

ob-udpst output mapping to (current) JSON and TR-471 info model

OB UDP Speed Test

Exported on 11/18/2021

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1 Introduction

At the [May 28, 2021 project meeting](#)¹, we set the stage for some [OBUDPST-17](#)² JSON output label revisions in the near term.

2 passes (slightly clarified from the meeting notes)

- - first pass is to produce the JSON output for the **easy-to-capture text output**, and the test context/configuration (elements for the Minimum Profile are included below).
 - Completed documenting the First Pass on [22 Sep 2021](#) and moved the table to section 3 below.
- - Next - work JSON for the entire MINIMUM Profile - section 2 table below

¹ <https://wiki.broadband-forum.org/x/6AGsBg>

² <https://issues.broadband-forum.org/browse/OBUDPST-17>

2 Second Pass - Rosetta Stone (Implemented in Release 7.3.?)

Table below starts with Test context and configuration info, then output (results). "X" = Part of Minimum Profile. The Release 7.2.1 Default values for SeqErrThresh (10) and SlowAdjThresh (3) are used below.

In the Second Pass, areas for udpst development are identified - primarily in the area of sub-interval output (results) - where Minimum Profile rows have no entry

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Input":	"Interface": "",	Table 1: Interface TR-181 The value MUST be the Path Name of a table row. The IP-layer interface over which the test is to be performed. Example: Device.IP.Interface.1 If an empty string is specified, the device MUST use the interface as directed by its routing policy (<i>Forwarding</i> table entries) to determine the appropriate interface.	string(256)	
Mode: Client Downstream Test	"Input":	"Role": "Receiver",	Table 1: Role TR-181 Indicates whether the device will act as Sender or Receiver of test packets. Enumeration of: <ul style="list-style-type: none"> • <i>Receiver</i> (The device will act as the Receiver) • <i>Sender</i> (The device will act as the Sender) 	string(256)	X
NA (Command line input)	"Input":	"Host":	Table 1: Host	string(256)	X
NA	"Input":	"Port":	Table 1: Port	unsignedInt ; [1:65535]	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
Jumbo Datagrams: Enabled (above 1Gbps by default)	"Input":	"JumboFramesPermitted": 1,	Table 1: JumboFramesPermitted TR-181 same name (incomplete description, default not revised yet) SB - RED	Boolean; [0:1] <u>Default SHOULD BE 1</u> (True: permitted for sending rates above 1Gbps)	X
(only 1 supported)	"Input":	"NumberOfConnections": 1,	Table 1: NumberOfConnections	unsignedInt ; $1 \leq \# \leq 10$, or supported Maximum if less than 10	
		N/A	Table 1: EthernetPriority TR-181 same	unsignedInt ; [0:7] Default: 0 = Best Effort	
IPv4 ToS: 0	"Input":	"DSCP": 0,	Table 1: DSCP	unsignedInt ; [0:63] Default: 0 = Best Effort	X
Input options: -4 Use only IPv4 address family (AF_INET) -6 Use only IPv6 address family (AF_INET6) no output with addresses	"Input":	"HostIPAddress": "1.2.3.4", "ClientIPAddress": "10.0.0.226", (If IPv6 is used, it will be evident in these "key": value pairs)	Table 1: ProtocolVersion TR-181: same Indicates the IP protocol version to be used. The default value SHOULD be Any. Enumeration of: <ul style="list-style-type: none"> Any (Use either IPv4 or IPv6 depending on the system preference) IPv4 (Use IPv4 for the requests) IPv6 (Use IPv6 for the requests) 	string; Default is "Any"	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Input":	Min and Max NOW ADDED! "UDPPayloadMin":35, "UDPPayloadMax":8972,	Table 1: UDPPayloadRange TR-181 has UDPPayloadMin and UDPPayloadMax SB-RED Max=8972	unsignedInt ; [35:8972] Default for range, min and max Max 8972 when Jumbo Frames permitted, 1472 without Jumbo frames.	
	"Input":	"UDPPayloadContent": "zeroes",	Table 1: UDPPayloadContent TR-181 same Enumeration of: <ul style="list-style-type: none"> • ones, • zeroes, • alternates0and1 • random 	string; Default is all zeroes.	
			Table 1: PortRange TR-181 has PortMin and PortMax Not in Minimum Profile, but description in TR-181 says: [MANDATORY] Starting value for range of Dynamic Ports supported for test traffic and status feedback messages. SB-RED: Delete [MANDATORY] on Min and Max		
			Table 1: PortRangeOptional TR-181 has PortOptionalMin and PortOptionalMax		

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
SendingRate Index: <Auto> or <rate> from Command line input, -l <rate>	"Input":	"TestType": "Search",	<p>Table 1: TestType TR-181: same</p> <p>Indicates the type of IP-Layer Capacity test being run. The default value SHOULD be <i>Search</i>. Enumeration of:</p> <ul style="list-style-type: none"> • <i>Search</i> (Search algorithm will be used to determine sending rate) • <i>Fixed</i> (Fixed sending rate will be used) 	enumeration; search or fixed (default is search)	X
DelayVar Thresholds(ms): 30-90 [RTT]	"Input":	"IPDVEnable": 0,	<p>Table 1: EnableIPDV TR-181: IPDVEnable</p> <p>Configuration for the measurement system permitting One-way measurement of IPDV as per [Y.1540]</p>	<p>Boolean; [0:1] 0=False, Use RTT= round-trip delay variation in the load rate adjustment algorithm (non-default is 1=True EnableIPDV which uses one-way delay variation for the load rate adjustment algorithm)</p> <p>Note: Added more explanation in TR-471</p>	X

