Call Detailed Records (CDR) are generated and stored in Mobile Networks(MNs) and contain subscriber's in formation about active or passive usage of the network for various communication activities. The spatio-temporal nature of CDR makes them a valuable dataset used for forensic activities. Advances in technology have led to the seamless communication across Multiple Mobile Network (MMN), which poses a threat to the availability and integrity of CDR data. Present CDR implementation is capable of logging peer-to-peer communications over single connection only, thus necessitating improvements on how the CDR data is stored for forensic analysis. In this paper, the problem is solved by identifying and conceptually modelling six new artifacts generated by such communication activities. The newly identified artifacts are introduced into the existing CDR for an incident capturing of the required data for forensic analysis during investigations involved in the MMN communication. Results show an improved absolute speed of 0.0058 s for the MMN-CDR to associate a suspect with an incident, which is 0.0038 s faster than the speed of 0.0097s for the existing CDR to associate a suspect with an accomplice. Thus, a novel method for forensically tracking calls over the MMN has been developed. The MMN-CDR, when forensically analyzed, reveals an increase in time efficiency over the existing CDR due to its high absolute speed. Also, higher accuracy and completeness percentage are both obtained.