The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

Two Down…

,,,And quite a few still to go. I'm talking, of course, about the conversion of our playout system from Nexgen to Zetta. Both Denver and Birmingham are finished as of this writing, and we're in the middle of the conversion in Buffalo.

With the conversion in Denver under our belt along with several weeks of operation, we were better prepared when it came to the Birmingham conversion, which was the idea behind starting in Denver. Things went well in Birmingham, and other than a minor (and avoidable) snag with the server, we didn't have any big issues to deal with. Birmingham is up and running on Zetta and in the process of fine tuning the operation.

Both these conversions have prepared us even better for Buffalo, which should, in any event, be a simpler process because it's a much smaller operation than either Denver or Birmingham. Brian Cunningham has been through the Zetta academy and is now Zetta certified, so he's good to go.

Looking forward, the on-site work for Detroit is next on the agenda, set for 4/28-5/16. Overlapping with that will be our two California markets, with KBRT/KNSN converting the week of 5/5 and KCBC the week of 5/12. Chicago will finish things up June 9-27.

Traffic Changes

One thing we've found is that Zetta won't do spot rotation like Nexgen did. Rather, it relies on whatever external traffic software you are using to do the rotation. This requires us to make some changes in the way we do things. We use Visual Traffic across the entire company, and VT has provided us with a tutorial on how to implement spot rotation into the traffic system and exports, Our traffic people in each market where spot rotation is used will have to spend some time implementing the rotation, but once

done, the process is automatic. The payoff is that Zetta will report correctly back to VT that each spot did in fact run and thus reconcile the log. So, a little pain for a significant gain.

Metadata

We were fairly well prepared for the metadata exports in Birmingham after we figured everything out in Denver. The one thing that we're still working on is the multicast exports. We air our three formats on alternate station HD2 and HD3 multicasts, which extends their coverage and provides us with a secondary backup STL of sorts for all the stations. But every time we would do an HD2 or HD3 PSD export, it would crash the importer. What's up with that?

What we found was that although our importers are fairly new, each feeding a GV-series transmitter, they were all Generation 3 importers, which require MSAC to process PSD. At this writing, we're looking at our options. Seems like MSAC, which is required for Generation 3 PSD processing, requires Java. Seriously? What are we supposed to do with that? There's no upgrade path that would get our importers to Generation 4, so we'll have to figure out another way to make it work. We had Gen 3 importers running in Chicago until recently, so I'm confident that there's a way to make it happen.

Tieline/Wheatstone

We have for some time now enjoyed using Wheatstone-enabled Tieline Gateway codecs as primary STL audio transports in several markets. It's great to be able to route audio directly to and from these units, and their multi-unicast features and SmartStream Plus diversity backup feature provides for seamless transition to an alternate IP path if the primary path is lost or degraded.

Nowhere do we work our Gateways harder than in our Denver market, where we have not only four primary AM signals but also four FM signals plus backup alternate IP routes. The studio Gateway 8 has the following full-time outbound connections/streams:

- KLZ Main
- KLZ SmartStream Plus backup
- KLZ FM
- KLZ FM SmartStream Plus backup
- KLTT Main
- KLTT FM
- KLVZ Day
- KLVZ 94.3 FM
- KLVZ Night
- KLVZ Night SmartStream Plus backup
- KLVZ 95.3 FM
- KLVZ 95.3 FM SmartStream Plus backup
- KLDC

We also have several inbound streams from the KLZ transmitter site for satellite feeds – all our C-band antennas and receivers are at the KLZ transmitter site, so add four mono inbound streams to the list.

That's a lot of eggs in one basket, so we have a backup Gateway 8 in the rack, connected to both networks and ready to go with connection programs that duplicate everything in the main unit. Switching to the backup is simple: Log into both units, click connect on the backup and disconnect on the main. You're back up with all signals in a few seconds.

But there's one small problem with that. When we switch to the backup unit, the backhauled satellite feeds are not routed in Wheatnet where they need to go. We always had to do that manually, which is a PITA because they go several places as static routes and occasionally to a DRR channel as a dynamic, switched route. It sure would be nice if the routing would change with which Gateway is connected.

It occurred to Amanda and me as we were discussing this that there should be a way to fire a salvo in Wheatnet with a Gateway connection. Amanda asked Tieline's Jacob Daniluck about it and he pointed the way. It's possible to set a "rule" in the Gateway so that a program, a connection or specific stream can trigger a Wheatstone SLIO, and he told us how to set that up. It took some trial and error, but we figured out how to make it work in Wheatnet. Now, when we go to the backup Gateway, as soon as the KLZ connection is made, it sets the static routes for the satellite backhaul.

I'm still noodling on how to deal with the switched routes (DRR). I'm thinking a script in Wheatnet…

The New York Minutes
By
Brian Cunningham, CBRE
Chief Engineer, CBC – Western New York

Hello to all from Western New York! We as engineers are creatures of habit, constantly looking for ways to keep our stations on the air.

Daily, when I arrive at the studios, I immediately check in with the board operator to ensure that everything is operating properly in the studios, then proceed to check all our internet streams sound and program associated data are working.

Next, I make a check of the Sage ENDECs' monitor source audio and recent tests that have run for the previous week.

Additionally, I check all equipment located in the TOC to ensure that everything is running smoothly, along with each transmitters site remote control readings.

It was during one such check-in on March 3rd that I discovered that our Tieline Gateway-8 backup had failed. There was no display, nothing lit on the front of the unit.

Suspecting a power supply failure, I pulled the unit from the rack and set it up on the workbench for testing. After removing the cover, I discovered that both supplies were producing the correct voltage, so therefore the problem was likely in the main control board. I placed a call to Tieline technical support to discuss the issue with them, and to see if they could steer me in the right direction to find a resolution to this issue. They recommended sending the codec in for further evaluation.

