

Benchmark Kit Validation Test for IBM System i5 with JD Edwards EnterpriseOne 8.11 SP1

*An Oracle White Paper Written in Collaboration with
IBM Corporation*

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JD EDWARDS ENTERPRISEONE

PURPOSE STATEMENT

This document provides considerations when reviewing system performance relative to your JD Edwards EnterpriseOne system. Many factors can influence performance and your results may differ depending on many different variables.

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EXECUTIVE OVERVIEW.....	1
SUMMARY OF RESULTS.....	1
BENCHMARK PROFILE.....	2
METHODOLOGY.....	2
TESTED BUSINESS PROCESSES.....	3
Financials.....	3
Distribution.....	4
Manufacturing.....	4
TUNING.....	7
System Tuning.....	7
Application Tuning.....	7
ENVIRONMENT.....	7
Hardware.....	7
IBM System i5.....	7
LoadRunner Controller.....	8
Software.....	8
Patches.....	8
RESULTS.....	9
ACRONYMS.....	10
DEFINITIONS.....	10
APPENDIX A: ESUS APPLIED TO BENCHMARK ENVIRONMENT.....	11

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EXECUTIVE OVERVIEW

As a global leader in enterprise applications, Oracle's JD Edwards EnterpriseOne team is committed to delivering high performance solutions that meet our customers' expectations. Business software must deliver rich functionality with robust performance. This performance must be maintained at volumes that are representative of customer environments.

Oracle benchmarks demonstrate our software's performance characteristics for a range of processing volumes in a specific configuration. Customers and prospects can use this information to determine the software, hardware, and network configurations necessary to support their processing volumes.

The primary objective of our benchmarking effort is to provide as many data points as possible to support this important decision. For this evaluation seventeen JD Edwards EnterpriseOne business processes were tested using IBM System i5 (formerly iSeries) for the complete system.

SUMMARY OF RESULTS

Table 1 – Summary of Results		
Online Workload	number of users	1,200
Business Process Family		
▪ Financials	seconds	0.117
▪ Distribution	seconds	0.103
▪ Manufacturing	seconds	0.297
Weighted Average ("OK" Button Response Time)	seconds	0.153
Overall CPU Utilization	percent	65%

BENCHMARK PROFILE

In June 2006, IBM conducted a validation test in Rochester, Minnesota (USA) to measure the online performance of JD Edwards EnterpriseOne 8.11 SP1 with Tools 8.96_A1 on an IBM System i5 Model 570 with four 2.2Ghz advanced POWER5 processors. These tests were conducted using an “All-on-i” configuration (reference Figure 1) in which one instance of i5/OS is used for web, application, and database serving. This test used IBM WebSphere 6.0.2.7, V5R4 of i5/OS, and DB2 for i5/OS that is an integrated part of i5/OS.

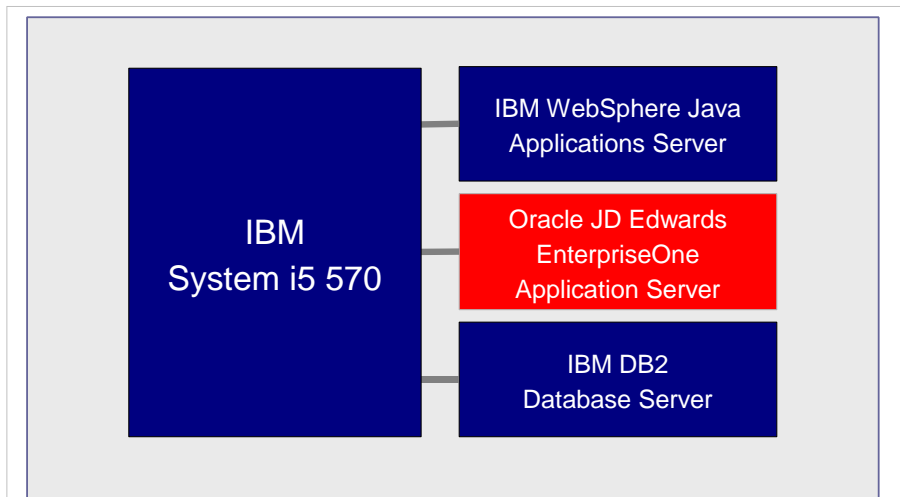


Figure 1. “All-on-i” Configuration for Benchmark Testing

The validation test measured client response times for 1200 users. The standard database composition model represents a medium-sized manufacturing company performing a wide variety of financial, distribution and manufacturing tasks. The testing was conducted in a controlled environment with no other applications running.

