The Processor and Buses

# Buses

The system bus contains the **data**, **address**, and **control** buses.

* The data bus transfers both data and instructions
* The address bus transfers memory locations to main memory
* The control bus sends control signals between components

32 bits “wide” ==> 32 bits can be transferred at once – can transfer binary “words” of lengths up to 32.

A wider address bus allows more bits to be transferred at once, meaning more memory locations can be referenced.

*What would be the effect on the performance of a computer system of increasing the…*

* *…width of the data bus?*

A greater number of bits can be sent per cycle, allowing data to be processed in fewer cycles.

* *…width of the address bus?*

A wider range of memory locations is available, meaning more data can be written to and retrieved from main memory – this would allow for better multitasking on the system.

* *…clock speed?*

More cycles can occur per second, thus increasing the speed at which the computer operates.

## Control Bus Signals

* **Clock Signal:** system timing
* **Reset Signal:** initializes components
* **Memory Read:** states that the memory location is being *read from*
* **Memory Write:** states that the memory location is being *written to*
* **I/O:** Indicates when the CPU wishes to use an I/O controller