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;
   - 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, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

4/00 Services specially adapted for wireless communication networks; Facilities therefor

NOTES
1. This group 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.

3. In this group, the first place priority rule is not applied, i.e. the common rule is applied.

4/02 Services making use of location information

WARNING
Group H04W 4/02 is incomplete pending reclassification of documents from groups H04W 4/04, H04W 4/043, and H04W 4/046.
Group H04W 4/02 is also impacted by reclassification into groups H04W 4/024 and H04W 4/029.

All groups listed in this Warning should be considered in order to perform a complete search.

4/021 Services related to particular areas, e.g. point of interest [POI] services, venue services or geofences

WARNING

Groups H04W 4/04, H04W 4/043, H04W 4/046 and H04W 4/021 should be considered in order to perform a complete search.

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]

**WARNING**
Groups H04W 4/04, H04W 4/043, H04W 4/046 and H04W 4/023 should be considered in order to perform a complete search.

4/024 . . Guidance services

**WARNING**
Groups H04W 4/02, H04W 4/04, H04W 4/043, H04W 4/046 and H04W 4/024 should be considered in order to perform a complete search.

4/025 . . [using location based information parameters]

**WARNING**
Groups H04W 4/04, H04W 4/043, H04W 4/046 and H04W 4/025 should be considered in order to perform a complete search.

4/026 . . [using orientation information, e.g. compass]

**WARNING**
Groups H04W 4/04, H04W 4/043, H04W 4/046 and H04W 4/026 should be considered in order to perform a complete search.

4/027 . . [using movement velocity, acceleration information]

**WARNING**
Groups H04W 4/04, H04W 4/043, H04W 4/046 and H04W 4/027 should be considered in order to perform a complete search.

4/029 . . Location-based management or tracking services

**WARNING**
Groups H04W 4/02, H04W 4/04, H04W 4/043, H04W 4/046 and H04W 4/029 should be considered in order to perform a complete search.

4/034 . . [using association of physical positions and logical data] in a dedicated environment, e.g. buildings or vehicles

**WARNING**
All groups listed in this Warning should be considered in order to perform a complete search.

4/043 . . [using ambient awareness, e.g. involving buildings using floor or room numbers]

**WARNING**
Group H04W 4/043 is no longer used for the classification of documents as of February 1, 2018. The content of this group is being reclassified into groups H04W 4/02 – H04W 4/029, and H04W 4/33.
All groups listed in this Warning should be considered in order to perform a complete search.

4/046 . . [involving vehicles, e.g. floating traffic data [FTD] or vehicle traffic prediction]

**WARNING**
Group H04W 4/046 is no longer used for the classification of documents as of February 1, 2018. The content of this group is being reclassified into groups H04W 4/02 – H04W 4/029, and H04W 4/40 – H04W 4/48.
All groups listed in this Warning should be considered in order to perform a complete search.

4/06 . . Selective distribution of broadcast services, e.g. multimedia broadcast multicast service [MBMS]; Services to user groups; One-way selective calling services

4/08 . . User group management
4/10 . . Push-to-Talk [PTT] or Push-On-Call services
4/12 . . Messaging; Mailboxes; Announcements
4/14 . . Short messaging services, e.g. short message services [SMS] or unstructured supplementary service data [USSD]
4/16 . . Communication-related supplementary services, e.g. call-transfer or call-hold
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

Services signaling; Auxiliary data signalling, i.e. transmitting data via a non-traffic channel

WARNING
Group H04W 4/20 is impacted by reclassification into groups H04W 4/21 and H04W 4/23.

Groups H04W 4/20, H04W 4/21, and H04W 4/23 should be considered in order to perform a complete search.

WARNING
Group H04W 4/21 is incomplete pending reclassification of documents from group H04W 4/20.

Groups H04W 4/20 and H04W 4/21 should be considered in order to perform a complete search.

WARNING

Groups H04W 4/20, H04W 4/21, and H04W 4/23 should be considered in order to perform a complete search.

WARNING
Group H04W 4/30 is incomplete pending reclassification of documents from group H04W 4/04.

Groups H04W 4/04 and H04W 4/30 should be considered in order to perform a complete search.

