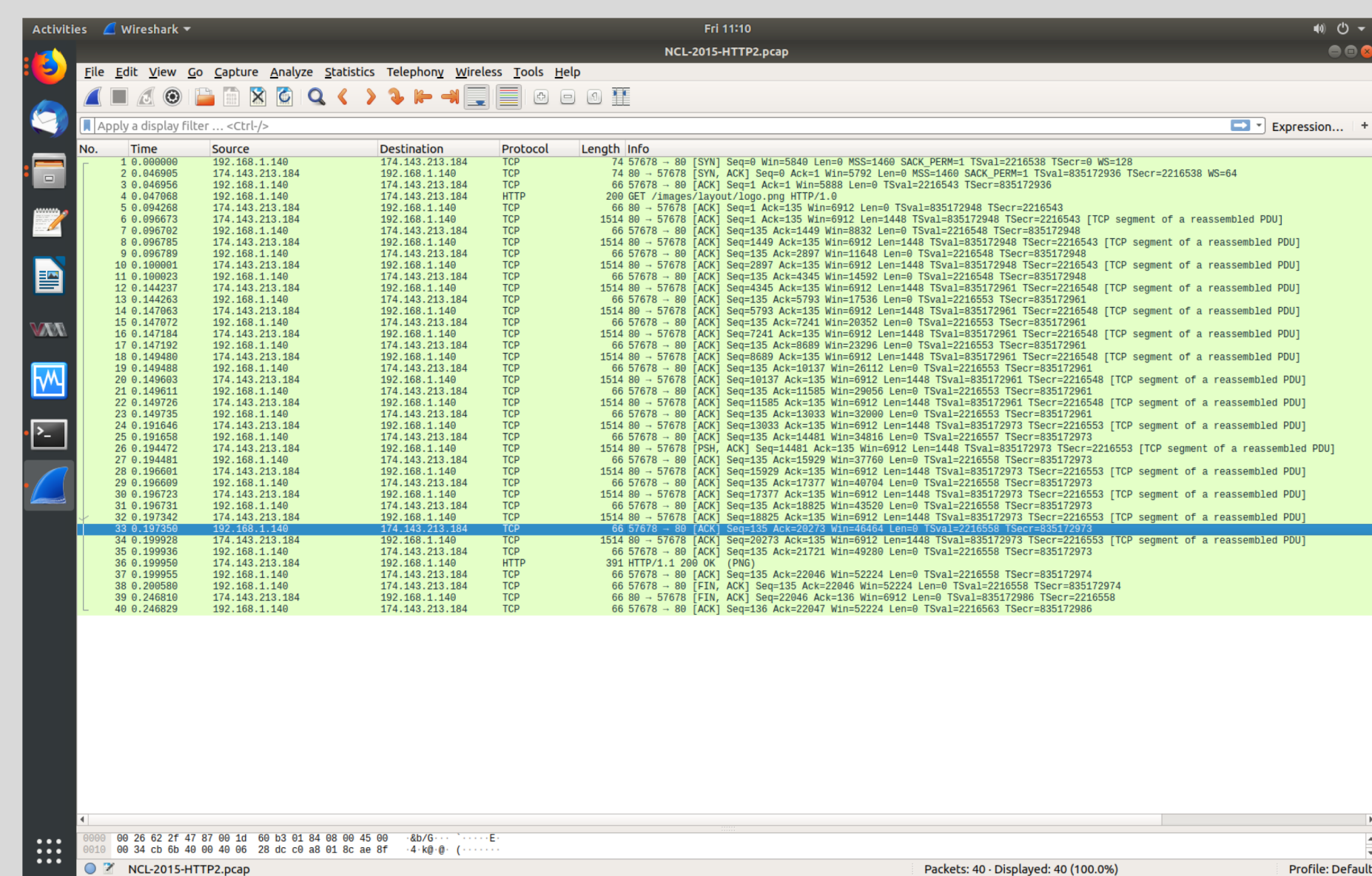# RET Site: Research Experience in Cybersecurity for Nevada Teachers (RECNT)

