# Advanced Engineering Taskforce Meeting August 18, 2014

The meeting was called to order at 10:08 a.m.

# **Members Present**

Name	Affiliation	Location
Scott Armstrong	Kishwaukee Community	Conference Bridge
	College	
Joel Mambretti	Northwestern University	Conference Bridge
Jim Flanagan	IL Chief Technology Officer	Conference Bridge
Anita Nikolich	National Science Foundation	Conference Bridge
Brandon Gant	ICARLI	Conference Bridge
Rich Kulig	College of DuPage	Conference Bridge
Tracy Smith	University of Illinois	Conference Bridge
Alan Pfeifer	Sauk Valley Community College	Conference Bridge
Jim Peterson	Bloomington S.D./Illini Cloud	Conference Bridge
Brian Tobin	DeKalb CUSD 428	Conference Bridge
Mike Dickson	Western Illinois University	Conference Bridge
Brian Murphy	Eastern Illinois University	Conference Bridge
Rob Zschernitz	The Field Museum	Conference Bridge
Raj Siddaraju	CC Presidents Tech Council	Conference Bridge
Herb Kuryliw	Northern Illinois University	Conference Bridge

# Members Absent

Andrew Bullen	Illinois State Library	
Troy Brown	IL Heartland Library System	
Glen Trommels	City of Rockford	
Robert Dulski	Brookfield Zoo	

# Guests

# Staff

Lori Sorenson	Central Management Services	Central Management Services
Kirk Mulvany	Central Management Services	Central Management Services
Robin Woodsome	Central Management Services	Central Management Services
Frank Walters	Central Management Services	Central Management Services
Adam Ford	Central Management Services	Central Management Services
Essam El-Beik	Central Management Services	Central Management Services
Michelle Medley	Central Management Services	Central Management Services

## **Review Agenda, Approval or Minutes**

Jim asked if there were any additions, corrections or deletions to the minutes. Kirk stated that a correction is that Robert Dulski's name wasn't listed as attending the May 16<sup>th</sup> meeting. Jim asked if there were any other updates to the meeting and there wasn't. A motion was made to approve the minutes; Allen Pfeifer made a motion to approve the May 16th minutes and Scott Armstrong seconds the motion. All are in favor and none opposed. The motion carried.

## FY 15 Budget and ICN Proposed Membership Model

Kirk asked Lori to speak regarding the FY15 budget. Then Robin and Essam can take the lead on the Proposed Membership Model. The ICN budget for the current fiscal year we're in was cut from \$6M down to \$1M.

- In FY13 we thought we were going to get \$6M which was what we were approved to get, but only \$4M was released to ICN.
- For FY14 it was \$5M, and we did receive all of it.
- For FY15 it has been reduced down to \$1M.

At the last Policy Committee (PC) meeting we're taking a look at what do we do, and how do we operate with \$1M. The biggest concern is if this is for one year, and you take the hit, it's one thing, but how you react and plan is different if it's become a new norm.

Our thought is that we should start thinking that this is the new norm. There is the issue of it's hard at this point in the process once the \$1M becomes known and time to work with the PC to adapt. It's pretty hard to implement any changes for this current fiscal year. It is going to come down to dealing with PC and with the Director's Office for the Department of Central Management Services. Right now we're proceeding with the credit allocation based on the \$6M formula.

Our main focus is looking forward for the next fiscal year to put in place some type of rate structure, service structure, and membership structure that assumes it's a \$1M or zero dollars of State Appropriation, and assuming that is gone. We have an issue with the E-rate cycle so we believe that we need to have something in place by the end of this calendar year in order for E-rate eligible entities to plan accordingly for next year.

Robin and Essam have been working on a model; our overall thought is that if we were to try and convert all of our customers, and get them to pay what they're receiving for the State Appropriation as far as credits. We assume it is a small percentage will spend that kind of money. At the end of the day our costs are very fixed. Our only variable cost is our Internet Egress. Other than staff we are pretty much at a fixed cost and it would be pretty hard to scale things back.

ICN's Operating Costs for last fiscal year was just above \$18M; we had projected \$19M, and budgeted \$19M, and they are coming in even lower than was thought. We had come from a

\$21M operating pre-fiber down to a little above \$18M. We're pleased at where the operating costs are coming in.