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Input":	"IPRREnable": 1,	Table 1: EnableIPRR TR-181: IPRREnable Configuration for the measurement system permitting measurement of IPRR as per [Y.1540]	Boolean; [0:1] 0=False,IPRR disabled	X
	"Input":	"RIPREnable": 1,	Table 1: EnableRIPR TR-181: RIPREnable Configuration for the measurement system permitting measurement of RIPR as per [Y.1540]	Boolean; [0:1] 0=False,RIPR disabled	X
			Table 1: PreambleDuration TR-181 same Duration of active traffic preamble to testing.	unsignedInt ; 0 ≤ seconds ≤ 5 default 2 sec	
	"Input":	"SendingRateIndex": -1,	Table 1: StartSendingRate TR-181: StartSendingRate (471) The current sending rate (equivalent to a row of the table), Initialized at minimum Sending Rate in the Table of Sending Rates (181) [MANDATORY] The Sending Rate for a <i>Fixed</i> ³ test or the initial Sending Rate value for a <i>Search</i> ⁴ test. Value specified in <i>kbps</i> . The default value SHOULD be 500 <i>kbps</i> . SB-RED: Delete [MANDATORY]	unsignedInt ; 500 ≤ # ≤ 10,000,000 (10 Gbps) default is 500kbps	

³ [https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity\(\).TestType.Fixed](https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity().TestType.Fixed)

⁴ [https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity\(\).TestType.Search](https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity().TestType.Search)

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Input":	"NumberTestSubIntervals": 10,	Table 1: <i>m</i> TR-181: NumberTestSubIntervals Number of intermediate measurement intervals, dt , in Δt	unsignedInt ; $1 \leq \# \leq 100$	X
	"Input":	"NumberFirstModeTestSubIntervals": 0,	Table 1: <i>i</i> TR-181: NumberFirstModeTestSubIntervals Number of measurement intervals, dt , included in the report of the initial Capacity mode (1 and higher). The remaining sub-intervals of the total <i>m</i> are reported separately. "0" is used to replace the EnableBimodal parameter, and means the Bimodal analysis is NOT enabled.	unsignedInt ; $0 \leq \# \leq m$ Note: <i>m</i> is the practical limit for a consistent test, and 100 is an absolute limit	X
Sub-Interval[1] (sec): 1	"Input":	"TestSubInterval": 1000,	Table 1: dt (TestSubInterval) TR-181: same Duration of intermediate reporting intervals	unsignedInt ; $100 \leq ms \leq 6000$ (max $\Delta t/(m=10)$) in milliseconds) MUST meet Type;Range constraints on $\Delta t = m * dt$.	X ??
Trial Interval(ms): 50	"Input":	"StatusFeedbackInterval": 50,	Table 1: StatusFeedbackInterval TR-181: same	unsignedInt ; 50ms $20 \leq ms \leq 250$	X

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Input":	"TimeoutNoTestTraffic": 1000,	Table 1: TimeoutNoTestTraffic TR-181: same Timeout value, no test packets at Receiver since previous test packet.	unsignedInt ; $500 \leq \text{ms} \leq 1000$ Default is 1000ms: This value is consistent with a 10 sec test duration.	
	"Input":	"TimeoutNoStatusMessage": 1000,	Table 1: TimeoutNoStatusMessage TR-181: same Timeout value, no Status Messages at Receiver since previous Status Message.	unsignedInt ; $500 \leq \text{ms} \leq 1000$ Default is 1000ms: This value is consistent with a 10 sec test duration.	
	"Input":	"Tmax": 1000,	Table 1: TimeoutNoTestTraffic TR-181: same Maximum one-way Waiting time for packets to arrive	unsignedInt ; $500 \leq \text{ms} \leq 1000$ Default 1000ms	
	"Input":	"TmaxRTT": 3000,	Table 1: TimeoutNoStatusMessage TR-181: same Timeout value, no Status Messages at Sender since previous Status Message	unsignedInt ; $500 \leq \text{ms} \leq 1000$ Default 1000ms	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Input":	"TimestampResolution": 1,	Table 1: TimestampResolution TR-181: same (from the data model) Indicates the requested precision of timestamp values. The test implementation will determine the actual precision to use based on the implemented resolution capabilities of the protocols used and this requested value. If the implemented resolution capabilities of the IPLayerCapSupportedMetrics ⁵ protocols being used are able to provide the requested resolution, this resolution SHOULD be provided. Value specified in <i>microseconds</i> . The default value SHOULD be 1 <i>microseconds</i> .		
SeqError Threshold: 10	"Input":	"SeqErrThresh": 10,	Table3: SeqErrThresh TR-181: same Threshold for Loss or Reordering or Replication impairments measured (events where received packet sequence number did not increase by one)	unsignedInt ; 10 $0 \leq \text{SeqErrThresh} \leq 100$	X
Ignore OoO/ Dup: Disabled	"Input":	"ReordDupIgnoreEnable": 0,	Table3: ReordDupIgnoreEnable TR-181: same Configuration of SeqErrors counting to ignore Reordering and Duplication impairments measured (only Loss counts toward received packet sequence number errors)	Boolean; [0:1] 0 (False: not enabled)	X

