

MMUSIC

Happy Eyeballs Extension for ICE

draft-reddy-mmusic-ice-happy-eyeballs-06

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IETF 89

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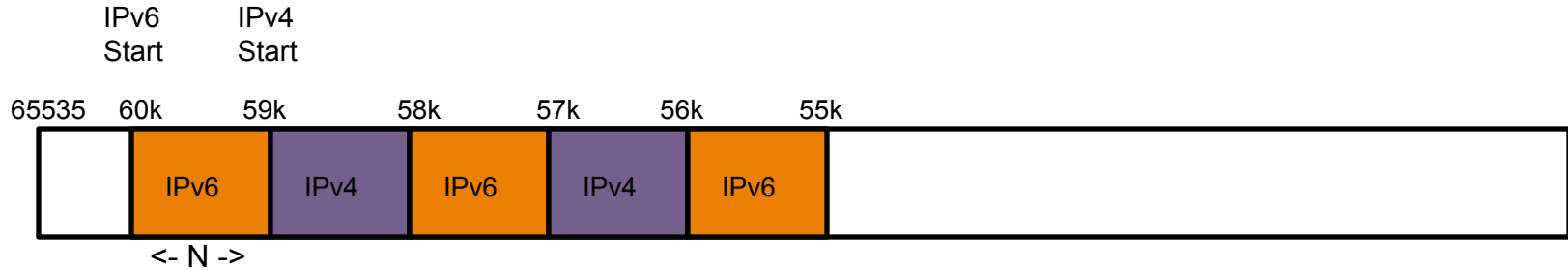
Presenter : Pål-Erik Martinsen

Draft Updates

- New proposed algorithm
- Added implementation details
- Trying to make it clear that we only “play” with the local_preference priority value
- Compatibility, local and remote checklists will be equal due to the formula:

$$\text{pair priority} = 2^{32} * \text{MIN}(G,D) + 2 * \text{MAX}(G,D) + (G > D ? 1 : 0)$$

Algorithm Overview



$$\text{local_preference} = S - N * 2 * (C_n / C_{\text{max}})$$

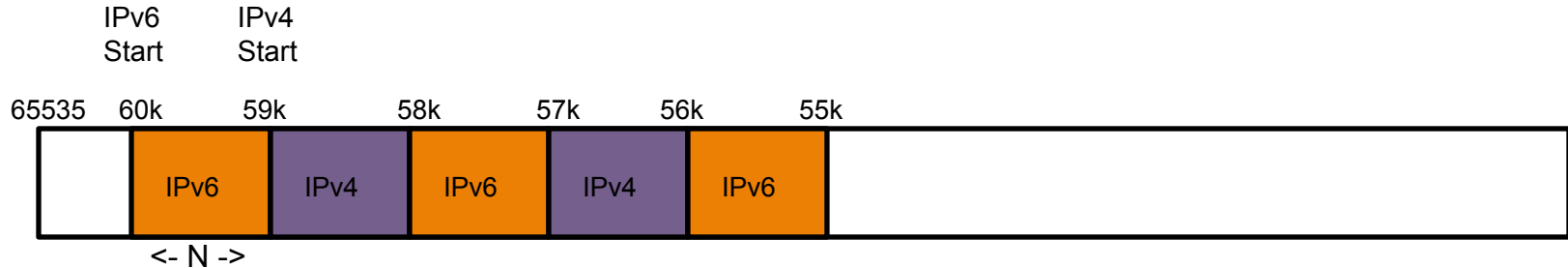
S = Address Type specific start value

N = $\text{abs}(\text{IPv6_Start} - \text{IPv4_Start})$

C_n = Number of candidates of specific type

C_{max} = Number of consecutive candidates of a addr type allowed

Algorithm Overview (2)



$$\text{local_preference} = S - N * 2^{(C_n / C_{\text{max}})}$$

Integer "math"

