



State Fiscal Year 2021 - 2023 Higher Education Department IT Strategic Plan

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EXECUTIVE SUMMARY

The New Mexico Higher Education Department (HED) seeks to promote accessibility to education for all New Mexicans. Information technology is a key element of this effort. Some of the areas in which IT is utilized are managing loan applications for Financial Aid, providing collaborative tools for teleworking, serving archived school transcripts for students, and delivering data for policy makers.

The Information Technology Services Division (ITS) helps facilitate the workflow of other HED divisions and enhance the overall efficiency of the agency. ITS's work and goals are in alignment with the Higher Education Department's and the State's IT strategic goals. Specifically:

ITS is working with Institutional Finance Division to improve an FY20-built application that replaced a paper-based reporting service with an easy-to-use yet highly secure online application. We have also migrated all staff to new laptops and VPN services, enabling everyone to telework effectively from home. Additionally, we continue to add features and improve performance of the Financial Aid Division's Health Professional Loan Repayment Program application (HPLRP) and the NM Children, Youth & Families Worker Loan Repayment Program application (CYFD) as well as Planning & Research Division's Electronic Data Editing and Reporting system (eDEAR), which has just received a major upgrade. Finally, ITS, Constituent Services and Private Postsecondary Schools successfully developed and deployed the Transcripts application, allowing for over 60,000 school records to be kept in a database and easily accessed and edited using an intuitive user interface.

In the inter-agency realm, ITS has (a) engaged the CIOs of all the New Mexico Higher Education Institutions (HEIs) on cybersecurity, especially on ransomware prevention and mitigation, and (b) spearheaded the NM Education Blockchain Initiative (NMEBI) to provide recent graduates with digital versions of their credentials; five institutions are currently participating, with more expected to come aboard in FY22.

Agency leadership continues to make it a priority to (a) better engage and support the State's higher education institutions, students and teachers and (b) more widely share the extensive information HED has collected and which ITS manages. To that end, FY21 and FY22 will see the Academic Affairs and Policy division replace a costly vendor-provided, subscription-based application that helps higher education institutions create and revise course descriptions and common course numbering with a low-cost, highly-adaptive internally-developed replacement. Also in FY21-22, (a) the FY20-begun blockchain technology pilot is planned to be expanded from the current 5 institutions to over 20, (b) the delayed off-site Business Continuity and Disaster Recovery solution (BC/DR) finally placed into service, and (b) the move of core services to hosted solutions provided by DoIT and/or commercial computing platforms (i.e., DBaaS, IaaS and SaaS) is to be completed.

Finally, a priority over the next two years is to move the multi-million-dollar inter-agency New Mexico Statewide Longitudinal System (NMLDS) project from the Initiation through the Planning and Implementation Phases with the goal of having it be fully operational come June, 2023.

I. AGENCY OVERVIEW

A. AGENCY MISSION

The New Mexico Higher Education Department provides financial, academic, and policy oversight to the NM public higher education institutions for the purpose of promoting efficiency, accountability and student success.

B. AGENCY GOALS

HED fosters and guides a system of higher education that best meets the needs of the citizens of the state by providing financing to and oversight of all of the state's public universities and colleges. The agency also has regulatory authority over private for-profit institutions operating within the state.

C. ORGANIZATION STRUCTURE

HED consists of seven main divisions that sponsor various education-related programs. These are as follows:

1. The Adult Education Division serves adults to become literate and obtain the knowledge and skills necessary for employment and self-sufficiency.
2. The Financial Aid Division is dedicated to helping students in pursuing their educational goals by educating students, parents and the community about state aid opportunities.
3. GEAR UP's mission is to increase the number of underrepresented students who are prepared to enter and succeed in Postsecondary education.
4. The Institutional Finance Division is responsible for the fiscal oversight of 32 colleges, universities and special schools.
5. The Academic Affairs and Policy Division is involved with a number of activities, including monitoring the transfer and articulation operation and the associated General Education Core Course listings.
6. The Private Postsecondary Schools Division (PPSD) issues licenses or letters of exemptions to private postsecondary Institutions allowing these institutions to legally operate in the state.
7. The Research and Planning Division provides quality assurance, reporting and planning support to the higher education community through collaborative data collection, analysis and reporting.

