



ATLANTA
PUBLIC
SCHOOLS

FIVE-YEAR APS INFORMATION TECHNOLOGY PLAN

JULY 1, 2022 –
JUNE 30, 2027

The mission of Atlanta Public Schools (APS) states that “With a caring culture of trust and collaboration, every student will graduate ready for college, career and life.”

Being college and career ready in an ever-changing global economy, means acquiring knowledge and skills in academia, **through the use of technology**, to communicate, collaborate, and solve problems.

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A LETTER FROM Chief Information Officer, **OLUFEMI AINA**



The Education sector is one of two areas (Healthcare being the other) that has not experienced any significant disruption for several decades. The pandemic, however, changed that for K-12, as technology became a focal point in the scramble to transition to either full-time remote or hybrid instruction. Whatever the option, technology departments had to quickly provide devices, connectivity, and collaboration tools (i.e., Zoom, Teams) to aid educators in teaching effectively. The importance of technology prompted the influx of significant funding to schools to support these needs.

In August 2020, Atlanta Public Schools (APS), with support from the Board of Education and the Superintendent, Dr. Lisa Herring, invested in APS students by entering into a contract to provide HP Chromebooks to all students in the traditional schools. This allowed the district to be fully 1-to-1 and to move closer to 21st-century teaching. As part of our Digital Bridge program, these 40,000 additional Chromebooks were fully deployed to APS students in August 2021.

With the significant increase in technology on the network and in the classroom, the district must evolve to enhance the backbone of the infrastructure to support the system. We must upgrade our wireless, Internet & intranet bandwidth, data center servers, storage, and more, to meet these new demands. Especially for urban school districts covering traditionally under-served neighborhoods, K-12 districts are increasingly responsible for ensuring that students are provided with connectivity tools (i.e., hot-spots, broadband, etc.) even when they are not at school.

This strategic technology plan aims to look at the next five years through the lens of equity and ensure that all APS students are “ready for college, career & life.”

Olufemi “Femi” Aina
Chief Information Officer, Information Technology

INTRODUCTION

The mission of Atlanta Public Schools (APS) states that “With a caring culture of trust and collaboration, every student will graduate ready for college, career and life.” Being college and career ready in an ever-changing global economy means acquiring knowledge and skills in academia, through the use of technology, to communicate, collaborate, and solve problems.

The Information Technology (IT) Division has built this five-year technology plan to align goals and guardrails with the district’s 2022 – 2027 “We Are APS – Building on our Legacy” strategic plan. The planning process involved gathering feedback from students, teachers, staff, and community through surveys and collaboration with other departments. The process also involved research, identifying the best practices for educational technology tools.

The plan is structured by the Information Technology department, with each program summarizing its current access and use of technology, how it operates to support technological implementations, its future

vision to enhance technology access and use, and the challenges that must be addressed to achieve the future vision, or the gap analysis. The five goals, listed below, emerged in response to the collective current reality, future vision, and growth areas. This plan outlines the technology response to support the strategic goals of the APS 5 overall vision, of being a high-performing school District where students love to learn, educators inspire, families engage, and the community trusts the system.

APS 5

1. Data

Utilize Data to drive all instructional decisions and ensure equitable outcomes for all students

2. Curriculum & Instruction

Educators provide rigorous, culturally relevant content, taught well

3. Whole Child & Intervention

Implement a Whole-Child system of support that integrates social-emotional learning behavior, wellness, and comprehensive academic intervention plans

4. Personalized Learning

Utilize flexible learning tools, technology integration, and targeted instruction to allow students to take ownership of their learning and growth at an adequate pace

5. Signature Learning

Strengthen the implementation of signature programming across all schools



INFORMATION TECHNOLOGY OVERVIEW

APS continues to move towards seamless technology integration throughout the district. Not only within the classroom, but also with the classroom support system and at the administration level. The Information Technology Department provides the servers, network infrastructure, hardware, applications, integration, and support solutions needed to fully leverage the technologies that allow teachers to deliver a relevant and highly engaging learning experience, in a 21st century classroom.

Through standards-based technology integration practices, APS is creating engaging and empowering learning experiences for all students that reflect their lives and their futures. Teachers employ technology to implement relevant, rigorous, and engaging learning experiences that promote student creativity and learning. APS administrators create, promote, and sustain a shared vision that maximizes the use of digital resources to meet learning goals, supports collaborative and technology-based instructional practices, and enhances the performance of District and school leaders.

Information Technology Division is responsible for the technological implementations for the Atlanta Public Schools District.

1) The Information Technology Team maintains the District's data center, operating systems, workstations, email, network, security, telecommunication, and other technology platforms. The department is also responsible for managing IT assets, providing first level support through the service desk, and desk-side support to the schools through Field Support Technicians.

~50,000

ATLANTA PUBLIC
SCHOOL STUDENTS

1:1

STUDENT-TO-
COMPUTER RATIO

APS District Technology 2020-21 Fast Facts

Network Infrastructure

Type/Speed of connection between district demark and schools WAN within the school system	Land Line Fiber
School Wide Area Network Speed	10 GB
Web Filtering and Firewall Protection	Palo-Alto/Securly
Classrooms with high-speed internet access	100%

IT Support Services

Field Support Technicians Provide level 2 hardware and software support for end users	65
Infrastructure/LAN/WAN Support Provide level 3 network, wireless, server, telecom, email and internet security support	8
Application Support Support the Districts enterprise applications	9
Service Desk Provide level 1 support for end users; document all calls and emails in regards to technology needs and issues	11
IT Logistics Support Manages assets at IT warehouse and provides warranty and break/fix support	6
Technology Administration Executive support for all levels of information technology	9

Student Instructional Computers

Laptops	3,274
Tablets	23,922
Chromebooks	68,087
MacIntosh 10.13+	1,418
Thin Clients	12,120

TOTAL STUDENT DEVICES

108,821

DISTRICT PARTNERSHIPS

The Information Technology Division provides support for the district's technology across all Divisions. Although all do not implement specific technology applications, they all use technology services. A short list of those that are partners, and IT collaborates with for district technology systems.



