



KHERSON STATE UNIVERSITY

CRISIS IT INFRASTRUCTURE MIGRATION & RESILIENCE

Chronicles of KSU's Technical Survival, Relocation,
and Sovereignty Amidst Full-Scale Invasion
(2022–2026)



TECHNICAL
SURVIVAL



RELOCATION



SOVEREIGNTY



RESILIENCE



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THE ONSET OF INVASION

February 24, 2022: Hostilities erupted. While the very first days remained manageable, safeguarding critical administrative assets became our race against time.



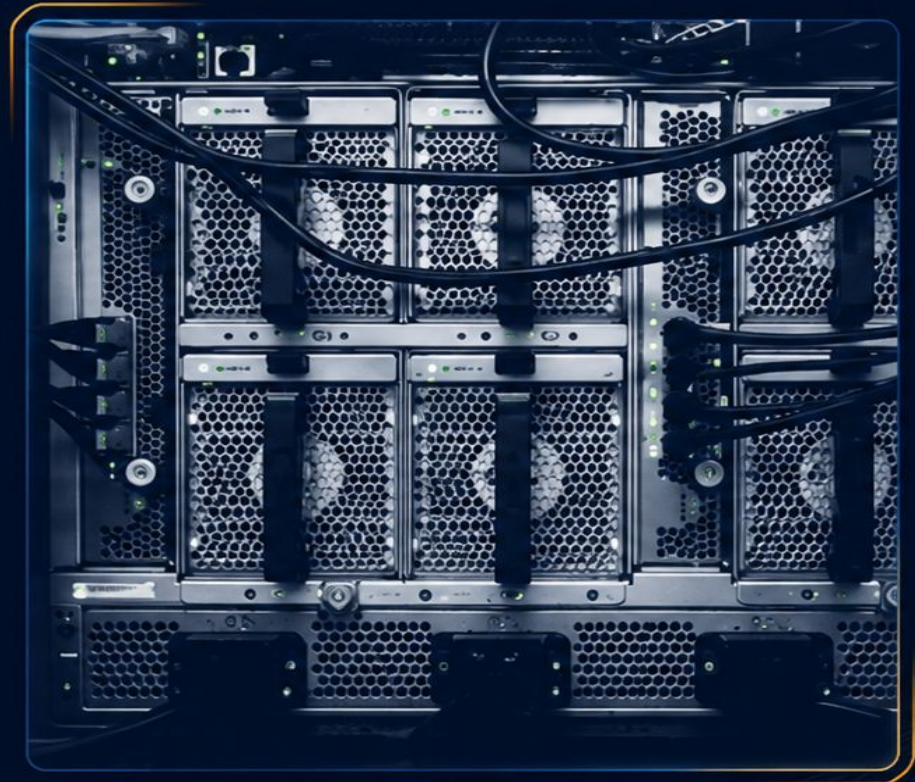
8 TB Local Snapshot: IT administrators took two high-capacity 8 TB external drives with core directory images.



Decentralized Files: All remaining non-structured backup profiles were temporarily distributed to personal local drives.



Target Horizon: Formulated plans to rapidly secure external cloud space to host our sovereign university operations.





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STAGE I – INITIAL CLOUD MIGRATION

In the face of war, we moved fast to **protect**
what keeps the university running.



24 FEB 2022
Hostilities erupted



01 APR 2022
Cloud migration completed



RAPID CLOUD ESCAPES (APRIL 1)

By April 1, 2022, critical backup routines were successfully deployed directly into external cloud providers.



Critical Nodes Secured: Active Directory, KSU Official Web Portal, and primary Financial/Accounting databases.



Turnaround: Accomplished comprehensive migration of all core entities in less than 30 days.



CAPACITY & CLOUD LIMITATIONS

Our architectural path was restricted by severe platform capacity imbalances:



Google Ecosystem: Deployed extensive directories thanks to their unrestricted, infinite capacity allocation.



Microsoft Account: Hampered by severe shared restrictions, limiting total allocation to a tight **1 TB** ceiling.

