

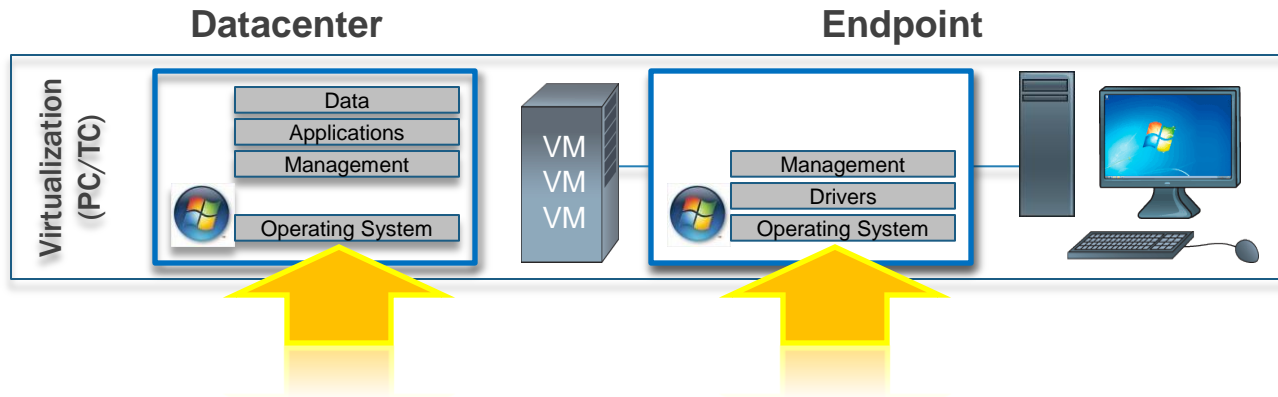


Virtual Desktop Infrastructure

Separating Backend from Endpoint

Parmeet Chaddha
EVP, Products and Technology
Pano Logic, Inc.

