USA TERRITORIES ONLY

CARGOBIT

Secured Desktop Storage

Amazon =
$2 Million Dollars + Every Year
10,000,000,000,000,000
Peta Tera Giga Mega Kilo Hecto

Azure =
$2 Million Dollars + Every Year
10,000,000,000,000,000
Peta Tera Giga Mega Kilo Hecto

Google =
$2 Million Dollars + Every Year
10,000,000,000,000,000
Peta Tera Giga Mega Kilo Hecto

Backblaze =
$720,000 Dollars Every Year
10,000,000,000,000,000
Peta Tera Giga Mega Kilo Hecto

Wasabi =
$859,200 Dollars Every Year
10,000,000,000,000,000
Peta Tera Giga Mega Kilo Hecto

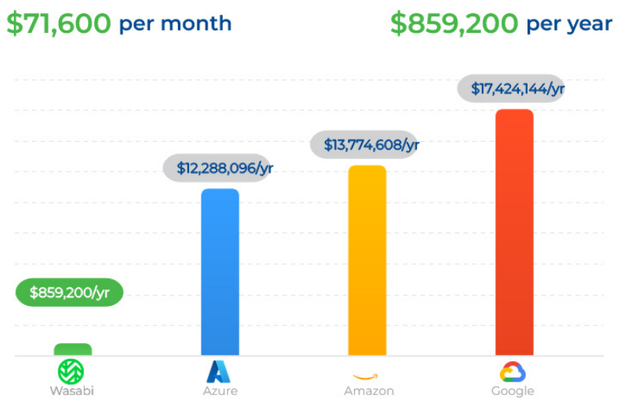
Seagate Lyve Cloud =
$7.50 TB/Mo Standard
$900,000 Dollars Every Year
10,000,000,000,000,000
Peta Tera Giga Mega Kilo Hecto

CargoBit (1 Single Data Cartridge) Near Real-Time Full Duplex = 18,014,398,509,481,984
Peta Tera Giga Mega Kilo Hecto

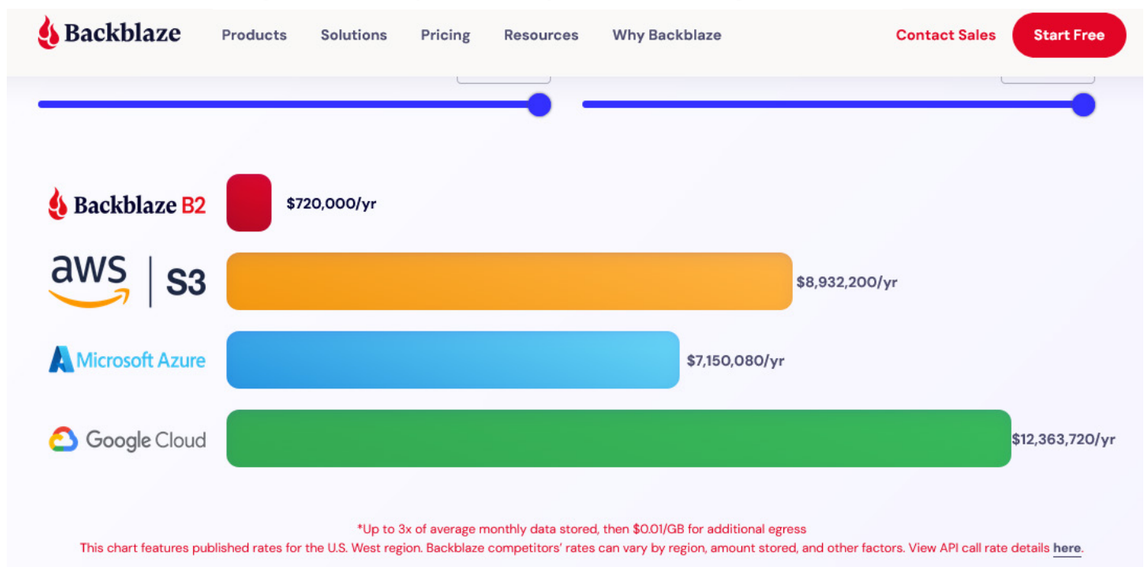
Disk Array Raid 60 = 3,221,225,472,000,000,000,000
Zetta Exa Peta Tera Giga Mega Kilo Hecto

$900,000+ Dollars 1Time

22 EPYC 9965 Processors
178,000 Cartridges/Disk Array
18 Peta Byte=180 100TB Tapes
200 Yr Retention
100,000 Total Full Cycles
8 sec R/W / Random Access
$1,024.00 Per Cartridge
Approximate Size of LTO Tape Cartridge



*billing estimates use base-2 system, estimates may not be exact due to rounding



Internet Website Screen Captures

Selected for 10,000 Tera Bytes Each

With Maximum Data Throughput

18 Peta Byte
200 Yr Retention
100,000 Cycles
8 second R/W
$1,024.00 Retail
CargoBit Only
~ Size of LTO Tape Cartridge
18PB at 4.4TbE = 11.373 Hours

CargoBit X (2^26) = Near Real Time 18,014,398,509,481,984
Peta Tera Giga Mega Kilo Hecto

LTO-10	**Compressed**	75,000,000,000,000 Tera Giga Mega Kilo Hecto
LTO-10	**Native**	30,000,000,000,000 Tera Giga Mega Kilo Hecto

One Single CargoBit Cartridge =
240 LTO-10 Compressed Cartridges
600 LTO-10 Native Cartridges

240/20=12 X $5,372.00 =
240 LTO-10 = $64,464.00

600/20=30 X $5,372.00 =
600 LTO-10 = $161,160.00

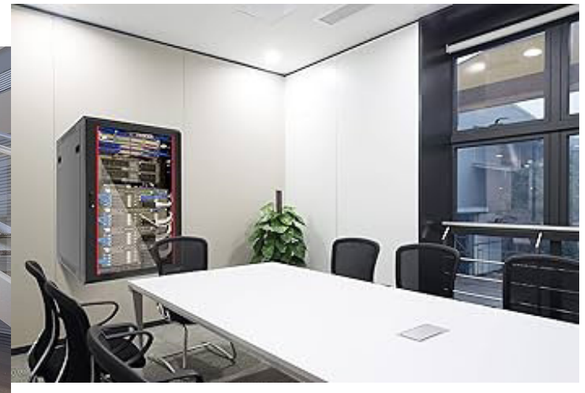
Data Retention
LTO-10 = 30Yr
LTO-10 = 20hr,50min Transfer

HPE LTO 10 Tapes Non-Custom Labeled Data Cartridge - 20 Pack - Q2080AN

HPE

MSRP: ~~$8,731.28~~
Your Price: $5,372.00

Data Retention
CargoBit = 200Yr
CargoBit 75TB = 2.84min 4.4TbE Transfer



FTLDCI

Faster **T**han **L**ight **D**ata **C**enter **I**nterconnect

CargoBit and FTLDCI are Codex Grandeur LLC products, that in no way, shape, or form are connected to the SpaceX, or Starlink Corporation. The Starlink services and hardware are not modified in any way, shape, or form.

The FTLDCI option is used to connect two or more CargoBit computers together with Starlink business services. The FTLDCI allows up to 335TbE over the common 5Mbs Uplink, and 5Mbs Downlink. Excessive service charges are not required.

CARGOBIT

Data compression and deduplication on *reducible data* are now available with a guaranteed 5:1 result, or more on typical systems. The fine print of *reducible data* does not include many pre-compressed or non-compressible data formats, or non-*reducible data* formats such as compressed audio, compressed image and compressed video file formats, PDF, most office work file formats, all compression formats, pre-compressed Data Sets, and almost any professional commercial file format being used. Large voluminous amounts of Data storage can achieve 65:1 or more with pattern sensitive data, and deduplication. Actual performance may vary.

CargoBit is a dedicated computer intensive lossless subspace conversion system for digital data storage and communication that goes far beyond normal pattern sensitive digital data compression. CargoBit will work with most digital storage, and communication systems available without modification in any way, shape, or form.

CargoBit is a lossless subspace conversion unit that in no way, shape, or form ever does any Data content or pattern analysis. CargoBit is not pattern or content sensitive, and there is no such thing as non-compressible data, or non-*reducible data*. CargoBit has always been very unique since 1983 with an all data 6:1 ratio.

CargoBit lossless subspace conversion is up to (2^52):1 at this time, not including any file formatting or pre-compression ratio. CargoBit subspace conversion requires simultaneous software threads of intense complex instruction set computer (CISC) time. All CISC cores will be 100% saturated per server. AI and GPU's are RISC.

Some custom hardware is included at each location for the physical security of CargoBit. Once installed, CargoBit can not be moved in any direction more than a couple of miles without termination of program. Special mobile CargoBit locations are possible, if justified.

CargoBit is a subspace conversion (state machine) only, and does not involve any normal processing of Data Center activity. Data is sent to CargoBit in a maximum ultra compressed 7zip formated file with a hash number from the customer, and returned to the customer in a much smaller (2^52):1 maximum compressed CargoBit formated file with a unique hash number. The processed data, serial number, time, conversion hash are all registered and stored into the Deep Freezer of the state machine to guarantee future returning file integrity.

Similar to a read head placed after the write head on a tape machine that reads back what has just been written on the tape, CargoBit reads back the subspace converted file and verifies the hash signature that every subspace conversion process starts with, that is provided by the customer when the original 7zip file is created. Read after Write subspace conversion system with hash, and a full bit level integrity comparison cycle will guarantee, and verify no bit loss for any future return to the original bit pattern before being sent out of the CargoBit machine with up to a (2^52) subspace conversion.

The (2^52):1 maximum compressed CargoBit formatted file can then be manipulated with any conventional program, however the internal compressed subspace converted data is not available for use by any conventional program without being returned, or having a CargpBit subspace conversion first.

Every CargoBit state machine is unique, and generate very different file contents that are not compatible with any other CargoBit state machine. A subspace conversion file can be intercepted on the public Internet forever, and only the one single CargoBit state machine that generated it will be able to return the data. The subspace converted file contents can only be returned by a customer authorized CargoBit unit, remote or on site. The FTLDCI option will allow the customer to decide which different CargoBit state machines can, and can not return the subspace conversion file.

The CargoBit System has a 2TB Ram Disk

X (2^26) = 2TB Ram Disk 134,217,728,000,000,000,000
Exa Peta Tera Giga Mega Kilo Hecto

X (2^52) = 2TB Ram Disk 9,007,199,254,740,992,000,000,000,000
Ronna Yotta Zetta Exa Peta Tera Giga Mega Kilo Hecto

CargoBit subspace converted files are naturally coded to specific CargoBit units only, and the customer decides what if any remote CargoBit units can return the file. CargoBit subspace converted files are naturally secured without external encryption, and can be placed on the open unsecured Internet with millions of unauthorized intercepted copies made, and no copy can be returned without the customer specified authorized CargoBit unit anywhere on planet earth.

FTLDCI Faster Than Light Data Center Interconnect is the option that allows communication with subspace conversion files between different CargoBit state machines typically located in the same Data Center, or at great distances from each other.

The reduced file size is a natural efficiency boost for any existing data communication link. The existing communication link with no modifications will achieve a (2^26) or (2^52) increase in both capacity and speed between the two CargoBit state machines, or storage to storage with subspace conversion occurring later.

FTLDCI

Faster Than Light Data Center Interconnect

Data communication performance at (2^26):1 achieved has: 99.999,998,509,883,880,615,234,375 % Efficiency.

