

Gigabit Buffered Distributor Proposal (a.k.a. Full Duplex Repeater) (a.k.a. Buffered Repeater)

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P A C K E T E N G I N E S I N C O R P O R A T E D

Buffered Distributor -- 1

The Issue

Desire better performance
for fiber links than proposed
half duplex repeater schemes



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With Gigabit Ethernet

We have

Full Duplex Media

Full Duplex PHY's

Full Duplex MAC's

Let's have a repeater/switch sort of device
that is not half duplex.



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The Breakthrough!

If all we have to do
is support full-duplex links,
the problem becomes very easy.



Buffered Distributor -- 4

An Important Point!

MOTIVATION FOR THE GIGABIT BUFFERED DISTRIBUTOR IS COST VS. GIGABIT SWITCH

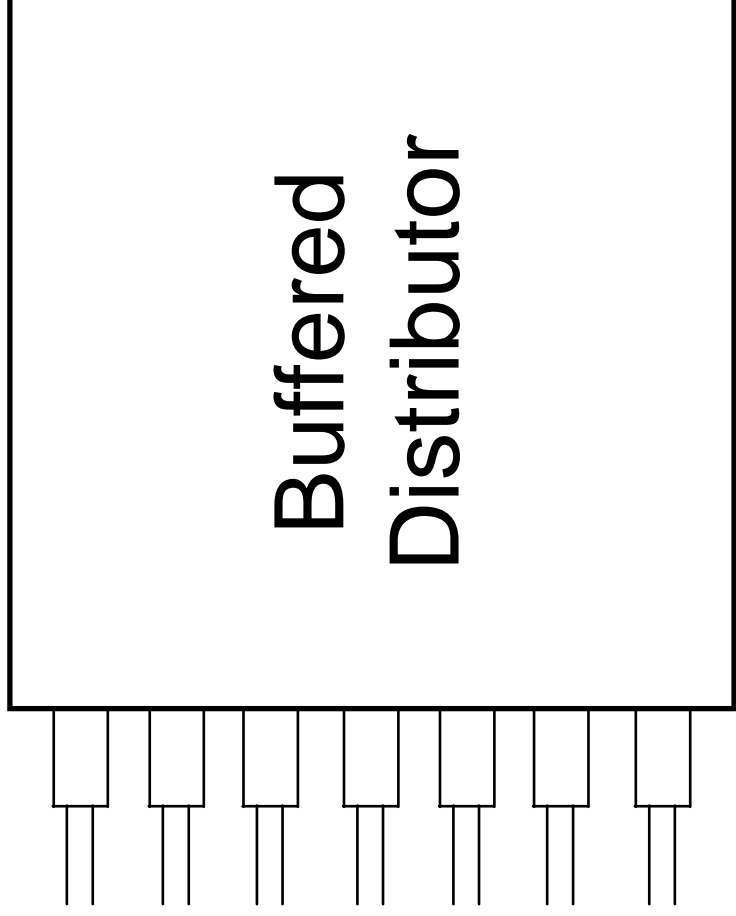


Buffered Distributor -- 5

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N Ports



N port hub
with
full duplex
links

Full Duplex Links



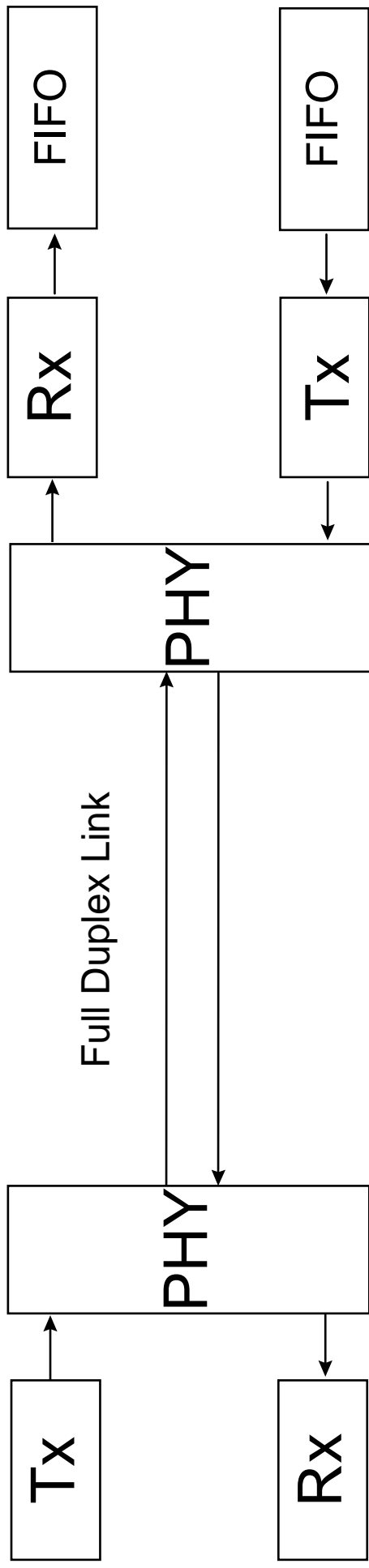
Buffered Distributor -- 6

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Step 1:

Provide a FIFO for each incoming line
to avoid collision domain timing
and distance restrictions.



