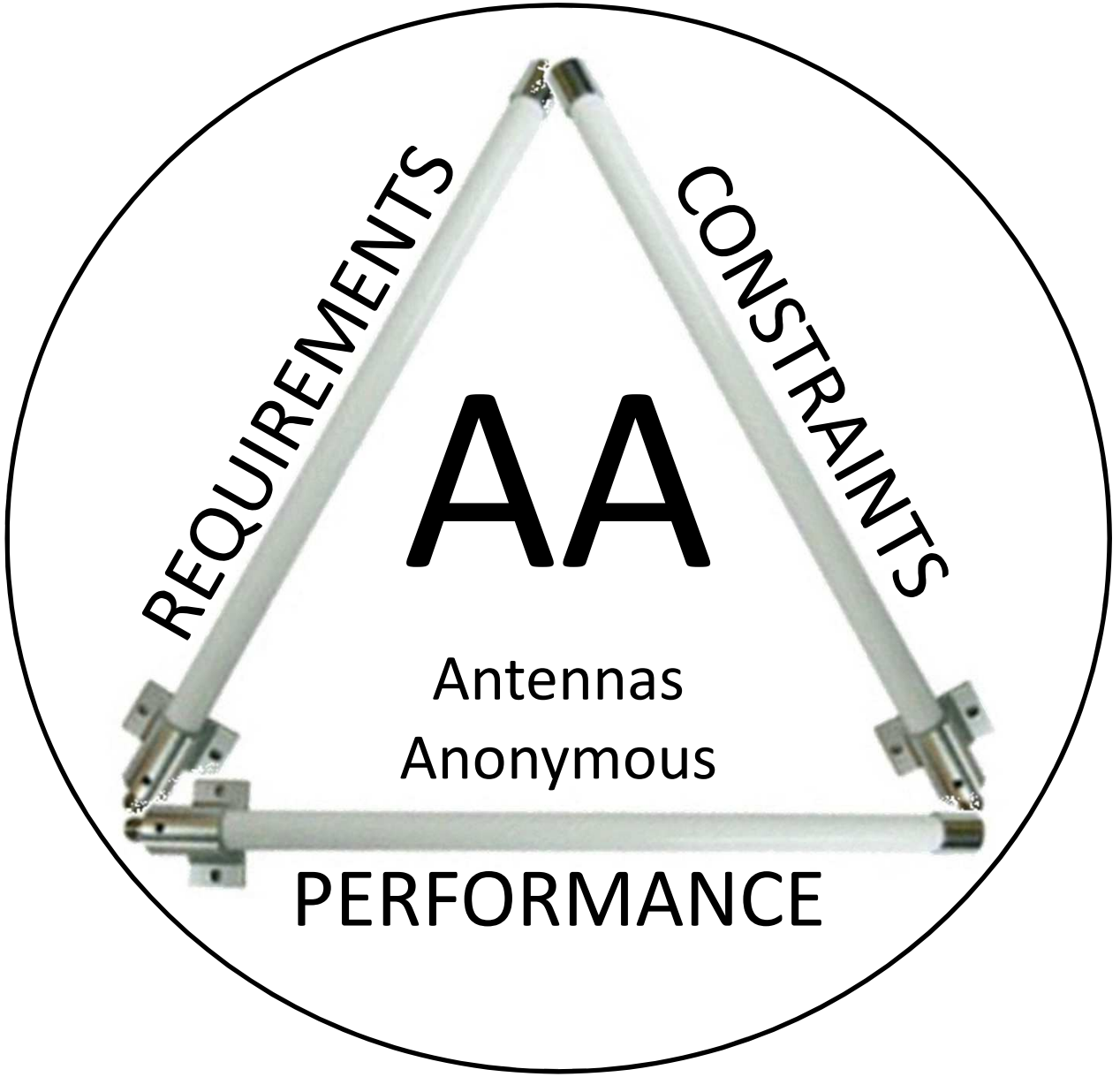
TEN TALK

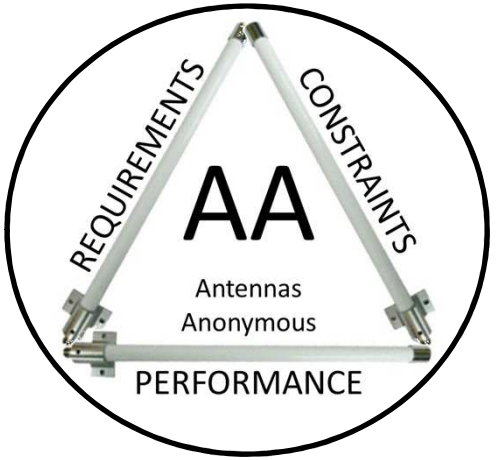
Deploying Wi-Fi in the Real World

Jason D. Hintersteiner, CWNE #171
Manager, Field Application Engineering
EnGenius Technologies, Inc.

