

Softwire Mesh Multicast

draft-ietf-softwire-mesh-multicast-01

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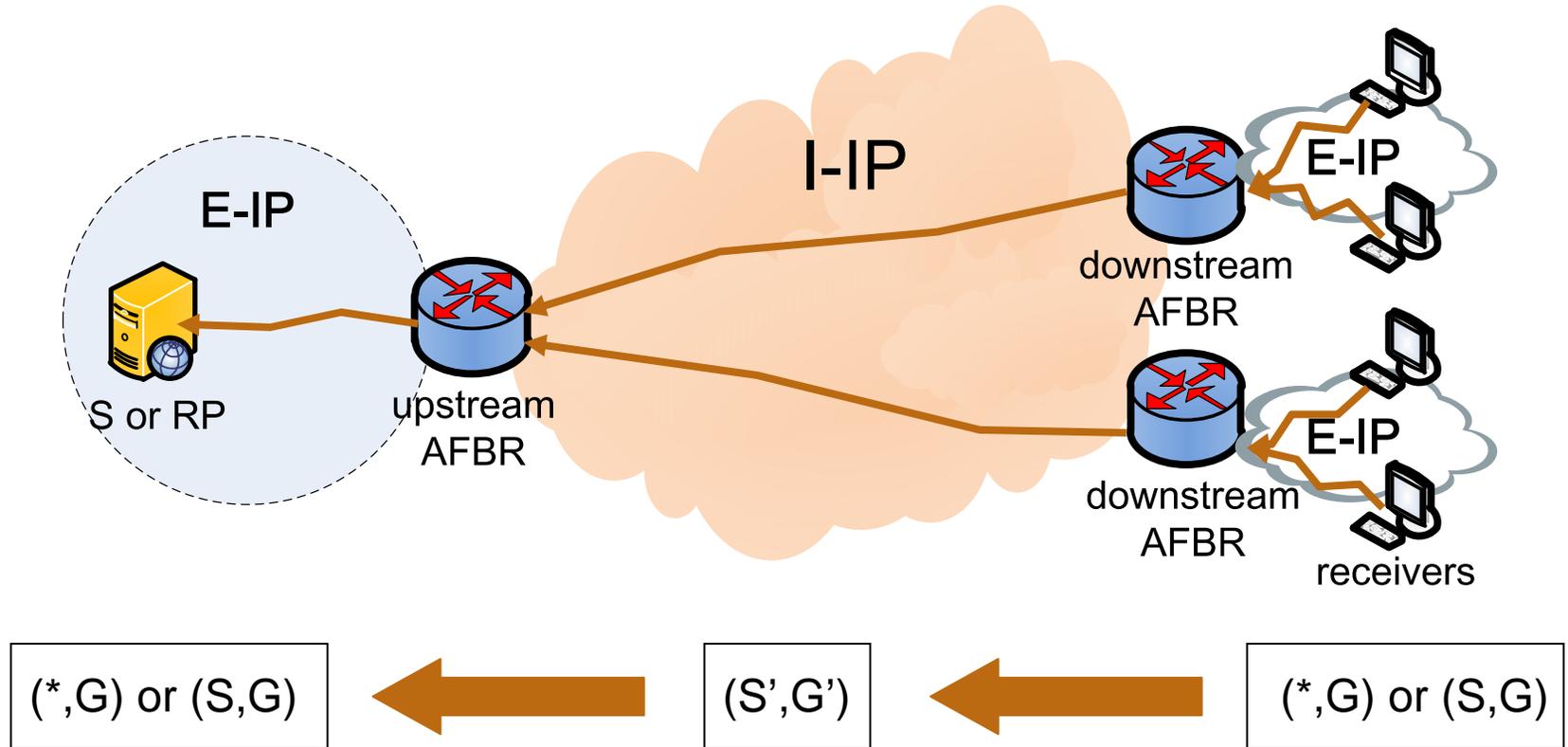
Chris Metz, Greg Shephard

Cisco

IETF 82 Meeting, Taipei

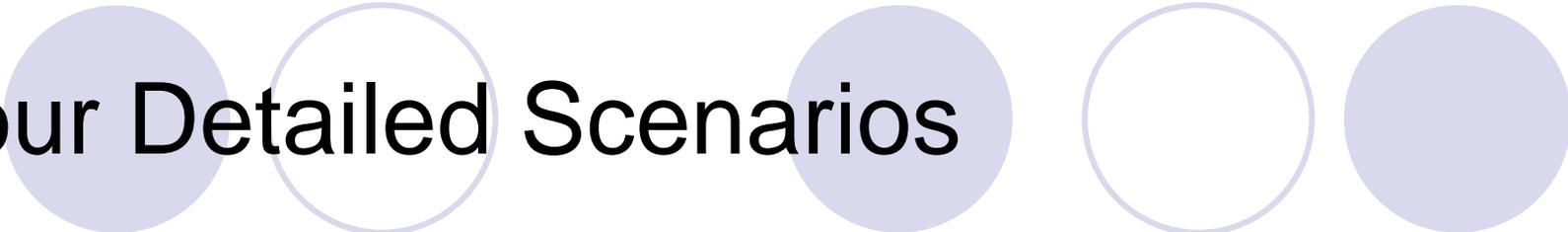
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Scenarios of Interest



