PALM Associates, Inc.

Software product development for communications

PALM Associates, Inc.

Design and Implementation of Secure Mobile Applications

Examples and Experience

v.81

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Handset Capabilities

- Mobile / Wireless Applications
  - Handset platforms: Windows Mobile, Symbian, Brew, iPhone, Java
- Variety of Real Time OS
  - Green Hills
  - zRex
  - Tiny51
  - VxWorks
- Embedded system development, both server and client
- Implementations using key protocols
  - RS 485
  - ZigBee
- Many small & embedded platform developments
- Low level development, test and integration with Cygnal, Lauterbach, Jtag, Freescale, etc.
- Sensors used – GPS, accelerometer, touch screen

Handset Developments

Developed a number of products for the handset market as well as conducting R&D on a wide variety of handsets and handset operating systems. Product development has been done on Symbian, Android SDK , Java J2ME/MIDP/CLDC, Windows Mobile, and Rex. These developments gave me an appreciation of the constraints engendered in small footprint platforms as well as a deep understanding of the technologies involved, such as ARM, Jazelle®, 3G modems, etc.

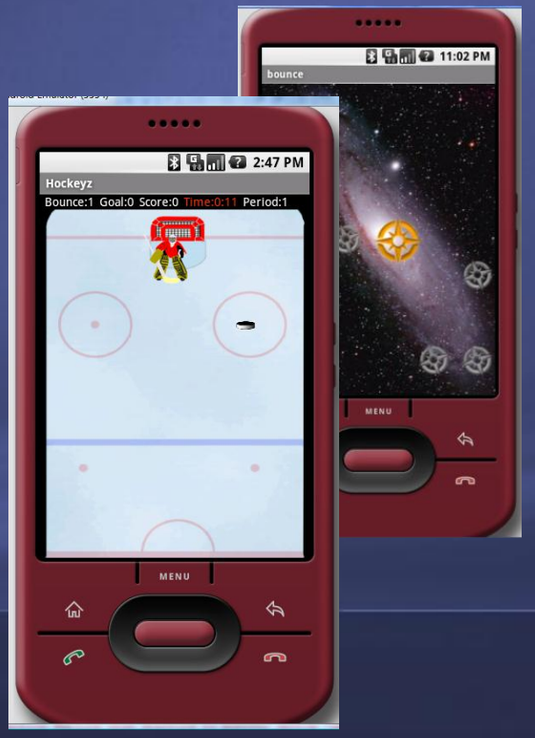
- **Android** –have implemented several products, including games, for this platform as well as a complete multi-body physics package. The NetPeek application has won acclaim and was ported over to Intel Atom® platform for CES 2010.
- For Qualcomm, implemented the Kilobyte Virtual Machine KVM) for the Qualcomm handset. To support the complete set of MIDP and CLDC Java graphics, had to extend the native REX support. The deliverable to Qualcomm was the KVM, demonstrated at JavaOne, as summarized below:
  - Developed KVM from Sun Sources
  - Implemented additional graphics support
  - Integrated with SABRE air reservation system
  - Developed applications to test KVM

Handset Developments (cont.)

- In addition the BREW-KVM interface was designed, a number of BREW applications implemented and the interface to ARM's Jazelle® Java Accelerator was supported.
- For Aviga, implemented a distributed speech recognition product using Windows Mobile
- As a demonstration for another new startup, implemented a video streaming application in Symbian. Working with Nokia's development team in Finland an early release of Nokia's 90 series handset was used.
- PALM is a development partner of Gemalto, and have used their SDK to implement a Smart Card Web Server (SCWS) for GSMA
- Under contract to Danger, implemented the following:
  - SIM Toolkit research for Full Type Compliance
  - Factory Programmer, a USB driver to load firmware into Danger handsets

Android Developments

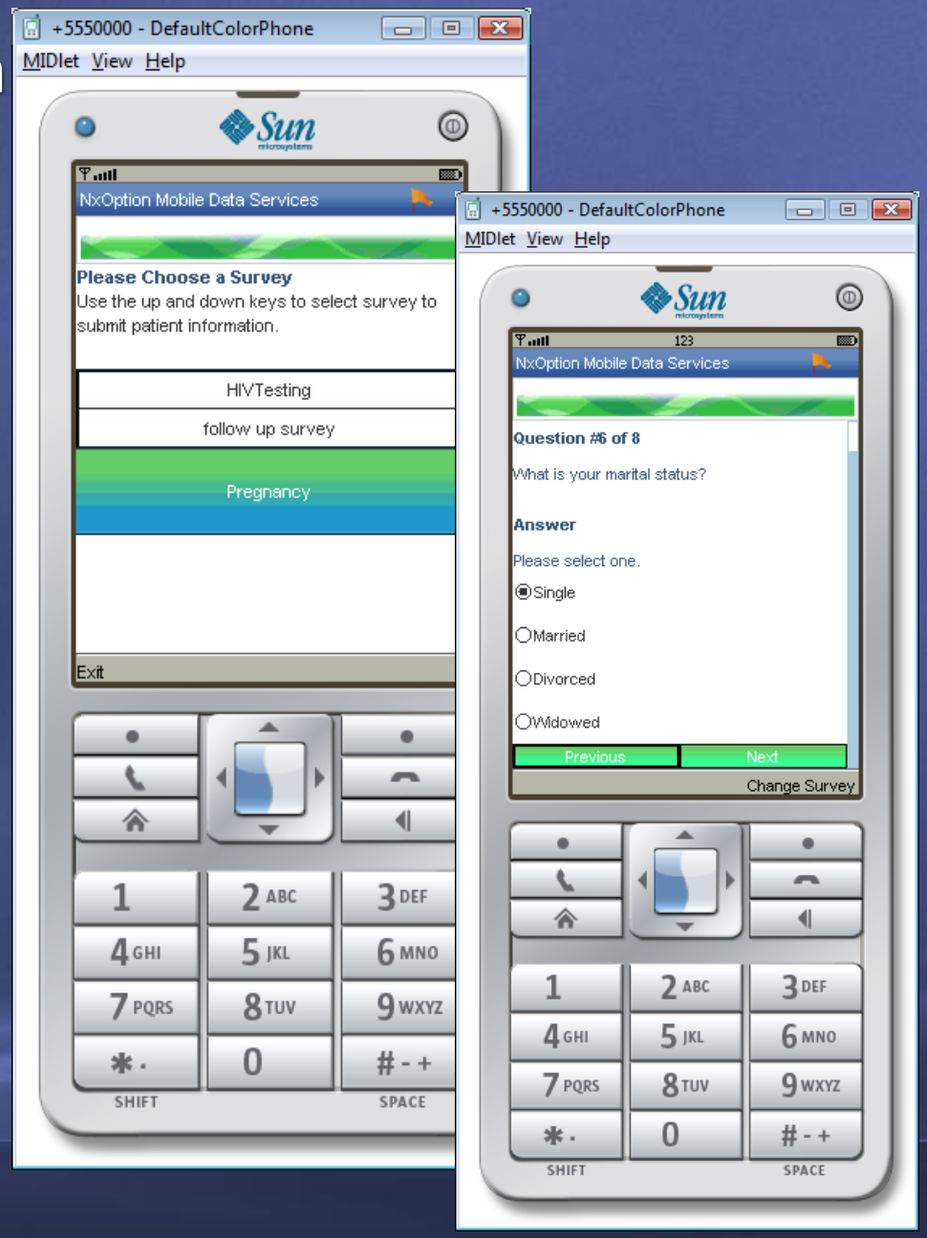
- NetPeek® Network monitor
- Handset applications
- Games
- Multi-body gravity physics package
- R&D on Android kernel for driver development and device support
- Eclipse Ganymede development



