

Softwires WG

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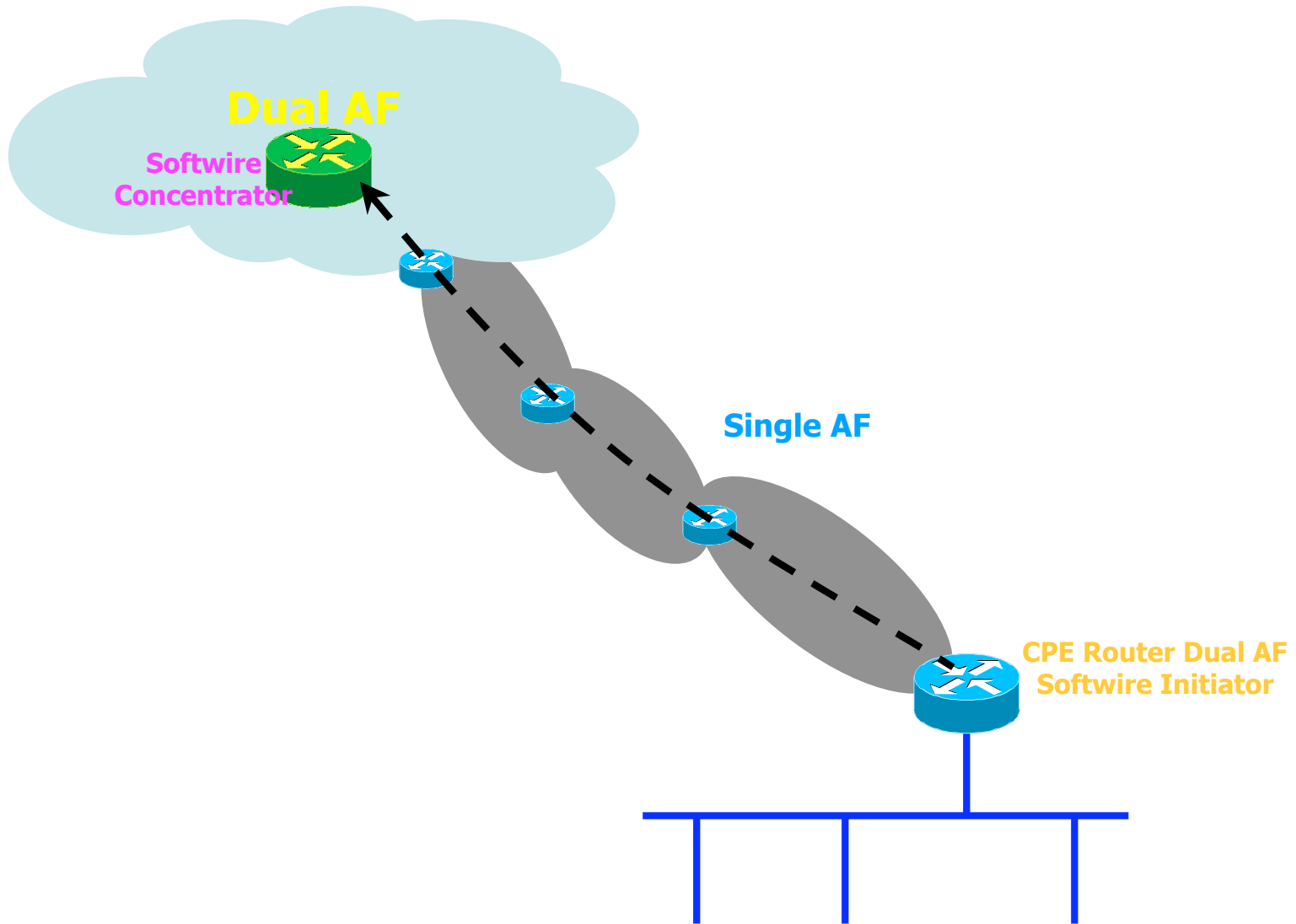
Hubs & Spokes Description

- ISPs with Dual Stack core and one or more dual stack Points of Presence (“Hubs”) where they connect their customers
- 2 issues have been identified (concurrent or not):
 - the networks between the CPE router and the hub supports only one address family
 - the CPE router cannot be easily upgraded to support both address families

