Wind River Embraces IOT

Zuo Yun: yun.zuo@windriver.com

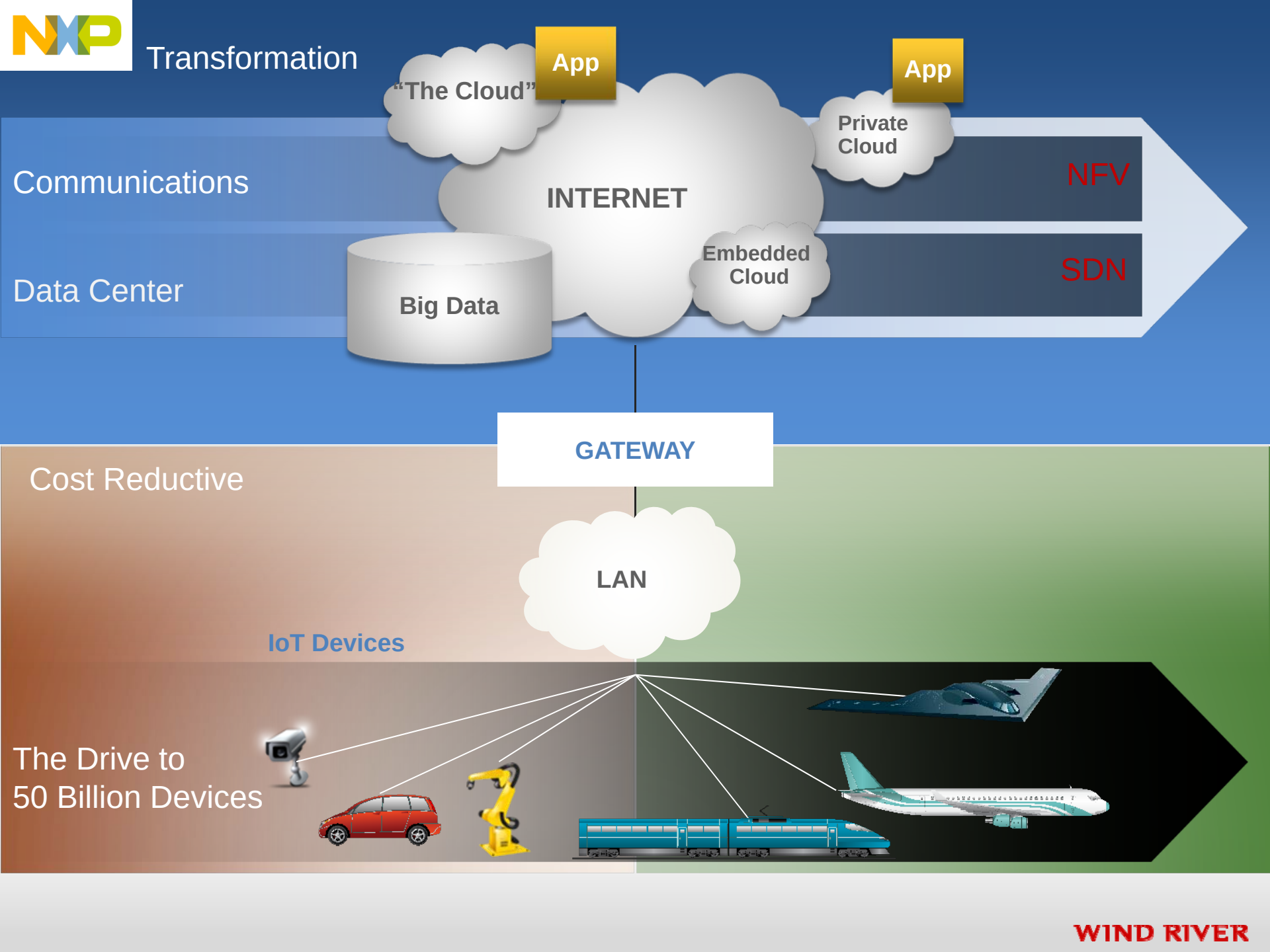
© 2014 Wind River All rights reserved

Wind River at a glance

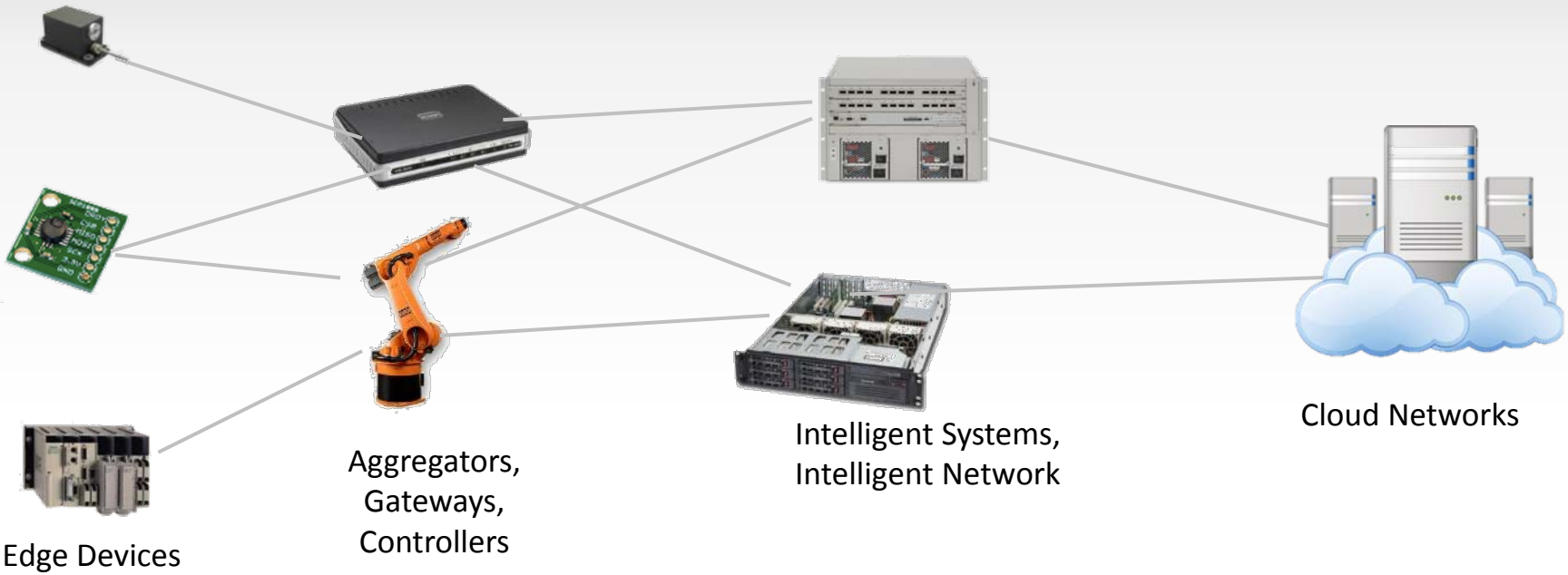
Aerospace & Defense	Automotive	Network Equipment	Industrial & Medical	Mobile & Consumer
Applied Signal	AWTC Europe	Alcatel-Lucent	ABB	Canon
BAE Systems	BMW	ARRIS	Agilent	Dell
Boeing	Bosch	Avaya	AREVA	Epson
EADS	Clarion	Ciena	Bombardier	Fuji-Xerox
Elbit Group	Continental	Dialogic	Emerson Electric	IBM
Finmeccanica	Daimler	Ericsson	General Electric	Intel
General Dynamics	Delphi	Fujitsu	Hitachi Medical	Konica Minolta
General Electric	Fiat	GENBAND	Intel	LG Electronics
Harris	Fujitsu	Hitachi	Invensys	NEC
Honeywell	General Motors	Huawei	KUKA	Oki
ITT	Harmann	Hypercom	Mitsubishi Industrial	Prima Cinema
L3 Communications	HKMC	Intel	Mitsubishi Electric	Qualcomm
Lockheed	Honda	Kapsch	Nikon	Ricoh
NASA	Johnson Controls	Kyocera	Panasonic	Samsung
Northrop Grumman	Mobis	Motorola	Philips Medical	Sharp
Orbital Sciences	Nissan	NEC	Rockwell Automation	SK Telecom
Raytheon	PSA Peugeot Citroen	Nokia	Schneider Electric	Sony
Rockwell Collins	Renault	Samsung	Siemens	Texas Instruments
Thales	Toyota	Tellabs	Sirona Dental Systems	Toshiba
U.S. Navy	Valeo Group	ZTE	Toshiba	Xerox

WIND RIVER

1 billion products worldwide
rely on Wind River technology.


Transformation
"The Cloud"
App
App
Private Cloud
INTERNET
Communications
NFV
Data Center
Big Data
Embedded Cloud
SDN
GATEWAY
Cost Reductive
LAN
IoT Devices
The Drive to
50 Billion Devices

Intelligent Devices → Intelligent Systems → Intelligent Decision Making



Edge Devices

Aggregators, Gateways, Controllers

Intelligent Systems, Intelligent Network

Cloud Networks

Core Attributes

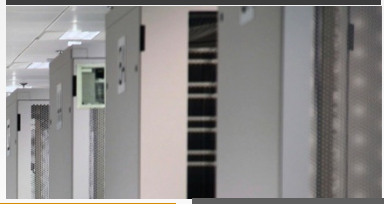
Safety | Security | Scalability

Platform Features

Connectivity | Graphics/ Manageability | Virtualization

WIND RIVER

风河IOT解决方案

国防军工	车载娱乐	消费电子	工业控制	网络设备
				

合作伙伴/生态系统

Workbench Development Suite | **Simics**

Middleware:Networking, Graphics, Security, Connectivity, Management…

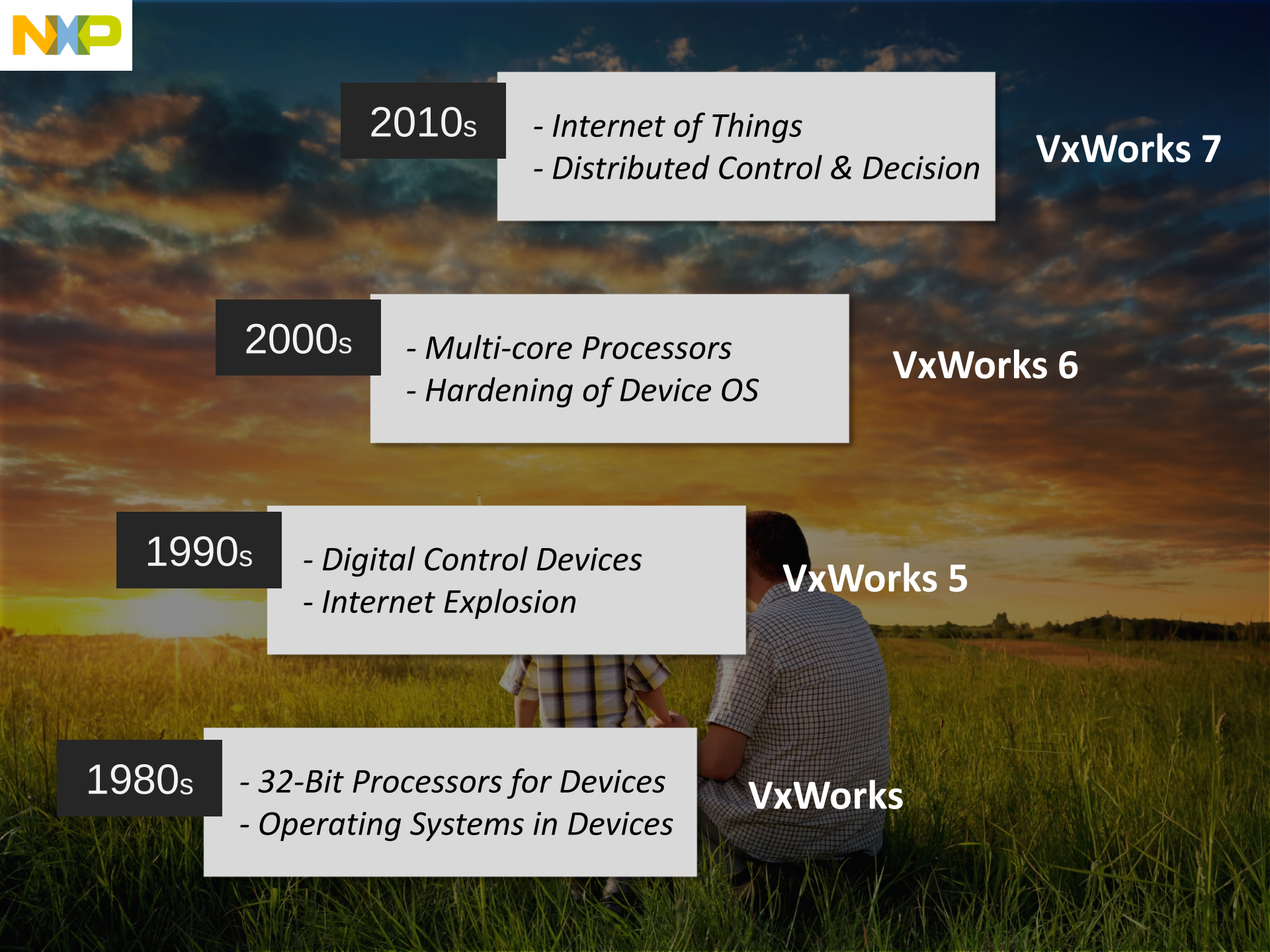
				Safety Certified	*Security-Critical*
VxWorks	Intelligent Device Platform **(IDP)**	Intelligent Network Platform **(INP)**	Carrier Grade Communication Server（**CGCS**）	**VxWorks Cert**	**VxWorks 653**	**Wind River Linux Secure**
	Wind River Linux					

