

# In The Boxing Ring



## Network Box Technical News from Mark Webb-Johnson, CTO Network Box

### IN THIS ISSUE

#### 2. **IPV6**

We present the current state of IPv4 and the upcoming transition to IPv6. In almost 40 years, we've grown from a small US military and academic research network, to one hosting 255 million websites, used by 2 billion human beings. The next stage of this growth requires the migration to a new protocol (known as IPv6) and offers as many challenges as it does opportunities.

#### 3. **FEBRUARY 2011 FEATURES**

As usual, we will be deploying our on-going enhancements and improvements as well as maintenance features to all NBRS-3.0 customers.

#### 3. **FEBRUARY 2011 HINT**

Envelope Pre-Scanning is an effective tool at reducing overall spam volumes. Network Box offers this, coupled with directory harvest protection features.

### Welcome

Welcome to the February 2011 edition of 'In the Boxing Ring'. In this edition, we focus on the next generation of Internet Protocol (IPv6).

On page 2, we present the current state of IPv4 and the upcoming transition to IPv6. In almost 40 years, we've grown from a small US military and academic research network, to one hosting 255 million websites, used by 2 billion human beings. The next stage of this growth requires the migration to a new protocol (known as IPv6) and offers as many challenges as it does opportunities. Network Box is here to assist and protect you with this.

Page 3 details the usual monthly features summary and January hint.

You can contact us here at HQ via eMail ([nbhq@network-box.com](mailto:nbhq@network-box.com)). Or, drop by our office next time you are in town. You can also keep in touch by following our Network Box Security Response twitter feed at:

[twitter.com/networkboxhq](https://twitter.com/networkboxhq)

Mark Webb-Johnson  
CTO, Network Box Corporation  
February 2011



For further information, refer to: [Mashable.com](http://Mashable.com)  
Sources: Mashable, MessageLabs, Radicati Group, Netcraft, Verisign, Internet World Stats, Facebook, Business Insider, Twitter, StatCounter, Comscore, Pew Research Centre, Flickr, royal.pingdom.com



## IPv6 - The Next Generation Internet Protocol

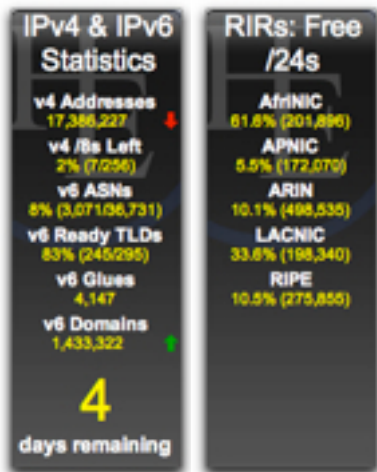


### IPv4 Exhaustion

The above picture is of the Internet as it was in 1972. At the time, it was called ARPANET, connecting just the Pentagon and a handful of universities, and was built on a protocol called the Internet Protocol (IP) and the version used became version 4 (v4).

IPv4 uses 32-bit addresses, giving a total of 4 billion (4,294,967,296) individual addresses. However, some are reserved for special purposes such as private networks (~18 million addresses) or multicast addresses (~270 million addresses), and a large number are wasted (due to division of the space into contiguous networks with empty allocation space).

Current estimates are that the central allocations of IPv4 address space to regional registries will be exhausted within the first few months of 2011 (Today, February 1<sup>st</sup> is the estimate, if some are to believed), many disagree, but what is certain is that IPv4 has been at the core of the Internet for the past 40 years, and is being rapidly exhausted. It is likely that by the end of 2011, ISPs will start to experience problems allocating IPv4 addresses to new customers.



Source: Hurricane Electric Internet Services <http://ipv6.he.net/statistics/>

### IPv6

Internet Protocol Version 6 (IPv6) is the version of the Internet Protocol that is designed to succeed version 4. It uses a 128-bit address, supporting  $2^{128}$  addresses. While that sounds like just 4 times IPv4, in reality it is 39 digit number (or almost 80 billion billion billion times the address space than IPv4). Something like  $5 \times 10^{28}$  addresses for every living person on the planet, and more addresses than atoms in the universe.

There is certainly enough address space, and the new features of the design are appealing, but the problem is that IPv6 is very incompatible with IPv4.

### IPv4 and IPv6 Co-Existence

The migration 'plan' for IPv4 to IPv6 calls for the two protocols to co-exist for quite some time, and for servers and hosts to implement the so-called "dual stack approach" to co-existence.

From a service provider point of view (such as operators of web sites, mail servers, etc), major service providers are already offering their services on both IPv4 and IPv6. The DNS system fully supports IPv6 addresses, and these can be published to allow the services to be reachable over both IPv4 and IPv6.

From an end-user client point of view (such as workstations connecting to web sites), IPv6 workstations use tunneling and gateway protocols to access IPv4 services, and IPv6 directly where possible. IPv4 workstations can only easily access IPv4 services (which is why those services will continue to be available in IPv4 for some time).

Think of it as two completely separate protocols and services, running on the same wire, with only limited inter-connection.

### Network Box and IPv6

Today, Network Box, like most of our competitors, has basic support for IPv6. We can operate as an IPv6 firewall and router, co-existing with IPv4 services, but the higher-level services don't have universal support for IPv6.

