UDP Flood and SlowLoris Ping Flood and R.U.D.Y UDP Flood Ping Flood Blacknurse Slow Read SlowLoris SYN Flood R.U.D.Y **Xmas** 0.354 0.284 0.207 0.354 0.255 0.226 0.268 0.228 0.382 0.314 Entropy of destination IP addresses 0.000 0.7 0.449 0.278 0.233 0.459 0.401 0.502 Entropy of source IP addresses 0.000 0.335 0.360 0.267 0.251 0.000 0.282 0.396 0.257 0.298 0.300 0.385 Entropy of bi-directional flows 0.176 0.343 0.364 0.000 0.316 0.370 0.316 0.268 0.164 0.312 0.270 0.552 Entropy rate of destination IP addresses 0.186 0.314 0.366 Entropy rate of source IP addresses 0.000 0.331 0.252 0.431 0.337 0.215 0.339 0.213 0.288 0.417 0.000 0.291 0.293 0.287 0.247 0.247 0.280 0.388 0.390 0.373 0.482 Entropy rate of bi-directional flows 0.465 0.000 0.348 0.260 0.383 0.243 0.177 0.274 0.166 0.346 0.302 Entropy of packet sizes 0.000 0.345 0.408 0.194 0.241 0.143 0.463 0.304 0.399 Entropy rate of packet sizes 0.212 0.204 - 0.6 0.408 0.607 0.337 0.405 0.374 0.258 0.429 0.444 Entropy of ingress packet sizes 0.000 0.219 0.205 0.220 0.000 0.579 0.333 0.317 0.188 0.435 Entropy rate of ingress packet sizes 0.139 0.151 0.266 0.257 Entropy of egress packet sizes 0.000 0.599 0.092 0.350 0.175 0.139 0.333 0.163 0.279 0.368 0.280 0.528 0.412 0.399 0.278 0.341 Entropy rate of egress packet sizes 0.000 0.258 0.340 0.187 0.324 Entropy of destination IP addresses with SYN flag 0.000 0.186 0.000 0.237 0.000 0.052 0.126 0.000 0.187 0.181 0.248 Entropy of source IP addresses with SYN flag 0.000 0.154 0.014 0.143 0.000 0.032 0.162 0.000 0.103 0.113 0.173 0.000 0.217 0.028 0.194 0.000 0.052 0.000 0.242 0.198 0.265 Entropy of bi-directional flows with SYN flag 0.131 0.5 K-means with NetFlow header fields 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 K-means with NetFlow entropy metrics 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 K-means with NetFlow combined feature set 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 K-means with telemetry measurements 0.556 0.429 0.479 0.543 0.416 0.394 0.451 0.192 0.284 0.458 K-means with telemetry entropy metrics 0.167 0.311 0.379 0.357 0.229 0.230 0.150 0.000 0.498 0.561 0.429 0.414 0.437 0.313 0.451 0.313 0.239 0.451 K-means with telemetry combined feature set 0.222 0.244 Random Forest with NetFlow header fields 0.000 Random Forest with NetFlow header fields without IPs 0.000 0.000 0.4 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Random Forest with NetFlow entropy metrics 0.000 0.000 Random Forest with NetFlow combined feature set 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Random Forest with NetFlow combined feature set without IPs 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Random Forest with telemetry measurements 0.000 Random Forest with telemetry entropy metrics 0.000 Random Forest with telemetry combined feature set 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.357 0.129 0.239 0.162 0.215 0.225 0.167 0.385 0.390 0.413 Bytes in NetFlow records - 0.3 0.000 0.291 0.230 0.240 0.200 0.247 0.476 0.397 0.437 Packets in NetFlow records 0.282 0.111 0.381 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Bi-directional flows in NetFlow records 0.000 0.387 Deviation score for egress queue size 0.071 0.348 0.190 0.429 0.208 0.354 0.367 0.431 0.364 0.265 0.554 Deviation score for egress bytes/s 0.407 0.348 0.458 0.465 0.449 0.533 0.610 0.602 0.705 0.616 0.513 0.523 0.679 Deviation score for egress packets/s 0.295 0.396 0.446 0.457 0.356 0.480 0.582 0.534 0.494 0.441 0.646 0.575 0.509 0.425 0.482 0.490 Deviation score for ingress bytes/s 0.236 0.388 0.382 0.635 Deviation score for ingress packets/s 0.462 0.534 0.551 0.652 0.493 0.450 0.708 0.567 0.327 0.562 0.2 0.022 0.428 Deviation score for egress queue size using maximum variance 0.000 0.245 0.041 0.085 0.175 0.018 0.229 0.095 0.015 Deviation score for egress bytes/s using maximum variance 0.489 0.491 0.405 0.403 0.406 0.475 0.380 0.391 0.495 0.470 0.495 0.427 0.409 0.394 Deviation score for egress packets/s using maximum variance 0.564 0.320 0.276 0.260 0.230 0.433 0.393 0.503 0.425 0.400 0.354 0.430 0.299 0.417 0.385 0.389 0.409 Deviation score for ingress bytes/s using maximum variance 0.521 0.485 0.483 0.449 0.440 0.590 Deviation score for ingress packets/s using maximum variance 0.617 0.290 0.249 0.259 ICMP destination unreachable packets 0.000 0.000 0.000 0.000 0.268 0.000 0.000 0.000 0.054 0.000 0.356 0.477 ICMP packets 0.000 0.219 0.257 0.131 0.149 **ICMP** ratio 0.000 0.202 0.283 0.101 0.152 0.072 0.208 0.407 0.298 0.286 0.312 0.1 Xmas flows 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 SYN flows 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Top 20 flows 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Alert fusion: time 0.163 0.565 0.586 0.671 0.434 0.678 0.578 0.476 0.699 0.564 0.000 0.000 Alert fusion: packet sizes 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.216 Alert fusion: attack types 0.000 0.092 0.206 0.232 0.514 0.227 0.001 0.242 0.241 0.267 Alert fusion: ranking 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 - 0.0 0.076 0.232 0.171 0.231 0.225 0.180 0.198 0.181 0.246

0.241

0.269