Bandwidth Trading: An Alternate Approach

A Study of Bandwidth Trading for Enterprises and Data Centers

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Summary:

Bandwidth trading is something that most everyone agrees is inevitable for managed transmission services, and further most agree that prerequisites for a thriving bandwidth trading market include such things as standard contracts across the industry, liquidity (meaning fungible assignable contracts), carrier interconnection, information about current and historical pricing records, and participation by the major carriers. Most analysis has focused on carrier-to-carrier trading, and this model has failed to live up to expectations for a number of reasons. The primary obstacle is that the carriers have been reluctant to participate, and to date it has been insurmountable. Second, carriers view commoditization of their services as a losing proposition from a financial perspective and antithesis to the current struggle to distinguish their products from those of their competitors. This view has been reinforced by heightened financial pressures that companies in the industry are currently experiencing. Additionally, the financial woes of some of the early leaders in bandwidth trading have set things back.

This paper examines a revised approach to the current carrier-to-carrier trading model. We propose breaking the necessary change process into smaller steps, rather than trying to achieve a fully dynamic bandwidth trading marketplace ab initio. The key stakeholders such as carriers, data centers, managed storage firms, and others need time to digest the necessary changes to their operating models required by a dynamic bandwidth trading environment. This stepped or phased approach demonstrates a more efficient trading model over the traditional carrier-to-user approach but not the full leap involved with a dynamic approach. A phased approach will lead to enhanced profit potential for all participants, and create opportunity for new intermediary businesses in the event the traditional suppliers do not actively participate. This will become apparent as the details of this revised business model are outlined in this paper. We have coined the term “Static Bandwidth Trading (SBT)” to label the model and which we feel could create the core building blocks for a scalable Dynamic Bandwidth Trading market in the future. The featured commodities discussed are managed dedicated optical data transmission services; OCn, GigE, or Fibre Channel.

Background:

Carrier Traditional Model:

The traditional telecommunications sales model is based on one-on-one (often lengthy) negotiations between parties for long term contracts. The minimum length of such a contract could be six months (although the minimum is usually one year), with maximums as high as twenty to twenty-five years. The cost to arrive at such a contract is very high, and this cost is factored into the pricing ultimately offered. Analysts have estimated that average Sales, General, and Administration (SG&A) expenses, account for about 25% of gross revenue for the Telecommunications industry.[1] This is an aggregate figure heavily weighted by the incumbent local exchange carriers (ILECs). The SG&A for many of the competitive local exchange carriers (CLECs) is generally much higher, in the 50-60% of gross revenue range[2], due to the fact that new sales make up a larger percentage of revenue for CLECs which are at an earlier stage of the company development lifecycle. Those figures are primarily driven by the one-on-one sales approach that all carriers use to close contracts.

The carriers currently employ a full time sales staff to solicit and close business. This is a fairly lucrative position; a good sales account manager can easily be paid a salary in excess of $100,000 per year. Added to that is a commission structure which pays anywhere from 40%-120% of the monthly charge of the sale. Behind the sales team are typically 3-5 support staff persons in functions like marketing, engineering, provisioning and other overhead which supports the acquisition of new revenue streams. It is easy to see how SG&A can grow to the 50-60% level. It is also easy to explain the carriers' reluctance to wholeheartedly participate in something (bandwidth trading) that they perceive will reduce revenues and leave SG&A expense levels intact.

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[1] S. Young, et al., "Trading Telecoms as a Commodity", Ovum, Ltd. 2001

[2] Annual reports of a sampling of large publicly traded CLECs

Today, cost containment for a carrier means limiting the number of times a facility is provisioned during its useful life. Carriers prefer long term contracts in order to

mitigate future revenue risk. While carriers have utilized bandwidth trading for unused/surplus facilities, they have done so in a deliberate manner using their standard practice for sales and provisioning. This is one of the reasons the bandwidth trading market has not been liquid to date. Long provisioning cycles hamper liquidity.

The SBT Model can be characterized as a "Provision Once, Sell Many" approach. Each time that a carrier provisions a circuit, a vast train of events take place. It is not a simple matter, often installation intervals are 3-6 month in duration. The primary reasons for this lengthy process are internal carrier procedures. In fact, 75-90% of the installation interval is not related to the actual physical implementation of the circuits. Equipment manufacturers have greatly improved their user-friendly interfaces to the point where an experienced technician can provision circuits in seconds or minutes. Emerging carriers have incorporated some of these provisioning enhancements into their services, while mostly continuing to use the traditional sales model.

Carrier processes and procedures are also very human centric, in that it takes many disciplines and people to provision a customer order. Anyone who has walked an order from customer signature to installation knows that the limiting factor is primarily process related. This should get more press than it has as an explanation of why bandwidth trading suffers from liquidity issues.

To recap:

- Carrier revenue is heavily dependent on the current one-to-one sales model
- Carriers have embedded processes that are extremely lengthy

These facts of the carrier environment are barriers to the implementation of bandwidth trading and should be understood as something that will not change overnight. Therefore, depending on carriers to drive the development of the bandwidth trading marketplace may not be the best approach.

Bandwidth Demand

The total worldwide marketplace revenue for managed transmission services is more than $50 billion per year according to Vertical Systems. Increasing the efficiency of transactions to a more reasonable level, which results in SG&A levels of less than 20% of revenue, would significantly improve the profitability of the entire industry. Improved transaction efficiency would enable lower unit pricing without an impact to profitability.

We consider that the development of a bandwidth marketplace will be driven in large part to the demand of mid-to-large scale enterprises with needs for intermittent (bursty) bandwidth connectivity. The current model for bandwidth trading does not take this into account, since most contracts sold reflect traditional contract duration terms, minimum of six months. Data bandwidth requirements usually have a daily cycle, which means there is a need for intermittent bandwidth.

End User Options:

Technologies such as IP, Frame Relay, or ATM are shared resource (sometimes called “cloud-based”) technologies which allow for unused, shared capacity to be utilized by any user who needs it, and were an early cost compromise solution to this issue. The word “compromise” is used because customers would rather have dedicated resources when they need it, but couldn’t afford to pay for the oversized traditional circuit that would be needed to accommodate the peak demands. Figure 1 illustrates a typical data load pattern seen in diurnal enterprises. This enterprise has to make some hard choices in a traditional approach to this network demand. One, they could purchase a dedicated OC3 between the two locations, where most of the day the port bandwidth is not

required. Hence, the customer network is over-provisioned and is a very high cost option for the enterprise (shown in Figure 1).

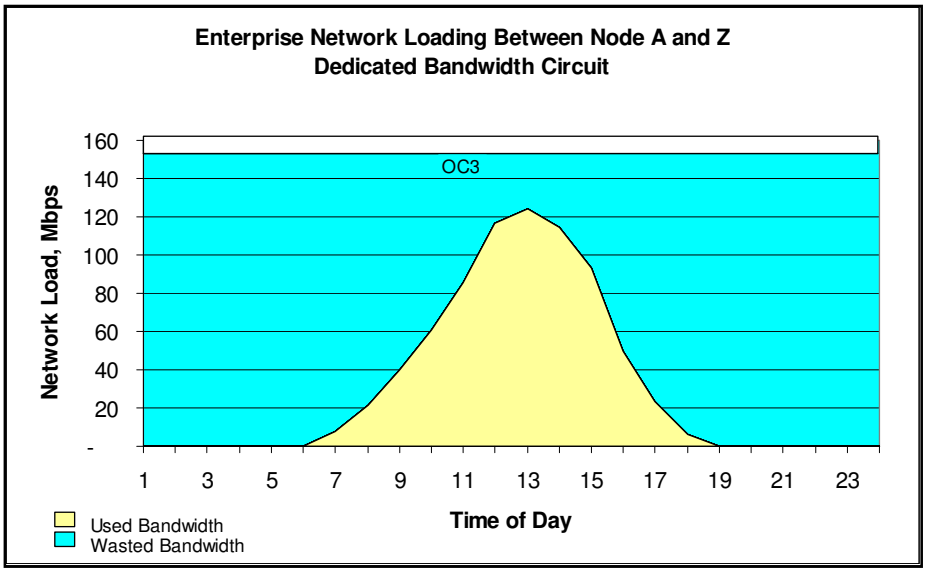

Figure 1: Traditional Dedicated Private Line

Alternatively, they could deploy an ATM OC3 (155 Mbps) connection with a committed information rate of 44 Mbps, capable of bursting to the full port rate of 155 Mbps. This allows for full coverage of their needs, but they are still wasting bandwidth in off-hours and dependent on availability above the committed information rate (CIR). If the burst capacity above the CIR was unavailable, enterprise network performance would suffer as the result. Figure 2 illustrates the bandwidth efficiency improvement of an ATM approach.

