

Data Analysis Applications Group Friday Science Meeting Update Calling C or Fortran from IDL on Mac OS X

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2005.04.15

You can call C or Fortran from IDL

- **Recall that you can easily call your C or Fortran routines from IDL**
- **Can be useful when:**
 - C/Fortran is faster than IDL implementation
 - Don't feel like porting your old code to IDL
 - An API exists for C/Fortran, but not IDL
- **Typically build a shared library, put your routines in that library**
- **Call the library using CALL_EXTERNAL**

You *can* call your C and Fortran routines from IDL on Mac OS X with only minor changes to how you compile

- On Linux/UNIX, typically one puts their C/Fortran routines in a shared library, then calls from IDL using `CALL_EXTERNAL`
- At first it would seem that this breaks on OS X
- Only change needed is to replace `-shared` with `-bundle` in the link step
- The following error indicates that you need to do this:

```
not a Mach-O MH_BUNDLE file type
```

Example: call Fortran on Mac OS X

- **Start with this simple Fortran subroutine**

```
subroutine timesfour(i)
integer*4 I
i=i*4
Return
end
```

- **Compile**

```
/sw/bin/g77 -fno-underscoring -c timesfour.f
```

– The -fno-underscoring prevents the extra _ at the end

- **Link**

```
ld -bundle -o libTimesFour.so timesfour.o
```

Example continued: call Fortran from IDL

- **Next we test our routine out**

```
IDL> num=2L
```

```
IDL> dummy = call_external('libTimesFour.so',  
    'timesfour', num, /auto_glue)
```

```
IDL> print, num
```

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- **The /auto_glue keyword generates our wrapper for us**
- **Note we used 2L to force a long integer**

Example: call C on Mac OS X

- **Start with this simple C function**

```
long timestwo(long *i)
{
    return (*i) * (long)2;
}
```

- **Remember to add the * to pass by reference in C**

- **Compile**

```
gcc -fPIC -c timestwo.c
```

- **Link**

```
ld -bundle -o libTimesTwo.so timestwo.o
```

Example continued: call C from IDL

- **Next we test our routine out**

```
IDL> help, call_external('libTimesTwo.so',  
    'timestwo', 2L, /auto_glue)
```

```
<Expression>      LONG      =      4
```

- **In this example we returned a value instead of using pass-by-reference**