Panel Discussion I

Embedded Core Design-In Services: Driving Global Embedded Business

Moderator: Steve Chang, Advantech AVP
Panelists: Aaron Su, Advantech AVP
Rex Lee, Advantech Product Director
Tony An, Advantech Sales Director
Embedded Core Design-in Services

Embedded Software Services
- Embedded BIOS
- Embedded OS
- SUSI Software API
- iManager: Intelligent Self-Management

Device Operation Management
- Remote Management
- Update Management
- Monitor & Control
- Alert & Action

Software & Cloud Integration
- Multiple Cloud Support
- McAfee IoT Security Solution
- Acronis Backup and Recovery
- Marketplace Online Software Store

Advanced
WISE-PaaS
AI Solutions & Marketplace

Windows Embedded
Linux
Android

Carrier Boards Design
Industrial Display Systems

Thermal Optimization

Full Spectrum of Embedded Platforms

Multiple I/O Extension
AI Acceleration Modules

SSD, Memory, Wireless Modules
Embedded Core Design-In Services:
Innovative Technology

Rex Lee, Advantech Product Director
Next Gen. Server-Grade Platform with Super Speed IO

**Scalability & Easy Deployment**
Full Spectrum for Diverse Applications

**Remote Management**
Easy Accessibility & Operations

**Low Latency**
Time-Sensitive Communication

**Data Processing Capability**
Manage Mass Data at Edge

**High Network Bandwidth**
Reduce Data Transmission Time

**Server-Grade Computing Power**
- 20 core/110W processor
- Max. 1TB reliable ECC memory

**Super Speed IO Bandwidth**
- Max. 100 Gb LAN
- PCI Express Gen5 (32GT/s)
- USB4.0, Thunderbolt (40Gbps)

**More PCIe for Function Expansion**
- Max. 65 Lanes PCIe
Quick Buildup System with Flexible I/O Options

- 3.5” Compact Size
- Rugged B/B Connection
- High Bandwidth PCIe
- Off-the-Self MIOe Module
- Compact Structure
- Various I/O Options
- Off-the-Self UIO Module
- Unified Software Package

WISE-PaaS/ DeviceOn
IoT Device Operation Management

Data Acquisition
Sensor Protocol Management
Edge Analytics
Real-Time Response
Cloud Connectivity

MIOe Extension
Flexible Design Made Easy

UIO40-Express
Build IO for Your Vertical Applications Speedily

Smart Packing
MIOe-210
6 UARTs

Surveillance
MIOe-3674
4 PoE

Medical Equipment
MIOe-3680
4 CAN w/ 15KV

Automation
MIOe-220
3 GbE

AI
MIOe-260
GbE, M.2, mPCIe

UARTs
PoE
CAN
GbE

UIO-4030
RS-485, RS-232, GPIO

UIO-4032
USB 2.0, RS-232, GbE

UIO-4034
CAN, RS-232
Palm-sized UTX MB Shrinks Down System Dimension

45% Dimension Shrank

Fast Time-to-Market

EPC-U series
- EPC-U2233 Performance
- EPC-U2117 Wireless
- EPC-U2217 AGV
<table>
<thead>
<tr>
<th>Wide Temperature</th>
<th>Anti-Vibration</th>
<th>Conformal Coating</th>
<th>Manufacture Capability</th>
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<tbody>
<tr>
<td>100% Quality Inspection</td>
<td>From Standard to Military-Grade</td>
<td>Tailor-Made Service &amp; Automated Process</td>
<td>Capability to Meet Highest Manufacture Process</td>
</tr>
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</table>

- IEC60068-2
- IEC60068-2-64/MIL-STD 810G
- CONAP® CE-1171
- IPC-A-610G Class 3

- Thermal Design
- Thermal Simulation
- Thermal Validation

**Embedded Core Design-in Service for Rugged Applications**
QFCS Releases 100% of Computing Power

Quadro Flow Cooling System

**Quadro Heat Flows**
- Heat pipe, Metal contact
- Mixed fins, Vented holes

**Silent Operating**
- Smart fan control
- 45 dB @ 4300 rpm (full run)

**100% CPU Power**
- No Throttling
  - 45W CPU @ 60C

**Thin & Light**
- Height: 27 mm
- Weight: 250 g

Design for SOM-5899 & SOM-5897
-40~85°C Extended Operational Temp. Guarantee

-40~85 °C Operation

**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)
Strict Design & Reliable Manufacture Process

- IPC-A-610G Class 3
- MIL-STD-810G
- Onboard Design
- Conformal Coating
- Corner Bonding
- IPC-A-610G

Validation Services RECOGNIZED
Embedded Core Design-In Services: Comprehensive Software

Aaron Su, Advantech AVP
Comprehensive Embedded Software Services

- **Public Cloud & Private Cloud**
  - Microsoft Azure / WISE-PaaS / Data Service Server

