

# Compaq Workstations:

## Enabling Next-Generation Trading Desk Solutions

As the securities and derivatives trading business moves into the 21st century, traders and IT executives face a growing array of choices about upgrading their systems. Should they migrate to the latest digital flat panel monitors and graphics cards? What about the seamless integration of market data? How can firms optimize their desktops to accommodate straight-through processing? For that matter, how can firms take advantage of increasingly more powerful processors on the desktop without sacrificing space and suitability, and without taking on an exorbitant expense.

Plying one's way through this new technological landscape is both a system-wide and budgetary challenge to traders and IT professionals. The trader workstation is undergoing rapid change in the securities industry, where pressure from traders for enhanced services plays hard against IT professionals' ability to deliver increasingly enriched features in tight surroundings and at reasonable costs. This is the challenge that Compaq Computer Corporation, the securities industry's leading workstation supplier, has taken on for itself. Known for its rigorous ergonomic and performance research, Compaq has been able to provide the securities industry with 'best-in-class' trader workstations. Today, Compaq offers the securities industry a suite of exceptional choices among high-end processors, desktop workstations and flat panel monitors to help the industry capture technological value on the trading floor now, while enabling firms to position themselves to make the transition to the next-generation trading desk of tomorrow.

Key to Compaq's success among its demanding client base is its refusal to be second best. Compaq's Professional Workstation AP400, for example, has been adopted by trading floors around the world because of its tested performance, built-in durability and Compaq's progressive yet customer cost-conscious approach to working with new technologies. Now, Compaq is introducing a new family of Deskpro Workstations and Professional Workstations that even further leverage new technologies for greater performance on the trading floor of the future.

The new Deskpro Workstation has been certified with



leading ISV applications and supports the latest in enhanced graphics, high-performance SCSI storage and error-checking and correcting (ECC) memory. What's more, the price points extend seamlessly from the rest of the Deskpro PC family of products, and the new Deskpro Workstation is easily available through commercial volume channels or over the Worldwide Web.

Designed specifically for the space-constrained trading room, the Professional Workstation AP400 is the smallest dual-processor workstation on the market. Compaq has upgraded the AP400 through several generations of Intel processors and third party graphic adapters, all the while maintain-

ing the stability and consistency that Y2K conscious infrastructure managers demand. The latest version of the AP400 supports two 700 MHz Pentium III processors and eight flat panel monitors.

For those requiring the absolute latest in trader workstation technology, Compaq is introducing the Professional Workstation AP550. The AP550 uses a new compact package and supports two 733 MHz Pentium III processors, Intel's new 840 chipset, RAMBUS (RDRAM) memory, and Matrox Millennium G400 graphics. And of course Compaq has not forgotten

about the

today and tomorrow. "These new Compaq workstations are robust platforms with high performance and large capacity that are particularly developed with financial, engineering and creative applications in mind," said Keith Lefebvre, Compaq's Director of Product Marketing. "We have demanding clients who are sensitized to cost, which is why Compaq follows the paradigm that it does. We can service our clients needs as they grow and expand in the future."

Compaq has developed a reputation for reliable, high-performance and durable workstations in the world of securities and derivatives trading. A 'who's who'

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extreme performance requirements of quants and risk managers. For this audience they are introducing the Professional Workstation SP750 which supports dual 733 MHz Pentium III Xeon processors, Intel's 840 chipset with scalable bandwidth technology, 4GB of RDRAM, and multiple high-performance SCSI disk drives.

### The Compaq Customer Paradigm

That paradigm insists that Compaq be at the forefront of the desktop industry with new technologies while also remaining acutely aware of its customers' real world needs

list of clientele includes Ark Asset Management, Banc of America Securities, Barclays Capital, Credit Suisse First Boston, DLJdirect and Janus. And when Robertson Stephens, the leading investment bank for growth companies, decided to rollout new equity trading floors across multiple sites, they turned to Compaq.

On the trading desk, Robertson Stephens uses Compaq Deskpro EN PCs equipped with biometric fingerprint ID and touch screens as the front-end for its in-house developed equity trading system. Notably, Robertson Stephens is one of the first firms to choose NT over UNIX for their order entry front end. For market data, analytics, and



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all other applications the traders are being supplied with Professional Workstation AP400s using dual processors and multiple TFT8000 flat panels. Celia Cattani, Vice President of Trading Floor Technology at Robertson Stephens, explained that before standardizing on Compaq’s AP400, Robertson Stephens had several different desktop hardware arrangements. “We’re now operating consistently across the sales and trading environments,” she said. “Before, with new application releases, we would have to go desk by desk, often spending a lot of time troubleshooting individual machine configurations. By standardizing on Compaq, our automated application installations run very smoothly, with no desk to desk tweaking.” Robertson will continue their standardization effort across the firm, with banking and research as the next focus.

