CS8601 –MOBILE COMPUTING

UNIT 4

MOBILE TRANSPORT AND APPLICATION LAYER

4.8. Wireless Telephony Application (WTA) architecture

WTA is a collection of telephony specific extensions for call and feature control mechanisms, merging data networks and voice networks. It is an extension of basic WAE application model

Features:

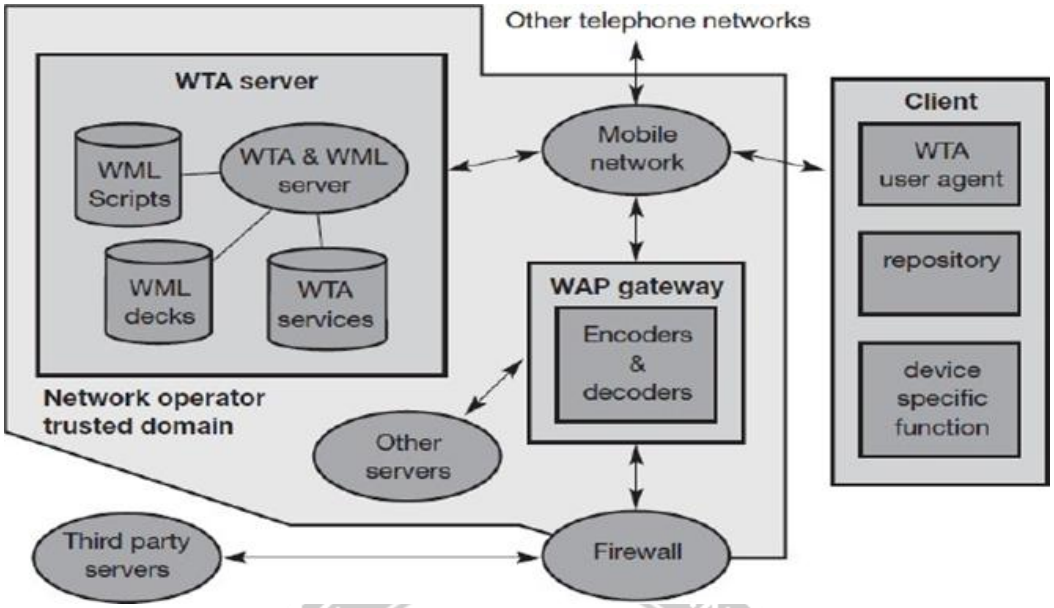
•***Content push:*** A WTA origin server can push content to the client. A push can take place without prior client request. The content can enable the client to handle new network events.

•***Access to telephony functions:*** The wireless telephony application interface (WTAI) provides many functions to handle telephony events such as call accept, call setup, change of phone book entries etc....

•***Repository for event handlers:*** The repository represents a constant storage on the client for content required to offer WTA services. Content are either channels or resources.

- ✓ Examples for resources: WML decks, WMLScript objects, or WBMP pictures.
- ✓ A channel comprises references to resources and is associated with a lifetime.
- ✓ Within this lifetime, it is guaranteed that all resources the channel points to are locally available in the repository.
- ✓ The motivation behind the repository is the necessity to react very quickly for time-critical events.

•***Security model:*** Mandatory for WTA is a security model. WTA allows the client to only connect to trustworthy gateways and check if the servers providing content are authorized to send this content to the client.



a)Client

•The client is connected via a mobile network with a WTA server, other telephone networks and a WAP gateway.

•A WML user agent running on the client.

•The client may have voice and data connections over the network.

b)Firewall: Firewall is useful to connect third-party origin servers outside the trusted domain.

c)WTA server: One difference between WTA servers and other servers besides security is the tighter control of QoS.

d)Other servers: Other origin servers can be connected via the WAP gateway. Other servers located in the internet, may not be able to give as good QoS guarantees as the network operator.

e)Network operator: A network operator knows the latency, reliability, and capacity of its mobile network and can have more control over the behaviour of the services.

f)WTA user agent: The WTA user agent has a very rigid and real-time context management for browsing the web compared to the standard WML user agent.

<u>Interaction between a WTA client, a WTA gateway, a WTA server, the mobile network and a voice box server:</u>

•WTA server to generate new content for pushing to the client.

