Wind River Systems Linux & the Yocto Project

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Yocto Project Summit, 2022.05
BY 2024:

THE WORLD EDGE COMPUTING MARKET IS PROJECTED TO REACH $250.6 BILLION

—Statista 2021
Some of the challenges faced by edge solution developers

- Time-to-market
- Hardware enablement
- Cost
- Memory and other device constraints
- Long term maintenance & support
- Managing CVEs
- Portability
- Managing compliance and export
- Technical assistance
Linux drives the intelligent edge

- Faster Community-based Innovation
- AI and Machine Learning
- Standards for All Industries
- Highest Levels of Security
- Adaptive to Multiple Use Cases
- Drives Cloud Native & DevOps
Purpose Built Linux: One Size Does not fit all

- Tiny kernel is absolute minimum; single task, unconnected, unintelligent device
- Standard kernel is server-class system (COTS server HPE, Dell, etc.)
- Real-time is medium-to-small configuration for low-latency and “real-time virtualization” use cases

<table>
<thead>
<tr>
<th>Physical Memory used</th>
<th>Thread Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Used Physical Memory</strong> (unit:MB)</td>
<td><strong>Cyclictest Maximum Value</strong> (sample: 43200000, 12 hours; unit: usec)</td>
</tr>
<tr>
<td>Tiny</td>
<td>25.44</td>
</tr>
<tr>
<td>Standard</td>
<td>431.78</td>
</tr>
<tr>
<td>Preempt-rt</td>
<td>423.11</td>
</tr>
<tr>
<td>OVP Host</td>
<td>582.22</td>
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</table>

LTS-10.21.12

CentOS_7.9 Standard

CentOS_7.9 Preempt-rt

LTS-10.21.12 Preempt-rt
# Yocto Project is the foundation for Wind River Linux

Build Your Own Linux Distribution from Source
- Derived from and fully compatible with Yocto Project
- Fully supported by Wind River
- Advanced embedded Linux development platform
- High performance with low-latency and small footprint
- Cloud native and DevOps enabled
- Continuous testing, integration, and delivery

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Year Standard or Premium Support and Maintenance</td>
<td>Support for a Wide Range of Embedded Devices</td>
</tr>
<tr>
<td>Security Vulnerability Protection</td>
<td>Full Range of Professional Services Available</td>
</tr>
<tr>
<td>Open Source Compliance and Export Artifacts</td>
<td>Wind River Studio Full CI/CD Application Development Environment (Optional)</td>
</tr>
<tr>
<td></td>
<td>Managed Distribution Services Available</td>
</tr>
<tr>
<td></td>
<td>Star Lab Titanium Security Portfolio (Optional)</td>
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</table>
Wind River Linux:
Multiple paths to a purpose-built Linux

Wind River Linux Distro
Binary Distribution with OSTree updates

Wind River Linux LTS
Source-based Distro Builder

Wind River Linux CD
Source-based continuous delivery

Studio Linux Services
Services for Yocto Project Linux
What Wind River brings to embedded Linux

✓ Community participation and contribution
✓ Commercial Support with CVE and bug fixes
✓ Board Support Packages – Ported, Tested, and Updated
✓ Long term support – Minimum of 10 years with periodic updates
✓ Optional CI / CD release for customers on the edge of the Edge
✓ SDK for Application Development
✓ Export and License management
✓ Extensive documentation
✓ Security Center for proactive CVE management
✓ Binary distribution for quick time-to-value
✓ Skilled Professional Services for BSP creation, project and custom layer management and more
# Wind River Linux Board Support Packages

<table>
<thead>
<tr>
<th>BSP for Wind River Linux</th>
<th>LTS18</th>
<th>LTS19</th>
<th>LTS21</th>
<th>LTS21 Distro</th>
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<tbody>
<tr>
<td>AMD Snowy Owl (EPYC 3000)</td>
<td>-</td>
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<td>RCPL11</td>
<td>RCPL9</td>
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<tr>
<td>Intel Agilex-F</td>
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<td>Intel x86 Ice Lake-SP (Xeon)</td>
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<tr>
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<tr>
<td>Intel Tiger Lake (Core)</td>
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<td>Marvell Armada 8K</td>
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<td>Marvell CN913x</td>
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<td>NXP i.MX7 (Dual)</td>
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<td>NXP LS1046 RDB / LS1026</td>
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<td>NXP LS1088/LS1048</td>
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<td>NXP LS2088</td>
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<tr>
<td>NXP LX2160 RDB / LX2080</td>
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<td>NXP S32G</td>
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<td>NXP T4240 (PPC)</td>
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<tr>
<td>Raspberry Pi 3 (B+)</td>
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<tr>
<td>Raspberry Pi 4</td>
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<td>Renesas R-Car H3</td>
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<td>TI Sitara AM335x SK/EVM</td>
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<td>TI J721E(DRA829/TDA4xM)</td>
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<td>Xilinx Zynq UltraScale+ MPSoC</td>
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<tr>
<td>Xilinx Zynq-7000</td>
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<td>Released</td>
<td>Released</td>
<td>RCPL5</td>
</tr>
</tbody>
</table>
Wind River Linux Distro

