

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H04 ELECTRIC COMMUNICATION TECHNIQUE

(NOTE omitted)

## H04W WIRELESS COMMUNICATIONS NETWORKS (radio transmission systems [H04B 7/00](#); transmission systems using electromagnetic waves other than radio waves, e.g. light, infrared [H04B 10/00](#); communication systems using wireless extensions, i.e. wireless links without selective communication, e.g. cordless telephones [H04M 1/72](#); broadcast communication [H04H](#))

### NOTES

1. This subclass covers :
  - communication networks for selectively establishing one or a plurality of wireless communication links between a desired number of users or between users and network equipment, for the purpose of transferring information via these wireless communication links;
  - networks deploying an infrastructure for mobility management of wireless users connected thereto, e.g. cellular networks, WLAN [Wireless Local Area Network], wireless access networks, e.g. WLL [Wireless Local Loop] or self-organising wireless communication networks, e.g. ad hoc networks;
  - planning or deployment specially adapted for the above-mentioned wireless networks;
  - services or facilities specially adapted for the above-mentioned wireless networks;
  - arrangements or techniques specially adapted for the operation of the above-mentioned wireless networks.
2. This subclass does not cover :
  - communication systems using wireless extensions, i.e. wireless links without selective communication, e.g. cordless telephones, which are covered by group [H04M 1/72](#);
  - broadcast communication, which is covered by subclass [H04H](#).
3. In this subclass, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

**4/00 {Mobile application} services or facilities specially adapted for wireless communication networks** {(wireless network security [H04W 12/00](#); arrangements for broadcast or conference [H04L 12/18](#); message switching systems [H04L 51/00](#); network arrangements or network protocols for addressing or naming [H04L 61/00](#); network architectures or network communication protocols for network security [H04L 63/00](#); network arrangements or protocols for real-time communications [H04L 65/00](#); network arrangements or communication protocols for networked applications [H04L 67/00](#); application independent communication protocol aspects and techniques in packet data networks [H04L 69/00](#); telephonic communication, substation extension arrangements, cordless telephones, portable communication terminals with improved user interface to control a main telephone operation mode or to indicate the communication status [H04M 1/72522](#); automatic or semi-automatic exchanges for telephonic communication - systems providing special services or facilities to subscribers [H04M 3/42](#))}

### NOTES

1. This groups covers mobile application services or application service signalling for communication over wireless networks.

2. This group focuses on application services specially adapted for wireless networks or adjusted to the wireless environment

- 4/001 • {Provisioning or reconfiguring application services, e.g. OMA DM (program loading or initiating [G06F 9/445](#); mobile agents [G06F 9/4862](#); network management [H04L 41/00](#); network arrangements or communication protocols for networked applications involving the movement of software or configuration parameters, e.g. applets [H04L 67/34](#))}
- 4/003 • {Mobile application execution environments for application services, e.g. communicating with application store or appstore servers in the application service network and *vice versa*, 3GPP SIM Application toolkit [SAT], 3GPP OSA or 3GPP MEXE (processing of user or subscriber data at user equipment or user record carrier [H04W 8/183](#))}
- 4/005 • {for Machine-to-Machine communication [M2M, MTC], e.g. 3GPP M2M, OMA M2M, 3GPP MTC or Wireless Sensor Networks [WSN] (self-organizing networks [H04W 84/18](#); network arrangements or communication protocols for networked applications adapted for proprietary or special purpose networking environments, e.g. medical networks, sensor networks, networks in a car, remote metering networks [H04L 67/12](#); mechanical means for transferring the output of a sensing member [G01D 5/00](#))}

