

Global Mobile LTE EPC Virtualization Forecast, 2013 - 2017: *Impacts and Benefits*

Market Study
Fourth Quarter, 2013





Global Mobile LTE EPC Virtualization Forecast, 2013 - 2017: *Impacts and Benefits*

A Market Study

Published Fourth Quarter, 2013
Version 1.0
Report Number: 4Q2013-03

iGR
12400 W. Hwy 71
Suite 350 PMB 341
Austin TX 78738

Table of Contents

Abstract	1
Executive Summary	3
Three types of mobile virtualization defined	3
Software-defined networks	4
Network Functions Virtualization	4
Business models	4
Implementation	5
Strengths and weaknesses	5
Mobile EPC Virtualization Forecast	6
Figure A: Global LTE EPC Virtualization Infrastructure CapEx Benefit by Region, 2013-2017 (\$M, depreciated CapEx).....	7
Figure B: Global LTE EPC Virtualization OpEx Savings by Region, 2013-2017 (\$M)	8
What is Mobile EPC Virtualization?	9
Three types of mobile virtualization defined	9
Software-defined networks	10
Figure 1: High Level View of SDNs	11
Network Functions Virtualization	11
Mobile Virtualization Standards and Working Groups	13
The ETSI Industry Specification Group (ISG) for NFV	13
Table 1: ETSI specifications on Network Functions Virtualization	14
OpenEPC	14
Blue Orbit	15
Virtualized EPC Business Models	16
Additional core capacity	16
Figure 2: Mobile Core Virtualization	17
RAN-neutral mobile services	17
Figure 3: Mobile Core Virtualization with a Third Party.....	18
Multi-RAN support	18
Figure 4: Mobile Core Virtualization with two mobile operators and a third party	19
Virtual EPC Implementation	20
Virtualizing incumbent EPC	20
Figure 5: Mobile Packet Core Architecture showing control and user planes	21
Figure 6: Mobile Packet Core Architecture with User Plane in SDN	21
Orchestration	22
Potential SWOT of Mobile EPC Virtualization	23
Strengths and opportunities	23
Figure 7: Mobile EPC Virtualization SWOT Analysis	24
Weaknesses and threats	24

Quoting information from an iGillottResearch publication: external — any iGillottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from iGillottResearch. iGillottResearch reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from iGillottResearch. The use of large portions or the reproduction of any iGillottResearch document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2013 iGillottResearch, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

Global LTE EPC Infrastructure Forecast.....	26
Global LTE Subscriber Forecast.....	26
Table 2: Global LTE Subscribers by Region, 2012-2017 (000s).....	26
Figure 8: Total Global LTE Subscribers, 2012-2017 (000s)	27
Figure 9: Total Global LTE Subscribers by Region, 2012-2017 (000s)	27
Table 3: Global LTE Subscribers by Region, 2012-2017 (Percentage Share)	28
Figure 10: Global LTE Subscribers by Region, 2012-2017 (Percentage Share).....	28
Global LTE EPC Infrastructure CapEx Forecast	29
Methodology.....	29
Forecast	29
Table 4: Global LTE EPC Infrastructure CapEx, 2012-2017 (\$M, depreciated CapEx)	29
Figure 11: Total Global LTE EPC Infrastructure CapEx, 2012-2017 (\$M, depreciated CapEx).....	30
Figure 12: Global LTE EPC Infrastructure CapEx by Region, 2012-2017 (\$M, depreciated CapEx)	31
Table 5: Global LTE EPC Infrastructure CapEx by Region, 2012-2017 (Percentage Share) ...	31
Figure 13: Global LTE EPC Infrastructure CapEx by Region, 2012-2017 (Percentage Share)	32
Global Mobile EPC Virtualization Benefit Forecast	33
CapEx Benefit of LTE EPC Virtualization.....	33
Table 6: Global LTE EPC Virtualization Infrastructure CapEx Benefit, 2013-2017 (\$M, depreciated CapEx)	33
Figure 14: Total Global LTE EPC Virtualization Infrastructure CapEx Benefit, 2013-2017 (\$M, depreciated CapEx)	34
Figure 15: Global LTE EPC Virtualization Infrastructure CapEx Benefit by Region, 2013-2017 (\$M, depreciated CapEx).....	35
Table 7: Global LTE EPC Virtualization Infrastructure CapEx Benefit by Region, 2013-2017 (Percentage Share).....	35
Figure 16: Global LTE EPC Virtualization Infrastructure CapEx Benefit by Region, 2013-2017 (Percentage Share).....	36
OpEx Benefit of LTE EPC Virtualization	36
Methodology.....	36
Forecast for LTE OpEx EPC Virtualization Savings	37
Table 8: Global LTE EPC Virtualization OpEx Savings by Region, 2013-2017 (\$M).....	37
Figure 17: Total Global LTE EPC Virtualization OpEx Savings, 2013-2017 (\$M)	38
Figure 18: Global LTE EPC Virtualization OpEx Savings by Region, 2013-2017 (\$M)	39
Table 9: Global LTE EPC Virtualization OpEx Savings by Region, 2013-2017 (Percentage Share).....	39
Figure 19: Global LTE EPC Virtualization OpEx Savings by Region, 2013-2017 (Percentage Share).....	40
Mobile EPC Vendors.....	41
Alcatel-Lucent.....	41
Cisco	44
ClearSky Technologies	46
Connectem	49
Ericsson	50

