MOBILE COMPUTING

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20PW37

Slides 43-46:

The following are part of the General Packet Radio Service (GPRS) architecture:

1. The **GPRS Base Station Subsystem** (GBSS) provides packet-switched data services to mobile devices. It is responsible for managing the radio communication between mobile devices and the network.The BSS consists of the Base Transceiver Station (BTS) and the Base Station Controller (BSC).
2. **Base Transceiver Station** (BTS): The BTS is responsible for transmitting and receiving radio signals to and from mobile devices. It is also responsible for radio resource management.
3. **Base Station Controller** (BSC): The BSC is responsible for controlling and managing the BTSs. It is also responsible for allocating and releasing radio resources and providing handover support.
4. **Serving GPRS Support Node** (SGSN): The SGSN is responsible for routing and forwarding packet data between the mobile devices and the external packet data network.
5. **Gateway GPRS Support Node** (GGSN): The GGSN is responsible for routing and forwarding packet data between the SGSN and the external packet data network. It is also responsible for interfacing with other network elements, such as the Internet and corporate networks.

When a subscriber initiates a call or data transmission from their mobile devices, the signal is transmitted wirelessly over the air interface to the Base Transceiver Station (BTS) in the cellular network. From there, the signal is sent to the Base Station Controller (BSC) which then separates the voice and data traffic.
The voice traffic is sent to the Mobile Switching Center (MSC) in the same way as a standard GSM call, while the data traffic is sent to a new device called the Serving GPRS Support Node (SGSN). The SGSN is responsible for routing the data traffic to the appropriate destination, such as the internet or another mobile device on the network.
This separation of voice and data traffic allows for more efficient use of network resources and enables the network to handle both voice and data traffic simultaneously.

ROUTING AREA:

In GPRS networks, the Routing Area (RA) is a smaller geographical area than the LA, consisting of several cells from different Base Transceiver Stations (BTSs). When a mobile device moves from one RA to another, it only needs to perform a routing area update, which involves signaling messages that are sent to the network to notify it of the new location of the mobile device. Because routing areas are smaller than location areas, the number of cells involved in a routing area update is smaller than in a location area update, and fewer radio resources are consumed during the update process.

Benefits of GPRS

1. High data transfer speeds: GPRS provides high-speed data transmission, with typical speeds of up to 114 kbps. This makes it ideal for applications that require high-bandwidth, such as multimedia messaging, internet browsing, and email.
2. Always-on connectivity: Unlike traditional circuit-switched networks, GPRS provides always-on connectivity, allowing users to stay connected to the internet and receive data even when they are not actively using the device.
3. Cost-effective: GPRS is a more cost-effective way to transmit data than traditional circuit-switched networks.
4. Improved efficiency: GPRS uses packet-switched technology, which allows data to be transmitted more efficiently than circuit-switched networks. This results in better utilization of network resources and improved network efficiency.