- 4/006 . . {using cooperative applications for harvesting, aggregating or forwarding data, e.g. data fusion, aggregation or diffusion in WSN, master/slave node hierarchy negotiations in WSN}
- 4/008 . {using short range communication, e.g. NFC, RFID or PAN (telephonic substation extension arrangements interfacing with an external accessory using a two-way short-range wireless interface [H04M 1/7253](#); mechanical means for transferring the output of a sensing member [G01D 5/00](#); near-field transmission systems [H04B 5/00](#))}
- 4/02 . {Mobile application} Services making use of the location of users or terminals {, e.g. OMA SUPL, OMA MLP or 3GPP LCS} (mobility data transfer [H04W 8/08](#); access restriction based on user location or mobility data [H04W 48/04](#); registration, e.g. affiliation to network, de-registration, e.g. terminating affiliation [H04W 60/00](#); locating users or terminals for network management purpose [H04W 64/00](#); navigation or navigational instruments [G01C 21/00](#); radio direction-finding, radio navigation, determining distance or velocity by use of radio waves, locating or presence-detecting by use of the reflection or re-radiation of radio waves or analogous arrangements using other waves [G01S](#))
- 4/021 . . {based on location controlled areas, e.g. geofencing}
- 4/022 . . . {with dynamic range variability}
- 4/023 . . {using mutual or relative location information between multiple location based services [LBS] targets or of distance thresholds}
- 4/025 . . {using location based information parameters}
- 4/026 . . . {using orientation information, e.g. compass}
- 4/027 . . . {using movement velocity, acceleration information}
- 4/028 . . . {using historical or predicted position information, e.g. trajectory data}
- 4/04 . . {using association of physical positions and logical data} in a dedicated environment, e.g. buildings or vehicles
- 4/043 . . . {using ambient awareness, e.g. involving buildings using floor or room numbers}
- 4/046 . . . {involving vehicles, e.g. floating traffic data [FTD] or vehicle traffic prediction}
- 4/06 . Selective distribution or broadcast {application services; Mobile application} services to user groups; One-way selective calling services {(connection management for selective distribution or broadcast [H04W 76/002](#); resource management for broadcast services [H04W 72/005](#))}
- 4/08 . . User group management {(group management mechanisms in peer-to-peer network applications [H04L 67/1044](#); processing of subscriber group data [H04W 8/186](#))}
- 4/10 . . Push-to-Talk {mobile application services} or Push-on-Call {mobile application} services {(arrangements for real-time multimedia Push-to-X-Services [H04L 65/4061](#); connection management for Push-to-Talk or Push-on-Call services [H04W 76/005](#))}
- 4/12 . {Mobile application service signalling using messaging, e.g. SMS [Short Message Service]; {Mobile application service signalling using} mailboxes; {Mobile application service signalling using} announcements, e.g. informing users on the status or progress of a communication request {(message switching systems [H04L 51/00](#); voice mail systems [H04M 3/533](#); arrangements for providing announcements [H04M 3/487](#))}
- 4/14 . . {Mobile application service signalling using} short messaging services, e.g. SMS or USSD [Unstructured Supplementary Service Data]
- 4/16 . {Mobile application service signalling using} communication-related supplementary services, e.g. call-transfer or call-hold {(automatic or semi-automatic exchange systems providing special services or facilities to subscribers [H04M 3/42](#))}
- 4/18 . {Customizing content of application services or} information format or content conversion, e.g. adaptation by the network of the transmitted or received information for the purpose of wireless delivery to users or terminals {(message adaptation based on network or terminal capabilities for message switching systems [H04L 51/06](#); network arrangements or communication protocols for networked applications involving intermediate processing or storage in the network, e.g. proxy, [H04L 67/28](#);)}
- 4/185 . . {by embedding added-value information into content, e.g. geo-tagging (intermediate arrangements for adding application control or application functional data [H04L 67/2804](#))}
- 4/20 . {Signalling of application services or} auxiliary data signalling, i.e. transmitting data via a non-traffic channel
- 4/203 . . {for converged personal network application service interworking, e.g. OMA converged personal network services [CPNS]}
- 4/206 . . {for socializing or targeting users of the same wireless application service, e.g. joint gesture signalling or mobile advertising signalling (marketing [G06Q 30/02](#); input arrangements for transferring data to be processed into a form capable of being handled by the computer for entering handwritten data [G06F 3/04883](#))}
- 4/22 . {Mobile application service} emergency connection handling {or mobile application services handling urgent or hazardous situations, e.g. 3GPP earthquake and tsunami warning system [ETWS] (connection management for emergency connection handling [H04W 76/007](#); centralised arrangements for answering calls for emergency applications requiring operator intervention [H04M 3/5116](#))}
- 4/24 . Accounting or billing
- 4/26 . . Usage measurement
- 8/00 Network data management**
- 8/005 . {Discovery of network devices, e.g. terminals}
- 8/02 . Processing of mobility data, e.g. registration information at HLR [Home Location Register] or VLR [Visitor Location Register]; Transfer of mobility data, e.g. between HLR, VLR or external networks
- 8/04 . . Registration at HLR or HSS [Home Subscriber Server]

