Central IT at a Major Research University

Tuesday, November 1, 2016

- The mission of the Information Technology Services organization is to accelerate the University's academic, research and patient care pursuits by providing accessible, reliable, efficient, scalable and innovative technologies that enable faculty, students and staff to realize their goals of leading change to improve society and help solve the greatest problems for our state, our nation and our global community.

- Position **ITS** as a valued and trusted University partner that delivers reliable, efficient and creative institutional technology strategy and solutions in partnership with the greater Carolina academic, research and administrative community.

IT by the numbers at Carolina

	ITS	University	Total
FTEs (source 2012 Carolina Counts)	400	~477	~877
Non-salary IT expenditure (source: 2012 procurement data)	$31m	$26m	$57m
Data Centers, server rooms, etc. (source: Space Planning System)	3	215	218
Data Centers, server rooms – sq ft (source: Space Planning System)	18,000	?	?
Storage (source: ITS Operations)	15.7PB	?	?

- 3900+ course sites hosted via Sakai, open source T&L platform

- 205 technology-outfitted classrooms

- 17,000+ jobs running on research computational clusters at any given time

- Approximately 55 million CPU hours for research computing per year on KillDevil cluster

- 100+ software applications supported, ranging from the PeopleSoft ERP to more specialized applications like EDS, an Energy Services application used to validate meter readings and create bills

- Maintain 15.7 petabytes of usable storage: 4.7 petabytes for Infrastructure and Operations; 11 petabytes for Research Computing
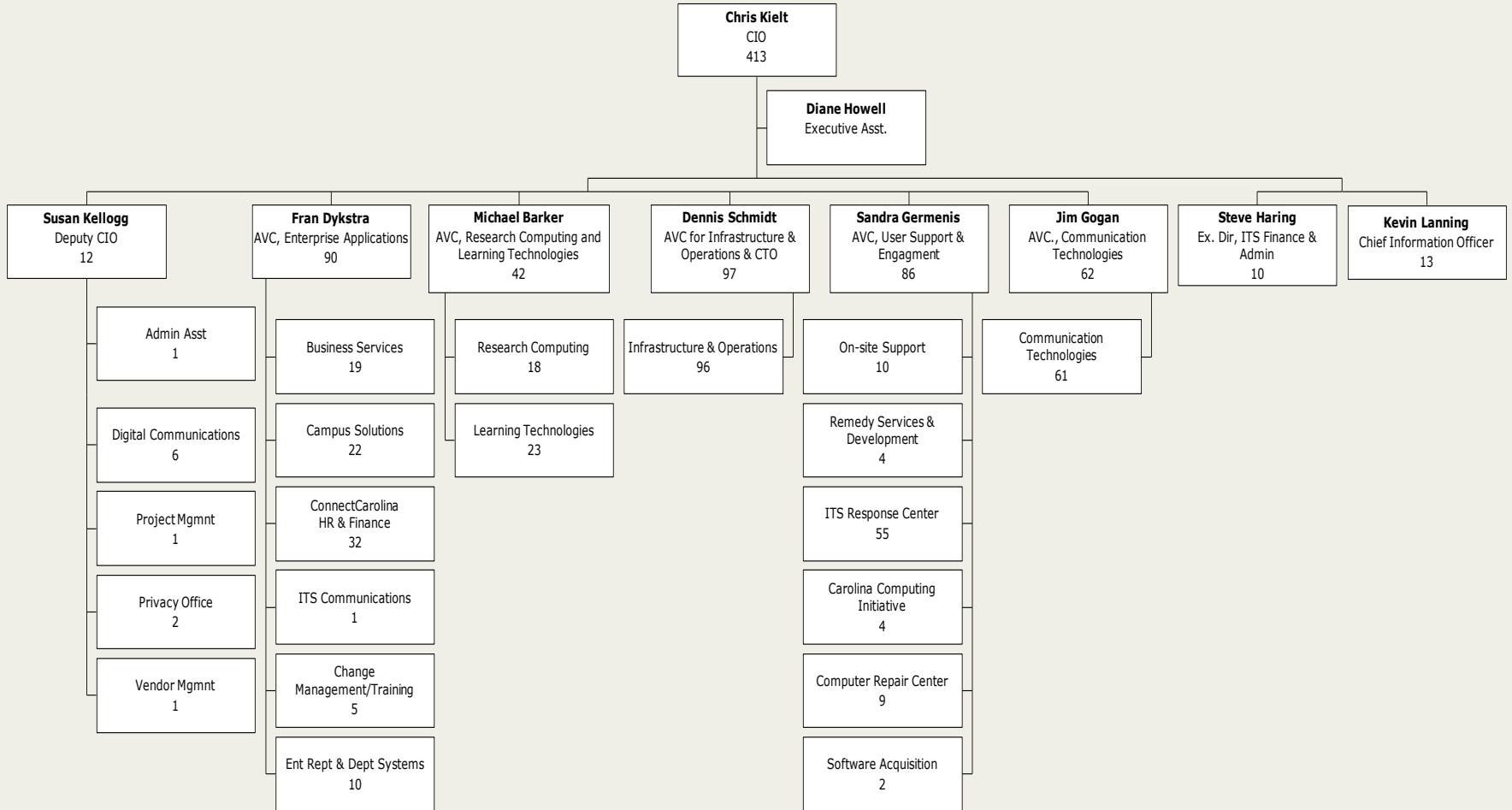
- Store 4.7 petabyte of backup data

