

Mainframe careers:



Information technology's best-kept secret

This presentation will answer these questions:

- What are mainframes?
- Who needs mainframes?
- Why a career in mainframes?
- Why would you want to work for IBM?

What are mainframes?

Mainframes defined

- Wikipedia says: “Mainframes (often colloquially referred to as [big iron](#)) are [large](#) and ‘expensive’ computers used mainly by government institutions and large companies for [mission critical](#) applications, typically bulk data processing such as censuses, industry/consumer statistics, ERP, and financial transaction processing.”
- searchDataCenter.com says: “Mainframe is an industry term for a [large](#) computer, typically manufactured by a large company such as IBM for the commercial applications of Fortune 1000 businesses and other [large-scale computing](#) purposes. Historically, a mainframe is associated with [centralized](#) rather than distributed computing. Today, IBM refers to its larger processors as large servers and emphasizes that they can be used to serve distributed users and smaller servers in a computing network”
- Mainframes.com says: “A mainframe is a continually evolving [general purpose](#) computing platform incorporating in its architectural definition the essential functionality required by its target applications.”
- Answers.com says: “A [state-of-the-art](#) computer for [mission critical](#) tasks. In the ‘ancient’ mid-1960s, all computers were mainframes, since the term referred to the main CPU cabinet. Today, it refers to a class of [ultra-reliable](#) medium and [large-scale](#) servers designed for [enterprise-class](#) and carrier-class operations.”

Differences between PCs and mainframes

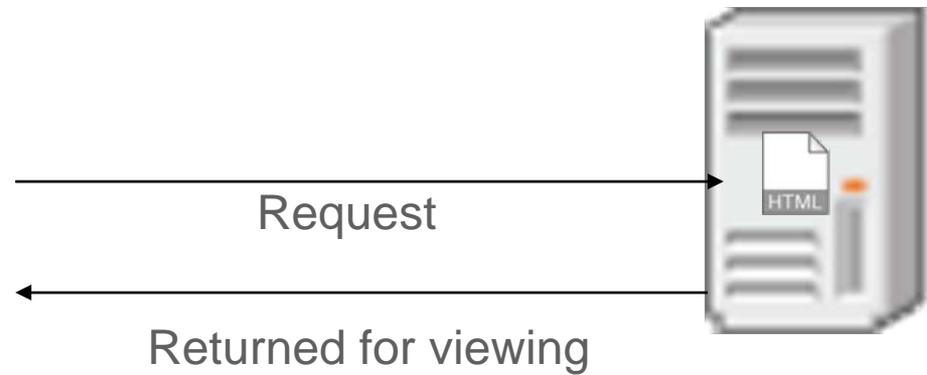


- Small size
- PC stores programs
- Files often on hard drive
- Perfect for a single user or grouped together for smaller businesses



- Large size
- Mainframe stores the programs, not terminals
- Files stored on the mainframe, not terminals
- Perfect for larger businesses with many users needing access to the same information

