Breakout Session

Helix Virtualization Platform – Advancing Safety for Avionics with Intel® Xeon® D-1700/2700 and 11th Gen Intel® Core™ processor

Teodor Bobirnila, Wind River

WNDR/VR

WIND RIVER AT A GLANCE

- **Global leader in delivering software for intelligent connected systems,** offering a comprehensive, edge-to-cloud software portfolio

- Technology and expertise that enable the **development, deployment, operations, and servicing of mission-critical intelligent systems**

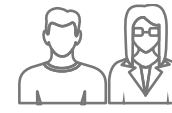- Wind River technology found in **more than 2 billion products**

- **Award-winning customer support, a broad partner ecosystem**, and world-class professional services

- Headquartered in Alameda, CA, with **~1,300 employees, including 460 in R&D and 235 in GTM**

1981
Founded

~1,300
Employees Globally

1,700+
Global Customers

~$400M
2021 Revenue

20
Countries/Global Presence

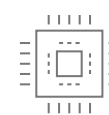**2B+**
Deployed Edge Devices

8
Consecutive Years Ranked As Top Workplace
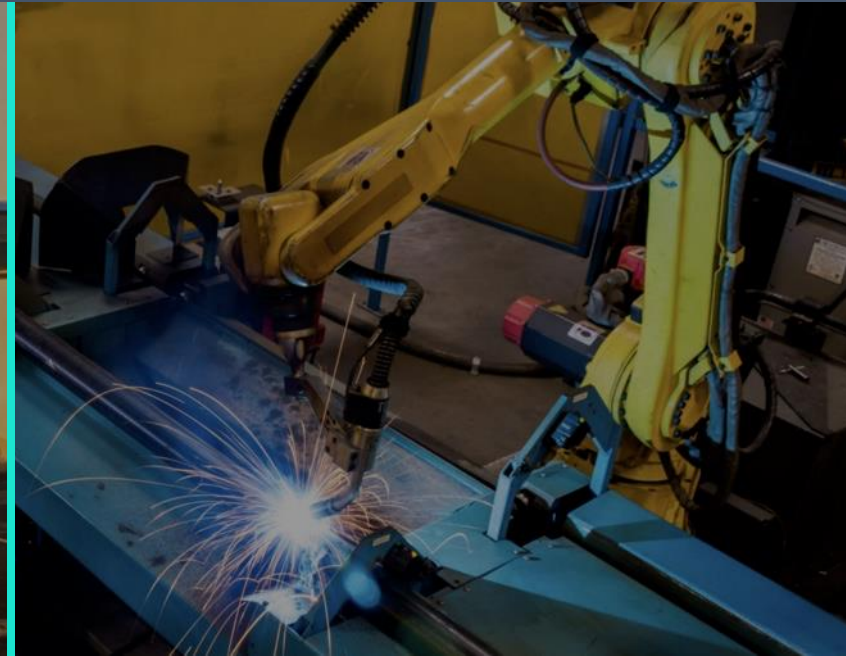
250+
Ecosystem Partners

#1
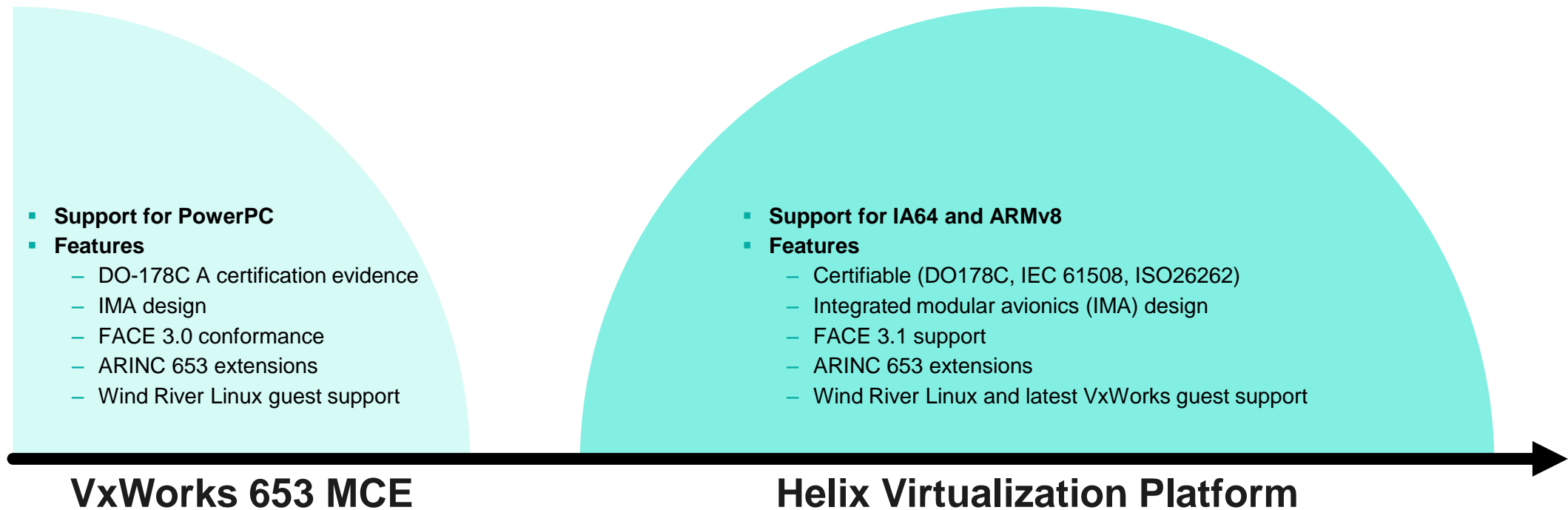Market Share in Edge Compute OS Platforms

WNDRVR

NEW WAVE OF AI-INFUSED EDGE SOLUTIONS THAT NEED COMPUTE, DATA ANALYTICS, AI/ML, 5G AT THE INTELLIGENT EDGE

WNDRVR

SAFETY CERTIFIABLE, MULTI-CORE, MULTI-TENANT PLATFORM FOR MIXED LEVELS OF CRITICALITY

WNDRVR

WIND RIVER STUDIO VIRTUALIZED OS PLATFORM

- Powered by Helix Virtualization Platform

