Introduction

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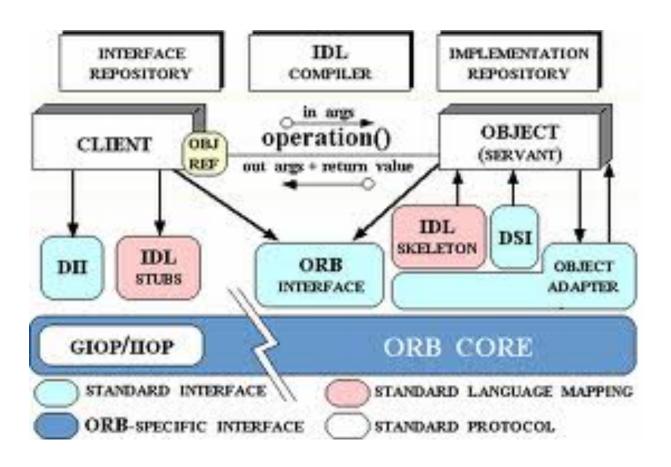
T-110.5140 Network Application Frameworks
Spring 2012

What is Network Application Framework?

- Collection of **interoperable technologies** that, when combined, allow the **network and its applications** to **operate seamlessly** as one fully connected **interdependent ecosystem** (Greenberg, 1999)

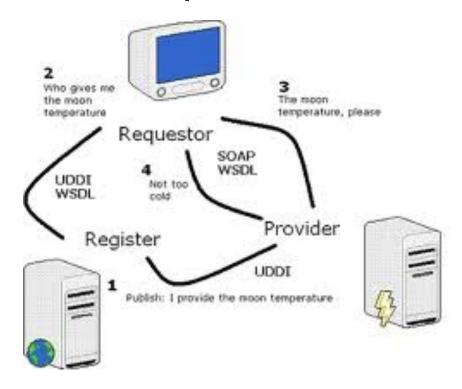- What this means in practice varies in time

The 90s answer

- CORBA
  - Common Object Request Broker Architecture

Early 2000 answer

- Web Services:
- SOAP – Simple object access protocol
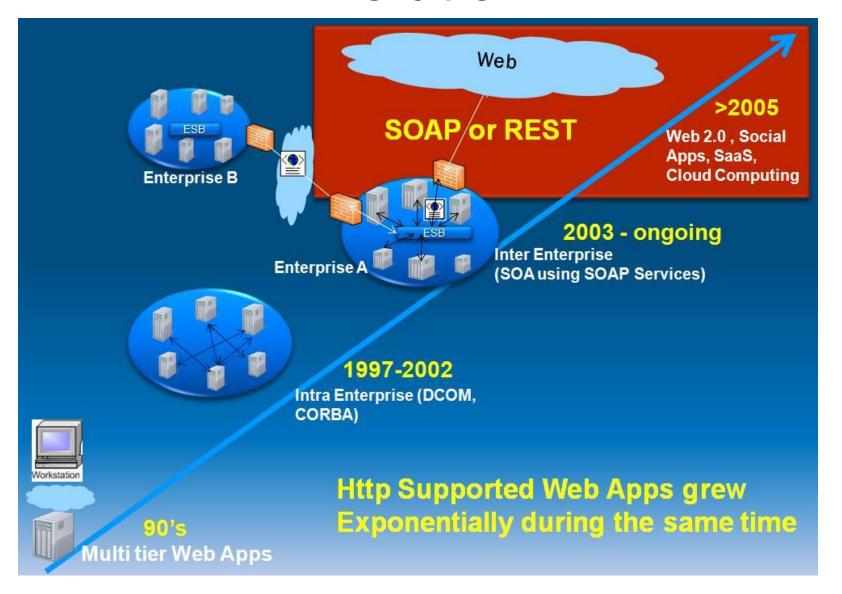 - Far from simple
- WSDL, UDDI

