# EDA Report — Stage: DIAGNOSTIC | Dataset: CICIDS2017

## ① Sample Records

Destination Port Flow Duration Total Fwd Packets Total Backward Packets Total Length of Fwd Packets Total Length of Bwd Packets Fwd Packet Length Max Fwd Packet Length Min Fwd Packet Length Mean Fwd Packet Length Std Bwd Packet Length Max Bwd Packet Length Min Bwd Packet Length Mean Bwd Packet Length Std Flow Bytes/s Flow Packets/s Flow IAT Mean Flow IAT Std Flow IAT Max Flow IAT Min Fwd IAT Total Fwd IAT Mean Fwd IAT Std Fwd IAT Max Fwd IAT Min Bwd IAT Total Bwd IAT Mean Bwd IAT Std Bwd IAT Max Bwd IAT Min Fwd PSH Flags Bwd PSH Flags Fwd URG Flags Bwd URG Flags Fwd Header Length Bwd Header Length Fwd Packets/s Bwd Packets/s Min Packet Length Max Packet Length Packet Length Mean Packet Length Std Packet Length Variance FIN Flag Count SYN Flag Count RST Flag Count PSH Flag Count ACK Flag Count URG Flag Count CWE Flag Count ECE Flag Count Down/Up Ratio Average Packet Size Avg Fwd Segment Size Avg Bwd Segment Size Fwd Header Length.1 Fwd Avg Bytes/Bulk Fwd Avg Packets/Bulk Fwd Avg Bulk Rate Bwd Avg Bytes/Bulk Bwd Avg Packets/Bulk Bwd Avg Bulk Rate Subflow Fwd Packets Subflow Fwd Bytes Subflow Bwd Packets Subflow Bwd Bytes Init\_Win\_bytes\_forward Init\_Win\_bytes\_backward act\_data\_pkt\_fwd min\_seg\_size\_forward Active Mean Active Std Active Max Active Min Idle Mean Idle Std Idle Max Idle Min Label  
 53 255 2 2 56 568 28 28 28.0 0.000000 284 284 284.0 0.000000 2.447059e+06 15686.274510 8.500000e+01 1.402961e+02 247 4 4 4.0 0.0 4 4 4 4.0 0.0 4 4 0 0 0 0 40 40 7843.137255 7843.137255 28 284 130.400000 140.216975 19660.800000 0 0 0 0 0 0 0 0 1 163.0 28.0 284.0 40 0 0 0 0 0 0 2 56 2 568 -1 -1 1 20 0.0 0.0 0 0 0.0 0.0 0 0 BENIGN  
 53 6971301 2 2 101 272 53 48 50.5 3.535534 148 124 136.0 16.970563 5.350508e+01 0.573781 2.323767e+06 3.893587e+06 6819663 61304 6880967 6880967.0 0.0 6880967 6880967 6909997 6909997.0 0.0 6909997 6909997 0 0 0 0 52 72 0.286890 0.286890 48 148 85.200000 47.187922 2226.700000 0 0 0 0 0 0 0 0 1 106.5 50.5 136.0 52 0 0 0 0 0 0 2 101 2 272 -1 -1 1 20 61304.0 0.0 61304 61304 6819663.0 0.0 6819663 6819663 BENIGN  
 53 85049 1 1 53 166 53 53 53.0 0.000000 166 166 166.0 0.000000 2.574986e+03 23.515856 8.504900e+04 0.000000e+00 85049 85049 0 0.0 0.0 0 0 0 0.0 0.0 0 0 0 0 0 0 20 20 11.757928 11.757928 53 166 90.666667 65.240580 4256.333333 0 0 0 0 0 0 0 0 1 136.0 53.0 166.0 20 0 0 0 0 0 0 1 53 1 166 -1 -1 0 20 0.0 0.0 0 0 0.0 0.0 0 0 BENIGN  
 53 199 2 2 64 96 32 32 32.0 0.000000 48 48 48.0 0.000000 8.040201e+05 20100.502510 6.633333e+01 7.354817e+01 147 3 49 49.0 0.0 49 49 3 3.0 0.0 3 3 0 0 0 0 64 64 10050.251260 10050.251260 32 48 38.400000 8.763561 76.800000 0 0 0 0 0 0 0 0 1 48.0 32.0 48.0 64 0 0 0 0 0 0 2 64 2 96 -1 -1 1 32 0.0 0.0 0 0 0.0 0.0 0 0 BENIGN  
 80 6202 2 0 12 0 6 6 6.0 0.000000 0 0 0.0 0.000000 1.934860e+03 322.476620 6.202000e+03 0.000000e+00 6202 6202 6202 6202.0 0.0 6202 6202 0 0.0 0.0 0 0 0 0 0 0 40 0 322.476620 0.000000 6 6 6.000000 0.000000 0.000000 0 0 0 0 1 0 0 0 0 9.0 6.0 0.0 40 0 0 0 0 0 0 2 12 0 0 16210 -1 1 20 0.0 0.0 0 0 0.0 0.0 0 0 BENIGN

