

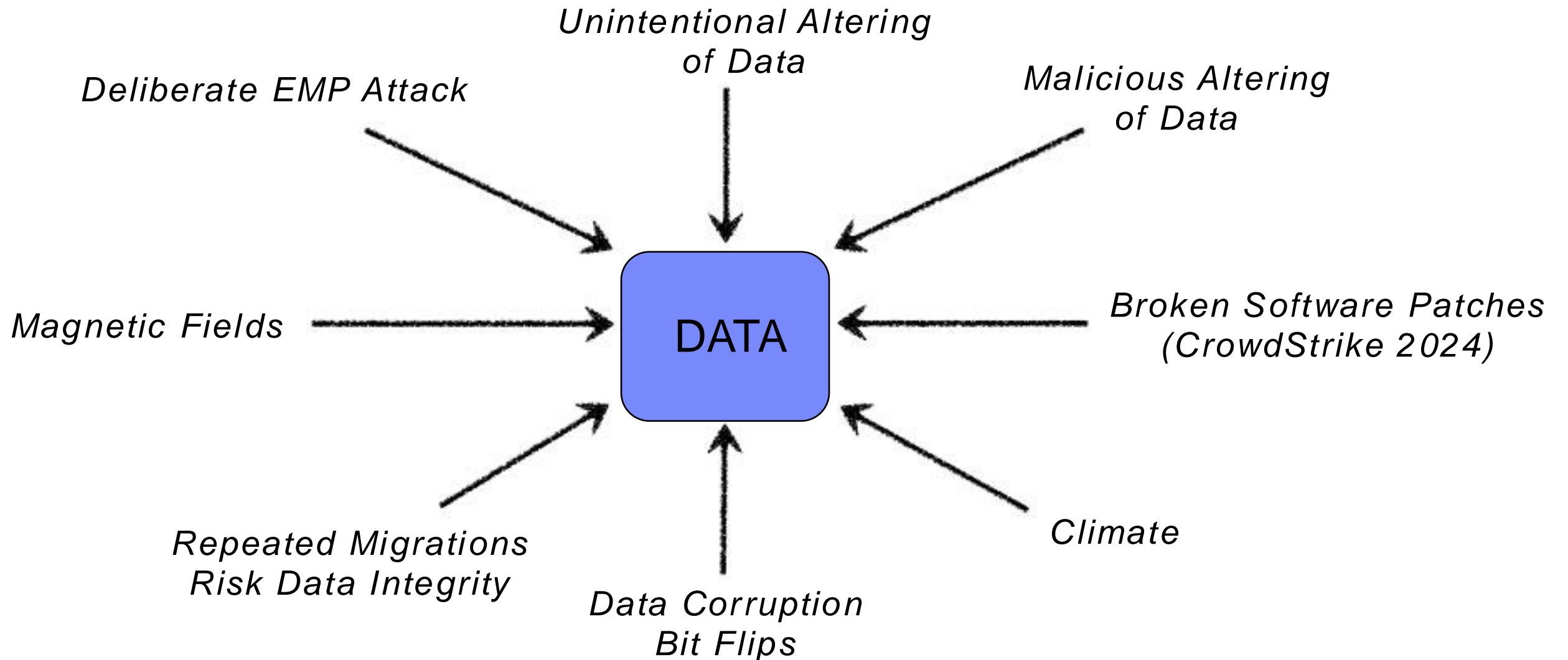


Ensure Data Provenance from Artificial Intelligence (AI)

- **Data provenance is immutable and conclusive with DOTS**
- **Immune from malicious or unintentional AI manipulation of data**
- **Immune from malware & EMP**
- **Non-magnetic photonics driven recording**
- **Data is retrieved with a camera**

The Data Provenance Problem

Current methods for ensuring data provenance are fraught with risk from AI, malware & magnetic media...



Requirements for Digital Information Provenance



- **The data must be saved to a WORM media (Write Once Read Many)**
- **The data must NOT be subject to migration in order to preserve 100% of digital files – This includes cloud data maintenance**
- **The mere act of migration puts provenance into question**
- **The data must be saved to an inert, stable archival media**
- **Must be non-magnetic, immune from magnetic fields & EMP**
- **Future proof storage format without operating system dependencies**

How Does **DOTS** Meet Those Metrics?

