



# Virtual IMS user group: Newsletter 77

Welcome to the Virtual IMS user group newsletter. The Virtual IMS user group at [itech-ed.com/virtualims](http://itech-ed.com/virtualims) is an independently-operated vendor-neutral site run by and for the IMS user community.

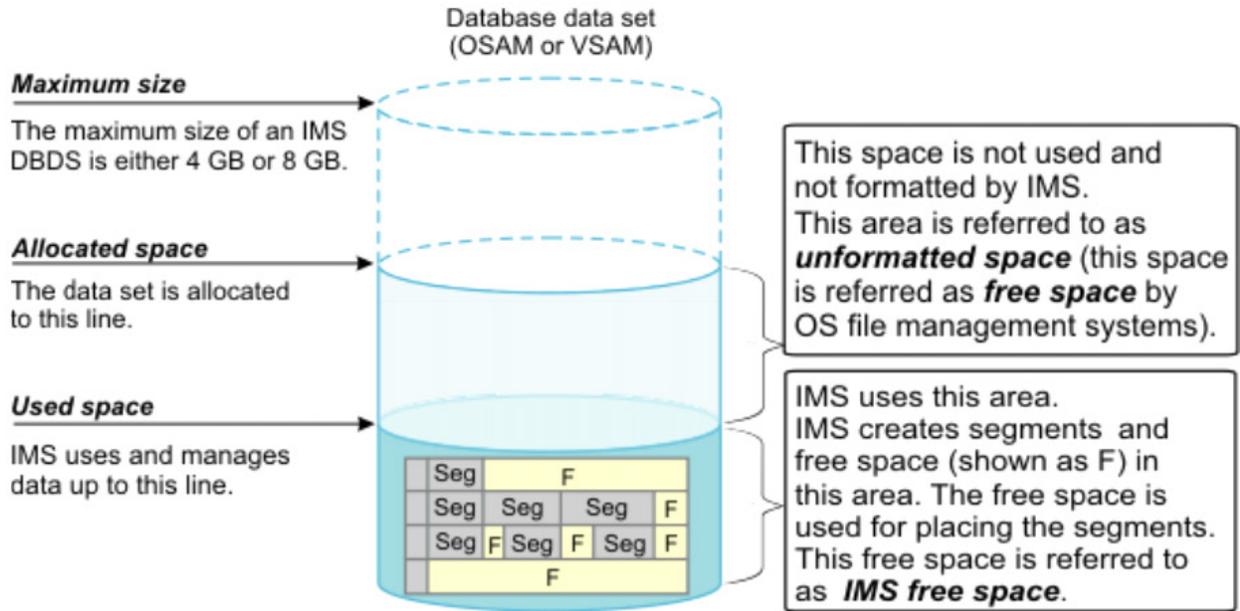


Figure 1: Space usage in a full-function database

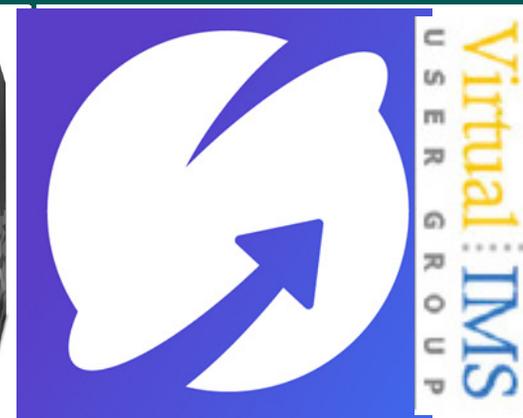
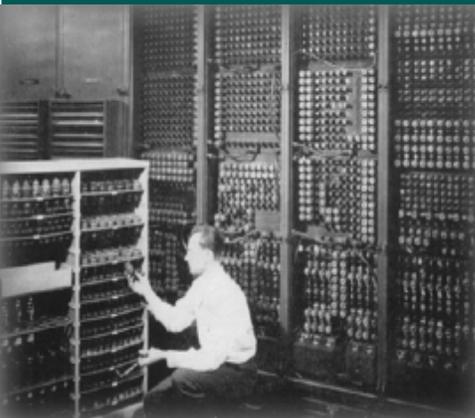
## Virtual IMS user group presentation