WARNING
Group H04W 4/35 is incomplete pending reclassification of documents from group H04W 4/04.

Groups H04W 4/04 and H04W 4/35 should be considered in order to perform a complete search.

WARNING
Group H04W 4/38 is incomplete pending reclassification of documents from group H04W 4/04.

Groups H04W 4/04 and H04W 4/38 should be considered in order to perform a complete search.

WARNING
Group H04W 4/40 is incomplete pending reclassification of documents from groups H04W 4/04 and H04W 4/046.

Groups H04W 4/04, H04W 4/046 and H04W 4/40 should be considered in order to perform a complete search.

WARNING
Group H04W 4/42 is incomplete pending reclassification of documents from groups H04W 4/04 and H04W 4/046.

Groups H04W 4/04, H04W 4/046 and H04W 4/42 should be considered in order to perform a complete search.

WARNING
Group H04W 4/44 is incomplete pending reclassification of documents from groups H04W 4/04 and H04W 4/046.

Groups H04W 4/04, H04W 4/046 and H04W 4/44 should be considered in order to perform a complete search.

WARNING
Group H04W 4/46 is incomplete pending reclassification of documents from groups H04W 4/04 and H04W 4/046.

Groups H04W 4/04, H04W 4/046 and H04W 4/46 should be considered in order to perform a complete search.
Network data management

8/00

8/00/05 . [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
8/06/5 . . [involving selection of the user mobility server]
8/08 . . Mobility data transfer
8/08/2 . . . [for traffic bypassing of mobility servers, e.g. location registers, home PLMNs or home agents]
8/08/5 . . . [involving hierarchical organized mobility servers, e.g. hierarchical mobile IP [HMIP]]
8/08/7 . . . . [for preserving data network PoA address despite hand-offs]
8/10 . . . . between location register and external networks
8/12 . . . . between location registers or mobility servers
8/14 . . . . between corresponding nodes
8/16 . . . . selectively restricting mobility [data] tracking
8/18 . . Processing of user or subscriber data, e.g. subscribed services, user preferences or user profiles; Transfer of user or subscriber data
8/183 . . . [Processing at user equipment or user record carrier]
8/186 . . . [Processing of subscriber group data]
8/20 . . Transfer of user or subscriber data
8/20/5 . . . [Transfer to or from user equipment or user record carrier]
8/22 . . Processing or transfer of terminal data, e.g. status or physical capabilities
8/24 . . . . . . [from a network towards a terminal]
8/26 . . . Network addressing or numbering for mobility support
8/26/5 . . . [for initial activation of new user]
28/0215 . .  [based on user or device properties, e.g. MTC-capable devices (services for machine-to-machine communication [M2M] or machine type communication [MTC] H04W 4/70; wireless resource selection or allocation plan definition based on terminal or device properties H04W 72/048)]

28/0221 . .  [power availability or consumption]

28/0226 . .  [based on location or mobility (handoff or reselection H04W 36/00; mobile application services making use of the location of users or terminals H04W 4/02)]

28/0231 . .  [based on communication conditions (dynamic wireless traffic scheduling definition based on channel quality criteria H04W 72/126)]

28/0236 . .  [radio quality, e.g. interference, losses or delay]

28/0242 . .  [Determining whether packet losses are due to overload or to deterioration of radio communication conditions]

28/0247 . .  [based on conditions of the access network or the infrastructure network (central resource management H04W 28/16)]

28/0252 . .  [per individual bearer or channel (dynamic wireless traffic scheduling H04W 72/12)]

28/0257 . .  [the individual bearer or channel having a maximum bit rate or a bit rate guarantee]

28/0263 . .  [involving mapping traffic to individual bearers or channels, e.g. traffic flow template [TFT]]

28/0268 . .  [using specific QoS parameters for wireless networks, e.g. QoS class identifier [QCI] or guaranteed bit rate [GBR] (negotiating QoS H04W 28/24)]

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 H04W 80/00)]

28/0278 . .  [using buffer status reports (dynamic wireless traffic scheduling definition H04W 72/1205)]

28/0284 . .  [detecting congestion or overload during communication (monitoring arrangements H04L 43/00)]

28/0289 . .  [Congestion control (performing reselection for handling the traffic H04W 36/22; load shedding arrangements in network planning H04W 16/08; dynamic wireless traffic scheduling H04W 72/12)]

28/0294 . .  [forcing collision (non-scheduled or contention based wireless access channel H04W 74/08)]

28/04 . .  Error control

NOTE  When classifying in this group, classification is also made in the appropriate groups under H04L 1/00.

