Linux Libraries

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Conventions

- Libraries that are loaded into an executable at run-time are called:
  - Dynamic Link Libraries (Windows)
  - Shared Libraries (Unix and Linux)
- Libraries that are bound at compile-time are called:
  - Static Libraries (both Linux and Windows)

Static Libraries

- Static libraries are created with the ar tool:
  - ar options archive object-file, …
  - ar r libdemo.a file1.o file2.o file3.o
- Naming convention:
  - lib<name>.a
- Some options:
  - r replace or insert
  - d delete
  - t show contents
  - v verbose

Static Libraries

- Create example:
  - g++ -c file1.cpp file2.cpp file3.cpp
  - ar r libdemo.a file1.o file2.o file3.o
  - rm file1.o file2.o file3.o
- Using library
  - g++ -c main.cpp
  - g++ -o main main.o libdemo.a
- Alternate use when library is in standard place like /usr/lib
  - g++ -o main main.o -ldemo

Shared Libraries

- Shared libraries are created with g++:
  - g++ -shared –o lib<name>.so file1.o …
- Naming convention:
  - lib<name>.so
- Object files must be position independent code:
  - g++ -c -fPIC -Wall file1.cpp …

Shared Library

- Creating shared library:
  - g++ -c -fPIC -Wall file1.cpp file2.cpp file3.cpp
  - g++ -shared –o libdemshare.so file1.o file2.o file3.o
- Using a shared library:
  - g++ -Wall –o main main.cpp libdemshare.so
  - LD_LIBRARY_PATH=. (lib in current directory)
  - ./main

Installing Libraries

- Standard library search path:
  - /usr/lib
- Set environment on startup
  - Put this definition in .profile
  - LD_LIBRARY_PATH=<your library path>