

# Chapter 1: The new mainframe

# Chapter objectives

Be able to:

- List ways in which the mainframe of today challenges the traditional thinking on centralized computing versus distributed computing
- Explain how businesses make use of mainframe processing power, the typical uses of mainframes, and how mainframe computing differs from other forms of computing
- Outline the major types of workloads for which mainframes are best-suited
- Name five jobs or responsibilities related to mainframe computing
- List four mainframe operating systems.



## Screenshot 1











































### Key terms in this chapter

- application programmer
- architecture
- balanced system
- batch processing
- Business Class
- compatibility
- e-Business
- EBCDIC
- Enterprise Class
- environment friendly
- extensibility
- high availability
- infrastructure
- mainframe
- MIPS
- online processing
- platform
- production control
- punched card
- RAS
- scalability
- server farm
- specialty engines
- system administrator
- system operator
- system programmer
- total cost of ownership
- transaction processing

## 7<sup>th</sup> April 1964, Poughkeepsie NY

- A new generation of electronic computing equipment was introduced today by International Business Machines Corporation. IBM Board Chairman Thomas J. Watson Jr. called the event the most important product announcement in the company's history.
- The new equipment is known as the IBM System/360.
- "System/360 represents a sharp departure from concepts of the past in designing and building computers. It is the product of an international effort in IBM's laboratories and plants and is the first time IBM has redesigned the basic internal architecture of its computers in a decade. The result will be more computer productivity at lower cost than ever before. This is the beginning of a new generation - - not only of computers - - but of their application in business, science and government."

# What Would You Title This Chart?

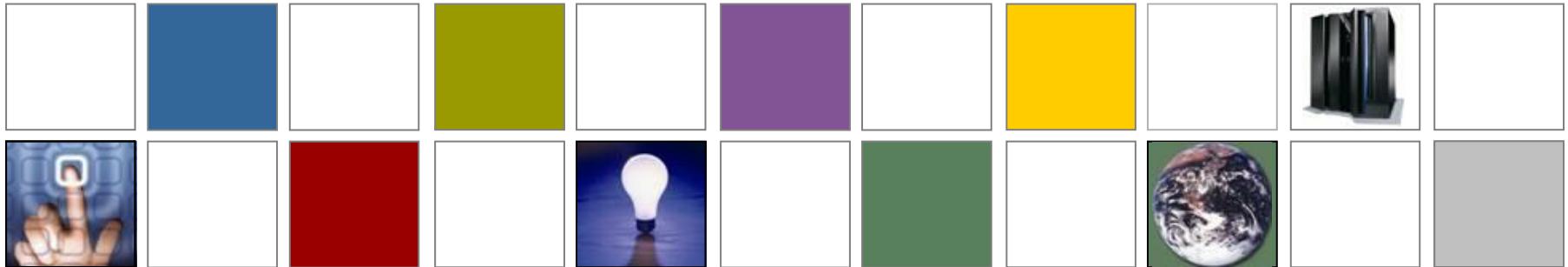
	IBM zSeries Z/OS	Fujitsu Primepower Solaris	Sun 15000 Solaris	HP Superdome HP-UX	IBM p690 AIX5L	Dell Intel SHV W2K	Unisys ES7000 W2K
Processor Technology							
System Performance							
Parallel Clustering							
Unplanned Downtime (S)							
Unplanned Downtime (C)							
Disaster Tolerance							

Based on  
September 2003  
Updated Model

Best      Worst

# The Mainframe Charter – Providing a Strategic Framework

*It is our intention to...*



## Innovation

- Provide leadership in innovation to enhance the use of the IBM mainframe to support increasingly integrated and flexible business processes for the On Demand Business.\*