## ② Dataset Shape & Columns

Shape: (9997, 79)

Columns (79): [' Destination Port', ' Flow Duration', ' Total Fwd Packets', ' Total Backward Packets', 'Total Length of Fwd Packets', ' Total Length of Bwd Packets', ' Fwd Packet Length Max', ' Fwd Packet Length Min', ' Fwd Packet Length Mean', ' Fwd Packet Length Std', 'Bwd Packet Length Max', ' Bwd Packet Length Min', ' Bwd Packet Length Mean', ' Bwd Packet Length Std', 'Flow Bytes/s', ' Flow Packets/s', ' Flow IAT Mean', ' Flow IAT Std', ' Flow IAT Max', ' Flow IAT Min', 'Fwd IAT Total', ' Fwd IAT Mean', ' Fwd IAT Std', ' Fwd IAT Max', ' Fwd IAT Min', 'Bwd IAT Total', ' Bwd IAT Mean', ' Bwd IAT Std', ' Bwd IAT Max', ' Bwd IAT Min', 'Fwd PSH Flags', ' Bwd PSH Flags', ' Fwd URG Flags', ' Bwd URG Flags', ' Fwd Header Length', ' Bwd Header Length', 'Fwd Packets/s', ' Bwd Packets/s', ' Min Packet Length', ' Max Packet Length', ' Packet Length Mean', ' Packet Length Std', ' Packet Length Variance', 'FIN Flag Count', ' SYN Flag Count', ' RST Flag Count', ' PSH Flag Count', ' ACK Flag Count', ' URG Flag Count', ' CWE Flag Count', ' ECE Flag Count', ' Down/Up Ratio', ' Average Packet Size', ' Avg Fwd Segment Size', ' Avg Bwd Segment Size', ' Fwd Header Length.1', 'Fwd Avg Bytes/Bulk', ' Fwd Avg Packets/Bulk', ' Fwd Avg Bulk Rate', ' Bwd Avg Bytes/Bulk', ' Bwd Avg Packets/Bulk', 'Bwd Avg Bulk Rate', 'Subflow Fwd Packets', ' Subflow Fwd Bytes', ' Subflow Bwd Packets', ' Subflow Bwd Bytes', 'Init\_Win\_bytes\_forward', ' Init\_Win\_bytes\_backward', ' act\_data\_pkt\_fwd', ' min\_seg\_size\_forward', 'Active Mean', ' Active Std', ' Active Max', ' Active Min', 'Idle Mean', ' Idle Std', ' Idle Max', ' Idle Min', ' Label']

## ③ Data Type Summary

int64 54  
float64 24  
object 1  
Name: count, dtype: int64

## ④ Mixed-Type Column Detection

No mixed-type columns found.

## ⑤ Object vs Numeric Column Breakdown

Object Columns: [' Label']

Numeric Columns (first 10): [' Destination Port', ' Flow Duration', ' Total Fwd Packets', ' Total Backward Packets', 'Total Length of Fwd Packets', ' Total Length of Bwd Packets', ' Fwd Packet Length Max', ' Fwd Packet Length Min', ' Fwd Packet Length Mean', ' Fwd Packet Length Std'] ...