8/06	. . Registration at serving network Location Register, VLR or user mobility server	16/20	. . for indoor coverage or short range network deployment
8/065	. . . {involving selection of the user mobility server}	16/22	. Traffic simulation tools or models
8/08	. . Mobility data transfer	16/225	. . {for indoor or short range network}
8/082	. . . {for traffic bypassing of mobility servers, e.g. location registers, home PLMNs or home agents}	16/24	. Cell structures
8/085	. . . {involving hierarchical organized mobility servers, e.g. hierarchical mobile IP [HMIP]}	16/26	. . Cell enhancers {or enhancement}, e.g. for tunnels, building shadow
8/087	. . . {for preserving data network PoA address despite hand-offs}	16/28	. . using beam steering
8/10	. . . between location register and external networks	16/30	. . Special cell shapes, e.g. doughnuts or ring cells
8/12	. . . between location registers or mobility servers	16/32	. . Hierarchical cell structures
8/14	. . . between corresponding nodes	<b>24/00</b>	<b>Supervisory, monitoring or testing arrangements</b>
8/16	. . . selectively restricting mobility {data} tracking	24/02	. Arrangements for optimising operational condition
8/18	. Processing of user or subscriber data, e.g. subscribed services, user preferences or user profiles; Transfer of user or subscriber data	24/04	. Arrangements for maintaining operational condition
8/183	. . {Processing at user equipment or user record carrier}	24/06	. Testing, {supervising or monitoring} using simulated traffic
8/186	. . {Processing of subscriber group data}	24/08	. Testing, {supervising or monitoring} using real traffic
8/20	. . Transfer of user or subscriber data	24/10	. Scheduling measurement reports {; Arrangements for measurement reports}
8/205	. . . {Transfer to or from user equipment or user record carrier}	<b>28/00</b>	<b>Network traffic or resource management</b>
8/22	. Processing or transfer of terminal data, e.g. status or physical capabilities	28/02	. Traffic management, e.g. flow control or congestion control
8/24	. . Transfer of terminal data	28/0205	. . {at the air interface (dynamic wireless traffic scheduling <a href="#">H04W 72/12</a> )}
8/245	. . . {from a network towards a terminal}	28/021	. . {in wireless networks with changing topologies, e.g. ad-hoc networks (self-organizing networks <a href="#">H04W 84/18</a> )}
8/26	. Network addressing or numbering for mobility support	28/0215	. . {based on user or device properties, e.g. MTC-capable devices (mobile application services or facilities specially adapted for wireless communication networks for machine-to-machine communication <a href="#">H04W 4/005</a> ; wireless resource selection or allocation plan definition based on terminal or device properties <a href="#">H04W 72/048</a> )}
8/265	. . {for initial activation of new user}	28/0221	. . . {power availability or consumption}
8/28	. . Number portability {; Network address portability}	28/0226	. . {based on location or mobility (handoff or reselection <a href="#">H04W 36/00</a> ; mobile application services making use of the location of users or terminals <a href="#">H04W 4/02</a> )}
8/30	. Network data restoration; {Network data reliability; Network data fault tolerance}	28/0231	. . {based on communication conditions (dynamic wireless traffic scheduling definition based on channel quality criteria <a href="#">H04W 72/1226</a> )}
<b>12/00</b>	<b>Security arrangements, e.g. access security or fraud detection; Authentication, e.g. verifying user identity or authorisation; Protecting privacy or anonymity</b>	28/0236	. . . {radio quality, e.g. interference, losses or delay}
12/02	. Protecting privacy or anonymity	28/0242	. . . {Determining whether packet losses are due to overload or to deterioration of radio communication conditions}
12/04	. Key management	28/0247	. . {based on conditions of the access network or the infrastructure network (central resource management <a href="#">H04W 28/16</a> )}
12/06	. Authentication	28/0252	. . {per individual bearer or channel (dynamic wireless traffic scheduling <a href="#">H04W 72/12</a> )}
12/08	. Access security	28/0257	. . . {the individual bearer or channel having a maximum bit rate or a bit rate guarantee}
12/10	. Integrity	28/0263	. . . {involving mapping traffic to individual bearers or channels, e.g. traffic flow template [TFT]}
12/12	. Fraud detection	28/0268	. . {using specific QoS parameters for wireless networks, e.g. QoS class identifier [QCI] or guaranteed bit rate [GBR] (negotiating SLA or negotiating QoS <a href="#">H04W 28/24</a> )}
<b>16/00</b>	<b>Network planning, e.g. coverage or traffic planning tools; Network deployment, e.g. resource partitioning or cells structures</b>		
16/02	. Resource partitioning among network components, e.g. reuse partitioning		
16/04	. . Traffic adaptive resource partitioning		
16/06	. . Hybrid resource partitioning, e.g. channel borrowing		
16/08	. . . Load shedding arrangements		
16/10	. . Dynamic resource partitioning		
16/12	. . Fixed resource partitioning		
16/14	. Spectrum sharing arrangements {between different networks}		
16/16	. . for PBS [Private Base Station] arrangements		
16/18	. Network planning tools		

