

SSD Total Bytes Written (TBW) Calculator

Solid-State-Drives are getting more and more common. A problem that comes with SSDs is their limited cell lifetime. Depending on their manufacturing technique, each cell can be overwritten from 1.000 times in consumer TLC SSDs to up to 100.000 times in enterprise SLC based SSDs.

The value to keep an eye on is the guaranteed **TBW** (Total Bytes Written or Terabytes Written) which is typically provided by the vendor in their specifications. This value describes how many Terabytes can be written to the device until the warranty expires. The TBW value can be readout with S.M.A.R.T. in the **Total_LBAs_Written** field. The value is in LBAs which has to be multiplied with the sector size:

On common Linux Systems you can determine "Total LBAs Written" and "Sector Size" with smartctl:

```
~# smartctl /dev/ada0 --all |grep "Sector Size"
Sector Size: 512 bytes logical/physical
~# smartctl /dev/ada0 --all | grep Total_LBAs_Written
241 Total_LBAs_Written 0x0032 099 099 000 0ld_age Always - 25351376107
```

Smartctl is not available on ESXi hosts by default, but the [Linux compatible precompiled versions](#) should work with ESXi (use the latest x86_64 build). Just copy it to your ESXi host, make it executable and run it as explained [here](#).

</div>

</div>

<div class="header-menu-sidebar-overlay hfg-ov hfg-pe" onclick="if('undefined' !== typeof toggleAriaClick) { toggleAriaClick() }"></div>

</div>

</header>

```
<style>.is-menu-sidebar .header-menu-sidebar { visibility: visible; }.is-menu-sidebar.menu_sidebar_slide_left .header-menu-sidebar { transform: translate3d(0, 0, 0); left: 0; }.is-menu-sidebar.menu_sidebar_slide_right .header-menu-sidebar { transform: translate3d(0, 0, 0); right: 0; }.is-menu-sidebar.menu_sidebar_pull_right .header-menu-sidebar, .is-menu-sidebar.menu_sidebar_pull_left .header-menu-sidebar { transform: translateX(0); }.is-menu-sidebar.menu_sidebar_dropdown .header-menu-sidebar { height: auto; }.is-menu-sidebar.menu_sidebar_dropdown .header-menu-sidebar-inner { max-height: 400px; padding: 20px 0; }.is-menu-sidebar.menu_sidebar_full_canvas .header-menu-sidebar { opacity: 1; }.header-menu-sidebar .menu-item-nav-search:not(.floating) { pointer-events: none; }.header-menu-sidebar .menu-item-nav-search .is-menu-sidebar { pointer-events: unset; }.nav-ul li:focus-within .wrap.active + .sub-menu { opacity: 1; visibility: visible; }.nav-ul li.neve-mega-menu:focus-within .wrap.active + .sub-menu { display: grid; }.nav-ul li > .wrap { display: flex; align-items: center; position: relative; padding: 0 4px; }.nav-ul:not(.menu-mobile):not(.neve-mega-menu) > li > .wrap > a { padding-top: 1px }</style><style>.header-menu-sidebar .nav-ul li .wrap { padding: 0 4px; }.header-menu-sidebar .nav-ul li .wrap a { flex-grow: 1; display: flex; }.header-menu-sidebar .nav-ul li .wrap a .dd-title { width: var(--wrapdropdownwidth); }.header-menu-sidebar .nav-ul li .wrap button { border: 0; z-index: 1; background: 0; }.header-menu-sidebar .nav-ul li:not([class*=block]):not(.menu-item-has-children) > .wrap > a { padding-right: calc(1em + (18px*2)); text-wrap: wrap; white-space: normal; }.header-menu-sidebar .nav-ul li.menu-item-has-children:not([class*=block]) > .wrap > a { margin-right: calc(-1em - (18px*2)); padding-right: 46px;}</style>
```

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<div class="container single-post-container">
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<div class="row">
```

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<article id="post-18796"
```

```
class="nv-single-post-wrap col post-18796 post type-post status-publish format-standard hentry category-virtualization tag-calculator tag-ssd">
```

```
<div class="entry-header" ><div class="nv-title-meta-wrap"><h1 class="title entry-title">SSD Total Bytes Written (TBW) Calculator</h1><ul class="nv-meta-list"><li class="meta author vcard "><span class="author-name fn">by <a href="https://www.virten.net/author/admin/" title="Posts by Florian Grehl" rel="author">Florian Grehl</a></span></li><li class="meta date posted-on "><time class="entry-date published" datetime="2016-12-28T18:27:19+01:00" content="2016-12-28">December 28, 2016</time><time class="updated" datetime="2020-09-30T17:27:17+02:00">September 30, 2020</time></li><li class="meta comments last"><a href="https://www.virten.net/2016/12/ssd-total-bytes-written-calculator/#comments">19 Comments</a></li></ul></div></div><div class="nv-content-wrap entry-content"><p>Solid-State-Drives are getting more and more common. A problem that comes with SSDs is their limited cell lifetime. Depending on their manufacturing technique, each cell can be overwritten from 1.000 times in consumer TLC SSDs to up to 100.000 times in enterprise SLC based SSDs.</p>
```

```
<p>The value to keep an eye on is the guaranteed <strong>TBW</strong> (Total Bytes Written or Terabytes Written) which is typically provided by the vendor in their specifications. This value describes how many Terabytes can be written to the device until the warranty expires. The TBW value can be readout with S.M.A.R.T. in the <strong>Total_LBAs_Written</strong> field. The value is in LBAs which has to be multiplied with the sector size:<span id="more-18796"></span></p>
```

```
<style>@media (max-width:480px){#cp_calculatedfieldsf_pform_2{min-height:5253px;}}@media (max-width:768px){#cp_calculatedfieldsf_pform_2{min-height:797px;}}@media (max-width:1024px){#cp_calculatedfieldsf_pform_2{min-height:1391px;}}@media (min-width:1024px){#cp_calculatedfieldsf_pform_2{min-height:847px;}}</style><form name="cp_calculatedfieldsf_pform_2" id="cp_calculatedfieldsf_pform_2" action="https://www.virten.net/2016/12/ssd-total-bytes-written-calculator/" method="post" enctype="multipart/form-data" onsubmit="return fbuilderjQuery.fbuilder.doValidate(this);" class="cff-form no-prefetch cff-form-12" data-nonce="4d963cec2b">
```

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<input type="hidden" name="cp_calculatedfieldsf_id" value="12" />

<input type="hidden" name="cp_ref_page" value="https://www.virten.net" />

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<div id="fbuilder_2">

<div id="formheader_2"></div>

<div id="fieldlist_2"></div>

<div class="clearer"></div>

</div>

</div>

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hidden" name="_wp_http_referer" value="/2016/12/ssd-total-bytes-written-calculator/" /></form>

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```

```
Sector Size: <span style="color: #ff0000;"><strong>512 bytes</strong></span> logical/physical
```

```
~# smartctl /dev/ada0 --all | grep Total_LBAs_Written
```

```
241 Total_LBAs_Written 0x0032 099 099 000 Old_age Always - <span style="color: #ff0000;"><strong>25351376107</strong></span></pre>
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- by [Florian Grehl](#)
- December 28, 2016September 30, 2020
- [19 Comments](#)

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