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Survey of IPv6 Support in Commercial Firewalls

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Purpose of Study

- Determine IPv6 transport support and security service availability among commercial firewall products
- Survey only, no product testing
- Did not include
  - Personal firewall software
  - Commodity broadband access device that only "block ports and such" (would skew results)

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Objectives

- How broadly is IP version 6 (IPv6) transport supported by commercial firewalls?
- Is support for IPv6 transport and security services available for all market segments?
- Are security services commonly used at Internet firewalls available when IPv6 transport is used?
- Can an organization use IPv6 today and enforce a security policy at a firewall that's comparable to one it would enforce using IPv4?

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Methodology

- Compile a list of commercial firewall products
  - Various resources yielded approximately 60 products
  - Identify target market segments for products:
    - Small office, home office (SOHO)
    - Small and medium business (SMB)
    - Large Enterprise, service provider (LE/SP)
- Survey commonly available security services
  - List based on vendor technical specifications and input from firewall administrator community

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Features included in survey

- IPv6 transport
  - Forward native IPv6 traffic between internal/external hosts
  - Participate in IPv6 routing or neighbor discovery
- Traffic filtering
  - Static packet filtering
  - Stateful inspection
  - Application level traffic inspection engines run on top of IPv6
- Advanced security features
  - IDS/IPS?
  - DDoS Protection?

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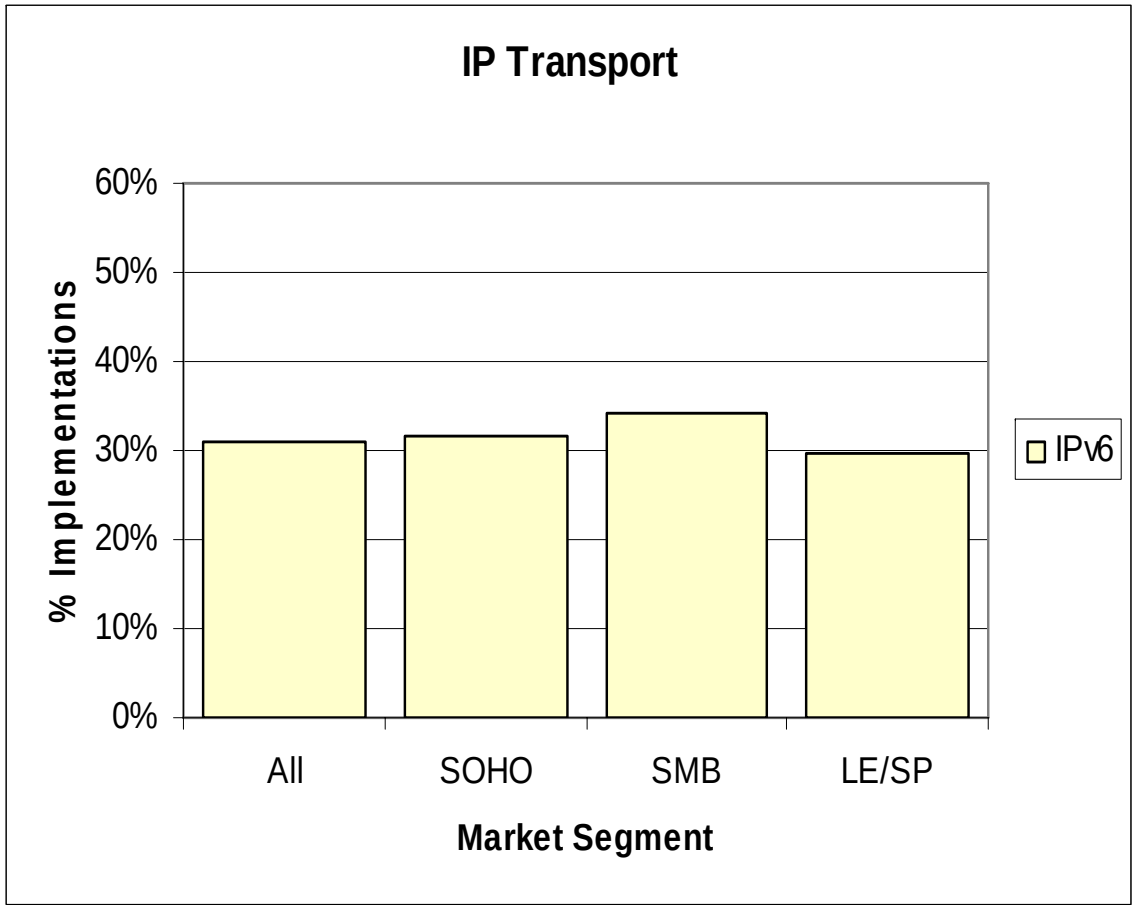
Features included in survey (cont'd)

