Operational Environments and Transition Scenarios for "Connecting IPv6 Islands across IPv4 Clouds with BGP“

draft-lefaucheur-bgp-tunnel-transition-00.txt

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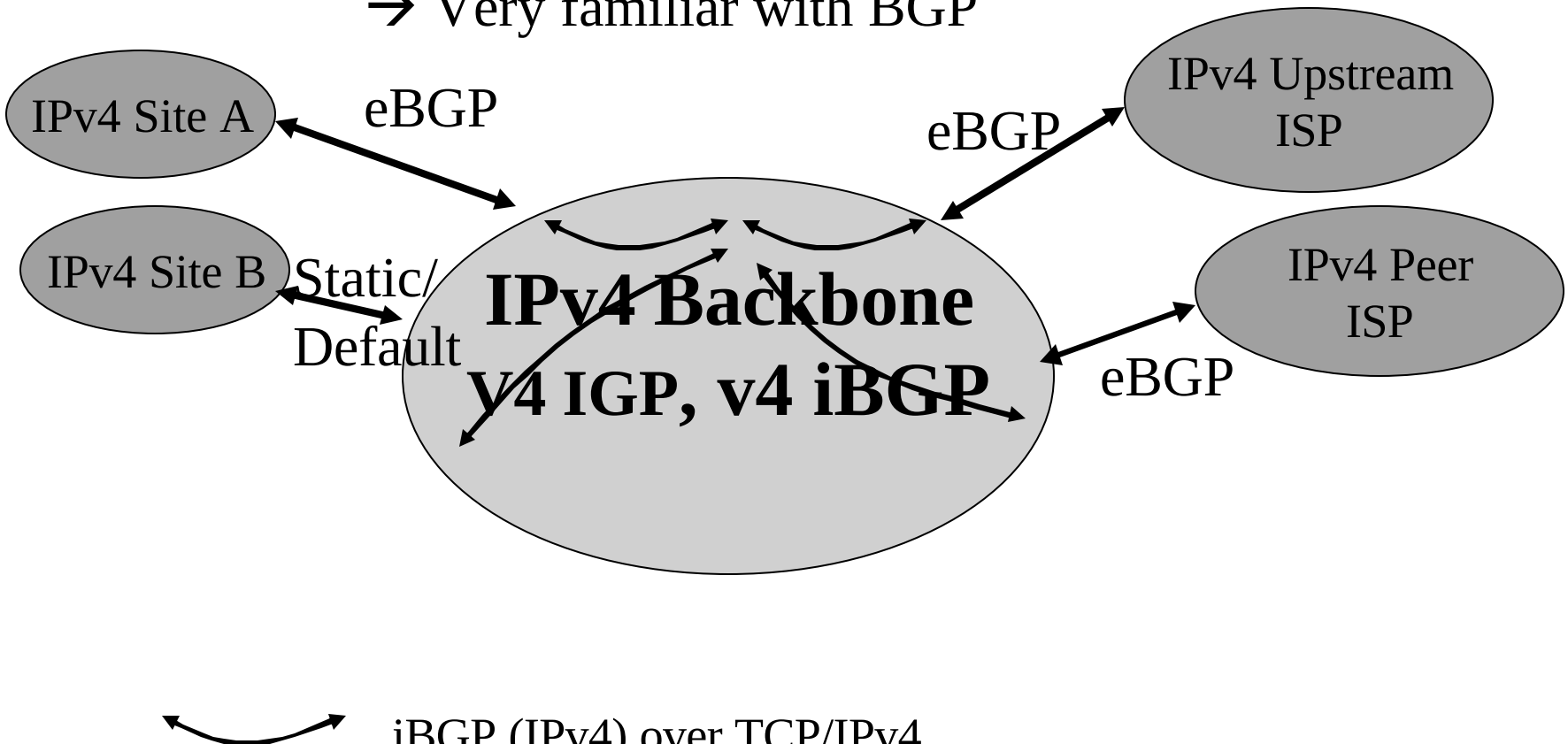
Scope

- Describes two specific Migration Scenarios (ie Operational Environments) of Service Providers
- Describes a Migration Solution for each, based on existing NGTRANS/IP6 mechanisms

