ADVANCED TECHNOLOGY GROUP (ATG)

Accelerate with ATG Webinar: IBM TS7700 Tape Solution Overview 301

Speakers:

Sandy Browning, ATG - Tape Solutions

Chris Cummings, IT Management Consultant – Mainframe Tape

Accelerate with ATG Technical Webinar Series

Advanced Technology Group experts cover a variety of technical topics.

Audience: Clients who have or are considering acquiring IBM Storage solutions. Business Partners and IBMers are also welcome.

To automatically receive announcements of upcoming Accelerate with IBM Storage webinars, Clients, Business Partners and IBMers are welcome to send an email request to accelerate-join@hursley.ibm.com.

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Ongoing Innovation – IBM Storage Virtualize 8.7.1 Technical Update – October 10th, 2024

Announcing the 10th Generation IBM DS8000 Enterprise Storage System – October 17th, 2024

Important Links to bookmark:

ATG Accelerate Site: https://ibm.biz/BdSUFN

ATG MediaCenter Channel: https://ibm.biz/BdfEgQ

Offerings

Client Technical Workshops

➢ IBM DS8900F Advanced Functions – November 6-7 (Virtual)

➢ IBM Cyber Resiliency with IBM Storage Defender – November 13 (Virtual)

➢ IBM Fusion & Ceph: A Deep Dive into Next Gen Storage – November 19-20 (Virtual)

➢ IBM FlashSystem Deep Dive & Advanced Functions – December 3-4 (Herndon, VA)

➢ IBM Storage Scale System & Storage Scale Workshop

TechZone Test Drive / Demo's

➢ IBM Storage Scale and Storage Scale System GUI
➢ IBM Storage Virtualize Test Drive
➢ IBM DS8900F Storage Management Test Drive
➢ Managing Copy Services on the DS8000 Using IBM Copy Services Manager Test Drive
➢ IBM DS8900F Safeguarded Copy (SGC) Test Drive
➢ IBM Cloud Object Storage Test Drive - (Appliance based)
➢ IBM Cloud Object Storage Test Drive - (VMware based)
➢ IBM Storage Protect Live Test Drive
➢ IBM Storage Ceph Test Drive - (VMware based)

Please reach out to your IBM Representative or Business Partner for more information.

IMPORTANT The ATG team serves clients and Business Partners in the Americas, concentrating on North America.

Registration Open!

Storage @ IBM TechXchange Conference 2024

October 21-24, 2024
Mandalay Bay | Las Vegas
#IBMTechXchange

Key Learnings
- Practical how-to advice
- Patterns and best practices
- Success stories, IBM PoV, proven techniques

Featured Products

IBM Storage Defender   IBM Storage Fusion

IBM Storage Scale + IBM Storage Ceph   IBM Tape + IBM SAN

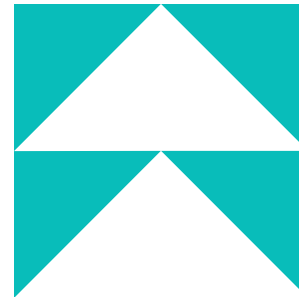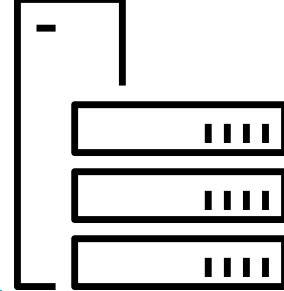IBM Storage FlashSystem + IBM Storage DS8000

Collaborate. Learn. Play.

Community
IBM Champions
User Groups
Tech Peers
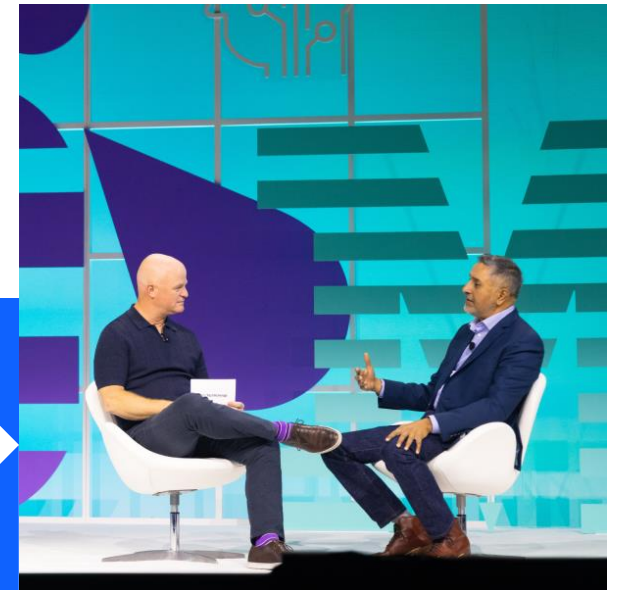Business Partners

Sandbox
Network   Learn
Collaborate   Play

Roadmaps
Go deep with people in the know and set the stage for where IBM is going in the future

Breakout Sessions
Trends and Directions   User Groups
Product Deep Dives   Meet the Expert
Professional Development   Show the Code
Birds of a Feather
Academic/Research

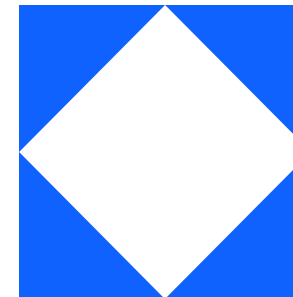## Accelerate your Career
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Game On! →

Accelerate with ATG Survey

Please take a moment to share your feedback with our team!

