



XML in the Mozilla Architecture

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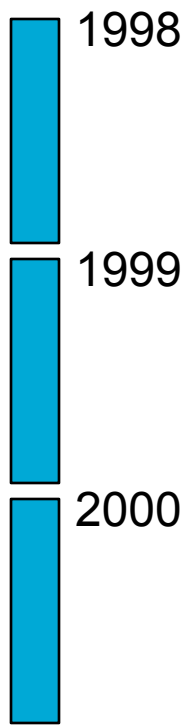
Outline

- What is Mozilla?
- XUL (XML Based User Interface Language)
- RDF (Resource Description Format)
- XUL Templates - Mixing XUL and RDF
- Possibilities

What is mozilla.

What will be talked about in this presentation.

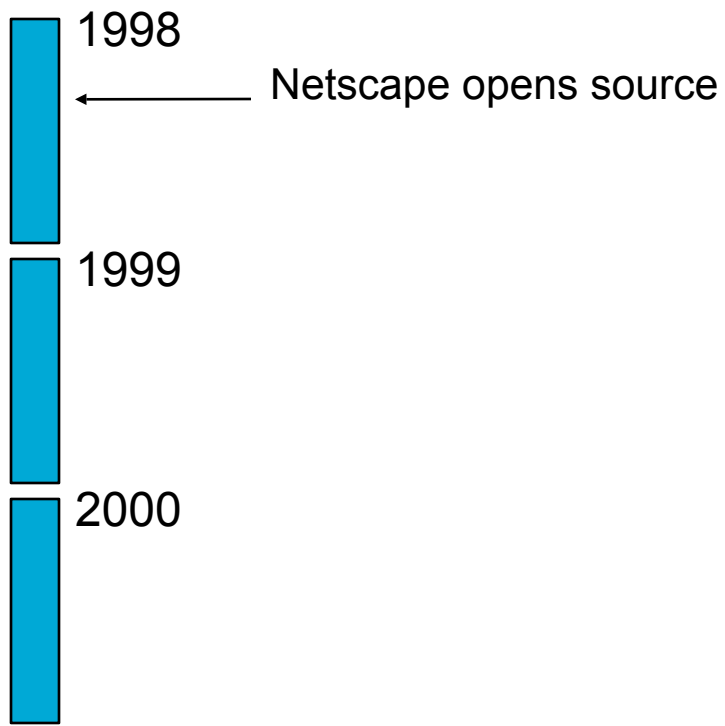