- 4,500 (virtual and physical) servers managed or hosted

- 100 million+ unwanted Internet connections blocked per day (~25% of all incoming traffic)

- 88,000+ calls answered by 962-HELP annually

- 23,000 annual visits to walk-in support center

- 143,000 calls, chats and web tickets to Help Desk annually

- 65,000 calls answered by University Operators annually

- 25,000 software titles distributed annually

Organization, including FTE count by major department

UNC INFORMATION TECHNOLOGY SERVICES

Chris Kielt
CIO
413

Diane Howell
Executive Asst.

Susan Kellogg
Deputy CIO
12

Fran Dykstra
AVC, Enterprise Applications
90

Michael Barker
AVC, Research Computing and Learning Technologies
42

Dennis Schmidt
AVC for Infrastructure & Operations & CTO
97

Sandra Germenis
AVC, User Support & Engagement
86

Jim Gogan
AVC., Communication Technologies
62

Steve Haring
Ex. Dir, ITS Finance & Admin
10

Kevin Lanning
Chief Information Officer
13

Admin Asst
1

Digital Communications
6

Project Mgmnt
1

Privacy Office
2

Vendor Mgmnt
1

Business Services
19

Campus Solutions
22

ConnectCarolina HR & Finance
32

ITS Communications
1

Change Management/Training
5

Ent Rept & Dept Systems
10

Research Computing
18

Learning Technologies
23

Infrastructure & Operations
96

On-site Support
10

Remedy Services & Development
4

ITS Response Center
55

Carolina Computing Initiative
4

Computer Repair Center
9

Software Acquisition
2

Communication Technologies
61

- Infrastructure and Operations manages the ITS data centers and provides around-the-clock operational support for ITS business computing activities. I&O also supports the infrastructure for the operating systems for non-research ITS servers and for disaster recovery and business continuity activities for ITS.

- Organizational Units:

  - Global Systems

  - Messaging and Collaboration

  - Identity Management

  - Middleware Services

  - Applications Infrastructure

  - Infrastructure Services

  - Operations Center

  - Data Center Operations

- 8.8 Million inbound email messages per day

- 8.2 Million email messages <u>rejected</u> per day due to malicious content (93%)

- 80-100 different phishing campaigns per week

- 40-90 compromised accounts per week due to phishing

- 18,049 email lists

- 2,451,898 list subscribers

- 93,350 Skype Sessions per month

- 12,004 devices monitored by the Operations Center

- Office 365 Migration

- OneDrive Deployment

- Advanced Threat Protection Rollout

- Duo 2 Factor Authentication

ITS Unit Highlight Example: Research Computing

- Research Computing aims to provide a world-class computing infrastructure as well as other technology tools and capabilities to support the research needs of UNC faculty and staff. The goal is to provide a state-of-the-art environment that will support the highest level of multidisciplinary research and help UNC Chapel Hill become the premier research university in the U.S.

- The services provided can be as complex as the research supported by these services

ITS Unit Highlight Example: Communication Technologies

- Communication Technologies designs, supports and maintains the communications systems, network and telephony infrastructure for the campus. The department also charts new directions and capabilities for integrated telecommunications and high-speed networking.

