CS Core & Network Fundamentals

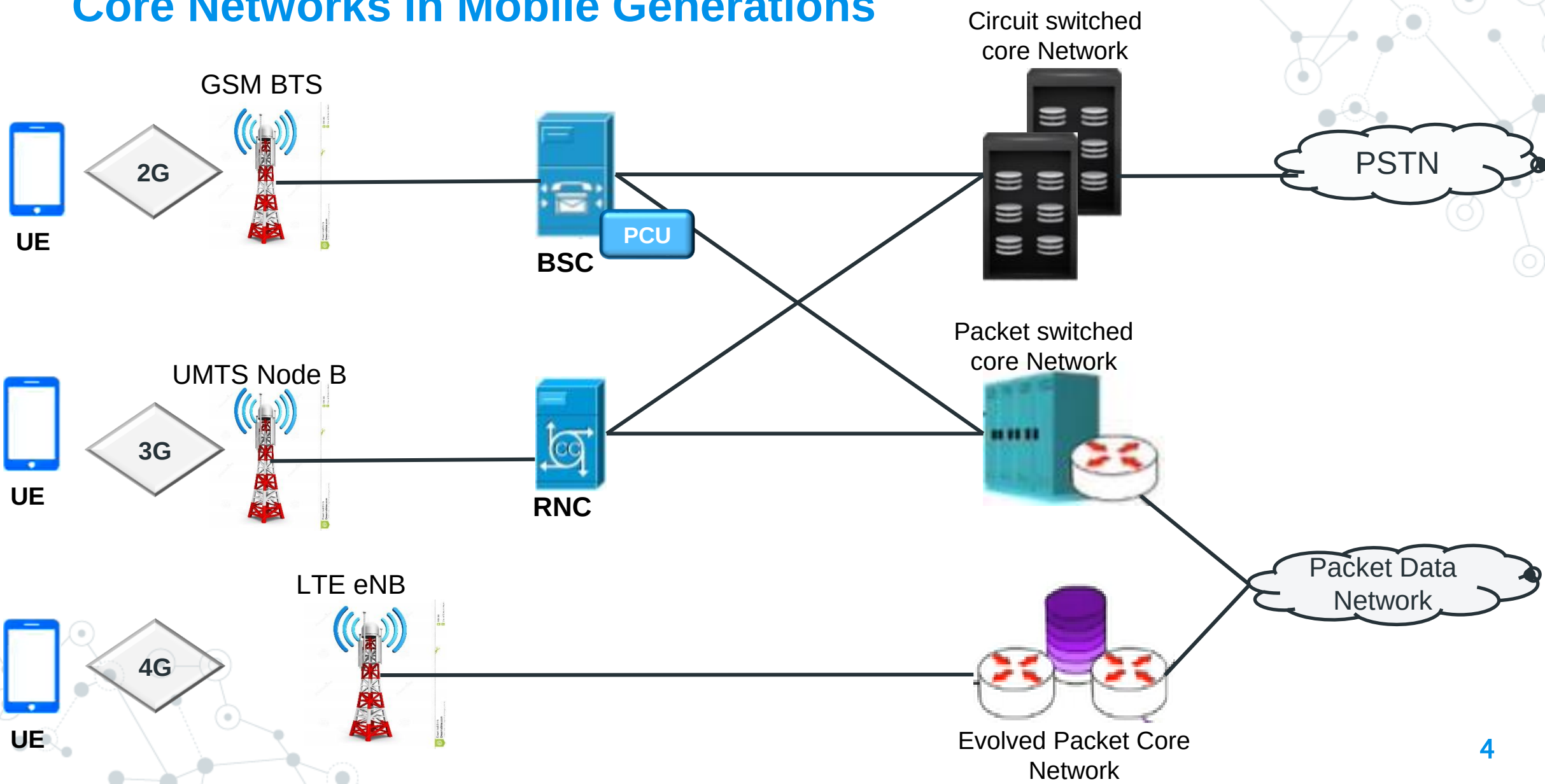
1.

Core Networks in Mobile Generations

Upon Completion of This lecture you will be able to:

- Describe the type of Core Networks in each Mobile Generation
- CS Core Refers to circuit Switching core Networks
- You will be able to explain the differences between Circuit & Packet Switching.
- You will know that in 4G we use New core called EPC.

Core Networks in Mobile Generations



2.

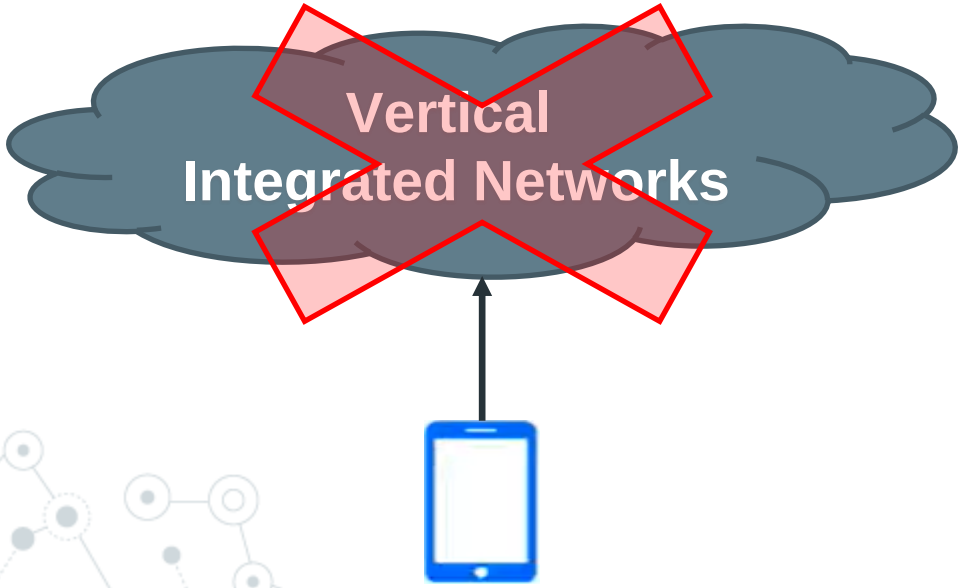
Layered Network Architecture

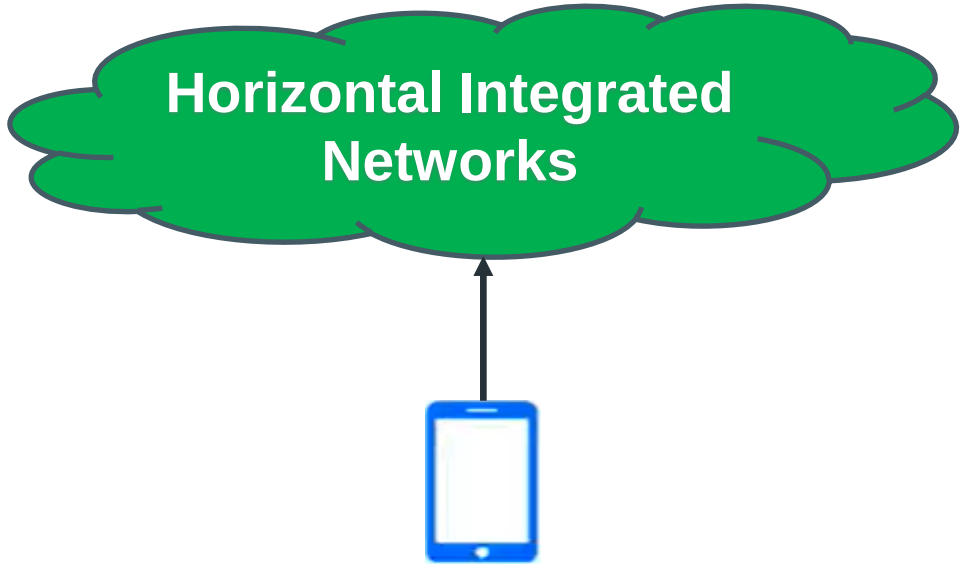
Upon Completion of This lecture you will be able to:

- Describe the concept of Vertically and Horizontally integrated networks.
- You will be able to explain the differences between Vertical & Horizontal Networks.
- Determines which Networks we are using in current Mobile Networks.

Layered Network Architecture

- Over the last few years or so, a major change for modern telecommunications networks has been the shift from a Vertically Integrated network model to a Horizontally integrated network model.
- There is a push to migrate all telecommunication networks to a horizontal layered model.