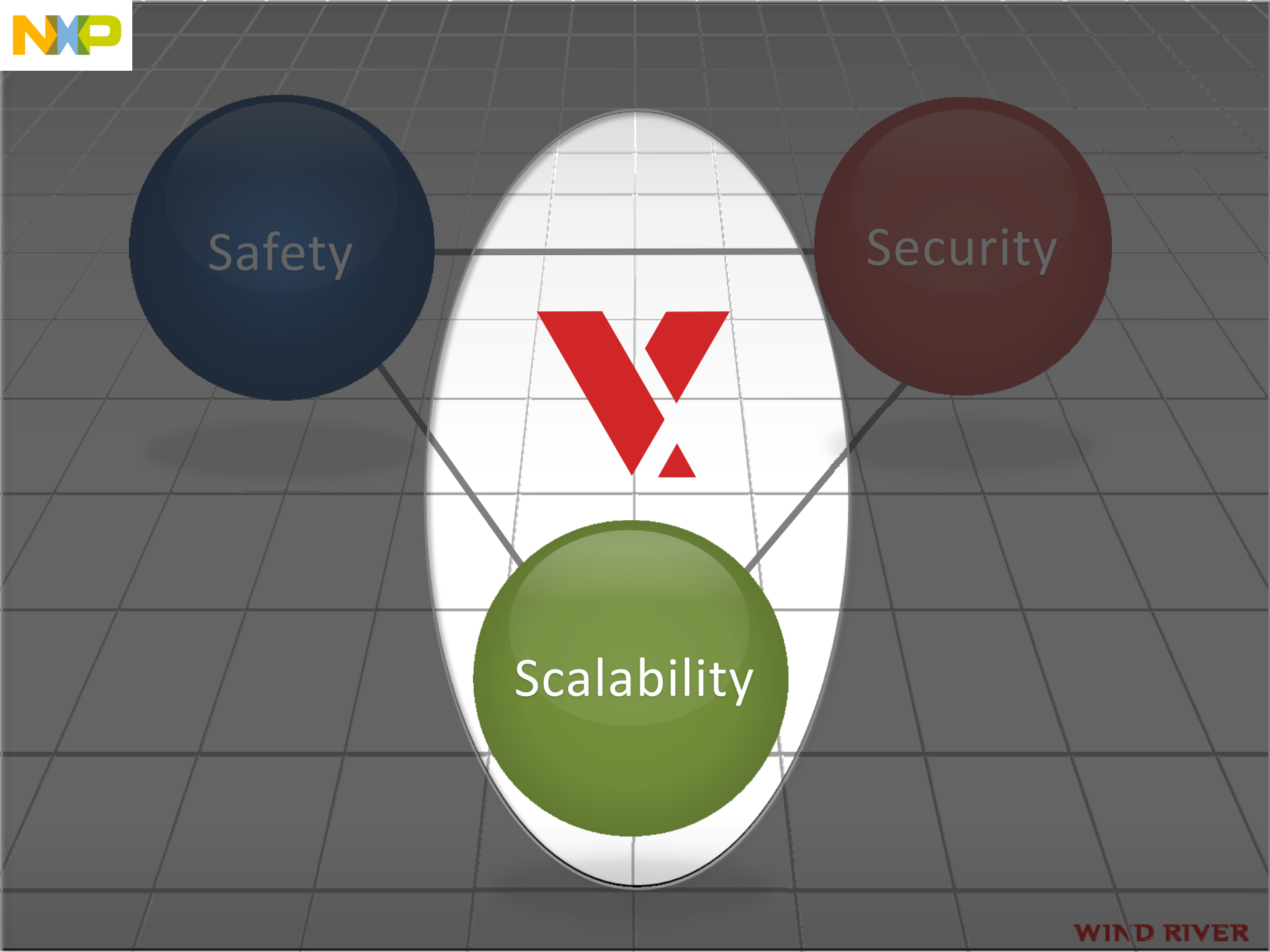
Wind River Hypervisor/ Open Virtualization Platform	**Cert Hypervisor**	**VxWorks MILS**

优化的硬件平台

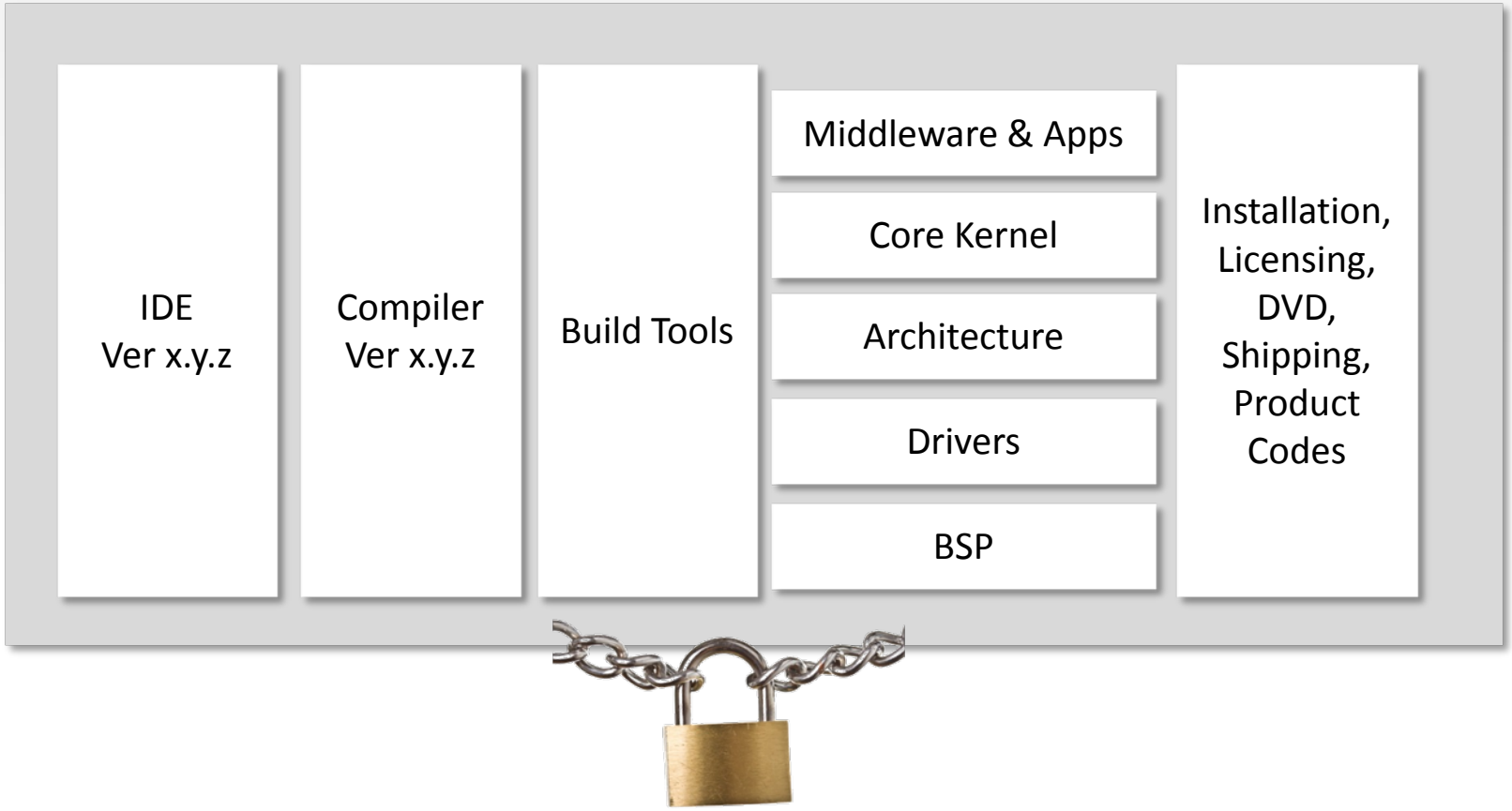
定制服务

WIND RIVER


2010s
- Internet of Things
- Distributed Control & Decision
VxWorks 7
2000s
- Multi-core Processors
- Hardening of Device OS
VxWorks 6
1990s
- Digital Control Devices
- Internet Explosion
VxWorks 5
1980s
- 32-Bit Processors for Devices
- Operating Systems in Devices
VxWorks


Safety
Security
Scalability
WIND RIVER

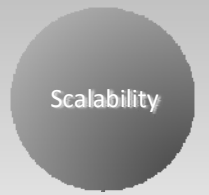
Centralization Paradigm of Operating Systems



Build and Distribution Infrastructure Based on Monolithic Platform Paradigm

 © 2014 Wind River. All Rights Reserved.

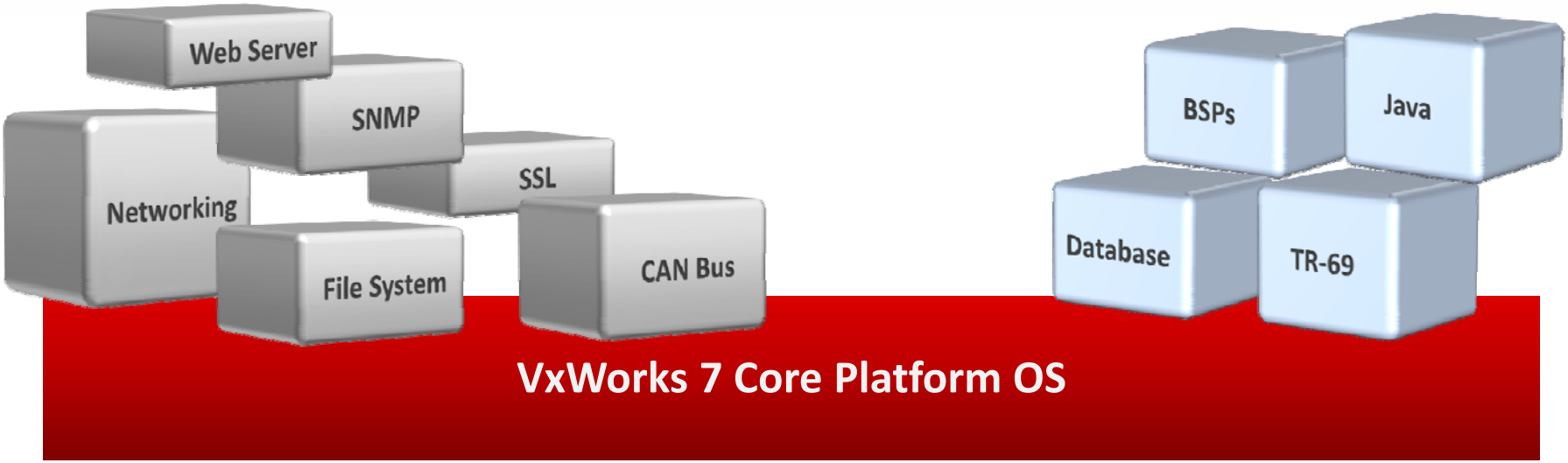
Package Paradigm for VxWorks 7



- New infrastructure for installation, distribution, and deployment of application packages
- Support for incremental addition or deletion of components

Wind River Packages

Ecosystem Packages



Litecycle of Application is separate from core kernel

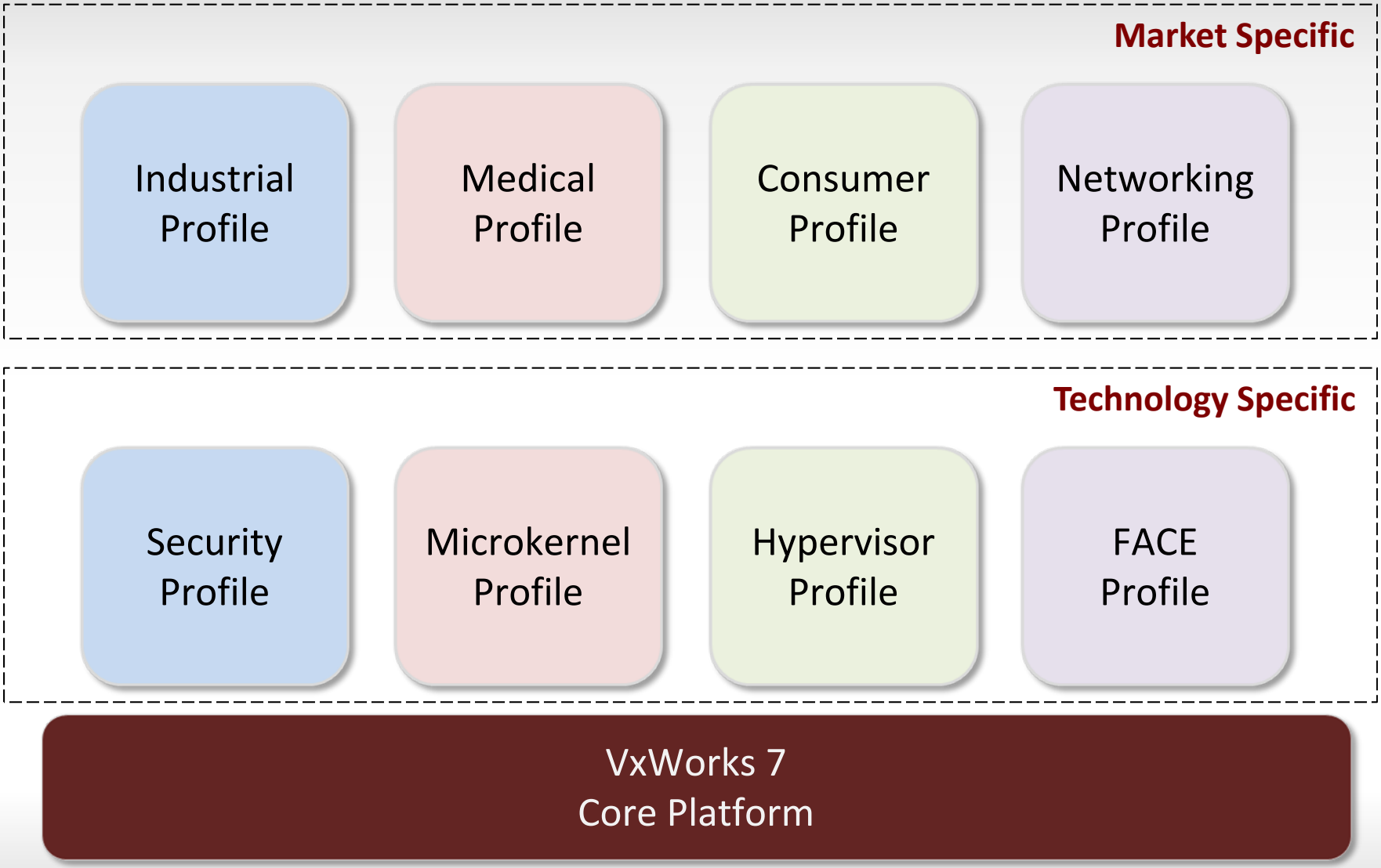
- Enables individual apps to be patched or updated at any time, as needed

