

Tandem Plans New OS, Data Base System For Fault-Tolerant Line

CUPERTINO, CALIF. — Tandem Computers Inc. plans to bolster its line of fault-tolerant computers later this year with a new operating system and data base system, officials said last week.

Tandem also has signed a \$10 million contract with JC Penney Inc. to create a credit authorization network hooking Penney's 1700 U.S. stores, Tandem president James Treybig said at the company's annual stockholders' meeting here. He noted that Penney chose Tandem over IBM.

New Zilog Add-On Boards Double Memory Capacity Of System 8000

CAMPBELL, CALIF. — Zilog Inc.'s Systems Division has introduced two new add-on memory boards, which double the maximum memory capacity of its System 8000 microcomputer family from the previous 4 Mbytes to 8 Mbytes.

Zilog is offering a 4-Mbyte board for a list price of \$18,950 and 2-Mbyte board for \$10,950. Previously, Zilog offered only 500k-byte and 1-Mbyte add-on memory boards.

Peter Beckett, Zilog product manager, said the boards not

Treybig also told stockholders that Tandem's 27 percent growth rate in fiscal 1984—to sales of \$532 million—was not as high as it could have been.

"Our lack of growth rate was not because of a lack of market or products, just a lack of software," Treybig said. "A big mistake we made was not getting enough third-party software houses three years ago."

To correct that problem, Tandem has redirected its marketing efforts to building a third-party software affiliation

program, which today consists of 71 companies, Treybig said.

Treybig declined to provide many details on the new operating system—called the B00—except to say that it will allow Tandem systems to achieve up to 250 transactions per second. Eighty transactions per second is currently the norm for mainframe systems, he said.

The release date for the new operating system has not been set, but it reportedly will not be out for several months. The system will continue Tandem's tradition of proprietary, software-intensive fault-tolerant computers, as exemplified by its TXP and NonStop systems.

Tandem's newest customer, JC Penney, has purchased 36 TXP high-end computers to be installed over the next year at its Reno, Nev.; Kansas City, Mo.; and Columbus, Ohio, credit centers. The TXPs will maintain an on-line data base



Treybig: 27 percent growth rate could have been higher.

of Penney's 30 million credit card customers accessible by point-of-sale terminals.

According to Treybig, the Penney deal and the upcoming product enhancements reflect

the company's performance edge over IBM, Tandem's major competitor. However, he acknowledged concern about Tandem facing increased competition from IBM in light of the new IBM Sierra mainframe as well as IBM's decision to remarket computers built by Tandem's fault-tolerant rival, Status Computer Inc.

"It is still difficult to know what the IBM/Stratus relationship is," Treybig said. "Stratus announced that it wouldn't materially affect them this year, so it won't affect us. Anyway, the most powerful Stratus machine is below our low-end machine."

"In addition, the Sierra announcement says that IBM chooses to operate in a 'hot standby configuration' whereby there are two systems, but only one is on line while the other is used as backup."

—Susan Kerr

Most of the newer FT suppliers are having a rough time competing with traditional vendors.

FAULT TOLERANT BLUES

by Omri Serfin

Fault tolerant (FT) systems are so called because they continue to function well despite some internal failures. Currently, the key issue is whether the companies who make those systems—most of whom have suffered a series of painful setbacks—can manage a similar feat.

With the exception of Tandem Computers of Cupertino, Calif., and Stratus Computer of Marlboro, Mass., virtually all FT system suppliers have encountered significant product development problems and increasing difficulty in raising much needed additional funding. Reflecting these pressures, at least four firms (Auragen Systems, Fort Lee, N.J.; Parallel Computers,

Santa Cruz, Calif.; Synapse Computer, Milpitas, Calif.; and Tolerant Systems, San Jose) have installed new ceos in 1984. Along with Sequoia Systems in Marlboro, Mass., which changed its top management in 1983, they have also had to institute layoffs and other cutbacks.

Even Tandem's growth has moderated noticeably since 1982; and Stratus, while posting revenue gains reminiscent of Tandem's early years, has so far been unable to maintain a consistent growth in profits.

Still, long-term prospects for FT systems are excellent. As more workers come to rely on computers in the performance of their daily duties, the tangible and intangible costs of computer downtime escalate



Illustration by [illegible]

the costs of computer downtime escalate sharply. Already there are many managers who must watch helplessly as workers idly mill around waiting for their shared computers to be repaired. Customers who are frustrated because they can't obtain urgent needed cash from a malfunctioning ATM may consider switching to another bank. Increasing computer downtime affects the profitability of a business, and management awareness of that fact will intensify the interest in FT systems.

FT systems are computers that are able, with a high degree of probability (but never a certainty), to detect and recover from some classes of internal failures—mostly hardware, but occasionally software errors, too. They do this before such fail-

ures affect the process being controlled, the database, or the end user.

High availability is especially desirable in two types of commercial applications: on-line transaction processing (OLTP), and "work group" servers, also known as team computers. Both are areas of very high growth. OLTP applications are characterized by a central database users can update and interrogate. The airline reservation systems of the mid-1960s were early examples of large-scale OLTP systems. Currently, OLTP applications are being fostered by the relentless drive to put all sorts of business applications on-line, including classical back-office tasks like accounting and inventory control. OLTP applications are the main target of Tandem and most of

the newer FT suppliers.

OLTP applications already consume the lion's share of the total throughput represented by mainframe shipments today, and a smaller but still significant share of supermini shipments. The potential OLTP market is measured in the billions. A recent survey of IBM mainframe installations, for example, found that nearly 70% employed CICS, while another 7% had IMS/DC or both; only 13% had no teleprocessing monitor of any kind.

