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LINES

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A Look Into the Future at the STC Conference in Baltimore by Eric Krapf

Eric Krapf is the program co-chairman of Enterprise Connect and editor of the NoJitter.com website. Enterprise Connect is the leading independent conference & exhibition in enterprise communications, and No Jitter is its daily news and analysis content website. Eric will present the keynote address, ***Enterprise Communications: Where Do We Go from Here?*** *on October 10, 2012 at the STC's Fall Conference in Baltimore.*

I'm really looking forward to speaking at the STC conference. As many STC members know, our organization shares a long history with STC, going back well before the days of our Enterprise Connect event and No Jitter website. I've worked for this company and its various owners for 16 years, and one of the first social events I attended, shortly after I was hired, was a reception at Jerry Goldstone's house for STC members who were meeting in Chicago for a conference. Jerry founded Business Communications Review magazine and the affiliated BCR conferences and training programs, and he always relied heavily on STC members as the independent experts that gave his content the unquestioned credibility that it always enjoyed, and that we still try to uphold so many years later.

Another reason I'm excited is that, believe it or not, this is the first STC conference I'll ever have attended. It'll be an opportunity for me to see old friends and of course meet new ones, and to immerse myself in the deep knowledge base that STC represents. And it's a real honor to be delivering the keynote address on Wednesday. This is a unique time to be a part of the enterprise communications industry, and I'm hoping to be able to convey some sense of the challenges we see facing our audience of enterprise decision-makers, equipment vendors and service providers.

We see enterprises and their technology providers pulled in a couple of directions at once. On the one hand, the slow economy of the last few years, with its attendant pent-up demand, combined with the natural technology replacement cycle, make this an opportune time for enterprises to consider refreshing their communications technology. And the crop of emerging technologies—from mobility to social networking to cloud-based systems—are really exciting in their potential to provide new benefits in terms of both cost and productivity gains. And yet, nobody seems ready to commit to a migration away from legacy architectures into a future where there's no standard vision: We knew, when we started migrating from TDM to IP PBXs, what the end state should look like. That's not the case with the generation of technology that's emerging to succeed the PBX.

Baltimore's Inner Harbor Photo by Kevin Carroll - Bowie, Maryland

So it's a fascinating time to be part of this industry, and I'm really happy to have the chance to share thoughts and insights with our friends at STC.

In This Issue . . . (*Click ➲ for Individual Page Access*)

Getting to Know You - Cathy Cimaglia

The STC is fortunate to have Cathy Cimaglia as our Administrative Manager. She is the workhorse of the STC, and she handles many tasks behind the scenes that make the organization (and especially the conferences) run smoothly. Cathy is the one person in the STC that every member knows, since she handles the new member onboarding process. So what really goes on at STC headquarters? We decided it was time to get to know Cathy a little better.

What do you like best about working with the STC? The ability to work with so many different personalities and meeting some really great people….and, it's never a dull moment!

What is the most challenging part of putting on the fall conference? Working as a volunteer organization, there are always challenges. Everyone has a different perception of what a conference should be about. Even with all the challenges, I have been thankful to be able to work with really great people that volunteer their time, even with their busy work schedules, to help put on these events and make them successful.

If you could visit anywhere in the world, where would you go? There are so many places in the US that I haven't seen, I would like to just hit the road and travel and see this great country of ours. The history, the beautiful country sides, the different cultures within these states are vast and waiting for me to visit them!

What do you do when you are not working on STC stuff? Well, in my spare time…..I am one of the owners of a vacation resort and little country store. We are open from April through November and it keeps us busy (thank goodness I have 3 others that handle the day-to-day). I also volunteer as a firefighter and EMT at our local Volunteer Fire Department, as well as sit on the Board of Directors. When I am not doing all the "work" stuff, I like to take my float pontoon and fly rod to the little lake on the mountain and float the day away….and I do fish, but catch and release – who has time to cook!