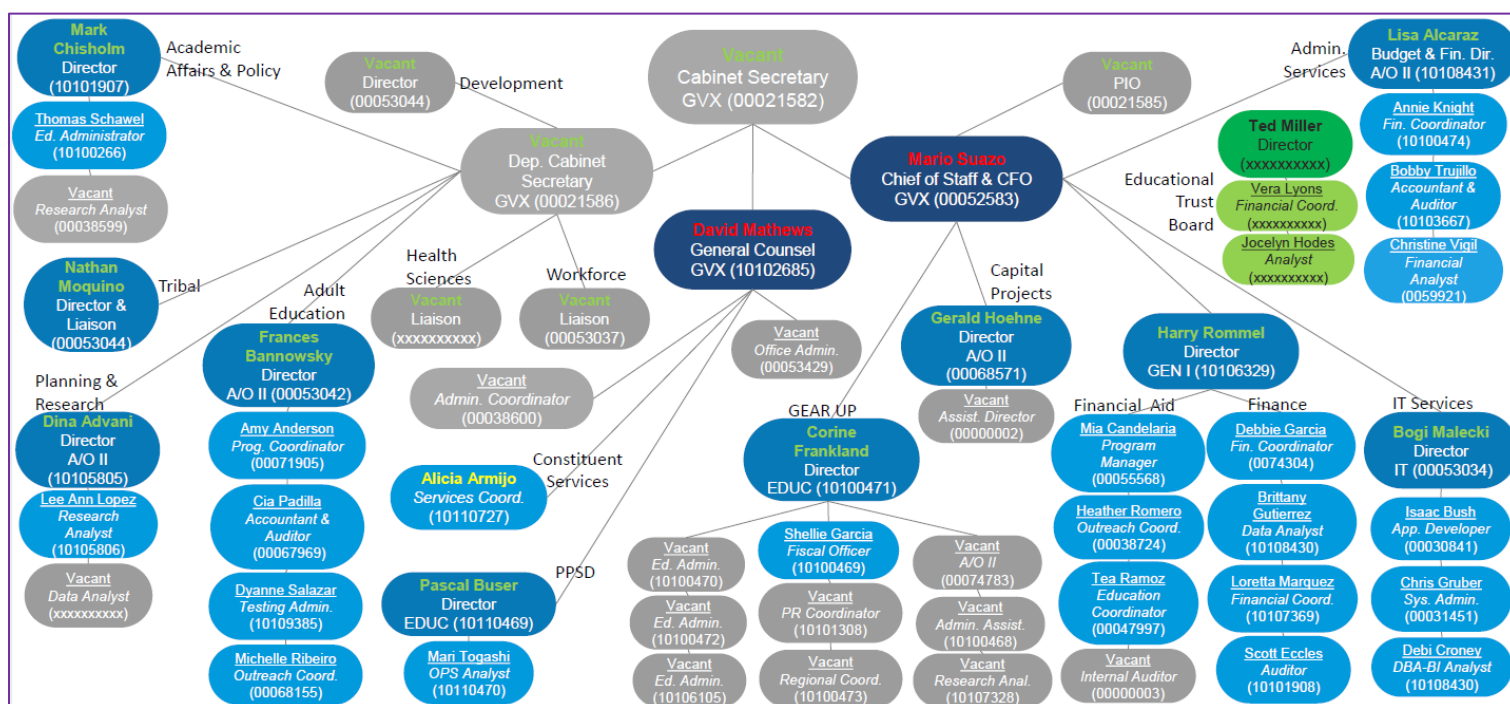


TABLE I.1: HED Organizational Chart

II. ITS DIVISION OVERVIEW

A. VISION AND PRIORITIES

To facilitate and transform the business processes of the agency and provide the highest possible value to all internal and external stakeholders.