- An evolutionary, modern platform, based on solid foundations and successful deployments of VxWorks 653 lineage

- **Support for PowerPC**
- **Features**
  - DO-178C A certification evidence
  - IMA design
  - FACE 3.0 conformance
  - ARINC 653 extensions
  - Wind River Linux guest support

- **Support for IA64 and ARMv8**
- **Features**
  - Certifiable (DO178C, IEC 61508, ISO26262)
  - Integrated modular avionics (IMA) design
  - FACE 3.1 support
  - ARINC 653 extensions
  - Wind River Linux and latest VxWorks guest support

VxWorks 653 MCE

Helix Virtualization Platform

PROVEN, SUCCESSFUL TRACK RECORD FOR ARINC 653 SPECIFICATIONS IN IMA

OVER 20 YEARS

experience in safety certification software products

Safety is paramount in today's advanced avionics systems, leaving no room for undue latency, system failure, or security vulnerabilities.

WNDRVR

MIXED CRITICALITY PARTITIONING

- Consolidate multiple operating systems and deploy mixed-criticality applications on a single edge compute platform, reducing size, weight, and power.

Wind River Linux

General Purpose
Open
Feature-rich

VxWorks

Real-Time
Performant
Safety certifiable

WNDRVR

AIRWORTHINESS STANDARDS

- Avionics OEMs, suppliers, systems architects, and planners can rely on the features and capabilities of the real-time platform that supports Intel® Xeon® D-1700/2700 and 11th Gen Intel® Core™ processor-based platforms and adhering to industry certification standards, including ARINC 653; POSIX®; and FACE™ Technical Standard, Edition 3.1

