# Data Center Interview -- October 3, 2014 @ 08:59

INT: If you could just tell me again what type of data center your company operates and what industries you serve and a little more about your particular role in the company.

R: Okay, just looking at it, I put down more than 2,000, but it’s probably less than 2,000 servers as a whole. It’s a corporate data center that I particularly operate.

INT: Okay, so you operate the data centers for one corporation?

R: Yes, one of the data centers. I’m involved with both of them at the larger enterprise end of it and not anything like the satellite offices.

INT: Sorry, can you repeat that last -- that you just said?

R: The satellite offices are the smaller data centers that we would have internationally.

INT: Okay, all right. So there are smaller satellite data centers for the satellite offices that you are not involved with?

R: Correct.

INT: Okay. And so I think you just said that there are two main data centers and those are the ones you manage or what is your particular…

R: I manage one and I consult on the other.

INT: Okay. And how long have you been in the industry or with this [company]?

R: Eighteen years.

INT: Okay, great. And what industry is this, [sir]?

R: Financial

INT: Okay, great. Okay, well -- all right, so first kind of warmup questions are more -- yeah, we’re gonna be getting into a lot of energy efficiency specific questions. but first I wanna kind of lead us into that by asking as you’re making investment decisions either in setting up a new data center -- I don’t know if you’ve been involved with that or if you’ve mostly been involved in doing major upgrades to an existing data center. But when you approach that problem, what would be -- if you could say the top, say, three factors that are most important to you or that you consider the most when -- in approaching that process, what would they be? And this could involve either a replacement of a major IT system or a major infrastructure facility system upgrade.

R: I’m more involved in the infrastructure side, so with regards to that it would be the time on the market of the product, past experience with the company and information gathered from networking with peers.

INT: Okay, all right, that’s interesting. Where does energy efficiency rank in the factors you consider or is that a separate, secondary issue?

R: Well, looking at total cost of ownership as opposed to first cost, that’s very much taken into consideration and the energy efficiency -- not sure what the -- if there were five -- like a choice of five things, probably they would be right in the middle. It’s a middle decision. It’s below reliability.

INT: Okay, that’s very helpful. And how often do you do, say, a major upgrade at your data centers? Is there some kind of set cycle or is it more of a as needed?

R: It would be as needed, but it typically tends to be in five year cycles.

INT: And what is usually the factor or factors what would generally tell you that it’s time to do it?

R: Currently that would be growth based.

INT: Sorry?

R: Growth based -- based on the critical load -- the critical load once it starts to approach -- we’ll run projecting -- we’ll do modeling to see where we would expect to be and then we would start the planning process approximately 18 months before projected time. And within probably another five years, then we would be looking more at end of life, extending the use of the facilities. Right around the 20 year mark is when we’d start to look at -- well, 18 months prior to that. So 2 years prior to maybe a 20 year age of facility mark, that’s when we would look at what parts of the systems we feel would need to be completely overhauled.

INT: The building systems itself?

R: Building systems, yeah, because the hardware refreshes occur all the time on the -- part of the IT compute.

INT: Okay. Yeah, the IT refreshes occur all the time and then what turns out to be a five year cycle that you were talking about, is that where you take -- you need an expansion based on the load? That’s what you’d be considering there? And then the full building kind of overhaul, that’s usually every 20 years or so?

R: Correct.

INT: Okay, all right, that makes sense. Okay, so starting from the idea that you’re ready to do either an expansion for load purposes or the major building overhaul, how do you gather information about what you might -- what kind of equipment or technologies or new management strategies are even out there for you?

R: Well…

INT: And your answer could vary depending on what type of upgrade you’re doing.

R: It’ll be everything from [trade] magazines to networking at a variety of events -- everything from DCD to 7/24 to bringing the vendors of equipment that is onsite already and do the ease of integration, so that would be -- I mean, that would be an important part. I want to go in a completely different direction and we’re staying with the equipment that we have.

INT: Right, okay. And do you talk to other companies similar to yours for ideas or is there not much interaction?

R: That would be with peers at networking events.

INT: Okay. And then do you have in-house engineers that maintain systems or do you contract that out? Do you talk to those folks?

R: Well, the in-house, we do the majority of the work, but we will use manufacturers, reps -- manufacture -- the site engineers from those companies to come onsite to do some of the maintenance on the equipment, like a major annual. We don’t have, we’ll say, PEs on staff, so that would be -- we would contact with a company at some stage to come in and vet the ideas that we have as to the direction that we wanna go, for them to validate it.

