



ITU Kaleidoscope 2014

Fast-Forward Poster Preview

- **Ellen Filipović**, TU Berlin, Germany
- **Mohammad Arifuzzaman**, Waseda University, Japan
- **Igor Vitas**, University of Zagreb, Croatia
- **Victor Koval**, Geyser-Telecom, Russia
- **Rahamatullah Khondoker**, Fraunhofer SIT, Germany
- **Eduardo Saiz Macías**, University of the Basque Country, Spain
- **Fan Bai**, Waseda University, Japan
- **Viliam Sarian, Nikolay Suschenko**, NIIR, Russia
- **Corlane Barclay**, University of Technology Jamaica

*St Petersburg, Russia
3-5 June 2014*





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Living in a converged world - impossible without standards?

**HOW TO SUPPORT A STANDARD
ON A MULTI-LEVEL PLAYING FIELD OF
STANDARDIZATION:
PROPOSITIONS, STRATEGIES AND
CONTRIBUTIONS**

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How can firms manage the proliferation of innovation by participating in standardization?



Automotive industry

- Multiple converging technologies
- Extended socio-technical network
- Motive: targeted, active participation

>> Forum-shopping approach



Mapping of basic strategies

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Stakeholders | <input type="checkbox"/> Instruments |
| <input type="checkbox"/> Contributors | <input type="checkbox"/> Interrelations |

>> Case study: EV charging interface



Multidimensional strategies dependent on external conditions and other supporter strategies

STILL PENDING: Success factors?!

Background

Aim

Conclusion



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Content Distribution in Information Centric Network: Economic Incentives Analysis in Game Theoretic Approach

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Russian Federation

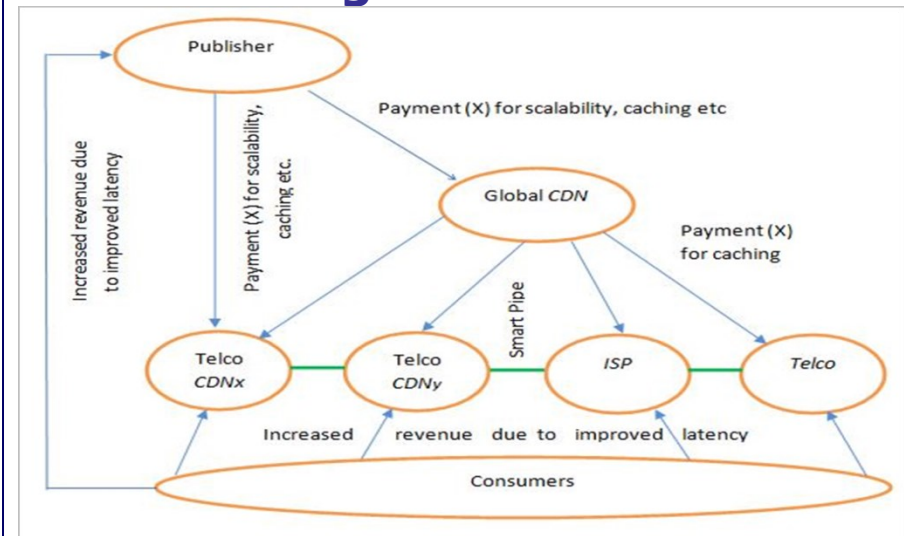
Content Distribution in ICN: An Economic Analysis

Background

- In ICN, a potential strategy by the publisher **ignores CDN** providers and direct connections with ISPs.
- It will take time to deploy **ICN** in **Internet scale**.
- **CDN** market estimated **\$12.16 billion** by **2019**
- During **incremental** deployment of ICN, we believe, there is no scope of ignoring CDN.
- This article is an initiative to find some rooms where the **ICN** and the **CDN** can **work together**.

Contributions

- Proposed realistic **content distribution** model for ICN.
- **Game theoretic model** to show how CDN and ISP/Telco can have **fair share of increased publisher's revenues** in ICN.
- Economic Analysis for **Live Streaming Media broadcast**.