- Network Address Translation
  - IP masquerading
- Tunneling
  - Tunnel IPv4 traffic in IPv6 packets (4to6)
  - Tunnel IPv6 traffic in IPv4 packets (6in4)
- Addition features supported
  - Flow monitoring
  - Log IPv6 traffic
  - IPsecv6
  - DHCPv6
  - RADIUS

Information Gathering: Beyond Survey Data…

- Direct vendor contact by email and telephone
  - Technical support, sales, marketing, general inquiries
  - Technical staff identified by colleagues and ICSA Labs
- 3rd party corroboration
  - Discussion with firewall administrators familiar with product
  - Discussion on firewall mailing lists
- Other corroboration
  - Review technical specifications, user and administration guides when made available
- Ultimately, 42 of 60 products included in report

IPv6 Transport



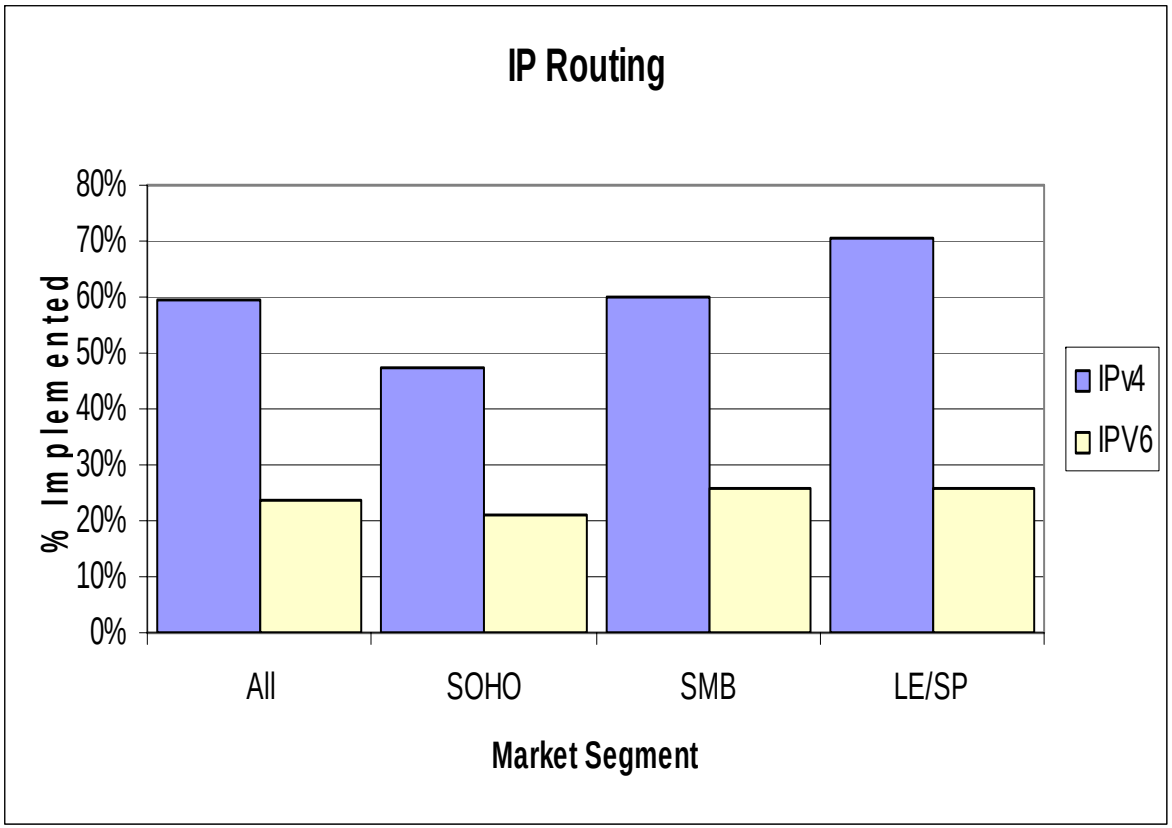
Overall

- All firewalls surveyed support IPv4 transport
- 31% of firewalls surveyed support IPv6 transport (13 of 42)

Breakdown (IPv6)

- SOHO: 32% (6 of 19)
- SMB: 34% (12 of 35)
- LE/SP: 30% (8 of 27)