I arranged for a loaner to be sent to us. However, it was not a Gateway unit but a Tieline Genie 4-channel codec. That's good enough, as it would keep us on the air should the main Gateway-8 fail.

I checked in with Tieline's technical support department after they received the failed unit, and they said that the codec needed to be shipped to Australia for further diagnosis and repair.

I'm thankful that they were able to supply us with a loaner, as it appears that it will be some time before our unit is repaired and back in service. Had I not had a system of checks and balances in place, it would have been disastrous if the failure had gone unnoticed and the main unit failed, taking all three stations off the air!

Later the same day as the Tieline failure, I received an email and text around 7 pm that the Legends 102.7 signal was down in Rochester. I logged into the site streamer and noticed that there was audio on the air and transmitter readings appeared normal. Not finding any issues, I went back to what I was doing. Around 11 pm later that evening, I received another alarm that the station's transmitter was down again, but this time, it was definitely off the air. I was unable to bring the transmitter back up via the remote control, so a trip to Rochester was required to see what could have happened.

Once I arrived at the transmitter site, I immediately switched the BE FMi-206 digital transmitter into FM + HD mode to get an analog signal on the air while I troubleshot the problem with the main Continental 816R-2C transmitter.

After several hours of troubleshooting, I found that the wiper of the motor-driven filament rheostat had burned up, therefore there was no filament voltage being applied to the 4CX15,000A tube.

Since I had been up nearly 24 hours by this time, I felt it wise not to try and re-tap the rheostat to see if I could find a winding tap that could supply adequate voltage to the tube.

Returning on Wednesday morning, I began by re-tapping the rheostat to see if one of the windings would provide sufficient voltage to the tube. The first tap I tried was only 3 volts, and the second provided 4.3 volts. For the third, the output voltage was 6.4 volts, a little high, but would enable me to get the transmitter back on the air.

After changing the taps, I attempted to turn the transmitter on, but the air interlock was not working. I had to jump out the air interlock to get the transmitter up, and I was not very happy about that, but the station had to get back on the air at full power.

I tried over a dozen times to contact Continental Electronics in Dallas to obtain replacement parts, but was only able to leave a voicemail message. After three days of calling, still no response. I finally got through on the fourth day of trying, only to find out that they had no parts available.

Thankfully, Mike Kernen in Detroit had a Continental in storage that he was able to loan me the air switch so we could operate the transmitter safely until a replacement could be obtained. As of this writing, I have been unable to find a new or used rheostat to replace the burned-up one. Looks like Continental Electronics is out of the parts business for good. It's a shame, as at one time they were in all probability were one of the best in the business.

On Monday the 24th, we began installation of Zetta here in Buffalo. As of this writing, we have our HD-2 audio server running Zetta live with no issues. We had some problems with PSD export, but got that issue resolved in short order. Our plan is to get Zetta up and running on WDCX(AM) next and WDCX-FM soon thereafter.

In next month's report I'll write on how our total installation went. I am thoroughly impressed with the power of Zetta and all the functions it provides. I still have a lot to learn, but our installer, Samantha Johnson, is a great teacher and has been working with Josh and me to teach us all she can about Zetta and how to properly program and maintain the system.

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

Climbing the TRE

Last month I wrote about our installation of the BE product, TREPlus. TREPlus is a middleware software that takes the 'now playing' data from audio storage and playout automation systems, enhances it and converts it to be ingested by HD Radio importers and/or many different types of RDS/RBDS encoders. Essentially TREPlus makes it possible for us to link advertising messages and logos to the audio commercial spot giving the advertiser a visual component to their ad.

Our writer-producer Pete Presnal has jumped in with both feet and created companion content within TREPlus for each advertiser running spots on our FM station WMUZ. I've been watching as our ads have run and it's exciting to see the client's logo and relevant text make its way to radio and being displayed.

Advertiser logos are only supported on HD Radio and enabled by what Xperi (the HD Radio people) calls The Artist Experience (or AE). As the name implies, this technology was first envisioned to enable the display of album art or other art related to music, but it can do so much more. Using TREPlus, we have it showing album art, advertiser logos, our logo, and headshots of our talent.

We have an Inovonics 551 modulation monitor which shows this content in real time, but I was interested in finding some other ways to see the content, too. I personally own an Audiovox table radio (there was an identical version that was sold under the brand name Sparc) which supports AE, but it's nearly impossible to find any that aren't designed for in-vehicle installation. I thought about buying an aftermarket car radio, which I have done in the past, but I found out that using Python and an SDR it was possible to display the HD Radio AE content right on a computer screen.

Sure enough, it can be done. For those unfamiliar, an SDR is a Software Defined Radio receiver that essentially takes the RF signal off the air, or from a suitable sample port in a transmission system, and tunes and demodulates it using software rather than other bulky electronic components. My assistant Steve has one that we've been experimenting with which is a USB stick SDR that can be bought from Amazon for $35.

Steve set up software he found to make his SDR decode HD Radio, and it supports AE, so we can verify the art and program associated data is being transmitted as we intend.

My kudos to Steve who figured this all out on his own. Since then, I was able to locate a video that outlines the process which you can check out below.

