

Mobile Architecture for Enterprises

Executive Summary

With rapid deployment of 3G networks, 3G cell phones and broadband access on cell phones the next generation of application are being developed keeping this new infrastructure in mind. This paper considers various architectural options available to IT team and suggests a converged solution of thick client, thin client (WAP), messaging and web services approach for future mobile application development.

Enterprise architecture for mobile phones?

This paper considers mobile application architecture relevant for current wireless networks and enterprises -

1. **Thick Client** Code and data stored on the device
2. **Rich Client** Code stored on the device; little or no resident data
3. **Thin Client** Browser or similarly generic client
4. **Messaging** E-mail, SMS, instant messaging or other messaging technology used as data transport and user interface

A comparison on Mobile Application Architectures -

	Thick	Rich	Thin	Message
Usability	High	High	Moderate	Low
Sophistication	High	High	Moderate	Very Low
TCO	High	High	Low	Low
Support Peripherals	Yes	High	Low	Low
Out of Signal Operation	Yes	Limited	No	No
Security	Flexible, High	Flexible, High	Inflexible, moderate	Inflexible, Low
Device Range	Very Limited	Limited	Broad	Very Broad

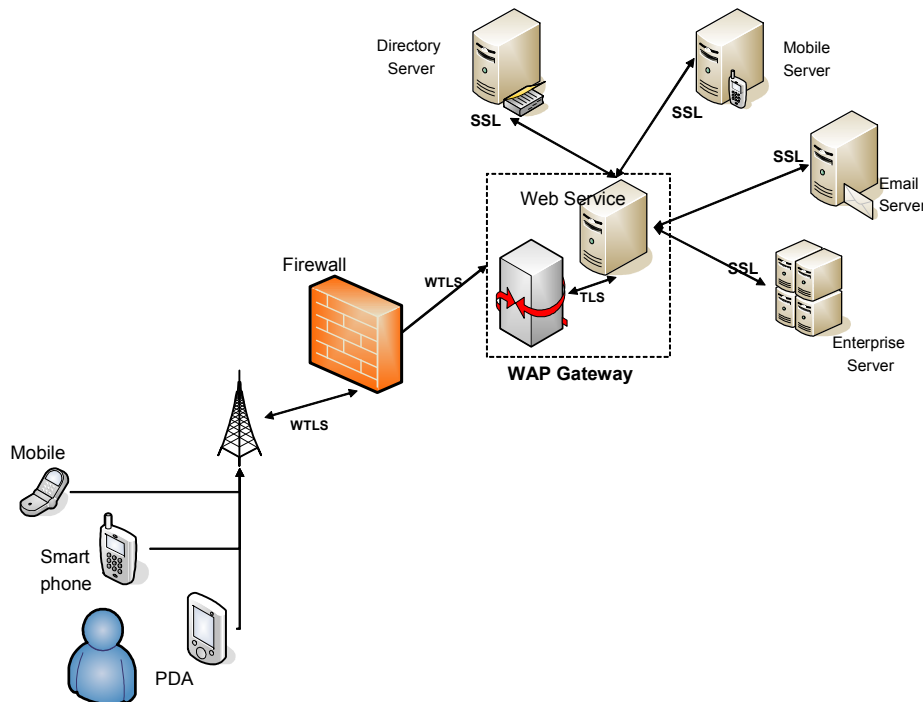
To help corporate technologists compartmentalize mobile architectures into categories with distinct characteristics, pros, and cons

- Thick client — the implication being that the client-side devices (PDAs, smartphones, and PCs) have local compute resources, thick clients are well suited to scenarios where end-users must work with data when no network is available and where security is a primary concern (thickness lends itself to a broader range of options when it comes to security). On the downside however, their sophistication and cost is commensurate with the complexity. It is the most expensive and involves the fewest number of devices.
- Rich client — Code may reside in the device, but not data — at least not a lot of data. The best vertical examples I can think of are the tablets that the folks from FedEx and UPS carry around with them. Gartner recommends rich client deployments when "you need better usability than thin clients but better TCO than thick ones."

