IT Wing

The IT Wing of the University monitoring maintains and secure the Information Technology infrastructure of the University, Besides these the IT Wings maintains and updates the official Website of the University in the name of "www.cukerala.ac.in" and providing all the IT related data supports to ensure solving problems. Also it provides complete web service support for the online activities. It makes smooth coordination with different section and departments and giving responsible relation between central authorities as a feed backup and ensures better relationship with general public by way of different notification and news from the University Website. IT Wings provides various services to pertained Faculty members, staffs, students of the University ,Moreover it develop configure and implement necessary s/w for different offices, sections and examination activities with a view to improve productivity, reduce expenses with optimum result. To provide support for Open Source technologies and implementations and to encourage their use in the University activities.

In simple sence, the IT Wings create act as a "backbone of the University", it strengthening and minimizing all weakness and threats in the University by providing different sources of information. IT Wings provide central facility for the growth and development of Teaching, Research and all other section of the University.

The System Analyst is become the head of IT section and all the works and procedure going on according to the direction of System Analyst.

About the IT Infrastructure of CUK

The IT Infrastructure of Central University of Kerala consists of more than 500 computers with 10 servers. The complete network infrastructure consists of 30 switches, 3 firewalls, and 20 wireless access points approximately.

NMEICT/NKN Connectivity

The internet bandwidth facility availed at the three campuses is as following.

Kasaragod Campus –10 Mbps, Periye Campus - 100 Mbps, Padannakkad Campus 10 Mbps .Central University of Kerala provides 24'7internet facilities to the CUK Family. The back bone of the internet facility is formed by the following servers which form the AAA(Accounting, Authentication, Authorization) of the connectivity.

FortiGate Firewall

In the IT Wings FortiGate Firewall includes FortiGate 600C Firewall and FortiGate 200Analyzer. And it gives as predominant role in the IT Infrastructure of the University. And moreover it ensures correct path to achieve single and group objectives. And this application explains separately as uses in the each functions in below.

- **FortiGate 600C :-**

FortiGate 600C firewall acts as the perimeter firewall for the permanent Campus at Periye. This Firewall for the permanent Campus at Periye.This firewall has been procured from NICSI. The FortiGate firewall is Fortinet's flagship integrated network security solution. The firewall protects the network from External threats and viruses.

The FortiGate-600C appliance delivers industry-leading performance and flexibility with hardware-accelerated essential security technologies, including firewall, VPN, intrusion prevention, application control, and web content filtering, all managed from a "single pane of glass" console. Advanced application control enables you to define and enforce policies for thousands of applications running across networks regardless of port or protocol. The FortiGate-600C also includes additional security technologies such as antivirus/antimalware, antispam, vulnerability management, and WAN optimization, giving you the ability to consolidate stand-alone devices.

- **FortiGate 200D Analyzer :-**

FortiAnalyzer platforms integrate network logging, analytics, and reporting into a single system, delivering increased knowledge of security events throughout your network. The FortiAnalyzer family minimizes the effort required to monitor and maintain acceptable use policies, as well as identify attack patterns to help you fine tune your policies. Organizations of any size will benefit from centralized security event logging, forensic research, reporting, content archiving, data mining and malicious file quarantining. You can deploy FortiAnalyzer physical or virtual appliances to collect, correlate, and analyze geographically and chronologically diverse security data. Aggregate alerts and log information from Fortinet appliances and third-party devices in a single location, providing a simplified, consolidated view of your security posture. In addition, FortiAnalyzer platforms provide detailed data capture for forensic purposes to comply with policies regarding privacy and disclosure of information security breaches.

Key Features & Benefits

- ➢ Graphical Summary Reports - Provides network-wide reporting of events, activities and trends occurring on FortiGate and third-party devices.

- ➢ Network Event Correlation - Allows IT administrators to quickly identify and react to network security threats across the network.

- ➢ Scalable Performance and Capacity - FortiAnalyzer family models support thousands of FortiGate and FortiClient™ agents, and can dynamically scale storage based on retention/compliance requirements.

- ➢ Choice of Standalone, Collector or Analyzer mode - Can be deployed as an individual unit or optimized for a specific operation (such as store & forward or analytics).

- ➢ Seamless Integration with the Fortinet Product Portfolio - Tight integration allows FortiAnalyzer resources to be managed from FortiGate or FortiManager user interfaces.

- **Juniper M10-Features :-**

In the IT section has one juniper M10i .The M10i Multiservice Edge Router provides high-speed interfaces for medium and large networks and network applications, such as those supported by Internet service providers (ISPs). Application-specific integrated circuits (ASICs), a definitive part of the router design, enable the router to forward data at the high speeds demanded by current network media.