Josh Barham

Ignacio Astaburuaga

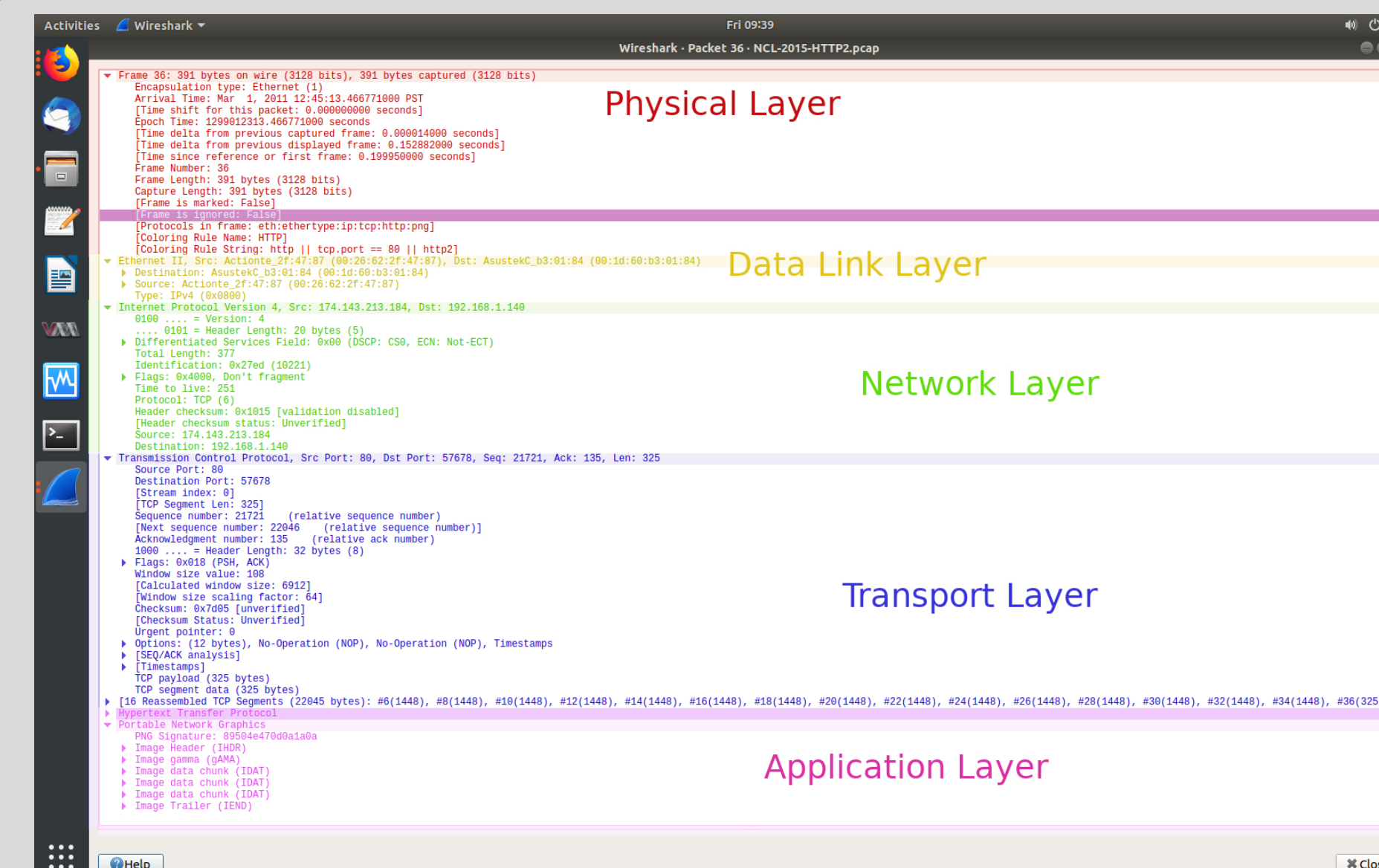PI: Shamik Sengupta, Co-PI: David Feil-Seifer

Introduction

Students at Carson High school will learn about and explore network packets. They will spend time not only learning about what a packet is but will also spend time dissecting them and analyzing how their data is being sent around the network.

Essential Questions

Some of the essential question's students will be able to answer are:
- What is a packet?
  - What kind of information can be found in a packet?
  - Why do we send data in packets?
- Are all network communication devices secure?
- What can be done to increase communication security
- What is encryption and why is it used?

Methodology

Before learning about packets students will be presented with some discussion questions. After discussing with classmates we will have a classroom discussion about the prompts. Students will use a guided note taker to help in learning about packets. Once complete students will perform a lab using wire shark to analyze packets and look for security vulnerabilities. They will also explore methods of securing said vulnerabilities.

