Seven Super Secrets to Debugging on IBM Z

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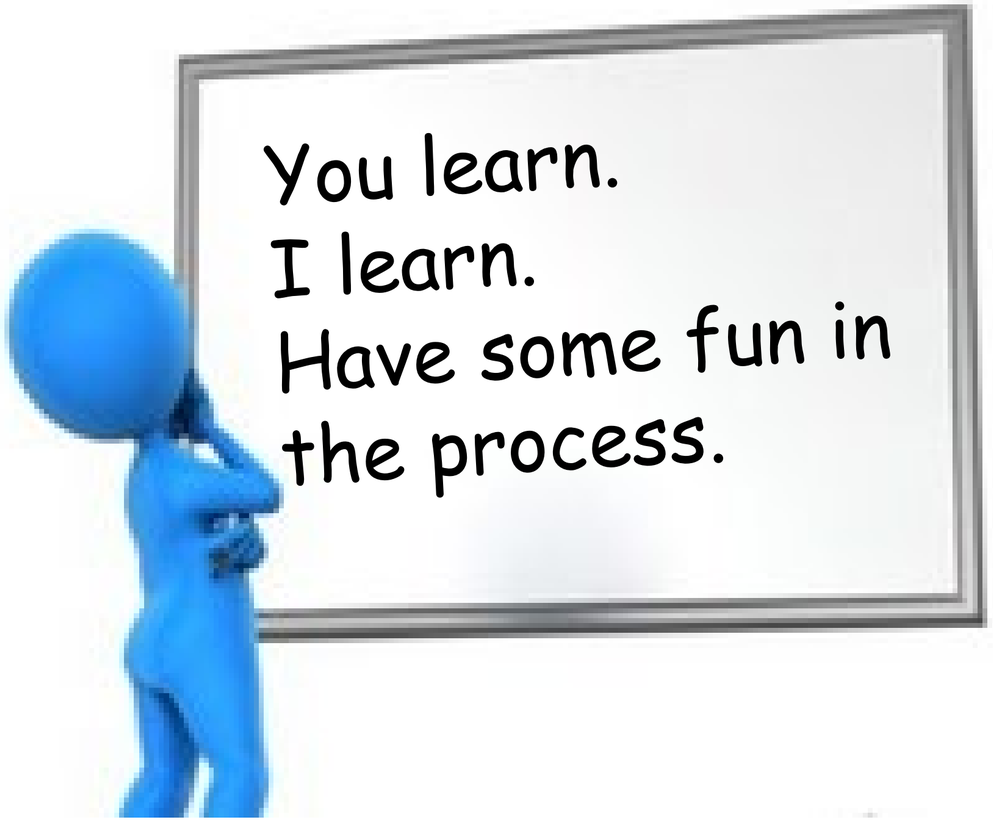
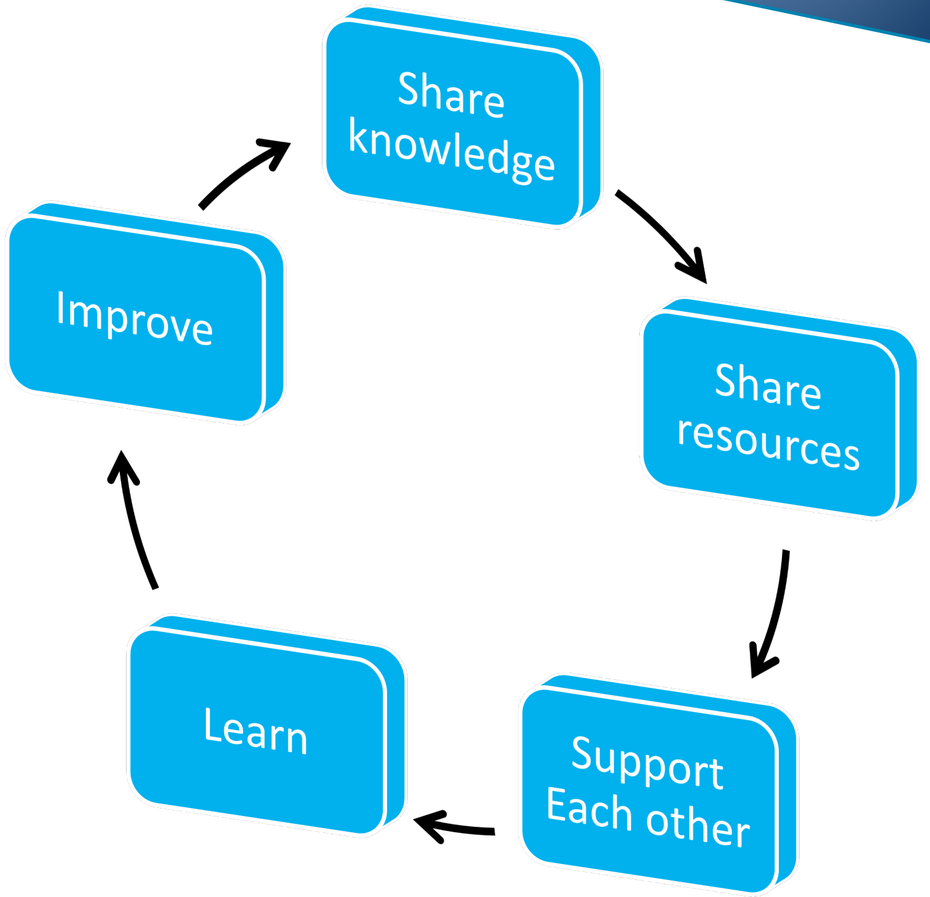
Agenda

- Background - What is a zSysProg?
  - Some context for this prez
  - How I am learning and developing
- Secrets
- Closing

Expectations for this session….

Please feel free to ask questions!





What is a zSysProg and why is debugging important?

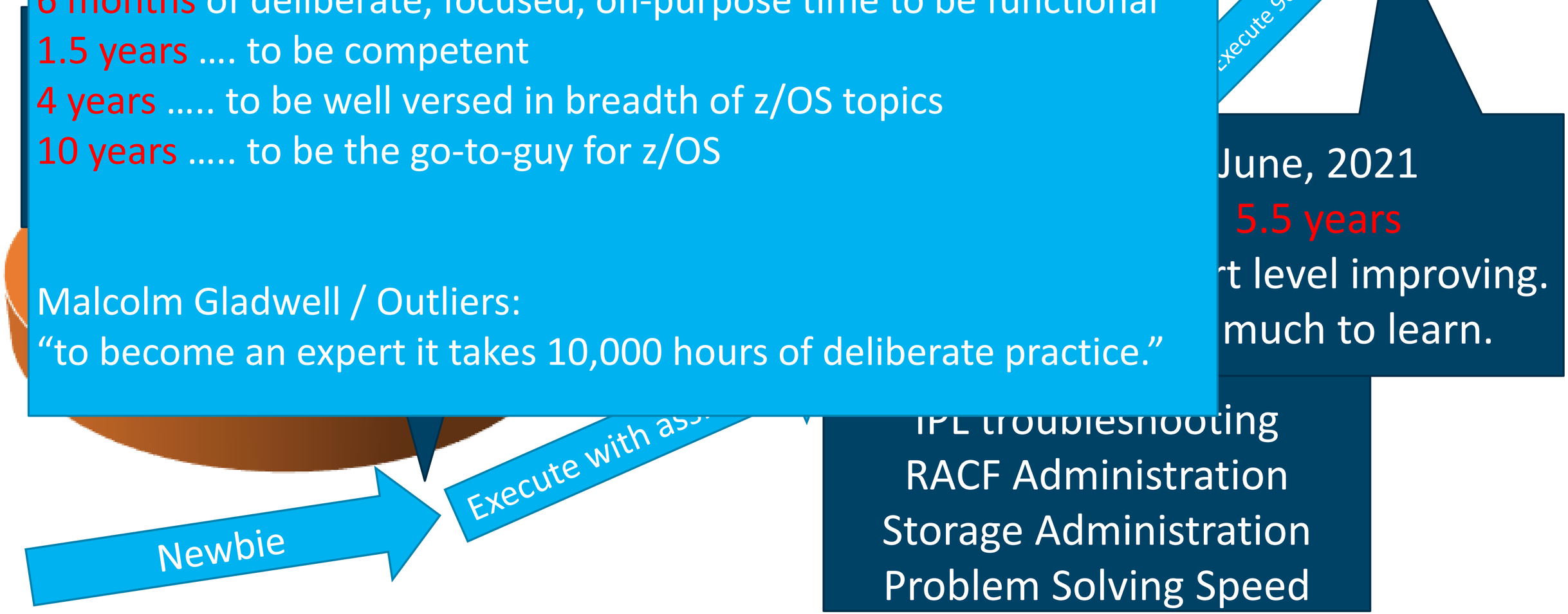
ASCH COBOL SMP/e
DASD TN3270 DFSMS
RACF StartedTask z/OSMF Sysplex
IOCDS Secure PDS/e
ParallelSysplex
IzODA RMF BigIron
SMFlogstream Crypto DeviceNum IEBCOPY
Liberty z/OS Data LPAR CLIST JCL ISPF
CouplingFacility LinkList Bootstrap Workload
Unix RRSCSI Processor Anaconda Information TopSecret ADRDSSU
IMS SysProg MVS IPL DB2
PL/1 Volser Thread .multi-tenant Hypervisor Weighting ZFS
APFauthorization ControlUnit
ZOWE Unix TSO Switch Logger
HSM Batch IBM Python Image
BPXPRMxx
AddressSpace SuperUserAuthPGM
Spark REXX CICS
VSAM PCOMM ECKD
SDSF SMF IOCP TAPE RMM

