Image Archive and Data Backup Status

Current State:

The current Avamar/Data Domain backup storage solution is nearly out of space. The image archive was anticipated to allow some Avamar/Data Domain space to be reclaimed but operational decisions have made that space unavailable. The planned migration of remaining tape based backup schedules to the disk based solution has been stalled.

Future State:

Consolidate and revise the backup strategy so that all backups, whether data or images, are maintained on disk and the tape system is removed as a routine component of the backup process.

Issue Analysis:

In 2014 plans were developed for an Image Archive project which would allow IT to move image data out of the tapeless backup process to an archival system more appropriate for image data retention. It was anticipated that moving these images from the tapeless backup would free sufficient space so that items remaining on the tape based backup could be moved to the tapeless system. At that time only LaserFiche images and SQL Server database backups remained on the tape based system.

Because of faster than anticipated growth in the LaserFiche image repositories those images could not be included in the tapeless backup solution. At the time the initial sizing was completed in April 2012 approximately 3.8 Terrabytes of LaserFiche images existed in the county. By the time the Avamar solution was purchased, installed and operational, in January 2014, the space used for LaserFiche images had increased more than 230% to 8.85 Terrabytes. As of January 2015, the space used for LaserFiche images had topped the 17 Terrabyte mark.

The SQL Server database backup files were being backed-up through the Avamar system, using a VM snapshot process, however long term restore needs beyond the planned thirty day period, required the data be written to tape using the decommissioned CommVault system.

To meet the business need that IT protect county data, and provide for a restoration process, we initiated the Image Archive project. One project goal was to move all image data, chiefly the Odyssey and LaserFiche images, from the Avamar backup system to an archival system to keep secondary image copies on separate network attached storage. Once the images were protected through the archive process they would be removed from the Avamar system which would allow any reclaimed space to be used for extended database retention.

Once the image archive project was completed in late 2015, we discovered that space issues within the Avamar solution had already led to removal of the Odyssey images. A secondary copy of Odyssey images were being kept on the old IBM N-Series N6040 solution. A straight file copy process, with no monitoring

capability, was used to facilitate the migration of the Odyssey images. The space anticipated to be recovered from the Image Archive project no longer existed. To further compound the issue, the Avamar backup grid has been running at nearly 90% capacity and the utilization rate is continuing to climb.

Pending imaging projects for Human Resources and the District Attorney, combined with changes in the way Odyssey will intake criminal eFilings and process redaction, will further impact the image archive and data backup process within the county.

Requirements to Reach Future State:

Modify the existing Avamar/Data Domain grid to utilize new features within the Avamar software to manage and control backup data stored within expanded Data Domain storage.

The steps to achieve the desired future state will be completed in two phases:

- Phase 1:
    - Initiate budget amendments to allow use of funds budgeted under projects R06303 and R06304 under account number 044-0630-411.90-02 to fund acquisition of the required Data Domain system expansion
        - The total available funds from these two projects is $379404 and the estimated total cost of the expansion is between $285000 and $350000
    - Initiate a budget amendment to move funds from project code R06210 and account number 001-0629-414.90-02 to fund acquisition and installation of a NetApp expansion tray
        - The total available funds from this project is $113200 and the estimated total cost of the expansion is between $70000 and $100000
- Phase 2:
    - Submit a budget request in the FY17 budget to expand the Data Domain storage system and add additional capacity to accommodate the longer term database backup needs
        - The estimated cost of the request is $200000

Supporting Data:

The following data sets are samples of the data used to estimate the sizing needs for the various storage and data backup projects.

Data Projections Used for Sizing Current IBM N-Series N6250 (created March 2014):

	Actual		Projected			Extended Projected Growth			
	Jan-13	Jan-14	Jan-15	Jan-16	Jan-17	Jan-18	Jan-19	Jan-20	Jan-21
NonImage	34.50	38.02	40.75	44.40	47.75	50.95	54.24	57.52	60.81
Image	15.06	24.43	33.25	41.10	49.75	58.53	67.14	75.74	84.35
Total	49.56	62.45	74.00	85.50	97.50	109.48	121.37	133.27	145.16

