



- ✓ DECREASE MSU/MIPS USAGE
- ✓ DRASTICALLY REDUCE COSTS
- ✓ INCREASE PERFORMANCE

Isolate Inefficiencies within Your Environment Before They Become Issues

“Performance is Profit”



When to use TurboTune®



Data center cost reductions

Reduce CPU consumption and recover storage.



Pre migration

Ensure performance, ease the process, and reduce costs on both sides.



In tandem with application modernization

Run faster I/O while running less I/O.



Mergers and acquisitions

Consolidate data centers faster and reduce storage requirements.



Increase performance

Solve for ABENDS, outages and latency issues.



Benefits of the TurboTune® Platforms

- Reduce File Level Inefficiencies
- Off-System Analysis
- Shorten Batch Run Times
- No Down Time
- Reduced Contention Between Systems
- Reduced CPU
- Lower Data Processing Costs
- Postpone Additional Hardware Purchases
- Better End-User Experience
- Improve Online Transaction Response Times
- Smoother Running Systems
- Faster Turn-Around Between Runs
- Reduced EXCP's
- Improved Batch Processing (overnight windows)
- More Productive Users (Payroll, AP,AR etc.)
- Faster TSO Response Times



Benefits of TurboTune®

Identifies inefficiencies in underlying VSAM performance as it applies to IMS, CICS, Db2 and all software operating in the z/OS environment.

Savings Projected:

Low:	5%
Average:	13%
High:	30%

Client Side Deployment:

No

Implementation Time:

Low (6 – 12 weeks)

Labor Requirement:

Medium (Data center size specific)

ROI:

Immediate

* TT savings projections are applied to aggregate system CPU consumption including system overhead.

TurboTune®

Beyond Cost Reduction:

Although cost reduction through performance optimization is the primary goal of the TurboTune® platforms there are several additional benefits, all of which reduce the likelihood of ABEND(s) and extended outages in your environment.

- TurboTune® identifies every broken user catalog pointers during the data gathering process. These breaks cause extended outages if not corrected.
- TurboTune® identifies every broken file in the catalog. These files may have partially written records that will inevitably cause ABEND(s) when accessed.
- TurboTune® identifies duplicate files in user catalogs which cause ABEND(s) when a program runs using the incorrect file.
- TurboTune® identifies every file that requires EXTENDED ADDRESSING prior to causing the inevitable ABEND.
- TurboTune® identifies all unusable files in the user catalog for removal. Stop using unnecessary I/O.





Benefits of TurboTuneSQL®

Created specifically to improve SQL performance and “clean-up” the Db2 environment as a compliment to TurboTune® or stand alone.

Savings Projected:	Low:	20%
	Average:	40%
	High:	65% (highest achieved 85%)
Client Side Deployment:	Optional	
Implementation Times:	Low (less than 2 weeks)	
Labor Requirement:	Low (less than 1 work day per week)	
ROI:	Immediate	

* TTSQL savings projections are applied to individual SQL/programs running in the Db2 system. Aggregate savings may vary.

TurboTuneSQL®

Beyond Cost Reduction:

TurboTuneSQL® is a robust tool providing an enormous amount of peripheral functionality.

TurboTuneSQL® was developed to reduce the manual workload of the DBA.

FUNCTION:	NOTE:
Automatic Indexes Recommendation	TTSQL can save 85% of DBA time to analyze indexes. AUTOMATIC!
DB2 Package Clean Up	TTSQL cleans hundreds of dead programs the DB2 catalog optimizing DB2 without effort or human intervention (AKA potential mistakes).
Copy of Catalog Statistics Management	TTSQL can copy statistics from other DB2s
Environment Virtualization	TTSQL can simulate other environments. Operate in TEST just like PROD!
SQL Inventory and Workload (Accounting/Cache)	TTSQL provides a complete view of Workload for ALL SQLs executed
Virtual Indexes Management	TTSQL creates virtual indexes without the need to create physical indexes allowing for testing of access paths.
Plan Table Comparison	TTSQL can predict if improvements will affect other access paths prior to promoting programs to production.
SQL Real Time Monitor (Cache / Dynamic and Static SQLs)	TTSQL monitor consumes less than 1.5% overhead while running.
Simulate PROD in your SANDBOX for any feature	TTSQL will not interfere in PROD at any time.
All analysis completed in Java off the environment.	TTSQL does not use DB2 to analyze PROGRAMS and SQL.

