OS, ELF

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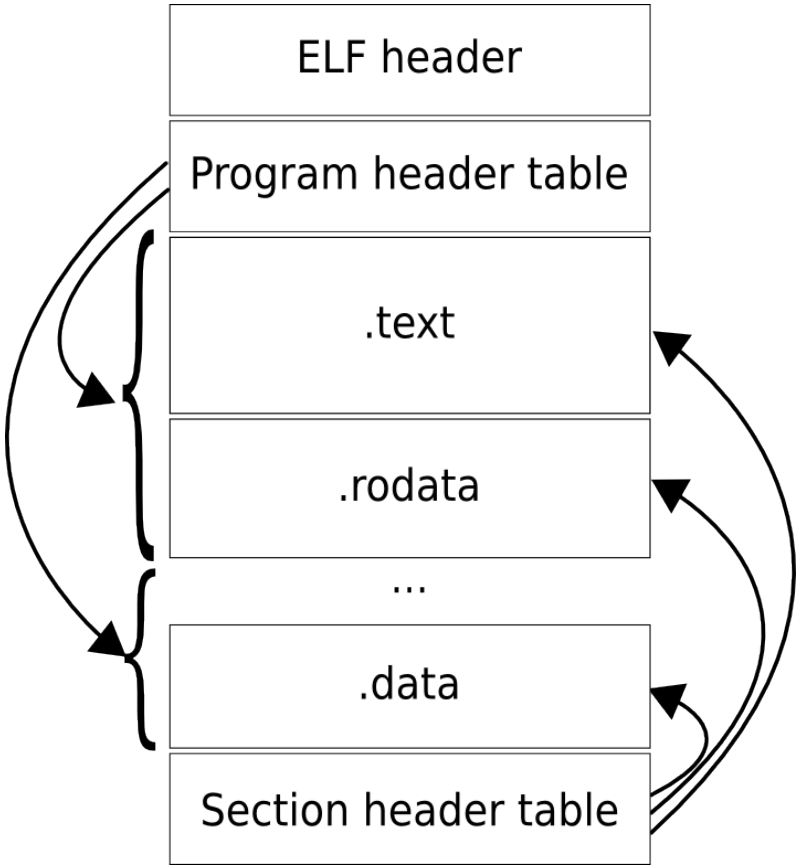
(static) Executlabe and Linkable Format (ELF)

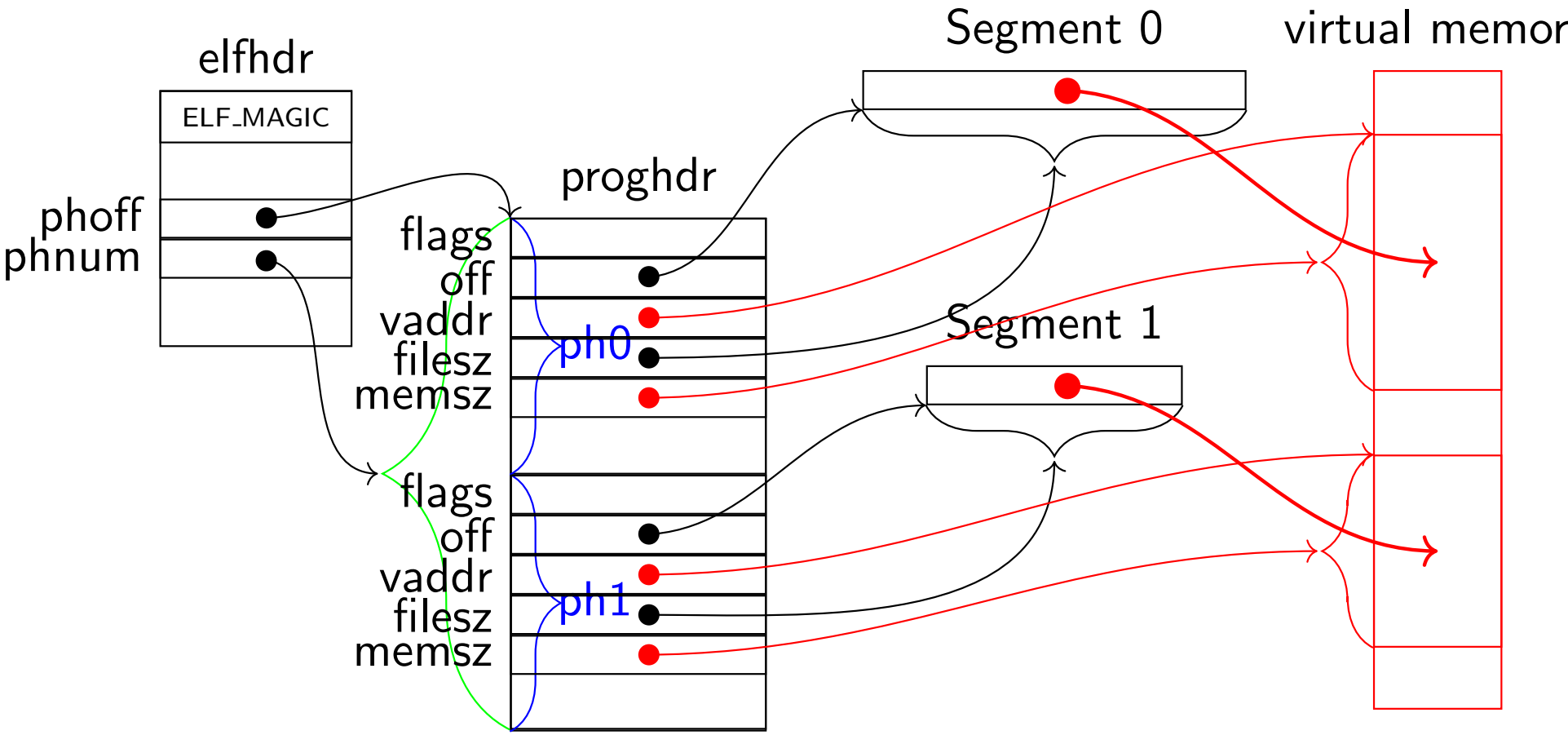
ELF components

1. ELF header. Must begin at byte zero of the file.
2. PROGHDR vector.
3. Program segments.

ELF file, very abstract



ELF, more detailed



ELFHDR

```
955 struct elfhdr {
    uint magic; // must equal ELF_MAGIC
    uchar elf[12];
    ushort type;
    ushort machine;
    uint version;
    uint entry;  // Entry point
    uint phoff;  // (File) Location of PROGHDR vectors
    uint shoff;
    uint flags;  // flag
    ushort ehsize;
    ushort phentsize;
    ushort phnum; // Length of PROGHDR vector
    ushort shentsize;
    ushort shnum;
    ushort shstrndx;
    };
```

ELFHDR fields we are interested in

- **magic**: Should be ELF_MAGIC (0x464C457F).
- **entry**: Virtual address the program is starting at.
- **phoff**: File offset the Program segments Headers vector begins at.
- **phnum**: Number of elements in the Program segments Headers vector.

For each segment there is PROGHDR

```
struct proghdr {
  uint type;   // Only PROG_LOAD matters to us
  uint off;    // Section location in file
  uint vaddr;  // Virtual address of section
  uint paddr;  // Physical address of section
  uint filesz; // Section size in file
  uint memsz;  // Section size in memory
  uint flags;
  uint align;
};
```