Barriers to Desktop Virtualization



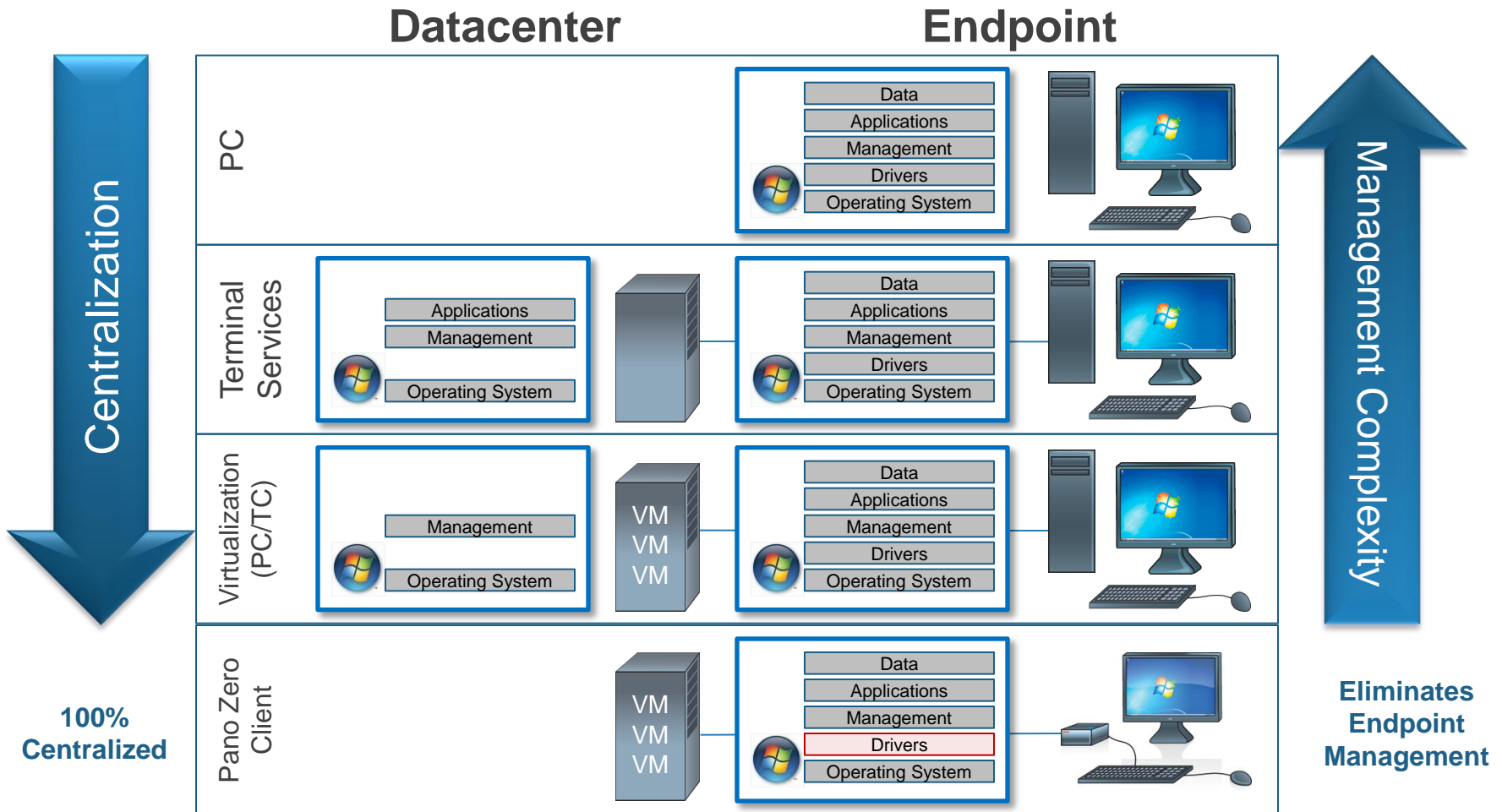
Server Virtualization

- Lower TCO
- Increased Utilization
- Standardized
- Centralized Control

