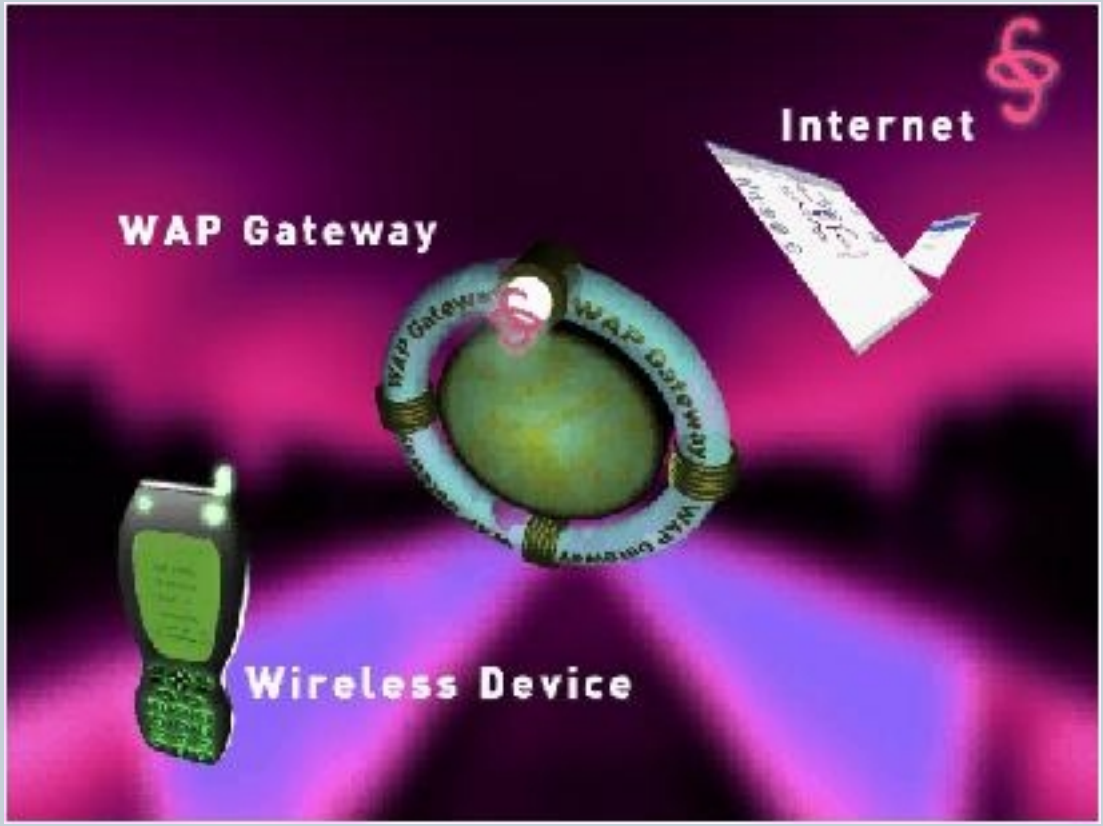
Mobile Computing
Lecture 23
WAP (Wireless Application Protocol) 2

CONTENTS

WAP DEVICES



Cont..

- **WAP DEVICE**

  - Is used to access WAP applications and content. It might be a PDA, handheld computer.

- **WAP CLIENT**

  - Entity that receives content from Internet via a WAP Gateway. This is usually the WAP Browser.

- **WAP CONTENT/ORIGIN/APPLICATION SERVER**

  - Element in the network where the information or web/WAP applications resides.

WAP PROXY

- Acts both as a client and as a server in the network. Typically has
  - Protocol gateway : translates requests from the WAP protocol stack to WWW protocol stack
  - Content encoders and decoders : translate WAP content into compact encoded formats to reduce the size of data over the network
- It allows content and applications to be hosted on standard WWW servers

Cont..

- **WAP GATEWAY**

  Intermediary element used to connect two different types of network. It receives request directly from the clients as if it actually were the origin server that clients want to receive the information form. The clients are usually unaware that they are speaking to the Gateway.

- **WAP BROWSER**

  Software running on the WAP device that interprets the WAP content arriving from the internet and decides how to display it on WAP device.

