Outline

- Active vs. Passive
- Triggers in DBMS
- RSS on the Web
Passive DBMS

- Client-Server architecture
- Client (users)
  - Inserts data into server
  - Retrieves data from server
- Server (DBMS) waits for client’s request
  - Until client issues queries, server sits there "passively"
How?

- Suppose client wants to monitor if an event X happens to server

- How?
Push vs. Pull Technology

- **Client-Server architecture**
- **Push technology**
  - Server pushes information to client
  - TV broadcasting
- **Pull technology**
  - Client pulls information from server
  - Purchasing books from bookstore
- **From server’s perspective**
  - Pull = “Passive” server / Push = “Active” server
Method 1: Polling

- Client periodically asks to server if X happens
- Called “Polling”

Pros
- Simple implementation to client
- No change needed to server

Cons
- How often does client poll? Every minute, hour?
- If poll too seldom → may miss the event X
- If poll too often → too costly, burden to server
Method 2: Active DBMS

- Polling is not good enough for advanced applications
- Ideal: when the event $X$ occurs, server notifies to client
- Called “Active” DBMS

Steps:
- 1: client notifies to server that it is interested in the event “$X$”
- 2: server monitors if “$X$” occurs or not
- 3: when “$X$” occurs, server notifies to client
Method 2: Active DBMS

• Steps:
  • 1: client notifies to server that it is interested in “X”: Subscription
  • 2: server monitors if “X” occurs or not: Monitoring
  • 3: when “X” occurs, server notifies to client: Notification

• Subscription in DBMS is expressed in Triggers
Triggers

● A method to implement the Active DBMS
● A trigger is a statement that is executed automatically by the system as a side effect of a modification to the database.

● To design a trigger mechanism, we must:
   ● Specify the conditions under which the trigger is to be executed.
   ● Specify the actions to be taken when the trigger executes.
create trigger overdraft-trigger after update on account
referencing new as nrow
for each row
when nrow.balance < 0
begin atomic
    insert into borrower
    (select customer-name, account-number
    from depositor
    where nrow.account-number =
    depositor.account-number);
    insert into loan values
    (n.row.account-number, nrow.branch-name,
    – nrow.balance);
    update account set balance = 0
    where account.account-number = nrow.account-number
end
create trigger overdraft-trigger on account for update
if inserted.balance < 0
begin
    insert into borrower
    (select customer-name, account-number
    from depositor, inserted
    where inserted.account-number = depositor.account-number)

    insert into loan values
    (inserted.account-number, inserted.branch-name,
     - inserted.balance)

    update account set balance = 0
    from account, inserted
    where account.account-number = inserted.account-number

end
Active Web

- One wants to monitor web sites to see if an event “X” occurs or not
  - How?
- If each web site is DBMS, then using Active DBMS (ie, Triggers), “Active Web” can be implemented
- But
  - Not all web sites are backed up by DBMS
  - Not all DBMS of web sites can be accessed
Active Web

- Full-blown push technique is **impossible** on Web
  - Web pages simply do not have the push capability

- **Pull** technique is viable
  - But how to specify the event “X” in a generic manner?

- Solution
  - Pulling data via XML-based polling → RSS
RSS

- = **RDF Site Summary**
- = **Really Simple Syndication**
- Lightweight XML format designed for sharing headlines and other Web content

**Idea**

- Each web site publishes updates in RSS format
- Client periodically retrieves updates from web sites of interest (ie, Polling)
- Since RSS format is in XML model, easy to interpret
Brief “Messy” History

- 0.9: original RSS format by Netscape (1999)
- 0.91: simple RSS format by UserLand
- 0.92-0.94: improvement to 0.91 by UserLand
- 1.0: RDF-based improvement by RSS-DEV Working Group – stable core
- 2.0: general-purpose RSS by UserLand – stable core
  - Popular version (as of 2011)
- 7 RSS formats by 3 groups are being used
RSS Briefs

- RSS is in XML format
- `<rss>` contains any number of `<channel>`
  - `<channel>` has elements: `<title>`, `<link>`, `<description>`, `<language>`, `<copyright>`, `<rating>`, `<image>` ...
- `<channel>` contains any number of `<item>`
  - `<item>` has elements: `<title>`, `<link>`, `<description>`, `<author>`, `<category>`, `<comments>`, `<pubDate>` ...
Application Scenario

