
Kathmandu University

ISMS (Information System Management Section)

Introduction

ISMS (Information System Management Section) is located in Central Administration Kathmandu University, Dhulikhel. This section is dedicated to:

- Development and Implementation of evolutionary University ICT Strategic Plans; Policies; Standards; Operational Plans; & Budgets; sensitive to emerging technologies and responding to changing needs and practices.
- Acquisition and Development of University ICT Network Infrastructure and Services
- Acquisition and Development of University Management Information Systems and Services
- Acquisition and Development of expanded Corporate Internet Services; especially Browsing (Research, Journals etc.) and E-mail (staffs & students)
- Aggressive and Continued Training on Basic and Intermediary ICT Skills for all Students and Staff
- Improve the use of technology to support teaching and learning.
- Improve access to information.
- Improve infrastructure and increase connectivity.
- Maximize benefits of investments in technology.
- Develop and integrate Information Management systems
- Design ISMS structure, develop specific TOR to assist on hiring Staffs
- Improve effectiveness of KU Information Technology operations.
- Promote use of open-source and genuine software and services

Activities of ISMS

System and Services Administration/Management

- Installation and Maintenance of Systems/Servers (Web, Mail, VOIP Telephone, Learning Management Systems, DNS, Storage/Backup, Database, HRIS, Monitoring)
- Administration of installed Systems/Servers
- Upgradation of Systems and Servers

- Development of Content Management System (CMS) for websites (Central, Schools and Departments)
- Administration of Web/Mobile Application Software for websites
- Install, configure and manage Software and their functions according to specifications
- Ensure system/server security and run timely security audits
- Maintain proper technical (Installation, administration) documentations and user manuals
- Facilitate online journals and journal publications

Network Administration/Management

- Network Design and Setup
 - VLAN design
 - Video conference network design
 - Wireless hotspot network setup
 - Network equipment (Switch, router and Firewall) installation and maintenance
 - Bandwidth monitoring and management
 - Network monitoring and maintenance
 - Network setup and support to different schools, projects and others
- Network authentication
- Server Networking
- KUCAT CBT Network management
- CCTV Networking
- Attendance/Biometric Networking
- Security Access control, Automatic Door Locks and RFID Registration
- Point-To-Point Optical Fiber Installation and Maintenance (building to building)
- Ensure Network security and run timely security audits

Support, Maintenance and Upgrade services

- Organize and schedule upgrades and maintenance without interfering work of others
- Perform troubleshooting to diagnose and resolve problems in a timely manner
- Upgrade the entire system to enable compatible software on all computers
- Perform tests and evaluation on new software and hardware
- Maintain records/logs or repairs and fixes

- E-Mail support and services (Central, SoE, SoS, SoA, SoL, SoEd)
- Video conference support and maintenance
- Training and training resources preparation for Staff, Faculty and Students
- e-Learning (Moodle) LMS support for faculty, staff, students and administrators of all Schools
- KUCAT CBT System administration and support
- Accounting, Inventory, HRIS software support
- Library software support (OPAC, SOUL, KOHA)
- Departmental Computer lab support (School of Engineering, School of Science, School of Law, School of Management)
- Assist in developing and maintaining local networks
- Online Admission for School of Science and School of Engineering
- Web hosting service to schools, departments, projects, clubs and others
- Assist in setting up workstations with computers and necessary peripheral devices
- News and notice, contents update in university webpages
- Operating System and software licensing
- PABX/VOIP support and maintenance
- Assist the users on how to operate software and computer equipment
- Provide and support dedicated internet services to faculty/staff and students (Central Administration, SoE, SoS, SoL, faculty/staff residence, students' hostels, guest houses)
- Provide and support wireless internet services inside KU premises Dhulikhel and SoL
- Networking and internet service/support for various events including Convocation, Welcome/Farewell, Trainings/Seminars/Conferences
- Provide remote support for internet and networking in Panchkhal premises, KUSoL, KUSoM Exam, KUSoEd, KUSoA

Facts & Figures

1. **Current Internet Connection:** Through Fiber optics link from **WorldLink Communications P. Ltd.**, Jawalakhel, Lalitpur, Nepal
2. **Intranet Connection:** Nepal Research & Education Network (NREN) and its member/s (100 Mbps local connection with Educational Network); Canteen (10 Mbps from Dhulikhel to Balkumari and Hattiban)
3. **Current Internet Bandwidth: 350 Mbps Symmetric**

