Volume 5, Issue 4, April 2015 ISSN: 2277 128X

International Journal of Advanced Research in Computer Science and Software Engineering

Research Paper

Available online at: www.ijarcsse.com

An Urbane Approach towards Recognition of malevolent Software

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***Abstract*—In today's planet there is enormous development of malevolent software's, which fallout in lot of sprain on workstation world. So there is a call for of precise and resourceful method for malicious software detection. Presently widely used methods for detection are anomaly and signature based practice. These methods are effectual when either existing samples are in attendance or malicious software signatures are known in databases. The projected system is also signature based but the accomplishment is much more skilled and convolution is reduced significantly then formerly presented systems. Our system along with existing automation also scans each code present in the projects across 4 defined realms, hence giving advanced precision and less corollary then prior work.**

***Keywords*— Malicious Software, Malevolent, Convolution, Automation, Corollary, Signature Based.**

I. INTRODUCTION

Malware detection is one of the most challenging aspects in today's world of computer. A small mistake and your data will be going to unauthorised peoples. Thus it is important to be aware of such consequences and try to be ready for appropriate measures to deal with it.[1] Malware may be of different types as : Virus, Worm, Spyware, Adware, Trojan, Bonet etc. These are handled by either incongruity detection or Signature based techniques. Sandboxing [2] may also used for this purpose. Malware Transformers [4] undoes the effect of the malware. Malware revolution can undo three techniques:

1. Packing.
2. Code reordering.
3. Junk insertion.

Behavioural prototype [5] identifies endeavour performed by malware rather than imitation markers. There is a clear difference among simulation-based authentication and formal authentication which are directly associated to the dynamic and static modes.

Semantics-aware malicious software [3] detection resists more to frequent obfuscations used by malicious software. This detection uses decryption loops. It has limitation that it only detects malicious software which represents identical ordering of remembrance allocation. It cannot switch malware which reorganize its memory.

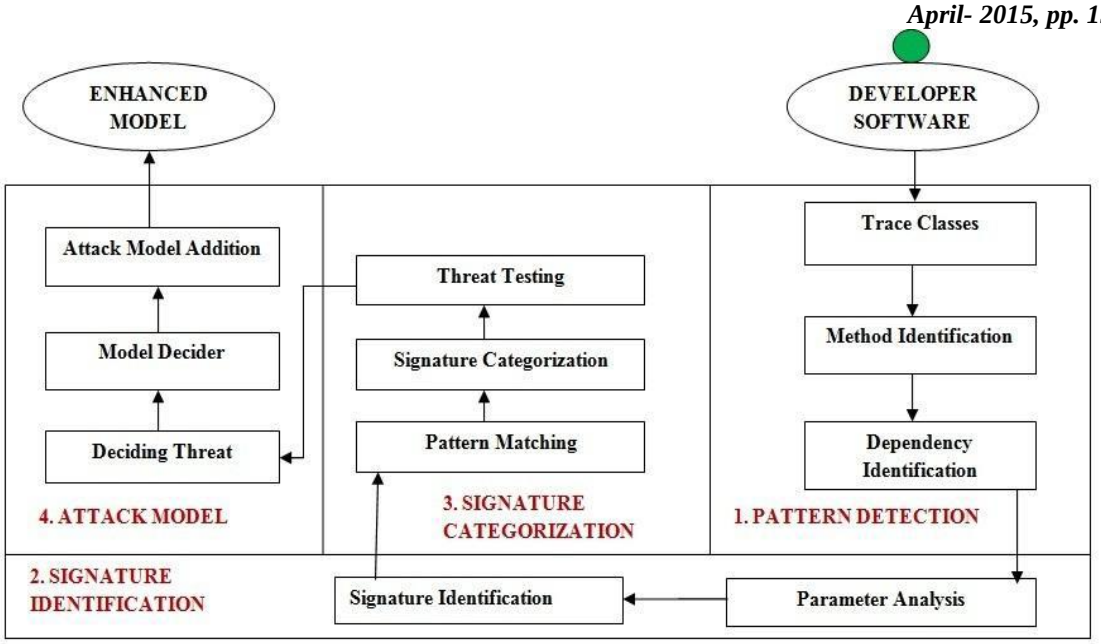
Behavioral detection fabrication a whole set of heterogeneous technique relying on a common standard: the identification of the functionalities [9].