TurboTuneSQL®

Other tasks you can perform:

- Map table access (Predicates in use, sort clauses, DB2 RTS usage, etc)
- Non-used indexes;
- Duplicated indexes;
- Plan Table comparisons (between two Plan Tables and also after index recommendations)
- High usage of identical SQLs spread in multiple programs;
- High usage of similar SQLs spread in multiple programs;
- Top ten CPU consumers (from cache traces):
 - By SQLs
 - By group of identical SQLs
 - By group of similar SQLs;
- High consumption of LOG, FETCHS (by program/statement);
- Overview of CPU consumption by:
 - Collection, Plan, Package, CICS, BATCH, DRDA, IMS, Connection Type, DB2 subsystem, etc.;
 - SQLs never executed (from cache traces)
 - CPU spent in Special Processors (ZIIP)
 - CICS/IMS transactions doing table or index scan
- Cross Reference: transactions, jobs, programs, used table columns, index and table scan, etc.;

Understanding TurboTune®

THE GOALS:

- Reduce CPU consumption.
- Improve file-processing times, batch turnaround times and/or access time for an on-line transactions.

THE FACTS:

- All systems operating in the mainframe environment are underpinned by Virtual Storage Access Method (VSAM) files. (“Sub-system”)
- File inefficiencies are the cause of process bottlenecks and heavy CPU/storage waste.
- The skills required to optimize files at this level are no longer possessed by most in the data center.

Next: Traditional Tuning vs. TurboTune® Optimization: THE VALUE PROPOSITION →



Traditional Tuning:

- The traditional method of tuning requires an analyst (in most cases an IBM specialist) who understands the impact of file parameters, blocksize, and many other variables affecting the performance of a VSAM file and its interaction with other files.
 - These skills have long since been lost to most systems and applications programmers. The use of “cover” software such as \$IAM produces lackluster performance results and hides poorly written code. This has been the choice of most companies for decades. This is rapidly changing as control and cost come to the forefront of ITAM decision making.
- Traditional tuning proceeds on a file-by-file basis. It is an iterative process of making one change to the file, running performance reports to observe the effect of the change, then making another change, repeat. This can take years in a relatively small system with many data sets.
- The traditional process has proved to be successful however labor intensive for long periods and cost intensive given the labor requirement.
- The impact on CPU utilization (cost reduction) is minimal due to the consumption utilized throughout the lengthy process.
- The most critical success factor of traditional tuning is the active involvement of knowledgeable application developers.



TurboTune® Optimization

- TurboTune® Optimization **DOES NOT** require an analyst. The process can be completed without substantial involvement from critical personnel. TurboTune® is the analyst.
- TurboTune® Optimization automates time consuming (often years) file-by-file iterative processes of traditional tuning. The software is the labor force identifying and improving files using 100% IBM RedBook recommendations. There is zero change to program logic.
- TurboTune® Optimization analysis and internal file testing is completed 100% off-line. Prior to testing and implementation this results in zero CPU consumption.
- TurboTune® Optimization is capable of reclaiming enormous amounts of storage.
- TurboTune® addresses several aspects of data center optimization resulting in performance improvement across the environment...FAST.
- TurboTune® Optimization provides substantial reductions in CPU time providing immediate ROI.



TurboTune® Optimization

THE PROCESS:

- TT collects VSAM data sets and runs each file through proprietary programs, which record performance characteristics and resource requirements.
- TT identifies which files require alterations (“improvements”) to create reductions in resource requirements (CPU, EXCP's, etc.).
- TT employs proprietary algorithms and more than 700 specialized ratios to analyze every combination of variable in the catalog.
- TT compares improved customer file definitions against their proprietary database of more than 1,000,000,000 previously analyzed statistical files and determines the "best optimized" settings for each file.
- TT alters each parameter one at a time, reruns the programs, and records the same statistics removing the labor intensive process of iterative file optimization.
- TT produces a report indicating the files requiring improvement and the necessary parameter changes to produce maximum efficiency.
- TT produces a conservative forecast of expected reductions of CPU consumption and relative performance enhancement.