⁵ <https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapSupportedMetrics>

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
DelayVar Thresholds(ms): 30-90	"Input":	"LowerThresh": 30,	Table 3: LowThresh TR-181: LowerThresh Low threshold on the Range of Round Trip Time variation, RTT (Range is values above minimum RTT)	unsignedInt ; $5 \leq \text{ms} \leq 250$ 30ms default	X
DelayVar Thresholds(ms): 30- 90	"Input":	"UpperThresh": 90,	Table 3: UpperThresh TR-181: same The number of rows to move in a single adjustment when initially increasing offered load (to ramp-up quickly)	unsignedInt ; $5 \leq \text{ms} \leq 250$ 90ms default	X
High-Speed Delta: 10	"Input":	"HighSpeedDelta": 10,	Table 3: HighSpeedDelta TR-181: same The number of rows to move in a single adjustment when initially increasing offered load (to ramp-up quickly)	unsignedInt ; ≥ 2 Default = 10rows	X
Congestion Threshold: 3	"Input":	"SlowAdjThresh": 3,	Table 3: SlowAdjThresh TR-181: same Threshold on SlowAdjCount used to infer congestion. Use values >1 to avoid misinterpreting transient loss.	unsignedInt ; > 1 Default = 3	X
NA (except with -S CLI command)	"Input":	"HSpeedThresh": 1000000000	Table 3: HSpeedThresh TR-181: same Threshold for transition between low and high sending rate step sizes (such as 1 Mbps and 100 Mbps). MAY result in use of Jumbo Frames if permitted.	unsignedInt ; ≥ 1 Default = 1 Gbps	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
OUTPUT Follows The rows of the 3 tables (TR-471, TR-181, and Wiki) have been re-ordered to match to match for Output		OUTPUT Follows	OUTPUT Follows	OUTPUT Follows	
	"IPLayerMaxConnections": 1,		ONLY TR-181: IPLayerMaxConnections Indicates the maximum number of connections that are supported for an IP-Layer Capacity test.	unsignedInt (1:)	
	"IPLayerMaxIncrementalResult": 3600,		ONLY TR-181: IPLayerMaxIncrementalResult The maximum number of rows in IPLayerCapacity().IncrementalResult ⁶ that the device will store.	unsignedInt (1:)	

⁶ [https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity\(\).IncrementalResult.{i}](https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity().IncrementalResult.{i}).

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
Software Ver: 7.2.1,	"IPLayerCapSupported": {	"SoftwareVersion": "7.2.1",	Table 4: IPLayerCapSupportedSoftwareVersion TR-181: IPLayerCapSupportedSoftwareVersion Installed version of the test software. Indicates the installed version of the test software. The software version string will be implementation-dependent, and SHOULD identify both the implementation and the version (e.g., UDPST-7.2.1).	string	X
Protocol Ver: 8,	"IPLayerCapSupported": {	"ControlProtocolVersion": 8,	Table 4: IPLayerCapSupportedControlProtocolVersion TR-181: IPLayerCapSupportedControlProtocolVersion Installed version of the test software's control protocol.	unsignedInt	X

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"IPLayerCapSupported": {	"Metrics": "IPLR,Sampled_RTT,IPDV,IPRR"	<p>TR-181 ONLY: IPLayerCapSupportedMetrics</p> <p>Comma-separated list of strings. Indicates the test metrics from [Section 5.2/TR-471⁷] that are supported by the device.</p> <p>Note that [TR-471⁸] mandates support for and use of IPLR and Sampled RTT. Each list item is an enumeration of:</p> <ul style="list-style-type: none"> • <i>IPLR</i> (IP packet Loss Ratio) • <i>Sampled_RTT</i> (Sampled Round Trip Time) • <i>IPDV</i> (IP packet Delay Variation, OPTIONAL) • <i>IPRR</i> (IP packet Reordering Ratio, OPTIONAL) • <u>should also have: RIPR (Replicated IP Packet Ratio, OPTIONAL)</u> <p>SB</p>	string	