INT: Okay. And everything you’ve been talking up to now, would you say that this is mostly facility related decisions or are you also including -- you said you weren’t really involved in the IT equipment side.

R: Correct.

INT: Does some of this also apply to IT or should I just assume that what we’re talking about is mostly the facility?

R: Mostly facilities.

INT: Okay. And I know -- right now you just have these two main data centers that you’re involved with, but you said you’ve been in the business for quite some time. Do you feel like this decision making process defers between revamping older data centers versus newer ones or designing a brand new facility versus an upgrade to an existing one?

R: Yeah, it gets to a price point where it’s preferential to go with a new facility and then it’s also driven by -- because as a financial industry with the government regulations as they change with regards to the level of resilience that is dictated to us by the different government entities. That’s where that decision would come into play.

INT: And what…

R: [Ability] to retain clients that -- clients do tour these facilities and they regularly go through how the corporation is operating as a whole. If their experts started to feel that there were deficiencies, we would listen to that and take that into the decision making as well.

INT: You mentioned government regulations. What types are the most relevant to you? Is this federal state or local? Are they billing code regulations or…

R: No, it’s federal.

INT: So federal regulations on the facilities themselves?

R: More on the -- just as a corporation as a whole.

INT: Oh, okay.

R: It’s a stock related -- SOC or SAS.

INT: Okay. Now in thinking -- in your questionnaire, you said that you don’t lease space from other data centers or rent space or servers from your data centers. Am I correct in interpreting that way or…

R: Correct.

INT: Okay. Then I think my next few questions don’t really apply to you ‘cause you don’t lease space or equipment to or from other companies. But can you tell me a little more about how your data center is run? Is it run as a single organization with one budget, one team, one boss or is it broken up into silos where you have kind of separate budgets and teams and decision makers for IT versus facility management or some other…

R: It’s separated.

INT: So within the corporation, you are managing this data center, but within that data center management, there’s kind of a facility side and an IT equipment side. Do they talk to each other? Do they kind of discuss decision processes along the way or is it…

R: No, no. We have pretty good collaboration between both teams.

INT: Okay, so one side knows what the others doing -- gets to weigh in on it or not so much?

R: Yeah, like equipment placement -- ability to support incoming equipment, providing the power and the cooling for that equipment and requesting that -- the efficiency of it, discussing the airflow through it, like what are the options that are available that it’s preferable to purchase, particular configurations, the density allowed in the racks -- a lot of that’s discussed. And again, we work together with projection modeling on where we expect to see power and cooling and our ability to support -- our ability to support the devices that they’re bringing in [to deploy].

INT: Okay and who is responsible for the electricity costs? Is that an IT department thing?

R: The facility.

INT: Okay, so does the IT department -- are they aware of the influences of their IT choices on electricity cost? Is there decision there or not?

R: There is discussion and we’ll say within the IT department, there’s -- infrastructure is the ones that we would mainly deal with but then the requests that go in for the efficiency of the equipment that’s purchased. But then outside of that, there’s about another six departments -- everything from networking to UNIX to mainframe. So all those environments onto themselves, even though it’s all in the same budget per say, the infrastructure team have their budget and then there’s a larger IT budget that’s split up. So that they -- it’s more that we’ll put into requests for how the airflow management, but we wouldn’t be involved with discussing what equipment they can and can’t bring in. We prefer that they deploy HP over Cisco or things like that, but that it’s through a power supply is a requirement from the facility than the IT infrastructure side.

INT: Okay. And I think you mentioned that you do contract out some maintenance and repairs?

R: Correct.

INT: And now how much -- do those folks have any say in how decisions get made or when things should be repaired or replaced or you just hire them on an on needed basis?

R: It would depend on the size of the job, but the rebuilds of major equipment, that would be left -- that would be at the suggestion of the manufacturer, with regards to what their warranty, that they wouldn’t continue to warranty the equipment unless it was -- unless it had received an overhaul.

INT: Okay, interesting. Okay, this is a slightly different question. Do you buy or sell equipment of any kind of a secondary market? I assume that’s mostly pertaining to your IT equipment, but it could be something else I suppose, too.

R: Well, we do -- we will do pre-purchased -- with that question, is that a nice way of saying it, we buy used equipment?

INT: Yeah, do you buy used equipment or do you sell any of your equipment when you’re done with it?

