

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, 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

Group [H04W 4/021](#) is incomplete pending reclassification of documents from groups [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

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 }

WARNING

Group [H04W 4/022](#) is incomplete pending reclassification of documents from groups [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

Groups [H04W 4/04](#), [H04W 4/043](#), [H04W 4/046](#) and [H04W 4/022](#) should be considered in order to perform a complete search.

- 4/023 . . {using mutual or relative location information between multiple location based services [LBS] targets or of distance thresholds}

WARNING

Group [H04W 4/023](#) is incomplete pending reclassification of documents from groups [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

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

Group [H04W 4/024](#) is incomplete pending reclassification of documents from groups [H04W 4/02](#), [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

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

Group [H04W 4/025](#) is incomplete pending reclassification of documents from groups [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

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

Group [H04W 4/026](#) is incomplete pending reclassification of documents from groups [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

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

Group [H04W 4/027](#) is incomplete pending reclassification of documents from groups [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

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

Group [H04W 4/029](#) is incomplete pending reclassification of documents from groups [H04W 4/02](#), [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/046](#).

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.

- 4/04 . . {using association of physical positions and logical data} in a dedicated environment, e.g. buildings or vehicles
(Frozen)

WARNING

Group [H04W 4/04](#) 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 4/30](#) – [H04W 4/48](#).

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}
(Frozen)

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}
(Frozen)

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

- 4/18 . 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
- 4/185 . . {by embedding added-value information into content, e.g. geo-tagging}
- 4/20 . 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.

- 4/203 . . {for converged personal network application service interworking, e.g. OMA converged personal network services [CPNS]}
- 4/21 . . for social networking applications

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.

- 4/23 . . for mobile advertising

WARNING

Group [H04W 4/23](#) is incomplete pending reclassification of documents from group [H04W 4/20](#).

Groups [H04W 4/20](#) and [H04W 4/23](#) should be considered in order to perform a complete search.

- 4/24 . Accounting or billing
- 4/30 . Services specially adapted for particular environments, situations or purposes

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.

- 4/33 . . for indoor environments, e.g. buildings

WARNING

Group [H04W 4/33](#) is incomplete pending reclassification of documents from groups [H04W 4/04](#) and [H04W 4/043](#).

Groups [H04W 4/04](#), [H04W 4/043](#) and [H04W 4/33](#) should be considered in order to perform a complete search.

- 4/35 . . for the management of goods or merchandise

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.

- 4/38 . . for collecting sensor information

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.

- 4/40 . . for vehicles, e.g. vehicle-to-pedestrians [V2P]

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.

- 4/42 . . . for mass transport vehicles, e.g. buses, trains or aircraft

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.

- 4/44 . . . for communication between vehicles and infrastructures, e.g. vehicle-to-cloud [V2C] or vehicle-to-home [V2H]

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.

- 4/46 . . . for vehicle-to-vehicle communication [V2V]

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.

