TURN
draft-ietf-behave-turn-11

Philip Matthews

Rohan Mahy

Jonathan Rosenberg

Recent work on TURN

- Two versions since Dublin: TURN-10 and TURN-11
- TURN-11 currently in WGLC

Changes: -09 to -11 (1 of 8)

- Added CreatePermission transaction
  - Permissions can only be created/updated by an authenticated transaction (CreatePermission or ChannelBind transactions)
  - Send indication and ChannelData messages no longer affect permission
  - Must create a permission before sending to a peer, to avoid attack found by Cullen
  - Can create/update multiple permissions in one CreatePermission transaction
    - Reduces the overhead of managing permissions.

Changes: -09 to -11 (2 of 8)

- Added DONT-FRAGMENT attribute
  - Include in Send indication to request that DF bit be set when sending to peer
  - Include in Allocate request to test whether server can support
  - Allows a limited form of Path MTU Discovery

Changes: -09 to -11 (3 of 8)

- Changed how ALTERNATE-SERVER attribute is used
  - Must only use with error code 300 (Try Alternative)
    - Previously allowed with other error codes
  - May appear in unauthenticated responses
    - Previously, only allowed iin authenticated responses
  - Allows anycast discovery of TURN servers

Changes: -09 to -11 (4 of 8)

- Removed concept of preserving allocations
  - Simplified document; concept can be added later
- Replaced REQUESTED-PROPS with EVEN-PORT
  - Can request an even port number, or an even port number with next higher port number reserved
  - Removes concept of “flags” for future extensions
    - Now, only way to signal a new feature is through a new comprehension-optional attribute

Changes: -09 to -11 (5 of 8)

- Reduced the range of channel numbers
  - Now: 0x4000 through 0x7FFF
  - 0x8000 through 0xFFFF reserved
    - Allows for future extensions
- Allow 508 responses for any capacity problem
  - Allows a server to fail attempts to create a new permssion or channel due to memory constraints, etc.

Changes: -09 to -11 (6 of 8)

- Corrected “SOFTWARE-TYPE” to “SOFTWARE”
  - Recommended only in Allocate and Refresh transactions, though can be used elsewhere
- Renamed attributes: XOR-PEER-ADDESS and XOR-RELAYED-ADDRESS
- Minor changes to semanics of Allocate, Refresh, and ChannelBind to support idempotency over UDP transport.

Changes: -09 to -11 (7 of 8)

- Allow server to restrict range of addresses and ports that can be specified as a peer.
- Client must now wait 5 minutes after a channel binding expires before reusing the channel number or the transport address in another binding.
- Recommended that the server impose quotas on the number of allocations and the bandwidth used by given username at any one time.

