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PRODUCT SUPPLEMENT – ETHERNET
to the
Master Service Agreement

This Product Supplement – Ethernet (this “Supplement”) is incorporated by reference into and made a part of that certain Master Service Agreement (including all attachments and incorporated documents, the “Agreement”) entered into between the Seller and the Buyer who signed the Master Service Agreement, as expressly provided therein and shall be effective as of the Effective Date defined in the Master Service Agreement. This Supplement provides additional terms and conditions governing the Ethernet Services.

1. SERVICE DESCRIPTIONS

(a) “Dedicated Ethernet Private Line” – shall mean a set of configurations where Buyer obtains dedicated point-to-point connections between two locations using Gigabit Ethernet protocols. The Point to Point Dedicated Ethernet Private Line Service has available capacity of 1 Megabit to 100 Gigabit services.

NOTE: The configurations above are subject to technical limitations, and Seller shall determine the actual allowed and available configurations. The Buyer understands that the bandwidth representations are only for Unicast Traffic, and Seller will not represent or guarantee the bandwidth for Multicast or Broadcast Traffic. Buyer agrees that it will utilize Layer 3 compliant (as implemented by Seller) devices in its use of any Dedicated Ethernet Private Line Services and that Buyer’s failure to use such Layer 3 compliant devices shall be deemed to be an Event of Default under Section 5(c) of the Master Service Agreement. Buyer agrees that if Buyer’s or its User’s equipment does, or Seller has a good faith reason to believe that Buyer’s or its User’s equipment will, cause instability on Seller’s Facilities, then for such Service, Seller shall be entitled to suspend its obligations with regard to such Service until Buyer’s or its User’s, as applicable, equipment conforms to Seller’s Facilities specifications.

(b) “Metro Ethernet Service” (“MES”) - shall mean a configuration where Buyer obtains ethernet frames between two or more end-points transparently through an Ethernet Virtual Circuit (“EVC”) analogous to Frame Relay. EVCs are used to provide bi-directional traffic for either point-to-point or hub and spoke connections.

<u>Service Description</u>	<u>Available CIR Capacity Levels</u>
Access Interface (AI)/User Network Interface (UNI)	1 Mbps to 100 Gbps
Ethernet Interconnect Interface (EII)/ Network to Network Interface (NNI)	1 Mbps to 100 Gbps
Ethernet Virtual Circuit (EVC) in combinations of EII to EII; EII to AI; and AI to AI	1 Mbps to 100 Gbps

Each EVC must be ordered with a specified Gold, Silver, or Bronze Class of Service (“CoS”) as set forth on the Service Order form. The specified CoS of an EVC will determine the service level that applies to the service in Section 4 of this Supplement. If for any reason a CoS designation is not made at the time of order, a default designation of Silver will be assigned.

MES shall be ordered as type EPL or EVPL and provided based on a combination of its component parts: Access Interface, Ethernet Interconnect Interface, and Ethernet Virtual Circuit. MES will be offered with both Gigabit Ethernet and 10/100 interfaces and a fixed Committed Access Rate. The provisioning information required shall be as set forth on the Service Order form. MES will also be offered at various Committed Access Rates as modified from time to time by Seller and shall be as set forth on the respective Service Order form. MES supports Jumbo Frames as defined in this Product Supplement and will support an MTU of 1532 bytes. Larger frame sizes may be supported on an individual case basis.

NOTE: The configurations above are subject to technical limitations, and Seller, in its sole discretion, shall determine the actual allowed and available configurations. The Available CIR Capacity Levels listed above are the provisioned level bandwidth; actual user bandwidth will be determined by the size of the Ethernet frames used by Buyer. Up to ten percent (10%) of the provisioned bandwidth may be used by Seller or Seller’s equipment for OAM. Buyer agrees that if Buyer’s or its User’s equipment does, or if Seller has a good faith reason to believe that Buyer’s or its User’s equipment will, cause instability on Seller’s Facilities, then for such Service, Seller shall be entitled to suspend its obligations with regard to such Service until Buyer’s or its User’s, as applicable, equipment conforms to Seller’s Facilities specifications or other reasonable directions.

