Building Mainframe Skills for the Future
Assisting the community with the next generation of Mainframe skills
Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

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Session Agenda

- Academic Initiative overview and update
- Program resources - something for everyone
  - Educators
  - Students
  - Mainframe community
- Mainframe communities
- Tips for connecting with schools to support skills development
- Q & A
What is the IBM System z Academic Initiative?

An IBM program that partners with academic institutions and System z clients and partners worldwide to build a pipeline of skilled enterprise system students for the IT jobs of tomorrow.

ibm.com/university/systemz

Contact us at zskills@us.ibm.com
Our goals

- Assist and enable the Mainframe community with skills
- Explore enterprise systems education alternatives
- Not selling IBM products
- Not asking educators to teach a predefined training program
- Resources available at no charge
- Build important relationships with educators, clients, and partners

The Academic Initiative System z Program assists and enables educators with IBM enterprise systems concepts, technologies, and examples.
System z Academic Initiatives

7 Years of investment, outreach, & growth = 2011 Student Hiring

PROGRAM INVESTMENT

OUTREACH (community)

GROWTH (# schools)

CONNECTIONS (academia/industry)
SHARE serves more than 20,000 individuals representing over 2,000 of IBM’s top enterprise computing customers. Our constituency includes many of the top international corporations (including the majority of the FORTUNE 500).

376 employers responded

6 out of 10 companies will be hiring programmers and developers over the coming year, and seek skills in application server environments, database languages, and Java

4 out of 10 companies still seek COBOL skills
Figure 29: Look to College or University Programs for Systems Programming and Administration Skills Preparation?

- Yes, colleges and universities should provide all skills development: 26%
- College and university programs should provide foundational knowledge; our company updates skills: 53%
- No, we provide training for skills we need: 10%
- Don’t know/unsure: 8%
- Other: 2%
**Figure 28: Platform-Specific Systems Programming and Administration Skills Needed**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database administration</td>
<td>58%</td>
</tr>
<tr>
<td>Mainframe administration</td>
<td>55%</td>
</tr>
<tr>
<td>JCL (Job Control Language)</td>
<td>50%</td>
</tr>
<tr>
<td>z/OS Internals (e.g., system error codes, EOB)</td>
<td>49%</td>
</tr>
<tr>
<td>Linux systems administration</td>
<td>46%</td>
</tr>
<tr>
<td>Unix systems administration</td>
<td>46%</td>
</tr>
<tr>
<td>TSO (Time Sharing Option)</td>
<td>45%</td>
</tr>
<tr>
<td>RACF</td>
<td>40%</td>
</tr>
<tr>
<td>Client/server architectures</td>
<td>38%</td>
</tr>
<tr>
<td>PC/PC server administration</td>
<td>38%</td>
</tr>
<tr>
<td>SMP/E</td>
<td>37%</td>
</tr>
<tr>
<td>VM system administration</td>
<td>26%</td>
</tr>
<tr>
<td>Midrange systems administration</td>
<td>20%</td>
</tr>
<tr>
<td>z/VM internals</td>
<td>19%</td>
</tr>
<tr>
<td>ACF2</td>
<td>13%</td>
</tr>
<tr>
<td>Mobile apps/mobile web</td>
<td>12%</td>
</tr>
<tr>
<td>VMSES</td>
<td>6%</td>
</tr>
<tr>
<td>None of the above</td>
<td>1%</td>
</tr>
<tr>
<td>Don’t know/unsure</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
</tr>
</tbody>
</table>
Fundamental to the program is ...

… Flexibility

- **Participation continues to increase**
  - 903 membership schools

- **WW demographics**
  - 45% North America
  - 24% Europe, Middle East, and Africa
  - 16% Latin America
  - 15% Asia/Pacific

- **Wide variety of schools in the program**
  - Different level of participation

- **All programs are unique**
  - Designed to provide flexibility to the school to meet their requirements and capabilities
Is the Academic Initiative a program for educators only?

