

AVOIDING THE DE-DUPLICATION USING CONTENT SIMILARITY AND JOB SCHEDULING ALLOCATION BASED ON WORKLOADS N. Ramki* & A. Anitha**

* PG Scholar, Department of Master of Computer Applications, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamilnadu

** Assistant Professor, Department of Master of Computer Applications, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamilnadu

Abstract:

Experimentally, magnetic tape item has been used for database backup. With the explosion in disk capacity, it is now impossible to use disk for data backup. The Cloud storage is used for the database backup. The chunk lookup in cloud bottleneck problem that inline, chunk-based De-duplication schemes face. We perform stream De-duplication by breaking up an incoming stream into relatively large segments and De-duplicating each segment against only a few of the most similar previous segments. To identify similar segments, we use content similarity and a sparse index. We choose a small portion of the chunks in the stream as samples. Our sparse index maps these samples to the existing segments in which they occur. To reduce the task of evaluating text similarity to assessment of content similarity and use features such as bag of words to find De-duplication content. The proposed method can be allocating the resource can be based on the dependencies and the particular job execution and its weight of the each job and content similarity avoid the De-duplications.

1. Introduction:

In modern server farms, virtualization is being used to provide ever-increasing number of servers on virtual machines (VMs), reducing the number of physical machines Permission to make digital or hard copies of all or part of this work for personal or class room use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page.

To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission. This approach better utilizes server resources, allowing many different operating system instances to run on a small number of servers, saving both hardware acquisition costs and operational costs such as energy, management, and cooling. Individual VM instances can be separately managed allowing them to serve a wide variety of purposes and preserving the level of control that many users want.

However, this flexibility comes at a price: the storage required to hold hundreds or thousands of multi-gigabyte VM disk images, and the inability to share identical data pages between VM instances. One approach saving disk space when running multiple instances of operating systems on multiple servers, whether physical or virtual, is to share files between them; i. e., sharing a single instance of the /usr/local file via network mount. This approach is incompatible with VM disk images; however, since the internal file structure of a VM disk image is invisible to the underlying file system.

Standard compression such as that provided by the Lempel-Ziv compression is ineffective because, while it can reduce the storage space used by a single disk image, it cannot eliminate commonalities between files. Instead, others have proposed the use of De-duplication to reduce the storage space required by the many different VM disk images that must be stored in a medium to large scale VM hosting facility. While it

(www.rdmodernresearch.com) Volume I, Issue I, 2016

seems clear that de duplication is a good approach to this problem, our research quantifies the benefits of using De-duplication to reduce the storage space needed for multiple VM disk images.

The experiments also investigate which factors impact the level of de-duplication available in different sets of VM disk images some of which are under system control (e. g., fixed versus variable-sized chunking and average chunk size) and some of which are dependent on the usage environment (e. g., operating system version and VM target use). By quantifying the effects of these factors, the results provide guidelines for both system implementers and sites that host large numbers of virtual machines, showing which factors are important to consider and the costs of making design choices at both the system and usage level.



2. Related Works:

The Effectiveness of Deduplication on Virtual Machine Disk Images:

Virtualization is becoming widely deployed in servers to efficiently provide many logically separate execution environments while reducing the need for physical servers. While this approach saves physical CPU resources, it still consumes large amounts of storage because each virtual machine (VM) instance requires its own multi-gigabyte disk image. Moreover, existing systems do not support ad hoc block sharing between disk images, instead relying on techniques such as overlays to build multiple VMs from a single "base" image. Instead, we propose the use of De-duplication to both reduce the total storage required for VM disk images and increase the ability of VMs to share disk blocks.

To test the effectiveness of De-duplication, we conducted extensive evaluations on different sets of virtual machine disk images with different chunking strategies. Our experiments found that the amount of stored data grows very slowly after the first few virtual disk images if only the locale or software con- figuration is changed, with the rate of compression suffering when different versions of an operating system or different operating systems are included. We also show that fixed length chunks work well, achieving nearly the same compression rate as variable-length chunks. Finally, we show

(www.rdmodernresearch.com) Volume I, Issue I, 2016

that simply identifying zero-filled blocks, even in ready-to use virtual machine disk images available online can provide significant savings in storage.

An Empirical Analysis of Similarity in Virtual Machine Images:

To efficiently design De-duplication, caching and other management mechanisms for virtual machine (VM) images in Infrastructure as a Service (IaaS) clouds, it is essential to understand the level and pattern of similarity among VM images in real world (IaaS) environments. This paper empirically analyzes the similarity within and between 525 VM images from a production (IaaS) cloud.

Besides presenting the overall level of content similarity, we have also discovered interesting insights on multiple factors affecting the similarity pattern, including the image creation time and the location in the image's address space. Moreover, we found that similarities between pairs of images exhibit high variance, and an image is very likely to be more similar to a small subset of images than all other images in the repository. Groups of data chunks often appear in the same image. These image and chunk "clusters" can help predict future data accesses, and therefore provide important hints to cache placement, eviction, and prefetching.

Efficiently Storing Virtual Machine Backups:

Physical level backups offer increased performance in terms of throughput and scalability as compared to logical backup models, while still maintaining logical consistency. As the trend toward virtualization grows, virtual machine backups (a form of physical backup) are even more important, while becoming easier to perform. The downside is that physical backup generally requires more storage, because of file system meta-data and unallocated blocks.

De-duplication is becoming widely accepted and many believe that it will favor logical backup, but this has not been well studied and the relative cost of physical vs. logical on de duplicating storage is not known. In this paper, we take a data-driven approach using user data to quantify the storage costs and contributing factors of physical backups over numerous generations. Based on our analysis, we show how physical backups can be as storage efficient as logical backups, while also giving good backup performance.

Allow Bandwidth Network File System:

Users rarely consider running network file systems over slow or wide-area networks, as the performance would be unacceptable and the bandwidth consumption too high. Nonetheless, efficient remote file access would often be desirable over such networks particularly when high latency makes remote login sessions unresponsive. Rather than run interactive programs such as editors remotely, users could run the programs locally and manipulate remote files through the file system. To do so, however, would require a network file system that consumes less bandwidth than most current file systems.

Avoiding the Disk Bottleneck in the Data Domain Deduplication File System:

Disk-based De-duplication storage has emerged as the new-generation storage system for enterprise data protection to replace tape libraries. De-duplication removes redundant data segments to compress data into a highly compact form and makes it economical to store backups on disk instead of tape. A crucial requirement for enterprise data protection is high throughput, typically over 100 MB/sec, which enables backups to complete quickly. A significant challenge is to identify and eliminate duplicate data segments at this rate on a low-cost system that cannot afford enough RAM to store an index of the stored segments and may be forced to access an on-disk index for every input segment. This paper describes three techniques employed in the

(www.rdmodernresearch.com) Volume I, Issue I, 2016

production Data Domain De-duplication file system to relieve the disk bottleneck. These techniques include: (1) the Summary Vector, a compact in-memory data structure for identifying new segments; (2) Stream-Informed Segment Layout, a data layout method to improve on-disk locality for sequentially accessed segments; and (3) Locality Preserved Caching, which maintains the locality of the fingerprints of duplicate segments to achieve high cache hit ratios. Together, they can remove 99% of the disk accesses for De-duplication of real world workloads. These techniques enable a modern two-socket dual-core system to run at 90% CPU utilization with only one shelf of 15 disks and achieve 100 MB/sec for single-stream throughput and 210 MB/sec for multi-stream throughput.

