Virtualization Technologies

Embrace the new world of healthcare

GALEN HEALTHCARE SOLUTIONS

Overview

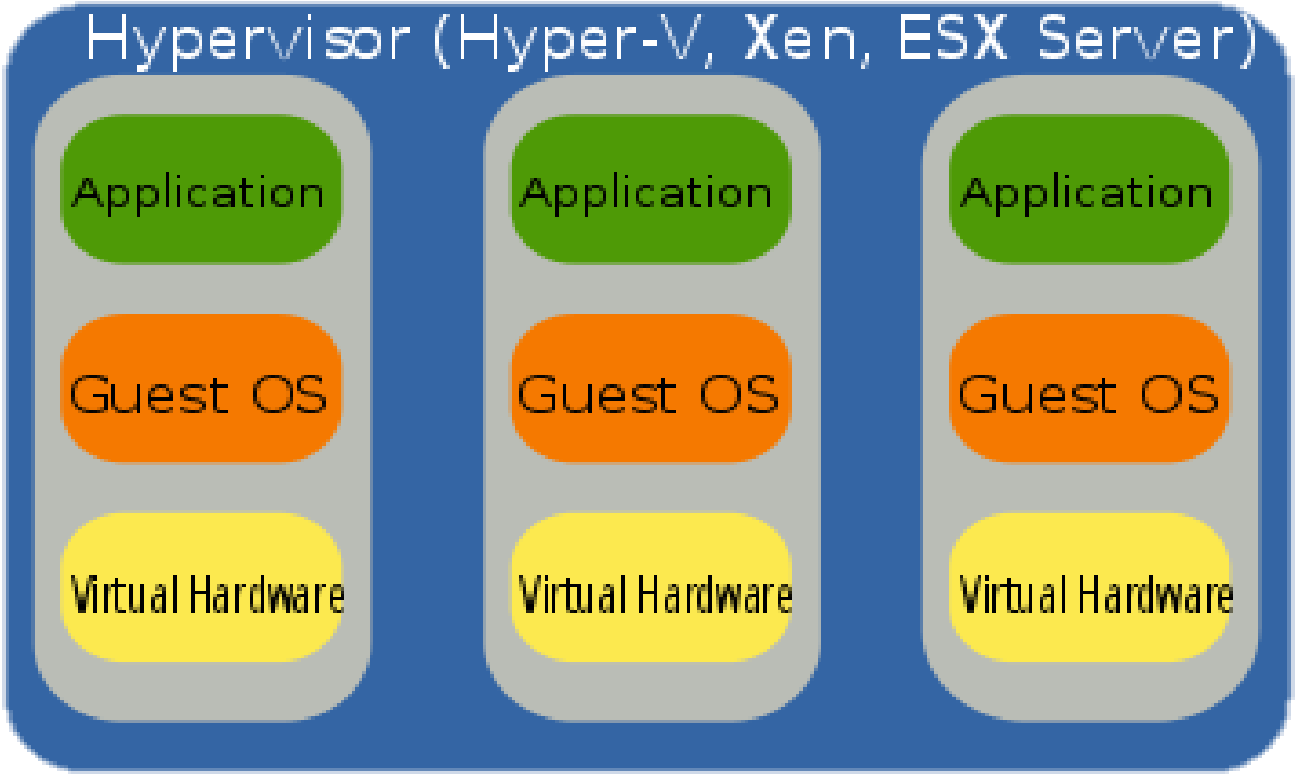
- **Introduction and Virtualization Basics**
- **Core Virtualization Technologies**
- **Enterprise Server Virtualization Solutions**
- **End User and Application Virtualization Solutions**
- **Virtualization in Practice with Enterprise EHR**

Virtualization Basics

- **What is virtualization?**
  - Software simulation of actual hardware, to create one or many isolated machine instances on a single set of hardware