Add small output FIFO for convenience.

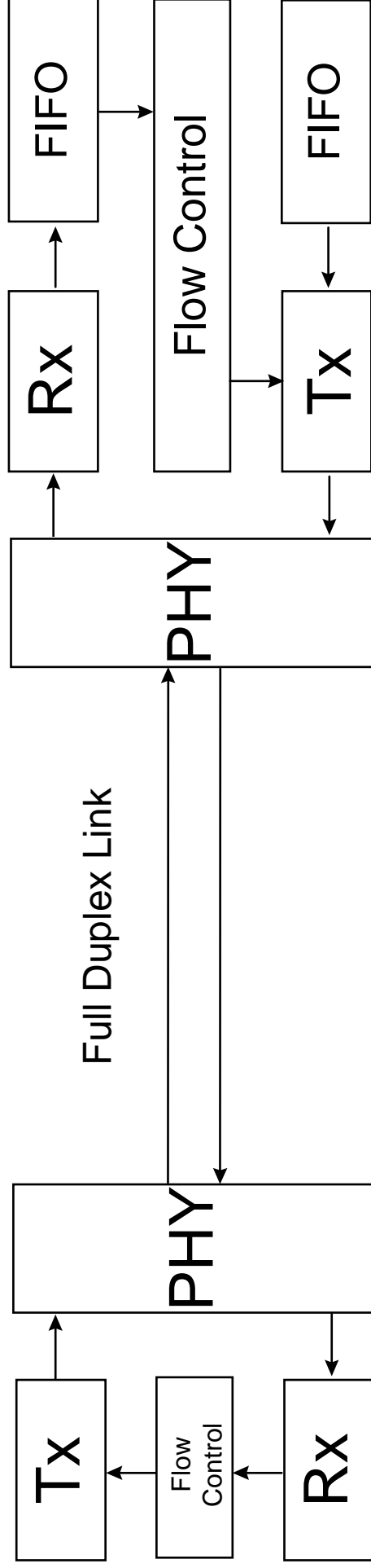
Solution!

Use frame based flow control to keep each input FIFO from overflowing.

- It's already standard.
- We don't have to invent anything new.

Step 2:

Add 802.3x flow control to each port.



Detailed view of port interface showing how flow control circuitry connects.

Step 3:

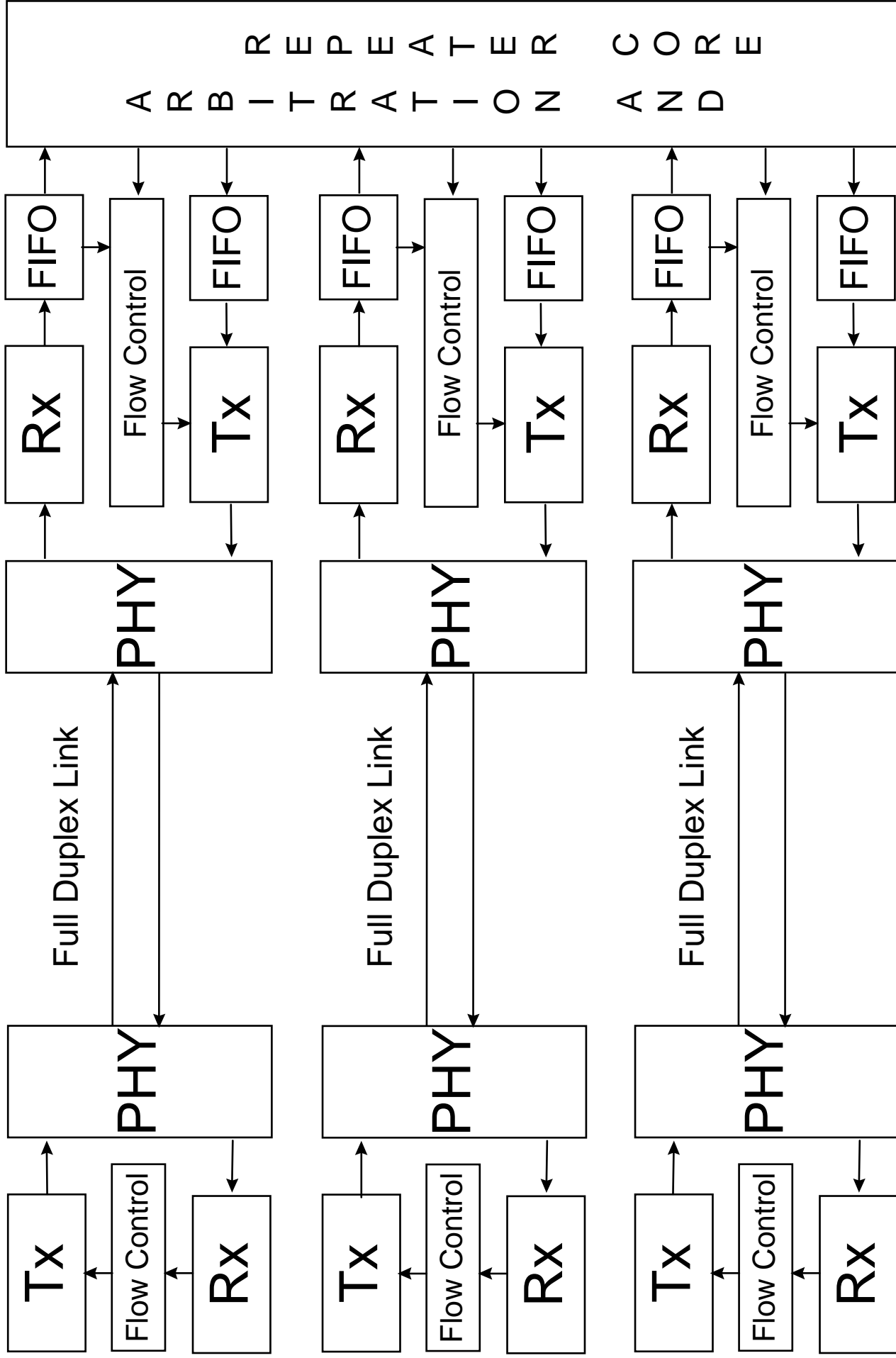
Hook ports
to the arbitration method
of your choice
inside the box.