Missing in 06 version of the draft

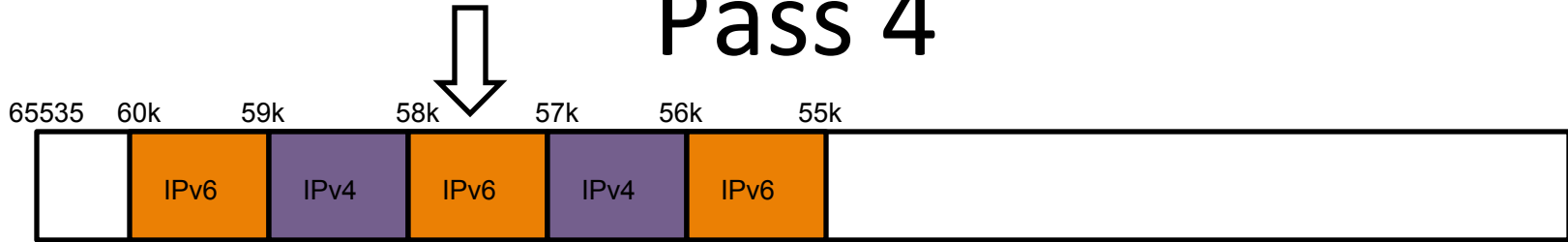
S = Address Type specific start value

N = $\text{abs}(\text{IPv6_Start} - \text{IPv4_Start})$

C_n = Number of candidates of specific type

C_{max} = Number of consecutive candidates of a addr type allowed

Pass 4



$$\text{local_preference} = S - N * 2 * (C_n / C_{\text{max}}) = 60000 - 1000 * 2 * (3 / 2) = 58000$$

	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv6	1	2128777471
4	HOST	IPv6	2	2128777470

$S(\text{IPv6}) = 60000$
 $S(\text{IPv4}) = 59000$
 $N = 1000$
 $C_{\text{max}} = 2$
 $C_n(\text{IPv6}) = 3$
 $C_n(\text{IPv4}) = 0$

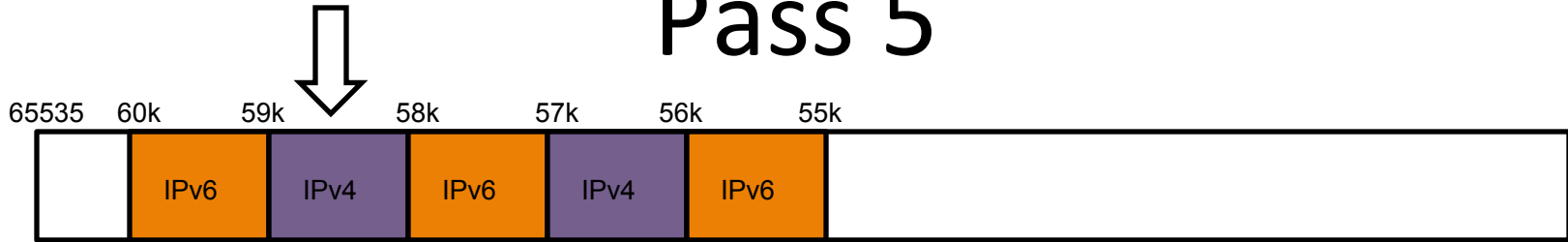
$$\text{priority} = (2^{24}) * (\text{type preference}) + (2^8) * (\text{local preference}) + (2^0) * (256 - \text{component ID})$$

type_preference = 126 (For host)

$$\text{Priority} = (2^{24}) * (126) + (2^8) * (58000) + (2^0) * (256 - 2)$$

$$= 2128777470$$

Pass 5



$$\text{local_preference} = S - N * 2 * (C_n / C_{\text{max}}) = 59000 - 1000 * 2 * (0 / 2) = 59000$$

	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv4	1	2129033471
4	HOST	IPv6	1	2128777471
5	HOST	IPv6	2	2128777470

