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ANOMALY BEHAVIOR ANALYSIS FOR ELIMINATE ATTACK USING IDS IN WIRELESS NETWORKS

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***Abstract*--Protocol is critically important for secure network operations. All networked applications request DNS protocol to translate the network domain names to correct IP addresses. The protocol is prone to attacks like cache poisoning attacks and DNS hijacking attacks that can lead to compromising user's accounts and stored information. In this paper, we present an anomaly based Intrusion Detection System (IDS) for the protocol (DNS-IDS) that models the normal operations of the DNS protocol and accurately detects any abnormal behavior or exploitation of the protocol. The DNS-IDS system operates in two phases, the training phase and the operational phase. In the training phase, the normal behavior of the DNS protocol is modeled as a finite state machine where we derive the temporal statistics of normal DNS traffic. Then we develop an anomaly metric for the DNS protocol that is a function of the temporal statistics for both the normal and abnormal transitions of the DNS protocol. During the operational phase, the anomaly metric is used to detect DNS attacks (both known and novel attacks). We have evaluated our approach against a wide range of DNS attacks (DNS hijacking, Kaminsky attack, amplification attack, Birthday attack, DNS Rebinding attack).**

Keywords: Anomaly detection, DNS-IDS, Attacks detection, Authentication Flood

I. INTRODUCTION

In recent days Wireless multimedia sensor network has been mostly preferred to collect the information from the external environment like border monitoring and tracking applications. When we go for wireless sensor network implementation we have to consider the network life time as well as individual node. It mainly depends on the amount of energy consumption when processing and transmitting process. To improve the network life time LEACH, Q-LEACH protocols are used. But when we go for image transmission the network has to handle the large amount of data packets. It increases overall network load, and also leads to network flooding.Some of the protocols help to achieve image transmission over wireless sensor network but it has more drawbacks too. Energy efficient reliable transmission protocols (ERTP) used to multi hop reliability control. It adjusts the maximum number of retransmission of packets. Simple interactive object extraction method is used to separate the foreground and background images, but only made when manually select the foreground and background part it is not suitable for WMSN network. Reference[2] EEIT presents the Running Gaussian Average method this is based on row and column scanning technique, and also Start of Transmission(SOT), End of Transmission (EOT) method has been proposed. When SOT gets enabledat the time protocol was not give the chances to high priority nodes on priority based wireless multimedia sensor network.

An MRP based efficient image extraction method has been proposed in this paper. Proposed MRP method is used to extract the foreground objects from the background image. Only the extracted foreground image is transmitted over wireless multimedia sensor network. At receiver end extracted foreground image is received and merging at actual position on the previous image, which is already available in the memory. It is providing energy-efficient image transmission in error-prone environments.

This protocol is used to reduce the transmission image data packet size, based on that overall network traffic load getsreduced in multi hop wireless environment. This paper also explains the operation of MRP extraction protocol anddeals with simulationresults and discussions of the transmission rate and Network Load.

A. FUNCTIONAL BLOCK DIAGRAM

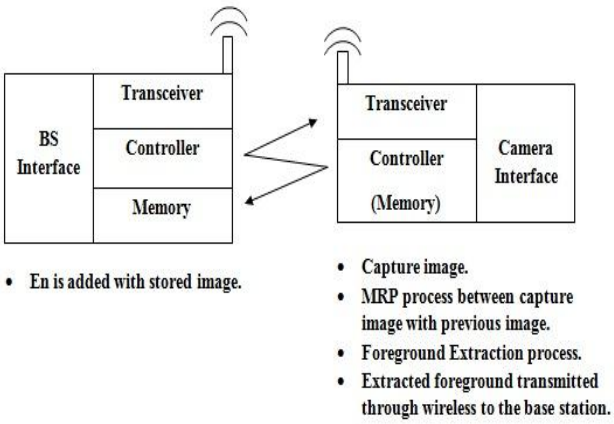


Fig.1 Basic Functional Block Diagram

Figure 1 shows the transmitter end process of Foreground Object Extraction method using morphological (Dilation and Erosion) operation with region properties based merging process at receiver end. By using this MRP technique the size of transmission image data packets and network load gets reduced.

B. EQUATIONS

Subtraction of previous background (Bn-1) image with current frame intensity (Fn)

$$En = Bn\text{-}1 \ (-) \ Fn$$

Threshold value comparison condition:

$$[Fn - Bn\text{-}1] > T$$

At the BS received extracted image (En) average is added with previous background (Bn-1), which is already in the base station.

