

# **Using AppleTV for Classrooms**

and other Interesting things

David Farmer

Winter 2012 Joint Techs

Lightning Talk

# Why do you care?

- IOS 5 on iPad 2 or iPhone 4S can screen share
- Professors want to use their iPads to present in the classroom
- Professors want the students to show what is on their iPads to the rest of the class
- Most important its just a COOL TOY!!!!

# AppleTV

- Literally a little black box



# AppleTV Ports

- HDMI
- Optical Digital Audio
- 10/100 Base-T Ethernet
- AC Power
- Micro-USB for services and support



↑  
0.9"  
↓

# AppleTV WiFi

- WiFi Support
  - 802.11 a/b/g/n
  - WEP or WPA/WPA2 PSK Security only
- So You CAN'T connect it to many campus wireless infrastructures
  - No WPA/WPA2 Enterprise Security
  - Embedded with no web browser
  - Maybe can to MAC auth if you support that

# AirPlay

- Screen Sharing uses AirPlay
  - Originally for streaming Music over the Network
  - Extended to streaming Video over the Network
  - Now Extended for Screen Sharing over the Network

# AirPlay and Bonjour

- AirPlay uses Bonjour
  - A.K.A. ZeroConf, Multicast DNS, DNS Service discovery
  - Only supports .local domain discovery and not full Wide-Area DNS Service Discovery

# What does this mean?

- WiFi network must support Link-Local Multicast
- AppleTV need to be in same broadcast domain as iPads or iPhones
- Or, need something to Proxy or Reflect Multicast DNS-SD



# DNS-SD between Subnets

- Mac OS DNS-SD
  - There is a Mac OS command “dns-sd -P ....” that will make proxy DNS-SD announcements
- Avahi
  - Avahi is a LINUX implementation of DNS-SD (Zeroconf)
  - The Avahi Daemon includes a Reflector function (disabled by default) that will reflect DNS-SD requests and responses between subnets

# MAC OS DNS-SD Example

```
dns-sd -P AppleTV _airplay._tcp . 7000 AppleTV.local  
134.84.116.113 "deviceid=28:CF:DA:10:A3:A6"  
"features=0x39f7" "model=AppleTV2,1" "srcvers=120.2"  
dns-sd -P 28CFDA10A3A6@AppleTV _raop._tcp . 49152  
AppleTV.local 134.84.116.113 "am=AppleTV2,1" "ch=2"  
"cn=0,1,2,3" "da=true" "et=0,3" "md=0,1,2" "pw=false"  
"sf=0x4" "sr=44100" "ss=16" "sv=false" "tp=UDP"  
"txtvers=1" "vn=65537" "vs=120.2"
```

# Other Tidbits

- Mac iTunes uses a TTL of 2 for AirPlay packets
- iOS 5 uses a TTL of 64 for AirPlay Packets
- See [www.hdfury.com](http://www.hdfury.com) for a excellent HDMI to VGA converter
  - Full Digital to Analog and HDCP deciphering

# DEMO

- Hopefully this was a live demo
- Also, an AppleTV will be setup downstairs if you want to play with your iPad or iPhone 4S following the session