Virtualization of Mobile Phones

Larry Rudolph

CFP (@MIT)

October 28 2009

What is virtualization?

vir·tu·al (adj): existing in essence or effect, though not in actual fact

Virtualization is

> time-sharing and abstraction done right

> layer of abstraction between OS and actual hardware

Current major use cases

> In data-center: server consolidation

> In home: multiple OS's in same box, e.g. windows on mac

Note: Smartphones are comparable with 10 year-old PC

> are more personal than PC's

vmware·

Smartphones are like PC's

Mobile Smartphone

> Apps: contacts, ringtones, photos, music, movies, browser, chess & other children games, facebook, IM, viruses, ...

> Personal (questionable?) content

Corporate Smartphone

> Corporate email, files, enterprise apps, sensitive data

> Locked down, encrypted, vpn'ed, password, managed by corporate IT department (e.g. Blackberry) -- lost, stolen, or hacked phone could be costly to enterprise
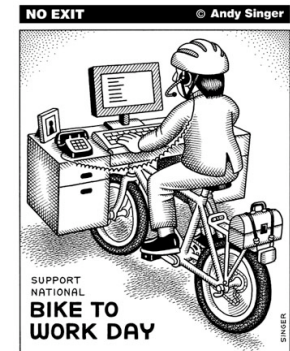
Peaceful Coexistence?

> "Fences make good neighbors," No restrictions to what I do with my phone, but no viruses, no political content, no ...

NO EXIT   © Andy Singer

SUPPORT
NATIONAL
**BIKE TO
WORK DAY**

vmware

Mobile phones are personal

Different uses

> Everyday: utilitarian (music, video, email, IM, ...)

> Beach & sports: rugged, scratchproof

> Formal: small, elegant, color-coordinated

> Vacation: great camera, global maps

Fashion

> Traditional: Style, size, color

> Geek: capabilities, auxiliary features

Like watches, music players, even shoes

> but there is no 2-year contract on shoes

vmware

Mobile phones are locked

You may own your phone but

> it may be locked to a particular carrier

> apps must first be signed before they can be installed.

> no root access; cannot install own drivers

Who cares?

> Teachers, Free-lance OS developers

Reason?

> Isolation from baseband

Is it legal?

> Can buy PC and install favorite OS, why can't we do the same for phones?
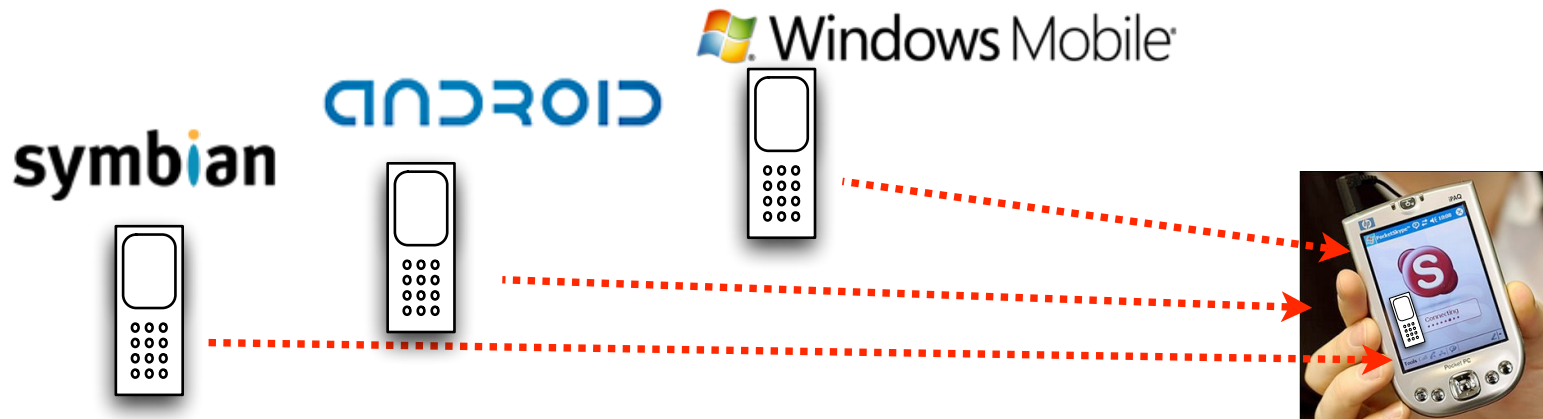
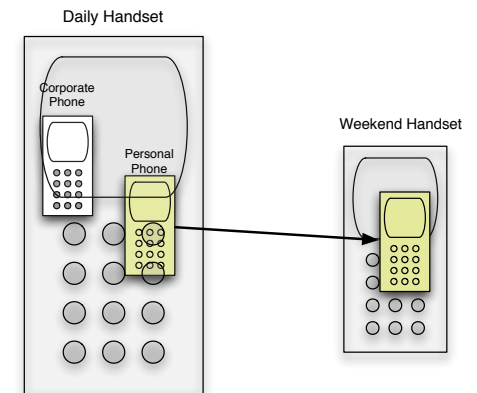**vmware**

