VPARS Introduction

- **VPARS**: Virtual Private Active Record Shadowing

- VPARS was developed in 1979-80 to provide a virtual test platform for the IBM TPF (Transaction Processing Facility) environment

- VPARS is a software extension to VM that allows multiple guests to transparently share disks in a R/W mode
VPARS DataBase

- Records modified by each guest are maintained on its own private (or shared) VPARS database

- Provides record isolation between guests that are sharing the disks
VPARS Concepts (1 of 3)

- Requires read-only links to the shared disks and read-write links to the VPARS database disk(s)
- A write request is intercepted and the updated record is written to the user’s VPARS database.
- Original record in the TPF base remains unchanged.
- A different virtual machine can retrieve the original record from the TPF base, update it, and write it to its own VPARS database.
VPARS Concepts (2 of 3)

- When a read is issued for a record, VPARS searches its database directory.
- If found, the record is returned from the VPARS database. Otherwise it is retrieved from the TPF base.
- Whenever a record is modified and filed, it is written to the VPARS database.
- A subsequent request for the same record will result in the record being retrieved from the VPARS database.
The TPF system is not aware that VPARS is intercepting and handling its I/O requests.

Complete integrity of the TPF system is maintained because the records on the TPF base are never altered.

Therefore, several virtual machines can share a common TPF database under VPARS.

Each virtual machine will have its own VPARS database.

The number of virtual machines sharing a TPF database using VPARS is theoretically unlimited.
VPARS Backups & Restores

• Various functions of VPARS provide the ability to resume testing from any point, or to start with a clean VPARS database without affecting the shared TPF base.

  • Backup / Restore
  • Checkpoint
  • Clear (all or to a checkpoint)
Benefits of VPARS

- VPARS reduces the amount of hardware required to run multiple TPF test virtual machines.
- Dedicated TPF disks are not required to run tests with different testing requirements.
- The time required to refresh or restore a damaged TPF database is eliminated.
TPF under z/VM without VPARS

TPF database 100 – 2000 disks each
TPF under z/VM with VPARS

VPARS database 50 cyl - 256 disks each / TPF base 100 - 2000 disks
Loosely-Coupled VPARS

- All participating loosely-coupled TPF virtual machines write to the same VPARS database.
- Each virtual machine must have write links to all disks in the database.
- VPARS provides only the multi-write capability; record locking is the responsibility of the application.
- IBM provides several facilities which can be used to provide record locking.
Versatility of VPARS

- In addition to TPF, VPARS can also service other operating systems such as Linux, running as guests under VM.
Multi-level VPARS

- Multi-level VPARS (or "concatenated") VPARS databases allow several databases to be searched for TPF input records.

- The primary VPARS database is normally a read-write database. The rest are always read-only. Several users can share a read-only VPARS database. This may reduce the number of records required on each user's read-write VPARS database.

- The primary database can also be a read-only database.
VPARS Without a TPF Base

- VPARS NOBASE provides an environment which requires significant space savings. No TPF base is required.

- Accomplished by restoring only active TPF records to a VPARS database. Short term and unused long term pool records are not restored.

- VPARS database can be shared by multilevel VPARS.

- VPARS will not issue I/O requests against the TPF base except to retrieve IPL text.

- A read of a record not found in the VPARS database will result in a zero record (binary zeroes) to be returned.
Linux under z/VM without VPARS

VM

Linux 1

Linux 2

Linux 3

Linux 4

VM

Linux base

Linux base

Linux base

Linux base

Linux database
Linux under z/VM with VPARS

Linux 1

Linux 2

Linux 3

Linux 4

VPARS

VM

VP DB

VP DB

VP DB

VP DB

Linux base

VPARS database 50 cyl - 256 disks each / Linux database
VPARS Internals include the following components:

- VM CP modules
- Modifications to IBM VM CP modules
- CMS modules
- Modifications to IBM CP commands
- CMS Execs for installation and maintenance
- Documentation: product installation and user reference
VPARS

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