AMT Draft Recommendations

March 30, 2011

Handling NAT

Problem:

- Network Address Translation is not specifically considered in the draft
- With NAT, multiple GWs may attempt to establish tunnels using the same external source IP address
- Some types of NAT devices (Symmetric NAT) may use different external source ports depending upon the destination address.
- Therefore GW messages to the Relay anycast address (Discovery) and messages to the Relay unicast address (AMT Request and AMT Update) may arrive with different source ports from a single GW

Recommendation:

- Relay must track GWs using both Source IP address and Source Port
- AMT GW should use the same local source port for all its messages to the Relay (especially all 3-way handshake messages)
- Relay should start tunnel only with the 3-way handshake (not Discovery)

Handling NAT (cont'd) - A reporting issue

Problem:

- Reporting Issue:
  - It may be useful for GW (or associated app) to record usage log
  - It may be useful to correlate these logs with AMT Relay logs
  - AMT GW may have no knowledge of the external source IP address and port as it was perceived by the AMT Relay (due to NAT)

Recommendation:

- The Relay could inform the AMT GW of the actual source IP address and port
- Previously, recommendation was made to pass this information back in the Relay Advertisement message. However, due to Symmetric NAT, recommendation is now to pass this information back in the AMT Query message.
- The information would be tagged on to end of the AMT Query message as an option. The presence of the optional data would be signaled in the Reserved field.

Handling NAT (cont'd) – GW Address Changes

Problem:

- Handling GW Address Changes:
  - GW's external address (Source IP, port) can change:
    - Shift from wireline to WiFi, etc.
    - NAT device reboot or DHCP renew
  - GW will present itself as a "new" tunnel to the Relay
  - Relay resources can be temporarily wasted as old tunnel cannot be torn down until Relay times it out
  - In some cases, the client may receive duplicate copies of the multicast stream until the Relay times out the "old" GW. For constrained local access networks, this could cause congestion problems for the end user.
  - The GW is able to detect a change in the local network interface, which would cover most of these scenarios, but not a change in upstream NAT address

Recommendation:

- Have mechanism whereby the GW when it detects a change could teardown the "old" tunnel
- Teardown message was introduced for this purpose
- Since the AMT GW would need to know it's external address, there is a dependency upon the enhanced AMT Query message (per previous slide)

Discovery – When to do?

Problem:

- Current AMT draft is ambiguous on when the AMT GW should do Discovery
  - Mentions both that it could do at startup and also that it should do to establish tunnel
  - Periodic refresh (e.g. every 24 hours) of Discovery is also mentioned
- Doing Discovery only at startup has issue that network/Relay conditions could change over time - thus, the "best" Relay available may have changed between startup and 1st join
- Doing periodic Discovery may have performance considerations when changing Relays mid-stream
- If the AMT Relay uses the Discovery to reserve resources, it is susceptible to DoS attacks using Discovery

Recommendation:

- Clarify draft to be specific that a Discovery is recommended by the AMT GW just prior to the start of each tunnel
- However, the Relay should not use the Discovery to establish the tunnel due to Symmetric NAT issue and DoS issue. It should establish tunnel at the 1st successful join from GW
- Periodic Discovery should be an option left as implementation issue. If changing Relays mid-stream, GW may use the Teardown message to clean up tunnel at "old" Relay

Relay Anycast

Problem:

- Current AMT Draft has specific guideline for determining Relay Anycast which is too restrictive:
  - Setting the low-order octet of the AMT Relay Anycast Prefix to 1

Recommendation:

- Allow AMT Relay Anycast to be any host address
- AMT GW could be hard-coded with the Anycast address or could dynamically determine it (e.g. a DNS lookup)

Proposed Next Steps

- Solicit interested parties to revise the AMT Draft with recommended changes
- Share proposed revision with Mboned group for approval