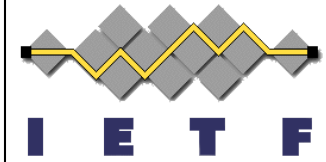


# Source/Destination Routing

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Fred Baker  
Cisco Systems



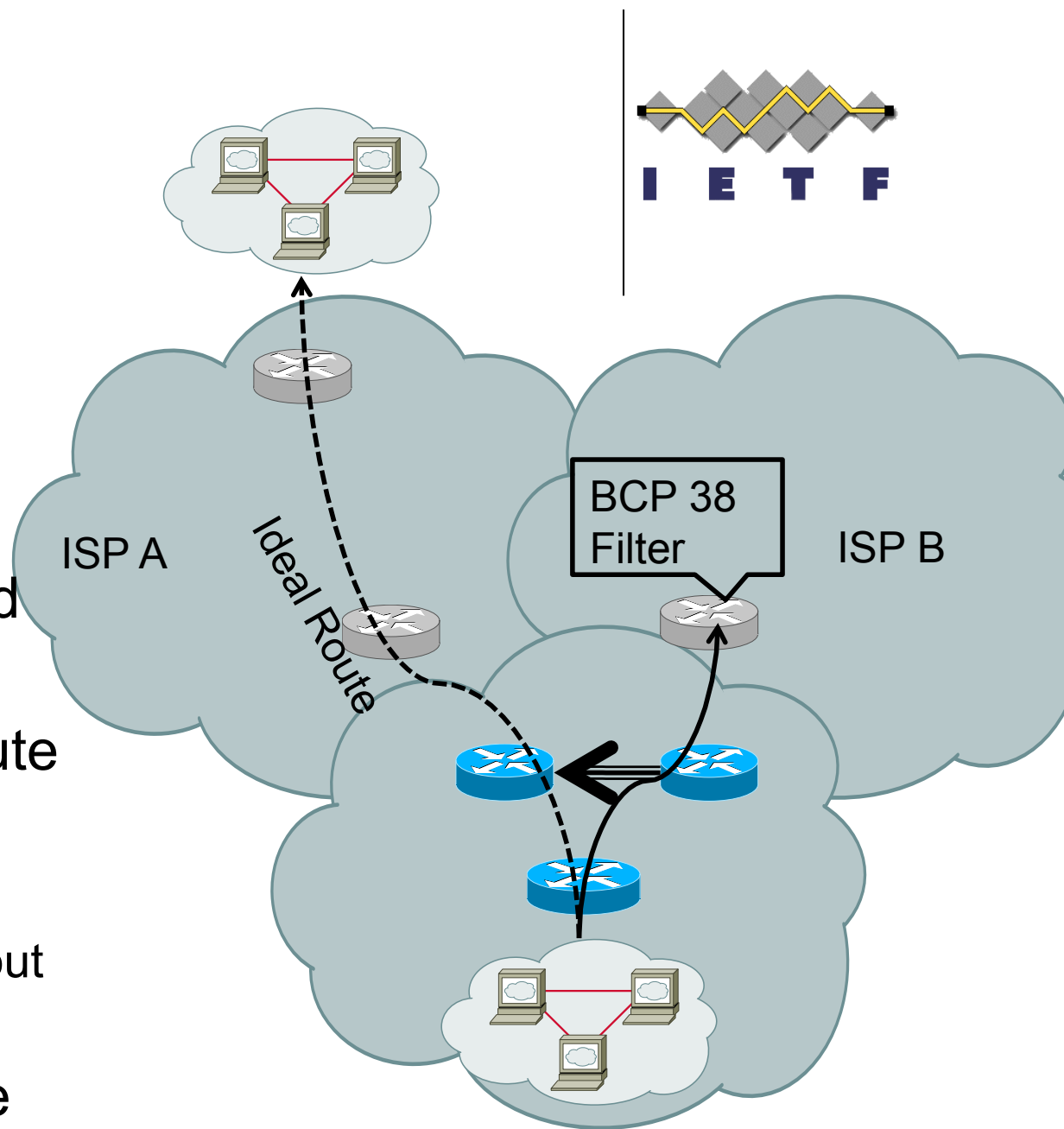


# Problem History

- Identified as a requirement soon after the deployment of BCP 38
  - Discussed as an objective in shim6 context
  - RFC 3704
  - Marcelo Bagnulo research (2003)
- Various efforts centering on homenet requirements
  - Troan & Colitti: draft-troan-homenet-sadr
  - Chroboczek & Boutier: draft-boutier-homenet-source-specific-routing
  - Baker: draft-baker-ipv6-ospf-dst-src-routing and draft-baker-ipv6-isis-dst-src-routing
  - Yang & Xu: draft-xu-homenet-traffic-class, draft-xu-homenet-twod-ip-routing

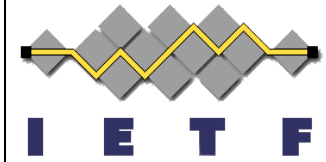
# RFC 3704

- Savola and Baker
- Suppose a session is opened up to a remote location in a multihomed network
- Suppose the default route takes it to the wrong egress
  - ISP A's source address but routed to ISP B
- Wouldn't it be nice if the packet got to the right egress somehow?