Mozilla Story



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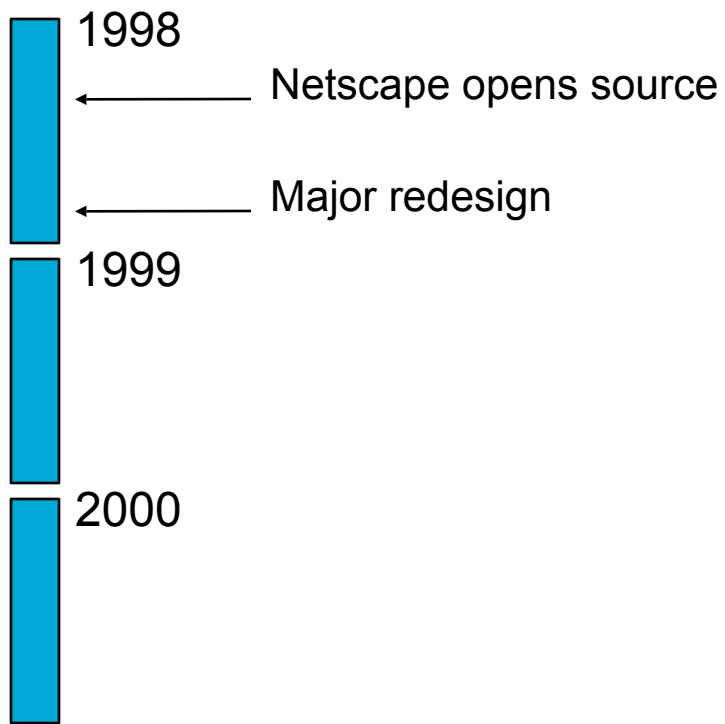
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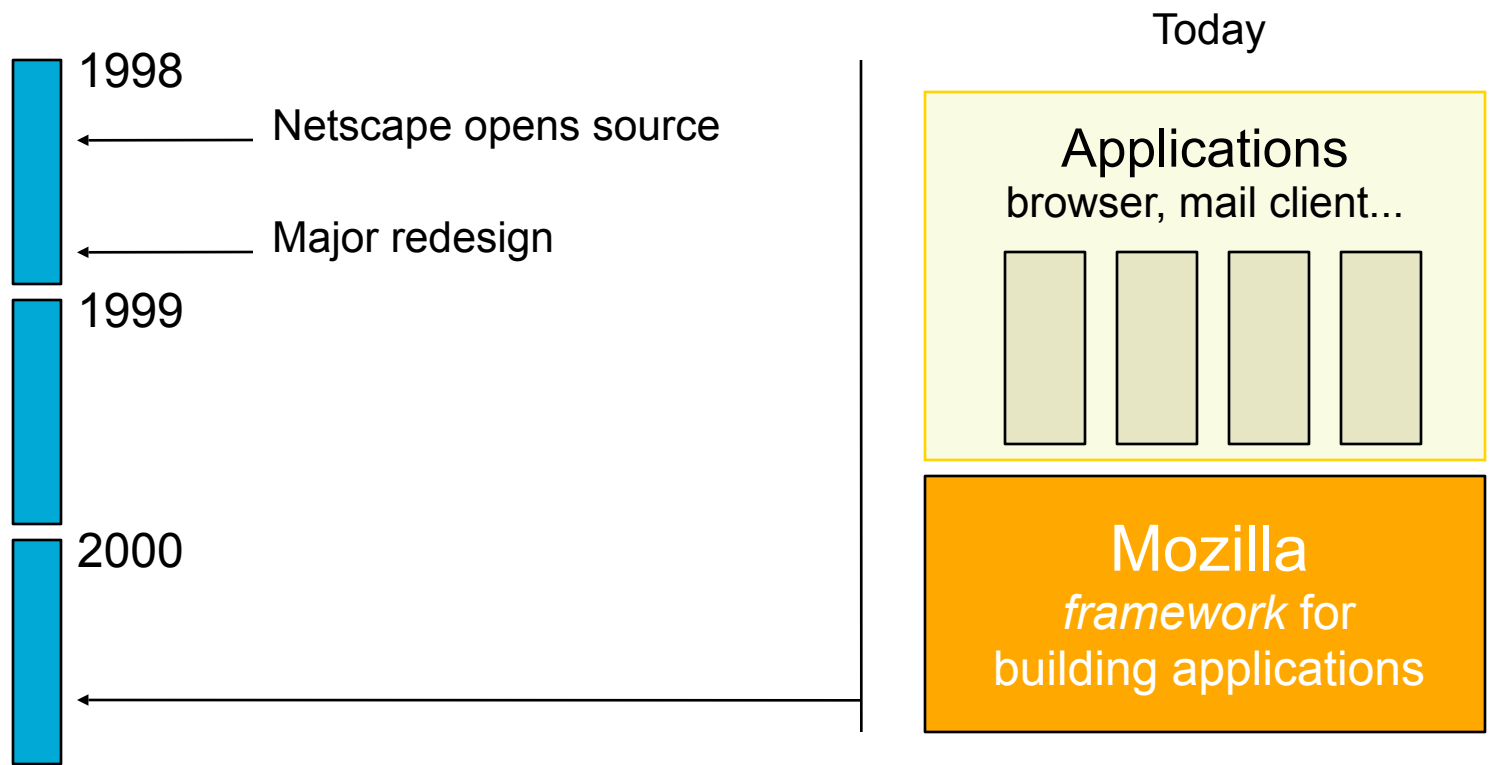
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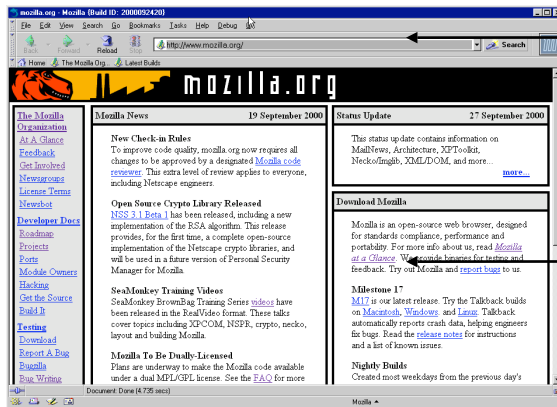
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Mozilla Design



