Welcome to the Event Tech Podcast, where we explore the ever-evolving world of event technology every week. This show is brought to you by Endless Events, the event AV company that doesn't suck. Now let's talk tech.

Brandt Krueger:
Hello everybody and welcome to the event tech podcast. He is Will Curran from Endless Events ...

Will Curran:
And he is the pleasant Brandt Krueger in the house.

Brandt Krueger:
Pleasant? Wow, I don't feel very .... not so pleasant today. You know what will make me feel better? You got.

Will Curran:
Wifi 6. I love it. Well I'm excited for this one because, as Brandt knows, maybe the audience doesn't know as much. I've gotten really into some network engineering stuff and I have been a huge fan of our guests podcast, for a very long period of time because it's actually where I went to cold start learning this sort of stuff. So naturally when I saw this topic kind of pop up in this trend in the wifi world as it may be, I of course hit up Rowell and was like, "Hey, we got to get them in here". So we are joined today by Rowell. Rowell is the master when it comes to everything wireless before I ... Can I call you the wireless Ninja of the world? Is that fair enough?

Rowell:
Sure. I'll take it.

Will Curran:
Well, Rowell's so good at this stuff. He has his own podcast where, literally, all he does is talk about this. I naturally had to have him on to talk about this trend that is Wifi 6 and where we're going when it comes to the wide world of event internet. So Rowell, you are so awesome. I'm so happy to have you on the show today.

Rowell:
Thanks for having me on this show. I'm really excited to talk about Wifi, because this is what I do. Talk about it on the podcast every week at cleartosend.net and I also do this stuff as my own business, helping people fix Wifi, one AP at a time.

Will Curran:
I love it. When you use the word AP, just so everyone who doesn't know what it is, what is the word AP?

Rowell:
Yeah, so I call them Access Points. That's for short AP. A lot of people will also call them extenders or routers. Kind of the right term but not really. I like to just say Access Points.

Will Curran:
I love it. So it's the thing that actually turns the hardwired internet into wireless, right?

Rowell:
Wireless, yes.

Will Curran:
I love it. All right, well I ... There's so much to talk about when it comes to this, and we were in the pre show, I was having to hold back because I think that there's just so much to cover when it comes to this. We'd be here for hours. Let's start off with the keystone title of this and there's been a big announcement over the last couple of months about Wifi 6. Can you tell us a little bit about what that news is and then we'll start to pick back to what it means for the events industry?

Rowell:
Yes. So there's a new protocol coming out, protocol being like how wireless works. There's a set of protocols that all make it work magically and you'd never see it, but it's called Wifi 6 and Wifi 6 is actually just a marketing term for the actual name. Just for everyone to understand what it is. Wifi 6 is a lot easier to say and it's really called 802.11ax and that is the latest protocol, which if you really want to try to understand it and we'll dive into this, but it really is about bringing efficiency to wireless...

Will Curran:
It has a couple of different components into it that allow it to do this, right? Can you kind of explain what each of the components are and then I'll try to ... I know it's super duper technical.

Rowell:
Yeah, really technical so be prepared.

Will Curran:
We're going to get in the nerdy, so get ready for the nerdy, but I'll try to do the best I can to also help explain this if we do and get into a little bit of a technical aspect, but ...

Rowell:
We probably have to go back in time a little to see how we got here, but the main components to Wifi 6 and how it's driving more efficiency over wireless is they're including something called OFDMA resource units. We can talk into that. BSS coloring, that's different. OFDMA sub carriers, target wake time and high efficiency channel access. So I know that's a lot to take in, but we can try to break those down into something a little bit more simple.

Will Curran:
Awesome. Well let's talk about, I mean a lot of these things can be really obviously beneficial to wireless in general, but what do you think out of all the different components is going to be most effective at helping event professionals have better internet or for attendees to have better internet at events? Which ones do you think are the best?

Rowell:
The one that will drive the biggest change or improvement is going to be the resource units. Because that handles the way Wifi works and it's very different with Wifi six compared to the previous wireless protocols that have already been released.

Will Curran:
Awesome. Can you explain what do resource units look like now and what does it look like now with Wifi 6?