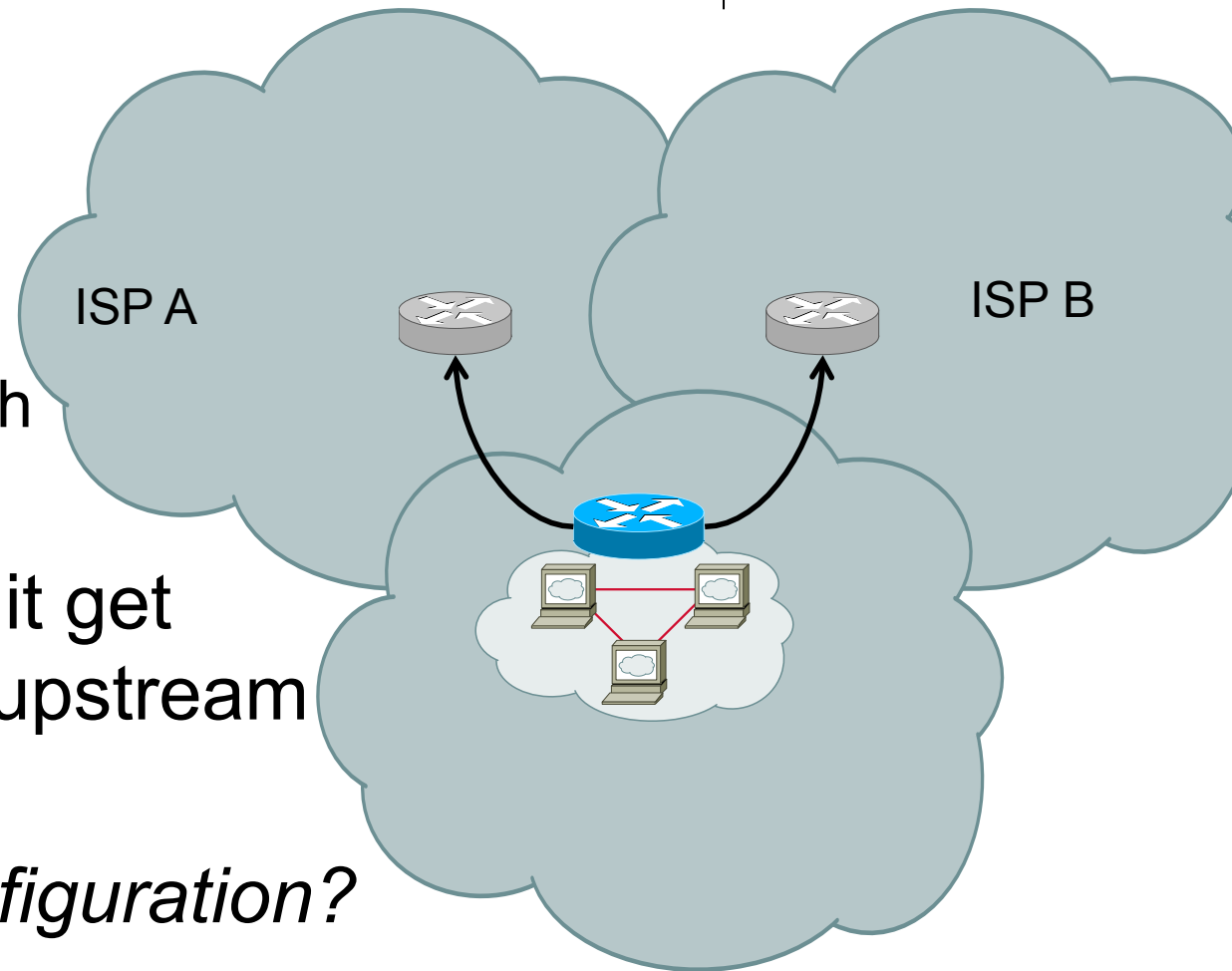


# USE CASES



# Homenet's first concern

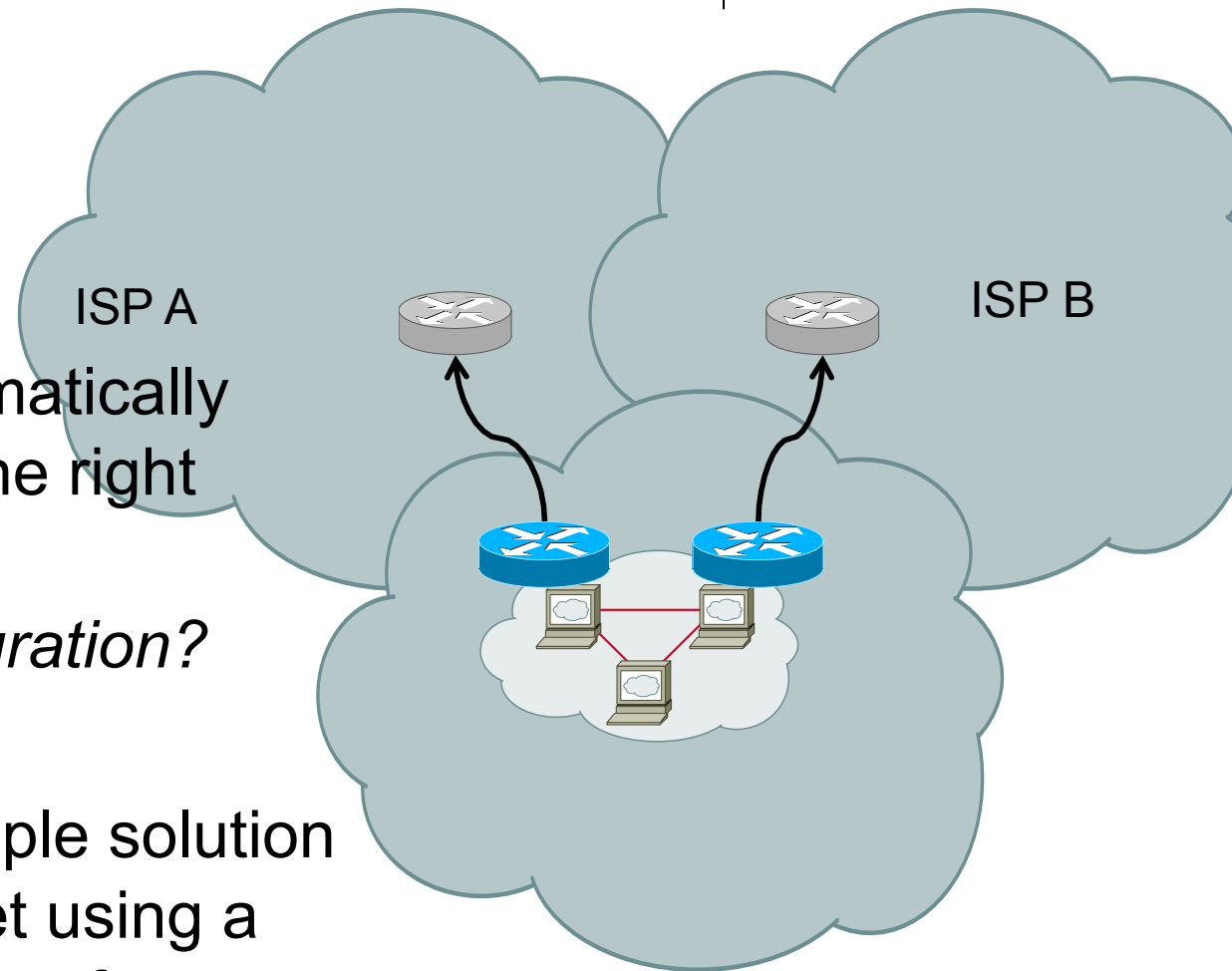
- A home with
  - one router,
  - two upstreams, and
  - a PA Prefix from each
- Is there a way to systematically have it get packets to the right upstream network?
- *Without manual configuration?*
- Might be solved from DHCPv6 IA\_PD



