



Capability to Record and Produce Call Transactions

- [Feature Summary and Revision History, on page 1](#)
- [Feature Description, on page 2](#)
- [How it Works, on page 2](#)
- [Configuring RTT for ePDG, on page 32](#)
- [Monitoring and Troubleshooting, on page 33](#)

Feature Summary and Revision History

Summary Data

Applicable Product(s) or Functional Area	ePDG
Applicable Platform(s)	<ul style="list-style-type: none"> • ASR 5500 • VPC-DI • VPC-SI
Feature Default	Disabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	<i>ePDG Administration Guide</i>

Revision History

Revision Details	Release
Added RTT Record Schema table.	21.26
ePDG supports capability to record and produce call transactions.	21.23
First Introduced.	Release 20

Feature Description

Real Time Tool (RTT) is used in Regions and Network Operations Center (NOC) for debugging network issues and to understand user behavior. All call transactions in ePDG are generated in RTT files. The ePDG support allows to understand service impact on the ePDG chassis for WLAN offload service. ePDG transfers RTT files to the external server through SSH File Transfer Protocol (SFTP). The RTT files that are in comma separated values (.CSV) format are transferred either in compressed or non-compressed format based on the configuration to the external servers such as servers in customer network either directly or through the Cisco Collector server.



Note RTT Record Schema and its procedure numbers are genericized to Gateway RTT. Contact your Cisco account representative for detailed information on specific RTT Record Schema.

How it Works

This section describes the RTT procedures and schema.

RTT Procedures

The following table lists the RTT procedures that are specific to ePDG, P-GW and SaMOG:

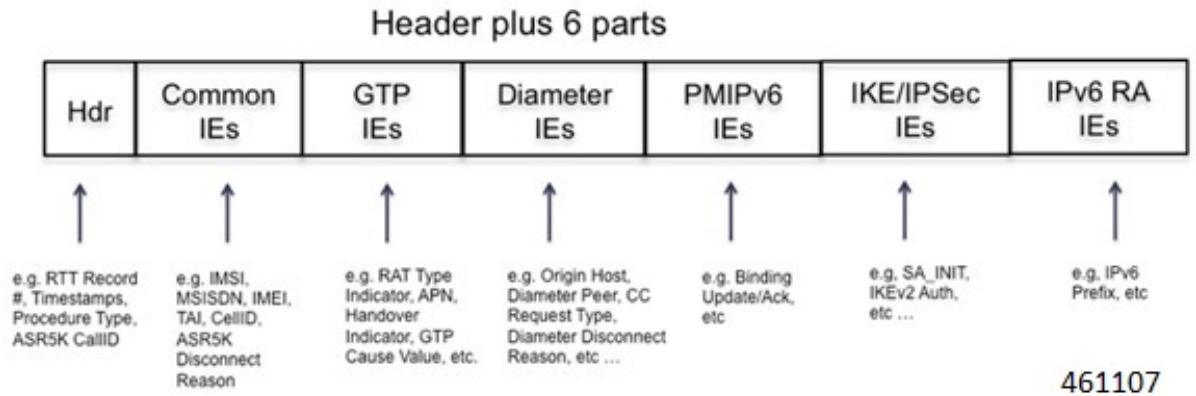
Procedure Number	Procedure Name	Applicability
1	S5/S8/S2b GTP Create Session	P-GW, ePDG, SaMOG
2	S5/S8/S2b GTP Create Bearer	P-GW, ePDG, SaMOG
3	S5/S8/S2b GTP Delete Session	P-GW, ePDG, SaMOG
4	S5/S8/S2b GTP Delete Bearer	P-GW, ePDG, SaMOG
5	GTP Modify Bearer	P-GW
6	S5/S8/S2b GTP Update Bearer	P-GW, ePDG, SaMOG
7	S6b/SWm – Diameter AAR/ AAA	P-GW, ePDG, SaMOG
8	S6b/SWm – Diameter RAR/RAA	P-GW, ePDG, SaMOG
9	S6b/SWm – Diameter Session Termination	P-GW, ePDG, SaMOG
10	S6b – Abort Session	P-GW, ePDG, SaMOG
11	Diameter Gx – CCR-I/CCA-I	P-GW
12	Diameter Gx – CCR-U/CCA-U	P-GW

