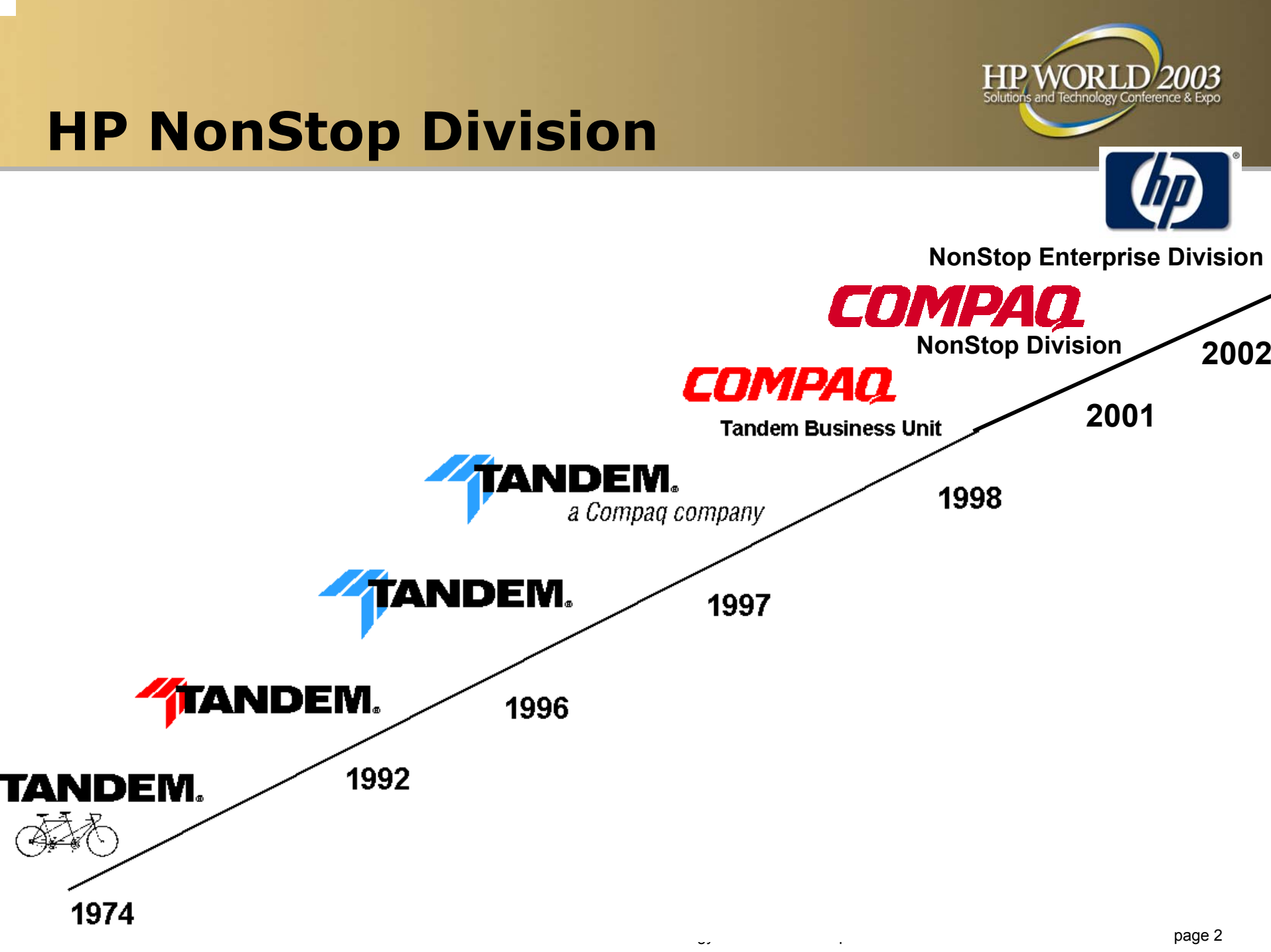
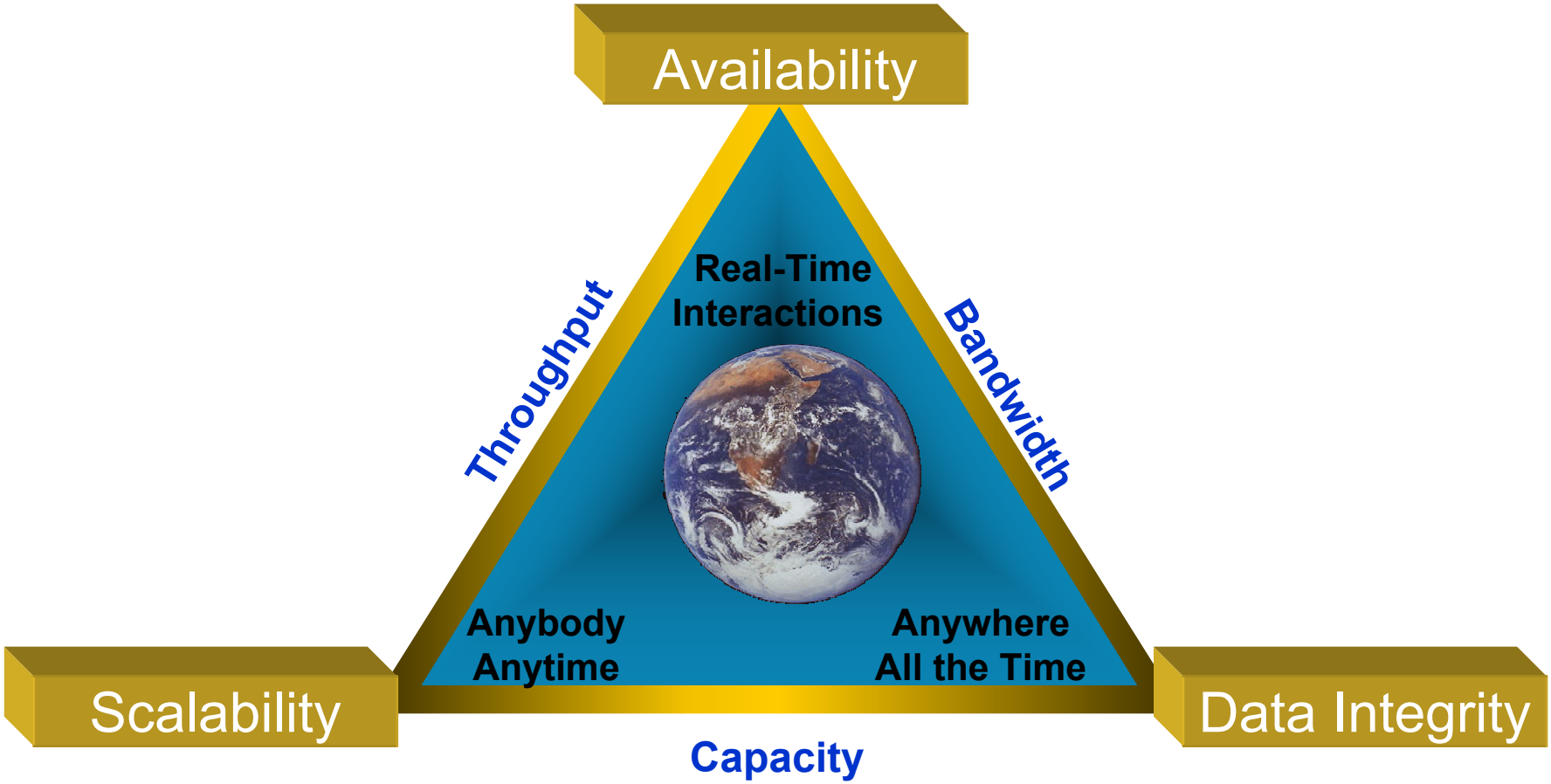
HP NonStop Servers 101