I've decided that from here on out I'll dedicate a laptop that would otherwise be retired to showing the HD Radio Artist Experience data just as a confidence monitor in the shop. This way we can notice should it get stuck or have some other problem.

https://www.youtube.com/watch?v=BT82rdPAYOg
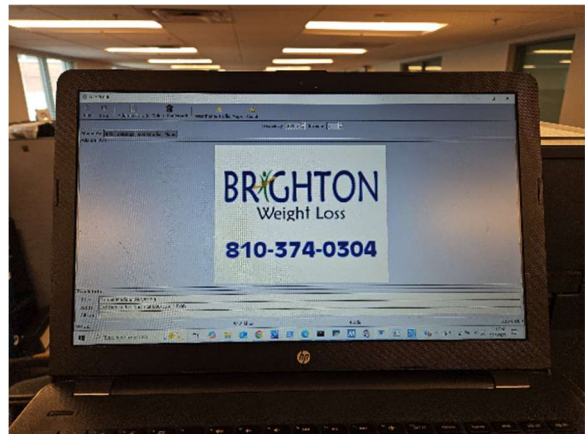
SDR HD Graphics Display

Zetta Preppers

For the better part of the month, I've been carving out bits of time to go through the Zetta for Engineers training program. RCS has done a fantastic job creating an online course that engineers can take

to better understand Zetta prior to its deployment at their facility. There is a companion course for users too. The courses consist of videos followed by knowledge check questions, then a summary quiz after each section. It is as grueling and unforgiving as any post grad college level doctorate dissertation – okay, well, no not really. Honestly, it's dialed in to get you familiar with the software and its concepts and capabilities. By the end, I feel like I'll be conversant and confident, but I'll also know when to make a call to RCS for support.

ATU UPS

Down at our 10-tower array transmitter site in Huron Township, Michigan, the earth has given up its frost and save for the road and general area of the garage and transmitter building, everywhere else is a soggy marsh. This was less than a perfect time to go out to tower 3 and replace the UPS that supplies power to the microwave radio up on this tower. Nonetheless, I put the tractor in 4WD and went and thankfully didn't get wet feet!

I found what just might be the perfect UPS for such a job. The APC Back-UPS BV400XU. This 400VA UPS has several design elements that made it a good candidate for the installation inside the antenna tuning unit (ATU) there. I wanted a ruggedized chassis, metal exterior, flexible mounting, and above all, a wide temperature range. Since this UPS has to be stationed inside the tower 3 ATU, it would be baked, frozen, exposed to high levels of RF, and even some vibration due to the windy environment.

This unit has the specs and came with a bracket which allowed it to be mounted to the inside wall of the ATU. The specs say the minimum temp is 0ºC (32ºF), but I can't imagine why it can't be left in colder temps. In fact, it's already gone below 0ºC in the days since it's been installed and had no issue. On the high end the specification says 50ºC (122ºF)

which I can imagine that the inside of an ATU in the summer sun, just might get there.

The CODEC Shuffle

Recently, two of our remote show hosts started to experience disconnects on their connections during their shows. One was our afternoon show host who mostly works from his home basement studio. In common to both was the quite old Telos Zephyr-IP, which had been doing yeoman's work since 2011. Having two of these racked up, I decided to start using our hot-spare for our show that comes from Texas. For our afternoon host, I had to do some CODEC shuffling, which had me changing an entire STL path over to our one remaining channel on our Tieline Gateway 8, freeing up a Tieline in TOC so I could send it home with our host. This would then connect to a Tieline Bridge-IT XTRA which had been freed up a while back when I moved an STL for a translator over to our (at the time new) Gateway 8.

Moving the afternoon hosts connection to the Tieline offered us additional advantages. First, I set it up to use SmartStream Plus, which essentially creates two redundant and independent IP streams that the receive side can switch between should there be any network irregularity like excessive latency or interruption.

Second, I set up a persistent peer-to-peer connection so the host would never have to initiate the connection or "dial in" prior to his show.

Third, Tieline offers AAC audio compression, which has superior sound quality. I set the host's Tieline to be plug-and-play so when he took it home, all he had to do was move the input and output XLR jacks from the Z/IP One he was using to the Tieline.

As I write this, a pair of WorldCast Horizon NextGen codecs have arrived from our Denver studios for the link to Texas. I'll let you know how those work out next month.

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

Checked off the List

March has come and nearly gone, and with it, our Birmingham market RCS Zetta conversion is complete and up and running. With a couple of exceptions that we've been working through (namely our signal metadata), the conversion went "fairly" smoothly. As our installer, Corbin Garcia, was fond of saying, "Every install is a little bit different and each has its own problems to overcome." Ours was certainly no different than any other Zetta install in that respect.

I think the difficulty for most installs lies in the fact that we tend to forget some of the engineering we did to make our Nexgen systems work the way they did. The little details we had cobbled together, whether it was a software or hardware solution, required a complete rethink (or remember) when it came to Zetta. Several times during the installation, I would be updating Cris on where we were on our install and told him that my Nexgen thinking had taken over when I should have been using my Zetta brain.

Several of our issues were simply computer hardware related. One of the things that kicked us in the pants a couple times was that we had four workstations that had issues with running Windows 11 and Zetta. The symptom was that the Zetta install, along with the entire system, would simply lock up.

We had had the issue with an ASERV1 machine that Corbin was trying to use when he was still off-site and doing remote database work, but I didn't attribute it to a lack of computer resources. I'm generally better at weeding through computer hardware issues, but my brain was really in overdrive regarding the details of our install and it didn't hit me what was going on until I had to work through our background recorder (BGR, previously the DRR) machine and get it ready to do its work with Zetta.

This machine had a 2 TB hard drive, 16 GB of RAM and an Intel I3-8100 processor, and I simply couldn't imagine it not having the horsepower to run Windows 11 and Zetta. Of all those specs, you can likely guess which was the drawback – the processor. The I3 is a four-core processor and 8100 denotes its generation (8th generation). The current Intel processors are on their 14th generation. To be honest, I believe that an I5 or I7 of that generation would have been able to manage the work that Zetta was asking of it.