	Projected			Extended Projected Growth			
	Jan-15	Jan-16	Jan-17	Jan-18	Jan-19	Jan-20	Jan-21
NonImage	40.75	44.40	47.75	50.95	54.24	57.52	60.81
%Full	39.61%	43.16%	46.41%	49.52%	52.72%	55.91%	59.11%
w/3	31.00%	33.78%	36.33%	38.76%	41.27%	43.77%	46.27%
w/3&S ATA	21.82%	23.78%	25.57%	27.28%	29.05%	30.81%	32.57%
w/5	27.08%	29.51%	31.74%	33.86%	36.05%	38.23%	40.42%
w/5&S ATA	19.80%	21.58%	23.21%	24.76%	26.36%	27.96%	29.55%

N6250 Aggr Capacity	
102.8809	
w/ 3 SAS	131.4
	306
w/3&S ATA	186.7
	287
w/ 5 SAS	150.4
	637
w/5&S ATA	205.7
	618

	Projected			Extended Projected Growth			
	Jan-15	Jan-16	Jan-17	Jan-18	Jan-19	Jan-20	Jan-21
Total	74.00	85.50	97.50	109.48	121.37	133.27	145.16
%Full	71.93%	83.11%	94.77%	106.41%	117.97%	129.53%	141.09%
w/3	56.30%	65.05%	74.18%	83.30%	92.35%	101.40%	110.44%
w/3&S ATA	39.63%	45.79%	52.21%	58.63%	65.00%	71.37%	77.74%
w/5	49.18%	56.82%	64.80%	72.76%	80.67%	88.57%	96.47%
w/5&S ATA	35.96%	41.55%	47.38%	53.21%	58.99%	64.77%	70.55%

