Bionano VIA[™] Installation Guide

DOCUMENT NUMBER: CG-00044

DOCUMENT REVISION: B

Effective Date: 04/26/2024

For Research Use Only. Not for use in diagnostic procedures.

Table of Contents

Revision History	4
VIA [™] Installation Overview	5
VIA Server Installation	5
VIA Server Installation – Windows OS	5
Start VIA Server – Windows OS	8
VIA Server Installation – Linux OS	10
Start VIA Server – Linux OS	12
VIA License Activation	12
VIA Processing Installation	14
VIA Processing Installation – Windows OS	14
VIA Processing Installation – Linux OS	17
VIA Client Installation	18
VIA Client Installation – Windows OS	18
VIA Client Installation – Mac OS	20
VIA Shutdown	22
Shutdown VIA – Windows OS	22
Shutdown VIA – Linux OS	23
VIA Update Overview	24
VIA Update – Window OS	24
VIA Update – Linux OS	24
VIA Client Auto Update	25
VIA Sample Importer Installation	26

VIA Sample Importer Installation – Windows OS	26
VIA Sample Importer Installation – Mac OS	27
VIA Sample Importer Installation – Linux OS	27
Nirvana Installation	27
Nirvana Installation – Windows OS	27
Nirvana Installation – Linux OS	28
Additional Installation Information	29
Alternate VIA Server Port	29
Specifying Server Host	30
Alternate Storage Location	30
Adjusting RAM Allocation	31
Database Contents	31
Technical Assistance	31
Legal Notice	32
Patents	32
Trademarks	32

Revision History

REVISION	NOTES
A	Initial release.
В	Updated for the VIA 7.1 release

VIA[™] Installation Overview

Installation of VIA includes the following overview steps:

- 1. Install VIA Server
- 2. Install VIA Processing Server
- 3. Install VIA Client
- 4. Install VIA Sample Importer (optional)
- 5. Install Nirvana (optional)

Instructions in this section will provide guidance through steps for installing VIA for the first time. For updating and installation of VIA please see the "VIA Update Overview" section in this guide.

VIA Server Installation

The VIA Server contains database files necessary for sample analyses in the VIA system. VIA Server installation must be completed prior to installing other VIA components. The VIA Server may be installed on either Windows OS or Linux OS.

VIA Server Installation – Windows OS

1. Run VIA Server installer with vIAServerX.x.exe. The "X.X" in the file name refers to VIA version number. This installer file is used only for new installations of the VIA Server.

InstallAnywh	ere
ی	InstallAnywhere is preparing to install
	94%
	Cancel

2. Follow prompts selecting the appropriate options and clicking the **Next** button. Installation can take several minutes; a progress status is displayed along the left side of the installer window.



3. In the License Agreement section, click on the check box to accept the terms of the License Agreement.



4. Choose a destination folder for server installation.



 Specify the storage folder location. The storage folder contains the database for the samples in VIA. By default, the storage folder is installed in the VIA Server directory. However, the storage folder may be specified elsewhere. For example, it can be installed on a mounted drive if there is more hard drive space.



6. Server installation progress.



- 7. Install complete. Click **Done** to quit the installer.
- 8. Specify port (if preference is different from default port) in the Internal.lax file in the install directory. The default port is 8443 using secure communication (https) between VIA Server, VIA Processing Server and VIA Client. The default http port is 8081. For instructions to change VIA Server port see the "Additional Installation Information" section in this guide.

NOTE: the ports used by VIA must be open on the server machine. If they are not open, please open the ports before continuing.

Start VIA Server – Windows OS

 Start VIA Server as a service. Go to Control Panel > System and Security > Windows Tools > Services. Open the Services application and select VIAServer. To start the service, click on Start the service.

Services					
VIAServer	Name	Description	Status	Startup Type	Log On As
	🖏 VIAServer			Automatic	Local System
Start the service	🖏 Virtual Disk	Provides ma		Manual	Local System
	🎑 Volume Shadow Copy	Manages an		Manual	Local System

2. Wait for service to time out. An alert window will display a progress bar with a note that Windows is attempting to start the service.



3. The service control window will time out before the service is started and an error message will appear.



NOTE: The message indicates that Windows could not start the service. Please ignore this error message and click **OK** to close the window.

Additionally, in the **Services** window, VIAServer service will not indicate **Running** in the **Status** column of the **Services** window even though the server is running. However, neither the absence of the service status nor the error message is an indication that the **VIA Server** has been started.

4. Check to see that VIA Server Java is running. If VIA Server has started properly, then the Java application for VIA Server should be running. Open the Task Manager application in Windows by holding down the [ctrl] + [shift] + [esc] keys at the same time. Navigate to the Processes tab and find the Java application for VIA Server. Make sure Show processes from all users is checked off if this option is in the Processes tab.

📐 Task M	👪 Task Manager								
File Opti	ons View								
Processes	Performance	App history	Startup	Users	Details	Services			
	^						4%	39%	1%
Name			Sta	atus			CPU	Memory	Disk
🔮 Ja	va(TM) Platfor	m SE binary					0.2%	830.6 MB	0 MB/s

Check that the Java that is running is **VIA Server** by right clicking on **Java(TM) Platform SE binary** and selecting **Properties**. Then go to the **General** tab and find **Location**, which should indicate the VIA Server install directory (default = "C:\Program Files\Bionano\VIA Server dev\jre\bin").

bionano[®]

5. Check the browser for the **VIA license** page. Enter the server url and port (e.g., https://localhost:8443), in a web browser. Replace "8443" in the url with other port numbers if using a different port. The VIA license page should appear. This is confirmation that VIA Server has started.

