Set it and Forget it – Allow Progress OpenEdge to Take Care of Your Environment

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About the Speaker

- ## President – White Star Software, LLC
  One of the oldest and most respected consulting and training companies in the OpenEdge Community

- ## Vice President – DBAppraise, LLC
  Managed Database services from the experts. Get an expert, not someone off the bench to manage your database

- ## Author - Progress Expert Series Books

About This Presentation

- I will tell you things that will help maintain the integrity of your database

- Self-healing and self-protection are more about good setup and maintenance than just adding a few switches on database startup

- Secret: The name of the presentation was chosen to "fool" marketing into selecting it and it appears to have worked

Job Responsibilities of the Database Administrator

- Protect the data
- Plan for the future
- Keep the environment predictable

Job Responsibilities of the Database Administrator

- Backup and recovery - Protect
  - Maintain backups
  - Test recovery procedures
- Database security - Protect
  Both OS and application
- Storage and capacity planning - Plan
- Performance monitoring and tuning - Predictable
- Software maintenance and control - Predictable
  Manage software release process

Agenda

- Build the right foundation
  - Hardware
  - Operating System
  - Database
  - Application
- Reliable high performance
- OpenEdge startup options
- Maintenance and upkeep

Build The Right Foundation

- No single points of failure
  Review your processes from end to end
- Disks (RAID 10 is your friend)
- Use journal-enabled file systems
- Memory (have enough and avoid interleaved/non-mirrored)
- CPUs
    - More than one CHIP not only more than one core
    - Note on NUMA (Don't) but if you do

Build the Right Foundation

- Infrastructure
    - Network (both internal and Internet)
    - Phones
    - Fax, EDI, Web, …
- Property, plant and equipment
    - Where do people go if we lose the building?
    - How do they find out?
    - Where can they check in?

No Single Point of Failure

- If one fails, there is another there to take over transparently from a user's perspective
- Build for high availability because everyone requires the system to be available 100% of the time during their business hours
- Think about the whole system (end to end)
- Determine what "touches" your customer
- This is a mindset that everyone needs when acquiring any new technology (every project, every person on every project)

Storage Considerations

- RAID 10 is still recommended for database storage
  - Database
  - Before and After Image journals
  - Temporary files
- Disks are where to spend your money
- Most people overbuy CPU and neglect storage
- Why no RAID 5?

RAID – Why RAID 10 vs. RAID 5

- RAID 10 – isn't 10 twice as good as 5
  - Two paths to the data
  - No calculation of parity
  - Optimized reads
- RAID 5
  - Great <u>most</u> of the time
  - Penalty for massive writes – like backup and recovery
  - Fine for test and development

Network Reliability

- Most companies cannot survive without Internet
  - Remote users
  - Customers
- All critical portions of the network must have redundancy
  All data center clients should have multiple routes and end to end redundancy (NICs to Switches to Cables)
- Dual Internet feeds are becoming required for most clients
  - Physical – No shared wire (poles, …)
  - Logical – multiple routes to Internet and intranet

Foundational Reliability

- View processes from end to end
  - Know your applications
  - Know the relationship between applications
- Prioritize items that directly affect your customers first
  - Know your business
  - Know your customers
    - Internal
    - External
- Next are things that indirectly affect customers
- Then come operationally critical items
- Last comes new development and reporting

Predictable Performance

- Performance should be essentially the same regardless of the load on the system

- The goals of data integrity and application performance are sometimes opposing

  Example: RAID 5 – Data protected but performance and material cost for extra overhead and extra disk space

- If the users can't get at the data (poor performance) then they don't care about other things you did right.

Build the DB for Your Environment

- Use the best database block size
  - 8k most places
  - 4k Windows Server
- Use Type II Areas (Always best)
- Use the right BI cluster size – default is wrong
- Use the right network message size (-Mm 8192)
- Do you want every area to end with a variable extent or do you want all fixed.(*)

  * You will **crash** if you fill an area with no variable extents

OpenEdge Startup Options: Self-Healing/Self-Protection

- **The Watchdog process**
  - Finds local users that have died abnormally and disconnects them
  - Remote Users are determined via a different mechanism

- **Database Integrity Check Parameters**
  - -DbCheck
  - -AreaCheck
  - -TableCheck
  - -IndexCheck

Database Integrity Check

- -DbCheck – Physical consistency check of all record and index blocks (except blobs) for the entire database

- -AreaCheck – Physical consistency check of all record and index blocks (except blobs) for an area

- -TableCheck – Enables consistency checks for a given table. Record block check only.

