



HP Compaq t5000  
Thin Clients

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Competitive  
Analysis

# Thin Client Server Computing: Benefit Analysis

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## **Abstract**

This paper examines the benefits associated with implementing a thin client server computing (TCSC) solution.

## **Executive Summary**

Today's information technology administrators must get as much value for their dollar as possible. They require rapid deployment, easier management of PCs, and uniformity of products. IT professionals demand easy access to technology, as well as more services and solutions that free up their resources. Quality, reliability, compatibility, and value are especially important attributes in the commercial marketplace. From these general requirements, customer needs become more refined and highly differentiated as they branch out to specific areas of usage.

## **Thin Clients Save Money**

The unique advantages of the TCSC model over traditional desktop computing clearly represent a significant opportunity to reduce the annual hard and soft costs for managing a network. Highly consistent and stable, thin clients connect to a server where all processing and storage occurs. Thin clients are positioned according to customer requirements and benefits, rather than by specific product features. These features significantly differentiate the TCSC model from traditional desktop computing solutions.

## **Thin Client Server Computing versus Unmanaged Desktops**

The typical computing solution for most enterprises is an unmanaged network. Unmanaged PC computing has its advantages: user autonomy, the ability to work independent of a network, and the ability to utilize graphics-intensive applications. However, unmanaged computing has significant drawbacks that lead to higher costs: lower security, increased downtime, and increased soft costs. Users are able to add, delete, and modify programs and data. Diskette drives allow for users to remove confidential data and load (intentionally or otherwise) harmful viruses.

Companies that are able to utilize a thin client server computing solution are able to reap substantial savings and benefits versus companies that use traditional PC-based computing solutions. Consider some of the traditional pitfalls that commonly occur in an unmanaged computing network:

- Hard drive crashes resulting in data loss and user downtime
- Costly service calls to repair hardware and solve software problems
- Multiple images on different PCs leading to a different set of problems for each machine
- Theft of equipment
- Theft of data
- Applications are not standardized
- Version control is difficult to maintain
- Increased time spent deploying software and upgrades
- Difficulty establishing uniform standards in complex business environments, such as post-merger companies

Companies may be forced to spend thousands of dollars every year on technical support, hardware replacements, and service calls. Industry standard estimates for such costs are as high as \$8000 per PC per year.<sup>1</sup> The costs associated with maintaining a thin client network are significantly lower than that of a PC network due to the inherent strengths of the TCSC model.

<sup>1</sup>Distributed Computing Benchmarks Analysis, Gartner Group 2001

## The Thin Client Advantage

The TCSC model provides global integration that can significantly lower the cost of ownership to customers looking for mission-critical, centralized server-based computing with maximum security, standardized desktop deployment, and 100% remote client management tools. Here is a list of the major benefits offered by thin clients:

- Rapid device/application deployment
  - Application upgrades are deployed to a single server instead of hundreds or thousands of individual PCs.
  - Because individual thin clients can be configured from a central location, it takes minutes instead of hours to deploy a new client.
- Simplified IT management
  - Applications are typically deployed on the server and merely accessed by the thin client, which can dramatically reduce the amount of time the administrator must spend on client management.
  - Data is automatically backed up for users.
  - Users cannot access or corrupt system files.
  - Network administrators can manage clients remotely.
  - Due to the relatively small client images used on thin clients, complete remote re-imaging becomes a viable solution to a local client problem. This solution may reduce the amount of time an administrator spends diagnosing problems.
- Increased reliability and security
  - Fewer maintenance events and less down time due to no moving parts to fail.
  - Fewer conflicts and configuration issues and reduced threat of viruses or data theft as a result of no removable media.
  - Because data is stored on network storage, the potential of data loss due to a hard drive crash is reduced.

