Network Based Connectivity and Mobility Management for IPv4

draft-chowdhury-netmip4-00.txt

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Motivations

- Connectivity Management:
  - MN needs address X which is from a different domain than the AR
  - The MN may not have a MIPv4 implementation
- Mobility Management:
  - The MN moves across subnet boundary at the point of attachment (AR)
  - How does the AR/Access Network offer seamless mobility for the MN (with address X) w/o requiring the MN to perform *any* L3 procedures

Overview

- The core idea is to perform Mobile IPv4 registration using MIPv4 client in a network node rather than the MN
  - Initiated by a network node
  - On behalf of a MN
  - Triggered by another protocol:
    - IPCP
    - DHCP
    - Some L2 trigger

- The MN acquires it's address e.g. X regardless of it's point of attachment

Illustration of the Connectivity Scenario

Serving AR/FA

HA

Serving BS

Cell 1

Illustration of the Connectivity Scenario

OTA Link Setup

Cell 1

Serving BS

Serving AR/FA

HA

Illustration of the Connectivity Scenario

OTA Link Setup

Cell 1

Serving BS

Serving AR/FA

HA

Illustration of the Connectivity Scenario

OTA Link Setup

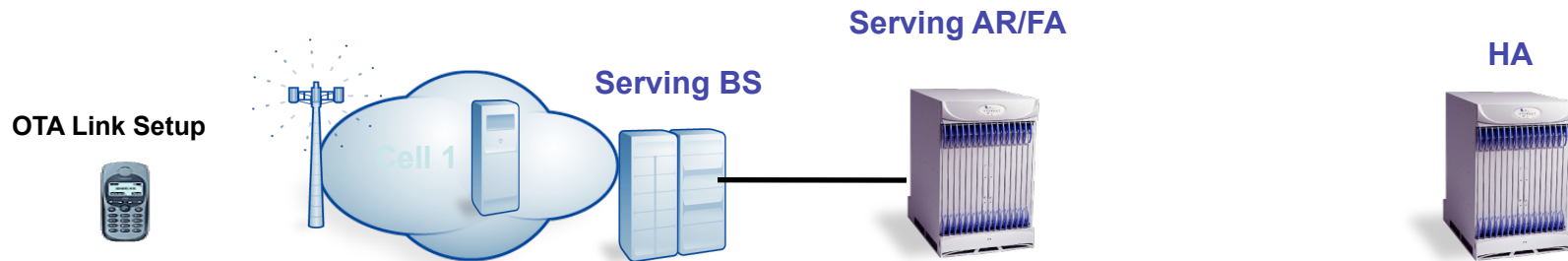**Serving BS**

Serving AR/FA

HA

Cell 1

IPCP or DHCP

Illustration of the Connectivity Scenario

Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Cell 2

Target BS

Target AR/FA

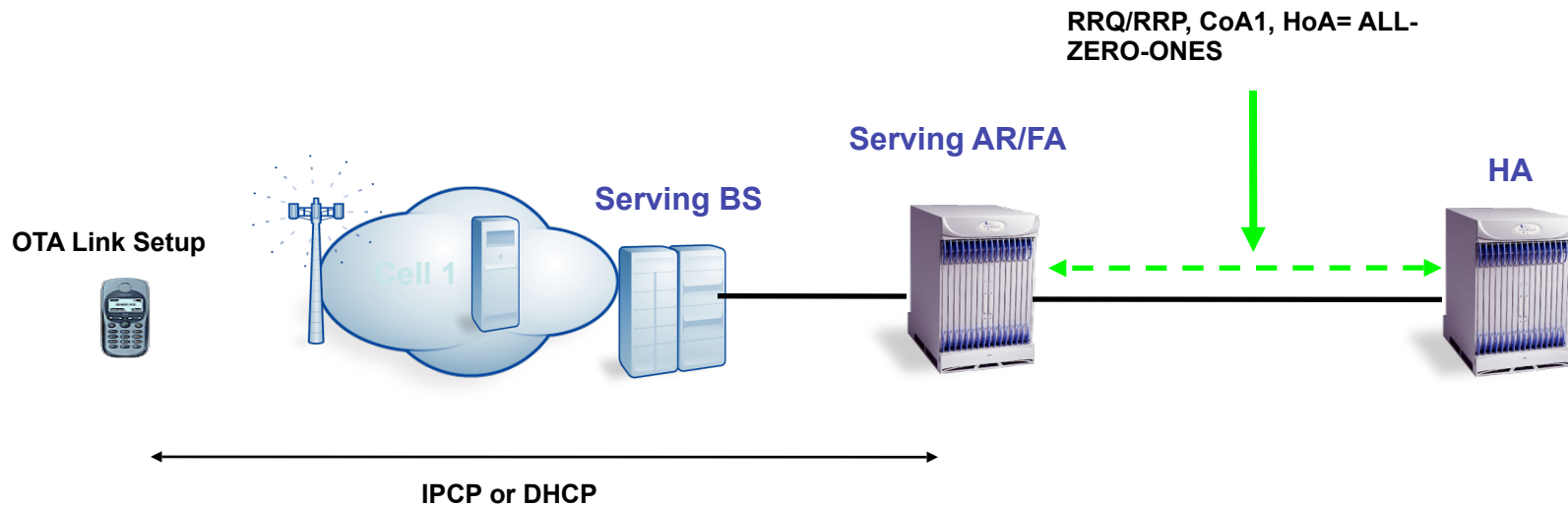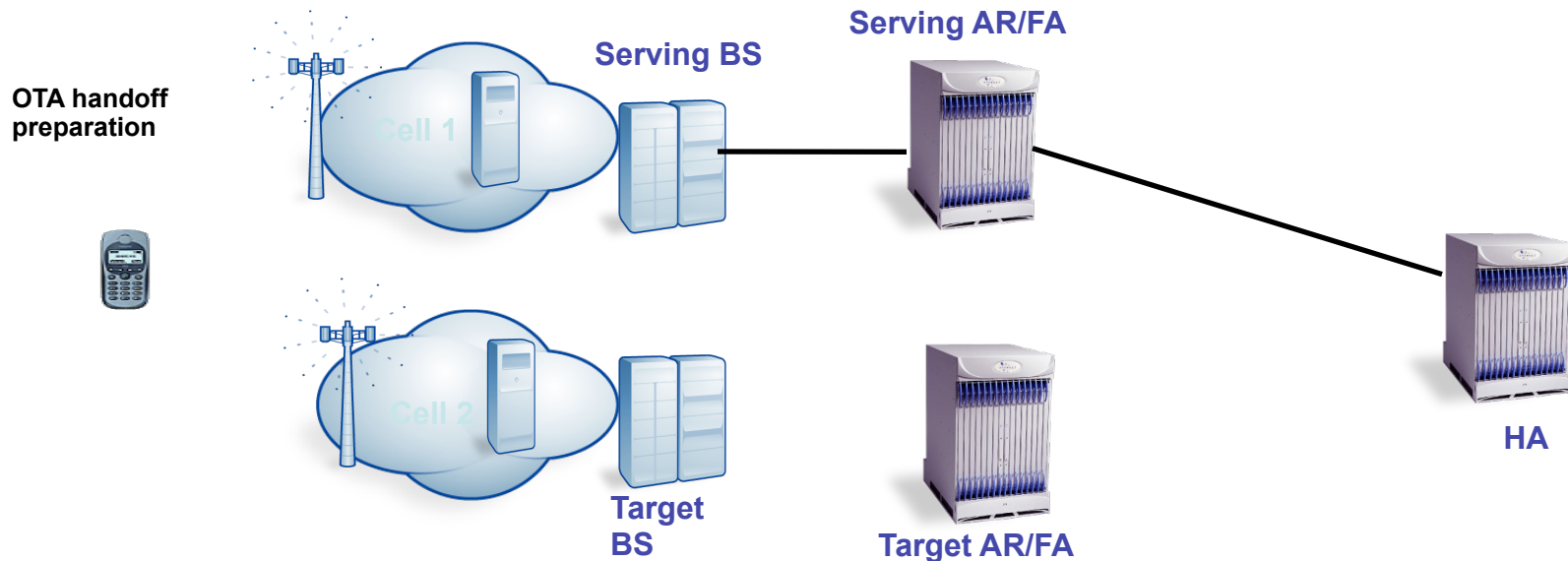**HA**

HA bi-cast can be a configurable feature in the HA based on operator's policy. It is also possible that the Serving AR establishes a transport connection with the Target AR instead of HA bi-casting

Illustration of the Mobility Scenario

OTA handoff preparation

Serving BS

Serving AR/FA

Cell 1

Cell 2

Target BS

Target AR/FA

HA

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Illustration of the Mobility Scenario