(c) **Definitions:** Capitalized terms or phrases not defined in this Supplement shall have the definitions ascribed thereto in the Agreement. In addition to terms or phrases defined elsewhere in the Agreement or this Supplement, the following terms or phrases, where capitalized, shall be defined as follows:

“Access Interface” or “AI” shall mean a UNI including a physical point to point segment or portion of the MES which typically connects Buyer’s end location to Seller’s Ethernet cloud. This is typically used to connect to another AI or an EII and requires at least one EVC.

“Broadcast Traffic” shall mean Ethernet frames sent to all network devices on the link.

“Class of Service” (“CoS”) shall mean a specified designation for the provisioning and treatment of Ethernet frames by Seller in accordance Section 4.

“Client Protection” shall mean a four fiber handoff between Seller and Buyer where the equipment between the two parties shall be configured with a unidirectional linear protect scheme.

“Committed Information Rate” (“CIR”) shall mean that fixed level of bandwidth up to which the Buyer shall be entitled to use for the Service. CIR shall be measured in megabits/second (Mbps) and shall take into account overhead inherent with Ethernet technology including the preamble and inter-frame gap. Such rate shall incur a fixed recurring charge as set forth on the Service Order.

“Cross-Connect” shall mean the connection of Buyer’s Service to another service, either within Seller’s Facilities or from Seller’s Facilities to a Third Party’s Facilities. When available, the rate for a Cross-Connect is in addition to the standard charges and shall be calculated on an individual case basis and included on the Service Order. Prior to Seller’s interconnection of a Cross-Connect to a Third Party Facility, Buyer agrees to provide a letter of authorization from such third party authorizing the interconnection of the Cross-Connect. Buyer agrees that if such third party revokes its authorization, Seller is expressly authorized to disconnect such Cross-Connect from such Third Party’s Facilities without any notice by Seller to Buyer upon such revocation of authority.

“Dedicated Ethernet Private Line” or “Dedicated EPL” shall mean a set of configurations where Buyer obtains dedicated point-to-point connections between two locations on Seller’s Network Facilities or point-to-point connections aggregated to a single endpoint on Seller’s Network Facilities using Gigabit Ethernet protocols.

“Demarc Extension” or “Extended Demarc” shall mean a build to extend Services from Seller’s stated Point of Demarcation to Buyer’s Point of Demarcation. In most cases, Seller’s stated Point of Demarcation is the Incumbent Local Exchange Carriers’ (“ILEC”) minimum point of entry (“MPOE”). Non-Recurring Charges for any Demarc Extension will be on an individual case basis.

“Ethernet Circuit” or “Circuit” shall mean two end points on a UNI and/or NNI connected by an EVC.

“Ethernet Interconnect Interface” or “EII” shall mean that physical point to point segment or portion of the MES which typically connects Buyer’s centralized aggregation point to Seller’s Ethernet cloud. The EII is typically used in a hub and spoke architecture and can also be used in a point to point architecture. The EII does not include an EVC. An EII consists of a service multiplexed NNI whereby IEEE 802.1q vlan tags signify respective EVCs for directing Ethernet frames.

“Ethernet Private Line” or “EPL” shall mean an Ethernet Circuit over the MES consisting of a single EVC logically connecting two Ethernet ports in a point-to-point configuration.

“Ethernet Virtual Circuit” or “EVC” shall mean a software-defined logical connection between a combination of UNI’s and/or NNI’s that is not a dedicated connection but acts as though it is and which is capable of transporting ethernet frames on a local or regional basis.

“Ethernet Virtual Private Line” or “EVPL” shall mean Metro Ethernet Service where one or more Ethernet Circuits are service multiplexed between Buyer’s and Seller’s networks using 802.1q vlan tags.

