

Industry Standard
LINUX
for
Device Software Optimization

Diego Bruno
Senior System Engineer
South-Western EMEA

WIND RIVER

Is This Happening at Your Company?

Do Your Developers

- Rely on basic, non-integrated, tools (e.g., printf) to debug complex applications?
- Spend more time finding and fixing code problems than creating new features?
- Spend too much time integrating different technologies from multiple suppliers?
- Write and support device software technology that offers limited value or differentiation?

Do Your Project Teams

- Suffer inefficiencies because they cannot leverage legacy or acquired code?
- Experience delays when code changes by one developer cause problems somewhere else in the project?

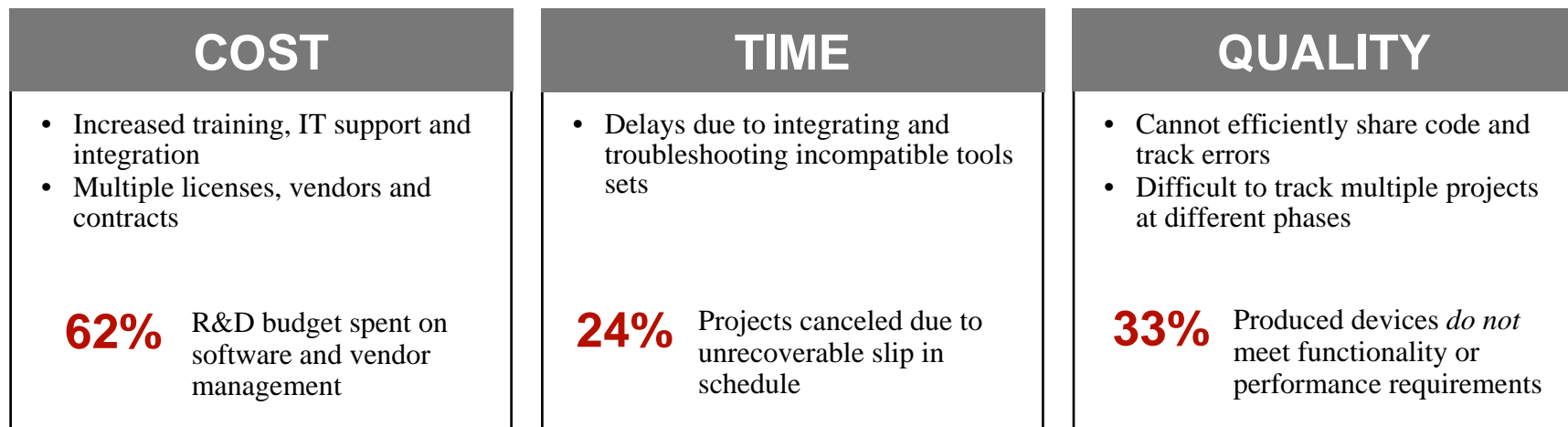
Does Your Organization

- Waste resources engaging and managing software vendors?
- Use a patchwork of closed development tools that prevents collaboration among your developers, projects, and sites?
- Experience inefficiency in both the IT and Development teams by supporting multiple tool chains or multiple OSEs?

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The Development Process is Broken

When teams working on same project use processes, tools and vendors that are incompatible with other teams, it impacts 3 critical areas:



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The Workbench Solution

Workbench **Optimizes**

- Capability for each phase of development
- Collaboration, reuse, flexibility, and the return on acquisition and training
- The entire end-to-end development process across all projects

Workbench **Enables**

- Effective completion of the primary tasks in each development phase
- Standardization via its breadth of OS and processor support
- Complete extensibility and scalability



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A footstep back: who is Wind River

- Founded in 1981 and headquartered in Alameda, CA
- 1000+ employees worldwide
- 40% market share*
- Global professional services
- Vertical market focus
 - Aerospace/Defense
 - Automotive
 - Digital Consumer
 - Industrial
 - Network Infrastructure
- Focused on reliability and innovation
 - More than \$60 million in R&D investments (last four quarters)



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* Various reports estimate Wind River market share between 30% and 40%

Global Customers

BAE SYSTEMS



DAIMLERCHRYSLER



The Ultimate Driving Machine

LOCKHEED MARTIN



Rockwell Automation

Raytheon



Agilent Technologies



BOSCH



SIEMENS

CISCO SYSTEMS



ERICSSON



Pioneer



MITSUBISHI

NORTEL NETWORKS



NOKIA

Panasonic

RCA

SONY

PHILIPS

WIND RIVER TOSHIBA

intel



Customer Momentum



Networking

Alcatel
Cisco
EMC
Ericsson
Fujitsu
Hitachi
Hewlett-Packard
Huawei
Intel
Italtel
Juniper
LG Electronics
Lucent
Marconi
Motorola
NEC
Nokia
Nortel
Pirelli
Siemens



Industrial

ABB
Agilent
BAE Systems
Comau
CREA
Bosch
Fanuc
Gambro Dasco
GE
Hitachi
Honeywell
Mitsubishi
National Instruments
Omron
Rockwell Automation
Samsung
Schneider
Siemens
Tektronix



Aerospace & Defense

Alenia
BAE Systems
Boeing
EADS
European Space Agency
Galileo Avionica
GE
General Dynamics
Harris
Honeywell
LG Innotek
Lockheed Martin
Marconi Selenia
MBDA
NASA
Northrop Grumman
Raytheon
SIA
Thales
Smiths Aerospace



Digital Consumer

Alcatel
Becar
BMW
Canon
Ericsson
Fujitsu
Hewlett-Packard
Hitachi
Kenwood
Konica Minolta
Motorola
Philips
Pioneer
Pirelli
Samsung
Seiko Epson
SIM2 Multimedia
Sony
Thomson
Toshiba