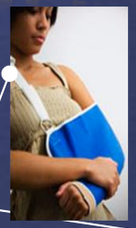
Field Medical Data Collection Demo

These developments specifically targeted low end handsets.

- Field collection of medical information using structured forms on low end cellular phones
- Uganda midwife and clinicians gathered data
- Central site consolidated information and analyzed
- Supports imagery and data
  - Photograph of patient often required for identification
  - Image of injury or other contributing factors
- Use Cases
  - Pregnancy Treatment
  - Pandemic Episode



Forms Driven Data Collection

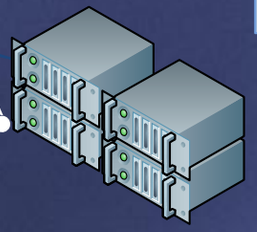


1. Image Face
2. Image Injury

Field Worker

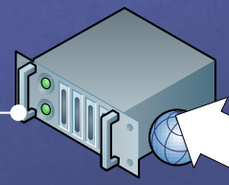
Treatment Notice

Send Alert



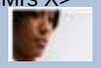
Edge Server

Treatment Notice
please seek medical attention for arm fracture at the Banglaquda Clinit



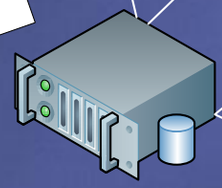
3rd Party Proxy

Medical Record
<Mrs X>