Bandwidth Upgrade history

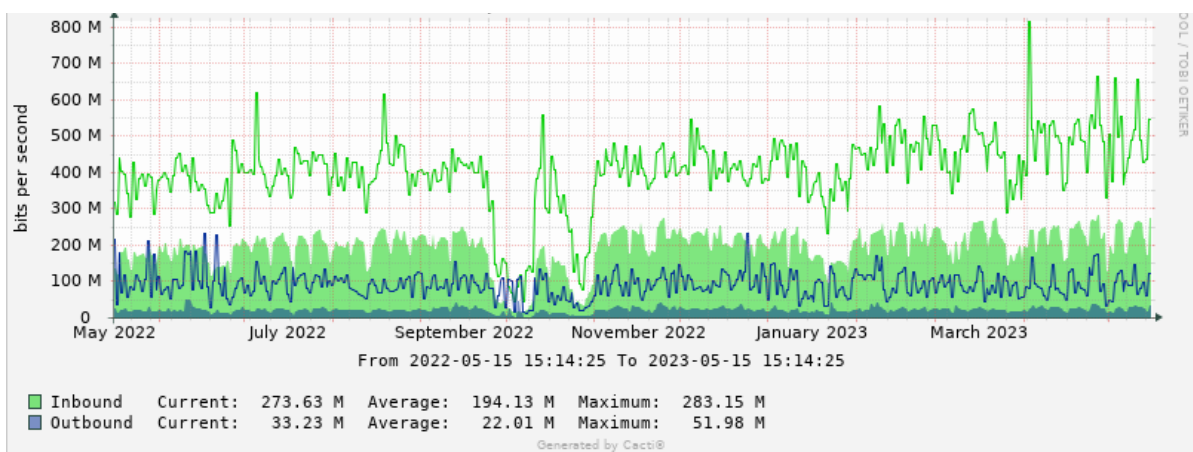
(1024 Kbps = 1 Mbps)

Year	Service Provider	Connection	Month	Bandwidth (Kbps)	
				Downlink	Uplink
2001	BTN Access, Singapore	VSAT	November	256	128
2003	BTN Access, Singapore	VSAT	June	512	160
2004	SinGTel, Singapore (Mercantile)	VSAT	May	1024	384
2005	SinGTel, Singapore (Mercantile)	VSAT	May	1152	384
2006	SinGTel, Singapore (Mercantile)	VSAT	October	1536	512
2007	SinGTel, Singapore (Mercantile)	VSAT	May	1536	512
2008	SinGTel, Singapore (Mercantile)	VSAT	May	1920	640
2008	Websurfer, Naxal	Fiber	October	3072	3072
2009	Websurfer, Naxal	Fiber	July	3584	3584
2010	Websurfer, Naxal	Fiber	July	4096	4096
2010	Websurfer, Naxal	Fiber	August	6144	6144
2011	Websurfer+Mercantile*	Fiber	July	11264	11264
2012	Websurfer+Mercantile*	Fiber	June	13312	13312
2012	Websurfer+Mercantile*	Fiber	July	17408	17408
2012	Websurfer+Mercantile*	Fiber	July	17408	17408
2013	Websurfer+Mercantile*	Fiber	April	19456	19456

2013	Websurfer+Mercantile*	Fiber	July	25600	25600
2014	Websurfer+Mercantile*	Fiber	August	35840	35840
2015	Websurfer+Mercantile*	Fiber	August	38912	38912
2017	Websurfer+Mercantile*	Fiber	June	51200	51200
2017	Worldlink	Fiber	October	102400	102400
2020	Worldlink	Fiber	March	153600	153600
2022	Worldlink	Fiber	April	256000	256000
2023	Worldlink	Fiber	February	358400	358400

*From Mercantile (5Mbps free)

4. **Bandwidth utilization:** 24 hours
5. **Fiber connection in KU:** Building to Building in Dhulikhel premises, P2P connection to School of Medical Sciences and School of Law
6. **Network Topologies:** Star & Extended Star
7. **Number of computers/internet devices connected to wired Network:** 1970+
8. **Average number of internet users per day:** 2500+ (Wired+Wireless)
9. **Intranet bandwidth:** Local (1 Gbps & 100Mbps) inside KU premises, Canteen (10 Mbps) KU Dhulikhel to Kathmandu (Balkumari, Hattiban)
10. **Annual Internet Bandwidth Consumption (Daily Average: May 2022 – May 2023)**