## Value

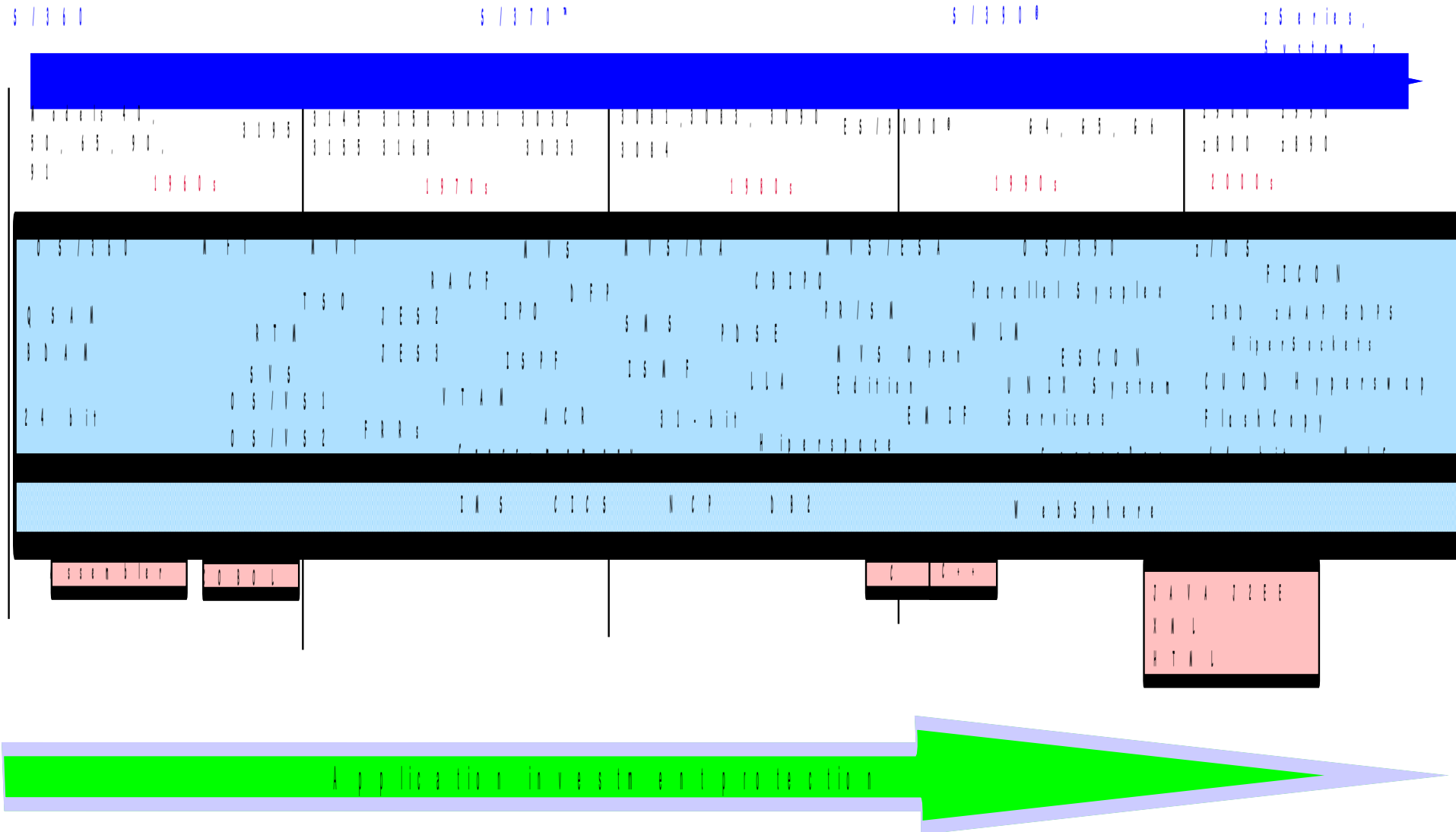
- Enhance the value proposition and lower the cost of computing of mainframe solutions in a way that is compelling, clear, and consistent.\*

## Community

- Support programs designed to foster vitality in the IBM mainframe community, helping to promote a strong application portfolio and world-class support services.\*

\* Excerpted from the Mainframe Charter – August 2003

# z/OS Innovation – Redefining the mainframe for 5 decades!





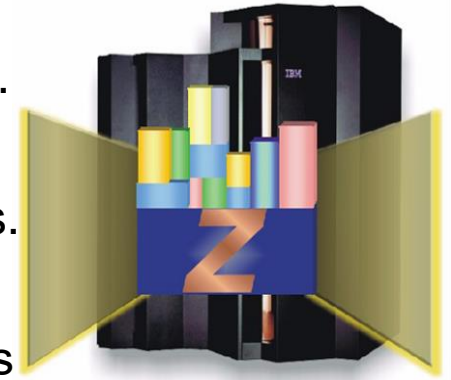
# Mainframes in our midst

- Mainframes:
- **Are prevalent, yet hidden from public eye**
- **Not often publicized – stable, reliable, dependable.**
- **Contrast with other forms of computing, such as PCs.**
- **Present opportunities for college graduates in a variety of technical fields.**
-