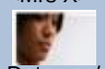
Date: ss/ss/ss
Broken Arm

Initial Record



Medical Db

Medical Record
<Mrs X>



Date: ss/ss/ss
Broken Arm

Updated Record

Clinic

Extension Worker

Treatment Alert
<Ms X> scheduled to visit Banglaguda Clinic

3. Update to Medical Record

3. Send Update to Medical Record

3. Image X-ray

Medical Record
<Mrs X>

Date: ss/ss/ss
Broken Arm

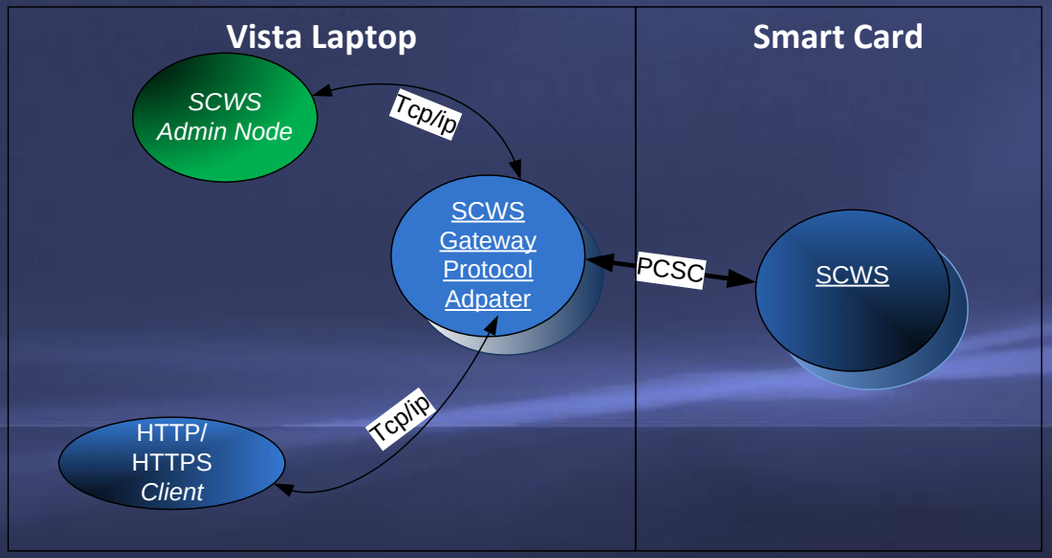
Public Internet

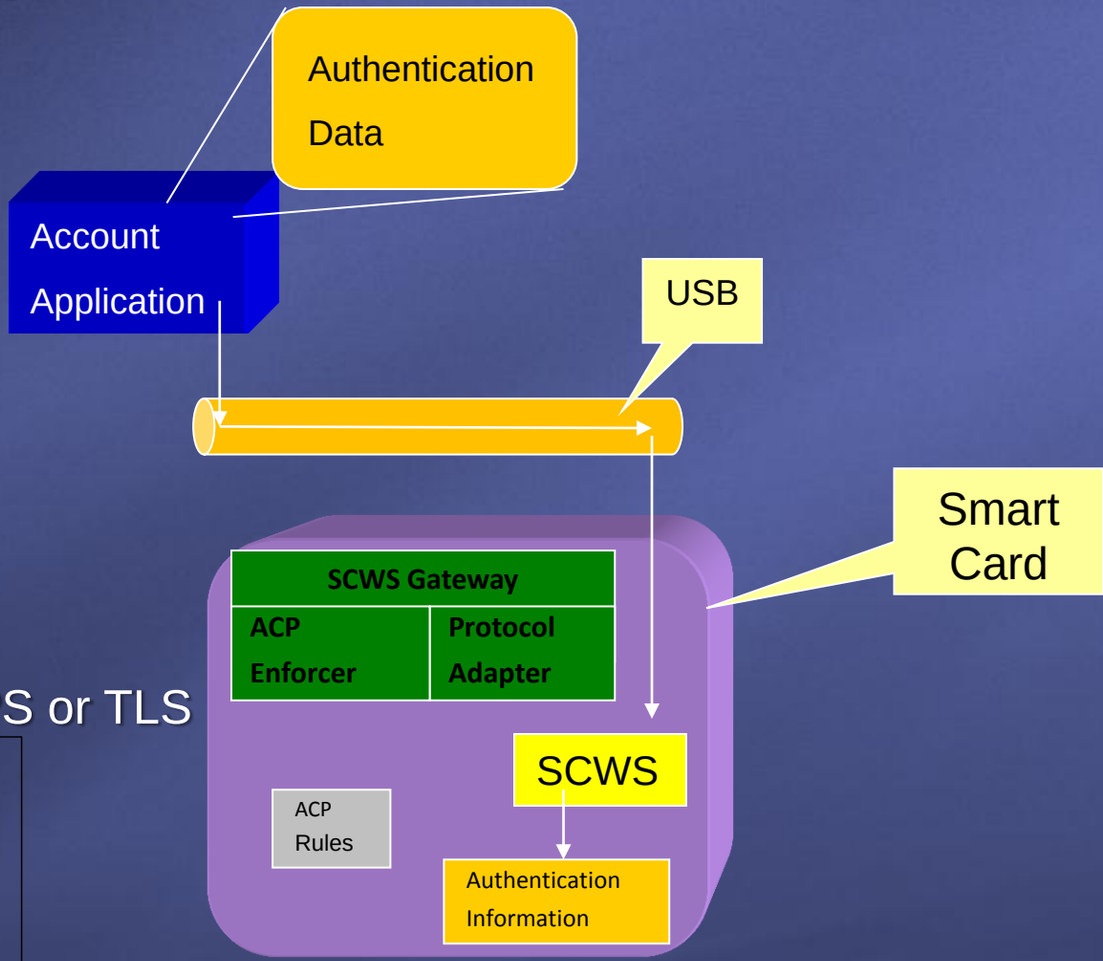
V0.4-4

SCWS Secure Channel Demo

Demonstrate secure connectivity between host application and SCWS using standard Windows libraries

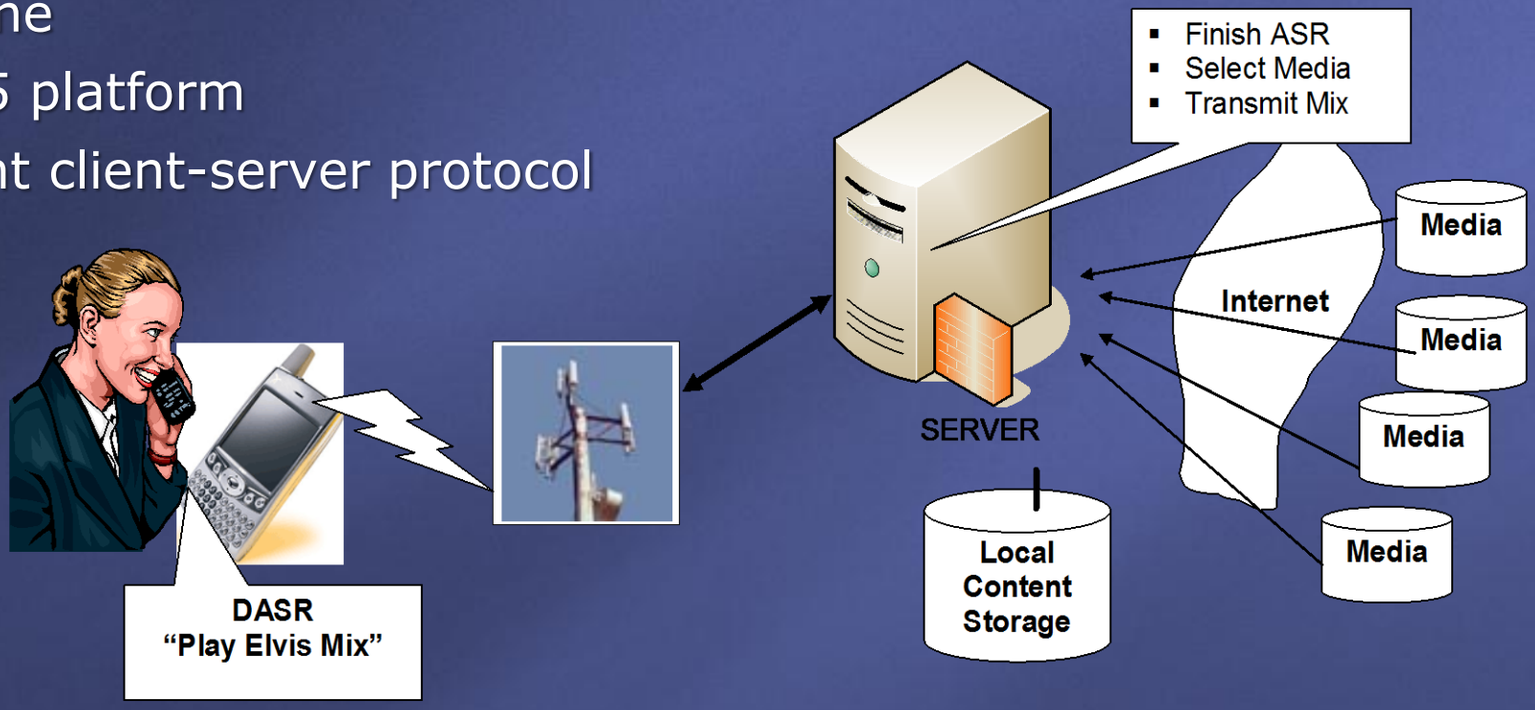
- Uses DOT Net Smart Card Infrastructure
- Used PC/SC through gateway
- Demonstration goals achieved:
  - Standard Libraries (IE)
  - Gateway provides routing knowledge
  - Application <-> SC Application
- Further objectives
  - SCWS interface over USB/EEM channel
  - Secure communications based on HTTPS or TLS