Instructional Technology

IT partners with the Office of Instructional Technology and the two departments of Instructional Technology, Media Services, and the Atlanta Virtual Academy (APS' Online virtual program). They have worked together in closing the digital divide and device and wi-fi gaps that exist for students at home through our 1:1 initiative. Students from Pre-K to grade 12 have been assigned iPads, Chromebooks and Wi-Fi to use both in school and at home.

The partnership continues in support and maintenance for the work Instructional Tech does in supporting our educators implementing instruction using Google Classroom and Ingenuity. They also support the IDD team in delivering professional learning to improve teaching and learning for educators through instructional coaches, learning communities, coaching academy, ambassadors and the Instructional Coaches Institute. Schools also integrate digital resources and tools into the curriculum like Nearpod, Zoom, Flocabulary, Formative, Freckle, SeeSaw, Imagine Learning, Remind and others to help close the digital divide.

IT will continue to support the Office of Instructional Technology as they implement future vision of expanding the Media Services eBook and library media services, the implementation of Kick-Up for managing, evaluating and tracking professional development, the technological collaboration tools that support the Atlanta Virtual Academy and the design and implementation of the Enovation Center, a 21st Century learning environment accommodating diverse learning needs.

Charter/Partner Schools

IT generates an annual Buy Back Services Guide that provides descriptions and pricing for services available to charter and partner schools, allowing these specialized programs the flexibility they need to accommodate their varied student populations and technology environments.

Parents and the Community

- IT provides parents and guardians with a secure portal – Infinite Campus – to access student class schedules, grades, and attendance records, and update contact information, as needed.
- Family Engagement Technology workshops offer technology training sessions for parents, grandparents, and caregivers. Conducted by Instructional Technology Specialists, attendees learn how to use available technologies -- cell phones, tablets, touch devices, apps and programs to assist children learning at home.
- 40+ parent centers throughout the district have been established to provide parents with access to computers, the Internet, and printers to both stay abreast of their child's education or for practical needs, such as pursuing employment.

Marketing & Communications

- IT partners with The Office of Communications to message the district's technological, learning, instructional, and administrative capabilities and total customer value to students, parents, community members and employees.
- IT manages the APS website to provide information about APS and its partnership with the community.
- IT partners with The Office of Communications to continuously solicit feedback from students, staff and stakeholders to assess the current state of technology throughout the District and evaluate future needs so that APS is on target, or ahead of industry standards. Vehicles for gathering information include the IT Steering Committee, round table discussions, teacher leaders, and online surveys.

Special Education

IT supports APS special education teachers by assessing and deploying assistive technology tools designed to meet the learning needs of students with disabilities, along with training to support Individualized Educational Program (IEP) goals. This includes support for Lexia Core 5 and PowerUp Literacy, Symphony Math and Read & Write.



INFORMATION TECHNOLOGY



VISION

Provide every student and teacher with the innovation, information, technology, and tools that are essential for learning and excellence in the 21st century.

MISSION

Provide district and school leaders, as well as teachers and staff, with the essential structures and data necessary for critical decision making, academic operation, and governance.

We promote, provide and support: Reliable infrastructure; Data to support student achievement; Safe Online environment; Connected Classroom; and Equitable access to technology.

The department is also responsible for managing IT assets, providing first level support through the service desk, and desk-side support to the schools through Field Support Technicians. The Information Technology Team along with other departments within the Information Technology Division, provides and supports each Division's technology implementations and purchases. They will be identified within the areas whose team provides primary support within their team for those purchases and implementations as technology continues to provide quality support for the District's instructional goals.

Infrastructure Ops Department

Infrastructure Operations provides a variety of services to support individual schools and the district as a whole, including the overarching IT architecture plan and deployment, implementation and maintenance of email and collaboration tools, network administration, telecom and wireless integration, management of the data center, MDF/IDF support, oversight of UPS and Citrix/VDI, deployment of applications, desktop and imaging services, and Mac and tablet support.

VIRTUAL DESKTOP

Current Reality

- APS implemented a virtual student desktop environment on a Citrix platform. The district is part of Citrix's partner for life program, and we have also partnered with a preferred Citrix partner for assistance with Citrix related issues. The student desktop environment supports approximately 12,000 Wyse zero client endpoints to accommodate 50,000 students.
- APS has regular meetings with Citrix to ensure APS is following best practices.
- APS has migrated the control plane (management servers) to the Citrix Cloud to reduce the load on internal resources, both for compute and human support resources.

Gap Analysis

The current infrastructure has the following limitations:

- Software requests typically do not follow any type of standard/process.
- Staff resources: Presently, there is one primary resource that supports the environment for the district.
- The initial project was designed solely for students; staff/employees could also benefit from utilizing this solution.
- The outdated Cisco UCS server hardware needs to be replaced.
- Update the security to require multi-factor authentication (MFA) for staff to access the environment and not students.

Future Vision

To achieve the future vision of continuing to provide a reliable and safe virtual computing environment, APS will take the following steps:

- Secure enough human capital to support the Citrix environment fulltime.
- Market and communicate that the Citrix environment is a solution for all staff and students that the solution has the capability to run Windows applications and Windows full desktops on Chromebooks and the ability to access internal resources from outside the APS network.
- Remove the Wyse Zero Clients from the classrooms and keep the ones that are in labs and better utilize our investment in Chromebooks by making the Citrix environment accessible from those devices.
- Implement new HPE Synergy servers as the host to replace the outdated Cisco UCS servers that are currently utilized.
- Update the security to require multi-factor authentication (MFA) for staff to access the environment and not students.

