The Local Oscillator

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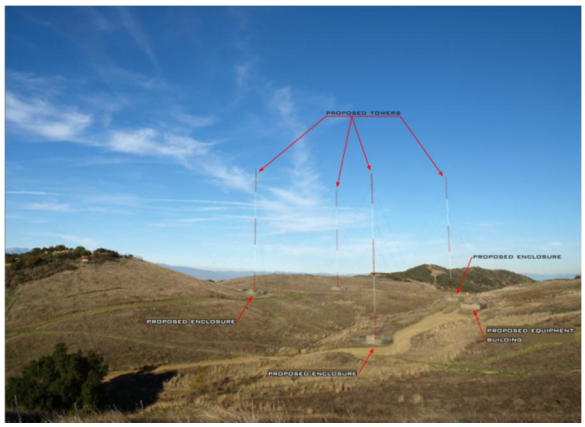
The Long and Winding Road

For the past several years, I have been working on a big and consuming project that I have not spoken of much in these pages. The reasons for my silence were numerous, but mostly I could not reveal strategies and maneuverings on our part in a public way that might jeopardize what we were working to achieve. As of two days prior to this writing, we have successfully navigated the first stage of the project, one that was very difficult and time consuming. Now that we are through this phase I can share with you our journey to date and give you a look ahead at the remainder of this project. I am talking, of course, about the development of a new mainland tower site for KBRT in Southern California.

Our lease at the existing island site will expire before too long, and with no other options on the island, we began searching for a mainland site back in 2007. By the end of 2008, we had narrowed the search to a single location in a basin on the spine of the Santa Ana Mountains in eastern Orange County. This was the only site that we could find that would provide adequate land, that was sufficiently buffered from the population and that had the proper zoning in place. The site was, as it turns out, once home to what is now KLAA (830 kHz). That station abandoned the site in the mid-1990s for a number of reasons, one of which was the lack of commercial power at the site (they had to generate all power on site).



Photosimulation of the new KBRT tower site and four-tower directional array

In December of 2008 we purchased the site from two separate owners. There were three total parcels, which we have now combined into a single parcel. With no guarantee of commercial power availability or that the county would permit construction of the four 281-foot towers we would need (the county height limit is 45 feet), we made this move on faith alone.

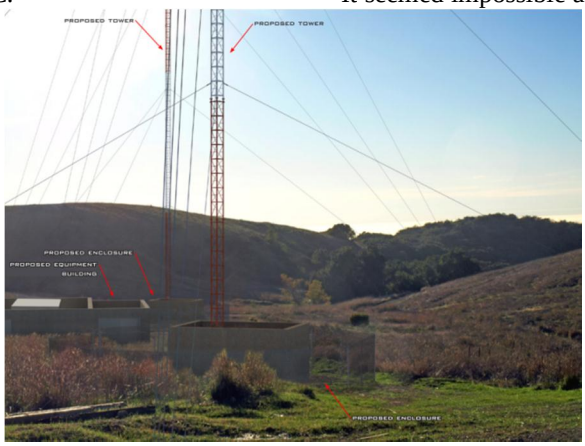
We immediately began working on all the aspects of the site development plan, starting with Southern California Edison. We found out within a few months that primary power was available at the NOAA radar site about ¾ mile south of our site, but we would need an easement from the adjacent property owner to convey that power from there to our site. That began an18- month process that eventually resulted in our being granted the needed easement, and with that done, we checked the power portion of the development plan off our list.

While we were working on getting everything in place to bring power to the site, I filed the FAA paperwork and we quickly received approval for four 281-foot towers. I didnôt think this would be a problem for several reasons, one of which was that KLAA (then KPLS) had once put three 350-foot towers at the site. The bigger factor, however, was simply terrain. Our site sits in a basin of sorts with higher terrain all around, not all that much unlike our existing site on the island. Common sense would dictate that an aircraft flying low enough that

our towers might be a problem would have much bigger problems with the surrounding peaks, some of which are quite close.

Once the FAA approvals were in hand, I immediately began work on the FCC application. This was a difficult challenge because of all the overlaps. We had KCBS to the north (San Francisco), KIDR to the east (Phoenix) and KFMB to the south (San Diego). Because of all the overlaps, we had to engineer the facility to essentially duplicate the location of our existing interfering and protected contours. I had already done the preliminary work and decided on a four-tower rectangular antenna array, but we had to further refine that before we were ready to file with the FCC.

One of the big aspects of any de novo FCC site applications these days is compliance with the National Environmental Policy Act (NEPA) and the Nationwide Programmatic Agreement (NPA). The former, as the name suggests, has to do with assessing the potential environmental impacts that a proposed facility may have; the latter has to do with the protection of items/places of Native American and other historical significance. We hired a consulting firm to do all this work, which took more than six months to complete.



Another photosimulation view showing the new transmitter building and one of the tower bases surrounded by a concrete block wall (a security measure to protect base insulators, ATUs, etc. from vandals and shooters who may find them to be irresistible targets).

With the NEPA and NPA screening done, we were ready to wrap up our FCC application and file it, but we didnôt want to do that just yet because FCC construction permits carry a 36-month non-renewable term. We wanted to wait a few months to file to make sure that our CP, when we received it, would span our lease termination date.

Next, we had to get both a site development permit and a use permit from the county. This turned out to be our greatest challenge. We started the process in June of 2010 by meeting with the Orange County Planning Department, then preparing the required documents and filing them. Very quickly we ran into problems. The 45-foot height limit became a sticking point that we were initially told we could not get around. At that point, we hired a Denver-based land use consultant that I knew. He is known in the business as a ñfixer,ò someone who knows how to get things done, and he certainly lived up to this as he helped us through the development/use permit process. In just nine months, from our first meeting in late January of 2011 to the planning commission hearing on October 26, we went from ñyou canôt do thatò to unanimous approval!

I saw Godôs hand at work all through this process, moving us through the minefield of CEQA (California Environmental Quality Act), which is far more stringent than NEPA. You wouldnôt believe all the things we had to consider in the process, including biological, archaeological, paleontological, hydrological, geological and other ñ-ogicalò impacts. It seemed impossible at times, and perhaps it was from a human standpoint. And yet here we are, praise God! We have our determination in hand and are now ready to move on to the building permit phase.

Rewinding a bit, as we were working our way through the labyrinth at the county planning department, we wrapped up our FCC application and filed it. You may recall from these pages one year ago this month my account of some conductivity measurements that we made from the site in October of 2010. Those measurements completed the needed data set for us to finalize the allocation study and DA design. The application was filed in December of last year and we now expect a grant any day.

So here we are, at the end of one long and winding road (quite literally), and perhaps at the beginning of another. We are even now hard at work getting our building permit application documents together, hiring consultants and contractors, working with Edison to get the power feed to the site and finishing up the designs of the towers and transmitter building. I hope to be ready to file the building permit application in December and perhaps to break ground in January of next year.

With the sensitive stuff all behind us now, I can and will keep you up to date each month. Each of you can, along with us, look forward with great anticipation to the new, 50 kW KBRT!

