

Where are we with IPv6?

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Running out of IPv4 ?

- Who cares ?
- Predictions are good, but tend to be inaccurate and can be misleading
- Market and policy could make any resource to stay or vanish
- Let's stop discussing about that. The message should be:
 - Start now with IPv6 !
- **A Pragmatic Report on IPv4 Address Space Consumption (Internet Protocol Journal - Volume 8, Number 3, September 2005):**
 - “At some point in the future, perhaps in the 2008–2010 timeframe, we should plan to turn on IPv6 networking capabilities throughout our networks, and this means gaining experience with IPv6 on a smaller scale in 2005–2007 in our networks, in server applications, and in user systems. Turning down IPv4 capabilities, which is the endpoint of such a transition, is a business decision that does not need to be made hastily; we should presume that coexistence will be important for a decade, and probably more.”
- I will add:
 - “this point in the future is today already for some people”

What we did, what we do ?

- We have invested some years in IPv6 R&D (with some public funding)
 - Helped to improve the protocol
 - Disseminated results
 - Created lots of expertise
- We now in return for the community contribution, help with deployment
- We are not just researchers (have real customers)

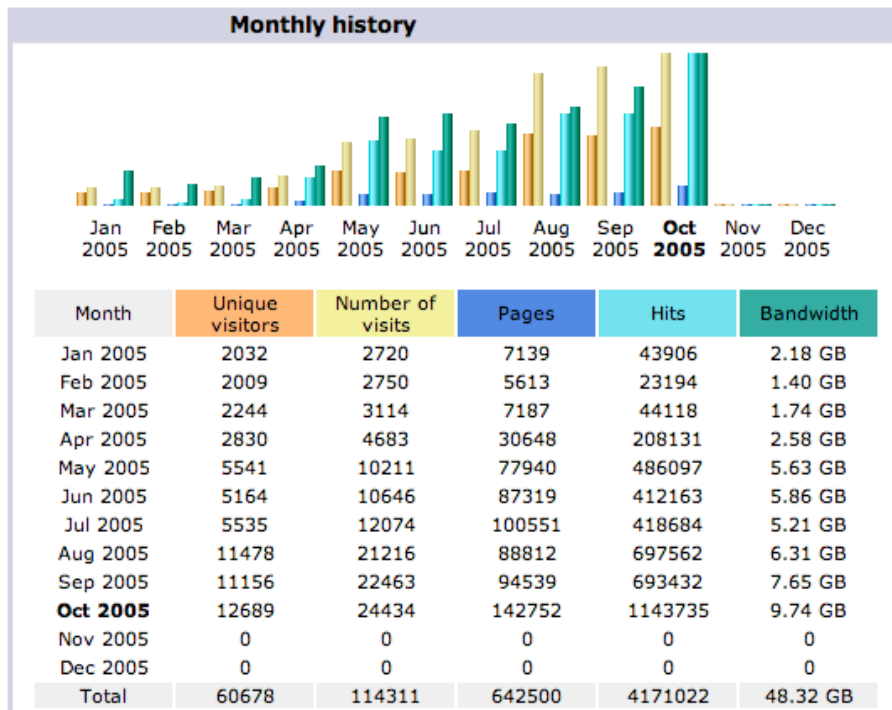
How we help ?

- Training people
- Looking at their networks
- Helping to decide convenient transition paths
- Contacting upstream providers
- Providing support at every step
- Doing internal pilots and then with customers
- Helping to look for business perspectives
- Following the chain ...

What we found ? (1)

| Summary | | | | | |
|----------------------|---------------------|---------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Reported period | Month Oct 2005 | | | | |
| First visit | 01 Oct 2005 - 00:00 | | | | |
| Last visit | 26 Oct 2005 - 19:00 | | | | |
| | Unique visitors | Number of visits | Pages | Hits | Bandwidth |
| Viewed traffic * | 12689 | 24434 (1.92 visits/visitor) | 142752 (5.84 pages/visit) | 1143735 (46.8 hits/visit) | 9.74 GB (417.99 KB/visit) |
| Not viewed traffic * | | | 245741 | 247001 | 11.64 GB |

* Not viewed traffic includes traffic generated by robots, worms, or replies with special HTTP status codes.



- IPv6 is happening in the industry
 - Daily news about that
- Interest in IPv6 is increasing
 - <http://www.ipv6tf.org>

What we found ? (2)

- IPv6 traffic is growing

| Summary | | | | | |
|------------------------|--|--------------------------------------|------------------------------------|-------------------------------------|--|
| Reported period | Year 2005 | | | | |
| First visit | 01 Jan 2005 - 00:06 | | | | |
| Last visit | 15 Sep 2005 - 02:43 | | | | |
| | Unique visitors | Number of visits | Pages | Hits | Bandwidth |
| Viewed traffic * | <= 21405 Exact value not available in 'Year' view | 30080 (1.4 visits/visitor) | 83671 (2.78 pages/visit) | 666071 (22.14 hits/visit) | 128.79 GB (4489.71 KB/visit) |
| Not viewed traffic * | | | 76618 | 84628 | 256.29 GB |

* Not viewed traffic includes traffic generated by robots, worms, or replies with special HTTP status codes.

| Summary | | | | | |
|------------------------|--|--------------------------------------|-----------------------------------|------------------------------------|---------------------------------------|
| Reported period | Year 2005 | | | | |
| First visit | 01 Jan 2005 - 12:25 | | | | |
| Last visit | 14 Sep 2005 - 18:37 | | | | |
| | Unique visitors | Number of visits | Pages | Hits | Bandwidth |
| Viewed traffic * | <= 719 Exact value not available in 'Year' view | 1058 (1.47 visits/visitor) | 4747 (4.48 pages/visit) | 45964 (43.44 hits/visit) | 10.38 GB (10290.2 KB/visit) |
| Not viewed traffic * | | | 619 | 792 | 2.64 GB |

* Not viewed traffic includes traffic generated by robots, worms, or replies with special HTTP status codes.