$S(\text{IPv6}) = 60000$
 $S(\text{IPv4}) = 59000$
 $N = 1000$
 $C_{\text{max}} = 2$
 $C_n(\text{IPv6}) = 4$
 $C_n(\text{IPv4}) = 0$

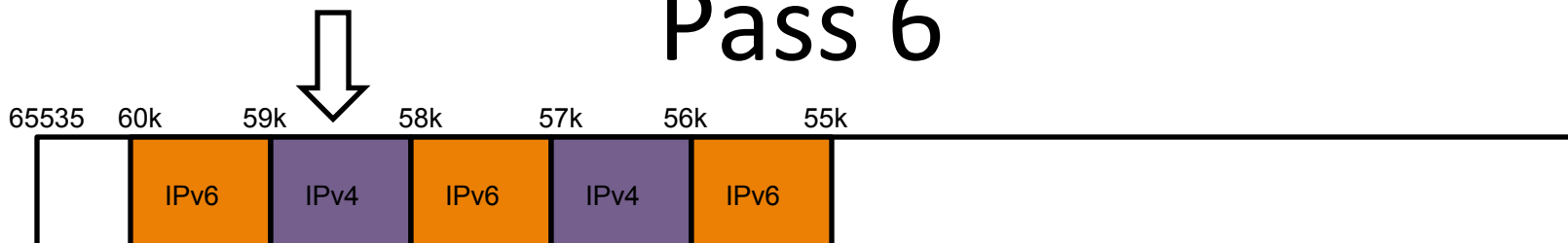
$$\text{priority} = (2^{24}) * (\text{type preference}) + (2^8) * (\text{local preference}) + (2^0) * (256 - \text{component ID})$$

type_preference = 126 (For host)

$$\text{Priority} = (2^{24}) * (126) + (2^8) * (59000) + (2^0) * (256 - 1)$$

$$= 2129033471$$

Pass 6



$$\text{local_preference} = S - N * 2 * (C_n / C_{\text{max}}) = 59000 - 1000 * 2 * (1/2) = 59000$$

	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv4	1	2129033471
4	HOST	IPv4	2	2129033470
5	HOST	IPv6	1	2128777471
6	HOST	IPv6	2	2128777470

$S(\text{IPv6}) = 60000$
 $S(\text{IPv4}) = 59000$
 $N = 1000$
 $C_{\text{max}} = 2$
 $C_n(\text{IPv6}) = 4$
 $C_n(\text{IPv4}) = 1$

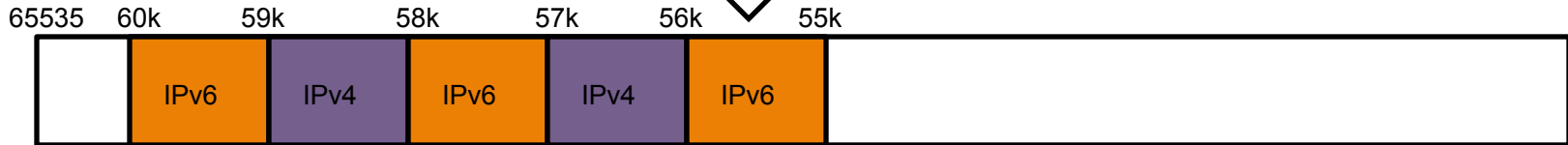
$$\text{priority} = (2^{24}) * (\text{type preference}) + (2^8) * (\text{local preference}) + (2^0) * (256 - \text{component ID})$$

type_preference = 126 (For host)

$$\text{Priority} = (2^{24}) * (126) + (2^8) * (59000) + (2^0) * (256 - 2)$$

$$= 2129033470$$

Pass 7



$$\text{local_preference} = S - N * 2 * (\text{Cn} / \text{Cmax}) = 60000 - 1000 * 2 * (4 / 2) = 56000$$