Data communication performance at (2^52):1 achieved has: 99.999,999,999,999,977,795,539,574...% Efficiency.

1 bit remains light speed. For every single 1 bit transmitted over fiber optics, or any physical transmission system running at the speed of light, (2^26) another 67,108,863 bits will also arrive at the same exact time. At (2^52) another 4,503,599,627,370,495 bits will also arrive at the same exact time.

Data Security

(2^26) = 67,108,863 bits or
(2^52) = 4,503,599,627,370,495 bits are missing for each bit transmitted, making interception of communications a waste of time, and effort. The missing bits can possibly be seen with a crystal ball, however the amount of crystal balls required is enormous, and time consuming.

18 Peta Byte
200 Yr Retention
100,000 Cycles
8 second R/W
$1,024.00 Retail
CargoBit Only
~ Size of LTO Tape Cartridge
18PB at 4.4TbE = 11.373 Hours

CargoBit X (2^26) = 18,014,398,509,481,984

Peta Tera Giga Mega Kilo Hecto

CargoBit X (2^52) = 1,208,925,819,614,629,174,706,176

Yotta Zetta Exa Peta Tera Giga Mega Kilo Hecto

(2^52) becomes practical after years of (2^26) data storage. More computer power is demanded, meaning more time, and the amount of time to move Yotta's, and Ronna's is significant. However with enough computer power (2^52) is practical now.

No customer raw data is stored inside the CargoBit. All customer data is stored, transmitted, or received in (2^26), or (2^52). Only customer authorized CargoBit systems are capable of returning any stored data. The CargoBit has a secured processor that will not function if moved from the assigned location. Any theft of physical computers to another location will stop the secured processor from working. No other computer system can recover any stored data, other than a different customer authorized CargoBit system.

Retrieval of a stolen, or destroyed CargoBit system storage can be reconstructed at the CargoBit factory from previous Deep Freeze Optical Disc backups provided to the factory from the customer.

Theft of the physical system does not provide access to any storage data.

CargoBit is not connected to the INTERNET. Local control console functions are possible with the two 8k monitors, keyboard, and mouse. The application program interface for remote control console functions is possible with expendable computers connected to the Internet, then a special hardware protocol to the CargoBit 1 GbE.

The CargoBit (2^26) 18PB or (2^52) 1.208YB data cartridge is the approximate dimensions of a standard LTO Tape Cartridge. The Microchip semiconductors do not require battery power, and will retain their data for at least 200 years in a reasonable environment.

The actual time to write (2^26) 18PB of data to the CargoBit to the cartridge is about 4 seconds. The actual time to read (2^26) 18PB of data from the cartridge to the CargoBit for verification is about 4 seconds.

Due to the actual size of raw 18PB, the original CargoBit access to the customer data is achieved through eleven computers at 400GbE each, in near real-time, taking just over 11.373 hours to input all the data, subspace converted, and stored inside of the CargoBit Ram Disk, and or Disk Array Raid 60. Input data is automatically stored into the Deep Freezer also. The completed input data is then formated, and sent to the 18 Peta Byte Cartridge.

Once inside of the CargoBit, the customer 18PB data is stored on a ram disk. Depending on the customer format of the data, pieces of the data can be moved, copied, manipulated, with individual pieces moved inside, and outside the CargoBit for customer usage. The entire 18PB does not have to be treated as one block if the customer formats their data for that purpose.

Read or Write is possible in random access if the data is formatted for that.

Customer data never has to leave the CargoBit. Individual formated blocks can be moved from one CargoBit unit to another CargoBit unit. The CargoBit cartridge is just one simple example. Business Starlink is another. Any low speed communications.

While ingress and egress of the raw 18PB of data through eleven 400GbE or 4.4TbE is 11.373 hours, once inside CargoBit that same (2^26) 18PB can be written to, and read back for confirmation from the CargoBit data cartridge in about 8 seconds.

From one CargoBit unit to another remote CargoBit unit authorized by the customer, the same (2^26) 18PB of data can be transmitted over a Business Starlink with their minimum 5 million bits per second uplink in about 7.2 minutes.

Individual sections of the stored (2^26) 18PB can be accessed at any time by the customer, and CargoBit will automatically convert the output data to the original customer format at the 400GbE or 4.4TbE near real-time speed. The customer is responsible for the individual section format for random access from the CargoBit. Entire blocks of 18PB are not required, if formatted for random access.

The (2^52) 1.208 Yotta byte format is mentioned, however it does require serious amounts of time (95,771+ Years) to move that scale of raw data through eleven 400GbE or 4.4TbE ports. Multiple CargoBit systems over time will reduce that limitation.

At (2^52) the CargoBit Cartridge provides a practically infinite amount of storage. Once the CargoBit unit builds up storage from normal use, it does become a practical format for working with CargoBit data inside of multiple remote customer authorized CargoBit units, and only move selected individual sections in and out of original raw format when required. All data is secured once inside of any CargoBit unit.

Any number of CargoBit units can be synchronized to work together in parallel.

FTLDCI

Faster Than Light Data Center Interconnect

No modification to SpaceX or Starlink hardware
No signal modification in any way, shape, or form
1 CargoBit unit/point A, 1 CargoBit unit/point B

Optional FTLDCI Business Package Starlink
For =>2 Customer Authorized CargoBit Units Only

Send Data FTLDCI Starlink Satellite to Another Customer Authorized CargoBit at

4TbE Near Real-Time Continuous [Half] Duplex
~400,000,000,000 Bytes per second (2^26) Only
or
2TbE Near Real-Time Continuous [Full] Duplex
~200,000,000,000 Bytes per second (2^26) Only

Full [5Mbs] Starlink Uplink / [5Mbs] Downlink
Maximum Continuous Bits per Second

5Mbs uplink x (2^26) = 335.544... Tbps
5Mbs downlink x (2^26) = 335.544... Tbps

5Mbs uplink x (2^52) = 22.517... Zbps
5Mbs downlink x (2^52) = 22.517... Zbps

Multiple CargoBit units will support higher Continuous Full Duplex Ethernet Throughput
(2^52) is NOT Near Real-Time Continuous

CargoBit Local Fiber Optic Network INPUT/OUTPUT

10 CargoBit 400GbE = ~400,000,000,000 Bytes per second
Near Real-Time (2^26) Continuous [Half] Duplex

10 CargoBit 400GbE = ~200,000,000,000 Bytes per second
Near Real-Time (2^26) Continuous [Full] Duplex

The CargoBit System has a 2TB Ram Disk

X (2^26) = 2TB Ram Disk 134,217,728,000,000,000,000
Exa Peta Tera Giga Mega Kilo Hecto

X (2^52) = 2TB Ram Disk 9,007,199,254,740,992,000,000,000,000
Ronna Yotta Zetta Exa Peta Tera Giga Mega Kilo Hecto

(2^52) becomes practical after years of (2^26) data storage.
More computer power is demanded, meaning more time, and the amount of time to move Yotta's, and Ronna's is significant.
However with enough computer power (2^52) is practical now.

The CargoBit System has a 48TB Raid 60 Disk

X (2^26) = 48TB Raid 60 Disk 3,221,225,472,000,000,000,000
Zetta Exa Peta Tera Giga Mega Kilo Hecto

X (2^52) = 48TB Raid 60 Disk 216,172,782,113,783,808,000,000,000,000
Ronna Yotta Zetta Exa Peta Tera Giga Mega Kilo Hecto

(2^52) becomes practical after years of (2^26) data storage.
More computer power is demanded, meaning more time, and the amount of time to move Yotta's, and Ronna's is significant.
However with enough computer power (2^52) is practical now.

(Head Lines)

All Data Remains on Your Desk
All Hardware is at Customer Locations Only

Or Send Customer Data Anywhere
4TbE Near Real-Time Full Duplex

Or Optional FTLDCI Business Package Starlink
For =>2 Customer Authorized CargoBit Units Only

Or Send Data FTLDCI Starlink Satellite to Another
Customer Authorized CargoBit at
4TbE Near Real-Time Full Duplex
~400,000,000,000 Bytes per second

Or Local Fiber Optics
For Customer Authorized CargoBit Units Only

Or Any Reliable Data Communications
For Customer Authorized CargoBit Units Only

Optional Starlink Business FTLDCI Continuous Full Duplex:
4TbE Between Customer Authorized CargoBit Units Only
No Physical Bulk Data Transfer Required of any kind
100% Mathematical Lossless Customer Data

All CargoBit Data Can Be Stored on
Any External SSD or Disk Drive Storage
200 Year 18PB Cartridges
1,000 Year Optical Discs

(Head Lines)

Deep Freezer for All Actions and Data Storage
For Emergency Use Only if everything fails
100% Recovery Return for Life

All Raw Data is Subspace Converted at Input
No Raw Data Stored Anywhere in CargoBit
Lossless Data Subspace Returned at Output

CargoBit Header Used for Raw Data Blocks
No Analysis of Raw Data Content - No Internet

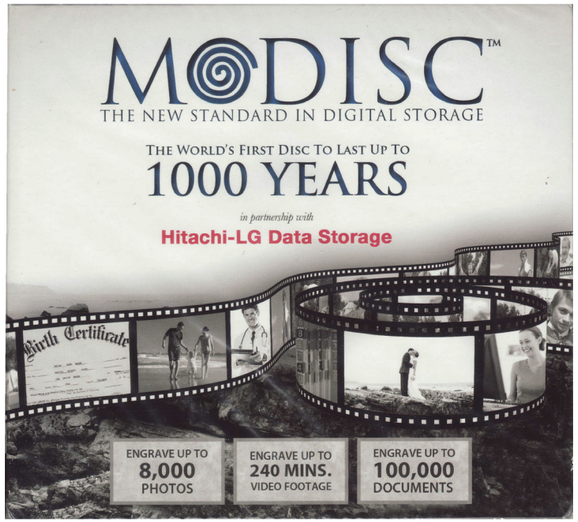
Raw Data Block Hash Codes for CargoBit Header
Guaranteed Raw Data Block Integrity At Input

Raw Data Block Hash Codes Returned at Output
Near Real-Time Random Access Read and Write

Deep Freeze of All Actions and Data
For Emergency Use Only
100% Recovery Return for Life

All CargoBit Data Can Be Stored on
1,000 Year Optical Discs

Each and Every CargoBit Unit is Unique
Customer Authorized Remote Units Only



2TB Ram Disk / 48TB Raid Disk / Deep Freezer

X (2^26) = 2TB Ram Disk 134,217,728,000,000,000,000
Exa Peta Tera Giga Mega Kilo Hecto

X (2^52) = 2TB Ram Disk 9,007,199,254,740,992,000,000,000,000
Ronna Yotta Zetta Exa Peta Tera Giga Mega Kilo Hecto

2TB Ram Disk (2^26)
Or 2TB Ram Disk (2^52)
Can be stored on a 100GB BDXL M-DISC three times for Triple Redundancy