## Best Practices

A best practice is a group of tasks that optimizes the efficiency or effectiveness of the business discipline or process to which it contributes. In "Best Practice Descriptions: 6 Major Process Categories TCO Distributed Computing Assessment" the Gartner Group classifies these best practices into six major process categories: Change Management, Operational Management, Asset Administration, Technology Planning and Process, Customer Service, and Training. The functionality and structure of thin client devices force them to conform to all software and hardware related Process Categories. This minimizes the number of decisions network administrators must make, allowing them to focus on procedural and non-technological Best Practice processes. The following sections illustrate how thin clients adhere to these best practices:

## Change Management

Change management is defined as technical support for installs, moves, adds, changes and removals of networks, systems, and system components. These activities are planned and scheduled, and are done on a proactive basis

Best Practice Process Category	TCSC Solution	Summary
<p><b>Deployment (installs/adds/changes)</b></p> <p>Deployment includes installing new or upgraded hardware and software, and introducing these devices and applications into service.</p> <p>Enterprises that implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Use technology to minimize labor</li> <li>■ Communicate the impact of change to end-users and business management</li> <li>■ Consolidate repetitive functions</li> <li>■ Minimize the impact of deployment on the end-user</li> </ul>	<p>The TCSC model allows a network administrator to deploy images and software locally to a server, which can be accessed by multiple thin client devices. The TCSC solution can reduce the time spent delivering upgrades and user downtime since applications don't have to be deployed on individual clients.</p>	<p>TCSC solution helps meet best practice standards.</p> <p>See section "HP and TCSC Best Practices" later in this paper to learn how HP further meets this requirement.</p>
<p><b>Retirement and Moves</b></p> <p>Retirement involves the decommissioning and disposal of outdated, redundant or non-standard hardware and software. Moves involve the physical relocation of equipment from one location to another. Moves may also involve the transfer of individuals or assets from one organization to another.</p> <p>Enterprises that implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Integrate these functions with an asset management process</li> <li>■ Ensure minimal disruption to end users</li> <li>■ Have and follow formal procedures</li> </ul>	<p>The operational lifespan for a thin client is longer because a thin client is a solid-state device.</p> <p>Since all data and applications reside on the network, moves can be accomplished quickly and easily.</p> <p>There is no PC staging or hard drive management for, which means that new clients can be up and running in minutes.</p>	<p>TCSC solution helps exceed best practice standards.</p>
<p><b>Change Management Technology &amp; Process</b></p> <p>Tools that automate and minimize the labor involved in making changes to hardware and software.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Minimize IS and end-user labor</li> <li>■ Ensure quality and reliability of the change management process</li> </ul>	<p>Because software can be deployed to servers and accessed remotely on thin clients, there is little to no disruption to the end user. The administrator is able to configure user and network settings remotely.</p>	<p>TCSC solution helps exceed best practice standards.</p> <p>See section "HP and TCSC Best Practices" later in this paper to learn how HP further exceeds this requirement.</p>

## Operational Management

Operational management is defined as technical support for the recurring, day-to-day activities that are required to keep networks, applications, systems and system components functional and operational.

Best Practice Process Category	TCSC Solution	Summary
<p><b>Virus Protection</b></p> <p>Tools, processes, and procedures that prevent virus attacks and/or ensure recovery after virus attacks.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Eliminate manual intervention in the virus detection process</li> <li>■ Protect both the desktop and server from viruses</li> <li>■ Have good follow-up activities once a virus is found</li> </ul>	<p>Because there's no data on the thin client, there's no risk of a virus attack on mission critical data on the client.</p> <p>Additionally, administrators can ensure the server is firewalled and virus protected.</p> <p>Virus protection will vary from one operating system to the next. Please check with the software manufacturer for more information.</p>	<p>TCSC solution helps meet best practice standards.</p>
<p><b>Data Management</b></p> <p>Involves back-up, restore, and repository services for client and server data.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Centralize data management</li> <li>■ Use automated tools</li> <li>■ Minimize labor for the user</li> <li>■ Integrate the backup, restore and storage management processes</li> </ul>	<p>In server-based computing with thin clients, critical information is stored on network storage, automating data backup with no end user labor.</p>	<p>TCSC solution helps exceed best practice standards.</p>
<p><b>Performance Monitoring and Event Management</b></p> <p>Processes and activities that allow IS personnel to either prevent problems or to detect them at an early stage.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Deploy problem detection technology</li> <li>■ Integrate problem detection tools with other systems management schemes</li> <li>■ Use redundant systems</li> </ul>	<p>Thin client management software allows network administrators to remotely browse, diagnose, and repair problems without leaving their desks.</p> <p>Since all software resides on the server and a common image is deployed to all thin clients, troubleshooting is greatly simplified.</p> <p>Thin clients are inherently redundant. Each thin client device on a TCSC network provides an identical user experience.</p> <p>Load balanced servers can increase uptime and reliability.</p>	<p>TCSC solution helps exceed best practice standards</p>

