

Capital IT Funding Request CSU-Fort Collins “Network Upgrades to Get to Steady-state Funding”

Dr. Patrick J. Burns, CSU System CIO,
Mr. Brandon Bernier, CIO of CSU-FC, and
Mr. Jason Huitt, Manager of Network Operations at CSU-FC
Colorado State University

CSU System-wide Scope – Shared Administrative IT Systems



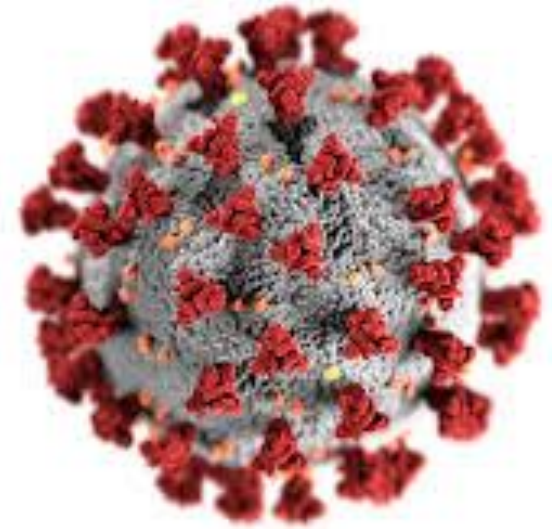
Planned

Upgrades Required to Support Evolving Needs

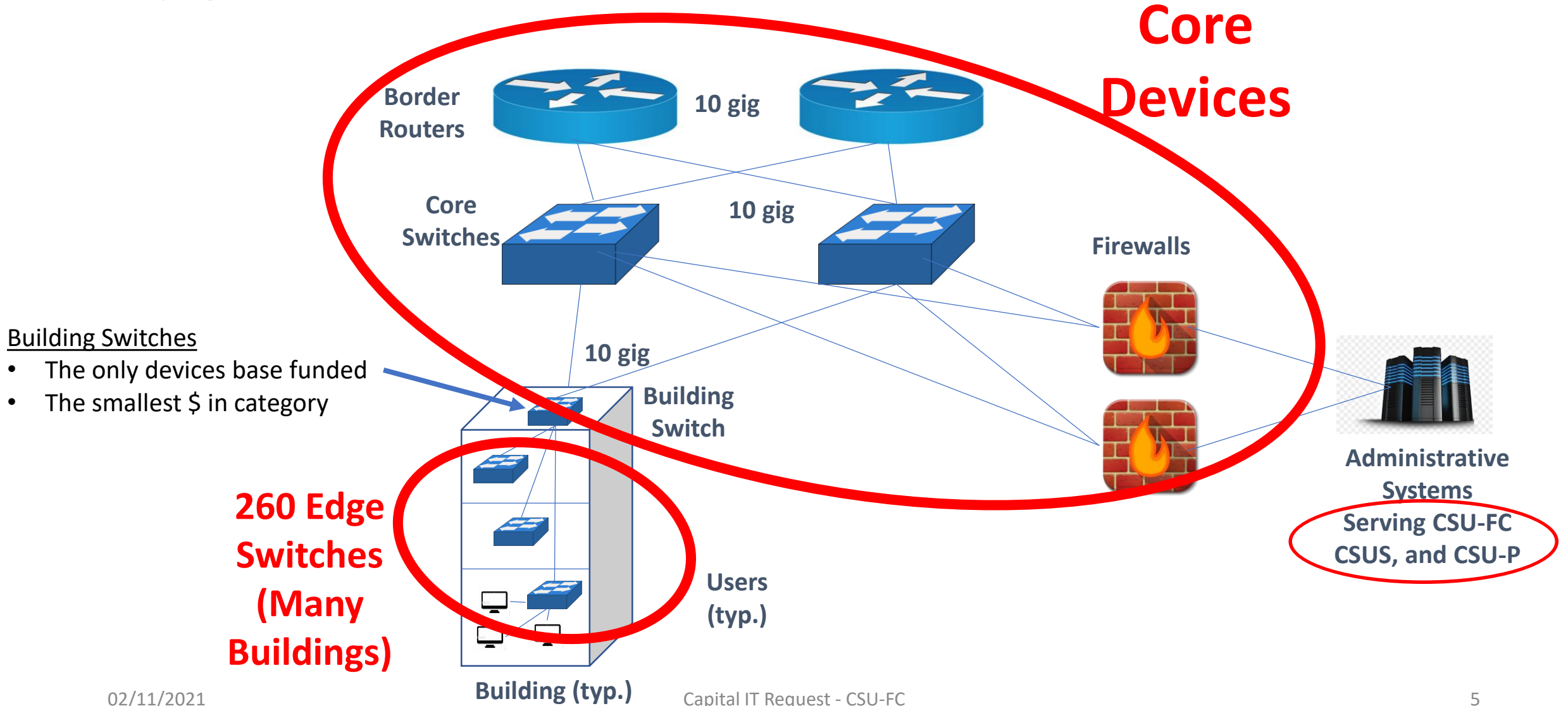
- Teaching and Learning
 - 30,000 Resident Instruction and 4,000 distance students
 - 98% are in our Canvas Learning Management System in the cloud
 - Focus is the “work force of tomorrow” for Colorado: student success, learning analytics, affordability (OER), credentialing, online courses, CDHE directions
 - Great internet access is fundamental to our educational mission
- Research and Innovation
 - CSU >\$400 million/yr. in leading-edge research funding
 - Scope of research is increasingly technical
 - Ergo, most rely upon (and demand) the most advanced network connectivity
 - Huge and many files requiring the most advanced internet access
- IT Security is ever evolving, and must be deployed progressively across all areas
- Internet is a basic, fundamental utility, upon which nearly all activities rely