Building a High-Performance Deduplication System:

Modern De-duplication has become quite effective at eliminating duplicates in data, thus multiplying the effective capacity of disk-based backup systems, and enabling them as realistic tape replacements. Despite these improvements, single-node raw capacity is still mostly limited to tens or a few hundreds of terabytes, forcing users to resort to complex and costly multi-node systems, which usually only allow them to scale to single digit petabytes. As the opportunities for De-duplication efficiency optimizations become scarce, we are challenged with the task of designing De-duplication systems that will effectively address the capacity, throughput, management and energy requirements of the peta scale age.

In this paper present our high-performance De-duplication prototype, designed from the ground up to optimize overall single-node performance, by making the best possible use of a node's resources, and achieve three important goals: scale to large capacity, provide good De-duplication efficiency, and near raw disk throughput. Instead of trying to improve duplicate detection algorithms, we focus on system design aspects and introduce novel mechanisms that combine with careful implementations of known system engineering techniques.

In particular, we improve single node scalability by introducing progressive sampled indexing and grouped mark and sweep, and also optimize throughput by utilizing an event-driven, multi-threaded client/server interaction model. Our prototype implementation is able to scale to billions of stored objects, with high throughput, and very little or no degradation of De-duplication efficiency.

Ceph: A Scalable, High-Performance Distributed File System:

Ceph, a distributed file system that provides excellent performance, reliability, and scalability. Ceph maximizes the separation between data and metadata management by replacing allocation tables with a pseudo random data distribution function (CRUSH) designed for heterogeneous and dynamic clusters of unreliable object storage devices (OSDs). We leverage device intelligence by distributing data replication, failure detection and recovery to semi-autonomous OSDs running a specialized local object file system. A dynamic distributed metadata cluster provides extremely efficient metadata management and seamlessly adapts to a wide range of general purpose and scientific computing file system workloads. Performance measurements under a variety of workloads show that Ceph has excellent I/O performance and scalable metadata management, supporting more than 250,000 metadata operations per second.

PVFS: A Parallel File System for Linux Clusters:

As Linux clusters have matured as platforms for low cost, high-performance parallel computing, software packages to provide many key services have emerged, especially in areas such as message passing and networking. One area devoid of support, however, has been parallel file systems, which are critical for high performance

(www.rdmodernresearch.com) Volume I, Issue I, 2016

I/O on such clusters. We have developed a parallel file system for Linux clusters, called the Parallel Virtual File System (PVFS). PVFS is intended both as a high-performance parallel file system that anyone can download and use and as a tool for pursuing further research in parallel I/O and parallel file systems for Linux clusters. PVFS and present performance results on the Chiba City cluster at Argonne.

The provide performance results for a workload of concurrent reads and writes for various numbers of compute nodes, I/O nodes, and I/O request sizes. We also present performance results for MPI-IO on PVFS, both for a concurrent read/write workload and for the BTIO benchmark. We compare the I/O performance when using a Myrinet network versus a fast ethernet network for I/O-related communication in PVFS. We obtained read and write bandwidths as high as 700 Mbytes/sec with Myrinet and 225 Mbytes/sec with fast ethernet.

3. Proposed Work:

The De-duplication method best suited to protect data in cloud. This process Deduplicates data both across backups and within backups and does not require any knowledge of the backup data format. The job can be system allocation can be performed for the batch jobs with the sequence of job allocation. And the content similarity is used for the de-duplications process and filtering the De-duplication content. In the time interval, the job can be finished with the effective resources then allocation can be in the order sequences. The included automates filtering, to help an analyst in cloud with similar content by designating of Data duplication can be easily removed by the content similarity algorithm. The workloads can be categorized as per the order of the job work load can be assigned. The scheduling can be maintained as per the sequence of the job within the time interval the particular job can be executed.

A. User Registration and Cloud Access: Access users only to have authentication process before registration, Authentication process is always occurred prior to mobility management process included location registrations and service delivery, and it also ensures network resources are accessed by authorized clients and prevents resources from any illegal client or damage. Before the registration of cloud services to ensure whether the client is an authenticated or not to access cloud server. We can ensure the information stored in the cloud is used judiciously by the responsible stakeholders as per the service level agreements.

B. Indexing the Cloud Data: The based on requirements to prepare the dataset in avoid de-duplication content. Indexing is nothing but consists of structured and unstructured format. Unstructured format is an unarranged format. Sparse Indexing is based on the reference format and capturing the repeated words queries. Indexing converts the unarranged format into structured arranged format. This may be avoid the problem of delay during searching. Sparse Indexing are used to quickly locate data without having to search every database based on the queries is accessed.

C. Finding & Avoiding Similarity: Content similarity detection is typically performed by means of De-duplication, which is broadly classified into static and content defined. Static approaches split the input data in to equally sized chunks, which are then compared among each other. In order to identify and eliminate duplicates. While simple and fast, static approaches suffer from misalignment issues (i.e insertions or deletions lead to the impossibility to detect duplicates).Comparison phase quantifies the degree of similarity between indexing pairs belonging to the same data. And blocking the De-duplication chunks using novel techniques. Novel technique strategy aimed at reducing the user labeling effort in large scale De-duplication tasks.

International Journal of Engineering Research and Modern Education (IJERME) ISSN (Online): 2455 - 4200 (www.rdmodernresearch.com) Volume I, Issue I, 2016

D. Allocating the Workloads Job Management Based on Content Similarity:

The resource can be allocated based on the dependencies of the each job. Based on the dependencies the resource can be allocated. The Content Similarity is a statistical methods to categorize a De-duplication and blocked the adjustable levels of granularity. We cultrate the data set, so that it contains only one representation of each sequence for quantifying and comparative studies. The included automates filtering, to help an analyst in cloud with similar content by designating of Data duplication can be easily removed by the content similarity algorithm.

4. Experimental Analysis and Results:

Implementation is often used in the tech world to describe the interactions of elements in programming languages. In Java, where the word is frequently used, to implement is to recognize and use an element of code or a programming resource that is written into the program.

One aspect of implementing an interface that can cause confusion is the requirement that to implement an interface, a class must implement all of the methods of that interface. This can lead to error messages due to insufficient implementation of methods. In general, the syntactical requirements of implementation and other tasks can be a burden for developers, and mastering this is part of becoming an in-depth user.



Figure 2: System Architecture

There are multiple storage services for a user to store data. Meanwhile, to avoid the problem produced by the centralized "trusted" third party, the responsibility of SeDas is to protect the user key and provide the function of self-destructing data. The brief structure of the user application program realizing storage process. In this structure, the user application node contains two system clients: any third-party data storage system (TPDSS) and SeDas. The user application program interacts with the SeDas server through SeDas' client, getting data storage service.

Implementation is the process of translating design specification in to source code. The primary goal of implementation is to write source code and internal implementation. So that conformance of code to its specification can be easily verified,

(www.rdmodernresearch.com) Volume I, Issue I, 2016

So that debugging, testing and modification are eased. The source is developed with clarity, simplicity and elegance.