STORAGE CAPACITY COMPARISON



MIGRATION DATE
01 APR 2022



CRITICAL SYSTEMS
3
Secured & Migrated



MIGRATION TIME
< 30
DAYS



MICROSOFT LIMIT
1 TB
Ceiling

SURVIVAL. ADAPTATION. RESILIENCE.



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SCALING & ARCHITECTURAL HURDLES

ADAPT. INNOVATE. OVERCOME.



APRIL 19, 2022: Hardware limits were expanded to 32 GB RAM, launching OpenVPN structures and Windows Admin Center controls.



DOWNLOAD BOTTLENECKS:

Cloud replication lasted an entire month. Critically asymmetric Google speeds then upload, slow download had to manage heavy samrpsets.



SILICON DISCREPANCY:

PNU structures utilized AMD EPYC processors, whereas KSU systems were built on Intel.



ACTIVE SOLUTIONS:

Systems engineers collaborated tirelessly for weeks to build a compatible transition bridge and safely secure our data.



32 GB RAM
NEW CAPACITY
ACHIEVED



OPENVPN
SECURE REMOTE
ACCESS ENABLED



WINDOWS
ADMIN CENTER
CENTRALIZED CONTROL



RESILIENCE
BUILT FOR CONTINUITY.
READY FOR SCALE.

TECHNOLOGY ADAPTS. RESILIENCE ENDURES.



THE EXCHANGE MIGRATION CRISIS

Stage 2 Operational Shift. Powered down all local infrastructure in occupied Kherson, relocating all workflows directly to PNU's data nodes.



1. PHASING OUT EXCHANGE:

Initiated the massive transition from on-premises Exchange servers directly to Gmail web services.



2. OVERWHELMING BULK STORAGE:

Our legacy Exchange databases was massive, housing more than **1 TB** of unstructured administrative messages.



3. POSTING THROUGH FAILURES:

Automated synchronization utilities failed. System administrators had to manually copy accounts **one single letter at a time**.



4. STRATEGIC PRIORITIZATION:

Prioritized top-tier accounts (university rector and administration), followed sequentially by key departments and departments of critical support.

THE SCALE OF THE CHALLENGE



> 1 TB

OF UNSTRUCTURED
ADMINISTRATIVE MESSAGES



100%

WORKFLOWS RELOCATED
TO PNU'S DATA NODES



SYSTEMS POWERED DOWN
IN OCCUPIED KHERSON



CONTINUITY ACHIEVED
THROUGH RESILIENCE
& DETERMINATION



MISSION CRITICAL. PEOPLE DRIVEN. RESILIENCE PROVEN.

Turning crisis into continuity.





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OCCUPATION & EMERGENCY LOCKDOWN

PROTECTING OUR DATA. DEFENDING OUR UNIVERSITY.

When physical university buildings in Kherson were seized by occupying forces, KSU faced severe threats of compromise and terminal data loss.



DUAL INFORMATION-ANALYTIC CENTERS:

KSU operated two centers:
IAC 1 (Kherson) and IAC 2 (Ivano-Frankivsk).



IMMEDIATE SHUTDOWN:

The Kherson IAC node was successfully deactivated and isolated at the exact moment of campus occupation.



ACTIVE DIRECTORY LOCK:

Admins instantly revoked all administrative privileges from Kherson staff, routing mission control strictly **through Ivano-Frankivsk.**



2 IAC CENTERS OPERATED

Kherson & Ivano-Frankivsk



IMMEDIATE SHUTDOWN

Executed at moment
of occupation



ALL PRIVILEGES REVOKED

Admin access secured
instantly



MISSION CONTROL SECURED

Routed through
Ivano-Frankivsk

RESILIENT INFRASTRUCTURE. SECURED FUTURE.



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AZURE INTEGRATION & DIGICODE

Building a secure, scalable, and future-ready digital foundation.



SECURING MICROSOFT AZURE

KSU operated transient systems over PNU resources while navigating the path to enterprise-grade solutions.



Sovereign Cloud: Negotiated full Azure cloud framework allocation, ensuring a secure operational continuity through **2023**.



Isolation: Successfully established high-grade cloud subnets for KSU administrative components.



PARTNERING WITH DIGICODE

In **April 2023**, KSU brought in DigiCode as an essential tech broker to orchestrate our cloud transformation.



