|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **start** | **end** | **size** | **type** | **description** |
| **Low Memory (the first MiB)** | | | | |
| 0x00000000 | 0x000003FF | 1 KiB | RAM - partially unusable (see above) | Real Mode IVT (Interrupt Vector Table) |
| 0x00000400 | 0x000004FF | 256 bytes | RAM - partially unusable (see above) | BDA (BIOS data area) |
| 0x00000500 | 0x00007BFF | almost 30 KiB | RAM (guaranteed free for use) | Conventional memory |
| 0x00007C00 (typical location) | 0x00007DFF | 512 bytes | RAM - partially unusable (see above) | Your OS BootSector |
| 0x00007E00 | 0x0007FFFF | 480.5 KiB | RAM (guaranteed free for use) | Conventional memory |
| 0x00080000 | 0x0009FBFF | approximately 120 KiB, depending on EBDA size | RAM (free for use, **if it exists**) | Conventional memory |
| 0x0009FC00 (typical location) | 0x0009FFFF | 1 KiB | RAM (unusable) | EBDA (Extended BIOS Data Area) |
| 0x000A0000 | 0x000FFFFF | 384 KiB | various (unusable) | Video memory, ROM Area |

Low Memory < MiB

# BIOS Data Area (BDA)

|  |  |
| --- | --- |
| **address (size)** | **description** |
| 0x0400 (4 words) | IO ports for COM1-COM4 serial (each address is 1 word, zero if none) |
| 0x0408 (3 words) | IO ports for LPT1-LPT3 parallel (each address is 1 word, zero if none) |
| 0x040E (word) | EBDA base address >> 4 (**usually!**) |
| 0x0410 (word) | packed bit flags for detected hardware |
| 0x0417 (word) | keyboard state flags |
| 0x041E (32 bytes) | keyboard buffer |
| 0x0449 (byte) | Display Mode |
| 0x044A (word) | number of columns in text mode |
| 0x0463 (2 bytes, taken as a word) | base IO port for video |
| 0x046C (word) | # of IRQ0 timer ticks since boot |
| 0x0475 (byte) | # of hard disk drives detected |
| 0x0480 (word) | keyboard buffer start |
| 0x0482 (word) | keyboard buffer end |
| 0x0497 (byte) | last keyboard LED/Shift key state |

# Extended BIOS Data Area (EBDA)

**ROM Area**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **start** | **end** | **size** | **region/exception** | **description** |
| **Standard usage of the ROM Area** | | | | |
| 0x000A0000 | 0x000BFFFF | 128 KiB | video RAM | VGA display memory |
| 0x000C0000 | 0x000C7FFF | 32 KiB (typically) | ROM | Video BIOS |
| 0x000C8000 | 0x000EFFFF | 160 KiB (typically) | ROMs and unusable space | Mapped hardware & Misc. |
| 0x000F0000 | 0x000FFFFF | 64 KiB | ROM | Motherboard BIOS |

Upper Memory > MiB

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **start** | **end** | **size** | **region/exception** | **description** |
| **High Memory** | | | | |
| 0x00100000 | 0x00EFFFFF | 0x00E00000 (14 MiB) | RAM -- free for use (if it exists) | Extended memory 1, 2 |
| 0x00F00000 | 0x00FFFFFF | 0x00100000 (1 MiB) | Possible memory mapped hardware | ISA Memory Hole 15-16MB 3 |
| 0x01000000 | ???????? | ???????? (whatever exists) | RAM -- free for use | More Extended memory 1 |
| 0xC0000000 (sometimes, depends on motherboard and devices) | 0xFFFFFFFF | 0x40000000 (1 GiB) | various (typically reserved for memory mapped devices) | Memory mapped PCI devices, PnP NVRAM?, IO APIC/s, local APIC/s, BIOS, ... |
| 0x0000000100000000 (possible memory above 4 GiB) | ???????????????? | ???????????????? (whatever exists) | RAM -- free for use (PAE/64bit) | More Extended memory 1 |
| ???????????????? | ???????????????? | ???????????????? | Possible memory mapped hardware | Potentially usable for memory mapped PCI devices in modern hardware (but typically not, due to backward compatibility) |