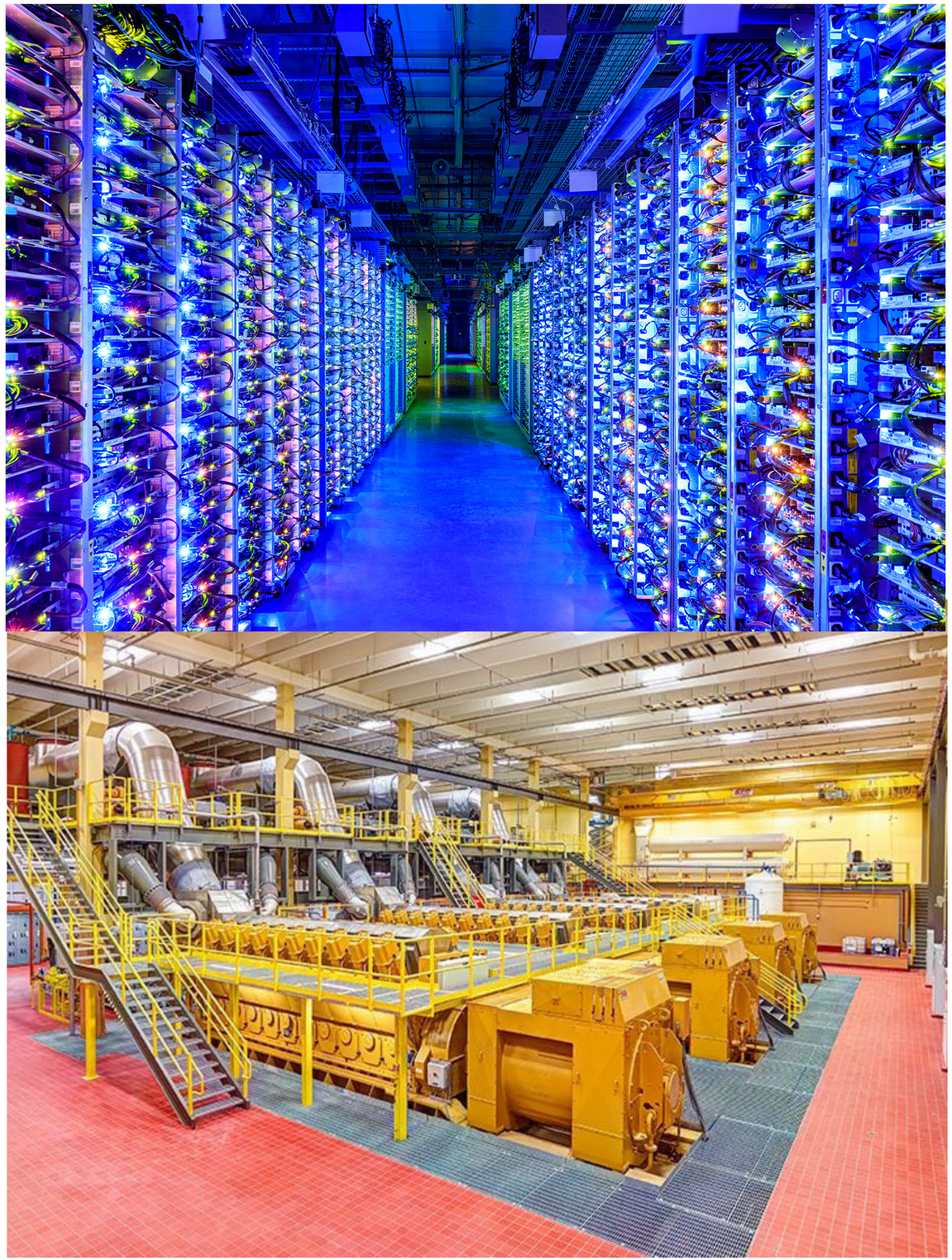
Both the (2^26) and (2^52) occupy a tangible 2.0TB amount of ram. A special subspace conversion is required to reduce the 2.0TB below the raw 100GB BDXL M-DISC with more processor time required.

Three 100GB BDXL M-DISC are used for triple redundancy with three simultaneous M-DISC drives for speed. The M-DISC drive units are remote located over a network for easy access. 100GB transfer is practical over +1GbE networks.

CargoBit has a special subspace conversion that takes the RAW 2TB from the Ram Disk that contain the original subspace conversion of (2^26) or (2^52) storage data, and has another special subspace conversion, including read after write subspace conversion with hash, and a full bit comparison cycle for a guaranteed return before the burn process begins.

This takes the RAW 2.0TB Ram Disk to less than one single 100GB BDXL M-DISC plus the overhead hash.

The process is reversed for retrieval of the (2^26) or (2^52) data stored from the one single 100GB BDXL M-DISC. The special subspace conversion will function at near real-time for the simultaneous data return to the 2.0TB ram disk.



CARGOBIT

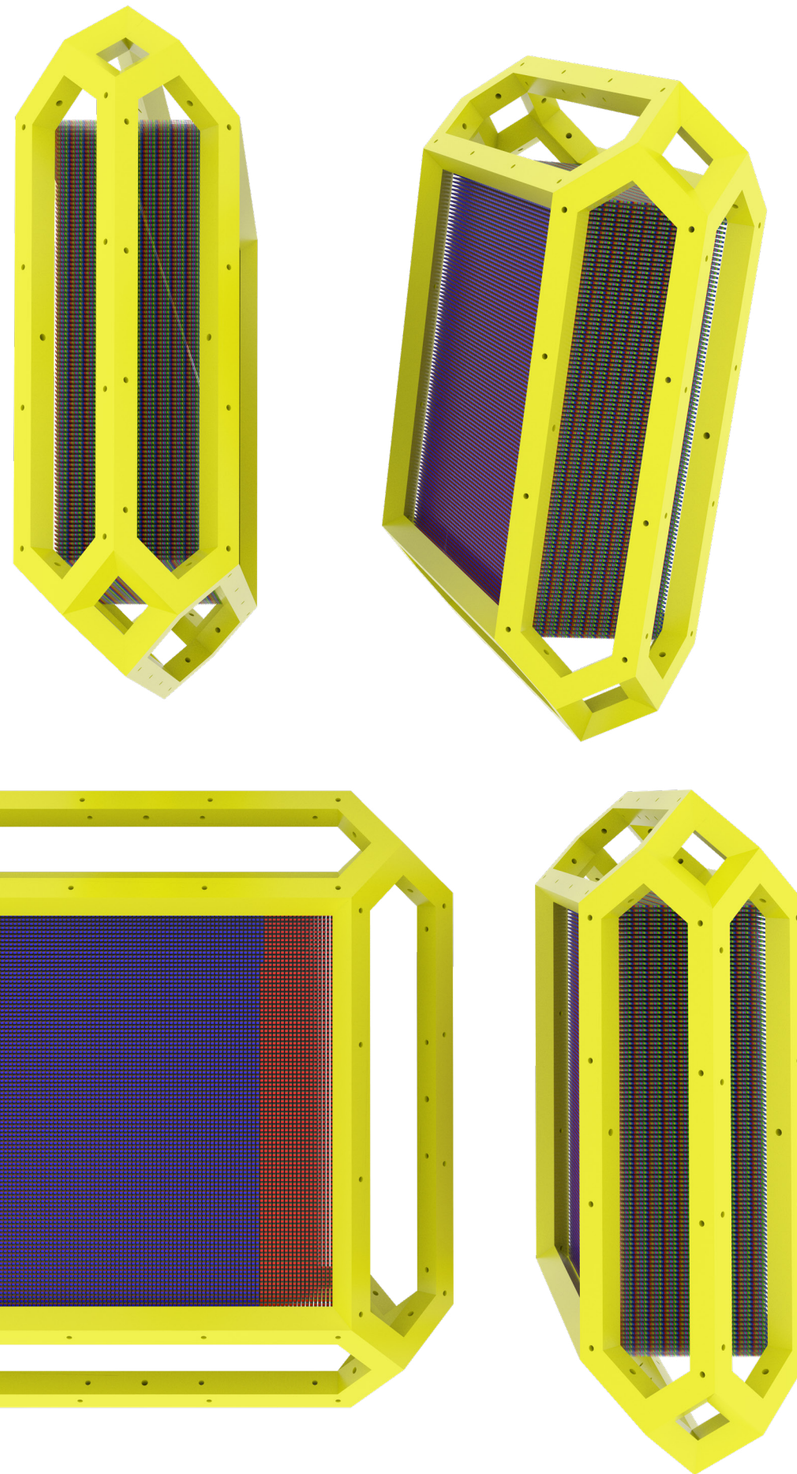
2.0TB Ram Disk Formatting

Usage of the Ram Disk magnified from (2^26) to (2^52) can be in the form of normal file storage, and retrieval similar to any typical disk drive on any typical computer system. The subspace converted files can easily be sent to external storage devices, or with the FTLDCI option sent out to remote locations inside the Data Center across multiple distributed low cost 1GbE fiber optic links (plus), or external to the Data Center anywhere in the USA where another customer authorized CargoBit system is located.

Remote transfer onto any public Cloud storage at (2^26) or (2^52) can be achieved with no possibility of an intercepted file bit pattern return without a customer authorized CargoBit system. A signature verification can be assigned to any or all files for any bit pattern return begins, even on authorized CargoBit systems to prevent a secreted transaction by trusted authorized personnel, or random intercept. Customer will be required to give permission before bit pattern return begins. Recommended for any external Internet communications.

In the Ram Disk drive, all the data is automatically formatted similar to a sectored disk drive that is compatible with most computer storage systems. No knowledge of data formatting is required by the customer in disk drive emulation, and what is stored, is exactly what is returned. Typically used for streaming. No data modification monitoring analysis such as data de-duplication, truncation, or quantization in any way, shape, or form is ever used.

The Ram Disk magnified from (2^26) to (2^52) can also be stored onto three 100GB BDXL M-DISC optical disc with a special procedure to allow many centuries of passive cold storage.



OPTION = Data, Dataset, Database Formatting

Data are observations or measurements (unprocessed or processed) represented as text, numbers, or multimedia.

A **Dataset** is a structured collection of data generally associated with a unique body of work.

A **Database** is an organized collection of data stored as multiple datasets. Those datasets are generally stored and accessed electronically from a computer system that allows the data to be easily accessed, manipulated, and updated. **www.usgs.gov reference = USGS**

Customer OPTIONAL formatting is not required, when conventional file systems are used.

