



IBM Software Group

Malpractices – How Customers get in Trouble

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WebSphere® Support Technical Exchange



Agenda

- What is a Malpractice
- What was this based on
- Frequency of Malpractices
- The 11 Malpractices
- What can you do
- Questions



What is a Malpractice?



Best
Practice



Malpractice

- Example: Brush your teeth
- Behavior that you would be better for if you do it over and over again.
- **Good**

- Example: Running with Scissors
- Behavior that will eventually hurt you
- **Bad**

What was this based on

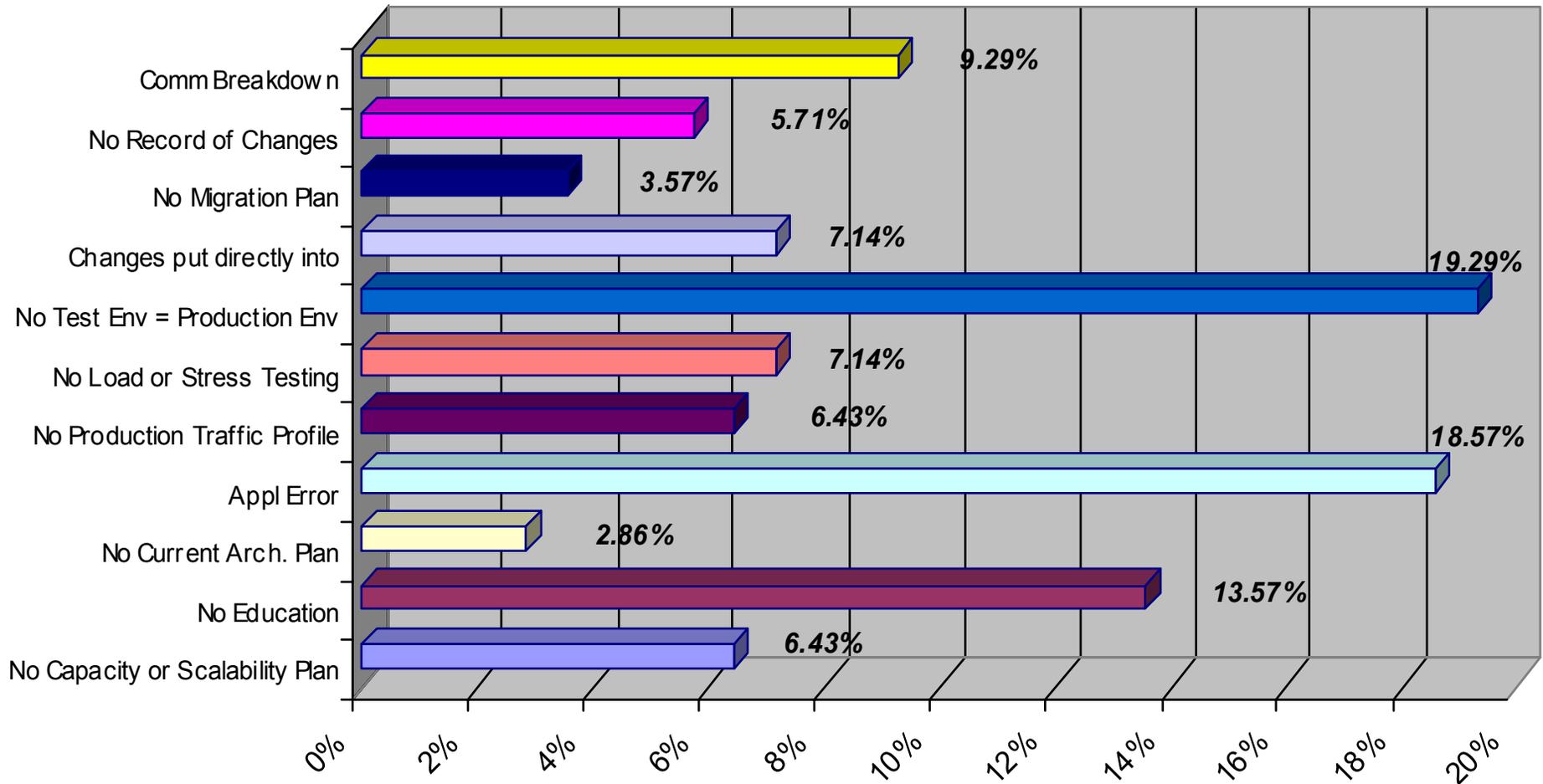
- WebSphere Serviceability Team works with over 100 unique WebSphere Application Server customers / year for the past 5 years
- Analysis of 2005 WebSphere Serviceability Team engagements
 - ▶ 2/3 of customers committed Malpractices.
 - ▶ 1/3 of customers were not observed closely enough to determine if there was a Malpractice
- Data fell into the 11 broad categories described here. These matched what similar teams and architects observed
- Many customers committed multiple Malpractices. One company committed all 11

