EsLaRed Trajectory:
23 years of experiences

Workshop on Scientific Applications for the Internet of Things (IoT)
Abdus Salam International Center for Theoretical Physics
Trieste-Italy (16-27 March 2015)

Edmundo Vitale/Ermanno Pietrosemoli

Latin American Networking School

www.eslared.net

Mérida- Venezuela

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Motivation

- **The university buildings at Universidad de los Andes are dispersed all over the town**

- **In 1990, ULA had 40.000 students, a computer center, but no network**

- **Strong need to improve the communications both inside the university and to the outside world**

A CITY INSIDE THE UNIVERSITY

Background

- **Very limited resources, both financial and human**
- **700 km by mountain road to the capital**
- **Telephone communication out of Mérida by terrestrial analog microwave only**
- **Low teledensidity, no cell phones**
- **Experience with radio ham technologies for voice and packet radio**
- **The only fiber optic deployed in the country was in a few basic industries**

Background

- **Faced with the need to deploy a computer network, we concluded that despite our big technical hurdles the main obstacle was the lack of trained people**
- **Established a pilot computer network with two LANs connected by modems**
- **Started training a group of enthusiastic students in Unix, TCP/IP, and basic networking techniques**
- **Realized that we did not have the means to provide advanced training**

Background

- **The International Centre for Theoretical Physics in Trieste organized in 1990 the First International School on Computer Networks, which was attended by a member of our group**

- **Upon his return Prof. Luis Nunez suggested that we did something similar in our institution, counting on the fact that the need of training in the whole region would helps us getting outside resources**

First experience

- **With this experience, and the contacts acquired we organized EsLaRed'92 during 3 weeks in November 1992**

- **45 participants from 10 countries where trained in hands-on techniques in computer networks by 15 Instructors from Europe and the Americas**

- **The Organization of American States provided the seminal financial support through Saul Hahn's Red Hemisférica Universitaria, RedHUCyT, which prompted several other institutions to chip-in.**

University Network: RedULA

-50 Kilometers Gigabit Ethernet SM fiber

Hechicera

49 clients nodes 2.4 GHz
7 clients nodes 915 GHz
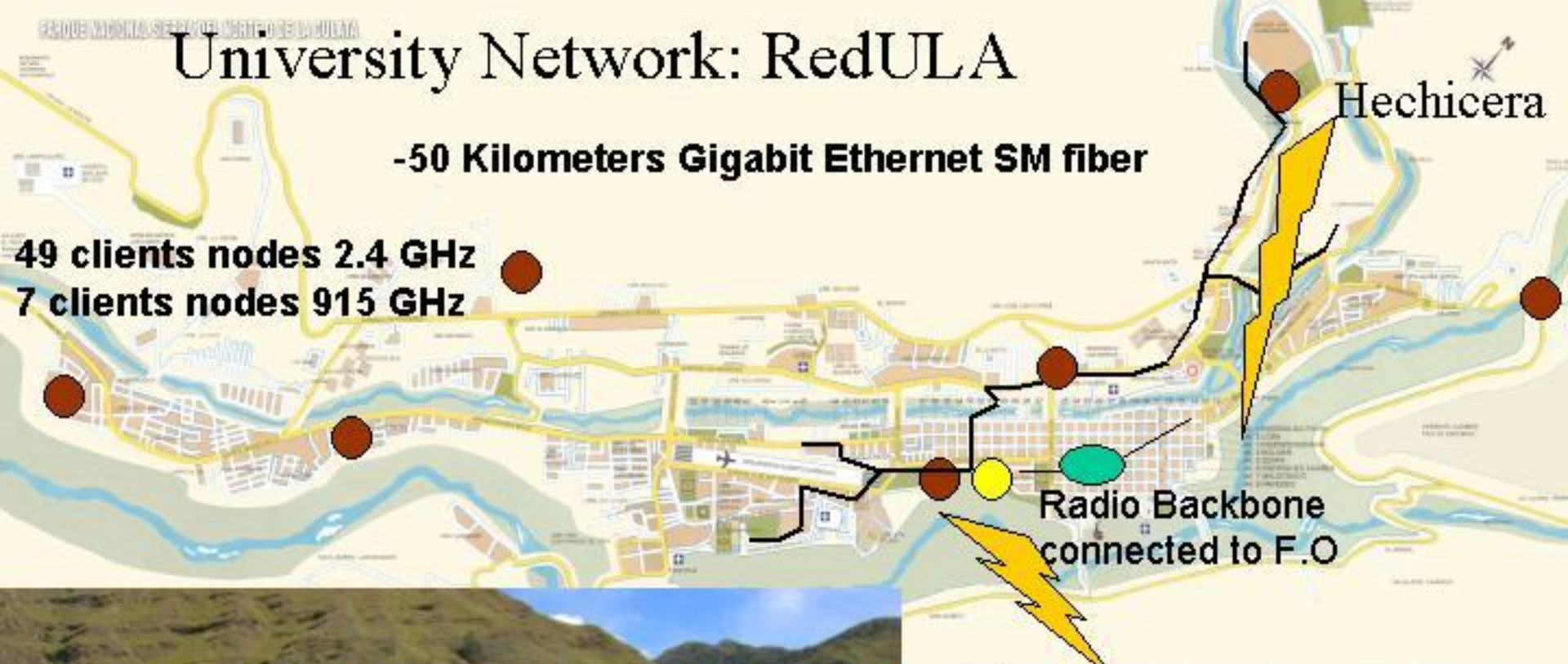
Radio Backbone connected to F.O

