

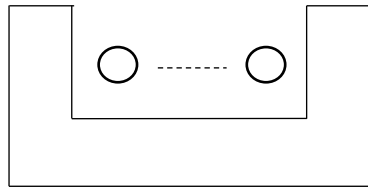
Software Platforms

From localhost to a Distributed Environment

LM in Computer Engineering

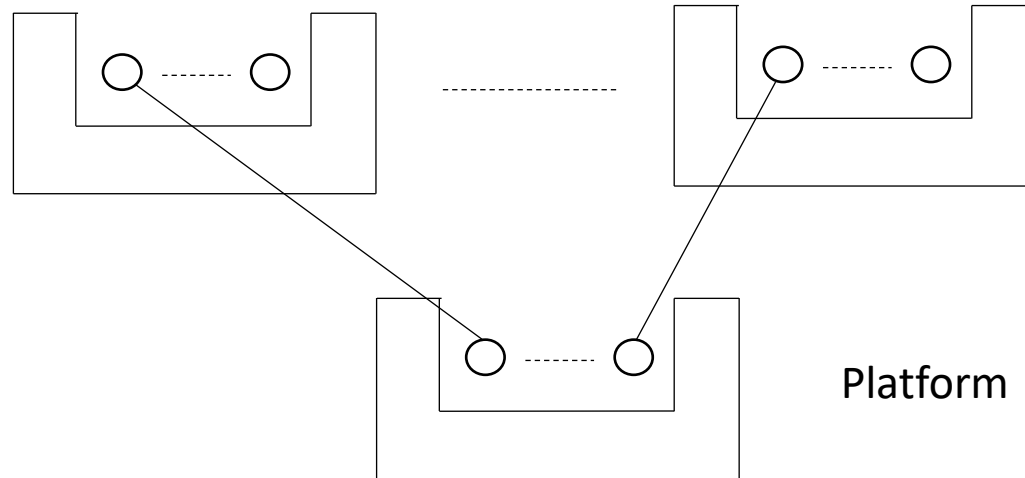
Massimo Maresca

Recap...



Platform

- Technologies
 - Socket (TCP, Http)
 - Multithreading
 - Dynamic Class Loading
 - Reflection
 - Annotations
 - Asynchronous I/O (decoupling socket from threads)
 - Example: Development of a simple Servlet Container
- Paradigms and Platforms
 - Web App (Tomcat)
 - RMI/RPC -> SOAP WS
 - REST WS

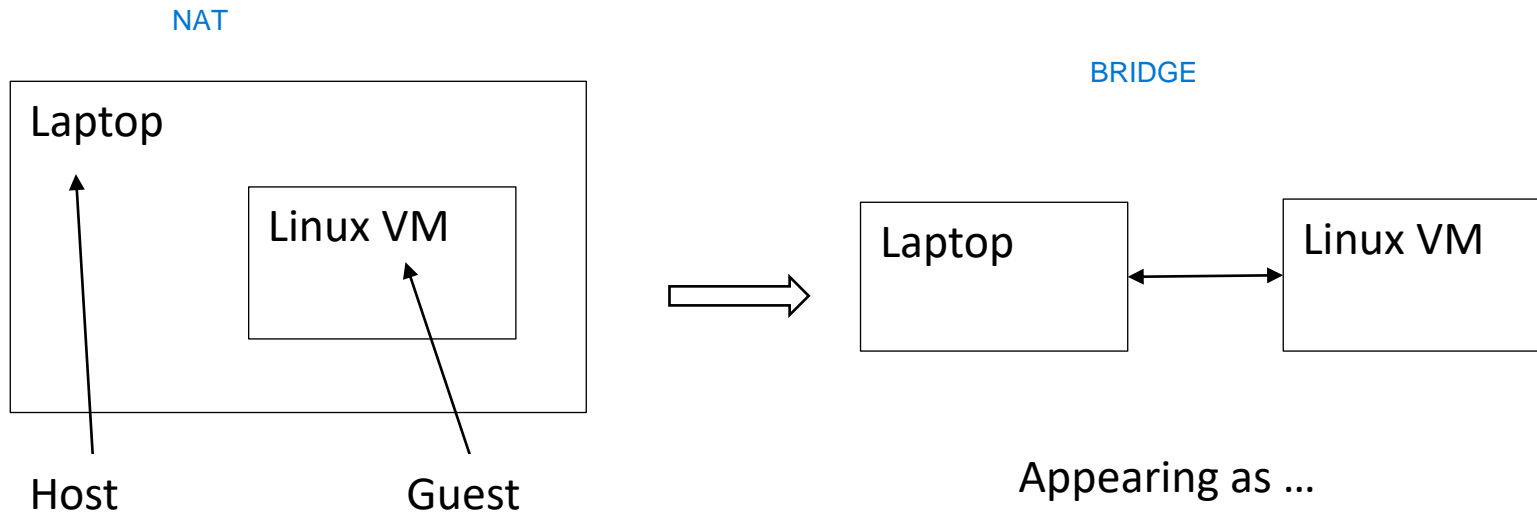


Platform

From localhost to Distributed Environment

- So far based on localhost – no communication
- Evolution to a distributed environment
 - Development Environment based on GUI
 - (MS Windows/Linux: we take Windows as a test case)
 - Client environment based on GUI
 - (typically MS Windows)
 - Server Environment based on CLI
 - (Linux/Windows : we take Linux as a case study)