Cell 1

Serving BS

Serving AR/FA

Cell 2

Target BS
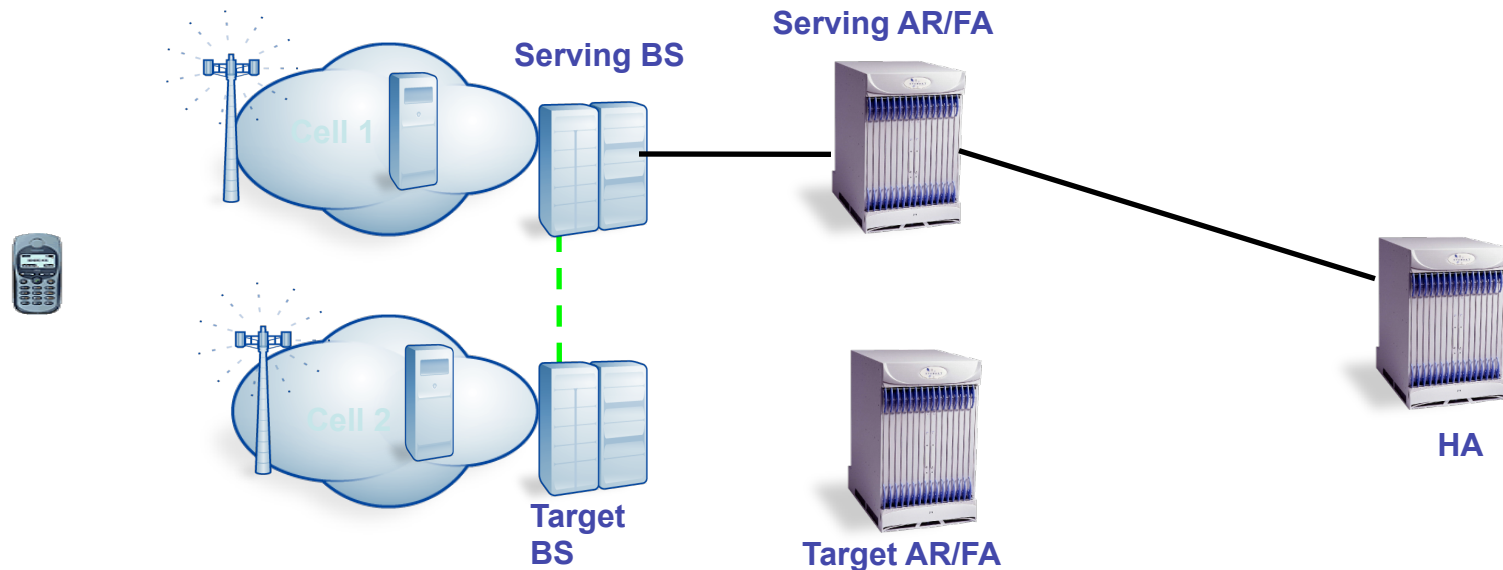
Target AR/FA

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Illustration of the Mobility Scenario

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Cell 2

Target BS

Target AR/FA

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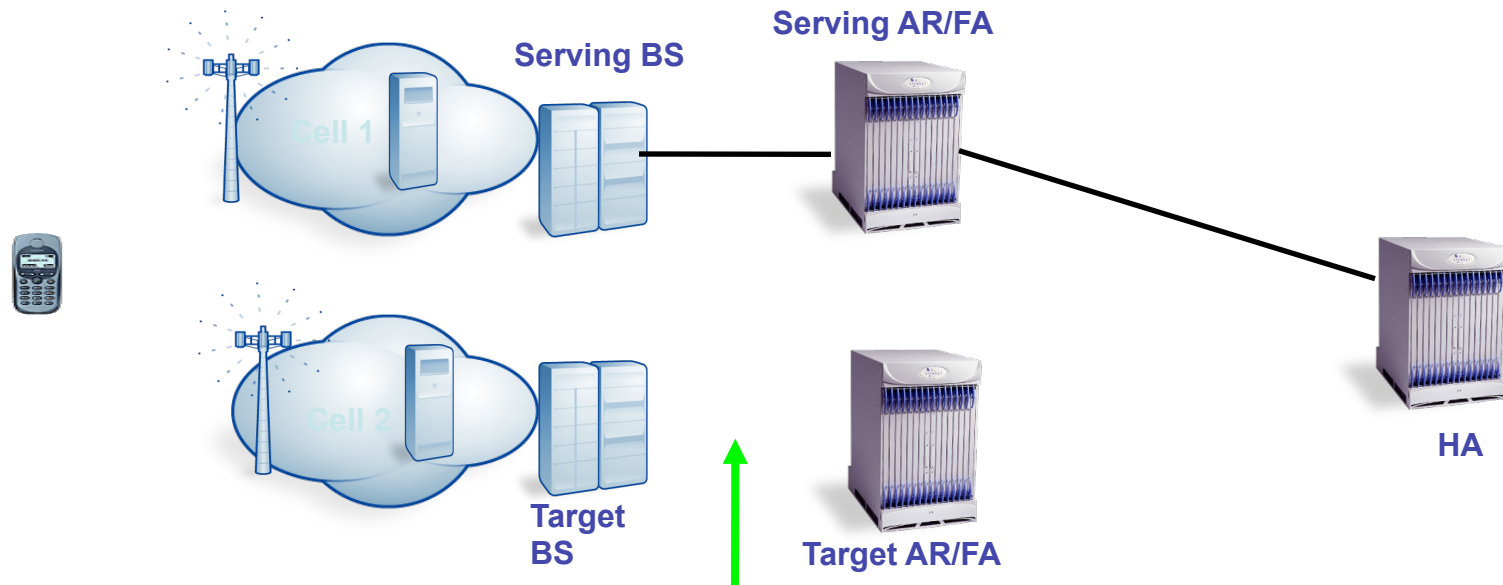
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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Serving AR/FA

