Embedded Software Service and Ruggedized Board Design
Arm Computing x Embedded Single Board Computer

Nathan Wang, Product Manager, Advantech
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Comprehensive Embedded Software Services

WISE-PaaS/ DeviceOn

Acronis  McAfee  Embedded features APIs

Applications and APIs

Linux  Android  Windows 10

Full Coverage of Operating System

Smart EC  Trusted BIOS

Reliable Board Foundation
Trusted Embedded BIOS Solutions
Diverse BIOS with reliability and long-term management

Sufficient Sources
• Strong partnership with BIOS vendors
• Profound Industry BIOS experience
• 50+ Engineers with profound industrial BIOS experience

Diverse BIOS Functions
• Multi-layer Security
• 3” sec Fast Boot
• Power Management
• BIOS Suite Utility

Long-Term Maintenance Services
• Platform Longevity Support
• Long-term BIOS version control (10 years)
• BIOS Remote Backup
# Allied, Industrial & Modular Linux Services

## AIM-Linux & AIM-Android

<table>
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<th>App Add-Ons &amp; SDKs</th>
<th>Distribution</th>
<th>DevelopSDK</th>
<th>Maintenance</th>
<th>Control</th>
<th>Edge AI</th>
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<td>Launcher</td>
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<td>Device Control</td>
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<td>• Quick Boot</td>
<td>• Realtime</td>
<td>• Python</td>
<td>• Remote Desktop</td>
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<td>• Extension Port Access</td>
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<td>• Status Bar</td>
<td>• Ubuntu</td>
<td>• HTML5</td>
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<td>• Navigation Bar</td>
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</tbody>
</table>

### Diagnostic
- RF Diagnostic
- Connection Diagnostic
- System Diagnostic

### Management
- SNMP
- Multi-Screen Control
- Resource Mgmt
- Applications Mgmt

### Security
- Secure Boot
- License Management
- Locr Device
- Secure On-device Data

## Unified Embedded Platforms

### Unified Core

### Industrial I/O Drivers

### Performance Optimization

### Peripheral Integration

## Compile-less Linux Solutions

## Function & security updates

## Ready-to-use utility tools

## Development Documentation

Next Generation of Arm Platform – i.MX8

Comprehensive Software Services
- Multi OS support
- Longevity BSP
- AIM-Linux & AIM-Android

Reliable H/W Design-in Service
- Various core module offerings
- Carrier board reference and consult
- Lifetime support

Trusty Peripherals Integration
- Industrial touch panel
- Wi-Fi, BT and cellular module
- Storage module

ROM-7720 Qseven 2.1 (i.MX8QM)
Highest Performance for AI & Machine Vision Applications

ROM-5720 SMARC 2.0 (i.MX8M)
4K Industrial Graphic Performance for Multimedia Applications

ROM-5721 SMARC 2.0 (i.MX8M Mini)
Power Efficiency for Entry HMI & Industrial Applications

ROM-5620 SMARC 2.0 (i.MX8X)
Safety Certified for Automation & Embedded Applications
Arm-Based

Edge AI Solutions

Real-Time Video and Image Inference

GPU-Accelerated Computing
- 256-core NVIDIA Pascal GPU
- CUDA-enabled parallel computing platform

Rapid & Reliable Deployment
- 2 PoE for camera deployment
- Industrial-grade and rugged design

Fast App Deployment
- AIM-Linux/Edge AI package
- JetPack AI package
- NVIDIA ecosystem
Empowers Edge Intelligence

Device Management
- Device Monitoring and Diagnostics
- Device Control & Updating

Data Management
- Data Acquisition and Storage
- Secure Data Access

Connectivity Service
- Device Connectivity
- Plug-n-Play Peripherals

OTA
- Software & Firmware Updates
- Advantech BIOS Updates

Rule Engine
- Distributed Rule Monitoring
- Flexible Trigger and Action

Data Security
- McAfee Threat Protection
- Acronis Backup Recovery

DeviceOn.Dev

DeviceOn.App

DeviceOn.OTA
- Software, firmware & configuration updates
- Advantech BIOS updates

FaceView
- Facial recognition
- People counting
- Behavior detection

E2I
- Protocol conversion
- Edge intelligence
- Real-time virtualization

ePaper Manager
- EPD device auto-discover
- Fast transmission
- Device association