My zSysProg journey…. timeline

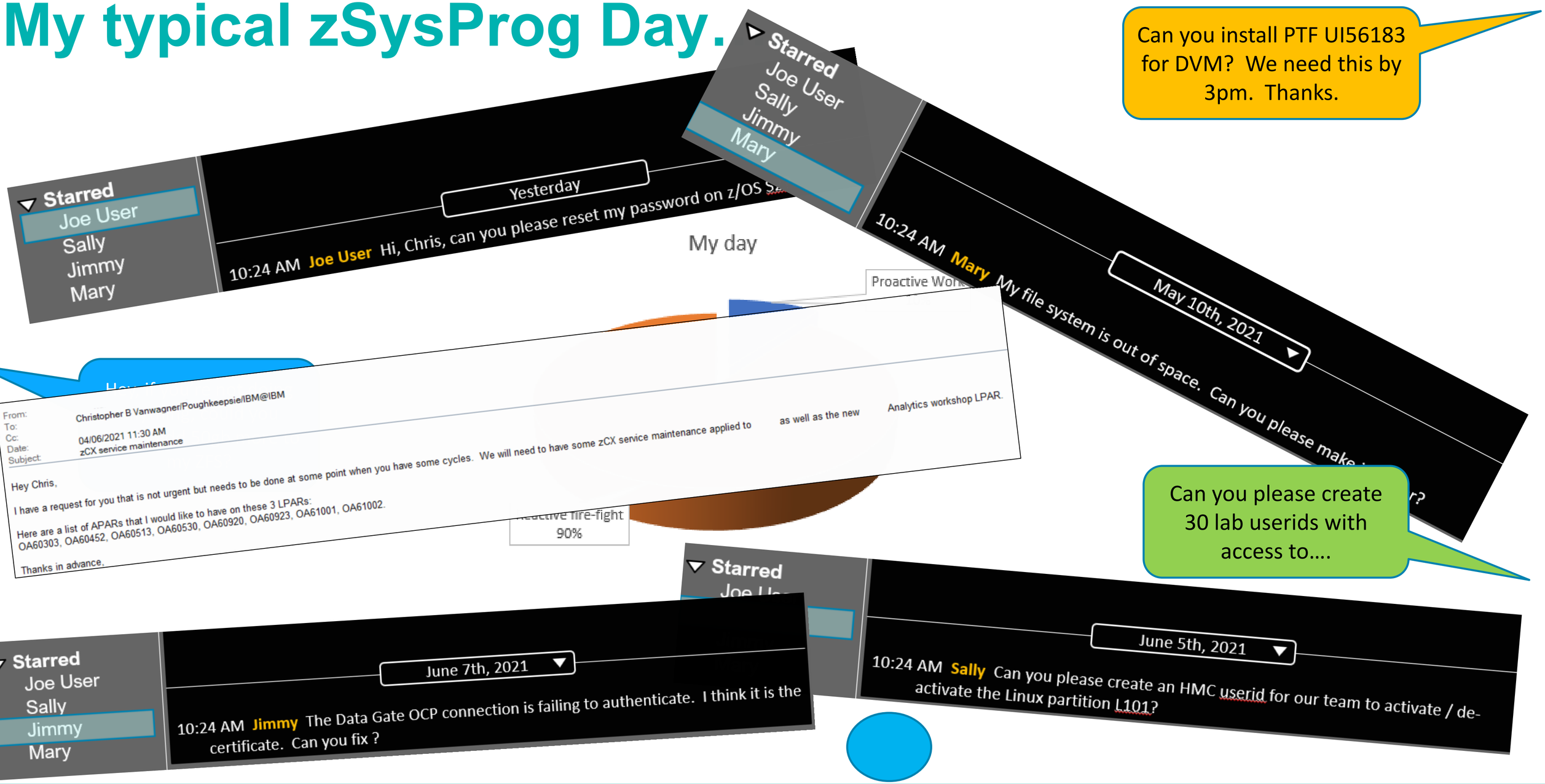
My experience:

6 months of deliberate, focused, on-purpose time to be functional
1.5 years …. to be competent
4 years ….. to be well versed in breadth of z/OS topics
10 years ….. to be the go-to-guy for z/OS

Malcolm Gladwell / Outliers:
“to become an expert it takes 10,000 hours of deliberate practice.”



My typical zSysProg Day.

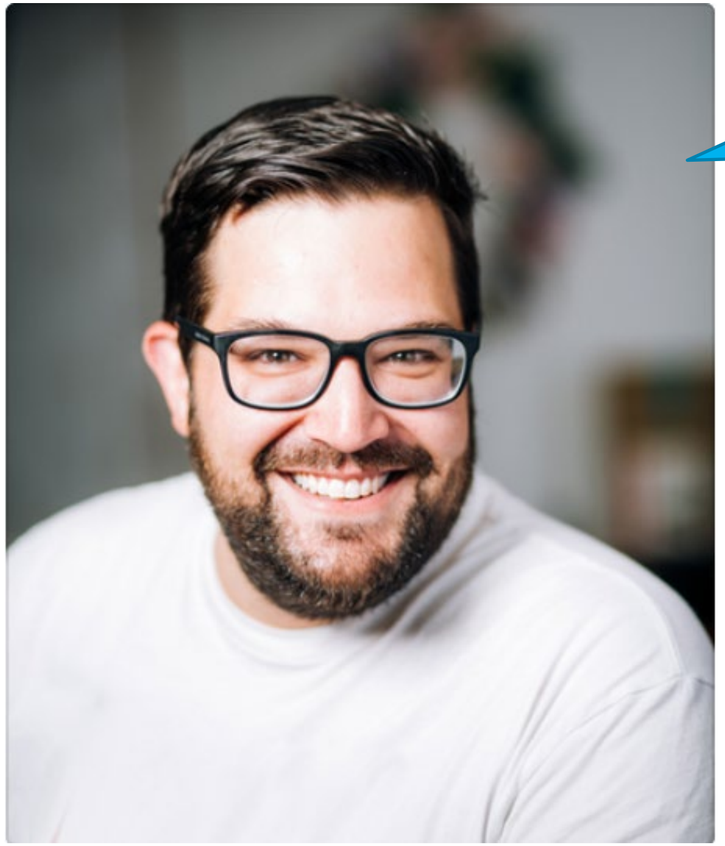


Some context; my debugging journey…
… and introduction to zSysProg work…

Began with a very small, very embarrassing, very eye-opening first step.

And I tripped and fell. Here's the story…

True story….On day 3 of my zSysProg journey….



Hey Chris, can you reset my password on z/OS?

Ummmm….. I'll try.

….30 minutes later….

I have to ask my mentor.

Sigh….. Newbies…..

Four days later…..

Hey Chris, can you reset my password on z/OS (again)?

Dude, you owe me lunch.

….10 seconds later….

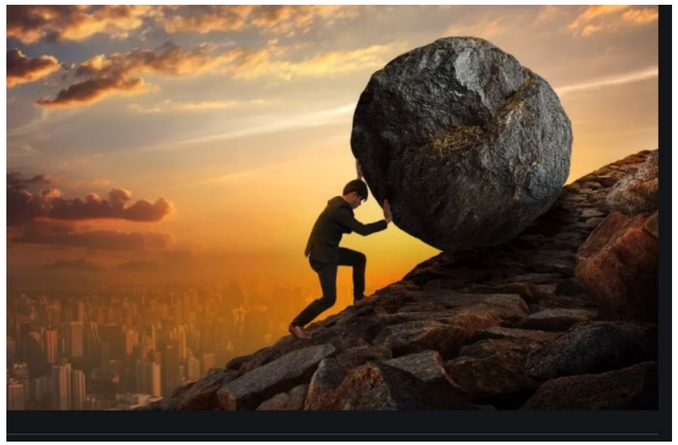
Done. Your password has been reset to “4GETFUL”.

Sigh….. zSysProg’s…..

What does this reflect about my debugging situation?