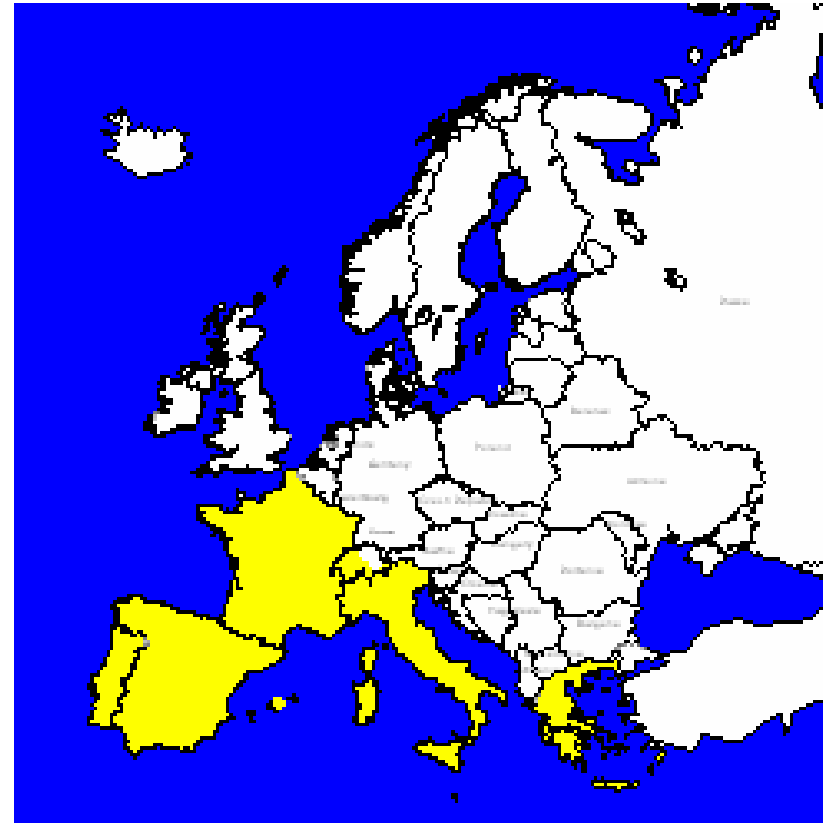
300 Million devices worldwide use **Wind River** technology

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The South Western Region

- **Geography:**

- France
- Italy
- Spain
- Portugal
- Greece
- Switzerland
(French + Italian)



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The Linux Dilemma

Open Standards ...

- Royalty-free
- Lower costs and faster time to market using COTS components
- Ensures portability and interoperability with third party Software
- Make application development easier
- Vendor Independence

However ...

Time

Wasted on bringing up a Linux environment

Spent maintaining and supporting Linux platform instead of product differentiation

Quality

Linux Development tools are poor

Test and validation of Linux open source content can not be ensured

Cost

Multiple in-house distributions impacts productivity

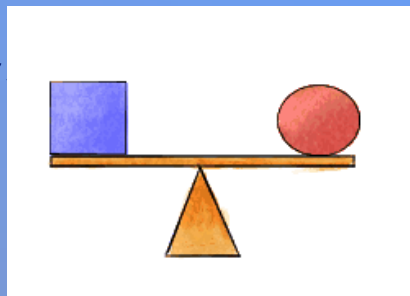
A product portfolio strategy requires Linux **AND** an RTOS.

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Hard Real Time or Soft Real Time?

Linux

Maximum functionality
Scales up through enterprise
Loose hardware coupling
(often standard COTS HW)
POSIX 53/54, High Availability
SMP & 64-bit req'ts

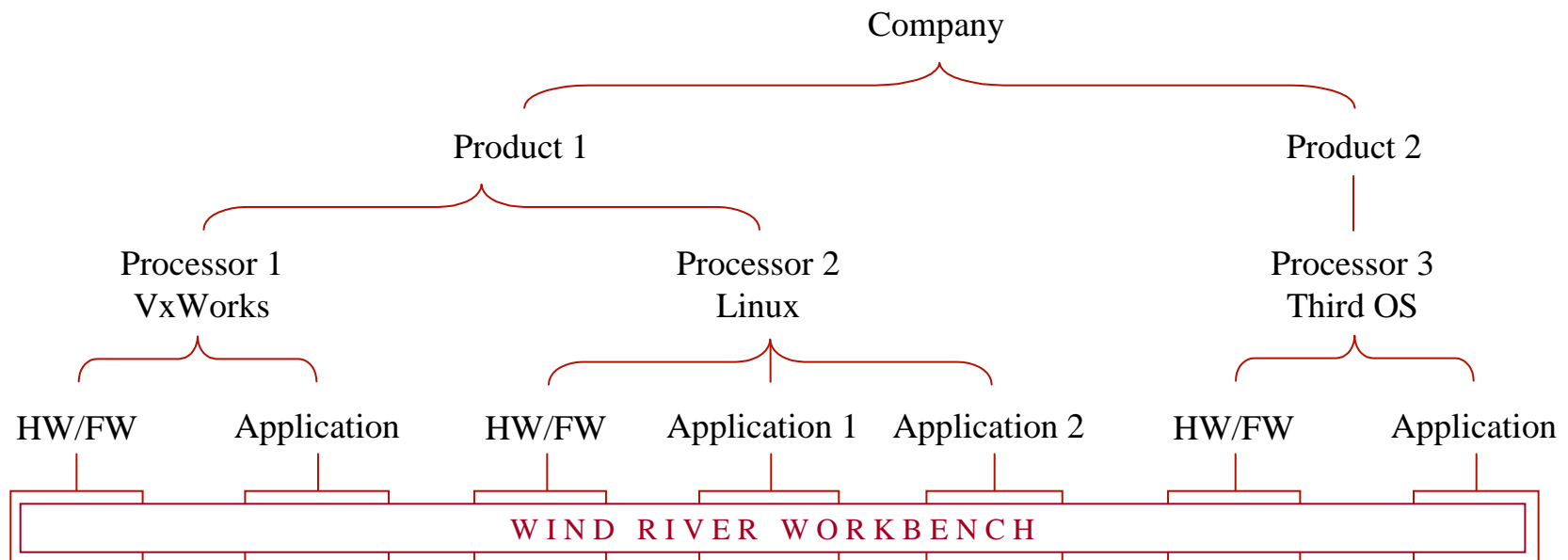


VxWorks

Responsiveness & determinism
Scales down for HW cost control
Close hardware coupling
Well-suited for custom HW
Safety & security certification