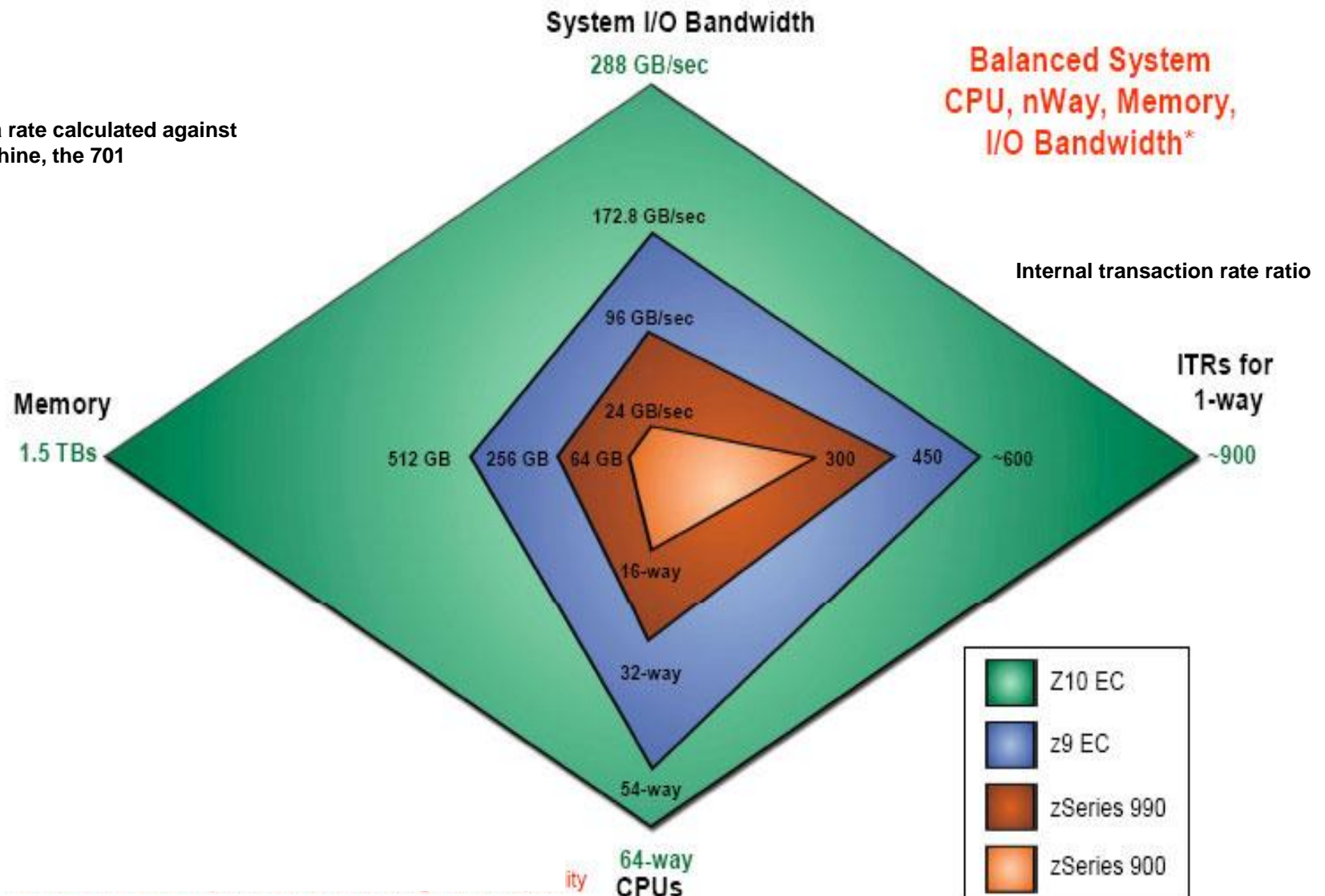
## What is a mainframe

- A *style* of operation, applications, and operating system facilities.
- Computers that can support thousands of applications and input/output devices to simultaneously serve thousands of users.
- A mainframe is the central data repository, or *hub*, in a corporation's data processing center, linked to users through less powerful devices such as workstations, terminals or media devices.
- Can run multiple, but isolated operating systems concurrently.
- What businesses use to host the commercial databases, transaction servers, and applications that require a greater degree of security and availability than is commonly found on smaller-scale machines.”.
- Centralized control of resources.
- Optimized for I/O in all business-related data processing applications supporting high speed networking and terabytes of disk storage.



