How to enable HTTPS in Bionano Access®

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Introduction

The Saphyr System consists of several components including the Saphyr Instrument, Instrument Controller, Bionano Access® Server, and Saphyr and Bionano Compute Servers. Together this system provides rapid, high-throughput, long-range genome mapping for de novo assembly of genome maps, hybrid scaffolding of NGS, and structural variation analysis. Data is exchanged between the system components to perform these functions. The Bionano Access web server acts as the hub at the center of most data exchanges. By default communication with the web server is HTTP. This guide provides instruction to upgrade communication with the web server to HTTPS. HTTPS encrypts the requests and responses going back and forth to the web server providing a more secure solution. We cannot provide HTTPS by default, because enabling SSL requires interaction with a third party certificate authority and the certificate issued is specific to the customer network domain.

Compatibility

HTTPS is required to initiate a remote support session on the Bionano Access Server through Bionano Access as of version 1.6.

Prerequisites

Assign Bionano Access Server a dedicated IP address and generate the Certificated Signing Request (RSA keys) on the server. Please refer to 30251 Saphyr Networking Bionano Access and Compute Setup Guide for more details.

How to enable HTTPS using a valid SSL certificate

Please follow the instructions below to enable HTTPS communication by using a valid SSL certificate from the third party.

1. Acquire and install a valid SSL certificate from a third party. Users must do it on their own.
   - 1.1 Get WHOIS record updated (it needs to show the correct company name and address), etc. You can check the WHOIS record for your domain name here.
   - 1.2 Submit the CSR and other info to the Certificate Authority.
   - 1.3 Have your domain and company validated
   - 1.4 Receive the issued certificate (key.pem and cert.pem).
2. Copy key.pem and cert.pem files to the /home/bionano/access/web/Server directory.
3. Add the https argument and restart your web server with https in the command line like this:

node --max-old-space-size=32768 server access https

Note: If you are using the Linux service, the command line used will be in the /home/bionano/access/web/Server/StartAccess.sh file.

4. When the web server starts in https mode the port used will typically increment by 1. So if the web server was configured to use port 3005 and you enable https, the port will change to 3006.
5. Update Data Server Configuration in ICS.
   1) Click **Connection** icon on the main screen.
   2) Click **Data Service Configuration**.
   3) Type IP address of Bionano Access Server in the field of **Name**.
   4) Type port (by default, it is 3005) in the field of **Port**.
   5) Check the box of **Secure**.
   6) Click **Apply**.

How to enable HTTPS using a self-signed SSL certificate

Please follow the instructions below to enable HTTPS communication if you use a self-signed SSL certificate.

1. Acquire and install a Self-signed SSL certificate.

   1.1 Install openssl.

   sudo yum openssl

   1.2 Create Self-signed SSL certificate.

   openssl req -newkey rsa:4096 -x509 -sha256 -days 3650 -nodes -out cert.pem -keyout key.pem

   Once you hit Enter, the command will generate the private key and ask you a series of questions that it will use to generate the certificate.

   Here is an example of the output and the words in bold are the typed information:

   Generating a 4096 bit RSA private key
   .....++
   .....++
   writing new private key to 'key.pem'

   You are about to be asked to enter information that will be incorporated
   into your certificate request.
   What you are about to enter is what is called a Distinguished Name or a DN.
   There are quite a few fields but you can leave some blank

For some fields there will be a default value,
If you enter '.', the field will be left blank.

Country Name (2 letter code) [XX]:US
State or Province Name (full name) []:California
Locality Name (eg, city) [Default City]:San diego
Organization Name (eg, company) [Default Company Ltd]:Bionano Genomics
Organizational Unit Name (eg, section) []:Support
Common Name (eg, your name or your server's hostname) []:support
Email Address []:support@bionanogenomics.com

2 Copy key.pem and cert.pem files to the /home/bionano/access/web/Server directory.

3 Add the https argument and restart your web server with https in the command line like this:

node --max-old-space-size=32768 server access https

Note: If you are using the Linux service, the command line used will be in the /home/bionano/access/web/Server/StartAccess.sh file.

4 When the web server starts in https mode the port used will typically increment by 1. So if the web server was configured to use port 3005 and you enable https, the port will change to 3006.

5 Update Data Server Configuration in ICS.

7) Click **Connection** icon on the main screen.

8) Click **Data Service Configuration**.

9) Type IP address of Bionano Access Server in the field of **Name**.

10) Type port (by default, it is 3005) in the field of **Port**.

11) Check the box of **Secure**.

12) Click **Apply**.

Technical Assistance

For technical assistance, contact Bionano Genomics 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.

Type	Contact
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