The Academic Initiative provides resources and services to:

- Educators
- Students
- Clients, Business Partners and the entire community

There’s something for everyone!
Something for Educators

- **Program membership**
  - 10 minutes ([ibm.com/university/systemz](ibm.com/university/systemz))

- **Remote access to IBM Mainframe systems**
  - Full software stack available on hub systems
  - WW coverage and support
  - System customization according to skills

- **Thousands of software products available for download**

- **Access to course materials**
  - Modules to full semester
  - Foundational to advanced topics
  - Applicable to multiple computing disciplines
  - Presentations, textbooks, labs, exams
  - Teach as is or integrate into existing curricula

- **Ongoing Faculty skills development**
  - Seminars and workshops
  - Calendar of events

- **Connections with the community**
  - Roundtable
  - Participating schools list

The Academic Initiative is **NOT** a predefined program.

It is designed for flexibility.

Use what you want when you want it.
# IBM System z courses

**Foundational principles**
- Intro to the Mainframe: z/OS Basics*  
- Intro to the Mainframe: Networking*  
- Intro to the Mainframe: Security*  
- Intro to the Mainframe: Large Scale Commercial Computing Operating systems  
- Linux on System z  
- Introduction to z/VM®  
- Introduction to z/VSE Basics  
- UNIX® System Services (Module) User interfaces  
- ISPF: z/OS Basic Interfaces  
- Storage management  
- VSAM  

**Programming languages**
- Assembler  
- COBOL  
- JCL  

**Other**
- Developing COBOL with Rational Developer for System z V7.6  
- z/OS Advanced Topics*  
- z/OS Emerging Technologies*  
- z/OS Installation  

**Tivoli security, systems, network, and storage management courses**
- IBM Tivoli License Compliance Manager for z/OS 4.2 Implementation  
- IBM Tivoli System Automation for z/OS 3.1 Introduction and Operations  
- IBM Tivoli System Automation for z/OS 3.1 Implementation and Administration  
- IBM Tivoli Workload Scheduler 8.2 for z/OS Scheduler's Workshop  
- Information, data and transaction management  
- Enterprise Server Data Management  
- DB2 for z/OS Fundamentals  
- DB2 Family Fundamentals (Cross product)  
- DB2 SQL Workshop (Cross product)  
- DB2 for z/OS Database Admin Workshop, Part 1  
- DB2 for z/OS Database Admin Workshop, Part 2  
- DB2 Programming Workshop for z/OS  
- DB2 for z/OS Application Development  
- DB2 for z/OS Query Optimization and Performance Tuning  
- Intro to IMS*  
- IMS Fundamentals  
- An Introduction to IMS (Textbook reference)  
- Transaction Management  

*available in audio version  

**Application development**
- WebSphere Application Server for z/OS  
- Intro to IBM WebSphere Developer for z (Web based)  
- WebSphere MQ for z/OS System Administration  
- Developing COBOL with IBM Rational Developer for System z  

**Diagnosis**
- z/OS RAS and Diagnostics*  

**eLearning resources**
- Interactive e-Learning Module: z/OS Basics  
- Flash Demo: Introduction to Rational Developer for System z  
- Develop a batch DB2 for z/OS COBOL application using RDz  
- Developing and debugging a COBOL DB2 application  
- Editing record-oriented programs with the System z LPEX editor  
- Learn about your future in Large Systems  
- Careers in Mainframes
Something for Students

- **Student Portal:** [ibm.com/university/students/](http://ibm.com/university/students/)
- **Participate in IBM sponsored contests**
  - [ibm.com/university/students/contests/](http://ibm.com/university/students/contests/)
  - Master the Mainframe (No experience necessary)
- **Launch your career**
  - [SystemzJobs.com](http://SystemzJobs.com)
  - Student Opportunity System: [ibm.com/university/sos](http://ibm.com/university/sos)
  - IBM jobs: [ibm.com/university/students/jobs/](http://ibm.com/university/students/jobs/)
- **Connect with the community**
  - developerWorks profile
  - Facebook (System z on campus)
- **Explore leading-edge technologies**
  - IBM Smarter Planet, Watson, Enterprise computing, Cloud computing, Business analytics, and others
- **Validate your skills and get recognized**
  - IBM Certification
  - IBM System z Mastery test (no cost in 2011)
- **Scholarships and awards**
  - IBM Destination z
  - SHARE Academic Excellence Award
  - NEW! Academic Excellence Award

