COURSE SUMMARY

HIGHLIGHTS

- Focused at telecoms professionals that need to assess threats and preparedness of mobile networks
- An interactive programme to inform attendees of the general architecture used by mobile operators
- Clearly identifies the security features within existing 2G/3G & 4G networks
- Describes possible attacks that could be deployed against modern mobile network
- Discusses best practice in response to possible mobile network attacks and mitigation strategies
- Identifies the residual security risks within modern LTE 4G mobile networks
- Reviews the technical standards from 3GPP and IETF RFCs relating to mobile network security
- Uses decoded traces from live networks as real life examples of security processes

COURSE SUMMARY

This 2 day program provides a grounding for telecoms professionals wishing to review the resilience of modern mobile networks around the world.

The structure of modern mobile radio and core networks are described and possible types of attacks discussed. Attendees are assisted to develop a register of possible threats and responses for each area of the course; this could easily be used as the basis for possible test plans.

The course is very interactive with much opportunity to discuss aspects and concerns with the expert facilitator.

WHO SHOULD ATTEND?

Telecoms Professionals requiring a practical grounding in modern mobile network architectures along with the associated security risks and responses.

OUTCOMES & COMPETENCY DEVELOPMENT

Participants will develop or be able to:

- Identify risks associated with mobile network infrastructure and systems
- Describe likely and possible attack pathways and types for mobile networks
- Discuss best practice for mitigating and testing mobile network weaknesses
- Plan an effective test plan for a modern 2G/3G & 4G network.
- Discuss the relative magnitude of threats on the various parts of the network
- Confidently discuss the relative security merits and weaknesses of the various network generations. (2G, 3G, 4G & Wifi)
- Confidently discuss CN and RAN architectures with target network professionals.
- Evaluate the significance and impact of threats to SS7, IP SIGTRAN, Databases, routers and transmission elements.
- Describe security aspects of Femto-Cell infrastructure.
- Understand the threat and functions of IMSI catchers.
- Discuss the 4G key hierarchy and key derivation.
- Describe the likely presence of MiM, Flood and Individual DoS, Spoofing, Location leakage and traffic injection within mobile networks.

Book online
Telecomsacademy.com

Book over the phone
+44 (0)20 7017 4144

Book via email
training@telecomacademy.com
DAY 1 CORE NETWORK ARCHITECTURES

- Generic architecture for the Core Network for CS and PS Services. (Including: 3G UMTS, HSPA & HSPA+ systems and interworking).
- Generic architecture of the 4G LTE and LTE Advanced Core Network for PS Services.
- VoLTE CN Architecture using IMS for voice and other CS services over the LTE PS Bearers.
- Identification of the residual threats in the existing 4G network architecture that remain unaddressed in current deployments.
- Description of the roles and functions of the various CN nodes and a discussion of the impact of a fault or removal of each particular node.
- Impacts on user experience and network resilience of various CN node failures.
- Identification of the various CN protocols and network segregation functions. The role of the control plane for signalling and user plane for user traffic and higher layer signalling.
- Role of SS7 and SIGTRAN within the CN and the impact of SS7 attack and failure.
- Femto-Cell Architecture within the core network and the connection out to the customer premises. Security features within the Femto-Cell.
- Role of BSS and OSS systems within the overall network monitoring and control functions.
- Identification of possible attacks on CN infrastructure (IP Database, DoS, SS7, Transmission network).
- Workshop exercise to identify (with the help of the expert facilitator) the dimensions of risks associated with CN architecture and best practice responses.