Front end or Chrome

- drawn using GUI toolkits
- platform specific

Web page

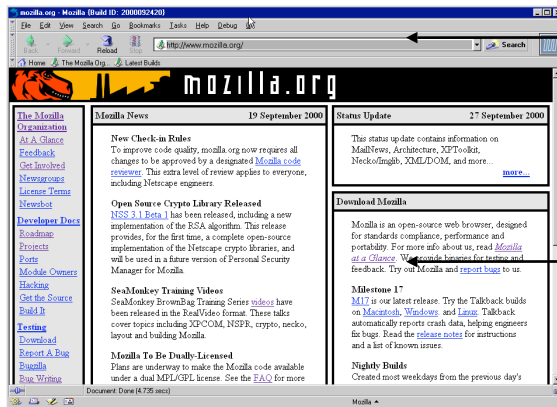
- drawn by a *layout engine*

A web browser

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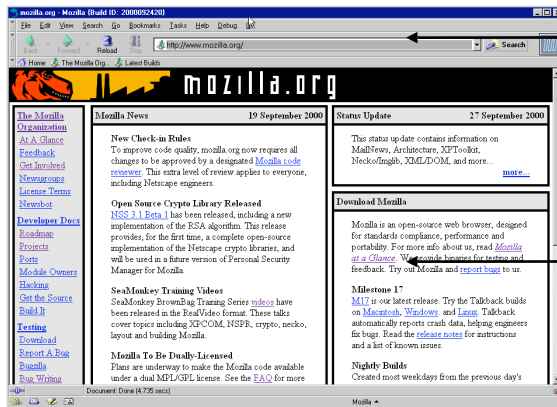
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Bitter truth: maintaining front ends on multiple platforms is painful

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Bitter truth: maintaining front ends on multiple platforms is painful