II. TOPIC DESCRIPTION

Our project is based on signature base anomaly detection [7]. Here in our project we first take a project from the developer as an entrusted application. This application is then tested in our secure GUI and determines its .java files. These files are then seen precisely and their data and member functions are recovered. This recovered function are seen and analysed to discover their appropriate domains on which they are working. If it matches then it is told to be safe and if it not then it is detected as malicious. Function Code scrutiny and Intrusion detection [8] facilitates us to catch any hidden malware more precisely.

Our system architecture consists of 4 major components:

1. Pattern detection- Our system originally traces the classes following the identification of process and dependencies.
2. Signature identification- Then these fundamentals are analyzed along with autograph recognition.
3. Signature Categorization- Here the detected pattern is matched and then categorized signature are sent for threat testing.
4. Attack model- Here the detected threat are analyzed, replica is being generated and passed on for in receipt of updated model.



III. ALGORITHM AND METAMETHICAL MODULE

Set theory of project:

1. PATTERN DETECTION:

Set C:
C0= Read Classes
C1=Identify Methods
C2= Identify Data members
C3= Identify Coupling Object
C4=List Dependency

2. SIGNATURE IDENTIFICATION:

Set l:
L0= Pattern Labelling
L1=Pattern Clustering
L2=Analyse Parameters
L3=Analyse Threshold
L4=Signature Identification

3 . SIGNATURE CATEGORIZATION:

Set T:
T0= Pattern Vector
T1=Pattern Matching
T2= Cluster Factor
T3=Signature Categorization
T4=Threat Testing

4. ATTACK MODEL:

Set M:
M0=threat Identification
M1= threat Deciding
M2=Model Deciding
M3=Identifying joint Cuts
M4=weave Model

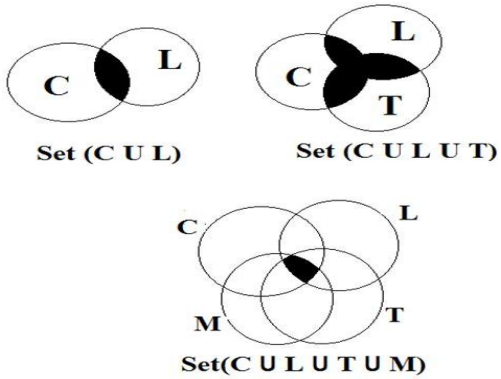
Representation of Sets and its operation:-

UNION REPRESENTATION

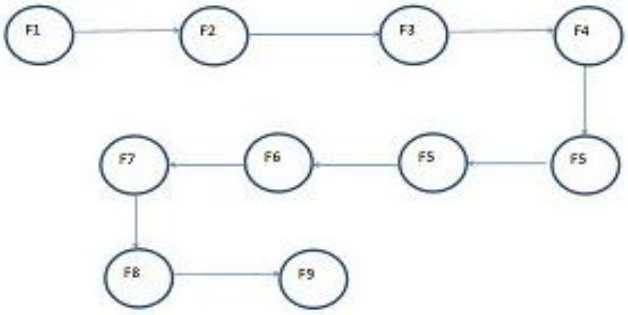
(A) Set C= {C0, C1, C2, C3, C4}
Set L= {L0, L1, L2, L3, L4}
Set(C u L) = {C0, C1, C2, C3, C4, L0, L1, L2, L3, L4}
(B) Set T= {T0.T1, T2, T3, T4}
Set(C u L u T) = {C0, C1, C2, C3, C4, L0, L1, L2, L3, L4, T0, T1, T2, T3, T4}

(C) Set M= {M0, M1, M3, M4}
Set(C u L u T u M) = {C0, C1, C2, C3, C4, L0, L1, L2, L3, L4, T0,T1, T2, T3, T4, M0, M1, M2, M3, M4}

Venn Diagram of Union of set C, L, T and M.



Functional Dependency Graph:



1) Function 1-Read Classes
2) Function 2- Identify Methods
3) Function 3- List Dependency
4) Function 4- Pattern Detection
5) Function 5-Analyze Threshold
6) Function 6- Identify Signature
7) Function 7-Pattern Matching
8) Function 8-Categorized Signature
9) Function 9-Identify Threat
10) Function 10-weave Model

The algorithm we used in our project is Signature detection algorithm.

Algorithm 1: Signature Identification.

Input: Data Member List as D={D_0,D_1…….D_n}
Member function List as M={M_0,M_1…….M_n}
Package List as P={ P_0,P_1…..P_n}

Output: Malicious Result as R.

Step 0: Start.
Step 1: Parameter vector initialization.
Step 2: Get the software Domain.
Step 3: **For** i=0 to D size
Step 4: check for the other Domain data member list.
Step 5: count the data members as $D_{c.}$
Step 6: **end FOR**
Step 7: **For** i=0 to M size
Step 8: check for the other Domain member function list.
Step 9: count the member function as $M_{c.}$
Step 10: **end FOR**
Step 11: **For** i=0 to P size
Step 12: check for the other Domain imported package list.
Step 13: count the packages as Pc.

