



Installation

Planning and Deployment

Skills Learned

You'll be able to:

- > Describe factors to be considered prior to installation

Practice Description

Lab will cover:

- > Pre-installation planning
- > Deployment best practices

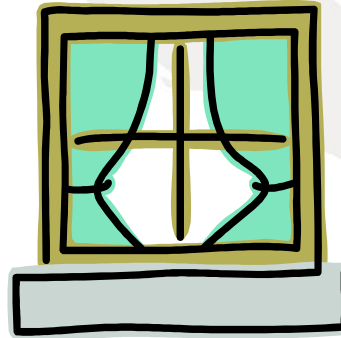
Background – How Does Radio Behave?

> Like light

- Gets dimmer the further away you are



- Goes through clear things
- Goes somewhat through others
- Is stopped by yet others



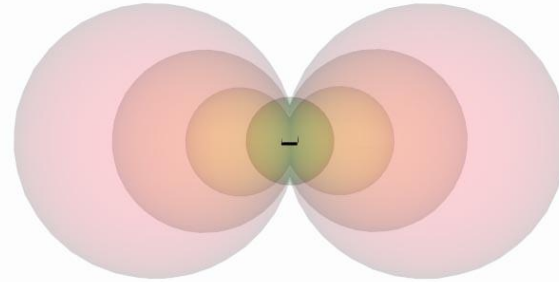
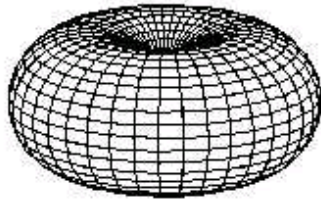
- Can be focused



Antennas Focus Radio

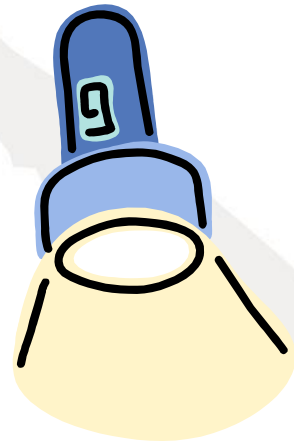
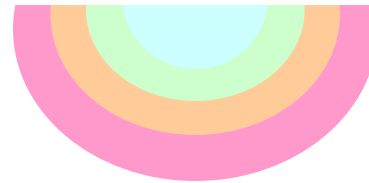
> “Omnidirectional”

