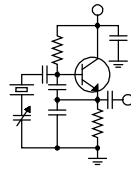


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Not Just a Job

In July of this year, I celebrated forty years with this great company. That's a long time, but it certainly doesn't seem like a long time. That anniversary gave me occasion to pause and look back over those four decades and more, thanking God for His grace, for this great company, for the trust our president has put in me, and for the skills, knowledge and bit of wisdom with which the Lord has blessed me.

A scripture came to mind as I mentally reviewed those years: "For we are God's workmanship, created in Christ Jesus to do good works, which God prepared in advance for us to do" – Ephesians 2:10.

You see, although it would seem like happenstance that brought me to this great company, it was anything but. It was prepared by God in advance.

Looking back, I can clearly see the twists and turns in the journey, every milepost engineered by the Lord to His purpose for my life. Those years I spent in the Texas panhandle working for FM and TV stations were in preparation for what was to come. Every work experience that I had in those years taught me something I would need later. Skills were developed and sharpened, and I learned, often the hard way, what worked and what didn't.

The time I spent starting, building and running my own business prepared me to be a businessman in addition to being an engineer. I learned business principles, learned the value of a dollar, and I learned accounting principles (I still have my college accounting textbook on the shelf in my office). Those skills have been invaluable over the years.

The day that I was laid off along with 23 others from the Dallas CBN TV station in 1984 seemed a dark day indeed when it happened. How

was I going to support my wife and young son? It was an awful, helpless feeling, but it was from there that within a few days I walked through the doors of Crawford Broadcasting Company and began my journey here. Without a doubt, the Lord orchestrated that change, and He took care of everything.

In the years since, this company has grown from six stations to what it is today. Our radio stations have been a constant in the lives of believers in the markets we serve, and untold thousands have been touched by the words and music they have heard coming through the radio medium that we provide.

This was brought home to me some twelve years ago when I heard the story of a young woman who some twenty years prior heard on one of our stations that she was loved and had options other than terminating her unexpected pregnancy, the procedure for which she was on her way to when she turned on the radio and heard something that changed her heart, a message of hope. That story was told twenty years later by another young woman, who was the child that was born as a result of that heart change!

At that point, I came to realize in a whole new way what I had believed all along, that what we do at this company is not just a commercial endeavor. It is a calling, a mission, and each of us that work here has a key part in that mission.

How many others have experienced life-changing spiritual breakthroughs as a result of the programming we broadcast on our stations? How many other infants' lives have been saved? How many have found salvation by grace through faith as the result of the solid Bible teaching and testimonies heard on our stations? How many have experienced significant spiritual growth as they followed the teaching aired on our signals? I daresay that we have a great cloud of witnesses that can testify to all of this

and more, and we are blessed – I am blessed – to be a part of it.

As engineers, we work behind the scenes. Our efforts are seldom recognized outside the walls of the radio stations. At the corporate level, we are even more invisible. And yet it is our efforts to keep our stations on the air and sounding great that make it possible for people to hear the Good News. I recognized on that day when I heard the young woman’s story that had it not been for the state-of-the-art, well-maintained and fully backed up facilities of that radio station, her mother may not have heard what she did so loud and crystal clear as she tuned through the stations looking for some kind of comfort. She may well have just tuned on past, nothing there to catch her ear and cause her to pause and listen. What a tragedy that would have been! And what a great responsibility we have to such people!

So as I sail through my forty-first year here (with no plans to stop!), I look forward with excitement to what the Lord has for us going forward. Every day I come to work excited at what lies ahead, at the possibilities and at the good works that the Lord has prepared in advance for me to do here. It is a calling, not just a job, and I will continue to treat it that way. And so should you, doing all as unto the Lord and not to men. We should all be excited and eager to see what the Lord has planned for us going forward.

Got Yer Spurs On?

We certainly have had our spurs on with one of our BW Broadcast TX600V2 FM transmitters recently.

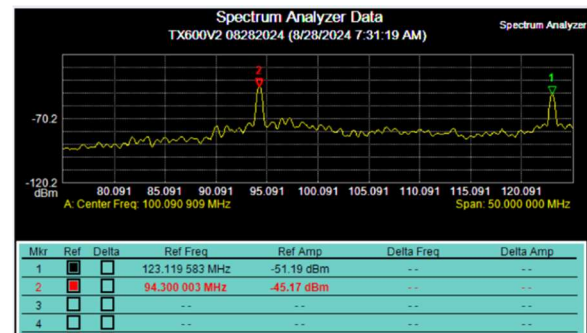
In a recent issue, I talked about building an antenna switch controller that uses a Raspberry Pi to do the sequencing, interlocks and all that. We had replaced that TX600V2 at KLVZ’s 94.3 MHz Brighton translator with a new Nautel VX600, and I wanted to have the TX600 available as a ready standby. Last month we finally got around to connecting the two transmitters to the antenna through the switch. The delay occurred because we were waiting on the arrival of a pair of custom-made LMR400 type-N coaxial jumpers that we ordered

from Pasternack. They came in and we hooked things up.

