

- Java has a pluggable framework for URL-based I/O
 - Standard protocols are available by default
 - `http`, `ftp`, `file`, `jar`, `gopher`, `mailto`
 - But you can install your own
 - Java code which uses URLs in standard ways can use custom handlers without source code changes
 - `URL.openStream()`, `URL.openConnection()`, ...
 - Works for both input and output (though most application code doesn't use URLs for output)

- Two new URL protocols for MySpace access:
 - `ivo`, uses same IDs as MySpace server
`ivo://uk.ac.le.star/filemanager#node-2583`
 - `myspace`, uses relative references to files in home directory of logged-in user
`myspace:/demo/messier.xml`
 - The hard work is done by the Astrogrid Runtime
- Others could be added:
 - `srb`, `vospace`, ...

- Two ways to install these into the JVM:
 - Set classpath and system properties:

```
java -classpath stilts.jar:app.jar \  
-Djava.protocol.handler.pkgs=uk.ac.starlink.astrogrid.protocols
```

 - can be used at runtime on third-party applications
 - also used for Java system methods
 - `java -classpath myspace:/jars/ext.jar anyone?`
 - requires control over JVM startup
 - Call configuration method:

```
URL.setURLStreamHandlerFactory(customFactory)
```

 - convenient if you are the author or have source access
 - no fiddling about by user required at JVM startup

- Installed in (pre-release) STILTS & TOPCAT

```
topcat myspace:/iphas/extracted/r368776_cat.fits
```

```
stilts in=myspace:/survey/2QZ_pubcat.vot \  
out=myspace:/survey/2QZ_z_hi.vot \  
cmd="select z1>2.0"
```

- Classes currently available in stilts.jar pre-release

```
ftp://andromeda.star.bris.ac.uk/pub/star/stilts/pre/stilts.jar
```

- May repackage as standalone (small) jar file if desired
- Or others could use similar concept