- Toroidal-shaped RF field centered around the pole of the antenna



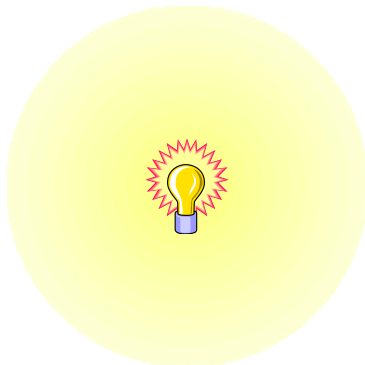
> Directional / Sector / Patch / Panel

- Focused and aimed in varying amounts of “beamwidth”
 - 180°
 - 120°
 - 90°



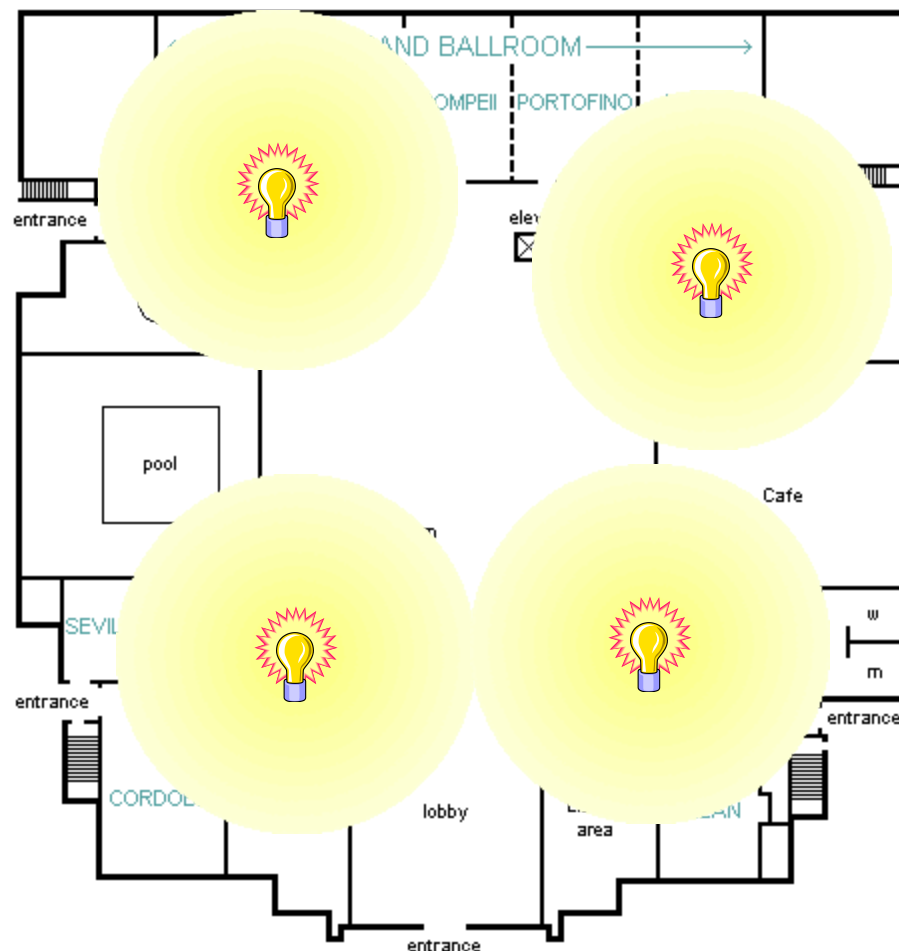
AP Placement Somewhat Like Lighting...

- > You need enough “lightbulbs” (APs)
- > You need them placed correctly
- > You need enough “light” (bandwidth) so everyone can see



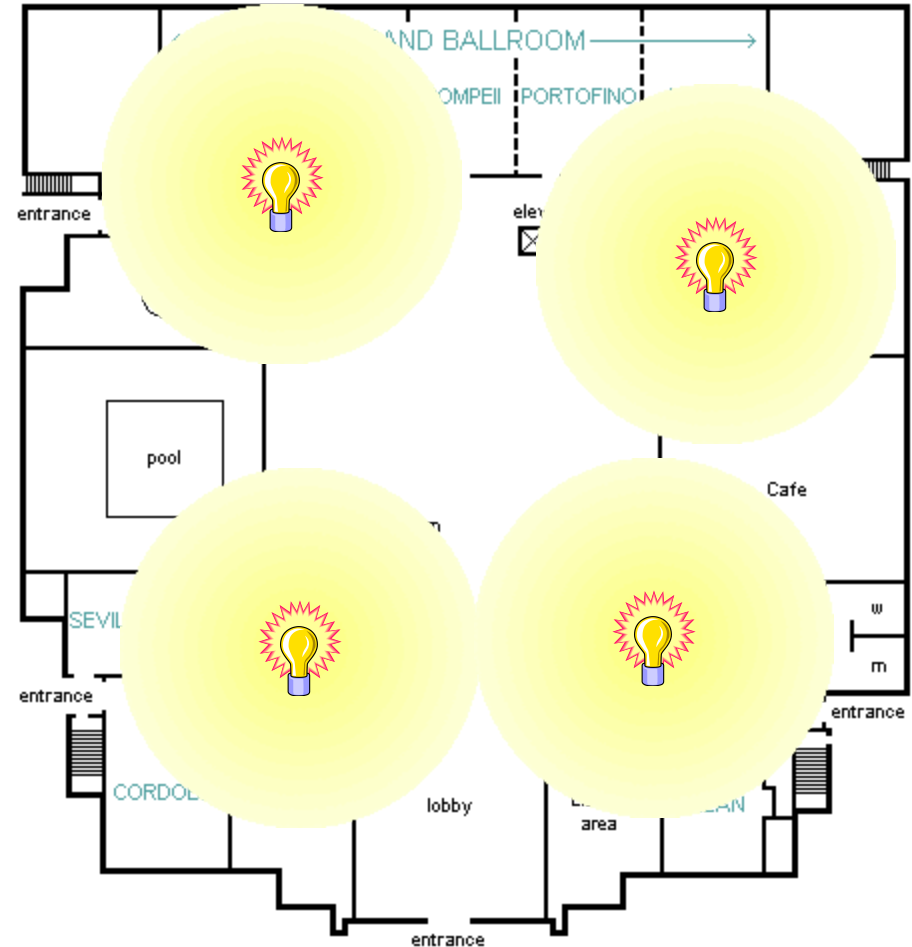
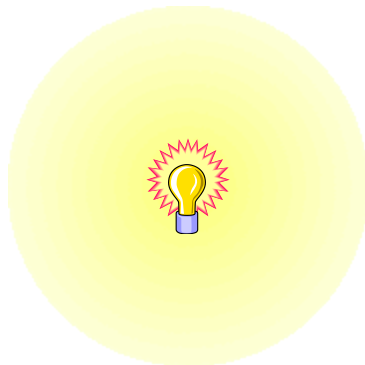
...Not Exactly...

