



## Alternative Client Architectures

### Delivering Applications to the Desktop

Enterprise IT departments are tasked with delivering applications, data, and services to users in a reliable, secure fashion. As the enterprise has evolved, the method for delivery has too. In today's enterprise, myriad architectural options exist for IT managers and implementers to choose from. These technologies include operating system streaming, application streaming, virtualization and isolation, Virtual Desktop Infrastructure, Terminal Server-based computing, operating system isolation, Web-based services, and many, many others. Each technology has its strengths and its challenges; and each can provide performance and cost benefits in certain situations.

| Virtual Desktop Infrastructure (VDI)                        | Terminal Server   | Operating System (OS) Streaming              | Blade PCs  |
|---|---|--|--|
|   |   |  |  |
| Desktop runs on virtualized server; UI local on thin client | Applications run on server; UI delivered over network to client | SATA over IP; runs on local fat client       | Desktop runs on Blade PC in data center; UI local on thin client |
| Shared hardware (VMs hosted on main server)                 | Shared hardware   | Blended hardware (central storage, local PC) | Unique hardware  |
| Unique OS   | Shared OS (each user has session on single OS instance)         | Unique OS                                    | Unique OS  |

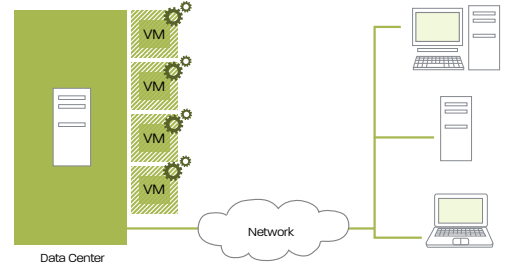
#### AMD Technology Advantages

At the core of enterprise computing, regardless of the architecture, is the server and the server processor. AMD manufactures processors with a wide range of technology options that can be tailored to enhance a variety of computing architectures.

- AMD processors support the performance and isolation requirements of the virtualization technology used in VDI and Terminal Services.
- AMD processors support the low power and memory requirements for concurrent users and applications demanded by Blade PCs and OS Streaming.

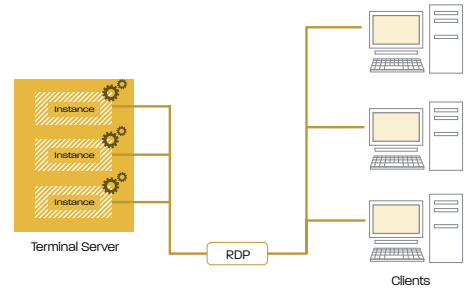
**Virtual Desktop Infrastructure (VDI)**

In the Virtual Desktop Infrastructure (VDI) model, a hardware abstraction layer (hypervisor) residing on the server creates and supports multiple virtual machines (VMs). Each VM is a unique, self-contained desktop environment that can be customized for each individual user. The isolation of user sessions on the server provides a greater level of security and manageability for the client; however, having many user sessions on a single server may provide a single point of failure—those implementing a VDI solution need to consider an adequate business continuity strategy.



**Terminal Services**

Terminal Services lets users access their desktops via sessions running on a server, much like VDI. Unlike VDI however, Terminal Services sessions are not isolated in virtual machines. Applications execute on the Terminal Server, and the graphical user interface (GUI) is delivered to the client hardware via Remote Display Protocol (RDP) or a similar technology. Terminal Services provides consolidated desktop management, but, like other server based computing architectures, it does require higher bandwidth and might act as a single point of failure.



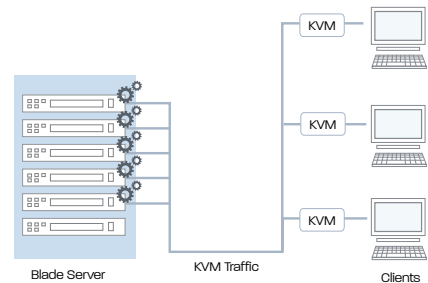
**Operating System (OS) Streaming**

OS Streaming provides the benefits of centrally managed thin clients while delivering the speed and functionality of a fully loaded PC. With OS Streaming, computers boot from an image file stored on a network server and stream only the portions of the operating system and applications that are necessary to support the user session. So, while a “full blown” instance of an operating system may exceed 1 GB in size, only a fraction of this is streamed and used on the PC at any given time. OS Streaming is useful when data security is critical, since files cannot be stored to a user’s local drive. However, for users who are remote to the network, OS Streaming may not be an ideal solution.



**Blade PCs**

With Blade PCs, the computer is moved to a data center: the CPU, RAM, and a hard drive are contained in a thin, modular circuit card placed in a centralized, secure location. Each server-side Blade PC is dedicated to a single user on the network and contains the basic PC configuration: an operating system and the standard set of applications, patches, and drivers that the enterprise requires. As with the other alternative architectures, Blade PCs provide a greater level of security and manageability; the main drawback with Blade PCs is the higher acquisition cost.



**AMD Technology Advantages**

The AMD Opteron™ processor family of server-class processors based on the 64-bit architecture is compatible with preexisting x86 32-bit architecture. AMD Opteron processors utilize Direct Connect Architecture, which helps to eliminate the challenges and bottlenecks associated with traditional front-side bus system architectures. The AMD Opteron processor introduces several new features, including quad-core upgradeability, AMD Virtualization™ (AMD-V™) technology, and energy-efficient double-data-rate two (DDR2) memory. In addition, AMD Opteron processors are designed to advance performance-per-watt (PPW) capabilities. AMD Opteron processors are a preferred platform for desktop delivery solutions, providing cost and performance advantages regardless of the architecture solution.