R: No, it’s all decom’d on the IT side. It’s just -- there’s a disposal company and it’s -- once we have a certificate of destruction from them on the hard drives and -- so they just remove the equipment.

INT: Okay. You mentioned something about pre-purchase. What does that mean?

R: Pre-purchase is where I would either purchase it or I’d have a broker purchase equipment that instead of having a mechanical contractor purchase the equipment as part of their scope, that we would go ahead and purchase the equipment ourselves and have them install it.

INT: Okay, and this saves you on a cost?

R: Yes, I save on cost.

INT: Okay, great. Sorry, go ahead.

R: Sometimes what that would entail is that somebody was going to build a data center, ordered a bunch of equipment and then financially or demand or whatever reason, never installed the equipment. That’s where sometimes these brokers come into play, that they can get the equipment on a shorter time table and at a better cost. So we will take that into consideration.

INT: But that’s still new stuff.

R: It’s still new. Yeah, it hasn’t been turned on, but it is -- in a way it is -- from a technical aspect, it is used -- not from an operation aspect.

INT: All right and now we’ll shift a little bit, more towards energy efficiency specifically. You mentioned in the beginning that energy efficiency is sort of a middle issue in purchasing decisions. It would maybe rank below reliability, but still be something you think about. Have you recently made any major investment that improved facility level energy efficiency? Is there an example you can give me that we can kind of talk through? This could be on a cooling or lighting or airflow side.

R: With the last -- I call a minor upgrade, the units that were purchased, we purchased them with the variable frequency drives on the larger CRAH units -- C-R-A -- computer room air handlers. They’re abbreviated, C-R-A-H. On those, we did spend the extra for the VFD feature on those. So cost-wise, it’s quite a difference, but it’s -- we felt that it -- it was worth it in the long run.

INT: How long do you keep one of those units?

R: It would be in the 20 year range.

INT: Okay, so this is a long lasting piece of…

R: Equipment.

INT: Do you know off the top of your head what the payback would be on that extra cost?

R: I think in the two year mark.

INT: Do you first try this out -- you just did this in one data center or do you -- or in one part of it or do you just adopt…

R: We adopted it that that’s what we would purchase, no.

INT: Is there any smaller type of investment you would make that -- where you might try it out first in one part of the facility or one facility and then expand it to your other facility when you make an upgrade there?

R: Right now, we’re in the early stages of switching out the lighting, even though it is efficient lighting. We’re doing a couple of pilots. We’re getting pricing on it for switching out the TH to LEDs in a few areas to see what kind of a cost savings and a payback we can get on those ‘cause the price points and reliability seem to be improving. Cost is going down, reliability’s going up, so that’s something that we’re in the process of looking at. And mechanically…

INT: So up to now you haven’t really considered that because what you’ve heard the reliability wasn’t there or you tried it out?

R: Yeah, there’s too many -- everybody was involved in it. A lot of companies popping up that might not have the longevity or some of the larger manufacturers -- their price point wasn’t -- you could see the price point from some of the smaller companies, but the larger multi-nationals, their price points stayed quite high. But now it seems to be not quite on a part or still a small premium to be paid, but that they’ve [dug] the product in a lot better, that I would feel that the reliability is there in the product now. They’ve worked the product up.

INT: How long do you feel like that process took for it to become more proven for you to consider adopting it?

R: About five years.

INT: So I know you’re more involved in the facility side, but are there any recent investments in equipment utilization? I guess this is more on the servers or other IT stuff -- that have been adopted that you could tell me about?

R: Yeah. The mainframe upgrade have -- they’ve gone to a different style of cooling on those that have -- where the same process mode has been decreased, the disc storage has anything from a half to a third -- the reduction has been -- a two/third reduction in power consumption for the same amount of storage.

INT: Wow.

R: So 50% -- like half to two/third. Every 25 kilowatt unit can replace 50 to a 75 kilowatt worth of previous load on storage.

INT: And was the power consumption reduction a main factor in why they made these upgrades or were they doing it for something else and it was a bonus?

R: Equipment lifecycle management and it was just that that’s the direction that the vendor had gone with the product. So if you wanted the latest from the vendor, to stay with the same platform, that’s what they were selling.

INT: In general, do you feel like the decisions about facility efficiency and IT utilization efficiency are made together or separately? Does one dominate over the other in decisions at all?

R: I would have to say that within the IT department, that it’s the product that they need defines what they’re gonna purchase, so that the cost -- because it’s not a burden to them. The cost to power it would not -- electrical cost would not be that big of a factor with them.

