

Redes IPv6 Multicast

Redes IPv6 Multidifusión

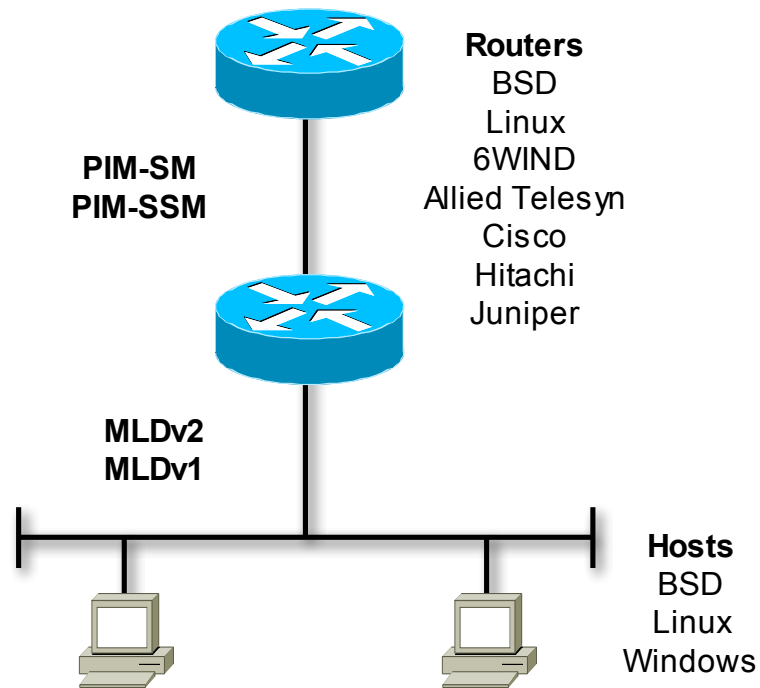
LACNIC VIII
Tercer Foro Latinoamericano de IPv6 (Flip-6)
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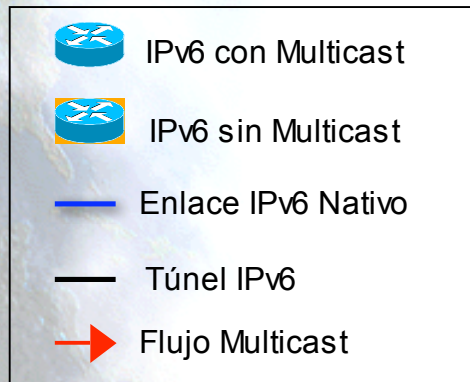
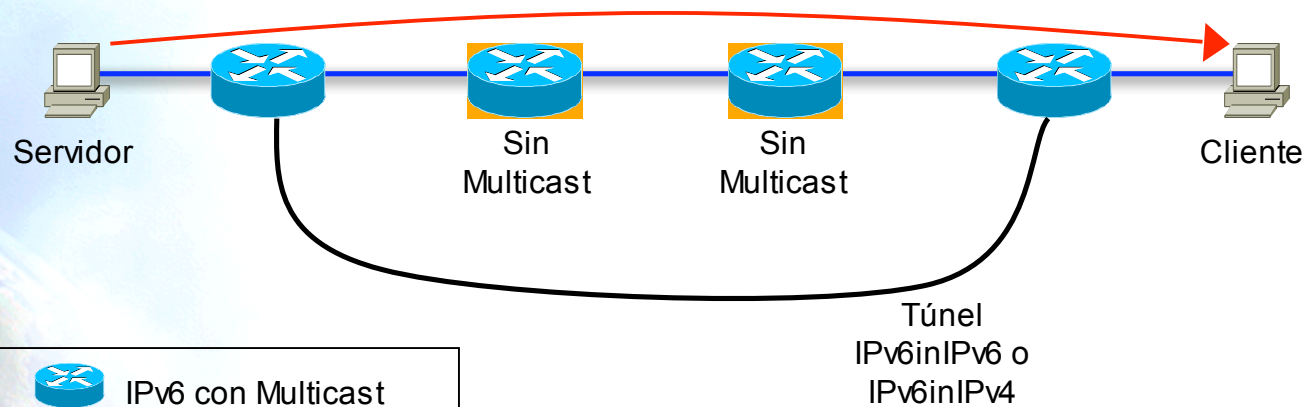
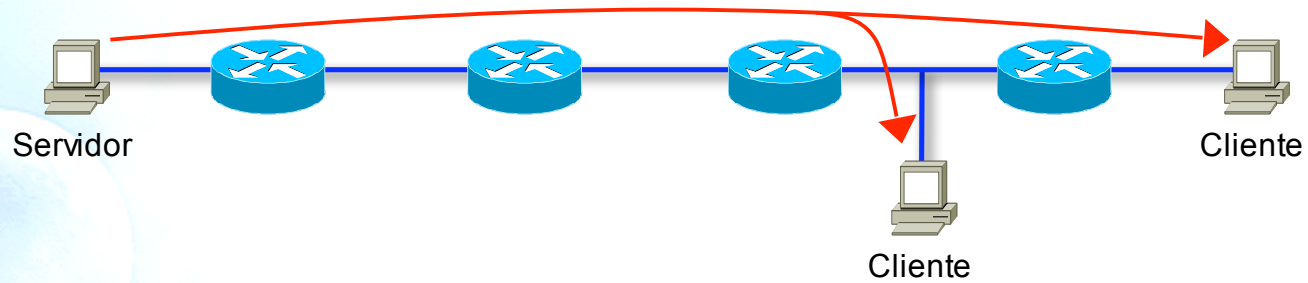
Agenda