The M10i router supports up to eight Physical Interface Cards (PICs). The router height of 8.7 in. (22.1 cm) enables stacked installation of five M10i routers in a single floor-to-ceiling rack, for increased port density per unit of floor space.

The router's maximum aggregate throughput is 12.8 gigabits per second (Gbps) simplex or 6.4 Gbps full duplex. Inserting a combination of PICs with an aggregate higher than the maximum throughput per FPC is supported, but constitutes oversubscription of the FPC.

The router architecture cleanly separates control operations from packet forwarding operations, which helps to eliminate processing and traffic bottlenecks. Control operations in the router are performed by the Routing Engine, which runs Junos OS to handle routing protocols, traffic engineering, policy, policing, monitoring, and configuration management. Forwarding operations in the router are performed by the Packet Forwarding Engine, which consists of hardware, including ASICs, designed by Juniper Networks.

Firewall

Firewalls are computer security systems that protect your office/home PCs or your network from intruders, hackers & malicious code. Firewalls protect you from offensive software that may come to reside on your systems or from prying hackers. In a day and age when online security concerns are the top priority of the computer users, Firewalls provide you with the necessary safety and protection.

PfSense is an open source firewall/router computer software distribution based on FreeBSD. It is installed on a computer to make a dedicated firewall/router for a network and is noted for its reliability and offering features often only found in expensive commercial firewalls. It can be configured and upgraded

through a web-based interface, and requires no knowledge of the underlying FreeBSD system to manage. pfSense is commonly deployed as a perimeter firewall, router, wireless access point, DHCP server, DNS server, and as a VPN endpoint. This firewall is currently installed at our three Campuses viz. Kasaragod, Periye and Padannakad.

RADIUS Server

Remote Authentication Dial In Service is a networking protocol that provides centralized Authentication, Authorization, and Accounting (AAA) management for users that connect and use a network. This server helps in authorizing users form other campuses when the central authentication server sits at the Kasaragod campus and helps controlling the overall internet usage throughout the three campuses. The major advantage of this system is that it is not required to have separate authentication on each campus and single username, password will cater to the needs of all internet access at any of the campus.

Radius Features

- **Client/Server Model**

➢ Radius server is responsible for getting user connection requests, authenticating the user, and then returning all the configuration information necessary for the client to deliver service to the user.
➢ A Radius server can act as a proxy client to other Radius servers.

- **Network Security**

➢ Transactions between a client and a server are authenticated through the use of a shared key. This key is never sent over the network.
➢ Password is encrypted before sending it over the network

Major Activities

- ## File Tracking System

FTS is a web based application to monitor the pendency of receipts and files and assist in their easy tracking. It is an integrated package which has features right from diarizing of receipts/files, updating its status, opening of new files, tracking the movement of files, dispatch of letters/files and finally records management.

The File Tracking System has been implemented at Central University of Kerala administration to help the tracking of files. The system has been developed indigenously by the IT wing. The File tracking system enables the users to track the position of files in the CUK. The movement of the files and date and time on which the file/mail has been moved from one department to another can be tracked.

- ## File Tracking Training Programme

For smooth running of FTS hereby conducted training program to all departments to aware handle and create, search, specific files from the system. It minimise time consuming for a manual procedure and reduce effort of job. Each department have separate username and passwords for FTS login.

File transfer system has significant role in entire department in the university , it's a system which carry on the movement of file from one place to another through electronically and by the helps of System Analyst, IT wings started FTS for create and transfer file from one point to various department and enlighten and provided awareness with training to all department by System Analyst at initially about ,how to create file , how to move /transfer file and how to search particular file through FTS. While transfer one file to various department through FTS ,it become very secure and easy to trace by file assign and

recognize its own date and time automatically once it create . However file can transfer only when FTS login and it enforcing to more secure from any other file transfer system.

- **Authorization:-**

For the access and surface of internet, all students, faculty, staff etc. required separate username and password in CUK and while opening the site it ask for firewall authentication ,it is possible only enter username and password by themselves. To get new user name and password, first of all the applicant or user have to send one request to System Analyst and System Analyst approve and give instruction to IT section to hand over username and pass ward to concerned individuals but same time it is not permitted to handover any other person or third party. And in the case of e-mail id same procedure as well as internet to send request to system analyst and IT section sending to e-mail ID to user and they get its auto generated password also. While retiring the job or complete the academic year of particular person, they will have to retain their username and password with university and at same time IT section will do that username, password and email id as a disable with very secure and properly.

