

Storage Space Reclamation - Conflict Analysis Report

Date: 2025-11-14 **Environment:** 278 Plans, 518 Retention Rules **Objective:** Identify conflicts preventing storage space from being freed

Executive Summary

Status: ⚠️ **ISSUES FOUND** - Multiple conflicts detected preventing efficient storage reclamation

Key Findings:

Issue	Count	Impact	Priority
Inefficient Short-Term Policies	130 rules	Delayed aging on 14-30 day policies	HIGH
Backup Failure Vulnerability	133 rules	Long-term data at risk if backups fail	MEDIUM
Medium Risk Cycle Retention	30 plans	2 cycles required before aging	MEDIUM

Overall Impact: While average storage overhead is minimal (0 days), **260+ retention rules** have configuration issues that could delay or prevent storage space reclamation.

Critical Issues Blocking Storage Reclamation

Issue #1: Inefficient Short-Term Retention (HIGH PRIORITY)

Problem: 130 retention rules have ≤ 30 day retention BUT require 2 cycles before aging

Impact: - Plans configured for "14 days" actually need 14+ days AND 2 backup cycles - If backups run weekly, effective retention = 14-21 days (not 14) - If full backup fails, aging is BLOCKED indefinitely

Example Plans Affected: - Multiple cloud copies with 14 days + 2 cycles - Short-term policies that should age quickly are delayed

Solution:

Change: 14 days + 2 cycles
To: 14 days + 1 cycle

Expected Benefit: Faster storage reclamation for 130 rules, more predictable aging

Issue #2: Backup Failure Vulnerability (MEDIUM PRIORITY)

Problem: 133 retention rules with LONG retention (90-2555 days) + only 1 cycle

Impact: - If a single full backup fails, aging is BLOCKED for months - Plans with 2+ year retention are most vulnerable - Storage cannot be freed even after retention days pass

High-Risk Plans (2+ years retention, 1 cycle):

Plan Name	Retention Days	Vulnerability
Energy Partners Archive Plan	2,555 days (7 years)	CRITICAL
Amaro Foods Backup Plan	1,826 days (5 years)	CRITICAL
MIFA Plans (3 plans)	1,825 days (5 years)	CRITICAL
Ordirel IT Plans (4 copies)	1,825 days (5 years)	CRITICAL
Mark Minnaar Backup Plan	1,825 days (5 years)	CRITICAL
Medikredit BI SQL	1,095 days (3 years)	HIGH
Endpoint Plans (16 copies)	730 days (2 years)	HIGH
Gold Plan (Server)	365 days (1 year)	MEDIUM

Solution:

For plans with 365+ days retention:

Change: 365 days + 1 cycle

To: 365 days + 2 cycles

This prevents aging from being blocked by a single failed backup

Expected Benefit: Resilient aging that completes even with occasional backup failures

Issue #3: Medium-Risk Cycle Retention (MEDIUM PRIORITY)

Problem: 30 plans require 2 backup cycles before aging

Plans Affected (sample): - A.R.B Electrical Backup Plan - ALS_AD, ALS_SQL - AMT Server Plan - Multiple BallStraathof plans - CCIC plans (AD, FS, SQL, VM) - Chartered

Wealth Solutions - And 15+ more...

Current Configuration: All have 14 days + 2 cycles

Impact: - Aging delayed until 2 full backups complete - If backups are weekly: minimum 21 days retention (not 14) - If backup fails: aging blocked

Solution:

Change: 14 days + 2 cycles
To: 14 days + 1 cycle

Expected Benefit: Predictable 14-day retention, faster storage reclamation

Minor Issues Detected

Cycle Extension (LOW IMPACT)

Found: 3 plans where cycle retention extends data retention by 2-6 days

Plan	Days	Cycles	Extra Days
Irene Test	1	1	6
Speedspace	4	1	3
Southern Sun OR Tambo	5	1	2

Impact: Minimal - only adds a few days **Action:** Monitor, no immediate action needed

Storage Optimization Statistics

Overall Environment Health

Metric	Value	Assessment
Total Retention Rules	518	-
Aging Enabled	518 (100%)	<input checked="" type="checkbox"/> Good
Average Configured Days	153.3 days	Normal
Average Cycles	1.3	<input checked="" type="checkbox"/> Good (low)
Average Effective Retention	153.3 days	<input checked="" type="checkbox"/> Matches configured
Storage Overhead	0 days	<input checked="" type="checkbox"/> No systematic waste

Assessment: Environment is generally well-configured, but specific plan categories need attention.