Priorities are as follows:

- Increasing information and data redundancy and security
- Increasing information and data availability
- Streamlining service delivery
- Improving responsiveness and customer service
- Becoming more transparent to stakeholders
- Consolidating services and reducing costs via virtualization and hosting

B. IT ENVIRONMENT

1. Major Applications

Name	Function
BAS	Legislative bill analysis system (INTRANET ONLY)
Budget	Institutional Budget submission application URL: https://Budget.hed.state.nm.us/
CPTSS	Capital Projects Report Submittal System URL: https://cptss.hed.state.nm.us/login
CCNS	Common Course Numbering System, a.k.a. Course crosswalk URL: https://ccns.hed.state.nm.us/
CYFD	Financial Aid application system for CYFD Loan Program URL: https://cyfdapp.hed.state.nm.us/
eDEAR	On-line data reporting system for all public postsecondary institutions in New Mexico URL: https://edear.hed.state.nm.us/app
HPLRP	Financial Aid application system for HPLRP Program URL: https://finaid.hed.state.nm.us/
Transcripts (internal)	Manage 60,000+ student credentials for closed schools URL: https://transcripts.hed.higher.ed (INTRANET ONLY)

TABLE II.1: Major HED Software Applications & Links

2. Infrastructure

Systems	Operations	Servers and/or Services
HPE server systems and HPE SAS storage	VMware vSphere running 16 virtual server instances <i>(See Appendix C for details)</i>	<ul style="list-style-type: none"> • Active Directory servers • Ubuntu LTS application servers • Windows Server 2012R2 File Share servers • Windows Server 2012R2 database servers • Windows Server 2012R2 application servers
Back-up systems	Disk- and tape-based back-ups	Disk- and tape-based back-ups
Juniper switches, Palo Alto firewalls and Ubiquiti WPAs	Network communications and security <i>(See Appendix C for details)</i>	<ul style="list-style-type: none"> • VPN • DMZ • Zero-trust subnets • External IP traffic • Wireless access

TABLE II.2: HED IT Infrastructure

3. Projects (current and planned)

#	PROJECT NAME	PURPOSE	CERTIFIED/ STATUS	RELATIONSHIP TO PRIORITIES & IT ENVIRONMENT
1	Local file back-ups	Enable automated back-ups of local user files	In-house; implementation phase	Modernization, improved security & improved user services
2	Activate Microsoft 365 Exchange Online email service	Move staff to cloud-based HED email service	In-house; implementation phase	Modernization and improved user services
3	NM Education Blockchain Initiative (NMEBI)	Enable students and schools to cost-effectively, readily and securely access and share records and credentials (See Appendix D for details)	In-house; implementation phase	Moving away from inefficient paper-based forms and processes; modernization, improved security and, improved user services
4	NM Longitudinal Data System (NMLDS)	Implement a central data and reporting system containing all student and workforce information (See Appendix D for details)	PCC certified project; in Initiating Phase	Moving away from inefficient paper-based forms and processes; modernization, improved security and, improved user services
5	SM Apply Application Replacement	Current hosted application is too costly & difficult to manage	In-house; in planning phase	Modernization and improved user services
6	Upgrade to MS Office 2019	Upgrade all agency staff to take better advantage of Microsoft 365	In-house; implementation phase	Modernization and improved user services
7	Bill Analysis Service Migration	Move Bill Analysis Service application to the hosted cloud	In-house; planning phase	Modernization, improved security and, improved user services

TABLE II.3: Current and planned IT projects

4. Challenges

ITS has two major challenges: Managing remaining legacy data and database systems and providing a BC/DR solution. Both should be substantially mitigated in SFY21-22. Specifically:

Challenge	Details	Mitigation
BC/DR system	We don't have an off-site Business Continuity and Disaster Recovery system. Our Server Room is neither secure nor power-redundant and, meanwhile, agency staff use and save ever more information, so implementing a BC/DR system is a priority	<ul style="list-style-type: none"> Secure space and network access in a bona fide Data Center. The NMEAF Data Center (Albuquerque) and DoIT Data Center (Santa Fe) are top candidates
Legacy data & database systems	<p>Reel tapes with 20+ year-old data, lack of redundancy across production server systems (AD excepted), looming end-of-life on critical database systems. These are the outstanding tasks requiring our attention.</p> <p>The most important requirement is increasing data and access security.</p>	<ul style="list-style-type: none"> Migrate databases to hosted systems/services, e.g., DoIT and/or commercial cloud computing services Convert and digitize 20-40 year-old data Migrate, virtualize and make redundant cost database and application systems (see projects #1 and #7 in Projects section) Deploy application and database development, test & QA systems Create network and systems diagrams Update security and application support plans Perform back-up data restore and verification

