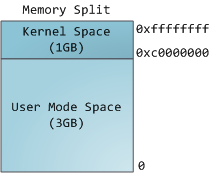
Atom OS Hydrogen

**Memory Layout:**



Kernel will boot with paged at virtual offset 0xC0000000-0xFFFFFFFF i.e.

Offset 0x00000000 – 0x40000000 is mapped to virtual address 0xC0000000-0xFFFFFFFF. In reality Kernel will be aligned to 0x100000.

**Process Stack Offset:** (0xBF000000 – rand () % 0x800000)

Generalization: The stack of any program is limit to 8MB and there is always a margin of 8MB (at least) between Kernel Space and Stack of program.

**Memory Mapping or Library Mapping Region:** 0x40000000

Generalization: Memory Mapping extends till (Stack Limit – rand () % 0x800000) It will contain all the referenced library mapping or I/O Mapping etc. In fact everything which is greater than 128KB.

**Program Heap:** No Definite Offset; Program Code End + rand () % 0x800000.

**Program Code**: 0x8000000 (128 MB).

**Frame Allocation:** It works on simple basic principle, each demand will be fulfilled by nearest Page aligned size. I.e. Multiple of 4KB chunk of memory. And when the task is finished the Frame is marked as free so other process may use it.

**I/O Cache:** The OS will always utilize all memory that is available, mean no frame is marked as free (literally) Whenever a Frame is freed and that frame contains any I/O operation resulted data than it will better marked to be Cache. If all Frame got allocated than I/O Cache which are less probability of accessibility will be freed.

**Memory Usage:** The Real Memory Usage by System will be as follows

*Here Page Size is 4KB, Total Memory is RAM Capacity.*

**Heap**: “*Best-Fit*” This will be the Main Algorithm of Heap *malloc* and *dealloc*.  
**Multitasking**: “Round-Robin” Primitive Algorithm + Interrupt And Resource Based Time slicing.

**Faults/Exception Handling:** Kernel Monopoly.

|  |  |  |
| --- | --- | --- |
| Name | Interrupt Vector | Response |
| Divide By Zero Error | 0x00 | BSOD | TPGE |
| Debug | 0x01 |  |
| Non-maskable Interrupt | 0x02 |  |
| Breakpoint | 0x03 |  |
| Overflow | 0x04 |  |
| Bound Range Exceeded | 0x05 |  |
| Invalid Opcode | 0x06 | BSOD | HAC |
| Device Not Available | 0x07 |  |
| Double Fault | 0x08 | BSOD |
| - | 0x09 |  |
| Invalid TSS | 0x0A | TPGE |
| Segment Not Present | 0x0B |  |
| Stack-Segment Fault | 0x0C | BSOD | TPGE |
| General Protection Fault | 0x0D | BSOD | HAC |
| Page Fault | 0x0E | HAC |
| - | 0x0F |  |
| x87 Floating-point Exception | 0x10 | BSOD | HAC |
| Alignment Check | 0x11 |  |
| Machine Check | 0x12 |  |
| SIMD Floating-point Exception | 0x13 |  |
| Virtualization Exception | 0x14 |  |
| - | 0x15 – 0x1D |  |
| Security Exception | 0x1E |  |
| Reserved | 0x1F |  |

**TPGE:** Terminate Process Giving Exception or Core Dump.  
**HAC:** Handled and Continued.

**Graphics:**

**Supported Chips**: VBE 2.0 ~~Intel HD~~, VMware SVGA II, Bochs/QEMU/VM – VBE.

**Resolution:** According to Driver.

**Driver Loading**: External.

**Keyboard/PS2 Mouse:**  
 **Driver**: Internal for PS2 Mouse and Keyboard.  
 **Additional:** Default Key map of Keyboard is loaded on Boot, And User Demanded Key map will be loaded after logon.

**File System:**

**Atomix File System:** Within Kernel.

**FAT-32:** External.

**Libraries:**

**Inside Kernel:** Crypto-MD5/SHA512 (+Salted), Memory Block Manager, And other Kernel Requirement Library.

**External:** All User Application Required Library. Including corelib and Functions.

**Sound:  
 Driver:** External.

**Chips/Models:** SB16  
 **Internal Driver:** Beep Manager (PC Speaker).

**Power Manager:**  
 **Driver:** ACPI (Internal), Extended Drivers + Batter manager (External).