Ethernet Dedicated E-Line +

Service Level Agreement

1. **Summary.**
    1.1   Other than for orders governed by German law, the SLA for Dedicated E-Line sets forth Customer's sole and exclusive remedy for any claim relating to the provision of Dedicated E-Line pursuant to the Agreement. To obtain Dedicated E-Line SLA coverage of Platinum, Gold, Silver or Bronze Local Access Levels, Customer must commit to a minimum of a continuous one-year service commitment period for Dedicated E-Line. Verizon will determine in its sole discretion what records and data will be used as the basis for all Dedicated E-Line SLA calculations and determinations. The maximum amount of credit in any calendar month will not exceed the amount that, absent the credit, would have been charged for Dedicated E-Line in the month for which the particular Charges were subjected to the credit. Verizon reserves the right to amend the Dedicated E-Line SLA from time to time, effective upon written communication that may be delivered to Customer in the invoice or by other reasonable means.
    1.2   For orders governed by German law only, all of the quality objectives and performance metrics in the Dedicated E-Line SLA should be understood as voluntary commitments of Verizon. The Dedicated E-Line SLA is provided free of charge and is not meant to give any guarantees or warranties as defined in the German Civil Code ("BGB"). It shall furthermore not extend the rights to which Customer is entitled pursuant to the BGB if Verizon is in breach of contract.
2. **Service Levels.** The Dedicated E-Line SLA consists of four Service Level Standards, a Service Level Objective, and associated metrics pertaining to the performance of Dedicated E-Line.
    2.1   **Service Level Standards.** The following Service Level Standards are provided under the Dedicated E-Line SLA:
    ● Availability.
    ● Mean Time to Repair ("MTTR").
    ● Data Delivery Ratio ("DDR").
    ● Frame Jitter ("FJ").
    2.2   **Service Level Objective.** The Service Level Objective under the Dedicated E-Line SLA is Round Trip Delay ("RTD"), as follows:
        2.2.1   **Definition.** RTD is the PE-to-PE monthly average round trip delay as measured in milliseconds within or between the PE device pairs on the Core Network in the U.S. Region or at the Global Tier A or Global Tier B Geographic Locations (defined below), respectively.
        2.2.2   **Process.** Upon Dedicated E-Line circuit implementation, Verizon will provide Customer with calculated or actual measured RTD. If at the time of such implementation, Verizon cannot meet the RTD estimate value that Verizon provided as a part of the supporting documentation with Customer's order, Customer has the option of either accepting the higher RTD or cancelling the circuit with the understanding that Customer will not be responsible for the payment of any applicable early termination charges for the circuit.
        2.2.3   **Calculation.** RTD is determined by measuring transit delay in milliseconds between the PE device **pairs**, whether across the Core Network or between PE device pairs at the Core Network and at Global Tier A or Global Tier B, as applicable, and averaging the results over a thirty (30) day period from when the Trouble Ticket was opened. RTD calculation is as follows:

$$RTD = T2 - T1$$

where:

T1 is the time when an Ethernet frame leaves the ingress reference point (i.e., frame exit event) and T2 is the time when an Ethernet frame arrives back at the ingress reference point (i.e., frame return event) with the difference measured. RTD is measured between the respective origination and destination infrastructure ports (i.e., between the points where the frame enters and exits the Core Network, regardless of the Local Access to Core Network). External factors are excluded from the measurement, including, but not limited to, Local Access issues.

        2.2.4   Customer is not eligible for any credits for a failure by Verizon to meet the RTD Service Level Objective.

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3. **Coverage Categories.** The Service Level Standards vary by Local Access operational levels and performance levels of Platinum or Gold, and are applicable to the specific Dedicated E-Line from the Geographic Region or Global Tier A countries or Global Tier B countries where Customer has a site sending traffic to the Geographic Region or country where Customer has a site receiving traffic based on the following variables:

    3.1   **Local Access.** Dedicated E-Line SLA covers all Platinum, Gold, Silver and Bronze access.

    3.2   **Outage Types.** The Dedicated E-Line SLA defines Service disruptions as either a "Hard Outage" or a "Service Issue". The Service restoration priority determines the ranking of the repair actions against other Service-related events. A Hard Outage has Priority 1 Service restoration priority with the exception of Hard Outages for Off-Net Silver, which has Priority 2 Service restoration priority. A Service Issue has Priority 2 Service restoration priority. The Dedicated E-Line Availability and MTTR Service Level Standards apply only to Hard Outages. RTD, DDR and Frame Jitter apply to Service Issues. Priority 3 and Priority 4 issues do not affect functionality of service and are not eligible for SLA credits.