- **Non-magnetic WORM Recording of any digital file**
- **Carnegie Mellon tests conclude well over 200 years stability**
- **Data is recorded *visually* - Literally an image of the data**
A dot = One, no dot = Zero
- **Future proof Bit Plane Image format ensures the provenance of video, photographs, and audio for centuries**
- **Noncomplex - Data is retrieved with a camera**
- **Immune from hacking, malware & EMP**
- **Store anywhere from -9° to 66° C – Immune from water & petrochemicals**
- **20 TBytes capacity per reel**

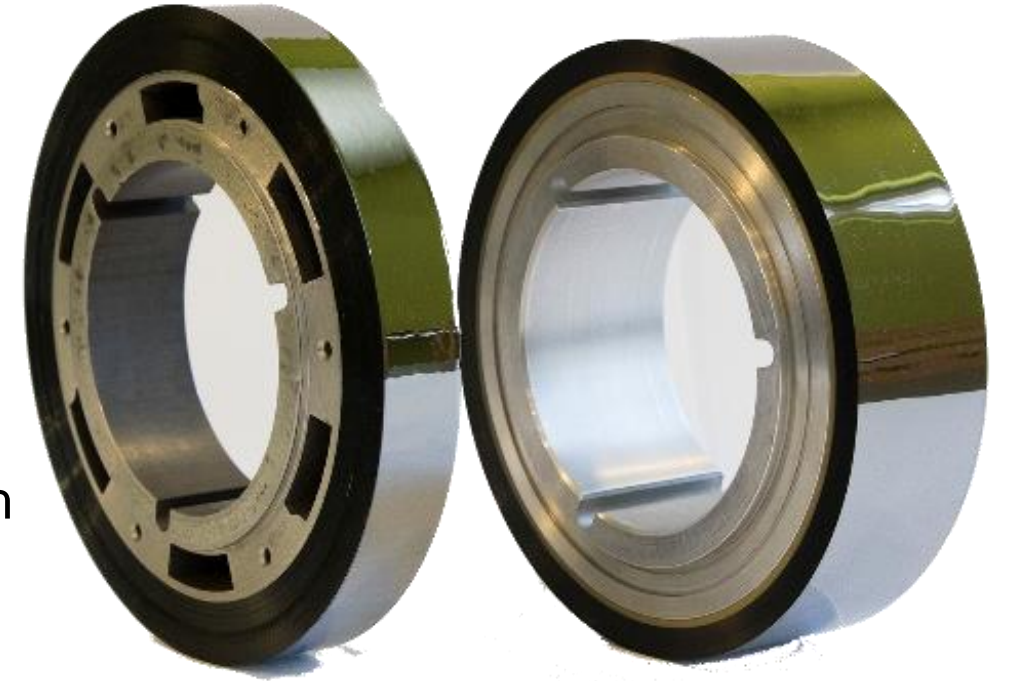
The Product



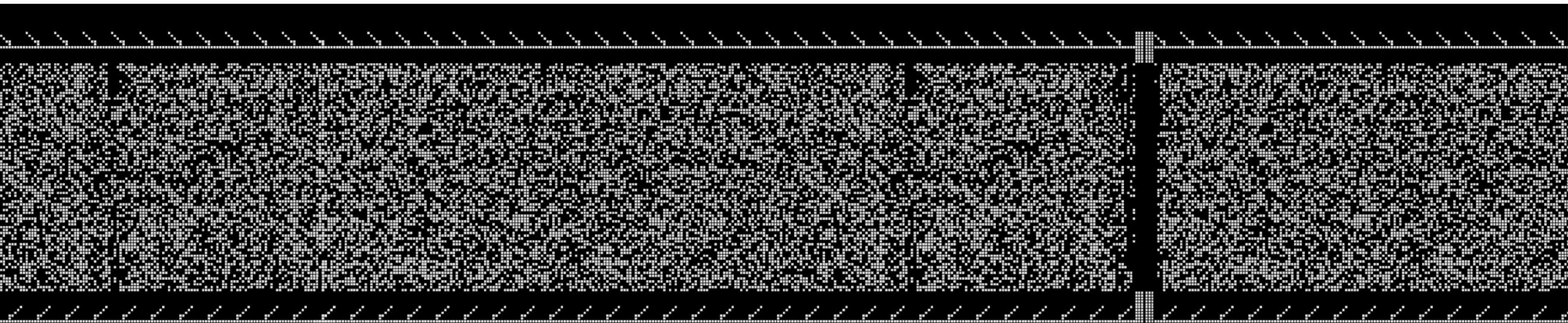
- **DOTS** provides a cost-effective alternative to those needing to keep everything forever
- There are billions of terabytes waiting to be moved to **DOTS** resulting in a TCO lower than any alternative
- Yes, that means there are billions of dollars of potential revenue
- Because the data is represented visually, as long as people have access to cameras, the data will always be recoverable
- [Bit Plane Image preservation](#) format guarantees provenance of image and sound files for centuries
- A visual representation means all hardware will be backwardly compatible to the first generation
- The **DOTS** design eliminates serpentine read/write methods and ensures record & read speeds in excess of 1 GByte/sec upon commercial availability
- Each unit of **DOTS** media will have factory-written, human-readable instructions for building a reader on the first few meters – Rosetta Leader

