Bionano Solve Installation Guide

DOCUMENT NUMBER :
CG-30182

DOCUMENT REVISION :
R

Effective Date:
01/02/2024

Table of Contents

Revision History

REVISION	NOTES
A	Initial release of document.
B	Revision to `wget` command.
C	Add install step for new packages.
D	Added install for Bionano Access Server. Removed install for IrysSolve.
E	Added section on Security Patches.
F	Overview updated.
G	Warnings and Notices updated.
H	Modified install file name.
J	Updated security patching procedure.
K	Adding Docker pre-requisite.
L	Modified python command syntax for `bng-install`.
M	Added reminder to patch before proceeding.
N	Update software download link.
O	Update to replace Docker installation with Singularity for dependency management
P	Typo corrected
Q	Update with RedHat 9 upgrade notice
R	Update with RHEL installation instructions

RedHat Enterprise Linux 9 Support

Solve 3.8.1 adds support for the RedHat Enterprise Linux 9 (RHEL 9) operating system. RedHat Linux is offered as a replacement for CentOS Linux 7 which will reach end-of-life (EOL) on June 30, 2024. The following installation directions are for customers upgrading to Solve 3.8.1 on CentOS 7 or on systems with RHEL 9 already installed. To migrate from CentOS to RedHat Enterprise Linux 9, contact Bionano Technical Support at support@bionano.com

Overview

Bionano Solve is installed on Bionano Access Servers, Saphyr Compute Servers, and Bionano Compute Servers before server shipment and installation.

The Bionano Solve folder, named “tools,” is located at the `/home/bionano` directory on the Compute Server. This folder contains various tools and scripts, including the Bionano Solve computation pipeline. Each tool is versioned independently but together perform computation jobs on the Compute Server.

Installation or upgrade of Bionano Solve involves downloading a zipped file to the `/home/bionano` directory and un-tarring the contents. Please refer to the *Bionano Solve Release Notes* (RNOTE-00007) for details of each update.

Warning

This installation is designed to overlay the existing `/home/bionano/tools` directory. **NOTE**: Do not move or delete the existing contents of that directory. If files are removed from the tools directory the system may not function properly after this installation. The installation process retains each version of the pipeline tools on the system automatically. There is no need to archive the existing contents.

Security Patches

Red Hat Enterprise Linux 9

See RHEL Updates (CG-00077) for instructions on applying security updates for RHEL systems.

CentOS 7

If security updates are not already applied to the system on a regular basis running ‘yum update’ on the Linux system prior to installing the latest version of Bionano Solve is recommended. This operation requires Internet access and will update the libraries on the system to the latest versions, including various security updates. Please be sure to reboot the system after applying system updates. For more information on security updates please refer to the security patching status page (http://www.bnxinstall.com/Videos/SecurityIndex.html).

Installation/Upgrade Instructions

As of version 3.8, Bionano Solve utilizes Singularity for dependency management. The Singularity container technology offers several advantages. Bionano can easily deploy the 150+ software dependencies the pipeline requires with a single image, in addition to supporting sites that do not have internet access on their Compute Servers. Additionally, Singularity requires no elevated user privileges at runtime. Be aware that Singularity installation requires root access. When running the installation script, an immediate acknowledgement will be sent, but it may take 15 minutes for the images to be fully installed. Please be aware that the installation will replace any existing installation of Singularity with the latest version. Solve versions 3.6 and 3.7 used Docker for dependency management. Docker support will not be removed when updating to Solve 3.8.

Installation with Internet Access

Before proceeding, please verify RHEL/CentOS has been patched according to the “Security Patches” section. Follow these installation instructions if the servers have Internet access. It will be used to download the Bionano Solve installation file and install Singularity.

1. Use putty or other terminal software to connect (ssh) to the Bionano Access Server using the ‘bionano’ account. The ‘bionano’ account credentials and the IP address for the Bionano Access Server are required to proceed.

```
ssh access
```

Download the installation file:

```
wget -N (https://s3.amazonaws.com/www.bnxinstall.com/access/tools/access.tools.tgz)
```

2. Unzip the installation file:

```
tar -xvf access.tools.tgz
```

Go to Step 8 for RHEL 9 installation. Steps 3-7 are for CentOS 7 systems only.

3. Give the session root privileges:

```
sudo su -
```

Make sure SGE is installed, and its binaries are in PATH of the root user by typing

```
qconf -sh
```

If above command fails with “qconf not found” or similar, open the `/root/.bashrc` file and add following line:

```
export PATH=$PATH:/opt/sge/bin:/opt/sge/bin/lx-amd64
```

4. Run the installation script:

```
cd /home/bionano/tools/access/1.0
python bng-install
```

5. Close the root session:

```
exit
```

6. Make sure Singularity is in the path of the bionano user by typing “which singularity.” If singularity is not found, add the following line to the `/home/bionano/bashrc` file:

```
export PATH=$PATH:/usr/local/bin
```

7. Close the bionano session:

```
exit
```

8. Repeat Steps 1-2 for RHEL 9 or Steps 1-7 for CentOS on the Saphyr1a Server.

Installation without Internet Access

NOTE: Before proceeding, please verify RHEL/CentOS has been patched according to the “Security Patches” section. Follow these installation instructions if internet access on the servers is not available. It is required to download the Bionano Solve installation file and the Singularity installation packages on a CentOS or RHEL based system and transfer them to the Bionano Servers to complete this installation. Use these commands to download the Bionano Solve installation file. Contact Bionano support to receive Singularity installation packages separately.

```
wget -N (https://s3.amazonaws.com/www.bnxinstall.com/access/tools/access.tools.tgz)
```

The installation instructions assume that the following has been received from Bionano support: the `singularity_darksite` folder with install script, README file and `singularity_rpms` folder containing all rpm files and the Bionano Solve installation file. This content must be transferred to `/home/bionano` on the Bionano Access Server and the Saphyr1a Compute Server.

1. Use putty or other terminal software to connect (ssh) to the Bionano Access Server using the ‘bionano’ account. It is required to know the ‘bionano’ account credentials and the IP address for the Bionano Access Server to proceed:

```
ssh access
```

2. Unzip the installation file:

```
tar -xvf access.tools.tgz
```

Go to Step 7 for RHEL 9 installation. Steps 3-6 are for CentOS 7 systems only

3. Give the session root privileges:

```
sudo su -
```

Make sure SGE is installed, and its binaries are in PATH of the root user by typing

```
qconf -sh
```

If the above command fails with a “qconf not found” or similar message, open the `/root/.bashrc` file and add following line:

4. `export PATH=$PATH:/opt/sge/bin:/opt/sge/bin/lx-amd64`Run the installation script:

```
cd /home/bionano/<singularity_darksite>

chimed +x sing_install.py

./sing_install.py
```

5. Exit the root session:

```
exit
```

6. Close the bionano session:

```
exit
```

7. Repeat Steps 1-2 for RHEL 9 or Steps 1-6 for CentOS on the Saphyr1a Server.

Technical Assistance

For technical assistance, contact Bionano Technical Support.

You can retrieve documentation on Bionano products, SDS's, certificates of analysis, frequently asked questions, and other related documents from the Support website or by request through e-mail and telephone.

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