- The time-consuming, technically complex tasks involved in meeting airworthiness criteria can be simplified by means of processor-specific Flight Safety Evidence Packages (FSEPs) available from Intel. Embedded Intel® Xeon® D processors include airworthiness evidence packages for DO-254 DAL C and DO-254 DAL A, as well as confirmed support for the leading DO-178C certifiable real-time operating system, VxWorks.
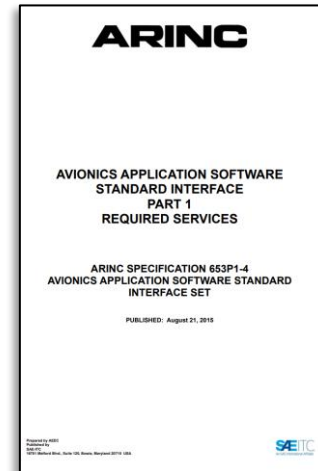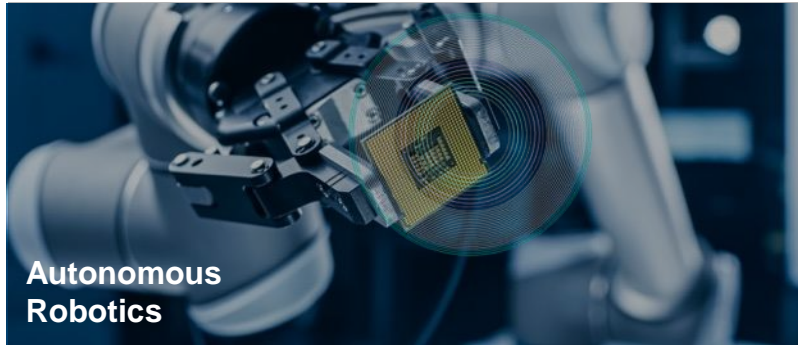

ARINC 653

FACE™ 3.1
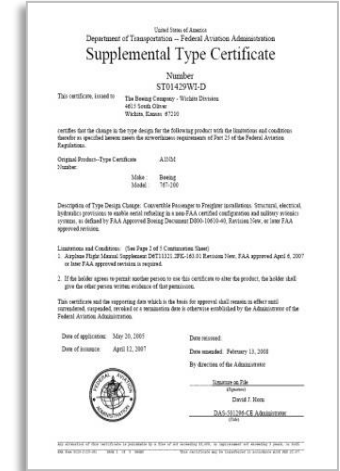
DO-178C
Software Considerations in
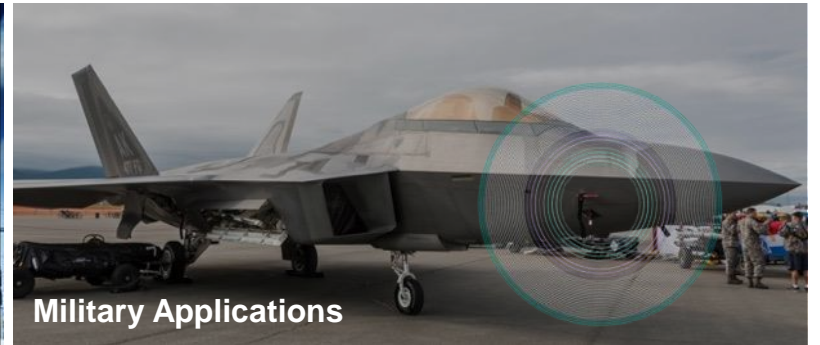Airborne Systems
(Certifiable to DAL A)