The 11 Malpractices



1. No Capacity or Scalability Plan
2. No Education
3. No current Architecture Plan
4. Blind to Application Errors
5. No Production Traffic Profile
6. No Load / Stress Testing
7. No Test Environment near or equal to Production Environment
8. Changes put directly into Production
9. No Migration Plan
10. No Record of Changes
11. Communications Breakdown

Frequency of Malpractices –



The 11 Malpractices

■ Malpractice #1 - No Capacity or Scalability Plan

- Customer did a sizing for 4 specific applications but now is adding 72 additional applications to the same box with no changes in hardware or network capacity.
- Load increased rapidly from initial plan – no incremental capacity plan



The 11 Malpractices

- **Malpractice #1 - No Capacity or Scalability Plan**
 - **What you can do:**
 - Determine the types of transactions you will have and the frequency of each
 - Identify peaks and valleys
 - Update this plan annually
 - Design the test environment to be able to exceed these levels so you can test boundary conditions



The 11 Malpractices



▪ Malpractice #2 - No Education

- Customer claims they can not afford the time and cost to send people to classes.
- Customer does not want to read InfoCenter, Redbooks, or Best Practices
- Customer has limited knowledge of:
 - Problem Determination
 - How to tune the environment (too many parameters)
 - Features available

The 11 Malpractices



■ Malpractice #2 - No Education

• What you can do:

- Use the free IBM Support Assistant: <http://www-306.ibm.com/software/support/isa/> to locate information
- Use the free IBM Education Assistant: <http://www-306.ibm.com/software/info/education/assistant/> when
 - You cannot attend a class
 - You want a quick refresh on a concept
- Join a WebSphere Users Group, virtual or local: <http://www.websphere.org/websphere/Site?page=home>
- Attend the free WebSphere Support Technical Exchange webinars: http://www-306.ibm.com/software/websphere/support/supp_tech.html
- Attend relevant conferences, web casts, etc: <http://www-306.ibm.com/software/sw-events/>

The 11 Malpractices

- **Malpractice #3 – No Current Architecture plan**
 - No CURRENT diagram, but have one from 4 years ago.
 - No diagram of the application flow between the various software products or between J2EE applications.
 - No diagram of where these products reside in the topology
 - What node is the database on?
 - What node is WebSphere on?
 - What nodes does the cluster span?
 - etc.



The 11 Malpractices

- **Malpractice #3 – No Current Architecture plan**
 - **What you can do:**
 - Refresh your Architecture documentation
 - Refresh your Project Management skills
 - Establish a process for keeping architecture updated throughout the full lifecycle of environment, including
 - Hardware layout
 - Software layout and data flows
 - Version levels
 - Functional additions
 - Any plans for expansion
 - Keep architecture clean, recognizable
 - Avoid patchwork



The 11 Malpractices



Malpractice #4 - Blind to Application Errors

Customer blames WebSphere without looking at their application at all. This includes problems like:

- Allocation of large objects causing heap size to grow too big.
- Redundant computation calls causing high CPU usage.
- Infinite loop causing high CPU usage.

The 11 Malpractices



Malpractice #4 - Blind to Application Errors

▪ **What you can do:**

- Document all changes to the environment, software and hardware
- Synchronize failure to what changed last
- Test changes in Test environment first and under load
- Refer to Troubleshooting chapter in "IBM WebSphere Application Server for Distributed Platforms and z/OS: An Administrator's Guide" available from IBM Press or online bookstores
- See free WebSphere Support Technical Exchange talks already done on Problem Determination, Troubleshooting:
http://www-306.ibm.com/software/websphere/support/supp_tech.html

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- **Malpractice #5 - No Production Traffic Profile**

- No network diagram of routers, networks, switches, hubs.
- No data on capacity of networks or network segments.

- Customer tested for his peak load, but forgot that during holidays, most addresses would not be the billing address. System slowing down.