Distributed access



Hardware and software



```
Have Fun! IP Address = 129.33.49.251
VTAM Terminal = TCP00006

Master the Mainframe Contest

      // 0000000 SSSSSS
     // 00 00 SS
    zzzzzz // 00 00 SS
     zz // 00 00 SSSS
    zz // 00 00 SS
     zz // 00 00 SS
    zzzzzz // 0000000 SSSSSS

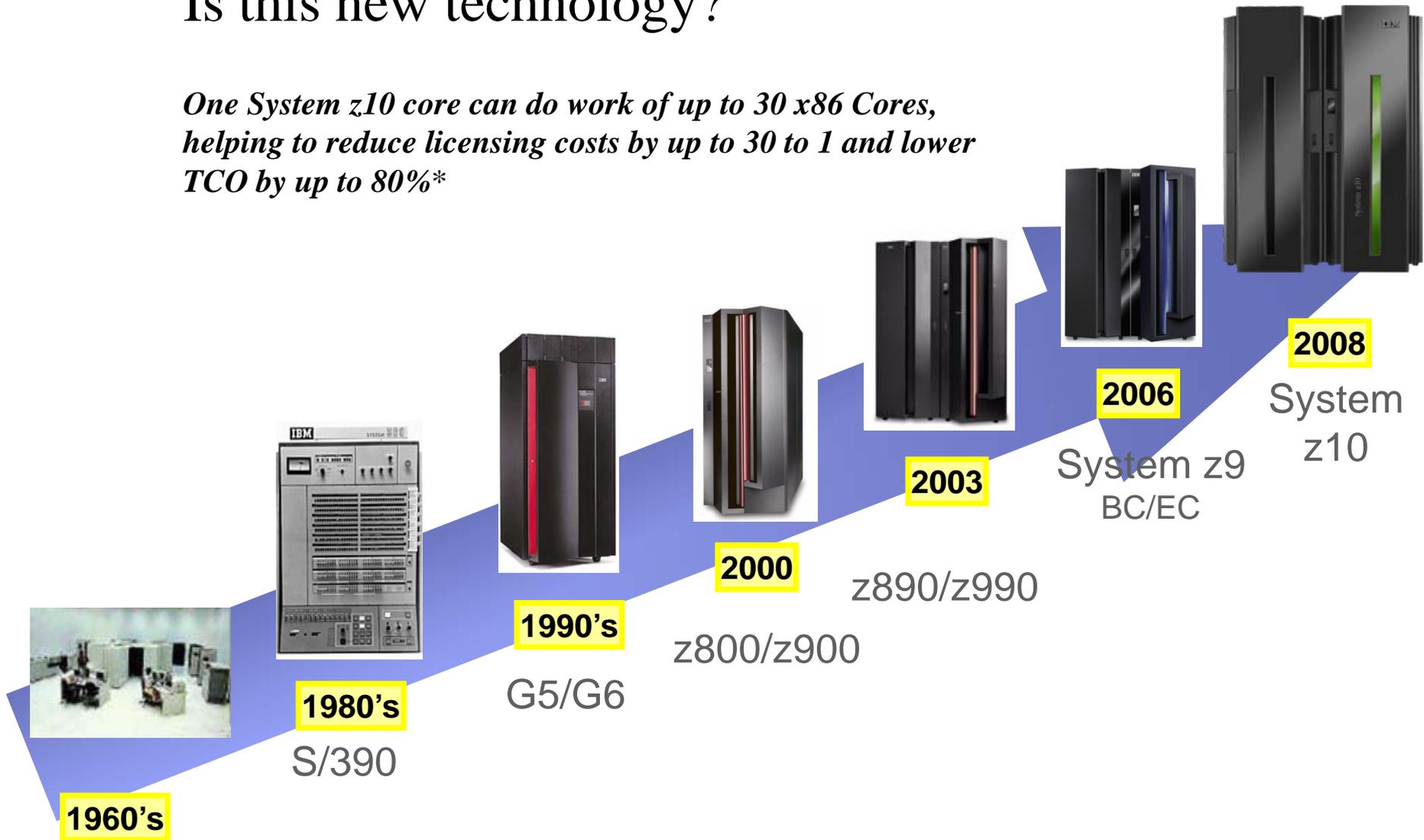
IBM System z Operating System - z/OS

This system must only be used for education by authorized
educational institution. Use is subject to audit at any time.

==> Enter "LOGON" followed by the TSO userid. Example "LOGON USERID" or
==> Enter TSO
```

Is this new technology?

*One System z10 core can do work of up to 30 x86 Cores,
helping to reduce licensing costs by up to 30 to 1 and lower
TCO by up to 80%**



Who needs mainframes?

Uses



Government



Auto insurance



Gaming / virtual worlds



Banking/finance



Airline

Advantages of mainframes

- Reliable
 - z/OS has up to 99.9999% uptime.
 - Some customers haven't rebooted in over 10 years.
- Secure
 - No known viruses have been created or deployed on mainframes.
 - Use logical partitions (LPARs) to control access to data and applications.
- Flexible
 - Run multiple operating systems on one mainframe
 - Run proprietary software (z/OS) or open software (Linux)

“IBM’s z10 is the computer industry’s pinnacle systems platform. Blow-away performance, increased capacity, and expanded memory makes this system the absolute best scale-up architecture — bar none — in the computing industry”

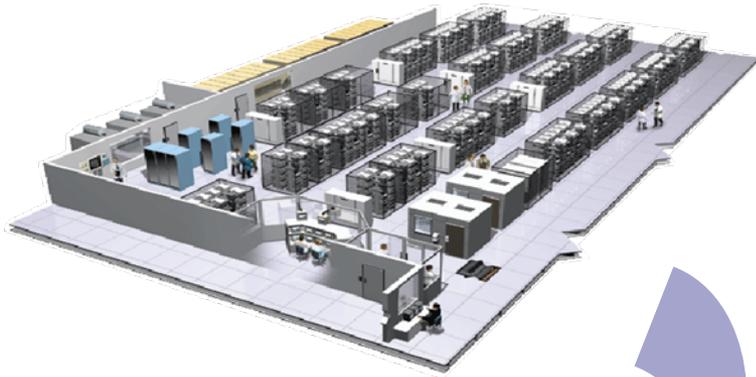
Joe Clabby, President, Clabby Analytics 2008

Environmental advantages of mainframes

- Reduces energy consumption
 - Fewer servers
 - Less heat
- Reduces required floor space



