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Address Family Translation (AFT)

Panel Presentation:
IPv4 to IPv4 Transition and Co-Existence Mechanisms

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What is AFT?

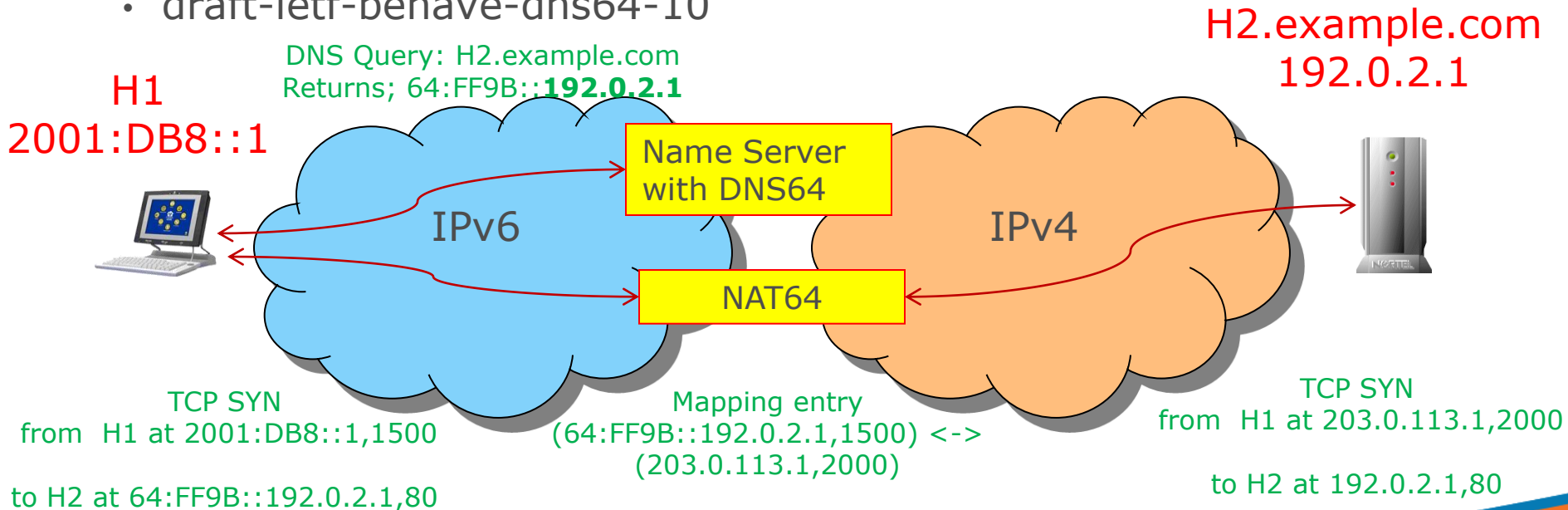
In general, AFT is all about replacing headers and addresses of one family of IP (IPv4, IPv6) with headers and addresses from another IP family, in an IP packet.

- Cf. NAT which translates addresses within one IP family e.g. private to public IPv4
- See draft-ietf-behave-v6v4-framework-10 NAT64
 - NAT64
 - NAT46
- Name to Address Family Translation may also be required
 - DNS64
 - DNS46

NAT64

Allows an IPv6-only client to communicate with an IPv4-only server, by translating IPv6 headers to IPv4 (and vice versa for the return traffic from the server). In order to work in a large network, it needs DNS64 to support domain name resolution.

