FIREWALL
IXP Vs Cosmic Cube

DDOS Shields (Manoj Singla)

ACL-Based Firewall (Girish P. Das)

What if we used Cosmic Cube

- **Harder, Slower and Worse**
  - No libraries available
  - No shared memory
  - No MSF
  - No hardware based context switch
  - OS overhead (message processing)
  - No signaling
  - No CAM
  - Explicit thread synchronization required
  - No fast path between neighbor node (IXP uses NN registers)
Implementation of Firewall on Cosmic Cube

All nodes run firewall and up to 64 packets can be processed in parallel
- Need synchronization to maintain packet order
- Receive and transmit will be bottleneck
- No need to transfer packet from one node to another

Node 0
Rx
Node 1
Node 63
Tx
Node 62

Implementation of Firewall on Cosmic Cube

All nodes run unique part of firewall
- No synchronization required to maintain packet order
- Receive and transmit will be bottleneck
- Need to transfer packet from one node to another

Node 0
Rx
Node 62
Fun
Node 63
Tx
Node 1
Fun