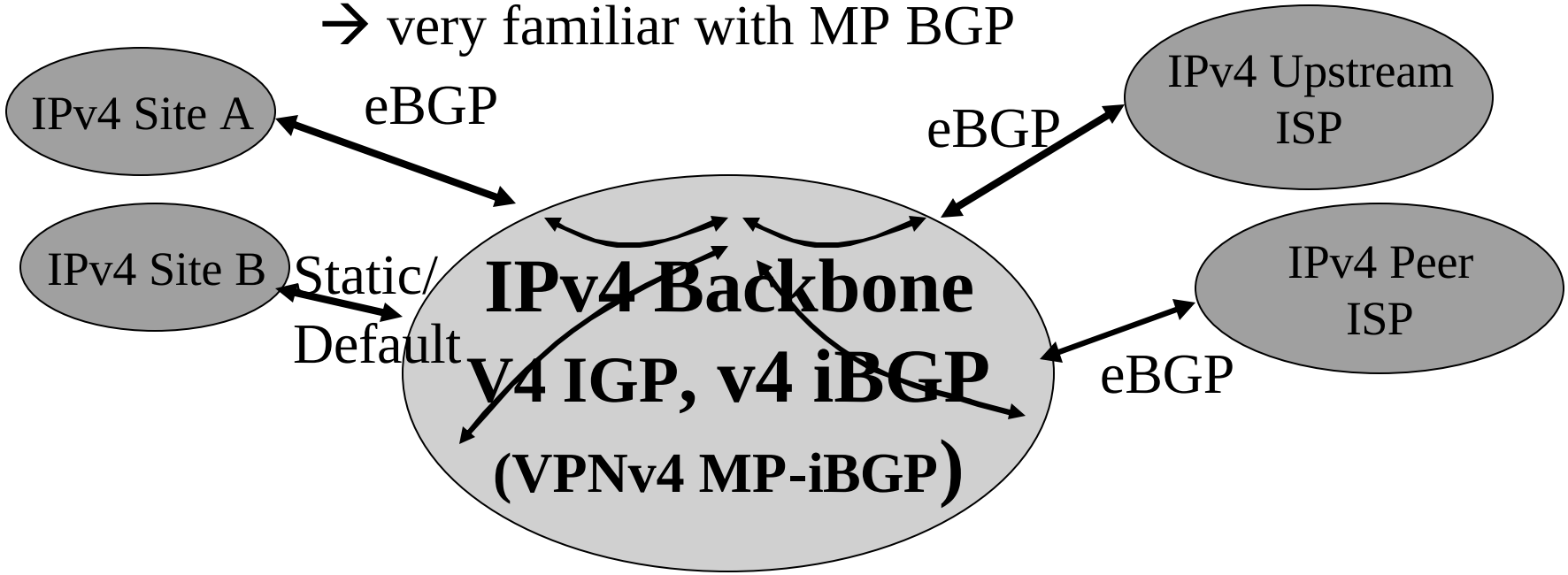
Operational Environment

IPv4 SP offering IPv4 services
→ Very familiar with BGP



Operational Environment

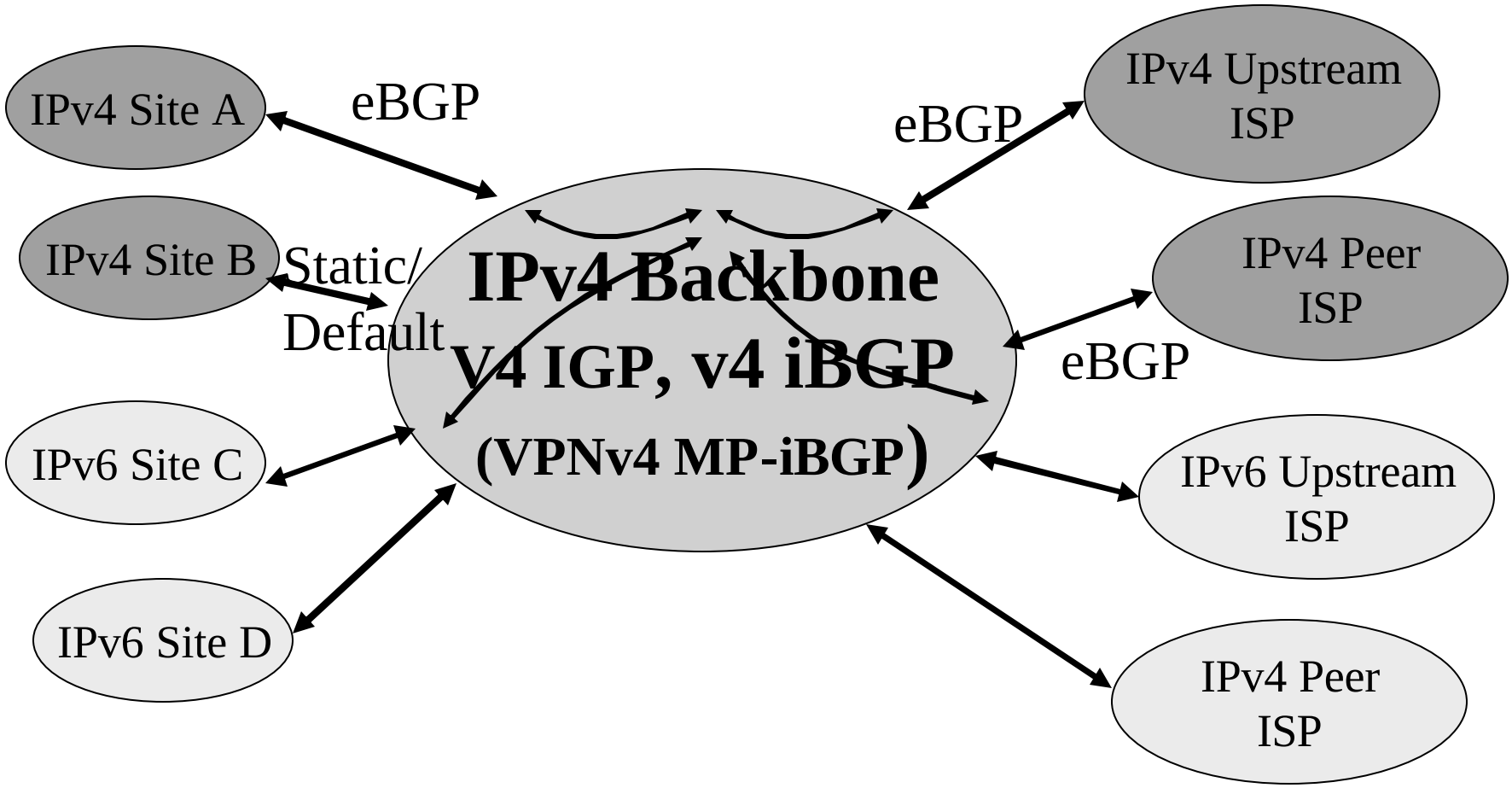
SP may also offer MPLS VPN service
→ very familiar with MP BGP



