


2023 CCDUG:

Everything you wanted to know about
the **IMPORT** command but were
afraid to ask

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Agenda

- IMPORT command basics
- IMPORT command details
- IMPORT command Parameters:
 - NAME
 - OPTION(NOCHECK)
 - OPTION(DELPENDERR)
- Using IMPORT in an IMSplex with multiple IMSs
- Rolling out PSB changes in a shared Catalog / Directory environment



IMPORT command basics

IMPORT command basics

- Type 2 IMS command
- IMPORT Type 2 command requires:
 - IMSplex (including a single IMS IMSplex)
 - CSL address spaces: SCI, OM
 - CSL address space: RM (if sharing resources e.g. **Shared Catalog**)
- IMPORT command can be submitted from:
 - TSO Single Point of Control (SPOC) and Batch SPOC utility
 - IBM® Management Console for IMS and DB2® for z/OS®
 - The Manage Resources options in the IMS Applications menu
 - User-written programs that issue commands through OM API.

IMPORT command basics

- Two flavors:
 - IMPORT DEFN SOURCE(REPO | RDDS) command
 - to IMPORT resource and descriptor definitions in an online IMS system from Resource Definition Data Set (RDDS) or the IMSRSC repository – **used in a DRD environment**
 - IMPORT DEFN SOURCE(CATALOG) command
 - to **activate** application and database resource definitions (PSBs and DBDs) in an online IMS system by importing them from the staging data Directory to the active IMS Directory
 - **Used to perform Online change in an IMS Managed ACB environment**

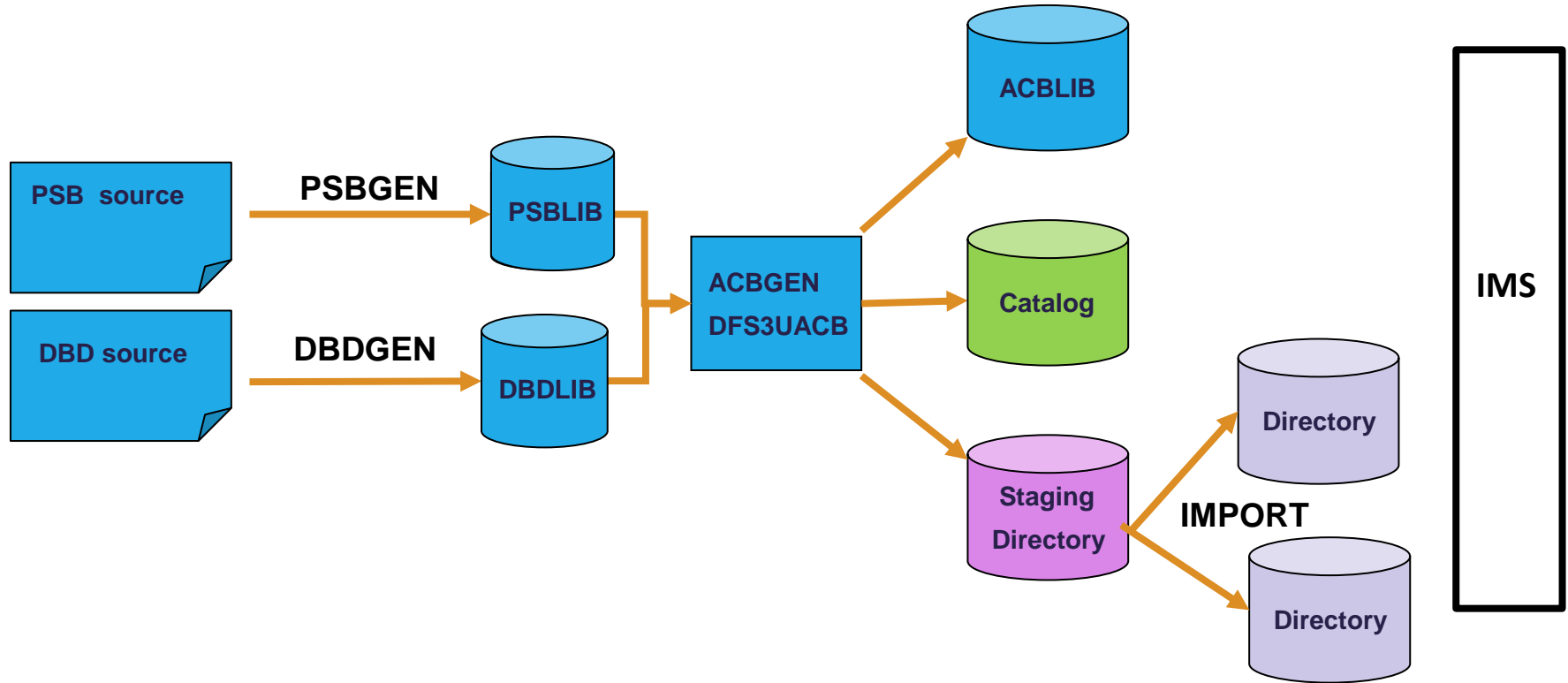
Online change in a non-IMS Managed ACBs environment:

1. ACBGEN into Staging ACBLIB
2. Copy from Staging ACBLIB to the INACTIVE ACBLIB
3. Switch the active & inactive libraries:
 - 3a. `/MODIFY PREPARE` or `INITIATE OLC PHASE(PREPARE)`
 - 3b. `/MODIFY COMMIT` or `INITIATE OLC PHASE(COMMIT)`
4. If `/MODIFY COMMIT` fails, then `/DIS MODIFY`

Online change in an IMS Managed ACBs environment:

1. ACBGEN into Staging Directory
2. Issue IMPORT command perform online change
IMPORT DEFN SOURCE(CATALOG) or
IMPORT DEFN SOURCE(CATALOG) NAME(...)
3. If IMPORT fails, it will tell you what in-use resource is stopping it from failing

Online change in an IMS Managed ACB environment





IMPORT command Details

IMPORT DEFN SOURCE(CATALOG) command processing

- Used to perform online change (**activate resources** in an online IMS system):
 1. Copies the resource ACBs from the STG directory to the active directory data set
 2. Deletes the resource ACBs from the STG directory
 3. Removes all old copies of the resources from memory and casts out DMBs and PSBs from their respective pools.
 4. If the IMS catalog is shared by multiple IMS systems, coordinates the change across the IMSplex
 5. Changes the same resources **in the Catalog** from **pending to active state**
- **Imported resources are logged** in 7002 log records and have the names of the resources that are changed or added
- Resource being changed should not be in use at time of IMPORT

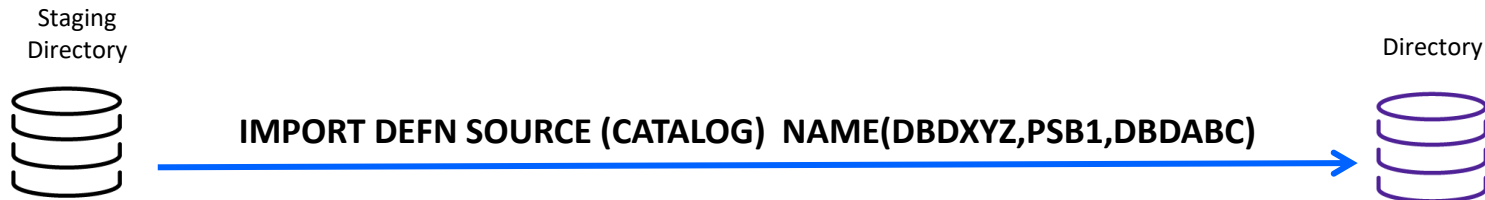
IMPORT DEFN Command – resources should not be in use

- Databases have to be stopped
 - DBR or UPDATE DB STOP(ACCESS)
 - Even, if they were not used or authorised
- Programs can't be scheduled in a region
 - BMP
 - IFP
 - MPR
 - WFI programs can be in a region but can't be processing
- Transactions must be stopped when
 - There is any queued transactions waiting
- IMPORT command output will tell what resource is causing the failure



