HARMAN

neighborPropDelayThresh Defaults

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Overview

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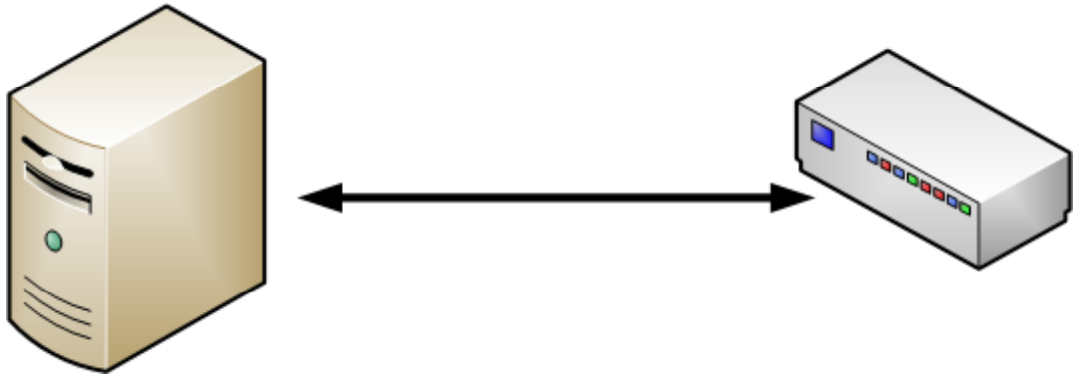
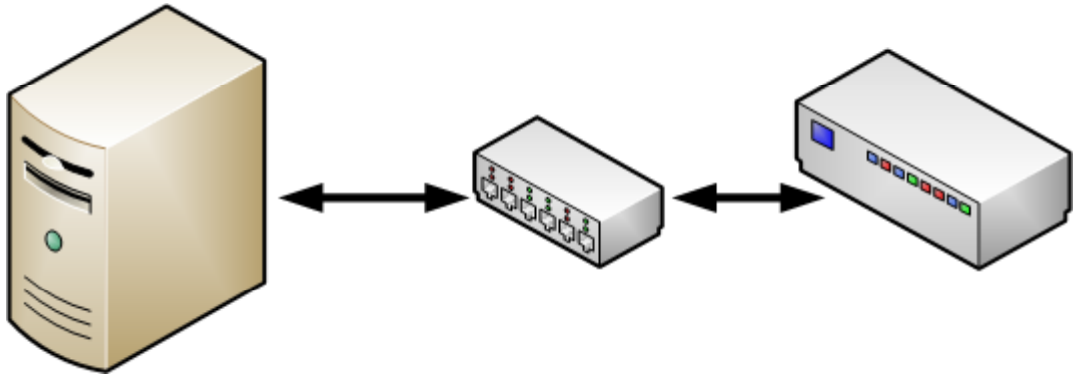
- Currently default values for neighborPropDelayThresh are not specified
- The market needs standard defaults in order to maintain plug and play compatibility
- neighborPropDelay is used to measure the wire delay between link partners
- If neighborPropDelay > neighborPropDelayThresh then it is assumed that a buffered repeater is in the path and asCapable is set to False

neighborPropDelay



- Structured wiring limit 100 meters of CAT 5 cable
- Unstructured wiring limit 130 meters of Cat 5 cable
- 1 / (299,792,458 meters/second * 2/3) = 5.003ns/meter
- 130 meter = 650.4ns wire delay

Fast Ethernet Buffered Repeater



- Minimum delay on a buffered repeater 8 bytes of preamble + 64 byte packet = 5493ns
- Minimum delay on a cut through repeater is 8 bytes of preamble + 6 bytes of DA
- Minimum time for a cut through repeater = 1068ns

Gigabit Ethernet Buffered Repeater

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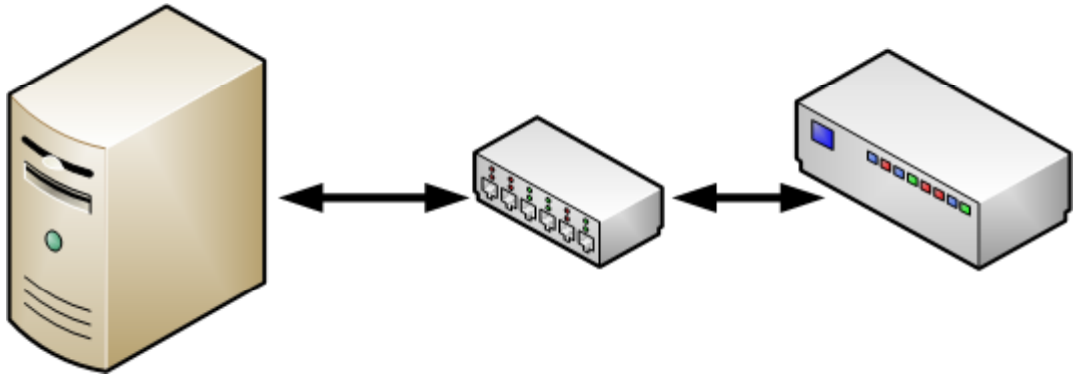

- Minimum delay on a buffered repeater 8 bytes of preamble + 64 byte packet = 549ns
- Minimum delay on a cut through repeater is 8 bytes of preamble + 6 bytes of DA
- Minimum time for a cut through repeater = 107ns
- We may not be able to detect a Gig Buffered Repeater

802.3 Cat 5 neighborPropDelayThresh

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- neighborPropDelayThresh > 618.8ns to accommodate 130m length
- neighborPropDelayThresh < 5493ns to detect a buffered repeater
- neighborPropDelayThresh < 1068ns to detect a cut through repeater

Buffered Repeater Testing

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- **FE Buffered repeaters**

Brand	Silicon	Delay
LinkSys	Realtek	8890ns
	Marvell	9292ns

- **GE Buffered repeaters**

Brand	Silicon	Delay
Dlink	Vitesse	1687ns
	Marvell	1464ns

Delay times represent only the additional delays from the buffered repeater on a network with no other traffic besides pDelay messages.

Recommended Defaults

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- **802.3 over Cat 5**
  - Theoretical minimum default should be > 618.8ns
  - From testing maximum default should be < 1464ns

- **A neighborPropDelayThresh of 1000ns would easily detect typical GE buffered repeaters and allow maximum length cables with adequate margin for error.**

References

- http://www.cisco.com/en/US/prod/collateral/switches/ps9441/ps9670/white_paper_c11-465436.html
- http://en.wikipedia.org/wiki/Wave_propagation_speed
- http://en.wikipedia.org/wiki/Multi-mode_optical_fiber
- http://en.wikipedia.org/wiki/Gigabit_Ethernet

WHERE SOUND MATTERS

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