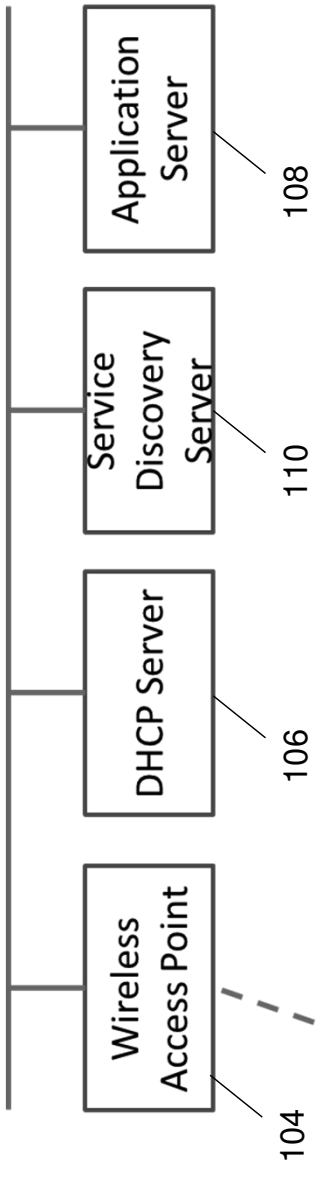

Application Server
108
Service Discovery Server
110
DHCP Server
106
Wireless Access Point
104
Mobile Terminal
102
100

Figure 1

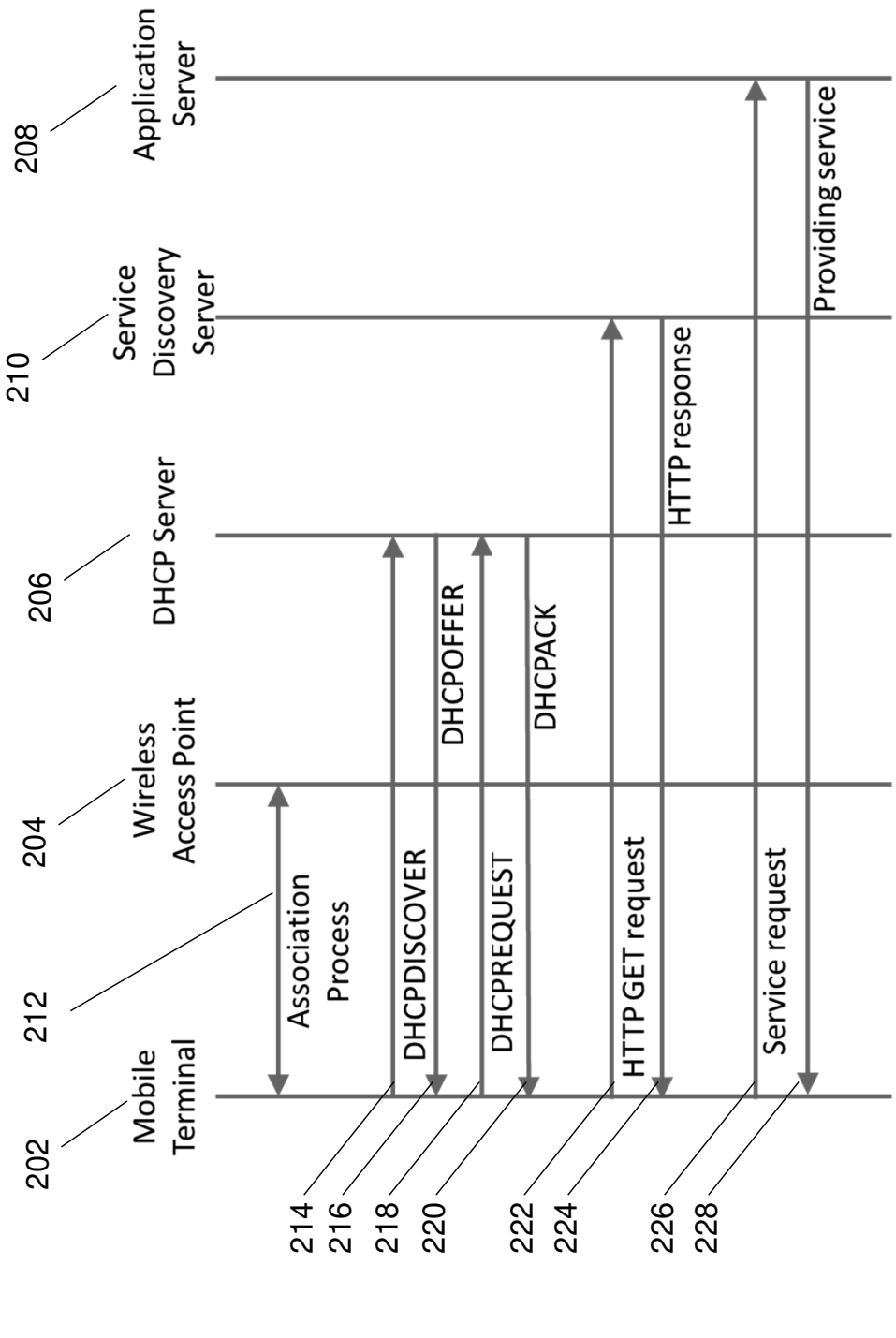

202
Mobile Terminal
212
204
Wireless Access Point
206
DHCP Server
210
Service Discovery Server
208
Application Server
Association Process
DHCPDISCOVER
DHCPOFFER
DHCPREQUEST
DHCPACK
HTTP GET request
HTTP response
Service request
Providing service
214
216
218
220
222
224
226
228
200

Figure 2

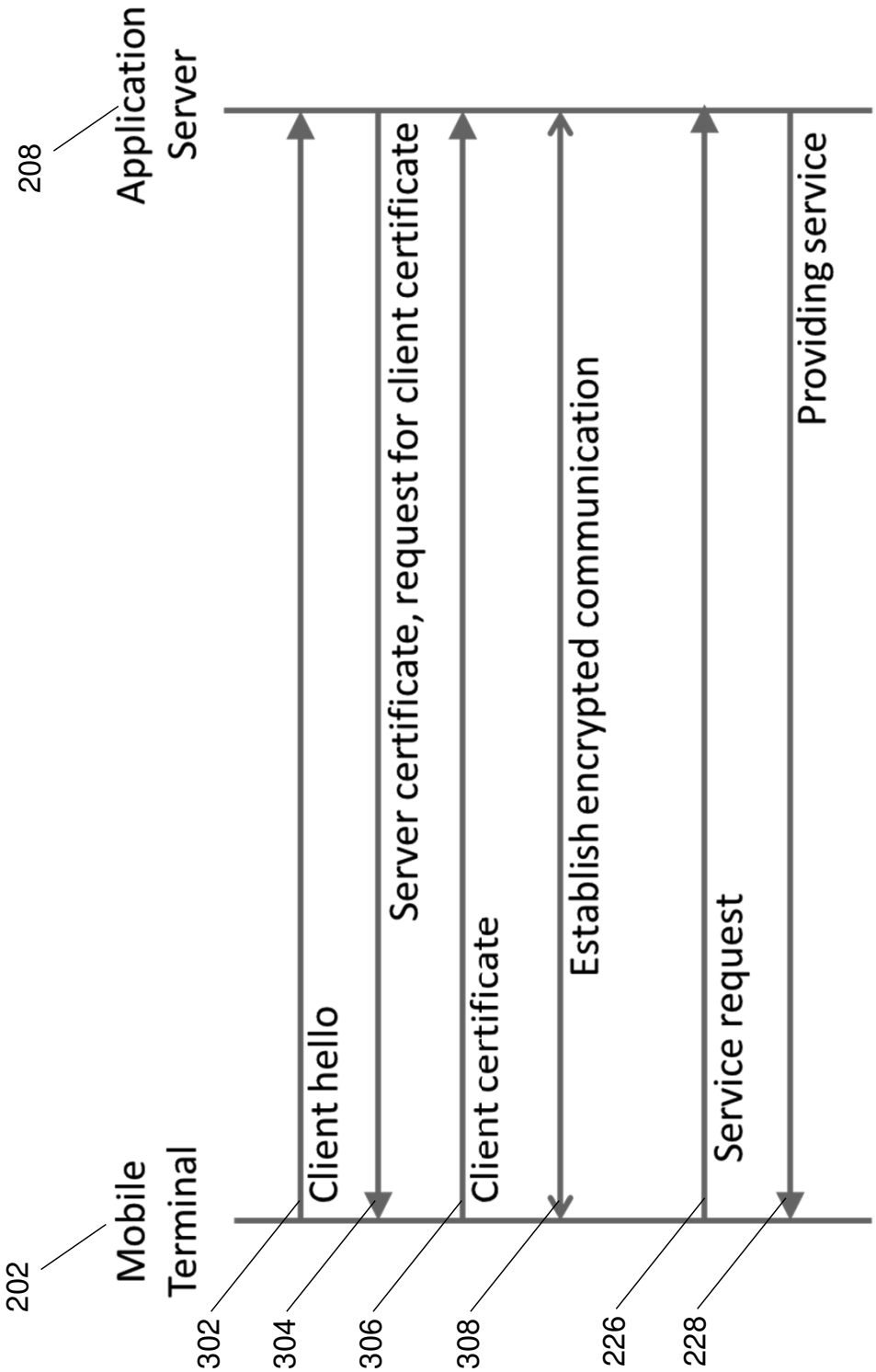

202
Mobile Terminal
208
Application Server
Client hello
Server certificate, request for client certificate
Client certificate
Establish encrypted communication
Service request
Providing service
302
304
306
308
226
228
300

Figure 3

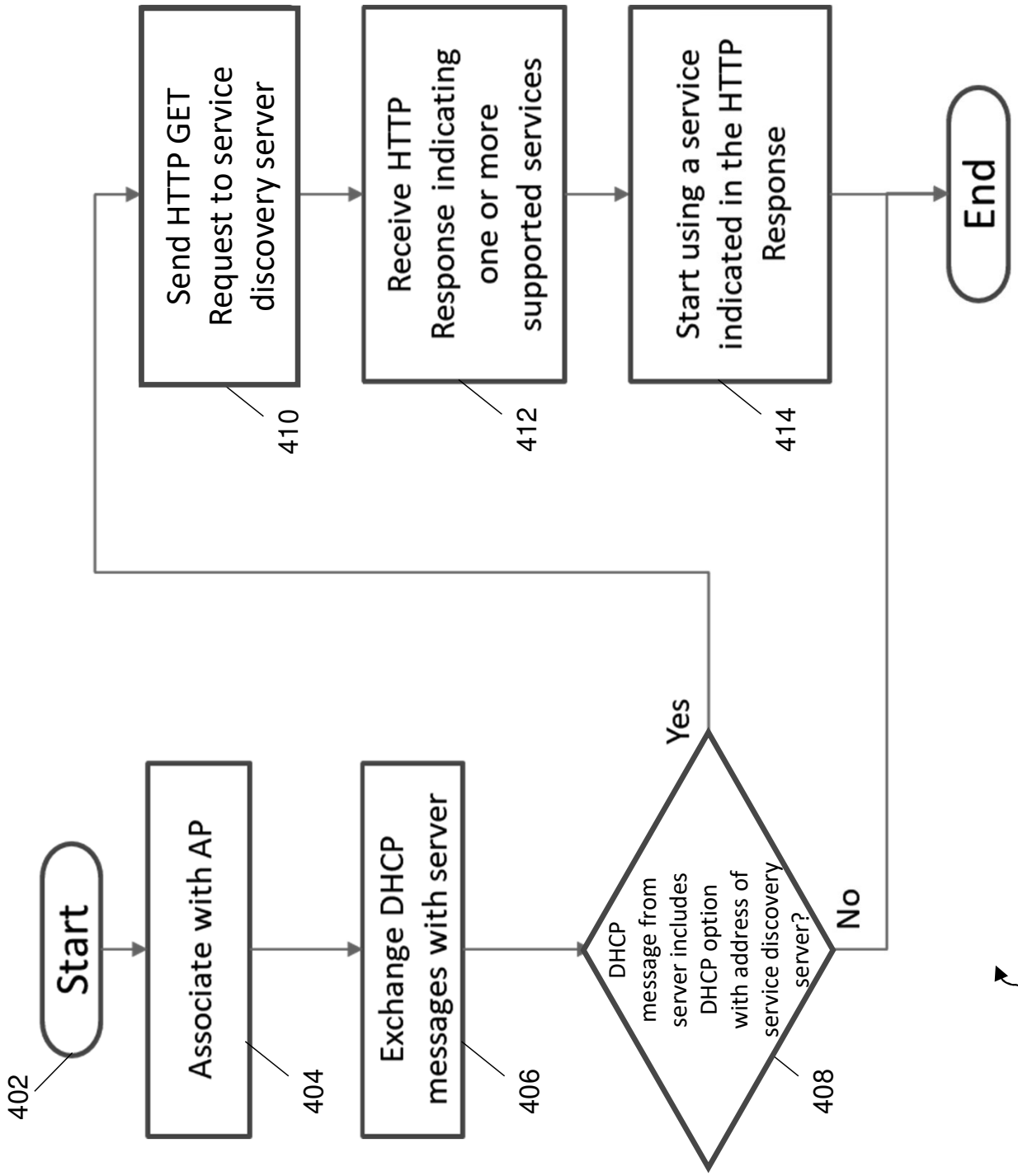

Start
402
Associate with AP
404
Exchange DHCP messages with server
406
DHCP message from server includes DHCP option with address of service discovery server?
408
Yes
No
Send HTTP GET Request to service discovery server
410
Receive HTTP Response indicating one or more supported services
412
Start using a service indicated in the HTTP Response
414
End
400

