LISP Mapping Versioning

Discussion

Luigi Iannone
Damien Saucez
Olivier Bonaventure

Quick update from the mailinglist

- http://www.ietf.org/mail-archive/web/lisp/current/msg00692.html

Let's do this at the meeting. I think face-to-face will be better. We have been oscillating and I think it's because email isn't working for this.
Luigi/Damien, can you think about these issues so we can discuss them:

(1) Your map-versioning has 2 versions numbers (sender's and receiver's). This is so when a packet comes from an ITR to an ETR, the ETR knows if the ITR is out of date with respect to an ETR's version number and updates the ITR. At the same time the ETR can tell if it is out of date with respect to the ITR's version number so then it can ask for an update.

(2) With what we have in the spec right now, the nonce is also a version number but it works in one- direction. And an SMR allows the side that needs the update to have it send a Map-Request.

What I want you guys to think about and articulate is what the pros and cons of "comparing" the two approaches. Rather the pros and cons of each. The later has been articulated as you said.

What I want to understand is if we can get your pros without having to make more changes. Because the map-versioning ID makes a lot of changes (data packet change, new message type in a Map-Update, and removing loc-reach-bits) so I am judging the benefit given this cost.

Now, one other thing. Since we are currently all thinking about locator reachability algorithms, and if we do an RLOC-probing algorithm, and if we use Map-Requests and Map-Replies as the probes, you have a built-in update mechanism with no other cost. That is, if you have to probe for liveness, you can also get the latest and greatest mapping data from the site. So something to think about.
Dino

Quick update from the mailinglist

- http://www.ietf.org/mail-archive/web/lisp/current/msg00692.html

Let's do this at the meeting. I think face-to-face will be better. We have been oscillating and I think it's because email isn't working for this.
Luigi/Damien, can you think about these issues so we can discuss them:

(1) Your **map-versioning has 2 versions numbers (sender's and receiver's).** This is so when a packet comes from an ITR to an ETR, the ETR knows if the ITR is out of date with respect to an ETR's version number and updates the ITR. At the same time the ETR can tell if it is out of date with respect to the ITR's version number so then it can ask for an update.

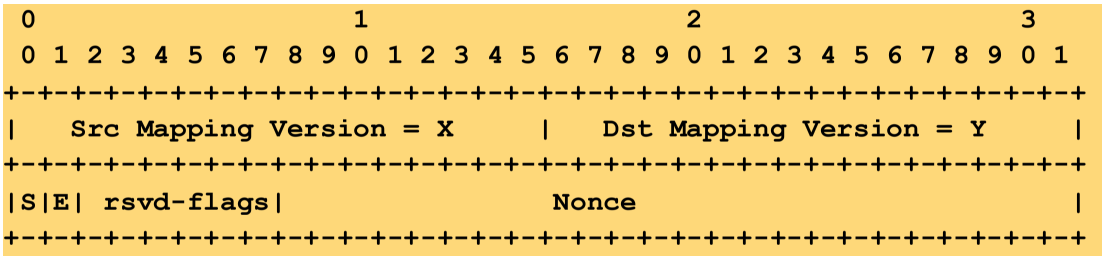
(2) With what we have in the spec right now, the nonce is also a version number but it works in one- direction. And an SMR allows the side that needs the update to have it send a Map-Request.

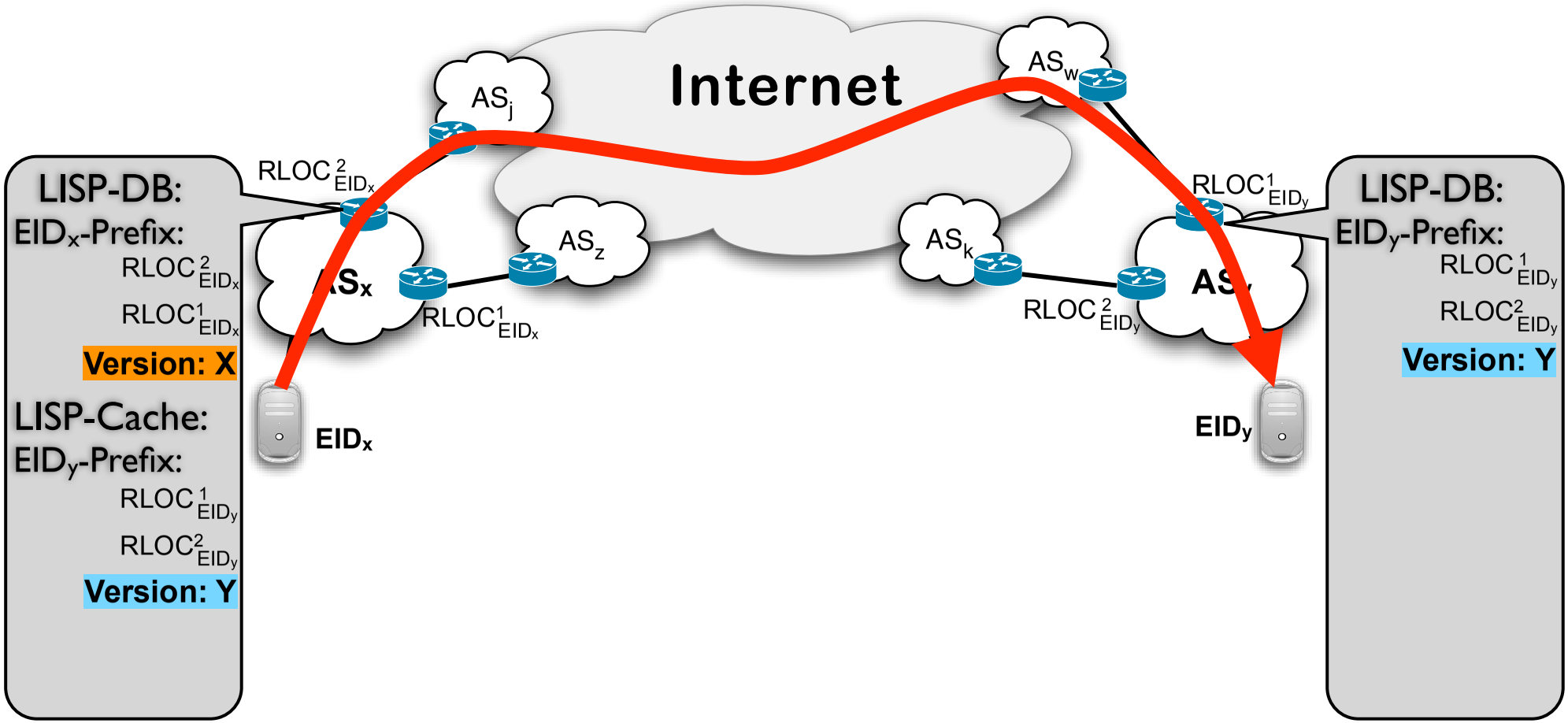
What I want you guys to think about and articulate is what the pros and cons of "comparing" the two approaches. Rather the pros and cons of each. The later has been articulated as you said.