Procedure Number	Procedure Name	Applicability
13	Diameter Gx – CCR-T/CCA-T	P-GW
14	Diameter Gx – RAR/RAA	P-GW
15	Diameter Gy – CCR-I/CCA-I	P-GW
16	Diameter Gy – CCR-U/CCA-U	P-GW
17	Diameter Gy – CCR-T/CCA-T	P-GW
18	Diameter Gy – RAR/RAA	P-GW
19	PMIPv6 S2a – Binding Update/Acknowledgement	P-GW
20	PMIPv6 S2a Revocation Update/Acknowledgement	P-GW
21	SWu – IKEv2 SA INIT/Resp	ePDG
22	SWu – IKEv2 Auth Req/Resp	ePDG
23	SWu – IKEv2 Information Req/Resp	ePDG
24	SWm – Diameter EAP Request/Answer	ePDG, SaMOG
25	ePDG Router Advertisement	ePDG, SaMOG
26	SWu – CREATE_CHILD_SA Req/Resp	ePDG
27	Radius – WLC-SaMOG Access Request/Challenge	SaMOG
28	Radius – WLC-SaMOG Access Request/Accept	SaMOG
29	Radius – WLC-SaMOG Disconnect Request/Response	SaMOG
30	Radius – WLC-SaMOG Accounting Request/Response	SaMOG
31	Radius – SaMOG-Radius Server Accounting Req/Res	SaMOG
32	WLC – SaMOG DHCP Discover/Offer	SaMOG
33	WLC – SaMOG DHCP Request/Ack/Nak	SaMOG
34	WLC – SaMOG DHCP Release/Ack/Nak	SaMOG

RTT Record Schema

The following figure details the new RTT schema.

Figure 1: RTT Record Schema



RTT schema has a Header and the following six blocks of Information Elements (IEs). There are totally 170 IEs that are grouped in 6 blocks. Contact your Cisco account representative for the complete list of RTT Record Schema IEs.

- Common IEs
- GPRS Tunneling Protocol (GTP) IEs. These IEs are existing and are re-used.
- Diameter IEs (new IEs)
- Proxy Mobile IPv6 IEs
- Internet Key Exchange (IKE)/ Internet Protocol Security (IPsec) IEs
- Internet Protocol v6 Router Advertisement (IPv6 RA IEs)



Note IKE/IPSec and IPv6 RA IEs are new and they are contained inside new blocks. Diameter IEs are new and are appended to the existing Diameter IE blocks.

The RTT Record schemas are listed in the following table:

EIR
CP
ymlGA
TDR
CIR
rdr
ck
*RT
ymlGA
TDR
rdr
rdr

~~61~~ ~~62~~
~~63~~
~~64~~ A
~~65~~ I
~~66~~ SFC
~~67~~ I
~~68~~ I
~~69~~ A
~~70~~ N
~~71~~ o
~~72~~ h
~~73~~ s
~~74~~ A
~~75~~ S
~~76~~ U
~~77~~ (M
~~78~~ s m
~~79~~ y
~~80~~ A
~~81~~ I
~~82~~ U
~~83~~ (M
~~84~~ s m
~~85~~ y
~~86~~ A
~~87~~ I
~~88~~ E
~~89~~ A
~~90~~ E
~~91~~ of
~~92~~ E
~~93~~ E
~~94~~ R
~~95~~ o t
~~96~~ 0 1
~~97~~ E
~~98~~ 1
~~99~~ 1
~~100~~ 2 1
~~101~~ 3 1
~~102~~ 2 2
~~103~~ 4 2
~~104~~ I
~~105~~ I
~~106~~ 5
~~107~~ 7
~~108~~ 5 1
~~109~~ 6 1
~~110~~ 7 1