<p><b>Security</b></p> <p>Policies and procedures that ensure the protection of data and assets</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Use tools and procedures that ensure proper access to data</li> <li>■ Use tools and procedures that prevent asset removal or tampering</li> </ul>	<p>Because all data resides on the server, end users typically cannot remove data or destroy it unintentionally.</p>	<p>TCSC solution helps exceed best practice standards.</p>
<p><b>Standards Compliance</b></p> <p>Methods used by IS organizations to ensure that all clients conform to the standard configuration.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Manage diversity in client configurations, while providing flexibility for users.</li> </ul>	<p>Thin clients allow administrators to choose what images and software can be deployed to the server and accessed by the thin clients. This ensures that clients all conform to standards set out by a company or organization.</p>	<p>TCSC solution helps exceed best practice standards.</p>
<p><b>Repair and Maintenance</b></p> <p>The day-to-day maintenance of equipment and the restoration of equipment to a functioning state.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Exploit warranty repairs</li> <li>■ Reduce user downtime from equipment failure</li> </ul>	<p>Because thin clients have no moving parts, they are more reliable mechanically than PCs. As a result, they rarely break down or require a service call. If a client becomes inoperable for some reason, it can be quickly and easily replaced. Since data, applications and user settings residing on the network, a user can be up and running in minutes with no loss of data and no need to reconfigure their system settings.</p>	<p>TCSC solution helps exceed best practice standards.</p> <p>See section "HP and TCSC Best Practices" later in this paper to learn how HP further exceeds this requirement.</p>

**Asset Administration**

Asset administration is defined as administrative support for acquiring and tracking systems and system components, and for managing relationships with external service providers.

Best Practice Process Category	TCSC Solution	Summary
<p><b>Hardware Inventory Management</b></p> <p>The creation and maintenance of an up-to-date record of hardware installs, moves, adds, changes, removals and final disposal. The record contains information for locating, assessing, auditing, troubleshooting, counting, and assigning equipment, or performing other technical and business functions, without the need to repeatedly visit the hardware location or reassemble data records.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Have an up-to-date hardware inventory</li> <li>■ Integrate hardware inventory data into other IT and corporate systems</li> </ul>	<p>Unlike a PC, a thin client device is not designed to be reconfigured by an end user. As a result, hardware configurations should all be uniform and therefore, easy to track.</p>	<p>TCSC solution helps meet best practice standards.</p>
<p><b>Software Inventory Management</b></p> <p>The creation and maintenance of an up-to-date record of software installations, upgrades, removals and final disposal, as well as the terms, conditions and status of software license agreements. The record contains information for locating, assessing, auditing, troubleshooting, and counting, or performing other technical and business functions, without the need to repeatedly visit the software location or reassemble data records.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Have an up-to-date software inventory</li> <li>■ Integrate software inventory data into other IT and corporate systems</li> <li>■ Use software inventory records to make purchasing/upgrade decisions</li> </ul>	<p>Network administrators can track software inventory including:</p> <ul style="list-style-type: none"> <li>■ System information: name, contact, location, OS type</li> <li>■ MAC/IP/DNS/WINS addresses, Domain name, network speed</li> <li>■ Applications, including name, version, vendor</li> </ul>	<p>TCSC solution helps exceed best practice standards.</p>