⁷ <https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#R.TR-471>

⁸ <https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#R.TR-471>

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
Complete can be implied from STDOUT = completed measurements, other notifications and warnings.	"Output":	<p>"Status":</p> <p>Note: Outside of the Output category, ErrorStatus and ErrorMessage reflect the overall test implementation status. For example:</p> <p>Note: StatusMessage content depends on implementation/ Operating System.</p> <p>"ErrorStatus": 0, "ErrorMessage": ""</p> <p>(and expect that TR-181 Status = <i>Complete</i>, else TR-181 Status = <i>Error_Other</i> for non-0 ErrorStatus).</p> <p>or</p> <p>"ErrorStatus": -1, "ErrorMessage": "GETADDRINFO ERROR: Invalid argument (Name or service not known)"</p> <p>or</p> <p>"ErrorStatus": -1,</p>	<p>ONLY in TR-181: Status</p> <p>Indicates the availability of diagnostics data. Enumeration of:</p> <ul style="list-style-type: none"> • <i>Complete</i> • <i>Error_CannotResolveHostName</i> • <i>Error_NoRouteToHost</i> • <i>Error_InitConnectionFailed</i> • <i>Error_NoResponse</i> • <i>Error_PasswordRequestFailed</i> • <i>Error_LoginFailed</i> • <i>Error_RejectedByRemote</i> • <i>Error_IncorrectSize</i> • <i>Error_Timeout</i> • <i>Error_Internal</i> • <i>Error_Other</i> <p>If the value of this parameter is anything other than <i>Complete</i>, the values of the other results parameters for this test are indeterminate.</p>	enumeration	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
		"ErrorMessage": "Timeout awaiting server response, exiting!" or "ErrorStatus": 1, "ErrorMessage": "LOCAL WARNING: Incoming traffic has completely stopped"			
TBD	"Output":	"BOMTime": "2021-10-24T22:38:02.202132Z",	Table 4: BeginningOfMeasurement TR-181: BOMTime t , the start of a measurement interval, in UTC, which MUST be specified to TimestampResolution precision (Table 2) For example: 2008-04-09T15:01:05.123456Z	datetime, UTC	Part of Minimum Profile, = X
TBD	"Output":	"EOMTime": "2021-10-24T22:38:12.710272Z", (see the very end of JSON output)	Table 4: EndOfMeasurement TR-181: EOMTime $t + \Delta t$, the end of a measurement interval, in UTC, which MUST be specified to TimestampResolution precision (Table 2). For example: 2008-04-09T15:01:05.123456Z	datetime, UTC	??
	"Output":	"TmaxUsed": 1000,	Table 4: TmaxUsed TR-181: TmaxUsed Configured value of Tmax used in the test (milliseconds)	unsignedInt	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	TBD		Table 4: TmaxRTTUsed TR-TR-181: same name Configured value of TmaxRTT used in the test (milliseconds)	unsignedInt	
	"Output":	"TestInterval": 10,	Table 4: TestInterval TR-181: TestInterval Measured Duration of the test (either downlink or uplink). This value is expected to equal TestSubInterval(see page 3) * NumberTestSubIntervals(see page 3) . This value is expressed in seconds.	unsignedInt	
Maximum Mbps(L3/IP)	"AtMax": {	"MaxIPLayerCapacity": 967.20,	Table 4: MaximumIP-LayerCapacity TR-181: MaxIPLayerCapacity	decimal64 number with fraction digits = 2, as specified in [Section 9.3 of RFC7950].	X
TBD	"AtMax": {	"TimeOfMax": "2021-10-24T22:38:12.264182Z",	Table 4: TimeOfMaximumIP-LayerCapacity TR-181: TimeOfMax	datetime, UTC	X
Mbps(L2/Eth):	"AtMax": {	"MaxETHCapacityNoFCS": 978.08,	Table 4: MaximumETHCapacityNoFCS TR-181: same	decimal, 2 digit fraction	X
Mbps(L1/Eth):	"AtMax": {	"MaxETHCapacityWithFCS": 996.73,	Table 4: MaximumETHCapacityWithFCS TR-181: same	decimal, 2 digit fraction	X
Mbps(L1/Eth+VLAN):	"AtMax": {	"MaxETHCapacityWithFCSVLAN": 999.84,	Table 4: MaximumETHCapacityWithFCSVLAN TR-181: same	decimal, 2 digit fraction	X

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
TBD Once the Max is found: LossRatio: 0.00E+00 (current output resolution is less than TR-471)	"AtMax": {	"LossRatioAtMax": 0.003065378,	Table 4: LossRatioAtMaxCapacity TR-181: LossRatioAtMax IP-Layer Capacity metric for a single interval dt_n to dt_{n+1} , see Equation 1, where the Capacity is the number of bits received in the subinterval divided by the duration, dt .	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	X
TBD Once the Max is found: RTTVar(ms): 0-x (current output resolution is less than TR-471)	"AtMax": {	"RTTRangeAtMax": 0.004,	Table 4: RTTRangeAtMaxCapacity TR-181: RTTRangeAtMax The Range of RTT during the dt_n corresponding to the Max IP-Layer Capacity above, determined at the conclusion of the test. The Range of RTT shall be calculated using the conditional distribution of all packets with a finite value of round-trip delay (undefined delays are excluded), a single value. The time value of the result is expressed in units of <i>seconds</i> , as a positive value.	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	X