INT: That doesn’t factor into their decision because they’re not the ones who are -- have to pay the bill -- factor it into their budget, right?

R: Correct.

INT: Okay. Are there any examples of energy or utilization efficiency technologies recently that you have chosen not to pursue? Do you have any examples that you can think of off the top of your head?

R: I know once the decision has been to look at geothermal cooling. We took a pass on that. As far as leading edge, a reliability aspect, it’s gotta have spent some time in the field. We would not purchase the latest and greatest.

INT: And is the geothermal cooling, is that -- are you not considering that because that’s still considered kind of leading edge or not proven yet or was there some other reason that it doesn’t work for you?

R: I don’t know that many people that have it, so that would be where my comfort level -- when I can discuss the operation of the equipment with somebody, that’s kind of where my comfort level would tend to come into play.

INT: Okay. So it’s not a location specific decision either, right?

R: Correct.

INT: That work in certain areas of the country better than others or is that not really an issue?

R: No, no, that’s something that we would come across, that somebody familiar with a particular environment or a particular piece of equipment from a PE engineering, that what they would recommend to use, then you go through and say, “Well where are you using it geographically?” And then you start looking at weather patterns, temperature, the high, the low, the seasonal fluctuations. The application might be great in certain areas, but that it’s just in the Chicago area, it’s not going to operate how it would in other areas of the country.

INT: Yeah, okay. Okay, we’ve been talking mostly about technologies or equipment decisions. Do you also use any maintenance or training as non-technology based approaches to reducing energy use? Can you give me an example of one of those? [Pause] Hello?

R: No, I’m thinking. [Laughter]

INT: That’s fine, just wanna make sure I didn’t lose you.

R: Nothing came to mind.

INT: Okay, all right. I mean, maybe in this category, I think might encompass something like changing ambient temperature in the facility itself. Is that something you guys have ever done or adjusted?

R: Yeah, we’ll go -- we’ll modify air handling programs and the office space as to when we’ll set back turning up certain fans when the occupancy gets to a certain level. So we have implemented a lot of those over the years, but in the -- for us, reliability outweighs improving energy efficiency. There are certain things that are no-brainers that you could do to improve energy efficiency, but then that would decrease reliability. At the end of the day, 100% up time is what they’re looking for and if there’s a glitch in that, then it’ll come back to, “Well nobody asked you to save this money.” Everybody wants you to save money, but the risk involved in doing certain things where you might be able to shave some kilowatts -- it’s not worth the risk of any impact that that would have on reliability.

INT: Yeah. I’m not an expert on data centers at all, but I have heard this before, that reliability is kind of, of the most importance. So that sounds like that is definitely the main issue if there is any tradeoff between -- with reliability for a particular energy efficiency enhancing improvement, then that’s probably not gonna be pursued. Is that sort of fair to say?

R: Correct.

INT: What about other factors? Are there tradeoffs or synergies with other factors that would influence whether you made a decision to reduce energy use? And here I’m thinking kind of more broadly. Are there, for example, borrowing constraints or other types of financing incentives out there that would encourage you to adopt something?

R: The municipality where one of the -- actually, where both data centers are located, the municipalities in those area’s only utility. So at a larger geographic region, we would fall under -- Con Ed is what is in the area. As the major utility company for the geographic location, they would provide and own most of the -- that would be who most of the population would go to for billing or for electrical. So they’ve got a massive incentive program, which we can’t avail of because we can’t broker out power because it’s just a municipality.

INT: Oh, so you can’t negotiate better rates with them for electricity because of potential energy savings from adopting a new technology or something like that?

R: Correct. They do have some programs available with limited funding and it’s nowhere near the money that’s available from Con Ed. And then when you start to put that into -- seeing what your return on investment is. Sometimes the decision would come down to if somebody just had a pool of money from a corporate social responsibility, so kind of green washing, that then they would go ahead and just do something so that it’s there on paper. So “We did it because it’s the right thing to do” as opposed to “We ran the numbers and saw that it’s got a payback of 20 years.”

INT: So there are cases where you would do something like that for the -- because it adds to the greenness of the company, so to speak.

R: Correct.

INT: Can you give me an example of something like that?

R: Parking lot lighting retrofit that go with the LED -- there are cost savings there, but they’re not -- I guess as they say, the devil can cite scripture for his own use. So you can make the numbers look good and then have somebody guy into it. When you get into the nitty gritty of it, there’s no payback.

