Technical Meeting

San Jose, USA, Friday January, 25th 2005

Mobile Phone Profile WG Technical Meeting Session

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WG Chair

Agenda

- Antitrust Warnings
- Introduction – Where We Are
- NEC/Panasonic API Update Presentation
- Review of Work Items and Participants
  - Reference Tiers and Profiles
  - Reference Architectures
  - MPP Requirements for Core Linux Components
  - Middleware Scope and Requirements
  - Open-Source Projects (Component Inventory)
  - Related Organizations
  - API Scope and Requirements
    - NEC/Panasonic API Proposal
  - Domain Roadmap
  - Schedule

WG Organization

- Chair: Scott Preece (Motorola)
- 58 Participants on mailing list from 25 member companies
  - 15 phone manufacturers
  - 5 chip vendors
  - 5 OS and middleware vendors
  - 2 other interested parties
- Core Group: Motorola, NEC, Panasonic, Samsung

MPPWG Priorities

- Standardization of architecture and APIs for mobile phone software providing internet and multimedia services
  - Develop Linux OS for Consumer Electronics that meets requirements for mobile phones
  - Accelerate migration of PC domain internet services to MP domain by use of Open Source Software
  - Establish platform to support common multimedia services with mobile phones

Deliverables / Work Items

- Reference Tiers and Profiles (Draft Available)
- Reference Architectures matched to tiers (First sketch)
- MPP Requirements for Core Linux Components (Not started)
- Middleware Scope and Requirements (Not started)
- Open-Source Projects (Component Inventory)
  – Project/Component list (Not started)
  – Reference implementations (Not started)
- Related organizations (Some identified)
- API Scope and Requirements (Proposal in preparation)
- Roadmap for domain evolution (Not started)
- Schedule (Out of date)

Working Plan

- Periodic teleconferences and face-to-face meetings to negotiate details
- E-mail interaction to provide raw requirements and review work products
- Focused small groups draft specific deliverables
- To-date:
  - Core Group provided initial materials
  - One face-to-face (November)
  - Very limited success at eliciting e-mail interaction

Mobile-Phone Profile Reference Model

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Applications (Phone,Browser,JAVA,PIM…)

APIs

Mobile Middleware Carrier Specification Modules (FOMA,Vodafone, i-Mode for overseas…)	MP-Domain-Specific Middleware Carrier Common Spec Modules	General purpose Middleware	Functional-Domain Specific OSS elements.	Specific Middleware (OCR recognition Engine, Bar code recognition Engine….)

Linux Kernel

Device Drivers (Communication)	Device Drivers (UI,Multimedia)

- █ Existing or WG-created OSS implementations
- █ WG-created or adopted plug-in points for non-OSS elements
- █ Licensed elements provided by vendor (not in WG scope)

Reference Tiers Profiles

- Set of "functionality points" – phone categories we will generate profiles for

- A Tier Profile Defines:
  - Typical functionality
  - Variability
  - Hardware performance and characteristics
  - Memory (RAM, ROM, Removable)

Reference Tiers Proposal

- WG has identified and characterized four tiers:
  - Smart Phone
  - Media Phone
  - Feature Phone
  - Basic Phone
- Described in terms of "typical" capabilities (i.e., qualitative tiering)
- MPPWGReferenceTiers

