

Industrial IoT: from Embedded to the Cloud using Java from Beginning to End

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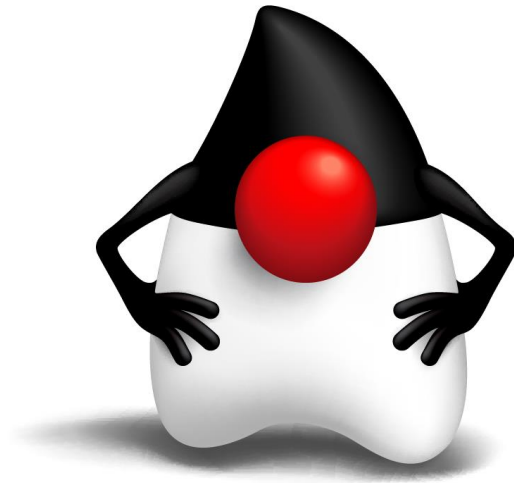
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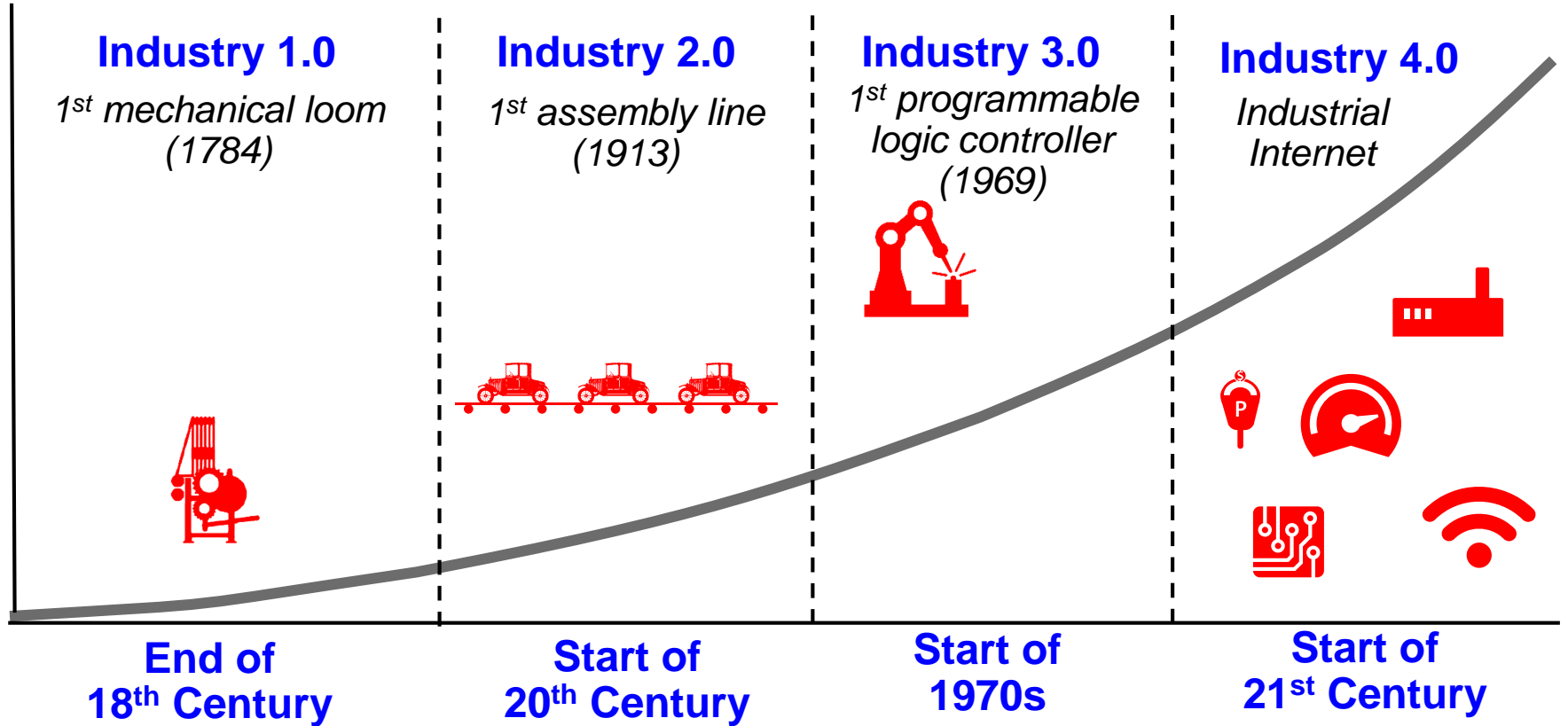


@speakjava

Industrial IoT



Industrial Revolutions

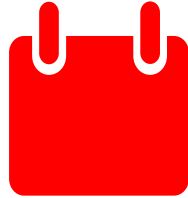


Industrial Automation

The traditional segment drivers haven't changed...