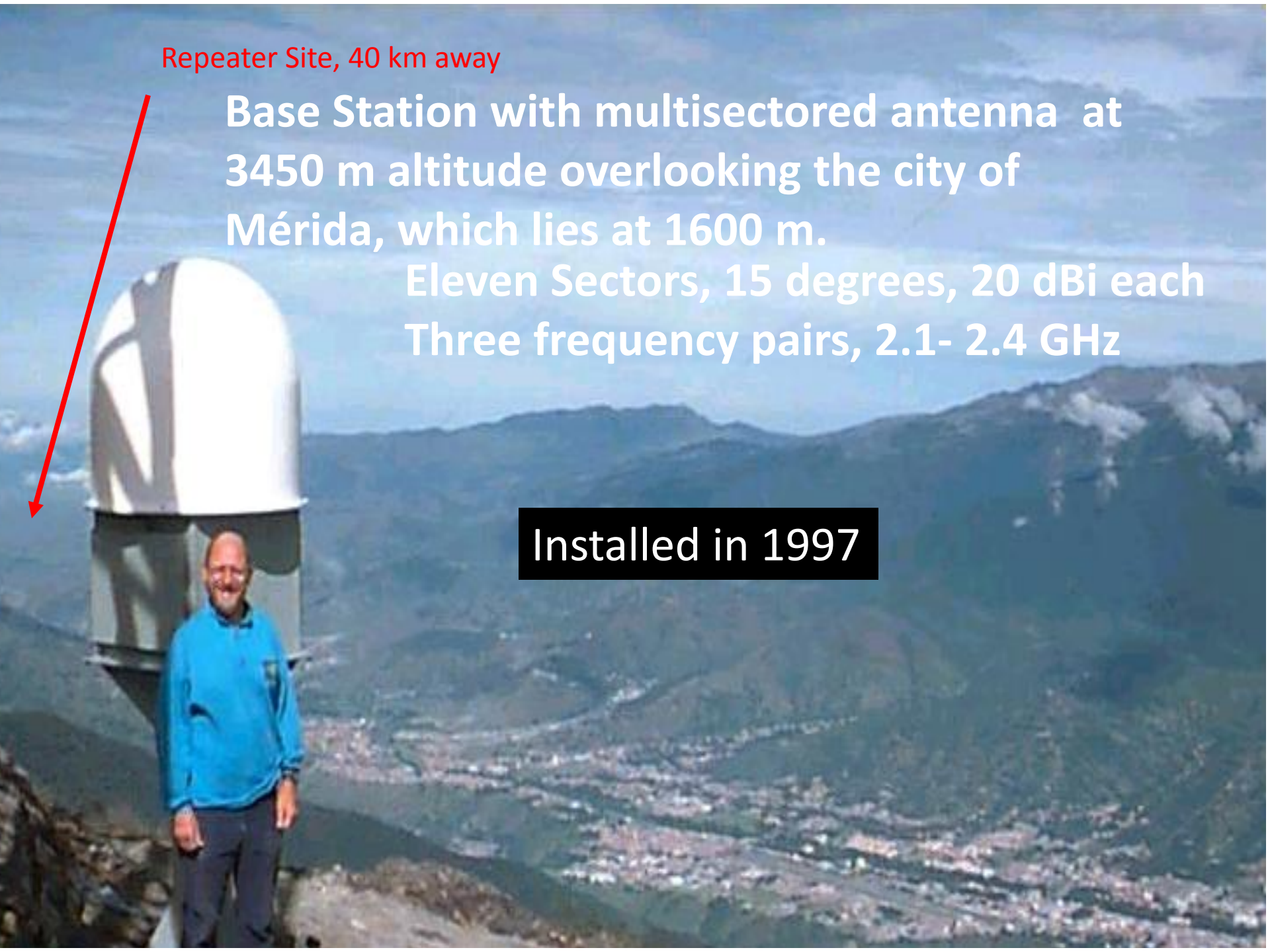Hechicera

Redula, Base Station La Aguada

Repeater Site, 40 km away

Base Station with multisectored antenna at 3450 m altitude overlooking the city of Mérida, which lies at 1600 m.