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The box arbitrates among its local FIFO's and forwards packets, one at a time, back to all the devices - except the source port.



Specifications

Link Length (up to 2km)

Receiver FIFO Size (10KBytes)

Repeater Core Algorithm (your choice)

Outbound FIFO (your choice)



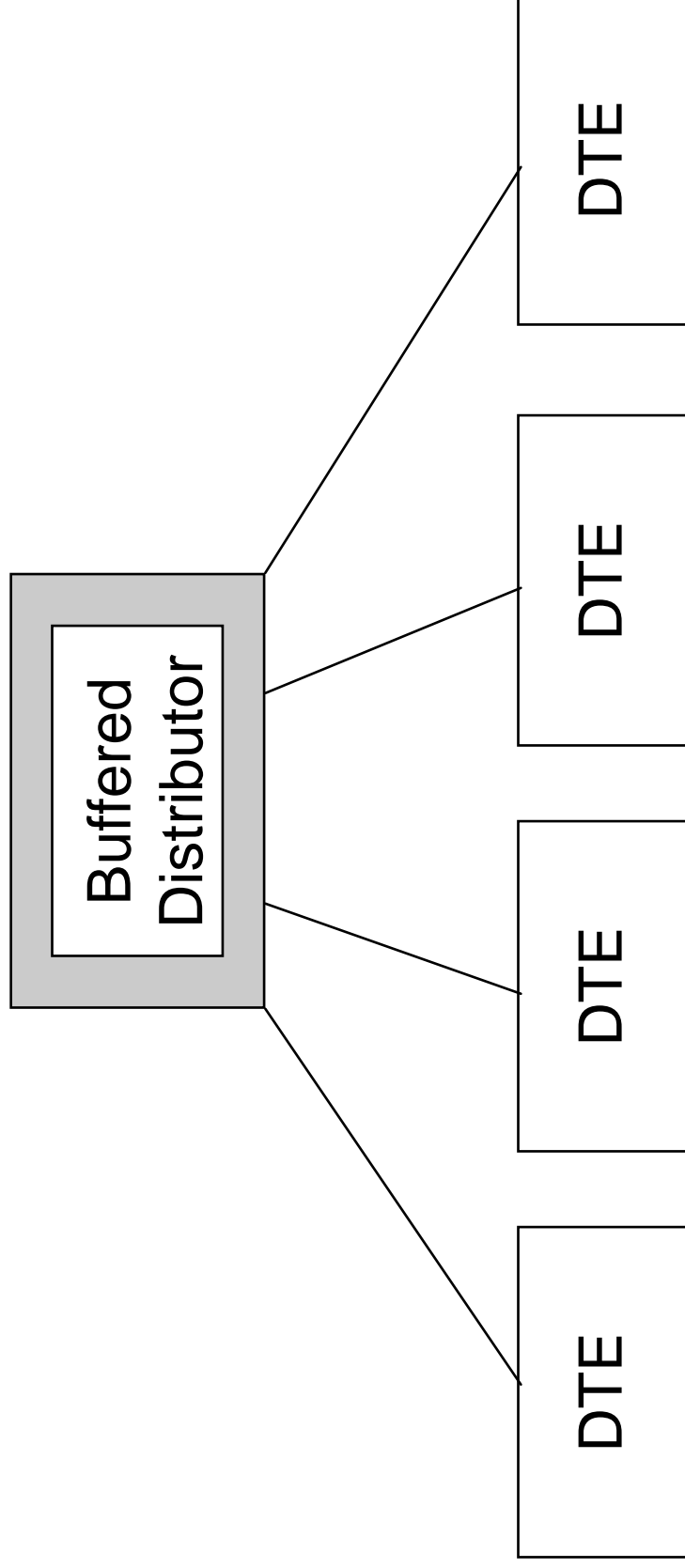
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1000BASE-T/F

