

Mobile Infrastructure

Accelerate your mobile technology



Roke Manor Research Ltd
a Siemens company

Consultancy

Product development

Test services

Flexible mobile infrastructure solutions from Roke



More than ever before, the world of mobile telecoms is undergoing rapid changes. As customer expectations increase with ever emerging mobile broadband standards, new business models and opportunities are being created.

The team at Roke is at the forefront of these changes and thoroughly understands the new business models. Our expertise is focused on wireless technologies such as LTE-A, LTE, FEMTO, HSDPA, HSUPA, UMTS (3G), GPRS, EDGE, GSM (2G), GSM-R, WiMAX and IEEE802.11.

Our unique offering is to deliver solutions to our customers in the category of *'First, Fast & Difficult'*.

Roke's services are tailored towards network equipment vendors, mobile operators, new startups and regulators:

- Mobile technology consultancy (see pages 4-5)
- Product development
 - Radio access (see pages 6-7)
 - Core network (see pages 8-9)
- Test services (see pages 10-11)

Mobile technology consultancy

Cutting edge technology consultancy to support new revenue opportunities

Our in-depth understanding of applied research* and emerging standards allows us to confidently advise customers making critical business decisions based on the technology.

Our services include:

Strategic regulatory advice

- Report on regulatory impact on current and new technologies
- Spectrum issues
- Emergency services provision
- Lawful Intercept

Spectrum management consultancy

- Spectrum engineering and interference management
- Technology selection recommendations
- Spectrum monitoring and re-farming

Systems Engineering

- System requirements capture
- End to end system analysis
- System modelling and design
- Architecture design
- System level simulation

Economic modelling and cost benefit analysis

- New technology analysis against baseline
- Cost benefit analysis
- Analysis of 3rd party patent portfolios to address exploitation routes
- Horizon scanning

* Examples include European programmes Ambient, Winner and Trilogy which are defining the future of mobile communications and the Internet

Case study

3GPP standards	
Challenge	To assist a Tier One vendor to advance the 3GPP standardisation process and generate IPR for the client
Approach	Roke designed and developed advanced HSPA, LTE link level and system level simulations using Roke's comprehensive suite of simulation tools
Benefits delivered	Rapid and timely generation of simulation results that predict system performance, and help to develop and refine the 3GPP standards





Radio access product development

Rapid development to take first product to market

Our leading-edge expertise has been used to deliver prototypes, testbeds, reference designs and 'first-to-market' products for our customers.

Our services include:

Standards support

- Monitoring
- IPR generation
- Active participation
- New work item generation

Radio access product development

- Rapid, cost-effective development of demonstrators/prototypes
- Basestation and controller product design and implementation
- Evaluation and validation

Antenna system design

- Design, simulation and prototyping
- Pre-compliance testing and emission testing using Roke's own test chambers

RF design

- RF system development
- RFIC design

Baseband platform and algorithm design

- Baseband system engineering
- DSP and FPGA platforms
- Embedded software design
- Simulation

RAN protocol development

- Layer 2/3 protocol analysis and development
- L2 scheduling to meet user quality of service
- User/control plane and interface to management plane
- Transport plane development (general and network processor platforms)
- Digital software and hardware design and development
- Multi access network migration

