

## Understanding your Parks WIFI Requirements

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## COURSE OBJECTIVES

- Understand the needs of your guests.
- Consider possible modifications to increase guest satisfaction related to WiFi.
- Better understand the technology behind Wi-fi and its capabilities

## WHO AM I?

- 2<sup>nd</sup> Generation owner of Pride of America
- Youngest of 3
- “IT Manager”
- Petehagen@camppoa.com

## PROFESSIONAL CAREER

- BSME – University of Wisconsin 1989
- 10 Years Mechanical Engineering and Machine control.
- 19 Years IT administration University of Wisconsin Bock Labs
  - 50 Employees
  - More than 150 network devices
  - 1 full time IT person

## SHOW OF HANDS

- How many currently have WiFi?
- How many currently charge?
- In-house or 3<sup>rd</sup> party?

## THE STATE OF WIFI

- It has become a necessary amenity
- For some customers it is a “Must Have”
- There are a lot of technical issue we have as an industry\*
- People have WAY too high of expectations\*

## WHAT I PLAN TO COVER

- Technical issues for WiFi @campgrounds
- Political issues
  - Free or Charge?
  - Customer expectations
  - Methods to diffuse bad experiences
- Non-technical hardware overview

## TECHNICAL ISSUES

- A lot of area to cover (delivery system)
- Limited bandwidth available due to rural location (supply line)
- Customers sitting in the perfect radio insulator
- Non-tech people onsite for support

## LARGE ARE - RADIOS ARE CHEAP

- More radios means better coverage
- Design to minimize hops
  - Consider spoke design
  - Multiple "supply drops" if possible

## HOPS ARE BAD

- Wireless N is capable of a theoretical 150 Mbps. In practice it is more like 40 and down to 20 for moderate signal levels.
- With hops: Speed =  $(1/n) * \text{Max}$
- So for 4 hops: Speed =  $\frac{1}{4} * \text{Max} = 10$

## AREA – POA 2013



## AREA - POA 2014



## AREA - 2015



## AREA - TODAY



## TECHNICAL ISSUES

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LIMITED BANDWIDTH  
AVAILABLE  
(SUPPLY LINE)

- *The Size of the Pipe*
- Rural setting means no cable and SLOW DSL
- Everyone can get a T1
  - Very reliable
  - 1.5 Mbps
  - Very expensive!



## LIMITED BANDWIDTH AVAILABLE (SUPPLY LINE)

- POA had 2 T1's (3 Mbps) that cost about \$1100/mo
- I have Charter at home. 60 Mbps for \$40
- In July of 2015 installed EOC line. Same price as 2 T1's for 10 Mbps. Upgradable to at least 20 Mbps

## TECHNICAL ISSUES

- ~~A lot of area to cover (delivery system)~~
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- Customers sitting in the perfect radio insulator
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## THE PERFECT INSULATOR -TIN FOIL HAT



## THE PERFECT INSULATOR



## SOLUTION...

- Education!
- Explain the problem
- Suggest trying to use device:
  - Near window
  - Outside under awning
- Recommend they buy a booster (but.... this adds a hop)

## TECHNICAL ISSUES

- ~~A lot of area to cover (delivery system)~~
- ~~Limited bandwidth available due to rural location (supply line)~~
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## NON-TECH PEOPLE

- Have a device that you know how to use
- Go to the area of the problem and see if it will connect
- Get some tools to measure "real" signal
- Not all devices are created equal
- Have some troubleshooting guides available

Can the customer "see" our access points when they look at all the available wireless connections?

If no, make sure that their radio is turned on. How this is done varies from laptop to laptop. Some have a hardware switch and others have a flag. Check the manual for the receiver card for the PC and one of the iPads. The last often looks like a small lever.

If yes, try to connect to the access point with the strongest signal. Does it finish and connect?

If no, try another access point if they "see" one. If still no, take down to the hardware and try to connect to that one. It will be, make sure our laptop can connect. If no connection and they can see that there is something wrong with software on their laptop.


If Connected, open a web browser and see if our log in page loads.

If no, make sure it works on our laptop. If it does and still does not work on theirs, there is something wrong with the configuration of their laptop.


The should be up and running. If other sites do not load, try our laptop. Also try reconfiguration.