61 300H
ref5
n i
o a l
w n
c n c
0
w e N
P
i
j a m
4 3 2 1
D m 1 2
r o f
P
c n c
E
W G a m 1
D m 1 2
r o f
P
c n c
E
6 P 2 1
W s a 2
s a 5
c n c
V G
W S H
r o
V G S
7 s a 1
m a
c n
a
8 1 1
s a 1
P 1
s a 1

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100

60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

8755
8756
8757
8758
8759
8760
8761
8762
8763
8764
8765
8766
8767
8768
8769
8770
8771
8772
8773
8774
8775
8776
8777
8778
8779
8780
8781
8782
8783
8784
8785
8786
8787
8788
8789
8790
8791
8792
8793
8794
8795
8796
8797
8798
8799
8800
8801
8802
8803
8804
8805
8806
8807
8808
8809
8810
8811
8812
8813
8814
8815
8816
8817
8818
8819
8820
8821
8822
8823
8824
8825
8826
8827
8828
8829
8830
8831
8832
8833
8834
8835
8836
8837
8838
8839
8840
8841
8842
8843
8844
8845
8846
8847
8848
8849
8850
8851
8852
8853
8854
8855
8856
8857
8858
8859
8860
8861
8862
8863
8864
8865
8866
8867
8868
8869
8870
8871
8872
8873
8874
8875
8876
8877
8878
8879
8880
8881
8882
8883
8884
8885
8886
8887
8888
8889
8890
8891
8892
8893
8894
8895
8896
8897
8898
8899
8900
8901
8902
8903
8904
8905
8906
8907
8908
8909
8910
8911
8912
8913
8914
8915
8916
8917
8918
8919
8920
8921
8922
8923
8924
8925
8926
8927
8928
8929
8930
8931
8932
8933
8934
8935
8936
8937
8938
8939
8940
8941
8942
8943
8944
8945
8946
8947
8948
8949
8950
8951
8952
8953
8954
8955
8956
8957
8958
8959
8960
8961
8962
8963
8964
8965
8966
8967
8968
8969
8970
8971
8972
8973
8974
8975
8976
8977
8978
8979
8980
8981
8982
8983
8984
8985
8986
8987
8988
8989
8990
8991
8992
8993
8994
8995
8996
8997
8998
8999
9000
9001
9002
9003
9004
9005
9006
9007
9008
9009
9010
9011
9012
9013
9014
9015
9016
9017
9018
9019
9020
9021
9022
9023
9024
9025
9026
9027
9028
9029
9030
9031
9032
9033
9034
9035
9036
9037
9038
9039
9040
9041
9042
9043
9044
9045
9046
9047
9048
9049
9050
9051
9052
9053
9054
9055
9056
9057
9058
9059
9060
9061
9062
9063
9064
9065
9066
9067
9068
9069
9070
9071
9072
9073
9074
9075
9076
9077
9078
9079
9080
9081
9082
9083
9084
9085
9086
9087
9088
9089
9090
9091
9092
9093
9094
9095
9096
9097
9098
9099
9100
9101
9102
9103
9104
9105
9106
9107
9108
9109
9110
9111
9112
9113
9114
9115
9116
9117
9118
9119
9120
9121
9122
9123
9124
9125
9126
9127
9128
9129
9130
9131
9132
9133
9134
9135
9136
9137
9138
9139
9140
9141
9142
9143
9144
9145
9146
9147
9148
9149
9150
9151
9152
9153
9154
9155
9156
9157
9158
9159
9160
9161
9162
9163
9164
9165
9166
9167
9168
9169
9170
9171
9172
9173
9174
9175
9176
9177
9178
9179
9180
9181
9182
9183
9184
9185
9186
9187
9188
9189
9190
9191
9192
9193
9194
9195
9196
9197
9198
9199
9200
9201
9202
9203
9204
9205
9206
9207
9208
9209
9210
9211
9212
9213
9214
9215
9216
9217
9218
9219
9220
9221
9222
9223
9224
9225
9226
9227
9228
9229
9230
9231
9232
9233
9234
9235
9236
9237
9238
9239
9240
9241
9242
9243
9244
9245
9246
9247
9248
9249
9250
9251
9252
9253
9254
9255
9256
9257
9258
9259
9260
9261
9262
9263
9264
9265
9266
9267
9268
9269
9270
9271
9272
9273
9274
9275
9276
9277
9278
9279
9280
9281
9282
9283
9284
9285
9286
9287
9288
9289
9290
9291
9292
9293
9294
9295
9296
9297
9298
9299
9300
9301
9302
9303
9304
9305
9306
9307
9308
9309
9310
9311
9312
9313
9314
9315
9316
9317
9318
9319
9320
9321
9322
9323
9324
9325
9326
9327
9328
9329
9330
9331
9332
9333
9334
9335
9336
9337
9338
9339
9340
9341
9342
9343
9344