The Nautel VX main came up and worked fine – 620 watts forward and just a few milliwatts reflected through the switch, the same as when connected directly to the antenna. The BW aux, however, showed close to 10 watts of reflected power. Huh? I swapped the coax jumper with the main to eliminate that, and the problem stayed with the BW. But if I started lowering power, the reflected power would reduce linearly with the forward power... until I got to 400 watts. Below that, it would go to less than half a watt.

Amanda and I took the spectrum analyzer out and used it to watch while I repeated that little exercise. Below 400 watts, all was well, but right at 400 watts, zing! A spurious signal within a few dB of the amplitude of the 94.3 MHz fundamental would show up at 121 MHz or thereabouts.

I poked around inside the transmitter some, checked all the hardware and connections for



This was the TX600V2 spectrum at 600 watts TPO after we got it back from Progressive Concepts.

tightness and all that, but nothing would make that spur go away. So we pulled it out and shipped it off to Progressive Concepts for repair.

They replaced the PA MOSFET and several capacitors and shipped the unit back to us. We fired it up at the site with a spectrum analyzer watching and... we’ve still got a strong spur, this time just above 123 MHz! And we immediately began smelling something burning within the unit. So back to Progressive it goes. Stay tuned...

The New York Minutes

By

**Brian Cunningham, CBRE
Chief Engineer, CBC – Western New York**

Hello to all from Western New York! It seems like only yesterday we were welcoming the start of summer, and now here we are at Labor Day, which marks the official end of summer here in Western New York.

If the extreme summer heat is any indication of how cold it may be this winter, we are in for a doozy! 2024 has been one of the hottest summers I have seen since moving to Buffalo back in 1991.

You would think that having been born and raised in the south, I would be immune to the heat and humidity, but not so! In the past, I couldn't wait until winter set in – it couldn't get cold enough for me. But, as I get older, the cold temperatures do not agree with me as much, and I no longer eagerly await the snow, bitter winds and sub-zero temperatures. I am hoping for a smooth and easy transition between seasons, and I am praying that we have ample time to get everything on my to-do list completed before the snow flies.

As with July, the month of August saw its share of problems. At the WDCX-FM transmitter site, we experienced an infestation of carpenter ants in the transmitter building, thousands of them! In all probability they entered the transmitter building trying to shelter the colony from the extreme heat we experienced this summer. As the building is climate controlled, the cooler air provided an ideal habitat for the colony to survive. We have several pine trees located near the building, so a food source was close by.

I set out 16 bait traps, eight Terro liquid traps, and eight chemical bait traps throughout the transmitter building. After several days, it appeared that the bait traps did the job, as I did not see any ant activity, and vacuumed up all the dead ants. I set out several more fresh bait traps, just in case, but have not seen any evidence of ant activity anywhere in the transmitter building since.

For many months now, we have experienced sporadic problems with NexGen audio servers losing their connections to the file server. Sometimes, it will

be only a couple of audio servers, other times everything connected to the file server will lose its connection. I have checked network cabling, switched ports on the network switch, etc., but nothing seems to point to the cause of this problem. This all started after we replaced older XP computers with new Dell Precision 3930 rack mount computers.

Looking at the on-board network cards of the audio servers, I noticed that each has a 10 GB network adaptor connected to a Cisco CBS250-48P network switch, which handles all of the NexGen traffic. I am wondering if the Cisco switch is bottlenecking the NexGen data, thus causing the lost connection to the file server? I called and spoke at length with Todd Dixon in Birmingham about this situation, and he concurs that everything points to the network switch. If any of our other market chiefs have experienced this, please get in touch with me and let me know what you did to alleviate the problem.

Last month at the WDCX(AM) transmitter site in Rochester, I had to install a retro-kit on the day/night RR contactor at tower #5. The solenoid burned out on the switch, not allowing the switch to put the network into night mode.

All worked well until the evening of August 7th. The Burk remote control ran the macro for day-to-night switching, but towers 5 and 6 did not switch to night mode.

I made the trek over to Rochester to check out the problem and found that the microswitches on the contactor at tower #5 were bad, and I discovered an open solenoid at tower #6. Additionally, I found that the wiring for each RF contactor was bad, very brittle, and the insulation would break off when touched.



I ordered two sets of microswitches from Kintronics, one set of four for each switch, purchased 40 feet of #14 AWG stranded wire, and pre-wired the switches before installing. I returned on Tuesday the 13th and made the repairs on both switches, cleaned and lubricated both before re-installing.

I checked all of the other switches in the four remaining tuning houses and did not find any additional problems with the RF contactors there. However, I did notice several ceramic standoffs were either cracked or broken, so I made a notation of the sizes and will look through my supply at the WDCZ transmitter site for the proper replacements, and order those that I do not have in stock from Kintronics.

