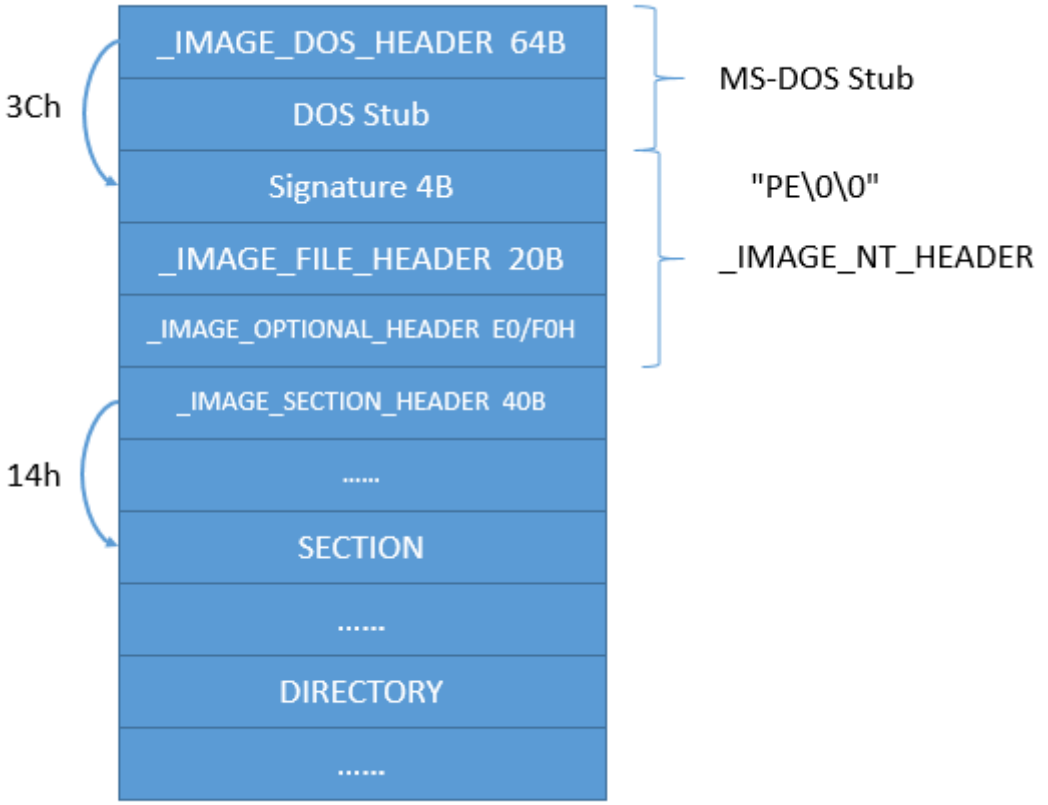
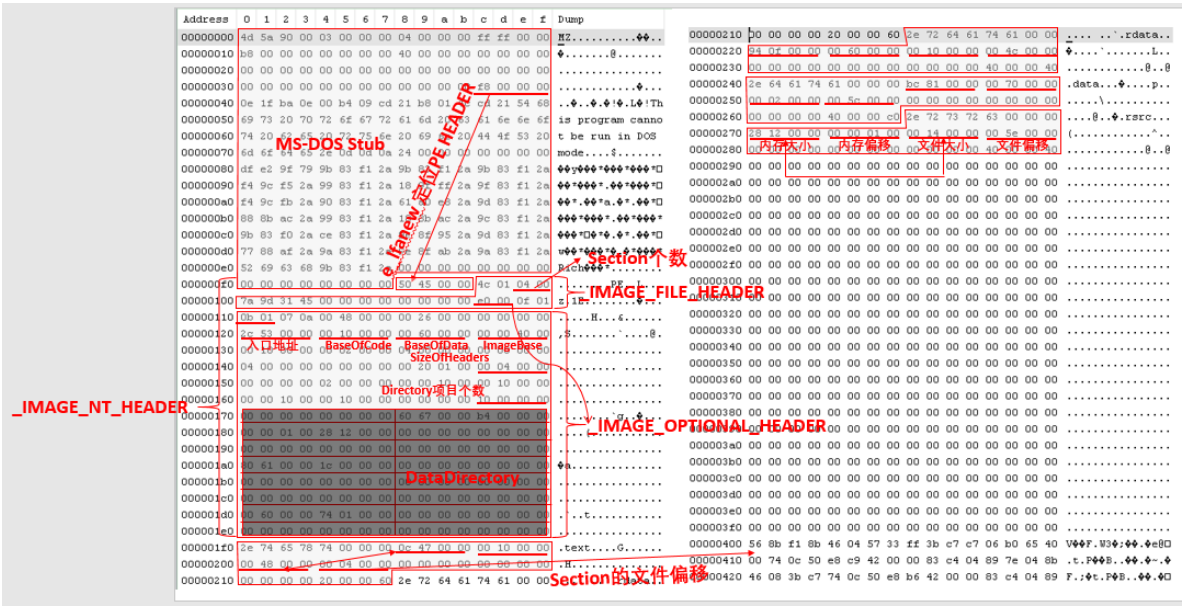
PE文件格式总结

