

Persistence

An Introduction to XML and Serialization

Produced Dr. Siobhán Drohan
by: Ms. Mairéad Meagher

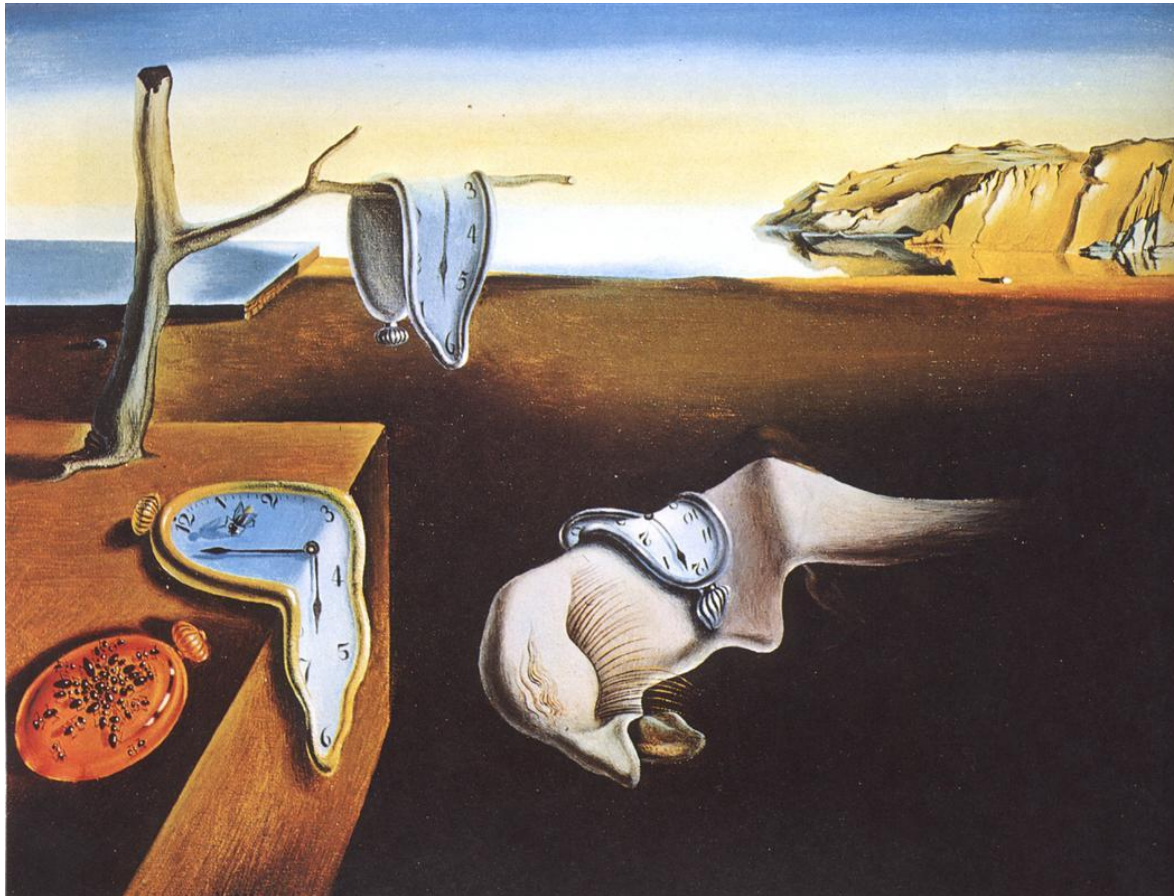


Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Department of Computing and Mathematics
<http://www.wit.ie/>

Persistence

“the continued existence of something”




Dali – “Persistence of memory”

Persistence – lack of (volatility - volatile)



Persistence - Topic List

1. Introduction to **XML**:

- 
- XML versus HTML
 - Example of XML
 - XML does not “do” anything

2. Object **Serialization**.

XML versus HTML

- **XML** was designed to **describe data**,
 - focus on **what** the data is.
- XML is about carrying information.

```
<note>  
  <to>Donald Duck</to>  
  <from>Minnie Mouse</from>  
  <heading>Reminder</heading>  
  <body>Meeting at 10am today</body>  
</note>
```