# Mainframe is a balanced system design

The ITR is a rate calculated against a base machine, the 701



# Mainframe facts

## Screenshot 1

- **Who uses mainframes?**

- Most Fortune 1000 companies use a mainframe environment
- 60% of all data available on the Internet is stored on mainframe computers

- **Why mainframes?**

- Large-scale transaction processing
  - Thousands of transactions per second
- Support thousands of users and application programs
- Simultaneously accessing resources
- Terabytes of information in databases
- Large-bandwidth communications

- **There are more CICS transactions processed daily than Web pages served**

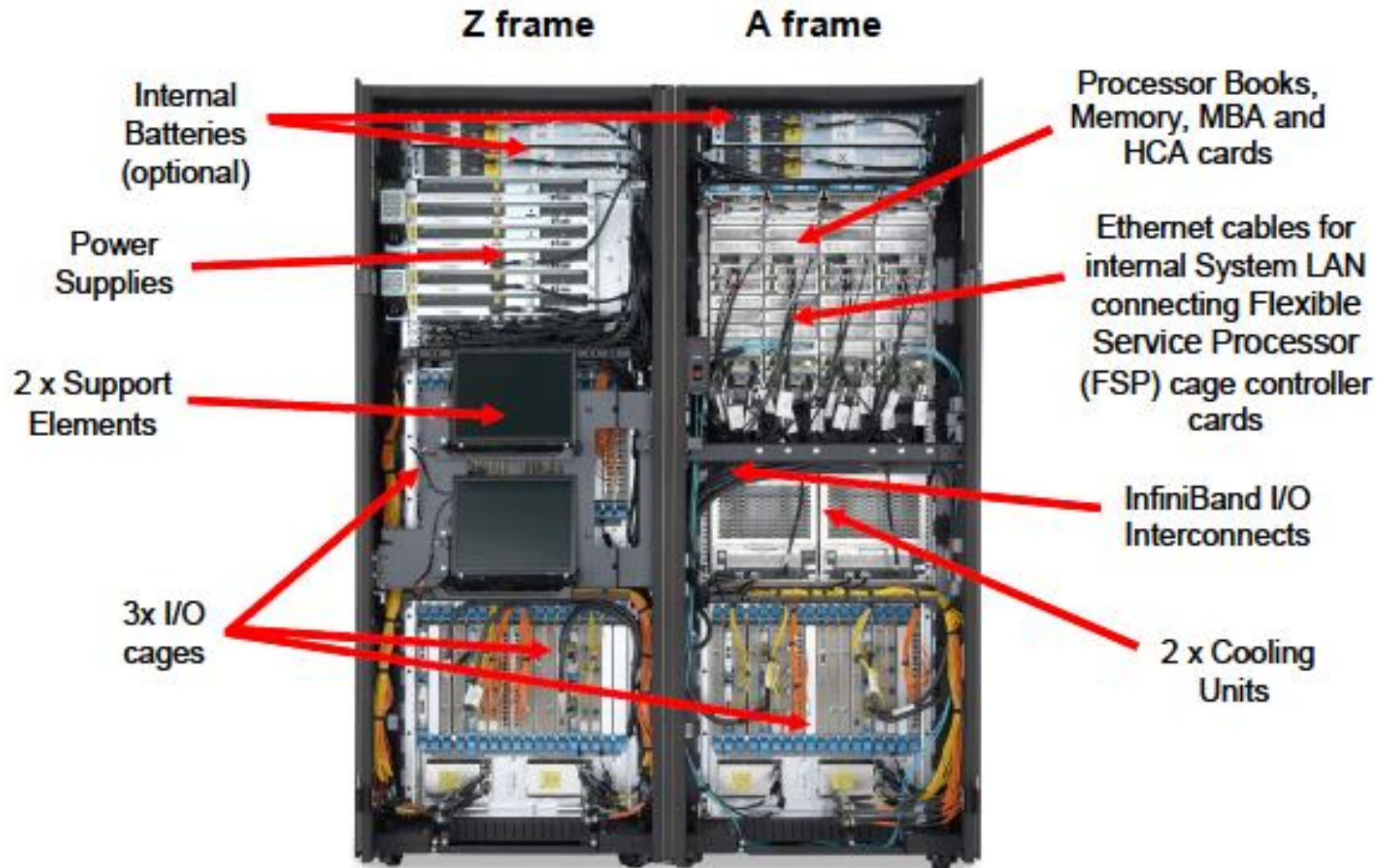
## Two mainframe models



System z Business Class and Enterprise Class



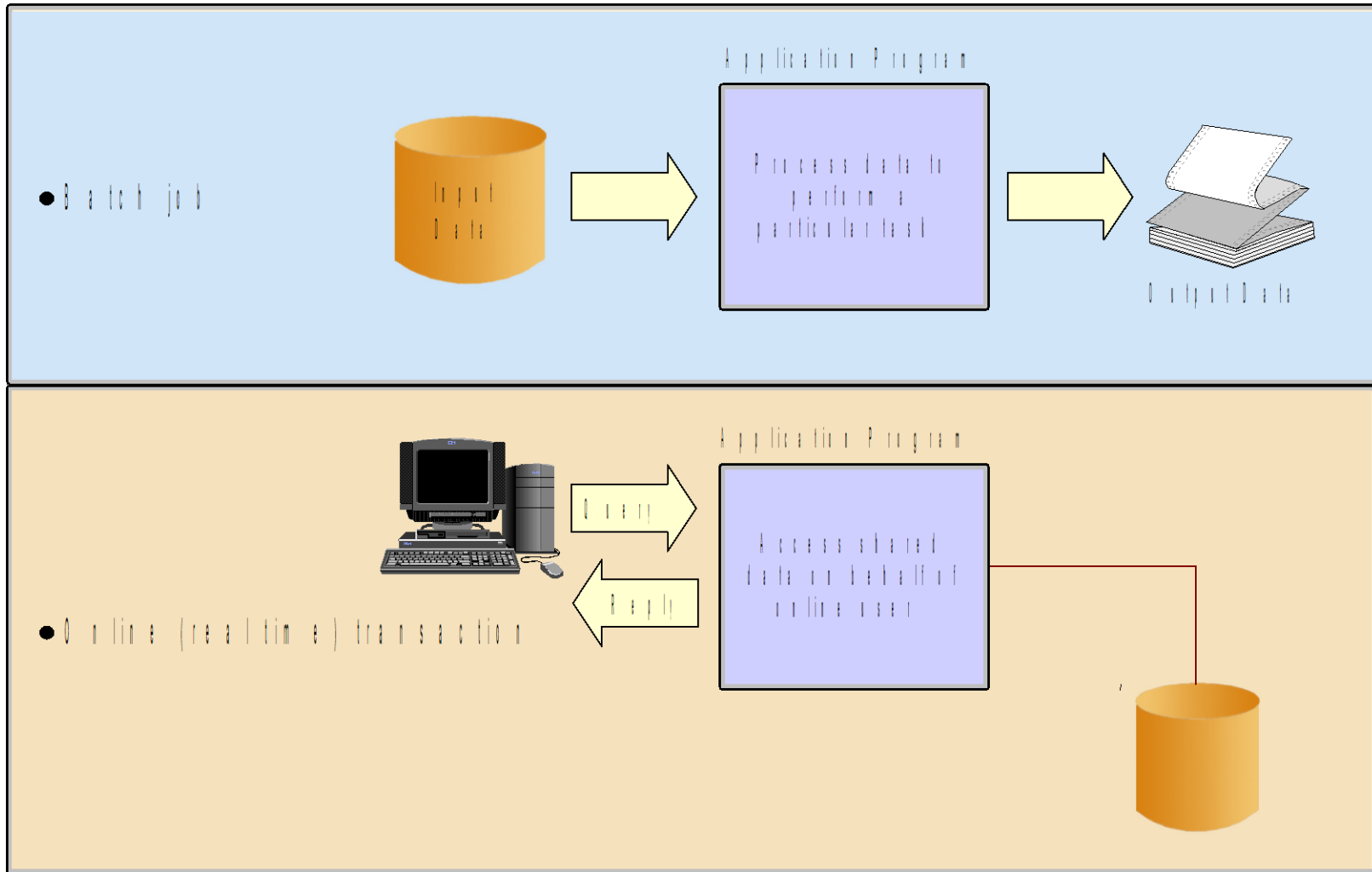
# Inside an Enterprise Class (EC) Mainframe