Windows Mobile Distributed ASR

- Voice capture at handset
- Some local analysis
- Centralized ASR engine
- Windows Mobile 2005 platform
- Design and implement client-server protocol
- Treo Smartphone



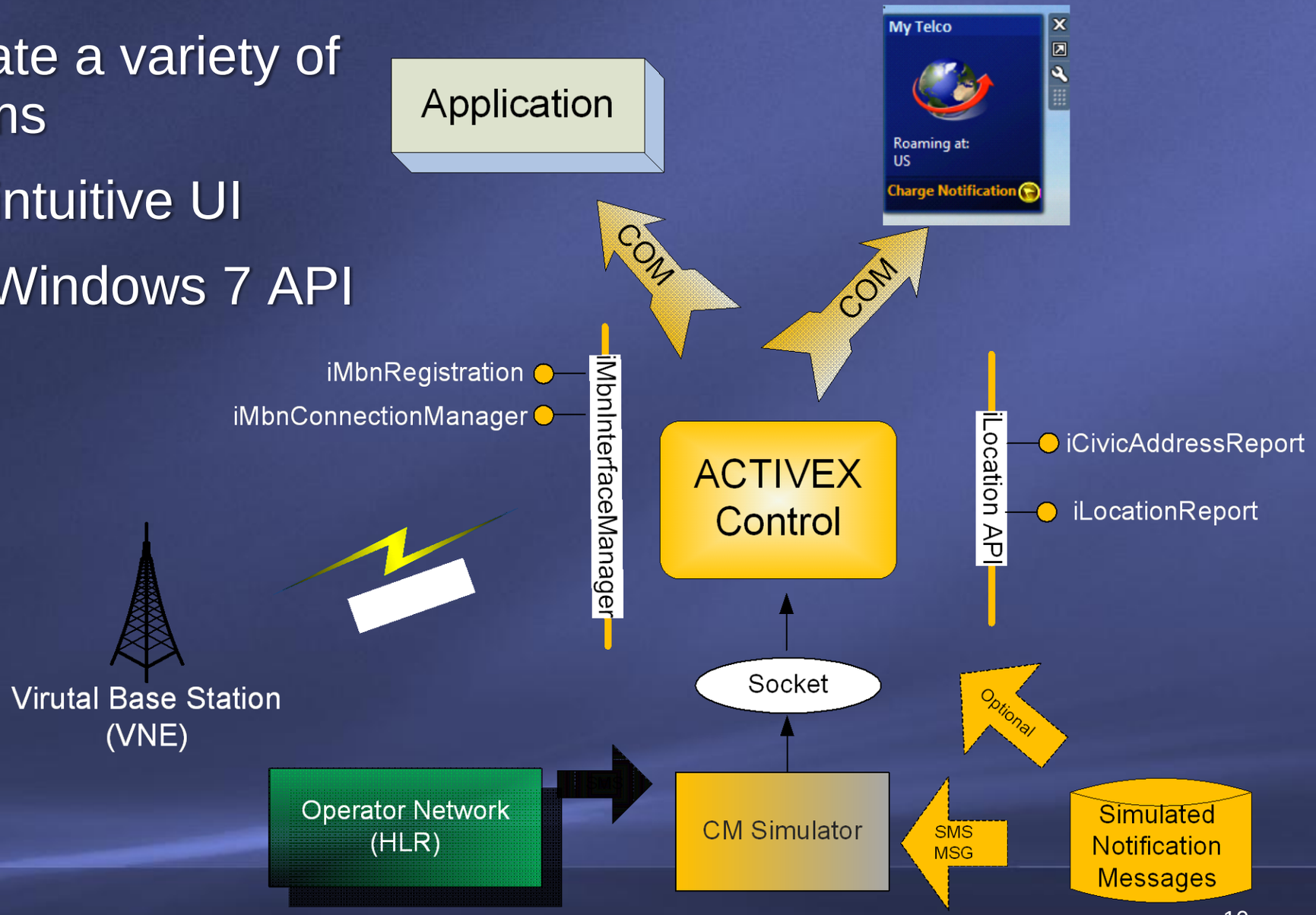
- Media distribution and streaming application
- GUI design and implementation
- Interoperability of MS SDK with 3rd party application

Test and Evaluation Involved

- Active Sync
- Windows 3G network interface
- Windows WiFi interface
- Connection Manager

Test Bed for Inbound Roamers

- Can simulate a variety of mechanisms
- Illustrates intuitive UI
- Based on Windows 7 API features



KVM Implementation for CDMA

Manufacturer IP

Vertical Application

Frame-work

PDK

Java Wrappers

MIDP

CLDC

API

KVM

Abstraction Layer

OAM

zRex

MSM5100

MSP1000

PALM Concept

MIDP Applications "MIDlets"

