

Desktop Virtualization and Cloud Computing Systems Security

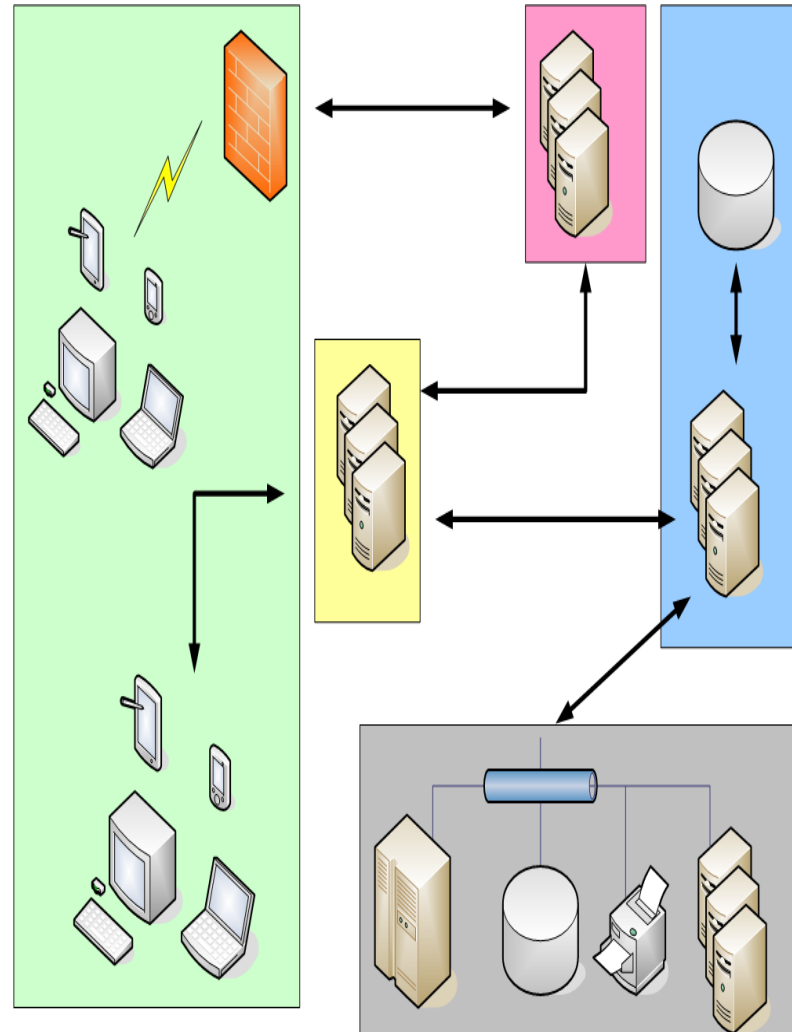
Audit Committee Item 5

July 14, 2011

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Virtual Desktop Infrastructure

- 9 Components
- How It Works



Virtual Desktop Infrastructure

VDI COMPONENTS

- Thin-Client, Browser Based, Smart Device Access
- Hypervisor
- Virtual Desktop Server
- Connection Broker
- Virtual Desktop Storage
- Remote Access Gateway
- Network
- Virtual Desktop Image
- Virtualized Applications

