One may wonder why memory-corruption vulnerabilities—a decades old problem—remain a persistent source of threats against modern software. The main problem is that modern software still contain vast amounts of unsafe, legacy code written in the error-prone C and C++ languages. Moreover, exploitation techniques are rapidly evolving and incorporate increasingly sophisticated techniques such as code reuse and can bypass widely deployed countermeasures like data execution prevention (DEP) and layout randomization (ASLR). The recent vulnerabilities (e.g., “StageFright” and "One Class to Rule them All") affect hundreds of millions of Android systems, and are just the latest entries in a long series of incidents that show the magnitude of the problem.

The good news is that researchers in both academia and industry have spent considerable effort to improve defenses against modern code-reuse exploits. Even though these solutions raise the bar for exploitation substantially, attackers continually discover new bypasses. This talk gives a brief overview of the exciting arms race between code-reuse attacks and mitigation techniques. We highlight the main challenges of recent defenses aimed at addressing the longstanding problems of memory corruption and memory disclosure vulnerabilities. The game is not over yet.

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