LTE Consultancy Services

Briskwave

For a better telecom deal

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Executive Summary

This document outlines Briskwave's series of LTE Consultancy Service packages to help wireless carriers in their planning, vendor selection, and deployment efforts of LTE.

1.0 Introduction

BriskWave Consulting is teaming up with network operators, BriskWave Consulting is teaming up with network operators, solutions providers, and investors to form the right technology and business strategies in a time when waves of promising new technologies and market opportunities are converging with a new financial rigor, and demanding a fresh approach to everything from strategic planning and technology and supplier selection, through to network design and service deployment.

BriskWave offers a rare blend of technical and business know-how, enabling clients to focus on the high-performance technologies and solutions that will bring high-return investments and enhance competitive differentiation.

BriskWave applies a strong financial discipline to the design, selection, development, and deployment of innovative wireless solutions, services, and processes. With a broad range of consultancy services, BriskWave helps clients rapidly take advantage of new opportunities, design cost-effective networks and efficient operational processes, and accelerate acceptance and deployment of new services and solutions.

We understand the technologies, market drivers, and business priorities, and we know how to bring them together successfully. Our seasoned telecom veterans use their vast international experience to help a wide range of businesses – from start-ups to large global companies. Our consultants have unique bench strengths in bringing together and applying the specialized disciplines of business and technology. We help clients improve business cases and network designs, and we provide effective planning of new services and products from end-to-end, including requirements specifications, vendor selection and contract negotiations, and program management.

For more information please visit www.briskwave.com.
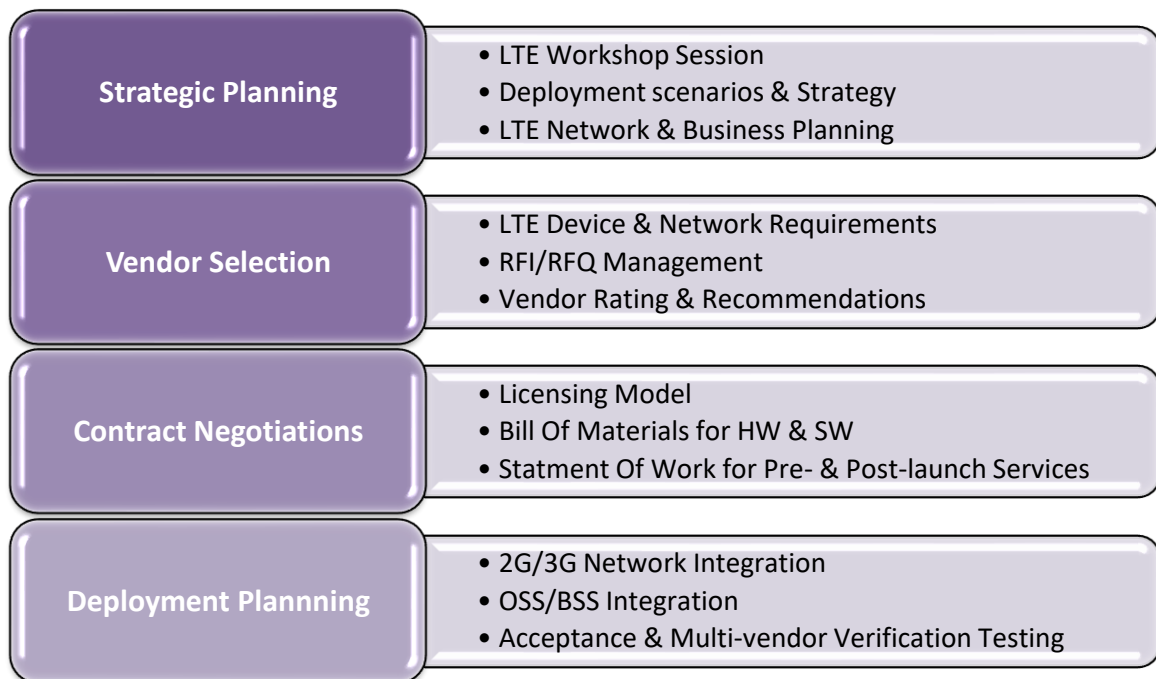
ABOUT LUC SAMSON

