Using jemalloc to Optimize Memory Allocation

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1 Introduction

This document describes the proper steps to install `libjemalloc.so` that is optimized for a user's Linux system. For any questions regarding this document, please contact Sentieon support at support@sentieon.com.

2 Background

jemalloc is a memory allocator, optimized for high memory allocation performance and fewer memory fragments in multi-thread scenarios. For more general information about jemalloc, please refer to https://github.com/jemalloc/jemalloc

Sentieon recommends using jemalloc to improve memory management and overall performance in Sentieon applications, especially Sentieon bwa-mem.

3 Installation

Sentieon recommends installing a pre-built `libjemalloc.so`. Users may need root access to complete the installation.

3.1 RHEL/CentOS 8.x

```
yum install epel-release
yum install jemalloc
```

By default, the `libjemalloc.so` is installed at

```
/usr/lib64/libjemalloc.so.2
```

3.2 RHEL/CentOS 7.x

```
yum install epel-release
yum install jemalloc
```

By default, the `libjemalloc.so` is installed at

```
/usr/lib64/libjemalloc.so.1
```

3.3 Ubuntu 20.04

```
apt update
apt install libjemalloc2
```

By default, the `libjemalloc.so` is installed at

```
/usr/lib/x86_64-linux-gnu/libjemalloc.so.2
```

3.4 Ubuntu 18.04

```
apt update
apt install libjemalloc1
```

By default, the `libjemalloc.so` is installed at

```
/usr/lib/x86_64-linux-gnu/libjemalloc.so.1
```

3.5 Other systems without a prebuilt package

Please refer to `INSTALL.md` on the jemalloc GitHub page, https://github.com/jemalloc/jemalloc, for more information on how to build and install jemalloc.

4 Loading jemalloc in a Sentieon pipeline

The `LD_PRELOAD` environment variable can be used to load the jemalloc library in Sentieon at run time.

For example, on a CentOS 8.x system, you can use the following code to set this environment variable before running the Sentieon tools:

```
export LD_PRELOAD=/usr/lib64/libjemalloc.so.2
```


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