

IPv6 Deployment Activities

Jordi Palet (jordi.palet@consulintel.es)

Consulintel, CTO/CEO

65th IETF, IEPPG, Dallas, March 2006

IPv6 is About INNOVATION

- Is not just about “more addresses”
- Is also about making possible new services
 - Not just Client/Server apps.
- New services which are easier to deploy
- New services which generate profit

Transitioning to IPv6

- The question is not anymore “if”
- Some lessons learnt during years of R&D
- When?
 - As soon as you can, it will be easier and cheaper !
 - Look at your maintenance cycle
- How?
 - Divide and Conquer:
 - Look at your network as a set of them, typically
 - Core/Backbone
 - Access

Core/Backbone Network

- Typically well maintained:
 - IPv6 comes, today, as an added value
- Ethernet and MPLS make it simple
 - Today most of the “big” networks have IPv6 support, typically native (dual-stack)
- In some cases, may be only possible to use tunnels, often in the early stage
 - May be until upstream routers are upgraded
- Is possible to enable IPv6 in a record time

Access Network

- Difficulties/delays due to:
 - PoP equipment (technology or vendor dependence)
 - CPE equipment (cheaper products, today often don't any IPv6 support, some times only tunnels)
- However this is changing very fast
- Despite that, IPv6 benefits can be achieved by using transition (tunnels)
- References:
 - <http://www.ipv6-es.com> (IPv6 deployment in broadband access networks)
 - draft-ietf-v6ops-bb-deployment-scenarios

What is Missing ?

- Training -> New doesn't means difficult !
- Some times you need to consider small network upgrades and the O&M apps.
- Take advantage with development of new services and applications
- We can go step by step with you !
 - Help to request the prefix (/32 or what is more appropriate)
 - Contact with your upstream providers
 - Arrange for a small pilot, if required
 - Deploy IPv6 in your network
 - And even activate it in production

LAC Situation



- Until June 2005
 - 18 IPv6 prefixes allocated
 - Only a few being announced
 - Almost no interest in the region
 - No production service available

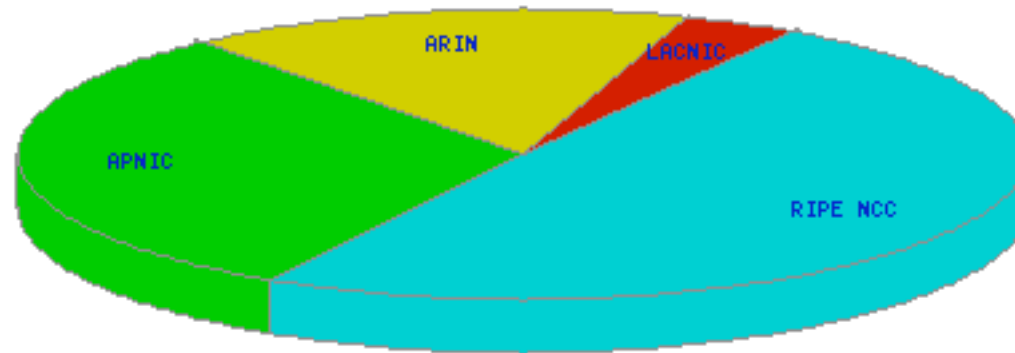
The IPv6 Tour



- <http://ipv6tour.lacnic.net>
- Extensive awareness, with over 3.000 people trained
 - Not just ISPs, also application developers
- Some results:
 - Number of new IPv6 Task Forces (Argentina, Brazil, Chile, Colombia, Cuba, Dominican Republic, Mexico, Panama, Perú, Uruguay, Venezuela, ...)
 - 51 Prefixes at the end of December
 - Most of them already being announced or in the way
 - Significant deployment cases, some commercial
 - Chain followed to make sure that they get IPv6 connectivity all the way thru ...
 - High level of interest from government organizations and regulators, but also enterprises, developers, press, etc.

The Picture

Distribution of IPv6 allocations by number



- Caching-up (39,89% in terms of IPv6 space vs. ARIN)
 - ARIN 11.993.137
 - LACNIC 4.784.131

Africa Situation

- This region has a very similar situation as LAC 2 years ago:
 - 5 IPv6 prefixes
- Situation quickly advancing:
 - 11 IPv6 prefixes
 - >50% working
 - Some more “almost ready”
- Trainings:

– 23 March 2006	Khartoum (Sudan)
– 03 April 2006	Tunis (Tunisia)
– 13-14 May 2006	Nairobi (Kenya)
– 13-14 June 2006	Lagos (Nigeria)
– 6-7 July 2006	Lomé (Togo)
– 10 July 2006	Accra (Ghana)
– 17-18 July 2006	Namibia
– 22 August 2006	Kampala (Uganda)
– 15 September 2006	Johannesburg (SA)
– 30 September 2006	Kigali (Rwanda)
– 27-28 November 2006	Mauritius



Helping the ISPs

- In some situations the ISP don't have good access to IPv6
- We also have a solution for that: OCCAID



About OCCAID



- OCCAID is a not-for-profit collaboration effort between the research communities and ISPs, working to foster and promote next generation internet technologies
- IPv6 bootstrap and promotion efforts
 - OCCAID currently provides IPv6 connectivity to over 300 end-sites and SixXS POPs in the United States
 - Recent expansions to other parts of the world to deliver services around the globe
 - Education and training of its membership on practical usage and deployment of IPv6, including proper and clean routing policies
 - Raising support for equal opportunity Provider Independent (PI) address space allocations for non-ISP institutions by the RIRs

What is GIPS ?