Membership is **NOT** required for students.
Student Mainframe contests: Generating student interest

17 countries to date

1. Brazil
2. Belgium (BeNeLux)
3. Netherlands (BeNeLux)
4. Luxembourg (BeNeLux)
5. Norway (Nordics)
6. Denmark (Nordics)
7. Sweden (Nordics)
8. Finland (Nordics)
9. Thailand

12 Contests planned in 2011

- Germany and Switzerland (new)
- Turkey (new)
- Argentina (new)
- China (new)
- France
- Mexico
- Australia
- Russia
- US and Canada
- Taiwan
- Brazil
- UK

<table>
<thead>
<tr>
<th>Location</th>
<th>Contests</th>
<th>Students</th>
<th>Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>2007</td>
<td>2011</td>
<td>390</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>3287</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>2008</td>
<td>390</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>4030</td>
<td>409</td>
</tr>
<tr>
<td>BeNeLux</td>
<td>2007</td>
<td>76</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>55</td>
<td>15</td>
</tr>
<tr>
<td>Nordics</td>
<td>2007</td>
<td>147</td>
<td>11</td>
</tr>
<tr>
<td>Thailand</td>
<td>2007</td>
<td>960</td>
<td>40</td>
</tr>
<tr>
<td>UK</td>
<td>2006</td>
<td>725</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td>676</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>876</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>1132</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>671</td>
<td>54</td>
</tr>
<tr>
<td>Mexico</td>
<td>2010</td>
<td>716</td>
<td>17</td>
</tr>
<tr>
<td>France</td>
<td>2010</td>
<td>324</td>
<td>27</td>
</tr>
<tr>
<td>North America</td>
<td>2005</td>
<td>750</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>1085</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td>1750</td>
<td>325</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>1879</td>
<td>325</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>3015</td>
<td>425</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>3537</td>
<td>417</td>
</tr>
<tr>
<td>Australia</td>
<td>2008</td>
<td>450</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>315</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>455</td>
<td>32</td>
</tr>
<tr>
<td>Taiwan</td>
<td>2009</td>
<td>560</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>724</td>
<td>46</td>
</tr>
<tr>
<td>Russia</td>
<td>2009</td>
<td>269</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>458</td>
<td>49</td>
</tr>
<tr>
<td>Totals</td>
<td>17 countries</td>
<td>32,941</td>
<td>4,021</td>
</tr>
</tbody>
</table>

ibm.com/university/contest
IBM subsidizes System z Mastery Exam in 2011 offered at no cost to educators and students

- **Worldwide offering ($95 USD value) available to professors and students**
  - z/OS Proficiency exam for entry level system programmers
  - Available at 5,000+ Prometric locations
  - Avenue for students to validate z/OS knowledge and distinguish themselves from other job candidates
  - Industry feedback: Valuable measurement of ‘Entry Level Criteria’
  - Analyst input: Key indicator of available skills
  - Eligibility – faculty members and students

- **Resources**
  - Based on the *Introduction to Mainframes: z/OS Basics* – 3,100+ attempts (78.9% success rate) in 40 countries

- **Learn more at**
  - [ibm.com/certify/mastery_tests/ovrZ01.shtml](http://ibm.com/certify/mastery_tests/ovrZ01.shtml)

*Take the Mastery test at SHARE for no cost – Session 9842, Monday at 6:00pm*
IBM Student Opportunity System
Connecting customers with students

Open to students who have:

- IBM Professional Certifications
- Completed relevant classes, labs, workshops or projects
- Participated in contests that utilize IBM or open source technologies

ibm.com/university/sos
System z Academic Initiative investment in student scholarships and awards

SHARE Academic Award for Excellence

- Create awareness of SHARE among the academic community and the next generation of enterprise IT professionals
- Showcase and reward academic work relevant to the future of enterprise computing
- Students submit an academic project they have completed in the past year that displays growth in skill sets critical for the future of enterprise computing
- Call for entries ends February 2012

share.org/Members/AcademicAwardforExcellence/tabid/602/Default.aspx

SHARE Student Award for Excellence sponsored by IBM and
c

IBM Destination z Enterprise Computing Scholarship Program

Students must demonstrate excellence in their enterprise computing coursework, with plans for continued growth on the Mainframe platform in their academic and professional careers.