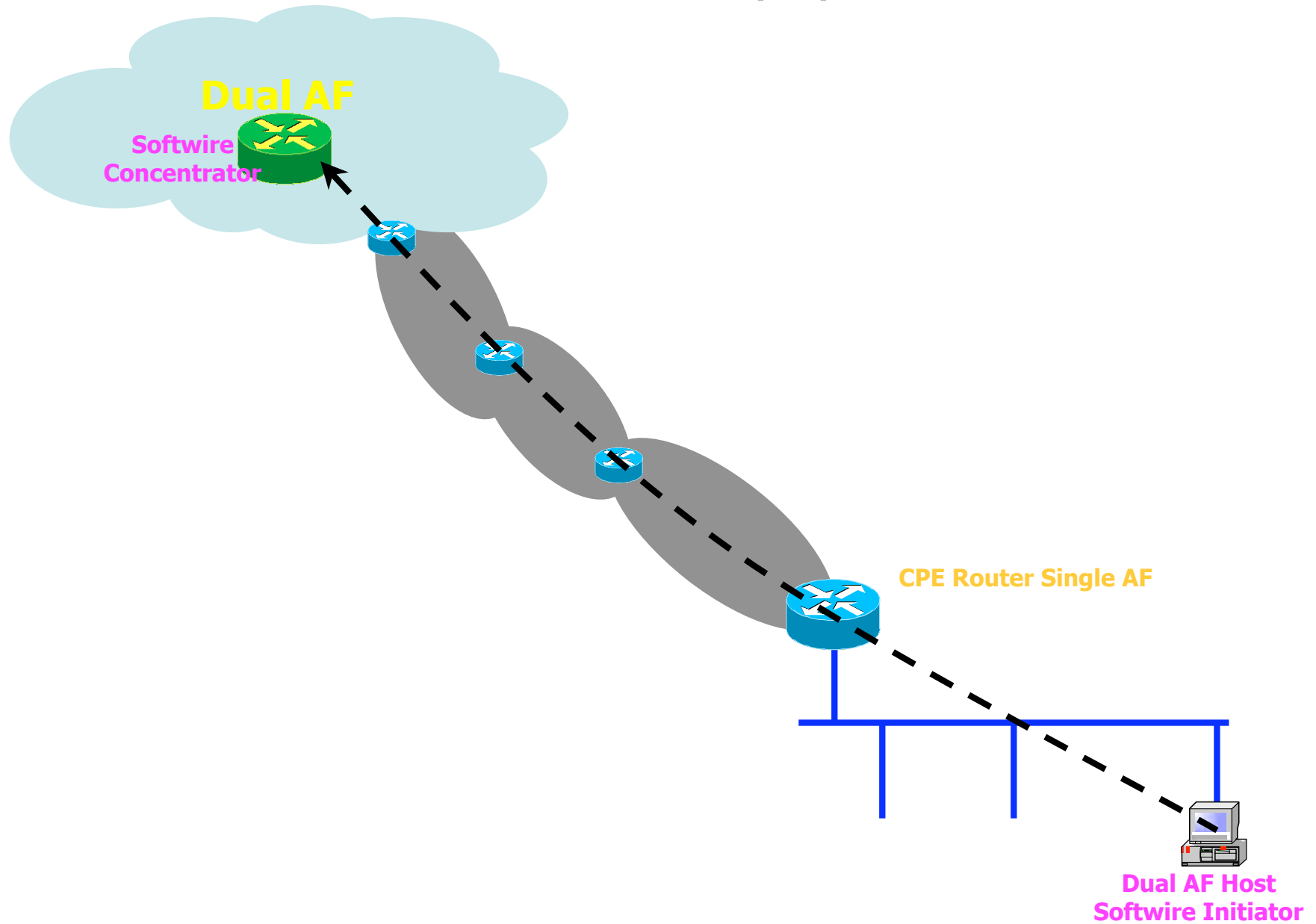
Hubs & Spokes Assumptions

- Assume NAT/PAT (in IPv4) may be present
- Assume non-upgradeable CPE router
- “Stable” IPv6 prefix desired
 - Not necessarily for the point-to-point link
- Softwires initiated by customer
 - Customer side: softwire initiator
 - May be a host or a router
 - ISP side: softwire concentrator
- Routing
 - Default route from softwire initiator to concentrator
 - CPE routers do not generally run a routing protocol, but the softwire solution will work even if it does

