

# Illumina DRAGEN Server v3

## Site Prep and Installation Guide

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## Introduction

This guide provides instructions for setting up the Illumina® DRAGEN™ Server, including preparing your site for installation and operation. You can use the following specifications and guidelines included to prepare your facility:

- ▶ Space requirements
- ▶ Electrical requirements
- ▶ Environmental considerations
- ▶ Computing requirements
- ▶ Network considerations

## Safety Considerations

See the *DRAGEN Bio-IT Platform Safety and Compliance Guide (document # 1000000096716)* for important information about safety considerations.

## Additional Resources

The [DRAGEN Bio-IT Platform support pages](#) on the Illumina website provide additional system resources. These resources include software, training, compatible products, and the following documentation. Always check support pages for the latest versions.

Resource	Description
<i>DRAGEN Bio-IT Platform Safety and Compliance Guide (document # 1000000096716)</i>	Provides information about operational safety considerations, compliance statements, and labeling.
<i>Illumina DRAGEN Bio-IT Platform User Guide (document # 1000000070494)</i>	Provides an overview of the platform and associated procedures. Instructions for use, maintenance, and troubleshooting procedures are included.

## Delivery and Setup

The DRAGEN Server v3 is unpacked and installed by the customer. The space must be ready before delivery.

## Box Dimensions

Use the following dimensions to determine transport, setup, and storage plans.

Measurement	Dimension
Height	41.0 cm (16.0 in)
Width	85.1 cm (33.5 in)
Depth	62.2 cm (24.5 in)
Weight	33.1 kg (73 lb)

## Shipping Box Components

The DRAGEN Server v3 and components are shipped in one box. The following components are included:

- ▶ Power cord, country-specific

- ▶ DRAGEN License USB key
- ▶ Rack mount rails
- ▶ Rack mount screws

## Facility Requirements

Use the specifications and requirements provided in this section to set up your lab space.

## Equipment Dimensions

Measurement	Dimension
Height	8.8 cm (3.5 in)
Width	47.8 cm (19 in)
Depth	49.32 cm (19.4 in)
Weight	16.10 kg (35 lbs)

## Placement Requirements

Position the DRAGEN Server v3 to allow proper ventilation, access to one power outlet, and access for servicing.

- ▶ Allow a rack height of at least 2U.
- ▶ Make sure that there is one standard pocket outlet within 10 ft (3 m) of the server.
- ▶ Position the instrument so personnel can quickly disconnect the power cords from the outlets.

## Electrical Requirements

### Power Specifications

Power	Specification
Power Supply Rating	1574 Watts at 100%. Maximum power draw under load 800 W
Input Voltage	100–240 V AC at 50/60 Hz, autoranging

## Receptacles

Your facility must be wired with the following receptacles:

- ▶ For 100–110 Volts AC—Two 10 amp grounded, dedicated lines with proper voltage and electrical ground.
- ▶ For 220–240 Volts AC—Two 6 amp grounded lines with proper voltage and electrical ground.
- ▶ North America and Japan—NEMA 5-15.
- ▶ If the voltage fluctuates more than 10%, power line regulators are required.

## Protective Earth



The has a connection to protective earth through the enclosure. The safety ground on the power cord returns protective earth to a safe reference. The protective earth connection on the power cord must be in good working condition when using this device.

## Power Cords

The DRAGEN Server v3 has international standard IEC 60320 C13 receptacles and is shipped with one region/country-specific power cords.

Hazardous voltages are removed from the DRAGEN Server v3 only when the power cords are disconnected from the AC power source.

To obtain equivalent receptacles or power cords that comply with local standards, consult a third-party supplier such as Interpower Corporation ([www.interpower.com](http://www.interpower.com)).



### CAUTION

Never use an extension cord to connect the DRAGEN Server v3 to a power supply.

## Fuses

The DRAGEN Server v3 contains no user-replaceable fuses.

## Environmental Considerations

The following table specifies temperature, humidity, and other environmental considerations for safely housing the instrument.

Element	Specification
Temperature	Maintain a server room temperature of 0°C to 40°C. This temperature is the operating temperature of the DRAGEN Server v3. Do not allow the ambient temperature to vary by more than $\pm 2^\circ\text{C}$ .
Humidity	Maintain a noncondensing relative humidity between 10–95%.
Altitude	Locate the DRAGEN Server v3 at an altitude below 2,000 meters (6,500 ft).
Air Quality	Operate the server in a data center environment with air filtration per ISO 14644-1 Class 8 with a 95% upper confidence limit.
Ventilation	Consult your facilities department for ventilation requirements sufficient for the level of heat output expected from the DRAGEN Server v3.
Location	Operate the server in an indoor environment only. The server is not suitable for use in locations where children are likely to be present.

## Heat Output

Measured Power	Thermal Output
1100 Watts	4100 BTU/hr

## Noise Output

A measurement of  $\leq 70$  dB is within the level of a normal conversation at a distance of approximately 1 meter (3.3 feet).

Acoustical Performance	Noise Output (dB)
Idle at 25°C Ambient	36
Max. Loading at 35°C Ambient	<75

## Uninterruptible Power Supply

Illumina recommends using a user-supplied uninterruptible power supply (UPS).

