



Statewide Education Network (SEN)

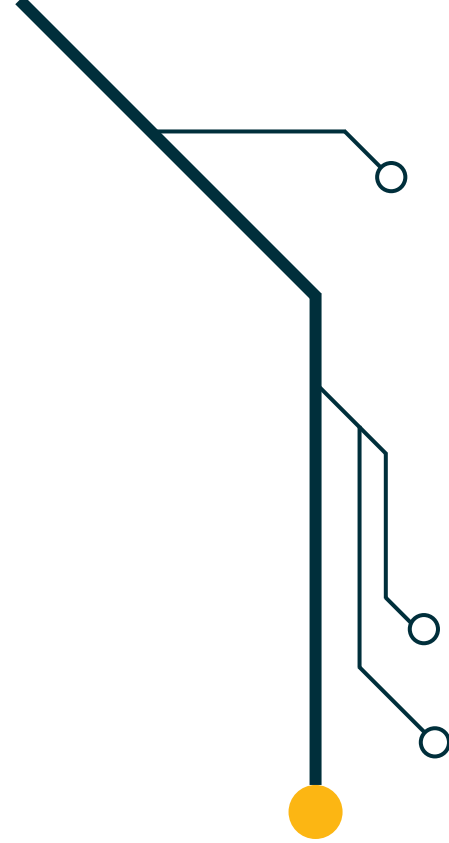
SEN Meeting

September 17, 2025



Agenda

- Brief Introductions / SEN Team & Advisory Committee
- BDCP & SEN: Education-focused network
- SEN Participation – Anatomy of a Connection
- Operating Local Networks: Inventory / Operations / Automation
- Creating Digital Resiliency – an overview
- Open Discussion & Help needed / feedback
- After-hour Networking



PSFA/OBAE Broadband for school programs



E-rate
Projects

\$10-20M /
year
\$1-2M
OBAE
(Fiberoptic /
Network
Upgrades)



NM SEN

\$4-8M /
year
OBAE
(depends on
size of
network)



Student
Connectivity
/ WiFi on
School
Buses (E-
rate)

& OBAE's
Student
Connect
\$25M

E-rate Projects



- Fiberoptic (Cat1) & Network equipment (Cat2)
- 2016-2024: ~450 Projects / \$135M / \$115M E-rate (85%) E-rate
- **NM #2 in the Nation in 2025**
- Better networks in schools

Row Label	Sum of C2 Budget	Sum of Funded C2 Budget Amount	Sum of Pending C2 Budget Amount	Sum of Total Requested	Utilization
1 NY	\$ 617,424,743.50	\$ 379,757,294.51	\$ 245,307,088.46	\$ 625,064,382.97	101.24%
2 NM	\$ 67,416,490.00	\$ 41,509,496.92	\$ 17,630,252.36	\$ 59,197,377.73	87.81%
3 AZ	\$ 245,021,469.00	\$ 148,592,595.52	\$ 64,364,047.23	\$ 212,956,642.75	86.91%
4 NC	\$ 306,045,114.50	\$ 220,033,635.31	\$ 45,405,092.21	\$ 265,438,727.52	86.73%
5 SC	\$ 153,233,355.00	\$ 110,181,980.23	\$ 22,196,355.91	\$ 132,378,336.14	86.39%
6 MS	\$ 90,632,131.00	\$ 55,590,749.31	\$ 22,395,569.97	\$ 77,986,319.28	86.05%
7 KY	\$ 132,495,711.50	\$ 89,837,728.45	\$ 21,799,237.39	\$ 111,636,965.84	84.26%
8 HI	\$ 37,005,063.00	\$ 29,077,678.78	\$ 1,961,413.71	\$ 31,039,092.49	83.88%
9 TX	\$ 1,109,329,552.00	\$ 704,245,804.72	\$ 216,292,213.46	\$ 920,538,018.18	82.98%
10 TN	\$ 191,324,510.50	\$ 121,370,866.90	\$ 34,895,464.86	\$ 156,266,331.76	81.68%