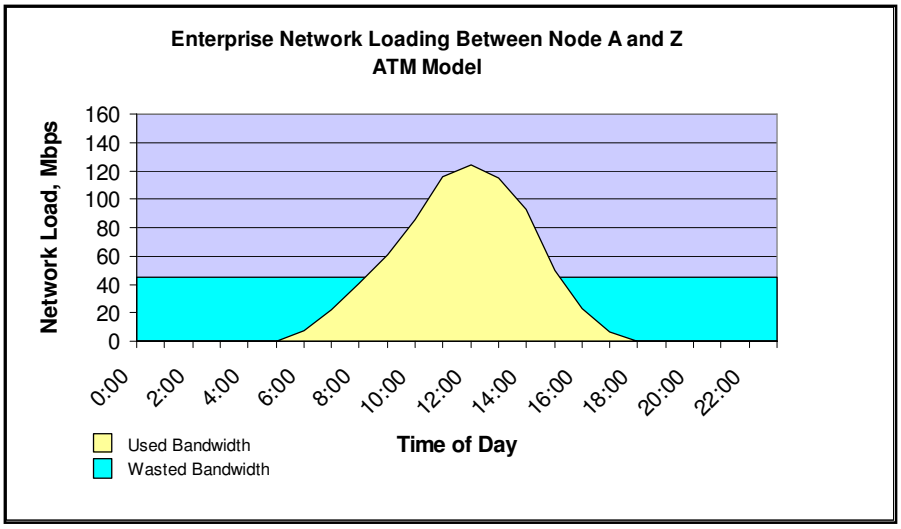

Figure 2: Asynchronous Transfer Mode (ATM) Service Model

In this scenario, from the hours of 9 AM to 4 PM additional bandwidth is available as network loading permits on a best efforts basis. The thought process is that dedicated bandwidth is provisioned which covers a good portion of the demand and reflects lower ongoing cash flow for the services. Note that on a per Mbps basis, ATM pricing is much higher than that of commercial private line. The difference is that private line requires purchase of the whole port bandwidth. [3]

The third option is one which lets an enterprise user turn up bandwidth as they need it, which is shown by Figure 3. This reduces very significantly the “wasted bandwidth” issue and provides dedicated facilities to the end user.

[3] Some partial rate circuit offerings exist but the bandwidth is typically fixed

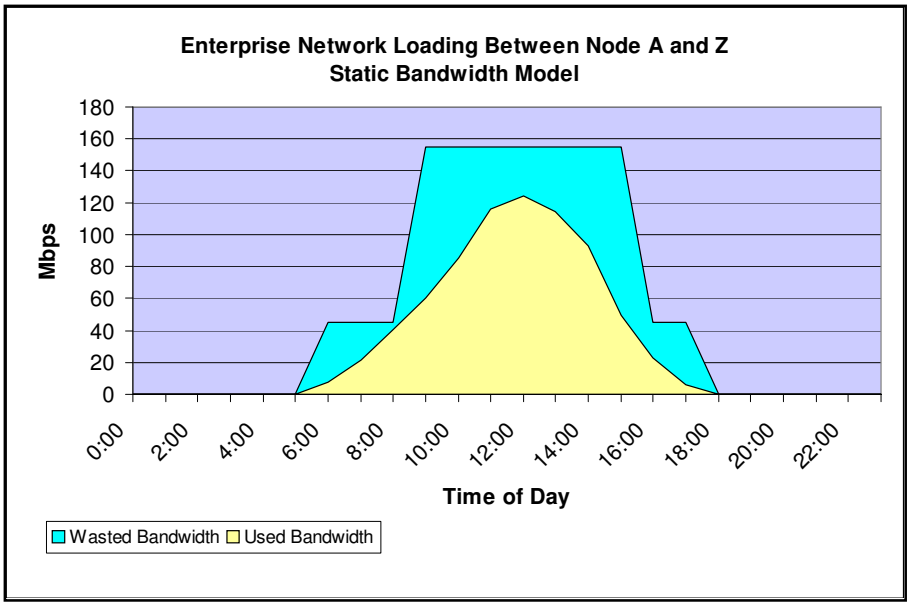

Figure 3: Static Bandwidth Trading Model

Note that the Static model has been shown in a simple fashion in this example and forms the basis for a much larger scale granular system.

Before we get into the details of the Static Bandwidth Trading Model, lets take a look at a user profile which is becoming more prevalent in the enterprise marketplace, namely that of a managed storage provider managing a remote backup service for multiple customers in multiple data centers. The simplest case involves a data center customer with a nightly backup to another data center and involves 400 GB of data transfer. The customer wants GigE, but needs only 1 hour per evening to accomplish the task. Figure 4 shows the bandwidth usage model of this application if provisioned under the classic dedicated GigE scenario. This is perhaps the easiest identifiable market segment that will realize tremendous efficiencies under the new approach.

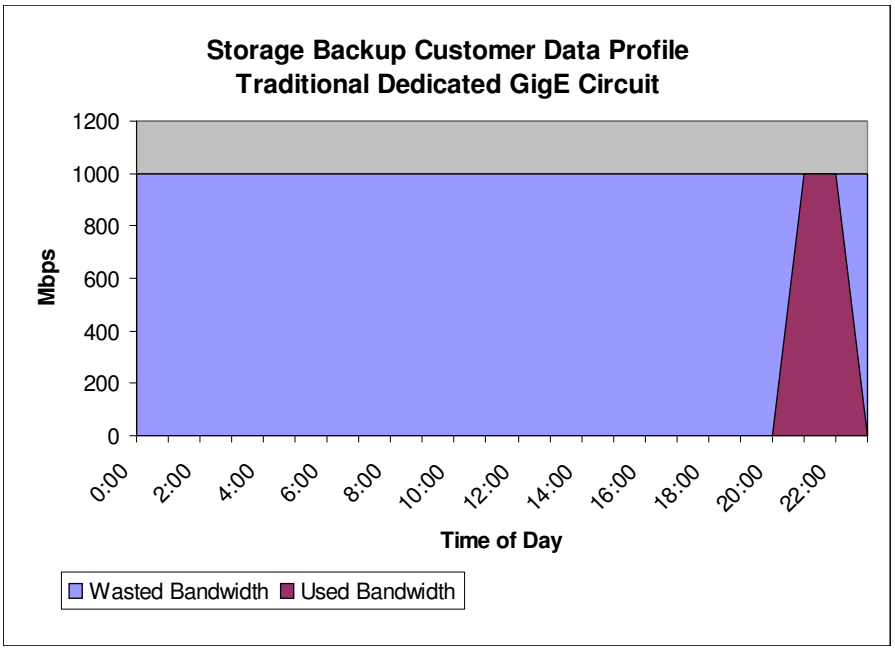

Figure 4: Traditional Dedicated GigE Transport

Today there are service providers who offer a shared IP Ethernet approach to reduce costs for end users. However, there have been issues with regard to data security and, where encrypted tunneling is deployed, data throughput. Dedicated facilities provide the best value for moving large amounts of data in the shortest guaranteed timeframe.