We had three new machines we were bringing into the family, so currently we're really only down one machine and the availability of five licenses of Zetta2Go will easily cover that lack of hardware. You probably know this, but you can easily determine what processor and RAM resources you have on your machine by typing "System Information" after clicking on the Windows start button. I would suggest at least 16 GB of RAM for every Zetta workstation as a baseline.

Cris jumped in and had our BE TREPlus installed and ready to go, but even so, we're still treading through a couple issues of our own that may just end up being Birmingham issues. As he mentioned last month regarding their installation, metadata in Zetta leaves a lot to be desired.

We were simply sending the RDS DPS field to our GV series transmitters on port 7005. Of course, the standard in the company is sending DPSTEXT, and the GVs don't handle that at all. Cris contacted Nautel and found a way around the GV's limitation by sending DPS in one of the RDS exports from TREPlus and RT data in another about a second later. Nautel says that DPSTEXT for GV series transmitters may be reality in a few short months, but for the time being, Cris' solution is completely workable.

The other metadata issue we have run into is that our HD2 and HD3 PSD data are not working correctly yet. Our GV 40 transmitters have the Generation 3 model importer and exporter, and they are separate pieces of hardware. The nomenclature for these units is misleading – we're actually on importer version 4.4.7, but its HD generation is 3. So our initial attempts to send metadata coded through TREPlus to talk with Generation 4 hardware resulted in our HD2 and HD3 streams simply shutting off. I don't mean that the metadata simply didn't show up when it was sent, I mean the SPS1 and SPS2 Capture

boxes would simply error out and bomb, leaving us with no audio at all on our HD multicast. Currently, we're not sending metadata to those channels and everything is fine, but that is obviously only a temporary solution.

The other option is that TREPlus allows for transmitting data to the secondary HD channels via MSAC. I reached out to Nautel support on this and they had a download package that installed a java-based MSAC solution, but their instructions included the use of Center Stage Lite (CSLite) that was a joint venture between Arctic Palm and Xperi and that free software is no longer available.

It wasn't exactly a dead end, but in the midst of my preparations for hari-kari, I remembered that Cris had given me the email address of Jeff Detweiler at Xperi. Jeff likely wishes that I didn't have his email address, but he has helped me out on several occasions regarding HD in the past, and after several email exchanges, I have a workable solution with a step-by-step video detailing the process and their java-based MSAC client setup. I have completed the work on our HD importer machine, so now it has an MSAC client on it and the next step is to get TREPlus sending MSAC coded metadata to our importer! After that, our metadata woes should be over.

A Day in the Life of a Zetta Install

So what happens in a normal day of a Zetta install? The short answer is that you spend each day building up your new Zetta system from scratch so that it can, at some point in the last week that you have the installer on premises, be able to switch your station from using Nexgen to using Zetta.

There is no doubt that your installer is doing most of the heavy lifting during the upgrade, but you are the one who is there to fill in the details about how each of your stations operates and how things are matched together.

One of the things that had happened in Birmingham with our Nexgen install is that we had not only added three stations since it originally was installed, we also consolidated two systems into one and moved several times, and our computer naming hadn't kept pace with that. There was a lot of momentum built up in Nexgen, and our labeling that kept CTRL4 in our WDJC G3 studio. So we had

some opportunity to change computer names to match their locations and lock them down a little better before they got entered into the Zetta database for good.

One of the things Jack and I would do with Corbin each day is spend the last hour of the day laying out the goals for what we needed to accomplish the next day and also readjust what we needed to do to meet our marks for when we would
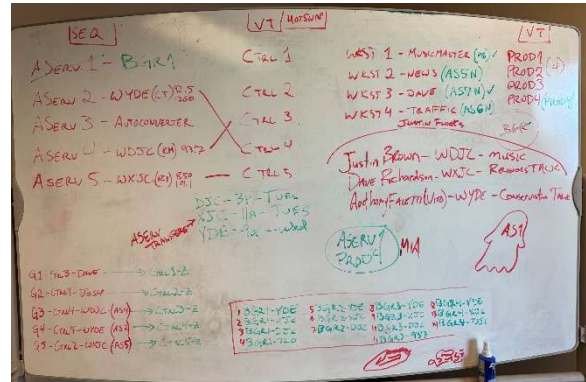

Figure 1 - This whiteboard had almost all of the install information we needed in one clear and concise space.

turn up each of the stations. I personally enjoyed that part of the day as we sometimes ended up fixing a problem we had run into during the day, and you could easily see that we were cutting into the overall work at the end of every day.

I mentioned last month that I had been sharing a training video each week with our staff, and I think it made a huge difference. Our staff generally jumped into Zetta with both feet by being at these video opportunities, and when they actually got their hands on Zetta, they all did great with it.

That isn't to say that there hasn't been a bump or two, but as of this writing (our first full week without the installer on site), everybody seems to be okay. Jack and I really do work with some of the best so I cannot say that I'm surprised by the limited number of issues we've had to deal with.

I hope this helps you prepare for your install just a little better, and until we meet on these pages again, may God bless the work of your hands (and your Zetta planning).

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

Truly, this is a great time to be alive. I just checked my CBC email and among all the spam was a missive from Grainger sharing the Deep Secrets of Sandpaper. They even offered a chart that I could print out and proudly tack on the wall. Is this a great country or what?

And no foolin', April is here! We had a few rounds of severe weather in March, including one tornado that put a scare into Jack and Todd south of Birmingham. Another passed pretty close to 101.1 FM's tower in Cullman, AL. But overall, we came through OK. I am by no means dismissing the fact that there were casualties from the storms; God bless them and their families. But I can – and do – thank the Lord for protecting us.