4/48	. . . for in-vehicle communication	8/28	. . . Number portability {; Network address portability}
	WARNING	8/30	. . . Network data restoration; {Network data reliability; Network data fault tolerance}
	Group H04W 4/48 is incomplete pending reclassification of documents from groups H04W 4/04 and H04W 4/046 .	12/00	Security arrangements, e.g. access security or fraud detection; Authentication, e.g. verifying user identity or authorisation; Protecting privacy or anonymity
	Groups H04W 4/04 , H04W 4/046 and H04W 4/48 should be considered in order to perform a complete search.	12/02	. . . Protecting privacy or anonymity
4/50	. . . Service provisioning or reconfiguring	12/04	. . . Key management
4/60	. . . Subscription-based services using application servers or record carriers, e.g. SIM application toolkits	12/06	. . . Authentication
4/70	. . . Services for machine-to-machine communication [M2M] or machine type communication [MTC]	12/08	. . . Access security
4/80	. . . Services using short range communication, e.g. near-field communication [NFC], radio-frequency identification [RFID] or low energy communication	12/10	. . . Integrity
4/90	. . . Services for handling of emergency or hazardous situations, e.g. earthquake and tsunami warning systems [ETWS]	12/12	. . . Fraud detection
8/00	Network data management	16/00	Network planning, e.g. coverage or traffic planning tools; Network deployment, e.g. resource partitioning or cells structures
8/005	. . . {Discovery of network devices, e.g. terminals}	16/02	. . . Resource partitioning among network components, e.g. reuse partitioning
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	16/04	. . . Traffic adaptive resource partitioning
8/04	. . . Registration at HLR or HSS [Home Subscriber Server]	16/06	. . . Hybrid resource partitioning, e.g. channel borrowing
8/06	. . . Registration at serving network Location Register, VLR or user mobility server	16/08	. . . Load shedding arrangements
8/065	. . . {involving selection of the user mobility server}	16/10	. . . Dynamic resource partitioning
8/08	. . . Mobility data transfer	16/12	. . . Fixed resource partitioning
8/082	. . . {for traffic bypassing of mobility servers, e.g. location registers, home PLMNs or home agents}	16/14	. . . Spectrum sharing arrangements {between different networks}
8/085	. . . {involving hierarchical organized mobility servers, e.g. hierarchical mobile IP [HMIP]}	16/16	. . . for PBS [Private Base Station] arrangements
8/087	. . . {for preserving data network PoA address despite hand-offs}	16/18	. . . Network planning tools
8/10	. . . between location register and external networks	16/20	. . . for indoor coverage or short range network deployment
8/12	. . . between location registers or mobility servers	16/22	. . . Traffic simulation tools or models
8/14	. . . between corresponding nodes	16/225	. . . {for indoor or short range network}
8/16	. . . selectively restricting mobility {data} tracking	16/24	. . . Cell structures
8/18	. . . Processing of user or subscriber data, e.g. subscribed services, user preferences or user profiles; Transfer of user or subscriber data	16/26	. . . Cell enhancers {or enhancement}, e.g. for tunnels, building shadow
8/183	. . . {Processing at user equipment or user record carrier}	16/28	. . . using beam steering
8/186	. . . {Processing of subscriber group data}	16/30	. . . Special cell shapes, e.g. doughnuts or ring cells
8/20	. . . Transfer of user or subscriber data	16/32	. . . Hierarchical cell structures
8/205	. . . {Transfer to or from user equipment or user record carrier}	24/00	Supervisory, monitoring or testing arrangements
8/22	. . . Processing or transfer of terminal data, e.g. status or physical capabilities	24/02	. . . Arrangements for optimising operational condition
8/24	. . . Transfer of terminal data	24/04	. . . Arrangements for maintaining operational condition
8/245	. . . {from a network towards a terminal}	24/06	. . . Testing, {supervising or monitoring} using simulated traffic
8/26	. . . Network addressing or numbering for mobility support	24/08	. . . Testing, {supervising or monitoring} using real traffic
8/265	. . . {for initial activation of new user}	24/10	. . . Scheduling measurement reports {; Arrangements for measurement reports}
		28/00	Network traffic or resource management
		28/02	. . . Traffic management, e.g. flow control or congestion control
		28/0205	. . . {at the air interface (dynamic wireless traffic scheduling H04W 72/12)}
		28/021	. . . {in wireless networks with changing topologies, e.g. ad-hoc networks (self-organizing networks H04W 84/18)}

- 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 72/1226](#))}
- 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 SLA or 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.

- 36/0009 . . {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.

- 36/0011 . . {for data session or connection}
 36/0016 . . . {for hand-off preparation}
 36/0022 . . . {for transferring sessions between adjacent core network technologies}
 36/0027 . . . {for a plurality of sessions or connections, e.g. multi-call, multi-bearer connections}
 36/0033 . . . {with transfer of context information}
 36/0038 {of security context information}
 36/0044 {of quality context information}
 36/005 . . {involving radio access media independent information, e.g. MIH [Media independent Hand-off]}
 36/0055 . . {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.

- 36/0058 . . . {Transmission 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.

- 36/0061 . . . {of neighbor cell information}
 36/0066 . . . {of control information between different types of networks in order to establish a new radio link in the target network}
 36/0069 . . . {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 36/0069](#) is incomplete pending reclassification of documents from group [H04W 36/0055](#).

Groups [H04W 36/0055](#) and [H04W 36/0069](#) should be considered in order to perform a complete search.