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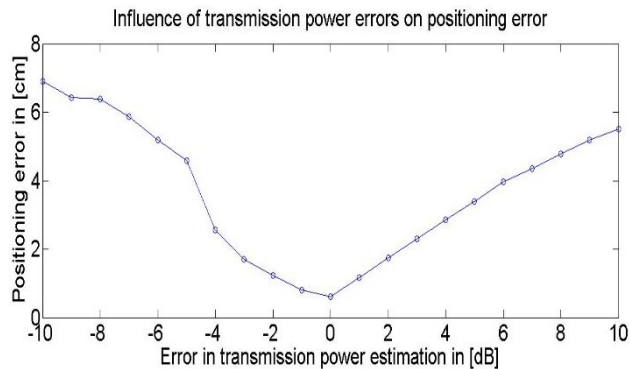
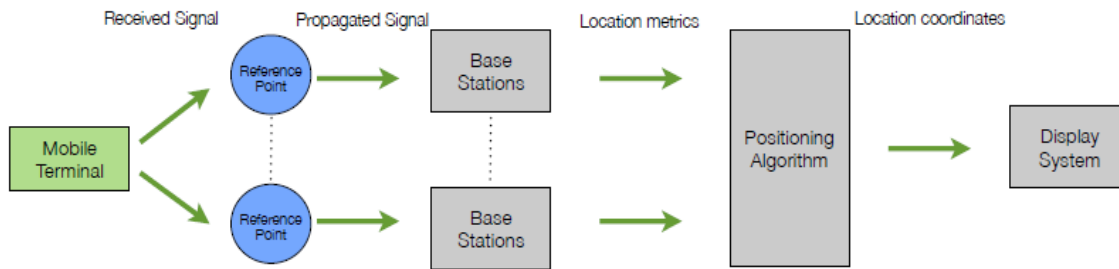
Innovative RF Localization for Wireless Video Capsule Endoscopy

**Igor Vitas
Faculty of Electrical Engineering
and Computing, University of
Zagreb**

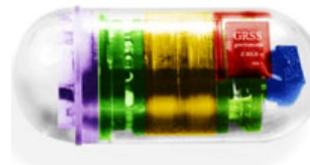
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Localization, communication and standardization in field of Wireless Video Capsule Endoscopy - eHealth



Wireless endoscopy capsule



- Camera
- Electronics
- Battery
- Gravimeter
- Antenna

Dimensions: typically 24-26 mm long,
11 mm wide
Volume: 1800-2500 mm³
Weight: 3-4 g
Power consumption: ~15-25 mW
Battery: 3.1V, up to 125 mAh
Operating time: 8-11 hours





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**ECONOMICAL EFFICIENCY
ASSESSMENT MODEL OF SPECTRUM
CONVERSION FOR NEW MOBILE
WIRELESS TECHNOLOGIES**

