A Primer on Fronthaul and Backhaul

Market Study
Fourth Quarter 2014

A Primer on Fronthaul and Backhaul

Market Study

Published Fourth Quarter 2014
Version 1.0
Report Number: 04Q2014-01

*iG*R
12400 W. Hwy 71
Suite 350 PMB 341
Austin TX 78738

Table of Contents

Abstract 1

Executive Summary 2

Methodology 3

What is Fronthaul? 4

What is CPRI? 4

Figure 1: CPRI Interface 5

Table 1: Specified Line Rates for CPRI 5

Figure 2: Remote Radio Head Configurations 7

Figure 3: Moving Toward a Cloud RAN Architecture 8

Providers of Fronthaul Services 8

Difference between RRHs and Metrocells 9

What is Backhaul? 10

Figure 4: Simple View of a Mobile Operator's Network 10

Throughput 11

Latency 12

Figure 5: How Latency Adds Up 13

Figure 6: Real-World LTE Network Latencies, June 2014 14

Small Cell Backhaul 14

Figure 7: Backhaul Technologies and Use Cases, Wired and Wireless 15

Small cell locations 15

Providers of Backhaul Services 17

Summary 18

Figure 8: Mobile Network Architecture with Fronthaul and Backhaul 18

Wired/Fiber Backhaul Vendor Profiles 20

Accedian Networks 20

Actelis Networks 21

ADTRAN 23

ADVA Optical Networking 24

Alcatel-Lucent 25

Brocade Networks 28

Calix 29

Canoga Perkins 30

Celtro Communication Ltd. 31

Ciena 32

Cisco 34

CommScope 35

Coriant 36

ECI Telecom 39

Quoting information from an *iG*illottResearch publication: external — any *iG*illottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iG*illottResearch. *iG*illottResearch 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 *iG*illottResearch. The use of large portions or the reproduction of any *iG*illottResearch document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2014 *iG*illottResearch, Inc. Reproduction is forbidden unless authorized.

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

Ericsson 40
Fibrolan 41
Fujitsu 42
GENBAND 43
Huawei 45
Infinera 47
IPITEK 48
Juniper Networks 49
MRV Communications 52
NEC 53
Nokia Networks 56
Overture Networks 58
Positron Access Solutions 60
RAD Data 61
SOLiD 62
TE Connectivity 63
Telco Systems 65
Tellabs 66
Zhone Technologies 67
ZTE Corporation 68

Definitions 71
General 71
Device Types 71
Services 72
Network Technology 73

About *iGR* 78
Disclaimer 78

Quoting information from an *iG*illottResearch publication: external — any *iG*illottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iG*illottResearch. *iG*illottResearch 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 *iG*illottResearch. The use of large portions or the reproduction of any *iG*illottResearch document in its entirety does require prior written approval and may have some financial implications.
Copyright © 2014 *iG*illottResearch, Inc. Reproduction is forbidden unless authorized.
FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

Abstract

This report provides a brief overview of two elements of the mobile operator's network:

- Backhaul: The connection between the baseband units and the EPC.
- Fronthaul: The connection between remote radio heads/units (RRHs/RRUs) and baseband units.

From these basic definitions emerge great complexity, particularly when the variations on each type are described. This report is offered as a primer to those more detailed topics that *iG*R has covered or will cover in existing or future reports.

Key questions addressed in this study:

- What is backhaul? What is fronthaul?
- What are the common backhaul technologies?
- What are small cells? What is the heterogeneous network?
- What is a metrocell? What is a remote radio head? What is the key difference between the two?
- What is CPRI?
- What are some of the basic requirements for backhaul and fronthaul?
- What companies provide fiber services?

This report is recommended for:

- Mobile operators, particularly those servicing the U.S. market
- Mobile backhaul providers, including telcos and cable MSOs
- Wired and wireless backhaul vendors and solution providers
- Mobile OEMs, particularly those servicing the U.S. market
- Wired and wireless infrastructure vendors, particularly those servicing the U.S. market

Quoting information from an *iG*illottResearch publication: external — any *iG*illottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iG*illottResearch. *iG*illottResearch 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 *iG*illottResearch. The use of large portions or the reproduction of any *iG*illottResearch document in its entirety does require prior written approval and may have some financial implications.
Copyright © 2014 *iG*illottResearch, Inc. Reproduction is forbidden unless authorized.
FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

- Financial and investment analysts.

Quoting information from an *iG*illottResearch publication: external — any *iG*illottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iG*illottResearch. *iG*illottResearch 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 *iG*illottResearch. The use of large portions or the reproduction of any *iG*illottResearch document in its entirety does require prior written approval and may have some financial implications.
Copyright © 2014 *iG*illottResearch, Inc. Reproduction is forbidden unless authorized.
FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.