What would you do if you won the lottery? I would like to say that I would save it….but, I know I would probably take care of my kids, grandkids, oh yeah, and the husband…then buy a big lake on a mountain to float the rest of my years away….It's great to dream.

How did you spend your first paycheck? Quickly, I'm sure.

What was the last book you read? *"10th Anniversary"* by James Patterson….love those Women's Murder Club books!

STC LINES

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About the STC

The Society of Telecommunications Consultants is an international organization of information and communications technology professionals who serve clients in business, industry, service organizations and government. For over 30 years STC consultants have delivered independent and ethical telecommunications expertise. This objective guidance and support enables clients of STC consultants to benefit from the efficient and effective use of information and communications technologies.

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Legal and Regulatory Update

By Martha Buyer
Law Offices of Martha Buyer, pllc

As the STC's Regulatory Attorney, Martha is available to STC consultant members for consultations of up to 15 minutes, at no charge. She can be reached at 716-652-4413, or at martha@marthabuyer.com

As the STC annual conference approaches, I've been combing through state and federal decisions and documents to find legal developments that I think will be of the most interest to consultants. With this in mind, here are three issues that I think fit into this category—that is, interesting and relevant, although not necessarily related to one another.

FCC Enforcement

The FCC and Federal Trade Commission have stepped up their enforcement actions against those who intentionally, willfully (and repeatedly) violate Commission rules. This is particularly true for crammers who have been subject to costly—and enforceable fines. Most notably, the FCC has recently issued a notice of apparent liability for forfeiture of $1,108,000 against LDC Telecommunications Inc. for repeated violations of the FCC's slamming rules. Not only did the FCC find that LDC had repeatedly violated rules by changing the long distance carriers of a mere 27 consumers without proper authorization (and that's 27 who complained. Who knows how many didn't notice the provider change?), but that it had further failed to respond to numerous consumer complaints, as well as failing to respond to an FCC Enforcement Bureau letter of inquiry in a timely manner. Compounding these challenges was LDC's inability to return phone calls—both from customers and regulators. One of the two newest commissioners (Ajit Pai) wrote a dissenting opinion, reflecting his concern that the amount of the fine was not sufficiently large given the egregious conduct of LDC. His dissent further suggested that before assessing fines designed to punish bad behavior, the commission should have access to information to allow it to determine whether the offending entity is in a position to pay a greater fine amount than is required to serve as a greater deterrent. The dissent also describes the proper course of action for the Commission is [only] to consider an inability to pay only after a violator responds with concrete evidence that it cannot pay. LDC must now either pay the full amount of the proposed forfeiture or file a written statement seeking reduction or cancellation of the proposed forfeiture. For a full description of the FCC's action in this matter, please see http://www.fcc.gov/document/ldc-telecommunications-inc-12.

TEM Market Impact

Just this week, in the course of reviewing a rather lengthy agreement provided to a large corporate client of mine by Verizon Wireless, I came across a paragraph specifically addressing the issue of TEM providers and their relationship both with the end user and the provider. Customer's Use of Third Parties: Customer may employ third parties to make purchases, act as an Authorized Contact or perform other telecommunications management services under this Agreement, subject to the following: (a) Customer must notify Verizon Wireless in writing prior to use of a third party and identify the scope of such third party's authority; (b) Customer grants Verizon Wireless permission to disclose to such third party any information relating to the Agreement or Customer's account (s); (c) such third party must be bound by confidentiality obligations that are substantially similar to those in this Agreement; (d) Verizon Wireless reserves the right to require such third party to enter into a non-disclosure agreement with Verizon Wireless; and (e) Customer's right to terminate this Agreement shall remain solely with Customer.