WML

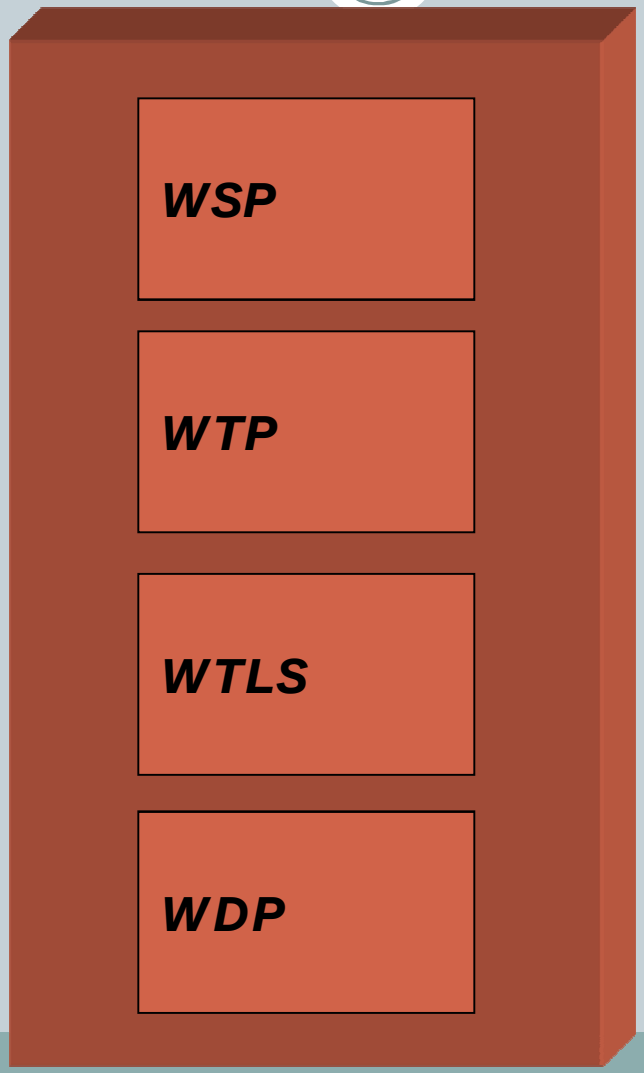
- WML – Wireless Markup Language formerly called HDML (Handheld Devices Markup Language)
- Is a tag language that allows the text portions of Web Pages to be presented on cellular phones and Personal Digital Assistants (PDAs) via wireless access.
- WML is used for delivering data to WAP devices, and is HTML- like in its appearance.

WAP PROTOCOL STACK

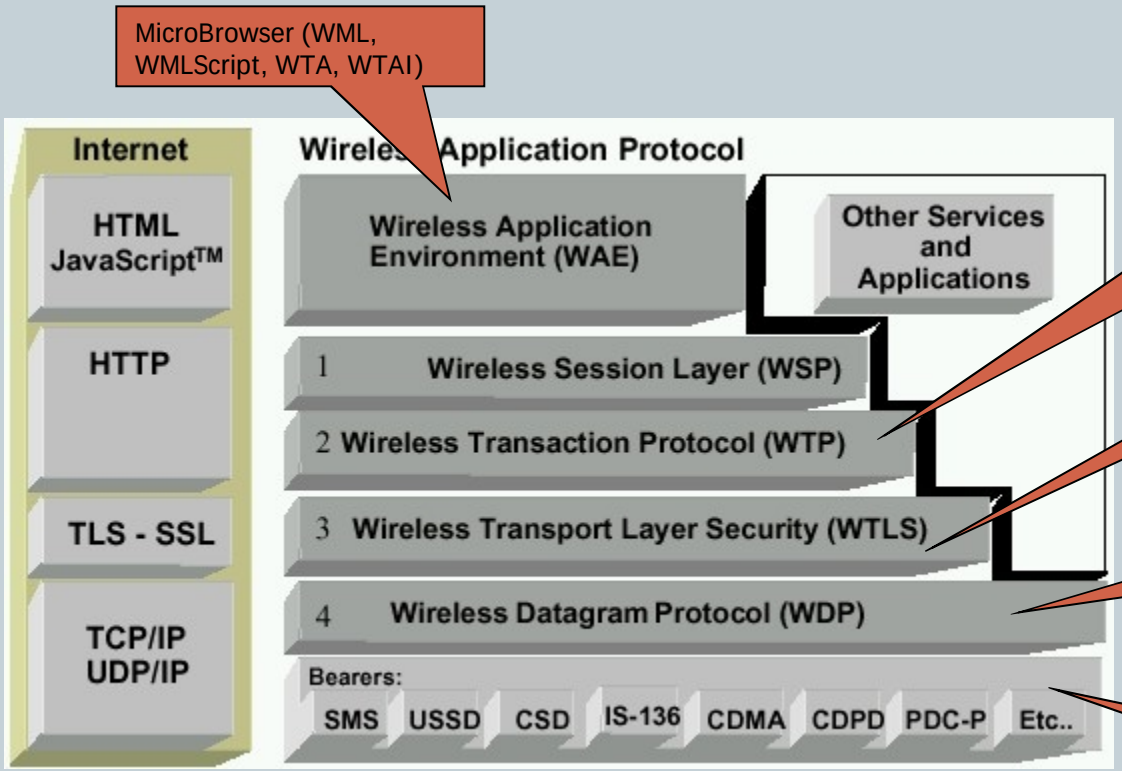
- The protocol for WAP is broken down into different parts which is known as the WAP protocol stack..