The model that Essam and Robin are looking at, it's a way that we have this great capacity with this network, and we have quite a bit of growth On-Net that we can do. We can increase the On-Net traffic significantly and not increase the operating cost at all.

Jim stated that it looks like the operating costs were lowered by \$3M. Maybe a lowering of \$4M or \$5M on the amount that the legislature is giving may not be that big of a deal but as a matter of one shot of \$5M fusion of E-rate money into the budget.

Yes, if you're looking at the E-rate money that came last year; that will not come again. It was for previous years where we were a recipient of E-rate funds, which was up to last year, and those were payments. They were that far behind in paying the money.

If the appropriation remains stable at \$5M or \$6M, we could have absorbed the fact that we were no longer getting the E-rate money, but our total budget is down \$9M or \$10M. The E-rate money wasn't budgeted and it wasn't counted on assuming we would get it. Where we're down is the State Appropriation. \$5M this year and then if it goes away completely, next year it's \$6M.

We would be looking at some additional revenues and cost cutting; trying to make up the difference of which we've made up a \$1M or so in savings over this last year. Yes.

Essam and Robin are going to walk us through it. The premise is, if we're able to take our entire customer base, or a significant portion of them, and convert them to paying customers; do so in a way that they are able to have the significant bandwidth. At least those on On-Net, the capacity of the current network, and get away from possibly the cost per Meg measuring meter model. Go to something a little different that states you're in as some type of member, or you buy-in at a certain level, and you're able to get a significant amount of bandwidth.

## **Approval of October AET Meeting Schedule Change**

Robin stated that an updated version of the slides were sent out on Monday, August 18<sup>th</sup>. The latest version was sent to the AET members list ahead of the meeting time, but for the meeting, will defer to the slides sent on Friday, August 15<sup>th</sup>.

Essam stated the reason for the slides is due to what is being seen in the landscape; what change is being seen. As Lori stated there is a large reduction in the State Appropriation from last year to this year is down from \$5M to \$1M. The other thing that is seen is the number of connected customers over the past six to twelve months has decreased for several reasons (page 3 of the slide, v.1.5).

- Increase in the number of fiber based providers in Illinois.
- Other options such as other BTOP projects that customers can get connected to.

- Downward trend in the Internet Egress market price, an ongoing downward trend.
- Many customers connected to the ICN via T1 connections in terms of Anchor Institutions, not including state agencies; that number is about 20 percent.
- Bandwidth demand has increased exponentially.
- Migration of applications and services to the cloud.

These are high level items that we see coming in the landscape. There are more details in the additional material section.

**Slide 4 and 5** is a high level of the proposal. We compared the non-paying primary customers to paying customers, by offering highly differentiated service, and focused on the customers' particular needs. Customers no longer receive pre-allocation. They've been moved to paying customers.

- Introduced a membership fee for certain customer categories.
- Introduced was a minimum purchase amount per month.
- Enhance the service offering by providing more On-Net bandwidth.
- Continue to develop interconnects with content providers.
- Further develop On-Net cloud based offerings.
- Work to reduce Internet Egress pricing in time for FY15.

#### Slide 5

- Working to move customers T1 last mile connections to fiber based connections
- Offering end to end connectivity for all customers including K-12 and libraries. Schools and Libraries only deal with one provider, the ICN for the end to end connectivity.
- Anchor Institution (AI) sites that are close to the ICN hand holes with 500 feet, 1000 feet; we develop a cookie cutter build program. There are approximately 80 sites within 1000 feet of the ICN fiber.
- We look to bundle value added services free with some other bandwidth levels that customers have purchased.

Slides 4 and 5 provided a high level of the proposals and what is done on slide 6, 7, 8, and 9.

# Slide 6

• Converting all on-paying primary customers to paying customers. Another alternative is since the allocation has been reduced to \$1M, we provide a pre-allocation for the most in-need 1/6 schools or most in need 1/6 AI.

How would Chicago Public Schools be handled? Robin stated to Jim that they're in almost a whole separate category. For the purpose of this proposal they would be included. When we're doing the count it is for all schools; it is a total count.

- The introduction of the membership fee means that we can allocate a fee, not necessarily based on the service they're directly purchasing, the bandwidth, but based on another type, another category of customer.
- The customer type or size of the customer.
- The proposal is to introduce a membership fee for non-primary customers, and waive the membership fee for primary customers.
- In return for the membership fee, an enhanced service offering will be offered (i.e. providing more On-Net bandwidth).

