MiCloud:
Evaluating the Feasibility of Centralizing Cloud Hosting and Platform Management Services For Michigan Intermediate and Local School Districts

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EXECUTIVE SUMMARY

MAISA
MICHIGAN ASSOCIATION OF INTERMEDIATE SCHOOL ADMINISTRATORS

MiCloud

Feasibility of Creating a Michigan K12 Cloud Hosting System

MiCloud Feasibility Study Executive Summary

Consolidation of Service Opportunity

Evaluating the Feasibility of Centralizing
Cloud Hosting and Platform Management Services for Michigan's 56 Intermediate School Districts (ISDs), 537 school districts, and 293 public school academies (Districts).

Feasibility Summary

In addition to lowering server costs, KRESA estimates that Digital Transformation has reduced their region's total number of servers from 160 to 105 (34%) over the past two years.

KRESA is demonstrating a sustainable model for transitioning and transforming to the Cloud.

ROI on Disaster Recovery (DR) is determined by comparing the direct costs of DR provision by ISDs and Districts acting independently vs. through MiCloud. The economies of scale in terms of software (33%) and cloud (10%) discounts, combined with lower direct labor costs associated with MiCloud's DR team's expertise and dedication to task (25%), result in an estimated **18.27% ROI**.

The core driver of R.O.I. in Digital Transformation (D.T.) is achieving significant cost savings "per server" based on what KRESA is achieving and the overall reduction in server count.

Recommendation

Create a centralized MiCloud Cloud Management Service operated by a 501(c)3 organization with lower cost structures, on behalf of all 56 ISDs, focusing on disaster recovery and digital transformation, that will result in:

- *Equitable Access*
- *Improve Operational Efficiency*
- *Leverage Shared Services*
- *Enhance Data Security and Privacy*
- *Support Technical Expertise and Development*
- *Achieve Cost Savings/Long-Term Sustainability*

MiCloud will leverage existing statewide support structures within MiNOC, MiSecure, and MiSEN for server management, secure transport, and cybersecurity services to enhance the disaster recovery and digital transformation efforts for districts.

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Summary of Financial Analysis

1. The Kalamazoo RESA (KRESA) Cloud operation demonstrates the power of Digital Transformation. Within three years, KRESA staff:
   - Eliminated 34% of their total number of servers.
   - Transformed 84% of their servers and reduced Cloud costs by 64%.

2. The Kalamazoo RESA (KRESA) Cloud operation demonstrates the sustainability of Cloud-based Digital Transformation:

2023-24 Revenue	$1,076,215	100%
Cost of Services Provided (COS)	$939,125	87%
Gross Margin	$137,090	13%
Operating Expenses	$42,983	4%
Operating Income	$94,106	9%

3. Using KRESA's performance as a guide, MAISA estimates:
   - By offering Cloud-based Disaster Recovery, a shared infrastructure model could save **21% on Total Cost of Operation (TCO)** and generate **53% Return on Investment (ROI)**.
   - By offering Cloud-based Digital Transformation, a shared infrastructure model could save **58% on Total Cost of Operation (TCO)** and generate **73% Return on Investment (ROI)**.

4. Based on these findings, MAISA recommends funding the MiCloud program to incentivize the Cloud transition and digital transformation of:
   - **Disaster recovery for 12,000 servers** statewide over three years, and
   - **Digital Transformation for 4,000 servers** statewide over three years.

	2024-25	2025-26	2026-27	Total
Disaster Recovery	$1,007,711	$1,896,265	$2,823,954	$5,727,931
Digital Transformation	$4,682,773	$7,921,252	$10,259,761	$22,863,786
Total Funds	$5,690,484	$9,817,517	$13,083,715	$28,591,716

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TABLE OF CONTENTS

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MAISA MICHIGAN ASSOCIATION OF INTERMEDIATE SCHOOL ADMINISTRATORS
SUPPORTING REGIONAL EDUCATION SERVICE AGENCIES

Introduction

When asked, "What keeps you up at night? What do you worry about most?" local and Intermediate School District (ISD) technology directors across Michigan respond without hesitation: "Security."

Cyber attacks and the need for better disaster recovery plans occupy the minds of our technology experts, leaving them acutely aware that, despite their best efforts, the schools they serve remain vulnerable. They are well aware that uninterrupted teaching and learning with minimal downtime rely on strategically layered plans for their data centers, and they are solely responsible for those plans.

Underfunded technology departments provide additional concerns for these dedicated leaders. In any given year, licensing for backup and recovery software can double or triple, dramatically altering the security landscape for technology directors. The slender margin for operations can be sabotaged by all too common increases of this nature.

Technology leaders know the only way to ensure 100% uptime and no data loss is by investing in virtual environments with continuous data replication. However, the cost of transitioning existing on-premises data centers to a cloud solution is impossible with existing budgets, leaving our school technology leaders feeling exposed.

The MiCloud Cloud Hosting Consolidation feasibility study focuses on determining the feasibility of a 501(c)3, working on behalf of its Intermediate School District (ISD) members, and creating a centralized, scalable, and sustainable non-profit operations group to provide,

a) cloud hosting and
b) platform management services

for Michigan's 56 Intermediate School Districts (ISDs), 537 school districts, and 293 public school academies (Districts).

A. Current State

The digital world surrounding K12 education is transforming by leveraging Cloud technologies. K12 schools and ISDs have invested in data centers that provide storage and back-up to their schools and districts. Management of these centers includes dedicated staff on call 24/7. Technology Directors know that the staff they have to manage data centers are often multi-purposed across many projects but

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would prefer to focus entirely on security and data needs. The pull of higher salaries in the private sector makes hanging on to trained, veteran staff part of their daily wish list.

At a recent statewide meeting of the Michigan Educational Technology Leaders (METL) Network convenors received the following communication from a Tech Director:

> *"Last night at 4 pm one of the locals had network issues and my network engineer was on vacation. So I was there till 9 PM and I had to be available in the morning if there were further issues…."*

This educational leader missed two days of critical statewide planning and shoulder-to-shoulder work with other leaders from across the state. Occurrences of this nature are typical for mid-sized and rural ISDs across Michigan.

In efforts to stay ahead of ever-growing data management and security needs, ISDs and locals have invested in the hardware and software necessary to host on-site data centers. Maintaining these annual costs now make it difficult to consider newer, more efficient models like Cloud solutions due to their slender budgets. Much like building a bigger, better house while managing all the financial commitments for an existing one, it is an impossibility without external financial resources – in other words, the need for a bridge loan.

B. Potential Barriers to Consider

Today, Michigan's ISDs and Districts face significant barriers in managing and maintaining their physical IT infrastructure. Because of limited resources, many ISDs and Districts struggle to keep pace. The decentralized nature of K12 IT services has led to inefficiencies, higher costs, increased cybersecurity risk, and inconsistent levels of service quality.

As described above, many ISDs and Districts also struggle with aging hardware. Software price shocks and inadequate data security measures provide additional barriers. Many districts operate with limited human resources and technical staff, making it difficult to keep pace with technological advancements and increasing demands for digital learning environments.

Currently, decentralized IT services across districts often leads to inefficiencies, higher costs, and inconsistent levels of service quality. Additionally, many districts struggle with aging hardware, outdated software, and inadequate data security measures, compromising the effectiveness and security of their operations.