Luc Samson is a partner in Briskwave, a consulting firm that helps wireless carriers rapidly take advantage of new opportunities, design cost-effective networks and efficient operational processes, and accelerate acceptance and deployment of new services and solutions. Luc's expertise lies in managing strategic initiatives in technology evolution, vendor selection, and solution deployment with a focus on 5G transformation and network sharing. He is currently involved in planning 5G with carriers and enterprises in North-America, and has extensive experience in successful VoLTE and MOCN programs.

Prior to Briskwave, Luc was instrumental in helping Nortel and its customers around the globe, in different management and professional services roles. His 20+ years of experience covers business planning, product & service planning, and network engineering for all major wireless technologies, including 5G, LTE, HSPA, GSM/GPRS, CDMA, EVDO, 802.11 and 802.16. Luc holds has a Master degree in applied sciences, he is the author of numerous technical papers, and he owns 2 patents.

Luc speaks fluent French, English, and German.

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2.0 LTE Services Packages - Overview

The figure below presents Briskwave's LTE Service Packages regrouped in 4 categories. Each service package can be executed individually or can be bundled with one or more service packages. Depending on the specifics of the overall project, interdependencies may exist between the service packages. Furthermore, the scope of each service can be reduced and/or expanded to meet the particular needs of the wireless carrier.

Strategic Planning	• LTE Workshop Session • Deployment scenarios & Strategy • LTE Network & Business Planning
Vendor Selection	• LTE Device & Network Requirements • RFI/RFQ Management • Vendor Rating & Recommendations
Contract Negotiations	• Licensing Model • Bill Of Materials for HW & SW • Statment Of Work for Pre- & Post-launch Services
Deployment Plannning	• 2G/3G Network Integration • OSS/BSS Integration • Acceptance & Multi-vendor Verification Testing

3.0 Strategic Planning Services

3.1 LTE Workshop Session

The LTE Workshop Session is a 1-2 day "kick-off" training session for both technical and non-technical people. The draft agenda is presented in the *Appendix – LTE Workshop Seminar* on page 12.

The Workshop also serves to identify further training needs and refine scope of work packages and project deliverables.

3.2 LTE Deployment Scenarios & Strategy

The LTE Deployment Scenarios & Strategy Work Package includes the following activities & deliverables:

1. Review of all LTE deployment scenarios with regards to :
    a. Data-only or data & voice services;
    b. Voice&SMS support options;
    c. Single-vendor vs multi-vendor;
    d. Single (3G/LTE) or multi core networks;
    e. Inter-RAT voice and data handovers;
    f. Inbound roaming support;
    g. 2G & 3G service parity;
    h. LTE enhanced options such as SON, PCRF, ...;
    i. Antenna and site strategy;
    j. Others.
2. Assessment of each option against pros & cons, and risks & opportunities;
3. Recommendation of the optimal deployment strategy

3.3 LTE Network & Business Planning

Based on the selected deployment scenario, the LTE Network & Business Planning Work Package includes the following activities & deliverables:

1. Marketing forecasts of subscriber counts, usage & traffic demands, service packages & pricing;
2. High-level network planning, including roll-out plan, spectrum & antenna plan, site count based on link budget analysis, as well as coverage and capacity requirements, service & QoS modelling;
3. Financial analysis, including, CAPEX & OPEX modelling, Return On Investment, Net Present Value, and cash-flow analysis.

