|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 00:00:00,087 --> 00:00:01,159 | 大家下午好 |  |
| 2 | 00:00:01,159 --> 00:00:02,660 | 我自我介绍一下 |  |
| 3 | 00:00:02,661 --> 00:00:05,168 | 我是来自于赛昉科技的赵晶 |  |
| 4 | 00:00:05,434 --> 00:00:08,112 | 我在赛昉科技负责 |  |
| 5 | 00:00:08,112 --> 00:00:09,500 | 芯片的项目经理 |  |
| 6 | 00:00:10,175 --> 00:00:12,515 | 今天我跟大家分享的是 |  |
| 7 | 00:00:12,515 --> 00:00:13,505 | 赛昉科技 |  |
| 8 | 00:00:13,545 --> 00:00:15,837 | 在对RISC-V在芯片 |  |
| 9 | 00:00:16,084 --> 00:00:18,545 | 中应用的一些想法 |  |
| 10 | 00:00:18,545 --> 00:00:20,500 | 以及与之付出的一些努力 |  |
| 11 | 00:00:21,171 --> 00:00:22,134 | 说实话 |  |
| 12 | 00:00:22,134 --> 00:00:23,971 | 在疫情之前 |  |
| 13 | 00:00:24,405 --> 00:00:25,845 | 在这样的一个topic |  |
| 14 | 00:00:25,846 --> 00:00:28,500 | 我在RISC-V的很多活动中都讲过 |  |
| 15 | 00:00:28,805 --> 00:00:31,005 | 在当时我一定会跟大家分享 |  |
| 16 | 00:00:31,006 --> 00:00:33,985 | 我们的RISC-V有各种各样的特性 |  |
| 17 | 00:00:34,821 --> 00:00:36,230 | 非常优秀的特性 |  |
| 18 | 00:00:36,231 --> 00:00:38,006 | 可以满足于芯片当中的 |  |
| 19 | 00:00:38,006 --> 00:00:39,170 | 各种各样的应用 |  |
| 20 | 00:00:39,490 --> 00:00:40,590 | 可是现在 |  |
| 21 | 00:00:40,943 --> 00:00:43,410 | 经过这些年我们自己的沉淀 |  |
| 22 | 00:00:43,411 --> 00:00:44,805 | 包括我们自己的思考 |  |
| 23 | 00:00:45,130 --> 00:00:47,056 | 我想我们应该换一个思路去看 |  |
| 24 | 00:00:47,534 --> 00:00:49,075 | 这样的思路 |  |
| 25 | 00:00:49,076 --> 00:00:50,575 | 应该是什么样的应用 |  |
| 26 | 00:00:50,575 --> 00:00:51,968 | 需要什么样芯片 |  |
| 27 | 00:00:52,225 --> 00:00:53,415 | 什么样的芯片 |  |
| 28 | 00:00:53,415 --> 00:00:55,693 | 需要什么样的RISC-V的CPU |  |
| 29 | 00:00:56,150 --> 00:00:59,350 | 上午的时候戴博士做的 |  |
| 30 | 00:00:59,350 --> 00:01:00,284 | 圆桌会议 |  |
| 31 | 00:01:00,412 --> 00:01:02,590 | 正好给出了这样的一个答案 |  |
| 32 | 00:01:02,770 --> 00:01:05,630 | 我想我们60%的人都认为 |  |
| 33 | 00:01:05,670 --> 00:01:07,010 | 其实真正重要的 |  |
| 34 | 00:01:07,190 --> 00:01:09,043 | 是RISC-V的软件生态 |  |
| 35 | 00:01:09,043 --> 00:01:11,650 | 以及工具链 |  |
| 36 | 00:01:11,950 --> 00:01:13,670 | 只有这两项完备之后 |  |
| 37 | 00:01:13,670 --> 00:01:15,065 | 这样的生态完备之后 |  |
| 38 | 00:01:15,310 --> 00:01:16,875 | 我们RISC-V的红利 |  |
| 39 | 00:01:16,875 --> 00:01:18,170 | 它的优势 |  |