Figure 4

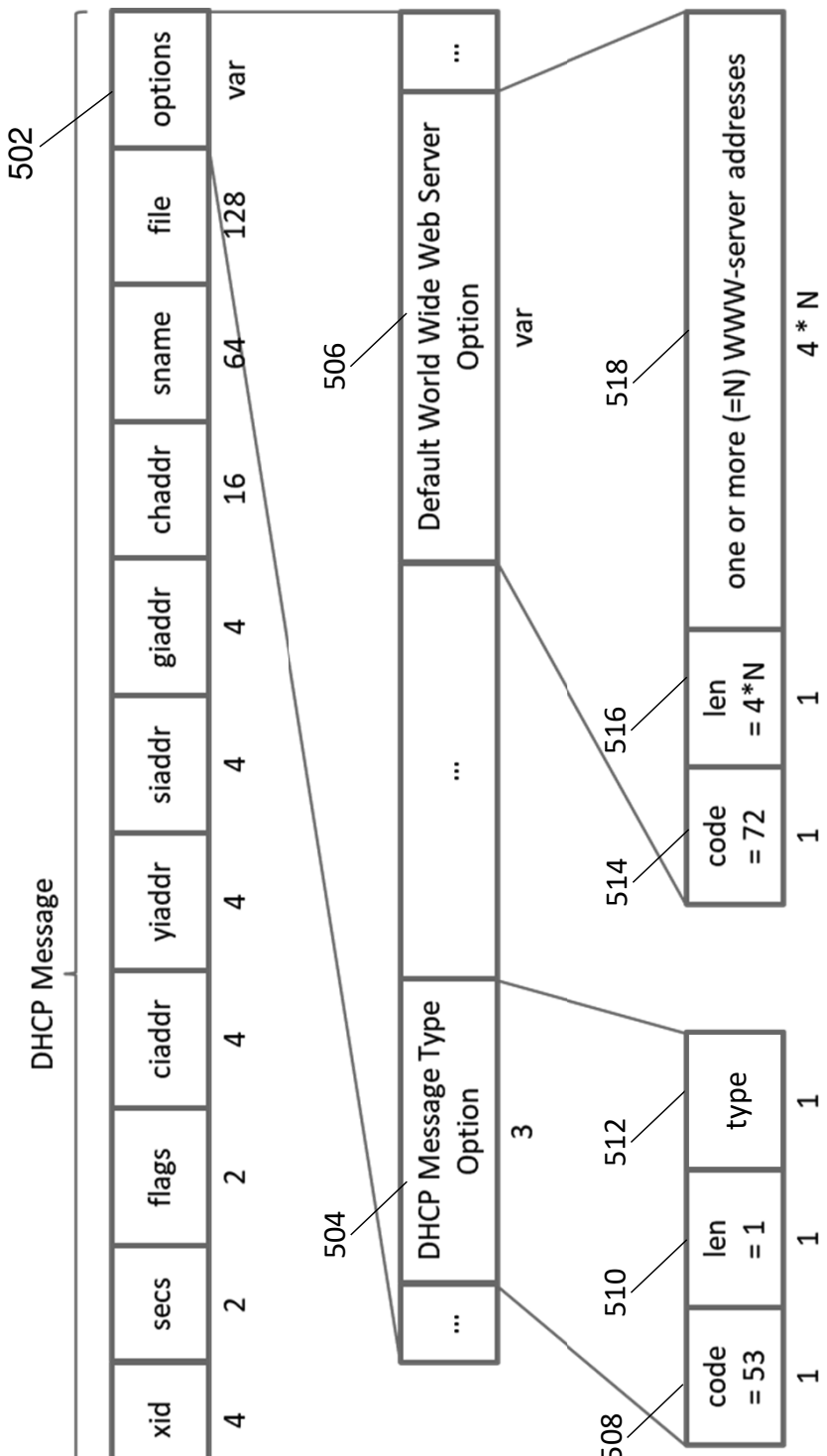

DHCP Message
op = 2
htype
hlen
hops
xid
secs
flags
ciaddr
yiaddr
siaddr
giaddr
chaddr
sname
file
options
1
1
1
1
2
2
4
4
4
4
16
64
128
var
DHCP Message Type Option
Default World Wide Web Server Option
...
3
var
code = 53
len = 1
type
code = 72
len = 4*N
one or more (=N) WWW-server addresses
4 * N
Value
Message Type
1 DHCPDISCOVER
2 DHCPOFFER
3 DHCPREQUEST
4 DHCPDECLINE
5 DHCPACK
6 DHCPNAK
7 DHCPRELEASE
8 DHCPINFORM
500
502
504
506
508
510
512
514
516
518
520
522

Figure 5

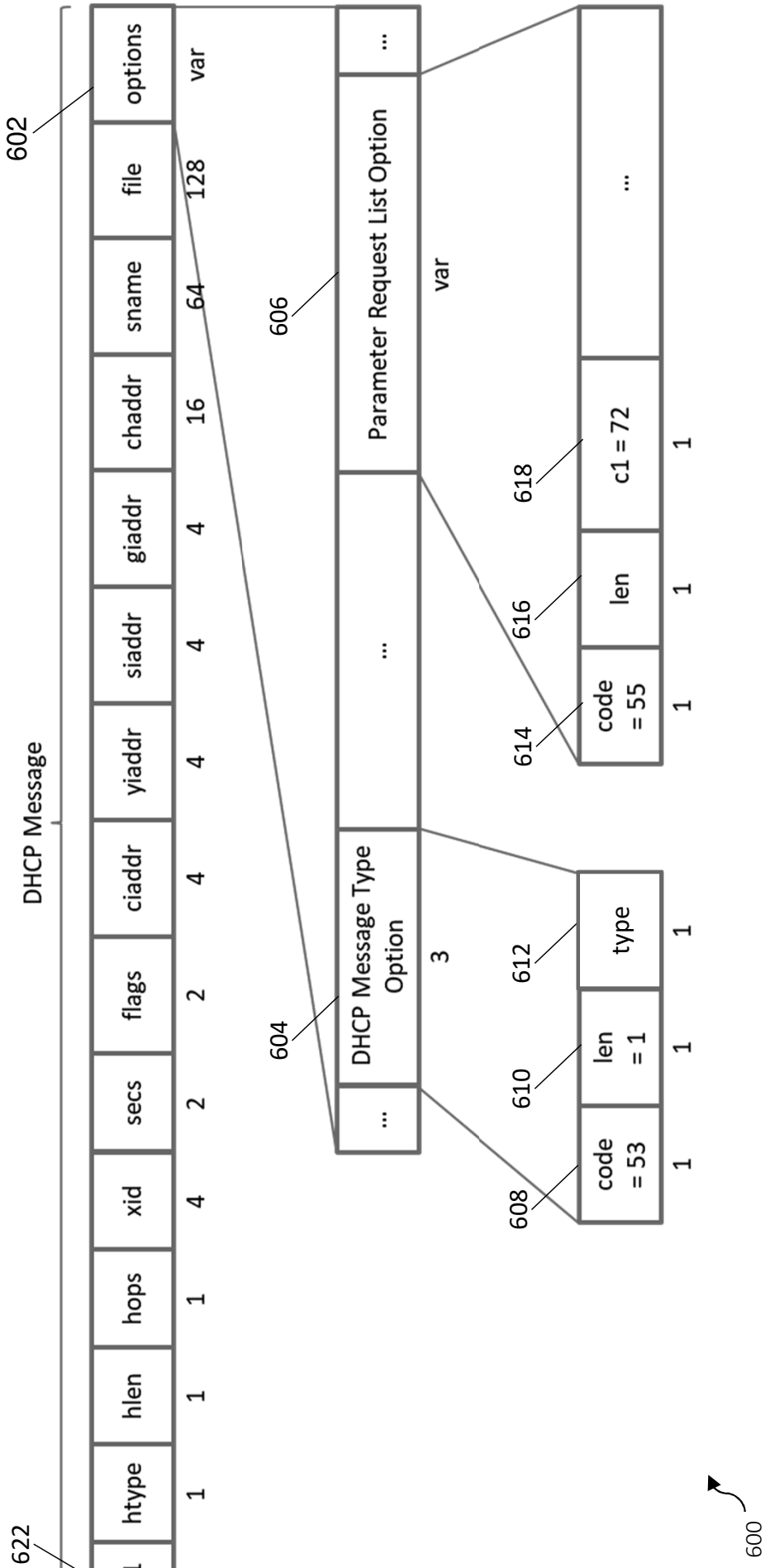

602
DHCP Message
622
Op=1
htype
hlen
hops
xid
secs
flags
ciaddr
yiaddr
siaddr
giaddr
chaddr
sname
file
options
1
1
1
1
4
2
2
4
4
4
4
16
64
128
var
604
...
DHCP Message Type Option
3
606
...
Parameter Request List Option
var
608
code = 53
1
610
len = 1
1
612
type
1
614
code = 55
1
616
len
1
618
c1 = 72
1
...
600

Figure 6

Contained in HTTP Response with Content-Type: application/json:

```
{
        {
                "service-type": "file_server",
                "is-available": true,
                "server-ip": "192.168.100.1",
                "port": 443,
                "protocol": "HTTPS",
                "domain-name": "file.service.com"
        },
        {
                "service-type": "streaming_server",
                "is-available": true,
                "server-ip": "192.168.200.1",
                "port": 80,
                "protocol": "RTSP" ,
                "domain-name": "streaming.service.com"
        }
}
```

702

704

700

Figure 7

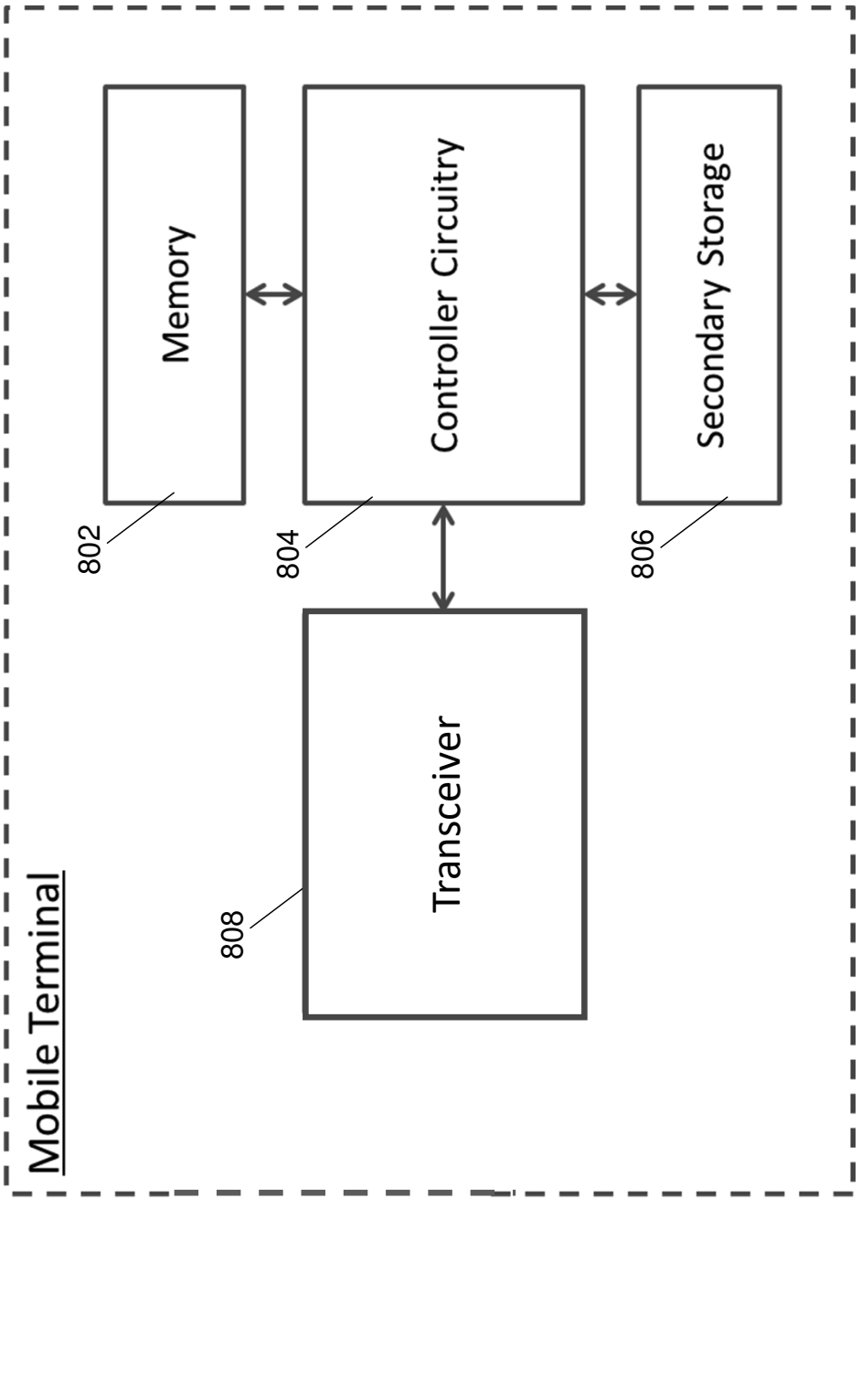

Mobile Terminal
Memory
Controller Circuitry
Secondary Storage
Transceiver
802
804
806
808
800