E-rate Projects



- ~\$0.75M in reimbursements
- 28 Projects reimbursed or in-progress

School / District	Project ID	Reimbursement	Status
Alamogordo Public Schools	BE24-043	\$ 47,366.74	In Process
Albuquerque Public Schools	BE22-059	\$ 93,420.01	Paid
Albuquerque Public Schools	BE23-024	\$ 57,973.14	Paid
Altura Preparatory School (Albuquerque)	BE25-001	\$ 712.23	In Process
Belen Consolidated Schools (Belen)	BE24-029	\$ 21,909.89	Paid
Bloomfield School District	BE25-020	\$ 27,549.41	Paid
Carlsbad Municipal Schools	BE22-033	\$ 1,263.71	Paid
Carrizozo Municipal School District	BE25-002	\$ 3,329.98	In Process
Cloudcroft Municipal Schools	BE25-003	\$ 2,737.82	Paid
Clovis Municipal Schools	BE24-045	\$ 38,280.62	Paid
Corona Public Schools	BE24-011	\$ 389.55	In Process
Cottonwood Classical Preparatory School	BE22-024	\$ 2,104.28	Paid
Cottonwood Classical Preparatory School	BE23-026	\$ 539.49	Paid
Deming Public Schools	BE23-030	\$ 8,908.35	Paid
Des Moines Municipal Schools	BE25-010	\$ 9,749.99	In Process
Dexter Consolidated Schools	BE25-024	\$ 1,766.03	Paid
Estancia Valley Classical Academy	BE25-011	\$ 2,706.91	Paid
Gallup-McKinley County Schools	BE22-025	\$ 57,834.19	Paid
Hobbs Municipal Schools	BE25-006	\$ 14,046.83	Paid
Las Cruces Public Schools	BE24-014	\$ 59,752.42	Paid
Las Vegas West Schools	BE22-027	\$ 25,383.07	Paid
Monte Del Sol Charter School	BE24-037	\$ 4,572.46	Paid
Rio Rancho Public Schools	BF24-001	\$ 206,065.66	Paid
Roy Municipal Schools	BE25-016	\$ 9,400.00	In Process
Santa Fe Public Schools	BE24-020	\$ 25,563.03	Paid
Santa Fe Public Schools	BE25-017	\$ 36,371.88	In Process
School of Dreams Academy	BE25-018	\$ 1,292.76	Paid
Voz Collegiate Preparatory Charter School	BE23-038	\$ 446.40	In Process
		\$ 761,436.85	\$ 653,670.08

