

OS: A bit more Detail

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The market

- User desktops
 - Heavy majority Windows
 - Very heavy majority of rest is Mac OS X
- Servers
 - Windows and Linux both significant
 - Other non-Linux, non-Apple Unix non-trivial
- Netbooks
 - Windows, significant minority Linux

OS Kernel

- **Kernel:** the part of OS that runs in privileged mode and must be used by processes to effect outside world
- 1/3–2/3 of code in the kernel is device drivers, of which any one computer uses only a tiny fraction.
 - The modules that make e.g., your Logitech M-UV96 mouse work with your computer

Security implication

- Maybe we don't need to make whole computer OS error free
- If we could just make the non-device driver part of the kernel bug free, that might be enough
- So, how big is the kernel

Kernel sizes

- Windows Vista SP 1: 10 million lines of code (LoC) *not counting drivers*, plus 7 million LoC of drivers.
- Linux: total 7 million LoC July 2007, 12 million today, $\frac{1}{2}$ to $\frac{2}{3}$ of code drivers.

If a very good to excellent error rate is 1 bug per 1,000
LoC,