HP WORLD 2003
Solutions and Technology Conference & Expo

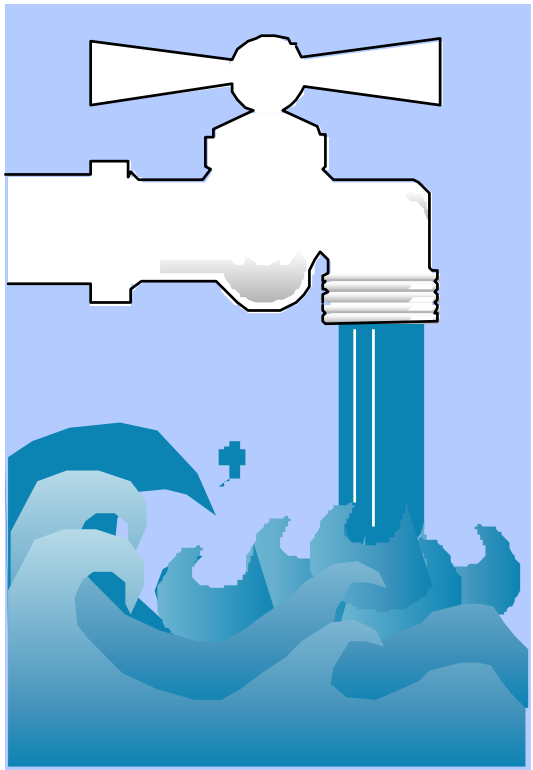
HP NonStop Division

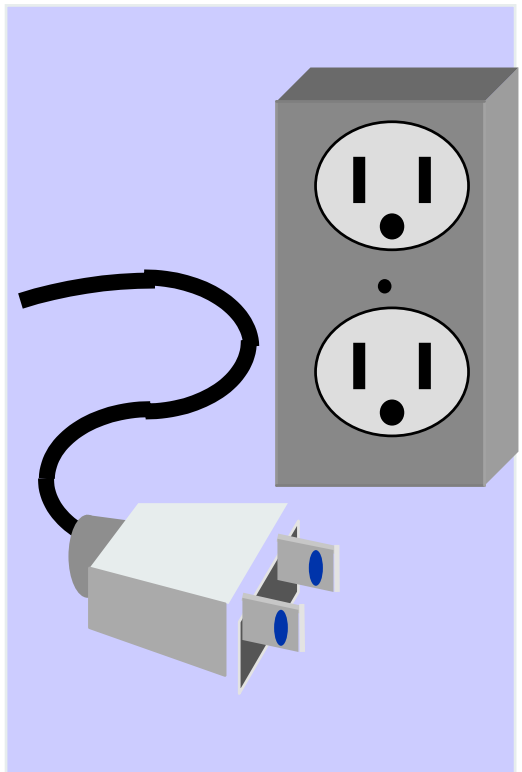


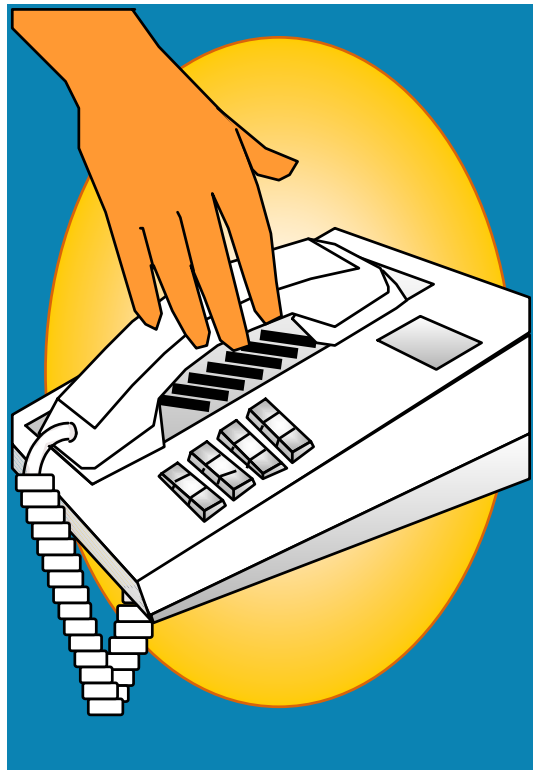
OLTP and Internet Transaction Processing Business Requirements



Reliability and Continuous Availability







Continuous Availability Versus High Availability

- Continuously available systems
  - The design goal is to **eliminate** downtime.
- High availability systems
  - The design goal is to **minimize** downtime.
    - Takeover versus restarting

Measuring Computer System Availability

Percent Availability *	90%	99%	99.9%	99.99%	99.999%	100%
Outage Minutes/ Year	~50,000	~5,000	~500	~50	~5	0
User Impact	36.5 days	3.65 days	8.8 hrs	~50 min	5 min	0 min

- * Based on percentage of 24 x 7 operations including both planned and unplanned outages
  - 100% availability does not necessarily require the system to be available 24 hours a day. In some environments it means that the system is always up and stays up at the required time.

Downtime is Expensive

- Lost productivity
- Customer dissatisfaction
- Lost revenue opportunities
- TCO "Virtual Advisor"
  - http://www.standishgroup.com/

The Standish Group ranks the HP NonStop server the leading system for application availability: "The HP NonStop [server] has the highest peak-time availability both on the system and the application level of all the systems we've researched."

Cost of Downtime

Industry	Business Operation	Average Cost per Hour of Downtime
Financial	Brokerage operations	$7.84 million
Financial	Credit card authorization	$3.16 million
Media	Pay-per-view	$183,000
Retail	Home shopping (TV)	$137,000
Retail	Home catalog sales	$109,000
Transportation	Airline reservations	$108,000
Media	Teleticket sales	$83,000
Transportation	Package shipping	$34,000
Finance	ATM fees	$18,000

Availability Continuum

100% availability objective (application level)

Recommended SLA commitment

% availability

99.99%	IBM Parallel Sysplex, *HP NonStop™ Server*	2.2
99.9%	Single mainframe	8.7
99.8%	AS/400, *HP OpenVMS™*, HP3000	17.5
99.6%	Solaris, HP-UX, HP *Tru64™* UNIX, AIX	35.0
99.2%	Windows NT and Microsoft Cluster Server	69.9

Hours lost/year

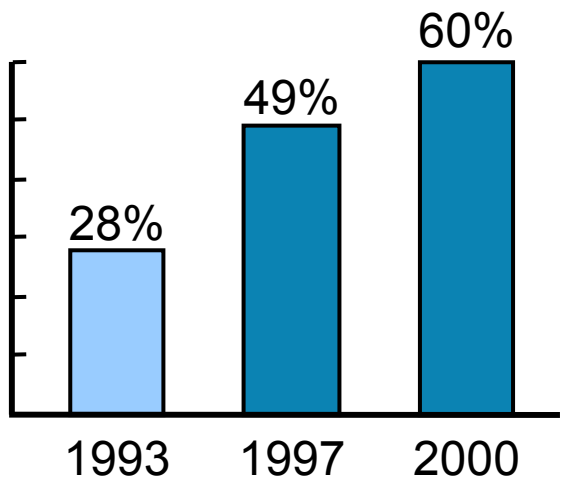
Windows 2000 will improve this rapidly in 2001, 99.5% for AS, even better for DCS

Source: Gartner 2001

The Demand for 7 x 24 Is Stronger Than Ever

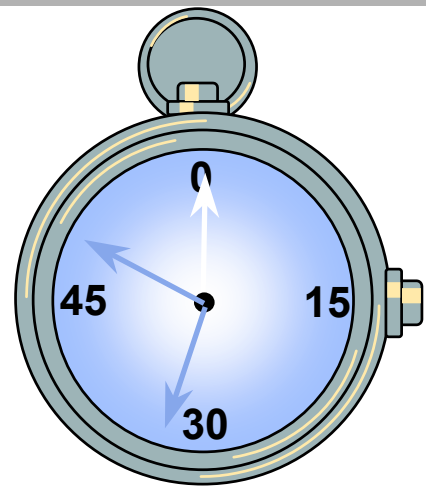
- The Internet is driving electronic commerce and a structural change in business
- Globalization of competition and companies
- Integration of customer and suppliers supply chains
- Networking of dispersed information systems
- 7 x 24 applications growing faster than total server market