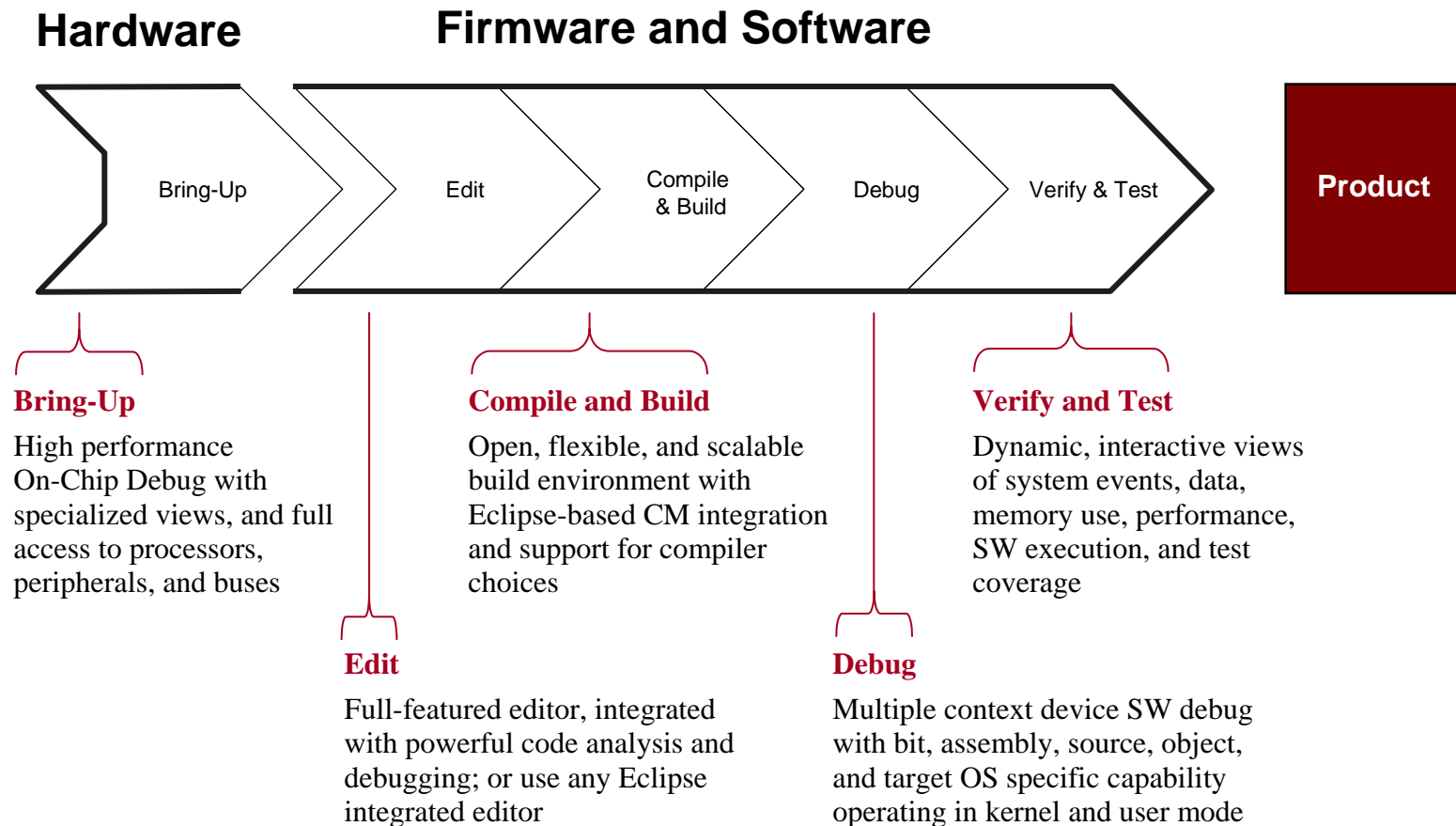
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The Workbench Solution



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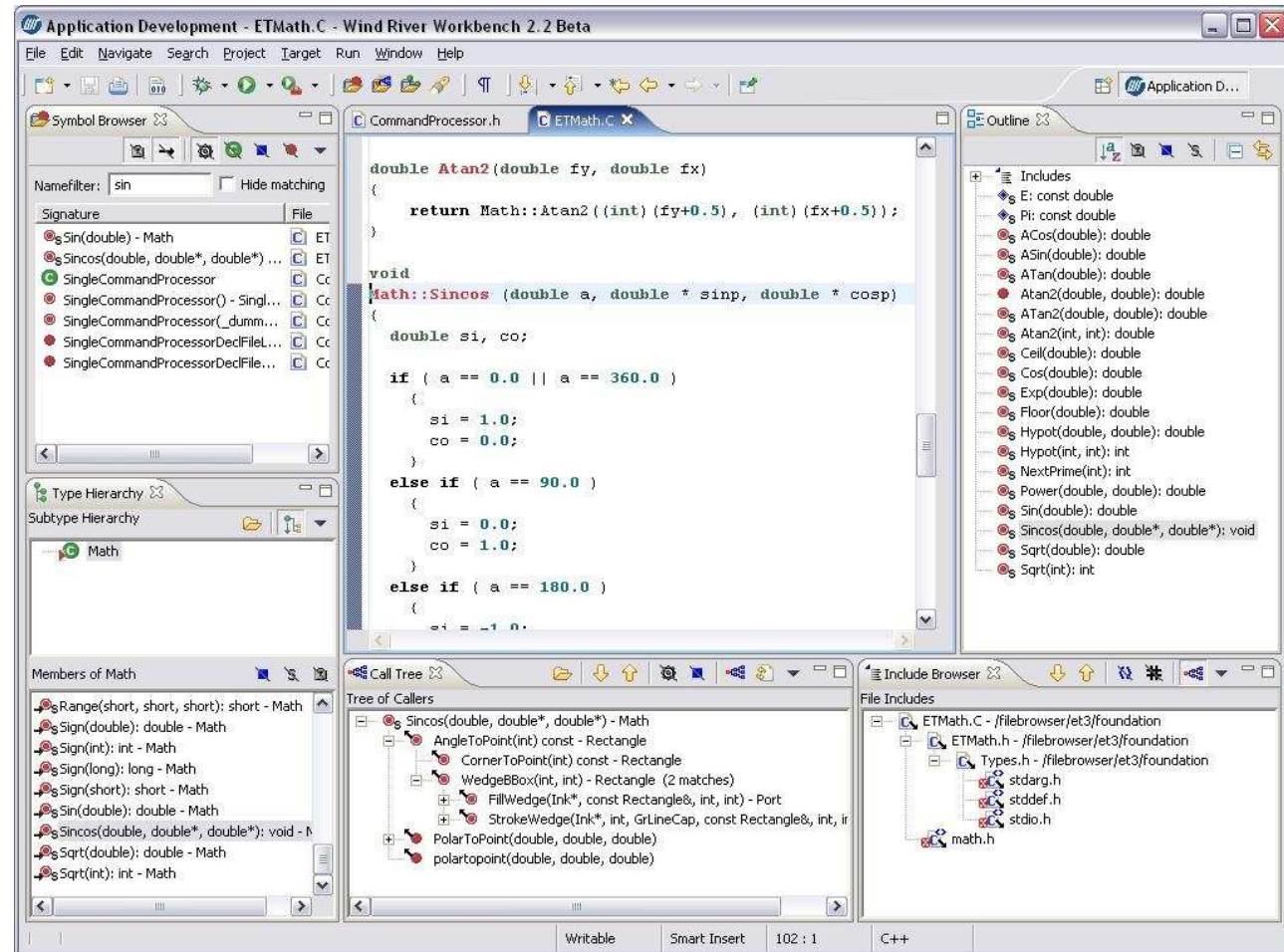
Wind River Workbench