- **Key Terms**
  - Host: the actual hardware system being used
  - Guest: virtual machine (VM) running on the host
  - Hypervisor: software creating a guest on the host hardware
  - Core: an independent hardware processor, of which one or more are included in a single chip package

Virtualization Basics



Wikipedia: Hardware Virtualization

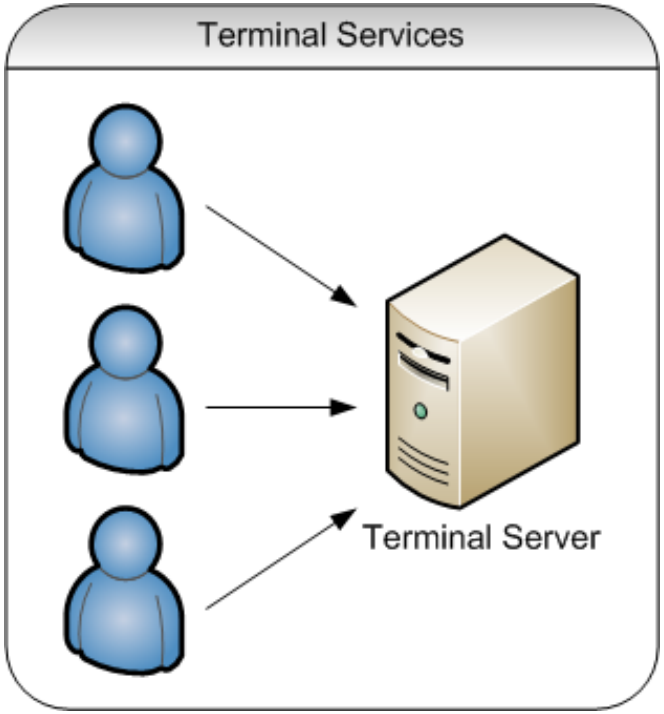
Virtualization Basics

- **What *isn't* virtualization (but might be called so)**
  - Multiple sessions ("terminals") to the same OS
  - Cloud solutions

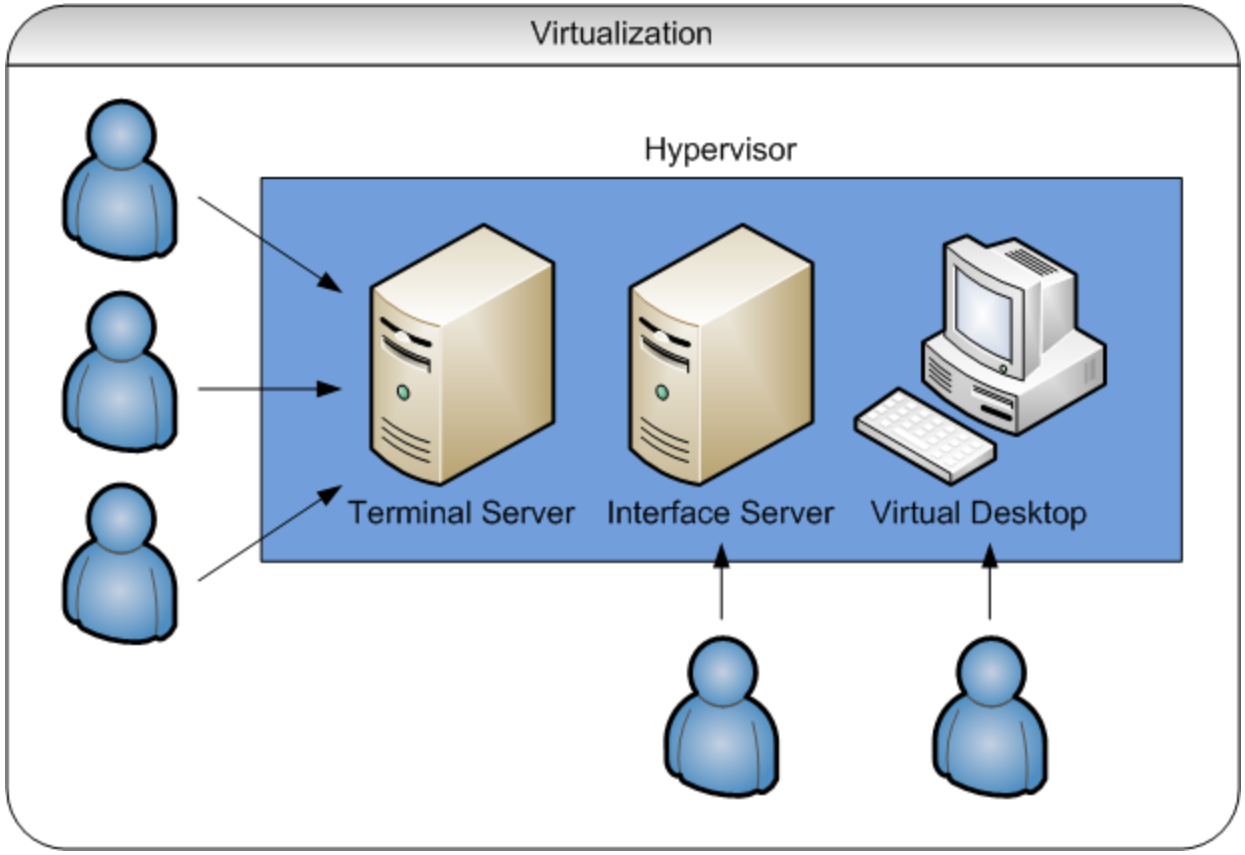
- **Terminal Services vs. Virtualization**
  - Terminal Services: Multiple users connected to the same operating system instance (virtual or physical)
  - Virtualization: Multiple servers or machines virtualized (regardless of whether or not they are used by more than one user)

