Wind River Systems

"Windriver" redirects here. For the Windows driver suite, see Jungo WinDriver. For WindRiver, see Wind River (disambiguation).

Coordinates: 37.78116°N 122.26195°W

Wind River Systems Inc.

WIND™

Type	Private
Founded	1981
Headquarters	Alameda, California, U.S.
Key people	Jim Douglas, President
Revenue	US$359.7 million (FY ended Jan 31 2009)[1]
Number of employees	1,800+[2] (11/2012)
Parent	TPG Capital
Website	www.windriver.com

Wind River Systems, also known as **Wind River**, is an Alameda, California-based wholly owned subsidiary of TPG Capital.[3] The company develops embedded system software consisting of run-time software, industry-specific software suites,[buzzword] simulation technology, development tools and middleware,[4] which is software and operating systems for information appliances and devices for intelligent connected systems.

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History

Wind River Systems was formed by a partnership of Jerry Fiddler[5] and Dave Wilner.[6][7] In 1981, Fiddler had come out of Berkeley Labs[8] to write software for control systems, but wanted to pursue a career in computer generated music,[9] which he funded through a consultancy business focused on real-time. His early clients included the National Football League and film director Francis Ford Coppola — for whom he designed a unique film editing system.[10] Wilner, a former colleague at Berkeley, joined Fiddler and they formed a partnership called Wind River Systems (named after Wind River, Wyoming, where Fiddler had vacationed that year).

Some of the key milestones are:[11][12]

- 1983: Wind River is incorporated in 1983 with each partner contributing $3,000 and a desk to the business.
- 1987: Wind River introduces VxWorks, a leading real-time operating system for embedded devices.
- 1995: VxWorks launches into space on the NASA Clementine moon probe. Also, the Tornado integrated development environment is launched and wins EDN's Embedded Development Software Innovation of the Year award as the first graphically oriented development environment for embedded.
- 1997: VxWorks, the real-time operating system for NASA's Mars Pathfinder mission, lands on Mars.[13]
- 1999: Acquisition of one of their major competitors, Integrated Systems Inc., makers of pSOS. Wind River has since discontinued the pSOS product line and has recommended existing pSOS customers move to VxWorks
- 2004: Wind River officially enters the embedded Linux market,[14] with a Carrier Grade Linux platform targeting the networking & communications infrastructure industry. Also, NASA's Mars Exploration Rovers, Spirit and Opportunity, powered by VxWorks,[15] land on Mars. Wind River helped in manufacturing the IntelliStar for The Weather Channel. The IntelliStar is used at Cable Headends to insert Local Weather into The Weather Channel's national programming.
- 2007: Wind River joins Google's Open Handset Alliance as an original Linux commercialization partner.[16]

- 2008: Wind River establishes the embedded Linux market share lead with greater than 30 percent of total market revenue, four years after entering the market.[17]
- 2009: Intel acquires Wind River for approximately $884 million and it becomes a wholly owned subsidiary of Intel. Wind River launches a commercial Android software platform.[18] Wind River becomes a founding member of the GENIVI Alliance.[19]
- 2010: Wind River adds Simics,[20] a full system simulator, to its product portfolio. VxWorks becomes the first RTOS to be certified under Wurldtech's Achilles certification program,[21] a standard for industrial cyber security. Wind River partners with Intel and the Linux Foundation to create the Yocto Project,[22] an open source collaboration project providing templates, tools and methods to help developers create embedded Linux-based systems.
- 2011: VDC Research names Wind River the embedded market leader; including title of traditional RTOS market leader for its complete portfolio of products and services for the 2nd consecutive year, led by its VxWorks RTOS; and as the embedded Linux market leader for the 3rd consecutive year for its Wind River Linux platform and related solutions.[buzzword][23]
- 2012: NASA Jet Propulsion Laboratory (JPL) successfully lands Mars Science Laboratory rover Curiosity, powered by Wind River technology.[15] Wind River debuts software platform targeted at gateways and hubs for the Internet of things.[24]
- 2013: Wind River becomes part of Intel's Internet of Things Group (IOTG), but remains a wholly owned subsidiary.[25] Barry Mainz assumes the position of President.
- 2014: Wind River introduces its commercial, carrier grade software platform for network functions virtualization (NFV) applications, as well as its next-generation VxWorks platform reinvented for the Internet of Things.[26][27]
- 2014: Wind River fined $750,000 by Bureau of Industry and Security for exporting encryption technology to countries including Israel and South Korea.[28]
- In 2015 the company was accused of repeated trademark and licensing violations of the Grsecurity project, which as response has restricted its code to commercial partners only.[29]
- In 2016, Intel announced that it intended to fully integrate Wind River into one of its divisions (thus ending Wind River's status as a wholly owned subsidiary,) although the scheduled completion date of this action has not been made public. Barry Mainz left the company to become President and CEO of MobileIron and Jim Douglas assumes the position of President.
- 2018: Intel divested Wind River Systems to alternative asset fund manager TPG under undisclosed terms.[30]

Products

Among the company's products are the VxWorks real-time operating system, the Wind River Linux operating system, and the Eclipse-based Wind River Workbench IDE. VxWorks began as an add-on to the VRTX operating system in the early 1980s. Wind River Workbench superseded the previous *Tornado* environment.[31]

VxWorks

Main article: VxWorks

VxWorks is the original flagship product of Wind River. It is a real-time operating system (RTOS) intended for embedded and critical infrastructure devices and systems. It supports multicore processors, 32-bit and 64-bit, for several architectures including ARM®, Intel®, and Power® and has over one hundred board support packages (BSPs) for different hardware systems. VxWorks is a real time and deterministic operating system that is secure, safe, reliable, and certifiable.