- Based on web technologies
- Rather complicated

Today's Answer

- Many different things depending on the point of view with web technologies is the focus
  - WEB languages (HTML, XML, HTML5)
  - WEB interfaces (REST)
  - WEB application extensions (mashups, Google APIs, Facebook APIs)
  - WEB servers and server-side applications
  - WEB browsers (JavaScript, AJAX)
  - Cloud platforms (Amazon, Google App Engine, MS Azure)
  - Mobile platforms (Android, iOS, Windows Phone7)
- This is the angle of this course

Evolution

XML, JSON, EXI

- ```
  <WebServiceResponse>
      <status>OK</status>
      <result>
      <type>sample</type>
      <name>Sample XML</formatted_address>
      <location>
              <lat>37.4217550</lat>
              <lng>-122.0846330</lng>
      </location>
  ```
  …

- Application independent communication language
  - XML (+ EXI Efficient XML Interchange)
  - JSON

REST

- [https://maps.googleapis.com/maps/api/place/search/xml?location=-33.8670522,151.1957362&radius=50&client=*clientId&sensor=true_or_false&signature=SIGNATURE*](https://maps.googleapis.com/maps/api/place/search/xml?location=-33.8670522,151.1957362&radius=50&client=clientId&sensor=true_or_false&signature=SIGNATURE)

- A way to remotely invoke execution at a remote node

Extend applications or use them as part of your app

☆ **Google Maps API Family**

Google Maps has a wide array of APIs that let you embed the robust functionality and everyday website and applications, and overlay your own data on top of them:

Maps JavaScript API

Embed a Google Map in your webpage using JavaScript. Manipulate the map and add content through many services.
Version 3 - Version 2

Maps API for Flash

Use this ActionScript API to embed a Google Map in your Flash-based web page or app. Manipulate the Map in three dimensions and add content through many services.
Learn more

Static Maps API

Embed a fast and simple Google Maps image in your web page or mobile site without requiring JavaScript or any dynamic page loading.
Learn more
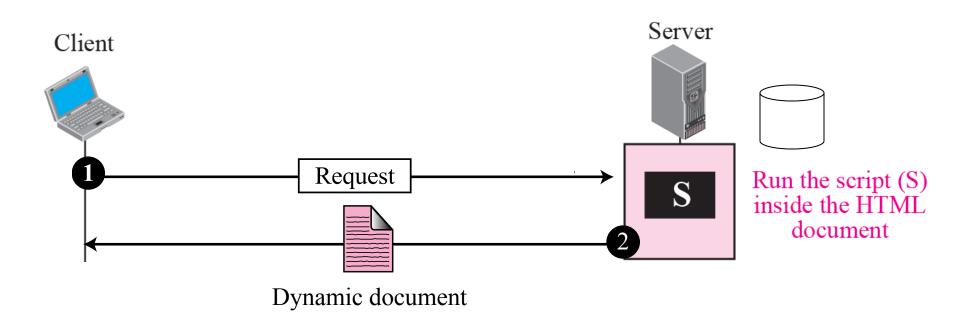
Web Services

Use URL requests to access geocoding, directions, elevation, and places information from client applications, and manipulate the results in JSON or XML.
Learn more
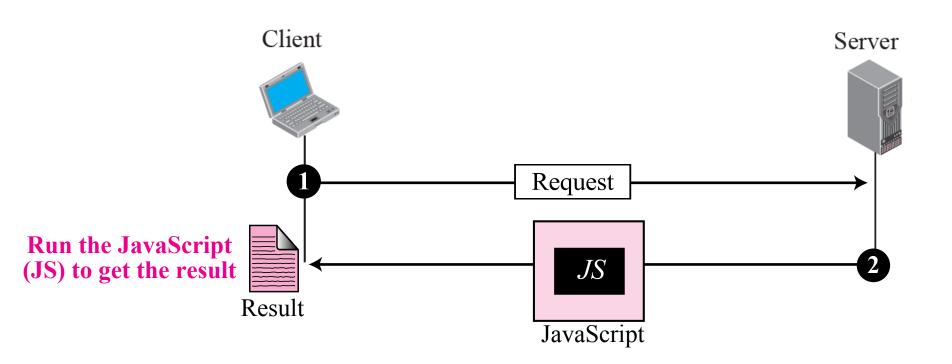
Web server generates content

