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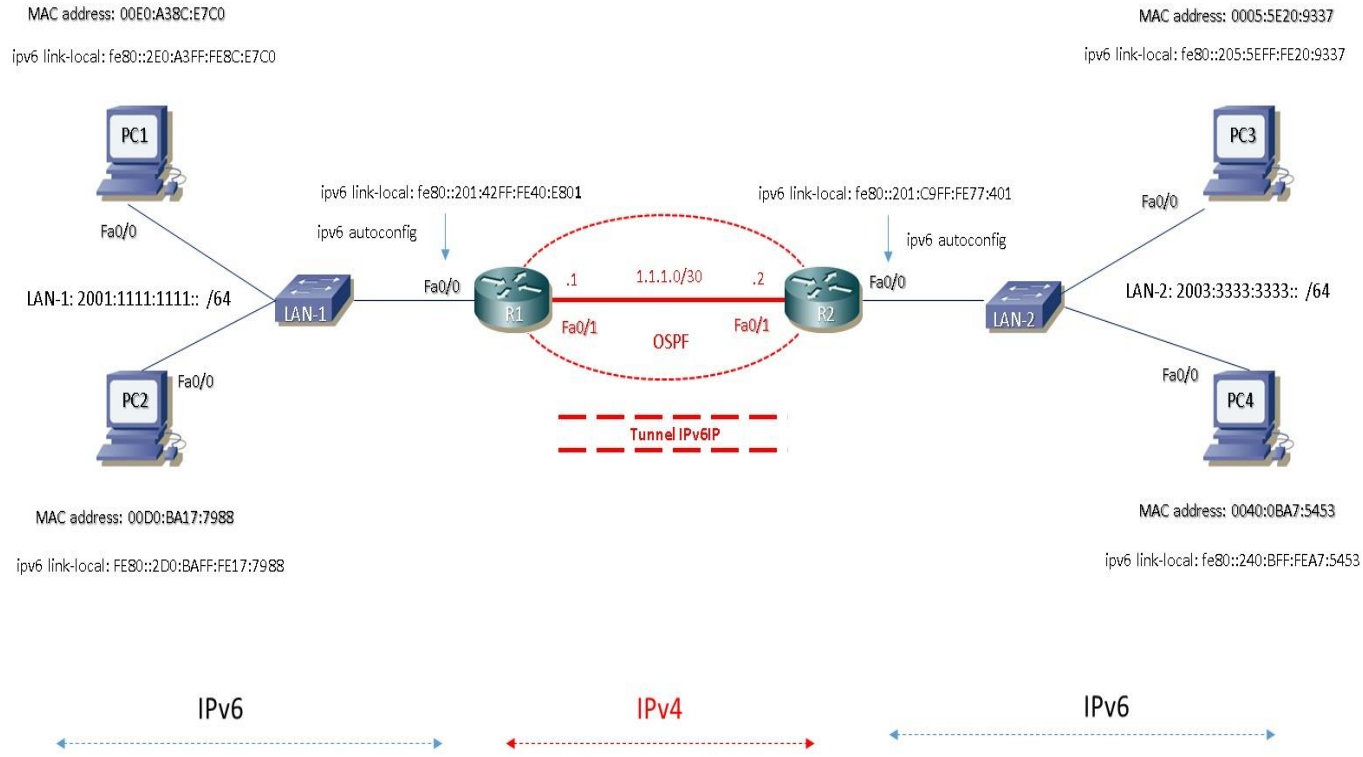
Configurazione di un tunnel manuale IPV6 tra due routers IPv4 core permettendo lo scambio di routes tra due isole IPv6 LAN remote



Attraverso la aut-config slaac dei rispettivi router i PC ottengono la seguente configurazione:

PC1:

FastEthernet0 Connection:(default port)

Physical Address.....: 00E0.A38C.E7C0
Link-local IPv6 Address.....: FE80::2E0:A3FF:FE8C:E7C0
IPv6 Address.....: 2001:1111:1111:0:2E0:A3FF:FE8C:E7C0/64
Default Gateway.....: FE80::201:42FF:FE40:E801
DNS Servers.....: ::
DHCPv6 Client DUID.....: 00-01-00-01-2B-0D-C3-EE-00-E0-A3-8C-E7-C0

PC2:

FastEthernet0 Connection:(default port)

Physical Address.....: 00D0.BA17.7988
Link-local IPv6 Address.....: FE80::2D0:BAFF:FE17:7988
IPv6 Address.....: 2001:1111:1111:0:2D0:BAFF:FE17:7988/64
Default Gateway.....: FE80::201:42FF:FE40:E801
DNS Servers.....: ::
DHCPv6 Client DUID.....: 00-01-00-01-40-77-87-80-00-D0-BA-17-79-88

PC3:

FastEthernet0 Connection:(default port)

Physical Address.....: 0005.5E20.9337
Link-local IPv6 Address.....: FE80::205:5EFF:FE20:9337
IPv6 Address.....: 2003:3333:3333:0:205:5EFF:FE20:9337/64
Default Gateway.....: FE80::201:C9FF:FE77:401
DNS Servers.....: ::
DHCPv6 IAID.....: 1731170596
DHCPv6 Client DUID.....: 00-01-00-01-E5-D8-69-80-00-05-5E-20-93-37

