The VRE (Volt Research Emulator) is a PC emulator, primarily focusing on emulating IBM PC-compatible computers made between 1981 and the advent of x86-64 in 2003. It intends to go for a high level of accuracy between game-oriented emulators like PCem and 86Box and extremely high accuracy emulators like reenigne’s XTCE and MartyPC; it should be able to emulate both a range of CPUs and any reasonable peripheral device that one may wish to plug into a PC, either via an external port or an internal (ISA, MCA, EISA, VLB, PCI, AGP, PCI-X, PCIe) expansion slot. It will also bring to the table various advanced functionality that PC emulators cannot yet achieve such as truly hardware-accelerated rendering, net play and scripting. It is written in C++ using the Squirrel scripting language.

1. Priority Definitions

Tasks and features delineated in this document will be grouped into priorities based on a subjective assessment of their overall importance to the success of the Volt project. The priorities are as follows:

**1:** Implementation of this feature is absolutely critical for the success of the Volt project. If it is not implemented, the Volt project is much less likely to succeed. This feature must not be likely to be encumbered by theoretically insurmountable technical challenges.

**2:** Implementation of this feature is important for the success of the Volt project. If it is not implemented, the Volt project is somewhat less likely to succeed. The successful development of this feature may be encumbered by theoretically insurmountable technical challenges

**3:** Implementation of this feature would be a “nice to have”. It would improve the user experience but would not affect the overall success likelihood of the project if it was not satisfactorily completed.

**4:** Implementation of this feature would only improve the experience of the user in a minor way and is more polish than anything else. Core system features cannot be priority 4, only module features.

**5:** This feature may be implemented in a 1.1, 1.5,or 2.0 release but would not be planned for a 1.0 release.

All priorities are for version 1.0, not 0.1 or any other beta or alpha release that may be released.

1. Definition of Success
2. Core Systems
3. Module Systems

A “module” does not imply a plugin system in the context of Volt. It is just a feature that is not required for the core design of the product. An example of a module is a CPU implementation.

1. User Experience
2. Supported Emulation Devices
   1. **CPUs**

|  |  |  |  |
| --- | --- | --- | --- |
| **CPU Model** | **Example Feature** | **Family** | **Priority** |
| 8088 | 8-bit bus, prefetched, unprotected | 808x | **1** |
| 8086 |  | 808x | **2** |
| NEC V20 | 186 clone; Faster than 8088 | 8018x (NEC) | **4** |
| NEC V30 | 186 clone ; faster than 8086 | 8018x (NEC) | **4** |
| 80186 | Much more efficient, embedded non-PC compatible peripherals | 8018x | **4** |
| 80188 | 80186 w/8-bit bus | 8018x | **4** |
| 80286 | Protected mode, 16 MB | 8028x | **1** |
| 80386 | 32bit, 4 GB address space | 8038x | **1** |
| AMD Am386 | First AMD design | 8038x | **3** |
| 80486 |  | 8048x | **1** |
| AMD Am486 |  | 8048x | **3** |
| Pentium (P5/P54C) |  | Pentium | **1** |
| Pentium Pro |  | P6 | **1** |
| Pentium MMX |  | Pentium | **1** |
| AMD 5x86 |  | “Super 486” | **3** |
| AMD K5 |  | Pentium | **2** |
| AMD K6/Athlon |  | K6 | **2** |
| AMD K6-2 |  | K6 | **2** |
| AMD K6-III |  | K6 | **2** |
| Pentium II |  | K6 | **2** |
| Pentium III / Katmai | SSE | P6+SSE | **3/5?** |
| Pentium 4 |  | NetBurst | **5** |
| AMD K7 “Thunderbird” |  | K7 | **5** |
| Ayy-MD Duron SpeetFire™ | Funny | K7 | **5** |
| Cyrix Cx486-SLC/DLC |  | “Super 386” | **5** |
| Cx486S/DX/DX2/DX4 |  | “Super 486” | **5** |
| Cyrix Cx586 |  | Pentium | **5** |
| Cyrix Cx686 |  | Pentium | **5** |
| Cyrix MII |  | Pentium+ | **5** |
| Cyrix M3 (Joshua) |  | M3 | **5** |
| Cyrix M3 (Samuel) |  | M3 | **5** |