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The MiCloud feasibility study evaluates both the potential barriers and enablers of centralizing cloud hosting and platform management services for Michigan's ISDs and Local Districts. Several critical challenges must be considered before scalable, secure, and cost-effective cloud solutions that enhance educational services and operational efficiency can be provided. Below are the most critical:

1. **Diverse Technological Readiness:** Michigan's Districts and ISDs vary widely in their current use of cloud technologies. Some have well-established systems, while others are just beginning to explore cloud solutions. This diversity presents challenges in assessing and ensuring compatibility across all districts for a seamless integration into a common platform.

2. **Funding and Resource Allocation:** Securing adequate funding for the initial setup, ongoing operations, and necessary upgrades of the centralized cloud infrastructure is a significant challenge. Identifying sustainable financial models and potential funding sources is crucial for a shared solution's long-term success and viability.

3. **Stakeholder Engagement:** It is essential to gain buy-in from stakeholders, including district administrators, IT staff, and educators. Concerns regarding data security, loss of autonomy, role clarity, and the potential risks of centralizing sensitive information exist.

4. **Technical Expertise and Training:** The successful implementation of a shared cloud solution requires highly skilled and specialized IT professionals to manage and maintain the cloud infrastructure. Additionally, local district staff will need training on shared systems and processes to support a smooth transition.

5. **Data Security and Privacy:** Centralizing cloud services raises critical concerns about data security and privacy. The feasibility study recognizes the need to evaluate potential risks and develop robust security protocols with stakeholders to safeguard sensitive student and administrative data and ensure compliance with local, state, and federal regulations.

6. **Scalability and Adaptability:** The system should be resilient enough to adapt to school districts' evolving needs and the rapid pace of technological change.

7. **Operational Continuity:** It is essential the transition to centralized cloud services is accomplished with minimal disruption, including contingency measures to maintain continuous operations and prevent service interruptions.

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8. **SaaS Alternatives:** Increasingly, education technology companies, such as student information system companies like PowerSchool and other hosted services providers are offering Cloud-hosting services that are competitive to the services for which this study is determining feasibility. This should be considered when determining the focus and extent to which MiCloud can be sustainable.

Scope of Work

A. Goal, Guiding Tenets, & Existing Collaboration Models

1. Overall Goal

To provide a centralized, scalable, and sustainable cloud hosting and platform management service, operated by Michigan's Intermediate School Districts in conjunction with a 501(c)3, that ensures equitable access to technology, enhances educational outcomes for each student, and improves operational efficiency across Michigan's educational landscape.

A Detailed Logic Model can be found in Appendix A.

2. Guiding Tenets

This feasibility study aims to evaluate the potential benefits, operational improvements, and cost savings associated with centralizing cloud management services under a shared Cloud storage initiative. To be considered feasible, the proposed centralization must align with the following guiding tenets:

a. Equitable Access: Ensure that all ISDs and districts have equitable access to high-quality cloud services regardless of size or financial resources. This initiative aims to eliminate disparities in educational technology resources and support across the state.
b. Improve Operational Efficiency: Operations that streamline processes, reduce redundancy, and enhance the overall efficiency of IT service management.
c. Enhance Data Security and Privacy: Ensure robust security measures and best practices to protect sensitive data, complying with local, state, and federal regulations. Provide standardized security protocols, reducing the risk of data breaches and guaranteeing consistent data privacy practices across districts.
d. Leverage Shared Services: Use shared cloud infrastructure and services to pool resources, expertise, and technology, thereby reducing individual district costs and maximizing service delivery efficiency.
e. Support Technical Expertise and Development: Provide comprehensive training and professional development programs to address the challenge of limited technical expertise.

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f. Achieve Cost Savings/Long-Term Sustainability: Reach cost efficiencies through economies of scale, optimized resource allocation, and reduced redundancy in cloud service management to provide long-term sustainability.
g. Late Adopters: Due to governmental funding models, K12 organizations tend to be late adopters of technology "at-scale", i.e., capex v. operation funding, per-student foundation allowance, and regulatory environments in which schools operate.

3. Existing Statewide Collaboration Models

While several statewide initiatives provide examples of collaborative purchasing power and the benefits garnered by schools, this study has identified two examples below that closely match the circumstances for scaling cloud storage beyond the regional level. These examples provide models to consider for the feasibility of cloud hosting. Four projects have driven down pricing through shared purchasing power.

a. MiSecure

MiSecure is a program that aims to improve cybersecurity for K-12 schools in Michigan. From the 2023-24 School Aid Fund, section 97g allocated $9,000,000 in one time funding to provide for a statewide K12 Security Operations Center (SOC) and Managed Detection and Response (MDR) services to ISDs, local districts and PSAs in the State of Michigan. By leveraging shared procurement, MISecure has **saved more than $6.9 million in the first year** allowing educational organizations to redirect funds, enhance teaching and learning, and allow schools to maintain focus on their educational mission. (MiSecure DRAFT Legislative Report.)

Organizationally, MiSecure works in conjunction with other similar organizations focused on technology services that are most effectively done at the state level. Michigan DataHub, MiCHDev, MiCloud, MiSEN, and MiServiceDesk are all coordinated by MAISA under the MichIT umbrella, and this coordination extends MiSecure cybersecurity services to support student statewide data efforts, cloud computing, and cybersecurity assessments. Likewise, MiSecure benefits by utilizing existing resources such as help desk, infrastructure, and data-sharing platforms.

b. MiSEN

The Michigan Statewide Educational Network (MiSEN) has brought 300 Gigabit internet connectivity to Michigan Intermediate School Districts (ISD) at a very low cost by purchasing consortia-based services to offer an inexpensive, reliable fiber-optic secure network to Michigan schools. MiSEN primarily services school entities through the ISDs to the State Education Network (SEN) fiber network for transport and internet access.

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MiSEN's support structures are managed in partnership with Intermediate Schools Districts to connect all schools. MiSEN was established out of the TRIG Grant Funding provided to consortiums in service to schools. Due to the wise investments of these dollars and the strategy to leverage Federal E-rate funding, MiSEN has been able to sustain operations for over a decade. MiSEN is uniquely qualified to succeed due to the partnerships and connections established with Regional Representees managing the board, advisory, and staff.

MiSEN
Michigan Statewide Educational Network

Empowering Digital Access for Endless Opportunities

2023-24 Statistics

Entities connected to the SEN transport	52
Entities utilizing Internet Access (Primary or Resilient)	47
Students Served	~1 M
Service Up Time	99.99%
DDoS Mitigation Events Mitigated	1,031 events
Preventative measures/tickets	14,435
Transport Capacity	200 G
Internet Access Capacity	300 G
Peak Internet Access	223.4 Gbps
Total E-rate Savings through 2023	$25,635,049.25
# Public Schools unconnected to the SEN	70
# underserved Public Schools	79

- **MiSEN Return On Investment:**
  Projected savings from statewide use of the MISEN in three areas:

  - Capturing Federal Funding for E-rate
    - $1,9M in Erate consultants and local staff time annually
    - $25M in E-rate funding disbursement for past filings for eligible services.

  - Providing low-cost equitable connectivity across the State
    - $6M in Internet costs annually from Pre-MiSEN to current

  - Additional Services
    - $3.5M in Transport Network service annually
    - $119,976.00 in DDoS Mitigation service annually

c. TRIG Device Purchasing

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The Device Purchasing initiative under the Technology Readiness Infrastructure Grant (TRIG) program (2012-2016) was designed to incentivize School District purchases of learning devices and make instructional technology more affordable for Michigan K-12 districts through collective statewide SPOT bidding. This effort has allowed districts to procure over 593,000 devices, including Chromebooks, laptops, and desktops, at significantly reduced prices. *The aggregation of demand has enabled cost savings of over $132 million across participating districts.*

A critical component of the SPOT Bid was the per-device incentives. Districts would receive a subsidy on individual device purchases through the program, ranging from $25 to $100-per-device. This subsidy guaranteed the lower Total Cost of Ownership (TCO) for Districts, removing much of the risk as schools moved from 3 students-per-school- provided-device to closer to 1-to-1. Districts went to their communities to raise additional capital funds to purchase subsidized computers, and this increased collective demand resulted in highly discounted pricing before applying the pre-incentive.