MP-iBGP (IPv4 + VPN IPv4) over TCP/IPv4

Operational Environment

Now: SP wants to also offer IPv6 services

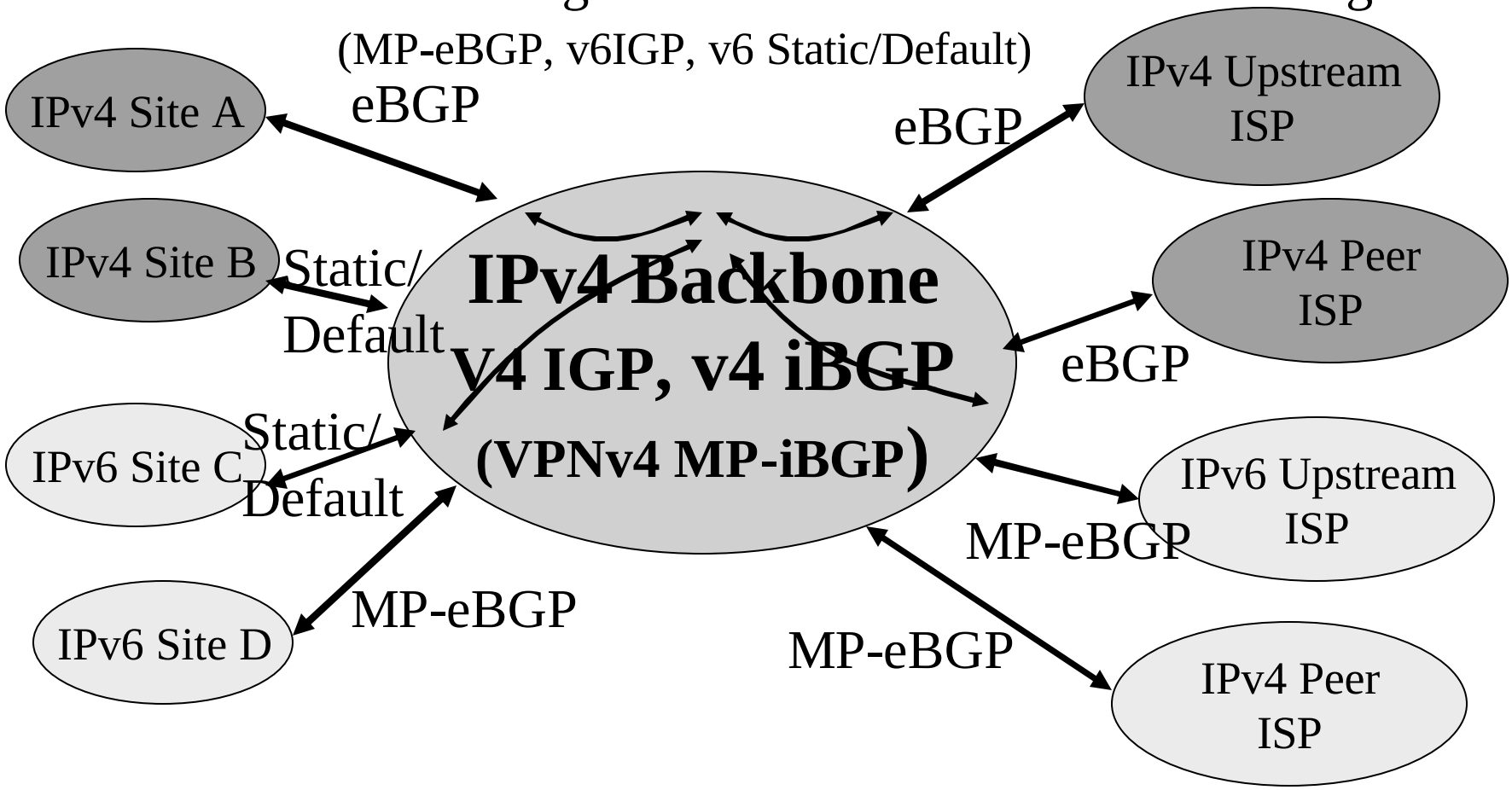


Operational Environment

Now: SP wants to also offer IPv6 services

→ at the edge uses standard native IPv6 Routing

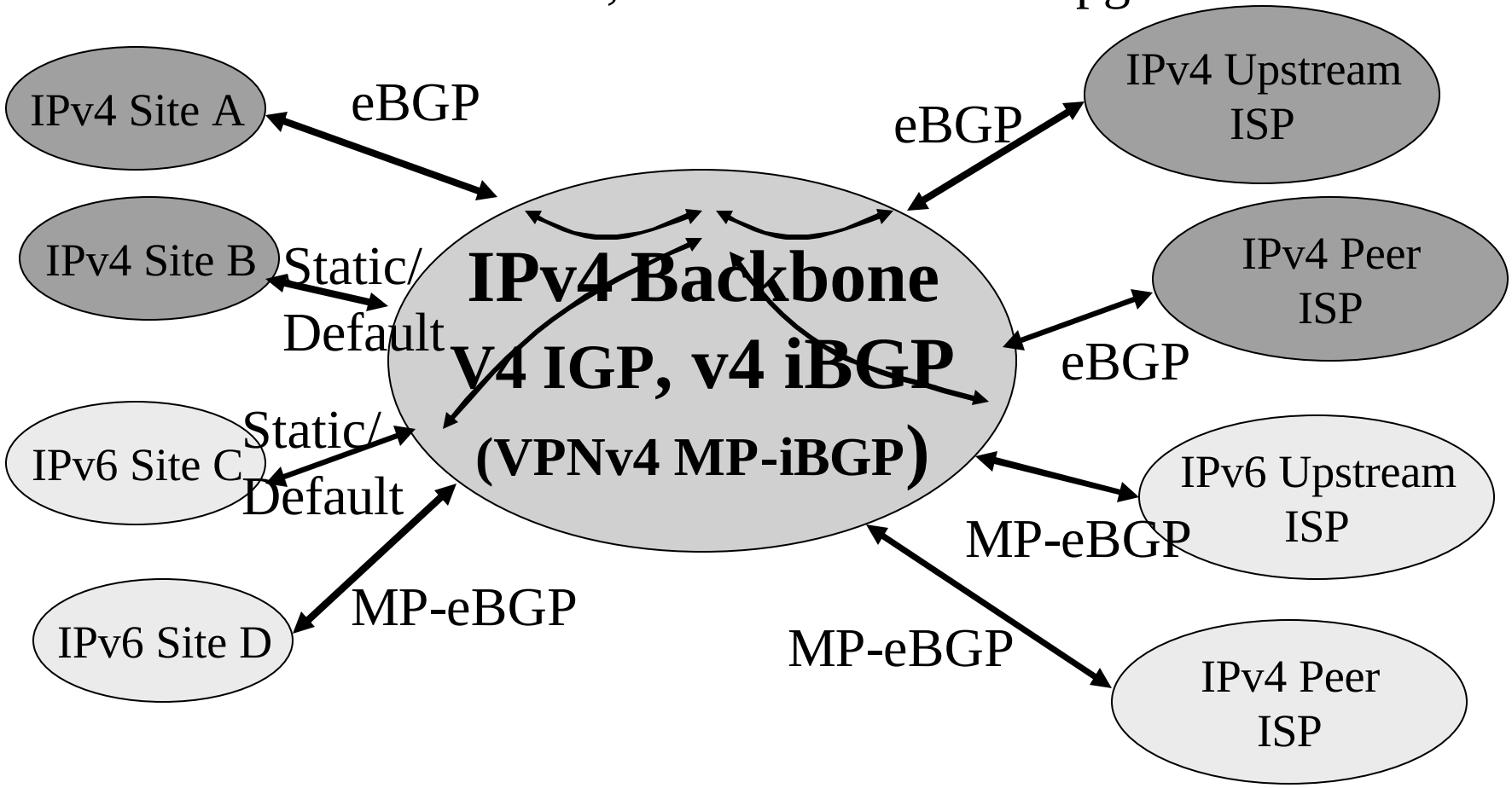
(MP-eBGP, v6IGP, v6 Static/Default)



