On semantics of self-modifying codes

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Team presentation

- Laboratoire lorrain de recherche en informatique et ses applications (LORIA) à Nancy
- CARTE team: Calculablity & complexity, virology

Self-modification

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- Does it exist framworks to study self-modifying codes?

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1:	`sub 2 42`	1
2:	`sub 3 42`	1
3:	$\mathbb{D}$(`mov eax 18`) `+ 42`) → $\mathbb{D}(\mathbb{E}(\texttt{mov eax 18}) + \texttt{42})$	2
4:	$\mathbb{D}(\mathbb{E}(\texttt{mov 5 } \mathbb{E}(\texttt{jump 666})) + \texttt{42})$	2
5:	`add eax ebx ecx`	

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> *the execution level of an instruction is the execution level of the instruction which wrote it, plus 1.*

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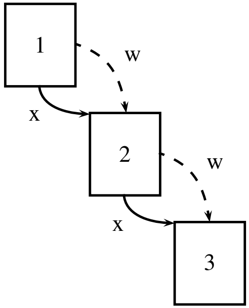
1:   sub 2 42                          1
2:   sub 3 42                          1
3:   𝔻(𝔼(mov eax 18) + 42)             2
4:   𝔻(𝔼(mov 5 𝔼(jump 666)) + 42)      2
5:   add eax ebx ecx                   3
```

Waves of self-modification

A wave is the set of addresses with the same execution level



Remaining questions

- Does it exist a semantic explaining waves?
- Is it possible to build a wave classification to specify compilers to self-modifying codes?
- Is there any existing framework which could catch self-modification semantics?

Idea for further developement

- Waves switches $\sim$ CPS
- Abstract machines (Kripke or Curien-Herbelin-Wadler machine)
- Link with LK?