XML versus HTML

- **HTML** was designed to **display data**,
 - focus on **how** the data looks.
- HTML is about displaying information.

```
<html>

<head>
  <title>My First Web Page</title>
</head>

<body>
  <h1>My First Web Page</h1>
  <p><b>Hello World Wide Web!</b></p>
  <p><i>Hello World Wide Web!</i></p>
  <p><u>Hello World Wide Web!</u></p>
  <p>This is my first web page.</p>
  <p>HTML tags can give <b><i>various</i></b>
  <u>looks and format</u> to the content of this web page.</p>
</body>

</html>
```

XML is NOT a replacement for HTML

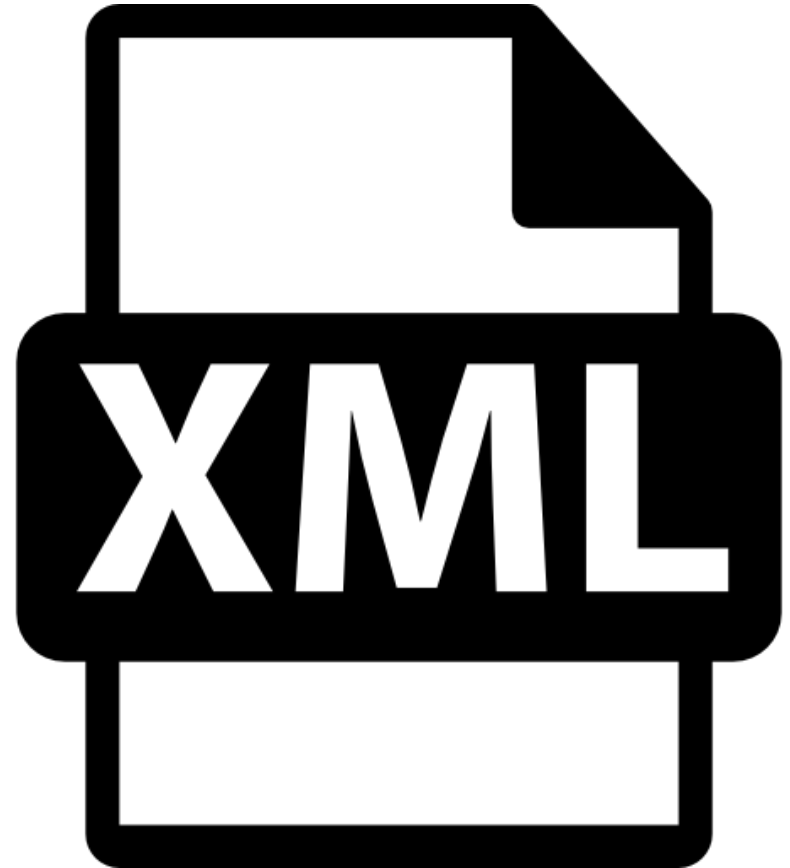
```
<note>  
  <to>Donald Duck</to>  
  <from>Minnie Mouse</from>  
  <heading>Reminder</heading>  
  <body>Meeting at 10am today</body>  
</note>
```



```
<html>  
  
<head>  
  <title>My First Web Page</title>  
</head>  
  
<body>  
  <h1>My First Web Page</h1>  
  <p><b>Hello World Wide Web!</b></p>  
  <p><i>Hello World Wide Web!</i></p>  
  <p><u>Hello World Wide Web!</u></p>  
  <p>This is my first web page.</p>  
  <p>HTML tags can give <b><i>various</i></b>  
  <u>looks and format</u> to the content of this web page.</p>  
</body>  
  
</html>
```


XML...

- Extensible
 - Extensible markup language
- Markup
 - Like HTML
- Describes Data
 - Not for displaying data HTML
- Define your own tags
 - Not predefined
- Self Descriptive



Persistence - Topic List

1. Introduction to **XML**:

- XML versus HTML
-  – Example of XML
- XML does not “do” anything

2. Object **Serialization**.

XML example



```
<note>
  <to>Donald Duck</to>
  <from>Minnie Mouse</from>
  <heading>Reminder</heading>
  <body>Meeting at 10am today</body>
</note>
```

A **note** to Donald Duck, from Minnie Mouse, stored as XML

It has sender **<to>** and receiver **<from>** information

It also has a **heading** and a message **body**.

The XML is self descriptive.