DATA CENTER

Current Reality

APS currently has two Physical Data Centers & One Cloud base Data Center

- Primary Data Center is located at the Center for Learning and Leadership (CLL)
- Disaster Recovery Data Center is located at 56 Marietta Street (Digital Realty)
- Microsoft Azure (Cloud Resource based Data Center)

Servers

(350) + physical servers including (650) + virtual servers

- HPE rack-mounted servers & HPE Synergy Systems (CLL & DR sites)
- IBM PureFlex chassis and blade servers & IBM Thinkservers (BigFix Relay servers 1 per school)
- Cisco UCS chassis and blade servers
- Patching for Physical Security Recording Servers in remote schools and administrative offices

Storage

1+ petabytes of local SAN storage & Azure cloud storage

- Microsoft Azure Cloud-based storage
- Two Brocade IBM Branded SAN Fabric switches, IBM Storwize V7000s & IBM DS3500
- Nimble Storage

Data Center Networking

- HP core and distribution switches, Load Balancers, Citrix NetScaler's (4) SDX (2 at CLL & 2 at DR) with (4) VPX Virtual Load Balancers for specific areas, (Internet Load Balancing, Identity Management, DNS, VDI, etc.)
- Kemp Virtual Load Master 10GB (2)
- DNS/DHCP
 - Microsoft AD-integrated DNS
 - Microsoft Dynamic Host Control Protocol (DHCP)
- Content Filtering and Mobile Device Management
 - Palo Alto Next Generation Firewall (2)
 - Securely Hosted Environment
- Next Generation Firewall
 - Palo Alto (2)

Operating Systems

- APS is mostly a Microsoft Windows Server environment, running on a VMware virtual infrastructure for our production business server environment, Disaster Recovery environment and running a Citrix environment on top of Microsoft Windows Hyper-V for our virtual desktop infrastructure (VDI).
- VMware vSphere 6.7U3 with vRealize Operations Monitoring
- Microsoft Windows Server 2012 through 2019
- CentOS 5.x
- Citrix XenApp and XenDesktop 7.x

Servers

- APS is a Microsoft SQL Server database environment
 - Microsoft SQL Server 2012 through 2019

Backups

- APS utilizes VEEAM Backup & Replication software to backup various systems in the district.
 - TSM for Mail to backup Exchange with weekly full and daily incremental backups
 - Currently at 1500-day retention & over 567TB in each storage pool (primary and copy)
- VEEAM Backup & Replication to backup data from selected servers
 - Incremental forever type daily backups (30-day retention)
 - Currently over 40TB of compressed data is backed up
- VEEAM Backup & Replication to back up our VMware infrastructure
 - Incremental forever type backups performed daily. 14 days onsite data & 30 days of offsite data retained
 - Currently over 40TB's of data stored in Scale-Out-Backup-Repository

Disaster Recovery (DR)

VEEAM is an all-in-one IT Resilience Platform, converging Disaster Recovery, Backup and Cloud Mobility in one simple scalable platform that provides us continuous data protection.

- Protects our virtualized VMware infrastructure against misconfiguration, disasters, and ransomware
- Recovery Point Objectives (RPO) happen within a few minutes vs. hours for traditional backup/recovery solutions
- Critical applications such as Lenel badging, secure file transferring Move-it, Edulog and Security Camera management systems can all be recovered and run from our TeleX DR location

Gap Analysis

- Backup solution for Microsoft 365 Suite of products including Exchange Online, SharePoint Online, and OneDrive
- Backup solution of Google Suite Data (Google Classroom & Drive)

Future Vision

Storage

- Expand storage capacity by adding an additional SAN storage to accommodate future growth needs
- Add fiber channel Nimble Storage array
- Segment development, test, and proof of concept workloads off production SAN environment

Data Center Networking

- Create a new virtual lab environment with enough host server, storage, and network resources to migrate all development, testing, and proof of concept workloads out of the production virtual environment.

Servers

- Upgrade VMware environment to VMware vSphere 7.x
- Replace outdated Cisco UCS Hardware for the VDI environment with a new HPE Synergy environment
- Upgrade Microsoft Windows Hyper-V environment in the VDI environment to Microsoft Windows Server 2019 and Microsoft System Center Virtual Machine Manager 2019
- Upgrade guest servers to Microsoft Windows Servers

Backups

- Work with the Policy and Governance Team to come up with appropriate retention policies
- Continuously review what is being backed up with the Application Support Team to ensure that all appropriate data is being backed up
- Schedule regular periodic testing of restores from the backups to ensure our ability to recover in the event of a disaster
- Upgrade to the newer versions of VEEAM Backup and Replication
- Decommission old TSM and Spectrum Protect environments
- Implement VEEAM Backup for Office 365 product to handle the backup of Microsoft 365 data (Exchange Online, SharePoint Online, OneDrive)
- Users transition to OneDrive for Documents for enhanced resilience and availability
- Create a private cloud infrastructure for hosting services that can be offered to charter schools



TELECOMMUNICATIONS

Current Reality

The current APS telecommunications infrastructure runs on the Cisco platform. All Services except Advanced Quality Manager (AQM) are high availability (HA) and are deployed at both CLL and Telex (Disaster Recovery) sites. The current deployment:

- Telecom PBX switch is Cisco Unified Communications Manager
- Signaling protocol is Session Initiating Protocols (SIP)
- Inbound / Outbound calling is handled by Cisco Unified Border Element (CUBE)
- Call Centers are handled by Cisco Unified Contact Center Express (UCCX)
- Call Recordings for call centers are handled by Calabrio Advanced Quality Manager (AQM)
- XMedius provides the Enterprise Fax (E-Fax) deployment with faxing from the Xerox copiers
- Call Detail Recording (CDR) records are handled by SPLUNK and Side-View Apps

Gap Analysis

- The current deployment of Cisco 7900 series telephones remaining are out of compliance for remediation of TLS 1.0.
- The current UCCX Contact Center makes it difficult to scale into a new call center quickly as the software is antiquated.
- The current Emergency 911 (E911) deployment does not comply with regulations coming out in the next year or so which will cause legal issues if an upgrade is not performed.

