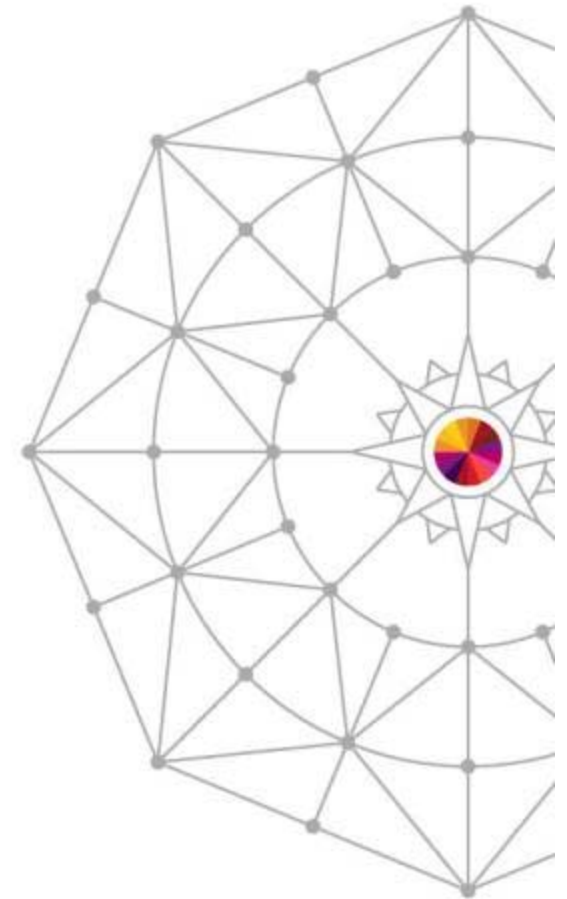# z/OS Planned Outages - Control Them, Instead of Them Controlling You
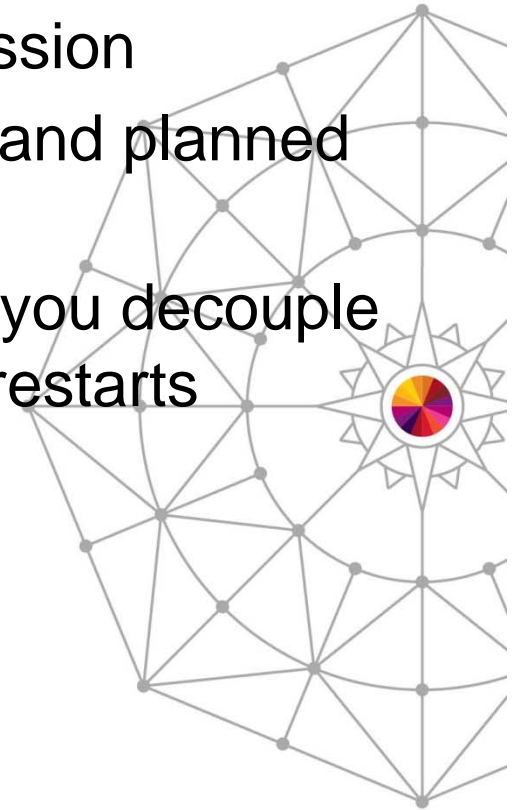
Frank Kyne (frank@watsonwalker.com)

Watson and Walker

Thursday, March 13, 2014

Session Number 15106

# Intro

- A little background – why we created this session
- A few thoughts about application availability and planned outages
- Enhancements in z/OS from 1.8 to 2.1 to let you decouple system changes from system or subsystem restarts
- What else the upcoming Redbook covers

# In memorium

- One of the writers of both the original Planned Outage Avoidance Checkist Redbook AND the upcoming Volume 2 of that book was Yvonne Zemotel.

- Yvonne was one of the key residents, and one of the most enthusiastic and jolly people that I had the honor of working with in my 16 years in the ITSO.