Rowell:
Sure. There are no resource units in Wifi today prior to Wifi 6. If you're looking at it ... I think Cisco has the best analogy for this. If you think of a single lane road and there's a car driving on that road, right? That one car driving is an example of, let's say, your phone transmitting over wireless or receiving over wireless. It's a single transmission, right? If you go back to the basics of wireless, wireless is what we call half duplex medium. By half duplex, if you guys consider two way radio, right? Only one person can speak at a time. You know, I say something and then you'll respond with, you know, "Copy that". Two people can never speak at the same time on the two-way radio. That's how wireless works. It's always like single transmission at a time.

Rowell:
If you look at that-

Will Curran:
I think that's really important for people to know because I can remember that was mind blowing when I learned that is that technically no one transmits at the exact same time. So how does this happen where ... how is it possible for two people to be connected to the network at the same time?

Rowell:
Yeah. So, so devices can connect to an access point, but what they will do is contend for airtime and airtime is basically that time that device can transmit or receive some information and usually the contention of that air time is done by the transmitter or whoever's transmitting, right? If two devices end up basically getting access to the airtime at the same time, that's what we call a collision. A collision actually slows things down on the network because when a collision happens, every single device would receive some sort of wireless signal that says, "There was a

collision. I need you guys to not talk for a certain amount of time or not transmit or receive at a certain amount of time so I can retransmit the original signal".

Will Curran:
It's like saying, "Hold the phone, hold the phone, I need to send something", and everyone else is kind of like, "Okay, we'll wait", and then let's go.

Rowell:
Yeah. Yeah. The best example I always give ... For anyone who has children, right? Let's take me and my wife speaking. We're talking, I'm responding to her, and then my eight-year-old just all of a sudden jumps in and starts talking at the same time my wife was talking. I cannot understand both people at the same time, right.? If anyone can, you'd be really amazing, but I can't understand. I have to say, "Hold on. You don't talk. Let my wife speak first so I can understand". That's kind of how Wifi works.

Will Curran:
Awesome. Then this new resource element ... resource groups is it called?

Rowell:
Resource unit.

Will Curran:
Resource unit. I was so close. Resource units will allow that this doesn't necessarily have to happen in this way anymore. So there's a new revolution happening. Can you explain how it's going to evolve?

Rowell:
Yeah, so in Wifi 6, resource units allow ... if we take that that single road and a car, it allows multiple transmissions from multiple devices at the same time. If you take, for example, a truck driving on the road, you can put multiple things in that truck. If you consider each different thing in the truck as a different device and its payload of data it's trying to transmit. That's the example there is now you can have multiple devices transmitting and receiving at the same time. When we are talking about how it's similar to like a two-way radio and then now with Wifi 6 you're like, "Wait, now multiple devices can talk at the same time?" That's because with these resource units, the frequency in which wireless communicates over, they cut that frequency into smaller chunks.

Rowell:
So a device will tune to that much smaller frequency, which is allocated across a more larger chunk of frequency and that's how the devices are able to speak at the same time. Whereas anything prior to Wifi 6, they had the whole frequency to themselves whenever they were transmitting or receiving.

Will Curran:
Wow. Okay. So all in all, this means that basically more devices can talk simultaneously. Does it mean basically that these access points that are now able to have higher capacity as well? Does that mean that?

Rowell:
Yeah. So it's more technically that the ... We're able to communicate more over the air versus less because of the multiple frequencies that are being used, these smaller chunks of frequencies. Because the goal that we should aim for as a wireless designer and implementer is to get devices to communicate on wireless and get off as possible just so we can accommodate other devices.

Rowell:
So Wifi 6 helps to make more efficient of this frequency space that we have because there's not a lot that we can use right now because the FCC hasn't allocated more frequency space to wireless. But the APs would be able to accommodate more clients. That means Wifi 6 you'd be able to handle higher capacity as long as it's Wifi 6. So we can kind of get into that too in our discussion. There's some caveats when you're going to implement Wifi 6.

Will Curran:
Yeah. Maybe we want to jump into those now because I'm curious. What sort of caveats are coming into this to make this happen?