DOTS What is it?

- **DOTS**, Digital Optical Technology System, is a method of representing data visually on a metal alloy
- Data is written with a laser at 1 GByte/second
- Data is read with a camera at equal or faster speeds.
- When read under polarized light, the metal alloy becomes dark with the written data contrasting sharply with the background



Low resolution example of data on 1/2" tape



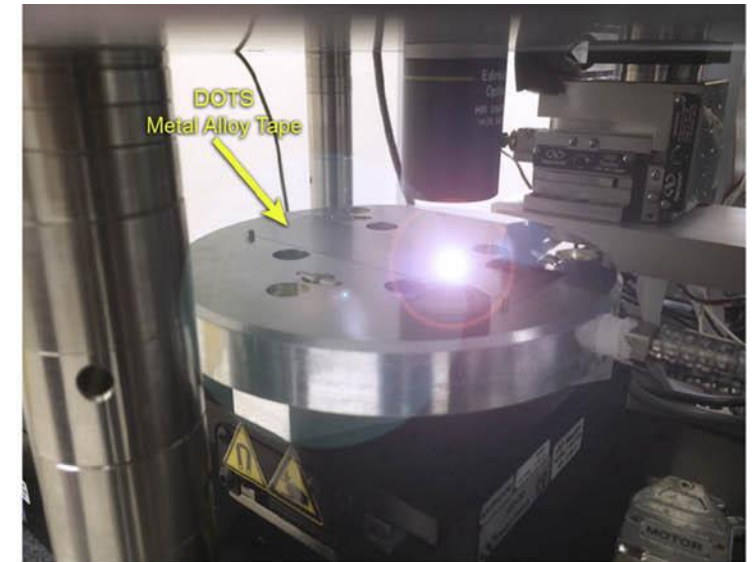
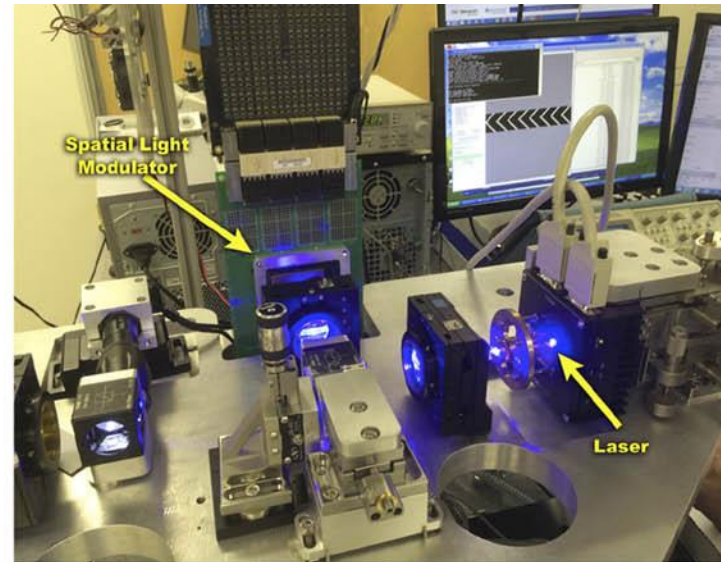
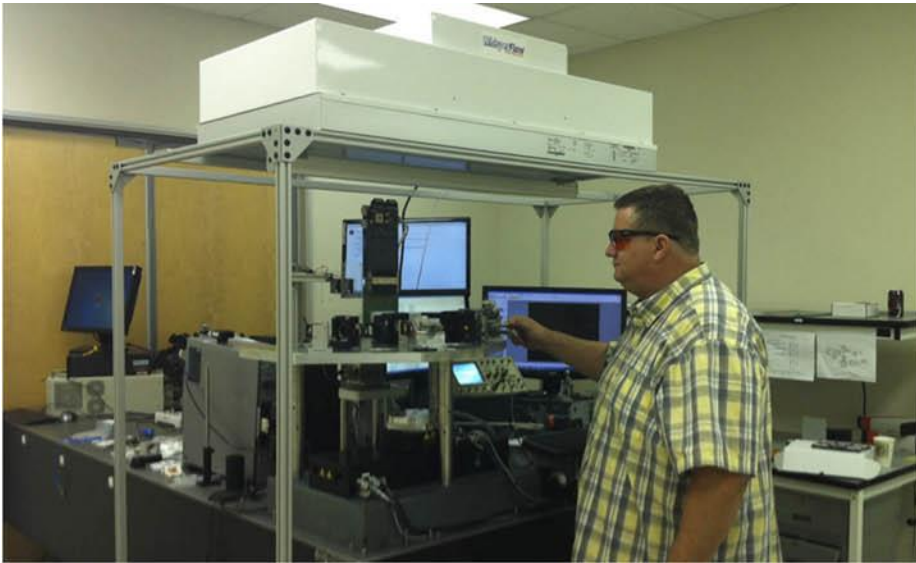
DOTS What is it?