| 40 | 00:01:18,387 --> 00:01:20,750 | 才能够被这样的应用所享受到 |  |
| 41 | 00:01:22,953 --> 00:01:24,168 | 首先我们可以看到 |  |
| 42 | 00:01:24,168 --> 00:01:25,209 | 可喜的是 |  |
| 43 | 00:01:25,518 --> 00:01:27,293 | RISC-V我们看到 |  |
| 44 | 00:01:35,825 --> 00:01:38,860 | 我们看到通过不同的 |  |
| 45 | 00:01:39,221 --> 00:01:41,096 | 在RISC-V已经大量的应用在 |  |
| 46 | 00:01:41,096 --> 00:01:42,684 | IoT端侧的芯片 |  |
| 47 | 00:01:42,925 --> 00:01:45,015 | 通常是说包括兆易创新 |  |
| 48 | 00:01:45,015 --> 00:01:45,765 | 中科蓝讯 |  |
| 49 | 00:01:45,766 --> 00:01:47,043 | 物奇微 乐鑫 |  |
| 50 | 00:01:47,043 --> 00:01:47,765 | 沁恒 |  |
| 51 | 00:01:47,765 --> 00:01:49,368 | 都已经做了大量的 |  |
| 52 | 00:01:49,368 --> 00:01:50,925 | 出货这样的动作 |  |
| 53 | 00:01:51,046 --> 00:01:52,390 | 其实这中间 |  |
| 54 | 00:01:52,390 --> 00:01:54,362 | 有很多的系统厂商 |  |
| 55 | 00:01:54,362 --> 00:01:55,421 | 芯片原厂 |  |
| 56 | 00:01:55,421 --> 00:01:57,171 | 软件RT-Thread这样的 |  |
| 57 | 00:01:57,587 --> 00:01:59,915 | 整个生态在一起为之做出贡献 |  |
| 58 | 00:02:02,330 --> 00:02:05,460 | 所以基于这样的的一个生态 |  |
| 59 | 00:02:05,460 --> 00:02:08,060 | 我们赛昉科技也推出了两个平台 |  |
| 60 | 00:02:08,061 --> 00:02:10,560 | 一个是低功耗BLE平台 |  |
| 61 | 00:02:10,743 --> 00:02:13,220 | 一个是智能语音的平台 |  |
| 62 | 00:02:13,420 --> 00:02:16,080 | 这两个平台充分给赋能了 |  |
| 63 | 00:02:16,475 --> 00:02:19,825 | 发挥了RISC-V的低功耗 |  |
| 64 | 00:02:19,955 --> 00:02:22,795 | 一个可配置的模块化的功效 |  |
| 65 | 00:02:26,143 --> 00:02:28,190 | 但是我们又要提出另外一个问题 |  |
| 66 | 00:02:28,191 --> 00:02:30,131 | 那RISC-V在高端应用领域的 |  |
| 67 | 00:02:30,131 --> 00:02:31,010 | 前景如何 |  |
| 68 | 00:02:31,050 --> 00:02:32,365 | 其实我想这里面 |  |
| 69 | 00:02:32,365 --> 00:02:33,310 | 不仅是高端 |  |
| 70 | 00:02:33,468 --> 00:02:34,562 | 也包括中端 |  |
| 71 | 00:02:34,634 --> 00:02:36,590 | 在平板 |  |
| 72 | 00:02:36,806 --> 00:02:38,690 | 在个人电脑 在PC上 |  |
| 73 | 00:02:38,790 --> 00:02:40,170 | 它的应用领域是如何 |  |
| 74 | 00:02:41,065 --> 00:02:42,525 | 其实很多人都充满了问号 |  |
| 75 | 00:02:42,565 --> 00:02:44,785 | 这个时候我们要问自己很多问题 |  |
| 76 | 00:02:45,565 --> 00:02:46,105 | 第一 |  |
| 77 | 00:02:46,225 --> 00:02:47,875 | 高端应用它需要什么样的 |  |
| 78 | 00:02:47,875 --> 00:02:48,653 | 软件生态 |  |
| 79 | 00:02:48,965 --> 00:02:50,145 | 看到这张图会发现 |  |
| 80 | 00:02:50,146 --> 00:02:51,406 | 很多都是一些 |  |