- Yvonne sadly passed away suddenly in October 2013. This presentation is dedicated to her memory…

# Acknowledgements

- This presentation is a result of the enthusiasm and hard work of the following residents:
  - Yvonne Zemotel
  - Andy Clifton
  - Justin Deane
  - Fernando Ferreira
  - Richard Gunjal
  - Chuck Laurent
  - John Papp
  - Judy Ruby-Brown
  - Maida Snapper
  - Mike Stephens
  - David Viguers
  - Marna Walle
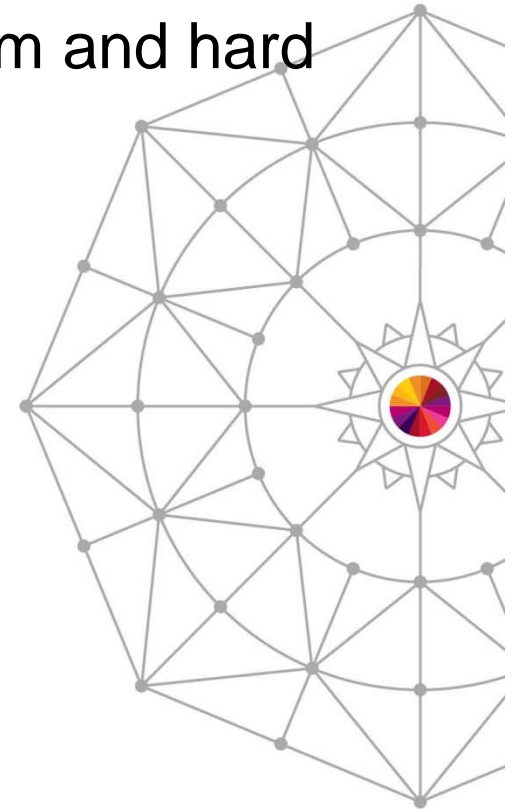
# Background

- In 2005 ITSO published a Redbook called "z/OS Planned Outage Avoidance Checklist (SG24-7138)"
- Book was very popular – all 5-star ratings.
  - However it only went up as far as z/OS 1.7, and IBM's efforts in this area have not stopped…
  - PRIMARILY BECAUSE OF REQUESTS FROM SHARE FOR AN UPDATED VERSION, IBM funded a project to create a logical follow-on Redbook to that original Redbook.
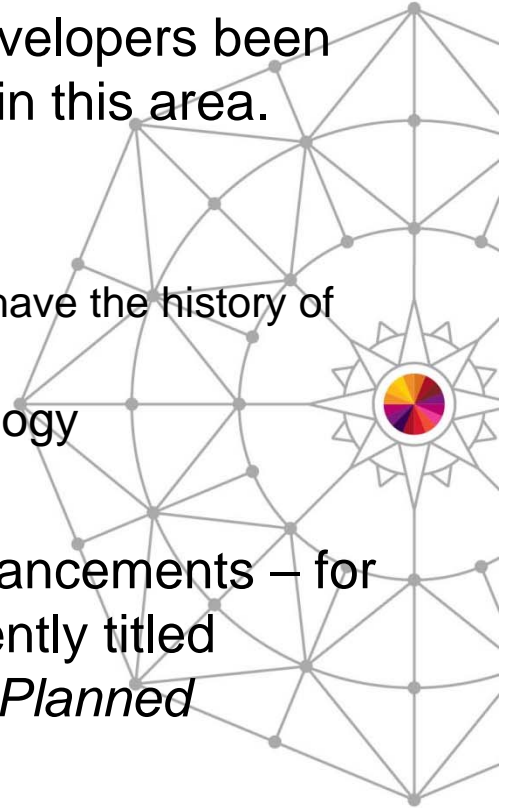
# Son of Planned Outage Avoidance….

- Apart from providing information about the many enhancements to z/OS since 1.7, we also wanted to change the focus a little…
  - Using "Avoidance" makes it sound like Planned Outages are a BAD THING – something to be avoided.
  - But Planned Outages can actually be a good thing (how else can you apply preventive service?) <u>as long as they don't impact application availability</u>.
- As a result, the focus of the book changed subtly – now it focuses on how to decouple (even just psychologically) making changes to your system (to installed new Hardware or Software, for example) from taking Planned outages.