28/0273	. . {adapting protocols for flow control or congestion control to wireless environment, e.g. adapting transmission control protocol [TCP] (wireless network protocols or protocol adaptations to wireless operation, e.g. wireless application protocol <a href="#">H04W 80/00</a> )}	36/005	. . {involving radio access media independent information, e.g. MIH [Media independent Hand-off]}
28/0278	. . {using buffer status reports (dynamic wireless traffic scheduling definition <a href="#">H04W 72/1205</a> )}	36/0055	. . {Transmission and use of information for re-establishing the radio link}
28/0284	. . {detecting congestion or overload during communication (monitoring arrangements <a href="#">H04L 43/00</a> )}	36/0061	. . . {of neighbor cell information}
28/0289	. . {Congestion control (performing reselection for handling the traffic <a href="#">H04W 36/22</a> ; load shedding arrangements in network planning <a href="#">H04W 16/08</a> ; dynamic wireless traffic scheduling <a href="#">H04W 72/12</a> )}	36/0066	. . . {of control information between different types of networks in order to establish a new radio link in the target network}
28/0294	. . {forcing collision (non-scheduled or contention based wireless access channel <a href="#">H04W 74/08</a> )}	36/0072	. . . {of resource information of target access point}
28/04	. . Error control	36/0077	. . . {of access information of target access point}
	<b>NOTE</b>	36/0083	. . {Determination of parameters used for hand-off, e.g. generation or modification of neighbour cell lists}
	When classifying in this group, classification is also made in the appropriate groups under <a href="#">H04L 1/00</a> .	36/0088	. . . {Scheduling hand-off measurements}
		36/0094	. . . {Definition of hand-off measurement parameters}
28/06	. . Optimizing {the usage of the radio link}, e.g. header compression, information sizing {, discarding information (system modifying transmission characteristic according to link quality by modifying frame length <a href="#">H04L 1/0007</a> ; dynamic adaptation of the packet size for flow control or congestion control <a href="#">H04L 47/365</a> )}	36/02	. Buffering or recovering information during reselection {; Modification of the traffic flow during hand-off}
28/065	. . . {using assembly or disassembly of packets}	36/023	. . {Buffering or recovering information during reselection}
28/08	. . Load balancing or load distribution	36/026	. . {Multicasting of data during hand-off}
28/085	. . . {among bearers or channels}	36/04	. Reselecting a cell layer in multi-layered cells
28/10	. . Flow control {between communication endpoints}	36/06	. Reselecting a communication resource in the serving access point
28/12	. . . using signalling between network elements	36/08	. Reselecting an access point
28/14	. . . using intermediate storage	36/10	. Reselecting an access point controller
28/16	. Central resource management; Negotiation of resources {or communication parameters}, e.g. negotiating bandwidth or QoS [Quality of Service]	36/12	. Reselecting a serving backbone network switching or routing node
28/18	. . Negotiating wireless communication parameters	36/14	. Reselecting a network or an air interface
28/20	. . . Negotiating bandwidth	36/16	. Performing reselection for specific purposes
28/22	. . . Negotiating communication rate	36/165	. . {for improving the overall network performance ( <a href="#">H04W 36/18</a> - <a href="#">H04W 36/22</a> take precedence)}
28/24	. . Negotiating SLA [Service Level Agreement]; Negotiating QoS [Quality of Service]	36/18	. . for allowing seamless reselection, e.g. soft reselection
28/26	. . Resource reservation	36/20	. . for optimising the interference level
36/00	<b>Handoff or reselection arrangements</b>	36/22	. . for handling the traffic
	<b>NOTE</b>	36/24	. Reselection being triggered by specific parameters {used to improve the performance of a single terminal}
	In this group, local priority rules supersede the first-place priority rule (FPPR) applying throughout <a href="#">H04W</a>	36/245	. . {by historical data}
36/0005	. {Control or signalling for completing the hand-off}	36/26	. . by agreed or negotiated communication parameters
36/0011	. . {for data session or connection}	36/28	. . . involving a plurality of connections, e.g. multi-call, multi-bearer connections
36/0016	. . . {for hand-off preparation}	36/30	. . by measured or perceived connection quality data
36/0022	. . . {for transferring sessions between adjacent core network technologies}	36/32	. . by location or mobility data, e.g. speed data
36/0027	. . . {for a plurality of sessions or connections, e.g. multi-call, multi-bearer connections}	36/34	. Reselection control
36/0033	. . . {with transfer of context information}	36/36	. . by user or terminal equipment
36/0038	. . . . {of security context information}	36/365	. . . {by manual user interaction}
36/0044	. . . . {of quality context information}	36/38	. . by fixed network equipment
		36/385	. . . {of the core network}
		40/00	<b>Communication routing or communication path finding</b>
		40/005	. {Routing actions in the presence of nodes in sleep or doze mode}
		40/02	. Communication route or path selection, e.g. power-based or shortest path routing
		40/023	. . {Limited or focused flooding to selected areas of a network}
		40/026	. . {Route selection considering the moving speed of individual devices}