– More to come in few months

What we found ? Buts ...

- Lot's of myths
 - Not talking about “protocol technicalities”
- Some big folks not ready

Some of the Myths

- Generic fear to anything new/unknown
 - Natural human reaction 😊
- IPv6 is difficult
 - Not really true, but anything new takes time
- Moving to IPv6 is expensive
 - Planning is the question
- IPv6 don't provide new business
 - Do you care about losing customers ?

The New Business

- Customers don't pay for protocols
 - Transit for applications and services
 - Hundreds (thousands or even millions) of smart devices, appliances, gadgets, consumer electronics, etc.
 - Easier life, Plug & Play, not reading manuals
- Applications work better end-to-end
 - Lower development and deployment cost
 - Lower operational and support cost
- ISPs make more money from services than with “protocols” or IP addresses
 - Bundle apps. and broadband
 - Increase of broadband demand
 - Make customers more “network dependable”
 - They will pay then also for better SLAs

Who want to make the business ?

- The new Internet boom is coming
 - IPv6 is an innovation enabler: Everything connected
- Let's make networks simpler
 - End-to-end, intelligence to the edge
- Allows everyone to develop applications
 - ISPs could be the reselling channel
- If ISPs don't make the business, someone else will make using their network for free
 - Transition mechanisms allow that, so you decide

Service example: ConferenceXP



Open Room (3.0) - Conferenc...

Settings Actions Help

Lea

Joel

Participants: 1

ConferenceXP

Settings Actions Help

| | | |
|-----------------------------|--------------------------------|--------------------------|
| | | |
| .NET & Grids (3.0) | Argonne National Lab (3.0) | CITRIS (3.0) |
| | | |
| Cornell Theory Center (3.0) | East Carolina University (3.0) | ICT4B, UC Berkeley (3.0) |

Venue Service: <http://services.learningwebservices.com/>

Module 5: Synchronizing SQL Server CE Data - ConferenceXP Presentation

File Tools Slide Help

RDA APIs

- System.Data.SqlServerCe.SqlCeRemoteDataAccess
 - Pull method**
 - Brings data from server to device
 - Select data by using SQL statements
 - Creates and populates local table
 - Allows for tracked and untracked data
 - Push method**
 - Sends modified data to server
 - Only used subsequent to Pull method with tracking on
 - SubmitSql method

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Waking up people & networks

- LAC case
 - Over 3.000 people trained in the last 9 months
 - Not just ISPs, also application developers
- The IPv6 Tour
 - <http://ipv6tour.lacnic.net>
- Some results:
 - From 18 prefixes at the end of June (most of them not announced) up to 45 at the end of September (already being used or in the way to)
 - 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, etc.



However ...

- There is a significant difference depending on who are the upstream providers ☹️
- Europeans are able to offer native IPv6 service in just hours
- Some big US providers only offer tunnels and there are some routing concerns
 - Following the chain, some other US ISPs also depend on those big players ...
- More IPv6 customers outside NA or just more service available ?

Do you care your customers ?

- We have requested connectivity and roadmaps to lots of transit providers
 - Not many even take the time to reply ...
- So, don't tell us
 - “there is not a business case”
 - “there is no customer demand”
- We want to help
 - Need your cooperation
- We have a commitment with our customers
 - Need to answer their questions

Planning Ahead

- Take advantage of early deployers
- Incremental upgrade with the demand
- Native is good, but transition mechanisms work well when properly setup, specially for the access network
 - Inexpensive, zero O&M cost
- IPv6 is coming as an added-value when you upgrade your network for other reasons

Where are you with IPv6

- How many in the room believe is not going to happen ?
- How many don't have an IPv6 prefix already ?
- From those that have a prefix, how many aren't announcing it yet ?
- For both of you:
 - What are you waiting for ?

Count on us !

- This is not an advertisement
- Is an offer for helping you to move on
 - Because this way we also help our customers
- There is no associated cost

NANOG list comments

- Consumer routers with 6to4
 - Already there !
- Reclaiming not-used address space
 - Cost/effectiveness/time ...
- Some people moving to IPv6 to manage their networks
 - Some cable operators already got more IPv4 space because net 10 is short for them
- IPv6 is painful for the user
 - More than NAT ? Or we want to say painful for ISPs because is easy to say so when something is new for us ?
- Just wait for a popular adult-content-provider offering website-access for free via IPv6
 - No comments !

Conclusions

- Delaying the inevitable don't seems the best approach to me, instead, preparing everything ahead of time, helping to reduce the cost
- Do we charge to our customers when we solve a bug or problem in our network? IPv6 was invented to solve a "bug" in IPv4:
 - The lack of enough addresses
- Having more services and apps running into our networks will mean more revenue ... depending on your business model
- May be instead of getting a new check for the IPv6 service, not providing it, you will lost some checks from existing customers who demand dual stack ;-)
- Business is also “to be competitive”, and other carriers already have the service as a value added to the existing IPv4 customers
- The cost of NOT being prepared for IPv6 is vastly higher than the cost of easing into it
- Make sure to plan ahead and order any new equipment with IPv6 on it

Thanks !

- Questions ?

- **The IPv6 Portal**

<http://www.ipv6tf.org>