Future Vision

- Complete the upgrade of all remaining 7900 series telephone sets to the latest telephone set which is the 8851 set.
- Move to Cloud Based Contact Center solution, to allow scalable contact centers & ease in establishing new call centers.
- Partner with vendor to provide an all-encompassing E911 solution to handle both current regulations/future updates.
- Update the security to require multi-factor authentication (MFA) for staff to access the environment and not students.



COLLABORATION TOOLS

Current Reality

EMAIL

A hybrid environment, employing Microsoft Exchange Server 2013 on virtual servers for SMTP relay and Microsoft Office 365.

- We have over 65,000 mailboxes in our current environment, running ~150k messages out and ~525k in, each week.
- The migration of users to Office 365 has increased the mailbox default size from 800 MB to 49 GB.
- Proofpoint protection and Microsoft Exchange Online Protection filter incoming messages; Microsoft Exchange Online Protection (EOP) for outgoing messages. Email is now protected by MFA “Multi Factor Authentication.”
- The on-premises Exchange 2013 environment is monitored through Microsoft Managed Availability tool.
- The Office 365 environment is monitored through the office 365 Admin Center.

Gap Analysis

EMAIL

- **Microsoft Exchange Version** – Microsoft Exchange Version 2013 is now in Extended support until April 2023.
- **Monitoring**
 - On premise 2013 environment is monitored through Microsoft Managed Availability tool.
 - Cloud is Managed through Office 365 Admin Center.
- **Documents and Attachments** – Version 2010 had limited capability and size limited to 10MB.
 - Office 365 size limit increased to 55 MB and protected by Safe Attachments.
- **High Availability/Disaster Recovery** – Version 2010 requires manual restart, no self-recovery capabilities.
- **Microsoft Version 2013** exchange environment deploys self-recovery capabilities on virtual machines.
- **O365 Environment** is Cloud based housed on Microsoft’s servers with multi-location redundancy.
- **Mailbox Size** – Version 2010 default mailbox size was set at 800 MB, O365 default mailbox size is set at 49 GB – 99 GB.

COLLABORATION

APS has multiple collaboration tools. In the Cloud we have Microsoft Teams, OneDrive, Zoom, and SharePoint.

Future Vision

EMAIL

- Update 2013 exchange servers to 2019 or build a 2019 server and switch on-premises services.
- Create a knowledge base to better acquaint users with Outlook 365 capabilities.
- Update the security to require multi-factor authentication (MFA) for staff to access the environment and not students.

COLLABORATION

- Continue Microsoft collaboration environment knowledgebase to acquaint users with the capabilities of Teams.
- Provide licenses to enable conference calling Teams for all users.
- Purchase Zoom Webinar licenses that will allow district programs to be able to host large participant webinars.

WIRELESS INFRASTRUCTURE



Current Reality

- Infrastructure is Xirrus platform, with ~1500 wireless access points across the District, installed in hallways providing wireless in classrooms. The design to provides signal strength of -65db.
- There are two on-site controller servers to manage and monitor the wireless infrastructure.

Gap Analysis

- **Capacity & Coverage** – The current deployment model does not provide sufficient coverage or capacity to meet current and future business needs, especially with the ever increasing use of mobile devices for instruction.
- **Optimized Performance (802.ac Compliance)** – The current wireless infrastructure does not have the capability to support optimized performance, a feature of the latest wireless technologies, such as 802.11 ac/ad.
- **Ease of Management & Monitoring** – As the management servers cannot support redundancy and are only available on-premise/over VPN, the current wireless infrastructure doesn't lend itself to easy management or monitoring.

Future Vision

Recent contract implements a managed services solution to close existing gaps.

- A new design implemented to provide a wireless infrastructure of a 1:1. This will put 1 AP (access point) per classroom, in hallways, office areas, auditoriums, gyms, conference rooms, and other instructional spaces.. This scalable design model will provide adequate coverage and capacity.
- **Install Optimized Performance Capable APs** – The new upgrade will replace the current Xirrus Arrays with Cisco Meraki APs. The new Meraki APs will be optimized for high performance, and are compliant with 802.ac/ad standards. They also feature backward compatibility with older technologies, such as 802.11a/b/g/n.
- **Cloud-Managed Service** – The new upgrade will also come with a cloud-managed service that will allow access to manage the infrastructure from anywhere over the internet, 24/7 monitoring, and alerting capabilities.
- **Student Wireless SSID** – There will be a separate wireless network specifically provisioned for students.
- **Bring Your Own Device (BYOD)** – The APS board has approved a BYOD policy which will allow APS staff and students to bring in their own devices and connect securely to the APS network.

MDM (MOBILE DEVICE MANAGEMENT)

Current Reality

APS has made a substantial investment in the purchase of Chromebooks, and iPads, primarily purchased as devices for students to use during state mandated online testing, online assessments, and virtual instructional needs from home.

Gap Analysis

- The current device management platform does not easily support the management of iOS or Chrome OS devices.
- There is a need to push software across the internet to iOS and Chrome OS devices.
- Staff resources: one primary resource each supports the iOS and Chrome OS environments.

Future Vision

- Implement Google Admin Console to manage Chrome OS devices (Google has a proprietary MDM to manage Chrome OS).
- Phase out Lightspeed and move devices to Securly MDS to manage iOS devices.
- Secure and cross train enough human capital to support the MDM environments fulltime.
- Institute regular meetings with our partners to ensure APS is following best practice.

APPLICATION SUPPORT

Current Reality

A four-person team manages application scripting, imaging, and software deployment. Tools used include LANDesk, Microsoft System Center, Autolt, Orca, AppDeploy (Kace), and Powershell. Requests generated via work order system Nimbus or projects.

Gap Analysis

- Absence of Application Support Request Process.
- Inability to Accurately Monitor Software Licensing – IT does not have oversight of all District software purchases.
- Standardization of Hardware Platforms – The District currently allows sites to purchase hardware independently.
- Not Fully Utilizing Software Tools.

