

## Samsung SDS Genomics Ver. 1.4

### Technical Specification Material

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#### **Main Features**

Samsung SDS Genomics is a software solution designed to manage genomic analysis workflows, and disseminate genomic analysis results to clinical service providers. Samsung SDS Genomics takes sequencing data as input, detects genomic variations in sample, and consolidates findings with relevant biological functions for further clinical review. The final confirmed report can be used by providers and genetic counselors to determine the best treatment or prevention options with patients.

The key functionality of Samsung SDS Genomics is as follows:

- 1) Managing information from end-to-end genomic test processes
- 2) Detecting genomic alterations using configurable bioinformatics pipelines
- 3) Annotating genomic alterations using public or proprietary biological databases
- 4) Generating clinical, research, quality control, and custom reports

#### **User interface and main menu**

Samsung SDS Genomics is a web-based solution and provides the below menus.

Table 1. The list of main menus and the corresponding components or tasks

Menu	Components or tasks
Overview	<ul style="list-style-type: none"><li>• Sample status</li><li>• Project status</li><li>• User activity</li></ul>
Sample	<ul style="list-style-type: none"><li>• Test order information</li><li>• Sample information</li></ul>
Prep	<ul style="list-style-type: none"><li>• Experimental quality control results</li><li>• Plate design for next-generation sequencing</li></ul>
Run	<ul style="list-style-type: none"><li>• Choosing sequencing data files</li></ul>

	<ul style="list-style-type: none"> <li>• Running, controlling, and monitoring bioinformatics pipelines</li> </ul>
Report	<ul style="list-style-type: none"> <li>• Reviewing and confirming clinical reports</li> <li>• Reviewing research and quality control reports</li> </ul>
Analytics	<ul style="list-style-type: none"> <li>• Comparison between sample groups</li> <li>• Statistical information from analysis results</li> </ul>
Knowledgebase	<ul style="list-style-type: none"> <li>• Managing public or in-house databases</li> <li>• Managing and formatting supplementary interpretation contents</li> </ul>
SOP	<ul style="list-style-type: none"> <li>• Managing the components of standard operating procedures, such as gene panel, quality control item, and bioinformatics module and pipeline</li> <li>• Registering in-house bioinformatics pipelines</li> </ul>

### **Hardware and Software Requirements**

The following computer hardware systems are required to run Samsung SDS Genomics.

- A web application server connected to a network for web services
- A cluster of analysis engine servers for data analysis
- Storage for saving data

### **Hardware Specification**

The hardware specifications listed below are recommended to run Samsung SDS Genomics.

Hardware	Web Application Server	Each Analysis Engine Server
CPU	4-core processor	8-core processor
Memory	16 GB	48 GB
Shared Storage	more than 12 TB	

### **Operating System**

Samsung SDS Genomics is based on the Linux operating system. For web application and analysis engine servers, the following operating systems and versions are recommended because the functions of Samsung SDS Genomics were tested and confirmed in those operating systems.

	Web Application Server	Analysis Engine Server
Operating System & Version	CentOS (version 6.3, 6.7, and 7.2) or Ubuntu Server (version 12.10)	Rocks Cluster (version 6.1)

## Software Package

For web application and analysis engine servers, the software packages listed below should be installed prior to the installation of Samsung SDS Genomics.

Table 2. The list of software packages that should be pre-installed on the web application server

Name	Description	Version	Download
J2SE	Java runtime environment	1.7	<a href="https://www.oracle.com/downloads/">https://www.oracle.com/downloads/</a>
Tomcat	Web application server	7	<a href="http://tomcat.apache.org">http://tomcat.apache.org</a>
MariaDB	Database management system	10.0.15 or later	<a href="http://www.mariadb.org">http://www.mariadb.org</a>

Table 3. The list of open-source software packages that should be pre-installed on each analysis engine server

Name	Description	Version	Download
Sun Grid Engine	Job Scheduler	8.1.8	<a href="http://arc.liv.ac.uk/SGE">http://arc.liv.ac.uk/SGE</a>
Python	Executing the analysis module	2.7	<a href="https://www.python.org">https://www.python.org</a>
Perl	Executing the analysis module	5	<a href="http://www.perl.com">http://www.perl.com</a>
Java	Executing the analysis module	1.7	<a href="https://www.oracle.com">https://www.oracle.com</a>
R	Executing the analysis module	2.15.2	<a href="https://www.r-project.org">https://www.r-project.org</a>

## Client PC

The following PC environment is recommended for users when using Samsung SDS Genomics through web access.

- Operating system: Windows 7 or higher
- Web browser: Google Chrome 30 or higher
- Display resolution: 1280 × 850 pixels or higher

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