What I want to understand is if we can get your pros without having to make more changes. Because the map-versioning ID makes a lot of changes (data packet change, new message type in a Map-Update, and removing loc-reach-bits) so I am judging the benefit given this cost.

Now, one other thing. Since we are currently all thinking about locator reachability algorithms, and if we do an RLOC-probing algorithm, and if we use Map-Requests and Map-Replies as the probes, you have a built-in update mechanism with no other cost. That is, if you have to probe for liveness, you can also get the latest and greatest mapping data from the site. So something to think about.
Dino

Mapping Version Numbers





Example from: http://www.ietf.org/mail-archive/web/lisp/current/msg00617.html

Quick update from the mailinglist

- http://www.ietf.org/mail-archive/web/lisp/current/msg00692.html

Let's do this at the meeting. I think face-to-face will be better. We have been oscillating and I think it's because email isn't working for this.
Luigi/Damien, can you think about these issues so we can discuss them:

(1) Your **map-versioning has 2 versions numbers (sender's and receiver's).** This is so when a packet comes from an ITR to an ETR, the ETR knows if the ITR is out of date with respect to an ETR's version number and updates the ITR. At the same time the ETR can tell if it is out of date with respect to the ITR's version number so then it can ask for an update.

(2) With what we have in the spec right now, the **nonce is also a version number but it works in one- direction.** And an **SMR** allows the side that needs the update to have it send a Map-Request.

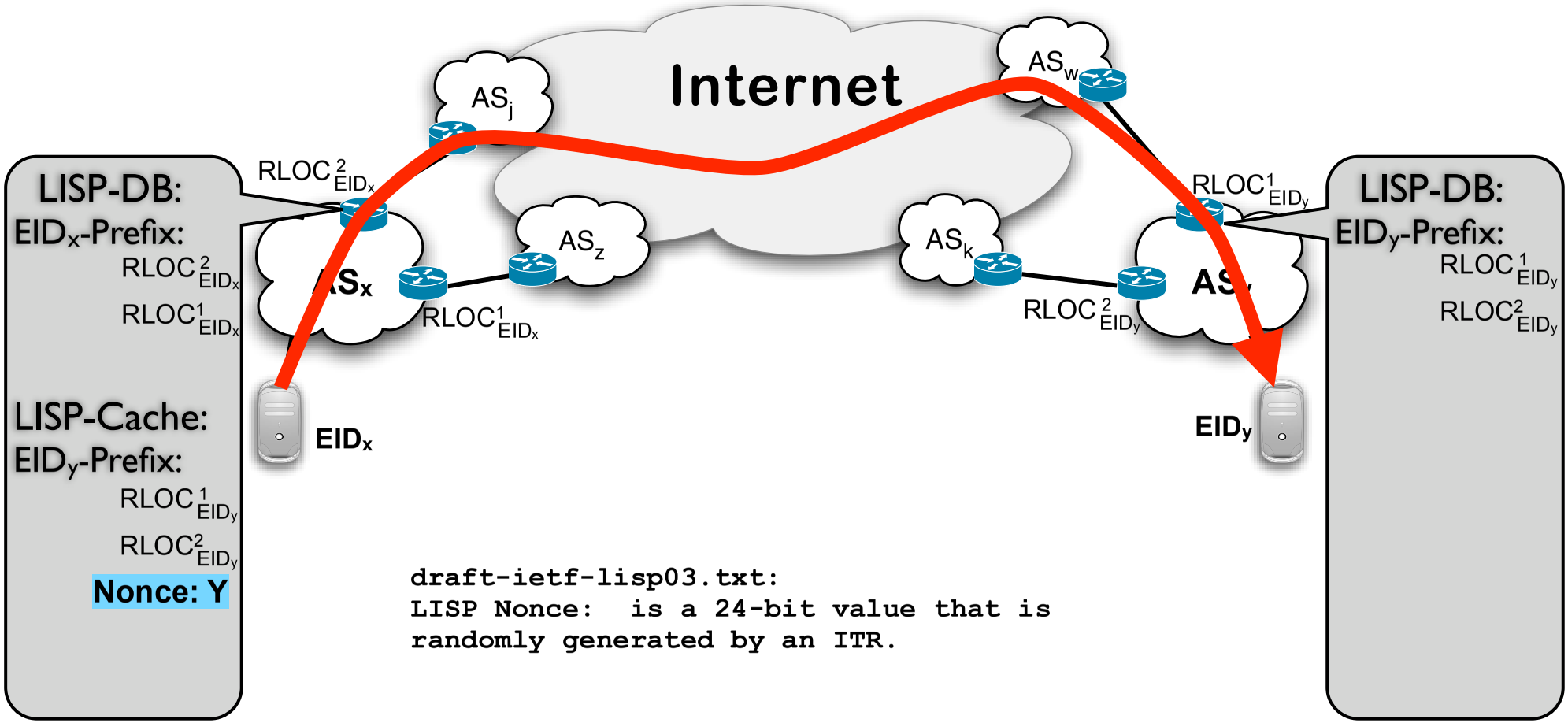
What I want you guys to think about and articulate is what the pros and cons of "comparing" the two approaches. Rather the pros and cons of each. The later has been articulated as you said.

What I want to understand is if we can get your pros without having to make more changes. Because the map-versioning ID makes a lot of changes (data packet change, new message type in a Map-Update, and removing loc-reach-bits) so I am judging the benefit given this cost.

Now, one other thing. Since we are currently all thinking about locator reachability algorithms, and if we do an RLOC-probing algorithm, and if we use Map-Requests and Map-Replies as the probes, you have a built-in update mechanism with no other cost. That is, if you have to probe for liveness, you can also get the latest and greatest mapping data from the site. So something to think about.
Dino

SMR+Nonce

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                      Locator Reach Bits                       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|S|E| rsvd-flags|                  Nonce                        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```




```
draft-ietf-lisp03.txt:
LISP Nonce:  is a 24-bit value that is
randomly generated by an ITR.
```

Example from: http://www.ietf.org/mail-archive/web/lisp/current/msg00617.html

Quick update from the mailinglist

- http://www.ietf.org/mail-archive/web/lisp/current/msg00692.html

Let's do this at the meeting. I think face-to-face will be better. We have been oscillating and I think it's because email isn't working for this.
Luigi/Damien, can you think about these issues so we can discuss them:

(1) Your **map-versioning has 2 versions numbers (sender's and receiver's).** This is so when a packet comes from an ITR to an ETR, the ETR knows if the ITR is out of date with respect to an ETR's version number and updates the ITR. At the same time the ETR can tell if it is out of date with respect to the ITR's version number so then it can ask for an update.