9345
9346
9347
9348
9349
9350
9351
9352
9353
9354
9355
9356
9357
9358
9359
9360
9361
9362
9363
9364
9365
9366
9367
9368
9369
9370
9371
9372
9373
9374
9375
9376
9377
9378
9379
9380
9381
9382
9383
9384
9385
9386
9387
9388
9389
9390
9391
9392
9393
9394
9395
9396
9397
9398
9399
9400
9401
9402
9403
9404
9405
9406
9407
9408
9409
9410
9411
9412
9413
9414
9415
9416
9417
9418
9419
9420
9421
9422
9423
9424
9425
9426
9427
9428
9429
9430
9431
9432
9433
9434
9435
9436
9437
9438
9439
9440
9441
9442
9443
9444
9445
9446
9447
9448
9449
9450
9451
9452
9453
9454
9455
9456
9457
9458
9459
9460
9461
9462
9463
9464
9465
9466
9467
9468
9469
9470
9471
9472
9473
9474
9475
9476
9477
9478
9479
9480
9481
9482
9483
9484
9485
9486
9487
9488
9489
9490
9491
9492
9493
9494
9495
9496
9497
9498
9499
9500
9501
9502
9503
9504
9505
9506
9507
9508
9509
9510
9511
9512
9513
9514
9515
9516
9517
9518
9519
9520
9521
9522
9523
9524
9525
9526
9527
9528
9529
9530
9531
9532
9533
9534
9535
9536
9537
9538
9539
9540
9541
9542
9543
9544
9545
9546
9547
9548
9549
9550
9551
9552
9553
9554
9555
9556
9557
9558
9559
9560
9561
9562
9563
9564
9565
9566
9567
9568
9569
9570
9571
9572
9573
9574
9575
9576
9577
9578
9579
9580
9581
9582
9583
9584
9585
9586
9587
9588
9589
9590
9591
9592
9593
9594
9595
9596
9597
9598
9599
9600
9601
9602
9603
9604
9605
9606
9607
9608
9609
9610
9611
9612
9613
9614
9615
9616
9617
9618
9619
9620
9621
9622
9623
9624
9625
9626
9627
9628
9629
9630
9631
9632
9633
9634
9635
9636
9637
9638
9639
9640
9641
9642
9643
9644
9645
9646
9647
9648
9649
9650
9651
9652
9653
9654
9655
9656
9657
9658
9659
9660
9661
9662
9663
9664
9665
9666
9667
9668
9669
9670
9671
9672
9673
9674
9675
9676
9677
9678
9679
9680
9681
9682
9683
9684
9685
9686
9687
9688
9689
9690
9691
9692
9693
9694
9695
9696
9697
9698
9699
9700
9701
9702
9703
9704
9705
9706
9707
9708
9709
9710
9711
9712
9713
9714
9715
9716
9717
9718
9719
9720
9721
9722
9723
9724
9725
9726
9727
9728
9729
9730
9731
9732
9733
9734
9735
9736
9737
9738
9739
9740
9741
9742
9743
9744
9745
9746
9747
9748
9749
9750
9751
9752
9753
9754
9755
9756
9757
9758
9759
9760
9761
9762
9763
9764
9765
9766
9767
9768
9769
9770
9771
9772
9773
9774
9775
9776
9777
9778
9779
9780
9781
9782
9783
9784
9785
9786
9787
9788
9789
9790
9791
9792
9793
9794
9795
9796
9797
9798
9799
9800
9801
9802
9803
9804
9805
9806
9807
9808
9809
9810
9811
9812
9813
9814
9815
9816
9817
9818
9819
9820
9821
9822
9823
9824
9825
9826
9827
9828
9829
9830
9831
9832
9833
9834
9835
9836
9837
9838
9839
9840
9841
9842
9843
9844
9845
9846
9847
9848
9849
9850
9851
9852
9853
9854
9855
9856
9857
9858
9859
9860
9861
9862
9863
9864
9865
9866
9867
9868
9869
9870
9871
9872
9873
9874
9875
9876
9877
9878
9879
9880
9881
9882
9883
9884
9885
9886
9887
9888
9889
9890
9891
9892
9893
9894
9895
9896
9897
9898
9899
9900
9901
9902
9903
9904
9905
9906
9907
9908
9909
9910
9911
9912
9913
9914
9915
9916
9917
9918
9919
9920
9921
9922
9923
9924
9925
9926
9927
9928
9929
9930
9931
9932
9933
9934
9935
9936
9937
9938
9939
9940
9941
9942
9943
9944
9945
9946
9947
9948
9949
9950
9951
9952
9953
9954
9955
9956
9957
9958
9959
9960
9961
9962
9963
9964
9965
9966
9967
9968
9969
9970
9971
9972
9973
9974
9975
9976
9977
9978
9979
9980
9981
9982
9983
9984
9985
9986
9987
9988
9989
9990
9991
9992
9993
9994
9995
9996
9997
9998
9999