Virtualization Basics

- **Terminal Services vs. Virtualization**



Virtualization



Virtualization Basics

- **Why is virtualization used?**
  - Testing/Using multiple operating systems
  - Hardware consolidation
  - Isolation/Protection
  - Manageability
  - Disaster Recovery/High Availability

Core Virtualization Technologies

- **Bare Metal vs. Hosted Hypervisors**
  - Bare Metal: Host is dedicated to hosting guests, hypervisor runs at lowest level
  - Hosted: Hypervisor runs on top of existing host operating system

- **The Big 3 Bare Metal Hypervisors**
  - Microsoft Hyper-V
  - VMware ESX (vSphere)
  - Xen

Core Virtualization Technologies

- **Virtual Hard Disks**
  - Standardized file formats used as virtual drives for guests
  - Contained on physical drive(s) attached to host
  - Allows guest to be moved and copied between hosts
  - Formats: VHD (Hyper-V and Xen), VMDK (VMware)

- **Guest "Tools"**
  - Drivers and utilities provided with hypervisor, to be installed on guest operating system
  - Allows for performance optimization and management of guests

Enterprise Server Virtualization Solutions

- **How do I…**
  - manage multiple guests?
  - manage multiple *hosts*?
  - monitor performance and environment health?

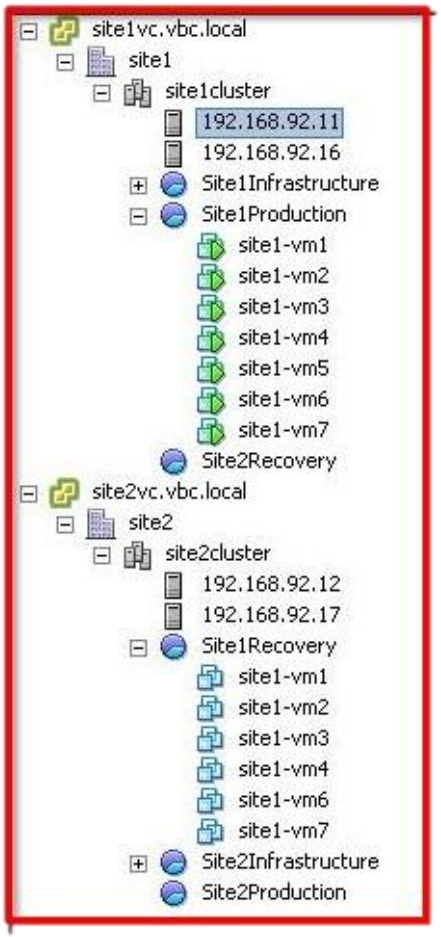
- **Enterprise server virtualization platforms:**
  - Citrix XenServer and XenCenter
  - VMware vSphere and vCenter Server
  - Microsoft Hyper-V and System Center VM Manager