III. SFY 2020 ACCOMPLISHMENTS

A. SFY 2020 STRATEGIC IT ACCOMPLISHMENTS

IT Strategic Goal:	Deliver Capabilities to Foster Collaboration and Knowledge Management
SFY 2020 Strategy:	More fully leverage collected institutional and student information
Metrics:	<ul style="list-style-type: none"> • 100% increase in number of inter-agency and inter-institution IT activities and/or initiatives • 2-4 New and/or improved secure, easy-to-use web services
Accomplishments:	<ul style="list-style-type: none"> • 200% increase in IT collaboration and/or initiatives with DoIT, PED, ECECD, and DWS • 300% increase in IT collaboration and/or initiatives with NM Higher Education Institutions • Deployed 2 new responsive-designed applications (Budget and Transcripts)

TABLE III.1: SFY 2020 strategic IT accomplishments

B. OTHER SFY 2020 IT ACCOMPLISHMENTS

CATEGORY	ACCOMPLISHMENT	VALUE or IMPACT
APPLICATIONS	Deployed BUDGET and Transcripts	Increased efficiency and security and improved User Experience
CUSTOMER SERVICE	Activated Comodo One Service Desk	More effective troubleshooting and resolution of user issues
DATA	Expanded hosted data storage	More redundant and secure data
INFRASTRUCTURE	Enabled snapshots and versioning; deployed laptops to all staff	Staff now have access to historical versions of shared drive files; all staff can now access all HED resources remotely
SECURITY	Upgraded firewall operating systems	All staff now securely access all HED resources from home
WORKFORCE	Provided instructor-led training to IT staff	Key staff were able to attend technical conferences and attend real-time instructor-led courses

TABLE III.2: Other SFY 2020 IT accomplishments

IV. SFY 2021-2023 IT STRATEGIC GOALS & STRATEGIES

Primary IT Strategic Goal:	Further expand capabilities to foster collaboration and knowledge management
Agency Strategic Goal:	Better leverage and share institutional and student information
SFY 2021 Strategies:	<ul style="list-style-type: none"> • Further engage DWS, ECECD, PED, DoIT, and other institutions to share and better utilize key constituent data • Make more information more readily available to the higher education institutions (HEIs) and the public • Complete migrating on-premises databases to highly-secure, hosted data repositories
Metrics:	<ul style="list-style-type: none"> • 2-3 new inter-agency and inter-institution projects • 0 major on-premises databases • 2-4 new and/or upgraded web applications and/or services • 15+% increase in data sharing with other agencies • 40+% increase of web-based custom and ad hoc reports
SFY 2022 Strategy:	Make inter-agency data sharing standard and transparent by way of secure, on-demand access technology
Metrics:	<ul style="list-style-type: none"> • 10-20 newly implemented of APIs, federated services, RESTful web services, and/or blockchain technologies • 50+% increase in data sharing with other agencies • 20+% increase of web-based custom and ad hoc reports
SFY 2023 Strategy:	Make complex analyses easily and readily accessible to management and staff
Metrics:	<ul style="list-style-type: none"> • 1-2 new wizard-driven, web-based reporting services • 10+% increase of web-based custom and ad hoc reports • 25+% increase in data sharing with other agencies

TABLE IV.1: SFY 2021 – 2023 IT strategic goals and strategies

V. IT FISCAL AND BUDGET MANAGEMENT

A. IT OPERATING BUDGET (C1)

Information Technology Base Operating Budget Informational Purposes Only					
Agency Name:	NM Higher Education Department			Agency Code:	950
Appropriation Funding Type:	Base Request Operational Support of IT. Check one of the options below: Flat Budget <input checked="" type="checkbox"/> or Expansion from previous year <input type="checkbox"/>				
Revenue IT Base Budget (dollars in thousands)					
	SFY19 Actual	SFY20 Actual	SFY21 OpBud	SFY22 Request	SFY23 Estimate
General Fund	741	632	1,975	1,105	1,310
Other State Funds	15	36	45	42	65
ISF/IAT	0	0	0	0	0
Federal Funds	10	20	20	45	45
Total	766	688	2,040	1,172	1,420
Expenditure Categories (dollars in thousands)					
Category or Account Description	SFY19 Actual	SFY20 Actual	SFY21 OpBud	SFY22 Request	SFY23 Estimate
Personal Services & Employee Benefits	380	420	425	432	439
Contractual & Professional Services	54	79	1,260	708	708
IT Other Services	13	15	240	18	22
Other Financing Uses	0	0	0	0	0
Total	447	514	1,925	1,158	1,169
	Agency Cabinet Secretary/ Director (mandatory)		CIO or IT Lead (mandatory)	Budget Director (mandatory)	
Name	Ricky Serna		Bogi Malecki	Lisa Alcaraz	
Signature					
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TABLE V.1: NM Higher Education Department C1