| 81 | 00:02:51,406 --> 00:02:53,085 | 非常如雷贯耳的名称 |  |
| 82 | 00:02:53,325 --> 00:02:56,365 | 我们需要很丰富的 |  |
| 83 | 00:02:56,505 --> 00:02:58,145 | 支持各种各样的操作系统 |  |
| 84 | 00:02:58,490 --> 00:02:59,703 | 我们需要各种各样 |  |
| 85 | 00:02:59,703 --> 00:03:03,281 | V8 DPDK Vulkan OPenGL OpenBlas |  |
| 86 | 00:03:03,281 --> 00:03:04,412 | 这样的一个库 |  |
| 87 | 00:03:04,670 --> 00:03:05,450 | 基于这样的库 |  |
| 88 | 00:03:05,451 --> 00:03:07,810 | 我们还有各种各样的一些框架 |  |
| 89 | 00:03:07,930 --> 00:03:09,090 | 而且这样的框架 |  |
| 90 | 00:03:09,090 --> 00:03:10,150 | 每天都在膨胀 |  |
| 91 | 00:03:10,151 --> 00:03:11,910 | 新的框架都在产生 |  |
| 92 | 00:03:12,300 --> 00:03:13,393 | 基于这样的框架 |  |
| 93 | 00:03:13,393 --> 00:03:15,185 | 以及我们的开发工具 |  |
| 94 | 00:03:15,525 --> 00:03:16,925 | 和大量的应用 |  |
| 95 | 00:03:16,926 --> 00:03:19,184 | 才能基于此得到开发 |  |
| 96 | 00:03:20,590 --> 00:03:21,820 | 现实情况下 |  |
| 97 | 00:03:22,337 --> 00:03:24,400 | RISC-V是什么样的一个 |  |
| 98 | 00:03:24,750 --> 00:03:25,620 | 软件生态呢 |  |
| 99 | 00:03:26,887 --> 00:03:27,656 | 我们可以看到 |  |
| 100 | 00:03:27,656 --> 00:03:29,290 | 在当前操作系统 |  |
| 101 | 00:03:29,291 --> 00:03:30,378 | 我们支持了Fedora |  |
| 102 | 00:03:30,378 --> 00:03:31,096 | Debian Vxworks |  |
| 103 | 00:03:31,096 --> 00:03:32,356 | RT-thread FreeRTOS |  |
| 104 | 00:03:33,006 --> 00:03:33,670 | 开发工具 |  |
| 105 | 00:03:33,671 --> 00:03:35,012 | 我们已经有了GCC |  |
| 106 | 00:03:35,012 --> 00:03:36,650 | 也相对比较齐备 |  |
| 107 | 00:03:36,690 --> 00:03:38,165 | 但是在库在框架上 |  |
| 108 | 00:03:38,165 --> 00:03:39,343 | 我们是欠缺的 |  |
| 109 | 00:03:39,803 --> 00:03:40,928 | 这两边的问号 |  |
| 110 | 00:03:40,928 --> 00:03:42,275 | 就导致了实际当中 |  |
| 111 | 00:03:42,276 --> 00:03:45,159 | 在中高端的应用是缺失的 |  |
| 112 | 00:03:45,796 --> 00:03:49,318 | 这两问号我们怎么去弥补它 |  |
| 113 | 00:03:55,562 --> 00:03:56,870 | 这是我们得出来的结论 |  |
| 114 | 00:03:57,250 --> 00:03:58,590 | 因为我们必须要提供 |  |
| 115 | 00:03:58,590 --> 00:04:00,170 | 合适的硬件载体 |  |
| 116 | 00:04:00,400 --> 00:04:03,609 | 给上面因为在上面这些库 |  |
| 117 | 00:04:03,609 --> 00:04:06,784 | 有很多很出色的开发者 |  |
| 118 | 00:04:07,010 --> 00:04:08,684 | 我们了解到这些开发者有 |  |
| 119 | 00:04:08,684 --> 00:04:09,850 | 强烈的意愿 |  |