Future Vision

- Develop and implement software acquisition requests and deployment processes for the District.
- Develop standard for requesting, testing, and deploying software.
- Collaborate with Procurement to develop processes that restrict the purchase of software until vetted by IT.
- Allow IT the ability to manage all software licensing for District, allowing better support from Applications Support Team.
- Develop, implement, and enforce hardware standards to allow for better software and hardware management.
- Pair training with application rollouts at the appropriate time(s) to leverage full capabilities of the tools.

IT Security & Networking

Information sharing is vital to carrying out the district's mission to ensure every student will graduate ready for college and career. Information about students, staff, courses, programs, facilities, and fiscal activities is collected and maintained to effectively coordinate services offered, measure learning progress, assign and monitor staff and resource use. It is essential to have an effective information security strategy to protect the confidentiality, integrity, and availability of the District's information assets.

IT SECURITY

Current Reality

- Palo Alto firewalls detects/blocks sophisticated attacks by URL filtering/enforcing security policies at application level.
- Securely web filter provides safe Internet access for our students while off campus.
- Cyclance provides endpoint protection to servers and workstations.
- Rapid 7 Vulnerability Scanner used to scan devices on the APS network & report vulnerabilities to teams for mitigation.
- Active Directory/Microsoft Identity Manager are identity management tools used to manage user digital identity, credentials, and groupings. With the use of Active Directory group policy, the IT Team manages users and governs how users and computers operate within the APS network and provide a consistent security configuration in the environment.
- Multi-factor Authentication (MFA) is an authentication method that requires the user to provide two or more verification factors to gain access to resources such as VPN, email and ERP.
- Proofpoint is the email security tool used to filter emails for malware, phishing and spam.
- Clearpass Network Access Control tool used to implement policies controlling devices and connected users.
- IP and Analog Security cameras (conversion to full IP system is planned).
- Support for Safety & Security Systems: Fire and burglar alarms; Intercom system Badge readers; Motion Sensors; Metal Detectors; Perimeter Door Audible Alarms; Door/Vestibule Stations – (Buzzers).
- APS Information Technology has made great strides to improve the **security infrastructure**; however, more needs to be done in the areas of organization policy and processes to minimize security risks. These risks include but are not limited to: Critical system failures; Unauthorized access to confidential information; Loss of electronic educational records; End-point patch management; Mandatory cyber security training.



Gap Analysis

APS IT has implemented some cutting-edge security technologies, but there are still challenges managing security risks due to the lack of, or the need to re-engineer organizational and operational policies and processes. Information security policies must be a shared vision that requires input and commitment from the whole organization and buy-in from senior leadership.

- **Lack Of Contingency Plans** for newer security cameras.
- **Coordination With Local Law Enforcement & First Response Agencies** (Pending).
- **Lack of Awareness of New Security Technology** – Collaborate with stakeholders on security needs, i.e.. The International Security Conference – West, the American Society for Industrial Security Global Security Exchange.
- **Cell Phone & Radio Reception Limitations** – At some schools, and administrative sites, cell phone reception is weak, or non-existent.
- **Lack of Integration Among Systems** – There are systems that cannot be integrated due to safety regulations.
- **CCTV “Pop-up” at CCR** – Intrusion alarms “self-activates” the camera nearest the location to a dedicated screen.
- **“LPR to SRO”** – This directly informs the SRO assigned at a location that a vehicle entering the property is to be evaluated. Early detection can address a wide range of issues, from a stolen vehicle to a “Megan’s Law” predator.
- **Single button – LOCKDOWN (SBL)** – Single button lock down allows for car-reader entrances for police personnel only.
- **CCTV Additional integration** – Implement Main Office monitor which will only display with the nearest camera to an alarmed door to circumvent the main entrance and vestibule, to avoid screening and ID at that location.
- **Playgrounds Point to Point (PTP) Wireless Technology for CCTV** – Good CCTV coverage of playgrounds is often difficult, as they are distant from the main building, so, the ability to have wireless technology cameras should be explored.

Future Vision

The vision of IT Security & Network Services is to safely secure the District’s assets by establishing an IT Security Framework that will enhance the educational experience. This will be accomplished by building relationships and collaborating with organizational leaders to provide appropriate security policies, processes, and controls that will incorporate security practices into the daily use of the District’s information assets.

This vision includes four strategic objectives and 8 key initiatives necessary to iteratively improve the security posture of the District. Assuming that there will be sufficient resources for people, processes, and tools, it will take 3 to 5 years to fully implement all of the objectives.

- **Proactive Risk Management** – Initiatives that will support this objective will allow data owners and administrators to be more aware of the security risks that their information assets are vulnerable to, identify controls to reduce those risks, and understand what risks remain after any identified controls have been implemented.
- **Data Loss Prevention** – Initiatives that support this objective will help the District reduce the likelihood of data loss or disclosure of confidential or federally protected data.
- **Improved Security of System and Network Services** – Initiatives that support this objective will support a defense in depth architecture and provide increased security of critical services. Many of these initiatives and projects are required to be in place according to Federal regulations and various State laws (FERPA, HIPAA, GLBA, GIPA, etc.).
- **Crisis and Security Incident Management** – Initiatives that support this objective will help the District recover its information assets in the event of a catastrophic event or service disruption. Additionally, these initiatives will enable the District to manage security events more efficiently and effectively, thereby reducing or minimizing damages.

NETWORK

Current Reality

- The APS enterprise network infrastructure runs on both Cisco and HP platforms, with approximately 4,500 switches. The District's backbone network is co-located at two central facilities with a total bandwidth of 40 GB, 20 GB at each location.
- Most of the schools and remote administrative sites connect back to the central locations with 1GB Multi-Protocol Label Switching (MPLS) Wide Area Network (WAN) circuits.

Gap Analysis

Considering the drive towards a "21st century classroom", in which the model of instruction is leaning towards heavy use of Online instructional technologies, namely in the areas of augmented, virtual and mixed reality content and Online testing, we need to improve the network infrastructure and capacity.