- 36/0072 . . . {of resource information of target access point}
 36/0077 . . . {of access information of target access point}

- 36/0079 . . . {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.

- 36/0083 . . {Determination of parameters used for hand-off, e.g. generation or modification of neighbour cell lists}

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.

- 36/00835 . . . {Determination of the neighbour cell list}

WARNING

Group [H04W 36/00835](#) 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.

- 36/00837 . . . {Determination of triggering parameters for hand-off}

WARNING

Group [H04W 36/00837](#) is incomplete pending reclassification of documents from group [H04W 36/0083](#).

Groups [H04W 36/0083](#) and [H04W 36/00837](#) should be considered in order to perform a complete search.

- 36/0085 . . . {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 36/0085](#) should be considered in order to perform a complete search.

- 36/0088 {Scheduling hand-off measurements}

- 36/0094 {Definition of hand-off measurement parameters}

- 36/02 . . Buffering or recovering information during reselection {; Modification of the traffic flow during hand-off}

- 36/023 . . {Buffering or recovering information during reselection}

- 36/026 . . {Multicasting of data during hand-off}

36/03	<ul style="list-style-type: none"> • {Reselecting a link using a direct mode connection} <p>WARNING</p> <p>Group H04W 36/03 is incomplete pending reclassification of documents from group H04W 36/00.</p> <p>Groups H04W 36/03 and H04W 36/00 should be considered in order to perform a complete search.</p>	36/305	<ul style="list-style-type: none"> • . . . {Reselection due to radio link failure (control signalling for hand-off failure H04W 36/0079)} <p>WARNING</p> <p>Group H04W 36/305 is incomplete pending reclassification of documents from group H04W 36/30.</p> <p>Groups H04W 36/30 and H04W 36/305 should be considered in order to perform a complete search.</p>
36/04	<ul style="list-style-type: none"> • Reselecting a cell layer in multi-layered cells 	36/32	<ul style="list-style-type: none"> • . . by location or mobility data, e.g. speed data
36/06	<ul style="list-style-type: none"> • Reselecting a communication resource in the serving access point 	36/34	<ul style="list-style-type: none"> • Reselection control
36/08	<ul style="list-style-type: none"> • Reselecting an access point 	36/36	<ul style="list-style-type: none"> • . . by user or terminal equipment
36/10	<ul style="list-style-type: none"> • Reselecting an access point controller 	36/365	<ul style="list-style-type: none"> • . . . {by manual user interaction}
36/12	<ul style="list-style-type: none"> • Reselecting a serving backbone network switching or routing node <p>WARNING</p> <p>Group H04W 36/12 is impacted by reclassification into group H04W 36/125.</p> <p>Groups H04W 36/12 and H04W 36/125 should be considered in order to perform a complete search.</p>	36/38	<ul style="list-style-type: none"> • . . by fixed network equipment
		36/385	<ul style="list-style-type: none"> • . . . {of the core network}
		40/00	Communication routing or communication path finding
		40/005	<ul style="list-style-type: none"> • {Routing actions in the presence of nodes in sleep or doze mode}
		40/02	<ul style="list-style-type: none"> • Communication route or path selection, e.g. power-based or shortest path routing
36/125	<ul style="list-style-type: none"> • . . {involving different types of service backbone} <p>WARNING</p> <p>Group H04W 36/125 is incomplete pending reclassification of documents from group H04W 36/12.</p> <p>Groups H04W 36/12 and H04W 36/125 should be considered in order to perform a complete search.</p>	40/023	<ul style="list-style-type: none"> • . . {Limited or focused flooding to selected areas of a network}
