

Date 1-20-2010

Addendum Number 23

From: Verizon Business Network Services Inc. on behalf of MCI Communications Services, Inc. d/b/a Verizon Business Services and Verizon Virginia Inc. Network Infrastructure and Services, 0506 Virginia Tech Blacksburg, Virginia 24061

Verizon Business Services  
22001 Loudoun County Parkway  
Ashburn, Virginia 20147

A proposal to amend contract number CC-0696-Bell-Atl is requested. Attached is Addendum No. 23 reflecting the change.

Type of Change	Service Requested	Purpose of Change
Change in Pricing	Internet Access	Pricing Change
Change in Pricing	ELAN (EMS)	Pricing Change
Change in Pricing	ELAN-RT	Pricing Change
Change in Pricing	ELAN-PAL	Pricing Change
Change in Pricing	EVPL	Pricing Change

Verizon is pleased to submit this proposal to amend the contract referenced above at the price and terms indicated in the attached document. Should the University wish to accept this proposal, please have your duly authorized representative sign in the space provided below and return this copy to the Verizon Representative at the address listed above.

All other terms and conditions of the contract shall remain in full force in effect except as modified herein.


Verizon Business Network Services Inc. on behalf of MCI Communications Services, Inc. d/b/a Verizon Business Services and Verizon Virginia Inc.

 2/09/2010  
Suleiman Hessami, Vice President Date

To: M. Dwight Shelton, Jr., VP for Finance and CFO  
210 Burruss Hall (0174)  
Blacksburg VA 24061

From: Judy Lilly, Associate VP, Network Infrastructure and Services (0506)

Attached are documents to amend the contract referenced above. This request has been reviewed and approved by the Office of the General Counsel. Please sign and return to me at the address above.

 1/20/10  
M. Dwight Shelton, Jr. VP Finance and CFO Date

 1/25/10  
Judy Lilly, Associate VP Date

cc: Purchasing

**BROADBAND NETWORK SERVICES  
AGREEMENT ADDENDUM**

**THIS ADDENDUM** No. 23 ("Addendum") and its Exhibits attached hereto modify the Broadband Network Services Agreement ("Agreement") dated June 12, 1996 by and between Virginia Polytechnic Institute and State University ("Virginia Tech") and Verizon Virginia, Inc. ("Contractor"). The Parties hereto agree and acknowledge Verizon Select Services Inc., ("VSSI"), is hereby an additional separate Party to this Agreement for the purposes of provisioning its respective Services set forth in this Addendum and extending the Agreement.

**WHEREAS**, this Addendum is being entered into pursuant to section 5.14 of the Agreement, the services in this Addendum are in addition to and support the existing Services contained in the Agreement. This Addendum will be held by Virginia Tech; and

**WHEREAS**, Section 5.14 of the Agreement permits the parties, to add new services to the Agreement; and

**WHEREAS**, Virginia Tech, Verizon Virginia, and any of Verizon Virginia's affiliates or subcontractors who agree to participate under the terms and conditions of this Addendum agree to provide the services contained herein to the Ordering Parties; and

**WHEREAS**, the Parties wish to work together to implement services that will serve Virginia's research institutions and other permitted Ordering Parties ; and

**WHEREAS**, the parties have agreed to a pricing change outlined in Exhibit 1, 2 and 3 of this Addendum No. 23.

**NOW, THEREFORE**, in consideration of the premises, mutual promises and covenants contained therein, the parties hereto agree as follows:

**CHANGES:**

The pricing for ELAN, ELAN-RT, ELAN-PAL, EvPL and Dedicated Internet services introduced in Addendum 19 is hereby amended and outlined in Exhibits 1, 2, and 3 to this Addendum. The pricing for the below services is effective on the first day of the second full billing cycle. All rights, duties, and obligations assumed there under Statements of Work unless superseded by a subsequent addendum are hereby transferred and are continued under this Addendum and it's Exhibits 1, 2, and 3 upon mutual agreement in writing by both Contractor and respective Ordering Parties affected by such Statements of Work.

