The IX Multilevel-Secure UNIX System

J. A. Reeds

M. D. McIlroy

ABSTRACT

A collection of papers about the IX system, a simple but comprehensive multilevel-secure operating system with mandatory access control, based on the research v10 UNIX® system.

The IX security model centers on processes and files or channels (not on ''subjects'' and ''objects''). The system calculates security-classification labels dynamically, so that outputs are classified as highly as the inputs from which they were derived. The label mechanism is *mandatory*; not even the superuser can subvert it.

A structured privilege mechanism allows system and security administrators to bend the rules in an orderly way for purposes such as maintenance or document declassification. Privilege may be suballocated in parts of the label space so that projects may administer their own security.

A private-channel mechanism guarantees freedom from eavesdropping or spoofing for communications among trusted processes and for special communications, such as password dialogs, with external sources.

The papers in the collection are

Multilevel Security in the UNIX Tradition. An overview of the IX system and important utilities. 19 pages.

The Design of IX. Detailed specification of the security behavior of the kernel. 32 pages.

A Tour of IX. Some examples of the use of security labels and of privilege in IX. 11 pages.

Multilevel Windows on a Single-Level Terminal. The workings of *mux,* a windowed-terminal handler, when it is possible for run differently classified sessions in different windows. 3 pages.

Secure IX Network. A discussion of the major security features of IX and how they could be extended to a network of secure computers. 8 pages.

Appendix.

Glossary. The jargon of IX that differs from that of UNIX. 2 pages.

Manual Pages. Features peculiar to IX described in the classical UNIX style. 50 pages.