Future Vision

SHORT TERM VISION

The future of instructional technology will be characterized by the ever-increasing amounts of multimedia content traversing the enterprise network.

Preparing for the future requires planning and upgrading network infrastructure inside the schools and the external WAN and Internet capacity. For classrooms this includes upgrading to more robust access points to support the increase of devices in the classroom, as well as having network switches that can support the needs of these access points and other instructional technologies.

LONG TERM VISION

In support of the growing need for network capacity, it is recommended that APS implement a private fiber ring solution. This will provide direct fiber connectivity between the central facilities and all remote sites. Future bandwidth demands can easily be fulfilled by simply installing the appropriate fiber optics. Alternatively, APS can adopt a LTE Wireless topology which provides dynamic bandwidth capabilities. All sites will aggregate back to the two central facilities:

- Central locations will have direct connectivity to each Hub site over 50 GB per site.
- Data Center will have a direct connectivity to each school/site over 10 GB.
- Data Center will have a direct connectivity to the co-location site over 40 GB.

All sites will aggregate back to APS's Data Center with direct connectivity to:

- Each Hub-site over 80 GB.
- Each school/site over 10 GB.
- Telex (disaster recovery) over 10 GB.
- The disaster recovery (DR) site over 40 GB.

IT SERVICE DELIVERY

Current Reality

- **IT Service Delivery Team** - consists of the Service Desk (Level 1 support), Field & Service Delivery Support (Level 2 support), I.T. Logistics, and escalation support from the IT School Support Specialists and the Asset Management team.
- **Service Desk** - serves as first-level support, operating from 7AM-5:30PM, logging incidents and using remote management tools to implement local system activities; also manages support hot-lines.
- **Field Support** - 54 technicians and contractors, support 82 instructional sites and 8 admin offices: approximately 28k desktops and laptops and 3,500 interactive panels/boards used by 40k students and 4,500 staff.
- **Student Device Support** - 9 technicians troubleshoot student-issued devices and software; approximately 36k Chromebooks, 4k iPads and 10k hotspots.
- **IT School Support Specialists and Asset Management Team** - 8 staff, 2 managers, and 2 Assistant Directors focus on: Service Desk; Field Support; Student Device Support; Asset Management; Interactive Technology; A/V Event Support.
- **Support Specialists and Asset Management units** also serve internal business units as project liaisons and representatives on cross-functional teams working to ensure that project initiatives are properly transitioned into supportable operational models that will serve our school users.

Gap Analysis

- Current hours of the Service Desk do not fully support the needs of instructional staff. In addition, the hours do not lend to full event monitoring in the APS Network Operations Center (NOC).
- The existing ticketing system is difficult to manage and requires third-party support. Greater functionality is needed to provide more asset management functions. The poor line of sight into our mobile hardware means frequent asset loss.
- Flexibility will be needed if multiple charter schools choose to purchase technology services via APS internal resources.
- The Service Integration Team supports many initiatives and projects without clear role and responsibility focus.
- Hardware deliveries frequently handled in personal vehicles; the IT Department does not have access to a lift gate truck.

Future Vision

- Increase Service Desk staff to provide support from 7AM-7PM to give staff access to high-level phone support through the business day. Virtual Assistant technology and Self-service will be introduced, as well.
- Implement new ITIL-compliant ITSM suite to support robust ticketing and tracking processes, to better support management and tracking of all mobile configurable items, and track laptops and tablets.
- Field Support should move to a clear 1:1 (technician per school) support model to lessen downtimes, and create better collaborative partnership opportunities with schools, with respect to PTA or Foundation sourced technology purchases. With the increased human resources, we would also be able to better support internal IT infrastructure projects.
- More clearly define School Support Specialist Team roles, allowing for closer contact with school administrators/staff.—
 - Expansion of School Integration by at least 1 staff person to provide better management of field technicians.
 - Expansion of Service Desk, by at least 2 persons, to provide the District with support scalability.
 - Assignment of at least four (4) dedicated IT Warehouse personnel & one (1) IT Warehouse lead to better facilitate the warranty management process, parts inventory, & overall asset management activities including annual site inventories.

Enterprise Application Team

The Business Applications Team is within the Information Technology department and works alongside other departments to manage, support, and administer more than 60 software information systems. The applications and systems cover those implemented and purchased throughout the district. The list includes but is not limited to: Blackboard (school websites), my-Backpack (student application portal), Lawson, Kronos, SharePoint, AiM, Destiny, Nimbus (IBM Smart Cloud), and Lenel.

Current Reality

The Business Applications Team manages, supports, and administers 60+ software information systems including:

- Lawson
 - Kronos
 - SharePoint
 - Power Apps
 - Let's Talk
 - Webquery
 - ARC – GIS
 - Aesop
 - Fingerprinting
 - Maris Maps
 - ClickUp – Facilities
 - Let's Talk – Facilities
 - SIMBLI – Facilities
 - AiM
 - Asset Works/Fleet Focus/Fuel
 - Image Director – Facilities & Transportation
 - Edulog Routing – Transportation
 - Trip Tracker Electronic Field Trip Program
 - SMARTPTT – Cloud Radio/Dispatch System
 - Seon – Onboard Video Surveillance & DVR Stop Arm Cameras
 - School Dude Facility Mgmt-Facilities
- APS Nutrition Website – houses School Menus, Nutrition Information, Parent Newsletter, Digital Application for Free or Reduced Lunch, Educational nutrition games for students and many other nutrition support resources.
 - My School Bucks Application for Smart Phones and Tablets – Set up recurring automatic payments for lunch accounts, track meal history and create low balance alerts.
 - Newton Point of Sale (POS) system – used to manage student lunch accounts, take meal payments and to integrate with district and state financial systems.

