The rise of ARM in the industrial Embedded Market

At ADLINK, We CARE

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IDC predictions for 2012

- Mobile devices spending will grow 23%, driving 43% of the IT growth.
- Over 700 million smart phones and tablets will ship, a jump of 34%, nearing 2 times of PC shipments.
- Mobile device spending will exceed PC spending, growing 4x as fast
- 1.5 million mobile apps will be available, over 15 times the number of PC apps, while the number of Android apps will finally exceed those for Apple's iOS

from IDC Predictions 2012 : Competing for 2020

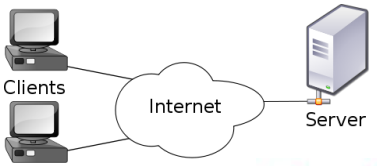
Disruptive technology

"Innovate or be left behind"

- The first IT platform
  - Mainframes and terminals
    single source environment (Processor + OS)

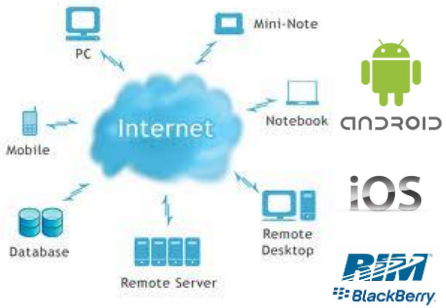
IBM, CONTROL DATA, Bull, WANG, digital, NCR, UNISYS

- The second IT platform
  - the client-server model
    dual source environment (Wintel : Microsoft Windows and Intel x86)



Novell NetWare, hp, acer, Microsoft Windows, DELL, COMPAQ

- The third IT platform
  - Mobile devices and clouds
    multiple source for OS,
    and multiple sources for processors



Google, SAMSUNG, Texas Instruments, ARM, amazon.com

The commercial computing market

- **2000 ~ 2010** : focus on productivity and performance using wired networks
  - Windows XP to Windows Vista/7
  - Battery Powered Notebook replacing Desktops
  - Notebooks becoming high end productivity and multimedia centers

- **2010 ~ today** : focus on communication and mobility
  - Mobile means
    - Wireless communication
    - Wireless Power (Battery powered)
  - Smart phones, Smart Tablets mostly ARM based

Keys to enabling the third Generation

- Wireless communication (Wifi and 3G)
  - Free Wifi is becoming a bussiness model and 3G in every smart phone

Wi Fi™

3G

- "Wireless" Power (battery powered)
  - A boost for power efficient RISC based technology **such as ARM**

ARM POWERED

- Large OS Base support and middleware



android

Windows 8

iOS

VxWorks

Windows Embedded CE

QNX

A Short History of ARM

- **1983–1985: Acorn Computer Group**
  ARM originates from the English brand Acorn that was responsible for the popular (pre Personal Computer era) BBC Micros
- **1987 : Acorn Archimedus**
  based on first production ready 32-bit ARM2 core
  first name *Acorn RISC Machine* and later *Advanced RISC Machine*
- **1990 : the Apple and Acorn cooperation**
  resulted in : ARM6 core, spurning of the design team into a new IP company called *Advanced RISC Machines Ltd* and Apple releasing the *Apple Newton*
- **2008** : 10 billion processors shipped based on ARM IP and licensed to all major players : Intel , TSMC, Samsung, TI, NEC, ST, ZTE, Broadcom, AMD, Infineon, Apple, Qualcomm, Fujitsu, UMC, Lenovo
- **Today** : Almost all major OS vendors support ARM
  Many Linux flavors, Microsoft, Windriver, QNX

ARM POWERED

ARM is RISC

- **RISC :** Reduced Instruction Set Computing
  - Simpler instruction set resulting in less transistors resulting in low power consumption
  - fast response, low power, and coding flexibility, makes the RISC architecture is highly suitable for embedded systems
  - RISC hardware designs are smaller and thus cheaper

ARM/RISC in Embedded Applications

- **The Internet of Things**
  - 100+ billion sensors and tags and 11.5 billion communicating "things" on the network by 2020.
- **Key area's for Smart Solutions**
  - **Energy**
    - Smart metering and monitoring
  - **Healthcare**
    - mobile health applications
    - Clinical mobility
    - Remote patient monitoring using sensors and videoconferencing
  - **Transportation**
    - Intelligent transportation
    - congestion management,
    - infrastructure management,
    - real-time travel management

Example of mobile medical solutions : GE Medical's Ultra Sound evolution

Cart : 100,000 US$

Portable : 20～50,000 US$

Pocket : < 10,000 US$

Example of mobile traffic solutions :

Realtime highway monitoring on your smart phone

- Android, IOS User Apps
- Live CCTV camera feeds accessible for all roads
- Current traffics speeds
- Real time overview of island wide traffic status

Adlink current ARM/RISC projects
TIOT : Handheld Computers

- General purpose RFID/Barcode reader with 3G/Wifi support
  - Processor Qualcomm 7227T
  - 3.5" QVGA TFT-LCD with Touch Panel
  - 28 Numeric push keys + 4 side push keys
  - Camera with 5 Mega pixel
  - WLAN : IEEE 802.11 b/g/n
  - WPAN : Bluetooth V2.0, EDR Class 2
  - WWAN : WCDMA+ EDGE module , HSDPA 7.2Mb/s, HSUPA 5.8M and 384K bps
- OS Support : Android and WinCE