## Factors contributing to mainframe use

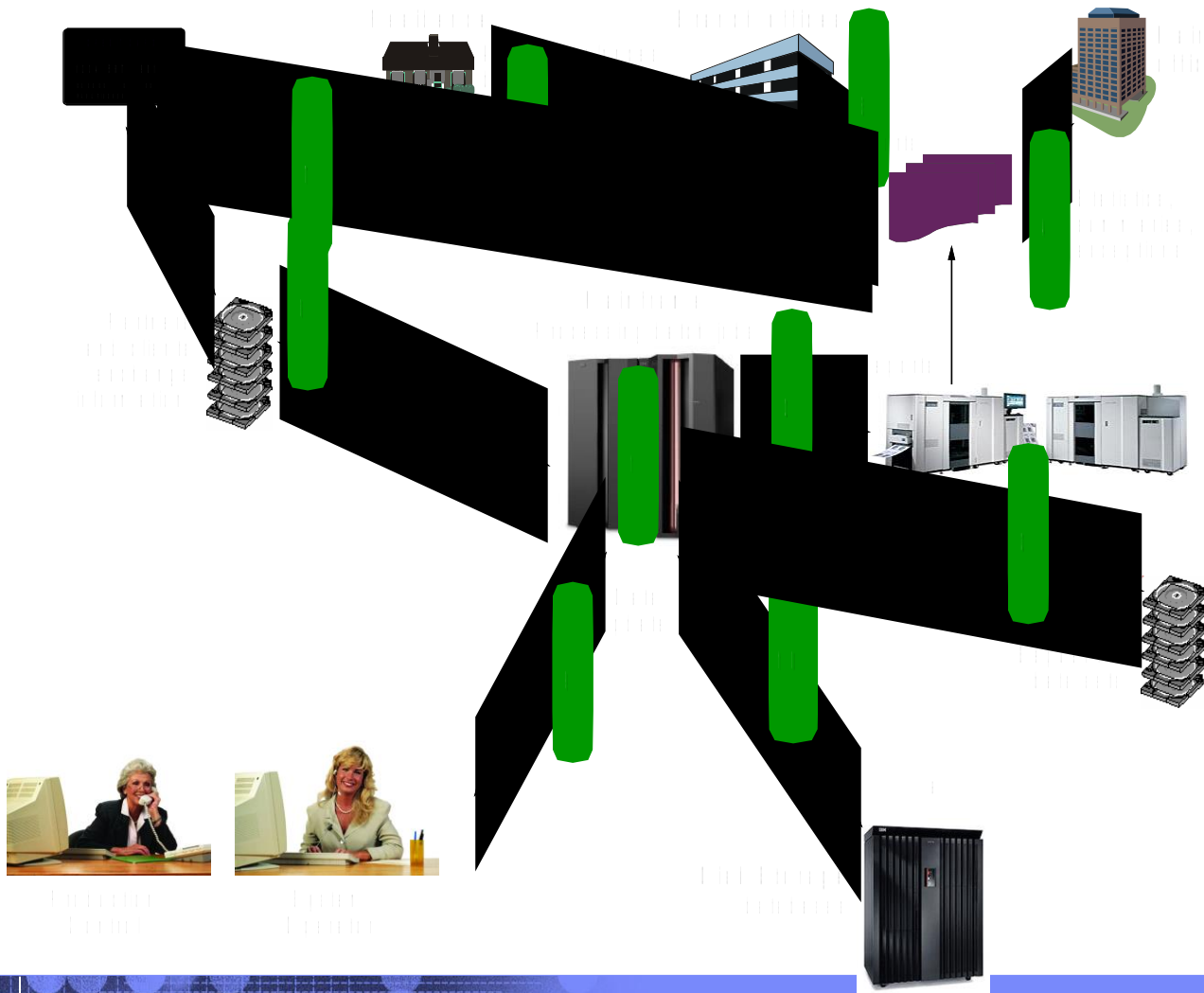
- **RAS -- *reliability, availability, serviceability***
- **Security**
- **Scalability**
- **Centralized control**
- **Workload management**
- **Partitioning / virtualization**
- **Continuing compatibility**
- **Evolving architecture**
- **Application enablement, complexity, variety**
- **Potential for thousands of users**
- **Extensibility**
- **Total cost of ownership**
- **Environment friendly**