- > Most people cannot see radio waves
 - Need to use site survey tools to verify coverage
- > People have to share the “light”
 - Total amount (of bandwidth) is split amongst all people
 - As more people join it is a little dimmer for everyone



...but with Meru, it is Close Enough

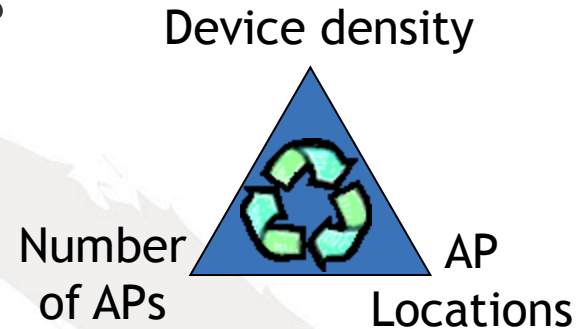
- > If an area is uncovered, or too dim, add another “lightbulb” (AP)



Installation Phases

> Planning: Where is the network needed?

- AP locations
- Device density
- Number of APs

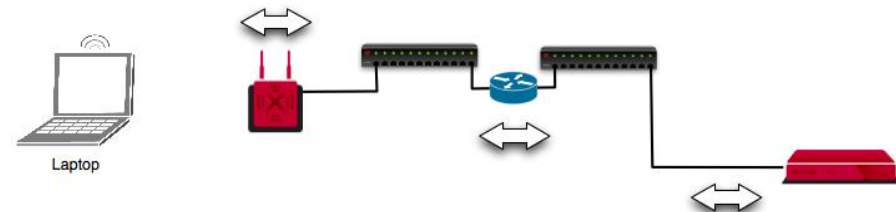


> Install APs

- Wiring (if needed)
- PoE availability


> Integrate with backbone network

- VLAN distribution
- Client IP address ranges (DHCP config)
- Authentication policies



Where is the Network Needed?

- > Assist you in collecting the information you will need for a well-considered deployment
- > Provided in spreadsheet format

Wireless Network Implementation Interview									
Wireless Requirements									
Engineer:									
Interviewee:									
Company Name:									
Date:									
1.	How many buildings will be implemented in all?								
2.	Will the implementation use a phased approach?								
3.	If implementation is phased, then how many phases and how many bldgs per phase?								
4.	Please provide the names of the buildings for each phase and addresses?								
5.	Are buildings fully wired with correct cabling (including PoE)?								
6.	Have the blueprints for these buildings been submitted, if not can we get copies?								
7.	Do you have any information on the materials used for interior walls?								
8.	Are there any known RF interference barriers or radiators in these buildings?								
9.	If there is known interference can we get a list of these by building?								
10.	Do any of these buildings currently have wireless implemented?								
11.	Will any of these buildings have competitors wireless cohabitating with Meru?								
12.	If competitors wireless is in use please list this information by bldg/floor?								
13.	Are any of these buildings/rooms special purpose? i.e.; warehouse, freezer, stable etc.								
14.	Where will the APs be hung?								
15.	Have all additional brackets required for this installation been ordered?								
16.	Who will be taking care of the actual hanging of APs?								
17.	Who will be taking care of collecting site install data of serial numbers/AP location?								
18.	Are there any unusual density requirements or large rooms?								
 General Data / Customer Interview / Wireless Requirements / Application Requirements / Security / Co									

AP Placement – Simulation

- > Take a typical floor plan
- > Draw in walls
- > Add APs for coverage
 - No channel planning!
- > Adjust AP positions as needed for sufficient coverage everywhere
 - -70dBm for data
 - -65 dBm for voice



Choosing Access Points

- > Low density (~20 devices per radio), remote AP
 - AP150 (11a/b/g; omnidirectional)
 - AP1000i (11n ; 180° sector)

- > High density (~50 users per radio), or voice or video
 - AP300 (11n; omnidirectional)
 - AP300i (11n; 180° sector)

- > Spectrum Analysis
 - PSM3x

Note: using different AP families in the same area will require special configuration.