- Organizational Units:
  - Network Operations
    - Network Architecture
    - Network Services
  - Network Deployment
  - Voice and Remote Services
  - Engineering
    - Materials Management
  - Transport Operations

Comm Tech Cost Overview

- Annual expenses: approx. $20M

- 51 employees

- Unique funding model for Network Core Services

- Includes an annual lifecycle budget for replacement of EOL equipment ($2.4M)

- Includes software and H/W maintenance

- Includes ~$130K Internet connectivity costs (deeply discounted)

Financials

	FY2013	FY2014	FY2015
Revenues	16,678,736	21,161,750	19,062,644
Expenses			
Personnel	5,960,496	6,128,147	6,500,463
Non-Personnel	9,035,983	10,600,048	10,607,166
Capital	1,301,997	987,721	2,880,650
Gross Income	380,260	3,445,883	(925,635.31)
Admin Fee	469,872	502,356	539,112
Net Operating Income/(Loss)	(89,612)	2,943,477	(1,464,747)
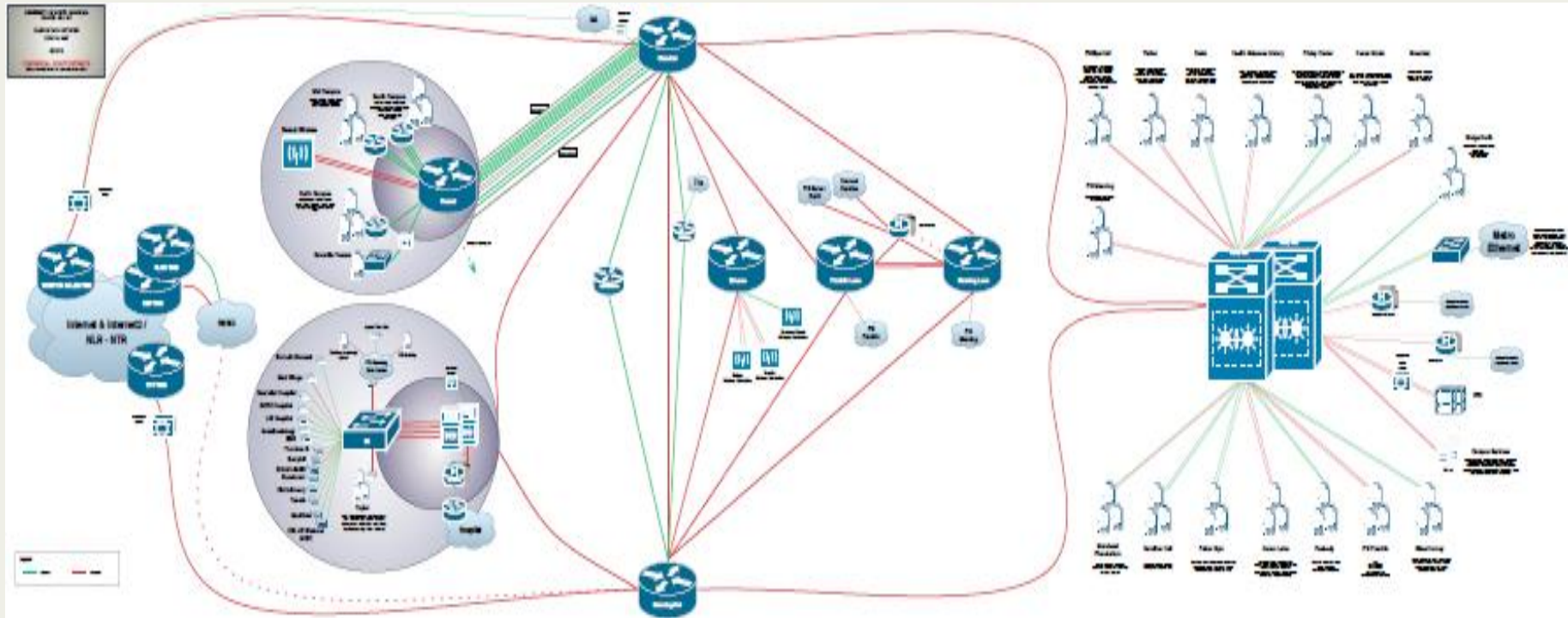
- ITS coordinates wiring of buildings (within and between) based on physical layer standards

- ITS deploys, operates, maintains and secures campus network from the core to the border