IPv6 Routing



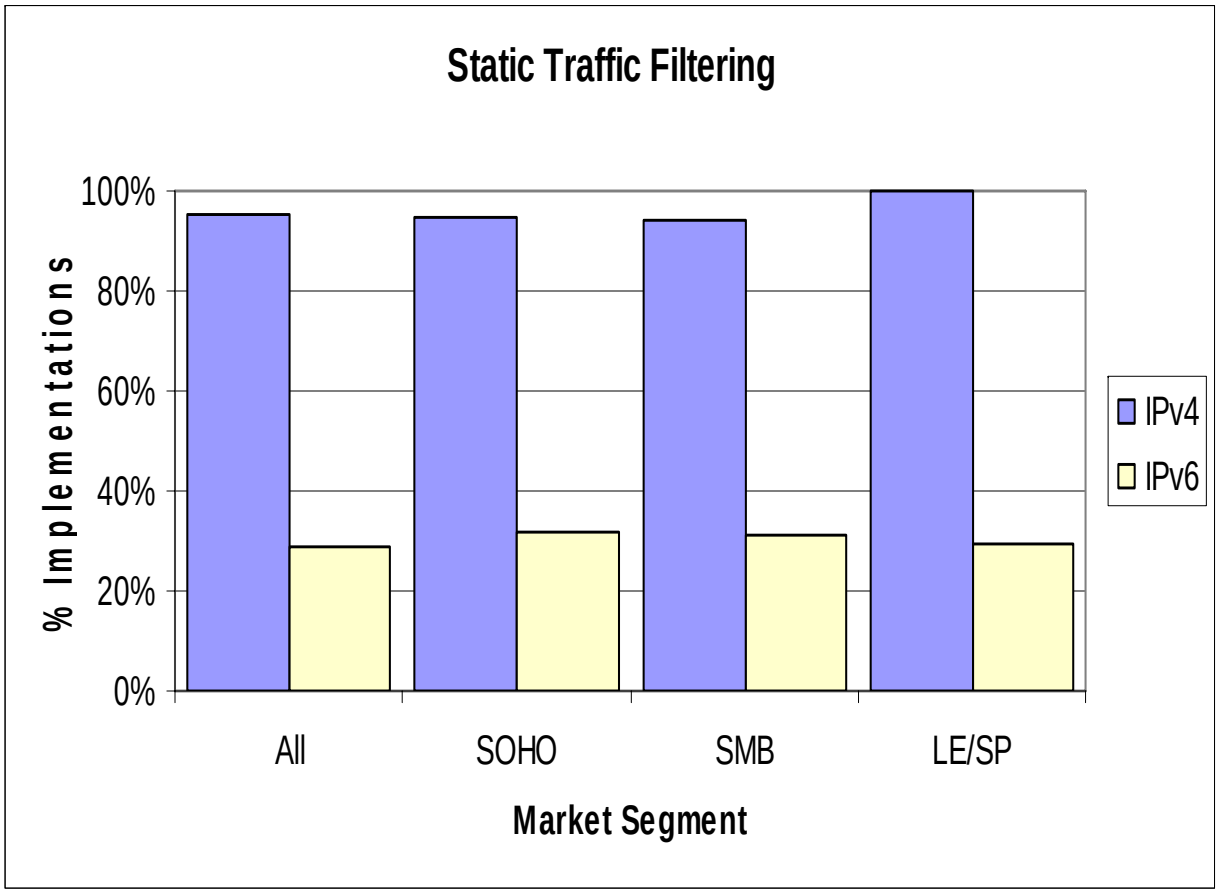
60% of firewalls surveyed participate as peers in IPv4 routing or perform neighbor discovery (35 of 42)

24% participate in IPv6 routing

Breakdown (IPv6)

- SOHO: 21% (4 of 19)
- SMB: 26% (9 of 35)
- LE/SP: 30% (8 of 27)