<p><b>Lifecycle Management</b></p> <p>The determination of an asset’s useful life, including planning for the installation, upgrade, and removal/disposal of the asset, and executing on the plan. An asset may be a piece of hardware (to the level of granularity that the hardware inventory is maintained) or software (to the degree that discrete license inventory is maintained).</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Minimize variability in configurations by putting policies and procedures in place to retire older assets</li> </ul>	<p>Although this is a policy issue, it is important to note that thin client devices have no moving parts and therefore have a longer useful lifespan than PCs. Thus, retirements are likely to be less frequent.</p> <p>With thin clients, all configurations in the box should be the same so it’s easy to minimize variability in configurations. Because these configurations are standardized, upgrades and retirements become more uniform.</p>	<p>TCSC solution helps exceed best practice standards.</p>
<p><b>Procurement</b></p> <p>The buying of hardware, software and services.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Determine requirements</li> <li>■ Automate repetitive tasks</li> <li>■ Prevent unauthorized purchases</li> <li>■ Leverage the purchasing process</li> </ul>	<p>Procedural decision to be followed by IT department.</p>	<p>Not applicable for standard TCSC solutions.</p> <p>See section “HP and TCSC Best Practices” later in this paper to learn how HP meets this requirement.</p>
<p><b>Vendor Management</b></p> <p>The practice of selecting and contracting with hardware, software and service providers, and establishing and managing vendor relationships, including defining the criteria for vendor selection and determining the service levels required. Vendor management typically involves negotiating and defining terms and conditions, service levels, points of contact, rules of engagement, problem resolution, escalation procedures, and discount structures.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Consider their vendors’ strategic partners</li> <li>■ Maximize their use of service level agreements (SLA)</li> </ul>	<p>Procedural decision to be followed by IT department.</p>	<p>Not applicable for standard TCSC solutions.</p> <p>See section “HP and TCSC Best Practices” later in this paper to learn how HP meets this requirement.</p>

## Customer Service

Customer service is defined as customer-facing activities that help manage customer relationships and provide assistance with service issues. Dispatched technical support for troubleshooting and other problem resolution activities is not included in this category.

For the customer service process, the scope is reflected as the percentage of the user population that is covered by each response. Within customer service, the percentage of the user population covered by service desk-related practices is generally associated with the number of service desks in the organization. For example, if you have a single service desk, the scope of the user population covered by each response is typically either 0% or 100%.

Best Practice Process Category	TCSC Solution	Summary
<p><b>Service Desk Technology &amp; Process</b></p> <p>The technologies deployed by your IT service desk(s) to increase efficiency and improve service levels.</p> <p>The processes used by your IT service desk(s) to increase efficiency and improve service levels.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Minimize IS and end-user labor</li> <li>■ Ensure quality and reliability of the problem management process</li> </ul>	<p>By nature, the TCSC model highly streamlines your service desk:</p> <ul style="list-style-type: none"> <li>■ Because administrators can deploy controlled images on servers, service desk staff will be more familiar with the typical user's issues than they would in an unmanaged desktop environment. This should decrease troubleshooting, reduce costs, and increase customer satisfaction.</li> <li>■ Image is administrator controlled and accessible from any terminal.</li> </ul>	<p>TCSC solution helps exceed best practice standards.</p>
<p><b>Marketing and Relationship Management</b></p> <p>Processes, techniques, and methods used to improve the relationship between the IS organization and the business areas, provide an IT-face to the user community, and increase customer satisfaction with IT services and systems.</p> <p>Enterprises who implement best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Increase customer satisfaction</li> <li>■ Improve alignment of business and technology goals and objectives</li> </ul>	<p>Since thin clients are highly reliable and easy to replace in the event of a problem, end user satisfaction should be higher than those working in an unmanaged desktop environment.</p>	<p>TCSC solution helps meet best practice standards.</p>

## Training

Training is defined as the formal learning required to equip both end-users and IS personnel with the technical skills they need to perform their jobs.