The coding is done in a modular fashion giving such importance even to the minute detail so, when hardware and storage procedures are changed or now data is added, rewriting of application programs is not necessary. To adapt or perfect use must determine new requirements, redesign generate code and test exiting software/hardware. Traditionally such task when they are applied to an existing program has been called maintenance.

M. Conton	tSimilarity (Punning) M	crosoft Visual Stu	dio					~ ~ -	
	itannilanty (Running) - M	CIUSUIT VISUAI STU	Cia/Gausa	- 1	1 X				r
			Fileviewer			o. ≜ ₩ . ₹	el = •- = «		sign in E
		Content	Similarity (DeDuplication)) → ;	역 1 16 - 2 등 4		t nt nt 🕫 🗸	
¹						* -			
File	Old Server Name H	amki-PC	New Server Name Sriram-PC		ools				• 4 X
œ	Old Server IP	7.0.0.1	New Server IP 127.0.0.2		ools▼ €	Zoom In 🔍 Zoom Ou	t 🔠 Reset View		
					session: 1	3:57 minutes			-
		Single File Transfer	Multi File Transfer			13:52min		13:56min	
	010	onge ne name							
1112	Uld Server 7.0.0.1\Old Server\1et review - Con	DV114	FileName	New Server					
\\12	7.0.0.1\OldServer\1st review.pptx	· · · · ·	table docy	\\127.0.0.1\NewServer\2nd review - Cop	Manage	MD)		alaat 🔿 Dairata D	0.44
\\12	7.0.0.1\OldServer\2nd review - Cop 7.0.0.1\OldServer\2nd review.pptx	y	Created Time	\\127.0.0.1\NewServer\AddMinutesToCu \\127.0.0.1\NewServer\Avoiding de (3) -	s Memory	MD)	UC Shap	STOL Private D	22
\\12	7.0.0.1 \Old Server \AddMinutes ToCi 7.0.0.1 \Old Server \Avoiding de (3) -		4/28/2016 3:21:57 PM	\\127.0.0.1\NewServer\Avoiding de - Co \\127.0.0.1\NewServer\Content emilativ					
\\12	7.0.0.1\OldServer\Avoiding de (3).	č	Extension	\\127.0.0.1\NewServer\DIAGRAM - Cop					
\\12	7.0.0.1\OldServer\Avoiding.de.co 7.0.0.1\OldServer\Avoiding.de.doc		.docx	\\127.0.0.1\WewServer\MyClass.java					0
\\12	7.0.0.1\OldServer\Content similarity 7.0.0.1\OldServer\Content similarity		Size	\\127.0.0.1\NewServer\new - Copy.docx \\127.0.0.1\NewServer\table - Copy.docx	emory Usar	e CPU Usane			_
\\12	7.0.0.1\OldServer\DIAGRAM - Cop	,	385949		shory easy	Time	Duration	Thread	
\\12	7.0.0.1\OldServer\DIAGHAM.docx 7.0.0.1\OldServer\MainActivity.java		Path			Time	Duration	Trifead	
\\12	7.0.0.1\OldServer\MyClass.java 7.0.0.1\OldServer\new - Copy.docx		Caller	Content Similarity					
\\12	7.0.0.1\OldServer\new.docx		V127.0.0.1\OldSenar\table.dom						
112	7.0.0.1\OldServer\table - Copy.coc 7.0.0.1\OldServer\table docx		11127.0.0.11010361461 2006.0004						
100				FILES UPLODED					_
Bre									
Ne									
Na				OK					_
1									
Ι.									
Breakpoints	Diception Settings Command	Vindow Immediate W	Vindow Output Error List						
Dec. 4.						Ln 13	Col 23	Ch 23	INS
кеаду									
Keady	- A M						20		
(eady	🗎 🥹 🕅						- [• 1 🗟 🛈	12:43 PM 5/7/2016
(eady	🗎 🥝 🖂	-					-	• 1 🗟 🛛	12:43 PM 5/7/2016
e Contonti	Similarity (Russian) Mi		in .			V C Ou	▲)	۹ 🖬 🕈 ا	12:43 PM 5/7/2016
	📄 🔮 🕅	rosoft Visual Stud	io			V 🙂 Qu	▲ ick Launch (Ctrl+Q)	• 🖬 🖬 •	12:43 PM 5/7/2016
Content	📔 🕑 🕅	rosoft Visual Stud	lio FileViewer	- "	1 ×	V C Qu	ick Launch (Ctrl+Q)	۵ 😨 ۲ ۹	12:43 PM 5/7/2016
Content	😭 🕑 🕅	rosoft Visual Stud	io FileViewer Similarity (DeDunlication)		1 × } → ‡	र 9 Qu २ः ४ ₌्री∎ वी	- ick Launch (Ctrl+Q) 턉 '또 '잼 🗮 1	• • • • • • • • • • • • • • • • • • •	12:43 PM 5/7/2016 2 Sign in
Content	Similarity (Running) - Mi	rosoft Visual Stud	io FileViewer Similarity (DeDuplication)		1 × }[÷‡	₹ <mark>9</mark> Qu • • 17 - 5 = 1	•) ick Launch (Ctrl+Q) [[]] 3 3 ■ 1	ר פי	12:43 PM 5/7/2016 2 3 Sign in
Content	Similarity (Running) - Mi Old Server Name Ro	rosoft Visual Stud	io FileViewer Similarity (DeDuplication) New Sever Name Stran-PC		1 × ; = + +	₹ <mark>9</mark> Qu 7 8 - 8 t	•) ickLaunch (Ctrl+Q) [1] (김 정말) 및 (1	▶ 1 😨 ● 	12:43 PM 5/7/2016 - ₽ 2 Sign in E
File R	Similarity (Running) - Mil	rosoft Visual Stud	io FileViewer Similarity (DeDuplication) New Server Name Sram-PC		1 × , → ; ools	♥ 😄 Qu ? : ₩ .	ick Launch (Ctrl+Q)	۲ (۱۹۹۹) ۱۹۹۹ - ۲	12-43 PM 5/7/2016 ■ 🗗 2 Sign in 📘
Content File 2	Similarity (Running) - Mi Old Sever Name Ra Old Sever IP 12	rosoft Visual Stud Content S HePC	io FileViewer Similarity (DeDuplication) New Server Name Stran-PC New Server IP 127.0.2		2 × , ⇒ ± ools ⊂ Q	₹ 🙂 Qu ? : 1 % , 3 ⊨ ¶ Zoom In 즉, Zoom Out	ick Launch (Ctrl+Q)	► • • • • • • • • • • • • • • • • • • •	12-43 PM 5/7/2016
Content File	Similarity (Running) - Mi Old Sever Name Pa Old Sever IP 12	rosoft Visual Stud Content S mePC 200.1	io FileViewer Similarity (DeDuplication) New Server Name Stran-PC New Server IP 127002		3 × 2 → 2 005 005 3 ession: 12 3 ession: 12	₹ 🙂 Qu عند الالاع عند المراجع عند Zoom In ج Zoom Out 1:49 minutes	ick Launch (Ctrl+Q)		12-43 PM 5/7/2016 □ 2 Sign in □ 4 Sign in Sign in □ 4 Sign in □ 4 Sign in □ 4 Sign in Sign i
Content File	Similarity (Running) - Mi Old Server Name Ra Old Server IP 12	rosoft Visual Stud Content S ne PC 10.1 Sngle File Transfer	io FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server IP 127:0.2 Nut: File Transfer		3 ×	♥ ● Qu ♥ ● Qu ♥ ● Qu ♥ ● Qu ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 ♥ ■ 0 <td>t 🔐 Reset View</td> <td> P P S S</td> <td>12-43 PM 5/7/2016 ■ ■ 2 Sign in ■ ■ ↓ ×</td>	t 🔐 Reset View	 P P S S	12-43 PM 5/7/2016 ■ ■ 2 Sign in ■ ■ ↓ ×
Reserved and the second	Cid Server Name Old Server I 12 Old Server I	rosoft Visual Stud Content S ne PC 100.1 Single File Transfer	IO FileViewer Similarity (DeDuplication) New Server Name Sinan-PC New Server 1P 127:00.2 Mub File Trender	- 🗆	3 × cols ools © s session: 11 min	₹ © Qu • 2 • 1 • 5 • 0 • 2 • • • 0 • 2 • • • • • • • • • • • • • •	ick Launch (Ctrl+Q)	P	12-43 PM 5/7/2016
Respy Content File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File File F	Cid Sever Name Pa Old Sever Name Pa Old Sever IP 12 Old Sever 20 1 Sever 12 review - Copy	rosoft Visual Stud Content S HePC Single File Transfer PKL*1	Io FileViewer Similarity (DeDuplication) New Server Name Stran-PC New Server IP 127.00.2 Multi Rie Transfer FielName	New Server 11/2700 TiVers Server 1d review - Cop	a × p → t ools • ⊂ p session: 11 min	₹ © Qu • • • • • • • • • • • • • • •	 ↓ ick Launch (CM+Q) iii 3 32 ↓ iii 3 32 ↓ iii 8 Reset View iii 1 + + + + + 	P	12-43 PM 5/7/2016
