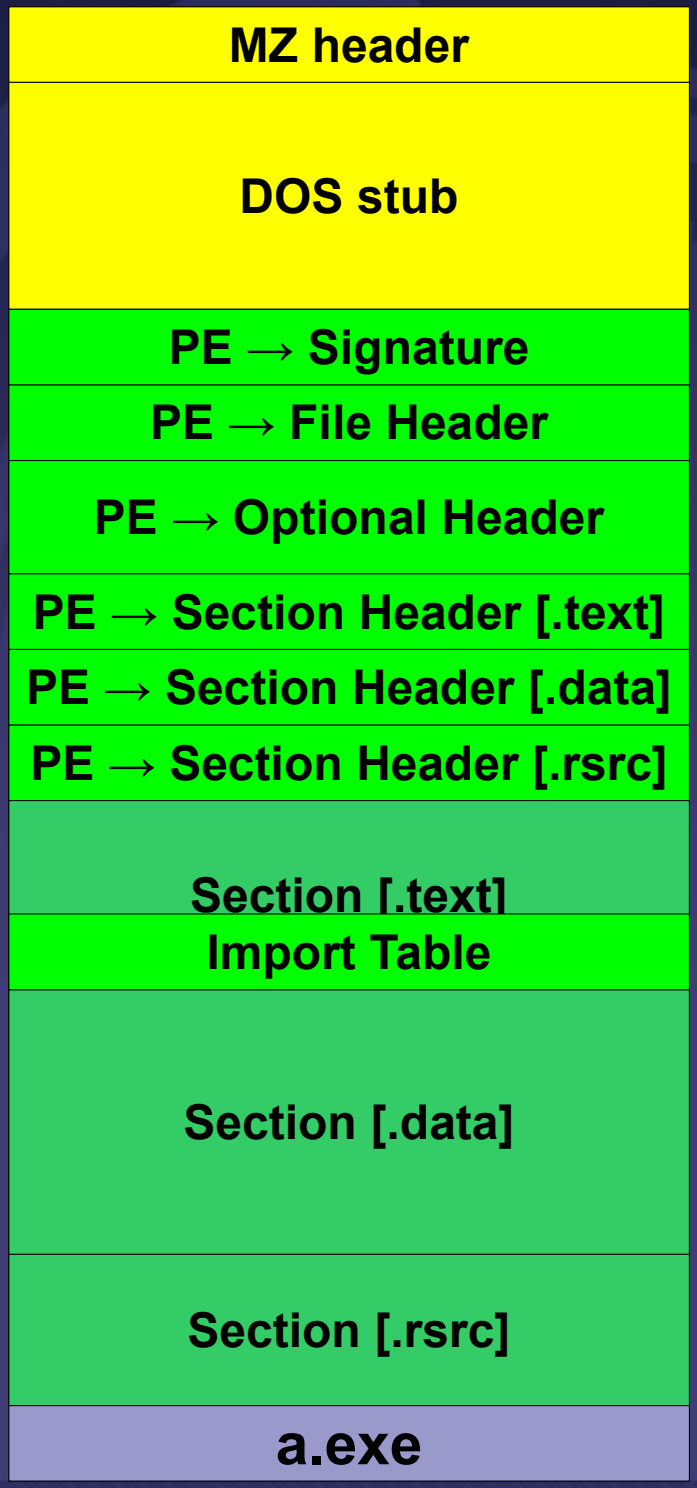
ReverseCraft

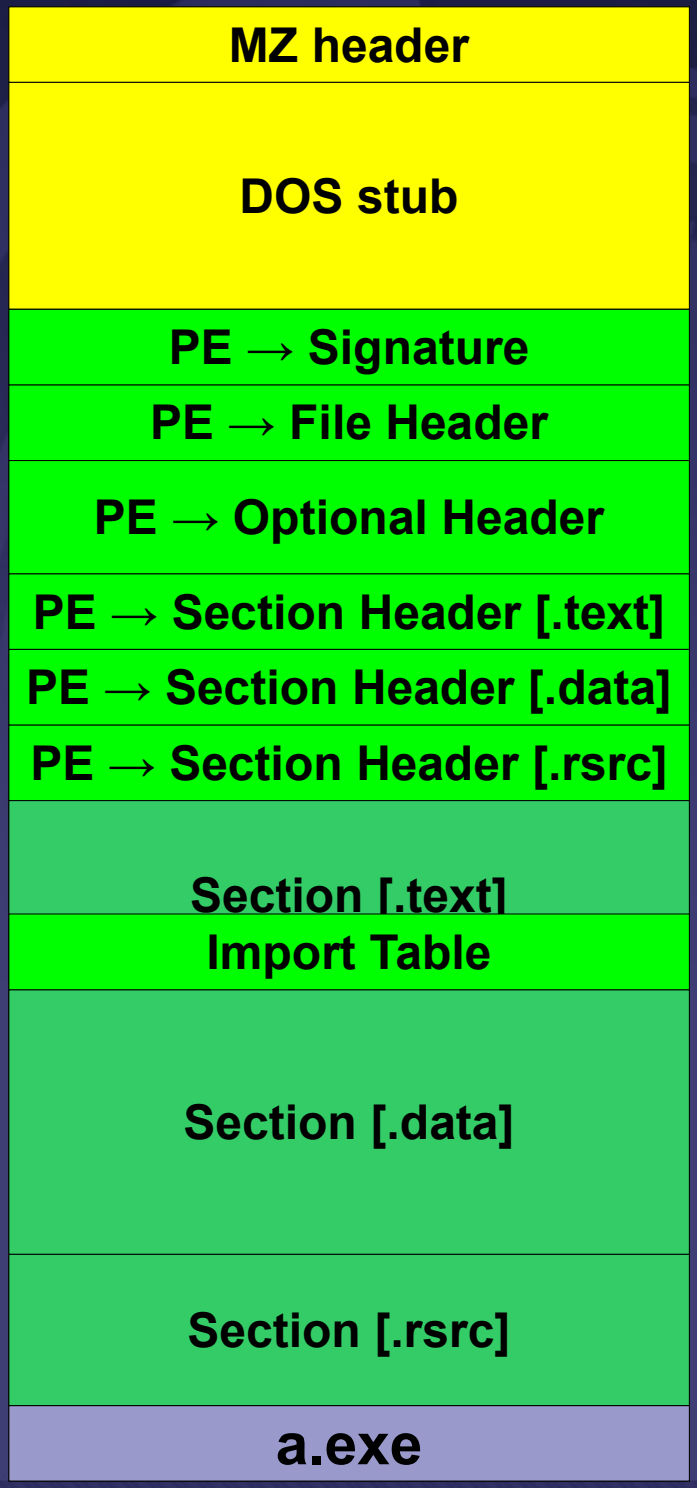
by gynvael.coldwind//vx

003 – Pamięć, proces i PE

Strony projektu:

http://re.coldwind.pl/
http://www.uw-team.org/


MZ header
DOS stub
PE → Signature
PE → File Header
PE → Optional Header
PE → Section Header [.text]
PE → Section Header [.data]
PE → Section Header [.rsrc]
Section [.text]
Import Table
Section [.data]
Section [.rsrc]
a.exe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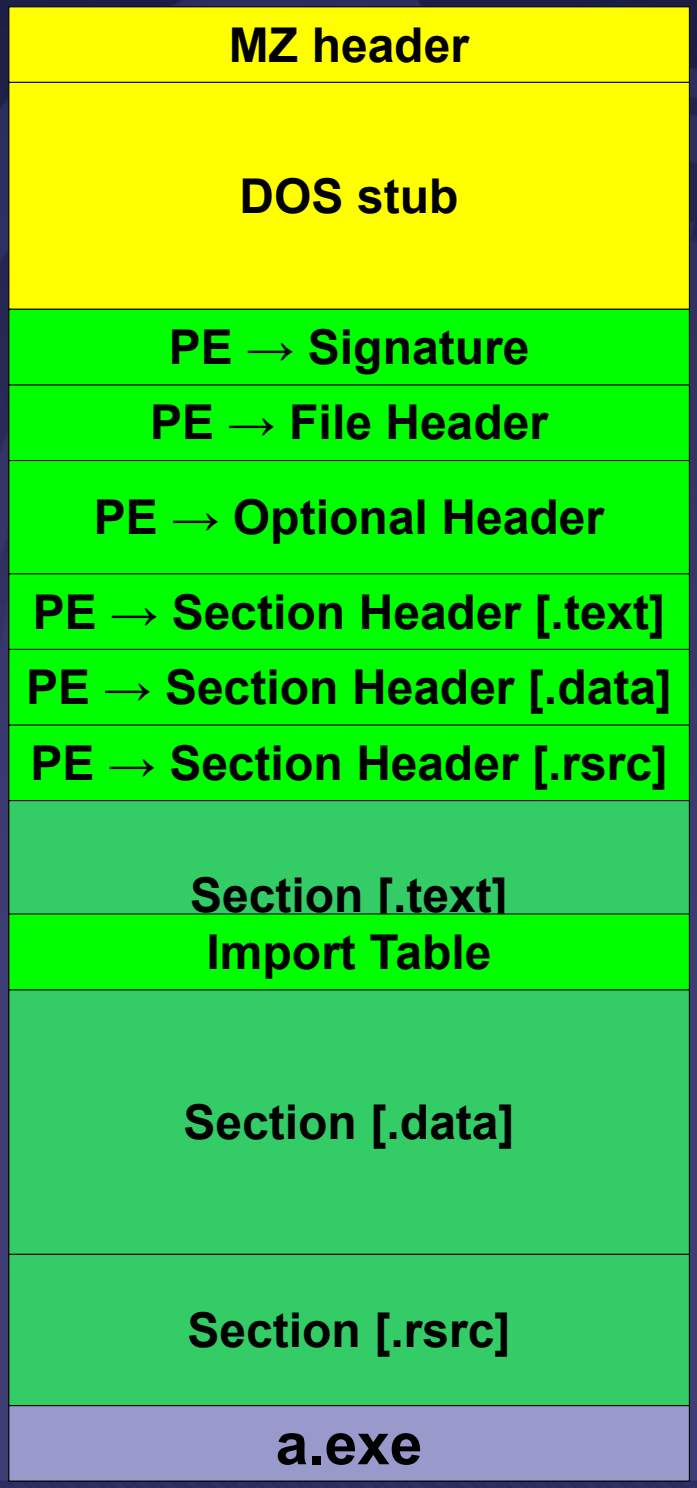
Section [.rsrc]
a.exe