7 x 24 applications as percent of total



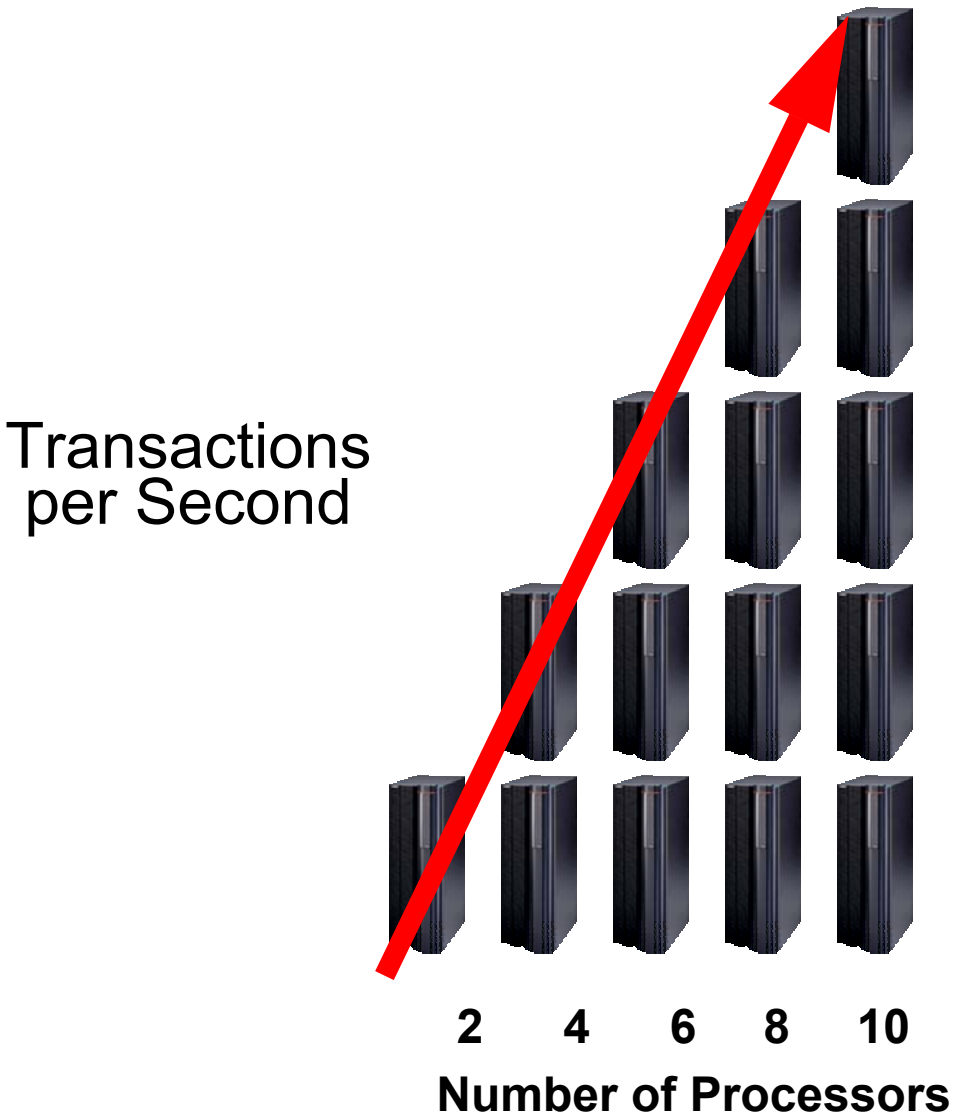
Source: The Standish Group, 1998

We Take Our Customer Availability Seriously!



- We have 3 escalation programs...
  - Sensitive accounts to deal with chronic, long term, relationship type problems
  - Alerts to escalate specific issues. If there is an outage, an alert is automatically generated
  - Crisis. When business is down and we need to get a customer up a running.
- If a system is down:
  - 2 hours: Account Service Mgr is paged
  - 4 hours: NonStop Escalation Group/Crisis folks get paged
  - 8 hours: Pauline would get paged
    - In actuality, Pauline would hear about things much earlier.
    - In practice, these types of crises are escalated much faster..
- There is also an alert sent by services to management to warn them of brewing issues. This is something now standardized across HP.
- Links
  - http://tep.cac.cpqcorp.net/
  - http://www.mse.qvar.cpqcorp.net/ManagementAlerts/ManagementAlerts.plx

Scalability and Performance (1 of 2)

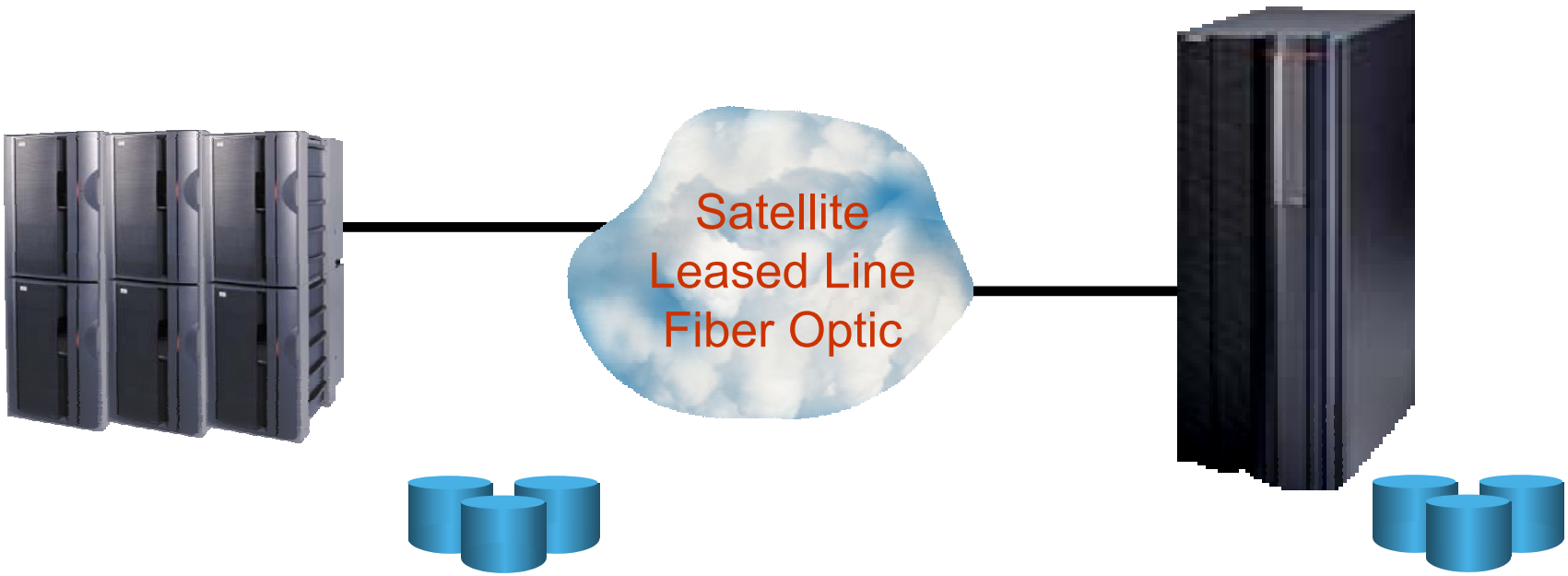


Scalability

- The ability to expand system resources to meet performance requirements:
  - Processors
  - Storage / Database
  - Peripheral devices
  - Applications
- The challenge is to do this while Online/Internet transaction processing continues!

Data Integrity

Facilities for Database Recovery



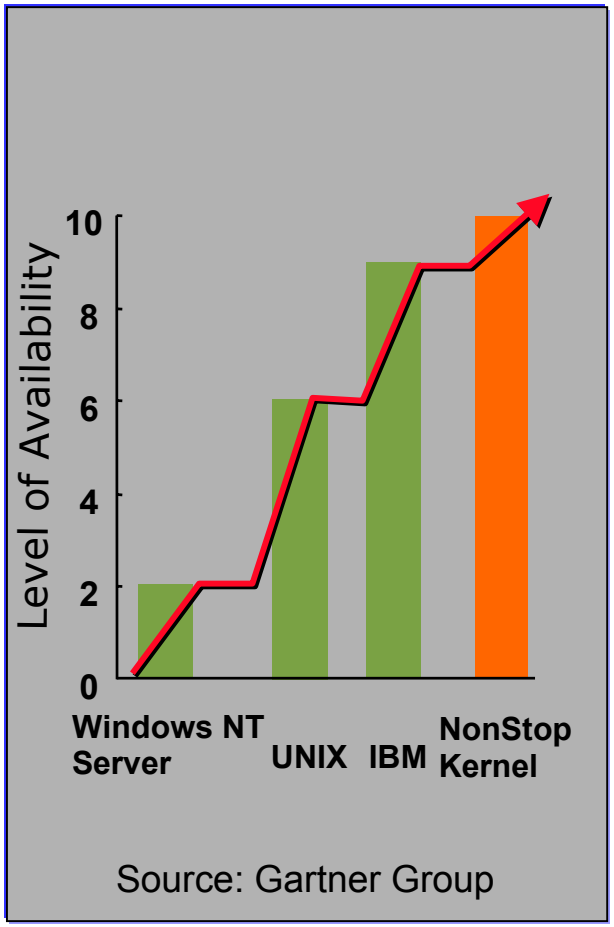
NonStop Hardware and Fault-Tolerant Software