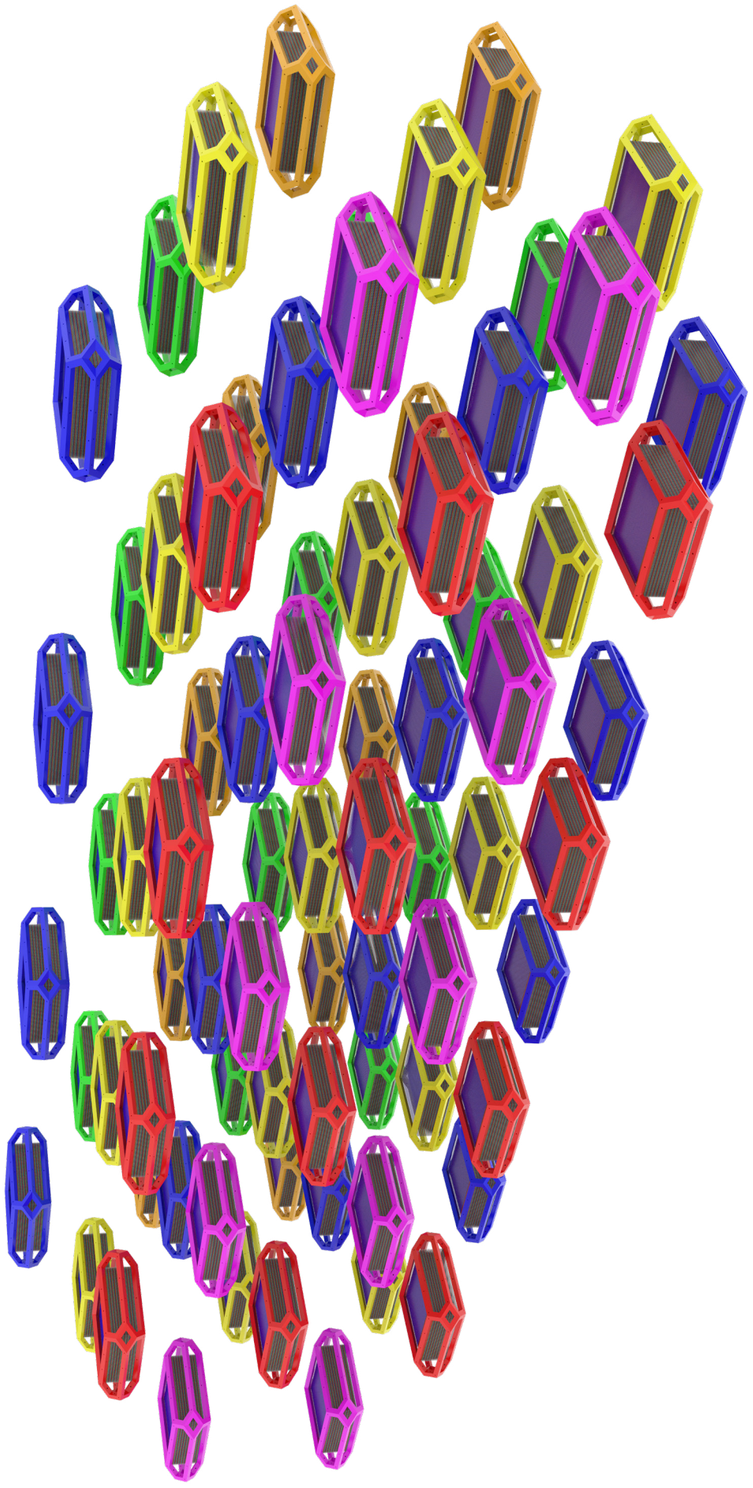
OPTIONAL formatting can be manipulated external to CargoBit by remote existing computers. Only the initial subspace conversion and eventual return is required on the CargoBit machine. Usage of the Ram Disk magnified from (2^26) to (2^52) can optionally be used in the form of extreme detail expansion, being the opposite to data storage efficiency. The conceptional model on Page 24 represents a structural housing containing the data array. The planar surfaces of the housing represent electrical interconnection socket panels providing data paths to the data array. One single housing is one single Element.

The Data, Dataset, and Database can be dynamically formatted with a vernier fine grain, to a coarse grain supporting custom Data, Dataset, and Database architectures. Vernier fine grain will use the most number of bytes, and provide the most multidimensional interconnected dynamic detail supporting optimal analysis, and work. Coarse grain is typical of current Database formatting designed for optimal byte storage efficiency.

Each conceptual model Element has 14 direct connection planar surfaces used for communication switching between different Elements in the array of multiple Elements. The 14 direct connection surfaces have 8 switchable positions for each separate Element. High frequency electrical switching between different Elements allows dynamic reconfigurations without computation of any kind. The constituent fine grain component factors that are customer defined inside of each Element are dynamic also, however with some computation required for location reconfiguration.

CargoBit numerical multidimensional interconnected geometric array of Elements can be static or dynamic. CargoBit has the customer option of dynamic constructions, where the Database is configured with customer input for optimized long distance fiber optic communications, and Dell computer architecture ability for diverse, multidimensional and dynamic numerical interconnection of Element arrays used in machine intelligence, machine vision, and pattern analysis.

Each element also has its own unique Database that is both local, and global to authorized customer elements. Additional bytes are used for checksum, ECC, and Database formatting, with proprietary overhead not involved in the direct customer usable data count. The customer byte count and actual byte count used for checksum, ECC, and Database formatting through the CargoBit application program interface, both automatic, and customer programmable will be different. CargoBit proprietary overhead is invisible to the customer, and not involved in any data communications. No additional charge is applied for the CargoBit Element Database, or proprietary overhead, and is considered a unique CargoBit feature.



OPTION = Data, Dataset, Database Formatting

Almost all data processing up till now has been concerned with limiting the real world needs to fit the boundary limitations of data storage, time, cost, energy, environment, human cost, buildings, communications, profit margin, and final product. Maximum efficiency with minimum resource allocation, and utilization, will achieve a serious loss of both strategic, and tactical performance.

CargoBit is capable of exploding data detail into permutations, and combinations not practical and low cost until now. The current perspective of data is viewed from the outside-in because of human, and machine limitations. CargoBit can achieve an inside-out perspective on data.

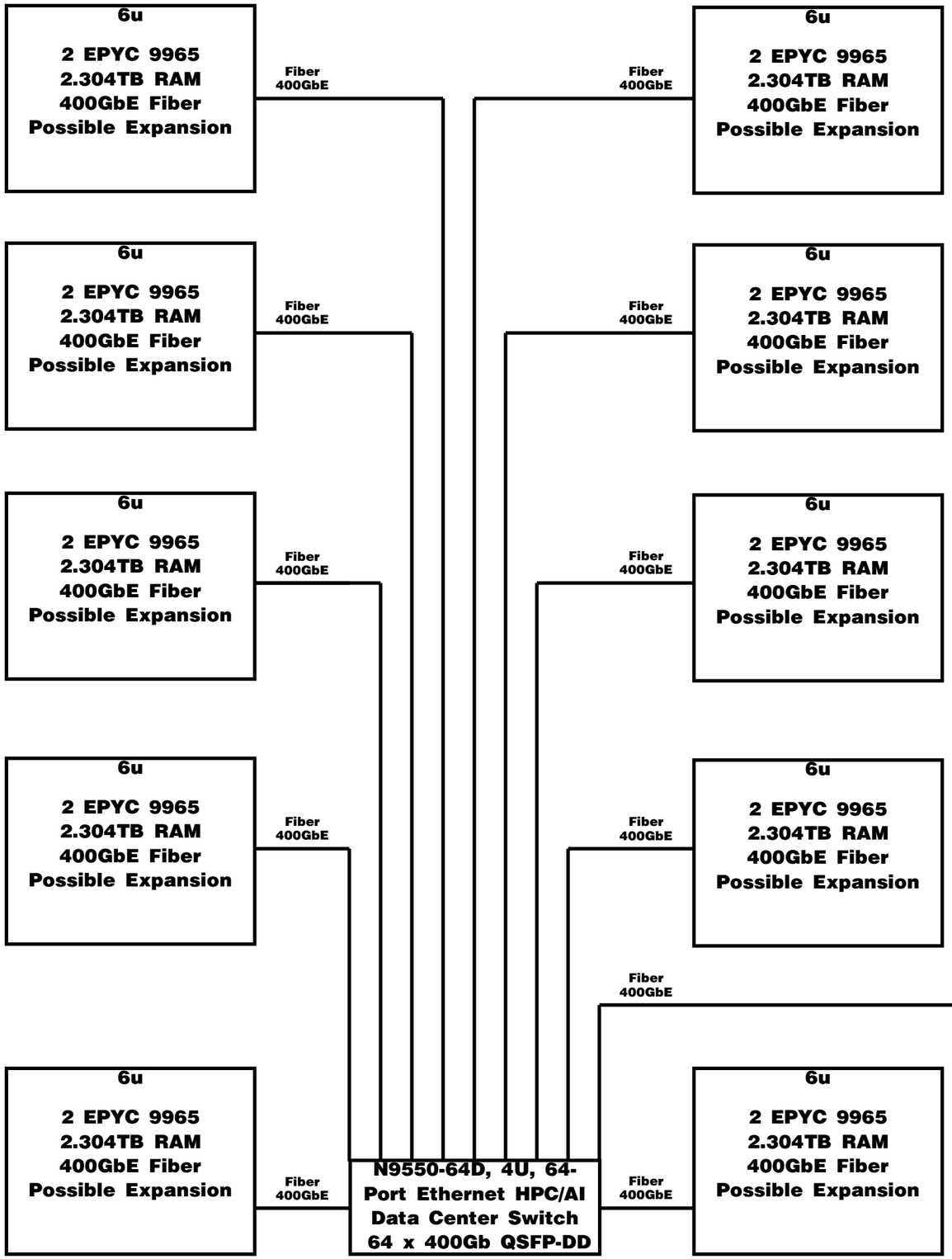
It is now possible to expand data into unlimited components that enhance association, analysis, and generate targeted processing segmentation, while quiet data remains dormant. The constant generation of associative data blocks insure new analysis results. CargoBit compressed data blocks are created, and updated based on desired target characteristics such as video surveillance automobiles of a specific manufacture, color, shape, license, occupants, location, time, are stored in different associative blocks.

Knowledge-Based systems with deductive and inductive inference, and dynamically-reconfigurable systems with software-controlled reconfigurability are given almost unlimited data storage, including complex question-answering: knowledge-based systems with correlation analysis. Simultaneous communication of data among processors with (2^52) increase in performance. Lower native 1GbE Ethernet allows multi-dimensional network arrays with very low cost overhead. Actual data throughput is (2^52) time 1Gb Ethernet with CargoBit. Of course 800 GbE is also multiplied by (2^52) with CargoBit.

CargoBit supports very fine grain subspace conversion data blocks eliminating the need for massive scale data storage and retrieval at one time. Every single CargoBit payload section has a very limited non-compressed write-able area for customer usage that allows real time dynamic update of Data Base and Data Set pointers of the (2^52) compressed data, so no conversion is required. The (2^52) to 1 compression ratio is maintained. Of course a Data Base, and Data Set of pointers can be generated. Individual CargoBit payload sections are independent, and can be maneuvered without destruction of overall compression. Only customer data contained in the individual CargoBit payload section is relocated. Customer formatting of CargoBit payload sections is possible with optional software.

Similar to a very large file that has been compressed with the 7-zip file manager into different files numbering into the hundreds, where every single specific different numbered file has to be available, or the original very large file can not ever be decompressed. CargoBit is just the opposite. The original very large file that has been compressed with CargoBit into specific different files numbering into the hundreds, thousands, or millions, can be decompressed individually. Also the separate individuals, including individuals from different compressed very large files, can be assembled into new creations before decompression.

A very large file that has been compressed with the 7-zip file manager into segmented different files numbering into the hundreds, and every single specific different segmented numbered file has to be available, or the original very large file can not ever be decompressed. CargoBit is just the opposite. The original very large file is subspace converted with CargoBit into specific different files numbering into the hundreds, thousands, or millions, can be decompressed individually. Also the separate individuals, including individuals from different compressed very large files, can be assembled into new creations before decompression.