Multiple versions of Packages can coexists in the development tree

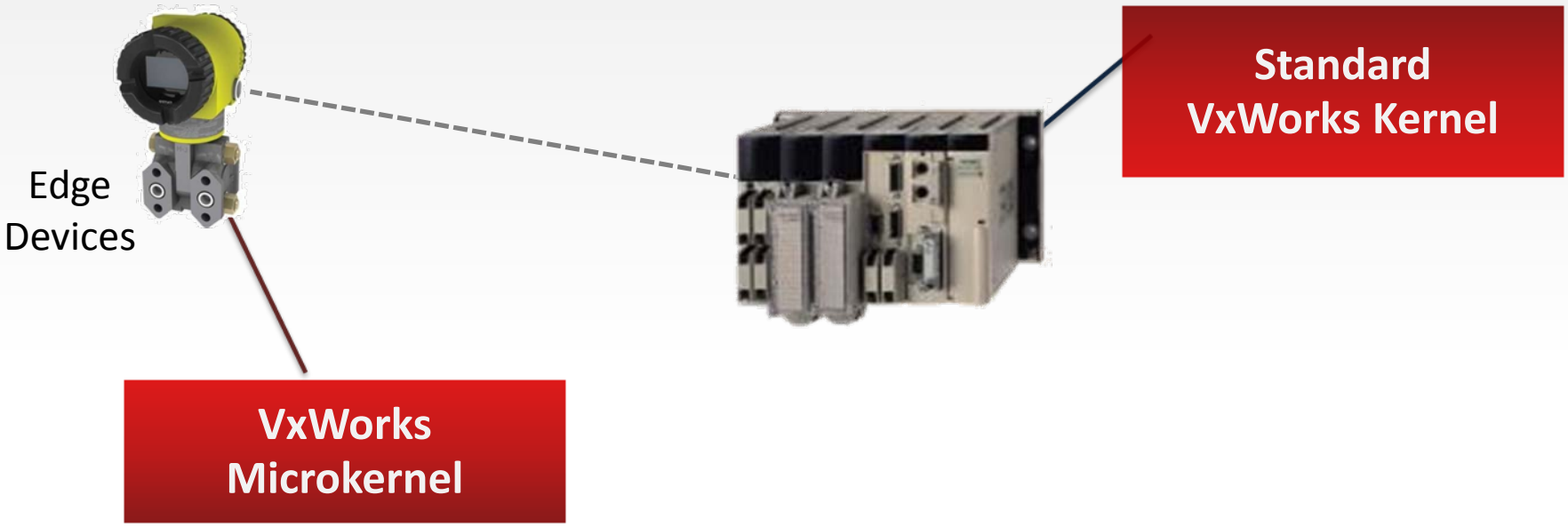
- Enables patches or new versions to be tried out and rolled back when required

VxWorks 7 Core Platform OS

Concept of Profiles



Microkernel Profile

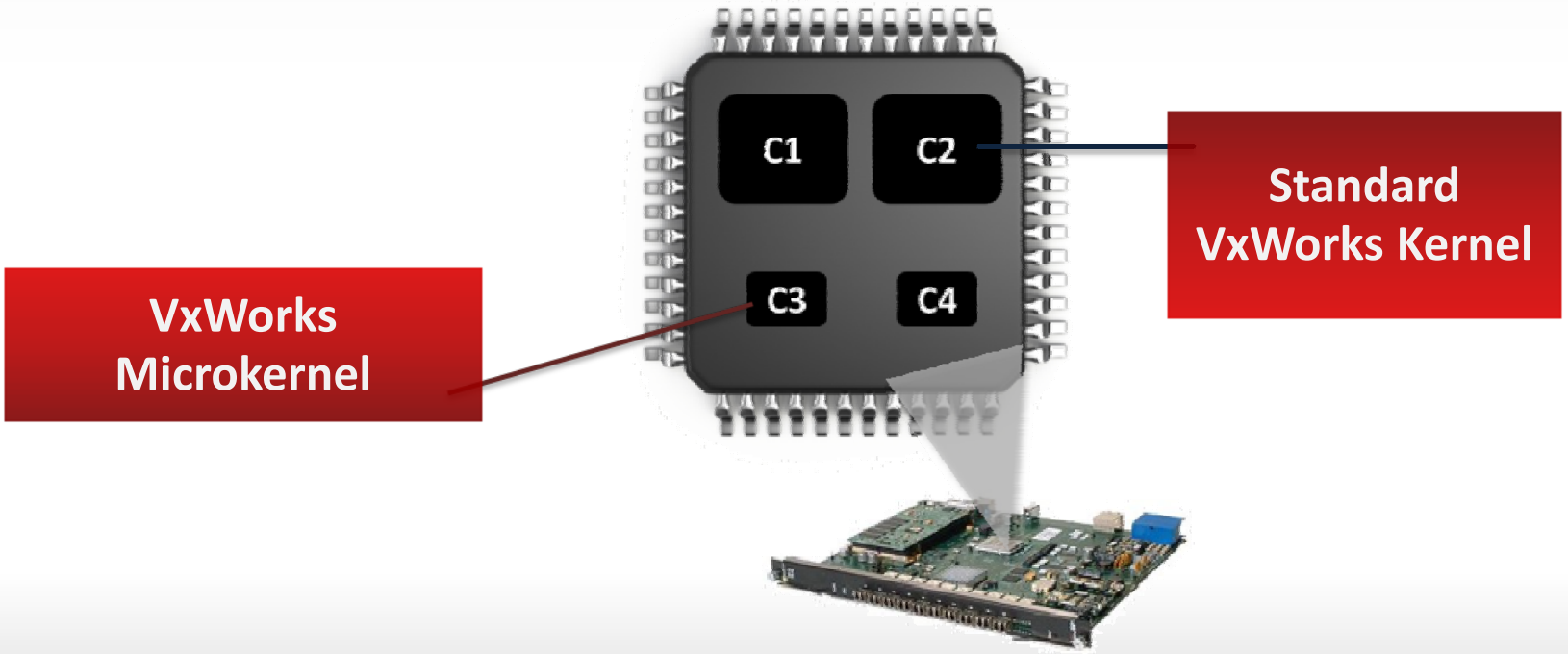


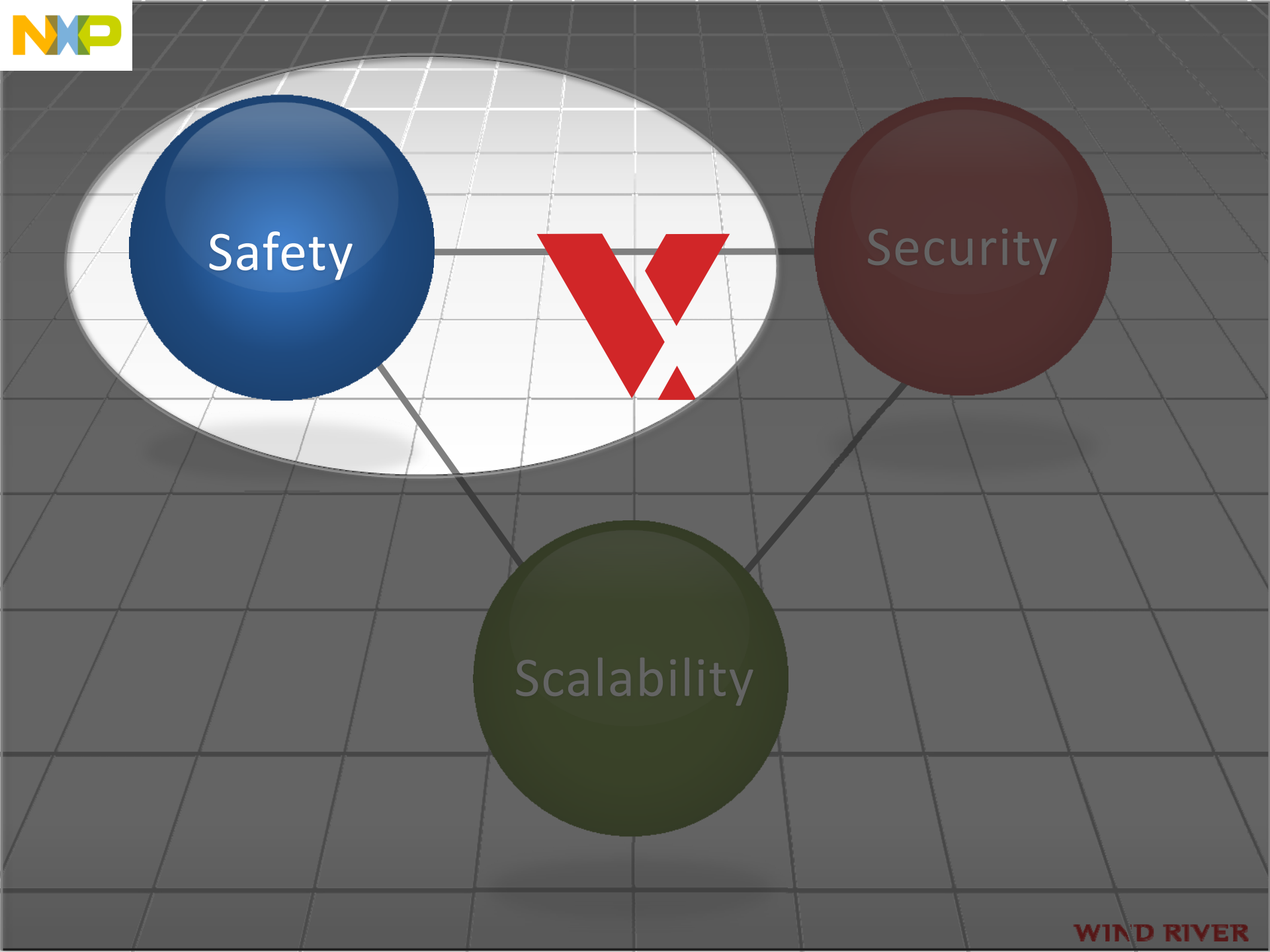
- Very small kernel (~20 KB)
- Lower safety certification cost
- Fast threading model
- Suitable for multi-core SoC, multiprocessor, or sensors

