Stanford Linear Accelerator Center

Archiving Into ORACLE

Archiver Progress
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Background

- EPICS Channel Archiver developed by Kay Kasemir at LANL

- Uses linked-list binary files for storage

- Providing an Oracle storage alternative would allow leveraging of products developed for Oracle

- Previous attempts elsewhere (e.g. at BESSY) abandoned using versions prior to Oracle8i

Evaluation Goals for Oracle

- Parameterize the capabilities of Oracle as a repository for archive data

- Gather performance data for both storage and retrieval

- Comparison of throughput rates between Oracle and binary file system

- Determine effects of partitioning and indexing on performance

Test Environment

Dedicated machine

- Sun SPARC Ultra-4

- 4x100 MHz CPU

- 1 GB Memory

- Solaris 8

- Oracle 8i

Data Table Definition

pv_id	number(38)
value	number(15)
timestamp	date
nanosecs	number(9)
comments_id	number(8)
stat	number(8)
sevr	number(8)
rid	number(38)

Oracle Storage Technique

Oracle Call Interface Direct Path

- Advantage:
  - Dramatic performance improvement for storing large amounts of data

- Disadvantages:
  - Block oriented
  - Restrictions for data retrieval
  - Low-level

Oracle Storage Findings

- Approximately 12,000 samples/sec. for floating point or integer data

- Approximately 15,000 samples/sec. with archiving of redo logs disabled

- Appears to scale with CPU power

- Maximum throughput exceeds Channel Archiver throughput maximum

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Oracle Retrieval Methodology

- SQL SELECT statements within Oracle Call Interface C program

- SELECT statement WHERE clause includes channel name and time range

- 12 million row data table

- Effects of indexing and partitioning studied
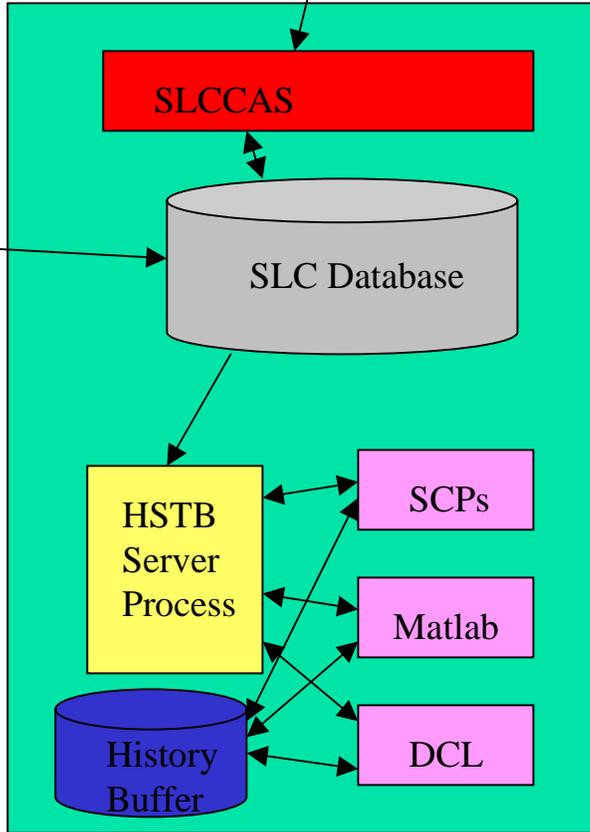
Oracle Retrieval Findings

- Retrieval is reasonably fast– less than 1 second to retrieve 0.1% of table (12,181 rows) with indexing or partitioning

- Indexing effective in increasing retrieval speed when retrieving small percentages of table (less than 2-4%)

- Many partitions (e.g., 1000) results in equal or better performance than indexing