22 AMD EPYC 9965 CISC Chips
Complex Instruction Set Computers
Necessary to Support Hatch Secure Processor
192 Cores / 384 Threads Each
4,224 Cores / 8,448 Threads Total
99+% Continuous Duty Cycle Saturation
Hatch Secure Processor Always Running
Custom Customer Configuration
Dedicated State Machine Only
No General Purpose Operating System
No Direct Internet Connection Possible
Sacrifical Customer Internet Connection Only

6u
CARGOBIT
CONTROL DATA
CONTROL CONSOLE
2TB Ram Disk
48TB Array Raid 60
UPS = Soft Power Off

CargoBit System Foundation = $900,000

10-1 6U Chassis Boxes Typically 4 Racks or 11 Desktops with Fiber Optics

22 - EPYC 9965 Processors

400GbE X 11 = 4.4TbE Full Duplex

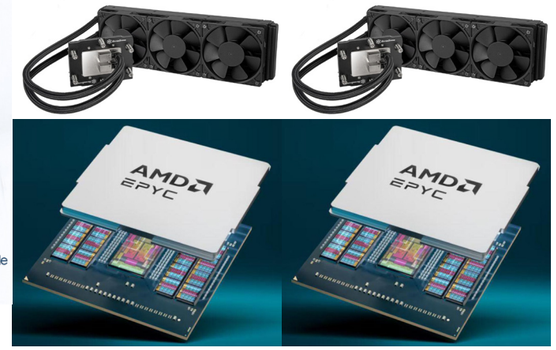
Disk Array Raid 60 3.221 Zeta Bytes

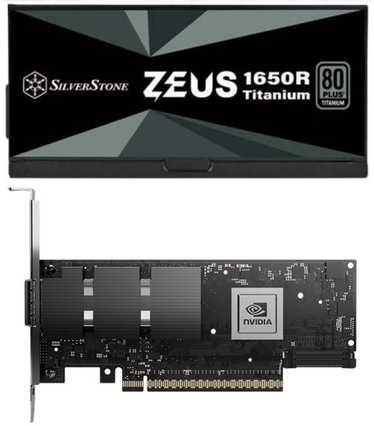
Data Communications / Data Storage

Custom Options Not Included

Two 8K Monitors

N9550-64D, 4U, 64-Port Ethernet HPC/AI Data Center Switch, 64 x 400Gb QSFP-DD





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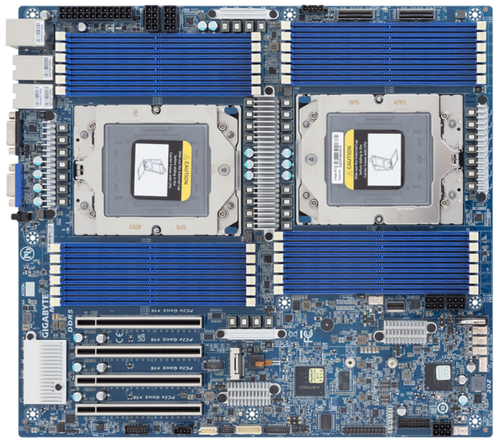

CargoBit System Foundation = $900,000
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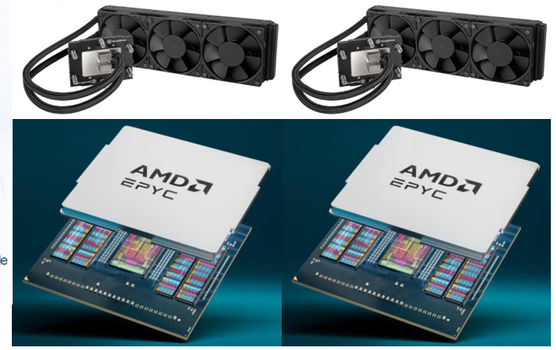
or 11 Desktops with Fiber Optics
22 - EPYC 9965 Processors
400GbE X 11 = 4.4TbE Full Duplex
Disk Array Raid 60 3.221 Zeta Bytes
Data Communications / Data Storage
Basic Included Components 10X and 1X
Custom Options Not Included



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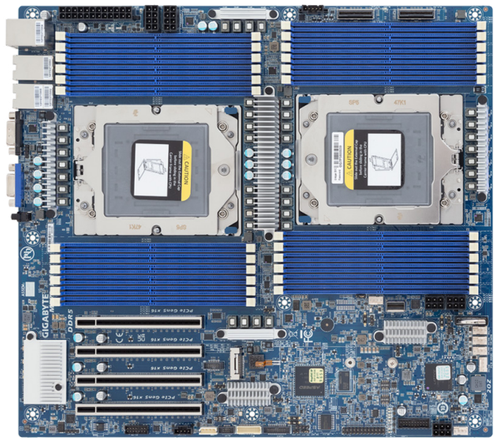
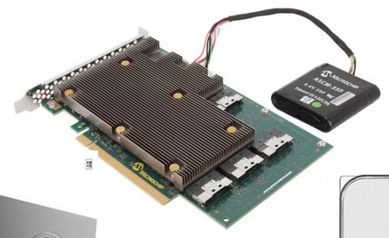
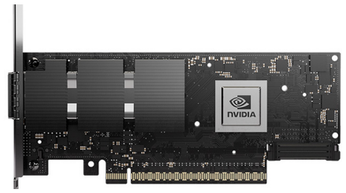
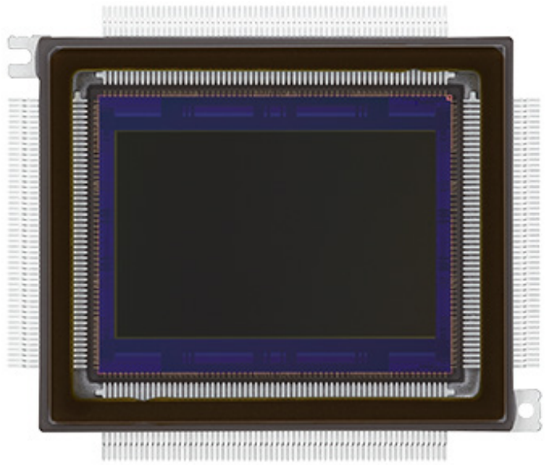
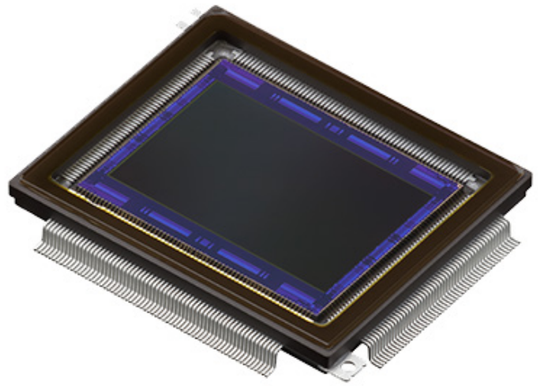
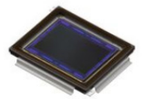












4900C002

DigiKey Part Number	2157-4900C002-ND
Manufacturer	Canon
Manufacturer Product Number	4900C002
Description	LI8020SAC
Manufacturer Standard Lead Time	6 Weeks
Customer Reference	
Detailed Description	Image Sensor
Datasheet	Datasheet

Image shown is a representation only. Exact specifications should be obtained from the product data sheet.

In-Stock: 1

Check for Additional Incoming Stock

QUANTITY

Add to List | Add to Cart

All prices are in USD

Tray

QUANTITY	UNIT PRICE	EXT PRICE
1	$14,131.25000	$14,131.25

Manufacturers Standard Package

Note: Due to DigiKey value-add services the packaging type may change when product is purchased at quantities beneath the standard package.

Product Attributes

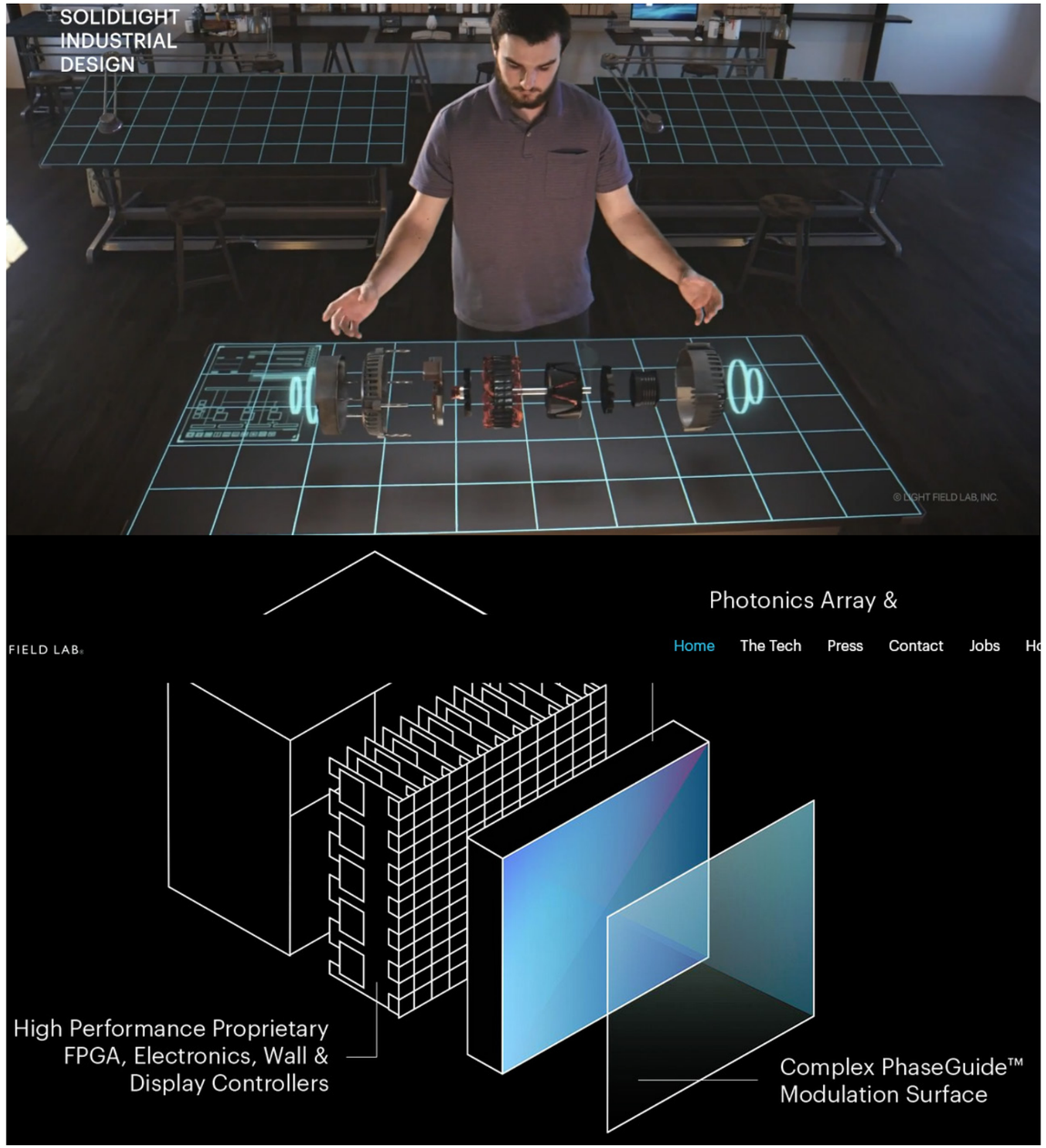
TYPE	DESCRIPTION	SELECT ALL
Sensors, Transducers		

Canon
LI8020SAC
(Lima India 8020 Sierra Alpha Charlie)
19568 x 12588 (Horizontal x Vertical)

34.9mm Diagonal 246MP CMOS Sensor on 228pin QFP / 2.304 m Square Pixels at 5.0fps