Solution: Virtualize

Many vPhones in one physical handset

Grandma doesn't care what OS is running

> She should be able to buy apps from any store

Uniform UI, isolated virtual machines underneath

> work/personal phone; compartmentalize personalities

Daily Handset

Corporate Phone

Personal Phone

Weekend Handset

symbian

ANDROID

Windows Mobile
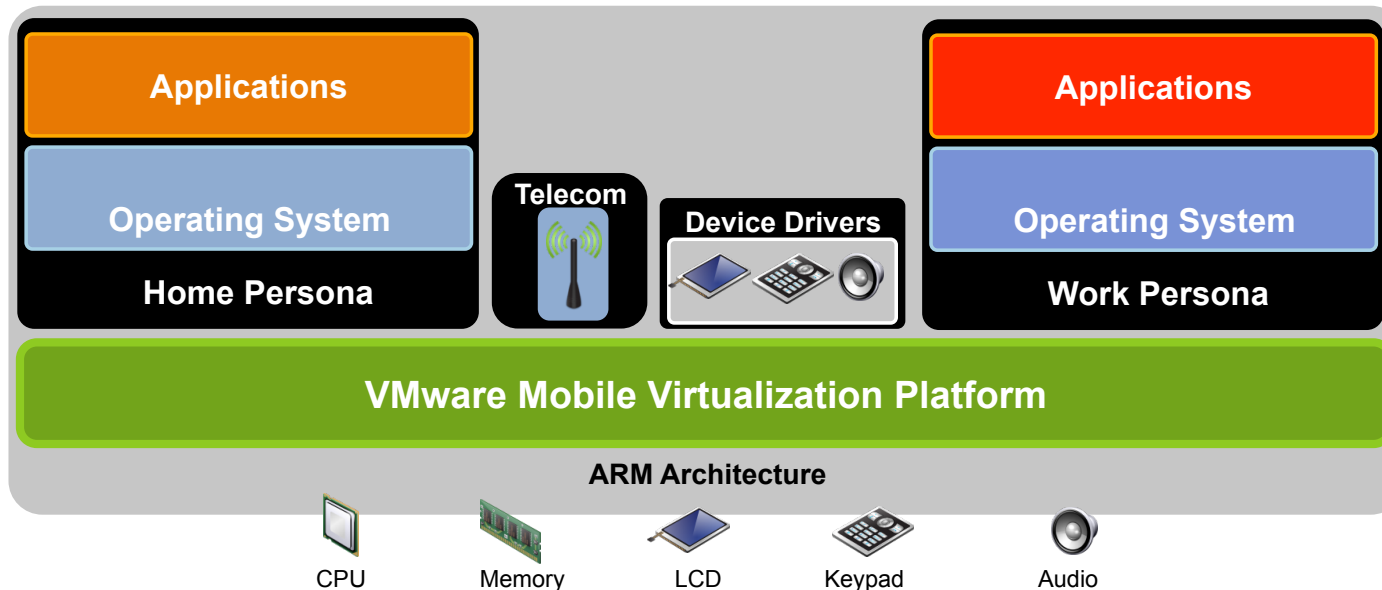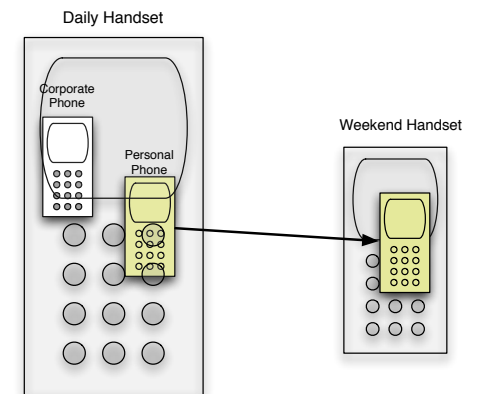
vmware

Solution: Virtualize

Many vPhones in one physical handset

Grandma doesn't care what OS is running

> She should be able to buy apps from any store

**Uniform UI, isolated virtual machines underneath**

> work/personal phone; compartmentalize personalities

Daily Handset

Corporate Phone

Personal Phone

Weekend Handset

Applications		Applications
Operating System	Telecom	Operating System
Home Persona	Device Drivers	Work Persona

VMware Mobile Virtualization Platform

ARM Architecture

CPU Memory LCD Keypad Audio

vmware

Solution: Virtualize

Data, Applications, Communications can be moved to:

> physical handset (symbian, windows, palm, linux, ...)