# But residential routers usually have one upstream...



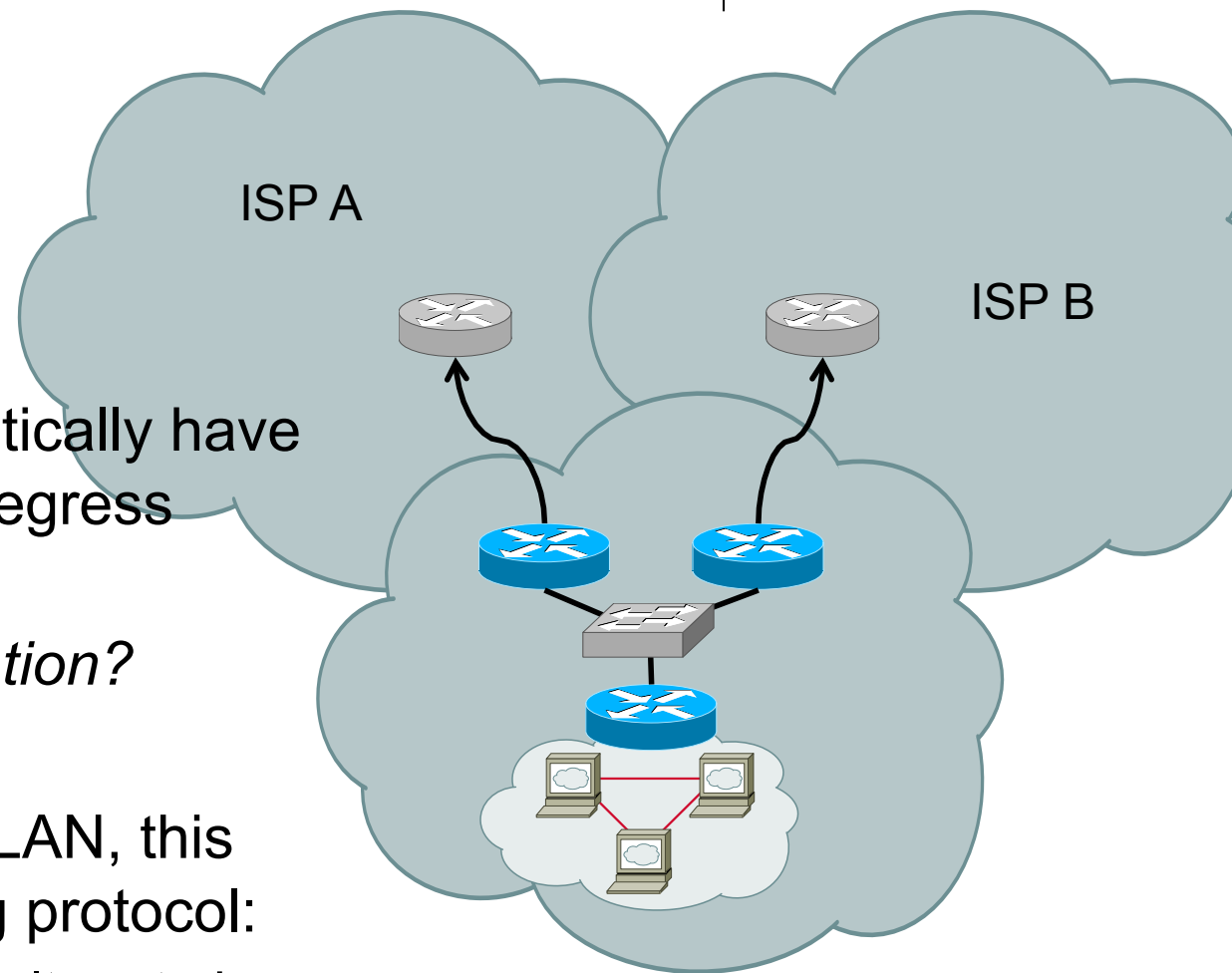
- A home with
  - multiple routers,
  - two upstreams, and
  - a PA Prefix from each
- Is there a way to systematically have it get packets to the right egress router?
- *Without manual configuration?*
- If there is one LAN, simple solution is for host to give packet using a source prefix to the router from which it learned a prefix