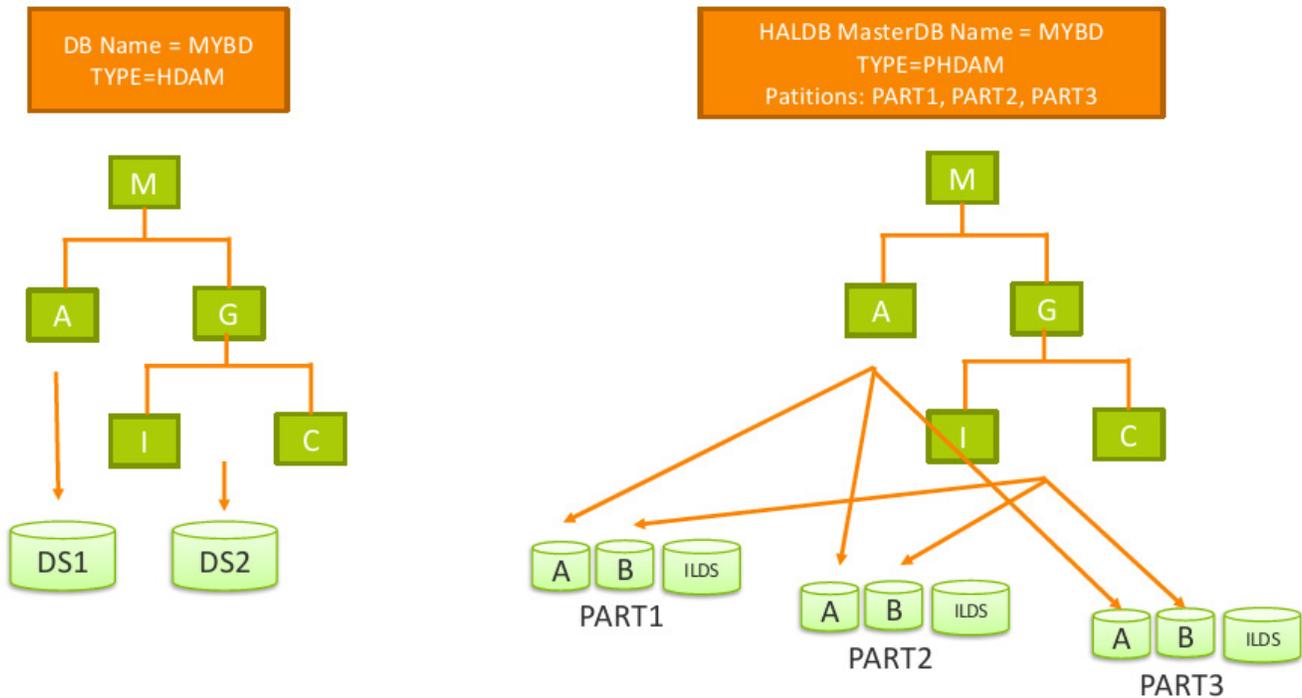
The latest webinar from the Virtual IMS user group was entitled, "Reached the IMS Database 4/8gig line, Now What?". It was presented by Nick R Griffin, WorldWide IMS Specialist at BMC Software.

Nick has over 45 years of mainframe experience in Development, Systems, and Database Administration for IMS, MVS, CICS/VSAM, and VTAM applications. Nick has been a developer for IMS Monitoring code and managed a development group for a competitive

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**Figure 2: HALDB database**

software vendor. Nick managed large, complex, mission-critical IMS database applications for a variety of Fortune 500 companies. Most recently, he spent 14 years as IMS Product Manager for a large tools vendor. Nick is currently assisting sales as IMS Product Account Manager.