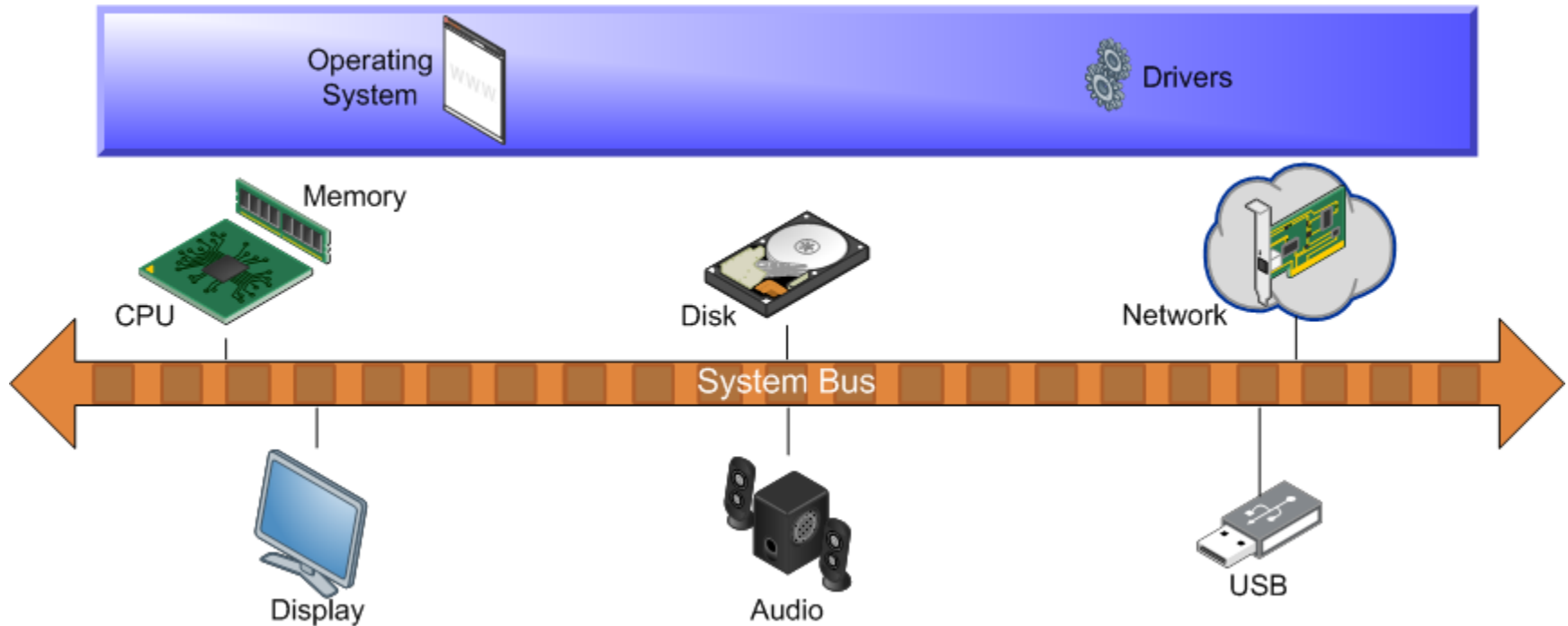
Desktop Virtualization

- Costly
- Overly Complex
- Lack of Security Controls
- Scalability

Radical Centralization or Client-Server?