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

Hello to all from Western New York! In last monthôs report, I ñgently roastedò Roy Sampson and iBiquity on the lackluster job they have done thus far on promoting HD Radio. I shared my thoughts and viewpoints with Roy (and threw in a few frustrations) on how little the public is aware of HD-R and the benefits they could derive from this technology. Many of you engineers share my same thoughts, so I was not hesitant to share my experience with you here in the pages of *The Local Oscillator*. After the October issue was released, I heard from several people commenting on my article about iBiquity. Surprisingly, the e-mails I received were all from persons outside the CBC group! It is good to know that this little publication has grown to a point that it is read by others in the broadcast industry, whether they are vendors, fellow engineers, staff members or management, even engineering personnel from other broadcast groups. I will always welcome comments or suggestions about any article I submit to the *The Local Oscillator*, and can be contacted via e-mail at brianc@crawfordbroadcasting.com

WDCX – Buffalo, WDCX (AM) – Rochester

This time of year always seems to be the busiest time as we prepare our sites for the upcoming winter months and install any cap-ex equipment purchases that were made. At the time of this writing, I am in the middle of installing a new Nautel NV-40 transmitter for WDCX-FM, and (hopefully) a new 10-bay ERI antenna. The new antenna finally arrived on site the 20th of October, with installation set to begin on Monday the 24th, but weather conditions were far from favorable to begin an antenna installation.

We have been experiencing a lot of rain and wind for the past several weeks, and to top off all that I have going on right now, we experienced some wind damage to our studio STL tower on Saturday the 15th. That morning, wind gusts were reported to be at 60 mph with sustained winds at near 50 mph. There is little around our four story studio building that will deter the winds coming off of Lake Erie, and we were experiencing direct wind blasts through most of Friday, Friday night and into Saturday. About 8:30 AM, the board operator called and reported a loud crash from the rooftop area and reported that our carrier immediately went silent. Steve Napoli went up to the roof and found that our STL tower had fallen due to the high winds. I arrived at the station just minutes later and found that indeed the tower had fallen, but thankfully, no damage was noted to either STL antenna. In order to get us back on the air, I grabbed the Comrex Matrix unit and headed for the transmitter site. We were back up, albeit in mono, in about half an hour.

Heading back to the studios after connecting up the Comrex, I was trying to figure out what could have caused the STL tower to fall. This tower has been up for about 30 years, and was (over) due to be replaced. Upon closer inspection, I found that the guy wires had broken on 3 of the 4 corners, and strangely, some of the concrete blocks that provided ballast on the platform on which the tower was built, had been moved off of the structure. The lack of ballast, coupled with the extremely high winds on guy wires

that were rusted, proved to be too much, and the structure fell.

Last year, we purchased a new Glen Martin tower to replace the existing tower, but we did not take delivery of the tower until late November due to back orders from the manufacturer. The new one was installed this summer, but we had not yet moved the antennas over. As the majority of our programming is paid teaching programs, our window of opportunity to get this work done was limited. When we did have the chance to get it done, either the weather was bad or the tower contractor had other obligations, or I couldnôt be available to oversee the move. Ultimately, we paid the price for not getting it done sooner, because when the tower fell, it damaged the roof, causing water to leak onto the ceiling of the 4th floor and evidentially down to our ceiling on the 3rd floor. The buildingôs maintenance contractor made temporary repairs to the roof, but a roofing contractor will have to make permanent repairs before the snow flies.

Exhaust ductwork for the new WDCX-FM NV-40 transmitter.

Getting back to our new transmitter installation, I knew that Detroit and Chicago had each already installed one of the NV-40 transmitters, so I contacted Joe and Art to see how they handled the heat exhaust for their rigs. Taking recommendations from both, I came up with a workable plan for our particular installation. After meeting with Mike Solly of Solly Industries and explaining what I wanted to have done as far as ventilation for the NV-40, they went to work and got the ductwork installed along with a ¾-horsepower squirrel cage exhaust fan and a thermostatically controlled damper that will provide heat into the building when needed. Once the duct work was in place, I had them to insulate all of the ducting to minimize any heat radiation into the room from the ducts. This will help keep the heat down in the summer months so the air conditioners will not be overworked. Overall, I was extremely pleased with how the ventilation system came out. Thanks Joe and Art for your input and suggestions. Your advice made this installation much easier!

As I mentioned earlier, we are attempting to replace our ailing 32 year-old main antenna on the WDCX-FM tower. I have contracted with Great Lakes Tower to remove the old antenna and replace it with a new ERI SHPX 10-bay antenna that has been modeled by ERI to provide maximum signal towards the Toronto area. Weather conditions have delayed getting the tower crew on site for the past two weeks at this writing, but the extended forecast for next week looks promising and Tom Johnson has scheduled his crew to be on site Tuesday, November 1st to get the project underway.

We are all anxious to see how much of an improvement in coverage area and carrier strength this new antenna will provide. After it is installed, we will take a drive up into Canada throughout known trouble spots to see if there has been any marked improvement in coverage.

WLGZ – FM - Rochester

As I mentioned in last monthôs report, the Rochester FM, WLGZ, has been doing remarkably well as of late in the Marketron ratings. The oldies station, now owned by Don Crawford, Jr., has been ranked 4th in the market, tied with longtime Top 40 hits station WPXY. This is a tremendous improvement over past rating periods, when the station was barely rating a 1-share. Mark Shuttleworth has done an outstanding job programming the station, but I like to attribute their success with outstanding engineering services! All kidding aside, I am proud to be a small part in their success, and I congratulate everyone on the WLGZ-FM staff, collectively you all have made Legends 102.7 what it is, and now, how about the # 1 spot??

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 Thanksgiving!

The Motown Update

By
Joseph M. Huk, Jr.,
P.E., CPBE, CBNT
Chief Engineer, CBC–Detroit

NV 40 Transmitter Issues

Over the last month, we continued to have issues with the Nautel NV-40 main transmitter at WMUZ. This problems began with a couple of lightning hits we had back in August. I worked with Nelson and Naji from Nautel to try to address the issues, but I always seemed to fix one issue and found myself with another. It seems that the transmitter had one issue masking another.

Initially, we had many amplifier modules fail. In the process of finding these bad modules and other defective modules in the past, I found myself in a situation where the edge connector sockets on one of the backplane circuit boards were wearing out, presenting many intermittent conditions. This wear was exacerbated by a set of locator pins on the back housing of the transmitter. These pins are used to provide mechanical resistance and alignment needed to keep the RF module tightly seated in its respective slot.

Since I have had this transmitter, these pins have loosened up and caused modules not to seat properly in their respective sockets, and this in turn caused damage to other receptacles on the RF modules. With this frustrating issue, some RF modules would work and other times would not. Once the backplane PWB board was replaced, we were confident that any other further issues were going to be related the RF modules themselves.

Even with the new backplane PWB in place, however, I still had issues where the transmitter would indicate a high IPA (Intermediate Power Amplifier) reject power. Usually you can use the ñauto tuneò software feature to allow the microcontroller to adjust the bias values on the PA modules to lower or raise power to individual modules to produce minimum reject power. However, if the computer shows a fault, it may not allow the transmitter to properly perform the IPA tuning.