Best Practice Process Category	TCSC Solution	Summary
<p><b>End User Training</b></p> <p>End user training improves users' ability to understand and utilize IT resources, including systems, processes and applications.</p> <p>Enterprises with best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Track and understand user skills</li> <li>■ Institutionalize end-user training to ensure that it always happens</li> <li>■ Offer a variety of training mechanisms</li> </ul>	<p>End users will require little specialized training to operate thin clients. The user experience is similar to a traditional PC for typical applications.</p> <p>Since there is a high degree of control of the deployed server image, it is easy to determine and develop consistent training material.</p> <p>A controlled server image means that it is easier to set requirements for training and therefore, easier to develop training material for end users.</p>	<p>TCSC solution helps exceed best practice standards.</p>
<p><b>IS Training</b></p> <p>IS training improves the skills and knowledge of IS personnel, enabling more effective support of the IT infrastructure and end user community.</p> <p>Enterprises with best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Track and understand IS staff skills</li> <li>■ Institutionalize IS staff training to ensure that it always happens</li> <li>■ Link training to professional development</li> <li>■ Provide opportunities for skills certification</li> </ul>	<p>The controlled image helps simplify the training process.</p>	<p>TCSC solution helps meet best practice standards.</p> <p>See section "HP and TCSC Best Practices" later in this paper to learn how HP further meets this requirement.</p>

**Technology Planning and Process Management**

Technology planning and process management is defined as activities related to the planning for and management of current and future technology needs, and the establishment of policies and processes relating to technology.

Best Practice Process Category	TCSC Solution	Summary
<p><b>Technology Planning and Process Management</b></p> <p>Enterprises with best practices in this area:</p> <ul style="list-style-type: none"> <li>■ Deal with business change effectively</li> <li>■ Focus on proactive planning that includes customer input</li> <li>■ Develop good standards</li> <li>■ Employ an effective chargeback mechanism</li> </ul>	<p>Procedural decision to be followed by IT department. However, the TCSC solution can streamline business change. For example, in a post-merger environment, the controlled image offered by the TCSC solution allows for an easier rollout period for new software applications.</p>	<p>TCSC solution helps meet best practice standards.</p>

**Best Practices Summary**

As the above table indicates, thin client server computing can help meet or exceed all applicable hardware and software best practices standards. Because thin clients inherently help users apply these best practices set out for desktops, they may reduce costs associated with unmanaged PCs. Administration and application deployment are easier because thin client management and applications are centralized. Security and backup are enhanced due to the use of network storage resources, and the total cost of application ownership may be reduced. In addition, a TCSC solution deployed enterprise-wide can further ensure rapid application availability. To deploy an application to a large number of users it is no longer necessary to load it onto each client. Instead, the application is loaded onto the servers. Since each server manages 30 to 100 clients, there is a tremendous reduction in the number of machines to update. TCSC solutions optimize server utilization through load-balancing features that automatically route user sessions to the server with the lightest load, helping make the IT department of an enterprise more effective. HP's key partnerships with Microsoft and Citrix ensure a complete array of processes, methodologies, tools, and software to create, support, and expand TCSC solutions.

## Who Can Use A TCSC Solution

- Any company deploying Citrix Metaframe Solution or Microsoft Terminal Server.
- Firms that require a highly reliable network of computers connected to a centralized server running mission critical applications can greatly benefit from thin clients due to their highly reliable nature. Hospitals, insurance agencies, airline reservation centers, and hotels are typical businesses that fall into this category.
- Companies with departments that utilize highly standardized computing tasks, like sales or service call centers, data entry departments, or technical support desks can realize substantial cost savings from thin clients. The computing power and flexibility of a PC is often unnecessary and potentially undesirable as end-users can reconfigure, loads local applications or otherwise tamper with the PCs settings.
- Educational institutions that require more computing resources. Universities and schools with under-funded IT departments must keep hundreds or thousands of computing devices up and running with the latest software and very limited staffs.
- Fortune 1000 firms with aggressive cost cutting agendas. IT managers are challenged daily to do more with less. The TCSC solution enables most firms to realize tremendous cost savings by reducing the amount of support staff per 100 client computers from 5 to 1. Thin clients enable network administrators to deploy a new system rapidly because a thin client can be set up and functional in under 15 minutes. Finally, since thin clients are managed 100% remotely, network administrators can update software on the server instead of deploying it over and over again at the client site.
- Firms that have green screen or "dumb" terminals and would like to upgrade to a more robust GUI platform that can handle email programs like Outlook 2000 and common business applications (Microsoft Word, Excel), while still retaining access to legacy database information (through terminal emulation).

