Note: This is a preliminary discussion
Introduction

• Purpose
  – Provide common interface to mobile app developers for translating health data into consumable FHIR resources
  – Provide platform agnostic interface to mobile app developers
  – API definitions to accomplish secure exchange of PHI (Personal Health Information)
  – Common open API with translations at edge to different paradigms

• Intended Use - Mobile health applications to transport health data:
  • Electronic health record system
  • Personal health record system
  • Health information exchanges
  • Others (e.g. public health systems)
Architecture

Device Translation Layer
- iOS
- Microsoft
- Android
- "Future" Platform
- FHIRframe Device API

Process Flow Layer
- IHE Workflow (e.g. XDS-MS, XPHR)
- "Future" Workflows
- Simple Workflow

Enterprise Translation Layer
- FHIRframe Enterprise API
- EHR
- HIE
- PHR
- Other Systems

Cloud

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Mobile Health - FHIRframe
Operational Context

Tethered Personal Medical Devices

Thermometer
Glucose Meter
Pulse / Blood Pressure
Weight Scale
EKG Monitor

Application Hosting Device (Smartphone or Tablet)

FHIRframe

Device Interface

FHIRframe

Enterprise Interface

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Device Interfaces

- Health Device
- Mobile Application
- FHIRframe
- EHR
Device Interfaces

- Health Device
- John Doe Developer Code
- Mobile Application
- FHIRframe
- EHR
Device Translation Sublayer Interfaces

Illustrating a *Medical Infusion Pump application* interfacing over a *proprietary* interface connected to a Medical Infusion Pump machine over a *USB* connection.
Device Translation Across Platforms

Device Type Layer

Interface Type Layer (HL7, ITU-T H.810/Continua, proprietary)

Transport Type Layer (Bluetooth, WiFi, Ethernet, etc)

Future Platform

Android

Microsoft

iOS

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Security Considerations

API Considerations

- User Identification and Authentication
- Confidentiality
- Non-repudiation
- Privacy
- Secure Logging
- Accountability
- Intrusion Detection and Response
- Secure storage and retrieval in addition to data storage “at rest”
- Secure link establishment and maintenance
- Information hiding
- Strength of cryptographic support

Phase II

May include a threat assessment,
- security policy and
- countermeasures definition

The documents can be used as templates for developers using the FHIRframe
Use Cases

• Health Application
• Medical Device
• Wearable Device
• Server Side Medical Data Repository
API Concepts

• Functional Calls
  – API calls
  – Call back functions
  – Transactions

• Layered Architecture
  – Each layer carries out operations in a specific paradigm
  – Layer may have a sublayer of limited functionality
Functional Description of Interfaces

• Device Layer
  – Device Type Translation sublayer
  – Device Interface type sublayer
  – Device Transport sublayer

• Core FHIRframe Layer
  – Workflow Layer
  – Enterprise Interface Sublayer

Note: preliminary
Conclusion

• FHIRframe is a valuable component for mobile healthcare application development ecosystem

• Interfaces to devices and servers should be standardized for the application, with changes, updates and modifications at the translation layer

• Security solution is drafted for developers
ACKNOWLEDGMENTS/CONTRIBUTORS

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PALM Associates, Inc.