Kasay Content Fik Image: State	Cid Server Name Pa Old Server Name Pa Old Server P 12 Old Server D0 10d/Server 18 review pCo. D0 10d/Server 18 review pCo.	rosoft Visual Stud Content S 001 Single Rie Tiender PKU1	io FileViewer Similarity (DeDuplication) New Server Name, Stram PC New Server IP 127:00.2 Multi Rie Transfer FileName Anoding de -Copy doct	New Server 1/12700 11 Wes Server 1 dt review - Cop 1/12700 11 Wes Server 1 dt review - Cop	a ★	₹ € Qu * * € Qu * * € Qu * * € Qu * * * € * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * <td>- ick Launch (CM+Q) 15 3 3 3 1 1 1 1 3 3 2 1 1 1 1 3 3 1 1 1 1 1 3 1 1 1 1 1 1 1 1</td> <td>P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P</td> <td>12-43 PM \$/7/2016 ■</td>	- ick Launch (CM+Q) 15 3 3 3 1 1 1 1 3 3 2 1 1 1 1 3 3 1 1 1 1 1 3 1 1 1 1 1 1 1 1	P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P	12-43 PM \$/7/2016 ■
Image: Content Image: Conten <	Cid Server Name Pa Old Server Name Pa Old Server IP 12 Old Server IP 12 Old Server IP 12 Old Server 010005erver Vid review -Copy 010005erver Vid review -Copy	Content S Content S as-PC 201 Single Rie Transfer PKLM	IO FileViewer Similarity (DeDuplication) New Sever Name Stran-PC New Sever IP 127.00.2 Multi File Transfer Relvance Andring & -Copy docs Created Time	New Server 1/27/00 TWen Server 1d review - Cop 1/27/00 TWen Server 1d review - Cop	3 × 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2	₹ € Qu ₹ 75 € E \$ 75 € E \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	ick Launch (Ctrl+Q)	P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P	12-43 PM \$/7/2016 ■ ■ 2 Sign in ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Reserve Content File Image: Content	Cid Sever Name Old Sever Name Old Sever IP Old Sever IP 2010/Sever Nateway ptc. 2010/Sever Nateway ptc. 2010/Sever Nateway ptc. 2010/Sever Nateway ptc. 2010/Sever Nateway ptc. 2010/Sever Nateway ptc. 2010/Sever Nateway ptc.	Content S Gontent S Gal Single Ric Transfer PKU1	IO FileViewer Similarity (DeDuplication) New Server Name Sinan-PC New Server 17 1270.02 Mult Ple Transfer Fielhame Fielhame Fielhame S77/2016 12:30.46 PM	New Server VIZ20 B VNew Server 1st review - Cop VIZ20 B VNew Server 1st review - Cop	a X cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols cols c	₹ € Qu ₹ ₹ ► ¶ ₹ ₹ ► ¶ ₹ ₹ ► ¶ ₹ ₹ ► ¶ \$ Zoom Un ¶ Zoom Out \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- ick Launch (CM-Q) 1 3 3 3 1 ■ 1 1 3 73 1 ■ 1 1 3	P - P - Statemin - Statem	12-43 PM \$/7/2016 ■ 2 2 Sign in ■ 2 3 Sign in ■ 2 4 Sign in ■ 2 2 Sign in ■ 2 2 2 2
	Cid Server Name Pa Old Server Name Pa Old Server IP 12 Old Server IP 12 Old Server II treiver poto 10 10 OdServer Vid review poto 10 10 OdServer Vid review r-Copy 10 10 OdServer Vid review roto 10 10 0dServer Vid review roto 10 0dServer Vid	Content S Content S del PC Sage Re Tander PKL19	IC FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server IP 127.00.2 Mult Rie Transfer Rielhame Anoding de -Copy docs Created Time Stranding de -Copy docs Created Time Stranding de John Stranding Stranding de Stranding Stranding Stranding de Stranding Stranding de Stranding Stranding Stranding de Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding Stranding S	New Sever 112720 11 Wes-Sever Jac meier - Cop 112720 11 Wes-Sever Jac meier - Cop 112720 11 Wes-Sever Jack meier - Cop 112720 11 Wes-Sever - Month Sev - Cop 112720 11 Wes-Sever - Month Sev - Cop 112720 11 Wes-Sever - Month Sever - Cop 112720 11 Wes-Sever - Mandhah - Cop 112720 11 Wes-Sever - Mandhah - Cop	3 × i ⇒ ± ools • ⊂ s session: 15 min _ 1 i Memory (₹ € Qu	(b) (P P P P P	12-43 PM S/7/2016 - 2 2 Sign in Pytes 22 0
Image: Second	Cid Server Name Pa Old Server Name Pa Old Server P 12 Old Serv	rosoft Visual Stud Content S 001 Single Rie Tiernfer PKLIS	lio FileViewer Similarity (DeDuplication) New Server Name Stran-PC New Server IP 127.00.2 Multi Rie Transfer FileName Anordry de - Capy door. FileName Anordry de - Capy door. Develot Time Service Jacobier Bereton door.	New Server 1220.01 New Server'1 at review - Cop 1220.01 New Server'1 at review - Cop 1220.01 New Server'1 at review - Cop 1220.01 New Server'1 Add Neuta 10 1220.01 New Server'1 Man Andrey Jan 1220.01 Ne	3 × 2 → 2 0 0 s 0 s 0 3 session: 11 min 1 3 Memory (1 min 1)	₹ € Qu	- ick Launch (Chi-Q) fi 3 3 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	P • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	12-43 PM S/7/2016 Sign in Sign in Si
Image: Second	Cid Server Name Pa Cid Server Name Pa Cid Server Part Cid Server P 12 Old Server P 12 D110dServer 18 review pCor D110dServer 18 review pCor D110dServer 18 review pCor D110dServer 19 review pCor D110dServer 19 review pCor D110dServer 10 review pCor	Content S Content S 001 Single Re Transfer PKLU9	lio FileViewer Similarity (DeDuplication) New Server Name Stram PC New Server Name Stram PC New Server IP 127:00.2 Multi File Transfer FileName Anoding de -Copy docs Deated Time S77/2016 12:30 45 PM Exercision docs Sale Sale Sale Sale Sale Sale Sale Sale	New Server 1/27/00 TWer-Server 1 dt revier - Cop 1/27/00 TWer-Server 1 dt revier - Cop 1/27/00 TWer-Server 1 dt revier - Cop 1/27/00 TWer-Server 1 de Twer-Server 1/27/00 TWer-S	3 × 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2	7 © Qu 7 7 0 0 2 7 0 0 0 2 7 0 0 0 2 2 0 0 0 0 549 minutes 15:44min 15:44min 0 0 0 MB) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	 I ick Launch (Chri-Q) I I<td>P P s s s s s s s s s s s s s s s s s s</td><td>12-43 PM 577/2016 e e 3 Sign in E Sign in E Bytes 22 0</td>	P P s s s s s s s s s s s s s s s s s s	12-43 PM 577/2016 e e 3 Sign in E Sign in E Bytes 22 0