The 11 Malpractices

- **Malpractice #5 - No Production Traffic Profile**
 - **What you can do:**
 - Determine the types of transactions you will have and the frequency of each
 - Capture data from historic highs and typical days for testing environment
 - Design test environment to handle pseudo loads generated from this data

The 11 Malpractices



- **Malpractice #6 - No Load / Stress Testing**
 - Customer does not do any load/stress test .
 - Customer has a test that does not reflect the actual load he will see in production.
 - “We just let people pound on it in the cafeteria for a few days”
 - Customer does not include the variety of transactions types that occur in production
 - Customer does not update their testing after the initial deployment
 - Load was simulated but the backend database is much smaller than production

The 11 Malpractices



- **Malpractice #6 - No Load / Stress Testing**
 - **What you can do:**
 - **Project load in the future, if business is booming or hurricanes are booming**
 - **Design load/stress tests that accurately mirror current and projected normal and boundary condition traffic profiles**
 - **Make load/stress tests repeatable and reusable**
 - **Use a test generator**
 - **Use a load generator**
 - **Document the tests for others can run them**

The 11 Malpractices

Malpractice #7 - No test environment near or equal to production environment

- This is the most common Malpractice observed by WAS SWAT in the customers we have worked with
 - “It worked on my laptop”
 - “We have servers across the USA– I can’t duplicate that!”
- “This Malpractices often is paired with other Malpractices, like
 - Malpractice #6 - No Load / Stress Testing
 - Malpractice #8 - Changes put directly into Production

The 11 Malpractices

Malpractice #7 - No test environment near or equal to production environment – continued

Customer may not have

- Additional hardware to test application outside of the production environment
- A second environment with the same hardware as their production environment
- The people or bandwidth to maintain a duplicate environment
- The floor space to even create a duplicate environment
- Considered how to do testing once the application went into production

The 11 Malpractices

Malpractice #7 - No test environment near or equal to production environment - continued

Result: Debugging on Production Machine(s)

- Setting Trace has performance impact (varies by method used)
- Restarting servers means production downtime
- Addition stress/visibility can cause mistakes
- Changes are forced to put on production without testing offline, in the privacy of the lab

The 11 Malpractices

Malpractice #7 - No test environment near or equal to production environment – continued

- **What you can do:**
- Have a second environment with the same hardware and software architecture as the production environment. This requires additional hardware plus
 - The people or bandwidth to maintain a duplicate environment
 - The floor space to even create a duplicate environment
 - Additional hardware or software for load generation, etc.
 - If you don't have these, consider renting, simulating or changing your processes.
- Design how to test once the application is in production. Every fixpack? Every component upgrade? Every application change?

The 11 Malpractices

Malpractice #8 - Changes put directly into production

- Customer puts changes, sometimes a minor tweak, sometimes a temporary fix, directly into production during peak load and now it doesn't work.
- Customer has no test environment
- Customer has an inability to create the same load in test
- Customer simply doesn't use their test environment



The 11 Malpractices

Malpractice #8 - Changes put directly into production

- **What you can do:**
 - **Danger. Danger. Don't do this!!!**
 - **See free WebSphere Support Technical Exchange talk already done on debugging Performance. It include debugging Performance in production (go to talk at <http://www-1.ibm.com/support/docview.wss?uid=swg27007387>)**
 - **Have a well known process for documenting what changes are put in production, why, when, by whom and who approved this**



The 11 Malpractices

■ Malpractice #9 – No Migration Plan

- Customer is unaware of how new J2EE standards affect their applications function and performance.
- Customer does not allow adequate time for migration
- Customer is not aware of other co-requisite changes that need to be made when WebSphere level is changed (or when an application or vendor software that pre-req's WebSphere changes)



The 11 Malpractices

- **Malpractice #9 – No Migration Plan**

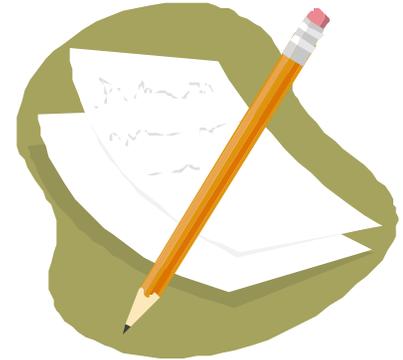
- **What you can do:**

- **Learn the requirements**
 - What has changed
 - What are the co-requisites for your architecture
- **Plan the migration. Allow time for**
 - Education
 - Application changes
 - Functional, Load/Stress, Error Recovery Testing
 - Deployment
 - Documentation updates