“Frame Loss Ratio” (“FLR”) shall mean a measure of the number of lost frames between the ingress port and the egress port. Frame Loss Ratio is expressed as a percentage.

“Jumbo Frame” shall mean any Ethernet frame larger than 1518 bytes.

“Layer 3 Device” shall mean a device that utilizes network addresses (IP address) to make data traffic destination decisions, not physical addresses (MAC address).

“Load Shared Dedicated Ethernet Private Line Service” shall mean Service where Seller provides two client-side interfaces with two physically diverse, unprotected connections. Buyer is responsible for routing traffic for a Load Shared Service.

“MTU” or “Maximum Transmission Unit” shall mean the largest frame size, measured in bytes, that can be transmitted across an Ethernet Circuit.

“Multicast Traffic” shall mean Ethernet frames sent to a single destination address which then distributes the frames to multiple network devices, each with its own destination address.

"OAM" or "Operation, Administration, and Maintenance" shall mean in-band traffic that provides system or network fault indication, performance monitoring, security management, and diagnostic functions.

“Off-Net” shall mean a Service where Buyer obtains connections between a location on Seller’s Facilities and a location on Third Party Facilities.

“Performance Liquidated Damages” shall mean those credits issued to Buyer under Section 4.2(d) of this Supplement or those rights available to Buyer under Sections 4.2(e), 4.3(b) or 4.4 of this Supplement.

“Point-to-Point Ethernet” shall mean a concatenated Dedicated Ethernet Private Line Service where Buyer specifies both the A-location and Z-location on the Service Order.

“Point-to-Point” shall mean Service from Buyer’s or its User’s premise to any location at the rate specified.

“Protected”, when used with a Dedicated Ethernet Private Line Service” shall mean Service where Seller provides protection via diverse network paths, but still only a single client-side interface.

"Service Frame" shall mean an Ethernet frame transmitted across the UNI toward the Service Provider or an Ethernet frame transmitted across the UNI toward the Subscriber.

"UNI" or "User Network Interface". See “Access Interface” or “AI”.

“Unicast Traffic” shall mean Ethernet frames sent to a single destination address and network device.

“Unprotected”, when used with a Dedicated Ethernet Private Line Service shall mean Service where Seller provides only a single client-side interface and one network path (not protected).

2. PROVISIONING INTERVALS FOR FACILITIES.

2.1 Provisioning Intervals. Seller shall use reasonable commercial efforts to meet the following Provisioning Intervals for the Services that are provided entirely on Seller’s Facilities:

<u>Service</u>	<u>Minimum Provisioning Interval (in Business Days, from date of Service Order)</u>
Dedicated Ethernet Private Line - No vendor equip. required	10
Dedicated Ethernet Private Line -Vendor equip. or construction required	(Interval to be provided by Seller)
Metro Ethernet Service	(Interval to be provided by Seller)

The Provisioning Intervals for all other Services shall be provided by Seller on an individual case basis (“ICB”) and as set forth in the applicable Service Order FOC.

2.2 Remedies. If the Commencement Date does not occur prior to the Scheduled Service Date with regard to Services and such delay in the Commencement Date is not due to a Force Majeure Event or an act or omission of Buyer, Buyer’s Users or their respective representatives, then the following remedies shall apply:

(a) Delay of Recurring Charge. Buyer shall not be obligated to pay the Recurring Charges until such time as the Service commences.

(b) Termination of Service. If the Commencement Date does not occur on or before sixty (60) days following the applicable Scheduled Service Date, then Buyer shall have the right to terminate the applicable Service by providing written notice to Seller to the extent that such notice is provided prior to the Commencement Date. In such event, unless otherwise provided in the Service Order, Buyer shall not be obligated to pay, and shall receive reimbursement for any amounts previously paid with regard to, any Recurring Charges or Non-Recurring Charges associated with such Service.