一、图解





二、结构体详细信息

1. IMAGE_DOS_HEADER

```
struct _IMAGE_DOS_HEADER{
```

```
    0X00 WORD e_magic;     // Magic DOS signature MZ(4Dh 5Ah):MZ标记:用于标记是否是
可执行文件
    0X02 WORD e_cblp;
    0X04 WORD e_cp;
    0X06 WORD e_crlc;
    0X08 WORD e_cparhdr;
    0X0A WORD e_minalloc;
    0X0C WORD e_maxalloc;
    0X0E WORD e_ss;
    0X10 WORD e_sp;
    0X12 WORD e_csum;
    0X14 WORD e_ip;
    0X16 WORD e_cs;
    0X18 WORD e_lfarlc;
    0X1A WORD e_ovno;
    0x1C WORD e_res[4];
    0x24 WORD e_oemid;
    0x26 WORD e_oeminfo;
    0x28 WORD e_res2[10];
    0x3C DWORD e_lfanew;   // Offset to start of PE header:定位PE文件，PE头相对于文
件的偏移量
};
```

2. IMAGE_NT_HEADERS

```
typedef struct _IMAGE_NT_HEADERS {
    0x00 DWORD Signature;        // PE Signature: 50450000 ("PE"00)
    0x04 IMAGE_FILE_HEADER FileHeader;
    0x18 IMAGE_OPTIONAL_HEADER32 OptionalHeader;
} IMAGE_NT_HEADER32, *PIMAGE_NT_HEADER32;
```

3. IMAGE_FILE_HEADER

```
struct _IMAGE_FILE_HEADER{
    0x00 WORD Machine;                    // 程序执行的CPU平台:0X0:任何平台，
0X14C:intel i386及后续处理器
    0x02 WORD NumberOfSections;           // PE文件中区块数量
    0x04 DWORD TimeDateStamp;             // 时间戳：连接器产生此文件的时间距
1969/12/31-16:00P:00的总秒数
    0x08 DWORD PointerToSymbolTable;
    0x0c DWORD NumberOfSymbols;
    0x10 WORD SizeOfOptionalHeader;   // IMAGE_OPTIONAL_HEADER结构的大小(字节数):32
位默认E0H,64位默认F0H(可修改)
    0x12 WORD Characteristics;            // 如果 & 0x2000 后不为零，说明是DLL文件
};
```