40/04	. . . based on wireless node resources	52/0212	. . . . {managed by the network, e.g. network or access point is master and terminal is slave}
40/06	. . . . based on characteristics of available antennas	52/0216	. . . . {using a pre-established activity schedule, e.g. traffic indication frame}
40/08	. . . . based on transmission power	52/0219	. . . . {where the power saving management affects multiple terminals}
40/10	. . . . based on available power or energy	52/0222	. . . . {in packet switched networks}
40/12	. . . based on transmission quality or channel quality	52/0225	. . . . {using monitoring of external events, e.g. the presence of a signal}
40/125	. . . . {using a measured number of retransmissions as a link metric}	52/0229	. . . . {where the received signal is a wanted signal}
40/14	. . . . based on stability	52/0232	. . . . . {according to average transmission signal activity}
40/16	. . . . based on interference	52/0235	. . . . . {where the received signal is a power saving command}
40/18	. . . based on predicted events	52/0238	. . . . . {where the received signal is an unwanted signal, e.g. interference or idle signal}
40/20	. . . based on geographic position or location	52/0241	. . . . . {where no transmission is received, e.g. out of range of the transmitter}
40/205	. . . . {using topographical information, e.g. hills, high rise buildings}	52/0245	. . . . . {according to signal strength}
40/22	. . . using selective relaying for reaching a BTS [Base Transceiver Station] or an access point	52/0248	. . . . . {dependent on the time of the day, e.g. according to expected transmission activity}
40/24	. . Connectivity information management, e.g. connectivity discovery or connectivity update	52/0251	. . . . . {using monitoring of local events, e.g. events related to user activity}
40/242	. . . {aging of topology database entries}	52/0254	. . . . . {detecting a user operation or a tactile contact or a motion of the device}
40/244	. . . {using a network of reference devices, e.g. beaconing}	52/0258	. . . . . {controlling an operation mode according to history or models of usage information, e.g. activity schedule or time of day}
40/246	. . . {Connectivity information discovery}	52/0261	. . . . . {managing power supply demand, e.g. depending on battery level}
40/248	. . . {Connectivity information update}	52/0264	. . . . . {by selectively disabling software applications}
40/26	. . . for hybrid routing by combining proactive and reactive routing	52/0267	. . . . . {by controlling user interface components}
40/28	. . . for reactive routing	52/027	. . . . . {by controlling a display operation or backlight unit}
40/30	. . . for proactive routing	52/0274	. . . . . {by switching on or off the equipment or parts thereof}
40/32	. . . for defining a routing cluster membership	52/0277	. . . . . {according to available power supply, e.g. switching off when a low battery condition is detected}
40/34	. . Modification of an existing route	52/028	. . . . . {switching on or off only a part of the equipment circuit blocks}
40/36	. . . due to handover	52/0283	. . . . . {with sequential power up or power down of successive circuit blocks, e.g. switching on the local oscillator before RF or mixer stages}
40/38	. . . adapting due to varying relative distances between nodes	52/0287	. . . . . {changing the clock frequency of a controller in the equipment}
<b>48/00</b>	<b>Access restriction; Network selection; Access point selection</b>	52/029	. . . . . {reducing the clock frequency of the controller}
48/02	. . Access restriction performed under specific conditions	52/0293	. . . . . {having a sub-controller with a low clock frequency switching on and off a main controller with a high clock frequency}
48/04	. . . based on user or terminal location or mobility data, e.g. moving direction, speed	52/0296	. . . . . {switching to a backup power supply}
48/06	. . . based on traffic conditions	52/04	. . . TPC [Transmission power control]
48/08	. . Access restriction or access information delivery, e.g. discovery data delivery	52/06	. . . TPC algorithms
48/10	. . . using broadcasted information	52/08	. . . Closed loop power control
48/12	. . . using downlink control channel	52/10	. . . Open loop power control
48/14	. . . using user query {or user detection}	52/12	. . . Outer and inner loops
48/16	. . Discovering, processing access restriction or access information	52/125	. . . . . {cascaded outer loop power control}
48/17	. . {Selecting a data network PoA [Point of Attachment]}	52/14	. . . . Separate analysis of uplink or downlink
48/18	. . Selecting a network or a communication service	52/143	. . . . . {Downlink power control}
48/20	. . Selecting an access point	52/146	. . . . . {Uplink power control}
<b>52/00</b>	<b>Power management, e.g. TPC [Transmission Power Control], power saving or power classes {(gain control in transmitters or power amplifiers H03G 3/3042)}</b>		
52/02	. . Power saving arrangements {(in wired systems H04L 12/12; signaling of mobile application services, e.g. low battery notifications H04W 4/20)}		
52/0203	. . . {in the radio access network or backbone network of wireless communication networks}		
52/0206	. . . . {in access points, e.g. base stations (access point devices per se H04W 88/08)}		
52/0209	. . . {in terminal devices (terminal devices per se H04W 88/02)}		