Persistence - Topic List

1. Introduction to **XML**:

- XML versus HTML
- Example of XML
- XML does not “do” anything

2. Object **Serialization**.

Our Shop App



Shop V4.0

implemented the **CRUD** process



Problem: All entered **data is lost** if we **close our application**

Shop V5.0

use XML to make our **data persistent**
beyond the life of our app



Solution: **Store our objects from memory to XML files.**

XML does not “do” anything

- XML is just information wrapped in <tags>.
- Someone must write a piece of software to send, receive or display it.
- We will write Java code to:
 - **SEND objects TO** an **XML file** on the hard disk.
 - **READ objects FROM** an **XML file** on the hard disk.
- This is called **Object Serialization**

Persistence - Topic List

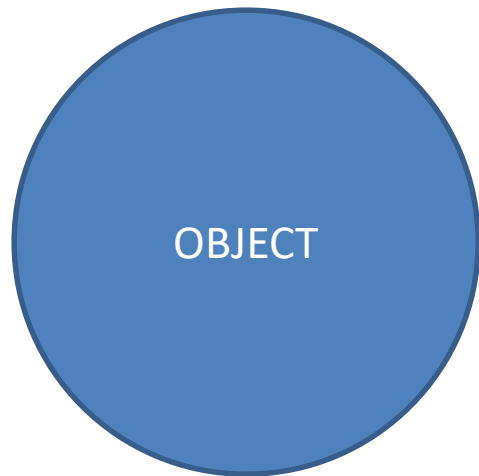
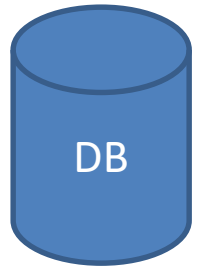
1. Introduction to **XML**:
 - XML versus HTML
 - Example of XML
 - XML does not “do” anything

 2. Object **Serialization**.

Java Serialization

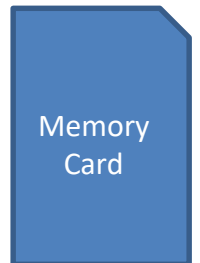
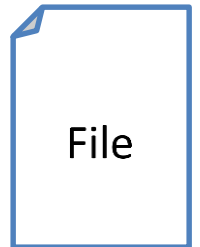
Volatile
Storage

Persistent
Storage



1011 0101 1000 0101 1011 1000

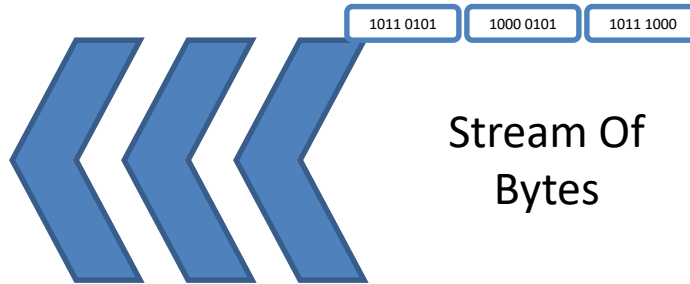
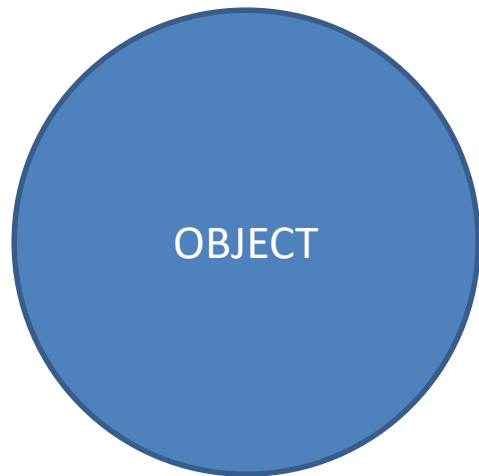
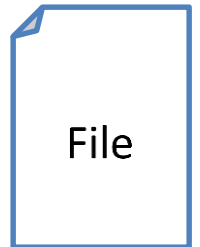
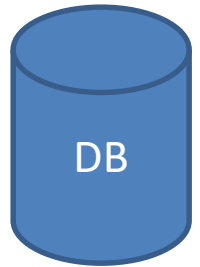
Stream Of
Bytes