Common Security Methods

Students will explore different ways networks are secured. They will look a different protocols that are being used and identify which ones offer security vulnerabilities and which ones are secure. They will explore other security methods like firewalls, Anti Malware programs, MAC filtering, etc.. and identify their security features as well as ways they can be fooled or bypassed. Students will also learn about encryption, what It is and why we use it.
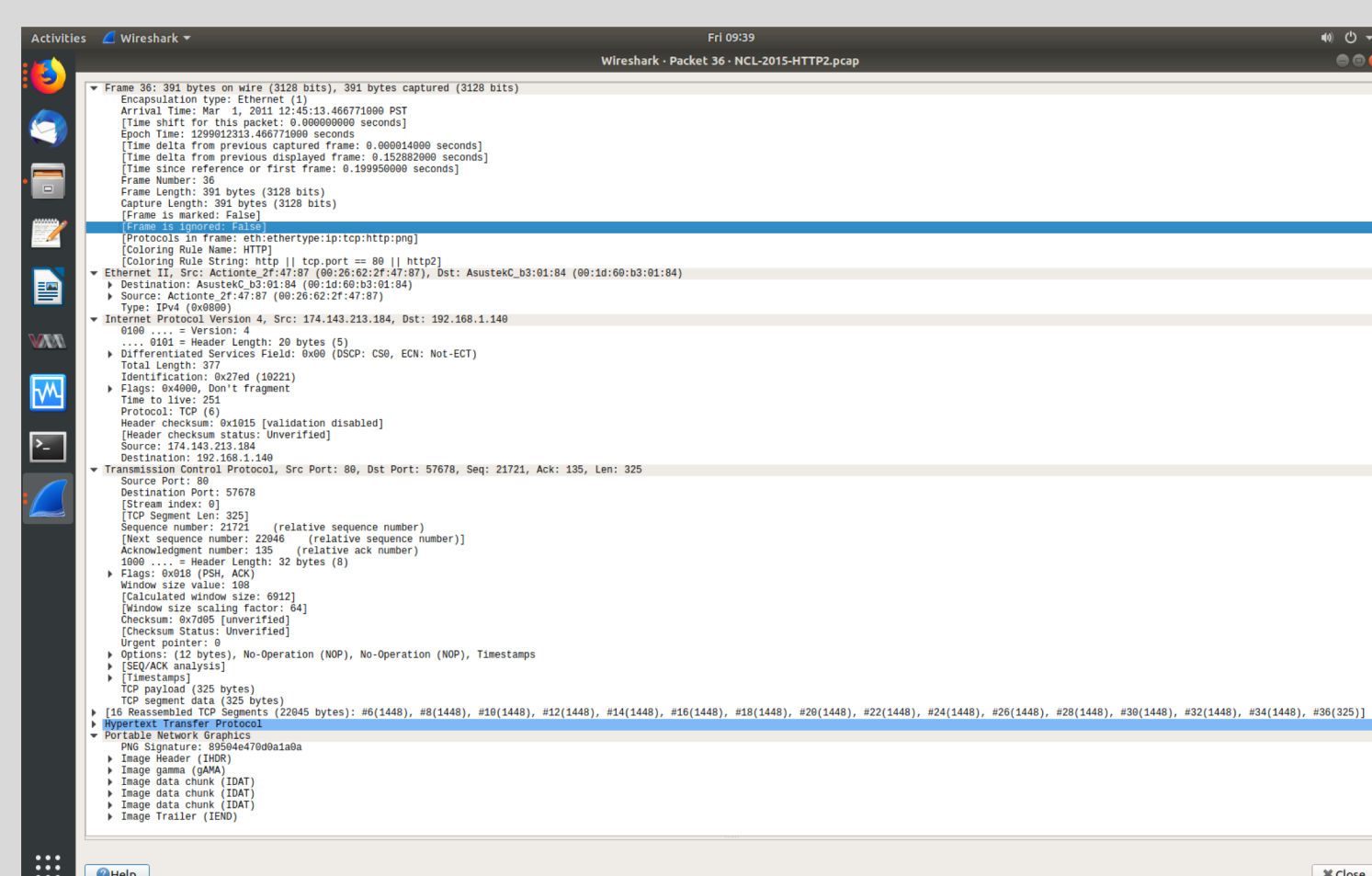
UAV's

DJI Tello drones will be used to explore the application of some of the concepts learned. Students will be tasked with learning how to program the drones to carry out various assignments. They will explore the drone's security and try different types of attacks against the drone. Once vulnerabilities have been discovered students will work to try and find ways to secure them

Evaluation

Pre-Assessment:
Students will first participate in group discussion and then classroom discussion based of given prompts.

Post-Assessment:
Students will use their newly obtained knowledge to complete a worksheet on packets. Students will also be given a formative assessment at the end of the unit and again at the end of the semester.