Basic Requirements for IPv6
Customer Edge Routers

<draft-palet-v6ops-rfc7084-bis>

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Market reality

• Small and medium ISPs buy CEs in small quantities
  – Often locally (even retail)
  – Vendors “unaware” of their requirements
  – Vendors don’t have “different” models
    • Sometimes different firmware for big ISPs

• No purchasing “power” to ask for any specific protocol support
IPv4 reality

• ISPs willing to deploy IPv6 still need to support IPv4
  – No more IPv4 addresses available
    • IPv6-only WAN is required

• Options:
  – CGN with DS-Lite or lw4o6
  or
  – 464XLAT or MAP (E/T)

• Vendors don’t support them
  – When approached: “not required by IETF”
Code reality

• OpenWRT (now LEDE), support all those protocols since early-2015
  – Open Source, 10-12Kbytes (0,15% vs total)
    • Code is “shared” across several protocols
  – No extra cost in hardware requirements
  – No need to ”develop” anything
  – There are other sources for similar code

• Only 3 vendors included it, up to now
  – Expensive in small quantities

• Other vendors include it for “big” customers
Scenarios

1. Residential/household users
   – Common usage “Internet access” (web, email, streaming, online gaming, ...)

2. Residential with Small Office/Home Office (SOHO)
   – Same as 1

3. Small Office/Home Office (SOHO)
   – Same as 1

4. Small and Medium Enterprise (SME)
   – Same as 1

5. Residential/household with advanced requirements
   – Same as 1 + exporting services to the WAN (IP cameras, web, DNS, email, VPN, etc.)

6. Small and Medium Enterprise (SME) with advanced requirements
   – Same as 5
Wait a minute …

• Advanced requirements ????
  – Exporting services to the WAN …

• IPv6 using GUA requires “nothing special” to “export services”

• IPv4 CEs (and IPv6 CEs with IPv4 support), already allow:
  – DMZ
  – Virtual Servers
  – Port/Protocol forwarding

• Firewall support: Security Considerations
One or several documents? (1)

- The IPv6 CE router described in this document is not intended for usage in other scenarios such as bigger Enterprises, Data Centers, Content Providers, etc.

- Even if the documented requirements meet their needs, may have additional requirements, which are out of the scope of this document
  - Number of users supported
  - Hardware capabilities (CPU, Flash, RAM, redundant power …)
  - Number of interfaces, type, …
  - Support for routing protocols?
    - Look at 50USD hardware with 4 cores, 64-128 Mb flash / 1-2 Gig RAM, 5-6 Gigabit ports, SFP, Micro SD, USB3, SATA, 2.4+5 GHz WiFi, …
One or several documents? (2)

1. Actual document (as in RFC7084) including IPv4 transition support if IPv4 is required.

or

2. IPv6-only router document (downgrade RFC7084) + new IPv4 transition support document for CEs
Changes vs RFC7084

1. “Usage Scenarios” section
2. L-15: LAN support for HNCP (RFC7788)
3. 464XLAT support
4. MAP-T & E support
5. 6in4 support (implicit with 6rd support)
6. LW4o6 support (same as DS-LITE, so was there)
Open Questions

• Should explicitly ask for IPv6 firewall “on by default” or support of RFC6092 is enough?
Next steps (1)

- Correct editorial errors

- Add section to explain cost in terms of implementation (memory) for the transition mechanisms
Next steps (2)

• Become a WG item?

• Further inputs?

• Ready for last call?