Proces 1234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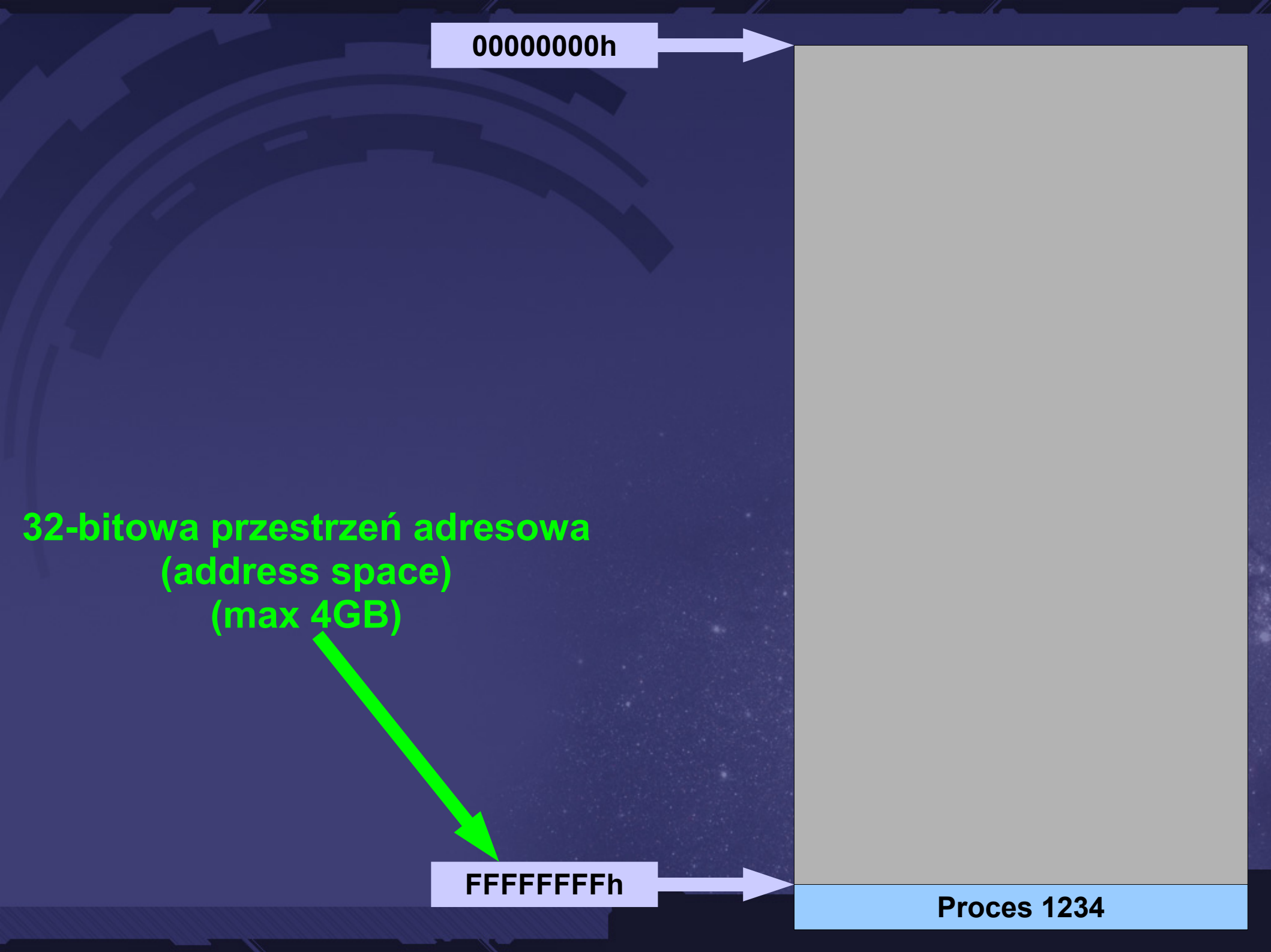
Section [.rsrc]
a.exe

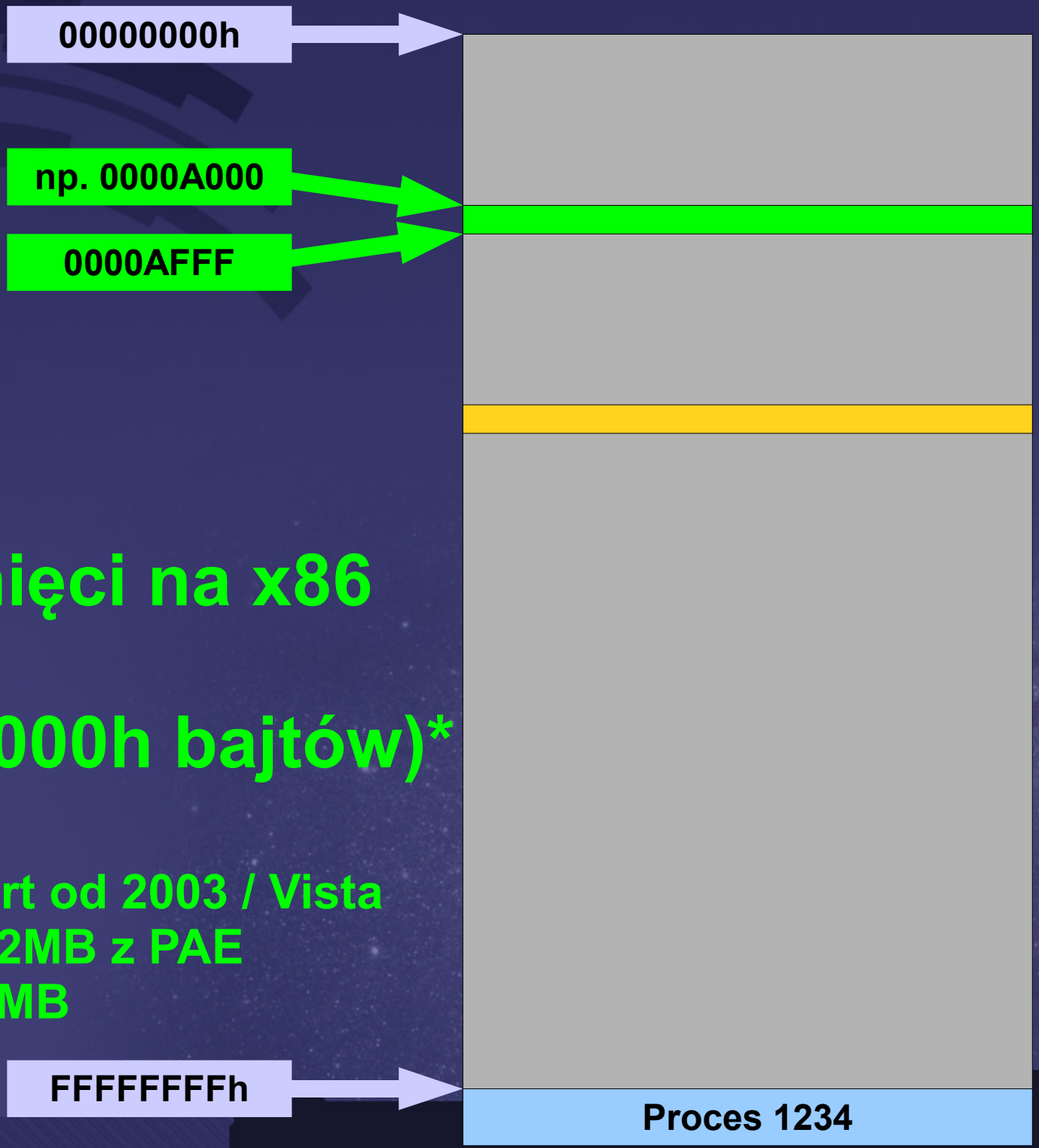

PROCESS
VIRTUAL
SPACE
Proces 1234


00000000h
32-bitowa przestrzeń adresowa
(address space)
(max 4GB)
FFFFFFFFh
Proces 1234