MIDP

CLDC

KVM

OS

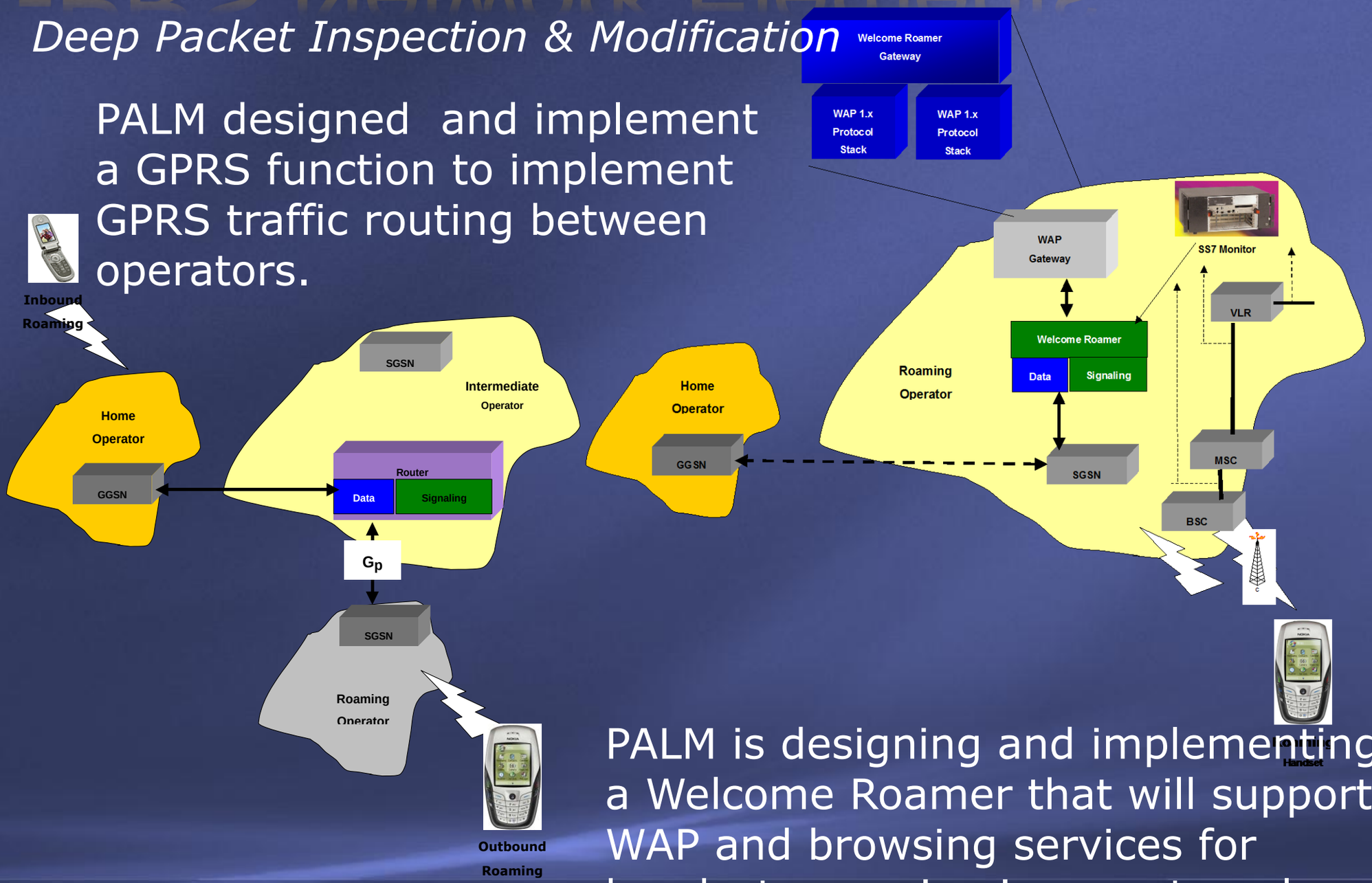
Sun Standard

- PALM built abstraction layer
- Ported Sun code to zRex Platform
- Integrated Saber reservation application and demonstrated at JavaOne

GPRS Network Elements

Deep Packet Inspection & Modification

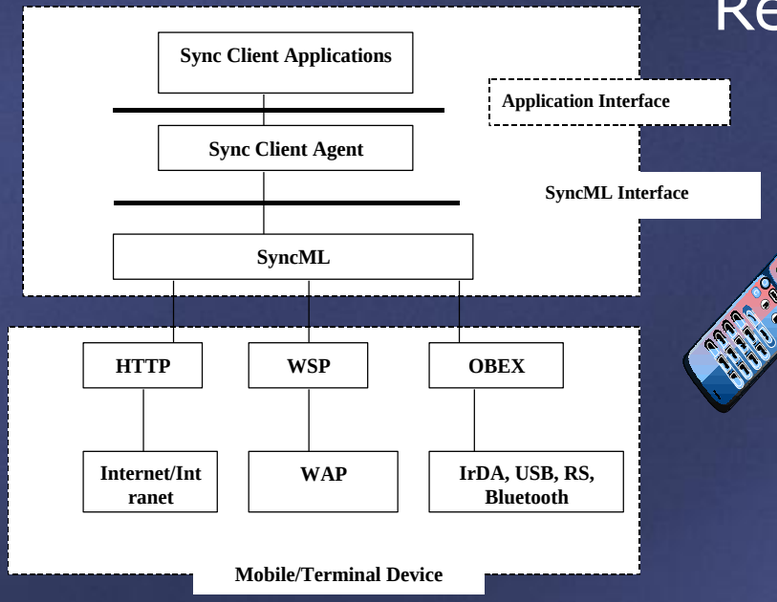
PALM designed and implement a GPRS function to implement GPRS traffic routing between operators.