- “Renee” wants to monitor IST 777 web page, but does not want to browse it every day.
- The instructor is cooperative so that he agrees to write updates in RSS format and store them in a pre-arranged location.
- “Renee” writes a piece of Java code that can:
  - Retrieve updates from IST 777 regularly.
  - If there is interesting update, email to “Renee”.
  - Then, let the java code run and monitor IST 777.
<rss version="0.91">
  <channel>
    <title>IST777</title>
    <link>http://pike.psu.edu/classes/IST777/latest</link>
    <description>IST777 web page.</description>
    <language>en-us</language>
    <item>
      <title>Active Web</title>
      <link>http://pike.psu.edu/classes/IST777/latest/rss.ppt</link>
      <description>Presentation slide for active web.</description>
    </item>
    <item>
      <title>Proj#1 Newsl</title>
      <description>Proj#1 is due on XXX midnight…</description>
    </item>
  </channel>
</rss>
<rdf:RDF
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns="http://purl.org/rss/1.0/
    xmlns:dc="http://purl.org/dc/elements/1.1/"
    
    <channel rdf:about="http://pike.psu.edu/classes/IST777">
    <title>IST777</title>
    <link>http://pike.psu.edu/classes/IST777/latest/</link>
    <description>IST777 web page.</description>
    <language>en-us</language>
    <items>
        <rdf:Seq>
            <rdf:li rdf:resource="link>http://pike.psu.edu/classes/IST777/latest/rss.ppt="/"></rdf:Seq> …
        </items>
    <item>
        <title>Active Web</title>
        <link>http://pike.psu.edu/classes/IST777/latest/rss.ppt</link>
        <description>Presentation slide for active web.</description>
        <dc:creator>Dongwon Lee</dc:creator>
        <dc:date>2011-01-01</dc:date>
    </item> …
    
    </channel>
</rdf:RDF>
<rss version="2.0" xmlns:dc="http://purl.org/dc/elements/1.1/">
  <channel>
    <title>IST777</title>
    <link>http://pike.psu.edu/classes/IST777/latest/</link>
    <description>IST777 web page.</description>
    <language>en-us</language>
    <item>
      <title>Active Web</title>
      <link>http://pike.psu.edu/classes/IST777/latest/rss.ppt</link>
      <description>Presentation slide for active web.</description>
      <dc:creator>Dongwon Lee</dc:creator>
      <dc:date>2011-01-01</dc:date>
    </item> ...
  </channel>
</rss>
RSS Readers/Aggregators

- Software that can read RSS feeds from the chosen content providers
- Really a generalization of the Renee’s Java code in the aforementioned example
- Eg
  - Awasu: http://www.awasu.com/
  - FeedDemon: http://www.feeddemon.com/
  - NewsCrawler: http://www.newzcrawler.com/
  - RSSReader: http://www.rssreader.com/
  - Google Reader: http://www.google.com/reader
VHS vs. Beta

- Alternative to RSS: Atom, MetaWeblog API
- RSS was originally designed for news feeds in 1999
  - To list short and simple headlines
- RSS does not fit well into some of the currently popular web applications (eg, Blog)
- Too messy specifications of RSS
- Who will win?...
Atom 1.0

- New XML-based syndication format
  - V 1.0: IETF RFC, 2005
- More robust and feature-rich than RSS
- RSS 2.0 is copyrighted by Harvard U.
  - No further change/development is possible
- Better well-defined elements than RSS
- Better handling of contents than RSS
  - Content: plain text, HTML, XHTML, XML, binary
- RSS: `<channel>` has multiple `<item>`
- Atom: `<feed>` has multiple `<entry>`
Atom 1.0 Elements

- `<feed>` contains:
  - `<id>`: feed ID
  - `<title>`
  - `<updated>`
  - `<author>`: have `<name>`, `<email>`, `<uri>`
  - `<link>`: related page
  - `<category>`
  - …

Mandatory elements: `<id>`, `<title>`, `<updated>`

- `<entry>` contains:
  - `<id>`: entry ID
  - `<title>`
  - `<updated>`
  - `<author>`: have `<name>`, `<email>`, `<uri>`
  - `<content>`
  - `<link>`: related page
  - `<category>`
  - `<summary>`
  - …
RSS vs. Atom Comparison