**ORDER OF PRECEDENCE**

In the event of a conflict between the terms of this Addendum with regards to services provided by Verizon Business and the Agreement or any previous Addenda, the terms of this Addendum shall take precedence over the Agreement or any previous Addenda.

**PARTIES TO THIS ADDENDUM:**

This Addendum No. 23 shall become effective upon signature by Verizon and Virginia Tech. Authorized representatives of both parties shall acknowledge this Amendment by signing above in the space provided. It may be terminated by either party as provided in the Agreement, provided that the terms hereof shall continue after termination for any Statement of Work in effect on the date of termination. All other terms and conditions of the Agreement shall remain unchanged and in full force.

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**EXHIBIT 1:**

Note: Service Descriptions for the Ethernet services in Exhibit I (ELAN, ELAN-RT, EVPL, and PAL) have been copied from Addendum 19 and included in this Addendum as Attachment A

**ELAN Services**

<u>Service</u>	<u>3 Year Install</u>	<u>3 Year Term Monthly Charge</u>
10Mbps ELAN UNI, each	\$0	\$ 750
100Mbps ELAN UNI, each	\$0	\$1,300
1000Mbps ELAN UNI, each	\$0	\$2,200

**ELAN-RT Services**

<u>Service</u>	<u>3 year Install</u>	<u>3 Year Term Monthly Charge</u>
100Mbps ELAN-RT UNI, each, CIR=2M	\$0	\$1900
1000Mbps ELAN-RT UNI, each, CIR=10M	\$0	\$3000

**EVPL Premier UNI Services**

<u>Service</u>	<u>3 Year Install</u>	<u>3 Year Term Monthly Charge (f)</u>
10Mbps EVPL Premier UNI, each*	\$0	\$700
100Mbps EVPL Premier UNI, each*	\$0	\$900
1000Mbps EVPL Premier UNI, GigE each*	\$0	\$2000

\* EVPL Premier UNI must be ordered with EVPL Premier EVCs

**EVPL Premier EVC Rates**

<u>Bandwidth (Mbps)</u>	<u>NRC**</u>	<u>ERS-B</u>	<u>ERS-PD</u>	<u>ERS-RT</u>
1	\$0	\$35.00	\$15.00	\$40.00
2	\$0	\$35.00	\$30.00	\$80.00
3	\$0	\$35.00	\$45.00	\$120.00
4	\$0	\$35.00	\$60.00	\$160.00
5	\$0	\$35.00	\$75.00	\$200.00
6	\$0	\$70.00	\$90.00	\$240.00
7	\$0	\$70.00	\$105.00	\$280.00
8	\$0	\$70.00	\$120.00	\$320.00
9	\$0	\$70.00	\$135.00	\$360.00
10	\$0	\$70.00	\$150.00	\$400.00
20	\$0	\$200.00	\$300.00	\$800.00
30	\$0	\$350.00	\$450.00	\$1,100.00
40	\$0	\$350.00	\$600.00	\$1,300.00
50	\$0	\$350.00	\$750.00	\$1,500.00
60	\$0	\$400.00	\$900.00	\$1,700.00
70	\$0	\$400.00	\$1,050.00	\$1,900.00

80	\$0	\$435.00	\$1,200.00	\$2,100.00
90	\$0	\$435.00	\$1,350.00	\$2,300.00
100	\$0	\$435.00	\$1,500.00	\$2,500.00
200	\$0	\$750.00	\$1,650.00	
300	\$0	\$850.00	\$1,800.00	
400	\$0	\$850.00	\$1,950.00	
500	\$0	\$850.00	\$2,100.00	
600	\$0	\$890.00		
700	\$0	\$890.00		
800	\$0	\$925.00		
900	\$0	\$925.00		
1000	\$0	\$925.00		

**\*\*Initial EVC for every Premier UNI purchased does not require a NRC. EVCs installed or changed after the initial installation will carry a \$200.00 NRC.**