Vertical Focused Solutions

Embedded Boards

Wireless IoT Gateways

Embedded PCs

Fanless Embedded Computers

DeviceOn.OTA

Advantech

Embedded Boards

Wireless IoT Gateways

Embedded PCs

Fanless Embedded Computers

Vertical Focused Solutions
Embedded Feature APIs
Simplified Integration, Configuration and Management

- Standard API for H/W platform
- Cross-Platform Programming
- Easy upgrade and maintenance
- Ready to Use IoT Translator SDK

Board Management
- I/O Control
- System Protection
- Device Monitoring
- Application Extension

Unified APIs
- Standard API for H/W platform
- Cross-Platform Programming
- Easy upgrade and maintenance
- Ready to Use IoT Translator SDK
Multi-Layer Security Approach
Protect your devices effectively and efficiently

Device Protection
- Secure Boot Certified Device
- Authority Control
- TPM

Storage Security
- HDD access control
- Storage Encryption
- Configuration Tool

Application Add-On
- SSL/TLS
- Blacklisting and Whitelisting
- Powerful recovery and easy backup
Embedded Linux and Android Alliance
Unified Platform for Embedded Linux & Android Industrial Applications

9+ Software Partners from WW
50+ Projects Get Involved......
Rugged Design Empowers Embedded Boards

- Over 20% boards
  - Extended Temperature
  - Operation: -40~85 °C

- Over 15% boards
  - with Conformal Coating
  - IPC-A-610G Production
  - MIL-STD-810G Vibration
  - Expertise Customization
-40~85°C Extended Operational Temp. Guarantee

**Component Selection**
- Industrial grade power solution
- -40 ~ 85°C companion chip
- Centralized component management center (CMC)

**Strict Thermal Design**
- FloTHERM simulation tool finds hot spots
- Innovation thermal solution: DHCS, QFCS

**Laboratory Validation**
- Industrial standard -40 ~ 85°C validation: IEC60068-2-1, IEC60068-2-2, IEC60068-2-78, IEC60068-2-14

**Mass Production**
- Phoenix: 100% testing in chamber before shipping
- Phoebus: regular ongoing reliability tests (ORT)
Conformal Coating for Water/Dust Proof

In-House Coating Ability
- One-stop-shop and Easy for Customer Service

Automatic Coating Machine PVT Delta6
- Shop Floor System for backward analysis

Various Coating Material for Standards
- CONAP® CE-1171, ELECTROLUBE URC-800

<table>
<thead>
<tr>
<th></th>
<th>CE-1171</th>
<th>URC-800</th>
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<tbody>
<tr>
<td>Regulation</td>
<td>MIL-I-46058C</td>
<td>MIL-I-46085C</td>
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<tr>
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<td>MIL-STD-810B</td>
<td>ASTM B117-03</td>
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<tr>
<td></td>
<td>FED-STD-406</td>
<td>IPC-CC-830</td>
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<tr>
<td></td>
<td>MIL-STD-810B</td>
<td>UL, RoHS</td>
</tr>
<tr>
<td>Temperature</td>
<td>-65°C~125°C</td>
<td>-45°C to +140°C</td>
</tr>
<tr>
<td>Insulation (Ω)</td>
<td>$1.5 \times 10^{13}$</td>
<td>$1 \times 10^{16}$</td>
</tr>
</tbody>
</table>

Temperature: 65°C ~ 125°C, -45°C to +140°C
Reliable Design & Manufacture Process

PCB Design & Manufacturing

- Tighter layout design rule
- ISO certified manufacture
- Monthly quality testing
- IPC-A 6012 Class 3 compliant

Board Manufacturing & Inspection

- Inspection with IPC-A qualified
- 100% functional check & visual inspection
- Regular statistical process & quality track system
- IPC-A 600 Class 3 compliant

PCB Inspection

- Highest printed board inspection in IPC standard
- 10% sample test for each batch in house or 3rd party lab
- IPC-A 600 Class 3 compliant
Strict Design & Reliable Manufacture Process
Expertise Board Customization Service

Customization

Min. Development Cost

More Fit in Features

Reliable Core Design
Full Product Offerings for Rugged & Harsh

- **MIO-5373**
  3.5” Intel Core

- **AIMB-U117**
  UTX Intel Atom

- **SOM-5992**
  COMe Intel Xeon

- **ROM-5620**
  SMARC i.MX 8X

- Conformal Coating
- IPC-A-610G
- MIL-STD-810G
- Extended Temperature -20/-40°C to 85°C
Co-Creating the Future of the IoT World