The good news is that at least Verizon Wireless has recognized the presence (and value) of TEM providers in the marketplace. The bad news is that Verizon Wireless is requiring both its customers and the customers' consultants to define their respective responsibilities both clearly and carefully

None of the contract language seems either offensive or inappropriate. However, what it does reflect is that Verizon Wireless is insisting (not inappropriately) that it have written directions from its customer(s) regarding the actual power that the consultant has with respect to the end user's agreement (s) and network configuration. The good news is that at least Verizon Wireless has recognized the presence (and value) of TEM providers in the marketplace. The bad news is that Verizon Wireless is requiring both its customers and the customers' consultants to define their respective responsibilities both clearly and carefully.

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Legal & Regulatory Update *(continued from Page 3)*

Telemarketing Rules – New York Ups the Ante

In late August, New York Governor Andrew Cuomo signed a bill toughening the terms under which telemarketers, from both within and outside New York must operate if they plan to make calls to consumers within New York State. This information is relevant to those consultants and vendors who serve customers beyond New York's borders, because it's a reflection of the general animus directed toward telemarketers. Additionally, the fact that the bill passed the New York State Assembly unanimously suggests that no one wanted lack of support for this issue to affect an election going forward. The fact that the entirety of the New York Legislature could agree on anything is monumental in and of itself. But I digress.

Primarily, the new substantive provisions involve express written consent requirements and increased opt-out mechanisms. Under the new law, telemarketers may not deliver a pre-recorded message without the express written agreement of the consumer that includes the following information: (1) that such consent was obtained only after the telemarketer's clear and conspicuous disclosure that the purpose of the agreement is to authorize telemarketing calls to that customer; (2) that the agreement to allow telemarketing calls was not executed as a condition of purchasing any goods or service; (3) proof that the consumer has actively agreed to receive telemarketing sales calls from a specific seller; and (4) provides the consumer's telephone number and signature.

The new law also requires that telemarketers provide customers with more opt-out mechanisms then are currently required under either federal or state law. Presently, a telemarketer that delivers a pre-recorded message to a live customer must offer an automated interactive voice and/or keypress opt-out mechanism to invoke a do-not-call request. The new law, further requires that the call also include a mechanism to allow the consumer to automatically add the number called to the seller's entity-specific do-not-call list. Once this option is invoked, the telemarketer must immediately end the call. Further, if the call is answered by a consumer's voicemail, the new law requires that the telemarketer's message include a toll-free number at which the consumer may add the number called to the seller's entity-specific do-not-call request. Again, once this option is invoked, the telemarketer must immediately end the call. Additionally, an additional new requirement is a mandatory registration by those firms that telemarket to consumers within New York State with the NY Secretary of State's office in Albany. Firms that fail to register are subject to additional and onerous penalties.

For a copy of the full text of the bill (A10569), please see http://assembly.state.ny.us/leg/?default_fld=&bn=A10569&term=2011&Summary=Y&Actions=Y&Text=Y&Votes=Y.

As the STC's fall conference approaches, please feel free to send me questions you'd like me to address during my presentation. I'm happy to prepare a program that addresses consultants' questions. I will be largely unavailable during the week before the conference, so the earlier these questions can be raised, the better.

Please send me a note at **martha@marthabuyer.com** or call me at **716-652-4413.**

STC global expansion revealed!

Globalization certainly includes telecom as more companies look to achieve seamless international operations and create seamless global call centers. Being able to offer international telecom / UC solutions is becoming more essential to our value and competitiveness as consultants and introduces new and potentially lucrative and interesting opportunities.

Your STC International Affairs Committee(IAC) has been working to expand the STC internationally so you'll have partners on the ground when that international opportunity comes up. We are also working to create North American partnering opportunities for international STC consultants and VAC members with international peers.

This year, the STC IAC very successfully introduced the STC in Europe and is planning aggressive marketing and partnering activity for 2013 in Europe and beyond.

You'll want to attend a briefing on STC international activity at our Fall Conference.

