



LTE Radio Access, Rel. LTE 18, Operating Documentation, Issue 02

LTE4044: Support 2T2R with AirScale for TD-LTE

DN205294103

Issue 01

Approval Date 2018-01-11

The information in this document applies solely to the hardware/software product ("Product") specified herein, and only as specified herein. Reference to "Nokia" later in this document shall mean the respective company within Nokia Group of Companies with whom you have entered into the Agreement (as defined below).

This document is intended for use by Nokia's customers ("You") only, and it may not be used except for the purposes defined in the agreement between You and Nokia ("Agreement") under which this document is distributed. No part of this document may be used, copied, reproduced, modified or transmitted in any form or means without the prior written permission of Nokia. If You have not entered into an Agreement applicable to the Product, or if that Agreement has expired or has been terminated, You may not use this document in any manner and You are obliged to return it to Nokia and destroy or delete any copies thereof.

The document has been prepared to be used by professional and properly trained personnel, and You assume full responsibility when using it. Nokia welcomes your comments as part of the process of continuous development and improvement of the documentation.

This document and its contents are provided as a convenience to You. Any information or statements concerning the suitability, capacity, fitness for purpose or performance of the Product are given solely on an "as is" and "as available" basis in this document, and Nokia reserves the right to change any such information and statements without notice. Nokia has made all reasonable efforts to ensure that the content of this document is adequate and free of material errors and omissions, and Nokia will correct errors that You identify in this document. Nokia's total liability for any errors in the document is strictly limited to the correction of such error(s). Nokia does not warrant that the use of the software in the Product will be uninterrupted or error-free.

NO WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF AVAILABILITY, ACCURACY, RELIABILITY, TITLE, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS MADE IN RELATION TO THE CONTENT OF THIS DOCUMENT. IN NO EVENT WILL NOKIA BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL OR ANY LOSSES, SUCH AS BUT NOT LIMITED TO LOSS OF PROFIT, REVENUE, BUSINESS INTERRUPTION, BUSINESS OPPORTUNITY OR DATA THAT MAY ARISE FROM THE USE OF THIS DOCUMENT OR THE INFORMATION IN IT, EVEN IN THE CASE OF ERRORS IN OR OMISSIONS FROM THIS DOCUMENT OR ITS CONTENT.

This document is Nokia proprietary and confidential information, which may not be distributed or disclosed to any third parties without the prior written consent of Nokia.

Nokia is a registered trademark of Nokia Corporation. Other product names mentioned in this document may be trademarks of their respective owners.

Copyright © 2018 Nokia. All rights reserved.



Important Notice on Product Safety

This product may present safety risks due to laser, electricity, heat, and other sources of danger.

Only trained and qualified personnel may install, operate, maintain or otherwise handle this product and only after having carefully read the safety information applicable to this product.

The safety information is provided in the Safety Information section in the "Legal, Safety and Environmental Information" part of this document or documentation set.

Nokia is continually striving to reduce the adverse environmental effects of its products and services. We would like to encourage you as our customers and users to join us in working towards a cleaner, safer environment. Please recycle product packaging and follow the recommendations for power use and proper disposal of our products and their components.

If you should have questions regarding our Environmental Policy or any of the environmental services we offer, please contact us at Nokia for any additional information.

Table of Contents

This document has 12 pages

	Summary of changes.....	5
1	LTE4044 overview and benefits.....	6
2	LTE4044 requirements.....	7
3	LTE4044 system impact.....	9
3.1	LTE4044 impact on other features.....	9
4	LTE4044 description.....	10
5	LTE4044 reference data.....	12

List of Tables

Table 1	LTE4044 hardware and software requirements.....	7
Table 2	LTE4044 sales information.....	7
Table 3	LTE4044 - supported cell set configurations.....	10

Summary of changes

This is the first issue of the document.

1 LTE4044 overview and benefits

Main idea of the feature and advantages it brings

The *LTE4044: Support 2T2R with AirScale for TD-LTE* feature introduces TD-LTE AirScale support for:

- four cells of 2T2R per ABIA board
- four cells of 1T1R per ABIA board

The feature enables 2TX2RX/1TX1RX and introduces basic 2TX2RTX site configurations for customer deployment.



Note: 1TX1RX site configurations will be available in a future release.

2 LTE4044 requirements

Hardware, software, and knowledge requirements

Equipment preconditions

Table 1 LTE4044 hardware and software requirements

	FDD	TDD
System release	Not supported	TD-LTE 18
Flexi Multiradio 10 BTS	Not supported	Not supported
Flexi Multiradio 10 Indoor BTS	Not supported	Not supported
Nokia AirScale BTS	Not supported	TL18
Flexi Zone BTS	Not supported	Not supported
Flexi Zone Access Point	Not supported	Not supported
Cloud Flexi Zone Controller	Not supported	Not supported
OMS	Not supported	Support not required
NetAct	Not supported	Support not required
MME	Not supported	Support not required
SAE GW	Not supported	Support not required
UE	Not supported	Support not required

The *LTE4044: Support 2T2R with AirScale for TD-LTE* feature requires the following HW elements:

- *LTE2114: AirScale Common ASIA*
- *LTE2261: AirScale Capacity ABIA*
- *LTE2262: AirScale Subrack AMIA*

The *LTE4044: Support 2T2R with AirScale for TD-LTE* feature supports basic 2TX2RX configurations for the following RRHs:

