .	{during transmission, i.e. identity only known to the other party or parties involved in the communication}
29/06653	. . . . . .	{Anonymous communication, i.e. identity not known to any party at all}
29/06659	. . . . .	{Protecting the content, e.g. encryption}
29/06666	. . . . . .	{using symmetric encryption, i.e. same key used for encryption and decryption}
29/06673	. . . . . .	{using asymmetric encryption, i.e. different keys for encryption and decryption}
29/0668	. . . . . .	{using hybrid encryption, i.e. combination of symmetric and asymmetric encryption}
29/06687	. . . . . .	{using dynamic encryption, e.g. stream encryption}
29/06693	. . . . . .	{Re-encryption}
29/067	. . . . . .	{Hardware and software architectures for enhanced packet encryption processing}

29/06707	. . . .	{Key management}
29/06714	. . . . .	{Key exchange, e.g. in peer-to-peer networks}
29/06721	. . . . .	{Key distribution, e.g. centrally by trusted party}
29/06727	. . . . . .	{Hierarchical key distribution, e.g. by multi-tier trusted parties}
29/06734	. . . . .	{for group communications}
29/06741	. . . . .	{One-time keys}
29/06748	. . . . .	{Time-dependent keys, e.g. periodically changing keys}
29/06755	. . . .	{Authentication mechanisms}
29/06761	. . . . .	{Tickets, e.g. Kerberos}
29/06768	. . . . .	{Single-sign-on}
29/06775	. . . . .	{Certificates}
29/06782	. . . . .	{Passwords}
29/06789	. . . . . .	{One-time-passwords}
29/06795	. . . . . .	{Time-dependent-passwords, e.g. periodically changing passwords}
29/06802	. . . . .	{using an additional device, e.g. smartcard, SIM}
29/06809	. . . . .	{using biometrical features, e.g. fingerprint, retina-scan}
29/06816	. . . . .	{Mutual authentication}
29/06823	. . . .	{Access control}
29/06829	. . . . .	{Access control lists [ACL]}
29/06836	. . . . .	{User profiles}
29/06843	. . . . .	{Grouping of users}
29/0685	. . . . .	{Multiple levels of security}
29/06857	. . . .	{Verifying the information received}
29/06863	. . . . .	{Checking the content, e.g. message integrity}
29/0687	. . . . .	{Checking the source, e.g. non-repudiation}
29/06877	. . . .	{Detection of malicious traffic; protection against malicious traffic}
29/06884	. . . . .	{Monitoring network traffic}
29/06891	. . . . . .	{Event detection}
29/06897	. . . . . .	{Traffic logging}
29/06904	. . . . .	{Vulnerability analysis}
29/06911	. . . . .	{Countermeasures against attacks}
29/06918	. . . . . .	{Viruses; Trojans; Worms}
29/06925	. . . . . .	{Denial of Service}
29/06931	. . . . . .	{Session hijacking, e.g. TCP sequence number attacks}
29/06938	. . . . . .	{Session spying, e.g. eavesdropping}
29/06945	. . . .	{Security features implemented at a particular protocol layer}
29/06952	. . . . .	{at the data link layer, e.g. SILS, EAP}
29/06959	. . . . .	{at the network layer, e.g. IPSec AH, ESP}
29/06965	. . . . .	{at the transport layer, e.g. SSL, TLS}
29/06972	. . . . .	{above the transport layer, e.g. https, JAVA}
29/06979	. . . .	{using a different network or path for securing the traffic}
29/06986	. . . .	{Security management; Security policies in general (filtering policies H04L 29/06578)}
29/06993	. . .	{Timer mechanisms used in protocols}
29/08	. . .	Transmission control procedure, e.g. data link level control procedure

29/08009 . . . . {Open systems interconnection [OSI] architecture, e.g. layering, entities, standards; Interface between layers; Software aspects}

29/08018 . . . . . {Physical layer, i.e. layer one}

29/08027 . . . . . {Data link layer, i.e. layer two, e.g. HDLC}

29/08036 . . . . . {Network layer, i.e. layer three, e.g. X.25}

29/08045 . . . . . {Transport layer, i.e. layer four}

29/08054 . . . . . {Session layer, i.e. layer five}

29/08063 . . . . . {Presentation layer, i.e. layer six}

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 H04L 29/08072 are reclassified in these groups

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)}

29/0809 . . . . . {involving the use of web-based technology, e.g. Hyper Text Transfer Protocol [HTTP], (information retrieval from the Internet G06F 17/30861)}

29/08099 . . . . . . {for remote control or remote monitoring (Network management using Internet technology H04L 12/2408; Network monitoring H04L 12/2602)}

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)}

29/08117 . . . . . {adapted for file transfer, e.g. File Transfer Protocol [FTP]}

29/08126 . . . . . {adapted for terminal emulation, e.g. telnet (protocols for telewriting or protocols for networked simulations, virtual reality or games H04L 29/06034)}

29/08135 . . . . . {in which application tasks are distributed across nodes in the network (multiprogramming arrangements G06F 9/46)}

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 47/125; video servers using load balancing strategies H04N 21/23103)}

NOTE

In this group and its subgroups, the term "servers" includes non-dedicated servers, such as peer nodes in a peer-to-peer architecture

29/08153 . . . . {Server selection in load balancing (allocation of processing resources to service a request in a distributed system G06F 9/5027)}

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)}

29/08171 . . . . {based on parameters of servers, e.g. available memory or workload (allocation of processing resources considering the load G06F 9/505)}

29/0818 . . . . {based on network conditions}

29/08189 . . . . {based on compliance of requirements or conditions with available server resources}

29/08198 . . . . {based on the content of a request}

29/08207 . . . . {based on round robin mechanisms}

29/08216 . . . . {based on random server selection}

29/08225 . . . . {based on locations of client and servers}

29/08234 . . . . {based on other criteria, e.g., hash applied to IP address, specific algorithms or cost}

29/08243 . . . . {Dynamic adaptation of server selection criteria for load balancing}

29/08252 . . . . {Persistence of sessions during load balancing}

29/08261 . . . . {Collection and organization of data related to the state of servers by a load balancer}

29/0827 . . . . {Controlling of the operation of servers by a load balancer, e.g. adding or removing servers that serve requests}

29/08279 . . . . {Reaction to server failures by a load balancer}

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)}

29/08297 . . . . {Load balancing arrangements to avoid a single path through a load balancer}

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 13/34)}

29/08315 . . . . {involving topology management mechanisms}

29/08324 . . . . {Group management mechanisms}

29/08333 . . . . {Joining mechanisms}

29/08342 . . . . {Departure and maintenance mechanisms (counter-measures to a fault H04L 29/14)}

29/08351 . . . . {Group master selection mechanisms}

29/0836 . . . . {with pre-configuration of logical or physical connections with a determined number of other peers}

29/08369 . . . . {involving connection limits (involving dynamic management of active down/uploading connections H04L 29/08495)}

29/08378 . . . . {involving pre-assessment of levels of reputation of peers}

29/08387 . . . . {Inter-group management mechanisms, e.g. splitting, merging or interconnection of groups}

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 45/02)}

29/08405 . . . . {Discovery through centralizing entities}

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)}

29/08423 . . . . {Discovery involving direct consultation/announcement among potential requesting and potential source peers}

29/08432 . . . . {with limitation/expansion of the discovery scope}

29/08441 . . . . {Discovery involving ranked list compilation of candidate peers}

29/0845 . . . . {involving resource distribution mechanisms}

29/08459 . . . . {Resource dissemination mechanisms and resource keeping policies for optimal resource availability in the overlay network}

29/08468 . . . . {Resource delivery mechanisms}

29/08477 . . . . {characterized by resources being split in blocks or fragments}

29/08486 . . . . {involving incentive schemes}

29/08495 . . . . {involving dynamic management of active down/uploading connections}

29/08504 . . . . {involving cross functional aspects}

29/08513 . . . . {Hierarchical topologies}

29/08522 . . . . {Interfacing with client/server systems and between P2P systems}

29/08531 . . . . {Some peer nodes performing special functions}

29/0854 . . . . . . {Arrangements for replication or mirroring of data, e.g. data synchronisation between network nodes and/or user terminals}

29/08549 . . . . . . {Arrangements and networking functions for distributed storage of data in a network, e.g. Storage Area Networks [SAN], Network Attached Storage [NAS]}

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 12/2803; total factory control characterised by the network communication G05B 19/4185; games involving transmission A63F 13/30)}

29/08567 . . . . . . {involving the management of devices over a network (network management H04L 12/24; device management using web-based technology H04L 29/08099)}

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.