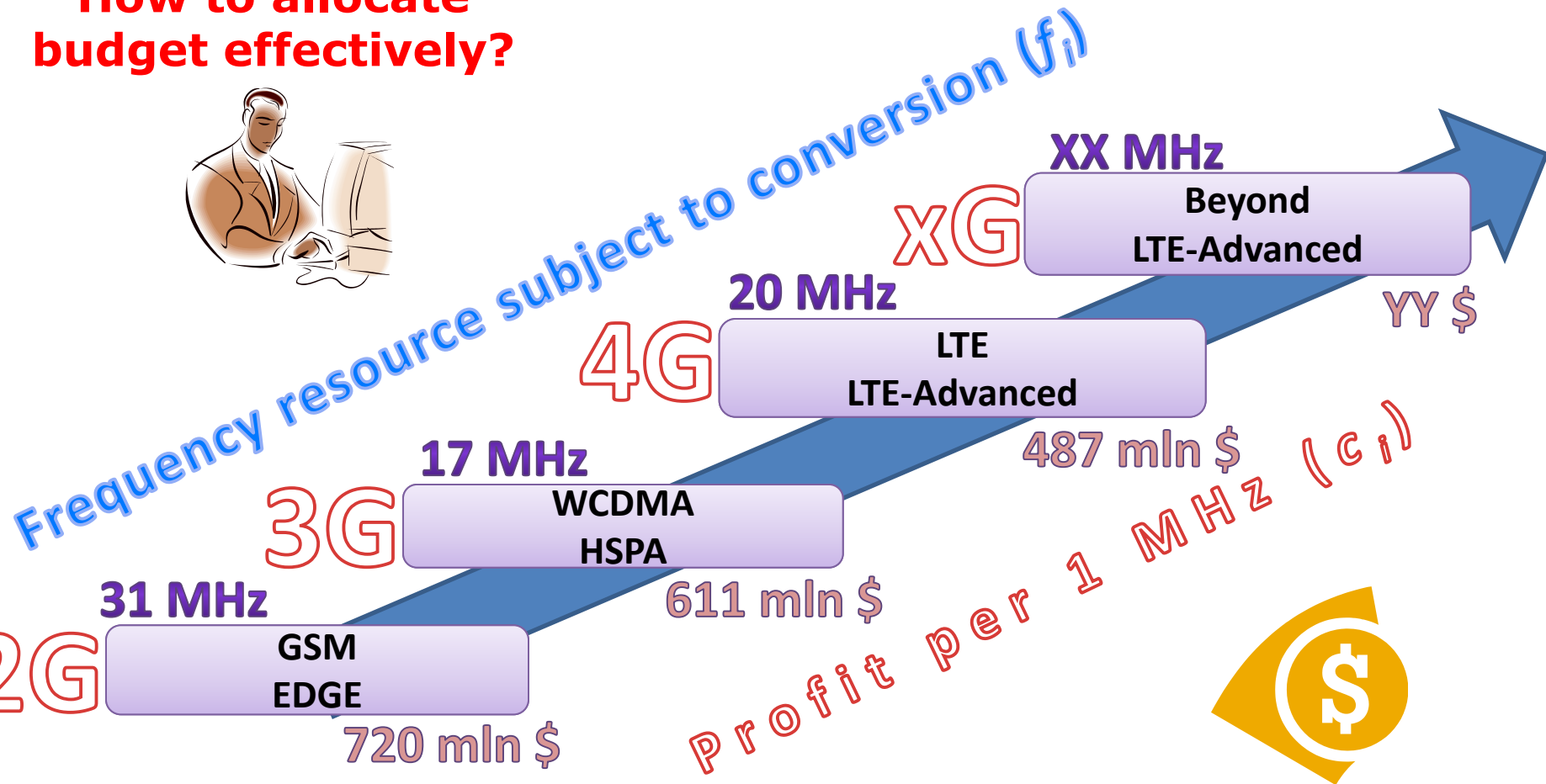
Victor Koval

Geyser-Telecom LLC (Russia)

**koval@geyser-telecom.ru Saint Petersburg,
Russian Federation**

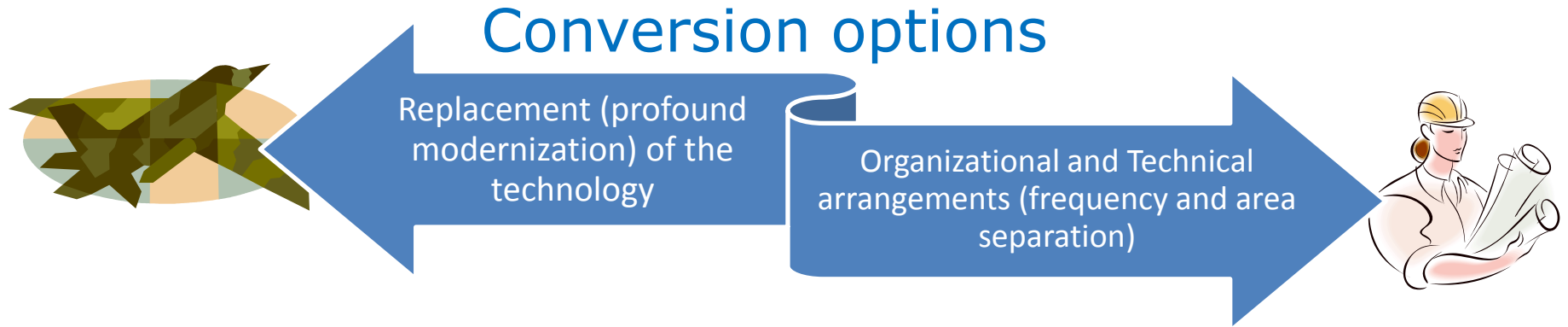
ECONOMIC EFFICIENCY OF CONVERSION

How to allocate budget effectively?