Wind River Linux

Wind River's Linux product is source code and a build system that generate runtime images suitable for embedded devices. It supports a variety of architectures, including ARM, MIPS, PowerPC, IA32 and SPARC.

In 2004, Wind River announced a partnership with Red Hat to create a new Linux-based distribution for embedded devices.[32] Wind River has since ended its partnership with Red Hat and now ships its own Linux distribution optimized for embedded Linux development.

Wind River released the first version of its embedded Linux distribution, Platform for Network Equipment - Linux Edition (PNE-LE) 1.0 in 2005.[33] It was registered against the Carrier Grade Linux 2.0 specification and supported IA32 and PPC architectures. They added other platforms in subsequent releases, General Purpose Platform - Linux Edition (GPP-LE) and Platform for Consumer Devices - Linux Edition PCD-LE) starting in version 1.4. In 2013 Wind River announced Wind River Linux 6.0.[34]

Wind River Systems acquired FSMLabs embedded technology in February 2007[35] and made a version available as Wind River Real-Time Core for Wind River Linux. As of August 2011, Wind River has discontinued the Wind River Real-Time Core product line, effectively ending commercial support for the RTLinux product.[citation needed]

On August 7, 2007, Palm Inc. announced that it had chosen Wind River Systems as the software solution[buzzword] for its (later aborted) Palm Foleo.

In 2008, Wind River announced cooperation with BMW, Intel and Magneti Marelli for development of a Linux-based open-source platform to control in-car electronics,[36] which was extended in the GENIVI Alliance in 2009.[37]

In 2012, Wind River introduced a new version of Wind River Linux that was developed from the Yocto Project open source development infrastructure and has achieved Yocto Project Compatible registration.[34]

Helix Virtualization Platform

Wind River® Helix™ Virtualization Platform consolidates multi-OS and mixed-criticality applications onto a single edge compute software platform.

Wind River (Diab) Compiler

Wind River acquired [Dataindustrier AB](#)'s Diab Compiler as part of its acquisition of [Integrated Systems Inc.](#)[38] Originally designed by Wind River's former CTO, [Tomas Evensen](#), it is now available as part of Wind River's VxWorks platforms. It can also be licensed separately for non-VxWorks users. The compiler supports [PowerPC](#), [ARM](#), [MIPS](#), SH, [ColdFire](#), [TriCore](#), [Intel](#), and more architectures.

Simics

[Simics](#) was added to Wind River's product portfolio after the acquisition of [Virtutech](#) by [Intel](#) in 2010.[20]

Wind River Titanium Cloud

Introduced in 2014, Wind River Titanium Cloud provides a [Network Functions Virtualization](#) (NFV) infrastructure software platform used by network equipment suppliers to build NFV equipment[39] and by [communications service providers](#) (CSPs) to deploy next generation edge computing services. The product is based on open source software, specifically the [OpenStack](#) project, StarlingX which includes components from various other open source projects such as: [Ceph](#), [DPDK](#), [OpenStack](#), [Linux](#), KVM, and [Kubernetes](#). StarlingX is an edge, or distributed, cloud software infrastructure designed to meet computing needs for communications service providers as they evolve their networks to [5G](#).

Some of the key attributes of Titanium Cloud include:

- **Ultra-low latency**. Predictable, deterministic performance with flexible profiles tuned to match use case
- **Manageability**: scheduling and orchestration of workloads, failures, and security to management service-level agreements (SLAs). The platform manages applications through existing (OSS/BSS/NMS)systems (operation support system / business support system / network monitoring system) and uses standards-based application programming interfaces (APIs)
- **Fault Tolerance**: capable of being configured to achieve a range of service availability requirements, including "six nines" availability which is achieved by carrier-grade fault management features and reliable software.
- **Telecom-grade Security**. Fully integrated [carrier-grade](#) security that starts with the development process

Edge Sync

Wind River® Edge Sync is an over-the-air ([OTA](#)) update and software lifecycle management solution enabling auto manufacturers to remotely maintain the integrity of embedded systems, apply feature and performance enhancements, and collect and report critical data across the lifecycle of the vehicle.

Workbench

Wind River Workbench [integrated development environment (IDE)](#) and set of tools for software running on Wind River platforms. It configures operating systems, analyzes and tunes software applications, and debugs entire systems.