52/16	. . . Deriving transmission power values from another channel	52/34	. . . TPC management, i.e. sharing limited amount of power among users or channels or data types, e.g. cell loading
52/18	. . TPC being performed according to specific parameters	52/343	. . . . {taking into account loading or congestion level}
52/20	. . . using error rate	52/346	. . . . {distributing total power among users or channels}
52/22	. . . taking into account previous information or commands	52/36	. . . with a discrete range or set of values, e.g. step size, ramping or offsets
52/221	. . . . {using past power control commands}	52/362	. . . . {Aspects of the step size}
52/223	. . . . {predicting future states of the transmission}	52/365	. . . . {Power headroom reporting}
52/225	. . . . {Calculation of statistics, e.g. average, variance}	52/367	. . . . {Power values between minimum and maximum limits, e.g. dynamic range}
52/226	. . . . {using past references to control power, e.g. look-up-table}	52/38	. . TPC being performed in particular situations
52/228	. . . . {using past power values or information}	52/383	. . . {power control in peer-to-peer links}
52/24	. . . using SIR [Signal to Interference Ratio] or other wireless path parameters	52/386	. . . {centralized, e.g. when the radio network controller or equivalent takes part in the power control}
52/241	. . . . {taking into account channel quality metrics, e.g. SIR, SNR, CIR, Eb/Io}	52/40	. . . during macro-diversity or soft handoff
52/242	. . . . {taking into account path loss}	52/42	. . . in systems with time, space, frequency or polarisation diversity
52/243	. . . . {taking into account interferences}	52/44	. . . in connection with interruption of transmission
52/244	. . . . . {Interferences in heterogeneous networks, e.g. among macro and femto or pico cells or other sector / system interference [OSI]}	52/46	. . . in multi hop networks, e.g. wireless relay networks
52/245	. . . . {taking into account received signal strength}	52/48	. . . during retransmission after error or non-acknowledgment
52/246	. . . . {where the output power of a terminal is based on a path parameter calculated in said terminal}	52/50	. . . at the moment of starting communication in a multiple access environment
52/247	. . . . {where the output power of a terminal is based on a path parameter sent by another terminal}	52/52	. . using AGC [Automatic Gain Control] circuits or amplifiers
52/248	. . . . {where transmission power control commands are generated based on a path parameter}	52/54	. . Signalisation aspects of the TPC commands, e.g. frame structure
52/26	. . . using transmission rate or quality of service QoS [Quality of Service]	52/545	. . . {modifying TPC bits in special situations}
52/262	. . . . {taking into account adaptive modulation and coding [AMC] scheme (AMC per se <a href="#">H04L 1/0001</a> )}	52/56	. . . Detection of errors of TPC bits
52/265	. . . . {taking into account the quality of service QoS}	52/58	. . . Format of the TPC bits
52/267	. . . . {taking into account the information rate}	52/60	. . . using different transmission rates for TPC commands
52/28	. . . using user profile, e.g. mobile speed, priority or network state, e.g. standby, idle or non transmission	<b>56/00</b>	<b>Synchronisation arrangements</b>
52/281	. . . . {taking into account user or data type priority}	56/0005	. {synchronizing of arrival of multiple uplinks}
52/282	. . . . {taking into account the speed of the mobile}	56/001	. {Synchronization between nodes}
52/283	. . . . {Power depending on the position of the mobile}	56/0015	. . {one node acting as a reference for the others}
52/285	. . . . {taking into account the mobility of the user}	56/002	. . {Mutual synchronization}
52/286	. . . . {during data packet transmission, e.g. high speed packet access [HSPA]}	56/0025	. . {synchronizing potentially movable access points}
52/287	. . . . {when the channel is in stand-by}	56/003	. {Arrangements to increase tolerance to errors in transmission or reception timing}
52/288	. . . . {taking into account the usage mode, e.g. hands-free, data transmission, telephone}	56/0035	. {detecting errors in frequency or phase}
52/30	. . using constraints in the total amount of available transmission power	56/004	. {compensating for timing error of reception due to propagation delay}
52/32	. . . TPC of broadcast or control channels	56/0045	. . {compensating for timing error by altering transmission time}
52/322	. . . . {Power control of broadcast channels}	56/005	. . {compensating for timing error by adjustment in the receiver}
52/325	. . . . {Power control of control or pilot channels}	56/0055	. {determining timing error of reception due to propagation delay}
52/327	. . . . {Power control of multicast channels}	56/006	. . {using known positions of transmitter and receiver}
		56/0065	. . {using measurement of signal travel time}
		56/007	. . . {Open loop measurement}
		56/0075	. . . . {based on arrival time vs. expected arrival time}
		56/008	. . . . . {detecting arrival of signal based on received raw signal}