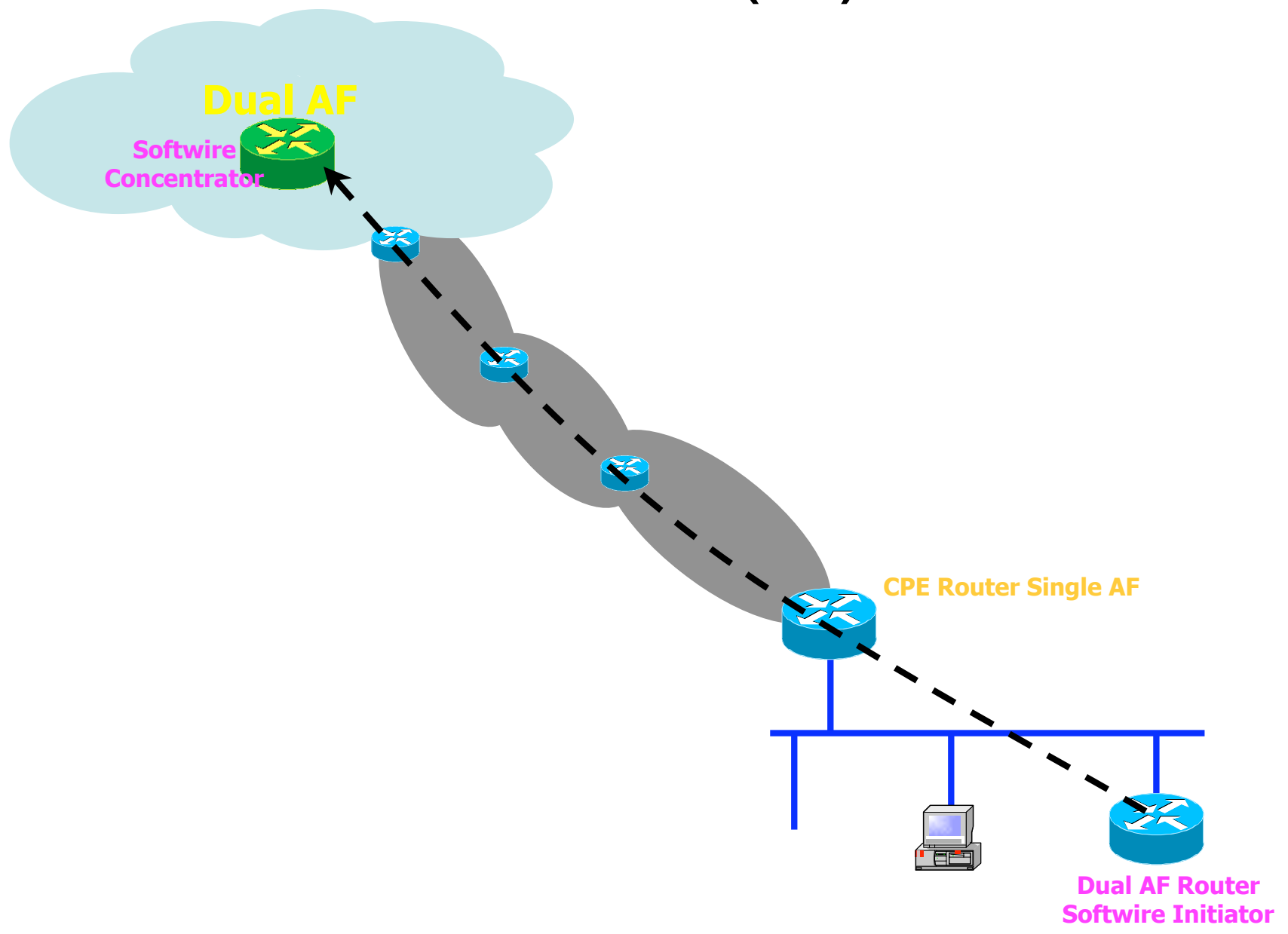
Cases (I)



Cases (II)



Cases (III)



Hubs & Spokes Properties (1)

- Scaling:
 - To the millions
- Set-up time:
 - A fraction of the total set-up time of the CPE router
- Multicast
 - Classic multicast solution run over the software

Hubs & Spokes Properties (2)

- Security
 - Must support simple user authentication
 - May be turned off
 - Must be able to support payload security when desired outside of the software mechanism
- Operation And Management
 - Keep alive
 - Usage accounting
 - End point failure detection
 - Path failure detection

Hubs & Spokes Encapsulations

- Critical path
 - IPv6/IPv4
 - IPv6/UDP/IPv4
 - IPv4/IPv6
- Other encapsulations which could also be supported at a later stage (for instance, IPv6/IPv6)