If they have problems with the username and password, look for the red x/flag when they try to log in. If it says too many sessions or no more sessions left, it means they have used the login on another device and will need to purchase the 2 more add on.


On Windows Vista or Windows 7 computer open the network connection pane by either clicking on this system tray icon:



...or by going to Control Panel, Network and Internet, Network and Sharing Center and selecting Connect to a network link:



On this connection pane find your network, click it, and then click the Connect button:




Note: Pick the radio with the strongest signal. All of our radios begin with POA.


Wait while Windows registers within the network. You will see a system tray icon with a spinning wheel during this time:



After a spinning wheel is gone, you're connected. You can check if you're actually connected by bringing up the connection pane again and checking a status of your network. You should see the Connected label there:



Open up a web browser by clicking on the



Enter your username and password in the page that is displayed.

## POLITICAL ISSUES

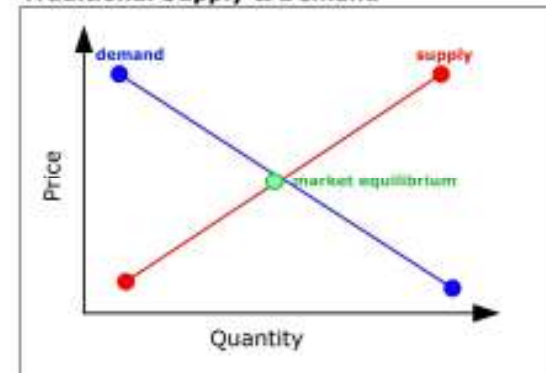
- Free or Fee?
- Customer expectations
- Customer education
- Provide alternatives
- Always offer a refund

## YOU MUST CHARGE FOR WIFI

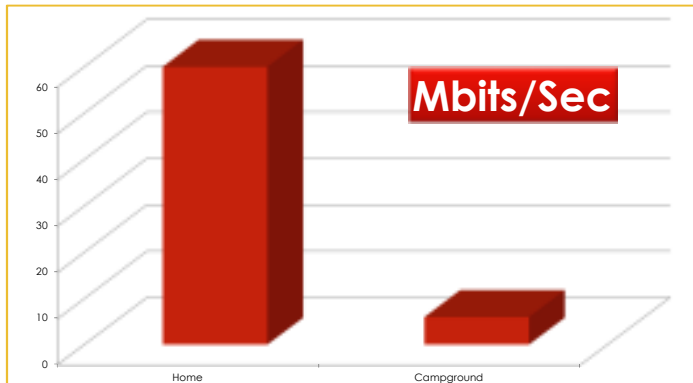
- Can you really rely on the excuse of “At least we don’t charge you for it?”
- People think-If you have it, it should work
- Do you charge for you pool? If the pool is not working are people ok “since it was free?”
- Simple supply and demand

## SUPPLY AND DEMAND

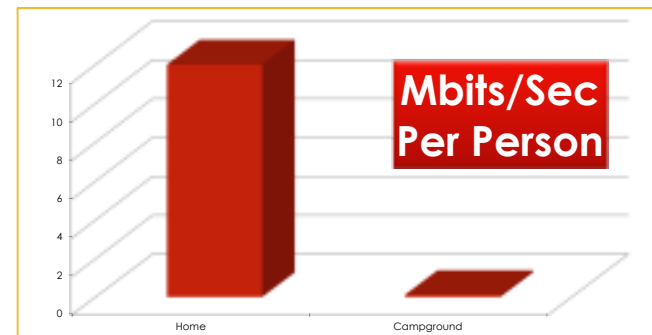
Traditional Supply & Demand



## SUPPLY – VERY LOW



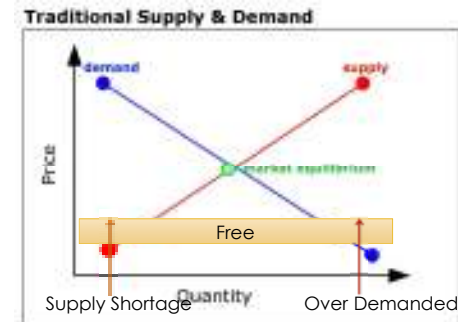
## FACTORING PEOPLE



## DEMAND – VERY HIGH

- Nearly everyone over 12 has a smart phone
- Lots of families have a laptop and or multiple tablets
- All of these device “see” you WiFi network and want to connect and start talking