29/08585 · · · · · · {provided for setup of an application session}

29/08594 · · · · · · {provided for managing session state for stateless protocols, e.g. HTTP; Signalling a session state; State transitions; Keeping-state mechanisms}

29/08603 · · · · · · {provided for session termination, e.g., event controlled end of session}

29/08612 · · · · · · · {provided for avoiding end of session (e.g. keep-alive, heartbeats, resumption message, wake-up for inactive or interrupted session)}

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)}

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}

29/08639 · · · · · · {provided for migration or transfer of sessions}

29/08648 · · · · · {Arrangements for service discovery, e.g. Service Location Protocol [SLP] (address allocation to terminals or nodes connected to a network H04L 29/12009)}

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)}

29/08666 · · · · · {involving third party service providers (e-commerce G06Q 30/00)}

29/08675 · · · · · {Arrangements for tracking the activity of the application user (monitoring arrangements in general H04L 12/2602; e-ommerce G06Q 30/00)}

29/08684 · · · · · {Arrangements for presence management (instant messaging H04L 12/581)}

29/08693 · · · · · {Arrangements for push based network services (broadcast and multicast push services H04L 12/1859)}

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 - H04L 29/08783, and H04L 29/08801 - H04L 29/08855 are not complete pending reorganisation. See also H04L 29/0872, H04L 29/08729 and H04L 29/08792)

29/08711 · · · · · · {Arrangements for adding application control or application functional data, e.g. adding metadata}

29/0872 · · · · · · {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 - H04L 29/08909

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 - H04L 29/08909

29/08738 · · · · · · {Arrangements for data redirection (load balancing H04L 29/08144; access network selection H04L 12/5691; routing path selection H04L 12/5689; context based routing H04L 29/08972; addressing aspects H04L 29/12009)}

29/08747 · · · · · · {Arrangements for evaluation of intercepted application data aiming at enhancement of application control}

29/08756 · · · · · · {Arrangements for conversion or adaptation of application content or format (H04L 29/08783 takes precedence; protocol conversion H04L 29/06068)}

29/08765 · · · · · · {Arrangements for grouping or aggregating service requests, e.g. for unified processing of service requests}

29/08774 · · · · · · {Arrangements for integrating service provisioning from a plurality of service providers}

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 19/00)}

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 19/00)}

> **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 - H04L 29/08909

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)}

29/0881 · · · · · · · {involving pre-fetching or pre-delivering data}

29/08819 · · · · · · · {involving policies or rules for updating, deleting or replacing the stored data}

29/08828 · · · · · · · {involving storage of data provided by user terminals, i.e. reverse caching}

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)}

29/08846 · · · · · · {Arrangements to globally emulate or virtualize the functionalities of an end device (H04L 29/08837 takes precedence)}

29/08855 · · · · · · {Architectural aspects}

29/08864 · · · · · · · {Implementation details of a single intermediate entity}

29/08873 · · · · · · · {Pairs of interprocessing entities at each side of the network, e.g. split proxies}

29/08882 · · · · · · · {Distributed intermediate devices, i.e. intermediate device interaction with other intermediate devices on the same level}

29/08891 · · · · · · · {Hierarchically arranged intermediate devices, e.g. hierarchical caching}

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}

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}

29/08918 · · · · · {involving profiles}

29/08927 · · · · · · {Terminal profiles}

29/08936 · · · · · · {User profiles}

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 12/1881)}

29/08954 · · · · · · {whereby quality of service and priority requirements are taken into account}

29/08963 · · · · · · {whereby a time schedule is established for servicing the requests}

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}

29/08981 · · · · · {involving the movement of software and/or configuration parameters, e.g. applets, (programme loading or initiating G06F 9/445)}

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)}

29/10 · · characterised by an interface, e.g. the interface between the data link level and the physical level {contains provisionally no documents}

29/12 · characterised by the data terminal {contains provisionally no documents}

29/12009 · · {Arrangements for addressing and naming in data networks}

> **NOTES**
>
> 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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 61/1576

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

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

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 61/1594

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

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

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

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

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

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

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 61/2046

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

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

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

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

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

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

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

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 61/2503

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

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

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

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

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

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

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

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

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

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

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

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

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

29/12471 . . . . . . {Binding renewal aspects; Keep-alive messages}

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

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

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

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

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

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

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

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

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

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

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

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 61/2596

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 61/6072

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

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

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

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

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

29/14 . Counter-measures to a fault

41/00 **{Arrangements for maintenance or administration or management of packet switching networks}**

41/02 . {involving integration or standardization}

41/0206 . . {using standardized network management architectures, e.g. telecommunication management network [TMN] or unified network management architecture [UNMA]}

41/0213 . . {using standardized network management protocols, e.g. simple network management protocol [SNMP] or common management interface protocol [CMIP]}

41/022 . . {Multivendor or multistandard integration}

41/0226 . . {Mapping or translation of multiple network management protocols}

41/0233 . . {using object oriented techniques, e.g. common object request broker architecture [CORBA] for representation of network management data}

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)}

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)}
41/0253	. . .	{involving a browser or web-pages for accessing management information (graphical user interface for network management H04L 41/22)}
41/026	. . .	{involving e-messaging for transporting management information, e.g. email, instant messaging or chat}
41/0266	. . .	{involving management internet meta-data, objects or commands, e.g. by using mark-up language}
41/0273	. . .	{involving the use of web services for network management, e.g. SOAP}
41/028	. . . .	{for synchronization between service call and response}
41/0286	. . . .	{for search or classification or discovery of web services providing management functionalities (network applications and protocols for service discovery H04L 67/16)}
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)}
41/04	.	{Architectural aspects of network management arrangements}
41/042	. .	{Arrangements involving multiple distributed management centers cooperatively managing the network}
41/044	. .	{Arrangements involving a hierarchical management structure}
41/046	. .	{Aspects of network management agents}
41/048	. . .	{mobile agents}
41/06	.	{involving management of faults or events or alarms}
41/0604	. .	{Alarm or event filtering, e.g. for reduction of information}
41/0609	. . .	{based on severity or priority}
41/0613	. . .	{based on the type or category of the network elements}
41/0618	. . .	{based on the physical or logical position}
41/0622	. . .	{based on time}
41/0627	. . .	{by acting on the notification or alarm source}
41/0631	. .	{Alarm or event or notifications correlation; Root cause analysis}
41/0636	. . .	{based on a decision tree analysis}
41/064	. . .	{involving time analysis}
41/0645	. . .	{by additionally acting on or stimulating the network after receiving notifications}
41/065	. . .	{involving logical or physical relationship, e.g. grouping and hierarchies}
41/0654	. .	{Network fault recovery (backup route selection H04L 45/22; route fault recovery H04L 45/28; techniques for recovering from a failure of a protocol instance or entity H04L 69/40)}
41/0659	. . .	{by isolating the faulty entity}
41/0663	. . . .	{involving offline failover planning}
41/0668	. . .	{selecting new candidate element}
41/0672	. . .	{by re-configuring the faulty entity}
41/0677	. .	{localization of fault position}
41/0681	. .	{involving configuration of triggering conditions}
41/0686	. .	{involving notification enrichment}
41/069	. .	{involving storage or log of alarms or notifications or post-processing thereof}
41/0695	. .	{involving fault of the network management or monitoring system}
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)}
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)}
41/0806	. . .	{for initial configuration or provisioning}
41/0809	. . . .	{Plug-and-play configuration}
41/0813	. . .	{Changing of configuration}
41/0816	. . . .	{due to adaptation, e.g. in response to network events}
41/082	. . . .	{due to updating or upgrading of network functionality, e.g. firmware (topology update or discovery for routing purposes H04L 45/02)}
41/0823	. . .	{Configuration optimization}
41/0826	. . . .	{for network cost reduction}
41/083	. . . .	{for network speed increase}
41/0833	. . . .	{to reduce network energy consumption}
41/0836	. . . .	{to enhance reliability, e.g. reduce downtime}
41/084	. . .	{Configuration by copying}
41/0843	. . . .	{based on generic templates}
41/0846	. . . .	{based on copy from other elements}
41/085	. .	{Keeping track of network configuration}
41/0853	. . .	{by actively collecting or retrieving configuration information}
41/0856	. . .	{by archiving or backing up configuration information}
41/0859	. . .	{by keeping history of different configuration generations or versions}
41/0863	. . .	{by rolling back to previous configuration versions}
41/0866	. .	{Checking configuration}
41/0869	. . .	{by validating configuration within one network element}
41/0873	. . .	{by checking configuration conflicts with other network elements}
41/0876	. .	{Aspects of the degree of configuration automation}
41/0879	. . .	{Manual configuration through operator}
41/0883	. . .	{Semiautomatic configuration, e.g. proposals from system}
41/0886	. . .	{Fully automatic configuration}