Remote Duplicate Database

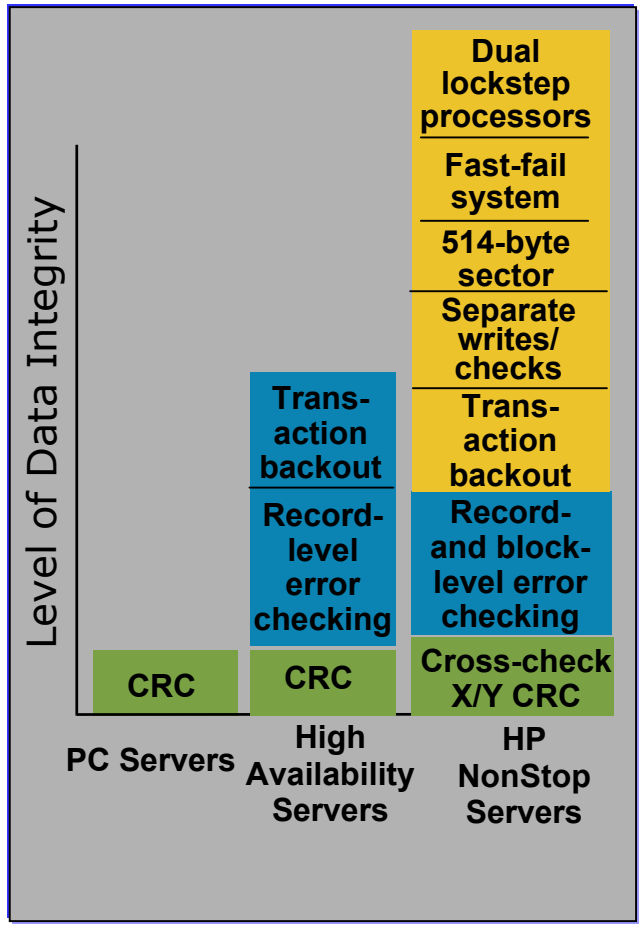
HP NonStop Servers Set the Standard

HP WORLD 2003
Solutions and Technology Conference & Expo

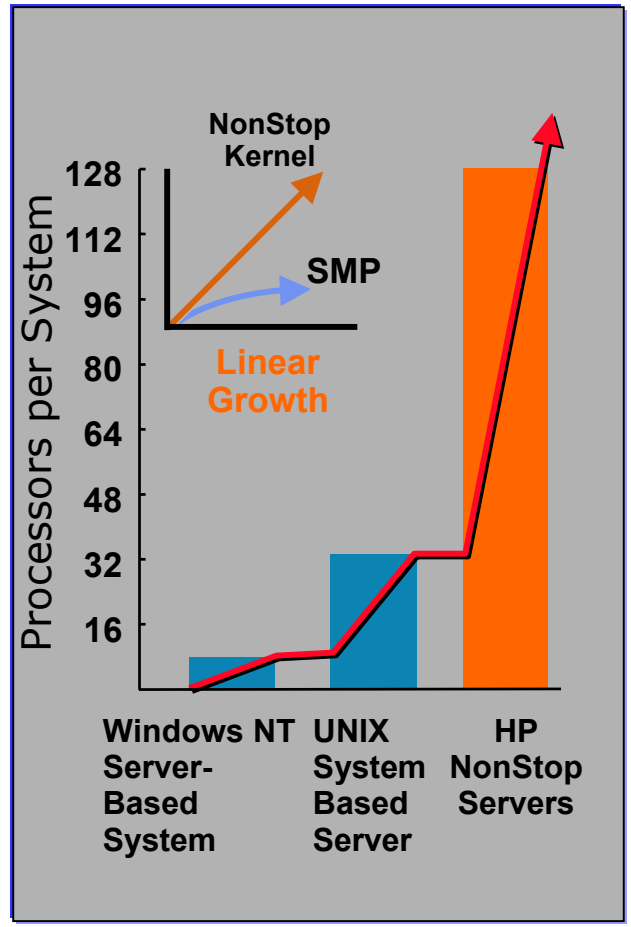
Industry Leader in Availability



Industry Leader in Data Integrity



Industry Leader in Scalability



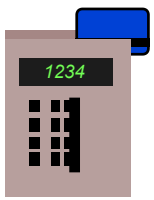
HP NonStop Fundamentals

Target Markets and Customers

HP WORLD 2003
Solutions and Technology Conference & Expo

The "Infrastructure Box"

Input Flexibility



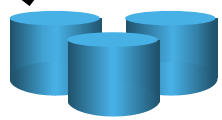
The Piece in the Middle

- Distributed Data
- Open Access
- Client/Server
- Communications
- Security

Output Flexibility

UNIX and Windows 2000

IBM

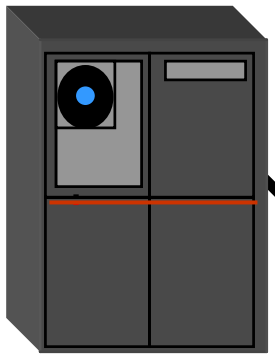


DEC

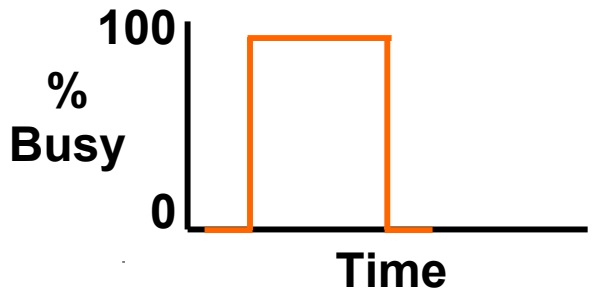
HP

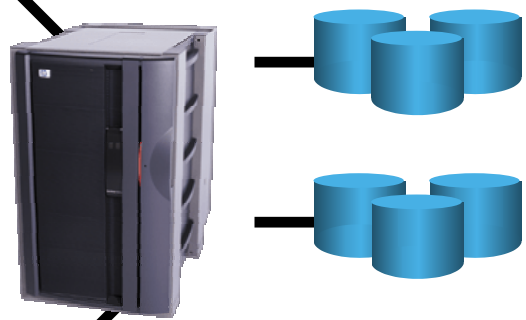
Demanding OLTP and Internet Transaction Processing Environments