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
TBD Once the Max is found: OWDVar(ms) : 0/0/1 (min/ave/max?) (current output resolution is less than TR-471)	"AtMax": {	"PDVRangeAtMax": 0.003,	Table 4: PDVRangeAtMaxCapacity TR-181: PDVRangeAtMax The Range of PDV during the dt_n corresponding to the Max IP-Layer Capacity above, determined at the conclusion of the test. The Range of PDV shall be calculated using the conditional distribution of all packets with a finite value of one-way delay (undefined delays are excluded, as described for other delay measurements). This value is expressed in <i>seconds</i> . This value is expressed as a decimal to 9 decimal digits.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	X
TBD Once the Max is found: OWDVar(ms) : 0/0/1 (min?/ave/max) (current output resolution is less than TR-471)	"AtMax": {	"MinOnewayDelayAtMax": 0.01	Table 4: MinOnewayDelayAtMaxCapacity TR-181: MinOnewayDelayAtMax The Minimum One-way Delay during the dt_n corresponding to the Max IP-Layer Capacity above, The Minimum One-way Delay is determined at the conclusion of the test. The Minimum One-way Delay shall be calculated using the conditional distribution of all packets with a finite value of one-way delay (undefined delays are excluded, as described for other delay measurements). This value is expressed in <i>seconds</i> .	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
TBD Once the Max is found: Loss/ OoO /Dup: 0/ 0 /0 Note: this is a count, a ratio can be calculated.	"AtMax": {	"ReorderedRatioAtMax": 0.0,	Table 4: ReorderedRatioAtMaxCapacity TR-181: ReorderedRatioAtMax Ratio of Reordered total packets sent during dtn corresponding to the Max IPLayer Capacity above, determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	
TBD Once the Max is found: Loss/ OoO/ Dup : 0/0/ 0 Note: this is a count, a ratio can be calculated.	"AtMax": {	"ReplicatedRatioAtMax": 0.0,	Table 4: ReplicatedRatioAtMaxCapacity TR-181: ReplicatedRatioAtMax Ratio of Replicated packkeys to total packets sent during dtn corresponding to the Max IPLayer Capacity above, determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	
	"AtMax": {	"InterfaceEthMbps": 0.0,	Table 5: InterfaceEthMbpsAtMax TR-181: same The number of bits observed on the Interface during an IP-Layer Capacity test for time interval of duration TestSubInterval ending at TimeOfSubInterval corresponding to the MaxIPLayerCapacity, divided by the duration of TestSubInterval. Result is expressed in Mbps with 2 digits beyond the decimal. 10^6 bits/second = 1 Mbps. This is primarily a diagnostic measurement. Measurement direction follows the Role (Sender or Receiver). This measurement is optional.	decimal64 number with fraction digits = 2, as specified in [Section 9.3 of RFC7950].	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"AtMax": {	"Mode": 1, The bimodal mode number and about 9 other metrics are only available in JSON Output: "LossCount": 372, "ReorderedCount": 0, "ReplicatedCount": 0, "PDVMin": 0.007, "PDVAvg": 0.008, "PDVMax": 0.01, "RTTMin": 0.007, "RTTMax": 0.012,			
			Table 4: TR-181:	dateTime	
Downstream Summary (over the entire test Interval)	"Summary": {		<There is not an exact match for the Summary among udpst STDOUT, These are measurements that apply to the entire test duration, TestInterval. >		
Mbps(L3/IP):	"Summary": {	"IPLayerCapacitySummary": 729.85,	Table 4: IP-LayerCapacitySummary TR-181: same Results of measurements using the IP-Layer Capacity metric over the complete TestInterval, $dt * m$, see Equation 1	decimal64 number with fraction digits = 2, as specified in [Section 9.3 of RFC7950].	X

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
Delivered(%):	"Summary": {	"LossRatioSummary": 0.002482453,	Table 4: LossRatioSummary TR-181: same Ratio of lost to total packets sent during the complete TestInterval, $dt * m$, determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	X
RTTVar(ms):	"Summary": {	"RTTRangeSummary": 0.012,	Table 4: RTTRangeSummary TR-181: same The Range of RTT during the complete TestInterval, $dt * m$, determined at the conclusion of the test. ...	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
OWDVar(ms):	"Summary": {	"PDVRangeSummary": 0.014,	Table 4: PDVRangeSummary TR-181: same The Range of PDV during the complete TestInterval, $dt * m$, determined at the conclusion of the test. ...	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
Downstream Minimum One-Way Delay(ms): 18 [w/clock difference],	"Summary": {	"MinOnewayDelaySummary": 0.005,	Table 4: MinOnewayDelaySummary TR-181: same The Minimum One-way Delay during the complete TestInterval, $dt * m$, The Minimum One-way Delay is determined at the conclusion of the test. ...	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
Downstream Minimum Round-Trip Time(ms):	"Summary": {	"MinRTTSummary": 0.007	Table 4: MinRTTSummary TR-181: same The Minimum RTT during the complete TestInterval, $dt * m$, The Minimum RTT is determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	X
TBD	"Summary": {	"ReorderedRatioSummary": 0.0,	Table 4: ReorderedRatioSummary TR-181: same Ratio of Reordered to total packets sent during the complete TestInterval, $dt * m$, determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
TBD	"Summary": {	"ReplicatedRatioSummary": 0.0,	Table 4: ReplicatedRatioSummary TR-181: same Ratio of Replicated to total packets sent during the complete TestInterval, $dt * m$, determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	
	"Summary": {	"InterfaceEthMbps": 0.0,	Table 5: InterfaceEthMbpsSummary TR-181: same The number of bits observed on the Interface during an IP-Layer Capacity test for the entire time interval of duration TestInterval, divided by the duration of TestInterval. Result is expressed in Mbps with 2 digits beyond the decimal. 10^6 bits/second = 1 Mbps. This is primarily a diagnostic measurement. Measurement direction follows the Role (Sender or Receiver). This measurement is optional.	decimal64 number with fraction digits = 2, as specified in [Section 9.3 of RFC7950].	
Loss/OoO/Dup:	"Summary": {	"seqErrLoss":	Loss Count - do we need this too? NOT CURRENTLY ADDED		
Loss/OoO/Dup:	"Summary": {	"seqErrOoo":	Table 4: ReorderedRatioSummary TR-181: same Ratio of Reordered to total packets sent during the complete TestInterval, $dt * m$, determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
Loss/OoO/Dup:	"Summary": {	"seqErrDup":	Table 4: ReplicatedRatioSummary TR-181: same Ratio of Replicated to total packets sent during the complete TestInterval, $dt * m$, determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	
OWDVar(ms): RTTVar(ms): (others)	"Summary": {	About 8 metrics not in the data model or specification: "LossCount": 1679, "ReorderedCount": 0, "ReplicatedCount": 0, "PDVMin": 0.0, "PDVAvg": 0.004, "PDVMax": 0.011, "RTTMin": 0.0, "RTTMax": 0.012,	do we need this too? NOT CURRENTLY ADDED		