This discounted pricing on aggregated purchasing sustained the program after the initial incentive funds elapsed. The Regional Educational Media Centers (REMC Saves) assumed administration of the program and charged a 1% administrative fee to vendors to cover the operating expenses. This self-sustaining model has proven successful and continues to support the growth of digital learning environments across the state.

d. Cloud Hosting Models

Kalamazoo Regional Education Service Agency (KRESA) is organized as a governmental regional educational service agency. Cloud services are included in the full-service list for the regional agencies and local school districts serviced by MiTECH (KRESA) and billed separately for those districts and organizations outside the MiTECH service region.

KRESA is considered a Cloud Reseller Select Tier Partner, and purchases are made through Ingram Micro as the distributor. Ingram Micro bills KRESA for Cloud consumption and rebills Cloud customers using a cost-recovery model.

Cloud Services is not a formal revenue or cost center of KRESA; The following financial numbers are estimates based on information provided by KRESA.

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1) KRESA demonstrates a **sustainable business model**:

	2023-24	% of Rev
Revenue	$1,076,215	100%
Cost of Services Provided (COS)	$939,125	87%
Gross Margin	$137,090	13%
Operating Expenses	$42,983	4%
Operating Income	$94,106	9%
KRESA Indirect Expense	$23,327	2%
Net Surplus	$70,780	7%

* Details are provided in the Appendix B.

2) KRESA demonstrates the cost saving power of digital transformation:

Server Size (Storage)	Number	2023-24 Pricing	Extension
L Servers (250GB)	3	$2,649	$7,947
M Servers (100GB)	10	$1,766	$17,660
S Servers (40GB)	2	$1,324	$2,648
Digitally Transformed (D.T.) Servers	**90 (86%)**	**$826***	**$74,309***
Cloud Expense	105		$102,564

* Calculated: $102,564 less $28,255 = $74,309 divided by 90 = $826.

In addition to lowering server costs, KRESA estimates that Digital Transformation has reduced the total number of servers from 160 to 105 (34%) over the past two years.

KRESA is demonstrating a sustainable model for transitioning and transforming to the Cloud.

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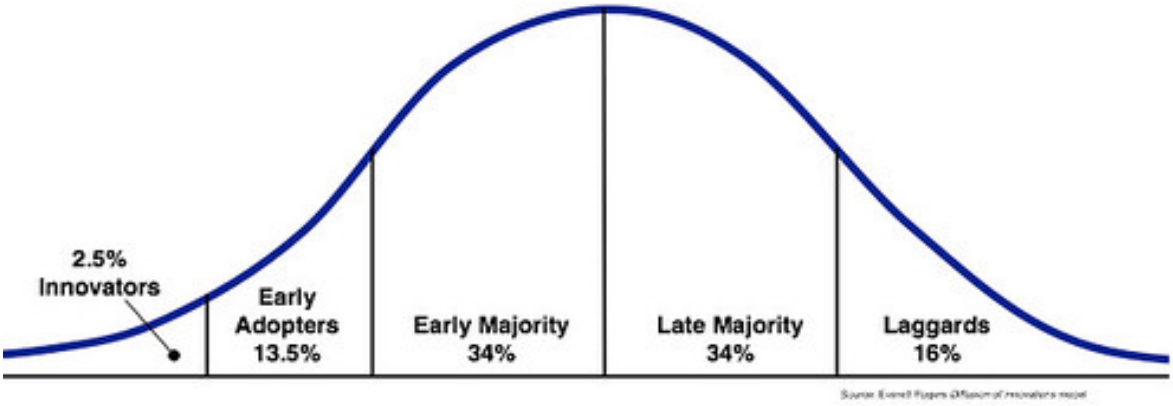
Feasibility of Consolidation of Cloud Services

The proposed MiCloud initiative addresses the needs identified in this study by centralizing cloud hosting and platform management services. This centralization will provide a unified, scalable, and secure solution for all Michigan ISDs and Districts. Schools across Michigan will have a sustainable path to the cloud that will enhance operational efficiency and reduce costs. Additionally, shared cloud services will ensure that all districts have access to the latest technology and security features, regardless of size, location, or financial, human, and technical resources.

A. Assumptions

The MASIA Consolidation Feasibility Team performed this study under the following assumptions:

1. Due to governmental funding models, K12 organizations tend to be late adopters of technology "at-scale", i.e., capex v. operation funding, per-student foundation allowance, and regulatory environments in which schools operate.



2. As late adopters of technology, K12 organizations tend to sustain obsolete technologies longer than ideal.
3. On-premises data centers have become increasingly vulnerable to security threats, challenging to maintain, and costly to update, making cloud hosting attractive as an alternative/substitutionary technology.
4. Additional government support (financial incentives) is required to assist K12, at scale, adopt new technology and obsolete old technologies.
5. These incentives should celebrate local ISD and District decision-making and avoid all approaches suggesting a state mandate.
6. A centralized cloud management service operating through an ISD fiscal relationship would be better positioned (with a non-profit cost structure) to service all ISDs and Districts across the state.

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B. Incentivized Participation

Understanding the revolutionary significance financial incentives have had on technology initiatives in Michigan schools is critical for applying assumptions in the MiCloud proposition. Several K12 statewide initiatives have provided monetary discounts and rebates to schools to participate, reducing the financial threshold for participation, creating a fiscal reprieve allowing schools an on-ramp for sustainability. The most important incentivization benefit to schools has been the ability to drive down purchasing costs for all participating organizations by leveraging statewide pricing.

Statewide Savings Examples include:

1. SPOT: 1:1 Device Purchasing $132,000,000 (11 years)
2. MiSEN: $11.5 million annually, $26.5 million (Erate)
3. MiSecure: $6.9 million (year 1)

This type of incentive has played a significant role in shaping savings strategies for schools. These steep discounts have encouraged schools to adopt ambitious technology initiatives that would have otherwise been unattainable. The ability to focus on efficiency, consolidation, and strategic purchasing assists schools to continue prioritizing classroom instruction and student success.

The centralized Cloud hosting and platform management services described in the MiCloud study are incumbent on benefits similar to those other statewide programs have realized through incentivization to participating entities – in other words, this cannot be accomplished without a financial bridge.

C. Proposed Consolidated MiCloud Services

Based on KRESA's demonstration of sustainability and how Cloud optimization leads to increased cost efficiency, this study determines how best to share this benefit with the other 55 ISDs and their service districts. Primarily, we studied the feasibility of creating a centralized MiCloud Cloud Management Service operated by a 501(c)3, a non-profit organization representing and with oversight by all 56 ISDs, focusing initially on disaster recovery and an expanded demonstration of digital transformation.

1. Disaster Recovery (DR)

Disaster Recovery (DR) is the process and set of procedures that ISDs and school districts implement to protect and recover critical IT infrastructure and data in the event of a disruption, such as a natural disaster, cyberattack, or system failure. It involves regular backups of essential data to secure off-site locations, often in the form of server replicas for quick restoration. In Michigan, disaster recovery is often done on-premise because of the excessive cost of off-premise replication of

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facilities, hardware, software, and support. On-Premise DR leaves districts vulnerable to physical risk as operating and recovery systems are in the same physical location. In large districts and ISDs off-premise DR exists, generally at a regional level and high cost.