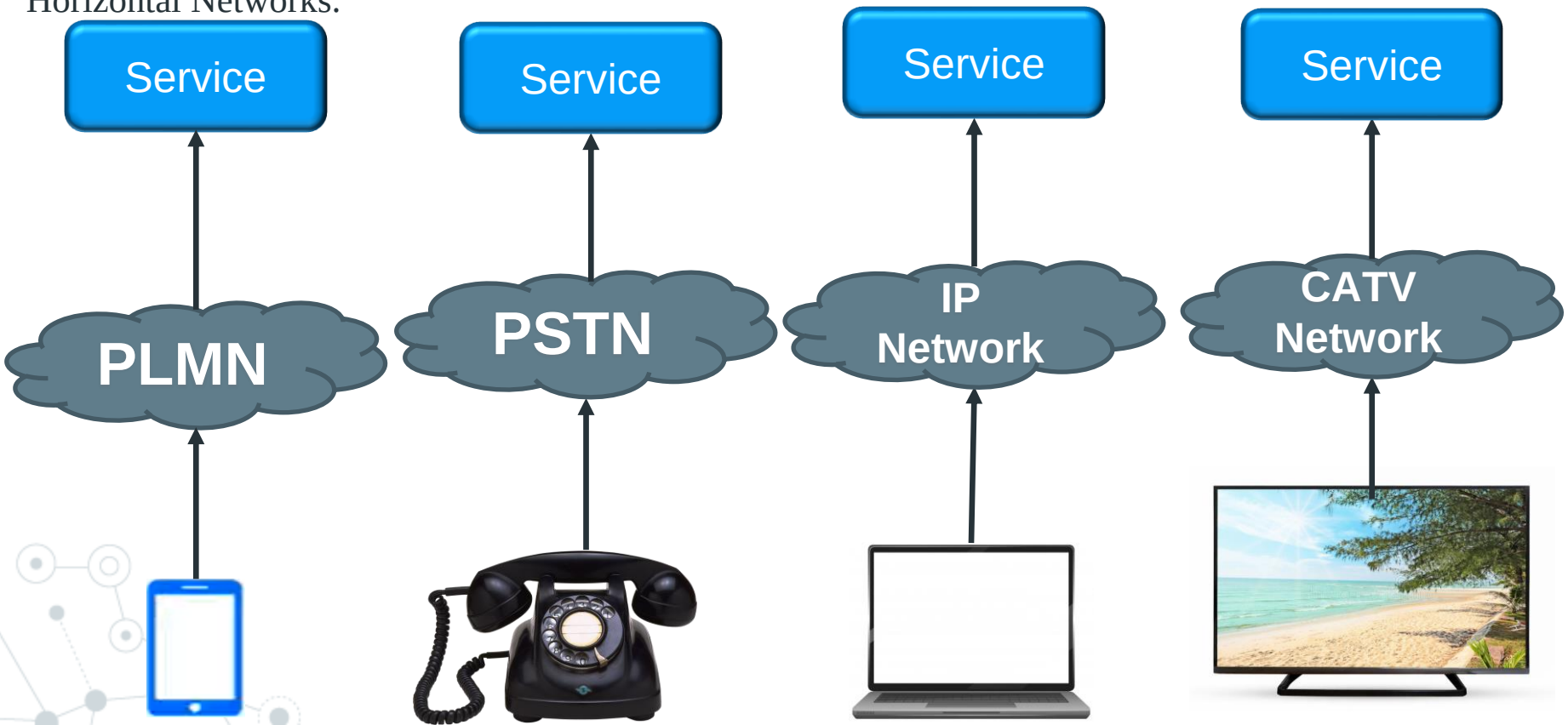




Layered Network Architecture

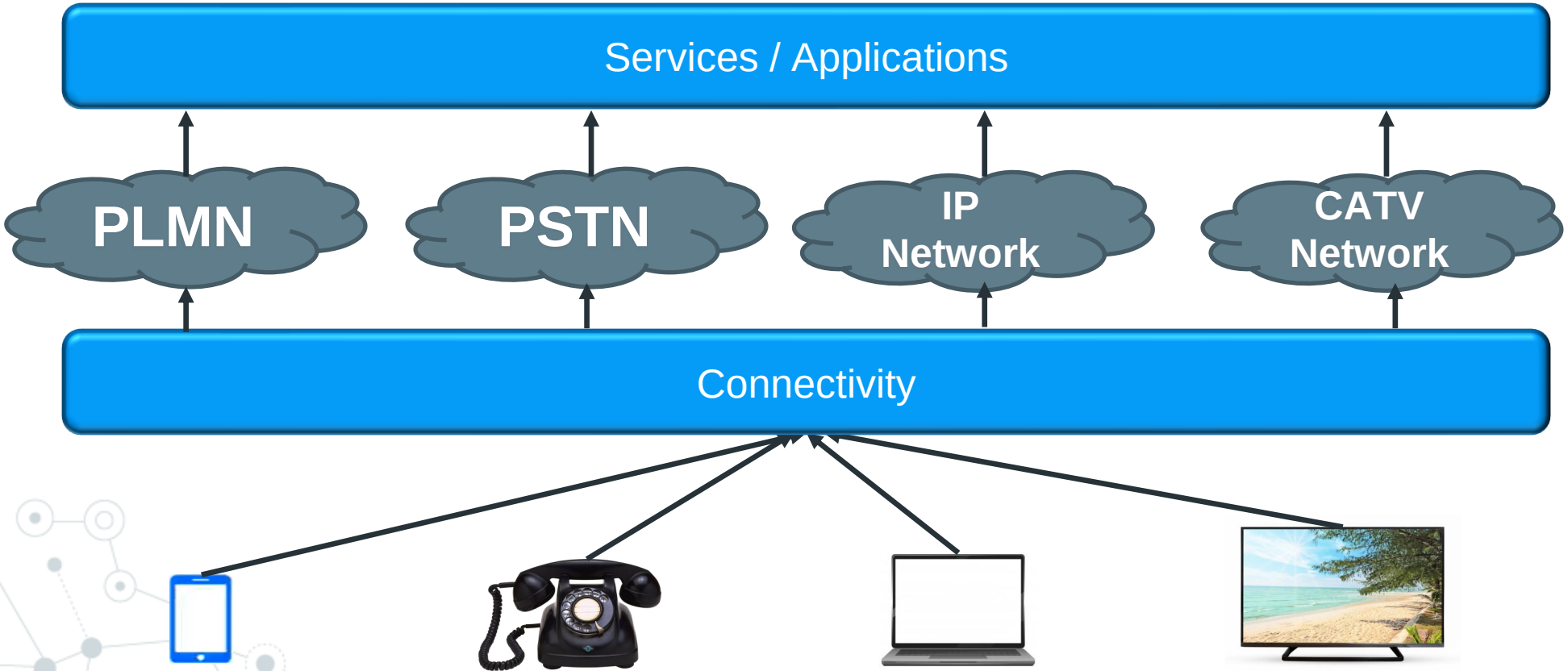
Vertically integrated networks

- Vertically integrated networks are optimized for a particular service category and typically offer a single service.
- New Integration to vertical Networks is done, to provide reliable communication , This approach is called Horizontal Networks.

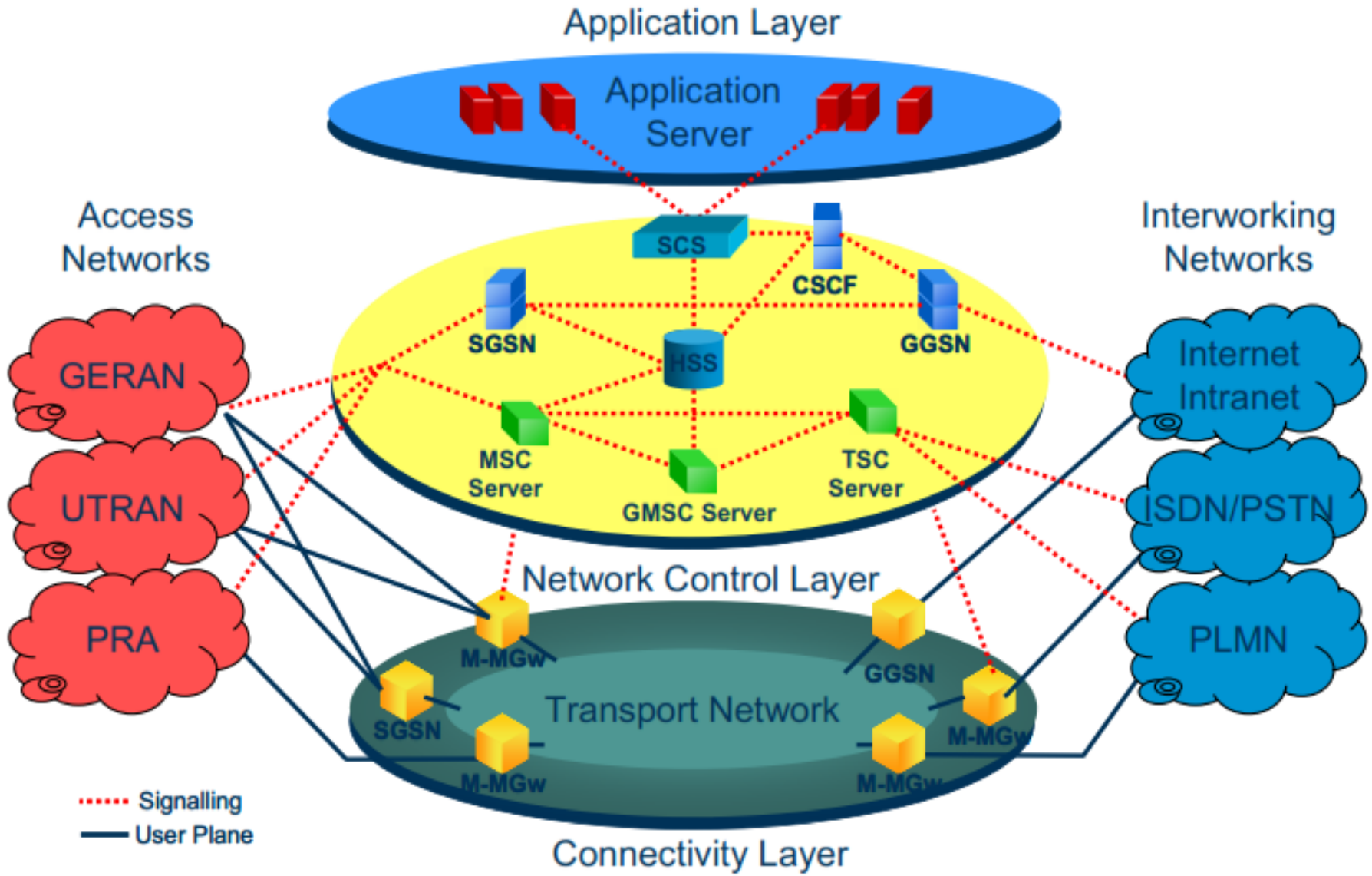


Layered Network Architecture

- **Horizontally integrated networks**
  - In the horizontally integrated network model, each layer provides a particular function independent of other layers.



Lavered Network Architecture



Layered Network Architecture

Horizontally integrated networks

- In the horizontally integrated network model, each layer provides a particular function independent of other layers.

1. The Connectivity layer provides transport functionality. The key nodes located in the Connectivity layer are the Media Gateways

2. The Control layer provides control functionality and consists of various Control servers that control the Media Gateways.

3. The Services/Application layer provides services and applications via Application Servers and Service Capability Servers.

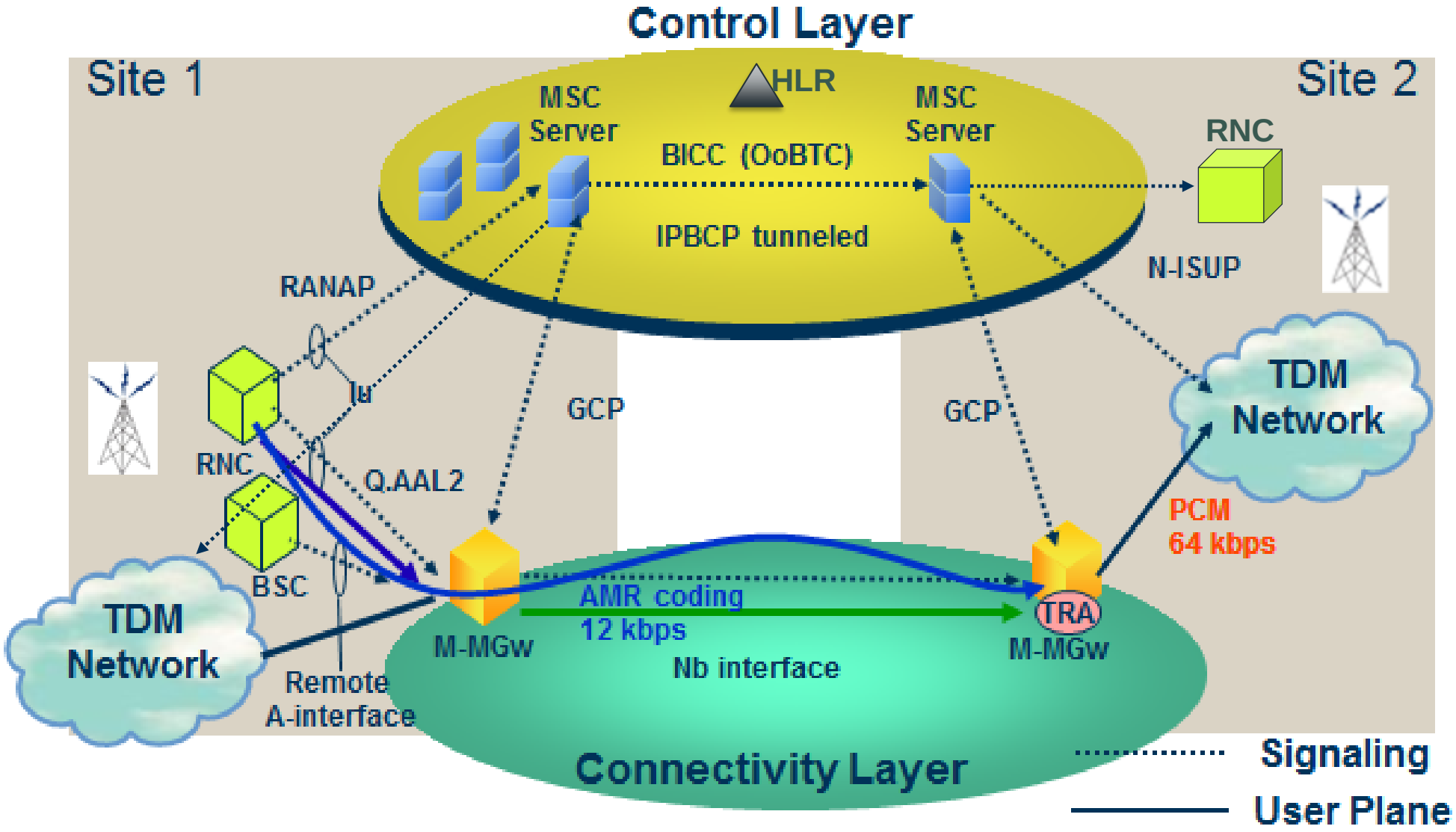
3.

