Portable Executables

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Betriebssysteme II

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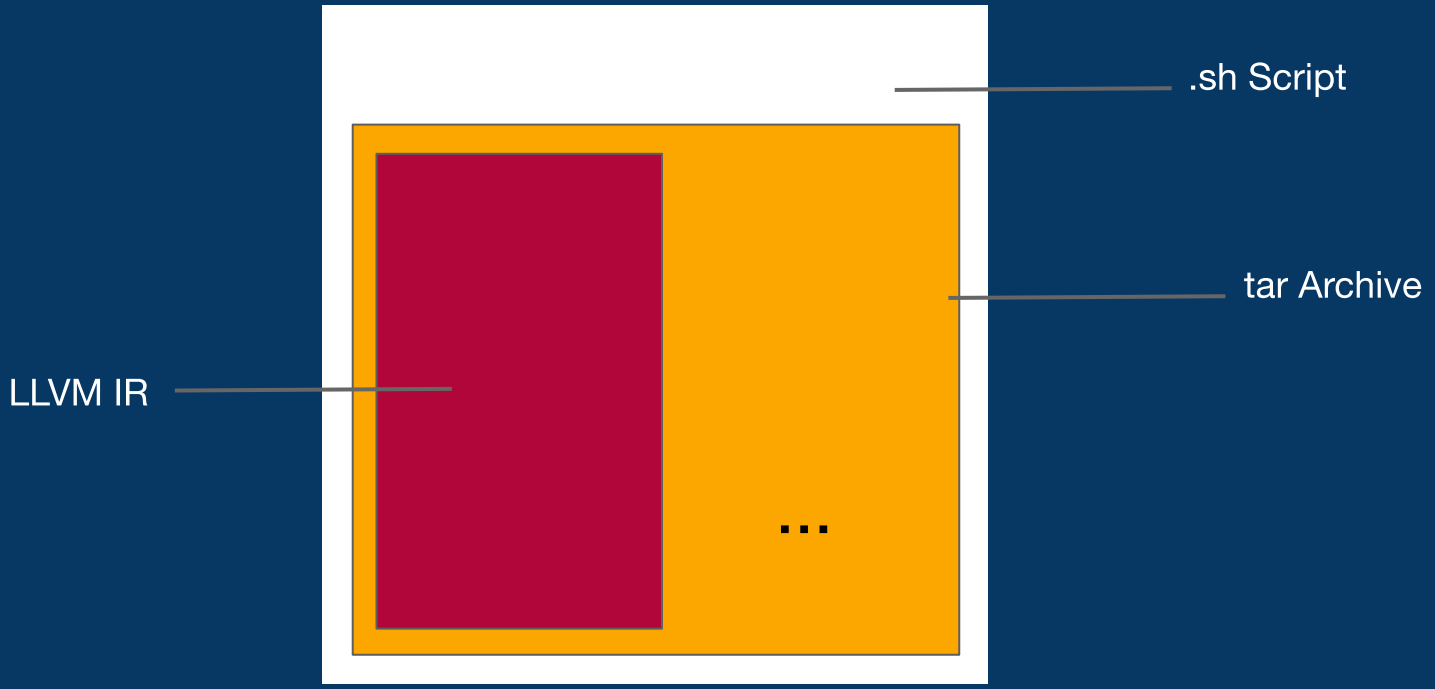
Demo Time

