

# Auriga, Inc.

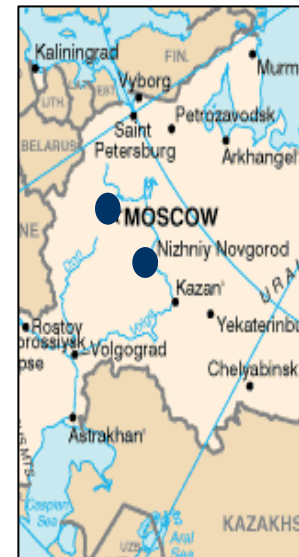
Software Testing Services



Elite Software R&D Services  
*Since 1990*

# Auriga At a Glance

- 2006-2008 Global Services 100 and 2008-2009 Global Outsourcing 100 company
  - **Top 10** Leaders, **Emerging European Markets**
  - **Best 10** Companies by Industry Focus: **Health Care**
- In business since **1990**—first in Russia
- Incorporated in the **U.S.** in 1993
- **4 engineering centers**—Moscow (3), N. Novgorod (1)
- **250+** FTEs with **low attrition & rotation**
- **CMMI Level 4** company
- **SPICE** (ISO 15504) accessed
  - **Life critical software** compliant
- Member of  
- Focus on **software R&D and product engineering** for high-tech clients
- **Leader in system-level & embedded** development services
- **Proficient in Web & enterprise** applications



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# Full Spectrum of Testing Services

- **Test development and optimization**
  - Test strategy definition and refinement
  - Test case development, refactoring and maintenance
  - Requirements coverage and traceability analysis
- **Functional test execution and reporting**
  - Unit, regression, integration, system, acceptance, ... testing
  - Full defect lifecycle support
  - Quantitative product quality and testing quality data: metrics
- **Non-functional testing**
  - Performance/Load/Stress testing
  - Compatibility/Configuration testing, Usability testing
  - Security testing
  - Data migration/conversion testing
- **Test automation**
  - Automated test suites and frameworks
- **Consulting**
  - Defect root cause analysis, defect prevention
  - Testing process improvement
  - Feasibility study, 3<sup>rd</sup> party solutions evaluation

# Functional Testing

- **Sample Project—Testing Framework for Complex Medical Software Products**
  - Draeger Medical—FDA/EU regulated medical environment
  - Development and implementation of a complex testing framework for sophisticated critical care products
  - Services
    - Definition of the test specifications and manual test implementation
    - Design and implementation of complex automated testing frameworks based on Rational Robot and CppUnit unit testing library
    - Development of the testing scripts
    - Design and implementation of several debugging and inspecting tools
    - Implementation of Unit tests in accordance with high-level component requirements
    - Integration of result products into Draeger Medical's components environment
  - Tools and Technologies
    - C++ ,
    - CppUnit
    - Rational Robot
    - XML
    - Windows
    - Microsoft Visual Studio .NET 2003



# Automated Testing

- **Experience**

- Application-level and system-level products
- Development of automated test suites
- Development of testing frameworks
- Development of special hardware tools to allow automated testing

- **Sample Projects**

- Development of the automated test framework for testing AdvancedTCA Shelf Management and backplane networking products for Pigeon Point Systems
- Development of the automated test framework and automated test suites for the Hot Swap Kit and the Hot Swap Controller Kit products licensed by Motorola, Force Computers, Ziatech/Intel, and Microsoft
- Development of automated test suites for Motorola Computer Group's/LynuxWorks' High Availability Package
- and others



# Testing: Telecom and Computer Telephony

- **Telecom Experience**

- Telecom hardware from Motorola, Force Computers, and others
- High availability, hot swap, checkpointing
- IPMI, AdvancedTCA, CompactTCA

- **Computer Telephony Experience**—development and testing of NMS Communications products, including

- Voice processing services, call control, IVR, conferencing
- High availability, hot swap
- SS7 signaling protocol

- **Sample Projects**

- Development of an automated test framework and a set of test scripts for local and distributed testing of NMS Communications' Natural Access product core and services
- Development of an automated test framework and a set of test scripts for acceptance testing of a backplane network emulation product for telecom hardware