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 H04L 1/0007; dynamic adaptation of the packet size for flow control or congestion control H04L 47/365)}

28/065 . .  [using assembly or disassembly of packets]

28/08 . .  Load balancing or load distribution

28/085 . .  [among bearers or channels]

28/10 . .  Flow control {between communication endpoints}

28/12 . .  {using signalling between network elements}

28/14 . .  {using intermediate storage}

28/16 . .  Central resource management; Negotiation of resources { or communication parameters }, e.g. negotiating bandwidth or QoS [Quality of Service]

28/18 . .  Negotiating wireless communication parameters

28/20 . .  Negotiating bandwidth

28/22 . .  Negotiating communication rate

28/24 . .  Negotiating SLA [Service Level Agreement]; Negotiating QoS [Quality of Service]

28/26 . .  Resource reservation

36/00  Hand-off or reselection arrangements

NOTE  In this group, local priority rules supersede the first-place priority rule (FPPR) applying throughout H04W.

WARNING

Group H04W 36/00 is impacted by reclassification into group H04W 36/03.

Groups H04W 36/00 and H04W 36/03 should be considered in order to perform a complete search.

36/0005 . .  [Control or signalling for completing the hand-off]

WARNING

Group H04W 36/0005 is impacted by reclassification into groups H04W 36/0007 and H04W 36/0009.

All groups listed in this Warning should be considered in order to perform a complete search.

36/0007 . .  [for multicast or broadcast services, e.g. MBMS (multicast or broadcast application services H04W 4/06; resource management for broadcast services H04W 72/005; connection management for selective distribution or broadcast H04W 76/40)]

WARNING

Group H04W 36/0007 is incomplete pending reclassification of documents from group H04W 36/0005.

Groups H04W 36/0005 and H04W 36/0007 should be considered in order to perform a complete search.
{ for a plurality of users or terminals, e.g. group communication or moving wireless networks (user group management H04W 4/08; processing of subscriber group data H04W 8/186) }

**WARNING**

Group H04W 36/0009 is incomplete pending reclassification of documents from group H04W 36/0005.

Groups H04W 36/0005 and H04W 36/0009 should be considered in order to perform a complete search.

{ for data session or connection }

{ for hand-off preparation }

{ for transferring sessions between adjacent core network technologies }

{ with transfer of context information }

{ [of security context information] }

{ involving radio access media independent information, e.g. MIH [Media independent Hand-off] }

{ Transmission and use of information for re-establishing the radio link }

**WARNING**

Group H04W 36/0055 is impacted by reclassification into groups H04W 36/0058, H04W 36/0069, and H04W 36/0079.

All groups listed in this Warning should be considered in order to perform a complete search.

{ of neighbor cell information }

{ of control information between different types of networks in order to establish a new radio link in the target network }

{ in case of dual connectivity, e.g. CoMP, decoupled uplink/downlink or carrier aggregation (allocation of physical resources in CoMP or in carrier aggregation H04L 5/0035) }

**WARNING**

Group H04W 36/0083 is impacted by reclassification into groups H04W 36/00835, H04W 36/00837, and H04W 36/0085.

All groups listed in this Warning should be considered in order to perform a complete search.

{ of resource information of target access point }

{ of access information of target access point }

{ in case of hand-off failure or rejection }

**WARNING**

Group H04W 36/0079 is incomplete pending reclassification of documents from groups H04W 36/0055 and H04W 36/30.

Groups H04W 36/0055, H04W 36/30 and H04W 36/0079 should be considered in order to perform a complete search.

{ Determination of parameters used for hand-off, e.g. generation or modification of neighbour cell lists }

**WARNING**

Group H04W 36/0083 is incomplete pending reclassification of documents from group H04W 36/0083.

