

K-12 network

A BIT ABOUT BANDWIDTH

Day One to Today - WAN School Circuits

Internet

1997 – SMDS 1.2 mbps

- - averaged about 40% utilization

2000 – Frame Relay ATM 1.5 mbps

2007 – TLS 10 mbps

- - averaged about 50% utilization

2014 – TLS

- 10 mbps 111 school buildings
- 100 mbps 99 school buildings
- 1000 mbps 3 school buildings

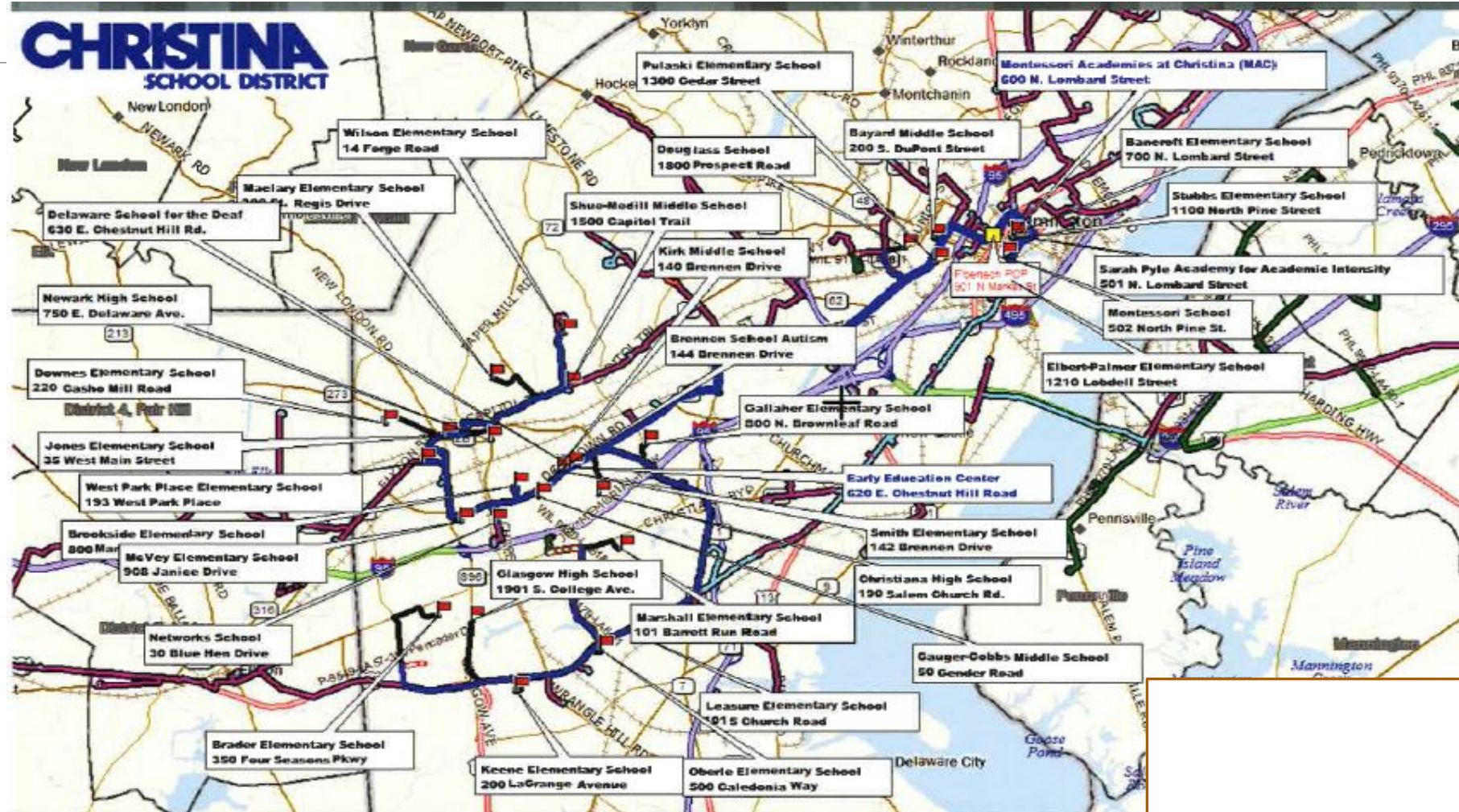
201? – TLS, private fiber, leased fiber

SMDS 1.2 mbps

100 mbps

5 Gb

Fiber versus TLS



Day One to Today - LAN

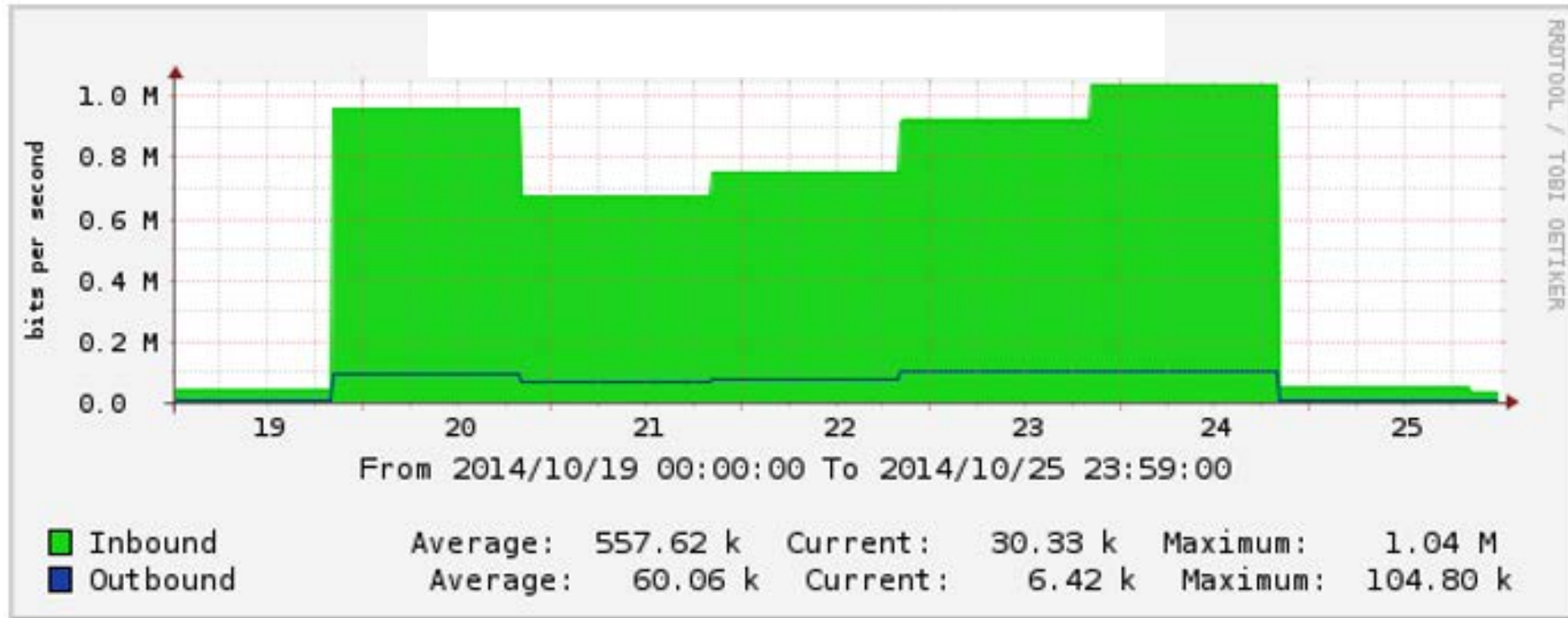
- 1996 - 1999 DCET wiring project installed two strands of fiber optic cable to every classroom.
- Original fiber currently supports a 1GB local area network communications
- Original fiber cannot support next generation 10GB LAN's
- 10GB requirement anticipated within the next 2-3 years
- Wireless technology expansion impacting LAN capacity as well

Top Sites Accessed Report *(example only)*

Site_20150106_1108_28.csv - Microsoft Excel

	A	B	C	D	E	F	G	H
1	Site	Categories	Requests	Page Views	Browse Time	Total Bytes	Bytes Receive	Bytes Sent