(2) With what we have in the spec right now, the **nonce is also a version number but it works in one- direction.** And an **SMR** allows the side that needs the update to have it send a Map-Request.

What I want you guys to think about and articulate is what the pros and cons of "comparing" the two approaches. Rather the pros and cons of each. The later has been articulated as you said.

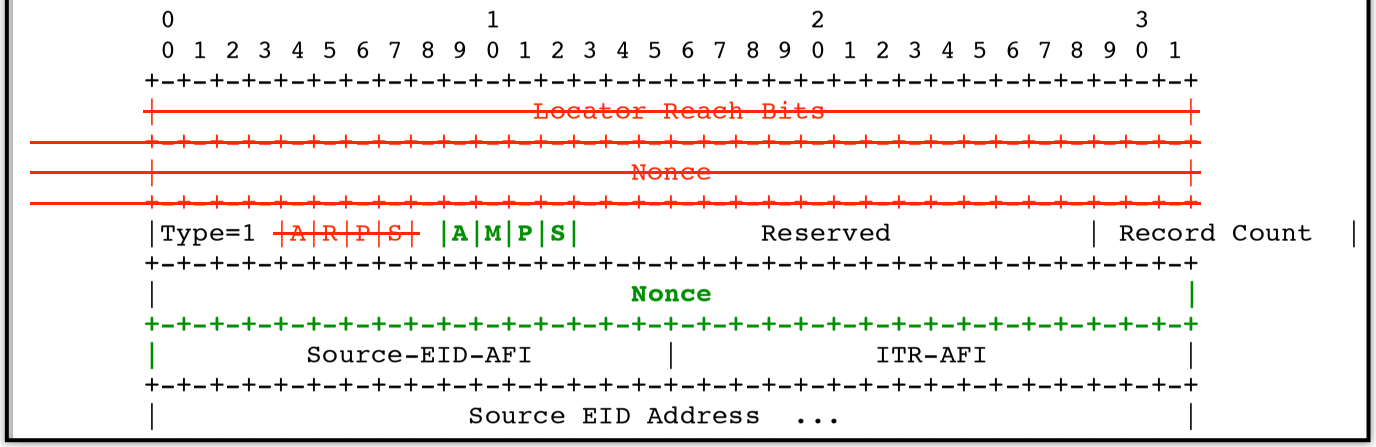
What I want to understand is if we can **get your pros without having to make more changes.** Because the map-versioning ID makes a lot of changes (data packet change, new message type in a Map-Update, and removing loc-reach-bits) so I am judging the benefit given this cost.

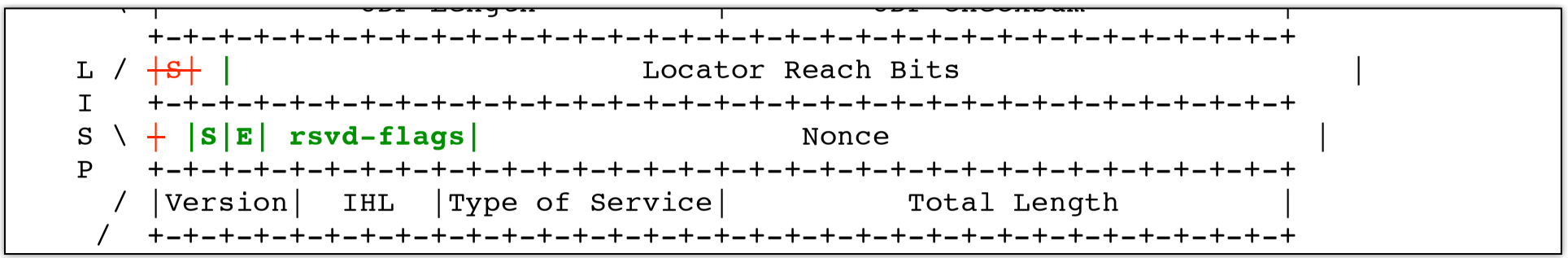
Now, one other thing. Since we are currently all thinking about locator reachability algorithms, and if we do an RLOC-probing algorithm, and if we use Map-Requests and Map-Replies as the probes, you have a built-in update mechanism with no other cost. That is, if you have to probe for liveness, you can also get the latest and greatest mapping data from the site. So something to think about.
Dino

No more changes....

- not after the last three months..... ;-)

6.1.2. Map-Request Message Format





-

Quick update from the mailinglist

- http://www.ietf.org/mail-archive/web/lisp/current/msg00692.html

Let's do this at the meeting. I think face-to-face will be better. We have been oscillating and I think it's because email isn't working for this.
Luigi/Damien, can you think about these issues so we can discuss them:

(1) Your **map-versioning has 2 versions numbers (sender's and receiver's).** This is so when a packet comes from an ITR to an ETR, the ETR knows if the ITR is out of date with respect to an ETR's version number and updates the ITR. At the same time the ETR can tell if it is out of date with respect to the ITR's version number so then it can ask for an update.

(2) With what we have in the spec right now, the **nonce is also a version number but it works in one- direction.** And an **SMR** allows the side that needs the update to have it send a Map-Request.

What I want you guys to think about and articulate is what the pros and cons of "comparing" the two approaches. Rather the pros and cons of each. The later has been articulated as you said.

What I want to understand is if we can **get your pros without having to make more changes.** Because the map-versioning ID makes a lot of changes (data packet change, new message type in a Map-Update, and removing loc-reach-bits) so I am judging the benefit given this cost.