You can access this 6-question survey via Menti.com with code 1708 6924 or

Direct link https://www.menti.com/alwhyze7z1gz

Or

OR Code

Join at menti.com | use code 1708 6924

If you were to live in any fantasy world, where would it be?
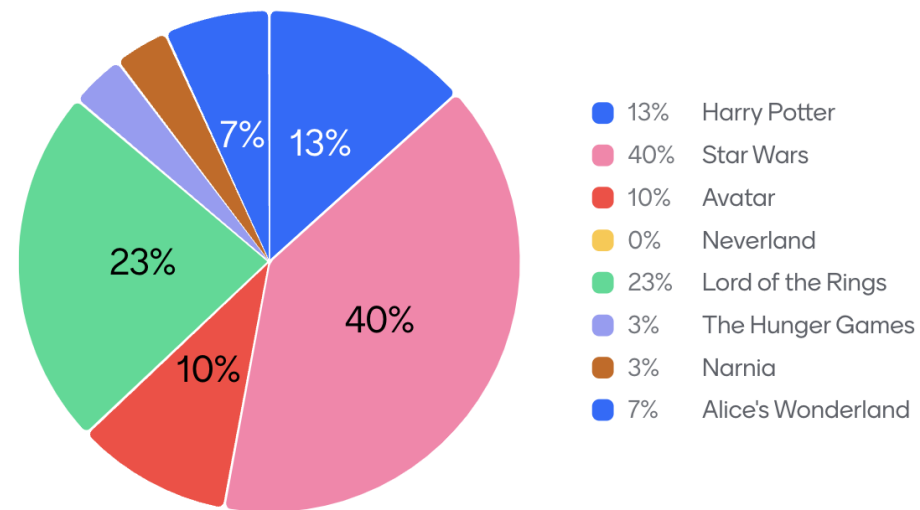
13%	Harry Potter
40%	Star Wars
10%	Avatar
0%	Neverland
23%	Lord of the Rings
3%	The Hunger Games
3%	Narnia
7%	Alice's Wonderland

ADVANCED TECHNOLOGY GROUP (ATG)

Accelerate with ATG Webinar: IBM TS7700 Tape Solution Overview 301

Speakers:

Sandy Browning, ATG - Tape Solutions

Chris Cummings, IT Management Consultant – Mainframe Tape

Meet the Speakers

Sandra Browning has been with IBM 14 years, she started out working for Storage Sales as a Client Technical Specialist. Sandy is currently part of the ATG (Advanced Technical Group) specializing in tape. She has been working with IBM tape equipment for over 36 years both as a customer, and as a vendor.

Chris Cummings has over 25 years of mainframe experience. He worked for 18 years at Atos NA, formerly Affiliated Computer Services (ACS) in Dallas, Texas. During his time at Atos, he was the North American Mainframe Storage Architect responsible for DASD, TAPE, and Directors. He also was one of the Architects of the Mainframe HUB environment. After Atos, Chris serviced is the VP Business Analyst and Product Manager for the High-Performance Compute Environment (IBM Symphony) for 1.5 years. In 2020, Chris came to IBM as a Mainframe Tape CTS and finally Mainframe Tape Consultant for Expert Labs.
He specializes in the implementation and migration of the TS7700 family of products.

Session objectives

To share with the audience an overview of the major steps to install an IBM VTS TS7700.

Agenda

- TS7760 – End of Support December 31st, 2024

  a. No more code releases – R5.2 is last code level.

  b. Security Fixes Only – All Code fixes would end – No Root Cause Analysis

  c. Extended support – break/fix is being offered – response time subject to part availability

- TS7770 - New Code R5.4 is recommended – it has some cool new features

  a. LWORM Retention

  b. Dual Factor Authorization – Enhancements were added

  c. 65GB Virtual Volume Size

- Overview of the major steps of an Install of an IBM TS7700

- Lab Services Offerings – with Chris Cummings

Install Steps of the TS7700

The Basics of a TS7700- VTS System (TS7700, IBM VTS, model 7770)

