1. Panel ICN
Scale, Responsiveness and Innovation in Future Networking

Moderator:
Tibor Gyires
Illinois State University
USA

Panelists

- Eva Hladka, Masaryk University, Czech Republic
- Petre Dini, Concordia University, Canada/IARIA, USA
- Tibor Gyires, Illinois State University, USA

Internet Challenges

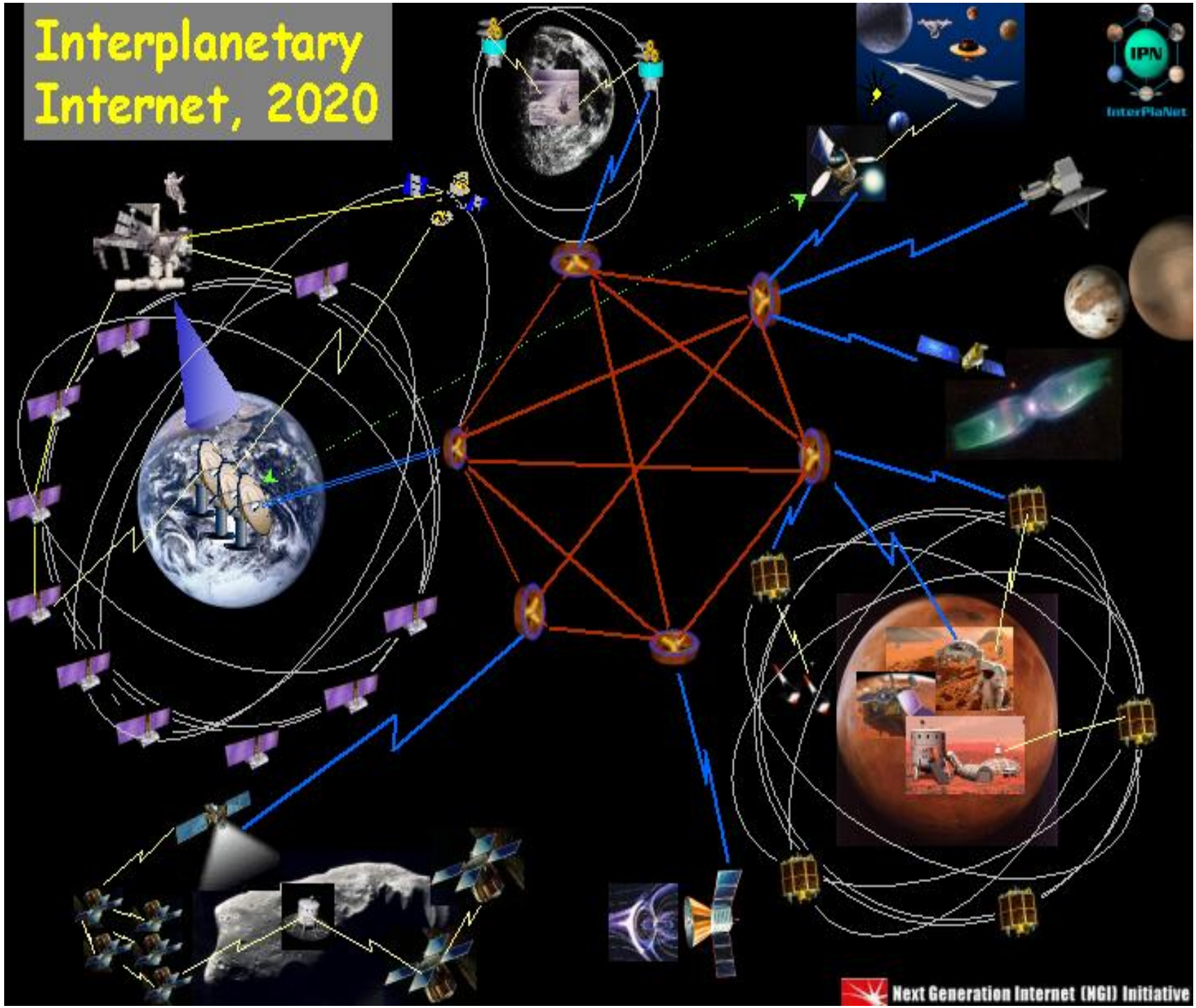
- Limited bandwidth
- Increasing traffic
- Greater demands on bandwidth and performance associated with a growing population of users – human and machine
- Greater use of visual, multimedia and interactive applications
- Bottlenecks at the ISP and NSP levels, as well as at exchange points greatly affects performance of new technologies like Internet telephony and multimedia applications

Communications Backbone Trends

Application	Backbone Bandwidth
Online virtual reality	1,000 Tbps to 10,000 Tbps
3-D holography	30,000 Tbps to 70,000 Tbps
Grid Computing	50,000 Tbps to 200,000 Tbps
Web agents	50,000 Tbps to 200,000 Tbps

Next Generation Internet Infrastructure

- High-speed real-time, multimedia network
- Class of Service and Quality of service guarantees
- Next generation telephony
- SDH/SONET, DWDM, optical networking
- Use of MPLS, GMPLS networking protocols
- IPv6 protocols addressing real-time traffic requirements
- Increased security
- Distributed networked intelligence
- Multiple broadband access alternatives


Interplanetary
Internet, 2020
IPN
InterPlaNet
Next Generation Internet (NGI) Initiative

Convergence in Transport

- Convergence in transport refers to voice, data, and video traffic all sharing a common packet-based network, generally based on IP at present.
- From the standpoint of a service provider, convergence has to do with having one common infrastructure, rather than each technology requiring its own separate platform.

Convergence in Systems

- To equipment manufacturers system convergence means creating systems that allow voice, data, and video traffic to all be commonly served through one device.
- In the context of next-generation network infrastructures, this most commonly refers to the use of soft switches, also known as call servers.
- From the standpoint of an enterprise network, this can also involve the use of IP PBXs at the customer premise or a service provider making IP centrex available to the enterprise.

Convergence in Applications

- In the realm of applications, convergence refers to the integration of voice, data, and video at the desktop, mobile device, or in servers.
- Examples of this might include
  - integrated messaging
  - instant messaging
  - presence management
  - real-time rich media e-learning and training products,
  - multimedia sales presentations, and a variety of interactive programs, such as video games

References

- Lili Goleniewski, The LIDO Organization, Inc.
- www. telecomessentials.com
- http://www.internet2.org/
- http://apps.internet2.edu
- http://dast.nlanr.net/Clearinghouse/Query.htm
- http://www.advanced.org/tele-immersion/news.html
- http://www.i2dvn.org/

1. PANEL ICN
Topic: Scale, Responsiveness and Innovation in Future Networking
Moderator: Tibor Gyires, Illinois State University, USA

Eva Hladká, CESNET & Masaryk University, Czech Republic

The Ninth International Conference on Networks, ICN 2010

Menuires, The Three Valley, 12. 4. 2010

Scale in Future Networking

- IPv4 address space practically full
  - `http://isacc.ca/isacc/_doc/ArchivedPlenary/ISACC-10-42200.pdf`
- Is IPv6 solution?
- Problem with MAC address space
- Problem of IPv6 ready software

Responsiveness in Future Networking

- How are the networks responsive now?
- How the networks might be responsive in future?
- The basic world infrastructure connecting all people and places?
- Impact of the technology
  - CANARIE's Green IT Pilot Program

Innovation in Future Networking

- Innovation on all levels of TCP network model
  - Physical: all optical, satellite, new medium?
  - Network: is IPv6 the future?
  - Transport: from TCP + UDP to IPN?
  - Application: new applications for new areas