

# Open Communication Interface— Full lifecycle development

## Client

LynuxWorks, a leading manufacturer of embedded operating systems and development tools for real-time and embedded system applications.

## Project Summary

Auriga performed full lifecycle development of the Luminosity Open Communication Interface (LOCI)—a multi-platform debugging interface covering full range of LynuxWorks operating systems on x86 and PowerPC platforms. LOCI is a unified communication channel for system debugging of various LynuxWorks products. It enables third parties to develop host-based tools for different families of LynuxWorks OS using a single OS-independent interface.

## Business Need

LynuxWorks decided to introduce a solution that would ease the development and debugging of third-party applications for LynuxWorks operating systems without exposing system internals.

## Implementation

To abstract the information coming from the various LynuxWorks Operating Systems and convert it to a less proprietary form, Auriga engineers implemented a design where a proxy server handles the requests from host-based applications via standard API and sends them to the target server.

The solution is compatible within the LynuxWorks Integrated Host-Target Model (IHTM).

The works on the project included development of the following components:

1. Target LynuxWorks Server. Coordinates sessions with targets via serial line or Ethernet connections. The OS and hardware abstraction layer is implemented as set of independent target agents which communicates with external world via target LynuxWorks server.

- LW Server system agents for debugging:
- application and kernel debugging
- file operation
- system viewer (monitoring access to system data)
- kernel profiling

2. LynuxWorks ProxyThe proxy server, with integrated FLEXlm license manager, is used as an access point to the target servers. The target access rules are stored in an internal database. A Java-based GUI client has been developed for certificate configuration, to define the target access rules and manage user access rights. LW Proxy connects to the target server via Ethernet Network or RS-232 serial line.

3. Host-side Java API Library provides unified debugging interface, it can work on remote workstation within Ethernet visibility of system with LynuxWorks Proxy software deployed or on the same system where Proxy software runs. The API library supports both synchronous and asynchronous multithread safe communication with different targets.

4. Target C API is a reduced API that can work directly on the target server

Auriga created a test framework and a set of test cases for automated testing, and carried out the testing of LOCI. Auriga also developed a complete documentation package.

Auriga created a test framework and a set of test cases for automated testing, and carried out the testing of LOCI. Auriga also developed a complete documentation package.



## Results

LOCI is a unified debugging interface that will be available to LynuxWorks clients. Its multi-platform API package supports:

- various versions of Linux, Windows, Solaris on generic x86 and SPARC CPUs - as host OS
- 7 LynuxWorks operating systems on generic x86 and PowerPC platforms – as target OS

LOCI will be offered as a COTS product or as an add-on for the Luminosity IDE.

## Project Details

### *Project statistics*

- Project duration: 10 months
- Average team size: 12 FTE

### *Project phases*

- Design
- Development
- Testing and Quality Assurance

### *Tools and Technologies*

- Host operating systems:
  - RHEL 3.0 and 4.0, Win2k (on x86)
  - Solaris 2.10 (on SPARC)
- Target operating systems: LynxOS-SE 3.0, LynxOS 2.3, 5.0, BlueCat Linux, generic x86 and PowerPC
- Technologies:
  - C, Java
  - IntelliJ IDEA 5.0, MS Visual Studio 6.0
  - GNU tool chain, SPyKer TM
- Testing Tools: PVCS, Jython