Comparison of Wireless Protocols

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Comparison of Wireless Protocols

Field test and comparing
802.11 protocol vs nstreme
In Point To Multipoint scenarios

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IDEA ?

What force me to make such a comparison.

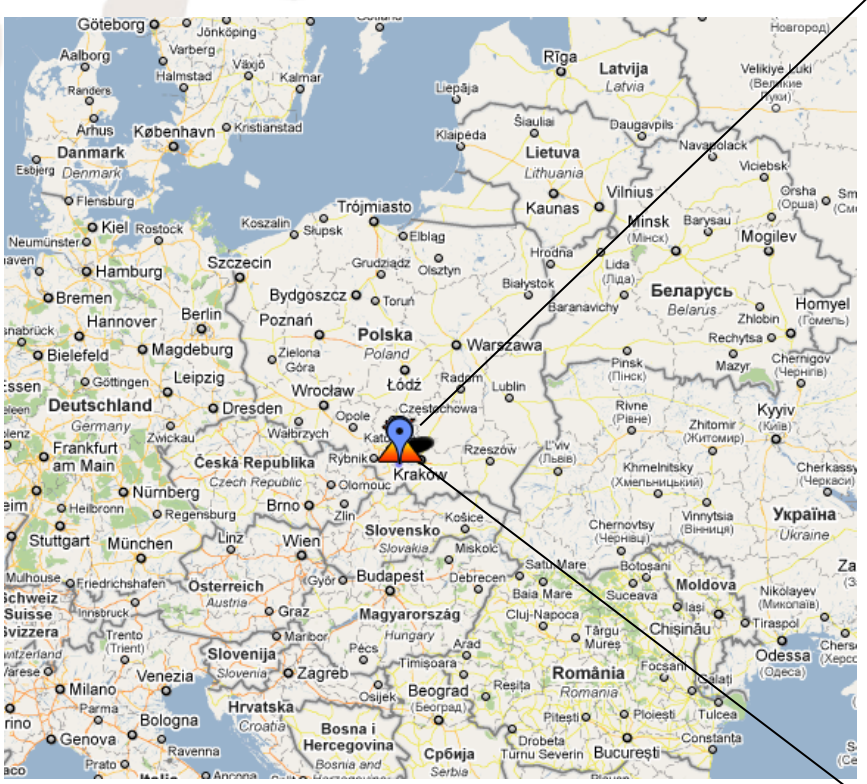
Testing Equipment

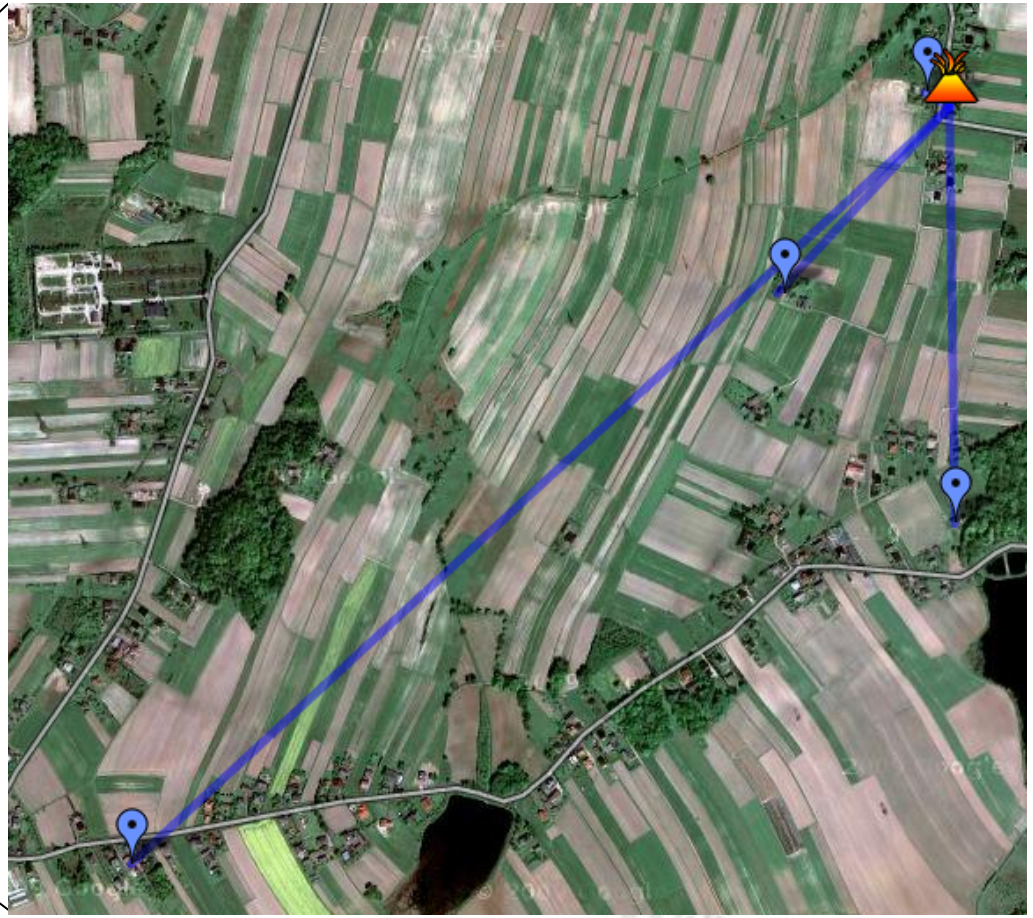
- Network:
  - Access Point :
    - RB 433
    - 17 dBi sector Antenna
  - 10 CPE's
    - RB 711
    - 23 dBi Panel Antenna

Testing Equipment

- Testbed:
  - Linux Server
    - Intel C2D 2GHz
    - 512 MB RAM
    - 100 mbps ethernet interface
    - Debian Lenny 5.0.2
  - 10 traffic terminals
    - RB 411
    - OpenWRT backfire 10.3

Testing Location





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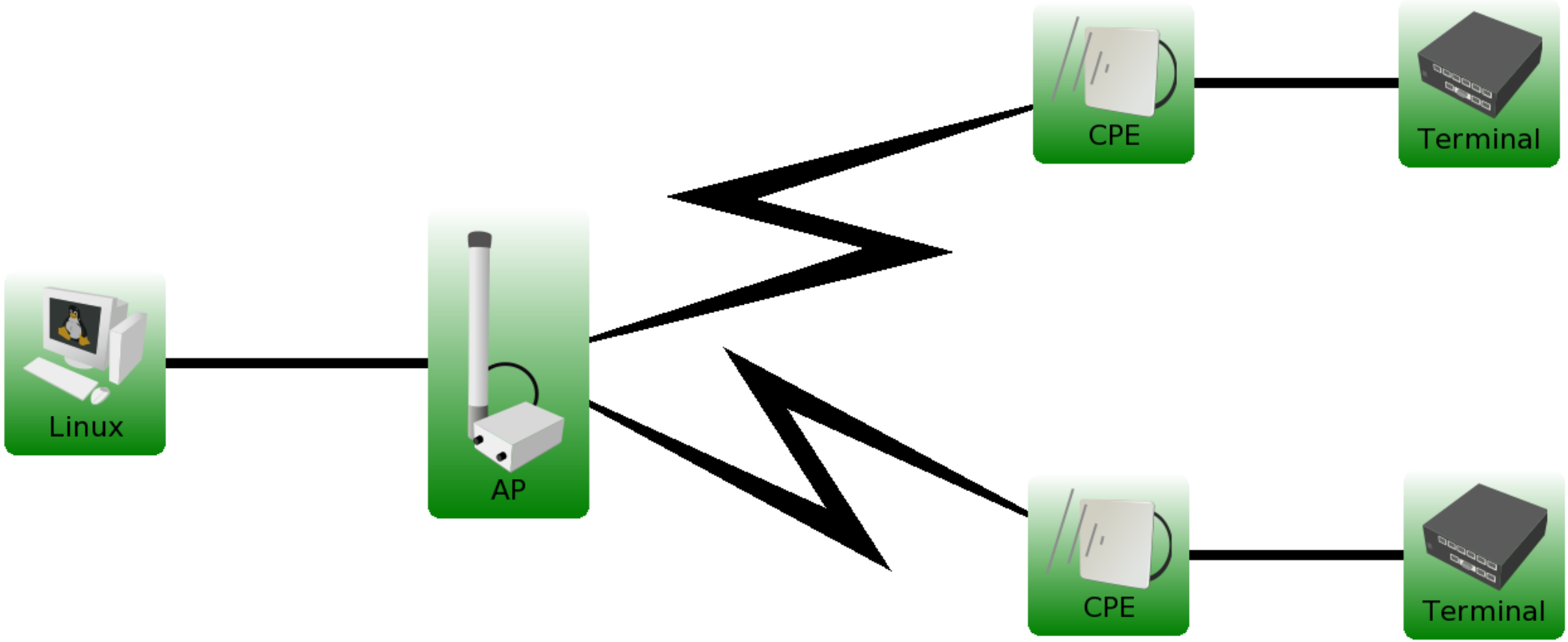
Testing Network Overview



Network Configuration

- 802.11:
  - 802.11a network with no fancy configuration (most of settings were default)
- Nstreme:
  - No aggregation
  - Just nstreme enabled with polling with CSMA on

Traffic Generator

How to choose good Generator ?