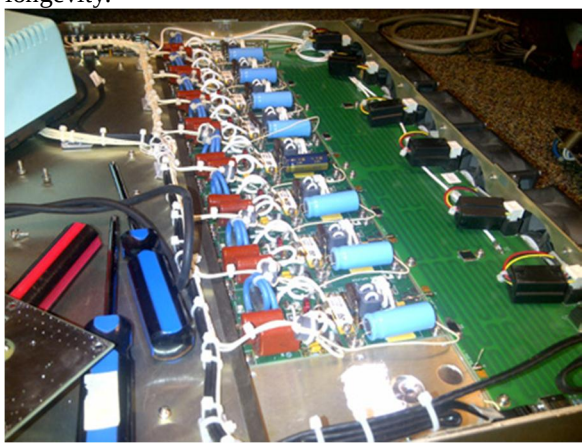
After further investigation, it was found that I had faulty rejects loads. Therefore, with the load faults, and the stray RF due to mismatches, we were getting RF on the tach (hall-effect) signals of the cooling fan motors, which caused the controller to see even more faults and resulting in inhibiting operation of the transmitter. The software, over time, has been made more stringent with later revisions, to prevent the transmitter from operating under a condition where damage may result to its electronics.

At this point, Nautel, in addition to sending me replacement parts, sent one of their development engineers, Matt Skinner, to help me with the resolution of the transmitterôs issues. Matt went through the transmitter from top to bottom. I learned when troubleshooting the transmitter when in a state where not all the RF stages are tuned or faults are indicated, manual tuning is the best way to coarsely adjust the operating parameters to a point where you can partially operate the transmitter. In this state, it is much easier to further evaluate problems.

As we further investigated the transmitter, we found other issues with other RF modules. When those issues and other faults were resolved, the transmitter behaved normally, just like it did before the lightning storms. Further refinement included installation of ferrites on the tach lines of all the cooling fans on the reject loads and RF modules. Some modules already had the suppression but others did not. This suppression further reduced faults perceived by the transmitterôs controller.

Finally, we installed a set of cooling fans with their related plenums to keep the controller and video monitor cool. The NV-40 transmitters sold today have this cooling system already installed. This extra cooling provided a 30 degree (F) decrease

in temperature in the area of the transmitterôs controller. This will provide an improved operating environment for the transmitter and increase its longevity.



Ferrite beads are visible on the right that were installed to cure RFI in the fan tach signals.

In the process of troubleshooting and repairing the transmitter, I (we) learned several lessons:

- If an NV40 has multiple new modules, it may necessary to perform *manual* adjustment to the IPA bias voltages (DAC) to optimize combiner reject power. The auto routine which is performed through software will only work if you have no alarms related to defective modules or other devices (i.e. fans, etc.).
- When performing manual reject load power optimization or reduction, start with a lower *set power* (say 5-10 kW) than your licensed TPO. Then start with the 5 kW combiners for optimization (i.e. pairs of RF modules). Then move on to the 10 kW combiners, which would be the combination of two pairs of RF modules (i.e. four in total). At this point you would optimize two quad groups of modules (eight in total) with their respective set of eight to optimize the set of 20 kW combiners. Finally, the two sets of eight RF modules would be optimized with their respective set of eight modules for optimization up to 40 kW.
- The software generations have matured to a point where many issues with RFI contaminated telemetry samples may be interpreted as a faulty device (i.e. fan, etc.). Therefore, if your transmitter was an early model like mine (serial number 103), it will not have the latest RFI suppression (manufacturer prescribed ferrites) to prevent the transmitter from shutting off due to a false fan motor speed. I suspect if your transmitter is new, you would not have this kind of issue. My transmitter used to run just fine with occasional noise on these TAC lines, but with the new software, the transmitter will protect itself from any fan failure.
- Be extremely careful when you remove and reinstall RF modules into any slot of the transmitterôs frame. There is a locator pin that is known to loosen up or bend with time. If a module does not seat easily for any reason, carefully examine socket of on the transmitterôs back plane PWB and locator pin. In addition, anytime a module is removed, check the respective RF module for tightness of the locator pin and look for any bent pins on the RF connectors or warn tracks on its PWB. Any miscommunication between the RF moduleôs microcontroller and the transmitterôs microcontroller could produce false telemetry readings and shut the transmitter down. Simply speaking, the RF modules should insert smoothly without any mechanical interference.
- In analog mode, the NV-40 power control will be done by the transmitterôs amplifierôs controller. In the HD/Hybrid mode, the power control is done in the exciter. The amplifier is run in a fixed linear mode where you can achieve a very high peak to average power ratio.

I would like to thank Matt for all of his work and for being an excellent mentor and teacher.

Until next time, be safe, and if all goes well, we will be reporting to you from the pages of *The Local Oscillator* next month. Best regards.

News From The South

By
Stephen Poole, CBRE, CBNT, AMD
Chief Engineer, CBC–Alabama

Itôs finally starting to cool off a bit in Birmingham. We donôt know how to act. After a summer filled with scorching, 100-degree days and 90% humidity, people are walking around with blank stares and slight smiles on their faces. This is unexpected. It must global warming or climate change (or whatever theyôre calling it this week). But Iôll take it.

Rethinking That STL Thingie

When I moved here in late 1998, we had two stations. 93.7 FM was on a standard 950 MHz analog STL and 1260 AM was on a T1 using a QEI CAT-Link. A few short years later, we had expanded to five stations and were scrambling for ways to get audio from studios to transmitters. We decided to use the 93.7 tower on Red Mountain as ñSTL Central,ò so we needed a way to get a bunch of audio feeds from the studios to that site, from which point theyôd be distributed to the other stations.

To make that all-important ñfirst hopò from the studios to Red Mountain, we chose the Harris Aurora T1-over-IP system. At the time, it was state of the art, an unlicensed link that operated at 5.8 GHz and presented a DS-1 to our equipment. At first, we used Adtran TSUs with the Moseley DSP-6000 encoder/decoder pairs. Later, we moved to Harris Intraplex units for the hop to Red Mountain. But we remained ñAll T1, All the Time.ò

Now, of course, everything is moving to audio-over-IP. The digital links have improved dramatically as well: the Aurora needed 300 MHz of bandwidth just to ferry a 1.5 Megabit DS-1 in each direction. Nowadays, itôs quite common to see bitrates that are 4-5 times the channel bandwidth: 40 Megabits over a 20 MHz channel, for example.

Given that, and the fact that prices on IP-based equipment continue to drop, we decided to make 2012 the year that everything in Birmingham goes to audio over IP. But ATT had recently increased the price on 1260ôs T1 line (again), so we decided to go ahead and address that this year out of our maintenance budget. We couldnôt afford to replace all of our T1-based equipment just yet, so we needed a way to ferry a DS-1 over IP. We purchased the Adtran MX-408e to do the T1-over-IP, as I mentioned here several months ago. For the IP side of things, Cris set us up with a Trango Apex Plus link, 44 Megabits over a licensed 18 GHz link. This would do the hop from Red Mountain to the 1260 transmitter site.