Virtual Desktop Infrastructure

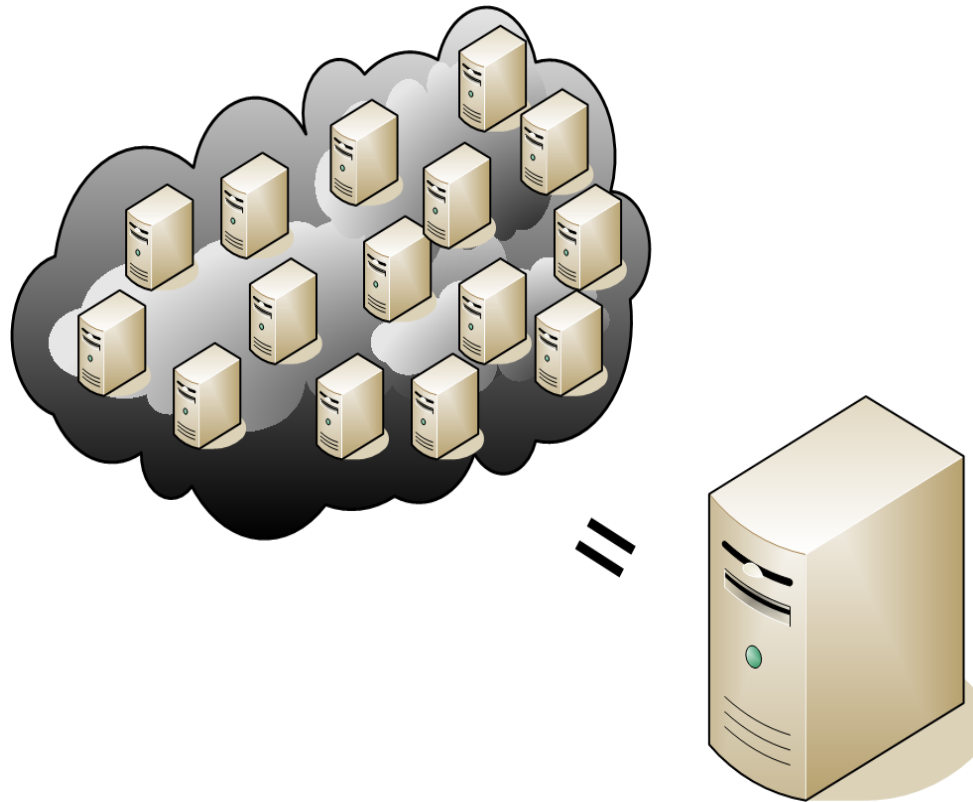
Thin-Client, Browser Based & Smart Device Access

- Thin Client – a small office device that takes the place of a PC or laptop. Small enough to be mounted to the back of the monitor.
- Browser Based Access – Java-based client that can be ran from a PC or laptop (regardless of Operating System) in order to access the VDI solution.
- Smart Device Access – Software that enables a user to access the VDI solution from a smartphone, tablet, netbook, or similar personal computing device.

