

# ISO IT PROJECT 2021

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# Executive Summary

Information technology resources provide an enabling, but essential foundational capacity for modern schools to provide quality education, and adapt to changing demands for both on-campus and remote learning as the need arise. Recognizing the advantages that a modern, secure, and reliable information technology infrastructure provide, ISO initiated an assessment of the IT infrastructure in August, 2020 with the intent to determine the capacity, and operational status in order to lifecycle aging and faulty IT equipment, and modernize the infrastructure to meet ISO present and future information technology needs

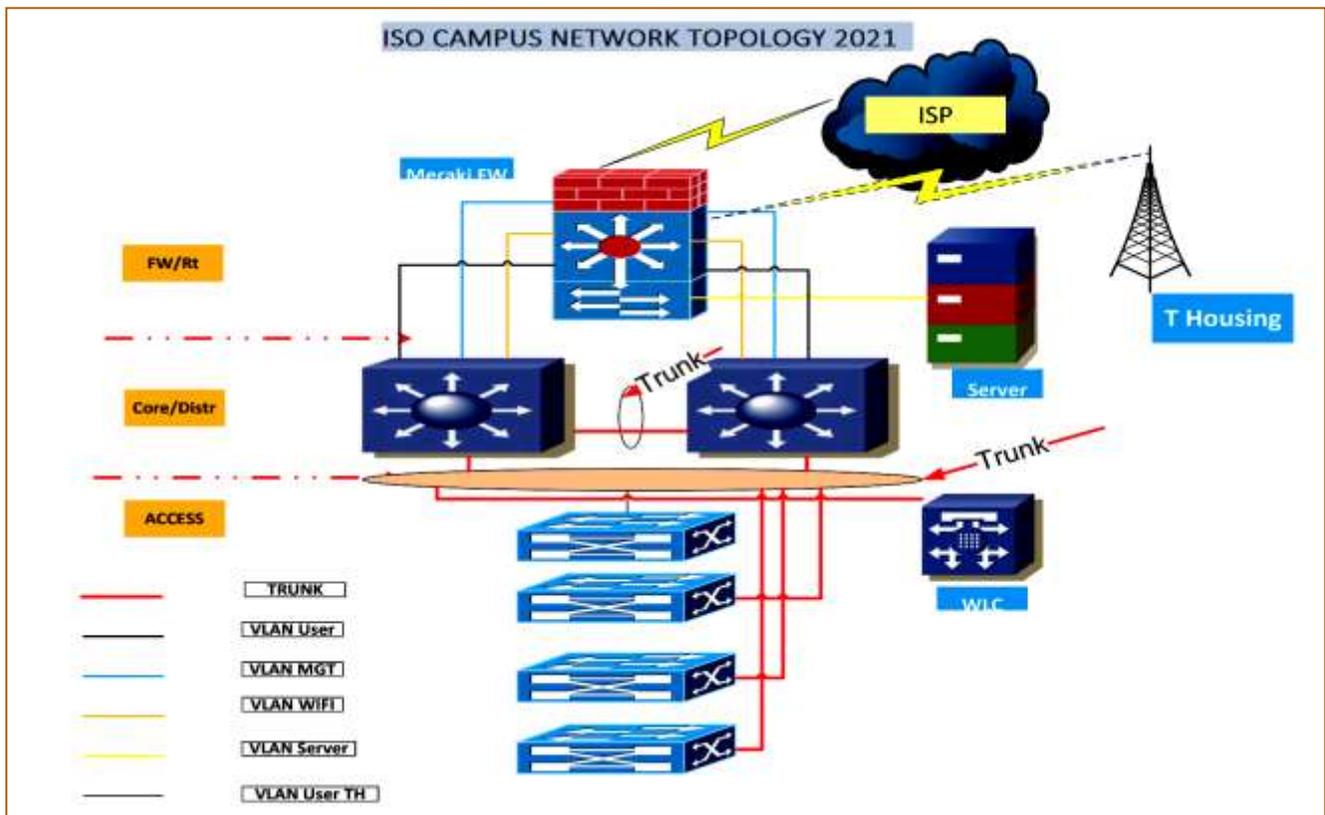
ISO IT infrastructure assessment was conducted by ISO overseas IT Consultant in collaboration with ISO IT Department - headed by Kiema Dieudonné. A review of ISO ISP service level agreement and internet bandwidth requirements, Google Cloud services configuration and performance metrics and requirements, administrative and technical policies for currency, relevance, and applicability, Standard operating Procedure, computers, servers, network devices, printers, and software status were assessed for upgrade, replacement, or migration to the most current version release. A complete inventory of all IT infrastructure equipment was also conducted for accountability, and suitability for retention, or disposal.