Java De-Serialization

Volatile
Storage

Persistent
Storage



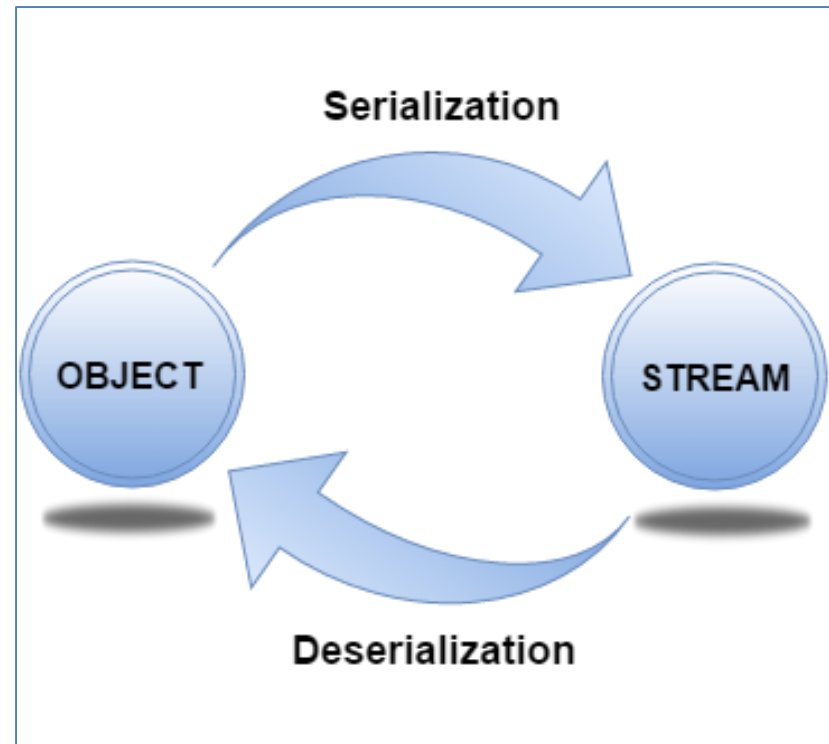
Object Serialization

An object can be represented as a **sequence of bytes**

that includes the object's **data**

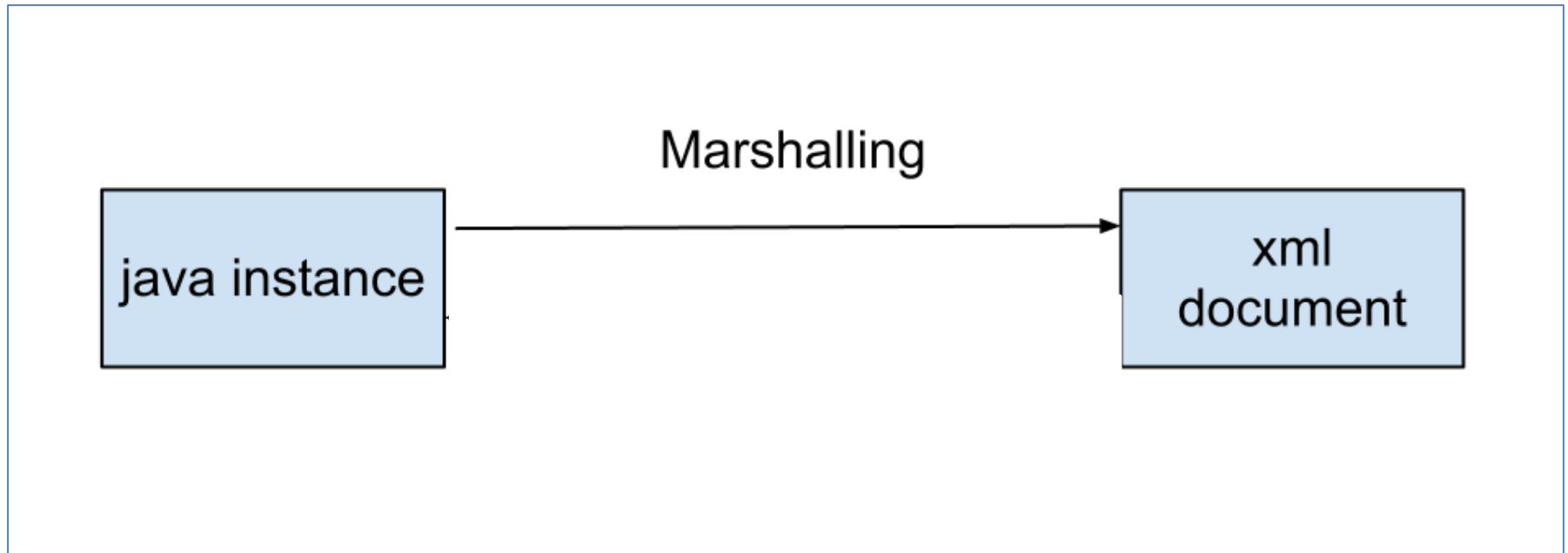
as well as information about the object's **type**

