A new card edge format for ARM and SoC

IT paradigm shift

- We are in the middle of a major IT paradigm shift
- Wireless and Low power ARM and SOCs in Smart Phones and Smart Tablets constitute “disruptive technology” and will be a driving change and innovation in the embedded market
- To go forward we have to break with the past and rethink our whole strategy

Embedded Formats

- 1992 – PC/104 multi board / parallel interfaces
- 1998 – ETX 2-board / parallel interfaces
- 2005 – COM Express 1.0 2-board / LVDS intefaces
- 2006 – XTX 2-board / parallel+LVDS
- 2010– COM Express 2.0
- 2012 – COM Express 2.1

- Definitions centered around x86 chipset
  - National Semiconductor, Cyrix, VIA, AMD, Intel

What happened with ARM?

- <2007 ARM in low power and low perforamnce
- 2007 first cellphone with GUI (iPhone)
- 2010 first cellphone with dual core CPU
- 2010 iPad with dual core CPU & retina display
- 2012 fist smartphone with quad core

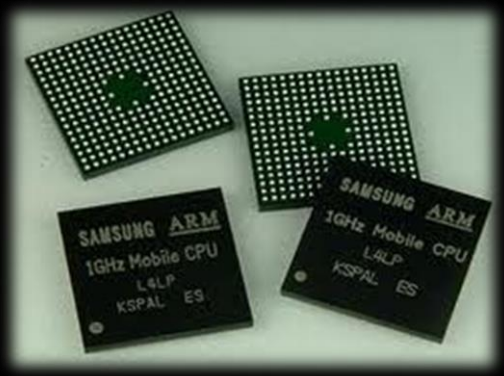
Driving forces

- evolution of device interfaces (SATA 3/6GB, USB 2/3, PCIe G2 G3)
- Increasing I/O density on processors
- 3 chip to 2 chip to1 chip
- trend to SoC even in server class (Intel Xeon, Calxeda)
- Even “high end” chips are under 10W TDP

- ARM SoC as powerful as Intel ATOM
- They can drive a “connected OS” with touch GUI

- Know form factors have very x86 centric I/O mix
- About twelve “private” card edge ARM standards = no standard

ARM comes to embedded



Board 2 Board ARM pin-out challenge

- **Typical ARM/RISC signals**
- 24-bit RGB Video
- Serial Camera
  Parallel Camera
- 2x USB 2.0
- 1x USB / USB OTG
- LAN
- SDIO 4-bit
- eMMC 8-bit
  4x UART
- 2x CAN
- 2 x SPI
- 5x i2C
- Multiple I2S
- GPIO
- Boot Select
- Singe Power Voltage
- Power Management

&

- **Modern Interfaces**
- 24-bit LVDS
- HDMI
- Displayport
- 3x PCIe
- SATA
- GbE LAN
- HD Audio
- SPDIF

- **Latest arrivals**
- Secondary GbE
- USB3.0
- DSI
- Fieldbus
- Reserved Pins

What format to use?

- Use an existing footprint?

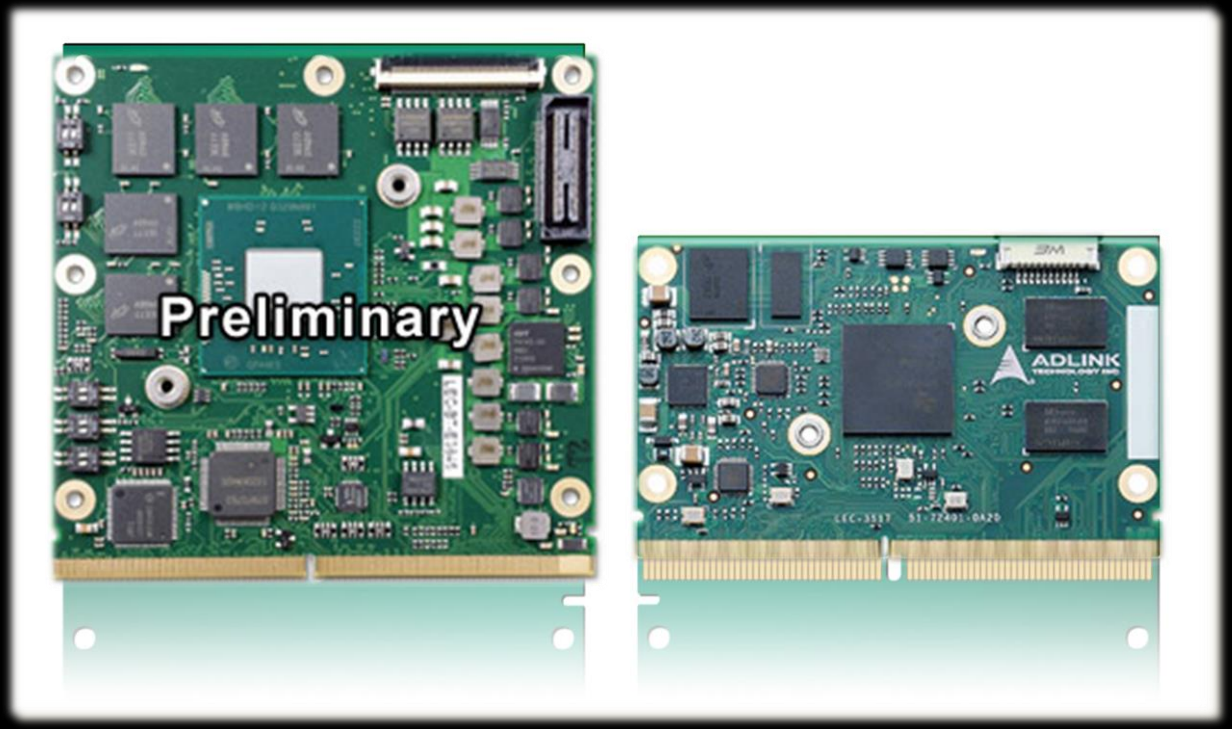
What format to use?

What format to use?

- Define a new one
  that fits just right?

What format to use?

SMARC in a nutshell



314-pin MXM 3.0 connector

Functions on connector

- 24-bit RGB
- 24-bit LVDS
- HDMI
- Displayport
- PCIe
- SATA
- USB
- USB OTG
- Gigabit LAN
- SDIO/eMMC
- Camera IN (Par / Ser)
- UART
- CAN bus
- SPI
- i2C / I2S
- GPIO

What is SMARC standard?

- **A Kontron / ADLINK initiative**
- **Processor targets :** ARM/RISC & SOC
- **Module Sizes** : short 82x50 mm / full 82x80 mm
- **BtB Connector** : low cost 314-pin MXM 3.0
- **Display support** : RGB, LVDS, HDMI, Displayport
- **OS Support** : Linux, Android, Windows WES WEC, VxWorks, QNX

- **An Open Standard** : SMARC
- SGET committee - www.sget.org
  vendor independent

Closing notes

- Low power embedded <10W, (typical up to 6W)
- Specified to allow thinnest 2-board solutions (6mm)
- “MXM 3” Connector available, inexpensive, multiple sources, multi height, extended temp verison
- Defined for ARM SoC, now the latest Intel ATOM CPU also fits with the “tablet/phone” I/O mix
- Now technology is a open choice
  Android & Linux on ARM or Intel

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