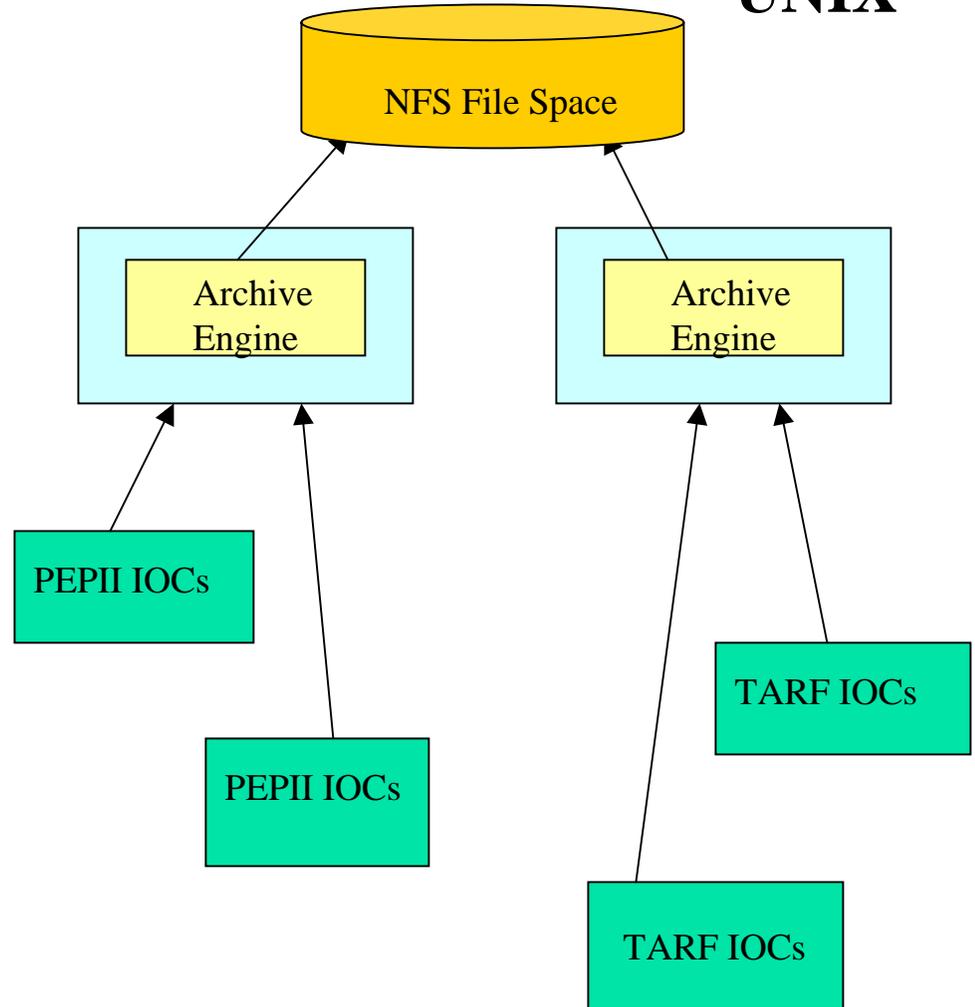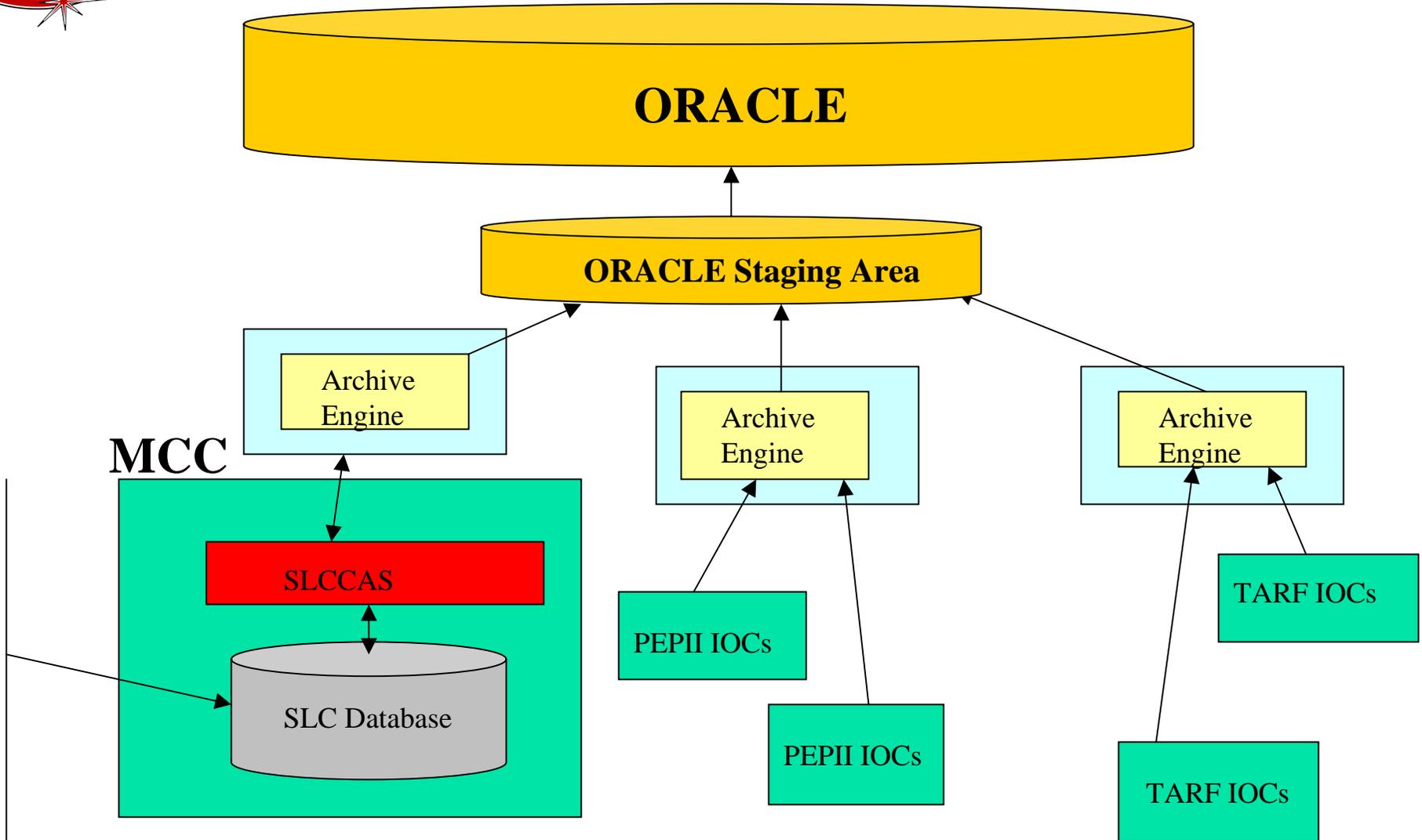# Current Archiving View

MCC

Any SLAC-only process with access

UNIX

NFS File Space

SLCCAS

SLC Database

HSTB Server Process

SCPs

Matlab

History Buffer

DCL

Archive Engine

Archive Engine

PEPII IOCs

PEPII IOCs

TARF IOCs

TARF IOCs

SLC Micros

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