The goal of this validation test was to obtain baseline performance and response time results for JD Edwards EnterpriseOne 8.11 SP1 / 8.96_A1 on System i5 technology and V5R4 of i5/OS. These results demonstrate stability, scaling, and performance of JD Edwards EnterpriseOne on IBM System i5.

METHODOLOGY

Mercury Interactive’s LoadRunner was used as the load driver, simulating concurrent users. It submitted a business process at an average rate of one every five minutes for each concurrent user.

Measurements were recorded during a 60 minute test window after all users had completely logged on and positioned at their respective initial application screens.

The benchmark was run in an “All-on-i” configuration with one System i5 hosting

the web, application, and database servers.

Response times were measured from the time the user clicks the <OK> button until the HTML response page is returned for the final step of a business transaction.

JD Edwards EnterpriseOne applications, whether interactive or batch processes, can be initiated from a browser. Mercury Interactive's LoadRunner was used as the load driver, simulating interactive users for this test. It submitted transactions at an average rate of one every 2.5 to 10 minutes depending on the user's workload profile.

The goal of this test is to support sizing efforts across a commonly used range of applications. The workload is based on usage models representing a mid-size manufacturing company. This test scenario provides a way to simulate how users might interact with a particular program. The scenarios include think time to simulate the typical user's working style benchmark business processes

JD Edwards defines a business transaction as a series of HTML pages that guide a user through a business process, such as entering a new multi-line sales order.

TESTED BUSINESS PROCESSES

The following seventeen JD Edwards EnterpriseOne business processes were tested.

Financials

H0411E – Standard Voucher Entry: User enters two voucher payments against five G/L accounts each. User then performs a name search for a supplier and enters a third voucher, again applied to five G/L accounts. This business process is performed 10 times in one hour per user.

H0411I – Supplier Ledger Inquiry: User performs two searches on a supplier ID and then opens the document for review. This business process is performed 10 times in one hour per user.

H03B102E – Standard Receipts Entry: User receives payments and applies to the appropriate invoices. This business process is performed 10 times in one hour per user.

H0911E – Journal Entry: User enters two 10-line journal entries. This business process is performed 16 times in one hour per user.

H09210I – Trial Balance/Ledger Comparison: User navigates to Trial Balance/Ledger Comparison page and enters search date range and performs the search and compare on two different accounts. This business process is performed five times in one hour per user.

Distribution

H4114E – Inventory Adjustments: The user performs a 10 line inventory adjustment. This business process is performed 20 times in one hour per user.

H41202I – Summary Availability: The user performs a lookup of an inventory item, and then checks for its availability. This business process is performed 10 times in one hour per user.

H4310E – Purchase Order Entry: The user enters four 10 line purchase orders. This business process is performed five times in one hour per user.

H43214I – Open Receipt Inquiry: The user performs a lookup of a specific order number. This business process is performed 10 times in one hour per user.

H4205U – Confirm Shipments: The user confirms an order has shipped. This business process is performed 10 times in one hour per user.

H4210I – Customer Service Inquiry: The user performs a lookup of a customer order. This business process is performed 10 times in one hour per user.

H4210E – Sales Order Entry: The user enters four 10 line sales orders. This business process is performed five times in one hour per user.

Manufacturing

H3002E – Work Order Entry: The user enters a new work order. This business process is performed 20 times in one hour per user.