Local Site

Remote Site

IBM zOS Processor

IBM TS4500 Tape Library

IBM TS4500 Tape Library

IBM TS7700

IBM TS7700

Ficon

IBM Cloud Object Library

IBM Cloud Object Library

On Prem or in public Cloud

On Prem or in public Cloud

Grid / IP
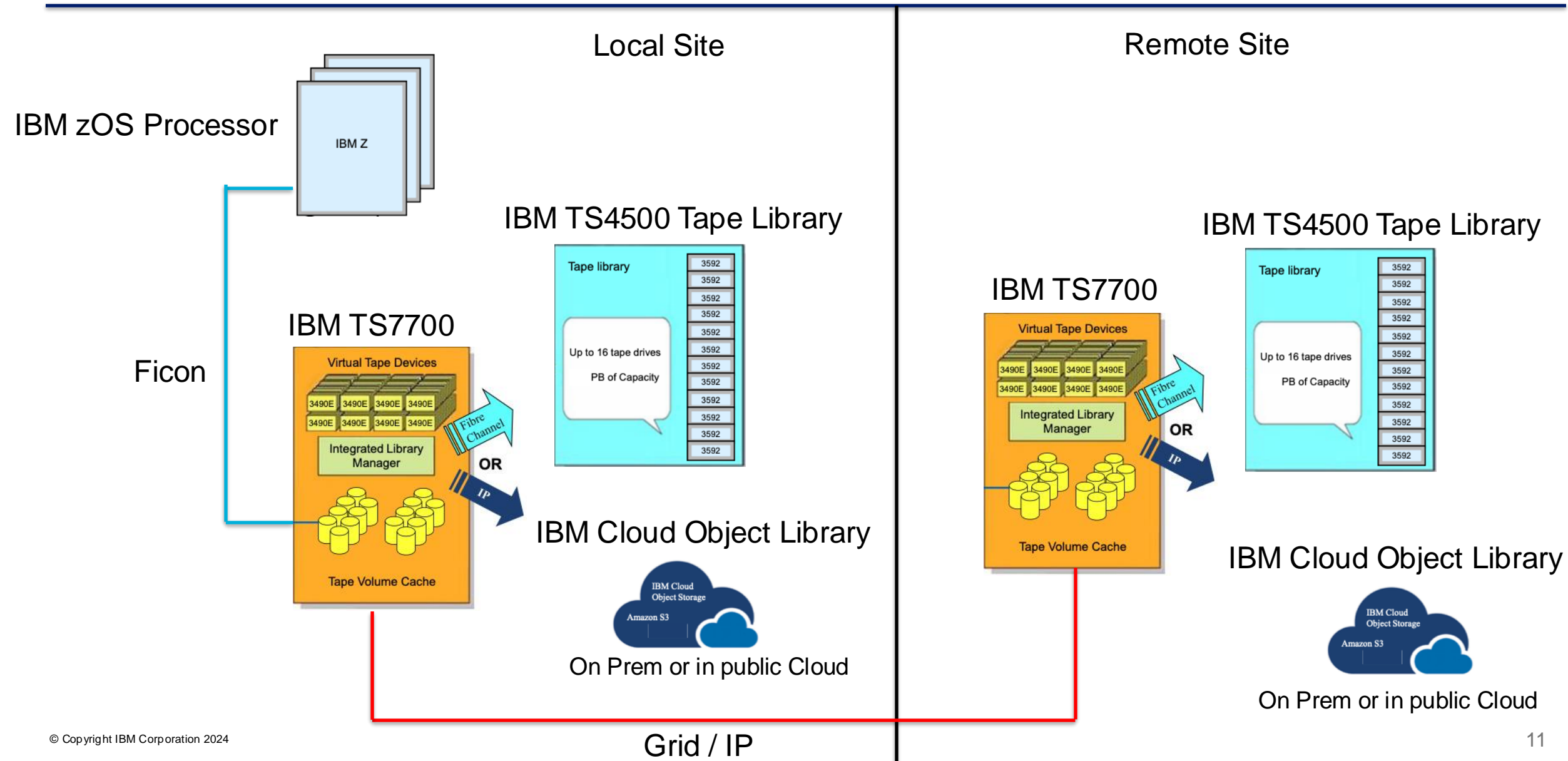
Install Task Worksheet

Task	Prep						Testing
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 1
Physical site							
* Floor space	■						
* Power	■	■	■	■	■		
* Cabling	■	■	■				
Network							
* Configuration	■	■	■	■	■	■	
* IP address						■	
Hardware							
* Delievery					■	■	
* Install							■
Lab Services Engagement							
* Software planning						■	
* Training						■	
Software configuration planning							
* HCD						■	
* SMSTape						■	
* Update TMC						■	
Activate software configuration							
* HCD						■	
* SMSTape configuration							■
Testing							
* Insert virtual volumes							■
* Define replication policies							■
* ACS routines & replication							■
** DEF mode copy							■
** SYNC mode copy							■
** UNIT=AFF & VOL=REF							■
* Remote Read/Write							■
* Eject virtual volumes							■
Advanced funtions testing							
* High availability							■
* DR							■
* Flash Copy for DR							■

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Major Install Steps in Order – TS7700 – IBM VTS – Model 7770

A new TS7700 VTS is ordered and on its way to your location

Systems Assurance Meeting with IBM

    a. Order / Shipping information will be provided

    b. Worksheet will be provided – Everything you need to provide for Network attachment