N6250 Aggr Capacity	
w/ 3 SAS	131.4
	306
w/3&S ATA	186.7
	287
w/ 5 SAS	150.4
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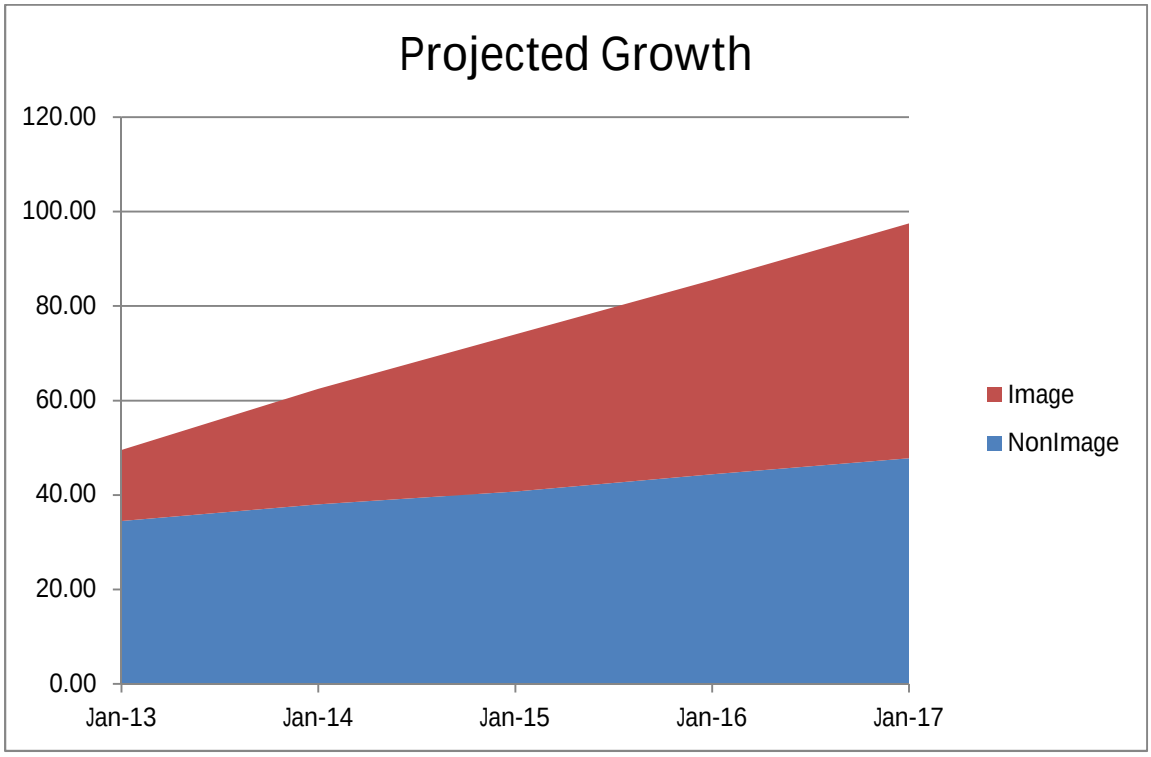
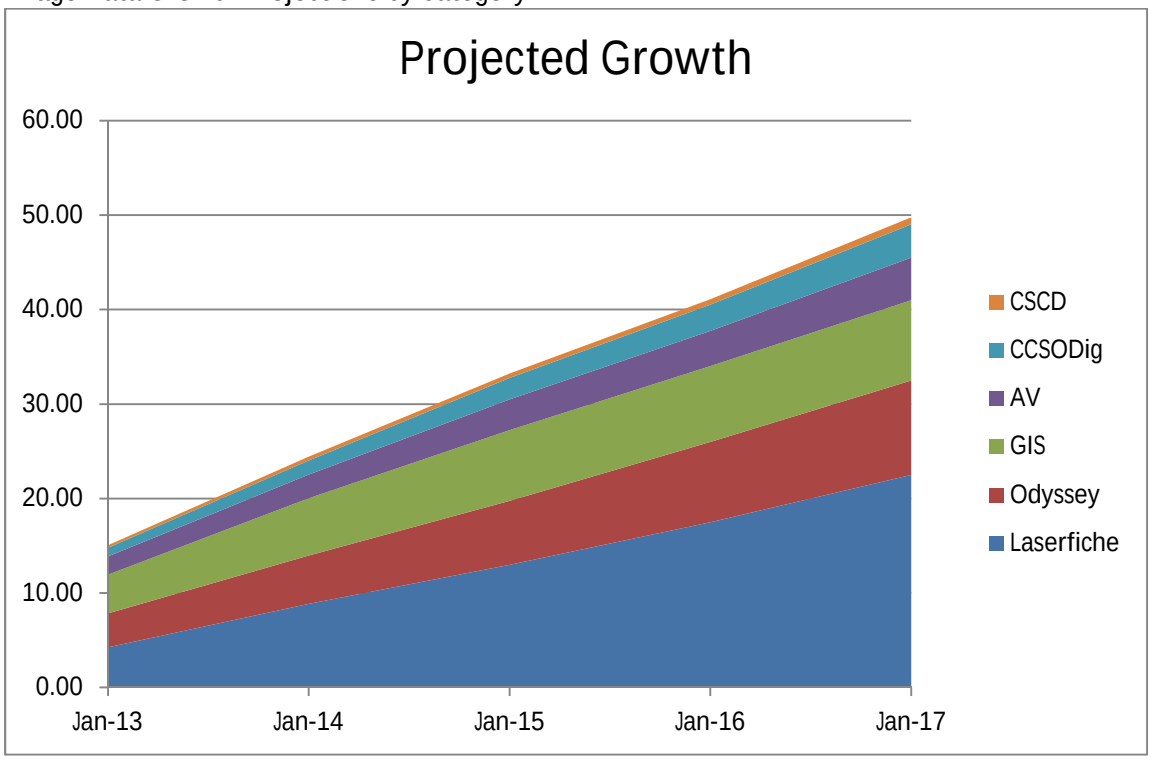


Image Data Growth Projections by Category:



LaserFiche Storage Requirements for Avamar Sizing Estimates (created February 2012):

Object ID	Volume	Aggregate	Storage Server	Total	Used	Avail	Used (%)	Filer	Volume	Total TB	Used TB	Avail TB
148	vm_nfs4a_aggr4_sata	aggr4	CCNAS01A.co.collin.tx.us	2040109468	1269190144	770919324	62.2	A	vm_nfs4a_aggr4_sata	1.900	1.182	0.718
150	vm_nfs5a_aggr4_sata	aggr4	CCNAS01A.co.collin.tx.us	2040109468	1448499772	591609696	71	A	vm_nfs5a_aggr4_sata	1.900	1.349	0.551
152	vm_nfs6a_aggr4_sata	aggr4	CCNAS01A.co.collin.tx.us	2040109468	1302743984	737365484	63.9	A	vm_nfs6a_aggr4_sata	1.900	1.213	0.687
212	vm_nfs4b	aggr0	ccnas01b.co.collin.tx.us	2147483648	79387728	2068095920	3.7	B	vm_nfs4b	2.000	0.074	1.926
										7.700	3.818	3.882

Avamar/Data Domain Grid Utilization Ratios (created January 2016):