Negatives

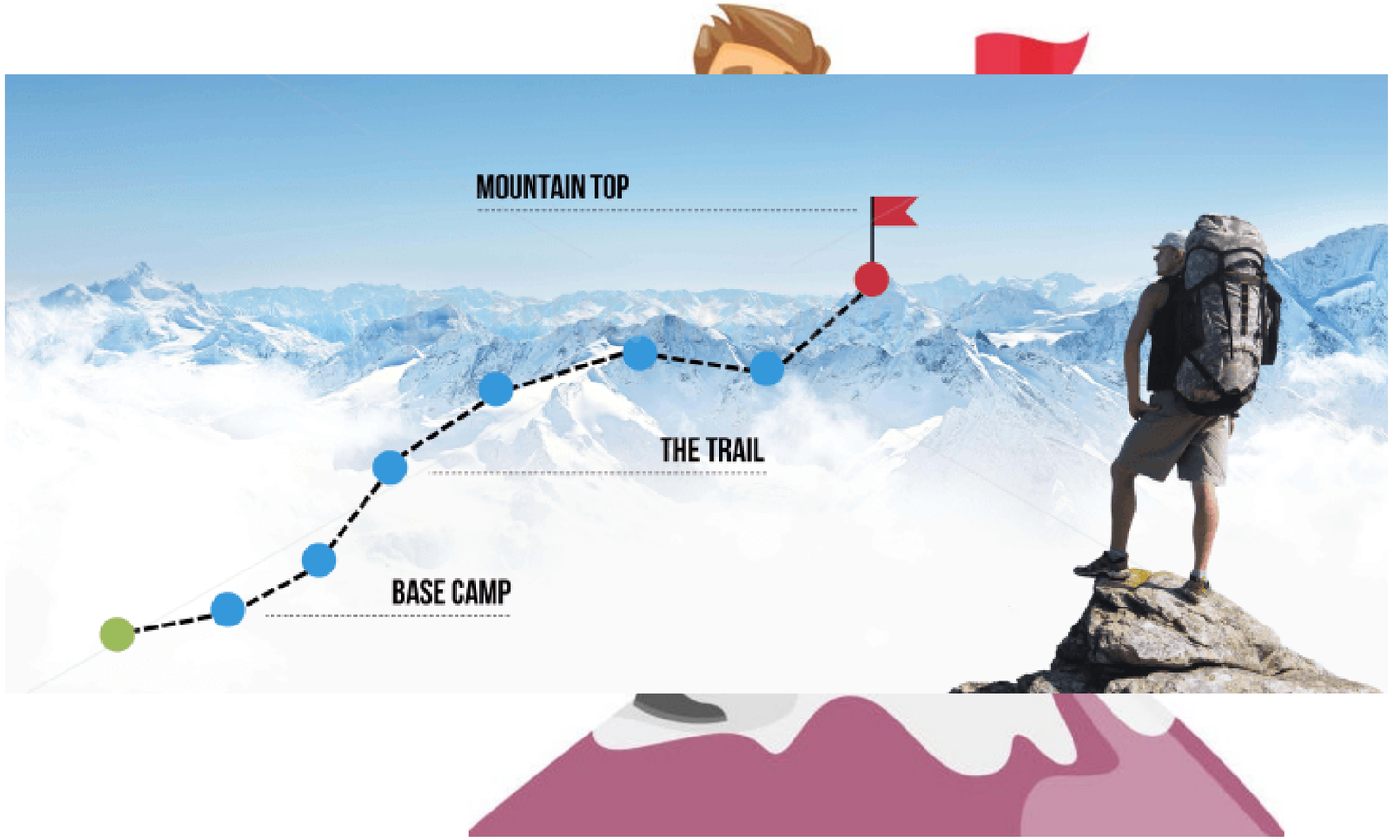
- No experience
- No process for debugging
- No understanding of basic nuts-n-bolts
- Inexperience with zSysProg doc



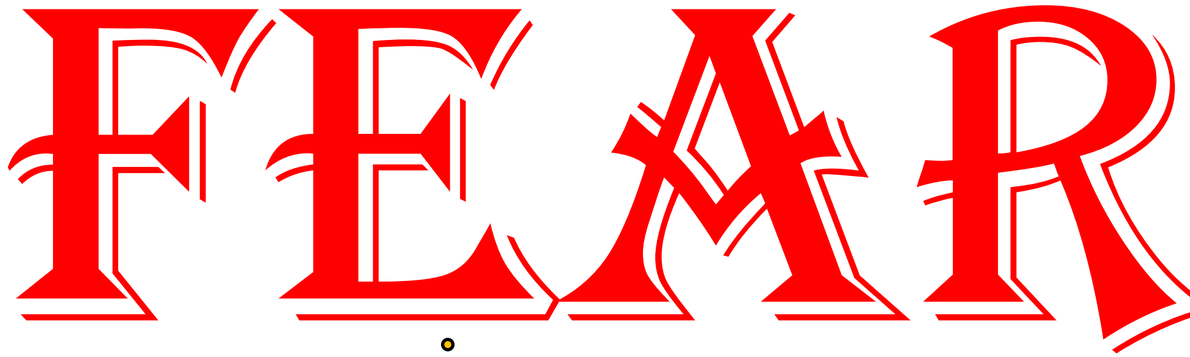
- Positives
- Supportive Team – KEY!!!
- Start my own crib-notes document
- Start to develop a debugging process
- Gain experience
- Gain mentors

My rate of effectiveness with our team

How long will it take you to become a high-functioning zSysProg?



My #1 obstacle for progress….



Lack of confidence to get out of a jam

Wrecking a system

Letting down my team mates

Inexperience leading to accidental impacts

Fear…. A healthy thing….

All veteran zSysProg's have HORROR stories.

Let's hear 'em…

I made a RACF change that prevented TN3270 from starting. Next IPL, PCOMM would not start…..

Know a guy who did RACF cleanup and deleted TCPIP.** profiles.

My mentor…. Dynamically activated an IODF change. Hit <enter>. PCOMM goes blank.

Know a guy who "restored" a customer's DB2 instead of making a copy.

Super Secret #1 – ATTITUDE!

Become the person you want to be around

Confidence

Determination

POSITIVE

Happiness

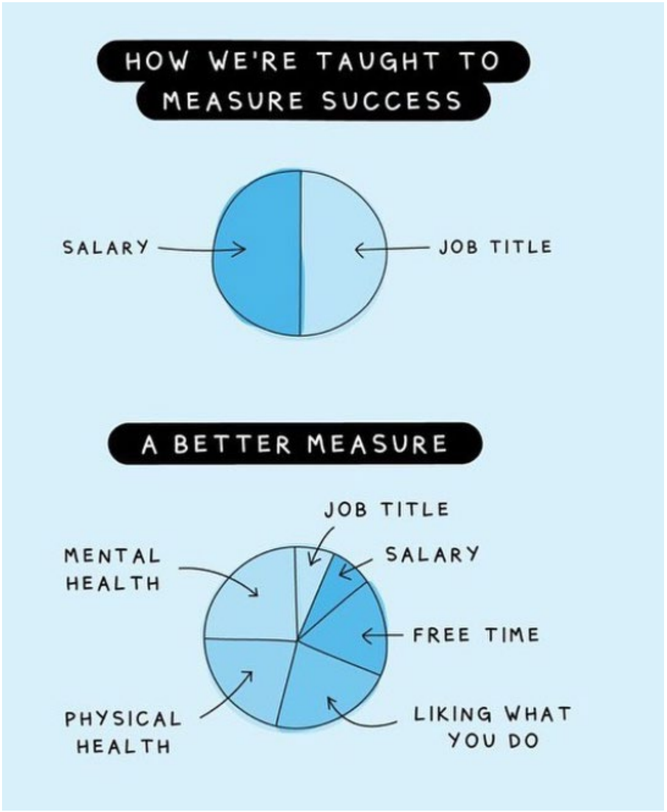
Sincerity

"Aim for nothing and you'll hit it every time"
– Zig Ziglar

Super Secret #1 –ATTITUDE!

- Deciding to get some sleep and continue debugging tomorrow is NOT giving up

- Sometimes, the journey is more valuable than the destination



Avoid the negative attitude trap

Story – TCPIP Nightmare

- May 2021
- Could not g
- Used my de
- Went to IBM

System action

The TCP/IP failed to initialize.

Operator response

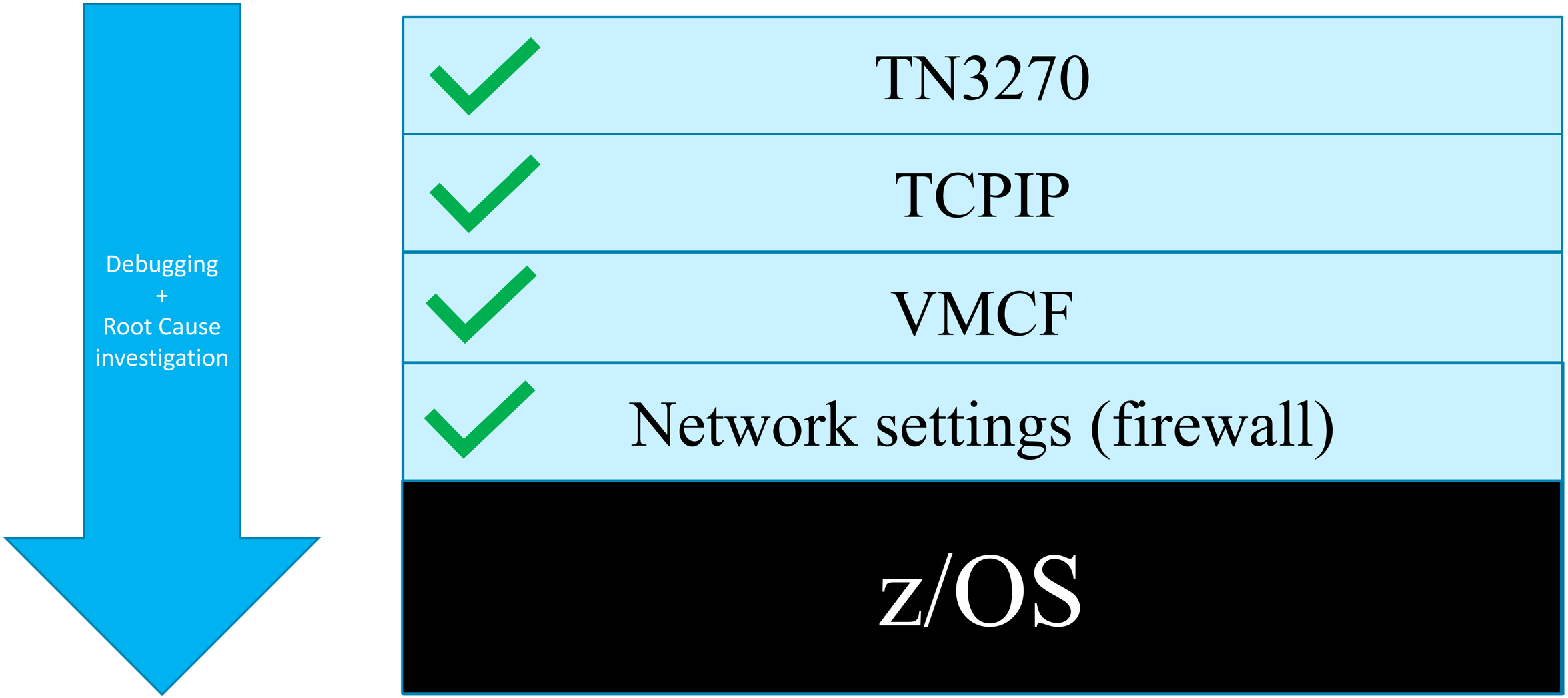
Contact the system programmer.

