Technology Update

Universal Processor Revolutionise AI Supercomputing

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Microchips: Newly developed chips must no more physically specialize on one operation type. So-called universal processors command several aspects of high efficiency computers and with that shake up the price structure.

Up-to-date high efficiency processors find application in big data centres and cloud servers in the artificial intelligence (AI) and in the industrial sensors. Through a new type of processor chips big changes lie ahead. These domains when one follows the argumentation of Slovak American semiconductor developers Tachyun confounded. The established offerers as Intel, Nvidia AMD would be confounded as also the price structure of application that as per expert opinion could reduce one-third of the price structure through the new chips.

The not long ago advertised Prodigy Chip T16128 of Tachyum is partly originated on European soil. In 2016 the established farm with base in Bratislava and in California Santa Clara in the centre of Silicon Valley has its product as "Universal Processor" concepted, which for the first time for all aspects of high performance computing (HPC) could be placed at the disposal.

Up-to-date high performance processors have separate specialized hardware blocks for the assignments of CPU (Central Processing Unit), GPUs (Graphic Preparation Units) and TPU (Tensor Processor for Machine Learning). The Tachyum-chip is however as universal usable processor developed. It replaces the special blocks and comprise them through a puzzled out architecture functionally overlapping multitasking. Prodigy transforms data centres in Universal Computer Centres" clarified Rob Reiner Tachyum's Director of Product Marketing, end of May 2022 at the conference "ISC High Performance 2022" in Hamburg.

His chip development should spare in addition to the insertion of today's marketable performance hungry hardware accelerators and with that save energy. The foundation stones are up-to-date necessary in order to accelerate the computation in exacting application. Today's HPC processor systems are comparatively complex. The new universal processor should minimize the complexity through homogenous structures on silicon. To others the likewise complex installation should be simplified and their expenses for maintenance are reduced.

Uptil now the processors of these new types certainly only virtual as emulation, so as full functional mock up on the basis of programmable construction block of Type FPGA (Field Programmable Gate Arrays). Privileged customers already test out with that their intended programme and processing strategies already

Tachyum had already in 2019 one something assigned forerunner of Prodigy with 64 cores announced, which with Taiwanese ordered producer TSMC in one 7 nm FinFET-proess manufactured and should have been deliverable in 2021. However Tachyum could not complete this first processor type timely, so-called difficulty due to the deliverers in the processing of intellectual properties of storage elements.

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In deliverable bulk number of pieces, the prodigy-processor chips after long time again were an innovative semiconductor development contribution with European origin (source Provenance). The new prodigy T16128-AIX should not be finished in a distantly identified 5 nm processor technology and produce 128 computation cores with 64 bit processing width as also in total 16 quicker DDR5-Dram storage canals and one working cycle frequency of 5.7 GHz. However on Hamburg ISC 2022 the 64 mm x 84 mm big chip which joined together the technical world would be only presented virtually. The first real building blocks should appear as prototypes later in the year 2022. Beyond 2023 prodigy should be generally deliverable. With Tachyum there are already plans for the production with a 3 nm process.

Tachyum founder and CEO Radoslav Danilak is a recognized specialist in his technical discipline. He was previously one of the GPU architects with Nvidia and has among others served for the Nishan systems. Gizmo-Tech and Toshiba. He is therefore with the worldwide stand of technique in the best manner relied upon. As an expelled expert with Tachyun founding, Steve Furban functioned as designer of the first Arm-processors and Jack Weber one of the developers of x86 chips with AMD.

Additionally Danilak is engaged as innovation advisor of Slovakian Academy of Science. It has plans for state supercomputer centre under application of prodigy chips. It should be for artificial intelligence and for HPC computer centres instituted and has on promotion in the framework of EU initiative IPCEI (Important Project of Common European Interest) to the tune of 50 million Euros. That allows us to revolutionizing of industries with 3 nm version of prodigy and rendering possible the superhuman computing at the scale of human brain, says Danilak.

AI Supercomputer 100 times faster: Beyond with Tachyum plans for the construction of one AI Super computer they take care, of the computing performance of 128 Megaflops. As comparison, the US Supercomputer Frontier since June 2022 is the fastest worldwide and performs 1, 1 Megaflops (a measure of performance for a supercomputer). Therefore a little more than one trillion Gleitkomma (floating point) computations per second (flops).

Also the Jülich supercomputer Research Centre wants to collaborate with Tachyum in the sundry AI projects and the prodigy to test in one suitable HPC infrastructure for AI application, as soon as these are available. Danilak says "I believe that our collaboration with that can help bring the EU in the leading position of Supercomputer and Data centre markets."

Ref: Technik & Wirtschaft, 1 Juli 2022, Nr 13 VDI nachrichten vn+, von Werner Schulz.
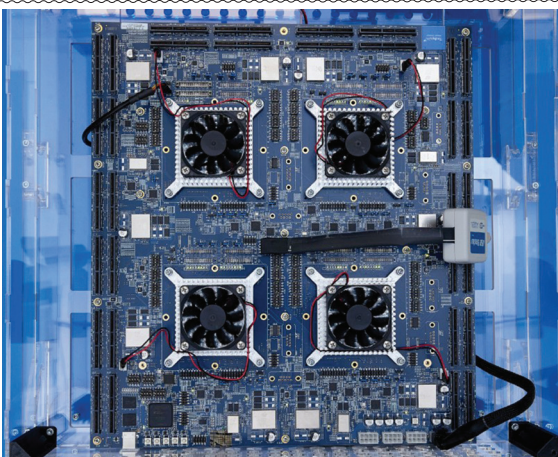
The Universal processor Prodigy is only available as Emulation. An Emulation is one fully functional replica on the basis of traditional programmable building blocks.

On an Emulation the customers can test out their programmes and preparations strategies. The prodigy as real processor should be marketable at the end of the year 2023.