Server started su	ccessfully	:	
Build: 16849 Serial number: Request key: c51 Expiration date:	3/31/24 1.	2:00 AM	
Sample Class	Allowed	Processed	
Sample Class	Anomeu	Trocesseu	
Array Only	1000	7	
Array Only	1000	7	
GxA-Cyto	1000	0	
Array Only	1000	7	
GxA-Cyto	1000	0	
Low-Res WGS	1000	0	
Array Only	1000	7	
GxA-Cyto	1000	0	
Low-Res WGS	1000	0	
Methylation	1000	0	
Array Only	1000	7	
GxA-Cyto	1000	0	
Low-Res WGS	1000	0	
Methylation	1000	0	
NGS and Array	1000	398	
Array Only	1000	7	
GxA-Cyto	1000	0	
Low-Res WGS	1000	0	
Methylation	1000	0	
NGS and Array	1000	398	
OGM and NGS	1000	933	

If VIA is started for the very first time, then a **VIA license request** page will appear. Instructions to request a VIA license are in the "VIA License Activation" section of this guide.

VIA Server Installation – Linux OS

The supported Linux distribution is CentOS 7 and 8 with the Java 8 JRE installed from Oracle's RPM (http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html).

RPM install instructions can be found at, https://www.java.com/en/download/help/linux_x64rpm_install.xml.

1. Enable executable permission for viaserverx.x.bin file. The "X.x" in the bin file name refers to the VIA version number.

~]# chmod +x VIAServerX.x.bin

2. Run VIA Server installer VIAServerX.x.bin. This installer file is used only for new installations of the VIA Server.

~]# ./ VIAServerX.x.bin

By default, the Server will be installed under the user home, /\$USER_HOME\$/Bionano/VIA server directory. For example, if running the installer as root, VIA Server will then installed in "/root/Bionano/VIA\ Server". To install it at some other location use "-DUSER_INSTALL_DIR=" command line parameter. For example, the command below specifies the VIA server install directory as /software/Bionano/VIA Server.

~]# ./ VIAServerX.x.bin -DUSER_INSTALL_DIR="/software/Bionano/VIA\ Server"

NOTE: If the GUI option is enabled in the LINUX OS, it can be turned off so the installer is not run in GUI interphase. The following commands can be used. Users may need to stop the display manager service prior to running the below commands (systemctl stop gdm). To turn off GUI, use the following command:



~]# ./ VIAServerX.x.bin --i silent

- If necessary, create a symbolic link to redirect the VIA storage directory. The storage directory contains the database for the samples in VIA. By default, the storage directory is installed in the VIA Server directory under /\$USER_HOME\$/Bionano/VIA Server. Follow the steps below to specify a different storage directory:
 - a. Mount a drive. Use the mount command with flag -t for type device directory where type can be ntfs, ext or fat. USB devices are usually vfat. Example:

```
~]# mount -t ntfs /dev/sda1 /mnt
```

b. Create a Symbolic link to the storage directory on the mounted drive:

```
~]# ln -s /root/Bionano/VIA\ Server /mnt/d
```

 Set up VIA Server as a service. Create a unit file via-server.service in the VIA Server install directory (default = /root/Bionano/VIA server). Make sure it has the correct file permissions. Execute as root. Example:

```
~]# touch "/root/Bionano/VIA Server/via-server.service"
```

```
~]# chmod 664 "/root/Bionano/VIA Server/via-server.service"
```

5. Add the following content to the file. **NOTE**: If the default install directory was not used, specify the VIA Server install directory.

```
# systemd unit configuration
±
# This can be installed as a service on new system with
#
    systemctl enable "$PWD/via-server.service"
# Check status with
#
    systemctl status via-server
[Unit]
Description=Bionano VIA Server
After=remote-fs.target
[Service]
Type=simple
WorkingDirectory=/root/Bionano/VIA Server
ExecStart="/root/Bionano/VIA Server/Internal"
LimitNOFILE=65535
[Install]
WantedBy=multi-user.target
```

NOTE: If the default install directory was not used, specify the VIA Server install directory.

- 6. Execute the following commands to enable the configuration:
 - ~]# systemctl enable "/root/Bionano/VIA Server/via-server.service"

Start VIA Server – Linux OS

1. Start the VIA Server as a service:

```
~]# systemctl start via-server
```

2. Check if the server is running by checking if the service has started:

```
~]# systemctl status via-server
```

3. Check if Java for VIA server is launched:

~]# ps aux | grep java

6. Check browser for the **VIA license** page. Enter the server url and port (e.g., https://localhost:8443) in a web browser. Replace "8443" in the url with other port numbers if using a different port. The **VIA license** page should appear. This is confirmation that the VIA Server has started.

VIA Ser	ver		
Server started suc	ccessfully	:	
Build: 16849			
Serial number:	Of the star	派派演	
Request key: c51	2/21/24 1	2.00 AM	f93
Expiration date:	5/31/24 1.	2:00 AM	
Sample Class	Allowed	Processed	
Array Only	1000	7	
GxA-Cyto	1000	0	
GxA-Cyto Low-Res WGS	1000 1000	0	
GxA-Cyto Low-Res WGS Methylation	1000 1000 1000	0 0 0	
GxA-Cyto Low-Res WGS Methylation NGS and Array	1000 1000 1000 1000	0 0 0 398	
GxA-Cyto Low-Res WGS Methylation NGS and Array OGM and NGS	1000 1000 1000 1000 1000	0 0 398 933	

If VIA is started for the very first time, then a **VIA license request** page will appear. Instructions to request a VIA license are in the "VIA License Activation" section of this guide.

VIA License Activation

Once the VIA server is running, a license needs to be created and installed on the VIA Server install directory.

1. Open a web browser and enter the server url and port (e.g., https://localhost:8443). Replace "8443" in the url with other port numbers if using a different port.

2. A message stating there is no **VIA license** appears. If a message stating that the server has started does not appear, wait up to 10 minutes and check again. The following message should appear:



3. Click on the **Generate license request key** link, fill in the fields, and click **Submit**. A license request ID will be generated as shown in the example below:

Please DO NOT edit the text below and just send to Bionano Customer Service(customer-service@bionano.com). You will receive your activation code within 1 business day.

Name: John Doe Institution: ABCD Request ID: 064

Select the entire text displayed and email to support@bionano.com with subject "VIA License Request." Bionano Support will send an email with the license file.