Groups H04W 36/0083 and H04W 36/00835 should be considered in order to perform a complete search.

{ of hand-off measurement information, e.g. measurement reports }

**WARNING**

Group H04W 36/0058 is incomplete pending reclassification of documents from group H04W 36/0055.

Groups H04W 36/0005 and H04W 36/0058 should be considered in order to perform a complete search.

{ of neighbor cell information }

{ of control information between different types of networks in order to establish a new radio link in the target network }

{ in case of dual connectivity, e.g. CoMP, decoupled uplink/downlink or carrier aggregation (allocation of physical resources in CoMP or in carrier aggregation H04L 5/0035) }

**WARNING**

Group H04W 36/0083 is incomplete pending reclassification of documents from group H04W 36/0083.

Groups H04W 36/0083 and H04W 36/00835 should be considered in order to perform a complete search.

{ Determination of the neighbour cell list }

**WARNING**

Group H04W 36/0083 is incomplete pending reclassification of documents from group H04W 36/0083.

Groups H04W 36/0083 and H04W 36/00835 should be considered in order to perform a complete search.

{ Determination of triggering parameters for hand-off }

**WARNING**

Group H04W 36/0083 is incomplete pending reclassification of documents from group H04W 36/0083.

Groups H04W 36/0083 and H04W 36/00835 should be considered in order to perform a complete search.

{ Hand-off measurements }

**WARNING**

Group H04W 36/0085 is incomplete pending reclassification of documents from group H04W 36/0083.

Groups H04W 36/0083 and H04W 36/00835 should be considered in order to perform a complete search.

{ Scheduling hand-off measurements }

{ Definition of hand-off measurement parameters }

{ Buffering or recovering information during reselection [ Modification of the traffic flow during hand-off] }

{ Buffering or recovering information during reselection }

{ Multicasting of data during hand-off }
36/03 \[\text{Reselecting a link using a direct mode connection}\]

**WARNING**

Group H04W 36/03 is incomplete pending reclassification of documents from group H04W 36/000.

Groups H04W 36/03 and H04W 36/000 should be considered in order to perform a complete search.

36/04 \[\text{Reselecting a cell layer in multi-layered cells}\]

36/06 \[\text{Reselecting a communication resource in the serving access point}\]

36/08 \[\text{Reselecting an access point}\]

36/10 \[\text{Reselecting an access point controller}\]

36/12 \[\text{Reselecting a serving backbone network switching or routing node}\]

**WARNING**

Group H04W 36/12 is impacted by reclassification into group H04W 36/125.

Groups H04W 36/12 and H04W 36/125 should be considered in order to perform a complete search.

36/125 \[\text{Reselecting a network or an air interface}\]

36/14 \[\text{Performing reselection for specific purposes}\]

36/16 \[\text{[for improving the overall network performance (H04W 36/18 - H04W 36/22 take precedence)]}\]

36/18 \[\text{for allowing seamless reselection, e.g. soft reselection}\]

36/20 \[\text{for optimising the interference level}\]

36/22 \[\text{for handling the traffic}\]

36/24 \[\text{Reselection being triggered by specific parameters [used to improve the performance of a single terminal]}\]

36/245 \[\text{[by historical data]}\]

36/26 \[\text{[by agreed or negotiated communication parameters]}\]

36/28 \[\text{[involving a plurality of connections, e.g. multi-call, multi-bearing connections]}\]

36/30 \[\text{[by measured or perceived connection quality data]}\]

**WARNING**

Group H04W 36/30 is impacted by reclassification into groups H04W 36/305 and H04W 36/0079.

Groups H04W 36/30, H04W 36/305 and H04W 36/0079 should be considered in order to perform a complete search.

36/32 \[\text{[Reselection due to radio link failure (control signalling for hand-off failure H04W 36/0079)]}\]

**WARNING**

Group H04W 36/305 is incomplete pending reclassification of documents from group H04W 36/30.

Groups H04W 36/30 and H04W 36/305 should be considered in order to perform a complete search.