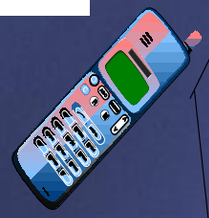


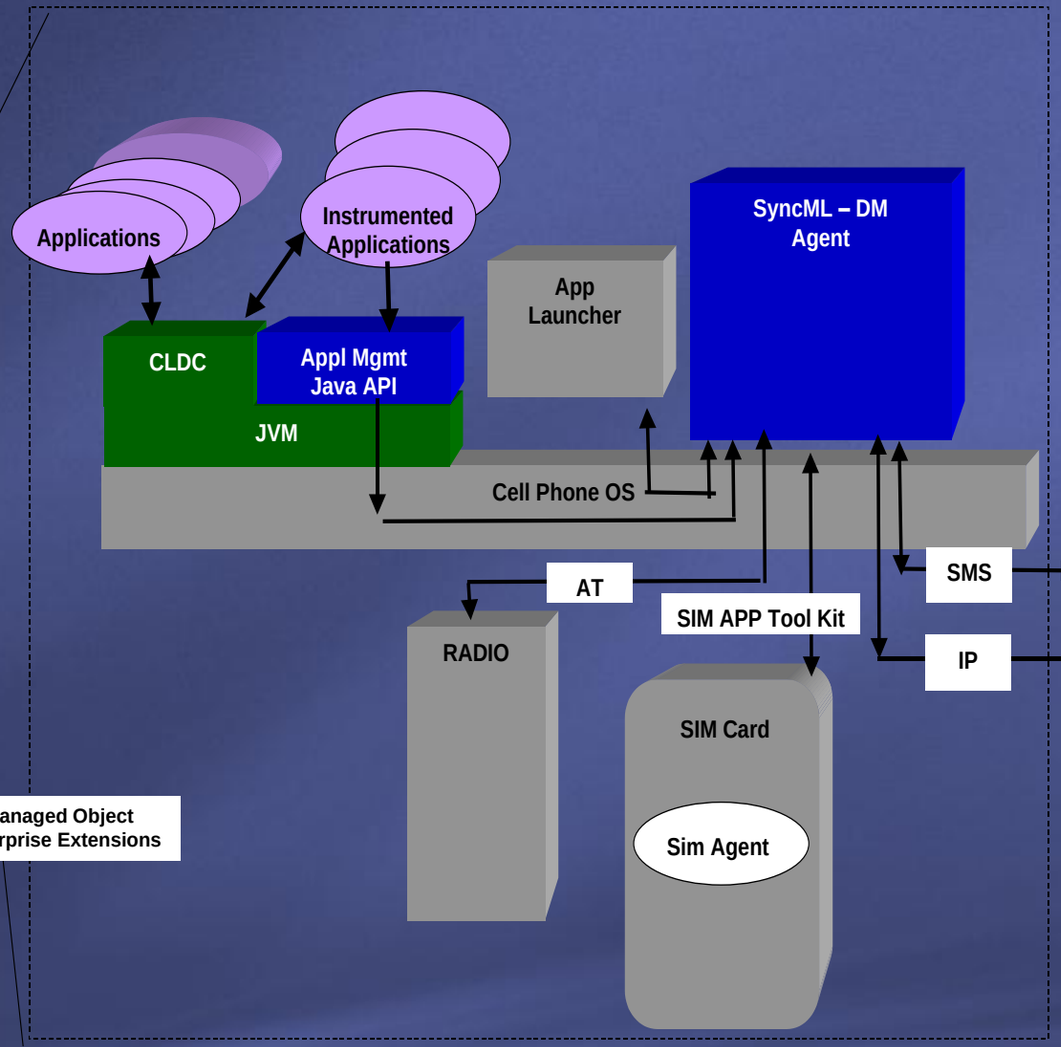
PALM is designing and implementing a Welcome Roamer that will support WAP and browsing services for handsets roaming in an external network.

