Securing the confidentiality and integrity of information manipulated by computer software is an old yet increasingly important problem. Current software permission systems present on Android or iOS provide inadequate support for developing applications with secure information flow policies. To be useful information flow control policies need to specify declassifications and the conditions under which declassification can occur. Having these declassifications scattered all over the program makes policies hard to find, which makes auditing difficult. To overcome these challenges, a policy specification language, "Evidently" is discussed that allows one to specify information flow control policies separately from the program and which supports conditional gradual releases that can be automatically enforced. I discuss the Evidently grammar and modular semantics in detail. Finally, I discuss the implementational details of Evidently compiler within the Xtext language development environment and the implementation’s enforcement of policies.

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Approved for distribution by Gary T. Leavens, Committee Chair, on June 21, 2018.

The public is welcome to attend.