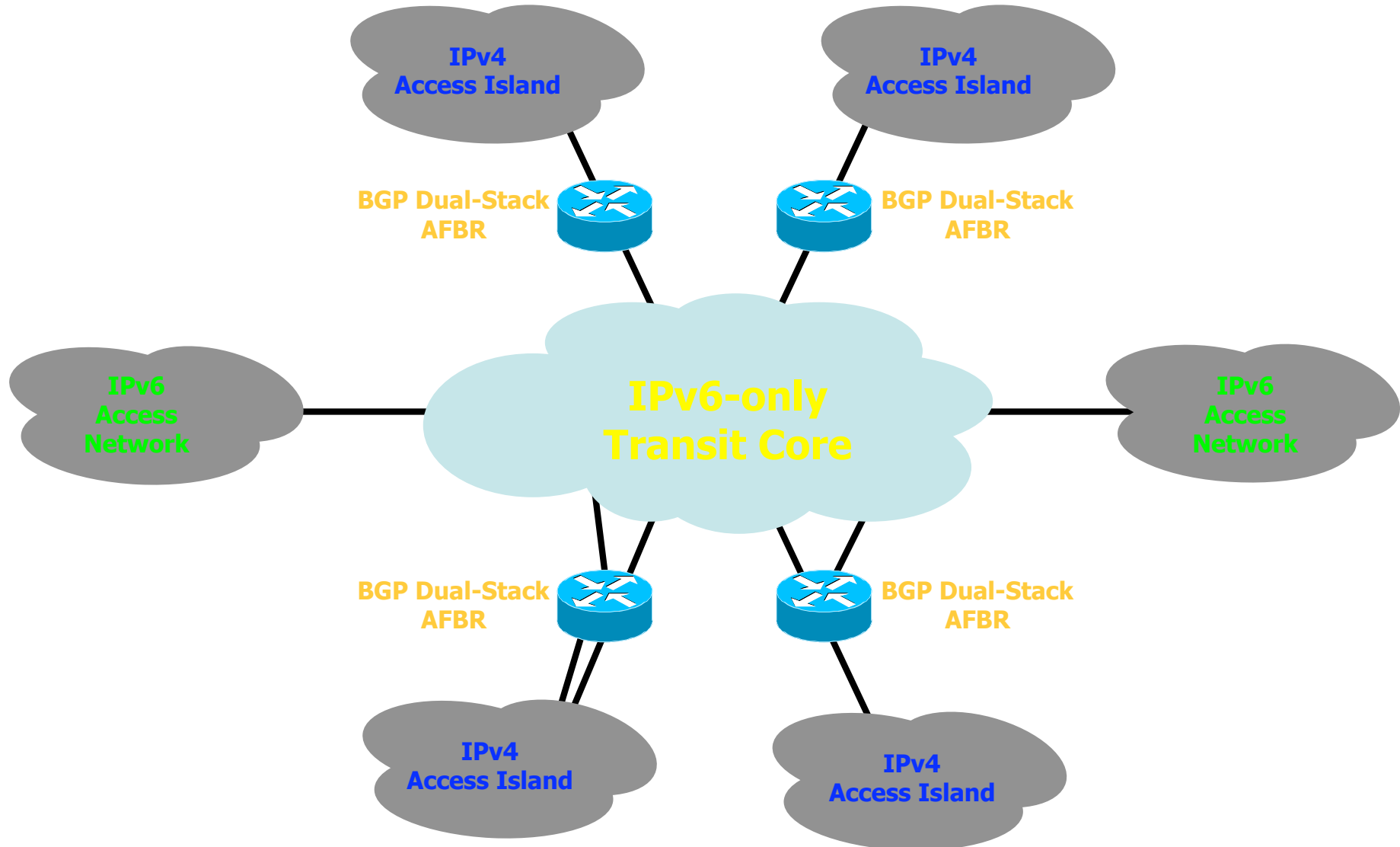
Mesh Description

- ISPs (or large enterprise networks acting as ISP for their internal resources) establish connectivity to 'islands' of networks of one address family type across a transit core of a differing address family type

AFBR

- To provide reachability across the transit core, dual-stack devices are installed that act as "Address Family Boundary Routers"
- AFBR provide peering across AS or within an AS (and act as PE)

Mesh Case



Mesh properties (1)

- **Scaling**
 - Number of AFBR related to the number of islands
 - Full routing table may need to be supported
- **Services / Encapsulation**
 - IPv4/IPv6, IPv6/IPv4, L2VPN, L3VPN
 - Multicast
- **Security**
 - No “user” authentication
 - Authentication for control plane
 - may be turned off
 - Support for IPsec in data plane (outside of softwires)

Mesh properties (2)

- Operation And Management
 - No need for keepalive
 - Usage accounting
 - End point failure detection
 - Path failure detection
 - Flexible encapsulation
 - Interconnection at L2 or L3
 - Can not require full mesh of all AFBRs