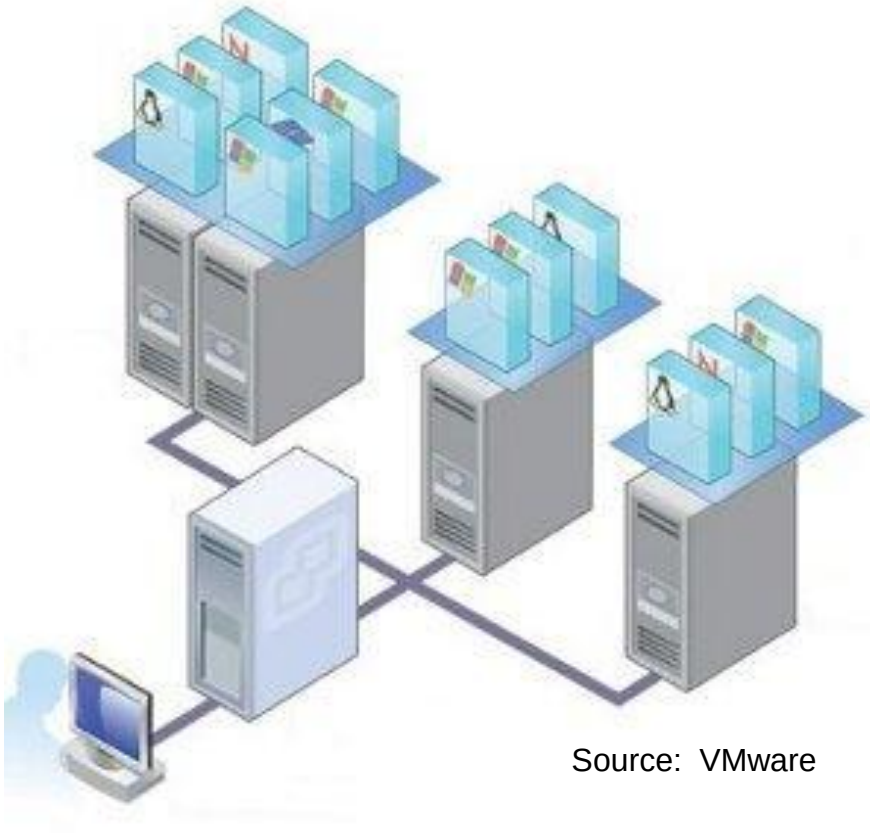
Enterprise Server Virtualization Solutions

- **Basic functionality from a central console:**
  - Create, destroy, or make copies (“clones”) of guests
  - Power up, shut down, suspend guests
  - Make changes to virtual hardware on guests
  - Take snapshots of guest disk state

- **Advanced functionality:**
  - Move guests between hosts (even while powered on!)
  - Share a disk volume amongst many hosts
  - Monitor guest performance and receive alerts
  - Automatically move guests from a failed host