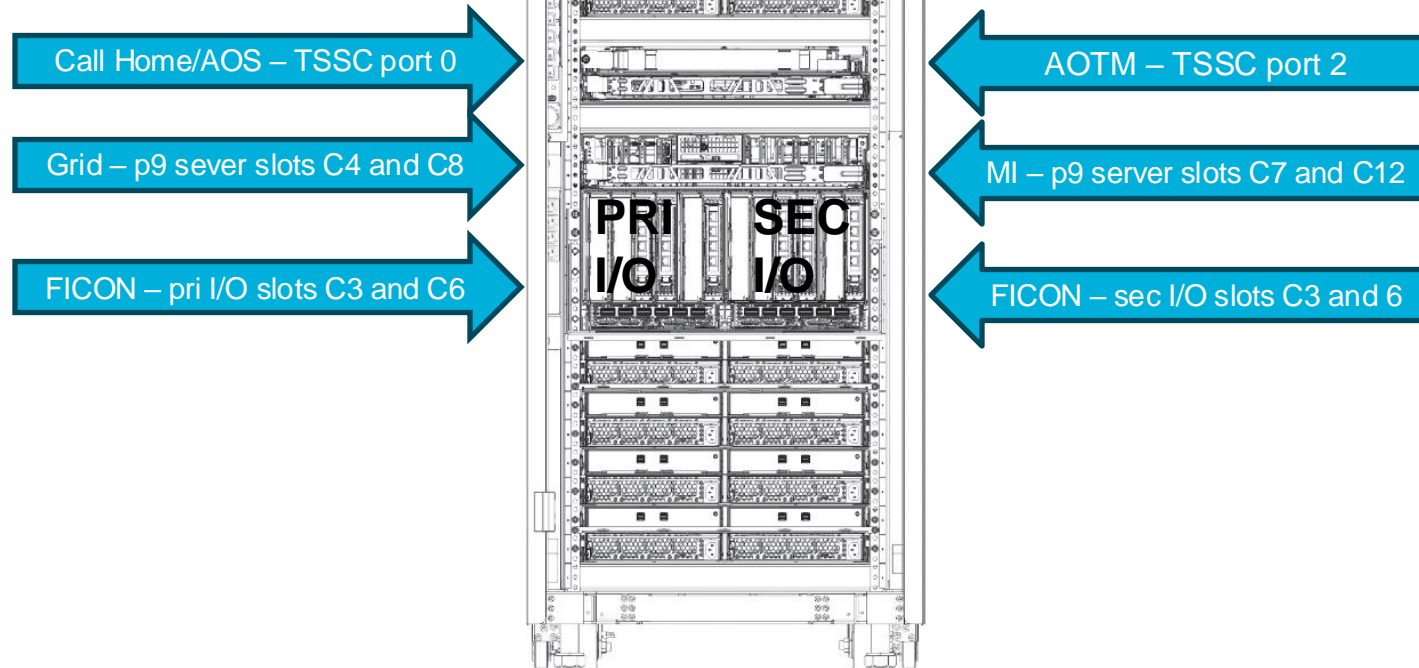   c. Software Requirements Reviewed

Physical Site

- Floor space = Width: 644 mm (25.4 in) Depth: 1102 mm (43.4 in) Height: 1804 mm (71.0 in) Weight: 565.6 kg (1247 lb)
- Power (single phase 240 Volt AC and/or 3-phase 400 Volt AC) – 2 power connections to each frame for High Availability
- Physical Cabling
  - Ficon (SW or LW) – Max 8 connections to zOS (2, 4 or 8 supported)
  - Grid – Max 4 connections to each VTS in the grid (2 or 4 supported)
  - Management Interface – 2 connection
  - Call Home/AOS – 1 connection
  - AOTM – 1 connection