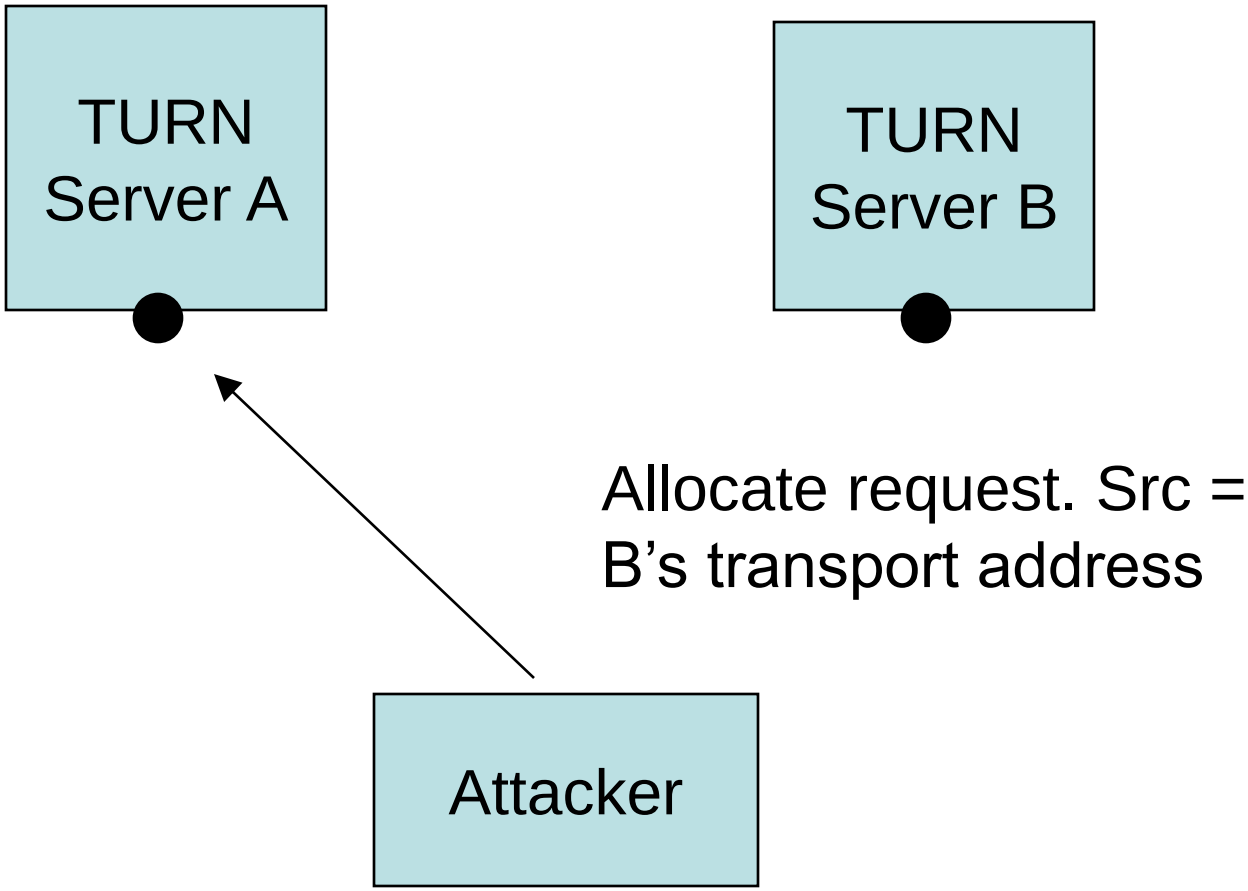
Changes: -09 to -11 (8 of 8)

- Removed all support of IPv6 to TURN-IPv6
- Added a long and detailed example
  - Includes attribute values
- Various other minor changes. See section 21 in the document for details.

Issue 1: TURN server names

- Spec says:
  - By default, TURN runs on the same port as STUN
  - TURN uses new SRV service names “_turn” and “_turns”
- Can IANA handle this? Can one allocate a service name without allocating a new port number?