Virtual Desktop Infrastructure

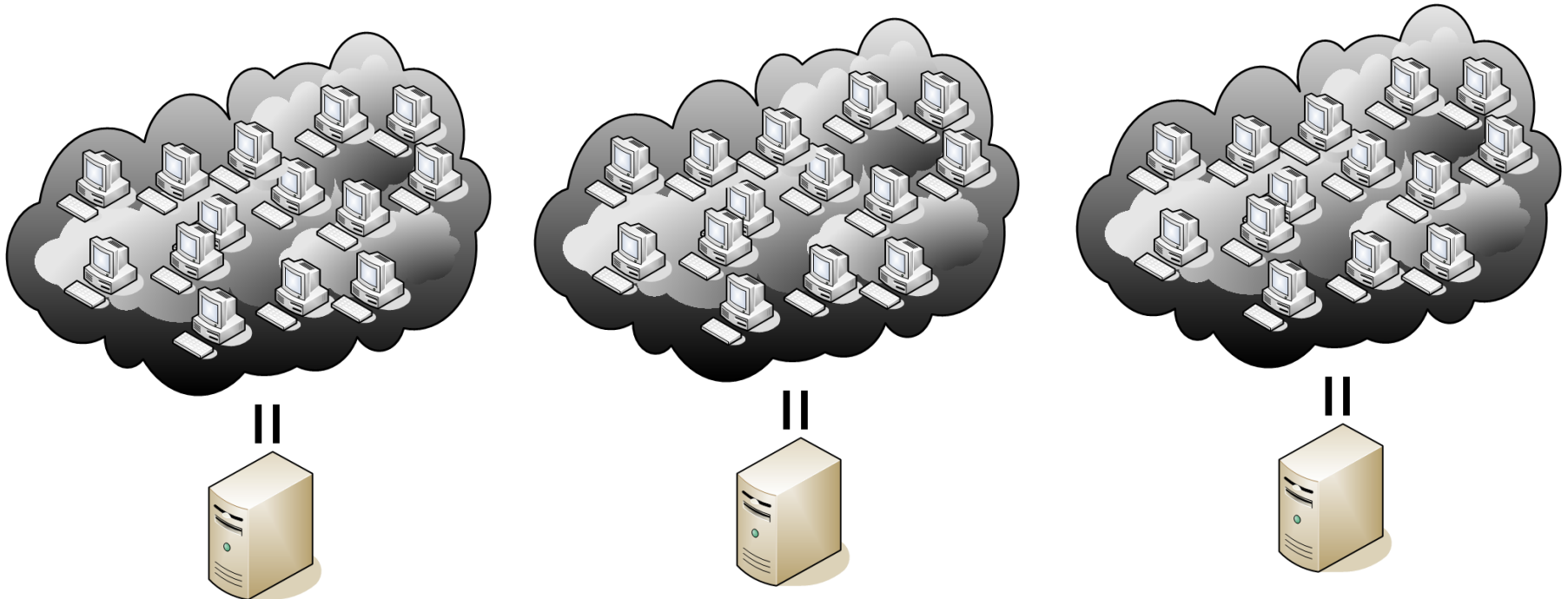
Hypervisor

- Server Software that Allows Virtualization



Virtual Desktop Infrastructure

Virtual Desktop Server
20 to 100 Virtual Desktops per Server



Virtual Desktop Infrastructure

Connection Broker

- Negotiates (Brokers) Virtual Desktop Services between VDI Servers and Clients



Virtual Desktop Infrastructure

Virtual Desktop Storage

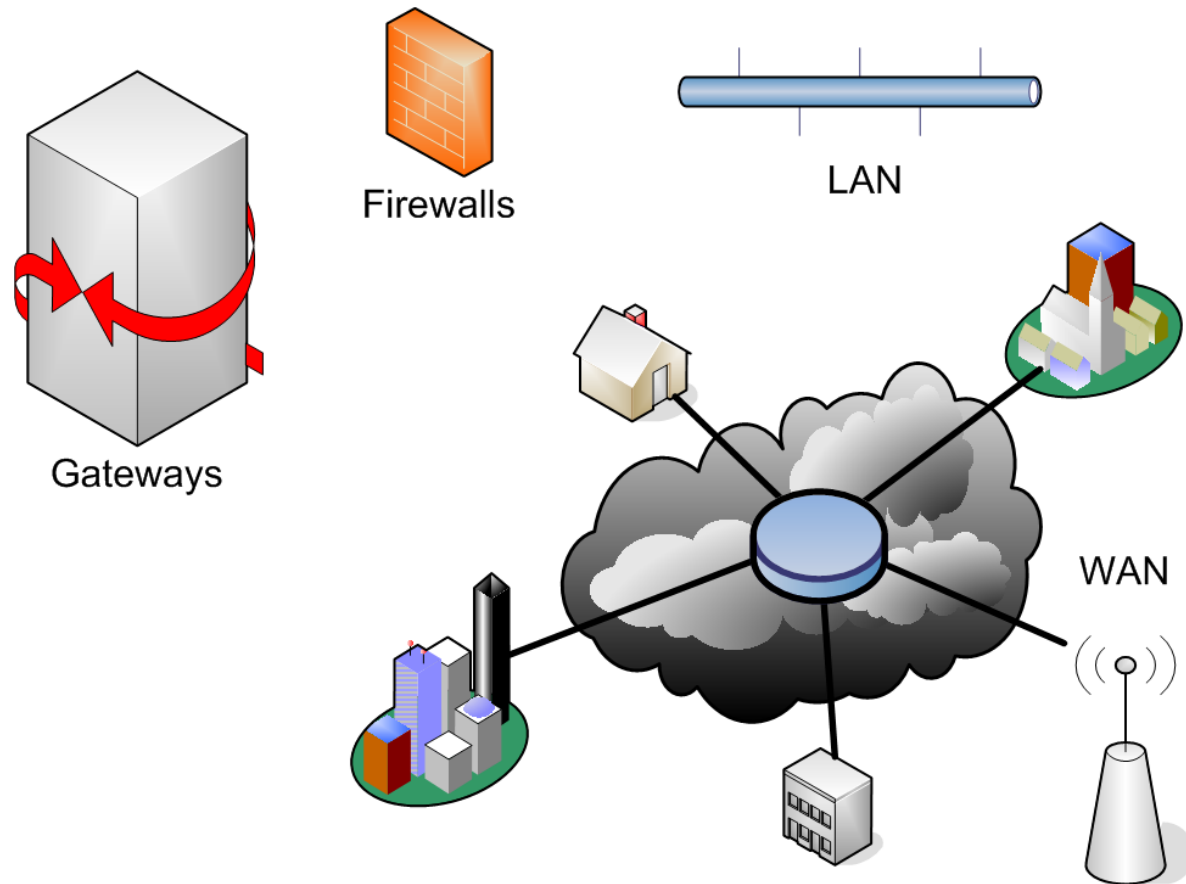
- Storage for the Desktop Software Components (Desktop Image)
- Not to be confused with Data Storage