(c) **SOLE AND EXCLUSIVE REMEDIES. THE PARTIES ACKNOWLEDGE THAT THE REMEDIES IN THIS SECTION 2 SHALL BE THE SOLE AND EXCLUSIVE REMEDY OF BUYER AND THE SOLE AND EXCLUSIVE LIABILITY OF SELLER FOR THE FAILURE OF THE COMMENCEMENT DATE TO OCCUR PRIOR TO THE SCHEDULED SERVICE DATE OR ANY OTHER DELAY IN PROVIDING THE SERVICE.**

2.3 Supp or Deferral Rights – With respect to any Services provided entirely on Seller’s Facilities, Buyer shall have the right to request up to three (3) deferrals of the Scheduled Service Date; provided that, unless otherwise agreed by Seller, in no event may Buyer request a deferral of more than thirty (30) days in aggregate from the Scheduled Service Date set forth in the initial FOC for the Service. The Supp Charges applicable to any such deferrals of the Scheduled Service Date are set forth in Seller’s Miscellaneous Price Schedule. With respect to any Services provided in

whole or in part on Third Party Facilities, any rights of Buyer to defer the Scheduled Service Date and any associated charges shall be determined by Seller on an individual case basis.

2.4 Facility Unavailability; Remedy for Incorrect Information – Buyer understands that certain transmission facilities may be ordered by Seller at times from third parties, including the incumbent local exchange carrier (“ILEC”). In such event, Seller will provide a FOC for orders based on information provided from the third party. Should such information be incorrect and not as originally represented to Seller, Seller may require modifications to the Service Order and respective FOC, including the number and type of facilities ordered and the pricing therefore. Should Buyer not desire the revised terms, Buyer shall notify Seller within two Business Days of receiving notice of the change in terms of such rejection and such Service Order will be cancelled without liability for either party related to such order.

3. TESTING PROCEDURES FOR FACILITIES.

3.1 Testing Standards. Tests of each Service provided on Seller’s Facilities shall be made to determine whether the Service complies with the following specifications:

- (a) Dedicated Ethernet Private Line - The applicable Service will successfully pass 99% of the Ethernet frames during the duration of the testing period.
- (b) Metro Ethernet Service – The applicable Service will successfully meet the CoS Performance Objectives as outlined in Section 4.3 below during the duration of the testing period at a rate of not less than 99% of CIR.
- (c) Other Services – The testing procedures and criteria for acceptance shall be determined on an individual case basis and set forth in the applicable accepted Service Order or other written agreement of the Parties.

3.2 Testing Periods. Seller will use a reasonable duration for the tests for Services provided on Seller’s Facilities.

4. PERFORMANCE AND OPERATING STANDARDS FOR FACILITIES.

4.1 Availability. If a Service Outage (as defined below) occurs with respect to Services provided entirely on Seller’s Facilities and Seller is unable to provide the Services at the Availability Factors (as defined below), then Seller will credit Buyer’s invoice for the applicable period with an amount equal to the Service Outage Credit (as defined below) in the month following the request by Buyer and determination of the applicable Service Outage Credit pursuant to the provisions set forth below; provided that Buyer must request such Service Outage Credit and such request must be made within thirty (30) days of the applicable Service Outage. If a Chronic Service Outage (as defined below) occurs for any Service, then Buyer shall have the right to terminate the applicable Service consistent with paragraph (e) of Section 4.2.

4.2 Service Outage. A “Service Outage” shall mean that Buyer is unable to exchange ethernet frames over the Facilities.

(a) A Service Outage shall begin upon the earlier of Seller’s actual knowledge of the Service Outage or Seller’s receipt of written notice from Buyer of the Service Outage and shall end upon the correction of the loss of service as set forth above.