Illumina is not responsible for data loss caused by interrupted power, regardless of whether the DRAGEN Server v3 is connected to a UPS. Standard generator-backed power is often not uninterruptible, so a brief power outage occurs before power resumes. This power outage interrupts analysis and data transfer.

The following table shows three example recommended UPS models for the DRAGEN Server v3.

**Table 1 Region-Specific UPS Recommendations**

Specification	Japan APC Model # SMX1500RMJ2U	North America APC Model # SMX1500RM2UNC	International APC Model # SMX1500RMI2UNC
Maximum Output Capacity	1200 W 1500 VA	1200 W 1440 VA	1200 W 1500 VA
Input Voltage (Nominal)	100 VAC	120 VAC	230 VAC
Input Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Input Connection	NEMA 5–15P	NEMA 5–15P	IEC-320 C14 Schuko CEE7/EU1-16P British BS1363A
Built-In UPS Output Receptacles	Six NEMA 5—15 R (battery backup)	Eight NEMA 5–15R (battery backup)	Eight IEC 320 C13 (battery backup)
Dimensions	8.9 cm × 43.2 cm × 46.8 cm	8.9 cm × 43.1 cm × 49.0 cm (3.5 in × 17.0 in × 19.3 in)	8.9 cm × 43.2 cm × 49.0 cm
Weight	27.8 kg	24.8 kg (54.6 lb)	24.8 kg
Typical Run Time (at 500 Watt Average Draw)	19.5 minutes	22.9 minutes	22.9 minutes

## Network Considerations

Before running tests, make sure that your network contains the required components and meets the network connection recommendations.

DRAGEN Server v3 setup requires the following network components:

- ▶ Default gateway address
- ▶ DNS Server IP address
- ▶ IP addresses (2)
- ▶ Subnet mask for the IP addresses

The following operations require an external internet connection using TCP on ports 80 and 443:

- ▶ Updating the software
- ▶ Remote assistance from Illumina Technical Support
- ▶ Access to license server

## Network Connections

Use the following recommendations to install and configure a network connection:

- ▶ Recommended bandwidth for a connection is as follows.
  - ▶ 10 Gb per second connection to storage.
- ▶ Switches and other network equipment must have a minimum of 10 Gb per second.
  - ▶ Calculate the total capacity of the workload on each network switch. The number of connected instruments and ancillary equipment, such as a printer, can impact capacity.
- ▶ For 10 Gb connections, SFP+ and RJ45 connections are supported. If using SFP+ ports, twinax cables or SFP+ transceivers are required. Validated transceivers include Intel and Finisar.
- ▶ Ask your IT professional to review network maintenance activities for potential compatibility risks with the system.

## Third-Party Software

DRAGEN Server v3 does not support software beyond what is provided at installation. Do not install any software that was not provided with the DRAGEN Bio-IT Platform. Third-party software is untested and can interfere with performance and security.

## User Behavior

The DRAGEN Server v3 is designed to analyze sequencing data. Do not consider it a general-purpose computer. For quality and security reasons, do not use the computer for web browsing, checking email, reviewing documents, or other unnecessary activity. These activities can result in degraded performance or loss of data.

## Security and Safety

The DRAGEN Server v3 is designed to resist attacks. Supplement this design with the following security recommendations:

- ▶ A secure internal LAN to prevent the distribution of data to all web browsers.
- ▶ Limited access to the DRAGEN Server v3 to prevent the removal of the RAID controller, disk drives, and access to data. Booting in single-user mode allows access to the whole system.

## Antivirus Software

Illumina does not recommend running any virus scanners on the DRAGEN Server v3. Virus scanners often impact the performance of High-Performance Computing (HPC) systems.

## Restricted Ports and Authentication

<b>Outbound Connections</b>	lus.edicogenome.com port 80
<b>Inbound Connections</b>	SSH: TCP port 22

## Stack Overflow Protection

Modern processors disable coded execution in data sections of the program to address stack overflow attacks. By default, this feature is enabled.



## Set Up the DRAGEN Server

This section provides information on installing the DRAGEN Server v3. Before beginning, make sure that you have all the components and your facility meets the necessary requirements. For more information, see [Shipping Box Components on page 1](#) and [Facility Requirements on page 2](#).

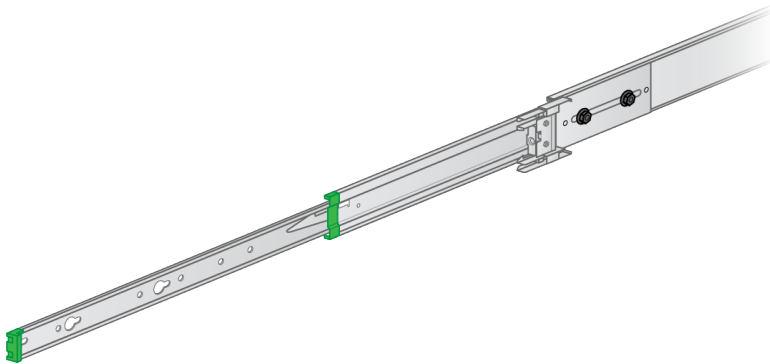
The following components are **not included** with the DRAGEN Server v3 and required to set up the sever:

- ▶ Monitor with a HDMI input
- ▶ HDMI cable
- ▶ Keyboard with a USB input
- ▶ Mouse with a USB input
- ▶ Two USB cables