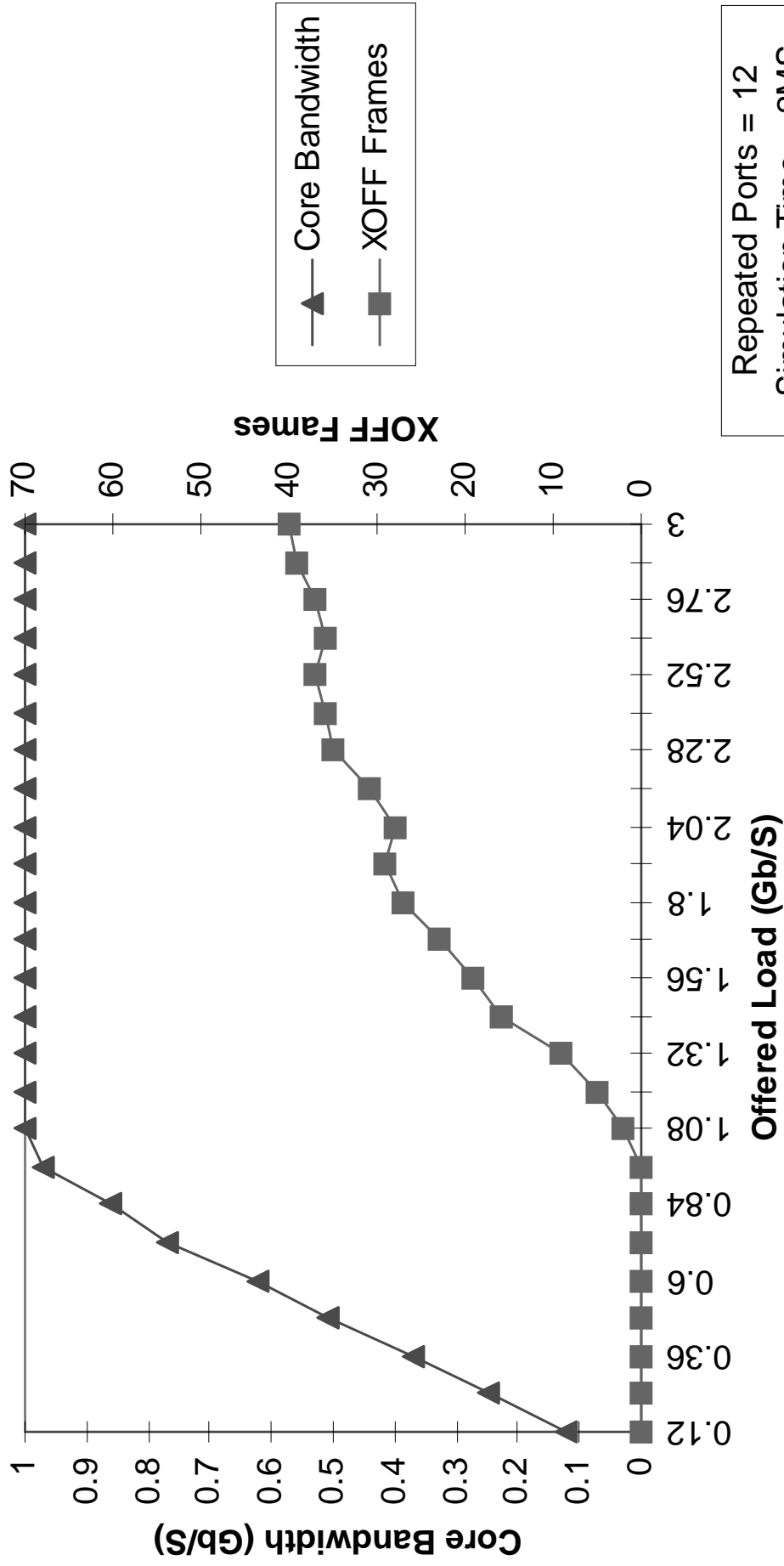
Just One Distributor!