In this issue, I want to look at some of the general problems you could encounter with file transfer in general. Some of you are trying to marry a new Zetta installation to an FTP server as I write this; you can use the info here for troubleshooting. Note that I use the terms "directory," "subdirectory" and "folder" interchangeably.

Our Internet-capable servers generally use Red Hat Linux or one of its many clones (such as Rocky Linux). I'll just use "Linux" throughout, but BSD, classic Unix and MacOS generally work the same way. To talk" to any of our servers, you can use SSH or Putty, but since Filezilla is familiar to many of you, I'll illustrate with that.

Now for the acronyms. Of course. Gack, put on your helmet ...

Using FTP/FTPS/SFTP
The regular (unencrypted) File Transfer Protocol is simply "FTP," and by default uses ports 22 and 21. The encrypted and secure version, "FTPS," uses ports 990 and 989 by default.

You may wonder, "Why isn't secure FTP called 'SFTP?'" That acronym is already taken by the Secure Shell (SSH) suite, which offers a command named "SFTP." Filezilla, which I'll describe in more detail as we continue, supports both FTP and SSH/SFTP transfers, though you can't use "quick connect" for the latter.

Select "File," -> "Site Manager," then create a new site with the SSH/SFTP info.

See Figure 1, where I'm connecting to our corporate webserver. Sites can be stored for later recall (double-click on the site name to the left to change it). The default SSH port number is 22, but we always change that for any Internet-facing server. (I blacked it out in Figure 1 for obvious reasons.)

To transfer files from Windows onto one of our Linux servers, you will be given your credentials, the port number and whether you need SSH/SFTP or FTP/FTPS. What I want to look at here are the problems you can run into with this in general, whether audio or logs, using our program bank (S)FTP servers or uploading a new page to a website.
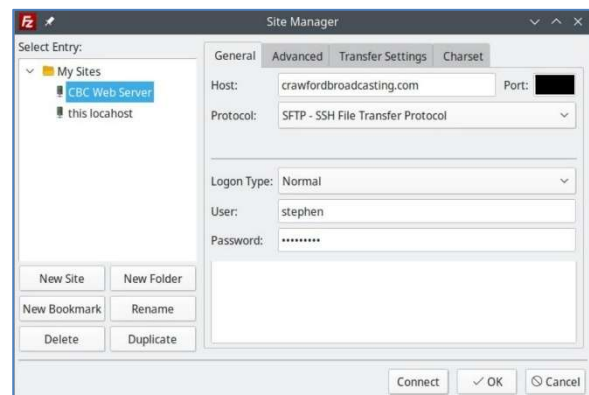

Figure 1 - Filezilla's site manager.

Permissions: Linux vs. Windows
Windows uses a different scheme, and the standard Windows file transfer programs sometimes miss things. When you log in, Linux will automatically note who you are and what permissions you should be granted, but strange things can still happen. The most common is that you'll upload a file, then decide later that it should be updated or deleted ... and get, "access denied."

Linux security is based on tiered access. Any file, stream or device can be marked as "read

only," "write only," "read-write" or none of the above (i.e., no access), for ...

- The User (that's you)
- Group members
- Anyone else ("other")

In Figure 2, the "drwx" letters describe the permissions, from left to right, for User, Group and Other:

- d -- directory
- r -- readable
- w -- writable
- x -- executable, or if a directory, is accessible
- - (a single dash) -- access denied

"User" can set permissions on his/her own files. But you cannot set the permissions on someone else's files without root (administrator) privileges. In

Figure 2 - Note 'hairless' at the bottom.

Figure 2, also note that I disabled "other's" read-write permissions for the bin and Business directories. I don't want anyone else poking around in there.

Groups
This is the key to Linux file security: any user can be a member of any number of groups. Let's say I want to give Cris and Amanda in Colorado, as well as Todd and Jack here in Alabama, exclusive access to a particular folder. On the server, I might create a new group called "geniuses," add these four folks to that group, then set that folder's group and permissions to allow them access.

After uploading files, you should always check the owner, group name and permissions. At the bottom of Figure 2, you'll see where I've created a User named "hairless" in the group "geniuses" and have given him a folder called "hoodat." Even though it's in my personal /home folder, because I am neither "hairless" nor a member of "geniuses," I can't access it! See Figure 3.

You normally won't be creating users or groups; this is background info. If you have trouble working with someone else's files, talk to those who

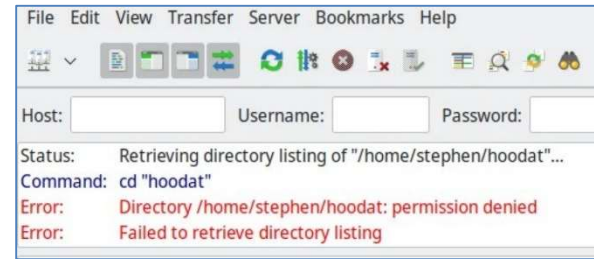maintain the server(s). It may simply be a matter of adding you to a group(s), or changing the permissions

Figure 3 - Only 'hairless' can access this – in MY home folder!

for group access.

As always, there's a complication: every user will have a default group, and that group name will automatically be assigned to any uploaded file. There's no easy way around this, either. In the example I just gave, I'd have to manually (or automate it with a script) change any new uploaded file to the "geniuses" group.