Eleven Sectors, 15 degrees, 20 dBi each

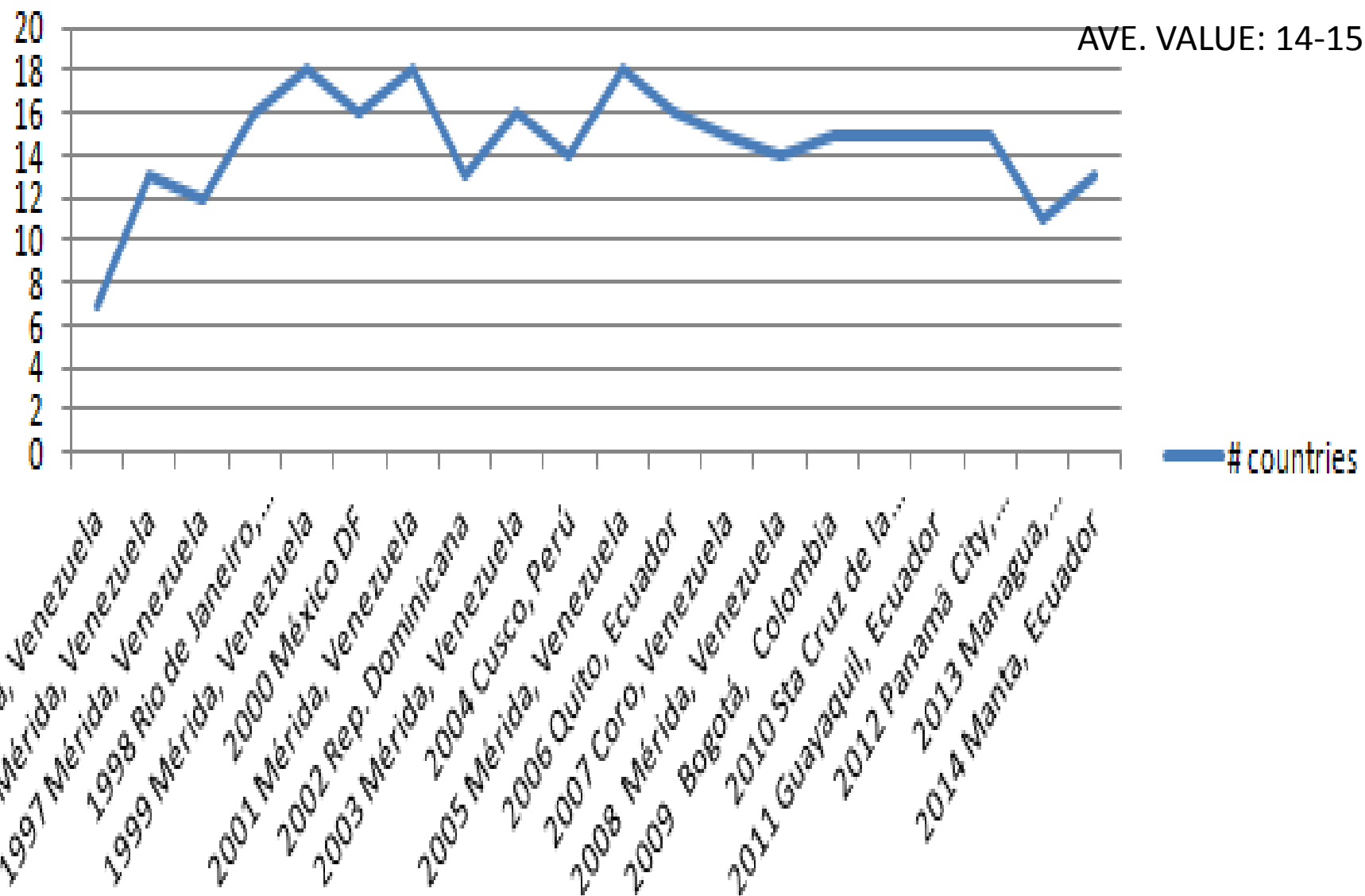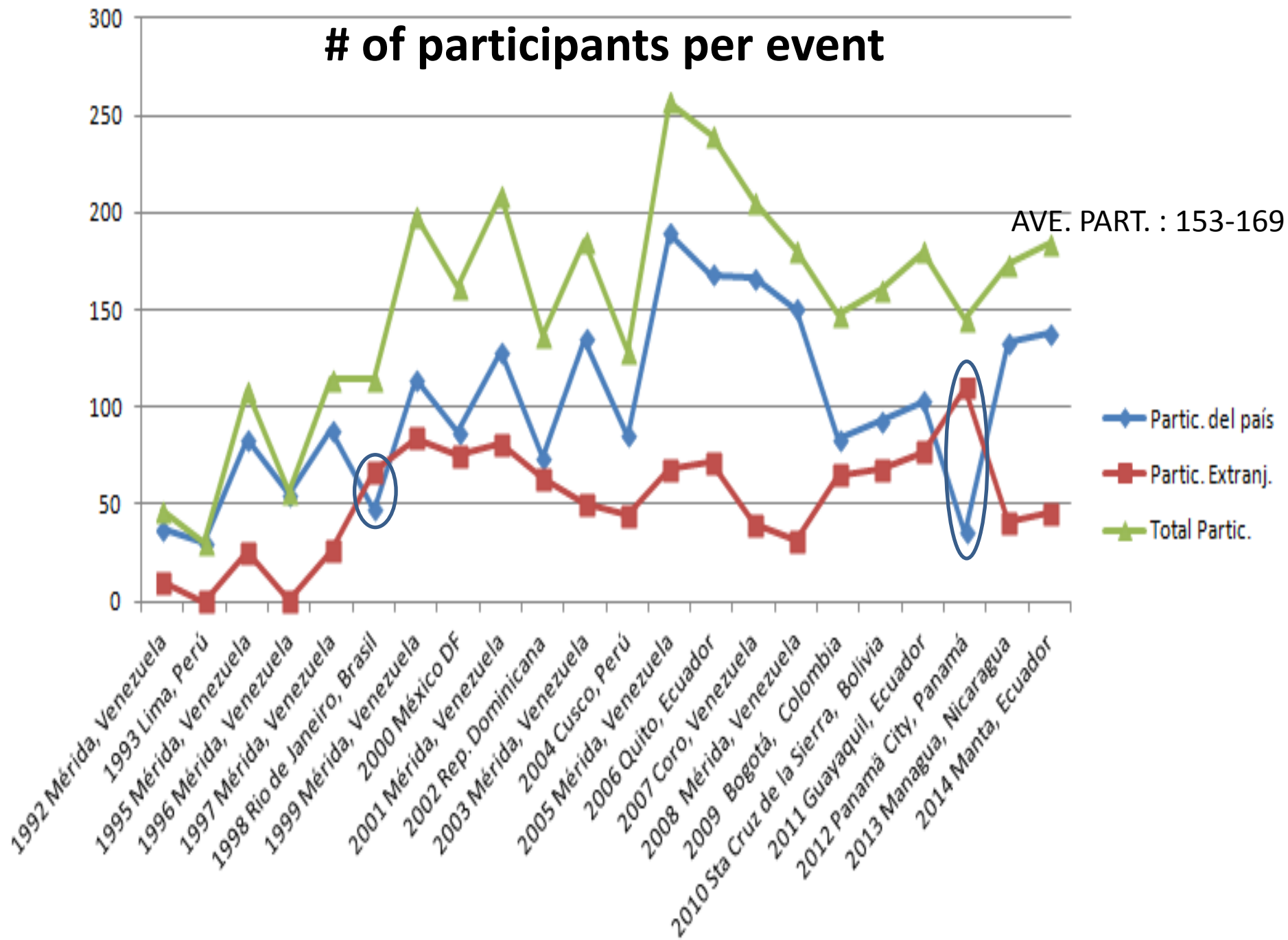**Three frequency pairs, 2.1- 2.4 GHz**