INT: That’s helpful, the example. That’s great. Okay, we’ve talked about reliability obviously in terms of off time, I assume. But is there also -- within reliability issues, do you also include maintenance or repair concerns or do you ever not adopt something or -- because you worry that it’s not gonna be as -- it’s gonna break down more often or need to be repaired more often or there isn’t a warranty on it?

R: No, we -- like I said, it goes back to the -- between different clients coming in, just to see what we have and how we’re doing it and the SAS 70 testing. We will stay within manufacturer’s recommended guidelines for the maintenance on all equipment. We do have a synergy between data centers where any maintenance that could possibly impact up time will be placed in technology windows or within maintenance windows. And then there’s a checks and balances between both facilities that they get -- we’ll call each other to make sure that they are not impaired prior to us impairing one of our systems.

INT: Okay. Now we already talked about the utility and municipality incentives. Are there any broader energy policies that influence your decision making, whether that be state or federal, energy efficiency policies that ever help tip the scales towards adoption of a particular energy improving -- energy efficiency improving technology?

R: After the reliability part’s looked after, then it’s kind of more of just the familiarity that -- going from one manufacturer to another manufacturer and looking at their literature to see if there’s any difference, but then trying to integrate somebody -- moving in another direction, then you have the problem of trying to integrate that into your system, as in -- like the billing automation system. So the intelligence of the monitoring of that equipment, how you would incorporate that into what you already have existing, rather than having to go in a whole new direction. So it would be -- look at what the most efficient equipment that -- of the manufacturer vendor that you have their equipment. That would kind of be more the deciding factor than going out looking for somebody has it for less money. If somebody had something that did the equivalent for cheaper, that necessarily wouldn’t influence the purchasing decision. What would influence that would be going out to different people and going, “Well, how much would you charge me to install this?” That’s where that decision would come in.

INT: Okay. Let me just see where I am in my list of questions here. Okay, so you’ve already mentioned some -- the sources you use to gather information about new technology. Did you say that some of these sources provide more or less reliable estimates for the likely energy use of the particular feature or equipment? Are there estimates you don’t believe or don’t bother looking at? How do you…

R: Yeah, I’ll look at the methodology of how they came to those numbers and sometimes I’ll correct them for my facility or somebody will make an assumption that “You’re paying $0.15 a kilowatt hour” and then I know what my actual number is and then I can actually see that we have a demand factor just on the kilowatt. So just starting that equipment because chances are it’ll run 24/7/365. It’s a lot easier for me to run those numbers after I get -- if somebody was comparing and contrasting the operation of the equipment, I can put in real numbers and generate my own numbers to see how comparable it would be.

INT: And that’s relatively easy to do usually? Because you can kind of adjust whatever estimates you find for your specific case.

R: Application, yeah.

INT: That’s great, okay. So we talked about payback a little bit. Do you have a standardized, quantified way of weighing the upfront cost against all these other factors to incorporate them into an ROI or a payback calculation?

R: I’m still here. I’m crunching it in my head. [Laughter]

INT: Okay, that’s fine.

R: Well, here’s to sum it. We had looked at, we’ll say, containment -- cold out containment.

INT: What is that?

R: Cold out containment is where just on the IT equipment, when they put it in the racks. The racks are facing each other and then the [tiles] that are in the middle of that, that’s -- the cold air goes in the front of the server rack and then it comes out the back end to -- considered the hot aisle. And then from there it goes back to the CRAH unit. And then what people will do is they’ll either contain the air in the hot aisle or they’ll contain the air in the cold aisle, so then it doesn’t just start wafting around into space. So originally when I looked at those, they were in the $10,000 range. Now they’re in the $3,000 range. And then I’ll have various companies come through, take a look at it, run numbers for me that they’ll actually show me how they arrive with the savings that could be involved with putting the system together. And a lot of times I’ll have to look at the numbers that they produce, but take my whole facility into consideration and how it operates because sometimes people will look at something -- try to solve the problem right where the problem is and not look at the impact to the facility as a whole. So they’ll say, “If you put the walls up here, this is gonna save you so much money because it’s gonna reduce this, it’s gonna fix this” and all these different things it’s going to do. But if you remove yourself further upstream of that, that the larger system is already dealing with and taking out some of those inefficiencies, which they don’t particularly look at. Or they’ll tell you that you can run it warmer. Well, I have constraints that I can’t run it warmer because that’s -- we have specific parameters that are dictated to us by the IT team, that we have to provide a certain amount of air and keep the ambient in the data center. They’re not options that we can just change. So when somebody comes in and produces those numbers, there’s certain things they can take out of their calculations that we just wouldn’t be allowed to do.