* 1. **Floating Point Units (FPU)**

|  |  |  |  |
| --- | --- | --- | --- |
| **CPU Model** | **Example Feature** | **Family** | **Priority** |
| 8087 |  |  | **1** |
| 80287 |  |  | **1** |
| 80387 |  |  | **1** |
| 80487 |  |  | **1** |
| Cyrix FasMath 82S87/83S87/83D87 |  |  | **4** |
| C&T Supermath J38700 |  |  | **5** |

* 1. **System Buses**

|  |  |  |
| --- | --- | --- |
| **Bus** | **Era** | **Priority** |
| ISA | 8086-late 1990s | **1** |
| MCA | PS/2 | **3** |
| EISA | Late 1980s/early 1990s | **3** |
| VLB | 486, early P5 | **1** |
| PCI | Early 1990s-early 2010s | **1** |
| AGP | 1997-2004 | **1** |
| PCI-X | 2000s | **5** |
| PCIe | 2005-present | **5** |

* 1. **Pre-Chipset Support Chips**

|  |  |  |
| --- | --- | --- |
| **Chip** | **Era** | **Priority** |
| 8253 PIC |  |  |
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* 1. **Chipsets**

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| **Chipset** |  |  |  |
| SCAT (Single-Chip AT) |  |  |  |
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* 1. **Video Devices (GPU)**

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| --- | --- | --- | --- | --- |
| **Video Device** | **Year** | **Bus** | **Era** | **Priority** |
| MDA |  |  |  |  |
| CGA |  |  |  |  |
| Plantronics Colorplus |  |  |  |  |
| Tandy/PCjr |  |  |  |  |
| Hercules |  |  |  |  |
| Hercules Plus |  |  |  |  |
| Hercules InColor |  |  |  |  |
| EGA |  |  |  |  |
| PGC |  |  |  |  |
| Vermont Microsystems IM-1024 |  |  |  |  |
| IBM VGA |  |  |  |  |
| Tseng Labs ET4000/W32p |  |  |  |  |
| Cirrus Logic 543x/4x/8x “Alpine” |  |  |  |  |
| Cirrus Logic 546x “Laguna” incl. Laguna3D |  |  |  |  |
| ATI mach8/32 |  |  |  |  |
| ATI mach64 |  |  |  |  |
| ATI mach64VT |  |  |  |  |
| ATI mach64GT (3D Rage) |  |  |  |  |
| ATI mach64GT-B (3D Rage II) |  |  |  |  |
| 3D Rage Pro |  |  |  |  |
| Rage 128 |  |  |  |  |
| Radeon 7000 (R100) |  |  |  |  |
| S3 Trio64 |  |  |  |  |
| S3 ViRGE 325 |  |  |  |  |
| S3 ViRGE DX/GX/GX2… |  |  |  |  |
| Weitek Power 9x00 |  |  |  |  |
| TIGA |  |  |  |  |
| IrisVision |  |  |  |  |
| Matrox Impression |  |  |  |  |
| Matrox Millennium/Mystique  / Millennium-2 |  |  |  |  |
| Matrox G100 |  |  |  |  |
| Matrox G200 |  |  |  |  |
| Matrox G400/450/550 |  |  |  |  |
| Matrox Parhelia |  |  |  |  |
| Chromatic Mpact |  |  |  |  |
| Nvidia NV1 |  |  |  |  |
| Nvidia RIVA 128 (NV3) |  |  |  |  |
| Nvidia RIVA 128 ZX (NV3T) |  |  |  |  |
| Nvidia RIVA TNT (NV4) |  |  |  |  |
| Nvidia RIVA TNT2 (NV5) |  |  |  |  |
| Nvidia GeForce 256 (NV10) |  |  |  |  |
| Trident TVGA8800/8900/9000 |  |  |  |  |
| Trident TGUI series |  |  |  |  |
| Trident 3DImage 9750 |  |  |  |  |
| Trident 3DImage 9850 |  |  |  |  |
| Trident Blade 3D |  |  |  |  |
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* 1. **Sound Devices**
  2. **Floppy Drive Controllers**
  3. **Hard Drive Controllers**
  4. **Cache**
  5. **Monitors**
  6. **Networking**
  7. **Misc**
  8. **PC Industry Specifications Required**
  9. **Pre-Configured Machines**

1. Marketing & Distribution
2. Testing & Debugging
3. Release Plan