Operational Environment

Now: SP wants to also offer IPv6 services

→ in the core, does NOT want to upgrade to v6 IGP



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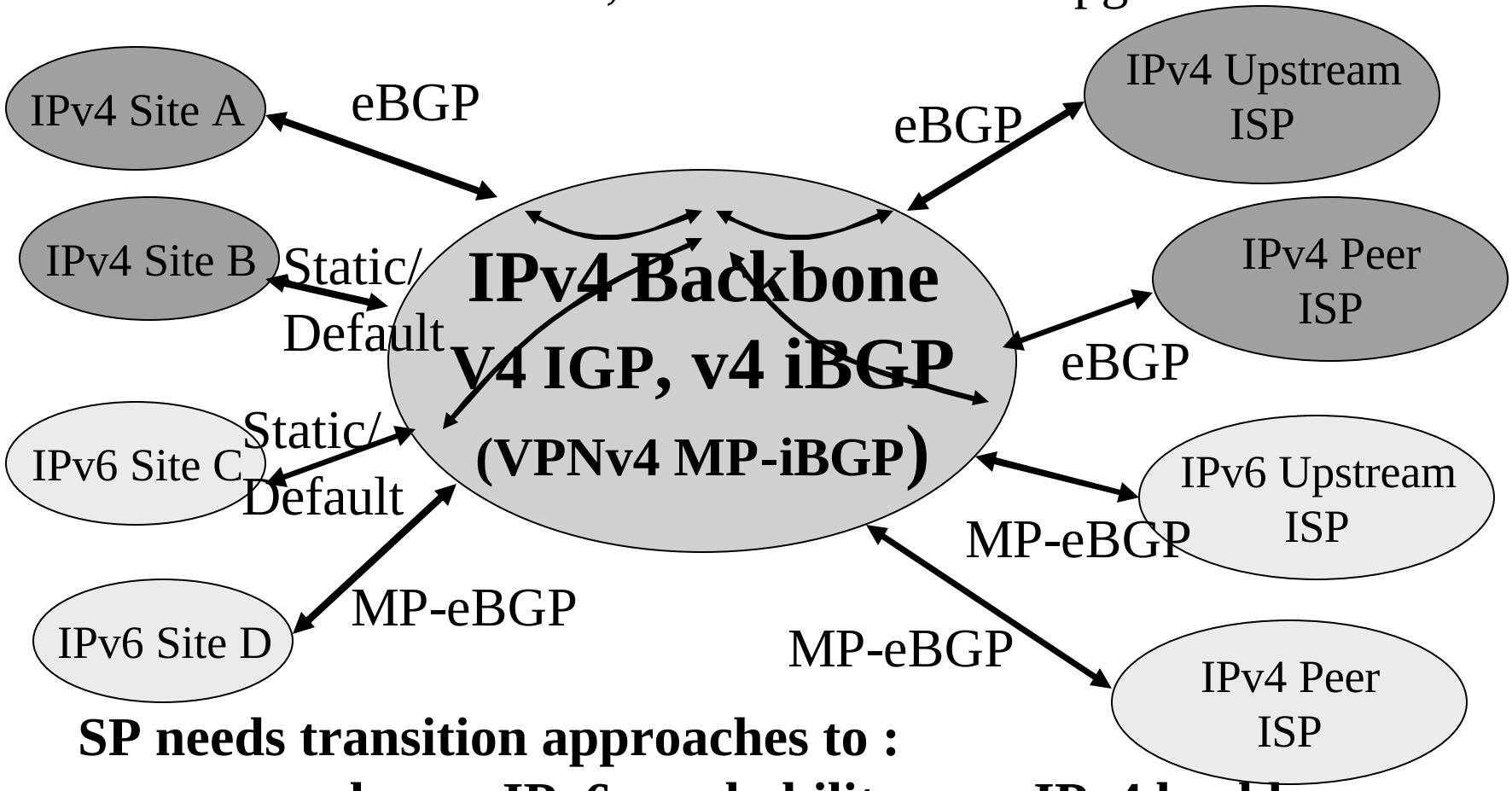


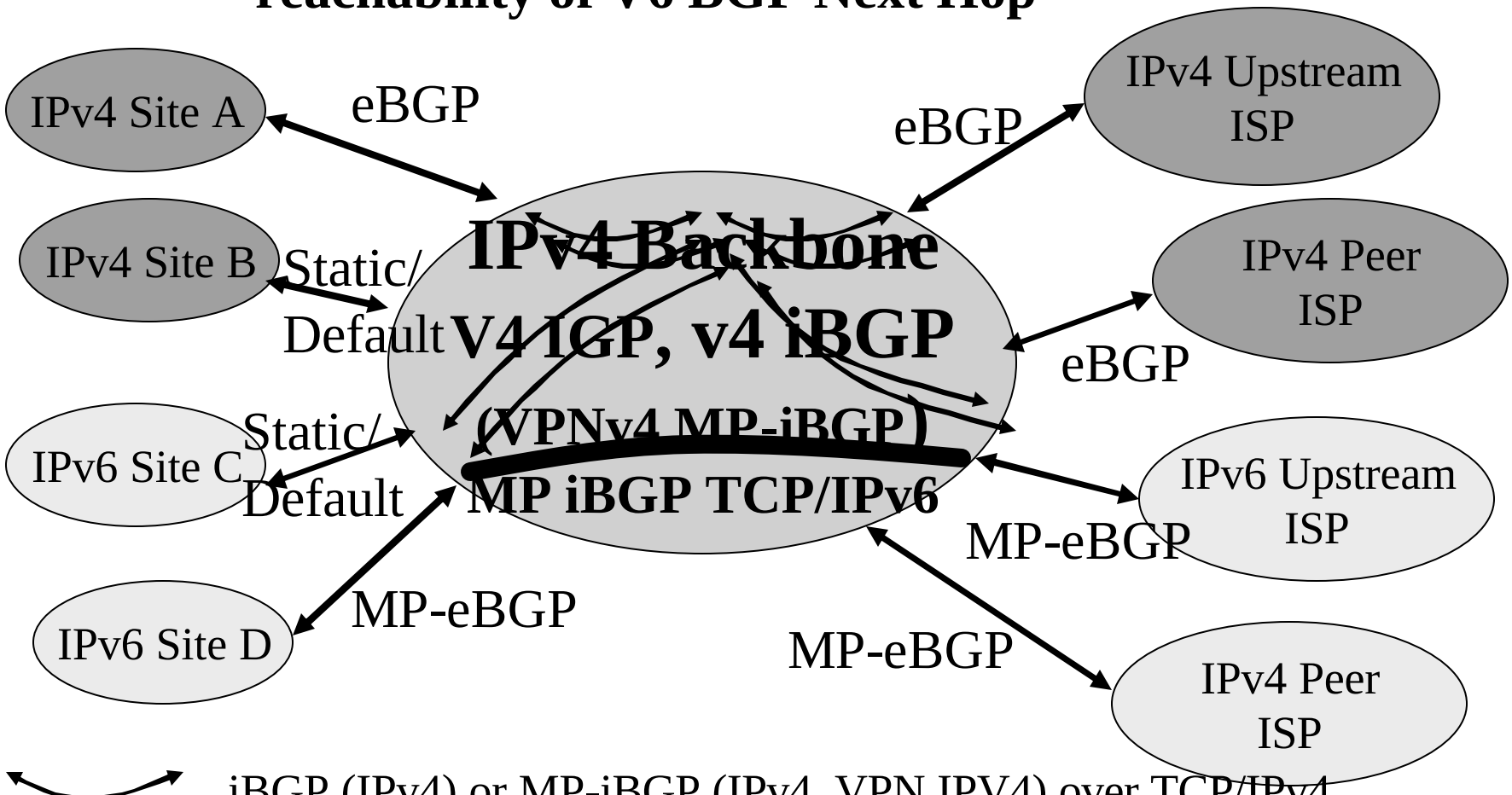
SP needs transition approaches to :