- 20 Terabytes per 12-inch reel of $\frac{3}{4}$ inch metal alloy tape
- **DOTS** is a phase change media composed of a patented metallic alloy sputtered on an archival polyester base (e.g.: Aramid, Mylar™, Estar™)
- Standard manufacturing techniques are used to create **DOTS** tape
- **DOTS** media and prototype recorder/readers were successfully built by early 2001
- Group 47 has dramatically improved and simplified the hardware design with an engineering upgrade/refresh, and strengthened the patent portfolio
- Group 47's new design was proven in a contract with the CIA
- Components for **DOTS** recorder/readers employ off-the-shelf imaging and laser technologies

US Government Proof of Concept

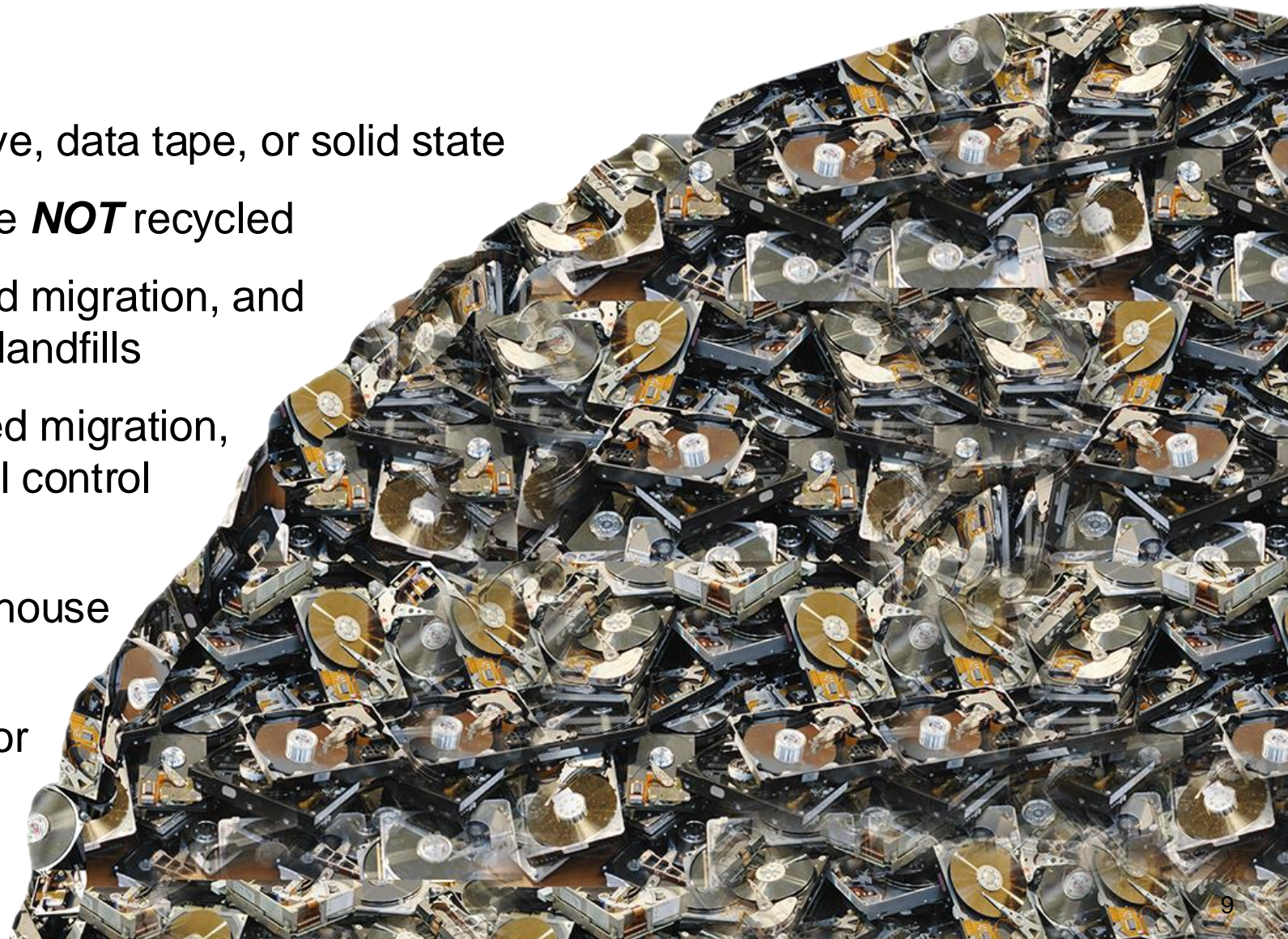
- Group 47 successfully completed a contract awarded by the CIA to build a laboratory prototype proving the **DOTS** technology.
- Contract milestones included demonstration of writing and reading applications and document data in the **DOTS** visual format, and successfully writing and reading to **DOTS** metal alloy tape in the [Bit Plane Image preservation](#) format.



