School of Computing Science and Engineering

Course Code : CSCN 4021

Course Name: Cyber Crime Investigation

UNIT I

PRESEARCH CONSIDERATION & ACQUISITION

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Name of the Faculty: Dr. Jayakumar

Program Name: B.Tech

Outline

- Digital Evidence and Recovery
  - Digital Evidence on Computer Systems
  - Digital Evidence on Networks
- Challenges

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Computer (or Cyber) Forensics

(Warren, G. Kruse ii and Jay G. Heiser, 2002, *Computer Forensics – Incident Response Essentials*, Addison Wesley)

- Methodology:
  - Acquire the evidence without altering or damaging the original.
  - Authenticate that the recovered evidence is the same as the original seized.
  - Analyze the data without modifying it.

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Category of Digital Evidence

- Hardware
- Software
  - Data
  - Programs

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Digital Evidence

- Definition
  - Digital data that can establish that a crime has been committed or can provide a link between a crime and its victim or a crime and its perpetrator.(source: Casey, Eoghan, *Digital Evidence and Computer Crime: Forensic Science, Computer and the Internet*,Academic Press, 2000.)
  - Categories
    - Text
    - Audio
    - Image
    - Video

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Where Evidence Resides

- Computer systems
  - Logical file system
    - File system
      - Files, directories and folders, FAT, Clusters, Partitions, Sectors
    - Random Access memory
    - Physical storage media
      - magnetic force microscopy can be used to recover data from overwritten area.
  - Slack space
    - space allocated to file but not actually used due to internal fragmentation.
  - Unallocated space

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Where Evidence Resides (continued)

- Computer networks.
  - Application Layer
  - Transportation Layer
  - Network Layer
  - Data Link Layer

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Evidence on Application Layer

- Web pages, Online documents.
- E-Mail messages.
- News group archives.
- Archive files.
- Chat room archives.
- …

