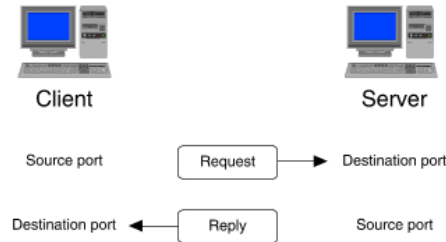

Network Programming

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Client - Server Model (UDP)



1. Create packet
2. Event-1 : Send data
(sendto())
3. Event-2 : Receive data
(recvfrom())
4. repeat

1. Start listening on a port
2. Event-1 : Incoming connection
(recvfrom())
3. Event-2 (sendto()) :
 - a. Receive data from client,
 - b. Process this data
 - c. Send this as response

Demo of the Provided Network Program

Compiling :

Basically need to “make” (import existing project with makefile)

On Linux:

- a. comment `#include <ddi.h>`
 - b. edit makefile. remove `-lSocket`
-

Running the Code

<https://www.youtube.com/watch?v=6cvWoOnXEZ8>

Code Explanation

Please read the Beej's Socket Programming tutorial to understand it better

<http://www.gta.ufrj.br/ensino/eel878/sockets/index.html>

Hint: Need to use `getpeername()` for your assignment

Provided code - Files

udp_client.c → connect to server

dg_cli.c → Gets input from command line and
sendto() server

udp_server.c → Starts a server

dg_echo.c → recvfrom() data from client and
responds back the same data

Introduction to Qt

What is Qt

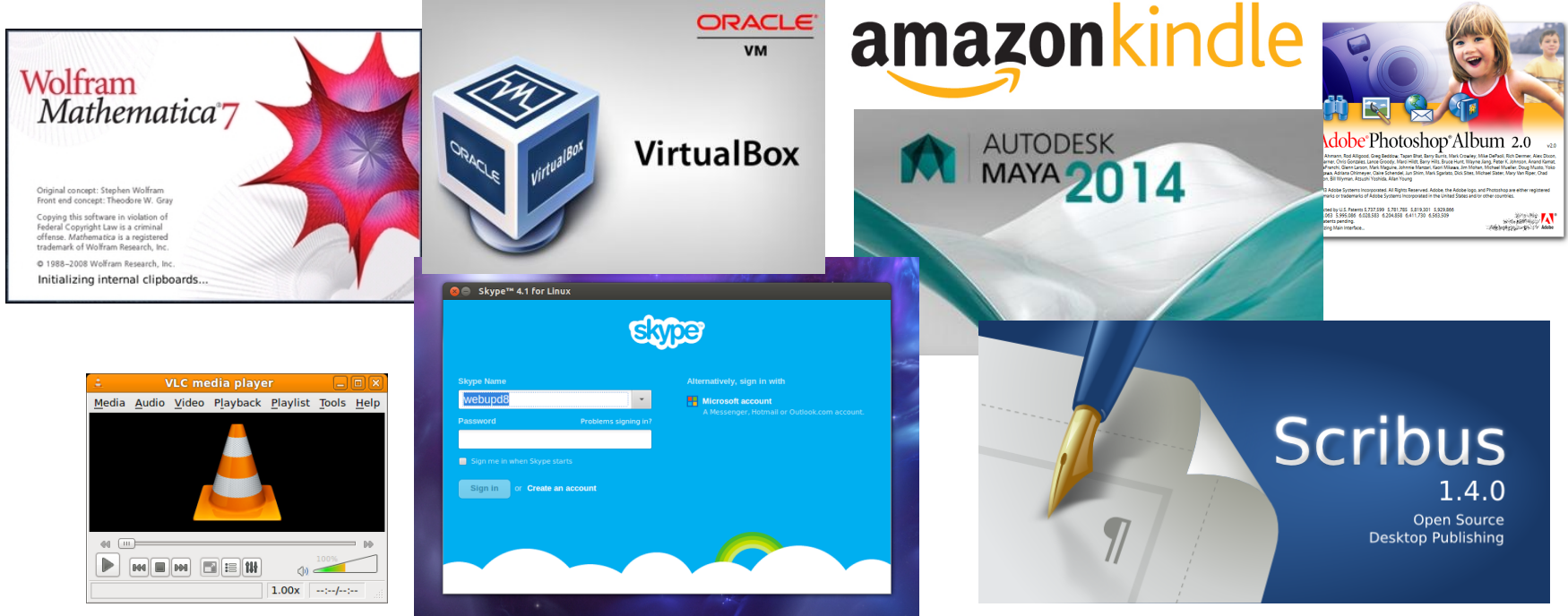
- C++ Library
 - Gives extra functions to C++
- Object Oriented
- Cross Platform
 - Windows, Linux, Mac, Android
- Developed by Nokia (now by Qt-project.org)

Official Site : <http://qt-project.org/>

What can I do with Qt ?