As of this writing, Robertson Stephens has upgraded its trading floors to the AP400 workstation at 250 positions in San Francisco, New York, Boston and London. When the rollout is completed, there will be 400 workstations installed, each using multiple Compaq TFT8000 flat panels. When asked to list the benefits realized from adopting the Compaq machines, Robertson identified: increased multi-application performance with dual processors, broader access to 3rd party development tools, faster time-to-market with internal application development, the rapidity of installation, and the productivity traders gain from having access to other Windows programs.

Robertson Stephens’ CTO Daniel Moore explained that firm’s

ambitious desktop strategy is part of a larger vision that embraces a firm-wide commitment to technology as a competitive advantage for the firm. Central to this vision, Robertson Stephens has embarked on an overhaul of their trading and STP systems, automating their trading flow across all their trading operations. By the time this article appears, the firm will have standardized and automated their entire listed and over-the-counter equity trading operations, and by the first quarter of next year, will have its Financial Information Exchange (FIX) strategy in place across all equity markets. Compaq workstations have figured largely in the overall strategy.

“Robertson Stephens is among our most forward-looking customers,” said Andrew Wescott, Finance Segment Marketing Manager for Compaq’s Workstation Division. “The firm’s equity trading system is ‘best-in-class’, and they are ahead of the curve in implementing a next-generation trader workstation infrastructure.”

The Enron Corporation, one of the world’s leading energy companies with \$34 billion in assets, has similarly positive things to say about their experience with Compaq. Houston-based Enron manages the largest portfolio of fixed-price natural gas and power-related risk management contracts in existence, so they insist on a reliable, high-performance operating environment.

“The power trading environment is extremely stressful, where mistakes and downtime can literally cost us millions,” said John P. Tollefsen, Sr. Director of Infrastructure and Integration at Enron.

“its a matter of traders knowing what Enron’s position in the market is at all times and having the ability to respond. There are times when traders have had to change our positions very quickly—literally within minutes.”

For this demanding deal-capture and trading environment, Enron has turned to Compaq. Initially—rolling out their power trading infrastructure on a mix of Compaq Deskpro EN PCs and dual processor Professional Workstation 5100s, Enron is expanding its Professional Workstation investment with 200+ new Compaq SP700s for its trading floor. The first phase is targeted at the Equity traders and once they are complete, the power, gas and other trading environments will be refreshed with SP700s as well.

“We’re one of the first adopters of Microsoft Windows NT on the trading system back-end, although some of our systems, notably the databases, are still on Unix,” Tollef-



sen said. “Compaq has grown with us. There has been a lower cost of ownership with the Compaq and NT infrastructure. It operates on one platform in a truly homogeneous environment.” With the Compaq TFT8000 flat panels, Tollefsen said that Enron has also been able to cut down measurably on heat, electricity, and—an ever-important commodity, physical space on the trading desk. “We’ve been able to save a foot at each desk,” he said.

### The Need for More Power in Less Space at an Affordable Price

Compaq’s new high-performance Deskpro Workstation and Professional Workstation families were developed with just these objectives in mind. Compaq’s Lefebvre said that Compaq’s pricing is designed to be customer-conscious with step-ups to dual processors, enhanced graphics and other features. As technology makes more application tools available to traders and analysts, Compaq is at the forefront, work-

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*— according to Daniel Moore, CTO, Robertson Stephens*

ing with IT executives to help them deliver these tools in a seamless and cost-effective manner.

Electronic video-conferencing, cable television financial news, historical and real-time market data, and robust connectivity to various points of market liquidity have permanently changed the operations of trading floors. As the securities industry moves into the 21st century and space constraints make multiple workstations for each trader less likely, the demand to have these multiple electronic sources presented at one workstation will be satisfied by next generation applications from the industry's software and market data vendors. Compaq has responded with its new Deskpro Workstation and Professional Workstation families, which can accommodate sales, trader, analyst and support software; digital graphics; multiple market data feeds and cable television with no latency—all on a single system that can accommodate up to eight monitors.

Of course Compaq may outwardly hang its hat on the processing power of its workstations, but architectural and ergonomic design is every bit as important. The AP400 has always led the trader workstation market with its minimal form factor. Compaq went so far as to work with SBFI, the industry leading trading desk vendor, to design a tray to hold the workstation inside of the desk. Compaq has been a leader in the flat panel monitor segment as well. The TFT500 series was the industry's first 15-inch flat panel, and the new TFT5000S pivots up to 90 degrees. Last year Compaq released the TFT8000 series, after

rigorous ergonomic research which determined 18-inches to be the maximum size a flat panel can reach while still providing traders with tangible space-saving benefits, said Scott Gray, Compaq's Marketing Manager for Flat Panel Displays.

