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FAFSA 7.0 on WAS 5.0 Performance Test



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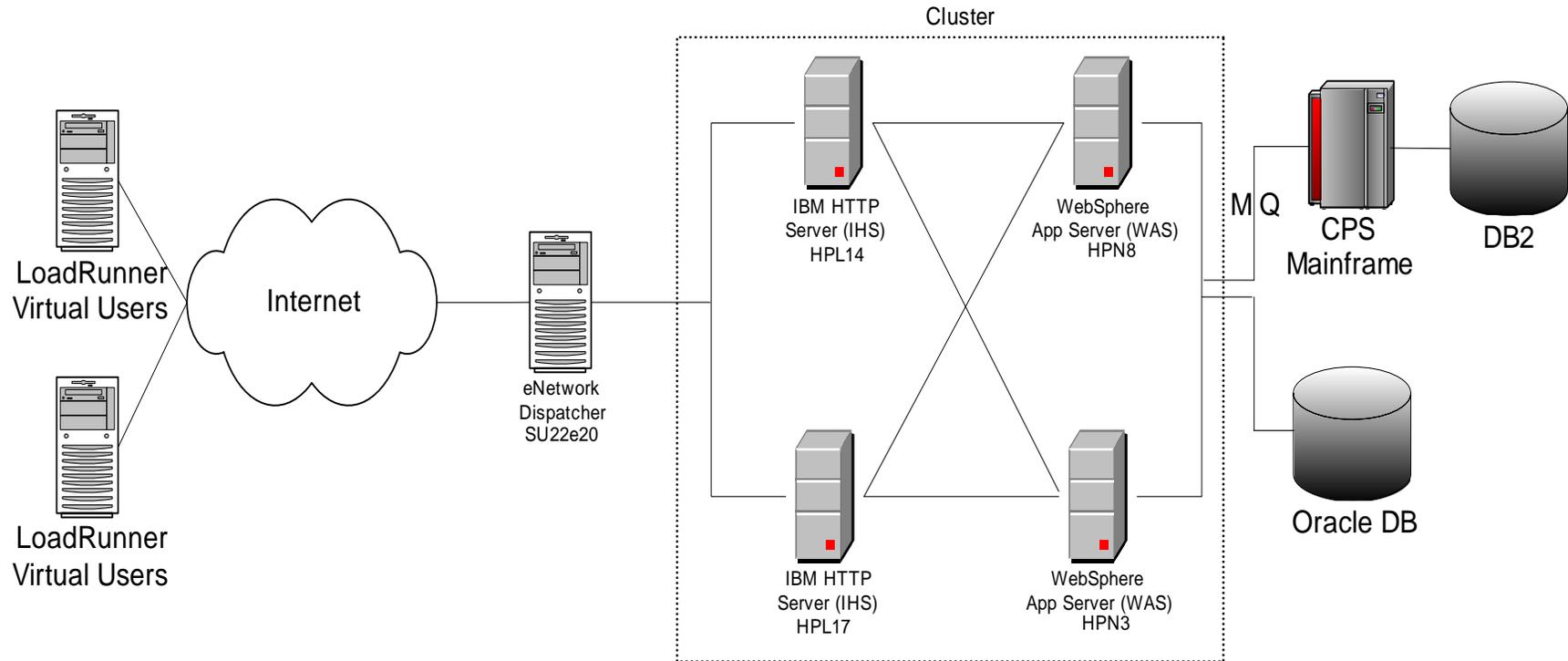
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Performance Test Goals

- Verify FAFSA 7.0 can handle production load of 1000 concurrent users, while employing Fill Out a FAFSA 7.0 and FAFSA Correction business processes
- Validate FAFSA 7.0 code on WAS 5.0 will operate under simulated production load
- Test the upgraded server software under simulated production load



Performance Test Environment





Cycle 1 – Performance Test

The following is a synopsis of Cycle 1 performance test:

- ❑ Goals: Execute a 500 user load utilizing Fill Out a FAFSA 7.0 script
- ❑ Hardware: One web server, one app server (1 clone)
- ❑ User Distribution: 100% Fill Out a FAFSA 7.0
- ❑ The first test commenced with a gradual ramp up. The system was stabilized at the 100 and 300 user thresholds. In the second test, the 500 concurrent user goal was reached without error. Average transaction response time for the entire test was less than 3 seconds.

| | CPU Utilization | | Memory Utilization | |
|--------|-----------------|-------|--------------------|------|
| | HPL14 | HPN8 | HPL14 | HPN8 |
| Test 1 | 7.5% | 6.5% | 7% | 10% |
| Test 2 | 21.7% | 11.7% | 9.3% | 10% |