Static Bandwidth Trading Model:

The Static Bandwidth Trading Model is based upon permanent (or long term) communication facilities between data centers. While this is similar to the approach taken by the existing pooling point providers, there are differences in the roles of the parties to the transactions. The reason we use the word “static”, is that the carriers would not have to dynamically provision their facilities for each new contract. A permanent static connection between data center nodes can serve many switched customers. We also believe this type of implementation will not exhibit a great deal of forward price variability until multiple transport providers enter the system. As additional

supply enters, market pricing will evolve into a liquid and scalable commodity capable of supporting a robust futures market. The reason additional suppliers will enter the market is demonstrated profitability, but initial implementation will likely involve one carrier's facilities, and the carrier may not be actively involved in the first iteration, until the concept is proven effective.

A simplified topology is shown in Figure 5 below.

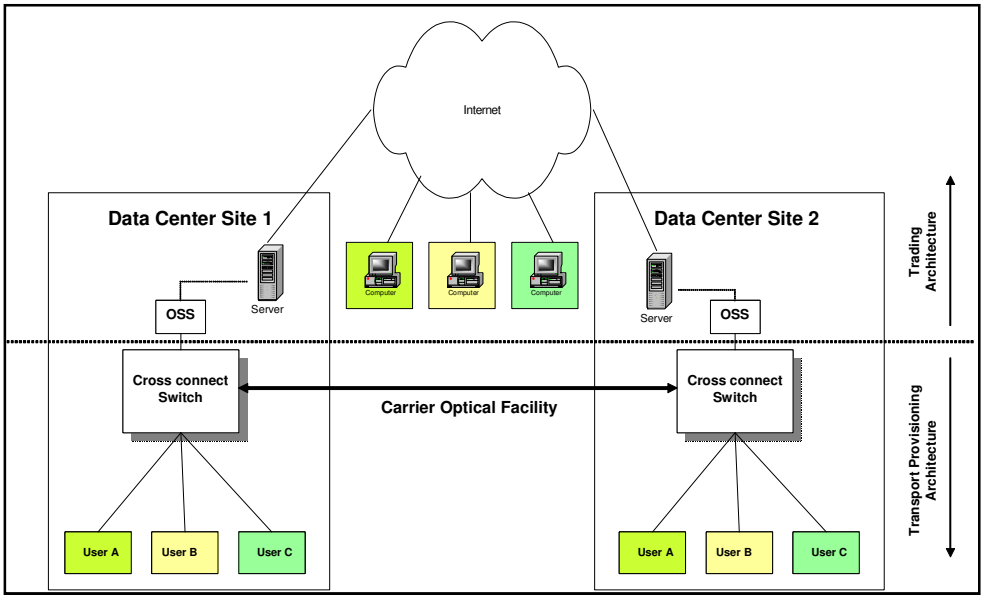

Figure 5: SBT Model Topology

The concept, in its simplest form, is that a carrier permanently provisions a high speed optical facility between two data centers in the same metropolitan area. The end users have servers/networks in both data centers which need intermittent connection. The data centers are owned/operated by the same corporate entity, for simplicity of analysis, and rent space to the end users.

The commodity will be a bandwidth contract for an interval of one specific hour during a specific day. The data center will deploy a master contract to which all active players are parties. A possible exception could be that the carrier may not be directly involved except as a provider of the long term contract for the circuit facility to the data center.

Table 1 delineates the roles and responsibilities of each party.

End Users	Data Centers	Carriers
• Lease ports in each data center • Purchase contracts as needed via web-based GUI reservation system	• Provide cross-connect switch in each data center and lease ports to users • Deploy OSS management system to manage ports (manual or automatic) • Manage End User credit risk • Host web-based GUI reservation system • Handle Reconciliations	• Provision circuit once • Maintain/monitor circuit • Set pricing for contracts with web-based GUI reservation system (If an active participant)

Table 1: Roles and Responsibilities Static Bandwidth Trading (SBT) Model

Carrier Responsibilities:

The underlying physical circuit between the data centers will be provisioned in advance of sale to end-users. The carrier will provision the circuit once, and sell it many times if they participate in the system. The carrier will agree to provide certain standard SLA commitments and monitor/maintain the circuit accordingly. If a carrier participates, they would assume the investment risk of provisioning the circuit, (the data center doesn't

contract for the circuit facility) and will set the rates for the hour long contracts via a web-based GUI reservation/ordering system maintained by the data center.

If the carrier does not elect to participate, they will sell one circuit on a 5 year contract to the data center. The carrier sole responsibility then would be to agree to provide certain SLA commitments and monitor/maintain the circuit accordingly.

Data Center Responsibilities:

The data center is responsible for investing in carrier grade cross connect switches, with the associated management platform which would allow the data center operations staff to execute port switching scripts simultaneously between locations. A fully optical cross connect would be ideal.

The data center also handles reconciliation, by billing and collecting from the users, and remitting collected transport usage revenue to the carrier (where applicable). The pricing is set via an administrative access to the web-based GUI reservation/ordering systems.

In the case where the data center has purchased the long term facility themselves, the data center would set pricing on the web GUI. Nothing more complicated than a standard conference room reservation system (mostly manual and inexpensive) would be needed to implement the system. The data center would include the sold transport services as a line item on their monthly billing statement to user-tenants.

The data center would also provision cross-connects from the customer's rack locations in the facility to the carrier grade cross connect switch location in the facility. The data center would charge monthly port fees to the users for enabling participation in the SBT system. The data center would not only realize significant revenue from deploying this

capability, but also use it as a differentiator to attract new data center tenants. The data center would have a master contract which covers the trading agreements as well as the underlying service level commitments which are a standard feature of the commodity. Nothing prevents data centers from expanding coverage to competing data centers, assuming all the implementing parties can agree on standards.

Clearly this approach can be implemented in a multitude of ways; we have performed pro forma business cases around several possibilities which illustrate the strengths of this first step towards dynamic bandwidth trading.

Case Study Analysis:

We will look at a series of cases with common characteristics as follows.

- One OC48 circuit deployment in a single metropolitan area[4]
- Each case is a standalone profit center to better assess performance
- The contract period is one hour increments

Case 1: The Carrier Traditional Approach.

The Carrier would negotiate a contract with the user for a minimum of a one year commitment. Assumptions in the baseline model are shown in Table 2.

[4] To simplify capital analysis we will deploy the full capacity of the SONET system

Carrier Traditional Approach				
MRC 2 Year Contract, $	14,000		**Results**	
Equipment Depreciation Period, years	7		5 Year IRR, %	36%
Fiber Depreciation Period, years	10		Gross Margin, avg%	75%
Operating Expenses % of Revenue	10%			
Maintenance Cost % of Revenue	10%			
Sales Support Factor %	250%			
G&A % of Revenue	18%			
Tax Rate	35%			
Loan Rate, %	13.50%			

Table 2: Case 1 Assumptions and Results

This model is based on the carrier being able to conclude two separate 2 year contracts with a user over the 5 year span of the business case. In order to capture fiber costs, we assume a 10 year IRU for the underlying fiber plant, which is paid by the carrier at the time of turning up the service. Operating and Maintenance costs are overstated in this type of implementation, barring a fiber cut, but lends conservatism to the model. Sales support costs are based on the number of persons who support each sales effort and is defined as one month's fee multiplied by that factor.