Rowell:
Yeah. So you'll see a lot of vendors out there saying, "We have Wifi 6 capable APs. You should buy these now because that's the latest and greatest". Now the thing is though, to use Wifi 6 if you're going to implement Wifi 6 APs or access points, is that you need a device that is also Wifi 6 capable. Because if someone were to deploy at an event space all Wifi 6 APs because they think Wifi 6 is going to make everything better, but everyone is still using five-year-old phones and five-year-old laptops, those devices don't understand Wifi 6. They only understand whatever protocols were installed at the time that that device came out. So whether that's 80211ac, 80211n and I'm just going backwards in time there. 80211ac is where we're at now, where people are ... they're calling that Wifi 5.

Will Curran:
So it's kind of like back dating into these older names. Now they have a simpler name to follow.

Rowell:
Exactly.

Will Curran:
Right? Now that we have devices that obviously over time are going to come and hopefully have wifi 6. What do you think the timeline looks like that this will be more common on the consumer

grade? So when do you think more devices like laptops, phones ... when do you think they're all going to start to have this?

Rowell:
I think phones are more likely to come onboard faster because of the typical plans we have with our mobile provider. I can change out my phone every year if I want to with whatever plan you have. I think the mobile phones will get more adoption that way as long as they are Wifi 6 capable phones. As we're recording this right now, the only Wifi 6 capable phone is a Samsung S 10.

Rowell:
If you were to upgrade a Samsung S 10, you have a Wifi 6 capable device and you could use that Wifi 6 capability as long as there's a Wifi 6 access point in the area. Now, if there isn't a Wifi 6 access point available that has this capability, it's not that you won't be able to use wireless on your device. It'll just down step to Wifi 5 for example.

Will Curran:
Yeah, I was going to say it's backwards compatible, right? Technically Wifi 6 will be able to connect to Wifi 5. Similar to that right now, I guess, Wifi 5 can connect back to Wifi 4 and so on and so forth. Correct?

Rowell:
Yeah, yeah. It just has a different protocol that's configured on the device.

Will Curran:
So, we're probably looking at a couple of years before clients start to have this sort of ... clients being like phones and laptops start to have this ...

Rowell:
Laptops will take longer to get that adoption Because if you look at event space and the people that are coming into this event space with their company provided laptops. Typically those companies don't swap those out that quickly. It's usually a three year cycle or even a five year cycle if you happen to work at that type of company. Hopefully three year cycle.

Will Curran:
hopefully three year cycle. Hopefully less would be nicer. But yeah, you definitely see a lot of like old school IMB thinkpads still being brought out. The thicker generation MacBooks and things like that. You don't really see the touch bar quite as much out on the events space's watch.

Rowell:
Yeah.

Will Curran:
So Wifi 6 is probably ... We're talking at least three out before it's widely available across the events world and conferences and hotels and everything like that. Would you say three years is probably the right amount?

Rowell:
I think three years is when we'll see at least a good adoption rate. Because I was just at a conference in San Diego a couple of weeks ago and the network guys there were showing us the client distribution, like how many supported ... were connecting with Wifi 5 or lower. When they showed us the Wifi 6 number ... This is a conference with like 28,000 people, there were only five devices connected with Wifi 6.

Will Curran:
Oh Wow. They're obviously Samsung S 10s.

Rowell:
Obviously.

Will Curran:
Or something we don't know.

Rowell:
It could have been because it was a tech conference so there could have been some device that some vendor was testing and it could be Wifi 6 cable. Because there is also an Intel chip set for laptops that's available to purchase and upgrade that on your laptop.

Will Curran:
Okay. So unless someone's may be busting out their custom built laptop or they're bringing their desktop computer to hook it up, they're probably not running it in any sort of way. Awesome. I mean at that point too, I mean the question is with that low adoption rate, you probably won't even see that big of a benefit from it as much. It's like we're when there's way more.