Cell 2

Target BS

Target AR/FA
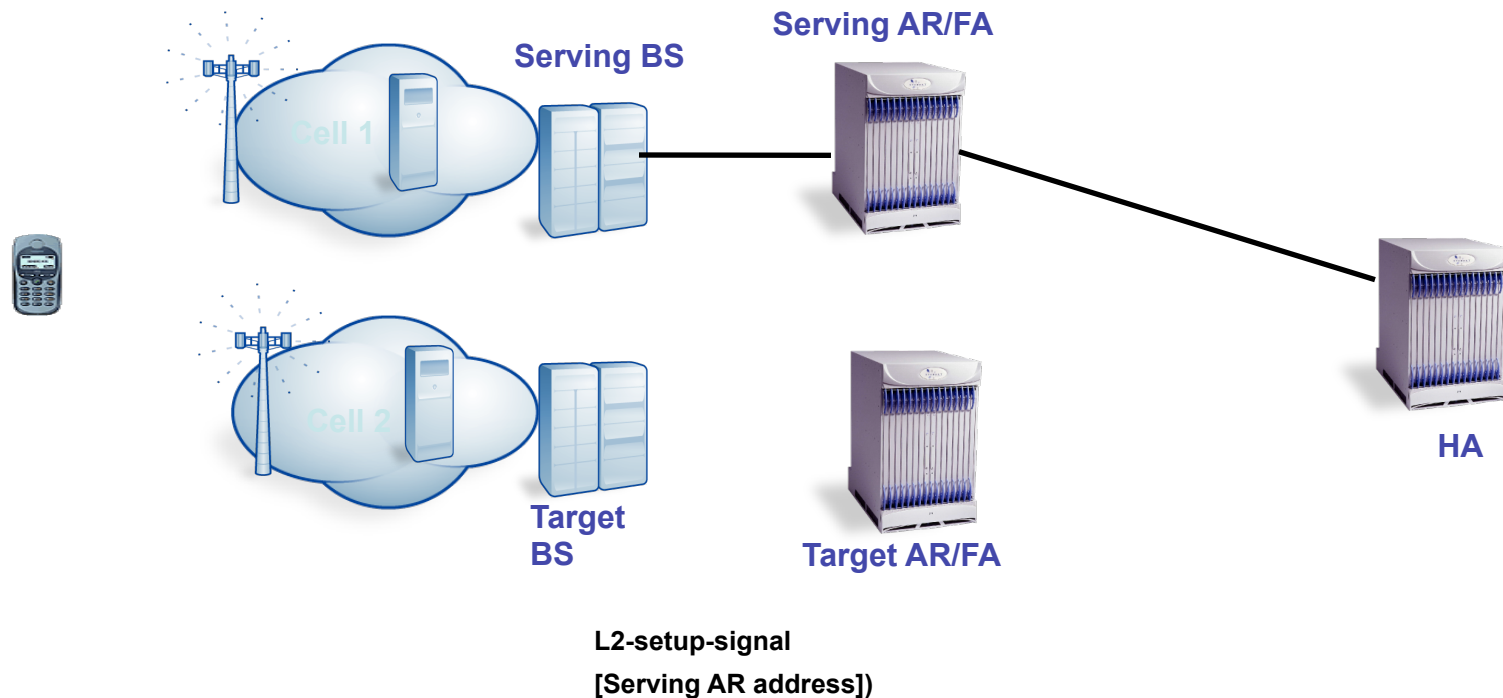
HA

L2-setup-signal

[Serving AR address])