MPPWGReferenceTiers

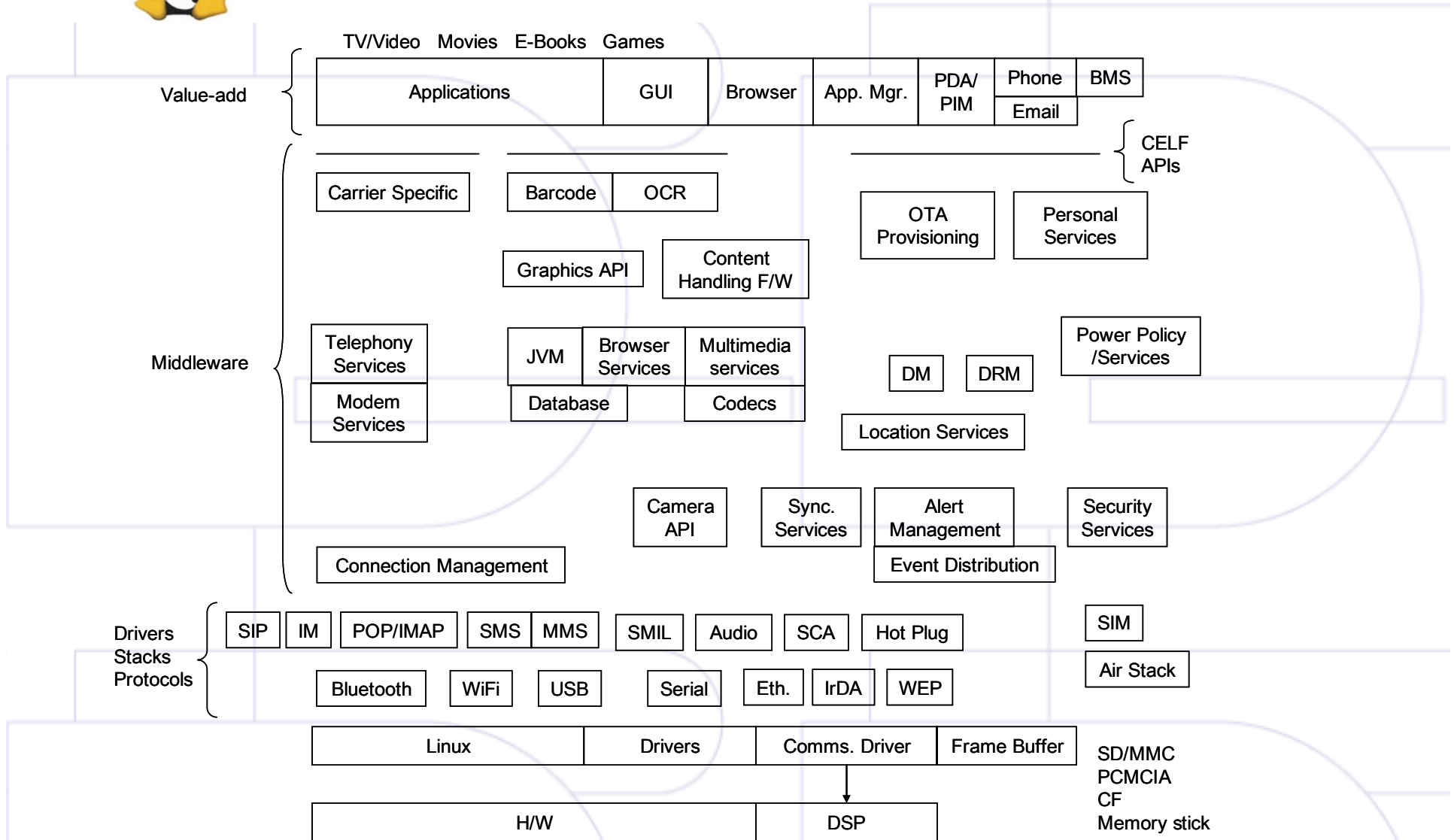| Aspect	Smart Phone	Media Terminal	Feature Phone	Plain-Old Mobile
Focus	business focus	Personal/Entertainment Focus	Lifestyle Focus (voice plus social networking support features)	Voice
Primary Functionality	Full PDA functionality (Calendaring, address book)	Strong PIM support, personal content management features	Minimal PIM functionality (phonebook, datebook)	Phonebook and call logs
Extensibility	Extensible (downloadable features)	Limited extensibility (MIDlets or BREW)	Limited extensibility (MIDlets/BREW)	No extensibility
Multimedia	Optional	Vido capture support, Media/content players, stereo	Limited multimedia support (pictures, MP3, MIDI,Simple, low-frame-rate animations)	None
DRM	Optional	Multiple DRM schemes	Hard DRM (limits on copying any media of given types)	None
Camera	Optional	2-3 megapixel camera	VGA camera or no camera	No camera
Browser	XHTML Browser	XHTML Browser	WAP Browser (text-centric)	Embedded access to specific URLs
Display	QVGA or larger color display	QSIF or larger color display	QSIF or smaller color display	Small display (64x96), non-color
Interaction	Touchscreen UI or QWERTY keyboard plus pointing device	Specialized keypad for media/game interaction	Standard keypad plus carrier-specific keys	Standard keypad
Connectivity	3G connectivity, possibly WLAN, Bluetooth, IrDA	2.5G or 3G connectivity, possibly WLAN; High-speed USB; Bluetooth	2G connectivity; USB or serial cable	2G connectivity; proprietary accessory cable
Memory	32M RAM, 64M ROM, removable storage	64M RAM, 64M ROM, Hard Disk or large removable storage	16M RAM, 16M ROM, no removable storage	8M RAM, 8M ROM or less
Processor	120MHz	200MHz	30MHz	15MHz