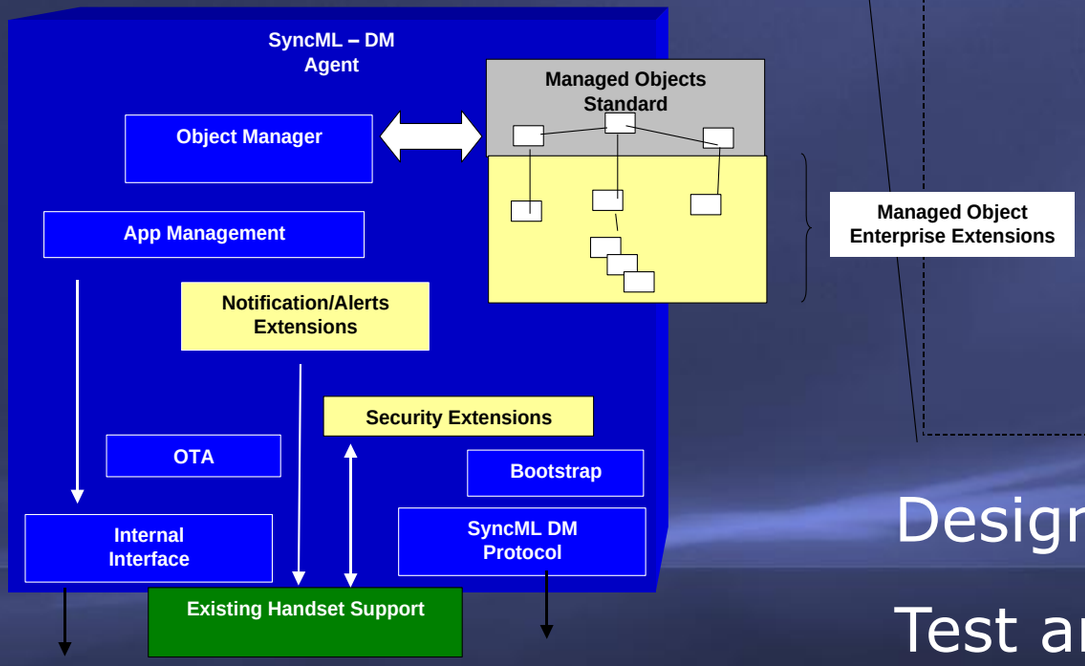
OMA DM Agent

Research SyncML Standard









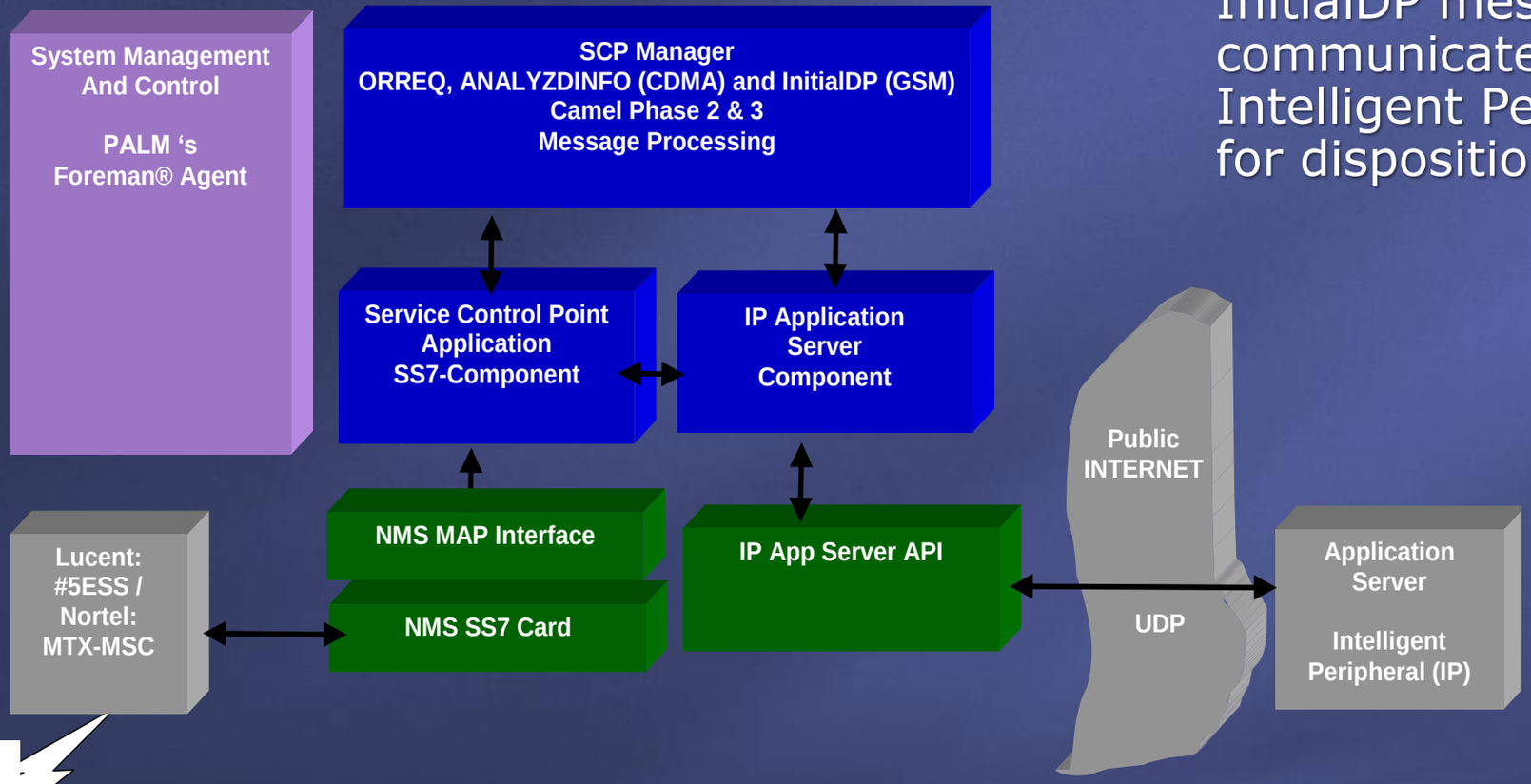
Design and Implement Agent

Test and evaluate

Wireless Op-In System

- PALM has implemented an SCP (Signaling Control Point) for a state of the art Op-In system that supports the mobile market place using ANSI 41/D/E, and CAMEL PH 2 & 3.

PALM's SS7 message processing software handles the ORREQ, ANALYZDINFO, and InitialDP messages and communicates with an Intelligent Peripheral (IP) for disposition.

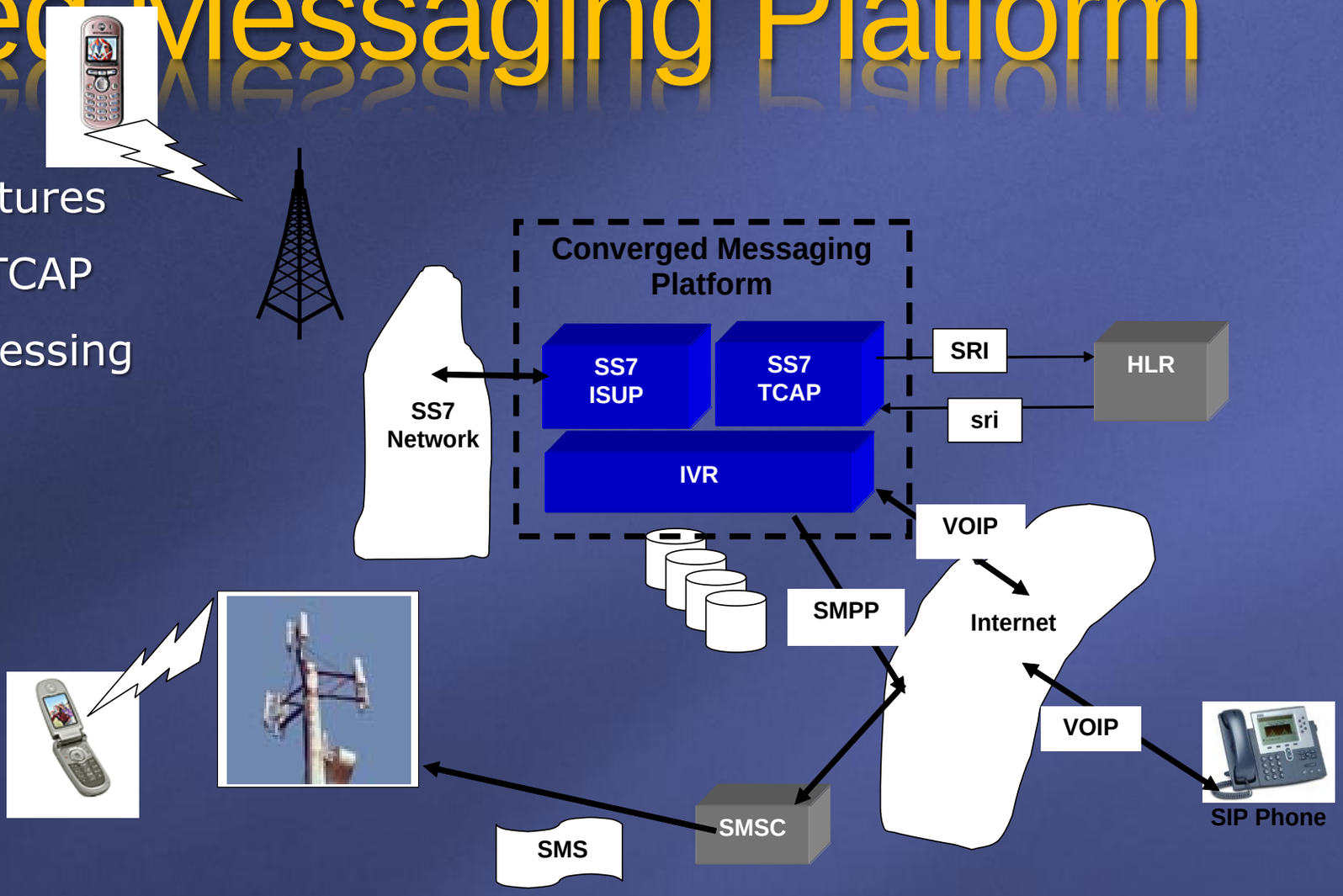


- The system is implemented on Linux ES (Enterprise Server) using NMS (Natural Microsystems) SS7 boards and has been successfully integrated with a Lucent #5ESS switch, as well as Nortel CDMA and GSM switches. Cantata MSP 1010 version integration with Alcatel underway.

