The Windows Embedded Academic Program (WEMAP) Retrospective & Directions, 2002-2006

Lindsay T. Kane

Product Manager Mobile & Embedded Devices Group One Microsoft Way, Redmond WA 98052, USA +1 (425) 707 7800

lindkane@microsoft.com

🖉 Windows Embedded

D. Stewart W. Tansley, PhD

Program Manager Microsoft Research One Microsoft Way, Redmond WA 98052, USA +1 (425) 707 5686

stansley@microsoft.com



Outline

- Introduction
- Background
- WEMAP Milestones
- WEMAP Components
- New Directions
- WEMAP Today
- Conclusions

Introduction

- Embedded Systems vendors often make their products easily available to academia
 - Pros and cons of commercial products in the classroom
 - Both teaching & research applications
- **WEMAP** (Windows Embedded Academic Program)
 - Primarily teaching-oriented academic support
 - With some research aspects
- We want to share some history, where we are today, and where we plan to go
 - Feedback from the academic teaching community is vital (<u>wemap@microsoft.com</u>)
 - We wrote the paper to encourage further dialogue with academia
 - To help us help you

WEMAP Motivations

The Windows Embedded Academic Program (WEMAP) helps promote education around Windows Embedded Technologies between Microsoft and higher education faculty and students.

Expected Benefits to Academia:

- Access to tools for learning embedded development
- Opportunities to solve real world problems
- Visibility into industry trends/challenges
- Career opportunities for graduates

Expected Benefits to Microsoft:

- Feedback on products
- Research opportunities
- Experience with new development techniques
- Recruitment of skilled graduates



Background



• What is Windows Embedded?

- Microsoft's portfolio of OS products and supporting tools designed for manufacturers of application-specific devices
 both mass-market consumer devices and specialized
- Adapts Microsoft's OS/tool platforms where applicable, but also includes embedded-specific technologies too

Windows XP Embedded

- Componentized XP for high-capability devices that use industry-standard PC components in embedded applications
- Standard NT kernel, leverages the desktop OS roadmap

Windows CE

- 32-bit, x86 and non-x86, real-time, small-footprint OS for low-power hand-held/mobile devices and controllers
- Unique kernel, imminently completely updated
- Other products from the embedded devices area
 - WEPOS (Point Of Service), Automotive, Windows Mobile, .NET Micro Framework (new)

PROCESSOR	REAL TIME OS	RUN WIN32 APPS
X86 only	Via Third Party Plug In	Existing or Customized Win 32 Apps
ARM MIPS SHx x86	Native Real- Time Support	Customized Win 32 Apps



Microsoft Embedded Products



WEMAP Milestones

• Origins (<2002)

- Long history of academic partnership, but usually not via product groups
- Windows Embedded keen to work with academia in both research and teaching
- An early research success: Lancaster University (IPv6)
- Partnership with Microsoft Research (MSR)
 - University Relations group (old name)
 - Bridges Microsoft and academia in research and teaching
 - Facilitated Lancaster project and helped in definition of nascent WEMAP
- The 2003-2004 Request For Proposals (RFP)
 - A bold world-wide partnership between WEMAP, MSR, academia
 - \$1.7M, >150 proposals, 76 projects, 26 countries, 14 teaching projects

- Windows Embedded Student Challenge (2003-ongoing)
 - IEEE/CSIDC partnership
 - 30 finalists from 200 entries
 - Inspirational theme every year
 - Cash and visibility as prizes
 - Common platform used: ICOP eBox II running Windows CE
- A New Proposal for Academic Training (2006)
 - WEMAP previously offered commercial training materials to academia for free
 - But training != teaching
 - Commissioned new curriculum materials through a competitive bid, awarded to Georgia Tech (James Hamblen)
 - Based on latest Windows CE 6.0
 - Available early 2007

Embedded Systems RFP Projects



Windows Embedded Student Challenge (WESC)

VIDEO



EverGreen – Intelligent Watering System

Team Sam – 2005 Winners Students:

Daravuth Luong, Alexander Reptis, Jason Shrapnel, Stephen van Rees *Faculty Mentor:* Professor David Jones

Royal Melbourne Institute of Technology, Australia

http://www.windowschallenge.com/winners_2005.aspx



WEMAP Today



- Accessing The Products
 - MSDN Academic Alliance
 - Trial Downloads
 - Note: hard to get access through other routes
- Curriculum License
 - 450 signatories worldwide
 - Enables use of Windows CE source code in curriculum/textbooks
 - Provides access to CE 5.0 Training Materials: Course 2540N

Hardware Empowerment Program

- Program to provide easier access to hardware in schools
- Discounts are vendor specific
- Access to Board Support Packages
- Microsoft just hosts the page of information

- Curriculum Repository
 - Academic Alliance Repository, accessed through MSDN AA
 - Large database of curriculum materials, presentations, papers, videos, training
 - Generally authored by academics for academics
- Student Design Competition
 - Imagine Cup 2007 Embedded Development Invitational
- Academic Workshops
 - Tongji University Training (China)
- Other Components
 - eMVPs, DevCons, being a default point of contact for academics (technical Q&A, etc.)

- Next Steps
 - Development of Academic Specific Curriculum on Windows Embedded CE 6.0 and target hardware
 - More Academic Workshops

Microsoft[®] Windows[®] Embedded Developer Center Develop customized, embedded devices

MSDN Home > Windows Embedded Home > Windows Embedded Community > Academic

Windows Embedded Academic Program (WEMAP)

The Windows Embedded Academic Program (WEMAP) helps provide a better understanding of the Windows CE and Windows XP Embedded operating systems to faculty and students. As a participant in this program, you can learn how to be part of the next generation of embedded developers or educators on Windows Embedded.