Reference Architectures

- Reference Architecture is a commonly understood structuring of systems

  – Common components

  – Common subsystems

  – Relationships, dependencies, interactions

  – Variabilities

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TV/Video   Movies   E-Books   Games

Value-add

| Applications | GUI | Browser | App. Mgr. | PDA/ PIM | Phone | BMS |
| | | | | | Email | |

CELF
APIs

Carrier Specific

| Barcode | OCR |

Graphics API

Content
Handling F/W

OTA
Provisioning

Personal
Services

Middleware

| Telephony Services | | JVM | Browser Services | Multimedia services | | Power Policy /Services |
| Modem Services | | Database | | Codecs | |

| DM | DRM |

Location Services

| Camera API | Sync. Services | Alert Management | Security Services |
| | | Event Distribution | |

Connection Management

**Drivers
Stacks
Protocols**

| SIP | IM | POP/IMAP | SMS | MMS | SMIL | Audio | SCA | Hot Plug | SIM |

| Bluetooth | WiFi | USB | Serial | Eth. | IrDA | WEP | Air Stack |

| Linux | Drivers | Comms. Driver | Frame Buffer |

| H/W | DSP |

SD/MMC
PCMCIA
CF
Memory stick

MPP Requirements for Core Linux Components

- Attributes commonly required for the domain
- Options commonly required
- Configuration options commonly required
- Dependencies on other working groups

Middleware Scope and Requirements

- Middleware important for the domain
- Boundaries of WG scope

Open-Source Projects (Component Inventory)

- Open-source software projects that fill slots in the reference architecture(s)

- Building the Component Inventory

- MPPWGComponentInventory

MPPWGComponentInventory

This table lists many of the components of a mobile phone, with information about the APIs that provide access to the component and available open-source implementations fo the APIs. Component names will be tied to the Reference Architecture, once that is defined; the current names are temporary.

Only projects available with OSI-compatible licenses should be included.

The columns in the table are:

- a descriptive name for the component
- the name of a known API (typically a library)
- the name of an open-source project implementing that API
- the names of WG member companies familiar with the project
- the names of WG member companies prepared to work on the component to

make it meet MPP WG needs

Note that there may be more than one API and/or project for a given component; if so, there should be a separate line for each, with only the first line containing the component name.