Rowell:
Wifi 6 is supposed to be about high efficiency, right? It's supposed to make wireless more efficient. If there's only a handful of devices connected to a Wifi 6 access point and there are also Wifi 6 devices, like one or two clients, you're not going to see that big efficiency in there because there's nothing to make efficient, right? Because it's only a small number of devices. Where we'll see the efficiency kick in is when you have this more devices, more people in the same space and if they're all wifi 6 capable, that's where we get to see those efficiencies take place. We won't necessarily see that with a really small number of devices.

Will Curran:

That totally makes sense. To jump back to something you said earlier, I was going to ask this and then I jumped on another question before then was you saw this breakdown of all the devices that we're using, what generation of Wifi that they were using. I'm curious to know how many devices ... what was the breakdown of people may be using Wifi 5, Wifi 4 and Wifi 3. Was it surprising or did it align to what you thought it would be?

Rowell:
It aligned with what I thought. A big majority of those users were using the Wifi 5. I mean, we're pretty much at the tip, like the end of Wifi 5. We've already rolled out everything regarding Wifi 5, which is 80211ac. Everything's out already and that rolled out in phases as well. That also reminds me of that Wifi 6 will probably roll out in phases, which means we probably won't see every single feature rolled out to the first gen devices. But in the second wave of Wifi 6, which I think there's going to be two waves, we'll probably see the rest of those features deployed.

Will Curran:
Good to know. All right, cool. So we've looked into the peered future of what wifi will look like into the future where it comes to Wifi 6. Is there anything else that you think that our audience needs to know when it comes to Wifi 6, before I like totally have a million other questions related to Wifi in general?

Rowell:
There's a lot of marketing out there and you just have to do some due diligence because a lot of people think that Wifi 6 is going to solve all the wireless problems. It is not. There's a lot of things that depend on making wireless work better. Wireless is just one of those protocols that's very forgiving. If you have ... An example is you may have a poor connection, right? But you still have a wireless connection. So maybe you can't do HD video, but you can send out an email for example. That's how resilient this wireless protocol is. Because if your connection starts to weaken, you might not have the best connection, but you still have some connection to do something. A lot of those factors depend on many other things, which I don't even know if we'll talk about all of these things. But a lot of these factors also do not rely on just Wifi 6. A lot of it depends on how the wireless network was designed and also what your infrastructure's like supporting the wireless network. So many things.

Will Curran:
I remember we were talking a little bit about this during the pre show was that Wifi sometimes gets to blame for things that it's not really to blame. I think that's perfectly said because you focus primarily on the wireless element. There's a million different elements when it comes to what makes that successful connection go from your phone all the way to the Internet. Can you talk a little bit about common areas of fail points maybe that people tend to blame when the "Wifi is not working"?

Rowell:

Typically that's the first blame, right, is Wifi is not working, and then you need to figure out what isn't working specifically. Like can you see the SSID and if you can see it-

Will Curran:
SSID meaning?

Rowell:
The network name. You look at your wireless signal or you click on your wireless icon and you see a list of networks, right? The most familiar one that people know about is Xfinity because Xfinity has their network everywhere. So you click on the wireless signal, do you see the network name there, which I also call an SSID, which is a service set identifier. If you can see that, can you click on it and does your device connect to it? If it does, usually the icon shows that it connected, right? But from there, then people might have problems. They just say, "I can't get to the Internet even though it's connected". So then you just going to have to move through that troubleshooting stuff. This is where I'm not just a wireless guy, but I'm also a network engineer. I was brought up from the help desk, all the way up to systems administrations.

Will Curran:
God bless your heart. You were the help desk guy. Oh my gosh.

Rowell:
But now I know what to look for on somebody's device if they have a problem. I can kind of go through the troubleshooting steps. You peel it back like an onion. You take a layered approach. Some of the common things are not really wireless related because more often than not if one person is having an issue, but everyone else is having good wireless connection is probably not the wireless. But when some widespread issues come on when many people can't connect and by connect, that could be anything. Sometimes it's the DHCP server, which is handing out an IP address to every single device that needs to connect and the DHCP server, which heads out your IP address, that's what's used for you to get out to different parts of the network and out to the Internet, for example.