| 120 | 00:04:10,010 --> 00:04:10,887 | 把这些东西都 |  |
| 121 | 00:04:10,887 --> 00:04:12,170 | 抛进到RISC-V里面 |  |
| 122 | 00:04:12,470 --> 00:04:13,437 | 但是他们受困于 |  |
| 123 | 00:04:13,437 --> 00:04:15,150 | 没有合适的硬件载体 |  |
| 124 | 00:04:15,380 --> 00:04:16,460 | 去做这样的事情 |  |
| 125 | 00:04:16,640 --> 00:04:20,143 | 我们赛昉科技 |  |
| 126 | 00:04:20,143 --> 00:04:23,256 | 就面对这样的一个需求 |  |
| 127 | 00:04:23,460 --> 00:04:24,534 | 我们开发了 |  |
| 128 | 00:04:24,534 --> 00:04:26,460 | 自己高性能应用的开发板 |  |
| 129 | 00:04:27,512 --> 00:04:28,362 | 我们的星光板 |  |
| 130 | 00:04:30,215 --> 00:04:32,146 | 星光板是基于我们的 |  |
| 131 | 00:04:32,146 --> 00:04:33,750 | 惊鸿7000系列 |  |
| 132 | 00:04:33,810 --> 00:04:34,890 | 这是第一款 |  |
| 133 | 00:04:34,930 --> 00:04:35,971 | 全球关于RISC-V的 |  |
| 134 | 00:04:35,971 --> 00:04:38,012 | 人工智能视觉处理平台 |  |
| 135 | 00:04:40,106 --> 00:04:42,480 | 基于7000芯片 |  |
| 136 | 00:04:42,480 --> 00:04:46,340 | 这是7000芯片的主要的介绍 |  |
| 137 | 00:04:46,696 --> 00:04:48,456 | 这里我们可以提到 |  |
| 138 | 00:04:48,612 --> 00:04:49,306 | 我们可以看到 |  |
| 139 | 00:04:49,306 --> 00:04:52,195 | 它提供了充足的系统带宽 |  |
| 140 | 00:04:52,915 --> 00:04:54,790 | LPDDR4和DDR4 |  |
| 141 | 00:04:54,790 --> 00:04:57,628 | 提供了3200Mbps |  |
| 142 | 00:04:57,628 --> 00:04:59,840 | 64比特双通道这样的一个带宽 |  |
| 143 | 00:05:00,040 --> 00:05:00,855 | 我们的目的 |  |
| 144 | 00:05:00,855 --> 00:05:02,340 | 就是为了让开发者 |  |
| 145 | 00:05:02,620 --> 00:05:04,200 | 去充分释放他们的 |  |
| 146 | 00:05:04,340 --> 00:05:06,680 | 不会是受硬件的性能的限制 |  |
| 147 | 00:05:06,900 --> 00:05:09,371 | 充分的去开发他们的一些应用 |  |
| 148 | 00:05:10,953 --> 00:05:14,200 | 在这里我们提到7000系列的时候 |  |
| 149 | 00:05:14,201 --> 00:05:15,660 | 我们会想到另外一个生态 |  |
| 150 | 00:05:15,661 --> 00:05:17,971 | 其实刚才芯原的汪总也提到 |  |
| 151 | 00:05:17,971 --> 00:05:19,240 | 一个IP的生态 |  |
| 152 | 00:05:19,380 --> 00:05:21,140 | 我们不仅仅只去看RISC-V |  |
| 153 | 00:05:21,180 --> 00:05:23,280 | 我们要去看其他三方IP的生态 |  |
| 154 | 00:05:23,281 --> 00:05:24,340 | 比如说GPU |  |
| 155 | 00:05:24,471 --> 00:05:26,491 | 比如说一些高速接口的生态 |  |
| 156 | 00:05:26,765 --> 00:05:27,921 | 其实我们也很 |  |
| 157 | 00:05:28,300 --> 00:05:30,315 | 高兴的和很多合作伙伴 |  |
| 158 | 00:05:30,562 --> 00:05:32,695 | 包括Imagination 包括芯原 |  |