Static Packet Filtering



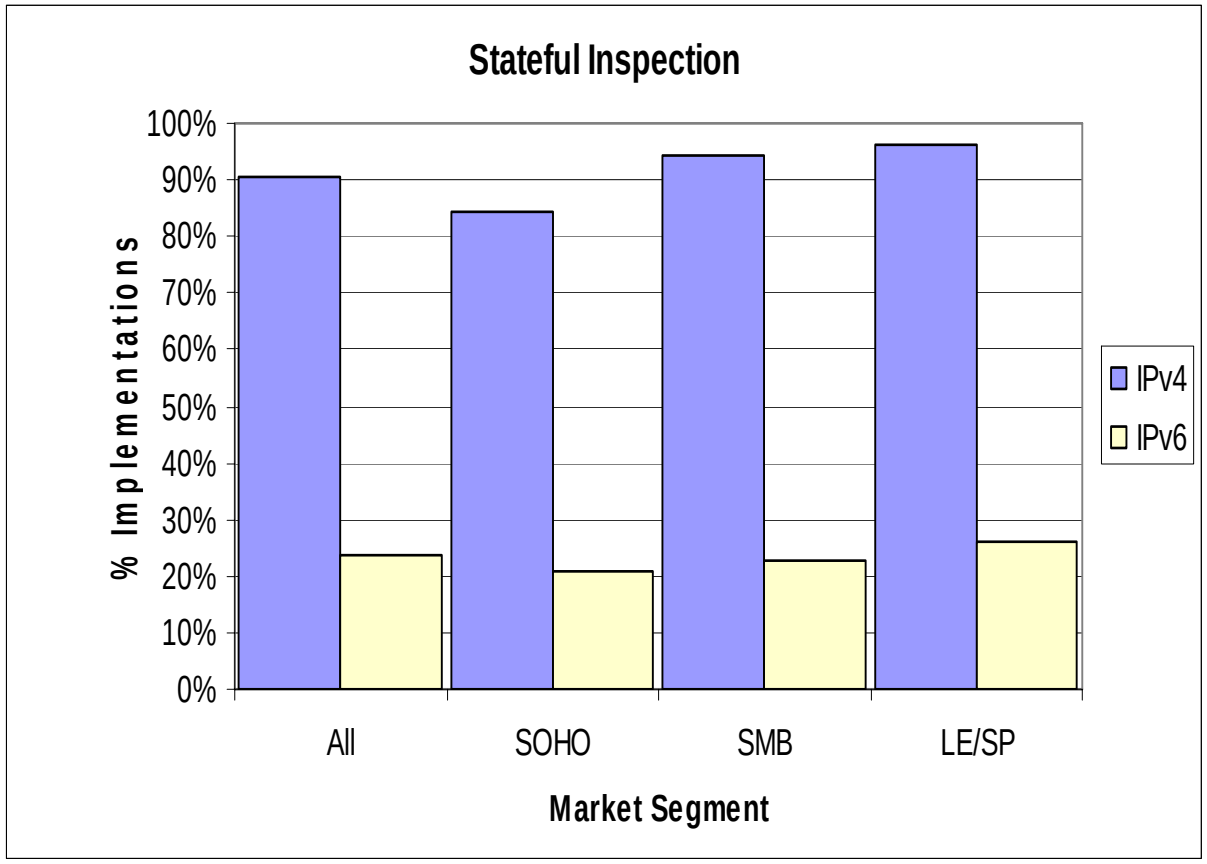
95% of firewalls surveyed provide static filtering when IPv4 is used (40 of 42)

29% provide static filtering when IPv6 is used (12 of 42)

Breakdown (IPv6)

- SOHO: 32% (6 of 19)
- SMB: 31% (11 of 35)
- LE/SP: 30% (8 of 27)