(By the way: it also doesn't help that, by default, Red Hat and clones set very restrictive permissions and set your default group to the same name; for example, "stephen:stephen." If Tom uploads a file, it'll be given to "tom:tom" by default. Speaking as an administrator, it takes work to change this, too. It's easy to miss something when creating a user. Holler for help!)

chmod/chown
Filezilla will let you examine the ownership and permissions for any file or folder in the right pane once you're connected. The user and group names will be listed, along with the other info. You can right click on any file or folder, then select "permissions" to see how they're set.

However, most FTP clients have a major shortcoming, and Filezilla is no exception: they can't change user or group names. This is primarily a limitation of both the FTP and SFTP protocols, not of Filezilla. (Well, technically, it's possible for user to change group and other names, but it's quite geeky and requires the latest versions of the FTP and SSH suites.)

To change the group name, you might be able to log in to a terminal with SSH or Putty, using the same information that you use to log in with Filezilla. You can change the group name on anything that you own (i.e., for which you're the user). I can't change that "hoodat" folder in my home directory, because I don't own it. I CAN change the

Business folder, though. For example, to set Business to the group "wheel," I could enter:

- chown -R stephen:wheel Business

The group must exist and only the administrator – root – can add or delete a group. Don't miss the colon (":") between the user and group name, either. But back to Figure 4: you'll also see a "numeric value." I won't get into bit masks, umasks and all that other gibberish here. Historically, Unix users had to set these using octal values. Just accept what the dialog has calculated for you and don't alter it.
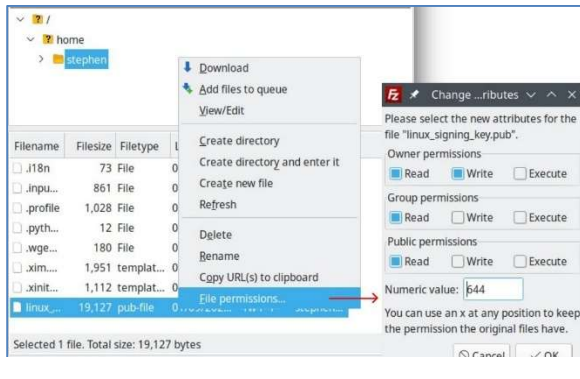

Figure 4 - Using Filezilla to troubleshoot permissions.

I'll mention that the command-line will let you set this with "r", "w" and "rw," as discussed above. You use "chmod" for this. To add "rw" access for Others for my bin folder, I could enter

- chmod -R o+rw bin

One more probably useless detail: strictly speaking, the "-R" option isn't required in most cases. It stands for "recursive" and only has effect if you're changing a folder. This tells chown and chmod to alter the folder AND all files and subdirectories within. Obviously, if you don't want that, but only want to change the folder without touching the files inside that folder, leave out the "-R".

Final Thoughts

Hopefully, I've provided at least a rough look at how Linux file ownership and permissions work, enough to help you troubleshoot "access denied" problems. In every case that I've encountered, either the group was wrong or the permissions weren't set properly.

That's enough for this time; take off your helmet, breathe easy, and until next time, keep praying for this nation!

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The Chicago Chronicles
by
Rick Sewell, CSRE, CBNT, AMD
Engineering Manager, CBC–Chicago

Five years ago, we installed a Nautel GV20 transmitter at our Lansing, Illinois transmitter site. That's it in the photo with me. This was attached to a dual frequency antenna so that the transmitter could be an auxiliary to both WSRB, whose main transmission system is on the same tower and to WPWX with its main transmitter at another site in Burnham, Illinois just a few miles to the north.

When we installed the transmitter, we faced the issue that the existing electrical infrastructure was not designed to handle a 20 kW transmitter running near full power. The TPO for the transmitter when backing up WSRB is 2.7 kW at 106.3 FM, and 18 kW for WPWX at 92.3 FM.

The existing infrastructure featured a 200-amp 3-phase service entrance to an outdated mains breaker of 200 amps with a sub-breaker of 100-amps. This fed an Onan automatic transfer switch rated at 100 amps, then to a 100-amp breaker box, which then fed two transmitters and all the other equipment in the room and an adjacent room where have clients that rent tower space from us.

This was all backed up by a 25 kW generator, which was barely able to keep one transmitter on air during outages. We couldn't just put the GV20 on the breaker which the previous transmitter resided. If we turned it on in the 18 kW mode alongside the WSRB main transmitter running at 4.5 kW, plus HD power, we would quickly

have tripped the transmitter breaker along with either or both 100-amp breakers.

Despite the fact of the mains panel being older and parts no longer manufactured for it, we were able to find another 100-amp sub-breaker that we installed in parallel with the other electrical run. We then put the GV20 transmitter on that breaker. This allowed us to run the transmitter at 18 kW and not interfere with the WSRB main transmitter. It did, however, present us with one big issue: the GV20 wouldn't be able to run during power outages.

In past articles, I did present the need for a larger generator at our Burnham site than the 100 kW generator installed there. We decided several years ago that we would purchase a 150 kW generator for Burnham and a new transfer switch for Lansing that would handle the 200-amp load. The plan was that once the new generator was installed at Burnham, we would bring the 100 kW generator from Burnham to Lansing.

This project really got stretched due to COVID and we didn't install the new generator at Burnham until 2023, despite the transfer switch arriving in early 2022.

We did achieve the desired results with the generator installation at Burnham. We don't have the failures we once had with choking on the load on initial startups. However, the installation cost quite a lot more than we planned, and when we were quoted the installation of the transfer switch and generator at Lansing, it wasn't the generator that was choking this time.

We really had already spent way more than we should have upgrading the backup power at two sites. It was hard to justify the next step. Still, we had a new transfer switch sitting in its box and a generator sitting inside the tower switch. Then we got the news that the 25 kW generator at Lansing was limping along due to a bad radiator and would need very costly repairs.

