The OpenEdge Project

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Outline

• Profile of OpenEdge Project

• Architecture

• Roadmap and Upcoming release feature

• Application PoC 1

• Application PoC 2

• OpenEdge in Education
OpenEdge, Open Source

- [https://github.com/baidu/openedge](https://github.com/baidu/openedge)
- Moving to openedgetech/openedge in next release
- First release in Dec. 2018
- 4 Releases
- 12 Contributors
- 900+ stars on [github.com](https://github.com)

Focus
- Cloud Native infrastructure on Edge
- Large-scale mgmt of unattended equipments
- Toolkits & services for creating applications

Vision
- Edge Operating System
- Edge Toolchain for Developers
- Cloud, Edge and IoT data collaboration
Roadmap: Edge Toolchain for Developers

OpenEdge EDK
- Edge Development Kit
  - Message Kit
  - Instance Kit
  - LocalStorage Kit
  - LocalQueue Kit
  - Security Kit
  - ML Inference Kit
  - Video&Image Kit
  - GeoLocation Kit
- Cross-build Toolchain Image
- LLVM Toolchain Image
- WASM Toolchain Image

OpenEdge EDK plus
- Multi-Cloud connector
- DevOps connector
- IDE plugins

Edge Deployment Kit
- OpenEdge in Production
- OpenEdge under Diagnostic
- OpenEdge emulated by Cloud

C/C++ interface
Go interface
Rust interface
WASM interface
Lang bridge
Cross-build Toolchain
LLVM Toolchain
WASM Toolchain
Multi-Cloud connector
DevOps connector
IDE plugins
OpenEdge in Production
OpenEdge under Diagnostic
OpenEdge emulated by Cloud
Upcoming: Device Activation and End-to-End Security

- No password
- No root console
- No remote shell
- Ready for massive delivery

Free Device
- Secret Code
- OpenEdge Activator

Activated Device
- Secret Code
- License
- OpenEdge OTA
- Security Kit
- Containers

Certificated OAS
- Hardcoded URL
- DNS redirect

OpenEdge Activate Server
- Hardcoded URL

On-Premises OAS

Certificated OTA

OpenEdge OTA Server
- URL from License

On-Premises OTA

Root License

Operate
- Claim ownership
- Release free
Application: Real-time monitoring and crop protection

- Background
  - Intelligent Agriculture is now the focus of “13th Five-Year Plan” in China
  - Automatize and intellectualize the process of crop cultivation, plant protection, and insect pest control
  - Edge computing takes the advantage of localized computation and enables spraying the pesticides automatically

- Solution
  - OpenEdge enabled BOX on Drone
  - Baidu IntelliEdge software suite
    - Take video by camera and make ML inference
    - Generate real-time monitor graph
Application: Detect construction dregs and alarm

Background

- People are paying more and more attention to the urban environmental sanitation level
- Discovery of pollutants in advance is more significant

Solution

- OpenEdge enabled BOX on truck
- Baidu IntelliEdge software suite
  - Take video by camera and make ML inference
  - Send structured analyze result to cloud
OpenEdge in Education

OpenEdge, with Baidu IntelliEdge suite

Nvidia Jetson Nano

Baidu IntelliEdge Development Broad

Baidu Cloud Academy Course

Laboratory
Tested and confirmed hardwares

- Common PC & laptops with Linux and macOS
- Limited support on Windows & Windows Container
- Raspberry Pi Model 3B, Linux-armv7, Raspbian stretch
- NXP LS 1043 ARDB, Linux-aarch64, Ubuntu 16.04
- Xilinx ZC702, Linux-armv7
- CT3-CPU-38, Linux-armv7, LinuxRT
- Intel Apollo Lake Atom, Linux-x86_64, Ubuntu 16.04
- Nvidia Jetson Nano, Linux-aarch64