- **Applications & APIs**
  - Embedded Security Solution
    - McAfee
      - Configuration toolkit
      - 0-day threat protection
      - Prevent Zero-Day Attacks
  - Backup & Recovery Solution
    - Acronis
      - Whole system backup
      - Realtime incremental backup
      - One key recovery
  - Windows 10 Lockdown Utility
    - Unified Write Filter
    - Keyboard & USB Filter
    - Block windows update
  - HDD Predictive Maintenance Quality
    - Storage health monitoring
    - Support hard disk & SED flash
    - HDD lifetime prediction

- **Operation System**
  - AIM-Linux / AIM-Android
  - Yocto
  - Ubuntu
  - Windows 10

- **BIOS & Embedded Controller**
  - Multi-Layer Security
    - Storage security
    - Booting management
    - Boot guard, BIOS guard
  - BIOS Customization Tools
    - Change logo
    - DMI edit
    - Configuration tool

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**Arm Based Computing**

**X86 Computing**

**Edge Computer**
Trust Embedded BIOS Service

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

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

Long-Term Maintenance Services
- Platform Longevity Support
- 10 years BIOS version control
- BIOS Remote Backup
# Allied Industrial Modular - Linux & Android Services

## AIM-Linux & AIM-Android

### Launcher
- Quick Boot
- Boot Logo
- Status Bar
- Navigation Bar

### Protocol
- CANopen
- J1708
- J1939
- MODBUS
- 1-Wire

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

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

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

### Distribution
- Yocto
- Realtime
- Debian
- Ubuntu

### DevelopSDK
- Qt
- Python
- Java
- HTML5

### Maintenance
- OTA
- Remote Desktop
- App Management

### Control
- Device Control
- System Control
- Extension Port Access
- Extension Modules Access

### Edge AI
- HD PMQ
- Pre-trained Models
- Edge AI APP

## App Add-Ons & SDKs

### Modularized Framework
- Efficient Resource Allocation
- Unified Core Structure
- Easy Migration

### Value-Added Industrial App & SDK
- Accelerated Development
- High Efficient Library
- Comprehensive Documentation

### Longevity BSP Maintenance
- Reliable Foundation
- LTS Kernel Selected
- Planned Roadmap and Validation

## Unified Embedded Platforms

### Unified Core
- Industrial I/O Drivers
- Performance Optimization
- Peripheral Integration

## Development Documentation

**AIM-Linux Roadmap**

### V1.0 2018/12E

**App Add-Ons**
- Yocto 2.1
- Ubuntu 14.04
- Debian 8
- Security Boot
- Modbus
- CANopen

**Kernel V4.1**

**System Integration**
- New peripheral module list
- New Display & Touch list

### V2.0 2019/8E

**App Add-Ons**
- Yocto 2.4/2.5
- Ubuntu 16.04
- Debian 9
- EdgeX
- Multi-Screen Control
- License Management

**Kernel V4.14 LTS**

### V3.0 2020/6E

**App Add-Ons**
- Yocto 2.x
- Ubuntu 18.04
- Debian 10
- SNMP Manger
- Data Services with EdgeX
- Cipher SDK

**Kernel V5.X**

**+Plus**
- NXP i.MX8
- Rockchip RK3288

**+Plus**
- Rockchip RK3399

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- NXP i.MX6
- TI AM335x
- TI AM57xx
- NXP i.MX8
- Rockchip RK3288
- Rockchip RK3399
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

Next Generation of Arm Platform – i.MX8

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
UIO40-Express
Build Systems for Your Vertical Applications with Speed

Step 1
2.5” Core Boards
- RSB-3430
  - NXP iMX6 Cortex-A9 Dual Lite Cores
- RSB-3710
  - Rockchip RK3399 Cortex-A72/53 Dual/Quad Cores

Step 2
Vertical I/O Boards
- UIO-4030
  - RS-485 x 1, RS-232 x 1, GPI x 4, GPO x 4
- UIO-4032
  - USB 2.0 x 2, RS-232 x 2, GbE x 1
- UIO-4034
  - CAN x 1, RS-232 x 2

Step 3
Vertical Application Systems
- EPC-R3430 with RSB-3430 2.5” SBC
- EPC-R3710 with RSB-3710 2.5” SBC

Step 4
AIM-Linux & AIM-Android
- Modularized Framework
- Value-added Industrial App & SDK
- Longevity BSP Maintenance

Step 5
WISE-PaaS/DeviceOn
- IoT Devices Operation Management
Get Your AIM-Linux & AIM-Android Support!

Arm-Based Computing Platforms

Why Advantech
Product by Platform
Product by Form Factor
AIM-Linux Embedded Software Services
What AIM-Linux Offers
Unified Embedded Platforms
App Add-Ons & SDKs
Design-to-Order Services
Download Center
Media Center

Software & Tools

Why Advantech
Product by Platform
Product by Form Factor
AIM-Linux Embedded Software Services
Design-to-Order Services
Download Center
Documentation
Software & Tools
Media Center

What AIM-Linux Offers

AIM (Allied, Industrial and Modular) forms the core of Advantech’s Embedded Operation System Services for Linux and Android. AIM-Linux and AIM-Android were created to help our customers accelerate their software development on Arm-based platforms by providing a flexible and modular framework, targeting the foundations of industrial markets, and focusing on long-term BSP maintenance and longevity support. With AIM, Advantech provides you with a verified solid foundation (Unified Embedded Platforms) and industrial-focused value-added supports (App Add-Ons and SDKs) embedded Linux and Android that allow you to simply focus on your own vertical application development.