Issue 2: TURN Loop Attack

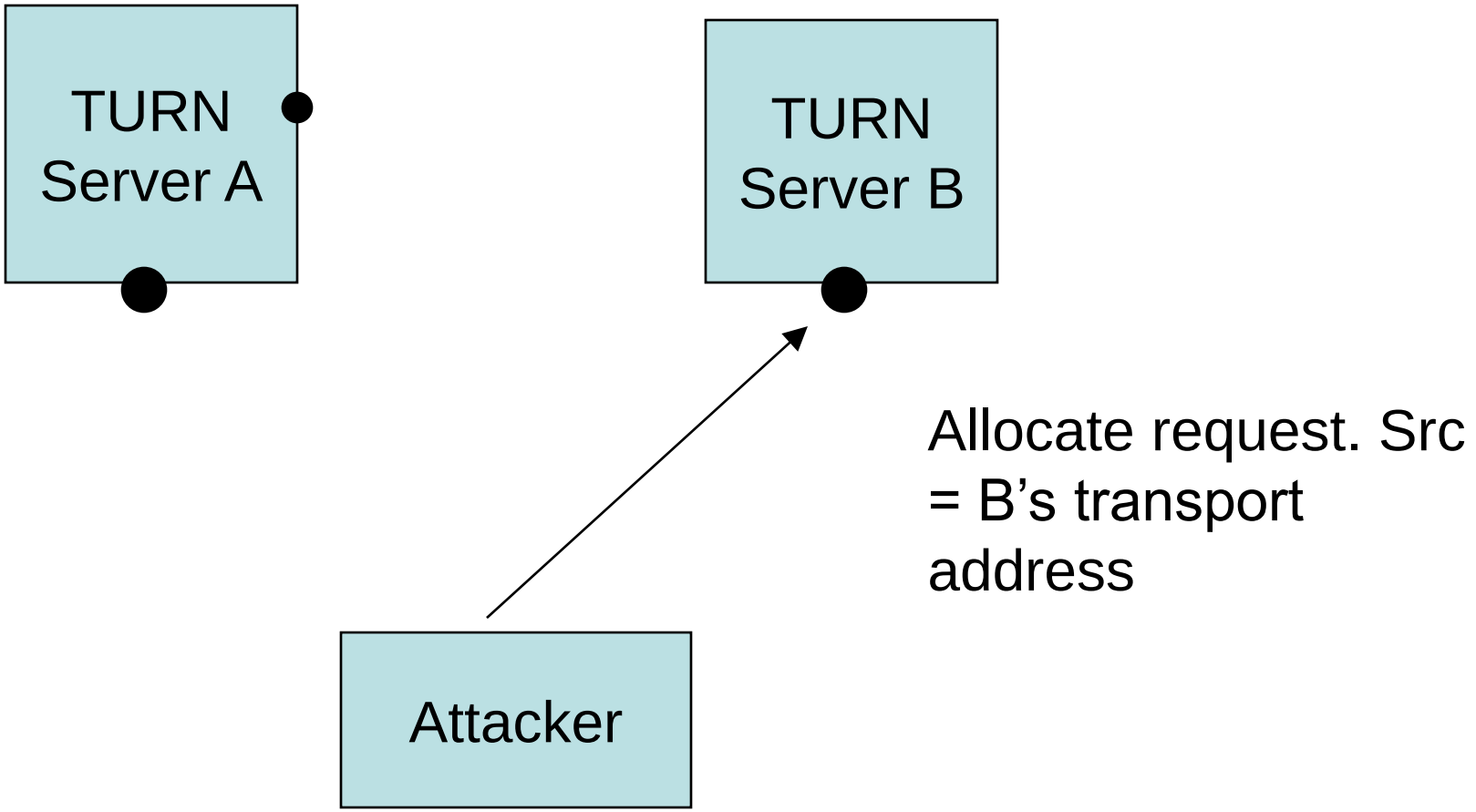


Issue 2: TURN Loop Attack

Allocate response.