NAME parameter

NAME () Parameter on IMPORT command



- Selectively IMPORT – like member online change
- If **DBDs are specified** on the NAME () Parameter, then **all of its referencing PSBs must exist** in the Staging Directory and both the DBD & its referencing PSBs will be IMPORTed
- Any errors will result in the entire command failing
 - Example: `IMPORT DEFN SOURCE (CATALOG) NAME(DBD1,PSB!)`
 - Misspelt PSB name: PSB! Will cause the entire command to fail

Wildcard specification in NAME () Parameter



- % = any single character, * = 0 or more character
- `IMPORT DEFN SOURCE (CATALOG) NAME (DBDAX*, ...`
All PSBs referencing DBDs that match `DBDAX*` must exist in the Staging Directory & will be IMPORTed.
- Wildcard usage can affect the performance of the IMPORT command
- Any errors will result in the entire command failing
 - Example: `IMPORT DEFN SOURCE (CATALOG) NAME(DBD1,PSB%%%%)`
 - If no PSB matching `PSB%%%%` found in staging Directory, the entire command fails

Referencing PSBs – The whole Truth & nothing but ...

- For the following IMPORT commands:
 - IMPORT DEFN SOURCE(CATALOG)
 - IMPORT DEFN SOURCE(CATALOG) NAME(DBD)
- DBD member in Staging directory is compared with DBD member in active directory
 - To determine if the DBD change is **non-structural change** or **structural change**
- For **non-structural DBD changes**:
 - We look for **one or more** referencing PSBs in the staging directory datasets.
 - If none found, the command will fail.
- For **structural DBD changes**:
 - We do the same check as non-structural DBD change (mentioned above)
 - In addition, we scan the active directory for PSBs that reference the changed DBD & **ALL** those PSBs need to be in staging directory also, otherwise, the command fails



OPTION(NOCHECK)

OPTION(NOCHECK) on IMPORT Command

- Does not check for PSBs that reference the changed DBDs
- OPTION(NOCHECK) can be specified with all existing options on the IMPORT command
- to disable the OPTION(NOCHECK), you can use the OM Input Exit to reject the IMPORT DEFN SOURCE(CATALOG) OPTION(NOCHECK) command



OPTION(DEPENDERR)

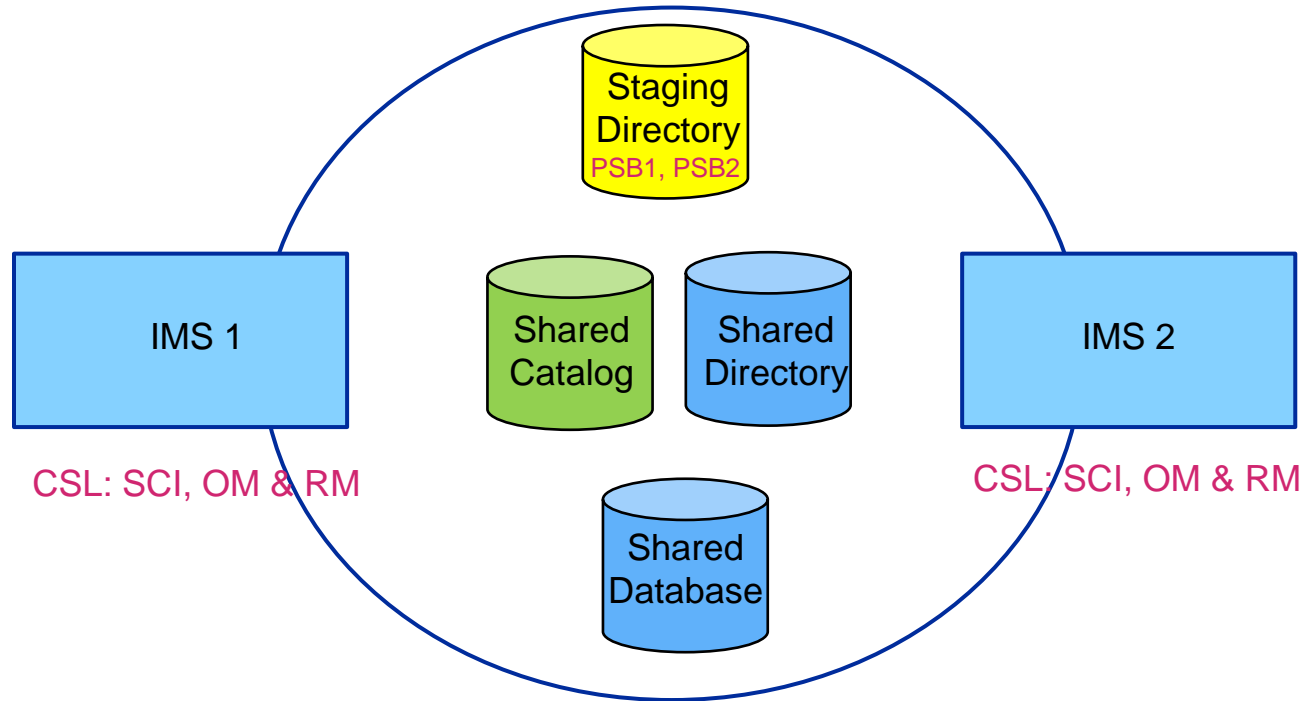
OPTION(DELPENDERR)