RSS 2.0

```xml
<?xml version="1.0" encoding="utf-8"?>
<rss version="2.0">
  <channel>
    <title>Example Feed</title>
    <description>Insert witty or insightful remark here</description>
    <link>http://example.org/</link>
    <lastBuildDate>Sat, 13 Dec 2003 18:30:02 GMT</lastBuildDate>
    <managingEditor>johndoe@example.com (John Doe)</managingEditor>
    <item>
      <title>Atom-Powered Robots Run Amok</title>
      <link>http://example.org/2003/12/13/atom03</link>
      <guid isPermaLink="false">urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a</guid>
      <pubDate>Sat, 13 Dec 2003 18:30:02 GMT</pubDate>
      <description>Some text.</description>
    </item>
  </channel>
</rss>
```

http://www.intertwingly.net/wiki/pie/Rss20AndAtom10Compared
RSS vs. Atom Comparison

Atom 1.0

```xml
<?xml version="1.0" encoding="utf-8"?>
<feed xmlns="http://www.w3.org/2005/Atom">
  <title>Example Feed</title>
  <subtitle>Insert witty or insightful remark here</subtitle>
  <link href="http://example.org/">
  <updated>2003-12-13T18:30:02Z</updated>
  <author>
    <name>John Doe</name>
    <email>johndoe@example.com</email>
  </author>
  <id>urn:uuid:60a76c80-d399-11d9-b93c-0003939e0af6</id>
  <entry>
    <title>Atom-Powered Robots Run Amok</title>
    <link href="http://example.org/2003/12/13/atom03"/>
    <id>urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a</id>
    <updated>2003-12-13T18:30:02Z</updated>
    <summary>Some text.</summary>
  </entry>
</feed>
```

http://www.intertwingly.net/wiki/pie/Rss20AndAtom10Compared
Eg #1: ist.psu.edu
Eg #1: ist.psu.edu

The XML Source view of IST’s RSS
Eg #1: ist.psu.edu (RssReader)

- Place the mouse arrow on the RSS icon:
- Click the right mouse, then choose "Copy Shortcut".
- Start RssReader and go to add(+) channel/feed and then paste (click right mouse button) the url and press ok.
Eg #1: ist.psu.edu (RssReader)

- When new RSS item is updated at the IST site, RssReader notifies it to the user automatically.
Eg #2: PSU Daily Live

http://live.psu.edu/rss

Still Life

Arboretum sundial dedicated

Featured Video

1 2 3 4 5
Eg #2: PSU Daily Live
Eg #2: PSU Daily Live

Subscribe Here
Eg #2: PSU Daily Live (FireFox)

- Using FireFox live bookmarks:

![Firefox Live Bookmarks](image)

**Penn State Live – Daily**

**Research spending totals $804 million, emphasizes collaboration**
September 9, 2011 10:35 AM

Penn State’s expenditures on research and development totaled about $804 million for the previous year, noted Vice President for Research and Dean of the Graduate School H. James III today (Sept. 9).

**Travelers in Pennsylvania should check on potential road closings**
September 8, 2011 2:03 PM

Those traveling across Pennsylvania and possibly to University Park today (Sept. 8) are advised to check roadway advisories often. While Centre County was spared the worst of Tropical Storm Lee, much of eastern Pennsylvania is getting hit with heavy rains and reported flooding. Employees and students who travel ...

**Penn State’s director of Career Services wants to lead internationally**
August 31, 2011 12:00 PM

Jeff Garis, a Pennsylvania licensed psychologist who has worked in career services in higher education for almost 40 years, has returned to his alma mater as director of Penn State Career Services. Garis replaces Jack Rayman, who retired last December. "Jeff’s extraordinary
How to Generate RSS Feed?

1. In your server, designate one location for RSS feed and announce it
   - Eg, http://foo.bar.com/rss/
2. Generate news/update contents in an XML document (complying to either RSS or ATOM syntaxes)
   - Eg, use XMLPad for RSS 2.0 format
3. Put them into the designated location
4. That’s ALL! Wait for your contents to be PULLeled by RSS readers
Reference

- RSS at Harvard Law, Dave Winer, 2007
  - [http://cyber.law.harvard.edu/rss/rss.html](http://cyber.law.harvard.edu/rss/rss.html)
- The Atom Syndication Format, 2005