



Cybersecurity

Distributed processing and ubiquitous high-speed networks empower a vision for instant access to any information, anywhere, at any time. How will we protect privacy, property and system integrity of “digital everything”?

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Cybersecurity

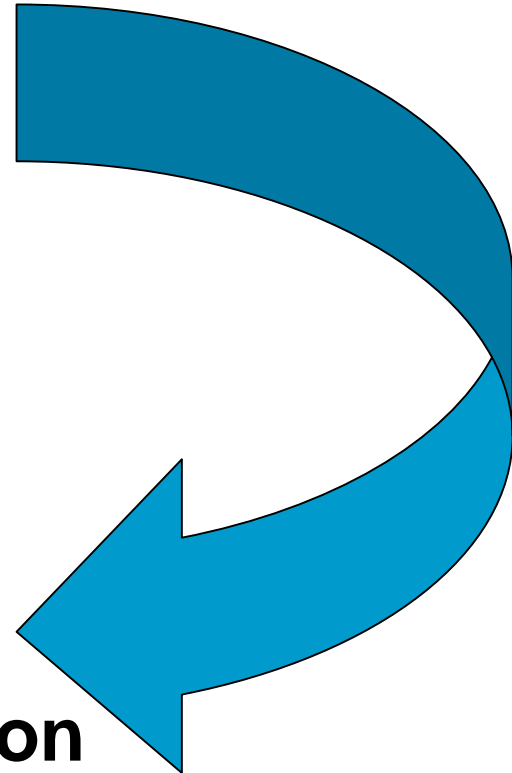
- *Secure Information Anywhere, Anytime* -

- ➔ **Authentication**
- ➔ **Access Control**
- ➔ **Activity Monitoring**
- ➔ **Abnormal Recovery**
- ➔ **Apprehension**

Secured Storage

Secure Operation

Secured Transmission





Cybersecurity

- *Functional Competencies* -

- Secured digital multi-media
 - Y.Q. Shi, A. Dhawan, N. Ansari, A. Akansu
- Intrusion/Anomaly detection
 - S. Papavassiliou, C. Manikopoulos
- Attack traceback
 - N. Ansari
- Security system support infrastructure
 - S. Zivras, Z. Zhu, S. Tekinay, R. Rojas-Cessa
- Sensor networks
 - S. Tekinay, S. Papavassiliou, N. Ansari



Cybersecurity

- *Institutional Resources* -

- NJ Multimedia Research Center
- NJ Wireless & Internet Security Center
- NSA Center of Excellence in Information Assurance Education
- Strong DoD, Industrial & NSF Support
- 10 faculty members: - Plus Collaboration with Princeton, RU, SIT

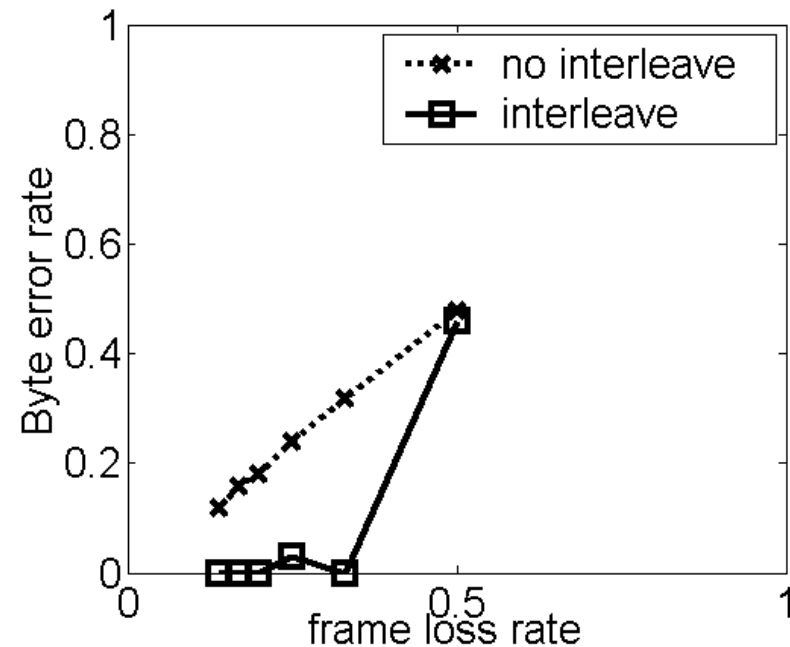
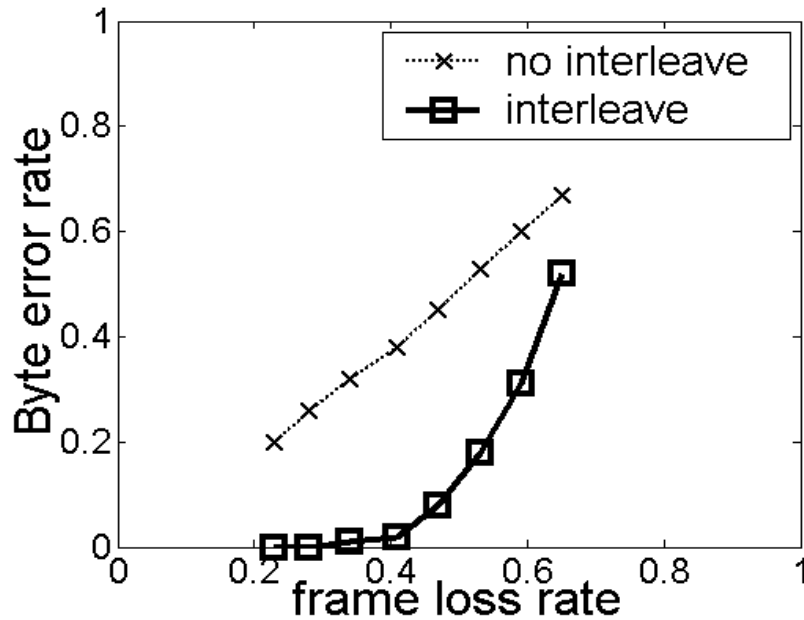