- Must support multipoint scenarios
- Must logs all data like: throughput, packetloss, delay, etc.
- Must be FREE ☺

Traffic Generator

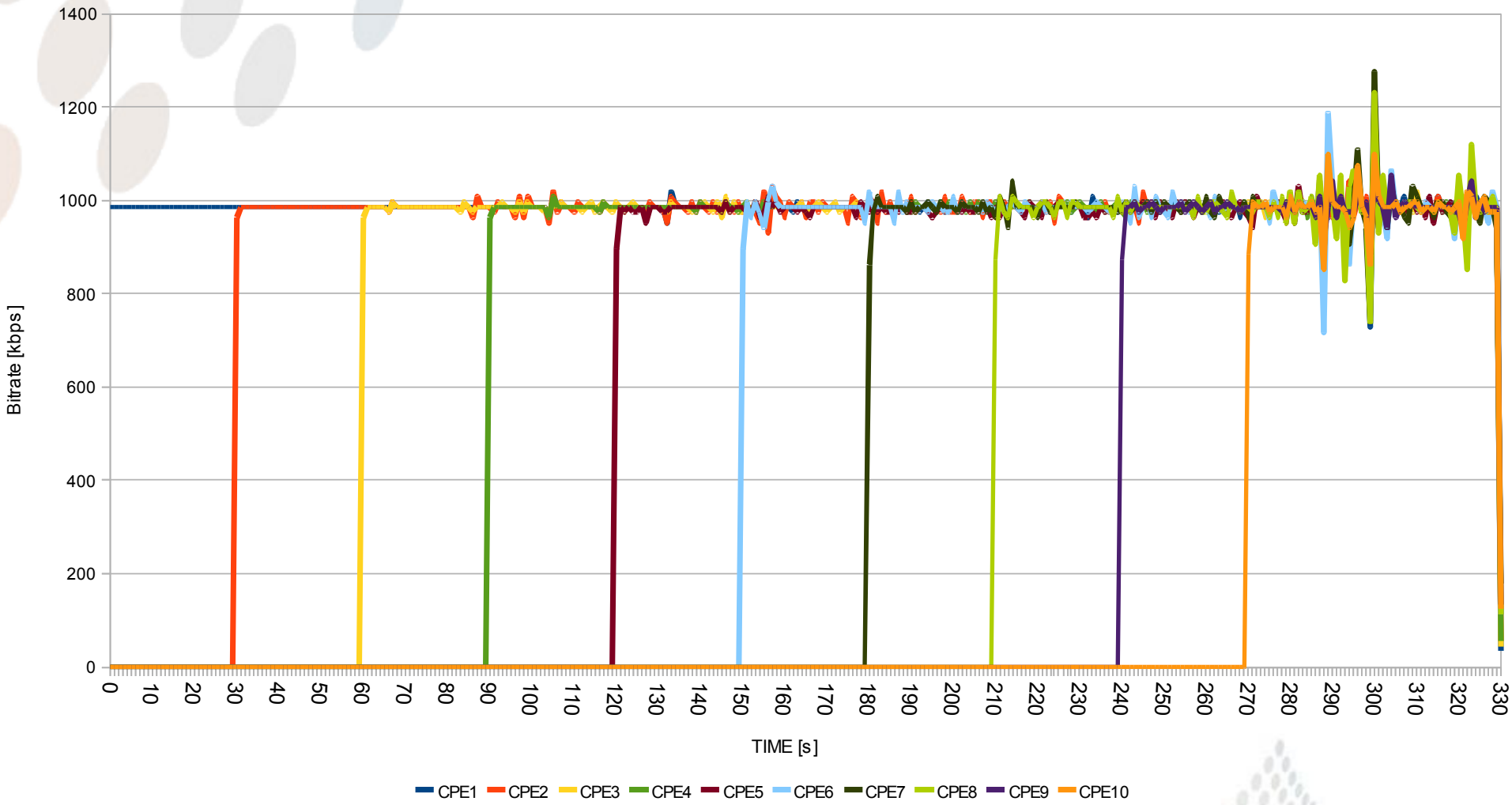
- D-ITG (Distributed Internet Traffic Generator) is a platform capable to produce traffic at packet level accurately replicating appropriate stochastic processes for both IDT (Inter Departure Time) and PS (Packet Size) random variables (exponential, uniform, cauchy, normal, pareto, ...). D-ITG supports both IPv4 and IPv6 traffic generation and it is capable to generate traffic at network, transport, and application layer.
- Available at: http://www.grid.unina.it/software/ITG/

Traffic Scenario

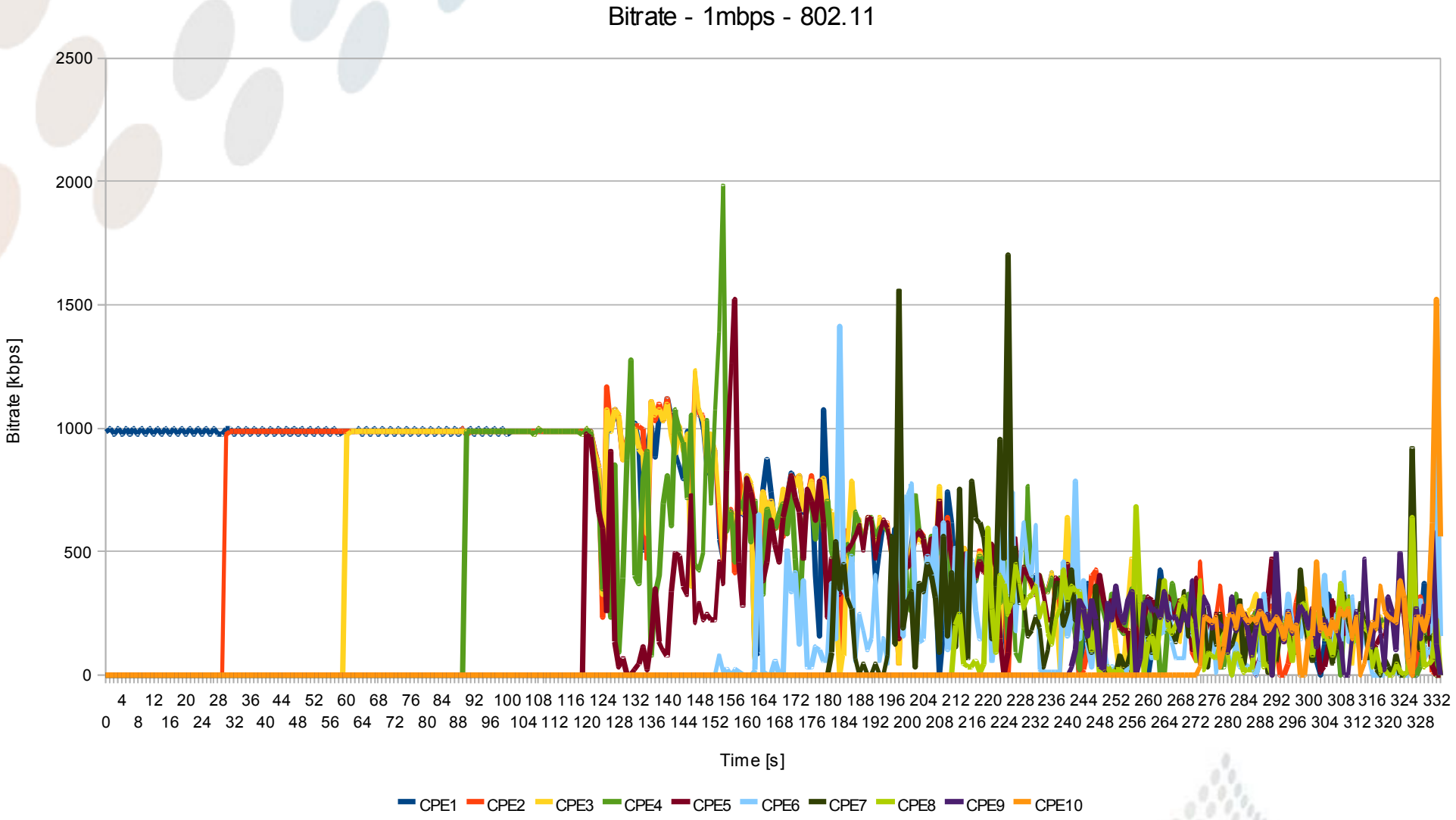
- Server starting sending flow #1: 1 mbps UDP traffic to terminal 1, and terminal 1 back to server
- Waits 30 seconds
- Servers starting flow #2: 1mbps UDP to Terminal 2 and Terminal 2 back to server.
- And so on.....