Virtual Desktop Infrastructure

Remote Access Gateway & Network Infrastructure

- Physical and Logical Network Services including:
- LAN
- WAN
- Firewalls
- Gateways



Virtual Desktop Infrastructure

Virtual Desktop Image

- The Base Virtual Desktop Configuration
- Also known as the “Golden Image”
- Usually includes the standard applications like:
 - Microsoft Office Suite
 - Microsoft Internet Explorer

Virtual Desktop Infrastructure

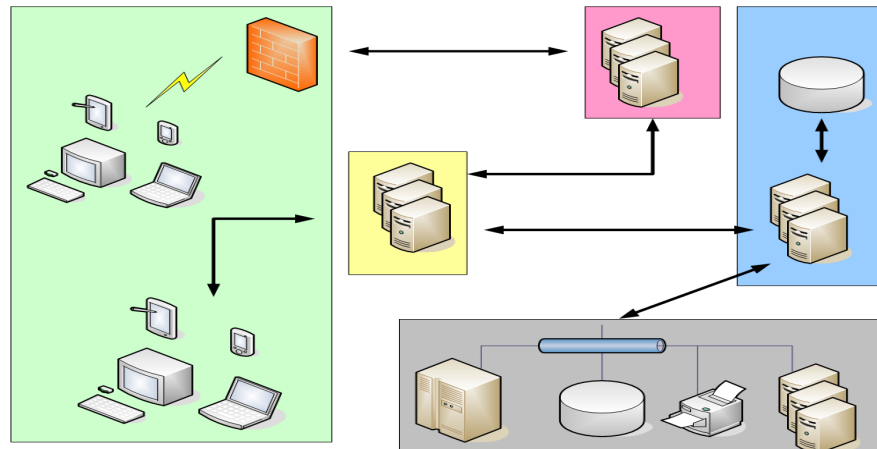
Virtualized Applications

- Applications that are Streamed, Hosted, or Extended to the Virtual Desktop
- Streamed Examples
 - Adobe Acrobat Pro and MS Project
- Hosted Examples
 - MS Visio and MS OCS
- Extended Examples
 - OpenText Right FAX, McAfee USB Manager, and Roxio Image Creator

Virtual Desktop Infrastructure

How It Works - Overview

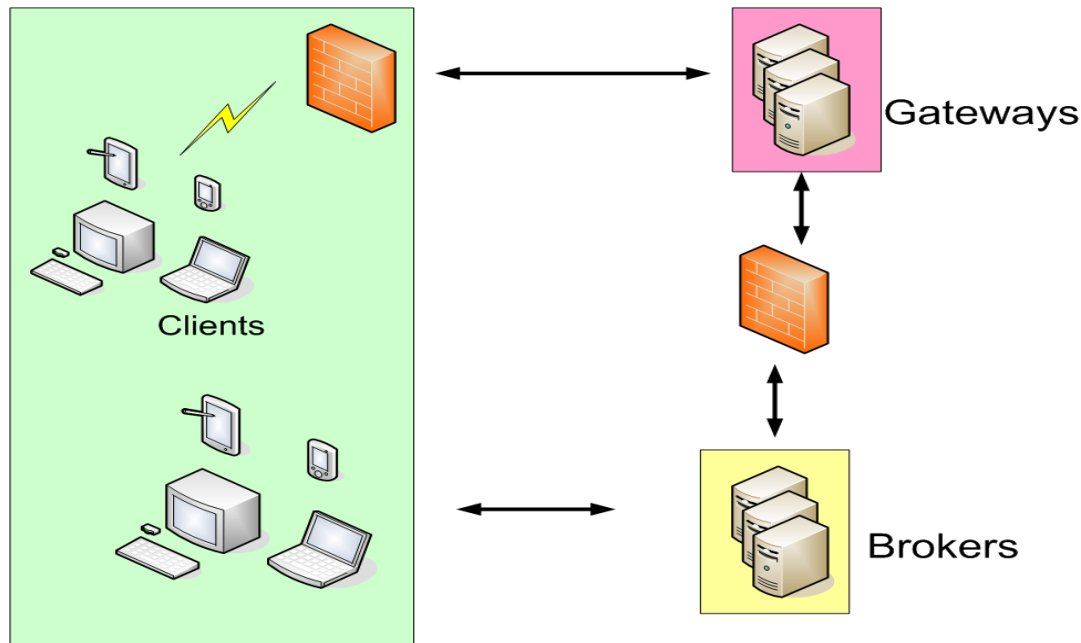
- Client requests a Desktop from the Broker
- Broker Negotiates Virtual Connections
- Broker Delivers Virtual Desktop Image to the client
- Virtual Applications are streamed to the Desktop or hosted by the Virtual Server. The Virtual Desktop can be extended to the locally installed applications



