Boston Data Center Focus Group One – Parts One & Two June 2, 2015 @10.02 AM

[TRANSCRIPTIONIST’S NOTE: In Part One, there were instances where the Participants were challenging to hear.]

MOD: I’d like to go around and have each of you say your first name and tell us what type of data centers your company operates and what industry you serve. And by type, I mean is it a traditional enterprise model, you know, however you describe them. Now I’ve told you more than I know. What’s your role in the company regarding the data center management and how many data centers do you make purchase and management decisions? Is that all clear? Let’s start with Gary, I never remember you. Can you pass that around?

[Laughter]

MOD: This is how I appear to know what’s going on.

MALE1: I’m Gary, I manage a Tier 1 enterprise data center, small, below two thousand square feet. For my company I manage everything on the infrastructure side, primarily power coolant, fire suppression, facilities. I do have a role in operations, that’s my primary data center. The company has a number – manufacturer in a smaller server rooms at our manufacturing sites and we have a server in our corporate headquarters in Boston. I’ve got responsibility around two of those for structural things.

MOD: So you have your main one and at least two others.

MALE1: There’s two others and we have others too, but these three are my primary – the ones that keep me up at night.

[Laughter]

MOD: Yeah, this is the kind of business that keeps you up at night. Okay, Mike?

MALE2: Good morning, my name’s Mike and I manage – I call it an enterprise wide data center for a small company that services the life insurance industry. We have about two thousand feet of raised floor space. It is a co-location facility so from the aspects of cooling our energy, we just pay the bill. It’s rated at about tier 3, so there are many redundant systems. I wear multiple hats in my role, where I do provide some raised floor support, mainly from a computer operations perspective. So if you think of a 7/24 staff that will allow our vendors in to repair disc failures, server failures, it’s kind of a long break/fix scenario. There is an infrastructure team that I work closely with, so I wouldn’t say the data center is totally mine, but I do have to deal with all the problem side of it.

MOD: Okay, huh – that seems unfair.

MALE2: And glad to do it.

[Laughter]

MOD: Next? I say your name, then you just have to say it again, so you have to say it yourself.

MALE3: Okay, I’m Henry. My primary responsibility around enterprise data center located in Massachusetts, we have secondary data centers at different locations and we have something like 70 different sites, that all have some sort of IT equipment at them. I am not an operations manager, I’m an analyst with experience in HVAC so a combination HVAC engineer and IT and data center analyst. We are in the process right now, hopefully today, working on it. Modernizing our data center in Massachusetts.

MOD: Can you speak up just a little bit.

MALE3: Sure.

MOD: Okay.

MALE4: Okay, I’m notice there’s another Mike here, so there’s only Mike 2. So I’m responsible for data center operations at a major financial services firm. We have over 250 thousand square feet of white space under management. Data center operations is responsible to make sure that all of the parties associated with the operations, the planning of the data centers, are functioning, and that they’re functioning at maximum efficiency and adding maximum business value. I’m responsible for other pieces of that, systems operations, what we call hand and eye support. People come to visit the data centers to press buttons and portable storage media is another piece, the off-siting of tapes is part of that. I have some other responsibilities with regard to output operations, CD production. We still produce paper, paper output.

MOD: Oh, really?

MALE4: Yeah, still there.

[Laughter]

MALE5: My name’s Rich, I am director of infrastructure or previously was a director of infrastructure for a high tech manufacturing company, also on the board of directors for a colo data center that has about 50 thousand square feet in downtown Boston-ish. The manufacturing company I worked with had ten thousand or so data center square footage in different data centers, most of them were three or four thousand or less globally. And I was responsible for infrastructure as well as overseeing.

MOD: That’s quite a few hats. That’s for sure, have to be flexible. Well, to get us going, I’d like to ask you what are the top three factors you consider when setting up a new data center or when you’re doing a major remodel or a modernization, I think Henry was doing, right, on a data center? What are the top three factors that you think about, that you have in your mind when you’re doing a major remodel or a new center? Who would like to start? Mike?

MALE2: Tiering level is important to us, so when we say tier 3 data center, with the redundancy factor, also the capacity to grow even though we’re in a stagnant model right now in terms of business growth. I have to consider what could be the potential growth pattern. And location. I like to have my data center close to my corporate headquarters. If I didn’t mention earlier, the corporate headquarters and data center are about 30 miles apart. And I still need to get to those locations. So these are three things that I consider very important.

MOD: All right. Shall we just follow around the table. Henry, you want to tell me about your top three.

MALE3: Sure, so it’s important in this modernization that the modernization is modular because it couldn’t be cost competitive with colo if we don’t build a new 20 thousand square foot data center, so we have it planned out to be modular and 250 kw increments to we can grow that up to megawatts. I put that in the general category of scalability. Flexibility is very important and the most important thing in flexibility is being able to handle multi-density, anywhere from 10 to 30 kw per rack on an as needed basis. So if this rack now started out at 10, I can now add another 10 to the same rack and now I’m at 20 and add another 10, I’d be at 30. So that’s important because a lot of the new equipment that’s coming in is higher and higher density and we were just kind of spreading it all out across the data center and now we’re going to stack it all up high, which will save a tremendous amount of floor space and compact the data center into a lot smaller space which will allow us to triple the size of the data center in the same footprint. The initial cost was important, so it had to be competitive or the cheapest as it turns out to be. And also we’re very interested, given the kind of company we are, being in the research area, that it will be an innovative system and that meant high efficiency, high efficiency cooling, high efficiency power, so I’m doing 415 volts to the rack and using a rear door, active rear door refrigerant heat exchanges.

MOD: Okay, and Mike 2?

MALE4: Mike 2, okay. So I think the most important component that I would talk about is the business drivers and the associated applications that will be placed in the data center. Then there is a component about resiliency which feeds into the uptime institute tier structure selection. Looking at availability, reliability, scalability and security, those are some key points to focus on. Then lastly would be the life cycle expectancy of the new facility.

MOD: That affects the kind of equipment you would put in?

MALE4: Absolutely.

MOD: And I just want to make sure about the tier, tier has to do with what?

MALE4: The Uptime Institute tier structure, so the Uptime Institute came up with a tier structure associated with availability of an infrastructure or a data center. So for instance, if you have a tier one structure, you have a lower availability than a tier four structure, which would have the highest level of availability.

MOD: And availability means?

MALE4: Lack of failure –

MOD: Lack of failure, so that’s why you chose quite a high tier because of the business that you’re in, perhaps? I don’t know --

MALE4: So the typical tier one has no backup, tier two has two, their three has three and tier four has four. Four ways, that’s a simple way to look at it.

MALE: A matter of redundancy.

MOD: A matter of redundancy and ensuring that they’re sometimes – they’re there.

MALE: Like service from a vendor to generators that you have, power distribution is the key, IT infrastructure that’s in any normal data center, not normal, but – any professional strength.

[Laughter]

MOD: Okay, how about you Rich?

MALE5: Cost obviously. Both the initial cost and then the ongoing operating cost. I think they’re obviously a big play, you know, to Mike 1’s point, location is important. In some cases we want it close. If it’s a DR site we want it far away, though not so far away that you can’t ever see anything. And then obviously reliability and redundancy is important too.

MOD: Okay, and not least – Gary?

MALE1: My initial thought was why would any company want to build a data center?

[Laughter]

MALE1: I’m thinking that those days should be over, the only people that should be building data centers are companies that serve people who need that, colos and what have you, or maybe the financial industry.

MOD: You mean, there’s enough of them out there so you’re saying –

MALE1: I mean, they’re too expensive.

MOD: Too expensive?