Offering Disaster Recovery to ISDs and Districts is the ideal complement to the MiSecure program because it seeks to optimize the recovery of data affected by a cybersecurity breach. As the following financial forecast will show:

1. Cloud-based DR collectively achieves a lower overall cost.
2. This service would provide a pathway for all ISDs and Districts to seek other Cloud-based Digital Transformations of their IT infrastructures.
3. This service would create a sustainable model for MiCloud to operate.

a. Disaster Recovery Per-Server Cost

Based on the MiSecure data collection, there are approximately 20,000 critical servers across the state. We estimate that **12,000 critical servers** would be eligible for the MiCloud DR offering.

Size/Distribution/Count		Count	Cloud Cost	Labor Costs	Direct Cost
2XL Server (1,000GB)	10%	1,200	$264.40	$42.50	$306.90
XL Server (400GB)	14%	1,644	$219.30	$42.50	$261.80
L Server (250GB)	20%	2,400	$174.20	$42.50	$216.70
M Server (100GB)	30%	3,600	$129.10	$42.50	$171.60
S Server (40GB)	16%	1,956	$106.55	$42.50	$149.05
Mini Server (20GB)	10%	1,200	$99.03	$42.50	$141.53
Total/Average	100%	12,000	$157.33	$42.50	$199.83

	Count	Direct Cost	Ops Costs	Indirect	Total Cost
Annual DR Costs	12,000	$199.83	$17.59	$13.05	$230.47

Disaster Recovery represents 20% of the total expense. We then apply 20% of Operating Expense to Disaster Recovery to achieve Total Expense. Operating Expense details are provided in the Recommendation section.

b. Total Annual Cost of Operation (TCO): Disaster Recovery

After analyzing the data, we estimate that the statewide annual provision of disaster recovery services for 12,000 critical servers would cost approximately **$2,765,582.**

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This cost is based on a distribution of server sizes and accounts for both direct and administrative expenses. The comprehensive approach ensures that each server, regardless of size, is adequately supported, making this a robust and scalable solution for disaster recovery across ISDs and districts.

c. TCO: Disaster Recovery with Digital Transformation

We also considered three example ISDs and anticipated **Digital Transformation** (next section) reducing the number of servers requiring DR by 25% and 34% over three years, respectively.

TCO: DR	Servers x Average DR	Extension	25% Reduction in No. of Servers	34% Reduction in No. of Servers
CGRESD	106 * $230.47	$24,429	$18,322	$16,123
GIISD	152 * $230.47	$35,031	$26,273	$23,120
KISD	353 * $230.47	$81,354	$61,016	$53,694
3 ISDs	716 * $230.47	$140,814	$105,611	$92,937
Statewide	12,000 * $230.47	$2,765,582	$2,074,187	$1,825,284
TCO DT/DR Savings			**$691,396**	**$940,298**

- CGRESD: Clare-Gladwin Regional Education Service District
- GIISD: Gratiot-Isabella Intermediate School District
- KISD: Kent Intermediate School District

d. Return on Investment (ROI): Disaster Recovery

The second financial metric we considered is the Return on Investment:

- The calculation used evaluates an investment's sustainability. It measures the plus or minus generated relative to the amount invested, expressed as a percentage.

Initially, the ROI on Disaster Recovery (DR) is determined by comparing the direct costs of DR provision by ISDs and Districts acting independently vs. through MiCloud. (We used Direct Costs for comparison because Operational Costs and Indirect vary between organizations).

The economies of scale in terms of software (33%) and cloud (10%) discounts, combined with lower direct labor costs associated with MiCloud's DR team's expertise and dedication to task (25%), result in an estimated **21.3% ROI**.

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	Veeam/ Per-Server	Cloud/ Per-Server	Direct Labor/ Per-Server	Total Direct DR Per-Server
Independently	$111.72	$89.57	$52.77	$254.06
MiCloud	$84.00	$73.33	$42.50	$199.83
	25%	18%	19%	**ROI: 21.3%**

The ROI goes up considerably as Digital Transformation reduces the total number of servers in the program:

	Direct Cost	Increased ROI	Combined ROI
• 12,000 Servers x $199.89 =	$2,397,960		21.3%
• 9,000 Servers x $199.89 =	$1,798,470	+25%	43.3%
• 7680 Servers x $199.89 =	$1,582,654	+34%	52.3%

B. Digital Transformation

Examining the financial benefits of digital transformation is more challenging. The initial cost of Cloud hosting "Lift and Shift," moving applications and data to the cloud without making major changes to the underlying architecture, can be discouraging due to "sticker shock." For example, the Feasibility Team conducted diagnostic studies of several ISD data centers using RVTool by Dell Technologies.

This diagnostic allowed the team to utilize the KRESA t-shirt sizing model, applying changes to server architecture, to make effective comparisons. Following analysis of the associated server data we find the estimated average cost per server is $**3,024.00** for 4,000 servers statewide.

Size/Distribution/Count		Count	Cloud Cost	Labor Costs	Direct Cost
2XL Server (1,000GB)	10%	400	$6,329	$113	$6,442
XL Server (400GB)	14%	560	$4,308	$113	$4,421
L Server (250GB)	20%	800	$1,929	$113	$2,0420
M Server (100GB)	30%	1,200	$1,506	$113	$1,619
S Server (40GB)	16%	640	$1,144	$113	$1,257
Mini Server (20GB)	10%	400	$700	$113	$813
Total/Average	100%	4,000	$2,653	$113	$2,765

	Count	Direct Cost	Ops Costs	Indirect	Total Cost
Avg. Server Cost	4,000	$2,765	$88	$171	$3,024

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Digital Transformation represents 80% of the total expense. We then apply 80% of Operating Expense to Disaster Recovery to achieve Total Expense Operating Expense details are provided in the Recommendation section.

1. The Digital Transformation Effect

The biggest lesson learned from KRESA's demonstration is the power of Cloud to deliver digital transformation at the server level:

- Over a 3-year period, KRESA was able to eliminate 34% of its servers.
- Digitally transform 84% of the remaining servers as shared infrastructure to reduce their direct cloud consumption dramatically.
- The average Direct Cost of these Digitally Transformed Servers (D.T. Servers) was **$866** or 70% less than the average T-Shirt size server.
- The average Total Cost of these Digitally Transformed Servers (D.T. Servers) was **$969** or 68% less than the average T-Shirt size server.

	Count	Direct Cost	Ops Costs	Indirect	Total Cost
Avg. D.T. Server Cost	N/A	$826	$88	$55	$969

2. Total Cost of Operation: Statewide Digital Transformation

These examples suggest substantial potential savings of digital transformation that would allow a 501(c)3, on behalf of its ISDs, to establish a sustainable pathway of affordability to the Cloud. We ran pricing estimates for digitally transforming **4,000 servers** (20% of statewide total).

- **Total Cost of Operation (TCO)** moves from **$12,09,479 annually** to **$5,026,800** over three years, resulting in **58% annual savings**.

Statewide Transformation:	Servers	Extension
T-Shirt Pricing - Lift and Shift	4,000 individual servers ($3,024 avg. server)	$12,097,479
Digital Transformation - Shared Infrastructure	560 individual servers (14%) & 3,440 DT servers (86%) ($969 avg. server)	$5,026,800
Annual D.T. Savings	58% annual savings	$7,069,200

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3. Return on Investment (ROI): Digital Transformation

The core driver on ROI in Digital Transformation (D.T.) is achieving significant cost savings "per server" based on the KRESA model and the reduction in overall server count.

