Replay/Freshness Viewpoint/Framing

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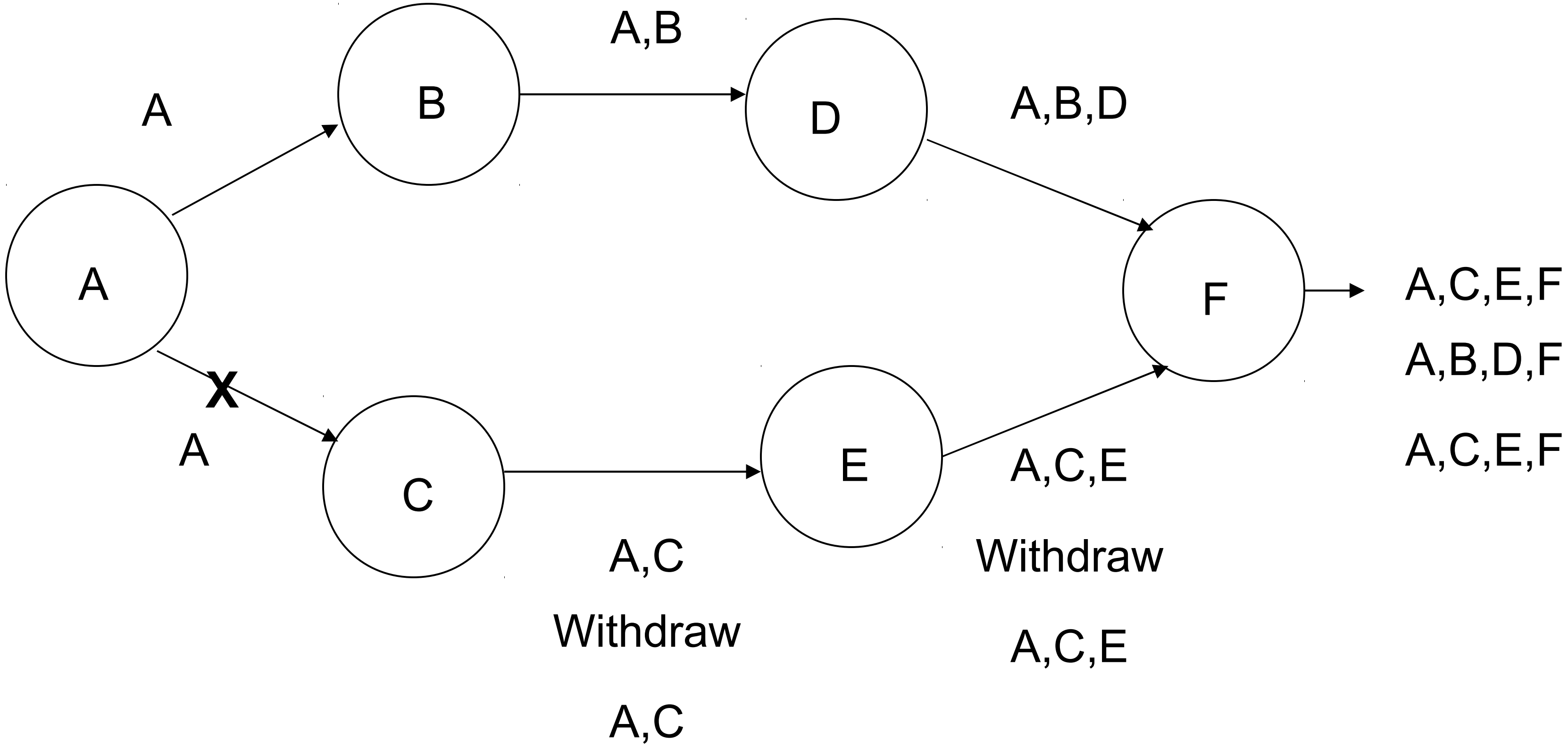
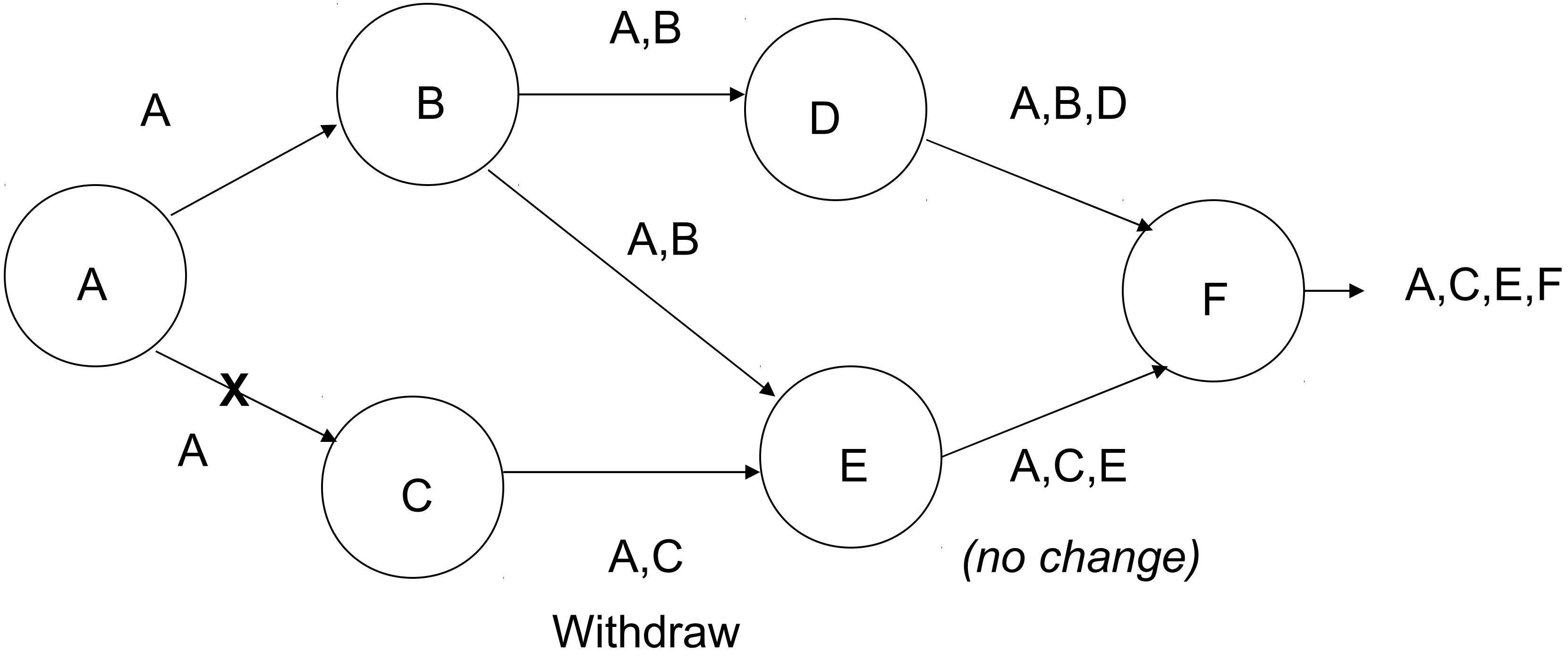
Replay and Freshness