- **Use free IBM Redbooks on Migration:**

<http://www.ibm.com/products/finder/us/en/finders?pg=rdfinder>

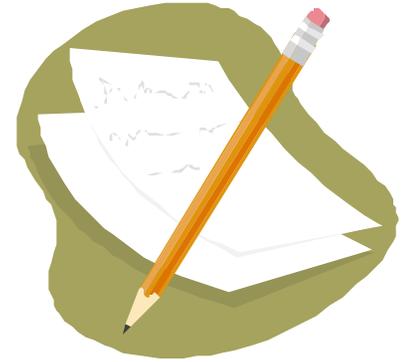
The 11 Malpractices



■ Malpractice #10 – No Record of Changes

- No record of the changes are made. Changes are made in panic mode.
- No coordination between 2 or more groups that are modifying the same environment at the same time, e.g., before say putting into production.
- No idea of what tuning was done that got the last performance results. Hence cannot obtain the same results again.

The 11 Malpractices



■ Malpractice #10 – No Record of Changes

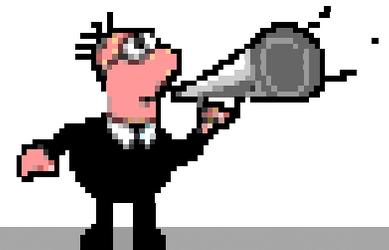
■ What you can do:

- Record every change when it is made, even if it is on a napkin
- Have a single process for recording changes to a given environment, listing what changes were made, why, when, by whom and who approved this
- Do not let one person be the memory bank for all the changes – write it down
- Use templates in appendix of Malpractices white paper to get started: <http://www-1.ibm.com/support/docview.wss?rs=180&uid=swg27007543>

The 11 Malpractices

■ Malpractice #11 – Communications Breakdown

- No effective communication within the customer
 - Who's the point of contact at the customer?
 - Who's the point of contact at IBM?
- No effective communication between IBM and the customer
- No effective communication between the customer and the various vendors
- No one in charge



The 11 Malpractices

▪ Malpractice #11 – Communications Breakdown

▪ **What you can do:**

- Clearly understand the workflow between groups, who needs to know what, esp. for groups who have not worked together in the past
- Introduce the contact points for all the groups to each other and review the workflow
- Speak up when information does not flow : do not assume silence is good.
- Confirm your audience understands what is said
- If there are problems,
 - Have a single leader during problem recovery
 - Bring in a referee/coach if needed



What is the cost of a Malpractice? aka **What is the cost of an outage!!**

- Number of transactions/hour = T
- Revenue/transaction = R
- Number of hours to put backup system in place = B

Cost of an outage = $T * R * B = \text{Trouble}$

- Also consider adjusting revenue for which hours of the day, which time of the year and missed revenue while backup system in place



Example of the cost of a Malpractice



You run a department store. It is the holiday season where you make 50% of your revenue for the year. There is a blizzard in your major shopping areas. Online shopping is your only way to reach those customers.... And your server goes out at 9 a.m. on Friday, December 14, 2006.

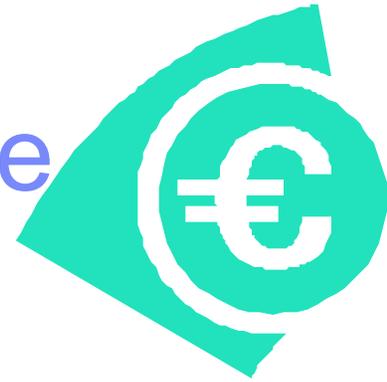
- You normally do 500 transactions/hour but during the holidays you do 700 transactions/hour. You expect higher volume during the blizzard and its cleanup.
- Revenue/transaction = \$156
- Number of hours to put backup system in place = 45 minutes when everyone is in place and in the office.



Example of the cost of a Malpractice

Minimum Cost of outage = 700 trans./hr *
\$156/trans * .75% hr
= \$81,900 US\$ if everyone is in the office and
switch done in 45 minutes
= \$109,200 US\$ if it takes 1 hr
= \$218,400 US\$ if it takes 2 hr
= \$436,800 US\$ if it takes 4 hr
= \$873,600 US\$ if it takes one 8-hour shift

- Also consider adjusting revenue for which hours of the day, which time of the year and missed revenue while backup system in place



What can you do?

