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(54) **SEAMLESSLY NETWORKED END USER DEVICE**

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(57) **ABSTRACT**

An end user device is provided that supports a connection to a plurality of data communication networks. The end user device detects which data communication networks are available, and selectively determines which of the plurality of data communication networks provides the most optimal communication channel. The end user device also provides for seamless transitions between different data communication networks, thus permitting all network communication tasks to be performed in a seamless, uninterrupted manner regardless of the location of the device, the type of network connection being used, or the form of data communication being carried out. The end user device further provides for simultaneous communication over a plurality of data communication networks utilizing a single network identity.

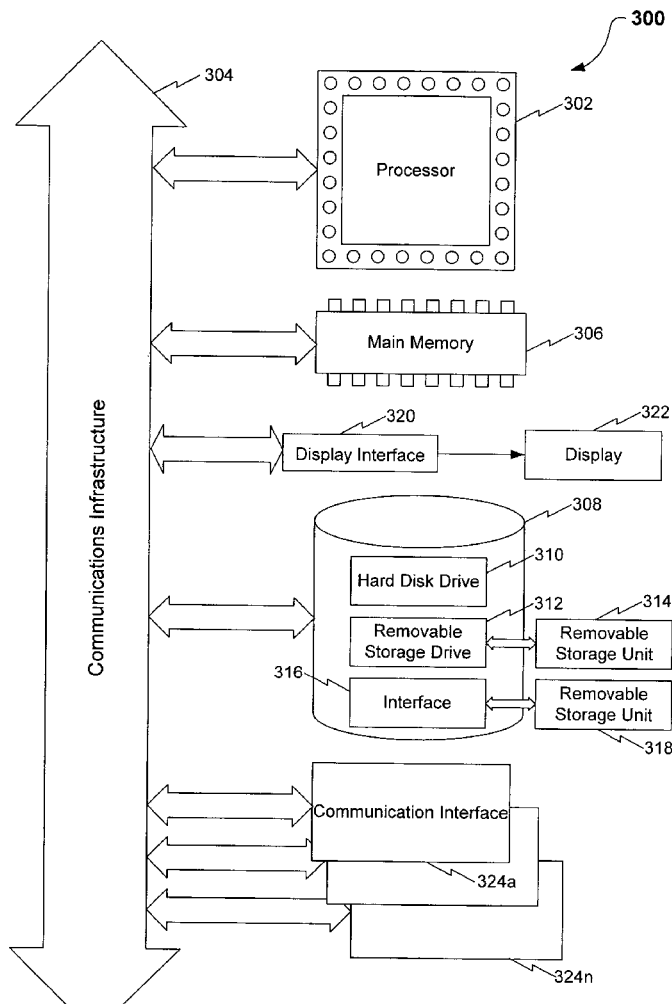
(73) Assignee: **Broadcom Corporation**

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(60) Provisional application No. 60/409,959, filed on Sep. 12, 2002.



