

Cheryl Watson's *z/OS 101 Primer*

Updated 2009

The z/OS 101 Primer

At the 2008 SHARE conference held in Orlando, I gave a lunchtime presentation called *The Tips Your Mentor Forgot to Mention*. It was for the zNextGen project, which was created to help those people who are new to mainframes or new to performance. The response to that project was incredible. One teacher even brought several students from his class in Georgia to the conference JUST to attend the zNextGen sessions.

Because of the project's success, and because several of our readers responded so favorably to my advice for new techies, I decided to include a new section in every Tuning Letter called "z/OS 101". Each Tuning Letter issue will contain this section and address a topic that should be useful to those new to mainframes, especially in the performance, capacity planning, data center reporting, and charge back areas. If you'd like some special topic addressed, please let me know.

This particular document is a compilation of the z/OS 101 articles written so far and is offered to the public via our website. Please use it and copy it as you see fit, provided that you use the entire document if you distribute it, always credit us as the source, and make no attempt to resell it. The most recent compilation can always be found at www.watsonwalker.com/zos101.pdf.

So, hats off to our next generation of z/OS techies, and welcome to the exciting world of performance!



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Advice for New z/OS Techies

As I mentioned, I was on a panel at SHARE called *zNextGen Lunchtime Panel Discussion: The Tips Your Mentor Forgot to Mention*. In preparation for that panel, I was asked to list some of my best advice to people who are new to z/OS. So I wrote up the following list that I hope will be of use to some of our readers. We'll probably have some additions after the panel, and would love to include any of your favorites in our next newsletter. So please send any additional ideas to me at <mailto:technical@watsonwalker.com>.

Advice for New z/OS Techies

1. Measure everything you do! Whether you make a change to a program, a parameter, a file specification, or simply move a file to a different device, you could make things better or you could make things worse. If things got better, your manager should know so that he/she will trust you to make other changes. If things got worse, you can back it out so that your manager doesn't even need to know! If you are trying to improve TSO response time, make sure that you don't penalize the CICS users, or vice versa. This is the most important piece of advice that I can give, and I followed it for over 40 years.
2. Don't ever think that an area of computing doesn't affect you - it does. If you are a systems programmer, what the DB2 application programmers do will impact your system. If you're a DB2 application programmer, how the system programmer sets up parameters will impact your application. If you are only looking at z/OS and not listening to what's happening with Linux on z/VM, you may get behind the curve. I've been a generalist all my life and it's served me well because I can apply what I learn in one area (e.g. DB2 likes lots of storage) to other areas (e.g. CICS also likes lots of storage). It helps me understand the types of things to look for.
3. If you don't like to read manuals, or don't have the time, then often your best option is to GOOGLE it (<http://www.google.com>). If I forget what the ISPF keys are, I can find them quicker with Google than by searching through several manuals (is it in the Users Guide or the Users Reference?). If you only want to find things on the IBM web site, then you can enter 'site:ibm.com' at the end of your search (such as 'smf exit iefujv site:ibm.com') and you'll find APARs, publications, and other goodies to help you out.
4. For helpful links, we have a great handout of links for new users. You can find it on our website at <http://www.watsonwalker.com/PR070213.pdf>. I'm not going to duplicate the contents here - it's several pages long. If you click on a link in the presentation, you can go directly there.
5. One of my favorite sources of information is the Washington Systems Center (with their flashes, presentations, hints & tips, etc.). They have some outstanding pieces of information. Just place a keyword or two in their search at <http://www.ibm.com/support/techdocs>.

6. I think that the best way to understand something is from the IBM Redbooks. They are extremely easy to read and either explain everything from step one, or will at least provide a bibliography to get you started. See <http://www.redbooks.ibm.com>.
7. One redbook I love dates from 1999 - SG24-4757 (P/390 OS/390: New User's Cookbook). It was developed for software developers who might not be MVS sysprogs, and who might need help with some of the basics: How to IPL, How to Reset a Password, How to Add RACF Users, How to Clear SYS1.LOGREC, How to Set Up NJE, etc., etc. What I like most about it is that it's all in one place, and I always keep it by my side. You can find it on the Redbooks site above.
8. Find a good users' forum and become familiar enough that you can ask a question if you need to. Check out our presentation (in #4 above) for several suggestions.
9. Share what you learn. Whether returning from a SHARE conference, or reading something new in a manual, share the information with your colleagues. They will appreciate it, and maybe they'll return the favor. Spreading knowledge instead of hiding it helps everyone. And of course don't forget to share at SHARE. ■