INT: Okay, that’s great. That’s very helpful. I’m understanding it. Do you have a standardized set of business metrics into which you map or benchmark IT costs and benefits? Does that exist in your company?

R: No.

INT: Okay. All right, I’m looking at the questionnaire that you filled out on specific technologies and energy savings strategies and thanks for taking the time to look through that. I see a lot of things you seem to have adopted already or would use again. So yeah, I guess we were just sort of talking about the isolating hot and cold aisles, right? Is that the containment you were just talking about?

R: Yeah.

INT: And you said you might consider this in the future, but what would be…

R: Price -- it would be price points.

INT: So you’re waiting for the cost to come down?

R: Yeah or if somebody would pilot the program. So if I got a free one to kind of give me the warm and fuzzy about it and then actually see the real numbers, then I could adopt it and deploy it on a larger scale.

INT: But for now, that still feels uncertain to you?

R: Yeah, just because of the way the facility’s structured on the main cooling system. It’s designed to take out a lot of the inefficiencies of warm air bypass and we also -- the particular style of tile that we use is almost a containment unto itself. It’s got a TAC rating of about 90 -- I think it’s 90% plus and the TAC is the total air containment and just the way the tile is designed, you don’t get much leakage out the sides. Are you familiar with a perforated floor tile?

INT: Uh-huh.

R: It’s kind of like if you have one of those ones -- the sprinkler system you stick out in your garden and you know you’ve got the one where you put it in the middle and it just all comes out in the fountain?

INT: Right.

R: And there’s just a big circle around it, whereas you get the one with the wand, where it’ll go back and forth. Well if you lock that in one position and it just throws the water in one direction, like if you were doing your shrubs. Well, that tile -- that’s what that tile does. It captures the air and locks it in right up the front of the cabinet and doesn’t let a lot out the side as opposed to -- the first version of it was the one where it just falls all over the place. So you get the push from under the floor, but it doesn’t really disperse the air where the air needs to go.

INT: That makes sense. Thank you for that analogy. That helps me understand it better. There are two things here you mentioned that you would never consider. I think strip curtains or enclosed server racks and you wouldn’t consider raising your temperature set points any more than I suppose you already have. On the enclosing server racks, can you tell me more about that or why that’s not a good idea?

R: The strip curtains, it’s a visual thing. That’s more isolating the hot aisle, cold aisle. So the strip curtain, you see them at grocery stores.

INT: Yeah, they’re pretty gross.

R: Yeah, so just from that aspect -- because we have clients come through the facility and stuff, we like to engineer certain things, but it has to look like it’s a custom product. It’s got to have a good finish, not just putting something up that it should work, it could make a difference, but it doesn’t look good. So I guess the aesthetics would be -- is a part of that.

INT: That’s really interesting. I’d never thought about aesthetics mattering in a data center, but I guess -- our previous case study was grocery stores, so there we kept asking the people we were talking to about aesthetics, customer appeal and things like that. But it sounds like that’s an issue too here in your case. That’s interesting. Okay, and then temperature set points -- you listed your facility temperature at 72. Is that normal for the industry? Is that on a high end or low end?

R: I think that’s right there across the board. What typically tends to happen is that -- and it can’t happen at the C level, that somebody reads an article and then wants to know why the data center isn’t operating -- what are we doing to drive up our temperatures. It’s more energy efficient and there’s so much more that goes into it. When they originally did the -- I think it a technical committee; [94 ASHRAE 52:32] -- they do a lot for data center temperatures. And they were talking about drive up the temperature and, “Do this and these are the parameters that we expect you to operate in.” And what they found was the first time that they did it that the actual fan -- the fans are running so hard with the warmer temperatures, trying to get the air out of the server units, that it did away with all the efficiency. You just moved your problem -- you moved your energy consumption from one area to another. So then after they convened, they go, “Oh, whoops.” You have a lot of people sitting around with a lot of time on their hands I think. These ideas that aren’t really in the field as much are not familiar with an environment because they really say that data centers are all different. They’ve all got their own personality, per say. What we particularly do here, we have such a variety of equipment. So it’s not like you go to we’ll say a Microsoft or a Google where they build their own servers or they buy hundreds of thousands of servers that they can dictate to whoever they buy them from that, “Hey, your components are going to run at 90 degrees of our failure rate.” We started to experience a higher failure rate and we’d turn around and we go, “Hey, Hewlett-Packard or Cisco, your blades are failing all the time.” And then they’ll come in and they’ll go, “Well look, you’re running them too warm, so too bad. You destroyed them yourself.” Also then they call it -- the thermal mass that you have available in the event that you do have an interruption in cooling, you drive those temperatures up to the -- you’re running at the edge. You lose your cooling, you don’t have anything. You’re done. There’s no residual cooling left in the space. So it’s just not -- that’s kind of why the raising the temperature set points -- think if you’re managing your data center as an individual thing. We’ll bring it up a little bit, but not because as dictated by the latest guru’s paper.