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Wind River Workbench 2.2

- Highly optimized environment for developing VxWorks 6.0 and Linux device software
- Makes debugging, porting and bring-up of VxWorks 6.0 and Linux devices more efficient
- Easily customizable and extensible with 3rd party plug-ins via the Eclipse framework

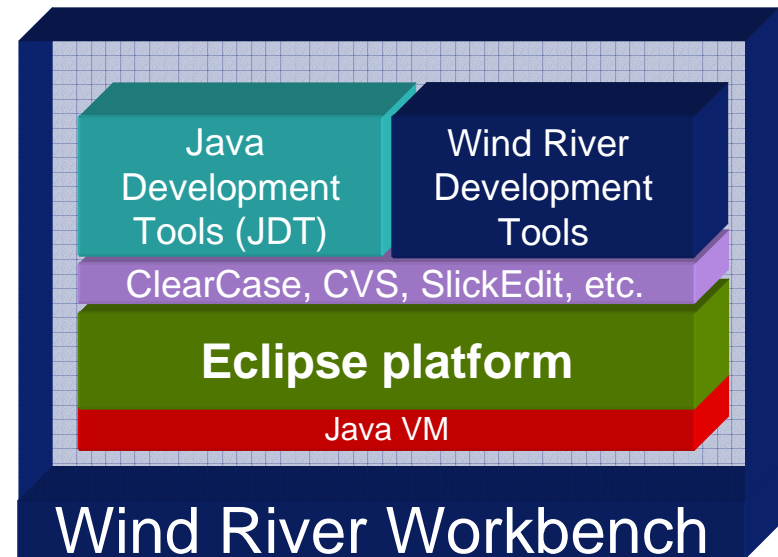


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Eclipse

Eclipse is an **open platform** for **tool integration** that leverages **open-source** licensing and a **community** of tool developers

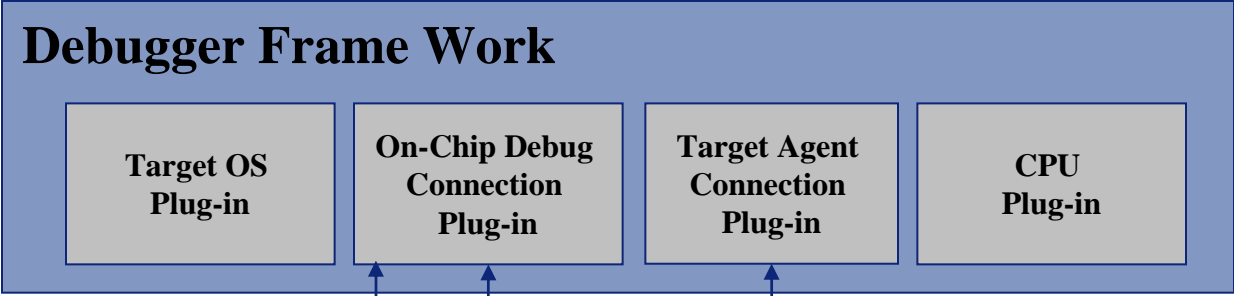
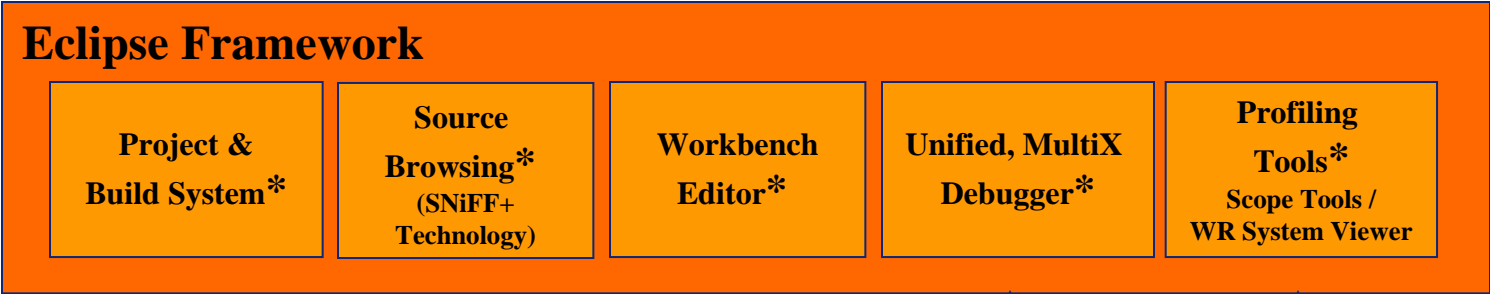
- **Ready to use UI features**
 - Native look and feel on all supported host platforms
 - Dockable views
 - Floating views
- **Perspectives** (user customizable views to the IDE)
 - Toolbars configurable/dockable by end user
 - Drag & Drop support
 - History
 - Bookmarks
 - Context sensitive Online Help
 - Online Upgrade (could be integrated with existing WRS technology)
- **Integration with 3rd party tools**
 - ClearCase, SlickEdit, over 300 more ->
please see <http://eclipse-plugins.2y.net/eclipse/>



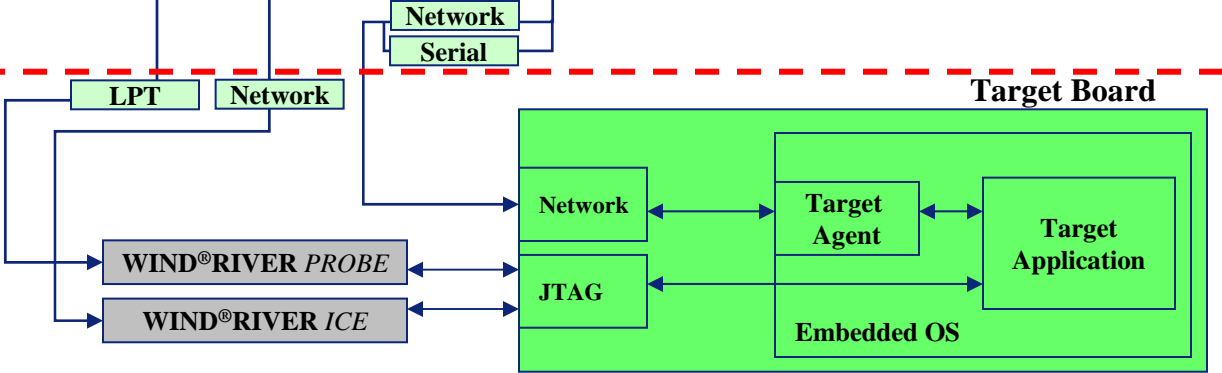
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Workbench - Architecture