The need for workgroup servers is created in part by the popularity of desktop computers, especially in offices. These servers act as custodians of shared databases, common depositories of private files, hubs of electronic mail systems, and arbiters of

ILLUSTRATION BY BERNARD BORTHUMME



New architectures can be successful in serving new market requirements, as IBM has proved with its PC and Apollo with its CAD/CAE workstations.

printers. Stratus, Parallel, and NoHalt Computers of Farmingdale, N.Y., are attempting to serve this marketplace.

While workgroup servers are still nascent, IBM for one has recognized their potential: recent moves strongly suggest it will position the System/36 line for "departmental" applications.

FT MARKET NOT LIMITED

The potential market for FT systems is therefore not limited by lack of opportunities. Tandem Computers was the first to see this potential, and the loosely coupled, multiminicomputer system it began shipping in 1976 led to five years of torrid, 100% compound growth.

By 1980, Tandem's success inspired a new wave of FT suppliers, including Stratus Computer, Sequoia Systems, Synapse Computer, Auragen Systems, Tolerant Systems, Parallel Computers, and Computer Consoles of Rochester, N.Y. Capitalizing on the advances in microprocessor technology, these newcomers set out to develop clever and cost-effective multiprocessor architectures offering various degrees of fault tolerance. They were able to attract substantial support from venture capital firms and major investment funds. But, as noted above, virtually all have experienced difficulties recently. What went wrong?

Product delays. With the exception of Stratus, all of the new-wave players have encountered substantial product development delays. Although all base their products on off-the-shelf microprocessors (especially the Motorola 68000), the complexities introduced by the multiprocessing architecture and the FT features are at least an order of magnitude more severe than those encountered in designing a run-of-the-mill, single-processor system. Software in particular proved a tough nut to crack, both for those who decided to start from scratch (Synapse, Sequoia), as well as for those who tried to adapt Unix.

It is interesting to note that all of these startups were formed by people with little previous experience in commercial FT systems; even today there are no direct Tandem spin-offs. They therefore needed to learn on the job, a difficult task made harder by competitive pressures and by investors' impatience.

Stratus is the only new-wave company that has been able to bring out an initial product, along with an impressive array of software, less than two years after launch. It also managed to introduce two more advanced models about two years after the original product. Stratus has been able to achieve this principally because its

self-checking, "pair-and-spare" FT architecture is transparent to all user software and most system software. Thus, most software could be developed without reference to the FT intricacies, an important advantage.

Financing. An inability to demonstrate working products made it difficult for the startups to obtain orders. Auragen appeared to be an exception; in October 1982, it concluded an agreement with the West German firm, Nixdorf Computer AG. But that agreement, reached well in advance of the product's existence, was not a simple oem deal; rather, it was a technology exchange agreement, under which Nixdorf received manufacturing rights and exclusive marketing rights in parts of Europe.

While some players (including Auragen) eventually did manage to build working prototypes, in general they still required much more development work, especially in the area of FT features and software support. With the investment community becoming much more selective in its support of computer startups in 1984, the fledgling FT suppliers found themselves caught in a vicious circle. Incomplete product development made it hard to get orders, and the lack of orders made it impossible to raise the additional funds needed to complete product development.

ACHIEVING FAULT TOLERANCE

Compatibility. Clever architectures have been devised by FT suppliers in order to achieve robust fault tolerance. Unfortunately, these architectures are drastically different from existing systems, especially the IBM mainframe line and the DEC VAX family. There are two main reasons for this. First, FT systems are based on multiprocessor architectures, whereas IBM and DEC offerings are implemented as conventional single-processor systems. Even the so-called multiprocessor models (IBM's 303X attached or multiprocessor complex, and 3084; DEC's VAX 11/782, and the VAXcluster) are essentially minimal extensions of the single-processor environment. Second, the instruction repertoire and I/O structure of individual processors in current FT systems are substantially different from IBM's or DEC's; Tandem's was influenced mainly by the HP3000, while the new-wave FT suppliers embrace the standards established by their microprocessing unit supplier; most of them use the Motorola 68000.

New architectures can be successful in serving new market requirements, as IBM has proved with its PC and Apollo with its CAD/CAE workstations. Organizations im-

plementing OLTP applications (e.g., banks, brokerage firms, and other financial institutions), however, tend to have a large investment in IBM mainframes and/or the DEC VAX line. Such investment includes not only the CPU and peripheral hardware, but also custom and packaged software and training for MIS staffs and end users. Users are becoming reluctant to accept systems that require substantial new investment in any of these areas.

Some FT suppliers—notably Auragen, Tolerant, Sequoia, and Parallel—hoped to overcome these objections by offering Unix compatibility. This hope has been thwarted so far by two factors. First, Unix is singularly unsuited for supporting multiprocessing environments and transaction processing missions, so much so that at least one FT vendor, Sequoia, decided to implement Unix compatibility by developing a completely proprietary kernel, discarding the one supplied by AT&T.

Second, end-user acceptance of Unix as a universal standard has been painfully slow, despite an apparent ground swell of support from major suppliers (Hewlett-Packard, Sperry, and even some IBM divisions). Few end users care about Unix per se; most are unlikely to be interested until convincing end-user software, available exclusively on Unix systems, begins to develop.

Tandem and Stratus have attempted to ameliorate the compatibility problem by offering high-level SNA compatibility. Their systems can coexist with IBM systems within the framework of an SNA network, in the sense that terminal users connected to any one of these systems can access application programs on any other.

