Review (1)

- Reliable data communication
  - Message re-transmission
  - Stop-and-Wait protocol
  - Pipelining protocol
    - Go-Back-N
    - Selective Repeat
    - Relationship between size of the sliding window and the size of the sequence number space
- Transport layer communication protocols
  - Socket programming, developing concurrent servers
  - UDP, RTP (general conceptual understanding)
  - TCP
    - Sequence number and acknowledge number
    - TCP three-way handshaking process
    - TCP flow control and TCP congestion control (slow start algorithm)

Review (2)

- Application layer communication
  - Communication architectures
  - Request-response: HTTP, FTP (notice the difference)
  - Messaging: SMTP
  - Domain Name Systems (DNS query resolution process, DNS caching)
- Developing networked applications
  - XML
    - How to write a well formed XML document
    - How to verify the validity of an XML document
    - Namespace in XML
  - Android Application Development
    - Key components of the Android System
    - Key components of the Android application
    - How to develop activity and manage activity lifecycle
    - How to use intents, how to perform network operation asynchronously

Review (3)

- Web service
    - The concept of RPC, RPC timing
    - The concept of Web Service
    - WSDL
- Streaming media communication
    - Three key problems to be addressed by using application level communication techniques.
    - Application layer technologies for concealing packet loss.

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Q&A

Quick exercise

- When will a proxy server decide not to cache a Web object?

    - A. The no-store option is used for the Cache-Control HTTP header.

    - B. The last-modified header is absent from the HTTP response.

    - C. The HTML document carried with the HTTP response is not well formed.

    - D. The HTTP response carries an XML document.

Quick exercise

- Why FTP is efficient in transferring big files?

    - A. No control message will be transmitted through data connection.

    - B. FTP control connection can also be used for transferring big files.

    - C. Using the stream data transfer mode, data communication can be conducted very efficiently.

    - D. Several data connections can be jointly used to transfer a big file.

Sample question

- In comparison with HTTP, identify at least three different reasons for FTP to be less useful for data transmission in the Internet.

Sample question

- In DNS, multiple name servers are often used for each DNS zone.

- What is the most important principle for selecting the location of secondary name servers.

Sample question

- You are administering a network connected to the Internet.

- Your users complain that everything is slow.

- Preliminary research of the problem indicates that it takes a considerable amount of time to resolve names of resources on the Internet.

- Identify two most likely reasons for this problem?

Sample question

- Create an XML document that records the retail price of one laptop model (e.g. 11-inch MacBook Air).

- Your XML document should include such information as
    - the currency used
    - the memory capacity
    - the storage capacity
    - the CPU speed
    - the price
    - the model

Quick exercise

- When should we use elements or attributes?

    - A. In general, data should go in elements, metadata in attributes.

    - B. If the information is expressed in a structured form, especially if the structure may be extensible, use elements.

    - C. If the information is intended to be read and understood by a person, use attributes.

    - D. Use an attribute if you need its value to be modified by another attribute.

Quick exercise

- Is there any problem with the use of elements and attributes in this XML document?

```
<menu>
  <menu-item portion-size="250" portion-unit="mL">
    <name>Small soft drink</name>
  </menu-item>
  <menu-item portion-size="500" portion-unit="g">
    <name>Sirloin steak</name>
  </menu-item>
</menu>
```

Quick exercise

- Which statements below about WSDL are correct?

  - A. WSDL is needed for publishing a Web Service.

  - B. WSDL is needed for subscribing to a Web Service.

  - C. The current version of WSDL is WSDL 2.0.

  - D. WSDL is developed by the World Wide Web Consortium

Sample question

- Identify and briefly explain four types of components that an Android application may have.

Quick exercise

- What are the main usage of intents?

  - A. Explicitly start a particular Service or Activity.

  - B. Explicitly stop a particular Service or Activity.

  - C. Start an Activity or Service to perform an action with a particular piece of data.

  - D. Broadcast that an event has occurred.

Sample question

- What are the benefits of externalizing resources in an Android application?