Figure 8

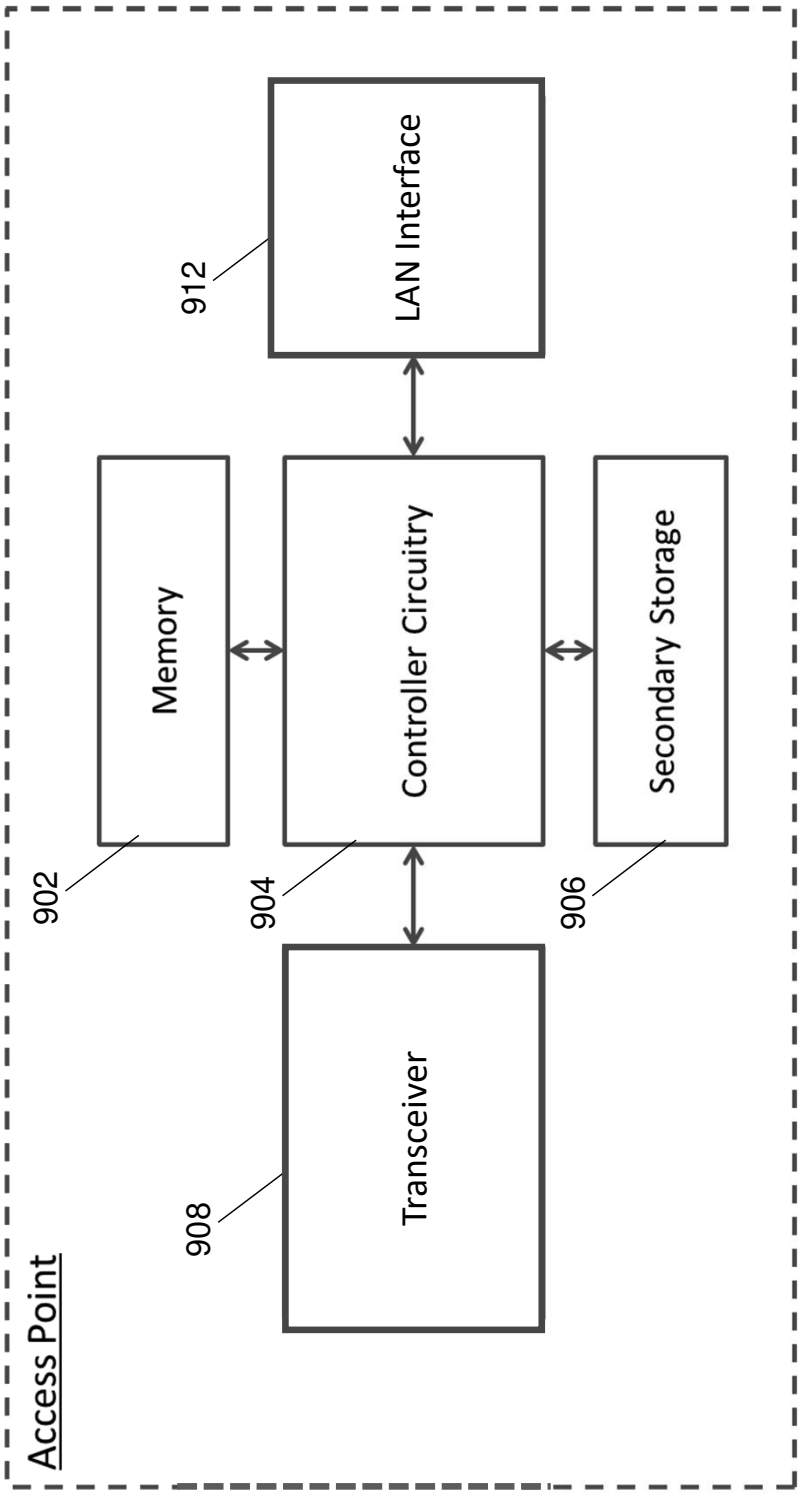

Access Point
LAN Interface
912
Memory
Controller Circuitry
Secondary Storage
902
904
906
Transceiver
908
900

Figure 9

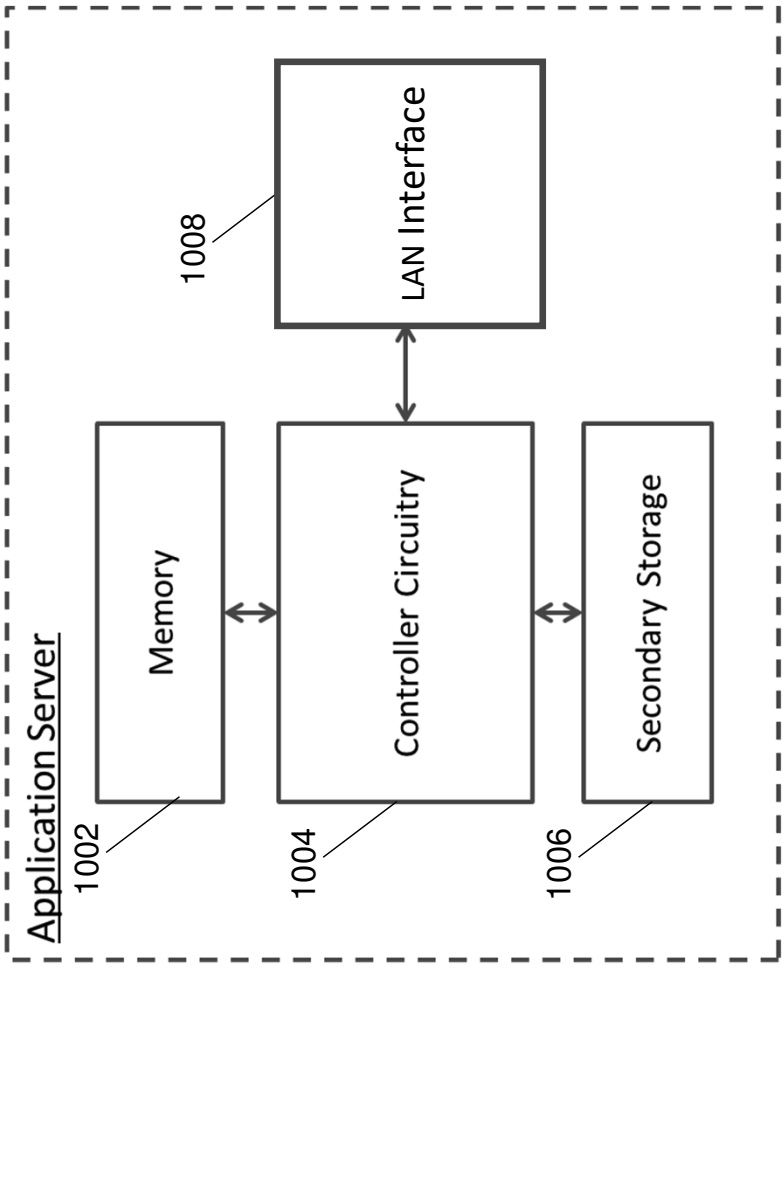

Application Server
Memory
Controller Circuitry
Secondary Storage
LAN Interface
1002
1004
1006
1008
1000

Figure 10

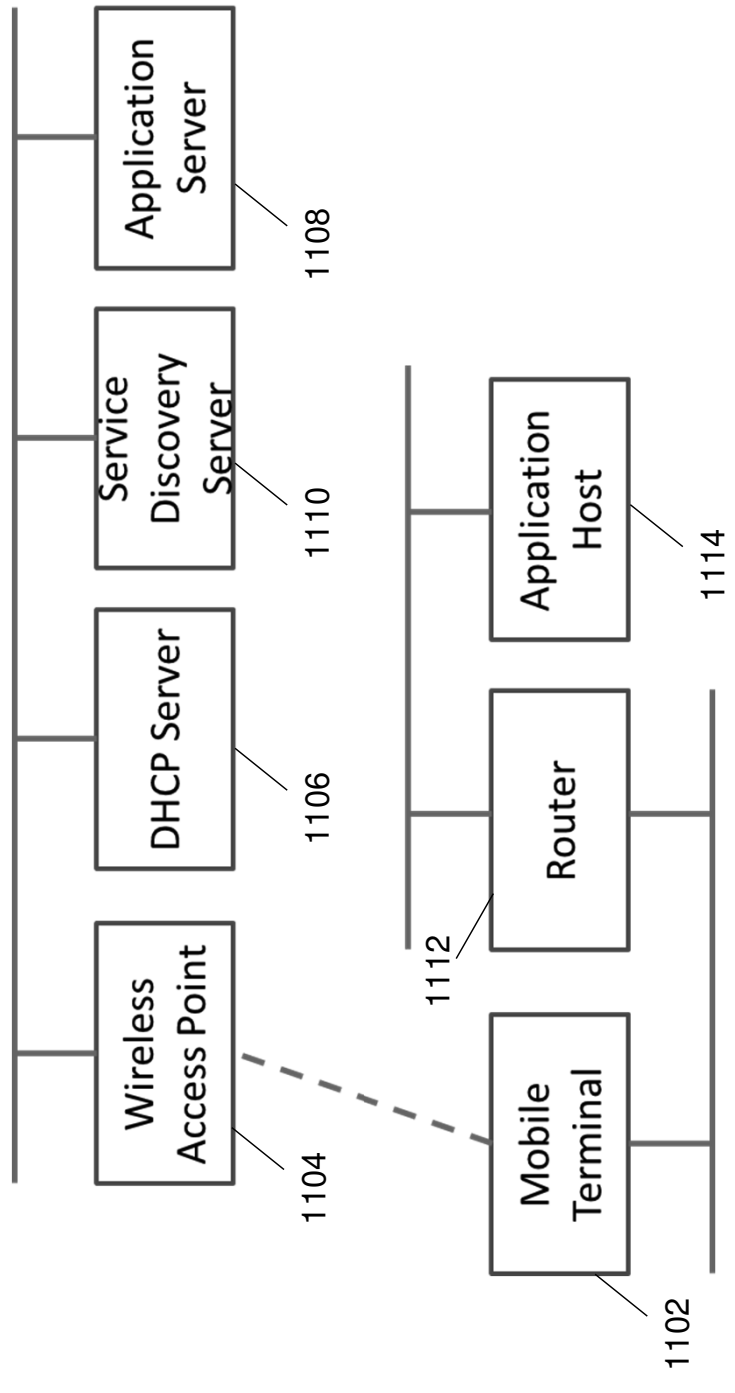

Application Server
1108
Service Discovery Server
1110
DHCP Server
1106
Wireless Access Point
1104
Application Host
1114
Router
1112
Mobile Terminal
1102
1100

Figure 11

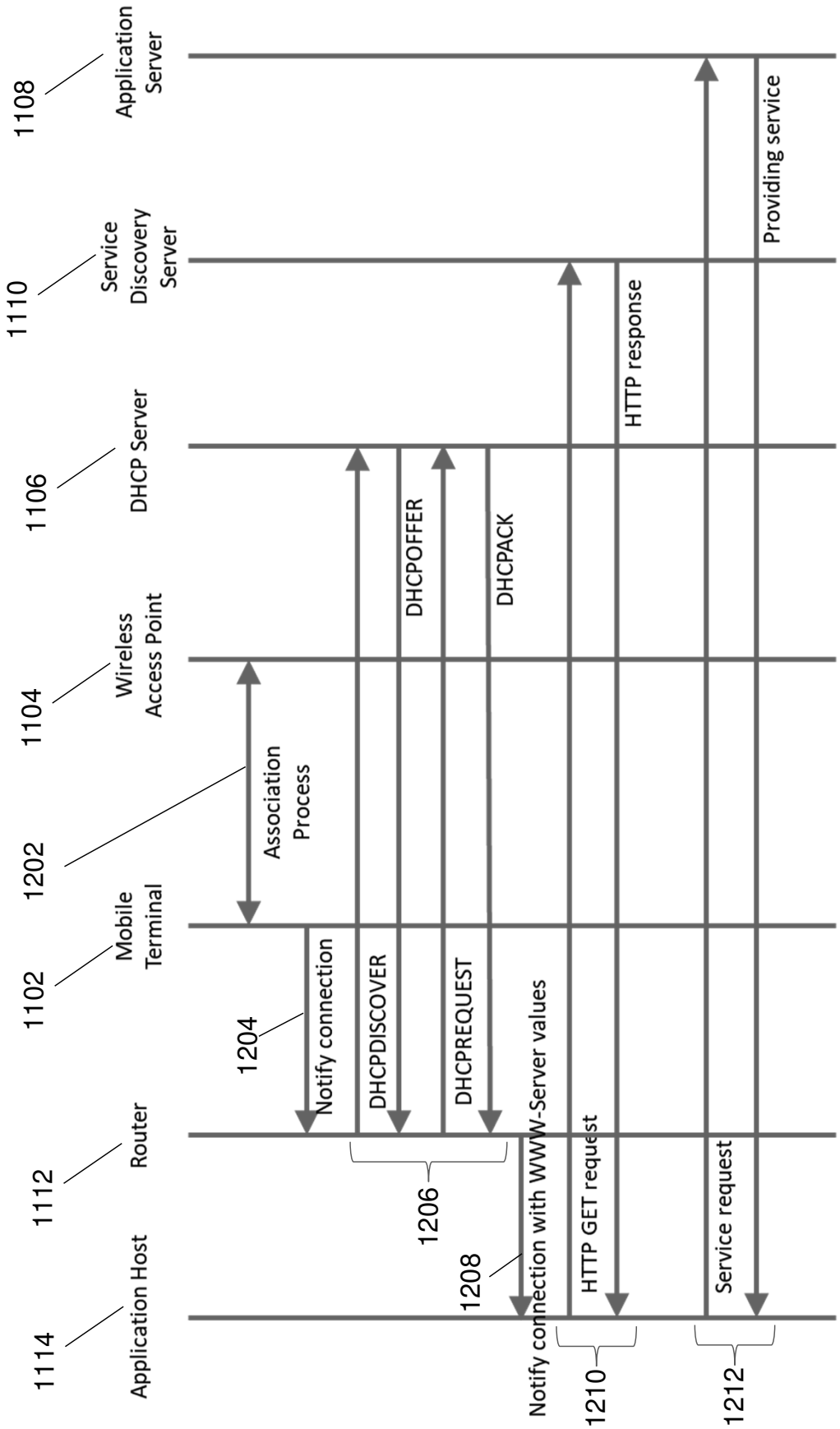

1114
Application Host
1112
Router
1102
Mobile Terminal
1202
1104
Wireless Access Point
1106
DHCP Server
1110
Service Discovery Server
1108
Application Server
Association Process
1204
Notify connection
DHCPDISCOVER
DHCPOFFER
DHCPREQUEST
DHCPACK
HTTP response
Providing service
1206
1208
Notify connection with WWW-Server values
HTTP GET request
Service request
1210
1212
1200