This is a common approach that other research and education networks throughout the U.S. have. Many have a combination of fee for services as well as a membership fee.

- Introduce minimum purchase amount by mandating their customers purchase at least \$140 worth of service per month, e.g. 10Mb/s of bandwidth.
- Enhance the service offering by provide 5x On-Net bandwidth with the purchase of Public Internet. On-Net means access within the ICN network. (pg. 7)
- Continue developing interconnects with content providers-currently paired with 14 content providers.
- Further developing relationships with cloud based offerings, example, Illini Cloud. That will enhance the value of the On-Net offering and also ensures as much traffic as possible stays On-Net. That is the goal that we want to have.
- Continue working to reduce the ICN Egress cost. The Egress cost we pay for public internet access we're averaging \$3.2 per Mb/second. When we factor in redundancy that we offer, effectively \$6-\$9 per MB/s due to redundancy.

An RFP has been issued and we're expecting the price to reduce in the coming month or two due to the RFP responses.

### Slide 8

- Moving T1 customers over to Ethernet over fiber, and as a temporary measure over copper. Move them away from T1 circuits connected to the ICN.
- There are a significant number of customers connected to the ICN via T1. It is about 20% of CAI without including state agencies. When you include state agencies the number is over 50 percent.
- The goal would be for ICN to provide to customers, particularly schools and libraries an end-to-end circuit. From the school premises, to the ICN network, then to the public internet, and basically provide one voice to the customer for the circuit. That would also enable to customer to deal with one provider on the E-rate form 470.

Jim asks if we would be offering a similar model but with improvements to what commercial providers are offering; where they offer over a five year contract to build out connectivity to

the school. Then there's a monthly fee that includes the build out cost as well as the connectivity cost with the big advantage being that at the end of five years, since E-Rate wouldn't allow the schools to own the fiber, unless the new E-Rate regulations going to allow the schools to own the fiber.

Essam stated the schools will not own the fiber. Since the schools cannot own the fiber ICN would own the fiber as a trust for the school district; then ICN after the first five years contract is out would then start charging fees based on removing the build out cost, which is what the Telco's and the other providers don't do when they get to the second contract term. They could also allow the schools to also have an even longer contract and lower the monthly cost. Whichever one would be better.

Yes the model Jim described is a valid model which we will move forward with and go with the exact scenario that was described. The multi-server five years to cover the cost that is the reasonable rate of return which will be lower than the market place. Then after the build is recovered we can remove that piece, and lower monthly price to the school.

Essam stated we would do that, and we actually are implementing that model for Manteno School District. In the upcoming E-Rate season we well be looking at which locations are close to the ICN Network and offering that solution to those Schools, School Districts and Libraries, and particularly those that are still connected via T1.

Herb-NIU- Does the state have money to carry a loan for five years or is there a mechanism that we can do that?

The State has a level of funding to enable that to happen. It was just done at Manteno and Lori can possibly speak to how much we would have available, and there is a certain level of funding available to do that.

The exact amount varies from year to year. Our operating budget is within, what is called the Communication Revolving Fund. It has all of the states Telecommunications and Network Services. It is a \$100,000,000 a year fund close in and out, money in and out, and the ICN as a service break even over the long run. We can ebb-n-flow a little bit from year to year. Ideally we want to break even from year to year. Out of that fund, those different services, and different projects it creates in a way revenue that can generate new initiatives, self-fund new initiatives, and recover those costs over five years. We have to manage it with what other projects here at CMS, and Telecommunications that we have going on, and what other initiatives may be vying for those dollars.

Sometimes there are good things that happen being in a large revolving fund and this is one of them. We are also talking with some private entities that have met with us and want to do public-private partnerships, and where they would be bringing the private dollars to the table. We're very interested in that as an option as well.

Herb stated in that option, ultimately the state doesn't own the plant and that might be unless you can word it differently.

Lori stated that we would and we're talking with them where there would be some conditions. They would give up the fiber plant to the schools and they would own the other fiber plant going into the community.

Essam stated that would be like a shed type scenario where we would own a certain number of strands to the school, and the provider benefits by having strands for other business, residences and other locations in the community.