1. WDP
2. WTP
3. WSP
4. WTLS

WAP PROTOCOL STACK



WAP Stack



MicroBrowser (WML, WMLScript, WTA, WTAI)

Runs on top of WDP
Provided lightweight X-oriented service
- Unreliable 1-way request
- Reliable 1-way/2-way req./response

Lightweight SSL
Uses WIM/PKI-Cards

Datagram service on different bearers
Convergence between bearer services

Different Wireless Tech.

Source: WAP Forum

COMPONENTS OF WAP ARCHITECTURE

Wireless Datagram Protocol (WDP)

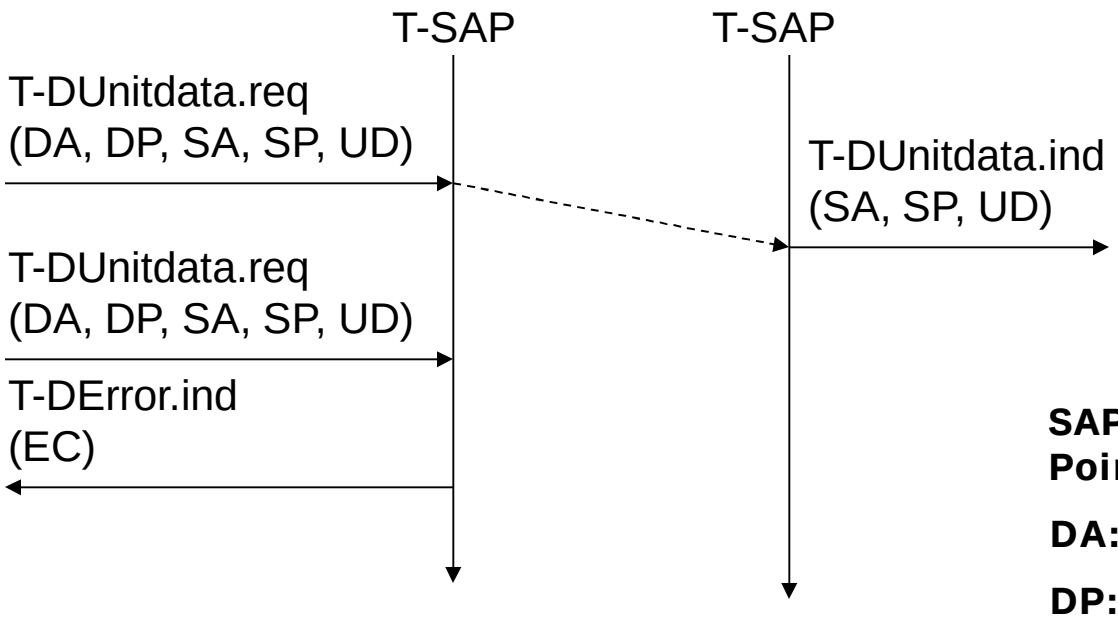
- The WAP datagram protocol (WDP) is the Transport layer that sends and receives messages via any available bearer network.
- It is the most bottom layer and responsible for moving WAP data from sender to receiver & back again.
- Provides a common interface to the upper layer protocols and hence they function independent of the underlying wireless network.

Cont..