61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100

61 07
ep
41 07
rct
s1
m1
RP
SCO
r
c
m
51 07
rct
s1
4
RP
SCO
r
c
m
61 07
rct
s1
6 1
7 1
U
I
71 07
rct
s1
r
5 1
6 1
7 1
81 07
rct
s1
s2
r
c
m
91 07
rct
Dsl 1

51 07
can

41 07
can
nr f
lcy
4P
sa
s
o t
e b
ch
ch
hi

51 07
can
nr f
lcy
6P
x6
s
o t
e b
ch
ch
hi

61 07
n o2
28
cha
22
chE
chE
M

71 08
4 ol
28
cha
22
chE
chE
10

51	3	3
41	N	
	o	
	chr	
	dm	
	egm	
	dr	
	enc	
	S	
53	3	3
	61	
	3	
	enc	
	dm	
	Q	
63	3	3
	61	
	3	
	enc	
	dm	
	Q	
75	3	3
	3	
	enc	
	dm	
	6	
	6	
	6	
	6	
	U	
83	3	3
93	3	3
Q3	3	3
P3	3	3
	3	
	Q	
N3	3	3
	3	
	3	
	3	

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100

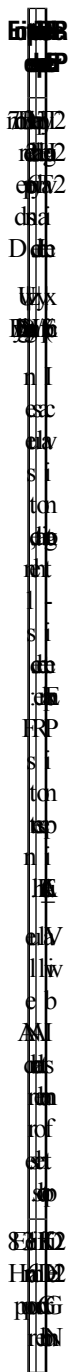
51 513
52 523
53 533
54 543
55 553
56 563
57 573
58 583
59 593
60 603
61 613
62 623
63 633
64 643
65 653
66 663
67 673
68 683
69 693
70 703
71 713
72 723
73 733
74 743
75 753
76 763
77 773
78 783
79 793
80 803
81 813
82 823
83 833
84 843
85 853
86 863
87 873
88 883
89 893
90 903
91 913
92 923
93 933
94 943
95 953
96 963
97 973
98 983
99 993
100 1003