Quick Brief about Circuit switching core Networks

Upon Completion of This lecture you will be able to:

- Understand that MSCS is the Main Node in circuit switching core Networks.
- The term ‘Core Network’ is typically used to describe the core components of the Control and Connectivity layer

Layered Network Architecture



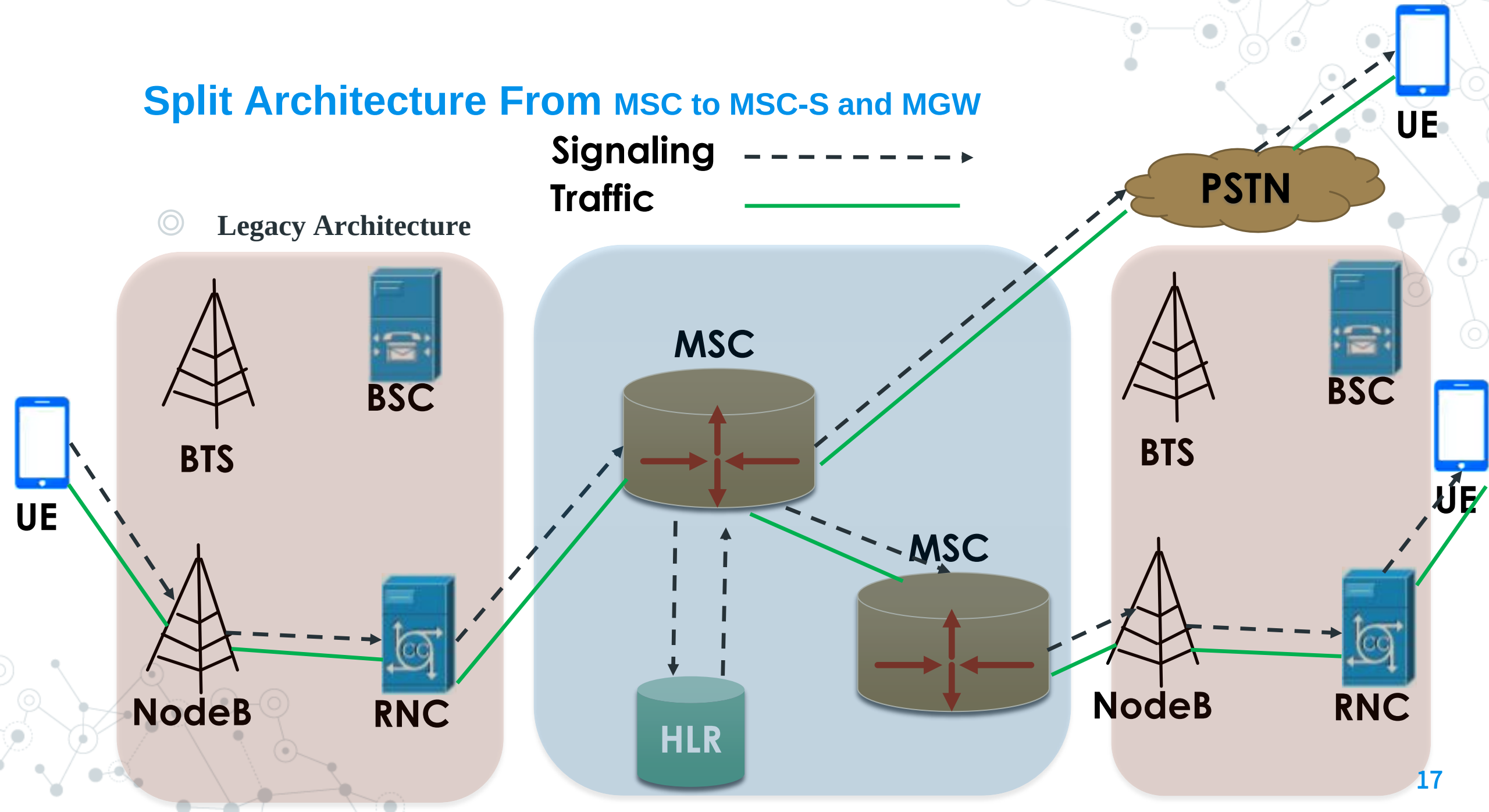
4.

Split Architecture From MSC to MSC-S and MGW

Upon Completion of This lecture you will be able to:

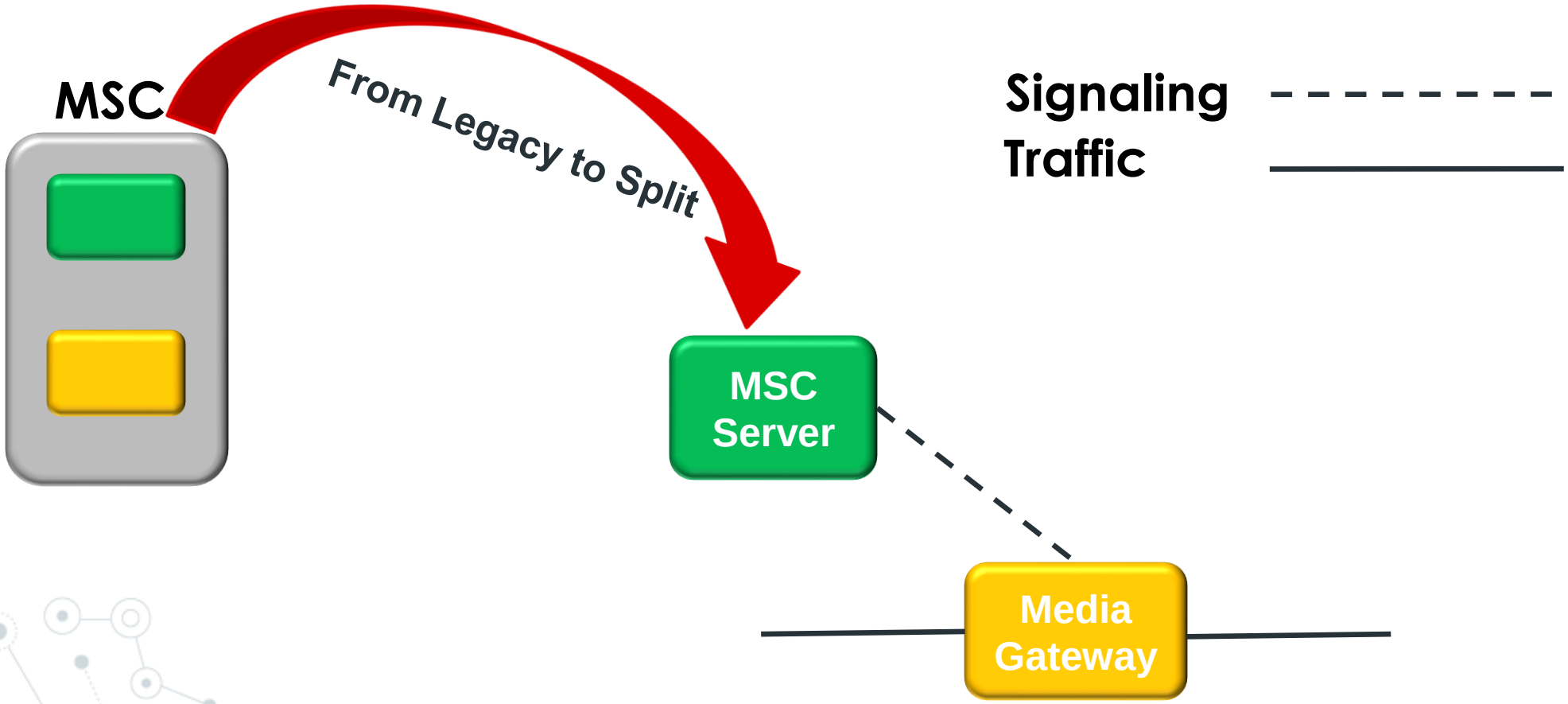
- You will know how to differentiate between access networks and Core Networks.
- You will know the meaning of Legacy architecture and Split Architecture.

Split Architecture From MSC to MSC-S and MGW



Split Architecture From MSC to MSC-S and MGW

- Monolithic Architecture Vs Split Architecture



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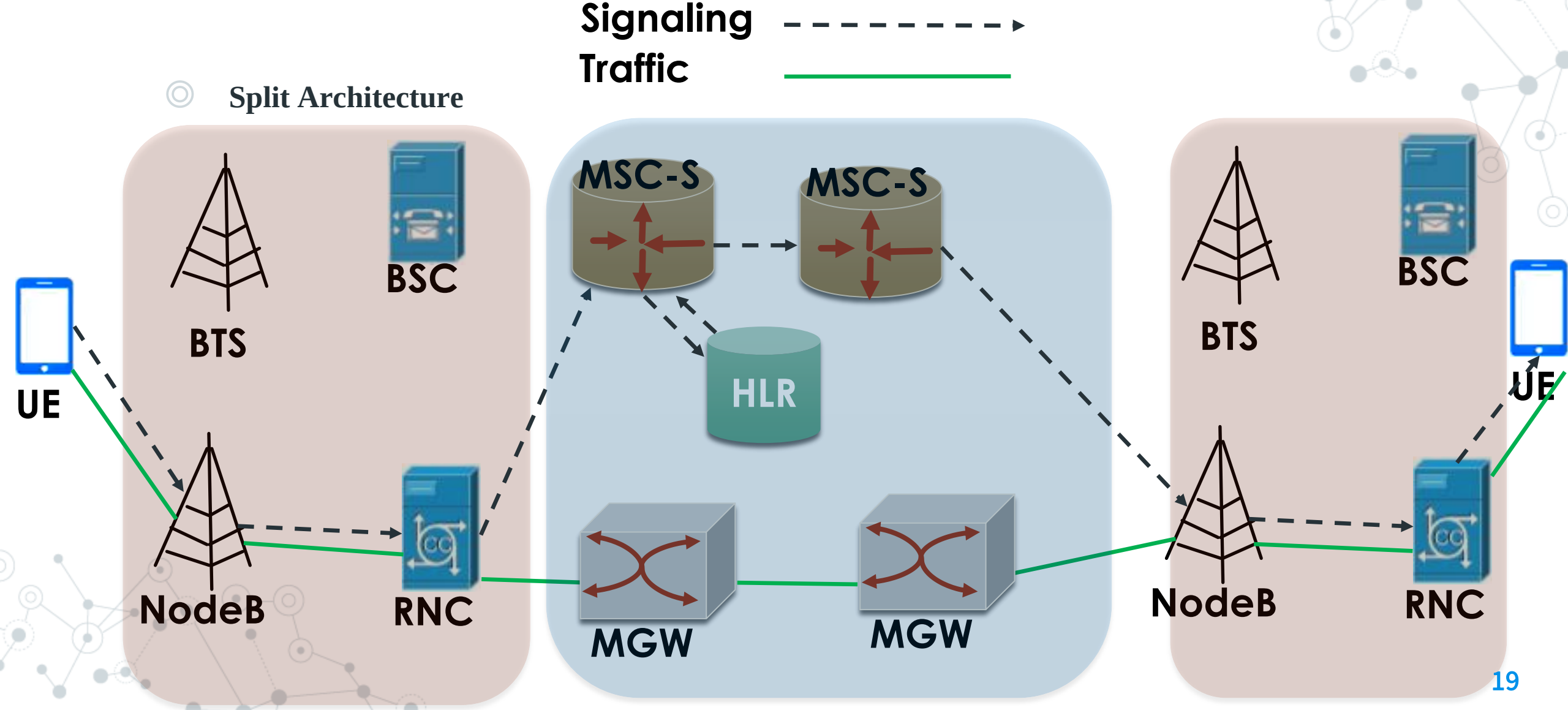


5.