- Goals
  - create a worldwide interoperable transport system by adapting WDP to the different underlying technologies
  - transmission services, such as SMS in GSM might change, new services can replace the old ones

- WDP
  - Transport layer protocol within the WAP architecture
  - uses the Service Primitive
    - T-UnitData.req .ind
  - uses transport mechanisms of different bearer technologies
  - offers a common interface for higher layer protocols
  - allows for transparent communication despite different technologies
  - addressing uses port numbers
  - WDP over IP is UDP/IP

WDP: Service Primitives



SAP: Service Access Point

DA: Destination Address

DP: Destination Port

SA: Source Address

SP: Source Port

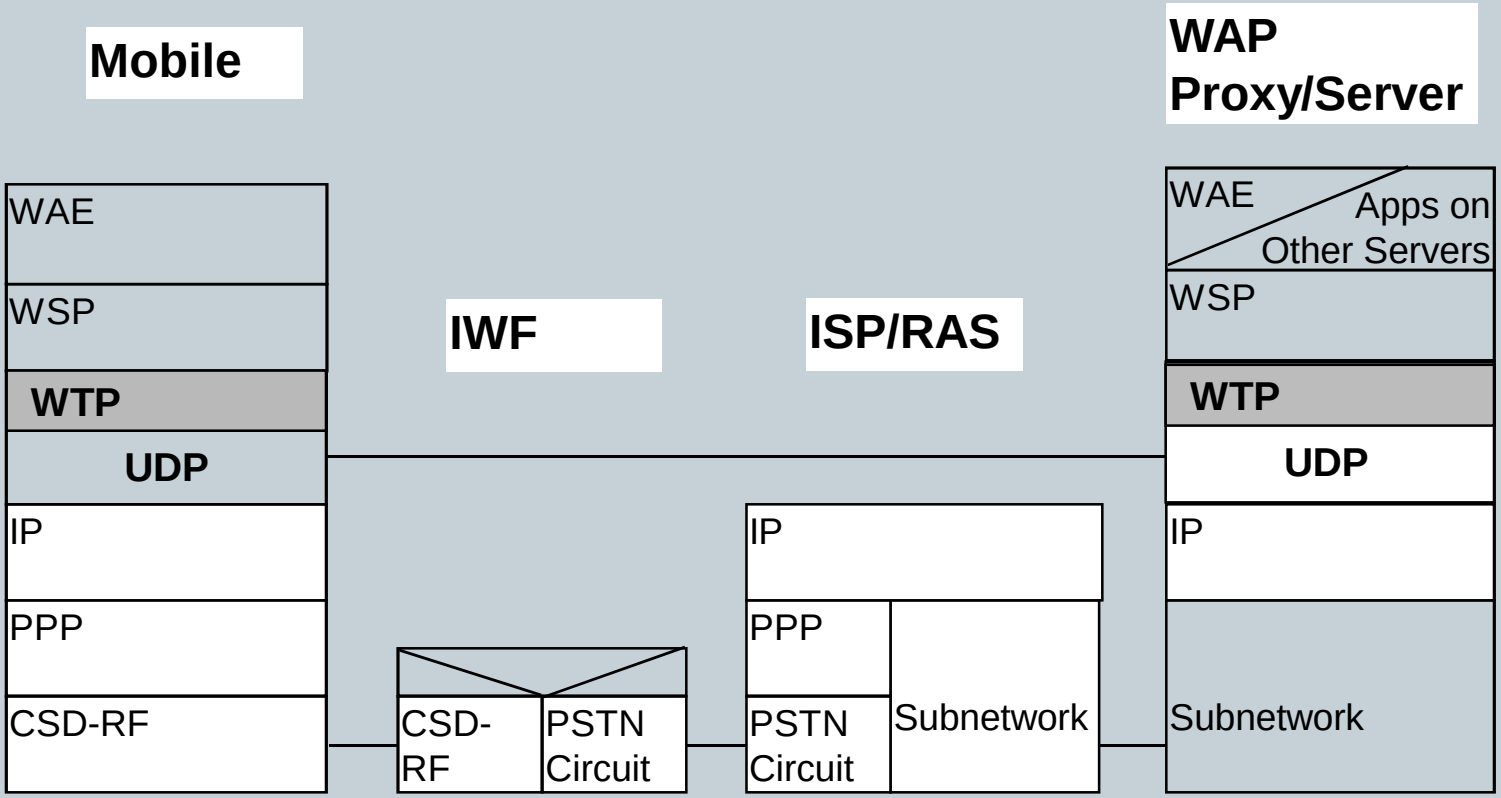
UD: User Data

EC: Error Code

Source: Schiller

Service, Protocol, and Bearer Example

