

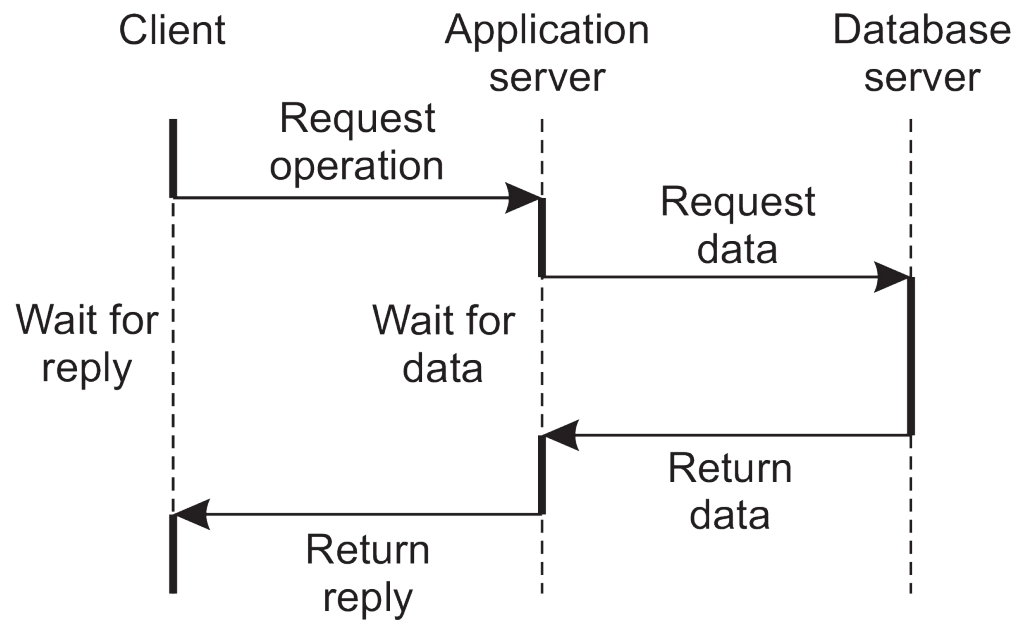
Web Services

Dr. Padraig Corcoran

Service-Oriented Architecture (SOA)

- A distributed system is constructed as a composition of different services (e.g. payment and database services).
- Developing a distributed system involves service composition or mashup.
- Each service must offer a well-defined (programming) interface.
- Can be implemented using Web services (e.g. SOAP and RESTful web services).

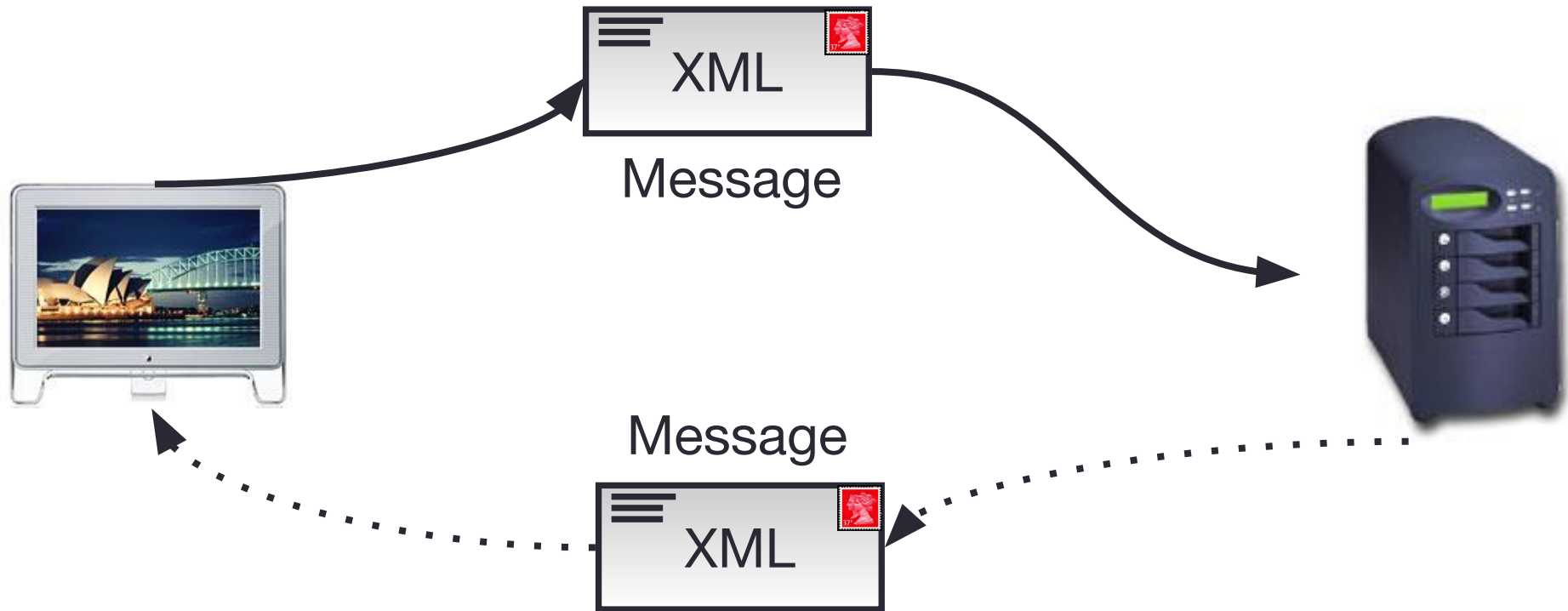
- A server may sometimes need to act as a client.