Now, one other thing. Since we are currently all thinking about **locator reachability algorithms, and if we do an RLOC-probing algorithm,** and if we use Map-Requests and Map-Replies as the probes, you have a built-in update mechanism with no other cost. That is, if you have to probe for liveness, you can also get the latest and greatest mapping data from the site. So something to think about.
Dino

Probing

3.2.2. Complexity of Network-Based Probing

Network-based implementations must keep per-destination egress point liveness. The complexity of probing in a network-based implementation can be thought of as follows:

```
Let N   = the number of EID-prefixes in a network element's
          cache
Let L_i = the number of locators for EID-prefix N_i
Let M   = the number of source locators

Then the complexity of network-based probing, P_network,  can
be described as

O(P_network), where P_network = M*sum(L_i), i = 0...N-1
```

Note that a network-based probing scheme might have an advantage here because a single EID-prefix may cover many correspondent hosts. That is, sum(L_i), i = 0...N-1 < sum(D_i), i = 0...C-1

- How many RLOCs a famous site can probe?
- How many probes a famous site can reply to?
  - Not saying is not feasible, but we have the interest to keep signaling load very very very low.
  - Active measurements research proves that the “active” approach does not scale

Quick update from the mailinglist

- http://www.ietf.org/mail-archive/web/lisp/current/msg00692.html

Let's do this at the meeting. I think face-to-face will be better. We have been oscillating and I think it's because email isn't working for this.
Luigi/Damien, can you think about these issues so we can discuss them:

(1) Your **map-versioning has 2 versions numbers (sender's and receiver's).** This is so when a packet comes from an ITR to an ETR, the ETR knows if the ITR is out of date with respect to an ETR's version number and updates the ITR. At the same time the ETR can tell if it is out of date with respect to the ITR's version number so then it can ask for an update.

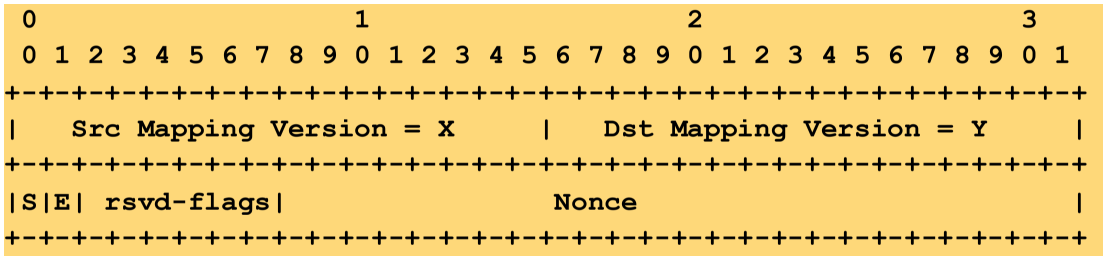
(2) With what we have in the spec right now, the **nonce is also a version number but it works in one- direction.** And an **SMR** allows the side that needs the update to have it send a Map-Request.

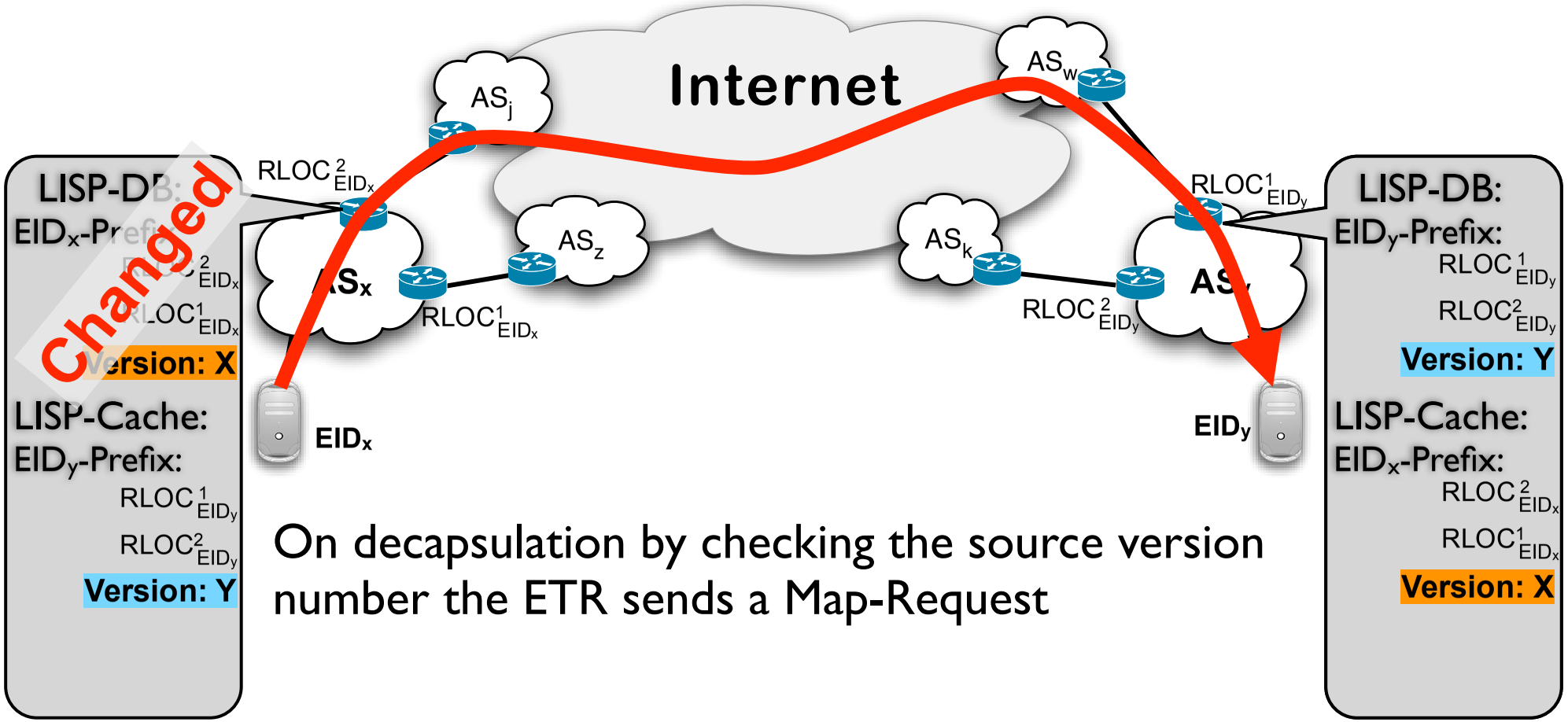
What I want you guys to think about and articulate is what the **pros and cons of "comparing" the two approaches.** Rather the pros and cons of each. The later has been articulated as you said.

What I want to understand is if we can **get your pros without having to make more changes.** Because the map-versioning ID makes a lot of changes (data packet change, new message type in a Map-Update, and removing loc-reach-bits) so I am judging the benefit given this cost.