Rowell:
Sometimes in a large event space where you're having thousands of people, you could have a server, which is then being hit by thousands of devices and you could basically overload that server to capacity. You either exhaust however many IP addresses you've assigned to the wireless network or the server is just getting hammered, right? It can't keep up with all the requests. That's one aspect of things. Then the other issues I've seen that are not wireless related is DNS, which is a host name resolution to an IP address. So when you type in google.com, a DNS server will ... that request that you make hits a DNS server and a DNS server goes, "Okay, what IP address should I give you to reach a google.com?" Sometimes the DNS server could also get overloaded if you don't build that to capacity of your event space.

Rowell:

Because our devices have so many apps on them, we have a lot of tabs open, there's a lot of applications running in the background. There's constant DNS requests being sent out, so you have to have infrastructure to be able to handle that. The other issue I see is with the network infrastructure itself. Basically access points, in order to provide wireless, they have to be wired to a network switch get that connectivity.

Will Curran:
Switches like where all the Ethernet ports are on...

Rowell:
The switches, what provides power to the AP, the access point, and also is that data path for the clients to connect onto the wired network and into the internet. Sometimes your network switches could get congested as well. There's just too much packets going through and packets are the payload in which you're ... It's the like the little nitty gritty ones and Zeros of what you're doing on your computer. Sometimes that overloads the network switches and the routers for example, and you have to be able to handle all that. There's many more. It gets a little bit more technical, but that's the best way to put it.

Will Curran:
Like you said, there was like almost this checklist that your network engineer on site, which I think we might've talked about this on the show before, how we highly recommend having a network engineer. I know I've talked about it probably somewhere before, but having someone onsite who is constantly monitoring your network, and I'm guessing someone like yourself, he would sit here and say, "Okay, this isn't working", and you kind of make your way backwards through this list trying to resolve each issue, kind of putting out a little fire as he goes. That sounds about right?

Rowell:
It does, and also before you even get to that point, because that's troubleshooting right there, right? You have your event network running. Now you've got thousands of people coming in and you see issues. You don't want to get to that point where the moment people get in, there's issues. Now it's not to say that there won't be any issues, but you want to try to mitigate that as much as possible. So prior to any deployment, prior to installing anything, prior to even getting into the configuration of these devices, you want to design for the capacity of what you're expecting, right? So, if you've got a large conference of like 30,000 people, you want to be able to determine what type of hardware do I need that'll support that many people, devices and the data that we expect to see.

Rowell:
That means getting beefier network switches and routers to be able to handle all that traffic. Then on the wireless side, because I mean we are talking about wireless, so I won't talk too much about the infrastructure side. Wireless is very similar in how you have to plan for that capacity too. You have to design for it. Wireless signals are invisible, so we can't really see how

it's propagating into the air. We have to design for the capacity of all those wireless devices coming into the show floor for example. A lot of things are taken into consideration there, such as the number of access points, right? So usually people say, "How many access points do I need?" And so people usually just drop random numbers, right? They go, "Well, x number of APs per person" or the another common value is x number of APs per square feet and usually those numbers are not really good for planning capacity because that doesn't tell you, "Okay is that the right number of APs for the amount of devices and traffic we're going to see for this space?"

Rowell:
That's just a number that you can draw up just because of how much square footage the event space is. But you want to design for the number of devices and the types of applications you think you're going to see to really come up with the right amount of APs. Now it's going to take a little bit of guesswork because these devices are not under your control. You don't know how many devices and, and what kinds, because even the different kinds of devices offer their different capabilities. One could be 80211n only or the other ones could be 80211ac. One's a laptop and one's a phone. They have different capabilities there.

Will Curran:
You also don't know if Joe is going to show up with a thousand laptops.

Rowell:
You just don't know. Or you could have guys that are going to come into your show floor and they might have a device that actually interferes with the wireless network, right? You just never know. Then there's also things you take into consideration such as the frequency that's being used. In wireless, there's a certain number of channels that you could use, right? People might know channel bonding where you could take a 20 megahertz channel and then combine that with another 20 to get 40 megahertz. Then that way people have faster speeds over wireless, but when you do that, you have less channels to use. So then you get to a point where you have to start reusing those channels.

