AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

OPN311

Build your AWS Cloud-connected embedded Linux OS faster

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Agenda for today

Open source, embedded Linux, and AWS

Device software recipes

Prototyping environments

Continuous integration and delivery

Open discussion

Call to action

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Open source, embedded Linux, and AWS

AWS partners with semiconductors providing embedded Linux solutions in 2017

The meta-aws project formed in 2019

Joined Yocto Project as Platinum Member in 2021

Joined Automotive Grade Linux as Platinum Member in 2021

The meta-aws layer becomes Yocto Project Compatible in September 2021







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Provide device software recipes



AWS IoT Device SDK C++ v2



AWS SDK for Python (Boto3)



Firecracker



AWS IoT Greengrass



Amazon Corretto



Amazon SageMaker DLR

Open-source software development kits provided by AWS

SDKs provide builders with the open-source libraries they need to integrate with the AWS Cloud quickly and effectively

Open-source systems software provided by AWS

Open-source system software such as Firecracker and AWS IoT Greengrass provide builders with the foundations to build comprehensive yet distributed and resilient applications for IoT devices

Open-source runtimes provided by AWS

Open-source runtimes such as Amazon Corretto and Amazon SageMaker Neo provide builders with robust tools for the most demanding workloads

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Provide a fast prototyping environment





Develop embedded Linux solutions using AWS Cloud 9

Using the open-source IDE AWS Cloud9, develop applications using a cross-compile environment using the Yocto Project SDK for your target architecture from any supported AWS Region



Run and debug embedded Linux solutions using AWS Cloud9

Using the open-source IDE AWS Cloud9, run embedded Linux in QEMU to experience your application at runtime; use gdb to debug applications running in QEMU or Renode

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Provide CI/CD mechanisms



AWS CodeBuild



AWS CodePipeline

Reference implementations for embedded Linux CI/CD

Building entire custom Linux distributions with fast completion turnaround requires scalable infrastructure – ready-to-use CI/CD pipeline templates plug into your delivery cycle

LAVA

docs.lavasoftware.org/lava/index.html

LAB GRID

www.pengutronix.de/en/software/labgrid.html

Mechanisms for on-premise lab testing

When you're ready to test the built image on your customized hardware, you will want to efficiently transfer the image from the cloud to on-premise, and then use tried and true mechanisms to facilitate testing with open-source apps LAVA or Labgrid



Amazon CloudFront



AWS IoT Device Management

Mechanisms for global distribution

Eventually, your devices will run in the wild and will need updates to extend your device's security and longevity – having the right mechanisms for system update global distribution reduces delivery risk

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Call to action

- Start using the meta-aws project today to include AWS device software
  github.com/aws/meta-aws
- Take the meta-aws workshop for deeper technical understanding
  github.com/aws/meta-aws-ci
- Learn how to include AWS software using specific board support packages (BSPs)
  github.com/aws-samples/meta-aws-demos
- Engage with the meta-aws project – we love feedback and contributions!

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Thank you!

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