56/0085	. . . . . {detecting a given structure in the signal}	72/0486	. . {where an allocation plan is defined based on load}
56/009	. . . {Closed loop measurements}	72/0493	. . {where an allocation plan is defined based on a resource usage policy}
56/0095	. . {estimated based on signal strength}	72/06	. . {where an allocation plan is defined} based on a ranking criteria of the wireless resources
<b>60/00</b>	<b>Registration, e.g. affiliation to network; De-registration, e.g. terminating affiliation</b>	72/08	. . {where an allocation plan is defined} based on quality criteria
60/005	. {Multiple registrations, e.g. multihoming}	72/082	. . . {using the level of interference}
60/02	. by periodical registration	72/085	. . . {using measured or perceived quality}
60/04	. using triggered events	72/087	. . . {using requested quality}
60/06	. De-registration or detaching	72/10	. . {where an allocation plan is defined} based on priority criteria
<b>64/00</b>	<b>Locating users or terminals {or network equipment} for network management purposes, e.g. mobility management</b>	72/12	. {Dynamic} Wireless traffic scheduling {; Dynamically scheduled allocation on shared channel}
64/003	. {locating network equipment}	72/1205	. . {Schedule definition, set-up or creation}
64/006	. {with additional information processing, e.g. for direction or speed determination}	72/121	. . . {for groups of terminals or users}
<b>68/00</b>	<b>Notification of users, e.g. alerting for incoming communication or change of service</b>	72/1215	. . . {for collaboration of different radio technologies}
68/005	. {Transmission of information for alerting of incoming communication}	72/1221	. . . {based on age of data to be sent}
68/02	. Arrangements for increasing efficiency of notification or paging channel	72/1226	. . . {based on channel quality criteria, e.g. channel state dependent scheduling}
68/025	. . {Indirect paging}	72/1231	. . . . {using measured or perceived quality}
68/04	. multi-step notification using statistical or historical mobility data	72/1236	. . . . {using requested quality}
68/06	. using multi-step notification by changing the notification area	72/1242	. . . {based on precedence or priority of the traffic information}
68/08	. using multi-step notification by increasing the notification area	72/1247	. . . {based on priority of the information source or recipient}
68/10	. using simulcast notification	72/1252	. . . {based on load}
68/12	. Inter-network notification	72/1257	. . . {based on resource usage policy}
<b>72/00</b>	<b>Local resource management, e.g. wireless traffic scheduling or selection or allocation of wireless resources</b>	72/1263	. . {Schedule usage, i.e. actual mapping of traffic onto schedule; Multiplexing of flows into one or several streams; Mapping aspects; Scheduled allocation}
<b>NOTE</b>		72/1268	. . . {of uplink data flows}
	In this group, local priority rules supersede the first-place priority rule (FPPR) applying throughout <a href="#">H04W</a>	72/1273	. . . {of downlink data flows}
72/005	. {Resource management for broadcast services}	72/1278	. . {Transmission of control information for scheduling}
72/02	. Selection of wireless resources by user or terminal	72/1284	. . . {in the uplink, i.e. from terminal to network}
72/04	. Wireless resource allocation	72/1289	. . . {in the downlink, i.e. towards the terminal}
72/0406	. . {involving control information exchange between nodes}	72/1294	. . . . {using a grant or specific channel ( <a href="#">H04W 72/14</a> takes precedence)}
72/0413	. . . {in uplink direction of a wireless link, i.e. towards network}	72/14	. . using a grant {or specific} channel
72/042	. . . {in downlink direction of a wireless link, i.e. towards terminal}	<b>74/00</b>	<b>Wireless channel access, e.g. scheduled or random access</b>
72/0426	. . . {between access points}	74/002	. {Transmission of channel access control information}
72/0433	. . . {between access point and access point controlling device}	74/004	. . {in the uplink, i.e. towards network}
72/044	. . {where an allocation plan is defined based on the type of the allocated resource}	74/006	. . {in the downlink, i.e. towards the terminal}
72/0446	. . . {the resource being a slot, sub-slot or frame}	74/008	. . {with additional processing of random access related information at receiving side}
72/0453	. . . {the resource being a frequency, carrier or frequency band}	74/02	. Hybrid access techniques
72/046	. . . {the resource being in the space domain, e.g. beams}	74/04	. Scheduled {or contention-free} access
72/0466	. . . {the resource being a scrambling code}	74/06	. . using polling
72/0473	. . . {the resource being transmission power}	74/08	. Non-scheduled {or contention based} access, e.g. random access, ALOHA, CSMA [Carrier Sense Multiple Access]
72/048	. . {where an allocation plan is defined based on terminal or device properties}	74/0808	. . . {using carrier sensing, e.g. as in CSMA}
		74/0816	. . . {carrier sensing with collision avoidance}
		74/0825	. . . {carrier sensing with collision detection}
		74/0833	. . {using a random access procedure}
		74/0841	. . . {with collision treatment}