Wartime Intermediary: Provided technical design blueprints, advisory services, and operational cloud integration support.



Implementation: Managed the configuration of isolated infrastructure workloads.

STRATEGIC IMPACT



Enhanced Security
Isolated environments and secure access.



Scalable Infrastructure
Built to scale with resilience in mind.



Trusted Partnerships
Leveraging expert allies for rapid transformation.



Operational Continuity
Maintaining university missions without pause.

COLLABORATION. INNOVATION. RESILIENCE.

CYBER WARFARE & FINANCIAL RELIEF

Responding to the April 11 Cyberattack on KSU

APRIL 11

DEVASTATING CYBERATTACK

On April 11, a coordinated, high-intensity **cyberattack** targeted KSU, completely paralyzing network endpoints and server configurations.



\$16,500 Pilot Sponsorship:

Secured immediate disaster funds to deploy active threat monitoring and restoration frameworks.



\$60,000 Microsoft Relief:

Gained comprehensive technical recovery support paired with premium **Microsoft 365 A5 enterprise** licenses for our entire workspace.



24/7

THREAT MONITORING
ACTIVATED



100%

CRITICAL SYSTEMS
RESTORATION UNDERWAY



FULLY

EQUIPPED TO
MOVE FORWARD

ATTACKED. RESILIENT. RESTORING. **STRONGER TOGETHER.**



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SUBSCRIPTION MIGRATION NIGHTMARE

Complex licensing restrictions and infrastructure reconstruction created critical operational blockers.



THE LICENSE COPY RESTRAINT

Transitioning from one Microsoft cloud subscription layer to another introduced complex architectural blocks.



No Direct Cloning: Tenant configuration blocked direct transfers of server systems from old subscriptions to new ones.



Forced Deletions: Server migrations were strictly blocked until admins ****manually hard-deleted**** all legacy system backups.



NETWORK RECONSTRUCTION

Rather than risking database corruption, KSU administrators opted to safely build our secure cloud network from the ground up.



Manual Deployments: Manually configured and deployed all new VPN tunnels, custom route tables, and Active Directory domains.



Active Directory Domains: Established and hardened new AD domains to ensure long-term security, isolation, and manageability.

THE IMPACT



SECURITY FIRST

Protected our systems from data risks and configuration conflicts.



INFRASTRUCTURE RESET

Clean, modern, and secure foundation for future growth.



OPERATIONAL CONTINUITY

Systems restored and services maintained through resilience.



STRONGER TODAY

A more secure, scalable, and future-ready cloud environment.

CHALLENGES OVERCOME. RESILIENCE DELIVERED.



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RECIPROCAL SOLIDARITY

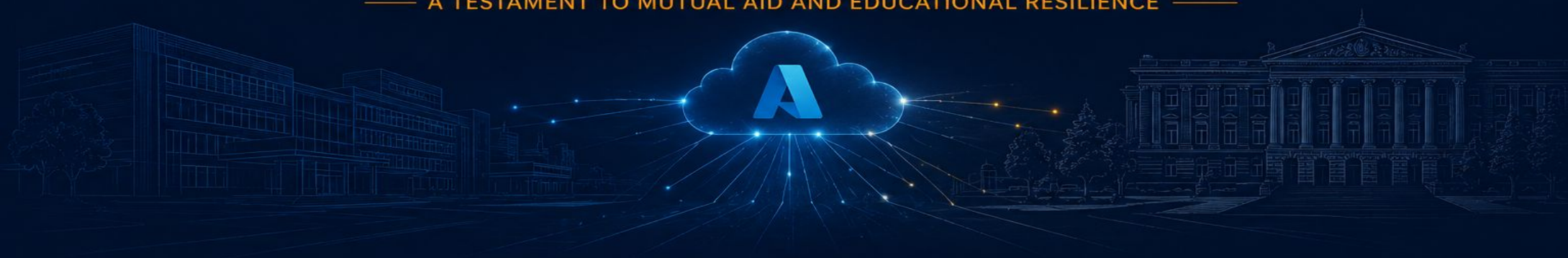
“

IN SUMMER 2023, THE ROLES REVERSED. RESPONDING TO AN OFFICIAL REQUEST FROM THE RECTOR OF VASYL STEFANYK PNU, KHERSON STATE UNIVERSITY HOSTED PNU'S ENTIRE ADMINISTRATIVE CORE AND PUBLIC WEBSITES INSIDE KSU'S NEWLY BUILT MICROSOFT AZURE CLOUD ENVIRONMENT FOR

”

A FULL ACADEMIC YEAR.