Figure 12

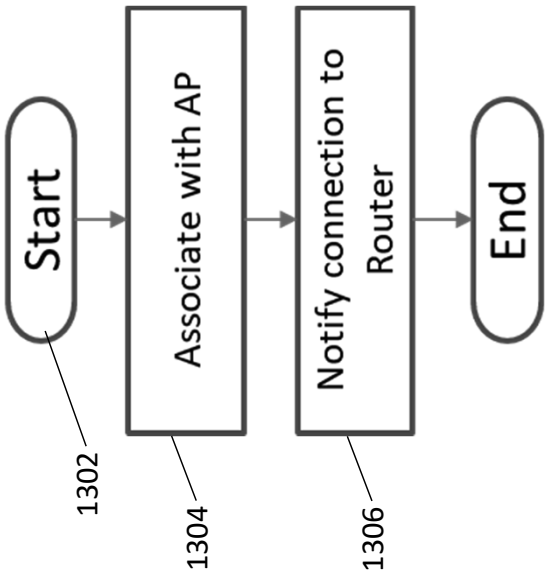

Start
Associate with AP
Notify connection to Router
End
1302
1304
1306
1300

Figure 13

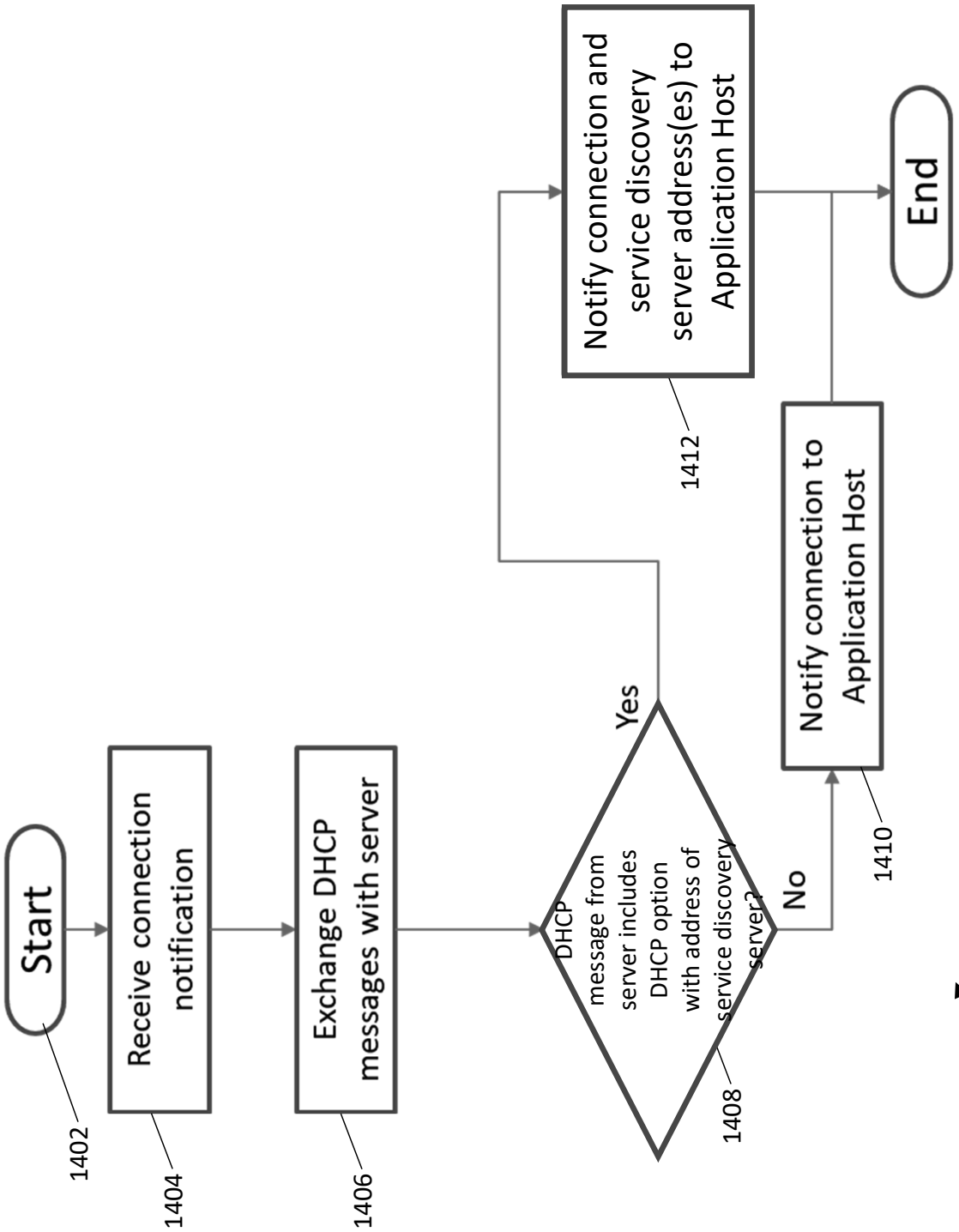

Start
Receive connection notification
Exchange DHCP messages with server
DHCP message from server includes DHCP option with address of service discovery server?
Yes
No
Notify connection and service discovery server address(es) to Application Host
Notify connection to Application Host
End
1402
1404
1406
1408
1410
1412
1400

Figure 14

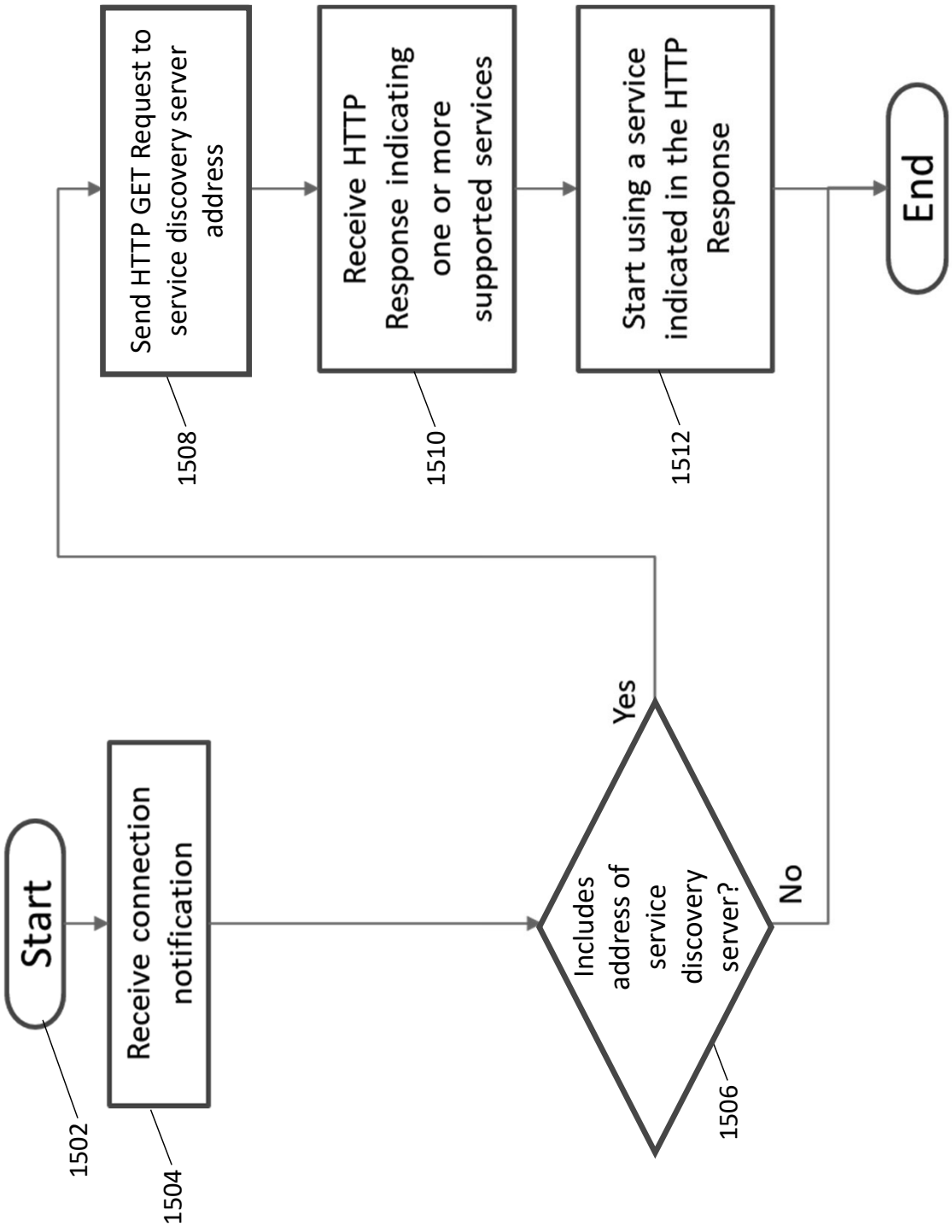

Start
Receive connection notification
Includes address of service discovery server?
Yes
No
Send HTTP GET Request to service discovery server address
Receive HTTP Response indicating one or more supported services
Start using a service indicated in the HTTP Response
End
1500
1502
1504
1506
1508
1510
1512

Figure 15

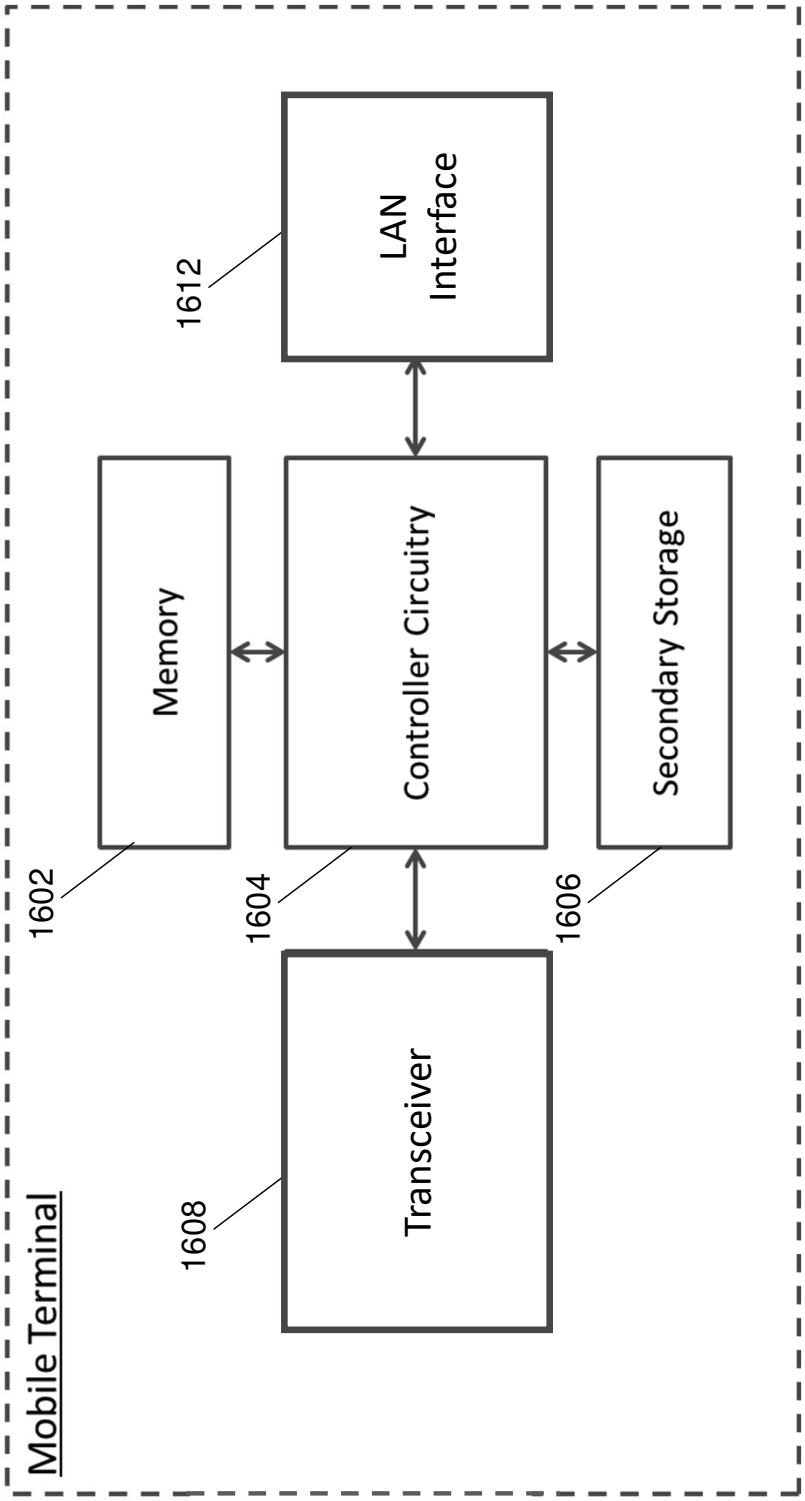

Mobile Terminal
LAN Interface
1612
Memory
Controller Circuitry
Secondary Storage
1602
1604
1606
Transceiver
1608
1600

Figure 16

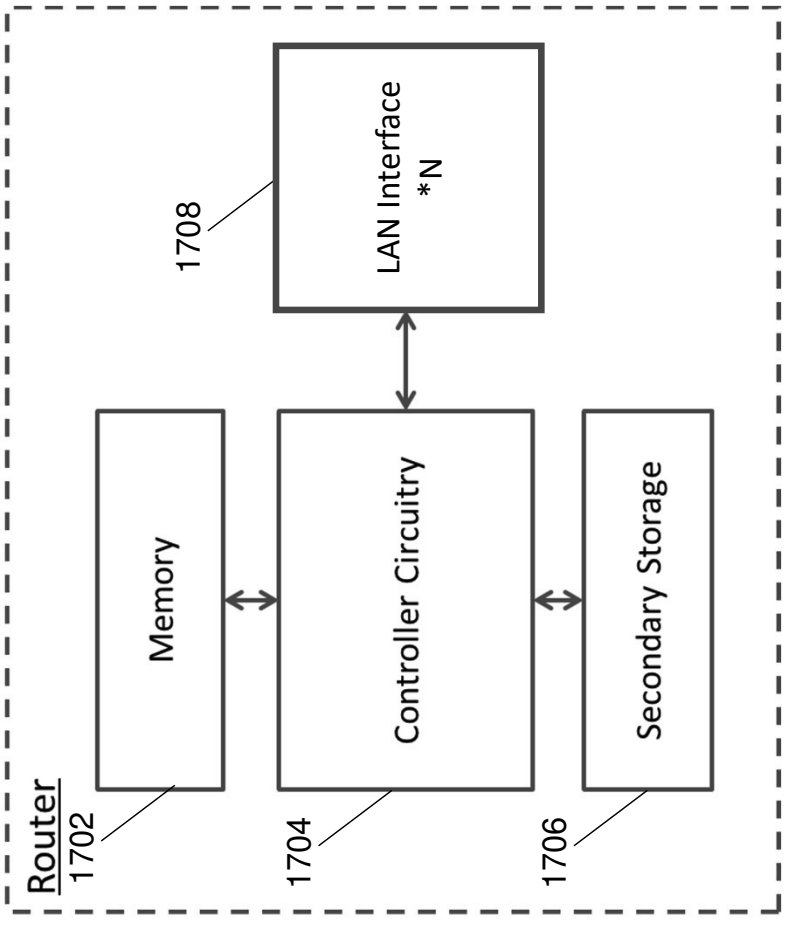

Router
1702
Memory
1704
Controller Circuitry
1706
Secondary Storage
1708
LAN Interface
*N
1700

