BCNET

Shared IT Services for Higher Education & Research

Conference 2017

Apple Caching @ BCNET

Saving Transit Internet Bandwidth

The Team

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BCNET Caching Overview

- BCNET On Premise Caching
  - Akamai for HTTP cacher access (https in discussion)
  - BCNET partners with Verisign and provides J-Root DNS for IPV4 and IPv6
  - ICANN provides on-site L-Root as well

BCNET Caching Overview

- BCNET Partner Caching with CANARIE

Adhost	Desire2Learn	Yahoo!
Altopia (incl alt.net)	Facebook	
amazon.com	Google	
box.net	Limelight	
Cisco WebEx	Microsoft	

https://www.canarie.ca/network/services/cds/

Peering Services

Peering

- CANARIE CDS new peers added: Cisco WebEx, IBM SoftLayer
- **15 Gbps** sustained traffic 47% of all BCNET external traffic
- Peers: Amazon, D2L, FB, Limelight, Microsoft, Novus, Rackforce, VANIX, Yahoo!
- Local caches: Akamai, Google

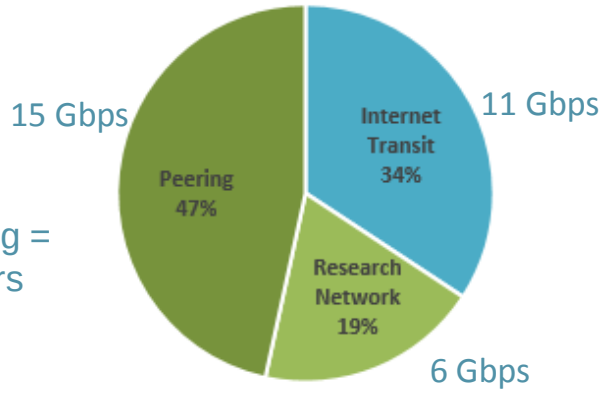
Investment in Research Network + Peering = $1.5 M annual avoided costs for members