Stateful traffic inspection



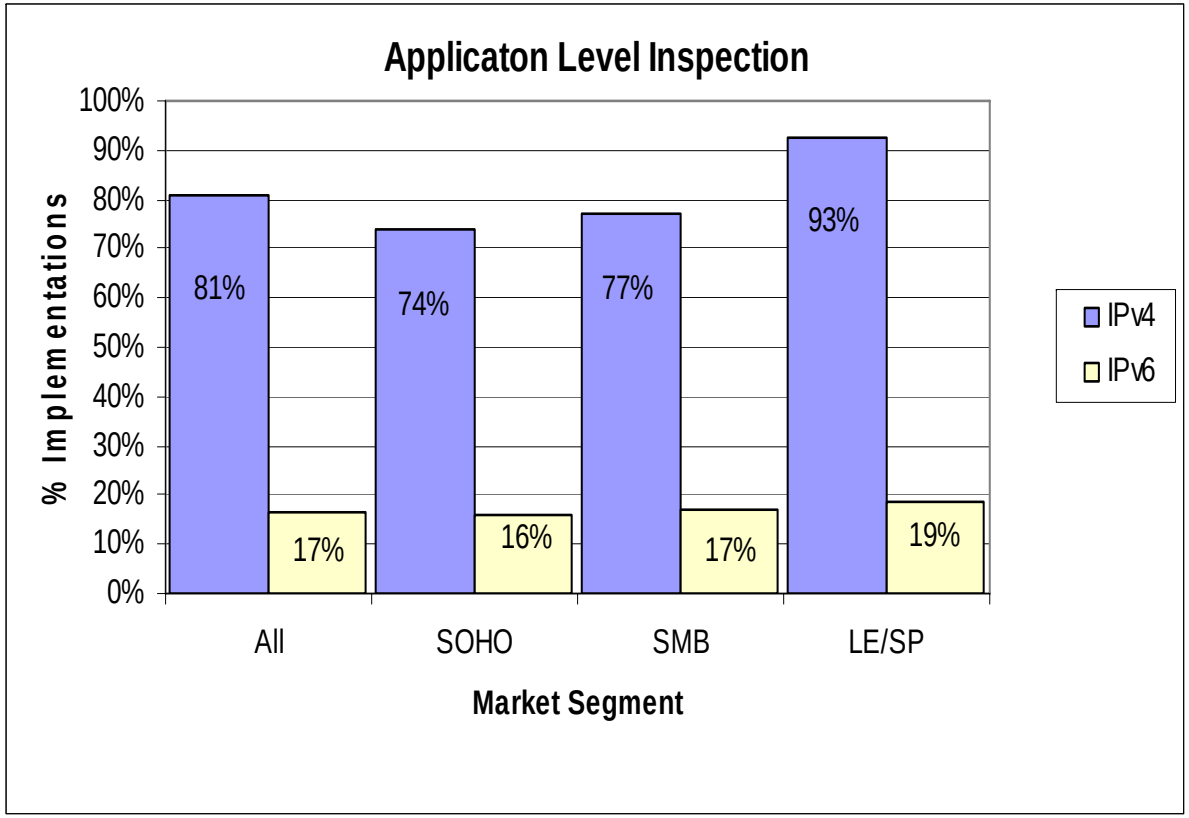
90% of firewalls surveyed offer stateful inspection when IPv4 is used (38 of 42)

24% of products do so when IPv6 is used

Breakdown (IPv6)

- SOHO: 21% (4 of 19)
- SMB: 23%, (8 of 35)
- LE/SP: 26% (7 of 27)

Application Level Inspection



81% products across all market segments offer Application Level inspection when IPv4 is used (34 of 42)