„Zamapowana” strona

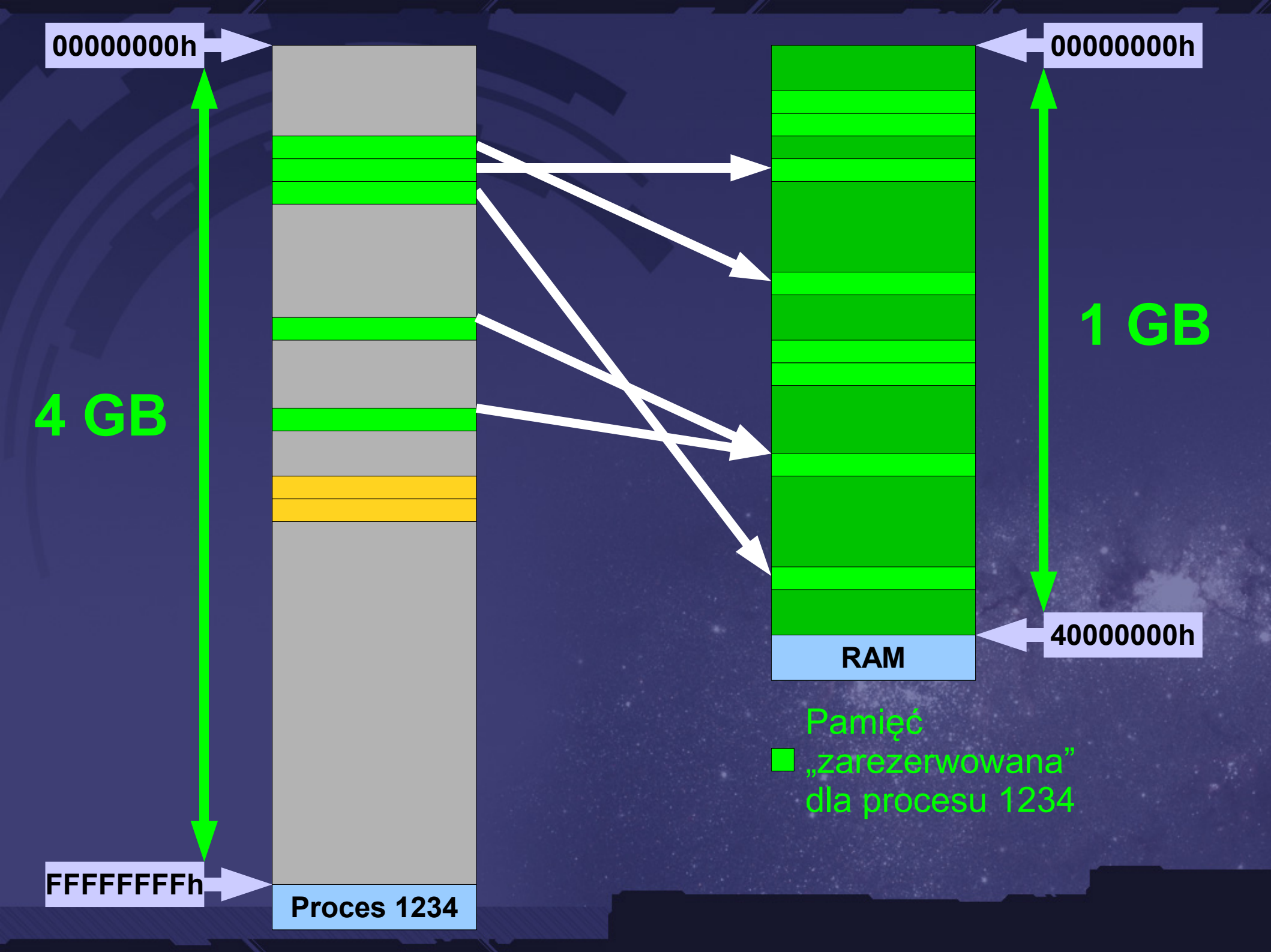
Strona nieistniejąca

Strona zarezerwowana



1 strona pamięci na x86 to 4096 bajtów (1000h bajtów)*

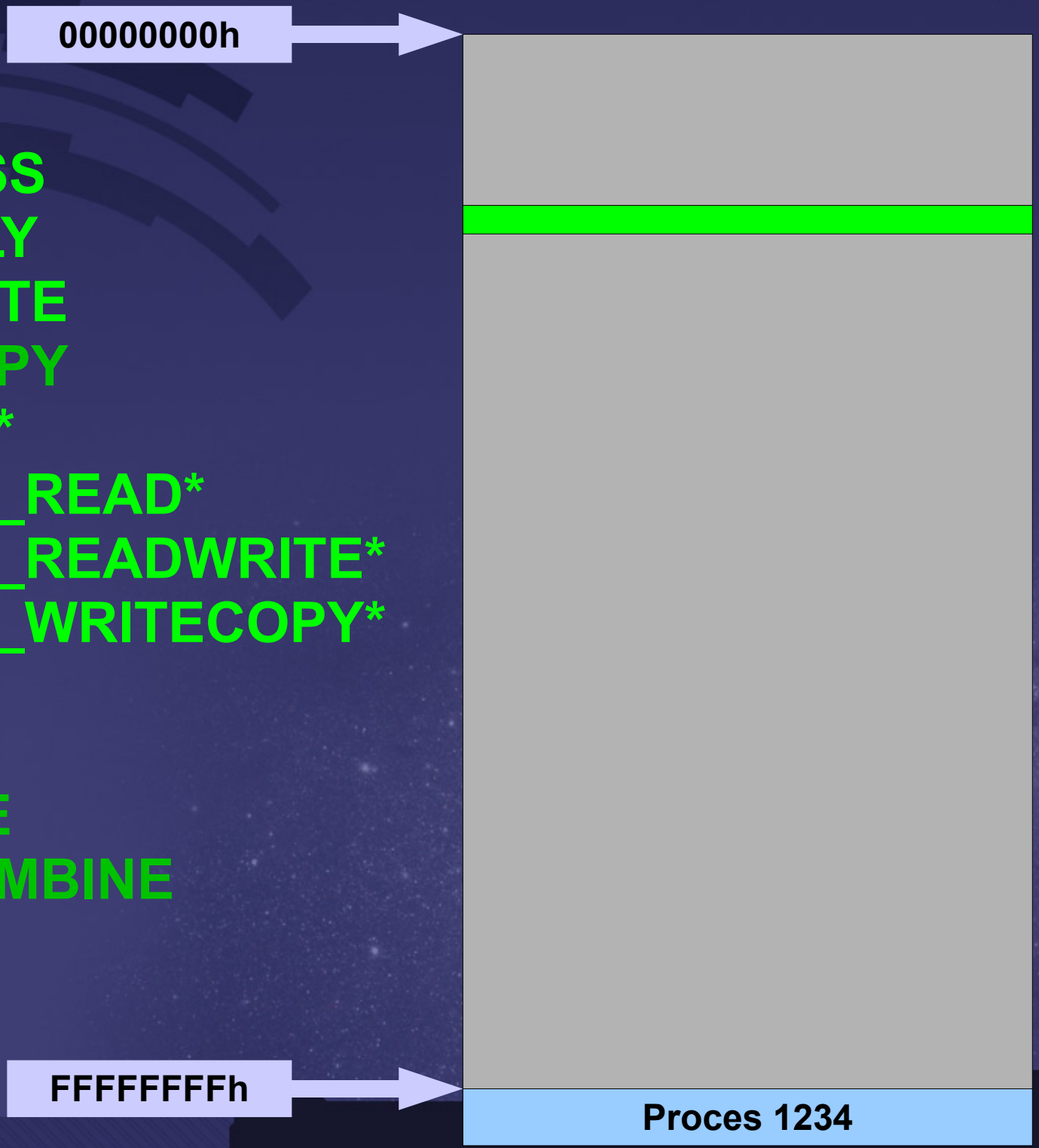
*** Large Page Support od 2003 / Vista**
x86: 4MB lub 2MB z PAE
x64: 2MB

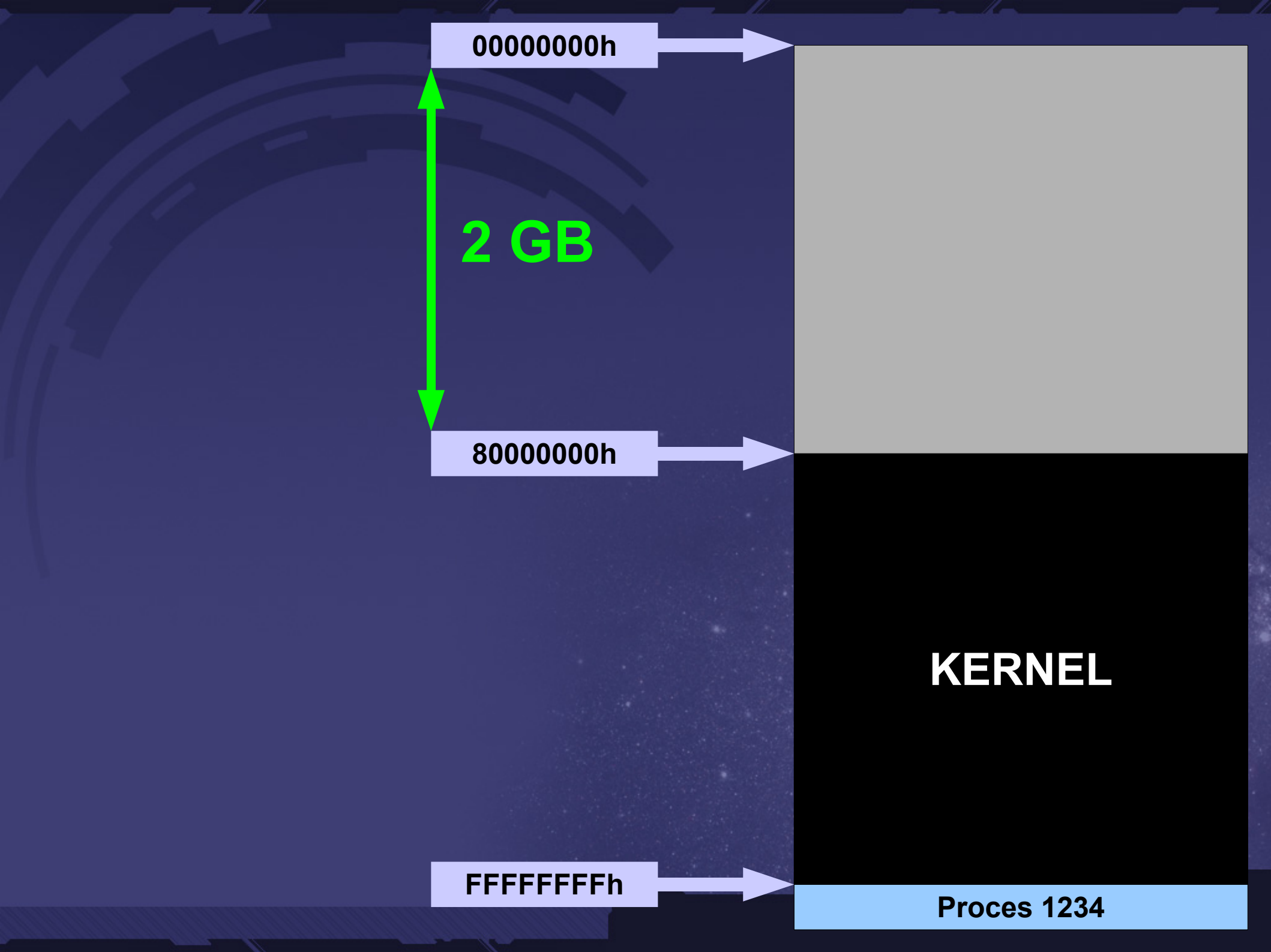

00000000h
FFFFFFFFh
4 GB
Proces 1234
00000000h
40000000h
1 GB
RAM
Pamięć
„zarezerwowana”
dla procesu 1234

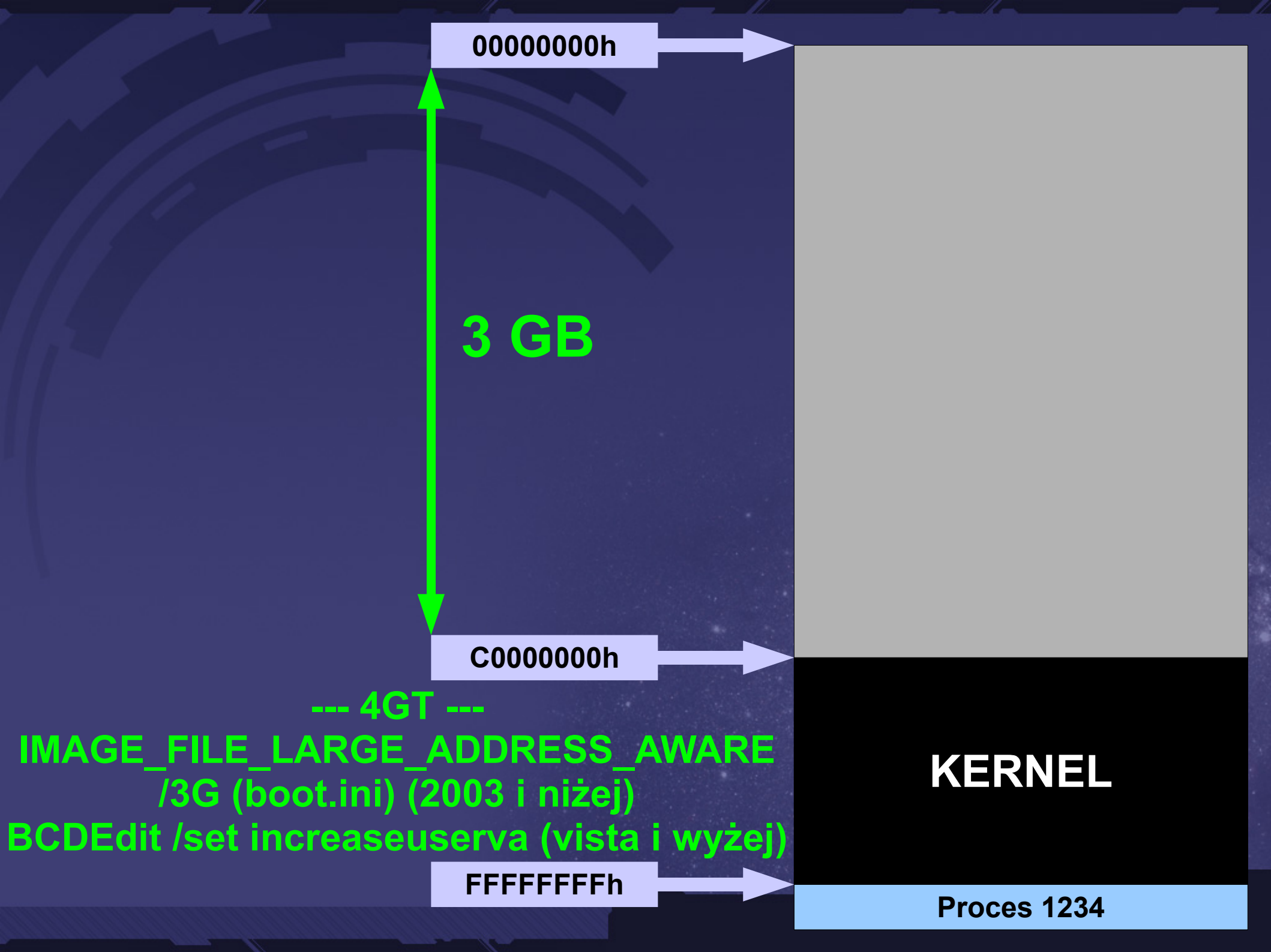
PAGE_NOACCESS
PAGE_READONLY
PAGE_READWRITE
PAGE_WRITECOPY
PAGE_EXECUTE*
PAGE_EXECUTE_READ*
PAGE_EXECUTE_READWRITE*
PAGE_EXECUTE_WRITECOPY*