We had to decide what direction to take because budgets everywhere were tightening, and we were no exception. Given some thought about the situation, I decided that without any major purchase we could still upgrade the generator. We would have to do the work ourselves.

I figured the part that was most out of our wheelhouse was the concrete pad for the generator to sit on. Our maintenance man, however, has a lot of construction experience and we are going to rent a Bobcat for a day and dig the hole for the pad. Then, once he gets the rebar in place and we get the conduit in place, we'll order a cement truck to get the pad poured.

The rest is just running conduit and electrical wiring. So, it's a good thing that one of our engineers has worked for electrical contractors in the past. Between us all, we can get this done.

At the time of this writing, we are currently working on installing the new automatic transfer switch in the room and running the conduit for it. We are going to run the two systems side by side at first, so we don't have time without a generator during the upcoming storm season.

What this entails is that the new transfer switch will just be handling the GV20 load and then when have the generator up and running and have been assured of its readiness, we will re-wire the rest of the room, namely 100-amp breaker panel to the new transfer switch. Then we can decommission the other generator and transfer switch.

This is a project that is not normally in the purview of the broadcast engineering description, but we felt we were up to the challenge.

Rocky Mountain Ramblings
The Denver Report
by
Amanda Hopp, CBRE
Chief Engineer, CBC - Denver

To say time is flying by would be a complete understatement. Usually, this time of year isn't too busy for me, yet I'm finding myself busier than I have been in many years, even years with transmitter installs and other projects. Zetta has taken much of my time which is fine. It has given me the opportunity to really learn it. I am grateful for the RCS FTS people like Scott Wells and all the work he did while out here in Denver installing Zetta, and I am also grateful for Samantha Johnson. As I write this, she is in Buffalo getting them moved over. She has proven invaluable in helping me get so much done and to learn more about Zetta and how it operates.

Automation of Shows

When we left off last month, I was getting ready to figure out AFC Launcher...well, at least how to automate our FTP downloads within Zetta. This proved to be a chore. Using Zetta's Autoload feature would mean the clients would have to change their file nomenclature to have an asset number.

Rather than deal with the headache of having them do this, I was given the AFC Launcher program. It is free from RCS, and it is an amazing tool! I was having a heck of a time getting it to work initially, though. You set up what are called mappings. You can tell it to log into, in our case, an FTP site. I used my own login to our Crawford Broadcasting FTP site and directed the program to look at specific folders.

The key to this working successfully is having a good, constant naming convention. For instance, naming each day's show a specific title based on the tops is not good. But if you do that and have somewhere the date in a two-digit format (MM-DD-YY or YYYY) you can easily tell the mapping what to look for. I have told it to look for, for most of these, the next day. It is all based on the upload schedule. Some clients get their programs uploaded several days in advance, and others the day of. If you set a restriction for the day, you want it to check, it

somehow knows what to do. I don't understand all the ins and outs, but I do know it seems to be working great for us.

One of the other nice things about AFC Launcher is you can change the Title in Zetta. We typically have show names with a day and date, so we know it's up to date. I can tell AFC Launcher, when it loads it, to update that information so it's current. We do one mapping for each weekday program, in other words "show name Monday date," show name Tuesday date," and so on. I also really like the fact that you can export these mappings. You could split up the work to different computers or even have a good backup setup elsewhere ready for you to hit run. It's such an easy program to use.

My next step is to start working on the automatic download from external FTP sites with the program. I have a nice extensive list. Our hope is to free up the time of our producers and make work more efficient overall.

KLTT Tower Parameters

In February, I noticed the KLTT nighttime tower parameters began wandering. Still within tolerance, barely, but it was still worrisome. We wrote down the settings of each phasor knob and then began adjusting to get things back to normal. Really, the weather was bad, and we knew we had an issue, most likely at a tower, but couldn't really go look at it safely.

In early March I woke up to the nighttime parameters being way off, out of tolerance off. Everything else on the station seems fine. No other alarms and no signal issues. Thankfully, the weather wasn't horrible. It was spitting snow and windy but workable.

The cracked capacitor that caused all the trouble.

We made our rounds to each tower and found towers three and four to be fine. When we crossed the canal to get to tower 1, we found the issue. I first noticed a smell. We visually inspected the ATU and didn't see anything too obvious, but the smell told us there was an issue. We soon found a cracked capacitor. We got the info from it, an 0.0024 uF 292, and went to the building to see what we had that might work. We didn't have another 0.0024 uF cap, but we did have a pair of 0.005 uF caps, one a 292 and the other a 293. We put them together in

This temporary lash-up netted 0.0025 uF, which got the pattern back to normal.

series, mounted them in the ATU, connected them with some braid, and brought the system up. With a little adjustment we had the night parameters back on licensed values.

We ordered a new capacitor of the proper value and have since installed it. All is working well now. We put the phasor knobs back to the original starting point and then adjusted from there. Based on the number of adjustments we made, it's possible the capacitor has had an issue for quite some time and that we've been chasing it with small adjustments.

For now, all is well with the towers.

Networking

When you're already busy, why not make even more work for yourself? We did this in the form of a dual WAN router at the KLZ transmitter site. Cris had bought one, programmed it up and sent it to Todd Stickler and it just didn't work for them. So, what better way to find the issue than do it locally? It had been something we've discussed so why not make the jump?

Cris programmed the router, and we went out and plugged it in and began working on one piece of equipment at a time. It took two days at the site to get it fully working. There were some issues here and there, but we worked through them. Now we will work to do this at two of our other Denver sites. These routers will isolate our sites from the rest of the network, but they will also give us two ways in, including one via the internet backup. This will provide us with seamless throughput in the event that our microwave feed goes down.