Red Mountain to 1260

To my pleasant surprise, we put the dishes at each end of the run to 1260, powered everything up, and ï after a good bit of dish tweaking, anyway ï we had a 44 MB link. It was a beautiful thing.

More on that dish tweaking: when you hire a tower crew to install anything that operates at Ku band or above, make sure they understand that the pattern probably resembles a laser beam. The tower crew was taking forever to get the dishes aligned; I finally looked up and noticed that the guy on the tower was moving the thing by hand back and forth(!!). That ainôt gonna work at 18 GHz. Once I convinced them to use the screw adjustments, we got it peaked in at an RSSI of -45 dbm. Crisôs software had predicted just under -44, so we decided we could live with that.

1260 is an interesting case because itôs a 199-foot self-supporting tower with a folded unipole (and almost no ground system, but thatôs for a different discussion). Southern Broadcast Services had to fabricate a mount that would clamp to that old angled steel, yet allow the dish to miss the skirt wires. Figure 1 shows how tight a fit it was: the SBS crewman is carefully aligning it so that it can ñseeò Red Mountain without striking any wires. The 4-foot Scala antenna right below the white Trango dish was removed shortly after this photo was taken.

Figure 1 - Carefully mounting the Trango dish between the unipole lines at 1260.

It worked out quite well. Also to my pleased surprise, 1260ôs antenna impedance wasnôt even affected. That made us very happy; I just knew it was going to change, requiring us to file with the FCC. Another beautiful thing.

The data rate on our link is a full 44 mbps, which is probably overkill for this STL. For now, weôre still using Moseley DSP-6000s over a T1 with the Adtran MX-408e units, which are *definitely* overkill. Theyôll support 8 separate DS-1 signals and offer a crowd of other buzzers and bells that weôll never need or use. Because they were so much fun to configure, we tested them thoroughly before we ever placed them on air. Figure 2 shows the test rig. In spite of the ratôs nest of wiring, all blinkies were green and we had no errors!

Figure 2 - Testing the DSP6000s and Adtran CSUs prior to putting them in service.

Incidentally, as part of this project, I had to learn more about VLANs that I ever wanted to know. The Adtran MX-408es are actually intended for Telco use: simply put, Ma Bell might use them to ferry a bunch of DS-1s over a high-speed fiber IP link. One of the features of the 408 is that it ñtagsò all packets for a VLAN (and you can assign different Virtual LANs to each DS-1, to further optimize bandwidth usage).

The problem was, our Netgear switch kept blocking the signal from the 408 and this had us scratching our heads for a bit until we figured it out. This switch supports VLAN, but weôve never used it. The setup acted like we had bad network cables: the lights on the switch ports didnôt even glow! When those packets from the 408 started arriving with VLAN tags, the Netgearôs tiny little brain woke up and said, ñHmm, finally, VLAN! Letôs see where to route it ... nope, no one in the table, weôll just drop the packets, have a nice day and *do* come back!ò

As it turns out, learning how VLAN works made us think about implementing it everywhere in 2012 and 2013. Weôve been chatting with Cris and Amanda about using VLANs to eliminate some of the congestion that theyôre experiencing out in Denver, too. But more on that in the future, Lord willing.

Studios To Red Mountain

The link from Red Mountain to 1260 was covered by the Trango; now we needed a way to get the T1-over-IP link from the studios to Red Mountain. We briefly considered just sending audio up to Red Mountain, and putting the DSP-6000 and Adtran boxes up there, but quickly rejected that. We wanted to send the DS-1 directly from the studios to 1260 over wireless Ethernet.

As part of our upgrade next year, weôre going to install a ñbig pipeò Trango on that hop but we needed something that was cost-effective now. We had a 7 Megabit Canopy link between the studios and Red Mountain, but thatôs only 3.5 megabits each way. The T1-over-IP alone would need 1.5 to 2 Megabits; that didnôt leave much room for anything else. While (to my surprise ï again) the Canopy worked fine with only occasional errors, we didnôt think we could trust it.

After discussing it with Cris, we opted for a little Nanobridge wireless link on that path. These units arenôt all that revolutionary: theyôre simply a commercial application of standard 802.11b/g/h wireless networking. But Ubiquiti adds some nice features, including the ability to ñchannel shiftò ï i.e., to use spectrum ñbetweenò the standard wireless

channels. These added features, coupled with a highly directional dish, make them ideal for short hops. Plus, theyôre astonishingly inexpensive (about $75 each!), making them a ridiculously attractive alternative in many cases.

The distance between the studios and Red Mountain is only 3.15 miles, well within the capability of a Nanobridge. We hired Southern Broadcast to mount the dish at Red Mountain; Todd, Jimmy and I took care of the studio end. Because weôll still need the Intraplex studio-to-Red Mountain link until next year, we carefully configured the Nanobridge to operate on the lower channels, well away from the 5.6-5.8 GHz range taken by the Aurora. Another pleasant surprise: even with the Nanobridge pointed directly at the Aurora dish, only a few inches away, it never even blipped. Another beautiful thing.

I have only one complaint about the Nanobridges: they look like toys! In Figure 3, itôs the tiny little dish in the middle of the picture. At the bottom right is the Aurora link, and our old 950 MHz backup STL dish is mounted to the left. We simply purchased a galvanized pipe, mounted it to the existing supports, and clamped the Nanobridge onto that. Worked like a hose.

Server Moves

One other thing that has changed in the past several years is how much you can do by remote access nowadays. Denver has been upgrading servers ï NexGen, FTP and WWW, as well as new firewalls for a couple of networks. Iôm sure Amanda will have more to say about this, but weôve been working

Figure 4 - Isn't it *cute*?

together on this for the past week. I can go in with SSH and VNC and tinker with the settings while Amanda and Cris do all of the ñrealò work (read: they have to hump the heavy things into the racks!).

This, my friends, is the most beautiful thing of all.

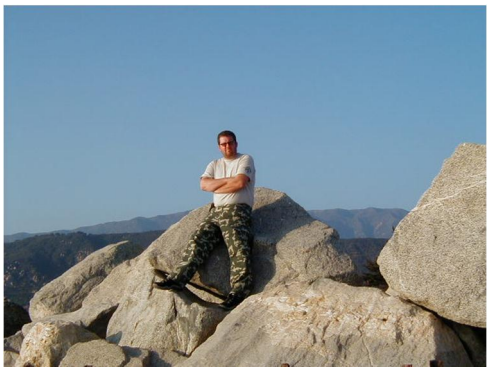
As I write this, the new NexGen server is done, and weôre on the new FTP server. The NexGen firewall has been done. We decided to use ClearOS for that. Weôll have more to say about ClearOS in the future; itôs a free, dedicated Firewall OS, based on Red Hat Enterprise Linux, which works like a champ and is very easy to configure. Check it out at www.clearfoundation.com.

Thatôs about it for this time; until next month, take care, and keep praying for America!!

Catalina Tales

by
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! From the land of the *island factor* comes more chaos than will fit into one report. The past couple months have been full of power issues. Just after getting our Nautel XL12 main transmitter operating reliably and becoming comfortable that it is in fact fixed this time, I find myself faced with more issues of a different type, a type that I have little control over.