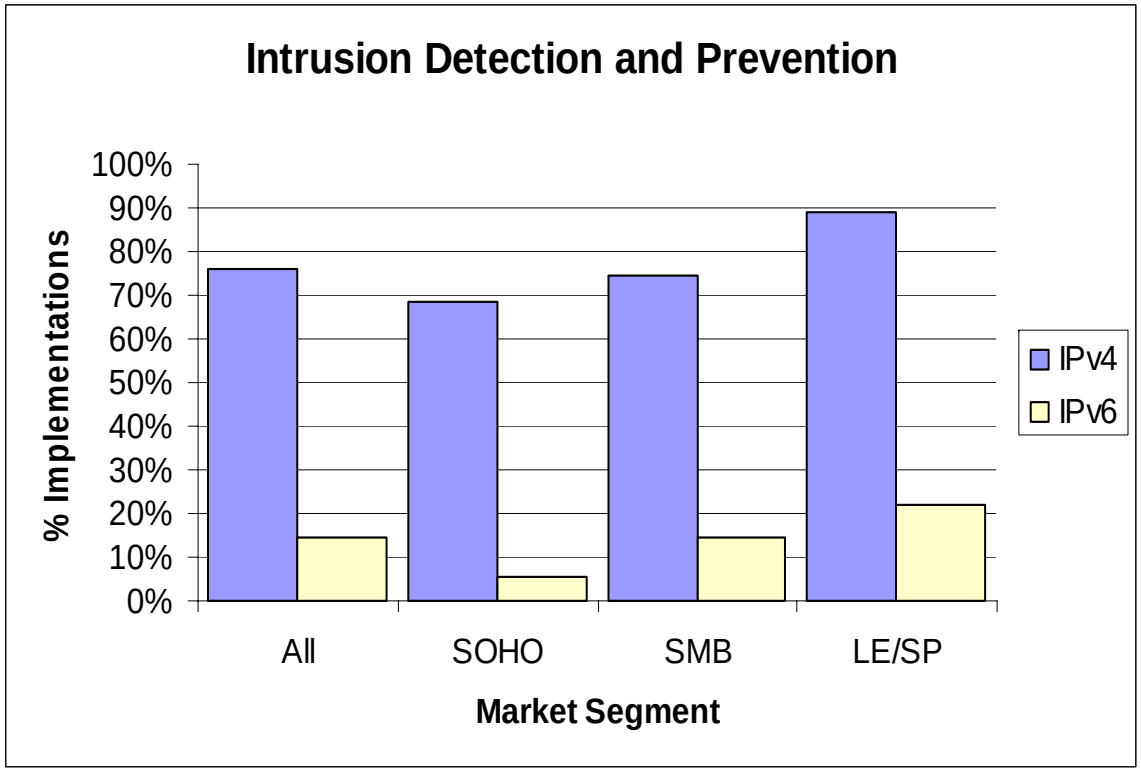
17% when IPv6 is used

Breakdown (IPv6)

- SOHO: 3 out of 19 (16%)
- SMB: 6 out of 35 (17%)
- LE/SP: 5 out of 27 (19%)

[Note: This question covers a broad swath of features. Subsequent studies should inquire about specific features]

Intrusion Detection, Prevention



76% of surveyed firewalls provide IDS/IPS when IPv4 is used (32 of 42)

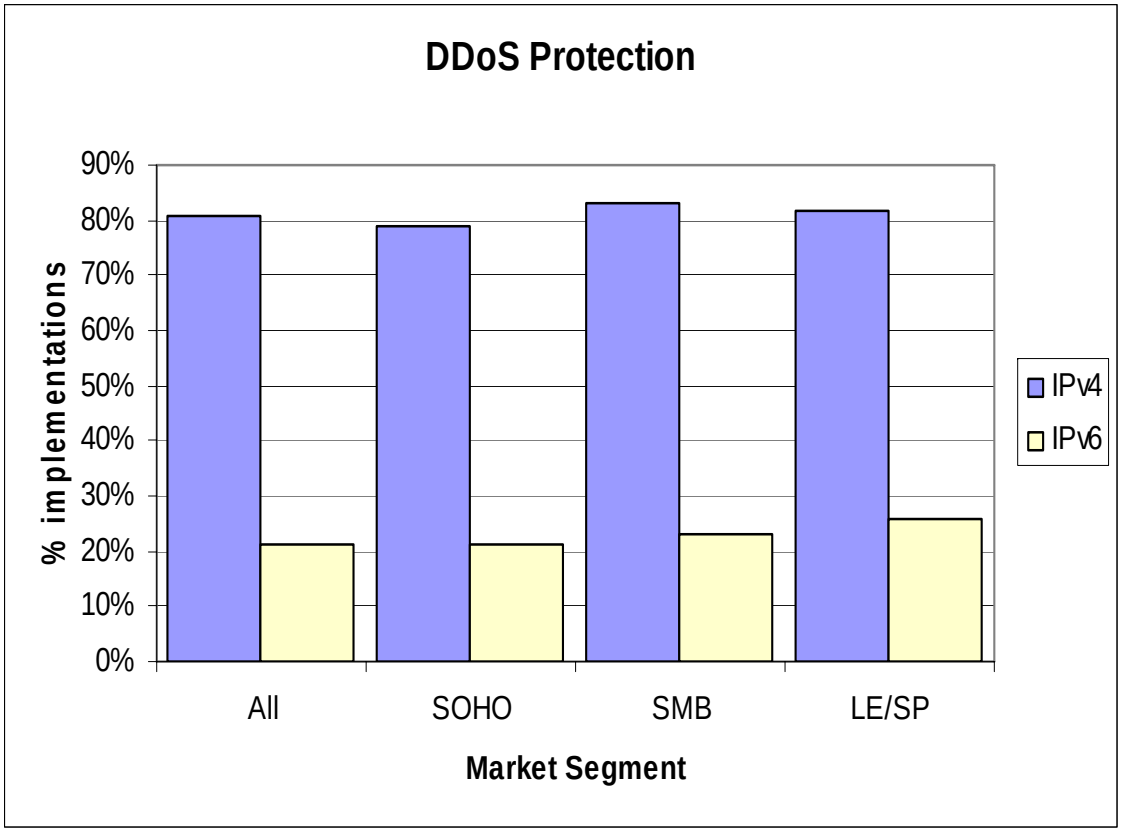
14% of products provide IDS/IPS when IPv6 is used (6 of 42)

Breakdown (IPv6)
- SOHO: 1 out of 19 (5%)
- SMB: 5 out of 35 (14%)
- LE/SP: 2 out of 27 (22%)

5% availability of IDS/IPS among SOHO products when IPv6 transport is used biases result

This result does not include commercial appliances that are "IDS/IPS only".