41/0889	. .	{Techniques to speed-up the configuration process}
41/0893	. .	{Assignment of logical groupings to network elements; Policy based network management or configuration}
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 47/76)}
41/12	.	{network topology discovery or management (topology discovery for routing H04L 45/02)}
41/14	.	{involving network analysis or design, e.g. simulation, network model or planning (network monitoring H04L 43/00)}
41/142	. .	{using statistical or mathematical methods}
41/145	. .	{involving simulating, designing, planning or modelling of a network}
41/147	. .	{for prediction of network behaviour}
41/16	.	{Network management using artificial intelligence}
41/18	.	{Arrangements involving CNM [Customer Network Management]}
41/20	.	{Network management software packages}
41/22	.	{using GUI [Graphical User Interface]}
41/24	.	{using dedicated network management hardware}
41/26	.	{using dedicated tools for LAN [Local Area Network] management}
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)}
41/30	.	{Decision processes by autonomous network management units using voting and bidding}
41/32	.	{Specific management aspects for broadband networks}
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}
41/5003	. .	{Managing service level agreement [SLA] or interaction between SLA and quality of service [QoS]}
41/5006	. . .	{Defining or negotiating SLA contracts, guarantees or penalties (SLA negotiation in wireless networks H04W 28/24)}
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)}
41/5012	. . . .	{determining service availability, e.g. which services are available at a certain point in time}
41/5016	. . . . .	{based on statistics of service availability, e.g. in percentage or over a given time}
41/5019	. .	{Ensuring SLA (flow or congestion control at network level H04L 12/569)}
41/5022	. . .	{by giving priorities, e.g. assigning classes of service}
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)}
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)}
41/5032	. .	{Generating service level reports}
41/5035	. .	{Measuring contribution of individual network components to actual service level (alarm or event correlation H04L 41/0631)}
41/5038	. .	{Testing of service level quality, e.g. simulating service usage}
41/5041	. .	{Service implementation}
41/5045	. . .	{Making service definitions prior to deployment}
41/5048	. . .	{Automatic or semi-automatic definitions, e.g. definition templates}
41/5051	. . .	{Service on demand, i.e. services are defined and provided in real time as requested by the user}
41/5054	. . .	{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)}
41/5058	. .	{Service discovery by the service manager (automatically determining the actual topology of a network H04L 41/12; topology discovery for routing H04L 45/02; arrangements for service discovery, e.g. service location protocol H04L 67/16)}
41/5061	. .	{Customer care}
41/5064	. . .	{Customer relationship management (arrangements involving customer network management, i.e. giving the customer access to network management functions H04L 41/18)}
41/5067	. . .	{Customer-centric quality of service [QoS] measurement}
41/507	. . .	{Filtering out customers affected by service problems}
41/5074	. . .	{Handling of trouble tickets}
41/5077	. .	{wherein the managed service relates to simple transport services, i.e. providing only network infrastructure}
41/508	. .	{based on type of value added network service under agreement}
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)}
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)}

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 H04N 21/00)}
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)}
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)}
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)**}**
43/02	.	{involving a reduction of monitoring data}
43/022	. .	{using sampling of monitoring data, i.e. storing only a selection of packets}
43/024	. . .	{using adaptive sampling}
43/026	. .	{using flow generation}
43/028	. .	{using filtering (alarm or event filtering H04L 41/0604)}
43/04	.	{Processing of captured monitoring data}
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)}
43/06	.	{Report generation}
43/062	. .	{for traffic related reporting}
43/065	. .	{for device related reporting (reporting of sensed information of home appliances H04L 12/2803)}
43/067	. .	{for time frame related reporting}
43/08	.	{Monitoring based on specific metrics}
43/0805	. .	{Availability}
43/0811	. . .	{Connectivity}
43/0817	. . .	{functioning (networked applications tracking the activity of users H04L 67/22; monitoring appliance functionality of home appliances H04L 12/2803)}
43/0823	. .	{Errors (management of events, faults or alarms in networks or network elements H04L 41/06)}
43/0829	. . .	{Packet loss}
43/0835	. . . .	{One way packet loss}
43/0841	. . . .	{Round trip packet loss}
43/0847	. . .	{Transmission error}
43/0852	. .	{Delays}
43/0858	. . .	{One way delays}
43/0864	. . .	{Round trip delays}
43/087	. . .	{Jitter}
43/0876	. .	{Network utilization}
43/0882	. . .	{Utilization of link capacity}
43/0888	. . .	{Throughput}
43/0894	. . .	{Packet rate}

43/10	.	{using active monitoring, e.g. heartbeat protocols, polling, ping, trace-route}
43/103	. .	{with adaptive polling, i.e. dynamically adapting the polling rate}
43/106	. .	{by adding timestamps to packets}
43/12	.	{using dedicated network monitoring probes}
43/14	.	{using software, i.e. software packages (network security related monitoring H04L 63/1408)}
43/16	.	{using threshold monitoring}
43/18	.	{using protocol analyzers}
43/50	.	{Testing arrangements}
45/00		**{Routing or path finding of packets in data switching networks** (specially adapted for wireless routing H04W 40/00)**}**
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)}
45/021	. .	{Routing table update consistency, e.g. epoch number}
45/023	. .	{Delayed use of routing table update}
45/025	. .	{Updating only a limited number of routers, e.g. fish-eye update}
45/026	. .	{Details of "hello" or keep-alive messages}
45/028	. .	{Dynamic adaptation of the update interval, e.g. event-triggered update}
45/04	.	{Interdomain routing, e.g. hierarchical routing}
45/06	.	{Deflection routing, e.g. hot-potato routing}
45/08	.	{Learning-based routing, e.g. neural networks}
45/10	.	{Routing in connection-oriented networks, e.g. X.25, ATM}
45/12	.	{Shortest path evaluation}
45/121	. .	{Minimizing delay}
45/122	. .	{Minimizing distance, e.g. ? number of hops}
45/123	. .	{Evaluation of link metrics (techniques for monitoring network metrics H04L 43/08)}
45/124	. .	{using a combination of metrics}
45/125	. .	{based on throughput or bandwidth}
45/126	. .	{minimizing geographical or physical path length}
45/127	. .	{based on intermediate node capabilities}
45/128	. .	{for finding disjoint paths}
45/1283	. . .	{with disjoint links}
45/1287	. . .	{with disjoint nodes}
45/14	.	{Routing performance; Theoretical aspects}
45/16	.	{Multipoint routing (arrangements for multicast or broadcast in data networks H04L 12/18)}
45/18	.	{Loop free}
45/20	.	{Hop count for routing purposes, e.g. TTL}
45/22	.	{Alternate routing}
45/24	.	{Multipath}
45/245	. .	{Link aggregation, e.g. trunking}
45/26	.	{Route discovery packet}
45/28	.	{Route fault recovery (network fault recovery H04L 41/0654)}
45/30	.	{Special provisions for routing multiclass traffic}
45/302	. .	{Route determination based on requested QoS}
45/304	. .	{Route determination for signaling traffic}

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)}
45/3065	. . .	{for real time traffic}
45/308	. .	{Route determination based on user's profile, e.g. premium users}
45/32	.	{Flooding (denial of service attacks H04L 63/1458)}
45/34	.	{Source routing}
45/36	.	{Backward learning}
45/38	.	{Flow based routing}
45/40	.	{Wormhole routing}
45/42	.	{Centralized routing}
45/44	.	{Distributed routing}
45/46	.	{Cluster building}
45/48	.	{Routing tree calculation}
45/50	.	{using label swapping, e.g. multi-protocol label switch [MPLS]}
45/502	. .	{Frame based}
45/505	. .	{Cell based}
45/507	. .	{Label distribution}
45/52	.	{Multiprotocol routers}
45/54	.	{Organization of routing tables}
45/56	.	{Routing software}
45/563	. .	{Software download or update (software deployment in general G06F 8/60)}
45/566	. .	{Routing instructions carried by the data packet, e.g. active networks}
45/58	.	{Association of routers}
45/583	. .	{Stackable routers}
45/586	. .	{Virtual routers}
45/60	.	{Router architecture}
45/62	.	{Wavelength based (optical switching H04Q 11/0062)}
45/64	.	{using an overlay routing layer (Peer-to-Peer networks H04L 67/104)}
45/66	.	{Layer 2 routing, e.g. in Ethernet based MAN's}
45/68	.	{Pseudowire emulation, e.g. IETF WG PWE3}
45/70	.	{Routing based on monitoring results (techniques for monitoring network metrics H04L 43/08)}
45/72	.	{Routing based on the source address}
45/74	.	{Address processing for routing}
45/741	. .	{Routing in networks with a plurality of addressing schemes, e.g. IPv4 and IPv6}
45/742	. .	{Route cache and its operation}
45/745	. .	{Address table lookup or address filtering}
45/7453	. . .	{using hashing}
45/7457	. . .	{using content-addressable memories [CAM]}
45/748	. . .	{Longest matching prefix}