- Opciones disponibles para la instalación de Redes IPv6 Multicast (Multidifusión)
- Herramientas de pruebas, validación y explotación de tales redes
- Red IPv6 Multicast en LACNIC VIII

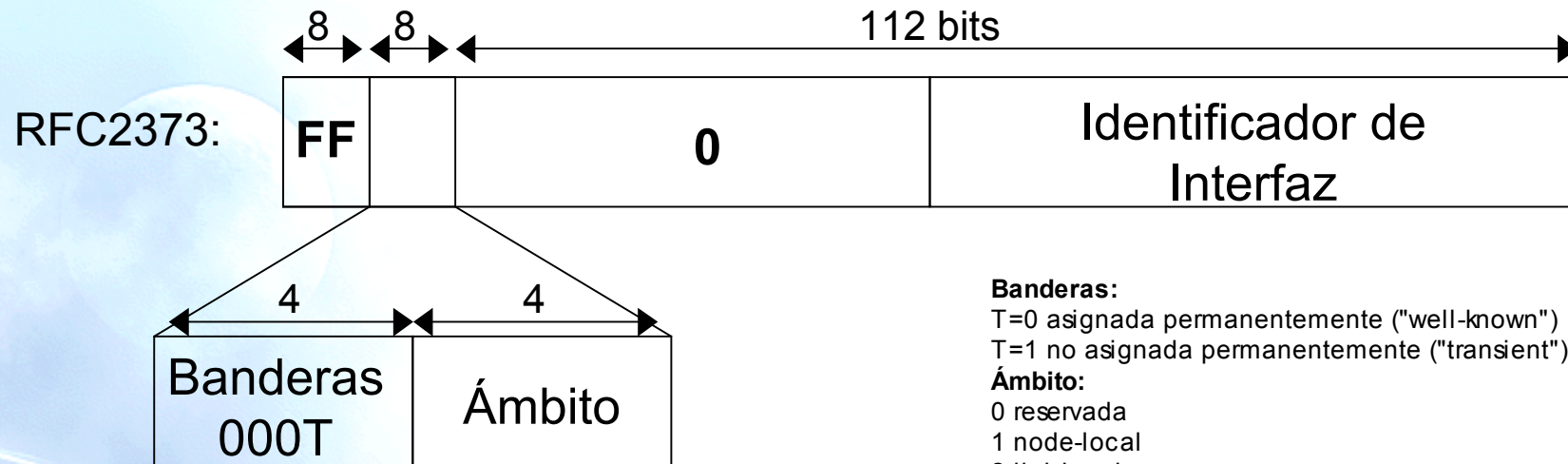
IPv6 Multicast



Escenarios IPv6 Multicast



Direcciones IPv6 Multicast



Ejemplos:

- FF1E::2001 > Dirección global no asignada perm.
- FF16::/16 > Prefijo con ámbito no asignado
- FF3x::/96 > Prefijo de SSM

Banderas:

- T=0 asignada permanentemente ("well-known")
- T=1 no asignada permanentemente ("transient")

Ámbito:

- 0 reservada
- 1 node-local
- 2 link-local
- 3 no asignada
- 4 no asignada
- 5 site-local
- 6 no asignada
- 7 no asignada
- 8 organization-local
- 9 no asignada
- A no asignada
- B no asignada
- C no asignada
- D no asignada
- E global
- F reservada

Aplicaciones de Verificación (1)

- **smping/ssmpingd**
- Verifica si hay conectividad SSM entre dos hosts IPv4/IPv6
- Se ejecuta "ssmping <host>", entonces ssmping se une a la dupla (S,G) donde (hosts,ff3e::4321:1234)
- <http://www.venaas.no/multicast/ssmping/>

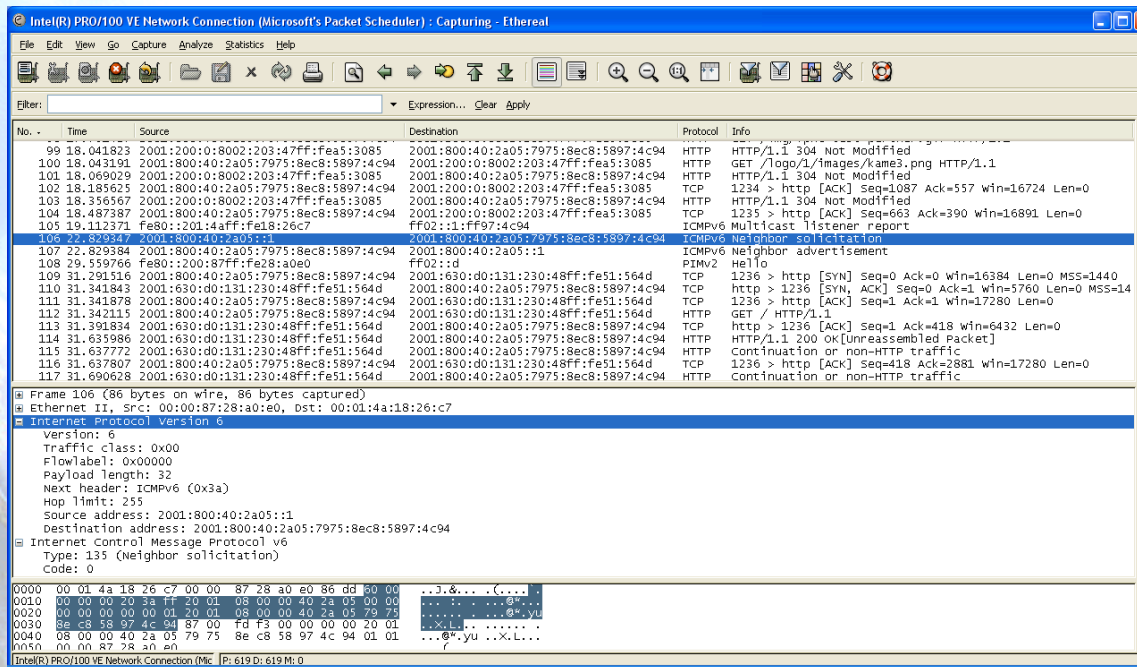
Ejemplos:

```
[consulintel@lacnic ssm ping-0.6]$ ./ssmping -6 -l eth0 -c 50 2001:800:40:2b18:2b0:d0ff:fe16:76fc
ssmping joined (S,G) = (2001:800:40:2b18:2b0:d0ff:fe16:76fc,ff3e::4321:1234)
pinging S from 2001:1820:1a::2
  unicast from 2001:800:40:2b18:2b0:d0ff:fe16:76fc, seq=0 dist=10 time=164.701 ms
  unicast from 2001:800:40:2b18:2b0:d0ff:fe16:76fc, seq=1 dist=10 time=173.912 ms
  multicast from 2001:800:40:2b18:2b0:d0ff:fe16:76fc, seq=1 dist=5 time=174.710 ms
  unicast from 2001:800:40:2b18:2b0:d0ff:fe16:76fc, seq=2 dist=10 time=193.795 ms
  multicast from 2001:800:40:2b18:2b0:d0ff:fe16:76fc, seq=2 dist=5 time=195.473 ms
```

```
[consulintel@lacnic ssm ping-0.6]$ ./ssmping -6 -l eth0 -c 50 2001:800:40:2a0a:2c0:26ff:fe50:2115
ssmping joined (S,G) = (2001:800:40:2a0a:2c0:26ff:fe50:2115,ff3e::4321:1234)
pinging S from 2001:1820:1a::2
  unicast from 2001:800:40:2a0a:2c0:26ff:fe50:2115, seq=0 dist=9 time=163.997 ms
  unicast from 2001:800:40:2a0a:2c0:26ff:fe50:2115, seq=1 dist=9 time=161.113 ms
  multicast from 2001:800:40:2a0a:2c0:26ff:fe50:2115, seq=1 dist=4 time=162.104 ms
  unicast from 2001:800:40:2a0a:2c0:26ff:fe50:2115, seq=2 dist=9 time=161.357 ms
  multicast from 2001:800:40:2a0a:2c0:26ff:fe50:2115, seq=2 dist=4 time=161.898 ms
```