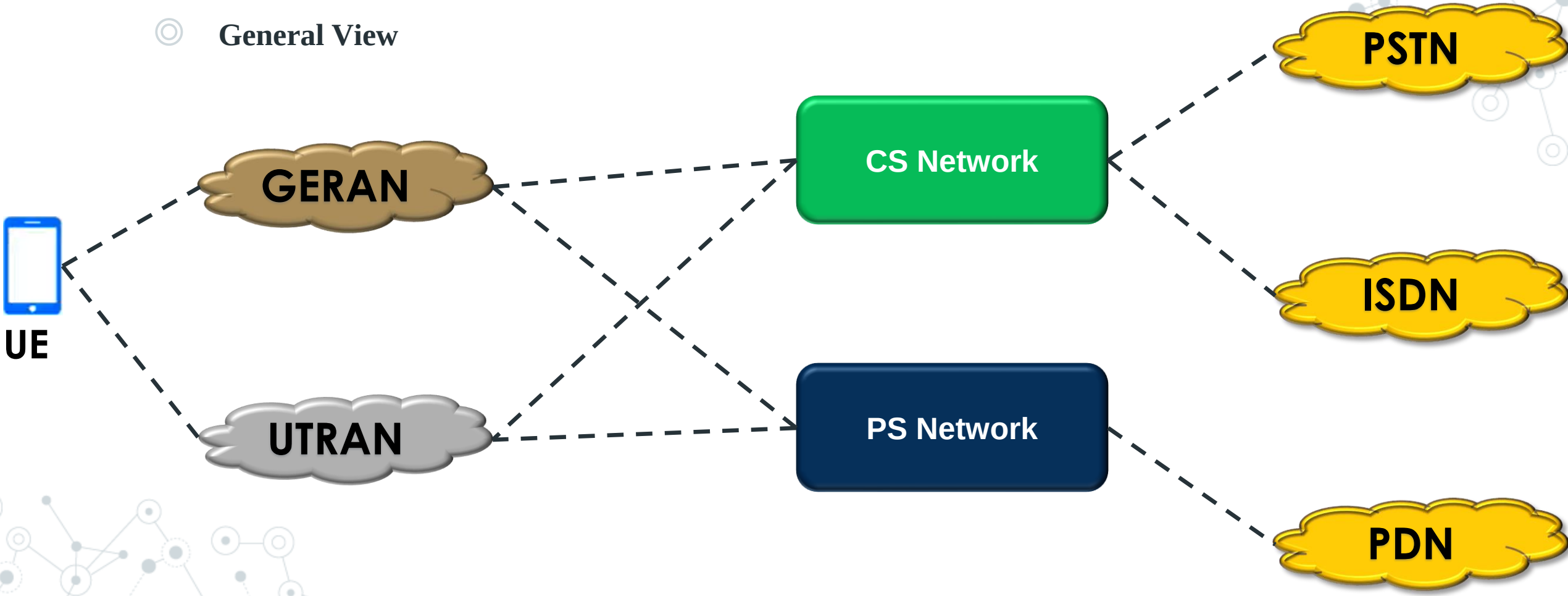
Mobile Network Access & Core Elements

Upon Completion of This lecture you will be able to:

- We will know that, In the 2G Networks it’s Structure is : GERAN Access connected to CS & PS Networks.
- We will know that. In the 3G Networks it’s Structure is: UTRAN connected to CS & PS Networks.
- We will learn the function of each node in the GERAN, UTRAN, CS & PS Networks.

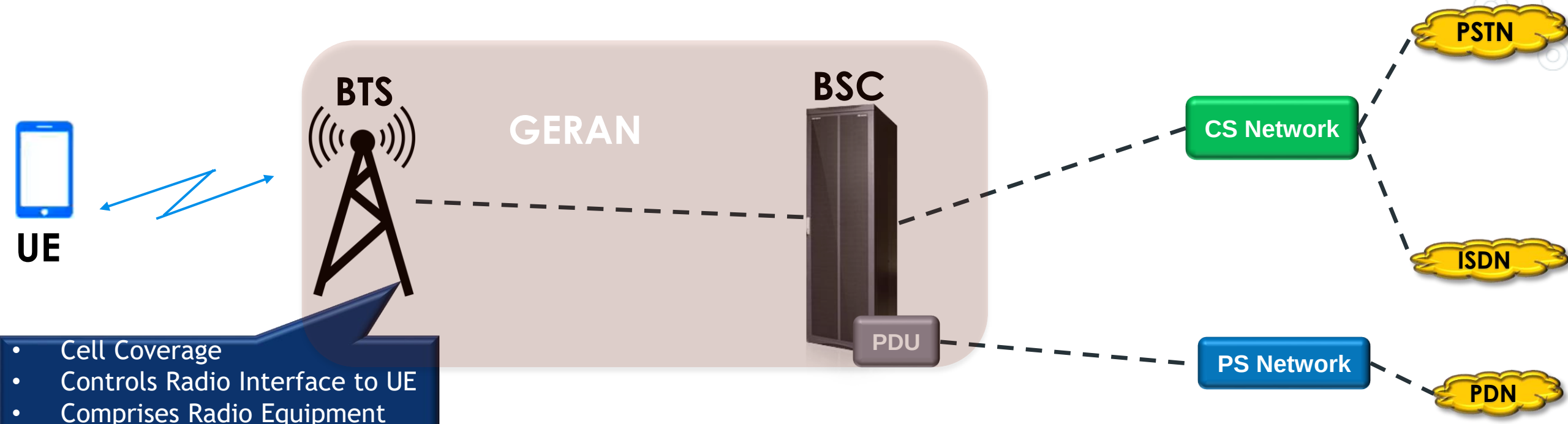
Mobile Network Access & Core Elements

- General View



Mobile Network Access & Core Elements

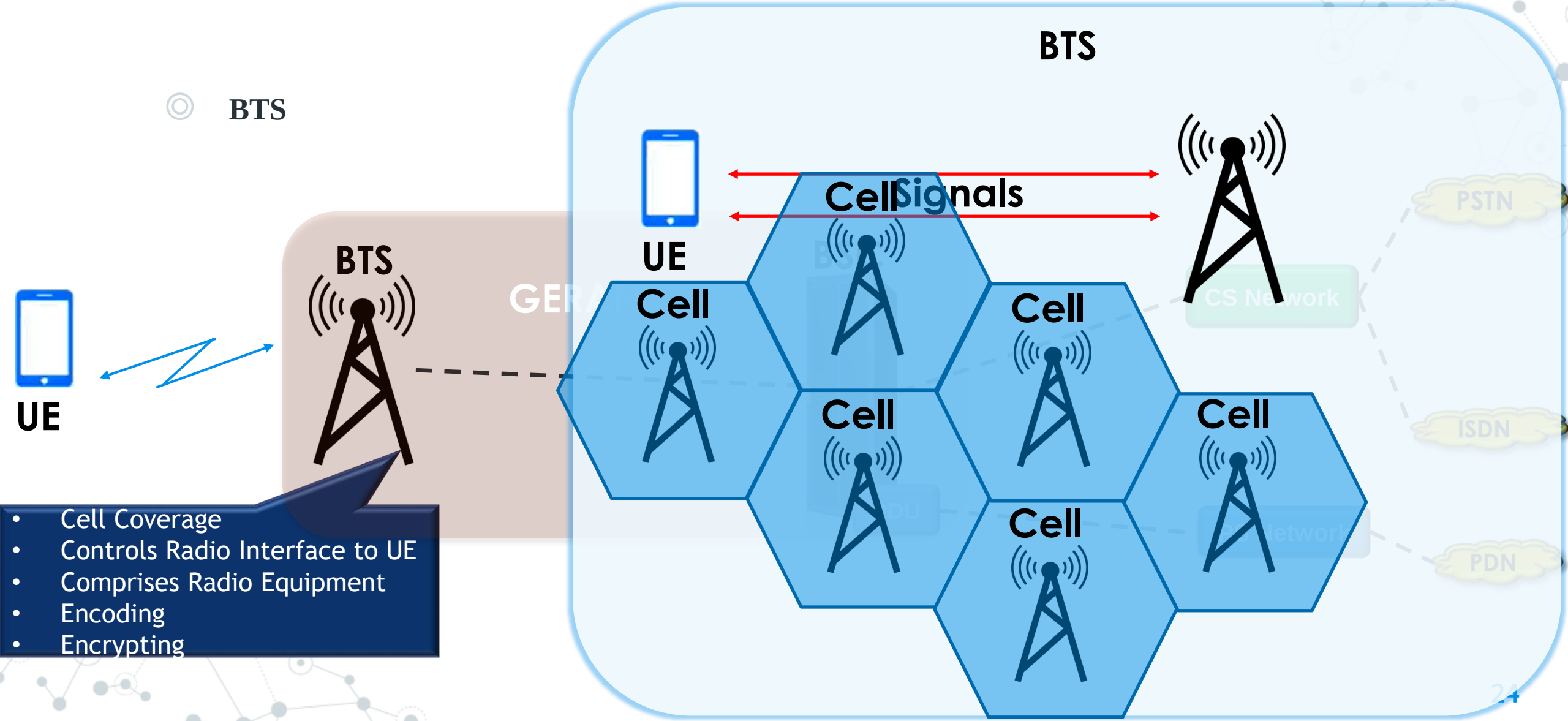
- GERAN



- Cell Coverage
- Controls Radio Interface to UE
- Comprises Radio Equipment
- Encoding
- Encrypting

Mobile Network Access & Core Elements

- BTS



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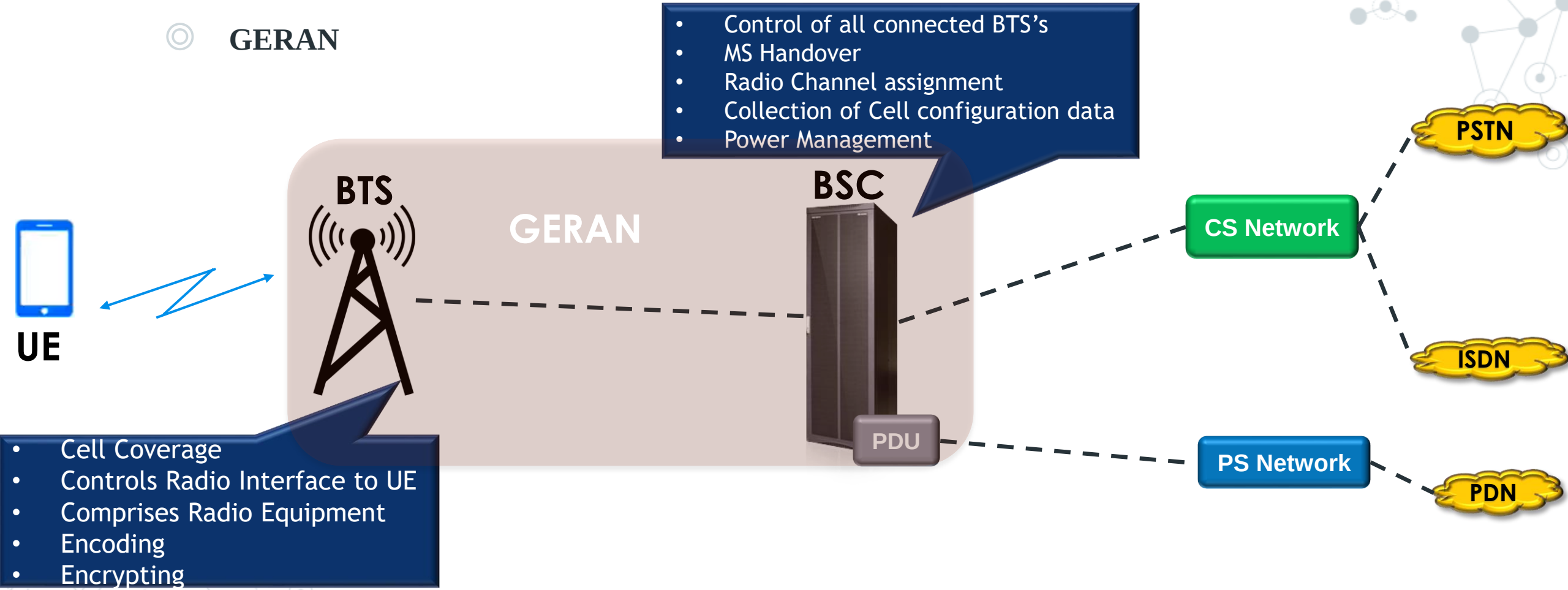
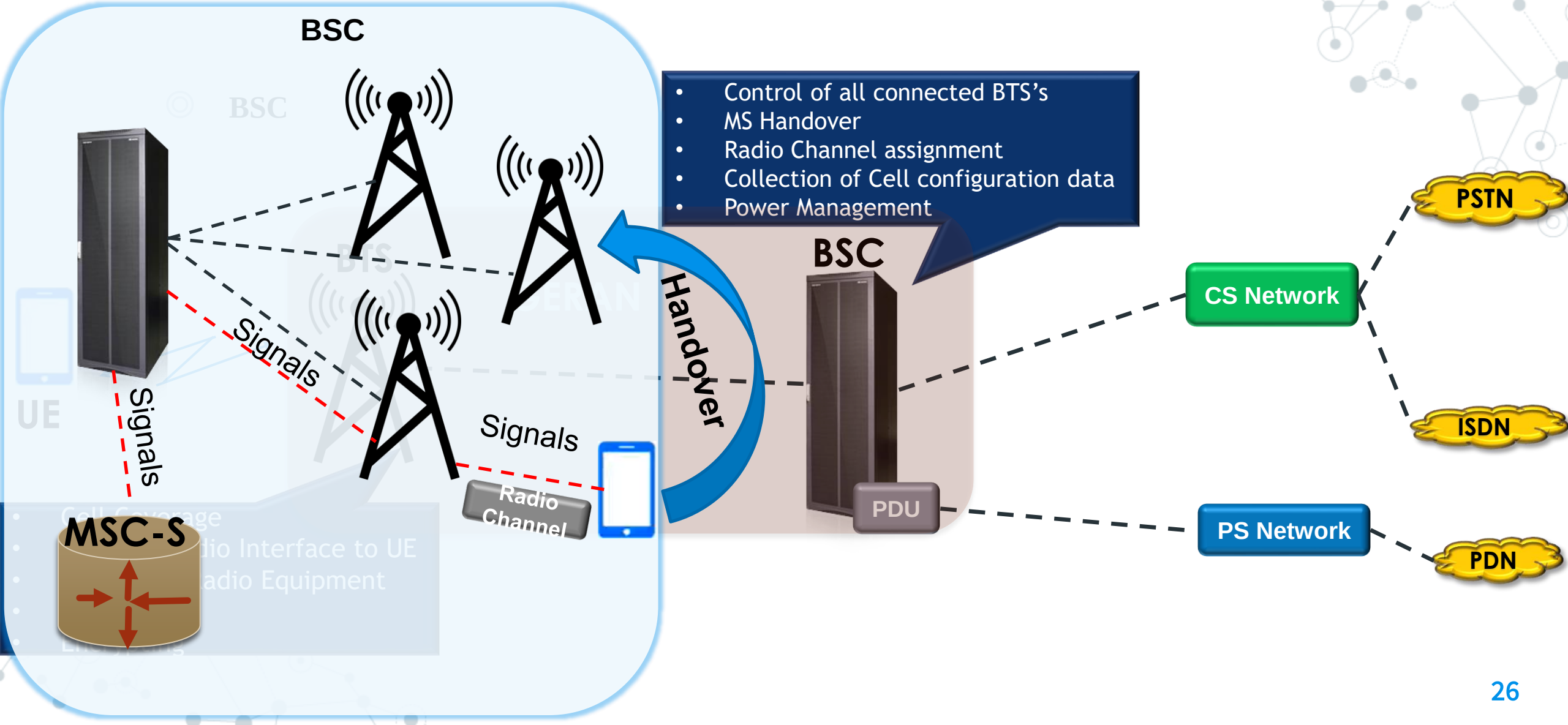