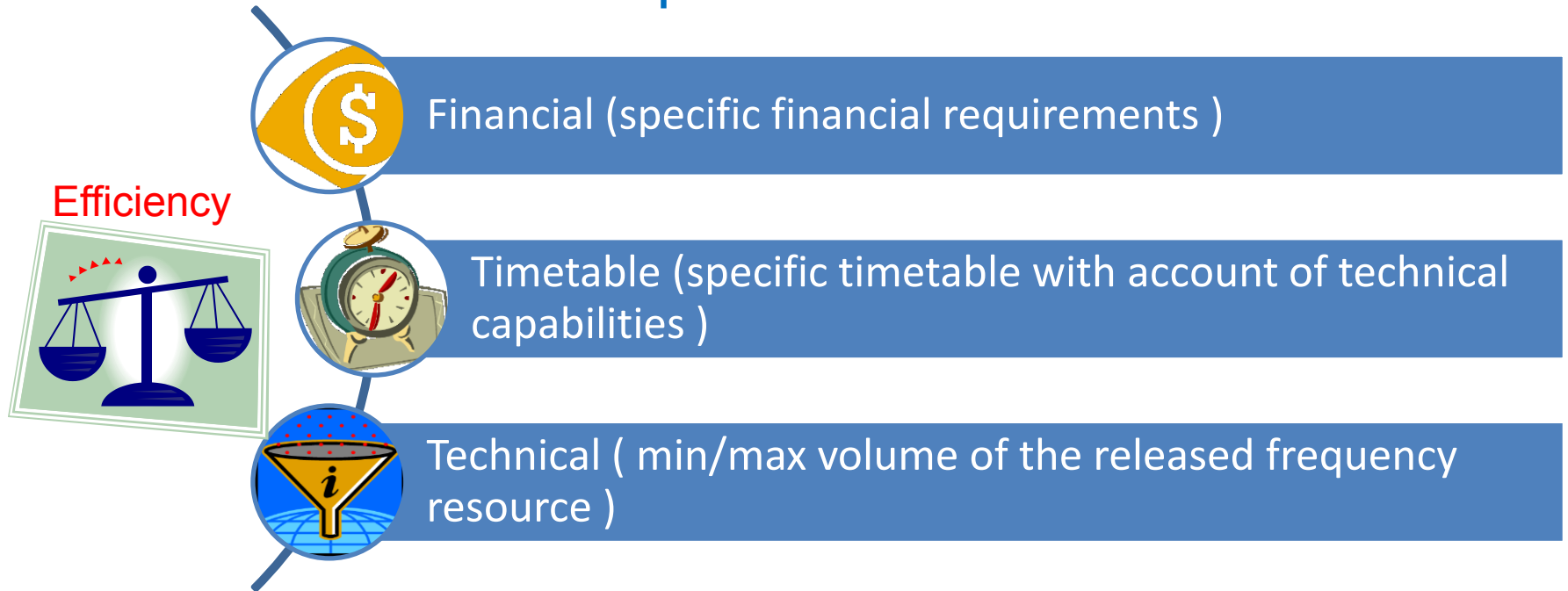


$$E_{ef} = \text{Efficiency} / \text{Expenses} = \sum c_i * f_i / \text{budget}$$

OPTIMIZATION OF BUDGET



Indicators of optimization model



A Mutual Key Agreement Protocol to Mitigate Replaying Attack in eXpressive Internet Architecture

- **Rahamatullah Khondoker**
- Fraunhofer SIT, Darmstadt, Germany

Introduction

Seven Future Internet Architectures have been chosen to be analyzed since each of the architectures

- solves problems of the current Internet such as flexibility, mobility, and security.
- has demonstration and/or prototype available

Security Goals	Security Attacks	SONATE	NENA	XIA	RINA	MobilityFirst	NDN	NEBULA
Confidentiality	Snooping	√	√	√	√	√	√	X
	Traffic Analysis	X	X	√	√	X	X	X
Integrity	Modification	√	√	√	√	√	√	√
	Repudiation	X	X	√	X	√	√	√
Availability	Denial of Service	√	√	√	X	√	X	√
Authentication	Man-In-The-Middle	√	√	√	√	√	√	√
	Reflection	√	√	√	√	√	√	√
	Masquerading	X	X	√	√	√	√	X
	Replaying	√	√	X	√	X	√	√

Legend:
 √: Has (by design) mitigation mechanism(s)
 X: Has no (by design) mitigation mechanism(s)

XIA is vulnerable to replaying attack. XIA is chosen as it is

- the most secure one than other existing network architectures.
- a content-centric network which is claimed to be the Future Internet by the FIA FCN group

Conclusion

The eXpressive Internet Architecture (XIA)

- is a Content-Centric Network (CCN) which has potential to be standardized in future.
- lacks mechanism to mitigate replaying attack.