- Build GUIs (Graphical User Interfaces)
 - Network Programming
 - Handling Databases (like MySQL, Oracle etc)
 - Multi-threaded programming
 - Graphics for computer games (OpenGL)
-

Which Software use Qt Libraries ?



http://en.wikipedia.org/wiki/Category:Software_that_uses_Qt

Learning Qt

My Tutorial

- <http://kusemanohar.wordpress.com/2012/08/19/qt-beginners-tutorial/>

Books

The famous ones

- <http://catalog.ust.hk/catalog/archives/734729>
- <http://catalog.ust.hk/catalog/archives/645062>

Other Books

- <http://catalog.ust.hk/catalog/search/Qt>

Youtube

- <http://www.youtube.com/playlist?list=PL2D1942A4688E9D63>

Other useful guides

- http://qt-project.org/resources/getting_started
 - <http://qt-project.org/wiki/developer-guides>
-

My suggestion

1. Install Qt Creator on your PC/Mac/Linux
2. Understand today's toy project
3. Go through my tutorial.

<http://kusemanohar.wordpress.com/2012/08/19/qt-beginners-tutorial/>

If you still want to learn more follow a book from library

Installation

- I also have a section on Qt Installation in my tutorial
 - In case you are installing on windows make sure you have C/C++ compiler installed.
 - Either of Visual Studio or MinGW
 - Download Qt from : <http://qt-project.org/downloads>
-

Today's Toy Project



What the Toy Project should do?

A GUI

- An input field for your name

- Button (Say Hi)

- Pop-up

- Greeting on the application

Demonstration

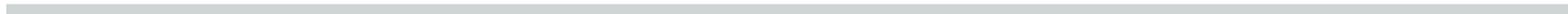
I have put this demonstration on youtube

<http://www.youtube.com/watch?v=dcjgzlezwE0>

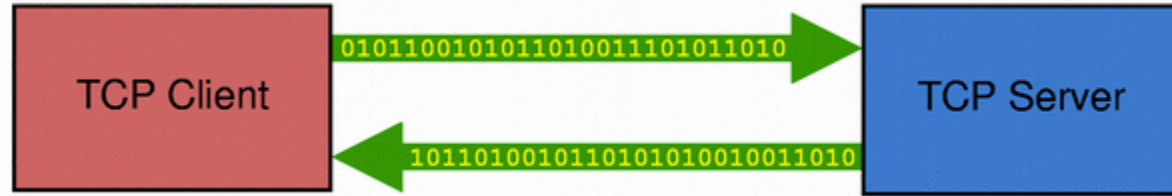
Things to Take away

- Know how to create a Qt project
- Know how to create a GUI form
- Understand what I mean with event programming
- Understand connect() in Qt
- Understand how to retrieve text from QLineEdit and how to write text on the application
 - `QString input = ui->lineEdit->text();`
 - `ui->label->setText(input + QString("this is appended"));`

Network Programming with Qt



Client - Server Model (TCP)



1. Connect to server
2. Event-1 : Send data
3. Event-2 : Receive data
4. repeat

1. Start listening on a port
2. Event-1 : Incoming connection
3. Event-2 : accept connection
4. Event-3 :
 - a. Receive data from client,
 - b. Process this data
 - c. Send this as response

Toy Network Project

Aim : Client sends some text to the server.
Server converts this to upper case and
responds the same

Lets call

KClient

KServer

Demonstration of Toy Network Project

I have put this demonstration on youtube

<http://www.youtube.com/watch?v=EzQICMXvaxY>

You can download the source code from

https://dl.dropboxusercontent.com/u/28068989/Qt_Network.zip

Summary

1. Learnt socket programming with system calls (Sample UDP Client-Server)
 2. Intro to Qt
 3. Network Programming with Qt (Sample TCP Client-Server)
-

References

1. Beej's Socket programming tutorial
<http://www.gta.ufri.br/ensino/eel878/sockets/index.html>
 2. Demo of provided program
<https://www.youtube.com/watch?v=6cvWoOnXEZ8>
 3. Qt GUI Tutorial
<http://kusemanohar.wordpress.com/2012/08/19/qt-beginners-tutorial/>
 4. Qt Network Code & Demo
https://dl.dropboxusercontent.com/u/28068989/Qt_Network.zip
<http://www.youtube.com/watch?v=EzQICMXvaxY>
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