The General and Administrative (G&A) cost assumption is based on the standard of established incumbent carriers. Note that emerging carriers would experience higher rates. We assume all profits are taxed at a standalone rate as shown. In real life, taxes should be somewhat lower due to aggregation of loss making segments of the firms, plus most of the emerging carriers have yet to show a net profit. Financing is meant to reflect total cost of capital, again as though the opportunity was standalone. Figure 6 shows the cash flow relationships of this model.

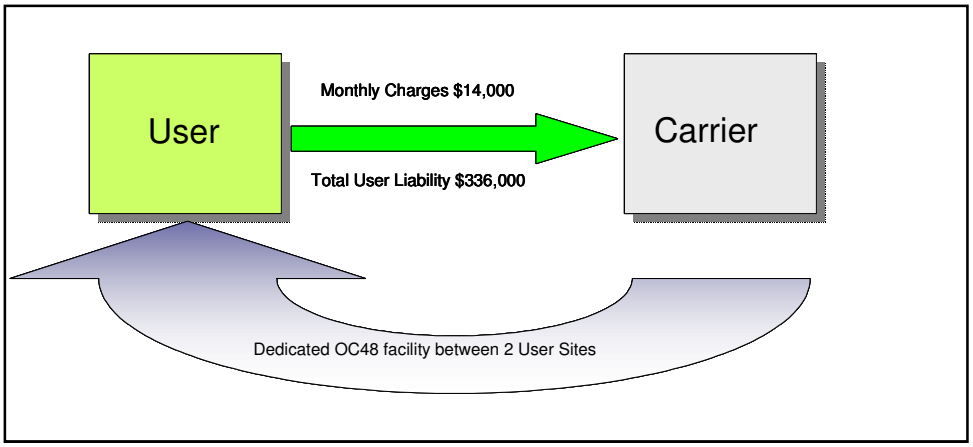

Figure 6: Traditional Carrier Cash Flow Relationship

Case 1 Result:

Experienced parties should see results that are recognizable, gross margins in the 75%+ range with five year IRR of 36%. That qualifies under most company's metrics as a desirable investment opportunity. The pro forma year-to-year financials are available in the appendices for reference. The carriers have clearly mitigated their investment risk by requirement of a long term contract. Figure 7 show some selected sensitivities of this business case.

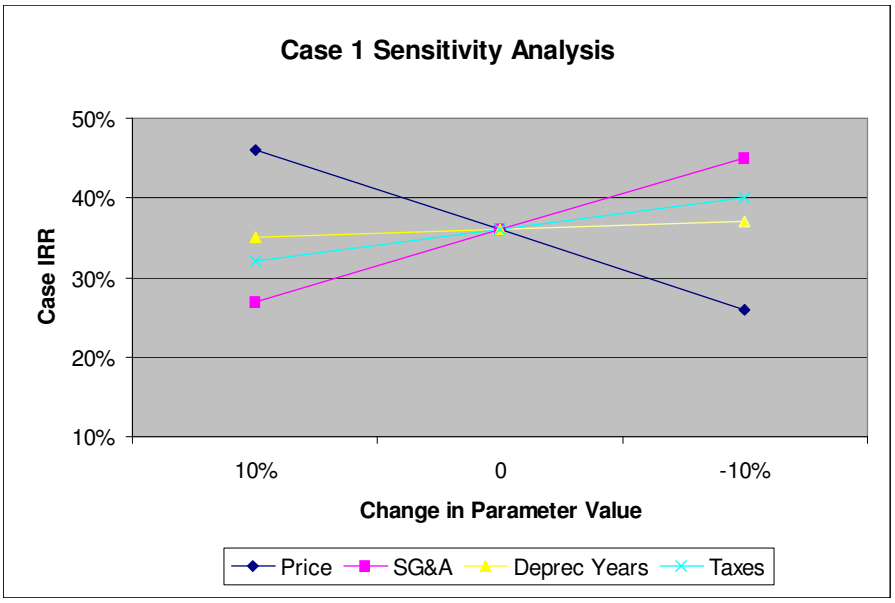

Figure 7: Case 1 Sensitivities

Case 2: Carrier SBT Approach

In Case 2, the carrier provisions the same circuit with terminations in each data center's cross connect switching platform. The carrier then offers the commodity as defined in the Master Contract. In this example we use one hour contract increments of OC48 connectivity between the A and Z locations. Table 3 details the assumption set.

Carrier Static Bandwidth Trading Approach				
Day (0600-1800) Service Charges/hour, avg $	$ 55.00		**Results**	
Night (1800-0600) Service Charges/hour, avg $	$ 40.00		5 Year IRR, %	60%
Hours available per month	730.5		Gross Margin, avg%	63%
Day Hours sold per month %	40%			
Night Hours sold per month %	35%		Blended Rate/Month	$ 13,149
Monthly Charge per xconnect port	$ 1,000			
Equipment Depreciation Period, years	7			
Fiber Depreciation Period, years	10			
Sales Support Factor %	50%			
Tax Rate	35%			
Loan Rate, %	13.50%			

Table 3: Case 2 Assumptions

In practice, the pricing for the service periods can float dramatically based on supply and demand. This example assumes that there is an average daytime (peak) price and an average nighttime (off-peak) price. Note that the hourly rate is significantly higher than the rate of the traditional model. This level (or higher) is supportable based on the improvements to user cash flow (shown in Cases 5 and 6).

In this case, the carrier sells 40% of the daylight hours and 35% of the night. That amounts to a 37.5% utilization rate for the circuit facility. Sales support for this model is dramatically reduced, as the carrier is not involved in the sale other than a price setting role. The data center management is hosting the reservation web GUI, selling ports (access to the SBT facility), and managing the switching function. G&A and the balance of the assumptions remain the same as Case 1.

Figure 8 details the modified cash flow relationships of the SBT model.

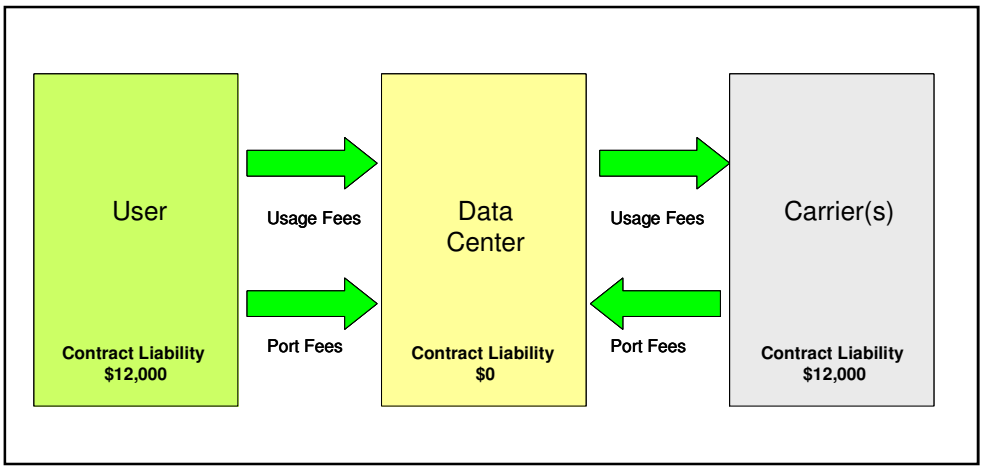

Figure 8: SBT Model Cash Flow Relationships (with Carrier)

Case 2 Results:

The trading approach yields a dramatic increase of return for the carrier from 36% to 60% over a five year period. The carrier does not have to utilize their provisioning processes more than once, and sales expense is dramatically reduced. Carriers could utilize a static pricing model or dynamic, without major transition process impacts usually associated with a pricing change.

The pro forma year-to-year financials are available in the appendices for reference. Figure 9 show some selected sensitivities of this case.