B. CAPITAL IMPROVEMENT, SPECIAL AND SUPPLEMENTAL FUNDING (C2)

1) NM LONGITUDINAL DATA SYSTEM

C2: Information Technology

Data Processing - Computer Systems Enhancement Fund (CSEF)

Agency Name	Agency Code	Project Name	Priority (one is highest)	Projected Start Date	Projected End Date
Higher Education Department (HED)	95010	NM Longitudinal Data System (NMLDS)	1	8/31/2020	6/30/2024
Multi-Agency Project	Participating Agencies		Project Type Please select one of the options below:		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	DWS, ECECD, HED, PED		<input checked="" type="checkbox"/> New	<input type="checkbox"/> Replacement	<input type="checkbox"/> Existing

Revenue Project Cost (dollars in thousands, amounts calculate upon exit, click outside the cell after your last entry)					
Category or Account Description	FY20 & Prev Actual	FY21 Budget	FY22 Request	FY23 Estimate	Total
General Fund (CSEF)	0.0	274.0	401.0	0.0	675.0
Other State Funds (*specify funds below)	0.0	0.0	0.0	0.0	0.0
Federal Funds	0.0	0.0	2458.0	0.0	2458.0
Interagency Funds	0.0	0.0	0.0	0.0	0.0
Total	0.0	274.0	2859.0	0.0	3133.0
*If Other State Funds, Specify Funding Source/Fund Name					

Expenditure Categories (dollars in thousands, amounts calculate upon exit, click outside the cell after your last entry)					
	FY20 & Prev Actual	FY21 Budget	FY22 Request	FY23 Estimate	Total
Personal Services & Employee Benefits	0.0	35.0	113.0	0.0	148.0
Professional Services	0.0	228.0	218.0	98.0	544.0
Travel/Lodging	0.0	0.0	5.0	11.0	16.0
IT Hardware	0.0	0.0	65.0	30.0	95.0
IT Software	0.0	11.0	777.0	81.0	869.0
Other	0.0	0.0	919.0	542.0	1461.0
Total	0.0	274.0	2097.0	762.0	3133.0

2) NM EDUCATION BLOCKCHAIN INITIATIVE

C2: Information Technology Data Processing - Computer Systems Enhancement Fund (CSEF)

Agency Name	Agency Code	Project Name	Priority (one is highest)	Projected Start Date	Projected End Date
NM Higher Education Department (HED)	95010	New Mexico Education Blockchain Initiative (NMEBI)	2	2/1/2020	6/30/2023
Multi-Agency Project	Participating Agencies		Project Type Please select one of the options below:		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	10+ New Mexico Higher Education Institutions		<input type="checkbox"/> New	<input type="checkbox"/> Replacement	<input checked="" type="checkbox"/> Existing

Revenue Project Cost (dollars in thousands, amounts calculate upon exit, click outside the cell after your last entry)					
Category or Account Description	FY20 & Prev Actual	FY21 Budget	FY22 Request	FY23 Estimate	Total
General Fund (CSEF)	25.0	5.0	236.0	108.0	374.0
Other State Funds (*specify funds below)	0.0	0.0	0.0	0.0	0.0
Federal Funds	0.0	0.0	0.0	0.0	0.0
Interagency Funds	0.0	0.0	0.0	0.0	0.0
Total	25.0	5.0	236.0	108.0	374.0
*If Other State Funds, Specify Funding Source/Fund Name					