WNDRVR

INTELLIGENT SYSTEMS
USE CASES

Autonomous Robotics

Wind and Renewable Energy
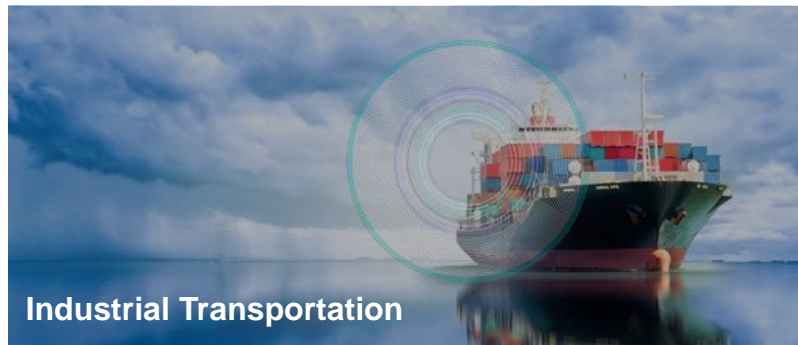

Military Applications

Medical and Health

Commercial Aviation

Autonomous Transport

Industrial Transportation
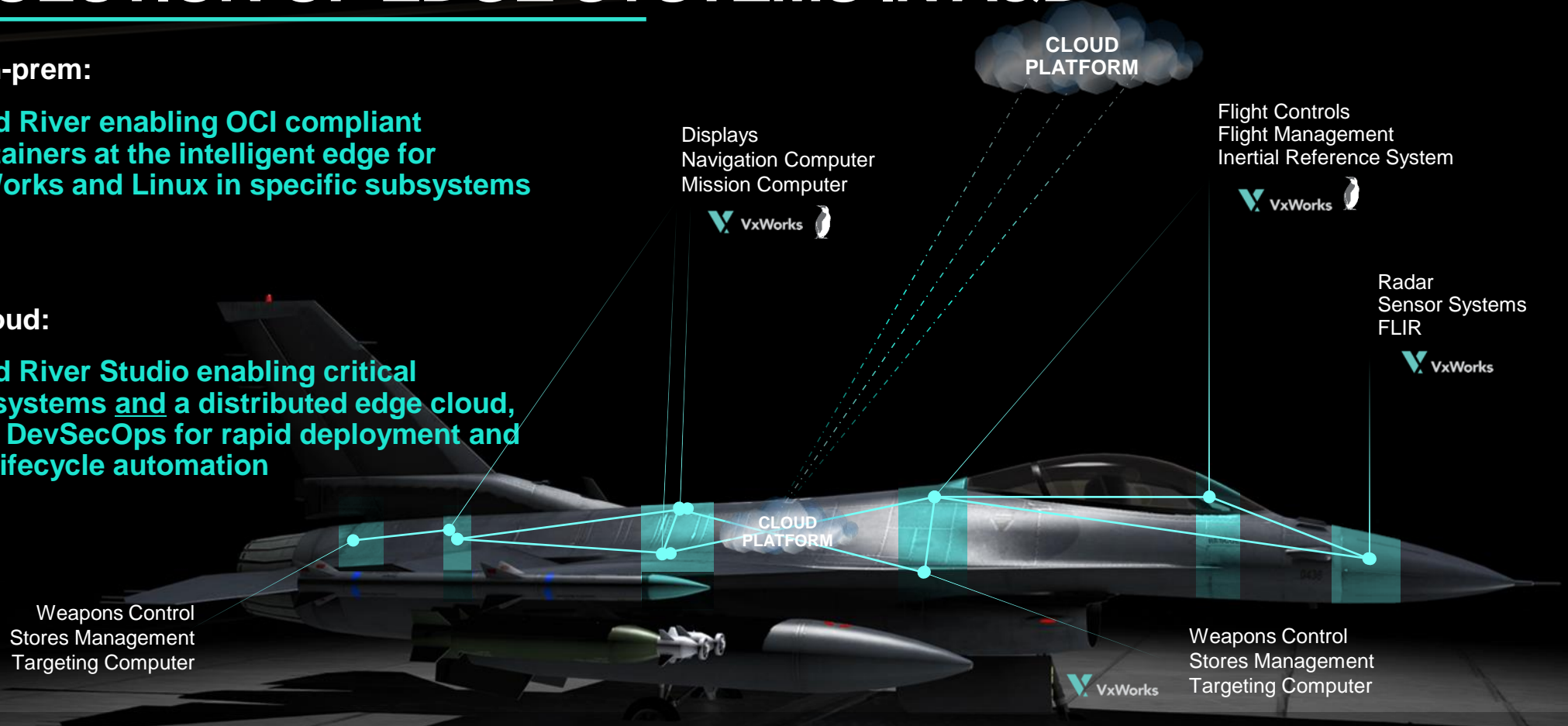

Telco Operations

Warehouse Robotics

CASE STUDY:
EVOLUTION OF EDGE SYSTEMS IN A&D

» **on-prem:**

Wind River enabling OCI compliant containers at the intelligent edge for VxWorks and Linux in specific subsystems

» **cloud:**

Wind River Studio enabling critical subsystems and a distributed edge cloud, with DevSecOps for rapid deployment and full lifecycle automation