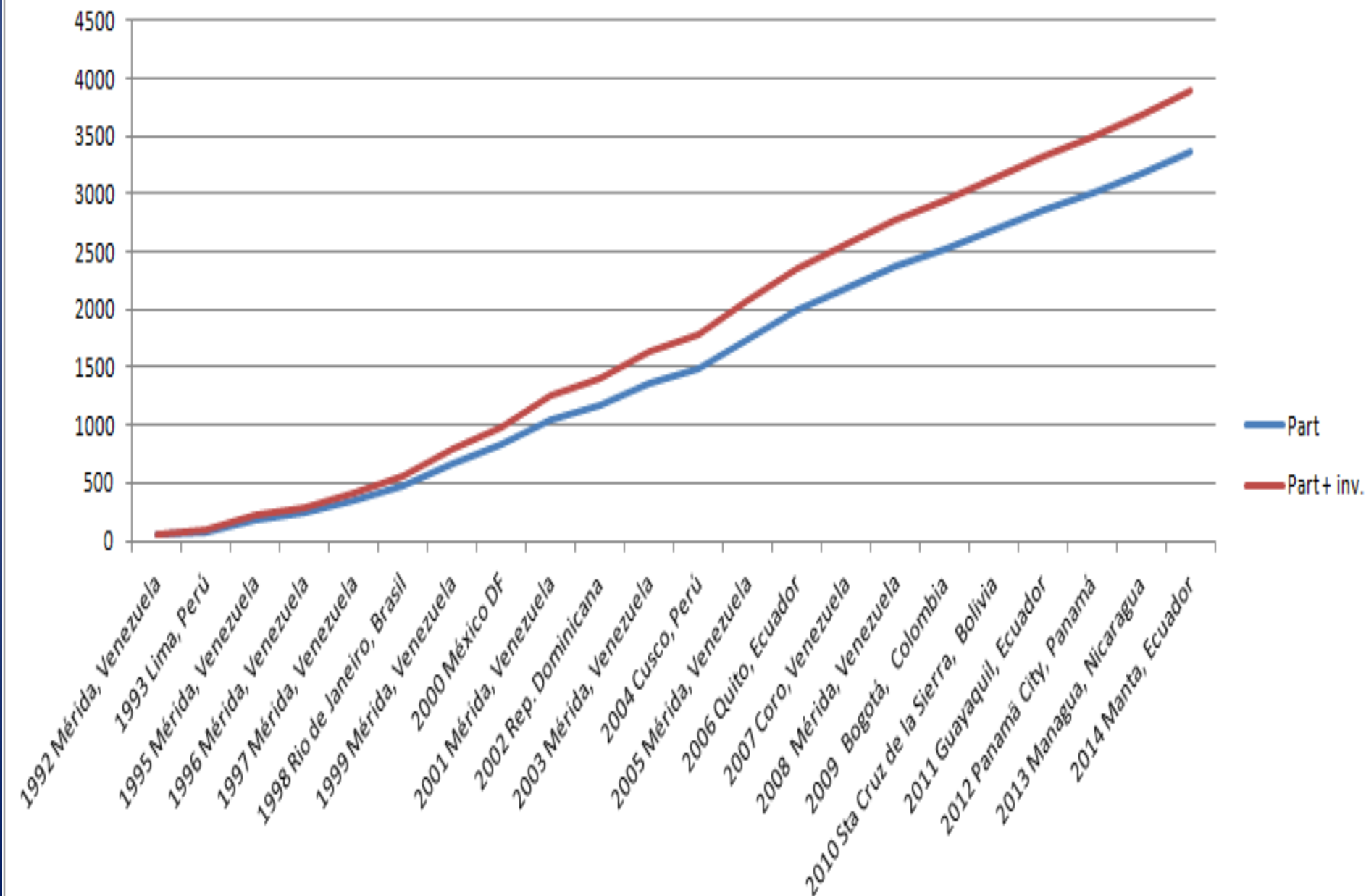Installed in 1997

ESLARED AND WALC STATS

countries

AVE. VALUE: 14-15

Legend: ——— # countries

X-axis labels: 1992 Mérida, Venezuela; 1995 Mérida, Venezuela; 1997 Mérida, Venezuela; 1998 Rio de Janeiro,…; 1999 Mérida, Venezuela; 2000 México Df; 2001 Mérida, Venezuela; 2002 Rep. Dominicana; 2003 Mérida, Venezuela; 2004 Cusco, Perú; 2005 Mérida, Venezuela; 2006 Quito, Ecuador; 2007 Coro, Venezuela; 2008 Mérida, Venezuela; 2009 Bogotá, Colombia; 2010 Sta Cruz de la…; 2011 Guayaquil, Ecuador; 2012 Panamá City,…; 2013 Managua,…; 2014 Manta, Ecuador

of participants per event

AVE. PART. : 153-169

Legend:
- Partic. del país
- Partic. Extranj.
- Total Partic.

