



More
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Strings

deanx

outline

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thanks

More Adventures In Format Strings

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Portcullis Computer Security Limited



outline

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What(*not*)?



Smashing the Heap

- Do some funky stuff (DL Style) and call free

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- Do some funky stuff (DL Style) and call free
- Free overwrites 4 bytes



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- Where?



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- Do some funky stuff (DL Style) and call free
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- Where?
 - PLT
- Why?
 - It's **rw**
 - It's **static**
 - It **will** get called again



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 - Pointer to trampoline that JMP's *edi
 - Where *edi contains your shellcode



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 - Where *edi contains your shellcode
- Problem: What if you have no appropriate registers?



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- Problem: What if you have no appropriate registers?
- Solution: ?



Luxuries of the Format String

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- Arbitrary Memory Overwrite



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- Arbitrary Memory Overwrite
- Non-contiguous Overwrite



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- Arbitrary Memory Overwrite
- Non-contiguous Overwrite
- Exploit: Follow Heap Smash Just Path



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- Arbitrary Memory Overwrite
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- Exploit: Follow Heap Smash Just Path
- Problem: What if you have no appropriate registers?
 - Again `Jump *edi` will fail
- Solution: Rewrite a register



How to change a Register

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- Use the format string



How to change a Register

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- Use the format string
- Write a small shellcode to the PLT



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- Use the format string
- Write a small shellcode to the PLT
 - `lea edi,[edi-2150]`
 - `jmp *edi`



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- Use the format string
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- Point a PLT Entry to your chain code



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- Use the format string
- Write a small shellcode to the PLT
 - `lea edi,[edi-2150]`
 - `jmp *edi`
- Point a PLT Entry to your chain code
- Now when it runs `*edi` will contain your long, stage 2 shellcode



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- Use the format string
- Write a small shellcode to the PLT
 - `lea edi,[edi-2150]`
 - `jmp *edi`
- Point a PLT Entry to your chain code
- Now when it runs `*edi` will contain your long, stage 2 shellcode
- Job Done



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■ Why Optimise?



- Why Optimise?
 - Format Strings Are inefficient
 - ~10 bytes in 2 bytes out (buffer space)
 - Large Logs



optimisation

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- Why Optimise?
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- What Can We Do?



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- What Can We Do?
 - Write in any order
 - Write in the most efficient order
 - Write `\x0a` before `\x1a` before `\x2a` before `\x3a`



optimisation

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 - `0x0a1a2a3a` (1byte) or `0x2a0a3a1a` (2 bytes)



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- How?
 - Write Write Address in order
 - Use `%x$hn` to pick the x'th memory location



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