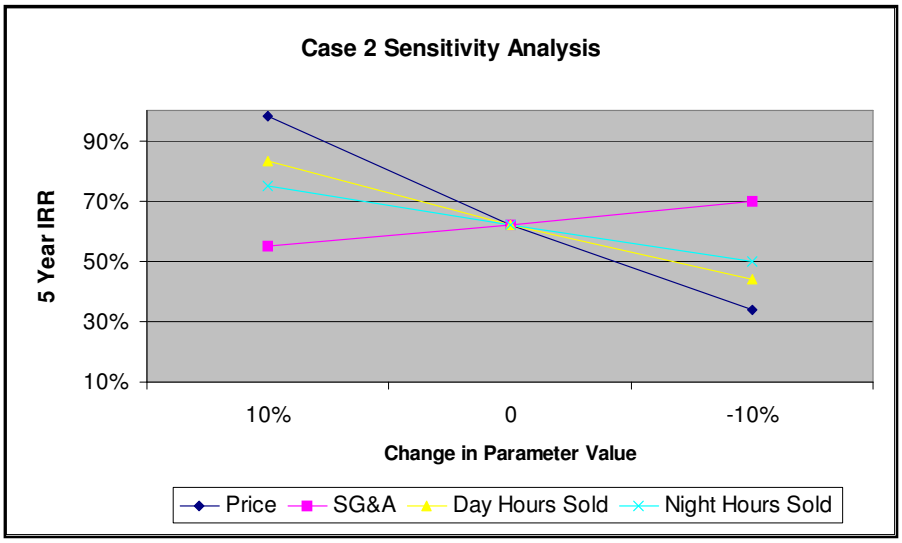

Figure 9: Case 2 Sensitivities

Case 3: Data Center (Pooling Point) Without Carrier

This case assumes that the carriers won't participate in the model, but would be happy to sell a long term contract for the facility. The carrier traditional business model is optimized when a long term contract is made and will typically offer discounts in excess of 25% under their nominal rates. Table 4 shows the assumption set of this case.

Data Center Trading Results (Where Carriers do not participate)				
OC48 MRC, 5 year Contract	$ 10,500		**Results**	
OC48 Port Charges per month	$ 1,000		5 Year IRR, %	49%
Average Ports per site leased	12		Gross Margin, avg%	62%
Operating Expenses % of Port Revenue	10%			
Maintenance Cost % of Port Revenue	5%			
Sales Expense % of Revenue	15%			
Day (0600-1800) Service Charges/hour, avg $	$ 55.00			
Night (1800-0600) Service Charges/hour, avg $	$ 40.00			
Hours available per month	730.5			
Day Hours sold per month %	40%			
Night Hours sold per month %	35%			
G&A % of Revenue	10%			
24x24 OC48 xconnects	300,000			

Table 4: Case 3 Assumptions

The data center has assumed the transport facility risk by committing to a 5 year contract with the carrier, total liability of $630,000. The data center also realizes revenue from port rentals to their tenants. Additional revenue, which is not considered, would be generated by the data center space rentals of new tenants seeking these types of bandwidth services.

The Sales expense is primarily driven by the maintenance of the bandwidth reservation web GUI hosting. The product (SBT) features would be included on the data center's normal sales collateral, as one of the reasons users would want to locate their server networks in that data center. Data centers have considerably lower G&A costs than carriers, and maintenance is required only for the cross connect portion of the system due to the carrier still having responsibility for the transport. All other aspects of the general model remain the same.

Figure 10 details the cash flow relationships where the Carrier does not participate in the SBT model.

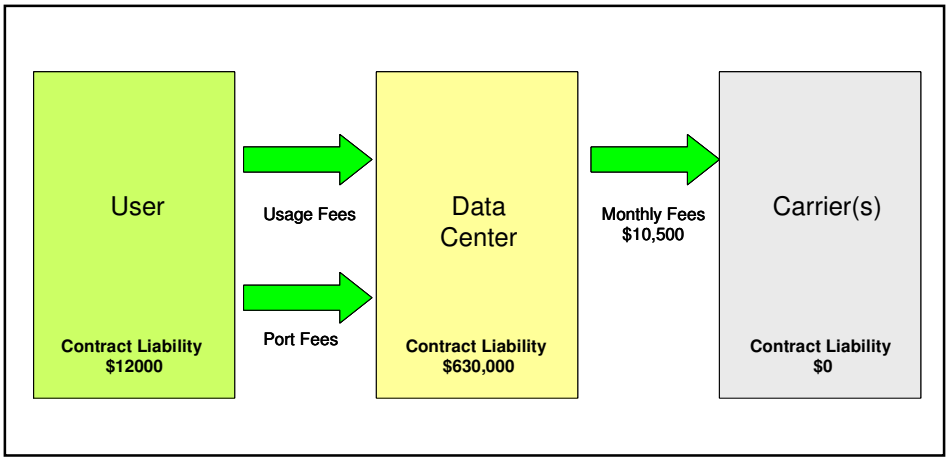

Figure 10: SBT Model Cash Flow Relationships (without carrier)

Case 3 Results:

The SBT service yields an attractive return for the data center of 49% IRR over a five year period. In this case, the data center, alone, has created the SBT model and assumed all of the investment risk. This would give large data centers a greater role in determining the future of bandwidth trading, since they would determine the entire system parameters.

The pro forma year-to-year financials are available in the appendices for reference. Figure 11 show some selected sensitivities of this case.

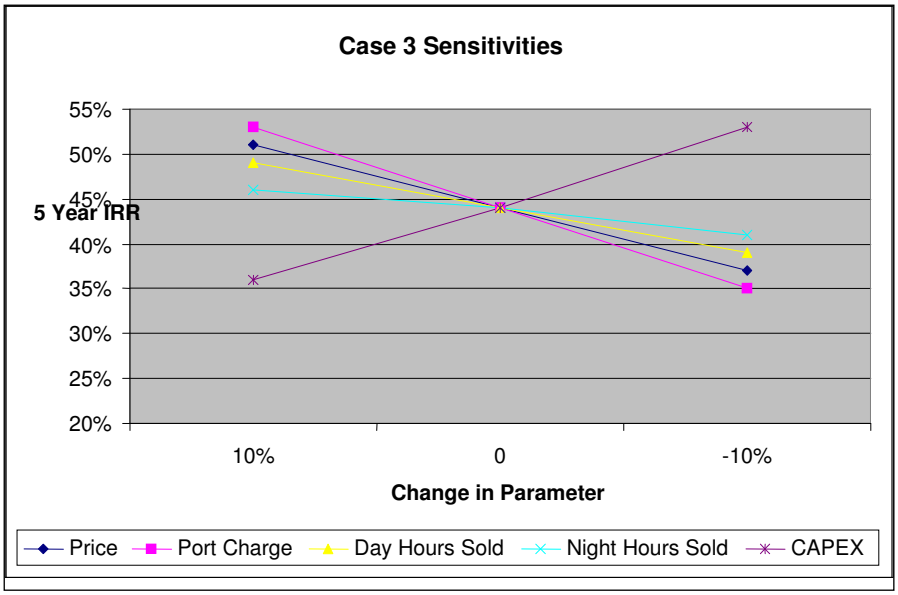

Figure 11: Case 3 Sensitivities

Case 4: Data Center (Pooling Point) With Carrier

This case assumes that the carriers will participate in the model, and will carry the investment risk associated with provisioning the circuit over the five year period. The results applicable to the carrier have been explored in Case 2 above. This case reflects the assumptions in Table 5 from the perspective of the data center.