Cybersecurity

- *Sample Projects* -



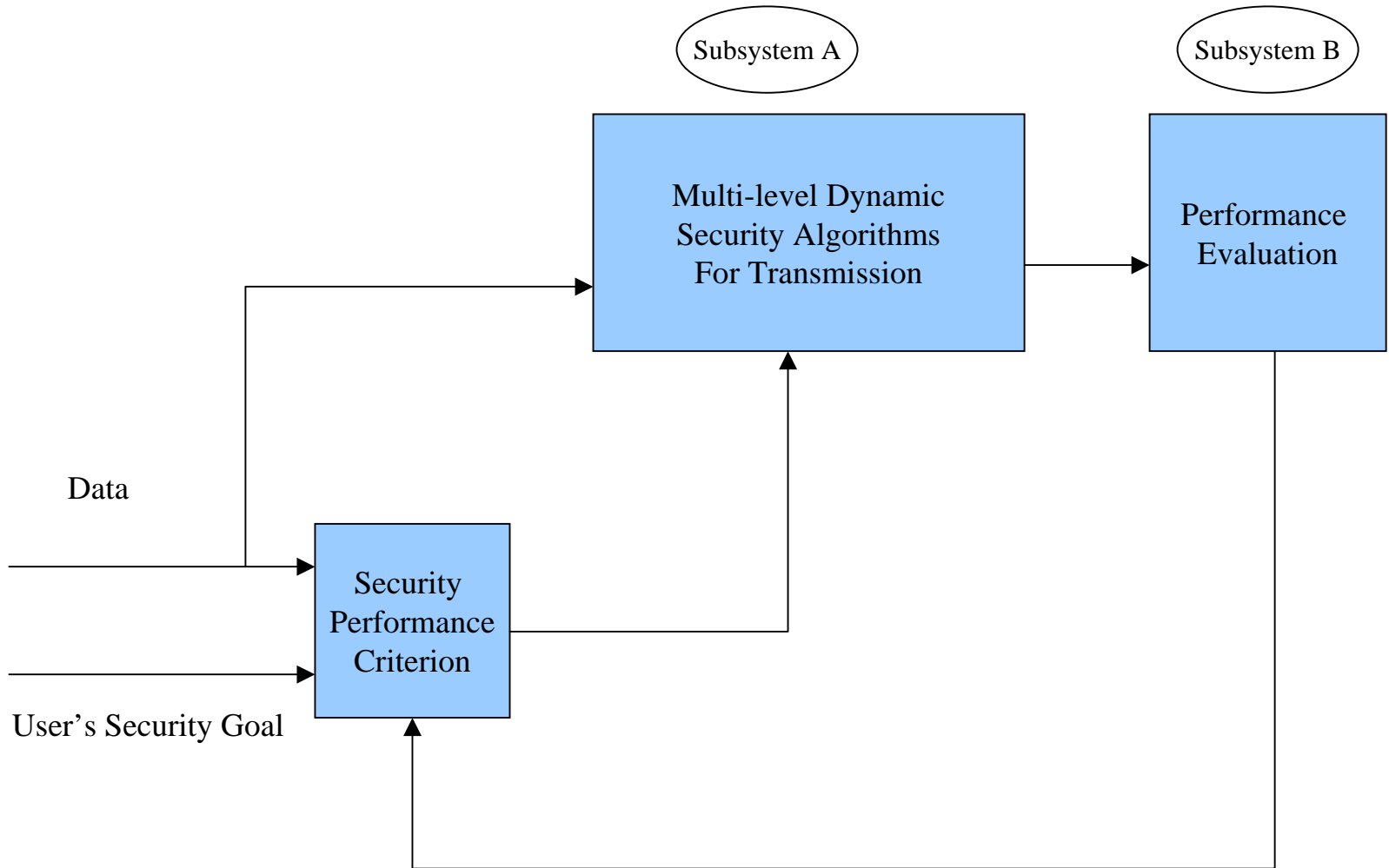
DWT blind data hiding experiments on “Mobile”, “Salesman” videos