		40/026	<ul style="list-style-type: none"> • . . {Route selection considering the moving speed of individual devices}
		40/04	<ul style="list-style-type: none"> • . . based on wireless node resources
		40/06	<ul style="list-style-type: none"> • . . . based on characteristics of available antennas
		40/08	<ul style="list-style-type: none"> • . . . based on transmission power
		40/10	<ul style="list-style-type: none"> • . . . based on available power or energy
		40/12	<ul style="list-style-type: none"> • . . based on transmission quality or channel quality
		40/125	<ul style="list-style-type: none"> • . . . {using a measured number of retransmissions as a link metric}
36/14	<ul style="list-style-type: none"> • Reselecting a network or an air interface 	40/14	<ul style="list-style-type: none"> • . . . based on stability
36/16	<ul style="list-style-type: none"> • Performing reselection for specific purposes 	40/16	<ul style="list-style-type: none"> • . . . based on interference
36/165	<ul style="list-style-type: none"> • . . {for improving the overall network performance (H04W 36/18 - H04W 36/22 take precedence)} 	40/18	<ul style="list-style-type: none"> • . . based on predicted events
36/18	<ul style="list-style-type: none"> • . . for allowing seamless reselection, e.g. soft reselection 	40/20	<ul style="list-style-type: none"> • . . based on geographic position or location
36/20	<ul style="list-style-type: none"> • . . for optimising the interference level 	40/205	<ul style="list-style-type: none"> • . . . {using topographical information, e.g. hills, high rise buildings}
36/22	<ul style="list-style-type: none"> • . . for handling the traffic 	40/22	<ul style="list-style-type: none"> • . . using selective relaying for reaching a BTS [Base Transceiver Station] or an access point
36/24	<ul style="list-style-type: none"> • Reselection being triggered by specific parameters {used to improve the performance of a single terminal} 	40/24	<ul style="list-style-type: none"> • Connectivity information management, e.g. connectivity discovery or connectivity update
36/245	<ul style="list-style-type: none"> • . . {by historical data} 	40/242	<ul style="list-style-type: none"> • . . {aging of topology database entries}
36/26	<ul style="list-style-type: none"> • . . by agreed or negotiated communication parameters 	40/244	<ul style="list-style-type: none"> • . . {using a network of reference devices, e.g. beaconing}
36/28	<ul style="list-style-type: none"> • . . . involving a plurality of connections, e.g. multi-call, multi-bearer connections 	40/246	<ul style="list-style-type: none"> • . . {Connectivity information discovery}
36/30	<ul style="list-style-type: none"> • . . by measured or perceived connection quality data <p>WARNING</p> <p>Group H04W 36/30 is impacted by reclassification into groups H04W 36/305 and H04W 36/0079.</p> <p>Groups H04W 36/30, H04W 36/305 and H04W 36/0079 should be considered in order to perform a complete search.</p>	40/248	<ul style="list-style-type: none"> • . . {Connectivity information update}
		40/26	<ul style="list-style-type: none"> • . . for hybrid routing by combining proactive and reactive routing
		40/28	<ul style="list-style-type: none"> • . . for reactive routing
		40/30	<ul style="list-style-type: none"> • . . for proactive routing
		40/32	<ul style="list-style-type: none"> • . . for defining a routing cluster membership
		40/34	<ul style="list-style-type: none"> • Modification of an existing route
		40/36	<ul style="list-style-type: none"> • . . due to handover
		40/38	<ul style="list-style-type: none"> • . . adapting due to varying relative distances between nodes
		48/00	Access restriction; Network selection; Access point selection
		48/02	<ul style="list-style-type: none"> • Access restriction performed under specific conditions