TCPIP

My Mentor and POSITIVE influence

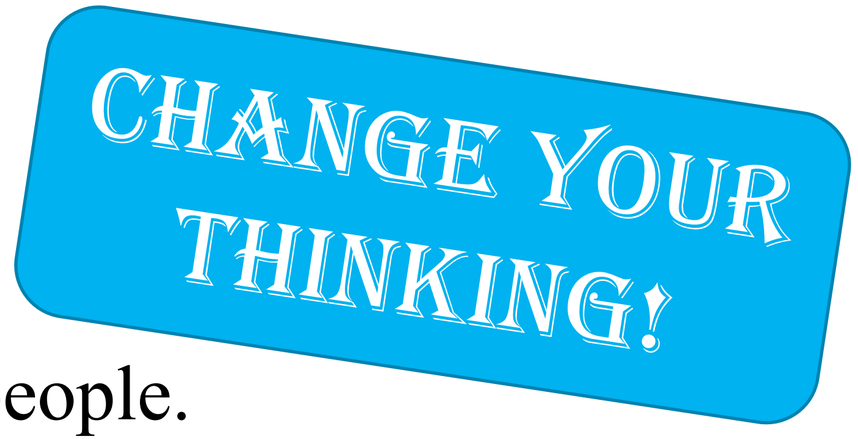
1. Reminded me of root cause analysis
2. Reminded me of my current attitude
3. Taught me some new tricks
4. Together, we solved the problem

TCPIP story continued… debugging

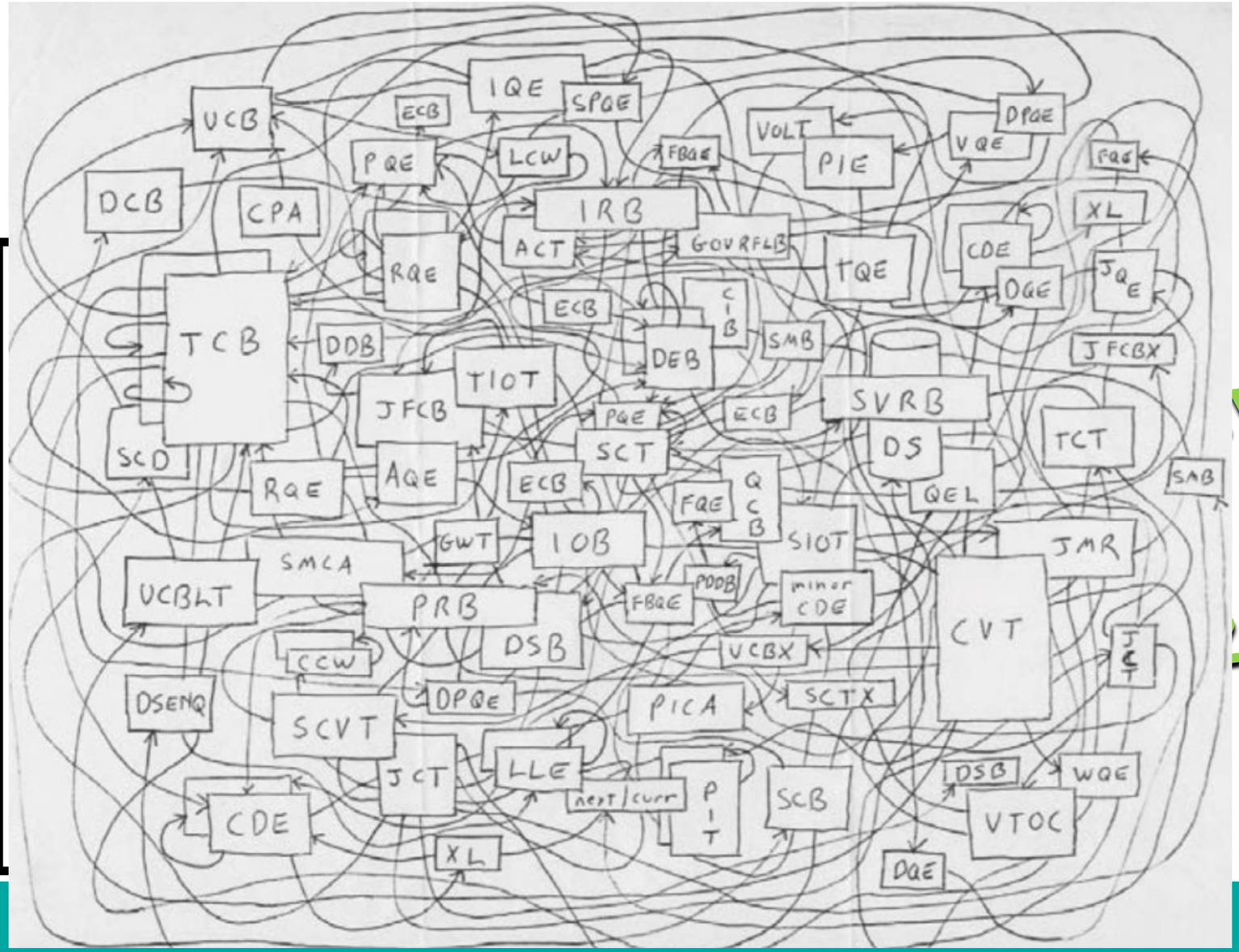


Steps to foster a positive attitude

1. There are two wolves fighting; a good wolf and bad wolf. Which one wins?
2. Help others.
3. Solve the problem.
4. Find the humor.
5. Surround yourself with positive people.
6. Put your team first and listen to them. Practice the art of listening.
7. Sincerely say ‘thank you’ to someone each day (gratitude).
8. Use the “yes, but…” answer.
9. Stop complaining.
10. Smile



Super Secret #2
Set your expectations accordingly



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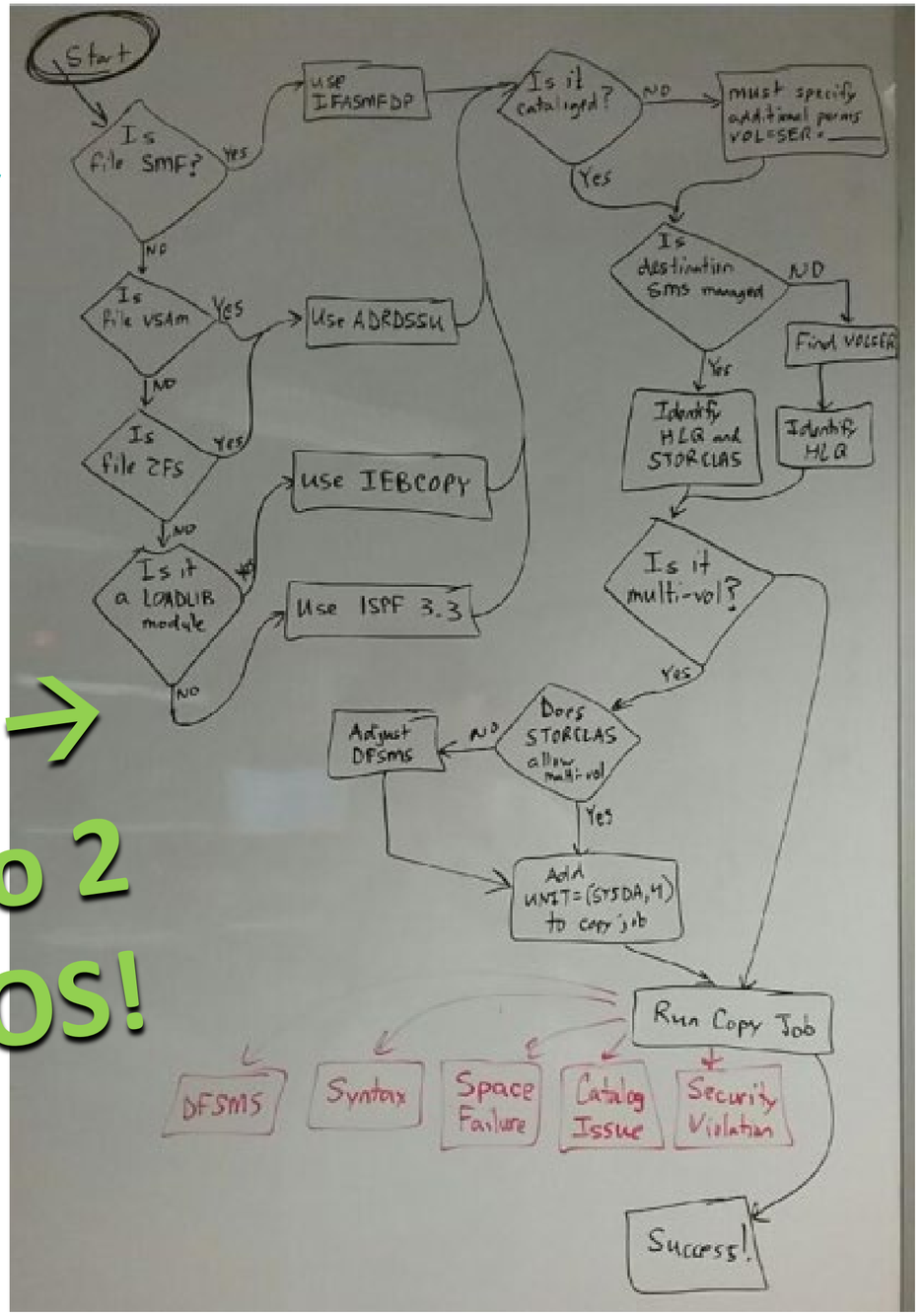
to 2

