MetaFrame XP Extends the Citrix Platform

BY S. JAE YANG AND JASON NIEH

After having led the thin-client movement in the Windows world, Citrix takes a step forward with MetaFrame XP. MetaFrame runs under Microsoft Windows 2000 Server, and the latest release demonstrated better performance in the lab than its predecessor (MetaFrame 1.8). It also delivers richer management features.

As is the case with most thin-client platforms, all of the application logic is processed by the MetaFrame XP server, which delivers display updates to the client via a LAN, WAN, or even a dial-up network connection. The MetaFrame XP server and client communicate using Citrix’s Independent Computing Architecture (ICA) protocol.

An ICA client may run on a standard PC or a dedicated terminal. The client system is responsible only for rendering the display updates to the screen and relaying user inputs, such as mouse movement or keyboard clicks, back to the server. So, a MetaFrame XP client lets you run your Windows applications with much less horsepower on each PC. As the computing resources (collective CPU clock cycles and memory) are pooled and shared, a thin-client–based IT infrastructure can be far more cost efficient yet achieve the same amount of productivity as a conventional network of desktops.

To address market needs, Citrix has packaged MetaFrame XP in three ways: XPs (for a small workgroup with individual single-processor servers and anywhere from 20 to 39 users per server), XPa (the base package plus a load management feature that lets the administrator of a MetaFrame server farm customize load-balancing rules to maximize each application’s availability), and XPe (all of the above, plus an application packaging and delivery mechanism that facilitates rapid distribution of applications over enterprise-scale server farms).

With MetaFrame XPs, even a small company can consider going to thin-client computing and then graduate to XPa and XPe as necessary.

What does thin-client computing mean to you if you are an end user? Our test scores indicate that you won’t experience a noticeable degradation in performance in running most business applications with thin clients like MetaFrame XP.

To gauge MetaFrame XP’s performance, we ran NCL ThinBench, developed by Columbia University’s Network Computing Lab (www.ncl.cs.columbia.edu) over five bandwidths ranging from the ISDN-level 128 Kbps to the 100-Mbps LAN. (We tested the XPe edition, as there is no performance variation among the three packages.) MetaFrame XP brings a significant improvement over its predecessor and Windows 2000 Terminal Services on the NCL ThinBench Web Page Load latency test, which is a good indicator of a thin client’s Web and business-application performance.

The improvement comes mostly from MetaFrame XP’s superior caching, which stores often-used bitmaps in the client’s local storage so that the server does not have to send the client so much data.

The downside of any caching system is the cache-miss penalty, incurred when a desired object is not found in the cache. In a cache miss, the client system must then fetch the data from the server, which is slower than going directly to the server in the first place.

In earlier studies, NCL found that MetaFrame 1.8’s disk caching was so inefficient that performance degraded when caching was engaged. But in MetaFrame XP, Citrix found a way to harness the benefit of caching without incurring a significant cache-miss penalty. The result is much better performance over all bandwidths.

To our disappointment, however, MetaFrame XP showed no improvement on the NCL ThinBench Video Playback test (not charted here). In delivering a 352-by-240 MPEG-1 video clip (encoded at 24 fps) to the client, MetaFrame XP scored a video quality (VQ) Index no better than 43 percent, even at 10 Mbps and 100 Mbps. The VQ Index is a metric of video quality relative to the “perfect” playback.

In an attempt to remedy the server-side latency that degraded the thin server’s responsiveness in MetaFrame 1.8, Citrix implemented its Zero Latency technology in MetaFrame XP. This lets the client display user-input elements such as mouse cursor movements or typed letters immediately without having to wait for the display update from the server. Despite this new technology, though, we did notice lingering latency under MetaFrame XP.

Though some of the shortcomings remain, Citrix has successfully reengineered ICA’s disk-caching mechanism to achieve a significant performance improvement. That, along with an entry point and upgrade path for smaller companies, should widen the appeal of Citrix’s thin-client approach.

Citrix MetaFrame XPs
Direct price: $400 per seat.

Citrix MetaFrame XPa
Direct price: $345 per seat.

Citrix MetaFrame XPe
Direct price: $290 per seat.