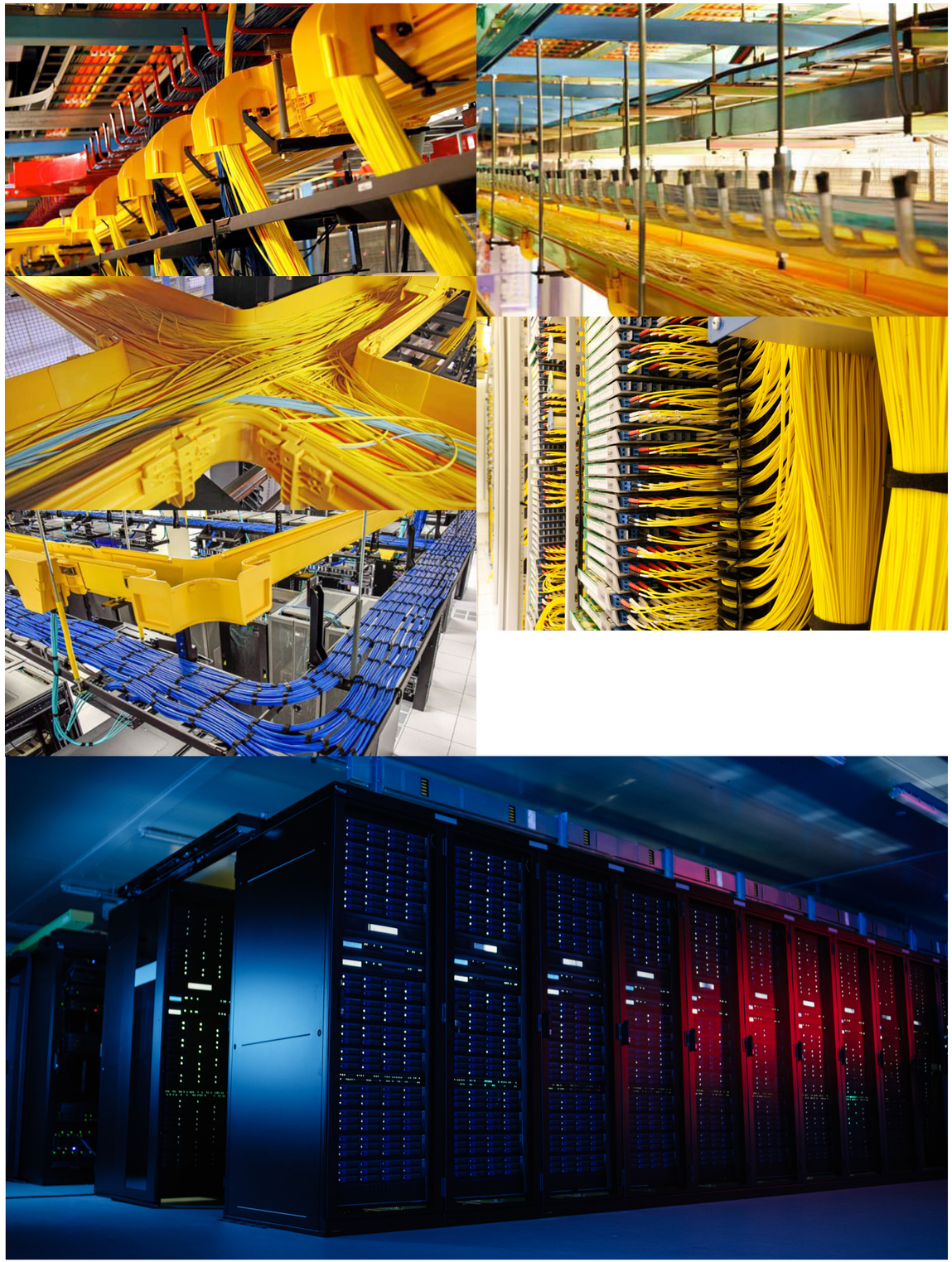
(Maximum Data Rate in bits per second)
(19568 X 12588) X (12 bits per pixel) X (5.0 Frames per second) = 14,779,319,040 bits per second = 14.779319040 Giga bits per second
Easily fits into one standard 25GbE Fiber Optic Cable

(160)-25GbE Fiber Optic Cameras can be supported in Near Real-Time with One CargoBit System storing 400+ Years of all 160 Cameras Lossless
Optional FTLDCI is transmitting all 160 Cameras Starlink (A) to another Starlink CargoBit System at Location (B) in Near Real-Time
Please see the 4 minute Canon Video:
https://youtu.be/3ND210j4EIM?si=HspsorYzCeSHV0J9
[Possible Application]



All 160 25GbE Fiber Optic Cameras can be sent Near Real-Time over Starlink to another CargoBit unit Thousands of miles away and displayed on the Light Field Labs display in 3D with computer conversion of strategically placed cameras

Codex Grandeur LLC has no connection to Canon, or Light Field Lab.



CargoBit Supercomputer

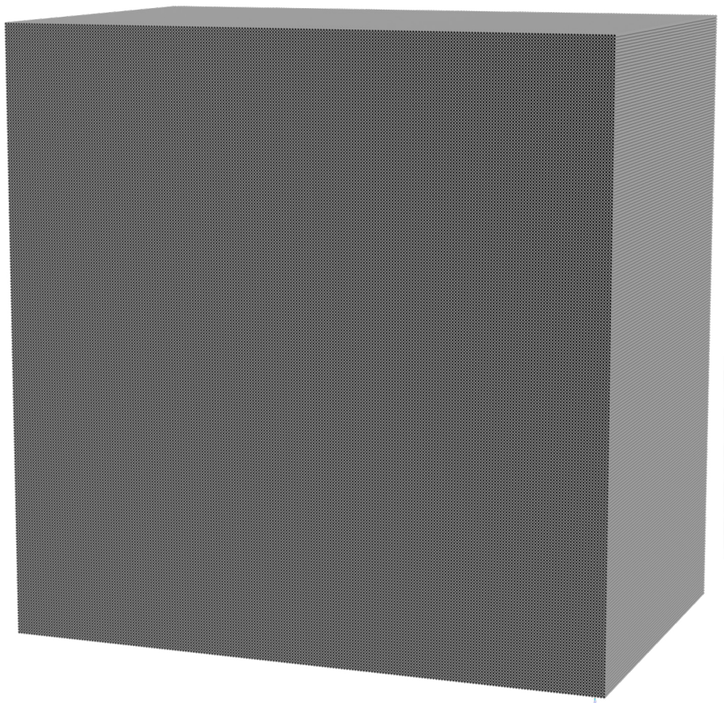
Cargo Bit at (2^26) operating at near real-time performance, and each single 400 GbE link carries the same data as 67,108,864 separated 400 GbE links near real-time. This makes the signal interaction of every single AMD EPYC processor can be simultaneously linked to any other AMD EPYC processor by any combination of the 128 PCIe lanes or SDRAM channels near real-time. ANY-ANY.

The RAM disk, SSD, input, output, program linkage, and more are supported by the FTLDCI (Faster Than Light Data Center Interconnect). Local or long range communication is enhanced by every single 1 bit transmitted over fiber optics, or any physical transmission system running at the speed of light, another 67,108,863 bits will also arrive at the same exact time. 67,108,863 bits travel FTL.

Complete AMD EPYC processors have the performance of Central Processor Unit (CPU) internal registers due to the data propagation increase possible in a running program memory distributed across large scale random access matrix, matched with a CPU large scale random access matrix.

Because of the massive amount of data storage available in CargoBit, many CPU functions, and or GPU functions can be stored directly “canned”, eliminating the need for hundreds or thousands of actual physical processors.

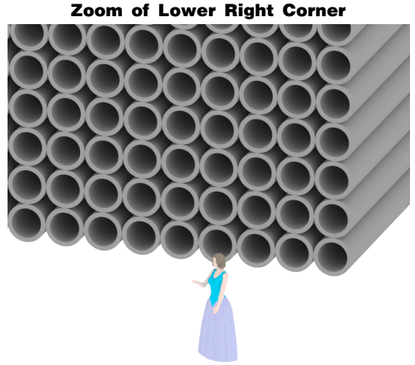
Massive reduction in cable networks is possible.



Rough Approx.
216 X 216 Pipes
=10,964,533,248
~410TbE Fiber Strands

Same Number of Bytes over 1 Single 1GbE at (2^52)

Zoom of Lower Right Corner



450 359 962 737 049 600 000 000 Bytes

Zetta Exa Peta Tera Giga Mega Kilo Hecto

Same # of bytes sent over 1 single 1GbE in 1.0 Seconds
450,359,962,737,049,600,000,000 Bytes / (2^52)=100,000,000Bytes
100,000,000 Bytes over 1GbE = 1.0 Seconds
1.0 Seconds over 1 single 1GbE up/down Line

OR

Same bytes sent over 46,656 Pipes full of ~410TbE in 1 Second
450,359,962,737,049,600,000,000 = No Subspace Conversion
450,359,962,737,049,600,000,000 / ~410TbE = 10,964,533,248
10,964,533,248 ~410TbE Fiber Strands 1.0 Full Second

26-in. HDPE sleeve with 34 (2-in. 6912 Fiber Strands) per pipe
34 X 6912 = 235,008 ~410TbE Fiber Strands per pipe
10,964,533,248 / 235,008 Fiber Strands per pipe
= approx. 46,656 Pipes
Square Root 46,656 = 216 X 216 Pipes of ~410TbE Fiber Strands
Continuous Run for 1.0 Full Second

PODCAST

Data Center Fiber at Gigawatt Scale: A Talk With Quantum Loophole CEO Josh Snowhorn

The Cabling Podcast sits down with Josh Snowhorn, founder and CEO at Quantum Loophole, to discuss the massive QLoop fiber ring project under the Potomac.

DCF Staff

April 21, 2023

Quantum Loophole CEO Josh Snowhorn testing one of the giant conduits that will house fiber for the QLoop, the company's fiber ring connecting the new campus to Data Center Alley in Northern Virginia.

Data centers are more than just the sum of their parts and there

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Phillip Marangella, Chief Marketing and Product Officer at EdgeConneX, shares his perspectives on why collaboration is the key to meeting the needs of data center customers.

Voices of the Industry

are far more pieces in play than most people outside the industry would consider. Connectivity is one of the key functions external to the data center that enables effective operation, and as such, we focus significant efforts in providing coverage of the activities of both the technology and the industry supporting these options.

Josh Snowhorn is founder and CEO at Quantum Loophole, an operator of data center campuses in the gigawatt scale. At DCF we've been providing regular updates on Quantum Loophole and its vision for "data center cities" since the company came out of stealth in early 2021. The company says it has already leased a massive 240 megawatts of capacity at its campus in Adamstown, Maryland.

Central to the entire undertaking is QLoop, the 43-mile hyperscale fiber ring connecting Quantum Loophole's 2,100+ acre data center development site in Frederick County, Maryland to the Data Center Alley connectivity ecosystem around Ashburn, Virginia.

In a recent edition of **The Cabling Podcast**, our sister publication Cabling Installation & Maintenance checked in with Snowhorn for an update on the construction of data center and fiber conduit infrastructure.

Snowhorn said the projects is the largest medium haul fiber backbone that's ever been created. The QLoop network ring network ring offer capacity for more than 200,000 strands of fiber connecting to the Ashburn ecosystem in under one half millisecond Round Trip Time (RTT). "And we are bolstering that with some pretty amazing cross-connect capabilities," he added.

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"Each property will have access to conduits and thousands of strands of fiber directly into the QLoop system to enable seamless, private and secure connectivity for all of our campus-wide customers."

Here's the podcast with CIM host Matt Vincent, followed by a summary of the key discussion points.