Events (x-axis):
1992 Mérida, Venezuela; 1993 Lima, Perú; 1995 Mérida, Venezuela; 1996 Mérida, Venezuela; 1997 Mérida, Venezuela; 1998 Rio de Janeiro, Brasil; 1999 Mérida, Venezuela; 2000 México DF; 2001 Mérida, Venezuela; 2002 Rep. Dominicana; 2003 Mérida, Venezuela; 2004 Cusco, Perú; 2005 Mérida, Venezuela; 2006 Quito, Ecuador; 2007 Coro, Venezuela; 2008 Mérida, Venezuela; 2009 Bogotá, Colombia; 2010 Sta Cruz de la Sierra, Bolivia; 2011 Guayaquil, Ecuador; 2012 Panamá City, Panamá; 2013 Managua, Nicaragua; 2014 Manta, Ecuador

TOTAL ATTENDANTS (PARTICIPANTS AND SPEAKERS)

INTERNET GROWTH, TECHNOLOGIES INVESTMENTS AND NETWORKING SKILLS DEMAND IN LATIN AMERICA REGION

--   ANALYSIS AND RECOMMENDATIONS   --

Internet stats

INTERNET USERS AND 2014 POPULATION STATS FOR THE AMERICAS

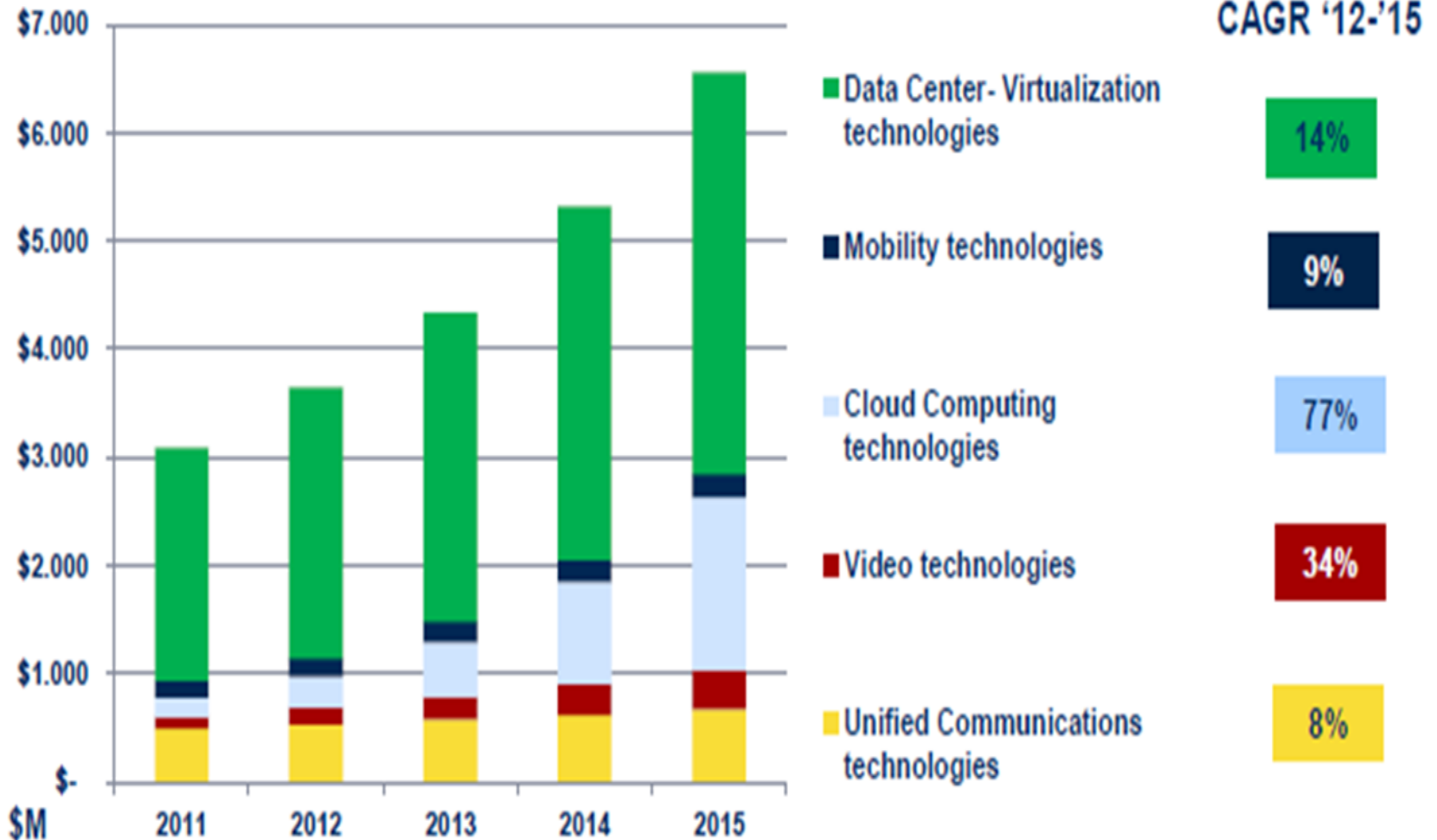| REGIONS	Population (2014 Est.)	% Pop. America	Internet Users 30-jun-14	% Population (Penetration)	% Users America	Facebook 31-Dec-2012
South America	406,194,811	42.0 %	230,727,557	56.8 %	36.6 %	142,708,440
Central America	164,210,961	17.0 %	72,373,646	44.1 %	11.5 %	48,933,540
The Caribbean	41,873,409	4.3 %	17,211,350	41.1 %	2.7 %	6,397,080
TOTAL LATAM	612.279.181	63,3%	320.312.553	52,3%	50,8%	198.039.060

WORLD INTERNET USAGE AND POPULATION STATISTICS
JUNE 30, 2014 - Mid-Year Update

World Regions	Population (2014 Est.)	Internet Users Dec. 31, 2000	Internet Users Latest Data	Penetration (% Population)	Growth 2000-2014	Users % of Table
Latin America / Caribbean	612,279,181	18,068,919	320,312,562	52.3 %	1,672.7 %	10.5 %

Source: Internet World Stats

WHY TRAINING?

New Networking Solutions Revenue Growth $M (2011-2015)*

CAGR '12-'15

- Data Center- Virtualization technologies — 14%
- Mobility technologies — 9%
- Cloud Computing technologies — 77%
- Video technologies — 34%
- Unified Communications technologies — 8%

WHY TRAINING?