Priority Level	Criteria
Priority 1	Total loss of Service or degraded Service to the extent that it is unusable by Customer and Customer is prepared to release its Service for immediate testing
Priority 2	Degraded Service, however Customer is able to use the Service and is not prepared to release its Service for immediate testing
Priority 3	A problem with the Service that does not affect the functionality of the Service; including a single non-circuit specific quality of Service inquiry.
Priority 4	Non-Service-affecting requests (e.g., a Customer request for an incident report) and all other queries not covered by Priority Faults 1–3 above. Priority 4 includes scheduled maintenance

4. **Geographical Locations.** The SLA covers the provision of Dedicated E-Line in the following categories:
   - **U.S. Region:** U.S. Mainland, Hawaii, and Alaska.
   - **Global Tier A:** Austria, Belgium, Canada, Denmark, Finland France, Germany, Hong Kong, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Singapore, South Korea, Spain, Sweden, Switzerland, United Kingdom.
   - **Global Tier B:** Australia, Brazil, Bulgaria, Chile, China, Columbia, Czech Republic, Estonia, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Puerto Rico, Romania, Russia, Taiwan.

5. **Service Level Standards.** The following provides the metrics pertaining to the Dedicated-Line SLA Service Level Standards:

Service Level Standard	Local Access Level	Scope	Restorable Option 1 and 2 (U.S.)	Restorable Option 1 and 2 (Global Tier A)	Restorable Option 1 and 2 (Global Tier B)	Unprotected
Availability	Platinum	End-to-End	99.999%	99.999%	99.999%	99.5
	Gold	End-to-End	99.9%	99.9%	99.9%	99.5
	Silver	End-to-End	99.5%	99.5%	99.5%	99.5%
	Bronze	End-to-End	99%	99%	99%	99%
Mean Time To Repair (MTTR)	Platinum	End-to-End	2 Hours	4 Hours	4 Hours	~~8~~ 24 Hours
	Gold	End-to-End	4 Hours	5 Hours	8 Hours	~~10~~ 24 Hours
	Silver	End-to-End	4 Hours	8 Hours	8 Hours	~~10~~ 24 Hours
	Bronze	End-to-End	24 Hours	24 Hours	24 Hours	24 Hours

Parameter	Access Level	Scope	Dedicated E-Line
Data Delivery Ratio ("DDR")	On-Net, Off-Net	PE-to-PE	≥ 99.995%

Frame Jitter	On-Net, Off-Net	PE-to-PE	< 5 ms

6. **Service Level Standards – Definitions.**

  6.1   **Availability.**

      6.1.1   **Definition.** The Availability Service Level Standard is the total number of Eligible Hard Outage Minutes for an applicable Dedicated E-Line Service connection, divided by the total number of minutes based on a 30-day calendar month. Availability includes the Local Access from a Customer Site to the PE and the Core Network. Availability excludes Customer-provided Local Access and CPE not provided as part of the Dedicated E-Line Service. A Dedicated E-Line point-to-point connection has one Local Access circuit on each end. An Availability Service Level Standard for a Dedicated E-Line provisioned with two different Local Access levels is determined by the Local Access level having the lowest Availability Service Level Standard.

      6.1.2   **Calculation.** The Availability Service Level Standard is calculated after Customer opens a Priority 1 Trouble Ticket with Verizon and represents the percentage of time that the connection for Dedicated E-Line is available within a given calendar month except as specified below. Hard Outages for Dedicated E-Line provisioned with Silver or Bronze Access are handled as Priority 2 tickets and eligible for the Availability Service Level Standard.

Availability (%) = (1 - (Total Eligible Hard Outage Minutes per connection for Dedicated E-Line per month / 43,200 minutes)) x 100

      6.1.3   **Credit Structure.** The Availability Service Level Standard credit is based on the number of Eligible Hard Outage Minutes independent of the actual percent availability calculation. Credit tables are provided in Section 7, below.

  6.2   **Mean Time To Repair ("MTTR").**

      6.2.1   **Definition.** MTTR is defined as the average time taken to restore a connection for Dedicated E-Line during a Hard Outage.