Another issue we had to deal with last month was the failure of the engine in our John Deere E-120 lawn tractor at the WDCX transmitter site. While mowing near the end of July, the mower suddenly stopped working, and after investigating the problem, I found that the oil filter had loosened and pumped all the oil out of the engine.

This particular model of mower utilizes a "Easy Change" oil system. Meaning, you do not drain used oil from the engine, you simply replace the oil filter with a new one that already has new oil in it. After replacing, you top off the oil to reach the recommended operating level. Somehow, while mowing, the filter loosened up, and in a matter of seconds, pumped all of the oil out of the engine, causing the crankshaft to warp from no lubrication.



The "Easy Change" oil filter on the John Deere E-120.

I have come up with a way for this to never happen again. I designed a bracket that will attach to the mower frame and the Easy Change oil filter that will not allow the filter to rotate to the unlocked position, causing all of the engine oil to be pumped out. After fabricating the bracket, I found out that there is a modification kit that you can purchase for around \$20 that will convert the "Quick Change" oil system back to a conventional oil filter system. This is a whole lot cheaper than replacing a \$1,500.00 engine!

That about wraps up another month here in the great northeast, and until we meet again here in the pages of *The Local Oscillator*, be well, and happy engineering!

The Motown Update
by
Mike Kernen, CSRE
Chief Engineer, CBC–Detroit

Spray Away!

This summer in Michigan has been nothing short of full wet-soggy, soaked, drenched. The grass and vegetation at the transmitter sites have been a major challenge to say the least. At our WMUZ-AM ten-tower site, we mow just over 23 acres and a key weapon in our arsenal is our sprayer, which has fought us tooth and nail and at every turn.

First, the unit's on/off switch failed, then tank itself started leaking a steady stream, dumping out all the herbicide we'd just mixed up. Within one week, its pump and one of the straps that hold the tank to the base snapped, forcing me to empty the tank again! Even the fuse size is too small for the



pump's electrical load, meaning it routinely blows after about 15 minutes of use.

There are rarely things more frustrating than a poorly designed product and then finding out that its manufacturer has made major improvements to their current one. Now that I have repaired exactly everything on this sprayer, it should work indefinitely, right?

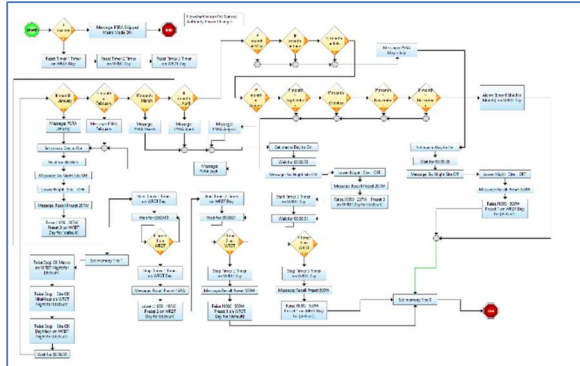
WRDT Twilight Authorization

As reported last month, WRDT has received authorization from the FCC to operate under 47 C.F.R. §73.99. This simply allows WRDT to extend operation of its daytime signal from Monroe, MI. It

sounds simple, and in principle, it is – start daytime

operation earlier, end daytime operation later. Uh, not so fast there, Sparky...

The FCC has given us two grids filled with times and power levels. The pre-sunrise authorization (PSRA) consists of 52 possibilities, and the post sunset authorization (PSSA) has no less than 96! To pare this down to something manageable, we decided not to use every permitted power level and time change. The FCC allows the station discretion as long as it does not exceed the maximum power level for a given time.



My Jet Flowchart for the WRDT PSRA/PSSA power changes.

With that in mind, Cris Alexander plucked out the times and power levels that would benefit our coverage the most.

WRDT uses a different site for nighttime operation and has done so for many years. Daytime operation is from Monroe, Michigan and nighttime is from Ferndale, Michigan. These two sites are separated by roughly 40 lineal miles. Since the Ferndale nighttime site is only allowed 14 watts (WRDT is 500 watts during the daytime), staying on for as long as possible from Monroe is highly desirable.

So, how do we accomplish the task of stepping the power levels up in the morning and back down in the evening? After trying to write macros and following a pair of examples Cris Alexander wrote to deal with this at KLDC, I decided to use a tool that is part of our Burk ARC Plus Touch called Jet™ Active Flowcharts.

Jet is a graphical tool for writing macros. It helps you create operational flows based upon actions and conditional elements, easily define and link them, and see how they relate to one another. Jet isn't new, and if you're unfamiliar with it, it may be because you don't have a license for it. It's an option for ARC Plus Touch, but it is included with ARC Solo units.

One of Cris's KLDC macros was 97 lines, and after copying it into my equipment by hand (no cut & paste nor import mechanism exists), I could tell it wouldn't quite let me do what I needed here.

One thing that had me stumped was the issue of daylight savings time or DST. While Burk's internal clock automatically adjusts for DST it can't make decisions purely based upon the status of DST.