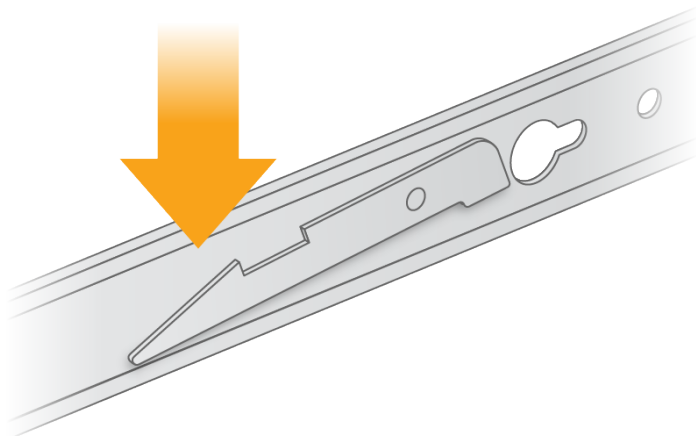
## Install the Server Racks

Use the following instructions to mount the DRAGEN Server v3 to your server rack.

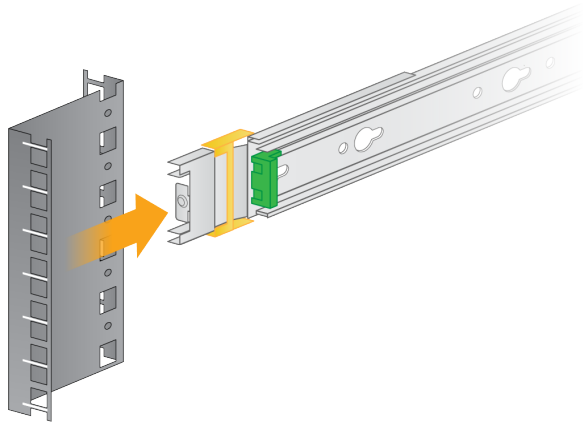
- 1 Pull the mounting bracket rail out from the rail assembly until you reach the safety lock.



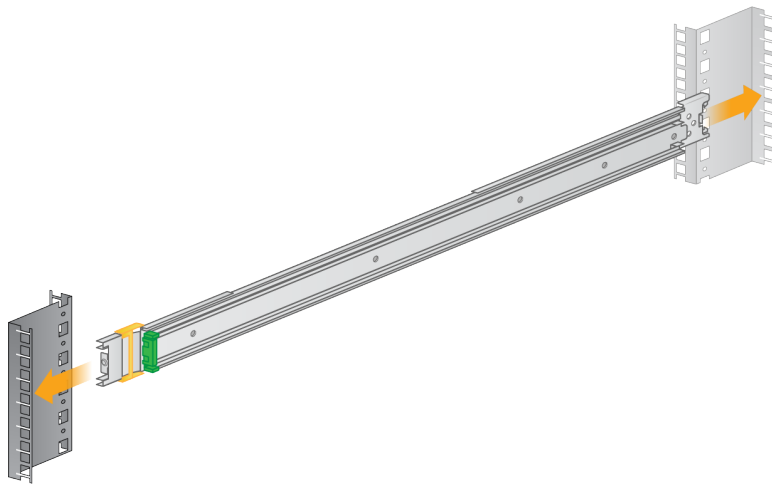
- 2 Press the safety lock trigger down, and then remove the mounting bracket rail from the rail assembly.



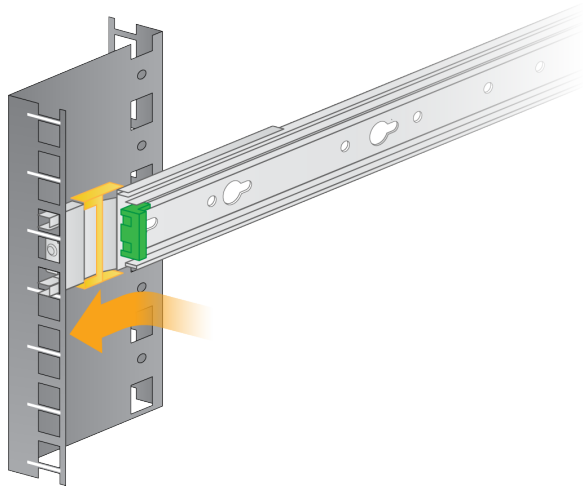
- 3 Release the sliding lock on both ends of the rail assembly.



- 4 Extend the slide rail out from the rail assembly.
- 5 Insert the rail assembly end that was not extended into the server rack brackets. An audible click indicates that the rail assembly is in place.