Data Center Trading Results (Where Carriers do participate)				
OC48 MRC, 5 year Contract	$ -		**Results**	
OC48 Port Charges per month	$ 1,000		5 Year IRR, %	51%
Average Ports per site leased	12		Gross Margin, avg%	85%
Operating Expenses % of Port Revenue	10%			
Maintenance Cost % of Port Revenue	5%			
Sales Expense % of Revenue	15%			
Day (0600-1800) Service Charges/hour, avg $	$ -			
Night (1800-0600) Service Charges/hour, avg $	$ -			
Hours available per month	730.5			
Day Hours sold per month %	45%			
Night Hours sold per month %	35%			
G&A % of Revenue	10%			
24x24 OC48 xconnect	300,000			

Table 5: Case 4 Assumptions

In this case, no payments are due to the carrier for the underlying facility, although the data center is responsible to collect usage fees from their user-tenants for reconciliation to the carrier. All other elements of Case 3 remain the same.

Case 4 Results:

The SBT service yields an attractive return for the data center of 51% IRR over a five year period. That return is not significantly different than Case 3, however investment risk is mitigated. The data center has implemented the SBT model with the active participation of the carrier resulting in reduced investment risk. This model is the most desirable, because it sets the stage for transport facility provision by multiple carriers, and from there the liquid marketplace. However, Case 3 may be necessary at first proof of concept before carriers participate.

The pro forma year-to-year financials are available in the appendices for reference. Figure 12 details some selected sensitivities.

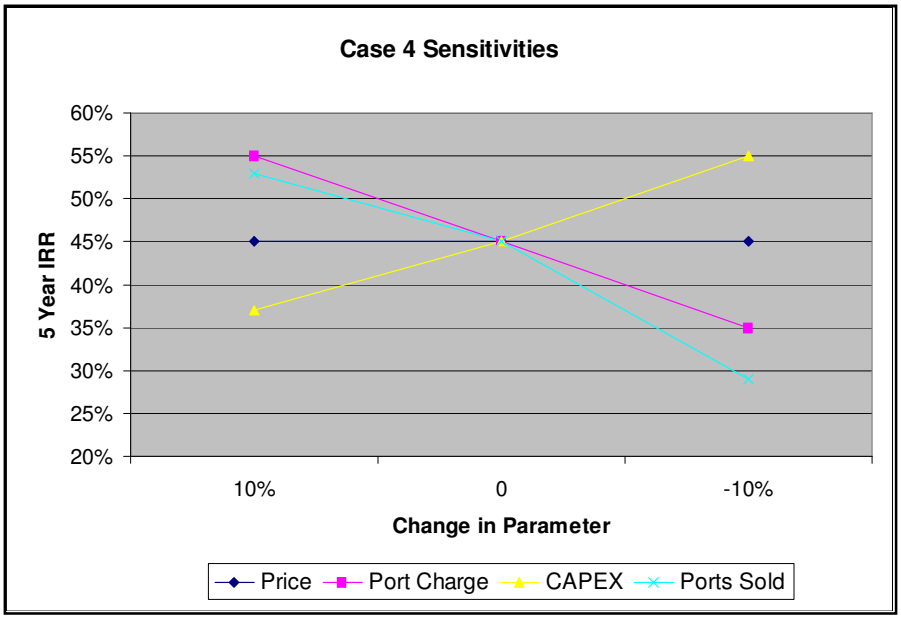

Figure 12: Case 4 Sensitivities

Case 5: Diurnal User

Why would a customer want to utilize a higher marginal cost source of bandwidth? The reasons will vary, but this case is based upon the usage pattern illustrated earlier in Figures 1, 2, and 3. Table 6 illustrates the costs associated with the user buying a two year contract from a carrier sized for peak bandwidth.

Diurnal User Traditional Approach	
OC-48 Monthly Cost	$ 14,000
Total Contract Commitment	$ 336,000
Hours available per month	730.5
Hours used per month (daytime 10 hours/day)	217.4
Effective Rate per Hour used	$ 64.40

Table 6: Key Elements Traditional Approach

This model is pretty simple, the bandwidth is purchased and available 24/7, the user actually uses it during the business days of the week, and most important, has to make a contract commitment of $336,000. That is a substantial liability and limits user's ability to attract additional financing. Compare that with the SBT model detailed in Table 7.

Diurnal User Trading Approach		
Monthly port charges per circuit/month	$ 2,000	
Total Contract Commitment (6 months ports)	$ 12,000	96%
Hours used per month (daytime 10 hours/day)	217.4	
Monthly Usage Charges	$ 11,957	
Effective Rate per Hour used	$ 64.20	0%

Table 7: Key Elements SBT Model

Using this model, the user rents ports from the data center on a six month contract with the data center. That enables the user to purchase one hour contracts for the bandwidth they need when they know they need it. For the purposes of this white paper, we have simplified this to one size facility, that being an OC48. There is no reason why, technically, they could not buy different size one hour contracts to suit their usage profile which would result in better cost efficiencies.

For approximately the same monthly outflow of cash, they receive all the bandwidth they actually need with one important difference. Under this model, the contract commitment

is one hour (and six months for the ports), meaning that the user reduces their contract liabilities for this service by 96% to $12,000! Furthermore, if you have such a customer, the earlier daytime hour sales could be largely amortized by this one customer, dramatically improving the data center or carrier's return. When you consider that this same concept can be applied to less expensive transport facilities such as GigE or wavelength products, showing an OC48 is the most capital intensive and thus conservative way of promoting the benefits of the SBT model.

Case 6: Data Storage Backup Application

The final case is based on the needs of the user needed to use a high capacity link, one hour per day off-peak. The classic carrier contract approach is shown in Table 8.

Storage User Traditional Approach	
GigE Monthly Cost	$ 10,000
Total Contract Commitment	$ 120,000
Hours available per month	730.5
Hours used per month (night 1 hours/day)	30.4
Effective Rate per Hour used	$ 328.54

Table 8: Storage User Traditional Gigabit Ethernet

This model is also simple, the bandwidth is purchased and available 24/7, the user actually uses it one hour per day, and most important, has to make a contract commitment of $120,000. (Customer can sign a 1 year contract with the carrier) That is also a substantial liability as in Case 5 and limits user's ability to attract additional financing. And the effective rate per hour is a staggering $328.54.

The user in this context is a managed storage service provider, who in turn bundles this transport with their product to their customer base. Compare that with the SBT model detailed in Table 9.

Storage User Trading Approach		
Monthly port charges per circuit/month	$ 2,000	
Total Contract Commitment (6 months)	$ 12,000	90%
Hours used per month (night 1 hours/day)	30.4	
Monthly Usage Charges	$ 1,218	
Total Monthly Charges	$ 3,218	
Effective Rate per Hour used	$ 105.71	68%

Table 9: Key Elements SBT Models

Using this model, the user rents ports from the data center on a six month contract with the data center. That enables the user to purchase one hour contracts for the bandwidth they need when they know they need it.

Under this model, the contract commitment is strictly port cost (six months for the ports), meaning that the user reduces their contract liabilities for this service by 90% to $12,000 from $120,000. Plus, their monthly rate, assuming the usage as shown, is reduced by $68% to $3,218 from $10,000. This type of service would dramatically change the business model of storage service providers for the better, and you would have to expect that they would be among the first adopters of this model.

Conclusion: A New Business Model

The Static Bandwidth Trading model is a means of starting the process of building a dynamic bandwidth trading marketplace. In order to get past the organizational issues of the large providers of bandwidth services, something like this model will have to be deployed and provide a proof of concept. That is largely due to first move risk aversion and fear of reduced returns.

Starting with one circuit deployed, one can easily envision a second, third, fourth circuit on the same route. The same goes for the carriers providing the circuit facilities. In this manual way, the underpinnings of a dynamic model can be deployed. Companies like LighTrade, BandX, and Arbinet have done substantial work on the backend of a trading floor, but pursued primarily the carrier market as a customer base, with mixed results. The transport technology exists today to deploy a dynamic model with equipment suppliers, such as Nortel Networks, Lucent, and Cisco, who have created intelligent provisioning systems for their optical transport platforms. Also, new companies like LighTrade, Arbinet, and Arbitor are busily pursuing system integration patents in anticipation of the day when provisioning is automatic. Until that time, Static Bandwidth Trading provides a means to create a sustainable revenue base for bandwidth trading today and a differentiated product offering for data centers.

