Embedded Computer Board and Module Market
ARM Adoption - Overview, Trends and Challenges

July 2012

Speaker: Mark Watson
Report Author: Toby Colquhoun
Agenda

- An introduction to IMS Research
- Report scope and research method
- Introduction to key report findings
- Why is ARM’s share of the embedded market forecast to increase?
- Projections for the future/open questions
- Questions
IMS Research Company Introduction
Who are IMS Research?

An established and global company

- Selling reports across 50 countries and to over 2500 clients
- Released over 250 syndicated reports in 2010
- Continued and substantial growth - 42% growth in FY11
- Founded in 1989
- Recently acquired by IHS Inc. (NYSE:IHS)

Report Scope and Research Method

- World report with 3 regional volumes
- 8 major technologies considered: Standalone Boards, ATCA, cPCI, VME, VPX, Mezzanine, COMs & PC/104
- Each technology further segmented by processor architecture, country/region and industry sector
- Market share statistics for the leading players in each region
- Point of market measurement: board-level component study
- Full report has approximately 150 tables, each with multiple data points, and provides discussion of key findings
Research Method

**IMS Research work flow**

- Scoping: Tailor previous report to reflect market changes. E.g. Addition of PrAMCs as SBCs added
- Collate In-House Data: Medical Imaging Yearbook, IHS Janes, Machinery Production Yearbook
- Send Preliminary Data to Early Purchasers
- Deliver Final Report
- Ongoing Analyst & Customer Dialogue

- 35 Interviews conducted with key board vendors, silicon suppliers, connector manufacturers and distributors
- High level of reported data
- Statistics based on aggregated supplier questionnaire data and supplier discussions
- Extensive library of secondary research
- Report will publish July 2012
Key Report Findings
Merchant Board Market Growth

- Make vs. Buy: Three main trends leading to cost analysis favouring “buy”
  - Declining OEM Resource
  - Increasing Silicon Complexity
  - Reduce development time
- Captive market exceeds merchant market size; good growth potential
ARM shipment market share is forecast to double to 2016; result skewed by influence of SBCs and Mezzanines

What does this analysis look like, just for COMs?
ARM Penetration for COMs Only

- ARM-based COMs are projected to substantially increase unit shipment share between '12 and '16
Why is ARM forecast to become a more important part of the merchant embedded computer board market?
Benefits of COM Concept on ARM Adoption

- Merchant market for embedded computer boards estimated at USD 2.6 billion in 2011; projected to reach USD 4.4 billion dollars in 2016 (CAGR of just under 9%)
Technical Trends have made ARM Viable

- Increasing feature/performance set of ARM processors, driven by consumer world:
  - PCIe
  - Multiple Cores
  - Gigabit Ethernet

- ARM is “suitably complex”

- ARM licensees have products suitable for tough applications

- Timing is at least as important as technical trends...
Has ARM’s time come?

“An invasion of armies can be resisted, but not an idea whose time has come.”

– Victor Hugo

- Average prices of x86 processors have increased year-on-year
- Several form factors are moving towards end of life
- Benefit of integration into standard form factors; small COMs (originally driven by Intel SOCs) are a very good platform for ARM technology
- Verticals that can benefit from the feature set of ARM are projected to grow well
New Vendors Entering ARM Space

Table 1
Market Share Estimates For Suppliers of Computer on Modules
Worldwide in 2010 and 2011 - $ Revenues

<table>
<thead>
<tr>
<th>Company Name</th>
<th>2010 Rank</th>
<th>2011 Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kontron</td>
<td>1st</td>
<td>1st</td>
</tr>
<tr>
<td>Congatec</td>
<td>2nd</td>
<td>2nd</td>
</tr>
<tr>
<td>MSC</td>
<td>3rd</td>
<td>3rd</td>
</tr>
</tbody>
</table>

The market in 2010 was estimated to be worth $500 million
The market in 2011 was estimated to be worth $630 million

Source: IMS Research Jul-12

- COM supplier base is highly fragmented
- Competition for projects is intense
- Vendors accounting for about 50% share of the COM market have announced new ARM products
Decreasing Share for Several Form Factors

- On average, ARM-based modules less expensive than these form factors
- End users that want to maintain original application can use a carrier board with a COM as a migration path
ARM Benefitting from Standards Integration

- Standards-based COMs include: COM Express variants, ETX/XTX, CORE Express, Qseven (small form factors driving adoption of ARM)
- Standards-based vs. Proprietary is a key buying decision for OEMs
Devices that require a battery, are power or space constrained can benefit from ARM.

- Medical - Home healthcare
- Industrial Automation (driven by India/China) - Space constrained applications: PLCs, HMI, M2M, Test and Measurement
Overall, these trends mean that ARM-based COMs are set to grow well: what other trends are there?
Other Trends Influencing COM –based ARM Adoption

- COMs market is forecast to become less European-centric
- Customisation becoming increasingly important for COM market
- Changing make vs. buy threshold (favouring “buy”)
- Possible penetration of ARM into communications
Remaining Challenges/Open Questions

- What will Intel’s response be to encroachment by ARM technology?

- How successful will standardisation of ARM-modules be?

- On-going economic uncertainty

- New users of ARM will likely experience some “pain.” How significant will this be?

- Will there be enough software engineering resource?

- Could there be a trend back to x86 (late ‘12 to early ‘13)?
Questions?

Speaker: Mark Watson
Report Author: Toby Colquhoun

T: + 44 (0) 1933 402255
www.imsresearch.com
www.ihs.com

E: Mark.Watson@ihs.com
E: Toby.Colquhoun@ihs.com