conference REPORT™

by Brooks Davis

BSDTW 2017 held in Taipei, Taiwan, November 11 and 12, 2017, was a great success. I attended as a both a speaker and BSD developer. This was the first BSDTW and the second BSD conference in Taiwan. It was hosted by the Open Culture Foundation and Skymizer, and spearheaded by Li-Wen Hsu.

The conference was smaller than many, with a single track of talks that avoided the all-too-frequent problem of talks I want to attend piling up in one slot. After the opening session, the first day kicked off with a talk on the RISC-V architecture by Arun Thomas. Arun gave us an overview of the architecture, an update on current status, and a preview of upcoming changes. RISC-V seems to be gaining traction in a number of areas, including industry and research, and so it's good that FreeBSD offers solid support for it.

George Neville-Neil was up next with an update on DTrace as used in the CADETS project. They use DTrace in an always-on mode where the traditional DTrace performance guarantees (little or no impact when probes are not enabled) are a poor fit. George covered a number of improvements in progress as well as the work on OpenDTrace, a project to bring various DTrace communities back together along the lines of OpenZFS.

Baptiste Daroussin then discussed work to extend the Poudrière package building system to build FreeBSD images. In some ways, this seems like a divergence in purpose, but in fact, Poudrière has always needed the ability to construct clean FreeBSD images to mount as the OS filesystem when building packages. The new functionality simply adds the ability to bundle those images rather than maintaining them as ZFS volumes.

After lunch I presented my talk on the history of virtual address space management, showing how we progressed from the break() interface in early UNIX to mmap() today. I also discussed why I think it is time to reconsider this interface in light of modern mitigation strategies and notions of API design.

Johannes M. Dieterich followed with a talk on the state of FreeBSD for HPC with a focus on program language support, numerical libraries, and GPU support. As someone who used to work in this area, it was interesting to see how FreeBSD has progressed and where work is needed.

The last talk of the day was given by Peter Grehan, who discussed the challenges of adding graphics support to bhyve. This work was motivated by the fact that without graphics support, there isn't a practical way to install non-server versions of Windows and some Linux distributions. bhyve is now an emulated graphics adaptor, keyboard, and mouse along with a VNC server. This talk was full of interesting examples of how notionally standard things like the VNC protocol are often less standard in practice.

That evening, the conference banquet was held at a restaurant in the Tamsui District. We walked from the end of the train line to the restaurant along the beach where there were many shops selling food, including some amazing-looking fried cephalopods on sticks. Unfortunately, we were in too much of a hurry to get to dinner to have time to partake.

Sunday morning kicked off with Allan Jude talking about advanced ZFS integration. His presentation focused largely on various enhancements to the boot

process, including boot environments, a new next-boot implementation of ZFS, and automated boot recovery. Allan also talked about GELI disk encryption and appliance upgrades using ZFS.

Theo de Raadt was up next with a compelling talk on the use of security mitigations to incrementally improve security and find bug or code quality issues that might become bugs early and fix them. He made a good case of the on-by-default approach taken in OpenBSD. This approach isn't for everyone, but it's excellent that someone is doing it.

Ruslan Bukin delivered a talk on the status of RISC-V support in FreeBSD as well as in the larger software ecosystem. He also walked us through the porting process and discussed changes to support the upcoming v1.10 privilege specification. In-tree Linux support will be based on this version, so it should be close to final.

After lunch Mariusz Zaborski discussed sandboxing applications with Capsicum. Among other things, he detailed the reasons for a variety of services to support existing libc interfaces. A new one (committed around the time of the talk) was the syslog service, which is required because there is no reliable way to pre-open log services in the current API.

The final full talk of the conference was by Mark Johnston on changes to the virtual memory system in FreeBSD. Mark covered a wide range of improvements, from the recent addition of `MAP_GUARD` to prevent some stack clash issues, to improvements to build performance on 128-thread systems that are now available on Amazon.

The conference concluded with Lightning Talks where time limits were rigorously enforced. The talks were interesting and the timekeeper kept the speakers on their toes.

I had a little time for tourist activities and enjoyed simply walking the streets of Taipei and a trip up Taipei 101 on a clear day. Unfortunately, there wasn't enough free time in my schedule to visit more of the many interesting sites such as the National Palace Museum. I look forward to future BSDTW conferences and getting to see some of the places I missed this time on my next trip to Taiwan! ●

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