Utilizando IPv6

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Objectivos

- Al final de este workshop podrás contestar las siguientes preguntas:
  - ¿ Cuales son las ventajas de IPv6 sobre IPv4 ?
  - ¿ Como configurar IPv6 para una red utilizando un Router Cisco con Túnel ?
  - ¿ Como configurar IPv6 para una estación utilizando un Túnel ?
  - ¿ Como configurar IPv6 para una estación utilizando un Túnel ?

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¿Por qué necesito IPv6 hoy?

- Mas direcciones de IP. Según los estimados se espera que para el 2010, ya no existan direcciones disponibles en IPv4.
- Problemas relacionados al NAT.
- IPsec

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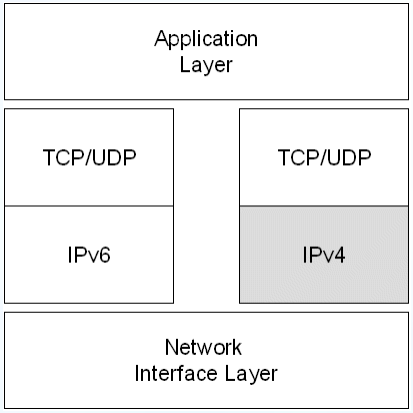
Diferentes tipos de implementación

- IPv6 Native
- IPv6 Over IPv4 Tunneling
  - http://www.tunnelbroker.net
  - http://www.sixxs.net
  - http://www.hpcf.upr.edu
- ISATAP
- Teredo



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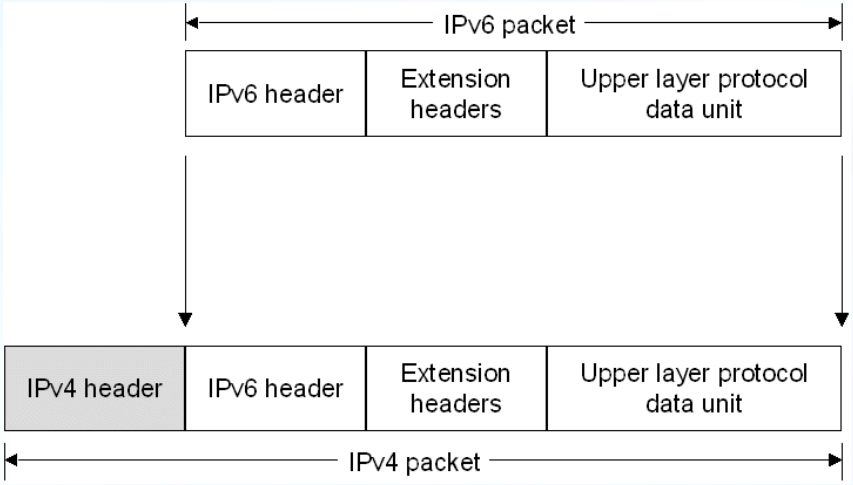
IPv6 Over IPv4 Tunneling

Como funciona IPv6 Over IPv4



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Ventajas y Desventajas

- Ventajas
  - No hay que hacer una inversión grande en equipo
  - Es un modelo Dual Stack (es backwards compatibility)
- Desventajas
  - No es escala bien.

¿Que necesita para configurar IPv6 en su network o en su PC?

- 1 PC que utilicé uno de los siguientes:
  - Sistemas Operativos:
    - Linux/Unix
    - Mac OS
    - Solaris
    - BSD
    - Windows XP/2003
  - Router
    - Cisco (IOS Advanced IP Services)
    - Juniper
    - Linux (quagga)
  - Conexión a la Internet

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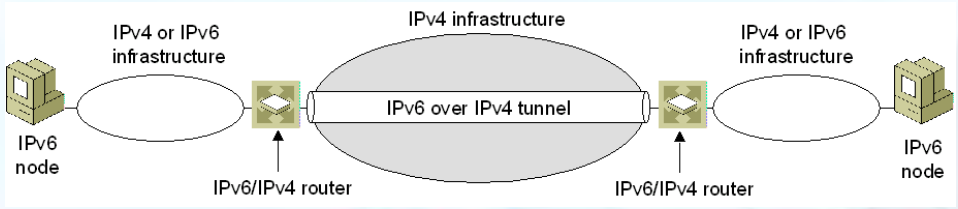
Creando un túnel sobre IPv4 en un Router Cisco para su network

```
configure terminal
ipv6 unicast-routing
interface tunnel0
 description Tunnel Broker
 no ip address
 ipv6 enable
 ipv6 address 2001:470:1F00:FFFF::FCD/127
 tunnel source 209.91.194.4
 tunnel destination 64.71.128.82
 tunnel mode ipv6ip
 !
interface vlan 1
 description Network Interno
 ip address ....
 ipv6 enable
 ipv6 address ipv6 address 2001:470:1F00:2122::1/64
!
ipv6 route ::/0 tunnel0
end
Write mem
```



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Creando un túnel sobre IPv4 en su estación Linux

Activar la interface sit0

$ ifconfig sit0 up

Crear un tunel a la dirección ipv4 (64.71.128.82)

$ ifconfig sit0 inet6 tunnel ::64.71.128.82

Activar la interface del tunel (sit1)

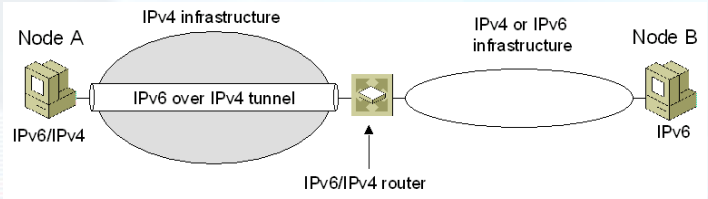
$ ifconfig sit1 up

Añadirle la dirección ipv6 (2001:470:1F00:FFFF::FCD/127) a la interface (sit1)