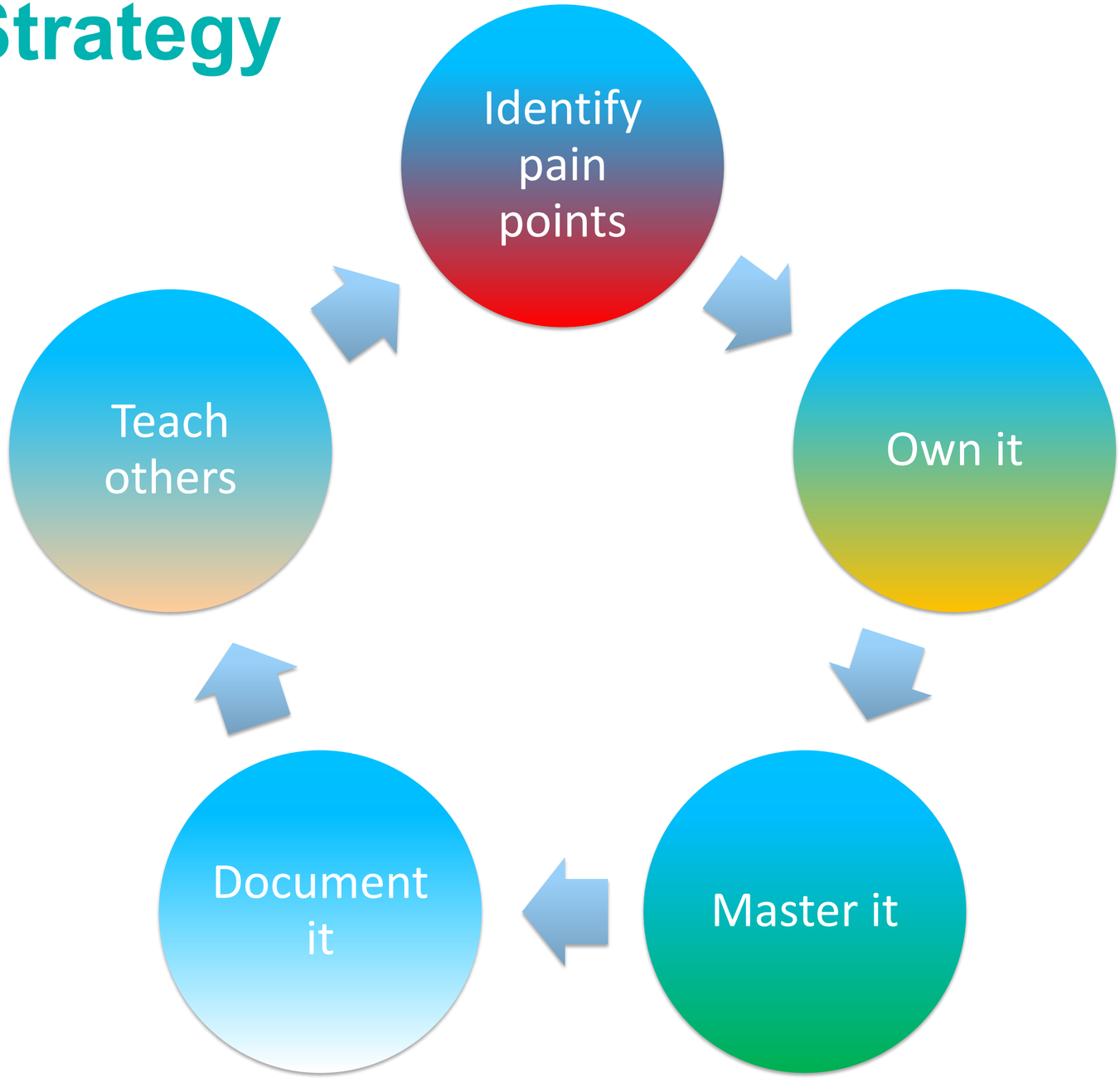
/OS!



Super Secret #3 - Your Strategy

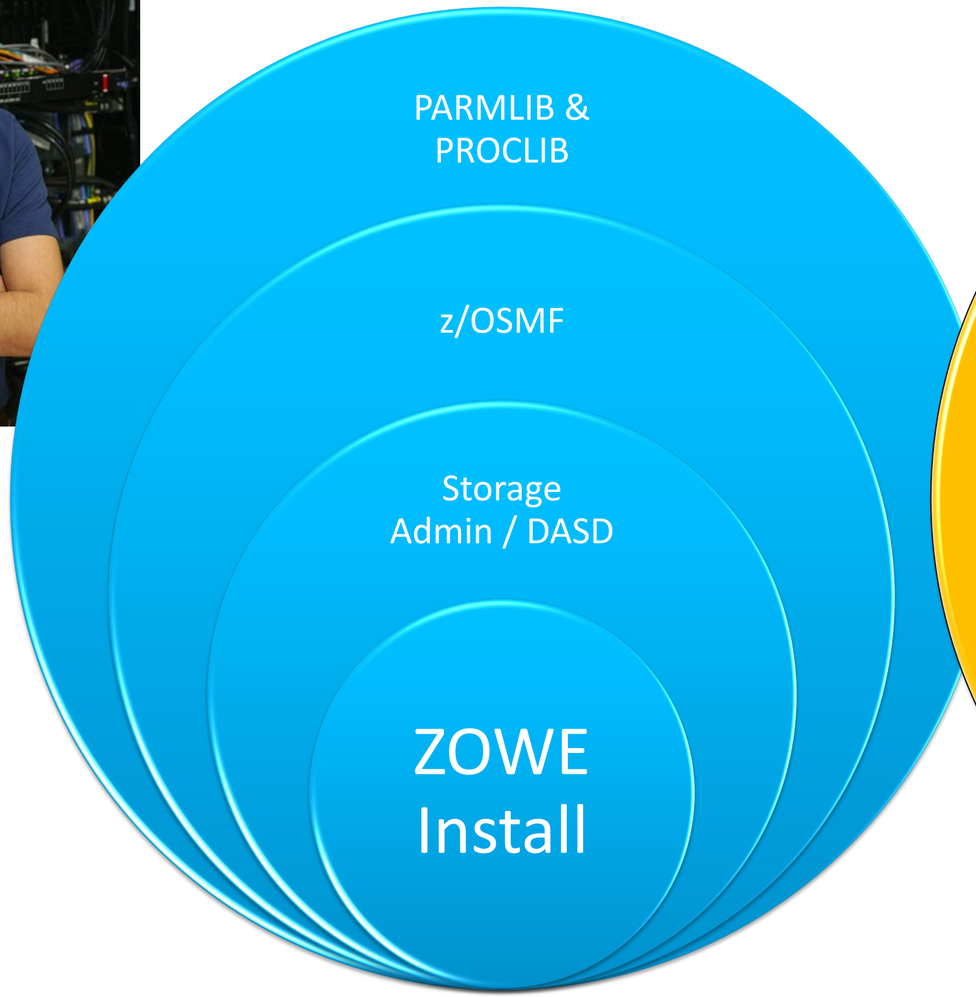
How do I fit in to the team?

~~What~~ How should I learn?