1 Application Framework

Component	API	Project	Knowledgeable	Work Interest
Application Management				
Application Download/Installation	OSGi			
Coding Utility library	Glib			

2 Feature Services

Component	API	Project	Knowledgeable	Work Interest
Location Service				
Alert Management				
Contact Management				
Content Management				
Media Player Services				

3 Connectivity

Component	API	Project	Knowledgeable	Work Interest
Bluetooth Stack		BLUEZ		Motorola
	Affix			
IrDA Stack	irda-utils			
Connection Management				
DSN		DNSMASQ		
Buffer Management				
Accessory Support				

Session Management	
Connectivity Framework	
Hotplug Control	hotplug
	murasaki

4 Browser

Component	API	Project	Knowledgeable	Work Interest
XML Parser	expat			
	libxml2			
HTTP				
HTTP Client		jakarta		
	dillo			
Browser Push				
WAP				
OMA				
WTLS				
Rendering (HTML, XML, xHTML, WML)				
ECMAScript				
WCSS				
SSL	OpenSSL			
WAP Binary XML support	libwbxml	libwbxml		

5 Java

Component	API	Project	Knowledgeable	Work Interest
JVM				
MIDP/CLDC				
Various JSRs				
Java Application manager				

6 Device Management

Component	API	Project	Knowledgeable	Work Interest
Power-Up and Power-Down				
Power Policy Management				
OTA Patch Support				

7 Security

Component	API	Project	Knowledgeable	Work Interest
Certificate Service				
User Authentication Service				
Crypto Service and Libraries	OpenSSL			
	GnuPG			

Security Policy Manager and Framework	SELinux		
Key Management			
Secure Boot			
Secure Communications Protocols	OpenS/WAN	IPsec	
Protected Filesystem			Motorola
Encrypted Filesystem	SFS		
	EncFS		
Digital Rights Management (we will share our LUFS-based implementation)			Motorola

8 Persistent State

Component	API	Project	Knowledgeable	Work Interest
Database Service	SQLite	SQLite		Motorola
	Berkeley DB			
Device State Management (configuration)				
SIM Management				
Removable Storage Management				
Download Management				
Filesystems		SquashFS		
	JFFS2			
	cramfs			
		Dosfstools		
Flash Filesystem				

9 Synchronization

Component	API	Project	Knowledgeable	Work Interest
OBEX		OpenOBEX		
Synchronization Management				
Synchronization Services (protocols)	SYNCML			

10 Multimedia

Component	API	Project	Knowledgeable	Work Interest
Audio Management				
Codecs				
Multimedia Framework (for codec plug-ins)				
Content Handling Framework				
Video Transfer (window)				
SMIL				
MIDI				

11 Messaging

Component	API	Project	Knowledgeable	Work Interest

SMS	
EMS	
MMS	
E-Mail (POP3, IMAP)	
Instant Messaging	

12 Telephony

Component	API	Project	Knowledgeable	Work Interest
Telephony API	GSM 7.07/9			
Call Processing				
Call Control				
Messaging				
Network Registration				
Voice Call Stack				
Data Call Stack				
GPRS				
EDGE				
Modem Control (AT Commands)				

13 User Interaction

Component	API	Project	Knowledgeable	Work Interest
Toolkit(s)	GTK+			Motorola
	Qt			
	Qt/Embedded			
Skinning				
Window Management				
Localization				
SVG (Scalabe Vector Graphics)				
Framebuffer Abstraction	DirectFB			Motorola
OpenGL	OpenGL/ES			Motorola
Text renderer		Pango		
Font Engine		freetype		
Font Management	fontconfig			
Layout Engine				
Graphics Library	Gdk			
	gdk-directfb			
	libpng,libungif,libjpeg,libtiff			

14 Test Support

Component	API	Project	Knowledgeable	Work Interest
Logger	syslogd			
	klogd			

Test Command Interpreter	
Test Framework	GNU check
	CUnit
Profiler	gprof
Coverage mesurement	gcov

15 Device Drivers

Component	API	Project	Knowledgeable	Work Interest
USB (Client, Host, OTG)				
Serial I/O				
WiFi				
Bluetooth				
IrDA				
Location Device(s)				
Audio				
Headset				
Display(s)				
Keypad(s)				
Touchpad				
Memory Card				
SIM Card				
Battery				
Power Management				
Real-Time Clock				
Timers				
Flash memory				
Accessory Bus				
Lights				
Chipset Management				
Physical Manipulation				