Host



Target



* WR Extensions to Eclipse

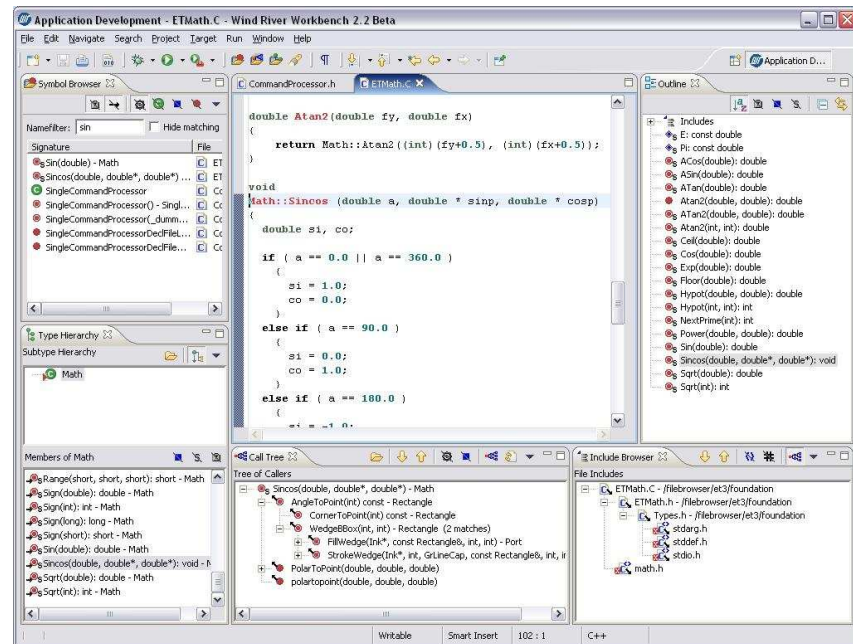
Source Analysis

Features

- Symbol browsing
- Function call trees
- Dependency graphs
- Class and diagrams
- Include hierarchies
- Code completion
- Conditional code highlighting

Benefits

- Better understand Linux kernel updates and open source software
- Better understand legacy software
- Port to custom hardware more quickly
- Simplify code reviews



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Source Analysis

Navigate instantly

- Through millions of lines of code
- Thousands of files and directories
- Without getting lost
- Every code symbol at your finger tip

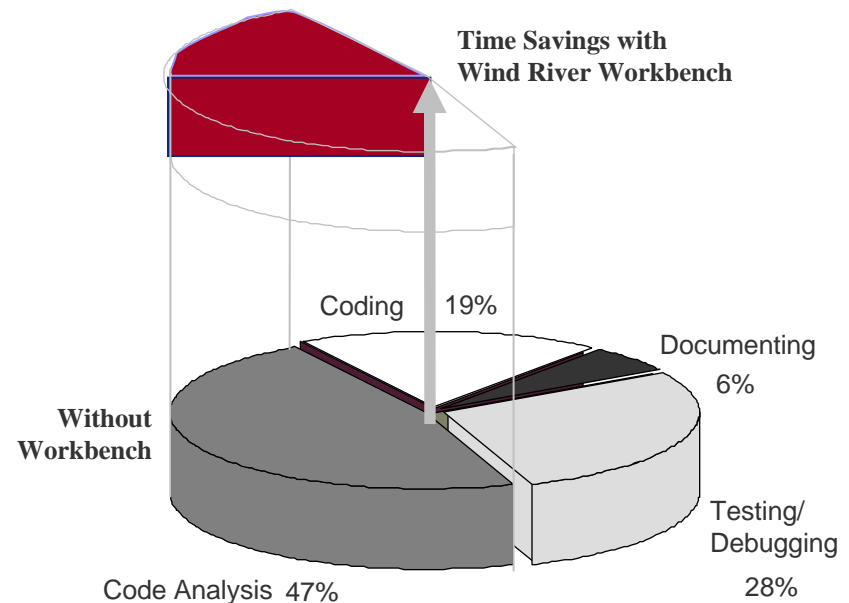
Better comprehend source code

- Excellent dependency visualization
- Rapid employee ramp-up

Make code reuse reality

- Understand VxWorks 6.0 and Linux source code
- Port to custom hardware more quickly
- Simplify code reviews

How do developers spend their time?

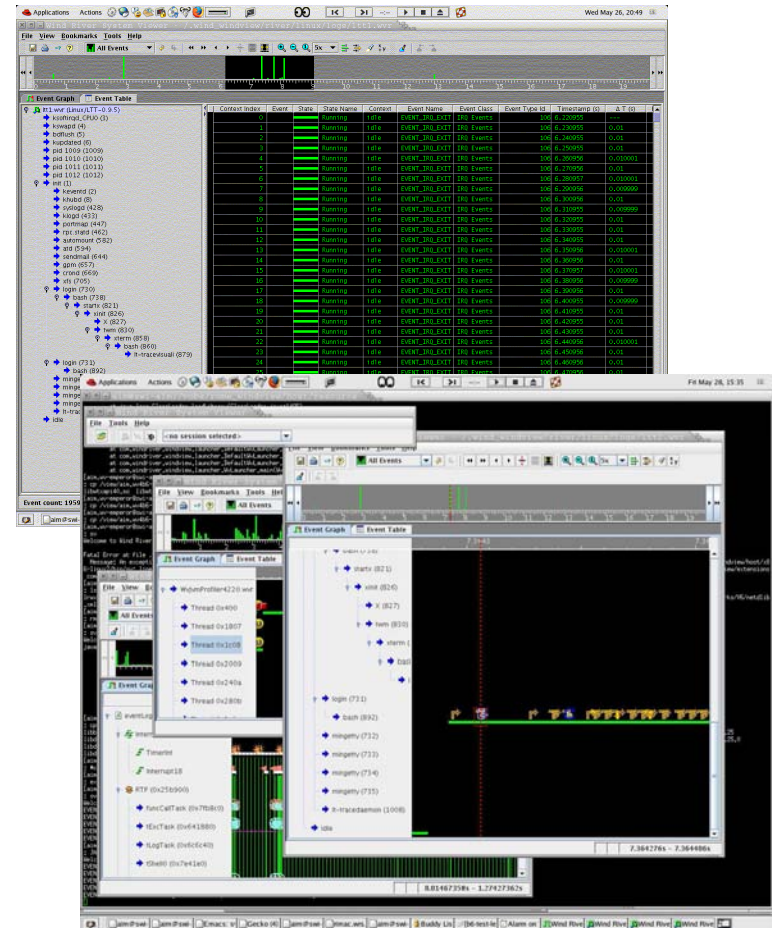


Source: Software Quality: Producing Practical, Consistent Software™
Mordecai Ben-Menarche & Garry S. Marliss, Thomson Computer Press

