

P6 File Corruption

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Construction CPM Conference
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**PLEASE USE MICROPHONE FOR ALL
QUESTIONS AND COMMENTS!**



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Bibliography of Ron Winter, PSP, FAACE

- Bachelor of Science in Engineering at UCLA
- **Construction Scheduler**
- US Air Force Navigator
- **Construction Scheduler**
- Master of Science in Systems Management at USC
- Programmer, Project Manager, Customer Support, and Industrial Trainer
- **Construction Scheduler**
- Developer of Schedule Analyzer Software
- Something you do not know about me
 - **My 12-year old lab puppy just matured**



Introduction – Marina Sominsky

- **Industry / Company Employment**

- Kitchell (2008 – Present) 
- PM Tec, Inc. (2007 – 2008)
- Freescale Semiconductor (2004-2007)

- **Education / Certification**

- BS, Chemical Engineering, KU 
- EIT, NCEES
- PMP, PMI
- PSP, AACE International

- **Professional Experience**

- Sr. Project Manager, Kitchell, Information Technology department

- **Something you don't know about me**

- Avid ski enthusiast

Introduction

- This is NOT an exposé on Oracle/Primavera P6™
- Database Corruption occurs with every software
- P6 Experts should understand this issue to
 - **Help prevent it**
 - **Recognize it when it occurs**
 - **Identify real cause when it is not occurring**
 - **Correct the issue when discovered**
- Oracle also has a role to play
 - **Making software resistant to corruption**
 - **Providing tools to support this issue**

Introduction

- Products referred to as P6:
 - **Oracle® Primavera P6 ProfessionalSM**
 - **Oracle® Primavera EPPMSM**
- Applicable to:
 - **Stand-alone and multi-user installations**
 - **Oracle Express and Microsoft SQL Express**
 - **Versions 7.x - 16.2**
 - **Oracle and Microsoft SQL Server Management Studios**
- Important Considerations:
 - **Frequently backup P6 data**
 - **IT background for Administrator is preferable**

Presentation Outline

- What is database corruption?
- Causes for corruption
- Corrupt backup files
- Misdiagnosing corrupt database tables
- What can Oracle Primavera do about this?
- What can P6 users do about this?
- Evaluation: How widespread is P6 database corruption?
- Questions/Comments

WHAT IS DATABASE CORRUPTION?

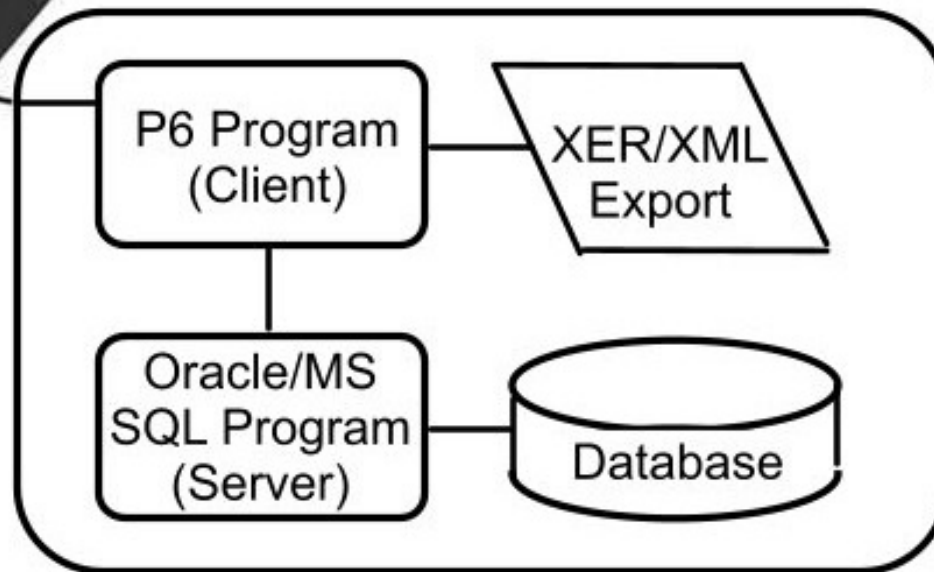


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How Your P6 Professional Works



Stand Alone Computer



What is Database Corruption?