(b) Notwithstanding the above, a Service Outage shall not be deemed to have occurred and no Service Outage Credits will apply:

(i) during periods (A) of less than ten (10) minutes, (B) in which Seller is not given access to its Facilities or equipment that are required to provide the Services or to remedy any Service Outage, (C) in which planned or scheduled maintenance and repair activities are occurring, (D) in which Buyer or its User continues to use the Services on an impaired basis, or (E) that are not reported to Seller within thirty (30) days of the date the Service was affected;

(ii) for interruptions that are caused by or due to (A) acts or omissions of Buyer, its User or another third party, (B) the failure or malfunction of facilities or equipment not owned or operated by Seller, including without limitation the failure of the power supply, (C) a Force Majeure Event or (D) disconnections by Seller for non-payment or other contract default or breaches by Buyer;

(iii) for Services utilizing in whole or in part Third Party Facilities; and

(iv) with respect to any Service whereby Buyer’s and/or its Users’ usage of or demand with respect to the Service is greater than the amount of usage or capacity for which the Customer has subscribed.

(c) Availability Factor. The following Availability Factors shall apply to the following Services that are provided entirely on Seller’s Facilities:

(i) Dedicated Ethernet Private Line Services

- (a) Unprotected – 99.0%
- (b) Protected (Network protection; no Client Protection) – 99.9%
- (c) Load Shared – 99.99% one of the two diverse paths will be available

(ii) Metro Ethernet Services

99.0% packet delivery rate

The Availability Factors set forth above shall apply for each calendar quarter and is a measurement of the percent of total time that Service is operative and deemed available to Buyer in accordance with the above specifications when measured over such period.

(d) Service Outage Credit. With respect to any Service Outages in excess of the Availability Factors, the Service Outage Credit shall be equal to an amount equal to (a) the Recurring Charge applicable to the affected Service during the calendar quarter in which the Service Outage occurred multiplied by (b) the number of hours or fractions thereof that the Service Outage occurred during the applicable period divided by 2160 hours. Service Outage Credits are calculated after deduction of all discounts and other special pricing arrangements, and are not applied to governmental fees, taxes, surcharges and similar additional charges, nor are credits available for any usage based Services. **OTHER THAN THE ADDITIONAL TERMINATION REMEDY SET FORTH BELOW FOR CHRONIC SERVICE OUTAGES, BUYER'S RIGHT TO RECEIVE SUCH SERVICE OUTAGE CREDIT SHALL BE BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S SOLE AND EXCLUSIVE OBLIGATION IN THE EVENT OF A SERVICE OUTAGE OR FOR ANY OTHER CLAIM THAT SELLER FAILED TO MEET ITS OBLIGATIONS IN THE PROVIDING OF THE SERVICE.**

(e) Chronic Service Outage. An affected Service shall be deemed to have experienced a Chronic Service Outage to the extent that in any calendar month (i) three or more Service Outages have occurred with each such Service Outage having a duration of more than thirty (30) minutes or (ii) one Service Outage has occurred for a duration of more than forty-eight (48) hours, in each case where the applicable Service Outage has been reported by Buyer to Seller with respect to any Service within ten (10) days. If a Chronic Service Outage occurs, then Buyer shall have the right to terminate the affected Service upon providing written notice to Seller, without the incurrence of any Termination Charge; provided that Buyer terminates the applicable Service on or before the expiration of the calendar month following which the Chronic Service Outage occurred. **BUYER'S RIGHT TO TERMINATE THE AFFECTED SERVICE SHALL BE THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND THE SELLER'S SOLE AND EXCLUSIVE OBLIGATION IN THE EVENT OF A CHRONIC SERVICE OUTAGE.**

4.3 Service Level Specifications.

(a)(i) Standards. The following standards shall apply with respect to Services that are actively being transmitted and are provided entirely on Seller's Facilities ("Service Level Specifications" or "SLS"):

Dedicated Ethernet Private Line Services - Background Bit Error Rate (BBER) 10^{-11}

Metro Ethernet Service – The following frame loss ratios ("CoS Performance Objectives") shall apply:

Frame Loss Ratio ("FLR") by CoS	
Gold	0.01%
Silver	0.05%
Bronze	0.10%

The Frame Loss Ratios set forth above shall apply for each calendar quarter and is a measurement of the percent of total time that Service is not operative and deemed unavailable to Buyer in accordance with the above specifications when measured over such period.