Results

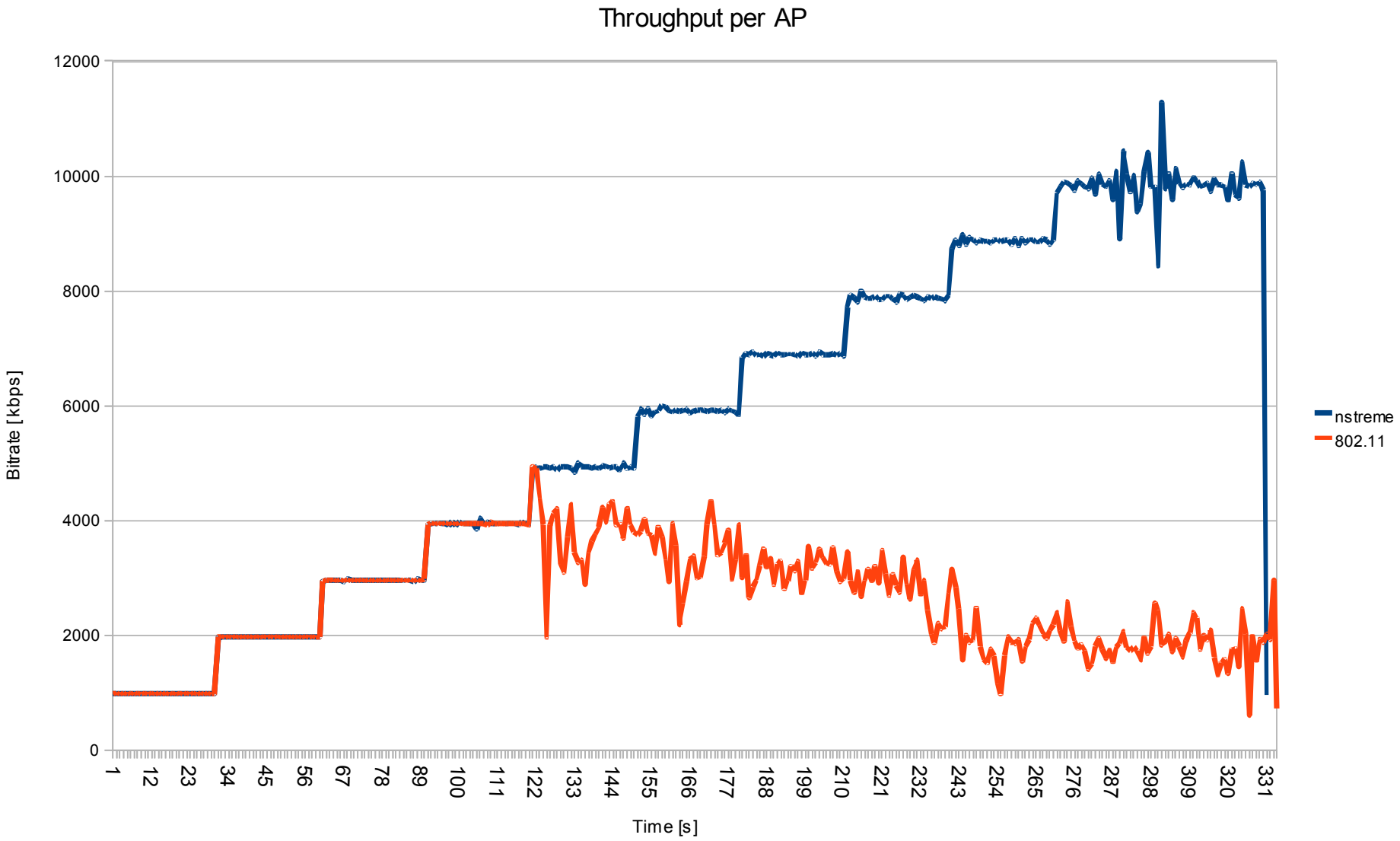
Throughput



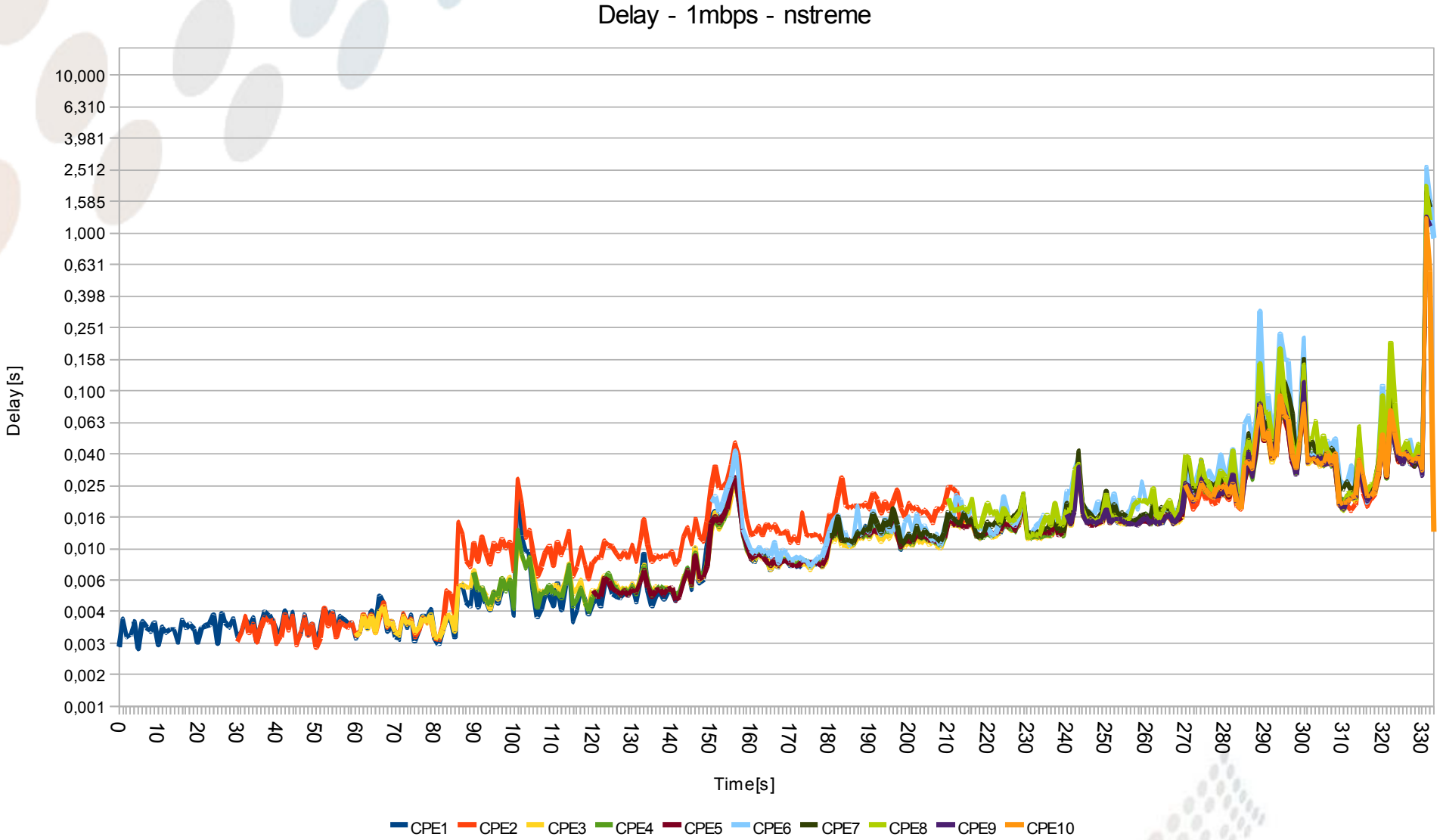
Throughput



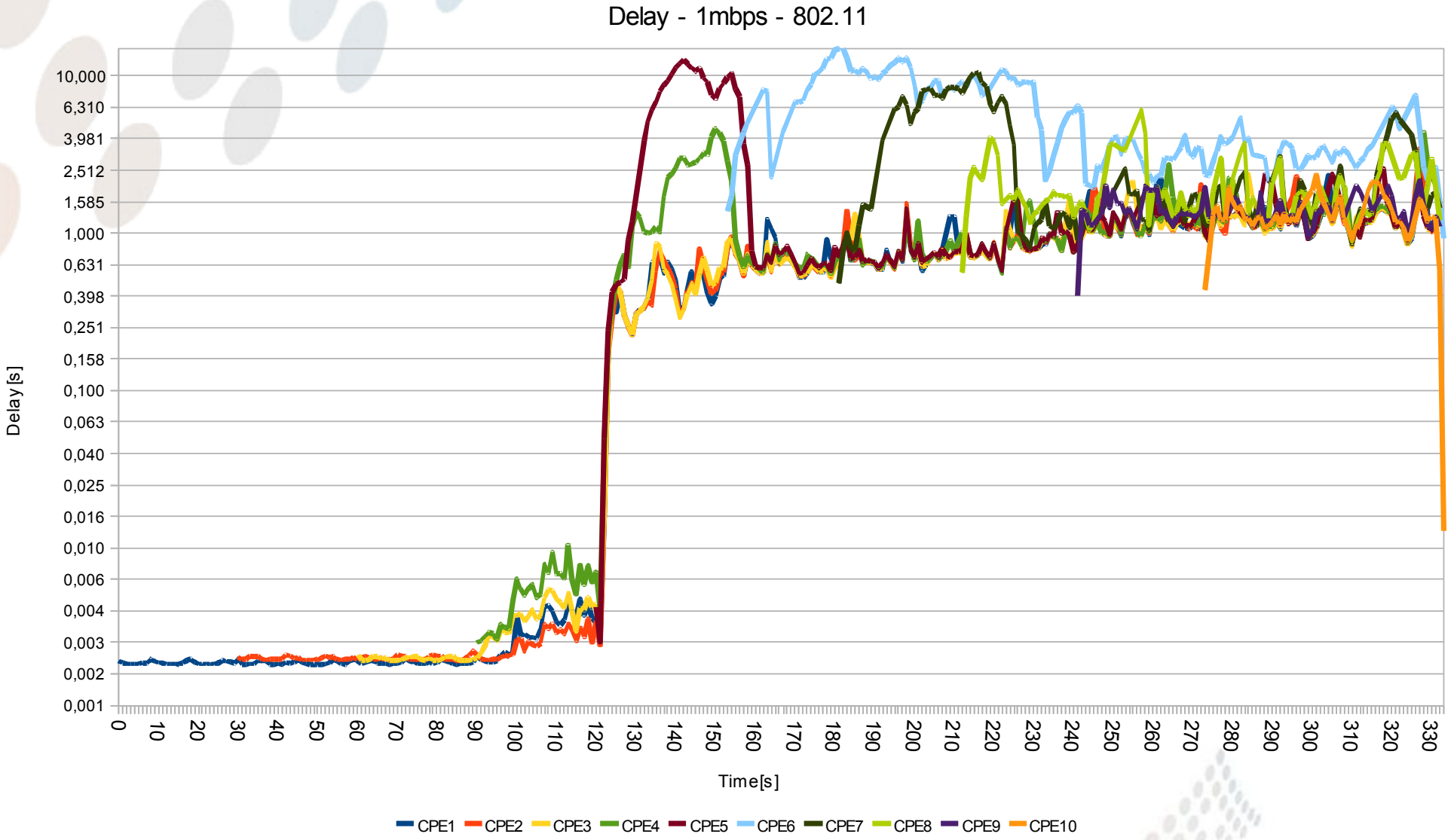
Aggregate Throughput



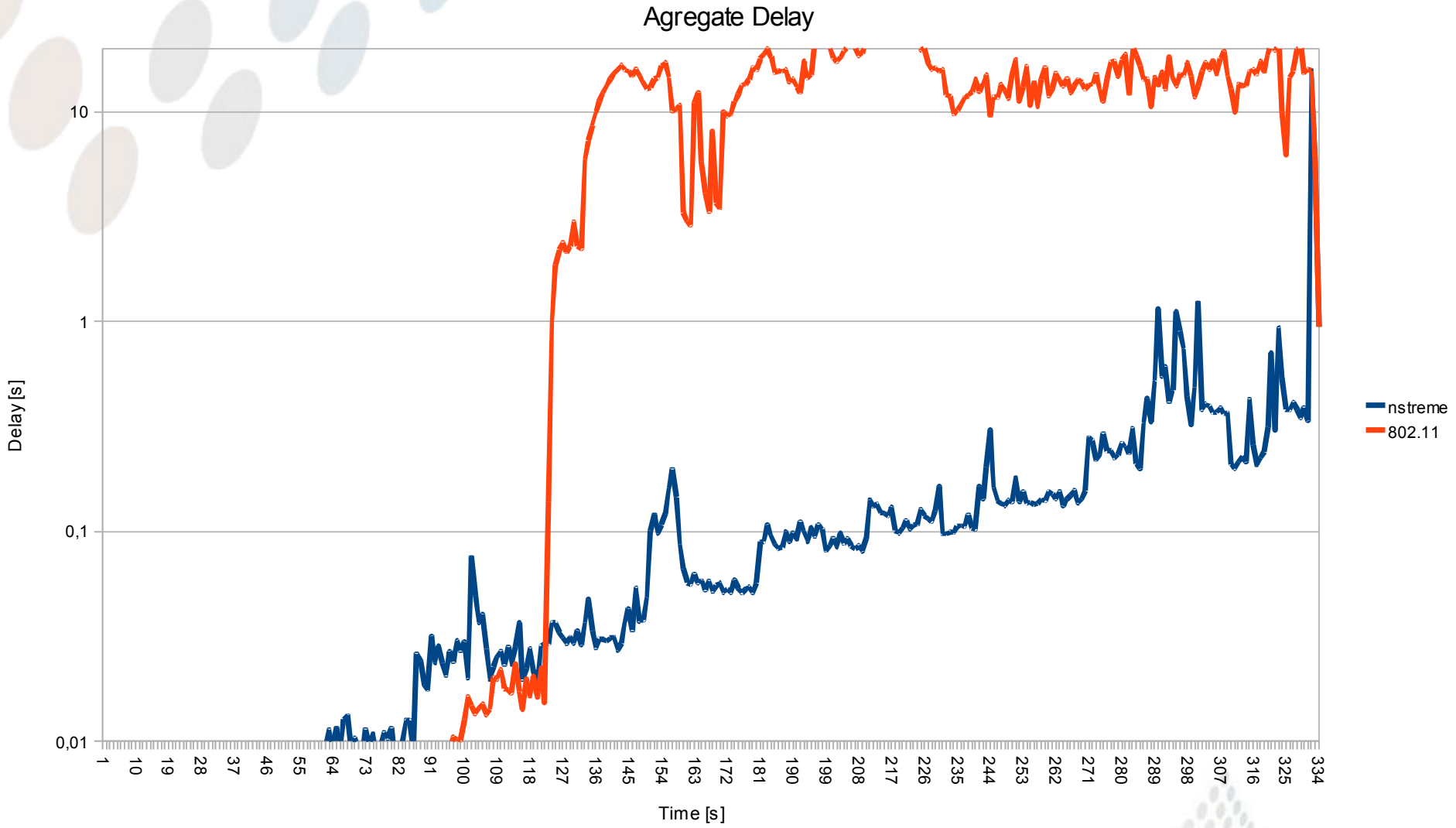
Delay