- Make Best Practices a habit.
- Flag a Malpractices as soon as you see it or even THINK it!!
- Keep things simple. Don't make designs more complex than needed
- Refresh your Project Management skills and habits
- Create a Failure plan to use for a production outage
 - What to do,
 - What to gather
 - Who does What
 - Who is in charge



What can you do?

- Learn from
 - ▶ Free WebSphere Support Technical Exchange webinars
 - ▶ Free IBM Education Assistant modules to learn new technology
 - ▶ Free IBM Support Assistant modules to navigate the WebSphere Support pages
 - ▶ Free guided tour of IBM Software Support websites
 - ▶ IBM programmers about Problem Determination. See the Troubleshooting chapter in "**IBM WebSphere Application Server for Distributed Platforms and z/OS: An Administrator's Guide**" available from IBM Press or online bookstores

What can you do?

- Attend WebSphere Conferences
- Join a WebSphere Users Group
- Consider
 - ▶ IBM Premium Support to keep you up to date on support
 - ▶ IBM Software Services for WebSphere for
 - project management,
 - modeling or simulation,
 - performance tuning, etc.



Watch out!!



Would you like to receive???

- Demo cd of ISA v3?
- Drive to the Web talk? (how to navigate the support url)
- eSR talk?
- Questionnaire on Serviceability so you can influence the future?
- **If Yes**, Send Katie@us.ibm.com your name, company, snail address, email and telephone number

Questions and Answers

References



- Read more on Malpractices: <http://www-1.ibm.com/support/docview.wss?rs=180&uid=swg27007543>
- Find technical information fast: <http://ibm.com/software/support>
- Join WebSphere Support Technical Exchange webcasts: http://ibm.com/software/websphere/support/supp_tech.html
- Use ESR online to submit problems electronically: <http://ibm.com/software/support/probsub.html>
- Sign up to receive weekly technical My Support emails: <http://ibm.com/software/support/einfo.html>
- Join the Global WebSphere User Group Community: <http://websphere.org>
- Discover the latest trends in WebSphere Technology and implementation, participate in technically-focused briefings, webcasts and podcasts at: www.ibm.com/developerworks/websphere/community/



References

- Bookmark WebSphere Support pages.
 - ▶ For Distributed : <http://www-306.ibm.com/software/websphere/support/>
 - ▶ For z/OS : http://www-306.ibm.com/software/webservers/appserv/zos_os390/support/
- Bookmark IBM Redbooks:
<http://www.redbooks.ibm.com/redbooks.nsf/redpapers/>
- Navigate IBM Support via IBM Support Assistant (ISA), <http://www-306.ibm.com/software/support/isa/>
- Learn via IBM Education Assistant (IEA), <http://www-306.ibm.com/software/info/education/assistant>
- Know when your software goes out of support by checking the IBM Support Lifecycle site: <http://www-306.ibm.com/software/info/supportlifecycle/list/w.html>

References



- Consider resources from
 - ▶ IBM Premium Support Services, <http://www-306.ibm.com/software/support/premium/>
 - ▶ IBM Software Services for WebSphere, <http://www-128.ibm.com/developerworks/websphere/services/>
 - ▶ IBM Proof of Concept Centers, http://w3-03.ibm.com/systemstechnology/industrysolutions_poccenters/

Technotes of special interest

- **Americas Techline ISV Sizing Support**

Document Author:
Luanne Carlton

Document ID:
TD101564

Doc. Organization:
Techline

Document Revised:
05/20/2005

Product(s) covered:
iSeries; pSeries; xSeries; zSeries

Abstract: This technote provides information on the ISV sizing support provided by Americas Techline, including links to ISV sizing questionnaires.

Technotes of special interest

- Optimizing WebSphere for z/OS Performance
- Document Author:
Additional Author(s):
Paul Glass
Mike Cox, John Hutchinson

Document ID:
WP100558

Doc. Organization:
Washington Systems Center

Document Revised:
03/21/2005

Product(s) covered:
DB2 for z/OS and OS/390; WebSphere Application Server; WebSphere Application Server for z/OS; z/OS; z/OS.e

Abstract: This paper discusses performance factors that should be considered in the design, development and support of on-demand, high volume Web applications that access Enterprise data. It reviews results of recent Customer and IBM benchmarks which demonstrate enormous performance improvements gained by locating Web Application servers and data servers on the same z/OS server.