Bash Shell Interface for I2C

On the kernel level, I2C communication is handled by the `i2c-dev` kernel driver. On the lowest level, the bus is seen as a file and using a file descriptor one can read from it or write to it. The shell interface is a set of compiled programs that wrap this functionality for specific uses at a higher level. The intended use is interactive debugging to see if something works or not. For programmatic use it's better to take a look at the C API for C/C++ and the smbus2 library for Python.

These programs are part of the `i2c-tools` package that usually comes preinstalled in most Linux distributions.

i2cdetect

Detects I2C chips. Use: `i2cdetect [options] i2cbus [first_addr last_addr]`. Special flags that don't require a given i2cbus are `-V` that prints the current version and `-l`.

- `i2cdetect -l` to list busses. To access each buss you have to used it's number (`i2c-{NUM}`) or the full string name.
- `-q` and `-r` options are to use quick write and receive byte commands for probing. They can corrupt certain IC chips.
- `-F` displays the list of functionalities available on the bus.

i2cdump

Examines registers on the I2C bus. Use: `i2cdump [options] i2cbus address [mode [bank [bankreg]]]`

- `i2cbus`: One of the buses represented by the number or string name from `i2cdetect -l`.
- `-r first-last`: Limit the range of registers being accessed. Incompatible with `s`.
- `address`: The address of the IC chip on the bus.
- `mode`: Chooses the mode to access the register as a single byte, a double byte word or a block. If not provided, defaults to single byte without PEC. Options are listed below:
  - `b`: Single byte (default).
  - `w`: Word.
  - `i`: I2C block.
  - `c`: Consecutive block. Useful for ICs with automatic increment, like EEPROMs.
  - `W`: Word, but the command will only be issued on even addresses. Also useful for EEPROMs.
  - `s`: SMBus block. Avoid it, it's deprecated.
  - `p`: Can be appended on the mode parameter (not on `i` and `W`) to enable Packet Error Checking (PEC).
- `bank`/`bankreg`: Used on Winbond and Asus chips. `bank` is an integer from 0 to 7, and `bankreg` an integer from 0x00 to 0xff with a default of 0x4e.

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