**Name of the Department: Computer Science and Engineering (Networks)**
Name of Research and Education center: CSE (Networks)

Research & Education Center
CSE(Networks)

About the Center:
The Research & Education Center for CSE(Networks) serves as a dynamic hub for exploring and innovating in areas such as networks, security and network monitoring. With cutting-edge facilities and expert faculty, it fosters groundbreaking research in networking. The center empowers students with hands-on experience, equipping them with skills to tackle real-world challenges. Faculty, researchers and students collaborate in this dynamic environment to deploy efficient routed networks, create packet analysis tools, network management solutions, deployment of automation in the field of networking.
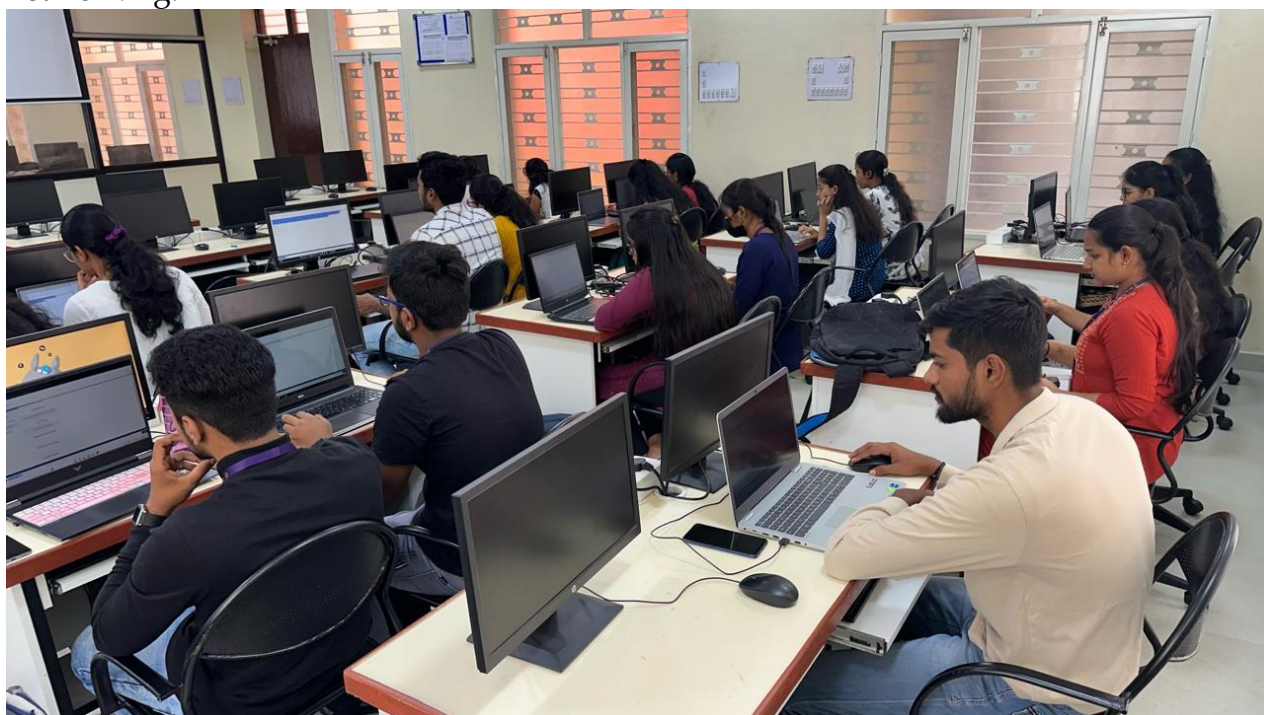
The primary functions of the center:
Architectures and considerations related to designing, securing, operating, and troubleshooting networks at Local and enterprise level.
Wide area network (WAN) technologies and quality of service (QoS) mechanisms to create secure remote access.
Implementation of software-defined networking for effective device management
Application of virtualization functions so as to implement networks in cloud environments
Automation concepts that support the digitalization of networks.

ISO 9001:2015   AICTE-CII: GOLD Category Institute   NAAC-'A' Grade Institute (CGPA: 3.21)

KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE
Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506015, TELANGANA, INDIA
काकतीय प्रौद्योगिकी एवं विज्ञान संस्थान, वरंगल - ५०६०१५, तेलंगाना, भारत
కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ – ౫౦౬ ౦౧౫ తెలంగాణ, భారతదేశము
(An Autonomous Institute under Kakatiya University, Warangal)
(Approved by AICTE, New Delhi; Recognised by UGC under 2(f) & 12(B); Sponsored by EKASILA EDUCATION SOCIETY)
Estd: 1980   KITSW

website: www.kitsw.ac.in   E-mail: principal@kitsw.ac.in   ☎ : +91 9392055211, +91 7382564888

Major equipments:
Nodes: 77 + 1 Server
Cost of new equipment added since 2018-19:   Rs: 50,88,874=00
Minor equipment details: N/A

Major software list with description:
Operating Systems:
       Windows 11 Operating System,
       Ubuntu, Redhat Linux OS,

Application software:
       CISCO Packet Tracer
       Wireshark
       Nmap
       Pcap
       Dev-C++
       Jdk1.8
       Python (Anaconda) framework
       Oracle10g
       Android Studio,
       XAMPP server
       MS-Office

Virtualization Software:
       Oracle VM Virtualbox

Network Simulation:
       CISCO Packet Tracer
       GNS3
       Mininet

Types of projects / research carried out with description:
- **Network Routing**: Developing algorithms for basic network route creation using simulation tools like CISCO Packet Tracer, GNS3
- **Network monitoring tools:** Developing solutions for monitoring networks in LAN and WAN networks by implementing SNMP
- **Network Packet Analysis:** Analyzing network packet data which is scanned in real time network either in LAN/WAN to and prepare brief information on data analyzed.
- **Spam Content Filtering/Monitoring**: Develop tools/software to monitor the spam content in the existing networks and give alerts so as to secure the nodes/servers in the network .
- **Network Simulation:** Developing network solutions through simulations with the help of simulation tools like CISCO Packet Tracer, GNS3.