# Son of Planned Outage Avoidance….

- Since the first Planned Outage book, the System z developers been working hard to provide more capability and flexibility in this area.
  - There are over 100 enhancements in z/OS alone
  - Enhancements in each release of CICS, DB2, and IMS
    - Because WebSphere and MQ Series are newer, they don't have the history of requiring outages that the other subsystems do
  - Also enhancements in CEC and Disk subsystem technology

- This presentation only provides a sampling of the enhancements – for the gory details, refer to the upcoming Redbook, currently titled "*Improving z/OS Application Availability by Managing Planned Outages*, SG24-8178".

# Son of Planned Outage Avoidance….

- What types of thing does the book cover?
  - Enhancements that let you change something that previously required an IPL – updating a Parmlib member, for example.
  - Enhancements that give you the ability to run for longer between IPLs IF THAT IS APPROPRIATE – a change to use common storage more intelligently, for example
  - Enhancements that help you do better problem diagnosis, so you can fix a problem rather than doing an IPL to get over it.
  - Enhancements to let you add, change, or remove devices dynamically – Basic HyperAwap, for example.
  - Any other enhancement we could find that lets you decouple making changes to your system from doing system or subsystem restarts, or enhancements that give you more control over when you will IPL.
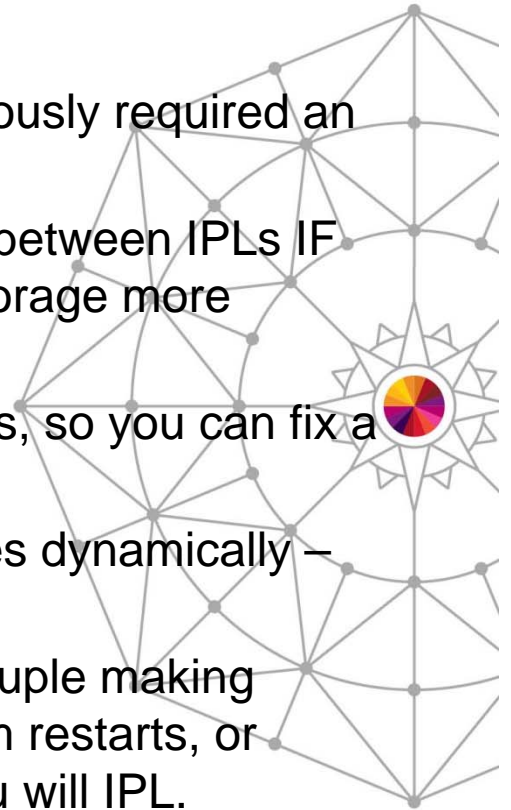
# z/OS Enhancements

| Component | Description | Exploiting? |
|-----------|-------------|-------------|
| BCP | Health checks for linkage indexes and non-reusable ASIDs | |
| | Change all-but-one value in ALLOCxx without an IPL using the SETALLOC command | |
| | SET SMF and SETSMF command support for dynamic buffer size and NOBUFFS changes for SMF log streams | |
| | An IBM first - reusable non-reusable address spaces! | |
| | CMDS FORCE command to kill a long-running or hung command to avoid an IPL | |
| | Ability to add, remove, and alter amount of Storage Class Memory in a z/OS LPAR without any z/OS outage | |
| | New operand on the FORCE command to let you terminate a task (FORCE jobname,TCB=tttttt) | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| BCP | System Auto-Reply function for common WTORs | |
| | Provide ability for Auto Reply function to reply to synchronous WTORs | |
| | Dynamically modify VLF definitions using MODIFY VLF rather than restarting VLF | |
| | Add, remove, or modify consoles dynamically using SETCON or SET CON=xx commands | |
| | Message Flood Automation, previously only available to GDPS customers, is now part of z/OS | |
| | Added Defer Wait (CSVDYLPA and CSVDLPAW) Capability to let you include PDSEs in LPALST | |
| | More effective use of space in ECSA (VSM BESTFITCSA parm in DIAGxx) | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|-----------|-------------|-------------|
| BCP | SETPROG LNKLST enhancements to let you specify default values | |
| | Update SVCs dynamically using SETPROG LPA command | |
| | Support for concatenated libraries for System REXX (no longer have to place your System REXX execs in SYS1.SAXREXEC data set) | |
| | Ability to restart the System REXX address space | |
| | FINALLY!!  A fully supported way to dynamically change system symbol values, complete with its own operator command (SETLOAD)! | |
| | Auto-IPL z/OS and/or Stand Alone Dump via definitions (dynamically modifiable) in DIAGxx | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| BCP | Ability to configure on more CPs than are defined in RESERVED field in LPAR HMC profile (DYNCPADD) without an IPL or deactivate/reactivate | |
| | Basic HyperSwap capability | |
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# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| Comms Srvr | Hot standby Sysplex Distributor | |
| | Increased resiliency in RESOLVER address space for parm errors | |
| | Command to validate TCP profile syntax – **VARY TCPIP,,OBEYFILE,profile** | |
| | RPCBIND/NFS use of ENF signals to enable automatic re-registration | |
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# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| DFS | Automatic zFS internal restart instead of stopping and requiring manual restart | |
| | zFS automatic re-enable of disabled file systems | |
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# z/OS Enhancements