Internet Transit & Peering Working Group

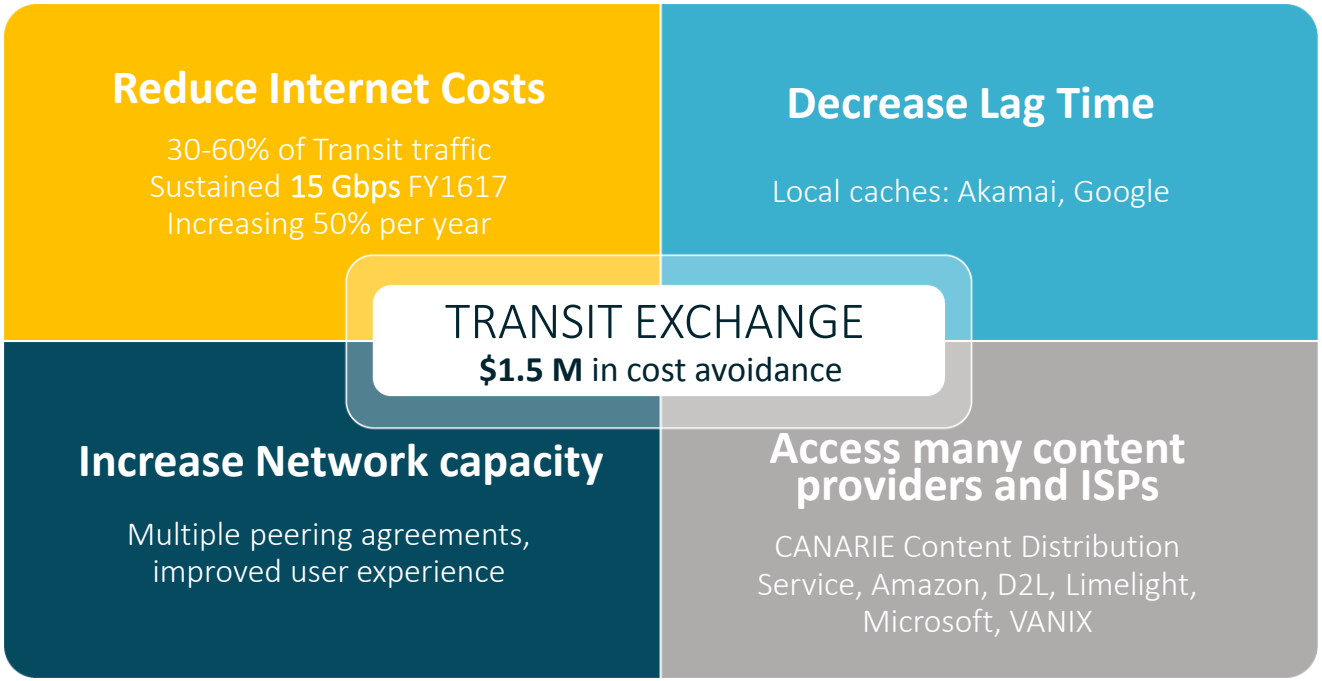
- Member developed

  Apple Caching Service in Proof of Concept phase

- Full service planned for FY1718



Transit Exchange Peering Service



Apple Caching Timeline

- April 2016 – Apple Cache server at UBCO
- June 2016 – proposal submitted to ITAPWG
- September 2016 – POC approved by ITAPWG
  - UBCO, TRU, VIU
- January 2017 – UVIC joins the POC

Configuration

- Hardware
  - MacMini i5 8GB Ram
  - 4TB Drive for cache + 1 TB drive for Backup
  - Thunderbolt to Gigabit adapter for cache data
  - USB Ethernet Dongle for Management