In the meantime, if you have questions, recommendations or international opportunities, contact **Ken Krupp, Agustin Argelich, Georges Mokhbat, Jim O'Gorman or Garrett Myers.**

Adventures in Telecom Consulting by Randi Smaldone

With over twenty-seven years of auditing experience, Randi Smaldone has been at the helm of TRAK Communications since 1995. Randi has a proven track record for providing high level and technical cost reduction analysis to significantly reduce telecommunications expenses and improve quality of services. As a long standing presence in the industry, she has an extremely favorable reputation and relationship with the vendors and carriers in the industry.

Prior to establishing her independent auditing firm, Randi served as the Director of Audit Operations for two leading Expense Management Firms in the industry. She continues to serve as a leading auditor and advisor for several TEM companies today in addition to running her own independent firm.

Whenever someone asks what I "do" – and my answer is Telecom Bill Auditing – the dazed look on their face says it all! Why?

At the tender age of sixteen, I graduated from High School and went directly into college. It didn't take long before I realized that I was too young to make decisions about my future without knowing what was out there in the world. So off I went, into the jungle of New York looking for my first job. Fortunately, who was the first person that my path crossed with? Our very own STC consultant member, Jane Laino! What this woman saw in me I will never know but she gave me my first job opportunity as an office administrator for her consulting practice. I quickly moved on to begin working as a Telecommunications Consultant. During my four years with Jane, I experienced every aspect of telecommunications that there was. She was my mentor and remains the dearest friend that I have.

My experience as a telecom consultant.

Now I was an 18 year old, big haired, typical Brooklyn Girl working in Manhattan along-side electricians, architects, vendors and contractors (all men of course!) As I conducted the site survey during one PBX installation, I fell right through the raised floor boards. Right on my buttocks with my legs sticking up like an aerobics instructor! During another installation, the phone company and the electricians were arguing over whose cable was stopping the fire wall from closing. I was "invited" to climb the ladder and give my opinion. So up the latter I went… in my 4" heels and skirt…yep. Applause was all I heard when I got to the top rung of the ladder! These were not the best of times for a young woman trying to make a name for herself in the telecom industry.

During this time I also reviewed the phone bills for our

clients to make sure the phone company had the lines right and began the journey into what was becoming known as "auditing". (a.k.a. reading SN981s). One customer, a foreign government agency, wanted to know why their phone bill was $25,000 per month when it used to be $3,000. I spent a few hours analyzing the call detail and saw a ton of calls to 900 numbers. Now, keep in mind I was maybe 18 years old and 900 numbers were a new, relatively unfamiliar service, so of course, I dialed some . Oh my gosh! What trash were these people listening to at work at all hours of the night??? I added up the calls and it amounted to $19,000 of the $25,000 charges. The next day at a conference call that involved me and twelve male government employees, I honestly didn't know how to explain to these perverts what I had found. I dialed one of the numbers from a nearby speakerphone and they all got to hear all the pornographic details for themselves. There was absolute silence on their end and a very red face on my side.

I started to get more involved with auditing during the next few years of my career and stumbled across a billing issue that changed my life. The phone company was going to charge one of our client's $2 million dollars in underbilling fees. I asked for the opportunity to review the billing and had to audit a CSR that stood five feet tall. Yes…it buried me. I discovered a HUGE overbilling that not only exceeded the underbilling, it resulted in a $4 million dollar refund check for our client. It was that moment that I knew auditing was for me! That exhilarating feeling of "winning the lottery" with these refunds – NOT CLIMBING LADDERS!

Editor's Note: Join Randi for more great auditing stories at the STC conference in Baltimore, where she will be participating the TEM Panel Discussion, "Auditor vs. TEM" at 1 PM on Tuesday, October 9.

Distributed Antenna Systems in Higher Education

By Jim O'Gorman

Jim O'Gorman is the current President of the Society of Telecommunications Consultants. Jim started his consulting career over 40 years ago in the Bell System and held management positions in sales and engineering. He co-founded Communications Engineering in 1988, which is based in the Greater New York metropolitan area and specializes in strategic enterprise telecommunications planning, technology acquisition and project management.