Network

- Grid Links 2 - 4 (four 1GbE Copper and/or 10GbE Optical) - each on their own subnet
  - We recommend 4 – because of balanced performance and if you lose ONE – you're not left with all traffic on ONE connection
    High availability, high redundancy If you lose an adapter, you can still have two active links – if you lose switch, you can still have two active links
- Flow Control must be turned on
- Jumbo Frames are not supported
- IP addresses 5 are required (Management Interface require 3 IP - Call home 1 IP – AOTM 1 IP)
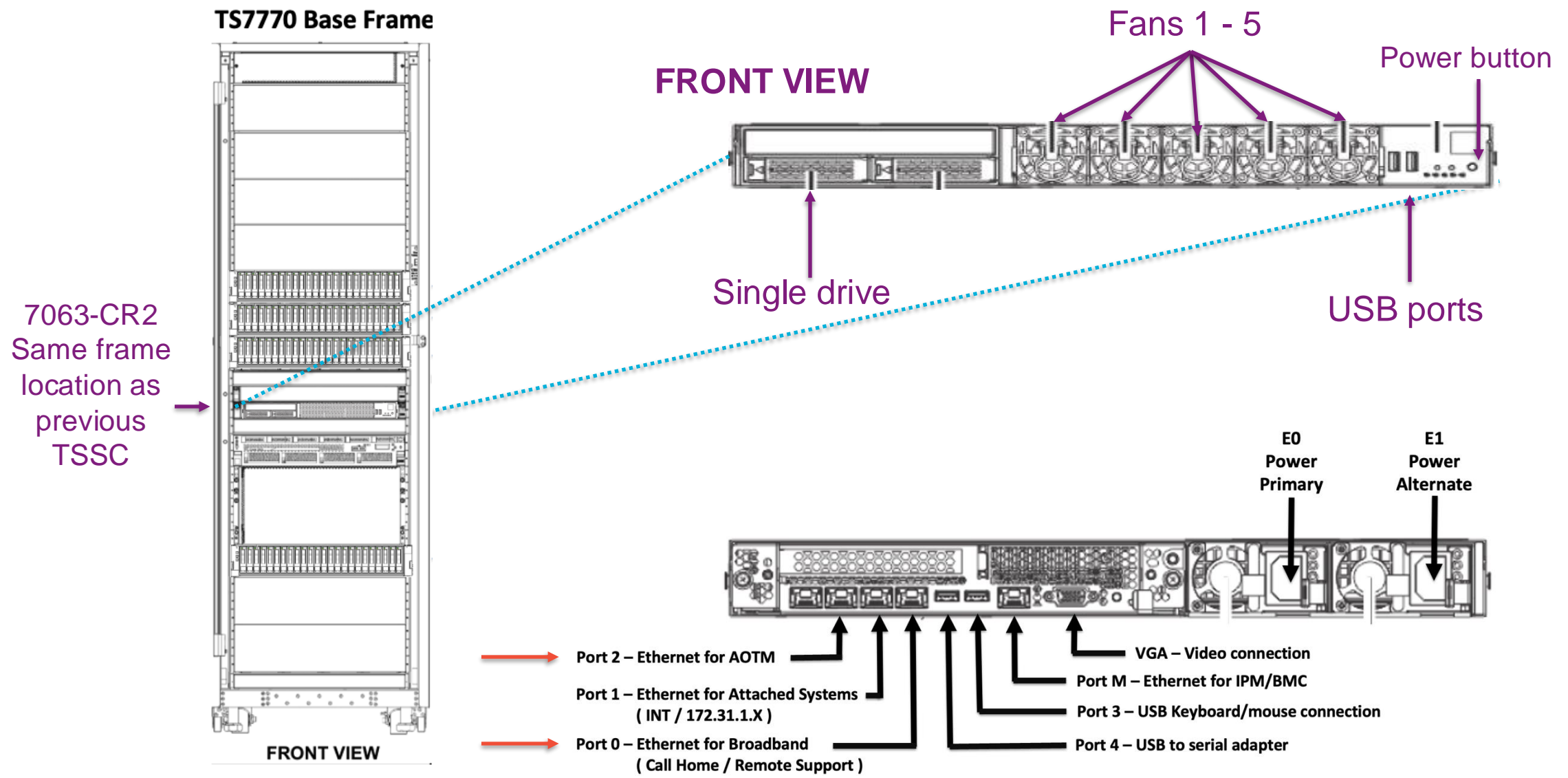
TS7770 3948-VED connection

	# of IPs/ports	# of cables
MI	3	2 CAT6
Grid	2 or 4	2 or 4 1Gb or 10Gb LW
Call Home	1	1 CAT6
AOTM	1	1 CAT6
FICON	2, 4 or 8	16Gb LW or SW

Call Home/AOS – TSSC port 0

AOTM – TSSC port 2

Grid – p9 sever slots C4 and C8

MI – p9 server slots C7 and C12

PRI I/O **SEC I/O**

FICON – pri I/O slots C3 and C6

FICON – sec I/O slots C3 and 6

REAR VIEW

Frame layout

TS7770 Base Frame

FRONT VIEW

Fans 1 - 5

Power button

Single drive

USB ports

**7063-CR2
Same frame
location as
previous
TSSC**

E0
Power
Primary

E1
Power
Alternate

Port 2 – Ethernet for AOTM

Port 1 – Ethernet for Attached Systems
(INT / 172.31.1.X)

Port 0 – Ethernet for Broadband
(Call Home / Remote Support)

VGA – Video connection

Port M – Ethernet for IPM/BMC

Port 3 – USB Keyboard/mouse connection

Port 4 – USB to serial adapter

FRONT VIEW

Major Install Steps in Order – TS7700 – IBM VTS – Model 7770

A new TS7700 VTS is ordered and on its way to your location

LAB Services Engagement
- Software configuration and planning
- TS7700 configuration and planning
- Training

Software Configuration & Planning
- HCD – zOS hardware Gen – define the virtual tape drive device addresses
- Select media categories and update DEVSUPxx parmlib member
- Define SMSTape/OAM environment, SMS constructs, and update ACS routines
- Select logical volser range
- Update Tape Management Catalog (CA1, RMM, Zara, etc.)