Give up the farm...the server farm



- IBM has invested billions of dollars in Hardware and Software Development to make System z10 an industry-leading platform.
- System components are integrated and tested to enable optimal synergies
- Powerful and scalable capacity
- Hundreds of support processors
- Central point of management
- High resource utilization
- May offer lower cost of operations
 - Fewer servers
 - Fewer software licenses
 - Fewer resources to manage
 - Less energy, cooling and space
- Fewer intrusion points help provide tighter security
- Fewer points of failure help provide greater availability

Workload advantages over server farms

■ Near-linear scalability	allows up to 900,000+ concurrent users
■ Mean Time Between Failure	is measured in decades vs. months
■ One-fourth of the network equipment costs	using virtual resources versus physical
■ 1/25 th floor space of a server farm	400 sq. ft. versus 10,000 sq. ft
■ 1/20 energy requirement	\$32/day versus \$600/day
■ 1/5 the administration	Less than 5 people versus less than 25 people
■ Highest average resource utilization	Greater than 70% versus less than 15%
■ Highest concurrent workload	hundreds of applications versus a few

Strength of the mainframe market

- \$4.5 Billion in IBM mainframe sales in 2006
- All of the top 25 worldwide banks use mainframes
- 23 of the top 25 retailers in the U.S. run on mainframes
- 95% of US Fortune 500 companies are System z clients.
- 71% of global Fortune 500 companies are System z clients.
- 80% of world's corporate data resides or originates on mainframes.
- The mainframe is one of the most secure servers on the market; a 16-way System z990 can securely process 12,000 transactions per second.
- Since 2000, the mainframe has captured 17 points of market share in the high-end server category according to IDC, a global provider of market intelligence.

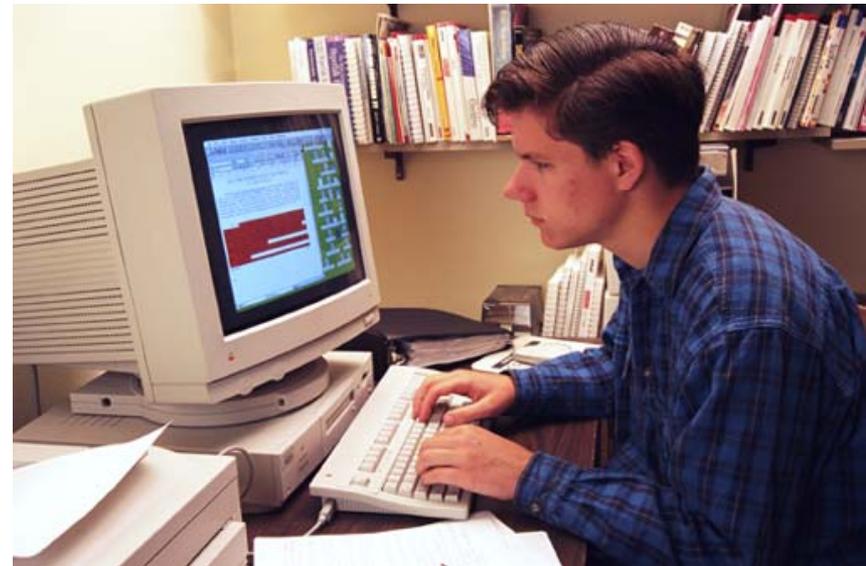
In other words, without a mainframe...

- Your airplane might not land safely (air traffic control)
- Your ATM would not give you \$\$ (banks all over the world)
- You could not buy something online (transaction processing)
- Trains could not run everywhere (virtual Linux servers)
- Hospitals could not access patient records (Patient Management)
- Your FedEx /UPS package would not ship? (shipping and tracking of shipments)
- The internet would not work.

Why a career in mainframes?

Career outlook

- Many jobs are predicted to open in the upcoming years, as current workers retire.
- Salary range for an entry-level position is over \$50,000.
- Job placement is very high.
- Patent opportunities.



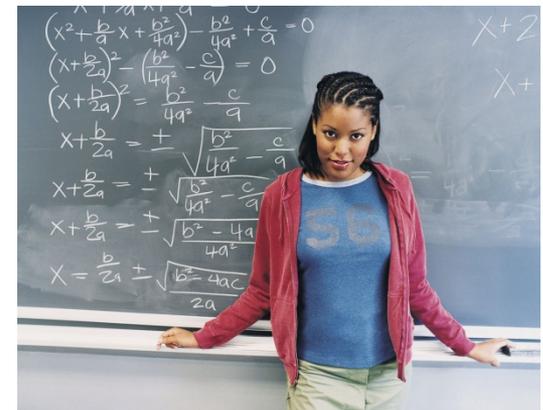
Required skills

- Computer programming
- Communication skills
- Teaming skills
- Project management skills
- Attention to detail
- Creativity



Things you can do...