•The server sends a push message containing a single URL to the client.

•The WTA gateway translates the push URL into a service indication and codes it into a more compact binary format.

•The WTA user agent then indicates that new messages are stored.

•If the user wants to listen to the stored messages, he or she can request a list of the messages. This is done with the help of the URL. A WSP get requests the content the URL points to.

•The gateway translates this WSP get into an HTTP get and the server responds with the prepared list of callers.

•After displaying the content, the user can select a voice Powered by TSS message from the list.

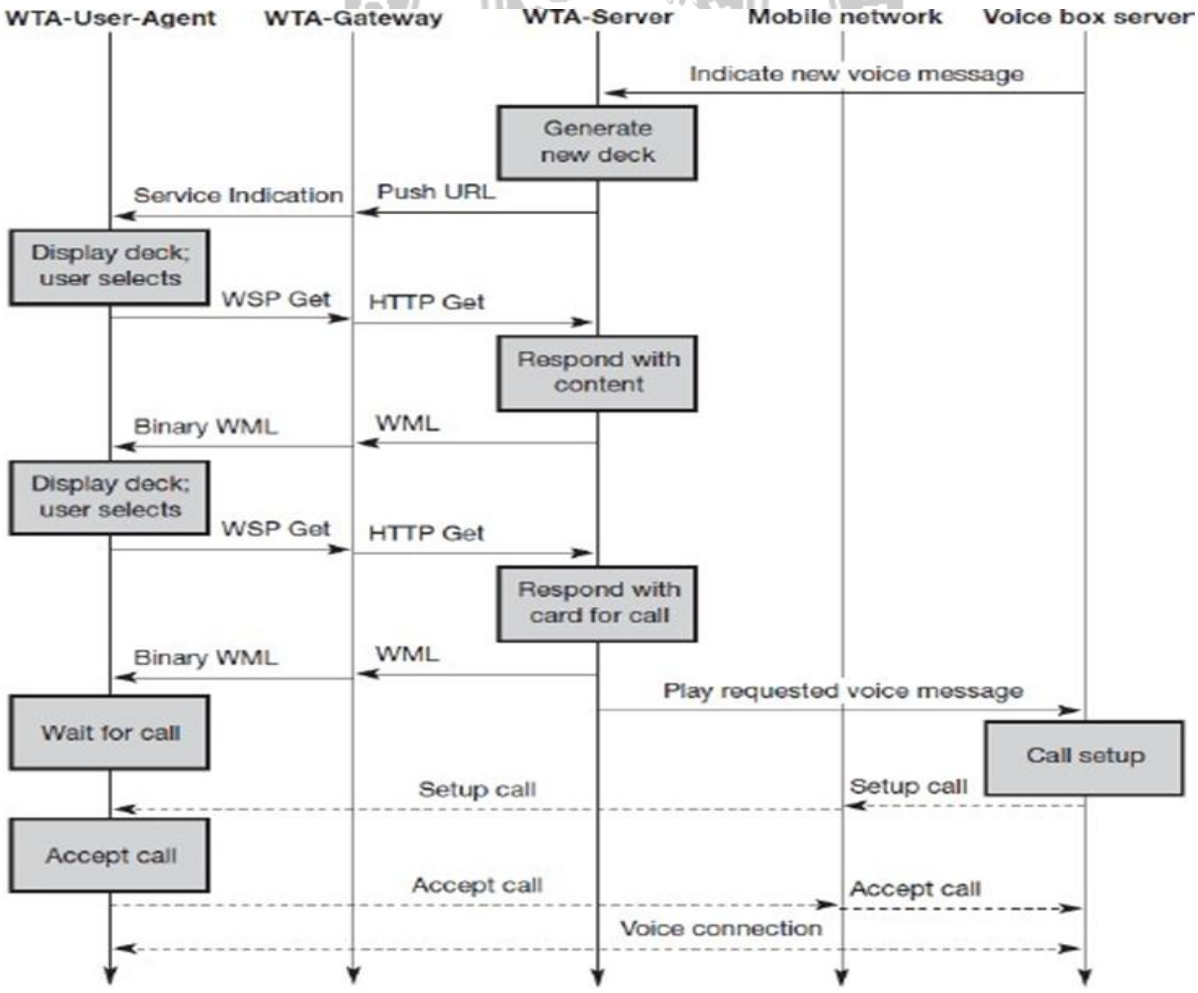
•Each voice message in this example has an associated URL, which can request a certain WML card from the server. The purpose of this card is to prepare the client for an incoming call.