Nick started by looking at the amount of data generated in a single day, saying that 500 million tweets are sent, 294 billion emails are sent, 4 petabytes of data are created on Facebook, 4 terabytes of data are created from each connected car, 65 billion messages are sent on WhatsApp, and 5 billion searches are made.

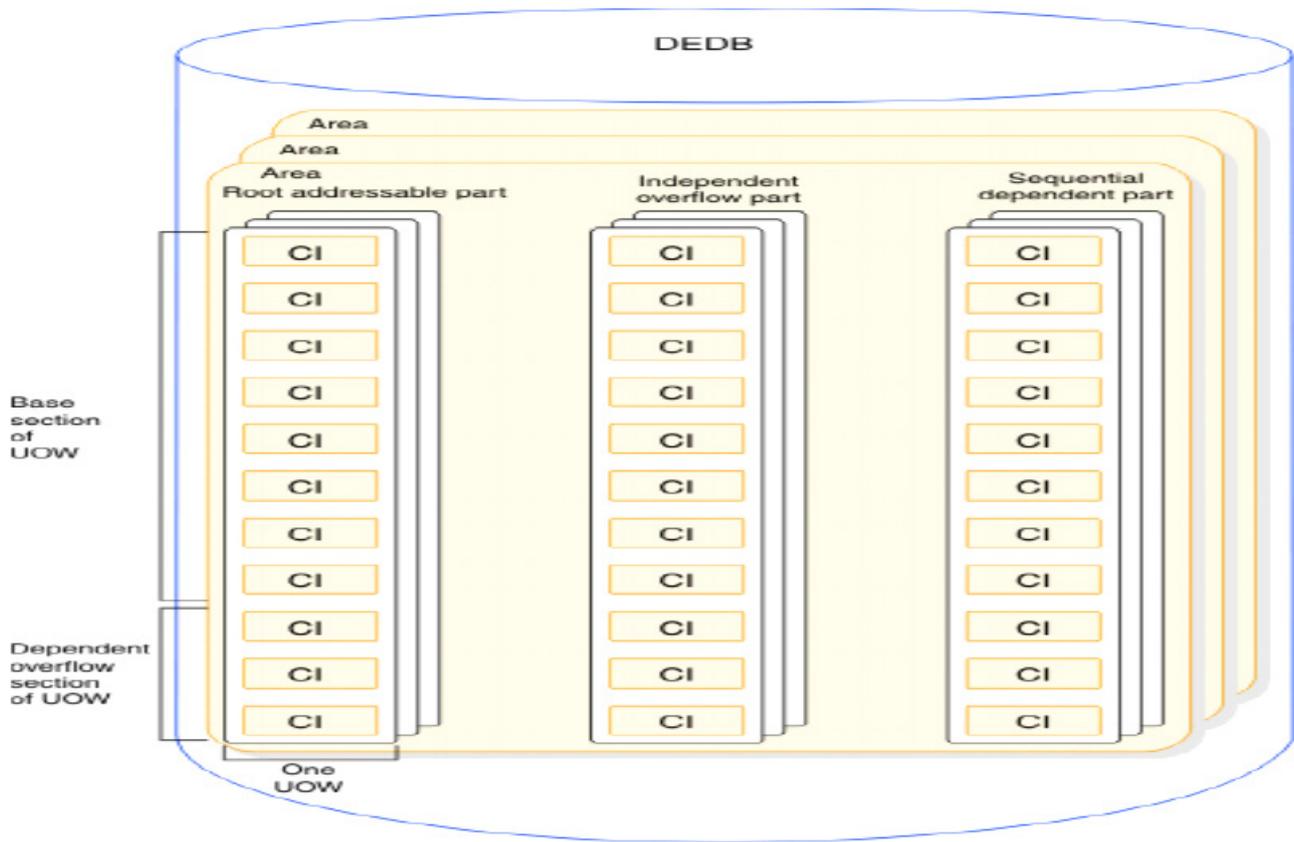
By 2025, it's estimated that 463 exabytes of data will be created each day globally – that's the equivalent of 212,765,957 DVDs per day!