      6.2.2   **Calculation.** MTTR is an average of the time taken to repair all Priority 1 Trouble Tickets generated by Customer on a specific connection for Dedicated E-Line except as specified below. The duration of each Hard Outage on a specific Dedicated E-Line is totaled at the end of each calendar month and divided by the corresponding number of Hard Outages for that Dedicated E-Line. Service Level Standard for Dedicated E-Line provisioned with two different Local Access Operational Performance levels is determined by the Local Access having the lowest Operational Performance level. This is calculated from Trouble Tickets opened during that calendar month. MTTR per calendar month is calculated for Customer's Service as follows:

Cumulative length of Hard Outage(s) per Dedicated E-Line / Total number of Trouble Tickets per calendar month per Dedicated E-Line

      6.2.3   **Credit Structure.** The MTTR credit is based on the average repair times for all Hard Outages on a specific Dedicated E-Line within a calendar month. Credit tables are provided in Section 7, below. Customer may qualify for credits under the MTTR Service Level Standard in addition to the Dedicated E-Line Availability Service Level Standard for a particular Hard Outage.

  6.3   **Data Delivery Ratio ("DDR").**

      6.3.1   **Definition.** The DDR Service Level Standard represents the Dedicated E-Line effectiveness in transporting Customer frames across its Core Network. DDR is the average ratio of (i) Ethernet frames within a specified traffic priority class successfully delivered from PE to PE between PE devices within the Verizon Core Network to (ii) total Ethernet frames within the specified traffic priority class that are sent over Verizon's Core Network in a calendar month, excluding frames that are not delivered due in whole or in part to factors unrelated to Verizon's Core Network. The DDR Service Level Standard does not include frames that are dropped due to congestion at Customer's ingress or egress port.

      6.3.2   **Standard.** If the applicable Dedicated E-Line Service does not meet the DDR Service Level Standard, the matter is considered a Service Issue and accorded to a Service Restoration Priority 2.

      6.3.3   **Calculation.** DDR is calculated as the number of Dedicated E-Line test frames that are successfully delivered from PE to PE within the Core Network divided by the total number of Dedicated E-Line test frames sent per calendar month, as shown below:

DDR (DDR for load consisting of frames) = Frames Delivered/Frames Offered X 100

6.3.4 **Credit Structure.** To obtain a credit, Customer must open a Trouble Ticket in accordance with the "Credit Application – Process" section below. Verizon will work with Customer to confirm that a DDR issue exists with the Core Network and repair the problem(s), as applicable. Once Verizon confirms that the DDR on the Core Network for a specific Customer Dedicated E-Line connection does not comply with this Service Level Standard, Verizon will have 30 calendar days from the opening of the Trouble Ticket to address the Service Issue and close the applicable Trouble Ticket before Customer may be eligible for SLA credits. If, after 30 calendar days of opening the Trouble Ticket, the DDR Service Level Standard issue is not corrected, but has been agreed to as a Service Issue, Customer may qualify for credits.

6.4 **Frame Jitter.**

6.4.1 **Definition.** Frame Jitter is the average of the mean deviation of the difference in frame arrival time at the receiver compared to the sender for a pair of frames, calculated on the round trip from PE to PE within the Core Network.

6.4.2 **Standard.** The Service Level Standard for Frame Jitter applies to the Core Network performance. If the applicable Dedicated E-Line Service does not meet the Frame Jitter SLA, the matter is considered a Service Issue.

6.4.3 **Calculation.** Verizon calculates Frame Jitter by measuring the mean deviation of the difference in test frame spacing at the receiver compared to the sender for a pair of test frames, Verizon calculates the mean by sampling the Core Network frequently and averaging the results over a 30 calendar day period. The calculation for Frame Jitter "J (i)" for two consecutive frames i and i+1 is as follows:

$$J(i) = DeltaT(i) - DeltaT(i')$$

where

$T(i)$ = time 1st byte of frame (i) is received by the source port (ingress time);
$T(i+1)$ = time 1st byte of frame (i+1) is received by the source port (ingress time);
$T(i')$ = time 1st byte of frame (i') is received at the destination port (egress time);
$T(i+1')$ = time 1st byte of frame (i+1') is received at the destination port (egress time).

and

$DeltaT(i) = T(i+1) - T(i)$ (DeltaT(i) is the time interval between frames at ingress);
$DeltaT(i') = T(i+1') - T(i')$ (DeltaT(i') is the time interval between frames at egress).

The average jitter is calculated as follows:

$$J = Sum\ J(i)/(N-1)$$

where

"N" is the number of measurement intervals over thirty (30) day period.