  - Has grown into an extremely complex endeavor

    - security, virtualization, redundancy, load balancing, end-to-end performance, firewalls… not to mention actual users and their devices
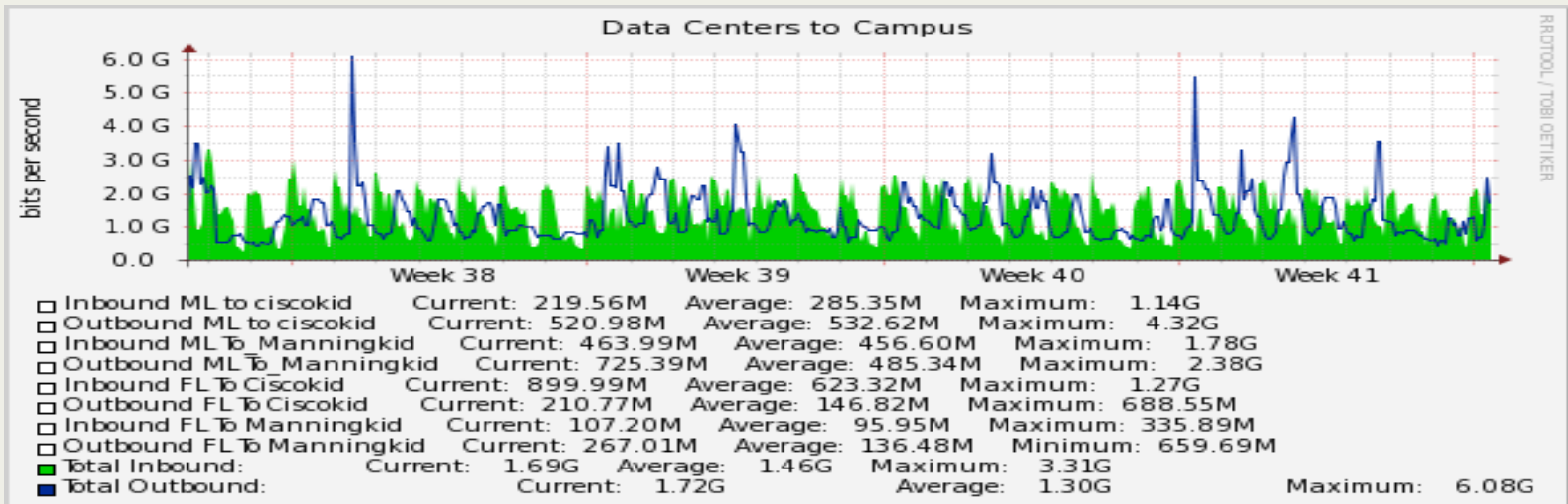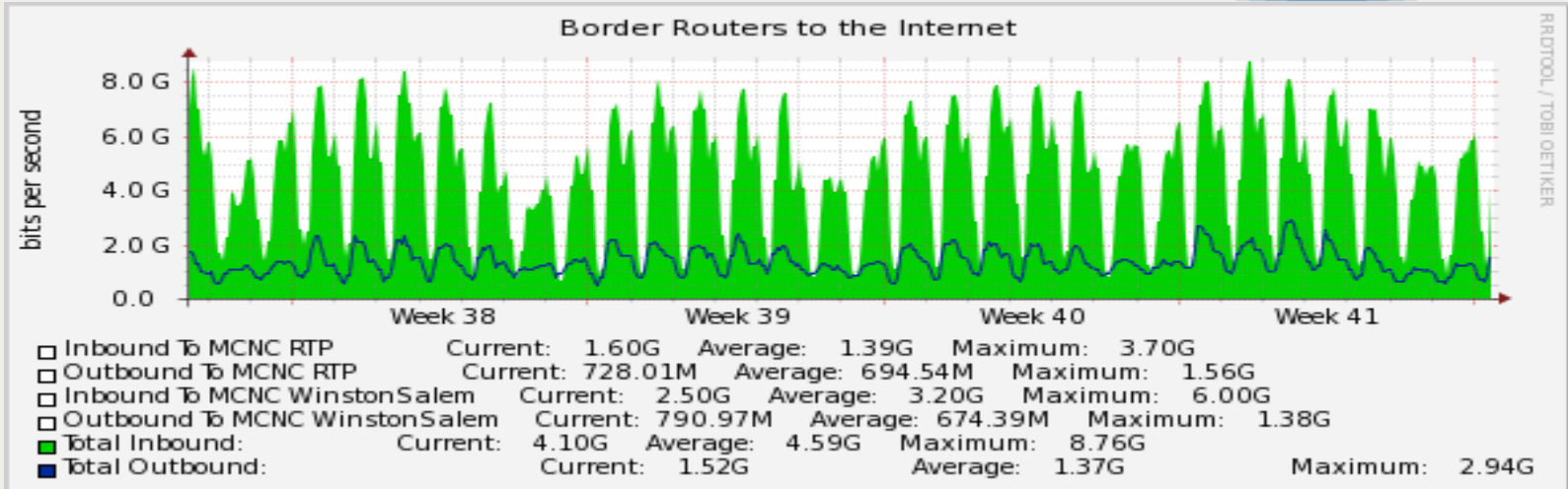
- Networks are now very capable, very complex systems that must be carefully managed