Competition from established suppliers. Thus far, no conventional supplier has attempted to offer a standard system designed specifically for FT service. The problem these suppliers face is the other side of the compatibility coin: their range of design options is substantially restricted by the investment in existing architectures and software they (and their users) have made.

On the other hand, several conventional suppliers have developed a variety of loosely coupled solutions involving slightly modified existing products. Examples of this approach are the DEC VAXcluster, the NCR V8500/V8600 cluster with the Instant Ready software, and the Perkin-Elmer Series 3200 Resilient System, to name a few. IBM has been offering multiple-access disk, tape, and communications controllers for about 20 years now; such controllers have been used to construct multicomputer complexes for high-availability as well as high-throughput requirements.

End-user acceptance of Unix has been painfully slow, despite an apparent ground swell of support from major suppliers.

SOLUTIONS NOT COST-EFFECTIVE

Compared with "true" FT systems, such solutions are not cost-effective, because the smallest replicated module is a complete, standalone computer system with most of its own peripherals. They are also flawed in that the user must typically develop the software needed to implement automatic recovery from faults. Nevertheless, in situations where the user places a large value on the investment in existing facilities, such systems may be more appealing than the elegant solutions offered by the FT vendors.

Transaction throughput. Most current FT architectures employ multiple, relatively low-powered processors, where the individual processors are capable of handling about one to five transactions per second (tps). Such architectures can adequately handle low-to-medium transaction applications, where cpu requirements are light relative to I/O loads. When the application calls for processing power beyond the 100tps to 200tps range, or when the cpu load is heavy, an architecture using a small number of very powerful processors that take advantage of economies of scale may be more appropriate.

IBM has had notable success in penetrating these latter classes of applications, beginning with the airline reservation systems of the mid-1960s. The IBM Airline Control Program has since been substantially enhanced. This real-time transaction system, now renamed TPF2 (Transaction

Processing Facility, Version 2), has been selected by the Bank of America in California to support the next generation of on-line teller systems. Even though TPF2 has little in common with CICS, IMS, and IMS-FastPath, IBM's current flagships in transaction processing, the compatibility argument combined with the transaction throughput consideration often wins the day against the FT suppliers.

Similar compatibility and throughput considerations have excluded the FT suppliers from competing for the design prototypes of the computer systems to be installed in the 20 en route air traffic control centers (awarded in late 1983 to teams led by IBM using IBM gear and Sperry using IBM-compatible systems from Amdahl.) The high-availability system will replace the currently installed IBM 9020 triple-processor systems, in which the individual processors are essentially System/360 compatible.

Increased reliability of conventional systems. IBM staffers are fond of pointing out that some of their installations have never experienced a TCM failure. (TCMs, or thermal conduction modules, are the basic sealed component packages from which the 308X series machines are constructed.) Their point is that the reliability of conventional systems has reached such high levels as to obviate the need for special fault tolerant features.

It is certainly true that as more functions are compressed into fewer VLSI

chips, the reliability of systems offering a constant level of functionality and performance will improve, simply by virtue of reduced component counts. Desktop microsystems can already boast mean time between failures (MTBF) measured in years. Large-scale systems routinely offer 99% availability.

It is worth noting, however, that 99% availability is not especially high; it means, for example, that a system operated eight hours a day can be expected to be unavailable some five minutes every day. While the number of applications requiring better than 99% availability is relatively small, that number is increasing.

Focusing on the problem. Probably the most fundamental argument against current FT systems is that they are focusing on the wrong problem. Just about all FT suppliers offer systems that provide reasonably robust fault detection and recovery within the cpu proper, and which are capable of maintaining database integrity and consistency. Of course, the degree of such robustness is the subject of hot disputes among the competing firms.

FACTORS CAUSING DOWNTIME

Unfortunately, high availability is not assured by a system's ability to recover from processor or disk failures. Several other factors contribute to downtime. Some are factors within the computer proper that reduce the system's availability and for which no effective solutions are known. These include operator errors, various software bugs, the installation of new operating system releases, and sometimes even the collection of database checkpoints needed to support database recovery. During the installation of new software, or database dumps, the system is generally unavailable for routine operation.

The design of the AT&T 3B20D fault tolerant supermini anticipated the following frequency of downtime causes (evidently based on accumulated experience with previous FT computers in the telephone network): hardware, 20%; system software, 15%; inability of recovery software to effect automatic recovery, 35%; and procedural (operator) errors, 30%. Note that at least 30%, and possibly 65%, of these causes are beyond a designer's control.

Still other factors are external to the computer. Although uninterruptible power systems are often installed to support critical on-line applications, few computers incorporate such systems as an integral part, and few computer suppliers undertake to supply them.

Unreliable communications lines



"Too subtle."

If these systems were offering 100% availability at no added cost, wouldn't everyone be buying them?

are another external factor. Data reported by the Bank of America, for example, based on early experience with its teller support system, which went into operation in 1978, suggest that some 50% of the causes of unavailability to end users resulted from communications line problems, not problems with the central or remote computer gear.

The cost of fault tolerance. It's commonly said that FT systems cost more, and that users are resisting them for that reason. To prove this, a bit of sophistry is used: if these systems were offering 100% availability at no added cost, wouldn't everyone be buying them? Since everyone clearly isn't buying FT systems, they must cost more.