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

47/10	.	{Flow control or congestion control}

47/11	. .	{Congestion identification}
47/115	. . .	{using a dedicated packet}
47/12	. .	{Congestion avoidance or recovery}
47/122	. . .	{Diverting traffic away from congested spots}
47/125	. . .	{Load balancing, e.g. traffic engineering (load balancing among servers H04L 67/1002)}
47/127	. . .	{Congestion prediction}
47/13	. .	{in a LAN segment, e.g. ring or bus}
47/135	. . .	{by jamming the transmission media}
47/14	. .	{in wireless networks}
47/15	. .	{in relation to multipoint traffic (arrangements for broadcast or multicast in data networks H04L 12/18)}
47/16	. .	{in connection oriented networks, e.g. frame relay}
47/17	. .	{Hop by hop}
47/18	. .	{End to end}
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)}
47/193	. . .	{at transport layer, e.g. TCP related}
47/196	. . .	{Integration of transport layer protocols, e.g. TCP and UDP}
47/20	. .	{Policing}
47/21	. .	{using leaky bucket}
47/215	. . .	{Token bucket}
47/22	. .	{Traffic shaping}
47/225	. . .	{Determination of shaping rate, e.g. using a moving window}
47/23	. .	{Bit dropping}
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)}
47/2408	. . .	{Different services, e.g. type of service [ToS]}
47/2416	. . .	{Real time traffic (arrangements for real-time multimedia communications H04L 65/00)}
47/2425	. . .	{Service specification, e.g. SLA (general aspects of SLA management H04L 12/2417)}
47/2433	. . . .	{Allocation of priorities to traffic types}
47/2441	. . .	{Flow classification}
47/245	. . .	{using preemption}
47/2458	. . .	{Modification of priorities while in transit}
47/2466	. . .	{Modification of handling priority for control packets, e.g. for ACK or signaling packets}
47/2475	. . .	{Application aware}
47/2483	. . .	{Flow identification}
47/2491	. . .	{Mapping QoS requirements between different networks}
47/25	. .	{Rate modification upon detection by the source of changing network conditions}
47/26	. .	{Explicit feedback to the source, e.g. choke packet}
47/263	. . .	{Source rate modification after feedback}
47/266	. . . .	{Stopping or restarting the source, e.g. X-on or X-off}
47/27	. .	{Window size evaluation or update, e.g. using information derived from ACK packets}

47/28 . . {using time considerations}

47/283 . . . {Network and process delay, e.g. jitter or round trip time [RTT]}

47/286 . . . {Time to live}

47/29 . . {Using a combination of thresholds}

47/30 . . {using information about buffer occupancy at either end or transit nodes}

47/31 . . {Tagging of packets, e.g. discard eligibility [DE] bit}

47/32 . . {Packet discarding or delaying}

47/323 . . . {Discarding or blocking control packets, e.g. ACK packets}

47/326 . . . {With random discard, e.g. random early discard [RED]}

47/33 . . {Forward notification}

47/34 . . {Sequence integrity, e.g. sequence numbers}

47/35 . . {Embedded flow control information in regular packets, e.g. Piggybacking}

47/36 . . {Evaluation of the packet size, e.g. maximum transfer unit [MTU]}

47/365 . . . {Dynamic adaptation of the packet size}

47/37 . . {Slow start}

47/38 . . {Adapting coding or compression rate}

47/39 . . {Credit based}

47/40 . . {Using splitted connections, e.g. IP spoofing}

47/41 . . {Actions on aggregated flows or links}

47/50 . {Queue scheduling}

47/52 . . {Bandwidth attribution to queues}

47/521 . . . {Static queue service slot or fixed bandwidth allocation}

47/522 . . . {Dynamic queue service slot or variable bandwidth allocation}

47/524 . . . . {Queue skipping}

47/525 . . . {Redistribution of residual bandwidth}

47/527 . . . {Quantum based scheduling, e.g. credit or deficit based scheduling or token bank}

47/528 . . . {Minimum bandwidth guarantee}

47/54 . . {Loss aware scheduling}

47/56 . . {Delay aware scheduling}

47/562 . . . {Attaching a time tag to queues}

47/564 . . . {Attaching a deadline to packets, e.g. earliest due date first}

47/566 . . . . {Deadline varies as a function of time spent in the queue}

47/568 . . . {Calendar queues or timing rings}

47/58 . . {Changing or combining different scheduling modes, e.g. multimode scheduling}

47/60 . . {Hierarchical scheduling}

47/62 . . {General aspects}

47/6205 . . . {Arrangements for avoiding head of line blocking}

47/621 . . . {Individual queue per connection or flow, e.g. per VC}

47/6215 . . . {Individual queue per QOS, rate or priority}

47/622 . . . {Queue service order}

47/6225 . . . . {fixed service order, e.g. Round Robin}

47/623 . . . . {weighted service order (H04L 47/52, H04L 47/54, H04L 47/56 take precedence)}

47/6235 . . . . {variable service order}

47/624 . . . {Altering the ordering of packets in an individual queue}

47/6245 . . . {Modifications to standard FIFO or LIFO}

47/625 . . . {Other criteria for service slot or service order}

47/6255 . . . . {queue load conditions, e.g. longest queue first}

47/626 . . . . {channel conditions}

47/6265 . . . . {past bandwidth allocation}

47/627 . . . . {policing}

47/6275 . . . . {priority}

47/628 . . . . {packet size, e.g. shortest packet first}

47/6285 . . . {Provisions for avoiding starvation of low priority queues}

47/629 . . . {Fair share of resources, e.g. WFQ}

47/6295 . . . {Multiple queues per individual QOS, connection, flow or priority}

47/70 . {Admission control or resource allocation (medium access in wavelength-division multiplex systems H04J 14/0227)}

47/72 . . {Reservation actions}

47/722 . . . {at the end terminals, e.g. buffer space}

47/724 . . . {involving intermediate nodes, e.g. RSVP}

47/726 . . . {over a plurality of alternate paths, e.g. for load balancing}

47/728 . . . . {for backup paths}

47/74 . . {Reactions to resource unavailability}

47/741 . . . {Holding a request until resources become available}

47/743 . . . {Reaction at the end points}

47/745 . . . {Reaction in network}

47/746 . . . {Reaction triggered by a failure}

47/748 . . . {Negotiation of resources, e.g. modification of a request}

47/76 . . {Reallocation of resources, renegotiation of resources, e.g. in-call}

47/762 . . . {triggered by the network}

47/765 . . . {triggered by the end-points}

47/767 . . . . {after changing the attachment point, e.g. after hand-off}

47/78 . . {Resource allocation architecture}

47/781 . . . {Centralized allocation of resource}

47/782 . . . {Hierarchical allocation of resource, e.g. involving a hierarchy of local and centralized entities}