Conclusion

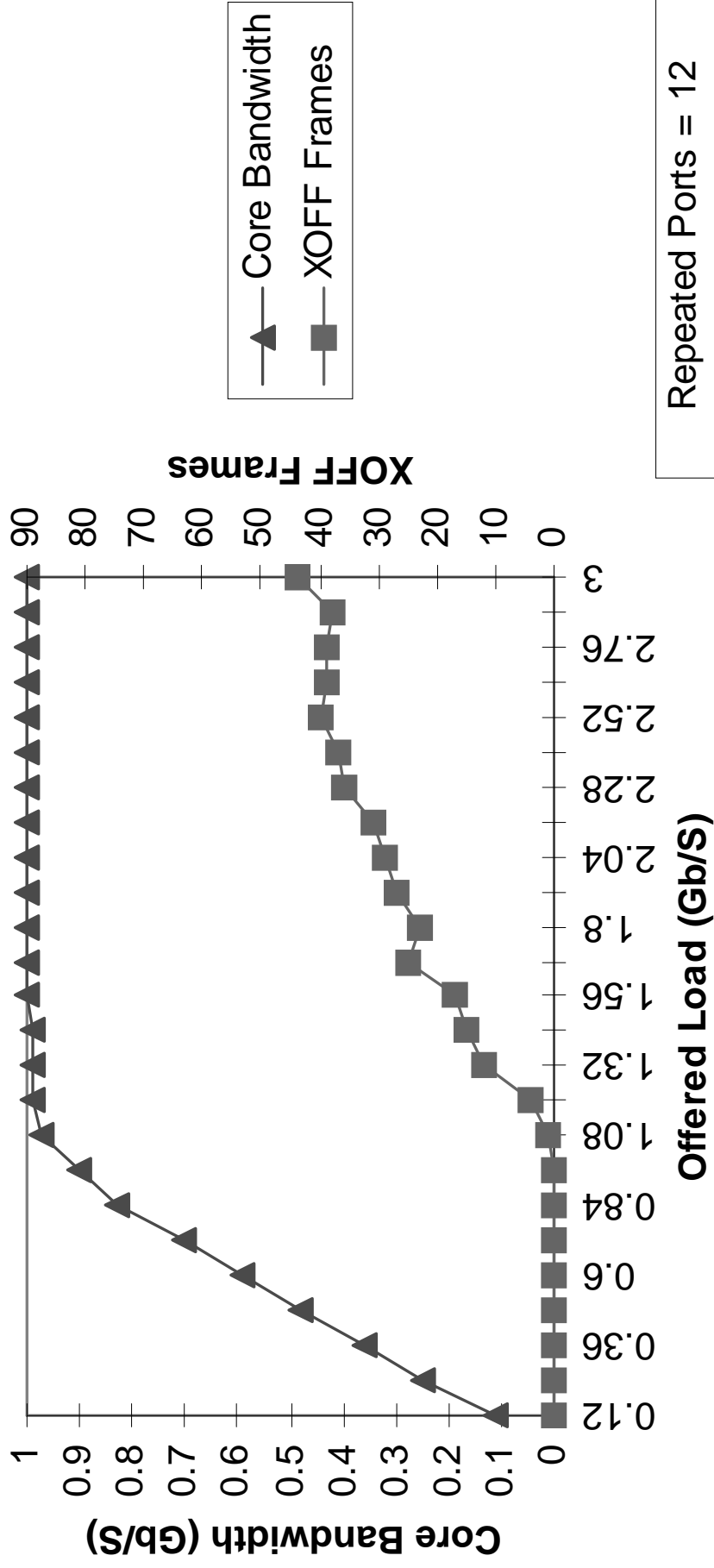
- Formalize a one distributor topology
- Standardize asymmetric flow control
- Standardize only minimal behavior of buffered distributor leaving features and link lengths to implementers