36/34 \[\text{Reselection control}\]

36/36 \[\text{[by location or mobility data, e.g. speed data]}\]

36/365 \[\text{[by manual user interaction]}\]

36/38 \[\text{[by fixed network equipment]}\]

36/385 \[\text{[of the core network]}\]

40/00 \[\text{Communication routing or communication path finding}\]

40/005 \[\text{[Routing actions in the presence of nodes in sleep or doze mode]}\]

40/02 \[\text{Communication route or path selection, e.g. power-based or shortest path routing}\]

40/023 \[\text{[Limited or focused flooding to selected areas of a network]}\]

40/026 \[\text{[Route selection considering the moving speed of individual devices]}\]

40/04 \[\text{based on wireless node resources}\]

40/06 \[\text{[based on characteristics of available antennas]}\]

40/08 \[\text{[based on transmission power]}\]

40/10 \[\text{[based on available power or energy]}\]

40/12 \[\text{[based on transmission quality or channel quality]}\]

40/125 \[\text{[using a measured number of retransmissions as a link metric]}\]

40/14 \[\text{based on stability}\]

40/16 \[\text{[based on interference]}\]

40/18 \[\text{[based on predicted events]}\]

40/20 \[\text{[based on geographic position or location]}\]

40/205 \[\text{[using topographical information, e.g. hills, high rise buildings]}\]

40/22 \[\text{using selective relaying for reaching a BTS [Base Transceiver Station] or an access point}\]

40/24 \[\text{Connectivity information management, e.g. connectivity discovery or connectivity update}\]

40/242 \[\text{[aging of topology database entries]}\]

40/244 \[\text{[using a network of reference devices, e.g. beacons]}\]

40/246 \[\text{[Connectivity information discovery]}\]

40/248 \[\text{[Connectivity information update]}\]

40/26 \[\text{[by manual user interaction]}\]

40/28 \[\text{[using topographical information, e.g. hills, high rise buildings]}\]

40/30 \[\text{[based on stability]}\]

40/32 \[\text{[based on predicted events]}\]

40/34 \[\text{[based on geographic position or location]}\]

40/36 \[\text{[using a network of reference devices, e.g. beacons]}\]

40/38 \[\text{[connecting various devices]}\]

48/00 \[\text{Access restriction; Network selection; Access point selection}\]

48/02 \[\text{Access restriction performed under specific conditions}\]
Power management, e.g. TPC [Transmission Power Control], power saving or power classes (gain control in transmitters or power amplifiers [H03G 3/3042])

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])]

52/0212 . . . [managed by the network, e.g. network or access point is master and terminal is slave]

52/0216 . . . [using a pre-established activity schedule, e.g. traffic indication frame]

52/0219 . . . [where the power saving management affects multiple terminals]

52/0222 . . . [in packet switched networks]

52/0225 . . . [using monitoring of external events, e.g. the presence of a signal]

52/0229 . . . [where the received signal is a wanted signal]

52/0232 . . . . . . [according to average transmission signal activity]

52/0235 . . . . . . [where the received signal is a power saving command]

52/0238 . . . . . . [where the received signal is an unwanted signal, e.g. interference or idle signal]

52/0241 . . . . . . [where no transmission is received, e.g. out of range of the transmitter]

52/0245 . . . . . . [according to signal strength]

52/0248 . . . . . . [dependent on the time of the day, e.g. according to expected transmission activity]

52/0251 . . . . . . [using monitoring of local events, e.g. events related to user activity]

52/0254 . . . . . . [detecting a user operation or a tactile contact or a motion of the device]

52/0258 . . . . . . [controlling an operation mode according to history or models of usage information, e.g. activity schedule or time of day]

52/0261 . . . . . . [managing power supply demand, e.g. depending on battery level]

52/0264 . . . . . . [by selectively disabling software applications]

52/0267 . . . . . . [by controlling user interface components]