Essential and Emerging Networking FTE (%) Skills Gap in Latin America, 2011-2015

Source: IDC, 2013
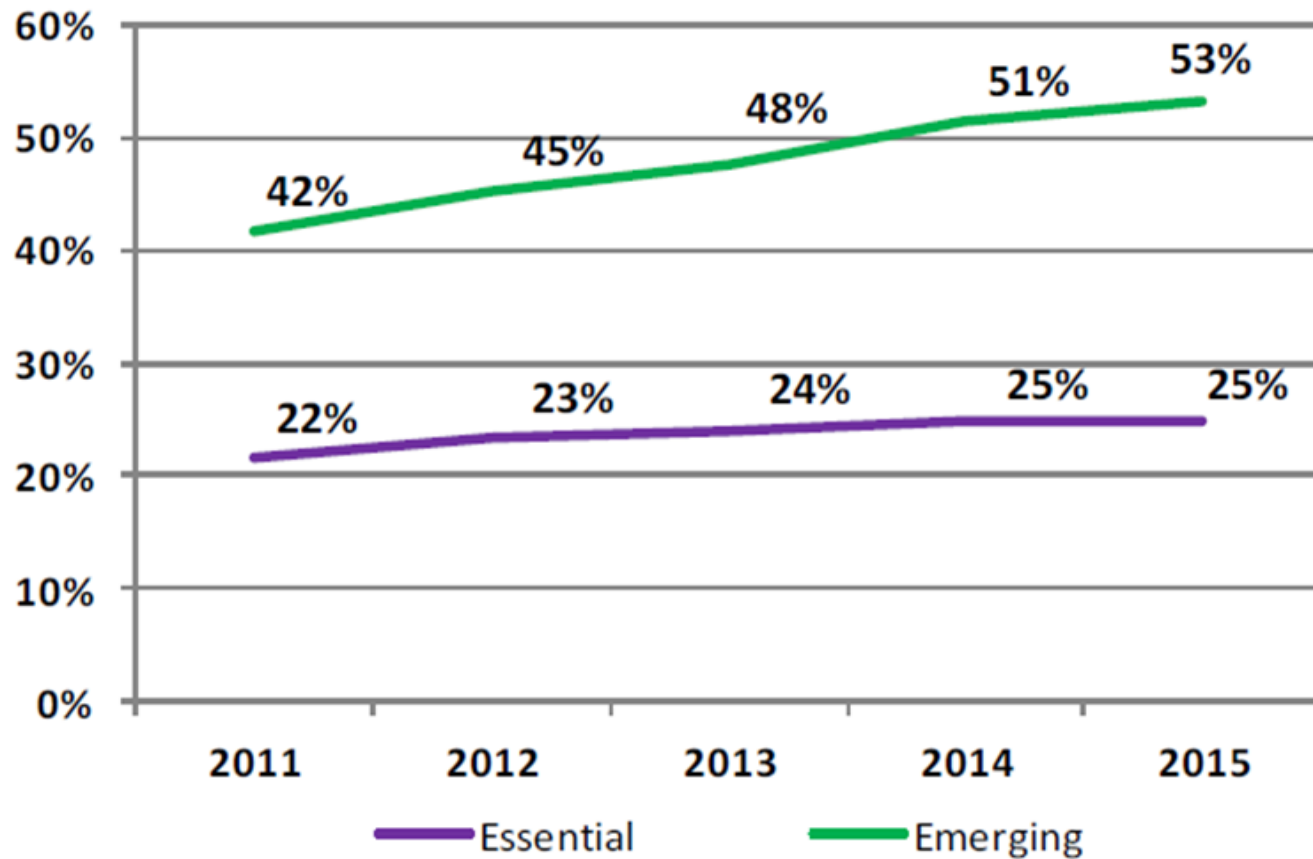
Networking Skills in LATAM