Updated background(Bn) = Bn-1 + En

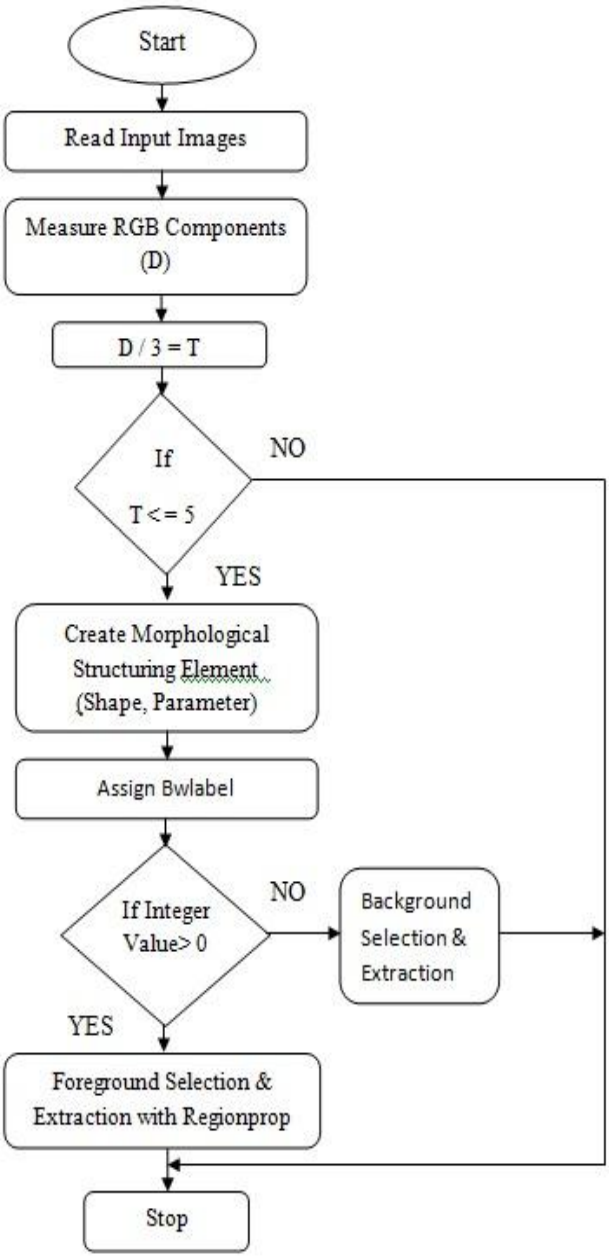
Where,

En - Extracted object image.
Fn - Foreground image.
Bn - Existing background image.

C. STEPS INVOLVED

- Capture the current image.
- Compare previous image and current captured image.
- Foreground Object Extraction method using morphological (Dilation &Erosion).
- Clustering pixel region formation based on label assignment.
- Extraction based on T (Threshold).
- Extracted output transmitted through wireless to the base station.
- Extracted foreground is merging (replace pixel) with the existing stored image by region properties.

II. ALGORITHM FLOW CHART



III. SIMULATION RESULT

This paper deals with simulation results and discussions of the transmission rate and Network Load. The software tools used in the proposed work is OPNET 14.5v.The simulation tool works based on the node modeling and process modeling.

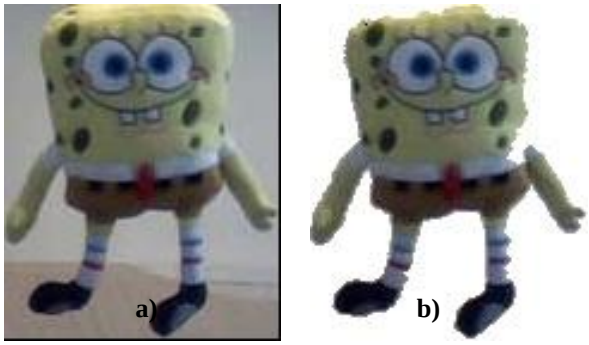


Fig.2SimulationResultofa)Existing Image(Size–24.9kb)& b)Proposed Extracted Image (Size - 17.5kb)

Figures 2 (a) and (b) shows the simulation results of existing and the proposed extracted image respectively. In the existing work, Running Gaussian average (Row and Column scanning) method has been used to extract the foreground object from the capture inputs.

The result shows that the extracted image in the existing method occupies 24.9kb. In the proposed method the extracted image occupies 17.5kb of memory. Hence there is a memory saving of 7.4kb. This memory saving is achieved in the proposed work by the employment of MRP (Morphological Region Property) based extraction. From the results it is clear that by using this method the size of the image has been reduced nearly 30%. Due to that overall network load has been reduced in implementing the proposed MRP method.

Fig.3Actual Input at Transmitter End and Merged Output at Receiver End

The transmitter end image has been extracted by using MRP based method and it has been converted into packets. This image data packet has been transmitted over wireless sensor network. That extracted image has been received at receiver end. Then it is going to form a merged output image by using region property technique. The simulation result has been shown in Figure 3.