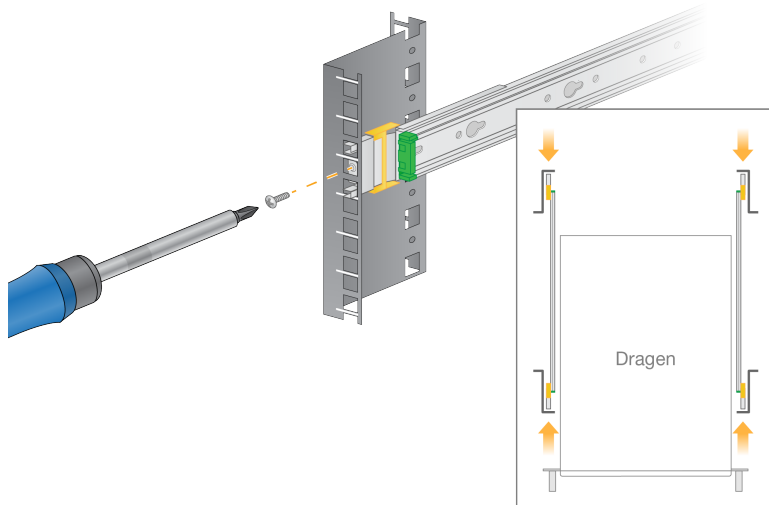


- 6 Push the rail assembly forward to secure.
- 7 Insert the other end of the rail assembly into the server rack brackets. An audible click indicates that the rail assembly is in place.
- 8 Push the sliding locks forward to secure.



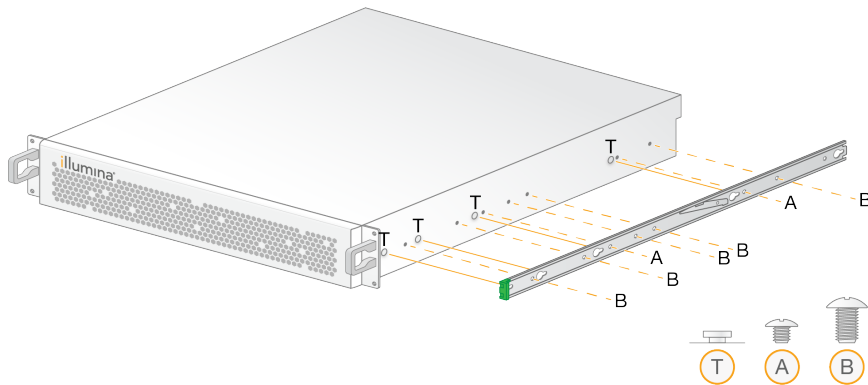
9 Install the other rail assembly.

10 Insert screws into each rail assembly to secure the rail assembly to the mounting bracket.



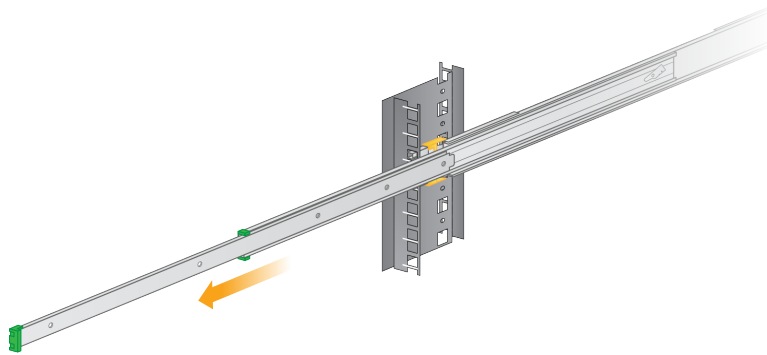
11 Position the mounting bracket so the green edge is located at the front of the server.

12 Line up the threaded holes on the server with the corresponding holes on the mounting bracket.

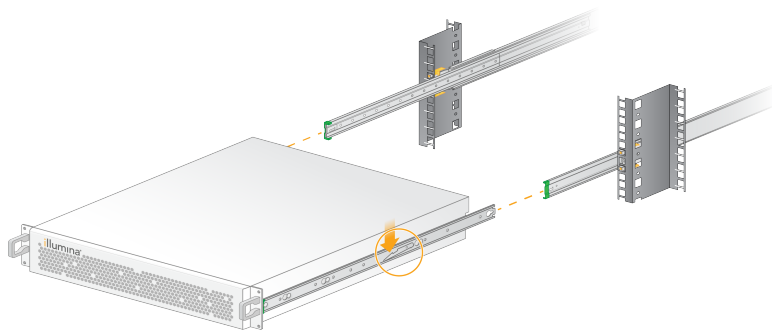


13 Insert the screws.

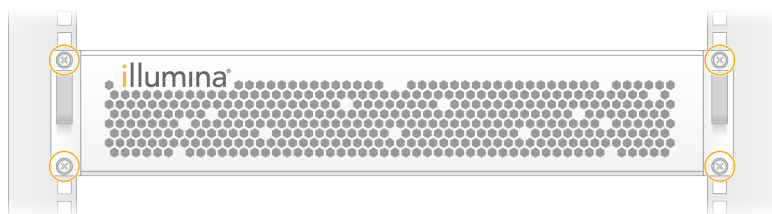
- 14 Make sure that all screws are fully seated.
- 15 Extend the slide rails out from the rail assembly.



- 16 Facing the front of the rack, lift the server between the slide rails.
- 17 Slide the mounting brackets into the slide rails until you reach the safety locks.