Now, one other thing. Since we are currently all thinking about **locator reachability algorithms, and if we do an RLOC-probing algorithm,** and if we use Map-Requests and Map-Replies as the probes, you have a built-in update mechanism with no other cost. That is, if you have to probe for liveness, you can also get the latest and greatest mapping data from the site. So something to think about.
Dino

Mapping Version Numbers

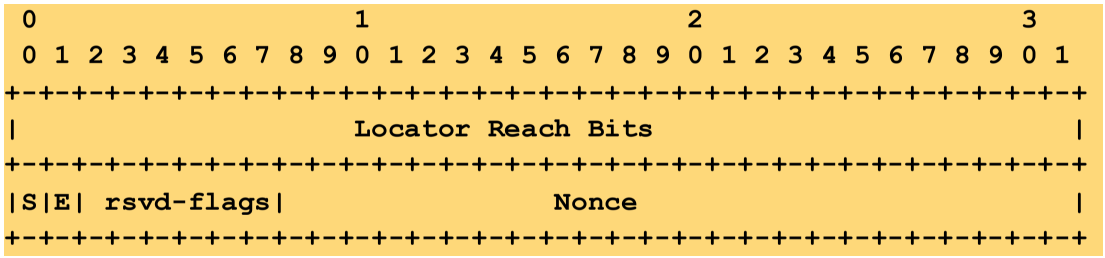


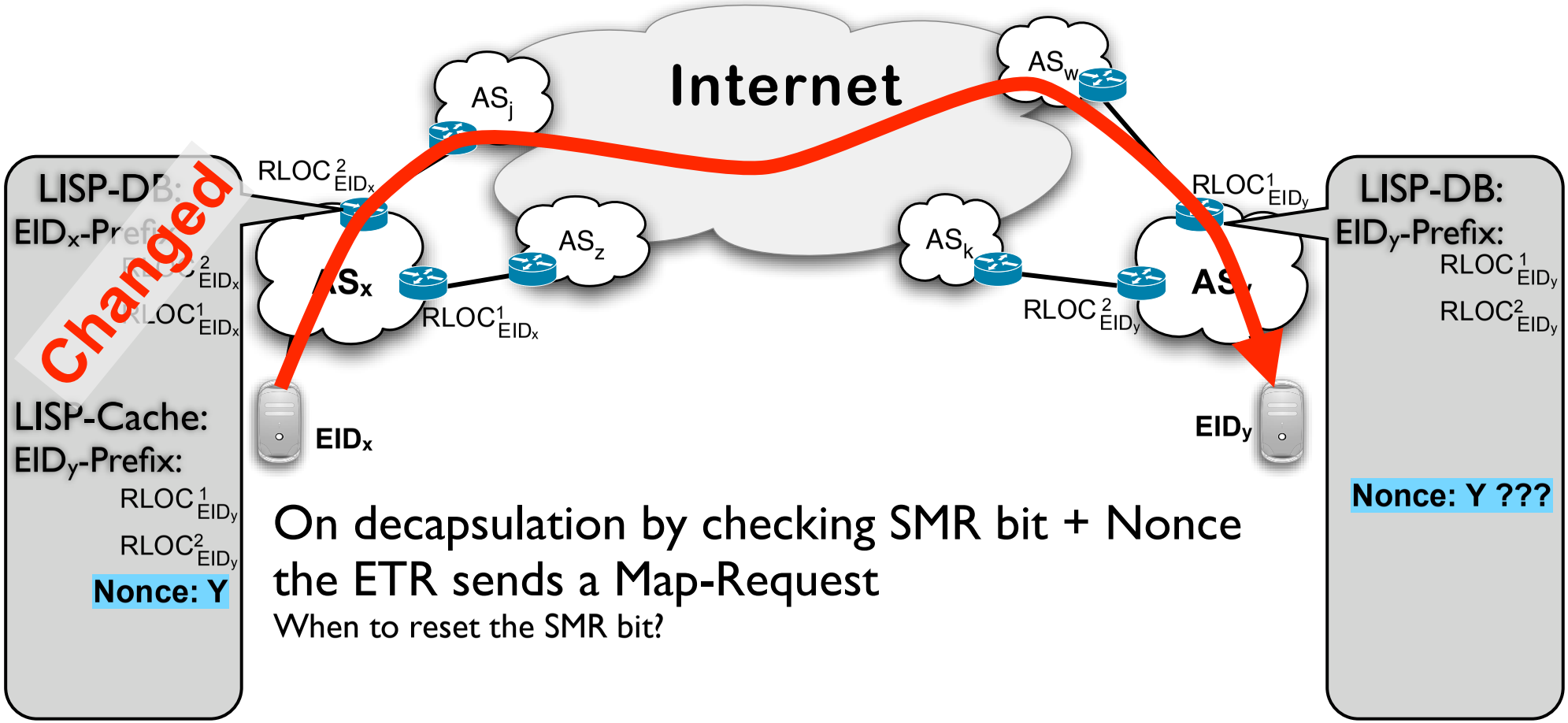


On decapsulation by checking the source version number the ETR sends a Map-Request