Mobile Network Access & Core Elements



Mobile Network Access & Core Elements

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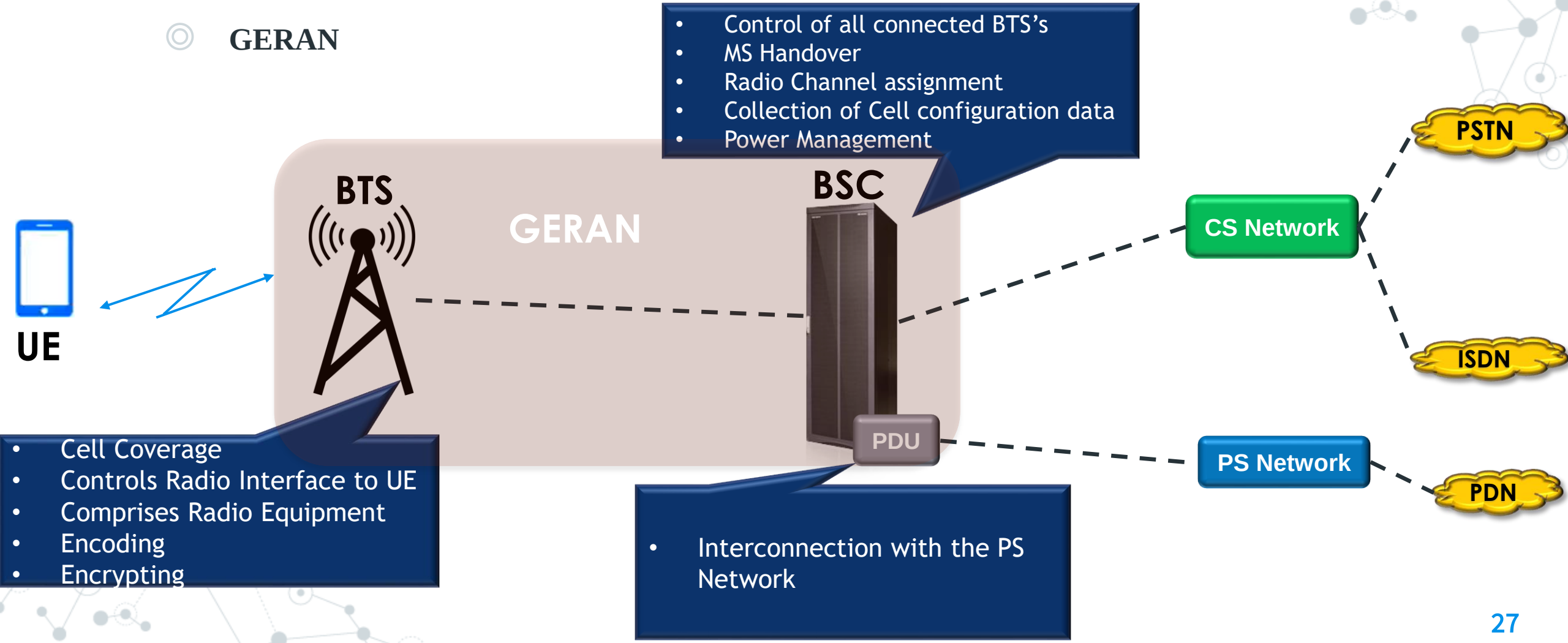
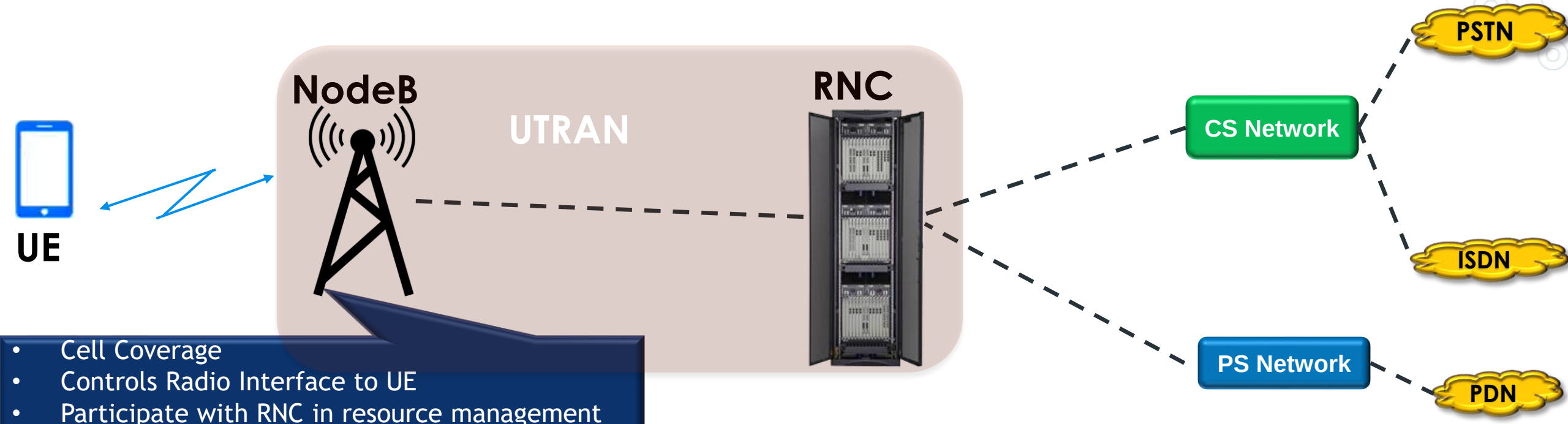


Mobile Network Access & Core Elements

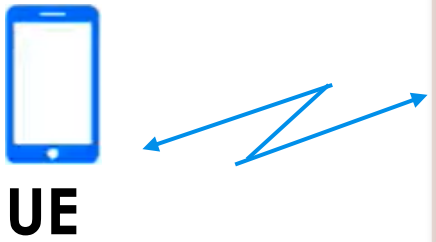
- UTRAN

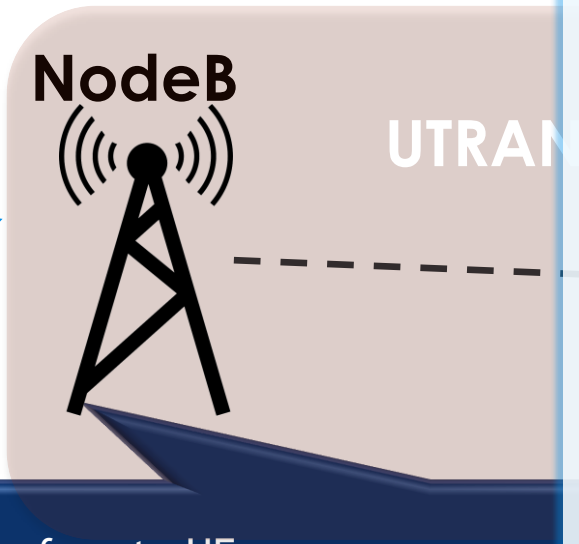


- Cell Coverage
- Controls Radio Interface to UE
- Participate with RNC in resource management
- Comprises Radio Equipment
- Other GSM BTS Functions

Mobile Network Access & Core Elements

- UTRAN





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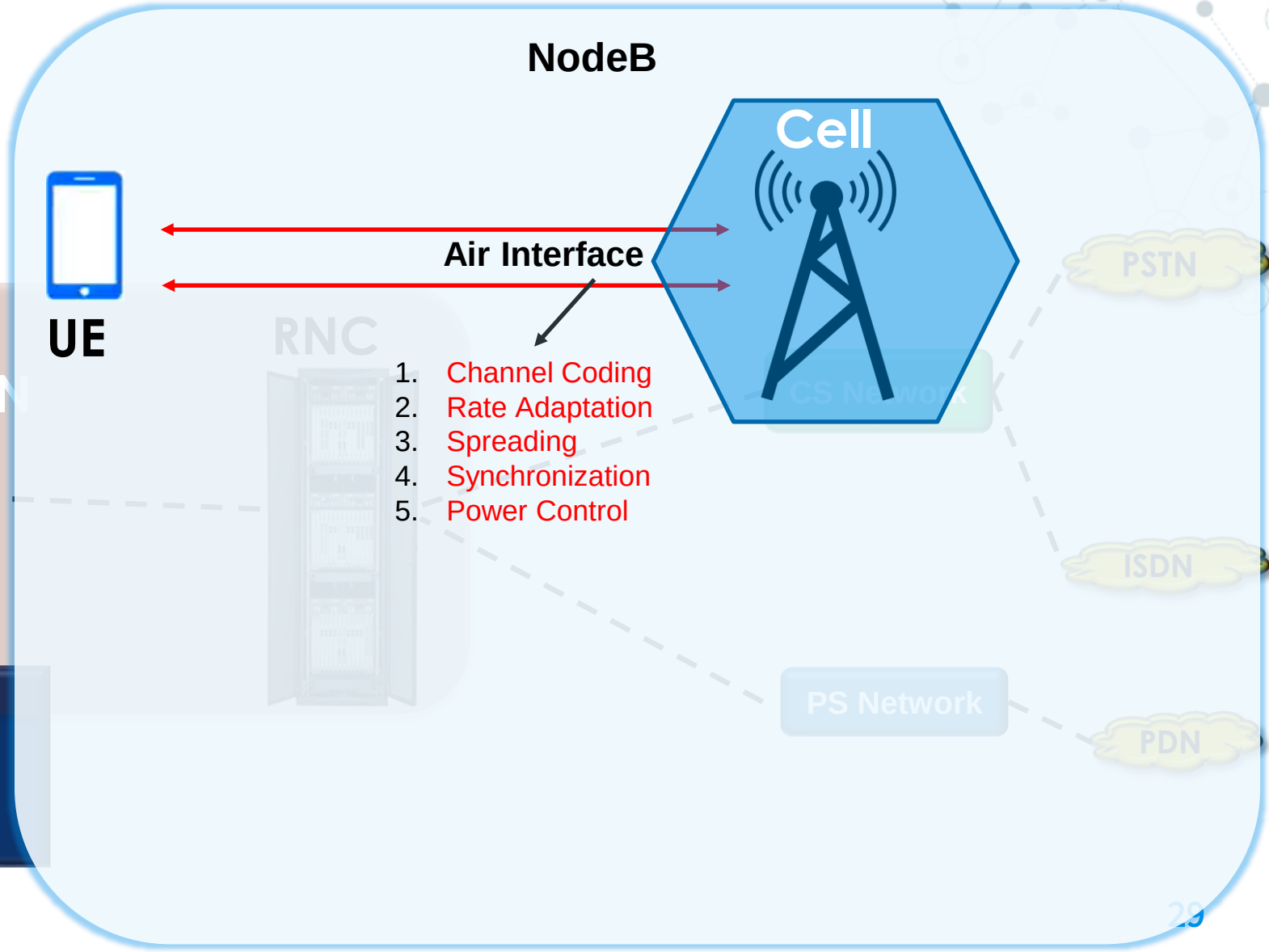