Figure 17

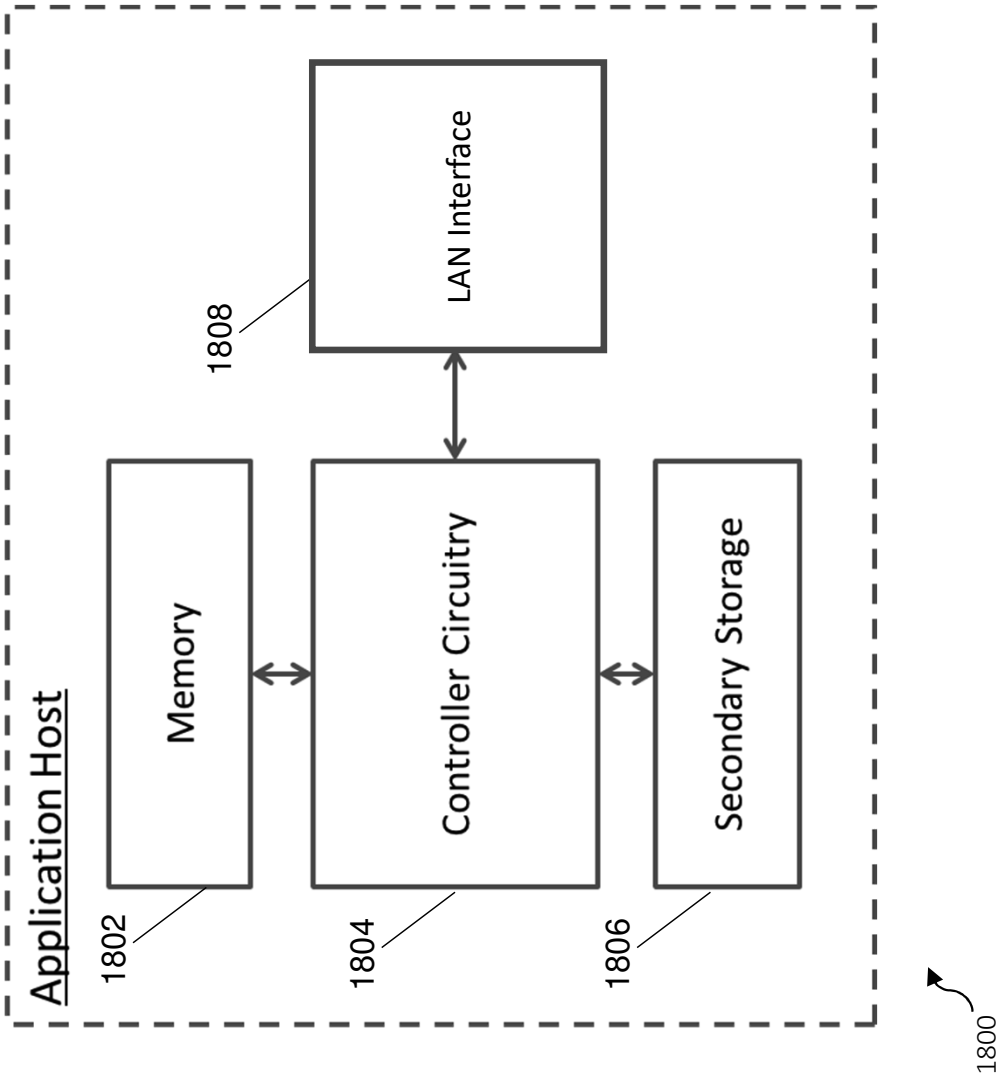

Application Host
Memory
Controller Circuitry
Secondary Storage
LAN Interface
1802
1804
1806
1808
1800

Figure 18

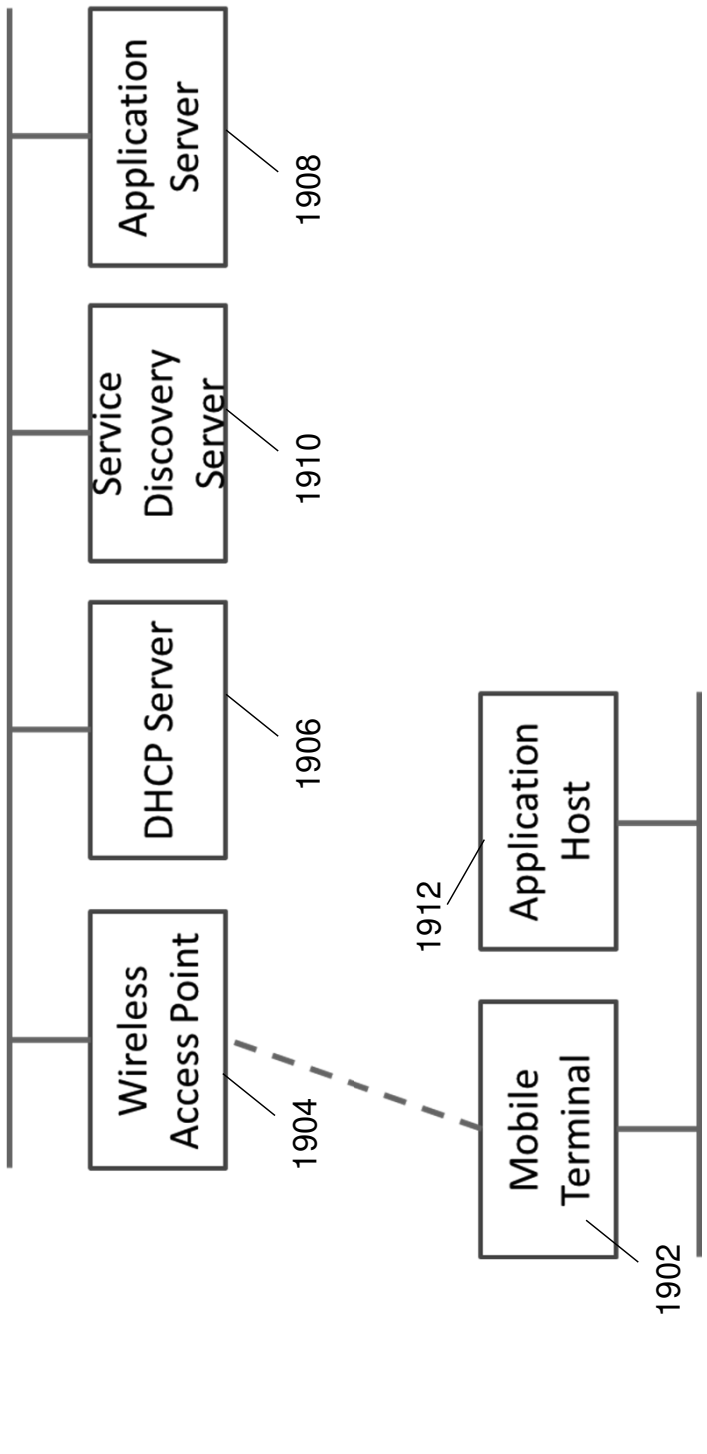

Application Server
1908
Service Discovery Server
1910
DHCP Server
1906
Wireless Access Point
1904
Application Host
1912
Mobile Terminal
1902
1900

Figure 19

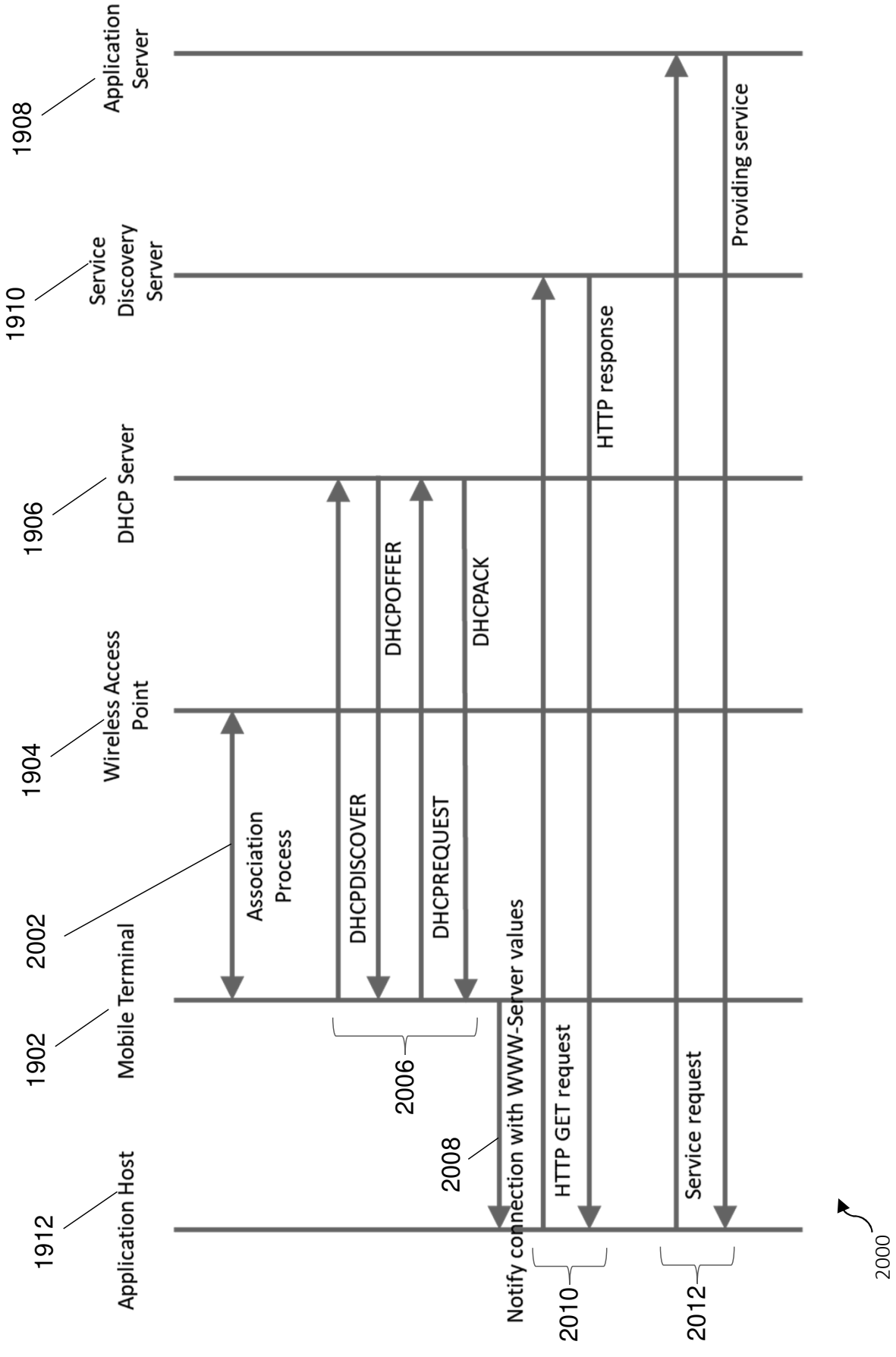

1908
Application Server
1910
Service Discovery Server
1906
DHCP Server
1904
Wireless Access Point
2002
1902
Mobile Terminal
1912
Application Host
Association Process
DHCPDISCOVER
DHCPOFFER
DHCPREQUEST
DHCPACK
HTTP response
Providing service
2006
2008
Notify connection with WWW-Server values
HTTP GET request
Service request
2010
2012
2000