Context – One additional Year of Delay

- Covid has introduced budget challenges, locally at CSU, and at the State
- So, we are updating last year's unfunded request
- Capacity needs have grown commensurately
- Work at home due to covid has made
 - Upgrading the core even more critical, and
 - We've delayed critically-needed edge switch upgrades
- In FY 22 and beyond, education and research are expected to be face-to-face, exacerbating needs
- Ergo, needs are even more critical now



Upgrades Needed



Shared Cost Funding Request: 2 Elements

1. Edge switches

- 206 of 1,100 edge switches total
- Some > 17 years old!!!
- Students to contribute via a tech fee increase

2. Core: border routers, central switches, firewalls

- Supports ~80,000 devices, including shared IT for the CSU System,
- Need 100 gig, and
- Need contemporary software stack for IT Security

1. 260 Edge Switches

260 of our ~1,100 edge switches will be at or beyond End of Life (EOL)

- FY 22: 65 EOL & to be replaced
- FY 23: 100 EOL & to be replaced
- FY 24: 95 EOL & to be replaced

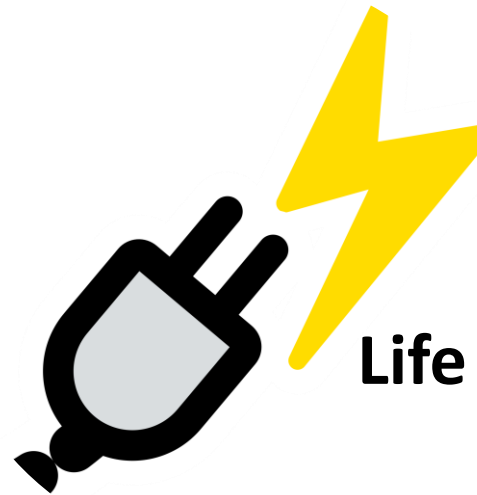
Lacking modern features, specifically:

- Capacity/Speed (need 1 gig)
- Power over Ethernet
- IT Security
- Manageability

 **Huge Risk**



Edge Switch (typ.)