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Wind River System Viewer

- Graphical visualization of all system activity over time
- Multiple data collection and upload methods including ring-buffer and post-mortem
- Data export for advanced analysis
- Operating System Support
 - Linux (Linux Trace Tool data)
 - VxWorks 6.0 (including triggering)



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Wind River OCD Tools

Debugging enhanced with the addition of On-Chip Debugging support

- Support for Board and Operating System Bring-up
- CPU and Board initialization
- Analyze and debug system crashes
- Program Flash devices in-circuit
- Built-in diagnostics for board testing

Hardware supported

Wind River ICE

- High Speed Ethernet connectivity
- Wind River JTAGServer™ support for multiple JTAG devices
- Wind River JTAGAccelerator™

Wind River Probe

- USB 2.0 Hardware supported
- USB 2.0 (1.x compatible)
- USB Powered, no additional power supplies required
- Support for 'suspend' on laptops
- 100MHz JTAG Clock support

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ScopeTools

ProfileScope

- Statistical Profiling

MemScope

- Memory Analysis with Leak Detection

Stethoscope

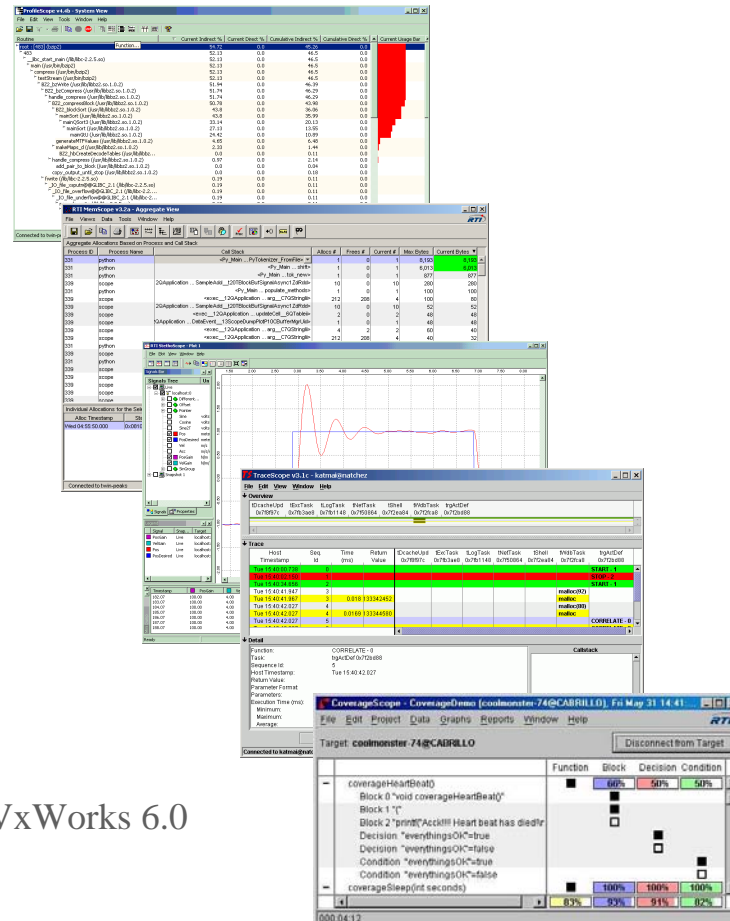
- Graphical Data Monitoring Tool that provides visualization of data