Aplicaciones de Verificación (2)

- **Ethereal**
- Captura y Decodifica Trafico IPv4/IPv6 Unicast/Multicast
- Muy útil validación de conexiones y solución de problemas
- <http://www.ethereal.com/>



Aplicaciones de Verificación (3)

- tcpdump
- Iperf (Gracias a Carlos Barcenilla, UPM)

```
[pc1 iperf]#./iperf -c ff16::2222 -u -V -T 5
```

```
Client connecting to ff16::2222, UDP port 5001
Sending 1470 byte datagrams
Setting multicast TTL to 5
UDP buffer size: 110 KByte (default)
```

```
[ 3] local 2001:db8::2115 port 32768 connected with ff16::2222 port 5001
[ ID] Interval   Transfer   Bandwidth
[ 3] 0.0-10.0 sec 1.25 MBytes 1.05 Mbits/sec
[ 3] Sent 893 datagrams
(none):/usr/apps/iperf #
```

```
[pc2 iperf]# ./iperf -s -u -B ff16::2222 -V -T 5
```

```
Server listening on UDP port 5001
Binding to local address ff16::2222
Joining multicast group ff16::2222
Receiving 1470 byte datagrams
UDP buffer size: 64.0 KByte (default)
```

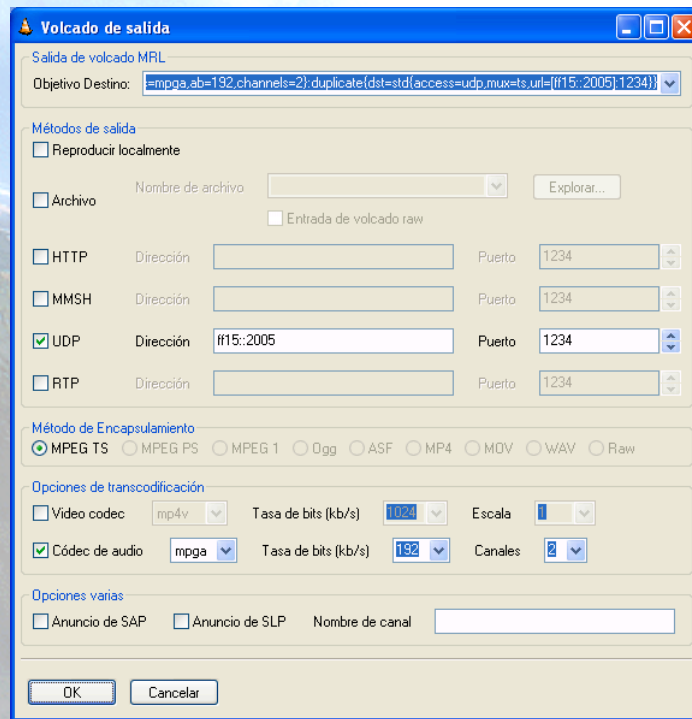
Aplicaciones (1)