Another quibble was that I wanted to write this logic and not have to update it every year, and Burk's standard macro functionality cannot decide based upon a month without knowing the year, too. This means that for every logic decision written into a macro, it's basically just for the year and month it is written for and must be updated for the next year's run. This means that you really must update the macros yearly at a minimum – forget to, and they just do nothing.

Curiously, Jet allows decision making based solely on the month irrespective of the year, making Jet created PSRA/PSSA flowcharts evergreen, but even then, there is the complication of DST. I solved that problem with Jet, too, by using the program's memory registers. I simply increment a register every time Sunday rolls around in March and November.

Unfortunately, I have uncovered a couple of minor bugs that I'm hoping Burk will squash for me, but I do have the flowcharts working as needed so power level changes and site switching occur at the correct times.



The new capacitor pair in the WRDT tower 2 ATU.

WRDT Daytime Pattern (or Chasing a Bad Capacitor with Phasor Tuning)

Occasionally I need to retune the four-tower array in Monroe to keep the array operating within its licensed parameters. Normally these are small movements that compensate for changes in atmospheric conditions or ground conductivity. In mid-August, tower 3 moved a significant amount, and though I was able to use the phasor tuning

controls to get it back where it ought to be, I was suspicious that something was wrong. A visual check of all four towers did not turn up anything obvious, so I started looking deeper.

I found a dead fieldmouse inside a static drain choke and noticed he'd made a mess on the capacitors below him. I was concerned that his "mess" might have made its way between the capacitor's endplate and the capacitor itself. Turns out, I was right. I took the plates off and cleaned them as well as the capacitor which had suffered some corrosion on its contact points. That made a small difference, but I quickly learned that that was not the only problem – a problem sure, but not the problem.

Even though tower three was the out of tolerance tower, tuning, looking at the schematics,

and consulting with Cris Alexander led us to a type 292 .0015 μF 9.1A 6 kV mica capacitor at tower 2. The suspicion was that this capacitor was changing value slightly possibly with temperature variation.

Neither Cris nor I had a direct replacement, but Cris was able to find a pair of type 291 .0033 μF and bolted them together making 0.00165 μF that was well within a voltage, current and capacitance range we could use.

After installation I tuned the phasor and as of this writing, the array has been stable. As I watch the antenna monitor, I am impressed by how much more zeroed-in it stays compared to what I've been accustomed to seeing. Makes me wonder how long I have been chasing this.

News from the South
by
Todd Dixon, CBRE
Chief Engineer, CBC–Alabama

Firewallmageddon

Well, it has started. I mentioned last month on these pages that Denver was going to get the temporary small form factor replacement box and then they would start running through upgrading their current three ClearOS firewalls to our new firewall standard, PfSense. The first thing we had to overcome was scheduled vacation days both in Denver and in Birmingham. Cardinal rule number one in IT is that you don't want to ever start a firewall project the week before vacation or the week after vacation.

With the box I had sent Amanda in her hands, she started with their office network, and other than a small hitch with their wireless access points, she was basically able to simply swap her WAN and LAN cabling and the temporary box began handling their network traffic. The process I worked out and wrote up is fairly straightforward, and she was able to get two of their three firewalls completed in a single day. Hopefully, they'll all go as well as they have so far in Denver without any real issues to overcome. Good work, Amanda!

Blinded by the Light(ning)

Early August (the 2nd) brought a flurry of

activity when a severe storm came through Birmingham and a lightning strike ended up hammering nine (!!!) power amplifier modules in the WDJC-FM Nautel GV40. The architecture in the GV40 has 16 2.5 kW power modules. Each of the individual power modules have four NAPA31C MOSFET power amplifier boards. Those boards are the ones we lost. The GV40 limped along at about 8.8 kw until Jack Bonds and I got them replaced on Tuesday, August 6th.



We've had similar instances like this happen before with not nearly as many casualties. The place we have seen it the most in the past is in the 7th power module, which is where all of the power combining happens for these transmitters. Three of the nine amplifiers we lost were on that module alone.

If you have followed Birmingham for very long, whether from Stephen Poole's writing or mine, some weather that comes through here is incredibly severe. To complicate matters, our WDJC-FM transmitter site is called "Red Mountain" for a reason. Birmingham, for much of its history, was considered the "Pittsburgh of the South," and there is iron ore in the ground around this area everywhere. The site is actually built on top of an old mine, and

our original site lease was with the mine owner.

The city made the area into a nature/walking trail park some years ago, but a number of the forgotten buildings of that era still exist on the property. So it should come as no surprise to anyone that our 700-foot metal antenna structure in the middle of this place takes a beating every so often from a lightning strike.



Figure 1 - Some damage is obvious, but both needed to be replaced.

The storm also carried strong winds that dislodged our POE ethernet cable from our Cambium radio on the tower about 270 feet in the air. I was able to get a tower crew out on Saturday morning to get that cable secured to the tower again and connected to the radio, and we got back on our data link in short order.