Client

Server

① Request

② Run the script (S) inside the HTML document

Dynamic document
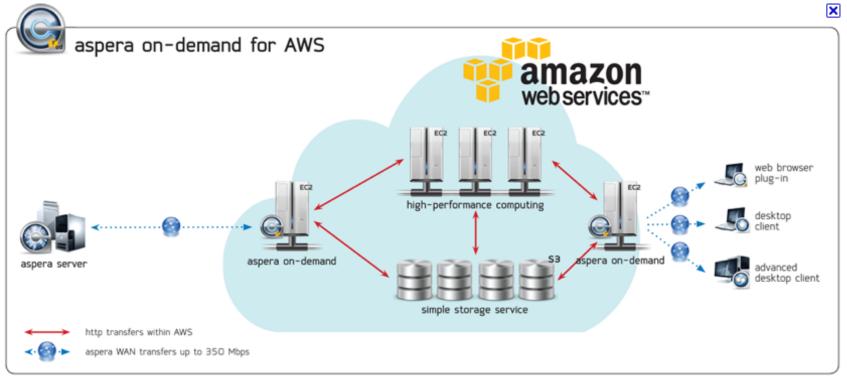
CGI, Java Server Pages, numerous language alternatives

Browser renders content but also executes code

Client

Server

1 Request

Run the JavaScript (JS) to get the result

JS

2

Result

JavaScript

JavaScript, AJAX

Hosting in the cloud

- No infrastructure investment, elasticity
- AWS, Azure, Google App Engine

Mobile platforms

End-to-end solution
with our niche skills set

Google Android

Windows Phone 7

iOS 4.2

HTML5
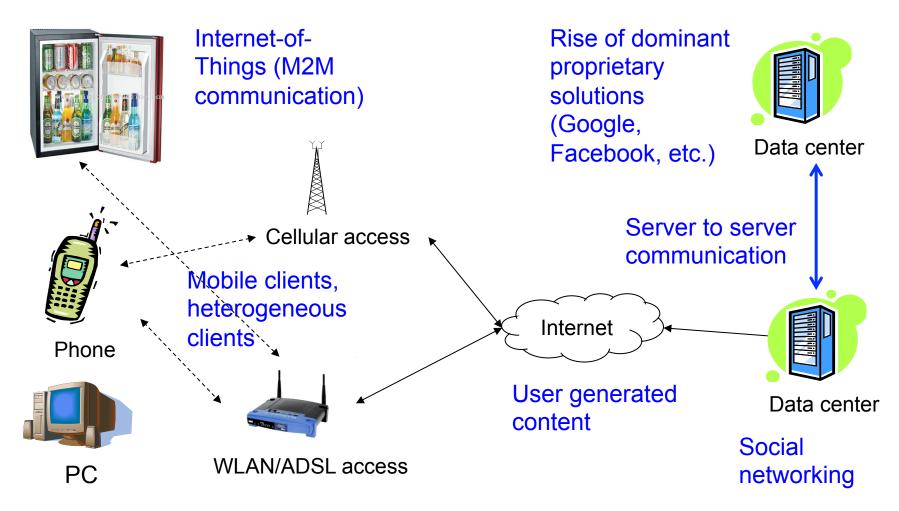
Improved HTML but more importantly new APIs for JavaScript applications
- Access to platform functionality (e.g. to location, video playback)
- Web Sockets (communication)
- Web Workers (threading)

High potential as a future platform for mobile apps

Currently splittered support in different browsers

New (or not so new) Challenges

Internet-of-Things (M2M communication)

Rise of dominant proprietary solutions (Google, Facebook, etc.)

Data center

Cellular access

Server to server communication

Phone

Mobile clients, heterogeneous clients

Internet

PC

WLAN/ADSL access

User generated content

Data center

Social networking

Usability of battery powered devices, energy cost, and environmental concerns

Questions / discussion