NOTE: After sending the details to Bionano for a license, <u>do not</u> click on **Generate license request key** again and <u>do not</u> refresh the link to the **Request ID** page. Each license generated is based on the latest license key created on the machine. Clicking this button again or refreshing the page will cause the Request ID to reset and the license Bionano Support sends will not work. Once the Request ID has been sent to Bionano Support, the browser page may be closed.

- 4. Once the license file is obtained, copy the file into the server install directory (e.g., default Windows OS = C:\Program Files\Bionano\VIA Server; default Linux OS = root/Bionano/VIA Server).
- 5. Confirm that the server has started successfully. Open the server url (e.g., https://localhost:8443) in a new web browser tab or window. The VIA Server license should appear displaying a message that the Server started successfully along with the server build number, serial number, license request key, expiration date, and allowed Sample Classes.

VIA Ser	ver		
Server started su	ccessfully		
Build: 16849 Serial number: Request key: c51 Expiration date:	3/31/24 1.	2:00 AM	f93
Sample Class	Allowed	Processed	1
Array Only	1000	7	
GxA-Cyto	1000	0	
Low-Res WGS	1000	0	
Methylation	1000	0	
NGS and Array	1000	398	
OGM and NGS	1000	933	

NOTE: If there is a need to restart the machine on which the **VIA Server** is running, make sure to follow proper shut down procedures as instructed in the "VIA Shutdown" section. If the server is not stopped correctly prior to computer restart, a sample in the server database may become corrupted or the server may take several hours to start up if there are many samples (hundreds to thousands) in the database.

VIA Processing Installation

VIA Processing is the component that processes samples. **VIA Processing** installation must be done after VIA Server and license file installation. VIA Processing may be installed on the same machine (preferred) as the VIA Server or on a different machine. In a high throughput environment, **VIA Processing** can be installed on multiple different machines – please contact Bionano Support for further assistance.

VIA Processing Installation – Windows OS

- 1. Run the VIA Processing installer (vIAProcessingX.x.exe).
- 2. Follow prompts selecting the appropriate options and clicking the **Next** button. Installation can take several minutes; a progress status is displayed along the left side of the installer window.
- 3. Make sure to check the box for the **License Agreement** and specify the **VIA Processing** install directory if default is not preferred.
- 4. Choose a shortcut folder. Several options are available to create a shortcut icon for VIA Processing. The default is to create a shortcut by choosing Other and specifying the folder: C:\Users\username\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Bionano\VIA Processing



 Specify VIA Server hostname/IP and port. If VIA Processing is installed on the same machine as VIA Server, then "localhost" can be entered as the server hostname. Otherwise, the server name or IP must be specified. If the default port 8443 (https) was changed on the VIA Server, the updated port number must also be specified in VIA Processing.

VIA Processing	- 🗆 X	
	Enter VIA Server Information	n
 Introduction License Agreement Choose Install Folder Choose Shortcut Folder Enter VIA Server Information Pre-Installation Summary Installing Install Complete 	Please enter the VIA server host and port so the processing unit can connect to it. Server HostName/IP localhost Enter Server Port 8443	
InstallAnywhere		
Cancel	Previous	

NOTE: VIA Processing connection settings can be altered in the Internal.lax in the VIA Processing install directory if the settings are not properly set during VIA Processing installation or if the settings need to be changed after installation.

- 6. In the **Pre-Installation Summary** review the installation specifications and when ready to proceed click **Install**. A progress bar will be displayed showing the installation status.
- 7. Once installation is complete, click **Done** to quit the installer.
- 8. Start VIA Processing as a service. Go to Control Panel > System and Security > Windows Tools > Services. Open the Services application.
- 9. Select VIAProcessing and click Start the service.

Services (Local)					
VIAProcessing	Name	Description	Status	Startup Type	Log On As
	🍓 VIAProcessing			Automatic	Local System
Start the service	Server VIAServer			Automatic	Local System

NOTE: The service control window will time out before the **VIAProcessing** service is started and an error message will appear. Please <u>ignore</u> this error message and click **OK** to close the window. The message does not necessarily mean that the **VIAProcessing** service has not started.

10. Confirm that VIA Processing is running. Open Task Manager and navigate to the Processes tab. Make sure Show processes from all users is checked off if this option is in the Processes tab. If VIA Processing is installed on the same machine as VIA Server, two copies of Java should be running – one for VIA Server and the other for VIA Processing.

Task Manager								
File Options View								
Processes Performance App history Star	tup Users Details	Services						
^			9%	55%	0%	0%		
Name	Status		CPU	Memory	Disk	Network		
Intel(R) Management Engine W			0%	0.1 MB	0 MB/s	0 Mbps		
Intel® Graphics Command Cent			0%	2.9 MB	0 MB/s	0 Mbps		
🔬 Java(TM) Platform SE binary			0.3%	2,284.5 MB	0.1 MB/s	0 Mbps		
■ Java(TM) Platform SE binary			0%	1,396.4 MB	0 MB/s	0 Mbps		
LaunchAnywhere (32 bit)			0%	0.5 MB	0 MB/s	0 Mbps		

Verify that one of the Java applications is **VIA Processing** by right clicking **Java(TM) Platform SE binary**, select **Properties**, and go to the **General** tab. The specified directory under **Location** should indicate the **VIA Processing** install directory.

NOTE: The processing server can be installed on multiple machines in a high throughput environment – please contact Bionano Support.

VIA Processing Installation – Linux OS

- 1. Enable executable permission for VIA Processing.bin file.
 - ~]# chmod +x VIAProcessingX.x.bin
- 2. Run VIA Processing.bin installer to install VIA Processing.

~]# ./VIA\ Processing.bin

If the installer is executed as root then the application will be installed as default in /root/Bionano/VIA Processing. If the installer is executed as the user then /Bionano/VIA Processing will be under **user** home.