Competitive edge



Production throughput



Enhanced quality



Manufacturing visibility
and control



Energy and
resource management



Government &
standards compliance



Safety
and security



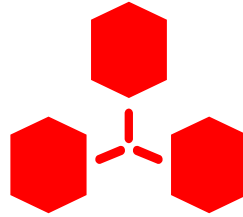
Business
integration

Industrial Automation

Smart devices are key



Local intelligence and
decision-making



Flexible networking



Performance and scalability



Security



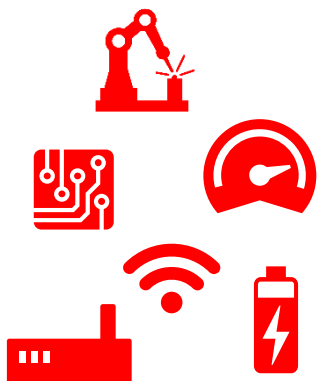
Remote management



Functions become services

Industrial IoT: Edge to Cloud

Intelligent Edge Devices



- Minimal compute power
- Raw event filtering
- Programmable control
- Mesh networking

Gateways



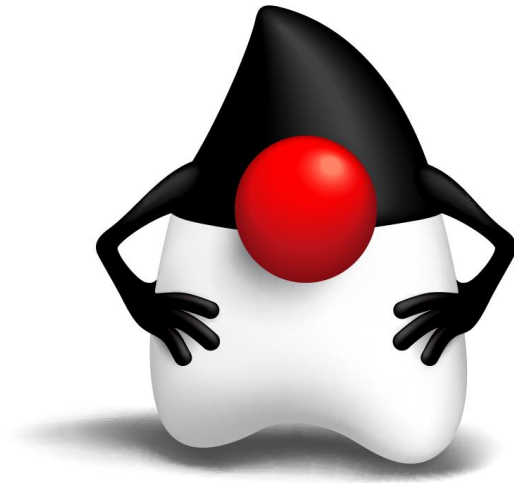
- Complex event filtering
- Basic analytics
- Offline/online control

Cloud



- Data collection
- Analytics
- Machine Learning
- Command & control

Why Java For Industrial IoT?



Java Embedded Platform

- Hardware and Operating System independence
- Local database, web-enabled, event aware
- Optimised for embedded hardware
- Rich graphics support (JavaFX)
- Comprehensive protocol support



Java Language and Developers

- Standards-based, modern language
 - Simple concurrency
 - Access to native system resources (JNI)
- Strong tool chains
- Reusable code
 - Wide range of 3rd party libraries and frameworks
- Millions of developers, worldwide



Java Applications

- Write once, run anywhere
- High performance
- Dynamically optimised
- Consistent runtime environments

