

# GNSS-equipped RS CDMA-based Ranging

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Purpose:

Propose the text regarding GNSS-equipped RS CDMA-based Ranging.

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# ***Introduction***

- Two ways to compensate the propagation delay between RS and its serving/target access station,
  - *Trial-and-error via CDMA ranging as proposed by IEEE 802.16-2004/16e-2005*
  - *RS time synchronized with access station via precise time reference as proposed in this contribution*

# *Benefit of MR-BS/RS Time Synchronized*

- If MR-BS and RS are time synchronized,
  - RS could estimate the UL propagation delay by measuring the propagation delay of DL frame start preamble
  - Moreover, RS should estimate UL transmitting power via open-loop power control mechanism
  - Therefore, RS can perform first initial ranging in periodic ranging region

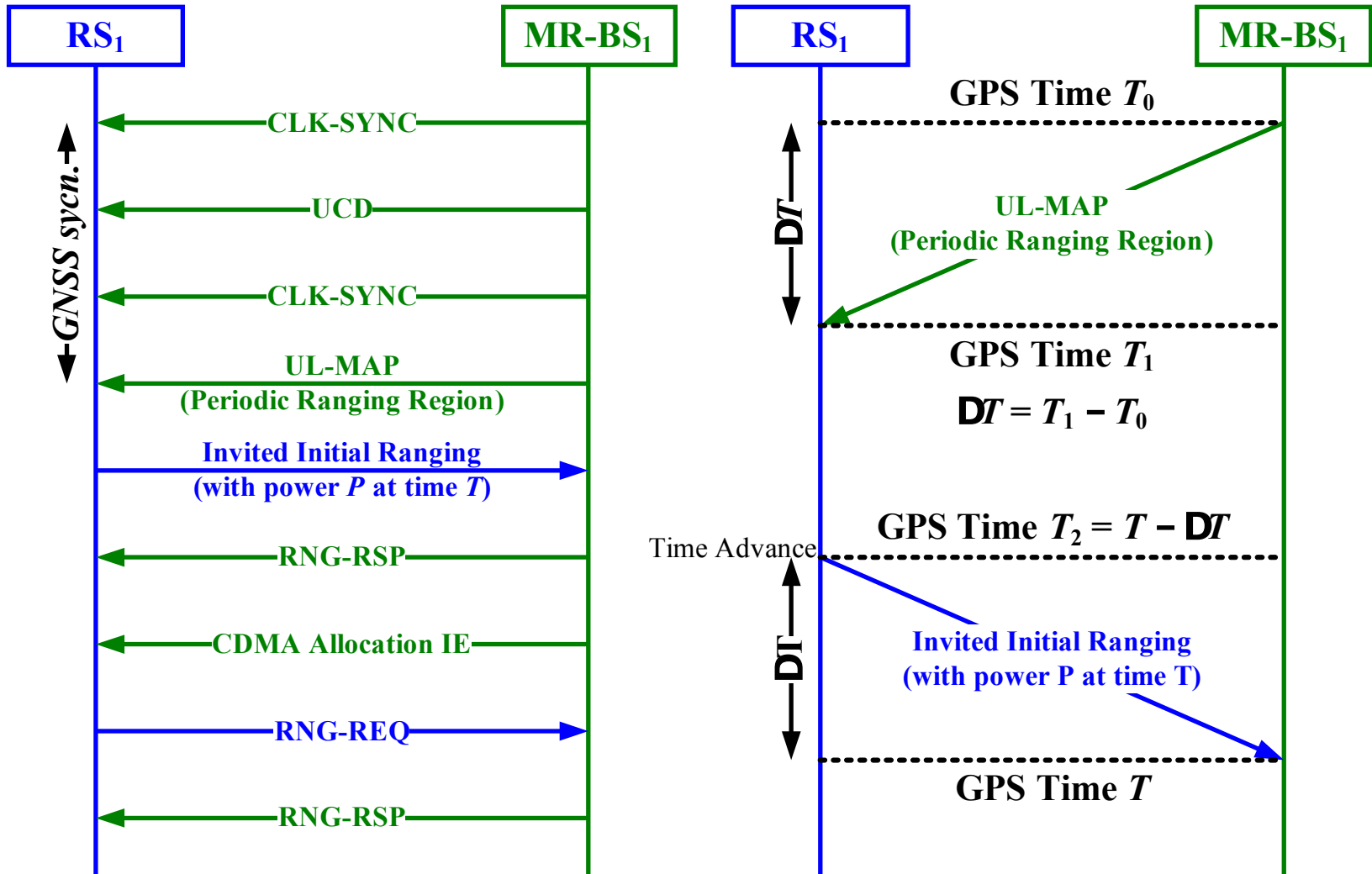
# ***MR System Time Synchronization***

- To synchronize with access station (AS), a AS should broadcast CLK-SYNC to synchronize frame-start preamble transmissions among MR-BS and RSs
- The feature is optional

<u>Syntax</u>	<u>Size</u>	<u>Notes</u>
<u>CLK-SYNC message_format () {</u>	=	=
<u>Management Message Type = xx</u>	<u>8 bits</u>	=
<u>Frame Sequence Number</u>	<u>8 bits</u>	<u>8-LSB Frame Sequence Number</u>
<u>Fraction GPS time</u>	<u>24 bits</u>	<u>Fraction GPS time for frame-start DL preamble of current frame, where fraction GPS time defined as the GPS time minus the integer GPS time in second (unit 1 micro second)</u>
<u>}</u>	=	=

# Example of GNSS-equipped RS

## CDMA-based Ranging



# *Summary*

- Propose CLK-SYNC message to perform RS autonomous synchronization, which is optional for MR-BS and RSs