The Development of Chips in China

Loongson

Loongson, developed at the *Institute of Computing Technology Chinese Academy of Sciences*, is a general-purpose CPUS based on mips. Loongson can be divided into three categories:

1. Loongson 1: embedded chip with low energy consumption
2. Loongson 2: SoC with low energy consumption and chips for mainstream computer
3. Loongson 3: CPU for server

The most powerful product is Loongson 3B-1500, featuring a 28 nm 8-core processor, clocking from 1.2 GHz to 1.5 GHz. Despite the quick development recently, Loongson has allways been a common complaint domestically. According to some evaluation using *benchmark CPU 2000*, the grade Loongson 3B get is just one-tenth of Apple A8, while consume more energy.

The popular architecture in chips is ARM (mobile devices) and X86 (PC and server). From the perspective of market, we can find similar result, ARM occupies the mobile field while X86 is the leader in chips of PC and server. Besides the different initial orientation, the inherent feature determines who will have an adventage in different field. By contrast, it seems like mips has been eliminated from mainstream.

When Loongson stuggles in mips, actually, there are some successful chip manufacturers in Chinese market, such Hisilicon of Huawei.

Hisilicon

Hisicon is a Chinese simiconductor company locating in Shenzheng of Guangzhou province and fully owned by Huawei. Hisilicon purchased licenses from ARM Holdings and its products concentrate on chips for wireless communication including phone chips with WCDMA.
It is said that the performance of Kirin 950 can challenge Apple A8X and A9 ， and it outperforms Samsung 7420 and Qualcomm 810. However, Samsung 7420 and Qualcomm 810 both are the products last year, and it seems unfair to compare Kirin 950 with other's privious versions. Actually, despite the achievement Hisilicon got, there is still a large gap between Hisilicon with Apple, Qualcomm and so on. In cpu, Kirin 950 adopt the original ARM architecture A53 without any changes, while the cpu used in Qualcomm(Kyro) is independent design. As we all know, original ARM architecture is just a general framework without optimization from mobile phone, such as performance and energy optimization. In GPU, Qualcomm always adopts their own products which is in the leading position. By contrast, Hisilicon using original ARM Mali-T800 have no advantages, too.
In conclusion, Hisilicon has made a great progress, there are still a long way to go.