MALE1: They’re just way too expensive. But if the company wants to build a data center, the first thing they have to tell me is what they want, what they expect out of a data center. Because that is going to drive everything, especially with regards to power which is my number one priority. After that, location, location not as a convenience to the business but from a security, availability, survivability standpoint, data center, you want to be away from flooding, hurricanes, tornados and things like that. Then after that, network to the communications. You need to have access or the assumption that you’re globally connected and you need high speed band widths, fiber, cable, whatever it is. So you have to have that availability somewhere.

MOD: Right, right. You guys need a lot of the same things and a lot of different factors. A few of you mentioned energy or power consumption and not all of you did. So I just wanted to check in with you that – how important is energy management, energy efficiency as part of this decision making? Would you say it’s very important, somewhat important, not very important?

MALE: It’s a big part of the cost.

MOD: Big part of the cost, so that makes it important, if cost is important. How about you, Mike 1?

MALE2: We’re in such a small data center, it is a substantial cost on a monthly basis, though it never really comes into play, we consider it a cost of doing business and when we’re not in a growth spike, we don’t see that variable monthly expense hitting us every time. So I keep it on this level and if it’s around that level, there’s no question.

MOD: So you think about it but not like a huge driver.

MALE2: No, it’s purely based on size.

MOD: Okay, how about you, Henry?

MALE3: It’s very important, like they said, our mission is to be research oriented so our focus is innovating and making the most efficient systems possible, state of the art kind of technology. And it’s also important from the standpoint of being cost competitive with colo.

MOD: Okay, Mike 2?

MALE4: Oh, it’s very important actually, if I look at one of my enterprise data centers, it’s a large tier four facility without the kind of sustainability approach there, not only with technology, but with data infrastructure. We do track the cost of wattage – that would be seven or eight times our energy bill on a monthly basis. So it’s very important. The other factors that are coming into it, long term, are the availability of energy. So wherever you pick your data center, I guarantee you over the next five years plus, you will not be able to get the energy that you need. So you really have to treat it as a precious commodity. And that also holds true for water if you’re using cooling systems that involve water.

MOD: We’ve been hearing about water lately, haven’t we?

MALE4: [Uh-huh, indicating yes.]

MOD: And how about you, Gary?

MALE1: Power is probably your primary cost. You’ve got to pay attention to that, I mean, the higher your availability or tier level the more you’re going to pay for power because you have essentially stranded cost for having stuff running but not used. That’s just the way it works. And if you’re in an area of the country that has some of the highest electricity rates, it’s not something you can ignore. So it’s not just – efficiency plays a role but cost, just the overall cost, is what should get your attention first.

MOD: Great, so energy and efficiency will emerge as a topic here.

[Laughter]

MOD: That can be ascribed to some of you. Continuing this idea of either a new facility or upgrading – if you make an upgrade to an existing one – where do you go to find out information about new equipment, new technology, new management strategies? Where would you go? Henry’s smiling, so I’m going to let him start.

MALE3: Well, once they scan your card, you know, they’re gonna come to you.

[Laughter]

MALE3: No, I’m involved in Datcom data center dynamics and I’ve been to a lot of training sessions. I’ve been to a lot of conferences. I get a lot of information from going to the meetings as well. I think there’s also a lot of webinars and stuff that you can attend online. But really once they start getting your name, it’s just a matter of filtering your junk mail so you don’t get the stuff you don’t need.

MOD: Who do you trust the most? Is there a category, a resource that you trust more than others? Or take in everything and try to sort it out?

MALE3: I’m pretty thorough about doing head to head comparisons and things like that, so I’ve found that an expensive comparison of cost coupled to liquid cooled systems, compared ten different vendors when I did that study. So, no I don’t take their word for it.

[Laughter]

MALE3: There’s a lot of stuff that’s popular, you know, it’s being talked about and it’s not always like the best solution.

MOD: I see nods around the table. Okay, someone else jump in, tell me where you go to get good information.

MALE: I’m in Ascom, I’m in 7/24 Exchange, I’m pretty active on LinkedIn and I get a number of trade magazines from CIO to Mission Critical, I do a tremendous amount of reading and what it all boils down to is it’s more important to understand the technology and where we’re going than it is to – before we even start looking at a product, because that gives you the idea of what to ask for, what not to ask for, what to watch out for. And it’s something that you just – it comes to you over time. You spend enough time doing all this time, sooner or later – you stay active in all these little forums and everything, you pick up just a wealth of information. After a while you know, you have a really good idea who to trust, who not to trust and where to go.

MOD: And then, the Mikes?

MALE: I may be facing this decision in a few years as our current contract at our colocation is up for renewal and I’ll likely be part of a team that works internally as well as probably with some consultant services to help us find our way. By that I mean, I don’t see us every building a data center again, like Gary said, probably look for a provider in that space and do some due diligence, as provided by the contractor we had, to make sure that these are – we believe, our needs for a three to five year – ten year time frame and which one of these vendors have the best price and costs that would meet that need.

MOD: Good.

MALE: We kind of follow the trust but verify process, so first if there’s an industry organization, the Uptime Institute is a good example, or the Green Grid that sets certain benchmarks and methodologies and that helps us. And 7/24 International, Ascom, the Uptime Institute, and there’s a number of other organizations which I think many of us in the room know each other. Peer to peer is very important for validation but we constantly are acquiring new data center space and we do bring in external experts. But we also don’t lose sight of the people who run the environment to bring their input into the picture. And then a lot of validation is done through these industry organizations.

MALE: I also spend a lot of time focusing on what’s going on in Europe. Europe is ahead of us.

[Laughter]

MALE: So I mean, no, I consider them leaders in a lot of areas on the infrastructure side. Even in data center management, you know, the regulations and things that they are coming up with are much more thorough, unencumbered by all of the different government organizations that have a say here in the U.S. So they’re streamlined, they are easy to understand and they’re readily adopted, it doesn’t take long to get them through. I try to model what’s going on there and do the same here. As long as I’m still within U.S. regulations, whatever regulations de jour.

[Laughter]

MALE: That’s interesting because a number of the processes that we follow, IDOL is a good example, started in the U.K. as a British standard and evolved into an ISO standard that we follow today, basically how we manage our day to day operations.

MALE3: Yeah, the U.K., that’s why I go to the data center dynamics meetings, is because it has the U.K. perspective, the European perspective.

MOD: Rich, you want to try next?

MALE5: Yeah, I think everyone already took everything.

[Laughter]

MALE5: Tiers, I think is a great thing, I was calling Gary up and saying – hey, how good does this generator really work versus the vendor saying – oh, no, this thing gets a thumbs up, this is great. I mean, so definitely organizations like this and being able to talk to people that run the data centers is way more valuable than the junk mail I’m going to get for the next six months.

MOD: And do you consider manufacturer, the vendor, I was just wondering to what degree you rely on manufacturer’s recommendations for equipment.

MALE5: Well, it starts with the manufacturer, and the manufacturer usually has someone who represents them.

MOD: Someone who is representing their product.

MALE5: Right, so they look up the standards for whatever product they’re offering, or it could be a service, too. And the validation, just to reiterate that, I mean, it’s just so important. We would not go into something without validating that across the peers of our industry.

MALE: And the trick is not the people that the vendor gives you to call, it’s the people that they didn’t give you to call.

MOD: Right, call Joe.

[Laughter]

MALE: Not just a tier one data center, I am not an engineer so I go through a lot and once I’ve picked a major vendor to provide me something, I’m pretty much stuck going to them for advice. I have to. Who else am I going to go to. I have their product in place, it’s running, maybe I want to upgrade it. I have to rely on them so I really go to great lengths to vet everybody that comes into my data center, not just the products, but the services. Because I have to rely on them for help. And if I lose that trust, chances are that vendor – some opportunity when it arises and there’ll be a change.