DAY 2 NETWORK SECURITY ASPECTS

- Workshop to further enhance and develop the personal risk register from day 1 for use as the basis for future mobile network test plans.
- Role of the SIM card within 2G networks for CS and PS services. Identification of the embedded algorithms and data stored.
- Signalling flows and parameters for the 2G authentication and encryption process.
- Role of the SIM card within 3G networks for authentication and integrity protection.
- Signalling flows and parameters for the 3G authentication, encryption and integrity processes.
- Role of the SIM card within 4G networks. Signalling flows for 4G authentication, encryption and integrity protection processes.
- 4G Session key management hierarchy and generation process.
- The role of IPSec within the LTE CN. And its use on exposed IP interfaces.
- Security algorithms used for 2G, 3G & 4G with a compression of their relative strengths.
- IMSI catcher functions and message flows. Along with a discussion of various potential countermeasures that could be used.
- Role of Intruder Detection Systems (IDS) within the mobile network infrastructure.
- Security and authentication considerations for non-3GPP networks (e.g. Wifi).
- Summary of 3GPP and IETF RFC security standards relevant to 2G, 3G & 4G architecture.
- Decoded traces from live networks are employed as examples at various places to illustrate the points made and show the format of likely trace data.
OUR TRAINING SERVICES

TELECOMS ACADEMY STRUCTURE

Our training programmes are delivered worldwide as part of the training and development plans of many operators, vendors, and service providers. The programmes cover a wide range of competency development requirements.

To ensure we meet the training needs of the industry as effectively as possible, we operate three schools:

School of Telecoms Management
Business training tailored to the telecoms industry, ranging from the intensive 5-day Telecoms Mini MBA to specialist leadership and marketing training.

School of Advanced Communication Technologies
Covering a multitude of technologies, these courses range from overviews aimed at nontechnical staff to in-depth engineering training.

Distance Learning
Our comprehensive suite of Distance Learning programmes provide an excellent opportunity to expand knowledge and build confidence.

OUR TRAINERS

We only use trainers and programme directors that satisfy the following three criteria:

- Experts in their field
- High level of Industry Experience
- Expert facilitators and training professionals.

All our trainers have undergone a rigorous election process and are subject to continuous monitoring and evaluation. Each trainer is accredited for specific courses or topic areas. Whether engineers or business experts, all our trainers are required to continue their own development within their specialist areas, and to broaden their Industry view of trends, best practice and technology.

This is achieved by our on-going work with many tier 1 operators and vendors, and by full exposure to Ovum research and KNect 365 TMT worldwide events.

UNIVERSITY ACCREDITATION

Some of our programmes have been accredited by the University of Derby Corporate, a UK-based university highly acclaimed in the area of employer engagement. They are at the forefront of the drive to integrate highly focused industry-led training with the academic rigor and quality control of university-based education. Our comprehensive Advanced Telecoms Management Series have been accredited Post-Graduate Level, with our extensive suite of Distance Learning at Undergraduate Level.

We would be happy to discuss extending accreditation to tailored ATMS or programmes based on our Distance Learning modules. Although accreditation is specific to these programmes, the work we do with the University of Derby enable us to develop and apply best practice across our portfolio.

CUSTOMISED IN-HOUSE TRAINING

Telecoms Academy has worked with countless companies to deliver customised training programmes. We take time to understand your requirements, you’ll work with our specialist training team to ensure that we deliver your perfect training programme for your business.

A customised training programme from Telecoms Academy ensures you get a course that precisely matches your organisation’s needs, presented by a first-rate training organisation, with access to all the latest industry research and analysis.

Why choose in-house training from Telecoms Academy?

- Content can be customised to focus on the issues you want – work with us to develop the training course to match the exact needs.
- Unique industry research – from Ovum’s team of industry leading analysts
- Expert trainers – our team of versatile trainers have the knowledge and experience to deliver a highly effective learning experience
- The most efficient way to train your staff – at the time and location to minimise disruption
- Flexible delivery options – with a range of instructor led, distance learning and virtual classroom formats available you can build a blended solution to maximise training effectiveness over the long term
- Pre and post course assessment – can be included in programmes to measure competencies and check on the required progress.

Contact us to discuss how we can build your perfect programme.

OUR TRAINING SERVICE