

VSFTPD Benchmark Results

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These results are generated from `ekiden/examples/vsftpd/ftp-tests/run_ekiden_benchmark.py`.

The versions being run are: [u'vsftpd-1.1.0', u'vsftpd-1.1.1', u'vsftpd-1.1.2', u'vsftpd-1.1.3', u'vsftpd-1.2.0', u'vsftpd-1.2.1', u'vsftpd-1.2.2', u'vsftpd-2.0.0', u'vsftpd-2.0.1', u'vsftpd-2.0.2', u'vsftpd-2.0.3', u'vsftpd-2.0.4', u'vsftpd-2.0.5', u'vsftpd-2.0.6']

All executions of vsFTPD use the two process model.

1 Single Version Serial Tests (90 Runs)

Command list used is `bench_script.rb`.

This benchmark measures how long a set of tests takes to run N times on a freshly started version. The idea behind it is to see if regular operations take longer on the Ekiden version than on the original. The time it takes to start vsftpd is not included.

Version	Ekiden Median (s)	Original Median (s)	Diff (Ek - Orig) (s)	Change (%)
vsftpd-1.1.0	0.001559	0.001516	0.000042	2.77 %
vsftpd-1.1.1	0.001572	0.001570	0.000002	0.12 %
vsftpd-1.1.2	0.001586	0.001563	0.000022	1.42 %
vsftpd-1.1.3	0.001562	0.001552	0.000010	0.63 %
vsftpd-1.2.0	0.001587	0.001575	0.000012	0.78 %
vsftpd-1.2.1	0.001588	0.001571	0.000017	1.11 %
vsftpd-1.2.2	0.001571	0.001546	0.000025	1.64 %
vsftpd-2.0.0	0.001587	0.001539	0.000048	3.11 %
vsftpd-2.0.1	0.001586	0.001561	0.000025	1.63 %
vsftpd-2.0.2	0.001605	0.001570	0.000034	2.17 %
vsftpd-2.0.3	0.001593	0.001550	0.000042	2.74 %
vsftpd-2.0.4	0.001604	0.001558	0.000046	2.93 %
vsftpd-2.0.5	0.001602	0.001578	0.000024	1.53 %
vsftpd-2.0.6	0.001586	0.001558	0.000028	1.82 %

This test also records memory usage of the server taken from `/proc/[pid]/status`. This is done at the end of execution of the tests.

Version	Ek. VmSize (kB)	Orig. VmSize (kB)	Diff (Ek - Orig) (kB)	Diff (Δ /Orig) (%)
vsftpd-1.1.0	2412	2236	176	7.87 %
vsftpd-1.1.1	2492	2316	176	7.60 %
vsftpd-1.1.2	2496	2316	180	7.77 %
vsftpd-1.1.3	2500	2316	184	7.94 %
vsftpd-1.2.0	2520	2332	188	8.06 %
vsftpd-1.2.1	2524	2336	188	8.05 %
vsftpd-1.2.2	2528	2336	192	8.22 %
vsftpd-2.0.0	2540	2340	200	8.55 %
vsftpd-2.0.1	2508	2312	196	8.48 %
vsftpd-2.0.2	2508	2312	196	8.48 %
vsftpd-2.0.3	2512	2312	200	8.65 %
vsftpd-2.0.4	2516	2316	200	8.64 %
vsftpd-2.0.5	2648	2316	332	14.34 %
vsftpd-2.0.6	2652	2316	336	14.51 %

Version	Ek. VmRSS (kB)	Orig. VmRSS (kB)	Diff (Ek - Orig) (kB)	Diff (Δ /Orig) (%)
vsftpd-1.1.0	952	604	348	57.62 %
vsftpd-1.1.1	976	628	348	55.41 %
vsftpd-1.1.2	984	628	356	56.69 %
vsftpd-1.1.3	984	636	348	54.72 %
vsftpd-1.2.0	1020	632	388	61.39 %
vsftpd-1.2.1	1024	636	388	61.01 %
vsftpd-1.2.2	1024	644	380	59.01 %
vsftpd-2.0.0	1040	640	400	62.50 %
vsftpd-2.0.1	1012	620	392	63.23 %
vsftpd-2.0.2	1008	620	388	62.58 %
vsftpd-2.0.3	1020	624	396	63.46 %
vsftpd-2.0.4	1024	624	400	64.10 %
vsftpd-2.0.5	1024	628	396	63.06 %
vsftpd-2.0.6	1028	628	400	63.69 %

2 Update Tests (90 Runs)

Command list used is bench_script.rb.