E-rate Projects



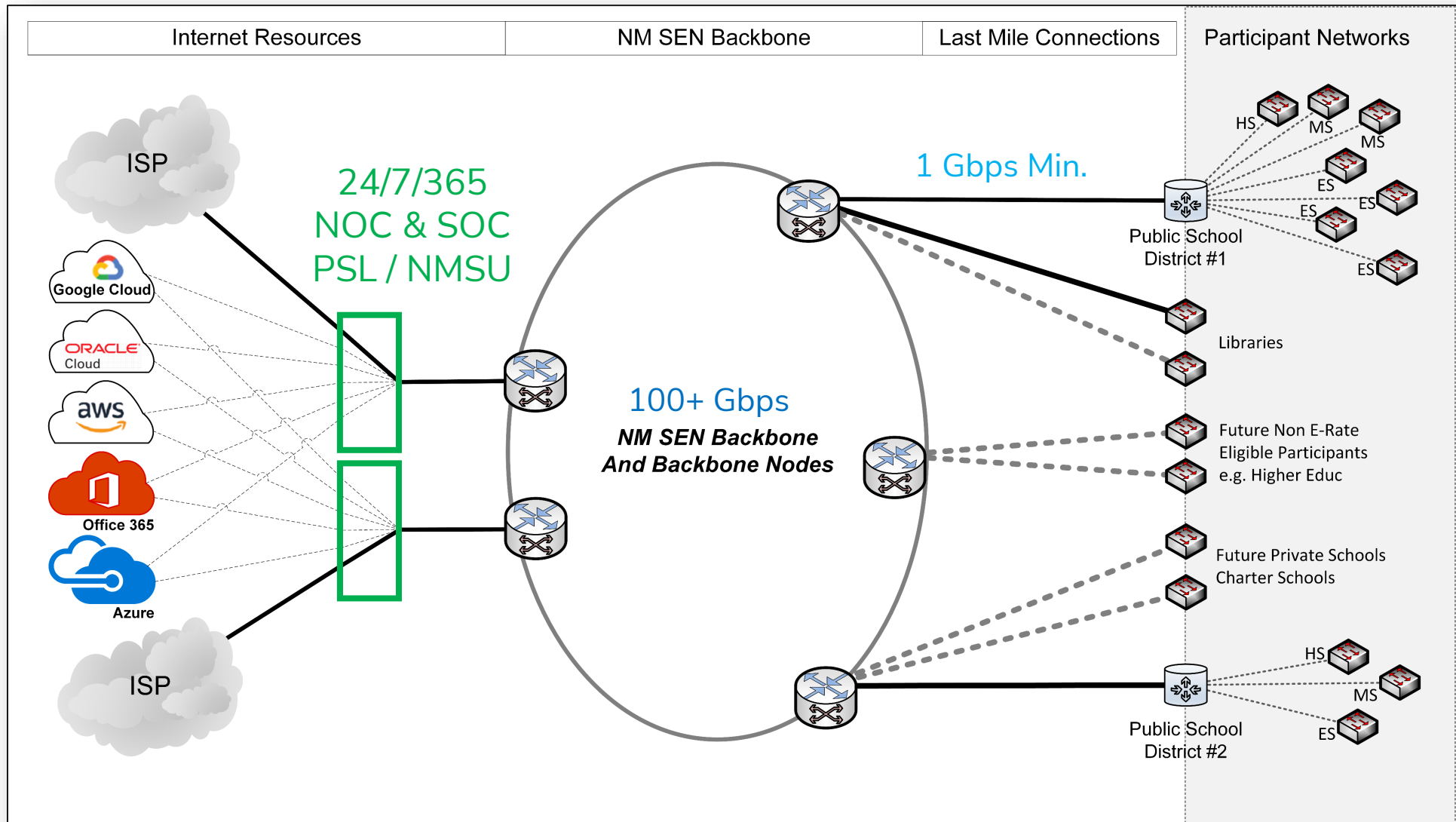
BDCP Required Documentation Category 2

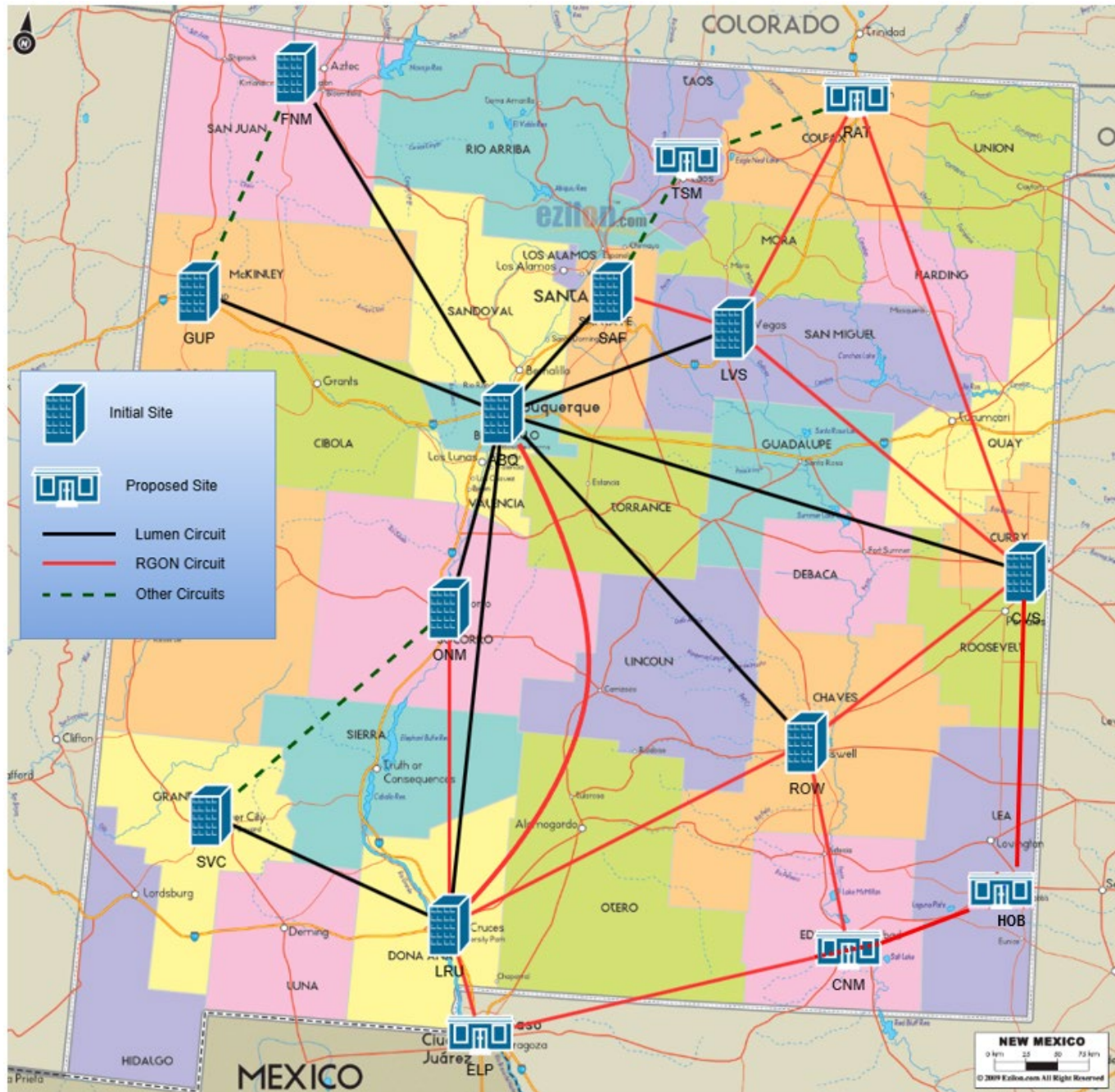
- Basic documentation
- FCC forms – automatic (OBAAE)
- Simplify process further
- Aim to expand state funding coverage

Here are listed documents which are required from the District by PSCOC to ensure the award of PSCOC funding from E-rate eligible projects. Please sign (when applicable) and return all listed documents.

- Application Letter** - Signed Document requesting funding from the BDCP
- FCC Form 470** - Description of Services Requested and Certification Form
- FCC Form 471** – Description of Services Ordered and Certification Form
- Procurement Process Statement of Compliance** – Signed Document certifying NM State procurement compliance.
- Signed Agreement** – Copy of official signed agreement between District and Vendor(s)
- PSCOC Award Letter** – Signed Award Letter – Notification of the allocation of the requested funds from the BDCP
- FCC FCDL** – Copy of Receipt from USAC - Funding Commitment Decisions Letters
- Memorandum of Understanding (MOU)** – Official Signed Document – MOU defines the scope of specific projects and delivery methodology for completing a public school capital outlay project as defined in the School District Master Joint Powers Agreement.
- PO** – Copy of Submission - Purchase Order submitted to Vendors(s)
- Invoices** – Copy of Submission - Invoices received from Vendor(s)
- Proof of Payment** – Copy of canceled check payment to vendor or reports from the district financial system.
- Closeout Form** - Signed Document closing out project

SEN Overview





SEN - Black Solid Lines: 7/01/24

OBAE Wide Area Network (Red)
Leverage SEN-developed sites

100 – 400Gbps
Circuits allow for all sites to
be protected from fiber cuts.