TS7700 Configuration & Planning
- Define TS7700 constructs – construct names must match SMS construct names

TS7700 – Implementation, Insert Virtual Volumes

- Pre-req activities
  - Add scratch categories (must match DEVSUPxx values for zOS platform or platform values)
  - Define scratch retention policies (best practice is 3 days no hold if no special requirement)
- Insert virtual volumes via *TS7700 MI Insert Virtual Volumes* page
  - Limit to 10,000 virtual volumes per insert
  - Split the insert across the I/O clusters
    - Example: 5,000 per cluster with two I/O clusters
  - Verify media type
    - Cartridge System Tape is MEDIA1
    - Enhanced Capacity Cartridge System Tape is MEDIA2 (default)
  - Leave constructs set to default unless non zOS platform

TS7700 – Implementation, Testing

High Availability Testing

- Run BVIR job on one of the I/O clusters

- Vary all the devices on the cluster offline where the BVIR tape volume is residence

- Submit an IEBGENER job to read the tape volume and it should get CC of 0

  - This will result in a remote mount

- This tests that you can access a logical tape volume - from a cluster A-OK even when it is offline

FlashCopy for DR Testing

- See TS7700 best practices – FalshCopy for DR testing for more information: https://www.ibm.com/support/pages/ts7700-best-practices-flashcopy-dr-testing-v16c

- Listen to ATG Webinar on TS7700 DR Testing in 2023

Hardware and Code Matrixes

Supported hardware
    3957 / 3948 VED

R5.4 code requirement
    128GB of memory

Code upgrade rule
    R5.2 code or above can be upgraded to R5.4

Cluster join rule
    R5.4 can be joined with R5.1 or latter with a total of 3 code levels in the Grid

Frame roll rule
    R3.3 (8.33.xx.x) code or later
    Source cluster does not have active data in cache partition 0
    Target cluster is completely cleaned

Whitepaper Link:
    TS7700 Code Update Recommendation
    https:/www.ibm.com/support/pages/node/6334607

    TS7700 Code, Hardware and Grid Interoperability
    https://www.ibm.com/support/pages/node/6354801

Hardware and Code Matrixes

- "Major Code Release specific recommendation and code upgrade path details:"
- https://www.ibm.com/support/pages/node/6334607

- Example:
- To upgrade a TS7760 with microcode levels R4.0 to R5.0, the system must first be upgraded to R4.1 or R4.2.
- To upgrade a TS7760 with microcode levels R4.0 to R5.1, the system must first be upgraded to R4.2.
- To upgrade a TS7760 with microcode levels R4.1 to R5.1, the system must first be upgraded to R4.2 or R5.0.
- To upgrade a TS7760 with microcode levels R4.x to R5.2, the system must first be upgraded to R5.0 or R5.1

- TS7760 ends with R5.2 Microcode !
- **Note:** As a reminder, End of Development (EoD) support was announced for TS7760, effective 31 December 2023, at which time no more code fixes will be provided.
  https://www.ibm.com/docs/en/announcements/2023-hardware-maintenance-services-withdrawal

- To upgrade a TS7770 with microcode levels R5.0 to R5.3, the system must first be upgraded to R5.1 or R5.2.
- To upgrade a TS7770 with microcode levels R5.0 to R5.4, the system must first be upgraded to R5.2.
- To upgrade a TS7770 with microcode levels R5.1 to R5.4, the system must first be upgraded to R5.2 or R5.3.
- TS7700 Recommended Code is R5.4. (8.54.1.27)

Hardware and Code Matrixes

TS7700 Recommended vtd_exec Matrix:
https://www.ibm.com/support/pages/node/6416101

TSSC Code Update Recommendation:
https://www.ibm.com/support/pages/node/6334617

TS4500 Code Update Recommendation:
https://www.ibm.com/support/pages/node/697693

IBM LAB SERVICES

IBM Lab Services - Best of the Best

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IBM LAB SERVICES

Mainframe Tape Offerings

- **Implementation Services**
  - **Technical Information Transfer**
  - **Hardware and Software Services**
- **Migration and Refresh**
- **Specialty Feature Implementation**
- **Secure Data Overwrite (SDO)**
- **Expertise Connect**

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IBM LAB SERVICES

Mainframe Tape Offerings
Technical Information Transfer

- **Provide Technical Information**
  - **TS7700 Virtualization Engine Overview**
    - Technology Overview
    - Advanced Functions
    - Physical Installation
  - **z/OS Implementation Requirements**
    - Parmlib changes
    - Security Updates
    - SMS Changes and updates
  - **TS7700 Management Interface Demo**
  - **TS7700 Disaster Recovery Testing, Reporting and Commands**
  - **TS4500 Overview**

IBM LAB SERVICES

Mainframe Tape Offerings

- **Implementation Services**
  - **Technical Information Transfer**
  - **Hardware and Software Services**
- **Migration and Refresh**
- **Specialty Feature Implementation**
- **Secure Data Overwrite (SDO)**
- **Expertise Connect**

IBM LAB SERVICES

Mainframe Tape Offerings
Implementation Services

- **Hardware Implementation**
  - **Working with customers implement hardware**
    - Verification of hardware licenses
    - Construct definitions (Dataclass, Storage Class, Management Class, and Storage Group)
    - Verification of copy modes
    - Validation of implementation and testing