To simplify the process, stateless one-to-one source address and group address mapping is applied

Four Detailed Scenarios



- E-IP supports SSM, I-IP supports SSM
 - S is embedded in S'
 - S' leads PIM messages to the upstream AFBR
- E-IP supports SSM, I-IP supports ASM
 - According to RFC4601, any network that supports ASM can also support SSM
 - To make it simple, I-IP works in SSM
- E-IP supports ASM, I-IP supports SSM
 - S or * is embedded in S'
 - S' leads PIM messages to the corresponding upstream AFBR
- E-IP supports ASM, I-IP supports ASM
 - To make it simple, I-IP works in SSM

Source Address Mapping(4over6)

0 32 64 72 96 128



- prefix: a “well-known“ prefix or a ISP-defined prefix
 - An existing “well-known" prefix is 64:ff9b, which is defined in RFC6052
- v4: the IP address of one of upstream AFBR's E-IPv4 interfaces
- u: must be set to zero
- suffix: reserved for future extensions and should be set to zero
- source address: stores the original S or *

Source Address Mapping(6over4)

0

96

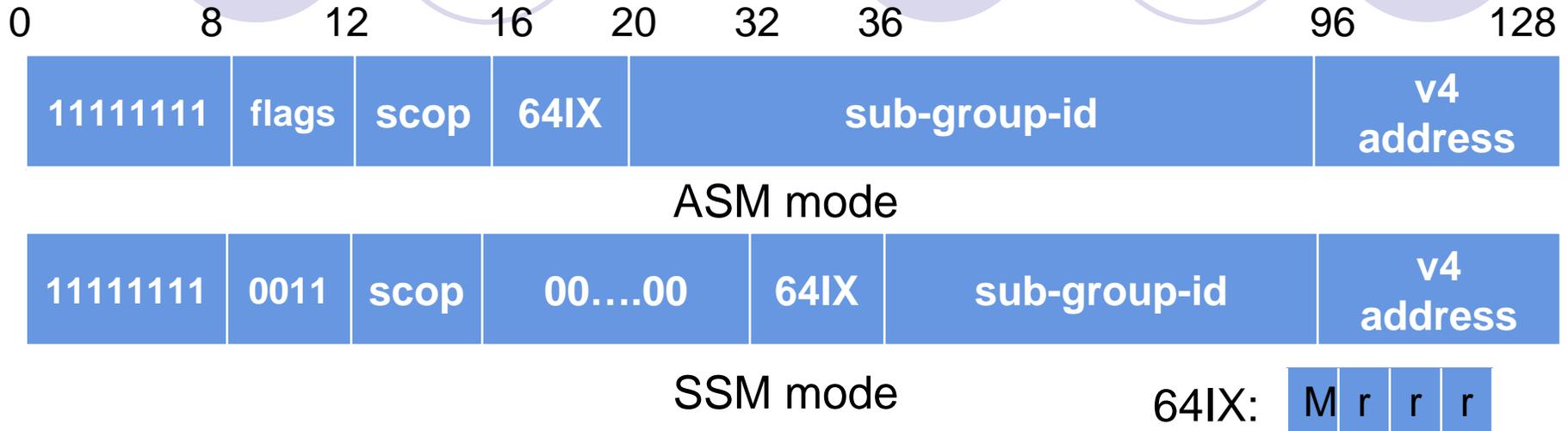
128

uPrefix64

source address

- uPrefix64: consists of a “well-known“ prefix or a ISP-defined prefix
 - An existing “well-known" prefix is 64:ff9b, which is defined in RFC6052
- source address: the mapped I-IPv4 address of S or RP
- Note: E-IPv6 address of S and RP must follow this format

Group Address Mapping



- Defined in draft-boucadair-behave-64-multicast-address-format-03
 - scop & flag: Defined in [RFC4291].
 - 64IX: When "M-bit" is set to 1, it indicates that an multicast IPv4 address is embedded in the "v4 address" field. All the remaining bits MUST be set to 0.
 - sub-group-id: The default value is all zeros.
 - v4 address: include an IPv4 multicast address when the M-bit is set to 1

Distribution of AFBR Routing Information

- 4over6

- Every AFBR should advertise the /96 prefix of S' to the I-IPv6 core
- Every AFBR should advertise the IP address in the "v4" field of the /96 prefix to other AFBRs by MPBGP

- 6over4

- Every AFBR should advertise the I-IPv4 address in "v4" field to the I-IPv4 core
- Every AFBR should advertise the /96 uPrefix64 to other AFBRs by MPBGP

4over6 Procedure



● Control plane

- Downstream AFBRs translate E-IPv4 PIM messages into I-IPv6 PIM messages

 - S (or *) -> S', G -> G'