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Output":	"ModalResult": [],	<p>Table 4: ModalResult{<i>i</i>} TR-181: ModalResult.{<i>i</i>} Modal test results. Only returned when bimodal test mode is enabled (NumberFirstModeTestSubIntervals⁹ >=1). If returned, it MUST contain one or more entries, with instance number 1 corresponding to the <u>second</u> mode and instance number 2 corresponding to the <u>third</u> mode, etc.</p> <p>Results for the Maximum in each mode/instance are calculated based on IncrementalResult.{<i>i</i>}¹⁰ data within the boundary of its corresponding mode.</p> <p><Deleted: This table MUST contain at least 0 and at most 2 entries.></p> <p>This table's Instance Numbers MUST be 1, 2, 3... (assigned sequentially without gaps).</p> <p>SB</p>	There is a Straw ballot comment here: only one mode in ModalResult when two modes are to be reported.	
IncrementalResult.{<i>i</i>} (Incremental Results for all sub-intervals below)	IncrementalResult.{<i>i</i>}	IncrementalResult.{<i>i</i>}	IncrementalResult.{<i>i</i>}	IncrementalResult.{<i>i</i>}	

⁹ [https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity\(\).NumberFirstModeTestSubIntervals](https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity().NumberFirstModeTestSubIntervals)

¹⁰ [https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity\(\).IncrementalResult.{i}](https://build.broadband-forum.org/artifact/BUSDM-DEV2DMDEV/JOB1/build-196/HTML/device2/docs/tr-181-2-usp.html#D.Device:2.Device.IP.Diagnostics.IPLayerCapacity().IncrementalResult.{i})

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Output": { "IncrementalResult": [{	"IPLayerCapacity": 93.36,	Table 4: IP-LayerCapacitySubInterval TR-181: IPLayerCapacity Results of measurements using the IP-Layer Capacity metric for a single interval dt_n to dt_{n+1} , see Equation 1, where the Capacity is the number of bits received in the subinterval divided by the duration, dt.	decimal64 number with fraction digits = 3, as specified in [Section 9.3 of RFC7950].	
	"Output": { "IncrementalResult": [{	"TimeOfSubInterval": "2021-10-24T22:38:03.253183Z",	Table 4: TimeOfIP-LayerCapacitySubInterval TR-181:TimeOfSubInterval End Time of the dt_n to dt_{n+1} sub-interval when each of the m IP-Layer Capacity was measured, in UTC, which MUST be specified to TimestampResolution precision(Table 2)	dateTime	
	"Output": { "IncrementalResult": [{	"LossRatio": 0.0,	Table 4: LossRatioSubInterval TR-181: LossRatio Ratio of lost to total packets sent during dt_n to dt_{n+1} corresponding to each IP-LayerCapacitySubInterval above).	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Output": { "IncrementalResult": [{	"RTTRange": 0.002,	Table 4: RTTRangeSubInterval TR-181: RTTRange The Range of RTT during dt_n corresponding to packets sent during dt_n to dt_{n+1} corresponding to each IP-LayerCapacitySubInterval above). The Range of RTT shall be calculated using the conditional distribution of all packets with a finite value of round-trip delay (undefined delays are excluded), a single value	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
	"Output": { "IncrementalResult": [{	"PDVRange": 0.0,	Table 4: PDVRangeSubInterval TR-181: PDVRange The Range of PDV during dt_n corresponding to packets sent during dt_n to dt_{n+1} corresponding to each IP-LayerCapacitySubInterval above. The Range of PDV shall be calculated using the conditional distribution of all packets with a finite value of one-way delay (undefined delays are excluded, as described for other delay measurements).	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Output": { "IncrementalResult": [{	"MinOnewayDelay": 0.005,	Table 4: MinOnewayDelaySubInterval TR-181: MinOnewayDelay The Minimum One-way Delay during dt_n corresponding to packets sent during dt_n to dt_{n+1} corresponding to each IP-LayerCapacitySubInterval above. The Minimum One-way Delay is determined at the conclusion of the test. The Minimum One-way Delay shall be calculated using the conditional distribution of all packets with a finite value of one-way delay (undefined delays are excluded, as described for other delay measurements).	decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
	"Output": { "IncrementalResult": [{	"ReorderedRatio": 0.0,	Table 4: ReorderedRatioSubInterval TR-181: ReorderedRatio Ratio of Reordered to total packets sent during dt_n to dt_{n+1} corresponding to each IP-LayerCapacitySubInterval above).	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	
	"Output": { "IncrementalResult": [{	"ReplicatedRatio": 0.0,	Table 4: ReplicatedRatioSubInterval TR-181: ReplicatedRatio Ratio of Replicated to total packets sent during dt_n to dt_{n+1} corresponding to each IP-LayerCapacitySubInterval above).	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	