Content Content Fit # Ter Ter Ter Ter Ter Ter Ter Ter	Cid Server Name Pa Old Server Name Pa Old Server I Part Old Server IP 12 Old Server II tervier - Copy 10 Old Server II tervier	Content S se-PC 2001 Single File Transfer PK US	IO FileViewer Similarity (DeDuplication) New Server Name Sinan-PC New Server Name Sinan-PC New Server Name Sinan-PC Nucle Transfer FileName Anoding de - Copy doct Desertor Transfer Sinanda de - Copy doct Desertor Sinanda de - Copy doct Sinanda de - Copy doct Desertor Sinanda de - Copy doct Sinanda de - Copy doct Si	New Server VIZ20.01 Nieu-Server 1st review - Cop VIZ20.01 Nieu-Server 1st review - Copto VIZ20.01 Nieu-Server 1st review - Copto	a X cols cols session: I: min i: Memory (mory Usag	V E Qu Image: I		P C C C C C C C C C C C C C C C C C C C	12-53 PM 5/7/2016
	Citizen Constraints (Constraints) Citizen Constraints) Citizen Constraints (Constraints) Citizen Constraints) Citizen Constraint	Content S de PC Sage Re Tander PKU1	IC FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server IP 127.0.2 Mult Rie Transfer Relvance Anordrig de - Copy docs Catado Time 5.7270 (212) 445 PM Eternion docx Site 7.2913 Path Path	New Sever NUZZO AT New Sever's 18 review - Copy VUZZO AT New Sever's New York 08 review - Copy VUZZO AT New Sever's New York 08 review - Copy VUZZO AT New Sever's Month 04 review - Copy VUZZO AT New Sever's Month 04 review - Copy VUZZO AT New Sever's Month 04 review - Copy VUZZO AT New Sever's Month 04 review - Copy VUZZO AT New Sever's Month 04 review - Copy VUZZO AT New Sever's Month 04 review - Copy VUZZO AT New Sever's Month 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's Month 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc VUZZO AT New Sever's MOL 04 review - Copy doc <t< td=""><td>2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 ×</td><td>T © Qu Image: State of the st</td><td>Control Control Contr</td><td>P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P</td><td>12-43 PM 5/7/2016 - 0 2 Sign in - 0 3 Sign in - 0 4 - 0 4</td></t<>	2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 ×	T © Qu Image: State of the st	Control Contr	P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P	12-43 PM 5/7/2016 - 0 2 Sign in - 0 3 Sign in - 0 4 - 0 4
Kasay	Cid Server Name Pa Old Server Name Pa Old Server Name Pa Old Server P 12 Old S	rosoft Visual Stud Content S da1 Single Rie Toender PKUS	lio FileViewer Similarity (DeDuplication) New Server Name Stran-PC New Server IP 127.0.2 Multi Rie Transfer Pandrig de - Capy docx Deseted Time 5-72015 12.20 45 PM Betreinn docx Sale 79813 Path	New Server 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop 1/27.00 Ti New Server 1 da rever - Cop <	x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x <	V E Qu V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V	ick Launch (Ctri+Q)	1548min shot Private B	12-23 PM 5/7/2016
Content C	Cid Server Name Ra Cid Server Name Ra Cid Server Rame Ra Cid Server Rame Ra Cid Server Rame Ra Cid Server Rame Ra Di Tudiserve To Rame Rame Da Tudiserve To Rame Rame Da Tudiserve To Rame Rame Da Tudiserve To Rame Rame Da Tudiserve Andrewer Copy Da Tudiserve Andrewer Andrewer Da Tudiserve Andrewer Andrewer Da Tudiserve Andrewer Andrewer Da Tudiserve Andrewer Andrewer Andrewer Da Tudiserve Andrewer Andrewer Andrewer Da Tudiserve Andrewer Andr	Insoft Visual Stud Content S 001 Single Re Transfer PKU9	IO FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server P 127:002 Mult Rie Transfer FileName Autor Rie Transfer FileName Stramsford &- Copy door Deated Time 57:72015 12:00:45 PM Eleman door Size 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:813 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:713 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:715 79:	Here Server 127.0.0 Tilee Server 1 dat treiter - Cop 127.0.0 Tilee Server 1 dat treiter - Cop 127.0.0 Tilee Server Add tester - Cop 127.0.0 Tilee Server Mones Add tester 127.0.0 Tilee Server tester - Copy doc 127.0.0 Tilee Server tester 127.0 Tile	3 × 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	7 © Qu 7 7 0 0 2 7 0 0 0 549 minutes 1544min 1544min 0 6 CPU Usage Time 1	ick Launch (Ctri-Q) ick Launch (Ctri-Q) ick Reset View Cc ▼ Snage cc ▼ Snage cc ▼ Snage	P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P	1243PM 5/7/2016 -
Content Content Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite Fite	Cid Server Name Ro Cid Server Name Ro Cid Server Name Ro Cid Server IP 12 Old Server IP 12 Old Server IP 12 Old Server II review - Copy D1 1005/serve Id review - Cop D1 1005/serve Id review - Cop	Content S sec PC Single File Transfer PK ^{LU}	IO FileViewer Similarity (DeDuplication) New Server Name Simm-PC New Server P 127:00.2 Multi Re Transfer ReName Avoiding de - Coxy doct Desetor Time 577/2016 12:30:46 PM Eternion Eternion Size 79813 Path W2720.010d/Server FullPath W1270.0.10d/Server-Vwoding de	New Server VIZ2020 INVen-Server' 1st review - Copy VIZ2020 INVen-Server' 1st review - Copy VIZ2020 INVen-Server' Addresser-Copy VIZ2020 INVen-Server' Addresser-Copy VIZ2020 INVen-Server' Addresser' Addresser VIZ2020 INVen-Server' Addresser VIZ2020 INVen-Server' Addresser VIZ2020 INVen-Server' Addresser VIZ2020 INVen-Server' Addresser VIZ2020 INVen-Server' Marchardy gas VIZ2020 INVen-Server' Marchardy gas	a X cols cols C is ession: It min i Memory (mory Usag	V © Qu * *6 \$ \$ * *6 \$ \$ \$ * * \$ \$ \$ \$ * * \$ \$ \$ \$ \$ * * \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	C Vereining Control of Control o	P Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q	12-23 PM 5/7/2016
	Cid Server Name Pa Old Server Name Pa Old Server Name Pa Old Server IP 12 Old Server IP 12 Old Server II treiver pat. 10 10 OdServer Vid Inverse Vid Inverse Pat. 10 10 OdServer Vid Inverse Vid Inverse Pat. 10 10 OdServer Vid Inverse Vid Inverse Vid Inverse Pat.	Content S de PC Sage Re Tander PKU1	IC FileViewer Similarity (DeDuplication) New Server Name Snam-PC New Server Name Snam-PC New Server IP 127.0.2 Mult Rie Transfer Relvance Anordry 64-Copy docs Copy docs Relvance Anordry 64-Copy docs Copy docs Stratistical Strategy Relvance Anordry 64-Copy docs Copy docs Strategy Strategy Relvance Anordry 64-Copy docs Copy docs Strategy Strategy Relvance Strategy Strategy Strategy Strategy Strategy Strategy Strategy Strategy Strategy Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrition Nutrito Nutrition Nutrito Nutrition Nutrit	New Server NUZZOB VINA-Server' Id mixeer - Cop VUZZOB VINA-Server' Id mixeer - Cop VUZZOB VINA-Server' VAndrage (G)	2 × 2 × 2 × 2 × 2 × 2 2	₹ ₹ ₹ € Qu ₹ ₹ ₹ ► ¶ ₹ ₹ ₹ ► ¶ \$200m In \$ \$ 200m Out \$49 minutes 1544min 1544min MB € CPU Usage Time	Children (Chi-Q) Children (Chi-Q) Children (Chi-Q) Children (Children (Chil	P P I I S-48min Shot Private Thread	1243PM \$77/2016