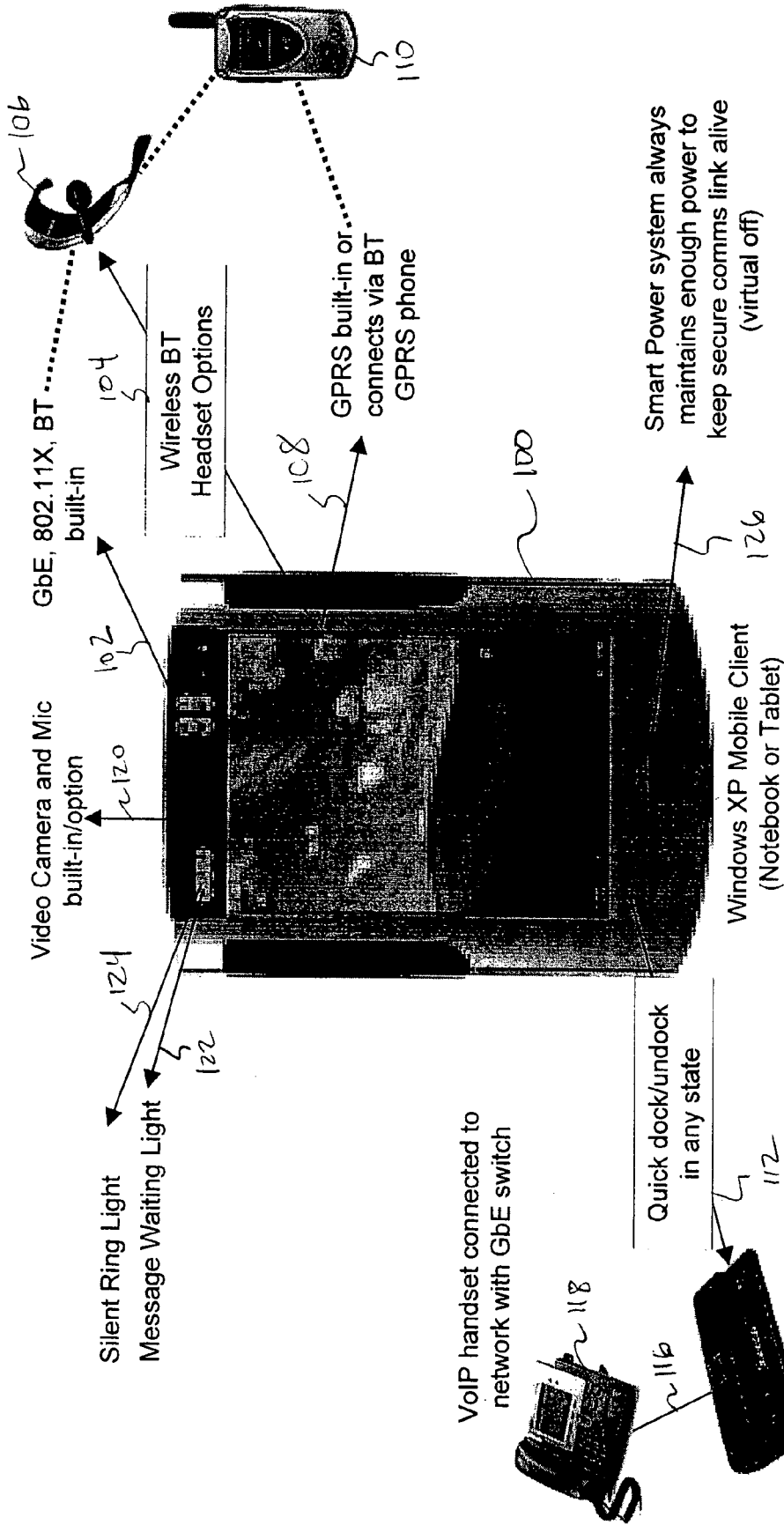


FIG. 1

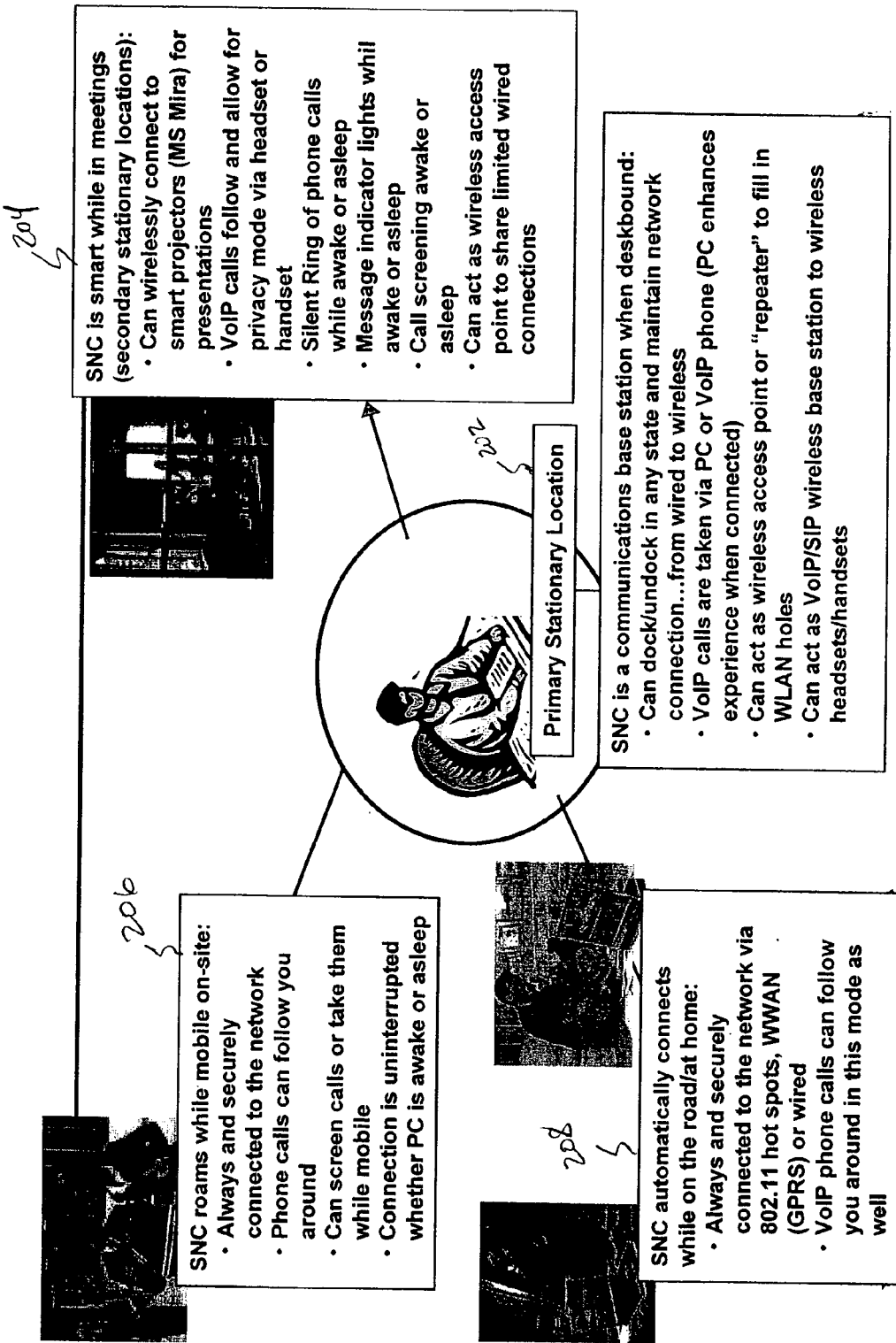


FIG. 2

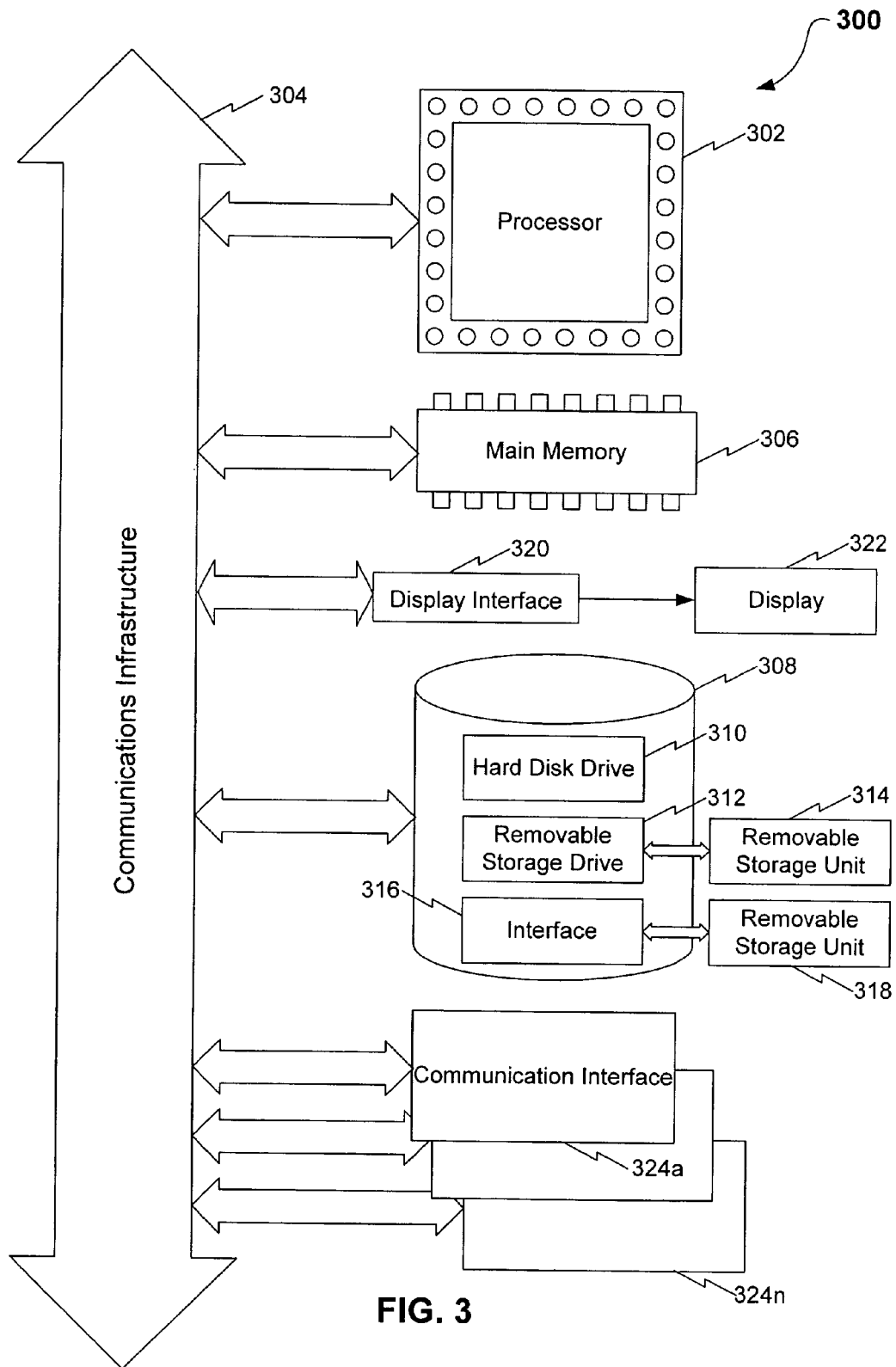


FIG. 3

SEAMLESSLY NETWORKED END USER DEVICE**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of U.S. Provisional Application No. 60/409,959, filed Sep. 12, 2002.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention is generally related to data communication networks. More specifically, the present invention is related to end user devices that are capable of interfacing with more than one data communication network.

[0004] 2. Background

[0005] A variety of data communication networks and protocols exist for transmitting data to and from an end user device. For example, conventional notebook or tablet personal computers (PCs) may communicate with a local area network (LAN) via a wired Ethernet connection or a wireless 802.11x connection, or may communicate with a wide area network (WAN) via a V.90 connection or a wireless General Packet Radio Service (GPRS) connection. Such devices may also connect to one or more communication peripherals, such as to a Voice over Internet Protocol (VOIP) phone via a wired network with Ethernet switch, or to a headset or GPRS phone via a wireless Bluetooth™ connection.

[0006] Depending on where the end user is located and the type of network application being used, each of these connection types may provide distinct advantages or disadvantages. For example, if the end user is in a primary stationary location, such as the office, and the end user device is docked, then a wired Ethernet connection may provide the most efficient data communication. However, if the end user is in a mobile mode, then a wireless connection may be necessary.