Enterprise Server Virtualization Solutions



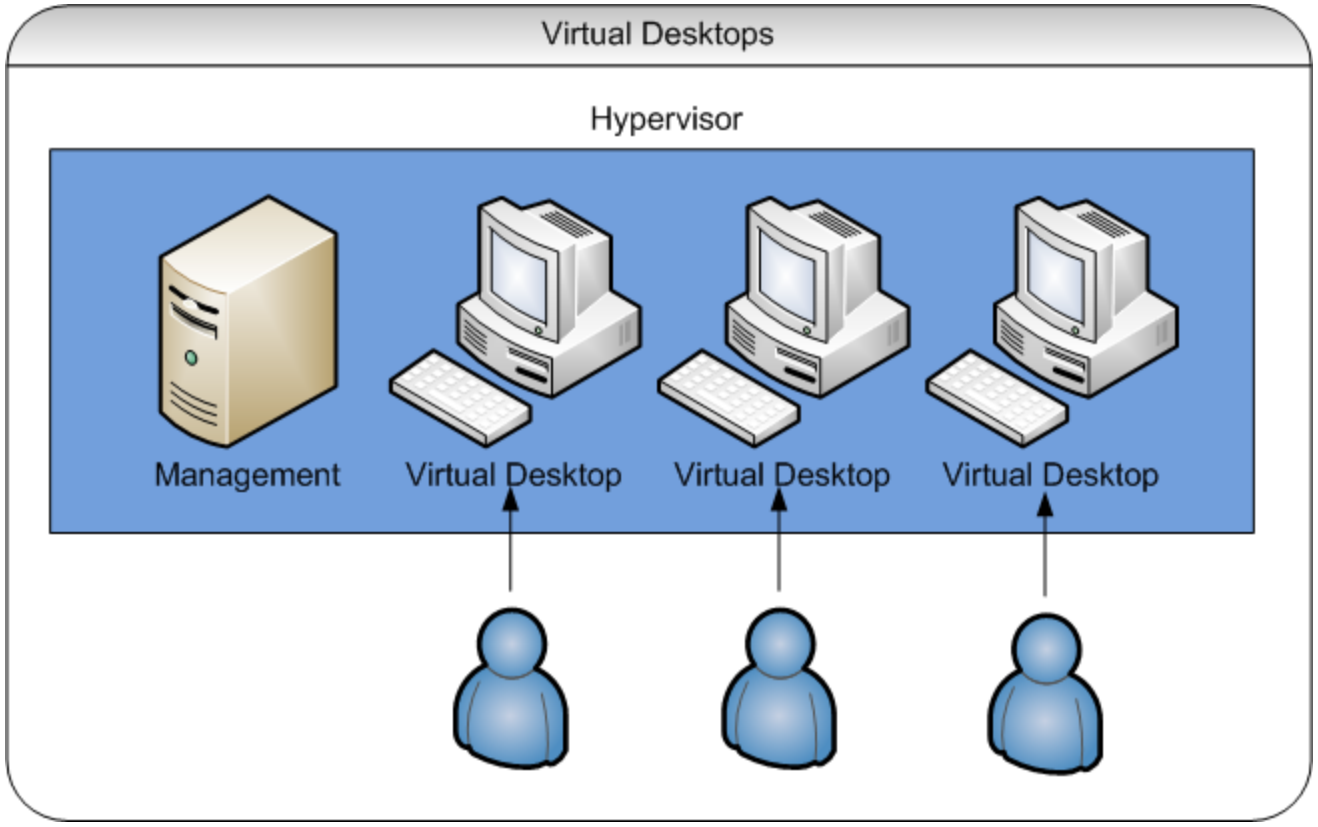


Source: VMware

End User Virtualization Solutions

- **Virtual Desktops**
  - End user PCs virtualized and put on hosts in a datacenter
  - Management layer automatically creates and destroys desktop VMs and allows users to log in via web interface
  - Changes to desktops centrally controlled, easy to “reset” desktops to their original state
  - Desktop virtualization platforms:
    - Citrix XenDesktop
    - VMware View
    - Microsoft Virtual Desktop Infrastructure