| Component | Description | Exploiting? |
|-----------|-------------|-------------|
| Diagnostics | Predictive Failure Analysis function (recently enhanced to make it smarter) | |
| | Add RunTime Diagnostics (RTD) function | |
| | Enhance RTD function and add PFA integration | |
| | IEBPDSE utility to check for damaged PDSEs | |
| | Ability to dynamically add and remove VSAM record management trace using new IDAVDT started task and new IDAVDTxx Parmlib member. | |
| | IOSSPOF service (and IOSSPOFD batch job) to check for single points of failure | |
| | HIS support for changing CPU speed without requiring an IPL | |
| | | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| Diagnostics | Enhancements to SLIP DUMP (MAXNDSP and DEFERTND) to reduce non-dispatchable time | |
| | Enhance CONFIGxx member and D M=CONFIG(xx) to support zIIP and zAAP PUs | |
| | New command (F CATALOG,CONTENTION) to help investigate CATALOG contention issues | |
| | D GRS,ANALYZE command enhanced to add support for latches | |
| | Enhancements to handling of broken PDSEs during IPL | |
| | Enhanced commands (D SMS,PDSE and V SMS,PDSE) to help you identify and address corrupted PDSE control blocks | |
| | | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| GRS | Ability to move GRS Contention Notification System role without an IPL (SETGRS CNS=sysname) | |
| | Dynamically control and change the maximum number of ENQs | |
| | Documented the procedure for switching from GRSRNL=EXCLUDE without a full sysplex IPL | |
| | SMF Type 87 and 72.5 records enhanced with more GRS monitoring information | |
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# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| JES2 | Infoprint support for dynamic configuration changes | |
| | Dynamic JES2 exit support | |
| | Support for SPIN data sets to let you process/delete output from a job step before that step completes – can avoid restarting started tasks simply to free output | |
| | Support for SPIN keyword for JES2 JOBLOG for long running jobs | |
| | SPIN=UNALLOC JCL keyword | |
| | Support for increased number of SPIN data sets | |
| | Dynamically modify TCP/IP NJE configuration | |
| | | |
| JES3 | Ability to dynamically add spool volumes | |
| | Dynamically remove spool volumes | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|-----------|-------------|-------------|
| System Logger | Force disconnection or deletion of a log stream without restarting System Logger | |
| | System Logger messages to warn you of log stream primary storage shortages | |
| | System Logger messages for offload delays | |
| | Control Logger defaults in IXGCNFxx member | |
| | | |
| RACF | Sample ICHPWX01 exit enhanced to support System Rexx | |
| | Sample ICHPWX11 exit (on Tools and Toys site) enhanced to support System Rexx | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| RRS | RRS internal cold restart in case of errors | |
| | Provide ability to have orderly RRS shutdown (SETRRS SHUTDOWN) | |
| | SETRRS command to activate/deactivate ARCHIVE log stream | |
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# z/OS Enhancements