# Multi-LAN case

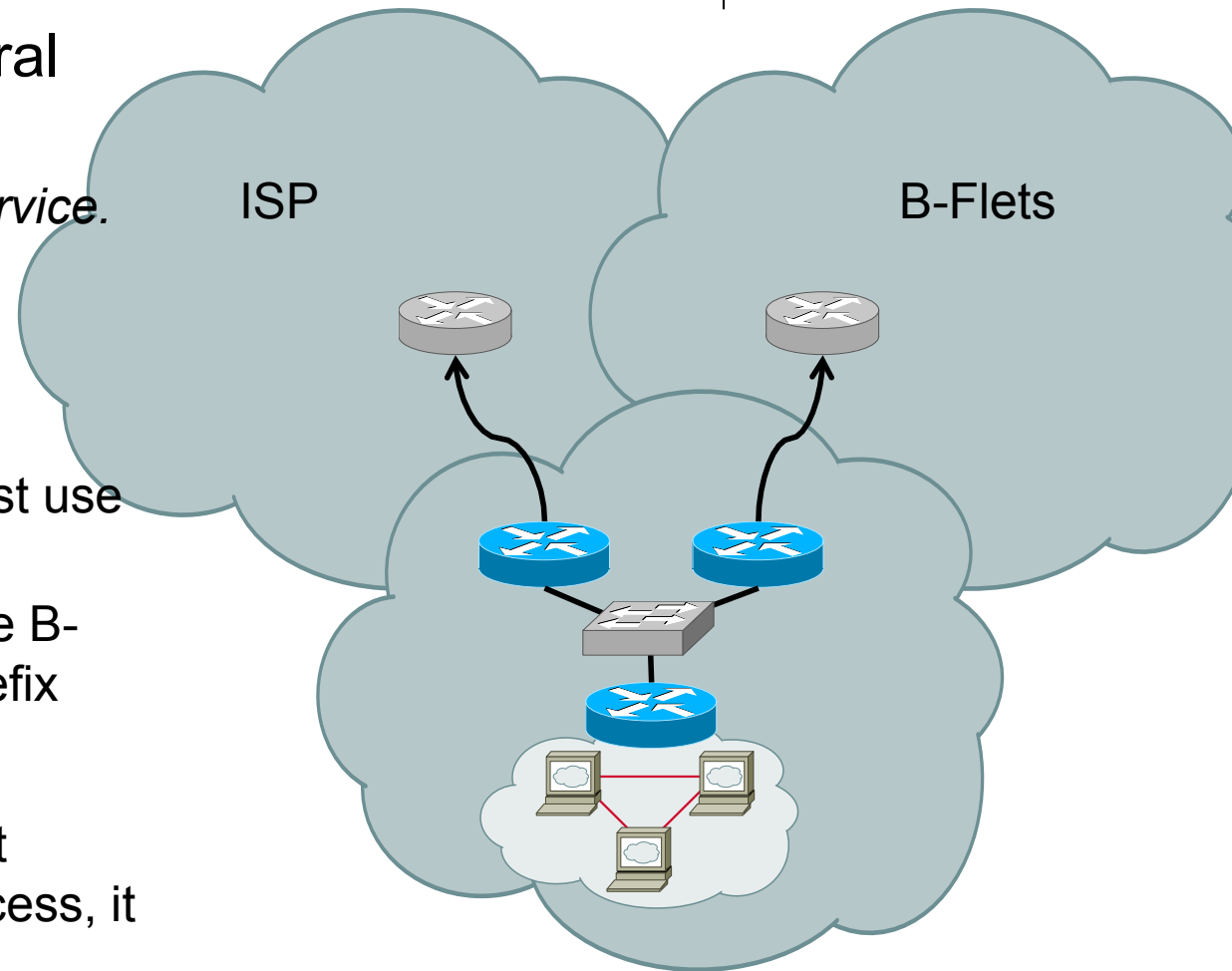
- A home with
  - Multiple routers,
  - Multiple LANs
  - Two upstreams, and
  - A PA Prefix from each
- Is there a way to systematically have it get packets to the right egress router?
- *Without manual configuration?*
- If there is more than one LAN, this begins to call for a routing protocol:
  - Separate routing for default route by source prefix



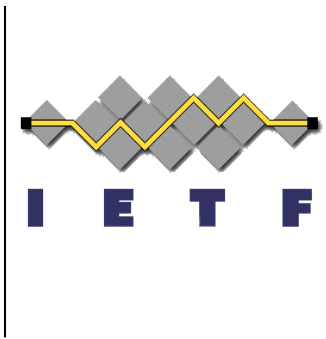


# NTT B-FLETS Case

- What if they are not general use ISPs?
  - *NTT B-FLETS is a video service.*
  - *It doesn't offer general ISP services*
- Source Prefix:
  - Traffic to consumer ISP must use ISP's source prefix
  - Traffic to B-FLETS must use B-FLETS-assigned source prefix
- Routing:
  - Although B-FLETS does not provide general Internet access, it advertises a default route
  - Ideally, that changes to advertising a route to B-FLETS







# Generalizing

- We need the ability to advertise and use a route
  - To a destination prefix (could be  $::/0$ )
  - From a source prefix (could be  $::/0$ )
- Ambiguity issues
  - There are a number of potentially ambiguous cases
  - Resolution similar to longest-match rule
  - *Use the FIB entry with the longest destination match that also matches the source*