More Advice for New z/OS Techies

If you missed my article in the last Tuning Letter, please start there with my original advice. Here, I'll include some new thoughts that were brought up during the panel or sent in by our readers. Thanks to fellow panelists **Chris Craddock**, **Dave Danner**, and **Bob Rogers**; and thanks to contributors from the audience for the following tips:

- Create a baseline of your system. "If you don't know when things are running well, then you won't know when it's running wrong." Although the panel didn't have time to go into specifics about what a baseline would include, I think that it should certainly include both key system indicators (average and peak CPU utilization by LPAR and system, DASD response time by CU, amount of paging (if any), network traffic), as well as application indicators (average response times, average and peak transaction rates, CPU usage by application, average and peak users).
- Question everything, and read (or try to read) manuals before asking the expert in your installation.
- Become a mentor yourself. This is especially applicable if you have UNIX knowledge that the more senior mainframers don't have.
- Do what you enjoy; let the wind blow your boat; don't do things for career advancement only.
- Trust your instincts and work hard.
- Remember that the mainframe has more users than a workstation or PC. You can't simply reboot. Anything you do will affect more people, especially an outage.
- Use Google for many of your questions. You'll be amazed.
- Put a date on every piece of documentation.
- Explain and document why you're doing something. This applies to program changes, parmlib changes, JCL changes, and more.

Linda Mooney's Tips

Linda Mooney is one of the zNextGen's project managers and self-described 'mentor' and 'mentee'. (Her real job is as a Senior IT Analyst at County of Sacramento.) She was scheduled to appear on the panel, but wasn't able to make it. She's graciously allowed me to include her list of tips here (I think they're wonderful!):

- 1.** Most people who have a lot of expertise tend to forget to mention one or more of the steps that are automatic (for them) when they are describing what or how to do something. Take notes; list everything you need to do. Ask your mentor to check it. Later on, when you are working on your own, these lists will be your cheat sheets.
- 2.** If you can't handle change and you aren't thrilled to see what's next, find another line of work! This business has changed tremendously over the years. Stay for the zNextGen Project opening and listen closely to the presentation. If you just can't stay, be sure to get a copy of the presentation and a copy of the grid of the zNextGen recommended sessions. Associate yourself with the zNextGen project, check out your educational opportunities through the IBM education Initiative, and always be on the lookout for opportunity. Remember, "Opportunity is not a lengthy visitor." (Into the Woods, Steven Sondheim, for rent on DVD)
- 3.** Mentors are almost always overloaded with work. They often don't really have the time – and some don't really want to mentor someone. It is up to you to make it a positive experience for them too! My first systems programmer mentor did me a favor when he told me straight out, I really don't have the time to deal with this. I don't have time for you. I was a good operator at the time, and I could roll COBOL, but I had no systems programming experience and he saw the enormity of what I didn't know more clearly than I did. I asked what it would take to get some time from him. First he taught me how to do his most routine tasks, then his monitoring and product testing. After I took that on and he didn't have to do it anymore, he had time to teach me lots of stuff I wanted to know – and he was happy to see me. As long as I didn't run out of questions, he didn't have to do his routine stuff. By the way, I learned a LOT by doing all of those routine tasks. Take the initiative. Who does the things you want to do in your career? What can you do to learn from them? Come in early to take some of their load? You pay for school don't you? What is one-on-one mentoring worth to you? You can do or be whatever you decide to. Dream, decide, act!
- 4.** Never talk bad about your mentor. If you are unhappy, it isn't working out and you really want to work with someone else, say only that you are seeking additional opportunities and perspectives. If you trash one mentor, do you think another will want to take you on?
- 5.** Ask your mentor why they do things the way they do them, why they use the utilities and use the methods they do. Is it because of product requirements, dependencies with other products or systems, shop standards, or personal preference? Be sure you fully understand. Your mentor may retire or leave the company. You may have to do it yourself next time.
- 6.** Listen to your mentor's IT stories. You will learn a lot. Tell your mentor how much you appreciate their help. Don't you like to be told when you have done well?
- 7.** When you install a product, there will be libraries that you will need to customize. Save yourself some time and a red face. As soon as that library is created, make a copy of it adding a low level qualifier of .VENDOR or

VANILLA, whatever. Don't make any changes to that library and be sure to keep it for the life of the product. If you need to get a fresh copy of a JCL or configuration member, it will be handy.