> much different phone or PDA

> laptop

> desktop

My
Phone
apps
data
config

vmware
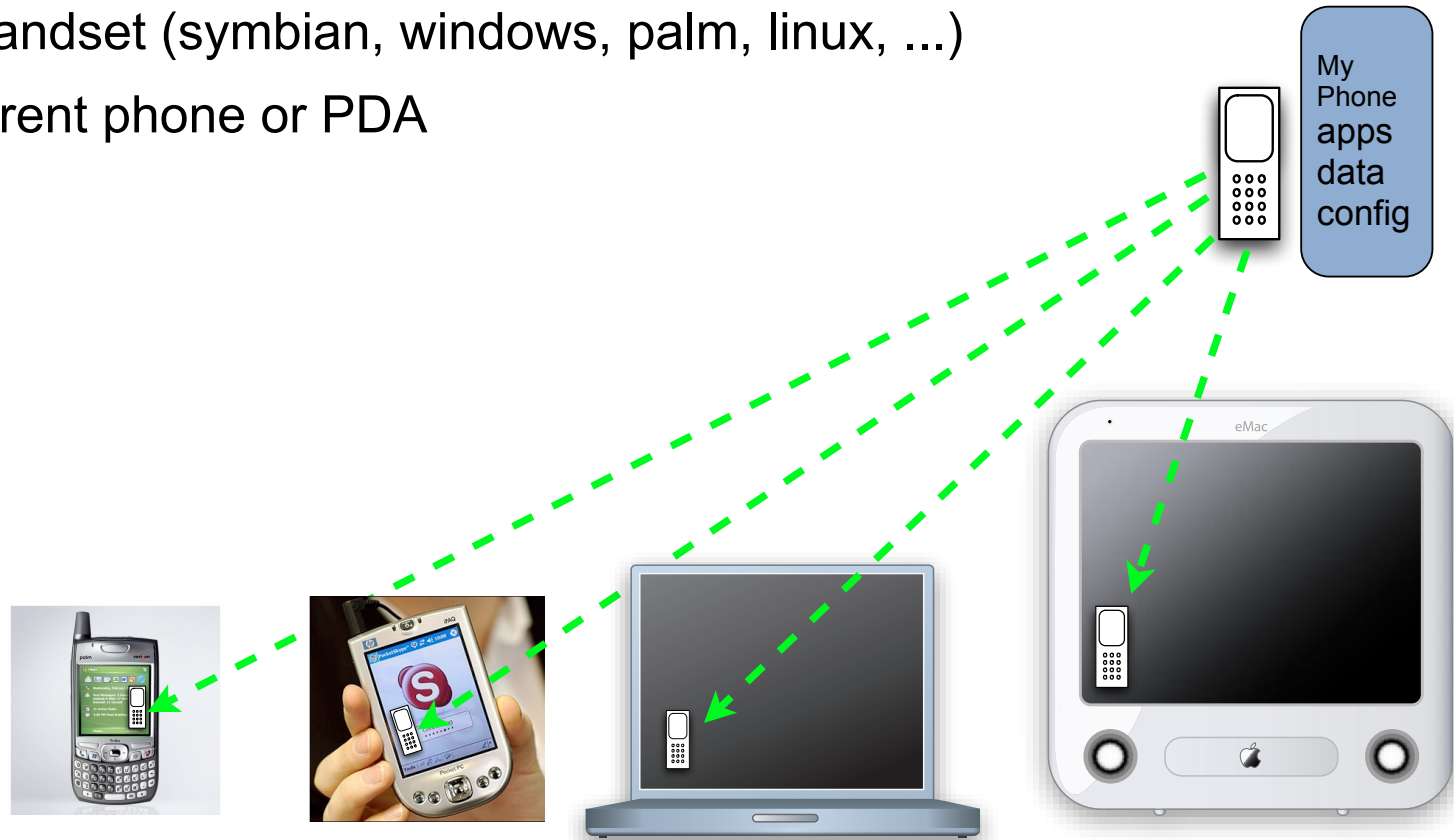
Summary

My phone is always with me and monitors everything I do

> I would like to monitor what it does

There is more to my life than interacting with my phone

> I sit in front of my laptop

Innovative applications will be directed towards the phone

> Personal Computers aren't sufficiently personal or location-aware

User Interface is where it is at

> Life is too short to spend 5 clicks in order to buy a candy bar

Need to work on User Interfaces

> Virtual phones encourage experimentation & innovation

vmware