Designed for Big-Little Core Configurations

Scalability

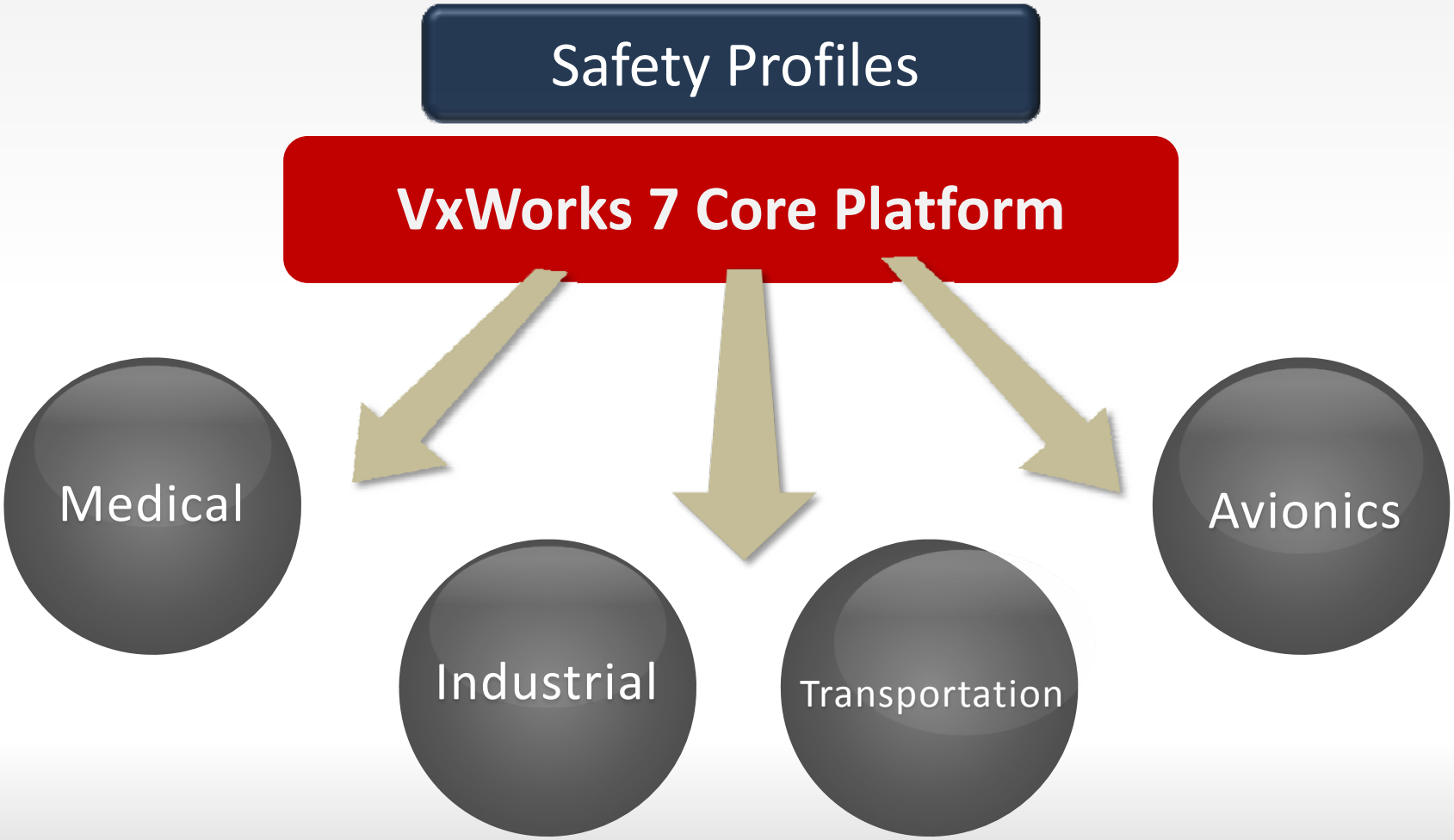
- Multi-core with big and small core configurations
- Offload of important or repetitive tasks for maximum processing efficiency




Safety
Security
Scalability
WIND RIVER

VxWorks 7 Scales in Functionality for Safety-Certified Applications

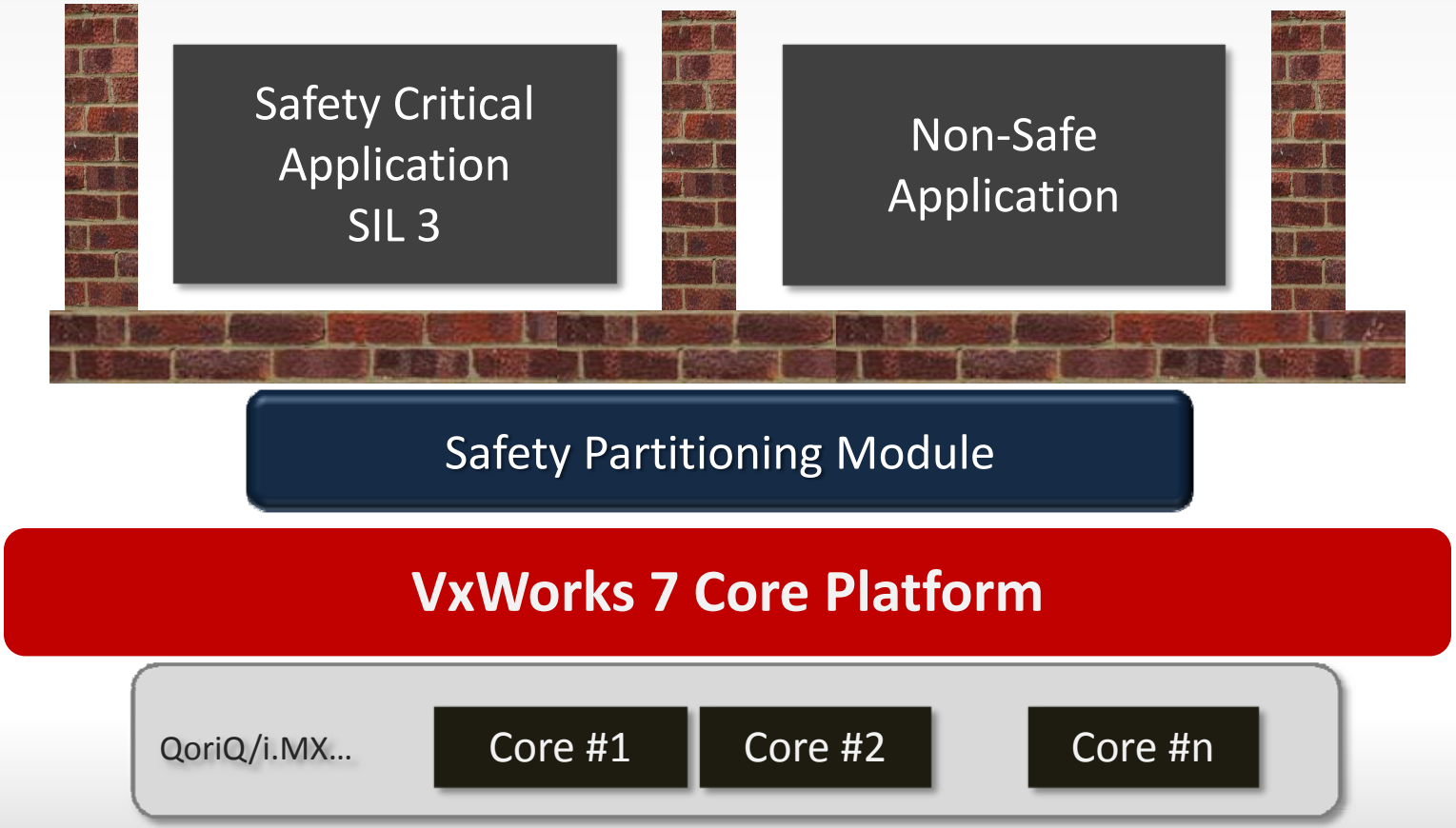
Safety

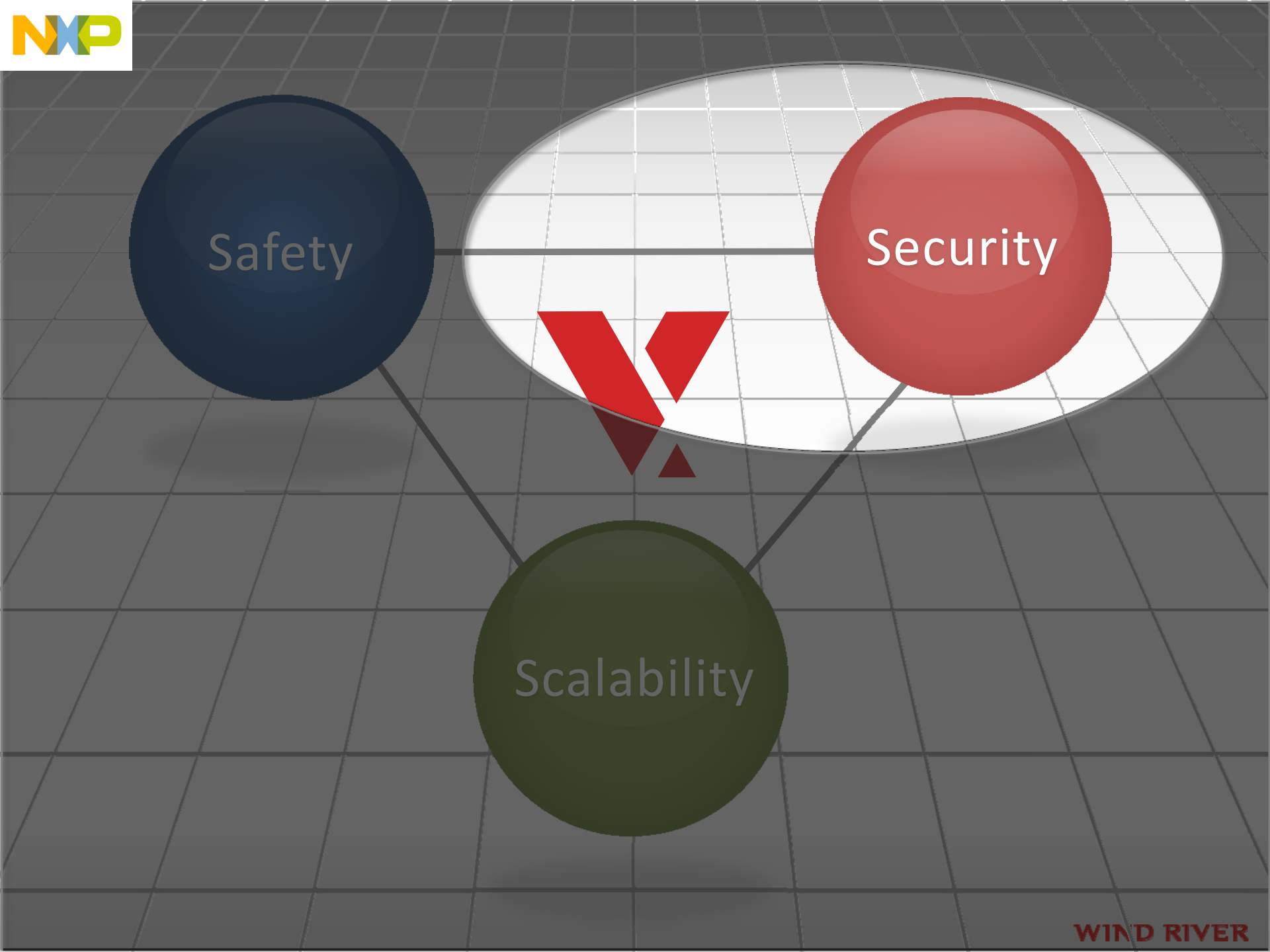


Enhanced Safety Partitioning

Safety

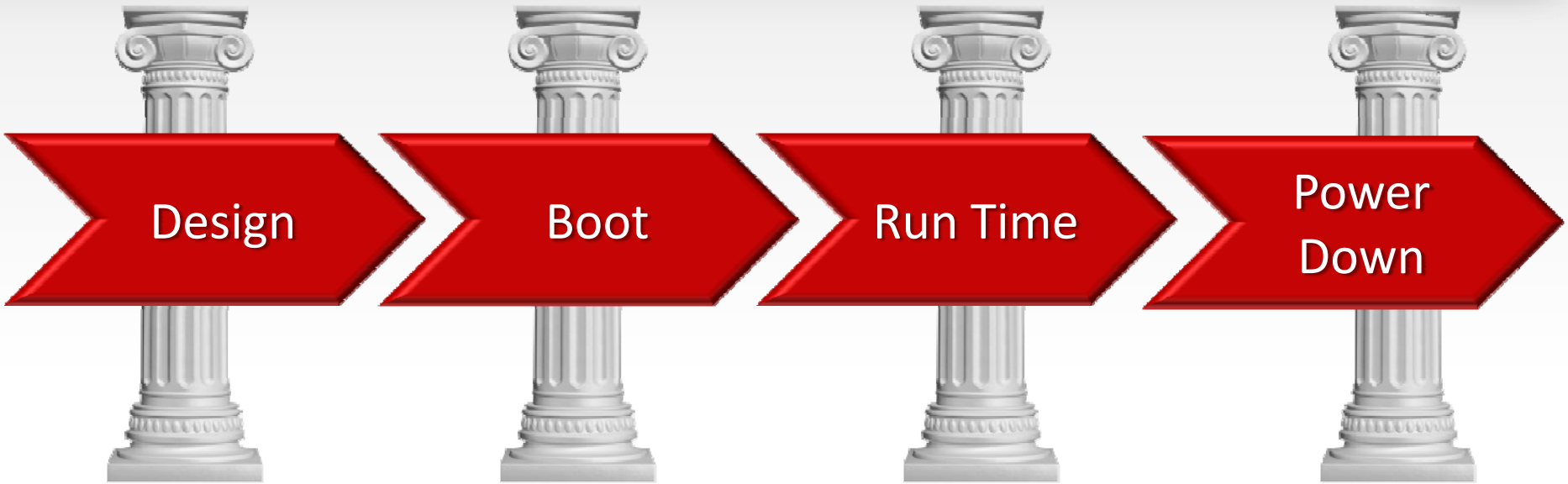
New partitioning components provide robust separation of time, space, and resources.




