Abstract

Live migration is an essential feature of virtualization that allows transfer of virtual machine from one physical server to another without interrupting the services running in virtual machine. Live migration facilitates workload balancing, fault tolerance, online system maintenance, consolidation of virtual machines etc. Unfortunately the disclosed vulnerabilities with the live migration pose significant security risks. Because of these security risks the industry is hesitant to adapt the technology for sensitive applications. This paper is an investigation of attacks on live migration of virtual machine and discusses the key proposed and implemented approaches to secure live migration.

References

- Gerald J Popek and Robert P Goldberg. Formal requirements for virtualizable third
generation architectures. In SOSP ’73: proceedings of the fourth ACM symposium on operating
- Chen Xianqin, Gao Xiaopeng, Wan Han, Wang Sumei, Long Xiang. Application-
Transparent Live Migration for virtual machine on network security enhanced hypervisor.
- Melvin Ver. Dynamic Load Balancing Based On Live Migration Of Virtual Machines:
Golisano College of Computing and Information Sciences (GCCIS), Rochester, NY, U.S.A.
- Jon Oberheide, Evan Cooke, Farnam Jahanian. Empirical Exploitation of live migration of
- Jakub Szefer, Eric Keller, Ruby B. Lee, Jennifer Rexford. Eliminating the hypervisor
Attack Surface for a More Secure Cloud. In Proceedings of ACM Conference on Computer and
communications Security’ 2011. PP 401-412
- Alternatives for Securing Virtual Networks: A Different Network Requires a Different
Approach—Extending Security to the Virtual World. white paper 1000220-012-EN Dec 2011,
Juniper Networks, Inc.
- C. Clark, K. Fraser, S. Hand, J. G. Hansen, E. Jul, C. Limpach, I. Pratt, and A. Warfield.
Live migration of virtual machines. In Proc. of NSDI’05, pages 273–286, Berkeley, CA, USA,
- Wei Wang†, Xiaoxin Wu, Ben Lin, Kai Miao, Xiaoyan Dang. Secured VM Live Migration
- Dewan, P., Durham, D., Khosravi, H., Long, M., and Nagabhushan, G. A
hypervisor-based system for protecting software runtime memory and persistent storage. In
Proceedings of the 2008 Spring Simulation Multiconference (Ottawa, Canada, April 14 - 17,
2008).
- Boris Dandev, Ramya Jayram Masti, Ghassan Karame, Srdjan Capkun “Enabling Secure
VM-vTPM Migration in private clouds” In Proceedings of the Annual computer Security
Applications conference (ACSAC) 2011.

Index Terms

Computer Science Communications
Keywords
Live migration  virtualization  security issues  virtual machine  virtual machine monitor