- Software
  - OS X 10.11.6
  - macOS Server

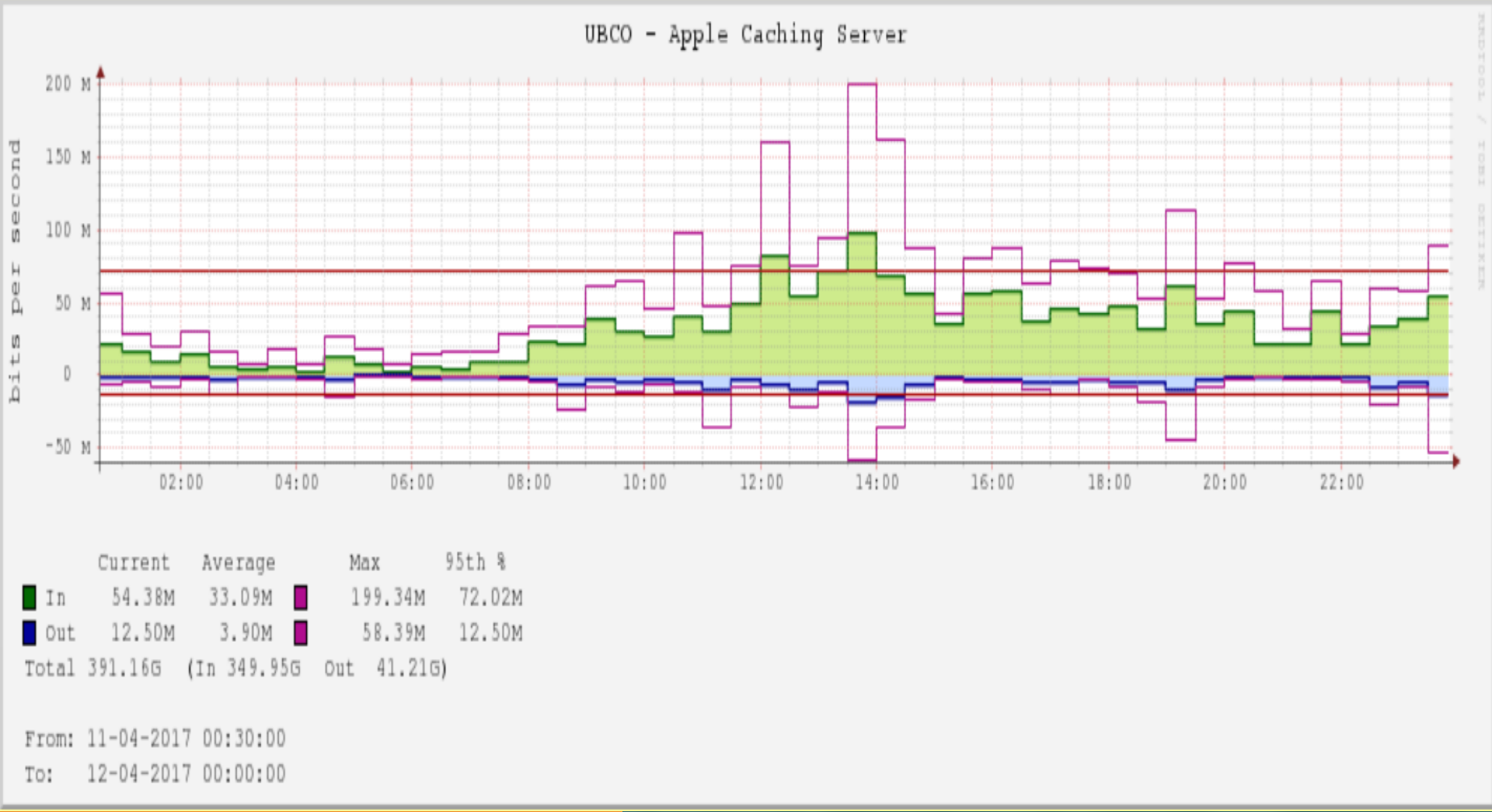
Configuration

- DNS
  - Record created after building networks that the cache server will be used with
  - aaplcache record generated within Cache Server tool in BIND or Windows format
  - Same record is added to all locations DNS servers that are using the cache
  - DNS timeout something to watch for when testing if the service is working or not

