

Adaptive Unicast to Multicast Forwarding

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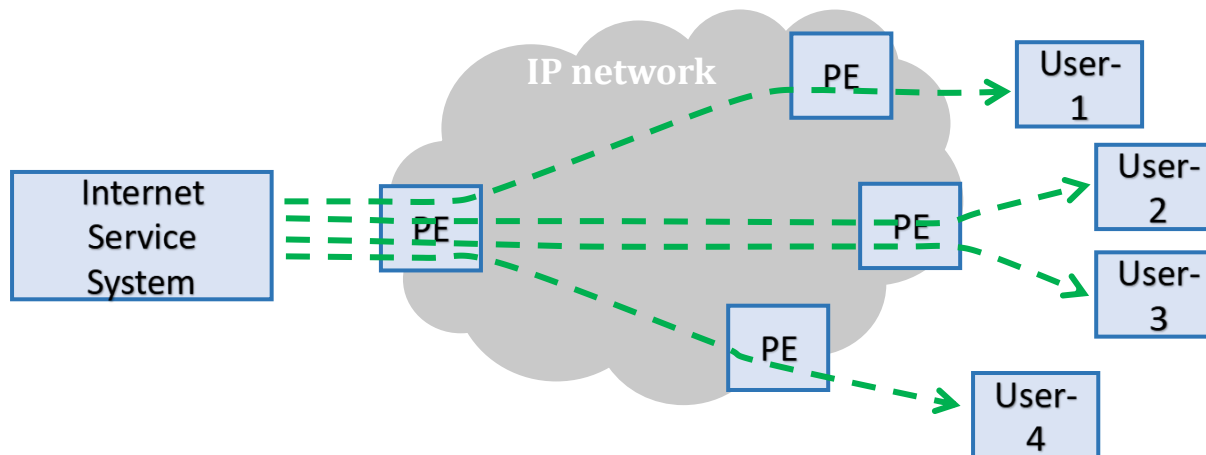
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IETF-121

Background

Current status of **point to multipoint** Internet service:

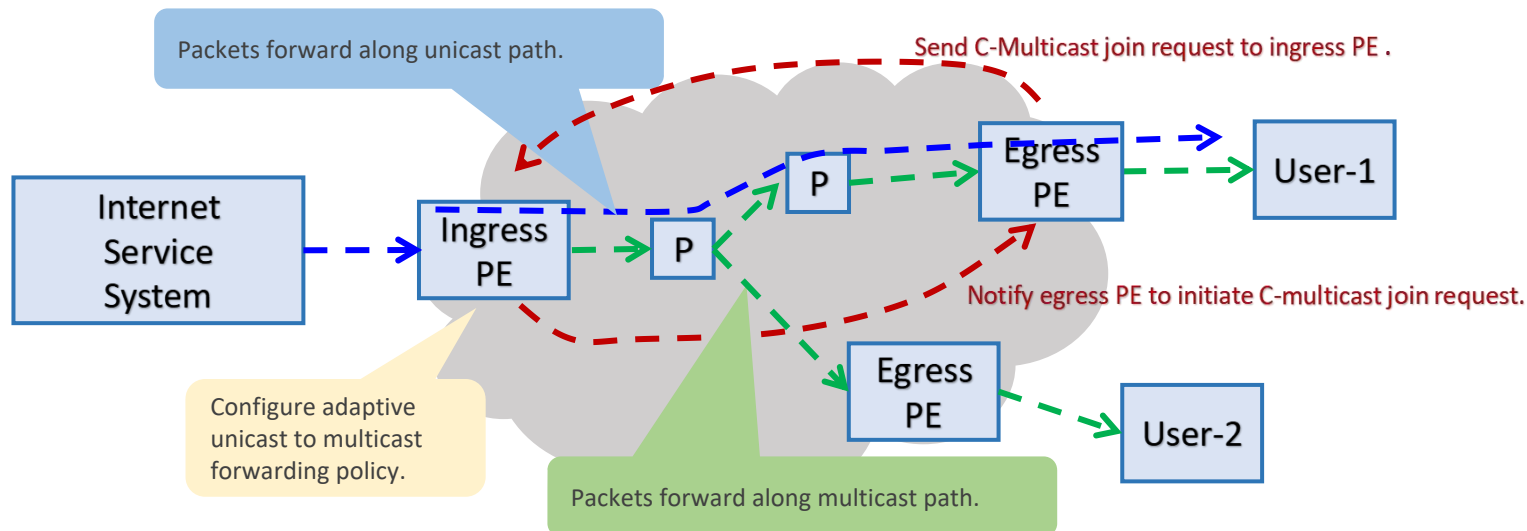
- Internet service systems don't support multicast
 - Need large scale transformation for multicast upgrade of service system, but lack driving force
- Through unicast forwarding, the bandwidth pressure on the carrier network is enormous
 - Redundant traffic for the same service : thousands of identical unicast traffic between edge service nodes and end users
 - Difficulty in improving the network quality of own service while occupying the bandwidth of other services