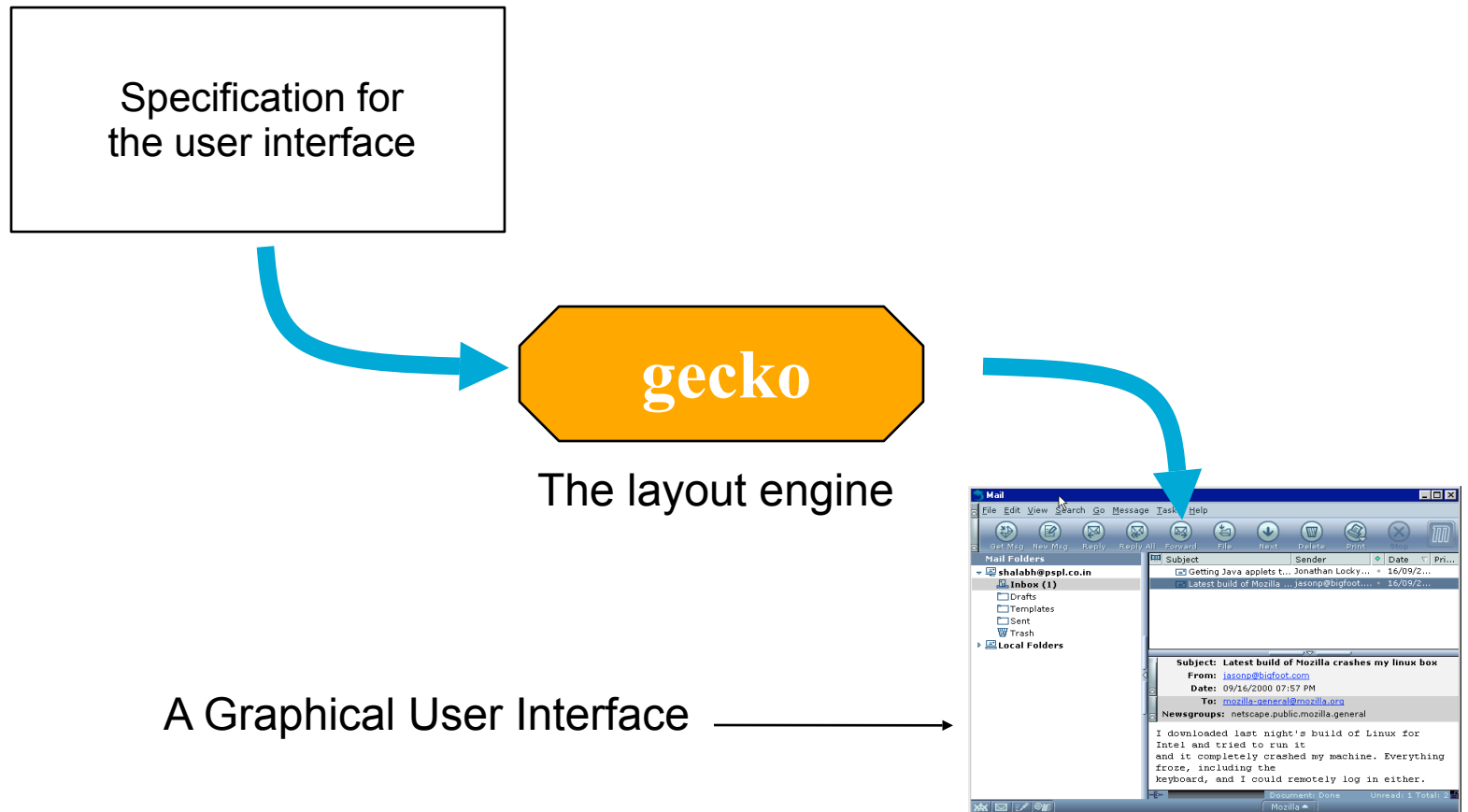
What if :

- Code could be written *only once*?
- Creating GUIs could be as simple as web pages?
- The layout engine also rendered the chrome?

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What is XUL ?



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An XML document is rendered by mozilla as a graphical user interface.

XML elements (or nodes the XML tree) correspond to widgets in the UI. Attributes correspond to properties of widgets.

XUL defines various elements for all the common UI widgets. Creating a plain UI is as simple as writing an XML document.

What is XUL ?

```
<?xml version="1.0" ?>
<window>
  <menubar>
    <menu item="File">
<!-- an XML document -->
```

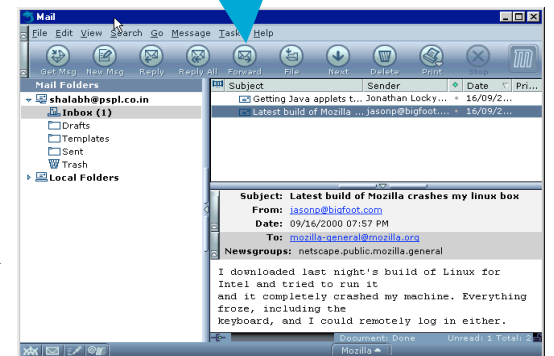
← An XML Document defining the User Interface

XML Based User Interface Language

gecko

The layout engine

A Graphical User Interface →



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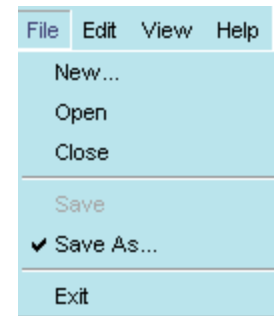
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XUL Elements

`<menubar>`, `<menu>`,
`<menupopup>`, `<menuitem>`



`<tabcontrol>`, `<tab>`,
`<tabpanel>`, `<tabbox>`



(many more...)