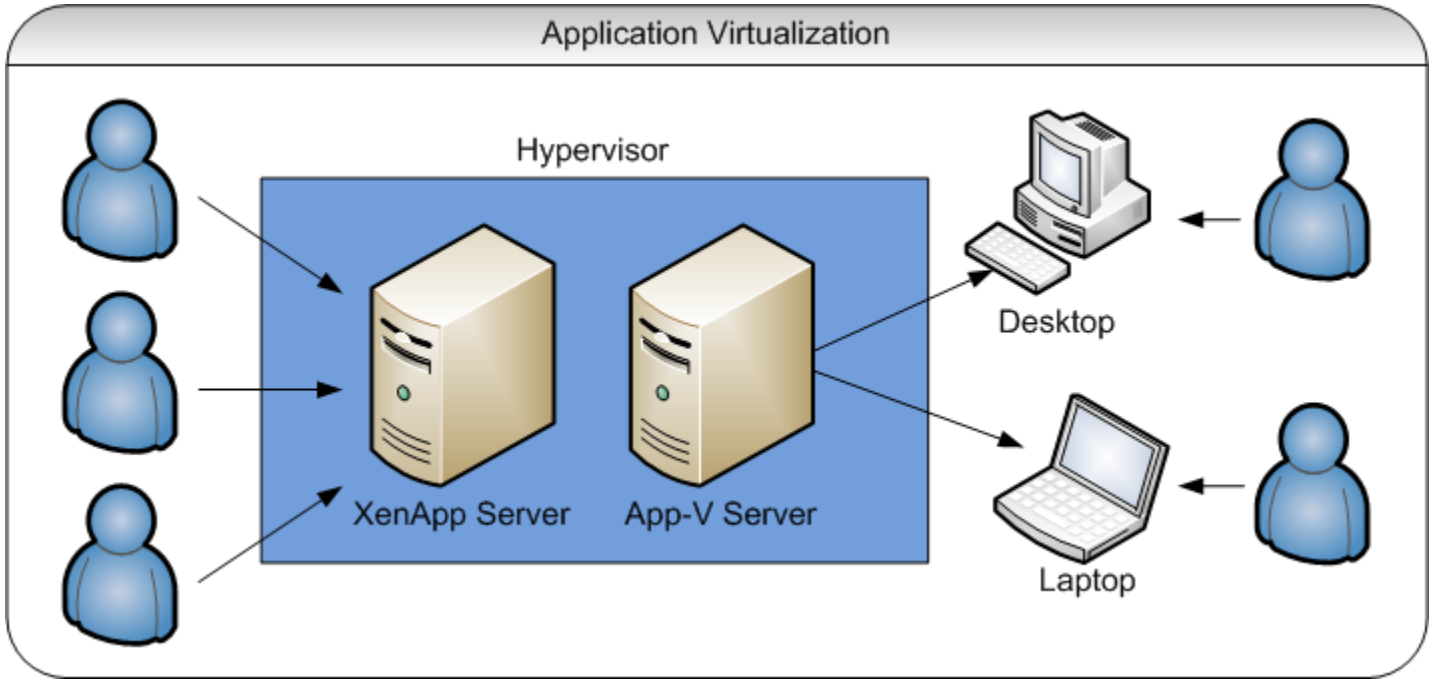
End User Virtualization Solutions



End User Virtualization Solutions

- **Application "Virtualization"**
  - Applications hosted on a central server or server farm
  - Depending on scenario:
    - User connects to application running in a Terminal Services session on the server (traditional Citrix XenApp)
    - Modular application components are streamed to local PC
  - Application delivery systems:
    - Citrix XenApp
    - Microsoft App-V and MED-V
    - VMware ThinApp