- -IndexCheck – Enables consistency checks for a given index. Index block check only.

Block-Level Integrity Check Rules

- Each option can only be used once.
- If –DbCheck is used then it takes precedence ans consistency checking for the whole database will be applied
- -AreaCheck, -IndexCheck and -TableCheck can be used at the same time.
- These option can be enabled online via promon
  - promon <dbname>
  - R&D
  - Option 4 (Administrative Functions)
  - Option 8 (Enable/Disable block level consistency check)

Database Maintenance Options

- dbtool
- aiverify
- prostrct list
- prostrct –validate option
- prorest –vp and –vf options
- Update SQL Statistics (if necessary)

dbtool

- Option 1 – Report SQL width and date violations
- Option 2 – Report and correct SQL width violations
- Option 3 – Compare defined vs. physical records
- Option 4 – Validate record schema versioning
- Option 5 – Validate database block headers
- Option 6 – Scan records for possible corruption
- Option 7 – Schema validation (_StorageObject)
- Option 9 – Enable/disable redirection of tool output

Yes, There is no 8

Checking After Image files: aiverify

- Validates after image files before they are applied
- Partial verification

    rfutil <dbname> -C aiverify partial -a <ai_file_name>

    - AI block verification
    - rlnote header verification

- Full verification

    rfutil <dbname> -C aiverify full -a <ai_file_name>

    - AI block verification
    - rlnote header verification
    - rlnote data verification

Maintenance – prostrct list

- Provides the current structure of the database
- Should be done after all structure maintenance
- I recommend running it as a scheduled task (cron) daily and putting the current copy in a separate directory (separate machine) for restore purposes

Maintenance – prostrct validate option

- Should be used in conjunction any prostrct add or create
- Determines if the .st file is valid
  - No blank lines
  - Correct starting character(s)
  - Extent definition info is valid and quoted
  - If it has area number, rec. per block, blocks per cluster they are correct
  - Correct delimiters
    - Colon followed by area number
    - Comma followed by records per block
    - Semicolon followed by blocks per cluster
  - Plus a bunch of other stuff

- probkup is the only way to backup your database truly online

- -vp – Is a partial verification pass
  - Does a CRC check of the blocks to check validity
  - Does not require the database to be down
  - No additional disk/tape needed as check is done in memory

- -vf – Full verification pass
  - Block for block check of backup against source database
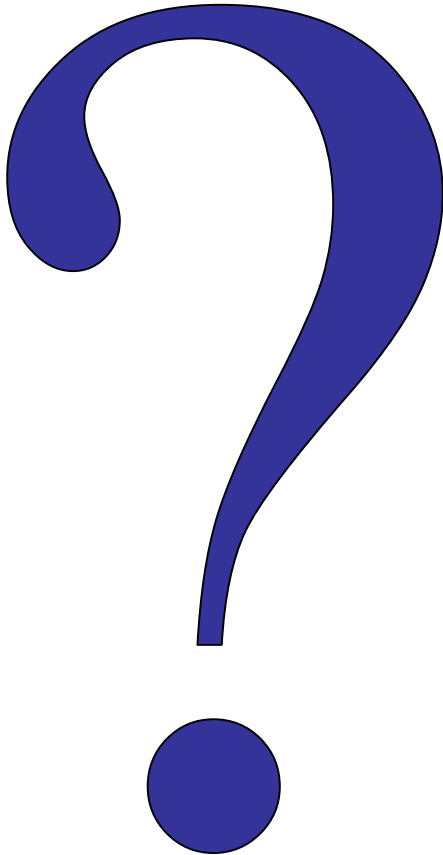 - Database must be down to use this option (or use copy)

Maintenance – update SQL statistics

- OpenEdge is SQL/92 compliant
- SQL, not ABL supports weight-based queries
- Weight-based queries are only as good as the data on which they are based.
- Active tables may warrant weekly statistic updates
- Generally, monthly is fine

Questions

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Still have questions?

Please feel free to contact me directly.

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Thank you for your time!