



Title: The Progress Type II Storage Area

Name: Richard Shulman

Title: Principal Support Engineer

PROGRESS
SOFTWARE

Agenda

- **Introduction**
- **Compare Type I and Type II**
- **Implementing Type II**
- **Summary**
- **Questions**

Title: What are Type I and Type II Storage Areas

- **Version 9 Storage Areas Introduced**
- **Release 10 Clusters Introduced**

How the database works without clusters

User requests a record be created in a table

- **Find area the table lives in**
- **Ask Record Manager for next block for record**
- **Lock the area block for that area**
 - **If block available**
 - Go to that block
 - Write the record
 - **If no block is available**
 - Extend the database,
 - Format the block
 - Write the record
- **Release the lock on the area block**

How the database works with clusters

User requests a record be created in a table

- **Find area the table lives in**
- **Find the root cluster object block**
- **Find there are no empty blocks**
- **Allocate more space**
- **Create cluster for the object**
- **Format the blocks for the cluster**
- **Create a record within the block**

World without Clusters

Without clusters, if there are a lot of tables in an area there is the opportunity for a high degree of scatter for the records.

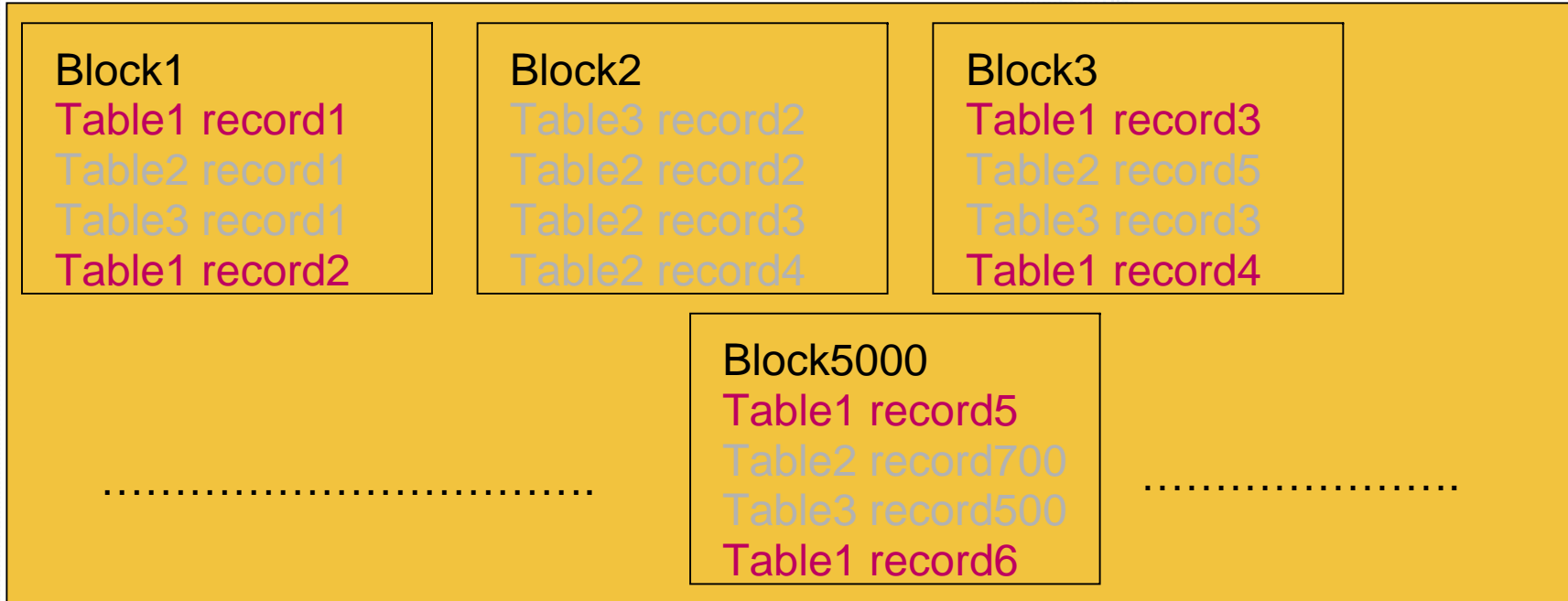
“Scatter” is the relative distance between records of the same table in the same area. It is measured in blocks between records.