## Who Should Not Use A TCSC Solution

It is important to evaluate your IT needs before implementing a TCSC solution. The following types of users should not employ a TCSC solution:

- Content creators, such as graphic designers and CAD artists
- Workers who need to constantly load new applications to their system
- Any users that require high control of their PCs and powerful local processing, such as marketing professionals

The following table presents a list of reasons not to use thin client technology.

Limitation	Description
Perceived loss of autonomy	Users accustomed to working in an unmanaged computing environment may perceive the inability to configure their desktops as a loss of autonomy.
Legacy applications conflicts	With the advent of terminal services, several users will be using the same PC (i.e. the terminal server) simultaneously to access the same application. Software certified for Windows 2000 will adequately resolve the potential problems associated with this, by tracking registry keys and ensuring that individual user settings do not overwrite system settings. Legacy software generally does not do this tracking and so the scope for conflicts between settings is greatly increased. These conflicts can normally be resolved, but it is crucial that adequate testing and redesign takes place.
Limited graphics	High-end graphics or moving environments are difficult to translate into thin client protocols. Thin clients are not an optimal solution for users that work with and develop such applications.  HP Thin Clients utilize ATI Rage XC graphics and faster processors to improve the performance of graphic-intensive applications for the best user experience available.
Reliance on LAN/WAN	Thin-client computing relies on constant connectivity between the server and the client. If that connectivity is broken, clients cannot continue working, although their current session will remain in the state it was in at the time the link was lost.  Although there is increased dependence to the server, thin client servers are typically load-balanced among a number of redundant servers for a highly reliable network.

## HP Advantage

The thin client server computing (TCSC) model can provide enterprises with valuable business-critical benefits. HP Compaq t5000 thin clients help organizations meet and exceed the thin client best practices standards by offering affordable server-based computing solutions and options that deliver desktop-like performance and increased flexibility. Here is a list of just some of the advantages offered by HP Compaq t5000 thin clients.

### HP and TCSC Best Practices

HP Compaq t5000 thin clients help businesses meet and exceed all of the aforementioned Best Practices categories. In addition, HP Compaq t5000 thin clients further improve on the following best practices categories:

- Deployment (installs/adds/changes)
- Change Management Technology & Process

HP Compaq t5000 thin clients come with Altiris Deployment Solution to assist in initial thin client rollout and simplify subsequent software changes.

- Repair and Maintenance
- Procurement
- Vendor Management

In each of the above categories, HP helps exceed best practices by providing a single point of service for its thin client products.

- IS Training

HP helps exceed this best practice category by using Altiris Deployment Solution as its management software for the t5000 thin client product line. Altiris Deployment Solution uses wizard-based, drag-and-drop interface to minimize training time without sacrificing functionality and power. Because it works on HP desktops, servers, and notebooks, Altiris Deployment Solution should be familiar to IS personnel.

### Increased Security

Options such as SmartCard Readers or biometrics can provide an extra, more sophisticated level of user authenticity.

### Increased Performance

Local applications run faster with up to 512 MB of DDRAM, a 1GHz processor, and ATI Rage XC graphics. HP has brought more than 20 years of experience in PC design and testing to the new HP Compaq t5000 thin clients, choosing the most reliable features of the PC to increase the performance and stability of thin clients. HP Compaq t5000 thin clients with Windows XP embedded use the default XP interface and tested, reliable drivers. The new t5000 series is run through rigorous hardware and software tests honed by decades of industry-leading experience.