Not only does DOTS ensure Data Provenance

DOTS is Sustainable & Green

- Whether it's cloud, enterprise data center, hard drive, data tape, or solid state
- All current storage media end up in landfills and are **NOT** recycled
- Current practices create massive waste from forced migration, and sending countless hard drives and data tapes into landfills
- **DOTS** eliminates media & energy waste from forced migration, costly power requirements, and rigid environmental control demands
- **DOTS** can be stored on a shelf in any typical warehouse with no special climate control
- Current practices of massive power consumption for archived data are not sustainable





To be clear....

DOTS can store ANY digital file – including images and sound

DOTS can store the same things you would save to your hard drive

However, **DOTS** ensures data provenance at a price point and simplicity of execution unlike any other alternative

Five NEW Patents Awarded to Group 47

(12) United States Patent Rosen	(10) Patent No.: US 9,208,813 B2
(54) DIGITAL OPTICAL TAPE STORAGE SYSTEM	(45) Date of Patent: Dec. 8, 2015
(71) Applicant: Group 47, Inc. , Woodland Hills, CA (US)	
(72) Inventor: Daniel Scott Rosen , Thousand Oaks, CA (US)	

(12) United States Patent Rosen	(10) Patent No.: US 9,508,376 B2
(54) ARCHIVING IMAGERY ON DIGITAL OPTICAL TAPE	(45) Date of Patent: Nov. 29, 2016
(71) Applicant: Group 47, Inc. , Woodland Hills, CA (US)	USPC 382/164; 369/100, 112, 122; 358/474, 358/487; 347/239, 255
(72) Inventor: Daniel Scott Rosen , Thousand Oaks, CA (US)	See application file for complete search history.
(73) Assignee: Group 47, Inc. , Woodland Hills, CA (US)	(56) References Cited
	U.S. PATENT DOCUMENTS
	4,661,941 A * 4/1987 Bell G11B 7/0031 347/248

- First new patent granted by U.S. Patent Office with multiple claims covering Group 47’s unique visual approach for writing and reading digital data
- The second new patent granted covers Group 47’s [Bit Plane Image](#) method for ensuring the provenance of archived audio and images (whether images of photos, videos, or documents) and removes all operating system dependencies
- The new method for archiving images and sound has quickly become one of the most compelling aspects of **DOTS** for all potential customers, since, with it, **DOTS** can guarantee image and sound files can be read securely decades into the future, without concern for operating system compatibility
- Three more patents have been granted, and twelve additional patents are ready to be filed

GROUP **47**



CONTACT

info@group47.com