TiOT 2000

TiOT 9000

ANDROID

Powered by Windows Embedded

Adlink current ARM/RISC projects

SP-860 : Smart Panel

- 8" Smart Panel
  - TI® - Sitara AM3517
    Cortex A8 Processor
  - Built in Wi-Fi+ BT SIP module
  - Supports 2 LAN ports
  - High brightness, sunlight readable LCD display options
  - Four-wire resistive touch sensor
- OS : Linux, WinCE, Android

Adlink current ARM/RISC projects

Core Express : Computer on Module

- CoreExpress®-A310CEM-ARM
  - Computer on Module with Marvell Logo Armada 310 ARM SoC at 1GHz with 512 MB RAM

310

MARVELL

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Adlink current ARM/RISC projects

RB-AM3715 : Robot Controller

- Processor TI Sitara AM3715 up to 1-GHz, Cortex-A8
- Mobile DDR2 SDRAM 256MB
- NAND Flash 4Gbit
- TFT Panel 24bit RGB
- Dual LAN with IEEE1588 2. 2 pcs on board for 512Mbyte
- Power : 18-30VDC (24V DC nominal)
- Board dimensions 106 (W) x 81 (L) mm
- OS : Monta Vista Linux

AM3715

TEXAS INSTRUMENTS

ADLINK TECHNOLOGY INC.

Adlink current ARM/RISC projects

MD-ARM2 : Medical Application

- Processor TI DM8148,
  ARM Cortex TM-A8 Core, 1GHz
- 2GB DDR3-800 SDRAM
- NAND Flash 1GB SLC (2x 512Mx8bit)
- TI Video Decoder, TVP5158PNPR
- TFT Panel 24bit RGB
- LAN Atheros AR8031 Giga LAN PHY
- PCI Express x1 extension
- SATA Exension
- Power : 12VDC
- Board dimensions 140 (L) x 100 (W) mm
- OS : Embedded Linux

DM8148

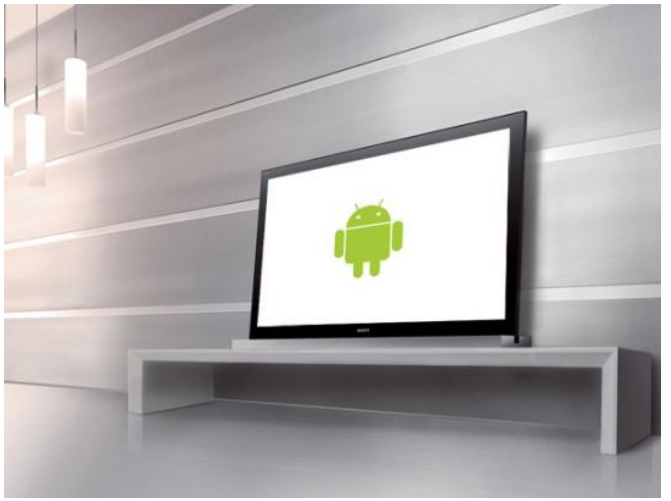
TEXAS INSTRUMENTS

ADLINK TECHNOLOGY INC.

Adlink current ARM/RISC projects

BX-T11 : Android TV STB

- CPU TI OMAP 4430/4460 Cortex A9
- 1080i full HD encode/decode
- Security and Payment smart card reader
- HDMI, YPbPr, Composite Video
- USB Host and OTG
- Ethernet, SPDIF, Line in/out, Mic
- OS : Android Linux



OMAP4460

Texas Instruments

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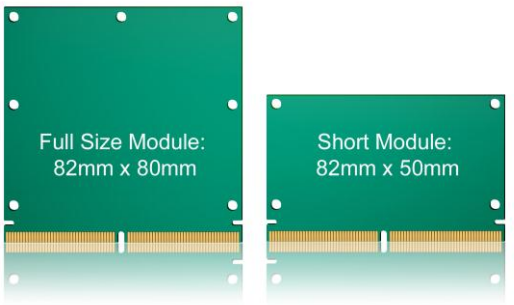
Adlink current ARM/RISC projects
ULP COM : a new standard

- Ultra Low Power Computer on Module for ARM/RISC an SOC
  - A Kontron initiative with participation from Adlink
  - Processor targets : ARM/RISC & SOC
  - Module Sizes : short 82 x 50 mm or full size 82 x 80 mm
  - Connector : 314-pin MXM 3.0 connector
  - Display support : RGB, LVDS, HDMI, Displayport Camera IN (Parallel and Serial)
  - SDIO/eMMC, UART, CAN bus, SPI, i2C / I2S, GPIO
  - OS Support : Linux, Android, Windows CE, Windows 8, VxWorks and QNX.“

ARM®

SOC



- Allowing full support of all native ARM and SOC interfaces on a 314 pin connector

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Questions ?

- End of Section One -

Danke schön

Thank you

ありがとう

謝謝

Gracias

3Q

Moito Brigado

Merci Beaucoup

Dank U wel

감사합니다