One of things that I had planned to request in the coming year was a backup internet option for the site. We already have it at every other site in our market but not at Red Mountain. This was partly by design – it is our closest site at 3.5 miles as the crow flies from the studio, so we have fairly robust primary and secondary audio going to the site and a

generator to make power. In my 23-year history with the company, I'm having trouble recalling not having access to the site – maybe only temporarily while the power company got their lines back in place – but twice in the last year we haven't been able to get access to the site at all for extended periods of time.

The first time was when a really bad storm downed so many trees that it took nearly 36 hours to get through. The other more recent issue was when a car careened into a power pole on the road in front of the gate and access to the site from both sides of the mountain was blocked once again. On a side note, I was also leaving the site earlier this month and was at the gate when a car dove into the ditch due to a broken tire rod right in front of me. Pro-tip: I am apparently a magnet for these type of events, so I urge you to keep your distance if we ever have an opportunity to meet in person.

The problem for us, as many of you have already surmised, is that the need for physical access without a backup network is mandatory. When all your equipment is connected via a network, access to what is happening on the network at the site is the more immediate concern. The ability to see your audio processor, codecs and transmitter over the network is a necessity, not a want.

In that vein, with this latest physical access issue at the site, Cris ordered us Viasat internet service at the site, and we are already connected with a dual-WAN router. We've gotten almost all our equipment configured for remote access from our local Cambium network or over the internet, and are looking forward to having this extra layer of redundancy at our Red Mountain site.

I'm praying for a better September. Until then, we'll either visit on these pages or maybe even a one-on-one phone call due to a PfSense firewall install in your market., but I pray God blesses you and the work of your hands.

Tales From Cousin IT
by
Stephen Poole, CBRE, AMD
CBC Corporate IT Specialist

Around here, when you say, "freeze," you're generally referring to an upcoming snow or sleet event. This results in a swarming horde of panicked Alabamans buying every scrap of bread and drop of milk within reach. But now I'm referring to a credit freeze, by which you can prevent anyone from using your personal info to obtain a loan or open a new account.

In August, a company called National Public Data (owned by Jerico Pictures, neither of which I'd ever heard of), which gathers and stores personal information for background checks, was hacked and mined. Almost 3 billion personal records were stolen, including names, addresses, SS numbers and dates of birth.



There's no cost for this, but you'll need to establish accounts with all three. I thought, "Yay, three new logins to forget." The "Forgot My Password" clicky and I are old friends, after all. But it was relatively painless at Equifax and TransUnion, and the Freeze button was easy to find and click. Done.

Experian, on the other hand, hid the free freeze option and hyped all sorts of paid services. I finally found a link near the bottom of one page that would give me the freebie and clicked it. I continue to receive spam from Experian begging me to purchase their "enhanced" protection.

These folks are obeying the letter of the 2018 Fair Credit Reporting Act, but the spirit of the thing apparently eludes them.

I strongly encourage everyone to do this. It won't prevent using your existing credit cards or accounts. In the future, if you decide that you want credit, go back to the three websites and click "unfreeze." Do your business, buy that car or whatever, then freeze again. It's a bit of a pain, but preferable to discovering that someone in Cancun has opened an account in your name.

Upgrades!!!

Todd has written in these pages about his experience with upgrading our ClearOS firewalls, and moving all of them to OPNSense, which is actively maintained. ClearOS was bought out by HP Enterprise some years ago, and they've apparently lost interest in it. Queries for support and licensing go unanswered. Maybe they got tired of playing. Whatever, they've obviously taken their little football home and are ignoring us now.

(This is a case of "How the Mighty Have Fallen," in my opinion. I hope HP isn't headed toward the type of train wreck that Boeing has become. At one time, they were my favorite choice for home computing products. The way they act nowadays – for example, their "forever" billing for ink and toner, and even disabling their equipment in some cases – smacks of Luca Brazi and I've abandoned them. Dell and Lenovo are happy to take my money. Just my opinion, but there you go.)

OR

Social Security Number (SSN)

OR

Phone Number

SEARCH

To help keep you anonymous, your search query is hashed locally and then sent to our servers to search against the NationalPublicData.com (NPD). We do not store any search data.

1 Result Found

Name	Address	ZIP Code	SSN	Phone
Stephen Poole	Redacted	35180	Redacted	Redacted

Result Logs

I'VE BEEN BREACHED, NOW WHAT? >

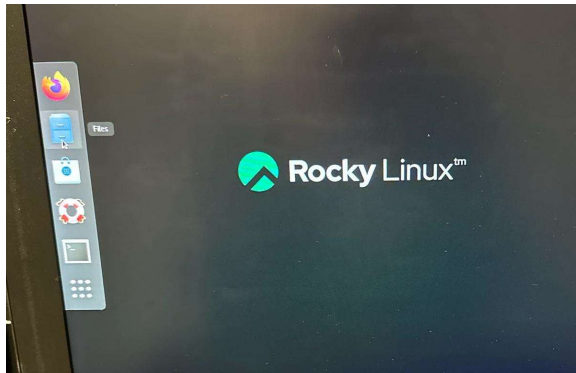
Discovering that my personal info has been hacked.