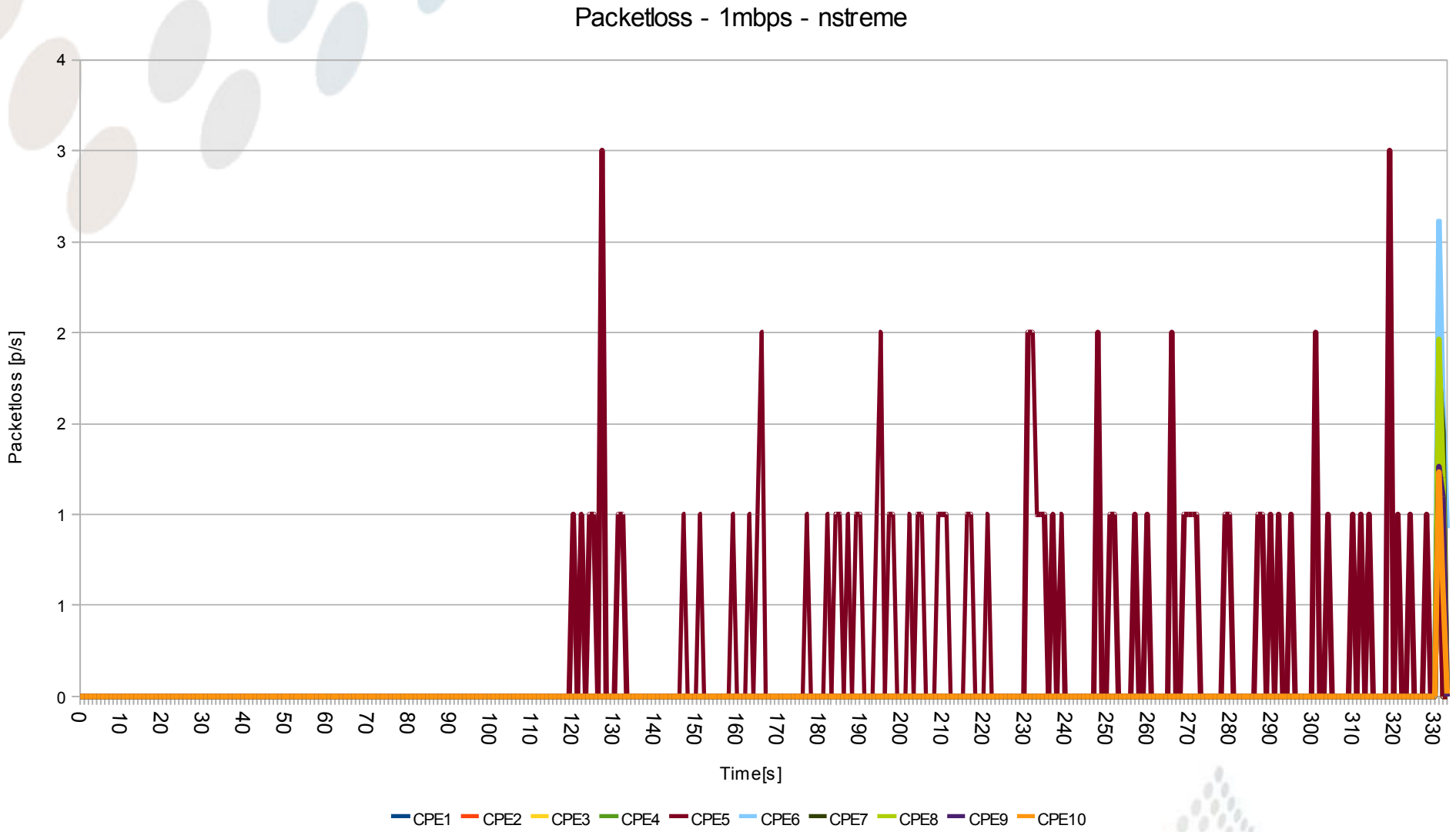
Delay



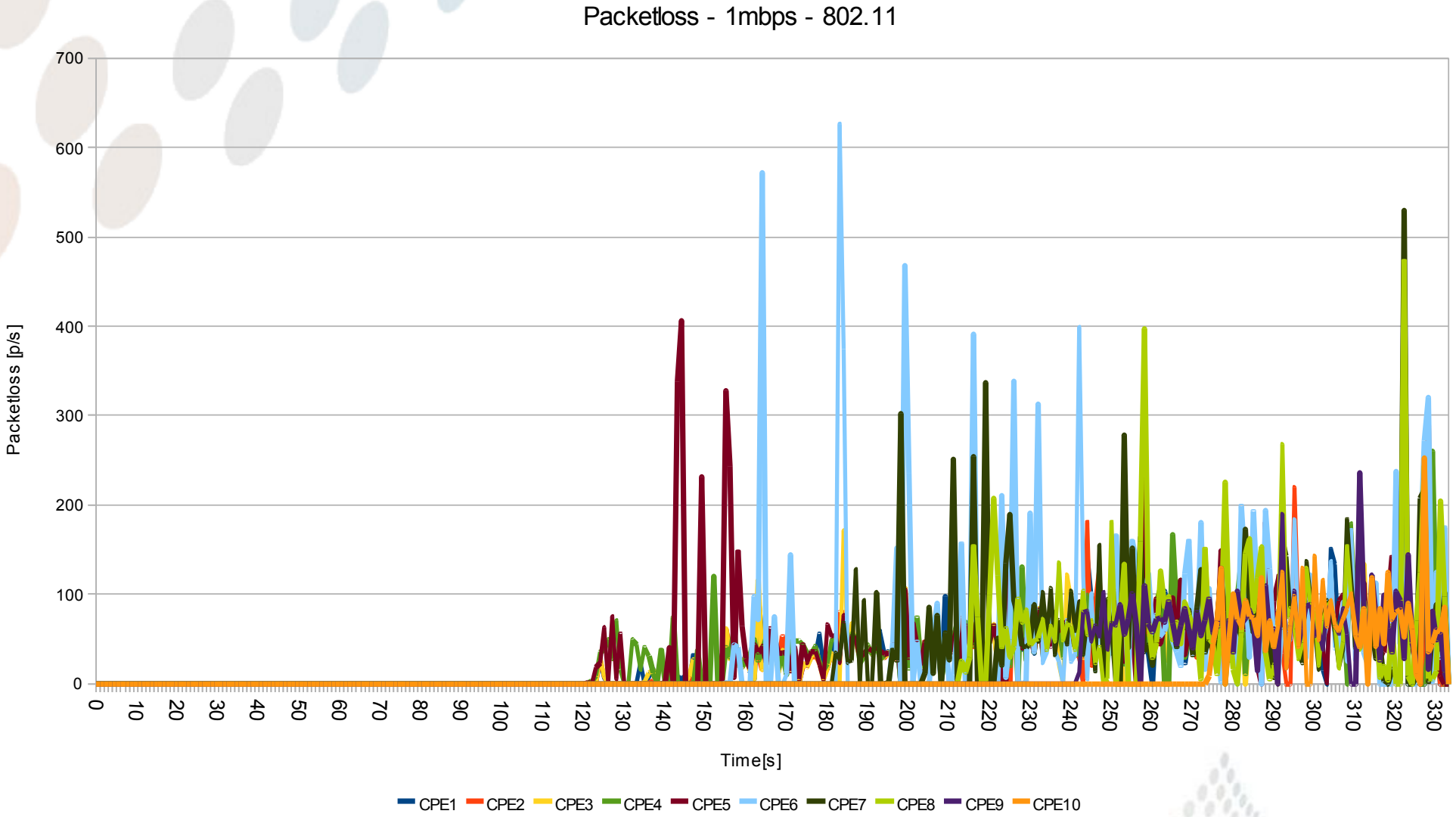
Aggregate Delay



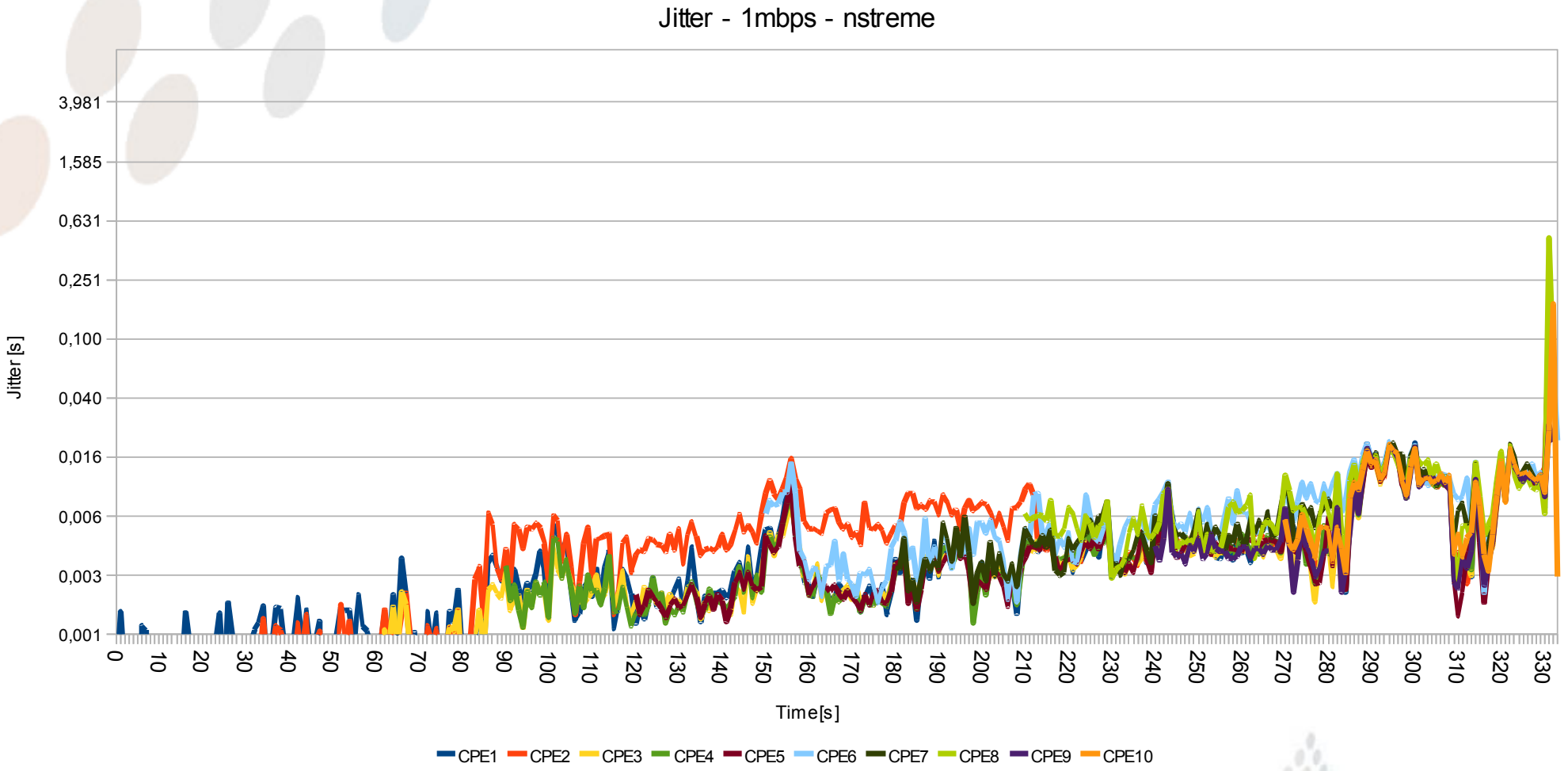
Packet Loss



Packet Loss



Jitter



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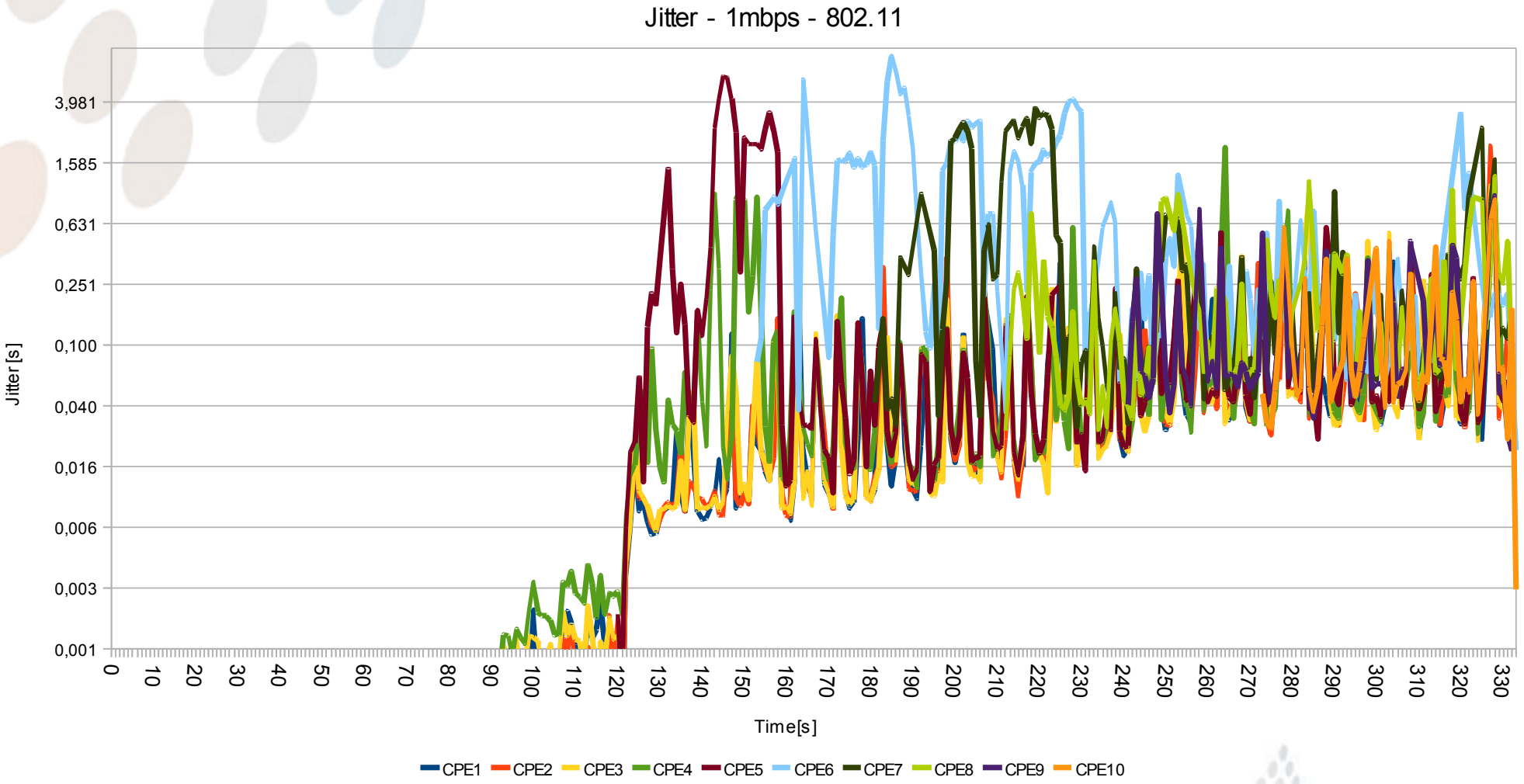

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Traffic Scenario II - Voice

- Server starting #1 voice call traffic to terminal 1
- Waits 30 seconds
- Server starting #2 voice call traffic to terminal 2
- And so on.....