Zasay Zasay Zasay Zontent Fik Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	Cid Server Name Pa Old Server Name Pa Old Server Part Old Server Part Old Server Part Di Old Server Part Di Di Old Server Part Di Old Server Part	PKUS	IC FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server Name Stram-PC New Server Name Stram-PC Nuth Rie Transfer Muth Rie Transfer Androg de - Capy docx Decedor Time S-Capy do	Image: Sever 1/127.08.11 New Sever 1 American - Coping 1/127.08.11 New Sever 2 American - Coping 1/127.08.11 New Sever 1 American - Coping 1/127.08.11 Ne	3 × 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	R Qu R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R Q R </td <td>ick Launch (Ctri+Q)</td> <td>1548min shot Private P</td> <td>12-39M 5/7/2016 - 67 2 Signin (- 77 2 - 77 2 Signin (- 77 2 - 77 2 - 77 2 Signin (- 77 2 - 77 2 Signin (- 77 2 Signin (-</td>	ick Launch (Ctri+Q)	1548min shot Private P	12-39M 5/7/2016 - 67 2 Signin (- 77 2 - 77 2 Signin (- 77 2 - 77 2 - 77 2 Signin (- 77 2 - 77 2 Signin (-
Content C	Cid Server Name Ra Cid Server Name Ra Cid Server P 12 Cid Server P 12 Cid Server Rame Ra Cid Server Rame Ra Cid Server Rame Ra Di Tudiserver State Rame - Copy Di Tudiserver State Rame - Copy State Di Tudiserver State Rame Rame - Copy State Di Tudiserver State Rame Rame - Copy State Di Tudiserver State Rame Rame Rame Rame Rame Rame Rame Ram	Insoft Visual Stud Content S 001 Single Re Transfer PKU9	IO FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server P 127:00.2 Multi File Transfer FileName Andrig de - Capy docs Desetal Time 577/2015 12:00 45 PM Destinan docs Size 79313 79313 79313 79313 79313 79313 79313 79313 79313	New Server New Server NU270.01 Niew Server' 1st miew - Cop NU270.01 Niew Server' Ast miew - Cop NU270.01 Niew Server' Addresser - Cop NU270.01 Niew Server' Home - Cop Nu270.01 Nie	3 × 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	V E Qu V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V	Ide Control (Chri-Q) Ide Control (Chri-Q) Ide Control (Chri-Q) Ide Control (Chri-Q) Ide Control (Christian Christian Christia	P P Pivate 5	1243PM 5/7/2016 - d ² 3 Signin [- + # × 0 - + # ×
	Cid Server Name Ra Old Server Name Ra Old Server Name Ra Old Server IP 22 Old Server IP 22 Old Server IP 22 Old Server II 22	RKU9	IO FileViewer Similarity (DeDuplication) New Server Name Sinan-PC New Server Name Sinan-PC Nuth Rie Transfer Nuth Rie Transfer Nuth Rie Transfer Riehame S77/2016 12/20 A 5 PM Exersion docx Sine 79/813 Path 11/27/0.0.10d/Server Fulfrah U127/0.0.10d/Server-Wooding desi	New Server VIZ2020 INVen-Server \1st review - Cop VIZ2020 INVen-Server \1st review - Cop VIZ2020 INVen-Server \1st review - Cop VIZ2020 INVen-Server \Xord pite - Cop VIZ	Cols Cols Cols Sector: P Sector: P Sect	V © Qu * *3 ÷ I * *3 ÷ I * Zoom Un I S:49 minutes * I I I MB) I I I * CPU Usage Tme I	C Vertex Control (Chr-Q) C C Snap C C Snap C C Snap C C C Snap C C C C C C C C C C C C C C C C C C C	P P P P P P P P P P P P P P P P P P Thread	1243PM 5/7/2016
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Cid Server Name Pa Old Server Name Pa Old Server Name Pa Old Server Serv	PKU1	IC FileViewer Similarity (DeDuplication) New Server Name, Sram-PC New Server Name, Sram-PC Nut: Rie Transfer Nut: Rie Transfer Andrig de -Copy doc Corected Time Serz 2012 16 123 46 PM Extension doc Serz 2012 16 123 46 PM Extension doc Serz 2013 16 23 46 PM Extension doc Serz 2013 16 23 46 PM Extension doc Serz 2013 16 23 46 PM Extension doc	Iew Sever VI22001 VIew-Sever's Ita review - Cop VI22001 VIew-Sever's And review - Cop VI22001 VIew-Sever's Mond cop VI22001 VIew-Sever's Mond cop VI220001 VIew-Sever's Mond cop VIEW-Sever's Mond co	2 × 2 × 2 × 2 × 2 × 2 × 2 2 ×	R R R R Soom In R MB In	Control Contr	15x48min shot Private C	1243PM 5/7/2016 - 6 ³ 3 - 6 ³ 4 - 7 ⁴ X -
Content C	Cid Server Name Park Cid Server Name Park Cid Server Park Cid	PKUS	lio FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server Name Stram-PC New Server Name Stram-PC Nuth Rie Transfer Muth Rie Transfer Andring de - Capy docx Decedor Time Scroot Strawer HellName Andring de - Capy docx Decedor Time Scroot Strawer HellName Vit27:00 1106/Server HellPath Vit27:00 1106/Server/Wooding de	New Saver 127200 Tilen Saver 1 127200 Tilen Saver 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3 × 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2	V E Qui V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V V	ick Launch (Chri-Q) ick Launch (Chri-Q) if 3 3 1 ick Reset View if GC * Snap ick Duration	1548min Thread	1243PM 5/7/2016 - 0 ³ 2 Signin [- 0 ³ 2 - 0 ³ 2
2009 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010	Cid Server Name Ra Old Server Name Ra Old Server Name Ra Old Server IP 12 Old Server IP 12	Content S se-PC Single File Transfer	io FileViewer Similarity (DeDuplication) New Server Nare Snam-PC New Server P 127.00.2 Muß Ple Trender Nuß de Capy doc. Detection Social Trender S772016 1230 46 PM Elemion doc. Size 73913 Path W277.00 10/d/Server FulPath W277.00 10/d/Server / Avading de	Ner Sener Ner Sener 127200 11Ner Sener 1st treiser - Cop 127200 11Ner Sener 1st treiser - Cop 127200 11Ner Sener 1Ast Nere - Cop 127200 11Nere Sener 1Ast Nere	a X	V E Qui V F Qui V F Qui V F Qui V V Qui <td>Ide Control (Chr-Q) Ide Control (Chr-Q) I</td> <td>P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P</td> <td>1243PM 5/1/2016 - d² 3 Signin [- d² 3 - d² 3</td>	Ide Control (Chr-Q) I	P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P P	1243PM 5/1/2016 - d ² 3 Signin [- d ² 3 - d ² 3