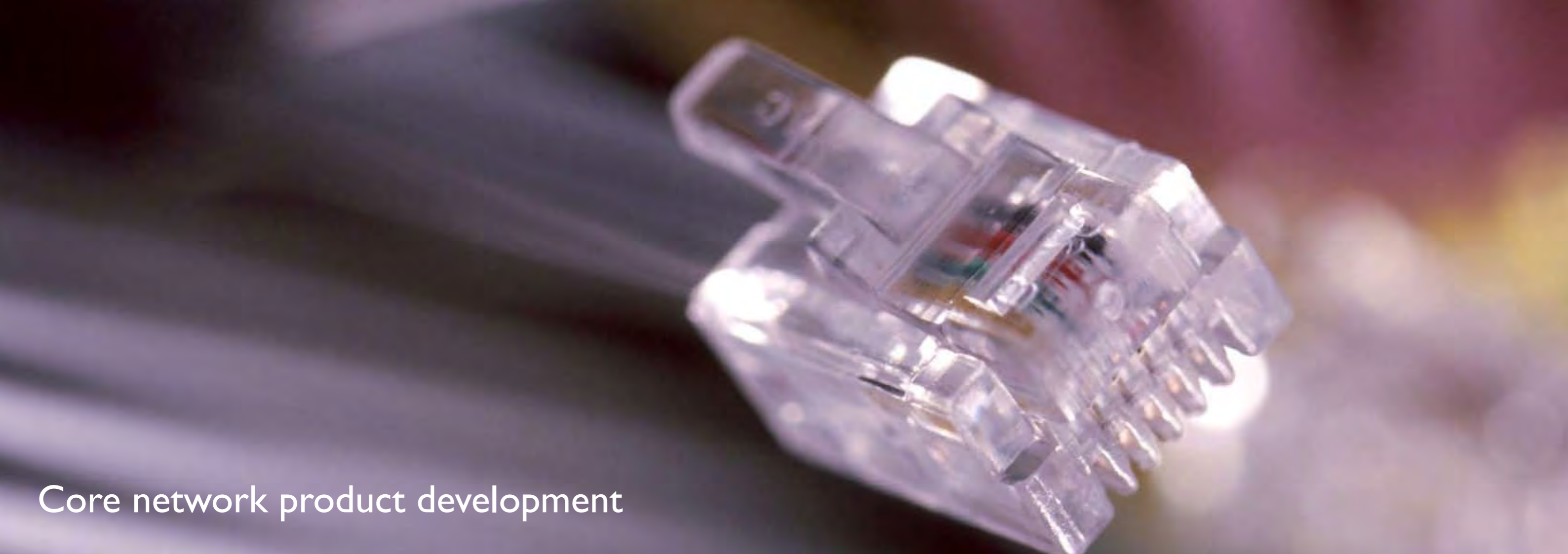
Operation and maintenance

- Element management
- Rapid prototyping

Case study

LTE protocol stack	
Challenge	To develop a "lite" LTE stack user plane and signalling with handover support
Approach	Rapidly designed the LTE stack prototype prior to completion of 3GPP standards, by building from our WCDMA components
Benefits delivered	Provide a prototype platform for demonstration and as the core to accelerate eNodeB development





Core network product development

Future proof your network, to secure revenue streams

Whether it's applied research, concepts or complete end to end development, Roke has the skills and expertise to meet your needs.

Our services include:

Standards support and research

- Monitoring
- IPR generation
- Active participation
- New work item generation

Core product development

- Rapid, cost-effective development of demonstrators/prototypes
- High speed router architecture
- Gateway product design and implementation
- Evaluation and validation

Network design

- Protocol analysis for deep package inspection (IPv4/IPv6)
- QoS enforcement and shaping (IPv4/IPv6)
- Intelligent traffic control
- Analysis of IP protocols and impact of enhancements (e.g. header compression)
- Network security assessment and recommendation
- Embedded software design

Network architecture

- Fixed/mobile convergence
- Multi technology interworking
- Network application optimisation

Case study

LTE/CDMA2000 interworking	
Challenge	To support Tier One vendor in understanding initial issues and feasibility of LTE/CDMA2000 integration
Approach	Developed early architecture proposals, assessed protocol and performance requirements focused on loose coupled core network integration
Benefits delivered	Captured the interworking requirements and recommendations to secure Tier One vendor interests on open interfaces. Technology transfer to development teams.



Test services

Gain competitive advantage by reducing time to market and costs

Our speciality is in improving product performance by troubleshooting test failures and technical problems. Our background in design and development along with our history of successful product design means we can provide innovative solutions and support for the most intractable problems.

Type approval and pre-compliance tests

- Core network and RAN equipment tests
- RF tests
- EMC tests

Over-the-air performance testing

- MAC scheduler simulation environment to test QoS performance
- Simulating effects of different radio environments on data rates

Compliance test

- Compliance against standard defined test environments

Interoperability testing

- Multi-vendor interoperability
- Radio level interoperability between different radio layers (macro, pico, femto)

Custom testing

- Tests aligned to specific vendor requirements and operator platforms
- Test harness – (databases Java/J2EE, web technologies, SOA)

Troubleshooting

- Debugging, regression tests, correlation analysis
- Fault/technical issue identification
- Expertise to improve product performance

Conformance testing

- Detailed understanding of standardised architectures and protocols
- Conformance tests to the latest process, functions and interfaces as defined in the standard specifications
- Use of industry standard test and test automation tools
- Customised test for optional functions/procedures for specific standard specifications

Case study

OEM Femto validation	
Challenge	To validate an OEM femto access point and the femto gateway for connection to Tier One vendor's core network
Approach	Developed test specification, test scripts for Catapult tester and automated test
Benefits delivered	Accelerated the development plans to reduce the time to market





Roke Manor Research Ltd
a Siemens company

www.roke.co.uk/mobile

Roke Manor Research Ltd
Roke Manor, Romsey
Hampshire, SO51 0ZN, UK

T: +44 (0)1794 833624
F: +44 (0)1794 833433
mobile@roke.co.uk
www.roke.co.uk/mobile

© Roke Manor Research Limited 2009.
All rights reserved.

This publication is issued to provide outline information only, which (unless agreed by the company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as representation relating to the products or services concerned.

The company reserves any right to alter without notice the specification, design, or conditions of supply of any product or service.



Certificate Number Q05609