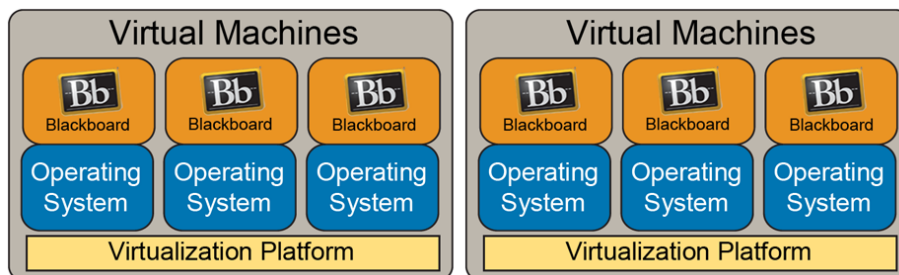


# Virtualizing the Blackboard Reference Architecture

## Virtualization

Virtualization is a deployment strategy that distributes server resources into separate, logical environments. When systems are virtualized, a layer of software is abstracted so that more than one operating system and application environment can operate on the same piece of hardware. Multiple virtual machines (VMs) share hardware resources without interfering with each other.

The Blackboard Reference Architecture extends virtualization to make the best use of today's powerful hardware. As organizations add hardware to their systems with multiple processors and multiple cores per processor, virtualizing those systems is the next logical step in maximizing the potential and efficiency of these resources.



## Blackboard's Virtualization Message

- Blackboard encourages the use of virtualization as an extension of the Blackboard Reference Architecture.
- Blackboard supports clients using virtualization when VMs are running Blackboard supported or certified operating system configurations.
- The creation, maintenance, and troubleshooting of the VM environment is the responsibility of the client.

Blackboard does not require the use of any particular virtualization vendor as long as it is able to support the operating system and software specifications. Below is a list of virtualization technologies that Blackboard has experience with:

- VMware® ESX (Linux® and Windows®)
- Solaris™ 10 Zones
- Red Hat® Enterprise Linux® 4 & 5 Xen™

## Benefits of Virtualization

The main benefits of virtualization are:

- **Save Money:** Virtualized systems reduce overall hardware costs because the hardware can be used more efficiently. Using fewer servers means there is less supporting physical infrastructure. The result is less power drawn to run hardware and lower cooling requirements. This allows organizations the flexibility to expand their IT infrastructure at an appropriate pace.
- **Save the Environment:** Reducing the number of servers in a datacenter reduces the energy footprint of the implementation. Fewer servers require less floor space, air conditioning, racks, networks, wire, cables, power supplies, and backup systems. The cost savings can be significant when adding up the amount for the servers, the monitors, and the air conditioning required for keeping them cool.
- **Achieve Higher Levels of Availability/ Business Continuity:** Virtualization minimizes server downtime. A crash can occur within a VM and not impact the other VMs on the same server. This allows an organization to shut down individual VMs without interfering with the use of other applications. VMs can save hours of downtime related to recovery to general maintenance. The ability to move servers between hardware can simplify upgrades.

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