- The data in the backup file is incorrect
 - **Cannot be used to restore the schedule**
 - **Restores the schedule incorrectly**
 - **Damages other global data when restoring**
- The data in the database is incorrect
 - **Not what was entered**
 - **Not logically possible**
 - **How do we know that the data is not logically possible?**

What is Database Corruption?

- A database is made up of normalized tables
 - **Eliminates redundant information**
 - **Greatly speeds up data operations**
- Normalized tables can become 'corrupt'
 - **Record normalization integrity is compromised**
 - Relationship predecessor activity does not exist
 - **Required field value is missing (set to 'NULL')**
 - Relationship lag is missing (blank)
 - **Field token contains invalid data**
 - Relationship Type = e.g. F1 (shown as blank)
- P6 does not report corrupt data on CPM calculations

What is Database Corruption?

- Obvious consequences
 - **Unable to open the schedule in P6**
 - **The schedule contains erroneous information**
 - **Incorrect dates, costs, and totals**
 - **Inconsistent calculation results using same information**
 - **Happens when two records exist for a single thing**
 - **Wrong calculation results**
 - **Missing records ignored or wrong assumptions**

CAUSES FOR CORRUPTION



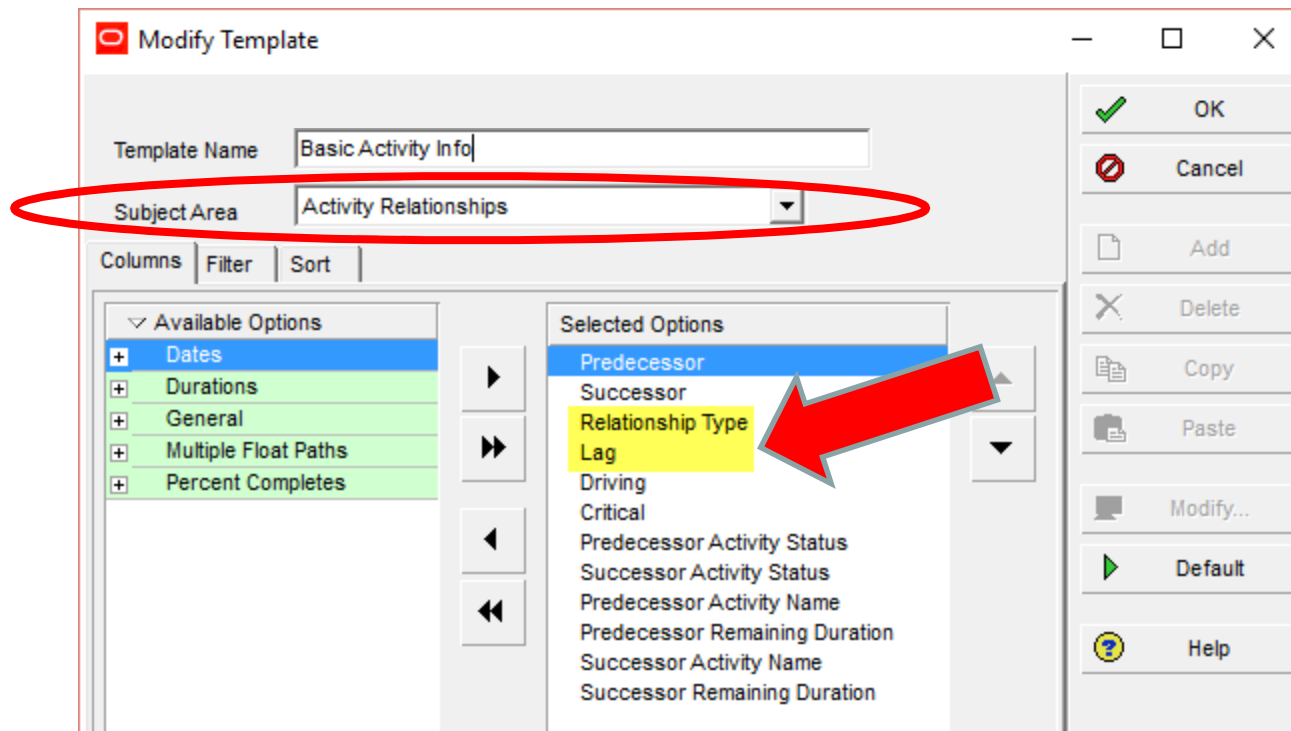
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Causes for Corruption

- Errors in the software program
 - **Relationship type is not an allowable type**
 - **Relationship duration (lag) field is missing**
- Interrupted data transmission
 - **User already logged on access error**
- So what can be done?

