



Portfolio of Defense Projects

US Army, Ft Monmouth, Secure NICE Bridge

Dot4 is developing a proof of concept network prototype for the US Army that will allow a highly secure network to be connected to a lesser secure network. The project goal is to use COTS hardware components and custom software.

The prototype is required to support an FDDI network. The platform chosen for the prototype includes VxWorks on an embedded Pentium based single board computer.

Successful demonstration of this gateway will result in a broad adaptation of this technology throughout Army installations on a variety of network media.

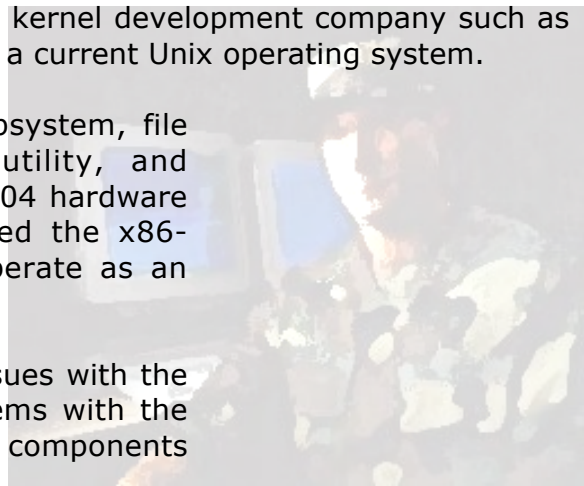
BBN Technologies/VenturCom Inc., NTDR

BBN Technologies was contracted by ITT to develop early models of a wireless internet device known as the *New Technology Digital Radio* (NTDR) for the US Army. This digital radio is capable of forming a wireless TCP/IP network with other NTDR units for voice and data communication.

Dot4 ported a set of real-time extensions from VenturCom's legacy VENIX product to the then-current version of SCO's UnixWare operating system. These extensions would permit UnixWare to operate in an embedded environment (without keyboard, monitor, or disk drive), and provide some real-time management of events. Since VenturCom had exited the Unix market, a Unix kernel development company such as Dot4 was needed to bring these technologies to a current Unix operating system.

Dot4's work involved the Virtual Memory subsystem, file system, creating a FlashROM reloading utility, and integrating these enhancements with the PC/104 hardware selected for the NTDR. Dot4's efforts allowed the x86-based hardware to boot UnixWare 7 and operate as an embedded device.

Do4 was then contracted to resolve several issues with the ethernet device driver, and to address problems with the build and packaging of the operating system components for FlashROM resident operation.



Northrop Grumman Corp., F-14B, D Weapons Systems Trainer

Dot4 provided Northrop Grumman with expertise critical to the development a state-of-the-art flight simulator for the Navy's F-14B and D Tomcat fighter. This project required a migration of hundreds of thousands of lines of Fortran code from the legacy Gould/Encore MPX platform that hosted the original F14A simulator, to a multiprocessor realtime Unix platform. An additional 150,000 lines of code were written in C to bring the simulation up to date with the B and D variants of the aircraft.

Northrop Grumman relied upon Dot4's systems engineering, Open Systems, and simulation expertise, allowing the client's staff to remain focused on the modeling of the airframe, flight characteristics, and weapon system components of the project.

The simulator utilizes over 20 board-level VME components that provide special processing capability, and connectivity to external devices and systems. Dot4 also contributed heavily to the software resident on the VME board-level processors, usually involving VxWorks, C Executive, and SPOX. Dot4 developed a comprehensive set of custom real-time monitoring tools to aid integration and testing. After 6 years of development and a successful delivery, this project has entered a long-term support phase.

ASC, F-14 Simulator Visual System Upgrade

Dot4 and Northrop Grumman deployed a state-of-the-art Flight and Weapon Systems simulator to the Navy for the B and D variants of the Tomcat. This simulator included a highly evolved, full surround visual system. The Navy has funded a program to upgrade other F14 simulators to incorporate this visual imaging technology as well as other improvements.

As a recognized expert in this area, Dot4 has been contracted by ASC to perform the host system modifications required to incorporate the imaging technology. The host platform for the upgraded simulators is a VxWorks, PowerPC embedded system, which will require that Dot4 port Unix based applications and driver software to the new platform.

Naval Foundry Propeller Center, APOMS Modernization

Dot4 is currently engaged with the Naval Foundry Propeller Center (NFPC) in Philadelphia. NFPC casts propellers from molten metal compounds, then mills them for use on US Navy vessels. When completed, the propellers undergo exhaustive digitized optical scanning and analysis to ensure that they are manufactured within extremely tight tolerances. The name of the scanning and analysis system is the Automated Propeller Optical Measuring System (APOMS).

APOMS, in conjunction with the Motion Control Processor and the Vertical Positioning Processor, is connected to a 40-foot robot arm and various special purpose computers for robot control. The computers are aging proprietary systems that are nearly impossible to maintain. Dot4 is rehosting and re-engineering selective components of the application to provide state-of-the-art hardware and more maintainable software, resulting in increased productivity and reliability at the Center.

TRW, GuardRail MSC Rehost

GuardRail is a US Army theater defense system designed to track and engage airborne threats in order to protect assets on the ground. GuardRail is a combined SIGINT, ELINT, and weapons control system that was first deployed 20 years ago. GuardRail is in a constant state of modernization to make the system faster, more accurate, more mobile, and more reliable.

Dot4 was contracted to accomplish the very difficult task of rehosting the Main System Computer (MSC) from the legacy OS/32 platform, to Concurrent's Maxion platform, which is a symmetric multiprocessor real-time Unix computer. Among the challenges Dot4 overcame, was the problem of converting over 400,000 lines of assembly code to C. Dot4's highly successful rehost was official named the Maxion Main Computer System (MSS).

L3 Ilex, GuardRail ESC Rehost

Following Dot4's highly successful rehost of GuardRail's MSC, the Ilex division of L3 Communication contracted Dot4 to rehost another portion of the complex system. The ELINT System Computer (ESC) had been partially rehosted onto a Unix platform, but many issues were unresolved. Dot4 completed the port to Sun Microsystems Solaris based Unix platform, re-engineering the system software and application software to bring the Unix version of the ESC to full functional capability. Dot4's rehost is named the ELINT System Computer on Solaris (ESS).

L3 Ilex, GuardRail System 4, System I, and System II

Two high profile successes with the GuardRail program resulted in Dot4 being invited to participate in development tasks on all three generations of the GuardRail system. System 4 is the oldest version of GuardRail still in active service, System I is the most current generation deployed to the field, and System II is the highly enhanced version still under development.

Dot4 is retrofitting System 4 with several enhancements. Dot4 engineers are also addressing performance issues and enhancements for System I. A dot4 engineer has been assigned to the Ilex team preparing to receive the completed System II. This team deploy and support System II t worldwide, addressing all software engineering issues that are expected to arise from field testing.

EMS Corp., USS Virginia EM Control System

EMS Corporation was contracted by General Dynamics Electric Boat to develop a system that masks and manipulate the magnetic signature of the USS Virginia class submarine under development. The embedded system monitors and controls multiple power supplies, sensors, and associated field generators that are to be deployed on the submarine.

EMS was faced with a set of design issues that required Dot4's deep embedded design expertise to resolve. Dot4 played a lead technical role on the software components of the project, encompassing the entire development cycle from preliminary design to development, test and delivery. Software and systems used and/or deployed on this project included PowerPC, VxWorks, HP/UX, and Windows NT, C and Ada.