

## Security of Next Generation Networks

### 1. Abstract of the tutorial

The Next Generation Networks will be the Information Infrastructure for the future, supporting many different data and voice services over the same underlying systems. Nevertheless, the increasing operational and functional possibilities are accompanied by vulnerabilities and threats. The paradox is that the technological improvements and the correlated security problems increase together. Unfortunately, current security solutions are insufficient for coping with all these vulnerabilities, threats and risks, and are equally insufficient for supporting the definition of new standards and for controlling the secure deployment of those new technologies. Other important point is that these information and communication systems – ICTs are greatly interconnected, therefore the risks are not just for the ICT services, but for the all national critical infrastructures, e-governance etc., thus they can have overwhelming effects on all of the aforementioned structures. This outcome is also supported by many statistical reports about security incidents and vulnerabilities<sup>1,2</sup>.

This tutorial presents information to participants about:

- Next generation networks and its future. This topic will be defined from many points of view, such as network architectures, security architectures, standardization studies, their tools and methods, security requirements and objectives etc.
- The causes for security breaches already present, and the growing gap between ICT and security solutions.
- The current and future risks for national critical infrastructures from those breaches.
- The research topics and projects to solve security problems for NGNs and its future.
- A general evaluation of the status of cryptographic requirements and security tools for NGNs, and its possible future problems and risks.

It is worth noting the importance of these new subjects. Participants from universities (e.g. students) will be able to appreciate these emerging hot research areas related to security problems and NGNs. Participants from industry or government will be able to understand the risks of the information infrastructure, and the current security solutions and standards.

### 2. Proposed duration

‘Security of Next Generation Networks’ tutorial is organized for half a day (3 hours).

### 3. Intended audience

University students who have been studying in computer engineering, computer science, electronic engineering, genetics, and nano technologies representing bachelor and/or graduate levels.

ICT security professionals and their managers from Industry and Government should participate as well.

### 4. Prerequisite knowledge

No prerequisites.

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<sup>1</sup> IBM Internet Security Systems X-Force® 2008 Mid-Year Trend Statistics  
[www.ibm.com/services/us/iss/xforce/midyearreport/xforce-midyear-report-2008.pdf](http://www.ibm.com/services/us/iss/xforce/midyearreport/xforce-midyear-report-2008.pdf)

<sup>2</sup> Cisco 2008 Annual Security Report [www.cisco.com/web/go/securityreport](http://www.cisco.com/web/go/securityreport)

## 5. Detailed outline

Topic	Duration
What is the next generation networks and future internet? This topic will be defined from many points of view, such as network architectures, security architectures, standardization studies, their tools and methods, security requirements and objectives etc.	40 min.
Break	10 min.
The reasons of the security breaches that have already been present and growing between ICT and security solutions. The current and future risks for national critical infrastructures from these breaches.	30 min.
The research topics and projects to solve security problems for NGNs and its future.	30 min.
Break	10 min.
A general evaluation for the status of cryptographic requirements and security tools for NGNs, and its possible future problems and risks.	45 min.
Conclusions	15

## 6. Tutorial goals

The goals of this tutorial are;

- To provide the participants with general information about the Next Generation Network plus Its related security problems, risks, threats, and current standardization studies, research activities.
- To underline the new research areas for security of NGNs and its future.
- To summarize the possible security solutions.
- To create awareness about upcoming risks by NGNs and future internet for national infrastructures, governments and industries.

### The presenter

Name	Serap ATAY, Ph.D.
Short biography	<p>She was born in 1966, received her BS in Computer Engineering from Ege University, Turkey in 1987 with a thesis on Expert Systems.</p> <p>Obtained her Ms.E from the same institution in 1989 with a thesis of a Systems Analysis and Design of Arkas Holding Information Systems. She worked in Arkas Holding as an Information Systems Coordinator in between 1987-2002 and conducted many projects concerning the maritime, air, rail transportation, port management and logistics.</p> <p>She started her academic studies in 2002 and completed Ph.D. research on Information Systems Security and Cryptology in Information Systems Strategy and Security Lab. of Izmir Institute of Technology, Turkey concerning the “Computational Speed Problem of Elliptic Curve Cryptosystems in Software Implementation”.</p> <p>She has been doing post doctoral research on ‘Security of Next Generation Networks’ project in Institute for the Protection and the Security of Citizen - IPSC, Joint Research Center - JRC, Italy with support of postdoctoral research fellowship program of TUBITAK, Turkey since September 2008. This research project will be finished on 16<sup>th</sup> September, 2009. She is a member of IEEE since 2002.</p>
Previous Tutorials of Presenter	<p><b>International Tutorials Conducted</b></p> <p>ATAY, S., Hışıl, H., “Making of a Multiprecision Cryptographic Software Library. Experiences: CRYMPIX”, International Conference on Security of Information and Networks (SIN 2007), May 7-10, 2007, Gazimagusa, Turkish Republic of North Cyprus.</p> <p>ATAY, S., Kurtel, K., Tunçay, A., “Information System of Logistics Centers”, 4th International Logistics and Supply Chain Congress, The Era of Collaboration Through Supply Chain Networks, November 29-30, December 1, 2006, Izmir, Turkey.</p> <p>ATAY, S., “Primitive Protocols on ECC: Authentication, Integrity and Secrecy”, CRYPTY 2003, International Summer School on Elliptic Curve Essentials and Cryptography, September 9-11, 2003, Urla İzmir, Turkey.</p> <p><b>National Tutorials Conducted</b></p> <p>ATAY, S., “Windows Research Kernel”, Windows Academic Program (WAP), Windows Kernel Source and Internals Workshop, 29-30 May 2008 Yıldız Technical University, Department of Computer Engineering, Istanbul</p> <p>ATAY, S., “Windows Research Kernel Applications”, IS3 Laboratory 2008 Seminars &amp; Tutorials, 9-13 June 2008, Izmir Institute of Technology, Department of Computer Engineering, Turkey.</p> <p>ATAY, S., “Parallel and Multicore Programming”, MAPP Workshop, IS3 Laboratory, 17-20 June 2008, Izmir Institute of Technology, Department of Computer Engineering, Turkey.</p>