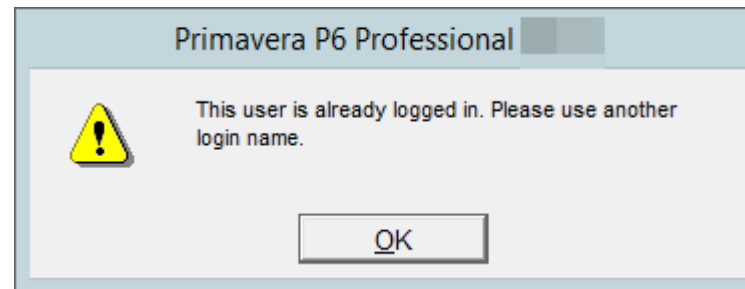
Relationship Type/Lag Fields Corruption Fix

- Export schedule in a spreadsheet format
- Select 'Activity Relationships' as export type
- Modify export template to include Lag and Relationship Type fields for visual inspection



Causes for Corruption (cont.)

- Loss of power
 - Interrupts the writing or reading process to database
 - Terminates user session abnormally
 - Creates orphan database record of the user's session



- User cannot log in as already logged in

User Is Already Logged-On Error Fix

- Log into database & execute delete session command
- Modify P6 INI file to allow you to fix problem
 - **Find P6 INI file:**
 - C:\Program Files\Oracle\Primavera P6\P6 Professional\PM.INI
 - **Edit setting to:**
 - DeleteCurrentUserSessions=TRUE
 - **Reboot computer and log into P6**
 - **This time, P6 will give you option to delete session**

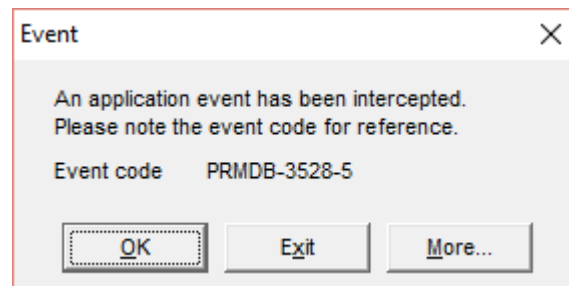
CORRUPT BACKUP FILES



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Corrupt Backup Files

- Two basic types of P6 backup files:
 1. XML
 2. XER
- Common corruption instances
 - **The backup file is not loading**



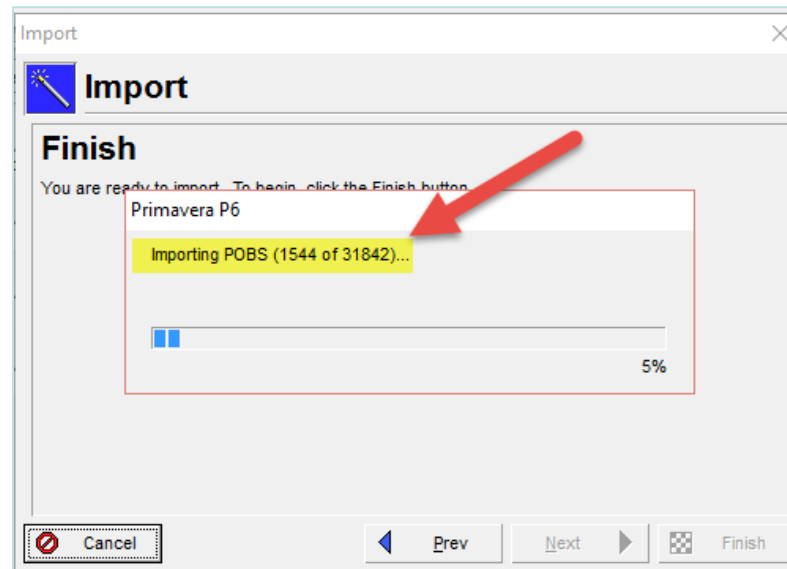
- **Import overwrites existing data (Global Calendars)**
- **Data is lost during the import**