— A TESTAMENT TO MUTUAL AID AND EDUCATIONAL RESILIENCE —





STAGE 3 — DIGITAL SOVEREIGNTY RESTORED

After ensuring continuity through cloud infrastructure, **KSU rebuilt its own sovereign computing environment**, using enterprise hardware, virtualization technologies, and international support.



THE DIGIUNI PROJECT

Partnered with the international DigiUni consortium to rebuild local high-performance centers.



AUSTRIAN SERVER CARGO

Secured physical enterprise servers shipped directly from Austria to restore our computing power.



PROXMOX VIRTUALIZATION

Built a resilient local host system using Proxmox VE, moving all processes away from cloud-dependent hosting.



CLOUD
DEPENDENCY

MIGRATION



PROXMOX
VE CLUSTER



KSU ON-PREM
INFRASTRUCTURE

SOVEREIGN & RESILIENT

NEW COMPUTING CORE



DGS-1210-28P 800G
L2/L3 Smart Switch
Data Center Switch



DS3000
L3 10G-port 1000-8E
Data Center Switch



DS4000 / DS400L
L3 32-port 40/80GbE
Data Center Switch



DS1000
L3 48-port 1GbE
Data Center Switch



SC6100
2U 24x SSD All-Flash
Storage Controller



SE4200
2U 24x SSD All-Flash
Storage Expansion



DS6200
4U 90 HDD
Storage Expansion



**BUILDING OUR
FUTURE ON
OUR OWN TERMS**



ENTERPRISE HARDWARE

High-performance
infrastructure
restored.



INTERNATIONAL SUPPORT

Global partnerships
making recovery
possible.



VIRTUALIZATION WITH PROXMOX

Flexible, resilient, and
independent computing
environment.



DATA SOVEREIGNTY ACHIEVED

Critical systems now
hosted securely
on-premises.

FROM CLOUD DEPENDENCY TO INFRASTRUCTURE INDEPENDENCE



COMPLETE TECHNICAL SOVEREIGNTY

Today, KSU's digital infrastructure is **100%** localized, highly secure, and completely **independent**.



\$55,000 CUSTOM AI NODE

Procured and configured a highly specialized, cutting-edge AI server to drive academic research and secure long-term engineering resilience.



COMPLETE SOVEREIGNTY

System access controls, directory structures, and primary educational modules are owned and maintained securely on-premises.



OWNED BY KSU
Critical systems are fully owned and operated by KSU.



MAXIMUM SECURITY
Infrastructure hardened, access controlled, and continuously protected.



OPERATIONAL RESILIENCE
Built for stability, redundancy, and long-term mission continuity.



ACADEMIC FREEDOM
Full control enables academic autonomy and protects data integrity.



100%

LOCALIZED
INFRASTRUCTURE



100%

SECURE &
CONTROLLED



100%

ACADEMIC SYSTEMS
ON-PREMISES



100%

INDEPENDENT &
SOVEREIGN

IMAGE SOURCES

External visual materials used in this presentation.



MICRO CENTER

Backup & recovery
hardware solutions

 microcenter.com



SLIDEEGG

Cloud computing &
network architecture

 slideegg.com



POPSCI

Cybersecurity & data
protection visuals

 popsci.com



BOOMSET

IT security & infrastructure
illustrations

 boomset.com



CELESTICA

Enterprise server & rack
infrastructure

 celestica.com



All external images are used for academic and educational purposes.



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THANK YOU



FOR YOUR ATTENTION



RESILIENCE
ACHIEVED



INFRASTRUCTURE
RESTORED



SECURITY
ENSURED



EDUCATION
CONTINUES



COMMUNITY
STRONGER

FROM CRISIS TO STRENGTH.
BUILDING THE FUTURE TOGETHER.