



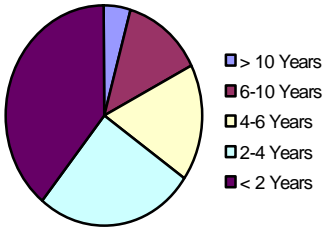
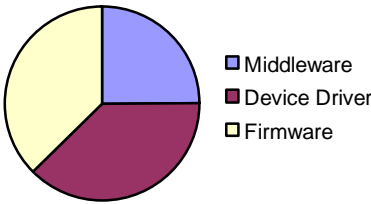
Embedded Solutions

INTRODUCTION

With a strong and dedicated workforce with over 200 man-years of experience, NeST has been offering products and services in a broad range of embedded technologies. This includes development in the field of multimedia streaming, Audio/Video CODEC, cryptographic related product, hard real time systems like rocket launching checkout, etc. The support of Device Drivers, Imaging, DSP and GUI teams available at NeST, makes it a single point destination for all the embedded solution.

TECHNOLOGY SKILL SET

NeST has a dedicated Embedded Systems Group with strength of 50 people. The various skills that the Embedded group at NeST has accumulated so far and which are available for our customers are as follows



Os
 VxWorks, pSOS, QNX, Windows CE
 Embedded XP, Embedded Linux, Proprietary
 Kernels

Processors
 8051, Motorola 68HC11, Hitachi H8 series, SGS
 Thomson T800, NEC V853, ATMEL AVR Micro
 controller

Intel x86, Motorola 68K family
 Motorola 56000 DSP, ADSP 2106x DSP
 Hitachi SH series Processors, MIPS VR5432, Intel
 i960, ARM RISC processor

Tools
 TASKING® EDE tool, Tornado IDE, Spectra
 Development Tools, prism3+ IDE, Matlab

Technology

- MPEG ,DOLBY® AC-3, WMA, Image
- USB, IEEE 1394
- Microsoft Direct X, DXVA, WDM, SDL
- RISC / CISC CPUs, DSP, Micro controllers, C and Assembly language Programming

Skills

- Multimedia system development and testing
- Multi-platform development
- Middle-ware and firmware development
- Embedded Real-time systems and Custom embedded executives



SAMPLE PROJECTS

1394 Stack for Digital Set Top Box

NeST implemented the following standards/protocols over IEEE1394 using Toshiba TX39X processor.

- IEC 61883 –1 (Consumer Audio / Video Equipment Digital Interface)
- AV/C Digital Interface Command Set General Specification version 1.0
- AV/C Tuner Model & Command Set version 1.0 and AV/C Tuner Broadcast System Specification – Digital Video Broadcast (DVB) version 1.0.
- AV/C Digital Interface Command Set VCR Sub-unit Specification version 2.0.1

DOCSIS Compliant Cable Modem Solutions

This project aims at developing a DOCSIS 1.1 Compliant Cable Modem Solution using a MIPS R3000 Processor derivative. This product is proposed to have multiple derivatives and has interfaces for USB, Wireless and Ethernet and X-10 protocols. It also involves extending the SNMP agent and support of customer MIBS. Uses Philips PR3930 processor.

- Uses pSOS for MIPS and prism3+ IDE
- Total turnkey development from schematic to prototype to production
- Involves in house development of both hardware and software

Bluetooth to CAN Gateway

This gateway module allows Bluetooth devices to communicate with in – vehicle modules like Engine Control Unit, Body Control Unit etc which are usually connected through a CAN network. The gateway uses an Ericsson Bluetooth Baseband module and is based on Hitachi 16 bit Controller. The

Gateway Firmware interfaces to the HCI layer through an USB transport layer. The firmware for the Bluetooth Driver was done using C and assembly programming. Uses H8S2623 processor.

Smart Book Reader

The project aims at developing a handheld device with dual LCD color display with VGA resolution. It also supports CD, Audio and Animation support. The project team had to customize the OAL (OEM Abstraction layer) and develop most of the device drivers for this purpose. The system has JAVA and Hypertext support. Implemented using SC400 processor.

- Windows CE 2.0 based hand held devices
- Driver development was one of the key areas in this project The drivers designed & developed are
- CD-IDE driver with ATAPI-5 support
- Dual display driver using 65545 display controller

CryptiPhone

Cryptiphone uses cryptocard for providing secure means of communications between telephone users and makes use of Diffie-Hellman algorithm, which is a key exchange algorithm.

During startup key exchange is initiated between the sender and receiver. This key is used for encrypting data (speech) for further communication and thus provides a secure means for communication. One of the challenges in the project was the implementation of D-H as this key exchange need to be over within 2-3 seconds after dialing the number. Cryptiphone is implemented in NEC V853, Vr 5432 platforms.

For more information on NeST's service offerings, please contact:

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