The responsibilities of the Business Applications Team can consist of and can include based on the application:

- Providing user support and helping users optimize use of applications; evaluating new technologies, in partnership with business owners; administering system configurations and role authorizations; and facilitating process improvements.
- Providing courses and training solutions for users.
- Ensuring integrity and improving accuracy of data and sources.
- Deploying new technologies.
- Creating new Power apps to facilitate automation of processes.
- Conversion of Old SharePoint site to SharePoint Online.
- Assist in sun setting of old technologies.

Beginning in FY22, APS transitioned the Lawson S3 platform to cloud hosting to lower total cost of ownership. Moving Lawson to the cloud will also allow us to sunset some existing, separate applications, and eliminate many manual processes, improving support for core business processes, including Payroll, Accounting, Budgeting, Procurement, and Human Resources.

Gap Analysis

Currently, the Business Applications Team supports a number of applications and business processes in the District. As the team looks toward the future, the following gaps have been identified:

- Higher levels of integration are needed between applications.
- Many manual business processes need to be automated.
- The team needs to determine how to help the business easily access this data to optimize the business processes.
- Streamline and simplify operational support processes to bring greater efficiencies and allow for more focus on projects.
- Review access levels to applications and update to meet audit specification.
- Key resources gap for support of the applications and cross training of resources for having back support model.
- Seek business support to include the team at the time of new applications sourcing, implementation and vendor training.
- Innovative POS technology to reduce person-to-person contact and crowding in high touch areas.

Create a vision for charter and partner school support. There are several business applications that charter schools currently access and may desire to access in the future. Flexibility will be needed to support those that decide to purchase business technology services from APS. As the demand for such support increases and if the charter cluster District is approved by the Atlanta Board of Education, more personnel will be needed to provide more timely services to our end users.

Future Vision

The Business Applications and Management Support Team will undertake efforts to:

- Improve integration of applications Automate key business processes.
- Help the organization access key data housed in the District's applications.
- Streamline operational support processes.
- Further define support to charter schools.
- Streamline the process of student-based application support in My Backpack with – Schools, Department initiated purchases, Procurement and SIS.
- Create a support matrix of applications by key issues to be leveraged for providing support.
- Grow the team of APS resources while reducing the need for contractors.
- Support Nutrition in investigation of mobile POS technology to support meal service in a variety of serving models.

An assessment of the ERP will be undertaken within the FY23 term for viability of the current structure and associated applications supporting business functions. This work will determine if the current ERP application and the current applications interfaced align well and will continue to support the future expanding needs of the District.



Project Management Office

The Mission of The APS IT Program Management Office is to provide quality program delivery and execution of projects and strategic technology initiatives throughout the district. We do this by providing a standard program management methodology, standard templates, and a staff of highly trained and certified program managers, business analysts and change managers. Included in the IT Program Management Office is IT Governance & Policy and Change Management/Business Analysis. These along with project management continue to allow IT to provide district support to implementing organizational goals.



PROJECT MANAGEMENT

Current Reality

This team is made up of 4 Senior Program Managers, 1 Project Coordinator, 1 Assistant Director of Business Development and Design, 1 Senior Business Analyst, and 2 Business Analysts who support the entire school district. We also have a number of contract consultants who help to augment the work needed on our ERP Cloudsuite upgrade.

Each Senior Program Manager has the responsibility of managing a portfolio of projects for each division. The PMO currently has over 30 active projects with an approximate project cost of \$20 million. We provide updates on all projects via the PMO Project Dashboard reports, facilitate Critical Projects reviews monthly with projects business owners and other leadership.

Gap Analysis

The APS district has grown to include 1 new Division and several new departments. These departments are currently not covered by a dedicated project manager. Several of our customers are in need of dedicated time from a business analyst and/or a project manager to review and provide improvements in business processes.

Future Vision

- To grow our team to better address the needs of our customers by adding/retooling staff.
- To provide more accurate project information via dashboard reporting by better use of project management tool.
- Apply better business process to the intake of projects to help manage the amount of active projects.



CHANGE MANAGEMENT / BUSINESS ANALYSIS

The Mission of the Development and Analysis Team is to ensure the adequacy of the change to the needs of the organization by engaging communication methods and channels that drive successful change initiatives. Also, this team engages business analysis techniques to advocate for the needs and requirements of all stakeholders within the district. Finally, this team seeks to provide quality, effective training designed to increase individual and organizational productivity and enrichment.

IT GOVERNANCE & POLICY

The IT Governance team coordinates the efforts of IT leadership to ensure that the division goals are aligned with those of the district. We ensure a better alignment of the business of the district's implementations of technology and other initiatives.

- Set priorities, maintain timelines and establish a mechanism for oversight of project and initiative implementation.
- Develop IT policies and procedures.
- Align the district strategic priorities and the APS Five with the business goals.
- Review critical projects and initiatives.
- Form Steering and Governance Committees to provide direction and funding for critical projects and initiatives.

GOALS, STRATEGIES & BENCHMARKS

As IT professionals, our work aligns most clearly with three of the APS 5: Data (APS 1), Whole Child Intervention (APS 3), and Personalized Learning (APS 4). We've also identified a number of strategies and benchmarks under the the departmental goal to: Provide consistent and reliable IT service & support.

DATA (APS 1)

Utilize data to drive all instructional decisions and ensure equitable outcomes for all students.

Strategies	Benchmarks	Evaluation	Funding/Amount	Responsibility
Deploy enterprise data warehouse (EDW) to consolidate data from multiple sources into useful analytical reports	Complete deployment of EDW to all APS departments and users by Fall 2022	Weekly, Monthly review of EDW reports	CARES	District Level: Executive Director of Information Technology, Directors Information Technology
Acquire enterprise solution for e- signature and electronic forms	Complete training and deployment by April 2022	Check usage/transaction reports every quarter to monitor number of transactions	CARES Act \$50,000	District Level: Executive Director of Procurement, Executive Director of Information Technology, Directors of Infrastructure Operations, IT Security, IT Systems Manager
Data Security Control Management	Complete process documentation and architectural design by April 2022	Weekly, Monthly project reviews	General Funds	District Level: Executive Director of Information Technology, Directors of Infrastructure Operations, IT Security, Enterprise Applications, IT Systems Manager

WHOLE CHILD & INTERVENTION (APS 3)

Implement a Whole-Child system of supports that integrates social-emotional learning behavior, wellness, and comprehensive academic intervention plans.

