Windows Embedded and .NET

Introduction to Windows Embedded and .NET Framework

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Windows Embedded and .NET

– About Me
  • Over Eight Years of Consulting Experience
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    – Beginning ASP.NET Using VB.NET
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Windows Embedded and .NET

– What is Windows Embedded?

• “Windows Embedded is a family of operating system software from Microsoft for use in non-personal computer devices such as cash registers, automated teller machines (ATMs), industrial controllers, gateways, Internet Protocol (IP) telephones, server appliances, Windows-based thin clients, advanced consumer electronics, and specialized handheld devices.” – www.microsoft.com
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- Embedded Computing
  - Using software application for a non PC system such as set top boxes, handheld scanners, device controllers among others
  - Usually dedicated to a specific task
    - E.g. ATM Machines
      » Acts like a teller
      » You cannot play a video game although some of the ATM machines are capable of.
  - Locking Down the functions
    - Reliable
    - Well Tested
    - Cost control
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- Two Embedded OS from Microsoft
  - **Microsoft® Windows® CE .NET**: the robust, real-time operating system for rapidly building the next generation of smart mobile and small footprint devices.
    - Small FootPrint (PDAs, SmartPhones, Cameras)
    - For use in X86 and non-X86 Processors (E.g. ARM, MIPS and X86)
    - Platform Builder to build image faster
  - **Windows XP Embedded**: the componentized version of Windows XP Professional, enabling rapid development of the most reliable and full-featured, connected devices.
    - Same Binary as XP Professional
    - Use in Retail POS terminals, Advanced set top boxes
    - Only X86 Processors
    - Target Analyzer and Target Designer to build OS configuration and analyze footprint impact.
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– Application Development
  • Windows XP Embedded supports .NET Framework.
    – Use XP workstation to develop and test application
    – Use Visual Studio.NET
    – Minimum or no learning curve involved

  • Windows CE.NET supports .NET Compact Framework
    – .NET CF contains a subset of classes available in .NET FW
    – Using CE.NET Emulator, develop and test application using workstation
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– What is .NET Framework?
  • Common Language Runtime and its wealth of classes
  • CLR provides
    – Memory Management
    – Cross-language support
    – Code access security

• Languages in .NET
  – VB.NET
  – C#
    – Several other such as C++, Eiffel, COBOL etc.

• Web Services
  – XML and HTTP
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– Visual Studio.NET
  • Powerful IDE
    – Develop .NET Application using language of your choice
    – Integrated support for VB.NET, C# and C++
    – Advance Debugging capabilities
    – Quick Development of Web Services
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– Automotive Industry [TODAY]
  • GM’s OnStar
    – Air Bag Deployment Notification
    – Emergency Services by press of a button
    – Stolen Vehicle Tracking
    – GM® Goodwrench® Remote Diagnostics
    – Etc.
  • Toyota’s G-BOOK (Japan)
    – Toyota's G-BOOK Using Windows CE for Automotive
    – Information Network Service
      » News/Sports/Stocks/Weather
    – Safety and Security Service
      » Roadside Assistance
      » Stolen Car Tracking
    – Update Maps at local convenience stores (E-Tower)
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– **Automotive Industry [TOMORROW]**
  - .NET Connected Car Initiative
    - Voice Activated Smart System
    - Schedule Meetings
    - Answer emails
    - Receive Phone Calls
  - Automakers Support
    - **BMW's 7 Series** includes a navigation application, part of the innovative BMW iDrive concept.
    - **Mitsubishi's Mirage Dingo, Airtrek, Lancer Cedia and Chariot Grandis** include expert navigation capabilities.
    - **Subaru's Legacy Lancaster ADA (Japanese model)** includes a leading-edge navigation system, part of the latest Active Driving Assist (ADA) feature, which helps drivers negotiate driving challenges such as sharp turns.
    - **Volvo's S60, S80, V70 and Cross Country models** include a high-performance Road and Traffic Information (RTI) navigation system that incorporates locally based services and the Traffic Messenger Channel (TMC).
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- Truly Connected:
  - Schedule Maintenance
    - Alert the driver of the maintenance appointment
    - Contact the Dealer for an appointment
  - Breakdowns:
    - Contact the closest Repair shop
    - Contact for tow and ride service
  - Home Appliances
    - Contact Refrigerator for inventory check
      » So you know to buy Milk while you are on the road
    - Turn down the thermostat at home on a hot day
      » To make the house cooler as you would like it
    - Turn the water sprinkler in the garden
      » So if you are going to be late to home that day the plants wont die.
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– Summary
  • Choice of OS
    – XPe
    – CE.NET
  • Developer Support
    – .NET Framework
    – .NET Compact Framework
    – VS.NET 2002/2003
  • Language Choice
    – VB.NET
    – C#
    – C++
  • Automotive Technology
    – Today (OnStar, G-Book)
    – Future (Connected Car and more)
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Q & A