- **ISABEL**
- IPv4/IPv6 Unicast/Multicast
- <http://isabel.dit.upm.es/>

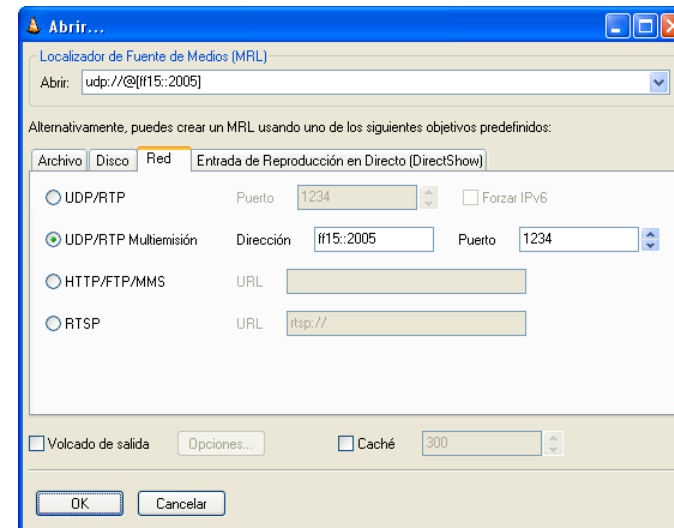


Aplicaciones (2)

- **VLC**
- Cliente y Servidor Multimedia
- Soporta IPv4/IPv6 Unicast/Multicast
- <http://www.videolan.org/vlc/>



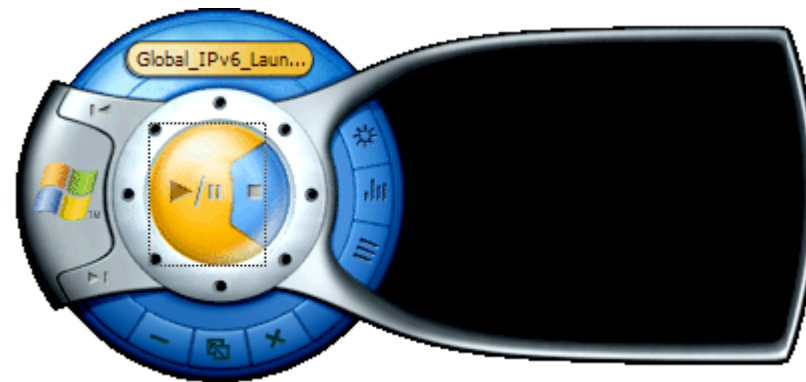
Servidor Multicast



Cliente Multicast

Aplicaciones (3)

- **Microsoft Windows Media Player y Server**
- Cliente y Servidor Multimedia
- Soporta IPv4/IPv6 Unicast/Multicast
- <http://www.microsoft.com/windows/windowsmedia/default.aspx>