[0007] In conventional devices, transitioning between one type of network connection to another typically requires user intervention to terminate one network connection to initiate another. This makes transitioning from a mobile mode to a stationary mode or vice versa more difficult for the user. Furthermore, in conventional mobile computing devices, the cessation of a network connection (either through user action such as undocking the station, through a loss of power such as expired battery or disconnect from power source, or loss of signal in a wireless environment) can result in lost data and require the user to reinitiate the network connection.

BRIEF SUMMARY OF THE INVENTION

[0008] An end user device in accordance with embodiments of the present invention supports a connection to a plurality of data communication networks. The end user device detects which data communication networks are available, and selectively determines which of the plurality of data communication networks provides the most optimal communication channel. Whether a communication channel

associated with each available network, the number of anticipated “hops” between the end user device and the remote network entity to which it needs to communicate, the cost associated with establishing and maintaining a network link, the best path, and/or anticipated power consumption.

[0009] An end user device in accordance with embodiments of the present invention also provides for seamless transitions between different data communication networks, thus permitting all network communication tasks to be performed in a seamless, uninterrupted manner regardless of the location of the device, the type of network connection being used, or the form of data communication being carried out.

[0010] An end user device in accordance with embodiments of the present invention further provides for simultaneous communication over a plurality of data communication networks, thereby enabling enhanced error control capabilities, delivery of different data types (e.g., video, voice, and computer data) over separate channels to enhance efficiency