1518 Byte Packets - Round Robin



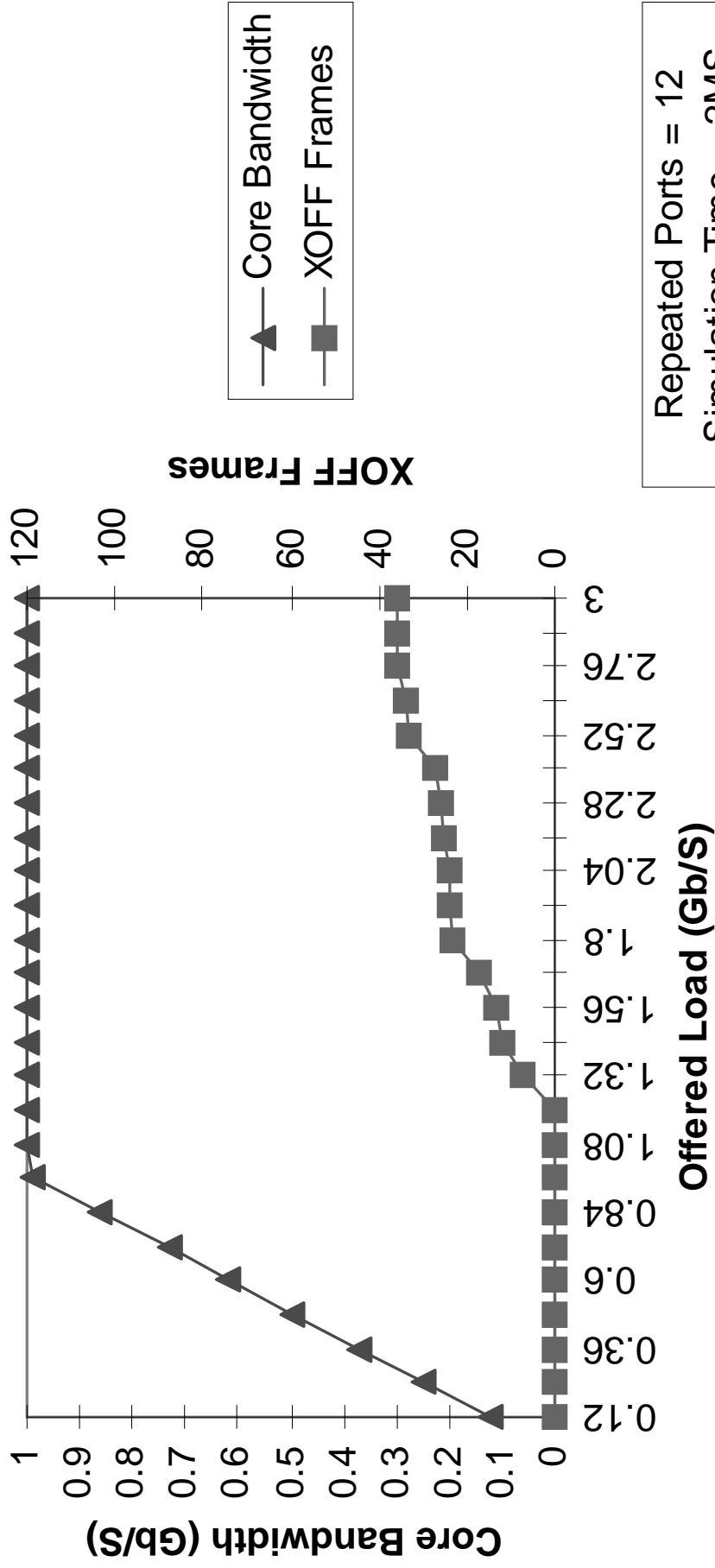
Repeated Ports = 12
Simulation Time = 2MS