MALE3: Just one additional comment, I very rarely stop at the sales rep. I usually wind up, you know, talking to the corporate engineers – the guy that’s buying the product or engineered it, because my questions can’t be answered by the sales rep. And they usually decide that it’s easier for me just to talk directly with the engineering guy instead of the intermediary.

MALE: Every company has two levels of the sales force, the guy that sells you what you want, and the guy that sells you what you need.

[Laughter]

MALE: What you need to do, if you can, is get to the guy that sells you what you need as soon as you can. Because the sales guys, they promise you everything. But if that’s all you pay attention to, you wind up paying more because you bought this thing and here it comes and all of a sudden, we need this or we’re stuck with this.

MALE5: It takes another six months to --

[Laughter]

MALE: And once you’ve made the decision and you can talk to the guy that sells you what you need as soon as possible.

MOD: Well, normally, I’m going to switch topics a little bit now. Oh, well just let me, one more thing on this. Do these people you rely on, are they able to provide you with reliable estimates of energy, how much equipment uses?

MALE: No.

MOD: No?

MALE: I don’t really know.

MOD: You don’t know, okay.

MALE: We’re still waiting for Energy Star in the U.S. anyway to be kind of put across all of the components. It’s not there. It’s on certain components but not on all components.

MOD: [Inaudible due to simultaneous dialogue 33:23].

MALE5: EPA is --

MALE: When we built the last center, I was specific in looking for the data engineer to say – okay, if you do hot aisle containment, you’ll save 26 percent. And they come in and say – we can design anything you want. Well, s\*\*t, if I knew what I wanted, I wouldn’t be hiring you. So definitely not the level of expertise I was expecting.

MOD: So that sounds like something you find desirable.

MALE: Impossible. Every piece of equipment or structure that you buy, our perspective, is going to perform differently depending on how it’s loaded and configured. No two are alike. So bench plate ratings are the biggest mistake to follow, you’ll just go oversized, go way over capacity.

MOD: I see nods to that.

MALE5: Yes, absolutely.

MALE3: Even at the engineering level, even at the best consulting engineer who only does data centers, there’s a real gap in terms of being able to model data centers’ energy consumption. I’m on TC9.9, currently working on a work statement that would couple CFD models with energy models. That has not been done yet. So there is no end modeling of a data center that anyone can do right now, as far as I know. So there’s an innate problem out of the gate in terms of even engineers telling you what the energy consumption of a data center is going to be. And that’s really problematic because ASHRAE 90.4 goes out for public release, that’s energy standards for data centers. There’s no method – it’s a performance payoff and there’s no method for calculating performance.

MOD: Okay, that’s a sobering statement.

[Laughter]

MOD: Now, I am going to switch to the next topic. Unfortunately, I do not have the questionnaire that you filled out prior to coming here, so I’m going to have to – I would normally say – well, I’m looking at your questionnaires and this is who you are. But this first question, I need to start out here – who owns their own equipment basically most of the time, and who are leasing or helping to maintain the lease system? Mike, you sounded like you lease space, is that true?

MALE: We lease space, right.

MOD: So you’re a space leaser ordinarily. How about you, Henry, are you an owner?

MALE3: No, our facility department, we have our facility department on the campus, all our equipment.

MOD: And Mike –

MALE: Yeah, we’re a combination so from the facility side, we do own and we do lease space. From the infrastructure side, the equipment side, it’s a combination as well, so depending upon the technology and its impact on the business, there’s a lease versus owning strategy.

MALE: Bigger data centers – smaller one sometimes depending on where the office is.

MALE: I’m an owner.

MOD: You’re an owner so some pure owners and one pure leaser and a combo team over here.

[Laughter]

MOD: Do you pay, when you’re renting or leasing space, do you pay based on the space alone or are you also charged for other factors such as power usage?

MALE: We have two aspects to the bill, mainly you pay for your space, your rental floor space, and your power. The higher the tier rating, in my situation, they double the power.

MOD: And when the system is going to be upgraded, it sounded like you actually might get involved in that process or sounds like you’re going to get involved with that process. Is that correct?

MALE: I’m involved in that, well, to my knowledge, major systems haven’t been upgraded in the short time that we’ve been there, five or six years. Now from a change management aspect, any maintenance being done to any of the equipment, I’m given the courtesy of an approval, awareness just so that I know these factors are taking place within the environment, and also explain the methods of procedure to ensure that redundancy is in place so the risk gets mitigated.

MOD: So you’re involved and might be involved in various ways. And the other lease part of what you do, do you pay for power or other factors besides the square footage of your space when you’re leasing it?

MALE: We do so it’s broken out in a similar fashion so you have a basic number – a dollar number, that’s associated with a space. But then you have a power bill based on, in our case, we base it on a PUE at the facility. So that if they’re more efficient, we get the benefit of them being more efficient as well.

MOD: Okay, and –

MALE: Yeah, a combination of space and power.

MOD: And you get involved if there’s upgrades or decisions on the lease equipment and space?

MALE: Yeah, it depends. Sometimes in a small facility, they’ll just give us a maintenance window and say – hey, we turned everything off Christmas Eve –

[Laughter]

MALE: Not a big deal to everyone in India, but to everyone in the U.S.A. happy holidays, really convenient. But it wasn’t necessarily – we would like to do this if it’s convenient for you. It was – oh, by the way, we’re turning all of your stuff off, so more of a notification than a request.

MALE: Yeah, we have regular service review meetings where that’s discussed along with change controls associated with it, which is very effective.

MOD: And on the flip side of that, the ones who own your own equipment, how do you – is the payment say for energy all factored into what you manage or is it separate from your management time, in the same department, but other times it goes to some other part of the corporation?

MALE: IT manages not only the data center but the facility building as well. We have the power to break it out. So, we’re building a data center –

MOD: So, you’re involved in all of that.

MALE: Yes, that’s all reported.

MOD: How about you, Henry?

MALE3: We’re just part of the electric bill for the whole campus but we have sub-metered it and we track it.

MOD: Okay, so even though someone else might pay for it, you’re definitely tracking what’s going on and what it’s costing you.

MALE3: No, POE is.

MOD: And Mike and Rich, what you own –

MALE: Yeah, it’s a partnership so we have a separate facilities organization but we partner with them and any of our decisions, even to the point where we’re bringing in major components that are going to utilize energy. So they’re part of that kind of onboarding process for hardware.

MALE: Yeah, I’d love to say we do that, we don’t. We don’t see the bill; don’t meter it, no matter how much we’re using.

[Laughter]

MOD: I’m glad someone has a different answer here.

MALE: It would be great. I think if we actually understood where we spent all our money – we have big labs that spend a million dollars a month on power, so the data center piece is so small that it’s almost lost in it. I think if we metered and allowed us to figure out – hey, you know, if I turn off this six racks of gear when I go home for the weekend, because we’re not using it for much power, I think that’d be huge. I think that information would drive better behaviors, so yeah. We’re able to get down to the power outlet level, which is pretty cool, and the temperatures at multiple locations in an aisle. One of the beautiful things that we discovered, because we thought we had this great concept of positioning global systems in one area of the room, for Asia pack, Europe, and America’s. So with an active CSD model that we have in place, we didn’t realize that the areas of the floor change based on the usage of the computer. So the way the computers work, is they’re processing more, they’re generating more heat, using more energy and that. So we could see the movement across our floor and it’s enabled us to kind of manage it a little bit so that we can kind of bring down some of the infrastructure in one area and bring it up in the other area and balance it out.

MOD: Yeah, that’s really interesting. For those of you who lease space, is the power bill an estimated bill or is it based on actual consumption that’s calculated?