1.0 is the best scatter factor.

>2.0 scatter factor should be dumped and loaded to regain performance for important tables.

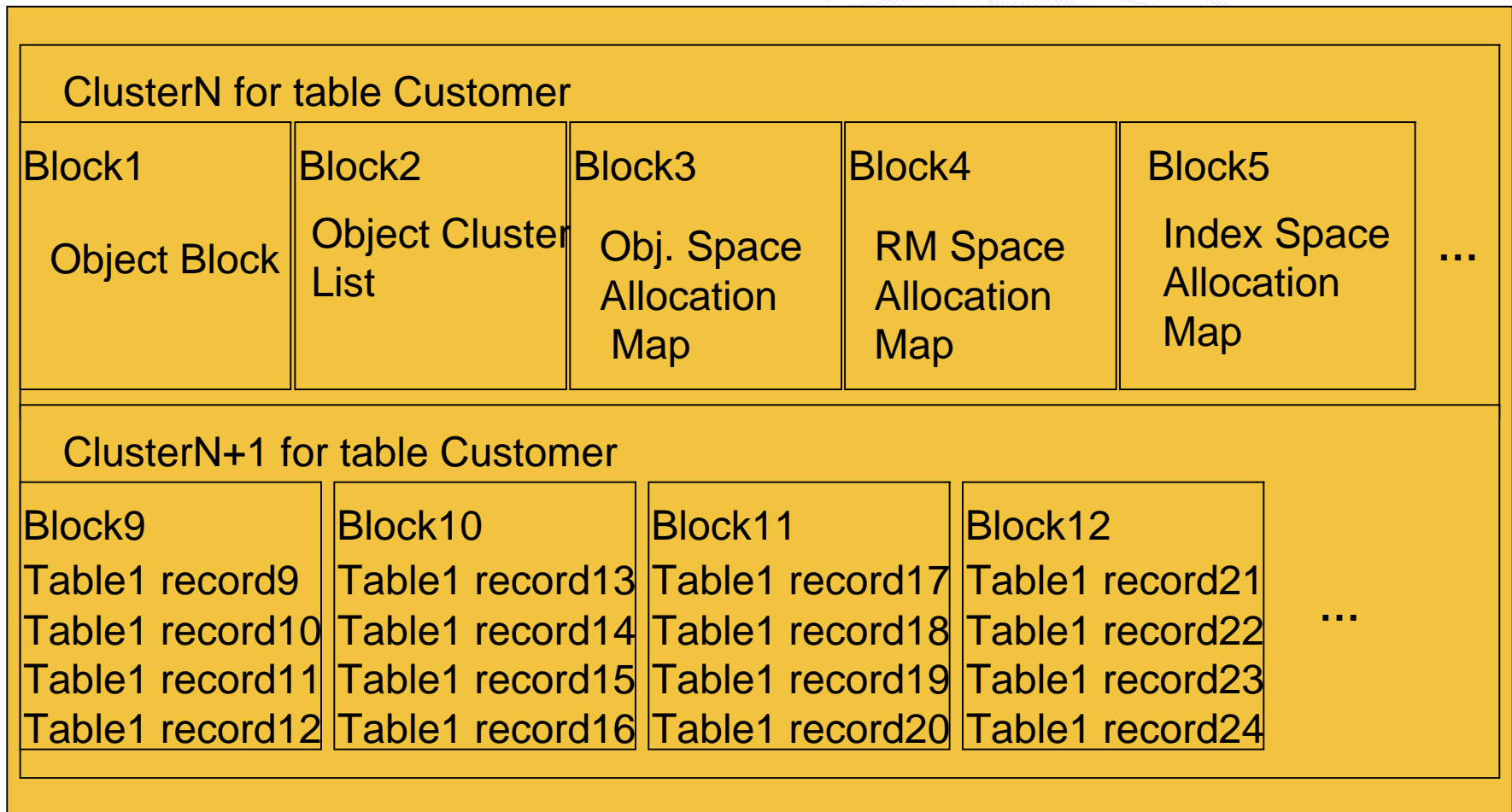
Example of scatter

Area7



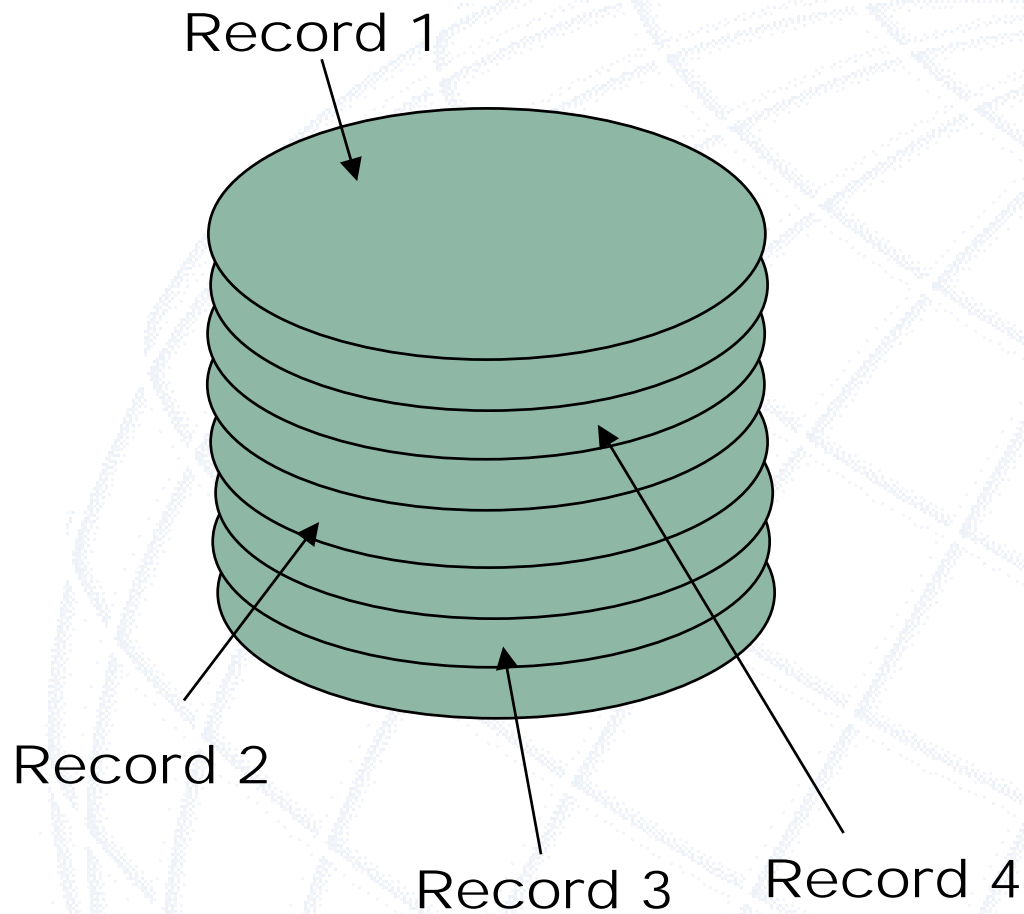
Example of Type II Cluster reduction of scatter