Safety
Security
Scalability
WIND RIVER

Four Pillars of Security Provided by VxWorks

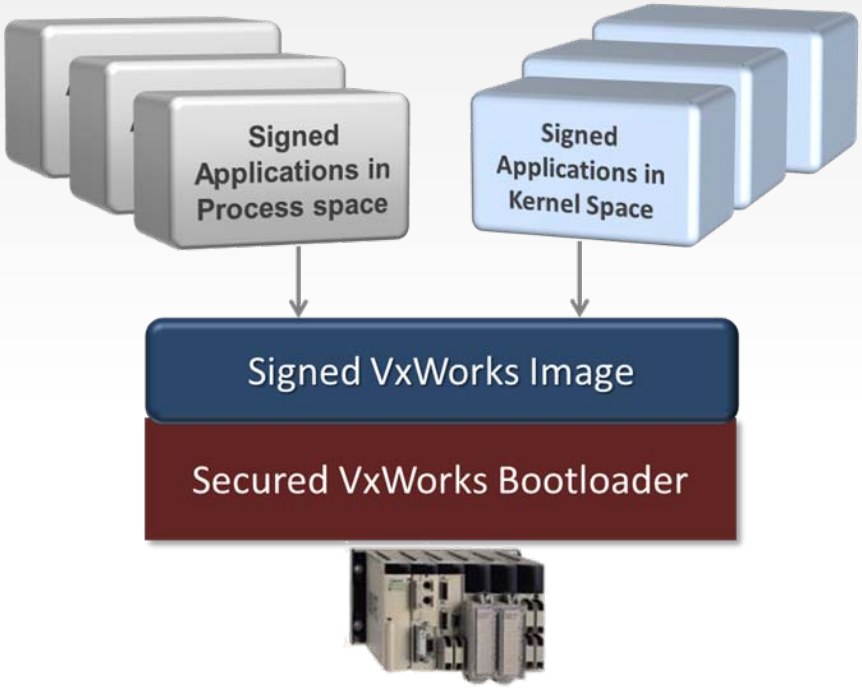
Security



Design	Boot	Run Time	Power Down
Prevent malicious code in development	Prevent untrusted binaries from executing	Prevent malicious attacks in operation	Prevent onboard data access when at rest

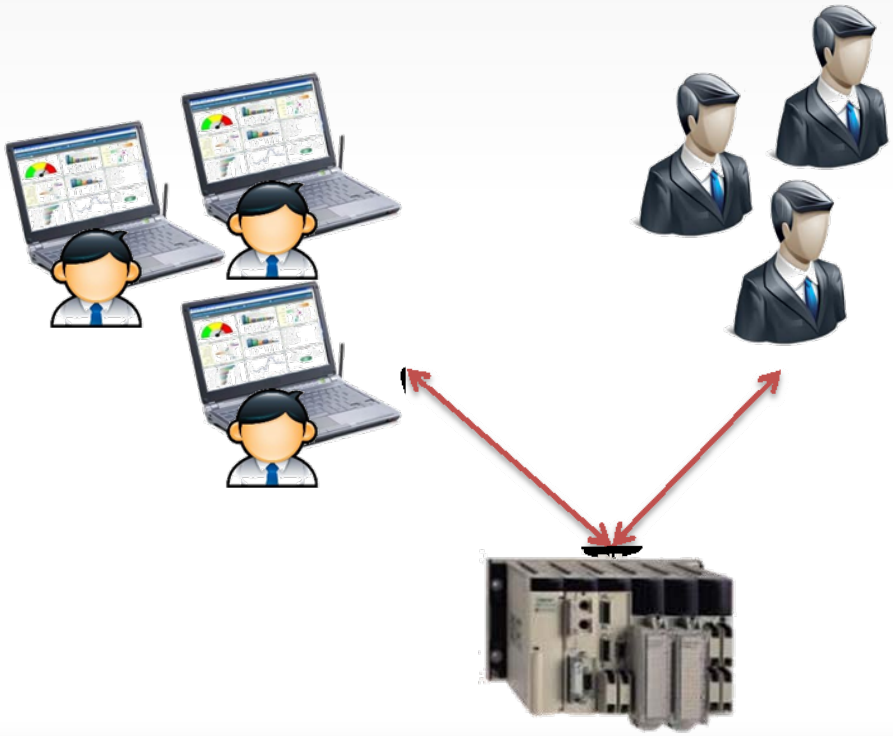
Security - Root of Trust

- Non authorized images won't load
- Only signed module will run
- No malicious code injection
- Decryption (optional)
- Digital Signature verification (X.509)
- Supports
  - DKM
  - RTPs
  - Shared Libraries
- Workbench plugin to integrate in build system
- Secure loader

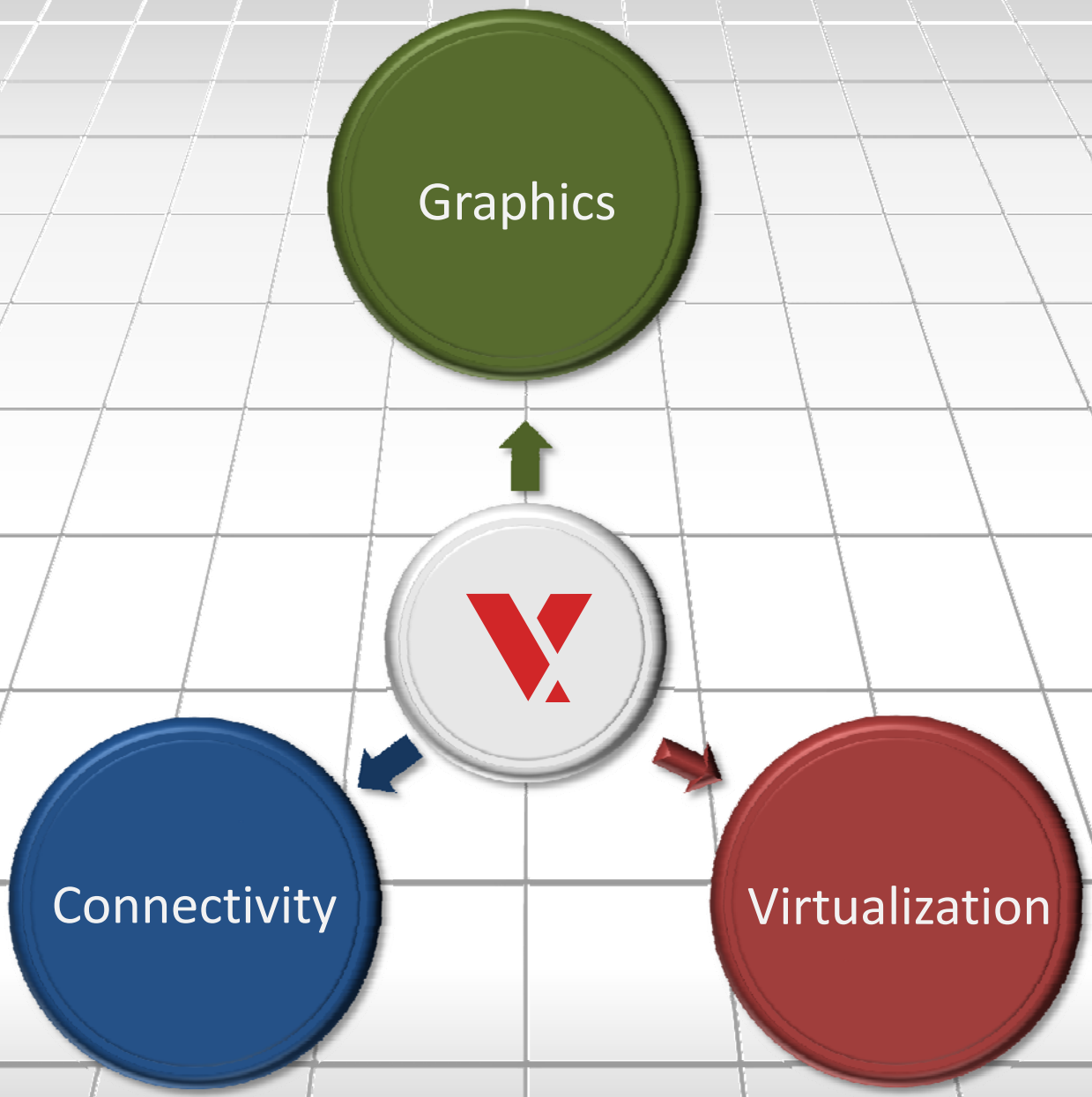


Security - User Management

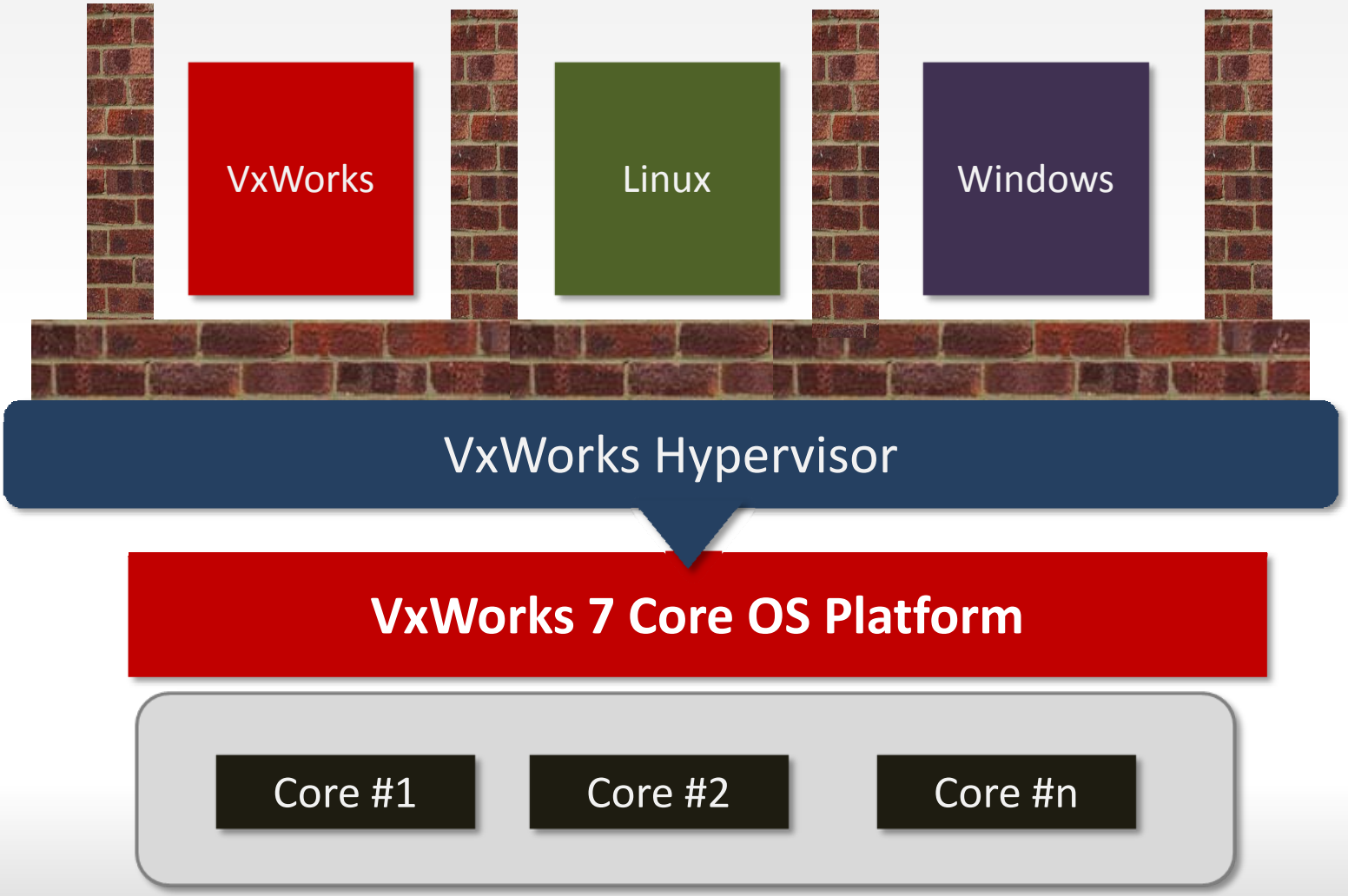
- Only authorized user have access
- Define and enforce user based policies
- Customized auditing and log management