Gigawatt-Scale Data Center Fiber

A frequent speaker at industry conferences, Snowhorn's key founding and executive positions include time at Terremark, Verizon, Cincinnati Bell, and CyrusOne. Snowhorn founded the Global Peering Forum, the annual meeting for the Internet interconnection and peering community, where he serves on the board of directors. He also serves on the advisory board of Telescent, a maker of automated data center interconnection machines.

As the discussion begins, Snowhorn provides an update on (1:46) underground fiber infrastructure linking up Quantum Loophole's Frederick data center campus' network center 1 and 2 sites, "which

are kind of like giant, horizontal meet-me rooms, multiple acres themselves. We have up to 60 conduits in some cases interconnecting the two network centers."

Of the QLoop (2:27) fiber ring project, Snowhorn adds:

> "We have completed our south Potomac river boring, which was over 3000 ft., and it goes 91 feet below the bedrock of the Potomac. That was a huge, 26-in. HDPE sleeve that was pulled through, and then 34 two-inch ducts inside of that. That's been completed and approved and vaults have been put in place. Terrestrial construction has started with multiple crews working laying in the 34 ducts, buried deeply to accomodate the most extreme security standards."

Of his company's partnership with Aligned Data Centers, Snowhorn noted that (3:43) "at Quantum Loophole, we don't build data centers ourselves. We supply land, energy, water, and fiber, or conduit. We call those 'the elements of the data center business.' Aligned is our first customer, they have closed on the acquisition of 75 acres of land, and I believe they're well underway with their permitting process and preparing to construct, hopefully, their first building by the end of the year."

Snowhorn also discussed (4:24) the origin and founding of his company.

> "The impetus for creating Quantum Loophole is really that we saw a gap in the industry -- there wasn't anybody providing just those baseline services, and entitlement preparation of site so others can go and just have an 'easy button' to build their data centers. We felt like we had a unique offering and it's proven to be true, we have lots of company demand, and lots of big-scale entities going in. We've sold several conduits already, so that's already well underway."

At the root of Quantum Loophole's stated "dig once" approach, Snowhorn said (5:20):

> "You're really trying to just prevent cuts, prevent what happens in the famous backhoe pictures you see, where they tear up a bunch of duct. In our case, we can hold over 235,000 strands of fiber in our primary system; the whole thing is designed for 6912-fiber trunks -- so imagine a backhole pulling that up and the splicing hell that would ensue afterwards to repair it. So dig once means, put it all in place and hopefully we don't overbuild, and hopefully we don't underbuild."

Quantum Loophole Founder and CEO Josh Snowhorn speaks to The Cabling Podcast.

Splicing Skills and Automated Connections

Later in the interview (6:36), Matt asks how working with a high-fiber-count cable like 3456 is different from working with 144-fiber cable (which the world used to consider high-fiber-count), and if installers had to to "level up" on their splicing skills or any other installation skills to get comfortable working with this high-fiber count fiber.

QLoop's press coverage mentions (7:51) that its network infrastructure has a radius that will accommodate 6912-fiber availability. In response to this info, we asked Snowhorn if his teams have worked with that fiber count yet; and if so, if there's been a noticeable difference between it and 3456-fiber cable.

Snowhorn also shared (9:07) his insights regarding the value proposition of automatic, robotic cross connections powered by Telescent, as installed at Quantum Loophole's Maryland data center campus.

> "It really comes out of a need to change how people do interconnection. Your classic way of doing it is either truck rolls to a remote hut, or having 24x7 staff with tickets open, and hopefully no RX/TX reversals in play. But when you start thinking about the scale of what we're building, with more fiber strand count coming into a single location than anyone's ever seen, that really starts to bring in a need for change. The Telescent machines do something quite unique in that we can give the control of the interconnection to the client, so they can use a portal via an API, log in,

and enable a cross-connect in 2 minutes without ever touching it as long as the machine has been pre-patched.

The bigger picture of that is they have the same machine on their campus and building, and then maybe they have the same machine located in Ashburn and Manassas, let's say 20 buildings, and they want to enable an interconnection. The machine has a built-in OTDR, they can punch light out, they can verify the connection and do 20 connections at the same time, all in 2 minutes, and batch a job. They can do 1,000 connections in 2,000 minutes theoretically, across 20 locations, without a human being touching it. That's game-changing. That really creates flexibility for outages, creates hopefully a reduction in truck roll and labor costs, and a more rapid delivery of interconnection."

As the QLoop is such a notably large outside and inside plant undertaking for data center construction, to close out the podcast (11:30) we asked Snowhorn for a recap of the project's specifications and a preview of what's in store for the rest of the year. In response, Snowhorn said:

> "It's literally hundreds of sites, hundreds of data centers, but we don't actually touch those other data centers once we get into Loudon County. We

cross the Potomac, which is insanely hard to do: I now know why nobody tries to do it, becuase it's that hard. It's just been nothing but a struggle to get it done, but we're doing it. I don't think anybody's going to try and do it again for a long time. Machines blowing up, costs, the approvals -- going 9 stories below the bedrock of the Potomac is insane. The costs are through the roof -- I cannot think of a single thing that was easy about what we've done.

We drop down [and] have over 500 vaults on the 43-mile ring, and those vaults are designed to create a massive intersection of splice points, so that people can tie into the system. We're a wholesaler to the wholesalers, so our goal was not to go build throughout the entire Ashburn corridor and interconnect every building and be another competitive carrier. We wanted to be a support mechanism to create an expansion of that ecosystem."

PODCAST

How Investment Powers the Global Growth of the Cloud

The Seagate Exos E SU84 storage enclosure supports 84 3.5 inch disk drives in a 5U box. A typical 42U rack cabinet will hold about 8-84 disk drive enclosures each.

CargoBit (2^26) will convert one single disk drive into the storage capacity of 67,108,864 disk drives, any size. 67,108,864 / 84 = 798,915 disk drive enclosures pictured above. 49,932 / 8 = 99,865 Cabinets full of disk drives. The electrical power and cost of physical space alone will pay for many, many CargoBit units instantly, not to mention the cost of all the disk drives that will wear out eventually, compared to the one single disk drive CargoBit uses.

The shadowy grey zone world of cutting undersea cables - and why it matters

Finland charges tanker crew members with sabotage of undersea cables

Captain and first and second officers of Eagle S, understood to be part of Russia's 'shadow fleet', charged over incident

The Eagle S anchored in Finland last December. Photograph: Jussi Nukari/AP

AI Overview

Undersea cables, essential for global internet and communication, are frequently damaged, with a significant portion being accidental incidents like ship anchors or fishing activity. However, there have also been instances of suspected sabotage, particularly in the Baltic Sea, with investigations focusing on Russia's role.

Why Russia and China May Be Cutting Europe's Undersea Cables | WSJ

China shows off powerful new technology which could cripple US military dominance in future wars

China has revealed a breakthrough deep-sea cable cutting device which could sever underwater communications lines across the world. The tool is said to be able to operate as deep as four kilometres below the waves - twice as far down as the maximum depth at which telecoms cables can run.

The device has been designed specifically to integrate with China's high-tech crewed and uncrewed submersible vehicles, according to the South China Morning post - but its unveiling marks an uneasy breakthrough in the eyes of the West.

The news marks the first time that any country has officially confirmed its ability to snip underwater cables - 870,000 miles of which exist around the world - and follows a series of China-linked sabotages in European waters.

In November 2024, a Chinese ship allegedly "under orders from Russia" was said to have sabotaged a pair of critical internet cables in the Baltic Sea.

That ship, identified by Denmark as the Yi Peng 3, severed the cables when it dragged its anchor along the seabed for over 100 miles.

Then in January this year, another Chinese vessel was accused of damaging an undersea telecommunications cable off the coast of Taiwan.

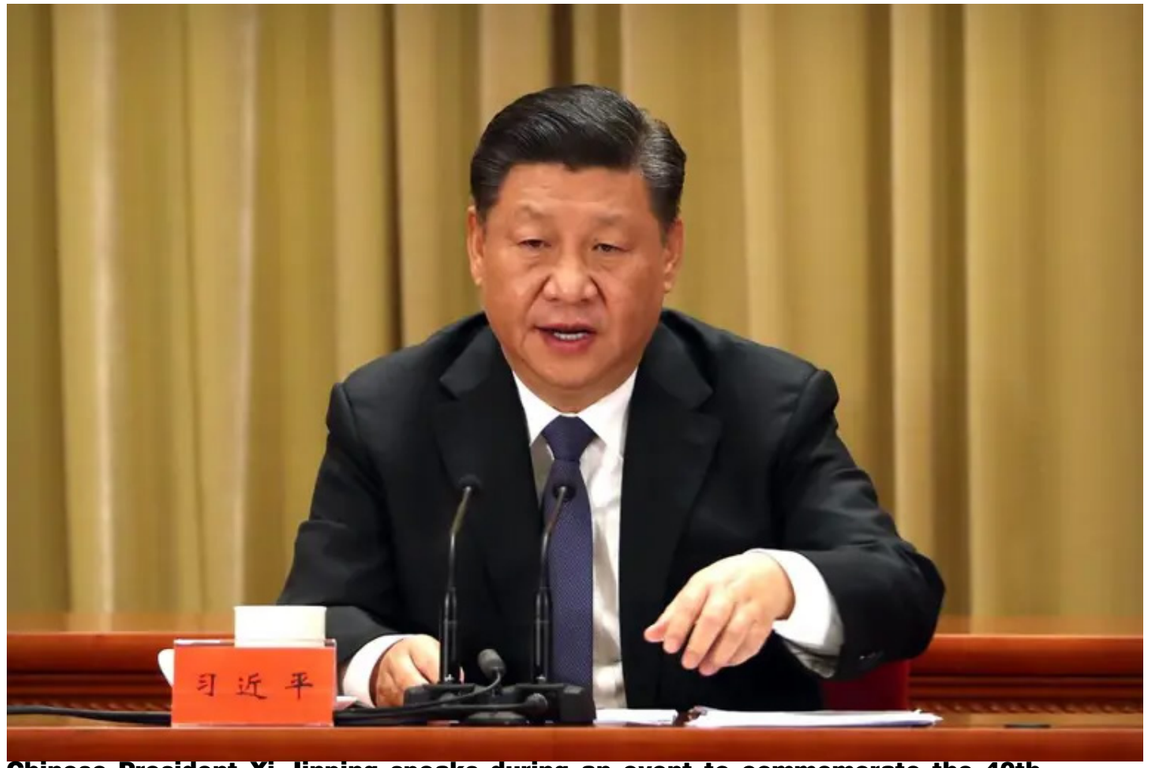
Taiwanese defence expert Ho Cheng-hui noted after that incident that China has an extensive history of using various maritime tactics to sabotage Taiwanese infrastructure.

Ho also warned the cable damage may have been a Chinese attempt to test the limits of any international response as part of its "grey zone" tactics.

The newly-unveiled cable cutter, developed by the China Ship Scientific Research Center and the State Key Laboratory of Deep-Sea Manned Vehicles, targets "armoured cables".

Said cables are communications lines with steel, rubber and polymer casings - and make up the overwhelming majority of global data transmissions.

Researchers have insisted the tools exist for "civilian salvage" and seabed mining use.