- Specifies that if **errors occur during the prepare phase** of IMPORT DEFN SOURCE(CATALOG) command processing, the pending resources are deleted from the staging data set.
- An error in the prepare phase is indicated by OLCPREPF in the IMPORT DEFN command output.
- High level Phases of online change:
 - **Prepare Phase:** prepare to do the online change
 - **Commit Phase 1:** check for work in progress and reject online change if work is in progress for affected resources
 - **Commit Phase 2:** Commit the changes



Using IMPORT in an IMSplex with multiple IMSs where the Catalog / Directory are shared

IMSplex with Shared Catalog / Directory



- Should the IMPORT command be routed to all IMSs? Only one IMS?



Q: How to IMPORT changes
for all IMSs in the IMSplex?

IMPORT command Routing

- By default, when the IMPORT command is issued, OM routes the command to **all active IMS** systems

OR

- ROUTE parameter can be used to direct the IMPORT command to a specific IMS.
- If you don't specify a specific IMS to route the IMPORT command to and it gets routed to all the IMSs, OM picks one **IMS as the command master**.

Command Master IMS

- If you don't specify a specific IMS to route the IMPORT command to and it gets routed to all the IMSs, OM picks one **IMS as the command master**.
- The IMPORT command master actually updates the staging directory and the directory.
- The IMPORT master uses RM services to coordinate **the phases of online change** with the other non-master IMSs.
 - To check for work in progress for resources affected.
 - To actually make the changes once the changes are committed in the directory by the IMPORT master and
 - To report back their results to the IMPORT command master to consolidate into IMPORT output.

Non-Master IMSs

- The non-master IMSs don't update the staging directory or the active directory
- Instead, they process the online change phases when the IMPORT command master notifies them to
- The non-master IMSs update their resources (add, change or delete) based on the resources changed
 - E.g. we changed a PSB, if that PSB is in the PSB pool of the other IMS, then it has to be flushed
- **Note:** all commands have only 1 master, but most commands don't care about the master because no coordination is required. For example, when the QUERY DB command is routed to all IMSs, they all report their own database status to OM. No coordination is needed.

Sample IMPORT output after routing to one IMS

```
File Action Manage resources SPOC View Options Help
-----
PLEX1                IMS Single Point of Control
Command ==>

----- Plex . . PLEX1  Route . . ims1      Wait . . 5:00
Log for . . : IMPORT DEFN SOURCE(CATALOG)

IMSpdex . . . . . : PLEX1
Routing . . . . . : IMS1
Start time . . . . : 2023.159 08:57:18.70
Stop time . . . . . : 2023.159 08:57:19.74
Return code . . . . : 00000000
Reason code . . . . : 00000000
Reason text . . . . :
Command master. . . : IMS1

Response for: IMPORT DEFN SOURCE(CATALOG)
MbrName  Member      CC CATSHR DBDName  PSBName  CHNG COPY
IMS1     IMS1           0 Y
IMS1     IMS2           0 Y
IMS1     IMS1           0 Y      DHIDAJ1      Y
IMS1     IMS1           0 Y      DHIDAK1      Y
IMS1     IMS1           0 Y      DI1XAJ1      Y
IMS1     IMS1           0 Y      DI1XAK1      Y
IMS1     IMS1           0 Y                PBAJKLD      Y
IMS1     IMS1           0 Y                PBAJK01     Y
IMS1     IMS1           0 Y                PBAJK02     Y
```