TraceScope

- Code Execution tracing tool for VxWorks 6.0

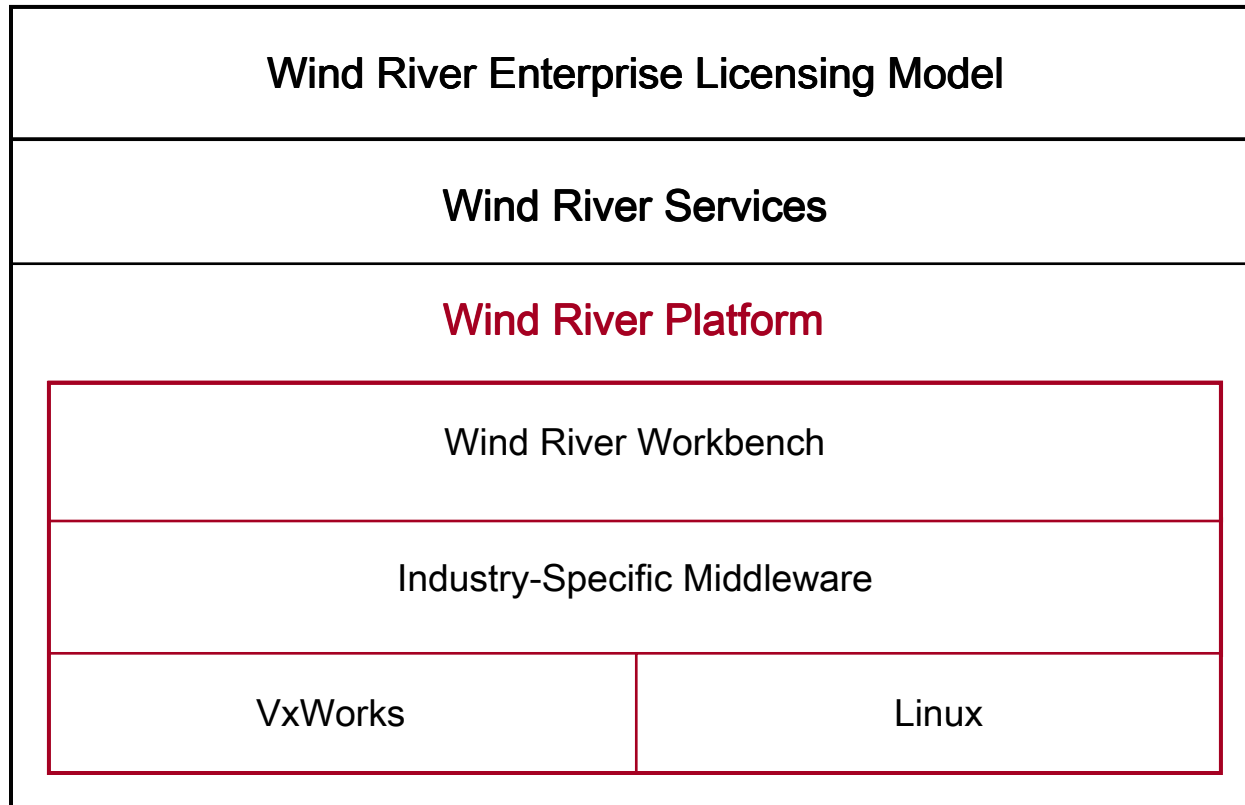
CoverageScope

- Complete code coverage information for testing VxWorks 6.0



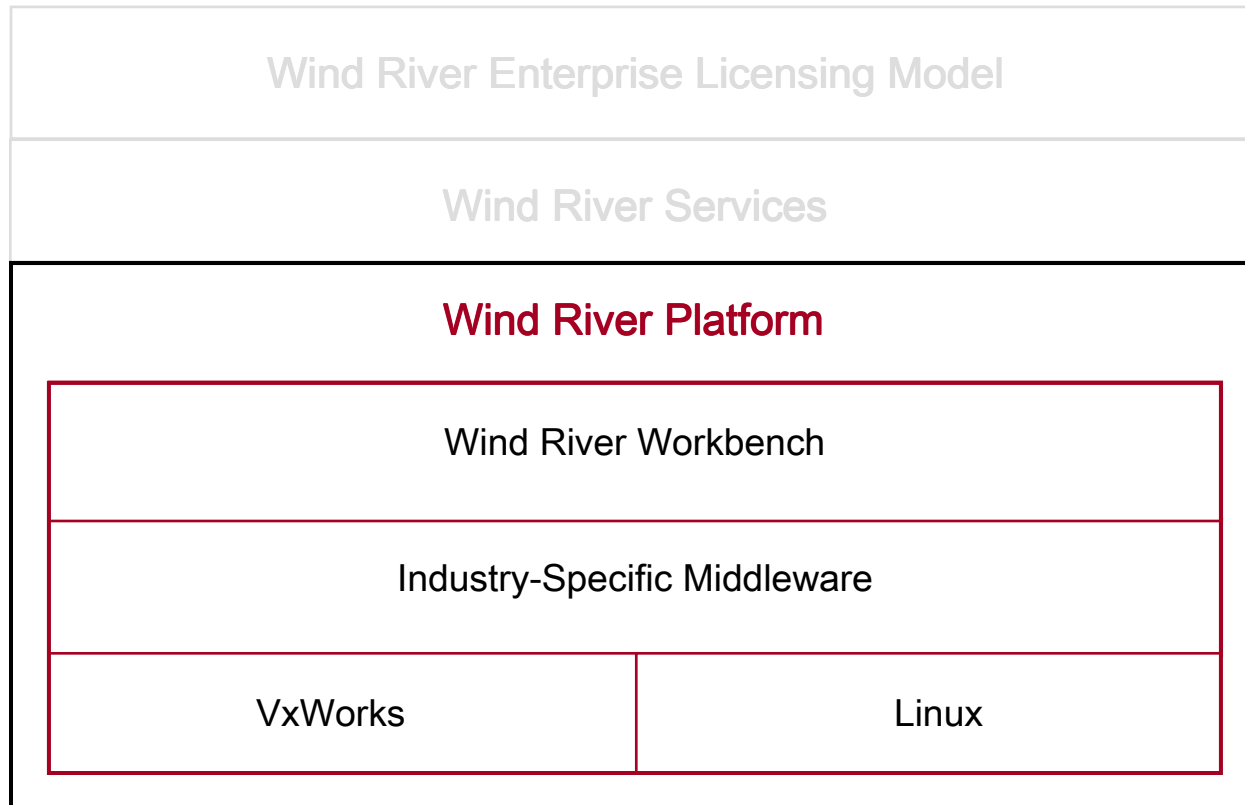
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Wind River Platform Integration



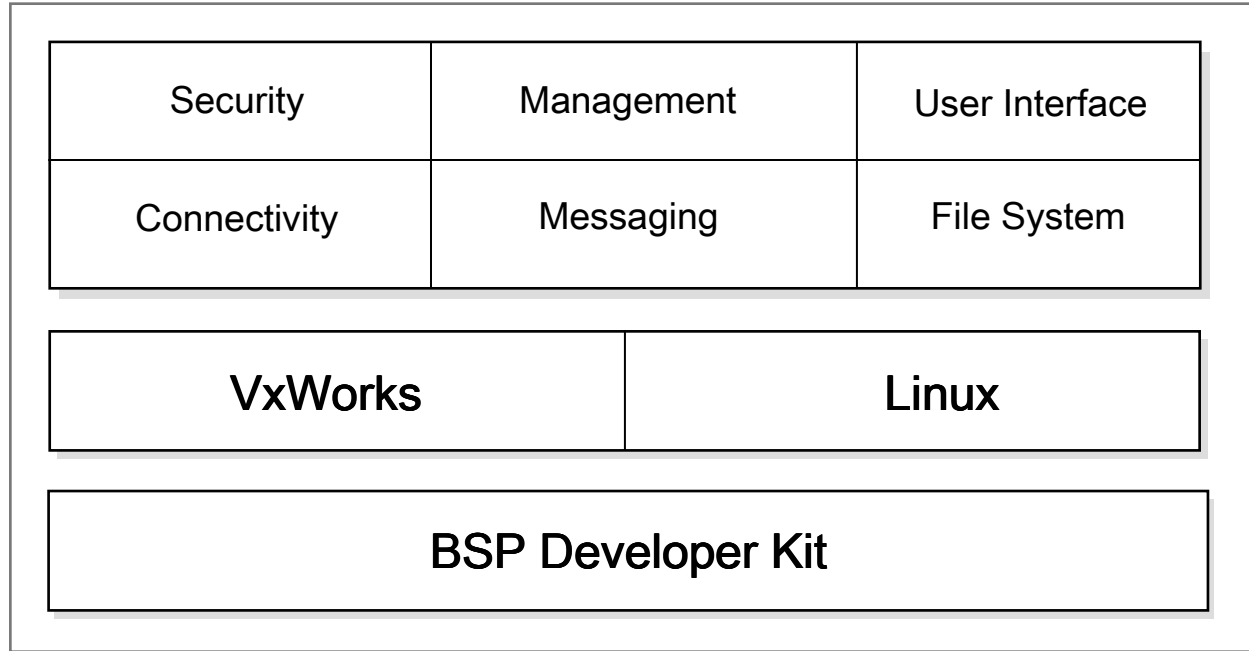
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How Do You Address This?