- **The potential ROI ranges from 29% to 73%.**

		43% DT Conversion Annual Savings	ROI	86% DT Conversion Annual Savings	ROI
4,000	Servers (100%)	$8,561,400	29%	$5,026,800	58%
3,000	Servers (25% Reduction)	$6,421,050	47%	$3,770,100	69%
2,640	Servers (34% Reduction)	$5,650,524	53%	$3,317,688	73%

Recommendation

Based on the feasibility study findings, this report recommends implementing shared MiCloud services across ISDs and Districts in Michigan utilizing a non-profit cost structure. KRESA's MiTECH Cloud services has a successful demonstration of concept, showing feasibility at scale. KRESA currently serves as lead for a large statewide project (MiDataHub) and exemplifies a replicable model for hosting statewide services other ISDs or organizations should consider.

The financial analysis validates centralizing these services through an independent non-profit organization. The POC is calculated using Indirect at 5% based upon current fee structures. Findings in this study establish that statewide Cloud services through the proposed MiCloud collaboration are feasible (see F. Indirect Expenses).

Qualitative data shows that although the concept of moving to cloud hosting is attractive, the high initial costs of a "lift and shift" approach is prohibitive to ISDs. In order to keep our statewide infrastructure secure and modernized, schools need a financial bridge to cover transition costs. When digital transformation aligns with the funding structures of technology departments, achieving sustainability on a large scale becomes possible.

The following proposition includes an implementation plan with budget estimates, detailing the required funding for consolidation, meeting the requirements of state legislation, and provides a roadmap for achieving the stated goals and objectives of the MiCloud initiative.

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- Based on our analysis of KRESA's Cloud operation, we determined it feasible to centralize Cloud operations into a MiCloud service operated by a 501(c)3 organization with lower cost structures, on behalf of and to the benefit of its 56 ISD members and their School Districts.

- Based on our financial analysis of Total **Cost of Operation** and **Return on Investment**, we determined the cost and economic benefit to the state for making such an investment.

- Given the successful, sustained experience with MiSEN, MiSecure, and REMC Device Purchasing Spot Bid, and from documented conversations with ISD and district officials, we believe **incentivizing the shift to Cloud** is required to accelerate the digital transformation as measured.

Based on this we make the following recommendation:

A. Incentivize the Shift to Cloud

We estimate it will take 3 years to produce the ROI forecasted above and the initial cost of "lift and shift" will prevent ISDs and Districts from moving to the Cloud today. We recommend offering a decreasing incentive to build the economies of scale that will achieve ROI and sustainability.

B. Cost of Living Adjustment

We included a 3% Cost of Living Adjustment for the 2025-26 and 206-27 school years.

C. Disaster Recovery

The assumption we made is this: to effectively move 12,000 servers to disaster recovery would require 3 years. To bolster early adopters and achieve the critical mass that will return maximum Cloud service savings, we assumed a tiered financial incentive strategy to shift to Cloud-hosted services with greater incentives – three years of cost coverage – offered to the first ISDs and Districts to sign up, followed by two, then one for those joining in subsequent years.

1. Cohort 1, 2024-25: 4,000 servers, 3 years of cost coverage
2. Cohort 2, 2025-26: 4,000 servers, 2 years of cost coverage
3. Cohort 3, 2026-27: 4,000 servers, 1 year of cost coverage

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	2024-25	2025-26	2026-27	Total
No. of Servers	3,334	8,000	12,000	12,000
- Cohort 1 Cloud Costs	$768,371	$791,422	$815,165	$2,374,958
- Cohort 2 Cloud Costs		$791,422	$815,165	$1,606,587
- Cohort 3 Cloud Costs			$815,165	$815,165
Total DR Direct Cost	$768,371	$1,582,844	$2,445,494	$4,796,709
Operating Exp. (20%)[1]	$182,300	$206,085	$218,614	$606,999
Indirect Expense (6%)	$57,040	$107,336	$159,846	$324,222
Total Expense	$1,007,711	$1,896,265	$2,823,954	$5,727,931

1. Disaster Recovery represents 20% of the total expense. We then apply 20% of Operating Expense to Disaster Recovery to achieve Total Expense.
2. The Direct Expense Breakdown can be found in Appendix D.

D. Digital Transformation

Similarly, we made the assumption that transitioning 4,000 servers through the Digital Transformation process would take 3 years. We believe 4,000 servers would provide the critical mass that will return demonstrable Cloud service savings. A tiered financial incentive strategy to shift to Cloud-hosted services was used, with increasingly greater incentives – three years of cost coverage – offered to the first ISDs and Districts to sign up, followed by two, then one for those joining in subsequent years.

1. Cohort A, 2024-25: 1,334 servers: Year 1: 100% cost coverage
   Year 2: 75% cost coverage
   Year 3: 50% cost coverage
2. Cohort B, 2025-26: 1,333 servers: Year 2: 100% cost coverage
   Year 3: 75% cost coverage
3. Cohort C, 2026-27: 1,333 servers: Year 3: 100% cost coverage

	2024-25	2025-26	2026-27	Total
No. of Servers	1,334	1,667	4,000	4,000
- Cohort A Cloud Costs	$3,688,510	$2,849,374	$1,956,570	$8,494,454
- Cohort B Cloud Costs		$3,799,165	$2,934,855	$6,734,020
- Cohort B Cloud Costs			$3,913,140	$3,913,140
Total DT Direct Cost	$3,688,510	$6,648,539	$8,804,566	$19,141,615

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Operating Exp. (80%)[1]	$729,200	$824,340	$874,454	$2,427,994
Indirect Expense (6%)	$265,063	$448,373	$580,741	$1,294,177
Total Expense/Rev.	$4,682,773	$7,921,252	$10,259,761	$22,863,786

1. Digital Transformation represents 80% of the total expense. We then apply 80% of Operating Expense to achieve Total Expense.
2. The Direct Expense Breakdown can be found in Appendix D.

E. Operating Expenses

The following estimates are based on what we assume it would take to manage the combined, centralized operations of MiCloud:

	2024-25	2025-26	2026-27	Total	%
Management Expense	$217,000	$223,510	$230,215	$670,725	22%
Cloud Offering Expense	$120,000	$123,600	$127,308	$370,908	12%
Administrator Expense	$82,500	$84,975	$87,524	$254,999	8%
Training	$125,000	$128,750	$132,613	$386,363	13%
Supplies	$120,000	$123,600	$127,308	$370,908	12%
Travel	$48,000	$49,440	$50,923	$148,363	5%
Legal and Insurance	$85,000	$87,550	$90,177	$262,727	9%
MiCH IT Administrative	$114,000	$209,000	$247,000	$570,000	19%
Total Operating Expense	$911,500	$1,030,425	$1,093,068	$3,034,993	100%

* Details are provided in the Appendix C.

F. Indirect Expenses

MAISA and the sponsoring ISD, in this model, KRESA, charge Indirect Expenses on the total program amounts:

1. MAISA Indirect Expense (1% of Total Revenue less ISD Indirect): Includes the general administrative tasks of the MAISA general staff required to support the overall project.
2. ISD Indirect Expense (5% of Total Revenue): Provides for the ISD's indirect costs related to the project, including administrative support, utilities, office space, or other overhead costs.