## ⑥ Summary Statistics (Numeric Columns Only)

count mean std min 25% 50% 75% max  
 Destination Port 9997.0 7.964575e+03 1.815707e+04 0.000000e+00 53.000 80.000 443.000 6.543900e+04  
 Flow Duration 9997.0 1.484010e+07 3.370678e+07 0.000000e+00 157.000 31525.000 3641623.000 1.199988e+08  
 Total Fwd Packets 9997.0 2.668300e+01 2.067272e+03 1.000000e+00 2.000 2.000 5.000 2.066870e+05  
 Total Backward Packets 9997.0 3.401900e+01 2.817979e+03 0.000000e+00 1.000 2.000 4.000 2.817410e+05  
Total Length of Fwd Packets 9997.0 6.516740e+02 1.267174e+04 0.000000e+00 12.000 62.000 191.000 1.231684e+06  
 Total Length of Bwd Packets 9997.0 6.660819e+04 6.071172e+06 0.000000e+00 4.000 123.000 506.000 6.070000e+08  
 Fwd Packet Length Max 9997.0 2.077510e+02 7.326910e+02 0.000000e+00 6.000 37.000 79.000 1.898000e+04  
 Fwd Packet Length Min 9997.0 1.869400e+01 5.948300e+01 0.000000e+00 0.000 2.000 36.000 1.472000e+03  
 Fwd Packet Length Mean 9997.0 5.779400e+01 1.848450e+02 0.000000e+00 6.000 34.000 50.000 3.917929e+03  
 Fwd Packet Length Std 9997.0 6.837500e+01 2.782040e+02 0.000000e+00 0.000 0.000 26.163 5.184101e+03  
Bwd Packet Length Max 9997.0 8.682190e+02 1.940388e+03 0.000000e+00 2.000 79.000 293.000 1.163200e+04  
 Bwd Packet Length Min 9997.0 4.120600e+01 6.959700e+01 0.000000e+00 0.000 0.000 76.000 1.442000e+03  
 Bwd Packet Length Mean 9997.0 3.069230e+02 6.056780e+02 0.000000e+00 2.000 72.500 180.000 3.869000e+03  
 Bwd Packet Length Std 9997.0 3.334870e+02 8.409810e+02 0.000000e+00 0.000 0.000 79.097 6.690912e+03  
Flow Bytes/s 9992.0 inf NaN 0.000000e+00 119.295 4491.874 176470.588 inf  
 Flow Packets/s 9997.0 inf NaN 1.900000e-02 3.155 98.590 23391.813 inf  
 Flow IAT Mean 9997.0 1.301234e+06 4.458158e+06 0.000000e+00 63.667 12778.400 365394.000 1.030000e+08  
 Flow IAT Std 9997.0 2.882666e+06 7.926271e+06 0.000000e+00 0.000 142.028 776007.151 7.600000e+07  
 Flow IAT Max 9997.0 9.027271e+06 2.407775e+07 0.000000e+00 124.000 30964.000 2998578.000 1.200000e+08  
 Flow IAT Min 9997.0 1.664025e+05 2.930004e+06 -4.000000e+00 3.000 4.000 65.000 1.030000e+08  
Fwd IAT Total 9997.0 1.454444e+07 3.365269e+07 0.000000e+00 1.000 47.000 1428566.000 1.200000e+08  
 Fwd IAT Mean 9997.0 2.627974e+06 9.436618e+06 0.000000e+00 1.000 45.000 268805.675 1.184661e+08  
 Fwd IAT Std 9997.0 3.181247e+06 9.509563e+06 0.000000e+00 0.000 0.000 73012.988 7.440000e+07  
 Fwd IAT Max 9997.0 8.881438e+06 2.413965e+07 0.000000e+00 1.000 47.000 1010416.000 1.200000e+08  
 Fwd IAT Min 9997.0 1.071340e+06 8.499599e+06 0.000000e+00 0.000 3.000 49.000 1.184661e+08  
Bwd IAT Total 9997.0 9.993598e+06 2.887174e+07 0.000000e+00 0.000 3.000 105022.000 1.200000e+08  
 Bwd IAT Mean 9997.0 1.832363e+06 8.816303e+06 0.000000e+00 0.000 3.000 19533.000 1.185197e+08  
 Bwd IAT Std 9997.0 1.453197e+06 6.203989e+06 0.000000e+00 0.000 0.000 14896.680 7.780000e+07  
 Bwd IAT Max 9997.0 4.633816e+06 1.689534e+07 0.000000e+00 0.000 3.000 64157.000 1.200000e+08  
 Bwd IAT Min 9997.0 1.006455e+06 8.217230e+06 0.000000e+00 0.000 2.000 46.000 1.185197e+08  
Fwd PSH Flags 9997.0 4.700000e-02 2.110000e-01 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 Bwd PSH Flags 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
 Fwd URG Flags 9997.0 0.000000e+00 1.000000e-02 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 Bwd URG Flags 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
 Fwd Header Length 9997.0 -3.229990e+06 3.221717e+08 -3.221223e+10 40.000 64.000 120.000 4.340524e+06  
 Bwd Header Length 9997.0 -7.672677e+03 8.408754e+05 -8.388514e+07 20.000 40.000 104.000 5.634820e+06  
Fwd Packets/s 9997.0 6.353922e+04 2.485094e+05 0.000000e+00 1.669 56.491 12121.212 3.000000e+06  
 Bwd Packets/s 9997.0 6.911238e+03 3.537746e+04 0.000000e+00 0.121 18.974 7117.438 1.000000e+06  