	Citizative (Running) - Mi Old Server Name Pa Old Server Name Pa Old Server IP 2 Old Server IP 2 Old Server IP 2 Old Server II to revery por Old Server II to rever II to revery por Old Server II to r	PKU1	III FileViewer Similarity (DeDuplication) New Server Name Sram-PC New Server Name Sram-PC Nuth Rie Transfer Nuth Rie Transfer Anodrog &- Copy docs Organization Muth Rie Transfer Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackster Strackste	Iter Server VIZ2001 Weis Server 1 de reiver - Cop VIZ2001 Weis Server 1 de reiver 1 de reiver 1 de reiver - Cop VIZ2001 Weis Server	Cols Cols Cols Session: 12 Session: 12 Sessio: 12 Se	V © Qu I V6 I I I V6 I I S49 minutes I I I MB) I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	Ide Contraction	P Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q	1243PM 5/7/2016 - C 3 3 Signin
1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000	Cid Server Name Pa Old Server Name Pa Old Server Name Pa Old Server Serv	PKU1	III FileViewer Similarity (DeDuplication) New Server Name, Sram-PC New Server Name, Sram-PC New Server NP 127.00.2 Mult: Rie Transfer Audrig de -Copy docs Control 12.000 (Song docs) Participation (Song	Iwi Savar NIZZ04 TWeisServi Tarover-Cop VIZZ04 TWeisServi Ta	3 × ools G s session: 11 iii iiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	Image: Constraint of the second se	ick Launch (Ctri+Q) isk Launch (Ctri+Q) isk Reset View isk Reset View isk GC ¥ Snap is Duration	Isotamin Thread	1243PM 5/7/2016 - 67 2 Sign in [- 77 X -
Content C	Cid Server Name Park Old Server Name Park Old Server Park Old	PKUS	IO FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server P 127.00.2 Multi File Transfer FileName Andrig de - Copy doct Desetat Telentan doct - S Size 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 79313 7931	New Sarer 127200 Tiles Sarer 1 dt triter - Cop 127200 Tiles Sarer 1 den Houte 1 dt 127200 Tiles Sarer 1 den Houte 1 dt 12700 Tiles Sarer 1 dt	3 × 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Image: Constraint of the second sec	Control (Christian Christian)	Isuania Thread	1243PM 5/7/2016 - C ³ 2 Signin [- V - V - V - V - V - V - V - V
2009 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010 2010	Similarity (Running) - Mi Old Sever Name R Old Sever Name R Old Sever Name R Old Sever IP 12 Old Sever IP 12 O	rosoft Visual Stud	io FileViewer Similarity (DeDuplication) New Server Name Snam-PC New Server P 127.00.2 Muß Ple Trender FileName Androg de - Capy dock Dested Time 577/2016 1230 46 PM Etersion dock Size 73913 Path W277.00 10/05 erver / Audity de W27.00 10/05 erver / Audity de W27.00 10/05 erver / Audity de	Ner Sover VIZ70.01 Weis Sover 1st treiser - Cop VIZ70.01 Weis Sover 1st treiser - Cop VIZ70.01 Weis Sover 1st treiser - Cop VIZ70.01 Weis Sover 1 Ast Nerse - Cop VIZ70.0	a X	V E Qui V F Qui V F Qui V V Qui <td>Ide Control (Chr-Q) Ide Control (Chr-Q) I</td> <td>P P Thread</td> <td>1243PM 5/7/2016 - d² 3 Signin [- - - - - - - - - - - - -</td>	Ide Control (Chr-Q) I	P P Thread	1243PM 5/7/2016 - d ² 3 Signin [- - - - - - - - - - - - -
2009 2000 Content File File Image: Content File Image: Conten <	Control Server Variance Server	Incosoft Visual Stud	IO FileViewer Similarity (DeDuplication) New Server Name Sram-PC New Server P 127/10/2 Multi File Transfer New Gever P 127/10/2 Multi File Transfer S77/2016 12/20 45 PM Exercision Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Social Soci	New Server MUZZ002 INVen-Server' Litt review - Copy VIZZ002 INVen-Server' Montchirdt review - Copy does VIZZ002 INVen-Server' Montchirdt review - Copy	Cols Cols Cols Sector I Sector I	V Image: Constraint of the second s	Cold2	Co 22	1249PM 5/7/2016
Reskpoints Content Fit Image: Content Fit <td>Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Control Co</td> <td>Indow Immediate W</td> <td>IC FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server Name Stram-PC New Server Name Stram-PC Nut Rie Transfer Andrig de - Coxy docs Cozetad Time Andrig de - Coxy docs Cozetad Time Andrig de - Coxy docs Cozetad Time StraZilo 12 (3 da FM Effersion docx StraZilo 12 (3 da FM Effersion docx StraZilo 12 (3 da FM Effersion docx StraZilo 12 (3 da FM Effersion USZ7 10 (10 de Server Handrig de USZ7 10 (10 de Server Vieweich) StraZilo 11 (0 de Server Vieweich) StraZilo 11 (0 de Server Vieweich) NUZZ 10 (10 de Server Vieweich) StraZilo 11 (0 de Server Vieweich) StraZilo 12 (0 de Server Vieweich</td> <td>Iter Server VIZ200 INVes-Server I tarvier - Cop VIZ200 INVes-Server I darvier - Cop VIZ200 INVes-Server I darvier - Cop VIZ200 INVes-Server I darvier - Cop VIZ200 INVes-Server Voordig de - Co VIZ200 INVes-Server Voordig de - Co</td> <td>Cols Cols Cols Cols Cols Cols Cols Cols</td> <td>Com In Q Zoom Un 49 minutes 15:44min MB) e CPU Usage Time</td> <td></td> <td>Thread</td> <td>12-39M 5/7/2016 - 67 2 Sign in (- 77 - 77 - 77 - 77 - 77 - 77 - 77 -</td>	Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Vision Control Server Control Co	Indow Immediate W	IC FileViewer Similarity (DeDuplication) New Server Name Stram-PC New Server Name Stram-PC New Server Name Stram-PC Nut Rie Transfer Andrig de - Coxy docs Cozetad Time Andrig de - Coxy docs Cozetad Time Andrig de - Coxy docs Cozetad Time StraZilo 12 (3 da FM Effersion docx StraZilo 12 (3 da FM Effersion docx StraZilo 12 (3 da FM Effersion docx StraZilo 12 (3 da FM Effersion USZ7 10 (10 de Server Handrig de USZ7 10 (10 de Server Vieweich) StraZilo 11 (0 de Server Vieweich) StraZilo 11 (0 de Server Vieweich) NUZZ 10 (10 de Server Vieweich) StraZilo 11 (0 de Server Vieweich) StraZilo 12 (0 de Server Vieweich	Iter Server VIZ200 INVes-Server I tarvier - Cop VIZ200 INVes-Server I darvier - Cop VIZ200 INVes-Server I darvier - Cop VIZ200 INVes-Server I darvier - Cop VIZ200 INVes-Server Voordig de - Co VIZ200 INVes-Server Voordig de - Co	Cols Cols Cols Cols Cols Cols Cols Cols	Com In Q Zoom Un 49 minutes 15:44min MB) e CPU Usage Time		Thread	12-39M 5/7/2016 - 67 2 Sign in (- 77 - 77 - 77 - 77 - 77 - 77 - 77 -