DDoS Protection



76% of surveyed firewalls provide IDS/IPS when IPv4 is used (34 of 42)

21% of products provide IDS/IPS when IPv6 is used (9 of 42)

Breakdown (IPv6)

- SOHO: 4 out of 19 (21%)
- SMB: 8 out of 35 (23%)
- LE/SP: 7 out of 27 (26%)

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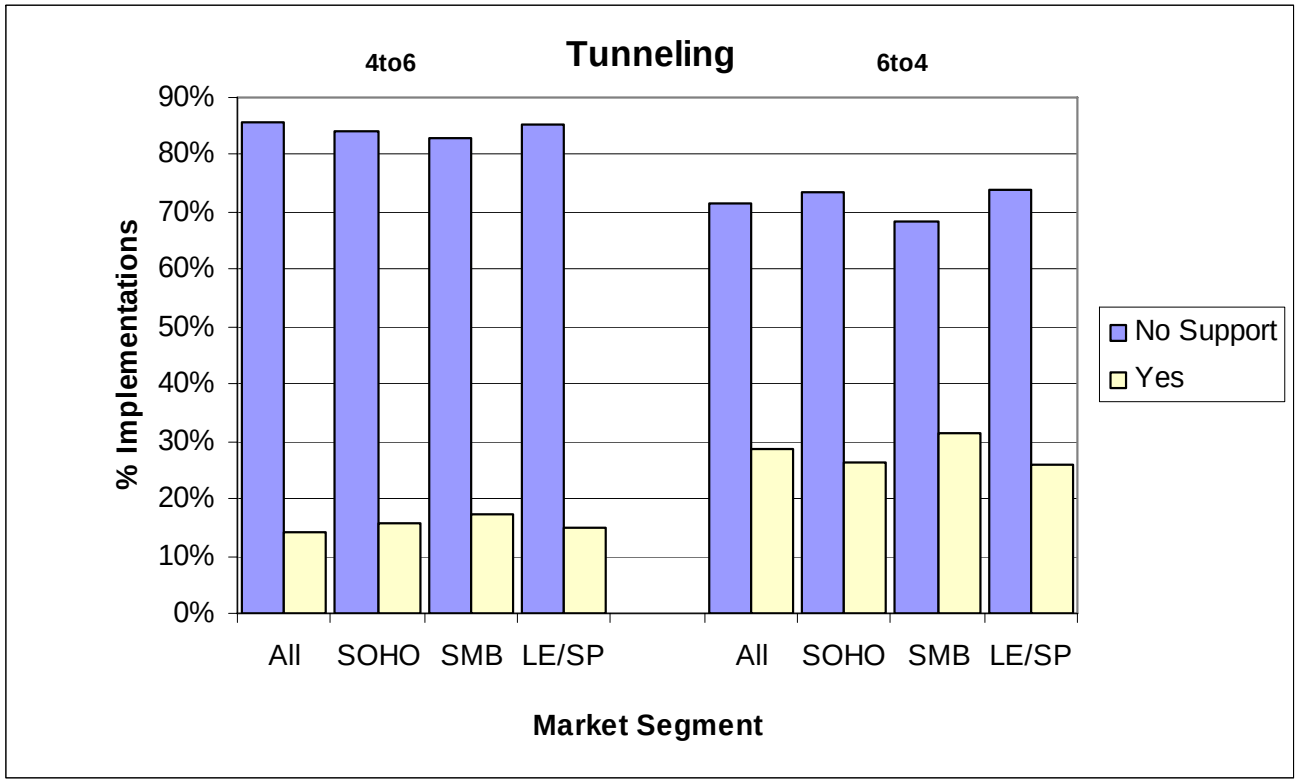
Tunneling Capabilities