H30200I – Single Level Bill of Material Inquiry: The user performs a lookup for an inventory item with subsidiary components. This business process is performed 20 times in one hour per user.

H31113U – Work Order Material Issues: The user looks up a work order and revises the quantity issued for a particular item. This business process is performed 20 times in one hour per user.

H31114U – Work Order Partial Completions: The user looks up a work order and updates one of the line items' status to completed. This business function is performed 10 times in one hour per user.

H4021I – Supply/Demand Inquiry: The user performs a lookup on a specific item number to check its supply and demand. This business function is performed 10 times in one hour per user.

Table 2 shows the proportions of the business processes used in the measurements of this benchmark. The proportions are intended to simulate a typical user scenario. Table 3 builds on Table 2 by listing the total application workload as a function of each application area with transactional data for number of users, transaction counts and descriptions of each transaction.

Table 2. JD Edwards EnterpriseOne Business Process Mix

Process by Application Area	Total Users	Documents Processed	Average Pacing
	%	users/hour	minutes
Financials (26% Overall)			
H0411E – Standard Voucher Entry	5	30	5
H0411I – Supplier ledger Inquiry	4	20	5
H03B102E – Standard Receipts Entry	4	20	5
H0911E – Journal Entry	3	32	3
H09210I – Trial Balance/Ledger Comparison	10	15	10
Distribution (44% Overall)			
H4114E – Inventory Adjustments	2	20	2.5
H41202I – Summary Availability	5	10	5
H4310E – Purchase Order Entry	10	20	10
H43214I – Open Receipt Inquiry	10	10	5
H4205U – Confirm Shipments	5	10	5
H4210I – Customer Service Inquiry	2	10	5
H4210E – Sales Order Entry	10	20	10
Manufacturing (30% Overall)			
H3002E – Work Order Entry	5	20	2.5
H30200I – Single Level Bill of Material Inquiry	5	20	2.5
H31113U – Work Order Material Issues	10	20	2.5
H31114U – Work Order Partial Completions	5	10	5
H4021I – Supply/Demand Inquiry	5	10	5
Total	100	16,960	documents/1k

Table 3. JD Edwards EnterpriseOne Business Process Mix

Process by Application Area		User Count	Total Txns	Transaction Description
Financials (26% Overall)				
H0411E	Standard Voucher Entry	60	1,800	Standard accounts payable vouchers entered with:
			9,000	▪ Journal entries
H0411I	Supplier ledger Inquiry	48	960	▪ Inquiry entries
H03B102E	Standard Receipts Entry	44	927	Standard account receivable receipts applied against:
			927	▪ Standard invoices
H0911E	Journal Entry	36	1,152	▪ 10 line journal entries
H09210I	Trial Balance/Ledger Comparison	120	1,800	Trial balance and ledger comparisons
Subtotal (Financials)		308	16,566	
Distribution (44% Overall)				
H4114E	Inventory Adjustments	24	4,800	Inventory adjustments with the corresponding:
			9,600	▪ General ledger entries
H41202I	Summary Availability	60	600	▪ Inventory lookups
H4310E	Purchase Order Entry	120	2,400	10 line purchase orders created with corresponding:
			24,000	▪ PO detail lines
H43214I	Open Receipt Inquiry	120	1,200	▪ Open procurement inquires
H4210I	Customer Service Inquiry	24	240	▪ Customer service inquired
H4210E	Sales Order Entry	120	2,400	10 line sales order entries created with corresponding:
			24,600	▪ Sales order detail lines
H4205U	Confirm Shipments	60	600	▪ Shipments confirmed
Subtotal (Distribution)		528	70,440	
Manufacturing (30% Overall)				
H3002E	Work Order Entry	60	1,200	Work order entries created with:
			1,200	▪ Work order instructions
H30200I	Single Level Bill of Material Inquiry	47	940	▪ Inventory item lookups
H31113U	Work Order Material Issues	120	2,400	▪ Work order quantity updates
H31114U	Work Order Partial Completions	55	550	▪ Work order detail line updates
H4021I	Supply/Demand Inquiry	60	600	▪ Item inquires
Subtotal (Manufacturing)		342	6,890	
Total Application Workload		1,178	93,896	

TUNING

System Tuning

Main storage pools were configured to minimize faulting in the machine pool and to eliminate transitions to ineligible in the *BASE pool.