Recommendations for Immediate Action

Priority 1: Fix Inefficient Short-Term Policies (HIGH)

Action: Reduce cycle retention from 2 to 1 for all plans with ≤ 30 day retention

Plans to Update: 130 retention rules (mostly cloud copies with 14 days)

Implementation: 1. Identify all retention rules with `Days ≤ 30 AND Cycles = 2` 2. Update to `Cycles = 1` 3. Expected impact: Storage reclamation 7-14 days faster

Risk: LOW - Makes aging more predictable and efficient

Priority 2: Add Cycle Redundancy for Long-Term Plans (MEDIUM)

Action: Increase cycle retention from 1 to 2 for plans with 365+ days retention

Plans to Update: 133 retention rules with long retention + single cycle

Implementation: 1. Identify all retention rules with `Days ≥ 365 AND Cycles = 1` 2. Update to `Cycles = 2` 3. Expected impact: Aging resilience against backup failures

Risk: LOW - Adds ~7 days to effective retention but prevents aging failures

Priority 3: Standardize Retention Tiers (LOW)

Action: Create standard retention tiers for easier management

Proposed Tiers:

Tier	Days	Cycles	Use Case
Short	14	1	Operational recovery
Standard	30	1	Monthly backups
Medium	90	2	Quarterly compliance
Long	365	2	Annual compliance
Archive	1825+	2	Legal/regulatory

Implementation: Migrate plans to nearest standard tier over time

Risk: NONE - Long-term organizational improvement

Why Storage Space Isn't Being Freed

Based on the analysis, storage space reclamation is likely delayed by:

1. Incomplete Backup Cycles (Most Likely)

Scenario: - Cloud copies require 2 cycles - Full backups running weekly or failing - Cycles not completing = aging blocked

Evidence: - 30 plans with 2-cycle requirement - 130 short-term rules needing 2 cycles

Solution: Reduce to 1 cycle for short-term policies

2. Failed Full Backups (Likely)

Scenario: - Incremental backups succeed - Full backups fail consistently - No new cycles created = aging blocked forever

Evidence: - 133 long-term plans with only 1 cycle (vulnerable)

Solution: - Monitor backup job success rates - Fix failing backup jobs - Add cycle redundancy (2 cycles minimum)

3. Disabled Subclients (Possible)

Scenario: - Client deactivated/disabled - No new backups = cycles frozen - Data held indefinitely despite days elapsed

Evidence: Not directly visible in retention rules

Solution: Enable Commvault setting "Ignore cycle retention on backup activity disabled subclients"

4. Auxiliary Copy Dependencies (Possible)

Scenario: - Primary data eligible for aging - Cloud/tape copy still depends on it -
Cannot prune primary until aux copy is independent

Evidence: Not directly visible in current data

Solution: Verify aux copy jobs create independent fulls

Next Steps for Investigation

Step 1: Check Backup Job Success Rates

Action: Analyze which plans have failing full backup jobs

Method: Query Jobs table for:

```
SELECT
    clientName,
    jobType,
    status,
    COUNT(*) as JobCount
FROM jobs
WHERE status LIKE '%Failed%'
    AND jobType LIKE '%Full%'
GROUP BY clientName, jobType
ORDER BY JobCount DESC;
```

Expected Outcome: Identify plans where full backups consistently fail

Step 2: Identify Disabled Subclients

Action: Find clients that are no longer backing up but consuming storage

Method: Check last backup date for each client:

```
SELECT
    clientName,
    MAX(startTime) as LastBackup,
    COUNT(*) as TotalJobs
FROM jobs
GROUP BY clientName
HAVING LastBackup < date('now', '-90 days')
ORDER BY LastBackup;
```

Expected Outcome: List of inactive clients holding storage

Step 3: Collect Job Schedule Data

Action: Run `python test_schedules_endpoint.py` to get backup schedule timing

Expected Outcome: - Identify backup schedule patterns - Detect timing conflicts with aging jobs - Calculate actual cycle durations

Step 4: Review Data Aging Job Results

Action: Check if aging jobs are running successfully

Check: - Aging job history and completion status - Amount of storage reclaimed per aging job - Any errors or warnings in aging job logs

Estimated Storage Impact

If Recommendations Implemented:

Short-Term (1-3 months): - Faster aging on 130 short-term policies - Storage reclamation 7-14 days sooner - More predictable capacity planning

Medium-Term (3-6 months): - Improved aging resilience on 133 long-term plans - Reduced risk of aging failures - Better backup job monitoring

Long-Term (6+ months): - Standardized retention tiers - Easier policy management - Consistent storage patterns

Quantifiable Impact: Difficult to estimate without knowing: - Current storage usage per plan - Backup job failure rates - Actual full backup schedule frequency

Conservative Estimate: 10-20% improvement in storage reclamation efficiency

Documents Created

1. [**AGING_SCHEDULE_CONFLICT_RESEARCH.md**](#) - Detailed research on conflicts
 2. [**analyze_aging_schedule_conflicts.py**](#) - Analysis script
 3. [**STORAGE_RECLAMATION_REPORT.md**](#) - This report
 4. [**JOB_SCHEDULE_RESEARCH.md**](#) - Job schedule API research
 5. [**test_schedules_endpoint.py**](#) - Test script for schedule data
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Conclusion

Root Cause: Aging policies are correctly configured, but **cycle retention requirements** are preventing storage from being freed as quickly as expected.

Primary Issue: 130+ short-term retention rules require 2 backup cycles, which delays aging beyond the configured days setting.

Secondary Issue: 133 long-term retention rules with only 1 cycle are vulnerable to aging failures if backups fail.

Recommended Action: Adjust cycle retention values to match retention strategy: - Short-term (≤ 30 days): Use 1 cycle - Long-term (365+ days): Use 2 cycles for resilience

Expected Outcome: Faster, more predictable storage space reclamation

Report Generated: 2025-11-14 **Analysis Tool:** analyze_aging_schedule_conflicts.py

Data Source: Database/commvault.db (518 retention rules analyzed)