	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv4	1	2129033471
4	HOST	IPv4	2	2129033470
5	HOST	IPv6	1	2128777471
6	HOST	IPv6	2	2128777470
7	HOST	IPv6	1	2128265471



$$\begin{aligned} S(\text{IPv6}) &= 60000 \\ S(\text{IPv4}) &= 59000 \\ N &= 1000 \\ \text{Cmax} &= 2 \\ \text{Cn}(\text{IPv6}) &= 4 \\ \text{Cn}(\text{IPv4}) &= 2 \end{aligned}$$

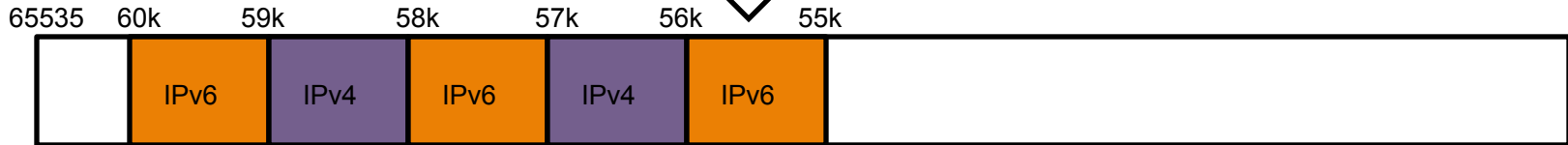
$$\begin{aligned} \text{priority} &= (2^{24}) * (\text{type preference}) + \\ &\quad (2^8) * (\text{local preference}) + \\ &\quad (2^0) * (256 - \text{component ID}) \end{aligned}$$

type_preference = 126 (For host)

$$\begin{aligned} \text{Priority} &= (2^{24}) * (126) + \\ &\quad (2^8) * (56000) + \\ &\quad (2^0) * (256 - 1) \end{aligned}$$

$$= 2128265471$$

Pass 8



$$\text{local_preference} = S - N * 2 * (\text{Cn} / \text{Cmax}) = 60000 - 1000 * 2 * (5 / 2) = 56000$$

	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv4	1	2129033471
4	HOST	IPv4	2	2129033470
5	HOST	IPv6	1	2128777471
6	HOST	IPv6	2	2128777470
7	HOST	IPv6	1	2128265471
8	HOST	IPv6	2	2128265470

$$S(\text{IPv6}) = 60000$$

$$S(\text{IPv4}) = 59000$$

$$N = 1000$$

$$C_{\text{max}} = 2$$

$$C_n(\text{IPv6}) = 5$$

$$C_n(\text{IPv4}) = 2$$

$$\text{priority} = (2^{24}) * (\text{type preference}) + (2^8) * (\text{local preference}) + (2^0) * (256 - \text{component ID})$$

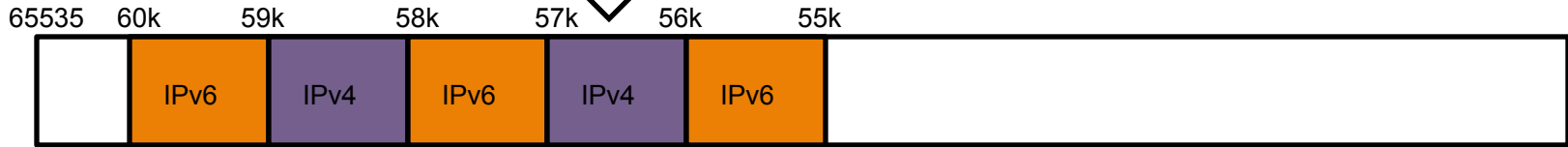
type_preference = 126 (For host)

$$\text{Priority} = (2^{24}) * (126) + (2^8) * (56000) + (2^0) * (256 - 2)$$

$$= 2128265470$$



Pass 9



$$\text{local_preference} = S - N * 2 * (\text{Cn} / \text{Cmax}) = 59000 - 1000 * 2 * (2 / 2) = 57000$$