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Target BS

Target AR/FA

HA

Cell 2

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

**HO Request/
Response**

Cell 2

**Target
BS**

Target AR/FA

HA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1
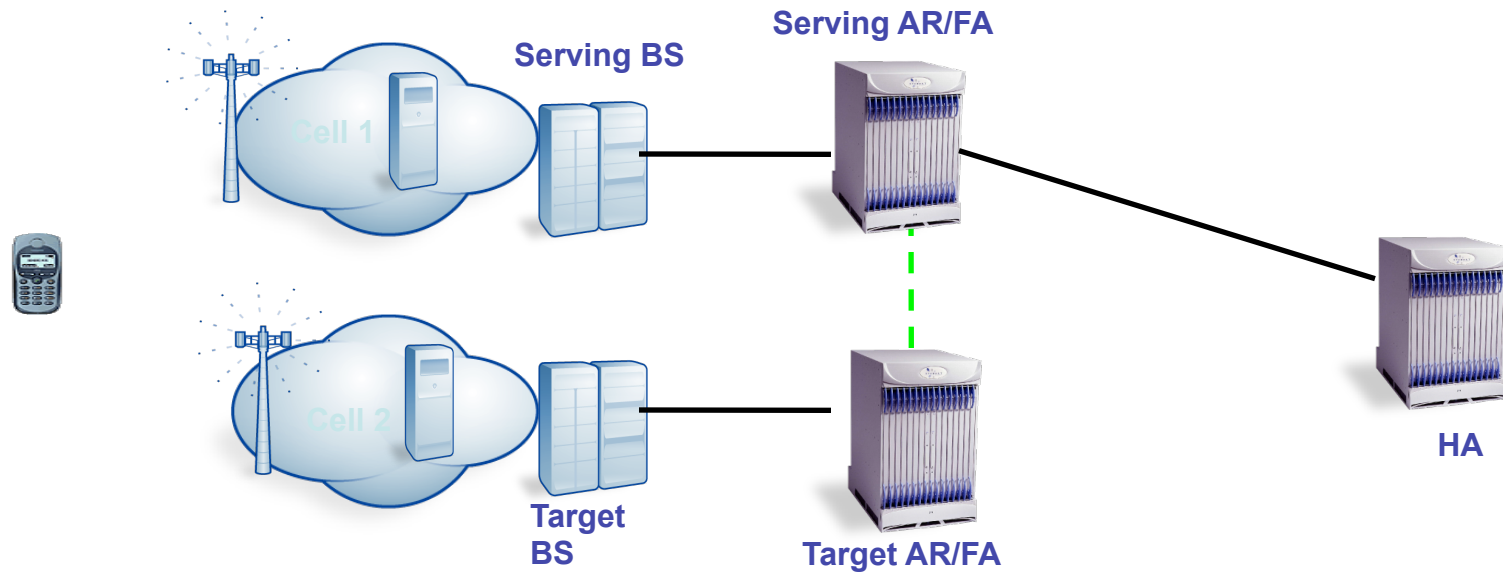
Cell 2

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving BS

Serving AR/FA

Cell 1

Cell 2

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS
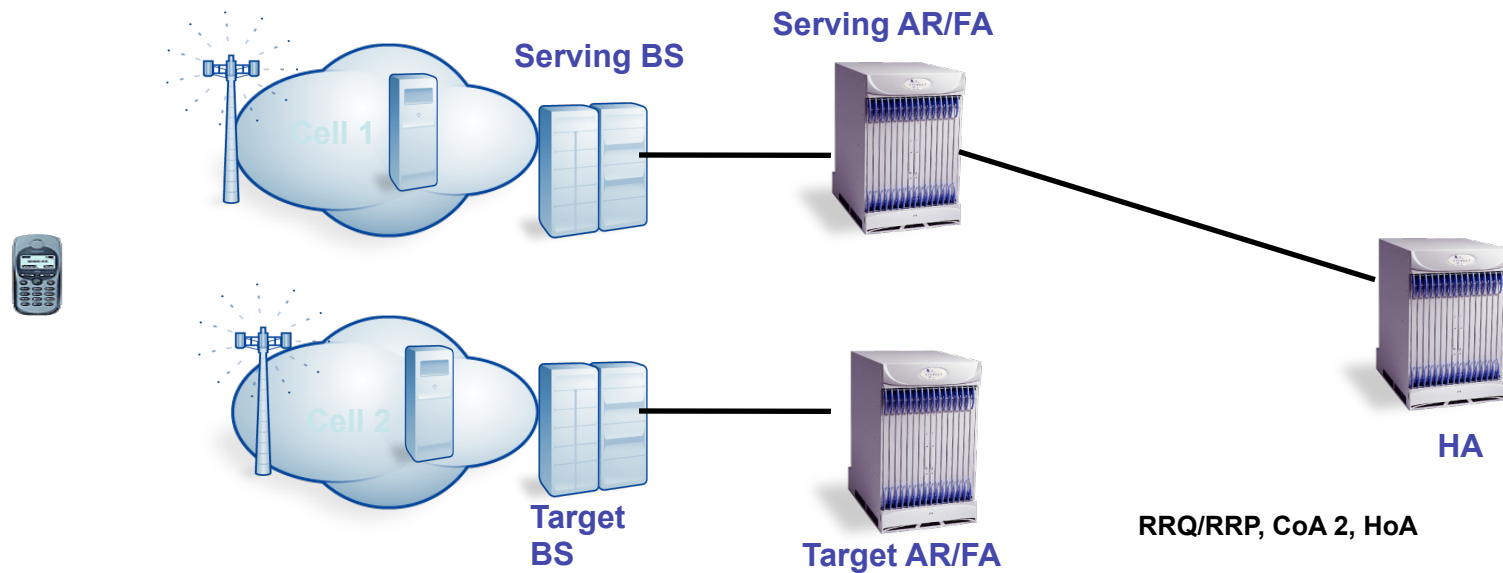
Cell 1