udpst text output	JSON Category	Current JSON name	TR-471 name (and TR-181 name for unique output parameters)	TR-471 Format and Units	Min Profile
	"Summary": {	"InterfaceEthMbps": 0.0,	<p>Table 5: InterfaceEthMbps TR-181: same</p> <p>The number of bits observed on the Interface during an IP-Layer Capacity test for time interval of duration TestSubInterval ending at TimeOfSubInterval, divided by the duration of TestSubInterval. Result is expressed in Mbps with 2 digits beyond the decimal. 10^6 bits/second = 1 Mbps. This is primarily a diagnostic measurement. Measurement direction follows the Role (Sender or Receiver). This measurement is optional.</p>	decimal64 number with fraction digits = 2, as specified in [Section 9.3 of RFC7950].	
	"Output": { "IncrementalResult": [{	<p>"Interval": 1,</p> <p>"Seconds": 1,</p> <p>"DeliveredPercentage": 100.00,</p> <p>"PDVMin": 0.0,</p> <p>"PDVAvg": 0.0,</p> <p>"PDVMax": 0.0,</p> <p>"RTTMin": 0.0,</p> <p>"RTTMax": 0.002,</p> <p>"InterfaceEthMbps": 0.00,</p>	There are lots of additional JSON outputs!		

3 First Pass (Implemented in Release 7.2.0, (with variable names updated to exact implementation, including a typo))

Table below starts with Test context and configuration. "X" = Part of Minimum Profile. The Release 7.2.1 Default values for SeqErrThresh (10) and SlowAdjThresh (3) are used below.

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
Mode: Client Downstream Test	"config": "type":	"Downstream", (reported on the client)	Table 1: Role	enumeration [Receiver, Sender]	X
NA (Command line input)			Table 1: Host	string(256)	X
NA			Table 1: Port	unsignedInt; [1:65535]	
(only 1 supported)			Table 1: NumberOfConnections	unsignedInt; $1 \leq \# \leq 10$, or supported Maximum if less than 10	
Jumbo Datagrams: Enabled (above 1Gbps by default)			Table 1: JumboFramesPermitted	Boolean;[0:1] Default: 0 (False: not permitted) Note: Default changing to True	X
IPv4 ToS: 0	"config": "type":	"iptos_byte": 0	Table 1: DSCP	unsignedInt; [0:63] Default: 0 = Best Effort	X
SendingRate Index: <Auto> or <rate> from Command line input, -l <rate>	"config": "type":	"sending_rate":	Table 1: TestType	enumeration; search or fixed (default is search, but the current JSON includes the summary fields for the entire TestInterval, making it more likely to be used ??)	X

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
DelayVar Thresholds(ms): 30-90 [RTT]	"config": "type":	"delay_usage": "RTT" or	Table 1: EnableIPDV	Boolean;[0:1] 0=False, Use RTT= round-trip delay variation in the load rate adjustment algorithm (non-default is 1=True EnableIPDV which uses one-way delay variation for the load rate adjustment algorithm) Note: Added more explanation in TR-471	X
Test Interval(sec): 10	"config": "type":	"duration":	Table 1: Δt (TestInterval)	unsignedInt; $5 \leq \text{seconds} \leq 60$	X
Sub-Interval[10] (sec):			Table 1: m (NumberTestSubIntervals)	unsignedInt; $1 \leq \# \leq 100$	
Sub-Interval[1] (sec): 1			Table 1: dt (TestSubInterval)	unsignedInt; $100 \leq \text{ms} \leq 6000$ (max $\Delta t / (m=10)$) in milliseconds) MUST meet Type;Range constraints on $\Delta t = m * dt$.	X
Trial Interval(ms): 50	"config": "type":	"interval":	Table 1: StatusFeedbackInterval	unsignedInt; 50ms $20 \leq \text{ms} \leq 250$	X
SeqError Threshold: 10	"config": "type":	"seqerr_th":10	Table3: SeqErrThresh	unsignedInt; 10 $0 \leq \text{SeqErrThresh} \leq 100$	X