In order to test to determine whether a Service complies with the above standards, Buyer shall be required to request and authorize an intrusive test to be taken of the applicable Service using the testing standards and for a period consistent with Section 3 above; provided an intrusive test shall not be required to the extent that Seller has installed equipment that is capable of monitoring or sampling such performance on an ongoing basis without the need for an intrusive test. The Parties will cooperate on the timing and manner in which any such intrusive test is conducted, taking into consideration the need to minimize the interruption of Buyer's, its Users', or Seller's other customers' services.

(ii) CoS and Overutilization. If the total utilized bandwidth of all EVC's on a facility (AI or EII) exceeds the available port bandwidth of any portion of such facility, then the frames being transmitted will be prioritized at the port by CoS, from Gold (highest priority), to Silver, and then to Bronze (lowest priority). During such overutilization of the port, any frames not provided access to the port may be dropped. The SLS and Service Outage terms for MES Services will apply only to frames receiving priority sufficient to pass the overutilized port and not to any frames in excess of the allowed bandwidth, which may be dropped.

(iii) Buyer understands that the Availability Factors, SLS and other representations in this Supplement shall not apply to Multicast or Broadcast Traffic or events caused thereby.

(b) Remedies for Failure to Comply with Standard. If a particular Service experiences Service Levels worse than those set forth in (a) above that is applicable to such Service during such testing period, then Seller shall have a period of thirty (30) days to correct such deficiency. If after such thirty (30) day period Seller has not retested such Service in compliance with the standards set forth above, then Buyer shall be entitled to terminate the applicable Service upon providing written notice to Seller provided prior to the Service complying with such standards set forth above. **BUYER'S RIGHT TO TERMINATE THE APPLICABLE SERVICE SHALL BE THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND THE SELLER'S SOLE AND EXCLUSIVE OBLIGATION IN THE EVENT OF SELLER'S FAILURE TO MEET ITS STANDARDS OBLIGATIONS.**

4.4 MeanTime to Repair. Mean Time to Repair (“MTTR”) shall be the average time required to repair a Service and restore its availability and is stated in terms of equipment and cable outages. The time is measured from the time that the Service Outage is reported by Buyer to Seller until the Service is available. With respect to Services provided on Seller’s Facilities, Seller will use all commercially reasonable efforts to (a) repair network equipment within an average of two (2) hours of when Seller’s technical representative arrives on the applicable site where the equipment is located, not to exceed a total of four (4) hours from the time the Service Outage is reported and (b) have the first fiber on a cable cut restored within an average of six (6) hours of when Seller’s technical representative arrives on the applicable site where the cable cut is located, not to exceed a total of eight (8) hours from the time the Service Outage is reported. Such averages will be calculated over a calendar quarter basis. Seller will undertake repair efforts on equipment or fiber when Seller first becomes aware of the problem, or when notified by Buyer and Buyer has released all or part of the Service for testing, at which point a trouble ticket will be established. Notwithstanding the above, the failure of Seller to meet such standards shall not constitute a default under this Agreement and Seller shall not be liable to pay Buyer any penalties or damages or credit any portion of the Charges under this Agreement as a result of such failure, other than as set forth in Section 4.1 above.

4.5 **PERFORMANCE LIQUIDATED DAMAGES**. **FOR THIS SUPPLEMENT, THE REMEDIES OF BUYER IN SECTIONS 2.2(C), 4.2(D), 4.2(E), AND 4.3(B) HEREOF SHALL CONSTITUTE BUYER’S PERFORMANCE LIQUIDATED DAMAGES FOR THE SERVICE OFFERED UNDER THIS SUPPLEMENT AND CONSTITUTE BUYER’S SOLE AND EXCLUSIVE REMEDY FOR ANY PERFORMANCE FAILURE RELATED TO OR ARISING FROM THE SERVICE OFFERED HEREUNDER.**