Indirect Expense	2024-25	2025-26	2026-27	Total	%
MAISA (1%)	$56,905	$98,175	$130,837	$285,917	17%
KRESA (5%)	$284,524	$490,876	$654,186	$1,429,586	83%
Total Operating Expenses	$341,429	$589,051	$785,023	$1,715,503	100%

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• Disaster Recovery	$68,286	$117,810	$157,005	$343,101	20%
• Digital Transformation	$273,143	$471,241	$628,018	$1,372,402	80%

It should be noted that most ISDs charge 1-2% Indirect, whereas KRESA charges 5%. We calculated the ISD Indirect was 2% to determine the following statewide benefits:

	2024-25	2025-26	2026-27	Total
Savings	$170,715	$294,526	$392,511	$857,751
Extra DR Servers ($230.47)	741	1,278	1,703	3,722
Extra DT Servers ($2,765.67)	62	107	142	311

G. 3-Year Projection

We aggregated these forecasts into a 3-year Income Statement to determine final feasibility:

	2024-25	2025-26	2026-27	Total	%
Disaster Recovery	$1,007,711	$1,896,265	$2,823,954	$5,727,931	20%
Digital Transformation	$4,682,773	$7,921,252	$10,259,761	$22,863,786	80%
Total Funds	$5,690,484	$9,817,517	$13,083,715	$28,591,716	100%
Cost of Services Provided (COS):					
Disaster Recovery	$768,371	$1,582,844	$2,445,494	$4,796,709	17%
Digital Transformation	$3,688,510	$6,648,539	$8,804,566	$19,141,615	67%
Total COS	$4,456,881	$8,231,383	$11,250,060	$23,938,324	84%
Gross Margin	$1,233,603	$1,586,134	$1,833,655	$4,653,392	16%
Total Op. Expense	$911,500	$1,030,425	$1,093,068	$3,034,993	11%
Operating Income	$322,103	$555,709	$740,588	$1,618,399	6%
MAISA Indirect (1%)	$56,905	$98,175	$130,837	$285,917	1%
ISD Indirect Exp. (5%)	$284,524	$490,876	$654,186	$1,429,586	5%
Total Indirect Expense	$341,429	$589,051	$785,023	$1,715,503	6%
+/- Project Margin	-$19,326	-$33,343	-$44,435	-$97,104	-0.3%

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The final financial analysis shows that, with an adjustment to the ISD Indirect Expense, the MiCloud program is both feasible and sustainable.

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Appendix A: MiCloud Logic Model

Overall Goal
To provide a centralized, scalable, and sustainable cloud hosting and platform management service operated by Michigan's Intermediate School Districts that enhances educational outcomes, improves operational efficiency, and ensures equitable access to technology across Michigan's educational landscape.

1. Inputs
Resources: • MiNOC and MAISA expertise • Commercial Cloud infrastructure and services • Funding from state and educational grants • Existing partnerships with ISDs and districts • Technical staff with cloud and security certifications
Stakeholders: • Intermediate School Districts (ISDs) • Local Education Agencies (LEAs) • Public School Academies • Michigan Department of Education (MDE)

2. Activities
Establishing Centralized Cloud Services: Develop and implement cloud hosting and platform management services Set up Security Operations Centers (SOC) and Network Operations Centers (NOC)
Training and Support: Provide comprehensive training programs for technical staff and end-users Offer 24/7 support for cloud services
Partnership Development: Strengthen existing partnerships with ISDs and districts Engage with new stakeholders and potential partners
Infrastructure Enhancement: Enhance cybersecurity measures and data protection protocols Optimize cloud infrastructure for scalability and cost-effectiveness

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3. Outputs
Services Provided: Cloud hosting, data backup, and disaster recovery Managed services, including automated server patching and databases Professional services, including application migration and integrations
Training Programs: Workshops and training sessions for staff and users Development of educational materials and resources
Partnership Agreements: Signed agreements with ISDs and LEAs for cloud services New partnerships with educational technology providers

4. Outcomes
Short-term: Increased adoption of MiCloud services by ISDs and districts Enhanced cybersecurity posture across the participating entities Improved technical skills and capabilities of the staff
Medium-term: Cost savings for districts through shared services and infrastructure Greater operational efficiency and reduced IT overhead for schools Strengthened collaboration and sharing of best practices among districts
Long-term: Sustainable operation of MiCloud with a clear ROI Broad equitable access to advanced cloud services for all Michigan schools

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Appendix B: KRESA Demonstration of Concept

For the past seven years, Kalamazoo Regional Educational Service Agency (KRESA) has offered Cloud hosting for its service Districts, Ottawa ISD, the Michigan Data Hub, and MAISA software development initiatives (.i.e., MiCHDev).

KRESA is organized as a governmental regional educational service agency. MiCloud services are included in the full-service list for the regional agencies and local school districts serviced by MiTECH and billed separately for those districts and organizations outside the MiTECH service region.

KRESA is considered a Cloud Reseller Select Tier Partner for purchases made through a distributorship. Ingram Micro bills for CLoud consumption and rebills customers using a cost-recovery model.

Cloud Services is not a formal revenue or cost center of KRESA.

A. **Existing Footprint**

The following organizations are Cloud customers:

KRESA	17% of Cloud Consumption	KRESA provides a range of ala cart and full-service IT services for it's 9 service districts, including Cloud server hosting.
Michigan Data Hub	50%	Michigan Data Hub is a cloud-based, statewide data service, serving 98% of Michigan's ISDs and Districts.
Ottawa ISD	19%	Ottawa ISD provides a range of ala cart and full-service IT services for it's 11 service districts, including Cloud server hosting.
MiCH IT (MAISA)	11%	MiCH IT operates a small, software development organization that provide Cloud-based statewide applications for several state-level initiatives.
Other Cloud Clients	3%	Includes Kalamazoo Public Library.

B. **Staff**

The KRESA Cloud staff include:

a. Mike Coats, IT Infrastructure Manager
   - 20% Michigan Data Hub, 80% non-cloud KRESA related activities
   - Solutions Architect Associate and SysAdmin certified

b. Mike Ciokiewicz, Cloud Architect

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- 60% Michigan Data Hub, 40% KRESA Cloud

c. Corey Thorpe, Systems Administrator
   - 100% KRESA Cloud

d. Bill Handling, Cloud Architect
   - 50% KRESA Cloud, 50% other KRESA responsibilities

C. **Cloud Services**

MiCloud currently provides a large variety of professional and managed services. Here is a list of use cases for engaging with MiCloud:

1. Backups:
   - Districts can purchase Veeam Backup & Replication licensing through MiCloud
   - Fully managed backups of EC2 instances
   - S3 for immutable, encrypted, offsite backup storage
2. Managed Services:
   - Domain Name Registration & DNS Zone hosting
   - Automated Server OS Patching
   - Fully managed Databases (SQL, MySQL, PostgreSQL, and others)
   - AppStream and Workspaces
   - Cost and resource optimization
3. Pro Services:
   - Account creation, VPC design, and deployment
   - Application and Server Migration
   - Ongoing Management, Monitoring and Alerting
   - Hybrid network connectivity (premise-to-cloud VPN)
   - Custom-built automations and integrations
4. Security: Optimizing, monitoring, alerting, and response

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D. Revenue and Expenses

The Cloud program is not a separate cooperative agreement or business unit under KRESA, which makes it challenging to determine revenue and expenses, which is important to determining feasibility. The MAISA feasibility study team pulled together the following income statement for 2023-24 to determine the viability of a similar statewide program.