And that's why IMS is filling up with data too. Nick explained that a full-function database consists of one or more data sets. As IMS data increases in the data set, the free space in the data set decreases. When all the free space is used up, IMS applications cannot insert new segments or replace existing segments. To prevent this situation, you must take appropriate actions to mitigate the potential problems before they become significant issues.

Out-of-space problems can be caused by one of the following three conditions:

- Primary space is used up and there is no more primary allocation space left.
- The data set is full because the size of the data set has reached the maximum limit that is defined by IMS.
- Extent resources are used up and the data set cannot be expanded.

Figure 1 shows how IMS uses space in a full-function database data set. Using VSAM, the maximum size of a DBDS is 4GB. With OSAM, the maximum size is 8GB.



**Figure 3: Parts of a DEDB area in storage**

Nick Griffin then explained that when you are running out of space, your choices are: do nothing, HALDB, Fast Path, PDF, or compression.

Doing nothing means that records need to be manually archived or deleted. This activity will need to occur regularly.

HALDB was introduced in IMS v7 in August 1997. It supports up to 1001+ partitions, with up to 10 datasets (max 10,010) at 4+ Terabytes each.

The partition size maximum is 4GB for VSAM and 8GB

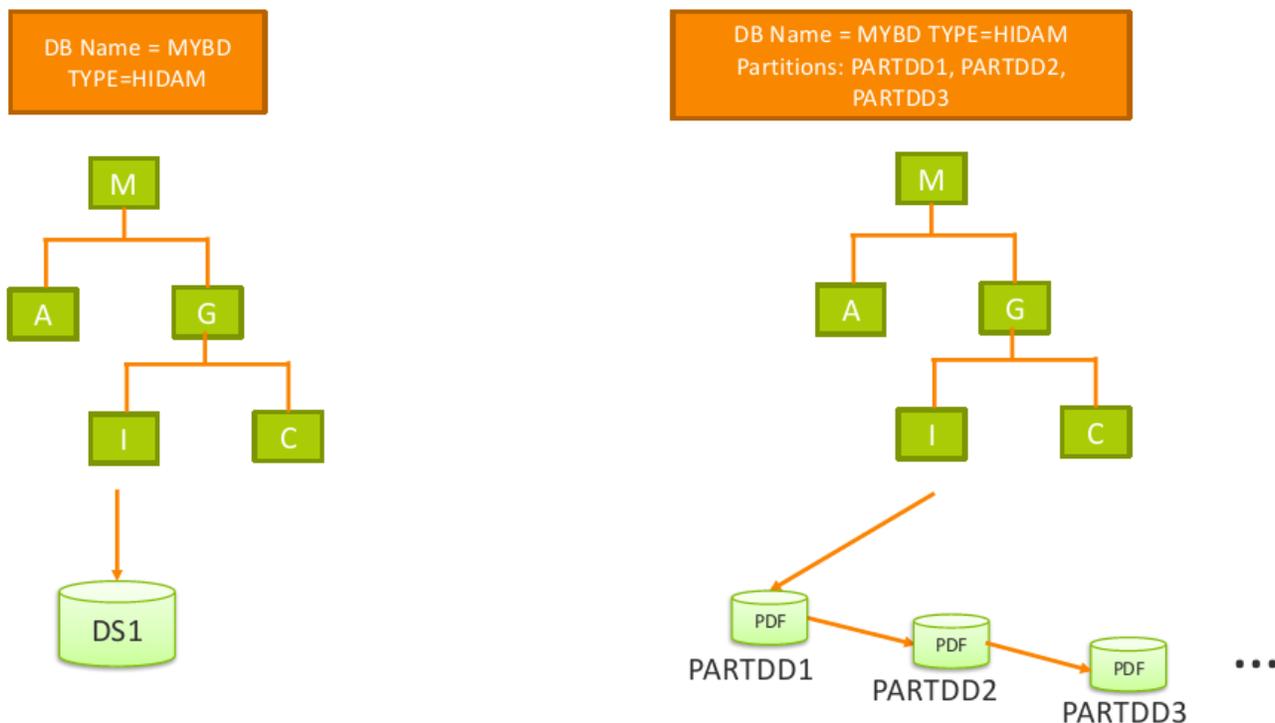
for OSAM, although OLR does not support OSAM 8GB, but other online reorgs do. It does require DBRC. The basic design is a master database with a number of partitions connected to it. They each have a specified high key. An HDAM and HALDB are compared in Figure 2.