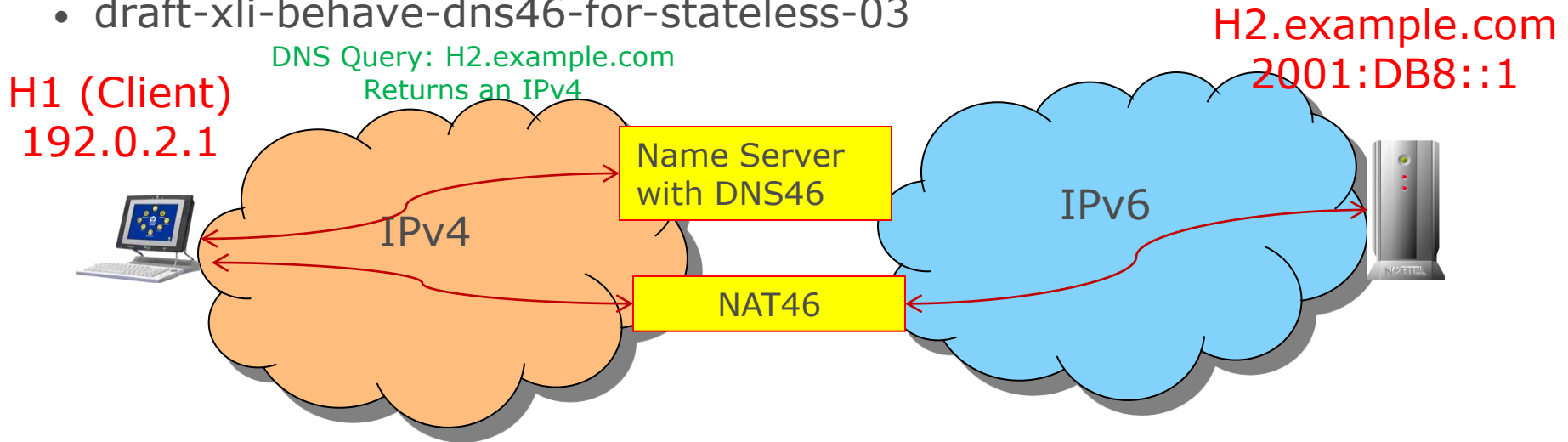
- draft-ietf-behave-v6v4-xlate-stateful-12
- draft-ietf-behave-dns64-10



NAT46

Allows an IPv4-only client to communicate with an IPv6-only server, by translating IPv4 headers to IPv6 (and vice versa for the return traffic from the server). In order to work in a large network, it needs DNS46 to support domain name resolution.

- draft-liu-behave-nat46-02
- draft-xli-behave-dns46-for-stateless-03



Issues with AFT

All the regular issues associated with NAT and Port Translation apply.

- See also NAT444, Address Sharing problems etc.

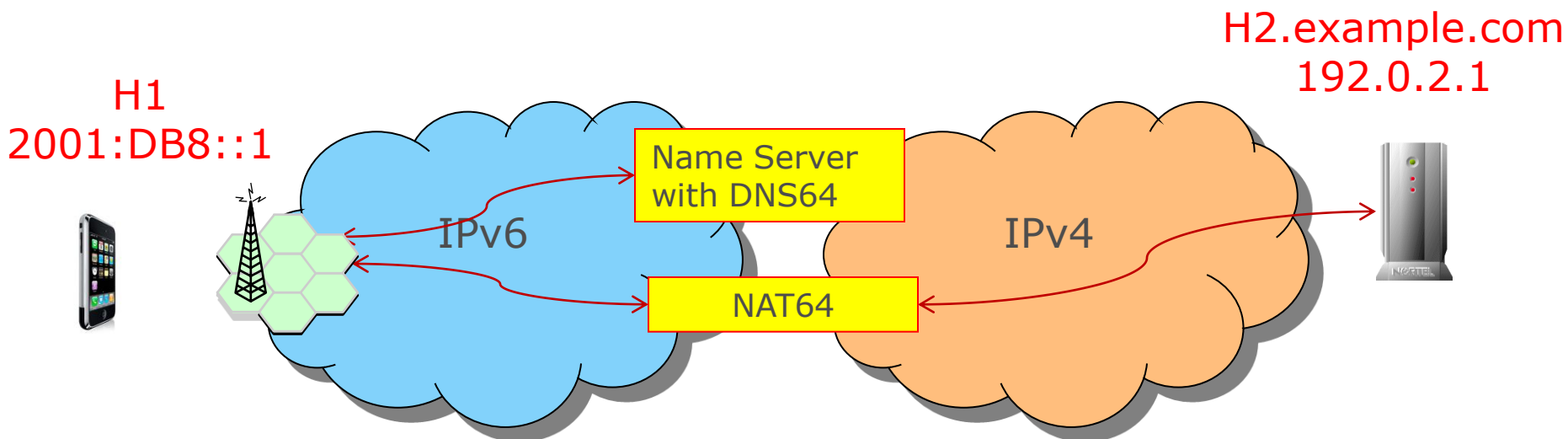
NAT	NAT Traversal (STUN), IP Masquerade IPSEC issues etc.
Double NAT	NAT + State coordination between NATs etc.
NAT444	limits the number of sessions per CPE so that rich applications such as AJAX and RSS feed cannot work well.
AFT	Now IPv6 not end-end as well

Which means...