PC4:

FastEthernet0 Connection:(default port)

Physical Address.....: 0040.0BA7.5453
Link-local IPv6 Address.....: FE80::240:BFF:FEA7:5453
IPv6 Address.....: 2003:3333:3333:0:240:BFF:FEA7:5453/64
Default Gateway.....: FE80::201:C9FF:FE77:401
DNS Servers.....: ::
DHCPv6 Client DUID.....: 00-01-00-01-12-A0-3D-A9-00-40-0B-A7-54-53

Vediamo ora la configurazione dei due routers con la modalità tunnel manuale IPv6IP

R1

ipv6 unicast-routing
!
interface Tunnel0
no ip address
mtu 1476
ipv6 address 3FFE:B00:C18:1::3/127
tunnel source FastEthernet0/1
tunnel destination 1.1.1.2
tunnel mode ipv6ip
!
!
interface FastEthernet0/0
no ip address
duplex auto
speed auto
ipv6 address 2001:1111:1111::1/64
ipv6 address autoconfig
ipv6 enable
!
interface FastEthernet0/1
ip address 1.1.1.1 255.255.255.252
duplex auto
speed auto
!
router ospf 1
router-id 192.168.1.1
log-adjacency-changes
network 1.1.1.0 0.0.0.3 area 0
!

R1#sh ipv6 interface tunnel 0
Tunnel0 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::201:C9FF:FE63:1A12
Global unicast address(es):
3FFE:B00:C18:1::3, subnet is 3FFE:B00:C18:1::2/127
Joined group address(es):
FF02::1
FF02::2
FF02::1:FF00:3
FF02::1:FF63:1A12
MTU is 1476 bytes
!
ipv6 route 2003:3333:3333::/64 3FFE:B00:C18:1::2
!
!
R1#sh ipv6 route
IPv6 Routing Table - 7 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
U - Per-user Static route, M - MIPv6
I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
D - EIGRP, EX - EIGRP external

C 2001:1111:1111::/64 [0/0]
via ::, FastEthernet0/0

L 2001:1111:1111::1/128 [0/0]
via ::, FastEthernet0/0

S 2003:3333:3333::/64 [1/0]
via 3FFE:B00:C18:1::2

C 3FFE:B00:C18:1::2/127 [0/0]
via ::, Tunnel0

L 3FFE:B00:C18:1::3/128 [0/0]
via ::, Tunnel0

C FD11:192:168:1::1/128 [0/0]
via ::, Loopback0

L FF00::/8 [0/0]
via ::, Null0

R0#ping ipv6 2003:3333:3333:0:205:5EFF:FE20:9337 → PC3 remote LAN

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2003:3333:3333:0:205:5EFF:FE20:9337, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/2 ms

---

R2

ipv6 unicast-routing
!
interface Tunnel0
no ip address
mtu 1476
ipv6 address 3FFE:B00:C18:1::2/127
tunnel source FastEthernet0/1
tunnel destination 1.1.1.1
tunnel mode ipv6ip
!

interface FastEthernet0/0
no ip address
duplex auto
speed auto
ipv6 address 2003:3333:3333::1/64
ipv6 address autoconfig
ipv6 enable
!
interface FastEthernet0/1
ip address 1.1.1.2 255.255.255.252
duplex auto
speed auto
!
router ospf 1
router-id 192.168.2.2
log-adjacency-changes
network 1.1.1.0 0.0.0.3 area 0
!
ipv6 route 2001:1111:1111::/64 3FFE:B00:C18:1::3
!
!
R2#sh ipv6 interface tunnel 0
Tunnel0 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::290:2BFF:FE42:BB2C
Global unicast address(es):
3FFE:B00:C18:1::2, subnet is 3FFE:B00:C18:1::2/127
Joined group address(es):
FF02::1
FF02::2
FF02::1:FF00:2
FF02::1:FF42:BB2C
MTU is 1476 bytes

!
R1#sh ipv6 route
IPv6 Routing Table - 7 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
U - Per-user Static route, M - MIPv6
I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
D - EIGRP, EX - EIGRP external

S 2001:1111:1111::/64 [1/0]
via 3FFE:B00:C18:1::3

C 2003:3333:3333::/64 [0/0]
via ::, FastEthernet0/0

L 2003:3333:3333::1/128 [0/0]
via ::, FastEthernet0/0

C 3FFE:B00:C18:1::2/127 [0/0]
via ::, Tunnel0

L 3FFE:B00:C18:1::2/128 [0/0]
via ::, Tunnel0

C FD11:192:168:2::2/128 [0/0]
via ::, Loopback0

L FF00::/8 [0/0]
via ::, Null0

!

R1#ping ipv6 2001:1111:1111:0:2E0:A3FF:FE8C:E7C0 → *PC1 remote LAN*

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:1111:1111:0:2E0:A3FF:FE8C:E7C0, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/2/12 ms