Example from: http://www.ietf.org/mail-archive/web/lisp/current/msg00617.html

SMR+Nonce



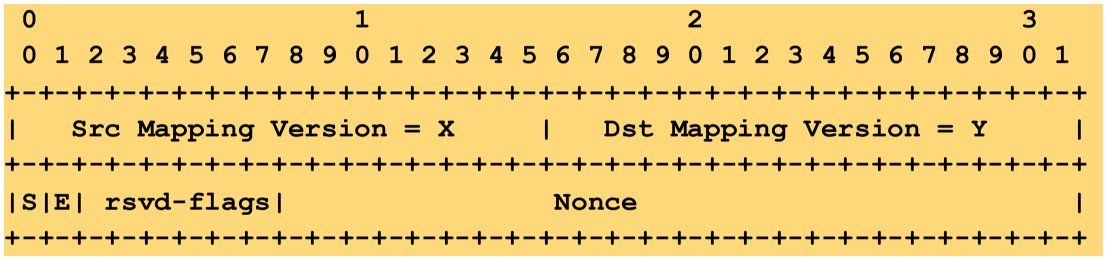


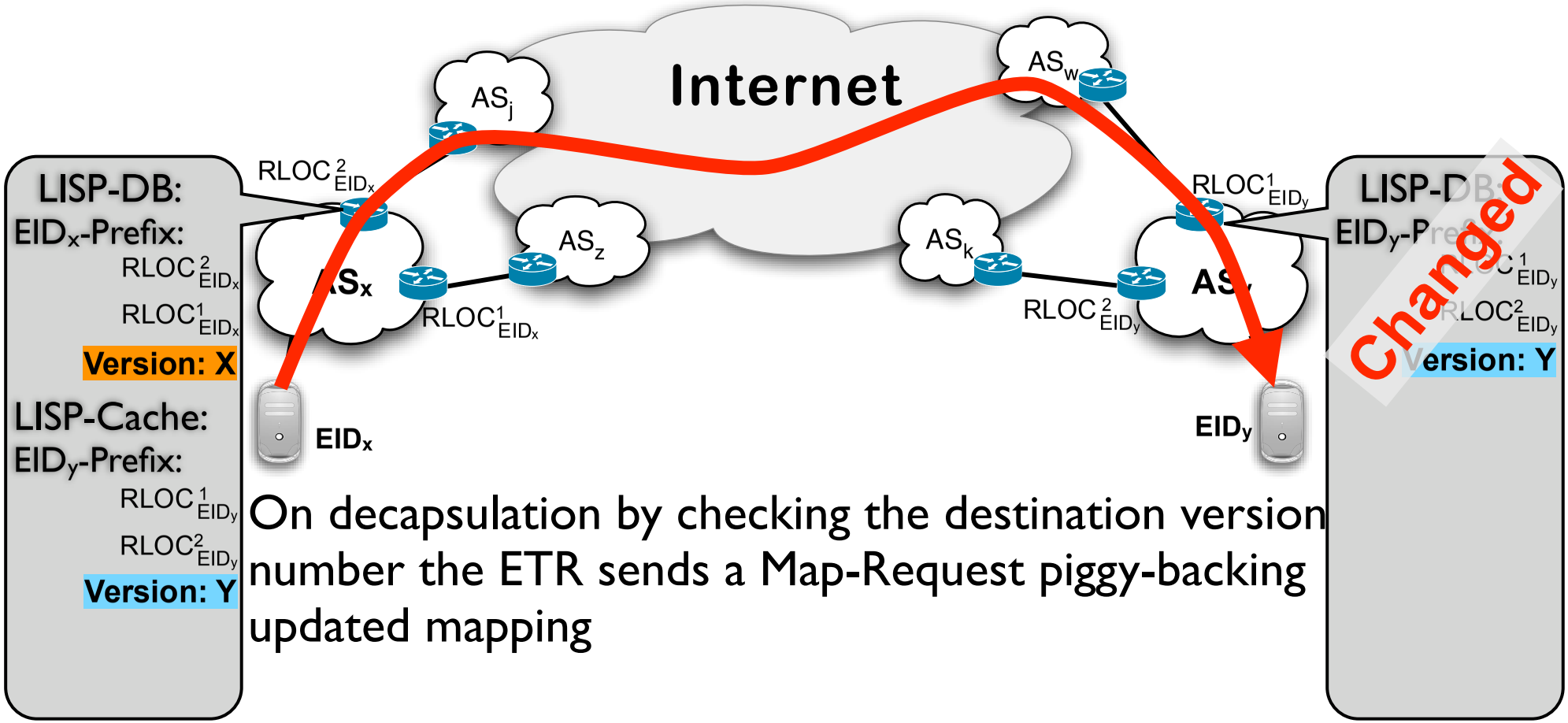
On decapsulation by checking SMR bit + Nonce the ETR sends a Map-Request

When to reset the SMR bit?

Example from: http://www.ietf.org/mail-archive/web/lisp/current/msg00617.html

Mapping Version Numbers



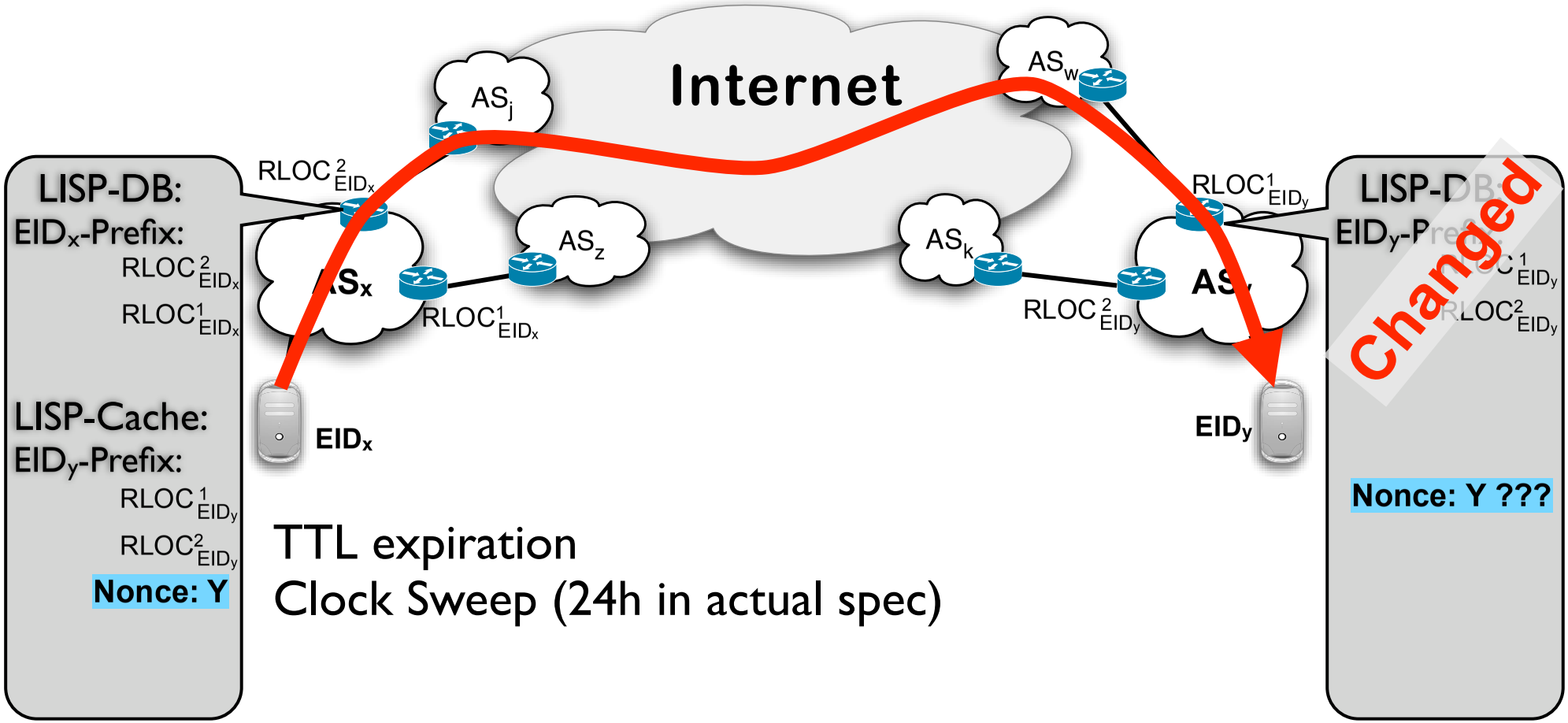


On decapsulation by checking the destination version number the ETR sends a Map-Request piggy-backing updated mapping

Example from: http://www.ietf.org/mail-archive/web/lisp/current/msg00617.html

SMR+Nonce

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                     Locator Reach Bits                        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|S|E| rsvd-flags|                  Nonce                        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