Corrupt Backup Files

- XML File Corruption
 - **Most prevalent in P6 v6 (relationship records)**
 - **Addressed in P6 v7 and later**
 - **Global data is locked down during import**
- XER File Corruption
 - **Multiple bug fixes over the past 16 years**
 - **The Public Operational Breakdown Structure (POBS)**
 - **First appeared in P6 v6**
 - **Acknowledged by Oracle in April 2015**
 - **XER fix in September 2015**
 - **Problem resolved in February 2016**

Corrupt Backup Files

- The Public Operational Breakdown Structure (POBS) table corruption
 - **Extremely long XER export and import times**
 - **Thousands of useless records**
 - **Always present when P6 schedule is backed-up**
 - **Added to the receiving database during an import**



Corrupt Backup Files

- Oracle provides fix for POBS table corruption as part of P6 patch set releases:
 - **r8.3.12.0**
 - **r8.4.8.0**
 - **r15.1.5.0**
 - **r15.2.1.0**
 - **r16.x**
- All others perform manual fix
 - **Open .xer with Notepad and delete POBS data**
 - **Use POBS Eraser tool**
 - **Delete data from POBS table in database**

Corrupt Backup Files

- POBS table corruption

```

%R      28      201      7      WP - Schedule Status
%R     57011    11700      7      WP - Lean Status
%T      PHASE
%F      phase_id      seq_num phase_name
%R     1163      17      Design and Engineering
%R     1164      12      Project Management
%R     1167     110      Procurement
%R     1168     211      Construction
%R     1169      10      Milestones
%R     1170      13      Pre-Con Safety
%R     1171      14      QA Pre-Meetings
%R     1172      19      Bid/Award
%R     1173     210      Pre-Construction
%R     1175      18      Permitting
%R     1176      15      Schedule Impacts
%R     1177      11      Executive Summary
  
```



Good Data

```

%T      POBS
%F      pobs_id pobs_parent_id seq_num pobs_name      pobs_descr      pobs_manager
%R     1915600      0      POBS_Root      Performing Organization_Root
%R     1915601    1915600      0      P      Performing Organization
%R     1915602    1915600    100      P-1      Performing Organization
%R     1915603    1915600    200      P-2      Performing Organization
%R     1915604    1915600    300      P-3      Performing Organization
%R     1915605    1915600    400      P-4      Performing Organization
%R     1915606    1915600    500      P-5      Performing Organization
%R     1915607    1915600    600      P-6      Performing Organization
%R     1915608    1915600      0      ?><,./;>[]\=-~ ?><,./;>[]\=-~ ?><,./;>[]\=-~
%R     1915609    1915600      0      ?&gt;&lt;,./;>[]\=-~ ?&gt;&lt;,./;>[]\=-~ ?&gt;&lt;,./;>[]\=-~
%R     1915610    1915600      0      ?&amp;gt;&lt;,./;>[]\=-~ ?&amp;gt;&lt;,./;>[]\=-~ ?&amp;gt;&lt;,./;>[]\=-~
  
```



POBS Data

MISDIAGNOSING CORRUPT DATABASE TABLES



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Misdiagnosing Corrupt Database Tables

- Not everything is the fault of database corruption
 - **P6 is a very complicated software**
- Situations where database corruption is not issue:
 - **Schedule reverting to earlier versions**
 - **Schedule is 'frozen' and immobile**
 - **Spurious LOE actual dates and durations**
 - **Durations go to zero after import from P3**
 - **Weird user name responsible for audit changes**
 - **User ID sometimes lost or access privileges change**

Schedule Reverting to Earlier Versions

- May be caused by XER import settings
- Overwrites new data with old
- This is the default modify setting
- Fix by first reviewing XER import action settings
- Check import log after every import
 - **Stored in User Windows temporary folder**
 - **Text file named: PrmImportLog.txt**
 - **Example:**
C:\users\Ron\AppData\Local\Temp\PrmImportLog.txt

