FTP64: making FTP work through IPv6→IPv4 translators

draft-ietf-behave-ftp64-04
IETF-78, Maastricht, july 2010
ftpext2 BoF
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IPv6→IPv4 translation

IPv6 host
→ IPv6 network
→ Translator
→ IPv4 network
→ IPv4 host
IPv6→IPv4 translation

IPv6 host

IPv6 network

(client)

IPv6 network

Translator

(stateful or stateless)

IPv4 network

IPv4 host

public or private

(server)
FTP and IPv6

- RFC 959 (1985):
  - passive mode (PASV): v4 address+port
  - active mode (PORT): v4 address+port

- RFC 2428 (1998):
  - passive mode (EPSV): only a port
  - active mode (EPRT): address family, address, port
Non-problem?

• If all clients and servers use EPSV FTP works without trouble through translators!

• Unfortunately:
  • EPSV works with 65% of servers
  • Windows CLI client only does EPRT
  • EPSV fails with timeout with 6% of servers
Possible solutions

1. Update servers to support EPSV
2. Update clients to fall back to PASV despite IPv4 address in 227 response
3. Implement application layer gateway in the translator
   • The draft recommends 1 and 2 and standardizes 3.
BEHAVE charter

- "ALGs may be considered only for the most crucial of legacy applications."

- Basically:
  - standardize ALG
  - NOT say anything about servers and clients

- So current doc is a compromise

- Or separate clientserver doc?
Server recommendations

- Support EPSV
- ability to switch off EPSV/EPRT
- report whether EPSV available in FEAT
- Only use control channel address in PASV
Client recommendations

• Support passive mode (EPSV)
• After EPSV failure (5xx or timeout) retry with PASV
  • assume that address in 227 response is control channel remote address
• Don't use arguments with EPSV
• EPSV → PASV is easy
• turn 227 into 229 ignoring IP address
• EPRT → PORT is harder with a stateful translator → could be left unimplemented
• Don't try to translate three-way FTP:
• 425 Can't open data connection.
• Stateful port 20 handling?
  • not too hard, but still in use?
• Go into transparent mode after AUTH
• ALGS command so client can query ALG status and enable/disable it
Both PORT and PASV

- RFC 959 allows a client to issue both PORT and PASV for the same transfer

- But:
  - PORT → server initiates data session
  - PASV → client initiates data session
Questions?