To install it at a non-default location use "-DUSER INSTALL DIR=" command line parameter. For example:

~]# ./VIA\ Processing.bin -DUSER_INSTALL_DIR="/home/VIA\ Processing"

- 3. Once **VIA Processing** installation is complete, the **VIA Server** hostname and port needs to be specified. To do this navigate to the **VIA Processing** install directory and open the **Internal.lax** file with a text editor.
- 4. Find the arguments line that begins with lax.command.line.args. After the = specify the VIA Server host and port. For example, if https port 8443 is used for VIA Server and VIA Server is installed on the same machine as VIA Processing then the line should be:

lax.command.line.args=localhost 8443 proclog

Default https port = 8443 and http port = 8081. If a different port number is preferred, this must be altered in the Internal.lax file for both **VIA Server** and **VIA Processing**.

The default connection between **VIA Server** and **Processing** is https. To use http instead, add <u>"--http"</u> immediately before the server hostname in the command line arguments line (e.g., lax.command.line.args=--http localhost 8081 proclog) in the Internal.lax file for **VIA Processing**.

- Set up VIA Processing as a service. Create a unit file via-proc.service in the VIA Processing install directory (default = /root/Bionano/VIA Processing). Make sure it has the correct file permissions. Execute as root. Example:
 - ~]# touch "/root/Bionano/VIA Processing/via-proc.service"

~]# chmod 664 "/root/Bionano/VIA Processing/via-proc.service"

Add the following content to the file. **NOTE**: If install directory is different from default, specify the correct **VIA Processing** install directory.

```
# systemd unit configuration
#
# This can be installed as a service on new system with
# systemctl enable "$PWD/via-proc.service"
```

```
#
# Check status with
# systemctl status via-proc
[Unit]
Description=Bionano VIA Processing
After=remote-fs.target
[Service]
Type=simple
WorkingDirectory=/root/Bionano/VIA Processing
ExecStart="/root/Bionano/VIA Processing/Internal"
LimitNOFILE=65535
[Install]
WantedBy=multi-user.target
```

6. Execute the following commands to enable the configuration:

~]# systemctl enable "/root/Bionano/VIA Processing/via-proc.service"

7. Start the service:

```
~]# systemctl start via-proc
```

- 8. Check if the server is running by checking if the service has started:
 - ~]# systemctl status via-proc
- 9. Check if Java for VIA server has launched:

~]# ps aux | grep java

10. Install VIA license. Instructions are outlined in the "VIA License Activation" section of this guide.

VIA Client Installation

VIA Client is the interface between the user and VIA Server. VIA Client is installed on each user machine. VIA Client may be installed on either Windows OS or Mac OS.

VIA Client Installation – Windows OS

- 1. Run **VIA Client** installer (v vIAClientX.x.exe) on the user machine.
- 2. Follow the prompts, select the appropriate options, and click the **Next** button. Installation can take several minutes; a progress status is displayed along the left side of the **Installer** window.
- 3. Make sure to check the box for the **License Agreement** and specify the **VIA Client installation directory** if default is not preferred.

- 4. Choose a shortcut folder. Several options are available to create a shortcut icon for VIA Client. Select **On the Desktop.** This will create a **VIA Client** shortcut on the user's Windows desktop.
- 5. In the **Pre-Installation Summary** review the installation specification and when ready to proceed click **Install**. A progress bar will be displayed showing the installation status.
- 6. Once installation is complete, click **Done** to quit the installer.
- 7. Launch **VIA Client** from the desktop shortcut.
- Specify VIA Server host and port. Upon initially launching VIA Client at the VIA login window, go to Repository Settings. The following image shows typical settings for a local installation where the VIA Client software is installed on the same machine as the VIA Server.

Repository ×		
Specify VIA Server host and port		
Host:	localhost	
Port:	8443	
	🕑 Use https	
Access support Specify Access Server host and port		
Host:	localhost	
Port:	3006	
	🔽 Use https	
	Cancel OK	

Host can be either server name or IP. The default VIA Server https port = 8443 and http port = 8081. If using https port, make sure to check the box for **Use https**. Once the host and port information has been entered, click **OK**.

Select **Access support**. In the repository settings, **Access Server** host and port can be specified. If Access is on the BAS, the IP address for the BAS should be used for the host. The default port for Access is 3005.

NOTE: The repository settings will be saved after clicking **OK**. If these specifications are not altered on the VIA Server, users do not need to re-enter the host and port settings.

- Select Access support. In the Repository settings, Access Server host and port can be specified. If Access is on the BAS, the IP address for the BAS should be used for the host. The default port for Access is 3006.
- Proceed to log into the VIA Client. The admin user may create a username and password for all other users. Default admin username = admin and password = admin7. To log in as an admin user, check the box for Login as Admin.

VIA Client Installation – Mac OS

- 1. Run the **VIA Client** installer (**VIACLientX.x.app**) on the user machine.
- 2. Follow the prompts, select the appropriate options, and click the **Next** button. Installation can take several minutes; a progress status is displayed along the left side of the installer window.
- 3. Make sure to check the box for the **License Agreement** and specify the **VIA Client** installation directory if default is not preferred.
- 4. Choose an installation folder. The default folder is /Applications/Bionano/VIA Client.



 Choose an alias (shortcut) folder. Several options are available to create a shortcut icon for VIA Client. If On the Desktop is selected a VIA Client shortcut will be created on the user's Mac desktop.



- 6. In the **Pre-Installation Summary** review the installation specifications and when ready to proceed click **Install**. A progress bar will be displayed showing the installation status.
- 7. Once installation is complete, click **Done** to quit the installer.
- 8. Launch **VIA Client** from the desktop shortcut.
- Specify host and port in VIA Client. Upon initially launching VIA Client at the VIA login window, go to Repository Settings. The following image shows typical settings for a local installation where the VIA Client software is installed on the same machine as VIA Server.

• • •	Repository		
Specify VIA Server host and port			
Host:	localhost		
Port:	8443		
	🗸 Use https		
Specify Access Server host and port			
	442		
Port:	Use https		
	Cancel OK		

Host can be either server name or IP. The default VIA Server https port = 8443 and http port = 8081. If using the https port, make sure to check the box for **Use https**.