- Elements exist for all common UI widgets
- Look and feel can be changed using CSS
- *Not yet a W3C Specification*

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RDF

Resource Description Framework

- Defines a data model for describing resources
- Suited to particular kind of information
- Data Model
 - Resources
 - Properties
 - Statements
- XML Serialization Syntax

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RDF is a *data model* suited for a particular kind of information. It is different from XML.

RDF is a mechanism of describing resources typically used to specify metadata. For e.g., metadata about a web-page could be author, date, related pages, etc.

Resources can be anything identified by a URI (e.g. web-sites, documents, parts of documents and even persons, objects etc). Property is a specific attribute of a resource. Statements are the essence of RDF. A statement is a triple consisting of

1. A subject (a resource)
2. A predicate (a property)
3. An object (a literal or another resource)

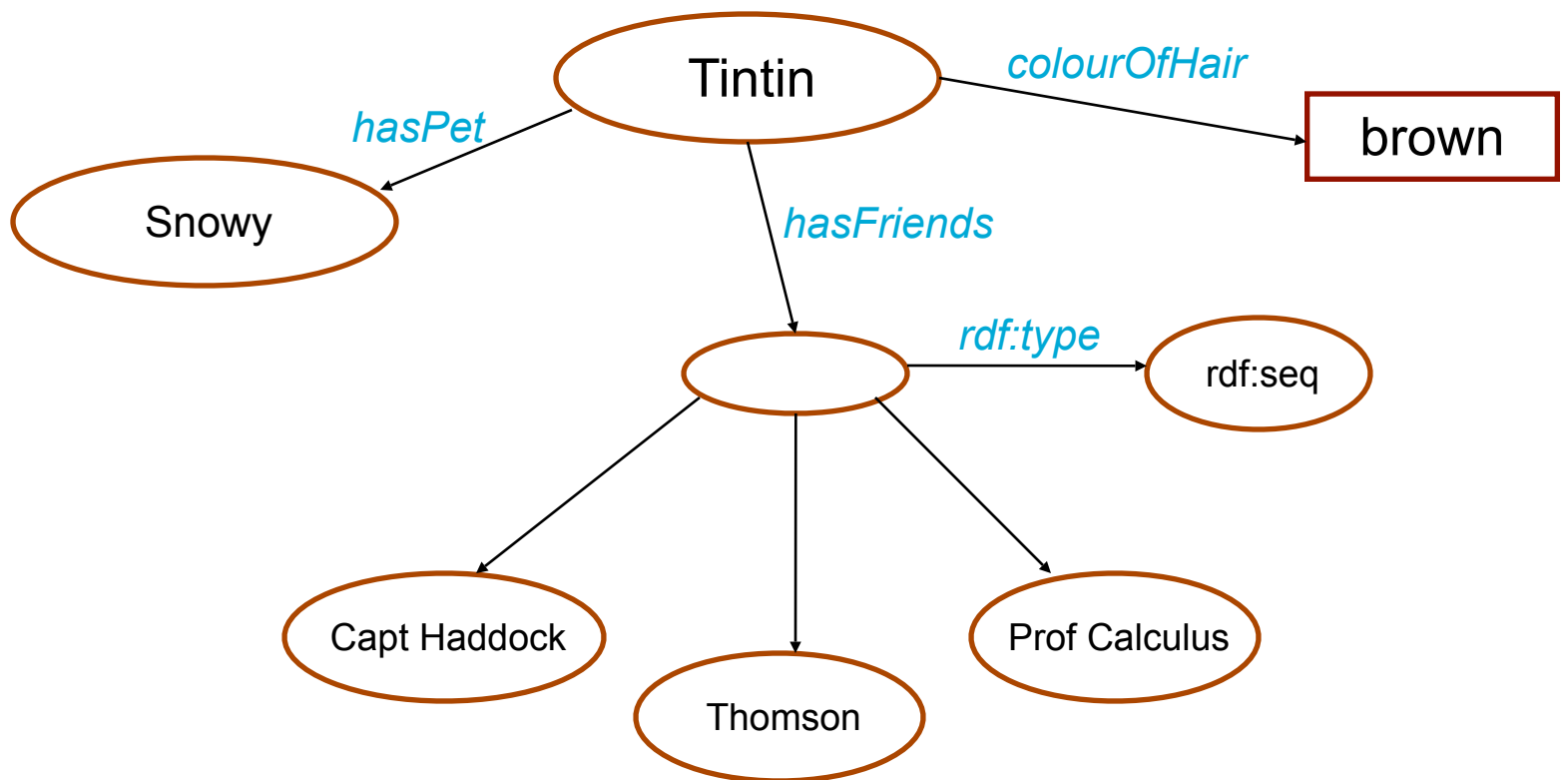
There is an XML serialization syntax for RDF.