2010 scholarship winners:
- Chhavi Gupta, Syracuse University
- Joseph Carmello, Marist College
- Sharon Akkoul, Syracuse University
- Aaron Simmons, University of Arkansas
- Jasy Suet Yan Liew, Syracuse University
- Jay Thomas, Pace University
- James True, University of Arkansas
- Zainab Yusuff, University of Maryland, Eastern Shore

www.destinationz.org
Something for the Mainframe Community

- **Locate schools teaching the mainframe**
  [ibm.com/university/systemz/schools.html](http://ibm.com/university/systemz/schools.html)

- **System z Job Board**
  Post your job requirements for job seekers to review and apply: [systemzjobs.com](http://systemzjobs.com)

- **Student Opportunity System**
  View student resumes: [ibm.com/university/sos](http://ibm.com/university/sos)

- **Get access to no cost System z courses**
  (for internal training)
  [ibm.com/systems/z/educationskills_coursematerials.html](http://ibm.com/systems/z/educationskills_coursematerials.html)

- **Online Mainframe Education**
  (High Quality / Low Cost!)
  - **IBM System z e-Learning bundles**
    For only $350 a bundle, receive three months of unlimited access to 55 comprehensive System z courses
  - **Enterprise System Certificate Programs at Marist College**
    [idcp.org](http://idcp.org)
Introducing SystemzJobs.com

The IBM System z Job Board at SystemzJobs.com is a new resource that connects IBM System z Clients, Partners, and businesses with students learning the Mainframe and professionals seeking System z job opportunities.

Benefits of using SystemzJobs.com

- Free, secure, and easy to use
- Specialized audience of Mainframe educated students and experienced professionals
- Global pool of Mainframe talent

Getting started

Follow these steps at SystemzJobs.com to get started:

1. Create a secure account (optional)
2. Put in your job description
3. Connect with qualified candidates

Sponsored by the IBM Academic Initiative, System z
Visit: ibm.com/university/systemz

Questions? Contact zskills@us.ibm.com
How can IBM clients and business partners participate?

- A strong local relationship between schools and the Mainframe community can provide valuable insights into business demands and future education requirements.

- View IBM Academic Initiative web site for participating schools and educators teaching the Mainframe ([ibm.com/university/systemz](http://ibm.com/university/systemz))

- Contact the IBM Academic Initiative team at [zskills@us.ibm.com](mailto:zskills@us.ibm.com) to recruit new schools

- Post your jobs on [SystemzJobs.com](http://SystemzJobs.com)
Marc Smith on

- COMMUNITIES

- THINGS YOU CAN DO TO SUPPORT SKILL DEVELOPMENT
Mainframe communities
Get connected!

IBM Destination z
www.destinationz.org

zNextGen
znextgen.org

zNextGen Project - a community designed for you.

New to Enterprise Computing?
In a new role that involves System z?
A new System z Professional?
Join Today!

zNextGen is a user-driven community of over 700 members, representing 24
countries for new and emerging System z professionals that has the resources to
help expedite your professional development skills.

