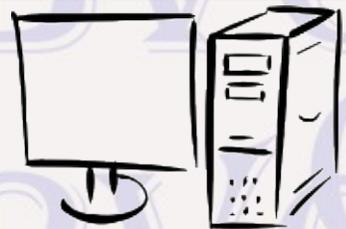


Bits & Bytes

Arkansas' Premier Computer Club



June 2019

Bella Vista Computer Club - John Ruehle Center

HOW TO FIND US

All meetings are on the lower level of the Highlands Crossing Center in Bella Vista. You may use entrance A on the West side or entrance C on the South side and take the elevator or stairs to the lower level. Turn left (West) to reach the General Meeting room, right for the John Ruehle Training Center. Additional information is on our web site.

MEETINGS

Board Meeting: June 10, 6:00 pm, John Ruehle Training Center

General Meeting: June 10, (2nd Monday), 7:00 pm, Community Room 1001.

Program: "Introduction to Last Pass", Woody Ogden. Use of a password manager like Last Pass makes it easy to follow safe computing practices of not using the same password on many different accounts.

Bring a guest! New Members and Guests are always welcome at the General Meeting

Genealogy SIG: June 15 (meets 3rd Saturday of the month).

MEMBERSHIP

Single membership is \$20; \$10 for each additional family member. Join by mailing an application (from the web site) with check, or complete an application

HELP CLINICS

Saturday, June 1, 9am – noon

Wednesday, June 19, 9am – noon

Saturday, July 6, 9am – noon

Help clinics are a free service for BVCC club members, held in the Training Center

Bring your tower, laptop, tablet or smartphone for problem solving.

CLASSES

“Computer Security for Regular People, Part 1” – Justin Sell, Tuesday, June 18, 6:30 – 8 pm
Part 2 will be offered again on 3rd Tuesday in July.

Advance sign up required for classes: Contact Grace: email to edu@bvcompclub.org, text 469-733-8395, call 479-270-1643, or sign up at the General Meeting. Classes are **free to Computer Club members** and are at our John Ruehle Training Center.

Check the monthly calendar and announcements for any last minute schedule changes at <http://bvcompclub.org> .

MY MESHED-UP WI-FI

By Greg Skalka, President, Under the Computer Hood User Group, CA

March 2019 issue, *Drive Light*

www.uchug.org

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Our modern electronic devices are all about connectedness. It seems everything we have now is connected, and that connection is integral to the capabilities that are provided for us. Before they were connected, computers were just big boxes that made calculating and writing easier; now with the Internet, they provide communications, information and entertainment. Thermostats, cameras and lights used to be just things to turn on your furnace, capture pictures and video and illuminate your surroundings. Now, when you connect them to your home network, they become the start of a smart home. All that connectedness is great, but to be useful it needs to be reliable, secure, easy to use and available where you need it.

The methods used to connect our devices have evolved and improved over time, going from wired phone and Ethernet cables to wireless communications, with cellular phone networks, Bluetooth and Wi-Fi.

Cables perform well, but limit mobility and can be unsightly or difficult to conceal. Cellular data connections can have great range but can have spotty coverage and require additional costs for data service. They can work fine on your phone or tablet but are harder to utilize for computers or small household devices. Bluetooth is useful for low data rate connections between devices at close range.

Wireless keyboard and mouse connections work great over Bluetooth, but it wouldn't work well for surfing the web. The best wireless method for medium range (in a house or building) and high bandwidth (web surfing and streaming) is Wi-Fi.

Wi-Fi provides wireless connections based on the IEEE 802.11 standards, which were originally established in the late 1990's. The standards and the capabilities they provide have evolved over the years.

Wi-Fi now utilizes a number of RF bands, mostly in the GHz frequency range (typically 2.4 GHz to 60 GHz), and can support over 1 Gbit/s.

My first computer (early 1980's) was a stand-alone device, as there were no popular networking standards at the time. When we got married in 1985, my wife and I shared one computer. Computers didn't get "personal" for us

until probably the late 1990's, when my wife wanted her own, and we started to think about separate computers for our two children. When we moved into our present house in 1987, it came brand-new with all the networking connections we needed - phone jacks and coax cables in a couple of the rooms for the dial-up modem and cable TV.