Expenditure Categories (dollars in thousands, amounts calculate upon exit, click outside the cell after your last entry)					
	FY20 & Prev Actual	FY21 Budget	FY22 Request	FY23 Estimate	Total
Personal Services & Employee Benefits	5.0	5.0	10.0	5.0	25.0
Professional Services	5.0	0.0	50.0	25.0	80.0
Travel/Lodging	0.0	0.0	0.0	0.0	0.0
IT Hardware	0.0	0.0	0.0	0.0	0.0
IT Software	15.0	0.0	98.0	58.0	171.0
Other	0.0	0.0	78.0	20.0	98.0
Total	25.0	5.0	236.0	108.0	374.0

C. REQUEST FOR REAUTHORIZATION OF GENERAL APPROPRIATIONS

Reauthorization of general appropriations will be made in FY22 for any remaining \$274,000 funding appropriated in FY21 (August 31, 2020) for the NMLDS Project.

APPENDIX A – MAJOR APPLICATIONS

NAME:	MS 365	BAS	CCNS	eDEAR	HPLRP	CPTSS	CYFD
FUNCTION:	Communication, collaboration & document management	Bill Analysis System	Common Course Numbering System	Data reporting system for all NM public post-secondary institutions	Financial Aid application for HPLRP Loan Program	Data reporting system for all NM public post-secondary institutions	Financial Aid application for CYFD Loan Program
(BUSINESS PROGRAM SUPPORTED)	<i>(All programs)</i>	<i>(All programs)</i>	<i>(Policy)</i>	<i>(Research & Planning)</i>	<i>(Financial Aid)</i>	<i>(Capital Projects)</i>	<i>(Financial Aid)</i>
SOFTWARE							
OS:	Agnostic	Windows	Linux	Linux	Linux	Linux	Linux
DBMS:	SQL Server	SQL Server	MySQL	SQL Server	PostgreSQL	PostgreSQL	PostgreSQL
Language:	.Net	.Net	Java	Java/Angular	Java/Angular	Java/Angular	Java/Angular
AGE:	4 months	5 years	1 year	2 years	6 months	1 month	3 months
SUPPORT MODEL:	Subscription	Swarming	Swarming	Swarming	Swarming	Swarming	Swarming
LIFE CYCLE STATUS:	Maintenance	Maintenance	Support	Support	Support	Development	Support

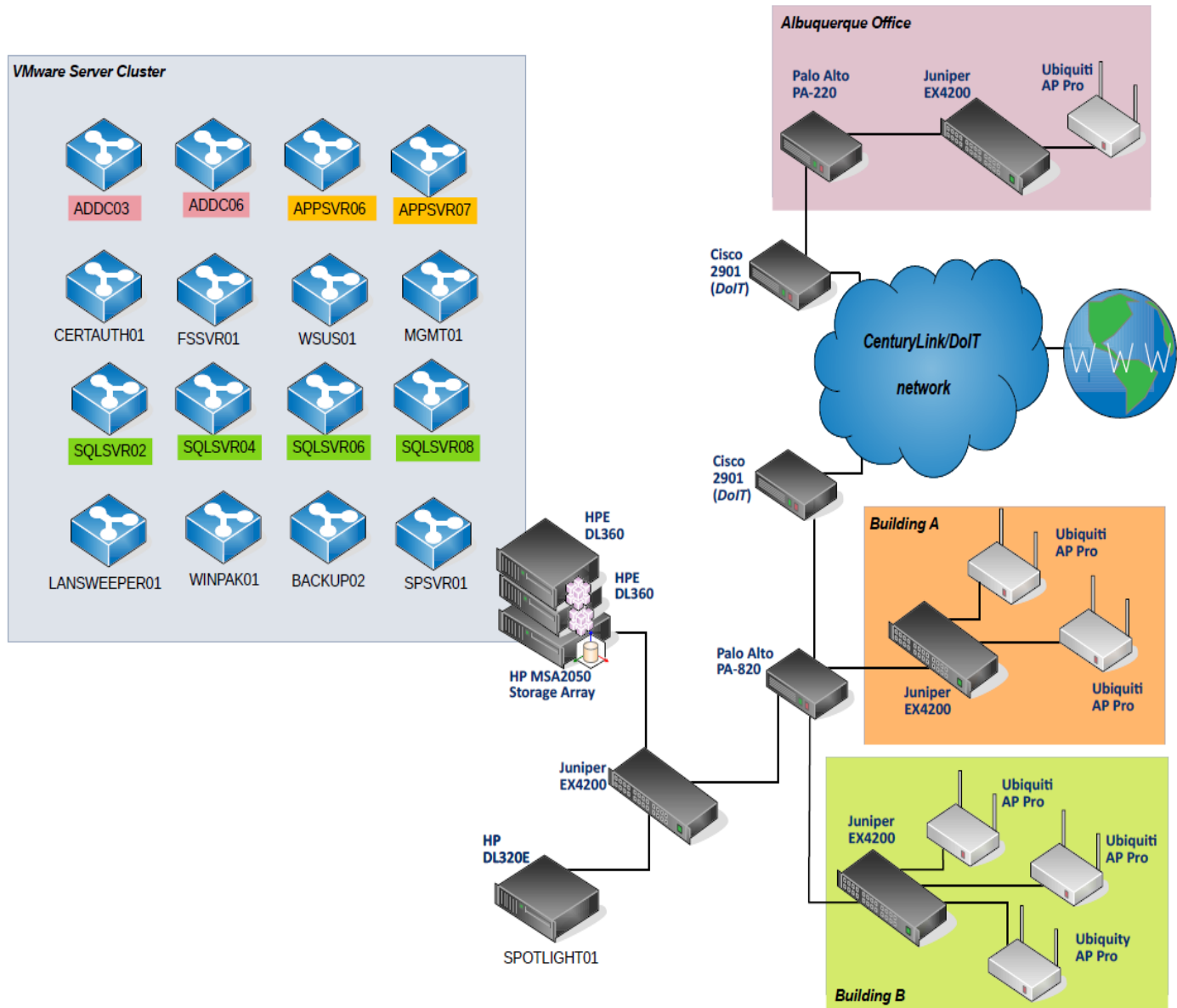
TABLE A.1: Major HED Software Applications