Schedule is 'Frozen' and Immobile

- Imported schedule does not respond to 'What Ifs'
- Culprit may be External Constraints
 - **External Start & External Finish**
- Automatically generated when schedules are linked
- Constraints do not show up in constraints box
- Add appropriate columns to display & remove
- OR check, "Ignore relationships to and from projects"
- OR export all linked schedules together
- Also listed in CPM re-calculation report

Spurious LOE Actual Dates and Durations

- Summary Level of Effort (LOE) tasks
- Mysteriously acquire Actual Starts
 - **Is the LOE linked to activities in other schedules?**
 - **Actual Start automatically generated by summarized**
- Mysteriously revert to zero duration
 - **Is “Ignore relationships to and from projects” checked?**
 - **Happens a lot in Master Schedules**

Durations Go To Zero After Import From P3

- After P3 import, activities have zero duration
 - **Even with Fixed Duration & Units/Time settings**
- Problem is Driving Resources
 - **P3 activity resource window**
 - **Task Resource has “Resource Driving” box checked**
 - **Task duration driven by (missing) resources**

Weird User Name on Audit Changes

- Audit fields tell who and when activities were changed
- Added or Modified audit User is, "NOTPRMUSER"
- P6 automatically applies this when,
 - **Job Services has created/updated this record**
 - **Check Project Integrity "Automatically fix errors" option**
 - **Project in P6 Web Access (known bug)**

User ID Sometimes Lost or Privileges Change

- P6 login name works one time but not another
- User privileges seen to change
- Answer: user entering User ID differently
- P6 login user names are case sensitive
 - **These are not the same User ID:**
 - adam
 - Adam
 - ADAM
- Not industry standard

WHAT CAN ORACLE PRIMAVERA DO ABOUT THIS?



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What Can Oracle Do About This?

- Bring back an improved Check Project Integrity utility
 - **Modify checks to exclude reporting on 'false positives'**
 - **12 unneeded checks out of 83 total**
 - **Provide explanation how to repair conditions detected**
- Report to the user corrupt data instances
- Make P6 operation to industry norms
 - **Make users IDs case insensitive**
- Resolve POBS table corruption for P6 v8.2 and earlier
- Make XER File Parser & Builder compatible with Microsoft Excel 2010 and later

WHAT CAN P6 USERS DO ABOUT THIS?



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What Can P6 Users Do About This?

- Best practice recommendations:
 - **Concise data backup and archival strategy**
 - **Two databases for production and testing**
 - **Separate databases for different types of projects**
 - **XML import to minimize corruption of global data**
- Options available to P6 users:
 - **Check Project Integrity utility**
 - **XER File Parser & Builder**
 - **P6 validate.bat utility**
 - **My Oracle Support Community (MOSC)**
 - **Database Management utilities**
 - **3rd Party Oracle/Primavera providers**

What Can P6 Users Do About This?

- Check Project Integrity utility
 - **Data Join integrity check**
 - Examines the entire P6 database
 - Provides 21 checks and fixes some of them
 - Available via single queries directly from the database server
 - **Data Value integrity check**
 - Scans currently open projects
 - Provides 62 checks
 - Custom reports and/or layouts can help to identify issues

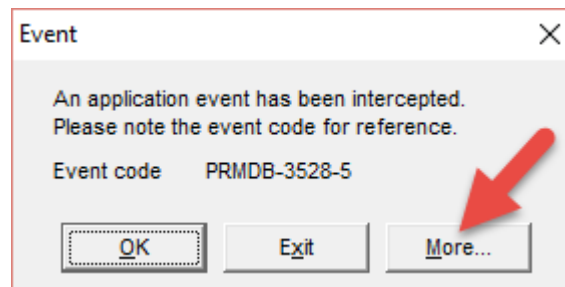
What can P6 users do about this?