MALE: Oh, it is metered.

MOD: It is metered, actual? Okay. And do they just have energy charges or is it energy and demand both, do you know – charges baked into that?

MALE: For our environment it’s just a flat rate energy charge, we buy in such bulk and our provider buys in such bulk, they’re able to do that.

MOD: And you don’t know because – well, maybe you do know.

MALE5: So, the stuff that we lease is energy and demand.

MOD: Okay, energy and demand.

MALE: Our rate changes from month to month based on the electricity company and what they’re feeding the colocation facility. Typically we’ll get pre-notice, three months in advance, based on trends, we expect electricity costs to go up in the month of November. We expect electricity costs to go down – based on this economic condition. So it’s communicated.

MOD: So it sounds like for most of you, aside from Rick –

[Laughter]

MOD: That it ends up being a pretty transparent situation with energy costs. Is that correct? And you’re either tracking it or you know exactly what’s going on and it’s not siloed out into other areas that you really don’t have control over. I mean, for you, Mike, I understand it’s a lease thing but –

MALE2: It’s a line item. We trend it because we’ve found billing errors. We have found computing errors within the invoice where we’ve been overcharged or undercharged. Our auditing will bring that to the company’s attention, they’ll do the research and [between delays 44:26], we’ll apologize for that. We made an error.

MALE: It doesn’t happen often.

MOD: The next part, continuing on, is about energy and we’re going to talk about efficiency a bit. I want to find out more about energy efficiency and how it fits into your purchase decisions and if there are barriers to making it into something energy efficiency. At the beginning you said, some of you, about how important it is to have the redundancy and the tier rating at a certain level, so for instance, that might be one thing that could interfere with choosing certain kinds of equipment. We’re interested in why you do or do not adopt particular technology. And if you have examples, I’m happy to hear about them, stories are so good. And then you all mentioned energy efficient – well, at least use of energy as important, and energy efficiency might be somewhat less important to some of you, as I understood. But you’re all tracking energy use, except Rich is tracking it so he’s not paying for it. So how many have recently made major investments and improved energy efficiency in your building? Show of hands, have any of you?

MALE: Recently? Like it’s been a few years ago.

MOD: Well, recently, that’s a few years. Mike? Not involved in that. So there’s four of you who have and can you give me a specific example of what you did to improve efficiency. Henry, you’re involved with it, why don’t you start.

MALE3: Okay, well, just to recap, we decided – after major virtualization consolidation we had a lot of available space in the data center. We have our high efficiency chiller plant for the campus so we decided to base our systems off of chilled water and look at all the different options for that and decided to use a refrigerant active rear door based, refrigerant, passive refrigerant system or pumped refrigerant system for cooling and to create basically a data center within the data center that in a quarter of the space has the same capacity as the entire data center had when it was originally built. And we also went with 415 volt power instead of normal 220 and end of row PDUs for distribution. We also, because of the fact that we were using chilled water from the central plant, the central plant does not have backup power, so we made the decision to actually go the opposite direction and not have redundancy on our chilled water. So – and there’s this trend among say, university and noncritical IT shops to not have so much redundancy as we used to have. So we took actually a step down in terms of our tier for this addition. And I think that there are people trying to rethink that in the noncritical industries like I mean, you can’t do that in financial or big commerce or any of that, but university research. And we found that we have dual power feeds from the utilities and that has never had both of those go down at the same time in the last 15 years, so you start wondering whether all that redundancy is necessary. So I think that’s something to bring up for some industries that there are energy savings to be made, and reexamining that whole resiliency thing. One thing I will mention though is that we try to take advantage of everything possible so I designed the system if there was to be a power failure, the backup generator from the old rack system would use the pump to pump all the chilled water out of the entire campus loop through the data center, gives us about 25 minutes of extra cooling by using those stored capacity and the piping system on campus.

MOD: You hedged it a little bit there. That’s good. So did you choose these technologies primarily because of the energy savings involved?

MALE3: And flexibility and the ability to support high power density. And the other thing is that this whole idea of resiliency, we’re reexamining that and looking at smart power shutdown, so instead of trying to keep things up, start phasing out the things that aren’t critical systems and to again allow for longer time before the power comes back on. So looking at the flip side of reducing load during a power failure in order to extend time available to run until the power comes back on.

MOD: And Mike 2, what have you being doing?

MALE4: So we have a number of things going on. So it starts out with variable frequency drives, centralization, ultrasonic humidification and centralization, were some [inaudible 50:54] returns for the hot aisle was a big factor force. I do have a number of other lists but we did explore alternative sources for energy, for instance wind power and solar power. Fortunately the efficiencies of the solutions aren’t there yet as far as the return on investment. The whole thing right now, and we’ll probably talk about this later, is containment is now on the radar screen.

MOD: And containment means?

MALE4: Containment would mean we would contain, say an aisle or a heavy usage device in its own environment and condition it a certain way. There’s two industry thoughts on it. One is hot aisle containment, one is cold aisle containment and this is an interesting discussion, what is the best one right now – the industry can’t make up its mind. Manufacturers have.

MALE: We can talk for the rest of the meeting on that one.

MALE4: But if you’re an individual having to go into a 130-40-50 degree aisle to do some work, maybe the cold is probably the better.

MOD: Yeah, I’ve been reading some things about India, 120 degrees there right now. So anything else along –

MALE4: Well, there’s efficiencies in the service selection. We have a preferred server list, however sometimes the server just basically can’t address the needs of the business, so we do have to go off bid, there’s always an exception process to it. But a preferred server list does help narrowing in on what servers we believe are more efficient than others from the energy side.

MOD: Rich, you want to start here?

MALE5: Yeah, we actually just built our data center a couple years ago, in fact we’ve got newer compressors and newer air conditioning, we saved some power costs, I’m told we do. But if I don’t see the bill, I’m just kind of guessing. We did do some air economizing [inaudible 53:01]. We did hot aisle, cold aisle, but not the containment. So we try to rethink all of it. And then ironically when we were in our last building, the labs were on the third floor, which not that this is good or bad, it’s just interesting that we had an air conditioned third floor and then heat the first two floors, thinking if we put the labs on the first floor we might have got free heat in winter. Yeah.

MALE: It’s all on one floor so it doesn’t really matter.

MALE5: So stuff like that.

MOD: Okay, good. Gary?

MALE1: The major thing I did was in the area of containment. I did a modified cold aisle containment, vinyl strip curtains. The entire purpose was to save money.

MOD: Through saving energy?

MALE1: Oh, yes, it most certainly did.

MALE: Do you know how much you saved?

MALE1: I do, I get the numbers mixed up, but I believe my kilowatt hours went down by 16 percent and my costs went down by 20 percent.

MALE: Great.

MALE1: Maybe they’re reversed, I can’t remember because it was a number of years ago. I put it on a survey, I think. And that was just strip curtains and I have DX HVAC units, which means there’s not a lot you can do with that as far as – they just run, no variable speed drives, they can’t run in tandem. They’re 2005s so they’re very hard to control, along with the modified containment that I did too, I essentially just turned off humidification, I let my humidity get down to 19 percent and up to 75 during the summer. It’s been that way for a number of years now and I’ve never had an issue.

MALE1: Even I’m nervous about that, that’s cool, you know, seven, eight – I don’t know about that.

[Laughter]

MOD: Interesting, I know, down the road. I can’t wait to hear what everybody else will say the situation is. And how about, have you done things, made major investments that improved server utilization? Have you done that?

MALE1: Of course, private cloud is a trend in many companies so virtualization is where you start and then you move over to private cloud. My environment, 65 percent is virtual, of the server population.

MOD: Okay, so they’re not in your head?