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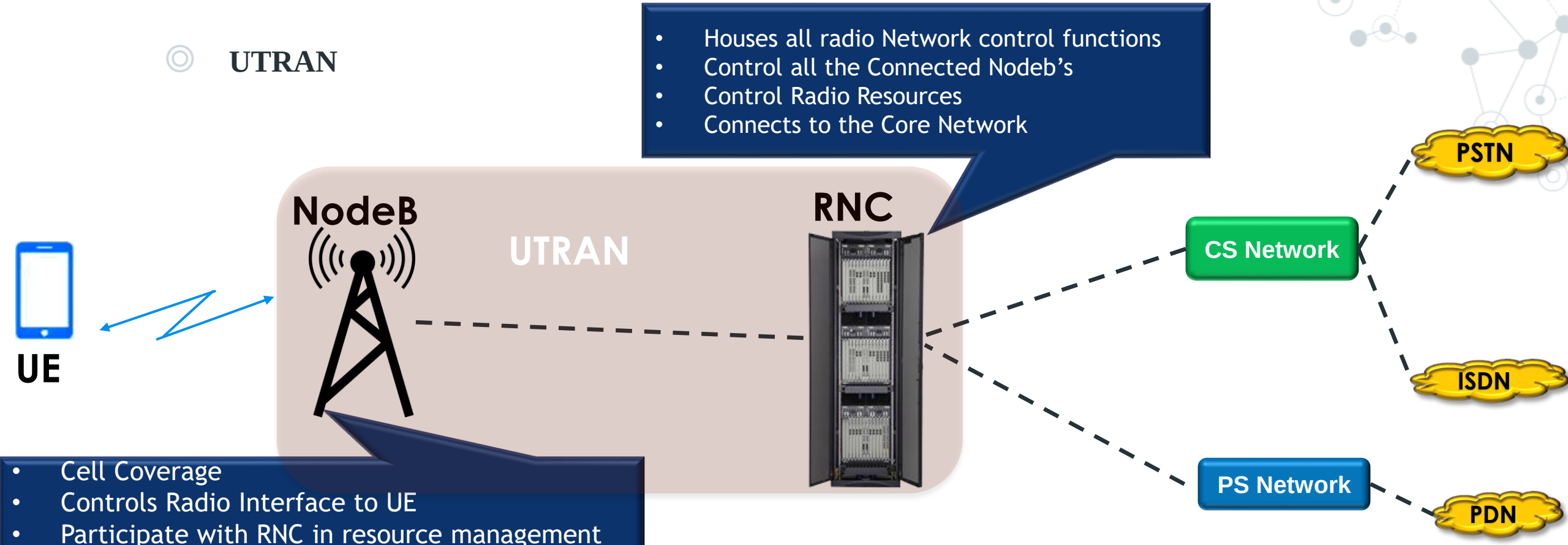

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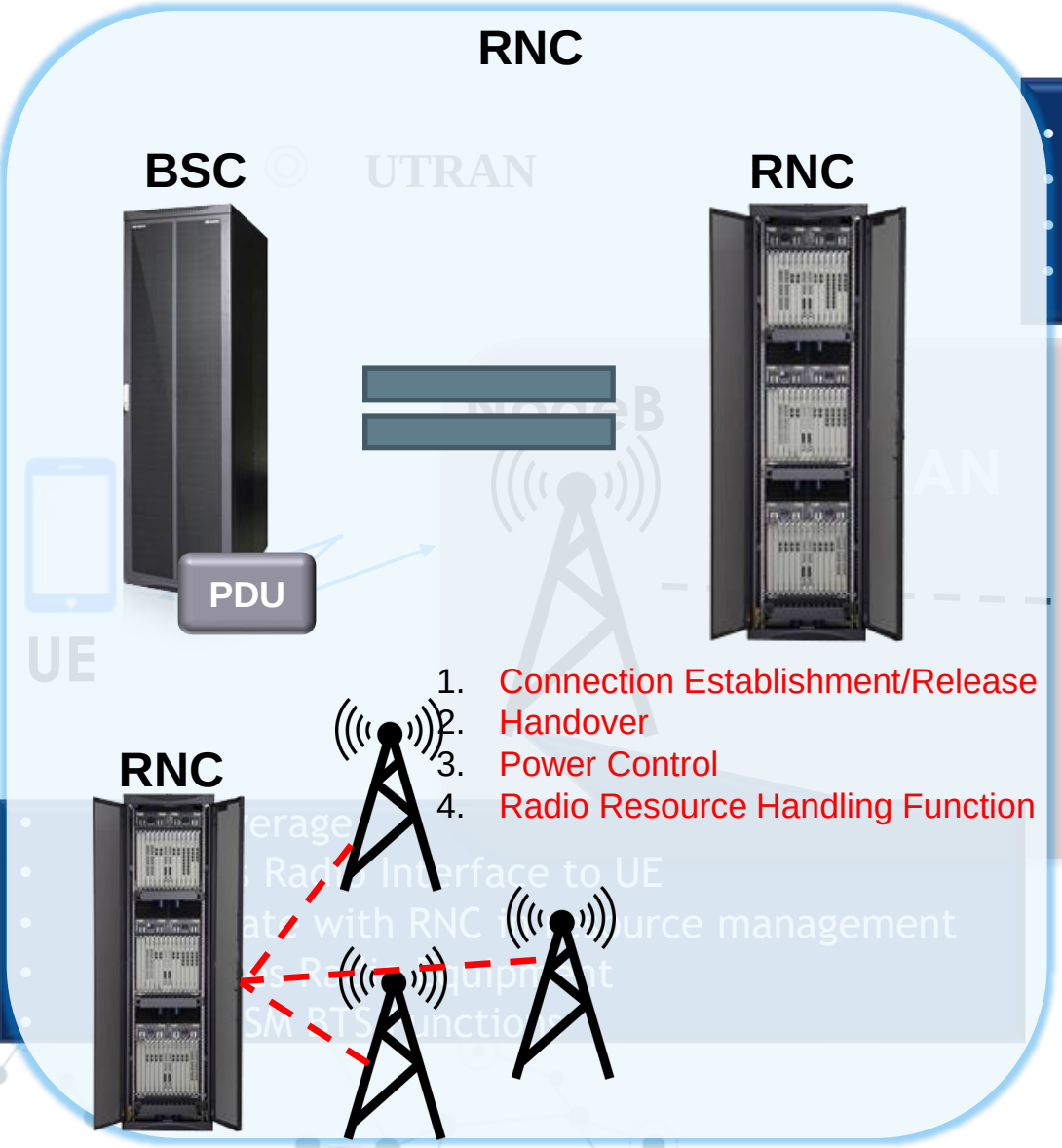
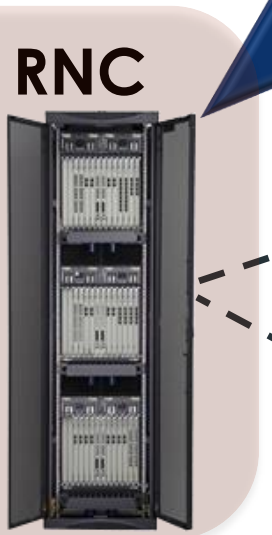
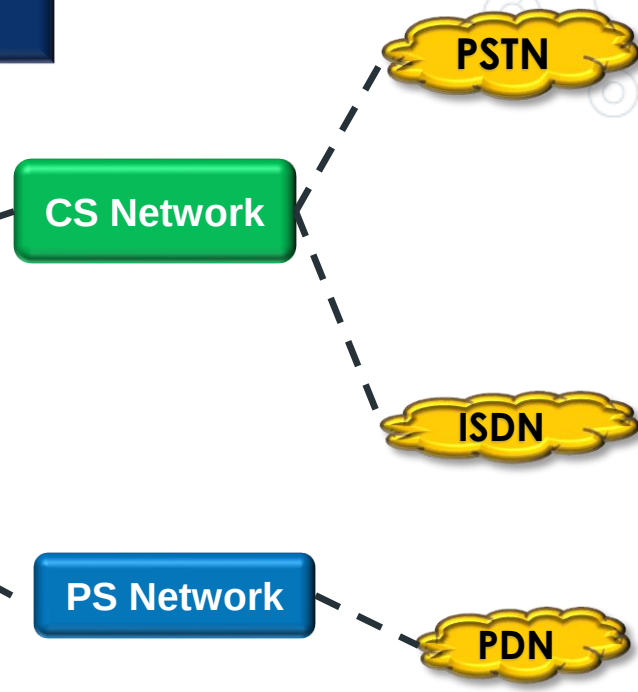


- Houses all radio Network control functions
- Control all the Connected Nodeb's
- Control Radio Resources
- Connects to the Core Network

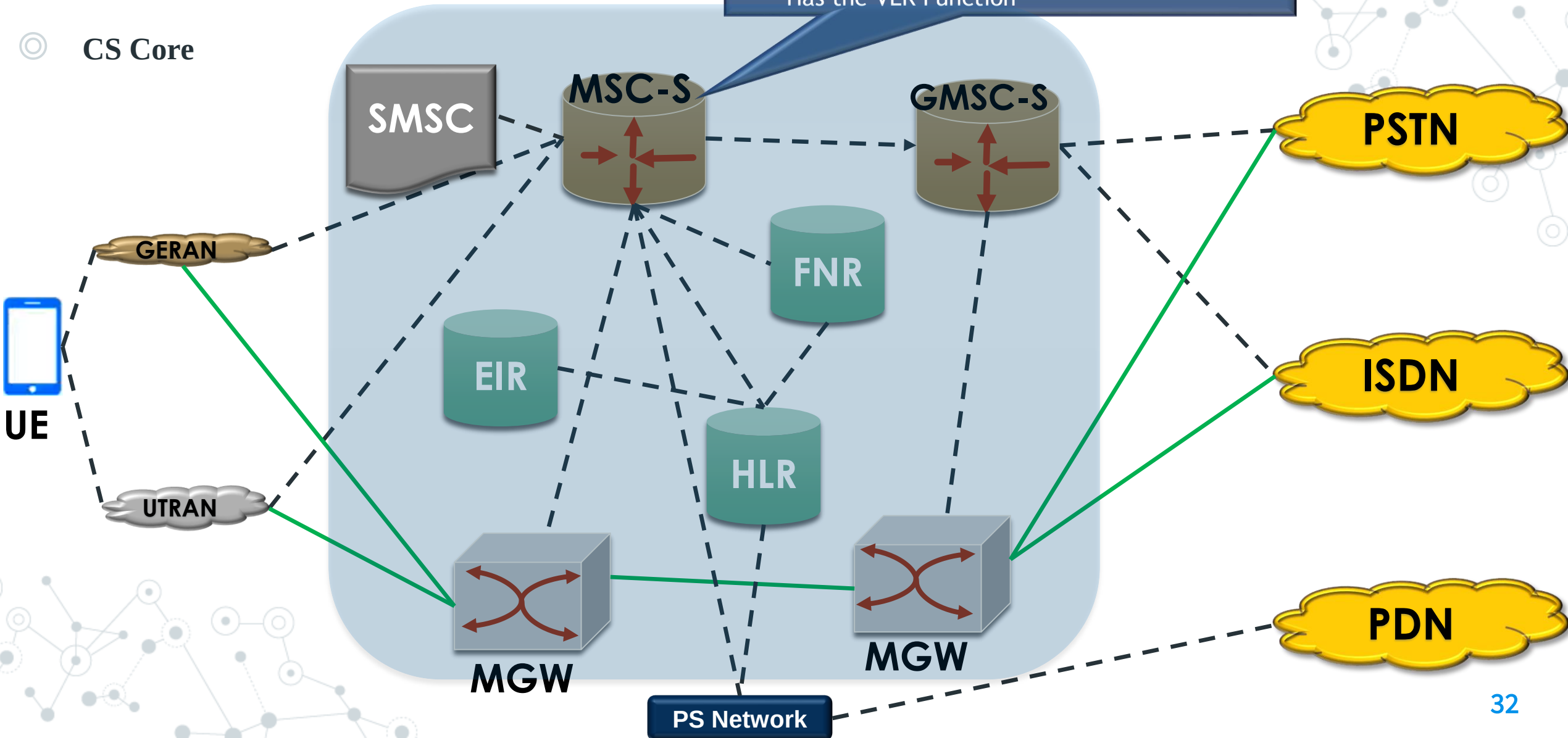




Mobile Network Access & Core Elements

- **Call control functionality**
- **Handover, Paging Support**
- Control all the Connected Elements
- Management of Mobile services
- Has the VLR Function