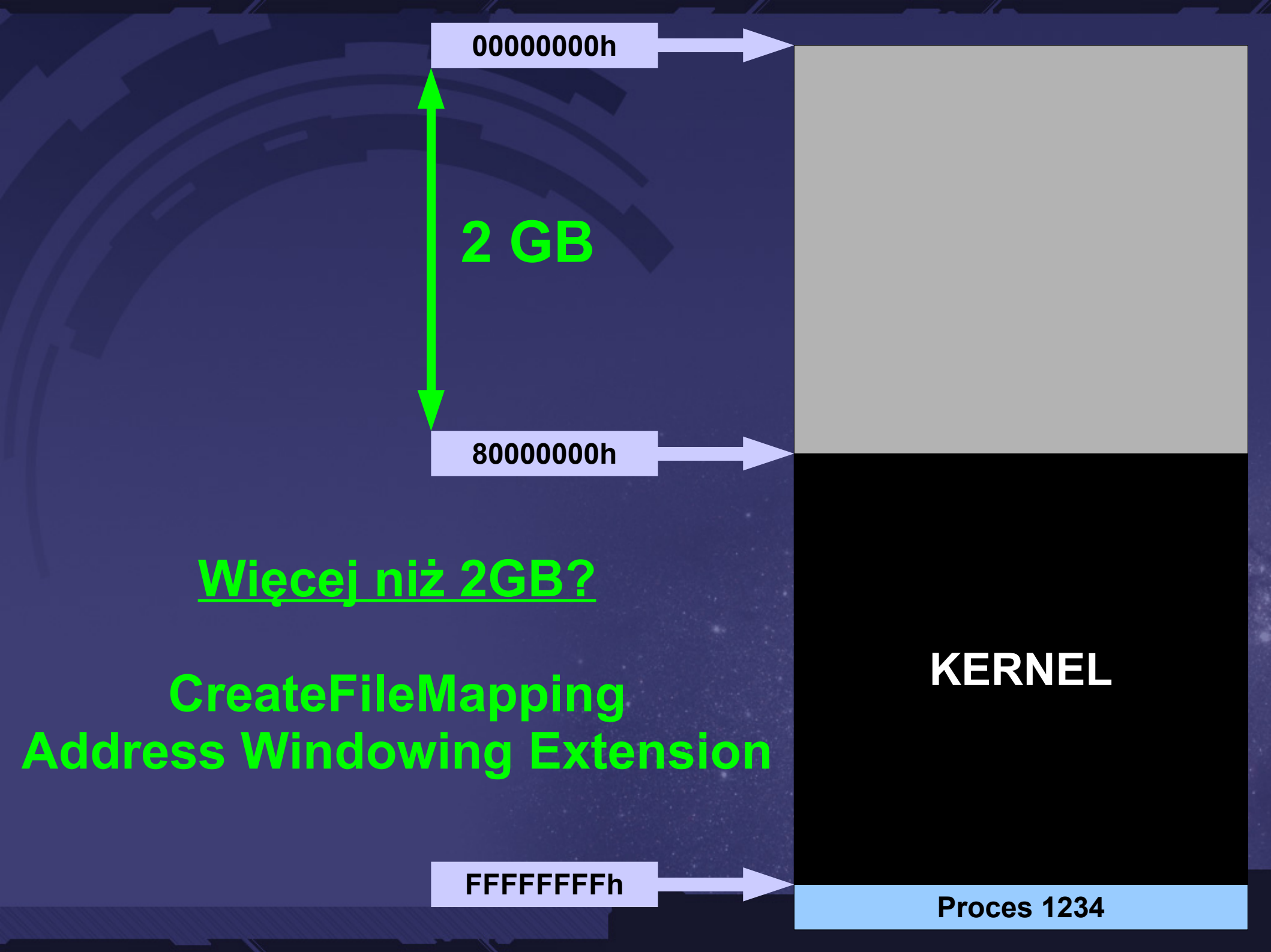
PAGE_GUARD
PAGE_NOCACHE
PAGE_WRITECOMBINE

* DEP, XD, NX



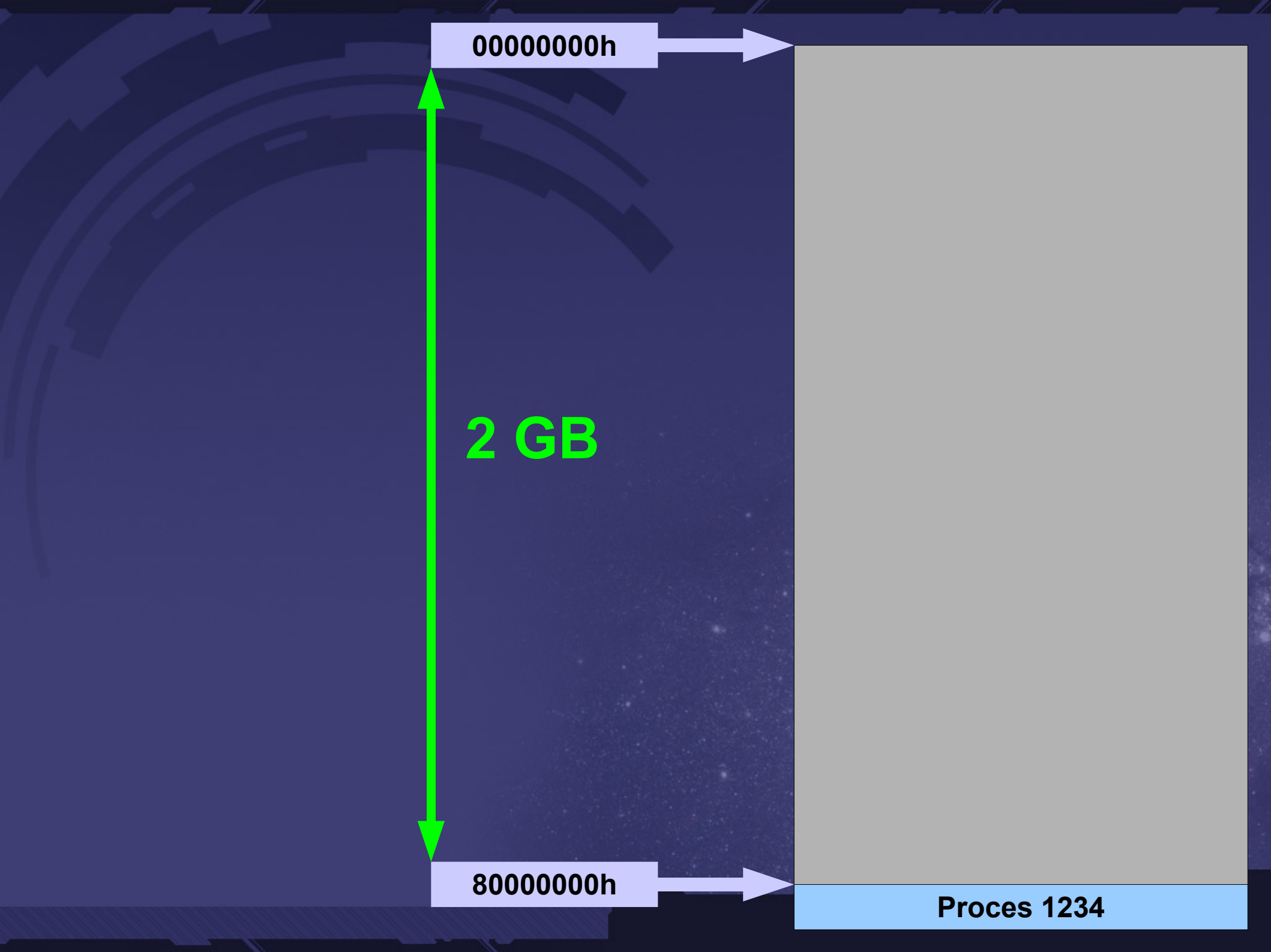

00000000h
2 GB
80000000h
KERNEL
FFFFFFFFh
Proces 1234


00000000h
3 GB
C0000000h
--- 4GT ---
IMAGE_FILE_LARGE_ADDRESS_AWARE
/3G (boot.ini) (2003 i niżej)
BCDEdit /set increaseuserva (vista i wyżej)
FFFFFFFFh
KERNEL
Proces 1234



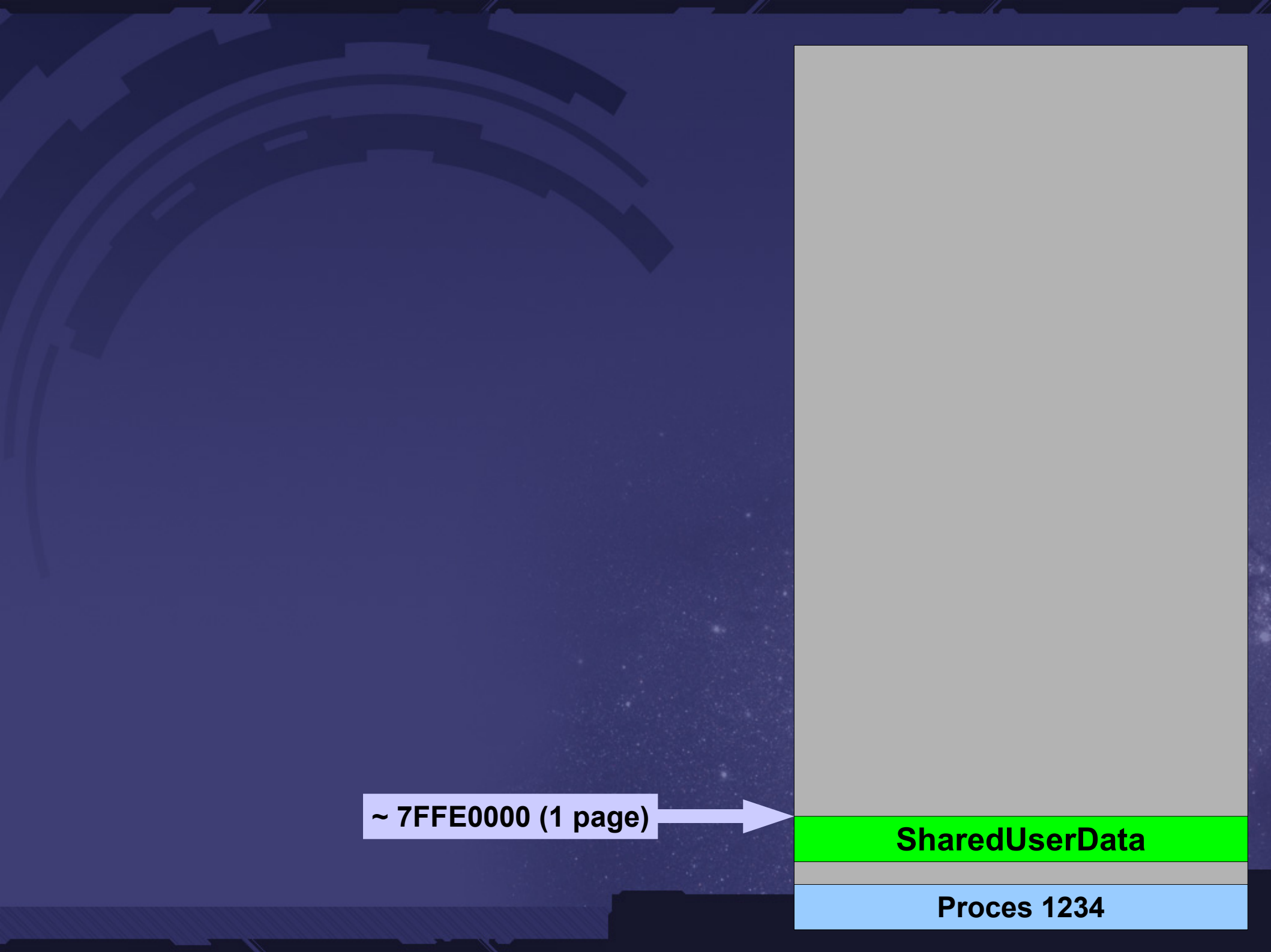
Więcej niż 2GB?

