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MINIX 3: A Highly Reliable, Self-Repairing Operating System

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Most modern computer users want their system to work all the time and never crash, ever. Yet operating system reliability is still poor. Since faults in software are a fact of life, our approach to reliability is to anticipate failures and design a self-repairing operating system.

By splitting the operating system into many small, tightly restricted user-mode server and driver processes, each with limited functionality, running on top of a tiny microkernel, we have built a system, MINIX 3, in which bug-induced damage cannot propagate and affect the entire system, and faulty components can often be replaced on the fly, during system operation, thus greatly improving reliability.

In this talk, I will present the multiserver architecture of MINIX 3, its self-repairing property, the most important reliability features, some performance characteristics, and the user view of MINIX 3. I will also briefly survey related work and show how MINIX 3 differs from other approaches.