While I was off island, KBRT went off the air, so I called my backup engineer only to find they, too, had left the island. Thank God I gave keys to a couple more people. My friend and local cable/IP system operator Ralph Morrow not only dropped everything for us but really went the extra mile.

Upon arriving at the site, he and I conferred over the phone and I realized this was an issue I had not seen before. My first thought was that it was a new issue with the XL12, so I asked Ralph to switch us to the auxiliary transmitter. It came up fine. Then, after he reset the XL12, it also made RF as it should.

Since he had observed our backup generator firing up and down and the transfer switch slamming back and forth, I figured we were on the low edge of the acceptable voltage window, so I asked him to check the B+ voltage on the XL12. It was within spec, so I figured the best course of action was to manually shut down the generator because it seemed apparent that the issue was the constant back and forth from Edison to generator power. That seemed to resolve the issue, at least for a few hours until we went off the air once again.

This time, Ralph noted some bizarre voltage readings when he arrived at the plant, so he called Edison. By the time they arrived, everything was back to spec and seemed stable, so away they went. Since these issues were intermittent, it was nearly impossible to get them resolved.

As things seemed to grow worse, I called mainland contract engineers Joel Saxburg and Bert Weiner to join us over the phone for added support as I worked on returning to the island. We went from looking as the RF chain to interlocks to power and back again. As Ralph watched our power situation, he noticed voltage sags that would fire up our backup generator over and over again. It would go low for two minutes, then back normal for a few minutes, then sag again.

Then we found another issue: we would lose the transmitter but the voltage seemed to be fine, at least on the leg he had been looking at until he went to another leg and noticed it was dead. That really caused some chaos for us. This, too, was intermittent and took a while to find.

Edison crews finally found this issue, however ï a corroded switch blade on the pole behind the transmitter building. Soon after, they also were able to bring up our voltage and it ran stable at 240 volts per leg as it should.

After a couple weeks, however, just as we thought we were out of the woods, we dropped off the air once again, this time while I was literally standing in front of the main transmitter. I noticed the B+ was quite a bit higher than usual, even for no RF. I grabbed a DVM and checked the panel voltage and WOW! We all of a sudden had 260 volts where just that morning we had 240 volts! This caused us more serious issues, though this time I was literally living in front of the transmitter.

Our generator automatic transfer switch does not have over-voltage sensors, so it was up to me to fire it up and switch it over manually. I was powering down most of the plant each evening from the breakers in order to protect our equipment and, of course, calling Edison several times per day. After a couple of weeks of this, I finally got a call back. The technician on the phone asked me if the power was back at 240 volts and told me they think we should see good power now. I asked him what they found. He said he was not sure if they found anything! I love this place!

After all the power issues seemed to be over, we realized our main backup generator had only a 25% fuel supply left in the tank, but as an added

bonus to our weeks of power issues, no one on the island will deliver propane to us. I had gotten the runaround as I tried to get fuel during the power issues, and as I dug in to get it done a few days after things settled down a bit, I came to find that the Conservancy is our only option and they do not seem willing to provide propane service to us. So I was once again forced back to the drawing board.

I am currently working with our generator service company to install some options that will allow us to remain on the air with the availability of back-up generator power. I will get into more details of this in the next issue.

Until next month, the Lord bless you and keep you; the Lord make his face shine upon you and be gracious to you; the Lord turn his face toward you and give you peace.

The Chicago Chronicles

By
Art Reis, CPBE, CBNT, AMD
Chief Engineer, CBC–Chicago

It Takes T (goof-ups) to Trango

I am pleased to report that at long last, our new 18 GHz STL is on the air and happy. The genesis of this project, for those of you who have seen my earlier account in these pages, was way back in May. We had some delays in getting the project going because we were swamped at the time with other projects, as were our tower riggers.

We started testing the units by turning them on with the transmitter off, and letting them cook. Which is precisely what one of the power supplies did. It overheated and stopped working... intermittently. Overheat, shut down, cool down, come back on, over and over again. Back to the factory it went. We waited for a replacement. Instead, we got a phone call. They couldn't get the supply to fail. I told them to be patient, it would happen. They were and it did, finally. Then they called back. They had discontinued the power supply and were waiting on new supplies to come in. So, we waited a couple of weeks, and in came a new, bigger, 2-amp 48V power supply. After I had done the panel metal work to accommodate a power supply the size of the old one. We got that straightened out, but it took a couple of weeks.

Finally, in late June, the project got going again. The riggers showed up and we re-started the installation process. Mind you, we had by now fully bench-tested and adjusted the units, following Cris' meticulous instructions, and thus avoiding all the pitfalls of his earlier experiences. We cut the UV-resistant CAT5 cabling to length, using up bunches of grounded-shell connectors in our quest to get it right. We tested the cables and pinged the electronics through their new CAT5 links. Check.

So, we were ready. We sent the crew up the tower, put the dishes and the electronic packages into place and set them in the alignment mode. Then the tower crew realized that they'd neglected to bring the proper standoff pole mounts for the dish. Down came the tower crew, headed for home, and we had to wait until the next day for them to get the mounts, even though they *knew* what the project was about. They wanted to charge us for that trip.

The next day, same scenario, this time *with* the proper mounting standoffs. Up went the tower crew with all the equipment, they put it all into place and started to align the dishes. The backhaul path from the transmitter site worked well. The path going to the transmitter didn't. It didn't exist. -90 dB on the signal readout, indicating zero signal. Next came a series of calls back and forth between us and Trango, culminating in the return the studio unit to the factory, on the belief that the studio site receiver was the bad part.

It wasn't. The factory found nothing wrong with it, and sent it back. By this point, all of us were livid. We demanded a new set of units. After much swordplay with the factory over this, they finally sent us the new units. We sent the original ones back.

Same story at both ends. We couldn't get a path going with the new units any better than with the original ones. And, back at the factory, the returned units were working perfectly. By this time, the customer service department was into our system

every day, trying to find the problem. After all, we'd left all the units up on their respective towers. This one really had everyone scratching their heads. Until, that is, the boys in the back room at the manufacturer asked a question: What's the model number listed on the dish at the studio end? Well, as bless, not luck, would have it, the tower crew was coming back the next day to do another project. Job One became ñfind the model number.ò They found it, all right. It was a dish designed for operation at 23 GHz, that's what it was. Bingo! Mystery solved.

But wait, there's a question. Why did the dish work as a receive dish and not as a transmit dish? The answer has to do with the frequencies involved. The channel split between the paths in the 18 GHz band is 1560 MHz. The STL path was at 17.945 GHz. The TSL path is 19.505 GHz. The 19.5 GHz frequency is of a short enough wavelength that it will just pass through a 23 GHz waveguide between the electronics and the antenna with only a few dB of attenuation. But as the frequency got below 18 GHz, it became waveguide below cutoff, and the signal was gone. The transmitter was gazing into a barrier as complete as a piece of steel. The problem was solved.

I called the factory, and Cris. The factory sent a dish cut for 18 GHz without delay, via FedEx next day delivery.... but to Denver and not here!! That set us all off again. More angry calls back and forth. The factory allowed the dish to be sent on to us on their nickel, Amanda Alexander re-sent it, and I sent the wrong dish back to the factory the same way. It required about 80 feet of packing tape (no kidding!) to get the shipping box back into some sort of reasonable shape so that it would work to ship it back.