Figure 20

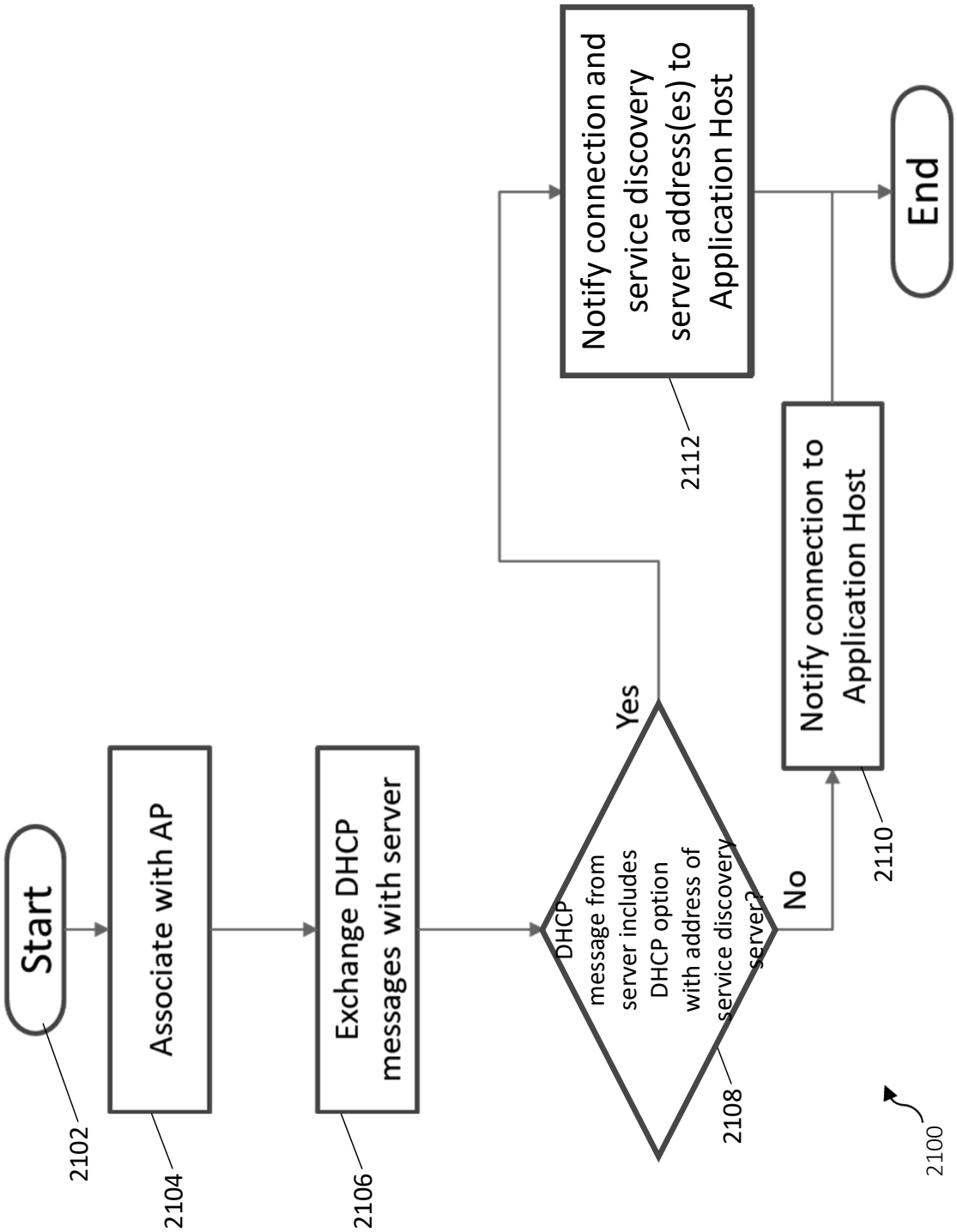

Start
Associate with AP
Exchange DHCP messages with server
DHCP message from server includes DHCP option with address of service discovery server?
Yes
No
Notify connection and service discovery server address(es) to Application Host
Notify connection to Application Host
End
2102
2104
2106
2108
2110
2112
2100

Figure 21

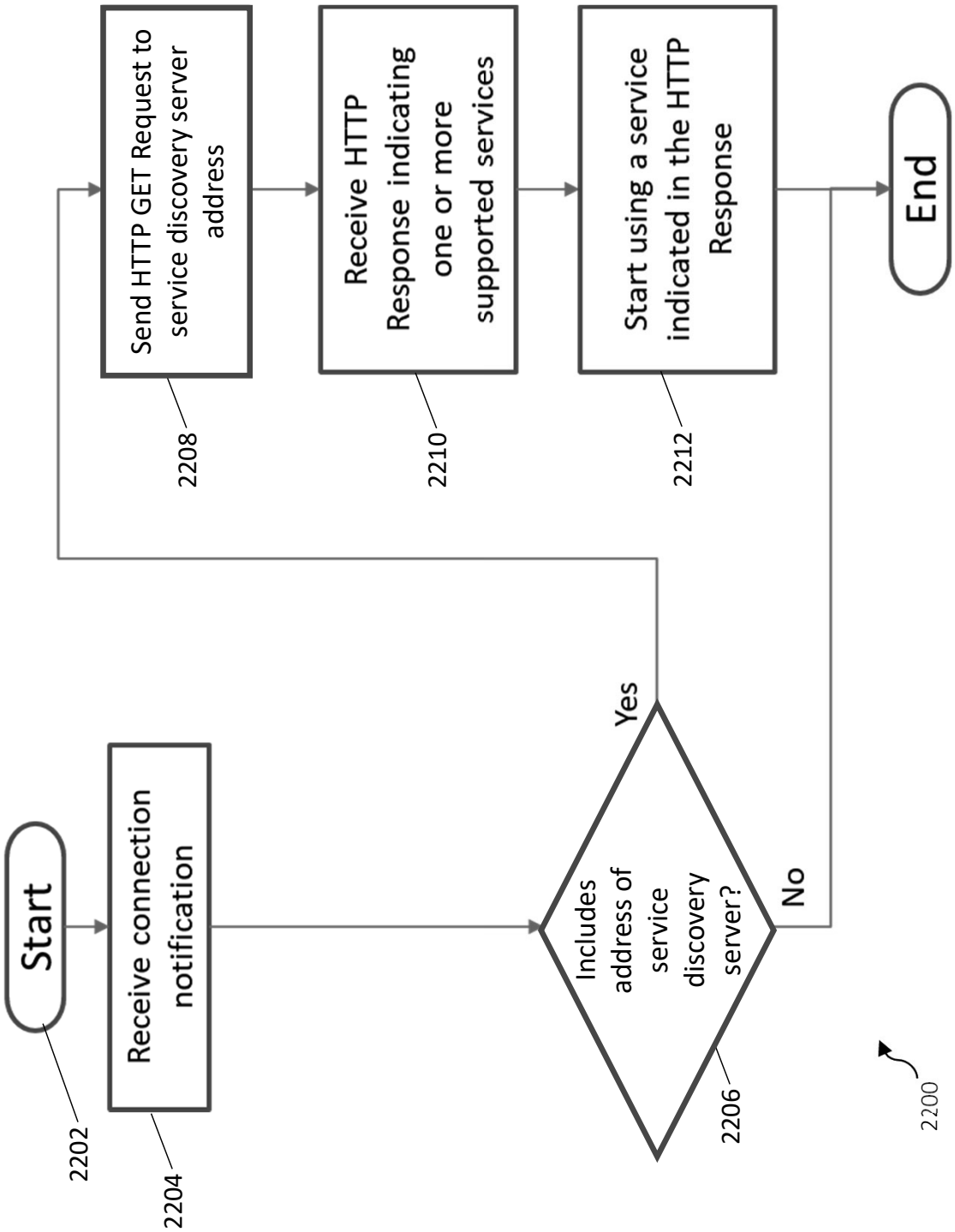

Start
Receive connection notification
Includes address of service discovery server?
Yes
No
Send HTTP GET Request to service discovery server address
Receive HTTP Response indicating one or more supported services
Start using a service indicated in the HTTP Response
End
2202
2204
2206
2208
2210
2212
2200

Figure 22

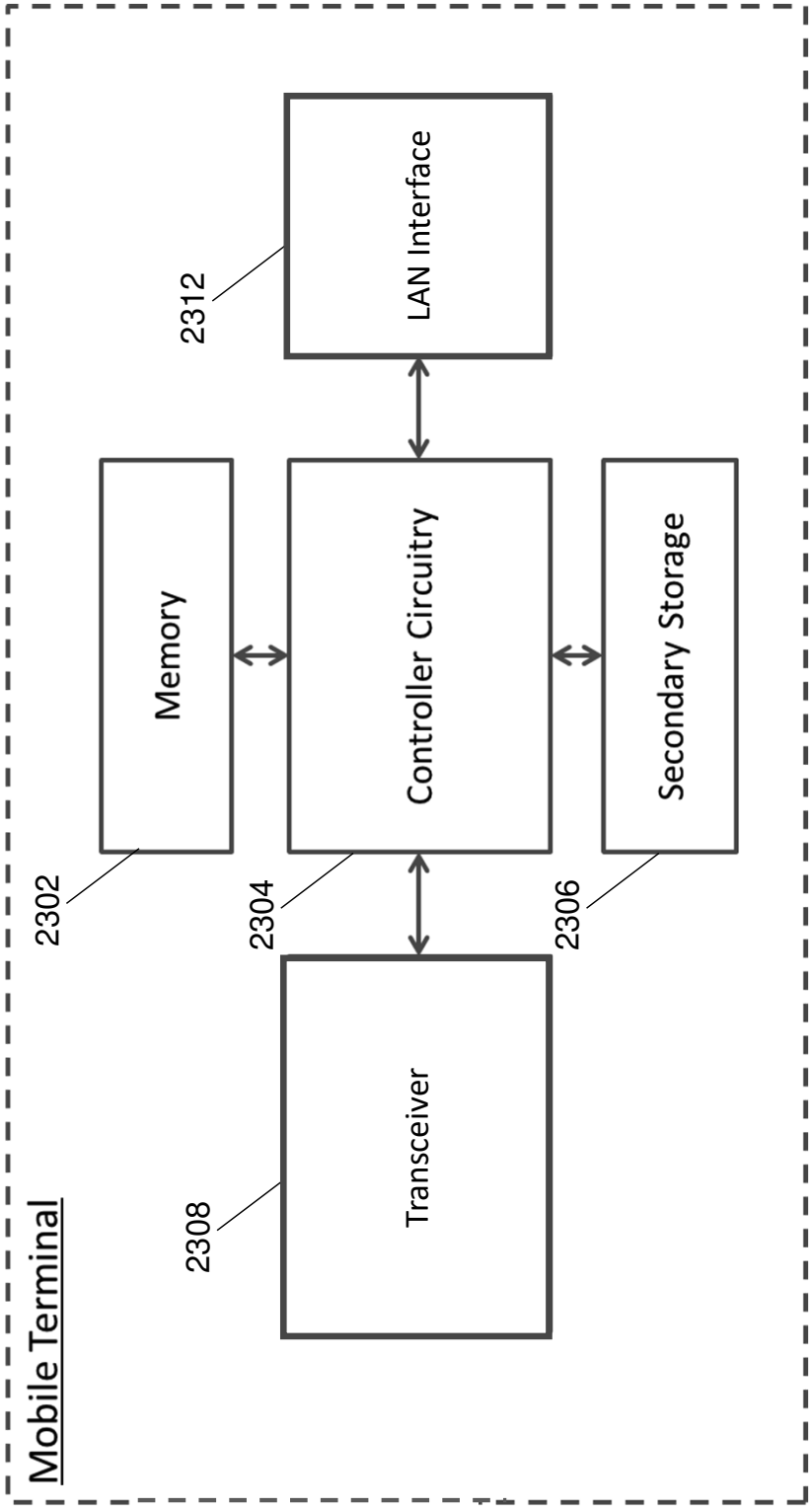

Mobile Terminal
LAN Interface
2312
Memory
Controller Circuitry
Secondary Storage
2302
2304
2306
Transceiver
2308
2300

Figure 23

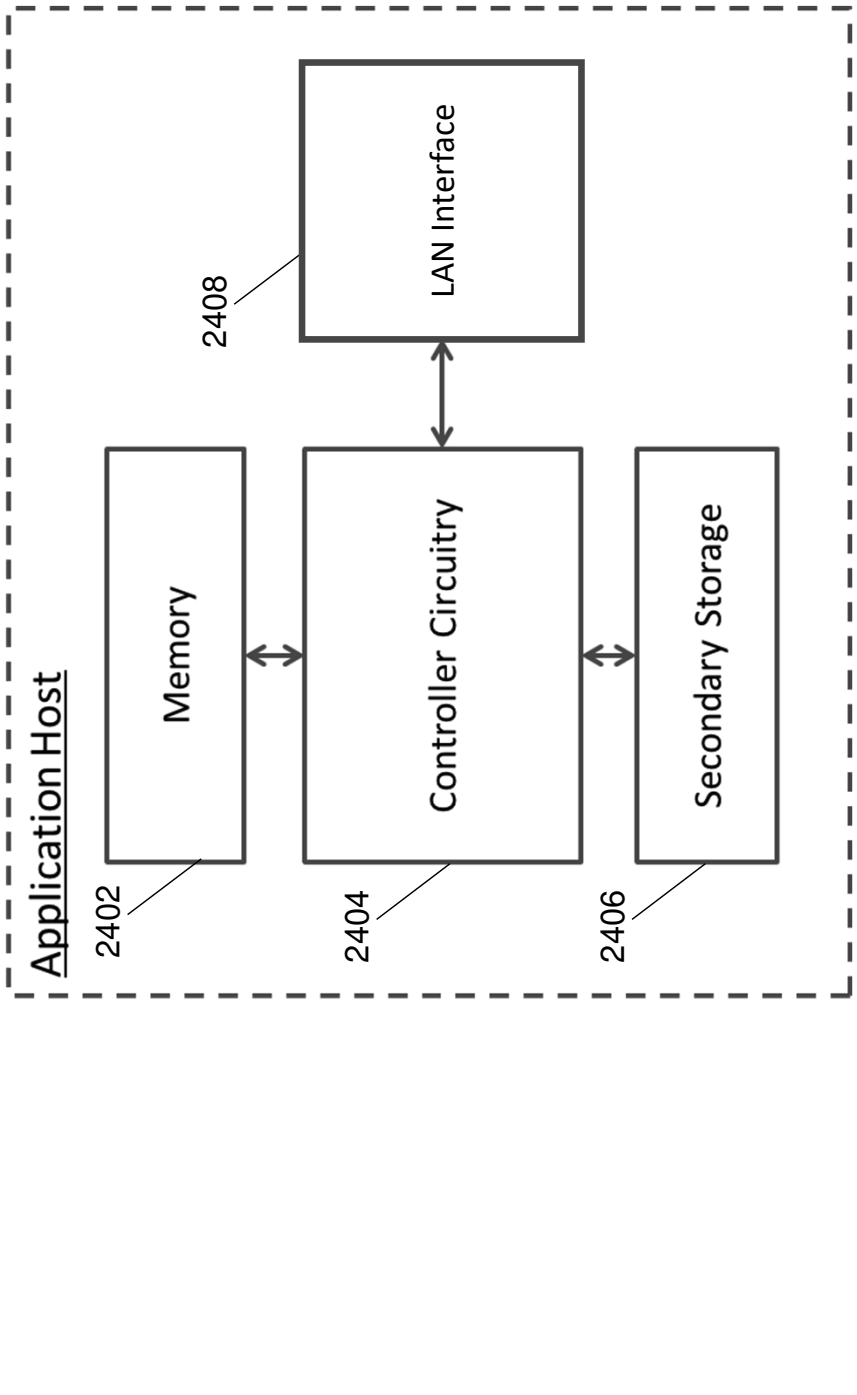

Application Host
Memory
Controller Circuitry
Secondary Storage
LAN Interface
2402
2404
2406
2408
2400