- BGP fundamental behavior is that
  - the system retains state until replaced or withdrawn
  - which works because protocol assumes
    - state is always fresh – changes at one router are propagated
    - state changes are ordered – propagated state represents most recent change received
- This means that replay and failure to propagate changes violate fundamental assumptions
- Classic responses:
  - Order updates – sequence numbers, timestamps
  - Provide state decay – expiration times, etc.

Replay Picture



Staleness Picture



From IETF82 - Lepinski

- An additional goal of BGPSEC is to prevent someone that you used to do business with from replaying stale information to keep attracting your traffic

From IETF82-Lepinski: Preventing Replay Attacks

- Properties of replay attacks
  - Business relationships change on a slow time-scale
  - May be more difficult for humans to detect replay attacks than other types of route hijacking
- Current -01 draft has an expire-time mechanism to limit vulnerability to replay attacks
  - Goal of this mechanism is just to make sure that ancient business relationships do not come back to haunt you
  - Intent is that validity periods will be long, because business relationships don’t change overnight

From IETF82: Preventing Replay Attacks

- There has been active discussion on the list on
  - Whether the benefits (replay protection) of the current expire-time mechanism are worth the cost
  - Concerns about the dangers of a misbehaving party who “beacons” too often
  - Possible alternative mechanisms
- We are not going to solve all this today
  - In order to have an informed debate about this mechanism, we probably need a better analysis of what is truly the cost of the current mechanism