48/04	. . based on user or terminal location or mobility data, e.g. moving direction, speed	52/0274	. . . . {by switching on or off the equipment or parts thereof}
48/06	. . based on traffic conditions	52/0277	. . . . {according to available power supply, e.g. switching off when a low battery condition is detected}
48/08	. Access restriction or access information delivery, e.g. discovery data delivery	52/028	. . . . {switching on or off only a part of the equipment circuit blocks}
48/10	. . using broadcasted information	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}
48/12	. . using downlink control channel	52/0287	. . . . {changing the clock frequency of a controller in the equipment}
48/14	. . using user query {or user detection}	52/029	. . . . {reducing the clock frequency of the controller}
48/16	. Discovering, processing access restriction or access information	52/0293	. . . . {having a sub-controller with a low clock frequency switching on and off a main controller with a high clock frequency}
48/17	. {Selecting a data network PoA [Point of Attachment]}	52/0296	. . . . {switching to a backup power supply}
48/18	. Selecting a network or a communication service	52/04	. TPC [Transmission power control]
48/20	. Selecting an access point	52/06	. . TPC algorithms
52/00	Power management, e.g. TPC [Transmission Power Control], power saving or power classes {(gain control in transmitters or power amplifiers H03G 3/3042)}	52/08	. . . Closed loop power control
52/02	. Power saving arrangements {(in wired systems H04L 12/12; signaling of mobile application services, e.g. low battery notifications H04W 4/20)}	52/10	. . . Open loop power control
52/0203	. . {in the radio access network or backbone network of wireless communication networks}	52/12	. . . Outer and inner loops
52/0206	. . . {in access points, e.g. base stations (access point devices per se H04W 88/08)}	52/125	. . . . {cascaded outer loop power control}
52/0209	. . {in terminal devices (terminal devices per se H04W 88/02)}	52/14	. . . Separate analysis of uplink or downlink
52/0212	. . . {managed by the network, e.g. network or access point is master and terminal is slave}	52/143	. . . . {Downlink power control}
52/0216	. . . . {using a pre-established activity schedule, e.g. traffic indication frame}	52/146	. . . . {Uplink power control}
52/0219	. . . . {where the power saving management affects multiple terminals}	52/16	. . . Deriving transmission power values from another channel
52/0222	. . . . {in packet switched networks}	52/18	. . TPC being performed according to specific parameters
52/0225	. . . {using monitoring of external events, e.g. the presence of a signal}	52/20	. . . using error rate
52/0229	. . . . {where the received signal is a wanted signal}	52/22	. . . taking into account previous information or commands
52/0232	. . . . . {according to average transmission signal activity}	52/221	. . . . {using past power control commands}
52/0235	. . . . {where the received signal is a power saving command}	52/223	. . . . {predicting future states of the transmission}
52/0238	. . . . {where the received signal is an unwanted signal, e.g. interference or idle signal}	52/225	. . . . {Calculation of statistics, e.g. average, variance}
52/0241	. . . . {where no transmission is received, e.g. out of range of the transmitter}	52/226	. . . . {using past references to control power, e.g. look-up-table}
52/0245	. . . . {according to signal strength}	52/228	. . . . {using past power values or information}
52/0248	. . . . {dependent on the time of the day, e.g. according to expected transmission activity}	52/24	. . . using SIR [Signal to Interference Ratio] or other wireless path parameters
52/0251	. . . {using monitoring of local events, e.g. events related to user activity}	52/241	. . . . {taking into account channel quality metrics, e.g. SIR, SNR, CIR, Eb/Io}
52/0254	. . . . {detecting a user operation or a tactile contact or a motion of the device}	52/242	. . . . {taking into account path loss}
52/0258	. . . . {controlling an operation mode according to history or models of usage information, e.g. activity schedule or time of day}	52/243	. . . . {taking into account interferences}
52/0261	. . . {managing power supply demand, e.g. depending on battery level}	52/244	. . . . {Interferences in heterogeneous networks, e.g. among macro and femto or pico cells or other sector / system interference [OSI]}
52/0264	. . . . {by selectively disabling software applications}	52/245	. . . . {taking into account received signal strength}
52/0267	. . . . {by controlling user interface components}	52/246	. . . . {where the output power of a terminal is based on a path parameter calculated in said terminal}
52/027	. . . . {by controlling a display operation or backlight unit}	52/247	. . . . {where the output power of a terminal is based on a path parameter sent by another terminal}
		52/248	. . . . {where transmission power control commands are generated based on a path parameter}