INT: Right. You mentioned the manufacturer telling you that if you run something too hot, it’s your fault for breaking the equipment and not working properly. Are temperature set points that were written into warranties on particular equipment?

R: It probably is different for different SLAs, but that they would have that information readily available to them. I know one particular device -- when we actually had the manufacturer’s guru on site that was explaining the benefits of their technology and we said, “Well, that’s really pushing it to the edge. What happens if we had a thermal event?” And his response was, “Oh, you don’t need to worry about that. There’s misters built into the server that once they reach a certain temperature, it’ll just shut the server down,” which is not what we want.

INT: Right. [Laughter]

R: But I was like, “Well, that’s all well and granted you’re protecting your equipment in the event that we have a blip, but our intent is to provide -- our intent is to be up 100%.”

INT: Just one other question on the questionnaire -- I noticed you didn’t answer the question about if you track server utilization. Is that because you don’t track it or is it -- what is the situation there?

R: Well, a lot of the equipment has -- it’s like ILO on some -- it’s probably specific to the manufacturer, but there’s a lot of power efficiency options that are available in the equipment. And again, we have the IT side on the infrastructure, but then we also have all the platforms that deploy their own equipment and then that’s kind of left up to them. And again, they don’t pay the utility bill, so they don’t tend to use that. So we’ll [say] -- under my current load at this facility, there’s -- oh, it’s -- give me a sec. We have about a 1 to 2% fluctuation in load, whereas part of the work load and the efficiencies that they’ve driven into server technology -- I wouldn’t necessarily push them to use that a lot more because then my load would start to fluctuate. And I wouldn’t really have as good an idea as to how close I am to needing to do an upgrade. So it’s better -- so from my aspect, it’s better that everything is kind of running about where it would run, whether it’s really busy or not really busy with a compute load.

INT: So are there actually these efficiency improvements or utilization devices part of the server? You can turn these features off if you want to?

R: Correct.

INT: Okay. And so you generally turn them off?

R: No, that would be a platform decision, but from what I see on my load I’m figuring that it’s not operating. But the virtualization has driven that base load up. So from that aspect, the servers are running harder, but as far as the use of those tools where it’ll de-clock or load limit, I don’t believe that those features are on, just based on the stability of the load at the facility.

INT: That’s interesting. Let’s see, now I think I really just have one more main question and that’s more about your payback period. You had mentioned -- I forget what the example was. I think it was your CRAH unit, that you kind of keep for 20 years, but you got the payback within two years. In other industries, we’ve heard from a lot of companies that they kind of have a required payback period if they need to justify certain technologies or features and often, we found that the payback periods they were telling us are a lot less than the time that they would hold on to that piece of that equipment. And I was wondering is that true for your company or in the data center industry as well?

R: I think part of what happens is that you -- once you get up to the C level, wherever they’re -- whatever they have, whether -- they’re not really data center related, they’re just office space -- they’re more like office buildings with data centers that they’ve taken in under their umbrella. I think for the most part, I think we’re in the 18 to 36 month is what they would have as a standard. And again, the methodology of getting to that, sometimes it’s difficult because it’s all based on -- right now, under the current loading that this is where we would expect that piece of equipment to run, that this is the payback. But if the load goes up or the load goes down, those numbers are -- they’re out the door. But when you look at something like a lighting upgrade, well that’s kind of set because the lights are gonna consume X amount of power and then you can start putting in reduction and labor, which would allow more time to do something else. That sometimes -- ‘cause sometimes somebody will go, “Well we’re not gonna reduce the steps, so why would you take that out?” And it’s like, “Well maybe there’s some stuff that’s getting done by an outside vendor that can be taken under -- in by the engineering department.” So like I said with the methodology, you said if there’s a standard one, I guess that’s where it really all depends on what the piece of equipment or what the upgrade really entails and who’s responsible for it.