So, what happened? Simple; over in China, where the dishes are made, someone put a whole bunch of 23 GHz-specific dishes into boxes marked ñ18 GHz.ò The factory sent folks into their warehouse to check for more of this. There was. No one is saying how many. The lesson: if you're the end user, and if it's imported, inspect *everything.* Trust *nothing.* Now I know why no one dares market bottled water from China to this country!

The new Trango system is now happily on the air. We're just beginning to discover all of its capabilities. With 44 MHz of digital bandwidth to play with, we have enough bandwidth on board to handle *everything* we want to send and get for the site.

Subject to approval on the 2012 capital budget, a second project like this for WPWX is in the offing for next year. If that project goes anything like the first one, it will harden my belief that attempting any such project is a true character-builder, and we can't have too much of that, of course.

Heads up for Hot Line users

I attended three trade shows in the space of about a month recently. I had a great time meeting some wonderful new people and learning a bunch about all sorts of things. More importantly, the experience actually whetted this old dog's appetite to learn more about those things, particularly IT issues, wherein I consider myself a comparative virtual novice. It also gave me a chance to learn things about items with which I'm already familiar.

One such experience concerns the Comrex Hot Line Digital POTS codec, which, for well over a decade, was ubiquitous as *the* remote origination device to have, but which also has been discontinued since Lord knows when. If nothing else, those red, black and yellow boxes were, and still are, the most distinctive in the business!

I had occasion to speak with Chris Crump, Sales Director at Comrex, and he told me that if I knew of any of those Hot Lines to still be in service, please take care of them. The key part of that box, the modem board, has long since been discontinued by its manufacturer, so thus cannot be replaced anymore. If your Hot Line's modem board is fried, said Chris, all you have left is a very pretty door stop. Or an equally pretty conversation piece.

This situation does not apply to the Comrex Matrix POTS codec, which is still repairable.
The original Hot Line box is occasionally available on eBay. The selling price for most of them, Chris Crump tells me, is around $1000. Here at CBC-Chicago, we still have a number of them on hand, and two are installed in our racks (one is a Matrix) for receiving live church broadcasts on Sundays. We also have several in storage and they may be available for sale, if Cris Alexander concurs. But we're not getting rid of them all, not yet. There's still some use, albeit diminished, left in those old Hot Line Boxes yet! Until AoIP is perfected, that is.

The Portland Report

by
John White, CBRE
Chief Engineer, CBC–Portland

The big news this publication cycle has to be the upcoming National EAS test. For approximately three minutes on November 9, every radio and TV station and cable system in the United States will rebroadcast the same test message from FEMA.

Two weeks ago, I thought we were prepared. The new Sage ENDEC was installed and working. Monitoring of the LP-1 and LP-2 stations was working. The EAN filter was at factory default and ready. Since Oregon does not have a PEP station, (OPB will be one, but they arenôt yet), the test message will be delivered via the LP-1 and LP-2 stations. So all was seté untilé

Until, that is, I received a bulletin from Sage via the Oregon EAS remailer. Almost immediately Cris forwarded the same bulletin to all Crawford stations. It turns out that to accommodate a spooling rebroadcast message like the national test the input level to the ENDEC needs to be no greater than -8. A quick input level check found the LP-1 and LP-2 input level peeking to zero, apparently good but no so according to the bulletin.

With multiple inputs at different levels, adjusting the ENDEC input sensitivity was not an option since all inputs are common to one level setting. Of course many of our input sources are fixed level and not adjustable. That necessitated a rush program to build external adjustable attenuators to bring all input sources to a common standard level, a problem that is complicated by the lack of a local over-the-counter electronic parts house, requiring ordering and shipping parts from a national parts house vender.

Long story short, I think we are ready. Only time and the test will tell. Either way, significant steps have been taken in Oregon to support a successful test. Multiple organizations are on board. For example, tests from the National Weather Service in Portland, Boise, Pendleton and Medford are being moved or rescheduling to prevent conflict.

Hereôs an update on the Dell monitor failures here in Portland. I have successfully repaired two of the monitors which failed. The problem is two filter capacitors on the DC side of the switching supply. The two 680 uF, 16 V capacitors failed with a telltale popped top. These two capacitors need to be replaced with a low equivalent series resistance capacitor.

Start disassembly of the monitor by prying the front cover free of the monitor housing. Close inspection of the bottom of the monitor will reveal several slots in which a screwdriver can begin disassembly. Once the cover is free, place the monitor face down to continue disassembly.

One caution: The ribbon cable that connects the panel buttons to the electronics appears to be connected with a fixed connector. This cable can be disconnected at the connector. Gently pry the black insert away from the connector. Once the insert is removed the cable will be released from the connector. Caution, DO NOT LOSE this tiny part!

For some time I have been talking about disaster preparedness and the broadcast industryôs obligations to the public during disasters. Recently, Cris announced partnering with Agility Recovery, to provide disaster recovery services for all our stations and offices. I would encourage all our stations to view that partnership from not only the perspective of continuation of business, but also from the public service prospective.

Not only should we be working with the new service, we should also be working with local emergency services building the relationships that will assist our operations during times of disaster. To name one specific example, snowstorms in Portland usually bring an official closure of roads to all but emergency and public transportation. Having been active in emergency services in years past and having ham radio call plates on my personal 4-wheel-drive vehicle usually allows me free travel during snow and ice conditions.

Here in the Northwest, the major disaster exposure is a 9 to 10 point subduction zone earthquake. In that event, I can guarantee seriously

enforced wide-scale road closures. Fuel transport and travel will be strictly limited to authorized vehicles only. Without that pre-disaster coordination with emergency services, travel authorization will be difficult at best, if permitted at all. Broadcasters in New Orleans learned this the hard way as several fuel deliveries to stations were diverted to other uses. Preparation, preparation, preparation!

This year, we worked on the emergency generator. The generator is installed in a daylight basement of the building with the exhaust originally vented directly outside. That wasn't a problem until the studios and offices were moved to the transmitter site last year. With the building now occupied on a regular basis, we changed the exhaust to vent above the building to limit diesel fumes entering the building. That certainly has made things more pleasant in the building during generator operation!

Rocky Mountain Ramblings
The Denver Report
by
Amanda Alexander, CBT
Chief Engineer, CBC - Denver

I think I always say something about time flying by. The beginning of last month I noticed Lowe's and Home Depot putting out their Christmas stuff. October has been an interesting month to say the least.

Tractor

We have begun having issues with the big tractor again. The end of September, we found out it was the starter that had gone bad. Keith took it off and took it over to a shop. They quickly repaired it and the beginning of the month we were able to get it running. It ran great, and Keith was able to get much of the 50-acre KLTT property mowed. We went out to KLTT when he finished to load the tractor up to take it back to the KLZ site, and upon moving the tractor around to the front of the building we found the brakes were not workingé AGAIN! I checked with Keith and they had been working for him, but he did complain of a burning smell while mowing. Now we know what the smell was. We have no idea what caused the issue but no doubt we will talk to our tractor guy. Chances are, we will dump the tractor in the canal and let it rot there. Okay, perhaps just let it sit in the barn. It's geared low enough that we can use it on level terrain with no problem, but loading and unloading it on the trailer are an adventure without any brakes!