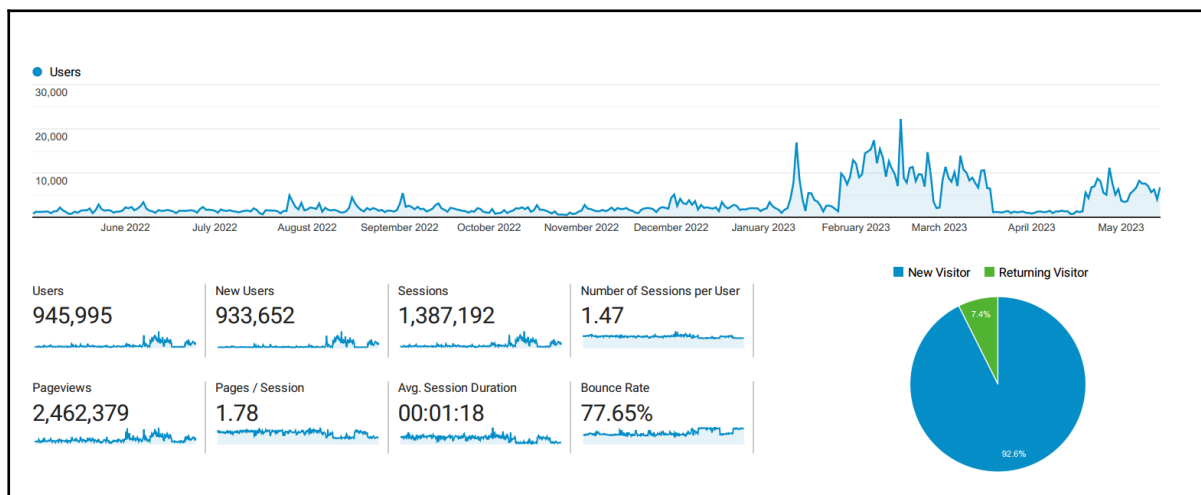


11. KU Website upgrade history (major releases):

- Web 1. 2002 November
- Web 2. 2003 July

- Web 3. 2006 January
 Web 4. 2009 April
 Web 5. 2012 October
 Web 6. 2019 June (Current)

12. Annual KU Homepage Website Visitors (Daily Average: May 1, 2022 – May 14, 2023)



13. KU Website Infrastructure Management System (Centrally Managed CMS)

Start Date: 30 June 2019; Total Websites: 25

Status of Web Infrastructure Management System

S.No.	Website Name	Remarks
1	Kathmandu University (https://ku.edu.np)	Deployed
2	School of Engineering (http://soe.ku.edu.np)	Deployed
3	School of Science (http://sos.ku.edu.np)	Deployed
4	School of Law (http://sol.ku.edu.np)	Deployed
5	School of Education (https://soed.ku.edu.np)	Deployed
6	School of Engineering (All six departments)	Deployed
7	School of Science (All six departments)	Deployed
8	School of Education (All four departments)	Deployed

9	School of Arts (https://soa.ku.edu.np)	Partially Deployed
10	School of Management (https://som.ku.edu.np)	Partially deployed
11	School of Management (Department of Management Informatics and Communication)	Deployed
12	Office of the Controller of Examinations (https://web.ku.edu.np/departexam)	Under Development

14. Other Websites (Units/Sections/Projects/Clubs/Programs/Events/Miscellaneous):

Total other websites: 100

15. Total number of public websites directly maintained by ISMS: 125

16. Total Server Resources in KU

S. No.	Server Location	No of Physical Servers	No of Virtual Servers	Total Servers	Total Memory	Total Storage
1	ISMS	32	51	83	930 GB	64.19 TB
2	EXAM	5	0	5	128 GB	9.35 TB
3	KUSOM	2	0	2	14 GB	1 TB
4	KUSOED	3	0	3	56 GB	5 TB
	Total	42	51	93	~1128 GB	~79.54 TB

