Lecture 9

Networking and Threads

Exercise 1

Write a fully-functional client-server program. The functionality of the server and a client are given in the next slides. A template of the server and client code can be found on http://kvir03.kvi.nl/rootcourse

See also: ftp://root.cern.ch/root/doc/chapter20.pdf

The Server: Header and Globals

```
#include "TThread.h"
#include "TSocket.h"
#include "TServerSocket.h"
#include "TH1.h"
#include "TCanvas.h"
#include "TRandom3.h"
#include "TSystem.h"
#include "TMessage.h"
#include <iostream.h>

TH1D* his = new TH1D("his","",5000,-4,4);

void* handleDAQ(void *arg);
void* handleClnt(void *arg);
void exampleServer(UInt_t portNumber=9191);
```

The Server: main

```
void exampleServer(UInt_t portNumber=9191)
{
  TThread *daqThread=new TThread("daqThread", handleDAQ);
  daqThread->Run();

  TServerSocket *listenSocket = new TServerSocket(portNumber);
  while (1)
  {
    TSocket *srvSocket = listenSocket->Accept();
    TThread *ct = new TThread("ct", handleClnt, (void*)srvSocket);
    ct->Run();
  }
}
```

The Server: DAQ

```
void* handleDAQ(void *arg)
{
  if (gRandom) delete gRandom;
  gRandom = new TRandom3(0);
  while (1)
  {
    his->Fill(gRandom->Rndm()*8-4);
  }
}
```

The Server: Client Handling

```
void* handleClnt(void *arg)
{
  Char_t request[8192];
  Int_t max, messageType;
  TSocket* sock = (TSocket*)arg;
  Int_t nrBytes;
  while (nrBytes = sock->Recv(request,sizeof(request),messageType))
  {
    printf("Sending histogram ...");
    TMessage mess(kMESS_OBJECT);
    mess.WriteObject(his);
    sock->Send(mess);
    printf("done!\n");
  }
  sock->Close();
  (TThread::Self())->Delete();
}
```

The Client

```
TSocket  *sock=NULL;

void openConnection(Char_t *host="localhost", UInt_t portnumber=9191)
{
  sock = new TSocket(host, portnumber);
}

void closeConnection()
{
  sock->Close();
}

TH1D* ptr;
void drawHisto()
{
  sock->Send("get histo",kMESS_STRING);
  TMessage* mess;
  sock->Recv(mess);
  TH1 *h = (TH1*)mess->ReadObject(mess->GetClass());
  ptr = (TH1D*)h->Clone("localHis");
  ptr->Draw();
}
```