Select **Access support**. In the repository settings, the **Access Server** host and port can be specified. If Access is on the BAS, the IP address for the BAS should be used for the host. The default port for Access is 3005.

NOTE: The repository settings will be saved after clicking **OK**. If these specifications are not altered on **VIA Server**, users do not need to re-enter the host and port settings.

10. Proceed to log into the VIA Client. The admin user may create a username and password for all other users. Default admin username = admin, and password = admin7. To log in as an admin user, check the box for Login as Admin. It is recommended that each site change the admin user password upon initial login to ensure security.

VIA Shutdown

To ensure that sample data and processing are not adversely affected, proper shut down of VIA is necessary. Prior to shutting down VIA, all users should be logged out of their **VIA Client**. The order of operation for properly shutting down VIA includes:

- 1. Shutdown VIA Processing
- 2. Shutdown VIA Server

When proper instructions are followed, **VIA Processing** will shut down without abruptly terminating a sample in the middle of processing. If a sample is in the middle of processing when the command to shutdown **VIA Processing** is executed, then **VIA Processing** will finish processing the sample prior to shutting down. If there are other samples in queue pending to be processed, then **VIA Processing** will continue processing after it is restarted. Abruptly shutting down **VIA Processing** through methods not outlined in this guide, such as end tasking the Java application or killing the service, may result in loss of data for samples in processing.

Before **VIA Server** can be shut down, make certain that all users are <u>not</u> logged into their **VIA Client**. Failure to check that all users are logged off may result in samples not being saved if in the middle of editing or may result in a corrupted sample.

Also, prior to shutting down **VIA Server**, confirm that **VIA Processing** is properly shut down. Shutting down **VIA Server** will immediately shutdown **VIA Processing**, which can result in loss of sample if in the middle of processing. Abruptly shutting down **VIA Server** through methods not outlined in this guide, such as end tasking the Java application or killing the service, may result in loss of data. When **VIA Server** is properly shut down, a check point will be created in the VIA Server database for faster indexing during VIA Server restart.

Shutdown VIA – Windows OS

- 1. Shutdown VIA Processing
 - i. Navigate to the **VIA Processing** install directory (default = c:\Program Files\Bionano\VIA Processing).
 - ii. Run the stopProcessing.exe file. To execute the file, right click on the file and select **Run as** administrator.
 - iii. Confirm VIA Processing has stopped. If VIA Processing is in the middle of processing a sample, it will finish processing the sample before it shuts down. Hence, please be patient if VIA Processing does not shut down immediately. To check if VIA Processing has stopped:
 - a. Open **Task Manager** and click on the **Processes** tab. Make sure **Show processes from all users** is checked off if this option is in the **Processes** tab.
 - b. Search for Java applications. Both VIA Server and Processing run on Java. If the Java application is running, right click on Java(TM) Platform SE binary, select Properties, and go to the General tab. The specified directory under Location will indicate the install directory.
 - c. When **VIA Processing** is shut down, the Java application from the **VIA Processing** install directory will not be displayed in the **Processes** tab.

- 2. Shutdown VIA Server
 - i. Navigate to the VIA Server install directory (default = /Program Files/Bionano/VIA Server).
 - ii. Run the stopserver file.
 - iii. Confirm VIA Server has stopped. There are two options to check if VIA Server has stopped:
 - a. Check that Java for **VIA Server** has stopped. Open **Task Manager** and click on the **Processes** tab. Search for Java applications. When **VIA Server** is shut down, the Java application from the VIA Server will not be displayed in the **Processes** tab.
 - b. Open a web browser and enter the address to the VIA license page (e.g., https://localhost:8081). If VIA Server is shut down, the VIA license page will not display on the browser.

Shutdown VIA – Linux OS

- 1. Shutdown VIA Processing.
 - i. Navigate to the VIA Processing install directory (default = root/Bionano/VIA Processing).
 - ii. Run the stopProcessing file.

~]# ./StopProcessing

iii. Confirm VIA Processing has stopped. If VIA Processing is in the middle of processing a sample, it will finish processing the sample before it shuts down. Hence, please be patient if VIA Processing does not shut down immediately. To check if VIA Processing has stopped, check that Java for VIA Processing has stopped.

~]# ps aux | grep java

2. Shutdown VIA Server.

- i. Navigate to the **VIA Server** install directory (default = root/Bionano/VIA server).
- ii. Run the stopserver file.

~]# ./StopServer

- iii. Confirm that **VIA Server** has stopped. There are two options to check if **VIA Server** has stopped:
 - a. Check that Java for VIA Server is shut down. ~]# ps aux | grep java
 - b. Open a web browser and enter the address to the VIA license page (e.g., https://localhost:8081). If VIA Server is shut down, the VIA license page will not display on the browser.

VIA Update Overview

This section is for updating the VIA system. The installation instructions are provided in the "Initial VIA Installation" section. Before updating the VIA Server, please note the following:

Make sure there is a backup of VIA before attempting an update to ensure that no data is lost in case something goes wrong during the installation process. Customers are responsible for having a backup system in place for VIA and we recommend an additional backup be created just prior to an update. At minimum, a copy of the **Storage** directory in the **VIA Server** install directory should be made prior to any update as well as the <code>license.nxc</code> and <code>lic.req</code> files (also in the **VIA Server** install directory).