WAP Over GSM Circuit-Switched

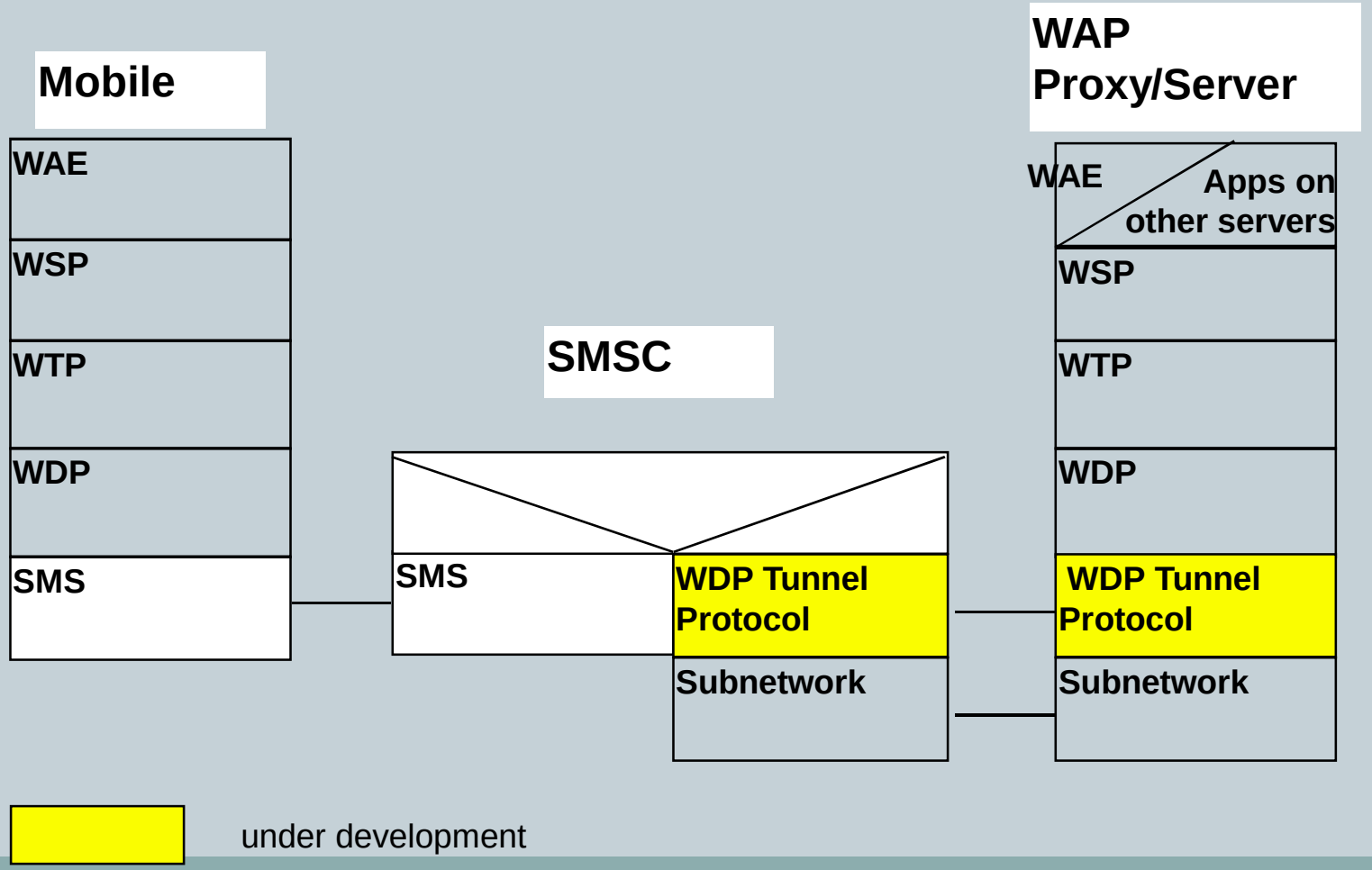


RAS - Remote Access Server
IWF - InterWorking Function

Source: WAP Forum

Service, Protocol, and Bearer Example

WAP Over GSM Short Message Service



Source: WAP Forum

Wireless Session Protocol (WSP)

- The WAP session protocol (WSP) layer provides a lightweight session layer to allow efficient exchange of data between applications.

- It creates a session between the WAP client & the WAP Gateways. Each session has an unique id & must be started, stop, resume or disconnected.

Wireless Transaction Protocol (WTP)

- The WAP transaction protocol (WTP) layer provides transaction support, adding reliability to the datagram service provided by WDP.

- It make sure that packets sent via WDP actually arrive at their destination by waiting acknowledgement.