52/027 . . . . . . [by controlling a display operation or backlight unit]
52/26 . . . using transmission rate or quality of service
52/262 . . . [Quality of Service]
52/265 . . . [taking into account adaptive modulation
52/266 and coding [AMC] scheme (AMC per
52/267 se H04L 1/0001)]
52/267 . . . [taking into account the quality of service
52/268 QoS]
52/267 . . . [taking into account the information rate]
52/27 . . . using user profile, e.g. mobile speed, priority
52/271 or network state, e.g. standby, idle or non
52/272 transmission
52/271 . . . [taking into account user or data type
52/272 priority]
52/274 . . . [taking into account the speed of the mobile]
52/276 . . . [Power depending on the position of the
52/278 mobile]
52/28 . . . . . . (modifying TPC bits in special situations)
52/281 . . . [taking into account the mobility of the user]
52/282 . . . [during data packet transmission, e.g. high
52/283 speed packet access [HSPA]]
52/285 . . . [when the channel is in stand-by]
52/287 . . . . . . [taking into account the usage mode, e.g.
52/288 hands-free, data transmission, telephone]
52/30 . . . using constraints in the total amount of available
52/31 transmission power
52/32 . . . TPC of broadcast or control channels
52/322 . . . [Power control of broadcast channels]
52/325 . . . [Power control of control or pilot channels]
52/327 . . . [Power control of multicast channels]
52/34 . . . TPC management, i.e. sharing limited amount
52/341 of power among users or channels or data
52/342 types, e.g. cell loading
52/343 . . . [taking into account loading or congestion
52/344 level]
52/346 . . . [distributing total power among users or
52/347 channels]
52/36 . . . with a discrete range or set of values, e.g. step
52/361 size, ramping or offsets
52/362 . . . [Aspects of the step size]
52/365 . . . [Power headroom reporting]
52/367 . . . [Power values between minimum and
52/369 maximum limits, e.g. dynamic range]
52/38 . . . TPC being performed in particular situations
52/383 . . . [power control in peer-to-peer links]
52/386 . . . [centralized, e.g. when the radio network
52/387 controller or equivalent takes part in the power
52/388 control]
52/40 . . . during macro-diversity or soft handoff
52/41 . . . in systems with time, space, frequency or
52/42 polarisation diversity
52/44 . . . in connection with interruption of transmission
52/46 . . . in multi hop networks, e.g. wireless relay
52/48 . . . during retransmission after error or non-
52/49 acknowledgment
52/50 . . . at the moment of starting communication in a
52/51 multiple access environment
52/52 . . . using AGC [Automatic Gain Control] circuits or
52/54 amplifiers
52/54 . . . Signalisation aspects of the TPC commands, e.g.
52/541 frame structure
52/545 . . . [modifying TPC bits in special situations]
52/56 . . . Detection of errors of TPC bits
52/58 . . . Format of the TPC bits
52/60 . . . using different transmission rates for TPC
52/603 commands
56/00 Synchronisation arrangements
56/0005 . . . [synchronizing of arrival of multiple uplinks]
56/001 . . . [Synchronization between nodes]
56/0015 . . . [one node acting as a reference for the others]
56/002 . . . [Mutual synchronization]
56/0025 . . . [synchronizing potentially movable access
56/003 points]
56/003 . . . [Arrangements to increase tolerance to errors in
56/004 transmission or reception timing]
56/0035 . . . [detecting errors in frequency or phase]
56/004 . . . [compensating for timing error of reception due to
56/005 propagation delay]
56/0045 . . . [compensating for timing error by altering
56/005 transmission time]
56/005 . . . [compensating for timing error by adjustment in
56/006 the receiver]
56/0055 . . . [determining timing error of reception due to
56/006 propagation delay]
56/006 . . . [using known positions of transmitter and
56/008 receiver]
56/0065 . . . . . [based on arrival time vs. expected arrival
56/007 time]
56/007 . . . . . [Open loop measurement]
56/0075 . . . . . [Power control of multicast channels]
56/008 . . . . . [Power control of control or pilot channels]
56/009 . . . . . [Power control of broadcast channels]
56/0095 . . . . . [Power control of broadcast or control channels]
60/00 Registration, e.g. affiliation to network; De-
60/005 registration, e.g. terminating affiliation
60/005 . . . [Multiple registrations, e.g. multihoming]
60/002 . . . by periodical registration
60/04 . . . using triggered events
60/06 . . . De-registration or detaching
64/00 Locating users or terminals (or network
equipment) for network management purposes, e.g.
64/003 mobility management
64/003 . . . [locating network equipment]
64/006 . . . [with additional information processing, e.g. for
direction or speed determination]
68/00 Notification of users, e.g. alerting for incoming
68/005 communication or change of service
68/005 . . . [Transmission of information for alerting of
68/006 incoming communication]
68/02 . . . Arrangements for increasing efficiency of
68/025 notification or paging channel
68/04 . . . [Indirect paging]
68/04 . . . multi-step notification using statistical or historical
68/06 mobility data
68/08 . . . using multi-step notification by changing the
68/08 notification area
68/10 . . . using multi-step notification by increasing the
68/12 notification area
68/10 . . . Inter-network notification
Local resource management, e.g. wireless traffic scheduling or selection or allocation of wireless resources