Deployment Best Practices

- > Scan for RF interference first
- > Survey areas where you anticipate problems
- > Install APs
 - Keep APs away from metal that would block radio
 - Verify adequate PoE power
 - Keep APs at least 2.5m (~8ft.) from each other
- > Configure AP location information
- > Survey for coverage after deployment
 - With normal people and equipment in place and functioning
 - Especially for 11n

802.11n Deployments

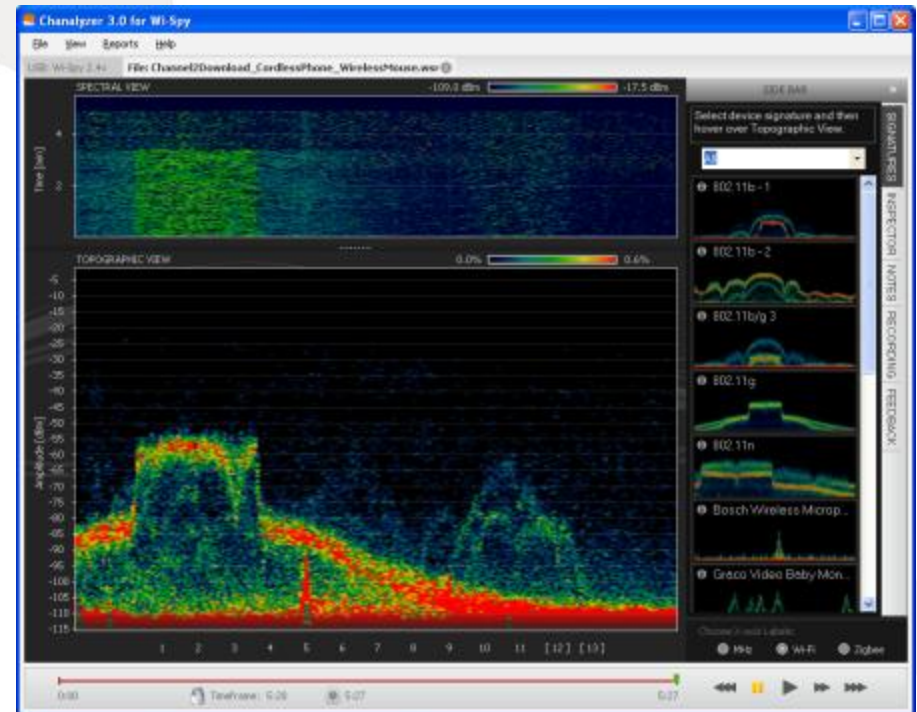
- > Use 20MHz channel(s) in 2.4GHz band, for legacy b/g/n support
- > Use 40MHz channels in n-only mode
- > Anticipate problems with backbone network; it may not have been stressed before

Scan the Wireless Spectrum

> Identify strongest channel(s)

> Tools:

- Wi-Spy - \$
- Cognio - \$\$\$
- Fluke - \$\$\$\$



Pre-deployment Survey

> Scanning Tools

- Ekahau Site Survey (passive)
- NetStumbler (active)
 - Scan using multiple client cards
 - e.g. Cisco, D-Link, Linksys, Netgear, Orinoco

> Coverage can be established using non-Meru APs

- e.g. Belkin, Linksys, Netgear

Deployment Worst Practices

- > Put APs near pipes
- > Rest APs on metal HVAC ducts
- > Combine for maximum effect



Integrate with Backbone Network

- > What IP address ranges will wireless clients use?
 - Configure DHCP accordingly

- > What wired VLAN(s) will the Controller be a part of?
 - Use trunk ports for controller Ethernet port(s)
 - Use access ports for AP Ethernet ports

Configuring WVLANs at the Switch