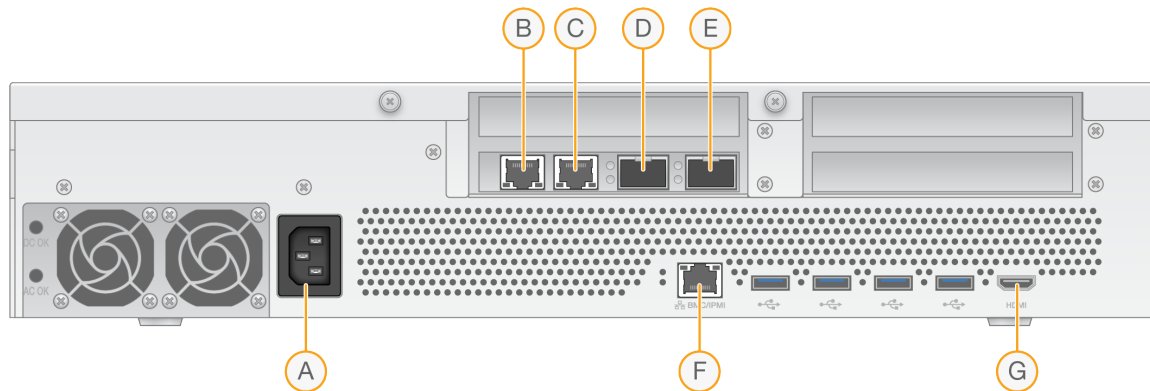


- 18 Press both safety lock triggers down simultaneously.
- 19 Slide the server forward until it rests against the server rack.
- 20 Insert the required cables. See [Insert Server Cables on page 9](#).
- 21 Insert screws into each corner of the server to secure the server to the mounting bracket.



## Insert Server Cables

The following figure indicates the port location for each cable required when installing the DRAGEN Server v3.

**Figure 1** Rear of DRAGEN Server v3

- A Power supply inlet
- B RJ45 10 GB Port 2
- C RJ45 10 GB Port 1
- D 10 GB SFP+ Port 2
- E 10 GB SFP+ Port 1
- F BMC
- G HDMI Port (monitor)

## Install the DRAGEN Server v3 License

You can activate the DRAGEN Server v3 by installing the USB license key as follows. You must activate the server before proceeding.

- 1 Connect the power supply to the AC inlet, and then to a wall outlet.
- 2 Locate the USB license key in the delivery box.
- 3 Plug the USB license key into any USB port on the back of the server.
- 4 Connect the power cord to the power supply inlet, and then to the wall outlet. The server powers on automatically.
- 5 Connect your monitor to the DRAGEN Server v3 using the HDMI port.
- 6 Connect your keyboard to the DRAGEN Server v3 using any unoccupied USB port.

## Configure BMC

You can connect to the Baseboard Management Controller (BMC) to provide remote monitoring and control for Illumina Technical Support.

- 1 Log in as root.
- 2 Enter the root password provided in the DRAGEN welcome email. If you have not received your sign in credentials, contact Illumina Customer Service.
- 3 If signing in for the first time, reset your password. Passwords must contain at least 10 alphanumeric characters and two special characters.

- 4 To use a static IP address, do as follows.
  - a Enter the following command:  
`ipmitool lan set 1 ipsrc static`
  - b To set the IP address, enter:  
`ipmitool lan set 1 ipaddr <IP address>`
  - c To set the netmask, enter:  
`ipmitool lan set 1 netmask <netmask ID>`
  - d To set the default gateway, enter:  
`ipmitool lan set 1 defgw ipaddr <gateway ID>`
- 5 Enter the IP address into the web browser. You can sign in as an admin using the password printed on the back of the DRAGEN Server v3.

## Configure the Server Network

Using the Network Manager Text User Interface (NMTUI), you can configure the IP address, gateway, DNS server, and additional options for your connection.

- 1 Enter the user name and password information included in your Welcome email.
- 2 Enter:  
`nmtui`
- 3 Use your keyboard to navigate the NMTUI.
- 4 Select **Activate a connection** to view your active Ethernet connection.  
 The active Ethernet connection shows an asterisk in front of the connection name.
- 5 Select **Back**.
- 6 Select **Edit a connection**.
- 7 Navigate to your active connection, and then select **Edit**.
- 8 Select **Show** next to IPv4 Configuration or IPv6 Configuration.
- 9 Select **Automatic** to choose one of the following IP configurations:
  - ▶ To remove the IP configuration, select **Disabled**.
  - ▶ To automatically obtain your IP address from DHCP, select **Automatic**.
  - ▶ To manually set your IP address, select **Manual**.
- 10 Set the following network settings:
  - ▶ IP address and subnet mask
  - ▶ Gateway
  - ▶ DNS server
  - ▶ **[Optional]** Search domain
- 11 **[Optional]** Select additional routing settings depending on your routing configuration.
- 12 Select how users can access the connection.
  - ▶ **Automatically connection**—The connection acts as the default connection for all users.
  - ▶ **Available to all users**—All users can access this connection. Disabling this option removes the connection from the list of available connections for users.
- 13 Select **OK**.

