

Confidential

**AMD PCSG Solutions
Understanding the Thin Client Segment**

What is a Thin Client?



- (n.) A system that runs a light operating system with no local system administration and executes applications delivered over the network.
docs.sun.com/db/doc/805-4368/6j450e60t
- A low-cost computing device that accesses applications and and/or data from a central server over a network. Categories of thin clients include Windows®-Based Terminals (WBT, comprises the largest segment), X-Terminals, and Network Computers (NC).
www.e-formation.co.nz/glossary.asp
- Term given to computer platforms (hardware and software) that hold a minimal set of software and data locally. These platforms get their software and data from network servers as needed. The central storage and automated distribution of data and applications dramatically decreases the Total Cost of Ownership (TCO). It also allows one or more users to work with multiple devices at many locations with one set of data and applications.
www.faughnan.com/imr/glossary.html

What do Thin Clients look like?



Server-centric/based computing (SCC or SBC)

- Centralized hardware upgrades
- Centralized software upgrades
- Centralized maintenance
- Centralized data storage
- Centralized security



Graphics display here



**Application runs on server,
graphics sent to thin client**

Windows® 2000/2003
Citrix MetaFrame
or Linux Server

Benefits of Thin Clients



- **Security** – Thin clients and SBC technology are more secure due to centralized security access control and data storage at the server and the use of a locked down embedded OS on the client prevent tampering and loss of data.
- **Manageability** – Thin clients and SBC technology are easier to maintain due to centralized system management, remote updates, and faster application deployment.
- **Affordability** - Thin clients and SBC technology over time reduce administration cost and maintenance, yield faster application and deployment times, and experience less downtime; resulting in lower Total Cost of Ownership (TCO). Also they use 1/8th the power of a typical PC.
- **Reliability** – Thin clients use low power processors and are fan-less and disk-less with no moving parts to break. This leads to much higher hardware reliability; lower service, maintenance, and repair costs; and a longer mean time between failure (MTBF).

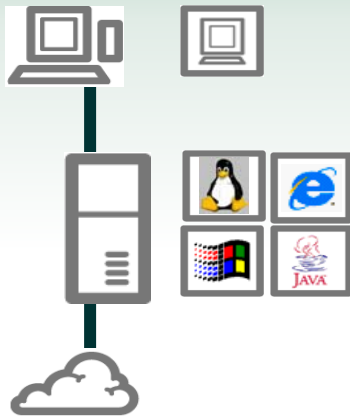
3 Main Types of Thin Clients



Entry-level

centralized
application access

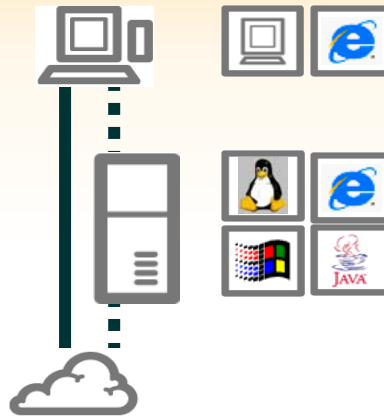
All apps run on central
server or farm



Mid-range

local browser and
media player
functionality

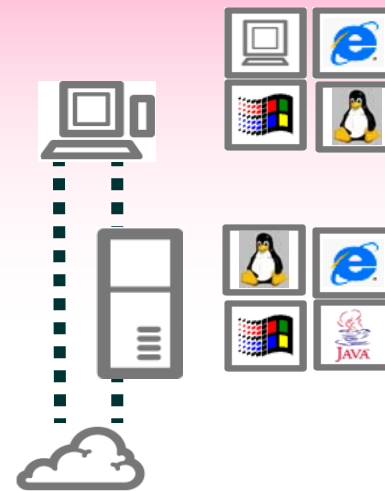
Web apps anywhere,
Windows® or Linux apps
on central server or farm



High-end

support for centralized
and local applications

Local Windows®, Linux, and
Java apps. Web apps
anywhere and additional
Windows and Linux apps on
central server or farm



Where can Thin Clients be used?



Pretty Much Everywhere!