52/26	. . . using transmission rate or quality of service QoS [Quality of Service]	52/60	. . . using different transmission rates for TPC commands
52/262	. . . . {taking into account adaptive modulation and coding [AMC] scheme (AMC per se H04L 1/0001)}	56/00	Synchronisation arrangements
52/265	. . . . {taking into account the quality of service QoS}	56/0005	. {synchronizing of arrival of multiple uplinks}
52/267	. . . . {taking into account the information rate}	56/001	. {Synchronization between nodes}
52/28	. . . using user profile, e.g. mobile speed, priority or network state, e.g. standby, idle or non transmission	56/0015	. . {one node acting as a reference for the others}
52/281	. . . . {taking into account user or data type priority}	56/002	. . {Mutual synchronization}
52/282	. . . . {taking into account the speed of the mobile}	56/0025	. . {synchronizing potentially movable access points}
52/283	. . . . {Power depending on the position of the mobile}	56/003	. {Arrangements to increase tolerance to errors in transmission or reception timing}
52/285	. . . . {taking into account the mobility of the user}	56/0035	. {detecting errors in frequency or phase}
52/286	. . . . {during data packet transmission, e.g. high speed packet access [HSPA]}	56/004	. {compensating for timing error of reception due to propagation delay}
52/287	. . . . {when the channel is in stand-by}	56/0045	. . {compensating for timing error by altering transmission time}
52/288	. . . . {taking into account the usage mode, e.g. hands-free, data transmission, telephone}	56/005	. . {compensating for timing error by adjustment in the receiver}
52/30	. . using constraints in the total amount of available transmission power	56/0055	. {determining timing error of reception due to propagation delay}
52/32	. . . TPC of broadcast or control channels	56/006	. . {using known positions of transmitter and receiver}
52/322	. . . . {Power control of broadcast channels}	56/0065	. . {using measurement of signal travel time}
52/325	. . . . {Power control of control or pilot channels}	56/007	. . . {Open loop measurement}
52/327	. . . . {Power control of multicast channels}	56/0075	. . . . {based on arrival time vs. expected arrival time}
52/34	. . . TPC management, i.e. sharing limited amount of power among users or channels or data types, e.g. cell loading	56/008	. . . . . {detecting arrival of signal based on received raw signal}
52/343	. . . . {taking into account loading or congestion level}	56/0085	. . . . . {detecting a given structure in the signal}
52/346	. . . . {distributing total power among users or channels}	56/009	. . . {Closed loop measurements}
52/36	. . . with a discrete range or set of values, e.g. step size, ramping or offsets	56/0095	. . {estimated based on signal strength}
52/362	. . . . {Aspects of the step size}	60/00	Registration, e.g. affiliation to network; De-registration, e.g. terminating affiliation
52/365	. . . . {Power headroom reporting}	60/005	. {Multiple registrations, e.g. multihoming}
52/367	. . . . {Power values between minimum and maximum limits, e.g. dynamic range}	60/02	. by periodical registration
52/38	. . TPC being performed in particular situations	60/04	. using triggered events
52/383	. . . {power control in peer-to-peer links}	60/06	. De-registration or detaching
52/386	. . . {centralized, e.g. when the radio network controller or equivalent takes part in the power control}	64/00	Locating users or terminals {or network equipment} for network management purposes, e.g. mobility management
52/40	. . . during macro-diversity or soft handoff	64/003	. {locating network equipment}
52/42	. . . in systems with time, space, frequency or polarisation diversity	64/006	. {with additional information processing, e.g. for direction or speed determination}
52/44	. . . in connection with interruption of transmission	68/00	Notification of users, e.g. alerting for incoming communication or change of service
52/46	. . . in multi hop networks, e.g. wireless relay networks	68/005	. {Transmission of information for alerting of incoming communication}
52/48	. . . during retransmission after error or non-acknowledgment	68/02	. Arrangements for increasing efficiency of notification or paging channel
52/50	. . . at the moment of starting communication in a multiple access environment	68/025	. . {Indirect paging}
52/52	. . using AGC [Automatic Gain Control] circuits or amplifiers	68/04	. multi-step notification using statistical or historical mobility data
52/54	. . Signalisation aspects of the TPC commands, e.g. frame structure	68/06	. using multi-step notification by changing the notification area
52/545	. . . {modifying TPC bits in special situations}	68/08	. using multi-step notification by increasing the notification area
52/56	. . . Detection of errors of TPC bits	68/10	. using simulcast notification
52/58	. . . Format of the TPC bits	68/12	. Inter-network notification

72/00 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}

- 72/1263 . . {Schedule usage, i.e. actual mapping of traffic onto schedule; Multiplexing of flows into one or several streams; Mapping aspects; Scheduled allocation}
- 72/1268 . . . {of uplink data flows}
- 72/1273 . . . {of downlink data flows}
- 72/1278 . . {Transmission of control information for scheduling}
- 72/1284 . . . {in the uplink, i.e. from terminal to network}
- 72/1289 . . . {in the downlink, i.e. towards the terminal}
- 72/1294 {using a grant or specific channel ([H04W 72/14](#) takes precedence)}
- 72/14 . . using a grant {or specific} channel