U2M Mechanism

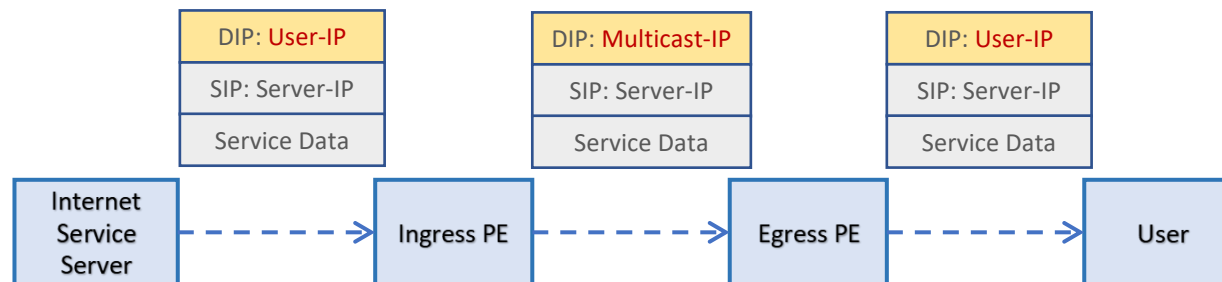
Based on existing multicast forwarding mechanisms (PIM, P2MP MPLS, BIER, etc.), unicast service packets with the same characteristics are converted into multicast packets and sent to multiple end users along the multicast tree

- Configure adaptive optimization policy on ingress PE, and specify the mapping relationship between unicast flow characteristics, multicast IP addresses and user IP addresses
- At the beginning, the ingress PE forwards the service traffic along the unicast forwarding path
- After receiving the stable service traffic with specified characteristics, the ingress PE sends a notification to the egress PE of the user to trigger the egress PE to send a C-Multicast join request
- The egress PE adds a mapping relationship entry and sends a C-Multicast join request to the ingress PE to join the corresponding multicast group

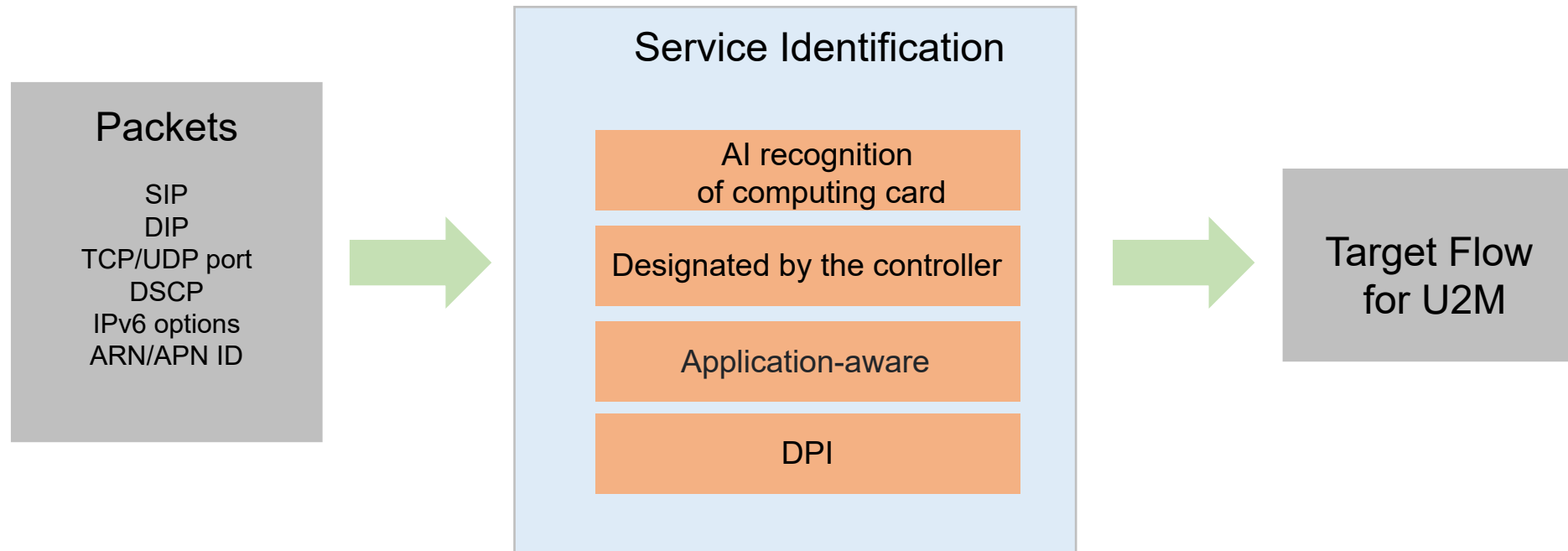


Packet Forwarding Process

- After receiving a packet from the server, ingress PE identifies the unicast packet that needs adaptive forwarding optimization based on the flow characteristics
- Ingress PE searches the mapping relationship table, replaces DIP with a multicast group address, and converts the identified unicast traffic into the corresponding multicast traffic
- According to the updated DIP, ingress PE forwards the message on the multicast forwarding path
- After receiving the multicast traffic, egress PE replaces DIP with the user' IP, and restores the multicast traffic to a unicast traffic based on the mapping relationship
- According to the DIP, egress PE sends the traffic to the user



Identification of Unicast Traffic



Updates from-00 to -01

- Clarified the difference between AMT and this draft in Section 1
- Added Section 2 for describing use cases
- Added description for identification of unicast traffic

Next Step

- More questions and comments
- Ask for WG adoption