@EmperorWiFi

wirelessLAN PROFESSIONALS CONFERENCE


REQUIREMENTS
CONSTRAINTS
AA
Antennas
Anonymous
PERFORMANCE



Hi, My Name is Jason

and I'm a Wi-Fi Engineer

It's been **3 days** since my last deployment of Bad-Fi

Deploying Wi-Fi in the Real World

Admit we are powerless to deploy the "Right Way"

- Customer Ignorance
  - Lack of understanding of RF
  - Lack of understanding of how Wi-Fi works
- Customer Conflicting Priorities
  - Aesthetics
  - Budget
  - Time
- Customer Poor Articulation
  - Requirements
  - Constraints

"Haven't you heard the phrase 'The customer is always right?' …The customer is always an @$$h0le!!"

-- Kevin Smith, Mallrats (1995)

Deploying Wi-Fi in the Real World

But it isn't just the customers…

- **A**rrogant
  - We are highly trained Wi-Fi engineers
  - We've been doing this forever, and we know better than everyone else
- **B**iased
  - Choose the vendor equipment we prefer (or work for)
  - Don't always choose the vendor equipment that is most appropriate for the job
  - Commercial pressure to sell "more" vs. sell "right"
- **C**heat
  - Take shortcuts, especially if we're not getting paid

"The fault, dear Brutus, is not in our customers, but in ourselves, that we deploy Bad-Fi."

-- William Shakespeare, Julius Caesar Act 1, Scene 2 (basterdized)

Deploying Wi-Fi in the Real World

Step 1: Gather Requirements and Constraints

- Really hard to do in practice
- Requirements are fluid
  - How are the requirements changing during the project?
  - How are the requirements going to change over the life of the network?
  - Many requirements are unstated or assumed
- Customer doesn't always know
  - What are the building materials made of?
  - How is the network going to be used (# / type of devices, applications, etc.)?

Deploying Wi-Fi in the Real World

Step 2: Perform a Predictive Design

- This is not a “survey”
- Oversimplification of environment
  - Guess at the types of walls
  - Often don’t draw in everything (e.g. bathrooms / closets)
  - Guess at absorption and reflectivity on each band
  - Cannot account for actual environment (e.g. furniture, appliances, etc.)
  - What about external interference?
- Oversimplification of deployment constraints
  - Can wiring be run to those specific locations?
  - Will the installer deploy based to your specs?

“Garbage in. Garbage out.”

-- Unknown

Deploying Wi-Fi in the Real World

Step 3: Perform a Pre-Deployment Site Survey

- Not Commonly Done
  - Especially true in SMB
  - Survey won't happen if nobody pays for it
- Installer Limitations
  - Are the right tools available?
  - Does the installer have the knowledge to properly use the tools?
- Walkthrough: Discover basics
  - IDFs
  - Cabling paths

Deploying Wi-Fi in the Real World

Step 4: Perform the Installation

- Deploying to spec
  - Will the installer cut corners and move your APs?
  - Will the installer follow your carefully planned channel and transmit power scheme?
- Cabling
  - Can wiring be run to those specific locations?
  - Are all the cables validated?
  - Are all of the connectors properly seated?
- Environment
  - Has it changed since the design was done?

