### Cloud Firmware in ByteDance



OSF

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### OPEN POSSIBILITI<mark>ES</mark>.





### ByteDance Cloud Firmware Status Update





#### OPEN SYSTEM FIRMWARE

Cloud FW 1.0 -- Launched Cloud FW 2.0 – In Progress

#### We are going to share

- Why
- What
- How

### OPEN POSSIBILITIES.

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OCP









## **Firmware Defects**

- Comparing Linux community, UEFI community is NOT active
- Can't fix UEFI issue immediately since some key modules are controlled by IBV
- Working Model is NOT efficient.



Current Firmware Working Model

Next Generation Firmware? OPEN POSSIBILITIES.

Hardware improvement: Core Count Memory Capacity Flash Size

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### Firmware Eco-system



OPEN SYSTEM FIRMWARE



	UEFI/Tiano	Min Platform	LinuxBoot	CoreBoot
FW Production Eco-system				
Community				
Boot Time				
Difficulty				

coreboot + LinuxBoot is direction





#### Legacy BIOS to UEFI Transition Steps **OPEN SYSTEM UEFI** Class 1 Production **UEFI Class 0 FIRMWARE** from 2008 **UEFI/PI** interfaces Legacy **BIOS** Only legacy BIOS No UEFI/PI interfaces runtime interfaces Done in 2020 **UEFI Class 2 UEFI Class 3** UEFI/PI interfaces **UEFI/PI** interfaces UEFI and legacy BIOS Only UEFI interfaces interfaces OCP

OPEN POC So, We need plan and steps for next generation Firmware.

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## Roadmap and its Info





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## **Cloud Firmware Working Model**



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### LinuxBoot Content



**SYSTEM** 

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	Kernel	https//github.com/linuxboot/linux/or linux upstream code	OPEN SYSTE FIRMWARE
	u-root	https://github.com/u-root/	
Linux Kernel	Drivers	Network etc	
Initramfs 🖌	Application	ByteDance	

Replace and Enhance Firmware Functions: **Provide a Diskless Linux Environment:** PXE、HTTP boot ٠

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- **Operation & Maintenance components** ٠
- System Stress Tools

OPEN POSSIBILITIES.

**Boot Option Manager** 

Redfish

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## Key Example in LinuxBoot

#### **UEFI Disadvantage**

- UEFI network stack is not powerful
- Hard to optimize
- etc

#### LinuxBoot Advantage

- Linux Network Stack is powerful
- Independent of firmware vendor
- There are more linux network experts





#### OPEN SYSTEM FIRMWARE



## **CloudFW 2.0 Status Update**



- LinuxBoot •
  - More features
- coreboot Status
  - Power On is done.
    - Features evaluation is done.

**Target to Production in 2022** 

- SMBIOS, ACPI... •
- RAS •
- Project was kicked off.



**FIRMWARE** 







**FIRMWARE** 

- ByteDance has launched Cloud Firmware 1.0;
- ByteDance is working on Cloud Firmware 2.0 Solution.

Looking forward to seeing more companies collaboration in New Firmware Eco-system!



### Thank you!