To be fair, some analysts are saying that a lot of the data is old and stale. But given that Social Security numbers don't change, I decided to proceed with the free credit freeze offered by the three major credit agencies – Equifax, TransUnion and Experian. Think about how you're often asked to verify a credit card with your ZIP code, or to access medical records with your date of birth and/or SS number.

I've had my own fun with the Upgrade Madness in the past month, helping Amanda in Denver to move our CentOS installations to Rocky Linux. For many years, CentOS (which stands for "Community Enterprise Operating System") was the go-to for people who wanted a RedHat "clone." RedHat bought it, and then changed it over to what they call "CentOS Stream," a development release. Think: a never-ending beta and you won't be too wrong.

Rocky (But No Bullwinkle)

In one of life's little twists, Rocky is being developed and maintained by one of CentOS's original founders, Gregory Kurtzer. The name is a tribute to Rocky McGaugh, who worked with Kurtzer to create CentOS as a binary-compatible Red Hat clone.



Amanda sent me this screen shot. It's missing the picture of Boris and Natasha.

We'll leave the ethics of using a free clone of a major operating system to others. Shouldn't we be willing to pay RedHat for all their hard work? We did with our web server because we wanted the support. But for other stuff? The clones are fine.

The bottom-line issue here is the licensing: Linux (and the GNU software that runs on top of it) was (were) developed, copyrighted and released under GNU Public Licenses under the aegis of the Free Software Foundation. They have some rather strict terms and rigidly enforce them.

The key is that all source code for GNU-licensed software is required to remain available to the public. Further – and this is the bottomest bottom-line – RedHat itself is built atop this free software. They charge for support and documentation, but the underlying software is free.

The GNU license permits developers to charge whatever they wish for that source code. They can lock it behind a paywall. BUT ... once it's sold,

whoever buys it can redistribute it any way they wish. (If they modify it, it has to be released under a GNU-compatible license, but that doesn't really apply here.) My answer to the complainers is that if they didn't want to be forced to release their source code, they could've used different software, written their own and/or used a different license. The BSD license, for example, is much less restrictive.

How Does It Look?

So, how is it? How does it work?

So far, so good. The installation was a bit tense, because in our case (two FTP servers for voice tracks/logs – "wancasting" – and archived program storage), we didn't want to overwrite all of the files that had been stored by our users. Fortunately, Linux makes this easy: all user content is supposed to be located in the "/home" subdirectory, typically under the user's name (ex., "/home/stephen/").

Most Linux distributions put /home on a separate disk partition by default. We did a lot of preparation and made complete backups of the servers in question, of course. (We ain't dumb.) During the installation, Amanda told Rocky to format and rebuild all partitions except for the one containing the /home folder, and it worked like a champ. All 1.3 terabytes of data came through intact. We used WebMin to export all user data from the old CentOS systems, then imported it into Rocky after installation. That worked like a champ as well; even the passwords came through without change.

But ... Zimbra. OH, Zimbra

Zimbra has pulled their own "RedHat" and have decided to stop releasing pre-built installation media for so-called "community" (i.e., free) distribution. They're hiding their source code as well, even though – just like RedHat! – their entire mail system is built on and based on free (mostly GNU) software! They use Postfix (free), SpamAssassin (ditto), MariaDB (ditto ditto), and ... you get the idea.

You have to pay and it ain't cheap. Just like M365, the fees are per-user. Given that we have hundreds of said users, you're talking some real money here. It's hard to justify spending thousands of dollars per year for transmitter sites and part-time board operators.

ZExtras, a company that started out by providing plug-ins for Zimbra users, took Zimbra 9's source code and built it, making packages available for everyone. Zimbra then "hid" (my term, not theirs) version 10's source code, so no one, not even ZExtras, has tried to build and distribute it.

In the plainest Ingles, we need to upgrade our Zimbra installation and it would be both expensive and difficult. I've been looking at alternatives, including a mail server called "Carbonio" produced by ZExtras. That's something else that needs to be done ASAP. As I told Cris when I learned about this, "because we didn't have enough to worry about ..."

The biggest problem isn't keeping the mail data intact; Zimbra stores it as gigantic plain-text blobs. I could easily write a Python script to pull out and sort each user's email. The problem is moving the

login info for each user, particularly the passwords. The latter are stored as encrypted gibberish. Simply put, a password like "@Zxy13!jbx" is converted to a hash, something like "\$6\$60282034\$5..." and so on and on. (No need to display all the characters here. My spell checker already hates me.)

When I moved our mail from Scalix to Zimbra, I had a time getting the passwords to transfer. I'm having the same joy now. But hey; that's my job, and I'm gonna do it, Lord willing.

That's it for this time; until next month, keep praying for this nation!

The Chicago Chronicles
by
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In last month's column, I mentioned the incident that caused heavy damage to our NV40 aux transmitter at the WPWX transmitter site. We had suspected that the cause of the fans not working on many power amplifier modules was actually the power splitter board on the modules that distributes the 48 volts DC to the fans.