Batch systems



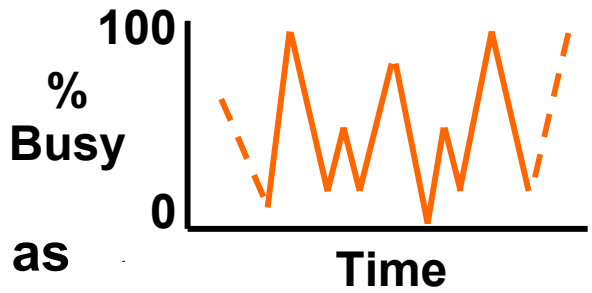
Delayed processing of data in batches



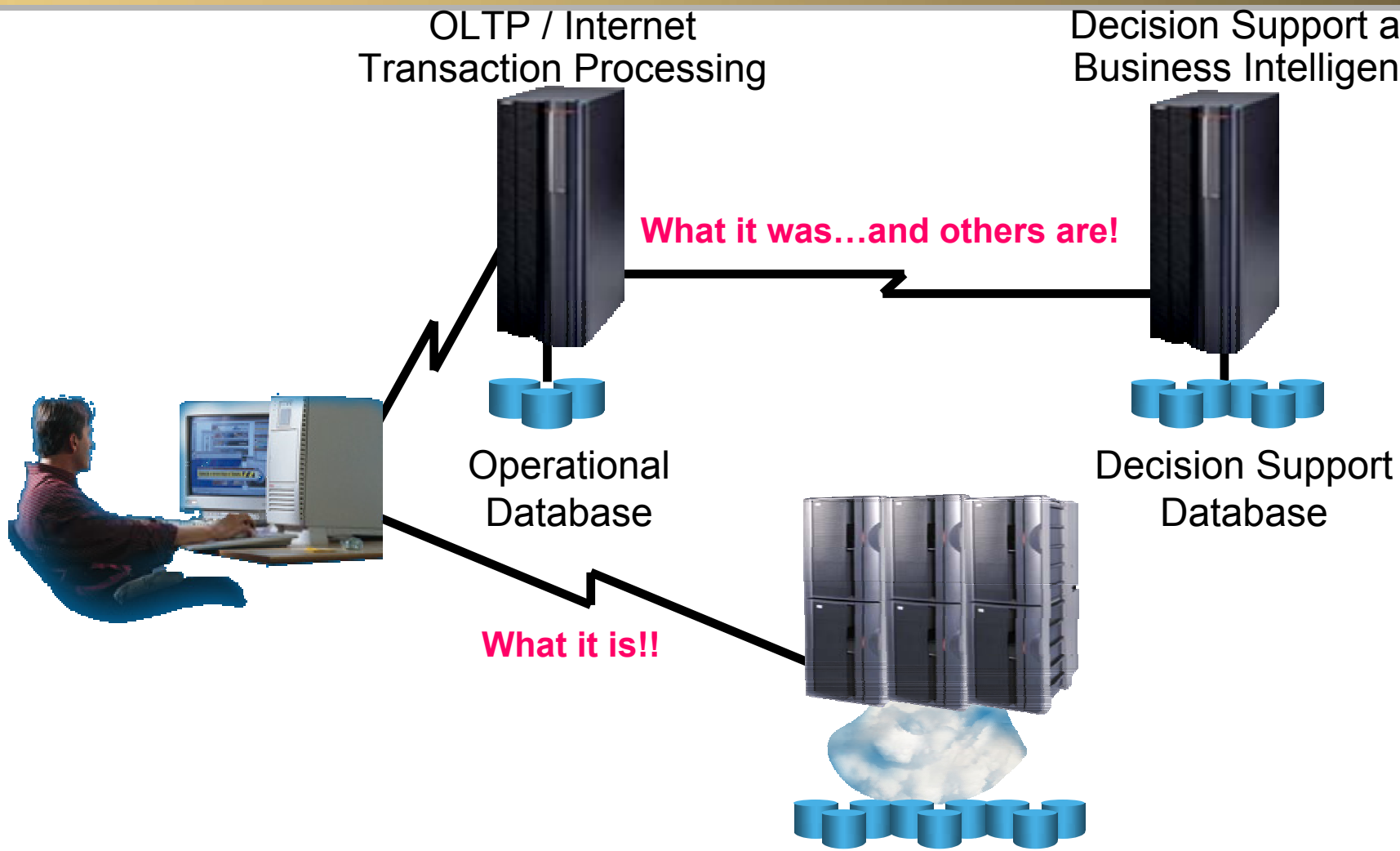


Online Systems

Processing of data as each transaction occurs



Decision Support Involvement

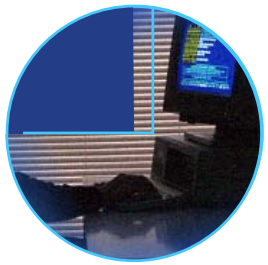


Target Customer and Application Profile

- Listen for these words:
  - "It doesn't go down often, but when it does, all $%#^@ breaks loose. We really must stop those rare but painful outages. It seriously HAS to be there all the time!"
  - "We are outgrowing our current computer system (or storage solution) and are looking for something that can handle our size and rapid growth!"
  - In response to the question"How is your business do today" and getting the answer "I'm not really sure, we run reports at the end of the month to tell us that!"
- Look for applications that you wouldn't use unless you knew they were there any time you needed them!

Chosen for Mission-Critical Environments

67% Credit Card Transactions

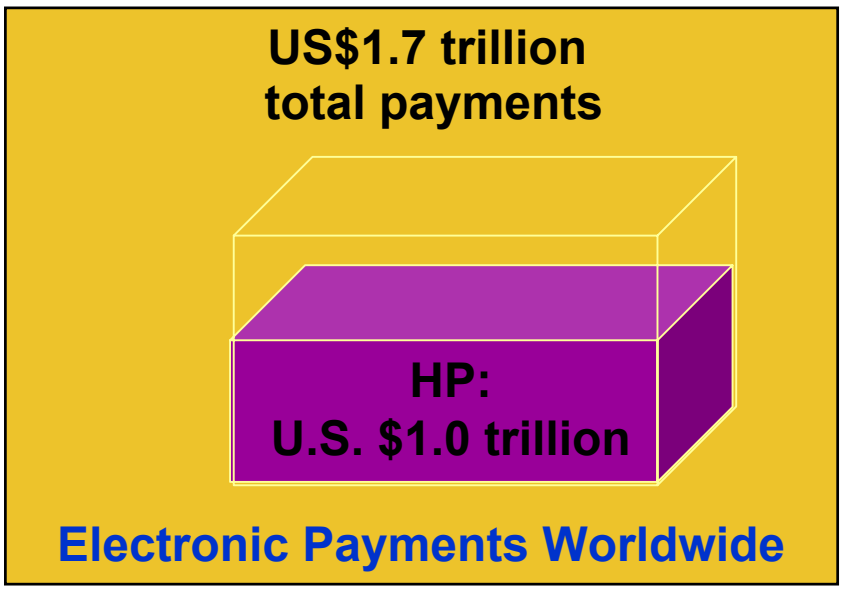


75% EFT Networks

95% Trade Transactions

80% ATM Transactions

70 Million Wireless Subscribers

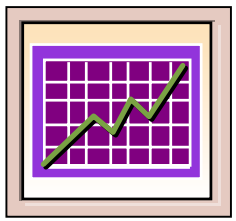


- Brokerages and investment banks
- Security and commodity exchanges
- The world's leading commercial banks

HP NonStop Servers — Business-Critical Enterprise Solutions

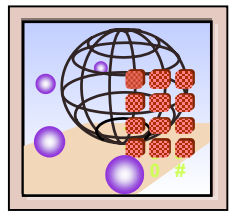
500 Financial Services Companies

- 80% of ATM transactions
- 67% of credit card transactions



40Securities / Commodities Exchanges

- 95% of securities transactions
- New York Stock Exchange
- London Exchange
- Singapore Exchange



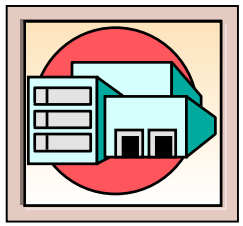
135 Telecommunications Providers

- 100% of the 35 largest
- Wireless and land line

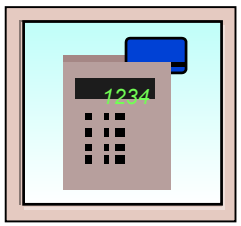
40 Police, Fire, and Emergency Dispatch Systems

- Including Denmark emergency service and Hong Kong police
- 50% of all U.S. 911 calls

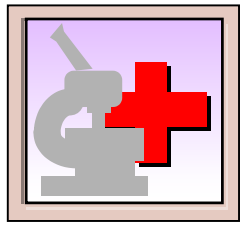
HP NonStop Servers — Business-Critical Enterprise Solutions



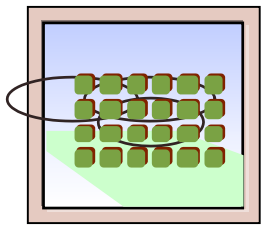
- 450 Manufacturers
  - Most European car manufacturers: Mercedes, Peugeot, Renault



- 400 Retailers and Wholesalers Worldwide
  - Including Hertz, Target, Victoria's Secret



- 200 Hospitals and Healthcare Providers Worldwide
  - World's Largest HMO: Kaiser Permanente



- 100 Very Large Databases for Business Intelligence
  - WorldCom
  - Deutsche Telecom
  - Ameritech

Specifically, Who Uses HP NonStop Servers?

- Citicorp EFS, the leading vendor of electronic benefits transfer in the U.S., processes around 35 million authorization transactions a month through its NonStop systems.
- On average, CRESTCo—which settles U.K., Irish, and international securities and money market instruments—processes 350,000 NonStop transactions per day, with a daily value of US$740 billion.
- NonStop servers at Visa handle approximately one billion debit card processing transactions every 70 days
- At TeleDanmark, the largest provider of Internet, mobile phone, and long-distance services in Denmark, NonStop systems provide 99.999 percent availability while handling up to 40 million call detail records each day.
- Three NonStop S72000 servers power Bank One's retail banking operations, processing more than 1.5 million customer transactions each day.
- SIAC and NASDAQ each trades over 1 billion shares each day, takes in data from more than 350,000 terminals, provides its real-time market data to over 1,000,000 terminals around the world, and processes more than 5,000 transactions per second.