Rowell:
When you reuse those channels, any AP that's operating on the same channel and they could hear each other, they're effectively one capacity zone. We go back to this whole walkie-talkie thing because if you have more than two APs mores operating on the same channel, they all kind of have to wait until the transmissions are done and the capacity is lowered that way. This gets into like the weeds of designing wireless networks. But these are the things I have to consider. Then there's also the consideration of the type of hardware I'm going to use with the access points. Access points usually come with the internal radios. You don't see those radios because they're usually enclosed in the access point itself. But in event space, larger events spaces, I like to use external antennas to really shape how the signal is going to be propagated. So there's a lot of things to consider and I guess I should ask where can we go from here?

Will Curran:
I think it was incredibly important for everyone to understand the amount of detail that goes into this because I think it's sometimes really easy to simplify it because yeah, we were all used to how we set up our own home internet. I mean there's some of us probably that are like, "I don't even want to set up my home internet. I'll let the Cox guy do it. I'll let the Internet person do it. I don't I don't want to deal with it", right?

Will Curran:
But then some of us are like, "Yeah, you plug in a modem to a router and you're good to go", but really there's so much more complexity when it comes to it. I think my question for you is what sort of things should people be evaluating when it comes to looking at their networks or the networks that the venues can provide? So let's say for example, they're not the ones who are actually going to set it up. They're trusting the venue to use what's already installed. Or maybe if they're, you know, doing a festival outside, they're providing a vendor like Endless or another internet vendor to be able to ... What sort of questions should an event planner be asking to making sure that they have exactly what they need?

Rowell:
Yeah. Some of those questions ... So I have to think like someone who's going to purchase a service. Usually I'm the one implementing, but some of those questions could be like what protocol do those access points provide? You want to know if they're still using something really old, right? Because something really old means slower speeds. Basically you want to use something like is it Wifi 5 or better, which would be a Wifi 6 afterwards. But you typically want to stay within like Wifi 5 capabilities because that's what devices are now. They're wifi 5. Then you want to ask, "Hey, what is the max capacity of this venue? Is the network going to buckle because of how many devices are going to come into the network?" Or you can ask them, "How many devices on the network can you support?" That kind of thing.

Rowell:
Honestly, I don't think those guys would give you the answers.

Will Curran:
They would say unlimited probably, right?

Rowell:
No one's going to say, "Oh yeah, we can't support that many", because that would mean they would lose the business. Typically you'll want to test it out for yourself as well. If there's an event happening or there's a lot of people you could test the wireless network out for yourself and see what it looks like. Or if you have someone who's a Wifi expert on your team, take a look at the environment, run their own tests and kind of see where the hangups are. But usually wireless looks good if there's not that many people on there. It's only when you have a large number of people, that's when the network starts to buckle.

Will Curran:
I think I recommend to people most of the time too, whenever you can, you know, similar to the way an event planner goes to an event maybe when the events are already going on. So, "Hey, can I come down when you have a big event going on so I can see what the venue looks like and how everything's going.?" Same with, I think, the internet for sure. Ask to come down during their big event and test their internet because that's when you get to see its full potential. You wouldn't ask somebody, "Hey, yeah, let's test out and see how well you do when absolutely nobody's there", is always going to seem the best.

Rowell:
Yeah.

Will Curran:
I think you brought up a really interesting point, too, about asking about the age of the networks. I think that it's really important for people understand the level of network going into everything. How far behind do you usually see networks are inside of hotels and convention centers and everything when it comes to their hardware technologies that they have for their-

Rowell:
I'm sorry. Repeat that last part of the question.

Will Curran:
How far behind is their like hardware and how far behind are these venue installations when it comes to...

Rowell:
A lot of times these venues are at hotels and I find that hotels do not update their equipment to be on the latest and greatest. That's usually a longer refresh cycle. Typically when they are refreshing the access points, the wireless network, they're probably going refresh some of the backend infrastructure, which is the network switches as well. Usually when I'm walking in, I can tell how old the equipment is just by seeing ... I can tell like what model the those access points are.

Rowell:
An older network can still function very well as long as it's been designed properly and also has been designed to fit the capacity of that event. It'll be an older technology but can still work very well.