The HALDB migration process recommended by Nick Griffin was:

- 1 Use a HALDB Migration Tool
- 2 Unload the full function database.

- 3 Save DBRC information for the full function database.
- 4 Delete the full function database information.
- 5 Define the HALDB information to the RECON.
- 6 Initialize the partitions.
- 7 Load the HALDB.
- 8 Image copy the partitions.

Note: all logically-related databases and their secondary indexes must be migrated to HALDB at the same time! Also, it assumes



**Figure 4: IMS PDF**

that the database name remains the same.

Fast path databases were introduced in IMS 1.1.4 in 1977. It currently supports 2048 areas of 8+TB, which will soon be raised to 9999 areas giving around 40TB. The Area size maximum is 4GB. DBRC is not required, but is recommended. It supports full online reorganization with concurrent update capability. No outage is required unless you are doing restructuring. DEDBs were designed with online reorganization in mind. Parts of a DEDB area in storage are shown in Figure 3.

Designing a DEDB requires the following steps:

- 1 Calculating the Average Database Record Length
- 2 Picking a CI Size
- 3 Picking a Unit of Work Size
- 4 Designing an Area
- 5 Defining Your DEDB to DBRC
- 6 Initializing a DEDB
- 7 Your DEDB is now ready for you to add the data. You do not need a load mode PSB to add data to a DEDB.

Partitioned Database Facility for IMS (PDF) was created by NEON for IBM in 1997 and was called IMS/ESA® Partition Support Product (PDB). It supports 127 partitions (around 1+TB). It includes support for HISAM, SHISAM, and OSAM 8GB. DBRC is not required. And there is minimal or no application changes required. The database is simply partitioned (see Figure 4).

Migrating to PDF involves the following steps:

- 1 Unload database (a single HD unload file)
- 2 Add PART statement(s) to DBD

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**[itech-ed.com/virtualims](https://itech-ed.com/virtualims)**

- 3 Run DBD and ACB GENs for new DBD
- 4 Notify DBRC (optional)
- 5 Update MDALIB
- 6 Load partitioned database
- 7 Build secondary index(es)
- 8 Image Copy database
- 9 Alter any JCL.

Compression requires less DASD space, image copy, and IMS Log volume to be used. You get better buffer hit ratios for online transactions along with improved performance during utility execution. And all this occurs with minimal or no changes to applications.

Nick concluded by saying that the amount of data is increasing and how you choose to deal with it depends on the amount of time and resources you have available.

A copy of Nick Griffin's presentation is available for download from the Virtual IMS user group Web site at [itech-ed.com/virtualims/presentations/IMSDB4gigFeb21.pdf](https://itech-ed.com/virtualims/presentations/IMSDB4gigFeb21.pdf).

You can see and hear the whole user group meeting at <https://youtu.be/HYK85LOKdpl>.

### Meeting dates

The following meeting dates have been arranged for the Virtual IMS user group:

- On 13 April 2021, Thomas Esser, zSolutions Architect, Director, IMS Solution Advisors, Rocket Software will be discussing "Saving CPU time with IMS database administration".
- The following meeting will be on 8 June, when Al Saurette, VP Business Development at Maintegrity Inc will be discussing "IMS, compliance, and ransomware".

