Aruba WiFi, Airwave, and Clearpass at NCAR

Better Wifi, easier to use, more secure

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Agenda:

- Introduction to the NETS wireless crew
- A very brief note on origin of “ISM bands” (Industry, Science, Medical)
- New Aruba Access Points replace old Cisco APs
- Airwave to monitor wireless network usage and issues
- Clearpass to replace homegrown NETS wireless authorization system
The NETS wireless crew:

- Jerome Martinez and Richard Mumford, assisted by Del Harris and Bryan Anderson - Physical layer and installation
- Jeff Custard, Susan Guastella, Fabian Guerrero, Marla Meehl – Decision making and purchasing
- Scot Colburn, John Hernandez, Pete Siemsen – Network management
Industrial, Science, Medical (aka “I.S.M. bands”)

ISM bands were first established at the International Telecommunications Conference of the ITU in Atlantic City, 1947: "The delegate of the United States, referring to his request that the frequency 2450 Mc/s be allocated for I.S.M., indicated that there was in existence in the United States, and working on this frequency a diathermy machine and an electronic cooker, and that the latter might eventually be installed in transatlantic ships and airplanes. There was therefore some point in attempting to reach world agreement on this subject.” (wikipedia.org/ISM_Band)
Aruba IAP-215

- 450 Mbps on 2.4GHz 802.11N
- 1.3 Gbps on 5 GHz 802.11AC
- “3x3:3SS” means 3x3 MIMO (Multiple-In Multiple-Out), 3 spatial streams
- Six integrated antennas, three for each band
  - Pointing ~45 degrees down, aimed 120 degrees apart

(OSX: Option-Click on WiFi icon to see this)
ClearPass Policy Manager...
but first, how it works today:

- UCAR has four WiFi networks:
  - **UCAR Internal** – EAP-TLS (Extensible Authorization Protocol – Transport Layer Security), essentially certificate-mediated access, the gold standard.
  - **eduroam** – EAP-TLS access for non-UCAR administered devices and visitors to same network as UCAR Guest.
  - **UCAR Guest** – WPA2-PSK (Wifi Protected Access – Pre-Shared Key)
  - **UCAR VPN Clients** – limited access unauthenticated access to NCAR VPN server

- EAP-TLS supported using home-brewed FreeRadius, OpenSSL, and Django, running on a couple Debian servers.
ClearPass Policy Manager

- "...provides role- and device-based network access control for employees and guests"
- Self-service Onboarding or guest registration using web login, e-mail or SMS password
- Supports Active Directory, RADIUS, EAP-TLS
- Hosts the Certificate Authority required to issue EAP-TLS certificates, and OCSP (Online Certificate Status Protocol) to revoke them
- Device profiling: an iPhone that becomes a Chromebook is likely a doppelganger
- In concert with an Intrusion Detection System, especially a Palo Alto IDS, can dynamically quarantine an infected mobile device and alert managers
ClearPass Policy Manager plausible “captive portal” page:

Choose one:
1. Already have a guest account?
   Enter credentials here: Username/Password.
2. Need a guest account?
   Click here to Create A Guest Account via UCAR sponsor, e-mail, or SMS
3. UCAR employee with a UCAR-administered device?
   Click here for UCAR Inside Onboarding (if a sysadmin can vet the device)
4. UCAR employee with a personal cell phone, tablet or laptop?
   Click here for eduroam Onboarding (using Active Directory credentials)
5. UCAR employee wanting to create guest accounts for visitors?
   Click here for Guest Account administration
Other useful features of ClearPass Policy Manager

- Use SMS or e-mail to send a potential guest a 6-digit password
  - This connects the guest account to a e-mail address or telephone number

- In concert with an Intrusion Detection System, especially a Palo Alto IDS, dynamically quarantine an infected mobile device and alert managers

- Profile a device, and alert on profile changes
  - Profile built up from DHCP and Web fingerprinting.
  - For example, an iPhone that becomes a Chromebook is likely a doppelganger
Thank you!

Questions? Comments?

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