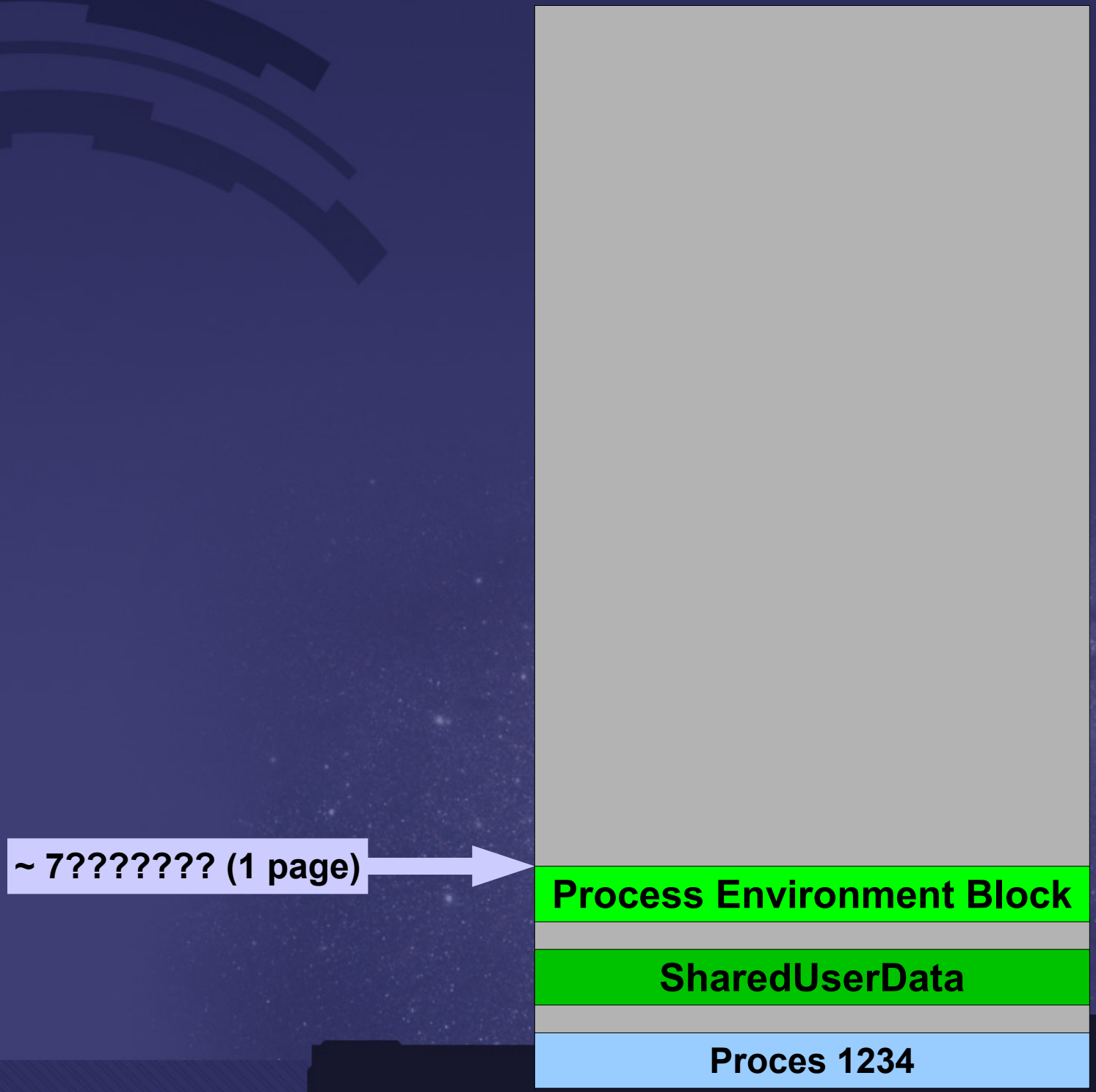
CreateFileMapping
Address Windowing Extension