Even the longest journey begins with one step. The data center industry should take that step, with or without carrier participation. The managed data storage industry should lobby the data centers to implement such a system as it will dramatically improve their viability.

Appendices 1-4

Carrier Traditional Model
OC48 2x2 year Contracts

Revenue Statement	Year 1	Year 2	Year 3	Year 4	Year 5
Operating Revenue					
Service Revenue	168,000	168,000	-	168,000	168,000
Operating Expenses	16,800	16,800	16,800	16,800	16,800
Maintenance Expense	16,800	16,800	16,800	16,800	16,800
Operating Income	134,400	134,400	(33,600)	134,400	134,400
Sales Expense	35,000	-	-	35,000	-
G&A	30,240	30,240	30,240	30,240	30,240
EBITDA	69,160	104,160	(63,840)	69,160	104,160
Depreciation/Accrual	13,429	13,429	13,429	13,429	13,429
EBIT	55,731	90,731	(77,269)	55,731	90,731
Interest Expense	13,500	10,800	9,450	4,050	-
Taxes	14,781	27,976	-	-	20,911
Net Earnings	27,450	51,955	(86,719)	51,681	69,821

Cash Flow Statement	Year 1	Year 2	Year 3	Year 4	Year 5
Net Income	27,450	51,955	(86,719)	51,681	69,821
Increase in Receivables	(26,880)	-	26,880	(26,880)	-
Increase in Payables	5,040	-	-	-	-
Add Depreciation	13,429	13,429	13,429	13,429	13,429
Cash flow from Operating	19,039	65,384	(46,410)	38,230	83,250
Less Capital expenditures	(100,000)	-	-	-	-
Cash Flow from Operations & CAPEX	(80,961)	65,384	(46,410)	38,230	83,250
Total Cash Available from Operations	(80,961)	65,384	(46,410)	38,230	83,250
Cash from Financing Activities					
Debt					
Bank Loan/Bonds					
Proceeds	100,000	-	-	-	-
Repayment	-	20,000	10,000	40,000	30,000
Capitalized Interest	-	-	-	-	-
Change in debt balance	100,000	(20,000)	(10,000)	(40,000)	(30,000)
Debt Balance	100,000	80,000	70,000	30,000	-
Equity					
Common Stock	-	-	-	-	-
Cash flows from financing	100,000	(20,000)	(10,000)	(40,000)	(30,000)
Payment of dividends	-	-	-	-	-
Net cash flow from Financing	100,000	(20,000)	(10,000)	(40,000)	(30,000)
Change in cash balance	19,039	45,384	(56,410)	(1,770)	53,250
Cumulative Balance	19,039	64,423	8,013	6,243	59,493

Carrier Traditional Model
OC48 2x2 year Contracts

Balance Sheet	Year 1	Year 2	Year 3	Year 4	Year 5
Assets					
Cash/Equivalents	19,039	64,423	8,013	6,243	59,493
Receivables (16% Revenue)	26,880	26,880	-	26,880	26,880
Other	-	-	-	-	-
Short Term Assets	45,919	91,303	8,013	33,123	86,373
Gross Property, Plant and Equipment	100,000	100,000	100,000	100,000	100,000
Accumulated Depreciation	13,429	26,857	40,286	53,714	67,143
Net Property, Plant and Equipment	86,571	73,143	59,714	46,286	32,857
Intangibles/Licenses	-	-	-	-	-
Total Assets	132,490	164,446	67,727	79,409	119,230
Liabilities					
Payables (15% OpCost)	5,040	5,040	5,040	5,040	5,040
Other Short Term Debt	-	-	-	-	-
Short Term Debt	5,040	5,040	5,040	5,040	5,040
Long Term Debt	100,000	80,000	70,000	30,000	-
Shareholder Equity	-	-	-	-	-
Retained Earnings	27,450	79,406	(7,313)	44,369	114,190
Net Shareholder Equity	27,450	79,406	(7,313)	44,369	114,190
Total Liability	132,490	164,446	67,727	79,409	119,230

Carrier SBT Model
OC48 1 Hour Contracts

Revenue Statement	Year 1	Year 2	Year 3	Year 4	Year 5
Operating Revenue					
Service Revenue	157,788	157,788	157,788	157,788	157,788
Operating Expenses	16,800	16,800	16,800	16,800	16,800
Port Charges	24,000	24,000	24,000	24,000	24,000
Maintenance Expense	16,800	16,800	16,800	16,800	16,800
Operating Income	100,188	100,188	100,188	100,188	100,188
Sales Expense	6,575	6,575	6,575	6,575	6,575
G&A	30,240	30,240	30,240	30,240	30,240
EBITDA	63,374	63,374	63,374	63,374	63,374
Depreciation/Accrual	13,429	13,429	13,429	13,429	13,429
EBIT	49,945	49,945	49,945	49,945	49,945
Interest Expense	12,150	6,075	-	-	-
Taxes	13,228	15,354	17,481	17,481	17,481
Net Earnings	24,567	28,515	32,464	32,464	32,464

Cash Flow Statement	Year 1	Year 2	Year 3	Year 4	Year 5
Net Income	24,567	28,515	32,464	32,464	32,464
Increase in Receivables	(25,246)	-	-	-	-
Increase in Payables	6,120	-	-	-	-
Add Depreciation	13,429	13,429	13,429	13,429	13,429
Cash flow from Operating	18,869	41,944	45,893	45,893	45,893
Less Capital expenditures	(100,000)	-	-	-	-
Cash Flow from Operations & CAPEX	(81,131)	41,944	45,893	45,893	45,893
Total Cash Available from Operations	(81,131)	41,944	45,893	45,893	45,893
Cash from Financing Activities					
Debt					
Bank Loan/Bonds					
Proceeds	90,000	-	-	-	-
Repayment	-	45,000	45,000	-	-
Capitalized Interest	-	-	-	-	-
Change in debt balance	90,000	(45,000)	(45,000)	-	-
Debt Balance	90,000	45,000	-	-	-
Equity					
Common Stock	-	-	-	-	-
Cash flows from financing	90,000	(45,000)	(45,000)	-	-
Payment of dividends	-	-	-	-	-
Net cash flow from Financing	90,000	(45,000)	(45,000)	-	-
Change in cash balance	8,869	(3,056)	893	45,893	45,893
Cumulative Balance	8,869	5,813	6,706	52,599	98,492

Carrier SBT Model
OC48 1 Hour Contracts

Balance Sheet	Year 1	Year 2	Year 3	Year 4	Year 5
Assets					
Cash/Equivalents	8,869	5,813	6,706	52,599	98,492
Receivables (16% Revenue)	25,246	25,246	25,246	25,246	25,246
Other	-	-	-	-	-
Short Term Assets	34,115	31,059	31,952	77,845	123,738
Gross Property, Plant and Equipment	100,000	100,000	100,000	100,000	100,000
Accumulated Depreciation	13,429	26,857	40,286	53,714	67,143
Net Property, Plant and Equipment	86,571	73,143	59,714	46,286	32,857
Intangibles/Licenses	-	-	-	-	-
Total Assets	120,687	104,202	91,666	124,131	156,595
Liabilities					
Payables (15% OpCost)	6,120	6,120	6,120	6,120	6,120
Other Short Term Debt	-	-	-	-	-
Short Term Debt	6,120	6,120	6,120	6,120	6,120
Long Term Debt	90,000	45,000	-	-	-
Shareholder Equity	-	-	-	-	-
Retained Earnings	24,567	53,082	85,546	118,011	150,475
Net Shareholder Equity	24,567	53,082	85,546	118,011	150,475
Total Liability	120,687	104,202	91,666	124,131	156,595