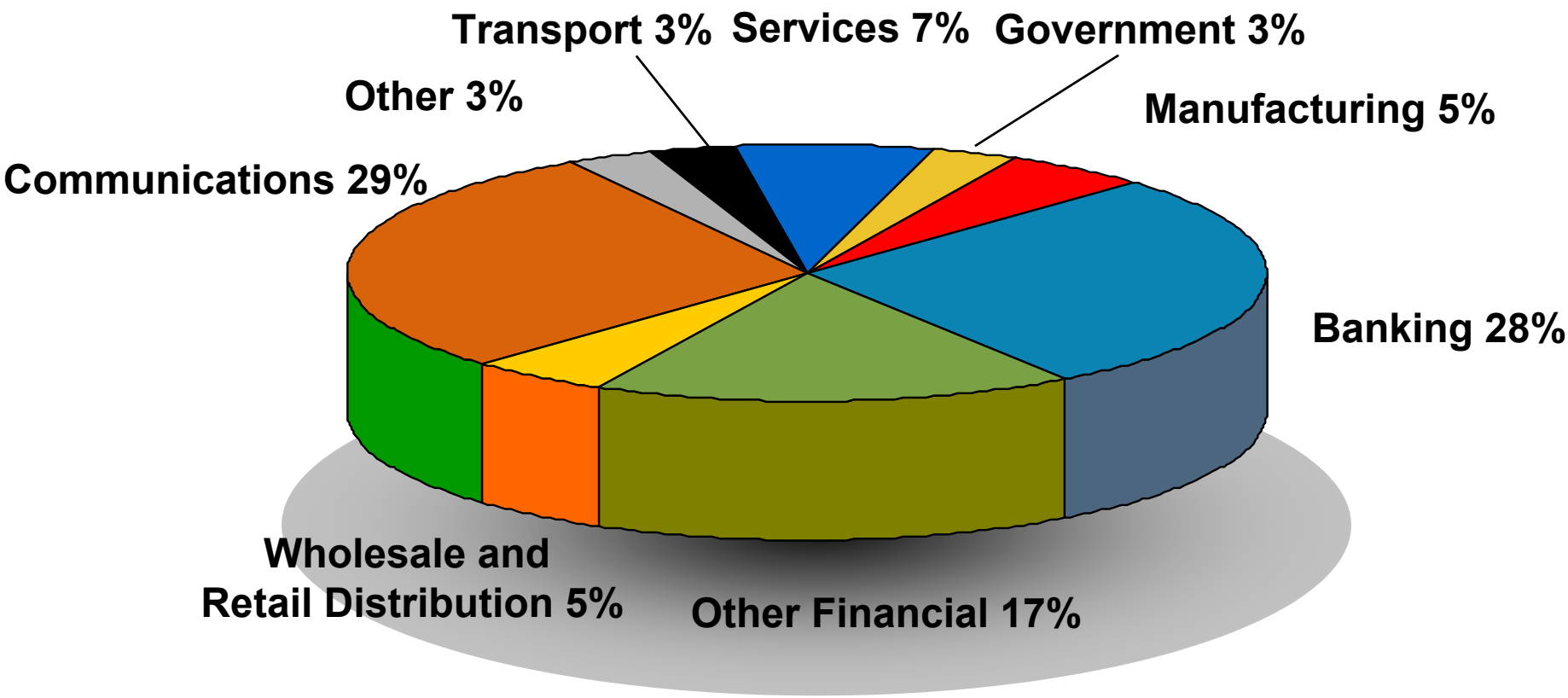
Specifically, Who Uses HP NonStop Servers?

- Sabre estimates that migrating from IBM mainframes to NonStop servers will cut the cost of running its airfare-pricing application by up to 40 percent.
- NonStop servers at Nakakita Yakuhin Co. Ltd. handle daily output of as many as 20,000 delivery slips that track sales transactions, as well as manage inventory, and analyze sales information in real time.
- Elder Beerman's senior vice president of information systems, James Lance: "Over 15 years, we've accumulated less than three hours of total downtime. In the last 4 years, we've had zero minutes of downtime."
- Powered by HP NonStop servers, the more than 8,000 lottery point-of-sale terminals operated by Loto-Québec typically handle volumes of 50 transactions per second. In a Super Lotto, volume can jump to 120 transactions per second.
- Scandinavian Airlines Systems (SAS) manages approximately 50,000 customer calls per day,
  24 x 7.

HP NonStop Systems for ATM POS (U.S.)

	Electronic Funds Transfer (EFT) Network (U.S.)	Main Hardware Platform	Monthly Transaction Volume (millions)
1	MAC	NonStop	94
2	HONOR	NonStop	37
3	NYCE Corp.	NonStop	32
4	Star System	NonStop	28
5	Interac Association	NonStop	25
6	TransAlliance	NonStop	15
7	Plus EFT Association	NonStop	14
8	Instant Cash	NonStop	12
9	MoneyMaker	NonStop	11
10	CO-OP Network	NonStop	9
11	Cash Station, Inc.	NonStop	9
12	Magic Line	NonStop	9
13	MPACT	NonStop	8
14	Tyme	IBM	7
15	Jeanie	IBM	6
16	Fastbank	NonStop	6
17	BankMate (Mo.)	NonStop	4
18	MONEY/Handibank	NonStop	4
19	TransFund	NonStop	4
20	Minibank	NonStop	3

HP NonStop Division Worldwide Revenue



How Do We Support These Customers?

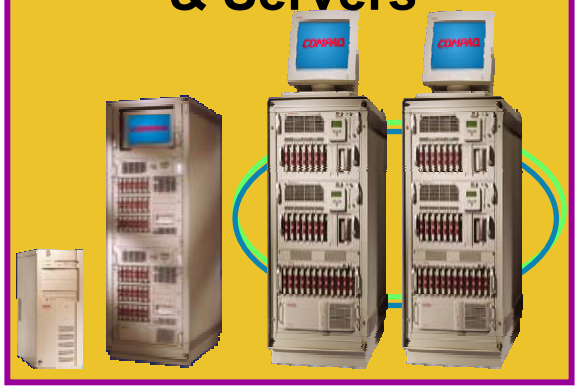
- Extensive experience in dealing with, supporting and managing mission critical customer environments
  - 65,000 Service professionals
  - 160 countries
  - 105 response & operations centers
  - 80 customer education centers
- Integrated organization of
  - Consulting and Integration for Architectural and Project services
  - Customer Support for Remedial and Proactive Services
  - Managed Services for Outsourcing and Disaster Recovery Services
  - Dedicated, certified Mission Critical & Proactive Services resources

Will All Work Together?

HP Provides the Total Range of Solutions

Enterprise-Class Technology

Hp Workstations & Servers



Windows / LINUX

HP UNIX

UNIX

HP NonStop Servers

S76000 / S86000

Leveraging Standards

WWW.OnlineVacationMall.com—Implementing HP Solutions Throughout the Enterprise

- Requirements
- Open environment
- 24 x 7 continuous availability
- True fault tolerance
- Security

- Business value through HP NonStop systems
- Ease call volume made to call centers
- Cost savings can be as high as 80%
- Secure transactions encourage repeat business

Oracle database stores all information on hotel, car rentals, and tickets to Disney centers.

HP Alpha server handles back-end bookings.