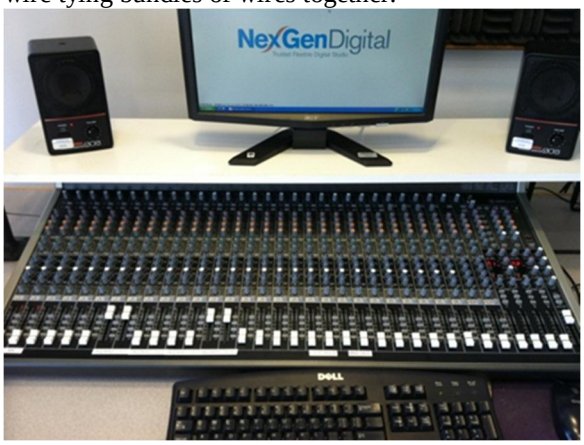
NexGen

We finally got the update to NexGen we had been waiting for. We are running 2.11.2 beta. It is supposed to allow the Sage 6411 EAS units to communicate with NexGen. After a couple weeks of testing, I am still finding bugs. The one issue that really "bugs" me right now is that any test received will be put on the air. I don't want *every* test to go on air. I want to be able to tell NexGen to look for a monthly test, a tornado warning, an Amber alert or an EAN before putting it on air. Thankfully, we have another bug and for some reason, although we can send tests using NexGen with no issue, when we receive tests, KLZ is the only one that puts them in the NexGen logs. I am working overtime to try and monitor the stations for tests so I can see what happens. It'd be nice if I could find a way to test on my own. Hmmmé I do have some older EAS units. I wonder if I could do something. We will see. Until then, we will have to just monitor it like crazy.

Mackie

We received a new Mackie board to replace an older one in one of our production rooms. It is really nice. It is a 3204 VLZ3, and it's significantly smaller than the old 32.8 we had in the room. In moving wires over, I was able to talk my dad into helping clean up the mess. We had a lot of wires that were not used anymore. During the move from the old studio location, we didn't take time to go through them as we were in a hurry. So he and I spent a good

hour or so tracing down the wires and tossing them in the pile. The birds nest is no longer. I then spent a while going through and making everything neat, wire tying bundles of wires together.



New Mackie 3204 VLZ3 in Prod 1

Servers

The beginning of this fiscal year, we budgeted in for four new servers to replace the NexGen firewall, NexGen server, Web server and FTP server. It started out a little bumpy as we realized we didnôt get quite the right thing for the NexGen server, so we had to order a different RAID controller and some more hard drives for more space. While we waited on that, I decided to have our board ops do some house cleaning. They went from using over a terabyte of space on the R drive, which is all NexGen stuff, to a little over 500 GB of usage. I plan on having them go through production and cleaning house there too. My goal is to get under 500 GB before we switch the server.

New CBC FTP server, a Dell R710

We began working on the NexGen firewall first. We were able to bring in local contract

Getting the new servers ready.

engineer/IT guy Derek Jackson to install the OSôs on the four servers. He did his work on the firewall and we were able to get it up before the end of business that day. He finished up the OS install two of the other new servers (at that time we were waiting on the replacement RAID controller). The next day, I began working, along with my dad, on the FTP server. We put it in the rack and were ready to run on it when Stephen realized the OS network manager was taking over and changing the subnet setting that we had already set. We ended up plugging the old FTP server in on the bench and using that for the time being. We decided to install CentOS 5.7, but for some reason could not get it to install. We went back to 6.2 after Stephen found a workaround for the network manager issue. While my dad was in California for some business meetings, I got to learn some Linux. Stephen and Todd were kind enough and patient enough to teach me as we were trying to get the server working. After several hours, we were finally able to get it up and running around noon on the 26th.

While I was waiting on Stephen to get to the office in Birmingham one morning he had me reinstall CentOS 6.2 on the web server just like we had done on the FTP server. It was fun, as I got to do that by myself. Again, Stephen walked me through the network part of it to get it working the way we want. Iôm happy to report that the new web server is now online and working great!

Next, weôll work on the NexGen server. That will take careful planning, though, as we will have to take the NexGen system down and run in ECR for several days. This is the reason for the clean-up of NexGen. So, Lord willing, by the next issue, we will have had a smooth transition to the new NexGen server.

Well, I guess thatôs it. So until next timeé thatôs all folks!!!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

The Great and Powerful Cloud Has Spoken

I occasionally mention in these articles that I consistently try to learn new programming languages, keep up on knowledge of new IT related equipment and research the latest concepts within the IT realm. Itôs an endless hunger to keep up on whatôs new and a borderline sick desire within to learn, ultimately resulting in me spending a significant amount of my free time reading university level IT related textbooks while on vacation. I knowé my relatives donôt get it either.

Aside from feeding the brain, I obviously focus on whether these new tools can be utilized to benefit CBC locally or company-wide. Most recently, I jumped into the intricacies of cloud computing. Although I had skimmed the surface before through various articles and other resources, I really wanted to get into the fine details, pros, cons and other aspects of this new buzzword. Although I donôt consider myself an expert by far, I have learned quite a bit and would like to share some of those things with you especially as they relate to the radio broadcasting environment.

One of the first things I encountered as I began my research is that even the experts have a tough time agreeing on a true definition of cloud computing. A simple web search in terms of ñwhat is cloud computingò will turn up a variety of different answers. Based on what Iôve learned, cloud computing can be divided into several different facets, each with their specific benefits and scope. Some envision business computers to be void of installed applications, accessing the necessary software remotely referred to as Software as a Service (SaaS). At this level, applications located on a remote server are accessed by the client machine. The key benefit is that the user no longer is required to download and install updates to the locally installed version of the application. Each time the application is accessed, the user can rest assured that the latest released version is present. Quite honestly, I can certainly see some significant benefits in this environment. But for anyone who has experienced setbacks and delays related to a software update that wasnôt properly tested by the developers, this has the potential to pose some significant problems.

The next layer is referred to as Platform as a Service (PaaS) in which the cloud provider is responsible for the server hardware, operating system and network accessibility to this data. In other words, they provide the servers and space for your data while taking care of everything else.

Finally there is Infrastructure as a Service (IaaS) where the provider rents the server hardware and network accessibility. Although IaaS may seem identical to PaaS, there are some differences. Primarily is the ability to administrate the server space and operating software as you feel is necessary. Under PaaS, the provider will perform operating system updates and a certain level of software installation options. The client gets what is provided with little to no flexibility. In an IaaS environment, the client has full control of operating system, server-based applications and other aspects of the environment. The best analogy I could come up with is an apartment versus a condominium. Some apartments will allow you to paint the walls as you see fit, but may have some words for you if you begin to remove or modify the internal walls. On the other hand, a condominium owner may paint, modify or decorate to his heartôs content provided the actual supporting structure of the building is not changed. Although there may be better examples out there, this is the one that helped me keep the two levels straight.

