RserveCLI

An Rserve Client Implementation for CLI/.NET

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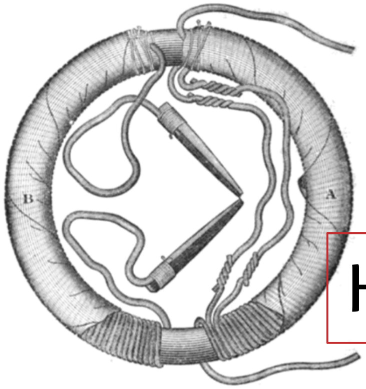
An Impedance Mismatch

R

- GNU toolchain
- More at home on *nix
- Dynamic typing
- GNU licenses

.NET/CLI

- .NET or Mono toolchain
- More at home on Windows
- Mostly static typing
- Permissive open source and proprietary licenses



How can we connect the two worlds?

Rserve to the Rescue!

- TCP/IP server to access R remotely
- Important Commands
  - Evaluate expression
  - Move R objects to and from the remote session
  - Move files
- Clients for Java, C++, and PHP
- http://www.rforge.net/Rserve/

All we need is a CLI client!
RserveCLI

A Simple Example

```
using (var s = new RConnection(
        new System.Net.IPAddress(
        new byte[] { 192, 168, 37, 10 }),
        port: 6311,
        user: "ruser", password: "rpwd"))
{
        // Generate some example data
        var x = Enumerable.Range(1, 20).ToArray();
        var y = (from a in x select (0.5 * a * a) + 2).ToArray();

        // Build an R data frame
        var d = Sexp.MakeDataFrame();
        d["x"] = Sexp.Make(x);
        d["y"] = Sexp.Make(y);
        s["d"] = d;
```

We make a data frame locally

Sexp.Make() turns native data into Sexps

Now we send the data frame to the R server

A Simple Example (2)

```
// Run a linear regression, obtain the summary,
// and print the result
var linearModelSummary = s.Eval["summary(lm(y ~ x, d))"];
Console.WriteLine(linearModelSummary.Count);
var coefs = linearModelSummary["coefficients"];
var rSquared = (double) linearModelSummary["r.squared"];
Console.WriteLine(
        "y = {0} x + {1}. R^2 = {2,4:F}%",
        coefs[1, 0], coefs[0, 0], rSquared * 100);
```

Evaluate a command

Sexp typecast to native type

Sexps can be indexed in one or two dimensions, by names or by indices

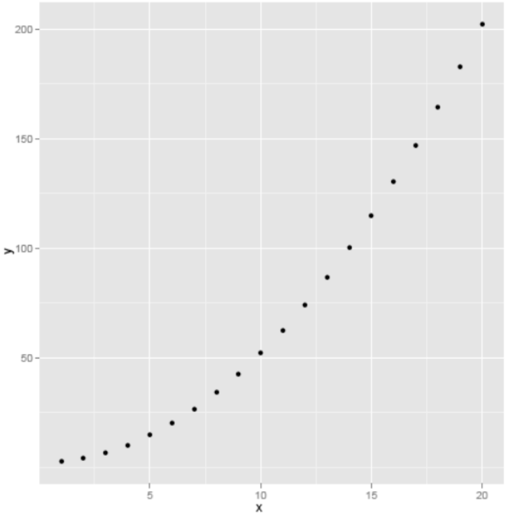
A Simple Example (3)

```
// Make a chart and transfer it to the local machine
s.VoidEval("library(ggplot2)");
s.VoidEval("pdf(\"outfile.pdf\")");
s.VoidEval("print(qplot(x,y, data=d))");
s.VoidEval("dev.off()");

using (var f = File.Create("Data Plot.pdf"))
{
        s.ReadFile("outfile.pdf").CopyTo(f);
}

s.RemoveFile("outfile.pdf");
```

Generate a PDF file on the server

Copy the file to the local machine

Remove the file from the server



A Simple Example (4)

```
// Now let's do some linear algebra
var matA = new double[,] {
        { 14, 9, 3 }, { 2, 11, 15 },
        { 0, 12, 17 }, { 5, 2, 3 } };
var matB = new double[,] { { 12, 25 }, { 9, 10 }, { 8, 5 } };
s["a"] = Sexp.Make(matA);
s["b"] = Sexp.Make(matB);
Console.WriteLine(s["a %*% b"].ToString());
```

Comfortable syntax. Sexp.Make() does the Right Thing.

Sexp.ToString() formats Sexps in a user-friendly way

```
[ 273, 243, 244, 102, 455, 235, 205, 160 ]
```

Try it out!

RserveCLI

http://rservecli.codeplex.com/