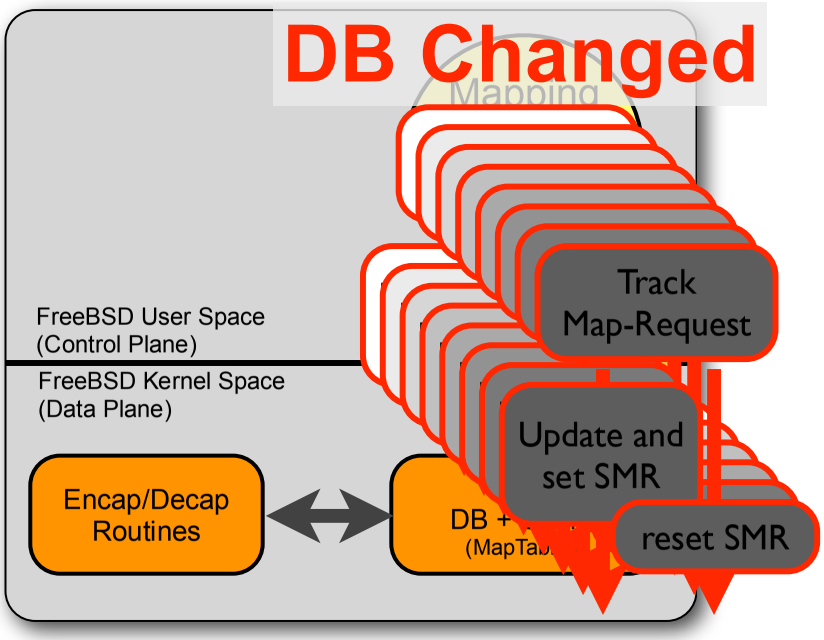


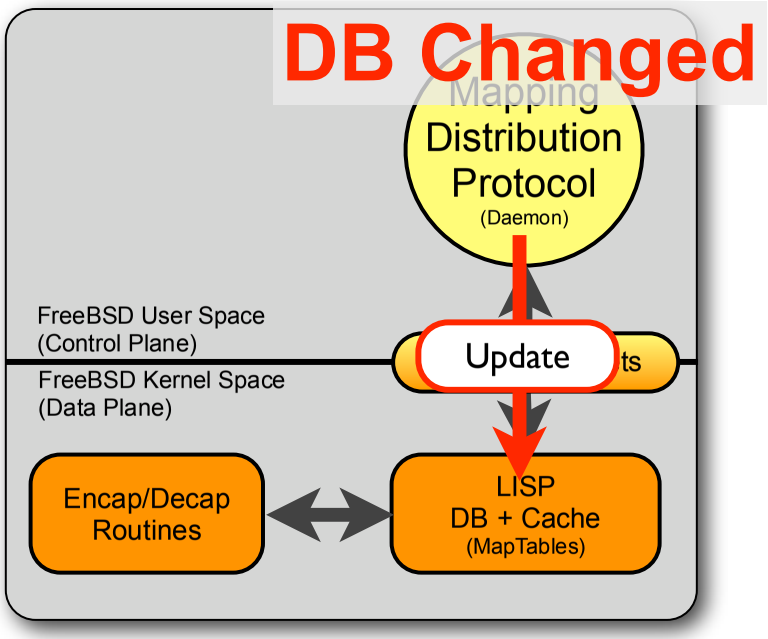
TTL expiration
Clock Sweep (24h in actual spec)

Example from: http://www.ietf.org/mail-archive/web/lisp/current/msg00617.html

SMR+Nonce vs. Versioning

- SMR+Nonce
- Mapping Versioning





Quick update from the mailinglist

- http://www.ietf.org/mail-archive/web/lisp/current/msg00692.html

Let's do this at the meeting. I think face-to-face will be better. We have been oscillating and I think it's because email isn't working for this.
Luigi/Damien, can you think about these issues so we can discuss them:

(1) Your **map-versioning has 2 versions numbers (sender's and receiver's).** This is so when a packet comes from an ITR to an ETR, the ETR knows if the ITR is out of date with respect to an ETR's version number and updates the ITR. At the same time the ETR can tell if it is out of date with respect to the ITR's version number so then it can ask for an update.

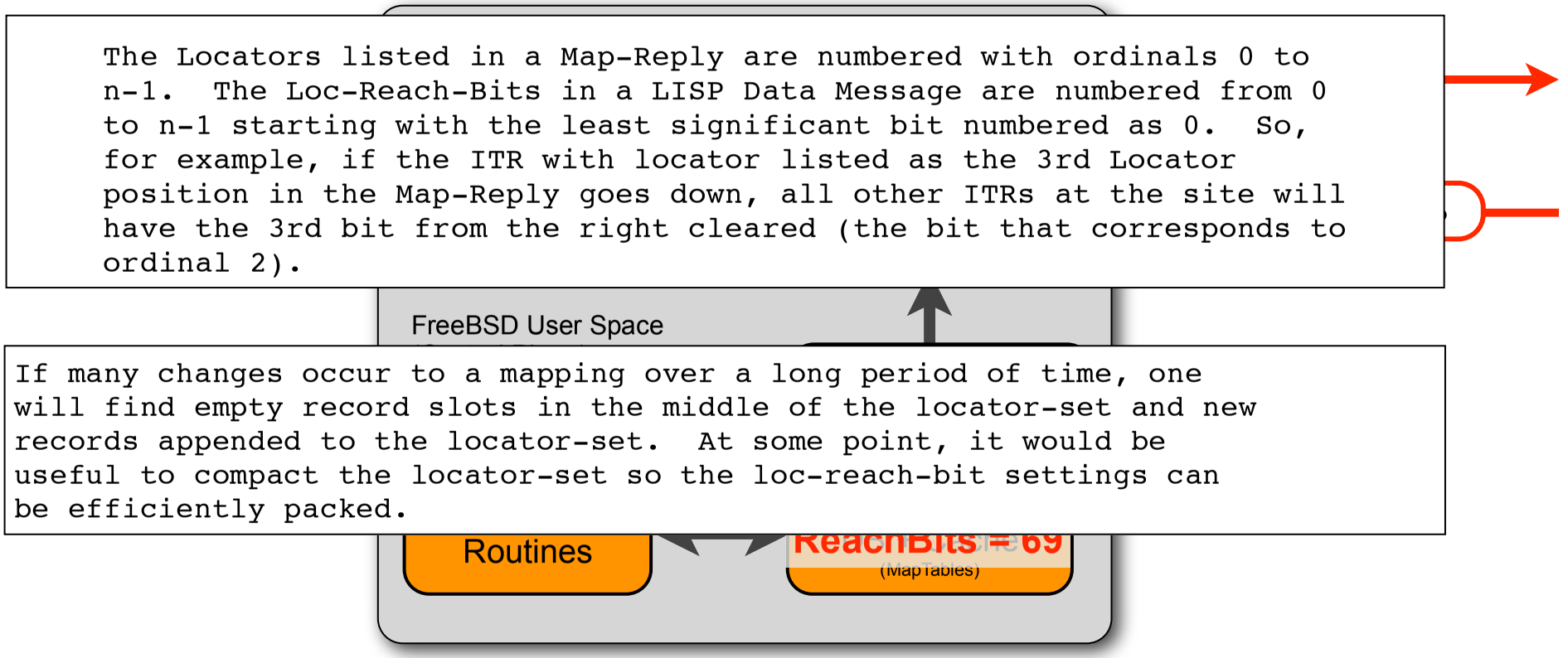
(2) With what we have in the spec right now, the **nonce is also a version number but it works in one- direction.** And an **SMR** allows the side that needs the update to have it send a Map-Request.