Area7



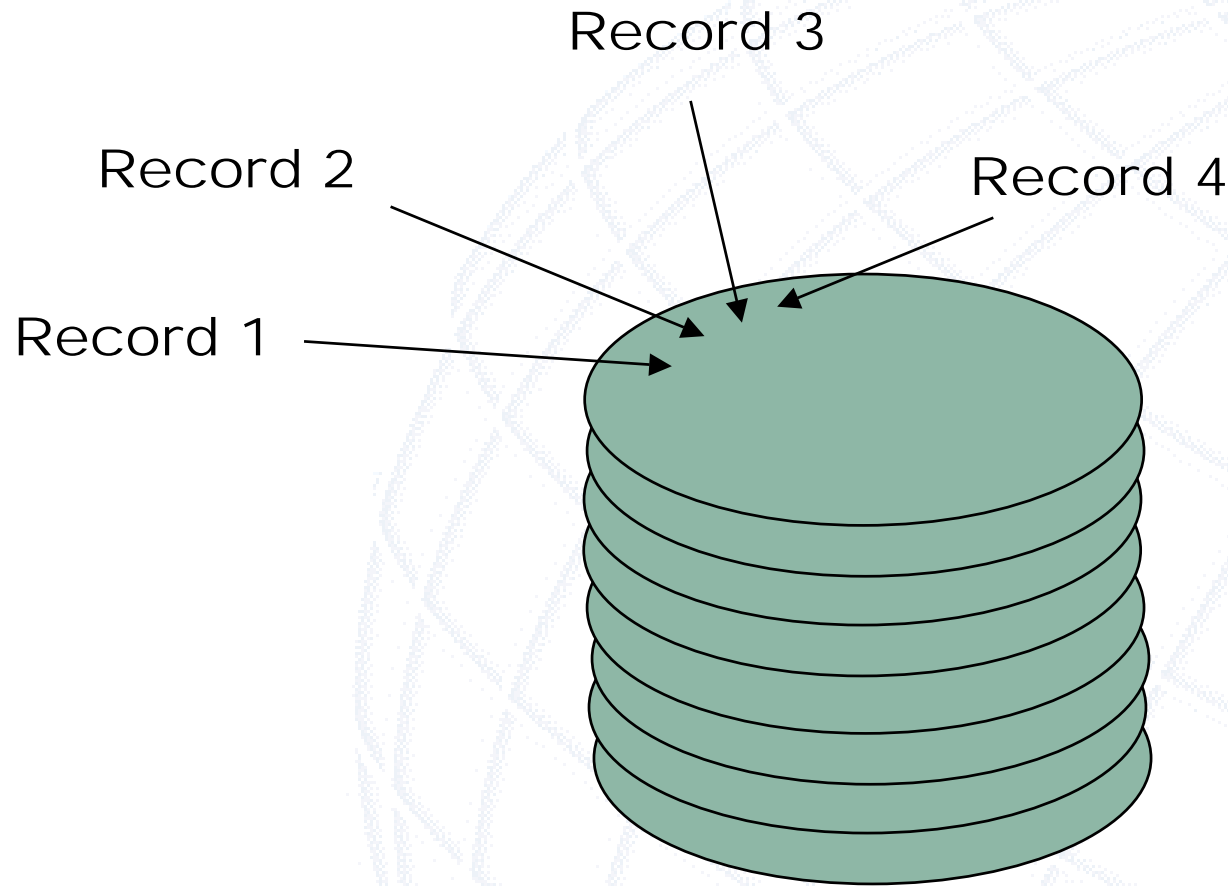
Difference in disk activity

Type I Model



Difference in disk activity continued

Type II Model



Ground Rules for Clusters

- **Only for OpenEdge 10 and beyond**
- **Extra option in .st for number of blocks per cluster (default 1)**
- **Blocks/cluster can be 0,1,8,64,512**
- **Blocksize is not defined by blocks/cluster**

Example line for .st file:

d “Area 51”:51,32;8 <location> f 1024

Differences between Type I and II

Type I:

RM allocation must lock area block

Type II:

RM allocation handled by each cluster object

Recommendations on Blocks/Cluster

- **Use 8 for index areas**
- **Use 64 for data areas**
- **Use 512 for high data growth areas**

How to migrate to Type II

Migration to Type II Areas can only be accomplished with:

- **Dump and Load**
- **Table Move**

Prorest will not allow migration to Type II areas.

How to test Blocks per Cluster

1) Download the ATM benchmark program from the PEG:

www.peg.com/utilities/atm.tar

Or

www.peg.com/utilities/atm.zip

2) Untar or unzip to a directory such as atm

3) On Windows, some files will need to be modified.

How to test Blocks per Cluster on Windows

Modify the following files:

- **Build.bat**
- **Driver.p**

For Unix & Windows Modify the .ST file

/* Example of .st file */

d /usr1/atmtest f 16000

d /usr1/atmtest

d "Area7":7,64;512 /usr2/atmtest f 90000

d "Area7":7,64;512 /usr3/atmtest f 90000

d "Area7":7,64;512 /usr4/atmtest

b /usr5/atmtest

For Unix & Windows Modify the .df files

For each table define the new area listed in the .st file:

ADD TABLE "account"

AREA "Area7"

← This must be added.