$ ifconfig sit1 inet6 add 2001:470:1F00:FFFF::FCD/127

Enrutar el tráfico ipv6 a la nueva interface (sit1)

$ route -A inet6 add ::/0 dev sit1



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Creando un túnel sobre IPv4 en su PC Windows

- **Utilizando Tunnelbroker.net**
- **Instalar el Support para IPv6 windows XP**

Instalar ipv6

> ipv6 install

Crear un tunnel de ipv4 (64.71.128.82) a ipv6 (2001:470:1F00:FFFF::FCD)

> ipv6 rtu ::/0 2/::64.71.128.82 pub

> ipv6 adu 2/2001:470:1F00:FFFF::FCD

- **Instalar el Support para IPv6 Windows XP SP2/2003**

Instalar ipv6

> netsh interface ipv6 install

Crear un tunnel de ipv4 (64.71.128.82) a ipv6 (2001:470:1F00:FFFF::FCD)

> netsh interface ipv6 add route prefix=::/0 nethop=::64.71.128.82 pub=yes

> netsh interface ipv6 add address int=2 addr=2001:470:1F00:FFFF::FCD

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Probando la Conexión

- Linux

```
$ ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0E:A6:74:71:12
          inet6 addr: 2001:470:1f00:2122:20e:a6ff:fe74:7112/64 Scope:Global
          inet6 addr: fe80::20e:a6ff:fe74:7112/64 Scope:Link
          UP BROADCAST NOTRAILERS RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:11620131 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1856298 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1142484528 (1089.5 Mb)  TX bytes:311956818 (297.5 Mb)
          Interrupt:177 Memory:fda00000-0
```

Probando la Conexión Cont…

- Windows

C:\ipconfig -all
Windows IP Configuration
Ethernet adapter Local Area Connection:

Description . . . . . : VMware Accelerated AMD PCNet Adapter

Physical Address. . . . . : 00-0C-29-12-41-FB
Dhcp Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IP Address. . . . . : 192.168.230.2
Subnet Mask . . . . . : 255.255.255.0
IP Address. . . . . : 2001:470:1f00:2122:20c:29ff:fe12:41fb
IP Address. . . . . : fe80::20c:29ff:fe12:41fb%4
Default Gateway . . . . . : 192.168.230.1
fe80::214:f2ff:fe85:c7f4%4
DHCP Server . . . . . : 192.168.230.1
DNS Servers . . . . . : 209.91.199.2
Lease Obtained. . . . . : Tuesday, February 21, 2006 12:59:58 AM
Lease Expires . . . . . : Tuesday, February 28, 2006 12:59:58 AM

Probando la Conexión Cont…

```
$ping6 www.nic.pr
PING www.nic.pr(2001:468:1300:101:206:5bff:fef8:41e1) 56 data bytes
64 bytes from 2001:468:1300:101:206:5bff:fef8:41e1: icmp_seq=1 ttl=48 time=470 ms
64 bytes from 2001:468:1300:101:206:5bff:fef8:41e1: icmp_seq=2 ttl=48 time=466 ms
64 bytes from 2001:468:1300:101:206:5bff:fef8:41e1: icmp_seq=3 ttl=48 time=462 ms
64 bytes from 2001:468:1300:101:206:5bff:fef8:41e1: icmp_seq=4 ttl=48 time=444 ms
64 bytes from 2001:468:1300:101:206:5bff:fef8:41e1: icmp_seq=5 ttl=48 time=441 ms
```

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IPv6: The Next Generation Internet! - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
Minimize
http://www.ipv6.org/
SUSE LINUX Entertainment News Internet Search Reference Maps and Directions Shopping People and Companies
IPv6
Welcome to the IPv6 Information Page!
You are using IPv6 from 2001:468:1300:101:211:43ff:feed:21a6
CONTENTS
How To
FAQ
IPv6 enabled applications
IPv6 accessible servers
IPv6 specifications
Implementations
Mailing List
Other Site
What is IPv6?
IPv6 is short for "Internet Protocol Version 6". IPv6 is the "next generation" protocol designed by the IETF to replace the current version Internet Protocol, IP Version 4 ("IPv4").
Most of today's internet uses IPv4, which is now nearly twenty years old. IPv4 has been remarkably resilient in spite of its age, but it is beginning to have problems. Most importantly, there is a growing shortage of IPv4 addresses, which are needed by all new machines added to the Internet.
IPv6 fixes a number of problems in IPv4, such as the limited number of available IPv4 addresses. It also adds many improvements to IPv4 in areas such as routing and network autoconfiguration. IPv6 is expected to gradually replace IPv4, with the two coexisting for a number of years during a transition period.
Some introductory information about the protocol can be found in our IPv6 FAQ. For those interested in the technical details, we have a list of IPv6 related specifications.
Where can I get an IPv6 implementation for my system?
There is software available for most operating systems in common use today. Find your favorite OS on our list of IPv6 implementations. We also have a collection of "how to
Done

Referecias

- **TunnelBroker**
  - http://www.tunnelbroker.net
- **Introduction to IPv6**
  - http://www.microsoft.com/technet/itsolutions/network/ipv6/introipv6.mspx
- **IPv6 for Microsoft Windows: Frequently Asked Questions**
  - http://www.microsoft.com/technet/itsolutions/network/ipv6/ipv6faq.mspx
- **Getting Started with the Microsoft IPv6 Technology Preview for Windows 2000**
  - http://msdn.microsoft.com/downloads/sdks/platform/tpipv6/start.asp

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¿ Preguntas ?

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