Segment 1
SQL Server 911
The Second Most Important Thing
Chris@sswug.org

- Understanding what needs to be backed up.
- Databases
- .mdf
- .ndf
- Transaction Logs
- .ldf
- File Groups
- Start with the Basics
- Check Points
- Dirty Reads/Writes
- Recovery Models
- Defines to your database how it should handle transactions based upon how you require it to be recovered.
- Simple
- Bulk-Logged
- Full
- Think in terms of the transaction log. How will you handle the transaction log?
- Backup Types
- Full Backups
- Differential
- Transaction Log Backups
- File Group Backups (Ideal for Large or high transactional Databases)
- Full Backups
- Standard is to create a .bak file
- Is a complete backup of all information in the database?
- SQL Server 2008 Enterprise can compress this backup for you
- SQL Server 2008 any addition can restore from compression.
- Device or File?
- Demo
- Backup a database using SSMS
- Backup a database using t-sql to file name
- Backup a database using t-sql use a mirror
- Backup a database using a stripe set
- Create a backup device
- Backup database to device using t-sql
- Backup a database to device using SSMS
- Differential Backups
- Demo
- Diff Backup from SSMS

- Diff Backup from t-SQL
- Look at the size difference.
- Transaction Log Backups
- Demo
- Transaction Log Backup from SSMS
- Transaction Log Backup from t-SQL
- Look at the size difference.
- Look at the file name difference.
- File Group Backups
- Allows you to backup single or multiple file groups.
- Works great for segmented VLDB's
- Depending on recovery mode still requires t-log backups.
- Think of it as a partial backup.
- Should only be used with using Multiple File Groups.
- Compression
- SQL Server Enterprise Edition
- Can be restored with any edition
- Saves Disk Space
- Add load to the processors
- Compared to 3rd party products
- Backup Compression Demo
- Turn Compression on
- Backup Database with Compression
- Set a Password
- Compare the size
- Back Up Strategy
- Questions often asked about backup strategies.
- How often should I do a full backup?
- What is the Maintenance Window?
- How often should I do a T-log backup?
- How can I be 100% sure that my backups are good?
- Should I backup straight to tape?
- How do I make all the decisions that need to be made?
- Back Up Strategy
- Answers back to Questions
- How fast and stable do you want your backup process?
- How much data can you lose?
- How often do you run restore tests?
- How many people to you want involved, how much space do you have on disk?
- Get Management involved, do they know the risks?
- Automating Your Backups
- SQL Jobs
- Maintenance Plans
- 3rd Party Tools

- Tape Vendor Software (personal opinion)
- O-SQL and Windows task scheduler
- Backup Retention
- Tape Backups
- Tape vendors diff is different from SQL Server diff backups.
- If you have a Backup Administrator work with them on a retention plan.
- VLDB's can get expensive to keep around.
- Management should know the impact.
- Most of the time, disk is shorter then tape
- Sample Retention plan

Segment 2
SQL Server 911
Fully-Understanding Restore Operations
Chris@sswug.org

- Restore Uses
- Disaster Recovery
- Creating a copy of the Database
- Moving a database
- Initial data load
- Recovery
- Using the with RECOVERY
- Using with NORECOVERY
- Demo
- Backup our database
- Delete all the records
- Discuss the Tail
- Restore Database
- Tail
- Demo
- Finish the Restore (In this case the tail is what we want to avoid)
- Restore a Diff
- Demo
- Backup Database
- Update Actor 6
- Run a Diff
- Update Actor 5
- Run a Diff
- Restore the database
- Brings us up to date where?
- Demo
- Restore Database
- Restore Transaction Logs
- Restore a Point in Time
- Restore the Full Backup
- Restore to a Point in Time
- Restore a Test Version of the Database
- Restore with Move
- Restore with Rename
- Restore the System Database
- Restore Master
- Restore MSDB
- Restore Model
- Very detailed listing in books online by searching for Restore and database name

    - Restore Master
    - Restore MSDB
- Steps to Restore Master DB
- Start the instance in single user mode (-m)
- Start a command window
- Enter into sqlcmd mode (sqlcmd)
    - Use server name option
- Issue Restore command
- Type “GO”
- Online Restores
- For use when restoring a file or a page
- Default for file or page restores is OnLine
- Drive or device configuration on restore must match backup configuration.