Will Curran:
Usually you're finding too that like, hey, what, what do these technologies look like? How can people when they walking in ... I guess other than knowing the models of the equipment, would you just recommend having someone who is very, very comfortable with this sort of technology walk into a venue with you?

Rowell:
Yeah, and usually just having a conversation with the people that know, that's also like very beneficial.

Will Curran:
That totally makes sense. I wanted to talk a little about this too because we obviously talk a lot about bringing along somebody who understands network design and all these things, all the things that you understand. But I think there's a really important thing to bring up is that event Wifi and conference Wifi and events is really different than the kind of internet that you're installing in offices as well because they're totally different environments. Can you talk a little bit about the difference between enterprise level install internet and event Wifi and why people have to know that? Just because someone knows how the Wifi works really great and their office is totally different.

Rowell:
It's also the same comparison when people say the Wifi is not working here but it works at home. When you compare them, you're like, "Okay, well at home you don't have over a hundred people at your house trying to connect to the wireless network as well". In the enterprise, a lot of those devices are either given to the employees by the IT department so they know what kind of devices are on the network and they have control over them. It's a much smaller network as well. So as you're dealing with office space, people are distributed in different cubicles and different meeting rooms, so you can kind of spread out the access points and they're not as hammered with traffic. Because when you go to an event space, you have a rush of people that come in once the event start. You have thousands of people that are coming in, they're registering. A lot of those people are, if they're registering, they're congregated in the same space. So if you put one access point, that one access point can probably get really congested immediately because of how many people are trying to join. Just with the law of physics, with our radio frequency, you're going to hit that capacity there because of ... If you go back to like that walkie-talkie example, x amount of device, only one device at a time can transmit and receive.

Rowell:
So with event space, you're having to deal with just large amounts of devices entering the network in very specific areas, and also just ... not only does that hit wireless hard, it also hits your infrastructure hard. So now you have to get equipment that can handle that large amount of capacity and data. Because in an enterprise, you could be transferring, I don't know, a couple of hundred gigabytes per day. At a conference, you could be hitting terabytes. So that's a large amount of traffic you're trying to push in and out through the network. You have to have the equipment that can handle that.

Will Curran:

So lesson learned, just because you're a guy who knows your office wifi really well doesn't mean that he could be the same person who manages your event Wifi, right? So definitely make sure that you are finding somebody who is qualified to understand event wifi and understand how it can be totally different than an enterprise setup.

Will Curran:
So I wanted to kind of pivot and talk a little bit about security because I think that's a big topic that Brandt and I talk about this year and this big trend, I think, across the board. I think we did a whole episode already on the Event Tech podcast about it. If we are able to, can you talk a little bit about your one tip when it comes to keeping their internet, their network setup super duper secure at events?

Rowell:
So typically events space will use a network that has no password to connect to and you connect to it and then you have internet, right? There was no password you had to put in, or there is no really high secure method of connecting, which is called 802.1X, which is a lot more secure than using a password. When you're not putting in a password or anything for the network, and usually you can see that when you look at the list of networks and it doesn't have the lock on it. When it's just an open network, that means your traffic is being communicated over the air unencrypted. If I were to take a wireless sniffer, I can see that same traffic communicating over the air with a sniffer on my laptop and then be able to see what your device is trying to communicate with.

Rowell:
Now with a lot of the security in place with applications, you know, if they're using SSL, like https for example, when encryption with their applications, I won't be able to see, hopefully, down to that level. If you're putting a username and password onto your banking site, as long as your banking site is secure, I wouldn't be able to see your username and password. But for sites that are not secure and they're just using unencrypted protocols, like just plain http and you put in your username and password. If I was sniffing that traffic, that wireless traffic, I could probably find that. The way we try to secure from people eavesdropping on our wireless networks and just try to be more secure in general with our wireless connectivity is the very first place people start off is with that pre shared key, that password they put on there. The other step that a lot of enterprises use, you won't see this being used a lot in event tech space or event space is 802.1X, which is certificate based. That allows devices and authentication servers to really identify whether they should trust that device connecting to the wireless network.