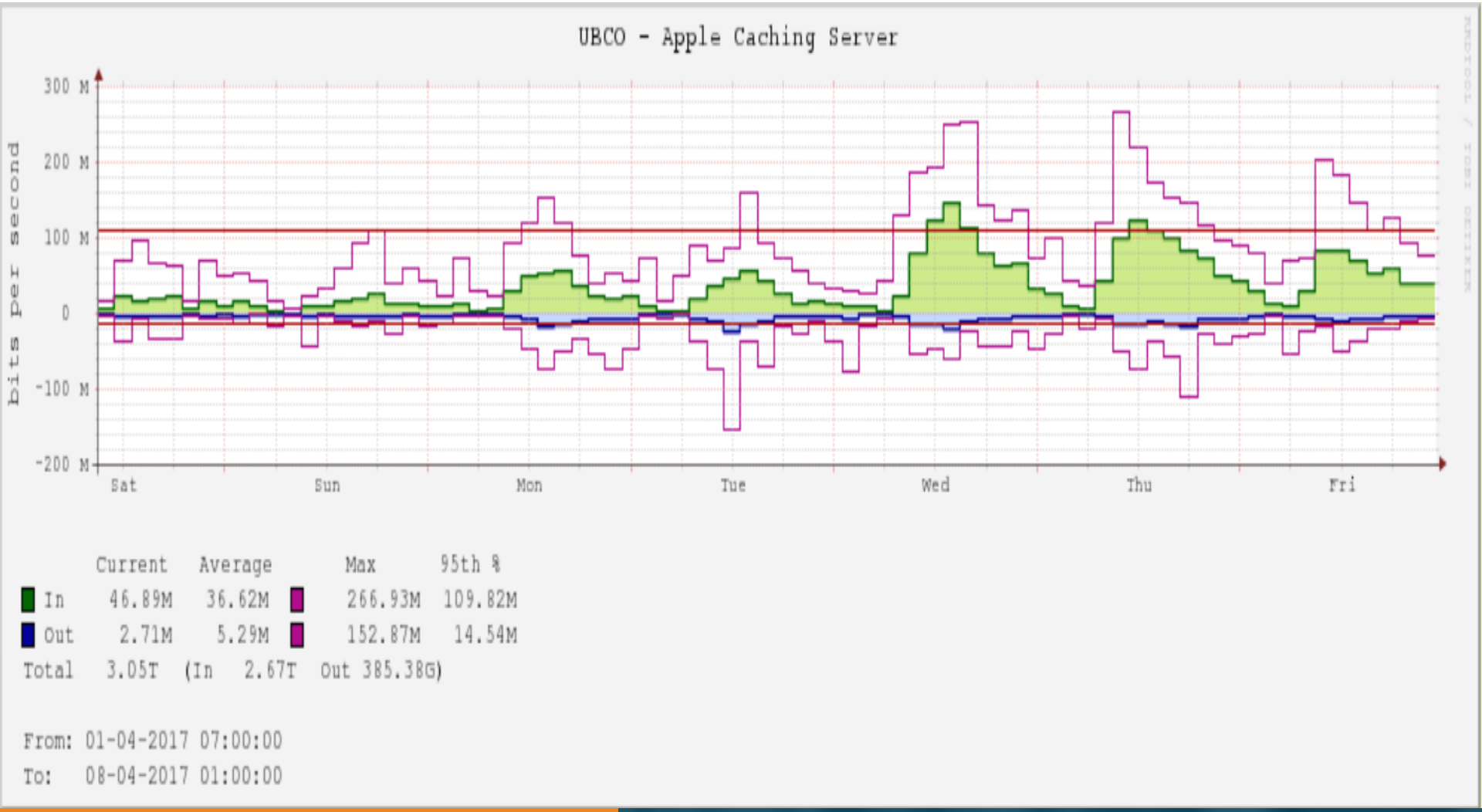
Configuration

- Peering
  - Cache servers on the same network will peer automatically.
  - Peers can be configured to listen only to certain servers or open to all
  - Order or operations is Device > Cache Server > Peer Server > Apple Servers with first Server to have the requested item returning it.