Figure 24

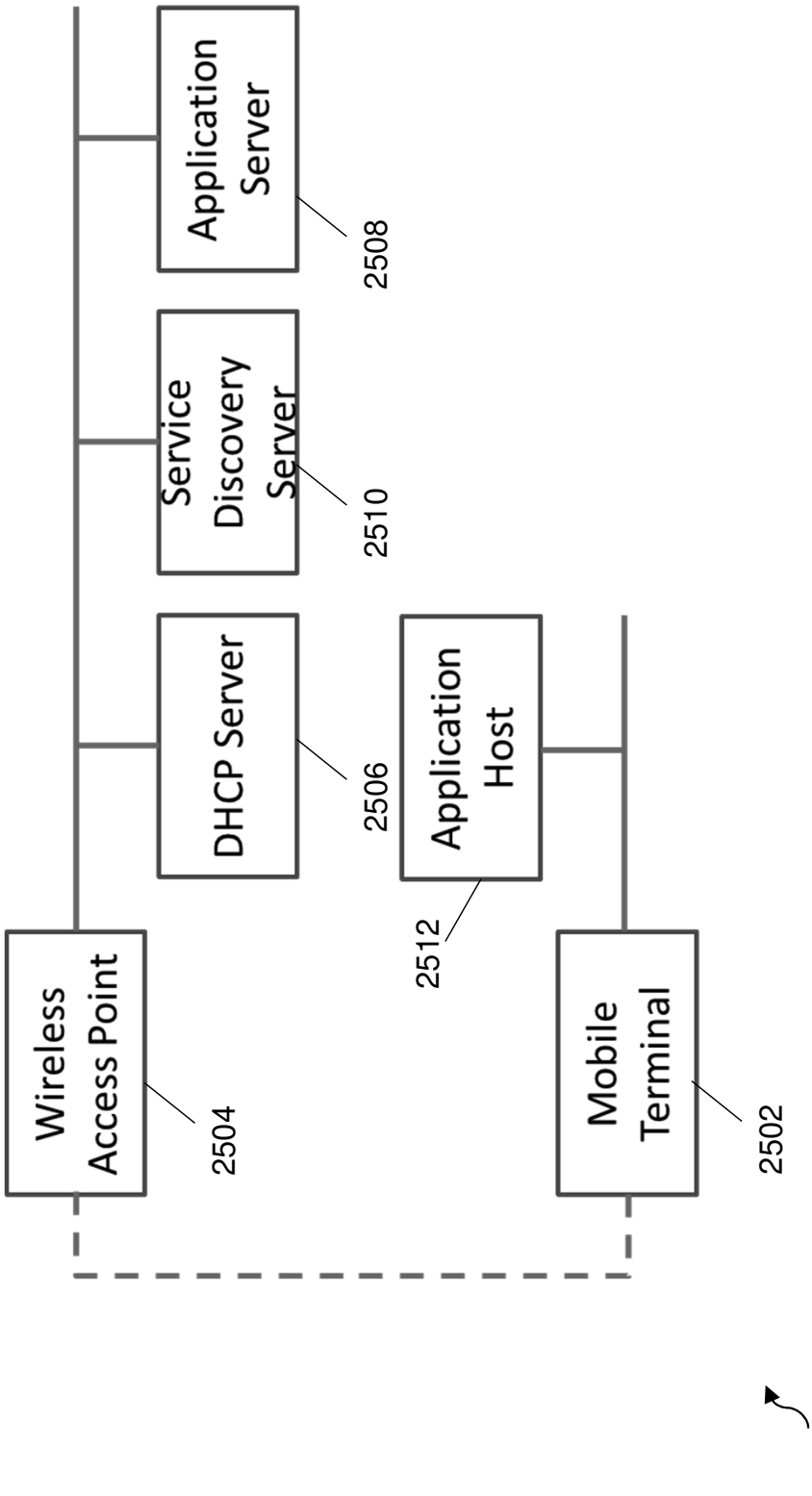

Application Server
2508
Service Discovery Server
2510
DHCP Server
2506
Application Host
2512
Wireless Access Point
2504
Mobile Terminal
2502
2500

Figure 25

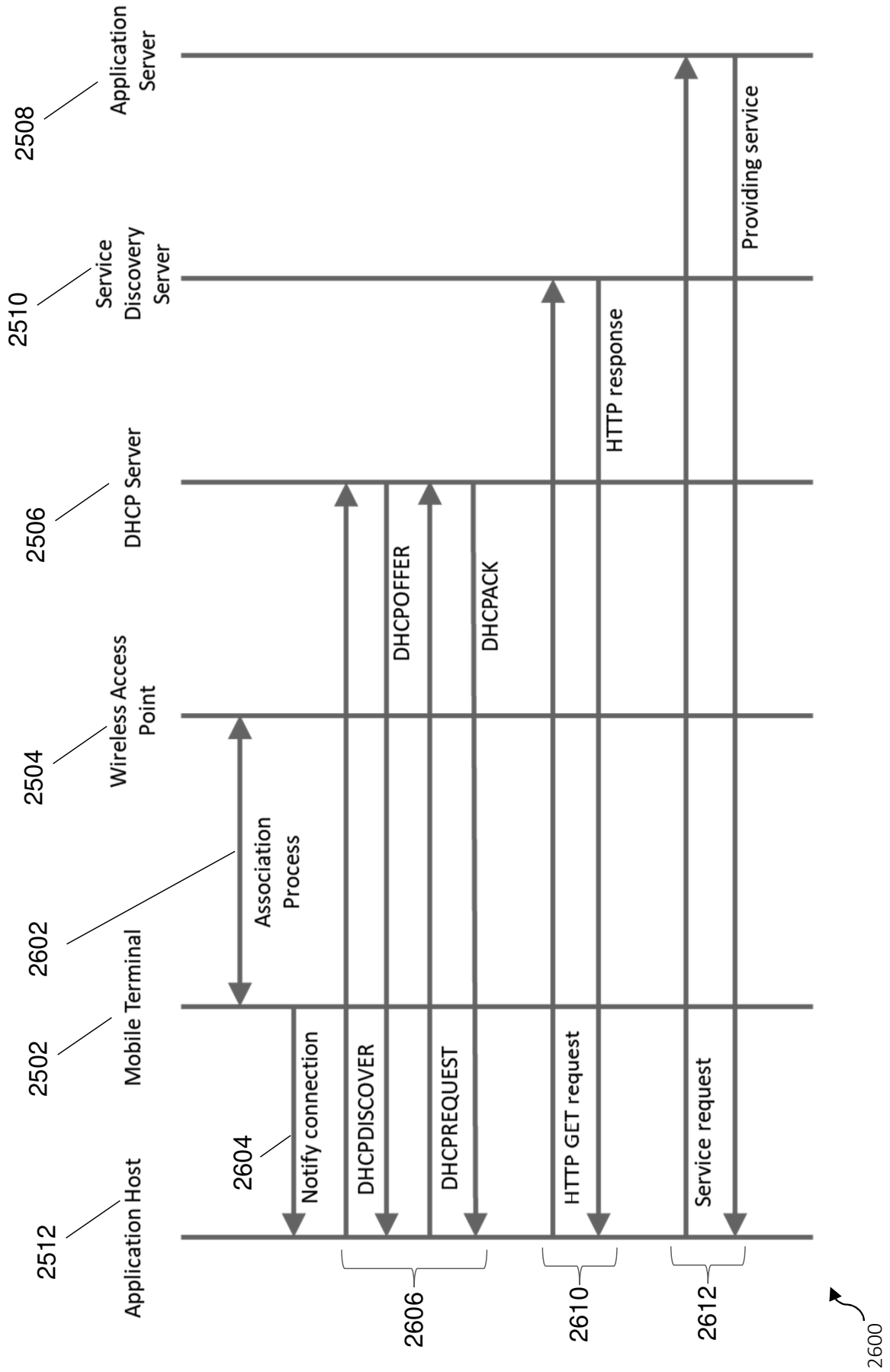

2512
Application Host
2502
Mobile Terminal
2504
Wireless Access Point
2506
DHCP Server
2510
Service Discovery Server
2508
Application Server
2602
Association Process
2604
Notify connection
DHCPDISCOVER
DHCPOFFER
DHCPREQUEST
DHCPACK
HTTP GET request
HTTP response
Service request
Providing service
2606
2610
2612
2600

Figure 26

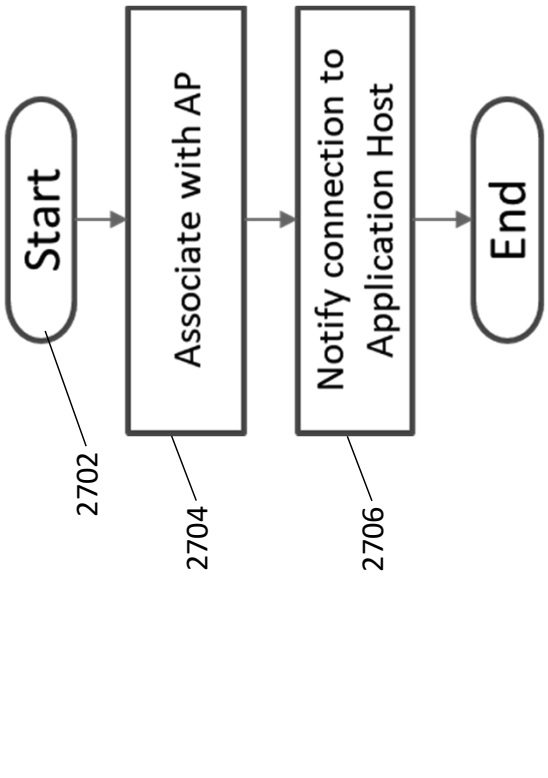

Start
Associate with AP
Notify connection to Application Host
End
2702
2704
2706
2700

Figure 27

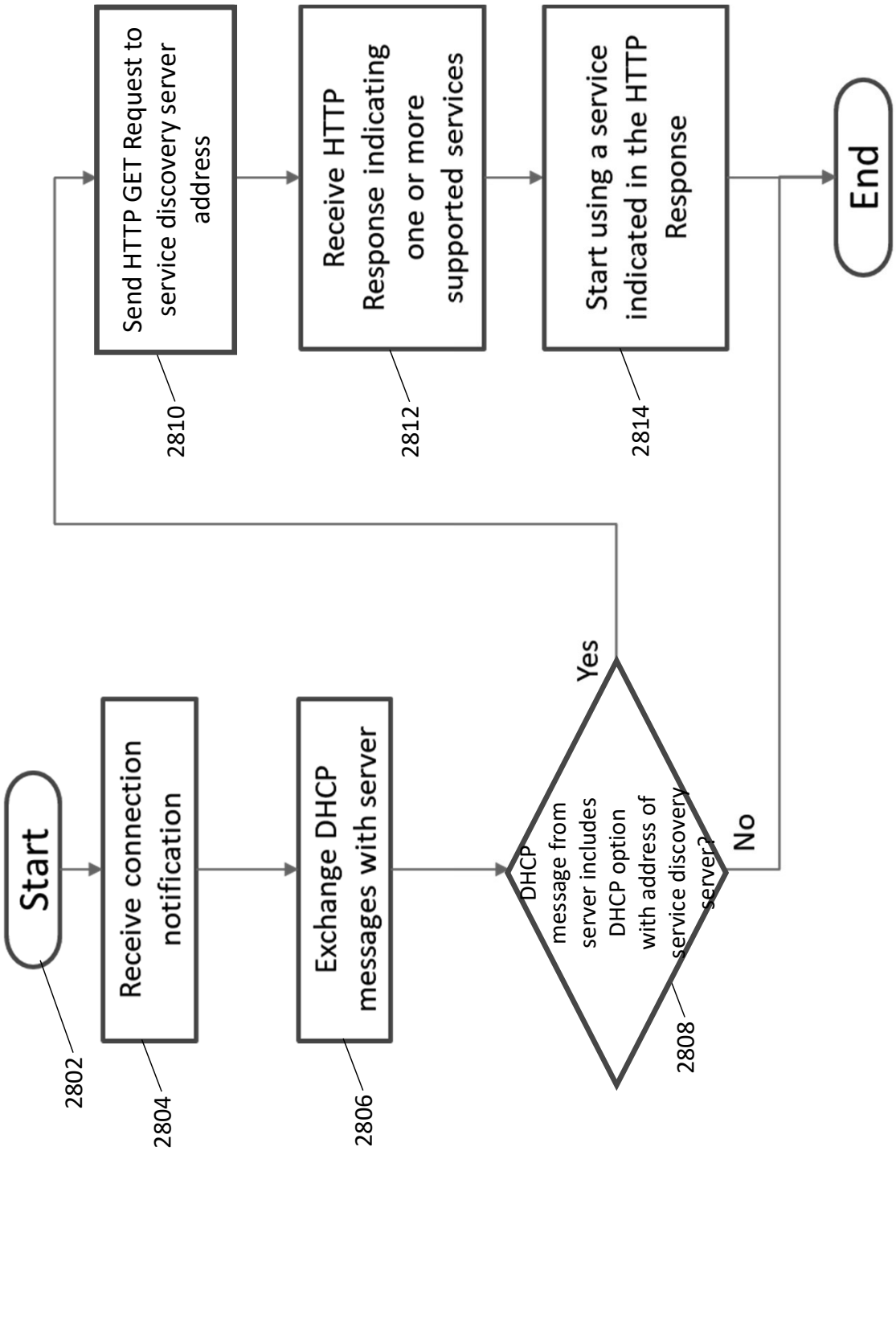

Start
2802
Receive connection notification
2804
Exchange DHCP messages with server
2806
DHCP message from server includes DHCP option with address of service discovery server?
2808
Yes
No
Send HTTP GET Request to service discovery server address
2810
Receive HTTP Response indicating one or more supported services
2812
Start using a service indicated in the HTTP Response
2814
End
2800