Revenue	2023-24	% of Cat	% of Rev
Staff Services (a)	$418,450	38.8%	
Cloud Services (b)	$634,425	58.8%	
Other Revenue (c)	$25,476	2.4%	
Total Revenue	$1,078,351	100.0%	100.0%
Cost of Services			
Staff Services (a)	$367,266	39.1%	
Cloud Services (b)	$571,847	60.9%	
Total COS	$939,113	100.0%	87.1%
Gross Margin	$139,238		12.9%
Operating Expenses			
Admin Salaries and Benefits (a)	$42,983	62.8%	
KRESA Indirect Expense (c)	$25,476	37.2%	
Total Operating Expense	$68,459	100.0%	6.3%
Surplus/Loss	$70,779		6.6%

a. *Staff Services:* this number reflects 100% of the staff costs associated with KRESA's Cloud Service to be billed to customers as revenue and expensed either as direct expense or management expense:

Staff Services Billed		
Michigan Data Hub	$160,979	38.5%
KRESA	$249,270	59.6%
Other	$8,200	2.0%
	$418,449	100.0%
Staff Services Expense		
Direct Staff Services	$375,466	89.7%
Admin Salaries and Benefits	$42,983	10.3%
Total	$418,449	100.0%

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b. *Cloud Services:* As a Cloud reseller, KRESA receives rebates on Cloud services, so KRESA passes through those costs and uses the rebated to offset it's overall operating costs:
   - Revenues are based on June 2024 invoices, multiplied by a factor of 12.
   - The estimated Cloud rebate is 10%.
   - Veeam, a disaster recovery software, provides a discount, which was calculated at $1,886 for the 2023-24 school year.

Cloud Services Revenue	2023-24	
Michigan Data Hub	$305,554	48.2%
KRESA	$102,564	16.2%
Ottawa ISD	$114,348	18.0%
MAISA IT	$66,427	10.5%
Other Cloud Services	$18,030	2.8%
Veeam Reseller Revenue	$27,502	4.3%
	$634,425	100.0%
Cloud Services Expense		
Rebate on Cloud	-$60,692	-10.0%
Rebate on Veeam	-$1,886	
Net Cloud Services COS	$693,231	

c. *Other Revenue/KRESA Indirect Expense:* KRESA charges State of Michigan grant funding the the Michigan Data Hub a 5% indirect rate to support the project and we applied that rate to the services billed by the KRESA Cloud team.

	2023-24
Michigan Data Hub - Direct Staff	$160,979
Michigan Data Hub - Cloud Services	$305,554
Admin Salaries & Benefits	$42,983
	$509,516
Indirect Rate	5.0%
KRESA Indirect Expense	$25,476

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E. T-Shirt Server Sizes

KRESA's demonstration is essential in determining feasibility: articulating Cloud pricing in an easily digestible pricing structure using "t-shirt" sizes:

Size (Storage)	2021-22	2022-23	+/-	2023-24	+/-	2024-25	+/-
2XL Server (1,000GB)	$3,800	$4,000	5%	$4,450	11%	$6,329	42%
XL Server (400GB)	$3,200	$3,456	8%	$4,709	36%	$3,456	-27%
L Server (250GB)	$1,800	$1,944	8%	$2,649	36%	$1,944	-27%
M Server (100GB)	$1,200	$1,296	8%	$1,766	36%	$1,296	-27%
S Server (40GB)	$900	$972	8%	$1,324	36%	$972	-27%
Mini Server (20GB)	$450	$486	8%	$662	36%	$486	-27%

Notes

1. The price increases in 2022-23 and 2023-24 reflect a learning curve on what Cloud services need to be included to provide adequate Cloud hosting services, including cybersecurity in 2023-24.
2. Hosting costs significantly decreased for 2024-25 as the overall cost of Cloud hosting services decreased based on optimization and efficiency.
3. The expectation is that the 2XL Server price will continue to rise, making large servers a prime target for digital transformation, which we discuss in the next section.

F. Digital Transformation

The KRESA example demonstrates the lifecycle of moving from on-premise to fully optimized cloud hosting through digital transformation, starting with a ***"Lift-and-Shift"*** transition:

- *Minimal Changes:* The primary characteristic of lift and shift involves moving applications "as-is" from their current environment to the cloud. This means that the underlying architecture, configurations, and dependencies remain largely unchanged.
- *Quick Migration:* Since no significant changes are made to the applications, lift and shift can be executed relatively quickly. This allows organizations to start benefiting from cloud infrastructure.
- *Limited Cost Savings:* Moving to the cloud can reduce costs related to physical infrastructure, such as data center maintenance, but the full potential for cost savings may take time to realize.

Once in the Cloud, KRESA started benefiting from ***Digital Transformation***:

- *Infrastructure Modernization:* Transitioning to cloud infrastructure enables on-demand resource allocation, scalability, and cost efficiency.

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- *Operational Efficiency:* Cloud-native tools and services streamline operations, reducing human intervention, and improving uptime.
- *Agility and Innovation:* Cloud technologies allow organizations to quickly adapt to changing market conditions, deploy new applications faster, and experiment with innovative solutions.
- *Enhanced Security:* Cloud providers offer robust security frameworks and tools that improve overall security posture.
- *Business Continuity and Disaster Recovery:* Cloud-based backup and D.R. solutions provide greater resilience and quicker recovery times.
- *Cost Optimization:* The Cloud allows for optimizing and scaling hosting resources as needed, leading to considerable cost savings.

KRESA currently has 105 Cloud-based servers, of which 90 have undergone digital transformation, allowing all districts in the MiTECH services to leverage a shared group of servers, providing optimized service at a significantly lower than the published T-shirt pricing:

Server Size (Storage)	Number	2023-24 Pricing	Extension
L Servers (250GB)	3	$2,649	$7,947
M Servers (100GB)	10	$1,766	$17,660
S Servers (40GB)	2	$1,324	$2,648
D.T. Servers	90 (86%)	$826*	$74,309*
Cloud Expense	105		$102,564

* Calculated: $102,564 less $28,255 = $74,309 divided by 90 = $826.

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Appendix C: Proposed Operating Expenses

Proposed Program Operating Expenses

The following estimates are based on what we assume it would take to manage the combined, centralized operations of MiCloud:

	2024-25[10]	2025-26[10]	2026-27[10]	Total	
Management[1]	$217,000	$223,510	$230,215	$670,725	22%
Cloud Offering[2]	$120,000	$123,600	$127,308	$370,908	12%
Business Services[3]	$82,500	$84,975	$87,524	$254,999	8%
Training[4]	$125,000	$128,750	$132,613	$386,363	13%
Supplies[5]	$120,000	$123,600	$127,308	$370,908	12%
Travel[6]	$48,000	$49,440	$50,923	$148,363	5%
Legal/Insurance[7]	$85,000	$87,550	$90,177	$262,727	9%
MiCH IT Admin.[8]	$114,000	$209,000	$247,000	$570,000	19%
Total Expenses[9]	$911,500	$1,030,425	$1,093,068	$3,034,993	100%

Notes:

1. Management: Full-time Program Manager who manages and coordinates the various aspects of MiCloud. This includes determining costs and pricing, overseeing implementation of the project in its entirety, long-term planning ensuring that the Cloud managed services meet its goals, stays within budget, and resolves issues that arise during the project. (Based on actual costs of a currently contracted Sr. Systems Engineer.)

	Salary/Fringe	Annual Total*
Program Manager (FT)	$130,000 $85,967 (67%)	$214,917

2. Cloud Offering: Full-time Assistant Program Manager who will offer Cloud services to districts, supporting organizations to build understanding and develop budgets for sustainability after incentive periods, sign services contracts, etc. This position also assists with developing models for costs and pricing, implementation facilitation including monitoring metrics and architecture management, ensuring that the Cloud managed services delivers value-added product, stays within budget, and mediates resolution of issues that predictably arise during the implementation and installation phases.

