

Interpreters Under Pressure

a.k.a. fuzzing languages for lulz


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Intro
(whoami etc)

Outline

- Revelation
- Initial experiment
- Initial results
- More experiments
- More results
- Future Work
- References
- Q&A

Revelation

What if I... 

Initial experiment

Where's my duct tape? 

Initial results

Wait, what? 🤔

Why did I switch to *dead languages?
Should've go with mainstream ones...



* Although I've heard greek is still alive 💪

More experiments

Even more duct tape! 🤘

More results



You know, sometimes I amaze even myself.

	PHP (php-7.1.1-asan)	HHVM (hhvm-3.15.6-dev)	Ruby (mri-2.4.0-asan)	Python (cpython-2.7.13-asan)
EXPLOITABLE	58	35	74	2
PROBABLY_EXPLOITABLE	8	0	0	2
PROBABLY_NOT_EXPLOITABLE	8	0	2	4
UNKNOWN	12	5	5	3

*Classification done with gdb !exploitable 😎

Future Work

Be smart.

Don't be dumb.



References

Standing on the shoulders
of giants. 🙌

- <https://www.usenix.org/conference/usenixsecurity12/technical-sessions/presentation/holler>
- <https://sean.heelan.io/2016/04/26/fuzzing-language-interpreters-using-regression-tests/>
- <https://vimeo.com/181078970>
- <https://docs.google.com/presentation/d/1vvl34hw0pAyFeNo-oqJnMUg8zsKIVNj0NHOKxdW-UEs/edit?pref=2&pli=1#slide=id.p>
- https://infiltratecon.com/downloads/sean_heelan_2014_slides.pdf
- <https://github.com/SeanHeelan/Malamute>
- <https://sean.heelan.io/2012/07/10/better-interpreter-fuzzing-with-clang/>
- <https://github.com/SeanHeelan/InterParser>
- <https://blog.exodusintel.com/2017/01/03/gramfuzz/>
- <https://users.own-hero.net/~decoder/holler-mthesis-2011.pdf>
- <https://people.csail.mit.edu/akiezun/pldi-kiezun.pdf>
- <https://www.microsoft.com/en-us/research/wp-content/uploads/2016/02/tr-2007-154.pdf>
- <https://theory.stanford.edu/~aiken/publications/new/InputGrammars.pdf>
- <https://github.com/silviocesare/Fuzzer>
- <https://www.usenix.org/legacy/event/lisa06/tech/slides/kaminsky.pdf>
- https://www.usenix.org/legacy/event/woot08/tech/full_papers/viide/viide.pdf

- <https://www.slideshare.net/logicaltrust/torturing-the-php-interpreter>
- <https://www.slideshare.net/logicaltrust/201105-owasp-fuzzing-interpretera-php>
- <http://php-security.org/2010/05/11/mops-submission-05-the-minerva-php-fuzzer/index.html>
- <https://www.evonide.com/how-we-broke-php-hacked-pornhub-and-earned-20000-dollar/>
- <https://www.evonide.com/fuzzing-unserialize/>
- <https://www.evonide.com/breaking-phps-garbage-collection-and-unserialize/>
- <https://github.com/80vul/phpcodz>
- <http://www.agarri.fr/en/publications.html>
- <https://medium.com/@dgryski/fuzzing-perl-xs-modules-with-afl-4bfc2335dd90>
- <http://www.geeknik.net/71nvhf1fp>
- <http://blogs.perl.org/users/rurban/2011/11/adventures-with-clang-and-asan.html>
- <http://blogs.perl.org/users/rurban/2012/03/address-sanitizer-round-2.html>
- <http://tomforb.es/segfaulting-python-with-afl-fuzz>

Q/A

Did I answer your question? 😎

Peace Out 🕊️

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