In fact, historically there has been no added cost for fault tolerance. Tandem systems had a whopping price/performance advantage against mainframes, and were at least equal to other superminis, provided the load called for at least two processors. Stratus uses off-the-shelf microprocessors to implement a high degree of redundancy, while still offering systems

price competitive with superminis.

It is true that there may be instances of lost performance, especially when such mechanisms as disk mirroring and transaction logging are invoked. It is possible to argue, however, that the penalties incurred are balanced by improved performance on disk reads (in the case of disk mirroring), and by the fact that the transaction logs can be used to extract data needed for applications-oriented audit trails.

Users can quantify the value of an FT system with the formula, $\text{Saved Profits} = F \times L$, where F is the probability that the FT system will reduce service disruptions, and L is the annual loss of profits due to service disruptions experienced with existing systems.

The real problem is not the added costs, but the fact that current FT systems cannot provide 100% protection from all causes of unavailability. (This means, incidentally, that in the formula above, F must always be less than 1.)

So the MIS manager is faced with a dilemma. On the one hand, the new FT suppliers offer elegant systems that provide

good protection against some, but not all, of the causes of downtime. Unfortunately, the architectures they offer are incompatible with his existing gear. On the other hand, the conventional supplier (IBM, DEC, NCR, and so forth) probably has some sort of kludgy but workable solution to high-availability requirements. These, too, do not solve all problems; in fact, they aren't even as effective as true FT systems in recovering from basic cpu and disk failures. The big advantage, however, is that the architecture is a known entity, most investment in existing software can be salvaged, and little if any new training is called for.

These are pretty powerful incentives to stay with the conventional supplier. It isn't surprising that, more often than not, the conventional supplier wins. ©

Omri Serlin heads ITOM International Co., a research and consulting firm in Los Altos, Calif. His monthly newsletter, *FT Systems*, analyzes business and technical developments in fault tolerant systems. His other interests include supermicros and local area networks.

FIRE... DESTROYS COMPUTERS



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Tandem gets million dollar contract with J.C. Penney

By NICK ARNETT

Tandem Computers Inc. of Cupertino reported last week it has edged out the competition, primarily IBM Corp., to sell \$8 million to \$10 million worth of computer processing and communications equipment over the next year to retail giant J.C. Penney Co. for a credit card authorization network.

A J.C. Penney spokeswoman in New York confirmed the agreement.

Dennis McEvoy, Tandem's vice president of software said, "We're real excited about this because we see a real opportunity for retail point-of-sale."

Tandem has installed point-of-sale systems for target stores in the Midwest, May Co. department stores in the East, and at Mobil Oil for credit card-operated gasoline pumps, said McEvoy.

Computers and memory units to store 6.5 billion characters of information will be installed in processing centers near Kansas City, Mo., Columbus, Ohio, and Reno, Nev., said Tandem officials. A Penney spokeswoman confirmed the plans and said the company has catalog distribution centers in Columbus, Reno, and Lenexa, Kan., near Kansas City.

The system will connect 37,000 cash registers in Penney's 1700 stores, through IBM Series/1 computers in each store, to the centers. The hookup will be used to

authorize credit card purchases instantly with Penney's cards, as well as Visa, MasterCard, and American Express cards, said McEvoy. The system will also perform other switching operations and is



expected to be working by February, 1986, he said.

Thrift Drug, a J.C. Penney subsidiary in the Southwest and Middle Atlantic states, accepts Penney cards, but it will not be included in the system at first, said J.C. Penney spokeswoman Ann Roberts.

J.C. Penney has issued 35 million credit cards, of which 20 million are "active," second to Sears among retailers, said Roberts.

McEvoy called the contract a coup for Tandem, describing Penney as a "showcase" for IBM products.

Formed in 1974, Tandem became a Fortune 500 company last year, with revenue of \$533 million and a net income of \$43 million or \$1.04 a share. Its "fault-tolerant" computers, memory and communications systems are used in "on-line transaction processing," such as airline reservation systems, banking, and stock exchanges.

Merger with Little Village gives Fox & Carskadon 2 Los Gatos offices

By TIM TURNER

Fox & Carskadon residential real estate now has two offices in Los Gatos since it recently merged with Little Village Real Estate, which some have described as one of the most prestigious real estate offices in the city.

Last year, Little Village was the No. 3 firm on the real estate board in Los Gatos. Before the merger, Fox & Carskadon was the top residential firm in Los Gatos and Saratoga. Now it has "improved its market position considerably," said Gary Hill, assistant manager for both offices.

The new office, which is called Fox & Carskadon, Little Village office, opened shortly after the merger, which took place Jan. 1.

Harry Murray, who is now the manager

July. The new Almaden office building will house about 40 active agents, said Bob Satterwhite, office manager.

"Business is booming" at the Almaden office as well, Satterwhite said. "It looks like 1979 all over again—the average listing lasts nine days."

Four months ago, Fox & Carskadon opened an office in Morgan Hill and about two weeks ago, opened yet another office in Carmel, Hill said. With the new offices, the firm now has 42 offices in the bay area.

Little Village was started by Kenn Kennedy in 1953, "back when you could buy a house in Los Gatos for \$4,500 to \$6,000," Hill said. Now, most houses in Los Gatos start at around \$180,000.

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and children. The executor's duties usually are finished within nine to 18 months of death, although in large or complicated estates the administration can take much longer.

The committee's survey on institutional fiduciaries indicates that consumers have several viable choices to consider in making a selection.

There still are a number of banking and savings institutions eager to obtain estate and trust business from smaller estates.

The accompanying table indicates the minimum probate fees which apply.

Some institutions do not have a minimum size of estate or trust.