Virtual Desktop Infrastructure

How It Works – Detailed

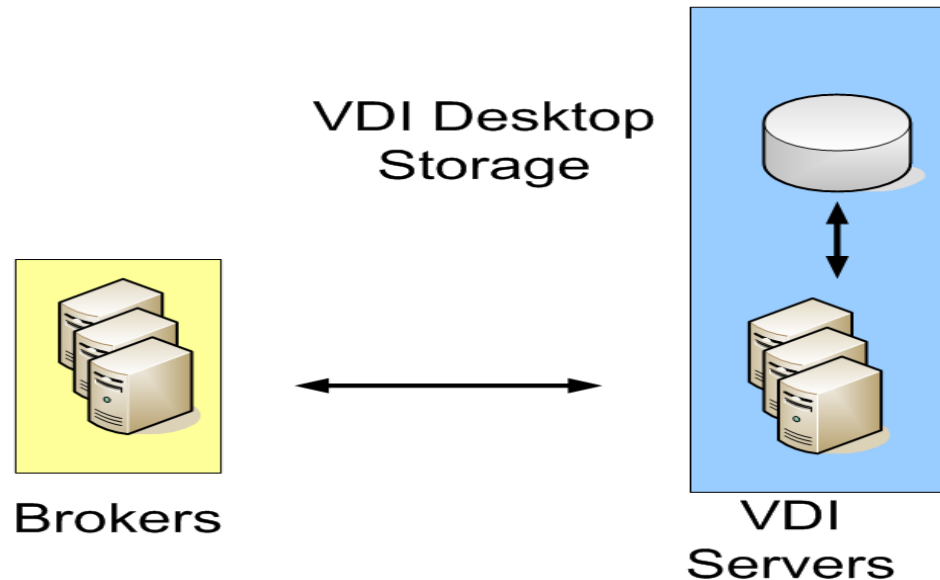
- Client requests a Desktop from the Broker
- If the Client is connecting via the Internet , it will need to pass through our firewalls & VDI Gateways



Virtual Desktop Infrastructure

How It Works – Detailed

- Broker Negotiates Virtual Connections Between Virtual Desktops and Virtual Servers
- The VDI Servers send the Virtual Desktop Images from the VDI Storage to the Clients via the Broker.



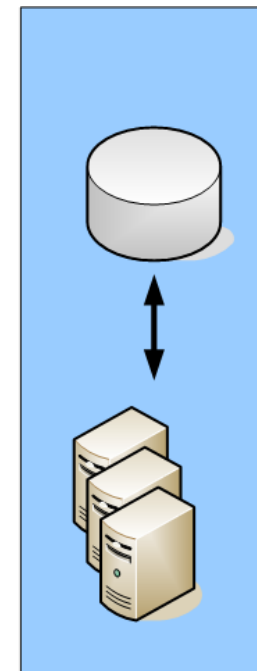
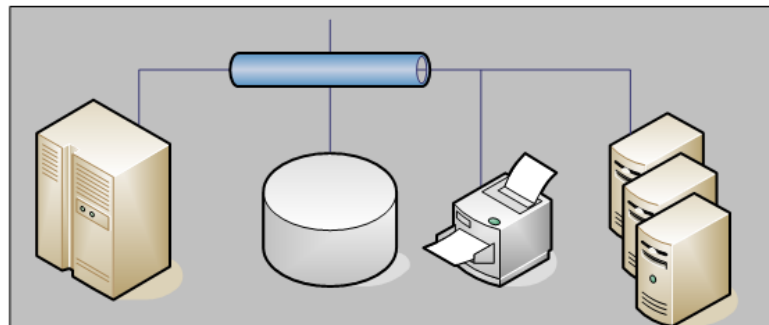
Virtual Desktop Infrastructure

How It Works – Detailed

- The VDI Servers talk with State Fund's Applications, Services, and Server on behalf of the clients via the virtual desktops.

Streamed, Hosted,
Or Extended Apps

State Fund's Apps, Servers & Services



VDI
Servers