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Abstract

Malware is spreading around the world and infecting not only for ending users, but also for large organizations and service providers. There is a real need of a dimension reduction approach of malware features for better detection. This system describes for malware detection and characterization framework which is based on Static Approach by only analyzing the Manifest File of android application. This system also describes a Feature Selection Approach, which is also based on Manifest File Analysis for the purpose of dimension reducing of malware features. Firstly, a number of Permission-Based Features are extracted by disassembling the Manifest File of Android application. Then, feature dimensions are reduced by proposing Score-based Approach. The results getting from the Correlation and Information Gain are used to compare the results of Score-Based Features Selection. According to the experimental results, proposed a light-weight approach can perform as equal as other feature selection methods. After feature selection, manifest file analysis based on malware classification and characterization results are also described in this system. The classification results tested by without reducing features and the results obtained by reducing features are compared to

determine which methods or classifiers are the best to detect malware.

References

1. K. Allix, T. F. D. A. Bissyande, J. Klein, and Y. Le Traon, "Machine Learning-Based Malware Detection for Android Applications: History Matters!," 2014.
2. D. Arp, M. Spreitzenbarth, M. Hübner, H. Gascon, K. Rieck, and C. Siemens, "DREBIN: Effective and Explainable Detection of Android Malware in Your Pocket," 2014.
3. Z. Aung and W. Zaw, "Permission-based android malware detection," *International Journal Of Scientific & Technology Research*, vol. 2, no. 3, 2013.
4. G. Canfora, F. Mercaldo, and C. A. Visaggio, "A classifier of malicious android applications," in *Availability, Reliability and Security (ARES), 2013 Eighth International Conference on*, pp. 607–614, IEEE, 2013.
5. W. Enck, M. Ongtang, and P. McDaniel, "On lightweight mobile phone application certification," in *Proceedings of the 16th ACM conference on Computer and communications security*, pp. 235–245, ACM, 2009.
6. L. Gomez and I. Neamtiu, "A Characterization of Malicious Android Applications," tech. rep., Technical report, University of California, Riverside, 2011.
7. M. Grace, Y. Zhou, Q. Zhang, S. Zou, and X. Jiang, "Riskranker: scalable and accurate zero-day android malware detection," in *Proceedings of the 10th international conference on Mobile systems, applications, and services*, pp. 281–294, ACM, 2012.
8. C.-Y. Huang, Y.-T. Tsai, and C.-H. Hsu, "Performance Evaluation on Permission-Based Detection for Android Malware," in *Advances in Intelligent Systems and Applications-Springer*, 2013. Volume 2, pp. 111–120.
9. T.M. Mitchell. *Machine Learning*. McGraw-Hill Series in Computer Science. McGraw-Hill, 1997.
10. C. Orthacker, P. Teufl, S. Kraxberger, G. Lackner, M. Gissing, A. Marsalek, J. Leibetseder, and O. Prevenhieber, "Android security permissions—can we trust them?," in *Security and Privacy in Mobile Information and Communication Systems*, pp. 40–51, Springer, 2012.
11. B. Sanz, I. Santos, C. Laorden, X. Ugarte-Pedrero, and P. G. Bringas, "On the automatic categorization of android applications," in *Consumer Communications and Networking Conference (CCNC), 2012 IEEE*, pp. 149–153, IEEE, 2012.
12. B. Sanz, I. Santos, C. Laorden, X. Ugarte-Pedrero, J. Nieves, P. G. Bringas, and G. A´lvarez Marañón, "MAMA: Manifest Analysis for Malware Detection in Android," *Cybernetics and Systems*, vol. 44, no. 6-7, pp. 469–488, 2013.
13. B. Sanz, I. Santos, C. Laorden, X. Ugarte-Pedrero, P. G. Bringas, and G. A´lvarez, "Puma: Permission usage to detect malware in android," in *International Joint Conference CISIS12-ICEUTE´12-SOCO´12 Special Sessions*, pp. 289–298, Springer, 2013.
14. B.P. Sarma, N. Li, C. Gates, R. Potharaju, C. Nita-Rotaru, and I. Molloy, "Android permissions: a perspective combining risks and benefits," in *Proceedings of the 17th ACM symposium on Access Control Models and Technologies*, pp. 13–22, ACM, 2012.
15. R. Sato, D. Chiba, and S. Goto, "Detecting Android Malware by Analyzing Manifest Files," *Proceedings of the Asia-Pacific Advanced Network*, vol. 36, pp. 23–31, 2013.

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