

VGA System Services

How to use Linux's 'vm86()' system-call to access the video ROM-BIOS functions

The SVGA firmware

- VESA-compliant graphics systems provide built-in service-functions (in adapter ROM)
- Services normally execute during 'startup' before processor enters 'protected mode'
- But cpu can still 'emulate' 8086 behavior after system has entered protected mode (although kernel privileges are required)
- Linux provides the system-call: 'vm86()'

8086

- At startup, the Pentium operates like 8086:
 - Physical memory is directly addressable
 - But memory addresses are only 20-bits
- CPU builds address from a pair of values:
 - Segment-address (16-bits) in special register
 - Offset-address (16-bits) in register or memory
- Formula: $\text{address} = (\text{segment} \ll 4) + \text{offset}$
- Address-range: $2^{20} = 1,048,576$ bytes