Source: IDC 2013
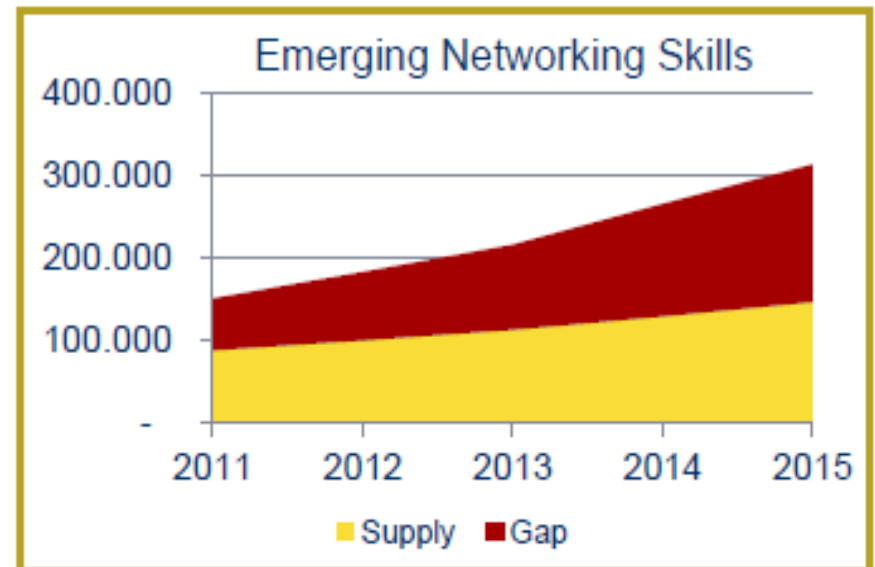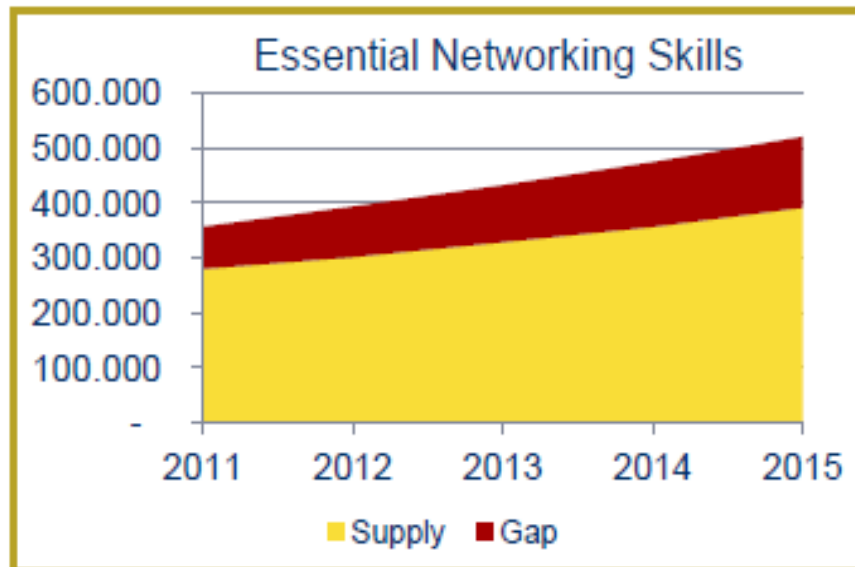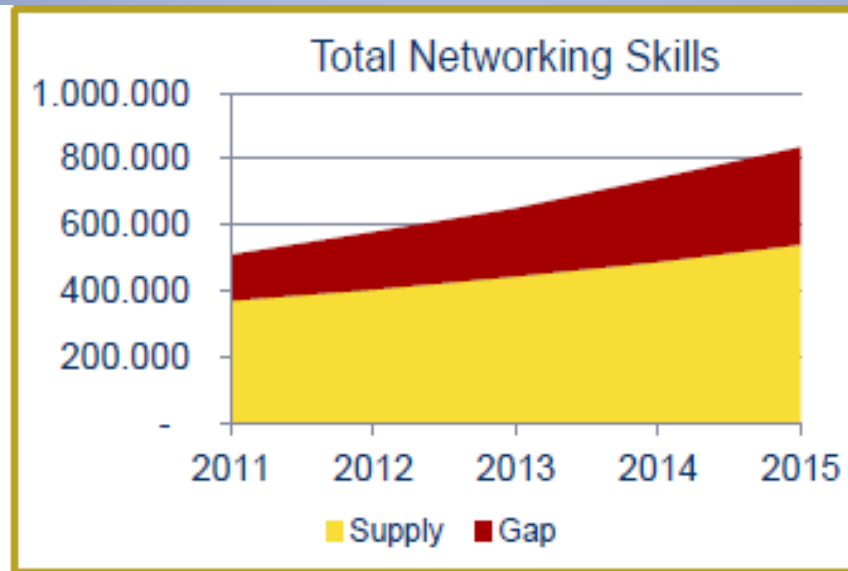
EsLaRed Training Conducted

Core networking skills, network security, IP Telephony, and wireless networking: Essential Technologies Tracks

IP Telephony
Wireless Networks
Network Security
Network Management
IPv6 Deployment
Information System Management
Design of Campus Networks
Project Management
Design and implementation of Telecommunications Networks
 (wired, wireless and optics)
Geographic Information Systems (GIS)
Advancing routing/BGP/peering pod

Third Platform of Technologies /Emerging Technologies

Big Data Networks
Big Data Network Security
Internet of Things/IoT   *
Cloud Computing Technologies
Mobile Technologies
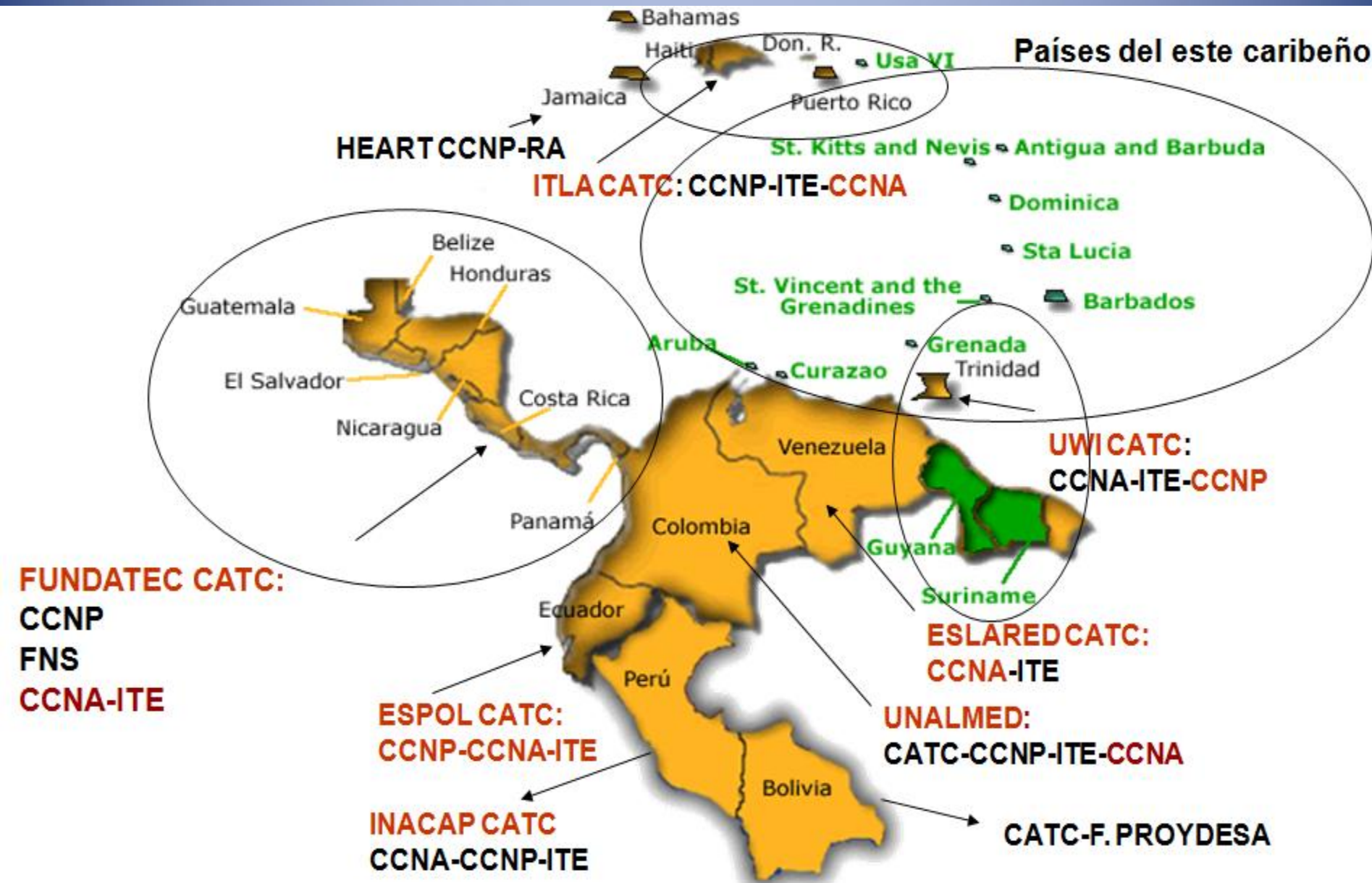**Wireless Sensor Networks***
High Availability and Virtualization*