If clients can support both IPv4 and IPv6 simultaneously (dual stack), then the best solution for the network is to support both stacks (through 6rd, DS-Lite, dual stack).

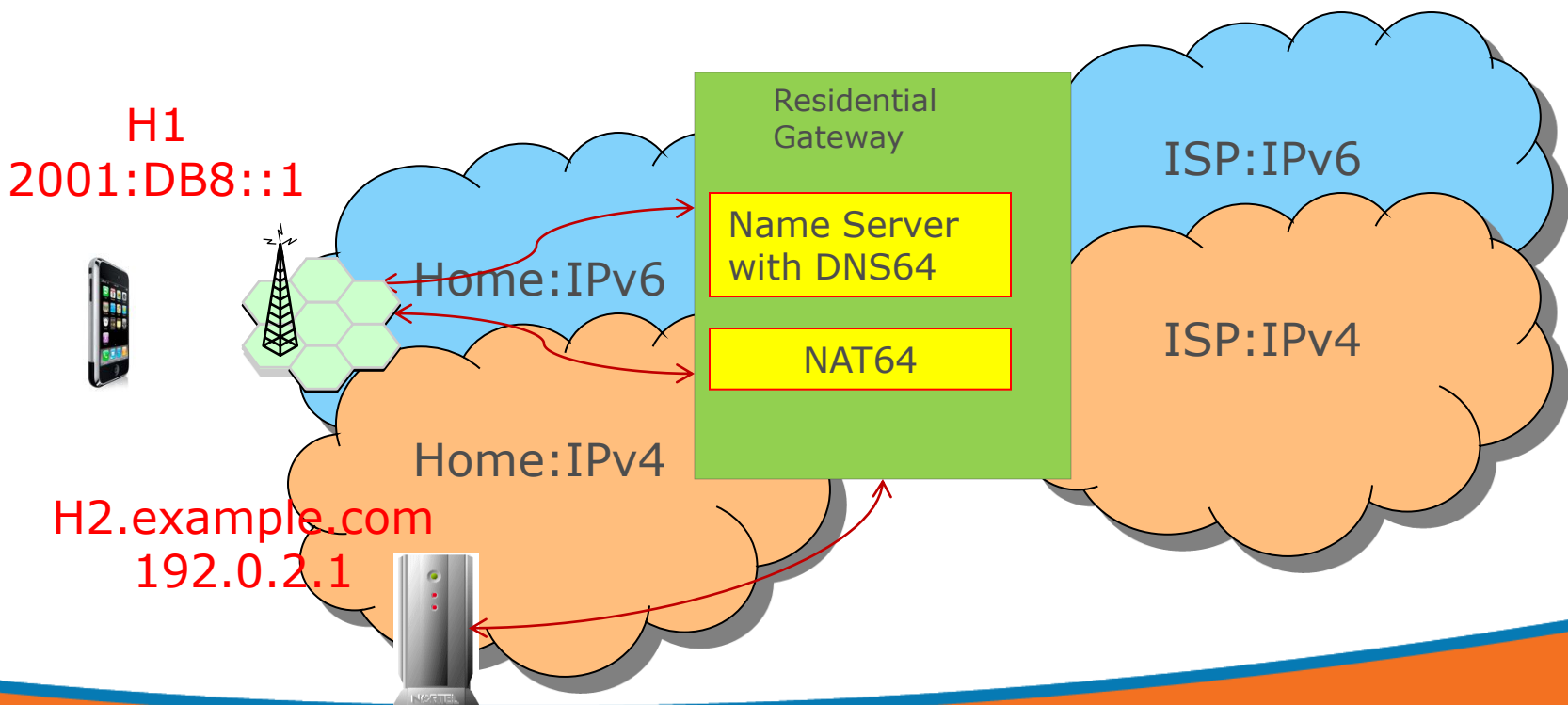
Where does AFT make sense (1)

Many mobile networks intend to support NAT64, so mobile clients do not have to run dual stack (which uses up battery life too quickly).



Where does AFT make sense (2)

Some home network services are not ready to migrate fully to IPv6, and may need a special gateway *inside the home* to support remote access by IPv6-only mobile clients. ISPs may choose to support this function inside the residential gateways they supply. Or not.



Conclusion

Examples above were both NAT64/DNS64. NAT46 seems both less mature (not fully defined) and less likely to be needed in the near term.

While there are some cases where AFT may be the better solution, in general it should be avoided.