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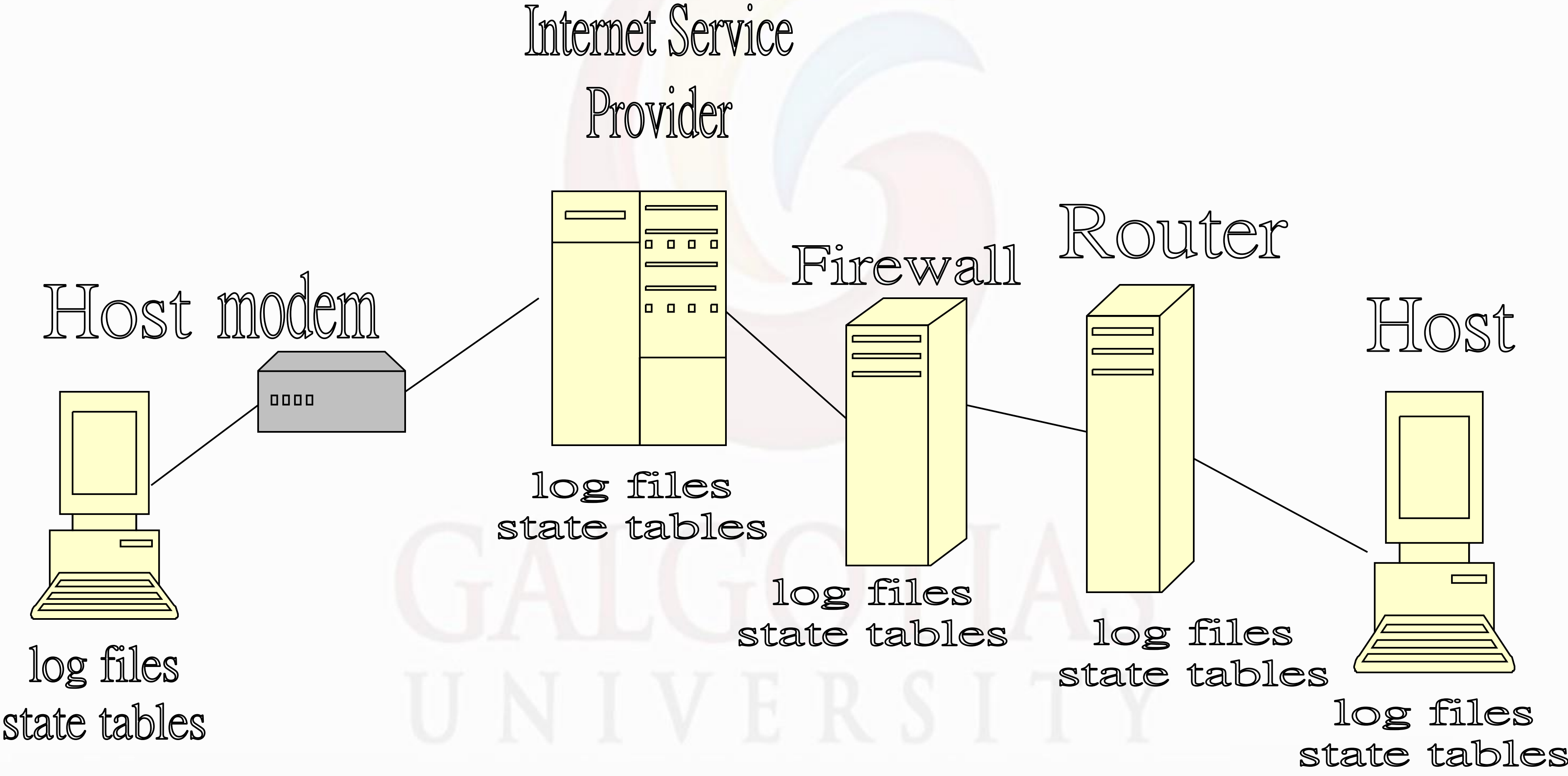
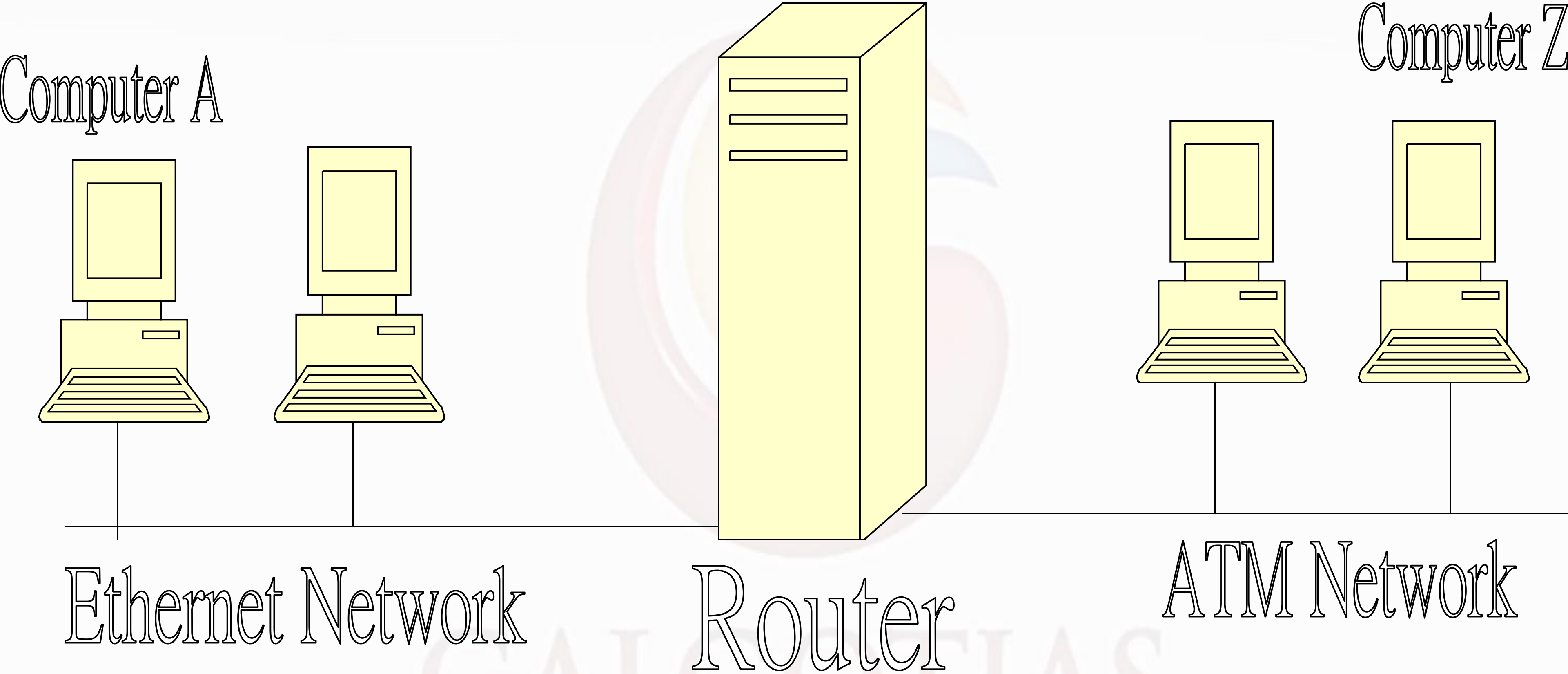
Evidence on Transport and Network Layers



Evidence on the Data-link and Physical Layers



MAC --> IP

MAC <-- IP

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Challenges of Computer Forensics (continued)

- How to collect the specific, probative, and case-related information from very large groups of files?
  - Link analysis
  - Visualization
- Enabling techniques for lead discovery from very large groups of files:
  - Text mining
  - Data mining
  - Intelligent information retrieval

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Challenges of Computer Forensics (continued)

- Computer forensics must also adapt quickly to new products and innovations with valid and reliable examination and analysis techniques.

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References

- Cyber Crime Investigations: Bridging the Gaps Between Security Professionals, Law Enforcement, and Prosecutors Kindle Edition by Anthony Reyes (Author), Richard Brittson (Author), Kevin O'Shea
- Investigation Manual for Cyber Crime & Cyber Laws Kindle Edition by Rohan Nyayadhish (Author), Kunal Kumar
- The 2020 Cyber Security & Cyber Law Guide Kindle Edition by Hazim Gaber (Author) Format: Kindle Edition

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Thank You