Data Center SBT Model
Carrier Not Participating

	Year 1	Year 2	Year 3	Year 4	Year 5
Operating Revenue					
Service Revenue	157,788	157,788	157,788	157,788	157,788
Port Rentals	288,000	288,000	288,000	288,000	288,000
Gross Revenue	445,788	445,788	445,788	445,788	445,788
Expenses					
OC48 Circuit Lease	126,000	126,000	126,000	126,000	126,000
Operating Expenses	28,800	28,800	28,800	28,800	28,800
Maintenance Expense	14,400	14,400	14,400	14,400	14,400
Operating Expenses	169,200	169,200	169,200	169,200	169,200
Operating Income	276,588	276,588	276,588	276,588	276,588
Sales Expense	66,868	66,868	66,868	66,868	66,868
G&A	28,800	28,800	28,800	28,800	28,800
EBITDA	180,920	180,920	180,920	180,920	180,920
Depreciation/Accrual	47,143	47,143	47,143	47,143	47,143
EBIT	133,777	133,777	133,777	133,777	133,777
Interest Expense	29,700	9,450	-	-	-
Taxes	36,427	43,514	46,822	46,822	46,822
Net Earnings	67,650	80,813	86,955	86,955	86,955

	Year 1	Year 2	Year 3	Year 4	Year 5
Net Income	67,650	80,813	86,955	86,955	86,955
Increase in Receivables	(25,246)	-	-	-	-
Increase in Payables	66,868	-	-	-	-
Add Depreciation	47,143	47,143	47,143	47,143	47,143
Cash flow from Operating	156,415	127,955	134,098	134,098	134,098
Less Capital expenditures	(330,000)	-	-	-	-
Cash Flow from Operations & CAP	(173,585)	127,955	134,098	134,098	134,098
Total Cash Available from Operatio	(173,585)	127,955	134,098	134,098	134,098
Cash from Financing Activities					
Debt					
Bank Loan/Bonds					
Proceeds	220,000	-	-	-	-
Repayment	-	150,000	70,000	-	-
Capitalized Interest	-	-	-	-	-
Change in debt balance	220,000	(150,000)	(70,000)	-	-
Debt Balance	220,000	70,000	-	-	-
Equity					
Common Stock	-	-	-	-	-
Cash flows from financing	220,000	(150,000)	(70,000)	-	-
Payment of dividends	-	-	-	-	-
Net cash flow from Financing	220,000	(150,000)	(70,000)	-	-
Change in cash balance	46,415	(22,045)	64,098	134,098	134,098
Cumulative Balance	46,415	24,370	88,468	222,566	356,664

Data Center SBT Model
Carrier Not Participating

	Year 1	Year 2	Year 3	Year 4	Year 5
Assets					
Cash/Equivalents	46,415	24,370	88,468	222,566	356,664
Receivables (16% Revenue)	25,246	25,246	25,246	25,246	25,246
Other	-	-	-	-	-
Short Term Assets	71,661	49,616	113,714	247,812	381,910
Gross Property, Plant and Equipment	330,000	330,000	330,000	330,000	330,000
Accumulated Depreciation	47,143	94,286	141,429	188,571	235,714
Net Property, Plant and Equipment	282,857	235,714	188,571	141,429	94,286
Intangibles/Licenses	-	-	-	-	-
Total Assets	354,518	285,331	302,286	389,241	476,196
Liabilities					
Payables (15% OpCost)	66,868	66,868	66,868	66,868	66,868
Other Short Term Debt	-	-	-	-	-
Short Term Debt	66,868	66,868	66,868	66,868	66,868
Long Term Debt	220,000	70,000	-	-	-
Shareholder Equity	-	-	-	-	-
Retained Earnings	67,650	148,463	235,418	322,373	409,328
Net Shareholder Equity	67,650	148,463	235,418	322,373	409,328
Total Liability	354,518	285,331	302,286	389,241	476,196

Data Center SBT Model
Carrier Participating

Revenue Statement	Year 1	Year 2	Year 3	Year 4	Year 5
Operating Revenue					
Service Revenue	-	-	-	-	-
Port Rentals	312,000	312,000	312,000	312,000	312,000
Gross Revenue	312,000	312,000	312,000	312,000	312,000
Expenses					
OC48 Circuit Lease	-	-	-	-	-
Operating Expenses	31,200	31,200	31,200	31,200	31,200
Maintenance Expense	15,600	15,600	15,600	15,600	15,600
Operating Expenses	46,800	46,800	46,800	46,800	46,800
Operating Income	265,200	265,200	265,200	265,200	265,200
Sales Expense	46,800	46,800	46,800	46,800	46,800
G&A	31,200	31,200	31,200	31,200	31,200
EBITDA	187,200	187,200	187,200	187,200	187,200
Depreciation/Accrual	47,143	47,143	47,143	47,143	47,143
EBIT	140,057	140,057	140,057	140,057	140,057
Interest Expense	32,400	14,850	-	-	-
Taxes	37,680	43,823	49,020	49,020	49,020
Net Earnings	69,977	81,385	91,037	91,037	91,037

Cash Flow Statement	Year 1	Year 2	Year 3	Year 4	Year 5
Net Income	69,977	81,385	91,037	91,037	91,037
Increase in Receivables	(49,920)	-	-	-	-
Increase in Payables	46,800	-	-	-	-
Add Depreciation	47,143	47,143	47,143	47,143	47,143
Cash flow from Operating	114,000	128,528	138,180	138,180	138,180
Less Capital expenditures	(330,000)	-	-	-	-
Cash Flow from Operations & CAP	(216,000)	128,528	138,180	138,180	138,180
Total Cash Available from Operatio	(216,000)	128,528	138,180	138,180	138,180
Cash from Financing Activities					
Debt					
Bank Loan/Bonds					
Proceeds	240,000	-	-	-	-
Repayment	-	130,000	110,000	-	-
Capitalized Interest	-	-	-	-	-
Change in debt balance	240,000	(130,000)	(110,000)	-	-
Debt Balance	240,000	110,000	-	-	-
Equity					
Common Stock	-	-	-	-	-
Cash flows from financing	240,000	(130,000)	(110,000)	-	-
Payment of dividends	-	-	-	-	-
Net cash flow from Financing	240,000	(130,000)	(110,000)	-	-
Change in cash balance	24,000	(1,473)	28,180	138,180	138,180
Cumulative Balance	24,000	22,528	50,708	188,888	327,068

Data Center SBT Model
Carrier Participating

Balance Sheet	Year 1	Year 2	Year 3	Year 4	Year 5
Assets					
Cash/Equivalents	24,000	22,528	50,708	188,888	327,068
Receivables (16% Revenue)	49,920	49,920	49,920	49,920	49,920
Other	-	-	-	-	-
Short Term Assets	73,920	72,448	100,628	238,808	376,988
Gross Property, Plant and Equipment	330,000	330,000	330,000	330,000	330,000
Accumulated Depreciation	47,143	94,286	141,429	188,571	235,714
Net Property, Plant and Equipment	282,857	235,714	188,571	141,429	94,286
Intangibles/Licenses	-	-	-	-	-
Total Assets	356,777	308,162	289,199	380,236	471,273
Liabilities					
Payables (15% OpCost)	46,800	46,800	46,800	46,800	46,800
Other Short Term Debt	-	-	-	-	-
Short Term Debt	46,800	46,800	46,800	46,800	46,800
Long Term Debt	240,000	110,000	-	-	-
Shareholder Equity	-	-	-	-	-
Retained Earnings	69,977	151,362	242,399	333,436	424,473
Net Shareholder Equity	69,977	151,362	242,399	333,436	424,473
Total Liability	356,777	308,162	289,199	380,236	471,273