| 159 | 00:05:32,696 --> 00:05:35,528 | 我们把这些IP的生态 |  |
| 160 | 00:05:35,528 --> 00:05:36,750 | 也整合到我们的 |  |
| 161 | 00:05:36,750 --> 00:05:37,906 | 7000芯片里面来 |  |
| 162 | 00:05:42,865 --> 00:05:46,309 | 这个是我们基于7100芯片 |  |
| 163 | 00:05:46,309 --> 00:05:48,410 | 做的一个星光的开发板 |  |
| 164 | 00:05:48,750 --> 00:05:50,930 | 这样的一个开发板其实我们已经 |  |
| 165 | 00:05:50,930 --> 00:05:54,050 | 推向了一些星光板的开源社区 |  |
| 166 | 00:05:54,553 --> 00:05:55,934 | 一开始是在几百片 |  |
| 167 | 00:05:55,934 --> 00:05:57,150 | 我们撒到社区里面 |  |
| 168 | 00:05:57,315 --> 00:05:59,153 | 请我们这些beta开发者 |  |
| 169 | 00:05:59,153 --> 00:06:01,210 | 去提供他们的一些 |  |
| 170 | 00:06:01,250 --> 00:06:03,690 | 库上面提到的驱动的移植 |  |
| 171 | 00:06:03,691 --> 00:06:04,930 | 一些生态的开发 |  |
| 172 | 00:06:04,930 --> 00:06:05,696 | 我们发现 |  |
| 173 | 00:06:06,000 --> 00:06:10,750 | 这是一个非常受欢迎的一个开发板 |  |
| 174 | 00:06:11,000 --> 00:06:13,830 | 在后天上午我们也会 |  |
| 175 | 00:06:13,850 --> 00:06:15,237 | 基于这样的一个开发板 |  |
| 176 | 00:06:15,237 --> 00:06:16,770 | 做一个很详细的Tutorial |  |
| 177 | 00:06:16,950 --> 00:06:18,630 | 如果大家有兴趣的话可以 |  |
| 178 | 00:06:18,630 --> 00:06:20,028 | 去了解 |  |
| 179 | 00:06:20,209 --> 00:06:22,570 | 我们这些开发板的一个生态 |  |
| 180 | 00:06:22,630 --> 00:06:24,706 | 一个开发版的一些具体的情况 |  |
| 181 | 00:06:25,128 --> 00:06:26,337 | 同时我也要提到 |  |
| 182 | 00:06:26,609 --> 00:06:28,406 | 在我们在做开发板的时候 |  |
| 183 | 00:06:28,406 --> 00:06:29,921 | 发现其实生态 |  |
| 184 | 00:06:29,921 --> 00:06:31,525 | 不仅仅是软件生态 |  |
| 185 | 00:06:31,585 --> 00:06:32,985 | 还是IP生态 |  |
| 186 | 00:06:33,025 --> 00:06:34,221 | 开发板本身 |  |
| 187 | 00:06:34,221 --> 00:06:35,606 | 也有它自己的生态 |  |
| 188 | 00:06:35,765 --> 00:06:37,865 | 所以我们看到一切一切 |  |
| 189 | 00:06:37,865 --> 00:06:38,887 | 都是源于生态 |  |
| 190 | 00:06:44,615 --> 00:06:47,131 | 我们的星光开发板 |  |
| 191 | 00:06:47,131 --> 00:06:49,603 | 可以提供一个完整的软件栈 |  |
| 192 | 00:06:50,030 --> 00:06:50,618 | 可以看到 |  |
| 193 | 00:06:50,618 --> 00:06:53,250 | 在这样的一个软件栈的基础之上 |  |
| 194 | 00:06:53,251 --> 00:06:55,468 | 大概我们是觉得 |  |
| 195 | 00:06:55,468 --> 00:06:56,890 | 经过我们的努力 |  |
| 196 | 00:06:56,970 --> 00:06:58,387 | 可以在短时间内 |  |
| 197 | 00:06:58,387 --> 00:06:59,410 | 去弥补刚才我们 |  |
| 198 | 00:06:59,411 --> 00:07:02,030 | 看到的那些问号的一些缺失 |  |