Random Size Packets - Round Robin



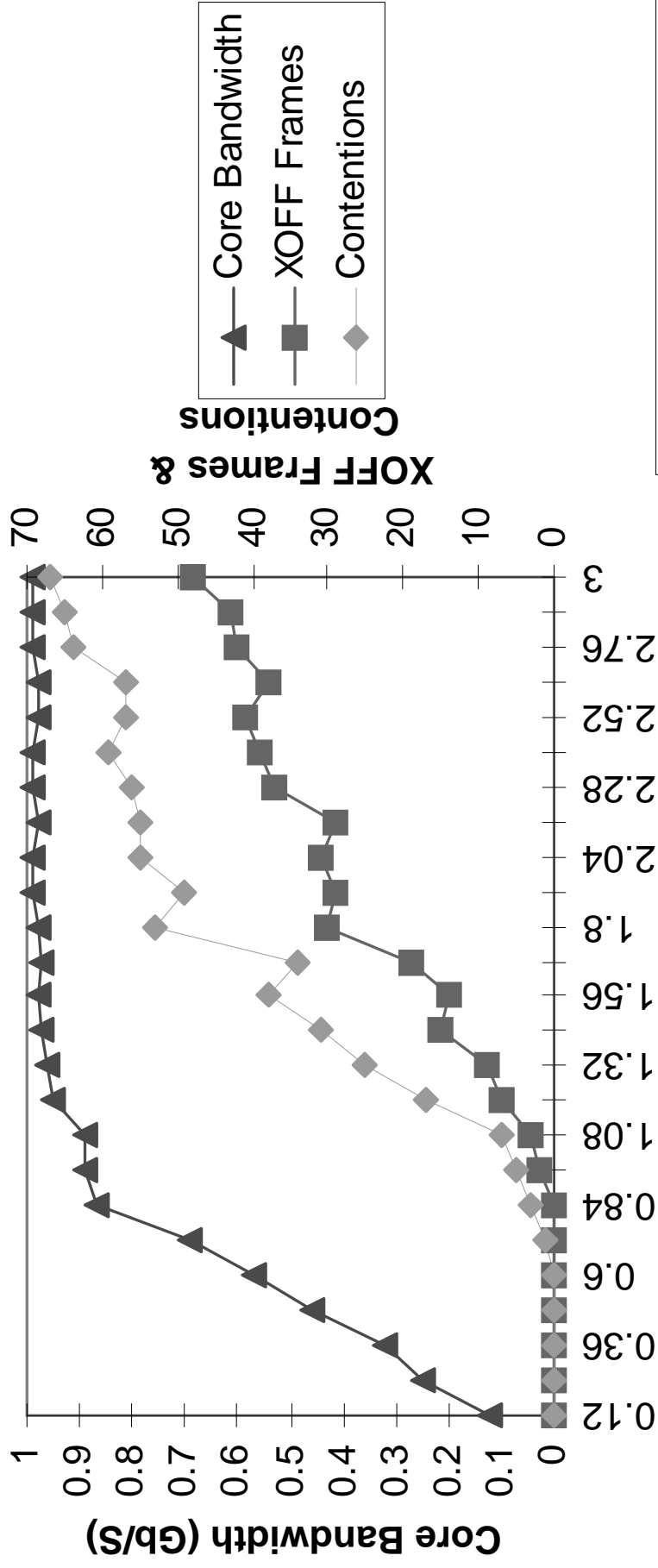
Repeated Ports = 12
Simulation Time = 2MS

64 Byte Packets - Round Robin



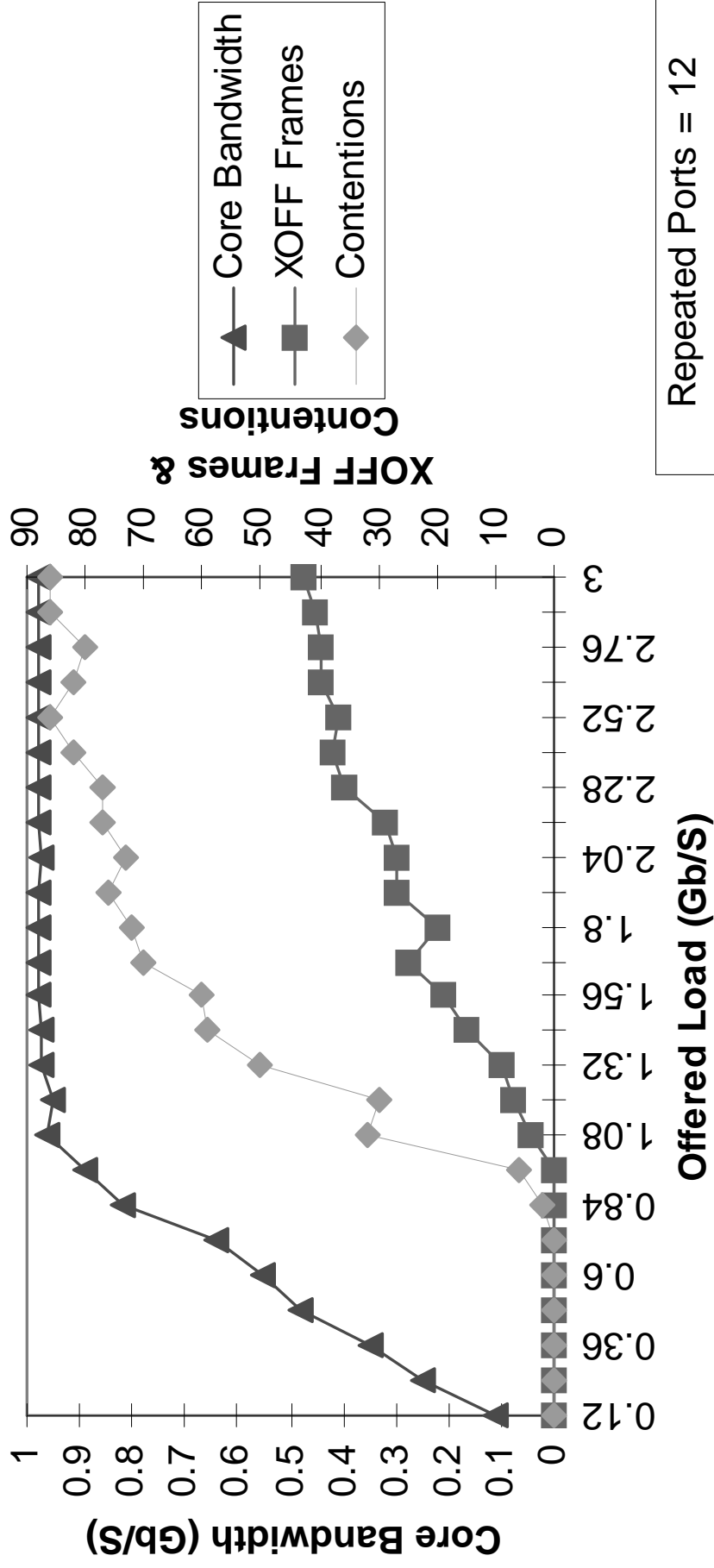
Repeated Ports = 12
Simulation Time = 2MS