The high-resolution, thin TFT8000 has a flexible mounting apparatus for maximum flexibility and two inputs to switch between different workstations. Moreover, Compaq built the flat panel to reduce the cost of ownership, Gray said. Florescent back lights are accessible for easy replacement, extending the life of the monitor over a CRT, and Compaq's unique Litesaver software extends the life of the monitor further by allowing administrators to program automatic shut-off times. With all Compaq monitors, asset management software is also available for a firm's central administrator to check on the firm's total workstation investment, enabling surveys of all monitors and their PC connections.

With its upcoming flat panel release, Compaq additionally offers an automatic set-up feature to eliminate any manual fine-tuning or adjustments, Gray said. The new monitors also exploit digital video technology to ensure there are no opportunities for loss of significant data between the computer and the screen. Compaq has added digital graphics card capabilities to its workstation family as well, for the option of purely digital graphic representation. "These are state-of-the-art industry standards," said Gray, who added that the newest Compaq flat panels will have even thinner screen borders (bezels) to maximize every

square inch of the monitor. "We've killed the dead space with narrower edges and have created a more continuous display," Gray said. "This is the direct result of Compaq going to the financial industry and listening."

### Fast Number Crunching with PC Technology? Really!

Out of the lab and in the real world at Enron Corporation, the energy trading-firm saved hundreds of thousands of dollars by running its highly demanding Monte Carlo simulation program on a cluster of Compaq Professional Workstations instead of on a Unix-based server. From Denver-based Decisoneering, Enron purchased the Crystal Ball® application which supports Monte Carlo simulation as an add-in to Microsoft Excel. Enron then contracted with Scientific Computing Associates (SCA) to develop a parallel version of Crystal Ball using Paradise®, SCA's parallel computing middleware product that enables independent workstations to share data in memory simply and efficiently. "Paradise makes it easy to spread a large application across processors on several workstations," explained Andrew Sherman, Vice President at SCA. "Each processor performs its part of the calculation and places its results in a virtual shared memory where they can be read by the other processors. By marrying Crystal Ball® and Paradise, we have created a parallel Monte Carlo simulation solution operating within the Microsoft Excel environment."

The net result has been that Enron traders and analysts who are structuring and pricing deriv-

atives deals can now run an extremely time-consuming simulation with thousands of variables in a fraction of the time it once took them to run the same job across a one or two processor workstation. "We use five dedicated dual processor Compaq machines configured as a workstation farm, and with at least 100 Monte Carlo permutations to each machine," said Enron's Tollefsen. "The Paradise middleware also provides a means to grab spare cycles from traders' workstations when they are idle and return the machines for interactive use when interactive activity resumes. The time for this Monte Carlo simulation has gone down from 20 hours to 20 minutes. The more boxes we threw at it, the faster it runs."

"We opened up our labs and dedicated people to performance characterization and scalability studies of the Crystal Ball® adaptation," said Compaq's Wescott, who said the Crystal Ball adaptation to Compaq's workstation farm is called Crystal Ball Turbo®. Today, Compaq supports Decisoneering and SCA in marketing this solution across the financial industry. Compaq has nominated Enron for a Smithsonian Institute award based on its application of Crystal Ball®, Paradise and Compaq's processing environment. Several firms in London and New York have already signed on. One New York firm converted a derivatives model to Crystal Ball Turbo® and performance improved by 40 times when spreading the work over 25 Compaq dual processor workstations.



“The level of consistency with deal capture and position keeping is critical to trading with 3000 Xtra, so high-performance workstations such as Compaq's are very important. Compaq works very closely with Microsoft, and that translates into very good performance, the kind that's needed for the next generation Intel-based workstation.”

*Alexander Hungate, Executive Vice President of Trading Systems, Reuters America*

## Partners Are Critical to the Strategy

Compaq has always listened to its customers, which is why it has been able to quickly adapt its workstation technology to the shifting landscape of trading floor technology. Equally as important have been the application providers and vendors that have worked closely with Compaq to set the stage for the next-generation trader workstation.

With its applications and information currently running across thousands of Compaq workstations in trading floors around the world, Reuters — the leading market data and trading systems supplier, has had a close association with Com-

plete straight-through-processing trading environment from Reuters. This open environment includes the market leading Triarch and TIB market data systems, trade-order management, order routing and settlement messaging with Inter Trade Direct, deal capture and position keeping with Kondor+ — all from a single workstation configuration.