#### Slide 9

- We're looking at locations that are within 1000 feet of the ICN fiber. There are currently 81 customers, and we are looking to develop a cookie cutter approach for permitting, engineering, and fiber build to connect these customers to the ICN network.
- We are also looking at bundling free services with sale of the broadband connections, and on the next slides we have talked to these services.

# Page 10 and 11

We have two proposals of pricing and service proposals that are being presented, and are up for discussion.

The first on slide 10 is where there a different levels of public internet access and in the bottom box you can see egress service level in Mb/s. We will also offer to the customer On-Net Service Level of 5X the public internet. The pricing hasn't changed at the low bandwidth level but we have reduced it down to \$6 per Meg at the high bandwidth level.

With this model we are communicating to the end customer the fact that they are getting a certain level of bandwidth to the public internet plus a certain level of On-Net bandwidth. We would need to communicate to customers the benefit of that, what is available to them by the On-Net network, and what is unavailable by the On-Net network will be available by the public internet.

On the top of page 10 is the current pricing.

# Page 11

This is a similar model with the exception that we have hidden the fact that the customer is getting more On-Net bandwidth, and it was managed internally. We'll manage internally the fact that there is a lot of traffic from about 50% of schools traffic we found stays On-Net; combining that with over subscription that we would do by access the public internet, and we have abated pricing here for certain public internet access.

Jim stated he wants to hear from other members, but the group he's most concerned about not being able to or not being willing to pay for what they are currently getting for free. They are the school districts that are really having a hard time financially; which are a lot of districts here in Illinois, but also that do not have the technical expertise to appreciate, and understand the benefits. For example, the over subscription of the Off-Net bandwidth, the ability it gives them to control the denial of service attacks, and those things for our constituents, and those other key benefits that they receive. For a large number of districts that do not have that level of technological expertise in house, or technological expertise doesn't get listened to in house, this pricing scenario would make more sense.

The more skilled and higher technical districts would probably handle the earlier budget better because they would self-manage their On-Net and Off-Net bandwidth in a way that they could maximize the advantage they would take of the pricing.

Could we offer both pricing scenarios or would that be too confusing? This pricing scenario would make a lot easier sale than a lot of districts.

Jim asks what the members on the call in the K-12 districts think.

Herb at NIU stated that although he is not a K-12, but to keep in mind that there is still an E-rate that will discount this heavily for a lot of schools. Not that it makes the hardship any easier, but with some of the harder schools that are hit; you would have 70%, 80% and 90% E-rate ability out there. That helps take this cost that states this is a number, but the number can be drastically reduced through E-rate. Lori stated Herb is correct, and that these are pre E-rate discounted figures.

Essam stated his opinion is that if we have a customer and they leave the ICN network due to a \$140 a month charge for 10 Mb/s is that they are not leaving us because of the \$140 per month for 10 Mb/s, it is because of other reasons. Whether it is administrative reasons, ease of ordering, or a better sales pitch from someone else.

If someone wanted to buy a T1 are they going to buy 20 Meg or 2 Meg? On the proposal (slide 11) the base would be 20 Meg and the customer is getting a T1 level of service and they have 20 Meg available from ICN whether they use it or not. They would be paying a minimum of \$140 per month, and we won't be going lower than \$140 per month in terms of price point.

It does depend on how it is marketed and sold because a lot of the K-12 schools are already looking at the future with one-on-one computing, and the estimates of megabit per student. We're talking about running fiber through a facility; when a school needs more this is a cheap avenue for them to turn up more without a build cost. It is just increasing their amount and billing for that amount. There are no upfront charges that are significant moving forward if Herb is correct.

Lori stated these costs do not include the fiber build or the circuit. It is for the internet access only. In the model with Manteno where we build, it's almost two separate rates. You have one for the internet service; let's assume everyone pays that regardless of how you get to us; then if we bill the circuit under various different models there are separate costs for the access.

We're securing their future, nonetheless by putting the fiber there, having the trusted partner the State of Illinois, having it there and keeping it there, and keeping their costs low in the future.

Also on slide 11 are the bundled services at no charge to the members.

- IP addressing
- Monitoring and Analysis
- Multicasting
- Standard BGP
- Configuring, QoS on Last Mile
- Connectivity Consultation
- Equipment Discounts
- Unlimited DNS Hosting

Also on this model we can introduce a membership fee which again can be a set fee per year or per month based on customer type or customer size.