Features and Benefits

- Modularized Framework
- Value-Added Industrial App & SDK
- Longevity BSP Maintenance
- Efficient Resource Allocation
- Accelerated Development
- Reliable Foundation

AIM-Linux Services Landscape

- WISE-PaaS/DeviceOn
  - WISE-PaaS/DeviceOn
  - AIM-Linux/Security
  - AIM-Linux/Launcher
  - AIM-Linux/Management
  - AIM-Linux/Distribution
- App Add-Ons
  - Qt
  - HTML5
  - EdgeFoundry
  - Yocto
  - Device Diagnostic
  - AIM-Linux/Protocol
  - AIM-Linux/Edge AI
- Unified Embedded Platforms
  - Unified Core
  - Industrial I/O Drivers
  - Performance Optimizations
  - Peripheral Integration

App Add-On

- Launcher
- Management
- DevelopmentSDK
- Diagnostic
- Protocol
- Security
- Edge AI

Yocto

- Sumo (Kernel 4.14.38)
  - Developers Guide
  - Release Notes
  - Recovery SD
  - Add-on Data
- Krogoth (Kernel 4.1.15)
  - Release Notes
  - Recovery SD

Android

Ubuntu

Select your product configuration from the menu below:

Platforms: NXP i.MX 6
Form: Qseven
Model Name: ROM-7421

Search

Product Page

ROM-7421
NXP i.MX6 Dual/Quad Plus 1GHz Qseven 2.0
Computer-on-Module

Product Page
Embedded Feature APIs

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

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

Connecting Your Application with Advantech Hardware Feature
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.Ota**
- Software, firmware & configuration updates
- Advantech BIOS updates

**DeviceOn.FaceView**
- Facial recognition
- People counting
- Behavior detection

**DeviceOn.E2I**
- Protocol conversion
- Edge intelligence
- Real-time visualization

**DeviceOn.ePaper Manager**
- EPD device auto-discover
- Fast transmission
- Device association
Embedded Core Design-In Services: Successful Cases

Tony An, Advantech Sales Director
Standard Product Services

**Smart Parking**

*Offering Std Product*

- AIMB/ESBC
- Local Chassis
- Storage
- OS

*Value Add Service*

1. 8 Serial + 2 Giga Ethernet
2. Compact size design chassis
3. Long term MP schedule
4. Cloud service consulting
5. Recovery App provide
6. Embedded CPU providing

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**Self Gas**

*Offering Std Product*

- ESBC
- Monitor
- Storage
- Ethernet

*Value Add Service*

1. Wide TEMP operating
2. 2 EA extra RS-232 module
3. Anti-electricity (high reliability)
4. IDK + local monitor chassis
5. Preload customer App
6. Solution provider (Switch etc)

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**EV Charger**

*Offering Std Product*

- ESBC
- Monitor
- Storage
- OS

*Value Add Service*

1. Customizing BIOS (LCD Resolution, quick boot)
2. Global technical support
3. Providing CERT. docs
4. Long term EOL plan (8 years)
5. Easy migrating for the next
Semi-Customized Services

1. Support customizing thermal design

2. Provide customizing service
   (Wide temp, BIOS/EC, SUSI, even H/W parts etc)

3. Understand Ultrasound feature
   (Image noise, Strain, Device size etc)

4. Strong local technical ability for long term Biz
# Embedded Core Design-In Services

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<th>Innovative Technology</th>
<th>Software Services</th>
<th>Integration Acceleration</th>
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<td>WISE-PaaS/DeviceOn</td>
<td>EPC CTOS</td>
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<td>MI/O Extension (2.5”/3.5”)</td>
<td>Embedded Feature API</td>
<td>Rugged Design Services</td>
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<tr>
<td>UIO40-Express (2.5”)</td>
<td>AIM-Linux / AIM-Android</td>
<td>DTOS Services</td>
</tr>
<tr>
<td>Quadro Flow Cooling System (QFCS)</td>
<td>Embedded BIOS</td>
<td>Peripheral Integration</td>
</tr>
</tbody>
</table>

- **EPC CTOS**: (IMB, Chassis, Peripherals, OS)
- **Rugged Design Services**: (Coating, Wide Temp., Anti-Vibration)
- **DTOS Services**: (Custom Board, I/O, 610G Class 3)
- **Peripheral Integration**: (Wireless, Storage, Display)
Your Success  
Our Mission

Faster Time-to-Market  
Leading Innovation  
Integration Acceleration

Industrial Motherboards  
Computer On Module

Embedded Single Board Computers  
Arm-Based Computing Platforms

Industrial Flash & Memory  
Embedded PCs  
Embedded Software  
Embedded Wireless Module
Co-Creating the Future of the IoT World