IT Wing authorized to create and secure all   devices by following things:

1. Each computer in the university have separate username and Passwords

2. IT wings provide password and username for each person in various Staffs, Faculties, Students, Research Scholars for surface and smooth access for Internet.

To create Email-id for various departments, Faculties, Staffs, Research Scholars, for E-communication and data transferring. It produce auto generated password.

Annual Maintenance Contract

AMC carry on under IT Wings. Its reporting authority and monitoring power concerned in System Analyst

Annual maintenance contract is a format document when a service provider agrees to provide a certain kind of service to an individual or concerns on an annual basis. The details mentioned in the contract include the kind of service to be provided annually, the service maintenance fee and the personal details of both the parties.

Service provider provide direct service .AMC contract include periodic service, replacement of defective parts, as per mentioned   in the agreement. In CUK given AMC to 'Nortech' in the year of 2015-2016.Its include their technical services and replacement.

➢ Provide technical support for conducting Seminars, meetings, webinar etc. Daily monitoring of Servers and Server Room, updating the Server Log reports, humidity and temperature log reports.

➢ Attend all user calls, resolve their issues and daily update the Call Log Report.
➢ Meet users once in every month and discuss computer related issues and solve them.
➢ Check and clean heads of label printers twice in a week.
➢ Send/receive the defective parts to/from Nortech.
➢ Communicate with Nortech and third party vendors for arranging repair/replacement of defective devices. Send/receive the defective parts to/from Nortech. Installing and configuring new PC's.
➢ Installing and configuring new PC's.
➢ Quarterly Preventive Maintenance of all computer's including peripherals like keyboard, mouse and monitor.

RESPONSIBILITIES

➢ Two engineers should be present in the company between 9.30am - 5.30pm from

➢ Monday to Friday. (if any work Saturday also working day)

➢ If the engineers are not able to attend a call by 5.30pm they have to stay late and complete the call before leaving the office.

➢ If required engineers have to take shifts and work on Sunday.

➢ All Servers under AMC are to be regularly monitored and logs to be updated.

➢ Installing and troubleshooting of all applications and software packages comes under engineer's responsibility.

➢ Sufficient spares and tools should be kept with the engineers.

➢ The printer heads of three label printers are to be checked and cleaned twice a week.

➢ In the case of a breakdown in any devices like printers, switches etc. which doesn't come under AMC, engineers have to take a preliminary examination and resolve the issue if they can, otherwise they have do all communication and follow up with the respective vendors for repair or replacement.

➢ Preventive maintenance of all computers should be done once in three months.

Responsibility of Website

The Website of CUK created in Joomla.IT Wings maintains and updates the official Website of the University in the name of www.cukerala.ac.in. All relevant information regarding courses, eligibility and admission process etc. are updated regularly. All University related information's (Admission and Examinations, News and Events, Carrier opportunities, Awards, Project and Adhoc Vacancies, Tender Notifications)are uploaded on the website. The Library catalogue is accessible to the users of the Library through the Online Public Access Catalogue in the Library. The books can be searched through the WebOPAC provided in the University Website.

Joomla is a free and open-source content management system (CMS) for publishing web content. It is built on a model–view–controller web application framework that can be used independently of the CMS. Joomla is an award winning content-managing system (CMS), which enables you to build a websites and powerful online applications. Many aspects, including its ease-of-use and extensibility, have made Joomla the most popular website software available. Best of all, Joomla is an open source solution that is freely available to everyone. **Joomla** is an open source platform on which Web sites and applications can be created. It is a content management system (CMS) which connects your site to a MySQLi, MySQL, or PostgreSQL database in order to make content management and delivery easier on both the site manager and visitor.

Content management system is software that keeps track of every piece of content on your Web site, much like your local public library keeps track of books and stores them. Content can be simple text, photos, music, video, documents, or just about anything you can think of. A major advantage of using a CMS is that it requires almost no technical skill or knowledge to manage. Content management system that allows you to create and maintain a website. It is open source which means that it's free.

Like other content management systems, Joomla removes much of the technical aspect of setting up and running a website.

Some Significant Features:

- Provides plugs ins and site modules to enhance websites and content.

- Over 6000 extensions available.

- Responsive templates adapt websites for various platforms, including mobile devices.

- Permission levels restrict site user file access while giving site workers access to the files they need to do their particular jobs.

- Support for different languages for different sites or site sections.

- Supports polls, search and web link management and analysis.

Centralized Antivirus System

Antivirus software, if properly installed on a computer system, can prevent access to computer systems by unwanted computer programs. Viruses, worms or Trojans Horses can be used by criminals or mischievous people (called Crackers). They can be used to steal information or damage computer systems. If no antivirus software is installed, hackers may be able to access the information in the computer.