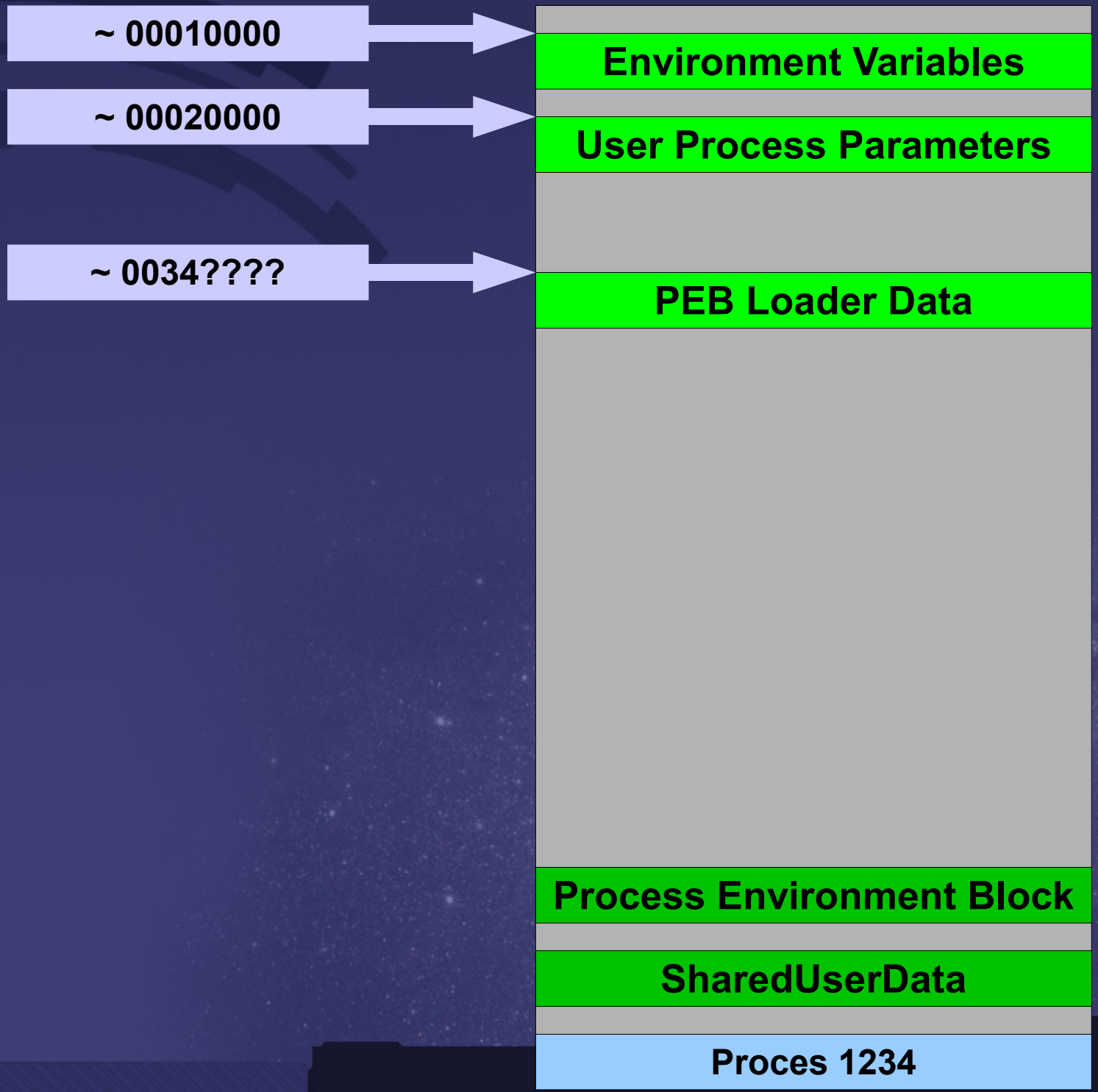

00000000h
2 GB
80000000h
Proces 1234

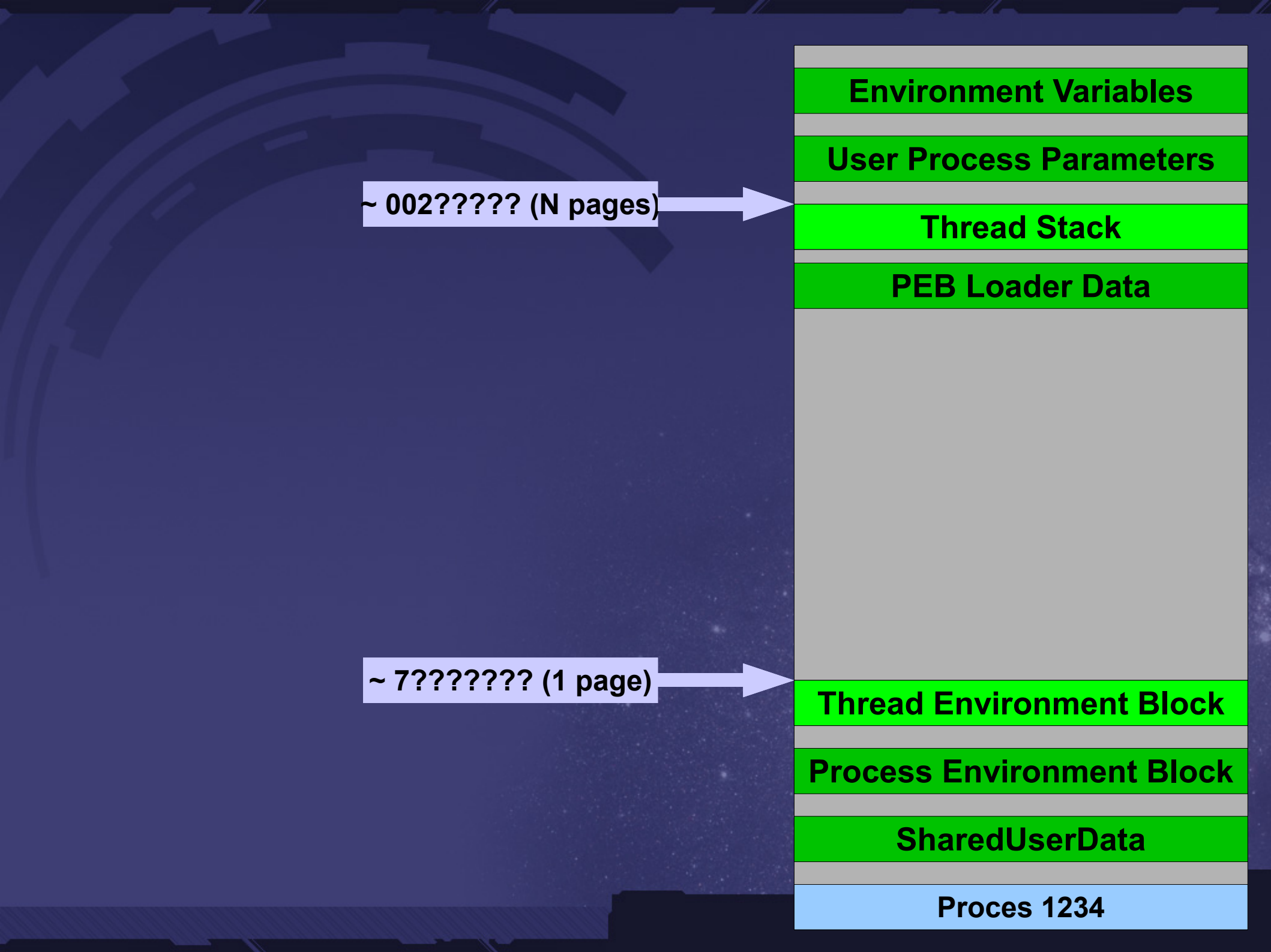
PROCESS VIRTUAL SPACE

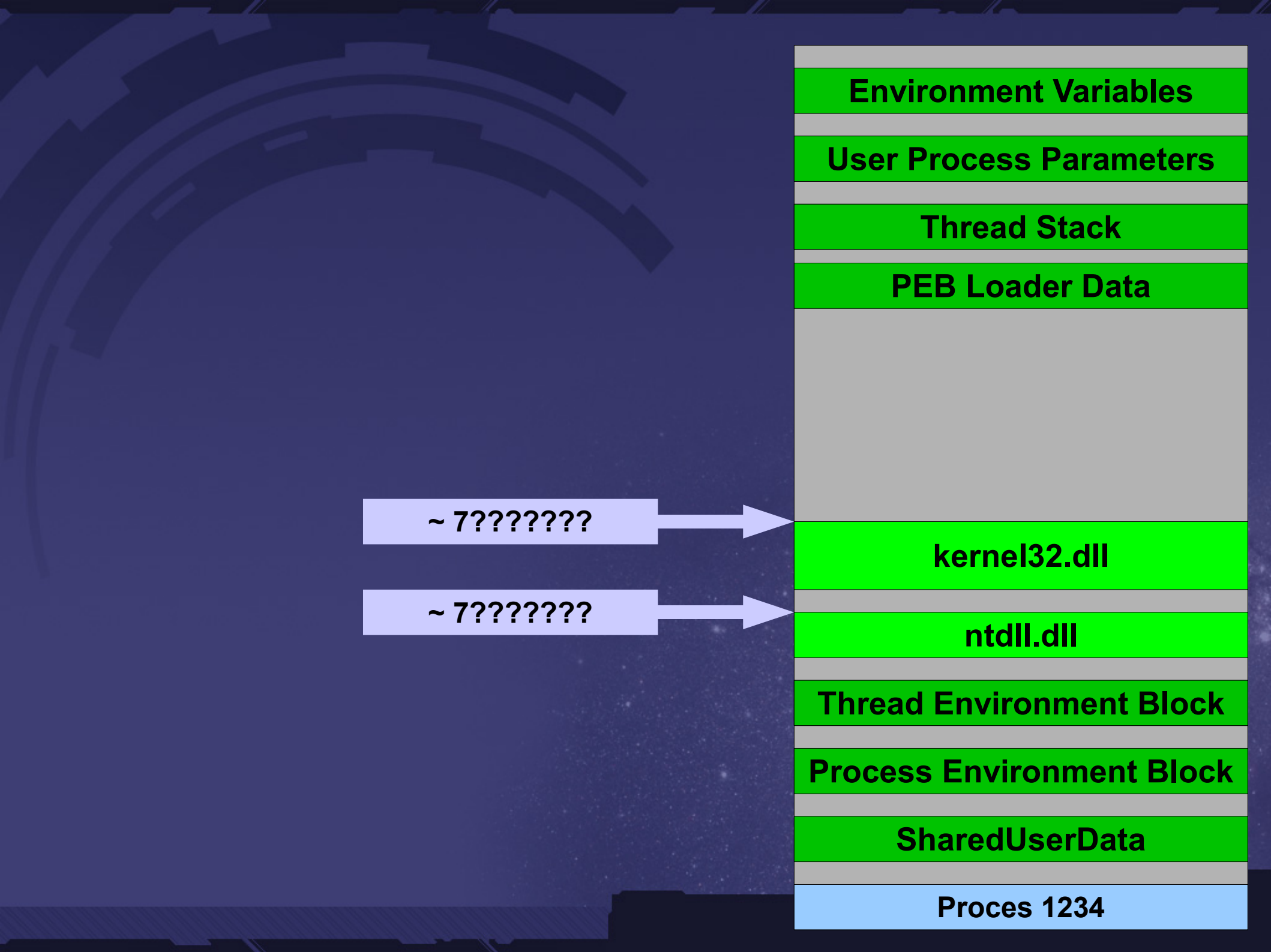
Proces 1234

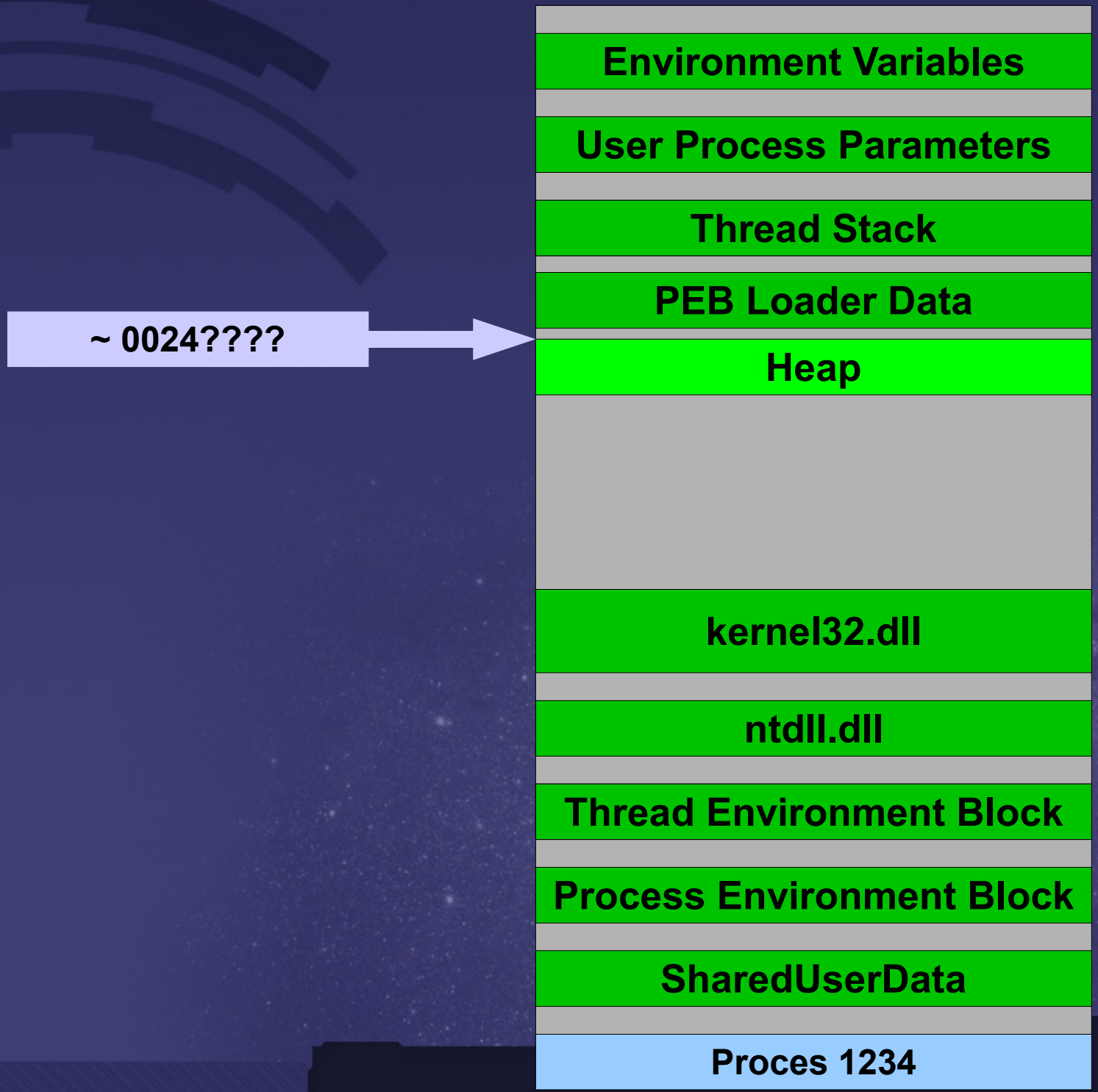

~ 7FFE0000 (1 page)
SharedUserData
Proces 1234


~ 7??????? (1 page)
Process Environment Block
SharedUserData
Proces 1234


~ 00010000
~ 00020000
~ 0034????
Environment Variables
User Process Parameters
PEB Loader Data
Process Environment Block
SharedUserData
Proces 1234


Environment Variables
User Process Parameters
~ 002????? (N pages)
Thread Stack
PEB Loader Data
~ 7??????? (1 page)
Thread Environment Block
Process Environment Block
SharedUserData
Proces 1234


Environment Variables
User Process Parameters
Thread Stack
PEB Loader Data
~ 7???????
kernel32.dll
~ 7???????
ntdll.dll
Thread Environment Block
Process Environment Block
SharedUserData
Proces 1234


~ 0024????
Environment Variables
User Process Parameters
Thread Stack
PEB Loader Data
Heap
kernel32.dll
ntdll.dll
Thread Environment Block
Process Environment Block
SharedUserData
Proces 1234


MZ header
DOS stub
PE → Signature
PE → File Header
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PE → Section Header [.text]
PE → Section Header [.data]
PE → Section Header [.rsrc]
Section [.text]
Import Table
Section [.data]
Section [.rsrc]
a.exe
Environment Variables
User Process Parameters
Thread Stack
PEB Loader Data
Heap
kernel32.dll
ntdll.dll
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Process Environment Block
SharedUserData
Proces 1234

VA – (Linear) Virtual Address

np. PE.OptionalHeader.ImageBase 0x00400000 lub 0x01000000

VA – (Linear) Virtual Address
np. PE.OptionalHeader.ImageBase
0x00400000 lub 0x01000000

RVA – Relative Virtual Address
np. PE.SectionHeader[.text].VirtualAddress

RVA → VA: VA(RVA) = ImageBase + RVA
VA → RVA: RVA(VA) = VA – ImageBase

To jest ImageBase modułu do którego dane RVA się odnosi!

RAW lub Offset – File Offset

np.

