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Bend, Don't Break: Using Reconfiguration to Achieve Survivability

We are becoming increasingly dependent on the continuous, proper functioning of large-scale, heterogeneous, distributed information systems. These systems are formed from large numbers of components originating from multiple sources assembled into complex and dynamically evolving structures. The goal of the Willow project is to design a secure, automated framework for the proactive and reactive reconfiguration of large-scale, heterogeneous, distributed systems so that critical networked computing enterprises can tolerate intrusions and failures, and continue to provide an acceptable level of service. The framework consists of two interrelated elements: an application architecture for dynamically reconfigurable systems and a common infrastructure for building and securely operating those systems. Willow is a blend of results from the disciplines of fault tolerance, configuration management, and security, building on a foundation laid by our previous research efforts.

The Willow project is a joint effort of researchers from the University of Colorado at Boulder, the University of Virginia, and the University of California, Davis.