Therefore, a solution to protect XIA from replaying attack has been proposed and implemented.

- Several existing solutions have been analyzed to derive the requirements for the proposed protocol.
- A new protocol is proposed because every existing solutions has its own disadvantages.
- The protocol has been implemented in XIA prototype and has been proven to be able to mitigate the replaying attack.

The proposed protocol has been evaluated to have more advantages over the reviewed existing solutions.

- It is more secure by having session key with length of 280 bits.
- Moreover, it is less complex as none of the random numbers used in the protocol are worthless.

By applying the proposed protocol, XIA is now able to mitigate all of the reviewed attacks.



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A Cloud Platform for QoE Evaluation: QoXCLOUD

Eduardo Saiz Macías

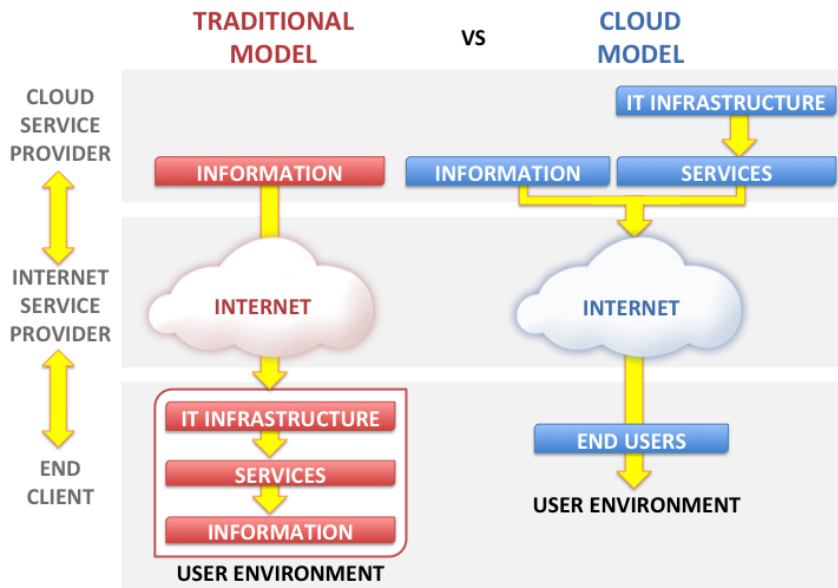
**Faculty of Engineering of Bilbao
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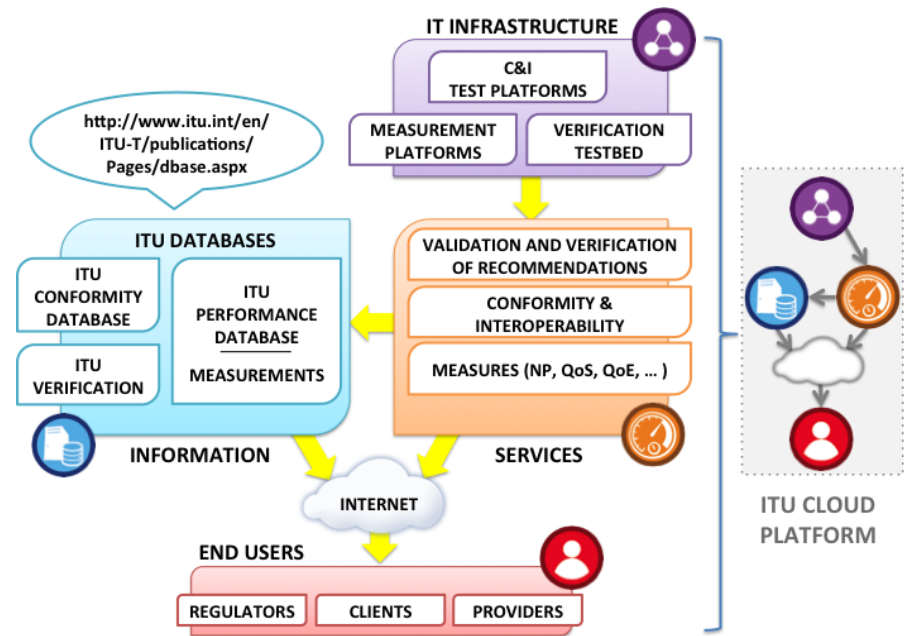
**Saint Petersburg,
Russian Federation**