VIA Update – Window OS

- 1. Properly shut down VIA as instructed in the "VIA System Shutdown" section.
- 2. Run **viAserver**Updatex.x.exe. Follow prompts selecting the appropriate options. Be mindful of the **VIA Server** installation directory and storage folder location. When **VIA Server** update is complete, click **Done** to quit the installer.
- 3. Unzip the VIAClientUpdate.zip file if performing VIA Client auto update.
- 4. Copy the contents in the zip file to the candidate folder in the VIA Server installation directory (default = C:\Program Files\Bionano\VIA Server\storage\resources\client_updates\candidate). The contents in the vIAClientUpdate.zip include a props file, readme.html, and another zip file with version and build in the name (eg. v7.0_16849.zip).
- 5. Run **VIAProcessing**Updatex.x.exe. Follow prompts selecting the appropriate options. Be mindful of the **VIA Processing** install directory. When **VIA Processing** update is complete, click **Done** to quit the installer.
- 6. Restart VIA Server and Processing.
- 7. Log into VIA Client as admin username and follow instructions for VIA Client auto update.
- 8. After the admin has updated the client, VIA will prompt all **VIA Clients** from other machines to update next time a user logs into the client.

VIA Update – Linux OS

- 1. Properly shut down VIA as instructed in the "VIA System Shutdown" section.
- 2. Run VIA server Update.bin. Provide executable file permissions if necessary.

~]# ./V VIAServerUpdateX.x.bin

Be mindful of the **VIA Server** installation directory. If the **VIA Server** installation directory is different from the default use "-DUSER_INSTALL_DIR=" command line parameter. For example,

~]# ./VIA\ Server\ Update.bin -DUSER_INSTALL_DIR="/home/Bionano/VIA\ Server"

- 3. Unzip the VIAClientUpdate.zip file if performing VIA Client auto update.
- 4. Copy the contents in the zip file to the candidate folder in the VIA Server installation directory (default = root/Bionano/VIA Server/storage/resources/client_updates/candidate). The contents in the vIAClientUpdate.zip include a props file, readme.html, and another zip file with version and build in the name (e.g., v7.0_16849.zip).
- 5. Run VIA Processing Update.bin. Provide executable file permissions if necessary.
 - ~]# ./ VIAProcessingUpdateX.x.bin

Be mindful of the **VIA Processing** installation directory because if it is different from the default, one must use "-DUSER_INSTALL_DIR=" command line parameter. For example,

~]# ./VIA\ Processing\ Update.bin -DUSER_INSTALL_DIR="/home/VIA\ Processing"

- 6. Restart VIA Server and Processing.
- 9. Log into VIA Client as admin username and follow instructions to update VIA Client.
- 10. After the admin has updated the client, VIA will prompt all **VIA Clients** from other machines to update next time a user logs into the client.

VIA Client Auto Update

VIA has a built-in system that checks for and alerts the VIA administrator of available **VIA Client** updates. Upon logging into **VIA Client**, an alert is displayed when software updates are available. During **VIA Server** update, contents in the **vIAClientUpdate.zip** may be placed in the **VIA Server** which will prompt the VIA administrator to initiate the update to **VIA Client** for all users. The VIA administrator must choose if and when to perform the update. **VIA Client** does not automatically update; it requires the administrator to initiate the update.

If **VIA Client** auto update is not preferred, then installation for a new version can be done for each **VIA Client**. The new version may be installed over the previously installed directory. Instructions for manual installation are outlined in the "VIA Client Installation" section of this guide.

For **VIA Client** auto update, instructions are provided below for admin and all users to follow when prompted by logging in. The VIA administrator must initiate the update for all users.

- When the VIA admin or user logs in, a notification to update for the new VIA Client version or build will appear. The VIA administrator (using admin username) must first update VIA Client before all other users. Admin update will prompt auto update notifications to all other clients. Failure to initiate the VIA Client update by the admin will result in other VIA Clients not receiving the notification to update.
- On the update notification window, a list of updated features is displayed along with options for the user to select. If VIA Server has been updated to a newer version or build, selecting to not proceed with an update to VIA Client may result in error messages or the inability to log into VIA Client.

- **Not now**: VIA Client will not update and will attempt to proceed with the user login with the current version of VIA Client. The update notification will appear again next time the user logs in.
- **Do not remind me again**: VIA Client will not update and will attempt to proceed with the user login with the current version of VIA Client. The update notification will not appear again.

Proceed: VIA Client will proceed with the update.

- 3. After clicking **Proceed**, **VIA Client** update will be downloaded to the user's computer. After download is complete, a prompt will show requesting the user restart the application to apply the updates. Close the window and restart **VIA Client**.
- 4. Once **VIA Client** is restarted, the updates are applied. Once the update is completed, click **OK** and restart **VIA Client**.
- 5. Finally, the VIA Client log in window should now appear. To check if VIA Client was successful go to the upper left corner of the window and click Help → About. The version and build for VIA Client will appear. If the update is confirmed, then log into VIA Client.

VIA Sample Importer Installation

The VIA **Sample Importer** is a command line utility that streamlines and automates sample loading and processing for VIA. It is required for uploading OGM samples from Access to VIA. For VIA software only installation, VIA **Sample Importer** is an optional component of VIA, which can be installed on Windows, Mac, or Linux OS.

VIA Sample Importer Installation – Windows OS

- 1. Run the VIA Sample Importer installer (vIASampleImporterX.x.exe) on the user machine.
- 2. Follow the prompts, select the appropriate options, and click the **Next** button. Installation can take several minutes; a progress status is displayed along the left side of the **Installer** window. Make sure to check the box for the **License Agreement**.
- 3. Specify the **VIA Sample Importer** installation directory if default is not preferred. The default install directory is c:\program Files\Bionano\VIASampleImporter.
- 4. Choose a shortcut folder. Several options are available to create a shortcut icon for **VIA Client**. If **On the Desktop** is selected, a **VIA Sample Importer** shortcut will be created on the user's Windows desktop.
- 5. In the **Pre-Installation Summary** review the installation specifications and, when ready to proceed, click **Install**. A progress bar will be displayed showing the installation status.
- 6. Once installation is complete, click **Done** to quit the installer.