Quoting information from an iGillottResearch publication: external — any iGillottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from iGillottResearch. iGillottResearch reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from iGillottResearch. The use of large portions or the reproduction of any iGillottResearch document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2013 iGillottResearch, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

General Dynamics Broadband	53
Huawei	56
Juniper Networks	58
Lemko	61
NSN (Nokia Solutions and Networks)	64
NetAmerica Alliance	68
Pario Solutions	70
Samsung Electronics	71
Tecore Networks	72
ZTE Corporation	76
Definitions	80
General	80
Device Types	80
Services	81
Network Technology	82
About iGR	87
Disclaimer	87

Quoting information from an iGillottResearch publication: external — any iGillottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from iGillottResearch. iGillottResearch reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from iGillottResearch. The use of large portions or the reproduction of any iGillottResearch document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2013 iGillottResearch, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

Abstract

Mobile virtualization is a hot topic in the wireless industry today. However, there is considerable lack of knowledge as to what constitutes mobile virtualization and how and when it will be implemented by mobile operators.

This report discusses the potential impact of mobile EPC (evolved packet core) virtualization, the potential benefits both in terms of CapEx and OpEx to operators deploying LTE, and the global implications.

Mobile EPC virtualization requires that the EPC functions and processes be recreated using off-the-shelf hardware and then deployed in a data center. A virtualized EPC could be used to provide additional core capacity to a legacy EPC for a mobile operator or could be used by a third party to provide services to a specific group of customers. (Note that simply hosting an EPC and offering it back as a managed service to a mobile operator is not virtualization.)

Key questions addressed in this report:

- What is mobile EPC virtualization?
- What types of mobile EPC virtualization exist and how do they differ?
- What are the current standards efforts and industry groups associated with mobile EPC virtualization?
- What is the relationship between virtualization of the EPC, SDN and NFV?
- How is a virtualized EPC implemented?
- What are the strengths, weaknesses, opportunities and risks associated with mobile EPC virtualization?
- What new business models are enabled by mobile EPC virtualization?
- How much are the mobile operators expected to spend globally on LTE EPCs in terms of CapEx and OpEx?
- What are the potential savings associated with mobile LTE EPC virtualization for the world's mobile operators (by region) in terms of CapEx and OpEx?
- What is the potential impact of mobile EPC virtualization on the mobile infrastructure OEMs such as Alcatel-Lucent, Ericsson, Cisco, Nokia Solutions & Networks, Samsung, ZTE and Huawei?

Quoting information from an *iGillottResearch* publication: external — any *iGillottResearch* information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iGillottResearch*. *iGillottResearch* reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from *iGillottResearch*. The use of large portions or the reproduction of any *iGillottResearch* document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2013 *iGillottResearch*, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

- What are the opportunities for new virtualized EPC vendors such as Connectem?

Who should read this report?

- Mobile network operators and MVNOs
- Mobile infrastructure OEMs
- Mobile EPC vendors and OEMs
- Virtualization software and solution vendors
- Financial analysts and investors.

Quoting information from an *iGillottResearch* publication: external — any *iGillottResearch* information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iGillottResearch*. *iGillottResearch* reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from *iGillottResearch*. The use of large portions or the reproduction of any *iGillottResearch* document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2013 *iGillottResearch*, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.