Background

New cloud based business model

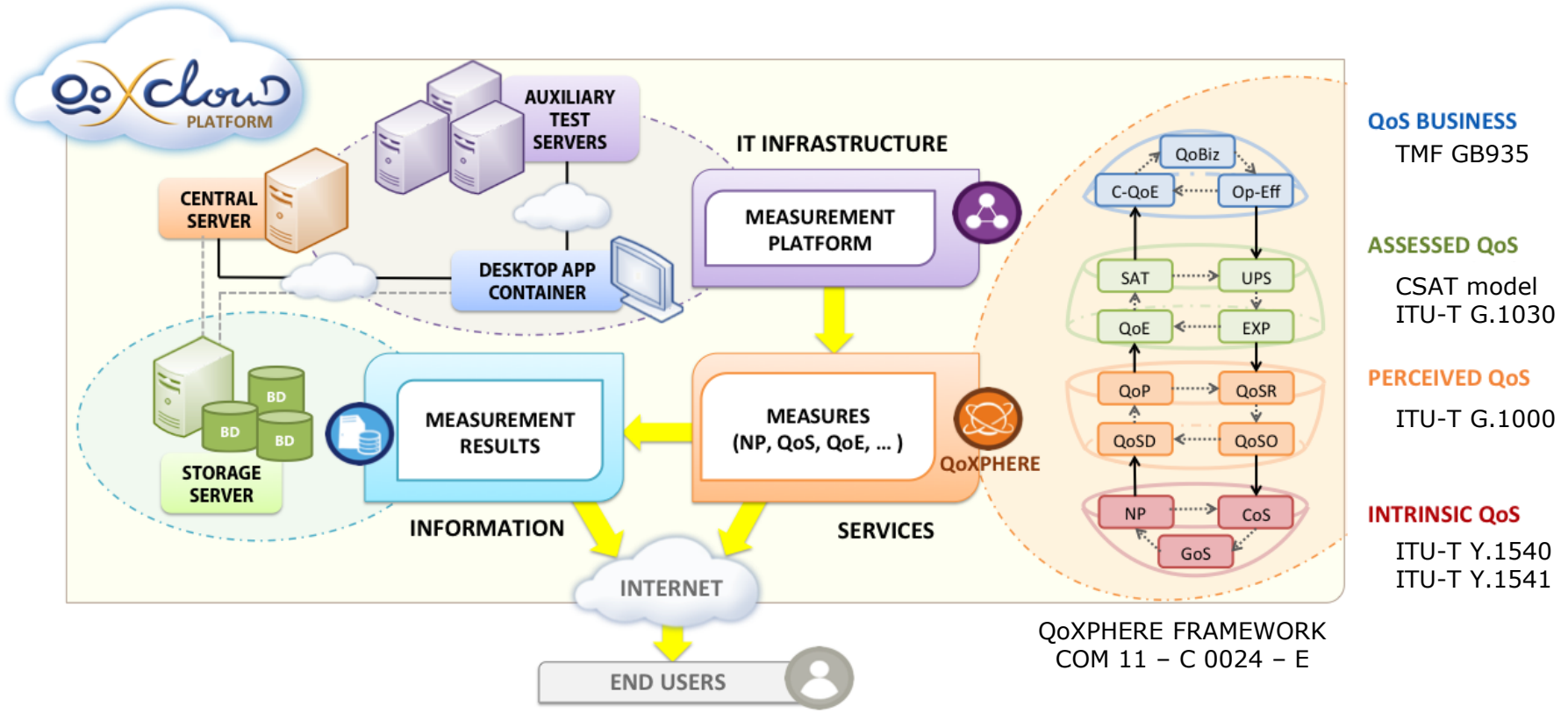


Proposal on ITU collaborative architecture



QoXCloud Platform

COM 11 - C 0099 - E





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**Performance Evaluation of a Dual
Diversity Reception Base on OFDM
RoFSO Systems Over Correlated
Log-Normal Fading Channel**

Fan Bai, Yuwei Su, Takuro Sato

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- Motivation

- Channel fading due to atmospheric turbulence(**scintillation**).
- Effect of channel correlation on diversity system performance.