Motivation

PEX Format



LLVM IR

```c
#include <stdio.h>

int main() {
    printf("Hello World!");
    return 0;
}
```

```
; ModuleID = 'hello.c'
source_filename = "hello.c"
target datalayout = "e-m:e-i64:64-f80:128-n8:16:32:64-S128"
target triple = "x86_64-pc-linux-gnu"

@.str = private unnamed_addr constant [13 x i8] c"Hello World!\00", align 1

; Function Attrs: noinline nounwind optnone uwtable
define i32 @main() #0 {
  %1 = alloca i32, align 4
  store i32 0, i32* %1, align 4
  %2 = call i32 (i8*, ...) @printf(i8* getelementptr inbounds ([13 x i8], [13 x i8]*
@.str, i32 0, i32 0))
  ret i32 0
}

declare i32 @printf(i8*, ...) #1

attributes #0 = {[...] "target-cpu"="x86-64"
"target-features"="+fxsr,+mmx,+sse,+sse2,+x87" [...] }
[...]
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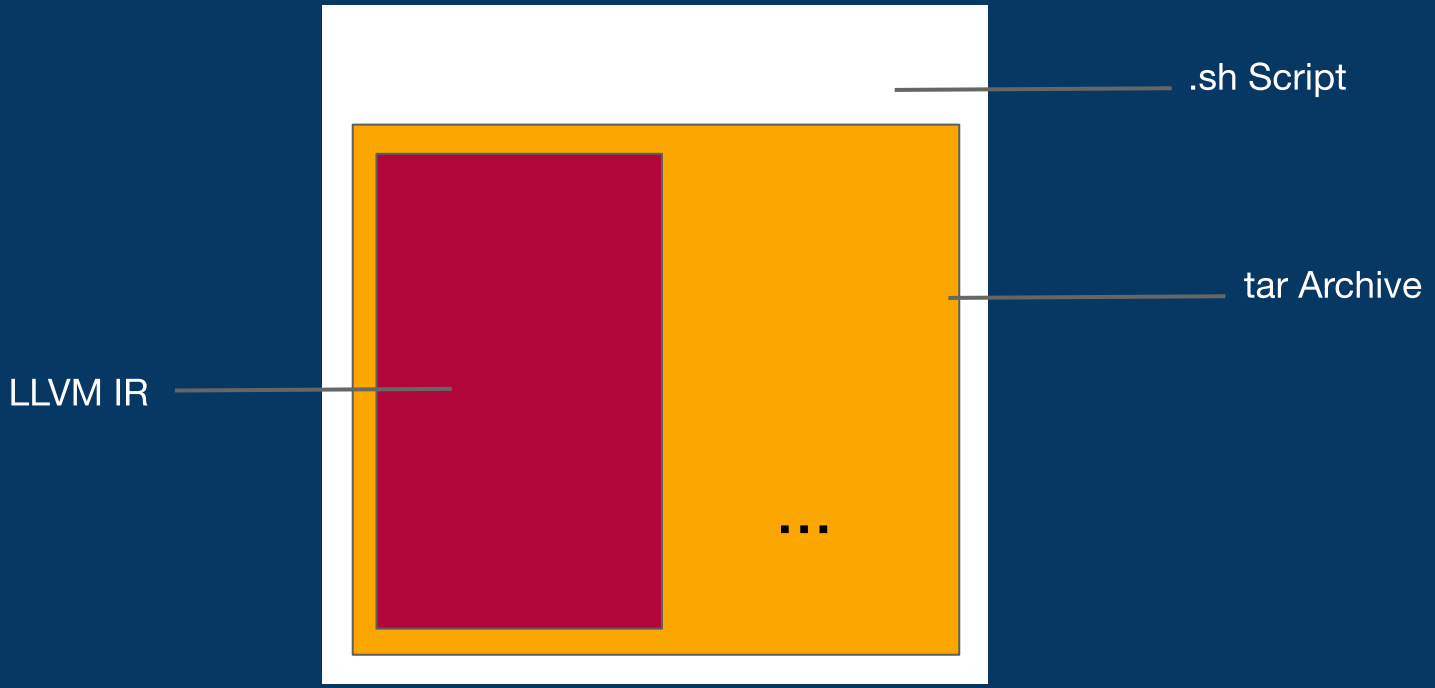

Limitations

Compilers and build processes are complex.

LLVM IR is not completely architecture agnostic.

PEX has performance and memory overhead.

Future Work

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Recursive PEX?

Integration with OS to improve performance

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Integration with OS to improve performance

Real IR Portability?

Integration with Compiler Toolchain