Photographs of working models / application software developed with description:

Title: Real Time network traffic analysis using Apache Spark (Kafka)

Network traffic analysis is a process of capturing a continuous stream of data generally packet, analysing the captured data in order to detect and respond to security threats within a shorter period of time. Real time streaming platform, Apache Spark is used to process and analyze the network traffic. It continuously monitors the packets captured by Wireshark, gives insight about the usage of vulnerable network traffic and detects malware activity.

```
-------------------------------------------------------------------
Batch: 5
-------------------------------------------------------------------
+-----+------------+-------------+-----+-----+-----+-------------------+
|count|      src_ip|       dst_ip|proto|sport|dport|          timestamp|
+-----+------------+-------------+-----+-----+-----+-------------------+
|   20|192.168.1.7| 192.168.1.11|   17|41618|59356|2021-09-13 08:02:...|
|   21|192.168.1.7| 192.168.1.11|   17|41618|59356|2021-09-13 08:02:...|
|   22|192.168.1.7| 192.168.1.11|   17|41618|59356|2021-09-13 08:02:...|
|   23|192.168.1.7| 192.168.1.11|   17|41618|59356|2021-09-13 08:02:...|
|   24|192.168.1.7|192.168.1.255|   17| 9956| 9956|2021-09-13 08:02:...|
+-----+------------+-------------+-----+-----+-----+-------------------+


-------------------------------------------------------------------
Batch: 6
-------------------------------------------------------------------
+-----+-------------+-------------+-----+-----+-----+-------------------+
|count|       src_ip|       dst_ip|proto|sport|dport|          timestamp|
+-----+-------------+-------------+-----+-----+-----+-------------------+
|   25| 192.168.1.7|192.168.1.255|   17| 9956| 9956|2021-09-13 08:02:...|
|   26| 192.168.1.11|74.125.68.188|    6|56812| 5228|2021-09-13 08:02:...|
|   27|74.125.68.188| 192.168.1.11|    6| 5228|56812|2021-09-13 08:02:...|
+-----+-------------+-------------+-----+-----+-----+-------------------+
```

Title: Packet capturing and analysis using Wireshark tool

Using this approach, live network traffic capturing can be done and data can be stored into a file for further analysis. All the types of protocol data can be captured using Wireshark.
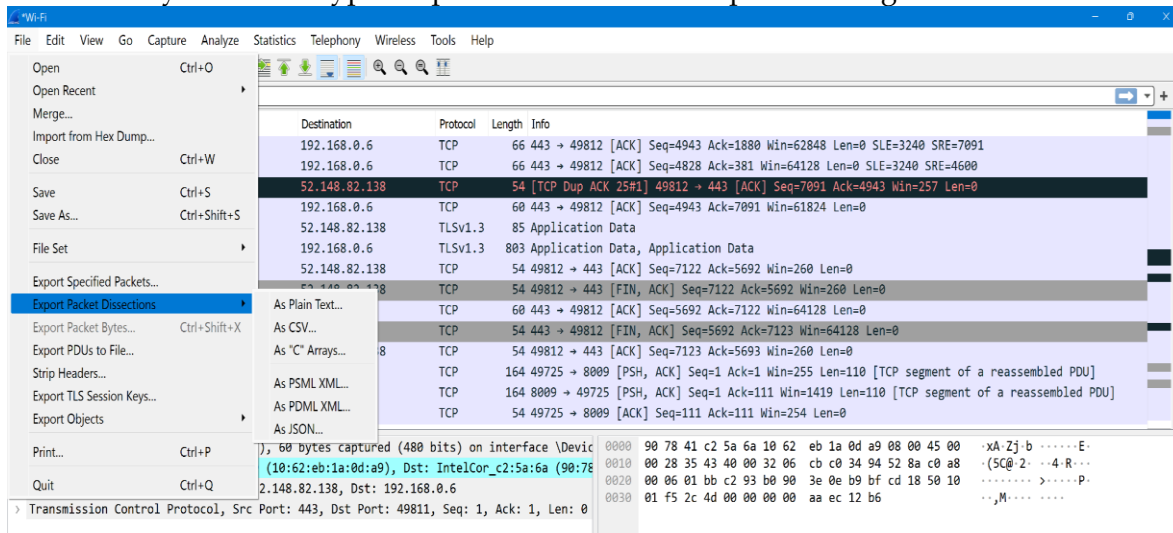
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Title: Security Using Post Quantum cryptography

A novel hybrid universal network-coding cryptosystem (HUNCC) to obtain secure post-quantum cryptography at high communication rates. The proposed Hybrid Universal Network-Coding Cryptosystem (HUNCC) combines information-theory security with public-key cryptography to achieve secure post-quantum cryptography at high communication rates.

Details of Faculty incharge for Research and Education Center: (Photo, Contact details)

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