PE.SectionHeader[.text].PointerToRawData

RVA → RAW:

1. Znajdź sekcję w której RVA się zawiera:

RVA >= Sec.VirtualAddress &&

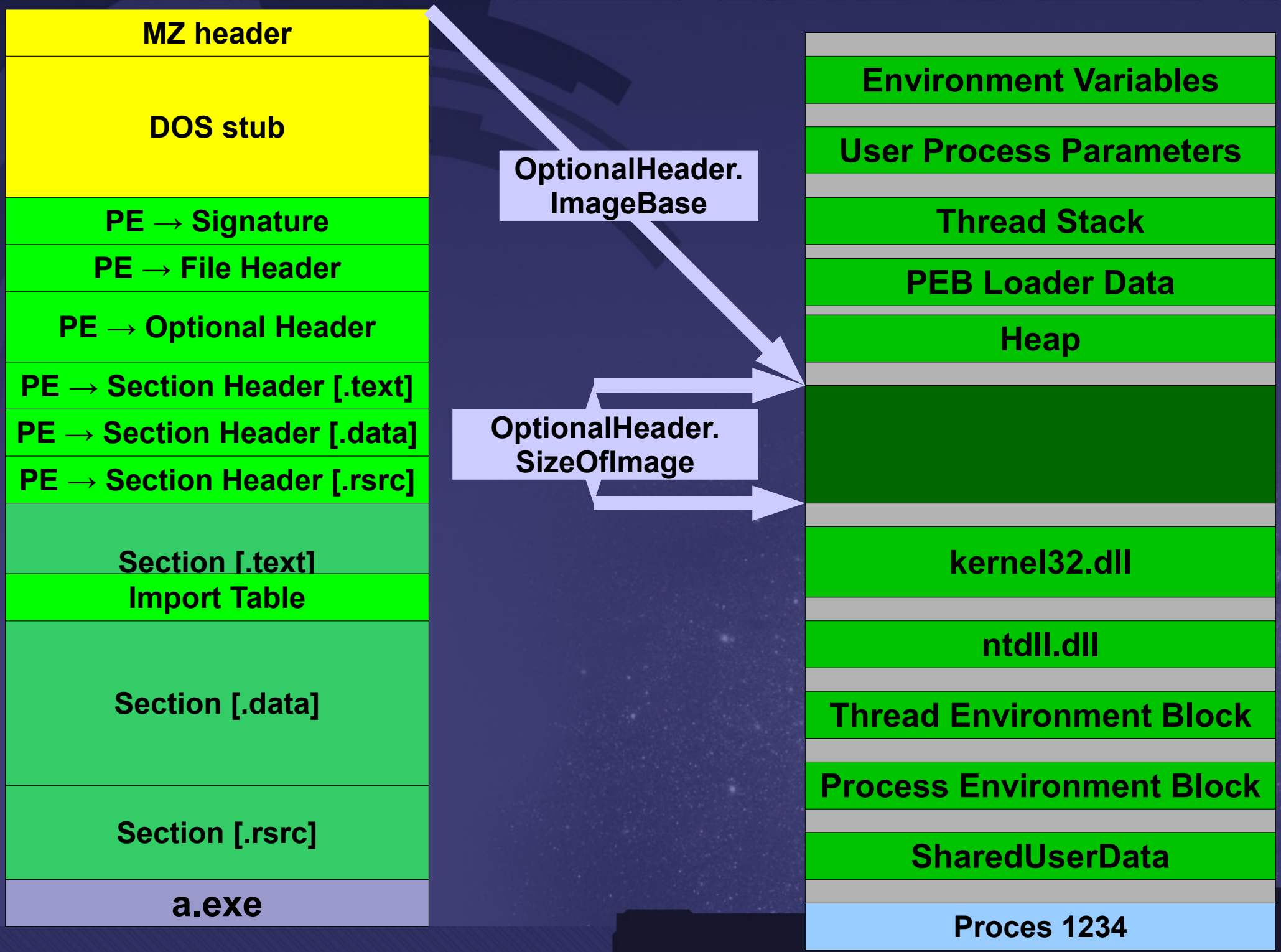
RVA < Sec.VirtualAddress +

Sec.Misc.VirtualSize

2. Oblicz:

RAW(RVA) = RVA – Sec.VirtualAddress +

Sec.PointerToRawData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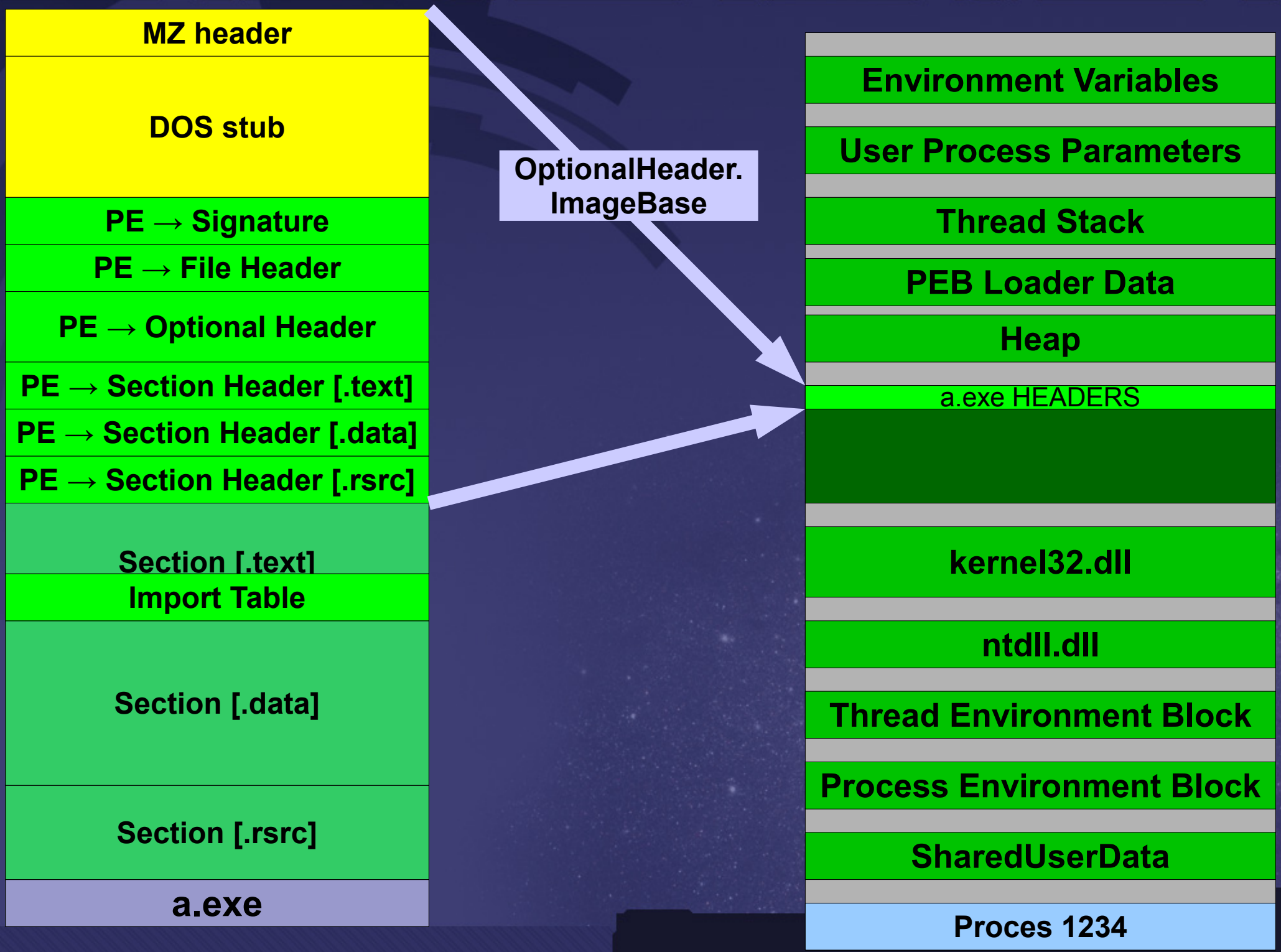
PE → Optional Header
PE → Section Header [.text]
PE → Section Header [.data]
PE → Section Header [.rsrc]
Section [.text]
Import Table
Section [.data]
Section [.rsrc]
a.exe
OptionalHeader.
ImageBase
OptionalHeader.
SizeOfImage
Environment Variables
User Process Parameters
Thread Stack
PEB Loader Data
Heap
kernel32.dll
ntdll.dll
Thread Environment Block
Process Environment Block
SharedUserData
Proces 1234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Section [.data]
Section [.rsrc]
a.exe
OptionalHeader.
ImageBase
Environment Variables
User Process Parameters
Thread Stack
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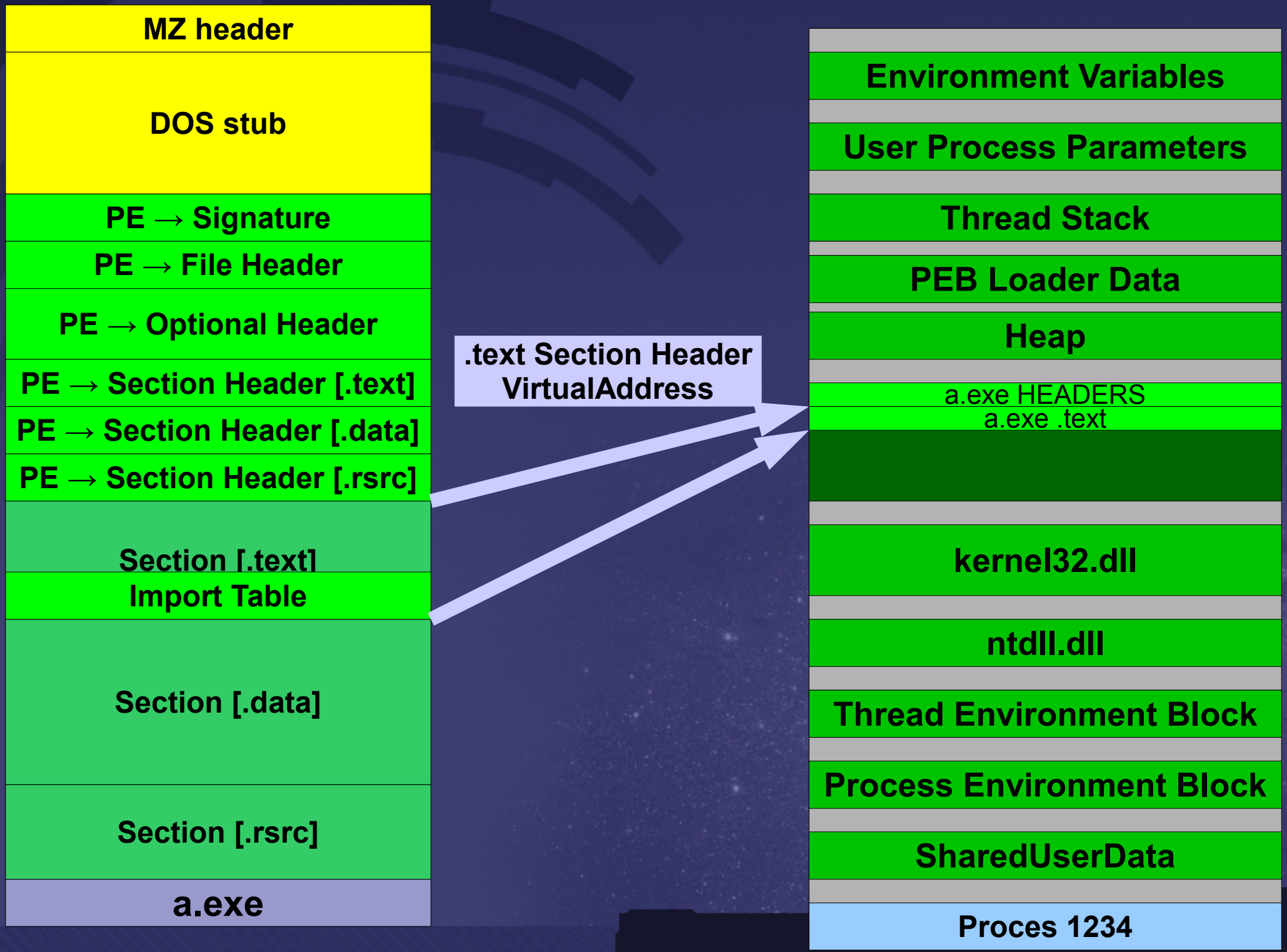
Heap
a.exe HEADERS
kernel32.dll
ntdll.dll
Thread Environment Block
Process Environment Block
SharedUserData
Proces 1234

IMAGE_SECTION_HEADER

RAW	RVA
PointerToRawData SizeOfRawData	VirtualAddress Misc.VirtualSize
Align to:	**Align to:**
FileAlignment np. 200h	SectionAlignment np. 1000h