SHARE
share.org/

SHARE
Technology • Connections • Results
Learn what System z can do for you

Gain skills to help you deploy Mainframe solutions

Reach out to others in the Mainframe community

Find key IBM Business Partners

Contact schools around the world to take advantage of their Mainframe programs

Destination z blog
ibm.com/developerworks/blogs/page/destinationz

New to System z: Mainframe basics
ibm.com/systems/z/advantages/newtosystemz/index.html

Discussion forum
ibm.com/developerworks/forums/forum.jspa?forumID=1128

Enterprise Computing Scholarship program for students
www.destinationz.org
Tips for reaching out to local schools

- Use personal contacts or look up on Web
  - Computer Science Chair
  - Business School (MIS) Chair
  - A fit across all computing disciplines
    (CS, CE, SE, IS, IT)

- Use the following tools to begin the discussion
  - Alert faculty to industry skills needs
  - Offer to do a guest lecture
  - Gain student interest through the Mainframe contest
  - Academic Initiative resources available at no cost – membership takes 10 minutes
  - If possible, invite faculty and students to your facility for a discussion or tour
Additional opportunities

- Be a guest lecturer or adjunct professor
- Visit the campus and meet with students to build interest in pursuing a career in Mainframe technologies
- Become a client representative on a school’s board – influence curriculum decisions
- Host a “Student Day” – meet with key technical to talk about opportunities and provide a tour of your location
- Attend campus recruiting events and career days
Reaching out to high school students

- **Local high schools**
  - Reach out to Computer Science or other tech oriented departments
  - Contact them through personal network (kids in school) or via Web site
  - Use the following tools to begin the discussion
    - Offer to do a guest lecture
      - Presentation available on AI Web site
    - Alert them to contest
    - Alert them to mini-module for use in current classes
    - If possible, invite them to your facility for a discussion or tour
    - Ensure they know about the Academic Initiative resources
    - Participate in local high school/middle school career days
  - Remember to point to AI Web site for list of colleges/universities

- **If interested, alert IBM** [zskills@us.ibm.com](mailto:zskills@us.ibm.com)
  - Will help with presentations/support as available
  - May be able to arrange for joint visit or teleconference

- **Work with IBM to arrange roundtable event**
Reaching out to your Alma Mater

- Use your contacts
- Alert them to need
- If interested, alert IBM zskills@us.ibm.com
  - Will help with presentations/support as available
  - May be able to arrange for joint visit or teleconference
- Work with IBM to arrange roundtable event
Final thoughts

- Community colleges are nimble
- Four-year schools harder to get started – but don’t give up!
- Most AI institutions contacts will talk about their program
- Use e-mail and phone … educators often slow to respond
- If you have a interested school, send e-mail to zskills@us.ibm.com for support
Summary

- IBM continues to *invest* in developing more Mainframe skills for clients
- The program and the number of schools continues to *grow*
- IBM Clients are *connecting* with System z Academic Initiative member schools
- You can be a catalyst for adoption at local schools (both high school and colleges)
Important Web sites and contacts

- **Academic Initiative for the Mainframe**
  [ibm.com/university/systemz](http://ibm.com/university/systemz)

- **IBM Academic Initiative Student Portal**
  [ibm.com/university/students](http://ibm.com/university/students)

- **IBM System z Mastery test**
  [ibm.com/certify/mastery_tests/ovrZ01.shtml](http://ibm.com/certify/mastery_tests/ovrZ01.shtml)

- **IBM Student Opportunity System – Connecting Industry with Students**
  [ibm.com/university/sos](http://ibm.com/university/sos)

- **System z Job Board – Connecting Students to Jobs**
  [SystemzJobs.com](http://SystemzJobs.com)

- **IBM Master the Mainframe Contest**
  [ibm.com/university/contest](http://ibm.com/university/contest)

- **Enterprise Computing Scholarship program for students**
  [www.destinationz.org](http://www.destinationz.org)

- **Support Mainframe Growth (article):**
  [ibmsystemsmag.com/mainframe/trends/whatsnew/ambassador_perspective](http://ibmsystemsmag.com/mainframe/trends/whatsnew/ambassador_perspective)

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**IBM Academic Initiative System z Program Manager**
Kathy Pfeiffer, pfeiff@us.ibm.com

**IBM University Ambassador**
Marc Smith, smarc@us.ibm.com
IBM can assist **you** with Enterprise Systems Skills and Education.

Contact us at [zskills@us.ibm.com](mailto:zskills@us.ibm.com)

*Questions?*