VIA Sample Importer Installation – Mac OS

- 1. Run VIA Client installer (VIASampleImporterX.x.app) on the user machine.
- 2. Follow the prompts, select the appropriate options, and click the **Next** button. Installation can take several minutes; a progress status is displayed along the left side of the **Installer** window. Make sure to check the box for the **License Agreement**.
- 3. Choose an installation folder. The default folder is /Applications/Bionano/VIASampleImporter.
- Choose an alias (shortcut) folder. Several options are available to create a shortcut icon for VIA Sample Importer. If On the Desktop is selected a VIA Sample Importer shortcut will be created on the user's Mac desktop.
- 5. In the **Pre-Installation Summary** review the installation specifications and, when ready to proceed, click **Install**. A progress bar will be displayed showing the installation status.
- 6. Once installation is complete, click **Done** to quit the installer.

VIA Sample Importer Installation – Linux OS

- 1. Run **VIA Client installer** (vIAsampleImporterX.x.bin) on the user machine. Provide executable file permissions if necessary.
 - ~]# ./VIASampleImporterX.x.bin

If the installer is executed as root then the application will be installed as default in /root/Bionano/VIA sample Importer. If the installer is executed as the user then /Bionano/VIA sample Importer will be under user **Home**.

To install it at a non-default location use "-DUSER_INSTALL_DIR=" command line parameter. For example:

- ~]# ./VIASampleImporterX.x.bin -DUSER_INSTALL_DIR="/home/VIA Sample Importer"
- 2. Once the installer completes the installation, VIA **Sample Importer** is ready for use.

Nirvana Installation

Nirvana is a sequence variant annotator installed on the same machine as **VIA Processing**. Installation of the Nirvana application and annotation data provided by Bionano Support is necessary for VIA to properly function with Nirvana. Other versions of the Nirvana application not provided by Bionano are not supported in VIA.

Nirvana Installation – Windows OS

1. Run NirvanaBundle.exe installer file. The default installation folder is c:\Program Files\NirvanaBDI. To select a different install folder, click **Options.**



- 2. After the installer has finished installing Nirvana, click Close.
- 3. Unzip data zip files for each genome build (e.g., GRCh37) into the **Data** folder in the **Nirvana** install directory (default = C:\Program Files\NirvanaBDI\Data).
- 4. Configure VIA Processing to route Sequence Variants to Nirvana.
 - a. Open windows-processing.config file in the VIA Processing installation folder.
 - b. If different from default, edit the Nirvana install directory specified in the file.
 - c. Save the file as processing.config.
- 5. Restart VIA Processing. Only VIA Processing needs to be restarted, not VIA Server. Restarting VIA **Processing** will apply changes to the files in the installation directory.

Nirvana Installation – Linux OS

 Install EPEL. Nirvana installer is an *.rpm file that depends on the following system dependencies: lttngust, userspace-rcu, and libicu. Installing EPEL will install these system dependencies. The openssllibs version 1.0 is also required if it is not present on the base OS. Please download it manually using the following before installing EPEL.

~1# wget https://mirrors.sonic.net/centos/8-stream/AppStream/x86_64/os/Packages/compatopenss110-1.0.20-4.el8.x86_64.rpm

~]# yum install epel-release

2. Run NirvanaBDI-*.rpm installer file. The default installation folder is opt/NirvanaBDI. To install in a different directory, first **symlink** the default directory to the desired install directory and then run the installer.

~]# yum install NirvanaBDI-*.rpm

- Unzip data zip files for each genome build (e.g., GRCh37) into the Data directory in the Nirvana install directory (default = opt/NirvanaBDI/Data).
- 4. Configure VIA Processing to route Sequence Variants to Nirvana.

- a. Open Linux-processing.config file in the VIA Processing installation directory.
- b. If different from default, edit the Nirvana install directory specified in the file.
- c. Save the file as processing.config.
- 5. Restart VIA Processing. Only VIA Processing needs to be restarted, not VIA Server. Restarting VIA **Processing** will apply changes to the files in the installation directory.

Additional Installation Information

Alternate VIA Server Port

The default port is 8443 using secure communication (https) between VIA Server, VIA Processing Server and VIA Client. The default http port is 8081. If the preference is to use a port number different from the default, changes must be made to the Internal.lax file in the **VIA Server** and **VIA Processing** install directories.

Changes to the default port can be made after installation is complete, but before starting VIA. If changes are made after VIA is started, then VIA will need to be restarted for changes to become effective.

To change the port on the VIA Server:

- 1. Go to the VIA Server install directory.
- 2. Open the Internal.lax file with a text editor.
- 3. Search for lax.nl.java.option.additional and add -Djetty.port=8081 (replace 8081 with the port of choice). To change secure HTTP (https) add -Dhttps.port=8443 (replace 8443 with the port of choice).
- 4. Save the Internal.lax file.
- 5. Restart VIA Server.

To change the port for **VIA Processing**:

- 1. Go to **VIA Processing** installation directory.
- 2. Open the Internal.lax file with a text editor.
- 3. Find the arguments line that begins with <code>lax.command.line.args</code>. After the **VIA Server** host name is the port number. For example, in the line below, the VIA hostname is "localhost" and port "8443" (https).

lax.command.line.args=localhost 8443 proclog

- 4. Change the port number in this line. The default connection between VIA Server and Processing is https. To use http instead of https, add --http immediately before the server hostname in the command line arguments line. The line below shows an example of VIA Server localhost with http port 8081. lax.command.line.args=--http localhost 8443 proclog
- 5. Save the Internal.lax file.
- 6. Restart VIA Processing.

To change the port in VIA Client:

- 1. Launch the VIA Client application.
- 2. Go to Repository (upper left corner) and click on Settings.
- 3. Change port to VIA Server and click OK to save.

Specifying Server Host

In some situations, the server host or IP address may need to be changed after initial installation. If this is the case, then the new host name should be specified in VIA Processing and Client.

To change the server host name in VIA Processing:

- 1. Go to the **VIA Processing** installation directory.
- 2. Open the Internal.lax file with a text editor.
- 3. Find the arguments line that begins with lax.command.line.args. After the **VIA Server host name** is the port number. For example, in the line below, the VIA hostname is "localhost" and port "8443" (https).

lax.command.line.args=localhost 8443 proclog

- 4. Change the server host name or IP address.
- 5. Save the Internal.lax file.
- 6. Start VIA Processing (or restart if VIA Processing is running).