6.4.4 **Credit Structure.** To obtain a credit, Customer must open a Trouble Ticket when a Frame Jitter issue surfaces as described in the "Credit Application – Process" section below. Verizon will work with Customer to confirm that a Frame Jitter issue exists with the Core Network and repair the problem(s), as applicable. Once Verizon confirms that the Frame Jitter on the Core Network between specific Customer Sites over a connection for the applicable Dedicated E-Line Service does not comply with this Frame Jitter Service Level Standard, Verizon will have thirty (30) calendar days to address Service Issue and close the applicable trouble before Customer may be eligible for credits under this Frame Jitter Service Level Standard. If, after thirty (30) calendar days of opening the Trouble Ticket, the Frame Jitter Service Level Standard issue is not corrected, Customer may qualify for credits. Customer's measure of Frame Jitter prior to opening a Trouble Ticket may be used by Verizon as a benchmark for the repair actions.

7. **Credit Amounts and Application Process.** Credit for SLA non-compliance is based on the MRC for each Dedicated E-Line connection. Credits vary by Service Level Standard, location, access type, and length of Hard Outage.

7.1 **Hard Outage Credit Schedules.**

Availability	Credits as a percent of MRC			
Dedicated E-Line Availability	**U.S. and Global Tiers A, B**	**U.S. and Global Tier A**	**Global Tier B**	**Unprotected**

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From > (Minutes)	To ≤ (Minutes)	Platinum	Gold or Silver	Gold or Silver	Platinum /Gold / Silver
1	43	5%	NA	NA	N/A
43	120	10%	10%	5%	N/A
120	240	15%	10%	5%	N/A
240	360	25%	15%	10%	10%
360	480	30%	15%	10%	10%
480	720	40%	20%	10%	10%
> 720		50%	20%	10%	10%

MTTR		Credit as a Percent of MRC				
Global Dedicated E-Line Ethernet Core Network Outage Time		U.S.	Global Tiers A & B	U.S.	Global Tier A	Global Tier B
From Hr:Min:Sec	To Hr:Min:Sec	Platinum	Platinum	Gold, Silver or Bronze	Gold, Silver or Bronze	Gold, Silver or Bronze
2:00:00	3:59:59	4%	NA	NA	NA	NA
4:00:00	4:59:59	4%	4%	2%	NA	NA
5:00:00	7:59:59	10%	10%	4%	4%	NA
8:00:00	11:59:59	10%	10%	4%	4%	4%
≥ 12:00:00		10%	10%	4%	4%	4%

7.2 **Frame Jitter and DDR Credit Schedule.**

Service Issue Credit Schedule	
Service Level Standard	Credit as % of MRC per connection of Dedicated E-Line *
Frame Jitter	20%
DDR	20%
* Service Issues occur between the PE Ports of the Dedicated E-Line Core Network. Consequently, two Customer connections for Dedicated E-Line will be affected by each Service Issue. For Service Issue credit purposes, the MRC will be defined as the average of the MRCs for each of the two affected Customer connections for Dedicated E-Line.	

7.3 **Credit Application Structure.** The credit structure described above will be applied to the corresponding net billing MRC for the specific connection(s) for the applicable Dedicated E-Line Service affected by the Hard Outage(s) or Service Issue(s). The total of all credits within any one month is limited to a maximum of one hundred percent (100%) of the MRC for the specific connection of Dedicated E-Line affected. Credits for Hard Outages are determined based on Eligible Hard Outage Minutes. Customer may claim the MTTR Service Level Standard credit in addition to the Dedicated E-Line Availability Service Level Standard credit in a given calendar month. All credits will be provided at the billing account number level in one lump sum, as opposed to each individual Dedicated E-Line connection under multiple BANs. Credits do not apply to Local Access or backhaul charges. The appropriate amount will be credited to the Customer's account, appearing as a line item on an invoice delivered within ninety (90) calendar days following Verizon's confirmation that the Service Level Standard has not been met.

7.4 **Credit Application – Process.** Customer must complete two steps in order to qualify for an SLA credit. First, Customer must open a Trouble Ticket in response to Service issues. This first step brings the problem to the attention of Verizon customer service for intervention and repair, as required. The second step is to request the credit in writing from Customer's account team contact. The timing of the written request varies by Service Level Standard and is described below. The account team receiving the SLA credit request will confirm receipt with Customer by either email or fax. Verizon will then investigate the outage through the Trouble Ticket history and notify Customer of the outcome of the investigation either by email or fax.

    7.4.1 **Opening a Trouble Ticket.** A Trouble Ticket can be opened either through the Customer Service Center or through the web-based tool called Service Event Management. The number for the assigned Customer Service Center is printed on Customer's invoice. Access to the Service Event Management tool can be requested at the first use. The tool and registration for new users is located at: https://enterprisecenter.verizon.com/.