	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv4	1	2129033471
4	HOST	IPv4	2	2129033470
5	HOST	IPv6	1	2128777471
6	HOST	IPv6	2	2128777470
7	HOST	IPv4	1	2128521471
8	HOST	IPv6	1	2128265471
9	HOST	IPv6	2	2128265470



$$S(\text{IPv6}) = 60000$$

$$S(\text{IPv4}) = 59000$$

$$N = 1000$$

$$C_{\text{max}} = 2$$

$$C_n(\text{IPv6}) = 6$$

$$C_n(\text{IPv4}) = 2$$

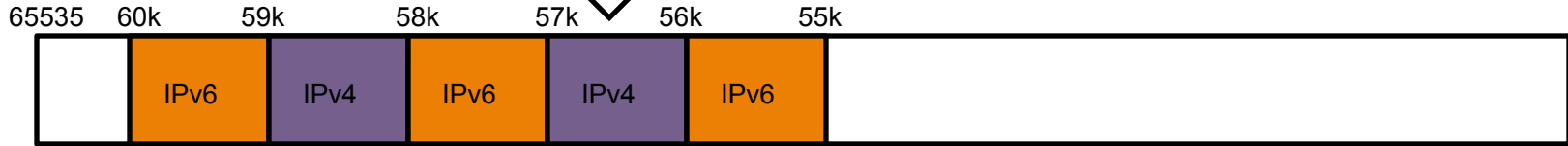
$$\text{priority} = (2^{24}) * (\text{type preference}) + (2^8) * (\text{local preference}) + (2^0) * (256 - \text{component ID})$$

type_preference = 126 (For host)

$$\text{Priority} = (2^{24}) * (126) + (2^8) * (56000) + (2^0) * (256 - 1)$$

$$= 2128521471$$

Pass 10



$$\text{local_preference} = S - N * 2 * (\text{Cn} / \text{Cmax}) = 59000 - 1000 * 2 * (3 / 2) = 57000$$

	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv4	1	2129033471
4	HOST	IPv4	2	2129033470
5	HOST	IPv6	1	2128777471
6	HOST	IPv6	2	2128777470
7	HOST	IPv4	1	2128521471
8	HOST	IPv4	2	2128521470
9	HOST	IPv6	1	2128265471
A	HOST	IPv6	2	2128265470

$$\begin{aligned} S(\text{IPv6}) &= 60000 \\ S(\text{IPv4}) &= 59000 \\ N &= 1000 \\ \text{Cmax} &= 2 \\ \text{Cn}(\text{IPv6}) &= 6 \\ \text{Cn}(\text{IPv4}) &= 3 \end{aligned}$$

$$\begin{aligned} \text{priority} &= (2^{24}) * (\text{type preference}) + \\ &\quad (2^8) * (\text{local preference}) + \\ &\quad (2^0) * (256 - \text{component ID}) \end{aligned}$$

type_preference = 126 (For host)

$$\begin{aligned} \text{Priority} &= (2^{24}) * (126) + \\ &\quad (2^8) * (56000) + \\ &\quad (2^0) * (256 - 2) \end{aligned}$$

$$= 2128521470$$

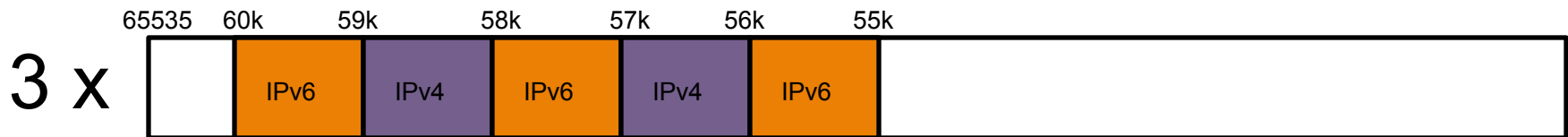


Candidate “list”