To change server host name in VIA Client:

- 1. Launch the VIA Client application.
- 2. Go to **Repository** (upper left corner) and click on **Settings**.
- 3. Change the VIA Server name or IP address in the Host field and click OK to save.

Alternate Storage Location

The storage folder is the directory where the VIA database (samples, regions, and annotations, etc.) is saved. For optimal performance, the storage folder should be on the same machine as **VIA Server**. However, in some situations, the storage folder may need to be moved to an alternate location. For Windows OS, changing the location can be done by editing the Internal.lax file in the **VIA Server** installation directory. For Linux OS, it is better to create a symbolic link from the storage directory in the installation directory to the alternate location.

To change the storage location in Windows OS:

- 1. Go to the VIA Server installation directory.
- 2. Open the internal.lax file with a text editor.
- 3. Find the line starting with lax.nl.java.option.additional= and add the option Dbd.nexus.storage.basePath to the end of the line and add the folder path. See the example below for an alternate storage folder called altstorage in **D Drive**: Windows OS = -Dbd.nexus.storage.basePath="D:\\mount\\VIA\\altstorage"
- 4. Save the file and restart VIA Server.

To change the storage location in Linux OS:

- Mount a drive. Use the mount command with flag -t for type device directory where type can be ntfs, ext or fat. USB devices are usually vfat. Example command to mount ntfs: mount -t ntfs /dev/sda1 /mnt/d
- 2. Create a symbolic link to the storage directory on the mounted drive by running this command: ln -s /root/Bionano/VIA\ Server /mnt/d

Adjusting RAM Allocation

By default, VIA Server and VIA Processing are allocated 4g of RAM. VIA Client allocates half the available system RAM to the application. Depending on the types of samples processed by VIA, the amount of RAM allocated to each application may be adjusted.

- 1. Go to either the **VIA Server** or **VIA Processing** installation directory and open the *internal.lax* file with a text editor. For changes to VIA Client, go to the installation directory and open the *vIA* Client.lax file.
- 2. Go to the line starting with lax.nl.java.option.additional= and find -xmx.
- Change the value to specify the RAM allocated followed by g to indicate gigabytes. Below is an example for 12 gigabytes of RAM:

lax.nl.java.option.additional=-Xms512m -Xmx12g

4. Save the file and restart the application.

Database Contents

The VIA admin will set up and maintain the system, permitting specific functions, user accounts, and access to specific features, and will create the **Sample Types** and regions files as well as the decision tree scripts for the logic used within the lab's review process. The installer comes with "seed data" so that the admin can customize to individual lab needs. Seed data includes data types and sample processing settings for the data types, including several up-to-date tracks from ClinGen (prenatal, postnatal, and dosage sensitive map), OMIM, DECIPHER Syndromes, RefSeq, and additional **Sample Types** and regions can be added. Please refer to the *Bionano VIA Software User Guide* (CG-00043) and/or contact Bionano Support for details.

Technical Assistance

For technical assistance, contact Bionano Genomics Technical Support.

ТҮРЕ	CONTACT
Email	support@bionano.com
Phone	Hours of Operation: Monday through Friday, 9:00 a.m. to 5:00 p.m., PST US: +1 (858) 888-7663 Monday through Friday, 9:00 a.m. to 5:00 p.m., CET UK: +44 115 654 8660 France: +33 5 37 10 00 77 Belgium: +32 10 39 71 00
Website	www.bionano.com/support
Address	Bionano, Inc. 9540 Towne Centre Drive, Suite 100 San Diego, CA 92121

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.

Legal Notice

For Research Use Only. Not for use in diagnostic procedures.

This material is protected by United States Copyright Law and International Treaties. Unauthorized use of this material is prohibited. No part of the publication may be copied, reproduced, distributed, translated, reverseengineered or transmitted in any form or by any media, or by any means, whether now known or unknown, without the express prior permission in writing from Bionano Genomics, Inc. Copying, under the law, includes translating into another language or format. The technical data contained herein is intended for ultimate destinations permitted by U.S. law. Diversion contrary to U. S. law prohibited. This publication represents the latest information available at the time of release. Due to continuous efforts to improve the product, technical changes may occur that are not reflected in this document. Bionano Genomics, Inc. reserves the right to make changes in specifications and other information contained in this publication at any time and without prior notice. Please contact Bionano Genomics, Inc. Customer Support for the latest information.

BIONANO GENOMICS, INC. DISCLAIMS ALL WARRANTIES WITH RESPECT TO THIS DOCUMENT, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THOSE OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TO THE FULLEST EXTENT ALLOWED BY LAW, IN NO EVENT SHALL BIONANO GENOMICS, INC. BE LIABLE, WHETHER IN CONTRACT, TORT, WARRANTY, OR UNDER ANY STATUTE OR ON ANY OTHER BASIS FOR SPECIAL, INCIDENTAL, INDIRECT, PUNITIVE, MULTIPLE OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING FROM THIS DOCUMENT, INCLUDING BUT NOT LIMITED TO THE USE THEREOF, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BIONANO GENOMICS, INC. IS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Patents

Products of Bionano Genomics[®] may be covered by one or more U.S. or foreign patents.

Trademarks

The Bionano logo and names of Bionano products or services are registered trademarks or trademarks owned by Bionano Genomics, Inc. ("Bionano") in the United States and certain other countries.

Bionano[™], Bionano Genomics[®],Bionano Access[™], and VIA[™] are trademarks of Bionano Genomics, Inc. All other trademarks are the sole property of their respective owners.

No license to use any trademarks of Bionano is given or implied. Users are not permitted to use these trademarks without the prior written consent of Bionano. The use of these trademarks or any other materials, except as permitted herein, is expressly prohibited and may be in violation of federal or other applicable laws.

© Copyright 2024 Bionano Genomics, Inc. All rights reserved.