Life & Safety

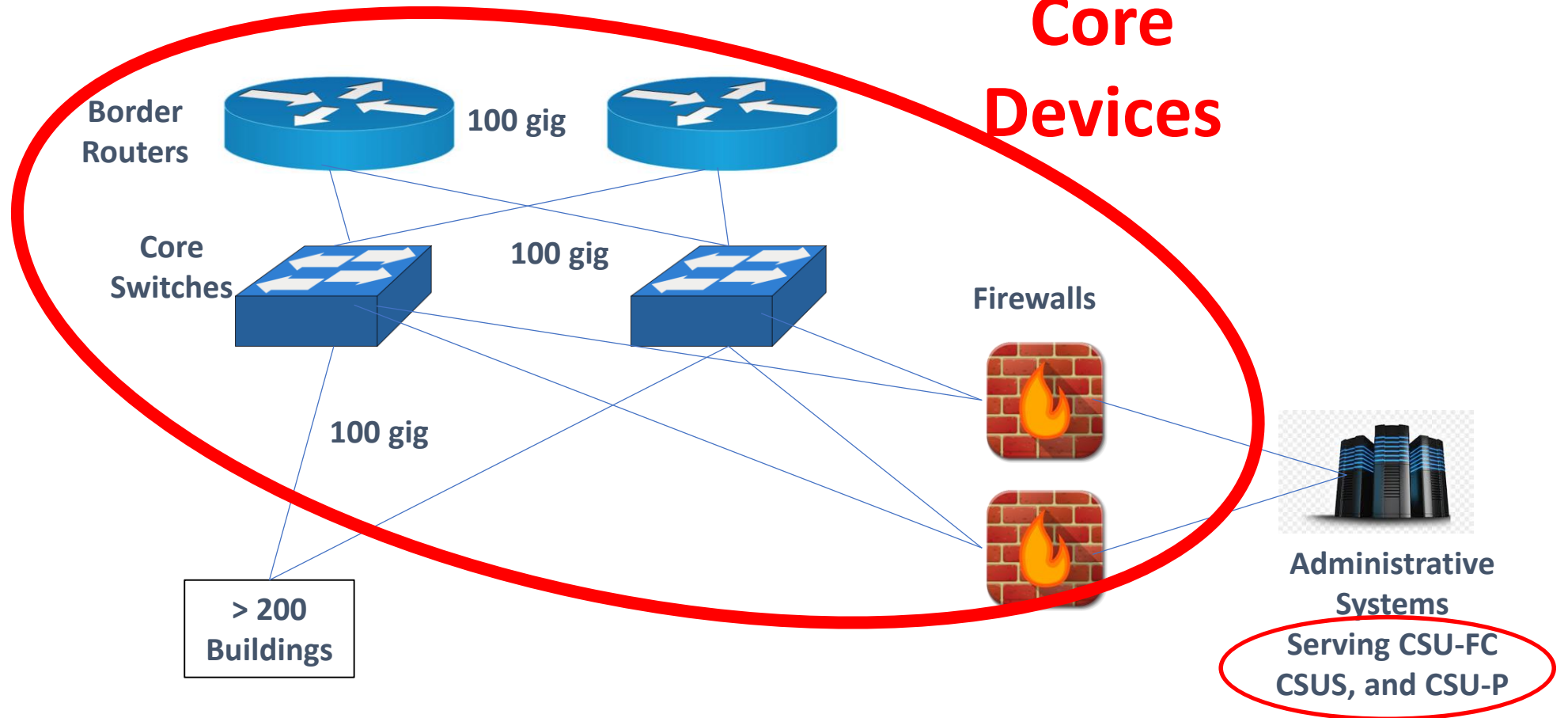
100 meg -> 1 gig



2. Six Core Devices (critical redundancy)

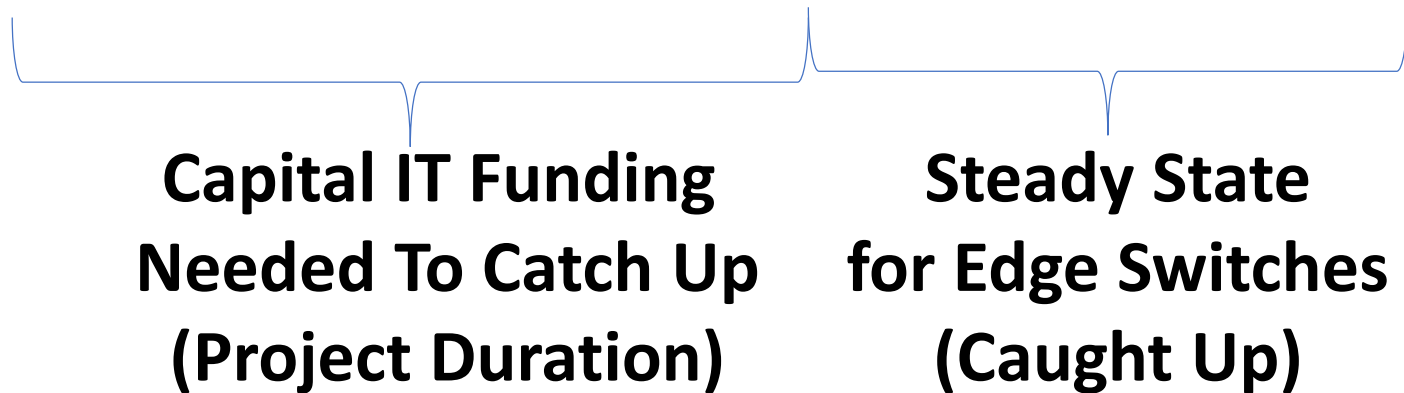
**Core
Devices**

- 100 gig
- Contemporary software stack



Funding Request for a 3-Year Ramp-up to Steady State Internal Base Funding (k\$)