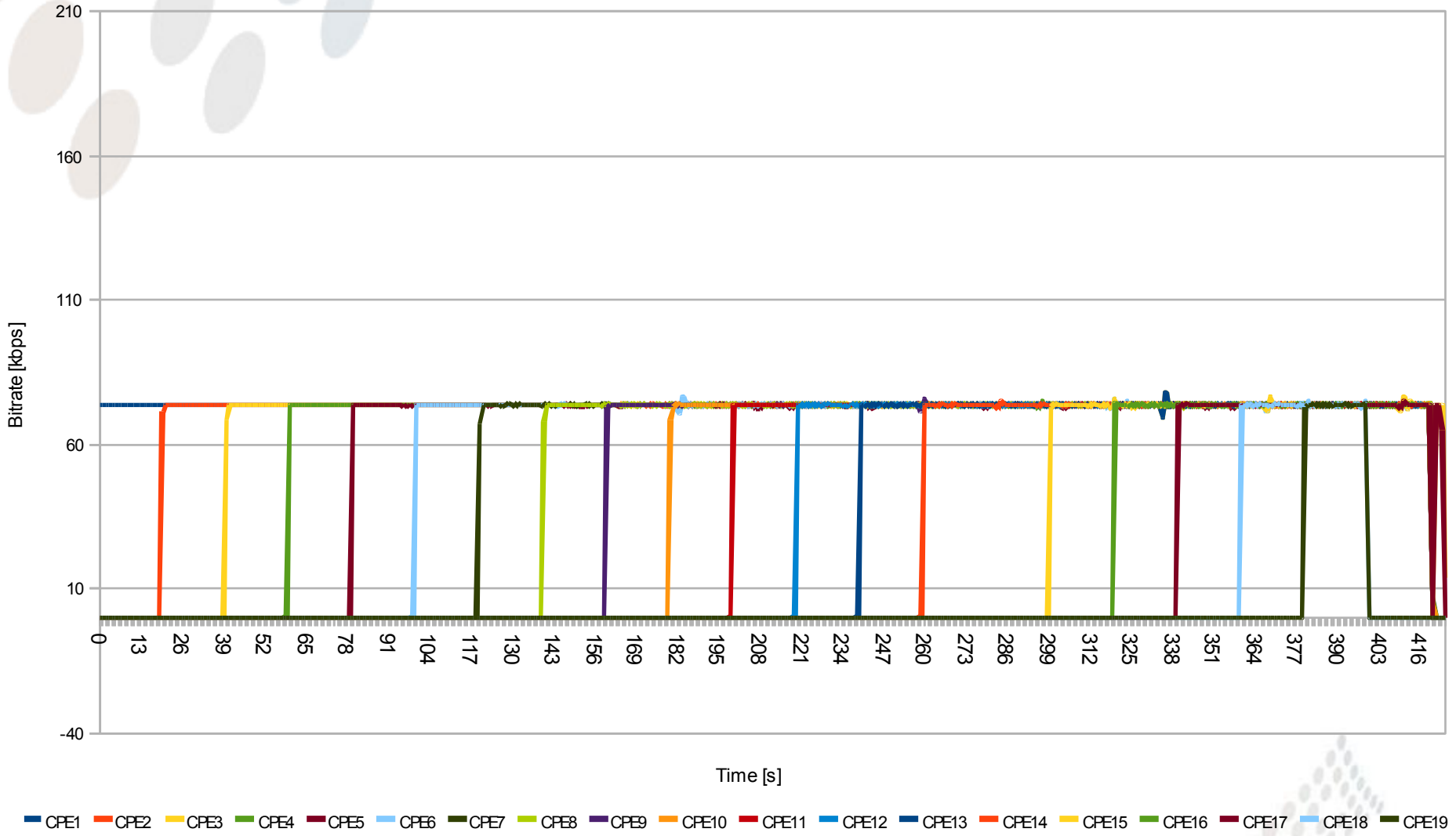
Traffic Scenario II - Voice

- Voip Traffic: G.711 – 1sample / pkt

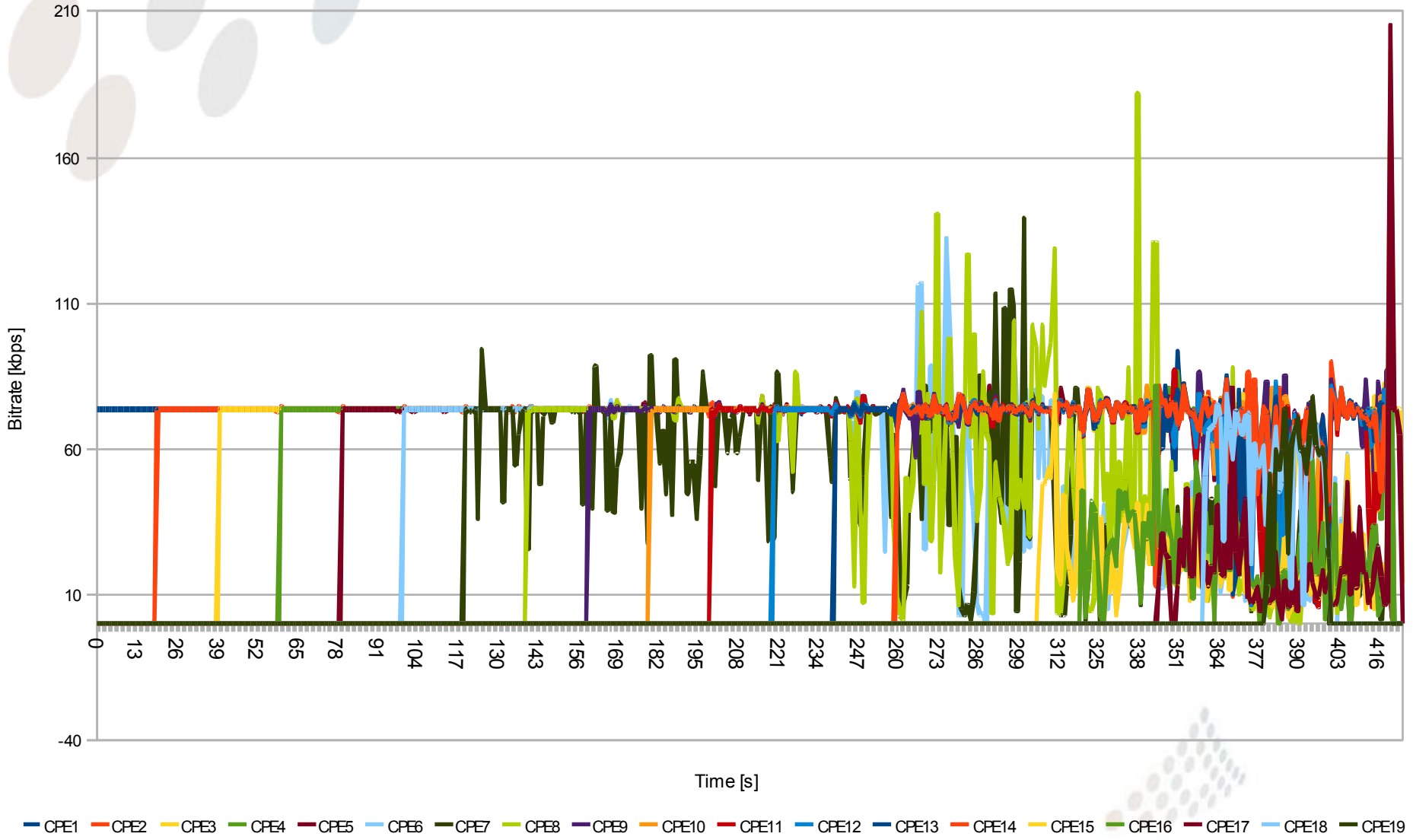
- Estimated Traffic (Layer 3):
- Bandwidth: 96,1 kbps
- Packet rate: 100 pkt/s
- Packet size: 120 Bytes