## Set Server Time

### Set Server Time to Local Time Zone

- 1 Log in as root.
- 2 Check if the current server time reflects the local time zone using the `date` command. Enter:  
`date`
- 3 Check for a nearby city with the correct time zone using the `timedatectl list-timezones` command.  
For example, use the following command to find time zones in Asia:  
`timedatectl list-timezones | grep Asia`
- 4 Change the server time to local time using the `timedatectl set-timezone` command.  
Example:  
`timedatectl set-timezone Asia/Singapore`
- 5 To make sure that the server time has changed, enter:  
`date`  
`ls -l /etc/localtime`

### Synchronize Server Time to NTP Server

- 1 Log in as root.
- 2 Check if chrony daemon is running. Enter:  
`systemctl enable chronyd`
- 3 If the result from the previous command shows inactive or dead, enable the chrony daemon. Enter:  
`systemctl enable chronyd`
- 4 To start the daemon, enter:  
`systemctl start chronyd`
- 5 Edit `/etc/chrony.conf` using `vi`. Enter:  
`vi /etc/chrony.conf`
- 6 Replace the default NTP server settings to the local NTP server.  
Example:  
`<original default settings>`  
`server 0.centos.pool.ntp.org iburst`  
`server 1.centos.pool.ntp.org iburst`  
`server 2.centos.pool.ntp.org iburst`  
`server 3.centos.pool.ntp.org iburst`  
`<settings to use local NTP server/s>`  
`server 192.168.1.1 iburst`  
`server 192.168.1.2 iburst`
- 7 To save the file, enter:

```
:wq!
```

- 8 To restart the chrony daemon, enter:
 

```
systemctl restart chronyd
```
- 9 Check the health of the local time server. Enter:
 

```
timedatectl
```
- 10 Make sure that DRAGEN can synchronize with the local NTP server using the `ntpdate` command.
 Example:
 

```
ntpdate -q 192.168.1.1
```

## Configure External Storage

The DRAGEN Server v3 storage uses PCIe NVMe: Micron 9300 max series 6.4TB NVMe U.2 SSD and SATA III SSD: Transcend 2.5" 256GB SATAIII SSD. Use the instructions in this section to mount an external storage server.

### Mount NFS on DRAGEN Server

- 1 Locate your NFS server and share name.
 Example:
  - ▶ Server: `192.168.100.100`
  - ▶ Share name: `/share`
- 2 Use `server:/share name` for the mount location.
 Example:
 

```
192.168.100.100:/share.
```
- 3 To map this share to `/mnt` on the DRAGEN Server v3, run the following command as root on your system:
 

```
mount -t nfs 192.168.100.100:/share /mnt
```
- 4 Share is mounted at `192.168.100.100:/share` to the local file system under `/mnt`.

### Mount SMB/CIFS on DRAGEN Server

- 1 Locate your SMB/CIFS server and share name.
 Example:
  - ▶ Server: `192.168.100.100`
  - ▶ Share name: `/share`
- 2 Locate the user name and password required to access this share (if applicable).
 Example:
  - ▶ User name: `sbsuser`
  - ▶ Password: `sbs123`
- 3 Use `//server/share name` as the mount location.
 Example:
 

```
//192.168.100.100/share.
```
- 4 To map this share to `/mnt` on the DRAGEN Server v3, run the following command as root on your local system:



```
mount -t cifs -o user=sbsuser //192.168.100.100/share /mnt
```

- 5 Enter password when prompted.
- 6 Share is mounted at `//192.168.100.100/share` to the local file system under `/mnt`.

## Add NFS or SMB mount to `/etc/fstab`

- 1 Add the network share to `/etc/fstab` so that the mount is permanent across reboots. Using the previous examples in *Mount NFS on DRAGEN Server on page 13* and *Mount SMB/CIFS on DRAGEN Server on page 13*, the following is an example basic entry for a NFS or SMB mount:

NFS:

```
192.168.100.100:/share /mnt nfs rsize=8192,wsiz=8192 0 0
```

SMB:

```
//192.168.100.100/share /mnt cifs user=sbsuser,pass=sbs123 0 0
```

## Activate DRAGEN Software License

The DRAGEN Server v3 ships with temporary short-term software licenses. The license activation process differs depending on whether the server is connected to the internet or is offline. Root/sudo access is required to run the commands below. For assistance with the various command line options, email Illumina Technical Support at [techsupport@illumina.com](mailto:techsupport@illumina.com). Use the following instructions to activate your licenses.

### Online Servers

For servers connected to the internet, activate your DRAGEN Software license as follows.

- 1 Test and confirm that the server is connected to the internet.

Example:

```
▶ ping www.illumina.com
```

- 2 To activate the license, enter:

```
/opt/edico/bin/dragen_lic -i auto
```

- 3 Confirm that the license has been updated. Enter:

```
/opt/edico/bin/dragen_lic
```

### Offline Servers

For servers not connected to the internet, Illumina Customer Service provides the necessary license files to activate the license on the server locally. If you have not received these license files, email Illumina Customer Service at [customerservice@illumina.com](mailto:customerservice@illumina.com).

After you have the necessary license files, activate your DRAGEN Software license as follows.

- 1 Copy the license files to the server.

- 2 Run the following commands:

```
sudo rm /var/lib/edico/*.gbin
```

```
sudo /opt/edico/bin/dragen_lic -i license_genome.bin
```

```
sudo /opt/edico/bin/dragen_lic -i license_somatic.bin
```

```
sudo /opt/edico/bin/dragen_lic -i license_cnv.bin
```

```
sudo /opt/edico/bin/dragen_lic -P license.dat
```

3 Confirm that the license has been updated. Enter:

```
/opt/edico/bin/dragen_lic
```

## Running the System Check

After turning on the server, make sure that your DRAGEN Server v3 is functioning properly by running the following self-test script:

```
/opt/edico/self_test/self_test.sh
```

The self-test script performs the following actions:

- ▶ Automatically indexes chromosome M from the hg19 reference genome.
- ▶ Loads the reference genome and index.
- ▶ Maps and aligns a set of reads.
- ▶ Saves the aligned reads in a BAM file.
- ▶ Asserts that the alignments exactly match the expected results.