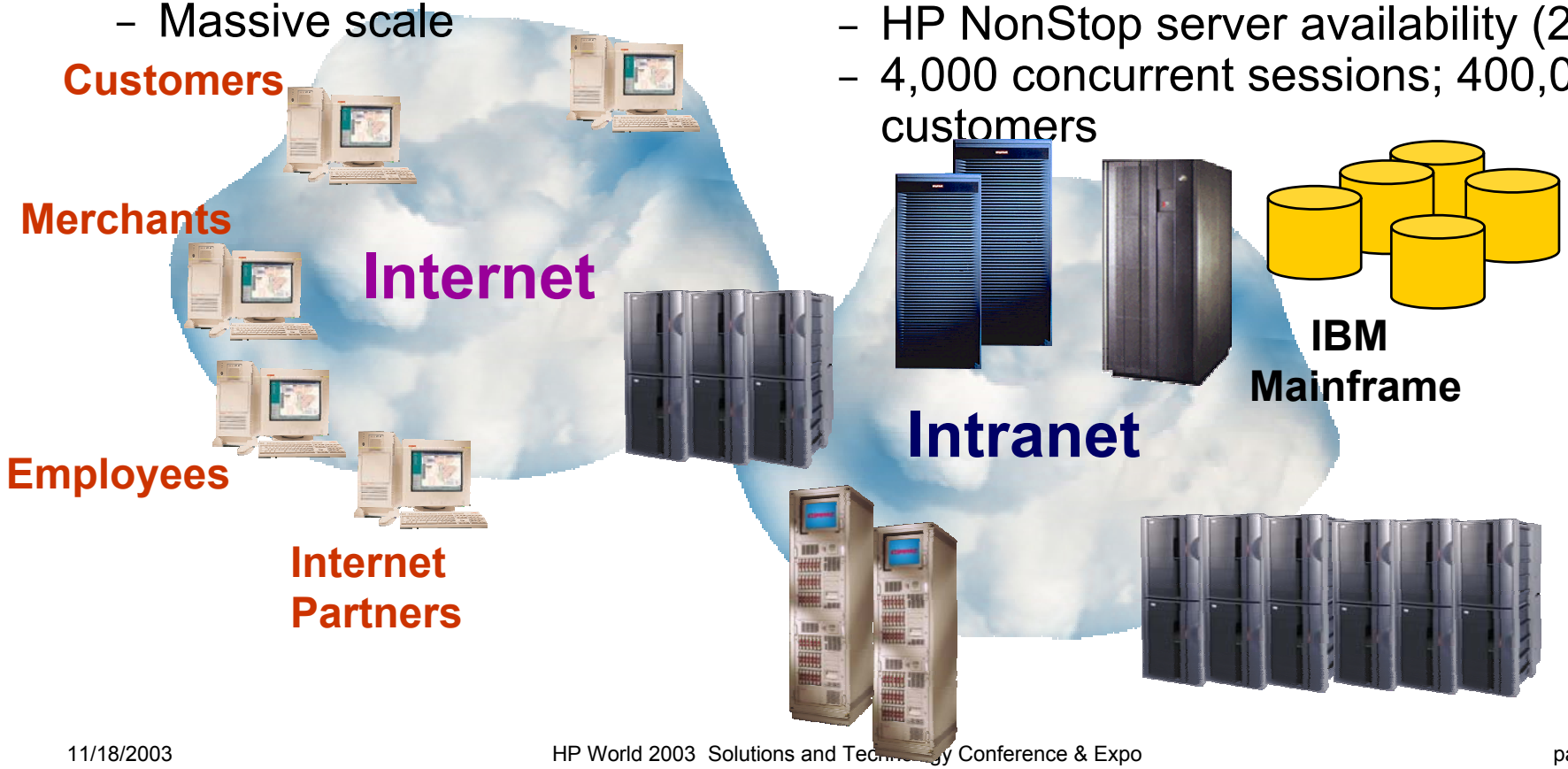
HP ProLiant servers run Windows NT Server and enterprise server applications.

HP NonStop server S70000 servers handle front-end applications.

HP 4000 series desktops handle online entries.

Merita Bank—First Internet Banking System in Europe

- Requirements:
  - Security
  - High throughput for media rich context
  - 24 x 7 continuous availability
  - Massive scale
- Business value using HP NonStop systems:
  - Bullet-proof security
  - ServerNet technology-based for data rich applications
  - HP NonStop server availability (24 x 7)
  - 4,000 concurrent sessions; 400,000 customers



HP – market share leader
1 in 3 of world's servers shipped is HP!

source: IDC

- UNIX systems
- Windows systems
- industry standard (IA-32) servers
- Linux systems
- fault tolerant systems
- high performance technical computing

- Manufacturing – 9 out of top 10 automotive companies
- Transportation – 4 out of world's 5 largest airlines
- Financial – 95% world's securities transactions
- Telecom – 80% Europe's mobile billing and traffic
- Utilities – 65% world's energy infrastructure

- DH Brown UNIX function review: best operating system – HP-UX
- Gartner Group application server evaluation model: best high-end UNIX

- Gartner Group – application server evaluation model: great reliability..solid choice as a database engine – HP NonStop server
- LinuxWorld '02 Best system integration solution: rapid Linux deployment with

HP NonStop Server Success Flash!

- "Telecom Italia Chooses Tandem NonStop Servers for Countrywide Automatic Voice Response System!"
  - With over 25 million subscribers, Telecom Italia is one of the most important telecommunications providers in Europe.
  - Telecom Italia has the largest subscriber database of any single operator in Europe.
  - In a deal that closed in June 1999 and was valued at approximately US$18 million, the customer purchased:
    - 18 2-processor Tandem NonStop Himalaya K2000 servers
    - 80 4-processor Model 4100 AlphaServers
    - 16 6-processor GS140 AlphaServers
    - 14 4-processor GS60 AlphaServers
    - 36 4-processor ProLiant 5500 servers
    - 14 WS Intel Pentium II workstations