Above figures are averages



Cycle 2 – Performance Test

The following is a synopsis of Cycle 2 performance test:

- ❑ Goals: Execute a 750 user load utilizing Fill Out a FAFSA 7.0 & FAFSA Correction
- ❑ Hardware: One web server, one app server (1 clone)
- ❑ User Distribution: 90% Fill Out a FAFSA 7.0, 10% FAFSA Correction
- ❑ The first test successfully executed 780 concurrent users. For test 2, the user load was increased to 1000. A garbage collection did not take place during the 37-minute run of the test. Hence a single clone can support 1000 users. Average transaction response time for the entire test was less than 3 seconds.

| | CPU Utilization | | Memory Utilization | |
|--------|-----------------|-------|--------------------|-------|
| | HPL14 | HPN8 | HPL14 | HPN8 |
| Test 1 | 25.7% | 19.3% | 11.3% | 11.7% |
| Test 2 | 36% | 25.5% | 13.5% | 11% |

Above figures are averages



Cycle 3 – Performance Test

The following is a synopsis of Cycle 3 performance test:

- ❑ Goals: Execute a 1000 user load utilizing Fill Out a FAFSA 7.0 & FAFSA Correction; test horizontal and vertical scaling
- ❑ Hardware: One web server, two app servers (1 clone each); one web server, one app server (2 clones)
- ❑ User Distribution: 90% Fill Out a FAFSA 7.0, 10% FAFSA Correction
- ❑ Both horizontal and vertical scaling were achieved, as was testing at the 1000 user threshold. Average transaction response time for this cycle was less than 3 seconds.

| | CPU Utilization | | | Memory Utilization | | |
|--------|-----------------|-------|-------|--------------------|------|------|
| | HPL14 | HPN8 | HPN3 | HPL14 | HPN8 | HPN3 |
| Test 1 | 32.7% | 13.3% | 36.3% | 18.3% | 9.7% | 16% |
| Test 2 | 30% | 24.3% | | 17.3% | 14% | |

Above figures are averages



Cycle 4 – Performance Test

The following is a synopsis of Cycle 4 performance test:

- ❑ Goals: Execute a 1000 user load utilizing Fill Out a FAFSA 7.0 & FAFSA Correction; test interaction of Wily 4.1 with environment and application
- ❑ Hardware: One web server, two app servers (1 clone each)
- ❑ User Distribution: 90% Fill Out a FAFSA 7.0, 10% FAFSA Correction
- ❑ Wily ran error-free in the performance test environment with both scripts at the 1000 user level. Average transaction response time for this test did not exceed 3 seconds.

| | CPU Utilization | | | Memory Utilization | | |
|--------|-----------------|------|-------|--------------------|------|------|
| | HPL14 | HPN8 | HPN3 | HPL14 | HPN8 | HPN3 |
| Test 1 | 27.3% | 11% | 19.3% | 16.7% | 10% | 16% |

Above figures are averages



Cycle 5 – Performance Test

The following is a synopsis of Cycle 5 performance test:

- ❑ Goals: Execute a 1000 user load utilizing Fill Out a FAFSA 7.0 & FAFSA Correction; test fail over capabilities of the environment
- ❑ Hardware: One web server, two app servers (1 clone each)
- ❑ User Distribution: 90% Fill Out a FAFSA 7.0, 10% FAFSA Correction
- ❑ The failover tests consisted of the following:
 - “Soft” failover, 114 transactions failed; CPU spiked once at 100%
 - “Harsh” failover 275 transactions failed
 - Session database recovery
 - Temp Save database recovery
 - Average transaction response time remained below 3 seconds for this cycle

| Test 1 | CPU Utilization | | | | Memory Utilization | | | |
|--------|-----------------|-------|------|------|--------------------|-------|------|------|
| | HPL14 | HPL17 | HPN8 | HPN3 | HPL14 | HPL17 | HPN8 | HPN3 |
| | 60% | 18% | 25% | 2% | 24% | 18% | 12% | 12% |

Above figures are averages



Findings

- KeepAlive requests changed
- Thread count changed
- eFix (PQ77056) so that Oracle will store session size greater than 4K
- WebSphere is generating start up error messages – FixPack2 addressed this problem
- CPU on web server spiked to 100% during failover test – Upgrade to HIS 2.0 will address this problem



Conclusion

- ❑ The FAFSA 7.0 application supported a load of 1000 concurrent users channeled through two business processes
- ❑ The FAFSA 7.0 application demonstrated its ability to operate under simulated in the upgraded WAS 5.0 environment
- ❑ The WAS 5.0 server software upgrade was tested under simulated production load conditions
- ❑ The performance test revealed several issues which have been resolved, save for 4k session size for FAFSA Correction business process