- Tests were run with four proxy users to avoid contention on user profile objects.
- Initial heap size for the Application Server JVM was set to 1800MB.

Application Tuning

All tests were run using:

- 60 Call Object Kernels
- 12 Security Kernels
- Maximum of 4 JDENET jobs
- Multithreading enabled
- The ThreadPoolSize was set to 20
- ThreadPoolSizeIncrement was set to 1

ENVIRONMENT

Hardware

IBM System i5

One IBM System i5 Model 9406-570 (Feature 7749) was used for the application, web and database server. It was configured with the following:¹

- 4 x 2.2 Gigahertz advanced POWER5 processors
- 32 Gigabytes of memory
- 3+ Terabytes of total disk space (90 x 35 GB, RAID5 protected)

The application, web, and database servers were run in the same instance of IBM i5/OS and shared processor and memory resources.

¹ For further information on this and other system configurations, refer to the IBM “System i5 Performance Capabilities Reference” which can be found on the web at: www.elink.ibm.com/public/applications/publications/cgi-bin/pbi.cgi?SSN=06HHO0039428097370&FNC=PBL&PBI=SC41-0607-10PBCEEBO200030327&TRL=TXTSRH

LoadRunner Controller

One IBM xSeries 330 was used to run the tests and collect the response time data. It was equipped with:

- 2 x 1.4 Gigahertz Intel Pentium III Processors
- 1.75 Gigabytes of memory

Software

- JD Edwards EnterpriseOne 8.11 SP1
- JD Edwards EnterpriseOne Tools 8.96_A1
- i5/OS Version 5 Release 4
- IBM WebSphere Advanced Server 6.0.2.7
- Microsoft Windows 2000 Server SP4
- Mercury Interactive LoadRunner 7.8.0.0
- Includes all PTFs recommended in the informational APAR II14151 as of June 1, 2006

The following group PTF's were installed with the level follows the PTF number in parentheses:

- SF99504 (Level 1) DB2 UDB for System i
- SF99301 (Level 13) WebSphere Application Server V6.0
- SF99296 (Level 3) WebSphere MQ for i Series - Version 5, Release 3
- SF99291 (Level 2) Java
- SF99114 (Level 2) IBM HTTP Server for i5/OS

Patches

The tests were run on JD Edwards EnterpriseOne 8.11 SP1 and Tools Service Pack 8.96_A1. In addition, the ESUs listed in Appendix A were applied to the benchmark environment. Regarding these applied ESUs, please note:

1. The Appendix A list of ESUs appears long because the system was made 100 percent release current (all point in time fixes). This benchmarking exercise could have only used a small subset of the ESUs.
2. The ESUs listed in Appendix A are "point in time" and there may be ESUs that supersede the current list.

RESULTS

Tables 4 and 5 summarize the results of this benchmark.

Table 4. Script Response Times ("OK" Button Only)	
Scripts	Response Time
	seconds
Financials	
H0411E_1_PST	0.148
H0411E_1_PST (2nd)	0.148
H0411E_2_PST	0.149
Voucher Entry Average	0.148
H0911E_1_PST	0.076
H0911E_2_PST	0.065
Journal Entry Average	0.071
Distribution	
H4210E_1_PST	0.137
H4210E_1_PST (2nd)	0.137
H4210E_1_PST (3rd)	0.137
H4210E_4_PST	0.127
Sales Order Average	0.135
H4310E_1_PST	0.072
H4310E_1_PST (2nd)	0.072
H4310E_1_PST (3rd)	0.072
H4310E_4_PST	0.071
Purchase Order Average	0.072
Manufacturing	
H3002E_1_PST	0.340
H31114U_1_PST	0.253
Manufacturing User Average	0.297
Group Response Times	
Financials	0.117
Distribution	0.103
Manufacturing	0.297
Combined Weighted Average	0.153
Note: "OK" button only	