SEN – Participants (~47% of student population)



	A	B	C	D
School/District - SEN Circuits	Schools / Sites	Students	Teachers	Staff
1 21st Century Academy	1	393	33	51
2 Mark Armijo	1	231	12	25
3 Mountain Mahogany	1	225	20	20
4 Gadsden	28	14170	868	1900
5 Farmington	20	11201	729	1100
6 APS	160	65919	5300	11000
7 Santa Rosa	6	608	54	859
8 Las Vegas City	7	1202	87	300
Grand Total	224	93949	7103	15159
School/District - Upcoming	Schools / Sites	Students	Teachers	Staff
9 Las Cruces Public Schools	40	23811	1514	5000
10 Albuquerque School Of Excellence	1	942	51	112
11 Archer Academy (Former Los Puente)	1	182	22	28
12 Raices Del Saber (Las Cruces)	1	133	11	30
13 Belen Schools	11	3602	240	600
14 Hatch Valley	5	1284	89	150
15 Los Alamos	8	3724	386	630
16 Monte Del Sol (Santa Fe)	1	380	26	41
17 Santa Fe Public Schools	31	13175	1000	1800
18 Truth or Consequences	4	1430	87	72
Grand Total	103	48663	3426	8463

Service Completion Document

- Conveys the following information for participants to attach to the SEN:
 - Port on the access router to connect to:
 - Port location
 - Media type
 - Speed
 - Number of connections
 - IDs, dates, and addresses
 - OrganizationID
 - CircuitID
 - ServiceID
- Describes the IPs to use and routing setup
 - Point-to-point WAN Ips – typically /30 or /31
 - Optional routable allocated IPs – to be considered by participant as Provider-Allocated

Operating Local Networks

Inventory • Operations • Automation

Objectives & Audience

- Audience: non-technical to basic proficiency staff; e.g., small schools with limited IT resources
- Outcomes: minimal Source of Truth (SoT), basic operations practices, safe first-steps in automation
- Constraints: low cost, low complexity, predictable upkeep

Inventory: Start Simple

- Begin with a spreadsheet for critical assets
- Capture (examples): name, vendor, function/role, IP, management URL, site/room, VLAN/SSID, owner, support notes
- Do not store credentials in the sheet; note where they are stored (e.g., password manager)

Source of Truth

- Single, authoritative record of network/server assets and intent
- Accurate and complete, with timely updates
- Goal: the SoT is trusted and used for reference

Keeping SoT Current

- Assign ownership: who updates which data
- Quick-update workflow after changes (moves, adds, VLAN changes)
- Monthly spot-checks; quarterly audits vs monitoring data

From Spreadsheet to NetBox

- Target: NetBox as the final SoT for devices, IPs, racks, sites
- Map columns → NetBox objects (device, interface, IPAM, site)
- Import via CSV or simple scripts; iterate in small batches
- Back up the SoT regularly (export/DB backup)

NetBox Labs Free Tier

What's included in the NetBox Cloud free plan:

- ✓ Private instance
 - ✓ 100 devices
 - ✓ 500 IP addresses
 - ✓ 10k API requests per month
 - ✓ Automatic upgrades and backups
 - ✓ 2 Operational branches
-

You can purchase additional resources at:

\$7.50 per hundred devices per month
\$1.50 per hundred IP addresses per month
\$2 per thousand API requests per month
\$10 per operational branch per month

Operations: What is the Current Status of your devices?