and the **types of data stored in the object.**



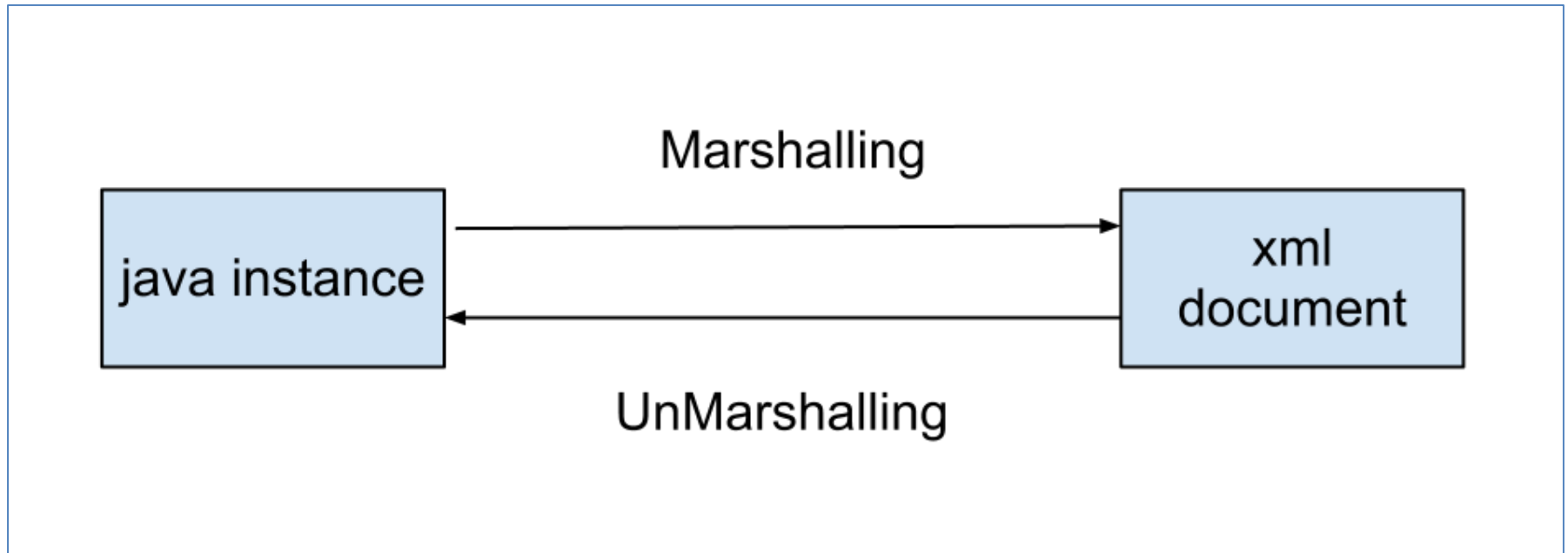
Serialization process involves **Marshalling**

Marshalling is the process of converting the objects & data into a stream.



Serialization process involves **Marshalling** and **unMarshalling**

Marshalling is the process of converting the objects & data into a stream.



UnMarshalling is the reverse process of converting the stream back to their original objects & data.

Self Study Questions

1. What does Persistence mean?
2. We use HTML for carrying data (T/F)?
3. We use XML for displaying data (T/F)?
4. XML is a replacement for HTML (T/F)?
5. When power is lost the data in a program is lost. What one word describes this?
6. Writing Java objects to a file is called?
7. Reading a file of data into Java objects is called?
8. Converting objects to a data stream is called?

**Any
Questions?**