# Testing: Embedded and Real-Time

## Sample Project—Dedicated Testing Team for LynuxWorks.

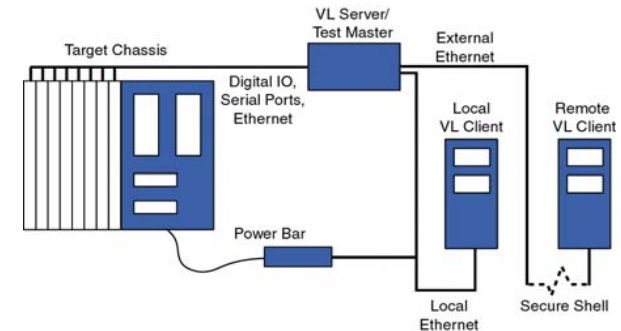
- Since 1996 up to 2004, LynuxWorks Inc. had been outsourcing software development tasks to Auriga, while still performing testing activities in-house. In 2004, due to increased in-house workload, LynuxWorks decided to outsource testing tasks as well. Auriga with its comprehensive testing facilities close to the development center, emerged as the best choice.
- Areas
  - System and tools testing—to verify the basic system functionalities, POSIX conformance, network functionalities, compilers, debuggers, etc
  - Performance testing
  - Real-time compliance testing
- Services
  - Test execution
  - Test development and update
  - Test porting



# Testing Solutions for Embedded Systems

- **Automated testing**

- Automated Testing Framework supports execution of automated test suites written in
  - Tcl, Expect
  - UNIX scripts
  - Perl
  - C
- Automatic installation and loading of target boards
- Simultaneous control over execution of software on multiple targets



- **Hardware control and remote access—Virtual Laboratory**

- Allows Controlling
  - Multiple serial ports
  - Multiple relay channels
  - Power supply for multiple boards
- Serves as a base for execution of automated test suites
- Provides APIs that allow test suites using resources of the Virtual Laboratory (VL)
  - Test suites can be executed on the VL server and/or on client machines
- Can be used to access hardware in remote labs
- Auriga has developed own hardware solution based on the idea of Virtual Laboratory

# Performance and Compatibility Testing

- **Performance Testing**

- Website load and stress testing and performance optimization for a high performance web service for a large Russian telecommunication company
  - Testing web service operating under a heavy load—10,000+ simultaneous users
- Performance testing and optimization for a backplane network emulation product
  - MS Windows (NT, 2000), LynxOS, Linux, VxWorks, OSE
  - x86, PowerPC
  - CompactPCI, PCI, VME
- Development of Load Test Engine for testing NMS Communications' Natural Access core and services

- **Conformance and Compatibility Testing**

- POSIX and real-time conformance testing for LynuxWorks
- Executing and updating Intel's ICTS test suite for Pigeon Point Systems
- AdvancedTCA conformance testing for Pigeon Point Systems
- Verification of Microsoft hot fixes (QFEs) for medical environment for Draeger Medical





# Test Resources

- **Existing Resources**

- 45 test engineers and managers working for 10 clients in all 5 Auriga offices
- Independent Test Group inside Project Services Department
- Average 7 years of experience
- 94% Master Degrees

- **Recruitment**

- 5 full-time recruiters
- Proprietary database of 6000 resumes with advanced search
- Formal and rigorous testing of candidates - engineering interviews, language tests, technical skill tests, cultural/team fit assessments

- **Training Center**

- In-house Hands-on Training Program
- Sound theory applied to real business
- Carnegie Mellon certified instructors in the QA area
- Instructors from real projects
- Training programs tailored to client/project specific needs