Markets

Wind River's technologies are used in a wide range of markets including Aerospace & Defense, Automotive, Energy, Industrial, Medical, and Networking & Communications.[39] The products are used in industrial and transportation systems such as factory automation, robotics, rail transport, smart grids; military systems such as unmanned vehicles and military communications, telecommunication infrastructure equipment such as routers; automotive systems such as connected in-vehicle infotainment, digital cluster displays, telematics, braking systems; consumer devices such as multifunction printers; digital cameras, projectors, set-top boxes, traffic signals aircraft and aerospace systems such as Mars rovers [MER-A](#) and [MER-B](#).[40]

Customers

- **Aerospace and defense**: Airbus Group, BAE Systems, Boeing, Lockheed Martin, Northrop Grumman, GE, Honeywell
- **Automotive**: BMW, Fiat, General Motors, Honda, Ford, Johnson Controls, Valeo Group, Continental
- **Industrial**: [B&R Industrial Automation](#), KUKA, Mitsubishi, Rockwell Automation, ExxonMobil, Schneider Electric, Siemens, Emerson Electric
- **Medical**: GE Healthcare, Olympus, Toshiba Medical, Varian, Dräger Medical, Stryker
- **Networking**: Alcatel-Lucent, Avaya, Ciena, Ericsson, Hitachi, HP, Tellabs, Fujitsu

Certificates

- TÜV SÜD: Diab Compiler and VxWorks certified to ISO 26262 (ASIL D) and IEC 61508 (SIL 3)[41]
- CMMI Institute: Connected Vehicle Solutions and Professional Services to Capability Maturity Model Integration (CMMI) Level 3[42][43]
- Future Airborne Capability Environment (FACE): Certified conformant to the Operating System Segment (OSS) Safety Base Profile[44][45]
- ISO 9001:2015 Certification[46]
- OpenChain Conformance[47]

Awards[48]

- Top Workplaces 2014, Bay Area News Group
- 2014 M2M Evolution IoT Excellence Award
- 2014 2014 Confirmit ACE Award

- 2014 Carrier Network Virtualization Award for the NFV Innovation of the Year
- Best Places to Work 2015, San Francisco Business Times and Silicon Valley Business Journal
- 2015 Connected World IoT Innovations Award
- 2015 IoT Evolution Product of the Year Award
- 2015 Smart Grid Product of the Year
- Top Workplaces 2015, Bay Area News Group
- CMMI Level 3 Appraisal for Automotive Expertise and Services
- 2016 Best Places to Work Designation
- 2016 Network Virtualization Industry Award Winner for Best NFV Infrastructure
- Top Workplaces 2016, Bay Area News Group
- 2016 IoT Evolution IoT Excellence Award
- 2016 Military & Aerospace Innovators Award
- 2016 IoT Evolution Connected Transportation Award
- 2016 Internet Telephony NFV Product of the Year
- Top Workplaces 2017, Bay Area News Group
- Stevie Awards for Favorite New Products
- 2017 Bronze Stevie Award, American Business Awards
- 2017 IoT Evolution Product of the Year
- 2017 Network Transformation Award/Best NFV Interoperability Award
- 2017 Network Transformation Award/Best New Open Source Product Award
- 2017 Military & Aerospace Electronics Innovators Award
- 2018 Best Places to Work Recognition
- 2018 Military & Aerospace Electronics Innovators Award Platinum Honoree – Simics
- 2018 Bronze Stevie Award, American Business Award
- MWC 2019 GLOMO Award Finalist
- Embedded Computing Design Awards – Best In Show – Helix Virtualization Platform
- 2019 Bronze Stevie Award, American Business Award
- 2019 Frost & Sullivan Technology Leadership Award: Avionics Software Platform
- 2019 5G World Award Finalist
- 2019 Top Workplaces, Bay Area News Group

Acquisitions

This section **needs additional citations for verification**. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.
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- 1991: Assets of ITRA (Vannes, France)
- 1997: DSP Foundry (WiSP RTOS for Motorola DSP563xx family)
- 1999: Integrated Systems Inc. (pSOS+)
- 2000: Merge staff of Dragonfly Software Consulting
- 2000: Embedded Support Tools Corp. (ESTC)
- 2000: ICEsoft[49] (Bergen, Norway)

- 2000: AudeSi Technologies Inc. (Calgary, Alberta, Canada)[50]
- 2001: Eonic Systems (Virtuoso RTOS)
- 2001: Berkeley Software Design Inc. (BSDI)
- 2005: ScopeTools business unit from Real-Time Innovations
- 2006: Interpeak AB[51] (Stockholm, Sweden)
- 2007: Assets of FSMLabs (Socorro, New Mexico, United States)
- 2008: MIZI[52] (Seoul, South Korea)
- 2009: Tilcon Software Limited[53] (Ottawa, Ontario, Canada)
- 2010: Virtutech (Stockholm, Sweden)
- 2011: Switch++ (Santa Clara, United States)
- 2016 Arynga[54]

Sponsorship

Wind River sponsors the Bay Area Science and Innovation Consortium (BASIC) WonderCup Challenge, a San Francisco Bay Area science knowledge competition for high school students, Alameda Boys and Girls Club, and Oakland Leaf STEM Program.[55][citation needed]