- Global IPv6 Advancement Program (GIPS)
- Pronounced as “Jeeps”, it is an initiative led by OCCAID and its partners to foster worldwide IPv6 deployment, with a special focus in developing countries
- Goals
 - Foster IPv6 development in areas of the world where it is still difficult to acquire IPv6 connectivity
 - Educate and train customers in getting acquainted with IPv6, in areas including, addressing, routing and ongoing maintenance issues
 - If there are no commercial offerings to IPv6 connectivity available, we can provide an option through OCCAID’s network
 - Continue to solve problems and participate in forums to address routing issues and multihoming requirements to further encourage IPv6 development



Current Problems



- Different Geographies
 - While commercial IPv6 development is already becoming a reality, it is still happening at a different rate in different geographies
 - Until there is sufficient development, someone needs to fill in the gaps
- Lack of Upstream Provider Interest
 - Large ISPs who are often upstream of small and medium sized networks still have little interest in IPv6
 - Some say it is a chicken and egg problem, due to low customer demand
 - Some upstream providers who can offer IPv6 today are not providing the best-of-breed “useable” transit service. Many still require you to run a long haul tunnel, and their peering with external networks consist of poorly tunneled connections
- Lack of Education and Training
 - Getting acquainted with IPv6 takes some time and effort. But once proper education and training is provided, the actual concepts of routing are not any different than IPv4

LAC Regional Activities



- Consulintel started working with ISPs and organizations in LACNIC service regions to promote IPv6 development in the region
- GIPS Partnership
 - GIPS initiative creates partnership between OCCAID membership and other partners to promote IPv6 in many areas of the world
- IPv6 Transit Services
 - There have been some ISPs and entities in LAC regions who were having difficulties in acquiring *useable* IPv6 transit service. Through GIPS program, we have connected these entities to OCCAID's IPv6 network
 - OCCAID currently has extensive IPv6 presence in North America, and maintains a POP in Miami, Florida. This allows LAC customers to reach OCCAID at the edge of the US, without having to run a long haul tunnel that doesn't follow realistic IPv4 paths
 - We are currently planning to extend OCCAID's network down to South America so that we can deliver native and short-tunneled IPv6 services throughout the LACNIC service regions

OCCAID Members in LAC

- Entities in LAC who have connected to IPv6 via our network, thanks to the GIPS program:
 - .comDominio Soluções de Tecnologia
 - Dominican Republic NetWorks Information Center (NIC.DO)
 - Newcom International (ARIN region)
 - OSI Guatemala
 - Panama Network Information Center (NIC.PA)
 - Pontificia Universidad Católica Madre y Maestra
 - RNP
 - TELVGG
 - Universidad Tecnológica de Panamá
- Through Newcom International, the following additional entities are connected to IPv6 via GIPS program:
 - Cuba Data
 - Red CENIAInternet
 - Empresa de Telecomunicaciones de Cuba



OCCAID Network



OCCAID R&D Backbone Network



- **OCCAID2 Phase I Upgrades**
1-2.4 Gbps Backbone Capacity Upgrade in 2008
- **100Mbps Connection**
MPLS, 802.1Q FastE or tunneled over same upstream
- **Tunnel Connection**
Tunneled over standard Internet.
- **Pending Connection**
- OCCAID Core Node**
- Pending OCCAID Core Node**
- Layer2 Facility**
Upstream/transport provider's POP
- Exchange Point**
- SixXS Access Node**

© OCCAID

November 2005

INFRASTRUCTURE PARTNERS



STRATEGIC PARTNERS



Consultores Integrales en Telecomunicaciones



Tertiary Education Network

OCCAID Differentiators



- Quality Network to Promote IPv6!
 - OCCAID runs one of the best operated IPv6 networks in the world, in part of its mission to provide a positive forward-looking step for people to enable IPv6 protocol on their networks
- Our IPv6 network (AS30071) provides you with:
 - High-quality useable transit through our extensive native peering with the world's largest IPv6 networks
 - Extensive BGP communities and routing policy options for customers to experience
 - 24/7 continuous monitoring and support
 - Ability to collaborate with other members to share knowledge and experience in leading edge Internet technologies, including IPv6
- Delivering IPv6 access to over 300 entities around the Americas, OCCAID itself is one of the largest IPv6 networks in the world, and a pioneer in global IPv6 development

Next Steps in Africa

- TENET and Consulintel, supporting AfriNIC, are willing to contribute and achieve the same results as in LAC



- How many don't have an IPv6 prefix yet ?
- Count on us !
 - This is not an advertisement
 - Is an offer for helping you to move on
 - There is no associated cost



IPv6 Information

- “The IPv6 Portal” (<http://www.ipv6tf.org>):
 - Technical Aspects
 - News
 - Deployment Aspects
 - Test Connectivity (Tunnel Broker) and applications
 - Training
 - Etc. ...
- Register for enhanced contents and weekly news
- Free IPv6 Publications
- <http://www.6sos.org> (Spanish)

Thanks !

Contact:

- **Jordi Palet (Consulintel):**
jordi.palet@consulintel.es
- **The IPv6 Portal: <http://www.ipv6tf.org>**
- **Barcelona 2005 Global IPv6 Summit, more info and slides at:**
<http://www.ipv6-es.com>