## WHEN NOT CHARGING



## RAISE THE PRICE



## EFFECTS ON DEMAND

- A LOT of devices not connecting just *because they can*
- People who really need the service are willing to pay
- *Appreciation weekend analogy*

## POLITICAL ISSUES



Fee

- ~~Free or Fee?~~
- Customer expectations
- Customer education
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## CUSTOMER EXPECTATIONS/EDUCATION

- LOWER EXPECTATIONS
  - The service the park gets is slower
    - 10 time slower than home service
    - 50 times more people using it
    - We pay BIG \$ for what we have and can't get more
  - Explain why we charge
    - Keep kids off
    - Only people who need it are using it
  - Give them a CLEAR understanding of what the service will do and NOT do

## POA WiFi Service

The bandwidth that POA is able to obtain is limited due to our rural location. Therefore, the service should NOT be expected to be the same as you have at home or work.

**Will work:**

- Checking and sending email
- Surfing the web
- Posting to Facebook (pictures may take a while)

**May work (depending on how many other people are on)**

- You tube videos
- Remote connection to work computer

**Will probably not work**

- Streaming movies or TV shows
- Online action gaming

## POLITICAL ISSUES



Fee

- ~~Free or Fee?~~
- Customer expectations
- Customer education
- Provide alternatives
- Always offer a refund

## PROVIDE ALTERNATIVES

- I let people know that the signal will always work down by the bar
- In emergency I let people “plug in”
- For Seasonals I explain alternatives
  - Cell Data Plan for \$50/mo
  - Satellite service for \$50/mo

## POLITICAL ISSUES

- ~~Free or Fee?~~  Fee
- Customer expectations
- Customer education
- ~~Provide alternatives~~
- **Always offer a refund**

## HARDWARE

### Terms

- 802.11n
- 23db
- 2.4 Ghz

## MHZ EXPLAINED

- Why does it matter?



## GHZ EXPLAINED

- 2.4 was the standard
- 5 is now available to reduce over-crowding and increase bandwidth
- Many new devices support both
- 2.4 should be around a long time
- The standard does not depend on the frequency!
  - 802.11a thru 802.11n
  - Analogy: the standard is the language the frequency is the type of phone

## THE LAWS OF PHYSICS

- The higher the frequency
  - The more bandwidth it can carry
  - The **worse** it is at penetrating objects
- Why I use 900 Mhz (or .9 Ghz) radios for my spoke
  - I need tree penetration
  - Bandwidth is still enough since I only have 6 leaving the park
  - **ONLY** good for backhaul since nobody else has 900 Mhz gear

## THE LAWS OF PHYSICS WHAT ABOUT POWER?

- FCC regs allow for 1W (30db) with small antenna
- Most laptops have a lot less transmit power
- Increased Power output is **NOT** the answer
- WIFI is 2-way communications.
- Bigger antennas!

## SUMMARY

- You need to provide 2.4 Ghz right now
- You can offer 5 Ghz now
- If you don't have LOS, consider 900 Mhz point to point
- Don't fall into the "super high power" trap
- Consider higher gain antennas



## HOW TO PROVIDE?

- Do it yourself
  - Buy radios direct
  - Go through 3<sup>rd</sup> party (e.g. check box systems)
  - Find a 3<sup>rd</sup> party turnkey provider

## BUY DIRECT MIKROTIK – WHAT I STARTED WITH

Show  
Item

- Advantages
  - Very flexible
  - Very powerful
  - Lower cost
  - Multiple configurations
- Disadvantages
  - Extremely high learning curve to program
  - Difficult to set each one up
  - I have not successfully configured a working Mesh

## BUY DIRECT MIKROTIK – CONTINUED

- I still use them, phasing them out as end point radios
- I will continue to use them for backbone haul
- Good point to point applications
- 900 Mhz capable
- Configurable power output

## BUY DIRECT OPEN MESH - ADVANTAGES

Show  
Item

- Open-mesh (<http://www.open-mesh.com/>)
- ~\$100 per access point
- Cloud based management ([Link](#))
- VERY easy to set up
- Can be configured to charge via vouchers or paypal (<http://goo.gl/QLljXS>)
- Outage alerts