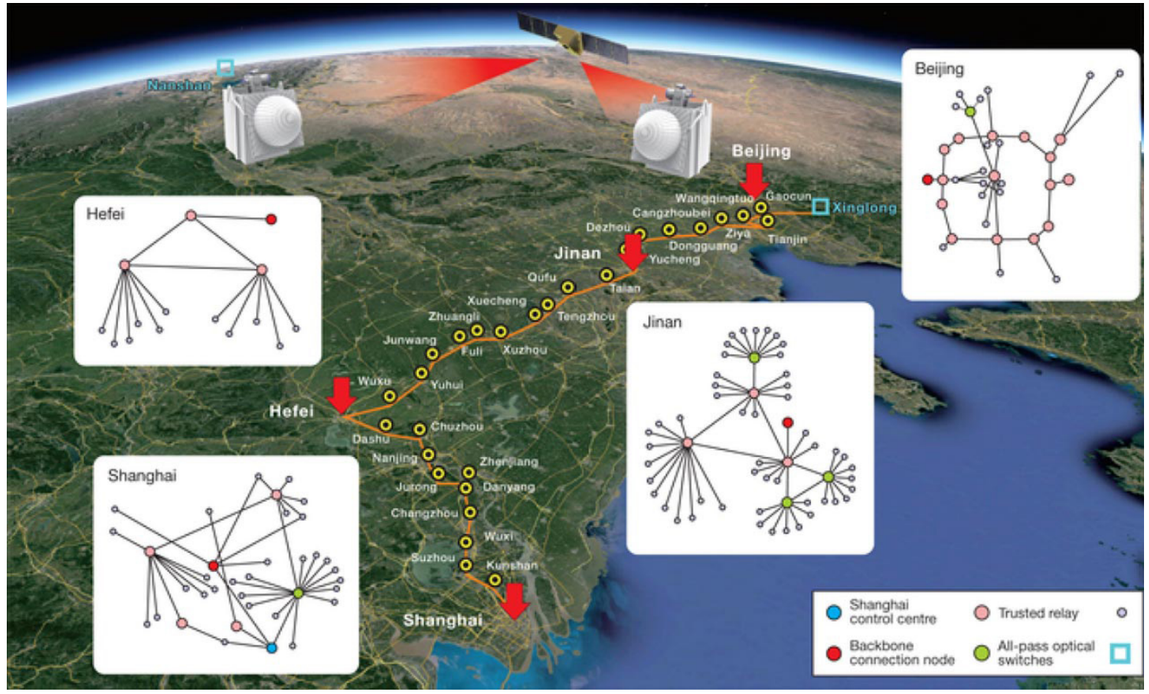
Chinese President Xi Jinping speaks during an event to commemorate the 40th anniversary of the Message to Compatriots in Taiwan at the Great Hall of the People © GB News (US)

But with Beijing's eyes on the South China Sea, which contains a selection of key US bases, worries have risen in recent years that the world's second-largest economy could cut the cables off in the event of a conflict.

Kenny Huang, chief executive officer at the Taiwan Network Information Center, told Bloomberg as far back as 2022 that the cables were an "Achilles' Heel" to Taiwan.

Meanwhile, security experts have, in the last few days, warned of infrastructural threats closer to home.

Alan Mendoza, executive director of the Henry Jackson Society think tank, told GB News: "If China maintains a stranglehold on our national security infrastructure, it could leave Britain undefended."



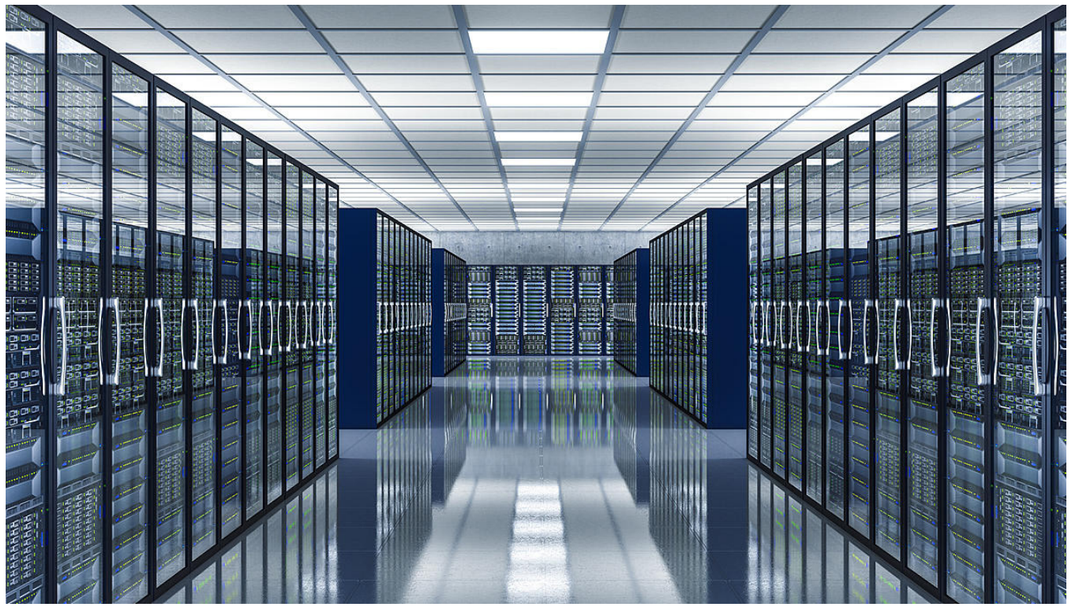
China Builds the World's First Integrated Quantum Communication Network

China has announced over 700 optical fibers on the ground with two ground-to-satellite links containing quantum computers to achieve quantum key distribution over a total distance of 4,600 kilometers for users across the country, reported in Nature. With all the very advanced physics of Albert Einstein spooky action at a distance, and German rocket science, China has managed to achieve a whopping 47.8 thousand bits per second to send their secret key. In order to justify all this nonsense, they say that they are transmitting secret keys to participants across this totally conventional network. The actual data that is important, has been secured with typical conventional cryptographic innovations, where a secret key enables a direct decryption of the 700 optical fiber data transmitted on the ground. Unlike CargoBit, 100% of the data bits are all included, compressed or not, simply encrypted with a secret key. It is still possible to reconstruct the data.

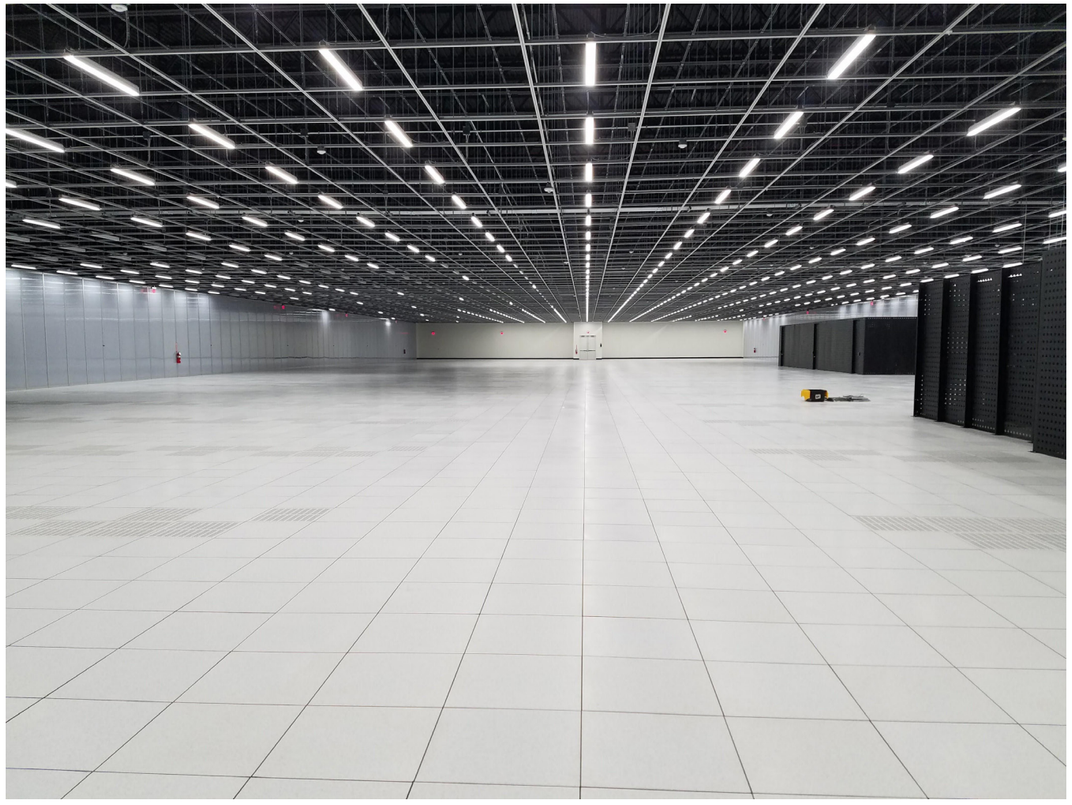
The CargoBit FTLDCI (Faster Than Light Data Center Interconnect) will convert one single 1GbE communications link into (2^26) or (2^52) 1GbE communication links with no change in hardware required, and this is compared to the China 700 optical fibers.

FTLDCI is a Codex Grandeur LLC package that allows customers to communicate between different CargoBit platforms. Anywhere a CargoBit system is located, it will become a USA territory, flying the USA flag.

Small Data Centers Win against Large Data Centers With CargoBit



Magnitudes More Space with Magnitudes Less Data Storage



Prefix	Symbol	1000^m	10^n	Decimal	Short scale	Long scale	Since[n 1]
yotta	Y	1000^8	10^{24}	1 000 000 000 000 000 000 000 000	Septillion	Quadrillion	1991
zetta	Z	1000^7	10^{21}	1 000 000 000 000 000 000 000	Sextillion	Trilliard	1991
exa	E	1000^6	10^{18}	1 000 000 000 000 000 000	Quintillion	Trillion	1975
peta	P	1000^5	10^{15}	1 000 000 000 000 000	Quadrillion	Billiard	1975
tera	T	1000^4	10^{12}	1 000 000 000 000	Trillion	Billion	1960
giga	G	1000^3	10^9	1 000 000 000	Billion	Milliard	1960
mega	M	1000^2	10^6	1 000 000	Million		1960
kilo	k	1000^1	10^3	1 000	Thousand		1795
hecto	h	$1000^{2/3}$	10^2	100	Hundred		1795
deca	da	$1000^{1/3}$	10^1	10	Ten		1795
		1000^0	10^0	1	One		–
deci	d	$1000^{-1/3}$	10^{-1}	0.1	Tenth		1795
centi	c	$1000^{-2/3}$	10^{-2}	0.01	Hundredth		1795
milli	m	1000^{-1}	10^{-3}	0.001	Thousandth		1795
micro	μ	1000^{-2}	10^{-6}	0.000 001	Millionth		1960
nano	n	1000^{-3}	10^{-9}	0.000 000 001	Billionth	Milliardth	1960
pico	p	1000^{-4}	10^{-12}	0.000 000 000 001	Trillionth	Billionth	1960
femto	f	1000^{-5}	10^{-15}	0.000 000 000 000 001	Quadrillionth	Billiardth	1964
atto	a	1000^{-6}	10^{-18}	0.000 000 000 000 000 001	Quintillionth	Trillionth	1964
zepto	z	1000^{-7}	10^{-21}	0.000 000 000 000 000 000 001	Sextillionth	Trilliardth	1991
yocto	y	1000^{-8}	10^{-24}	0.000 000 000 000 000 000 000 001	Septillionth	Quadrillionth	1991

Codex Grandeur LLC

www.ftlspinup.com

www.cargobit.com

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