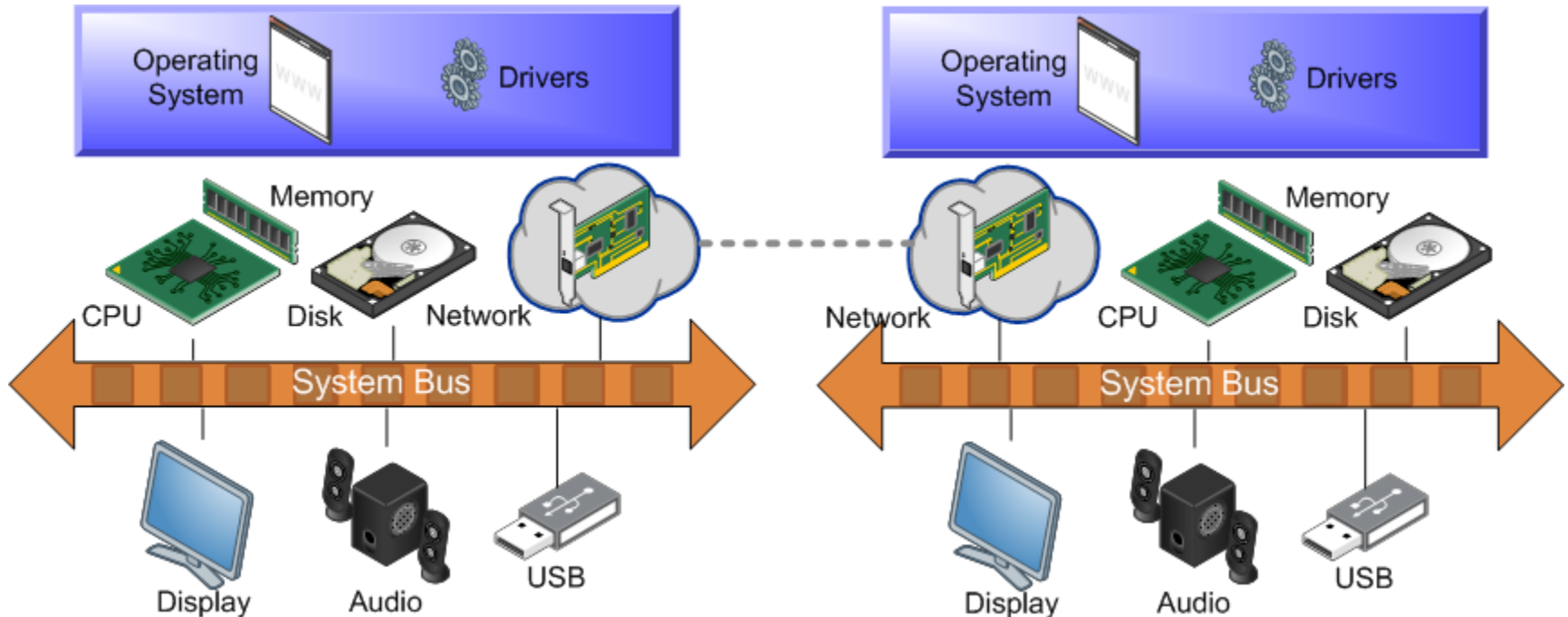


What is a PC?



PC is essentially a set of discrete computing components and I/O interfaces that are tied together by a system bus

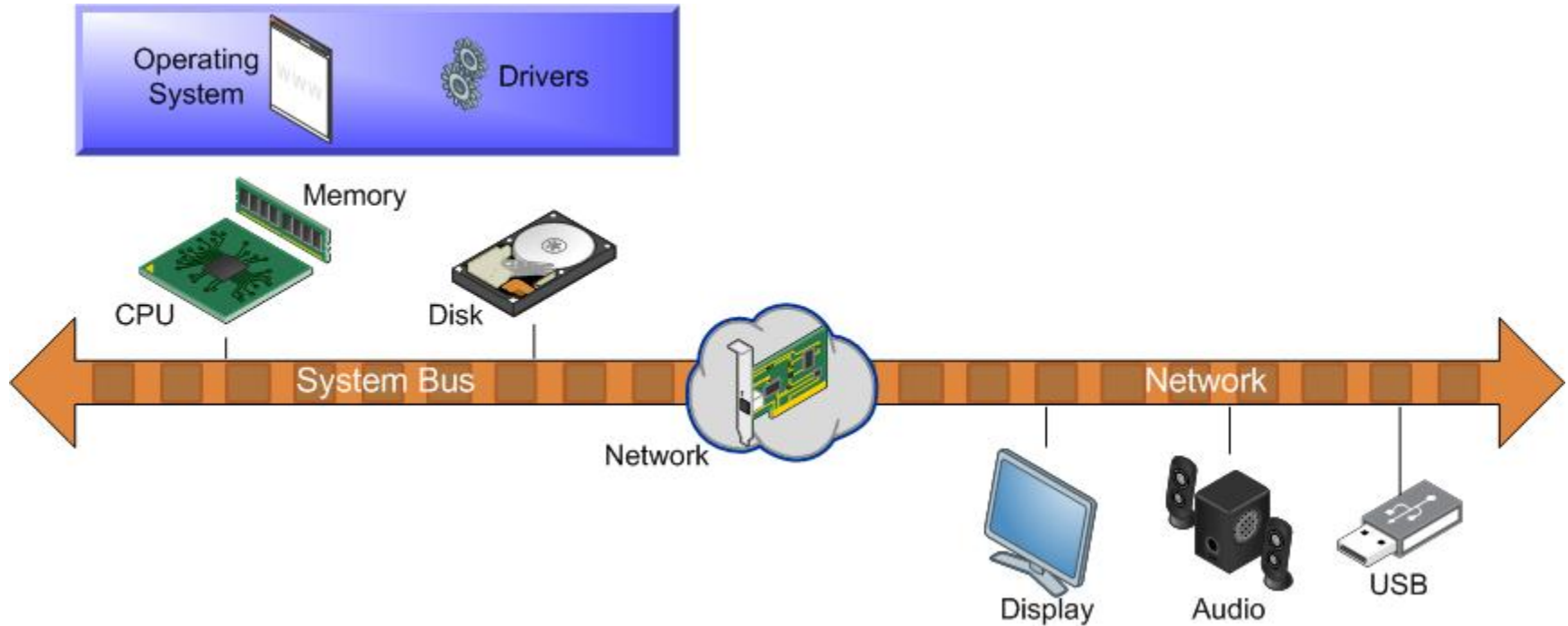
What is a Thin Client?



