1. Use of egress-ingress router HID pair for Opaque fields in SCION header information.
   a. Alternative is to use egress-ingress port numbers in the border routers. This needs adding a new XID type for port id.
2. SCION data packet forwarding inside the AD.
   a. Option 1: All routers inside the AD can read the SCION header in the packet to figure out the egress router HID, and forward based on it. Border routers should verify OFs in SCION header before it forwards the packet.
   b. Option 2: Border routers read the SCION header in the packet to figure out the egress router HID, verifies the OF MAC, then the border router encapsulates the SCION data packet with new DAG destined to egress router HID.
      i. For example, [• → XION(AD1) → HID(H1)] is transformed to: [• → HID(egress-router)][• → XION(AD1) → HID(H1)].
   c. Option 3: Border routers read the SCION header in the packet to figure out the egress router HID, verifies the OF MAC, then router mangles the DAG to add egress router HID on top of the XION node.
      i. For example, [• → XION(AD1) → HID(H1)] is transformed to [• → HID(egress-router) → XION(AD1) → HID(H1)].
3. SCION services inside an AD. (Architecture diagram)
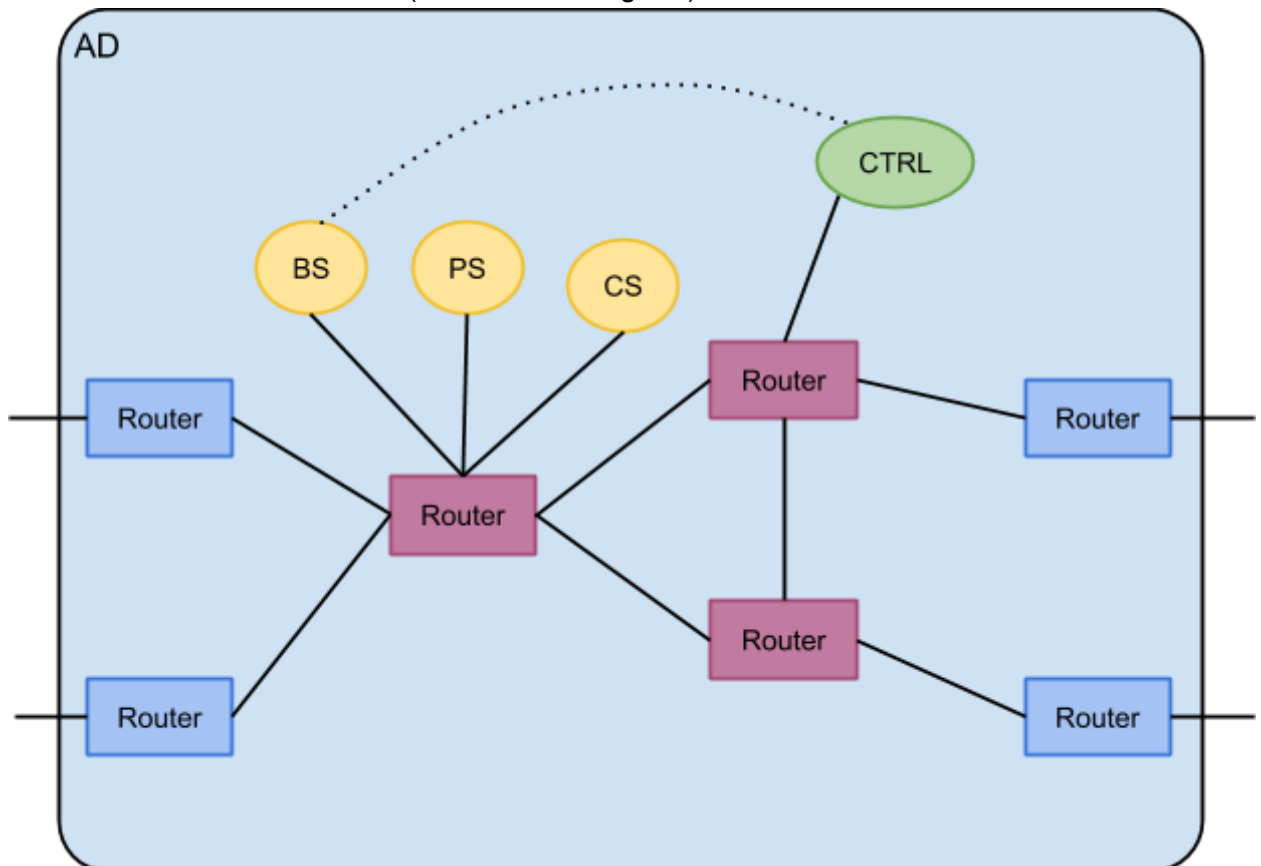
4. SCION PCB generation/propagation by Beacon Server
   a. Check if TDC
      i. If TDC then generate new PCB

      ii.   Else receive PCB then verify previous OF signatures in PCB
- b. For every link (AD(self) → HID(egress), AD(child or peer) → HID(ingress)) crossing over to child/peer ADs
  - i. Add HID(egress) to current OF and compute MAC for the OF
  - ii. Sign current OF
  - iii. Add HID(ingress) to next OF
  - iv. Send PCB with destination DAG
    [• → HID(egress) → HID(ingress) → SID(BS)]
5. Border router's architecture diagram.
   - a. Option 2 (2b):
     - i. Ingress router: Parses SCION header, figures out egress router HID, encapsulates the packet with this HID, and sends it to interior router.
     - ii. Egress router: Decapsulates the packet, figures out the ingress router in neighboring AD from SCION header, and forwards to neighboring AD via the explicit link specified by egress-ingress router pair.
   - b. Option 3 (2c):
     - i. Ingress router: Parses SCION header, figures out egress router HID, mangles the DAG by adding egress router HID into it, and sends out the packet to interior router.
     - ii. Egress router: Figures out the ingress router in neighboring AD from SCION header, replaces egress router HID with ingress router HID of neighboring AD, and forwards based on it.