14% of products surveyed are able to tunnel IPv4 traffic in IPv6 transport

29 % of product are able to encapsulate IPv6 traffic in IPv4 tunnels

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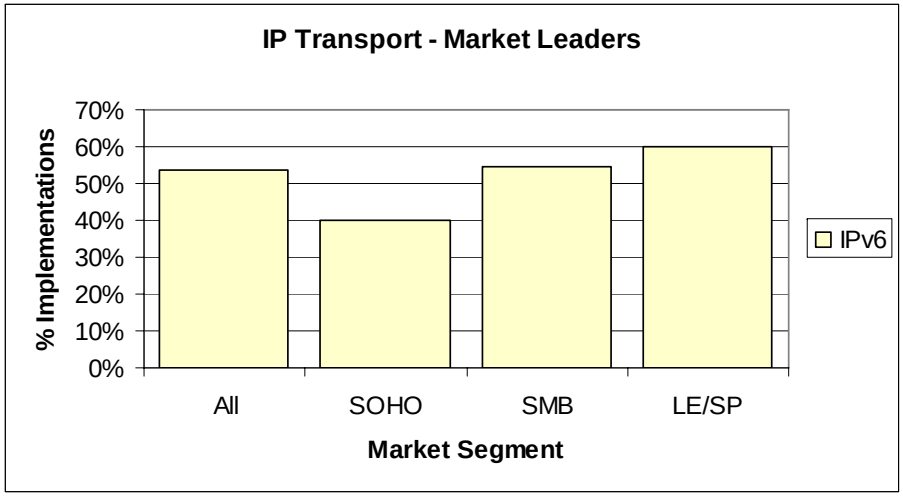
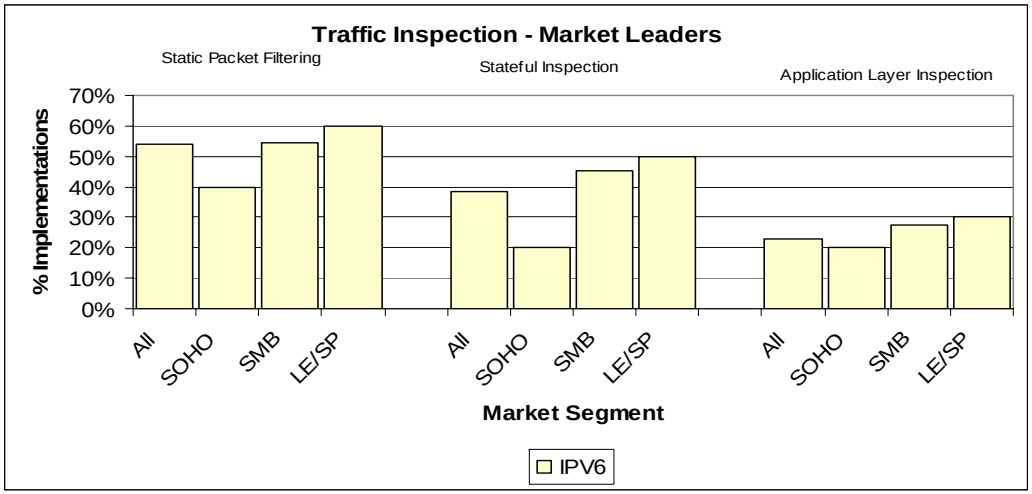
IPv6 Transport support (Market Leaders)

- Commercial firewall market dominated by small number of vendors
- Availability of IPv6 transport support improves when consumer choice is narrowed to the market leaders
- Sophisticated traffic inspection and advanced security features are still not prevalent





Additional Observations

- Generally, if a product supports IP transport and traffic inspection, that product
  - logs IP level events (true for IPv4 and IPv6 transport).
  - supports IPsec (true for IPv4 and IPv6 transport).
- Few firewall products support DHCPv6, RADIUS, and flow monitoring when IPv6 transport is used.
  - Inconsistent reporting on these features

Observations from Vendor Comments

- IPsecv6 support is not as fully-featured as IPv4
  - some vendors support fewer Internet Key Exchange (IKE) peer authentication options, or only support manual keying
- User Interfaces are not as robust
  - IPV6 transport can only be configured using a command line interface.
- IDS and DDoS support not as robust
  - Signature sets for IDS/IPS inspection engines for IPv6 not as extensive as sets for IPv4.
  - Number and kinds of DoS attacks they can detect and block are fewer when IPv6 transport is used.

"Why no support?"

- Vendors who responded that they had no IPv6 support typically claimed that they have received few if any requests for products that support IPv6.

Conclusions

- Support for IPv6 transport and security services is available from commercial firewalls for all market segments
- Firewall products that support IPv6 transport generally provide (some form of traffic inspection), event logging, and IP Security (IPsecv6)
- Availability of advanced security features is lagging in SOHO and SMB segments and strongest in the LE/SP segment.

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Conclusions

- IP version 6 (IPv6) transport is not broadly supported by commercial firewalls.
- Across all market segments, less than one in three products support IPv6 transport and security features.
  - Support among the firewall market share leaders improves this figure somewhat
- Can we extrapolate from these results? "Are we prepared to deploy IPv6"?