Will not cover RDF in detail but just see how it fits into the mozilla architecture.

RDF data model is used internally by mozilla. All data within mozilla is represented as an RDF graph. Note it may or may not come from XML.

RDF Data Model

Three statements about a resource 'Tintin'



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Example of an RDF data model

An arcs and ovals diagram

Ovals : resources

Boxes: literals

Arcs: properties

Three statements made are:

1. The colour of Tintin's hair is brown
2. Tintin has a pet Snowy
3. Tintin has friends Haddock, Thomson, and Calculus

Second statement shows 'objects' in a statement can be resource. They again may have their own properties.

RDF container in third statement.

These statements can be serialized in XML

Combining XUL and RDF

RDF in Mozilla

- RDF *datasource* : collection of RDF statements
- Within mozilla all data is represented as RDF datasources

XUL

- Defines the user interface

XUL Templates

- Pull data from RDF datasources into XUL elements
- Generate XUL elements dynamically

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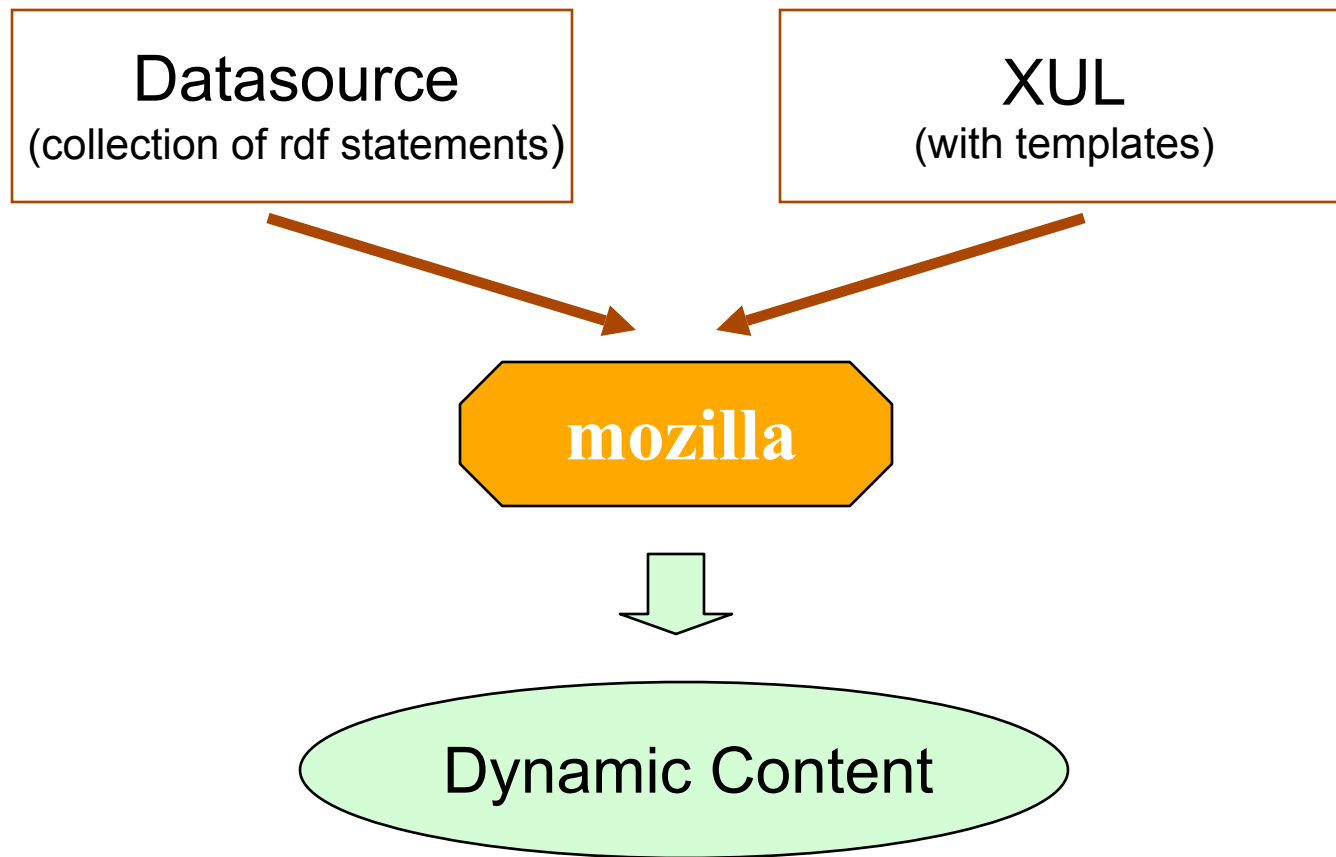
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The Big Picture