- Monitor availability: up/down of key devices and services
- Track basics: CPU, memory, interface errors, disk capacity
- Create simple dashboards for front office and IT

Monitoring Tools (Examples)

- Simple: Uptime Kuma, checkmk, Netdata
- Complex: LibreNMS, Zabbix, Prometheus
- Choose one to try or try them all if time permits
- All have some form of dashboard
- Take advantage of email/SMS/Teams/Slack alerts
- Pay attention to threshold tuning

Additional Operations Goals

- Use maintenance windows for planned changes
- Regular patching schedule for network/servers
- Lightweight change log and incident log
- Spare kit: console cables, SFPs, small switch
- Onboarding/offboarding checklists
- Discover unknown devices on the network

Advanced goal: Network Segmentation

- Separate VLANs/SSIDs: Infrastructure, Student, Guest, Cameras, IoT, Printers, etc.
- Default-deny between segments; allow only necessary flows
- Take advantage of Firewall capabilities

Automation: Start with Backups

- Schedule cloud backups of critical data and SoT exports
- Test restores!
- Document recovery steps for reference during incidents

Automation: Config Backups

- Use Oxidized or RANCID for network device configs
- Daily/hourly pulls, use versioning with Git; alert on config change
- Store repos securely; restrict device credentials

Other Automation Examples

- Scheduled VM/container backups and verification
- Device lifecycle automation
 - Add to Netbox
 - Add to monitoring
 - Update DNS, IP addresses
 - Decommission
- Generate Reports

Merike Kaeo – vCISO / SEN Security Framework Architect

- Creating Fundamental Digital Resilience
- Enabling Business Continuity
- Incident Detection/Response/Recovery



What Is Fundamental Cyber Hygiene ?

Incident Response / Crisis Plan

- Who do you notify or ask for help?
- Backups for Critical Assets

Vulnerability Management

- Responsible Disclosure
- Timely Patch Management

Network Segmentation

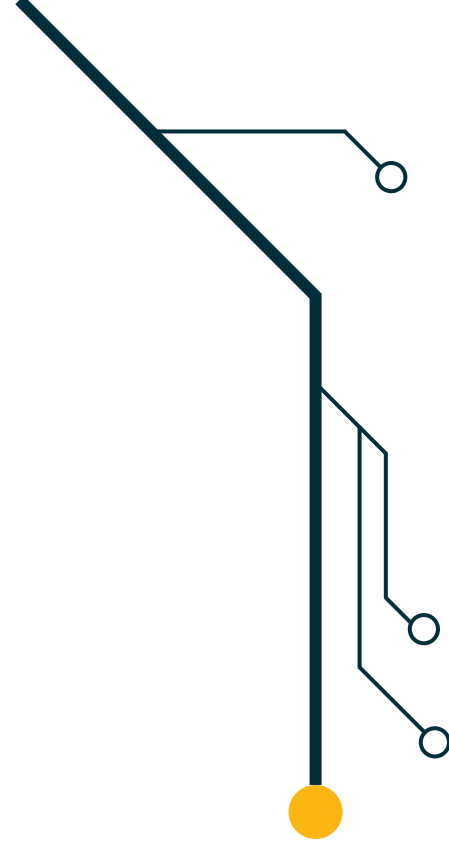
- Avoid Fate Sharing

Security Controls

- User **Authentication**/Authorization
- Device Authentication/Authorization
- Access Control (Packet/Route/URL)
- Data **Integrity**
- Data Confidentiality
- **Auditing** / Logging
- DDoS Mitigation
- Situational Awareness (Threat Intel)