47/783 . . . {Distributed allocation of resources, e.g. bandwidth brokers}

47/785 . . . . {Involving several network domains, e.g. multilateral agreements}

47/786 . . . . . {Mapping reservation between domains}

47/787 . . . . {Bandwidth trade among domains}

47/788 . . . {Autonomous allocation of resources}

47/80 . . {Actions related to the nature of the flow or the user}

47/801 . . . {Real time traffic}

47/803 . . . {Application aware}

47/805 . . . {QOS or priority aware}

47/806 . . . {Broadcast or multicast traffic}

47/808 . . . {User-type aware}

47/82 . . {Miscellaneous aspects}

47/821 . . . {Prioritising resource allocation or reservation requests}

47/822 . . . {Collecting or measuring resource availability data}

47/823 . . . {Prediction of resource usage}

47/824 . . . {Applicable to portable or mobile terminals}

47/825 . . . {Involving tunnels, e.g. MPLS}

47/826 . . . {Involving periods of time}

47/827	. . .	{Aggregation of resource allocation or reservation requests}
47/828	. . .	{Allocation of resources per group of connections, e.g. per group of users}
47/829	. . .	{Topology based}
49/00		**{Packet switching elements** (selecting arrangements for multiplex arrangements using optical switching H04Q 11/0001)}
49/10	.	{Switching fabric construction}
49/101	. .	{Crossbar or matrix}
49/102	. .	{using shared medium, e.g. bus or ring}
49/103	. .	{using shared central buffer, shared memory, e.g. time switching}
49/104	. .	{ATM switching fabrics}
49/105	. . .	{ATM switching elements}
49/106	. . . .	{using space switching, e.g. crossbar or matrix}
49/107	. . . .	{using shared medium}
49/108	. . . .	{using shared central buffer}
49/109	. .	{integrated on microchip, e.g. switch-on-chip}
49/15	.	{Interconnection of switching modules}
49/1507	. .	{Distribute and route fabrics, e.g. sorting-routing or Batcher-Banyan}
49/1515	. .	{Non-blocking multistage, e.g. Clos}
49/1523	. . .	{Parallel switch fabric planes}
49/153	. . . .	{ATM switching fabrics having parallel switch planes}
49/1538	. . . . .	{Cell slicing}
49/1546	. . .	{Pipelined operation}
49/1553	. .	{Interconnection of ATM switching modules, e.g. ATM switching fabrics}
49/1561	. . .	{Distribute and route fabrics, e.g. Batcher-Banyan}
49/1569	. . .	{Clos switching fabrics}
49/1576	. . .	{Crossbar or matrix}
49/1584	. . .	{Full Mesh, e.g. knockout}
49/1592	. . .	{Perfect Shuffle}
49/20	.	{Support for services or operations}
49/201	. .	{Multicast or broadcast}
49/203	. . .	{ATM switching fabrics with multicast or broadcast capabilities}
49/205	. .	{Quality of Service based}
49/206	. . .	{Real Time traffic}
49/208	. .	{Port mirroring}
49/25	.	{Routing or path finding through a switch fabric}
49/251	. .	{Cut-through or wormhole routing}
49/252	. .	{Store and forward routing}
49/253	. .	{Connections establishment or release between ports}
49/254	. . .	{Centralized controller, i.e. arbitration or scheduling}
49/255	. . .	{Control mechanisms for ATM switching fabrics}
49/256	. .	{Routing or path finding in ATM switching fabrics}
49/257	. . .	{Cut-through or wormhole routing}
49/258	. . .	{Grouping}
49/30	.	{Peripheral units, e.g. input or output ports}
49/3009	. .	{Header conversion, routing tables or routing tags}
49/3018	. .	{Input queuing}
49/3027	. .	{Output queuing}

49/3036	. .	{Shared queuing}
49/3045	. .	{Virtual queuing}
49/3054	. .	{Auto-negotiation, e.g. access control between switch gigabit interface connector [GBIC] and link}
49/3063	. .	{Pipelined operation}
49/3072	. .	{Packet splitting}
49/3081	. .	{ATM peripheral units, e.g. policing, insertion or extraction}
49/309	. . .	{Header conversion, routing tables or routing tags}
49/35	.	{Application specific switches}
49/351	. .	{LAN switches, e.g. ethernet switches}
49/352	. . .	{Gigabit ethernet switching [GBPS]}
49/353	. .	{Support for fire wire switches, i.e. according to IEEE 1394}
49/354	. .	{Support for virtual LAN, VLAN tagging or multiple registration, e.g. according to IEEE 802.1q}
49/355	. .	{Application aware switches, e.g. HTTP}
49/356	. .	{Storage area network switches}
49/357	. . .	{Fibre channel switches}
49/358	. . .	{Infiniband Switches}
49/40	.	{Physical details, e.g. power supply, mechanical construction or backplane}
49/405	. .	{Physical details, e.g. power supply, mechanical construction or backplane of ATM switches}
49/45	.	{Provisions for supporting expansion}
49/455	. .	{Provisions for supporting expansion in ATM switches}
49/50	.	{Overload detection; Overload protection}
49/501	. .	{Overload detection}
49/503	. . .	{Policing}
49/505	. .	{Corrective Measures, e.g. backpressure}
49/506	. . .	{Backpressure}
49/508	. . .	{Head of Line Blocking Avoidance}
49/55	.	{Error prevention, detection or correction}
49/552	. .	{Error prevention, e.g. sequence integrity of packets redundant connections through the switch fabric}
49/555	. .	{Error detection}
49/557	. .	{Error correction, e.g. fault recovery or fault tolerance}
49/60	.	{Hybrid or multiprotocol packet, ATM or frame switches}
49/602	. .	{Multilayer or multiprotocol switching, e.g. IP switching}
49/604	. .	{Hybrid IP/Ethernet switches}
49/606	. .	{Hybrid ATM switches, e.g. ATM&STM, ATM&Frame Relay or ATM&IP}
49/608	. .	{ATM switches adapted to switch variable length packets, e.g. IP packets}
49/65	.	{Fast packet switch re-configuration}
49/70	.	{Virtual switches}
49/90	.	{Queuing arrangements}
49/9005	. .	{Dynamic buffer space allocation}
49/901	. .	{Storage descriptor, e.g. read or write pointers}
49/9015	. . .	{for supporting a linked list}
49/9021	. .	{Plurality of buffers per packet}
49/9026	. .	{Single buffer per packet}
49/9031	. .	{Wraparound memory, e.g. overrun or underrun detection}

49/9036	. .	{Common buffer combined with individual queues}
49/9042	. .	{Separate storage for different parts of the packet, e.g. header and payload}
49/9047	. .	{Buffer pool}
49/9052	. . .	{with buffers of different sizes}
49/9057	. .	{Arrangements for supporting packet reassembly or resequencing}
49/9063	. .	{Intermediate storage in different physical parts of a node or terminal}
49/9068	. . .	{in the network interface card}
49/9073	. . . .	{Early interruption upon arrival of a fraction of a packet}
49/9078	. . .	{using an external memory or storage device}
49/9084	. .	{Reactions to storage capacity overflow}
49/9089	. . .	{replacing packets in a storage arrangement, e.g. pushout}
49/9094	. .	{Arrangements for simultaneous transmit and receive, e.g. simultaneous reading/writing from/to the storage element}

51/00   **{Arrangements for user-to-user messaging in packet-switching networks, e.g. e-mail or instant messages}**

51/02	.	{with automatic reactions or user delegation, e.g. automatic replies or chatbot}
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)}
51/043	. .	{use or manipulation of presence information in messaging (presence management H04L 67/24)}
51/046	. .	{interacting with other applications or services}
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)}
51/063	. .	{with adaptation of content}
51/066	. .	{with adaptation of format}
51/08	.	{Messages including annexed information, e.g. attachments}
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)}
51/12	.	{with filtering and selective blocking capabilities}
51/14	.	{with selective forwarding}
51/16	.	{including conversation history, e.g. threads}
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)}
51/20	.	{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)}

51/22	.	{Mailbox-related details (computer aided management of electronic mail G06Q 10/10)}
51/24	.	{with notification on incoming messages}
51/26	.	{Prioritized messaging (networked applications for intermediate processing whereby quality of service or priority requirements are taken into account H04L 67/322)}
51/28	.	{Details regarding addressing issues (arrangements and protocols for addressing and naming H04L 61/00)}
51/30	.	{with reliability check, e.g. acknowledgments or fault reporting}
51/32	.	{Messaging within social networks}
51/34	.	{with provisions for tracking the progress of a message}
51/36	.	{Unified messaging, e.g. interactions between instant messaging, e-mail or other types of messages such as converged IP messaging [CPM]}
51/38	.	{in combination with wireless systems (mobile application service signalling using messaging, e.g. SMS, H04W 4/12)}

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 45/00 or H04L 49/00, respectively.
– Aspects relating to configuration management of data networks or network elements in general which are classified in H04L 41/08.
– 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.

61/10	.	{Mapping of addresses of different types; Address resolution}
61/103	. .	{across network layers, e.g. resolution of network layer into physical layer addresses or address resolution protocol [ARP]}
61/106	. .	{across networks, e.g. mapping telephone numbers to data network addresses}
61/15	.	{Directories; Name-to-address mapping (telephone directories in user terminals H04M 1/27)}
61/1505	. .	{involving standard directories or standard directory access protocols}
61/1511	. . .	{using domain name system [DNS]}
61/1517	. . .	{using open systems interconnection [OSI] directories, i.e. X.500}
61/1523	. . .	{using lightweight directory access protocol [LDAP]}
61/1529	. . .	{using voice over internet protocol [VoIP] directories, e.g. session initiation protocol [SIP] registrar or H.323 gatekeeper (real-time signaling or sessions protocols H04L 65/1003)}
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)}