In these cases, however, there are minimum fees which may take a proportionally larger payment out of such small estates. Such minimum fees usually make it uneconomical to utilize such an institution for an estate of less than approximately \$90,000.

In some instances the minimum fee shown can be reduced if all of the trust funds are placed entirely in the institution's common trust.

Tandem donates computer system to science center

Tandem Computers Inc. has donated a \$300,000 computer system to The Exploratorium in San Francisco for use in administering museum operations.

More than half a million annual visitors to the hands-on science museum will now be able to view the NonStop 1+ (tm) system through a window to a centrally located computer room.

Aside from the computer's use as one of over 600 exhibit pieces in the Palace of Fine Arts building, museum officials anticipate the computer's help with accounting, membership, fund raising, storage inventory, exhibit registration, and administrative functions.

The donated system will "bring a cultural institution up to state of the art in computer technology," museum Public Information Director Linda Dackman said. She noted that the use of "up-to-the-minute technology" was "unusual" for resource-starved cultural institutions.

Besides the donation from Tandem, which manufactures and markets computer systems and networks for commercial on-line transaction processing, the museum received two compatible software contributions. PBL Associates of Point Richmond donated \$100,000 in accounting software.

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BODY:

Mednick Enterprises has announced a tape management system for Tandem Computers, Inc. computers.

Tapes/MGR cataloges magnetic tapes as they are used and tracks what is on each tape, where it is located and when it should be scratched and cleaned, a spokesman said.

The product consists of a maintenance program that allows the user to define data sets and produce reports; a tapes request program that notifies operators that a tape should be mounted or dismounted; a tapes scratch program that scratches expired tapes; and a tapes operator utility program used for handling missing tapes.

Tapes/MGR is priced at \$3,500.

Mednick Enterprises, 1680 Arbor Drive, San Jose, Calif. 95125.

M15 Week
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INFORMATION SYSTEMS

Tandem Upgrading 'Guardian' System

By JULI CORTINO

CUPERTINO, Calif.—Tandem Computers Inc. executives apparently let more than one cat out of the bag during a recent shareholders meeting.

Dennis L. McEvoy, vice president of software development, said customers could expect an upgrade of Tandem's proprietary Guardian operating system. The new operating system, called "B00," will be introduced in April.

Tandem is not prepared to say much about its new operating system before April. A Tandem spokeswoman said benchmarks are currently being done on B00, and the company is reluctant to cite any performance statistics until those tests have been completed.

An alliance between Tandem and the J.C. Penney Co. Inc., under which Tandem will supply the retail chain with to \$10 million worth of systems, was also mentioned.

A Penney's spokeswoman confirmed that 35 million J.C. Penney credit card holders would be served under the contract with Tandem. Initially, the contract calls for 12 of Tandem's high-end TXP systems in each of three data centers in the U.S. Those data centers are in Columbus, Ohio, Kansas City, and Reno, Nev.

The on-line credit authorization network being built by Tandem will also authorize credit for holders of Mastercard, Visa and American Express cards.

Tom Von, a spokesman for TRW in southern California, said Penney's currently uses databases compiled by TRW and four of its competitors in the U.S. to check the credit status of shoppers. Von said TRW is working

with J.C. Penney on a "more state-of-the-art interface for the purchase of credit reports."

Von said credit reports are currently pulled up by J.C. Penney employees on a teleprinter—a task that takes much longer than an on-line system would.

J.C. Penney currently uses International Business Machines Corp. mainframes in the 13 data centers that make up its credit authorization network. Neither Penney nor Tandem would say whether the Tandem data centers will replace existing IBM data centers.

The Penney's spokeswoman would say only that the retailer is "upgrading its service."

Insofar as the new operating system is concerned, McEvoy said B00 represents a rewrite of 60 percent of the Guardian operating system.

McEvoy said B00 will be available for Tandem's NonStop II and TXP systems. New systems will automatically come with B00. It can also be purchased as an upgrade to existing Tandem computers.

Tandem would not reveal the price of the B00 operating system.

In a separate announcement last week, Tandem said it has enhanced its 6100 Communications Subsystem by adding a new line interface unit called LIU4.

The LIU4 option lets the 6100 support four times as many asynchronous point-to-point devices as it can presently support, at no additional cost.

The 6100 system lets Tandem computers manage hundreds of communications lines simultaneously.

The LIU4 is priced at \$1,940. It requires host software called ATP6100. The software is priced at \$500 per processor.

Hitachi Un

By MINORU INABA

TOKYO (FNS)—In a rapid succession of local mainframe moves to counter IBM's Sierras, Hitachi Ltd. last week came up with a 34-million-instructions-per-second (mips) uniprocessor and 65-mips dyadic processor which, if compared with the industry leader's machines on a rental basis, reportedly have twice as great price/performance.

Hitachi's uniprocessor M-680H and its first dyadic M-682H follow NEC Corp.'s Acos 1500 family announcement in late February. Slated for shipments in June, the four-system NEC family starts with the 37-mips model 10.

Hitachi systems, scheduled for deliveries in Japan in the fourth quarter and in the U.S., through National Semiconductor's National Advanced Systems division, in the second quarter of next year, were accompanied by an array of new hardware and software products, including a 5-gigabyte disk drive unit with the regular ferrite head, unlike IBM's thin-film head.

Saying the new processors, which supersede the company's high-end M-280H processor, using the same air-cooling, outperform the Sierras on all scores, Hitachi executives added that they were hoping to sell 300 systems in four years in Japan and an equal number of them in overseas markets.