As stated in that writing, we were waiting for parts to test this theory, along with some power amps for modules that had those failures. We did finally receive the shipment, and when we replaced the one power splitter board, it worked, and the fans ran again in that particular module.

This meant that we could safely assume that we would get the same results in replacing the splitter board in the other modules and most

likely get the same results. Unfortunately, we had more of the modules now coming up with these alarms.

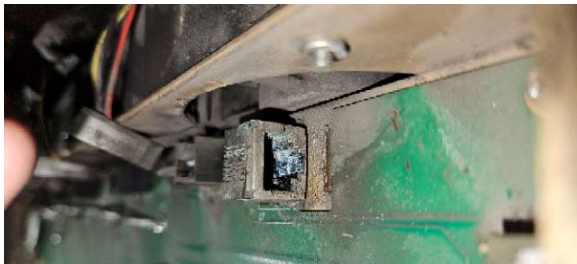


Even more interesting was that in the modules that were only coming up with power amplifier failures, once the amplifiers were replaced, we were getting the fan alarms now on that module. It would seem that the power amplifier failure was somehow masking the fan failure alarms. My guess is that when the transmitter is activated, the power amplifier failure shows up first, shutting the module down before the fan failure alarm occurs.

As we are now getting into more of the modules and pulling the splitter boards out, it is fairly obvious that these boards are the issue. We are seeing some very burnt connectors and components on the boards.

At the time of writing, we just received the shipment of splitter boards to hopefully finish the repairs. There may be some issues that are still going to present themselves once these repairs are finished.

What we are seeing is a testament to the power of a lightning strike. Even with all the measures we take to keep the strikes at bay, given enough power a strike can still find ground through the equipment.



Lightning damage on one of the PA modules.

Rocky Mountain Ramblings
The Denver Report
by
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August has absolutely flown by! I was able to enjoy a week away from the office down in Southwest Colorado in Lake City. It was very relaxing, although I still had to do a little bit of work. Having remote access to nearly everything really makes working from home or working from vacation easy. I am glad I was able to correct the issues myself rather than have to call in outside help.

KLZ Roadwork

The road widening project in front of the KLZ site is still ongoing. There were several days when we could not get onto our property by car. They poured a nice concrete area to get from the street to the gate. They put our fence back up and should be done on our property. They finally moved some of the closures, although it is still difficult to get to the site, it is nowhere near as difficult as it was. By the looks of things, we are thinking the main route in and out that we take will be fully open any day now. I was able to fly our drone and take some pictures of the progress. A good opportunity to get some practice in. I may be a licensed drone pilot, but I rarely fly.



The road widening project at the KLZ site. Our entry is fully restored, but there are still detours in place that make getting there a challenge.

Power Module

After vacation, I received an alarm from the KLDC J1000 transmitter. It had switched to the B exciter and would not put out any power. I put it on the aux transmitter and went out the next day. Sure enough, something was wrong. We brought the power module back to the office where we could more easily work on it. We found several components were fried. Thankfully Nautel has great instructions for what to look at and we were able to replace the parts with the spare parts kit we have. We were able to put the power module back in and all is right in the world again.



Swamp Cooler Woes

On the evening of Friday, August 16th, while I was at our mountain hole for the weekend, I received an alert from AcuRite saying the temperature at KLZ was above 75 degrees. I got on the ARC Plus Touch and told it to toggle the power of the swamp cooler. We do not have a status on that cooler to confirm its on/off state, but I was assuming we had a quick power glitch that caused it to turn off. I noticed the temperature did not go down and the humidity was really low. Thankfully, it did fine over the weekend until Sunday when I was able to get over there.

We found the belt had shredded and somehow bunched up and caused the motor to stop spinning. The flapping belt blew a hole in the filter and broke the water spreader. We went ahead and replaced the belt (thanks to my hubby for taking care of this for me).

We have been looking for replacement water pads with little luck. The local company that does the work for us wants more than double what they cost. And the other places that carry the required size say they will not have stock until January. I have got a call in to one other company. We may have to make do until the end of the season and go ahead and order the pads for us to use next year.



The flapping belt knocked a hole in one of the water pads and did some other damage inside the cooler.

KLVZ Transmitter Issue

On the same Friday that the swamp cooler gave us issue at the KLZ site, I also got an alarm about the ND2.5 at the KLVZ transmitter site. I got onto AutoPilot and could not get it to turn on. It would show an RF on status but not put out any power. I quickly switched it over to the night site to get us going again.

I had a concert on Sunday after I got back into town and didn't have much time to troubleshoot. I chose to troubleshoot the swamp cooler first. My dad ended up going out and trying to get it back up himself, with no luck.

