which provide a dedicated (connection-oriented paradigm) end-to-end channel portion (e.g., a time slot) for the duration of the call session, a packet-switched network that uses UDP as the transport layer and IP as the network layer is based on a connectionless oriented paradigm (both end-to-end and node-to-node). Packets or other units of data injected into a packet-switched data network may travel independently over any path (and possibly over different paths) to a destination point. For best effort quality of service, routing of packets in packet-switched communications is based on destination addresses carried in IP packets.

[**0028**] The overhead portion of each packet that carries real-time data can be rather large due to the presence of several headers, including RTP and IP headers as well as a User Datagram Protocol (UDP) header. UDP is described in RFC 768, entitled "User Datagram Protocol," dated August 1980. One issue associated with carrying the protocol header information, which in one embodiment includes the RTP, UDP, and IP headers, is the increased bandwidth required to carry the overhead information. This reduces spectral efficiency over the air interface (where bandwidth is a scarce and expensive commodity) between mobile stations and respective radio network controllers **12** and **14**. In addition, channel coding and interleaving schemes that have been standardized for channels carrying circuit-switched voice traffic (without the protocol headers) may no longer be acceptable for packet-switched voice traffic encapsulated in packets containing the RTP, UDP, and IP header information. Consequently, new channel coding and interleaving standards may have to be developed and adopted, which is typically a time consuming and complex process. Also, radio equipment (such as base stations) may have to be replaced if new channel coding and interleaving schemes are developed.

[**0029**] To address these issues, each end of the air interface between a mobile station and a radio network controller is capable of removing the RTP, UDP and IP headers from each packet before transmission of bearer traffic (e.g., voice data or other form of real-time data) over the air interface. Alternatively, instead of removing the protocol headers, a mobile station can simply choose not to generate the protocol headers. The receiving end then reconstructs the RTP, UDP, and IP header information. Thus, what is sent over the air interface is the bearer traffic itself without the overhead of the RTP, UDP, and IP headers. A benefit of sending bearer traffic (e.g., voice-over-IP data) without protocol headers is that existing channel coding and interleaving schemes can be used. Also, spectral efficiency is enhanced since communication of overhead information in each and every bearer packet can be avoided.

[**0030**] At least two alternative implementations of the protocol header removal/reconstruction scheme are possible. In a first implementation, the mobile station is a device (or plural devices) that requires the RTP/UDP/IP header information to be (1) constructed and then removed for voice data (or other forms of real-time data) transmitted on the uplink path from the mobile station to the radio network controller, and (2) reconstructed for voice data (or other forms of real-time data) received on the downlink path from the radio network controller to mobile station. In one example, the mobile station includes a computer (referred to as the TE device) coupled to a terminal (referred to as the MT device) capable of wireless communications with base station transceiver and a radio network controller. The combination of the TE and MT devices makes up the mobile station or user equipment (UE). In this example, the computer (or TE device) expects to receive voice packets (or other forms of real-time packets) that contain the appropriate protocol headers (e.g., RTP/UDP/IP headers) for the packet-switched communications.

[**0031**] In another arrangement of the first implementation, the mobile station is a single integrated device that includes software layers, including a protocol stack (e.g., RTP/UDP/IP stack), to receive packets that contain RTP/UDP/IP headers.

[**0032**] In the first implementation, the mobile station removes RTP/UDP/IP header information from packets that are communicated on the uplink to the radio network controller. The mobile station reconstructs RTP/UDP/IP header to add to packets containing bearer data received on the downlink.

[**0033**] In a second implementation, the mobile station can be a device such as a telephone that does not need to generate or reconstruct RTP/UDP/IP header information for voice data (or other forms of real-time data) transmitted on the uplink or received on the downlink, respectively. In this example, the mobile station includes the MT device without the TE device. Thus, bearer traffic, such as voice-over-IP data or other forms of real-time data, are passed directly to the other components of the mobile station for processing without reconstructing protocol headers. On the uplink, the mobile station either removes RTP/UDP/IP header information from packets or never actually generates the RTP/UDP/IP header information so that bearer data is communicated on the uplink without protocol headers.

[**0034**] In both implementations, the radio network controller (**12** or **14**) removes protocol headers associated with a packet-switched communications session before transmitting bearer traffic on the downlink. For example, IP packets containing bearer traffic are received from the SGSN **24**. The radio network controller **12** or **14** removes the RTP/UDP/IP headers from the packets and communicates the bearer traffic without the protocol headers over the downlink of the air interface to the target mobile station.

[**0035**] On the uplink, the radio network controller receives bearer traffic without protocol headers. It then reconstructs the protocol headers to add to packets containing the bearer traffic for communication to the SGSN **24**.

[**0036**] Referring to **FIG. 2**, an IP packet **200** for carrying bearer traffic (e.g., voice traffic or other forms of real-time traffic) is illustrated. The packet **200** includes an IP header **202**, a UDP header **204**, an RTP header **206**, and a payload section **208**. In the illustrated example, the payload section **208** carries the bearer traffic in RTP format.

[**0037**] In a packet-switched communications session over an IP network that involves an exchange of real-time data (e.g., voice data), IP packets according to the format of packet **200** are communicated between endpoints. At the transmitting endpoint, real-time data is converted into RTP format, and added as payload to the UDP/IP packet. The IP packet is communicated over the IP network to the receiving endpoint, where the real-time data is extracted. The IP header contains source and destination addresses that are used for routing the respective RTP/UDP/IP packet; how-