Introduction

Twenty five years ago, colleges and universities provided for students' communications with dormitory phones and voice mail via university-owned premised-based PBXs. The institutions financed their purchases and ongoing expenses by charging fees for basic service and marking-up costs for toll calls. In those days when toll fees were high, it was easy to amortize the system plus make a profit. That model is long gone, as toll rates have come down to pennies per minute, thanks to industry competition and IP telephony services. As student use has shifted from the institutions' PBXs to personal cell phones, even less justification exists for residential service in the dorms.

With nearly all students arriving on campus today with a smartphone, it is no wonder that the use of a dormitory telephone line is becoming obsolete. Students prefer to text rather than call someone. In addition to smartphones students are bringing wireless tablets, e.g., iPads and mi-fi devices to expand their personal mobile space. Internet access now goes beyond web surfing to video streaming and gaming and will require significant bandwidth from the carriers. Perhaps most importantly, mobile technologies are being integrated into new teaching methods for academic course work. As a consequence, providing high quality cell phone coverage and broadband internet access is becoming a fundamental necessity on campus, much like supplying electricity and water to the community.

Unfortunately, cell phone quality is often poor or lacking in residence rooms, student unions, and academic areas leaving administrators with questions on how to improve wireless coverage. They have several options: one option is to convince the wireless service providers (carriers) to augment their macro signal with external antennas near or on the campus; another is to place repeater antennas that amplify the carriers signal within the building; or finally, install an in-building antenna system, commonly referred to a distributed antenna system or DAS.

Distributed Antenna System (DAS)

Distributed antenna systems are used to improve reception of the cellular carrier signals within a building. Cellular carriers provide services like GSM (global system for mobile communications), CDMA (code division multiplex access), UMTS (universal mobile telecommunications system), and LTE (long term evolution) via a mix of technologies, riding on distinct frequency ranges (850, 9000, 1900).The carriers deliver their signals to the DAS either with a base transceiver station (BTS) or a donor antenna. DAS equipment, located in a "head-end" room, combines the signals and distributes them to antennas via a common antenna cable. The objective is to deliver "five bar" service to as much of the facility as possible.

The Discovery Process

While the process may seem "academic", discovering the who, what, where, when, and why of one's community of users is critical to determining the scope of the project. Gathering information on who the users are, where they plan to use the technology, and what devices they will use will be important in system design. Once known, one can determine if the DAS needs to provide indoor and/or outdoor coverage, what technology platform(s) to consider, and the negotiation strategy with the carriers. Interviewing key stakeholders such as students, faculty members, and administrative staff will provide this information. In addition, consider using an on-line survey to reach a larger audience and provide information relating to the demographics of your community. Based on the survey data, one can chart, document, and/or graph carrier subscription information, the types of devices used, and typical monthly data utilization per user. The survey can also probe for future considerations like use of mi-fi devices, on-line gaming and streaming video. Again, this information will be useful when designing the system as well as negotiating with the carriers for service. Remember to consider 911 emergency services as well, since 911 on cell phones will be routed to the public safety answering position (PSAP) not campus security.

Financial Considerations -How to fund the system

System cost-per-user can be about $1 per square foot of coverage. This figure includes head end equipment, cabling, remote units (nodes), and antenna installation. If one is lucky your institution may have existing fiber to extend services to other buildings. If not, that cost will add to the total price. Colleges and universities have three options to finance their distributed antenna system:

Option A – Carrier installed and maintained system.

Option B - Third party, such as American Tower or Crown Castle, installed and maintained system.

Option C – Landlord (owner) furnished installed and maintained system.

Option A is attractive because the lead carrier will generally install the system at no cost or low cost to the school. Sometimes tie-in agreements allow students can obtain discounted phones and rate plan. The downside is when the system is designed for multiple carriers, since there can be issues on how the tenant carriers are being

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Distributed Antennae Systems in Higher Education

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treated by the host carrier.