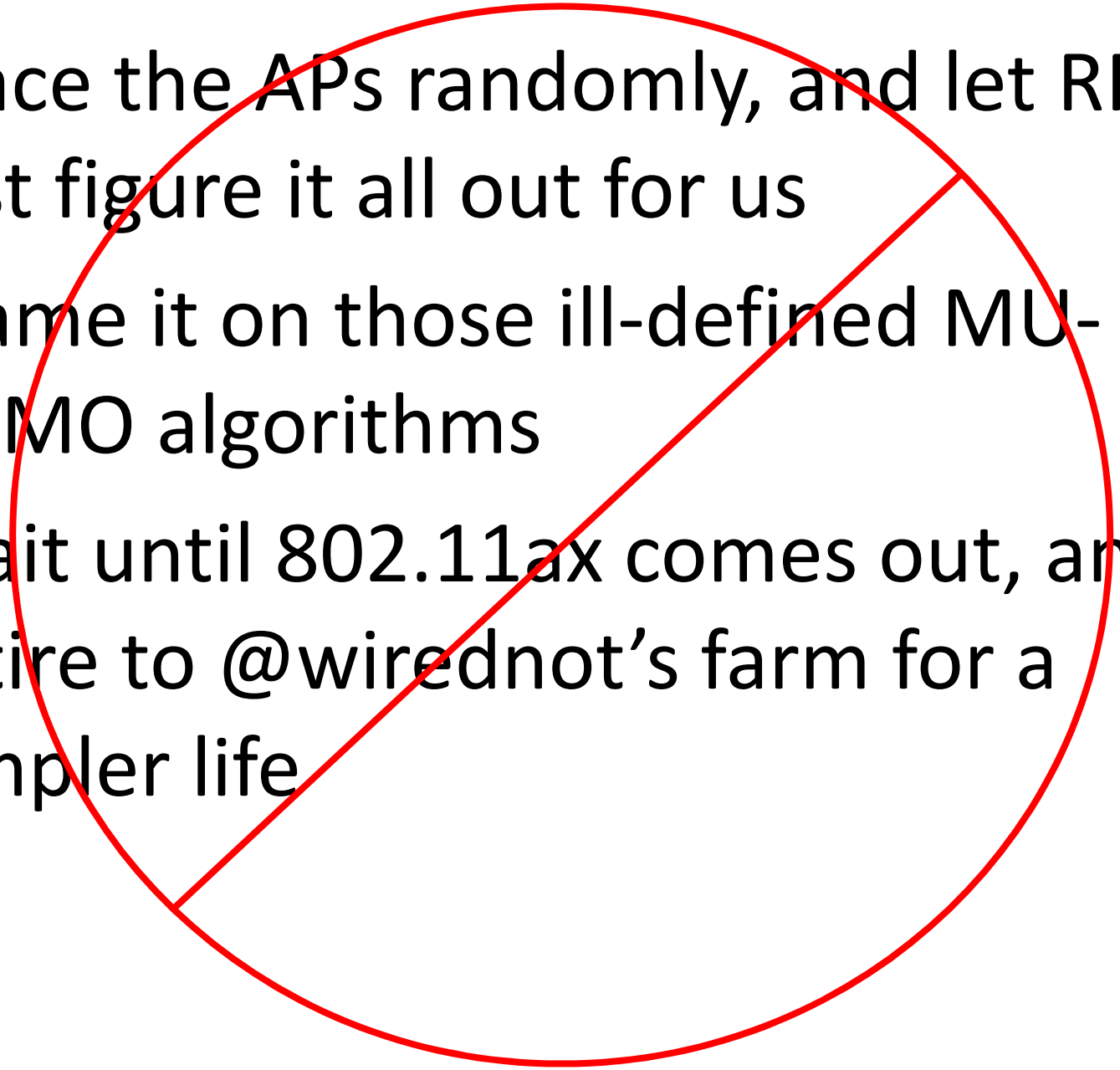
Deploying Wi-Fi in the Real World

Step 5: Perform a Post-Deployment Site Survey

- Again, Not Commonly Done
  - Survey won't happen if nobody pays for it
  - Often in a rush to finish the job
- Installer Limitations
  - Are the tools and knowledge available?
- Test for Basics
  - Internet connectivity
  - Wireless coverage
  - Spot check – not rigorous
- If there is a problem?
  - Are APs going to get moved or added after install?

Deploying Wi-Fi in the Real World

What can we do as Wi-Fi Engineers?



- Place the APs randomly, and let RRM just figure it all out for us
- Blame it on those ill-defined MU-MIMO algorithms
- Wait until 802.11ax comes out, and retire to @wirednot's farm for a simpler life

Deploying Wi-Fi in the Real World

What do we do as Wi-Fi Engineers?

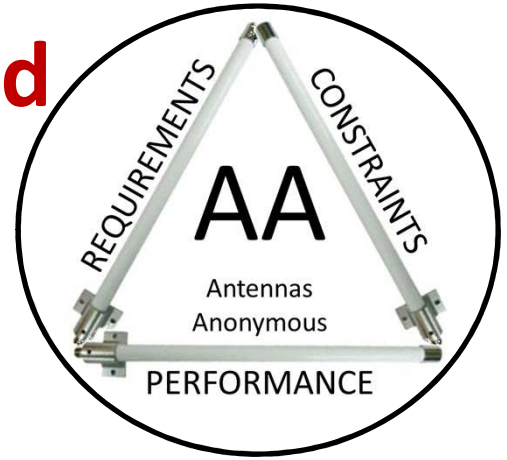
- The Best We Can
- Standardize, Standardize, Standardize
  - Set of preferred equipment (APs, switches, routers, controllers, etc.) for particular applications
  - Adapt / be flexible based on known requirements & constraints
- Build a Robust Design
  - Design to unstated requirements
  - Follow best practices
  - Build in margin / excess capacity
- Keep Learning and Refining our Craft!

"Failure is not an option."

-- Gene Krantz, Apollo 13

Deploying Wi-Fi in the Real World

The Wi-Fi Engineer's Serenity Prayer



Grant me the serenity…

to accept the things I cannot change

lack of requirements, budget, time

the courage to change the things I can

best practices, standardization, robust design

the wisdom to know the difference

failure is not an option – we make the Wi-Fi work as best we can no matter what