Step 14: **end FOR**
Step 15: if (D_c,M_c,P_c > Threshold)
Step 16: if Dev (Developer) € past Malicious Activity
Step 17: Declare software as Malicious.
Step 18: Update the history.
Step 19: Stop.

IV. IMPLEMENTATION

In this section, we describe our implementation of malware detection of any publishing software with the below mentioned steps as shown in figure 1.

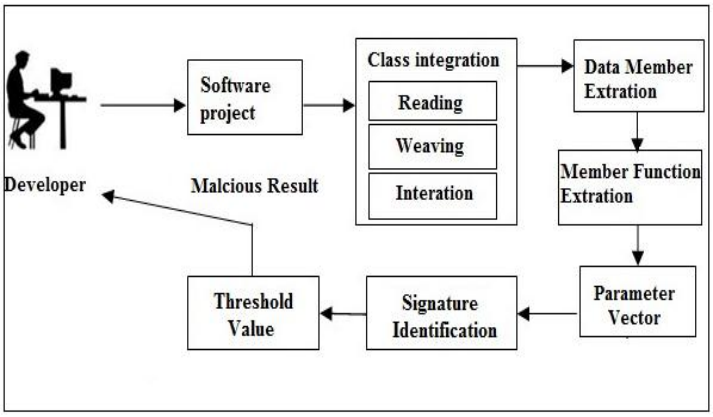


Figure 1: Overview of the project work

In our model we are considering the 4 domains on which our model is identifying the malwares. The chosen domains are like networking, database, data mining and image processing.

Step 2: This is the step where java classes are actually integrating with our model for the accurate prediction of malware traces in the released software by the following steps:

- Here all the java classes are been read in the byte stream to integrate in our model and retain as a string object.
- In this step the java class is been uploaded to the root path of the project with its complete classes itself along with the mother package in to the source path of the system.
- Here the uploaded project details are been stored for the further pre-processing.

Step 3:-Data member extraction: In this step the data member of the classes of the considered project is been identified and they are stored in a run time list for the further processing

Step 4: Member function extraction – In this step the member function of the classes of the considered project is been identified and they are stored in a run time list for the further processing.

Step 4: package extraction – In this step the all the imported packages of the classes of the considered project is been identified and they are stored in a run time list for the further processing.

Step 5: Signature Identification – This is the crucial step in our model where our system identifies the other domain features of the uploaded projects and counts all the possibilities by setting some protocols. Like if software belongs to standalone database system and if it contain many networking parameters, then it means something is cooking behind the codes to steal some data and pass it to some servers by using some network protocols.

Step 6: Malicious Declaration -So all the counts are been then finally calculated for the respective threshold , If any protocols are crosses the boundary and developer history is also bad in the past then the software is declared as malicious The complete working model is been depicted under algorithm 1.

V. RESULTS

Our project able to detect any malware present in any of the domains with high meticulousness which earlier was not done. It results in less time complexity and detects any menace very well in advance so that user who wishes to use the applications feels free in terms of any maliciousness which may mischief him/her.

Also as our project removes the effects earlier, it is huge plus for the user as it reduces the burden for the user in terms looking up for the vulnerabilities earlier before using it and thus saving his/her valuable moment in time.

VI. FUTURE SCOPE

Future work includes identify the scrutiny in more number of domains as possible. We have proposed general domains and if precise or more domains are discovered then appropriate work can be done. Also, here we have concentrating on the member and data function, if more detection parameters are found hen it can be concatenated along with this work to have greater chance of identifying the malwares.

Also there is also possibility that it can be use in smart phones in upcoming future for faster access and more reliability purposes.

VII. CONCLUSION

Thus, conclusion of this paper we make use of a fundamental surroundings where we test the untrusted function of developer before it can cause any blunder by using pattern detection, signature rationalization and categorisation along with its derived attack model. We work out on four different major domains and detect whether there is any fault with the system or not. Due to it possible errors can be detected well in advance and can be corrected according to the requirement finally giving an restructured valid and error free software free from any vulnerabilities

ACKNOWLWDGEMENT

We are particularly want to express our sincere appreciation to our assistant professor J.E.Nalawade who help us all the way through our project and provided priceless time for his uninterrupted support at Singhad Institute of Technology, Lonavala affiliated to Savitribai Phule of Pune University.

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