CLOUD PLATFORM

Displays
Navigation Computer
Mission Computer

V. VxWorks

Flight Controls
Flight Management
Inertial Reference System

V. VxWorks

Radar
Sensor Systems
FLIR

V. VxWorks

CLOUD PLATFORM

Weapons Control
Stores Management
Targeting Computer

V. VxWorks

Weapons Control
Stores Management
Targeting Computer

Joint All-Domain Command and Control (JADC2) is the DOD's concept to connect sensors from all of the military services — Air Force, Army, Marine Corps, Navy, and Space Force — into a single network
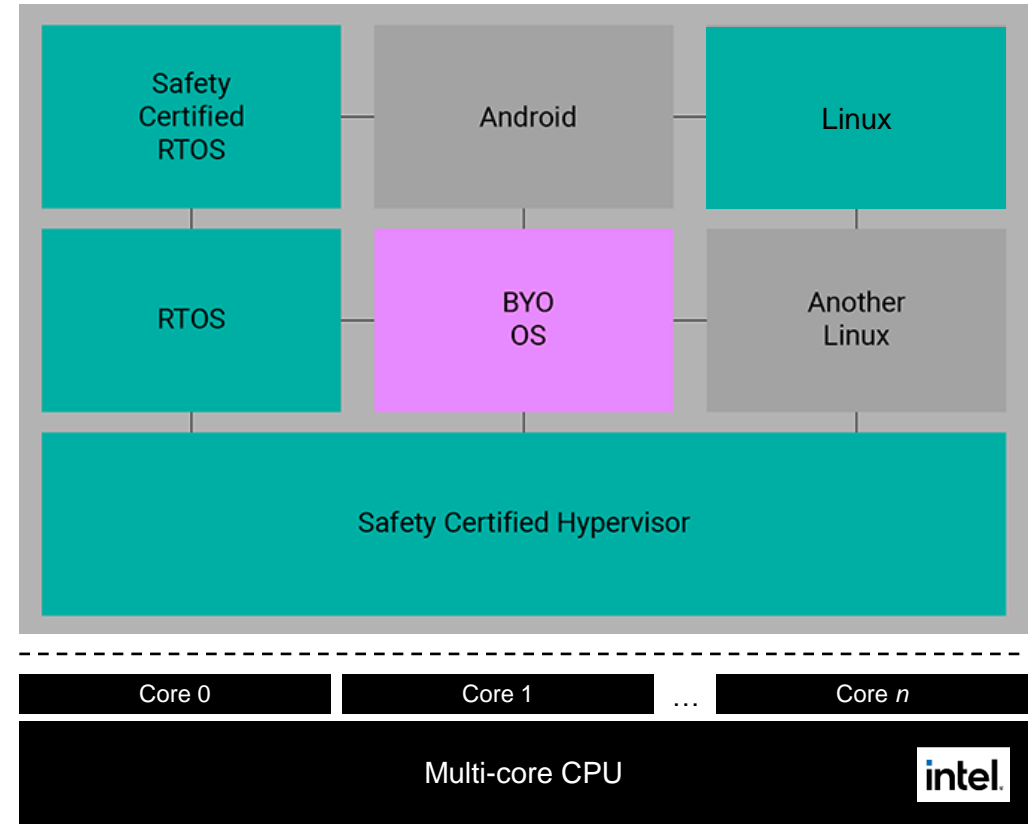
Implementation requires a cloud-like environment connected to existing critical systems for the Joint force to share intelligence, surveillance, and reconnaissance data, transmitting across many communications networks, to enable faster decision-making

GUEST OS AND HARDWARE SUPPORT

- **Guest OS support**
  - Support for SMP guests
    - APEX, health monitor, AMIO, shared memory, and MPFS
  - VxWorks (latest), VxWorks Cert
  - Wind River Linux
  - Bare metal
  - Non–Wind River OSes (via Professional Services)