- Thin client — Though not as good on the usability front as rich or thick clients, the main selling point of a thin client approach is the broad range of devices supported, largely due to the reliance on standard client side technology such as HTML or XHTML browsers or the mobile version of Flash (Flash Light). Thin clients involve no persistent code or data on the device side, but fall completely apart once network connectivity is lost. There are also fewer security options (eg: VPN or HTTPS) but the good news is that total cost of ownership is commensurate with such dramatically diminished complexity (relative to rich or thick clients).
- Messaging — confined to the limitations of mobile email or SMS messaging which means that as the need for more sophistication goes up (eg: something transactional), the more the final solution begins to look like a rich client, or, the more the burden is placed on end-users to massage the message formats into something that a back-end infrastructure knows what to do with. Security may or may not be a concern here. When relying on proprietary e-mail mechanisms such as those offered by RIM or Microsoft, security is good. But SMS over wireless and public networks does not offer the sort of security that many applications require. On the point of total cost of ownership, reliance on off the shelf solutions makes this a low cost option ¹

Accessing enterprise information on mobile is not as easy as one has to choose the architecture and functionality which allows for easy navigation, security, reduced latency and at the same time the solution needs to work on all devices seamlessly.

Mobile Architecture for Enterprise solution



The architecture above has certain salient features –

¹ <http://blogs.zdnet.com/BTL/?p=3753>

- Security over wireless networks is an issue where protocol jumps from wireless to wired networks which can be addressed for enterprises which host the WAP server inside the firewall as shown above.
- Integration with email and mobile server to enhance messaging
- Finally integration with directory server and Enterprise server using web services.

While looking at the industry technology trend where 3G iPhone from Apple, Nokia's code named product "tube" and AT&T plan to launch RIM of 3G Blackberry bode well for combination wherein we exploit thin client & thick client and provide access to enterprise users on mobile devices with ease. Industry standard WAP browsers like Opera and IE are available on most mobile phones.

Some of the pros and cons of this solution

- Multiple architecture support mobile browsers requiring only one set of source code for implementation.
- Future support and updates of the application are controlled on the server and don't require reinstallation on thousands if not millions of client devices.
- A thick client version of the application which allows for download of critical data with pre-defined frequency of synchronization will address the need for offline browsing.
- Licensing and legal issues are avoided with a WAP or thin client based model.
- User usage, trends and hit counts for marketing purposes are easily obtained from standard Web server metrics.

Accessing enterprise data using web services provides for a flexible implementation and reduces the need to make changes to enterprise systems while implementing mobile solutions.

CRM functionality on Mobile

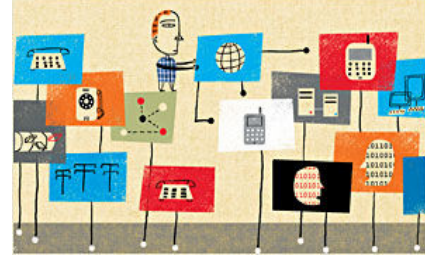
The paper highlights existing CRM functionality offered by package products and then selecting screens and functionality that should be provided to users where usability will not be compromised. Enable functions on mobile devices that will result in increase in productivity, reduce reporting effort and calls to head office. Emphasis was to enable search and viewing of information, messaging and calling with very few taps or presses to access information thereby providing ease of use, convenience and less strain on the sales person.

Secondly, recording vital information and assigning tasks in real time. Updates only for critical tasks related to an order or invoice which will give significant benefits. We've purposely avoided creation of complex invoices and order on mobile as this reduces the usability of the system for the user.

List of Sales Force functionality and features to be made available on mobile are listed -

1. Account Information – Display of representative (Contact) information related to account. To call the person or SMS someone by touching the screen or using stylus
2. Contact Information – Ability to add, track and update contacts and companies. Ability to search and access Organization chart in a tree view.

3. Opportunity Information – Record opportunities with contacts and their roles. Display List opportunities for various accounts and contacts. Search opportunities based on access rights.
4. Time Management – Calendar views, ability to schedule an activity in the calendar, display all the calls and tasks scheduled for the day. Bi-directional updates with MS Outlook Mobile and CRM systems.
 - a. Access to appointments programmed by head quarters.
 - b. Ability to create new appointments for users and reallocate leads.
 - c. Receive SMS whenever a critical appointment is scheduled by the inside sales team.
5. Invoice Management - Reception of pending invoices from headquarters. User can update invoices which have been delivered against orders to headquarters. Sales agents can view list of partial or total payment of invoices for various accounts.



Additionally, allow for users to set up data feeds for critical when they are in an out of coverage area or send an SMS request to receive data in SMS.

Conclusion

Having looked at various architectures, options and industry trends we feel that a mobile solution which combines the power of web services, messaging, a small footprint on device and a WAP browser will provide maximum benefit to the IT team and business users. Apart from the reduced TCO and an architecture which allows for easy management of the system it has potential for future growth once 4G networks are rolled out and bandwidth and latency is no longer a concern.

NEERAJ KAPOOR (E-mail: n.kapoor@one-associates.com)
7 Shankar Parvati Chambers,
Bund Garden Road, PUNE INDIA. (Tel: (91.20) 30524113)