For each index define the new area listed in the .st file:

ADD INDEX "account" ON "account"

AREA "Area7"

← This must be added.

For Unix & Windows

Build the atm database

- **Edit the build script to set TPS levels**
- **Run the build script**

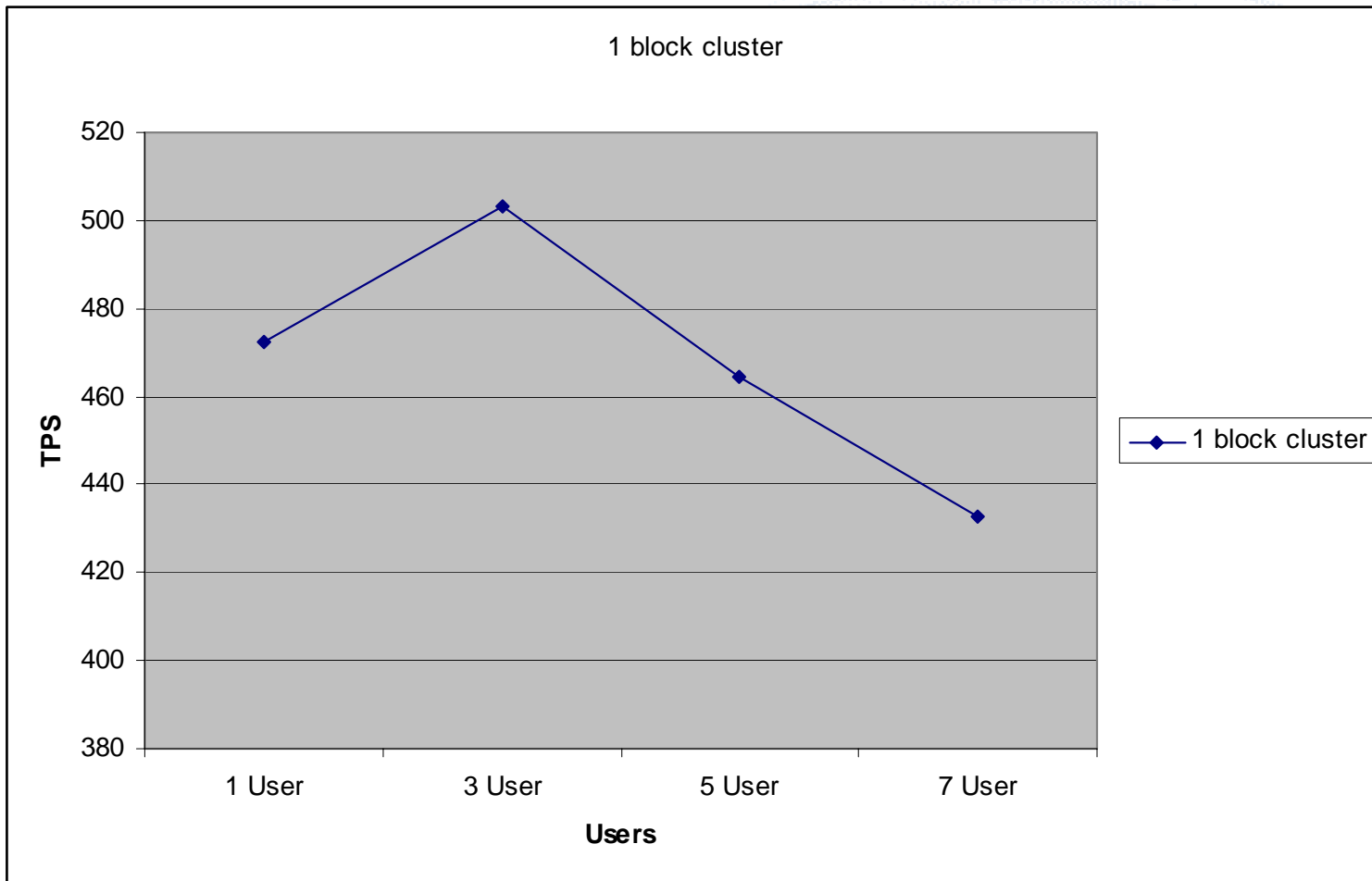
For Unix & Windows

Run the test(s)