Figure 28

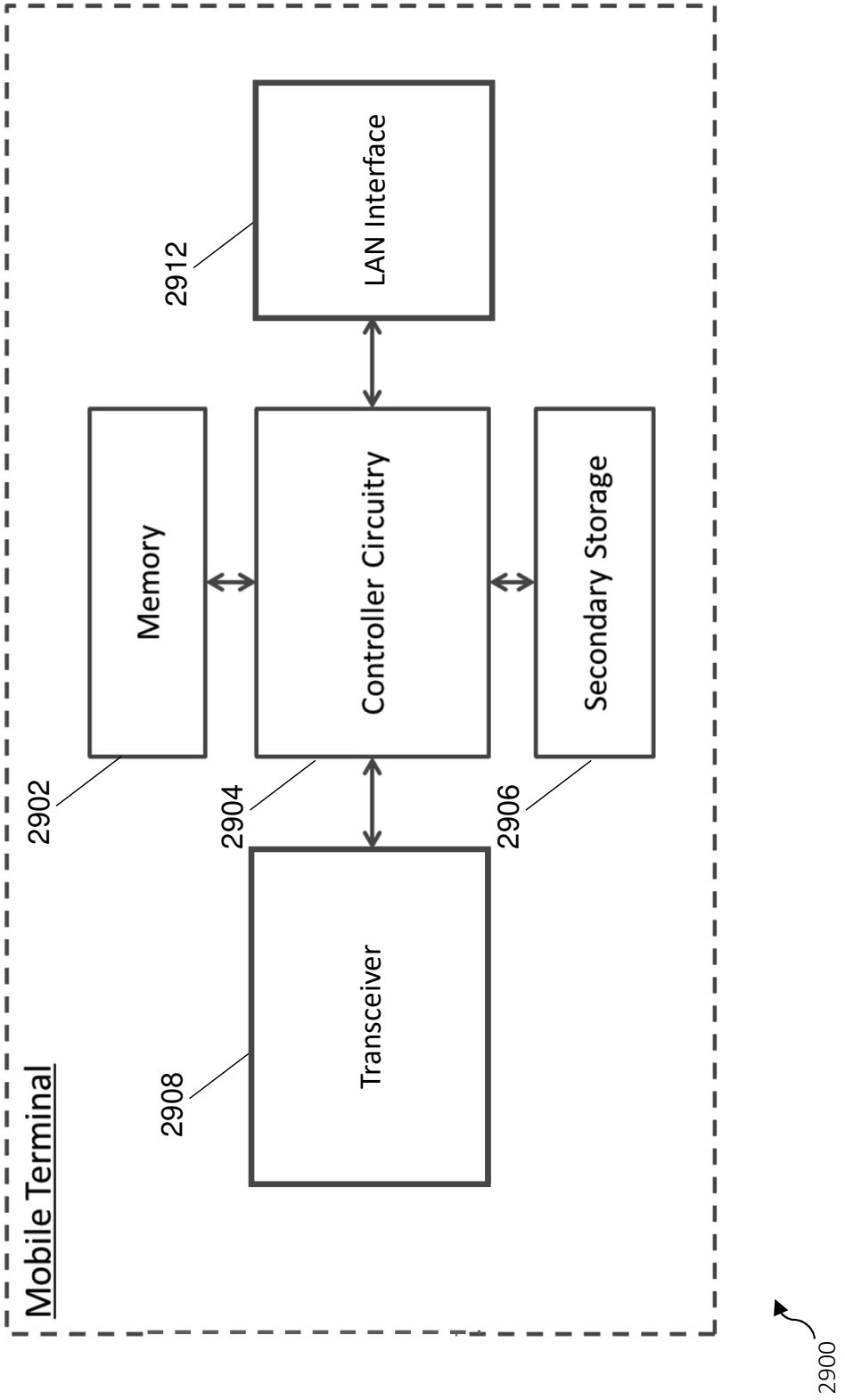

Mobile Terminal
LAN Interface
2912
Memory
Controller Circuitry
Secondary Storage
2902
2904
2906
Transceiver
2908
2900

Figure 29

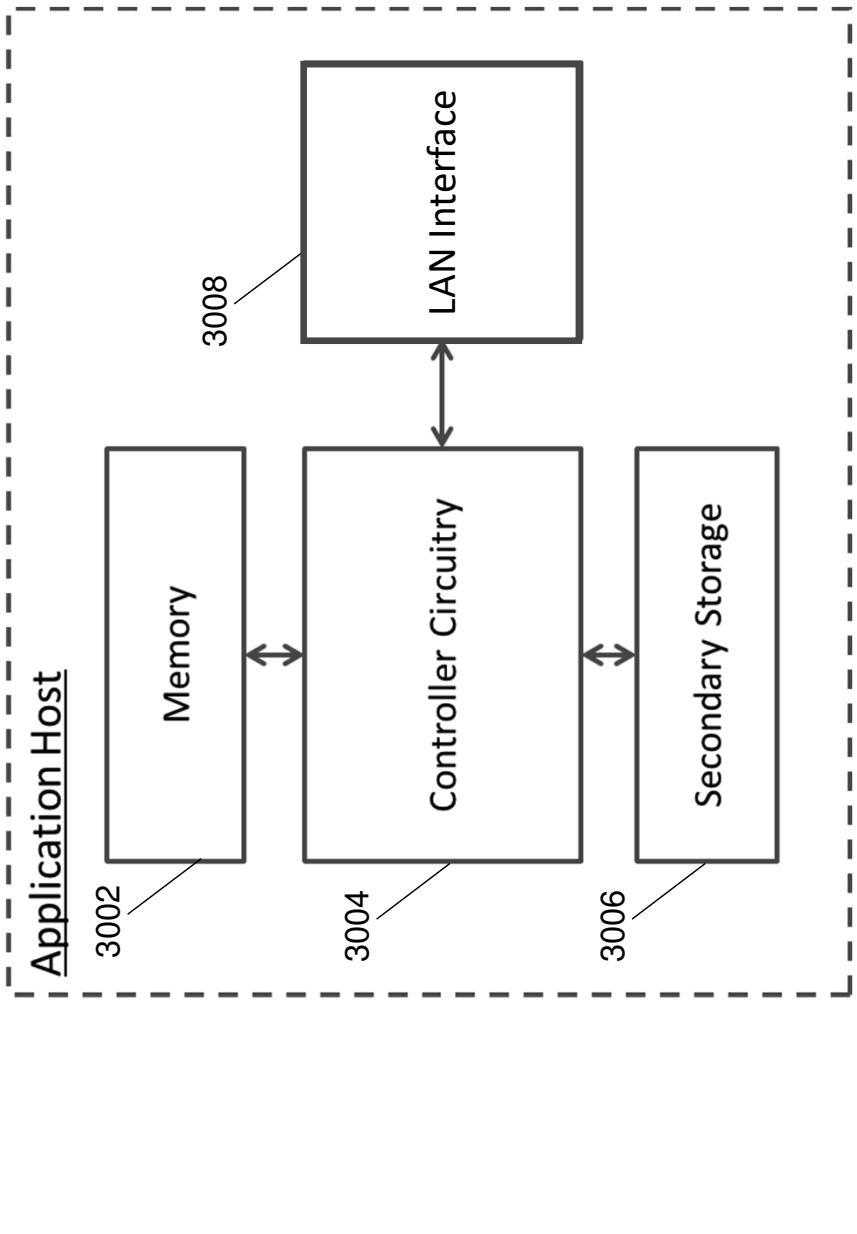

Application Host
Memory
Controller Circuitry
Secondary Storage
LAN Interface
3002
3004
3006
3008
3000

Figure 30

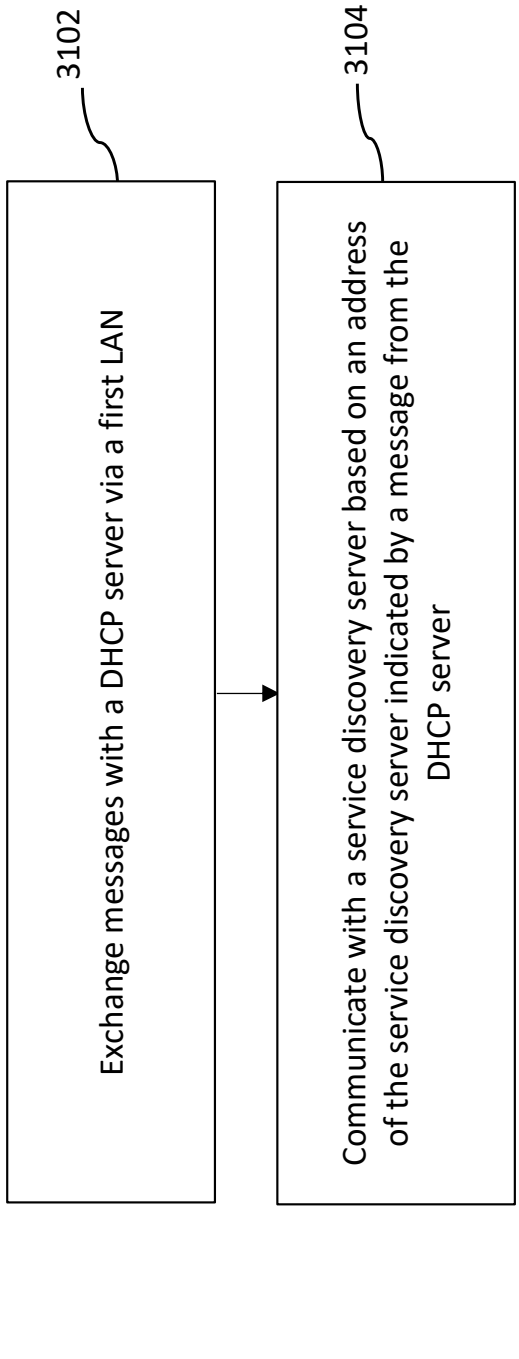

3102
3104
Exchange messages with a DHCP server via a first LAN
Communicate with a service discovery server based on an address of the service discovery server indicated by a message from the DHCP server
3100

Figure 31

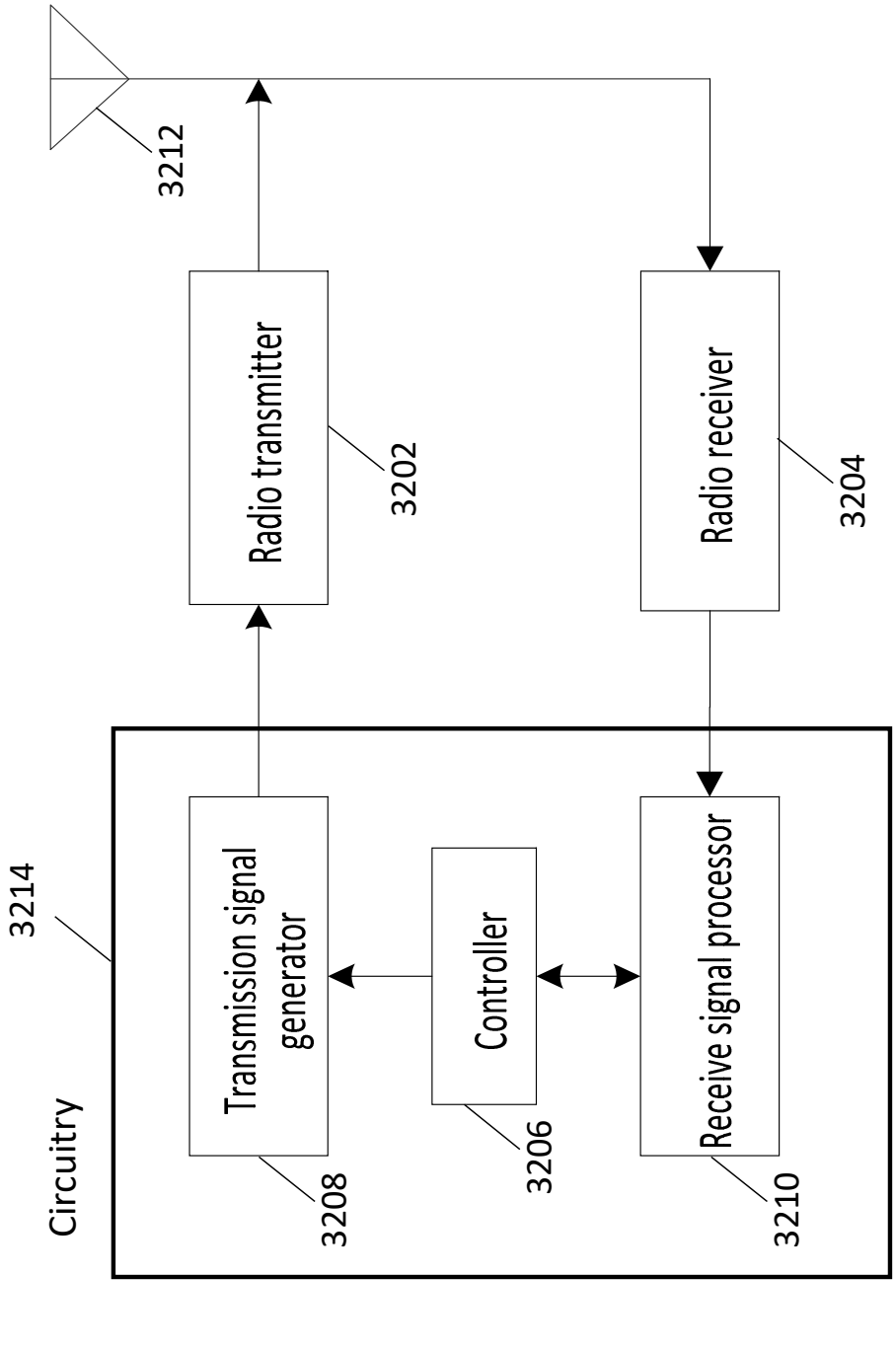

3212
Radio transmitter
3202
Radio receiver
3204
3214
Circuitry
Transmission signal generator
3208
Controller
3206
Receive signal processor
3210
3200

Figure 32