



# What is Microsoft EMET and why should I care?



| Report Documentation Page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                    |                                     |                                          | Form Approved<br>OMB No. 0704-0188       |                                 |
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# ROP Mitigations

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EMET 4.0 provides application-specific ROP mitigations

- LoadLibrary
- MemProt
- Caller
- SimExecFlow
- StackPivot

# LoadLibrary

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Extra checking when loading a library.

- e.g. don't allow loading from a UNC path

# Memprot

---

Check memory protection functions like VirtualProtect to make sure they are not doing things like marking stack as executable.

# Caller

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Before critical API functions called, disassemble backwards to verify that target function is called.

- Don't allow return into function ("Return" of ROP)

# SimExecFlow

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Forward execution simulation to verify normal program execution flow.

# StackPivot

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When entering a critical function, make sure that stack pointer is within bounds of the stack.

# EMET 5.0 New Features

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EMET 5.0 includes additional exploit mitigations

- Attack Surface Reduction
- EAF+
- Deep Hooks Enabled

# Attack Surface Reduction

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Reducing attack surface critical to prevention of exploitation.

Examples:

- Only allow Java in Intranet IE zone.
- Don't allow Flash in Microsoft Word

# EAF

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## Export Address Filtering

To perform useful functionality, shellcode usually needs to call exported functions.

e.g. `kernel32!WinExec()`

EAF blocks access to Export Address Table (EAT) based on calling address.

# EAF+

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## Export Address Filtering +

- Added KERNELBASE export protection
- Integrity checks on stack registers and stack limits
- Prevent memory operations for export tables when they originate from suspicious modules.

# EAF+ In Action

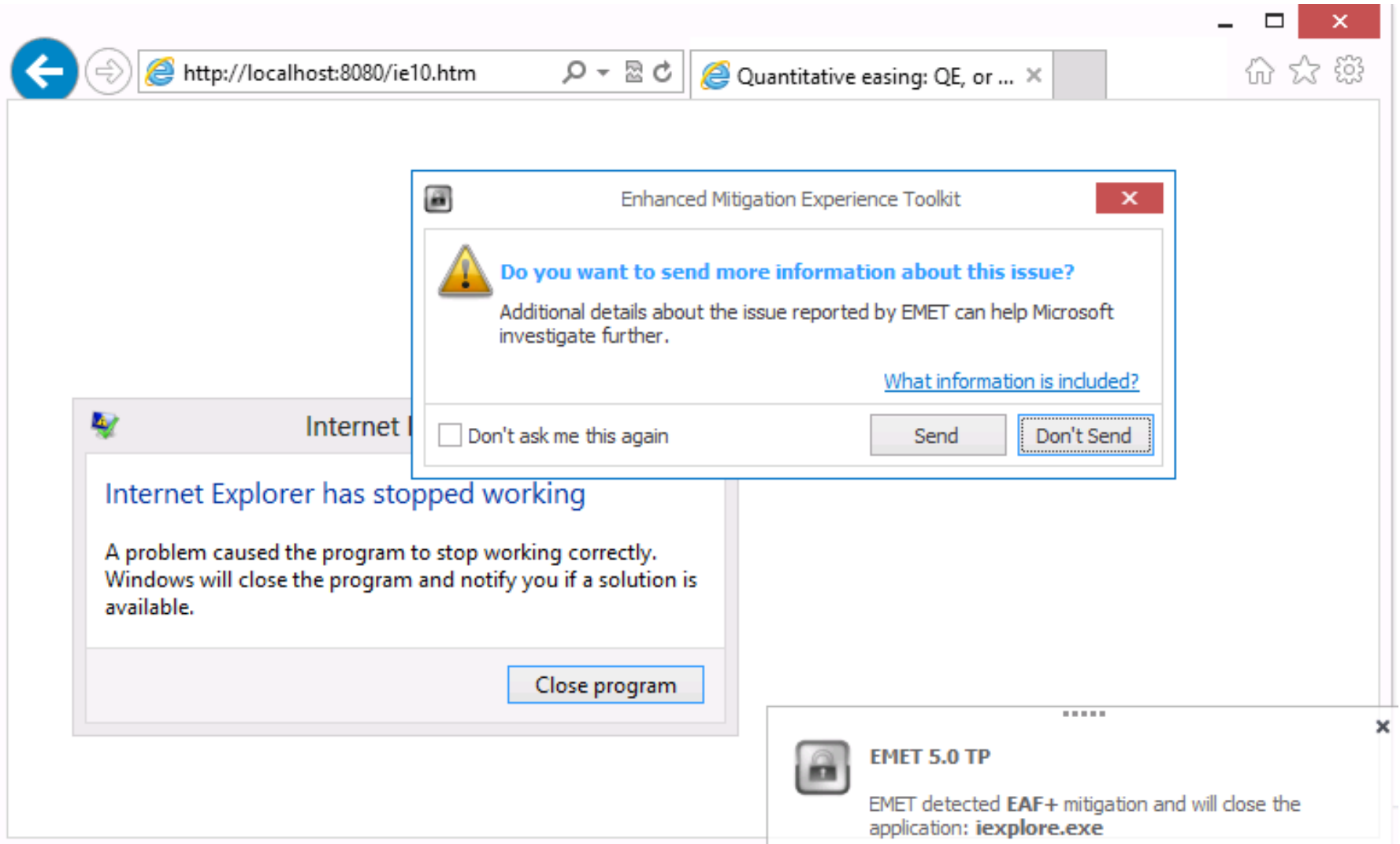


Image Credit: <http://blogs.technet.com/b/srd/archive/2014/02/25/announcing-emet-5-0-technical-preview.aspx>

# Deep hooks

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Protection of high-level functions applied towards lower-level function as well.

Microsoft has been working with vendors to make sure to ensure deep hooks compatibility.

# Use EMET to stay safe

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The only way to safely run applications on Windows is to use EMET!

- Minimize risk of delayed patching
- Protect against known vulnerabilities
- Protect against 0day vulnerabilities
- Protect against future vulnerabilities

# EMET Recommend Configuration

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## System Status

- **DEP**                      **Application Opt Out**
- **SEHOP**                  **Application Opt Out**
- **ASLR**                    **Always On\***

Import **Popular Software.xml**

Add every application you care about

# For More Information

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## Visit CERT® web sites:

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