MALE3: I think we’re like 85 percent virtualized now and we’re moving into object storage which is going to be, claims to save a lot of energy from the storage side. So we’re looking at that. And some smart power control, although we haven’t really started playing with that yet. So kind of spin up on demand, more servers if needed. We don’t really have that same kind of use case that others might have for that. We carefully measure, monitor all our server utilization and all of that along with the IT power in every rack, so we know what’s going on there. We try to purchase efficient servers, in the blade, we’re very much blade oriented and those are – some cases aren’t as efficient as the others because they’re so dense. But I think the biggest factor and something that we’re looking at, partially why we chose this active rear door system, is that server fans, although it’s evolving – you know, in the old days an idle server would be consuming 50 percent of the max power and mostly, a lot of that is due to the fact that the fan never – the idle fan speed is still using a lot of power and it’s important for future – manufacturers in the future to have the fans be at a more variable speed instead of multi-staged or just idled down to a lower speed, but part of the savings of this active rear door system is that it reduces the amount of energy consumed by the servers, because it’s pulling, drawing the air through the racks to get through the heat exchanger and that supposedly should reduce the amount of energy the fans and the servers need to consume, to transport cold air through the unit.

MOD: Other examples of server utilization efficiency you can think of or is that pretty much it?

MALE: Utilization just covers a lot.

MOD: And that’s the main thing. And just back to the question of why, obviously you’re all mentioning energy efficiency or saving energy or saving money now, and I know Henry mentioned some other reasons on the facilities management side. I’m interested in the whys of everything, so in terms of making things more efficient, or choosing more efficient equipment, on the facilities management side, were there other reasons to do this, such as the ones Henry mentioned, any other things?

MALE: Everything we do feeds up into our sustainability group, we have a centralized sustainability group. So we report our benefit to the community through that group, so that’s a factor in some of our decisions as well. So sometimes financially –

MOD: So that could be either facilities management or –

MALE: Or for systems or servers.

MOD: All that goes into that. Okay, Rich, how about you?

MALE5: It’s cost.

MOD: All cost.

MALE5: That’s it.

MOD: And Henry, you mentioned several other things.

MALE3: I’ll mention one last thing and again it’s on the redundancy level and it’s sort of like I said, we’re building these modules so we’re building the first module and the first module will only have one PDU and one RDU refrigerant distribution unit, right? But all the piping is laid in for a second one, so then when we move and add our capacity, double our capacity, then we switch over everything and make it redundant, so we add redundancy as we grow, not out of the gate. And I think that’s an interesting concept. So we put in the infrastructure for redundancy but we don’t have redundancy until we add the next phase and then we cross the room back and forth from each other.

MOD: Interesting. Can you turn your questionnaire over and look at the back, because I know whether most of you – I don’t know whether Mike 2 had gotten to it.

MALE4: Yeah, I did.

MOD: I don’t know whether this has happened. In some of the other groups, pretty much everybody has done most of the things that are on here and I was wondering if that is true, as you recall, filling this out. Mike 2 is the only one who has his. Are there any things on here you’re not doing?

MALE: We don’t do blank inpanels, we don’t really do like hot aisle, cold aisle containment.

MOD: Any particular reason you’re not doing this?

MALE: Partly because no one could tell us if we’d actually save money or if it was just work to do work. Now that I know that Gary saves 16 percent, maybe we’ll go back and do it.

[Laughter]

MOD: So not a bad experience or anything, it’s just that it didn’t seem like it would get you anywhere.

MALE: Yeah, and I didn’t have any blank inpanels so if I had, I probably would have put them in, but I didn’t want to buy them, no one could really justify why I had to buy them.

MOD: Anyone else, things that you’re not doing or haven’t been -- ?

MALE: Underclocking.

MALE: Never heard of it.

MALE: Yeah, I don’t know if we do.

MOD: What is underclocking?

MALE: You go down –

MOD: Oh, underclocking, is that not a familiar term?

MALE: I’ve don’t recognize it.

MALE: I don’t think it’s something like the OS automatically does anyway, that’s why we haven’t heard of it.

MALE: Yeah, I think it’s in the operating system.

MALE: So Windows 7 does that maybe, and so in the spirit of not trusting vendors, Microsoft came out and said – if you upgrade from Windows Vista to Window 7, you’ll save 23 dollars per year per PC and of course I thought they were full of crap and we actually counted it and they were right, 23 dollars per laptop.

MALE: I couldn’t believe it.

MALE: Yeah, so I’m thinking that was maybe something that we did by mistake.

MOD: It turned out all right.

MALE: It turned out good.

[Laughter]

MOD: Anything else on here that you haven’t tried or you tried and didn’t like it?

MALE: We have not tried server racks with curtain strips there.

MOD: And that’s what Gary was talking about that he had done. So any particular reason you haven’t tried it?

MALE: Never saw it, probably just resource constraint, you spend your money where you decide to spend your time on.

MALE: We haven’t tried the curtains for two reasons, one is aesthetics, since we do bring some key clients through our facilities. But two, the fire marshal is still – our local fire marshal has been adamantly against it. You know, fire codes are driver by local fire marshals so that could vary across the world, but in some of our major data centers, they’re against it, so we have not pursued it.

MOD: Have you experienced that, Henry?

MALE3: No, we have return air grill on the hot aisle but we don’t have containment and part of the reason for that was facilities reluctance to deal with the fire issue. So although the containment companies are trying to work through that, you don’t find that on a case by case basis, like you’re saying, you could get into issues with the fire marshal.

MOD: That’s an interesting issue.

MALE3: You don’t want to have issues with the fire marshal.

MOD: No, I would say not.

[Laughter]

MALE3: But it’s also, I mean, issues like what do you do with your sprinkler heads now, have to come down through containment if you’re doing containment over the top of the racks. I mean, there’s also technical issues related to certain aspects, certain types of containment.

MALE: Yeah, there’s hidden costs that you have to be aware of like that sprinkler head cost and then the smoke detectors, another cost. You have to basically reengineer your whole environment for additional costs.

MOD: So but it sounds like for the most part, most of the things that are listed on here in terms of facilities management and server utilization are –

MALE: I think there’s one missing on here, though, data center infrastructure management.

MOD: Tell me about anything that’s missing.

MALE: We’re missing that session right now.

[Laughter]

MALE: No, but we’ve heard it many times so we can tell you. We have heard it.

MALE: So data center infrastructure management, traditionally the data center and building have a building management system. Then we have this technology and that manages your computer room. They we have this technology, let’s say server technology, that has its own system. Well, right now, we have a human who changes the data center infrastructure environment. So wouldn’t it be great if they could talk to each other and adjust it. So going back to my model of different times, things change, right now I have to have an operator say – oh, yeah, it’s that time, I better press this button. Why not have the system automatically adjust it. Now that’s one definition of DCIM or data center infrastructure management. Every manufacturer has a different definition, so it really requires an industry organization, almost like an uptime institute approach that says – here’s data center infrastructure management, what it really needs. Standardized what data center infrastructure management really is. Right now some people look at it as an inventory system, some people look at it as the systems or the building management system – CFD system. So it’s a lot of that but it’s not defined in the industry right now.

MALE: I think Open Compute is trying to get into that area.

MALE: Are they? Somebody, if they can do it, that would really be beneficial.

MOD: So it sounds like, I mean, overall somehow integrating these various systems and having them more automated.

MALE: It’s the next level of efficiency, so we could see the environmentals of the server but we can’t see what the server’s doing in great detail internally, so even though it has internal sensors and things, if we were able to connect the systems themselves and link them together with the building management system, then the building would adjust dynamically with the systems. Right now, it’s manual -- I think Google or Ebay or one of these people did a presentation on this where even when it’s predictive analysis, so they make adjustments before the weather comes in, which is pretty cool, but they will admit there’s still a person there to say – or on a button. So even though they auto adjust their environments, they’re a little bit ahead. There’s a person there that says – no, no, don’t do that, that’s not the right thing to do.