61/1541	. .	{for service discovery (network applications for service discovery H04L 67/16; discovery of network devices in wireless communication networks H04W 8/005)}
61/1547	. .	{for personal communications, i.e. using a personal identifier}
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)}
61/1558	. .	{Object oriented directories, e.g. common object request broker architecture [CORBA] name server}
61/1564	. .	{Directories for electronic mail or instant messaging (arrangements for user-to-user messaging in packet-switching networks H04L 51/00)}
61/157	. .	{Directories for hybrid networks, e.g. including telephone numbers}
61/1576	. .	{Metadirectories, i.e. all encompassing global directory which interfaces to various underlying directories}
61/1582	. .	{containing identifiers of data entities on a computer, e.g. file names}
61/1588	. .	{containing mobile subscriber information, e.g. home subscriber server [HSS]}
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)}
61/20	.	{Address allocation (configuration management of network or network elements H04L 41/08)}
61/2007	. .	{internet protocol [IP] addresses}
61/2015	. . .	{using the dynamic host configuration protocol [DHCP] or variants}
61/2023	. . .	{using the bootstrap protocol [BOOTP] or variants}
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)}
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)}
61/2046	. .	{involving the solving of address allocation conflicts or involving testing of addresses}
61/2053	. .	{involving timing or renewal aspects}
61/2061	. .	{involving aspects of pools of addresses, e.g. assignment of different pools of addresses to different dynamic host configuration protocol [DHCP] servers}
61/2069	. .	{for group-, multicast- and broadcast-communication (broadcast or conference H04L 12/18)}
61/2076	. .	{involving update or notification mechanisms, e.g. update of a domain name server with dynamic host configuration protocol [DHCP] assigned addresses}
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)}
61/2092	. .	{by self assignment, e.g. pick address randomly and test if already in use}
61/25	.	{mapping of addresses of the same type; address translation}
61/2503	. .	{Internet protocol [IP] address translation}
61/2507	. . .	{translating between special types of IP addresses}
61/251	. . . .	{between different IP versions}
61/2514	. . . .	{between local and global IP addresses}
61/2517	. . . .	{involving port numbers}
61/2521	. . .	{Special translation architecture, i.e. being different from a single network address translation [NAT] server}
61/2525	. . . .	{Translation at a client}
61/2528	. . . .	{Translation at a proxy}
61/2532	. . . .	{Clique of NAT servers}
61/2535	. . . .	{Multiple local networks, e.g. resolving potential IP address conflicts}
61/2539	. . .	{for hiding addresses or keeping them anonymous}
61/2542	. . .	{involving dual-stack hosts}
61/2546	. . .	{Mechanisms for avoiding unnecessary translation}
61/255	. . .	{Map-table maintenance and indexing}
61/2553	. . . .	{Binding renewal aspects; Keep-alive messages}
61/2557	. . .	{Translation policies and rules}
61/256	. . .	{Network address translation [NAT] traversal}
61/2564	. . . .	{for a higher-layer protocol, e.g. for session initiation protocol [SIP] (SIP for real-time communications H04L 65/1006)}
61/2567	. . . .	{for reachability, e.g. inquiring the address of a correspondent behind a NAT server}
61/2571	. . . .	{for identification, e.g. for authentication or billing (charging arrangements H04L 12/14)}
61/2575	. . . .	{using address mapping retrieval, e.g. simple traversal of user datagram protocol through NAT [STUN]}
61/2578	. . . .	{transparent to the NAT server}
61/2582	. . . .	{through control of the NAT server, e.g. using universal plug and play [UPnP]}
61/2585	. . . .	{through application level gateway [ALG]}
61/2589	. . . .	{over a relay server, e.g. traversal using relay NAT [TURN]}
61/2592	. . .	{involving tunneling or encapsulation (providing a confidential data exchange among entities communicating through data packet networks H04L 63/04)}
61/2596	. .	{Non - internet protocol [IP] address translation}
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)}
61/3005	. .	{Mechanisms for avoiding name conflicts}
61/301	. .	{Name conversion}
61/3015	. .	{Name registration, generation or assignment}

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)}
61/3025	. . .	{Domain name generation or assignment}
61/303	. .	{Name structure}
61/3035	. . .	{containing non-Latin characters, e.g. Chinese domain names}
61/304	. . .	{containing protocol addresses or telephone numbers (address type involved H04L 61/6018)}
61/3045	. . .	{containing wildcard characters}
61/305	. . .	{containing special prefixes}
61/3055	. . .	{containing special suffixes}
61/306	. .	{Name types}
61/3065	. . .	{Application layer names, e.g. buddy name, unstructured name chosen by a user or home appliance name}
61/307	. . .	{E-mail addresses (arrangements for user-to-user messaging in packet-switching networks H04L 51/00)}
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]}
61/308	. . .	{Telephone uniform resource identifier [URI]}
61/3085	. . .	{Session initiation protocol [SIP] uniform resource identifier [URI]}
61/309	. . .	{Globally routable user-agent [GRUU] uniform resource identifier [URI] for the session initiation protocol [SIP]}
61/3095	. . .	{Internet protocol multimedia private identity [IMPI] or internet protocol multimedia public identity [IMPU]}
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}
61/60	.	{Details}
61/6004	. .	{Structures or formats of addresses}
61/6009	. .	{Caching of addresses (caching data temporarily at an intermediate stage in general H04L 67/2842)}
61/6013	. .	{Proxying of addresses}
61/6018	. .	{Address types}
61/6022	. . .	{Layer 2 addresses, e.g. medium access control [MAC] addresses}
61/6027	. . .	{Control area network [CAN] identifiers (electric circuits specially adapted for vehicles for transmission of signals between vehicle parts and subsystems B60R 16/023)}
61/6031	. . .	{Small computer system interface [SCSI] addresses}
61/6036	. . .	{IEEE1394 identification numbers}
61/604	. . .	{Asynchronous transfer mode [ATM] addresses}
61/6045	. . .	{Fibre channel identifiers}
61/605	. . .	{Telephone numbers}
61/6054	. . .	{International mobile subscriber identity [IMSI] numbers}
61/6059	. . .	{Internet protocol version 6 [IPv6] addresses}

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)}
61/6068	. .	{Internet protocol [IP] addresses subnets}
61/6072	. .	{Short addresses}
61/6077	. .	{Multiple interfaces, e.g. multihomed nodes}
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)}
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)}
61/609	. .	{involving geographic information, e.g. room number}
61/6095	. .	{involving masks or ranges of addresses}
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)**}**
63/02	.	{for separating internal from external traffic, e.g. firewalls}
63/0209	. .	{Architectural arrangements, e.g. perimeter networks or demilitarized zones}
63/0218	. . .	{Distributed architectures, e.g. distributed firewalls}
63/0227	. .	{Filtering policies (mail message filtering H04L 12/585)}
63/0236	. . .	{Filtering by address, protocol, port number or service, e.g. IP-address or URL}
63/0245	. . .	{Filtering by information in the payload}
63/0254	. . .	{Stateful filtering}
63/0263	. . .	{Rule management}
63/0272	. .	{Virtual private networks}
63/0281	. .	{Proxies}
63/029	. .	{Firewall traversal, e.g. tunnelling or, creating pinholes}
63/04	.	{for providing a confidential data exchange among entities communicating through data packet networks}
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)}
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}
63/0421	. . .	{Anonymous communication, i.e. the party's identifiers are hidden from the other party or parties, e.g. using an anonymizer}

63/0428	. .	{wherein the data content is protected, e.g. by encrypting or encapsulating the payload}
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)}
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)}
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 H04L 9/14)}
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)}
63/0464	. . .	{using hop-by-hop encryption, i.e. wherein an intermediate entity decrypts the information and re-encrypts it before forwarding it}
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}
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)}
63/0485	. . .	{Networking architectures for enhanced packet encryption processing, e.g. offloading of IPsec packet processing or efficient security association look-up}
63/0492	. . .	{by using a location-limited connection, e.g. near-field communication or limited proximity of entities}
63/06	.	{for supporting key management in a packet data network (cryptographic mechanisms or cryptographic arrangements for key management H04L 9/08)}
63/061	. .	{for key exchange, e.g. in peer-to-peer networks (cryptographic mechanisms or cryptographic arrangements for key agreement H04L 9/0838)}
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)}
63/064	. . .	{Hierarchical key distribution, e.g. by multi-tier trusted parties}
63/065	. .	{for group communications (cryptographic mechanisms or cryptographic arrangements for key management involving conference or group key H04L 9/0833)}
63/067	. .	{using one-time keys (cryptographic mechanisms or cryptographic arrangements for generation of one-time passwords H04L 9/0863)}
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)}
63/08	.	{for supporting authentication of entities communicating through a packet data network (cryptographic mechanisms or cryptographic arrangements for entity authentication H04L 9/32)}
63/0807	. .	{using tickets, e.g. Kerberos (cryptographic mechanisms or cryptographic arrangements for entity authentication using tickets or tokens H04L 9/3213)}
63/0815	. .	{providing single-sign-on or federations}
63/0823	. .	{using certificates (cryptographic mechanisms or cryptographic arrangements for entity authentication involving certificates H04L 9/3263)}
63/083	. .	{using passwords (cryptographic mechanisms or cryptographic arrangements for entity authentication using a predetermined code H04L 9/3226)}
63/0838	. . .	{using one-time-passwords}
63/0846	. . .	{using time-dependent-passwords, e.g. periodically changing passwords}
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)}
63/0861	. .	{using biometrical features, e.g. fingerprint, retina-scan (cryptographic mechanisms or cryptographic arrangements for entity authentication using biological data H04L 9/3231)}
63/0869	. .	{for achieving mutual authentication (cryptographic mechanisms or cryptographic arrangements for mutual authentication H04L 9/3273)}
63/0876	. .	{based on the identity of the terminal or configuration, e.g. MAC address, hardware or software configuration or device fingerprint}
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}
63/0892	. .	{by using authentication-authorization-accounting [AAA] servers or protocols}
63/10	.	{for controlling access to network resources (restricting network management access H04L 12/2461)}
63/101	. .	{Access control lists [ACL]}
63/102	. .	{Entity profiles}
63/104	. .	{Grouping of entities}
63/105	. .	{Multiple levels of security}
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}
63/108	. .	{when the policy decisions are valid for a limited amount of time}
63/12	.	{Applying verification of the received information (cryptographic mechanisms or cryptographic arrangements for data integrity or data verification H04L 9/32)}