**NOTE**

In this group, local priority rules supersede the first-place priority rule (FPPR) applying throughout H04W.

72/005 . . . {Resource management for broadcast services}
72/02 . . . Selection of wireless resources by user or terminal
72/04 . . . Wireless resource allocation
72/0406 . . . {involving control information exchange between nodes}
72/0413 . . . {in uplink direction of a wireless link, i.e. towards network}
72/042 . . . {in downlink direction of a wireless link, i.e. towards terminal}
72/0426 . . . {between access points}
72/0433 . . . {between access point and access point controlling device}
72/044 . . . {where an allocation plan is defined based on the type of the allocated resource}
72/0446 . . . {the resource being a slot, sub-slot or frame}
72/0453 . . . {the resource being a frequency, carrier or frequency band}
72/046 . . . {the resource being in the space domain, e.g. beams}
72/0466 . . . {the resource being a scrambling code}
72/0473 . . . {the resource being transmission power}
72/048 . . . {where an allocation plan is defined based on terminal or device properties}
72/0486 . . . {where an allocation plan is defined based on load}
72/0493 . . . {where an allocation plan is defined based on a resource usage policy}
72/06 . . . {where an allocation plan is defined based on a ranking criteria of the wireless resources}
72/08 . . . {where an allocation plan is defined based on quality criteria}
72/082 . . . {using the level of interference}
72/085 . . . {using measured or perceived quality}
72/087 . . . {using requested quality}
72/10 . . . {where an allocation plan is defined based on priority criteria}
72/12 . . . {Dynamic} Wireless traffic scheduling {; Dynamically scheduled allocation on shared channel}
72/1205 . . . {Schedule definition, set-up or creation}
72/121 . . . {for groups of terminals or users}
72/1215 . . . {for collaboration of different radio technologies}
72/1221 . . . {based on age of data to be sent}
72/1226 . . . {based on channel quality criteria, e.g. channel state dependent scheduling}
72/1231 . . . {using measured or perceived quality}
72/1236 . . . {using requested quality}
72/1242 . . . {based on precedence or priority of the traffic information}
72/1247 . . . {based on priority of the information source or recipient}
72/1252 . . . {based on load}
72/1257 . . . {based on resource usage policy}

Wireless channel access, e.g. scheduled or random access

74/002 . . . {Transmission of channel access control information}
74/004 . . . {in the uplink, i.e. towards network}
74/006 . . . {in the downlink, i.e. towards the terminal}
74/008 . . . {with additional processing of random access related information at receiving side}
74/02 . . . Hybrid access techniques
74/04 . . . Scheduled (or contention-free) access
74/06 . . . using polling
74/08 . . . Non-scheduled (or contention based) access, e.g. random access, ALOHA, CSMA [Carrier Sense Multiple Access]
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}
74/0858 . . . {collision detection}
74/0866 . . . {using a dedicated channel for access}
74/0875 . . . {with assigned priorities based access}
74/0883 . . . {for un-synchronized access}
74/0891 . . . {for synchronized access}

Connection management

**NOTE**

In this main group, the first place priority rule is not applied, i.e. the common rule is applied.