A Thin Client is just a stripped down PC running an application to interact with the PC in the datacenter.

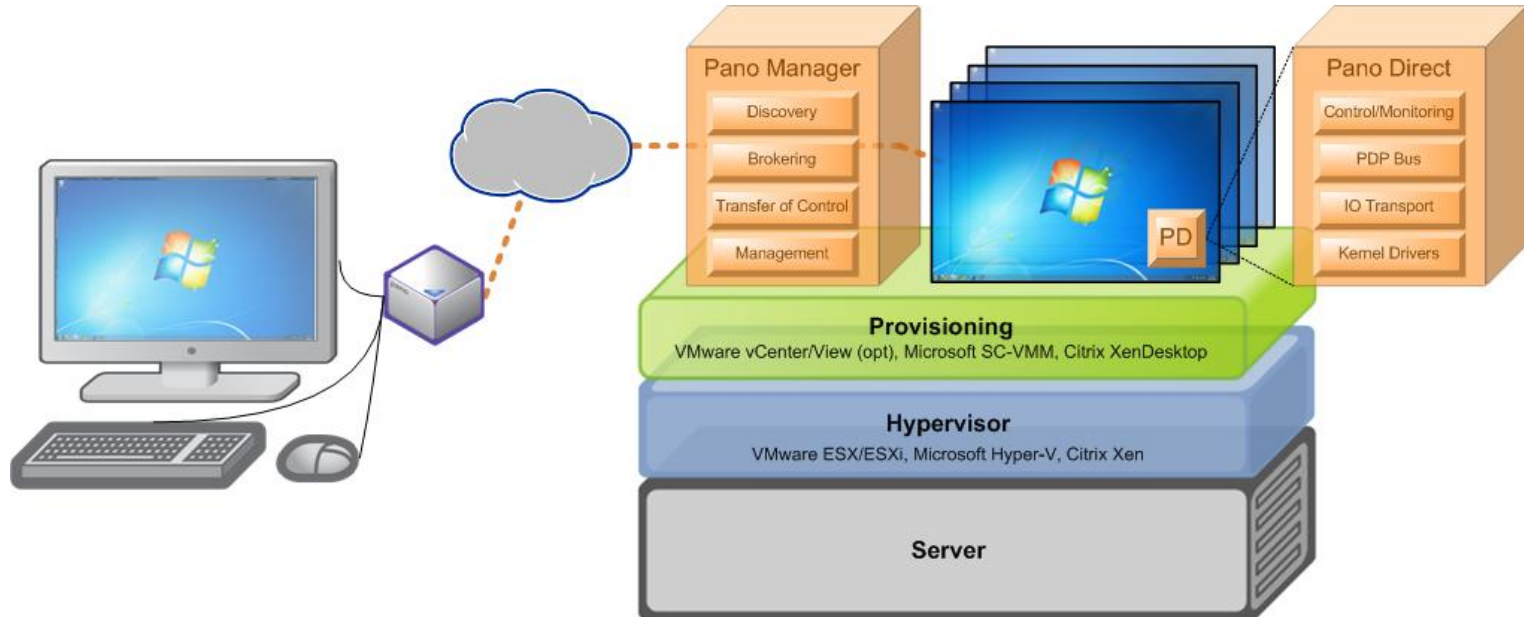
In other words, it's two PCs to do the job of one

What is a Zero Client?



A Zero Client eliminates the need for 2 PCs by stretching that PC system bus over the network, so that only the peripherals, the display, audio and USB ports are at the endpoint

Pano System



Pano Device: The only true “Zero Client” endpoint device that connects the display, input devices and other USB peripherals to the virtual desktop without requiring a local processor, operating system, drivers.....

Pano Direct: A service that runs within the virtual desktop operating system to extend the graphics and device bus across the network to the Pano Device

Pano Manager: A decomposed set of services that is the central control and connection point for all Pano Devices and the interface to the management systems of the underlying virtualization infrastructure and existing directory services

Pano System: How it works?