Findings from the IT assessment recommended the following actions which were adopted, and implemented with urgency to facilitate in the short term: remote learning, improve cyber security posture, improve internet and cloud services access, and system performance. Administrative and technical policies governing system access, maintenance, and operation were also proposed for consideration.

A plan to modernize ISO IT infrastructure was proposed, and accepted in August 2020. After funding was made available, IT equipment requisition orders were placed in October 2020. Equipment delivery was made in May 2021, and the IT modernization project was completed September 20, 2021 on time, and within projected budgetary costs. ISO now has a modern IT infrastructure with expanded capacity, and flexibility to support growth projections for the next 8 years.

# IT Security, Resources, and Capacity

The current ISO IT infrastructure was designed and implemented with cyber security defense-in-depth as a foundation. For this reason, the network was redesigned and segmented by vlans to control boundary and data access between server and data storage vlan segment, staff residential vlan segment, and the system management segment. A cloud managed content filter, layer-7 firewall and traffic monitor, and a McAfee Advanced Security, Domotz real-time network monitoring and alert system were installed. These technologies, working together-provide a defense-in-depth security solution for ISO IT systems, and users.



Google Cloud workspace was reconfigured with enhanced security features to support enrollment of Chromebook computers for central management and ISO brand logo and theme. Additional policies and controls were deployed to provide more visibility and oversight for safe use of ISO google cloud resources.

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Ten essential administrative and technical control policies were issued for compliance with data protection, access, transfer, retention, and destruction. Google privacy protection requirements, institutional accreditation requirements, and ISO cyber safety obligations are also addressed by these policies.

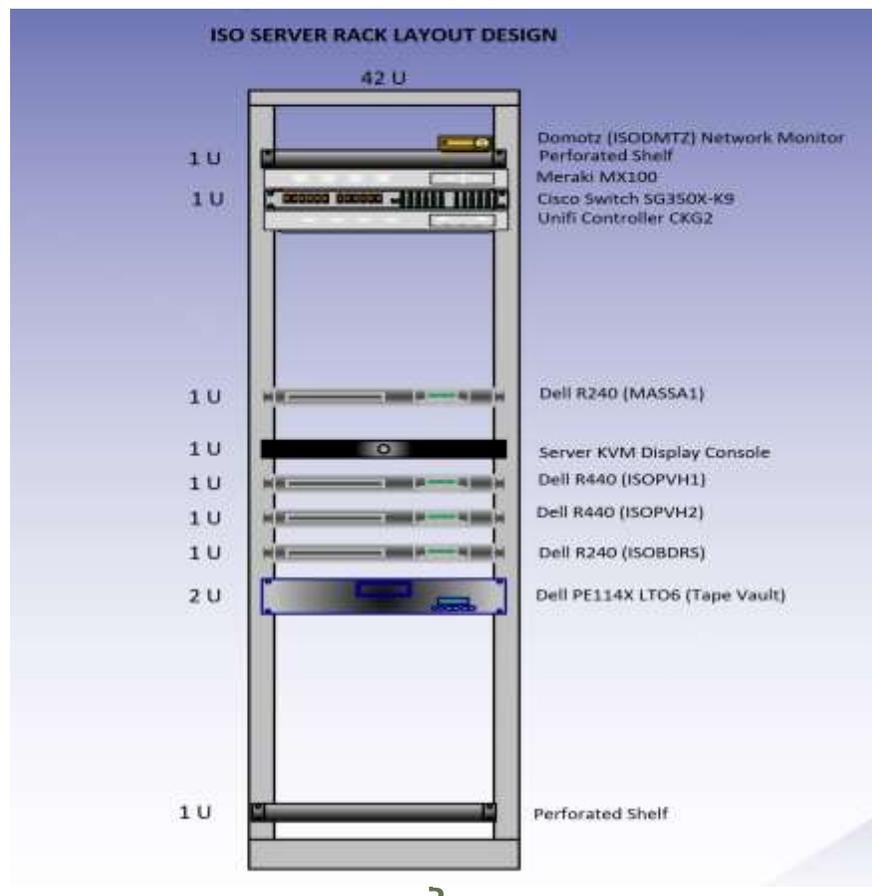
ISO local windows network domain was upgraded from 2012R2 to Microsoft 2019 Standard and Datacenter OS version 1809. Several additional servers and computers were deployed with trusted computing baseline to support specific and designated workloads. The system image baseline includes ISO organization theme and unique branding color scheme for security and identification. servers are now deployed to provide applications services, system and security management, print and file share resources, and windows software update servers. Windows services and policy objects were revised, and new security controls added for oversight, management, accountability, and roles or features provisioning. The windows 2019 environment is supported until 2029 with scheduled security updates.