IPv6 support at the gateway is relatively simple. If you have access to

IPv6, ping 2001:df0:a5::1 and you'll find a Network Box gateway running IPv6 (the same gateway is also dual-stack multi-homed to IPv4). The problems still to be solved by the industry are more:

- How to address connectivity issues for devices that do not fully support IPv6?
- How to NAT between IPv4 and IPv6, cleanly, effectively and securely (eg; IPv4 and/or IPv6 outside, with just IPv4 inside)?
- How to support customer's dual-stack implementations (IPv4 outside, IPv6 inside, and vice-versa)?
- How to support customers with just IPv6 connectivity, and allow them to offer services on the IPv4 Internet?
- How to address the new security concerns that IPv6 brings?

Google, perhaps one of the most experienced large service providers, says it well on their [Google over IPv6](#) page:

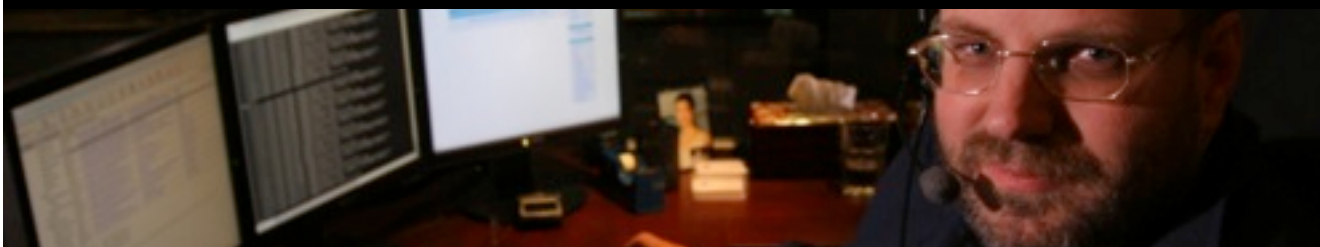
*"We continuously conduct detailed measurements on the quality of IPv6 connectivity, and our latest results show that making Google services generally available over IPv6 at this time would lead to connection problems and increased latency for a small number of users."*

Other commentators have questioned how to effectively conduct a penetration test or network map when the minimum typical IPv6 allocation is many thousands of times the size of the entire current IPv4 Internet.

Network Box intends to continue to fully support IPv4 connectivity to dual-stack services (as we do today) in our NBRS-3.0 product.

We are also working hard to address the IPv6 concerns in our upcoming NBRS-5.0 product, and for that product to have full dual-stack IPv4 and IPv6 support (including bi-directional NAT-equivalency between the two protocols, as well as protocol conversion services). Our roadmap calls for us to have full IPv6 support during 2011, including transitions arrangements for IPv6 and IPv4, and to offer these services to customers both as clients and servers on the IPv6 Internet.

Further information on this will be released during 2011Q2.



### February 2011 Features



On Tuesday, 1<sup>st</sup> February 2011, Network Box will release our patch Tuesday set of enhancements and fixes. The regional NOCs will be conducting the rollouts of the new functionality in a phased manner over the next 7 days. This month, these include:

- Changes to the Box Office portal, related to Contracts, Ticketing, SLA maintenance, and chinese language eMails.
- Enhancements to the Global Monitoring System (GMS), related to speed and handling of box reachability alerts.
- Enhancements to the box health monitoring system, related to web proxy performance under high workload.
- Enhancements to the mail scanning system, related to extraction of URLs and DKIM support.
- Enhancements to the web policy system, related to automatic build of the ‘everyone’ group.
- Enhancements to the network activity monitor, for support of ADSL network links.

In most cases, the above changes should not impact running services or require a device restart. However, in some cases (depending on configuration), a device restart may be required. Your local NOC will contact you to arrange this if necessary.

Should you need any further information on any of the above, please contact your local NOC. They will be arranging deployment and liaison.

### February 2011 Hint

An SMTP email transaction involves two phases:

1. The envelope (sender, recipient list, and some other message delivery parameters) is sent.
2. The message itself is sent.

The protocol permits the server receiving the message (or gateway device, such as Network Box, intercepting that reception for scanning / policy enforcement) to choose to accept, temporarily defer, or permanently reject the message reception at the envelope stage of the transaction (before actual transmission of the email message itself). The advantage of deferring/rejecting the email at this stage is that the costly (in terms of CPU, memory and bandwidth) transfer and analysis of the message itself is avoided.

Network Box supports advanced techniques such as sender address verification, recipient address verification, source IP RBL, whitelisting and blacklisting - all at envelope stage. Integrated to an Active Directory / LDAP server, few details need to be maintained on the Network Box itself. In addition, the option of directory harvest prevention is also available to protect the privacy of address records.

The February 2011 hint is that you consider deploying mail protection at the envelope level.

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### JANUARY 2011 NUMBERS

Key Metric)	#	% difference (since last month)
PUSH Updates	921	+13.4
Signatures Released	458,767	+11.9
Firewall Blocks (/box)	737,342	-2.1
IDP Blocks (/box)	100,051	-9.7
Spams (/box)	23,304	-13.5
Malware (/box)	423	+27.4
URL Blocks (/box)	92,265	-19.5
URL Visits (/box)	3,484,582	-3.6

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