Strategies	Benchmarks	Evaluation	Funding/Amount	Responsibility
Increase Parent Engagement in use of Securely Parent App to support student safety and student web presence	30% of District Parents using the Securely Parent App by Fall of 2023	Using Admin Console to monitor enrollment bi-weekly. Collaboration with Instructional Technology to communicate regularly how to enroll and use app in their monthly sessions.	General Funds	District Level: Executive Director of Information Technology, Directors of Infrastructure & IT Security and Network Director of Instructional Technology
Provide alert notification to school counselors and other administrators identified for students that need intervention based on their internet searches using Security Parent App	Process in place to include all need to know administrators of schools and district with procedures in place to intervene and support students/parents when a set of triggers occur by Fall of 2023	<ul style="list-style-type: none"> Quarterly Cluster Meetings Use of School Newsletters, Flyers, PTA session updates, Emails to provide updates, gather feedback on progress. Weekly Monitor App Dashboard 	General Funds	District Level: Executive Director of Information Technology, Directors of Infrastructure & IT Security and Network Director of Instructional Technology

PERSONALIZED LEARNING (APS 4)

Utilize flexible learning tools, technology integration, and targeted instruction to personalize learning for all students.

Strategies	Benchmarks	Evaluation	Funding/Amount	Responsibility
IIQ Asset Management – 1 to 1 student device support	Interface between applications for preventing teams from having to manage 2 separate systems. Improve ability for students to report issues with devices using system by Summer 2022	Weekly review of progress	General Funds	District Level: Executive Director of Information Technology, Directors of IT Support, IT Security, IT Infrastructure, IT PMO
Increase WAN bandwidth to 2GB for schools that are consistently using over 90% of bandwidth	Review monthly data usage reports for locations trend analysis to determine upgrade priorities Purchase upgrades for all qualifying sites	Trend analysis to identify locations using more than 90% of their current bandwidth Track new orders placed through completion	E-Rate	District Level: District Level: Executive Director of Infrastructure and Production Services, Director of Security & Network Services

PROVIDE CONSISTENT AND RELIABLE IT SERVICE & SUPPORT

Provide a robust infrastructure with high speeds, high availability, and reliability; maintain a knowledgeable support system; and manage a comprehensive application portfolio to support students, teachers, and staff.

Strategies	Benchmarks	Evaluation	Funding/Amount	Responsibility
Upgrade existing wireless infrastructure	Receive USAC approval for funding – October 2022	Conduct assessment by APS building Weekly/Monthly usage reporting	E-Rate SPLOST \$4 Million	District Level: Executive Director of Infrastructure and Production Services, Director of Infrastructure Operations, Network Manager
Gain complete visibility of software licenses purchased, deployed, and remaining with license tracking software.	Phase 1: Requirements Gathering by Fall 2022 Phase 2: Software Purchase by Spring 2023 Phase 3: Software Deployment by Summer 2024	Monitor software deployed to track licenses purchased, deployed, and remaining.	TBD	District Level: Executive Director of Infrastructure and Production Services, Director of Infrastructure Operations, Director of IT Security, IT Systems Manager
Cloud Migration for VoIP phone system infrastructure	Migrate current structure to cloud to upgraded VoIP phone system infrastructure by Spring 2023	Track phone system failure rate	TBD	District Level: Executive Director of Infrastructure and Production Services, Director of Infrastructure Operations, Network Manager
Upgrade network switches to enable faster network speeds and create better responses to heavy influxes in traffic and to replace end of life equipment.	Complete all locations by December 2022	Review monthly reports on network speeds Review weekly reports on incident tickets opened for network issues	SPLOST \$8 Million	District Level: Executive Director of Infrastructure and Production Services, Director of Security & Network Services
Automate contractor account provisioning and access	Phase 1: Update provisioning platform to pull users from HR system Phase 2: Organize user access rights based on similar responsibilities Phase 3: Implement role-based account provisioning Complete all phases by Winter 2023	Monitor weekly incident tickets opened with Service Desk for any gaps within the automated system. Monthly reporting to verify all users are getting captured in automated system and validate correct permissions	TBD	District Level: Executive Director of Infrastructure and Production Services, Director of Infrastructure Operations, Director of IT Security, Identity Management Specialist

Strategies	Benchmarks	Evaluation	Funding/Amount	Responsibility
Upgrade cabling within APS buildings for faster data speeds	Complete cable upgrades by December 2022	Review monthly reports on network speeds	SPLOST	District Level: Executive Director of Infrastructure and Production Services, Director of Security & Network Services
Obtain a privately owned fiber ring that connects all APS data sites	Complete fiber ring by Fall 2025	Feasibility study Cost benefit analysis	TBD	District Level: Executive Director of Infrastructure and Production Services, Director of Security & Network Services
Protect students, teachers, and staff from harmful content while minimizing interference with classroom learning activities by maintaining an up-to-date internet safety policy.	Complete quarterly review of internet safety policies	Quarterly reviews of best practice internet security policies Monthly reviews of sites trending through incident tickets Weekly reviews of harmful materials getting through policy	SPLOST	District Level: Executive Director of Infrastructure and Production Services, Director of Infrastructure Operations, Director of IT Security & Network Services
Strengthen vulnerability management to maintain a secure network.	Complete weekly vulnerability scans	Review vulnerability scan results Monthly	SPLOST \$8 Million	District Level: Executive Director of Infrastructure and Production Services, Director of Infrastructure Operations, Director of IT Security & Network Services, IT Systems Manager

Acknowledgements

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