- exchange IPv6 reachability over IPv4 backbone

- tunnel IPv6 traffic over IPv4 backbone

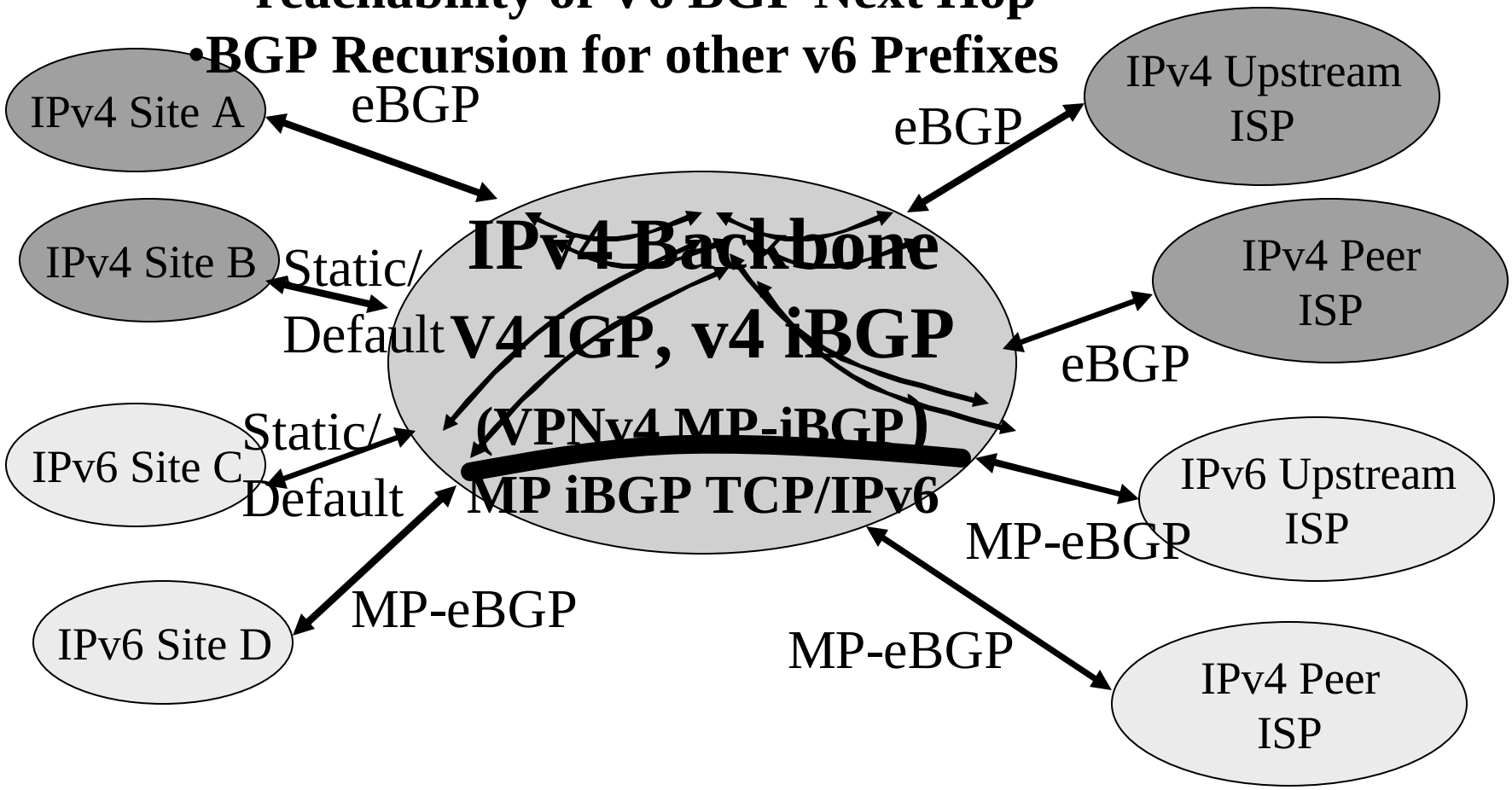
Scenario 1:

- **Additional MP-iBGP Peerings over TCP/IPv6 is OK**
- **Use of 6to4, ISATAP,… is OK for reachability of V6 BGP Next Hop**



Scenario 1: use “MP-BGP over v6”

- **Additional MP-iBGP Peerings over TCP/IPv6**
- **Use 6to4, ISATAP,… for reachability of V6 BGP Next Hop**
- **BGP Recursion for other v6 Prefixes**



