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# SATIS'18 REFLECTION REPORT

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## I. About SATIS

SATIS is the The 1st ACM SIGOPS Summer School on Advanced Topics in Systems. It was held in Tromsø Norway, between AUGUST 14-17, 2018.

This first summer school focused on advanced topics in Distributed Systems and was held on the 30th anniversary of the renowned “Arctic’88 Advanced Course on Distributed Systems,” with a target audience of about 120 students. The summer school featured 50-minute lectures a day on August 15, 16, and 17, for a total of 15 lectures.

The rest of this report presents a summary and reflections on the some of these lectures.

## II. From Byzantine Consensus to Blockchain

This 2 part lecture was given by Christian Cachin from IBM Research in Zurich. The first part covered a historical perspective on Byzantine consensus protocols, while the second one focused on IBM’s blockchain solution, HyperLedger.

The speaker presented in his talk a framework with a set if criteria to consider before deciding whether blockchain is a necessary or even appropriate for a certain project. This is important in order to avoid falling into the hype, and deploying useless blockchain projects which have negative returns on investments.

The lecture also focused on the differences between public ledgers such as the ones powering bitcoin, and enterprise ones, such as Ledger.

The speaker’s remarks about how byzantine consensus protocols have been available for two decades, yet they have never been deployed in production until very recently, due to the widespread interest in cryptocurrencies and blockchains highlights how radical innovation require both a technology and business change.

## III. Security from Tags

Reference monitors typically enforce security policies by intercepting operation invocations – the policy to be enforced is decomposed into operation-specific checks. This lecture discussed a data-centric alternative. Here, labels are attached to data, and each label gives a policy that describes how the associated value may be used. A new class of reactive information flow (RIF) labels is needed to fully support this view.

A proper access control design and implementation are fundamental to computer security. When we want to mediate operation invocations, the OS uses a reference monitor at runtime. However, ensuring confidentiality cannot be achieved at run time.

To support access control on data, the speaker proposes using tags and values:

- a tag  $Tv$  is associated with every value  $v$  and variable  $v$ ,
- it specifies allowed uses of  $v$  and implementing enforces restrictions in tags.

#### IV. Lamport turning Award Lecture

This talk was a historical a memoir and reflections on the “The early days of concurrency.

The following pioneering research work were covered in this lecture

- The Mutual Exclusion Problem: *E. W. Dijkstra. Solution of a problem in concurrent programming control. Communications of the ACM, 8(9):569, September 1965.*
- Producer-Consumer Synchronization: identified as concurrency problem in: *E.W Dijkstra, Cooperating Sequential Processes. EWD (1965).* Dijkstra implicit model is based on the representation of a execution as a sequence of states, it is called the **standard model**.
- Proving Invariance Properties in the Standard Model. *Edward Ashcroft, Proving Assertions in Parallel Models (1975).*

#### V. References

<https://medium.com/@madestro/satis-2018-day-3-39125d29c28f>

<http://site.uit.no/satis2018/program/>