Results

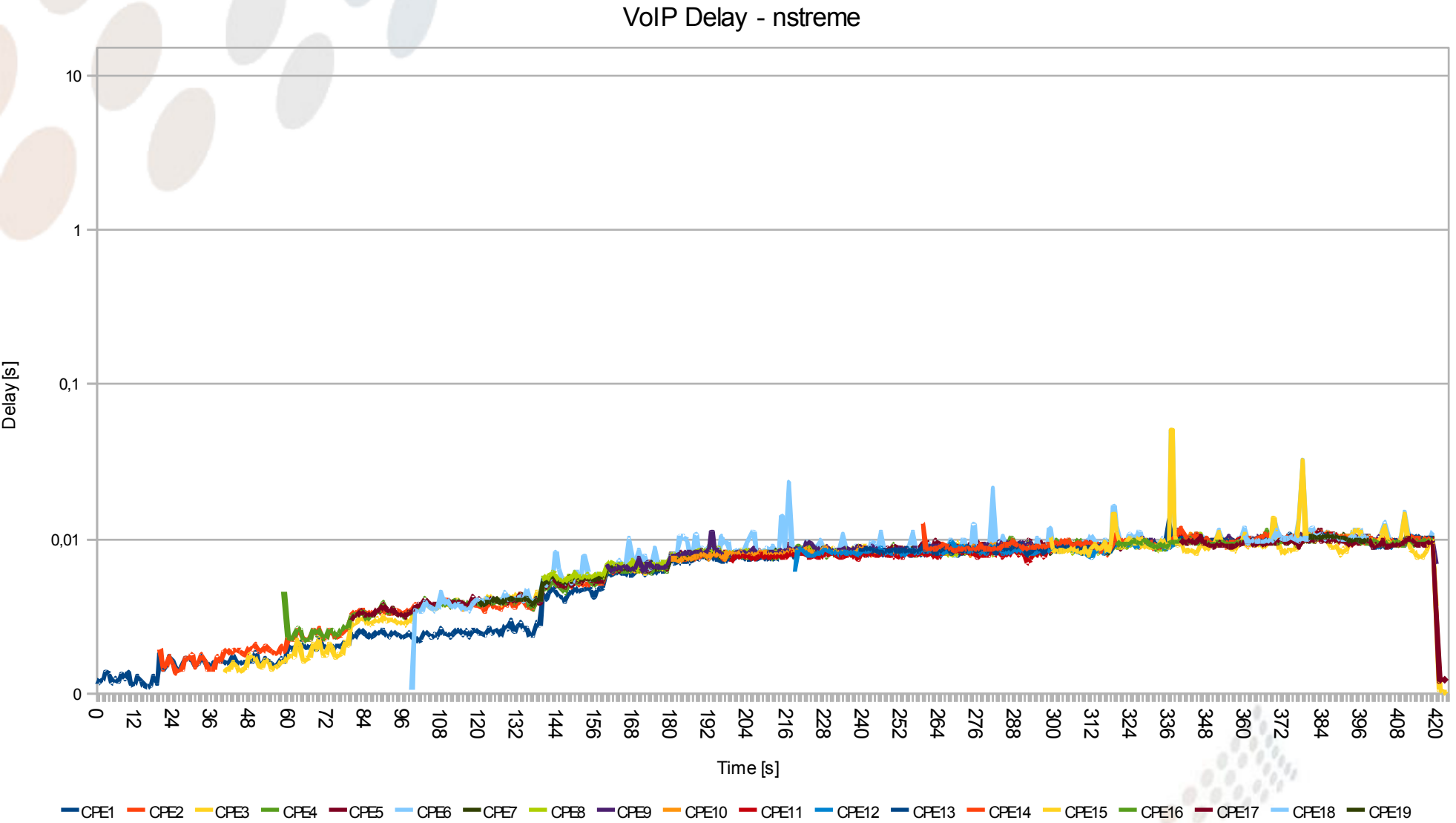
Throughput



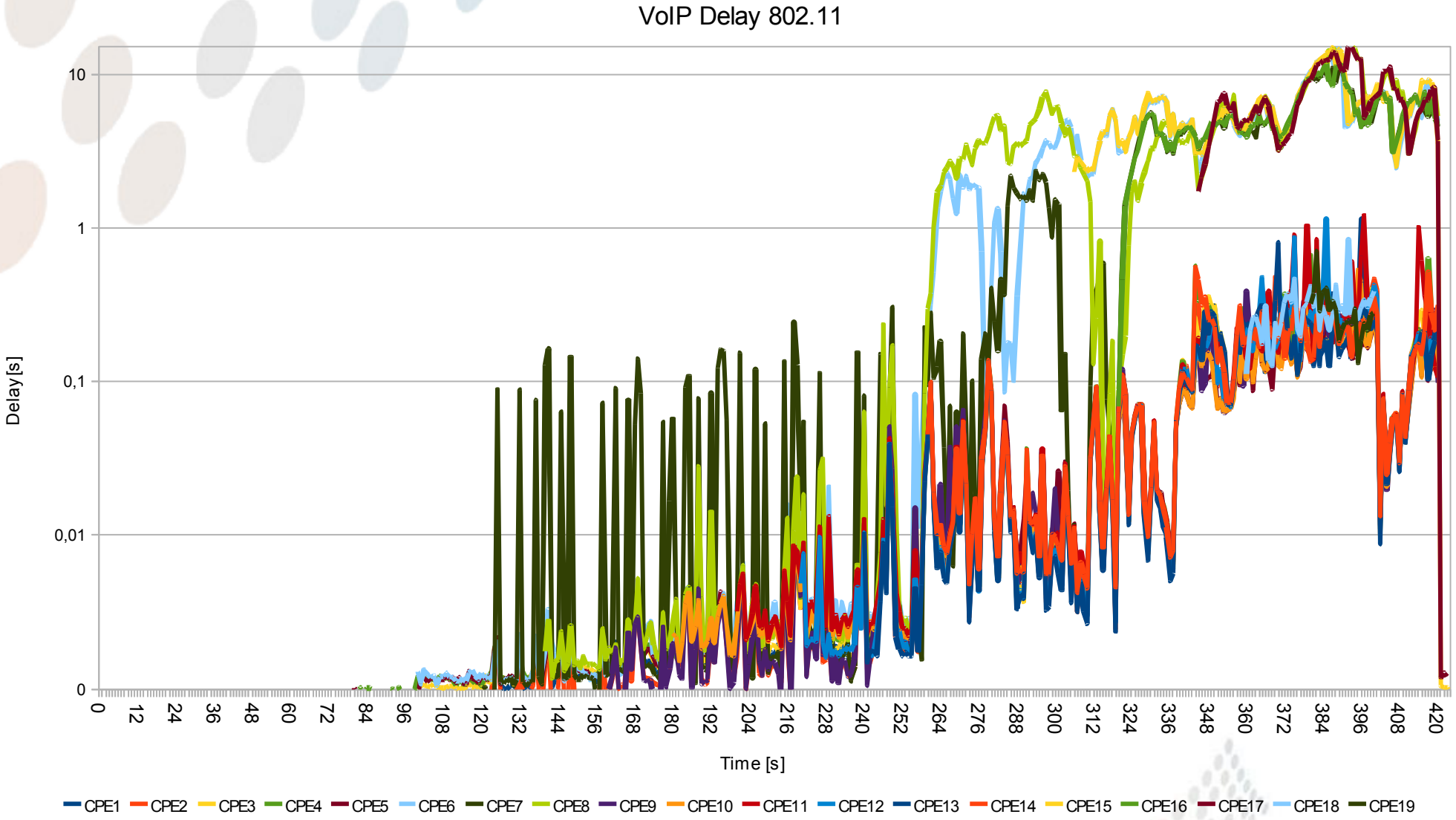
Throughput



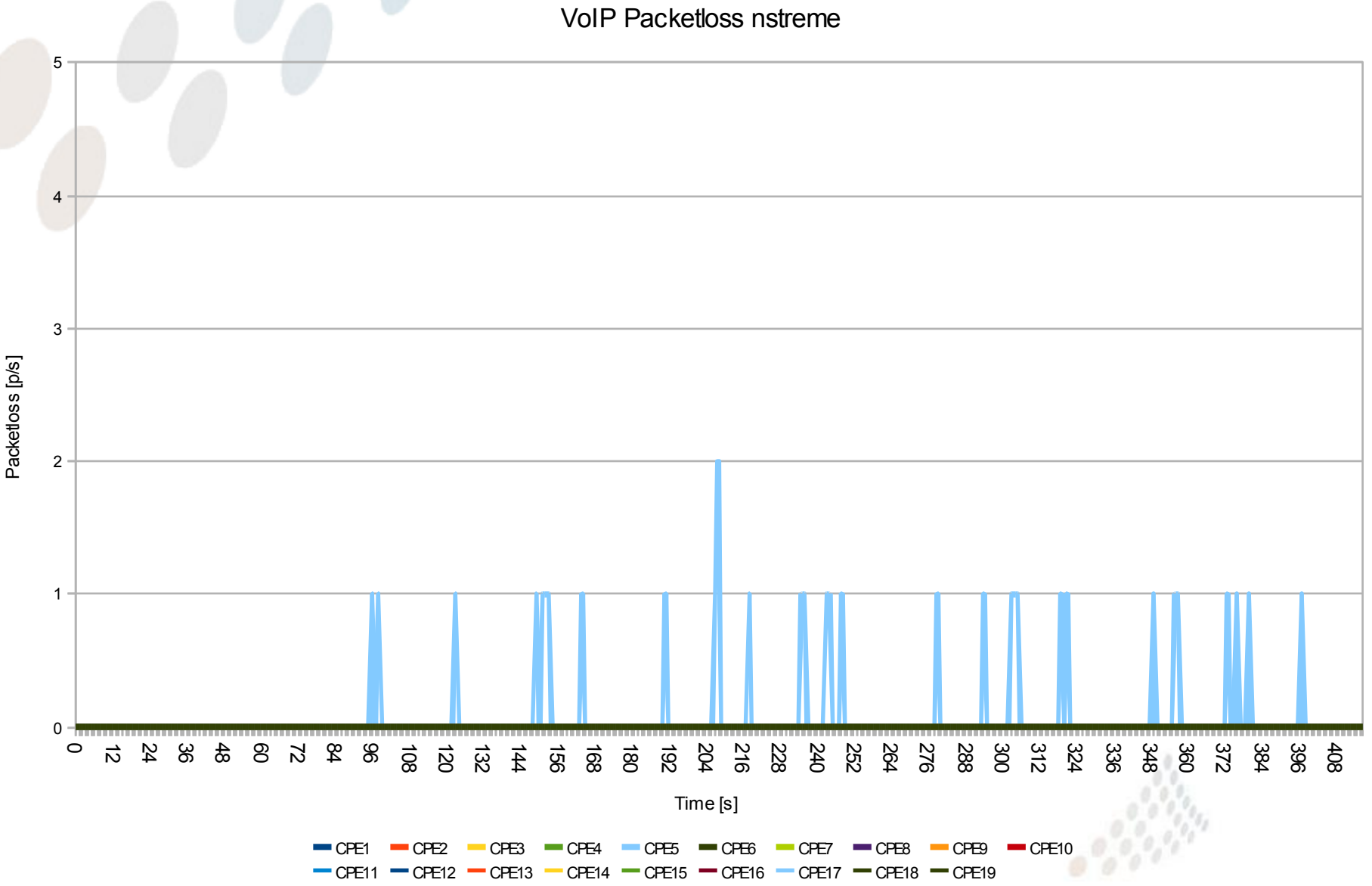
Delay



Delay

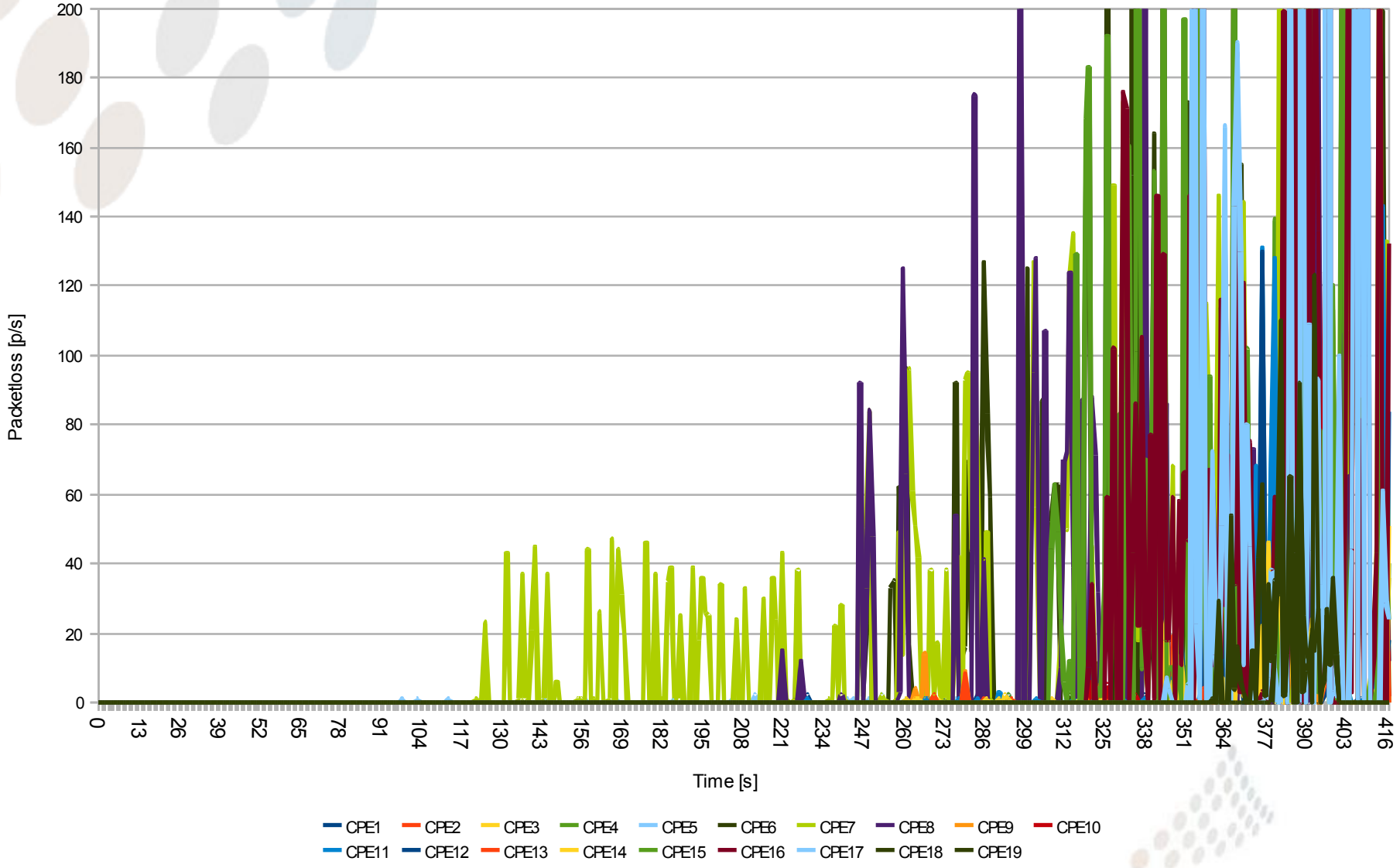


Packet Loss



Packet Loss

VoIP Packetloss 802.11



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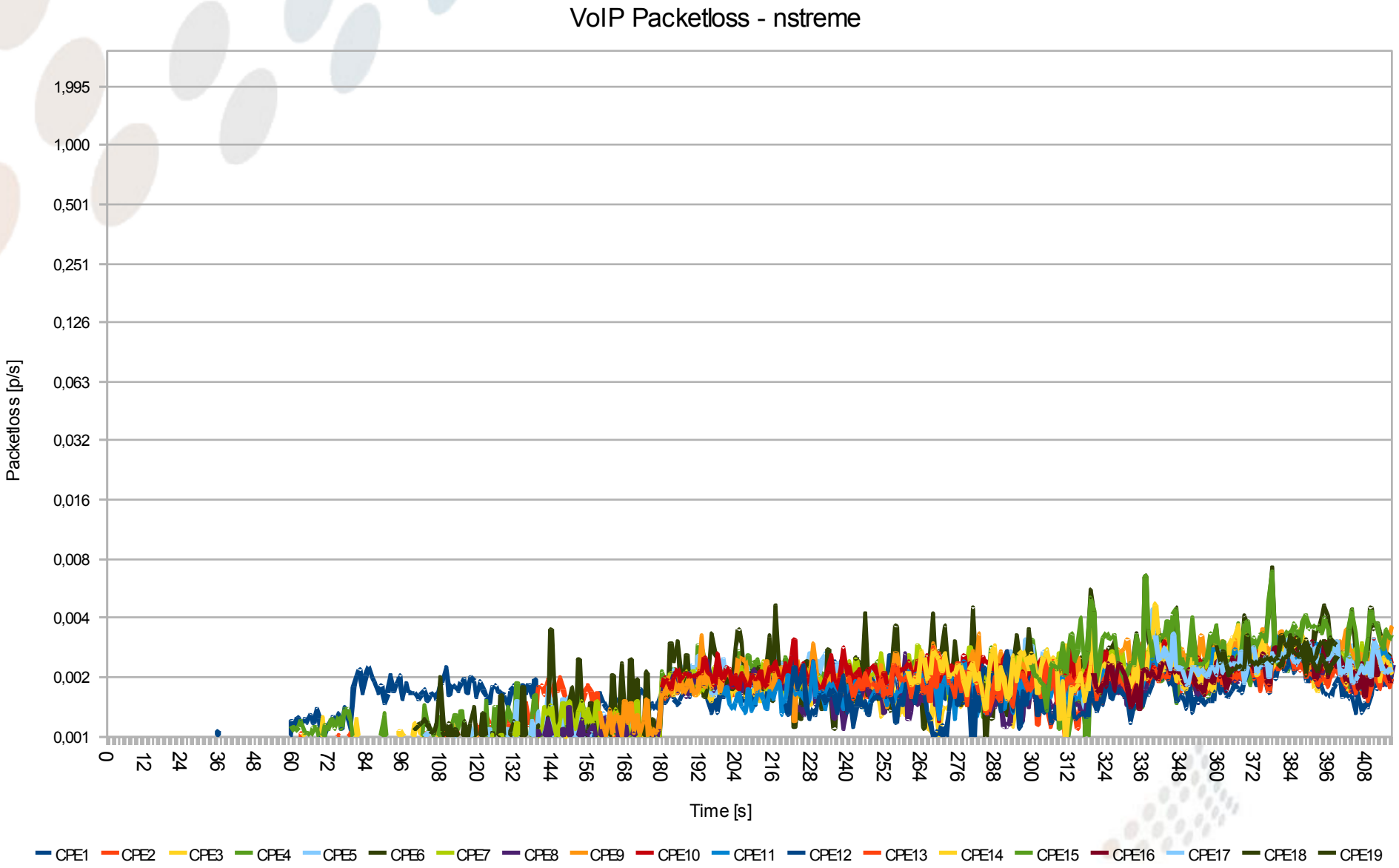