INT: So am I understanding you correctly? It sounded like something that was not dependent on load, so the lighting, for example, would perhaps not need as short a payback period to be worthwhile to do?

R: It wouldn’t need as in depth and analysis. It would be a pretty much a run of the mill throw the numbers into an application and have it spit a number out as to, “This is what -- this is how much we’re gonna spend on the fixtures and this is -- and over a five year period, this is how much money A, you’re gonna save and when is your breakeven point?” And once that breakeven point is some place in the 18 to 36 month range, then you can -- they could green light it.

INT: Okay. So that’s an 18 to 36 month range is pretty strict though? Is that just for facility level upgrades or is that also an IT payback rule of thumb?

R: Well the IT, I believe, they’re gonna cycle through that equipment. There wouldn’t be an immediate need to go out and do anything like that. From the IT aspect, they seem to be more labor reduction than they would be -- that seems to be their focus at the moment. They don’t pay the bill so they’re not worried about the electrical end of it.

INT: What is the reasoning behind the 18 to 36 month rule of thumb on other things like -- clearly the lighting would last longer than -- LED light should last much longer than that, for example. You feel like there’s a reason why we’re stuck on this one and a half to three years?

R: It’s what the guy before them told them. [Laughter] That’s where a lot of it comes into play.

INT: Okay. So you don’t think it’s -- it has never been explained to you as a hedge against something or the uncertainty, hidden costs or something else that can’t be factored in up front?

R: I’m sorry, you’ll have to go back through that again.

INT: So it sounds like it’s just a company or almost industry rule of thumb without much explanation, at least as far as you can tell, to why it has to be that specific range.

R: Yeah, I think things are getting a little better, but again I’m not too sure whose book everybody reads that -- like total cost of ownership, a lot of people are still first cost. This is the cheapest and best one. That’s what we’re buying. And then you go, “Well hang on a sec, I ran the numbers and that unit’s gonna cost $500,000 over the next five years. This one’s gonna cost $350,000.” Oh, in five years, you’re gonna pay $150,000. Then it’s like, “Yeah, well we don’t have it in the budget to buy the more expensive one.” And it’s like, “My God, what’s your incentive?” And it’s like well, they’re gonna get a percentage -- performance percentage to come in under a certain amount on a project. So then they don’t look at it because it’s all about them and I think that’s where the problem comes in a lot is that -- it’s like, “Here’s $10 million for project and you’ll get a performance bonus if you don’t spend the $10 million.” So the total cost of ownership, nobody cares.

INT: Yeah, that’s really interesting. Do you also think that for the guy who says, “Well, we don’t have it in the budget to spend the $5,000, but we do for the $3,500” -- is it also ever a matter of having a fixed budget and they have to -- there may be another investment in some other part of the company that would yield a greater return?

R: No.

INT: Sort of an opportunity cost of that?

R: No, I think they’re not open to changing the way that they learn how to do it or they don’t wanna be -- they wanna be [taken a task] to have to look at it more in depth. “I didn’t think of it so I’m not going with your idea.”

INT: But you did say that you feel like it’s slowly changing over time perhaps?

R: Yeah, I think that -- I would have to say having done this for 18 years that I can see that people are more open to looking at total cost of ownership as opposed to initial cost.

INT: Okay, well this has been very helpful. I think I’ve kind of gone through all of my questions, but I wanna give you an opportunity if there’s anything that we haven’t touched on that you would really like to talk about or any factor that would really influence these technology or strategy decisions that you think is important that I should have brought up and I’d like to hear from you on that.

R: No, I think that pretty much covered it.

INT: Okay, great. Well, if anything does come to mind and you wanna share any other information, please feel free to contact us. We really appreciate again you taking the time to talk to us this morning. And as she may have told you, this is -- we’re interviewing several people and we’re going to be conducting some focus groups hopefully over the next few months. All the information we glean from it will be folded into some type of research report that would be anonymous of course on what companies we talked to. But if you find it interesting, we can definitely share a copy of that with you once it is ready -- probably not until this spring or so. So we can stay in touch. Okay?

R: Sounds good.

INT: All right, thank you very much and have a great rest of your day.

R: You too. Have a nice weekend.

INT: Okay, bye-bye.

R: Bye.

[END OF INTERVIEW]