- Attend a school offering a mainframe program or mainframe courses. Some schools are listed at the [Participating Schools](#) tab of the IBM System z Academic Initiative Web site.
- Encourage your professors to enroll in the [IBM System z Academic Initiative](#) program
- Participate in the [Master the Mainframe](#) contest
- Apply for the [IBM co-op and intern program](#)
- Apply for the [IBM Extreme Blue](#) internship program for qualified college students



Why would you want to work for IBM?

IBM advantages

- Large, worldwide company
- Innovative

- Number one in patents for 15 consecutive years

- Genographic project

- Blue Gene/L

- Adaptive

- IBM used to manufacture meat slicers

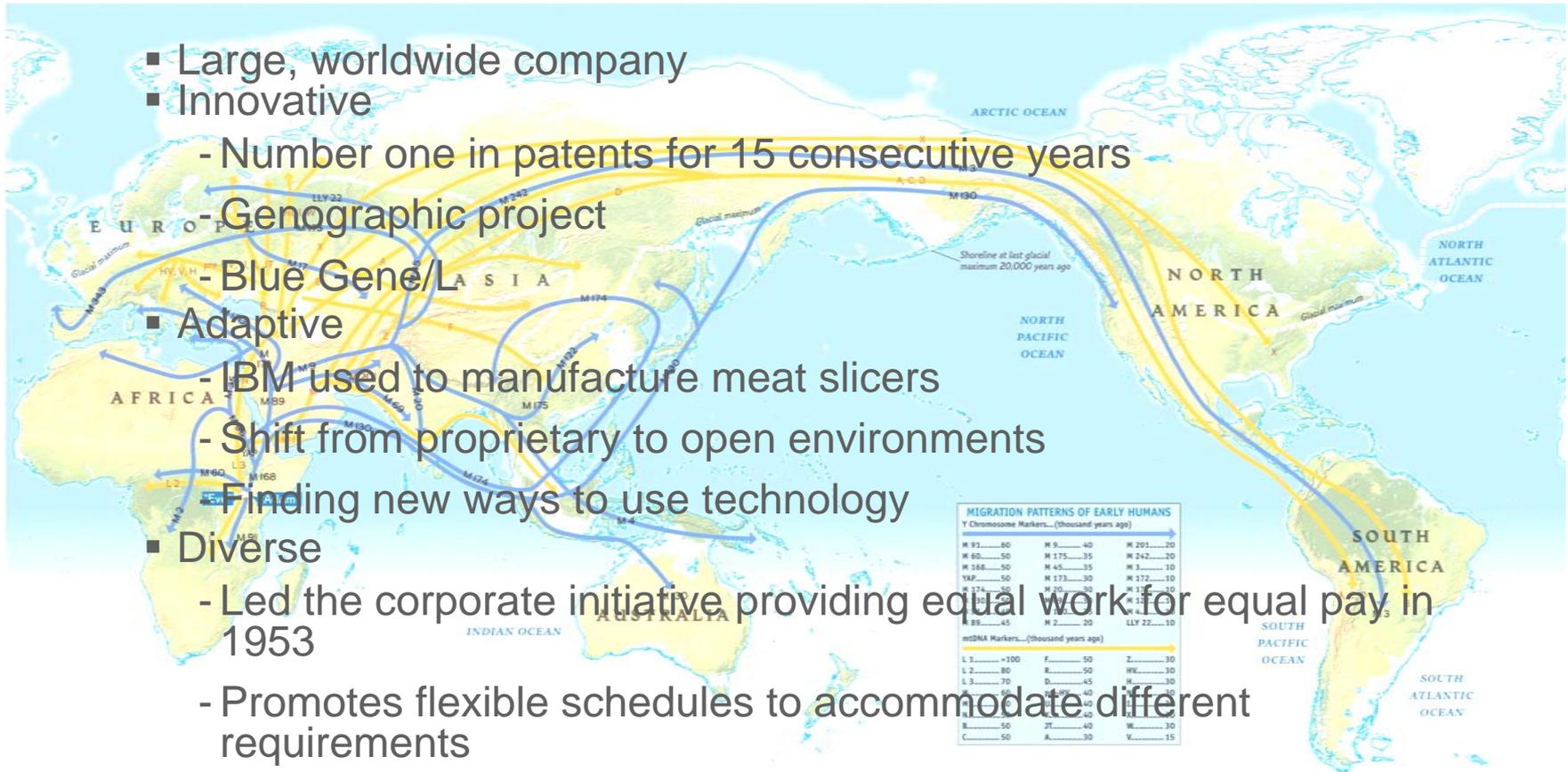
- Shift from proprietary to open environments

- Finding new ways to use technology

- Diverse

- Led the corporate initiative providing equal work for equal pay in 1953

- Promotes flexible schedules to accommodate different requirements



Thank you

For additional information about the IBM System z Academic Initiative,
visit our Web site at:

<http://www.ibm.com/developerworks/university/systemz/index.html>

Or contact the IBM System z Academic Initiative at:

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