1518 Byte Packets - CSMA/CD



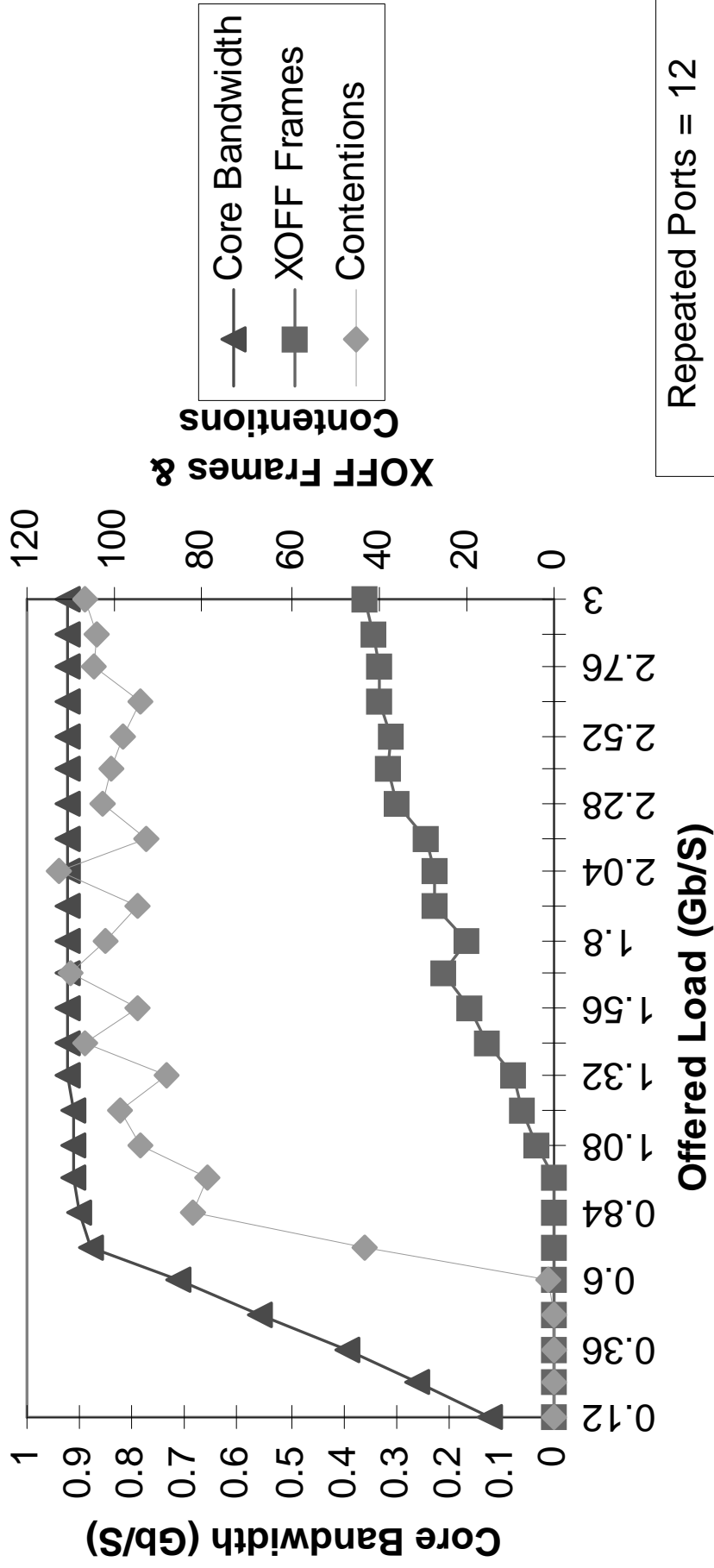
Repeated Ports = 12
Simulation Time = 2MS

Random Size Packets - CSMA/CD



Repeated Ports = 12
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64 Byte Packets - CSMA/CD



Repeated Ports = 12
Simulation Time = 2MS