4.0 Vendor Selection Services

4.1 LTE Device & Network Requirements

The purpose of the LTE Device & Network Requirements Work Package is to define the RFQ requirements and/or establish the Bill-Of-Materials to be ordered; it includes the following activities & deliverables:

1. Review & assessment of current commercial LTE device & network product offerings by major vendors, in terms of functionalities, capacity, availability timeframe, etc;

2. Review of carrier's specific requirements with regards to service offering, 2G & 3G network integration points, OSS/BSS integration points;

3. Finalize the list of mandatory and desirable featured.

4.2 RFI/RFQ Management

The LTE RFI/RFQ Management Work Package includes the following activities & deliverables:

1. Publishing the LTE RFI/RFQ based on the carrier's requirements;

2. Manage vendor interactions with regards to the communications, the schedule, the questions & answers, bid defences, responses to the RFI/RFQ;

3. RFI/RFQ Evaluation & Scoring matrix.

4.3 Vendor Rating & Recommendations

The Vendor Rating & Recommendations Work Package includes the following activities & deliverables:

1. Validate vendor's RFQ responses through bid defence meetings, lab visits, product demo or trials, and reference calls; modify the RFQ scoring accordingly;

2. Rate vendors according to both the revised RFQ scoring (i.e. alignment of solutions to carrier's requirements) and other strategic & commercial criteria such as vendor credibility, market presence, pricing and commercial terms, and others.

3. Final recommendations on vendor selection i.e. short-list.

5.0 Contract Negotiation Services

In support to carrier's procurement team in the contract negotiation phase, the services described in this section cover critical technical inputs to the contract necessary to guarantee that the contract will reflect carrier's needs.

5.1 Licensing Model

The purpose of the Licensing Model Work Package is to align all vendors to a licensing model that matches carrier's requirements in term of simplicity, manageability, predictability, price-point, traffic metrics, size of capacity steps, and many others.

This is a key component of the procurement efforts to guarantee that the LTE solution will ultimately match carrier's LTE business case.

The Licensing Model Work Package includes the following activities & deliverables:

1. Define the key metrics for licenses, on a per network element basis;
2. Align vendors' licensing models to the required models;
3. Evaluate risks by running what-if traffic scenarios and evaluate cost impacts;
4. Set maximum target price for each license metrics.

5.2 Bill Of Materials for HW & SW

The purpose of this activity is to align all vendors' Bill Of Materials (BoM) to match carrier's requirements.

This is a key component of the procurement efforts to guarantee that the LTE solution will ultimately match carrier's LTE requirements.

The BoM Work Package includes the following activities & deliverables:

1. Define carrier's functional and capacity requirements;
2. Review proposed vendors' BoMs against the functional and capacity requirements;
3. Align vendor's BoMs to carrier requirements;
4. Identify gaps and value-added functions beyond carrier's requirements.

5.3 SOW – Pre-launch & Post-launch Services

The purpose of the *SOW – Pre-launch & Post-launch Services* Work Package is to align vendors' service offering with regards to service definition and Statement Of Works (SoW) to match carrier's service requirements.

This is a key component of the procurement efforts to guarantee that the LTE solution will ultimately match carrier's LTE service requirements.

The *SOW – Pre-launch & Post-launch Services* Work Package includes the following activities & deliverables:

1. Define the generic set of carrier's service requirements, for both pre- and post-launch phases;

2. Review proposed vendors' SoW against the service requirements;

3. Align vendor's SoW to carrier's requirements;

4. Identify gaps and value-added services below and beyond requirements.

5. Pre-launch & post-launch services covered by this work package can include:

   a. Site Engineering

   b. Shipment to Site

   c. Installation

   d. Configuration

   e. Integration

   f. Commissioning

   g. Acceptance Testing

   h. Network Design

   i. Network Optimization

   j. Project Management

   k. Support & Maintenance - SLA

   l. Training & Documentation

6.0 Deployment Planning Services

6.1 2G/3G Network Integration

The purpose of the *2G/3G Network Integration* Work Package is to guarantee that the vendor's LTE solution is fully integrated with the carrier's 2G and 3G networks. This service can be partially integrated into the *Acceptance Testing –Launch Services*, depending on the specifics.

