A Quick Look At Spyne

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What is Spyne?

Spyne makes it convenient to

expose your services using multiple

protocols and/or transports.

What is Spyne?

It also forces you to have a well-defined api.

How?

Here's a simple function:

```
from datetime import datetime

def get_utc_time():
    return datetime.utcnow()
```

Now, to make this function remotely callable;

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1)

We wrap it in a `ServiceBase` subclass:

```
def get_utc_time():
    return datetime.utcnow()
```

```
from spyne.model.primitive import DateTime
from spyne.decorator import srpc
from spyne.service import ServiceBase


    def get_utc_time():
        return datetime.utcnow()
```

```
from spyne.model.primitive import DateTime
from spyne.decorator import srpc
from spyne.service import ServiceBase

class DateTimeService(ServiceBase):

    def get_utc_time():
        return datetime.utcnow()
```

```
from spyne.model.primitive import DateTime
from spyne.decorator import srpc
from spyne.service import ServiceBase

class DateTimeService(ServiceBase):
    @srpc(_returns=DateTime)
    def get_utc_time():
        return datetime.utcnow()
```

2)

Now, we have to wrap the service definition

in an `Application` definition.

```
[DateTimeService],
```

```
from spyne.application import Application
from spyne.protocol.http import HttpRpc

httprpc = Application(
          [DateTimeService],
```

```
from spyne.application import Application
from spyne.protocol.http import HttpRpc

httprpc = Application(
        [DateTimeService],
        tns='spyne.examples.multiprot',
```

```
from spyne.application import Application
from spyne.protocol.http import HttpRpc

httprpc = Application(
        [DateTimeService],
        tns='spyne.examples.multiprot',
        in_protocol=HttpRpc(),
        out_protocol=HttpRpc()
    )
```

3)

Finally, we wrap the application in

a transport.

```
from spyne.server.wsgi import WsgiApplication

application = WsgiApplication(httprpc)
```

This is now a regular WSGI Application that

we can pass to WSGI-compliant servers like

CherryPy, mod_wsgi, Twisted, etc.

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```
$ curl http://localhost:9910/get_utc_time
2012-03-09T17:38:11.997784
```

Now, what if we wanted to expose this function using another protocol?

For example: SOAP

```
from spyne.application import Application
from spyne.protocol.http import HttpRpc
from spyne.protocol.soap import Soap11

soap = Application([DateTimeService],
        tns='spyne.examples.multiprot',
        in_protocol=HttpRpc(),
        out_protocol=Soap11()
    )
```

For example: SOAP

```
$ curl http://localhost:9910/get_utc_time \
                                    | tidy -xml -indent
```

```
<?xml version='1.0' encoding='utf-8'?>
<senv:Envelope xmlns:wsa="http://schemas.xmlsoap.org/ws/2003/03/addressing"
 xmlns:tns="spyne.examples.multiple_protocols"
 xmlns:plink="http://schemas.xmlsoap.org/ws/2003/05/partner-link/"
 xmlns:xop="http://www.w3.org/2004/08/xop/include"
 xmlns:senc="http://schemas.xmlsoap.org/soap/encoding/"
 xmlns:s12env="http://www.w3.org/2003/05/soap-envelope/"
 xmlns:s12enc="http://www.w3.org/2003/05/soap-encoding/"
 xmlns:xs="http://www.w3.org/2001/XMLSchema"
 xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:senv="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/">
  <senv:Body>
    <tns:get_utc_timeResponse>
      <tns:get_utc_timeResult>
        2012-03-06T17:43:30.894466
      </tns:get_utc_timeResult>
    </tns:get_utc_timeResponse>
  </senv:Body>
</senv:Envelope>
```

Or, just XML:

```
from spyne.application import Application
from spyne.protocol.http import HttpRpc
from spyne.protocol.xml import XmlDocument

xml = Application([DateTimeService],
          tns='spyne.examples.multiprot',
          in_protocol=HttpRpc(),
          out_protocol=XmlDocument()
      )
```

Or, just XML:

```
$ curl http://localhost:9910/get_utc_time \
                                    | tidy -xml -indent

<?xml version='1.0' encoding='utf-8'?>
<ns0:get_utc_timeResponse
xmlns:ns0="spyne.examples.multiple_protocols">
  <ns0:get_utc_timeResult>
    2012-03-06T17:49:08.922501
  </ns0:get_utc_timeResult>
</ns0:get_utc_timeResponse>
```

Or, HTML:

```
from spyne.application import Application
from spyne.protocol.http import HttpRpc
from spyne.protocol.xml import HtmlMicroFormat

html = Application([DateTimeService],
        tns='spyne.examples.multiprot',
        in_protocol=HttpRpc(),
        out_protocol=HtmlMicroFormat()
    )
```

Or, HTML:

```
$ curl http://localhost:9910/get_utc_time \
                                    | tidy -xml -indent

<div class="get_utc_timeResponse">
  <div class="get_utc_timeResult">
    2012-03-06T17:52:50.234246
  </div>
</div>
```

etc…

Spyne also makes it easy to implement custom protocols.

Let's implement an output protocol that renders the datetime value as an analog clock.

(without going into much detail ☺)

To do that, we need to implement the `serialize` and `create_out_string` functions in a `ProtocolBase` subclass.