| 199 | 00:07:02,320 --> 00:07:03,359 | 尤其是我们在 |  |
| 200 | 00:07:03,359 --> 00:07:05,140 | 图形和图像标黄的这里 |  |
| 201 | 00:07:05,360 --> 00:07:07,190 | 图形和图像这边的一些 |  |
| 202 | 00:07:07,190 --> 00:07:08,125 | 软件栈的弥补 |  |
| 203 | 00:07:14,550 --> 00:07:16,500 | 这个是我们已经在Linux |  |
| 204 | 00:07:16,540 --> 00:07:18,680 | 在我们的星光板上跑出来的 |  |
| 205 | 00:07:18,680 --> 00:07:20,475 | Linux桌面系统 |  |
| 206 | 00:07:20,475 --> 00:07:22,000 | 和浏览器的一些页面 |  |
| 207 | 00:07:22,181 --> 00:07:23,562 | 这个在外面我们展台上 |  |
| 208 | 00:07:23,562 --> 00:07:25,740 | 大家都可以去看到实物的展示 |  |
| 209 | 00:07:29,390 --> 00:07:32,210 | 我们除了在硬件 |  |
| 210 | 00:07:32,211 --> 00:07:33,770 | 在其他一些IP |  |
| 211 | 00:07:33,771 --> 00:07:36,670 | 在图形上的一些硬件的积累 |  |
| 212 | 00:07:36,790 --> 00:07:38,109 | 同时我们还在想 |  |
| 213 | 00:07:38,109 --> 00:07:40,987 | 我们要推出更高性能的CPU |  |
| 214 | 00:07:41,184 --> 00:07:43,193 | 这里我先抛砖引玉 |  |
| 215 | 00:07:43,315 --> 00:07:45,118 | 我们推出了天枢系列的 |  |
| 216 | 00:07:45,118 --> 00:07:46,655 | 处理器的CPU |  |
| 217 | 00:07:46,855 --> 00:07:48,603 | 这是面向数据中心的 |  |
| 218 | 00:07:48,603 --> 00:07:49,315 | 高性能的 |  |
| 219 | 00:07:49,335 --> 00:07:51,355 | RISC-V应用处理器IP |  |
| 220 | 00:07:52,253 --> 00:07:54,900 | 这是它的一个基本的配置 |  |
| 221 | 00:07:54,900 --> 00:07:57,780 | 我在这里也不会去详细的去介绍 |  |
| 222 | 00:07:57,940 --> 00:07:59,681 | 因为等一下我们的 |  |
| 223 | 00:07:59,681 --> 00:08:01,320 | CPU的负责人【Morten-余红斌】 |  |
| 224 | 00:08:01,620 --> 00:08:03,800 | 他就会给大家详细的介绍 |  |
| 225 | 00:08:03,860 --> 00:08:05,307 | 我们是怎么样实现 |  |
| 226 | 00:08:05,307 --> 00:08:07,068 | 这么一个高处理器的 |  |
| 227 | 00:08:07,393 --> 00:08:08,975 | 天枢系列的IP的 |  |
| 228 | 00:08:10,281 --> 00:08:12,328 | 最后我们是有希望 |  |
| 229 | 00:08:12,690 --> 00:08:13,721 | 天枢的CPU |  |
| 230 | 00:08:13,721 --> 00:08:14,770 | 这样的IP可以 |  |
| 231 | 00:08:14,771 --> 00:08:16,331 | 帮我们打开RISC-V |  |
| 232 | 00:08:16,331 --> 00:08:19,862 | 在更加高端领域的应用 |  |
| 233 | 00:08:20,050 --> 00:08:21,650 | 包括在人工智能学习 |  |
| 234 | 00:08:21,651 --> 00:08:22,740 | 在数据中心 |  |
| 235 | 00:08:22,740 --> 00:08:24,170 | 和在5G通讯上面 |  |
| 236 | 00:08:27,868 --> 00:08:28,921 | OK 谢谢大家 |  |
| 237 | 00:08:28,921 --> 00:08:30,134 | 这是我的演讲 |  |