User workspace



← Pano Direct →

Zero Endpoint Management













- ESX / VDM / VirtualCenter
- User authentication
- DHCP Address

Server Room / Data Center



Hypervisors & Management Software

Pano Logic is the only vendor to provide interoperability with the Big 3 Hypervisors via a single endpoint

	vmware	CITRIX®	Microsoft
Device Discovery			
Connection Broker			
DVM Provisioning			
Hypervisor			

* Optional

pano
LOGIC

Pano Device

- USB
 - Four USB 2.0 ports
 - Isochronous USB supported
 - Webcams, VoIP phones, headsets, etc
- Video
 - Native Dual Monitor Support – Two DVI outputs
 - Up to 1920x1200 resolutions supported
 - EDID data from monitor passed through device to DVM/drivers
- Networking
 - RJ-45 10/100/1000* Ethernet
- Audio
 - Internal speaker
 - “Audio Out / Mic In” via 3.5mm tip-ring-ring-sleeve (TRRS) jack
 - 8-bit and 16-bit support



© Minós Osharina 2009

* Available via Pano Zero Client Reference Architecture

Pano Device

- Power
 - Modes
 - Full Power – 6 watts
 - Low Power – 4 watts
 - HSYNC turned off, allowing monitor to enter power save mode
 - “Zero” Power – <200mW
 - Information sent to Pano Manager for approval to enter sleep mode
 - Network disconnected, FPGA powered off, etc
 - Wake up with pressing Pano Button
 - Off – 0 watts
 - Occurs only when power unavailable to device
 - Power over Ethernet*
- Security
 - Keystrokes and mouse movements protected with 128-Bit AES Encryption



* Available via Pano Zero Client Reference Architecture

Pano Manager

- Self-contained Virtual Appliance
 - Configure, provision, restart, update, and retire Pano System DVMs.
- Administrator access via a web-based console
- The basic functions include:
 - Discovery and inventory of Pano Zero Clients
 - Authenticating users at login via a directory server
 - Microsoft Active Directory, Novell eDirectory, OpenLDAP
 - Connecting users to their selected DVMs
 - Provisioning new DVMs for users
 - Authorizing users and user groups to access specific DVMs
 - Monitoring the availability of running DVMs
 - Handling of the Pano Button requests to return to the login screen, restart the DVM or, for pooled collections, even get a fresh DVM