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Datasources in mozilla jargon represent a collection of RDF statements. Can be an XML document. Provides the data.

XUL is an XML definition of the UI. Templates define how to show data from the datasource.

Given the two, mozilla renders a UI with data from the datasource and look and feel defined by XUL. When the data changes, a similar view will be generated with the new data.

Same as model-view-controller paradigm. Controller not shown here and not discussed.

XUL Templates

Template

```
•A
• <template>
  • <rule>
    • <conditions>
      • ...
    • <action>
      •B
        •C uri="?x"
•D
```

Content produced

```
•A
  •B
    •C (1)
    •C (2)
    •C (3)
•D
```

Note: A, B, C and D are XUL elements

XUL Template Example

```
<menu datasources="tintin.rdf" ref="urn:tintin">
  <template>
    <rule>
      <conditions>
        <content uri="?uri" />

        <triple subject="?uri"
                  predicate="http://my.homepage.com/tintin#hasFriends"
                  object="?friends" />

        <member container="?friends" child="friend" />

        <triple subject="friend"
                  predicate="http://my.homepage.com/tintin#name"
                  object="name" />
      </conditions>

      <action>
        <menupopup>
          <menuitem uri="friend" value="name" />
        </menupopup>
      </action>

    </rule>
  </template>
</menu>
```

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Explanation.

Mention aggregation.



Possibilities

- Cross platform distributed applications
- The big XML advantage - *interoperability*
- Examples existing today
 - Mozilla web browser, mail client, editor
 - XMLTerm (terminal)
 - MozInvaders (space invaders game)
 - ZopeStudio (management console)
 - *many more...*

Mozilla is not the browser - it is a framework for building cross platform applications.

XML gives a very big advantage. Any application server, or data source that supports XML can be made to serve RDF (and even XUL). So the data is immediately grokked by mozilla.

Schema still needs to be standardized. An XML document not compliant to RDF cannot be processed by mozilla.

Even UI components can be picked up by mozilla from remote machines.



References

- Mozilla and applications
 - <http://www.mozilla.org/>
 - <http://dmoz.org/> (*search for 'XUL'*)
 - <http://www.mozdev.org/>
- XUL
 - <http://www.mozilla.org/docs/>
 - <http://www.mozilla.org/xpfe/xulref/>
- RDF
 - <http://www.w3.org/RDF/>
 - <http://www.mozilla.org/rdf/doc/>
 - <http://entwickler.com/mozine/doc/rdf-slides/>