63/123	. . {received data contents, e.g. message integrity}
63/126	. . {the source of the received data}
63/14	. {for detecting or protecting against malicious traffic}
63/1408	. . {by monitoring network traffic (monitoring network traffic per se H04L 12/2602)}
63/1416	. . . {Event detection, e.g. attack signature detection}
63/1425	. . . {Traffic logging, e.g. anomaly detection}
63/1433	. . {Vulnerability analysis}
63/1441	. . {Countermeasures against malicious traffic (countermeasures against attacks on cryptographic mechanisms H04L 9/002)}
63/145	. . . {the attack involving the propagation of malware through the network, e.g. viruses, trojans or worms}
63/1458	. . . {Denial of Service}
63/1466	. . . {Active attacks involving interception, injection, modification, spoofing of data unit addresses, e.g. hijacking, packet injection or TCP sequence number attacks}
63/1475	. . . {Passive attacks, e.g. eavesdropping or listening without modification of the traffic monitored}
63/1483	. . . {service impersonation, e.g. phishing, pharming or web spoofing (detection of rogue wireless access points H04W 12/12)}
63/1491	. . . {using deception as countermeasure, e.g. honeypots, honeynets, decoys or entrapment}
63/16	. {Implementing security features at a particular protocol layer}
63/162	. . {at the data link layer}
63/164	. . {at the network layer}
63/166	. . {at the transport layer}
63/168	. . {above the transport layer}
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)}
63/20	. {for managing network security; network security policies in general (filtering policies H04L 63/0227)}
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)}
63/30	. {for supporting lawful interception, monitoring or retaining of communications or communication related information (circuit switched telephony call monitoring H04M 3/2281)}
63/302	. . {gathering intelligence information for situation awareness or reconnaissance}
63/304	. . {intercepting circuit switched data communications (lawful interception of wireless network communications H04W 12/02)}
63/306	. . {intercepting packet switched data communications, e.g. Web, Internet or IMS communications}

63/308	. . {retaining data, e.g. retaining successful, unsuccessful communication attempts, internet access, or e-mail, internet telephony, intercept related information or call content}
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 H04N 21/00; 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 67/00)**}**

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 11/0428
   – 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 12/569. }

3. {In this group the following terms or expressions are used with the meaning indicated:

H04L

H04L 65/00
(continued)
- 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}

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)}
65/1003	. .	{Signalling or session protocols}
65/1006	. . .	{SIP}
65/1009	. . .	{H.323}
65/1013	. .	{Network architectures, gateways, control or user entities}
65/1016	. . .	{IMS (wireless communication networks H04W)}
65/102	. . .	{Gateways (arrangements for connecting between networks having differing types of switching systems, e.g. gateways H04L 12/66)}
65/1023	. . . .	{Media gateways}
65/1026	. . . . .	{at the edge}
65/103	. . . . .	{in the network}
65/1033	. . . .	{Signalling gateways}
65/1036	. . . . .	{at the edge}
65/104	. . . . .	{at the edge}
65/1043	. . .	{MGC, MGCP or Megaco (decomposed PSTN/ ISDN-IP gateways H04M 7/1255)}
65/1046	. . .	{Call controllers; Call servers}
65/105	. . .	{Proxies, e.g. SIP proxies}
65/1053	. . .	{Arrangements providing PBX functionality, e.g. IP PBX (circuit switched PBXs H04M 3/42314; PBX networks H04M 7/009)}
65/1056	. . . .	{for multi-site}
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)}
65/1063	. . .	{Application servers (systems providing special services to telephonic subscribers H04M 3/42)}

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)}
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)}
65/1073	. . .	{Registration (arrangements for addressing or naming in data networks H04L 61/00)}
65/1076	. . .	{Screening (arrangements for screening incoming telephone calls H04M 3/436; arrangements for network security H04L 63/00)}
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)}
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 47/74; reallocation or renegotiation of resources in packet switching networks H04L 47/76)}
65/1086	. . . .	{session scope modification}
65/1089	. . . . .	{by adding or removing media}
65/1093	. . . . .	{by adding or removing participants}
65/1096	. . .	{Features, e.g. call-forwarding or call hold (systems providing special services to telephonic subscribers H04M 3/42)}
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)}
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)}
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)}

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)}
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)}
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)}
65/4046	. . .	{with distributed floor control}
65/4053	. . .	{without floor control}
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 76/005)}
65/4069	. .	{Services related to one way streaming}
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)}
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)}
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 47/26; end-to-end flow control in packet switching networks H04L 47/18; analog television systems using two way working H04N 7/173; control signals to video servers issued by video clients H04N 21/6377)}
65/60	.	{Media handling, encoding, streaming or conversion}
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)}
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)}
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)}
65/605	. . .	{intermediate}
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)}
65/608	. .	{Streaming protocols, e.g. RTP or RTCP}
65/80	.	{QoS aspects (traffic-type related flow control in packet switching networks, e.g. priorities or QoS H04L 47/24; admission control/resource reservation in packet switching networks based on QoS or priority awareness H04L 47/805, 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 67/2828; 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)}

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)**}**

NOTES

1. 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.
2. 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

67/02 . {involving the use of web-based technology, e.g. hyper text transfer protocol [HTTP] (information retrieval from the Internet G06F 17/30861)}

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)}

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 H04W 4/00)}

67/06 . {adapted for file transfer, e.g. file transfer protocol [FTP]}

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)}

67/10 . {in which an application is distributed across nodes in the network (multiprogramming arrangements G06F 9/46)}

67/1002 . . {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 47/125; video servers using load balancing strategies H04N 21/23103; error detection or correction of the data by redundancy in hardware G06F 11/16)}

67/1004 . . . {Server selection in load balancing}

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)}

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)}

67/101 . . . . {based on network conditions}

67/1012 . . . . {based on compliance of requirements or conditions with available server resources}

67/1014 . . . . {based on the content of a request}

67/1017 . . . . {based on a round robin mechanism}

67/1019 . . . . {based on random server selection}

67/1021 . . . . {based on client or server locations}

67/1023 . . . . {based on other criteria, e.g. hash applied to IP address, specific algorithms or cost}

67/1025 . . . {dynamic adaptation of the criteria on which the server selection is based}

67/1027 . . . {Persistence of sessions during load balancing}

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)}

67/1031 . . . {Controlling of the operation of servers by a load balancer, e.g. adding or removing servers that serve requests}

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)}

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)}

67/1038	. . .	{Load balancing arrangements to avoid a single path through a load balancer}
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 13/34)}
67/1042	. . .	{involving topology management mechanisms}
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)}
67/1046	. . . . .	{Joining mechanisms}
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)}
67/1051	. . . . .	{Group master selection mechanisms}
67/1053	. . . . .	{with pre-configuration of logical or physical connections with a determined number of other peers}
67/1055	. . . . . .	{involving connection limits (involving dynamic management of active down- or uploading connections H04L 67/1085)}
67/1057	. . . . . .	{involving pre-assessment of levels of reputation of peers}
67/1059	. . . .	{Inter-group management mechanisms, e.g. splitting, merging or interconnection of groups}
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)}
67/1063	. . . .	{Discovery through centralizing entities}
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)}
67/1068	. . . .	{Discovery involving direct consultation or announcement among potential requesting and potential source peers}
67/107	. . . . .	{with limitation or expansion of the discovery scope}
67/1072	. . .	{Discovery involving ranked list compilation of candidate peers}
67/1074	. . .	{for supporting resource transmission mechanisms (routing over an overlay routing layer H04L 45/64; file transfer H04L 67/06)}
67/1076	. . . .	{Resource dissemination mechanisms or network resource keeping policies for optimal resource availability in the overlay network}
67/1078	. . . .	{Resource delivery mechanisms}
67/108	. . . . .	{characterized by resources being split in blocks or fragments}
67/1082	. . . . .	{involving incentive schemes}
67/1085	. . . . .	{involving dynamic management of active down- or uploading connections}
67/1087	. . .	{involving cross functional networking aspects}
67/1089	. . . .	{Hierarchical topologies}
67/1091	. . . .	{Interfacing with client-server systems or between P2P systems}
67/1093	. . . .	{Some peer nodes performing special functions}
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 G06F 17/30575; mass storage redundancy by mirroring for error detection or correction of data G06F 11/2056)}
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)}
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 13/30)}
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)}
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)}