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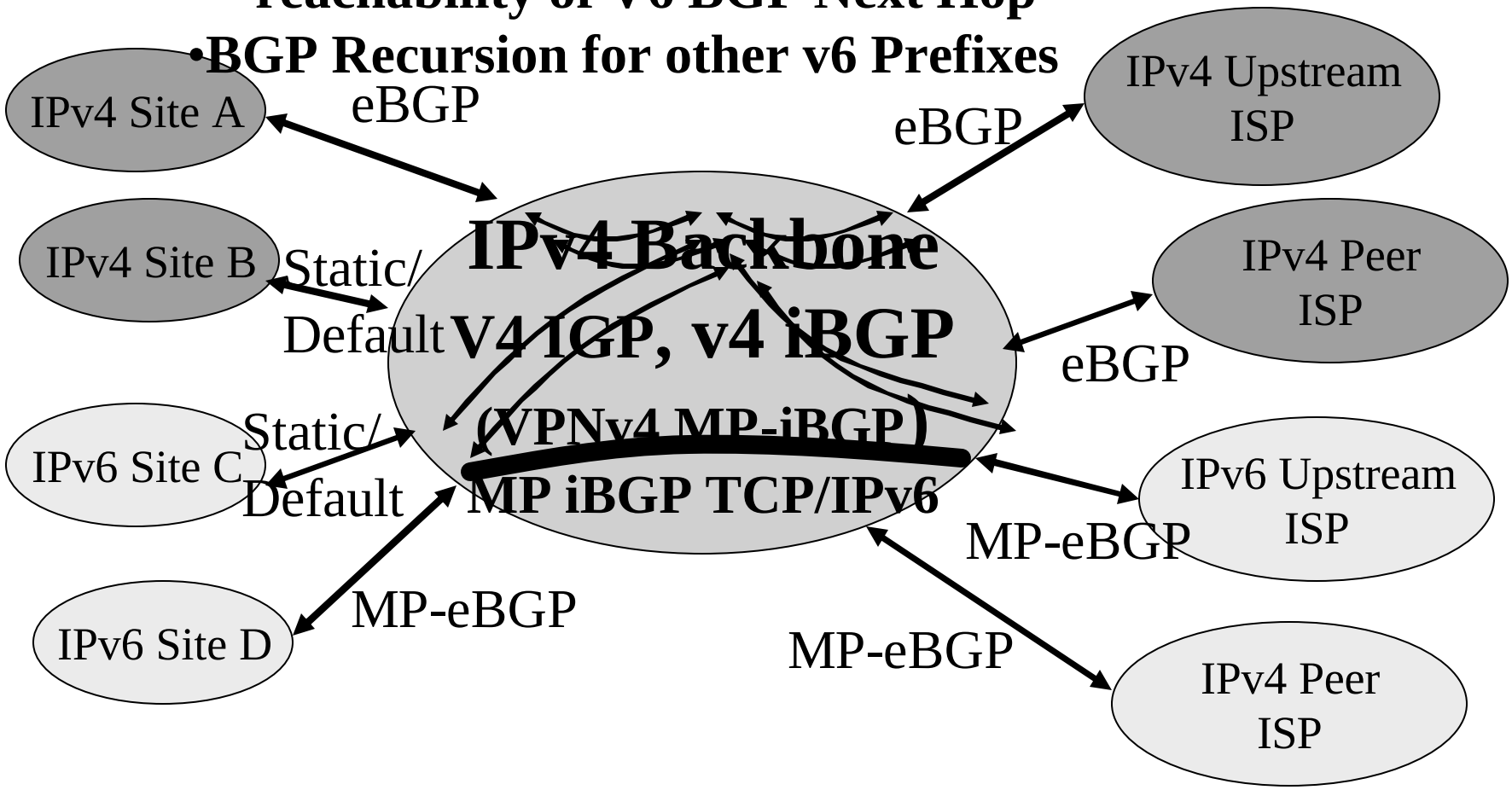
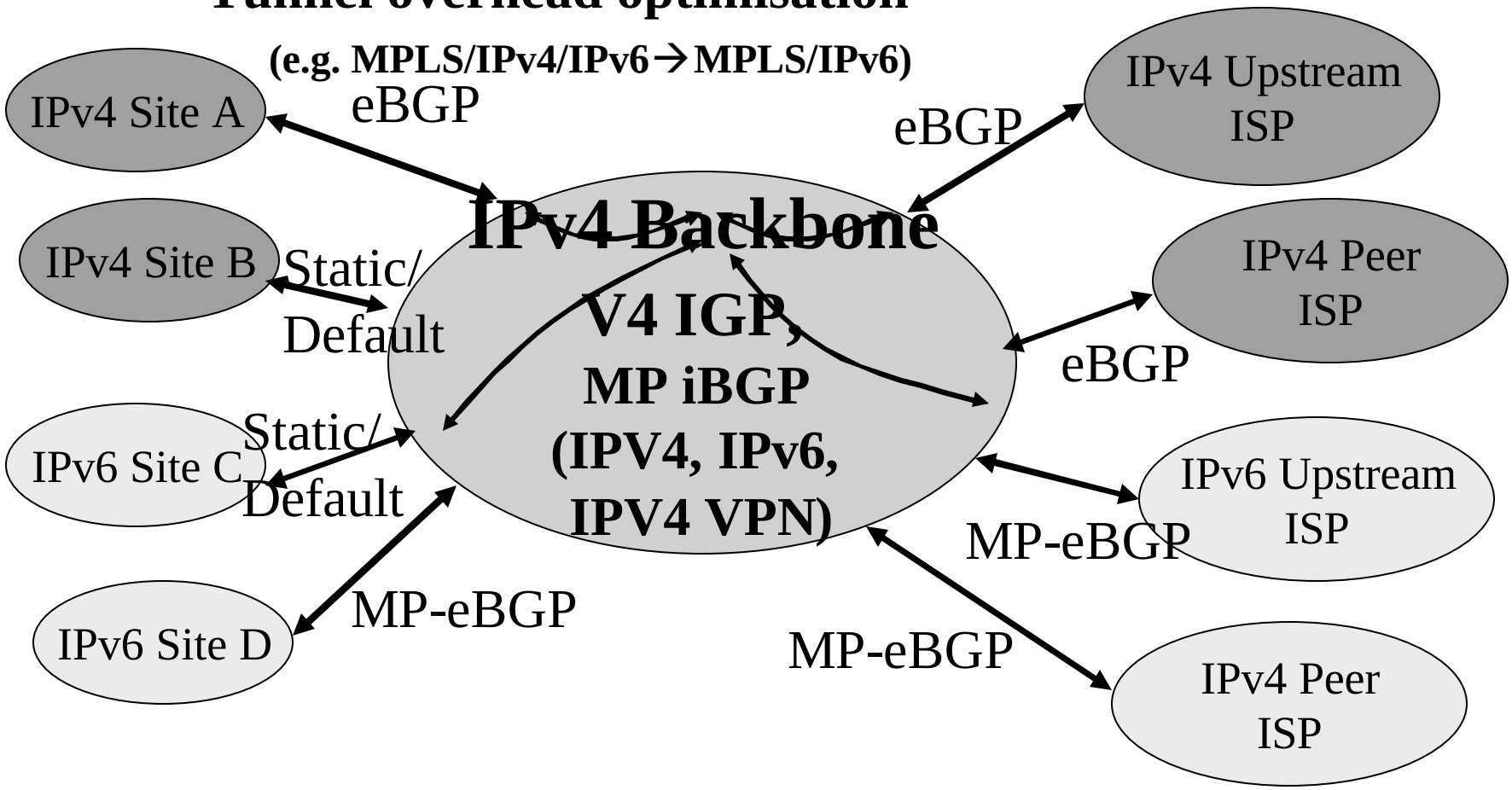


Just a combination of existing NGTRANS techniques

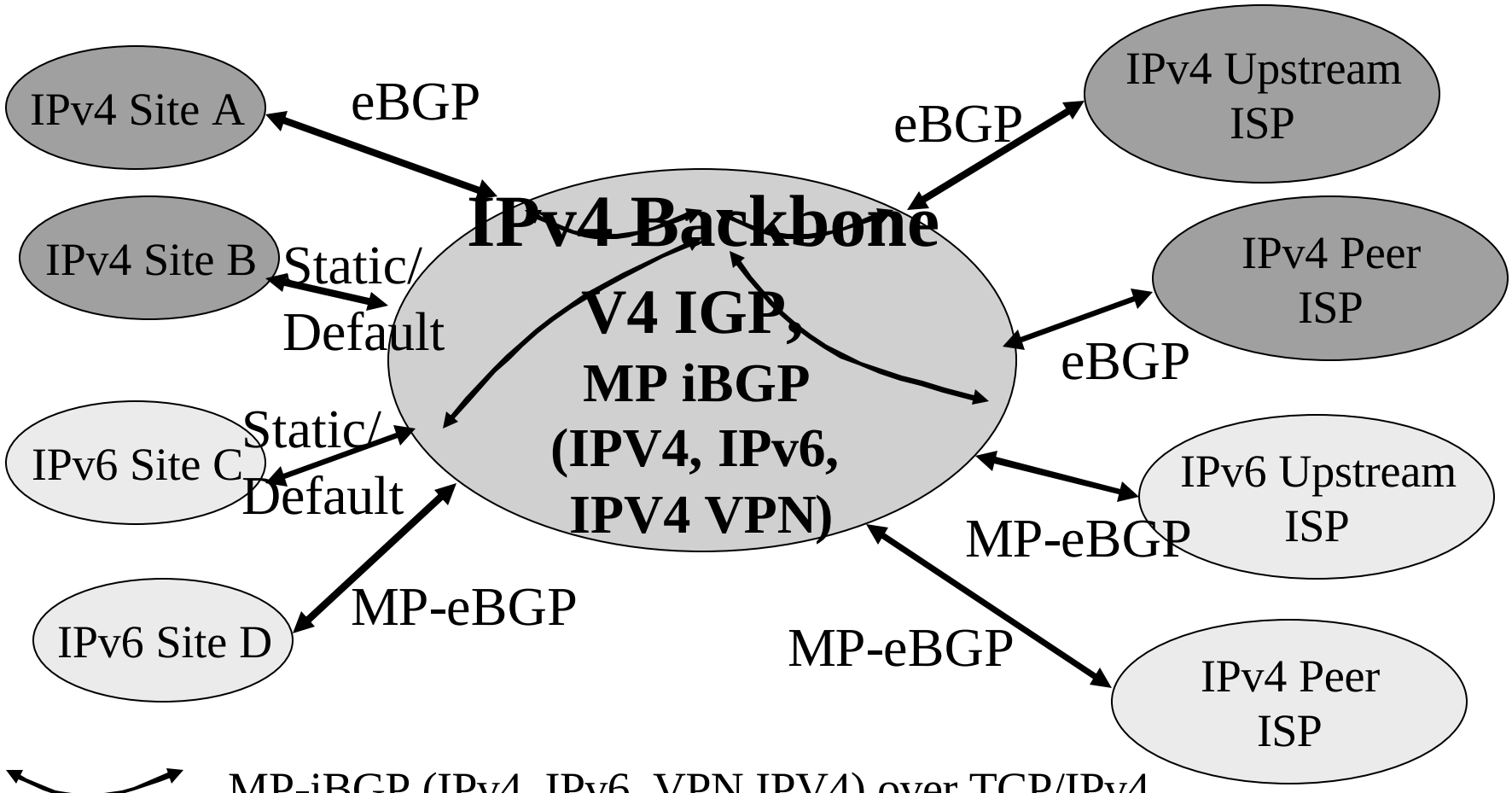
Scenario 2:

- **Reuse existing iBGP Peerings over TCP/IPv4**
- **No constraints/config due to tunneling**
- **Tunnel overhead optimisation**



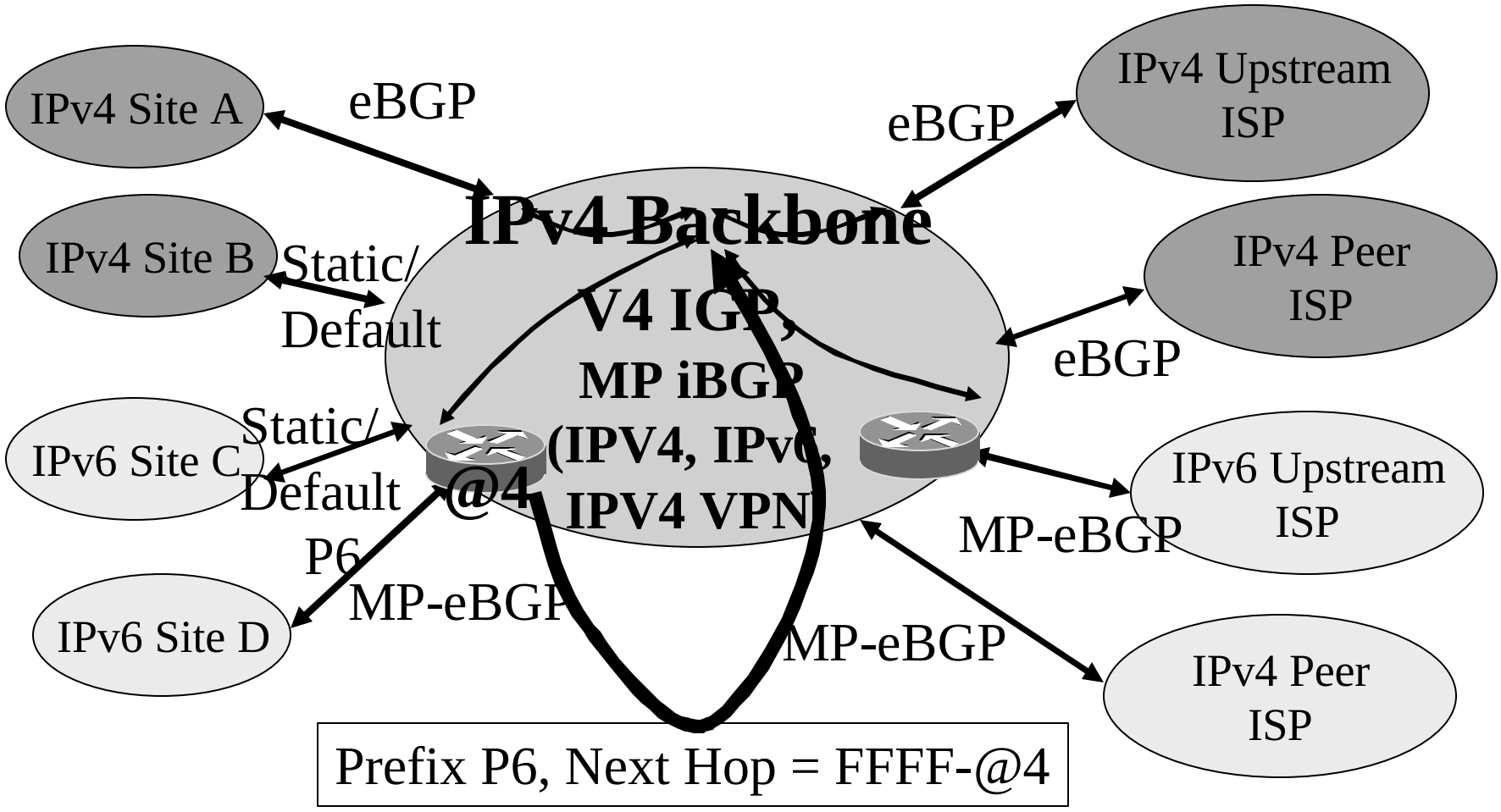
Scenario 2: use “MP-BGP over v4”