MALE: So things like doing anti-virus scans during nonpeak power periods, stuff like that, would fall in that?

MALE: Exactly, and then you’d be able to see what happens dynamically and the system itself, the facility would automatically adjust based on what you were doing on the systems. If you need more power, right now, we’ve shut off unit 22, but it’s kind of a guess, right? So we shut them off, we save, we watch the temperatures, we adjust them, then we bring them on, we shut them off. But there’s a lot of manual intervention there that could be addressed by having standards first for how this thing should work and what the definition of it is. And then the manufacturers out there all have solutions but they’re all very – the solutions are varied on different objectives.

MALE3: I have to bounce off of what you said and really give EPA s\*\*t.

MOD: I’ll give you a few moments.

MALE3: So basically they came up with the server standard, as Energy Star servers, great idea, wonderful idea. They said – and you have to, as part of this, report environmental like temperature, humidity, power. Fine, great idea, wonderful. They didn’t say put it in the standard MIB and so they can put it wherever the hell they want to and that means that you can’t just go to the same place on a Dell or HP or IBM and get the temperature. You have to dig into every freaking MIB, every freaking server, to find out where they put the temperature. So if EPA is listening, they should add that into the damn standard so that it becomes useful instead of a just a boilerplate, you know, people checking a box and it doesn’t help us out at all because we’ve got to go find it on every single brand of server. But you can tell I’m not upset about this.

MOD: I can tell you haven’t been through it.

[Laughter]

MOD: So your message has gotten through, I’m sure. Anything else that should be added to this list? I know this is a long list so it’s hard to see what might need to be added but it sounds like most of you have done or are doing most of these things and if you’re not doing them, something else has been substituted. I haven’t heard too many horror stories here.

MALE: Under servers, I think you’re going to see more and more of appliances. So the introduction of appliance under servers are probably something to consider.

MOD: What is an appliance?

MALE: So an appliance would be to take the functionality of various servers and put it into one solution that’s managed by one vendor. There is a Vblock is a good example of that. It’s a data center in a box.

MALE: [Like a new TANEx or something 1:10:22] --

MALE: Exactly, or some of the new storage arrays. They’re all managed as appliances so with that comes some additional challenges of – well, it has a variable load, but it also has higher capacities to deal with, so you need a strategy for how you want to handle your appliances. And appliances apply across the network to computer processing across the board.

MOD: In my mind, I thinking stoves and refrigerators.

MALE: Yes, those are appliances, right.

MOD: Beg your pardon, what did you say Henry?

MALE3: I was just checking to see if he was referring to hyper-converged infrastructure when he made that statement.

MOD: Anything else that’s missing on here that you see coming up or you’ve heard about? Gary, anything that you think is missing from this list?

MALE1: No. You’ve got most of it.

MOD: Most of it. And it sounds like we’ve talked about anything that you wouldn’t use again or that you haven’t used for some reason. Is that correct? I’m sorry I don’t have yours in front of me.

MALE1: No, no, no.

MOD: I’d be more precise if I could be.

MALE3: The idea of server on demand or what’s called DRS is on here. That’s like powering up servers as they’re needed or before they’re needed.

MOD: So if you’re going to invest in a cutting edge technology that could potentially improve the data center energy efficiency, how do you approach that? And Henry probably is the most involved here since he’s just been doing this, but others have done it too. Do you try them out first somehow? Or do – you put them in and see what happens? Or what’s the approach to trying something new given what you’re working in here?

MALE: It’s the great question. Outside of I’ll call it getting equipment on the raised floor, servers, main frames, storage that I own – as a re-server I utilize the colocation, I’m looking for them to kind of do the research and provide that back as a service that they offer for the customers. So I’m kind of looking at the provider of that space, who’s the subject matter expert, to be doing these types of things, because I certainly don’t have the time or resources to do it.

MOD: So you’re in a more receiving mode?

MALE: Right, and I think the colocation folks, facility folks could use that as an advantage to maybe attract new clients.

MOD: Okay, good point.

MALE: I think some of the facilities stuff doesn’t really lend itself well, but trying it would be a good choice.

[Laughter]

MALE: You can’t really try it.

MOD: Yeah, I’m just wondering.

MALE: Bring it in UPS.

MALE: You could pilot it, like a new data center or something and then see if it works out. But –

MOD: So if you had multiple data centers, you could try that one place and see if you wanted to use it.

MALE: Yeah.

MOD: Henry, what’d you do? Because you put in what sounds like some cutting edge things.

MALE3: Well, you can try it out. I mean, what commonly, if we’re going to make a refresh of our servers or whatever, like go on the four year life cycle, if we’re bringing in a bunch of servers and put them through the paces, spec marks or whatever, to decide which server we’re going to buy, and we try different power strips for the racks and stuff. But then you start getting into things like heat extractors and RPWs and PDUs, you’re not going to use larger ticket items and they’re not going to lend them to you to try them out and decide which ones you’re going to use. So I usually base it on creating a model of the different products that we’re considering purchasing. Because the rated conditions are useless and not applicable in most cases so I usually get the performance curves from the individual manufacturers of the cooling equipment or whatever. And run it through a series of different operating conditions and see how they compare. So I do it model based, I don’t physically bring them in and put them next to each other.

MOD: Yes, so Mike 2?

MALE4: Well, first of all, it all has to start with an ROI, business case. It’s all driven by the business case, does it make economical sense to do X, Y or Z? And then based on the proof of concept, has to be there, we talked a lot about that with regard to as best possible do a proof of concept. And then from there, you really go into a pilot so you just don’t want to throw it in. One good example that’s out there right now, DC Distribution. We take power in from the utility company, it’s AC, we convert it to DC for UPS, then we convert it back to AC, then we convert it back to DC again, and vice versa. And then the power supply in the server takes it and converts it from AC to DC. So there’s a lot of loss there, however the ROI, if you’re running a pure DC shop, is there. But if you’re running a combination DC/AC shop it isn’t there. And there’s other challenges with it. But right now, so those are the type of analysis that you have to kind of go through. And then of course, you want to bounce it off your peers and some other industry leaders, sometimes Gartner is a good source for that information, companies like that. And then you go to your engineering firms and those people.

MOD: We were talking about making major investments to reduce energy use and I’m just wondering if you do maintenance, use maintenance and operations or training the staff as a way to reduce energy use. Is that part of what you do? Is that –

MALE3: Maintenance, I’m pretty religious about maintenance. Sure, that will ensure that you remain efficient, save energy. But the real purpose there is durability.

MOD: Keep it running.

MALE3: Yeah, yeah.

MOD: How about your training and the maintenance folks and whoever’s operating the system that’s part of what you have?

MALE: I mean we try to train the engineers in the lab that spend a million dollars a month on power, you know, if you turn this stuff off Friday when you’re not using it, and that will actually help a little bit. And that’s more knowledge and training, how to turn something off.

MALE: Yeah, we do training on the system side so that people do know if they’re putting an application in, we haven’t reached this level yet, but we have a desire to sort of understand what the application running on the box is going to do from an energy profile. But right now it’s more hardware based and we do training based on the hardware and the infrastructure so how to operate that more efficiently, back to your environment, watching your environment constantly, making those adjustments during the interim periods.

MOD: Okay, Gary?