67/141	. .	{provided for setup of an application session (session setup for real-time communications H04L 65/1069)}
67/142	. .	{provided for managing session state for stateless protocols; Signalling a session state; State transitions; Keeping-state mechanisms}
67/143	. .	{provided for session termination, e.g., event controlled end of session}
67/145	. . .	{provided for avoiding end of session, e.g. keep-alive, heartbeats, resumption message, wake-up for inactive or interrupted session}
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)}
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}
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)}
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)}
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)}
67/20	.	{involving third party service providers (e-commerce G06Q 30/00)}
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)}
67/24	.	{Presence management (use and manipulation of presence information in instant messaging H04L 12/5815)}
67/26	.	{Push based network services (broadcast or multicast push services H04L 12/1859)}
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)}

67/2804	. .	{for adding application control or application functional data, e.g. adding metadata}
67/2809	. .	{for brokering (negotiation of communication capabilities H04L 69/24; e-commerce G06Q 30/00)}
67/2814	. .	{for data redirection (load balancing of replicated servers H04L 67/1002; access network selection H04L 12/5691; 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)}
67/2819	. .	{Enhancement of application control based on intercepted application data}
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)}
67/2828	. . .	{for reducing the amount or size of exchanged application data (protocols for data compression H04L 69/04; digital video compression H04N 19/00)}
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)}
67/2838	. .	{for integrating service provisioning from a plurality of service providers (web site content organization and management G06F 17/3089)}
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)}
67/2847	. . .	{involving pre-fetching or pre-delivering data based on network characteristics (cache prefetching within a hierarchical structured memory system G06F 12/0862)}
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)}
67/2857	. . .	{involving storage of data provided by user terminals, i.e. reverse caching}
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)}
67/2866	. .	{Architectural aspects}
67/2871	. . .	{Implementation details of a single intermediate entity}

67/2876 . . . {Pairs of interprocessing entities at each side of the network, e.g. split proxies}

67/288 . . . {Distributed intermediate devices, i.e. intermediate device interaction with other intermediate devices on the same level}

67/2885 . . . {Hierarchically arranged intermediate devices, e.g. hierarchical caching}

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}

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}

67/30 . {involving profiles}

67/303 . . {Terminal profiles}

67/306 . . {User profiles (configuring for programme initiating G06F 9/44505; information retrieval by personalized querying G06F 17/30867)}

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)}

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)}

67/325 . . {whereby a time schedule is established for servicing the requests}

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}

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)}

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)}

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)}

67/40 . {Protocols for remote procedure calls [RPC] (remote procedure calls G06F 9/547)}

67/42 . {Protocols for client-server architectures (access to replicated servers H04L 67/1002)}

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 H04L 12/00; 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)**}

69/02 . {Protocol performance}

69/03 . {Protocol definition or specification (protocol conformance testing H04L 1/244; specification techniques G06F 8/10)}

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)}

69/06 . {Notations for structuring of protocol data, e.g. abstract syntax notation one [ASN.1]}

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)}

69/10 . {Streamlined, light-weight or high-speed protocols, e.g. express transfer protocol [XTP] or byte stream}

69/12 . {Protocol engines, e.g. VLSIs or transputers}

69/14 . {Multichannel or multilink protocols}

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)}

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)}

69/162 . . . {involving adaptations of sockets based mechanisms (secure socket layer H04L 63/168)}

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 47/19; error control procedures in general H04L 1/18)}

69/164	. .	{Adaptation or special uses of UDP protocol}
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)}
69/166	. .	{IP fragmentation or TCP segmentation aspects (evaluation of maximum transfer unit [MTU] H04L 47/36; assembly or disassembly of packets in wireless networks H04W 28/065)}
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)}
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 2012/5667; special adaptation of TCP protocol for wireless media H04W 80/06)}
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)}
69/18	.	{Multi-protocol handler, e.g. single device capable of handling multiple protocols (multilayer or multiprotocol switches H04L 49/602)}
69/22	.	{Header parsing or analysis (traffic monitoring by flow aggregation or filtering H04L 12/2605; flow identification in packet switching networks H04L 47/2483)}
69/24	.	{Negotiation of communication capabilities}
69/26	.	{Special purpose or proprietary protocols or architectures (network applications for proprietary or special purpose networking environments H04L 67/12)}
69/28	.	{Timer mechanisms used in protocols}
69/30	.	{Definitions, standards or architectural aspects of layered protocol stacks}
69/32	. .	{High level architectural aspects of 7-layer open systems interconnection [OSI] type protocol stacks}
69/321	. . .	{Aspects of inter-layer communication protocols or service data unit [SDU] definitions; Interfaces between layers}
69/322	. . .	{Aspects of intra-layer communication protocols among peer entities or protocol data unit [PDU] definitions}
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)}
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)}
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)}
69/326	. . . .	{in the transport layer, i.e. layer four (TCP/IP H04L 69/16; streaming protocols, e.g. RTP, H04L 65/608)}
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)}
69/328	. . . .	{in the presentation layer, i.e. layer six (graphical user interfaces G06F 3/048; terminal emulation, e.g. telnet, H04L 67/08)}
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)}
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 45/28; fault recovery in packet switches H04L 49/557)}

2201/00		**Algorithms used for the adjustment of time-domain equalizers**
2201/02	.	minimizing an error signal, e.g. least squares, minimum square error
2201/04	.	zero-forcing
2201/06	.	using the output of a maximum likelihood decoder (Viterbi detector)
2201/08	.	Algorithms not covered by groups H04L 2201/02 - H04L 2201/06

2203/00		**Characteristics of phase shift key signals**
2203/02	.	differential
2203/04	.	continuous phase

2209/00		**{Additional information or applications relating to cryptographic mechanisms or cryptographic arrangements for secret or secure communication H04L 9/00}**
2209/04	.	{Masking or blinding}
2209/043	. .	{of tables, e.g. lookup, substitution or mapping}
2209/046	. .	{of operations, operands or results of the operations}
2209/08	.	{Randomization, e.g. dummy operations or using noise}
2209/12	.	{Details relating to cryptographic hardware or logic circuitry}
2209/122	. .	{Hardware reduction or efficient architectures}
2209/125	. .	{Parallelization or pipelining, e.g. for accelerating processing of cryptographic operations}
2209/127	. .	{Trusted platform modules [TPM]}
2209/16	.	{Obfuscation or hiding, e.g. involving white box}
2209/20	.	{Manipulating the length of blocks of bits, e.g. padding or block truncation}

2209/24	.	{Key scheduling, i.e. generating round keys or sub-keys for block encryption}
2209/26	.	{Testing cryptographic entity, e.g. testing integrity of encryption key or encryption algorithm}
2209/30	.	{Compression, e.g. Merkle-Damgard construction}
2209/34	.	{Encoding or coding, e.g. Huffman coding or error correction}
2209/38	.	{Chaining, e.g. hash chain or certificate chain}
2209/42	.	{Anonymization, e.g. involving pseudonyms}
2209/46	.	{Secure multiparty computation, e.g. millionaire problem}
2209/463	. .	{Electronic voting}
2209/466	. .	{Electronic auction}
2209/50	.	{Oblivious transfer}
2209/56	.	{Financial cryptography, e.g. electronic payment or e-cash}
2209/60	.	{Digital content management, e.g. content distribution}
2209/601	. .	{Broadcast encryption}
2209/603	. .	{Digital right managament [DRM]}
2209/605	. .	{Copy protection}
2209/606	. .	{Traitor tracing}
2209/608	. .	{Watermarking}
2209/64	.	{Self-signed certificates}
2209/68	.	{Special signature format, e.g. XML format}
2209/72	.	{Signcrypting, i.e. digital signing and encrypting simultaneously}
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)}
2209/80	.	{Wireless (network architectures or network communication protocols for wireless network security H04W 12/00)}
2209/805	. .	{Lightweight hardware, e.g. radio-frequency identification [RFID] or sensor}
2209/84	.	{Vehicles}
2209/88	.	{Medical equipments}
2212/00		**Encapsulation of packets**
2463/00		**Additional details relating to network architectures or network communication protocols for network security covered by H04L 63/00**
2463/041	.	using an encryption or decryption engine integrated in transmitted data
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)
2463/062	.	applying encryption of the keys (cryptographic mechanisms or cryptographic arrangements for key distribution using key encryption key H04L 9/0822)
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)
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)
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)
2463/102	.	applying security measure for e-commerce (data processing systems or methods, specially adapted for e-commerce G06Q 30/00)
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)
2463/121	.	Timestamp (cryptographic mechanisms or cryptographic arrangements involving time stamps H04L 9/3297)
2463/141	.	Denial of service attacks against endpoints in a network
2463/142	.	Denial of service attacks against network infrastructure
2463/143	.	Denial of service attacks involving systematic or selective dropping of packets
2463/144	.	Detection or countermeasures against botnets
2463/145	.	Detection or countermeasures against cache poisoning
2463/146	.	Tracing the source of attacks