Critical assumption: attacker can see response

Issue 2: TURN Loop Attack

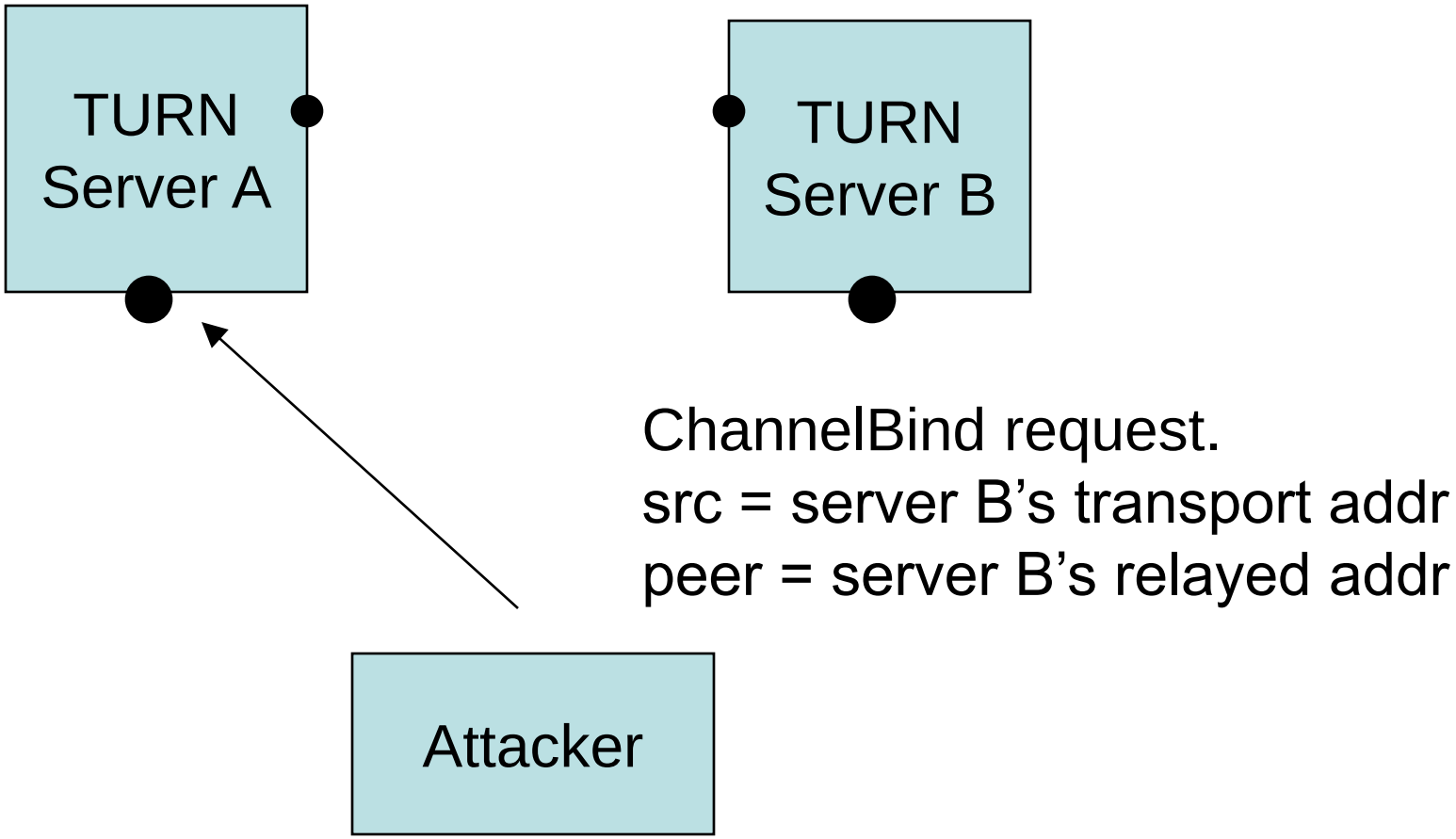