- **Software Implementation**
  - **Working with customers to implement software changes**
    - SYS1.PARMLIB changes
    - Tape Allocation Changes (MIM, ATAM, etc.)
    - DFSMS Changes for library implementation

Mainframe Tape Offerings

- Implementation Services
- Migration and Refresh
  - Host Migration
  - Migrations Made Easy
  - Grid to Grid Migration
  - Object Migration
  - Partition Refresh
- Specialty Feature Implementation
- Secure Data Overwrite (SDO
- Expertise Connect

Mainframe Tape Offerings - Migration and Refresh

- # Host-based
  - Install new empty TS7700 or grid, add host definitions
  - Enable storage group with new TS7700 for new allocations
  - Disable VSM, DLM, Luminex, etc. for new allocations
  - Data migrates as new versions are created
  - Copy residual data
  - Easy backout, no outages, no interruptions to production

Mainframe Tape Offerings

- Implementation Services
- Migration and Refresh
  - Host Migration
  - Migrations Made Easy
  - Grid to Grid Migration
  - Object Migration
  - Partition Refresh
- Specialty Feature Implementation
- Secure Data Overwrite (SDO)
- Expertise Connect

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Mainframe Tape Offerings - Migrations Made Easy for Logical Volume

- Eases the migration from current TS7700 (VEBs/VECs) hardware to newer technology TS7700 (VEDs)

  - Eliminates the need for using the IBMTools to build reports and jobs in order to migrate the data.

  - Eliminates the use of Host MIPS and runs as a low priority task in the cluster.. Timeline dependent on the:
    - Amount of data to be moved
    - Number of Grid Links
    - Grid Link Network Speed

- Does not require customer resources to execute and monitor the migration

- Consistency Check Verification of data

Mainframe Tape Offerings

- Implementation Services
- Migration and Refresh
  - Host Migration
  - Migrations Made Easy
  - Grid to Grid Migration
  - Object Migration
  - Partition Refresh
- Specialty Feature Implementation
- Secure Data Overwrite (SDO)

Mainframe Tape Offerings - Grid to Grid Migration

- Grid to Grid Migration (GGM) introduces a mechanism for two independent Grid configurations to intercommunicate for the purpose of replicating content from one Grid to another and addresses many of the migration issues described above.
  - The two grid configurations rely on their existing Grid WAN/LAN networks be temporarily interconnected allowing grid volume replication techniques to copy data between grids.
  - A volume serial or VOLSER is retained through the migration process, though host catalog and Tape Management System (TMS) updates may also be required given the volume location has changed.
- Two major use-cases are supported
  - Migration of logical volumes between grid configurations under the same system plex
  - Migration of logical volumes between grid configurations under independent system plexes.

Mainframe Tape Offerings

- Implementation Services
- Migration and Refresh
  - Host Migration
  - Migrations Made Easy
  - Grid to Grid Migration
  - Object Migration
  - Partition Refresh
- Specialty Feature Implementation
- Secure Data Overwrite (SDO)

Mainframe Tape Offerings - Migration for Objects

- The migration from FC 5282 to FC 5283
- Copy Refresh (Migration Made Easy for Objects)
  - Eliminates the need for hour GET/PUT operations
  - Timeline dependent on the:
    - Amount of data to be moved
    - Number of Grid Links
    - Grid Link Network Speed
  - Does not require customer resources to execute and monitor the migration
  - Consistency Check Verification of data

Mainframe Tape Offerings

- Implementation Services
- Migration and Refresh
  - Host Migration
  - Migrations Made Easy
  - Grid to Grid Migration
  - Object Migration
  - Partition Refresh
- Specialty Feature Implementation
- Secure Data Overwrite (SDO)

Mainframe Tape Offerings - Partition Refresh

- Assist with clients transitioning from TS7700T to
  - TS7700C
  - TS7700D
- Providing guidance on resizing VTS partition

Mainframe Tape Offerings

- Hardware Training Modules

- Implementation Services

- Migration and Refresh

- Specialty Feature Implementation

  - LWORM and LWORM Retention

  - Transparent Cloud Tiering (TCT)

- Secure Data Overwrite (SDO)

- Expertise Connect

Mainframe Tape Offerings - Specialty Feature Implementation

- **Logical Write Once Read Many (LWORM)**
  - Assist in planning LWORM
    - Data Class constructs in SMS
    - Data Class constructs on the TS7700
  - Work with the customer to test and verify

- **LWORM Retention**
  - Assisting customer through the RPQ process (Prior to 5.4 Code Level)
    - Deciding on the retention periods
    - Dataclass Construct names
    - Tape Management System requirements
  - Working with development on the LWORM worksheets
  - Working with customer and SSR to implement code on TS7700
  - Testing with the customer and validation LWORM retentions

Mainframe Tape Offerings

- Implementation Services
- Migration and Refresh
- Specialty Feature Implementation
  - LWORM and LWORM Retention
  - Transparent Cloud Tiering (TCT)
- Secure Data Overwrite (SDO)
- Expertise Connect