Enhanced Platform Values

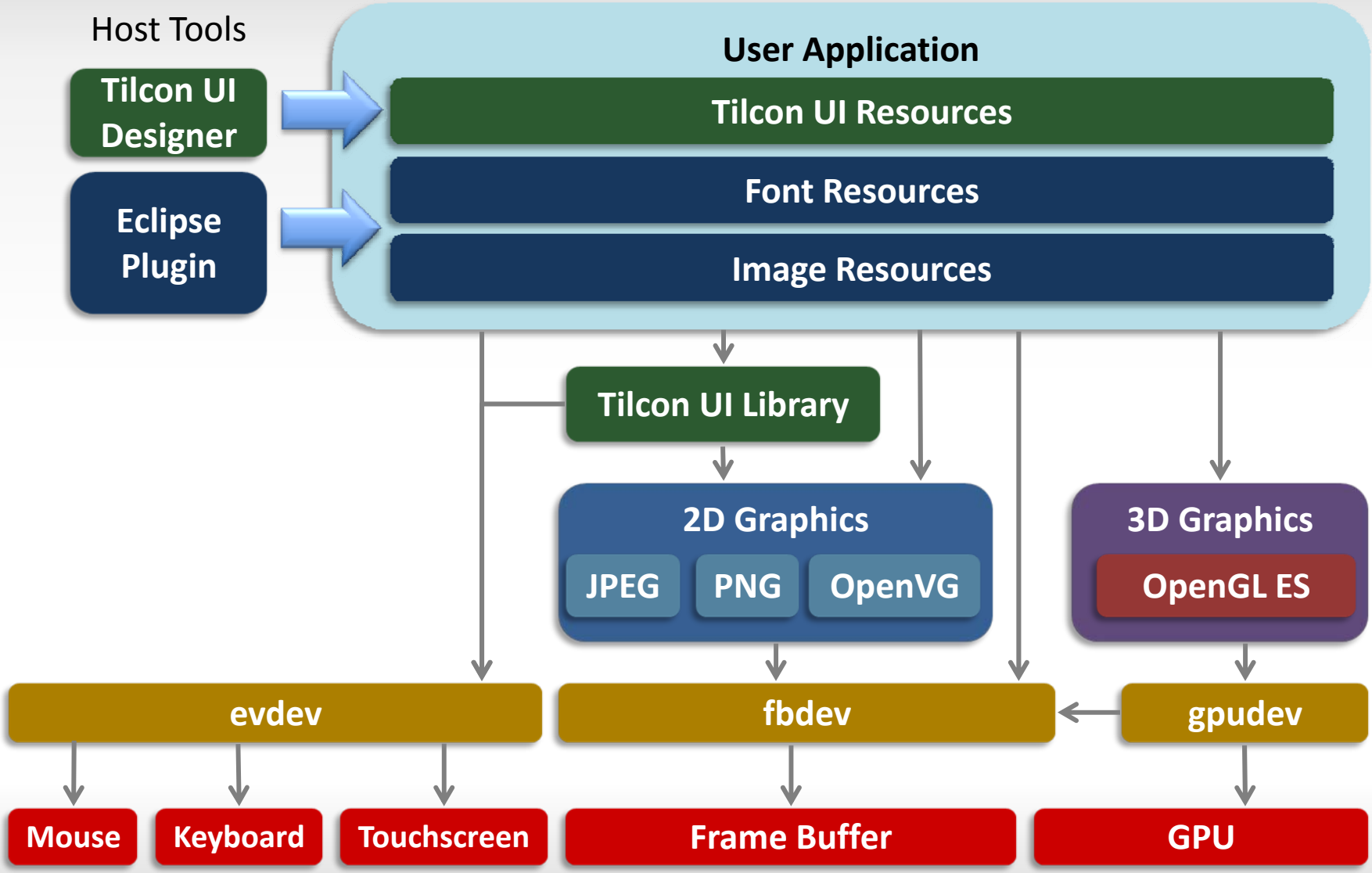


Foundation for Virtualization



UI Solution

Graphics

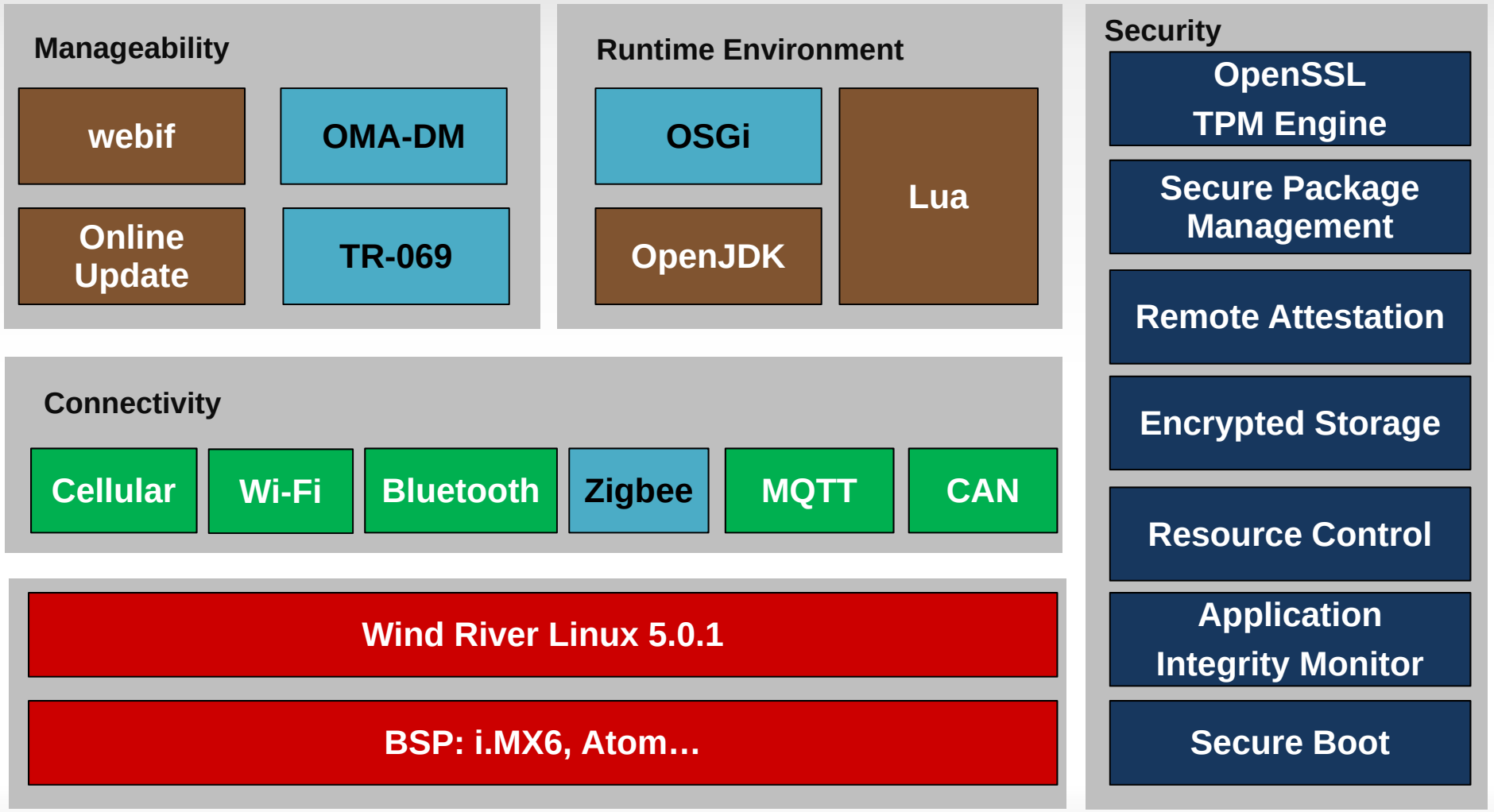


Support for Industry Standard Connectivity Protocols

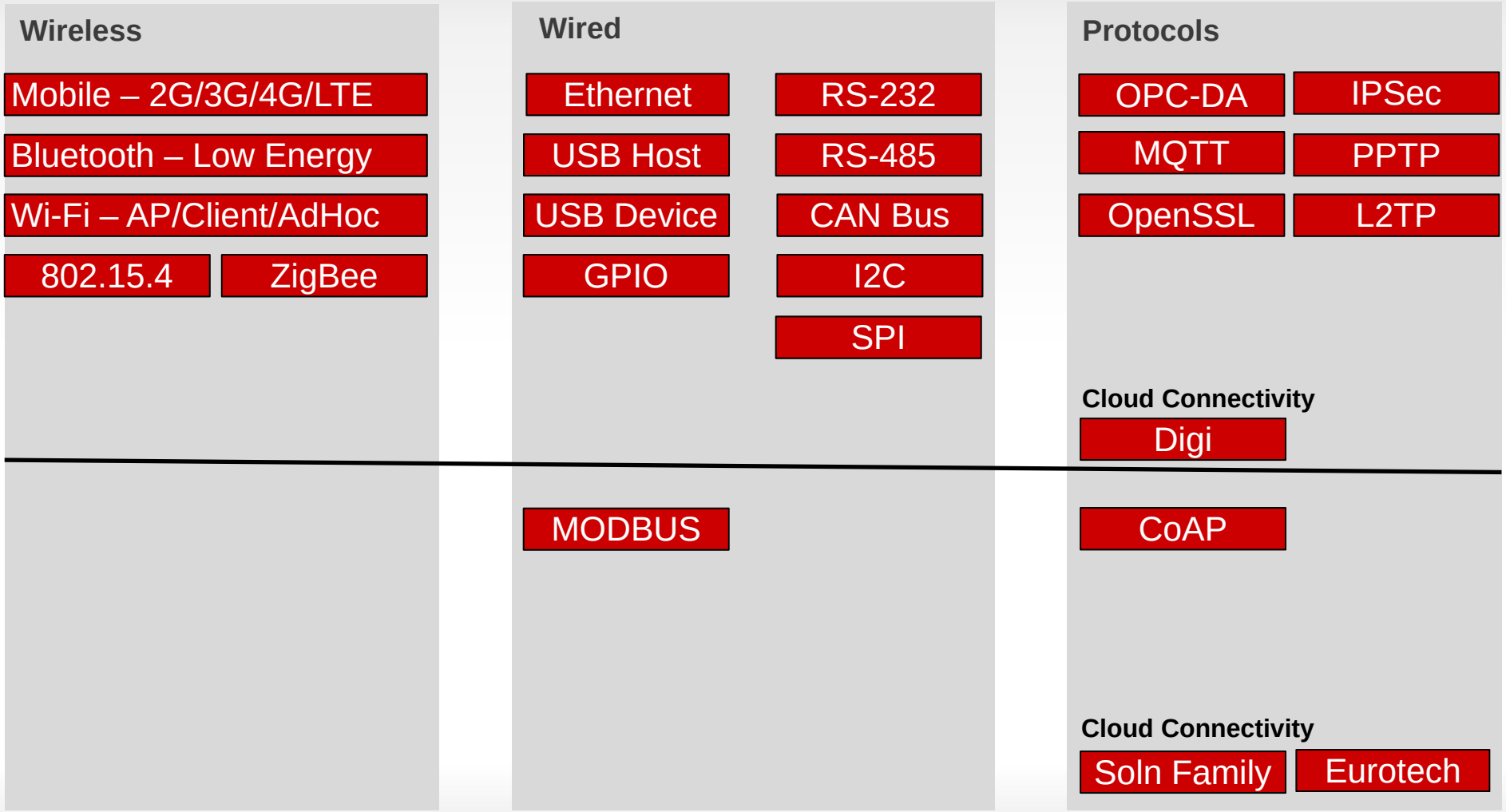
Connectivity

- Bluetooth, BLE, L2CAP, Health Device Profile
- CAN protocols
- FireWire (IEEE 1394)
- Continua stack for home medical applications
- USB
- Dual-mode IPv4/IPv6 with IPv6-Ready Logo certification

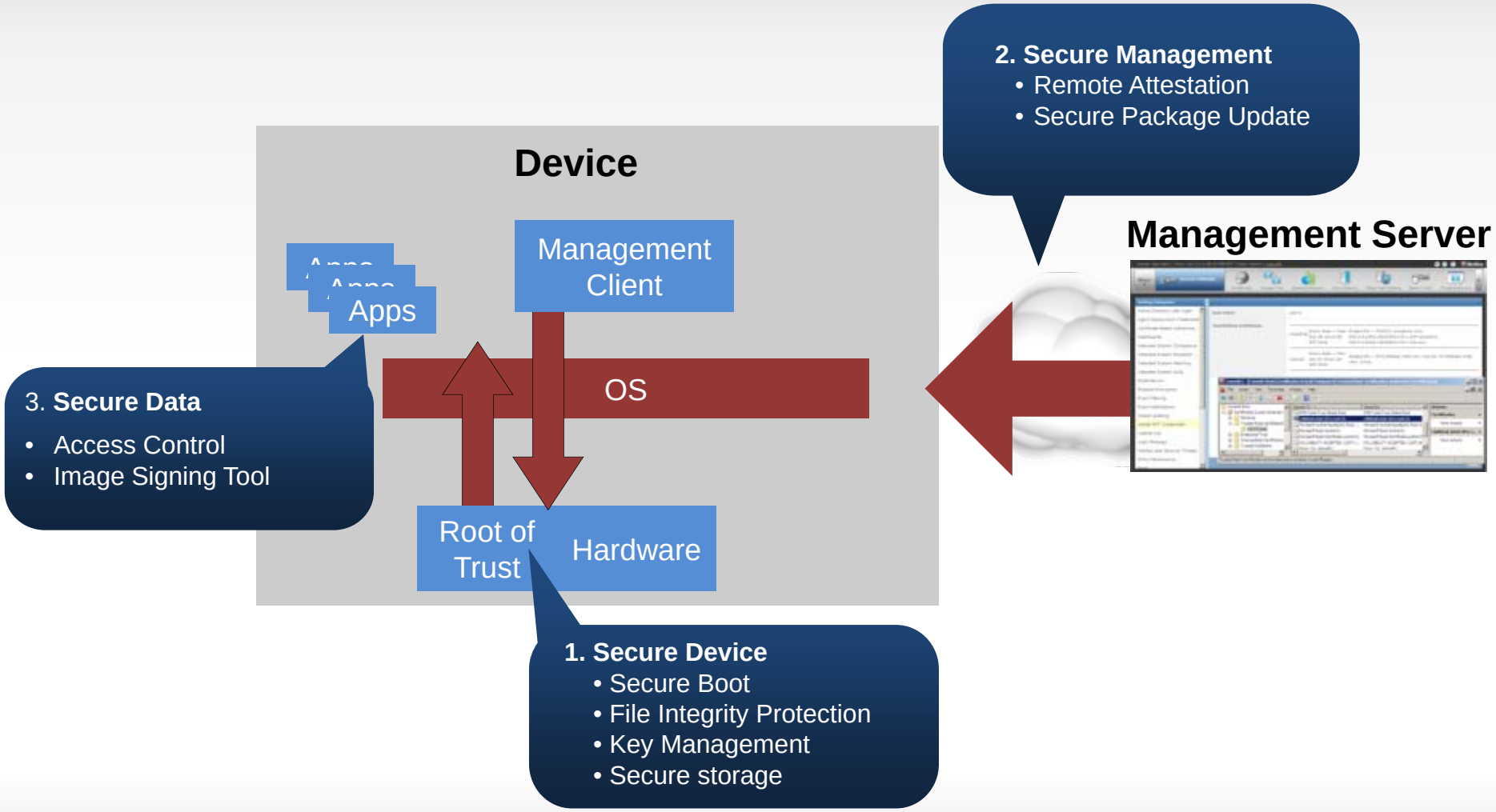
Intelligent Device Platform (IDP)