74/00 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}

76/00 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

76/28	. . Discontinuous transmission [DTX]; Discontinuous reception [DRX]	84/027	. . . {providing paging services}
76/30	. Connection release	84/04	. . Large scale networks; Deep hierarchical networks
76/32	. . Release of transport tunnels	84/042	. . . {Public Land Mobile systems, e.g. cellular systems}
76/34	. . Selective release of ongoing connections	84/045	. . . . {using private Base Stations, e.g. femto Base Stations, home Node B}
76/36	. . . for reassigning the resources associated with the released connections	84/047	. . . . {using dedicated repeater stations}
76/38	. . triggered by timers	84/06	. . . Airborne or Satellite Networks
76/40	. for selective distribution or broadcast	84/08	. . . Trunked mobile radio systems
76/45	. . for Push-to-Talk [PTT] or Push-to-Talk over cellular [PoC] services	84/10	. . Small scale networks; Flat hierarchical networks
76/50	. for emergency connections	84/105	. . . {PBS [Private Base Station] network (H04W 84/12 - H04W 84/16 take precedence)}
80/00	Wireless network protocols or protocol adaptations to wireless operation, e.g. WAP [Wireless Application Protocol]	84/12	. . . WLAN [Wireless Local Area Networks]
80/02	. Data link layer protocols	84/14	. . . WLL [Wireless Local Loop]; RLL [Radio Local Loop]
	<u>WARNING</u>	84/16	. . . WPBX [Wireless Private Branch Exchange]
	This group is used only for indicating additional information when it is of interest for search	84/18	. Self-organising networks, e.g. ad-hoc networks or sensor networks
80/04	. Network layer protocols, e.g. mobile IP [Internet Protocol]	84/20	. . Master-slave {selection or change} arrangements
	<u>WARNING</u>	84/22	. . with access to wired networks
	This group is used only for indicating additional information when it is of interest for search	88/00	Devices specially adapted for wireless communication networks, e.g. terminals, base stations or access point devices
80/045	. . {involving different protocol versions, e.g. MIPv4 and MIPv6}	88/005	. {Data network PoA devices}
	<u>WARNING</u>	88/02	. Terminal devices
	This group is used only for indicating additional information when it is of interest for search	88/021	. . {adapted for Wireless Local Loop operation}
88/005		88/022	. . {Selective call receivers}
88/02		88/023	. . . {with message or information receiving capability}
88/021		88/025	. . . . {Selective call decoders}
88/022		88/026	. . . . {using digital address codes}
88/023		88/027	. . . . {using frequency address codes}
88/025		88/028	. . . . {using pulse address codes}
88/026		88/04	. . adapted for relaying to or from another terminal or user
88/027		88/06	. . adapted for operation in multiple networks {or having at least two operational modes}, e.g. multi-mode terminals
88/028		88/08	. Access point devices
88/04		88/085	. . {Access point devices with remote components}
88/06		88/10	. . adapted for operation in multiple networks, e.g. multi-mode access points
88/08		88/12	. Access point controller devices
88/085		88/14	. Backbone network devices
88/10		88/16	. Gateway arrangements
88/12		88/18	. Service support; Network management devices
88/14		88/181	. . {Transcoding devices; Rate adaptation devices}
88/16		88/182	. . {Network node acting on behalf of an other network entity, e.g. proxy}
88/18		88/184	. . {Messaging devices, e.g. message centre}
88/181		88/185	. . {Selective call encoders for paging networks, e.g. paging centre devices}
88/182		88/187	. . . {using digital or pulse address codes}
88/184		88/188	. . . {using frequency address codes}
88/185		92/00	Interfaces specially adapted for wireless communication networks
88/187		92/02	. Inter-networking arrangements
88/188		92/04	. Interfaces between hierarchically different network devices
92/00		92/045	. . {between access point and backbone network device}
92/02		92/06	. . between gateways and public network devices
92/04			
92/045			
92/06			

H04W

- 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**