Other aspects of cloud computing revolve around whether itôs a public, hybrid or private cloud. Some experts feel that a private cloud doesnôt adhere to the ñall for oneò general concept of cloud computing and the idea of sharing resources as the public cloud does. In all honesty, my security minded brain has a tough time wrapping around the concept of numerous different businesses accessing their data and software from one general pool, but many companies are whole-heartedly buying into this

concept these days. Aside from data security from outside threats, some have also voiced concerns over the cloud provider's ability to secretly monitor the daily activity taking place on their servers. If Facebook's ability to track your every move on the web whether you're logged into their system or not doesn't raise a red flag, imagine the potential that every aspect of your business is being tracked, processed and sold. Of course this is an extreme scenario, but certainly within the realm of technical possibility.

So does cloud computing have a place in radio? Again, I'm simply a Padawan in the Cloud Jedi Community, but I'll try to give you my initial impression and will certainly eat my words at a later date if it comes to that. One of the primary draws for utilizing a cloud environment is reduced cost of entry related to acquisition and installation of an IT-related system when starting a business. Let's face it, servers and switches aren't cheap. Generally speaking, it could be significantly less expensive for a start-up broadcaster to deploy a central datacenter rather than a dedicated IT infrastructure at each market location. But the primary issue lies within the reliability of data accessibility between each remote site and the central datacenter. I can certainly see implementing a private Platform as a Service (PaaS) cloud system as a viable option for radio broadcasting companies, although only if internet connectivity between each location can be guaranteed to 100% or a sliver below that. Redundant web connections could solve this issue, but keep in mind that some ISPs lease space on the same telecom lines. An issue with the carrier line could potentially knock out both ISP connections to the station or datacenter and that would be bad news.

As it stands today and in a very simplistic view, each station relies on its local network to deliver server-based data to the transmitter. Overall, you can expect the on-air signal to remain if internet access fails. The primary effects of an outage would be the internet stream of on-air programming and an unhappy staff with the level of irritation rising exponentially based on the length of down-time. If the local infrastructure goes down, whether related to bad switches or a server failure, the local on-air signal could be affected, but your station in California is none the wiser.

Now let's consider a private cloud scenario in which primary audio servers are all located in one place. We'll leave the control servers locally, but data is being fed from the corporate datacenter to each of the stations. A failure in the internet connectivity at the datacenter or failure of the datacenter's infrastructure would essentially knock out the on-air recorded programming, live talk not included of course, at every one of the stations on the grid. A prolonged outage could cause significant headaches for the local managers. Obviously redundancy for internet connectivity would be a basic necessity in this type of scenario, but other issues could arise. So in my humble opinion, I don't believe the engineering side of radio is ready for the cloud… yet.

Where I do see a potential for utilizing a cloud type set-up is in the form of disaster recovery. Envision a centralized server or servers utilized to remotely image each station's primary audio and control servers. Although local back-ups or images are a huge part of a disaster recovery plan, a remote back-up or image is always preferable in the event of the unthinkable. Well… you can think it, but don't mention it. If restoration of a local server becomes necessary, the local engineer can easily access the datacenter and pull the server image to restore the machine.

In another scenario, the company's entire production data would be accessed in a cloud environment – most likely a PaaS approach. No longer stored locally, all master files would be stored on and accessed from a centralized server location. Collaboration on programming or advertising spots could be done easily by producers thousands of miles apart. Posting completed segments or spots intended for syndication throughout the company would no longer require uploading to an FTP server, but could simply be accessed directly from the central server. There are also numerous possibilities of cloud implementation for the sales and general office side which could certainly be a benefit in cost reduction and accessibility of data. Once again, consistent and dependable internet connectivity is a must in this type of scenario.

As I alluded to earlier, data security becomes a much more prevalent concern within a cloud environment. Whether private or public, security of the server system and the data which resides on it becomes critical. It's easy to imagine the effects from a security breech potentially affecting every station in the company. When you put all of your eggs in one basket, the potential of them all being crushed is considerably higher.

When time comes to bring the Cloud into radio, there will be many decisions to make. The choice of a PaaS or even SaaS model, private or public, would hinge upon several factors including primary scope and application requirements. Regardless, the IT landscape is changing once again. It certainly seems as if the set changes in this crazy play are happening more frequently as we move

ahead.

Has Streaming Killed The DVD?

One of the more recent news articles that caught my eye stemmed from the apparent collapse of Netflix. Although Iôm not included in the list, I personally know a dozen or so of the approximately 800,000 ex-subscribers that are being reported these days. Within this article, one claim made is that we are seeing the sunset of the DVD as a format. First the Video Disc, now DVDs? Please say it isnôt so!

The article went on to explain that online streaming services, such as Hulu Plus, will be taking over the video market making DVDs obsolete. Perhaps that could happen where the writer lives. But in my neighborhood, I sometimes have trouble watching a 30-minute video on YouTube without it buffering a dozen times. Try watching Lord of the Rings that way!

But seriously, based on my understanding, many of these services actually download the video to the local machine prior to you actually viewing it. So buffering is not an issue. But total download time, data storage and the fact that todayôs society wants things NOW certainly plays a part, especially considering the limitations of our general IT infrastructure. Throw in the fact that my ISP is capping the amount of data that I can download in a month and some diehard movie watchers could have some issues with this.

According to an article on masable.com, Netflix accounts for just under 33% of US downstream traffic. Further, real-time entertainment apps occupy 60% of peak downstream traffic on a global level and that trend is increasing every year. Iôve mentioned in the past that weôre running out of bandwidth and itôs happening faster and faster each year.

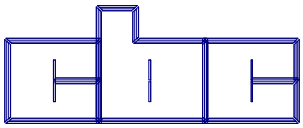
Go ahead and label me as someone who doesnôt want to give up something Iôve grown accustomed to, but I can see DVDs being around for a long time to come. Perhaps we will see a hybrid approach to movie releases in which the film companies release their movies for ñrentalò via streaming alone during the first year, followed by the hard copy edition after that. A model in which the cost of movie streaming for rental is significantly low and also provides the company with hard data to base their initial DVD production run. Low streaming rental numbers equates to a reduced number of DVDs to be printed for retail sale.

Following that notion and considering that I canôt tell you where the closest movie rental store is, I think we have officially seen the end of the brick and mortar video rental business. Personally speaking and kudos to Dave Ramsey, my family typically turns to our local library when in search of a DVD to ñrentò rather than spending money for it. Although the selection may be limited, the price is always right. Now leave my DVDs alone and donôt even think about touching my music cassettes!

é until next month!

KBRT • Avalon - Los Angeles, CA
740 kHz, 10 kW-D, DA
KCBC • Manteca - San Francisco, CA
770 kHz, 50 kW-D/1 kW-N, DA-1
KJSL • St. Louis, MO
630 kHz, 5 kW-U, DA-2
KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1
KLZ • Denver, CO
560 kHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2
KSTL • St. Louis, MO
690 kHz, 1 kW-D/18 W-N, ND
WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WLGZ-FM • Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
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, 5 kW-D/41W-N, ND
WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

CRAWFORD
BROADCASTING
COMPANY



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