- Left: Robustness to consecutive frame loss
- Right: Robustness to random frame loss



Multi-level Dynamic Security (MDS)





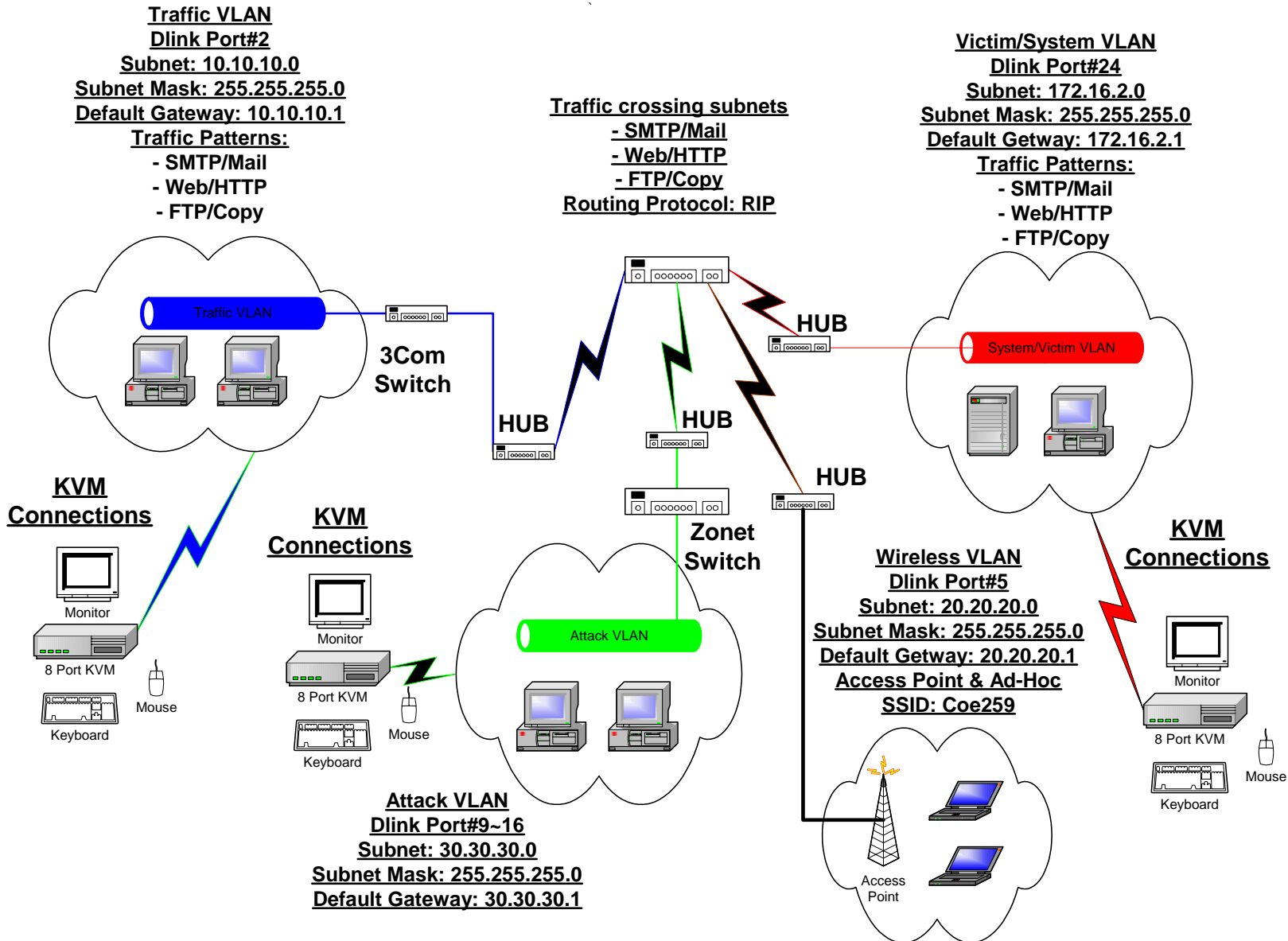
Cyberwarfare Network Testbed

- Conduct “red-blue team” network attack exercises.
- Evaluate: Intrusion Detection Systems
Intrusion Prevention Systems
- About 4 dozen students currently participating in the CONEX-NJWINS testbed cyberwarfare experiments.