Option B, like the first option, facilitates the technology decision and the installation. In addition, a tower company can provide a shared revenue stream to the school. The downside is that the institution has little say in the management and technology direction of the system. Further, if there are service issues or upgrade issues, the institution is beholden the third party to champion your needs.

Option C is becoming more popular. First, all leasing or licensing fees will go directly to the school. Second, the institution has full control over the system, including critical issues such as the lease terms, types of technologies to support, and the addition or deletion of carriers to the system.

Carrier Negotiations

One of the choices to make is whether it will be single or multicarrier carrier (also referred to as neutral host) system. As the name implies with a single carrier one will be negotiating with a single vendor with the other carriers excluded from the system design. For example, this may make sense at installations where there is a large homogenous group of users using a company plan that has its service exclusively with a single carrier. On the other hand, neutral host systems will require negotiations with all carriers that you would like to connect to your system.

It is important to remember that carriers have no obligation to provide connectivity to a DAS. Ensure that carrier(s) are committed to DAS connection before investing time, funds, and resources to build a DAS.

While carrier reasons vary for not connecting, the most common one is that their cost to supply the signal either via BTS or donor antennas cannot be justified with either their current or projected subscriber demand for that location.

Leasing/Licensing Issues

If carriers are installing base stations for macro coverage, i.e., coverage from the carriers' common cellular network, there is a good chance the institution will be able to collect rental income for the space supporting their equipment. Since these installations are capital intensive, expect leases to cover five or more years with options to renew for multiple five-year periods. Site rental fees can be lucrative with a typical range of $1500 to $2500 per month, though the amount will vary depending on demand and location. Annual escalations are usually included in the agreement. Also negotiate for electrical utility charges for the power used by the carriers' equipment. Expect the usage to be anywhere from 1000 to 5000 kWh per month depending on the BTS configurations.

Equipment combines the 12 different carrier signals into one composite signal.

Annual maintenance of the DAS hardware and software will be the responsibility of the owner. Consideration should be given to multi-year contracts to lower overall costs and protect against inflation.

If the institution is truly one of those "Hallowed Halls of Ivy", there is a good chance that the State Historic Preservation Office (SHPO) will exercise its oversight on the project. Carriers are sensitive to these requirements and will work to provide proper documentation during this process.

Designing the DAS

Carriers will not connect their signals to a poorly designed DAS, since that will translate into dropped calls and low data transmission speeds for their subscribers. It will be necessary to have a qualified and reputable radio frequency (RF) engineering firm design, install and maintain the DAS.

The goal of the RF engineer is to design a system that provides the maximum range of coverage at the desired signal strength (e.g. RSSI of > -85 dBm) and at a targeted signal quality level. The RF engineer will use floor plans to identify the locations of all active and passive DAS equipment (including cable routes, remote units and antennas). Then, based on a transmitter test and walk through, the engineer will provide "heat" maps, which indicate coverage quality via color coding, overlaid on the floor plans illustrating how the proposed signal will propagate within the buildings based on its construction and material characteristics. In addition, the RF engineer will provide link budgets that show the power loss as it travels from carrier signal source through the head end and then out to the antennas.

Site Preparation

If cell towers are to be constructed it may be necessary to obtain environmental and other regulatory approvals during the design process. FAA approval may be required to ensure the structure does not interfere with air traffic flight paths. Carriers may also be required to provide FCC RF Safety Emissions tests to prove no harmful radiation hazards exist. Be aware of other site-specific requirements, such as soil analysis, underground utilities, and in areas of historic nature, a review of Native American burial grounds. Remember to obtain "Dig Safe" permits to avoid damaging underground utilities.

The Head End Room

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Distributed Antenna Systems in Higher Education (Continued from page 7)

Carriers generally request more space than needed but with changes occurring so rapidly in this industry, it is best to provide as much as affordable. A good rule of thumb is 100-200 square feet per carrier so a neutral host solution with four carriers would require between 800 and 1000 square feet. Carriers will also request 200 amps service to power their BTS cabinets. To provide for this, it is recommended to put a main panel in the room so the carriers can take off service and terminate in their own sub-metered panels.