Pano Manager

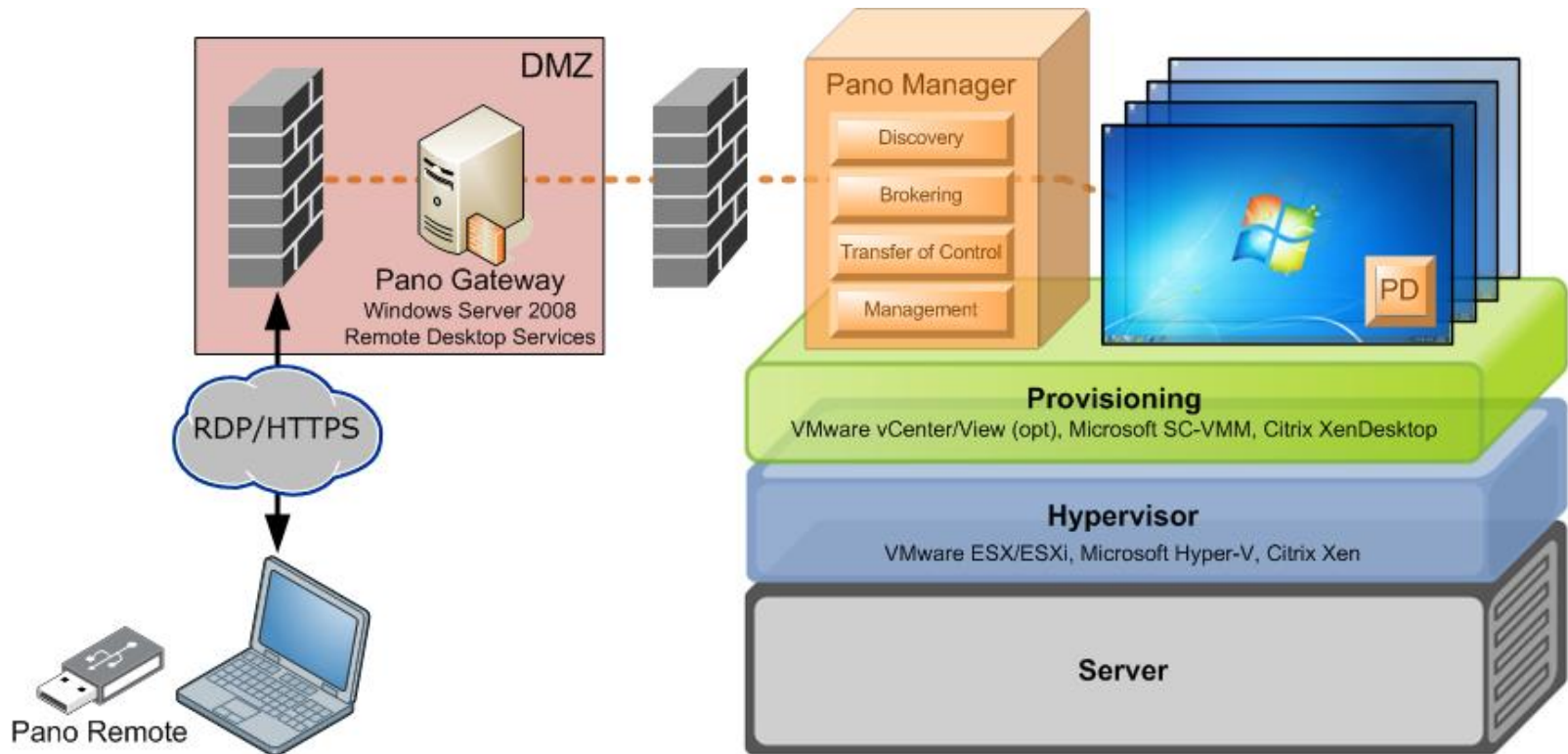
- DVM Management Features:
 - Management via User-Based Collections:
 - Permanently Assigned Desktops – with a persistent user-DVM image
 - Pooled Desktops – a group of identically configured DVMs.
 - Existing Desktops – for DVMs created by migrating physical desktops with a P2V (physical-to-virtual) tool.
 - Management via Device-Based Collections:
 - Automatic Logins – for fixed-use workstations like kiosks, where you want to automatically attach a device to a DVM without requiring a login.
 - Different Accounts w/Automatic Login – like the above collection type, but with a preset user/password used to automatically login to the DVM.
 - Windows Login – to link the DVM to a Pano Zero Client, such as when biometric or other specialized hardware is used to authenticate users on devices.
 - Management via Third-Party Provisioning and Brokering Suites
 - VMware View Manager, Citrix XenDesktop, Microsoft SC-VMM.
 - Creating and managing thresholds for available DVMs, ensuring instant access for users while managing compute and power resources by shutting down unused DVMs.