Each server ships with the test input FASTQ data for this script, which is located in `/opt/edico/self_test`. The system check takes approximately 25–30 minutes.

The following example shows how to run the script and the output from a successful test.

```
[root@edico2 ~]# /opt/edico/self_test/self_test.sh
-----
test hash creating
test hash created
-----
reference loading /opt/edico/self_test/ref_data/chrM/hg19_chrM
reference loaded
-----
real0m0.640s
user0m0.047s not properly paired and unmapped input records percentages:
  PASS
-----
md5sum check dbam sorted: PASS
-----
SELF TEST COMPLETED
SELF TEST RESULT : PASS
```

If the output BAM file does not match the expected results, then the last line of the previous text displays the following text:

```
SELF TEST RESULT : FAIL
```

If you receive a `FAIL` result after running the test script immediately after turning on your DRAGEN Server v3, contact Illumina Technical Support.

## Install the DRAGEN Software

If you are already running the latest version of the software, see the *Illumina DRAGEN Bio-IT Platform User Guide (document # 1000000070494)* for information on running system checks and self-tests.

- 1 Use the following commands to query the current version of the DRAGEN software and server.
  - ▶ To view the current version of only the Local Analysis Software, enter the following command:
 

```
dragen --version
```
  - ▶ To view the current versions of both the Local Analysis Software and hardware, enter the following command:
 

```
dragen_info -b
```
- 2 Download the software package from the [DRAGEN Bio-IT Platform support page](#).
- 3 Enter the following command to use the self-extracting .run file:
 

```
sudo sh dragen-3.3.7.e17.x86_64.run
```
- 4 If prompted to switch to a new hardware version, enter `y`.



### CAUTION

If the hardware upgrade process is interrupted, perform the software install steps again. If the DRAGEN Software is not functional after the second install attempt, contact Illumina Technical Support.

- 5 Use the following halt command to power the server off and on:  
A reboot command does not update the hardware version.
 

```
sudo ipmitool chassis power cycle
```

## Access the Server Remotely

To access your DRAGEN Server v3 from a remote location, you must set your firewall zone to public and allow root log in from SSH connections.



### CAUTION

Configuring remote access allows any device on the network to access your server and exposes your server to security risks.

## Set Firewall Zone

By default, the firewall is enabled and blocks all incoming connections. To allow remote SSH connections, the firewall zone must be set to public.

- 1 Log in as root.
- 2 Set the default firewall zone to public. Enter:
 

```
firewall-cmd --set-default-zone=public
```

## Allow Root Log in by SSH

To access the DRAGEN Server v3 remotely, you must enable root log in by SSH connections. By default, root log in from SSH connections are blocked.

- 1 Log in as root.
- 2 Open `/etc/ssh/sshd_config`.

- 3 Set `PermitRootLogin` to `yes`.
- 4 Restart `sshd`. Enter:  

```
systemctl restart sshd
```

## Shut Down the Server

You can shut down the DRAGEN Server v3 directly from the command line.

- 1 Log in as root.
- 2 To initiate system shutdown, enter:  

```
poweroff
```
- 3 Wait a few minutes until the server comes to a complete shutdown.

## Advanced Exchange

Because the DRAGEN Server v3 has no serviceable parts, Illumina uses an Advanced Exchange replacement model to rectify issues that cannot be resolved remotely.

Advanced Exchange replaces a damaged or defective DRAGEN Server v3 with a replacement server. To minimize downtime, you receive the replacement system before shipping back the original. The time it takes to ship the replacement can vary by region.

## Regional Applicability

Advanced Exchange is available in all regions.

## Receive a Replacement System

- 1 After a system check and other troubleshooting efforts have failed, email Illumina Technical Support at [techsupport@illumina.com](mailto:techsupport@illumina.com).
  - ▶ Make system check results available to Technical Support.
- 2 If Technical Support cannot resolve the issue remotely, a return is initiated and an order is placed for a replacement system.
- 3 When you receive the replacement server:
  - ▶ **Save all the packaging.** The packaging is used to return the original server.
  - ▶ Set aside the return documents, which include a UPS return label and commercial invoice (for international shipments).
  - ▶ Verify receipt and condition of the server.

## Return the Original Server

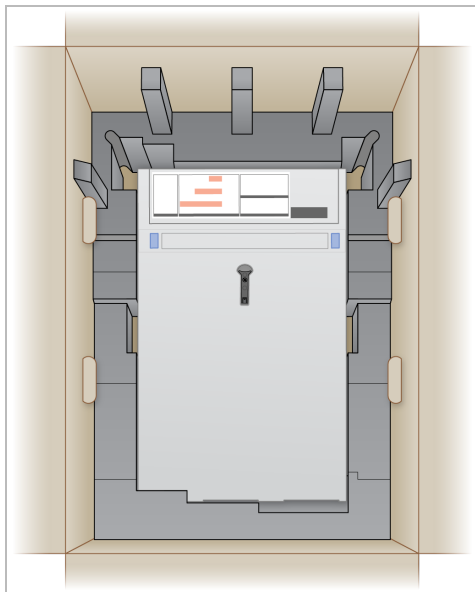
### Shut Down and Disconnect

- 1 If the DRAGEN Server v3 is turned on, do as follows.
  - a Back up all your data.
  - b Delete any files and folders you do not want to share with Illumina.
  - c Make sure that the server is not being used.
  - d Shut down the server. For instructions, see *Shutting Down the Server* on page 1.