**ELAN PAL (Protected Access Line) Service**

<u>Service</u>	<u>3 Year Install</u>	<u>3 Year Term</u>
		<u>Monthly Charge</u>
100Mbps ELAN PAL UNI	\$0	\$2,500
1000Mbps ELAN PAL UNI	\$0	\$4,100

**INTER-OFFICE FACILITY (IOF) CHARGES:**

For Ethernet services listed above (ELAN, ELAN-RT, EVPL, PAL), there is no charge for the first twenty miles of Inter Office Facility (IOF) on a per circuit basis. Beyond twenty miles of IOF, the Ordering Party will be charged an additional \$100 per mile to extend the service. Service is subject to availability and normal special construction charges may apply.

**COTERMINOUS AGREEMENTS:**

Ethernet services listed above (ELAN, ELAN-RT, EVPL, PAL) (and any resultant mileage) added subsequent to an initial installation may be coterminous with a 36-Month Service Period of the same product, provided the addition is within the first sixteen (16) months of the contract term. After month sixteen (16) they can add with the rates listed above and pay the NRC of \$1,300.00. Special Construction charges will apply in addition to these rates if Special construction work is required.

**ORDER ELIBIBILITY:**

Ordering Parties who meet the following criteria are eligible for the Ethernet (ELAN, ELAN-RT, EVPL, PAL) pricing listed above:

1. Ordering Party with expired contracts.
2. New Ordering Party with new networks-contracts.
3. Ordering Party under existing term agreements who will agree to a new term agreement - contract; that is equal to or greater than existing contract.

**TERMINATION LIABILITY:**

For disconnects of the Ethernet services listed above (ELAN, ELAN-RT, EVPL, PAL) within the first twelve months of a two- or three- year term plan, the termination liability charge is equal to 100% of the applicable MRCs for the unexpired portion of the first twelve months and 50% of the applicable MRCs for the remainder of the plan.

For disconnects after the first twelve months of a two- or three-year term plan, the termination liability charge is equal to 50% of the applicable MRCs for the remainder of the plan.

Early termination charges will apply only to those rate elements under a term commitment period. If any rates for the service are increased during the term period, exclusive of any increase due to local, state, federal fees, taxes, or surcharges, the Ordering Party may terminate the service without incurring an early termination charge.

If the Ordering Party cancels a confirmed order under the Broadband Services Agreement prior to the in-service date, the Ordering Party shall reimburse Verizon for the documented capital costs incurred by Verizon to deploy facilities to the ordering party's installation address

**EXHIBIT 2:**

Note: Internet pricing listed in Exhibits 2 and 3 are pricing updates to Internet service previously described in Addendum 19. See Addendum 19 for a full service description of Verizon Internet service.

**1 Year VBS II Rates for Internet Dedicated Ethernet – Port Charges**

Bandwidth	Monthly Recurring Rate
50 Mb	\$2,340.00
100 Mb	\$3,240.00
200 Mb	\$5,280.00
300 Mb	\$7,200.00
400 Mb	\$9,120.00
500 Mb	\$10,800.00

**EXHIBIT 3:**

**3 Year VBS II Rates for Internet Dedicated Ethernet – Port Charges**

Bandwidth	Monthly Recurring Rate
50 Mb	\$1,950.00
100 Mb	\$2,700.00
200 Mb	\$4,400.00
300 Mb	\$6,000.00
400 Mb	\$7,600.00
500 Mb	\$9,000.00

**INTERNET ACCESS CHARGES:**

Ordering Party will receive a 10% fixed discount off the monthly recurring charges set forth in the Guide for Converged Ethernet Access. This discount is in lieu of all other rates, discounts, or promotions.