Antivirus software uses many ways to protect the computer. They often search for signs of viruses in every website that is visited. Most also do a regular scan of all the data and files on the computer's hard disk.

Installing more than one antivirus is not a good idea. The 2 different antivirus software can interfere with each other.

CUK follows centralised Antivirus system. The advantage of this system is we can able to update all the user devices from the server itself. This will also save the precious internet band width since the clients will download the updates from internet server using local LAN rather than the direct internet download which used to be done earlier

In the CUK installed and operated with EScan Antivirus for the all systems. EScan Internet Security Suite (ISS) provides the best protection against Malware and other threats that lurk over the Internet. In addition to protecting your personal data, your identity, and network, eScan makes your online experience very safe, thus giving you peace of mind while you do online banking, shopping, or browse unpopular websites. EScan epitomizes the next generation of Antivirus software product that handles threats from a new perspective without compromising your computers performance. It is built on the MicroWorld Winsock Layer (MWL) technology. MWL forms a protective screen around your system and is always on guard from the moment you switch on your computer, till you shut it down.

escan Features

- Stylish, User-friendly & Trendy GUI

- eScan Security Network(Cloud Technology detects new and unknown threats)

- Advanced Virus Control (Smart Proactive Protection)

- Faster On-Demand Scanning

- Real-time Protection

- File & Folder Protection

- Effective Auto Back Up and Restore

- Advanced Anti-Spam

- Advanced Parental Control

- Effective Endpoint Security with USB Vaccination

- Two Way Firewall (Improved)

- Secure Delete

- Safe Mode Password Protection

- Automatic Downloads of Critical Windows® OS Patches

- eScan Rescue Mode

- Efficient Remote Support

- Uninterrupted Gaming Experience

- FREE Technical Support

- USB Vaccination

Internet and Wi-Fi

The **internet** is an informal term for the world-wide communication network of computers. The internet is used to send information quickly between computers around the world. It has millions of smaller domestic, academic, business, and government networks and websites, which together carry many different kinds of information (facts and details) and services. So in other words, the Internet is a network of networks.

The internet is used for many things, such as electronic mail, online chat, file transfer, and the interlinked web pages and other documents of the World Wide Web.

The most used service on the internet is the World Wide Web (which is also called the "Web"). The web contains websites. Blogs, and also wikis like Wikipedia. Webpages on the internet can be seen and read by anyone (unless the page needs a password, or it is blocked).

The second biggest use of the internet is to send and receive e-mail. E-mail is private and goes from one user to another. Instant messaging (such as AIM or ICQ) is similar to email, but allows two or more people to chat to each other much faster.

Wi-Fi enables a user to get access to internet anywhere in the given location. Now you can make a network in Hotels, Libraries, colleges, universities, campus, private institutes, and coffee shops and even on a public place to make your business more profitable and connect with their client any time. WiFi makes waves for business with their highly effective cable less media.

In CUK each computer connected with internet connection, areas like Kasaragod, Periye and Padannakkad and hostels. The Library has a separate Digital Resource Centre to provide access to Internet and other digital resources. The library is automated with KOHA Open Source Library System. The software is installed in the Linux platform (Debian) in the server computer and is accessible through all the nodes in the Library through the Wi-Fi network. An Internet connection with 8Mbps speed has been installed in the Library and is provided to the users through the Wi-Fi network in the Library. It will soon be switched over to 10Mbps connection provided by the INFLIBNET.

<u>Video-Conferencing</u>:-

Videoconferencing uses audio and video telecommunications to bring people at different sites together. Videoconferencing (VC) is the conduct of a videoconference (also known as a video conference or video teleconference) by a set of telecommunication technologies which allow two or more locations to communicate by simultaneous two-way video and audio transmissions. It has also been called 'visual collaboration' and is a type of groupware.

Videoconferencing differs from videophone calls in that it's designed to serve a conference or multiple locations rather than individuals.

The other components required for a videoconferencing system include:

- **Video input**: Video camera or webcam
- **Video output**: computer monitor, television or projector
- **Audio input**: Microphones, CD/DVD player, cassette player, or any other source of PreAmp audio outlet.
- **Audio output**: usually loudspeakers associated with the display device or telephone
- **Data transfer**: Analog or digital telephone network, LAN or Internet
- **Computer**: a data processing unit that ties together the other components, does the compressing and decompressing, and initiates and maintains the data linkage via the network

With the help of IT wings launched video conferencing facility in university, it got a successful result and through this media university did direct interview from oust side country also. Video conference is implementing as per the instruction of authority order for specific functions only.