Distributed environment configuration



Network Configuration based on Natting

- Guest on Private Address
- NAT to allow Guest to access the Internet through Host
- Port Translation to allow Host to access Guest on “localhost”

Network Configuration based on Bridging

- Guest independent from Host
- Guest visible from outside
- DHCP sharing

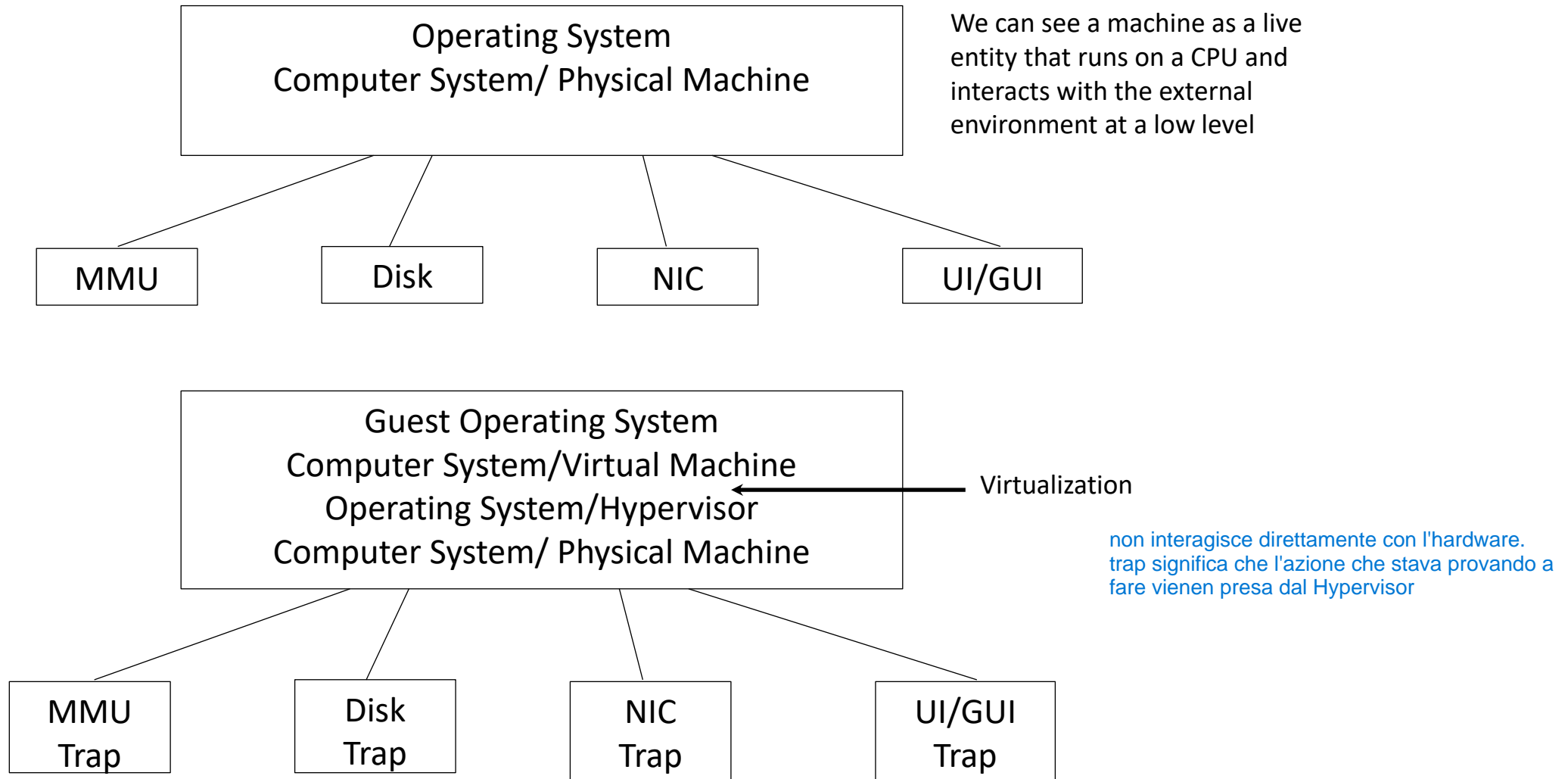
NAT MODE

il guest puo accedere all'host. al contrario per l'host il guest è accessibile solamente tramite una porta è proprio come se fosse un sistema esterno

BRIDGE MODE

sono sullo stesso livello entrambi hanno un indirizzo e comunicano come due sistemi ben distinti

Virtual Machine Principles



Virtual Machine Principles

- Three privilege levels: User, Supervisor, Hypervisor
- Trapping interactions is necessary because the Guest OS ignores that it is running as a Virtual Appliance. The Supervisor attempts to interact with the external environment. The Trapping mechanism routes interaction to Hypervisor.
- Trapping UI interaction is not needed in a headless set up. Only network access, file access, non-graphic User Interface are supported.
- Network configuration is a central issue:
 - Bridged Configuration sets the Guest at the same level as the Host. The Guest enters the Host network and needs an address. Guest activates a DHCP Request. The DHCP server must allow multiple request from the same interface.
 - NAT Configuration make the Guest able to access the external network through NAT, but it makes the Guest unreachable from outside. Mapping Host Ports on Guest ports creates static connections.