Intel® Xeon® D-1700/2700 and 11th Gen Intel® Core™ processor-based platforms

WNDRVR

Call of action

Wind River Studio

https://www.windriver.com/studio/tour

Helix Virtualization Platform Product Page

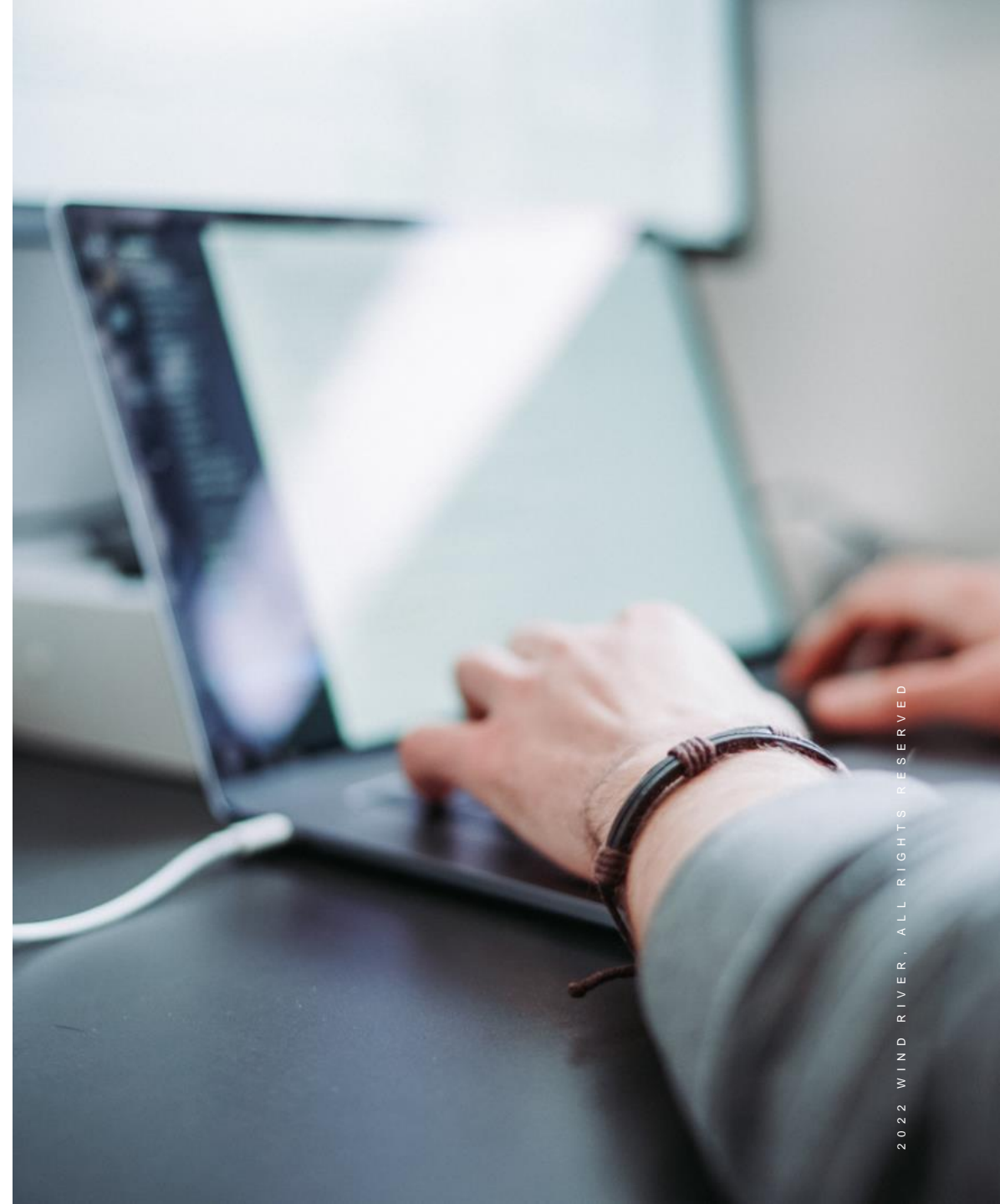https://www.windriver.com/studio/edge-devices/virtualized-os

White Paper

https://www.windriver.com/resource/enabling-the-migration-to-software-defined-platforms-for-critical-infrastructure

Video: Urban Air Mobility at the Intelligent Edge

https://www.youtube.com/watch?v=GGUfzGIBPAo

Video: Digital Cockpit Flight Display Demonstration

https://www.youtube.com/watch?v=-fDo2u3z3PA

WNDRVR

Thank you for watching!

Intel Legal Notice and Disclaimer

Intel technologies may require enabled hardware, software or service activation.

No product or component can be absolutely secure.

Your costs and results may vary.

Code names are used by Intel to identify products, technologies, or services that are in development and not publicly available. These are not "commercial" names and not intended to function as trademarks.