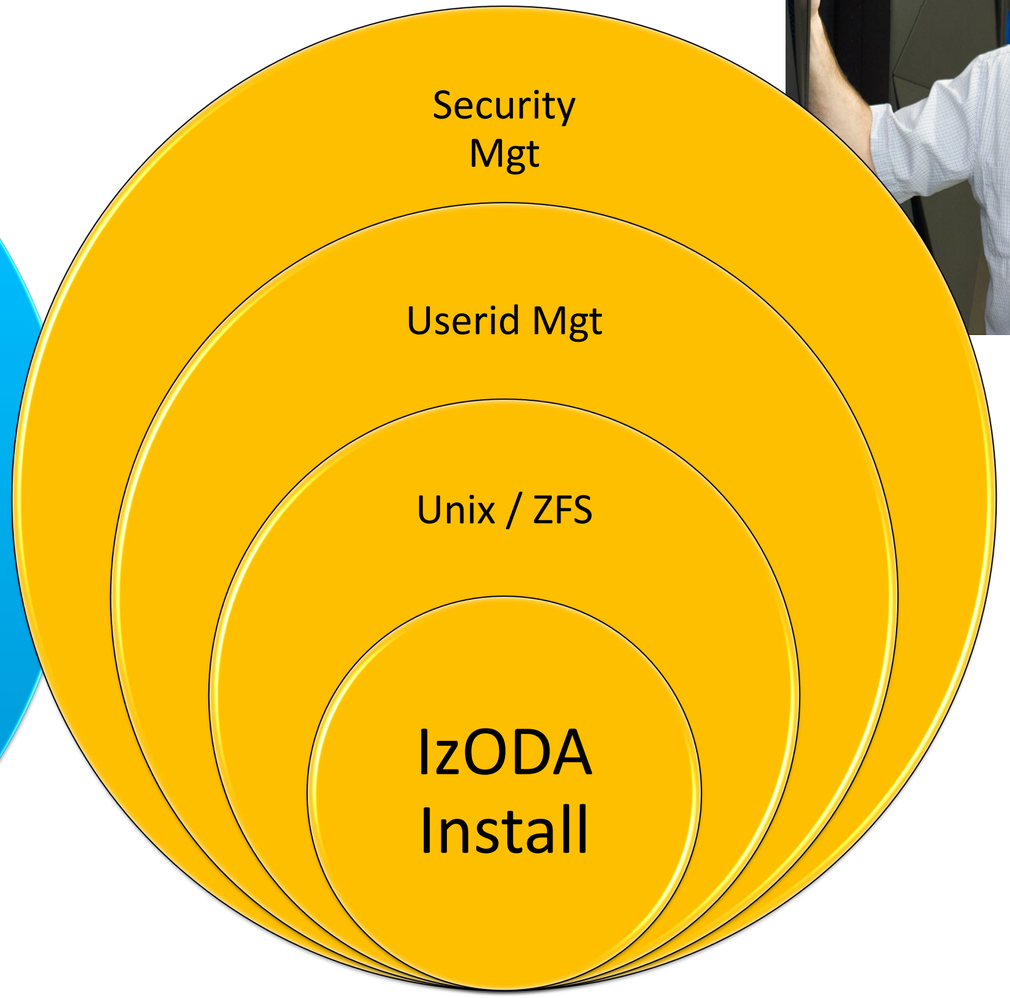


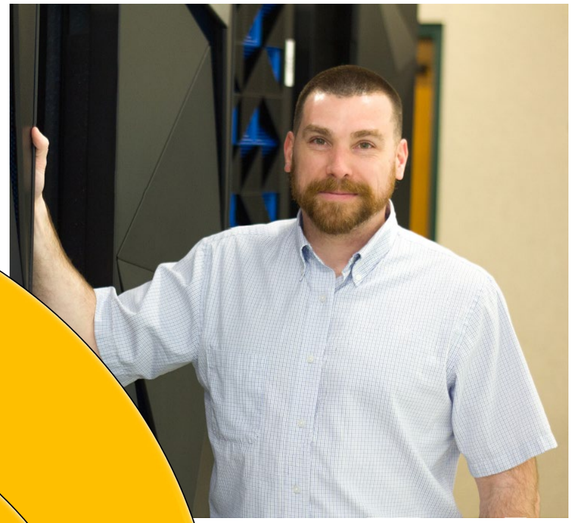
Super Secret #3 - Your Strategy

Example 1



Example 2





Your strategy for debugging

- What is the error message? Read it slowly again.
- Lookup message in IBM manual
- Check your personal notes / journal
- Check team notes / Box
- Compare to another system
- Google
- Mentor
- Don’t sit there idle. Do something, anything! Generate the error again if you can. Query things.
- Write up the problem officially in true root cause format. Engage with team.

Super Secret #4
GET OUT OF YOUR COMFORT ZONE

I know JCL and TWS, not z/OSMF. Therefore, I'm going to use JCL.

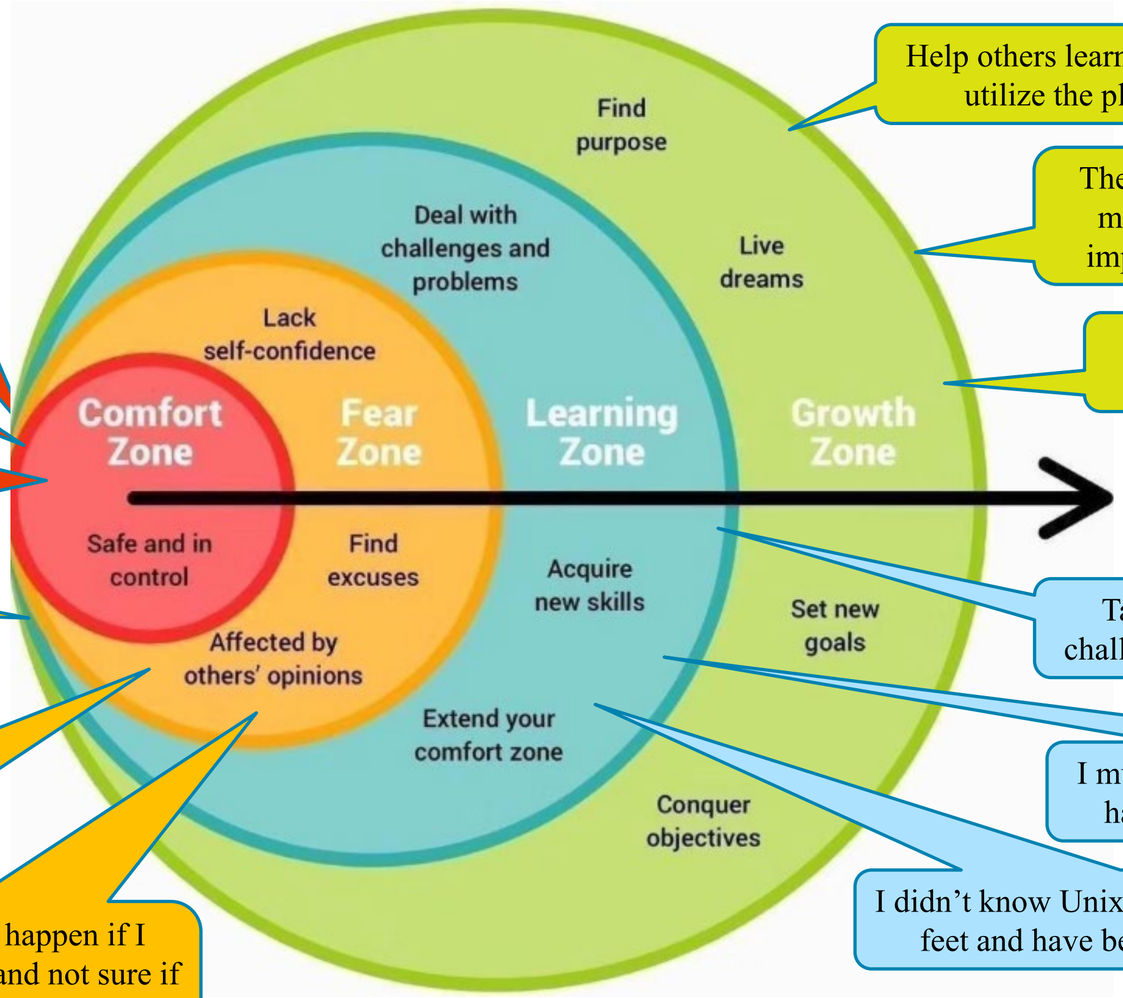
I am comfortable with A-B-C file editor so I am not going to learn ISPF text editor.

I like doing task A-B-C this way and can do it well, therefore I don't need to learn another way.

I don't know how to debug IPL issues so I'm afraid to IPL.

HSM / RMM is documented poorly and is complicated. If I take a long time doing this, others will think I'm incompetent. Therefore, I'm not going to volunteer to do this.

I don't know what will happen if I make this RACF change and not sure if I can fix it if it causes problems. Therefore, I'm not going to do it.



Help others learn IBM Z and utilize the platform!

The more we learn about IBM Z, the more tips and tricks we can use to improve our existing infrastructure!

I want to help other shops learn how to build z/OS' from scratch in 35 minutes (fact)

Taking the first baby-step is the most challenging but it pays off with new skills!

I muscled through VTAM configuration and now have some more knowledge of how it works.

I didn't know Unix, but I jumped in with both feet and have been learning ever since!

Get out of your comfort zone!