Video conferencing has innovation to the university and by this around more than 40 candidates attended in conference and it implement through sky via and for this all the infrastructural facility arranged and run by IT wings except this video conference for outside India's and important personal conference are very significant changes made very successful in IT wings. For the video conference arranged different camera and projector at different angles and more over that before functioning the conference the System Analyst coordinated and communicated with candidate for regarding to arrange and adjust time and

ascertain training to individually each with the help of Skype and fixed camera and ensure all infrastructure settings.

As per schedule and planed date and time done all video conference to each candidate from the University, in day around 4-5 candidate video conference interview held. It was 'golden feather on the Hat' of CUK besides we never to simplify the effort behind it and its proud to say history of CUK IT Wings.

CUG (Closed User Group) Plan under BSNL

Closed User Groups are groups of GSM mobile telephone subscribers who can only make calls and receive calls from members within the group. The advantages of closed user groups are as following.

1. Free calls between members of closed user group.

2. Discounted calls to other mobile networks.

3. Discounted charges for internet usage.

It is a good offer compared to normal mobile network charges. The offer is only for corporate/institutional customers. If we convert our existing mobile connections offered to officials to this plan this can give us substantial savings. Also we can provide option for employees/outsource staffs who are interested in joining this group so that they can also avail the advantages of this plan. To subscribe to this plan any staff of CU-Kerala can take a postpaid connection and request University to bring them under this plan.

There are no subscription charges which have to be paid by University since BSNL has proposed that they will waive off the subscription charges. However the mobile numbers issued to statutory officials who join the plan as per their personal preference they will have to pay the bills themselves.

It is also suggested that 'IT Section' can act as the co-ordinating department for managing subscription of University staff to the CUG plan. However it is required that whenever any staff leaves/joins the institution intimation has to be given to this section so as to enable removal/addition of mobile numbers to the CUG plan.

This offer will be only to postpaid customers of BSNL and during the subscription drive, interested staff can convert their existing prepaid connection to postpaid connection.

Central Procurement Portal(CPP)

The Central Procurement Portal handling by IT section and uploading all departmental Tender details to the CPP only with permission of System Analyst. The Central Public Procurement Portal of Government of India facilitates all the Central Government Organizations to publish their Tender Enquiries, Corrigendum and Award of Contract details.

CPP Portal is the central source of procurement data for all Government of India entities. Available at " http://eprocure.gov.in." Entails publishing of all tender enquiries, corrigenda thereto and awards of contract thereon on the CPP Portal. Bids will be invited in paper based format. Users can login using a login ID and password. No need for any additional mode of authentication. The Central Public Procurement Portal of Government of India facilitates all the Central Government Organisations to publish their Tender Enquiries, Corrigenda and Award of Contract details. The system also enables users to migrate to total electronic procurement mode.

In CPP we can add Tender details such as Basic details, Payment Instruments, Cover Details, Tender Fee details, EMD Fee details, Work/Items, Critical Dates, Tender Documents, Tender Inviting Authority and Tender Creator Details.

Help Desk Software

IT Section has installed open source help desk software for providing technical support to Departments. Anyone can report technical issues and problems related to the computers and peripherals by sending an email to 'help@cukerala.ac.in'. Details are in the following format, while sending e-mails.

1. Department Name
2. Concerned Person
3. Issue Description
4. Model Number of Computer/Printer
5. Serial Number/ Service Tag(if available)

A client version of the software will be installed in the computers so as to enable technical support. 'IT coordinators' are requested to permit the installation of the client version of the software in the computers.

IT section has installed an open source help desk software named as 'spiceworks'. The features of Spice works software are as follows.

- ➢ spiceworks help desk software helps to run a ship-shape help desk, at the office. Manage user tickets, organize your work, create a custom user portal, and even launch a knowledge base.

- ➢ Tracking and reporting: This is a great feature that provides IT pros with a system for sharing, supervising, and submitting help desk reports. With the use of customized dashboards, you can review and manage the status of all pending issues at a glance.

- ➢ Calendar scheduling: Online help desk should also provide a calendar, which is useful for scheduling issues or employee service requests that don't require an immediate response.

- ➢ Knowledge Base: Look for software solution that offers a knowledge base. This component provides common solutions to previous problems

that are likely to come up again, and prevents them from reoccurring. A knowledge base can provide answers to some of the most common issues.

The main advantage of the software is that the technical calls can be reported by simply sending an email to 'help@cukerala.ac.in'.