This Work Package includes the following activities & deliverables:

1. Identify all integration points between the 2G/3G and the LTE networks;

2. Define use cases and data flows involving the integration points;

3. Define the requirements on all integration points between the 2G/3G and the LTE networks;

4. Translate integration requirements into specific functional, configuration, and capacity requirements required on the 2G & 3G and LTE network elements;

5. Define detailed project plan for the procurement, activation, and availability of those requirements;

6. Define the detailed test cases & scenarios, including procedures to verify that the integration test criteria are met (*);

(*) The integration test criteria, but not necessarily the detailed test scenarios, shall have been defined in the SoW for Pre-launch services prior to the start of deployment and already included in the contract terms.

6.2 OSS/BSS Integration

The purpose of the *OSS/BSS Integration* Work Package is to guarantee that the vendor's LTE solution is fully integrated with carrier's OSS & BSS systems. This service can be partially integrated into the *Acceptance Testing –Launch Services*, depending on the specifics.

This Work Package includes the following activities & deliverables:

1. Identify all integration points between carrier's OSS&BSS systems and the LTE network;

2. Define use cases and data flows involved on the integration points; use cases shall cover all applicable OSS & BSS domains such as Fault, Configuration, Performance, Accounting, Security, and Provisioning Management

3. Define the requirements on all integration points between carrier's OSS&BSS systems and the LTE network;

4. Translate integration requirements into specific functional, configuration, and capacity requirements required on carrier's OSS&BSS systems;

5. Define detailed project plan for the procurement, activation, and availability of those requirements;

6. Define the detailed test cases & scenarios, including procedures to verify that the integration test criteria are met (*);

(*) The integration test criteria, but not necessarily the detailed test scenarios, shall have been defined in the SoW for Pre-launch services prior to the start of deployment and included in the contract terms.

6.3 Acceptance Testing

The purpose of the *Acceptance Testing –Launch Services* Work Package is to guarantee that the vendor's LTE solution meets carrier's operational requirements before product acceptance and commercial launch.

This Work Package includes the following activities & deliverables:

1. Define the overall and detailed product acceptance test strategy with regards to lab, pre-production and production networks;

2. Define the detailed test cases & scenarios, including procedures to verify that the acceptance test criteria are met (*);

3. Manage the troubleshooting for both single-vendor and multi-vendor scenarios;

4. Follow-up on issue resolution until carrier's full satisfaction.

(*) The acceptance test criteria, but not necessarily the detailed test scenarios, shall have been defined in the SoW for Pre-launch services prior to the start of deployment and included in the contract terms.

7.0 Some Customer References

"With a broad and deep knowledge of the wireless technology and business, BriskWave is able to manage Subject Matter Experts from all domains into very effective multi-group taskforces and activities. BriskWave's background working with equipment makers was instrumental in our negotiating high-value contracts with vendors. I can only recommend BriskWave to anyone looking for a technically-savvy, results-focused, and organizationally effective consultant."

Wireless Network Planning Director

"As we embarked into our HSPA network sharing program, one of the most significant programs in our history, I turned to BriskWave's consultancy services once again. BriskWave's contribution was key to launch our HSPA network on time."

OSS Director

"I am very pleased with my decision to hire BriskWave, and I can recommend this company to anyone looking for a business analyst coupled with strong network engineering and planning skills. BriskWave's contribution will translate into substantial improvement in our operational efficiency."

Director Network Support Systems

"BriskWave Consultant was instrumental in closing our first contract with Orange, and later on successfully project-managed our first commercial deployment – on schedule and without any issue. BriskWave's know-how, skills, and experience helped us successfully go through a turning point in our company's history."

