Advanced Programming Language (630501)
Fall 2011/2012 – Lecture Notes # 1

Overview of WAP (Wireless Application Protocol)

Outline of the Lecture
- ➢ **Introduction**
- ➢ **Problems of internet Wireless**
- ➢ **WAP Specifications and Architecture**

Introduction

- **WAP forum:** A Standard for wireless web Access (created by phone .com, Ericsson, Nokia and Motorola) and have over than 450 members.
- **Mobility:** is the ability to access information and services any time, anyhow and anywhere.
- **Popular technologies :**
  - ✓ Unwired planet (phone .com know) introduced **HDML** language (Handheld Device Markup language).
  - ✓ NTT DOCOMO → introduced **i-mode (cHTML).**
- **Other Technologies :**
  - ✓ **Push** Technology.
  - ✓ **WTA** (Wireless Telephony Application).
  - ✓ **LIS** (Location Information Service): GPS through many Antennas network Operator.
  - ✓ **WAP** Protocol (WML Language).
  - ✓ **Wireless LAN** (802.11b, 802.11a, 802.11g).
- **Connection to device (Laptop ,Phone,…..etc):**
  - ✓ **Cable.**
  - ✓ **IR.**
  - ✓ **Bluetooth** (faster connection speed).
  - ✓ Wireless LAN:-satellite networks (**GPS**).

Problems of internet Wireless
1.   Bandwidth.
2.   Screen (Mobile size and weight).
3.   TCP\IP not suitable for use with mobile phone communications.
4.   CPU.
5.   Memory Size.
6.   Batteries and power.
7.   Keyboard.

8. Connection kind.
9. Many overheads, requiring may messages between client and server just to set up a connection, so these call for a high processing power on the client device.
10. The internal structure of wireless network called latency: the information coming from the internet and going to the mobile phones has to go thought various elements in the mobile networks, each one introducing a little delay, also the air interface used to transmitted data to mobile telephones has a bandwidth that is very limited (9600 bit per second in GSM network) compared to (28-56 kbps) on a wired networks.

WAP Specifications and Architecture

- **WAP Specifications**
    1. **Applications layer.**
    2. **Session layer.**
    3. **Transaction layer.**
    4. **Security layer.**
    5. **Transport layer.**

> **These protocols (layers) use binary code to reduce the amount of data that has to be sent.**

- **WAP Application Architecture**
    - **Wireless network parts:**
        1. **Content provider** (Application or origin server).
        2. **Mobile device** (WAP client).
        3. **WAP gateway**, WAP proxy.

WAP Client	→	WAP Gateway	→	Application Server
	←		←	

- **Access information from internet using WAP client**
    a. **WAP phone → wireless network → WAP gateway → Internet → application server.**
    b. **WAP phone → wireless network → WAP gateway → company intranet→ application server.**
    c. **Web client → internet → application server (smart device).**

> **The WAP Architecture has been designed to closely follow the web; the only difference is the presence of the WAP gateway for translating between HTTP and WAP.**

- **WAP client**
  - ✓ **WAE user agent**

Wireless application environment user agent is the browser that renders the content for display.

  - ✓ **WTA user agent**

Wireless telephony application agent receives compiled WTA files from WTA server and executes them.

  - ✓ **WAP stack**

WAP stack allows the phone to connect to the WAP gateway using the WAP Protocols.

- **Application server**

This is the element is the network where the information (web, WAP) application reside.

- **WAP proxy, WAP gateway or WAP server?**
  - ✓ **Proxy**: this is an intermediary element acting both as a client and as a server in the network it is located between client and server; the client send requests to it and it retrieves and caches the information needed by contacting the origin Server.
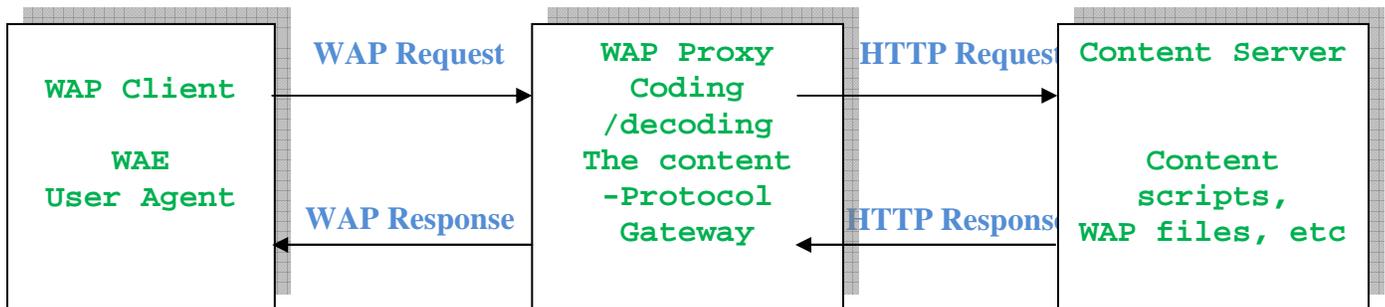 - ✓ **Gateway**: this is an intermediary element usually used to connect two deferent types of networks.
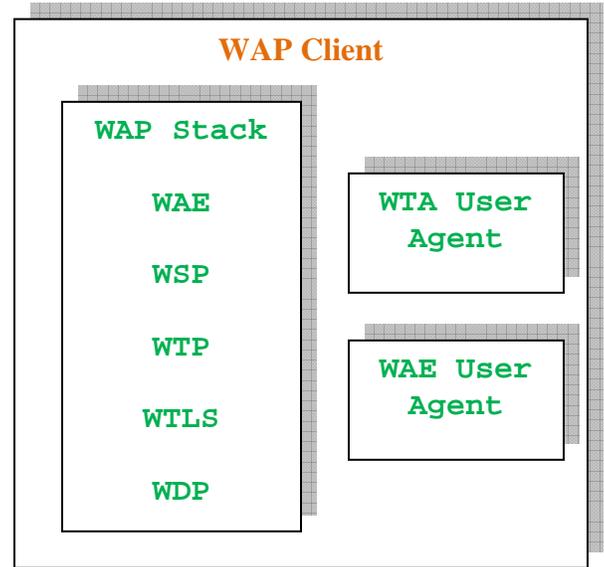
```
a) Client→ Internet→ origin server → HTML files.
b) Client→ proxy server→Internet→ origin server → HTML files.
c) Client→strange net→gateway→ Internet→ origin server → HTML
   files.
```

WAP Client

WAP Stack	
WAE	WTA User Agent
WSP	
WTP	WAE User Agent
WTLS	
WDP	

WAP Client
WAE User Agent
— **WAP Request** →
— ← **WAP Response** —

WAP Proxy
Coding /decoding
The content -Protocol Gateway
— **HTTP Request** →
— ← **HTTP Response** —

Content Server
Content scripts, WAP files, etc

WAP Gateway is basically software that is placed between a network that supports WAP and IP packet network such as Internet.