Reuse existing iBGP Peerings over TCP/IPv4



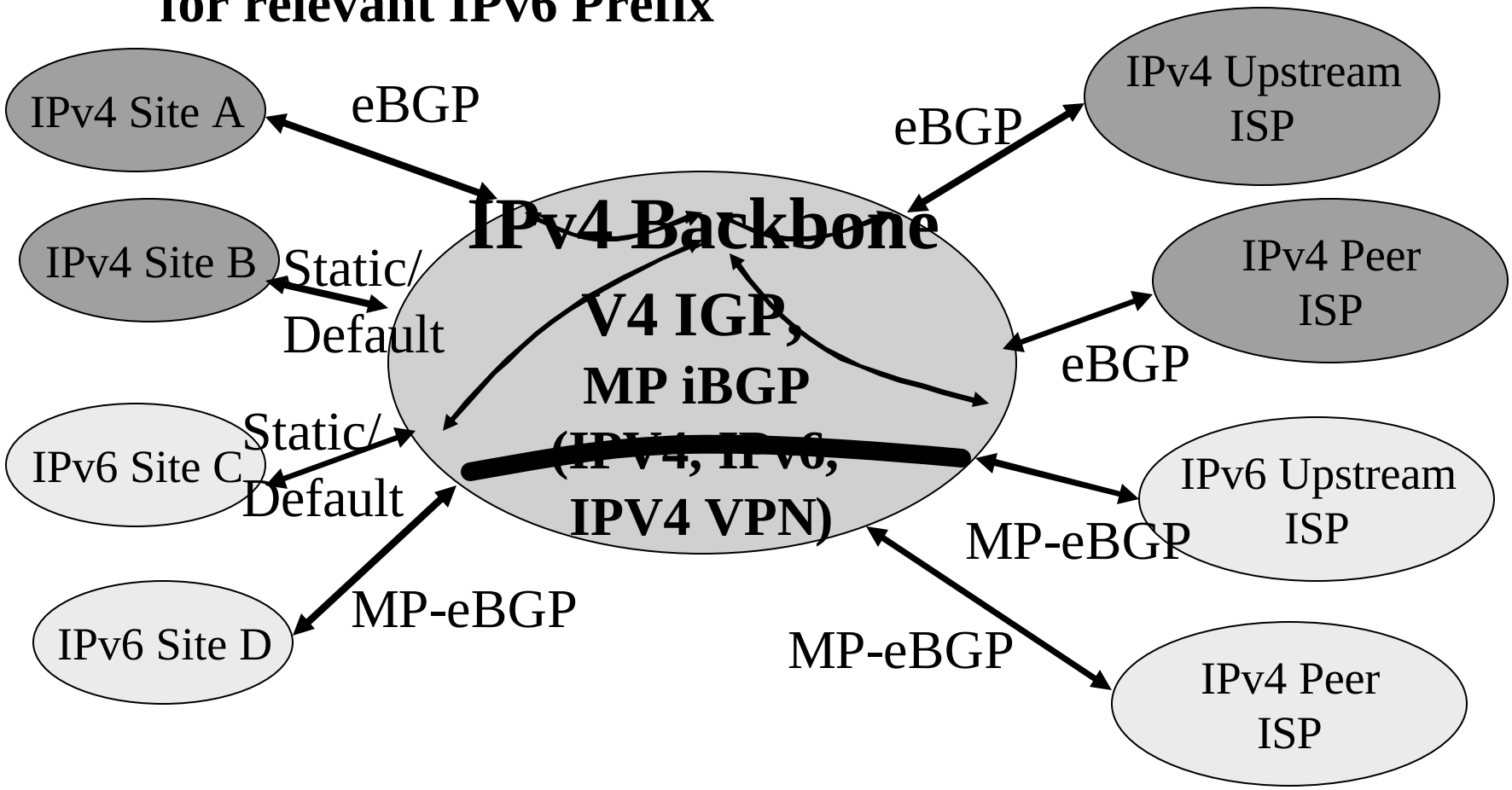
Scenario 2: MP-BGP over v4

For IPv6 Prefix, MP-iBGP conveys IPv4 @ of Next Hop by including it as an IPv4-mapped IPv6 @



Scenario 2: MP-BGP over v4

Tunnel IPv6 packet into tunnel towards the IPv4 @ that was "conveyed" as BGP NextHop for relevant IPv6 Prefix



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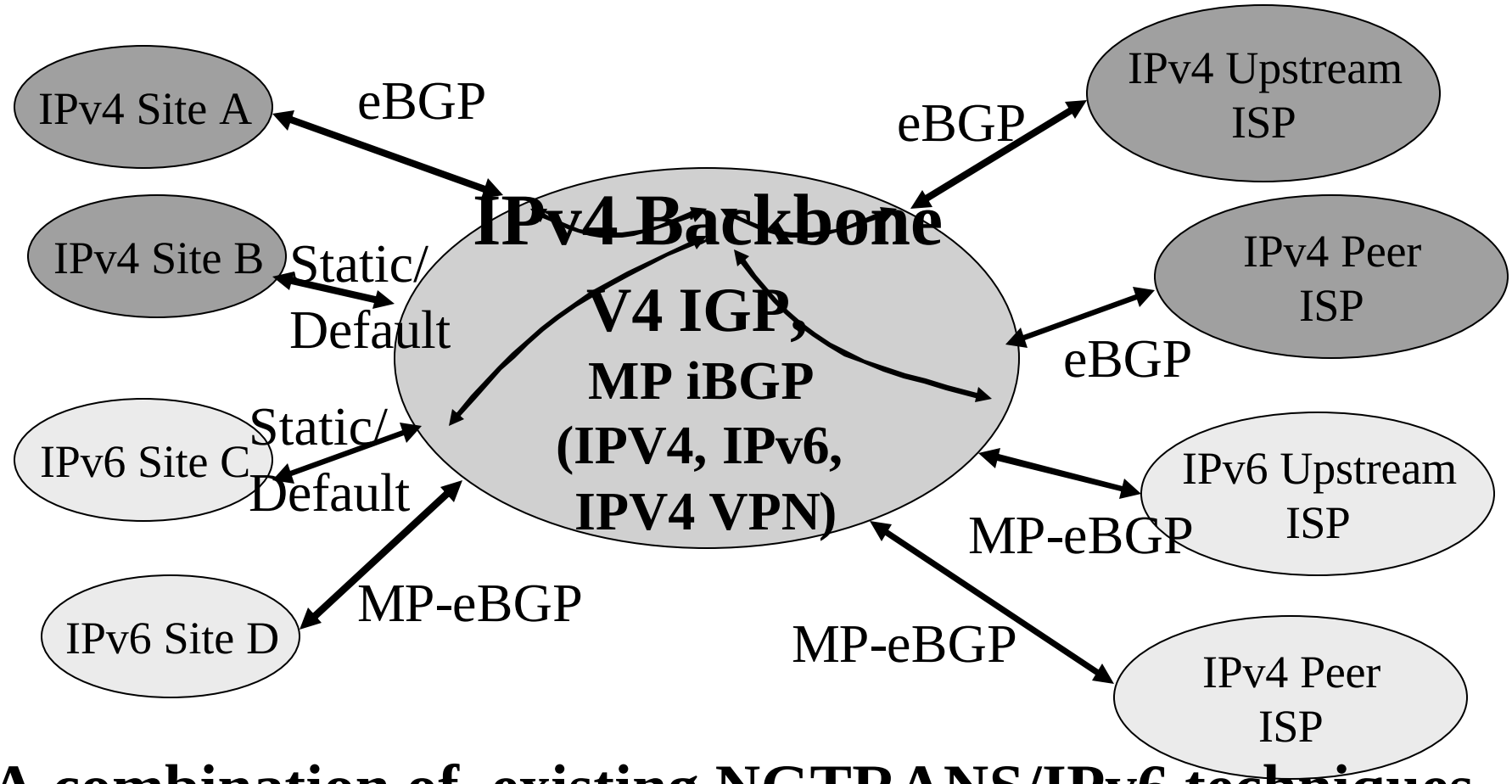

A combination of existing NGTRANS/IPv6 techniques (IPv4 mapped, raw tunneling)

Summary

- Two main scenarios for IPv4 SPs wanting to add IPv6 services without core upgrade
- Respectively addressed by two approaches (which are detailed in “draft-ietf-ngtrans-bgp-tunnel-04.txt):
  - MP-BGP over IPv6
  - MP-BGP over IPv4
- Those are particular combinations of NGTRANS/IPv6 techniques
- Implementations, tests, planned deployments

Proposal

- Feed this two Migration Cases (and associated Migration Solutions) into Cleeve's ISP Design Team document(s)
- Sorry, this is core stuff again…