### Designed for any situation.

Open Mesh has an access point and enclosure to fit your needs. Compare below:



	OM2P-LC Extreme Value	OM2P External antenna	OM2P-HS High Speed, Dual PoE	OM5P 5 GHz Band	MR900 Dual Band Performance
Speed class	150 Mbps	150 Mbps	300 Mbps	300 Mbps	600 Mbps
Power at max speed	20.4W (18 mW)	20.4W (20 mW)	20.4W (20 mW)	20.4W (18 mW)	20.4W (18 mW)
Antenna	Single Internal	Single External	Dual Internal	Dual Internal	Six External
Band	2.4 GHz	2.4 GHz	2.4 GHz	5 GHz	2.4 + 5 GHz (optional)
Optimized for	Price	General Use	Speed, PoE Switches	Speed, 5 GHz Band	Performance
Enclosure options	OM Wall Plug, Charcoal Ceiling, Outdoor	OM Wall Plug, Outdoor	OM Wall Plug, Charcoal Ceiling, Outdoor	OM Wall Plug, Charcoal Ceiling, Outdoor	Wall/ceiling (included), MR Outdoor
Price	\$55	\$75	\$95	\$95	\$225

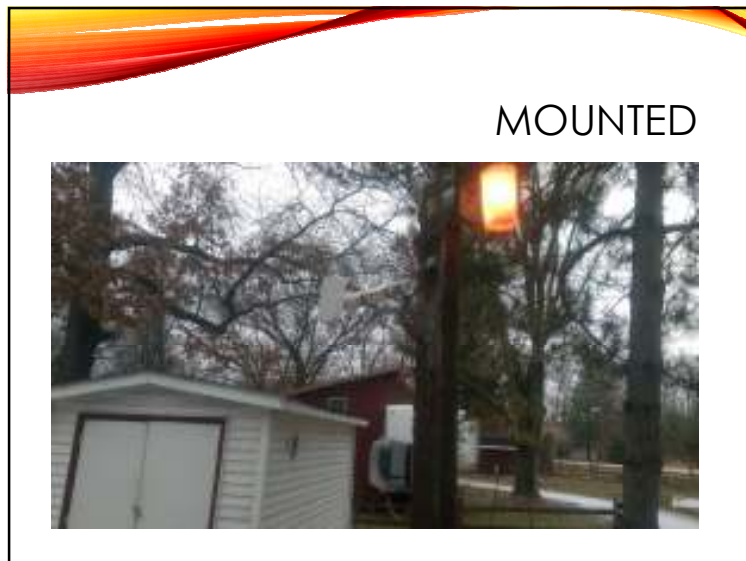


**OM Outdoor Post/Wall Enclosure**  
 Charcoal Ceiling  
 Available in stock  
**\$75.00**  
 Qty: 1 [Add to Cart](#) [Log in to Compare](#)

**Quick Overview**  
 This OM outdoor enclosure for OM Series Access Points. Provides protection and weather for your access point.

Single click on above images to view full picture

**MORE ITEMS:**

## BUY RADIO'S DIRECT - DISADVANTAGES

- No support
- Requires some expertise
- Problems are all on you (no scape goat)
- You need to engineer the layout

## HOW TO PROVIDE?

- Do it yourself
  - ~~Buy radios direct~~
  - Go through 3<sup>rd</sup> party (e.g. check box systems)
  - Find a 3<sup>rd</sup> party turnkey provider

## 3<sup>RD</sup> PARTY

- Advantages
  - Mount and go
  - You have a scape goat
  - Setup of software done for you
- Disadvantages
  - You still need to engineer the layout
  - Higher cost (\$500\* per point instead of \$100)

## 3<sup>RD</sup> PARTY TURNKEY (IF THEY EXISTS)

- Advantages
  - Everything done for you
  - You have a scape goat for problems
  - You also have a scape goat for why you charge
  - No upfront cost
  - Tech support
- Disadvantages
  - Lost revenue

## COURSE OBJECTIVE REVIEW

- Understand the needs of your guests.
- Consider possible modifications to increase guest satisfaction related to WiFi.
- Better understand the technology behind Wi-fi and its capabilities

## UNDERSTANDING YOUR PARKS WIFI REQUIREMENTS

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foundation