- **Use the go script to start the database**
- **Use the go script to start the test(s)**

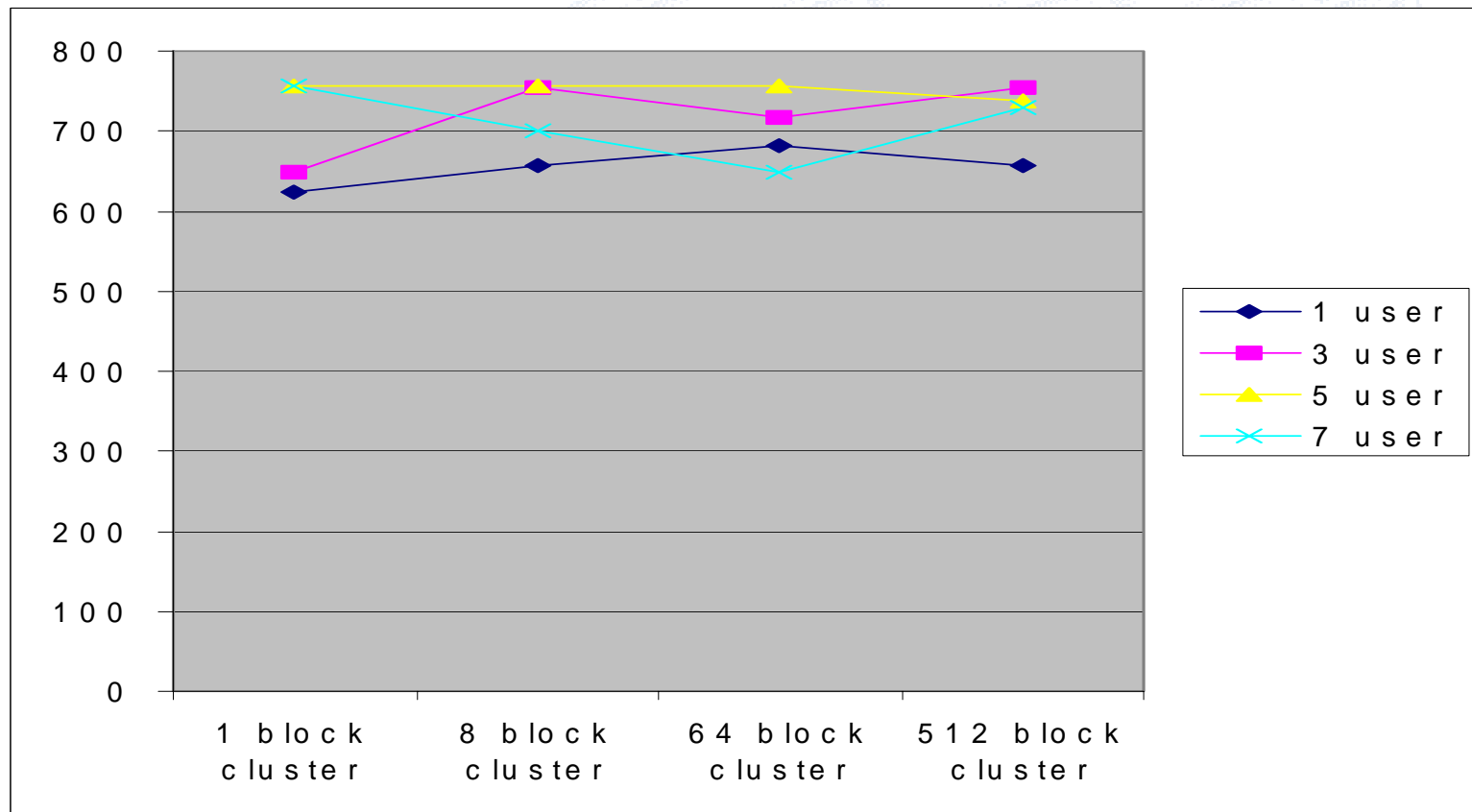
Performance without Clusters

Results from 9.1E Testing on machine with 3 disks



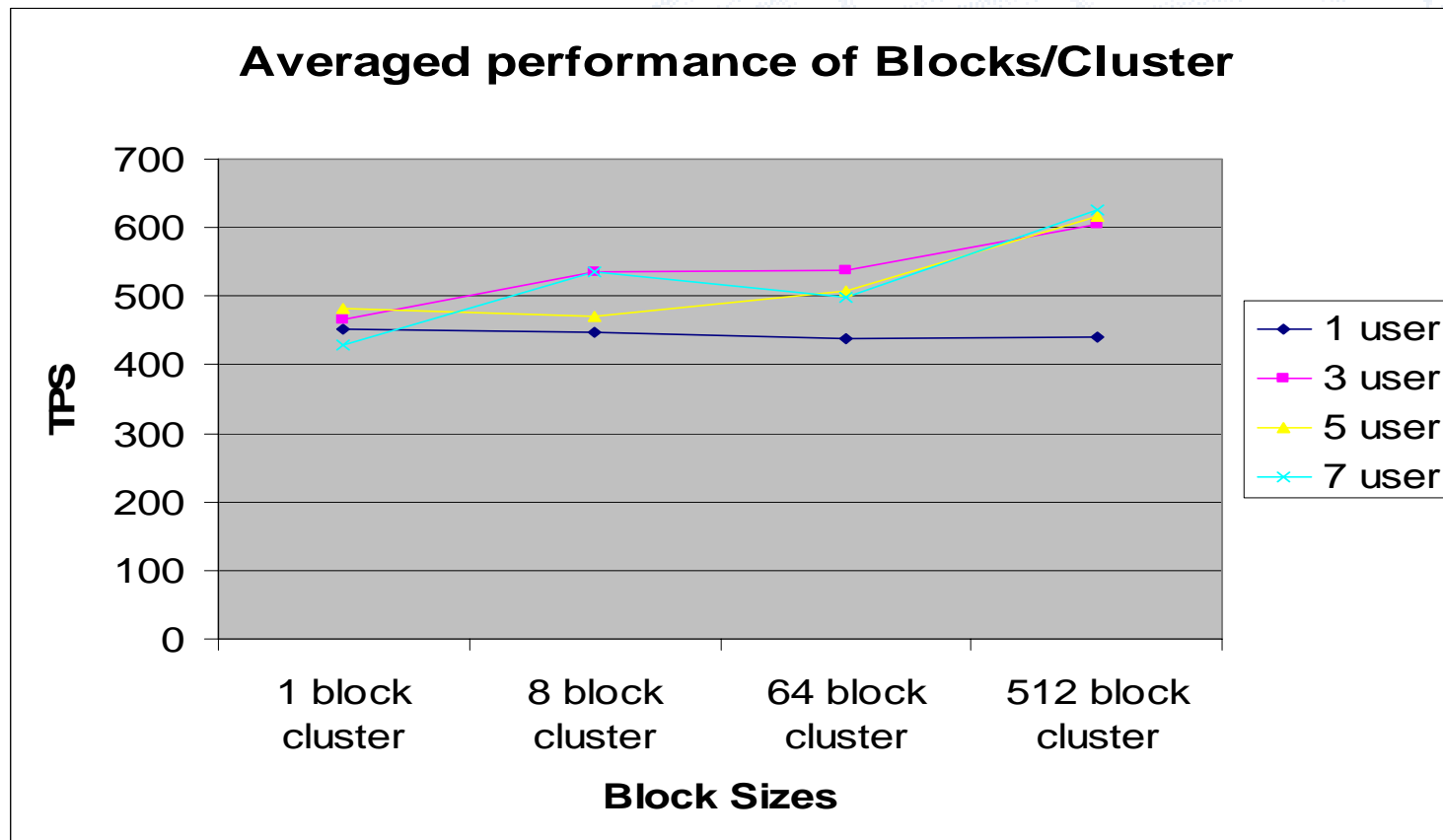
Performance with Clusters

Results from 10.0B Testing on machine with 1 disk only



Performance with Clusters continued

Results from 10.0B Testing on machine with 3 disks



Side Effects of Type II

- **More blocks created initially**
- **Databases may be physically larger**

Summary

- **Type II requires some forethought**
- **Type II has been seen to increase performance as much as 40% greater**
- **Type II will likely take more space initially but will more efficiently use the space over time than Type I**

Questions?



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