Rowell:
There are some advancements in wireless security that are coming out and that's WPA3, which is the enhancement of this pre shared key. Right now a lot of people are just using WPA2 and what WPA3 does is it strengthens the communication, the back and forth communication that handles the encryption and hashing, as you will, with the wireless communications. It also adds a little bit more stronger encryption with 192 bit enterprise, but we won't see that roll out very

soon. I mean, some of the vendors are starting to support it, but there's not a lot of devices that support WPA3.

Rowell:
The other one which I'm looking forward to is called opportunistic wireless encryption, I believe, or OWE. That's targeted towards those wireless networks that don't have a password. The reason why we don't use password on those is because it's easy to connect to. Now, what OWE does is that's going to form a secure connection without you putting a password in. But the caveat there is that there's no mutual authentication between your device and the access point. Meaning you can't verify that the access point you're connecting to actually belongs to the guys running the event. It could be some guy staging up a rogue access point who is just trying to get people to connect to his access point and get basically your funnel, your connections through a man in the middle who's trying to do something malicious.

Rowell:
That's the only thing that OWE doesn't prevent. Whereas if you're using more stronger authentication, you can at least know you're connecting to the ... your device will know you're connecting to the right access point. I mean, there's other way to do security and other ways people have tried to break that security, but that really gets down to the weeds of wireless security.

Will Curran:
I love it. I love the the future look at it too, because I mean that's one thing that we don't also get to see. Like well how are we moving forward ... And I think like OWE and WPA3 are going to be huge game changers. I mean especially OWE with events spaces because like you said, a lot of times we have to leave these networks open to make it for convenience standpoint. But obviously you, like you said, it can introduce a lot of issues as well. So I think we might have to have you come back to talk a little bit more about wireless security just in general because I think Brandt and I are just definitely fascinated on that one as well.

Will Curran:
Well, Rowell, this has been like super ... A jam packed technical episode all about Wifi, Wifi 6, security, you know, understanding how to evaluate your networks. I mean, this is just absolutely been fantastic. Rowell, thank you so much for being on-

Rowell:
Yeah, we only scratched the surface. I know I spewed out a lot of things so people must be ... their heads must hurt.

Will Curran:
Well if you have questions, hopefully you guys ask it on social media. We can potentially do a follow up episode and dive into a little bit of these in a little bit more in detail. But before we finish up today's episode, Rowell, because I know you obviously have an awesome podcast.

Can you tell everyone a little bit about where can they listen to your podcasts and where people can find you?

Rowell:
Sure. So the podcast is cleartosend.net. It's a very technical podcast on wireless. So it's catered towards people who are trying to deploy wireless designed for it. If you want to learn specifically about 80211ax or Wifi 6 a just go to cleartosend.net/ax and that has a list of just 11 Wifi 6 specific episodes. Then I'm also on Twitter, very engaged on Twitter @Rowelldneco but you can find me on cleartosend.net.

Will Curran:
I love it. I think if you want to know more about Wifi 6, you guys, they are doing this gigantic series where you're covering every single piece of it in detail. So I know we definitely only scratched the surface. If you're looking to learn more, definitely check out that series. It's absolutely fantastic. Rowell, this has been so awesome to have you on the show. I'm fan girling and out right now just being able to have you on the show. I appreciate you so much for coming on and we look forward to seeing you on future episodes.

Rowell:
Likewise. Thanks for having me.

Will Curran:
Well everyone ... Yeah, absolutely. So, everyone, thank you so much for tuning into the Event Tech podcast. You guys know what to do. If you're listening on your favorite podcasting platforms, you can check us out Spotify, Stitcher, iTunes. You know, we're everywhere you want to be, but you know, one of the best places to check it out is obviously eventtechpodcast.com, where you can subscribe to the emails, get all the latest episodes and get invited to our special Facebook groups and LinkedIn groups as well. So definitely go check that out and we'll look forward to seeing you guys all next week. But in the meantime, feel free to tweet us, email us, and let us know what kind of topics you want to hear and we want to cover them. This one came from an audience idea, so definitely let us know and yeah, we will see you guys all next week on the Event Tech podcast.

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