- *LTE2177: FZHR Flexi RRH 8-pipe 2600 160 W R*
- *LTE2552: FZHN Flexi RRH 8-pipe 2600 160 W N*
- *LTE3762: Flexi RRH 8T8R B38 160 W FZHW*
- *LTE2810: AZNA AirScale RRH 4T4R B40 160 W*
- *LTE3123: UZHA B41 RRH 8x20-25 2600 MHz*
- *LTE3143: UZHB B41 RRH 8x20-A 2600 MHz*

Sales information

Table 2 LTE4044 sales information

Pricing type	License control	Activated by default
Basic software (BSW)	-	Yes

Background information

Get familiar with the following terms:

SISO	Single Input Single Output - wireless communication method in which a single radio transmitter and a single radio receiver are used.
MIMO	Multiple Input Multiple Output - wireless communication method in which multiple radio transmitters and receivers are used to improve the performance.
Cell Set	site configuration block based on Nokia AirScale BTS. A minimum requirement is one ASIA AirScale Common unit and half a capacity of ABIA AirScale Capacity unit. A Cell Set can function as an independent basic configuration, or a sub-configuration combined with other Cell Sets to form complex (full) configurations.

3 LTE4044 system impact

The feature impacts the following aspects of the system: system performance and capacity

Impact on interfaces and management tools

The *LTE4044: Support 2T2R with AirScale for TD-LTE* feature has no impact on interfaces and management tools.

Impact on system performance and capacity

With the *LTE4044: Support 2T2R with AirScale for TD-LTE* feature new configurations are available.

For more information, see the following documents:

- **Integrate and Configure ► TD-LTE BTS Supported Configurations**
- **Nokia AirScale BTS ► Installing Nokia AirScale System Modules ► Creating Nokia AirScale BTS TD-LTE Configurations**

3.1 LTE4044 impact on other features

List of correlations between this and other features

The *LTE4044: Support 2T2R with AirScale for TD-LTE* feature impacts the following feature:

- [LTE3961: AirScale RRH 2T2R B40 120W AZND/AZNE](#)
LTE4044 introduces 2-pipe deployment (2T2R MIMO), which is a requirement for LTE3961 to be implemented.

The *LTE4044: Support 2T2R with AirScale for TD-LTE* feature is impacted by the following features:

- *LTE48: Support of High Speed Users*
LTE4044 supports high speed User Equipment (UE).
- *LTE112: Cell Bandwidth – 20 MHz*
It enables LTE 20 MHz carriers
- *LTE113: Cell Bandwidth – 15 MHz*
It enables LTE 15 MHz carriers.
- *LTE114: Cell Bandwidth – 10 MHz*
It enables LTE 10 MHz carriers.
- *LTE2720: AirScale Optimized TDD 8T8R Site Configurations*
LTE4044 re-uses the user plane deployment introduced by LTE2720.

4 LTE4044 description

The feature introduces 1T1R and 2T2R support for Nokia AirScale TD-LTE BTS

Functional description

The feature introduces the following deployment types for TD-LTE AirScale System Module:

- 1T1R - Single Input Single Output (SISO)
- 2T2R - Multiple Input Multiple Output (MIMO)

With this feature four cells per one ABIA are supported.

Previously, only 4T4R and 8T8R MIMO types were supported with AirScale TD-LTE BTS. Now, with LTE4044 implemented the AirScale TD-LTE solution is complete.

LTE4044 - supported cell set configurations

Site configurations defined by this feature are based on the Cell Sets concept.

For more information on the Cell Sets concept, see [Nokia AirScale BTS TD-LTE Cell Sets - overview](#).

Table 3 LTE4044 - supported cell set configurations

Cell Set type	Baseband resources	Capacity	Bandwidth	Fronthaul connection
Cell Set I	½ ABIA	2 cells 2T2R	10/15/20 MHz for each 2T2R cell	Any of the 6 optical ports in one ABIA can be used. The maximum number of ports to be used by two cell sets I in one ABIA is six.
Cell Set II	1 ABIA	4 cells 2T2R	10/15/20 MHz for each 2T2R cell	Any of the 6 optical ports in one ABIA can be used. One cell set II cannot consist of two cell sets I.
Cell Set III	2 ABIAs	8 cells 2T2R	10/15/20 MHz for each 2T2R cell	Any of the 12 optical ports in two ABIAs can be used. One cell set III cannot consist of multiple cell sets I or II.

Table 3 LTE4044 - supported cell set configurations (Cont.)

Cell Set type	Baseband resources	Capacity	Bandwidth	Fronthaul connection
Cell Set IV	3 ABIs	12 cells 2T2R	10/15/20 MHz for each 2T2R cell	Any of the eighteen optical ports in three ABIs can be used. One cell set IV cannot consist of multiple cell sets I, II or III.

With SW support, the cell set configurations can be combined with any other valid cell set configuration within one AirScale subrack. The configurations can be different in each of the combined cell sets. Cell set configurations can have the same or different AirScale Capacity-RFM/RRH interface protocols. If the interface protocols are different, they must be located in different ABIs. The following interface protocol combinations are supported:

- CPRI/L3 + OBSAI
- CPRI/L3 + CPRI/Ir
- CPRI/L3 + CPRI-A
- CPRI/Ir + CPRI-A
-



Note: Supported CPRI link rate is 9.8 Gbps.



Note: 2T2R cell set configurations can be combined with other 2T2R cell set configurations within one eNB. Configurations of 2T2R/1T1R and other valid cell set configurations will be supported in a future release (with LTE3839).

5 LTE4044 reference data

There are no alarms, measurements and counters, key performance indicators or parameters related to the LTE4044: Support 2T2R with AirScale for TD-LTE feature.