Hardware Architecture	Storage	Z Base	Networking	Security	Operations	Middleware	Performance	Automation / Programming
Architecture	Architecture	z/OS Building	Architecture	Architecture	Automations	SMP/e install	SMF / RMF	JCL
Floor admin	DASD, TAPE, RMM	z/VM….	Port admin	RACF	Daily maint	Configuration	Omegamon	REXX
Server admin	DASD volser mgt	Linux-on-Z…..	TCPIP stack	Pervasive Encryption		Dependencies	Tuning	COBOL
Cabling	Flash-copy	Catalogs	TN3270	Userid admin		Tuning	SMT	PL/1, PL/x
Performance	DCOLLECT admin	PARMLIB/PROCLIB		Keyrings, certificates		PTF applies	Unix --vs-- TSO	PERL
Card admin	DFSMS admin	Logon Procs						Unix Shell scripts
		GDPS						Bash
		SYSPLEX building						Java
		DR						
		IPL						
		Unix System Services						

Get out of your comfort zone!

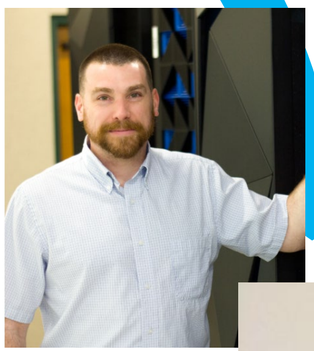
Super Secret #5 – Teamwork & networking

True story:

May 2019….

Stress Test

Test



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Test again

Super Secret #5 – Teamwork & networking

Career Mentor

Meet 4 times a year

Team-lead Mentor

Meet once a month

Technical Mentor

1 hour per day!

Peers

Daily

There is no one perfect path! Pick your own!

You must learn these z/OS things, like I did 35 years ago. Then you'll be a perfect zSysProg like me.

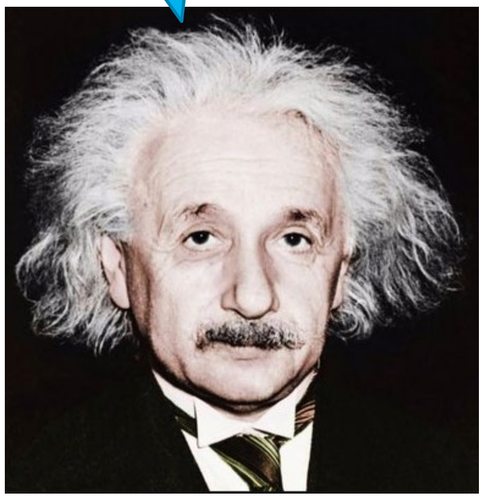
-Team Core Deliverables
-Organizational strategy
-Skill Gaps

-My Personality
-Career Direction
-Likes / Dislikes

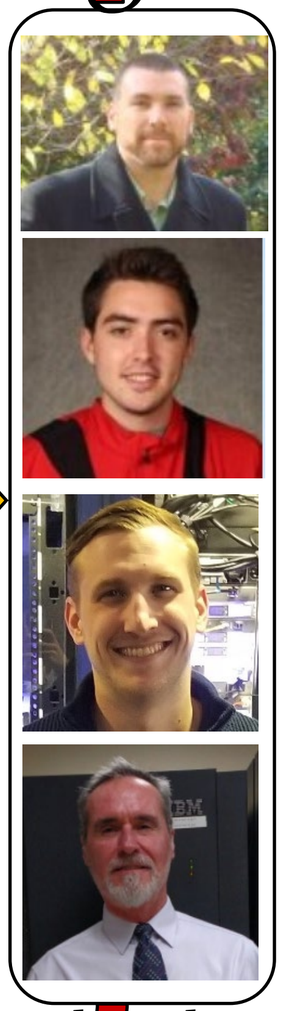
Super Secret #6 – Teach others & give-back

A gift that keeps on giving.

"I have no special talent. I am only passionately curious."



Teaching

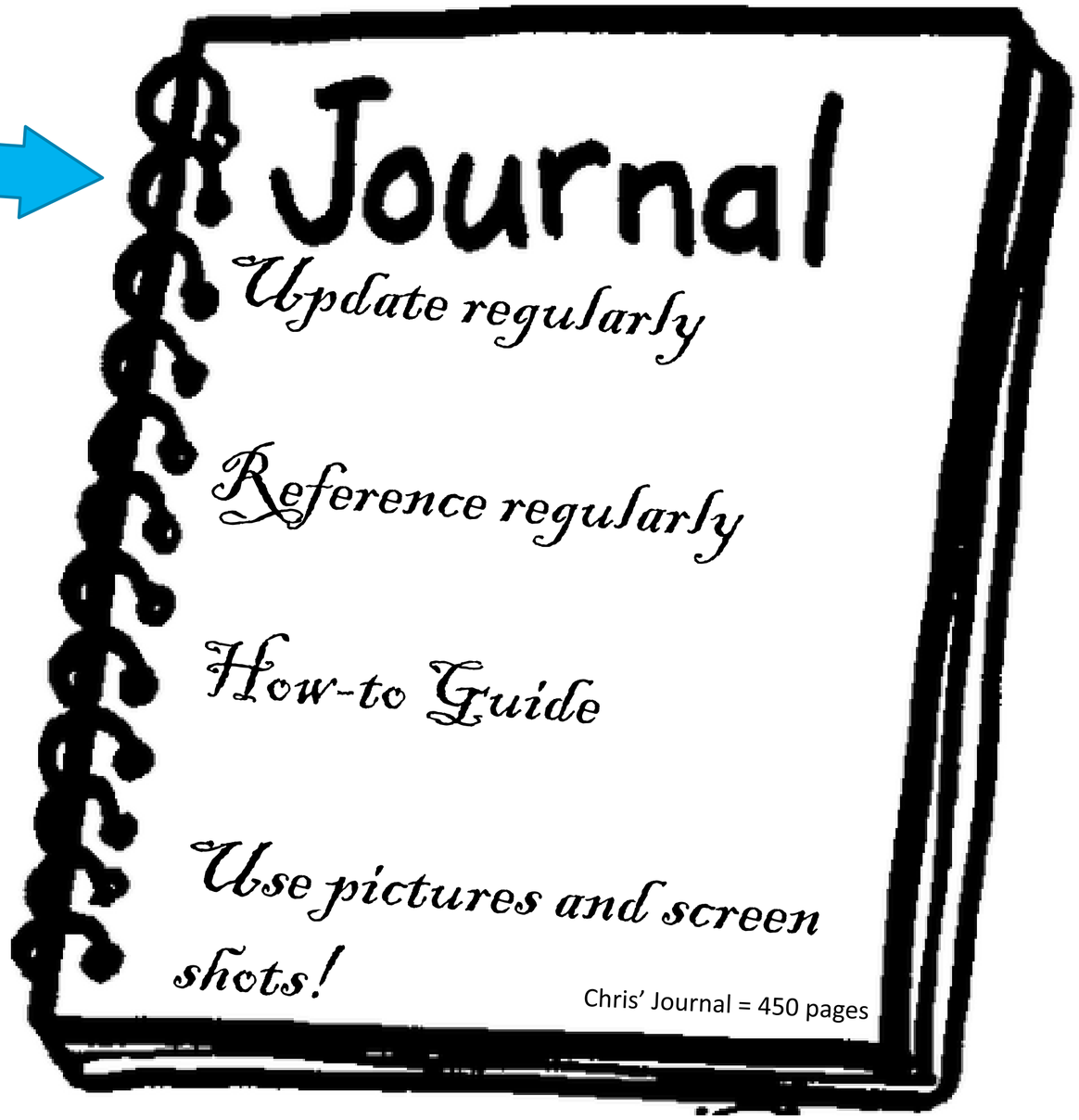


Team Capability

"Those who know, do. Those that understand, teach." - Aristotle

Super Secret #7 – Journal + Documentation

Personalized for me.