The currently high-end M-280H and M-280D, announced two years ago, have accumulated orders of 171 systems, well before the original marketing schedule, they said.

"The goal set for the new machines will also be easily met," one executive said.

The uniprocessor M-680H was said to offer two to two-and-a-half times improvement in performance over the M-280H in the

NAS Has Plug-Friendly Answer To IBM 'Sierra'

CONTINUED FROM PAGE 1

line, made for it by Hitachi Ltd. of Tokyo, was intended to unblock the growth plans of large users.

Firms such as General Motors, its new EDS electronics division, the Morgan Stanley investment house, GTE and British Airways,

frame market.

Hitachi introduced its computers in Japan with a proprietary operating system. NEC Corp. made its answer to the Sierra line late last month.

Jonathan Fram, Paine Webber's mainframe analyst, called

the fourth quarter. The AS/XL model 80, a dyadic (dual-processor) at 50 mips, matches IBM's 3090-400, a four-processor model due out in the second quarter of 1987.

Both NAS models are scheduled for roll-out the second quarter of next year and both support IBM's MVS/XA operating system. NAS's new models are 2.5 times faster than its existing top-of-the-line 9080 computer.

The cost for the XL 80 will be

Subsystem Option Added by Tandem

CUPERTINO, Calif. — Tandem Computers recently added to its 6100 communications subsystem product line an option allowing customers to support up to 180 asynchronous terminals and other devices from one subsystem.

Tandem said the LIU4 is a plug-in option to the 6100 communications subsystem. Each LIU4 supports up to four asynchronous devices such as

personal computers or Tandem's 653X terminals. Devices attach to the LIU4 via an RS232C interface.

The LIU4 option augments Tandem's LIU1 plug-in option which supports one connection of an asynchronous, synchronous or other device. Both the LIU1 and the LIU4 are priced at \$1,940. Tandem said it will continue to sell the LIU1 option.

Tandem offers interface option for 6100 front-end processors

CUPERTINO, Calif. — Tandem Computers, Inc. has enhanced its 6100 front-end communications processor by adding a line interface unit, the LIU4, that, according to the vendor, reduces connection costs for asynchronous point-to-point terminals by 75%.

According to a vendor spokesman, the LIU4, a plug-in hardware option, supports up to four asynchronous devices, such as Tandem 6530 series terminals, at no additional cost.

Reportedly, up to 45 LIU4s can be installed in a 6100 cabinet, supporting 180 local or remote asynchronous devices.

Typical applications of the LIU4 include credit authorization, home banking and shop floor control, the vendor said.

The 6100 Communication Subsystem allows Tandem systems to monitor several hundred communications lines at one time, the vendor said. The product is microprogrammable and allows different protocols, lines and line speeds to be mixed in one system.

LIU4 costs \$1,940. It requires Tandem's ATP6100 host software, which costs \$500 per processor.

Tandem is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

Computer World March 11, 1985 p 77

The Exploratorium's computer caretaker

COMPUTER companies are always donating machines for good causes — and usually for good tax breaks, too. But Tandem Computers' latest gift had an unusual twist.

Its donation of a \$300,000 NonStop computer system to San Francisco's hands-on science museum, the Exploratorium, came with a 29-year-old Tandem engineer who was to devote his six-week sabbatical to "bringing up" the computer.

As it turned out, Ron LaPedis not only spent his sabbatical at the Exploratorium but also kicked in his two-week vacation and weekends as well.

LaPedis has volunteered at the Exploratorium for four years, writing programs for the museum's small computers, blowing up balloons at its Bubble Festival and working at its non-profit store on weekends.

"I'm not spiritual or anything," he said, "but I think everyone is put on this Earth to do something or other, and I like to help people, especially children, understand things they wouldn't otherwise understand."

"I spend a lot of time explaining to kids what's in the store. We don't sell stuff like pens and cups and jackets. We sell chemicals and glassware and

C.W. Miranker Forward spin



gyros — things that can get kids interested in science."

Knowing the museum was in need of a large computer system, he decided to approach Tandem officials about a donation. At one of the weekly beer busts, when Tandem staffers at all levels mingle over beer and potato chips, he asked company President Jim Treybig how he could get the museum a donation.

"He said to come back next week to tell him about the Exploratorium. So I went to his office, and there was the entire executive staff of the company!"

"With my knees knocking, I gave them a presentation and proposed a deal: 'You give the machine, and I'll

give the manpower.'"

"They gave me a unanimous 'yes,'" LaPedis said.

How could he bear to part with his sabbatical?

"I'm a hacker," he explained. "Not someone who does something illegal with computers but someone in the old sense of the word who likes to fiddle around with machines."

"I built my first computer in 1977 from a kit and I've been gung-ho ever since. Computers are more a hobby and enjoyment for me than a job. I'm lucky — I'm one of the few people who can pursue their hobby as a job."

The NonStop computer, plus \$135,000 in software from two other companies, was delivered in mid-January and LaPedis has spent much of his time since then "shaking down" the system, moving databases from the museum's smaller computers, writing applications and coaching Exploratorium staffers on its operation.

The museum has built a separate room with a large picture window to house the system so that the computer will be an exhibit of sorts as it handles accounting, membership, fund raising, inventory and administrative tasks.

★★★

SENT: 16 Mar 85 13:55
From: MAIL (STOBING_CHUCK @MKT)
To: *.*.*.
Subject: 2: Local hero makes the news,congrats Ron LaPedis

Sunday, March 17 edition of the San Francisco Examiner page D2 ..