We went back out on Monday with an oscilloscope. After doing a ton of troubleshooting, searching for the reason that there was no mod drive, we found the external PDM Inhibit was the cause. Turns out a prairie dog probably ate through our control cable going to the tower. That cable controls the RF contactor switching between DA and ND modes. It's not something we use anymore in the moment method age and having a night site and all, so we just bypassed the closure that should have been coming from the microswitch in the ATU. That was a lot easier than trying to trench in a new cable that we don't really need.

Transmitter Interference

As some of you know, we have had issues on and off with the BW Broadcast transmitter for 94.3FM. At full power it puts out a spur on the local guard frequency. They were not too appreciative of it. We were able to lower power and have the spur go away for the most part. My dad contacted Progressive Concepts about sending it in for repair. They found some issues, repaired them, and sent it back.

However, after reinstalling it and running it at full power that spur was still there. Now we wait for the next steps.



My dad helping me trace out the PDM inhibit issue in the phasor controller wiring at the KLVZ day site.

Servers

I spent a few days last month getting our firewalls upgraded. Todd Dixon was kind enough to buy some sort of magic computer box and have it configured for temporary use as our office firewall. The idea is to plug it in and move the cables from the firewall I am upgrading to it. Ideally, this would allow it to run with no real interruption to the network.

For the most part, this worked. I found an issue here and there, but since I started things early in the day, no one noticed. I was then able to install the PFSense operating system on the Dell server used as the office firewall.

Then I reprogrammed the magic box Todd sent for the NexGen/Transmitter firewall and did the same thing. With this one, the biggest issue I found was that it caused some of our audio servers to lose their way. I had to restart NexGen to get things back.

Then I moved on to the stream firewall.

The Local Oscillator
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Initially it did not work. I had internet, but the streams did not work using the little box. I gave up for the day and tried again the next morning. I found an issue with the subnet on the main gateway, changed it and things started working. I was able to get the Dell server converted over in a matter of minutes.

The other project I had was upgrading our Corporate Program Bank and the Crawford FTP servers to Rocky Linux. Stephen worked to get these backed up and then I was able to take them down for a few hours while I installed the new operating system.

For the Program Bank, we figured out what checkbox not to check in regard to username and passwords. What ended up happening, if I understand correctly, is that Stephen encrypted the already encrypted passwords making the passwords worthless on the new operating system. We will reset these passwords as people scream about it.

The Crawford FTP server went more smoothly. The issue with this one is having to explain to clients, for whom I have no contact info, that they need to tell their system to update the key used to access the site.

We also decided during all this that the Program Bank needed to be replaced. That new Dell R250 server is in, and the trick now is getting Rocky Linux to install. I have tried several USB's and even a DVD (the same one I had been using to do my other machines) with no luck. I am hoping it is an issue with the Rocky servers, so we will see another day what happens.

Upcoming

I still cannot believe how fast the year has gone by. I have so much work to do. As I just mentioned, I have this new server to set up as the corporate Program Bank. I have mowing to do, too. We had a late monsoon this year and the growth at towers and building at KLVZ is massive. KLTT is also overgrown. I need to mow inside the tower bases and around the building. I may do some of the work on Labor Day... after all, mowing is labor! I also have cleanup up at some of the sites that needs to happen. Bugs and mice and dirt cause issues. On my most recent trip to KLTT, I found two dead mice (better than a transmitter building full of carpenter ants!). I have poison set out to try and keep the mice away, but they find any little crack and come in. I am hoping things slow down soon so I can catch my breath.

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KBRT • Costa Mesa - Los Angeles, CA
740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1

KNSN • San Diego, CA
1240 kHz/103.3 MHz, 550W-U

KCBC • Manteca - San Francisco, CA
770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2

KLZ • Denver, CO
560 kHz/100.7 MHz, 5 kW-U, DA-1

KLDC • Denver, CO
1220 kHz, 1 kW-D/11 W-N, ND

KLTT • Commerce City - Denver, CO
670 kHz/95.1 MHz, 50 kW-D/1.4 kW-N, DA-2

KLVZ • Brighton-Denver, CO
810 kHz/94.3 MHz/95.3 MHz, 2.2 kW-D/430 W-N, DA-2

WDCX • Rochester, NY
990 kHz/107.1 MHz, 5 kW-D/2.5 kW-N, DA-2

WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT

WDCZ • Buffalo, NY
950 kHz/94.1 MHz, 5 kW-U, DA-1

WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WCHB • Royal Oak - Detroit, MI
1340 kHz/96.7 MHz, 1 kW-U, DA-D

WRDT • Monroe - Detroit, MI
560 kHz/107.1 MHz, 500 W-D/14 W-N, DA-D

WMUZ-FM • Detroit, MI
103.5 MHz, 50 kW/150m AAT

WMUZ • Taylor - Detroit, MI
1200 kHz, 50 kW-D/15 kW-N, DA-2

WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT

WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT

WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT

WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT

WYDE • Birmingham, AL
1260 kHz/95.3 MHz, 5 kW-D/41W-N, ND

WYDE-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

WXJC • Birmingham, AL
850 kHz/96.9 MHz, 50 kW-D/1 kW-N, DA-2

WXJC-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT



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