- I-IP core routers transmit I-IPv6 PIM messages

- Upstream AFBRs translate I-IPv6 PIM messages back to E-IPv4 PIM messages

 - If IP address of RP is found in "v4" field of S': S'->*, else S'->S

 - G'->G

● Data plane

- Upstream AFBRs encapsulate multicast data

- Downstream AFBRs decapsulate multicast data

6over4 Procedure

- Control plane

- Downstream AFBRs translate E-IPv6 PIM messages into I-IPv4 PIM messages

- S(or *)->S', G->G'

- I-IP core routers transmit I-IPv4 PIM messages

- Upstream AFBRs translate I-IPv4 PIM messages back to E-IPv6 PIM messages

- If S' is the mapped I-IPv4 address of RP: S'-> *,
else S'->S

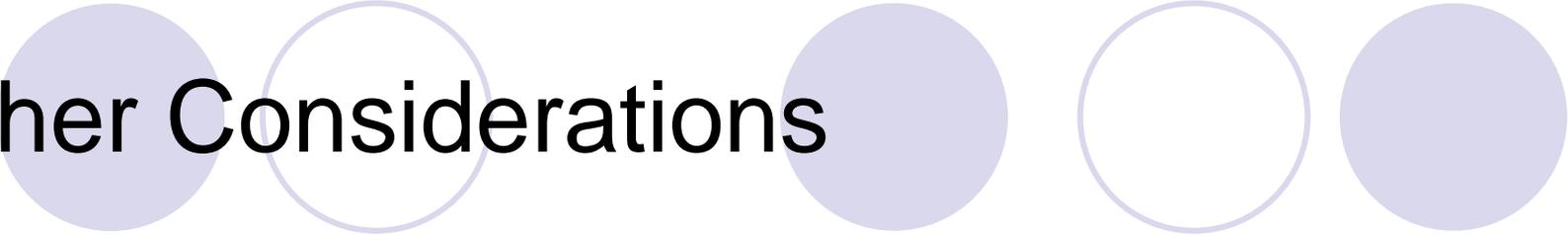
- G'->G

- Data plane

- Upstream AFBRs encapsulate multicast data

- Downstream AFBRs decapsulate multicast data

Other Considerations

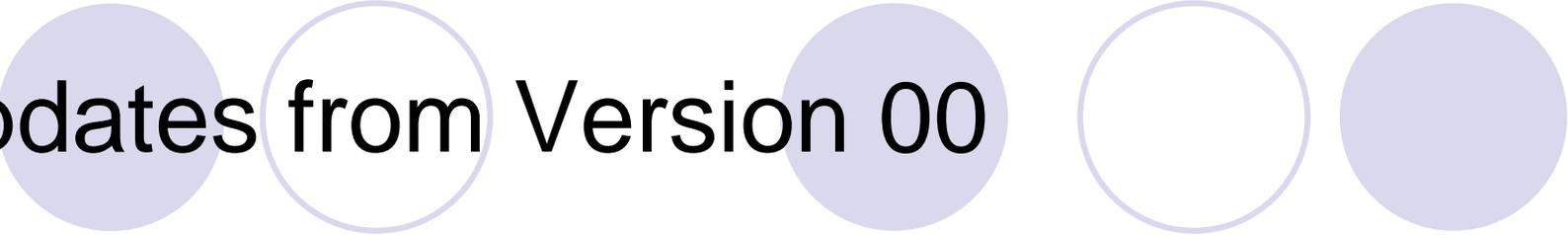


- Tunnel technology

- There may not exist one tunnel technique that all AFBRs support
- Solution: Divide AFBRs into one or more classes

- Fragmentation

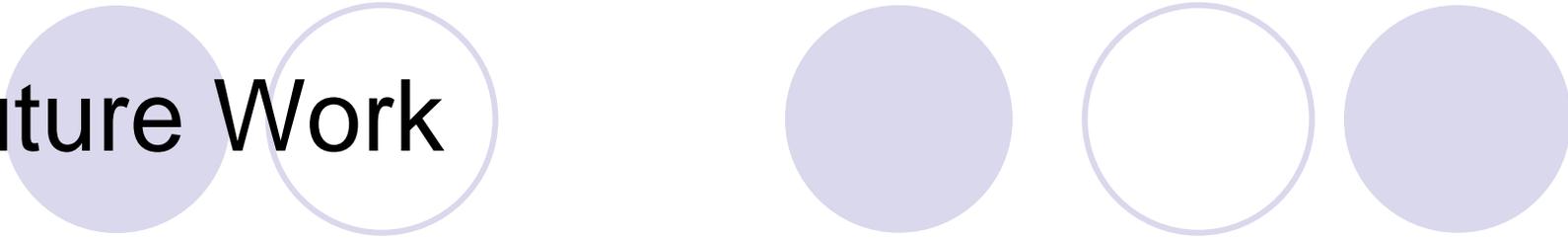
- Fragmentation and reassembling of encapsulated packets must be supported by AFBRs



Updates from Version 00

- More detail description about the distribution of AFBR routing information
- Discussion about tunnel technology and fragmentation

Future Work



- More details of ASM
 - The mapping between $(*,G)$ and (S',G') is a little bit complex, which will be discussed in detail
- More feedbacks are welcome