Getting Started with Windows Embedded in the Classroom

Learn more about how to get started using Windows Embedded as an academic. Learn how to access Windows Embedded software and find out about the best resources to help you get up and running.

Faculty

- <u>Academic Curriculum</u>: Learn more about curriculum to help you implement Windows Embedded in the classroom.
- <u>Faculty Training</u>: Learn more about opportunities to get training on Windows Embedded.
- Research Projects: Find out about Microsoft Research projects.
- <u>Discounted Hardware</u>: Learn how to get discounted hardware from leading hardware vendors through the Hardware Empowerment Program (HEP).

Students

- The Imagine Cup 2007 Embedded Development Invitational: Are you ready to change the world? Formerly the Windows Embedded Student ChallengE, this competition challenges you to build your own embedded device that will have an impact on solving some of our world's toughest problems.
- <u>Community Development Projects</u>: Find out about ways you can get involved in Windows Embedded Community projects.
- <u>Windows Embedded Career Opportunities</u>: Are you interested in exploring opportunities to work at Microsoft? Find out about ways you can apply for Microsoft internships of full-time opportunities.

Page Options





Home Comp

Competition Community

Support



Register | Log In

Tell A Friend

COMPETITION INFORMATION

English



Embedded Development

×

Devices are becoming smaller, more portable and are having a greater impact on our everyday lives. Here is your opportunity to unleash your creativity and to change the world by developing your own embedded device. Formerly the Windows Embedded Student Challenge, this competition challenges you to go beyond the desktop, challenge your creativity, and to build a complete hardware and software solution using Windows CE and the hardware provided. Create a team of three-four competitors, with a faculty mentor, to build a working prototype of a device that will have an impact on solving some of our world's toughest problems. Compete against students from around the world while demonstrating your ability to be truly innovative. Like former winners, you could use your ideas to start your own company or you could leverage this experience to jumpstart you into your future career.

Register

General Guidelines

- 3- 4 team members
- 1 faculty mentor is strongly suggested
- Teammates must all attend the same school

- 200 Teams will advance to the second round
- 15 Teams will advance to the worldwide finals in Korea



Embedded Development Invitational

- Challenges world-wide undergraduate teams of 3-4, with faculty mentor, to design a complete hardware/software solution using Windows CE on standard hardware provided
 - New ICOP eBox 2300



- Students build a working prototype of a device that will have an impact on solving one of our world's toughest problems
 - 2007: "Imagine a World where Technology Enables a Better Education for All"
- 200 Teams will advance to second round
- 15 Teams will advance to worldwide finals in Seoul, Korea
- Prizes
 - \$8,000 1st Place
 - \$4,000 2nd Place
 - \$3,000 3rd Place
 - Recognition and publicity
- Registration at <u>http://www.imaginecup.com</u>



New Directions

• Software Licensing

- We expect gradual evolution
- What works, what doesn't?

Academic Days

 Pervasive Computing event coming up next March – what would you like to see included?

• Application Development

- To date, emphasis on OS rather than whole device/application
- For apps: NETCF (.NET Compact Framework) for CE, .NET for XPE
- Visual Studio 2005 introduced comprehensive solution for both

• Hardware Availability

- Since WEMAP's conception, we sought a "price of a textbook" board
- This is getting closer all the time

Next Up

- Windows Embedded Virtual Launch Event
 <u>http://www.ce6launch.com</u>
 - Keynote Streamed LIVE from Microsoft Studios
 - November 1, 2006 8:00AM PST
 - One of the most significant launches in years of two products







Conclusions

• WEMAP

- Windows Embedded Academic Program
- 2002 to today
- Good feedback so far, but we want to hear where we can do better
 - What's working?
 - What isn't?
 - What's missing?
- If we returned to WESE next year, what would <u>one thing</u> you most like to see changed/improved/emphasized?



Key Resources

• WEMAP:

http://msdn.microsoft.com/embedded/community/wemap/default.aspx

- Imagine Cup 2007 Embedded Development Invitational: <u>http://www.imaginecup.com/Competition/EmbeddedApplications.aspx</u>
- Academic Alliance Repository:
 <u>http://www.msdnaacr.net/curriculum/facetmain.aspx</u>



© 2006 Microsoft Corporation. All rights reserved. Microsoft, Windows, Windows Vista and other product names are or may be registered trademarks and/or trademarks in the U.S. and/or other countries. The information herein is for informational purposes only and represents the current view of Microsoft Corporation as of the date of this presentation. Because Microsoft must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information provided after the date of this presentation. MICROSOFT MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AS TO THE INFORMATION IN THIS PRESENTATION.

Appendix



The Imagine Cup Integration



- The Imagine Cup is the world's premier student technology competition
- 6,800 students from over 120 universities, participated in Imagine Cup 2006 in China
- Integrating WESC into the Imagine Cup as the Embedded Development Invitational
- The 2007 Competition will have three categories:



Technology Solutions Software Design Web Development Embedded Development Skills Challenge Algorithm IT Challenge Project Hoshimi

Digital Arts Photography Short Film Interface Designer

- Why is this competition is important?
 - Driving Innovation learning from the technology leaders of our future
 - Education & Employability Encouraging skill development with real world applicability
 - Launching Pad for Future Opportunities- Promoting entrepreneurial spirit in students