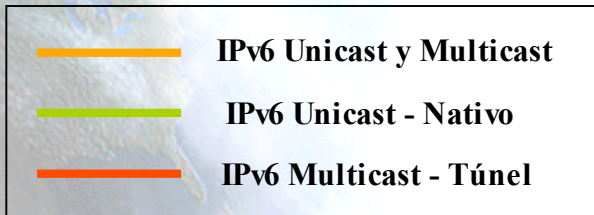
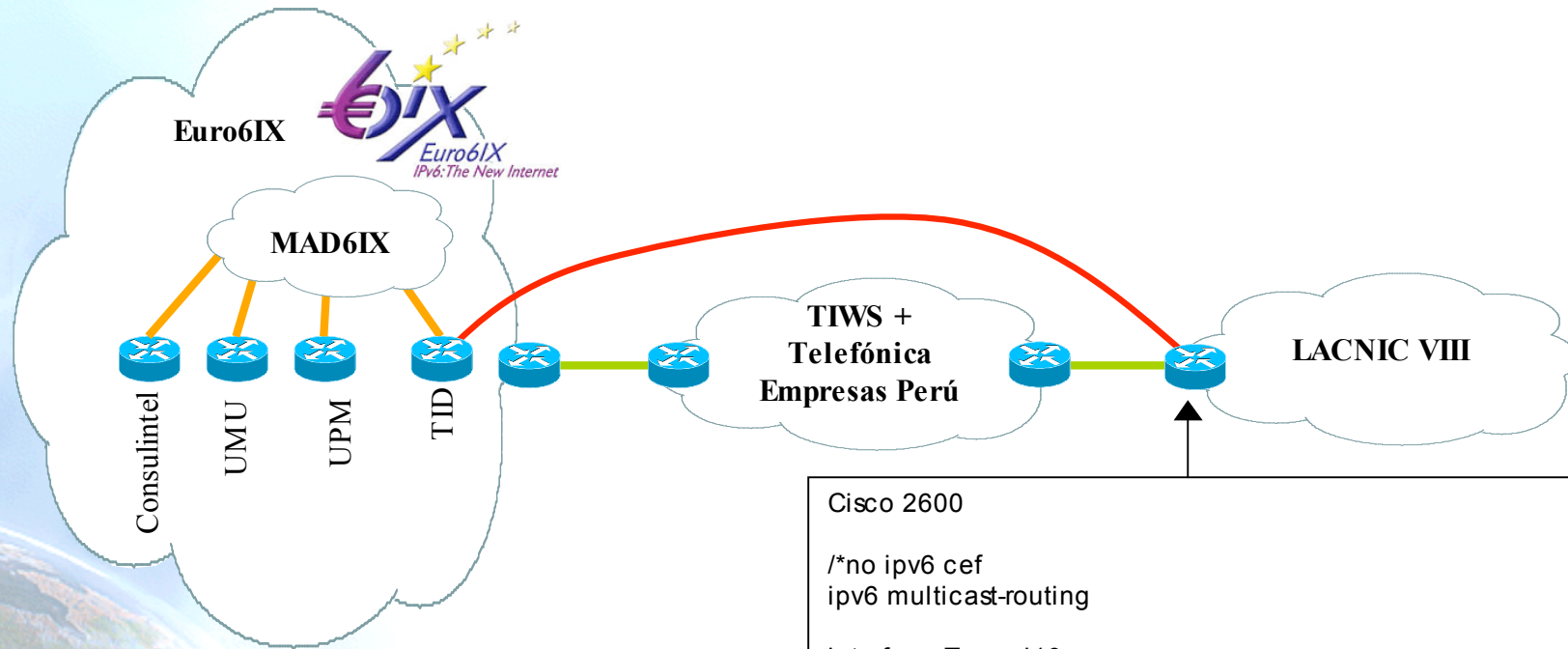


Cliente WMP

Aplicaciones (4)

- Beacon
- Freamp
- pcm6cast
- VIC, RAT, SDR, NTE, WBD

Red IPv6 Multicast en LACNIC VIII



```

Cisco 2600

/*no ipv6 cef
ipv6 multicast-routing

interface Tunnel10
description Tunnel 6in6 to Euro6IX for Multicast Connection
no ip address
ip route-cache flow
ipv6 address 2001:800:40:22F8::2/64
ipv6 enable
tunnel source Multilink1
tunnel destination TID_address_2
tunnel mode ipv6

ipv6 route 2001::/16 TID_address_1 multicast
    
```

Referencias

- <http://www.m6bone.net>
 - Aplicaciones
 - Routers
 - Hosts
- “Implementing IPv6 Multicast”, Cisco 2004
http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/123cgr/ipv6_c/sa_mcast.pdf
- “Multicast Configuration Guide Rel 6.0” Juniper 2005
<http://www.juniper.net/techpubs/software/junos/junos60/swconfig60-multicast/download/swconfig60-multicast.pdf>

Preguntas

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