Sample IMPORT output with no routing

```
File Action Manage resources SPOC View Options Help
-----
PLEX1                IMS Single Point of Control
Command ===>

----- Plex . . PLEX1  Route . .          Wait . . 5:00
Log for . . : IMPORT DEFN SOURCE(CATALOG)

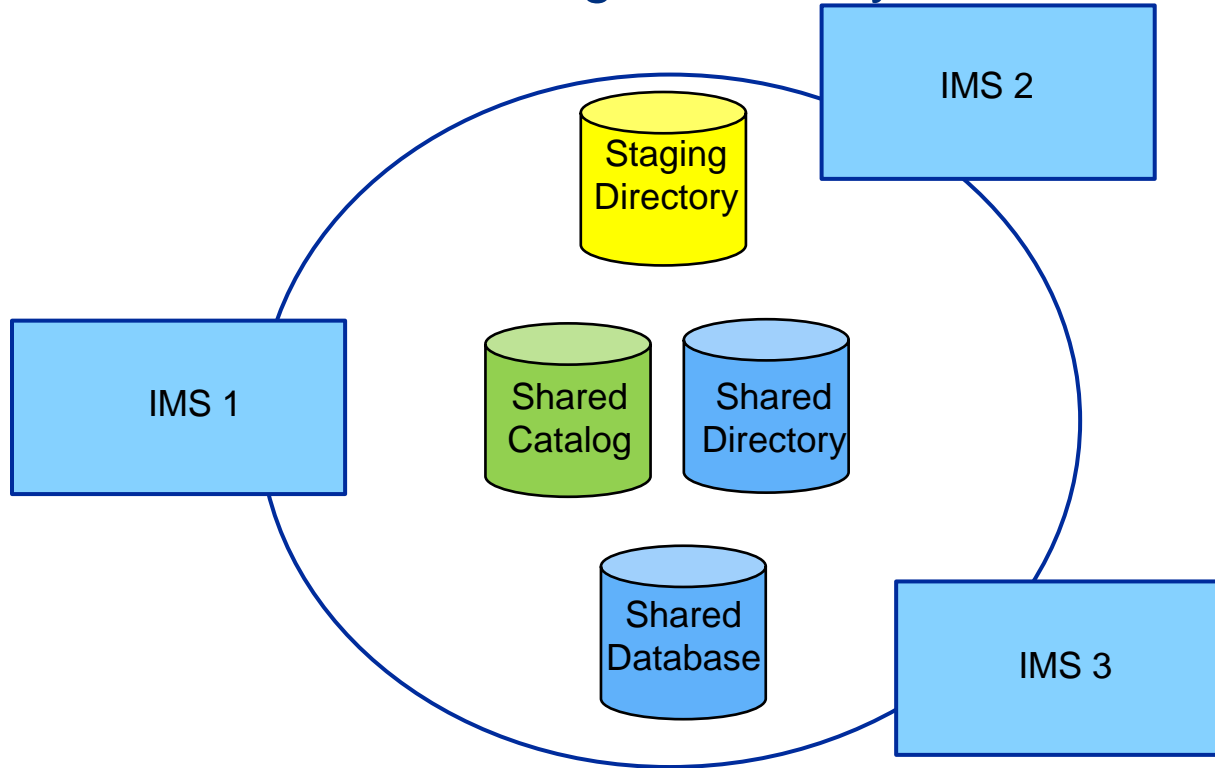
IMSpdex . . . . . : PLEX1
Routing . . . . . :
Start time. . . . : 2023.158 15:36:08.50
Stop time . . . . : 2023.158 15:36:09.68
Return code . . . : 02000004
Reason code . . . : 00001014
Reason text . . . : At least one request completed with warning/s.
Command master. . : IMS2

      Return      Reason
MbrName  Code      Code      Reason text
-----
IMS1      00000004    00001000  IMS not master, cmd ignored
Response for: IMPORT DEFN SOURCE(CATALOG)
MbrName  Member    CC  CATSHR  DBDName  PSBName  CHNG COPY
IMS2     IMS1      0  Y
IMS2     IMS2      0  Y
IMS2     IMS2      0  Y      DHIDAJ1      Y
IMS2     IMS2      0  Y      DHIDAK1      Y
IMS2     IMS2      0  Y      DI1XAJ1      Y
IMS2     IMS2      0  Y      DI1XAK1      Y
IMS2     IMS2      0  Y                      PBAJKLD      Y
IMS2     IMS2      0  Y                      PBAJK01     Y
IMS2     IMS2      0  Y                      PBAJK02     Y
```