Segment 3
SQL Server 911
Alternatives to a Full Restore
Chris@sswug.org

- Why?
- DBCC come page with corruption in an index.
- Msg 8928, Level 16, State 1, Line 1
    - Object ID 2073065812, index ID 0, partition ID 80920594038321152, alloc unit ID 80920594043301888 (type In-row data): Page (1:89) could not be processed. See other errors for details.
- One row needs to be restored
- One Table needs to be restored
    - Accidental Truncate
- Transactions need to be saved
    - Errors in application
    - Accidental Delete
- DBCC Option
- Is this an option, finding the corruption
- REPAIR_ALLOW_DATA_LOSS
- REPAIR_REBUILD
- Use this as a last option before a restore.
- Demo
- Look at a corrupt database
- Identify the error
- Identify the object
- Correct the error
- Recheck the database
- Partial Restore
- Scenario
    - One of the Admin's working on the database knows of a record that needs to be deleted from a table because the information is incorrect. When the delete statement was run all of the records were removed because the where clause was omitted.
- Partial Restore
- Demo
- Backup Database
- Delete Records from Table
- Restore Database as a new database
- Move records over to production Table
- Demo Notes
- When doing a Partial Restore If you restore T-Logs make sure you use a point in time to get all the records.
- Identity fields retain the values.
- Database stays "on-line" however should still be considered in a down state.
- Other Ways to "Back Up"

- T-Log Shipping
- Replication
- Database Snap Shots
- Database Mirroring
- T-Log review tools
- T-Log Shipping
- T-Log Shipping
- Benefits
- Can be used as a warm standby server.
- Transactions are applied when you tell it to.
- Standby can be used to report from.
- Solid Technology
- Negatives
- Does not have an auto failover.
- Connections are dropped when logs are being restored.
- Not up to the moment on records being applied
- Replication
- 3 core replication types
    - Snap Shot (Takes a picture of the database and creates a copy)
    - Transactional (Moves records over as changes happen)
    - Merge (works like transactional but both databases can be written read)
- Think of Magazine Publisher
    - Publisher
    - Subscriber
    - Publications
    - Subscriptions
    - Articles
    - Basic Principles
- Replication
- Benefits
- Create a Copy that can be updated quickly
- Subscriber remains on-line
- Synch can be scheduled
- Little Latency
- Setup is flexible
- Negatives
- Not a backup solution
- Not a load balancing solution
- No Automatic failover
- Data Errors will be copied
- Snap Shots
- Benefits
- Can restore from a snapshot
- Easy to implement
- Great for rolling schema changes into the database

- Negatives
- If the Source database is offline, the snap shot is as well.
- Need to be maintained as to not become large in size.
- Demo
- Create a database Snap Shot
- Review the size
- Run a number of updates
- See what's inside the snapshot
- Restore the database
- Database Mirroring
- Allows you to create a non-readable copy of a database.
- I think of it as a geographical cluster
- Failovers are dependent on a vote
- Witness servers are the tie breaker
- Third Party Log Readers
- These products can read the transaction log.
- You can then roll back individual transactions.
- You can roll back groups of transactions.
- Some can be difficult to find the actual transaction or transactions.
- Some can read current log and t-log backups.
- Could be used as a audit tool.
- Not always as fast to upgrade to new versions.

Segment 4
SQL Server 911
Creating and Managing Maintenance Plans
Chris@sswug.org

- Why?
- Automate your backup process.
- Add checks to your system to make sure the database is doing well.
- Keep the queries performing well.
- Manages your backups.
- Makes a log of actions taken.
- Changes
- SQL Server 2005 made this more or less an SSIS package.
- The UI allows for:
    - specifying order of events
    - Specifying fail/success paths
    - Many more options
- The Maintenance Wizard will help you get started.
- Demo
- Create a Maintenance Plan via the Wizard
- Execute the Maintenance Plan
- Look at the log
- Delete the Maintenance Plan
- Third Party Tools
- There are some third part tools that create Maintenance Plans.
- One thing I have noticed is the do not handle errors very well.
- They may require you to manage the maintenance plans using the tools, flexibility is a question.
- These tools many times come as add-ons to backup compression software.
- Demo
- Build a Maintenance Plan from Scratch
- Show a failed Path
- Show a notification
- Execute the Maintenance Plan
- When your plans are done
- Watch the execution times.
- Watch for failures.
- Review the jobs.
- Watch your disk space to make sure your retention plan is being followed.
- Don’t forget to test your backups.