(www.rdmodernresearch.com) Volume I, Issue I, 2016

5. Conclusion and Future Enhancement:

We explored the impact of many factors on the effectiveness of De-duplication. We showed that package installation and language localization have little impact on Deduplication ratio. However, factors such as the base operating system. The Linux distribution can have a major impact on De-duplication effectiveness. Thus, we recommend that hosting centers suggest "preferred" operating system distributions for their users to ensure maximal space savings. If this preference is followed subsequent user activity will have little impact on De-duplication effectiveness. We found that, in general, 40% is approximately the highest De-duplication ratio if no obviously similar VMs are involved.

In future work we plan to explore several promising avenues. First, we did not explore what happens when the groups are not operating simultaneously and/or access common content at different times. How to leverage and anticipate such Desynchronizations can provide further potential for improvement. Second, our approach treats all chunks individually, both in terms of advertisements and exchanges. Thus, it would be interesting to understand and exploit correlations between chunks.

6. References:

- 1. K. Jin and E. L. Miller, "The effectiveness of De-duplication on virtual machine (VM) disk images," in Proceedings of SYSTOR 2009: The Israeli Experimental Systems Conference, ser. SYSTOR '09. Haifa, Israel: ACM, 2009, pp. 7:1–7:12.
- 2. K. R. Javaram, C. Peng, Z. Zhang, M. Kim, H. Chen, and H. Lei, "An empirical analysis of similarity in virtual machine images," in Middle ware '11: Proceedings of the Middleware 2011 Industry Track Workshop. Lisbon, Portugal: ACM, 2011, pp. 6:1-6:6.
- 3. R. Schwarzkopf, M. Schmidt, M. R[°]udiger, and B. Freisleben, "Efficient storage of virtual machine images," in Science Cloud '12: Proceedings of the 3rd Workshop on Scientific Cloud Computing Date. Delft, the Netherlands: ACM, 2012, pp. 51-60.
- 4. Muthitacharoen, B. Chen, and D. Mazi'eres, "A low-bandwidth network file system," SIGOPS Oper. Syst. Rev., vol. 35, no. 5, pp. 174–187, Oct. 2001.
- 5. M. Rabin, "Fingerprinting by random polynomials," Center for Research in Computing Technology, Harvard University, Tech. Rep. TR-CSE-03-01, 1981.
- 6. B. Zhu, K. Li, and H. Patterson, "Avoiding the disk bottleneck in the data domain De-duplication file system," in FAST'08: Proceedings of the6th USENIX Conference on File and Storage Technologies. San Jose, USA: USENIX Association, 2008, pp. 18:1-18:14.
- 7. C. Dubnicki, L. Gryz, L. Heldt, M. Kaczmarczyk, W.Kilian, P. Strzelczak, J. Szczepkowski, C. Ungureanu, and M. Welnicki, "Hydrastor:a scalable secondary storage," in FAST '09: Proceedings of the 7th conference on File and storage technologies. San Francisco, USA: USENIX Association, 2009, pp. 197–210.
- 8. F.Guo and P. Efstathopoulos," Building a high-performance De-duplication system," in USENIXATC'11: Proceedings of the 2011 USENIX Conference on USENIX Annual Technical Conference. Portland, USA: USENIX Association, 2011, pp. 25–39.
- 9. B. Nicolae, "Towards Scalable Checkpoint Restart: A Collective Inline Memory Contents Deduplication Proposal," in IPDPS '13: The 27thIEEE International Parallel and Distributed Processing Symposium, Boston, USA, 2013, pp. 19–28.
- 10. Z. Shen, Z. Zhang, A. Kochut, A. Karve, H. Chen, M. Kim, H. Lei, and N. Fuller, "Vmar: Optimizing i/o performance and resource utilization the cloud," in Middleware

(www.rdmodernresearch.com) Volume I, Issue I, 2016

'13: Proceedings of the 14th ACM/I-FIP/USENIX International Middleware Conference, vol. 8275. Springer Berlin Heidelberg, 2013, pp. 183–203.

- 11. K. Razavi, A. Ion, and T. Kielmann, "Squirrel: Scatter hoarding vm image contents on iaas compute nodes," in HPDC '14: The 23rd ACM International Symposium on High-performance Parallel and Distributed Computing. Vancouver, Canada: ACM, 2014, pp. 265–278.
- 12. R. Koller and R. Raju, "I/o deduplication: Utilizing content similarity to improve i/o performance," in FAST '10: Proceedings of the USENIX File and Storage Technologies. USENIX Association, 2010, pp. 211–224.
- 13. B. Mao, H. Jiang, S. Wu, Y. Fu, and L. Tian, "Read-performance optimization for deduplication based storage systems in the cloud," Trans. Storage, vol. 10, no. 2, pp. 6:1–6:22, Mar. 2014.
- 14. U. Deshpande, X. Wang, and K. Gopalan, "Live gang migration of virtual machines," in HPDC '11: Proceedings of the 20th International Symposium on High Performance Distributed Computing. San Jose, USA: ACM, 2011, pp. 135–146.
- 15. S. Al-Kiswany, D. Subhraveti, P. Sarkar, and M. Ripeanu, "Vmflock: Virtual machine co-migration for the cloud," in Proceedings of the 20thInternational Symposium on High Performance Distributed Computing, ser. HPDC '11. San Jose, USA: ACM, 2011, pp. 159–170.