TABLE 1
SIMULATION TRAFFIC GENERATION PARAMETERS

Parameters	Value
Traffic type of service	Interactive multimedia
Data rate (bps)	11 Mbps
Transmit power (w)	0.005
beacon interval(sec)	0.02
Buffer size (bits)	256000
Packet size (bytes)	10240
Interval time (sec)	Constant(1.0)
On state time	Exponential (10)
Off state time	Exponential (90)

A. EXISTING SYSTEM NETWORK LOAD (bits/sec)

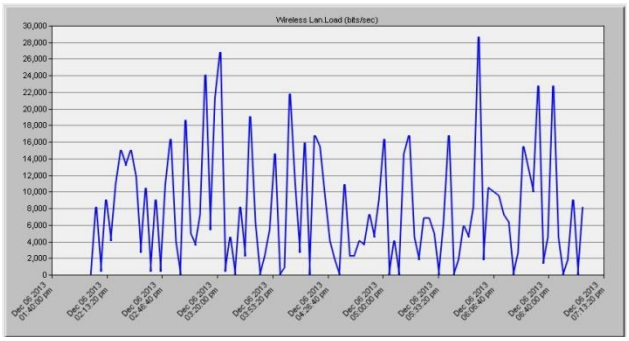


Fig.4 Simulation Result for Existing System

The simulation results of the existing system network load is shown in figure 4.This results shows a plot drawn between bit rate verses transmitting time in seconds. From the graph it is observed that the transmitting bit rate is reaching high (28000) in the existing system. This will lead to increase the network load which will affect the system performance.

B. PROPOSED SYSTEM NETWORK LOAD (bits/sec)

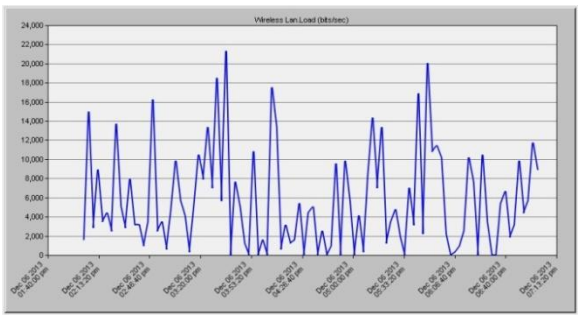


Fig.5 Simulation Result for Proposed Network Load (bits/sec)

The simulation result of the proposed system network load is shown in Figure 5.It show a graph drawn between bit rate verses transmitting time in seconds. From the graph it is observed that the maximum bit rate reaching is 22000 where as in the existing work the maximum bit rate is 28000. Hence in the proposed work because of the reduction of bit rate the network load is decreased which will improve the performance of the system.

C. OVERLAID STATISTICS

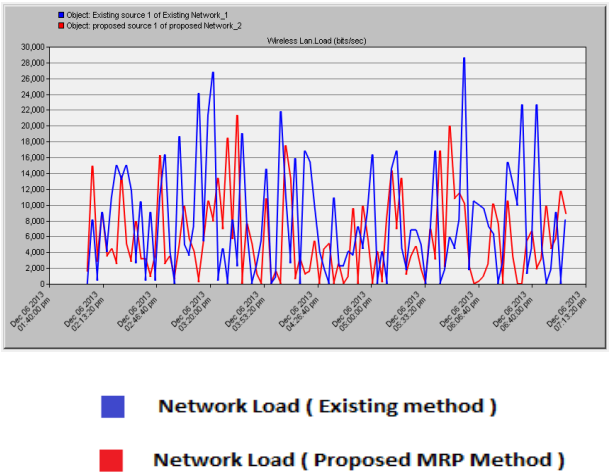


Fig.6 Simulation Result for Network Load (bits/sec)

In Figure 6 the simulation results obtained by existing and proposed method are shown. The plot in blue color shows existing method and the plot in red colour shows the proposed method.

IV. CONCLUSION

The challenge to efficiently process and transmit large volume of image data over wireless sensor networks has been addressed in this paper by developing a highly optimized architecture for object extraction and transmitting the updated object using morphological region properties based method. The proposed MRP method implements an effective extraction technique. Due to that transmission packet size gets reduced. Accordingly network load gets decreased and overall increase in data throughput. Simulation results have confirmed the very low energy requirement of the proposed scheme for image processing and communication. In addition, the proposed MRP-based extraction method consumes less energy to transmit than a Running Gaussian average based (row and column scanning method). Unlike some recent literature asserting that multi-hop transmission images over wireless sensor networks is not feasible, the work presented in this paper has demonstrated that it is indeed feasible. This could be made possible by the combination of the energy efficient image transmission using MRP method and the efficient hardware architecture.

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