By the early 2000's, we had at least four computers in the house, one for each occupant. Around this time we unfortunately had a leak in our plastic house water lines and had to repipe the house with copper. I took this opportunity to use the holes in the walls to pull Cat5e Ethernet, phone and coax cables into all bedrooms except the master (I never considered having a computer there). This allowed us to have a good

wired home network, with Internet at every computer. My "office" was in the upstairs bedroom in the front corner of the house; this is where I located the router for our home network. From that room I had cable connections that provided network and Internet to the kids' bedrooms and my wife's "office" downstairs in the center of the house.

This network worked well for us for many years. Even though early-version Wi-Fi was available, I preferred the superior security of my wired network, and even installed some wired Ethernet network cameras (this did take some work, as my wife hates visible cords and cables). We had laptops that had Wi-Fi capability, however, so I bought a wireless access point to connect to the wired network in my wife's office. I was still so worried about Wi-Fi's security that I plugged the access point into a separate power strip with switch, so it could be easily powered off and disabled when not in use.

It was either my wife's iPhone or our first Amazon Echo Dot that forced me to finally leave the Wi-Fi access point on all the time. I also bought a Chromebook, which required a wireless Internet connection to do most anything. I later added a second Dot, as well as three Samsung Wi-Fi network cameras. These cameras really pointed out the poor Wi-Fi coverage provided by the access point, as I could not place them far from the center of the house. I wanted to put one up in my office to replace one of the wired cameras, but the signal could not reach that far through the structure. One problem with the GHz frequencies used by Wi-Fi is that they are easily attenuated by the material in the walls and furnishings of a house. I tried using the Wi-Fi capability in my router (located in the front of the house) instead of the access point, which provided good signal strength there, but poor Wi-Fi in the middle and back parts of the house.

My poor Wi-Fi capabilities soon became a bigger issue, as I continued finding more and more smart home devices that I would like to have, including more voice-operated assistants (Amazon Echo and Google Home), more network cameras (video doorbells and outdoor cameras), smart light bulbs, smart outlets and smart thermostats. All these devices require a Wi-Fi connection to allow them to be used or controlled through smart phone apps. I needed to find a way to have good Wi-Fi coverage from my front yard all the way to my back yard.

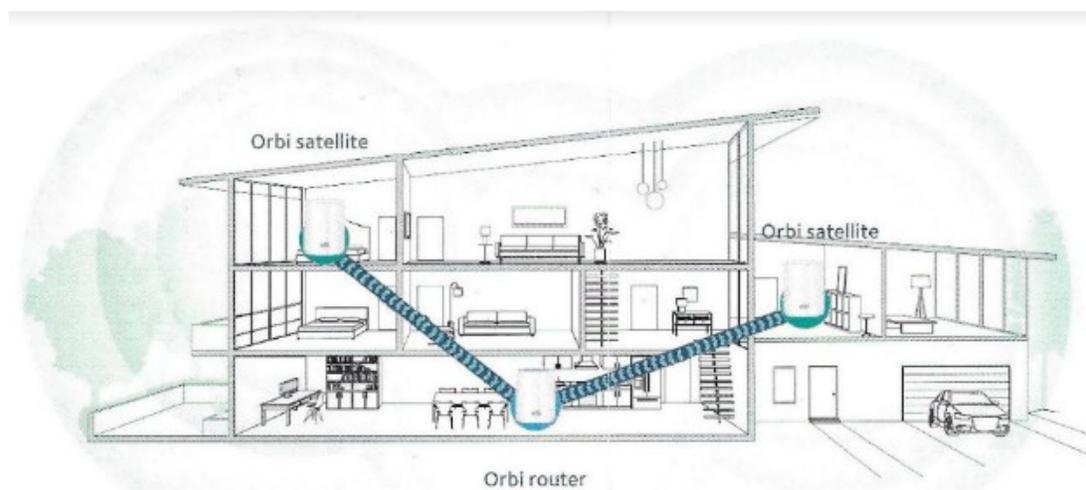
One handy tool for evaluating Wi-Fi signals and diagnosing coverage issues is a free Android app called “WiFi Analyzer” (by farproc). It can display a real-time graphical indication of the signal strengths of the Wi-Fi signals (networks identified by their SSIDs) that your phone sees. It allowed me to move around the house with my phone and see just how poor the coverage was with my access point. It can also be useful to determine if you are getting interference from a neighbor’s Wi-Fi, or if you have other signals in your house that you don’t know about. I found that our two HP all-in-one network printers, which have both wired and wireless interfaces, were broadcasting a Wi-Fi signal even though I was only using their wired Ethernet interfaces.