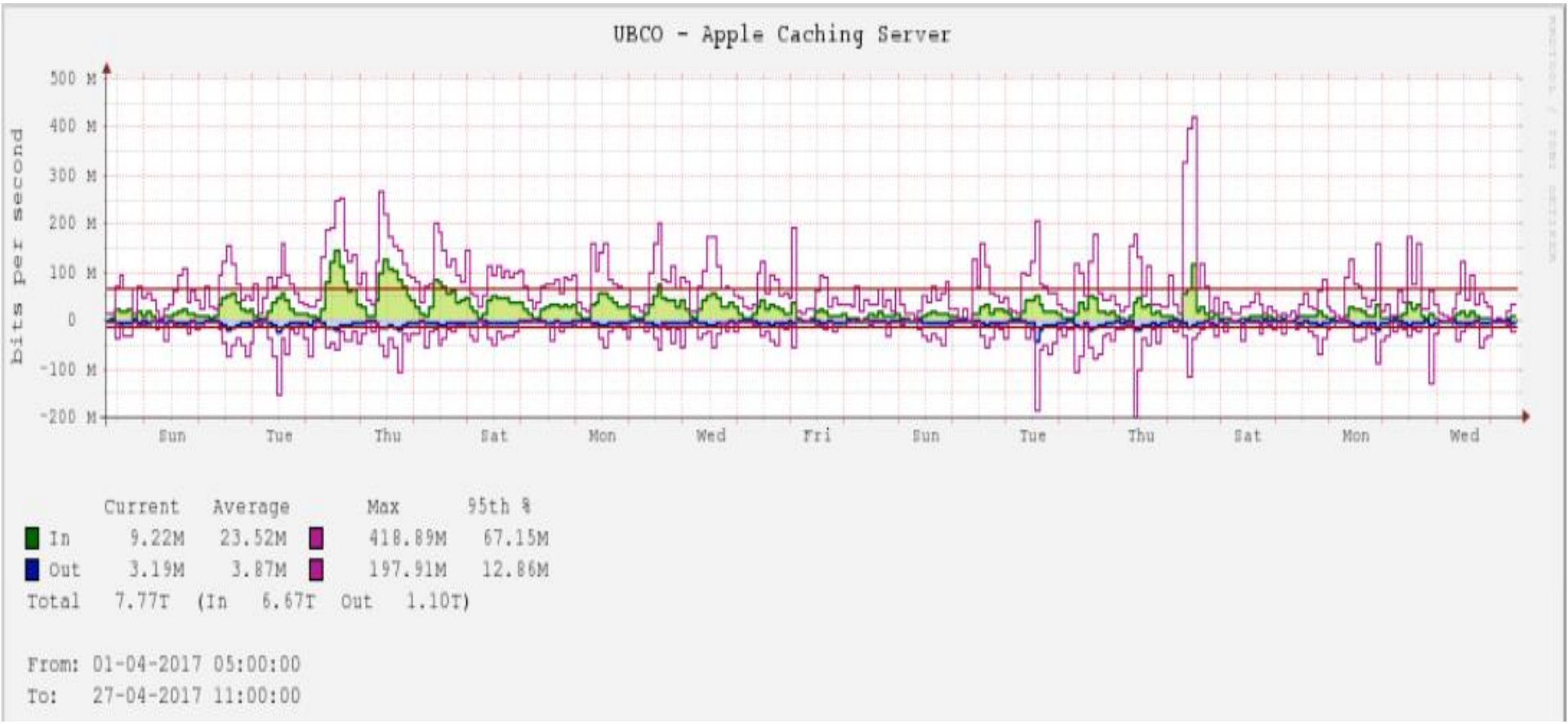
Daily Server Statistics



Weekly Server Statistics



Monthly Server Statistics



Server Statistics

- September to December

Month	To BCNET Clients from BCNET Cache	From Apple to BCNET Cache
September	2.00 TB	0.50 TB
October	9.22 TB	1.23 TB
November	3.20 TB	0.55 TB
December	1.20 TB	0.43 TB

Server Statistics

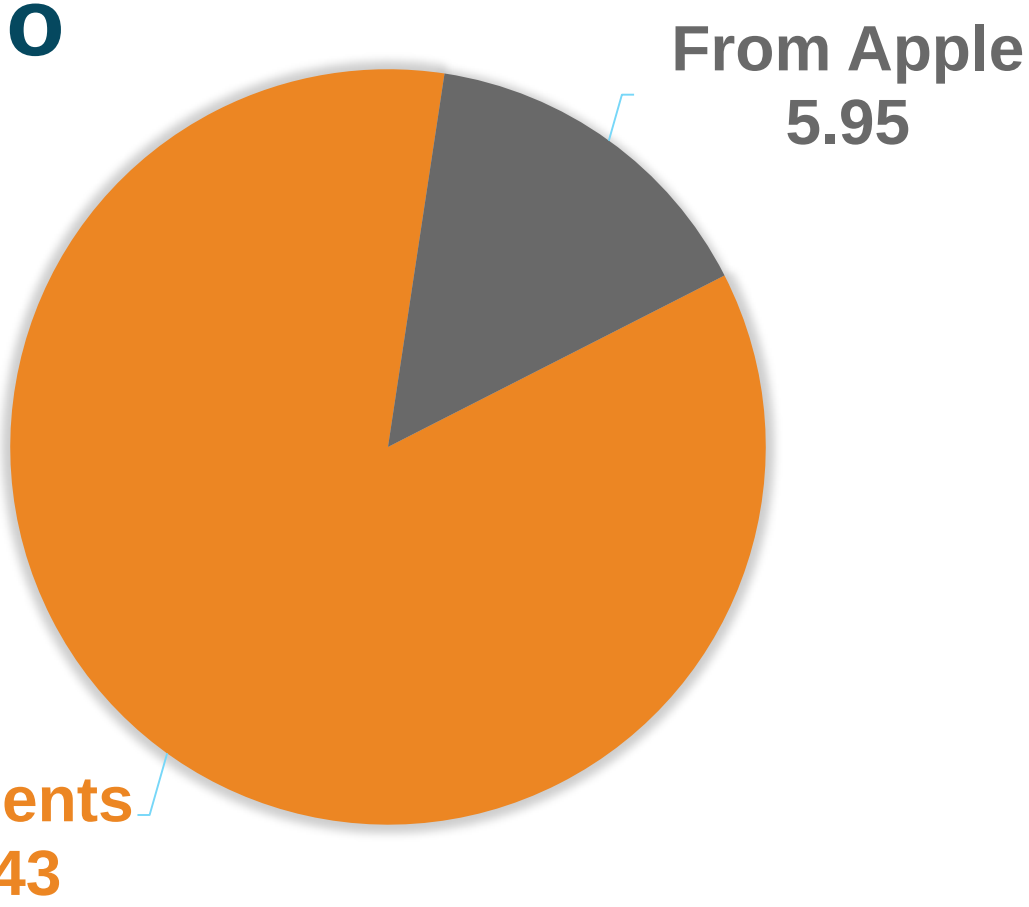
- January to April

Month	To BCNET Clients from BCNET Cache	From Apple to BCNET Cache
January	3.32TB	716GB
February	6.64TB	1.10TB
March	7.84TB	1.43TB
April *		

* Two cache drive purges due to testing Mac Pro hardware.

Server Statistics

5.6:1 Ratio



Next Steps

- Budget approval for a BCNET service
- Two BCNET cache servers
- Institutional local cache server
- Dual NIC configuration

Questions?