4. IMAGE_OPTIONAL_HEADER

```
struct _IMAGE_OPTIONAL_HEADER{
    0x00 WORD Magic;                      // 幻数(魔数)，0x0107:ROM image,0x010B:32
位PE，0X020B:64位PE
    0x02 BYTE MajorLinkerVersion;
    0x03 BYTE MinorLinkerVersion;
    0x04 DWORD SizeOfCode;
```

```
    0x08 DWORD SizeOfInitializedData;
    0x0c DWORD SizeOfUninitializedData;
    0x10 DWORD AddressOfEntryPoint;      // 程序入口地址OEP
    0x14 DWORD BaseOfCode;               // 代码段起始地址(代码基址),(代码的开始和程序无
必然联系)
    0x18 DWORD BaseOfData;               // 数据段起始地址(数据基址)
    0x1c DWORD ImageBase;                // 内存镜像基址(默认装入起始地址),默认为4000H
    0x20 DWORD SectionAlignment;         // 内存对齐:一旦映像到内存中，每一个section保
证从一个「此值之倍数」的虚拟地址开始
    0x24 DWORD FileAlignment;
    0x28 WORD MajorOperatingSystemVersion;
    0x2a WORD MinorOperatingSystemVersion;
    0x2c WORD MajorImageVersion;
    0x2e WORD MinorImageVersion;
    0x30 WORD MajorSubsystemVersion;
    0x32 WORD MinorSubsystemVersion;
    0x34 DWORD Win32VersionValue;
    0x38 DWORD SizeOfImage;          // PE文件在内存中映像总大小
    0x3c DWORD SizeOfHeaders;        //※DOS头(64B)+PE标记(4B)+标准PE头(20B)+可选PE头
+节表的总大小，按照文件对齐(FileAlignment的倍数)
    0x40 DWORD CheckSum;
    0x44 WORD Subsystem;             // GUI: 2; CUI: 3
    0x46 WORD DllCharacteristics;
    0x48 DWORD SizeOfStackReserve;
    0x4c DWORD SizeOfStackCommit;
    0x50 DWORD SizeOfHeapReserve;
    0x54 DWORD SizeOfHeapCommit;
    0x58 DWORD LoaderFlags;
    0x5c DWORD NumberOfRvaAndSizes;      //目录项数目：总为0X00000010H(16)
    0x60 _IMAGE_DATA_DIRECTORY DataDirectory[IMAGE_NUMBEROF_DIRECTORY_ENTRIES];
};
```

5. IMAGE_DATA_DIRECTORY

```
typedef struct _IMAGE_DATA_DIRECTORY {
    0x00 DWORD   VirtualAddress;
    0x04 DWORD   Size;
} IMAGE_DATA_DIRECTORY, *PIMAGE_DATA_DIRECTORY;
```

6. IMAGE_EXPORT_DIRECTORY

```
typedef struct _IMAGE_EXPORT_DIRECTORY {
    0x00 DWORD   Characteristics;    // 未使用，总为0
    0x04 DWORD   TimeDateStamp;      // 文件创建时间戳
    0x08 WORD    MajorVersion;       // 未使用，总为0
    0x0a WORD    MinorVersion;       // 未使用，总为0
    0x0c DWORD   Name;               // 指向一个代表此 DLL名字的 ASCII字符串的 RVA
    0x10 DWORD   Base;               // 函数的起始序号
    0x14 DWORD   NumberOfFunctions;  // 导出函数的总数
    0x18 DWORD   NumberOfNames;      // 以名称方式导出的函数的总数
    0x1c DWORD   AddressOfFunctions;     // 指向输出函数地址的RVA
    0x20 DWORD   AddressOfNames;         // 指向输出函数名字的RVA
    0x24 DWORD   AddressOfNameOrdinals;  // 指向输出函数序号的RVA
} IMAGE_EXPORT_DIRECTORY, *PIMAGE_EXPORT_DIRECTORY;
```

7. IMAGE_SECTION_HEADER

```
typedef struct _IMAGE_SECTION_HEADER {
    0x00 BYTE  Name[IMAGE_SIZEOF_SHORT_NAME];
    0x08 union {
        DWORD PhysicalAddress;
        DWORD VirtualSize;          // 进程加载时section占用空间大小
    } Misc;
    0x0c DWORD VirtualAddress;
    0x10 DWORD SizeOfRawData;       // section在硬盘上占据的大小，应接近VirtualSize
    0x14 DWORD PointerToRawData;
    0x18 DWORD PointerToRelocations;
    0x1c DWORD PointerToLinenumbers;
    0x20 WORD  NumberOfRelocations;
    0x22 WORD  NumberOfLinenumbers;
    0x24 DWORD Characteristics;
} IMAGE_SECTION_HEADER, *PIMAGE_SECTION_HEADER;
```