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Serving AR/FA

HA

Cell 2

Target BS

Target AR/FA

RRQ/RRP, CoA 2, HoA

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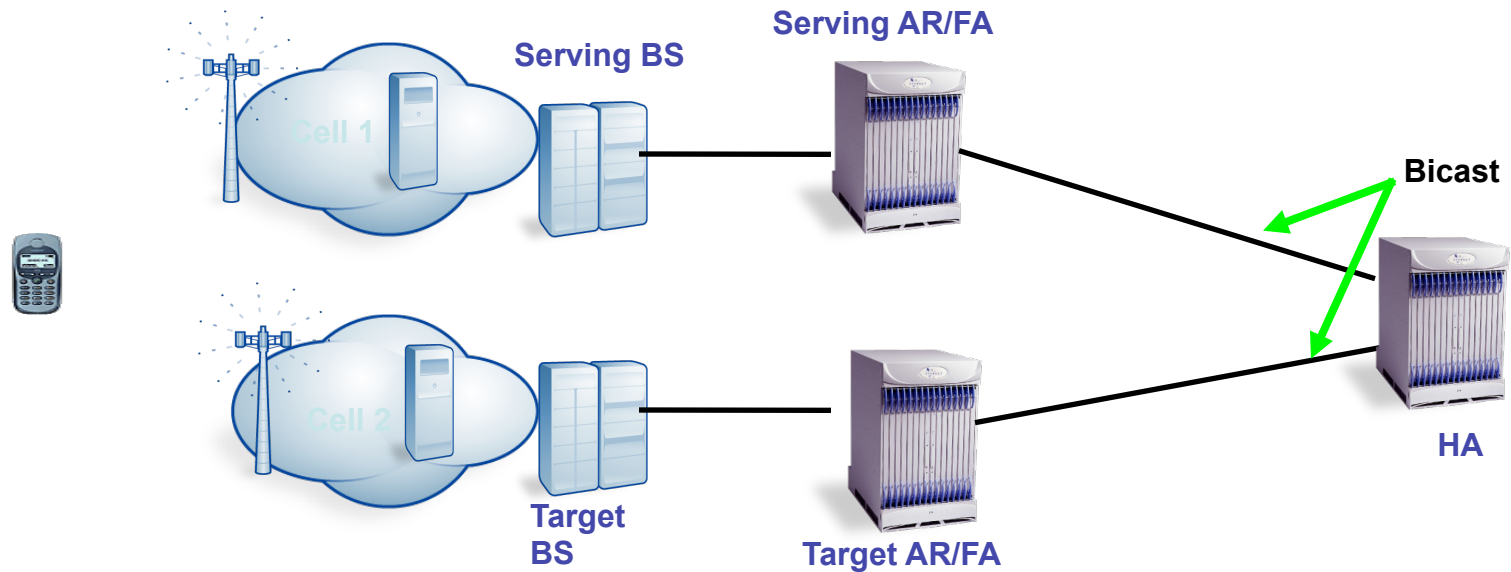
Illustration of the Mobility Scenario