76/10 . . . Connection setup
76/11 . . . Allocation or use of connection identifiers
76/12 . . . Setup of transport tunnels
76/14 . . . Direct-mode setup
76/15 . . . Setup of multiple wireless link connections
76/16 . . . Involving different core network technologies, e.g. a packet-switched [PS] bearer in combination with a circuit-switched [CS] bearer
76/18 . . . Management of setup rejection or failure
76/19 . . . Connection re-establishment
76/20 . . . Manipulation of established connections
76/22 . . . Manipulation of transport tunnels
76/23 . . . Manipulation of direct-mode connections
76/25 . . . Maintenance of established connections
76/27 . . . Transitions between radio resource control [RRC] states
80/00 Wireless network protocols or protocol adaptations to wireless operation, e.g. WAP [Wireless Application Protocol]

80/02 . . Data link layer protocols

**WARNING**
This group is used only for indicating additional information when it is of interest for search

80/04 . . Network layer protocols, e.g. mobile IP [Internet Protocol]

**WARNING**
This group is used only for indicating additional information when it is of interest for search

80/045 . . {involving different protocol versions, e.g. IPv4 and IPv6}

**WARNING**
This group is used only for indicating additional information when it is of interest for search

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)] H04L 69/16)

80/08 . . Upper layer protocols ([network arrangements or communication protocols for networked applications] H04L 67/00)

80/085 . . {involving different upper layer protocol versions, e.g. LCS - SUPL or WSN-SOA-WSDP}

80/10 . . adapted for [application] session management, e.g. SIP [Session Initiation Protocol] { (connection management H04W 76/00; arrangements for session management H04L 67/14) }

80/12 . . Application layer protocols, e.g. WAP

84/00 Network topologies

**NOTE**
In this group, local priority rules supersede the first-place priority rule (FPFR) applying throughout H04W.

84/005 . . {Moving wireless networks}

84/02 . . Hierarchically pre-organised networks, e.g. paging networks, cellular networks, WLAN [Wireless Local Area Network] or WLL [Wireless Local Loop]

84/022 . . {One-way selective calling networks, e.g. wide area paging}

84/025 . . . {with acknowledge back capability}

84/027 . . . . {providing paging services}

84/04 . . Large scale networks; Deep hierarchical networks

84/042 . . . . {Public Land Mobile systems, e.g. cellular systems}

84/045 . . . . {using private Base Stations, e.g. femto Base Stations, home Node B}

84/047 . . . . {using dedicated repeater stations}

84/06 . . . . Airborne or Satellite Networks

84/08 . . . . Trunked mobile radio systems

84/10 . . . . Small scale networks; Flat hierarchical networks

84/105 . . . {PBS [Private Base Station] network (H04W 84/12 - H04W 84/16 take precedence)}

84/12 . . . . WLAN [Wireless Local Area Networks]

84/14 . . . . WLL [Wireless Local Loop]; RLL [Radio Local Loop]

84/16 . . . . WPBX [Wireless Private Branch Exchange]

84/18 . . . . Self-organising networks, e.g. ad-hoc networks or sensor networks

84/20 . . . . Master-slave {selection or change} arrangements

84/22 . . . . with access to wired networks

88/00 Devices specially adapted for wireless communication networks, e.g. terminals, base stations or access point devices

88/005 . . . {Data network PoA devices}

88/02 . . . Terminal devices

88/021 . . . {adapted for Wireless Local Loop operation}

88/022 . . . {Selective call receivers}

88/023 . . . . {with message or information receiving capability}

88/025 . . . . {Selective call decoders}

88/026 . . . . {using digital address codes}

88/027 . . . . {using frequency address codes}

88/028 . . . . {using pulse address codes}

88/04 . . . adapted for relaying to or from another terminal or user

88/06 . . . adapted for operation in multiple networks {or having at least two operational modes}, e.g. multi-mode terminals

88/08 . . . Access point devices

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
Interfaces between hierarchically similar devices

- between user and terminal device
- between terminal device and access point, i.e. wireless air interface
- between access points and access point controllers
- between access point controllers and backbone network device
- Interfaces between hierarchically similar devices
- between terminal devices
- between access points
- between access point controllers
- between backbone network devices

Subject matter not provided for in other groups of this subclass