APPLICATIONS

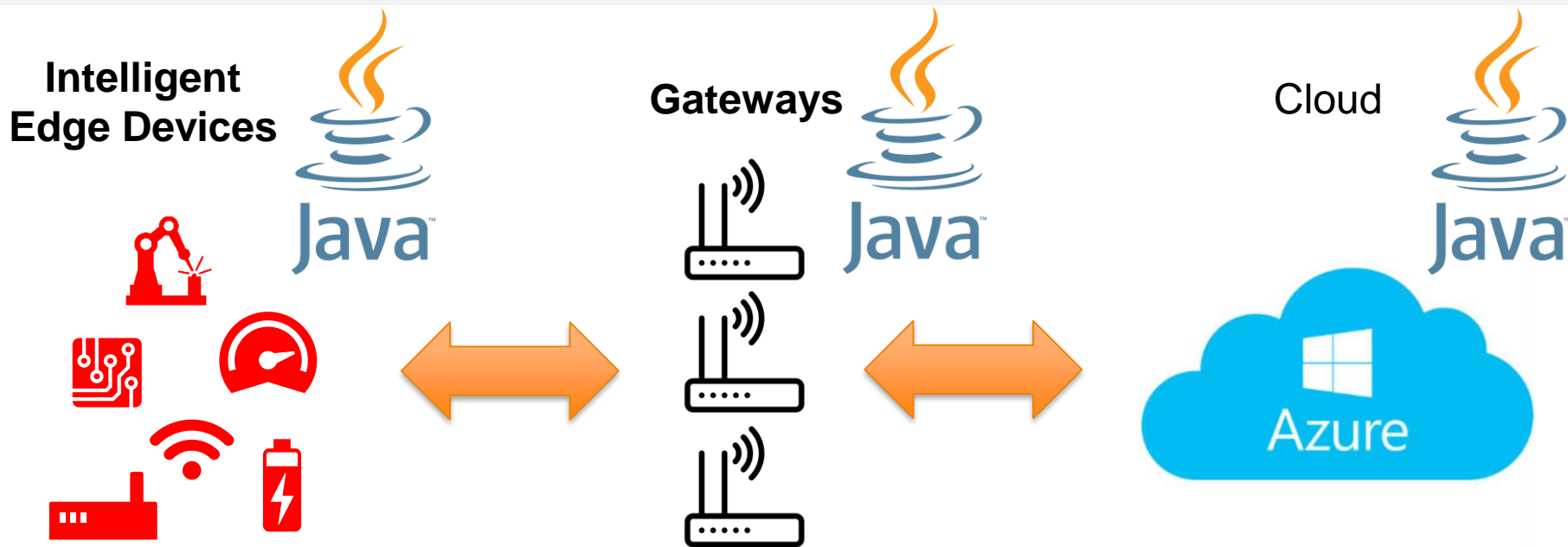


Java Security

- Proven security model
 - No Java viruses
- Strong cryptographic support
 - All modern standards
- Designed for distributed computing
 - Code moving around the network



Industrial IoT: Edge to Cloud

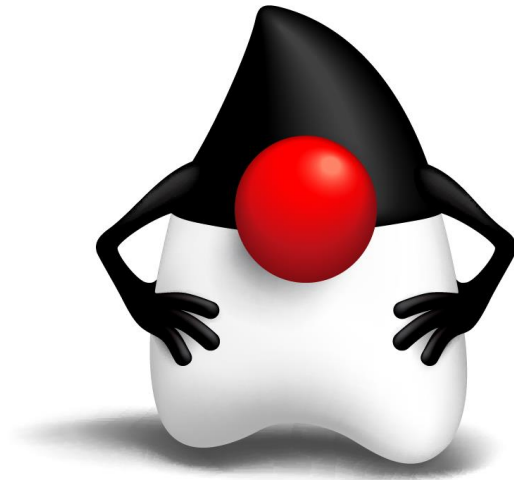


- Embedded Java
- Simple development
- Updateable
- Remote Management

- Java SE
- High performance
- Simplified development
- Remote management

- Enterprise Java
- Micro services
- Scalable
- Reliable

Azul's Zulu Java



Zulu Embedded Java

- Built from OpenJDK code base
- Passes all TCK tests
- Ports for Intel, ARM, PowerPC, MIPS
- ARM v6, v7, v8
 - Soft and hard float
 - 32 and 64 bit
 - C2 and C1+C2 compiler enhancements
- Drop in replacement for other JVMs
- No licensing restrictions (FoU): GPLv2 with CPE