- Proposal and Method

- A dual diversity reception base on OFDM RoFSO systems.
- Correlated Log-normal fading channel(**weak turbulence**).
- Spatial Diversity & Aperture Averaging (AA)
- Combining schemes (**MRC, EGC**).

- Results and Analysis

- System performance is sensitive on channel correlation and turbulence strength.
- Diversity reception can be obtained in practice through AA effect.



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**Assessment of New Information
and Communication
Technologies using activity-
based costing and tensor
analysis of networks**

Viliam Sarian, Nikolay Suschenko

NIIR, Russia

**Saint Petersburg,
Russian Federation**

Relation problem between the high-level criteria and technical criteria



High-level criteria
(literacy level, GDP, ...)



Relation is poorly studied



Quality of services criteria
(average time of providing service, reliability,...)



Technical criteria
(data transmission speed, timing delay, ...)



Bottom-up vs Top-down approach

- **Bottom-up approach:** «The introduction of the broadband access will lead to the growth of the Internet connection speed for most people; as a result, the population will use different IC services more, which will improve a quality of life for the population»
- **Top-down approach:** determine the relationships between the resources and conditions within which a new ICT is introduced and the social and economic effects of its introduction.



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**Sustainable Security Advantage
in a Changing Environment: The
Cybersecurity Capability
Maturity Model**

**Corlane Barclay
University of Technology Jamaica
clbarclay@gmail.com**

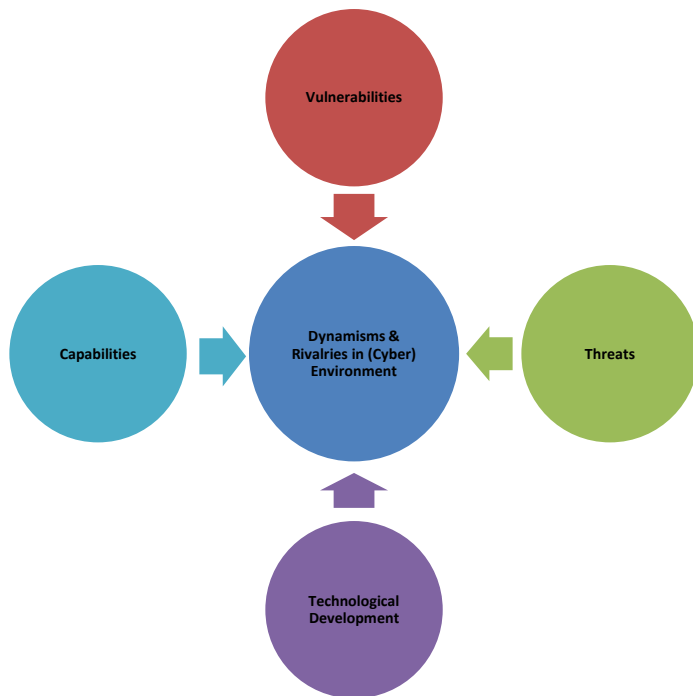
**Saint Petersburg,
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Background

- Cybersecurity considerations are imperative in any national development mandate
- Cybersecurity is not only about the technical issues, it involves management, legal, capacity building and other policy related considerations
- The objective of this research is to propose a conceptual framework for cybersecurity maturity model that is centred on capability
- To aid in guiding countries, particularly developing countries, in identifying key elements in their cybersecurity initiatives, and to inform an objective national cybersecurity index
- Two stage process of research
 - Identification of characteristics of security advantage
 - Development of a 6-stage cybersecurity management model

Towards Cybersecurity Maturity

5-Factor Model of the Cyber-environment



Stages of CM2

- ❑ Stage 1: Undefined
- ❑ Stage 2: Initial
- ❑ Stage 3: Basic
- ❑ Stage 4: Defined
- ❑ Stage 5: Dynamic
- ❑ Stage 6: Optimizing



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Meet the authors to find out more!

**Poster session:
14:30 – 16:00**

*St Petersburg, Russia
3-5 June 2013*