16 Debugging Support

Component	API	Project	Knowledgeable	Work Interest
Kernel Crash Dumps		LKCD		
Debugger	gdb(GNU Debugger)			

17 Operating System

Component	API	Project	Knowledgeable	Work Interest
Linux (kernel, libraries, utilities)				Motorola
Real-time support		RTAI		
Resource Manager				
Event Distribution				

Hotplug		Linux Hotplug	
Dynamic Power Management			Motorola
Networking (TCP/IP, IPv6, etc.)			Motorola
	USAGI(IPv6 stack)		
	OpenS/WAN(IPsec)		
SIP	oSIP(SIP library)		
	Vovida(SIP liblary)		
Performance, memory, power improvements			Motorola

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API Scope and Requirements

- Core group proposed that an API for third-party application builders should be a high priority

- Need WG agreement on scope of the API

NEC/Panasonic API Proposal

- The core group thought it was important to have a strawman API as a starting point

- Ideally this should be a "real" API, known to provide functionality needed to support the full scope of the domain tier

- NEC and Panasonic have jointly provided a proposed API

- Proposal is meant as a starting point – assume the WG would evolve it for consistency, organization, and needs of additional technologies

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▨ : Module (Planning to Open)
X11R6 may be removed

▬ ▬ ▬ : API (Planning to Open)

- ## Profile Body

Tel App	System App	MultiMedia App	Data processing App	Internet App	Internet AppEngine	Java AP Engine	Others
Standby Screen, main menu, videophone app, phone app, phonebook, NW service, and phone function setup	Air download Generic LCD display Backside LCD display PIN authentication and monitor mode Other function setup Equipment alarm	Multimedia app Still image viewer Video viewer Camera app Vector G viewer Avatar Ring tone	OCR, barcode, SD-PIM, data transfer, memory transfer, external I/F communication, user data, IR, schedule, voice memo, schedule alarm and data folder	Java Engine Java AP SMS, mailer Browser, HTML mailer	(AP Engine/CPE) CPE, AWS HTTP, SSL IMD, FLASH	(AP Engine) JAM CLASS KVM	Accessory menu Accessory (text memo) Accessory (calc)

M-5 Telephony API

[Services (ELIB)]
 Resource management
 library (API), SD file
 Packet communication
 Voice communication,
 SMS communication
 Equipment, key,
 Authentication
 Schedule, Data exchange
 Record playback
 Voice response
 UI control
 LMP management
 Sound system
 Service manager
 Event transmitter, DRM

M-2 AP Framework API

 [Window Manager]
  APC, WC, CLM, TMG
 [Window System]
  Fonts, Extended
Wiidget
 [Inter-App communication]
MSB
 [Other (AP Framework)]
  PICT display library
  Image library
 [Text input(AP Framework)]
  XIM server

GTK+

X11R6

M-4 Multi Media API

Multi Media Elib

 Video control ELIB
 Camera control ELB
 Video phone ELIB

 [3G-324M]
  H324, H245, H223

Multi Media Manager

[3G-324M] : H324, H245,H223
[Multi Media I/F]
 File I/O, Mux/Demux,
Streaming
[Multi Media Plug-in]
 File IO , Demuxer, Muxer ,
 Video/Voice/Text control
[SCA]
 Camera/Video control
[Video phone middleware]
 Video phone/Video control
 /Camera control ELIB

Multi Media Driver API

 VH(VideoHandler)

M-6 Data Processing API

・Bar code(API)
・OCR(API)

M-3 Mobile Middle API

[TAF(S-I/F)]
 AT, CS, PS,
 SMS, DCF,
 TMF, EXT-IF
[Mobile Middleware]
 MAW, OBEX,
 OMF

M-1 Common API   glibc

M-8 Driver API
 DSP Lib, Tone Lib, Voice Path Lib, Melody Lib

Linux Kernel(K1-K7 Kernel API)

Device Driver

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2 Feature Services
4 Browser
5 Java
10 Multimedia
11 Messaging

12 Telephony

1 Application Framework
13 User Interaction
14 Test Support
16 Debugging Support

3 Connectivity
6 Device Management
7 Security
8 Persistent State
9 Synchronization

Application (Phone, browser, Java, PIM etc.)