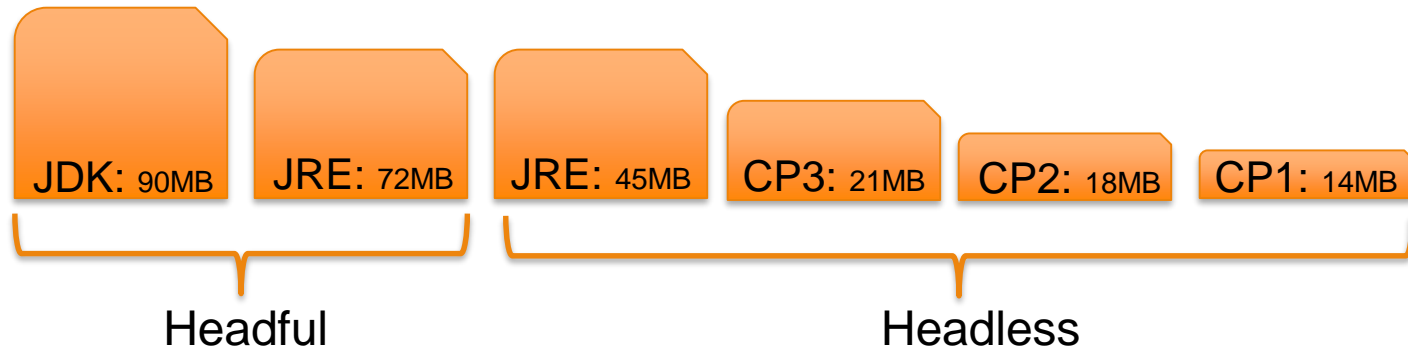


Customizable Packages

- Multiple OSs:
 - All Linux distros, Windows, Solaris, macOS, QNX
 - Also: Docker; Alpine Linux with musl libc
- CPUs: 32- and 64-bit x86, Arm, PPC, MIPS32
- Java versions: 6, 7, 8 and 11
 - 32-bit and 64-bit versions
 - Packages: ZIP, RPM, DEB, MSI

Customizable Packages

- JDK 8 bundles: 6 builds, including Compact Profiles 1/2/3



- JDK 11: jlink to build customised runtimes
 - Using module system

Zulu Embedded Support

- **Dedicated Support team**
 - Fault triage, root cause analysis and patch creation
- **Deep Java Engineering capabilities**
 - Strong Java runtime engineering expertise
 - Azul contributes and participates in JCP and OpenJDK
 - Zulu CPUs and security updates aligned with Oracle CPUs
 - Azul has visibility to upcoming Critical Patch Updates before the wider Java community
- **Possibility to serve specific customer requirements:**
 - Test on customer HW, or with customer's applications
 - On-site support available

Zulu Embedded Support SLA

Support Hours	24 x 7 x 365
First Response	1 hour
Product Downloads and Fixes	<ul style="list-style-type: none">• Regular quarterly releases• Early Access to upcoming releases• Hot Fixes
Number of tickets	Unlimited
Support access	Phone, email and web
Forum access	Read & Write
End Of Support (EOS) End Of Life (EOL = EOS + 2 years)	<ul style="list-style-type: none">• Minimum 10 years support for each major Long-Term-Support release (6, 7, 8, 11):• 8 years active + 2 years passive support

Zulu Enterprise Java

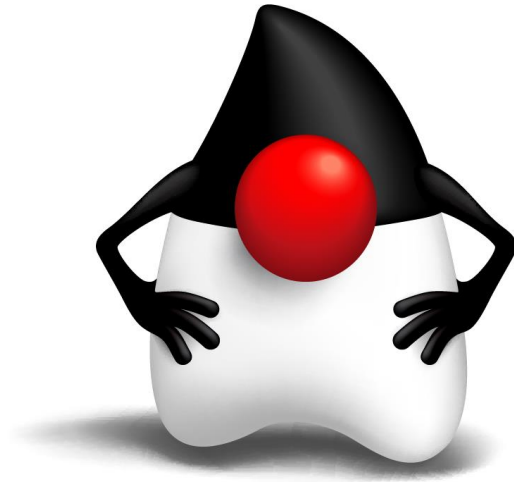
- Azul's binary distribution of OpenJDK
 - Passes all TCK tests
- JDK 6, 7, 8, 9, 10 and 11 available
- Wide platform support:
 - Intel 64-bit Windows, Mac, Linux
 - Intel 32-bit Windows and Linux

www.azul.com/downloads/zulu

Zulu Extended Support

- Backporting of bug fixes and security patches from supported OpenJDK release
- Zulu 8 supported until March 2026
- LTS releases have 9 years active + 2 years passive support
- Medium Term Support releases
 - Two interim releases between LTS releases (9, 13, 15...)
 - Bridge to LTS releases
 - Supported until 18 months *after* next LTS release

Summary



Java and Industrial IoT

- Java provides a consistent platform: Edge to Cloud
- One language to develop all code
- Extensive library and framework support
 - Simplify all areas
- Zulu Java
 - Cost-effective
 - Fully supported
 - Ideal across the whole enterprise

Questions?

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