 Min Packet Length 9997.0 1.646900e+01 2.621100e+01 0.000000e+00 0.000 2.000 36.000 1.276000e+03  
 Max Packet Length 9997.0 9.467100e+02 2.029025e+03 0.000000e+00 6.000 86.000 520.000 1.898000e+04  
 Packet Length Mean 9997.0 1.732620e+02 3.088330e+02 0.000000e+00 6.000 57.333 119.343 2.247868e+03  
 Packet Length Std 9997.0 2.943570e+02 6.350210e+02 0.000000e+00 0.000 25.373 170.051 4.380488e+03  
 Packet Length Variance 9997.0 4.898577e+05 1.704120e+06 0.000000e+00 0.000 643.810 28917.495 1.920000e+07  
FIN Flag Count 9997.0 3.400000e-02 1.820000e-01 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 SYN Flag Count 9997.0 4.700000e-02 2.110000e-01 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 RST Flag Count 9997.0 0.000000e+00 1.400000e-02 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 PSH Flag Count 9997.0 3.010000e-01 4.590000e-01 0.000000e+00 0.000 0.000 1.000 1.000000e+00  
 ACK Flag Count 9997.0 3.140000e-01 4.640000e-01 0.000000e+00 0.000 0.000 1.000 1.000000e+00  
 URG Flag Count 9997.0 9.400000e-02 2.920000e-01 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 CWE Flag Count 9997.0 0.000000e+00 1.000000e-02 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 ECE Flag Count 9997.0 0.000000e+00 1.400000e-02 0.000000e+00 0.000 0.000 0.000 1.000000e+00  
 Down/Up Ratio 9997.0 6.910000e-01 9.800000e-01 0.000000e+00 0.000 1.000 1.000 7.400000e+01  
 Average Packet Size 9997.0 1.931650e+02 3.346960e+02 0.000000e+00 7.667 72.500 148.143 2.277840e+03  
 Avg Fwd Segment Size 9997.0 5.779400e+01 1.848450e+02 0.000000e+00 6.000 34.000 50.000 3.917929e+03  
 Avg Bwd Segment Size 9997.0 3.069230e+02 6.056780e+02 0.000000e+00 2.000 72.500 180.000 3.869000e+03  
 Fwd Header Length.1 9997.0 -3.229990e+06 3.221717e+08 -3.221223e+10 40.000 64.000 120.000 4.340524e+06  
Fwd Avg Bytes/Bulk 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
 Fwd Avg Packets/Bulk 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
 Fwd Avg Bulk Rate 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
 Bwd Avg Bytes/Bulk 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
 Bwd Avg Packets/Bulk 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
Bwd Avg Bulk Rate 9997.0 0.000000e+00 0.000000e+00 0.000000e+00 0.000 0.000 0.000 0.000000e+00  
Subflow Fwd Packets 9997.0 2.668300e+01 2.067272e+03 1.000000e+00 2.000 2.000 5.000 2.066870e+05  
 Subflow Fwd Bytes 9997.0 6.516740e+02 1.267174e+04 0.000000e+00 12.000 62.000 191.000 1.231684e+06  
 Subflow Bwd Packets 9997.0 3.401900e+01 2.817979e+03 0.000000e+00 1.000 2.000 4.000 2.817410e+05  
 Subflow Bwd Bytes 9997.0 6.657678e+04 6.068032e+06 0.000000e+00 4.000 123.000 506.000 6.066860e+08  
Init\_Win\_bytes\_forward 9997.0 7.214433e+03 1.454258e+04 -1.000000e+00 -1.000 251.000 8192.000 6.553500e+04  
 Init\_Win\_bytes\_backward 9997.0 1.955995e+03 8.327025e+03 -1.000000e+00 -1.000 -1.000 235.000 6.553500e+04  
 act\_data\_pkt\_fwd 9997.0 2.282500e+01 1.980946e+03 0.000000e+00 0.000 1.000 2.000 1.980580e+05  
 min\_seg\_size\_forward 9997.0 -6.206804e+04 5.434579e+06 -5.368707e+08 20.000 24.000 32.000 5.200000e+01  
Active Mean 9997.0 8.588843e+04 6.401783e+05 0.000000e+00 0.000 0.000 0.000 3.068003e+07  
 Active Std 9997.0 4.322217e+04 3.840809e+05 0.000000e+00 0.000 0.000 0.000 1.410000e+07  
 Active Max 9997.0 1.642363e+05 1.071061e+06 0.000000e+00 0.000 0.000 0.000 3.770000e+07  
 Active Min 9997.0 6.246773e+04 5.889734e+05 0.000000e+00 0.000 0.000 0.000 3.068003e+07  
Idle Mean 9997.0 8.196338e+06 2.333692e+07 0.000000e+00 0.000 0.000 0.000 1.200000e+08  
 Idle Std 9997.0 4.872942e+05 4.445307e+06 0.000000e+00 0.000 0.000 0.000 6.350000e+07  
 Idle Max 9997.0 8.561557e+06 2.403524e+07 0.000000e+00 0.000 0.000 0.000 1.200000e+08  
 Idle Min 9997.0 7.806298e+06 2.307949e+07 0.000000e+00 0.000 0.000 0.000 1.200000e+08