Issue 2: TURN Loop Attack

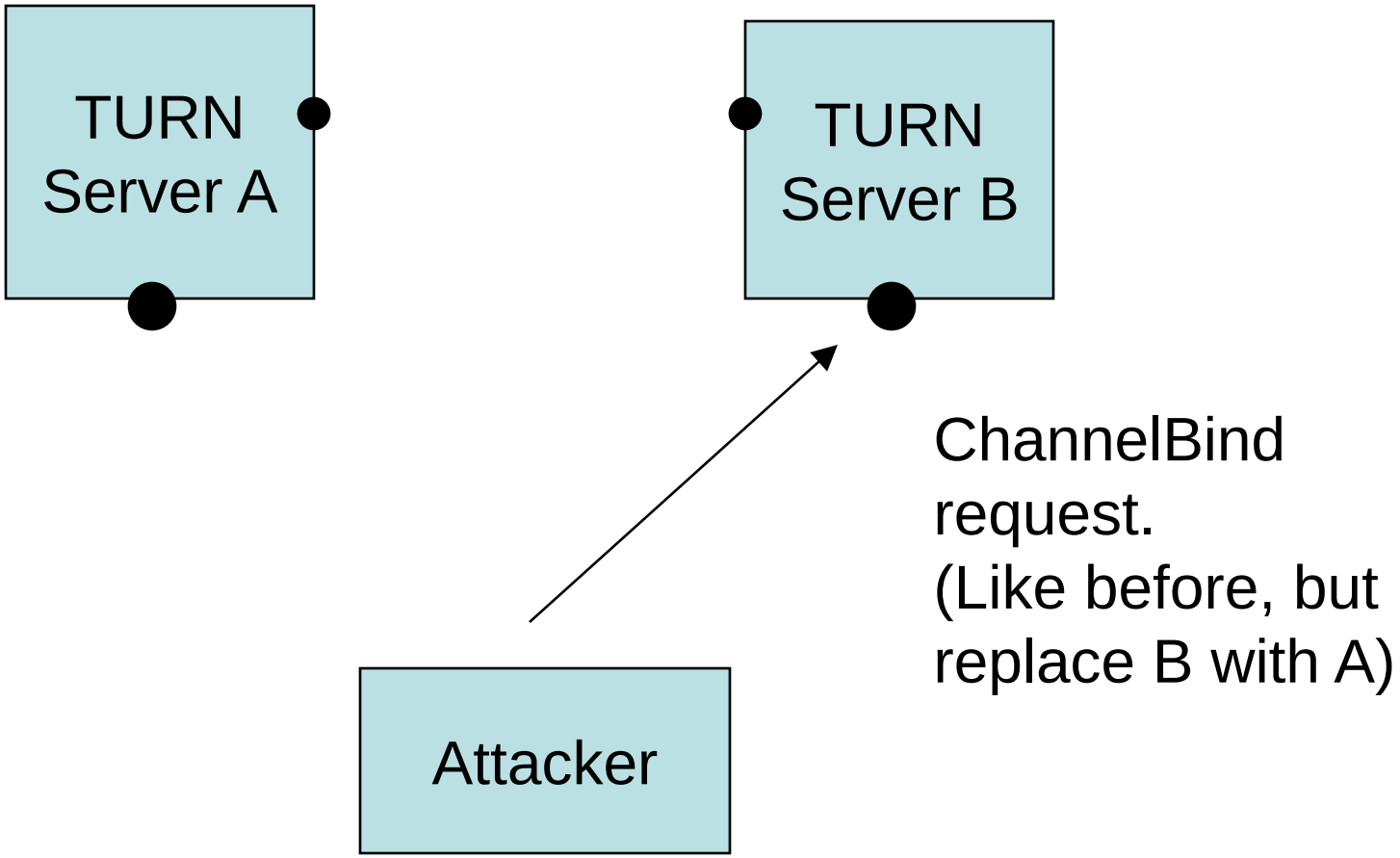
Allocate response.