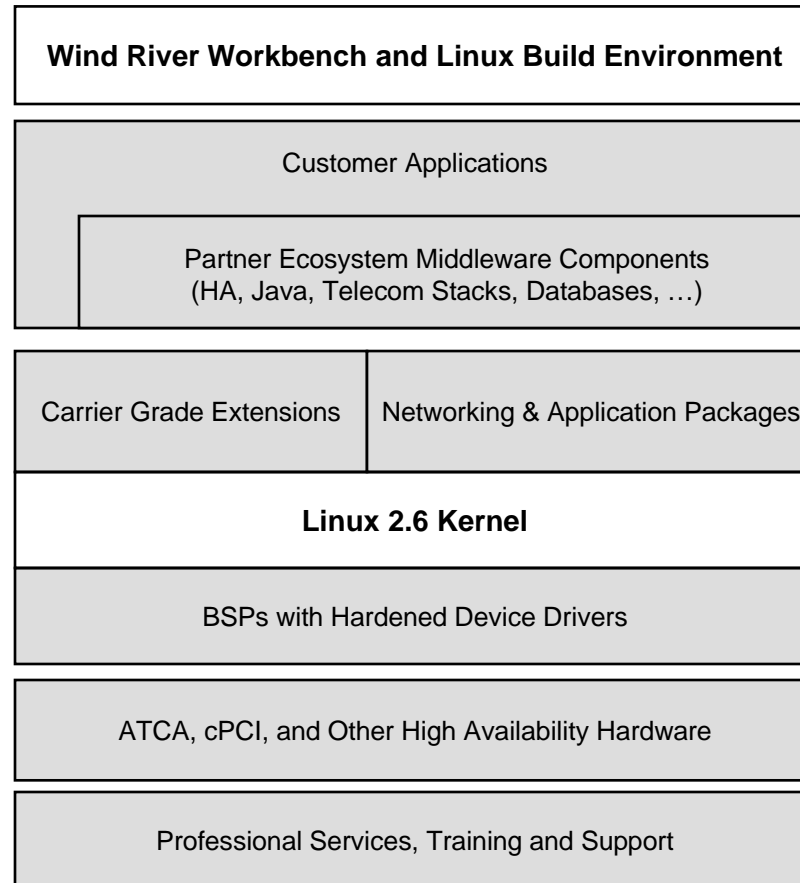
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Runtime Components



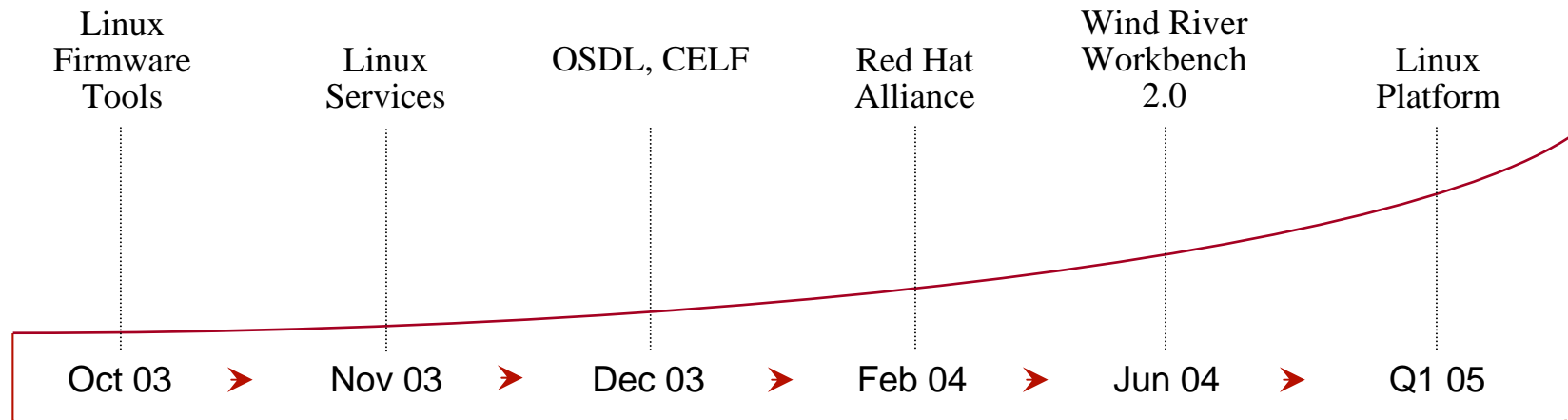
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Platform for Network Equipment, Linux Edition



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Linux Roadmap



People

- Training
- DSO Experts
- Design Centers
- Domain Experts
- Field Engineers
- Project Managers
- Specialized Support

Process

- Common Linux & VxWorks IDE
- Optimize product life cycle development
- Risk Management
- Quality Management
- Pre-tested distributions

Technology

- Wind River Platforms
- Validated COTS BSPs
- Ecosystems Partnerships
- Drivers
- Wind River IP
- Custom IP
- Starter Kits

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Wind River
UNIVERSITY PROGRAM

- Embedded technology is more and more popular as a tool for applied research.
- Colleges and universities, may receive software donations of Wind River technology.

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What Academic Activities are supported?

- Software donations are for non-profit, educational use by students and professors.
- Donations are possible for both classroom and research applications.

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Enrolled Universities in Italy

CONSORZIO RFX

CNR - CONSIGLIO NAZIONALE DELLE RICERCHE

CEFRIEL

ENEA

ISTITUTO SUPERIORE MARIO BOELLA

UNIVERSITA' DEGLI STUDI DI MILANO - DICO

POLITECNICO DI TORINO

UNIVERSITA' DI PADOVA - DIPARTIMENTO DI
UNIVERSITA' DI PADOVA - DIPARTIMENTO DI
ASTRONOMIA

UNIVERSITA' DI SIENA

UNIVERSITA' DI GENOVA

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