and/or quality of data communication, increased communication speed through transmission of a data request over multiple data communication networks and acceptance of the fastest response, improved reliability through the automatic migration to a new data communication network when a first network connection fails, packet verification, guaranteed on-time packet delivery for applications that require a minimal Quality of Service (QOS), improved interactivity with a user base, and/or the ability to report problems occurring on a first data communication network over a second data communication network.

[0011] An end user device in accordance with an embodiment of the present invention also supports “in session” hand-offs between access points in a wireless data communication network.

[0012] An end user device in accordance with an embodiment of the present invention additionally utilizes a single network identity, such as a single log-in, Internet Protocol (IP) address, or telephone number, to simultaneously access a plurality of data communication networks.

BRIEF DESCRIPTION OF THE DRAWINGS/FIGURES

[0013] The accompanying drawings, which are incorporated herein and form a part of the specification, illustrate the present invention and, together with the description, further serve to explain the principles of the invention and to enable a person skilled in the pertinent art to make and use the invention.

[0014] **FIG. 1** is a high-level diagram of an end user device in accordance with an embodiment of the present invention.

[0015] **FIG. 2** illustrates functions of an end user device in accordance with embodiments of the present invention during stationary and mobile modes of operation.

[0016] **FIG. 3** depicts an example end user device in accordance with an embodiment of the present invention.

[0017] The present invention will now be described with

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