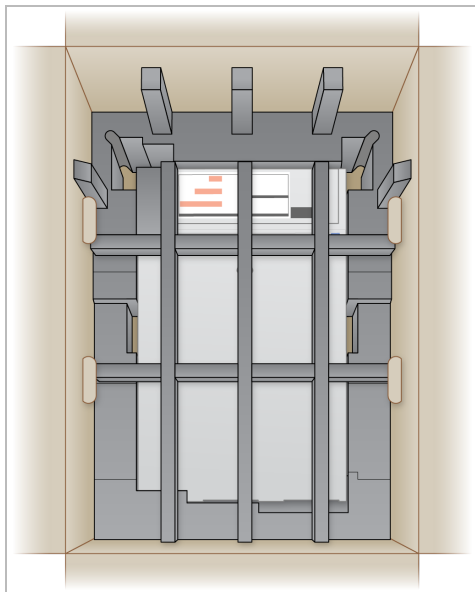
- 2 Disconnect all power and Ethernet network cords from the back of the server.
- 3 Disconnect monitor, keyboard, mouse, and cables from the server.
- 4 Uninstall server from the rack.

## Package the Server

- 1 Clear adequate space in the lab for the server and packaging.
- 2 Place the protective foam cover over the server.
- 3 Place the foam pad at the bottom of the box.
- 4 Place the original server into the box so that the top of the server faces up.



- 5 Place the foam cover on top of the server.

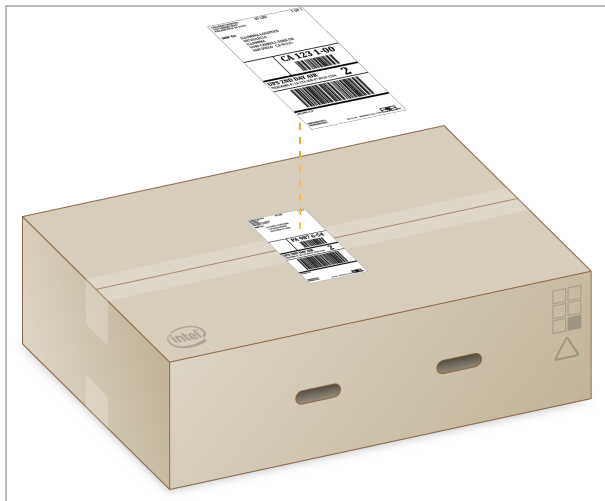


- 6 If necessary, place the accessories box into the center of the foam cover.
- 7 Make sure that the foam is flush with the top of the box.
- 8 Close the top of the box.



## Ship the Server

- 1 Secure the box with shipping tape.
- 2 Remove the original shipping label and attach the provided return label to the box. Alternatively, place the return shipping label over the original shipping label.



- 3 If shipping international, affix the commercial invoice to the shipping box.
- 4 Ship the instrument to Illumina via UPS.
  - ▶ If your facility has daily deliveries scheduled with UPS, give the labeled shipping box to the driver.
  - ▶ If your facility does not have daily deliveries with UPS, notify Illumina Customer Service so that they can schedule the return shipment for you.

## Server Specifications

This section includes additional specifications for the DRAGEN Server v3.

Component	Specifications
CPU	Dual Intel® Xeon® Gold 6226 2.7 GHz, 12 C/24 T
System Memory	256 GB DDR4
Scratch Drive	6.4 TB NVMe U.2 SSD
OS Drives	256 GB SATAIII SSD
FPGA Card	DRAGEN
Remote Access	IPMI 2.0 Compliant BMC
Operating System	CentOS 7.6
Networking	Dual 10 G Base-T & dual SFP+
Form Factor	2 U
Open PCIe slots	Riser Card: 1 x PCIe x16 slot

## Revision History

Document	Date	Description of Change
Document # 1000000097923 v02	September 2020	Updated the following information: <ul style="list-style-type: none"><li>• Shipping box components.</li><li>• Equipment dimensions.</li><li>• Power specifications.</li><li>• Server port locations.</li><li>• Server install instructions.</li><li>• Cable install requirements.</li><li>• Added additional server specifications.</li><li>• Added information to run a system check.</li></ul>
Document # 1000000097923 v01	February 2020	Removed unavailable shipping box component.
Document # 1000000097923 v00	January 2020	Initial release.



## Technical Assistance

For technical assistance, contact Illumina Technical Support.

**Website:** [www.illumina.com](http://www.illumina.com)  
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### Illumina Customer Support Telephone Numbers

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Safety data sheets (SDSs)—Available on the Illumina website at [support.illumina.com/sds.html](http://support.illumina.com/sds.html).

Product documentation—Available for download from [support.illumina.com](http://support.illumina.com).



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