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Bicast

Cell 2

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Bicast
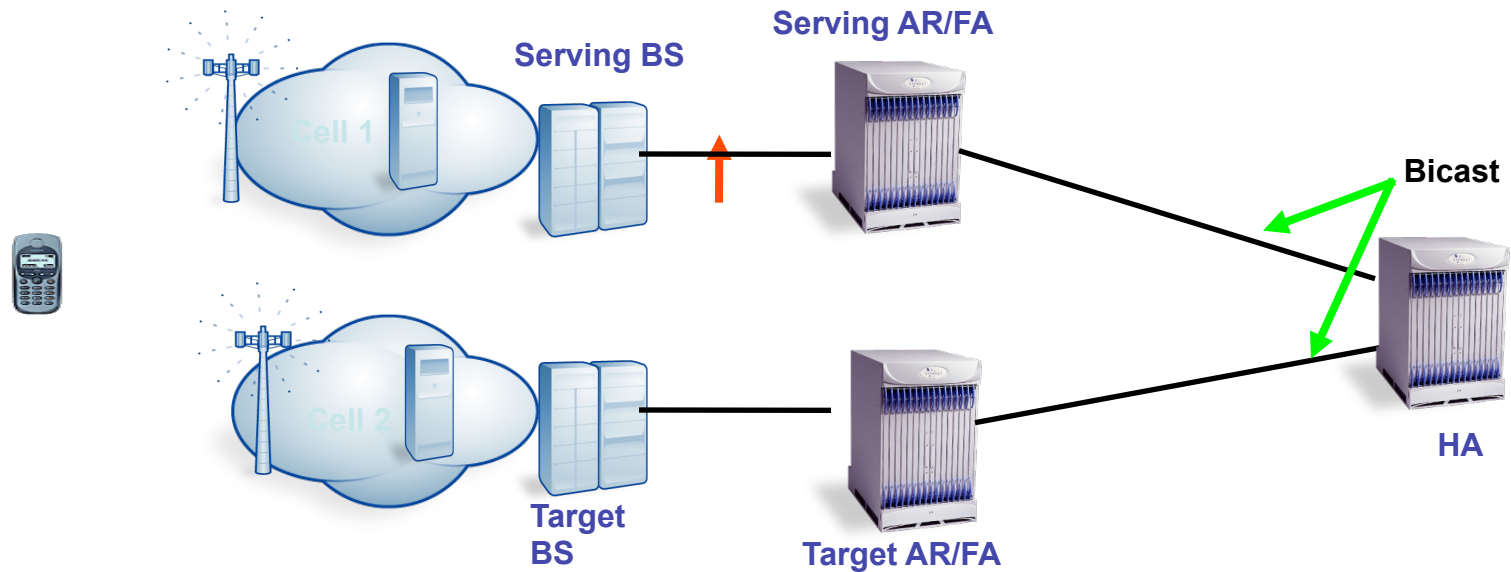
HA

Cell 2

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

Bicast

Cell 2

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Cell 1

L2-release-signal

Bicast

Cell 2
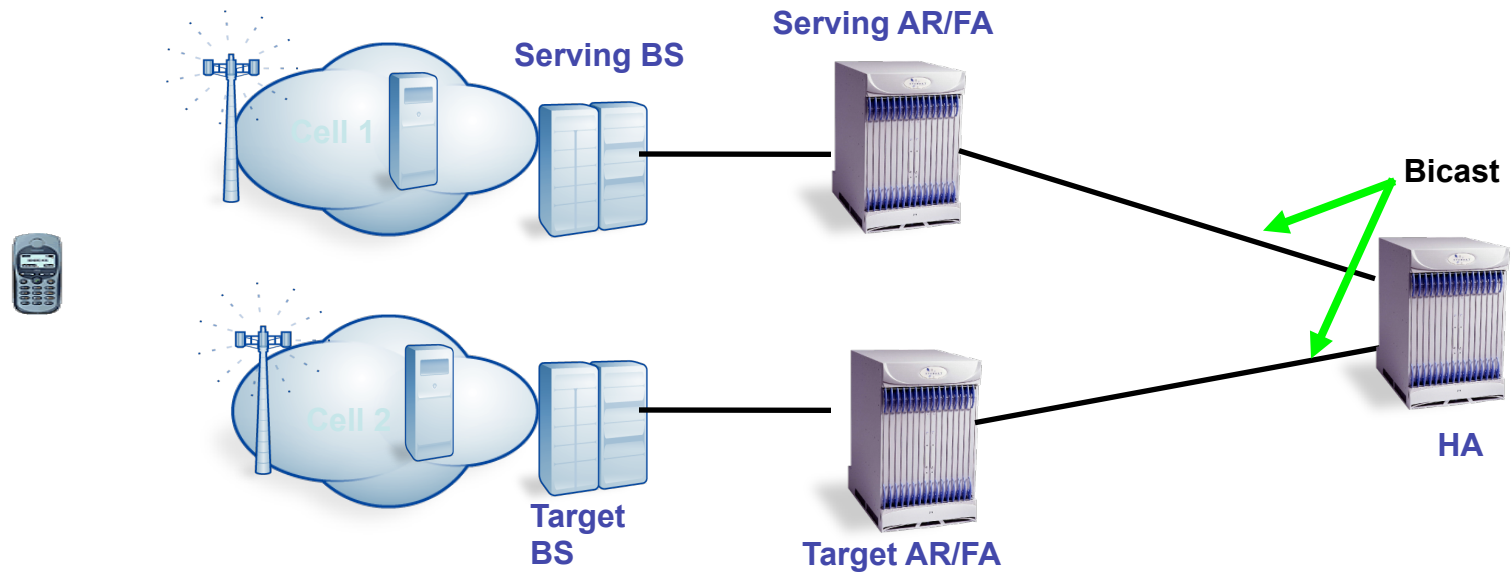
Target BS

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Illustration of the Mobility Scenario