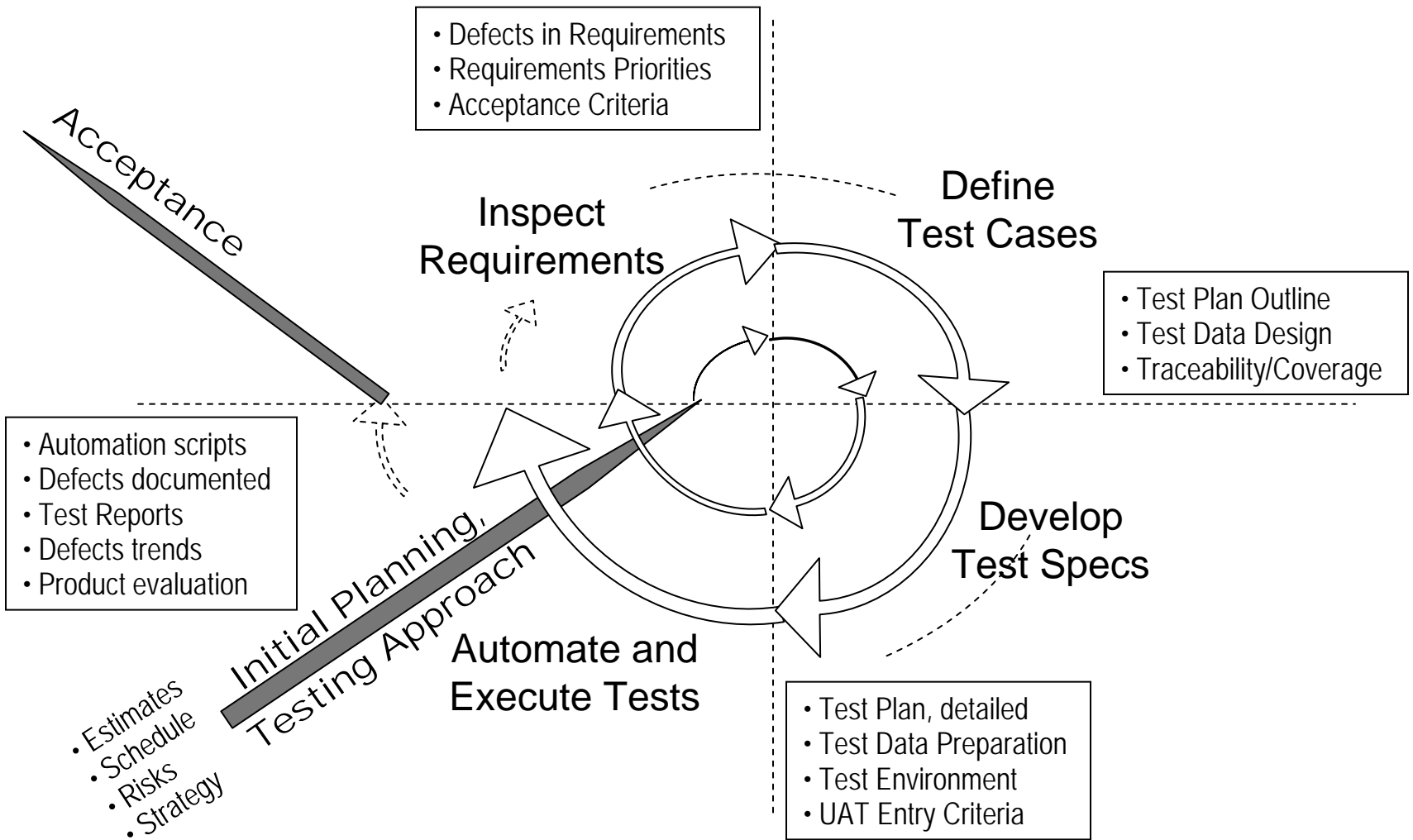
# Testing Methodology

## Part of Auriga time-tested Software Engineering methodology

- Performing according to the pre-defined strategy
- Requirements-based test specification
- Traceability of tests to requirements
- Requirements-driven defect classification and release evaluation criteria
- Performance test approach based on workload models
- Regression test strategies
- Templates for test specifications, test logs, test reports, etc
- Defect tracking system to provide immediate feedback during testing
- Quantitative measurements
- Regular reports to the Customer and supervisor, QA audits



# Testing Process Outline



# Contacts



**Thank You and  
We Look Forward to Working with You**

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