TurboTune® & Tailored Fit Pricing (TFP)

- TurboTune® and Tailored Fit Pricing work together to lower your aggregate operating costs and increase performance.
- Under the TFP Consumption model the customer needs to consider the consumption of all applications and software across the day, week and month instead of just what might be influencing the R4HA.
- Without capping in place, customers can expect jobs to finish faster, and online processing to process more transactions simultaneously improving response times. TurboTune® optimizes file efficiency to maximize the new benefits of TFP pricing by creating performance improvements and CPU reductions directly proportional to usage.
- TurboTune® Optimization processes have a cascading effect. Increased file efficiency at the sub-system level generates performance improvement upon execution, and therefore CPU reduction, across the environment any time improved files are utilized.
- No more peaks. Pay for what you use. Make sure you use less with TurboTune®.
- Reducing CPU consumption prior to annual baseline discussions can be the key to reducing effective MLC and growth pricing moving forward while delaying necessary upgrades, potentially for years.
- VUE pricing is complemented by TurboTune® reducing “high-water” marks and providing additional headroom for growth and/or delaying upgrades. Overages in the VUE model are expensive. (a multiplier of 48 months MLC). Reducing chargebacks internally and optimizing specific applications with TurboTune® is an effective tool for reducing department expenses.



TurboTune® Pricing:

TurboTune® price modeling is dependent on three factors which affect workload for Critical Path Software and the outcome of savings:

1. The size of the environment in term of aggregate number of files. This figure dictates the level of analysis and the labor consumption required to return the necessary improvements.
2. The number of improvements then required in terms of files and improvements within each improved file.
3. The current level of CPU consumption in terms of MIPS and financial impact.

Using these factors Critical Path Software internally calculates project price for each individual customer.

Recent Examples:

Continuing Annual Savings	One Time Cost
1,462,580 USD	453,400 USD
1,958,000 USD	361,000 USD

NOTE: This is a flat price. Savings created by the TurboTune® SAAS process are experienced by the customer each successive year at no additional cost.



TurboTuneSQL® Pricing:

TurboTuneSQL® is a deployable software when requested. The price modeling differs from TurboTune®. Immediate CPU reductions in specific program/SQL executions are quantified by the software in terms of CPU seconds, MSU/MIPS and ultimately direct cost reduction.

Recent Example: (U.S. Domestic Retail Client)

An external analysis of a specific 3 hour data capture identified these savings:

- 206.4808719 CPU Seconds
- 71.62511725 MIPS

These improvements reduced the cost of the daily batch execution significantly. Utilizing the clients machine rate and resource unit pricing calculations CPS priced the project at 12,800 USD per month, on a 36 month renewable contract.¹

Once TTSQL® was deployed savings were considerably higher. CPS did not increase the price.

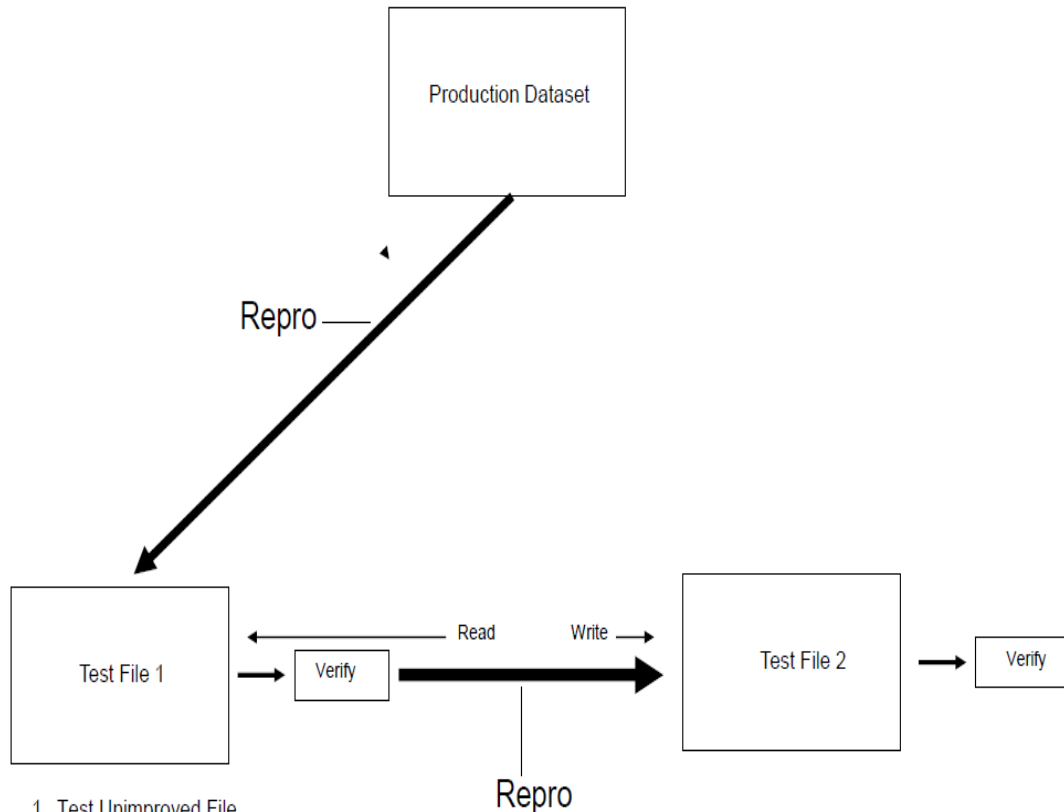
1. Accurate pricing is predicated on billing transparency of the customer. In the absence of accurate pricing CPS will utilize average market pricing of CPU resources.