" The Exploratorium's computer caretaker " by C.W. Miranker

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I hope no one objects to my including the entire text of the article, but four years ago today, I entered the Tandem San Francisco office and the first person to warmly greet me aboard was, Ron LaPedis. He worked for me for a short while and since then I have moved to Sales Support in Cupertino and Ron has been doing a fantastic "hackers" job in the Network Support Group providing many functions. Of which, one of his best is voice and data communications consultation for the group and Tandem as a whole. I again pass on my congratulations to Ron for spreading the Tandem spirit.

Chuck Stobing

Tandem Streamlines Operating Software

Boosted performance aimed at keeping market lead

Tandem Computers Inc. is making a determined effort to hold onto its lead in the fault-tolerant computing market by releasing major new software this spring.

Tandem officials described the new software, called B00, at the company's recent annual meeting. They promised to improve performance of Tandem systems and dismissed two recent IBM thrusts into their market. One analyst at the meeting suggested Tandem might be taking IBM's efforts too lightly.

Dennis McEvoy, Tandem's vice president for software development, says there are 200,000 total lines of code in Tandem's Guardian operating system, Transaction Monitoring Facility, Enscribe data base manager, and DP2 disk access method. Sixty percent of that code will be new or rewritten in B00 to improve performance.

Pricing and availability will not be determined until the B00 software release is formally announced this spring. Company sources indicate first customer shipments are unlikely until October or November. The new release will not run on the firm's original NonStop I computers. It will be compatible with all applications written for NonStop II and TXP proces-

The software will be compatible with all applications written for NonStop II and TXP processors and future lines.

sors, as well as for future Tandem product lines.

Omri Serlin, president of ITOM International Co., a Los Altos, Calif., marketing research firm, says the B00 changes represent the first major overhaul of Tandem's operating software since it was introduced in 1976.

Serlin predicts that B00 won't be any smaller than the software it replaces. But he expects it will be more modular and will give users more control over the space it takes.

B00 has had fewer bugs than similar software releases, says Robert Marshall, Tandem senior vice president and chief operating officer, because Tandem has installed a \$5 million quality assurance system called Gremlin at company headquarters in Cupertino, Calif. Tandem calls field software analysts into headquarters, where they use Gremlin to exercise unreleased software and search for bugs. In addition to the new software release, Tandem officials promise improved system performance. Existing Tandem hardware and software can easily handle 120 transactions per second. That figure will rise to 250 transactions when the B00 software is released. Within a year or so, says Tandem president James Treybig, the company will demonstrate the capability of handling 1,000 transactions per second.

Serlin isn't sure Treybig's performance claims can be reached in a wide range of user environments. Although a 120-transactions-per-second figure has been achieved, he says 250 transactions depend on unreleased software. Serlin adds that the 1,000 figure assumes that Tandem's Fox fiber-optic local-area network will not slow down performance in systems of more than 32 processors. "There are lots of 'ifs,'" Serlin says.

Treybig dismisses IBM's recent OEM arrangement with Stratus Computer Inc. (see *InformationWEEK*, Feb. 11). He contends Tandem rarely finds itself directly competing with Stratus, so a Stratus machine sold by IBM shouldn't pose any more of a serious threat.

Tandem officials also used the annual meeting to describe a case where they did compete head-to-head with IBM—and won. J.C. Penney Co., based in New York, was looking for a system to handle credit card authorizations, according to Tandem. Pen-



JAMES TREYBIG

ney had tentatively decided on IBM, but asked for a benchmark test of the proposed system, a 3081K mainframe running its Customer Information Control System data communications monitor.

Tandem says IBM could not meet price and performance constraints: Penney had specified a \$10 million price for the system. IBM could supply a system that would meet all the requirements, but it would cost \$30 million. A Tandem system could meet the requirements, and won.

As for IBM's new IMS Extended Recovery Facility (see *InformationWEEK*, Feb. 25), Tandem's McEvoy says it is not a "product threat." The facility requires the customer to have a mainframe, similar to the one doing production work, on "hot standby," typically being used for either batch work or program development.

Serlin calls IBM's extended recovery system "a quick and dirty patch" that will not be ready until the third quarter of 1986. He says IBM's willingness to offer such a product shows it is concerned about competition from Tandem.

Serlin thinks the Stratus deal may be more of a threat than Tandem realizes. In the short term, users may delay buying a Tandem until they see what kind of Stratus-based system IBM offers.

In the long term, users who might not buy a system from Stratus, because the company is small, might be willing to buy one from IBM, assuming that IBM will support the unit for years.

—Paul E. Schindler Jr.

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Week In CSN

March 4, 1985

COMMUNICATIONS

Berg submits a plan to under which Actrix Company Baccarat Electronics, a page 14.

ds its third-party main- total of 120 products and dits to customers wishing for comparable DEC-man- 5.

gns Arrow Electronics as Group as its first na- al said to be worth \$10 age 16.

ead of its Cybernex Ad- logy disk drive develop- ditional post of Cybernex 17.

as closes its doors after and financing. Page 18.

ceful personality has the past, the industry Tramiel style will aid he battle to achieve su- place. Page 20.

es its business strategy, inal emphasis on cartridge e media. Page 26.

a two-year pact valued at apply disk drives to Alpha

veils a pair of Win- s for the IBM PC AT a gap left by what difficulty in deliver- Page 29.

y surrounding IBM's the low end where Unix System III PC: PC/IX from 's Xenix. Page 30.

COBOL compiler for d at business applica- in Apple's "Macintosh ing the IBM-dominated er market. Page 32.