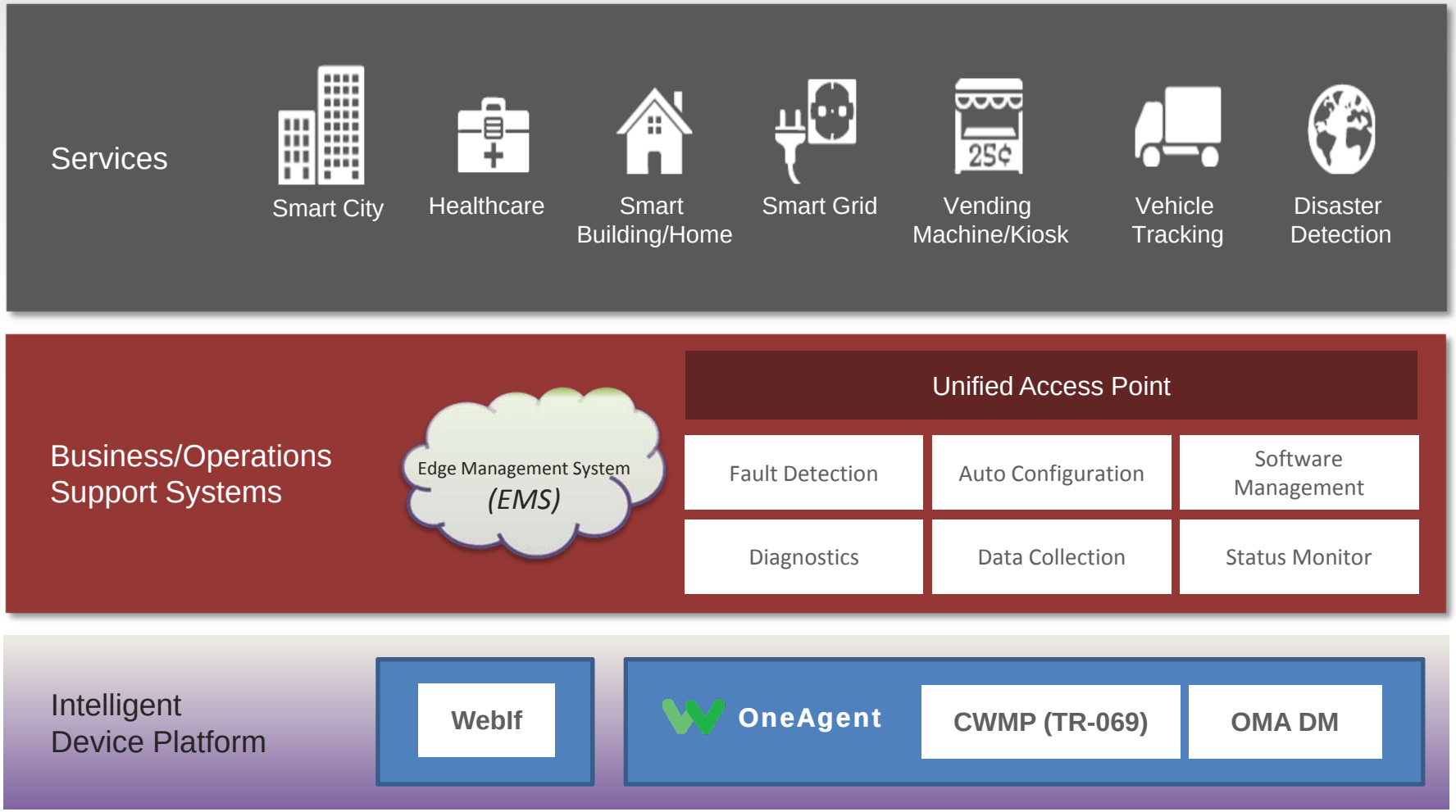
iDP Connectivity



Security


2. Secure Management
• Remote Attestation
• Secure Package Update
Management Server
Device
Management Client
Apps
OS
Root of Trust
Hardware
3. Secure Data
• Access Control
• Image Signing Tool
1. Secure Device
• Secure Boot
• File Integrity Protection
• Key Management
• Secure storage