  - 10 major routers

  - 3500 switches

  - 800 wireless access points

  - Over 100,000 individual devices seen daily on campus

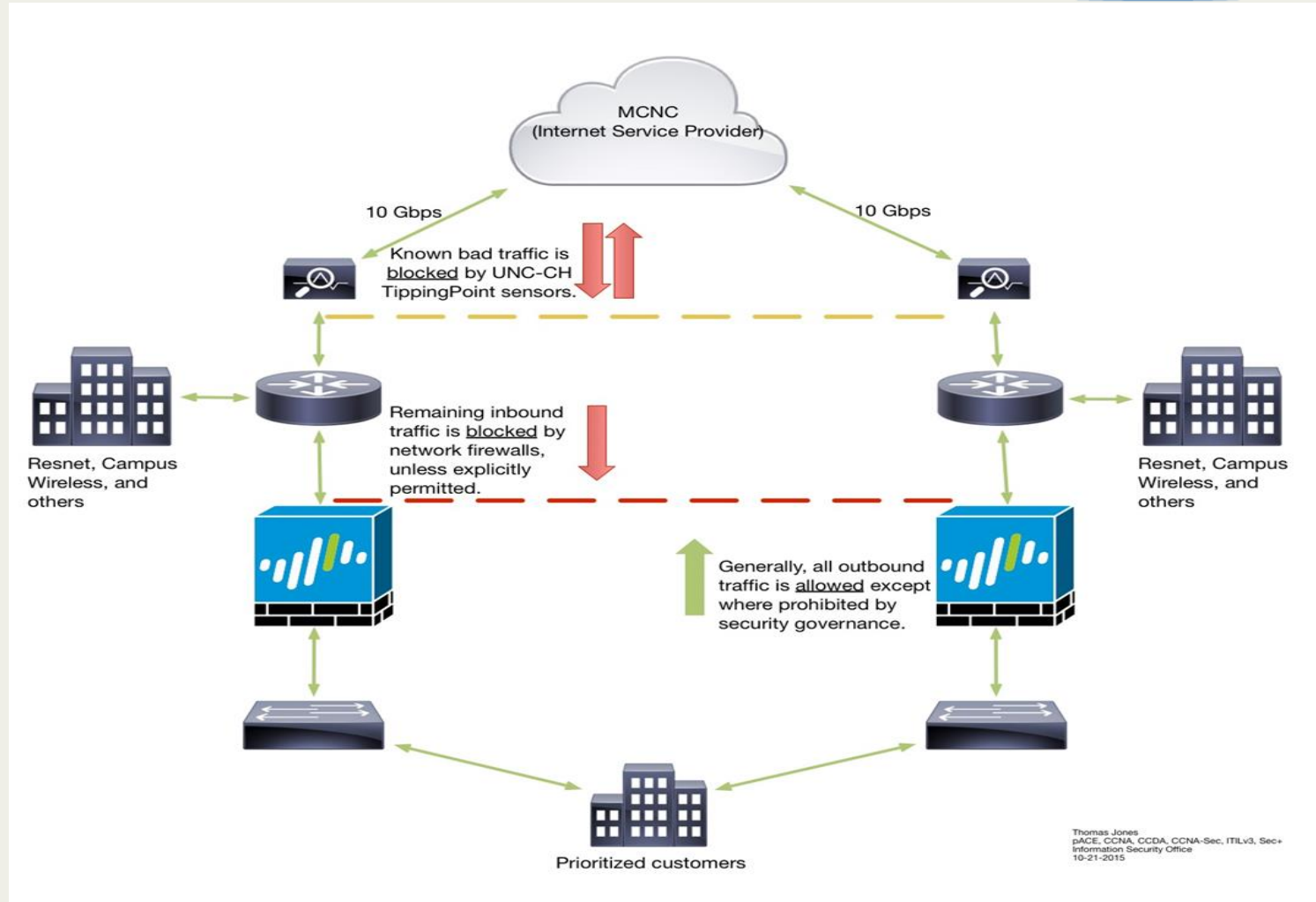 - Core network availability expectation ~ 99.999%

- Number of unwanted connections into UNC being blocked in any given day by security appliances:

  - 2011 –   4,500,000
  - 2014 –   23,000,000
  - 2015 – 105,000,000

- Thank you for your attention