What I want you guys to think about and articulate is what the **pros and cons of "comparing" the two approaches.** Rather the pros and cons of each. The later has been articulated as you said.

What I want to understand is if we can **get your pros without having to make more changes.** Because the map-versioning ID makes a lot of changes (data packet change, new message type in a Map-Update, and **removing loc-reach-bits**) so I am judging the benefit given this cost.

Now, one other thing. Since we are currently all thinking about **locator reachability algorithms, and if we do an RLOC-probing algorithm,** and if we use Map-Requests and Map-Replies as the probes, you have a built-in update mechanism with no other cost. That is, if you have to probe for liveness, you can also get the latest and greatest mapping data from the site. So something to think about.
Dino

Where to put Version Numbers?



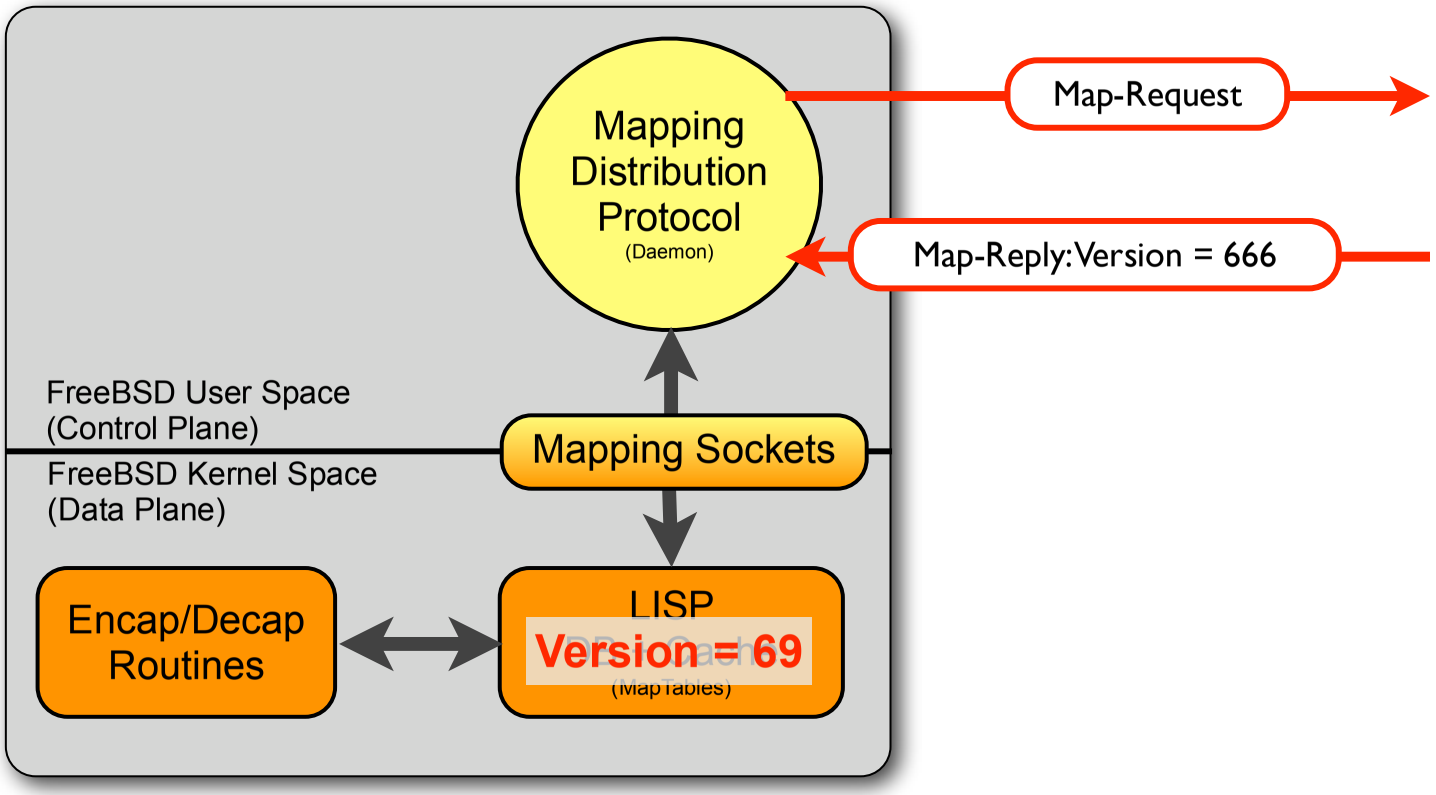
May this cause problem with draft-meyer-lisp-mn-00.txt?

Reach Bits are a hint: http://www.ietf.org/mail-archive/web/lisp/current/msg00546.html

ReachBits = 96

Where to put Version Numbers?

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   Src Mapping Version = X     |   Dst Mapping Version = Y     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|S|E| rsvd-flags|                Nonce                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```



Version = 70

Pros & Cons

- SMR+Nonce+Reachbits
- PROS
  - Implemented
- CONS
  - Unidirectional
  - Heavy Control Plane
  - ReachBit have a “loose” meaning

- Mapping Versioning*
- PROS
  - Versioning
  - Bidirectional
  - Lighter Control Plane
  - Helps in keeping signaling overhead low
  - Security & Mobility
- CONS
  - To be implemented

*Does not mean to get rid of Nonce + SMR + Reachability bit in the Map-Reply

Next Steps...

- WG deciding if it is worth to work on mapping versioning
- If no, let's go for beers
- If yes, synch with LISP Dev Team to agree on details
  - Update draft
  - and let's go for beers anyway....