CS Core



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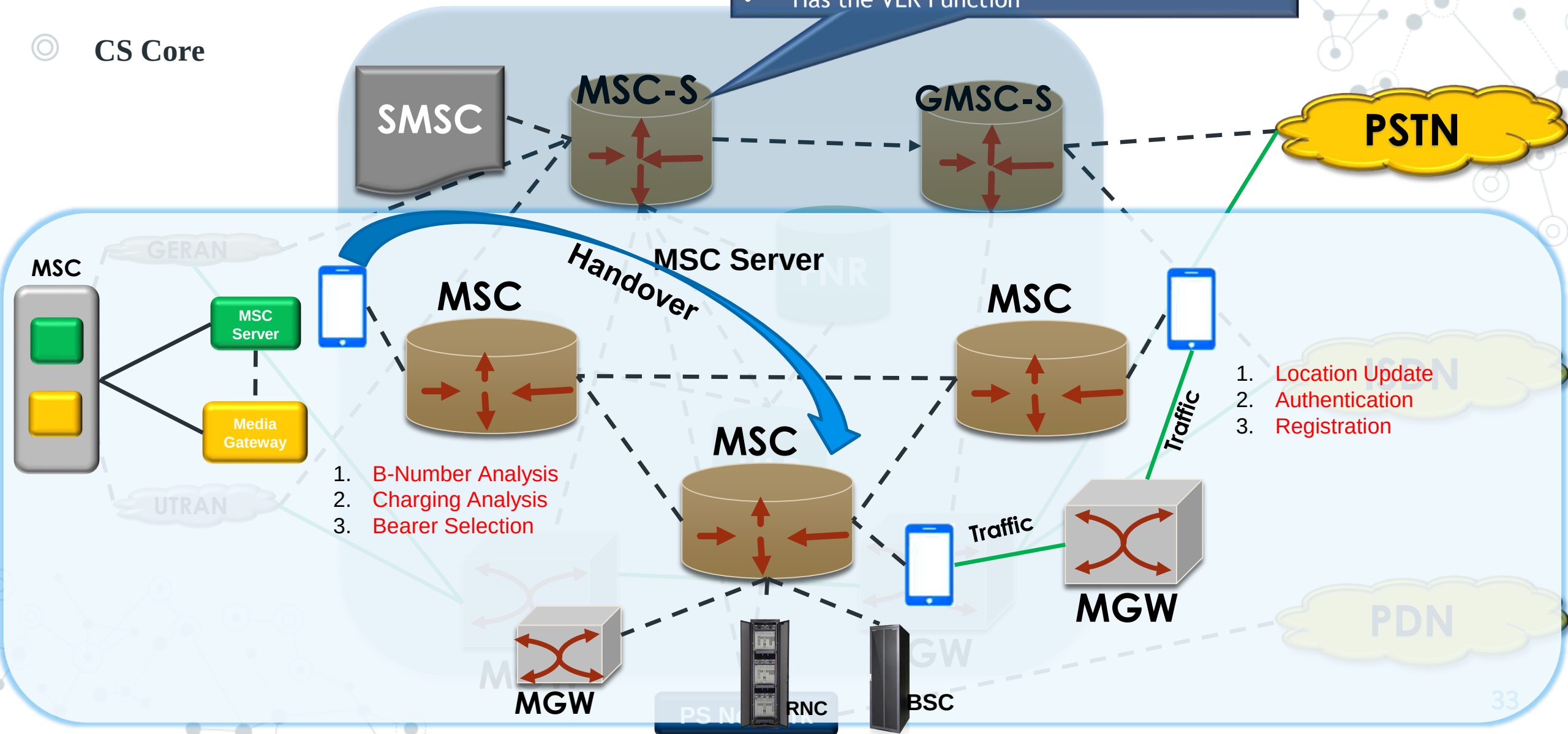

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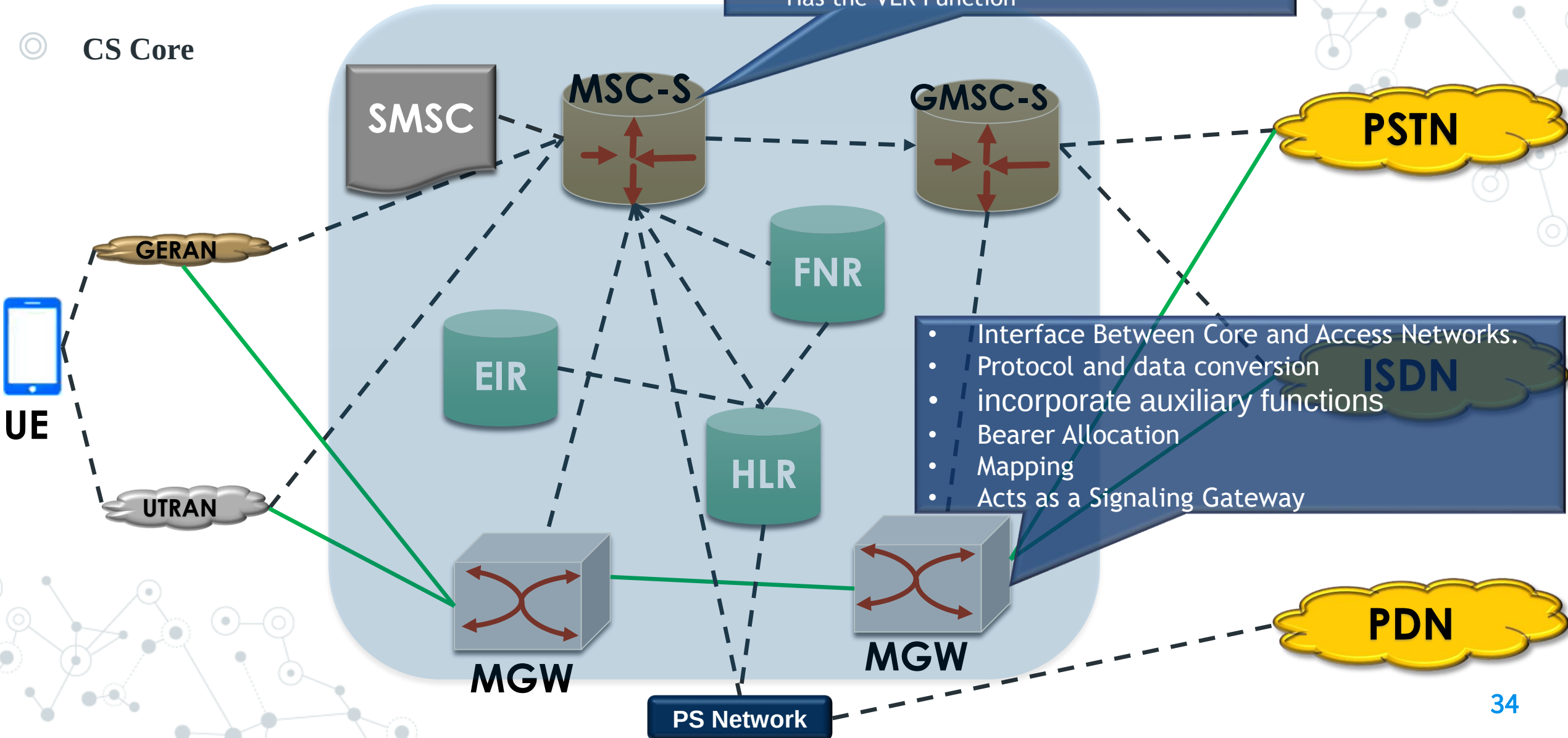

- Interface Between Core and Access Networks.
- Protocol and data conversion
- incorporate auxiliary functions
- Bearer Allocation
- Mapping
- Acts as a Signaling Gateway

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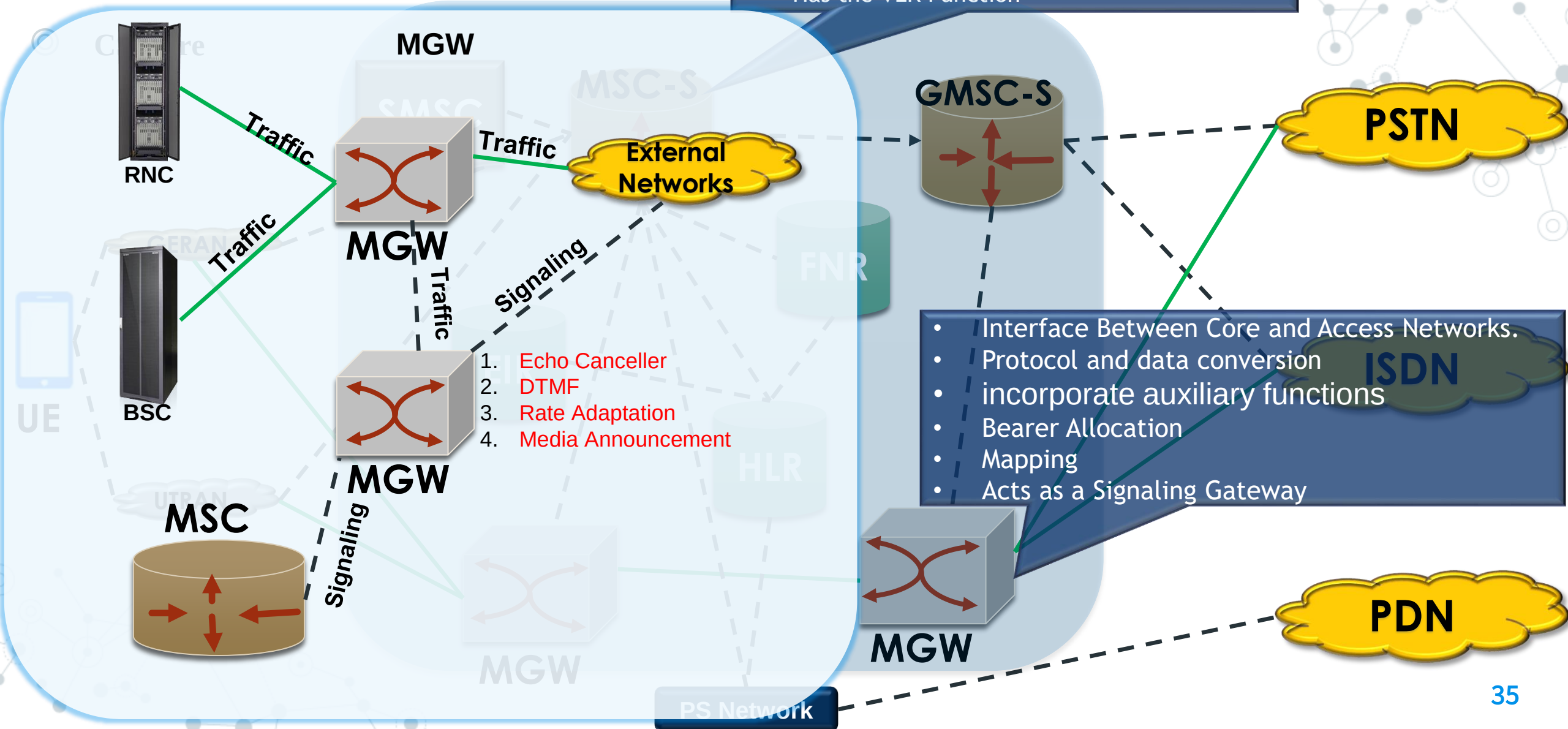

