

Raytheon

Blackbird Technologies

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DEP/ASLR Bypass Without ROP/JIT

For
SIRIUS Task Order PIQUE

Submitted to:
U.S. Government

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(U) Table of Contents

1.0 (U) Analysis Summary	1
2.0 (U) Description of the Technique	1
3.0 (U) Identification of Affected Applications	1
4.0 (U) Related Techniques.....	1
5.0 (U) Configurable Parameters	1
6.0 (U) Exploitation Method and Vectors.....	1
7.0 (U) Caveats	1
8.0 (U) Risks	2
9.0 (U) Recommendations	2

1.0 (U) Analysis Summary

(S//NF) This report is based on a CanSecWest 2013 briefing slide deck prepared by NSFOCUS, an international enterprise security systems provider. The slide deck provides very little context to the Windbg screenshots that make up most of the deck. The slide deck starts with an explanation of the security issues surrounding fixed address assignments of critical elements from NT 4 through Windows 8 and how those fixed addresses are leveraged to exploit systems.

(S//NF) The slide deck points out that despite ASLR, there are still fixed address items that can be used with predictable off-sets to reach the APIs of interest. In particular, the technique leverages KUSER_SHARED_DATA, Wow64SharedInformation, and LdrHotPatchRoutine. The limitation of this approach is it is restricted to 32-bit processes running on x64 Windows, and has been patched beginning with Windows 8. There are some well-formed code samples in the slide deck and while this technique may make an interesting PoC, we naturally defer to the Sponsor on pursuing a PoC with such restrictions in terms of the bit-ness of targeted processes and OS versions.

2.0 (U) Description of the Technique

(S//NF) The technique leverages fixed addressed structures in post ASLR Windows Vista and Windows 7 platforms and offsets to exploit 32-bit processes running in x64 bit versions of those OSes.

3.0 (U) Identification of Affected Applications

(U) Windows Vista and Widows 7.

4.0 (U) Related Techniques

(S//NF) Buffer overflow.

5.0 (U) Configurable Parameters

(S//NF) Offsets and buffer sizes.

6.0 (U) Exploitation Method and Vectors

(S//NF) Buffer overflow.

7.0 (U) Caveats

(U) Windows Vista and Windows 7 only.

8.0 (U) Risks

(S//NF) The risk associated with this PoC development, should Sponsor elect to pursue it, is moderate due to technical complexity. Given the code samples provided in the slide deck, we estimate this PoC to require 2 FTE weeks to complete.

9.0 (U) Recommendations

(S//NF) Defer to Sponsor on pursuing this PoC, which is limited to Windows Vista and Windows 7.