## ATTACHMENT A – Ethernet Service Descriptions

Switched Ethernet Services is a family of Ethernet based services offered by Verizon for metropolitan area networking. The family of services supports a multitude of customer requirements including point-to-multipoint with no quality of service, point-to-multipoint with some quality of service, point to point and full mesh topologies. The following section defines the various services offered under Verizon's Switched Ethernet Services (SES) portfolio.

### Ethernet Local Area Network (E-LAN)/Ethernet Multipoint Service (EMS) Service

E-LAN service is a fiber-based, metropolitan area LAN interconnecting service connecting customer locations together at native LAN speeds and Ethernet interfaces of 10, 100 and/or 1000 Mbps Ethernet. 10G Ethernet can be provided on an ICB basis. This is a point-to-multipoint Best Effort Layer 2 service.

Customer LANs are extended over a dedicated fiber loop into their local Verizon wire center, where Central Office (CO) based switches provide switching to circuits from other locations, or access to a shared backbone for transport to other local wire centers if necessary.

Through the use of port-based VLANs, each customer sees a "private" network or closed user group; and therefore can't communicate with other customer groups (referred to as domains).

E-LAN services are provided "where available" - the customer must have fiber to their premises, and must be within range of a Central Office that is E-LAN service-equipped. In order to provide this service, customers must purchase an ELAN User Network Interface (UNI) at each location where the service is required.

This service accepts untagged or tagged traffic, and also passes customer VLANs [802.3 Q (Q in Q)]

### Ethernet Local Area Network Real Time (ELANrt) Services

E-LAN-RT service is a fiber-based, metropolitan area LAN interconnecting service connecting customer locations together at native LAN speeds and Ethernet interfaces of 100 and/or 1000 Mbps Ethernet. This is a point-to-multipoint, Best Effort Layer 2 service with some real time capabilities.

ELAN-RT is designed for customer applications requiring low delay for *some* of their traffic. Customers who purchase ELAN-RT will have a percentage of their UNI configured to allow Real Time traffic. The remainder of the port is used for Basic traffic up to the UNI bandwidth limit. In order to provide this service, customers must purchase an ELAN-RT UNI at each location where the service is required. Customers who subscribe to a 100M UNI are provided a maximum of 2M for the Real Time traffic. Customers who subscribe to a 1000M UNI are provided a maximum of 10M for their Real Time Traffic. For example, if a customer has three locations they would like to network, they would need to purchase three UNIs.

#### Maximum RT traffic

- 100 Mbps UNI = 2 Mbps RT
- 1000 Mbps UNI = 10 Mbps RT

Service frames on ELAN-RT UNI's can be tagged or untagged – however, RT Frames must always be untagged. Any tagged Ethernet frames will be sent Basic class (best effort). RT traffic is passed when it is untagged, and the IP DiffServ Code Point Selector (DSCS) is either 4 or 5. Any untagged frames with DSCS other than 4 or 5, go Basic class.

### Ethernet Virtual Private Line (EVPL) Services:

EVPL services are a fiber-based, metropolitan area LAN interconnecting service connecting customer locations together at native LAN speeds and Ethernet interfaces of 100 and/or 1000 Mbps Ethernet. 10G Ethernet can be provided on an ICB basis.

Customer LANs are extended over a dedicated fiber loop into their local Verizon wire center, where Central Office (CO) based switches provide switching to circuits from other locations, or access to a shared backbone for transport to other local wire centers if necessary.

EVPL services are provided "where available" - the customer must have fiber to their premises, and must be within range of a Central Office that is EVPL service-equipped.

In order to purchase this service customers are required to (1) purchase Premier UNIs at all locations where the service is requested and (2) add one or more Ethernet Virtual Circuits (EVCs) to establish the Layer 2 path between the Premier UNIs. Each EVC is Class of Service (CoS) specific, allowing the customer to provide Basic, Priority Data, or Real Time EVCs between various locations.

### **Premier UNI**

A Premier UNI is the physical path between the Central Office based switch and the customer location. This service is provided over a fiber interface that Verizon terminates at the customer premises, handing to the customer a 100M and/or 1000M Interface.