Combined Messaging Platform

Features

- SS7 ISUP and TCAP
- Host Media Processing
- VOIP – SIP
- SMS Messaging
- IVR



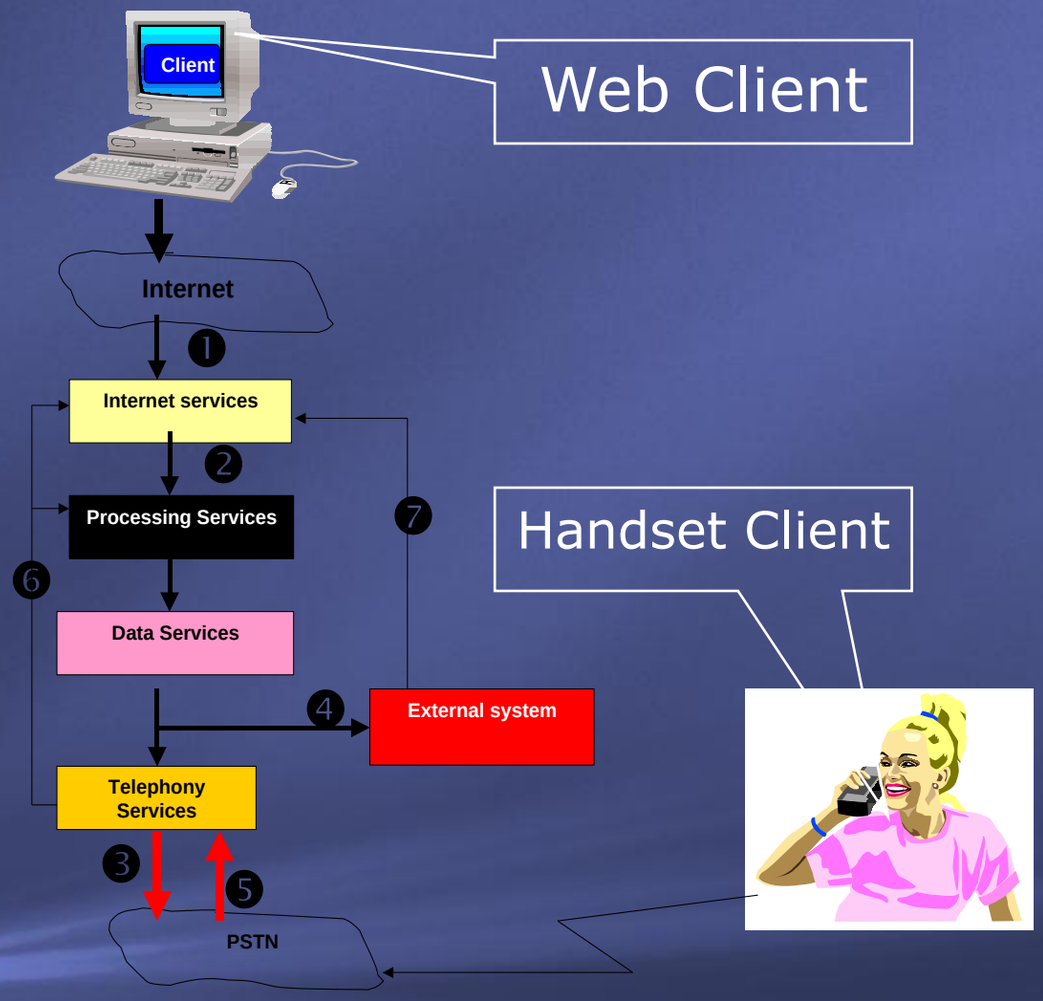
- Intel/Dialogic SS7 board
- Intel/Dialogic CTI board
- Intel/Dialogic HMP

- PALM designed and implemented all features for this innovative messaging platform

Multi-media Messaging Service (MMS)

Integration of telephony, ASR, web, cellular phone, and PDA technologies with carrier class Windows servers

- Personalized messaging based on audio recording and selection of sound-scape background from owned content library
- Digital Rights Management of IP protected content.
- Supports Polyphonic Ring tones, mp3 based electronic greeting card, personal greeting for voice mailbox
- Integration with multiple voice mail platforms
- PALM is the primary development contractor for this all Microsoft technology system
- Development of SS7 Telephony, ASR, and handset based applications
- DRM issues addressed in the server.



PALM Associates, Inc.

Software product development for communications

Value Proposition

- PALM is a long standing partner to Fortune 100 companies and new startups
- PALM is recognized as a development source for leading edge startups and large service providers
- PALM delivers turn key solutions for the next generation of enterprise and carrier products
- With skills honed on the best of breed for voice, video, cellular, networking, and Internet technologies**,** PALM can reduce the risk and shorten development time
- PALM's early adopter experience removes the risk when using new developments from OMA, Intel, Cisco, or any of the ANSI/ITU/ 3GPP/W3C/ETSI standards, VOIP, SigTran, or Microsoft products: Azure, .NET, Speech Server, etc.
- PALM understands the NEBS/Carrier HA world producing systems that meet the stringent requirements of carriers
- PALM has a superior SS7 platform that is the basis for a number of SCP and related products such as SMS filter, SS7 Monitor, and ANSI/WIN2, ITU CAMEL PH2/PH3 products

Conclusion

- PALM is a solution provider. We have a comprehensive range and depth of skill sets that make timely, high quality software product development a low risk endeavor for our clients.
- PALM posses a unique set of skills that facilitate the rapid development of video, CTI, IP and TDM networking, Intelligent Networking to create video, voice and mobile data products.
- PALM is interested in developing software products for OEMs in the communications, networking, video and speech market space.
- Our work with new startups and Fortune 10 companies in the valley makes PALM an ideal development partner.

Contact Information

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