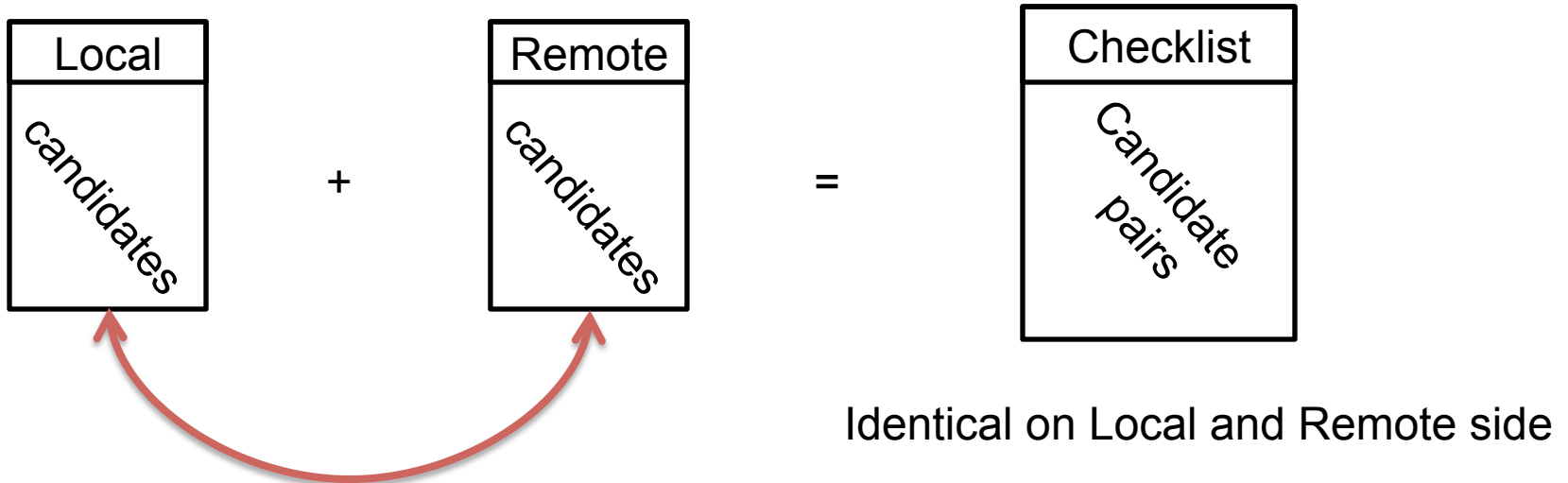
	Type	Addr	Cmp	Priority
1	HOST	IPv6	1	2129289471
2	HOST	IPv6	2	2129289470
3	HOST	IPv4	1	2129033471
4	HOST	IPv4	2	2129033470
5	HOST	IPv6	1	2128777471
6	HOST	IPv6	2	2128777470
7	HOST	IPv4	1	2128521471
8	HOST	IPv4	2	2128521470
9	HOST	IPv6	1	2128265471
10	HOST	IPv6	2	2128265470

	Type	Addr	Cmp	Priority
11	SRFLX	IPv6	1	1693081855
12	SRFLX	IPv6	2	1693081854
13	SRFLX	IPv4	1	1692825855
14	SRFLX	IPv4	2	1692825854
15	RELAY	IPv6	1	15360255
16	RELAY	IPv6	2	15360254
17	RELAY	IPv4	1	15104255
18	RELAY	IPv4	2	15104254

Local_preference value space reused for each candidate type (HOST, RFLX, RELAY)



Compatibility



Order does not matter due to:

$$\text{pair priority} = 2^{32} * \text{MIN}(G,D) + 2 * \text{MAX}(G,D) + (G > D ? 1 : 0)$$

Does it work?

- Does not break anything
- Effect depends on the other agent candidate priorities (If time permits show running code)
- Easy to implement, no SDP negotiation