RTT Record Schema

4	2
5	2
6	2
7	2
8	2
9	2
10	2
11	2
12	2
13	2
14	2
15	2
16	2
17	2
18	2
19	2
20	2
21	2
22	2
23	2
24	2
25	2
26	2
27	2
28	2
29	2
30	2
31	2
32	2
33	2
34	2
35	2
36	2
37	2
38	2
39	2
40	2
41	2
42	2
43	2
44	2
45	2
46	2
47	2
48	2
49	2
50	2
51	2
52	2
53	2
54	2
55	2
56	2
57	2
58	2
59	2
60	2
61	2
62	2
63	2
64	2
65	2
66	2
67	2
68	2
69	2
70	2
71	2
72	2
73	2
74	2
75	2
76	2
77	2
78	2
79	2
80	2
81	2
82	2
83	2
84	2
85	2
86	2
87	2
88	2
89	2
90	2
91	2
92	2
93	2
94	2
95	2
96	2
97	2
98	2
99	2
100	2

61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000



En
AP
7/12
r
2
e
2
dsa
De
Uy
n
exc
clv
s
ich
e
re
s
e
g
RP
s
ich
ro
n
llw
e
b
AM
ch
r
of
et
so
8
H
G
r

6/18/2018 9:45:02 AM
ebl
opt
s a
lliv
e o
did
s a
k
erov
zyx
era
fin
n i
e
dha
b/a
era
fin
n i
er
f i
ite
r o
did
can
yna
fin
t i
lliv
e o
lab
ite
r o
fin
hr
id
^

61 1000
62 1000
38 1000
63 1000
64 1000
65 1000
66 1000
67 1000
68 1000
69 1000
70 1000
71 1000
72 1000
73 1000
74 1000
75 1000
76 1000
77 1000
78 1000
79 1000
80 1000
81 1000
82 1000
83 1000
84 1000
85 1000
86 1000
87 1000
88 1000
89 1000
90 1000
91 1000
92 1000
93 1000
94 1000
95 1000
96 1000
97 1000
98 1000
99 1000
100 1000

82352
 g30U
 chsh
 hrx
 631w
 x
 s i
 4PI
 cha
 y
 s i
 6PI
 93352
 831
 831
 6312
 831w
 831x
 4PIw
 e b
 4PI
 sd
 mnM
 f b
 b
 sm
 d
 n i
 831