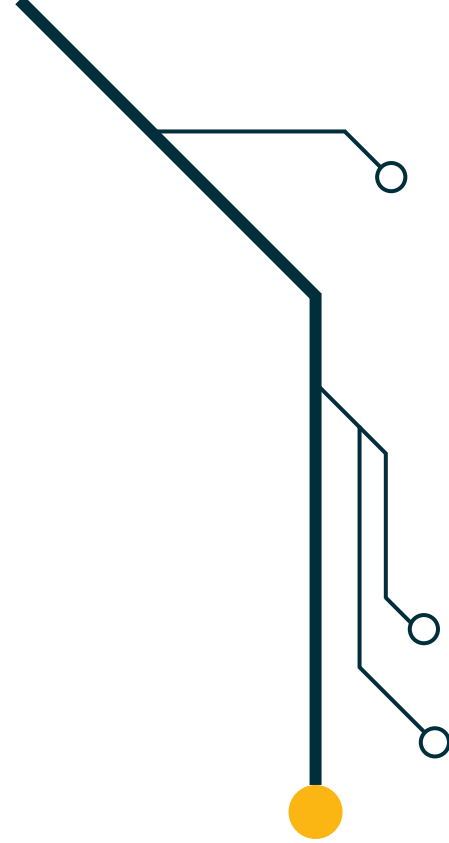
Stolen Credentials Often an Initial Vector

- Being a victim of a phishing attack
- Laptop gets stolen
- Sharing your password with another person
- Re-using same password on many systems
- Spyware on your computer installed a keylogger
- Storing your secret/private key in an easily accessed file
- Sending credentials in cleartext emails



Enabling Business Continuity

- Identify Most Critical Assets
 - Which system will cause most business disruption when not available?
- Ensure Critical Assets Are Recoverable From Incidents
 - How often are backups performed?
 - Can backups be tampered with to make data recovery impossible?
- Monitor Health of Critical Systems
 - Has anyone had unauthorized access?
 - Have any files been recently added or modified?
- Identify Outstanding Security Vulnerabilities
 - Vendor notifications
 - External vulnerability scans (especially Internet-facing assets)



Need To “Automate the Boring”

- Keep Track of Digital Footprint
 - IP addresses / Domains (subdomains)
 - Email addresses
- Enable Automated Periodic Vulnerability Scanning
- Monitor and Alert on Unauthorized Access to Critical Assets
- Monitor and Alert on Unusual Traffic
- Get Trusted Threat Intelligence Feeds To Automatically Block Going to Known Malicious Sites
 - Firewalls / DNS Resolvers



Incident Response Plan Basics

- Incident Reporting
 - Who do schools report any potential incident to?
 - Who gets informed at school if there's a potential incident?
- Incident Classification and Escalation
 - Who validates the incident and assesses impact?
 - When is an incident escalated and to whom?
 - Who is person in charge and authorized to make incident response decisions for the school?
 - Which secure communication mechanism will be utilized to discuss incident once it's been validated?
- Incident Handling
 - Who handles incident remediation and restoration of systems?
 - Who handles internal/external communication?



SEN Security Framework

IDENTIFY

PROTECT

DETECT

RESPOND

RECOVER

Center For Internet Security has 18 Security Domains with a total of 153 controls

SEN Framework will align with controls

Added 19th Domain to include Routing, DNS and Credential Management controls

1. Inventory and Control of Enterprise Devices
2. Inventory and Control of Software Assets
3. Data Protection
4. Secure Configurations of Device & SW Assets
5. Account Management
6. Access Control Management
7. Continuous Vulnerability Management
8. Audit Log Management
9. Email and Web Browser Protection
10. Malware Defenses
11. Data Recovery
12. Network Infrastructure Management
13. Network Monitoring and Defense
14. Security Awareness and Skills Training
15. Service Provider Management
16. Application Software Security
17. Incident Response Management
18. Penetration Testing

SEN Foundational Security

- Automation of Inventory Control
- Automated Network Infrastructure Management
- Automated User Provisioning
- Advanced Firewall Protection
 - Utilizing automated threat intelligence feeds
 - Proactively block traffic to known malicious sites
- Proactive Monitoring and Defense
 - DDoS mitigation
 - Intrusion detection infrastructure with continual updates of known threats
 - Netflow to act on unusual traffic patterns
- Incident Response via Dedicated SOC