## ⑦ Label Distribution for 'Label'

Label column 'Label' not found.

## ⑧ Missing Value Summary

Flow Bytes/s 5

## ⑨ NaN / Inf Row-Level Summary

Rows with only NaN: 0

Rows with only Inf/-Inf: 1

Rows with both NaN and Inf/-Inf: 5

Rows with NaN or Inf/-Inf: 6

## ⑩ Duplicate Row Check

Duplicate Rows Detected: 210

## ⑪ Known Non-Feature Column Detection

Detected: [' Destination Port']

## ⑫ Whitespace in Column Names

Columns with whitespace: [' Destination Port', ' Flow Duration', ' Total Fwd Packets', ' Total Backward Packets', ' Total Length of Bwd Packets', ' Fwd Packet Length Max', ' Fwd Packet Length Min', ' Fwd Packet Length Mean', ' Fwd Packet Length Std', ' Bwd Packet Length Min', ' Bwd Packet Length Mean', ' Bwd Packet Length Std', ' Flow Packets/s', ' Flow IAT Mean', ' Flow IAT Std', ' Flow IAT Max', ' Flow IAT Min', ' Fwd IAT Mean', ' Fwd IAT Std', ' Fwd IAT Max', ' Fwd IAT Min', ' Bwd IAT Mean', ' Bwd IAT Std', ' Bwd IAT Max', ' Bwd IAT Min', ' Bwd PSH Flags', ' Fwd URG Flags', ' Bwd URG Flags', ' Fwd Header Length', ' Bwd Header Length', ' Bwd Packets/s', ' Min Packet Length', ' Max Packet Length', ' Packet Length Mean', ' Packet Length Std', ' Packet Length Variance', ' SYN Flag Count', ' RST Flag Count', ' PSH Flag Count', ' ACK Flag Count', ' URG Flag Count', ' CWE Flag Count', ' ECE Flag Count', ' Down/Up Ratio', ' Average Packet Size', ' Avg Fwd Segment Size', ' Avg Bwd Segment Size', ' Fwd Header Length.1', ' Fwd Avg Packets/Bulk', ' Fwd Avg Bulk Rate', ' Bwd Avg Bytes/Bulk', ' Bwd Avg Packets/Bulk', ' Subflow Fwd Bytes', ' Subflow Bwd Packets', ' Subflow Bwd Bytes', ' Init\_Win\_bytes\_backward', ' act\_data\_pkt\_fwd', ' min\_seg\_size\_forward', ' Active Std', ' Active Max', ' Active Min', ' Idle Std', ' Idle Max', ' Idle Min', ' Label']