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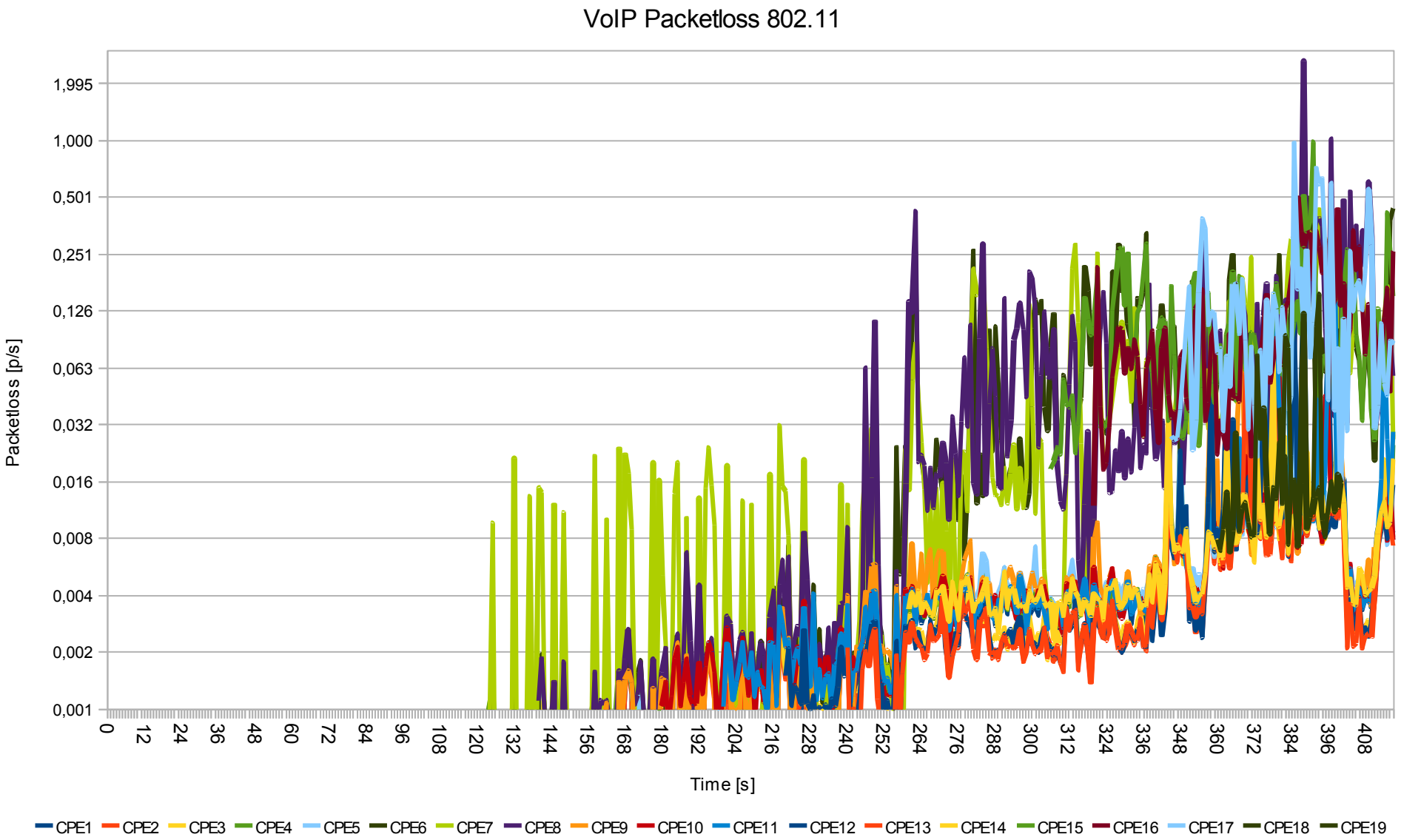

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What about NV2?

- NV2 was not available when test was performed.

Conclusion

- 802.11 does not provide reliable long distances or multipoint links !

- Testing Point-Point and Point-MultiPoint gives different results !