Table 1	FY 21-22	FY 22-23	FY 23-24	FY 24-25	FY 25-26	Totals
	(k\$)	(k\$)	(k\$)	(k\$)	(k\$)	(k\$)
Cash	\$219	\$477	\$678	\$709	\$709	\$2,792
CCF	<u>\$541</u>	<u>\$627</u>	<u>\$2,034</u>	<u>\$0</u>	<u>\$0</u>	<u>\$3,202</u>
Totals	\$760	\$1,104	\$2,712	\$709	\$709	\$5,994



Steady-state Funding: After 3 Years

Table 2 Steady-State Networking Device Replacement Costs

Item	No.	Unit Cost (k\$)	Total Cost (k\$)	Replacement Cycle (Years)	Annual Costs (k\$/yr.)
Edge Switches	1,100	\$4,514	\$4,965.4	7	\$709.3
Border Routers*	2	\$375	\$750	7	\$107.1
Core switches*	2	\$326.5	\$653	7	\$93.3
Firewalls*	2	\$600	\$1,200	7	<u>\$171.4</u>
Totals					\$1,082

Chargeback



E&G funds

* In data center.

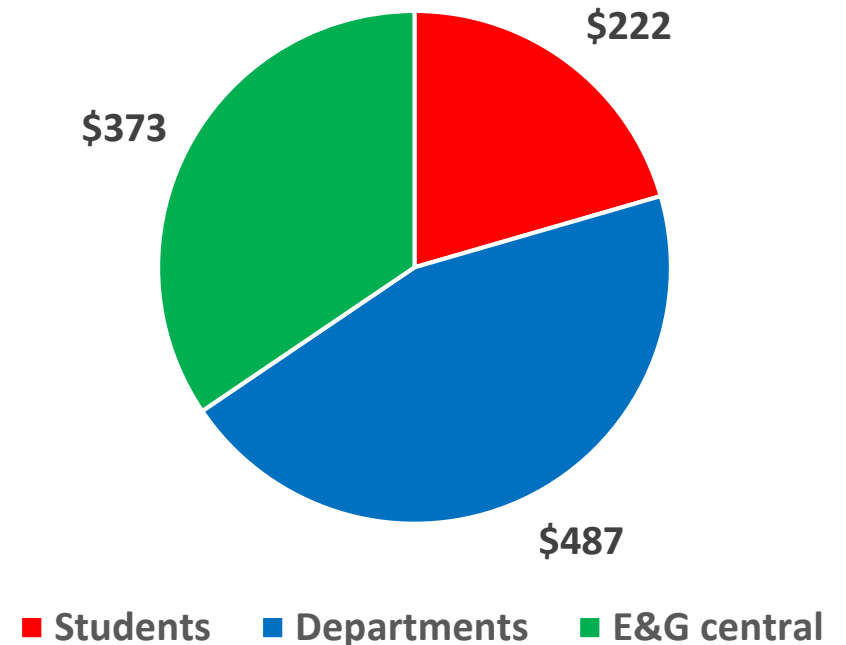
Why 3-Years?

To allow for

- Staff time to implement large number of “catch-up” devices
- Sufficient time to ramp up to steady-state
 - Students will increase their tech fee
 - Developing dept. network funding model
 - E&G central funding commitment
 - Created critical infrastructure fund

We plan to ramp up to steady-state funding in the fourth year.

Revenue Sources (k\$)
\$1.082 M/yr. total



Summary

- Need bridge funding over three years to ramp up to steady state
 1. Edge switches: 100 meg -> 1 gig
 2. Core routers, switches and firewalls, 10 gig -> 100 gig
- Contemporary, secure, interoperable, and adaptable software stack
 - And Power over Ethernet (PoE) for life & safety/IoT devices

Thank You



**Questions
Are Most
Welcome!**