End User Virtualization



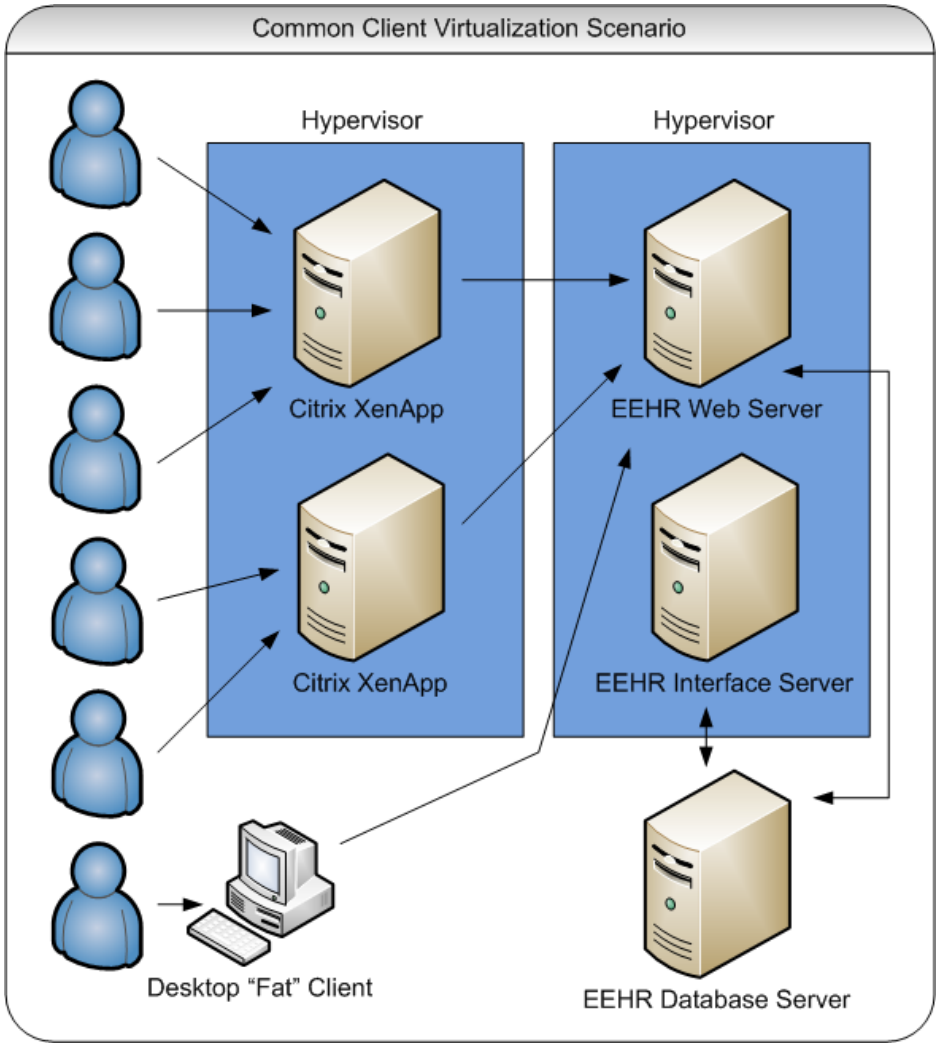
Virtualization in Practice - EEHR

- **Enterprise EHR Infrastructure Virtualization**
  - All production EEHR servers can be virtualized EXCEPT: interface, database, and fax servers
  - Virtual EEHR servers can be cloned with little fuss
  - Test environments can be fully virtualized
  - Allscripts now selling servers with Citrix XenServer (including virtual load balancer)
  - VMware vSphere in heavy use at many clients

Virtualization in Practice - EEHR

- **End User Virtualization and Remote Access**
  - "Traditional" Citrix XenApp used heavily to deliver EEHR to end users
  - Terminal Services desktops also common
  - Virtual Desktops less common
  - Eliminate issues with IE versions, Web Controls, etc. and allows easy access for end users from anywhere

Virtualization in Practice – EEHR



Questions?

Questions later?

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Slides (and more) available at

http://wiki.galenhealthcare.com/Webcasts