### IMS articles and blogs

*An Introduction to IBM IMS OTMA* by Subhasish Sarkar on TechChannel (29 January 2021). You can find the article at <https://techchannel.com/Enterprise/01/2021/introduction-ims-otma>

*Understanding IMS OTMA Commit Mode and Synchronization* by Subhasish Sarkar on

TechChannel (25 January 2021). You can find the article at <https://techchannel.com/Enterprise/01/2021/understanding-ims-otma-commit-mode>

*Assessing IBM® IMS™ OSAM encryption performance* by Jasdeep Singh in the IMS part of the IBM Z and LinuxONE Community (updated 21 January 2021). You can find the article at <https://community.ibm.com/community/user/ibmz-and-linuxone/blogs/jasdeep-singh1/2021/01/21/assessing>

*A Simple Way to Enhance IMS Database Dynamic Segment Layouts* by Carlos Alvarado in the IMS part of the IBM Z and LinuxONE Community (updated 16 January 2021). You can find the article at <https://community.ibm.com/community/user/ibmz-and-linuxone/blogs/carlos-alvarado1/2021/01/05/a-simple-way-to-enhance-ims-database-dynamic-segme>

*Understanding How a 'CM0 SL1' Input Message Sent to IMS Connect Works in the Case of a Client NAK* by Subhasish Sarkar on TechChannel (15 January 2021). You can find the article at <https://techchannel.com/Trends/01/2021/smo-sl1-input-message>

*Data Privacy for Diagnostics: Securing Diagnostics for IMS* by Sanjay Kaliyur in the IMS part of the IBM Z and LinuxONE Community (16 December 2020). You can find the article at <https://community.ibm.com/community/user/ibmz-and-linuxone/blogs/sanjay-kaliyur1/2020/12/15/data-privacy-for-diagnostics-ims>

*IMS Support for z/OS Workload Interaction Correlator* by Sanjay Kaliyur in the IMS part of the IBM Z and LinuxONE Community (16 December 2020). You can find the article at <https://community.ibm.com/community/user/ibmz-and-linuxone/blogs/sanjay-kaliyur1/2020/12/15/workload-interaction-correlator-ims>

*Pushing the Limits of Modern Security: Pervasive Encryption for IMS OSAM Databases* by Sanjay Kaliyur in the IMS part of the IBM Z and LinuxONE Community (15 December 2020). You can find the article at <https://community.ibm.com/community/user/ibmz-and-linuxone/blogs/sanjay-kaliyur1/2020/12/15/pervasive-encryption-ims-databases>

## IMS news

Infotel has announced Version 2.0 of its Eccox Application Parallel Testing (Eccox APT®) solution, which was designed to quickly spin up developer testing ‘containers’ on the mainframe. Built for Agile and DevOps methods, Eccox APT accelerates application production on z/OS by running tests in parallel, allowing a team of developers to have their own ‘sandbox’ to test and release iterations of their code. Eccox APT can find all the components of an IMS or CICS transaction with a click, and all programs and tables that the transaction uses are cloned in a test container. Mobile application and Internet development teams can create their test tracks of all the IMS or CICS transactions required and work completely independently of the mainframe developer teams. More details can be found at: <https://blog.infotelcorp.com/press-releases/articles/infotel-corp-announces-latest-release-of-its-container-based-eccox-application-parallel-testing-product-for-ibm-z-os-is-generally-available>

## About the Virtual IMS user group

The Virtual IMS user group was established as a way for individuals using IBM’s IMS hierarchical database and transaction processing systems to exchange information, learn new techniques, and advance their skills with the product

The Web site at <https://itech-ed.com/virtualims> provides a central point for coordinating periodic meetings (which contain technically-oriented topics presented in a webinar format), and provides articles, discussions, links, and other resources of interest to IBM IMS practitioners. Anyone with an interest in IMS is welcome to join the Virtual IMS user group and share in the knowledge exchange.

To share ideas, and for further information, contact [trevor@itech-ed.com](mailto:trevor@itech-ed.com).

The Virtual IMS user group is free to its members.