- Check Project Integrity Utility
 - **Scripts to check the P6 database**
 - **Pros**
 - Free tool
 - Can be included in a database maintenance plan (SQL) or scheduled job (Oracle)
 - **Cons**
 - Issues identified require manual correction
 - Automatic Data Value 'fixes' are not accurate
 - **Removed from P6 Client Application (r8.x and later)**
 - Scripts provided by Oracle 'as is' without warranty

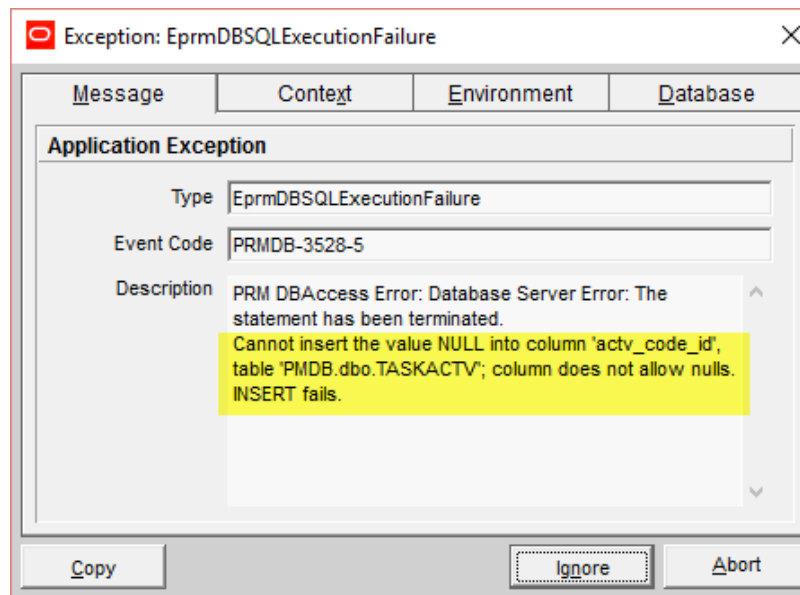
What can P6 users do about this?

- XER File Parser & Builder
 - Runs diagnostics and fixes corrupted XER files

- Example
 - Import fails



- Detailed error



What can P6 users do about this?

- To use the XERFileParserBuilder.xls utility
 - Load corrupted XER file
 - Define parameters and run diagnostic check
 - Build fixed XER file

XER File Parser & Builder

Select Diagnostic:

- check for NULL
- check for Duplicates
- cross check FK

Select Table:

ACTVCODE

Select Field(s):

- actv_code_id
- parent_actv_code_id
- actv_code_type_id
- actv_code_name

Select Secondary Table:

TASKACTV

Select Secondary Field(s):

- task_id
- actv_code_type_id
- actv_code_id
- proj_id

Close Run Diagnostic

What can P6 users do about this?

- XER File Parser & Builder
 - Finds and fixes corruptions in XER files
 - Excel-based program
 - Pros
 - Free tool
 - Contains diagnostic function for troubleshooting
 - Cons
 - Does not work with XER files > 90MB
 - **Not compatible with Microsoft Excel 2010 and later**
 - Manual and complicated process
 - Provided by Oracle 'as is' without warranty

What can P6 users do about this?

- **Validate.bat Utility**
 - **Finds missing, extra and modified database objects**
 - **Designed for the database version being checked**
 - **Recommended prior to P6 upgrade**
 - **Pros**
 - **Free tool**
 - **Ensures smooth P6 upgrade to the next version**
 - **Cons**
 - **Issues found must be researched and fixed by user**
 - **Only identifies incorrect database structure**

What can P6 users do about this?

- Primavera – PRIM (MOSC)
 - **Product support community**
 - **Upcoming webcasts, alerts, knowledge docs and more**
 - **<https://community.oracle.com/community/support>**
 - **Vote for Idea #11492**
- Database Management Utilities
 - **Oracle Database Homepage**
 - **MS SQL Server Management Studio**
- 3rd Party Oracle/Primavera Providers
 - **Provide dedicated IT support**
 - **Experienced at database repair**

EVALUATION: HOW WIDESPREAD IS DATABASE CORRUPTION?