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	Salary/Fringe	Annual Total*
Asst. Program Manager (FT)	$72,000 $48,000 (67%)	$120,000

3. Business Services: Full-time business professional who will handle the administrative and financial management of MiCloud, including billing, customer service, procurement, and other non-technical support functions.

	Salary/Fringe	Annual Total*
Business Manager (FT)	$49,500 $33,000 (67%)	$82,500

4. *Training:* Developing standardized practices and training plans, delivering training on new technologies, cybersecurity practices, Cloud management tools, and other relevant areas.
5. Supplies: Office supplies, software licenses, meeting materials, and other necessary tools and equipment to support MiCloud administration.
6. Travel: Extensive travel to job sites across the state, training sessions, meetings, or conferences related to MiCloud's build and operations.
7. Legal and Insurance Expenses: Contract management, compliance with state and federal regulations, and insurance policies that cover potential liabilities such as cyber threats, data breaches, or physical damage to infrastructure.
8. MAISA Administrative (2% of Direct and Administrative Costs): Coordination, oversight, and support tasks of the MAISA technology team in support of the MiCloud project.
9. Operating Expenses and estimated Indirect Expenses (next section) were added to the Cost of Services, distributed proportionally between Disaster Recovery (DR) and Digital Transformation (DT), to get Total Revenue by service line:

	2024-25	2025-26	2026-27	Total
DR - Operating Exp. %	15.10%	17.50%	20.57%	17.4%
DR - Operating Exp.	$80,218	$185,366	$238,742	$504,326
DT - Operating Exp. %	84.90%	86.75%	88.43%	82.6%
DT - Operating Exp.	$450,932	$918,852	$1,026,428	$2,396,211
Total Operating Exp.	$531,150	$1,059,165	$1,160,746	$2,900,537

10. Adjustments were made to the Operating Expenses based on predicted scaling of operations:
    Year 1: 100% of estimated expenses
    Year 2: 103% of estimated expenses
    Year 3: 103% of Year 2 estimated expenses

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Appendix D: Direct Costs

1. Disaster Recovery

A. Cloud Costs

Veeam Backup & Replication: Industry-leading software for protecting data, ensuring business continuity, and facilitating fast recovery of applications and workloads	$84.00 (Annual) - XX% of the list price
S3 (Simple Storage Service): scalable cloud storage service that allows users to store and retrieve large amounts of data.	$45.10 (Annual) - For Large Server size (based on Cloud Storage Calculator)
S3 IA (Infrequent Access): A storage class within S3 is designed for data accessed less frequently but needs to be available quickly when required. It offers lower storage costs compared to standard S3.	
Glacier: A low-cost cloud storage service for long-term data archiving and backup, optimized for infrequently accessed data and offering significantly lower storage costs.	
Total	$129.10 Per-Server

B. Disaster Recovery Direct Labor Costs

	Count	Salary	Fringe	Total	Per-Server
Jr. Engineers	4	85,000	$42,500 (50%)	$127,000	$42.50 (4,000 Server)

We estimated it would take **4 Jr. Cloud Engineers** ($85,000 salary, 50% fringe) to transition DR for 14,000 servers to the cloud and maintain that service over time. We then determined a calculation to apportion direct labor costs by server size.

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2. Digital Transformation

A. T-Shirt Server Sizes

Size/Distribution/Count		Count	Cloud Cost	Labor Costs	Direct Cost
2XL Server (1,000GB)	10%	400	$6,329	$113	$6,442
XL Server (400GB)	14%	560	$4,308	$113	$4,421
L Server (250GB)	20%	800	$1,929	$113	$2,0420
M Server (100GB)	30%	1,200	$1,506	$113	$1,619
S Server (40GB)	16%	640	$1,144	$113	$1,257
Mini Server (20GB)	10%	400	$700	$113	$813
Total/Average	100%	4,000	$2,653	$113	$2,765

	Count	Direct Cost	Ops Costs	Indirect	Total Cost
Avg. Server Cost	4,000	$2,765	$88	$171	$3,024

	Count	Direct Cost	Ops Costs	Indirect	Total Cost
Avg. D.T. Server Cost	N/A	$826	$88	$55	$969

B. Digital Transformation Direct Labor Costs

	Count	Salary	Fringe	Total	Per-Server
Sr. Engineers	3	100,000	$50,000 (50%)	$150,000	$112.50 (4,000 Server)

We used the average per-server costs for MAISA Direct Labor for digital transformation. We estimated it would take **3 Sr. Cloud Engineers** ($100,000 salary, 50% fringe) to digitally transform 4,000 servers.

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Appendix E: Qualitative Data Collection

SOAR Analysis (SOAR)

The SOAR Analysis is a function of the Appreciative Inquiry model. This model is a strength-based approach to change that focuses on what is working well and how to capitalize on it through a systematic change process.

The following SOAR Analysis on a centralized, statewide MiCloud service, was completed with METL attendees on Thursday, May 16, 2024:

Strengths, Opportunities, Aspirations, and Results Exercise (SOAR)

- *Strengths - Established Existence and Expertise:* MiCloud has a strong foundation with 7-8 years of operational experience and a proven disaster recovery capability. This ensures reliability and trust, providing a robust platform for scaling services statewide.
- *Opportunities - Enhanced Scalability and Security:* The cost of a core data center technology, VMware, has increased 10x, forcing ISDs and Districts to consider Cloud alternatives. Simply "lifting and shifting" to the Cloud would generate significant cost savings for ISDs and Districts and substantial demand for MiCloud's quickly scalable services and enhanced security measures. Re-engineering and re-architecting workloads promise even greater efficiencies.
- *Aspirations - Equitable Access and Cost Optimization:* MiCloud offers equitable access to Cloud services for all districts, which is critical to ISD's mission. MiCloud's advanced cloud services promise to remove financial barriers and foster a more inclusive educational environment.
- *Results - Sustainability, Increased Flexibility and Disaster Preparedness:* There is a clear path to centralized MiCloud sustainability by providing Michigan ISDs and districts with greater flexibility, agility, and reliability, ensuring continuous service and support.

SOAR Exercize Raw Data - May 16, 2024

Current State *Strengths - What can we build on?*	**Opportunities** *What are our stakeholders asking for?*
• Established existence of MiCloud. • Disaster Recovery (DR) capabilities. • Elastic resources for scalability.	• Roster recovery capabilities. • Enhanced redundancy. • Ability to quickly scale services.

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• High availability. • Secure data management. • Access to expert consultations. • 7-8 years of operational experience. • Established modeling for implementation.	• Fast implementation. • Improved security measures. • Acquisition of new skills and resources. • Pooling of expertise. • Promotion of learning.
Future State *Aspirations - What do we care deeply about?* • Easy access to support for MiCloud. • Equitable access to services for all districts. • Seamless data flow between multiple systems. • Cost optimization and value savings. • Statewide Student Information System (SIS) for reporting. • Reliability and high redundancy. • Distributed and highly skilled support teams across ISDs. • Improved reporting capabilities. • Inclusion of software in bond funding. • Legislative changes similar to Texas.	**Results** *How do we know we are succeeding?* • Averted disasters. • Increased flexibility and agility. • A higher percentage of LEAs/ISDs utilize cloud services. • Positive ROI with added value and cost savings. • 24/7 support availability. • Ability to change priorities without managing infrastructure. • Efficient redirection of resources.

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