

rpc

Save the following code as add.x
//Interface Definition Language (IDL)

```
struct intpair {
    int a;
    int b;
};
program ADD_PROG {
    version ADD_VERS {
        int ADD(intpair) = 1; // Function id
    } = 1;
} = 0x23451111; //program number is a 32-bit number
```

compile the idl using

```
rpcgen -C -a add.x
```

This will create add_client.c, add_server.c, add_svc.c, add_clnt.c,
add_proc_svc.c, add_xdr.c and the makefile (makefile.add or Makefile.add)

The server function, contained in add_server.c is a function which does nothing
but contains the comments:

```
/*
 * insert server code here
 */
```

replace those comments with a single print statement
printf("Calling add function\n");

Edit the makefile and find the line that defines CFLAGS:

```
CFLAGS += -g
```

and change it to:

```
CFLAGS += -g -DRPC_SVC_FG
```

Change the line in the makefile that defines:

```
RPCGENFLAGS =
```

to:

```
RPCGENFLAGS = -C
```

Compile the make file using

```
make -f Makefile.add
```

output is similar to:

```
cc -g -DRPC_SVC_FG -c -o add_clnt.o add_clnt.c
```

```
cc -g -DRPC_SVC_FG -c -o add_client.o add_client.c
```

```

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cc -g -DRPC_SVC_FG -c -o add_xdr.o add_xdr.c
cc -g -DRPC_SVC_FG -o add_client add_clnt.o add_client.o add_xdr.o -lnsl
cc -g -DRPC_SVC_FG -c -o add_svc.o add_svc.c
cc -g -DRPC_SVC_FG -c -o add_server.o add_server.c
cc -g -DRPC_SVC_FG -o add_server add_svc.o add_server.o add_xdr.o -lnsl
-----

```

In one window, run:

```
./add_server
```

In another window, run:

```
./add_client localhost
```

In the server window, the output will be:

```
Calling add function
```

Edit add_client.c

```
result_1 = add_1(&add_1_arg, clnt);
```

Note that the function add_prog_1 defines a variable add_1_arg. This argument is passed as a parameter to the remote procedure call

Before calling this function, we will initialize add_1_arg to contain the numbers 12 and 27

```

if (clnt == NULL) {
    clnt_pcreateerror(host);
    exit(1);
}
add_1_arg.a = 12;
add_1_arg.b = 27;
if (result_1 == NULL) {
    clnt_perror(clnt, "call failed:");
}

```

In The server function add the following:

```

printf("Calling add function\n");
printf("Parameters: %d, %d\n", argp->a, argp->b);

```

Compile and run

```
make -f Makefile.add
```

```
./add_server
```

```
./add_client localhost
```

In the server window, the output will be:

```

Calling add function
Parameters: 12, 27

```

In The server function add the following:

```

printf("Calling add function\n");
printf("Parameters: %d, %d\n", argp->a, argp->b);

```

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```
result = argp->a + argp->b;
printf("Returning: %d\n", result);
return &result;
```

Modify add_client.c to print the value:

```
if (result_1 == (int *) NULL) {
    clnt_perror (clnt, "call failed");
}
else {
    printf("Result = %d\n", *result_1);
}
```

Compile and run

In the server window, the output will be:

```
Calling add function
Parameters: 12, 27
Returning: 39
```

In the client window, the output will be:

```
Result = 39
```

main function used to look like:

```
main(int argc, char *argv[]){
    char *host;
    if (argc < 2)
    {
        printf("usage: %s server_host\n", argv[0]); exit(1);
    }
    host = argv[1];
    add_prog_1(host);
}
```

It now looks like:

```
int main(int argc, char *argv[])
{
    char *host; int a, b;
    if (argc != 4)
    {
        printf ("usage: %s server_host num1 num2\n", argv[0]); exit(1);
    }
    host = argv[1];
    if ((a = atoi(argv[2])) == 0 && *argv[2] != '0')
    {
        fprintf(stderr, "invalid value: %s\n", argv[2]); exit(1);
    }
    if ((b = atoi(argv[3])) == 0 && *argv[3] != '0')
    {
        fprintf(stderr, "invalid value: %s\n", argv[3]); exit(1);
    }
}
```

```
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    }
    add_prog_1(host, a, b);
}
```

change add_prog_1 to accept two additional parameters:

```
void add_prog_1(char *host, int a, int b)
```

and set the parameters for the call to the remote procedure with:

```
add_1_arg.a = a;
```

```
add_1_arg.b = b;
```

```
before(result_1 = add_1(&add_1_arg, clnt);)
```

```
make -f Makefile.add
```

```
./add_server
```

```
./add_client localhost 5 6
```