| Component | Description | Exploiting? |
|-----------|-------------|-------------|
| DFSMS | Ability to dynamically activate changes to the DEVSUPxx member using the SET DEVSUP member | |
| | DEVSUPxx REFUCB option to have VOLSER changes automatically propagated around the sysplex. | |
| | CA Reclaim for VSAM KSDSs | |
| | Sysplex-wide catalog suspend/resume | |
| | Ability to allocate catalogs in the EAS area of an EAV volume | |
| | DADSM and CVAF support for dynamic exits function | |
| | Enhancements to HSM CDS backup function to minimize impact of backup processing | |

# z/OS Enhancements

| Component | Description | Exploiting? |
|-----------|-------------|-------------|
| DFSMS | Ability to issue XRC XSTART and XADDPAIR for primary volumes that are still offline | |
| | Can perform FlashCopy to PPRC Source volume to create offsite PIT copy for testing | |
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# z/OS Enhancements

| Component | Description | Exploiting? |
|-----------|-------------|-------------|
| USS | Restrict mounting on an non-empty mountpoint | |
| | Dynamically switch from one sysplex root (any combination of HFS and zFS) to another without ANY outage | |
| | Define an alternate sysplex root data set that the sysplex will fail over to if current sysplex root becomes unavailable | |
| | Ability to increase MAXSOCKETS and INADDRANYCOUNT values using SETOMVS command | |
| | Ability to remount a file system without first having to do an unmount | |
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in Anaheim

# z/OS Enhancements

| Component | Description | Exploiting? |
|---|---|---|
| XCF | System Status Detection Partitioning Protocol can detect if a system that has not updated its sysplex heartbeat is still running (perhaps trying to recover). | |
| | CRITICALPAGING function ensures that all the pages required to complete a HyperSwap successfully are kept in storage | |
| | Non-disruptive CF dump capability helps IBM gather required diagnostic information without taking CF down | |
| | SETXCF MAINTMODE and SETXCF REALLOCATE commands help you empty and repopulate CFs | |
| | Serial Structure Rebuild minimizes recovery time following a CF-related failure AND re-duplexing time when a CF comes back online | |

# Other topics in upcoming Redbook

- In addition to all the enhancements in z/OS, the upcoming Redbook will include chapters on CICS, DB2, IMS, MQ, and WebSphere

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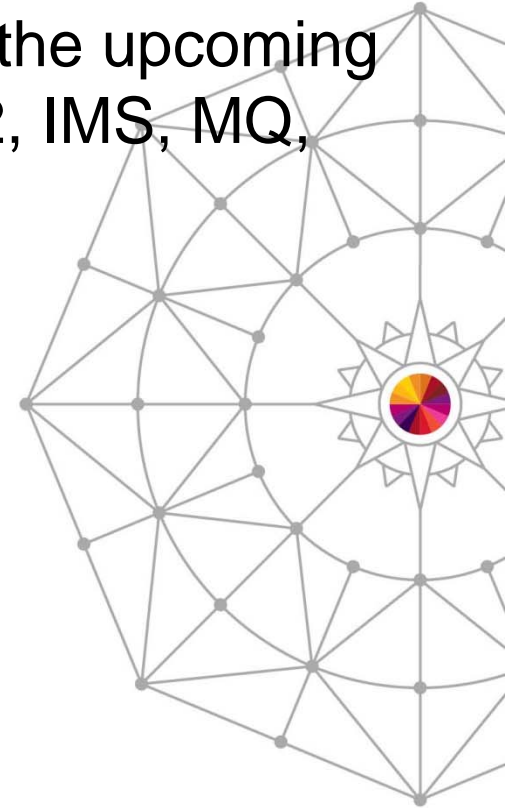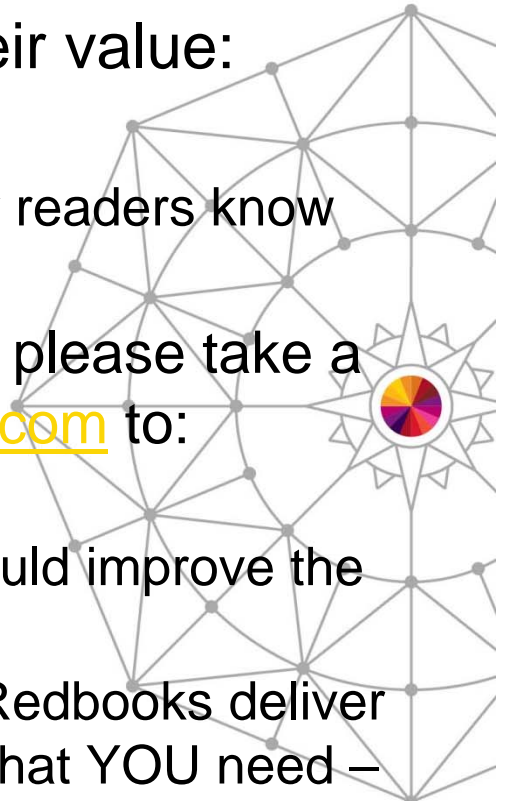
# A plug for my old friends