Total number of Servers directly maintained by ISMS: 85

17. Total number of registered subdomains (*.ku.edu.np): 143

18. Email System: Google Workspace/Suite Free Educational License

i. @ku.edu.np: Total accounts: 1254; Storage Used: 22.48 TB

ii. @student.ku.edu.np: Total accounts: 4412; Storage Used: 24.62 TB

Major activities of 2022/2023

- New Server/System setup and installation:
 - One BNESDG Project Server
 - Migration from traditional web hosting to two Educational licensed cPanel systems
 - Various virtual servers and docker containers for testing of different applications including LibreNMS, Portainer, Guacamole, Active Directory, NginxProxyManager, HAProxy, Pfsense Firewall
 - KUSOM Moodle Reinstallation and Migration after disk full error
 - OPAC and E-Library virtual server installation and basic configuration
 - NORPART-WEM virtual server installation and basic configuration
 - Windows Server 2019 Installation after technical issue on the Inventory and Finance virtual server
 - KUCAT-CBT Software testing virtual server installation and basic configuration
- New Websites deployments:
 - Hydro-Himalaya Project new website
 - Conference Program Websites including Communications and Information Processing - Nepal (CIPN), Biotechnology Conference 2023, Contemporary Management Education and Practices (CMEP)
 - Student Club websites including Kathmandu University AI Club, KU Indoors Club, Society of Business Information Students Club (SBIS), and Students for the Exploration and Development of Space Kathmandu University (SEDS-KU)
 - Research and Project websites including D-VA, Nepalese Education in E-Health Masters (NEEM), Norpart-WEM, Project 22-05, Gridville, BNESDG websites
 - KU CMS School/Department website deployed for School of Management, and School of Arts
- Old websites upgrade and migration:
 - Aquatic Ecology Center (AEC), Center for Electric Power Engineering (CEPE), Centre for Electricity Trade Research and Facilitation (CETRF), Confucius Institute, Green Hydrogen Lab, Hydro-Himalaya Project, LUPIC,

- Nepal Hydrogen Initiative, Open Lab, KUSOM Policy Lab, Rock Mechanics & Rock Engineering Lab, Renewable and Sustainable Energy Laboratory (RSEL), Surung, Technical Training Center, TTL, Community Engagement Division, Crisis Response Resource Portal (CRRP), Design Lab, Directorate of Research Development and Innovation (RDI),
- o Association of Mechanical Engineering Students (AMES), Kathmandu University Civil Engineering Club, DLR Lab, EnergizeNepal, Geomatics Engineering Society (GES), Kathmandu University Computer Club (KUCC), Kathmandu University Robotics Club (KURC), Society of Business Information Students (SBIS), TEDxKathmanduUniversity
 - Network upgrade and new installations:
 - o Block 28A New Networking, VLAN design and network equipment installation
 - o Block 28B New Networking, VLAN design and network equipment installation
 - o AWMRC building networking, VLAN design and network equipment installation
 - o NTIC Block New Networking, VLAN design and network equipment installation
 - o Block 31C New Networking, VLAN design and network equipment installation
 - o School of Law New Building New Networking, VLAN design and network equipment installation
 - o Mikrotik and Sophos Firewall upgrade to the newest stable versions and ran testings
 - o KU Girls Hostel Network maintenance and upgrade
 - o KU Boys Hostel networking system redesign, upgrade and new network equipment installation
 - o School of Law New Building logical network design, vlan design, network equipment configuration and installation, Wireguard VPN connection with central campus for resources sharing
 - Trainings, skill development and knowledge sharing:
 - o Moodle installation training for IT Administrator of School of Education through virtual sessions

- o Cisco Switch Configuration training for IT personnel of School of Science
- Research and testing of various system/applications:
 - o Moodle upgrade, issues troubleshooting and design testing
 - o Automatic scripts for one-click email registration and suspension
 - o Guacamole for accessing the servers from outside KU network
 - o Docker and Portainer for isolation and server resources sharing
 - o Gitlab source code management, version control, backup application for system/application backups and disaster recovery
 - o On-premises EDUROAM authentication system with RADIUS server for educational roaming internet access
- System, Servers, Network, Internet monitoring and notification system redesigned, real-time IT status dashboard and internet bandwidth consumption made publicly accessible through ISMS website
- KU Dhulikhel premises internet bandwidth upgraded from 250 Mbps to 350 Mbps International and 800 Mbps Local
- KUCAT CBT 2022 network design and system support
- KU 27th Convocation (Phase-II) and 28th Convocation (Phase-I) networking and internet support
- KU Web CMS bug fixes, redesigns, maintenance and feature addition as per new requirements in collaboration with the developer
- General service and support to all Staff/Faculty, Students, Guests, IT Administrators, Site Administrators
- Documentations of Systems, Servers, Networks, connection descriptions, setup and installation manuals, knowledge base and user manuals

Future Plan and Recommendations

- Deployment of New Website CMS to all Schools and Departments
- Underground of Currently Overhead Optical Fiber Cables
- Design and Implementation of IT Policies
- Implementation of User Authentication Services for application and wireless access
- Integration of all currently available database and Information Systems into **single gateway platform**
- The whole internal network needs to be upgraded into 1 Gbps by replacing all the older devices and equipment.
- The internet dependency needs to be distributed into at least **two ISPs** for consistency and reliability.
- Internet bandwidth (currently 350 Mbps) should be increased gradually as per future requirement and demand of internet usage.
- Design ISMS structure, develop specific TOR and hire Staffs

Human Resource

Currently, we have **three** active people who are involved in different activities listed in the earlier section, but it is very difficult to carry out all activities efficiently due to one person handling lots of activities. We require more people in order to efficiently handle the workload. Fulfillment of manpower can be done by hiring full time employees, work trainees, or student interns.