This benchmark does the same thing as the above "Single Version" benchmark with the only difference being that instead of starting each version separately, it updates from the previous version (original-vsftpd comparison data is taken from last benchmark).

Upd. To Version	Ekiden Median (s)	Original Median (s)	Diff (Ek - Orig) (s)	Change (%)
vsftpd-1.1.0	0.00155997276306	0.00151646137238	0.000044	2.87 %
vsftpd-1.1.1	0.00154209136963	0.00157010555267	-0.000028	-1.78 %
vsftpd-1.1.2	0.00154995918274	0.00156342983246	-0.000013	-0.86 %
vsftpd-1.1.3	0.00157904624939	0.00155186653137	0.000027	1.75 %
vsftpd-1.2.0	0.0015594959259	0.00157463550568	-0.000015	-0.96 %
vsftpd-1.2.1	0.00159907341003	0.0015709400177	0.000028	1.79 %
vsftpd-1.2.2	0.00157392024994	0.00154602527618	0.000028	1.80 %
vsftpd-2.0.0	0.00157499313354	0.0015389919281	0.000036	2.34 %
vsftpd-2.0.1	0.00160706043243	0.00156104564667	0.000046	2.95 %
vsftpd-2.0.2	0.00161302089691	0.00157046318054	0.000043	2.71 %
vsftpd-2.0.3	0.00160050392151	0.0015504360199	0.000050	3.23 %
vsftpd-2.0.4	0.00160908699036	0.0015584230423	0.000051	3.25 %
vsftpd-2.0.5	0.00163698196411	0.00157797336578	0.000059	3.74 %
vsftpd-2.0.6	0.0016565322876	0.00155758857727	0.000099	6.35 %

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vsftpd-2.0.3	1020	624	396	63.46 %
vsftpd-2.0.4	1024	624	400	64.10 %
vsftpd-2.0.5	1024	628	396	63.06 %
vsftpd-2.0.6	1028	628	400	63.69 %

3 Update Time and Memory Benchmark

No commands issued.

This benchmark times how long it takes for the standalone process to update from start to finish recording memory just prior to releasing the old .so file. This is done by modifying ekiden.c with the code found in ftp-tests/TEST. No connections are made during this test.

Upd. To Version	VmSize (kB)	VmRSS (kB)	Upd. Time (ms)
vsftpd-1.1.0	2420	604	—
vsftpd-1.1.1	2636	628	2.2710
vsftpd-1.1.2	2644	628	2.2760
vsftpd-1.1.3	2652	636	2.2360
vsftpd-1.2.0	2676	632	2.4570
vsftpd-1.2.1	2684	636	2.5190
vsftpd-1.2.2	2692	644	2.4000
vsftpd-2.0.0	2708	640	2.5620
vsftpd-2.0.1	2680	620	2.5540
vsftpd-2.0.2	2684	620	2.5120
vsftpd-2.0.3	2692	624	2.6210
vsftpd-2.0.4	2700	624	2.6160
vsftpd-2.0.5	2704	628	2.7010
vsftpd-2.0.6	2420	628	2.8060

4 Concurrent Connections Benchmark (30 Connections)

Test used is connect.

This benchmark records the memory used when running N connections simultaneously. The connection either idle for a few seconds (connect) or alternatively download a file for however long it takes to download (download_binary). This measures if having a large amount of connections causes a significant difference in memory between modified and non-modified vsftpd. Each version is started separately.

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