Bridge Communications gears up for head-to-head competition with arch rivals Ungermann-Bass and Sytek with the introduction of its first in a family of broadband LAN products. Page 36.

Network Software Associates develops a new software product for IBM PC-to-PC communications using the IBM SNA-based SDLC protocol. Page 36.

Despite facing numerous unresolved issues and uncertain demand, manufacturers in the chaotic IVDT marketplace are preparing for dramatic growth through the rest of the decade. Page 37.

SYSTEMS

Tandem plans to bolster its line of fault-tolerant computers later this year with a new operating system and data base system. Page 43.



Tandem's Treybig

Triconex introduces a trebly redundant fault-tolerant computer system designed for industrial automation and process control applications. Page 43.

Zilog's Systems Division introduces two new add-on memory boards, which double the maximum memory capacity of its System 8000 microcomputer family from the previous 4

Mbytes to 8 Mbytes. Page 43.

MANAGEMENT REPORT

Two Apple vice-presidents resign in what apparently were unrelated moves. Page 48.

Lotus establishes a new division to pursue new ventures for the company. Page 48.

VALUE-ADDED REMARKETING

Ask Computers Systems is named an Authorized Distributor of DEC systems. Page 52.

Data General establishes a new high-level software vendor program under which qualified vendors' software will be sold directly by DG's sales staff. Page 52.

Corporate Data Sciences is named an IBM VAD in the People's Republic of China. Page 53.

DISTRIBUTION

Micro D reduces dealer prices on 10 products the company markets nationwide. Page 56.

NOTABLE QUOTE

"The venture capital people move in a herd, and the herd has gone in another direction. So as far as an alternative, the chances are slim and none for somebody trying to raise money in any of the traditional fashions."

—Morrow president Robert Dilworth. See page P2.

Special Report

Personal computer makers take pains to meld their engineering and marketing efforts. Also: The search for funding in the PC market continues. Starting after page 36 on page P1.

BUSINESS & FINANCE

A proposal to increase taxes on capital gains is generating a keen interest on the part of young computer companies: Investors fear they will lose interest in risky start-ups or high-growth stocks without a special tax break on those investments. Page 57.

Hewlett-Packard president John Young tells shareholders to expect a more difficult year for the company than during 1984. Page 57.

Centronics Data Computer, which in the last five fiscal years has lost a cumulative \$76 million, reports its first quarterly profit in more than a year. Fourth-quarter net income was \$326,000, or 3 cents a share, compared with a loss of \$6.2 million in the like period last year. Page 57.



Morrison of Centronics

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Tandem Plans New OS, Data Base System For Fault-Tolerant Line

CUPERTINO, CALIF. — Tandem Computers Inc. plans to bolster its line of fault-tolerant computers later this year with a new operating system and data base system, officials said last week.

Tandem also has signed a \$10 million contract with JC Penney Inc. to create a credit authorization network hooking Penney's 1700 U.S. stores, Tandem president James Treybig said at the company's annual stockholders' meeting here. He noted that Penney chose Tandem over IBM.

New Zilog Add-On Boards Double Memory Capacity Of System 8000

CAMPBELL, CALIF. — Zilog Inc.'s Systems Division has introduced two new add-on memory boards, which double the maximum memory capacity of its System 8000 microcomputer family from the previous 4 Mbytes to 8 Mbytes.

Zilog is offering a 4-Mbyte board for a list price of \$18,950 and 2-Mbyte board for \$10,950. Previously, Zilog offered only 500k-byte and 1-Mbyte add-on memory boards.

Peter Beckett, Zilog product manager, said the boards not

Treybig also told stockholders that Tandem's 27 percent growth rate in fiscal 1984—to sales of \$532 million—was not as high as it could have been.

"Our lack of growth rate was not because of a lack of market or products, just a lack of software," Treybig said. "A big mistake we made was not getting enough third-party software houses three years ago."

To correct that problem, Tandem has redirected its marketing efforts to building a third-party software affiliation

program, which today consists of 71 companies, Treybig said.

Treybig declined to provide many details on the new operating system—called the B00—except to say that it will allow Tandem systems to achieve up to 250 transactions per second. Eighty transactions per second is currently the norm for mainframe systems, he said.

The release date for the new operating system has not been set, but it reportedly will not be out for several months. The system will continue Tandem's tradition of proprietary, software-intensive fault-tolerant computers, as exemplified by its TXP and NonStop systems.

Tandem's newest customer, JC Penney, has purchased 36 TXP high-end computers to be installed over the next year at its Reno, Nev.; Kansas City, Mo.; and Columbus, Ohio, credit centers. The TXPs will maintain an on-line data base



Treybig: 27 percent growth rate could have been higher.

of Penney's 30 million credit card customers accessible by point-of-sale terminals.

According to Treybig, the Penney deal and the upcoming product enhancements reflect

the company's performance edge over IBM, Tandem's major competitor. However, he acknowledged concern about Tandem facing increased competition from IBM in light of the new IBM Sierra mainframe as well as IBM's decision to remarket computers built by Tandem's fault-tolerant rival, Status Computer Inc.

"It is still difficult to know what the IBM/Stratus relationship is," Treybig said. "Stratus announced that it wouldn't materially affect them this year, so it won't affect us. Anyway, the most powerful Stratus machine is below our low-end machine."

"In addition, the Sierra announcement says that IBM chooses to operate in a 'hot standby configuration' whereby there are two systems, but only one is on line while the other is used as backup."

—Susan Kerr