#### Slide 12

We ran an estimate of revenue assumptions. We said primary customers now become paying customers. We also modeled what if 50% of the customers dropped, and then if 75% dropped.

- Assuming our primary customers today when we implement this model, all customers moving over, 50% moving over, and then 25% moving over.
- We introduce a membership fee of \$100 per month for non-primary customers and that would be State Agency customers.
- For primary customers we would waive the membership fee.
- Then we compared all customers to be paying at least \$140 per month and they will get the 10 Mb/s service whether they use it or not.

## Slide 13

This is the revenue for various take rates of our customers. The third line down is Public Customers.

- 100% is \$5.8 million
- 50% at \$2.9 million
- 25% at \$1.45 million in revenue.

That is taking the customers as of July 2014, moving them over to be paying customers, and putting a percentage take rate and that is the numbers you get.

The membership fee in the model we applied only to non-primary customers, so there is no change in State agencies. There are non-primary customers that don't get any free allocation because they were paying customers in the first place.

Lori stated that this model is not the final model; the dollar amounts are not the final dollar amounts. When you look at the revenue projections, we have to have 100% take rate to recoup the money. This exercise we did to find out if this is a model that works, and does it put us in the ball park. We want some reaction to the model because we have to go back and come up with a better model, and what we think is a good take rate. A best estimate on the take rate, conservative that we're going to generate the revenue, and based on that we have to go back and adjust the cost per Meg. Work it backward and forward until we think we land on a number that conservatively will generate the revenue.

We're looking at what do you think of the two options; the 5X On-Net, or go with a more simple model. What do you think of the reaction that will be from Higher Ed, K-12, Libraries, Museums and are we on the right track or you think that there's another model that we should pursue?

Brian-DeKalb, NIU-Fiber has been run to the University for 10 or 12 years now and they've always had their switch sit next to the ICN switch and it was a simple patch cable and the ICN just throttled it and was able to max out what they were given for free through their allotment from the ICN. We frequently use a lot of the DNS services from the ICN. Anymore they essentially gave their bandwidth to the full pool back at the NIU POP, and utilize the bandwidth we purchase from the NIU because of the cost. The amount they are able to purchase from them. Brian isn't sure as more and more people get fiber to the premise, He is not sure of the schools that have the fiber if they need the ICN other than for the other services. The bandwidth is there as a fallback should something go on. Maybe it needs to be the marketing of some of those services that are available, and utilized by districts such as his district. There are more districts like Brian's along with some smaller districts and because of their grant, and some of the other that were part of the BTOP grant, and they're not getting all of their bandwidth from the ICN anymore.

Lori states the customer base will shrink and that's not a bad thing. The landscape has changed and depending on where people are geographically; if they have access to local or some other type of network, and it provides the bandwidth they need the high speed, and reliability of what they need. One of the negative sides of the credit is how it goes into the pool which was intended to go to the pool, or you have people using the services, and not needing the bandwidth. The problem is that has a cost to us but there's no revenue being generate. The ICN is incurring a cost that other customers are bearing that cost. We think it will be a reduction in customer base because when people have to pay that is where you find out who really isn't using it.

Brian stated what the library there in DeKalb would need, more than possibly the ICN Network, is the ICN services to manage their DNS.

Jim asks Brian if he would like and additional item on the list which would state "X" number of dollars per month or per year. Brian said it makes sense, and it may keep people around that are bouncing back and forth between Charter, Comcast, Frontier and whatever fiber service or whatever is around.

We can take a look into it and also charging a fee. One of the reasons we talked about this last year is that we have schools and entities saying, I can get this for 50 cents or \$1.00 less per Meg if I go to another provider, but I want all of those services that I get from ICN. The notion was, but those costs are based into your per megabit rate and cost. What was found is people say they like it, but they weren't really willing to pay for it. We'll take a look at it and consider what the option of offering that as a service option only.

Our intent all along was that you had to be customer, in this case a paying customer, in order to receive those services. We have to protect our niche. Why are we so good or valuable and should we sell that service separately?

Jim stated on the other hand do we want our niche to be more and more the seller of bandwidth, or do we want to say it is providing telecommunication services or IP services to schools in which case schools can choose to pick IP services that are not just bandwidth but are other IP services if they like.