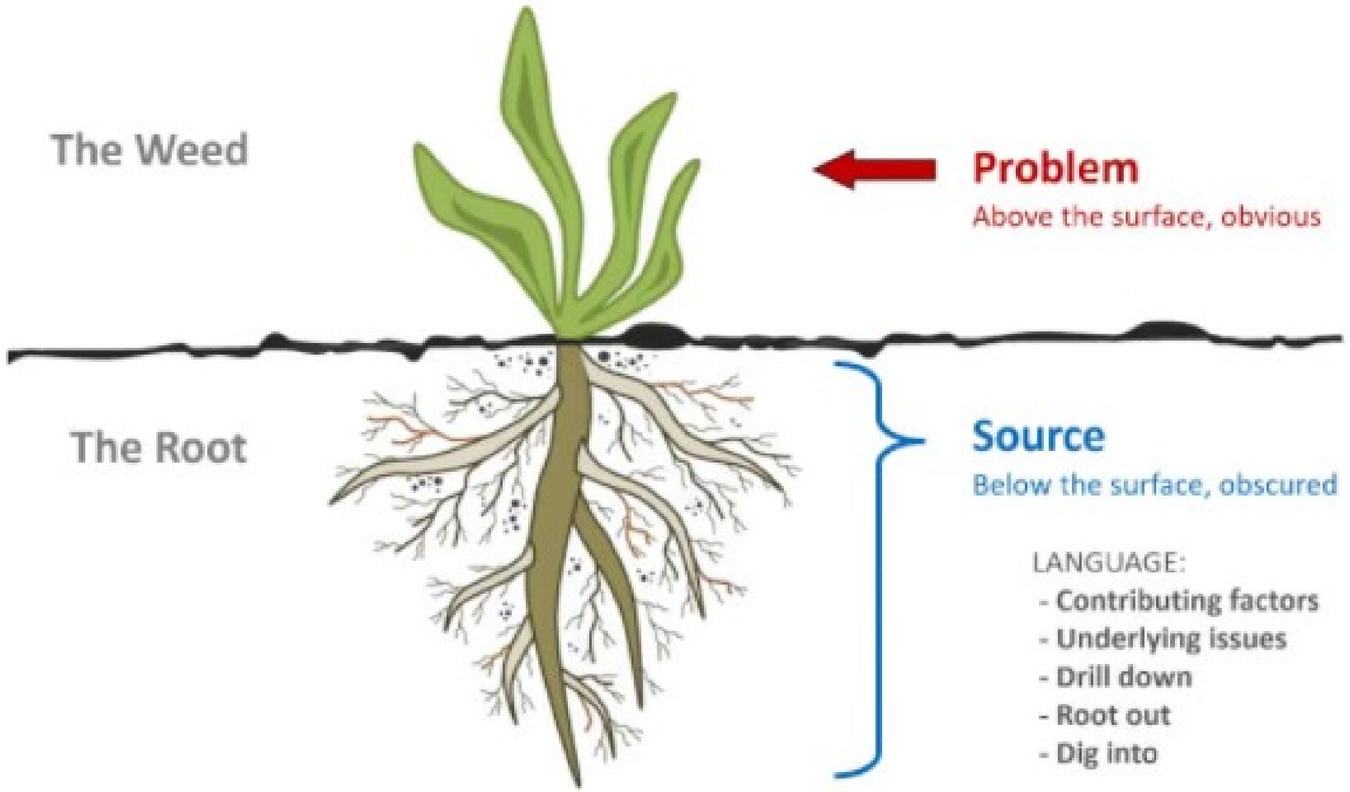
Extension of my memory

Once in 3 years = the number of times I've done a SLIP SET

My Journal – Table of Contents

Command Reference
(LOGON Proc) Command System Error / ACCOUNT cmd
Common Utilities / Don't Forget
IPL - Related
CEC Management
Adding a userid to zLIGHT
BPXPRM / BPXOINIT / FORKINIT / STORAGE SHORTAGE
C++
Creating Lpar / Sysplex / Provisioning
Command Recognition Character
Console – Issuing RACF commands
Copying Large files between LPARs
CPU Thrasher
CSI – Moving to non-PEL system
FMID – How to find from CSI
System GEN in PSM Environment
IEFSSN
HSM
Accessing PSM via Putty / Linux
Add Catalog
DB2 ZPARM
DB2 – What version?
DB2 – Generating DDL
DB2 Load Utility
DB2 – DB2 Admin fails with ADBL NOT FOUND
DB2: Applying Maintenance + Upgrading
DB2 Table Unload
DASD / Master Catalog
DASD – ISMF (DFSMS)
DASD – Clip
DASD / Re-initialize a Volume
DASD / Move a volume, keep the volser name
DASD / Logically move a user catalog
DASD / Cleanup / Moving datasets
DASD – Spray data
DASD – Striping
Delete dataset that no longer exists
Esoterics / SYSDA=3390
FTP'ing JCL to z/OS
HFS Creation
LPA / Link Pack Area
LOAD Module Dynamic Refresh
Link-Edit / Assemble / Exits
Netview Automations
Recycle OSA Card
Load an OSA Card
Adding more memory (for VM)
TAPE – Unpacking a mystery tape
TAPE Backup
OPRA
Master Console Password Change
Main CPU Storage
Node.JS Installation in Unix
Cleanup – Project (automation)
Cleanup – System Dumps on PSM
FTP File from Mainframe to PC
Coupling Facility / LOGR
SMF Logstreams
UNIX – Changing Extended Attributes
WLM (Workload Manager)
Adding new libraries to the LinkList (LLA system address space)
APF authorize a dataset
VTAM
TAPE (Physical)
SMP/e Notes
Installing MVS from Super Store
Installing "DB2 Administration Tool" from MVS Superstore
Installing "DB2 Query Monitor" from MVS Superstore
Installing Tools Base from MVS SuperStore
Inventory Schedule Tool
ISR@PRIM / Custom ISPF Panel / ISPPLIB
Multi-Threading
DSN Restore
Adding a dataset to the Linklist
PEL Logon
Slip Set
OMVS / Creating a new Mount Point
OMVS / USS / OPUT command to send file to USS
FTP/ Send a file from PC to USS
HMC (Hardware Management Console)
Networking / Change LPAR to Performance IP
PEL / PARMLIB special protection
Panel Trace
SAXREXEC / System REXX
ShopZ
RACF
RACF – Template Update (ICH579E)
RACF – Updating zLight RACF Database
RACF – Stage Conversion – AIM (Application Identity Mapping)
zLight – Resetting cloud provisioning after failed deploy
RMF Interval Recording
RMF Report
JES SPOOL full
Crypto Cards / ICSF
Configuring a Crypto Card
Crypto Domain Zeroize
SVC Dump
TCPIP with TN3270
z/OS RES refresh
SMF / Dumping / How to find datasets
SDSF – REXX Interaction
SMS – Re-building SCDS
SYSLOG
TERSE
TRANSMIT / Troubleshooting
UID / Adding a userid to OMVS
Unix – Waiting for Aggregate Solution
Unix – Automount
Unix – TAR and Un-TAR
UNPAX / USS Unpax
Userid Cleanup
Userid Password Reset Delegation
Virtual Tape
WebSphere / Liberty
WWPN / NPIV / SCSI / FCP
Virtual Tape / HSM / VTS
VM / Linux / Changing Memory
Linux / VI
VSAM Extended (VSAMEXAD)
VSAM COPY using REPRO
VSAM Copy ---- VSAM to VSAM
VSAM Copy using Dump + Terse + FTP
Vsam Rename
WLM
Windows Command Shell UNIX commands
ZAP – PGM=IMASPZAP
ZFS Copy
ZFS – HUGE Big Allocation
zLITE RES Refresh
OMVS Commands

Super Secret #7 – Journal + Documentation



Focus on facts and improvements, not on blame

Writing the problem out will help you be methodical.

Learn from my mistakes!

1. Attitude
2. Set your expectations appropriately
3. What's your strategy for learning?
4. Get out of your comfort zone
5. Teamwork makes the dream work
6. Give back to others
7. Journal + documentation

Abraham Lincoln:

"A man's mind stretched to a new idea never returns to it's original dimension."

Forward we go….

Support each other!

Veterans, remember what it's like to be a newbie!

Newbies, due diligence first before asking veterans!

Introduction to the New Mainframe: z/OS Basics

http://www.redbooks.ibm.com/abstracts/sg246366.html?Open

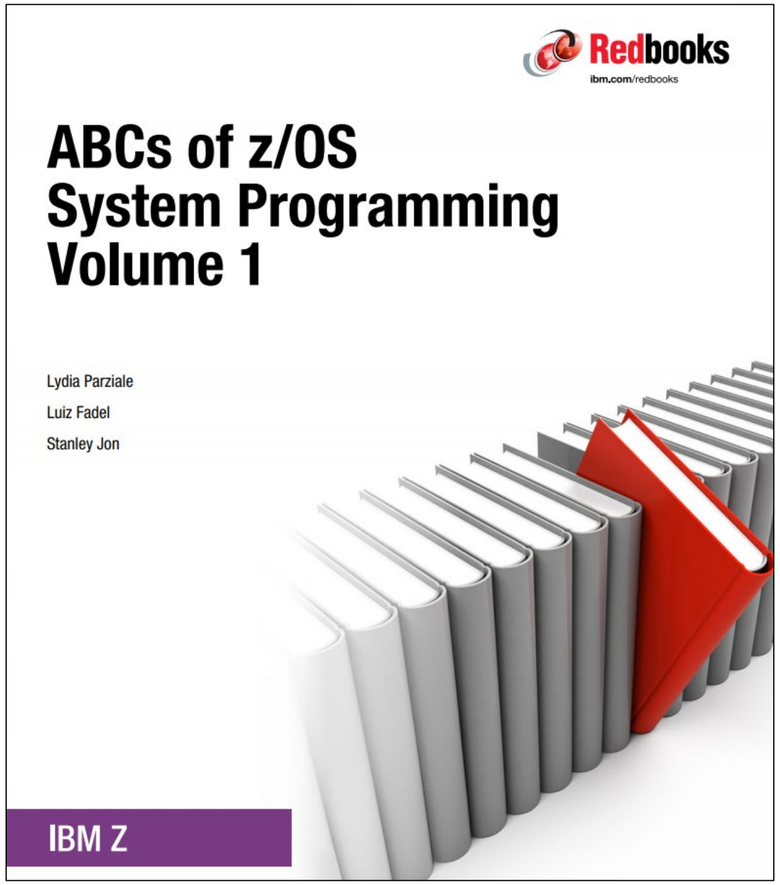
Have you helped someone today?

If the answer is, "no," then do something to change the answer.

ABC books - EXCELLENT resources

https://www.redbooks.ibm.com/abstracts/sg246981.html?Open

ABCs of IBM z/OS System Programming Volumes 1 --- 13



Slack template