Critical assumption: attacker can see response

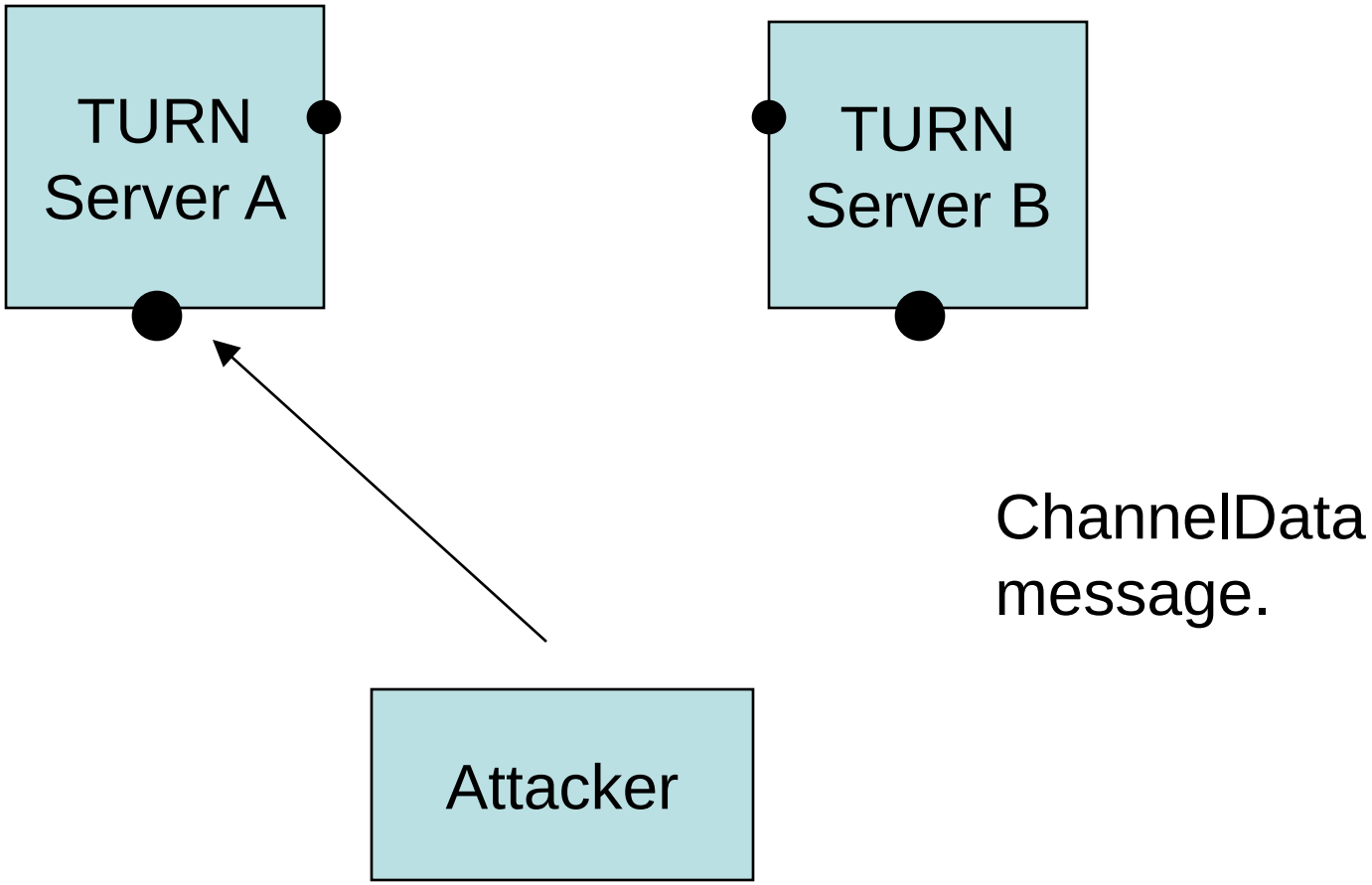
Issue 2: TURN Loop Attack



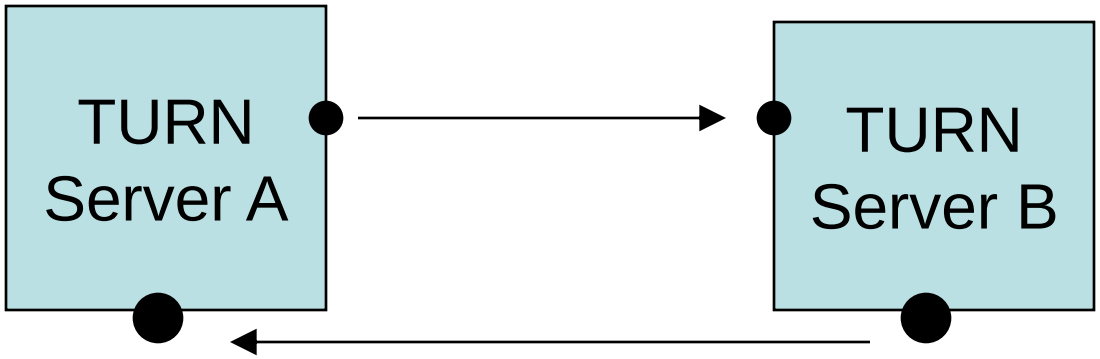
Issue 2: TURN Loop Attack



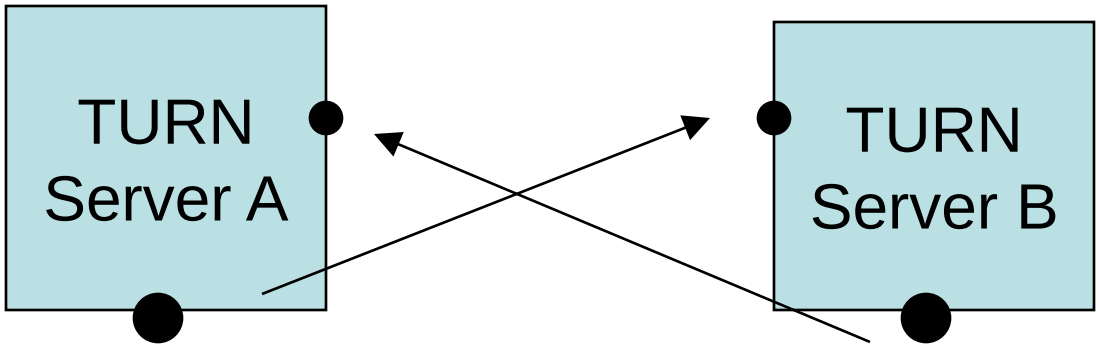
Issue 2: TURN Loop Attack



Issue 2: TURN Loop Attack



Issue 2: TURN Loop Attack variant



Loop

Attacker

Issue 2: TURN Loop Attack

- Assumptions:
  - At least one server does not decrement the TTL
  - If both servers use authentication, then attacker needs to be able to see Allocate responses even through they are addressed to the other TURN server.
    - If no authentication, then attacker might be able to guess the allocated relayed-transport-address
- Proposal:
  - Mention this attack in document
  - This is another reason servers should use authentication
  - Document already says that servers should decrement TTL if they can
  - Don’t do anything more

Finally …

- Please read and comment during WGLC period!