TurboTune® POC Examples:

Critical Path Software will choose, improve and provide JCL to implement improvements for a limited number of files allowing the customer to evaluate the efficacy of the TurboTune process.



1. Test Unimproved File
2. Test Improved File
3. Compare Consumption Results

REPRO RESULTS:	EXCP	CONN	TCB	SRB
OLD2OLD	1293	816	0.002679	0.00016
NEW2NEW	1029	630	0.002559	0.000138
IMPROVEMENT:	-20.42%	-22.79%	-4.48%	-13.75%
LISTCAT RESULTS:	HI-A-RBA	HI-U-RBA	INDEX LEVEL	TRACKS
LISTCAT.OLD.1	96645120	91852800	3	1815
LISTCAT.NEW.1	88657920	72683520	2	1665
IMPROVEMENT:	-8.26%	-20.87%	-33.33%	-8.26%

TurboTuneSQL® POC Examples:

Critical Path Software will optimize 1 – 3 programs/SQL requiring improvement allowing the customer to evaluate the efficacy of the TurboTune process.

TurboTuneSQL for Db2 Statements - Db2 Cache SAVINGS


Program Name Db2_SSID Max Lines
Filter DBBG 250

	Program	S Num	Stmt Type	Description	Date Time	CPU Savings	CPU Savings (MSUs)	Previous CPU Average	Db2 SSID
38	ZVPBT03	210	3030	DECLARE	2023-04-14-20.00.00	905.50494	46.5329	0.027894	DBBG
39	ZVPBT03	210	3030	DECLARE	2023-04-14-20.00.00	277.69998	14.270697	0.027894	DBBG
43	ZVPBT05	235	2000	UPDATE	2023-04-08-22.00.00	80.77404	4.150889	0.040605	DBBG
40	ZVPBT03	210	3030	DECLARE	2023-05-01-08.00.00	69.41722	3.5672746	0.027894	DBBG
44	ZVPBT05	235	2000	UPDATE	2023-04-09-22.00.00	22.432262	1.1527693	0.040605	DBBG
31	ZVPBR01	108	3030	DECLARE	2023-04-18-13.00.00	15.526872	0.79790884	0.020968	DBBG
37	ZVPBT03	210	3030	DECLARE	2023-04-14-20.00.00	13.759909	0.7071066	0.027894	DBBG
36	ZVPBT03	210	3030	DECLARE	2023-04-14-20.00.00	9.814942	0.5043791	0.027894	DBBG
45	ZVPBT05	235	2000	UPDATE	2023-04-13-20.00.00	6.0057173	0.30862722	0.040605	DBBG
32	ZVPBR01	108	3030	DECLARE	2023-04-18-13.00.00	5.920953	0.30427125	0.020968	DBBG

TurboTuneSQL for Db2 Programs - Db2 Accounting SAVINGS

Program Name Db2_SSID Max Lines
Filter DBBG 250

	Program	Date Time	CPU Savings	CPU Savings (MSUs)	Changed Token	Db2 SSID
6	ZVPBF44	2023-04-08-22.00.00	764.0364	39.26299	1	DBBG
7	ZVPBF44	2023-04-09-22.00.00	477.8208	24.55469	1	DBBG
1	ZVPBF03	2023-04-10-10.00.00	124.36867	6.3911695	1	DBBG
12	ZVPBF92	2023-04-24-20.00.00	96.65132	4.966805	1	DBBG
5	ZVPBF44	2023-04-08-20.00.00	94.51777	4.8571644	1	DBBG
13	ZVPBF92	2023-04-25-08.00.00	46.34047	2.3813858	1	DBBG
18	ZVPBF92	2023-05-01-15.00.00	46.271065	2.377819	1	DBBG





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