### **Ethernet Virtual Circuits (EVC)**

One or more Ethernet Virtual Circuit is provisioned between two Premier UNIs. Each Class of Service (COS) enabled EVC can be provisioned in a variety of bandwidths increments to meet the customer's bandwidth and application requirements. EVPL requires a Premier UNI for all Class of Service (COS) prioritization. Each Premier UNI can have multiple EVCs. EVCs will be offered in various bandwidth increments and will allow for three service classes - Basic, Priority Data, and Real Time. This is a *router to router* service.

- **EVPL Basic (EVPL-B)** is designed for Customer data applications that require no guarantees of performance and where cost per Mbps is the key requirement. This service class is available with a Premier UNI Port With Access Line Connections at various bandwidths between 1 Mbps and 1000 Mbps. ERS-B is designed for Customer applications that do not require a CIR or low delay, where CIR equals 0 and EIR equals the number of Mbps of the selected ERS-B EVC service class.
- **EVPL Priority Data (EVPL-PD)** is designed for Customer data applications requiring guarantees of frame delivery performance EVPL-Real-time. This service class is available with a Premier UNI Port With Access Line Connections at various bandwidths between 1 Mbps and 500 Mbps. PD is designed for Customer applications which do not require low delay, but require a CIR, where the CIR equals the number of Mbps of the selected PD EVC service class and the EIR equals the number of Mbps of the selected PD EVC service class.
- **EVPL Real Time (EVPL-RT)** is designed for Customer applications which require a CIR and low delay for some portion of their traffic, where the CIR equals the number of Mbps of the selected RT EVC service class and the EIR equals 0.

The Customer will be required to identify the Basic, PD and RT Class of Service Ethernet frames by one of the following choices: setting the VLAN Class of Service (CoS) ID (for 802.1q tagged Ethernet Frames), or setting the DiffServ Code Point (DSCP) (for tagged or untagged Ethernet frames) or setting the VLAN ID (for tagged or untagged Ethernet frames), appropriately. Multiple EVCs are allowed per UNI. If an EVC is ordered with only one CoS, then ONLY the VLAN-ID tagging needs to be done, as we do not need to

distinguish between different CoS classes. Any EVC with the wrong VLAN ID, gets dropped. The EVPL EVC can support either one, two or three classes of service (CoS) simultaneously. When multiple CoS are ordered on one EVC, the customer must tag the UNI with Verizon-specified VLAN ID and mark the Ethernet p-bits to distinguish each class.

EVPL also supports untagged UNI, and here (like above) the traffic must be IP and the DSCS selects the CoS class. On an untagged UNI, tagged traffic is dropped. EVPL does not support 802.3Q.

For all EVCs, the ingress port (RX) of the EvPL service, receives traffic and classifies it into the different CoS profiles.. It then is policed based on CoS profile.

Real Time (RT) traffic cannot be oversubscribed. When the RT CIR is exceeded, the ingress port polices the excess traffic and discards the traffic.

For Priority Data (PD) traffic, both a Committed Information Rate (CIR) and Excess Information Rate (EIR) exists. When PD CIR is exceeded, the traffic gets marked as Discard Eligible and passed as long as long as the EIR is not surpassed. Traffic that surpasses the EIR rate is discarded.

#### PAL Service

Protected Access Line (available for ELAN Service Type Only) – Protected Access Lines are provisioned as a survivable service with an alternate fiber pair between the central office and the customer premises. Protected Access Lines, in most situations, allow recovery from a detected failure by moving the customer's data to an alternate fiber pair in approximately one second. Both fiber pairs must be served by the same central office and must have the same access speed. The second fiber pair will be routed over a diverse fiber path when possible. A monthly rate applies on a per line basis, based on the speed of the access connection (i.e., 100 MBPS or 1000 MBPS) as well as applicable Inter Office Facility (IOF) charges calculated on each set of fiber pairs. The Protected Access Line is offered on a three-year Term Commitment Plan.