COMARCH AUTOMOTIVE

Implementing Bluetooth Message Access Profile

Customer:
Phone manufacturer

Country:
Finland

Broad-scope telecommunications company supplying mobile phones, mobile and fixed telecommunications networks, data communications solutions. It also offers Internet services including applications, games, music, maps, media and messaging.

Business type:
Outsourcing

Challenges

Message Access Profile (MAP)[1] facilitates the exchange of messages between devices. It is mostly used for hands-free use and for syncing SMS and email messages with an on-board terminal. Actually, the automotive industry is one of the fastest growing markets for Bluetooth technology in general and hands-free systems are now included as standard equipment in millions of new cars and trucks.

However, the existing solutions on the mobile phones side were only implemented by a handful of brands. Here was a gap that needed to be filled.

Back in 2011, the only devices which used MAP where:

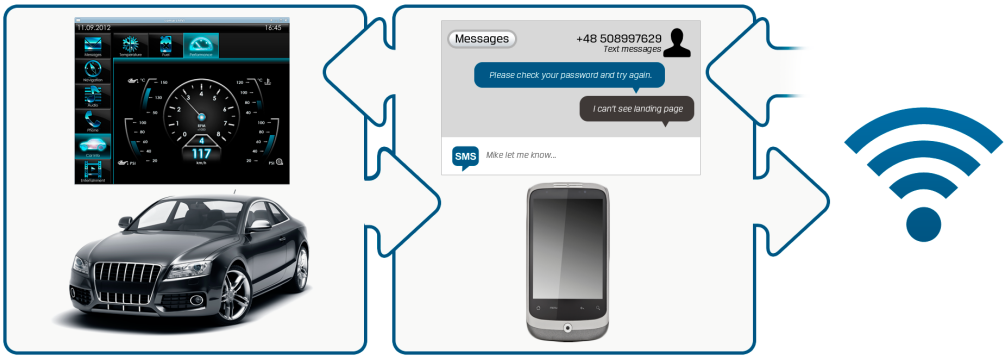
- Blackberry Style (9670)
- Blackberry Curve (9300)
- Motorola Atrix
- Motorola Droid Bionic
- Motorola Photon
- HTC EVO 3D
- HTC Sensation 4G

Our client felt the need to add their products to this portfolio.

Why Comarch?

- Comarch has vast experience in R & D SW Subcontracting
- Comarch provides outsourcing services for some of the largest OEMs - Device Manufacturers, ODM and Consumer Electronics segments
- Comarch services are offered based on the Security Area concept – projects are isolated from each other to meet the highest possible security standards, including IPR domain
- Very convenient business model and related organization
- Majority of the work is conducted in low-cost locations – inside dedicated security areas
- Project front-end is implemented by Comarch engineers working on-site. The typical roles of the small on-site team include:
  - Chief Engineer
  - Software Architect
  - Build Manager
  - Error ManagerSolution

[1] https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=215400



Head unit in the car **Mobile phone**

The Comarch Team fully implemented the MAP Profile with SMS, MMS and e-mail support. But this was only a part of the story. During MAP development our team found and solved many Bluetooth related problems, including:

- Resolving problems concerning:
  - HFP/HSP profiles
  - OPP file transfers
  - OVI Suite
  - DUN (dialup networking)
- Improved security of BT FTP profile

While developing an optimal solution for our client we created a test client using Python language to automate time consuming test cases. By doing this we improved the interoperability of all customer devices. Our framework covered more test cases than Bluetooth Profile Tuning Suites and this meant that we could quickly check for possible regressions.

We know that Bluetooth specification in some parts is not detailed enough or can be confusing. In the case of MAP there were missing event reports for partially downloaded emails or for messages with many parts. For each case we contacted bluetooth.org to ask for clarification and to suggest providing more detailed descriptions for reporting bugs in certification tools.

To achieve the best performance we needed to find out how particular MAP clients and servers behaved:

- What type of requests are used?
- The order of requests?
- How often do clients ask for new data?
- How messages are read?
- How long can client wait for messages (timeout values)?

A few optimizations can be performed, such as: lists of messages can be shown earlier– right after message listing result or by requesting only parameters that are used by a carkit. Time-consuming operations can be done right after Bluetooth is turned on – without waiting for connection to client. Email messages cache on the MAP side, caching the "downloaded" status of messages to reduce the amount of network traffic.

In our opinion this illustrates a huge difference between getting things done, and getting things done properly.

Results

Nowadays ... Supporting Bluetooth profiles is a must.

To name a few leading companies that have implemented Bluetooth MAP:

- More than one million Ford SYNC equipped vehicles [2]
- BMW with their iDrive system
- Lexus LX and GS 2013 models
- Honda CRV 2012

As for the mobile market, selected models of Blackberry, Motorola, HTC and Samsung already support MAP profiles, as for Nokia phones MAP is available as an additional application[3] , and it seems that Apple will soon introduce it to their iPhones and iPads when iOS6 is released.

Thanks to Comarch's efforts our client remains neck and neck with the competition and continues to maintain its position as one of the world's leading phone manufacturers.

[2] http://corporate.ford.com/news-center/press-releases-detail/pr-new-sync-software-update-adds-35451
[3] http://store.ovi.com/content/220465

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