APIs

Carrier specific module
(FOMA, Vodafone,
i-Mode for overseas)

Carrier common
module

Generic middleware

Functionally
specialized OSS

Vendor specific
middleware

Linux Kernel

Device   Driver
(Communication)

Device   Driver (UI, Multimedia)

17 Operating System

15 Device Drivers

■ API and profile specified part (Open source would be desirable)
■ Carrier specific module
■ Vendor specific module

Proposed Platform Profile (2/3)

- APIs(1/2)
  - Common
    - equal to glibc (POSIX API , LGPL)
  - Application Framework
    - Contains following interfaces.
      - Window Manager
      - Window System (X11R6, Xlib, Fonts etc.)
      - Inter-Application Communication
      - Basic Widget (GTK+ : LGPL)
      - Character input
      - etc.
  - Mobile Middle
    - Contains OBEX and Interfaces of Supervisor task.
  - Multimedia
    - Contains following interfaces.
      - Multimedia Manager
      - Multimedia Extended library
      - Multimedia Driver API(Video Handler interfaces)

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Proposed Platform Profile(3/3)

- APIs(2/2)
  - Data Processing
    - Contains following interfaces.
      - Bar-code reader
      - OCR access reader
  - Driver
    - Contains following interfaces.
      - Audio Voice
      - Audio Tone
      - Audio Melody (MIDI)
      - DSP
  - Telephony
    - Contains following interfaces.
      - Packet Communication, Voice Communication, SMS Communication, Device Service, Certification and DRM, Schedule service, Data Exchange, Recording / Playback etc.
    - Contains some carrier specific functions.
      It must be examined carefully.

APIs Design Concept and their current status

- Kernel-related-APIs
  - They are generic and independent of any carrier specification.
- Device driver-related-APIs
  - They are independent of any carrier specification. and abstract its hardware. However, only the verification on TI's OMAP16xx Series has been done at present. This I/F might be modified in case the functionality of its device is enhanced (e.g. adoption of 3D hardware accelerator.)
- Basic call (Out-going, in-coming, etc.)-related-APIs for mobile phones
  - They can be available to mobile phone worldwide, since those APIs are abstracted.（Verification will be required.）
- APIs for supplementary services of mobile phones
  - They are dependent on the specific carrier at present. Those shall be updated for the mobile phones worldwide.
- Multimedia APIs
  - They can be independently implemented from any carrier spec, since they have general-purpose-I/F called SCA（Stream Control API）.

Related Organizations

- Goal to build a list of other organizations working in the domain and plan relationships with them

- MppRelatedOrganizations

MppRelatedOrganizations

1 Related Organizations

This list includes organizations, consortia, standards groups, etc., working in the Mobile Phone domain.

Organization	Home	Relationship to MPP WG
OMA (Open Mobile Alliance)	http://www.openmobilealliance.org	Standards group driving data service standards for mobile phones
MeT (Mobile electronic Transaction)	http://www.mobiletransaction.org	Standards group for secure mobile transaction
MPF (Mobile Payment Forum	http://www.mobilepaymentforum.org	The work of Forum is focused on standardizing mobile payments
MIPC(Mobile Imaging and Printing Consortium)	http://www.mobileprinting.org	Industry group to provide for the camera-phone with wireless/wired printing standard
NFC(Near Field Connection)	http://www.nfc-forum.org	A industry association advancing near field short-range wireless interaction in CE devices
W3C(World Wide Web Consortium)	http://www.w3.org	Its activity covers common mobile access protocols based on Open Source/GPL compatible basis

Domain Roadmap

- Goal to build roadmap of expected future requirements/scope of the domain