- Redbooks are an invaluable (FREE!!!) resource, created from the blood, sweat, and tears of dedicated residents, and the endless patience and support of our friends in Development.

- But they are not just Redbooks any more – deliverables now include videos, Redguides, Redpapers, Redbooks in ePub format, blogs…. PLUS, they teach classes and provide consultancy services.
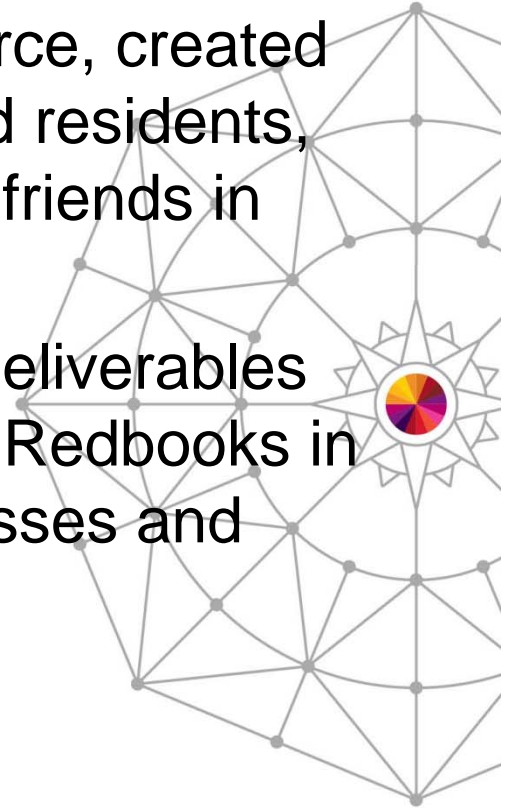
# A plug for my old friends

- But Redbooks need your help to maintain their value:
  - Take 30 seconds to rate deliverables
    - Help your colleagues by rating books to let other readers know which Redbooks helped you.
  - ITSO is good, but they are not mind-readers – please take a minute to send an email to redbooks@us.ibm.com to:
    - Suggest topics for future redbooks
    - Send them info – if you have information that would improve the value of a Redbook, tell them.
    - Tell them what type of deliverables you need – Redbooks deliver to a diverse audience, but they want to deliver what YOU need – maybe different audiences have different requirements, or maybe not, but they won't know unless you tell them.

# A plug for my old friends

- The mainframe community is a relatively small one, and we all benefit when we help each other.

- One way to do that is to present on your experiences at SHARE.

- Another way is to take part in an ITSO residency to create a Redbook:
  - It is THE best education opportunity you could wish for
  - You get to work with the nicest people and build your network
  - Get to visit one of IBM's many exotic locations…
  - AND, it is not a bad career move to have your name on the front of a Redbook…

# Thank you!!!

- Please remember to complete the evaluation
- And please let me know if you have any suggestions to make this material more valuable