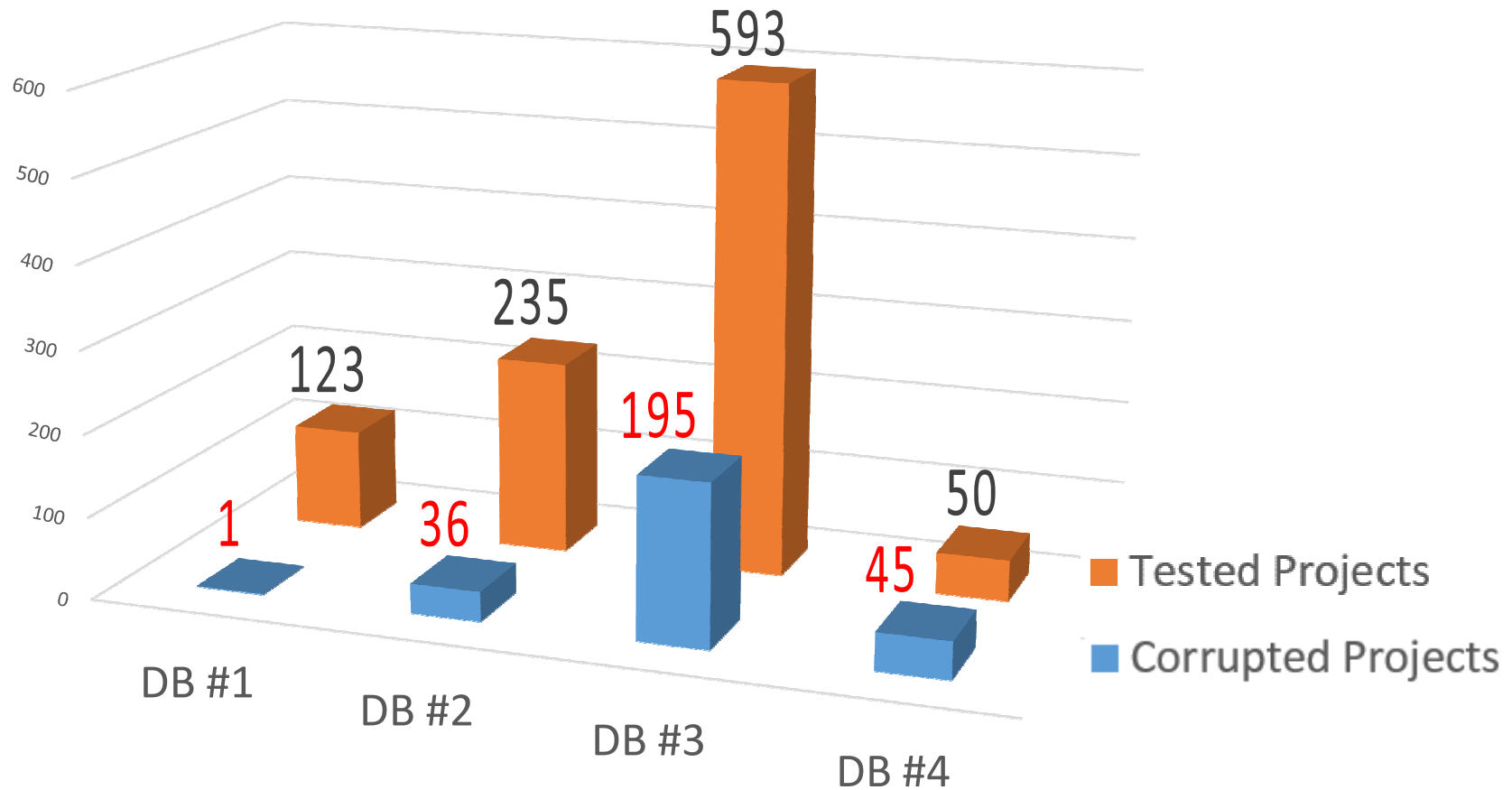
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Evaluation

- Four P6 databases tested
 - **Single/Multi user environments**
 - **Resource/Cost loaded**
 - **3rd party access**
- Three different testing methods
 - **Oracle P6 Check Project Integrity utility**
 - Found multiple 'false positives'
 - **Oracle P6 Schema Validation**
 - Found one extra object
 - **Schedule Analyzer eForensic Corrupt Files utility**
 - Provided most conclusive quantifiable results