HP NonStop Fundamentals

Hardware Overview

HP WORLD 2003
Solutions and Technology Conference & Expo

HP NonStop Servers

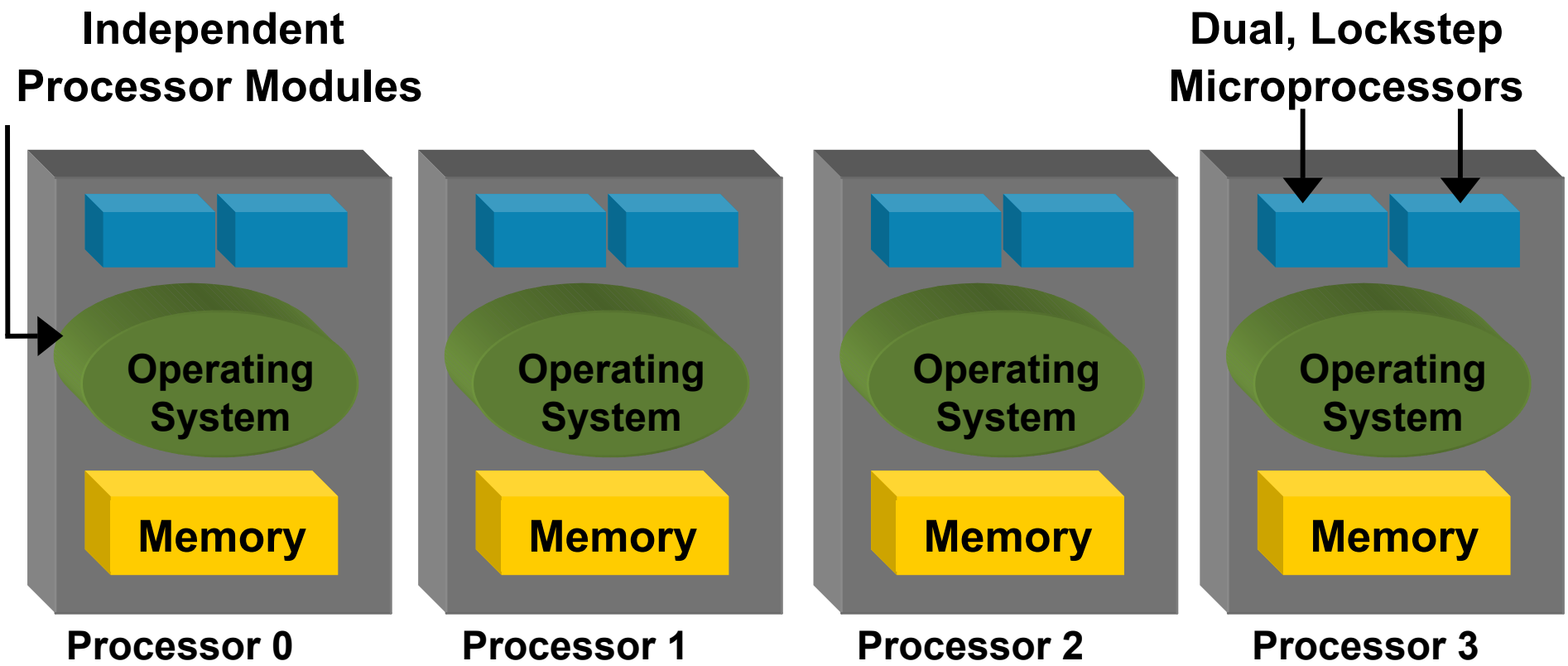
Tandem NonStop Himalaya K-Series

HP NonStop S-Series

Replication and Fault Tolerance

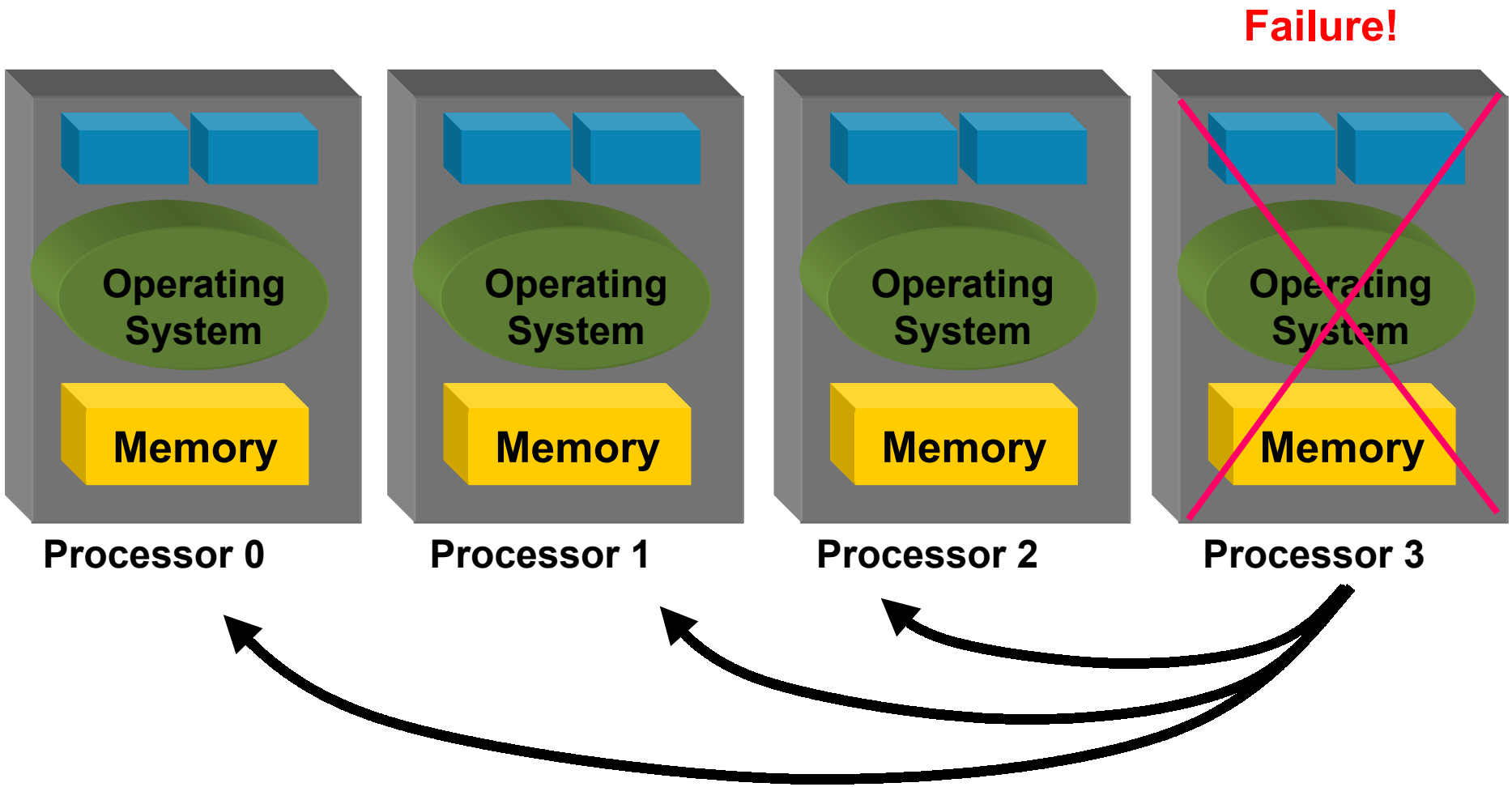
- Why replicate components?
  - Continuous availability
    - "Single point of failure"
  - Performance
    - "Bottlenecks"
  - To act as a hot backup (Not!)

An HP NonStop Server Is a Collection of Independent Processors



- Expandable from 2 to 16 Processor Modules Per Node
- “Shared Nothing” Architecture
- “Network in a Box”

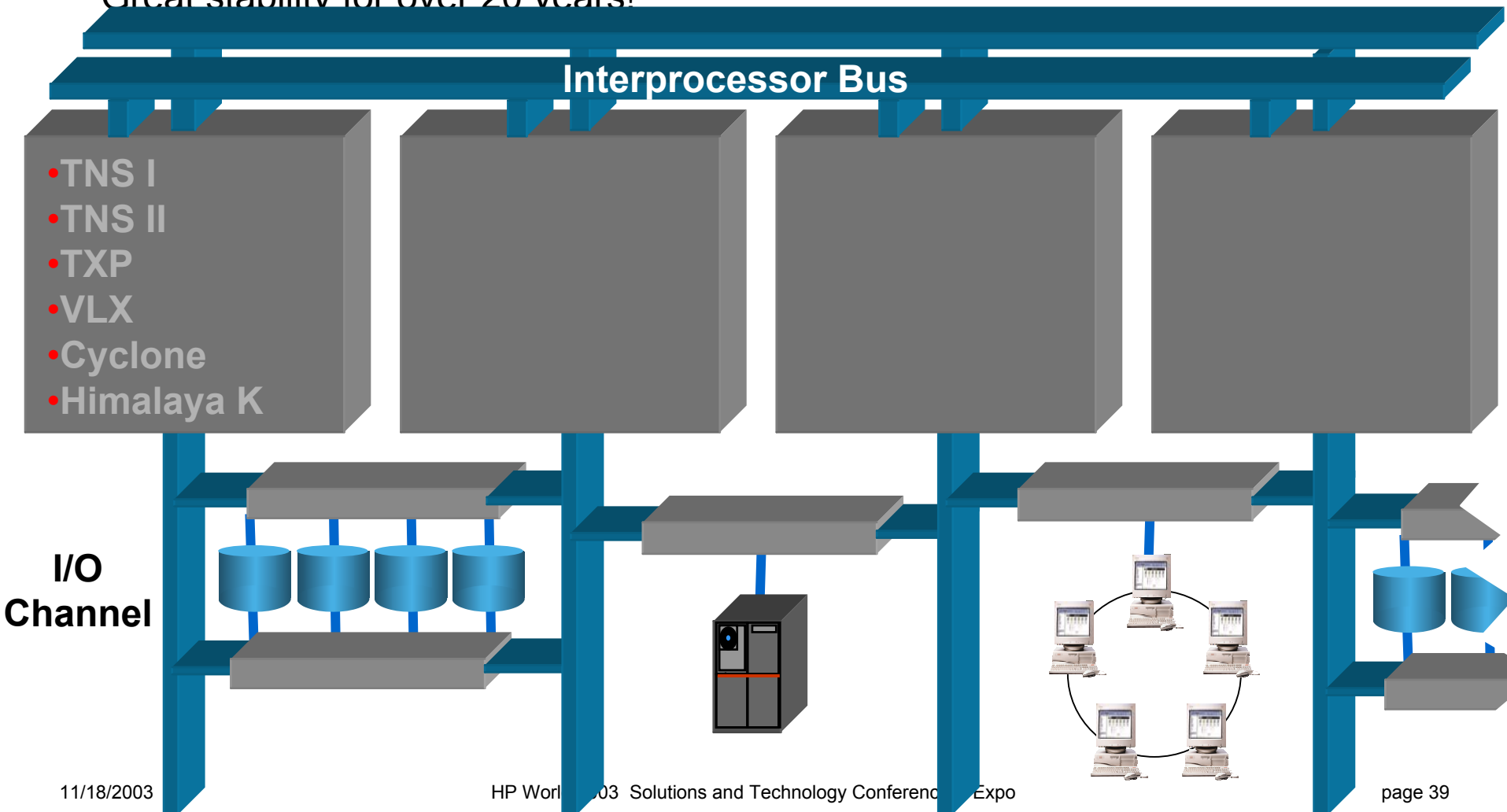
Basic Design Goal — No Single Point of Failure



Remaining processors assume workload and continue to run without restart!

Traditional "K-Series" Architecture

- Limited bandwidth in several ways
- Perfect for the "small" transactions
- Great stability for over 20 years!



Interex, Encompass and HP bring you a powerful new HP World.