What are the thoughts of Higher Education?

Alan said they are getting their base bandwidth from ICN, and we're doing Comcast for additional bandwidth. We're not using a lot of ICN services that he knows of. Also Brian doesn't think the prices are out of line with what they're paying Comcast, and today doesn't see and issue with it. What was just discussed the idea of paying the \$100 a month membership fee could become plausible for all customers whether they are primary or non-primary. If you want the additional 10 Meg you would pay and additional \$40 a month. That might resolve the other issue as well. Alan doesn't see this as a big problem and thinks the larger universities it might even be better for them, but he doesn't know what they're paying for bandwidth.

It may depend on their geography. Most of the customers we're talking about are not sitting within a cross connect throw from two of the largest providers for instance that are in DeKalb. There is no fiber around them, and they're waiting for the day that they can get 10 Meg. In the Northern Illinois area that is not the case. The poor districts are able to acquire bandwidth at what Southern Illinois would consider to be fantastic rates.

The question is we purchase bandwidth above and beyond the allocation too. Does that raise the cost or keep it the same? How does that model fit into it? Frank stated from the numbers

her saw, he would suspect you're going to get the same amount or more for less than what you are paying today.

With this model if there are less people using the network the cost is going to be higher. This is an exercise of trying to figure out what that is. This model assumes too unrealistic of a take rate. We are going to have to go into that 50% bucket. These rates as presented in the table (page 13) are going to have to increase and by how much we don't know. It is interesting hearing some of the reaction, and it tells Lori that it is definitely going to be at least a 50% reduction in the customer base.

Herb with NIU was asked how many schools connected to IFiber are buying their additional bandwidth through ICN and how many through NIU. Herb stated they have different package levels so when libraries came on NIU has what is called a small business office, and there are 20 of those, and \$25 per month to be in a pooled service of 100 Meg. It is an inexpensive cost, and as Lori was saying they don't have any application program. We want them on and we gave a low cost pool rate to have them on. When you count schools it is head end schools and Herb doesn't know the metrics at that moment to comment on it. A lot of folks did stay with ICN because of the quality of service, and what they like. It was as 50-50 split that some went with ICN and some with NIU Net as well.

Herb stated that there are 27 schools in the IFiber region, and that's school districts who picked up NIU Net and Herb was not sure of out of how many public entities are, but about 250 in IFiber that took a lit service. Out of those public entities we have about 52 that took NIU Net services. Then there is a dark fiber which is another 200, and these are schools that now have an interconnection between schools.

Alan stated that those would be numbers that it would be interesting to get as you start figuring the take rate and see what occurred in other areas that the schools have had an option.

Brandon asked what the membership fee gives him. Since he is a primary it is waived, but if he is not a primary what does he get. He will get the ICN services and not too long ago was implemented a rate that if you wanted Quality of Service you would pay extra, IP addressing and monitory analysis some of that you get free today. The other fees that we charge and now will give you for free are DNS and BGP configurations. It was also the idea of having the bandwidth multiplier On-Net. You get to take advantage of the multiplier and it is basically doubling your bandwidth. Even though we are offering 5X the effective benefit today is about 50 percent.

With the Cloud becoming more popular you might see organizations taking advantage of that and throw their email or web services, etc. onto the cloud and maybe we'll see greater than 50% but right now we're On-Net.

Kirk stated they wanted to put the proposed model out and get feedback from it which has been very helpful.

The next item we're looking at taking a vote for approval to change the October meeting date and bump it up a couple of weeks in schedule. The main reason is it will allow the AET group to get together and have a couple of weeks prior to that next ICN Policy Committee Meeting and that way any feedback we get between now and the next meeting and even at the next meeting could all be factored into our discussion at the next Policy Committee Meeting in Mid-October.

Jim asks if anyone has any other issues or questions and if you could send them to Kirk to share with the rest of the group.

Jim asks to for a motion to reschedule the meeting on October 17<sup>th</sup> to October 3. Brian Tobin makes a motion and Raj Siddaraju seconds the motion. All were in favor and none opposed. The motion carried.

Jim asks for a motion to adjourn the meeting at 11:17 a.m. The motion to adjourn was made by Scott Armstrong and Brandon Gant seconds the motion. All were in favor and none opposed. The motion carried.