“This level of seamless trading functionality has never been available in one place before. High-performance workstations such as Compaq’s allow the trader to make the most of these capabilities,” Hungate said. Reuters standardization at the desktop, which includes many Microsoft components, is intended to reduce the

be creative and bring value to the market. Their workstations and flat panels are the kind of platform that firms should be adopting for next generation floors.”

One breakthrough that came from the MarketNet work was in the area of multiprocessor workstation configurations. “Historically, we have seen 30-40% of our clients configure their workstations with dual-processors,” according to Michelle Westover, the Compaq finance segment manager who manages the MarketNet relationship. “Many firms did this because it was very affordable and they implicitly believed that they would get additional scalability. One of the things we were looking for in the MarketNet project was solid data to support this notion.” Fortunately, with their sophisticated Windows NT trading lab, MarketNet was able to clearly show that when running 6-10 simultaneous applications, as is common on trading floors, the Microsoft Windows NT operating system was adept at scheduling processes across the dual processors in an AP400. Ron Green commented that “We clearly demonstrated situations where an analytics application might be completely dominating a processor to the performance detriment of a market data or deal capture application. With a second processor, the analytics application gets what it needs and the trader is able to get the other applications to respond to them. Given what is at stake on trading floors, \$1000 for a second processor is cheap insurance.” Compaq plans to continue their work with MarketNet Group to include future workstation products and to develop a comprehensive set of ‘best fit’ workstation configurations for the different Reuters products such as Kobra Version 3.0 and 3000 Xtra.

Another partner with eye-catching technology is Approach Inc. Offering streaming video for the trading floor using Microsoft’s Windows Media Technologies, Approach is working with Compaq to provide traders with real time cable broadcasts of financial shows, such as CNBC and CNNfn,

to their desktops using Compaq’s AP400 workstation. This was demonstrated in Compaq’s booth at the June SIA show and was the major booth draw according to Compaq’s Wescott.

Using Compaq’s SP700 workstations installed in the network operations center, a trading firm can encode cable or television feeds in a real-time, multicast format for distribution over the firm’s network. With this arrangement, firms not only control the amount of bandwidth used, but also avoid the cost of running coaxial cable to and installing a TV tuner card in each workstation. With Compaq, Approach also supports video-conferencing, morning calls and analyst briefings over the workstations. “We consider Compaq a preferred vendor,” said Jill Soley, Program Manager of Streaming Video Solutions at Approach. “As for manageability and predictability, with Compaq, we know that its going to work.”

Finally, Compaq partner Raft International, a UK based firm with operations in a number of European countries as well as Asia, has worked with Compaq on RaftpaQ for Microsoft Windows NT. RaftpaQ is an ‘out of the box’, object-oriented component solution that trading firm application developers can use. RaftpaQ is compliant with Microsoft’s DNAfs architecture for financial services, and Raft is planning a concerted effort to expand its European-based services business into the U.S. beginning in 2000. “We have assembled several of the Raft International tools with the AP400 workstation, as most developers need high-performance machines,” said Compaq’s Andrew Wescott. “We’ll also be working closely with Raft International next year, when they make their debut in the United States.”

Scalable performance, intelligent ergonomic design, durability, ‘best-in-class’ components, and a partnership program with clients and the financial industry’s technological leaders—these are the hallmarks that characterize Compaq’s trader workstation program, not only for today, but for tomorrow as well.



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paq and the former Digital Equipment Corporation for years. Reuters recently launched 3000 Xtra as their flagship information and trading desktop. The product combines for the first time historical and real-time data and analytics on the desktop, said Alexander Hungate, Executive Vice President of Trading Systems, Reuters America. The Reuters product embraces Microsoft Active X COM technology in Reuters Kobra V3.0 container. Reuters 3000 Xtra combines real time and historical data and news with powerful analytics.

At their North America launch, Reuters used AP400s and TFT8000s to showcase their new product in front of sales and support personnel. Several Reuters’ customers have also successfully beta-tested 3000 Xtra on Compaq workstations and monitors. 3000 Xtra is the flagship information product in the

total cost of ownership for its customers. “Compaq works very closely with Microsoft, and that translates into very good performance, the kind that’s needed for the next generation trader workstation.”

In order to improve customers’ time-to-market with the latest Compaq workstations, Compaq has been working with the MarketNet Group (a Reuters Ltd. subsidiary) to test the Compaq workstation family. This work includes basic functionality testing of all the common Wall Street applications, performance characterization of different workstation models, and development of recommended configurations for different trading environments. According to Ron Green, Director of MarketNet’s, Integrated Solutions Group, “Our relationship with Compaq is important to us. They are trying to