Serving BS

Serving AR/FA

Bicast

Cell 1

Cell 2

**Target
BS**

Target AR/FA

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Illustration of the Mobility Scenario

Serving BS

Serving AR/FA

Bicast

Cell 1

Cell 2

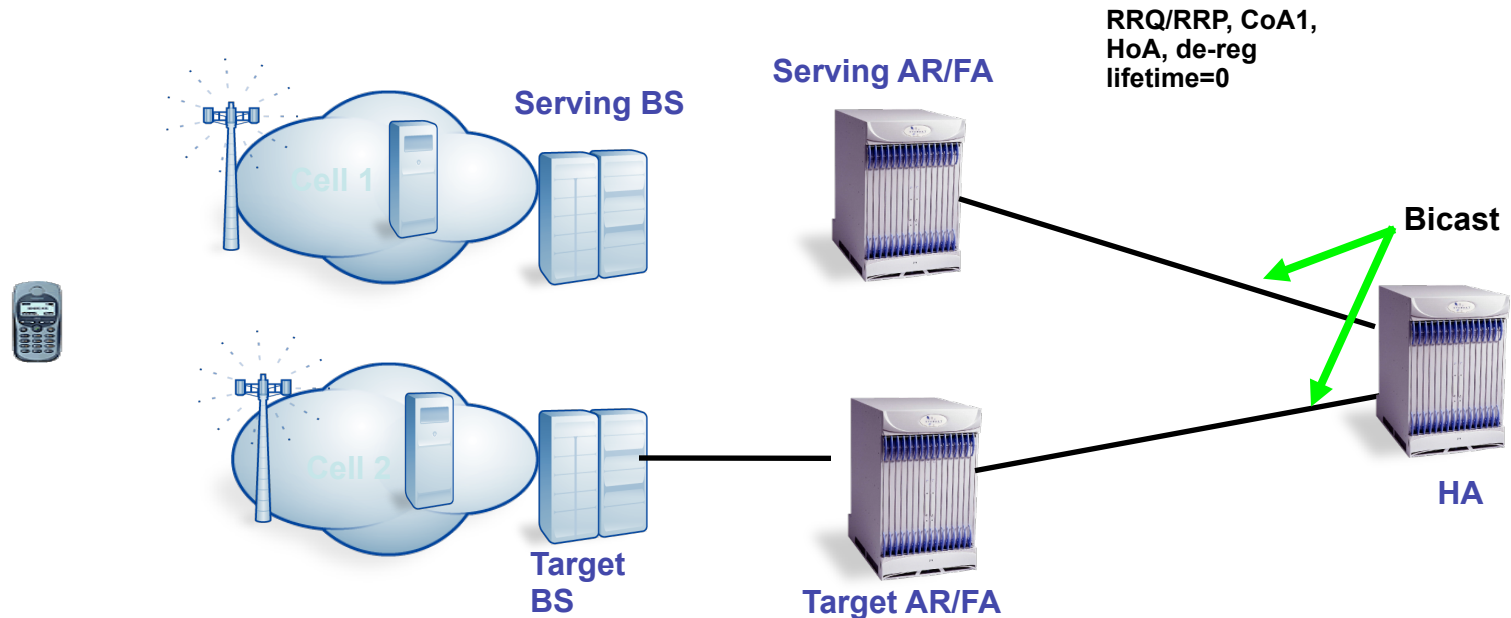**Target BS**

Target AR/FA

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Illustration of the Mobility Scenario

Serving AR/FA

Serving BS

Bicast

Cell 1

Cell 2

Target BS

Target AR/FA

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Illustration of the Mobility Scenario

RRQ/RRP, CoA1, HoA, de-reg lifetime=0

Serving AR/FA

Serving BS

Cell 1

Cell 2

Target BS

Target AR/FA

Bicast

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Goals

- A network based connectivity and mobility management scheme for IPv4 by using MIPv4 protocol
  - Leverage basic MIPv4 protocol for this purpose
  - Define a set of simple messages for inter-AR communication (HO request/response) or reuse another suitable protocol
  - Discuss and adopt bi-cast requirements

Next Step?

- Begin the work in MIP4 working group.