74/085	. . . . {collision avoidance}	80/085	. . {involving different upper layer protocol versions, e.g. LCS - SUPL or WSN-SOA-WSDP}
74/0858	. . . . {collision detection}	80/10	. . adapted for {application} session management, e.g. SIP [Session Initiation Protocol] {(connection management <a href="#">H04W 76/00</a> ; arrangements for session management <a href="#">H04L 67/14</a> )}
74/0866	. . {using a dedicated channel for access}	80/12	. . Application layer protocols, e.g. WAP
74/0875	. . . {with assigned priorities based access}		
74/0883	. . . {for un-synchronized access}		
74/0891	. . . {for synchronized access}		
<b>76/00</b>	<b>Connection management, e.g. connection set-up, manipulation or release</b>	<b>84/00</b>	<b>Network topologies</b>
76/002	. {for selective distribution or broadcast}	<b><u>NOTE</u></b>	In this group, local priority rules supersede the first-place priority rule (FPPR) applying throughout <a href="#">H04W</a>
76/005	. . {for Push-to-Talk or Push-on-Call services}	84/005	. {Moving wireless networks}
76/007	. {for emergency connection handling}	84/02	. Hierarchically pre-organised networks, e.g. paging networks, cellular networks, WLAN [Wireless Local Area Network] or WLL [Wireless Local Loop]
76/02	. Connection set-up	84/022	. . {One-way selective calling networks, e.g. wide area paging}
76/021	. . {Allocation or use of connection identifiers}	84/025	. . . {with acknowledge back capability}
76/022	. . {Set-up of transport tunnels}	84/027	. . . {providing paging services}
76/023	. . {Direct mode set-up}	84/04	. . Large scale networks; Deep hierarchical networks
76/025	. . {Set-up of multiple wireless link connections}	84/042	. . . {Public Land Mobile systems, e.g. cellular systems}
76/026	. . . {involving adjacent core network technologies}	84/045	. . . . {using private Base Stations, e.g. femto Base Stations, home Node B}
76/027	. . {Management of set-up rejection or failure}	84/047	. . . . {using dedicated repeater stations}
76/028	. . {Connection re-establishment}	84/06	. . . Airborne or Satellite Networks
76/04	. Connection manipulation	84/08	. . . Trunked mobile radio systems
76/041	. . {Manipulation of transport tunnels}	84/10	. . Small scale networks; Flat hierarchical networks
76/043	. . {Direct mode connection manipulation}	84/105	. . . {PBS [Private Base Station] network ( <a href="#">H04W 84/12</a> - <a href="#">H04W 84/16</a> take precedence)}
76/045	. . {Maintenance of an established connection}	84/12	. . . WLAN [Wireless Local Area Networks]
76/046	. . {Transitions among RRC [Radio Resource Control] states}	84/14	. . . WLL [Wireless Local Loop]; RLL [Radio Local Loop]
76/048	. . {Discontinuous transmission or reception [DTX, DRX]}	84/16	. . . WPBX [Wireless Private Branch Exchange]
76/06	. Connection release	84/18	. Self-organising networks, e.g. ad-hoc networks or sensor networks
76/062	. . {Release of transport tunnels}	84/20	. . Master-slave {selection or change} arrangements
76/064	. . {Selective release of ongoing connections}	84/22	. . with access to wired networks
76/066	. . . {for the purpose of reassigning the resources associated with the released connections}	<b>88/00</b>	<b>Devices specially adapted for wireless communication networks, e.g. terminals, base stations or access point devices</b>
76/068	. . {Connection release triggered by timers}	88/005	. {Data network PoA devices}
<b>80/00</b>	<b>Wireless network protocols or protocol adaptations to wireless operation, e.g. WAP [Wireless Application Protocol]</b>	88/02	. Terminal devices
80/02	. Data link layer protocols	88/021	. . {adapted for Wireless Local Loop operation}
	<b><u>WARNING</u></b>	88/022	. . {Selective call receivers}
	This group is used only for indicating additional information when it is of interest for search	88/023	. . . {with message or information receiving capability}
80/04	. Network layer protocols, e.g. mobile IP [Internet Protocol]	88/025	. . . {Selective call decoders}
	<b><u>WARNING</u></b>	88/026	. . . . {using digital address codes}
	This group is used only for indicating additional information when it is of interest for search	88/027	. . . . {using frequency address codes}
80/045	. . {involving different protocol versions, e.g. MIPv4 and MIPv6}	88/028	. . . . {using pulse address codes}
	<b><u>WARNING</u></b>	88/04	. . adapted for relaying to or from another terminal or user
	This group is used only for indicating additional information when it is of interest for search	88/06	. . adapted for operation in multiple networks {or having at least two operational modes}, e.g. multi-mode terminals
80/06	. Transport layer protocols, e.g. TCP [Transport Control Protocol] over wireless {(transmission control protocol/Internet protocol [TCP/IP] or user datagram protocol [UDP] <a href="#">H04L 69/16</a> )}	88/08	. Access point devices
80/08	. Upper layer protocols {(network arrangements or communication protocols for networked applications <a href="#">H04L 67/00</a> )}	88/085	. . {Access point devices with remote components}



- 88/10 . . adapted for operation in multiple networks, e.g. multi-mode access points
- 88/12 . Access point controller devices
- 88/14 . Backbone network devices
- 88/16 . Gateway arrangements
- 88/18 . Service support; Network management devices
- 88/181 . . {Transcoding devices; Rate adaptation devices}
- 88/182 . . {Network node acting on behalf of an other network entity, e.g. proxy}
- 88/184 . . {Messaging devices, e.g. message centre}
- 88/185 . . {Selective call encoders for paging networks, e.g. paging centre devices}
- 88/187 . . . {using digital or pulse address codes}
- 88/188 . . . {using frequency address codes}
- 92/00 Interfaces specially adapted for wireless communication networks**
- 92/02 . Inter-networking arrangements
- 92/04 . Interfaces between hierarchically different network devices
- 92/045 . . {between access point and backbone network device}
- 92/06 . . between gateways and public network devices
- 92/08 . . between user and terminal device
- 92/10 . . between terminal device and access point, i.e. wireless air interface
- 92/12 . . between access points and access point controllers
- 92/14 . . between access point controllers and backbone network device
- 92/16 . Interfaces between hierarchically similar devices
- 92/18 . . between terminal devices
- 92/20 . . between access points
- 92/22 . . between access point controllers
- 92/24 . . between backbone network devices
- 99/00 Subject matter not provided for in other groups of this subclass**