Manageability



Edge Management System

Cloud Connectivity Kit

Secure Connection

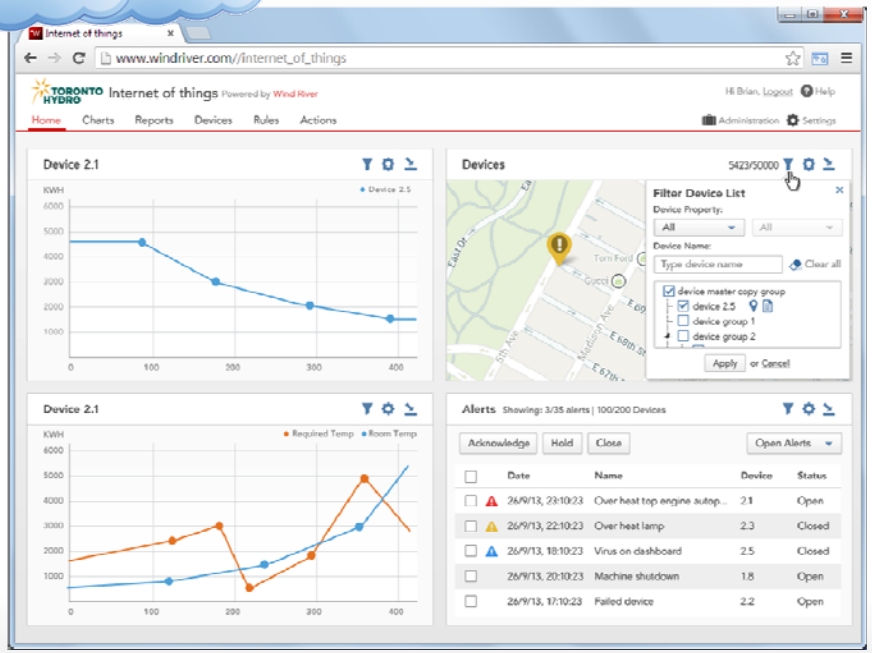
Application Launcher

Remote Upgrade

VxWorks 7 Platform/ Intelligent Device Platform

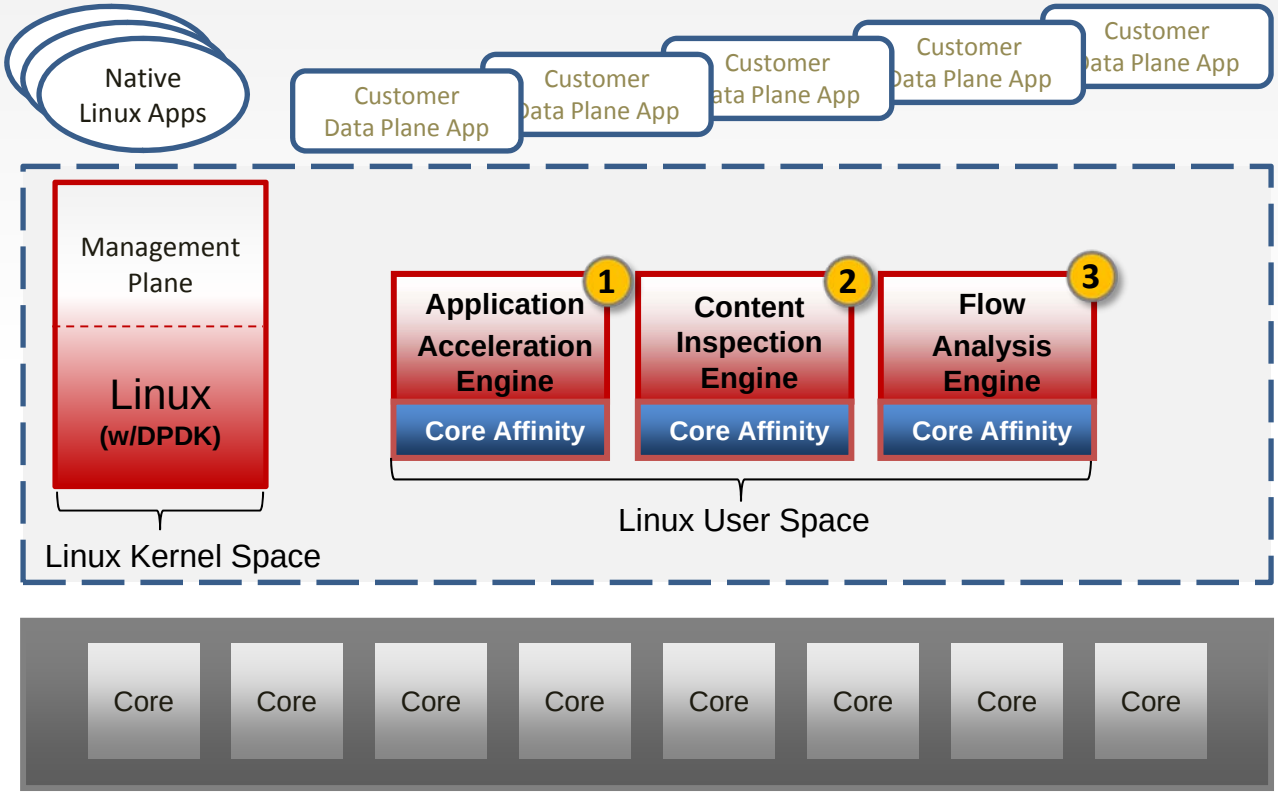
Edge Management System

- Event-based rules engine
- Data visualization
- API access to data

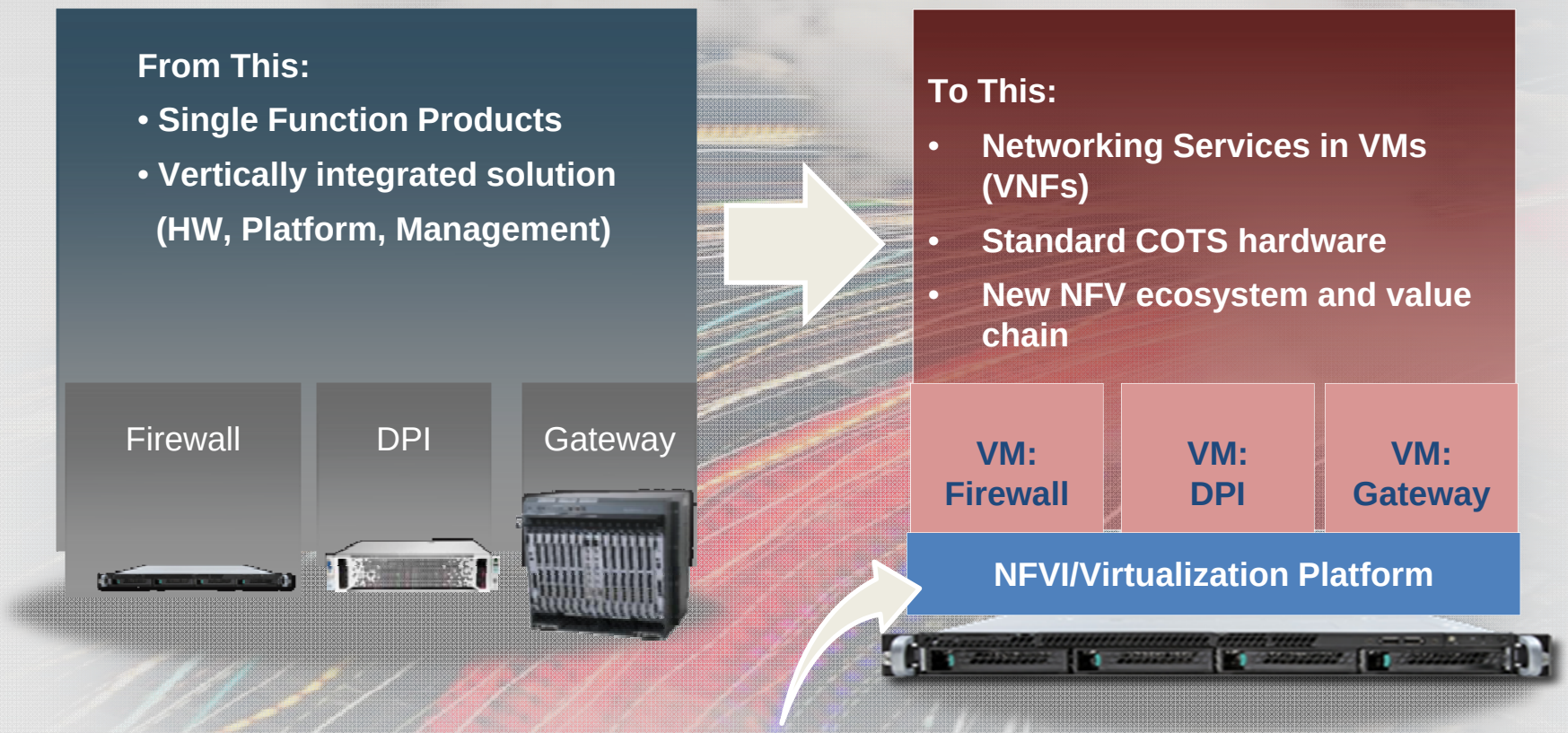


WIND RIVER

Intelligent Network Platform



NFV and Network Transformation



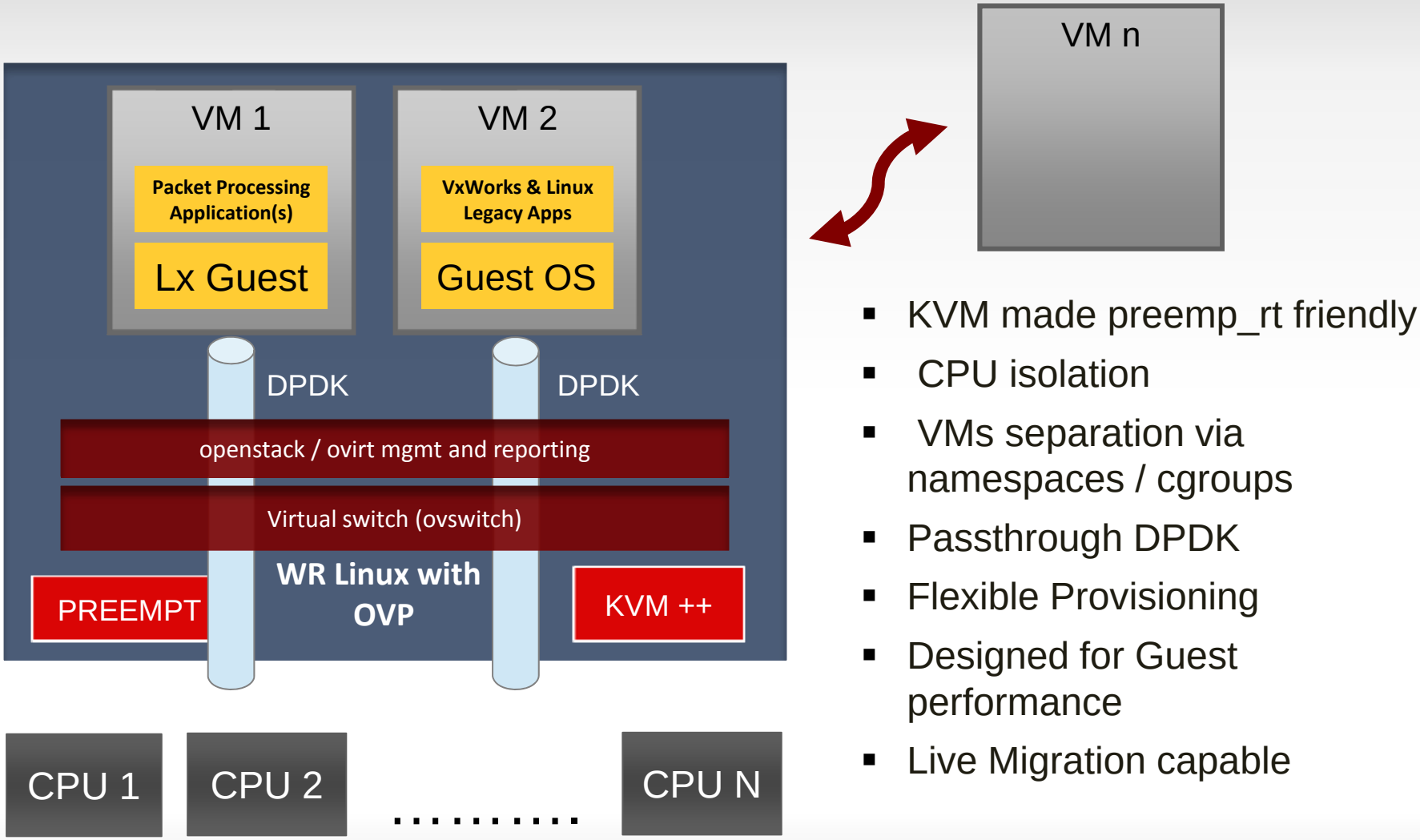
Focus of Wind River product portfolio

To Lower OPEX and CAPEX

Create Service Agility

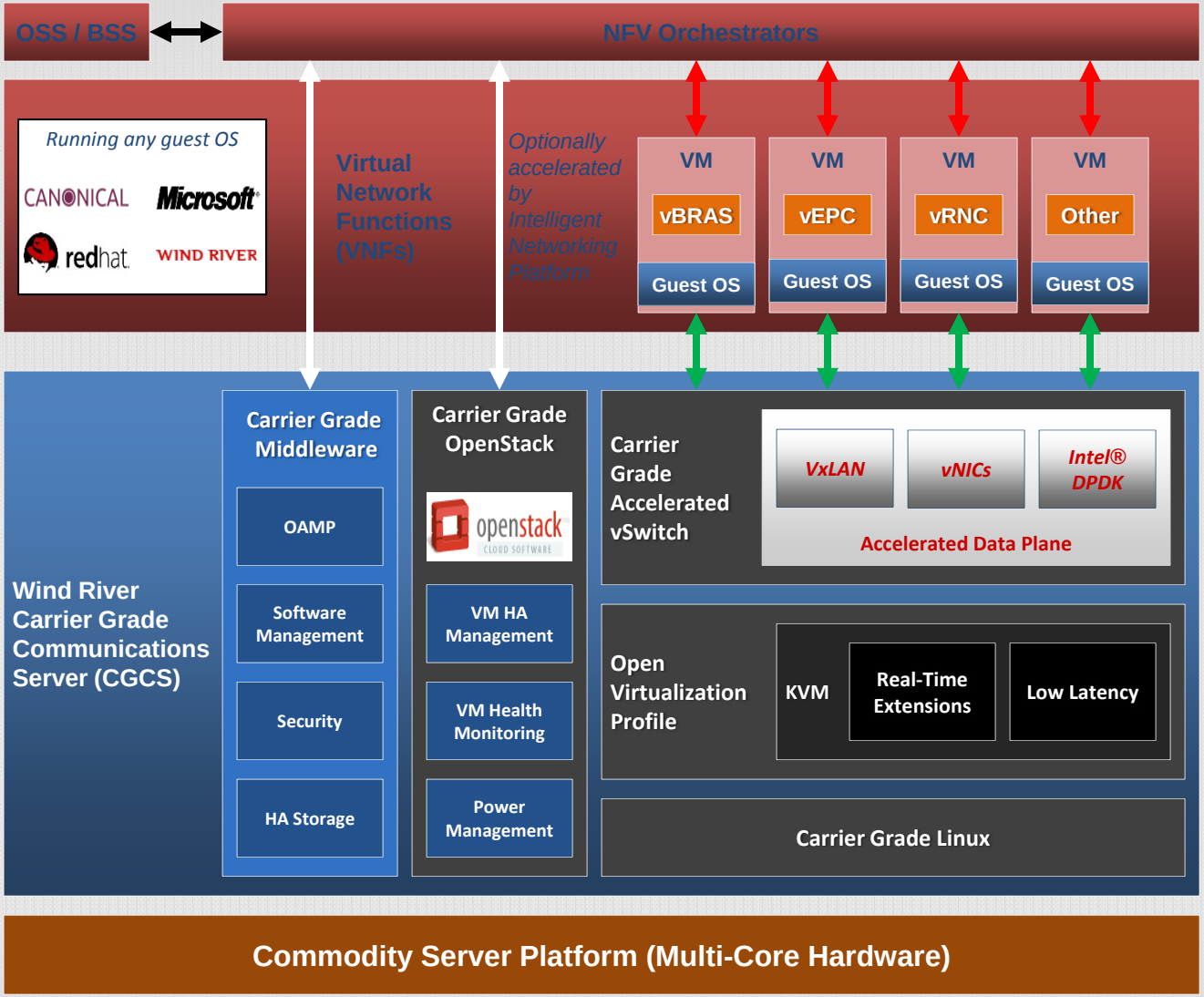
Accelerate Innovation

Open Virtualization Profile



- KVM made preemp_rt friendly
- CPU isolation
- VMs separation via namespaces / cgroups
- Passthrough DPDK
- Flexible Provisioning
- Designed for Guest performance
- Live Migration capable

Carrier Grade Communications Server Architecture



Support any guest Operating System

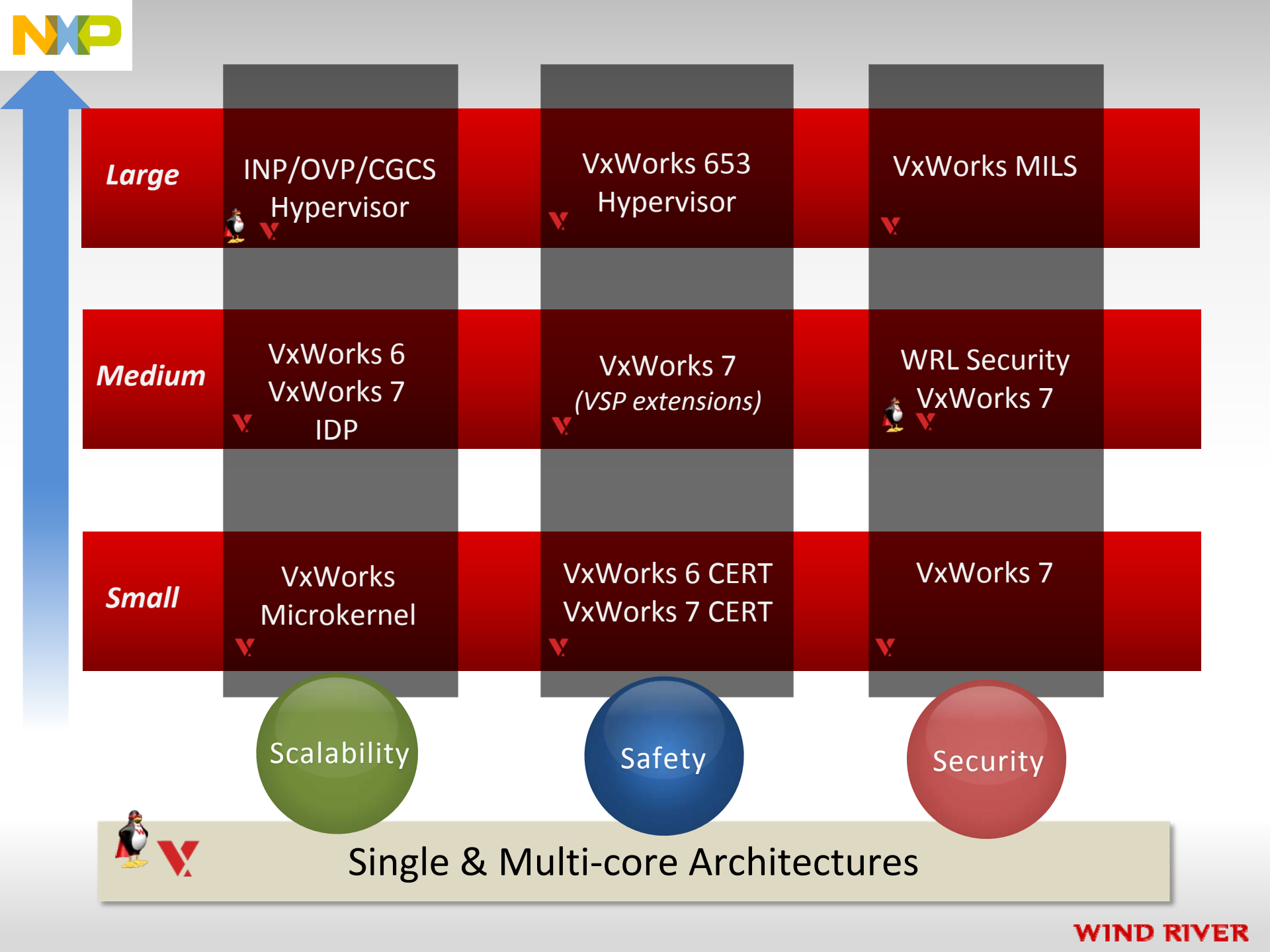
Add features for Carrier Grade platform management

Add Carrier Grade accelerated vSwitch

Add OpenStack Carrier Grade reliability and availability enhancements

Add critical real-time performance enhancements to KVM

Based on standard open source components


Large
INP/OVP/CGCS Hypervisor
VxWorks 653 Hypervisor
VxWorks MILS
Medium
VxWorks 6
VxWorks 7
IDP
VxWorks 7
(VSP extensions)
WRL Security
VxWorks 7
Small
VxWorks Microkernel
VxWorks 6 CERT
VxWorks 7 CERT
VxWorks 7
Scalability
Safety
Security
Single & Multi-core Architectures

Contact Us

- Beijing Office Tel：010-84777100
- Shanghai Office Tel：021-63585586/87/89/90
- Shenzhen Office Tel：0755-25333408/3418/4508/4518
- Xi’an Office Tel：029-87607208
- Chengdu Office Tel：028-65318000

To learn more, visit Wind River at ： http://www.windriver.com

Email: inquiries-ap-china@windriver.com

Wind River Sina Weibo，

@Wind River http://weibo.com/windriverchina