An example of a server acting as client.

Web services

- Web services are software programs that enable remote applications to talk to each other via XML messages.



A program sends a message to a remote Web service containing an XML message and (optionally) receives a message.

XML

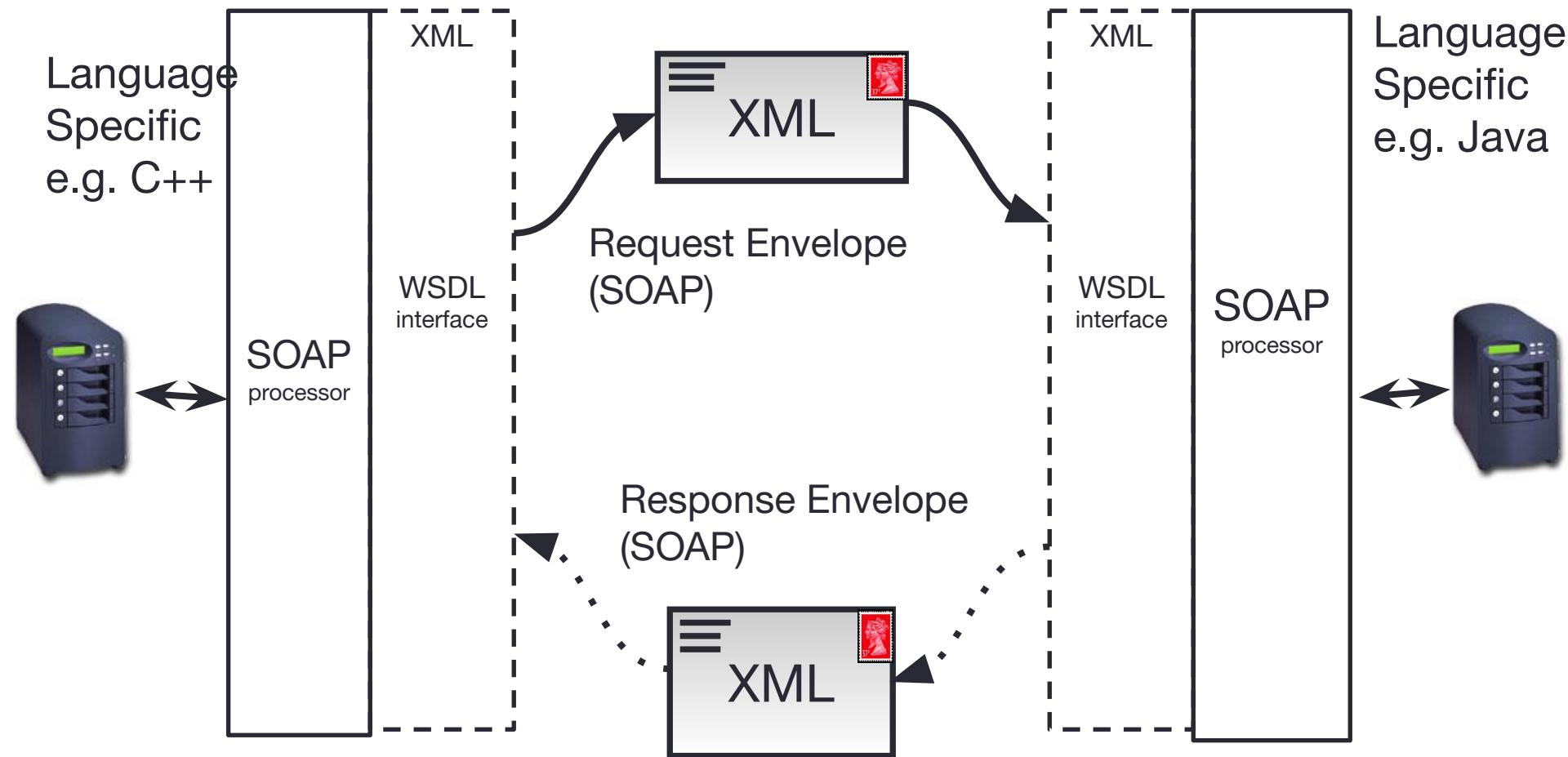
- Extensible Markup Language (XML) is a markup language.
- Defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.
- Widely used for the representation of arbitrary data structures.

```
<?xml version="1.0" encoding="UTF-8"?>
<note>
  <to>To</to>
  <from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this weekend!</body>
</note>
```

- There are three major roles in a web-service environment:
 - Service provider.
 - Service requester.
 - Service registry.
- Although they are not required, a web service may also have two additional properties:
 - A web service should be self-describing - a public interface to the service should be published.
 - A web service should be discoverable. If you create a web service, there should be a relatively simple mechanism for you to publish this fact.

SAOP web service

- Simple Object Access Protocol (SOAP) is a web service protocol (alternative is a RESTful web service).
- All messages encoded using XML and delivered using any transportation protocol (e.g. HTTP).
- Web Service Description Language (WSDL) is an XML language for defining interfaces.
- Each SOAP web service will have a WSDL file describing how a client should communicate with the web service.



The implementation is independent of its interface

References

Pautasso, Cesare, Olaf Zimmermann, and Frank Leymann. "Restful web services vs. 'big' web services: making the right architectural decision." Proceedings of the 17th international conference on World Wide Web. ACM, 2008.