- 8.** ALWAYS negative test your products. Run all of the fat finger checks a customer or newbie might stumble into. Get your security folks to set you up with an id with limited access so that you can make sure that the product's security calls happen the way they should. ALWAYS run shop-specific work to test your products in addition to the vendor provided IVPs (installation verification programs). Do you want to find your mistakes and any problems with the product itself or do you want your customers to find them? Ask your mentor how to do this for your products.
- 9.** ALWAYS make and keep your own backups. If you get in the absolute habit of building yourself a 'safety net' you won't have to worry about SPLAT!! Think of it as 'face plant in public' avoidance. A mistake or something else unforeseen can result in a moment of inconvenience nobody else has to know about or it can result in system downtime or corrupted production data that ends up on the front page of the local newspaper. Be sure you have a backup, a good backout, and a good recovery plan.
- 10.** ALWAYS check your results for every job you run, no matter how simple, no matter how many times you have run it before. Success with any IT task is a combination of your effort and knowledge, what the system does with what you give it, and your follow up.
- 11.** Condition code 4 is not always okay!! Check out the what, how, and why before you accept CC0004.
- 12.** Do you work with products that install with SMP/e? NEVER, NEVER, NEVER ACCEPT a USERMOD. I said NEVER! If you do, you'll wish you hadn't. Just ask your mentor!

ALWAYS, ALWAYS, use the SMPLOG and SMPLOGA datasets. You can use a separate set for each zone (GLOBAL, TARGET, DLIB) or just one set for each product. For z/OS, I use one for each zone, just like IBM supplies it. For ISV (independent software vendor) products, I use one SMPLOG, SMPLOGA set for each product install - (hlq.product.SMPLOG). That way I have a chronological log of the SMP/e I ran to install and support that product. I save the listings too, not just the SMP/e listings. While you are in TSO/SDSF, type XDC next to the job in the output list, fill in the panel and the listing will be copied to a dataset. Name the listing datasets so that the names tie in with the product dataset names. Save them for the life of the product. If you have to put maintenance on that product next year, you will be glad that you won't have to wonder about how things were done. I do this even though my shop has an online viewing product. I control the retention period on my datasets, so I can keep them as long as I want.

- 13.** Learn to use your tools really well! Be sure to learn how to use the IBM utilities, especially IEBCOPY, IEBGENER, IEHLIST, IEHPROGM, IDCAMS, IEFBR14, and IEBPTPCH. They are very useful and they will always be available where ever you work with z/OS. Explore and learn all about TSO.

- 14.** Be curious. Seek knowledge, Share knowledge, Share at Share! Don't be a Know-It-All! If you are not smart enough to realize that there is so much to do, learn and see in this business that nobody (that includes you) will ever master it all – well, go away kid, ya bother me! However, if you are like most of us, a product of the event driven learning that comes with rising to challenge after challenge, and you realize that your personal knowledge base still has too much free space, you will do well. Welcome aboard!

And More

Some readers sent in their favorite advice as well:

- **Mike Duffy** from Lloyds Bank provided these tips:
 - The new guys should cultivate the good techies at their site whether they are operators, DBAs, sysprogs, or operations support, as they usually have a wealth of experience.
 - Attend user groups and network.
 - Search the Web for mainframe forums (e.g. MXG, CMG etc), and participate.
 - If you get the chance on your system – experiment.

- **Howard Merrill** from Verizon suggested this:

One piece of advice I give to anyone that touches a computer (mainframe, PC....)

 - 1) Make sure you do a backup!
 - 2) Make sure you know how to USE the backup!!!

I have come across many situations in the last, um, 30 years, where someone did do a backup but had no idea how to use it. Take it from a Storage Manager, good advice! ■