Mainframe Tape Offerings - Specialty Feature Implementation

- **Transparent Cloud Tiering**
  - Working with customer on partition sizing
  - Validating Checklist
    - Microcode levels on DS8K
    - Microcode levels on TS7700
    - Necessary PTFs and APARs on z/OS
  - Coordinating with SSR for feature code updates
  - Coordinating with D8K Expert Labs for connections
  - Working with the customers on
    - TS7770 Object store policies
    - TS7700 Object store setup
    - SMS / ISMF configuration
    - Testing and validation
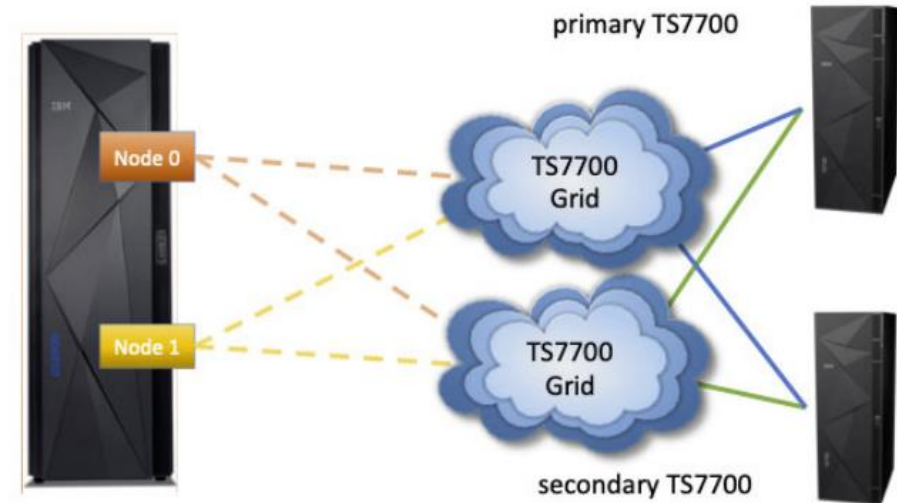
Mainframe Tape Offerings

- Implementation Services

- Migration and Refresh

- Specialty Feature Implementation

- Secure Data Overwrite (SDO)

- Expertise Connect

Mainframe Tape Offerings - Secure Data Erase

- **National Institute of Standards and Technology (NIST) Certified Data Erasure of the TS7700**
  - Connect and verify cluster serial number via AOS (Assist On-Site)
  - Verify cluster has been unjoined from the Grid
    - Requires FC4016 (Grid Cluster unjoin)
  - Perform 5 pass randomized overwrite
    - Read back the data
    - Verify the data has been overwritten
  - Restore TS7700 erased to a useable state
    - Requires FC4017 (Cluster Clean-up)
  - Provide IBM NIST Data Sanitation Report

IBM Storage
Quick Reference Guide

Expertise Connect for IBM TS7700 Mainframe Tape

Overview

Our Expertise Connect service will help you achieve your desired business outcomes from IBM TS7700 Mainframe Tape faster. One of our experienced Lab Services consultants will become an extended member of your team, acting as a trusted advisor and mentor to help you optimize or enhance your business continuity and disaster recovery and strategies.

IBM Systems Lab Services

Target Audience

- Mainframe customers that want to focus on accelerating their desired business outcomes in the areas of disaster recovery and business continuity.

Why Use This Service?

- Are achieving business outcomes more important to your team than implementing a new product?

- Do you want to establish and leverage an ongoing, trusted relationship with subject matter experts that can help you beyond just installing a product?

- Do you want to continuously learn and implement best practices in data security ?

Benefits

- You will work closely with a named IBM Systems Lab Services consultant, with deep technical experience in IBM TS7700.

- A committed, ongoing relationship with our team's expertise will help you achieve your business outcomes faster.

Services Provided

- Expertise Connect from Lab Services is a subscription service providing named access to:

  - IBM Technical Account Manager and an experienced IBM TS7700 technical consultant.

- Expertise Connect services from IBM Systems Lab Services include:

  - Perform proactive best practices consulting in disaster recovery, business continuity and encryption

  - Perform remote scale and optimization consulting

  - Advise and consult on system administration and new features

  - Perform a comprehensive health / performance assessment

  - Provide critical situation assistance and priority issue management

Deliverables

- Consulting services to help customers achieve their targeted business outcomes in disaster recovery and business continuity.

- Guidance on IBM TS7700 administration and management.

- Reports on health assessment findings with recommendations.

- Executive level report for quarterly business outcome review.

- Skills enablement and guidance on recommended practices for TS7700 administration.

Contacts

- Contact us at systems-expert-labs@ibm.com or Contact Expert Labs

Website

IBM Infrastructure Expert Labs

Thank you!

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Accelerate with ATG Survey

Please take a moment to share your feedback with our team!

You can access this 6-question survey via Menti.com with code 1708 6924 or

Direct link https://www.menti.com/alwhyze7z1gz

Or

OR Code