61 62
 63 64
 65 66
 67 68
 69 70
 71 72
 73 74
 75 76
 77 78
 79 80
 81 82
 83 84
 85 86
 87 88
 89 90
 91 92
 93 94
 95 96
 97 98
 99 100
 101 102
 103 104
 105 106
 107 108
 109 110
 111 112
 113 114
 115 116
 117 118
 119 120
 121 122
 123 124
 125 126
 127 128
 129 130
 131 132
 133 134
 135 136
 137 138
 139 140
 141 142
 143 144
 145 146
 147 148
 149 150
 151 152
 153 154
 155 156
 157 158
 159 160
 161 162
 163 164
 165 166
 167 168
 169 170
 171 172
 173 174
 175 176
 177 178
 179 180
 181 182
 183 184
 185 186
 187 188
 189 190
 191 192
 193 194
 195 196
 197 198
 199 200
 201 202
 203 204
 205 206
 207 208
 209 210
 211 212
 213 214
 215 216
 217 218
 219 220
 221 222
 223 224
 225 226
 227 228
 229 230
 231 232
 233 234
 235 236
 237 238
 239 240
 241 242
 243 244
 245 246
 247 248
 249 250
 251 252
 253 254
 255 256
 257 258
 259 260
 261 262
 263 264
 265 266
 267 268
 269 270
 271 272
 273 274
 275 276
 277 278
 279 280
 281 282
 283 284
 285 286
 287 288
 289 290
 291 292
 293 294
 295 296
 297 298
 299 300
 301 302
 303 304
 305 306
 307 308
 309 310
 311 312
 313 314
 315 316
 317 318
 319 320
 321 322
 323 324
 325 326
 327 328
 329 330
 331 332
 333 334
 335 336
 337 338
 339 340
 341 342
 343 344
 345 346
 347 348
 349 350
 351 352
 353 354
 355 356
 357 358
 359 360
 361 362
 363 364
 365 366
 367 368
 369 370
 371 372
 373 374
 375 376
 377 378
 379 380
 381 382
 383 384
 385 386
 387 388
 389 390
 391 392
 393 394
 395 396
 397 398
 399 400
 401 402
 403 404
 405 406
 407 408
 409 410
 411 412
 413 414
 415 416
 417 418
 419 420
 421 422
 423 424
 425 426
 427 428
 429 430
 431 432
 433 434
 435 436
 437 438
 439 440
 441 442
 443 444
 445 446
 447 448
 449 450
 451 452
 453 454
 455 456
 457 458
 459 460
 461 462
 463 464
 465 466
 467 468
 469 470
 471 472
 473 474
 475 476
 477 478
 479 480
 481 482
 483 484
 485 486
 487 488
 489 490
 491 492
 493 494
 495 496
 497 498
 499 500
 501 502
 503 504
 505 506
 507 508
 509 510
 511 512
 513 514
 515 516
 517 518
 519 520
 521 522
 523 524
 525 526
 527 528
 529 530
 531 532
 533 534
 535 536
 537 538
 539 540
 541 542
 543 544
 545 546
 547 548
 549 550
 551 552
 553 554
 555 556
 557 558
 559 560
 561 562
 563 564
 565 566
 567 568
 569 570
 571 572
 573 574
 575 576
 577 578
 579 580
 581 582
 583 584
 585 586
 587 588
 589 590
 591 592
 593 594
 595 596
 597 598
 599 600
 601 602
 603 604
 605 606
 607 608
 609 610
 611 612
 613 614
 615 616
 617 618
 619 620
 621 622
 623 624
 625 626
 627 628
 629 630
 631 632
 633 634
 635 636
 637 638
 639 640
 641 642
 643 644
 645 646
 647 648
 649 650
 651 652
 653 654
 655 656
 657 658
 659 660
 661 662
 663 664
 665 666
 667 668
 669 670
 671 672
 673 674
 675 676
 677 678
 679 680
 681 682
 683 684
 685 686
 687 688
 689 690
 691 692
 693 694
 695 696
 697 698
 699 700
 701 702
 703 704
 705 706
 707 708
 709 710
 711 712
 713 714
 715 716
 717 718
 719 720
 721 722
 723 724
 725 726
 727 728
 729 730
 731 732
 733 734
 735 736
 737 738
 739 740
 741 742
 743 744
 745 746
 747 748
 749 750
 751 752
 753 754
 755 756
 757 758
 759 760
 761 762
 763 764
 765 766
 767 768
 769 770
 771 772
 773 774
 775 776
 777 778
 779 780
 781 782
 783 784
 785 786
 787 788
 789 790
 791 792
 793 794
 795 796
 797 798
 799 800
 801 802
 803 804
 805 806
 807 808
 809 810
 811 812
 813 814
 815 816
 817 818
 819 820
 821 822
 823 824
 825 826
 827 828
 829 830
 831 832
 833 834
 835 836
 837 838
 839 840
 841 842
 843 844
 845 846
 847 848
 849 850
 851 852
 853 854
 855 856
 857 858
 859 860
 861 862
 863 864
 865 866
 867 868
 869 870
 871 872
 873 874
 875 876
 877 878
 879 880
 881 882
 883 884
 885 886
 887 888
 889 890
 891 892
 893 894
 895 896
 897 898
 899 900
 901 902
 903 904
 905 906
 907 908
 909 910
 911 912
 913 914
 915 916
 917 918
 919 920
 921 922
 923 924
 925 926
 927 928
 929 930
 931 932
 933 934
 935 936
 937 938
 939 940
 941 942
 943 944
 945 946
 947 948
 949 950
 951 952
 953 954
 955 956
 957 958
 959 960
 961 962
 963 964
 965 966
 967 968
 969 970
 971 972
 973 974
 975 976
 977 978
 979 980
 981 982
 983 984
 985 986
 987 988
 989 990
 991 992
 993 994
 995 996
 997 998
 999 1000