Ideally the head end room should be physically located where telco backhaul circuits already exist and distribution pathways, e.g., conduits, can bring the combined signal to remote distribution units. The

room will also need environmental conditioning. A good guide would be to the general environmental telecom room parameters as specified by the Building Industry Consulting Service International (BICSI) for air conditioning, non-static flooring, adequate ceiling height, lighting, physical access, security, fire suppression, and grounding.

Carrier Backhaul Requirements

Shown front to rear. Sprint, AT&T and T-Mobile racks

Carriers connect their BTS to their mobile switching centers using backhaul facilities. Backhaul circuits can range from one or two T1s to DS3 circuits to Ethernet links. It is critical to keep the local exchange carriers (LEC) outside plant engineer apprised of the institution's plans. In an installation with multiple carriers the LEC engineer may elect to install an Optical Carrier (OC) 3, OC12 or higher, to provide for future carrier bandwidth demands.

Testing

Testing of the DAS is essential for carrier acceptance. Once the system is in place, the RF engineer will walk the entire site with test equipment to capture the signal readings of each carrier technology and at each frequency, e.g., ATT UMTS 1900). During the walk through, the engineer will make test calls to the emergency 911 PSAP. The RF engineer will submit a plot of the readings as part of an acceptance sign off to the carrier. Once there is acceptance, the carrier will sign off and provide signal to the head end.

Going "On-Air"

Upon acceptance of the tests, the DAS is ready for service. In cases where multiple carriers are engaged, the test and acceptance will occur over a period of time. More likely each carrier is ready at different times and the RF engineer will have to make separate trips to properly set power levels and test with each carrier. A carrier may give preliminary approval of the design and keep its signal up and running. Once all carriers are on-air, the RF engineer then conducts a final and extensive check of received signal strength and forwards a written report to each carrier for acceptance of the system. If desired, the college may elect to do user surveys on the systems performance. Any issues should immediately be brought to the attention of the RF Engineer prior to final payments.

Ongoing Support

Maintenance and support of systems is done via remote monitoring. If continuous uptime of the system is necessary the operator may consider keeping selected spare cards on site. Carriers will monitor the sites very carefully and will often be the first to advise the owner of any potential problems. Usually the first time through the school calendar is a learning experience for the engineer who may alert the appropriate party when they see a drop in usage only to find out that it is spring break! Arrange with the carriers, either contractually or on an ad hoc basis, to provide automatic email updates to alert you of major and minor system outages.

Future Planning

It is difficult to guess where this industry is heading but as a general rule one cannot have enough "power, ping or pipe" to support the growing demand for mobile services. Try to plan for as much growth as possible and keep in mind that other carriers may join the mix. Technology will be changing, too, and that may reduce the size of current footprints. That said, carriers may develop other services which will require additional equipment and backhaul. This is a rapidly changing environment and will require frequent revisits with carriers and the user community to ensure the service and coverage stays current and operates at the highest levels of reliability, speed and access.

Getting Help

If all this seems a bit daunting, consider hiring an independent consultant to help guide you through the process. A fee-based, independent consultant (one with no ties to any manufacturer or carrier) can bring industry expertise plus understanding of the process to help you obtain the right DAS system solution for your institution's needs for today and tomorrow.

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Welcome New Consultant Members

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Annah Solutions is a limited-liability company (LLC) with two founding partners, located in Virginia. The company designs, develops, and markets instructional information and services for the corporate, education, government, and healthcare industries. It is committed to high quality instructional delivery and development materials, and provides a core deliverable of courses, and learning objects for various markets. Annah Solutions develops strategic relationships and builds its business on a new and returning customer base and an accumulation of educational content that can be re-purposed for products and services.

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