XML Events

Adding Behavior To XML Content

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Outline

- Motivation.
- DOM2 Interface *EventListener* .
- Authoring *EventListener* via XML.
- Bringing XML content to life via the DOM.

Motivation
Bring Static XML To Life

XML 1.0

Universal syntax for communicating S-expressions.

- Can encode structured data.
- Can encode structured documents.
- Enable self-describing content.

Syntactic Expressions

Come to life when bound *to behaviors.*

- *Semantics* implemented by consumer.
- XML separates *data* from *behavior*.

Example

```
<person>...</person>
```

Possible behaviors include:

- Insert appropriate record into a database.
- Generate human-readable display.
- Generate user interface to edit *person*.

Attached behavior determines interaction semantics.

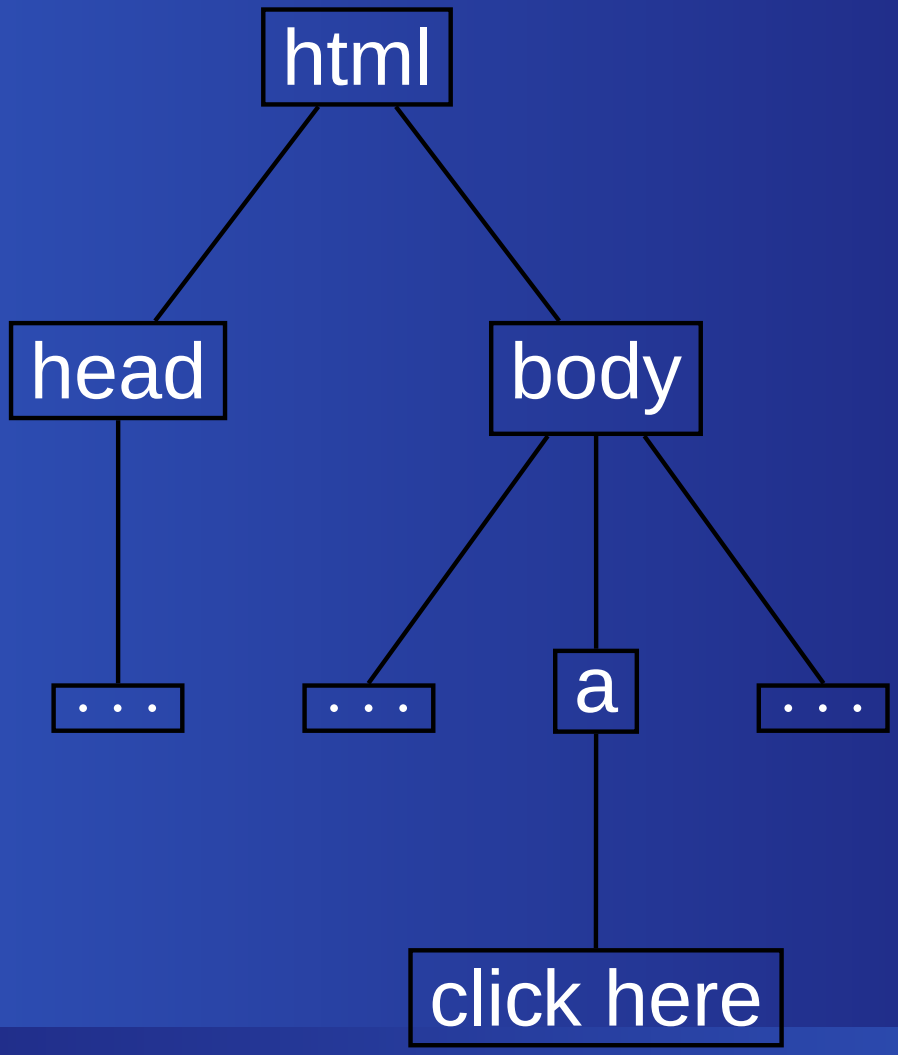
DOM2 Events

Interface EventListener

Defines event dispatch for XML browsers.

- Provides generic eventing framework.
- Generalizes HTML eventing mechanism.
- Framework for adding *behavior* to XML.

DOM2 Event Propagation



DOM2 Event Propagation

Event flow when click here *is activated.*

- User agent propagates event:
  - *Caputre* —Event travels from root to target,
  - *Target* —Event arrives at the target,
  - *Bubble* —event bubbles back to the root.

Observers can attach to nodes on path the event travels.

DOM2 Events Features

- A generic event system,
- Register event listeners and handlers,
- Route events through a tree structure,
- Access to context information for each event,
- Definition of event flow.

XML Events

Goals

- Expose DOM event model via XML markup.
- Extend events without modifying DTD.
- Integrate with other XML languages.

Authoring Behavior Via XML Events

Authoring —specify a $(element, event, handler)$ *triple.*

- ⟨listener⟩ —directly specify the triple.
- Observer —attributes specify event, handler.
- Handler —attributes specify event, observer.

Specifying Triple Explicitly

```
<listener event="activate"
observer="button1"
handler="#doit"/>
```

- Call handler identified by `#doit`
- When event `activate` occurs
- On element `id=button1`
- Or any of its children.

Stopping Event Propagation

```
<listener propagate="stop"
  event="activate" observer="block"
  handler="popup" phase="capture"/>
```

- Call handler `id=popup`
- when `block` receives event *activate*.
- *Stop* further propagation of this event.

Attaching Attributes To Observer

Events can be authored directly on the observer *element.*

```
<anyelement ev:event="ev:click"
  ev:handler="#clicker"/>
<a href="doc.html"
  ev:defaultAction="cancel"
  ev:event="activate"
  ev:handler="#popper">
  The document</a>
```

Attaching Attributes To The Handler

Handler can carry event attributes.

```
<script type="..." ev:event="submit"
  ev:observer="form1">
  return docheck(event);
</script>
```

- Declares script handler for event *submit*
- Arriving at element `id="form1"`.

XHTML
Generic Application Container

XHTML 1.1

XHTML 1.1 —Generic Application Container.

- Can host multiple namespaces.
- Presentation can be *styled*.
- Can be brought to life via events.

XML Vocabularies

XML vocabularies define domain-specific markup.

- Define constructs for encoding data.
- Declarative event handlers.
- Modality-specific event types.
- Use XML events to *bind* these handlers.

Turn XHTML browser into an application container.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