- A new option for developing purpose-built Linux for intelligent edge devices
- A binary Linux distribution based on the market-leading Wind River Linux LTS (Long-Term Supported)
- A flexible deployment option designed to support assembly of custom Linux images in minutes

Attributes:
- Includes multiple methods to customize your purpose-built Linux
- Support for a variety of Arm and X86 platforms
- Project-based pricing — no end-device royalties
- Includes updates and package feeds from Wind River
- Use for rapid prototyping and more

Wind River Linux Distro - Hardware Support
- Intel Atom X55xx / X56xx 32bit
- Intel Atom X56xx / X56xx 64bit
- Intel Elkhart Lake
- Intel Tiger Lake UP3
- Intel Ice Lake
- Intel NUC Kaby Lake
- Intel Snow Ridge
- Intel Stratix 10
- Marvell OCTEON CN96xx (TX2)
- NXP i.MX6
- NXP i.MX8 QuadMax MEK
- NXP LS1028
- NXP LS1043/LS1023A
- NXP LX2160
- NXP S32G
- Raspberry Pi 4
- TI DRA829/TDA4xM
- Xilinx UltraScale+ MPSoC
- Xilinx Zyqu-7000

*Highlighted boards are available for commercial support

Try it now!
https://www.windriver.com/products/linux/download
(Registration required)
Choosing the right Wind River Linux

Wind River Linux LTS

- Source-based OS builder
- Key Customer Values:
  - Extreme customization
  - Full control of kernel and user space
  - Supported by Wind River
  - All customizations tracked and reproducible
  - For rigid, complex solutions
  - CVE monitoring and mitigation by Wind River
- Characteristics:
  - Linux OS builder based on Yocto Project
  - Significant learning curve and resource intensive
  - Source code-based patches

Wind River Linux Distro

- Binary-based custom image creator
- Key Customer Values:
  - Simple and quick Time-to-Value
  - Customizable package selection and tuning
  - Supported by Wind River
  - Iterative or ad hoc approach to development
  - For quick prototyping and rapid app development
  - CVE monitoring and mitigation by Wind River
- Characteristics:
  - Pre-packaged OS, based on Wind River Linux
  - Simple Linux Assembly Tool configuration
  - Package Feeds and OSTree binary updates
Wind River Studio: full lifecycle management for systems on the intelligent edge

<table>
<thead>
<tr>
<th>SINGLE Pane OF GLASS FOR COLLABORATION AS A MODERNIZED TEAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEVELOPMENT</td>
</tr>
<tr>
<td><img src="https://via.placeholder.com/26x2/2022" alt="Image" /></td>
</tr>
</tbody>
</table>

- **CLOUD-NATIVE** curated, integrated pipeline for intelligent systems
- **RAPID PROTOTYPING** and automated testing
- **AUTOMATE DEPLOYMENT** of new services in minutes
- **CLOUD PLATFORM** for zero touch edge operation
- **ANALYTICS** keep the intelligent edge up and optimized
- **ACCELERATE** to the machine economy through automation, digital feedback loops, AI, and data insights
Five ways Wind River Studio Linux Services can help customers succeed with Yocto Project Linux

1. Scan and find security and compliance issues
2. Resolve and get Linux platform up-to-date
3. Keep it all up-to-date on an ongoing basis
4. Manage the lifecycle and all the complexity
5. Architect and implement unique requirements
Summary: The Wind River Linux Advantage

- Extreme customizability for the most demanding embedded applications
- Fully supported by Wind River to remove the burden of managing CVEs and bug fixes
- Available as a Yocto Project–based source environment or as customizable prebuilt binary images

<table>
<thead>
<tr>
<th>Security</th>
<th>Reliability</th>
<th>Performance</th>
<th>Sustainability</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous threat mitigation against emerging vulnerabilities</td>
<td>Engineering processes certified to ISO 9001:2015</td>
<td>Low-latency performance and small-footprint optimization</td>
<td>Designed and built with CI/CD and DevOps methodology</td>
<td>All open source products are export ready</td>
</tr>
<tr>
<td>Star Lab portfolio for cyber-hardening the Linux OS</td>
<td>More than 3,000 builds daily with over 60,000 automated tests</td>
<td>High-performance virtualization and container support</td>
<td>Complete lifecycle support; long-term and legacy support</td>
<td>Mitigation of legal risk, complete IP and code traceability</td>
</tr>
</tbody>
</table>