MALE1: So we’re not tightly integrated with our facility here. And so they do – and our maintenance is done by a third party, which is not facilities. So there is routine maintenance however, and for the most part my role has been in the area of predictive analytics so I’m the one who’s seeing stuff and saying – hey, something’s going on here with AC 5, you better check it out. And then they go in and realize that, yeah, it needs a new belt or whatever. Or something’s wrong with one of the compressors.

MOD: So you identify things and they execute.

MALE1: Yeah, so through our monitoring systems and going forward, I have a primary project, I just spent the whole weekend in predictive analytics.

[End Part One – Begin Part Two]

MALE: Our monitoring systems and going forward, I have a primary project I just spent the whole weekend in predictive analytics anomaly detection, working – oh, really exciting.

MOD: Sorry.

[Laughter]

MALE: So I’m planning on doing a lot more work in that area as part of my research.

MOD: Do you have anything to do with that, Mike?

MALE2: No.

MOD: You don’t make –

MALE2: We rely on the landlord of the space, because you know, it would be an attractive marketing vehicle and also improves redundancy and availability.

MOD: David, did we have a problem?

MALE: Yeah, we just lost the recording, that’s okay, keep going.

MOD: Should we keep going?

MALE: Yeah.

MOD: I have a list of factors here that you might consider when choosing technologies or strategies that reduce energy use and you can see I’m very focused on reduction of energy use here, not that it’s the whole thing in the world, but it’s the whole thing in my world at the moment. I’m interested in whether there are tradeoffs or synergies between these factors and energy use and if any of these factors encourage you to take a higher efficiency approach or discourage you from doing that. So here are the factors, and some of them we’ve maybe touched on before so just bear with me. One is performance, the uptime and reliability and redundancy, it sounded like – I’ve heard you talk a lot about those issues and tell me though, would you choose a piece of equipment that’s more efficient as long as you knew that it would maintain this level of performance that you want or tell me how it relates.

MALE: No brainer.

MALE: Yeah, it’s a win/win, if that’s the case.

MOD: If that’s the case, but it could also be a discouraging thing.

MALE: If you have to choose, it needs the work more than it needs to save power.

MOD: Right, so performance is going to trump power.

MALE: Reliability.

MOD: And reliability.

MALE: Reliability.

MOD: But if you could have something that you were sure was going to do both, that would be the best situation?

MALE: Maybe. I’m thinking of like UPS eco mode or transformer-less UPSs and things like that. They’re all about saving energy but there’s a lot of dissension over whether from a reliability standpoint they meet the grade.

MALE: Yeah, so reliability.

MOD: So reliability sounds like it’s going to always –

MALE: It all wraps up into that resiliency which is all availability, reliability.

MOD: How about maintenance repair issues, can you tell me about the tradeoff between that and energy efficiency choices, high efficiency choices.

MALE: That’s interesting, so just if we were looking at having a less robust environment, so it gets back to that robust environment if you’re looking at maintenance or repair, it’s a good consideration but you would still have to maintain your current expectation for maintenance and repair, I would think.

MOD: You wouldn’t want it to be worse?

MALE: No, and I mean what you’re really talking about is the equivalent of maybe mean time to failure, mean time to repair, and there’s not a manufacturer out there that can give you a reliable, or maybe would want to give you a reliable number around those factors. You’re kind of stuck on your own to determine – if I buy this piece and it fails, what are the odds it’s going to fail, and how easy it is to get it back on line. You’ve got to do that due diligence on your own.

MALE: Right, and parts availability.

MALE: Availability.

MOD: Parts availability.

MALE: Availability is important.

MALE: So it’s like something that’s really superefficient and made in Europe and high demand on the replacement parts.

[Laughter]

MOD: Yeah, we’ll get that for you in a few weeks, right?

MALE: Or the recommendation from the manufacturer for maintenance. I mean, that’s the only guide you have to go by.

MOD: How about climate and other location specific factors that would affect cooling or other choices, and what’s the tradeoff there between climate and energy efficiency? Does that make sense?

MALE: Climate has been a challenge because in most areas where you do have climate and energy efficiency and even reliability, you don’t have the utilities that you need from a standpoint of telecommunications and other things. So you’re always constantly kind of in the middle of it, so you’re not getting your maximum benefit from the climate. You’re getting some benefit but it’s only because those other infrastructure related components are not there.

MALE: So you’re not going to go to a barge?

MALE: No, we talked about one company here going to Nebraska, they probably had to put in a lot of infrastructure to get that out there, which was an additional cost, I would think.

MOD: He’s finding out why people are coming to Oregon.

[Laughter]

MALE: Oregon’s a great place but we need that infrastructure.

MALE: Climate’s pretty critical. I mean, I get really frustrated with like ASHRAE’s free cooling map.

[Laughter]

MALE: I mean, I’m in Maine and it’s just like you’re golden up there, you shouldn’t be using your HVAC systems at all, but I’m close to the coast and I come in at times and my building is one hundred percent fog enshrouded. There’s no way in the world I can bring in outside air. I wouldn’t do it in a heartbeat. So no I can’t use free coolant and why would I want to buy an air economizer coolant system? Half the time I might not be able to use it. And it’s not even something you can predict or even reliably manage. I mean, you just never know when stuff’s going to blow in from the ocean, so that’s just not worth it. It would cost more.

MALE: [Uh-huh, indicating yes.] Plus all the filtration for the –

MALE: Yeah, oh, yeah. So it’s not as easy as they make it out to be.

MALE: But that’s a great story about tradeoff between efficiency and reliability, right?

MALE: Oh, yeah, it’s more than that though, yeah, I mean, yeah.

MOD: Can I have you for like ten more minutes, because we started a little bit late and you’ll still make lunch. Is that okay?

MALE: Sure.

MALE: Fine with me.

MOD: Okay, thank you. I have two more things on my list here, financing, so a couple of things there, like utility or saving incentives, and borrowing constraints. I mean what’s the tradeoff or synergy between that.

MALE: I’ll jump in there first because incentives are a big driver.

MOD: They are?

MALE: You could drop down the cost of enhancement for efficiency by 50 percent in some cases.

MOD: So if the utility is offering incentives for that, that’s a big deal.

MALE: Major.

MOD: Okay, Henry?

MALE3: Yeah, unfortunately, our utility – the mechanisms for the incentives could be refined, you know, so there’s rebates up front and then there’s ongoing cost advantage. So right now it’s only ongoing cost advantage, not an upfront rebate or incentive.

MOD: How about energy policy, how does that interact with energy efficiency?

MALE3: Energy policy from a corporate standpoint?

MOD: Company-wide policy.

MALE3: So in our particular case, we have stated goals for the future and ISO certification is out there and right now all our data centers are run with green power. We offset the cost through financial means. But basically the driver of sustainability since the data center is the major user of energy in a company, whether it’s a colo or not, because you look at it as a whole, it contributes to the overall sustainability reporting of the company.

MOD: Sure. How about others, do you have company-wide policies that effect efficiency, Henry?

MALE3: We do have a sustainability mandate but I think the more important thing is within the next two years, ASHRAE will have issued a standard for data centers and so all new data centers will have to be compliant with ASHRAE 90.4.

MOD: You should talk to Gary because there aren’t supposed to be any new ones, right?

[Laughter]

MOD: Any of you have any comment on policies?

MALE: We’re a manufacturing company as our core business, the company is one hundred percent focused on manufacturing. So do they have an energy policy? Absolutely because it’s incredibly expensive. They actually partnered with a couple other companies to bring natural gas into the state, into the northern area of the state. But when it comes to IT there’s nothing, just me.

MOD: Just you? And Mike now. Okay, here’s the last topic for today and some of you have mentioned this before, it’s a really important topic, it’s return on investment and how you calculate return on investment, which people do in many ways, I’ve come to find out.