Common vertical segments include; Healthcare, Education, Financial, Hospitality, Retail, Transportation, Manufacturing, and Government

<http://www.sccspectrum.org/>

Market Drivers to Higher Thin Client Growth



Factors driving the Thin Client and Server Based Computing Market over the next couple of years:

- Slow economy driving the need to reduce TCO in Enterprise
- Security concerns in the Enterprise and Governments
- New laws for maintaining private information - HIPPA & Sarbanes-Oxley Act
- Growth in Microsoft® Server sales (MS Server 2000 & 2003)
- Virus and security problem at the unmanaged PC desktop
- Increase demand in emerging markets
- Improved user experience of server based computing from Microsoft and Citrix
- Better remote access connectivity from wireless hotspots to cable and DSL modem in the home allow remote access to work
- 100 million PCs to be replaced in 2004/2005 according to Gartner Study

Gartner — 2Q04 Update: PC Forecast Scenarios, 2004–2005 by George Shiffler, May 18, 2004

- **Enterprise solution providers/Server providers**
 - Their business is based around the server, its software and services
 - Thin clients will be bundled as part of the total solution
 - **HP, IBM, SUN, Fujitsu, Siemens, etc.**
- **Traditional Thin Client providers**
 - Their business is selling the terminal with value added software
 - **Wyse, Neoware, IGEL, etc.**
- **Thin Client ODMs, etc.**
 - Their business is designing and manufacturing low-cost thin clients for the other two
 - **BCOM, Visionbank, TUL, SmartInfo Tech, etc.**

AMD's Value Proposition



- Highly integrated x86 performance solutions with the AMD Geode™ GX processor to reduce system cost, power and size
- Leverage 7th generation AMD Athlon™ technology with the AMD Geode™ NX processor to deliver fanless operation for the highest thin client performance today
- Deliver complete embedded product line to address the full range of thin client performance needs
- Deliver an end-to-end solution from the AMD Geode™ processor on the client to the high performance 64-bit AMD Opteron™ processor on the server
- Ability to provide a complete optimized thin client reference platform
- System-level expertise
- World class technical support
- Strong brand recognition

- **Can a PC be a thin client?** Yes, you can install a software client that allows a connection to the server. You can use an old machine like a 486 x86 machine and migrate slowly to thin clients as they die or burn up.
- **What is a fat client?** A fat client is often referred to as a traditional full blown PC with all applications running locally and local storage.
- **How many thin client users per server?** This really varies by the application on the servers, but for typical office productivity applications anywhere from 30-50 users per processor. Most server manufacturers like HP will publish scalability documents on Microsoft® Terminal Services and Citrix MetaFrame
- **Are thin clients similar to green screen terminals?** Yes, in the sense they can run applications on the servers. Actually thin clients are an excellent replacement for green screens with the ability to access mainframe apps via software emulation plus have access to traditional business productivity apps.

- **Can a thin client be faster than a PC?** Yes - In some cases, since the servers are doing all the work with high performance server processors like the AMD Opteron™ processor. Also large memory resources on the server allow applications to run out of server memory and execute faster than some PCs with limited resources.
- **What is the common OS on a thin client?** – Thin clients run embedded OS like Microsoft® Windows® CE and XP Embedded, and Linux. Windows CE is the most popular OS for thin clients due to the smaller OS footprint and licensing cost.
- **What's holding back wider adoption of thin-client computing?** The biggest two things holding back thin client adoption is the awareness and benefits of the technology.
- **What happens if the network goes down?** This is a common concern, however, it is typically uncommon for networks to go down compared to PCs – very much like the phone company.

- **What are common thin client protocols?** Common thin client protocols that compress the data stream are the Microsoft® (RDP) Remote Desktop Protocol and Citrix (ICA) Independent Computing Architecture protocol. There are two other remote access protocols called VNC and remote X, but they use more network bandwidth compared to RDP and ICA.
- **What is the typical thin client life span?** The typical life span of a thin client is thought to be around 5-7 years compared to 2-4 years for a PC.
- **Do thin clients and server based computing have any disadvantages?** Yes, there are some areas that thin clients and SBC do not typically perform or scale well which include the following: video editing, 3D oriented games (like Doom3), 3D engineering software, and jobs that require off network work (like a sales laptop).

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