2	search.spotxchange.com	Web Ads/Analytics, Content Se	39425	17981	89577	797146602	446304502	350842100
3	www.google.com	Malicious Sources/Malnets, Fil	142962	15541	113649	1479463666	1357556908	121906758
4	grooveshark.com	Radio/Audio Streams, Entertain	16359	12910	51697	166435254	150460030	15975224
5	www.youtube.com	Technology/Internet, Office/Bu	33461	8093	80882	230333531	203098789	27234742
6	www.mobymax.com	Education	12499	5472	105512	164877122	148271378	16605744
7	www.delawareonline.com	News/Media	23514	4658	89537	137316092	107160095	30155997
8	84.docs.google.com	File Storage/Sharing, Office/Bu	2838	2762	81728	10610870	4459072	6151798
9	www.coolmath-games.com	Education, Games	87667	1990	18471	3058816865	2973681974	85134891
10	christinak12.org	Education	39866	1985	35634	552324325	535089239	17235086
11	d8rk54i4mohrb.cloudfront.net	Content Servers	4357	1820	158	21936157	17958608	3977549

Circuit Utilization Graphs *(example only)*



Support Components/Bottlenecks

- Routers 300 k per year
- Switches 800 k per year
- Core circuits
- Content Filtering 1.6 m per year
- Firewalls 700 k per year

* ROM costs only