[Laughter]

MOD: And from very complicated to not so complicated. So thinking about everything that you’ve mentioned, that would affect your investment decisions in equipment and services and so on, do you weigh them against the upfront cost and incorporate any of those costs into the ROI or payback calculation?

MALE: Well, a lot of it depends on where your company’s focused. There are times when companies are focused on the short-term costs and there are times when companies are focused on the long-term costs. We’re actually transitioning, I think, the industry right now, to more of the longer term investment versus the shorter term investment. But typically you’re looking at a short-term investment of three years to five years.

MOD: Return on investment of three years, I’ve heard that number before.

MALE: Three to five.

MOD: Three to five. How about you, Rich?

MALE5: There have been times we were owned by private equity and if the ROI is more than 12 months, they didn’t care because they weren’t going to have us that long. So it’s varied throughout the years. In some cases, they take a longer view but private equity guys are pretty short term focused.

MOD: It sounds like they’re living up to their reputation.

[Laughter]

MALE: They probably are.

MOD: How about you, Mike?

MALE2: I mean ROI from an energy basis in my situation, I can’t think of anything we do that really focuses on upgrades to infrastructure that we’re looking to get our return investment.

MOD: It’s not something, because you’re not making the decisions.

MALE2: Yeah, because not so much in that suite. In other areas of business it’s ROI based on the current baseline and how can you improve, I would say.

MOD: Henry, how about you? Upfront costs and then other things that might get incorporated?

MALE3: So bottom line is being cost competitive with colo, so if the project is retrofit or modernization it’s going to be cost competitive over a 15-year period or 10-year period with colo, then it’s considered a win. In terms of the payback of the actual installation for the capacity we’re putting in, it’s difficult to do that because we’re retrofitting, it’s always about the base case and base case is problematic because we couldn’t add more rack space because we want to be high density. I mean, there’s a variety, it’s difficult in my situation, I’m having a hard time coming up with economic justification other than the fact that it makes us competitive with colo.

MOD: Okay, okay, how about you, Gary?

MALE1: I struggle with it all the time. Our company pretty much demands a three-year return on anything we do, which on the infrastructure side, if you’re buying a piece of equipment with a life span of anywhere from 10 to 30 years, going into a facility with the same life span to try and get that payback down to three years, you really can’t, unless the vendor is going to give their equipment away. So it’s always a fight and sometimes I win and sometimes I lose.

MALE: That’s where those incentives come in because you can adjust the ROI.

MALE: Exactly.

MALE: You can get down to a two or one-and-a-half year payback and you’re golden.

MALE: You’re right, the incentives just knock the crap out of you. But even then sometimes you get – well, we don’t really want to spend the money.

MOD: So it sounds like in your case, I mean, mostly just how much does this cost?

MALE: And when do I get my money back?

[Laughter]

MOD: Yes, when do I get my money back? It’s not figuring in – we’ve talked about all these other factors that you could try to monetize, right, but it doesn’t sound like – you may try but it doesn’t always work.

MALE: I do a pretty good job of identifying where the savings come from and how it all works but it’s a hard sell, is what it is.

MALE: Well, sometimes the question is – do you want a paycheck this week or do you want a new air conditioner?

[Laughter]

MALE: I’d like a paycheck.

MOD: Well, that’s a reasonable statement.

MALE: But writing down the upfront costs or the initial costs would really help with some sort of incentive program.

MOD: So even if you have these other things that you can say – yes, this is worth it, if you can just reduce that part of it, it would really help.

MALE: [Uh-huh, indicating yes.]

MOD: And so I’ve heard a lot of you saying one to three years. So tell me why that is, because if this piece of equipment, for instance, is going to last ten years, it’s lifetime is going to be that, what is it that drives this rationalization or this thought that it needs to be paid back –

MALE: I think it’s the uncertainty of the data center, because the data center of 10 or 15 years ago is not the same data center that existed. And is that piece of equipment going to be obsolete in less time than you actually predict it to be?

MOD: Okay, so equipment obsolescence, are there other reasons why that payback gets shortened so much compared to the lifetime of the measures of efficiency – lifetime of the equipment?

[Laughter]

MALE: Not so much in my case but I think opportunity costs come into play with other organizations.

MOD: Or how you’re going to spend your money, is that what that means?

MALE: Oh, yeah.

MOD: Anything else that gets it back to that one to three years that’s so hard to meet, as Gary’s saying? No?

MALE: It’s the way, I don’t know, like I said –

MOD: I mean, what do your bosses tell you when you say but there’s this and then there’s this? What do they – what is their reasoning?

MALE: I mean, it’s guidance at a very high level so it’s not like they have any choice but again the core focus of our company is manufacturing and on the manufacturing side, that’s the rule for capital investments.

MALE: [Uh-huh, indicating yes.]

MOD: Okay, so that’s their—

MALE: So IT’s traveled with it too.

MOD: It’s their mental model for what – how they make investments.

MALE: Exactly.

MOD: Go ahead.

MALE3: I think that what you’re going to see and I think where a good example of that is – is that there’s a lot of data centers that are coming to end of life, you know, our rack data center’s 13 years old, we’re not going to retrofit it with variable speed drives. We’re going to move on to the next generation of cooling and power and that’s what we’re doing. And I think there’s going to be a lot of other people that are in that situation where the equipment is coming to end of life in the enterprise data center world, and at that point now the initial cost is going to be – have to be made one way or another because they have to replace equipment, it’s at end of life. So now the economic advantage of higher efficiency new piece of equipment versus a lower efficiency new piece of equipment is much better than just starting over with a new piece of equipment when you already have something in there, right? So I think it’s a big opportunity in the future, in the next five, ten years, where all these data centers are going to have to modernize either because equipment’s end of life or it can’t support 10 kw per rack and so they’re going to have to do it anyhow. And then they’ll be a better economic case.

MOD: You think it might be a little longer window of time because you can say --

MALE: That’s the mindset.

MOD: -- it’s gonna be operating for ten years.

MALE: No, they have to replace it anyhow. It’s got to be done. It’s puts a business in a situation where they have no choice, you get what you need. And the example I can give, it took me a year to get my flywheel. But that was an upgrade and I tracked that forever and it was like a six to seven year payback and the end of the day that was my argument, my biggest get over the hump, besides what if the generator doesn’t start? What is that six or seven year payback? But I won that argument. I’m reaching a point with my UPS, maybe within the next two years, either end of life or capacity. If I hit either of those, I won’t have any problem getting another UPS. I won’t have no problem whatsoever.

MOD: So, we should all hope for these centers to go defunct.

MALE: I think it’s introducing that risk, right? So you’re telling on the business – well, we have this risk now – the vendor can’t support this. It’s end of life, we’ll have to replace it.

MALE: It died last week.

MALE: Or even it’s about to die, right?

MALE: But it’s risk, not efficiency.

MALE: Exactly, exactly.

MALE: And that’s where I’ll need to do my homework.

MOD: So it’s really to get the efficiency levels in there because the risk –

MALE: It turns into a win/win because you get the latest and greatest and it has the efficiency.

MALE: But timing is everything with that.

MALE: It is.

MOD: Okay, so watch timing it sounds like.

MALE: And also, as things start failing, downtime, once you start incurring downtime because the equipment is not reliable.

MALE: You’re validating your risk.

[Laughter]

MALE: Absolutely.

MALE: Gives it attention you deserve.

MOD: Well, that’s it. I want to thank you so much. It’s been such an interesting discussion. I’ve learned a little bit more and a little bit of understanding of all those acronyms today. I greatly appreciate all your input, it’s really helpful. I’ll take your questionnaire.

MALE: Sure.

MOD: If you have any questions or comments for me, please feel free to give them to me. Otherwise, you’re free to go.

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