    7.4.2 **Trouble Ticket and Credit Request by SLA**

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7.4.2.1 **Availability and MTTR.** In order for an outage to qualify for an SLA credit, Customer must perform the following tasks:

☐Open a Trouble Ticket within 72 hours of the time the hard outage occurs.

● Customer submits an SLA credit request to Verizon within 30 days of the closing of the trouble ticket. The credit request may be submitted in writing to Customer's account team or via the Verizon Enterprise Center portal. The credit request must contain the following information:
  - o   The date the outage occurred.
  - o   The time the outage began and ended.
  - o   The circuit ID(s) for each affected connection.

7.4.2.2 **Frame Jitter and DDR.** In order to qualify for an SLA credit, Customer must perform the following tasks:

· Open a Trouble Ticket within 72 hours of the time the Service Issue arose.

☐Submit a written SLA credit request to its account team within fifteen (15) days of the end of the repair period. The written request must contain the following information:
  - o   The date the Service Issue occurred.
  - o   The time the Service Issue began and ended.
  - o   The circuit ID(s) for each affected connection.

8. **SLA Credit Time Limitation.** If Verizon has not met the same Service Level Standard for three consecutive months –

8.1   Customer may elect to discontinue the affected Dedicated E-Line circuit(s) without liability except for charges incurred prior to discontinuation of the affected circuits. To cancel a Dedicated E-Line connection pursuant to the preceding, Customer must submit a written disconnect notice to its account team within 30 days following the end of either the third or subsequent consecutive month of Verizon's failure to meet the affected Service Level Standard; or

8.2   Customer may elect to continue such Dedicated E-Line circuits with the understanding that Customer may only receive a maximum of six (6) months of credits for any individual Service Level Standard within a twelve (12) month period.

9. **Exclusions.**

9.1   **General.** The following exclusions apply to all SLAs set forth herein. Service Level Standard measurements do not include any periods the Service Level Standard was not met resulting in whole or in part from the following:
- ● Hard Outage minutes associated with failure of CPE not provided as part of the Dedicated E-Line service.
- ● CPE associated with Local Access for Dedicated E-Line.
- ● Service disruptions due to Customer traffic exceeding Customer-subscribed bandwidth or sending frames that do not otherwise comply with the applicable limitations on Customer's subscribed bandwidth.
- ● Any act or omission on the part of the Customer, its contractors, vendors, End Users, or any other entity over which the Customer exercises control or has the right to exercise control.
- ● Verizon-planned outages or scheduled maintenance where Customer is given reasonable advance notice, or Customer's scheduled maintenance performed by any party other than Verizon.
- ● Emergency maintenance.
- ● Lapses of Dedicated E-Line service necessitated by new installations of Dedicated E-Line service or other Verizon services.
- ● Force Majeure events.
- ● Fiber cuts, outages, or faults that require planned or unplanned maintenance on submarine cable or plant (e.g., power plant, lasers, repeaters, etc.).
- ● Extended outages due to events outside of Verizon's control which affects both the ERO primary and ERO secondary paths.

9.2   **Availability Exclusions.** In addition to the General Exclusions, Availability Service Level Standard measurements do not include periods of Dedicated E-Line Outage resulting in whole or in part from one or more of the following causes:
- ● For on-net circuits, any act or omission on the part of any third party including but not limited to any Local Access provider other than any third-party over which Verizon exercises control;
- ● For off-net circuits, any act or omission on the part of any third party (other than a local access provider) over which Verizon exercises control;
- ● Periods of Service degradation where Customer has not released its Service for immediate testing.

9.3   **MTTR Exclusions.** In addition to the General Exclusions, MTTR Service Level Standard measurements do not include the following:
- ● The period of time during an outage when Verizon was not granted the necessary physical or logical access to Customer's premises and facilities for testing.
- ● A submarine cable outage for an Unprotected Service Level Standard.
- ● Any act or omission on the part of any third party, other than a Local Access provider, over which Verizon does not exercise control.

- Periods of Service degradation where Customer has not released its Service for immediate testing at Verizon's request.

9.4 **DDR Exclusions.** In addition to the General Exclusions, DDR Service Level Standard measurements do not include any of the following:
- Frames dropped at an infrastructure egress port due to improper Customer specifications of Customer connection speeds.
- Frames dropped at infrastructure egress port due to congestion caused by Customer's traffic exceeding subscription parameters.

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