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
Ignore OoO/ Dup: Disabled	"config": "type":	"ignore_ooodup": false	Table3: EnableReordDuplgnore Configuration of SeqErrors counting to ignore Reordering and Duplication impairments measured (only Loss counts toward received packet sequence number errors)	Boolean;[0:1] 0 (False: not enabled)	X
DelayVar Thresholds(ms): 30-90	"config": "type":	"delvat_lower":	Table 3: LowThresh	unsignedInt; $5 \leq \text{ms} \leq 250$	X
DelayVar Thresholds(ms): 30-90	"config": "type":	"delvar_upper":	Table3: UpperThresh	unsignedInt; $5 \leq \text{ms} \leq 250$	X
High-Speed Delta: 10	"config": "type":	"hs_delta": 10	Table 3: HighSpeedDelta The number of rows to move in a single adjustment when initially increasing offered load (to ramp-up quickly)	unsignedInt; ≥ 2	X
Congestion Threshold: 3	"config": "type":	"congest_th": 3	Table 3: SlowAdjThresh Threshold on SlowAdjCount used to infer congestion. Use values >1 to avoid misinterpreting transient loss.	unsignedInt; >1	X
OUTPUT Follows					
			Table 4: BeginningOfMeasurement	datetime, UTC	Part of Minimum Profile, = X

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
Maximum Mbps(L3/IP)	"results" : "maximum":	"L3Mbps":	Table 4: MaximumIP-LayerCapacity	decimal64number with fraction digits = 3, as specified in [Section 9.3 of RFC7950].	X
			Table 4: TimeOfMaximumIP-LayerCapacity	datetime, UTC	
Mbps(L2/Eth):	"results" : "maximum":	"L2Mbps"	Table 4: MaximumETH Capacity(noFCS)		X
Mbps(L1/Eth):	"results" : "maximum":	"L1Mbps"	Table 4: MaximumETH Capacity(withFCS)		X
Mbps(L1/Eth+VLAN):	"results" : "maximum":	"L0Mbps"	Table 4: MaximumETH Capacity(withFCS+VLAN)		X
			Table 4: IP-LayerCapacitySubInterval IP-Layer Capacity metric for a single interval dtn to dtn+1, see Equation 1, where the Capacity is the number of bits received in the subinterval divided by the duration, dt.	Mbps, decimal64number with fraction digits = 3, as specified in [Section 9.3 of RFC7950].	
			Table 4: TimeOfIP-LayerCapacitySubInterval	datetime, UTC	

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
			Table 4: LossRatioAtMaxCapacity Ratio of lost of total packets sent during dtn corresponding to the Max IP-Layer Capacity above), determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	
			Table 4: LossRatioSubInterval Ratio of lost to total packets sent during dtn to dtn+1 corresponding to each IPLayerCapacitySubInterval above).	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.0000000001	
			Table 4: RTTRangeAtMaxCapacity	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
			Table 4: RTTRangeSubInterval	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
			Table 4: PDVRangeAtMaxCapacity The Range of PDV during the dtn corresponding to the Max IP-Layer Capacity above, determined at the conclusion of the test. The Range of PDV shall be calculated using the conditional distribution of all packets with a finite value of one-way delay (undefined delays are excluded, as described for other delay measurements).	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
			Table 4: PDVRangeSubInterval	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
			Table 4: MinOnewayDelayAtMaxCapacity The Minimum One-way Delay during the dtn corresponding to the Max IP-Layer Capacity above, The Minimum One-way Delay is determined at the conclusion of the test. The Minimum One-way Delay shall be calculated using the conditional distribution of all packets with a finite value of one-way delay (undefined delays are excluded, as described for other delay measurements).	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
			Table 4: MinOnewayDelay SubInterval	seconds, decimal64 with fraction digits = 9 (see section 9.3 of [RFC7950]) with resolution of 0.000000001 seconds (1.0 ns).	
			Table 4: ReorderedRatioAtMaxCapacity Ratio of Reordered total packets sent during dtn corresponding to the Max IPLayer Capacity above), determined at the conclusion of the test.	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.000000001	
			Table 4: ReorderedRatio SubInterval	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.000000001	
			Table 4: ReplicatedRatioAtMaxCapacity	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.000000001	
			Table 4: ReplicatedRatio Subinterval	decimal64 with fraction digits = 9 (see section 9.3 of [RFC6020]) with resolution of 0.000000001	
Downstream Summary Delivered(%):	"results": "summary":	"avgDeliveredPct":	<There is not an exact match for the this and the JSON labels in TR-471. These are measurements that apply to the entire test duration, TestInterval. >		

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
Loss/OoO/Dup:	"results" : "summary":	"seqErrLoss" :			
Loss/OoO/Dup:	"results" : "summary":	"seqErrOoo" :			
Loss/OoO/Dup:	"results" : "summary":	"seqErrDup" :			
OWDVar(ms):	"results" : "summary":	"owdVarMin":			
OWDVar(ms):	"results" : "summary":	"owdVarAvg":			
OWDVar(ms):	"results" : "summary":	"owdVarMax":			
RTTVar(ms):	"results" : "summary":	"rttVarMin":			

udpst text output	JSON Category	Current JSON name	TR-471 name	TR-471 Format and Units	Min Profile
RTTVar(ms):	"results" : "summary":	"rttVarMax" :			
Mbps(L3/IP):	"results" : "summary":	"avgL3Mbps":			
Downstream Minimum One-Way Delay(ms): 18 [w/clock difference],	"results" : "minimum":	"owd":			
Downstream Minimum Round-Trip Time(ms):	"results" : "minimum":	"rtt":			