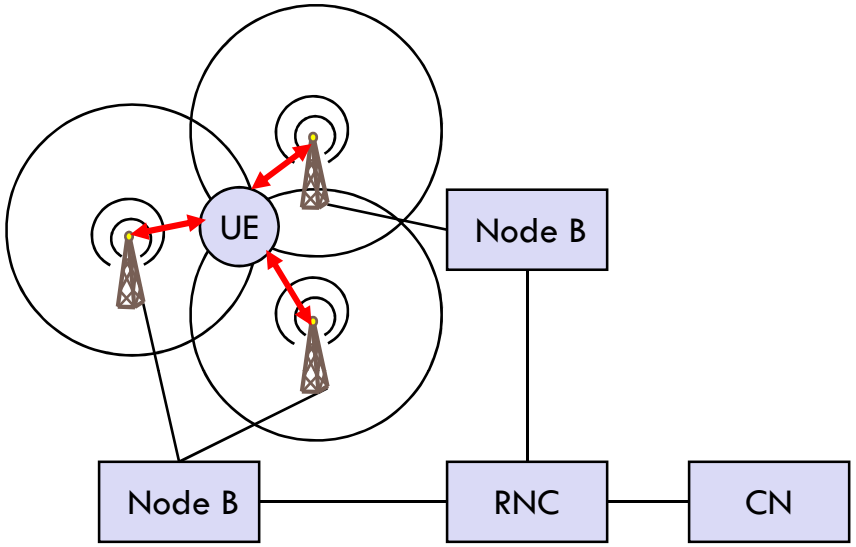
UNIT- III
UMTS-HAND OVER TYPES

MADHESWARI.K/AP/CSE 15/02/2017

UMTS-Handover

- **Handover**
  - **Hard handover**
    - UTRA-TDD can only use this type. Switching between TDD cells is done between the slots of different frames at a certain point in time.
    - **Inter frequency handover** (changing the carrier frequency) is a hard handover.
    - All inter system handover are hard handovers in UMTS (to and from GSM or IMT-2000 systems).
    - During a compressed mode which enables a UE to listen into GSM or other frequency bands, the spreading factor can be lowered or less data is sent before and after the break in transmission.
  - **Soft handover:** In CDMA they use macro diversity. A UE receiving data from different antennas at the same time makes a handover soft.