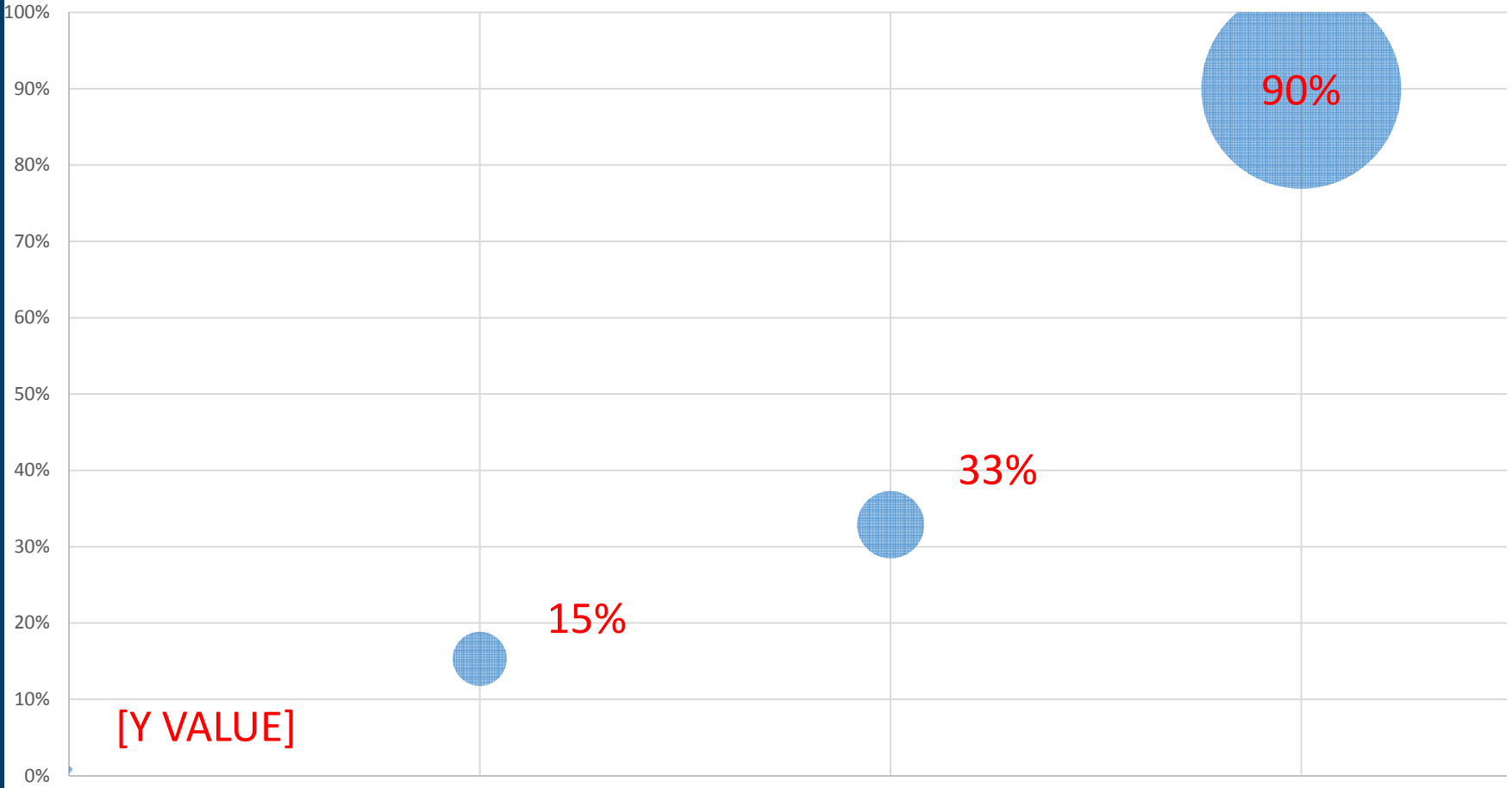
Evaluation

eForensic Testing Results



Evaluation

Corruption vs Number of Activities



[Y VALUE]

QUESTIONS / COMMENTS? (PLEASE USE MICROPHONE)



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Would You Like To Help?

- Would you like to help us further research this important topic of P6 Database Corruption?
- We need your help in researching the extent and type of P6 database corruptions. Please go to

**[http://ronwinterconsulting.com/
Research_P6_Corruption.htm](http://ronwinterconsulting.com/Research_P6_Corruption.htm)**

- Contact us at the following:
 - ron@ronwinterconsulting.com
 - msominsky@kitchell.com