All fixed! A shiny new 0.0024 uF cap.

Cleanup

It is amazing how much stuff piles up over the year. Twice a year I have to go through our office engineering storage and make a KLZ pile. The KLZ transmitter building is where we have room to store all sorts of stuff.

After having to replace some Zetta computers, I needed a place to store the old ones until we can recycle them. Our office storage room was full, so I took this as an opportunity to clean and organize. I started with that storage room. As engineers we tend to be pack rats. That old audio cable, we might need it again. Those 1,000 VGA cables, AES cables, network cables…we might use

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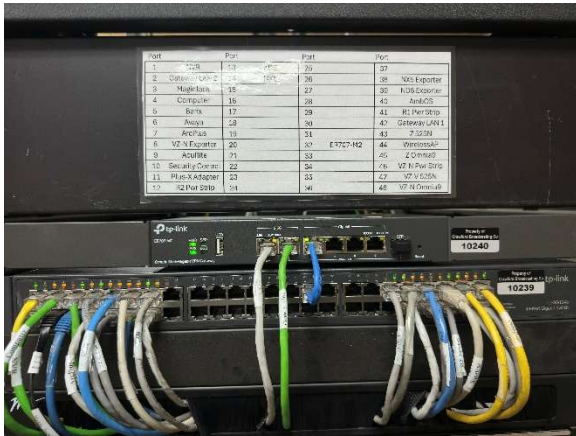
The new dual-WAN router brings in the studio network and CenturyLink internet to the KLZ site. The switch below it is also new. Note my cool connection chart for the network wiring at the top!

those too. The stand that goes on the back of the monitor mounted in the control room… well, we would never have the tabletop space to put it, but we still might use it. I went through everything, took a good long look at it, and made a realistic decision on if we really needed to keep it. I thinned out my cabling quite a bit. Got rid of a bunch of other unnecessary items as well. Once I got the storage room organized, I moved to our TOC. I spent the better part of the day going through all this. Made a KLZ pile and did some great organizing. I have storage space again in the storage room and I can easily find items in our TOC.

Zetta Computers

We ran into an issue on our Control Room 2 computer where it prompted for a login and then said the password had expired. When I set up NexGen, or in this case, Zetta computers, I make sure you never have to log into the computer. We found with Zetta, it's best to have the same username/password on all your machines, and I had done that. I guess since the control room is always so busy, I forgot about it, so it still had an old login. The password still should not have been prompted or expired. I quickly changed the username to be the same as we set up on all the other machines. I also made the password the same. I have triple checked that no password should ever be required to log in and that the password will never expire.

All that to say, because of this, I began checking on all the other machines. I wanted to make sure we wouldn't see this issue elsewhere. I got to

our production B computer, and when I'd open Computer Management, it would throw up some sort of error about something missing. I did a reboot, and that's when the computer died. It went into an endless repair mode. It would run the automatic repair, reboot, automatic repair, until sometimes I'd get to the advanced recovery screen, but I couldn't get it to do anything there either. I could not "burn" a USB with Dell Recovery on it either.

I finally grabbed one of our recently replaced Windows 10 machines and got it ready to go with Zetta. I must say, replacing a computer with Zetta is one hundred times easier than with NexGen. I checked the age of that production machine, and it was six years old. We like to do a maximum of five years to prevent events like this, but it slipped through the cracks as did the other two production room machines. Cris ordered three new computers that came in the following week. I set them all up on the bench, hooked them to the monitor and began working on them.

It is crazy to me that I have three identical brand new computers and all three had their own issues. One wouldn't boot up initially. It wanted a driver, but it needed internet, and the driver was for the NIC. After a reboot and unplugging and plugging the network cable back in, it began to work. Another machine had issues installing Adobe Audition, needing some DLL files. I installed what was needed but it still didn't work. I left it alone while one of our employees did her work in the room, and when she was done for the day, I went back in and it installed perfectly. Thankfully the third machine went flawlessly.

For our engineers and anyone else who uses Zetta, a key thing to remember when setting up a new computer is if you give it the same name as the computer it is replacing, Zetta will recognize it, so you don't have to add it into the system and set it up.

Coming Up

My list of things to do is ever growing. I don't seem to be making a dent in any of it. I don't have to worry about NAB this year. In some ways I'm sad about it. I had a fun time last year and was hoping to go back and spend an extra day just roaming the floors. Maybe next year. But no NAB means four more days to get things done.

I'll be working on automating more with our show downloads. I am working with our traffic department to get traffic where it will automatically load into the system. I need to produce some batch files to take care of deleting files as well as for uploading files to an FTP site. I still need to continue

helping get files dayparted for the proper station. I still have NexGen set up on our workstation so I can compare and make sure things are proper. Zetta for Denver is really taking shape, and I am looking forward to finding ways to make things easier for our people.

I know the growing season is here. I am seeing weeds pop up at our sites and know I need to make the time to deal with it all. My hope is to get ahead of it this year, but that is a big ask.

We are having some tree work done at the KLTT transmitter site. We have many trees that have finally gotten tall enough that they are a concern to me. One of them is leaning towards a guy wire and if it does fall, it would take the guy wire out. I am being proactive and getting rid of a bunch of dead trees, trees that block the view from our cameras to the towers, trees that are in our way when we drive and of course, the trees that are problematic with our towers.

We will also have the arborists clear out our canal again. We hope to one day have the people who own the canal maintain it. It is just beyond a point that we can do it. It's more than mowing too. We need to be able to do repairs to the sides of the canal and we just don't have the ability to do so and don't even know who to call.

That about covers it for this edition. I pray you all stay safe and well and have an enjoyable spring!

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