```
from lxml import etree
from spyne.protocol import ProtocolBase

class SvgClock(ProtocolBase):
  mime_type = 'image/svg+xml'
```

```
from lxml import etree
from spyne.protocol import ProtocolBase

class SvgClock(ProtocolBase):
  mime_type = 'image/svg+xml'

  def serialize(self, ctx, message):
    d = ctx.out_object[0] # the return value
```

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class SvgClock(ProtocolBase):
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    # (some math and boilerplate suppressed)
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  mime_type = 'image/svg+xml'

  def serialize(self, ctx, message):
    d = ctx.out_object[0] # the return value

    # (some math and boilerplate suppressed)

    # clock is a svg file parsed as lxml Element
    ctx.out_document = clock
```

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from spyne.protocol import ProtocolBase

class SvgClock(ProtocolBase):
  mime_type = 'image/svg+xml'

  def serialize(self, ctx, message):
    d = ctx.out_object[0] # the return value

    # (some math and boilerplate suppressed)

    # clock is a svg file parsed as lxml Element
    ctx.out_document = clock

  def create_out_string(self, ctx, charset=None):
    ctx.out_string = [
        etree.tostring(ctx.out_document)
    ]
```

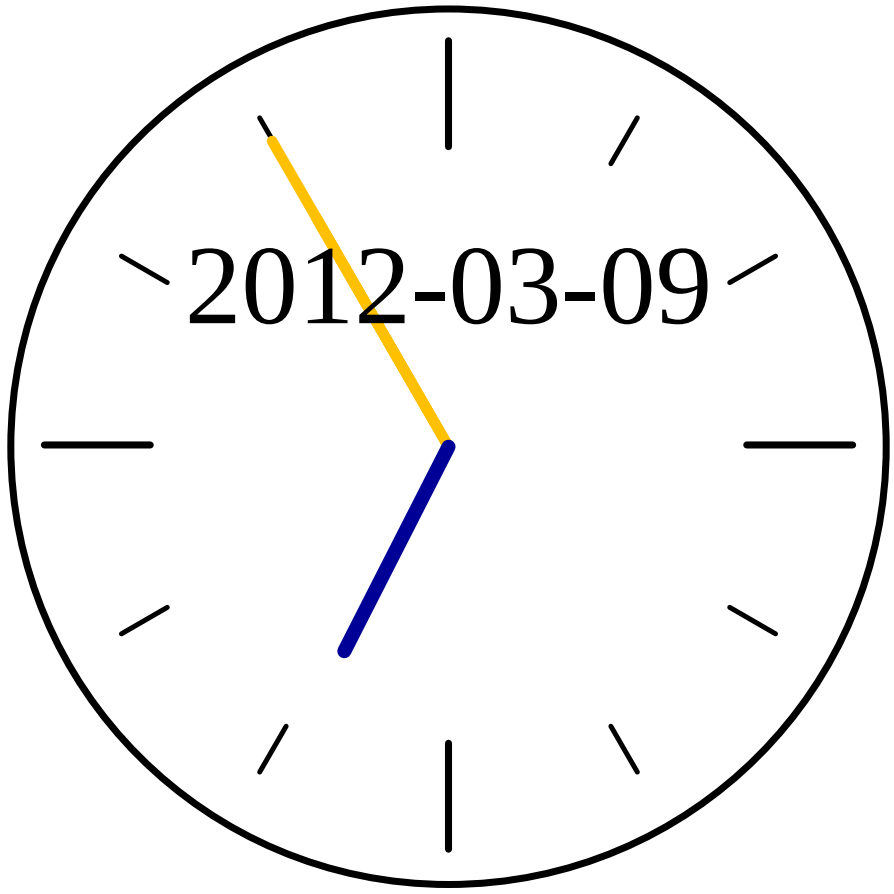
The custom SVG protocol:

```
from spyne.application import Application

svg = Application([DateTimeService],
          tns='spyne.examples.multiprot',
          in_protocol=HttpRpc(),
          out_protocol=SvgClock()
      )
```

The custom SVG protocol:

```
$ curl http://localhost:9910/get_utc_time \
                                    > utc_time.svg
```



It's also easy to implement declarative restrictions on your input data.

So instead of doing this:

```
def get_name_of_month(month):
    """Takes an integer between 1-12 and
    returns the name of month as string
    """

    value = int(month)

    if not (1 <= value <= 12):
        raise ValueError(value)

    return datetime(2000,month,1).strftime("%B")
```

You can do this:

```
class NameOfMonthService(ServiceBase):
  @srpc(Integer(ge=1,le=12), _returns=Unicode)
  def get_name_of_month(month):
    return datetime(2000,month,1).strftime("%B")
```

And if you enable validation;

```
from spyne.application import Application
from spyne.protocol.http import HttpRpc

rest = Application([NameOfMonthService],
        tns='spyne.examples.multiprot',
        in_protocol=HttpRpc(validator='soft'),
        out_protocol=HttpRpc()
    )
```

```
$ curl localhost:9912/get_name_of_month?month=3
March
```

```
$ curl localhost:9912/get_name_of_month?month=3
March
```

```
$ curl -D - localhost:9912/get_name_of_month?month=13
HTTP/1.0 400 Bad Request
Date: Sat, 10 Mar 2012 14:21:36 GMT
Server: WSGIServer/0.1 Python/2.7.2
Content-Length: 63
Content-Type: text/plain

Client.ValidationError

The string '13' could not be validated
```

So, what's missing?

Protocols: JSON! ProtoBuf! XmlRpc! Thrift!
YAML! HTML! (The whole document)

Transports: SMTP! Files! SPDY! WebSockets!

(and many other things! see the ROADMAP.rst in the source repo.)

Additional Information:

github.com/arskom/spyne

This example and the presentation are in:
examples/multiple_protocols
examples/validation.py

Stay for the sprints! I'll be around!