Rolling out PSB Changes in an IMSplex with shared Catalog/Directory

IMSplex with Shared Catalog / Directory



- How do I rollout PSB changes one IMS at a time?

Sample IMPORT output with **OPTION(UPDATEPSB) & FOR(IMSID())**

Log for: IMPORT DEFN SOURCE(CATALOG) **OPTION(UPDATEPSB) FOR(IMSID(IMS1))**

IMSplex : PLEX1
Routing : IMS1
Start Time. : 2016.264 15:18:59.26
Stop Time : 2016.264 15:18:59.86
Return code : 00000000
Reason code : 00000000
Reason text :
Command master. . . : IMS1

Response for: IMPORT DEFN SOURCE(CATALOG) **OPTION(UPDATEPSB) FOR(IMSID(IMS1))**

MgrName	Member	CC	CATSHR	PSBName	CHNG	REFP
IMS1	IMS1	0	Y			
IMS1	IMS1	0	Y	DDLTFPE1	Y	
IMS1	IMS2	0	Y	DDLTFPE1		Y
IMS1	IMS3	0	Y	DDLTFPE1		Y

Sample IMPORT output with OPTION(REFRESHPSB) & FOR(IMSID())

Log for: IMPORT DEFN SOURCE(CATALOG) **OPTION(REFRESHPSB) FOR(IMSID(IMS2))**

IMSpIex : PLEX1

Routing : IMS1

Start Time : 2016.264 15:19:57.28

Stop Time : 2016.264 15:19:57.67

Return code . . . : 02000004

Reason code . . . : 00001014

Reason text . . . : At least one request completed with warning/s.

Command master. . : IMS1

Response for: IMPORT DEFN SOURCE(CATALOG) OPTION(REFRESHPSB) FOR(IMSID(IMS2))

MbrName	Member	CC	CCText	CATSHR	PSBName	CHNG
IMS1	IMS1	2	CMD NOT ATTEMPTED BY THIS IMS			
IMS1	IMS3	2	CMD NOT ATTEMPTED BY THIS IMS			
IMS1	IMS2	0		Y	DDLTFPE1	Y

OPTION(UPDATEPSB) & FOR(IMSID())

- In an IMSplex, **activates PSB changes in the IMS catalog** and causes the IMS systems that are listed in the FOR(IMSID()) option to reload the changed PSBs the next time the PSBs are scheduled.
- If the staging data set of the IMS catalog contains any DBDs when the UPDATEPSB option is specified, the IMPORT command fails.
- IMS systems that are **omitted from the FOR(IMSID())** keyword are not notified by the command to reload the modified PSBs and continue to use the original PSB definition in online memory until the REFRESHPSB option is submitted or another event, like a system restart, causes the PSB to be reloaded.

OPTION(REFRESHPSB) & FOR(IMSID())

- Causes the IMS systems that are listed in the FOR(IMSID()) option to reload from the IMS catalog directory data set all PSBs in the system that have a *refresh-pending* (REFP) status.
- Specify the REFRESHPSB option to activate PSB changes in an IMSplex that were **previously activated by the UPDATEPSB option** in only a **subset of the IMS systems** in the IMSplex.
- Program resources that might be affected by the changes must be stopped on the systems that are listed in the FOR() option.

Thank You