## Typical mainframe workloads



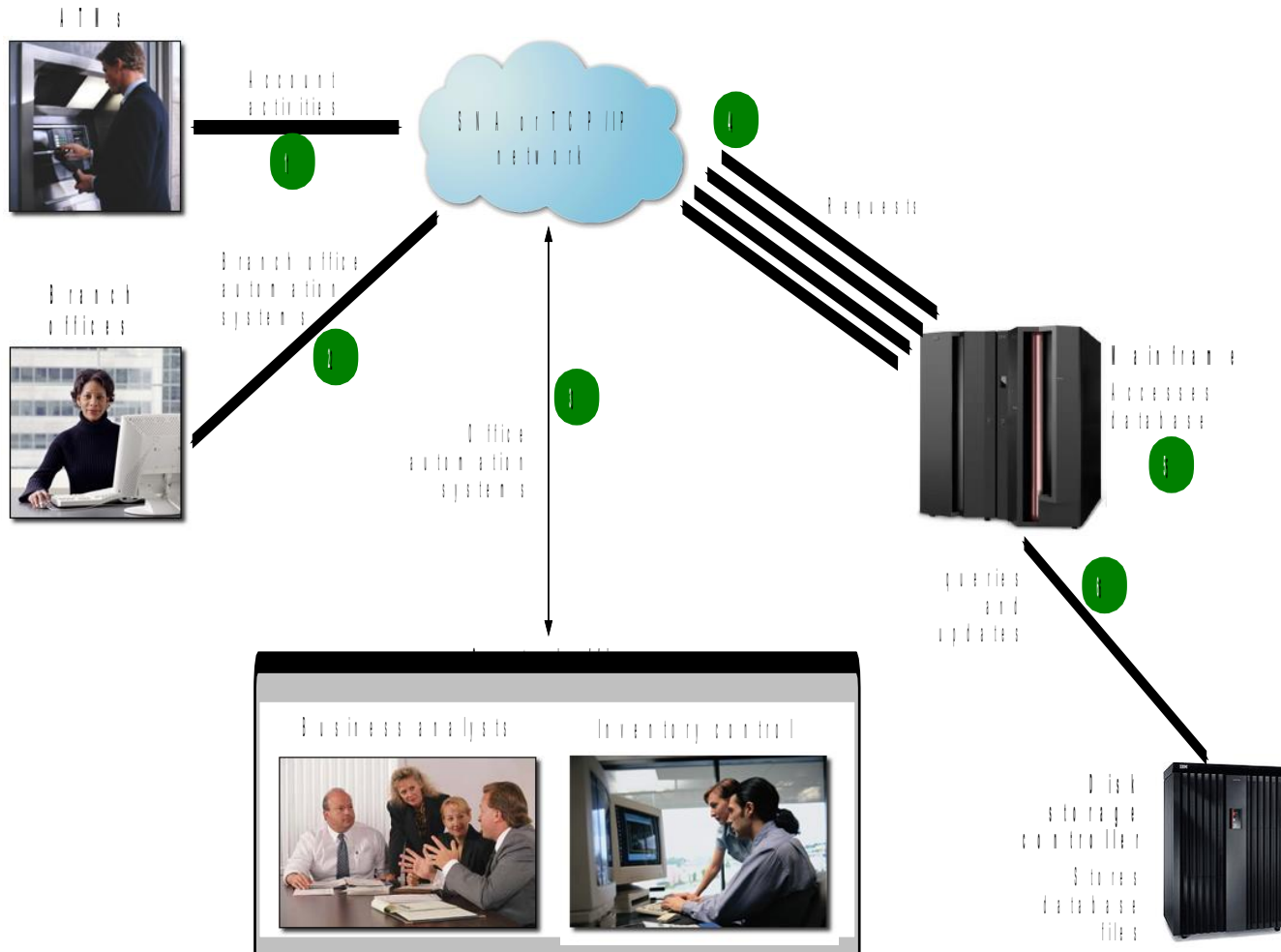


## Typical batch use



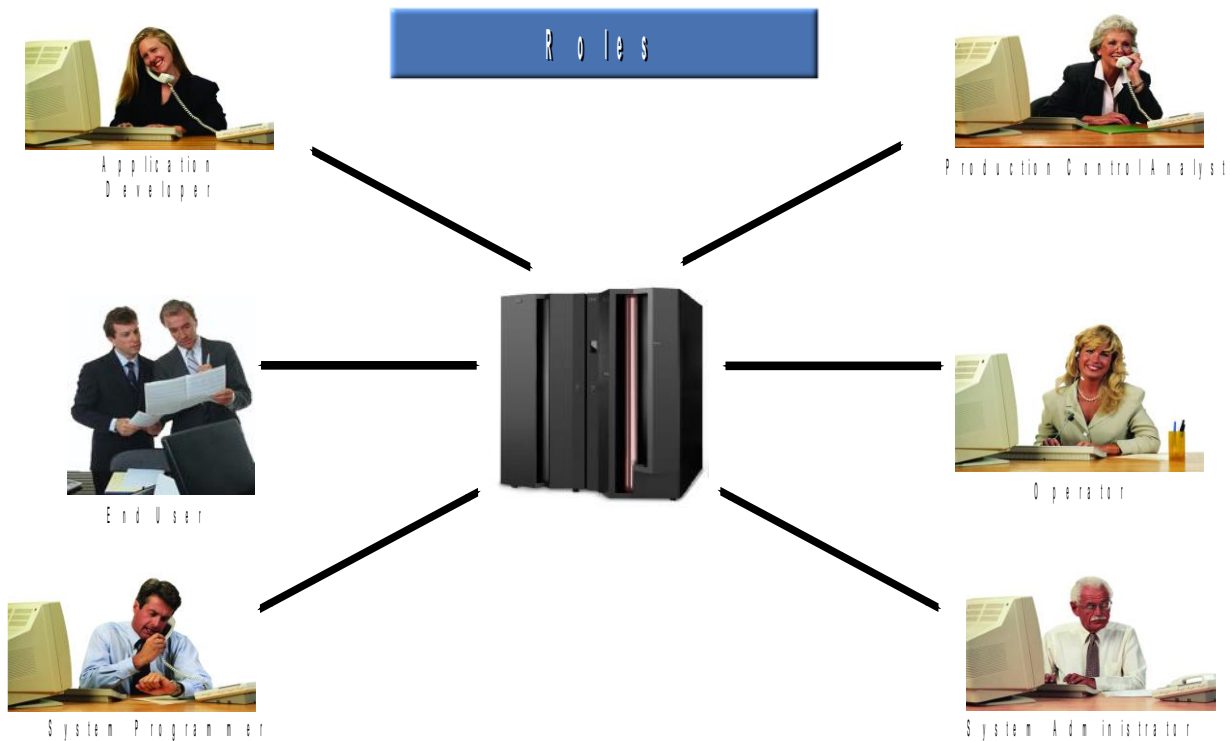
## Screenshot 2

### Typical online use



## Screenshot 2

### Roles in the mainframe world



# Mainframe Operating System Heritage

- **OS/360 -> OS/VS -> MVS -> MVS/SP -> MVS/XA -> MVS/ESA -> OS/390 -> z/OS**  
z/OS, IBM's premier zSeries operating system, is a highly secure, scalable, high-performance enterprise operating system on which to build and deploy traditional and Java-enabled applications, providing a comprehensive and diverse application execution environment.
- **DOS/360 -> DOS/VS -> VSE/SP -> VSE/ESA -> z/VSE**  
z/VSE enables proven, robust, and cost-effective solutions. z/VSE provides sturdy batch and industrial strength on-line transaction processing (CICS) capabilities. z/VSE can fit comfortably into a legacy of thrifty, dependable z/VSE solutions.
- **ACP -> TPF-> z/TPF**
- **TPF is the platform driving the business-critical systems for many of IBM's largest and most sophisticated users of online transaction processing - airlines, railroads, hotels, financial services, government, credit card and banking industries.**
- **CP/67 -> VM/370 -> VM/SP -> VM/XA -> VM/ESA -> z/VM**  
z/VM provides a highly flexible test and production environment for enterprises deploying the latest e-business solutions. z/VM helps enterprises meet their growing demands for multi-user server solutions with support for a broad range of operating systems.

## Summary

- The New Mainframe:
- **Plays a central role in the daily operations of the world's largest organizations – and the daily lives of most people.**
- **Is known for its reliability, security, and enormous processing capabilities.**
- **Is designed for processing large scale workloads and serving thousands of users and transactions concurrently.**
- **Is managed by highly skilled technical support staff.**
- **Runs a variety of operating systems.**