APPENDIX B – CORE INFRASTRUCTURE (hardware)

TECHNOLOGY PLATFORM	PHYSICAL LOCATION	SUPPORTED APPLICATION(S)	AGENCY-OWNED INFRASTRUCTURE		
			QTY	BRAND & MODEL/VERSION	AGE (years)
x64 servers	2044 Galisteo Santa Fe	VMware vSphere	2	HPE DL360	2
SAS storage	2044 Galisteo Santa Fe	VMware vSphere	1	HPE MSA2050	2
Network switches	2044 Galisteo Santa Fe	All IPv6-based communications	4	Juniper EX4200	2
Firewall	2044 Galisteo Santa Fe	DMZ, VPN, and Internet management	1	Palo Alto PA-820	3
Firewall	4700 Tiburon Albuquerque	DMZ, VPN, Internet and subnet IP traffic management	1	Palo Alto PA-220	3
Wireless Access Points	2044 Galisteo Santa Fe & 4700 Tiburon Albuquerque	All IPv6-based communications	6	Ubiquiti AP Pro	2

TABLE B.1: Core HED IT Infrastructure hardware

APPENDIX C - ARCHITECTURE DIAGRAM (hardware)



APPENDIX D – PLANNED FY2021-2023 PROJECTS

PROJECT NAME	BUSINESS NEED	PROJECT DESCRIPTION	FUNDING REQUEST
New Mexico Education Blockchain Initiative (NMEBI)	Enable more students and schools to cost-effectively, readily and securely access and share academic credentials and records. This aligns with the mission of HED of promoting efficiency, accountability, and student success	Issue digital diplomas and certificates to all NM Higher Education Institutions graduates. This project can be phased such that institutions – and state agencies – can come aboard over years and months. This project expands on the successful internally funded FY20-21 SaaS pilot project.	\$236,000
New Mexico Longitudinal Data System (NMLDS)	Comprehensive and qualitative data are required to track student and school achievement. Current agency-specific data systems collect information from constituent groups, but there's no capacity to adequately merge these data to give a full picture of individual outcomes or patterns.	Build a system which collects, validates and combines key child, student and worker data into a federated data warehouse. This request is for Planning & Implementation, of the 4-year project. This is a multi-agency project, involving DWS, ECECD, HED, and PED.	\$2,859,000
TOTAL:			\$3,095,000

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