VP Research & Development

 now Openwave

8.0 Briskwave Contacts

All inquiries concerning this service proposal should be directed to:

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Appendix – LTE Workshop Seminar

8.1.1 *Goals of the Workshop*

Participants to the workshop will get an understanding of the benefits and challenges offered by LTE so that they will be in the position to:

1. Determine the specific LTE options they have in terms of spectrum, equipment availability, timeline, and evolution from 3G;

2. Initiate key strategic activities that will lead to defining their optimal LTE strategy, on both the technology and the marketing fronts;

3. Understand all areas of their business that will be affected by LTE;

4. Start fleshing-out their specific requirements, for both the legacy network and the LTE network, necessary for their LTE deployment; and

5. Initiate an educated dialog with equipment vendors on procurement initiatives.

8.1.2 *Workshop Agenda*

I. LTE Overview

A. Technology & Business Drivers
1. 4G Drivers
2. 3GPP 4G Requirements
3. 3GPP Standard Evolution
4. LTE Key Features
5. Comparison of 4G Technologies

B. Spectrum Overview
1. Standard LTE Bands
2. Digital Dividend Bands
3. Prime LTE Bands
4. Re-farming Bands

C. Ecosystem & State of Deployments
1. LTE User Subscriptions
2. Carrier Strategies & State of Deployments
3. LTE Networks & Devices
4. LTE Advanced

D. LTE Architecture Overview
1. LTE Air Interface basics
2. LTE Evolved System Architecture
3. LTE Nodes and Interfaces

E. LTE Challenges
1. Voice Support
2. Spectrum Harmonization

3. Roaming
4. Integration with 3G
5. Device Availability
6. Backhauling

II.   LTE Architecture, Procedures & Protocols

A. LTE Air Interface
1. Overview of OFDMA & SC-FDMA
2. LTE Frame Structure
3. LTE Resource Grid
4. LTE Bandwidth/Resource Configuration
5. LTE Channels
6. LTE Protocol Architecture

B. MIMO Technologies in LTE
1. Spatial Multiplexing
2. Transmit Diversity
3. Beamforming

C. LTE System Architecture & Protocols
1. Basic Reference Model: eUTRAN, EPC, IMS
2. Functional Description of Network Elements
3. Interfaces & Protocols

D. LTE Basic Procedures
1. PLMN Selection
2. Cell Selection & Reselection
3. Tracking Area Optimization
4. RRC Connection Setup
5. Paging
6. Dedicated Bearer Setup
7. Intra-LTE Handovers
8. Inter-system Handovers
9. CSFB
10. VoLTE-SRVCC

E. Self-Organizing Networks (SON)
1. Overview
2. Use Cases & Solutions : 3GPP TS36.902
3. Benefits

F. QoS in LTE
1. LTE Bearer Architecture
2. LTE QoS Profiles
3. LTE QoS Functional Architecture

G. LTE Security
1. LTE Security Architecture

2. Security Algorithms
3. Backhaul & Relay Node Security
4. Lawful Interception
5. Security for Machine-Type Communications

H. LTE-ADVANCED (REL 10) AND BEYOND
1. Higher-Order MIMO
2. Carrier Aggregation
3. Heterogeneous Networks
4. Relaying
5. LTE Rel-11 & Rel-12

III. LTE Planning, Deployment & Interworking

A. LTE Network Planning
1. Overview
2. Frequency Planning
3. Coverage Planning
4. Capacity Planning
5. End-user Demand Model

B. LTE Deployment Scenarios
1. Date & Voice Services Deployment Scenarios
2. Network Deployment Scenarios

C. LTE Network Sharing
1. Triggers & Benefits
2. Passive & Active Network Sharing
3. Network & Business Management Aspects

D. Voice Services
1. Circuit-Switched Fallback (CSFB)
2. VoLTE
3. VoLTE with SRVCC
4. VoLTE with UMTS PS

E. 2G/3G Interworking
1. Idle-Mode Signaling Reduction (ISR)
2. Data Interworking Options
3. CSFB Mechanisms & Network Requirements
4. VoLTE-SRVCC Mechanisms & Network Requirements
5. QoS Interworking

F. LTE Roaming
1. Architecture Overview
2. Data Roaming Scenarios
3. Voice & SMS Roaming Scenarios
4. IMS Roaming Scenarios

ABOUT THE TRAINER

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