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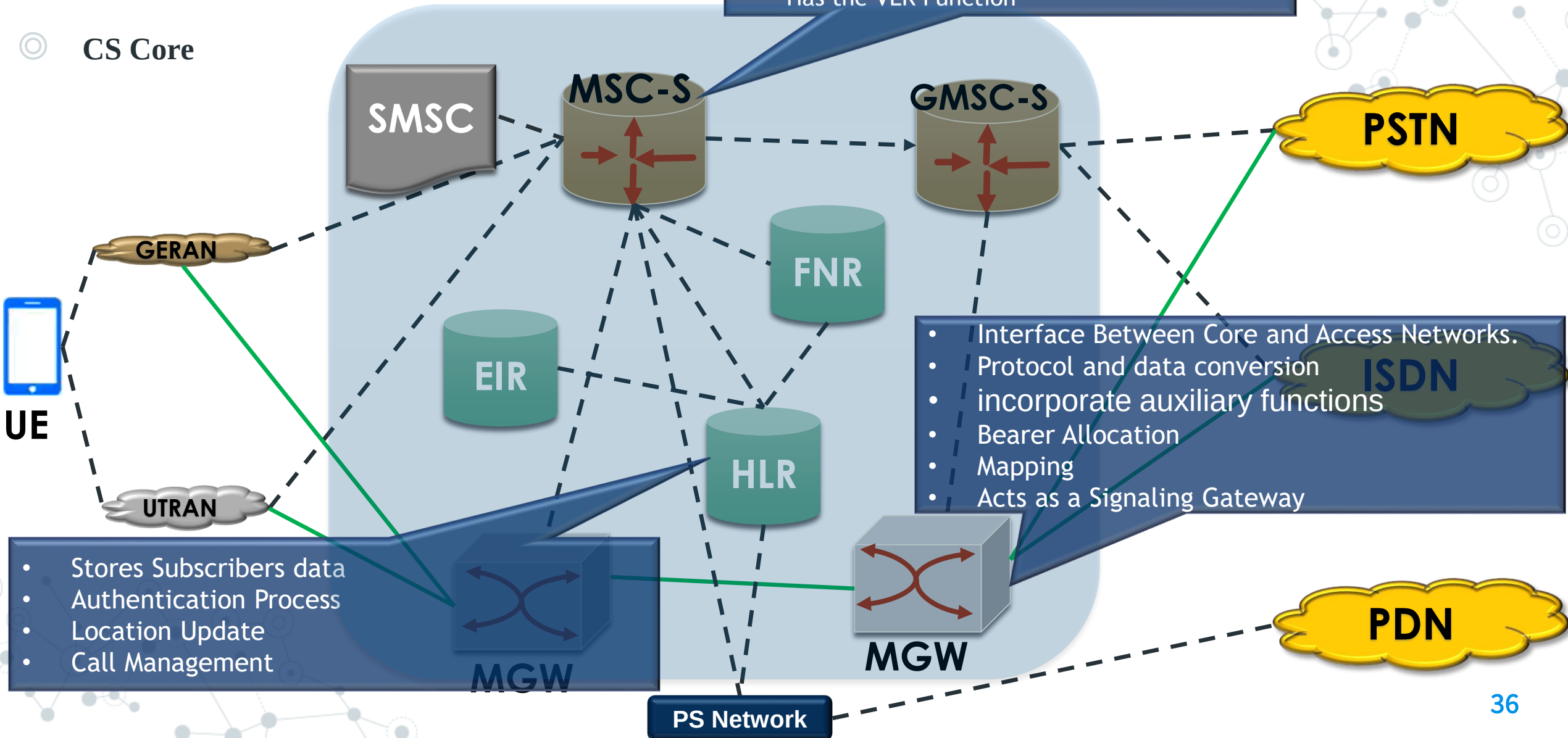

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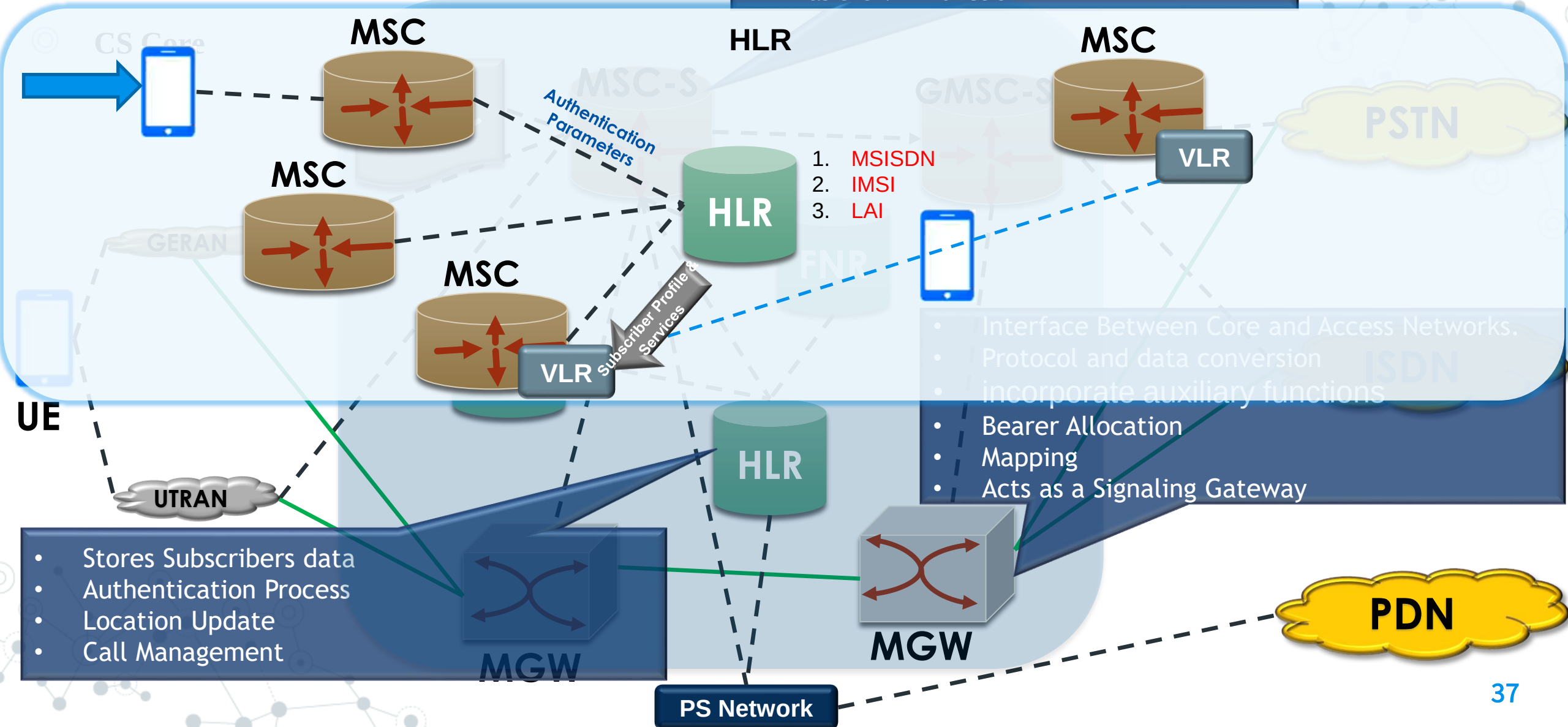
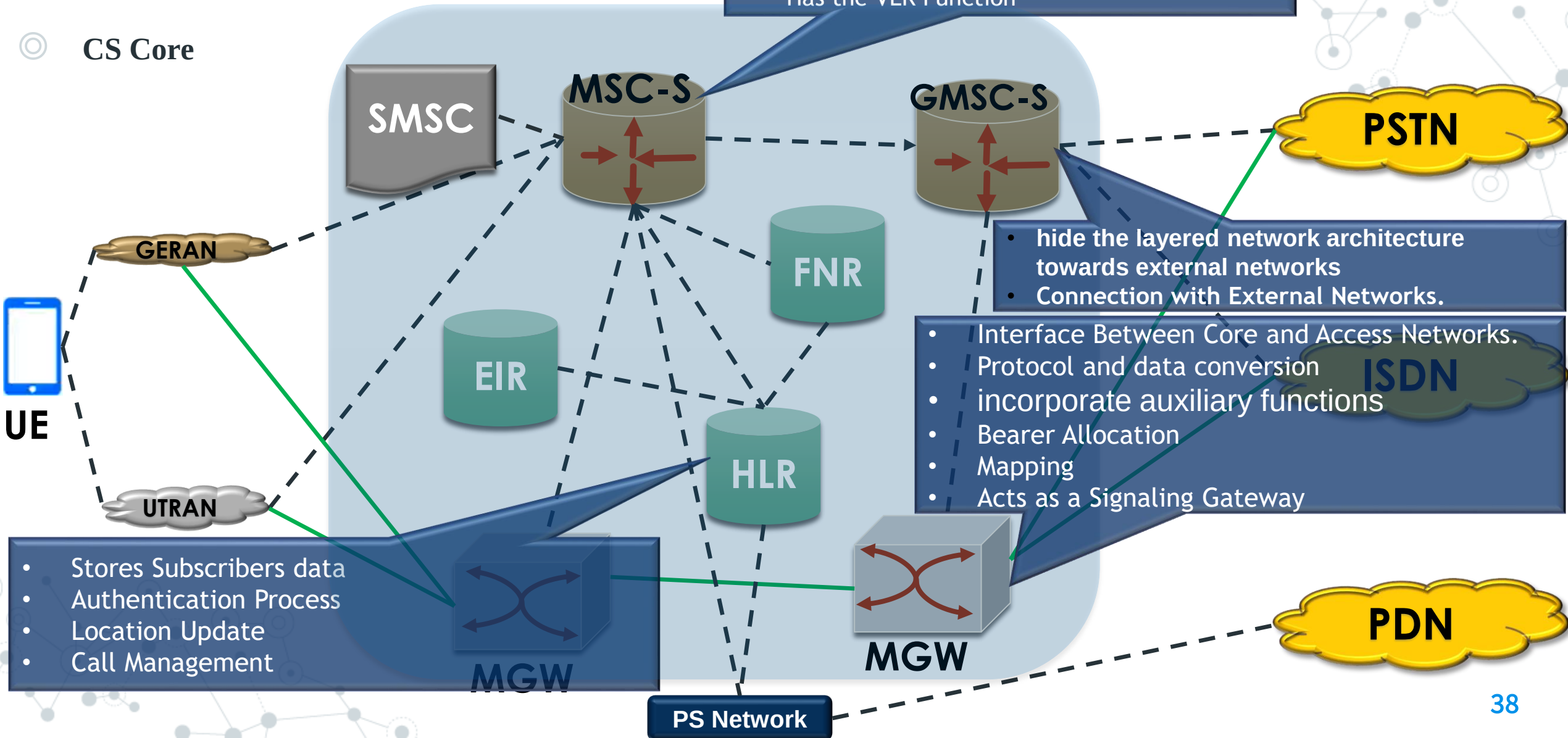


- Interface Between Core and Access Networks.
- Protocol and data conversion
- incorporate auxiliary functions
- Bearer Allocation
- Mapping
- Acts as a Signaling Gateway

- Stores Subscribers data
- Authentication Process
- Location Update
- Call Management

Mobile Network Access & Core Elements

- CS Core



Mobile Network Access & Core Elements