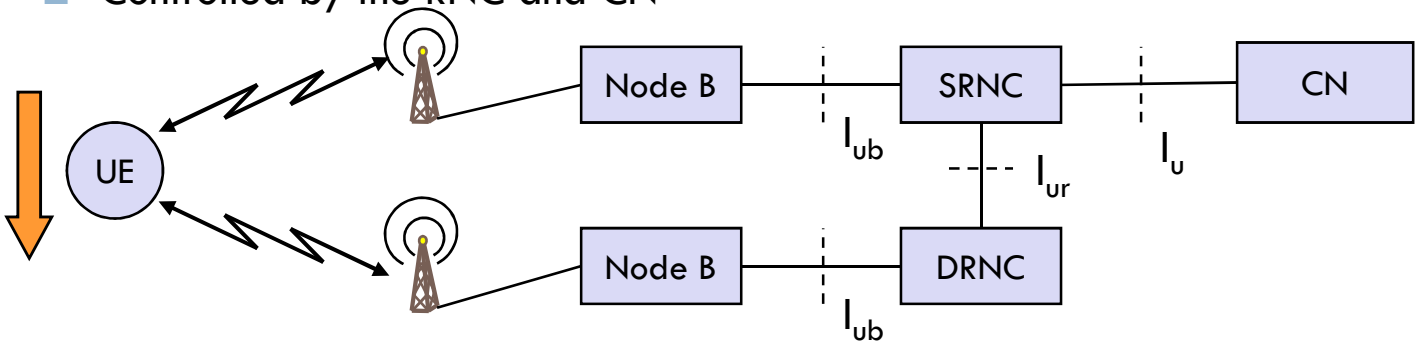
Support of mobility: macro diversity



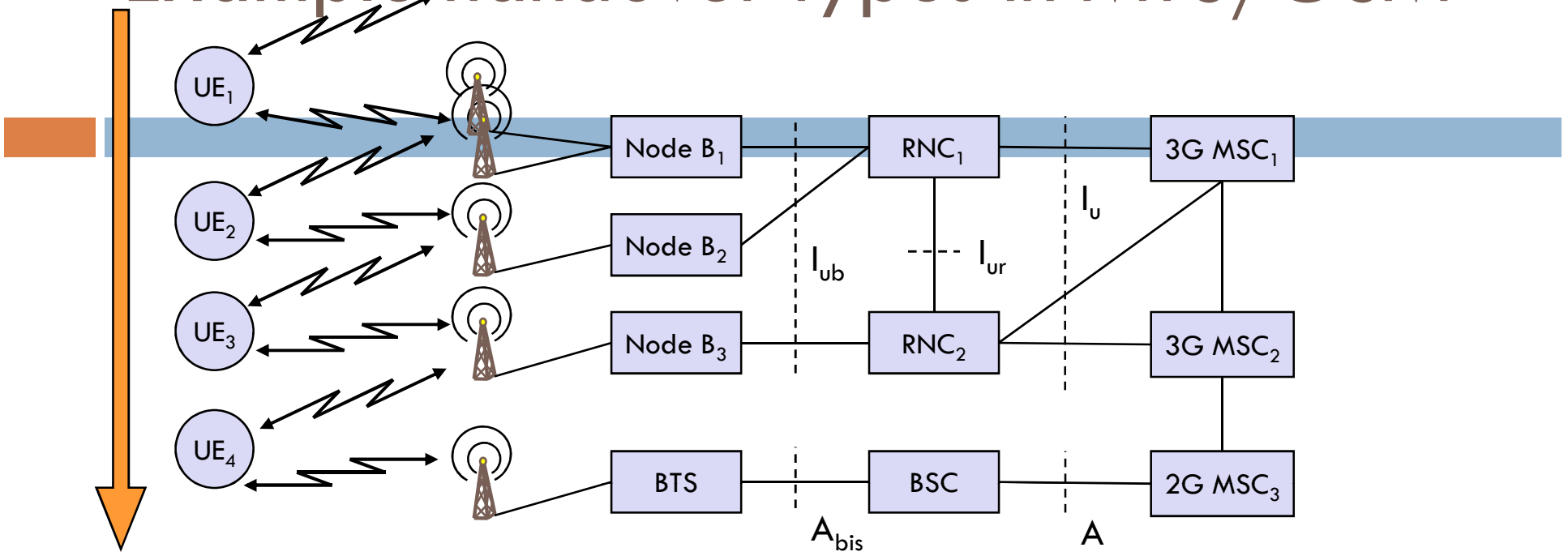
- Multicasting of data via several physical channels
  - Enables soft handover
  - FDD mode only
- Downlink
  - The RNC splits the data stream and forwards it to different nodes B. It allows simultaneous transmission of data via different cells. The UE combines the received data again.
  - Different spreading codes in different cells
- Uplink
  - The UE sends its data which is then received by several Node Bs.
  - Reconstruction of data at Node B, SRNC (Serving RNC) or DRNC (Drift RNC)

Support of mobility: handover

- From and to other systems (e.g., UMTS to GSM)
  - This is a must as UMTS coverage will be poor in the beginning
- RNC controlling the connection is called SRNC (Serving RNC)
- RNS offering additional resources (e.g., for soft handover) is called Drift RNC (DRNC)
- End-to-end connections between UE and CN only via I_u at the SRNS
  - Change of SRNC requires change of I_u
  - Initiated by the SRNC
  - Controlled by the RNC and CN



Example handover types in MTS/GSM



- Intra-node B, intra-RNC – UE_1 moves from one antenna, soft handover
- Inter-node B, intra-RNC – UE_2 moves from node B_1 to node B_2, soft handover
- Inter-RNC – UE_3 moves from node B_2 to node B_3, Intra-RNC – soft handover, Inter-RNC – hard handover.
- Inter-MSC – MSC_2 takes over and perform a hard handover
- Inter-system – UE_4moves from a 3G UMTS network into a 2G GSM network, hard handover.

Handover

- Intra-node B, intra-RNC
  - UE_1 moves from one antenna
- Inter-node B, intra-RNC
  - UE_2 moves from node B_1 to node B_2
- Inter-RNC
  - UE_3 moves from node B_2 to node B_3
- Inter-MSC
  - MSC_2 takes over and perform a handover
- Inter-system
  - UE_4moves from a 3G UMTS network into a 2G GSM network.

UMTS services (originally)

Service Profile	Bandwidth	Transport mode	
High Interactive MM	128 kbit/s	Circuit switched	Bidirectional, video telephone
High MM	2 Mbit/s	Packet switched	Low coverage, max. 6 km/h
Medium MM	384 kbit/s	Circuit switched	asymmetrical, MM, downloads
Switched Data	14.4 kbit/s	Circuit switched	
Simple Messaging	14.4 kbit/s	Packet switched	SMS successor, E-Mail
Voice	16 kbit/s	Circuit switched	

- Data transmission service profiles
- Virtual Home Environment (VHE)
  - Enables access to personalized data independent of location, access network, and device
  - Network operators may offer new services without changing the network
  - Service providers may offer services based on components which allow the automatic adaptation to new networks and devices
  - Integration of existing IN services