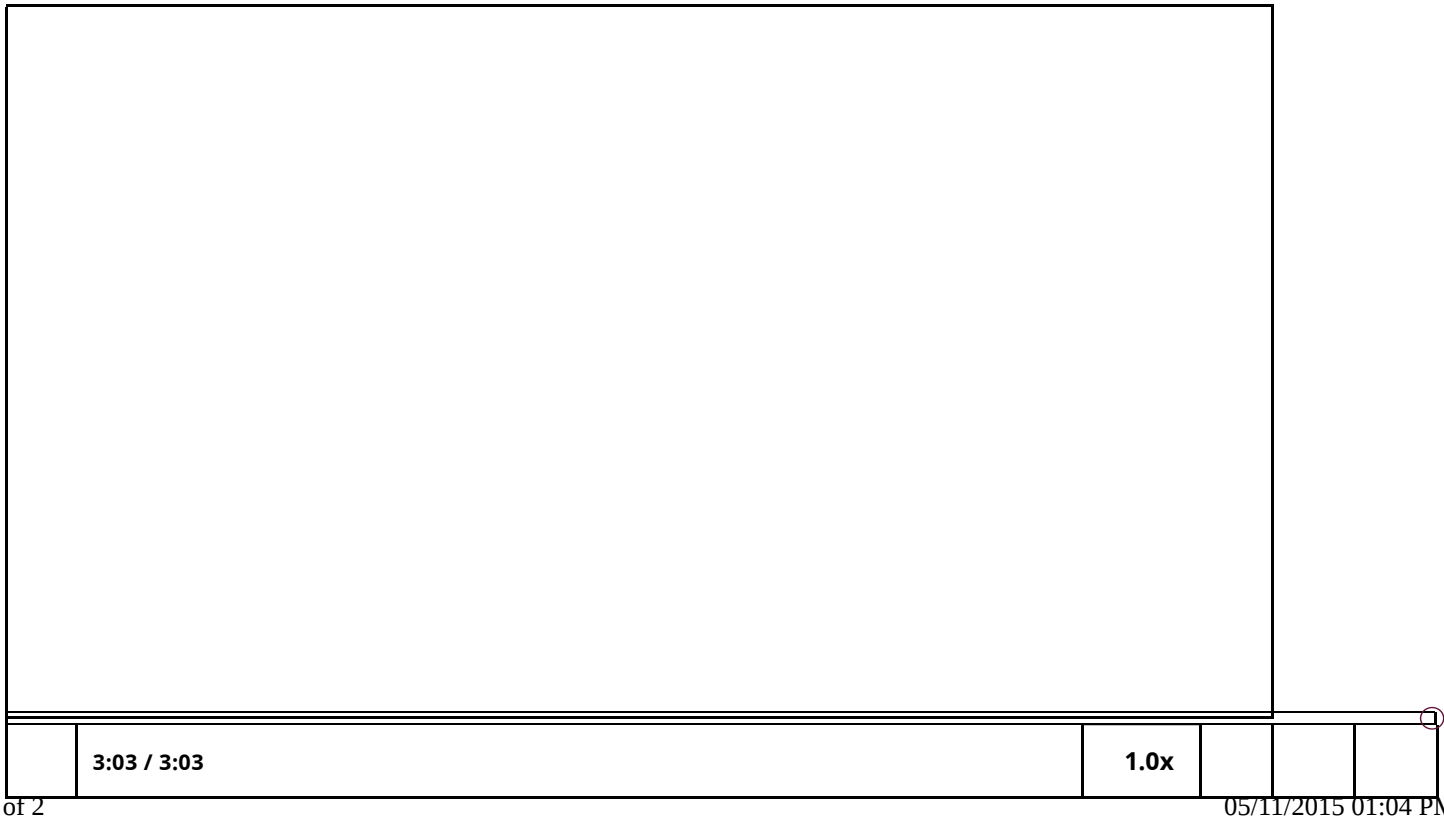
In this module, we will discuss how computers interact with the user. Supporting I/O requires additions to our computing model at both the hardware and the software levels. We need I/O hardware devices, like keyboards, touchscreens, monitors, and permanent storage. These devices provide input to the processor, and receive the processor's outputs. To connect the processor and memory to the I/O components, we need an I/O controller in hardware. The processor and controller communicate with a special set of registers, which are exposed to the software side by the ISA. In this unit we will learn about the I/O stack in the context of the LC-3, and ultimately we'll be able to write LC-3 assembly code that allows us to interact with I/O devices.

Learning Outcomes

At the end of this module you will be able to:

- Identify common I/O and storage devices.
- Describe the registers and connections used in the memory-mapped I/O architecture of the LC-3.
- Describe how data flows from an input device into the LC-3 processor or memory.
- Describe how, using memory-mapped I/O, the processor can write to an output device.
- Write LC-3 assembly code that performs I/O, using polling.

INTRODUCING I/O



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