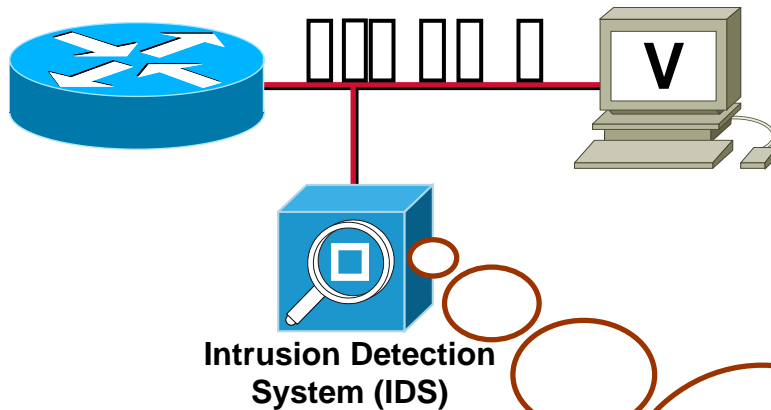
COE INTRUSION DETECTION SITE BUILD AND DETAILS

Completed for Dr. Manikopoulos





IP Traceback



Attack!!!

Who attacked me?

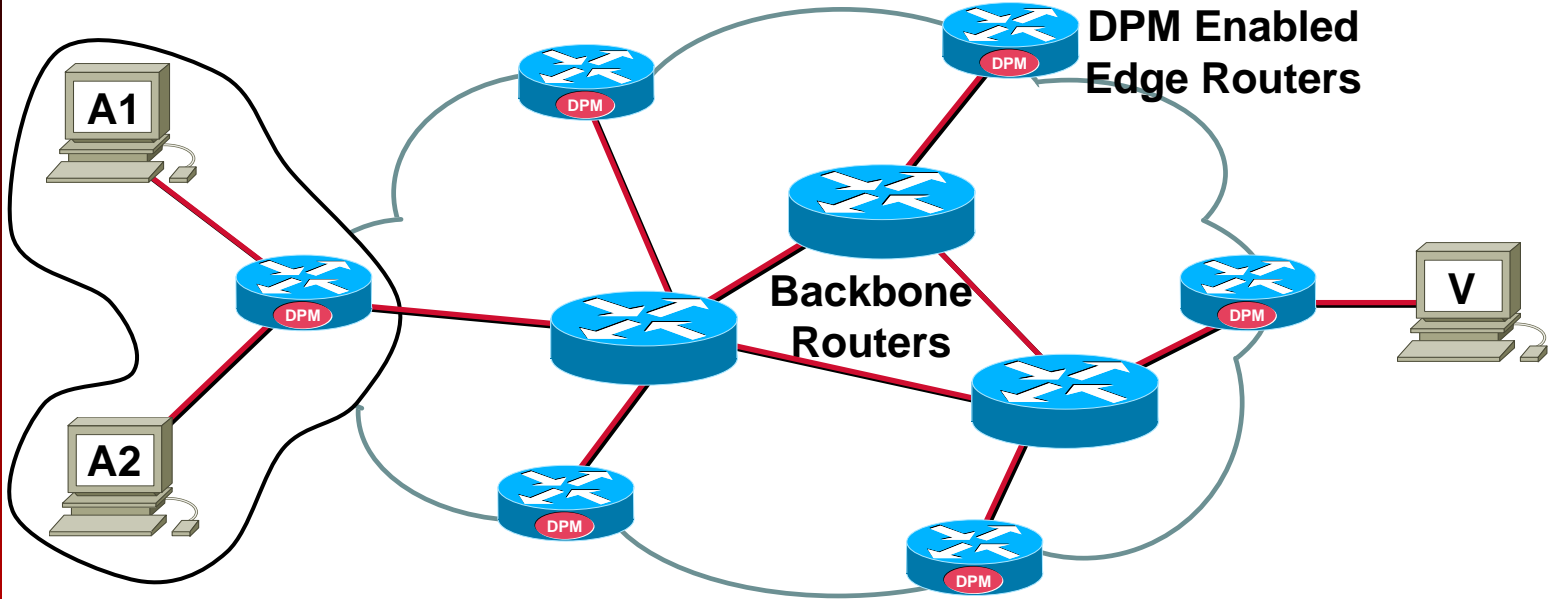
I will look at the Source Address (SA) field of IP pkt. and find out!

Source Address is SPOOFED!

Need IP Traceback!!!



IP Traceback with DPM





An Existing Testbed

- A state-of-the-art extensive and robust test bed network with a fiber optic backbone and various cutting edge networking technologies.
- Provides a perfect example of a real world inter-network.