SizeOfRawData ??? Misc.VirtualSize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Section [.text]
Import Table
Section [.data]
Section [.rsrc]
a.exe
.text Section Header
VirtualAddress
Environment Variables
User Process Parameters
Thread Stack
PEB Loader Data
Heap
a.exe HEADERS
a.exe .text
kernel32.dll
ntdll.dll
Thread Environment Block
Process Environment Block
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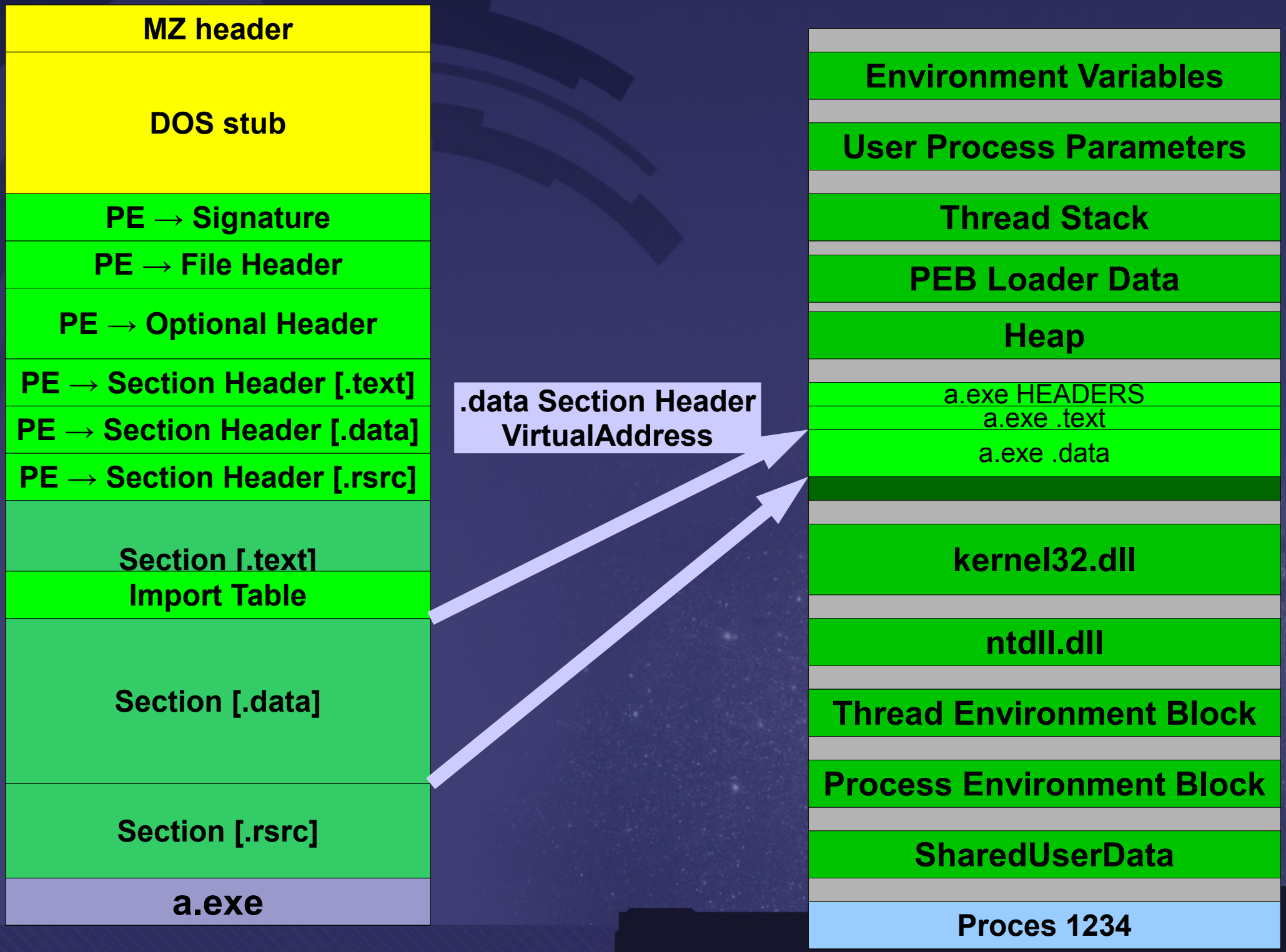
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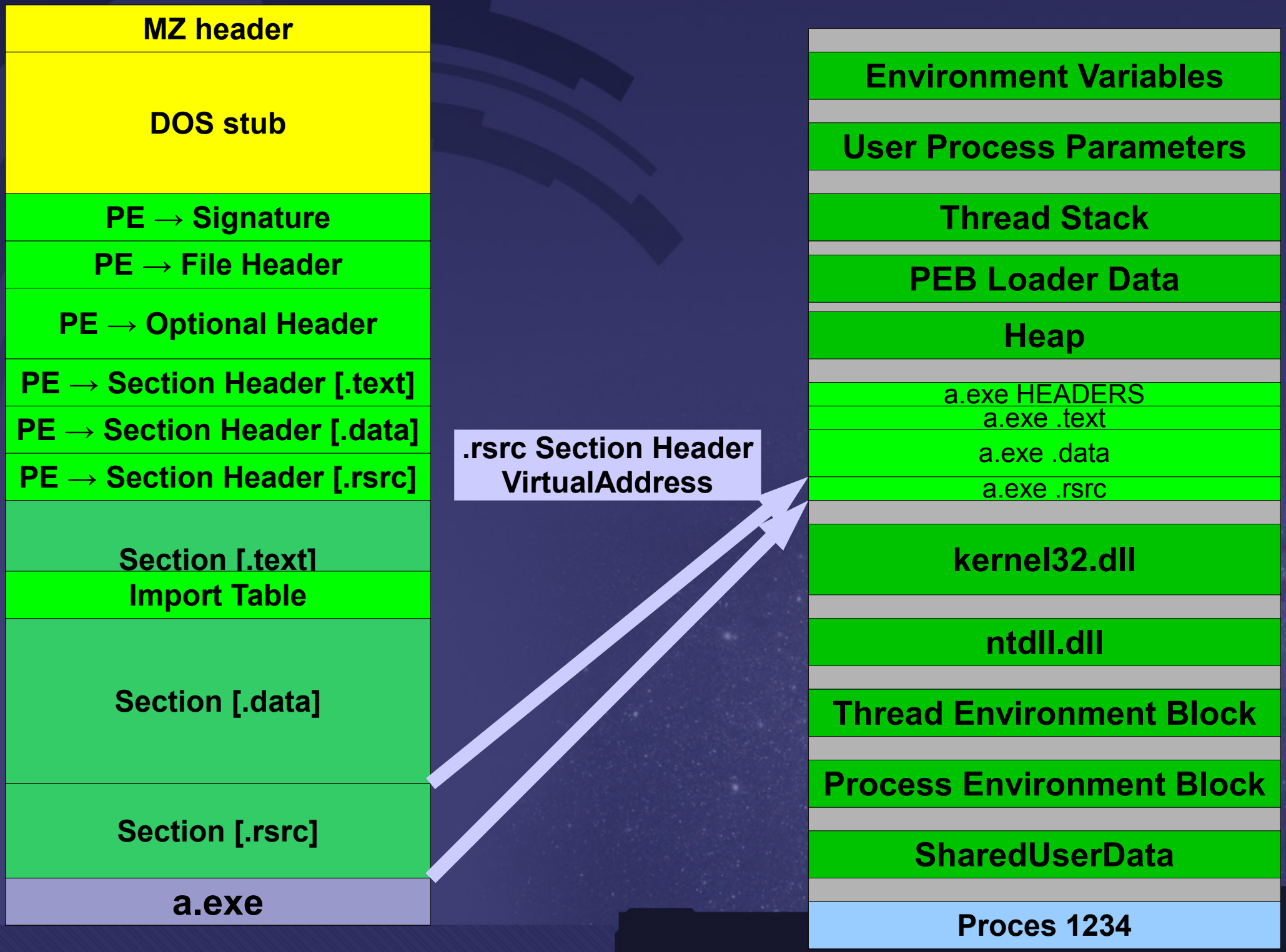
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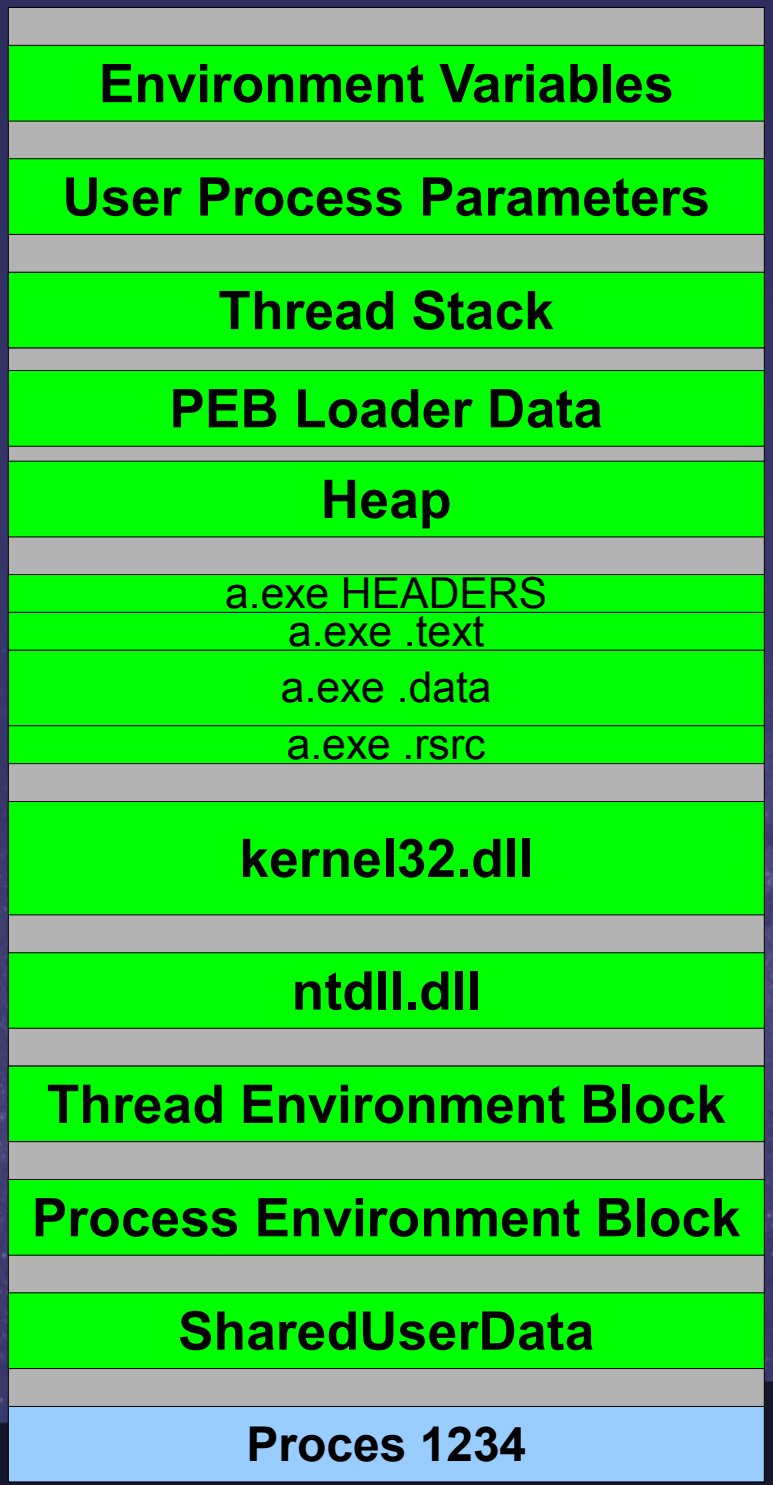
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ntdll.dll
Thread Environment Block
Process Environment Block
SharedUserData
Proces 1234

Dziękuje za uwagę :)

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