Assisted Tunneling

Comparison of “several” solutions against the assisted tunneling “goals”

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Solution space

- Isatap
- TSP
- STEP
- PPP based:
  - L2TP (IPv6/PPP/L2TP/UDP/IPsec/IPv4/...)
  - TCP (IPv6/PPP/TCP and IPv6/PPP/SSL/TCP)
  - UDP (IPv6/PPP/UDP)

Requirements

- Simplicity
- Registered mode
  - Authentication
  - Accounting
  - Prefix delegation
- Non registered mode
- NAT traversal
  - Keep alive
- Security
- Scalability
- Latency
- End-point discovery

Initial remark 1

- All solutions satisfy many requirements
- The difference are mostly on
  - Prefix delegation
  - NAT traversal
  - Registered mode
  - Security
  - Set-up latency

Initial remark 2

- All the solution on the table requires tunnel end point discovery...

  ... there is no (published) satisfying solution yet...

    ... but that may change!

ISATAP

- Fails:
  - Prefix delegation
  - NAT traversal
- Concerns:
  - In-band registered mode
    (out of band registered mode could work)

STEP

- Pass most requirements
- Concerns:
  - Out of band, IPv4 address based, registered mode
    - No roaming users
    - Authentication requires an extra layer of indirection (based on IPv4 address instead of user/passwd)
  - Need to be (better) documented
    - define port number
  - Not implemented

TSP

- Pass most requirements
- Concern:
  - Current version needs some refinements/simplifications

IPv6/PPP/L2TP/UDP/IPsec/IPv4

- Pass most requirements
- Concerns:
  - Heavy-weight! Extra encapsulations!
  - Simple to deploy for those who have L2TP already, more difficult for those who don't.
  - Security (do we need to secure L2TP with IPsec?)

IPv6/PPP/TCP

- Pass most requirements
- May use SSL to protect the data channel
- Concerns
  - TCP for link with packet loss
  - Overhead for small packets
  - Need to be documented
    - define port number

IPv6/PPP/UDP

- Pass most requirements
- Concerns
  - Need keep alive to preserve NAT mapping
  - Need to be documented
    - define port number

Conclusion

?

Back-up slides

Set-up latency (in packets): non registered, no prefix, no security

- Tunnel End-point discovery exchange (2) +
  - ISATAP: 2
  - TSP: 2 possible
  - STEP: 2
  - L2TP: L2TP (4) + PPP (2) + RA (1)
  - TCP: TCP hand-shake (3) + PPP (2) + RA (1)
  - UDP: PPP (2) + RA (1)

Set-up latency: registered, prefix delegation

- Tunnel End-point discovery exchange (2) +
  - ISATAP: not available
  - TSP: 7
  - STEP: not available
  - L2TP: a lot! (with IPsec)
  - TCP: TCP hand-shake (3) + PPP (4) + DHCPv6(2)
  - UDP: PPP (4 packets) + DHCPv6(2)