WALC2015- VENUE:TECNOLOGICO DE COSTA RICA
Santa Clara de San Carlos, 16 - 20 of November

1. **Wireless Networks**

2. **Network Management**

3. **Advanced routing/BGP/peering pod**

4. **Network Security**

5. **IoT, Internet of Things**

6. **Deployment of IPv6**

OTHER INICIATIVES

EsLaRed´s Deaf Academy

EsLaRed´s Awards

EsLaRed´s Awards

EsLaRed received the Jonathan B. Postel Service Award 2008 from ISOC

Special Jury Trophy 2013 from magazine ¨Red Seguridad¨, Spain

2014 LACNIC´s Lifetime Achievement Award EsLaRed´s President Ermanno Pietrosemoli

2012 LACNIC´s Lifetime Achievement Award EsLaRed´s General Manager Edmundo Vitale

ESLARED/WALC SPONSORS

OAS/RedHUCyT

World Bank

UNESCO

International Center for Theoretical Physics

Internet Society

LACNIC

Network Startup Resource Center

Afilias GLOBAL REGISTRY SERVICES

CLARA
Cooperación Latinoamericana de Redes Avanzadas

CONICIT

UNIVERSIDAD DE LOS ANDES
MERIDA VENEZUELA

REACCIUN

fonacit

WSFII

sgi

ALCATEL

COMSAT CORPORATION

NEWBRIDGE

Microsoft

CISCO

3Com

6deploy
With the support of 6DEPLOY

SPIKE

Prentice Hall

O'REILLY

INFO LAC

ciscopress.com

LOCAL ORGANIZATIONS

ULA   UNAM   PUCMM   St. Antonio Abad U. Tec.Equin.   ESPOL   U. Tec. Panamá
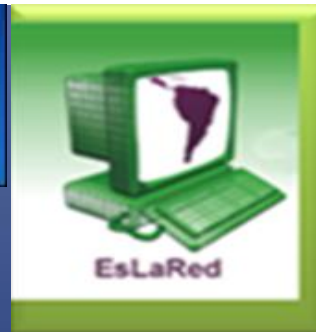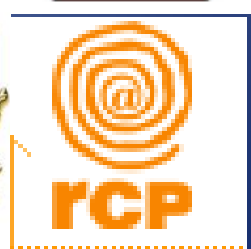
INSTRUCTORS
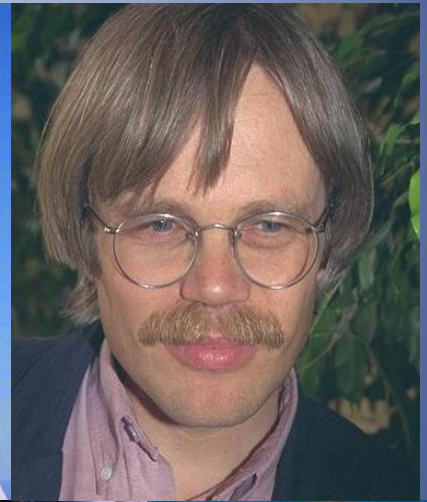
LAST EVENTS PARTICIPANTS

WALC 2012 | UTP-PANAMÁ
OCTUBRE 17

UNI,
NICARAGUA
2013

WALC 2014
Manta, Ecuador
27 al 31 de octubre

17o Taller sobre Tecnologías de Redes Internet para América Latina y el Caribe WALC 2014
Universidad Laica " Eloy Alfaro" de Manabí (ULEAM)
27 al 31 de Octubre de 2014   MANTA - ECUADOR

17º
Taller sobre
Tecnologías de Redes Internet
para América Latina y el Caribe

Organización General

Fundación Escalred

Conclusions

- **We succeeded in turning the region lack of trained personnel into an opportunity**
- **By focusing on manageable projects within the framework of a long term plan we were able to overcome budget limitations**
- **Team work was essential to accomplish our goals, and helped securing international support**

The end