Table 5. Throughput Summary Results				
Transaction Scripts	Pass	Fail	Actual User Count	Number of Failed Users
Inquiry				
H43214I	1,200	0	120	0
H4210I	240	0	24	0
H41202I	600	0	60	0
H4021I	600	0	60	0
H0411I	960	0	48	0
H09210I	1,800	0	120	0
H30200I	1,089	111	60	13
Entry				
H4310E	2,400	0	120	0
H4210E	2,400	0	120	0
H4114E	480	0	24	0
H3002E	1,200	0	60	0
H0911E	1,152	0	36	0
H0411E	1,800	0	60	0
H03B102E	927	33	48	4
Update				
H31114U	595	5	60	5
H31113U	2,400	0	120	0
H4205U	600	0	60	0
Totals				
	20,443	149	1,200	22
Note: The transaction and user failure rate should not exceed 2.5 percent				

ACRONYMS

APAR Authorized Problem Analysis Report (IBM)

PTF Program Temporary Fix - Standard IBM locution to designate single bug fix or group of bug fixes distributed in a form ready to install for customers. (IBM)

UDB Universal Database (IBM)

DEFINITIONS

Business Transaction: A series of HTML pages that guide a user through a business process, such as entering a new multi-line sales order.

APPENDIX A: ESUS APPLIED TO BENCHMARK ENVIRONMENT

JJ10001	JJ10056	JJ10108	JJ10167	JJ10223	JJ10271	JJ10319	JJ10363	JJ10410	JJ10452	JJ10492
JJ10003	JJ10057	JJ10110	JJ10168	JJ10224	JJ10272	JJ10320	JJ10364	JJ10411	JJ10453	JJ10493
JJ10006	JJ10058	JJ10111	JJ10169	JJ10225	JJ10273	JJ10321	JJ10365	JJ10412	JJ10454	JJ10495
JJ10007	JJ10060	JJ10112	JJ10170	JJ10228	JJ10274	JJ10322	JJ10366	JJ10413	JJ10455	JJ10496
JJ10009	JJ10062	JJ10116	JJ10172	JJ10229	JJ10275	JJ10323	JJ10367	JJ10414	JJ10456	JJ10497
JJ10011	JJ10063	JJ10118	JJ10174	JJ10230	JJ10276	JJ10324	JJ10369	JJ10415	JJ10457	JJ10498
JJ10012	JJ10065	JJ10119	JJ10175	JJ10231	JJ10277	JJ10325	JJ10371	JJ10417	JJ10458	JJ10499
JJ10014	JJ10066	JJ10121	JJ10176	JJ10232	JJ10278	JJ10326	JJ10372	JJ10418	JJ10459	JJ10500
JJ10015	JJ10068	JJ10122	JJ10177	JJ10233	JJ10279	JJ10327	JJ10373	JJ10419	JJ10460	JJ10501
JJ10017	JJ10069	JJ10123	JJ10178	JJ10235	JJ10280	JJ10328	JJ10374	JJ10420	JJ10461	JJ10502
JJ10019	JJ10070	JJ10126	JJ10179	JJ10237	JJ10281	JJ10329	JJ10376	JJ10421	JJ10462	JJ10503
JJ10020	JJ10071	JJ10127	JJ10180	JJ10240	JJ10282	JJ10330	JJ10377	JJ10422	JJ10463	JJ10504
JJ10021	JJ10072	JJ10128	JJ10182	JJ10241	JJ10283	JJ10331	JJ10378	JJ10423	JJ10464	JJ10505
JJ10023	JJ10074	JJ10129	JJ10183	JJ10242	JJ10284	JJ10332	JJ10380	JJ10424	JJ10465	JJ10506