Pano Direct

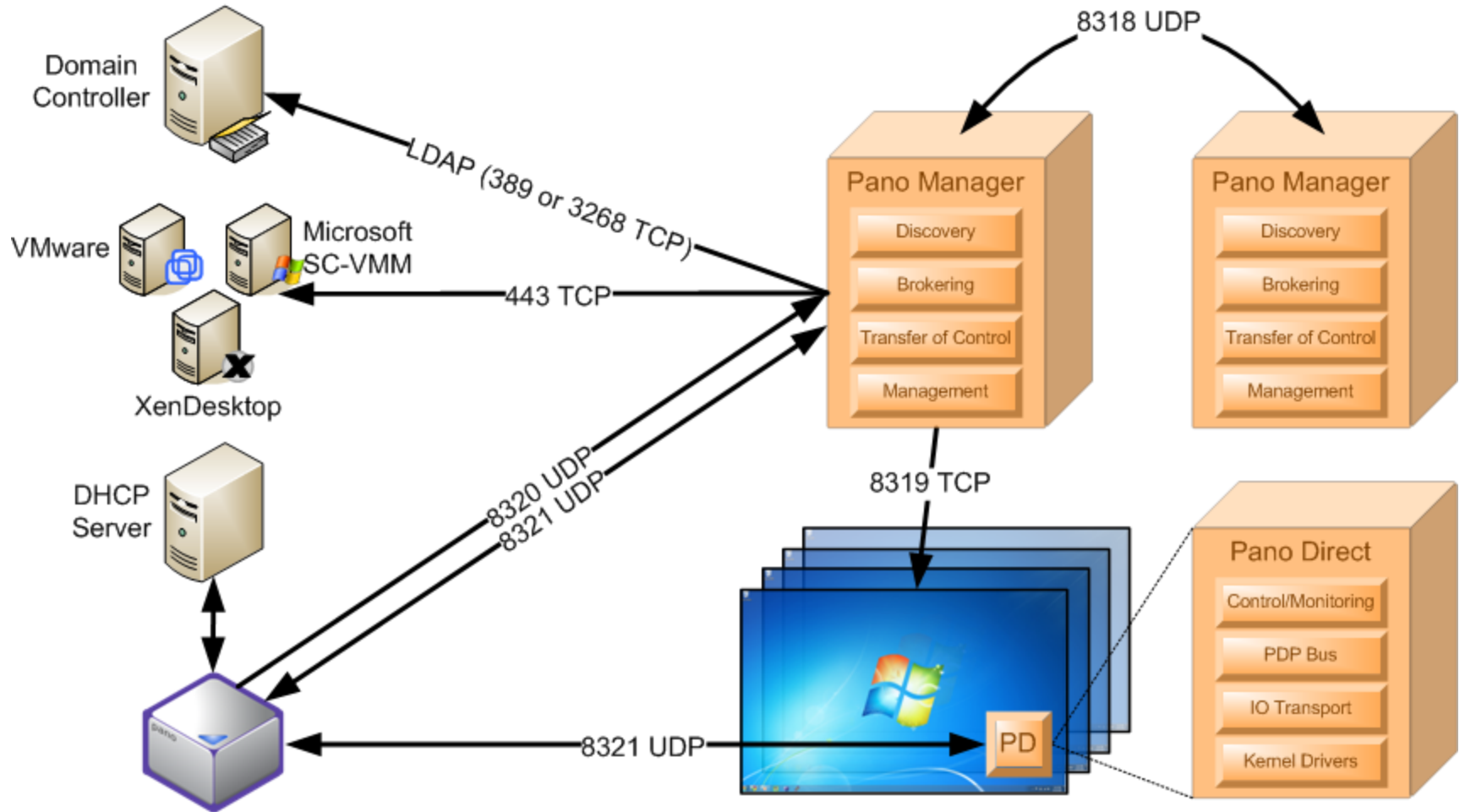
- Supports Windows 7 and Windows XP
- Native Multi-Monitor Support
- Pano Control Panel
 - Resides in the Windows taskbar
 - Allows end-user to adjust desktop settings
 - Display
 - Keyboard
 - Mouse
 - Audio

Pano Remote

Pano Remote lets you expand the reach of your Pano System virtual desktops to users anywhere (LAN or WAN)



Network Diagram



Company Profile

- Founded in August 2006
- Headquarters
 - North America: Redwood City, CA
 - EMEA: Munich, Germany
- Investors
 - Foundation Capital
 - Goldman Sachs
 - Mayfield Fund
- FY2010/11 – Doubled Revenue
- Over 250 Channel Partners
- 500+ Production Customers
- 500+ Pilot Customers
- 50,000+ Zero Client Pano Devices Shipped to Date
- Zero Client Reference Design



Thank You!