### Management Software

HP Compaq t5000 thin clients come with Altiris Deployment Solution software, allowing administrators sophisticated client management and deployment capabilities using an industry standard software package. Altiris Deployment Solution supports thin clients, PCs, and servers, so you can manage your entire organization with the same management software package. No other thin client manufacturer offers you this level of flexibility.

Wireless  
Connectivity &  
Options

HP Compaq t5000 thin clients support wireless connectivity, allowing you to operate wherever your needs take you. Wireless options are especially great for areas where it isn't feasible to run wires for network access. Additional options, such as a SmartCard Reader, biometrics, and Disk-on-Key provide greater flexibility and share commonality with select desktops and notebooks, thereby helping to reduce inventory and management costs. HP Compaq t5000 thin clients also come with drivers preinstalled for most of our list of qualified peripherals, reducing your deployment effort.

Superior Software  
Image

HP Compaq t5000 thin clients images come with several features not common to the industry:

- HP Compaq t5000 thin clients with the Windows XP embedded operating system use the same factory image, regardless of flash size. Similarly, all HP Compaq t5000 thin clients with CE.NET have a common factory image, dramatically reducing your IT administration efforts.
- HP has taken a very conservative approach in our image development process, leaving a more full-featured standard image for the customer. Examples of this are the use of an XP-style GUI to maintain a familiar look and feel and the inclusion of NetMeeting and Windows Messenger for real-time, collaborative workplaces.
- Screensaver with user password for increased workplace security.
- First Boot Agent: HP Compaq t5000 thin clients run through an agent that assigns each client a unique security identifier (SID) that identifies each operating system and user, which is crucial for adding your clients to a secure domain. Other manufacturers' clients have identical SIDs, requiring additional efforts to deploy.
- Flash image in multiple ways:
  - PXE: HP Compaq t5000 thin clients fully compliant with Microsoft Wired for Management (WFM)
  - USB: Disk on Key, ISO image on CD-ROM, diskette boot to support "ghosting" or FTP. HP Compaq t5000 thin clients are the only thin clients that can be re-imaged easily in a remote deployment via a USB device.
  - RIS: Remote Installation Service support
  - Both the HP Compaq t5300 and t5500 thin clients have easy FTP image updates.

BIOS on DISCRETE  
ROM

With the BIOS on discrete ROM, the HP Compaq t5000 thin clients offer a unique advantage over the competition. Most thin clients have their BIOS in Flash memory. With the BIOS on discrete ROM, you can manipulate, modify or flash the image without risk of modifying or deleting the BIOS, leading to much higher reliability.

PCI Expansion  
Module

HP now offers a PCI Expansion Module for the HP Compaq t5000 thin clients. The PCI Expansion Module offers expansion capabilities and a broader selection of options. The module allows users to incorporate additional peripherals for increased performance and flexibility.

## Best Value

By leveraging HP's broad buying power, we have built a more cost effective thin client and passed that savings on the customer in a feature-rich product.

## Why HP?

- HP offers Altiris Deployment Solution as a thin client management solution, which enables an IT department to deploy both thin clients and desktops with an enterprise-level, award winning management console.
- HP drives innovations and industry standards through close partnerships with industry leaders, helping you to maximize your return on IT investment by reducing the effort to manage your network clients and maximizing client reliability.
- HP has established some of the industry's key computer innovations that are now industry standards such as PCI, USB, ATA and a host of other inventions.
- HP provides an all-in-one thin client server computing solution and a single source for support and service.

## Conclusion

Thin client server computing can provide enterprises with valuable business-critical benefits and substantial savings. The HP line of thin client products can help provide increased benefits and savings through more robust performance and added flexibility.

## Additional Information

The following links provide additional information about thin client server computing:

[www.hp.com/products/thinclients/](http://www.hp.com/products/thinclients/)

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