JJ10025	JJ10076	JJ10130	JJ10184	JJ10243	JJ10287	JJ10333	JJ10381	JJ10425	JJ10466	JJ10508
JJ10026	JJ10077	JJ10131	JJ10185	JJ10244	JJ10288	JJ10334	JJ10382	JJ10426	JJ10467	JJ10509
JJ10028	JJ10078	JJ10132	JJ10190	JJ10245	JJ10289	JJ10335	JJ10385	JJ10427	JJ10468	JJ10510
JJ10030	JJ10079	JJ10133	JJ10193	JJ10248	JJ10290	JJ10336	JJ10386	JJ10428	JJ10469	JJ10511
JJ10031	JJ10080	JJ10134	JJ10194	JJ10249	JJ10291	JJ10337	JJ10387	JJ10429	JJ10470	JJ10512
JJ10033	JJ10081	JJ10135	JJ10196	JJ10250	JJ10292	JJ10338	JJ10388	JJ10431	JJ10471	JJ10513
JJ10034	JJ10082	JJ10137	JJ10197	JJ10251	JJ10293	JJ10340	JJ10389	JJ10432	JJ10472	JJ10514
JJ10035	JJ10084	JJ10140	JJ10198	JJ10252	JJ10294	JJ10341	JJ10390	JJ10433	JJ10473	JJ10515
JJ10036	JJ10085	JJ10141	JJ10200	JJ10253	JJ10295	JJ10342	JJ10391	JJ10434	JJ10474	JJ10516
JJ10038	JJ10086	JJ10144	JJ10201	JJ10255	JJ10296	JJ10343	JJ10392	JJ10435	JJ10475	JJ10517
JJ10039	JJ10088	JJ10145	JJ10202	JJ10256	JJ10298	JJ10345	JJ10393	JJ10437	JJ10476	JJ10518
JJ10040	JJ10089	JJ10146	JJ10204	JJ10257	JJ10301	JJ10346	JJ10394	JJ10438	JJ10477	JJ10519
JJ10041	JJ10090	JJ10147	JJ10205	JJ10258	JJ10302	JJ10347	JJ10395	JJ10439	JJ10478	JJ10520
JJ10042	JJ10091	JJ10148	JJ10206	JJ10259	JJ10303	JJ10348	JJ10396	JJ10440	JJ10479	JJ10521
JJ10043	JJ10093	JJ10150	JJ10207	JJ10260	JJ10305	JJ10349	JJ10397	JJ10441	JJ10481	JJ10522
JJ10044	JJ10094	JJ10151	JJ10208	JJ10261	JJ10309	JJ10350	JJ10398	JJ10442	JJ10482	JJ10523
JJ10045	JJ10096	JJ10152	JJ10209	JJ10262	JJ10310	JJ10351	JJ10399	JJ10443	JJ10483	JJ10524
JJ10046	JJ10097	JJ10153	JJ10211	JJ10263	JJ10311	JJ10352	JJ10401	JJ10444	JJ10484	JJ10525
JJ10047	JJ10098	JJ10157	JJ10212	JJ10264	JJ10312	JJ10353	JJ10402	JJ10445	JJ10485	JJ10527
JJ10048	JJ10099	JJ10158	JJ10213	JJ10265	JJ10313	JJ10355	JJ10403	JJ10446	JJ10486	JJ10569
JJ10050	JJ10101	JJ10160	JJ10215	JJ10266	JJ10314	JJ10356	JJ10404	JJ10447	JJ10487	
JJ10051	JJ10102	JJ10161	JJ10216	JJ10267	JJ10315	JJ10359	JJ10406	JJ10448	JJ10488	
JJ10053	JJ10104	JJ10163	JJ10218	JJ10268	JJ10316	JJ10360	JJ10407	JJ10449	JJ10489	
JJ10054	JJ10106	JJ10164	JJ10220	JJ10269	JJ10317	JJ10361	JJ10408	JJ10450	JJ10490	
JJ10055	JJ10107	JJ10165	JJ10222	JJ10270	JJ10318	JJ10362	JJ10409	JJ10451	JJ10491	



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