There are several ways to provide better Wi-Fi signal coverage; most involve adding additional Wi-Fi networks (with separate SSIDs). There are Wi-Fi repeaters (or extenders) that can extend your Wi-Fi coverage by receiving your existing Wi-Fi signals and repeating them, though on a separate wireless network (as if you had two wireless routers operating in your home). I could effectively do this with the wireless equipment I already have. If I turned on both my router’s Wi-Fi and my access point, then I could

have reasonable coverage over most of my house. This still would not cover the rear part of the house or back yard; I would need another Wi-Fi repeater for that and would wind up with multiple wireless networks to manage.

A new device for extending Wi-Fi, the mesh router, has recently become a popular option for providing whole-house Wi-Fi. Mesh routers use multiple devices or nodes to provide Wi-Fi from multiple locations in your home. They differ from Wi-Fi repeaters in that these nodes are connected to each other and coordinate between each other to provide the best signal for your device to connect to and present a single network and SSID. Mesh routers consist of a master device and one or more auxiliary or satellite devices.

There are now many mesh router systems available, including the Linksys Velop, Netgear Orbi, Asus Lyra, Google Wi-Fi, Samsung Connect Home and D-Link Covr; their prices range from \$66 to \$500. Since I felt I’d need three sources to cover my home’s area, I chose the Netgear Orbi AC3000 three-unit mesh router.



It claims to be able to cover up to 7500 square feet with three components - one router and two satellite units. The Orbi router would be placed in the center of the house (in my wife's office), where it would connect to my home network with an Ethernet cable. One satellite would be placed in a front bedroom upstairs and the other in our dining room in the back of the house. The satellites need only be located near a power outlet; they connect to the Orbi router through dedicated tri-band RF links (one 2.4 GHz and two 5 GHz connections).



Setting up the Orbi system was easy. I plugged in the Orbi router in place of my old access point (it requires only AC power and the network Ethernet cable in its yellow WAN port) and turned it on. Each Orbi component has a light ring at the top; the router's light ring starts green and then turns white when ready. I next placed each satellite where I wanted it, plugged it in and turned it on. The light ring on the satellites start white, and then after a few minutes indicate their connection status with the Orbi router through the light ring color. A blue ring on the satellite indicates a good connection with the Orbi router, while amber indicates a fair connection and moving the satellite closer to the router should be considered.

If the ring winds up magenta, the satellite could not connect, and should be moved closer. Both of my satellites lit up blue.

My next step was to access the Orbi router and configure it and the Orbi network. This can be done through a wired connection (the Orbi router has three RJ-45 jacks on the back for the Orbi network, while each satellite has four) or wirelessly. I decided to connect to the Orbi Wi-Fi with my Chromebook, using the default SSID and security password provided in the documentation. Using the specified URL in a browser to connect to the router's setup pages, I logged in with the default admin account settings, and then immediately changed them. I also changed the SSID, made sure the Wi-Fi security was the most robust allowed (WPA2+AES) and lengthened the Wi-Fi security password. The Orbi router has all the typical setup pages you would find in any modern router; I left the majority of them set to the defaults. I did note that the Orbi can be set to be a router (providing network translation between its Ethernet input and its Wi-Fi and wired outputs) or an access point (it would use the same IP subnet as on its input); I left it as the former.

I used my smart phone and the WiFi Analyzer app to check out my new Orbi wireless network. I found excellent signal strength throughout my house, and a reasonable signal in my front and back yards. I noticed that three signals were shown, one for each Orbi device, with all using the same SSID. I could tell which graph color in the app went with which Orbi by moving next to each and seeing which had the strongest signal. From this I could see at any point in the house which Orbi a Wi-Fi device would likely connect to. I installed the Orbi app on my

smart phone so that I could easily and remotely make changes to my Wi-Fi, including adding a guest Wi-Fi network.

With the mesh network effectively configured, I was ready for the hardest and most time-consuming part of the Wi-Fi upgrade - moving all my Wi-Fi devices to my new Orbi Wi-Fi network. It took several hours to switch all my network cameras, Amazon Echo Dots and smart lights to the Orbi network, as I had to go into the app for each device to change its settings. Once everything was switched over, it all worked great.

I used to have to reset (cycle power) my old access point periodically as it would sometimes lock up and lose connections; now with Orbi, everything is rock solid. I guess it is time to go shopping for new Wi-Fi gadgets.

With my old access point, our home Wi-Fi was rather messy. Now with Orbi, we are much happier with our Wi-Fi being meshy.