ISO IT infrastructure user-base is 192 consisting of students, faculty, and staff. However, the system has the capacity to support up to 500 LAN and wireless device concurrent secure connection sessions, and over 4000 active users or computing objects. Internet bandwidth speed and quality have been increased from 10 Mbps to 35-50 Mbps to support advanced cloud services, app features, remote work, remote learning, and other online activities. IT support personnel now have the technology resource and capacity to provide direct remote support by using available remote access, and desktop service. This resource significantly minimizes the need for physical interaction for assisting users.

# New IT Equipment

The following equipment were purchased to implement the IT infrastructure modernization project:

- 2 Dell PowerEdge R440 (Hosting capacity for 24 virtual servers)
- 2 Dell PowerEdge R240 for Domain controller, Backup Server
- Dell ME4012 data storage appliance-24TB data storage capacity
- Dell P114X LTO6 backup media for short and long-term data recovery
- 12 Cisco 350SX L2/L3 switches
- 1 Cisco Meraki MX100 Router, firewall, and content filter
- 10 Unifi Mesh WIFI Access Points
- 1 Unifi WIFI Controller
- 1 Domotz Network monitor
- 1 42U Server Rack, 1 Server KVM Display console



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Additional computing devices (Desktops, Laptops, Tablets) printers, and projectors were purchased to replace obsolete and failing devices that impact faculty and staff productivity, and student learning activities:

- 25 Dell Inspiron 11th generation laptops (replacement for old laptops)
- 8 new Dell Desktops (replacement for old desktops)
- 9 new Laptops for staff members, and replacement for 4 old devices
- 20 new Apple iPads were added to increase student device inventory
- 5 new HP printer (replacement for old faulty models)
- 5 new Projectors (replacement for old projectors)

*“Replacing aging, obsolete equipment, technologies, and processes is a recommended industry best-practice for equipment life-cycle management.”*

ISO student computing device inventory has been increased to provide additional capacity and access for student participation in computer lab, and other online learning activities.

Student computing device inventory 2021 stands at:

- 23 Desktops in PC LAB
- 8 Desktops in the Library
- 4 Desktops in Students center
- 15 Apple Macintosh PC in Mac Lab
- 24 Chromebooks provisioned under Google Workspace MDM
- 40 Apple iPads

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# Policies and Operating Procedures

ISO recognize that a modern IT System administration, management, and use require rules, guidelines, and controls for compliance, governance, smooth operation, and oversight of users and operators alike. The following administrative, technical control, and user policies were issued to meet ISO organizational standard, and comply with institutional accreditation, GDPR Data protection, MSA, AISA, U.S. COPPA requirements.

The policies and operating procedures below also provide guidelines for early, and systematic detection and remediation of policy violation, cyber threats, and other security incidents.

- ISO Student Cyber-Safety Policy
- ISO ICT Privileged-Level Access Policy
- ISO Faculty and Staff ICT Acceptable Use Policy
- ISO Social Media Policy
- ISO BYOD Chromebook Policy
- ISO Data Retention Policy
- ISO IT Standard Operating Procedure
- ISO ICT System Status Report format
- EU GDPR Designated Data Protection Officer
- ISO IT Network Topology
- ISO Network IP Scheme
- ISO Equipment and Service Inventory
- ISO Data Privacy Policy

Once detected, or notified via automated alerting system; the system administrator can direct the appropriate incident response.

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## Future Requirements

ISO IT infrastructure require periodic updates and upgrade to hardware, applications, firmware, and operating system to maintain the system in the best operational readiness. Recommended industry best practice suggests that life-cycle management practice of replacing aged equipment before the end of its established lifecycle. System configuration must be consistently maintained. Any configuration change, regardless of how minor, must be properly documented to avoid poor performance, decline, or system failure due to misconfiguration, or arbitrary configuration change.

Further, IT Department personnel must take advantage of professional development initiatives offered by ISO to improve technical support skillset, or acquire exposure to new technologies. This will help prepare participants for the challenges of managing a modern IT infrastructure. Training can be obtained through direct professional development course attendance locally, or an enroll in an online technical training program.