Configuring RTT for ePDG

This section provides RTT configuration information for ePDG.

Enabling RTT to Record and Produce Call Transactions

Use the following configuration for enabling RTT to record and produce call transactions.

```
configure
    context context_name
        epdg-service service_name
            [ no ] reporting-action event-record
        end
```

NOTES:

- **reporting-action event-record**: Enables event reporting through RTT in ePDG.
- **no**: Disables event reporting through RTT in ePDG.

Configuring RTT

Use the following CLI commands to configure the RTT feature in ePDG.

```
configure
    context context_name
        session-event-module
            event transfer-mode push primary url URL_address
            file name file_name|rotation volume volume_size|rotation time
rotation_time|compression compression_type|extension extension_type
            event use-harddisk
            event remove-file-after-transfer
            event push-interval interval_time
        end
```

NOTES:

- **transfer-mode**: Enables the transfer mode in RTT.
- **push primary url**: Specifies the external server location where the records are transferred from ePDG.
- **file name**: Specifies the RTT file name where the records are stored.
- **rotation volume**: The volume based on which the RTT file is generated.

- **rotation time:** The time based on which the RTT file is generated.



Note The RTT files are pushed to the external server based on the rotation volume or rotation time, whichever occurs first.

- **compression:** Specifies the file compression type. If enabled, the RTT file is generated as a Gzip file, else it is generated as a normal file.
- **extension:** Specifies the RTT file extension (.csv).
- **use-harddisk:** Specifies hard disk as the storage space for the RTT file generation.
- **remove-file-after-transfer:** Specifies RTT files to be removed after pushing the files to the external server.
- **push-interval:** Specifies the push interval time at which the RTT file are transferred from ePDG to the external server.

Monitoring and Troubleshooting

This section provides information on how to monitor and troubleshoot using show commands to support this feature.

Show Commands and Output

This section provides information regarding show commands and their outputs for this feature.

show Event-Record Statistics ePDG

This command displays the number of RTT record types generated based on different event types.

Table 1: show event-record statistics ePDG Command Output Descriptions

Field	Description
Total Number of Event Records	The total number of event records (GTPv2 + Diameter + IKE + RA).
GTPv2 Event Records	The total number of GTPv2 records
CSR	The total number of CSR (Create Session Request) events.
CBR	The total number of CBR (Create Bearer Request) events.
DSR	The total number of DSR (Delete Session Request) events.
DBR	The total number of DBR (Delete Bearer Request) events.
UBR	The total number of UBR (Update Bearer Request) events.

Field	Description
IKEv2 Event Records	The total number of IKE events.
IKE_SA_INIT	The total number of IKE_SA_INIT events.
IKE_AUTH	The total number of IKE_AUTH events.
IKE_INFORMATION	The total number of IKE_INFORMATION events.
CREATE_CHILD_SA	The total number of CREATE_CHILD_SA events.
IPV6 RA Event Records	The total number of IPV6 RA event records.
RA Prefix	The total number of RA prefix events.
Diameter Event Records	The total number of Diameter event records.
SWm Procedures	The total number of SWm interface specific events.
AAR	The total number AAR (AA-Request) events.
RAR	The total number of RAR (Re-Auth-Request) events
ASR	The total number of ASR (Abort Session Request) events
STR	The total number of STR (Session Termination Request) events.
DER	The total number of DER (DE-Request) events.