•As soon as the client receives the card, it waits for the incoming call.

•The call is then automatically accepted.

•The WTA server also signals the voice box system to set up a voice connection to play the selected voice message.

•Setting up the call and accepting the call is shown using dashed lines, as these are standard interactions from the mobile phone network, which are not controlled by WAP.



Wireless mark-up language (WML)

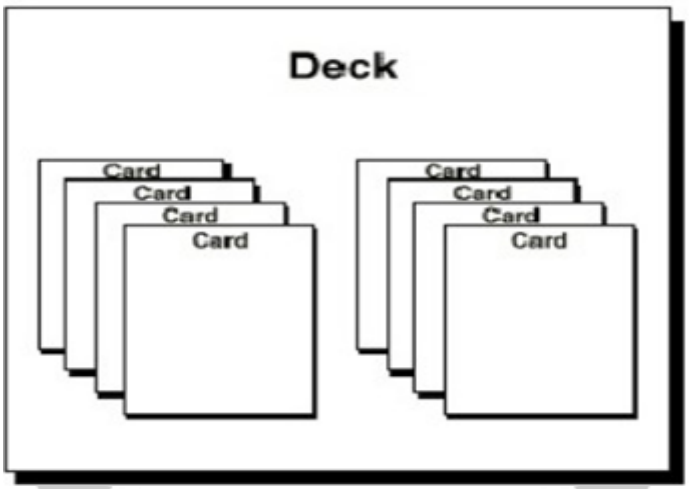
The wireless mark-up language (WML) is based on the standard HTML and on HDML.WML is specified as an XML document type.

•Constraints of wireless handheld devices when designing WML :

- ✓ Wireless link will always have a very limited capacity compared to a wire.
- ✓ Current handheld devices have small displays
- ✓ Limited user input facilities
- ✓ Limited memory
- ✓ Low performance computational resources.

•WML follows a deck and card metaphor. A WML document is made up of multiple cards. Cards can be grouped together into a deck. A WML deck is similar to an HTML page.

•A user navigates with the WML browser through a series of WML cards, reviews the contents, enters requested data, makes choices etc. The WML browser fetches decks as required from origin servers.



•Either these decks can be static files on the server or they can be dynamically generated.

•WML describes the intent of interaction in an abstract manner. The user agent on a handheld device has to decide how to best present all elements of a card.

Features of WML:

Text and images: WML gives hints how text and images can be presented to a user. However, the exact presentation of data to a user is up to the user agent running on the handheld device.

User interaction: WML supports different elements for user input. Examples: text entry controls for text or password entry, option selections or controls for task invocation.

Navigation: WML offers a history mechanism with navigation through the browsing history, hyperlinks and other inter card navigation elements.

Context management: WML allows for saving the state between different decks without server interaction so state can be shared across different decks.

WML	HTML
Mark-up language for wireless communication	Mark-up language for wired communication
Makes use of variables	Does not use of variables
WML script stored in a separate file	JavaScript is embedded in the same HTML file
Images are stores as WBMP(Wireless Bitmap)	Images are stores as GIF, JPEG orPNG
WBMP is a 2 bit image	Size of the images are much larger in HTML
Case sensitive	Not Case sensitive
WML has fewer tags than HTML	HTML has more tags than WML
A set of 'WML cards' make a 'DECK'	A set of 'HTML pages' make a 'SITE'

WMLScript:

•Provides a general scripting capability in the WAP architecture

•Offers several capabilities not supported by WML

Validity check of user input: Before user input is sent to a server, WMLScript can check the validity and save bandwidth and latency in case of an error. Otherwise, the server has to perform all the checks

Access to device facilities: WMLScript offers functions to access hardware components and software functions of the device.

Local user interaction: WMLScript can directly and locally interact with a user, show messages or prompt for input.

Extensions to the device software: With the help of WMLScript a device can be configured and new functionality can be added even after deployment.