

EasyGenomics

Next Generation Bioinformatics on the Cloud

http://www.easygenomics.com

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Contact Us info@easygenomics.com



Agenda

- Vision and Strategy
- Problems and Solutions
- Product Introduction
- LIVE Demo
- Future Roadmap
- Q&A



Trend of Volume and Cost EasyGenomics +10K \$10,000.00 -1000 \$1,000.00 \$/Mb \$100.00 100 D Ν А -10 \$10.00 S е q u \$1.00 е n С е \$0.10 2012 2013 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 Human Genome Sequenced Figures adapted from Sboner A, et al.: The real cost of sequencing: higher than you think! Genome Biology 2011, 12:125 3 Numbers and Images from private research and the open Internet





Geological side of the problem



Sequencing is a **COMMODITY** and happens **EVERYWHERE**.



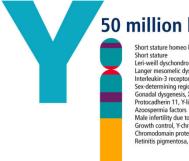




Interpretation is the KEY

• Analysis and Interpretation is the KEY

Application is the "Silver Bullet"



50 million base pairs

Short stature homeo box, Y-linked Leri-weill dyschondrosteosis Langer mesomelic dysplasia Interleukin-3 receptor, Y chromosomal Sex-determining region Y (testis-determining) Gonadal dysgenesis, XY type Protocadherin 11, Y-linked Male infertility due to spermatogenic failure Growth control, Y-chromosome influenced Chromodomain proteins Retinitis pigmentosa, Y-linked



153 million base pairs







Difficulties of Analysis

Primary analysis	Secondary Analysis	Tertiary Analysis	Post Tertiary Analysis	
Base calling	Mapping	Variant Calling	In-depth Annotation	
Data throughput Data storage	Computation intensive Data storage	Complicated Algorithms Computation intensive	Lack of knowledge	



A DESCRIPTION OF

3/10/07.



Problems and Solutions

Solutions

Cloud

- **High Speed Data Exchange**
 - Workflows
- +) Resource Management

EasyGenomics

Problems:

- Big genomic data
- Geological distribution
- Algorithm integration
- Computational demand



7



EasyGenomics[™]

• EasyGenomics is the bioinformatics platform for research and applications on the cloud



High speed data exchange

Fast and accurate pipelines

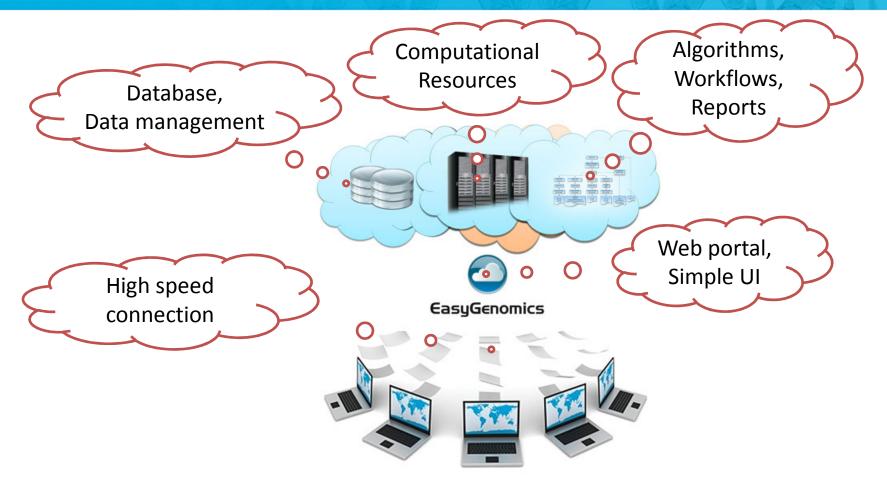
Easy and straightforward UI

Application integration





EasyGenomics[™]

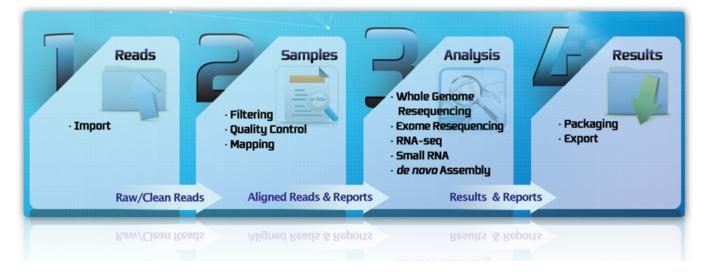


EasyGenomics is the bioinformatics platform for research and applications on the cloud





Bioinformatics Core



• Algorithms:

Carefully chosen, tested and optimized

• Workflows:

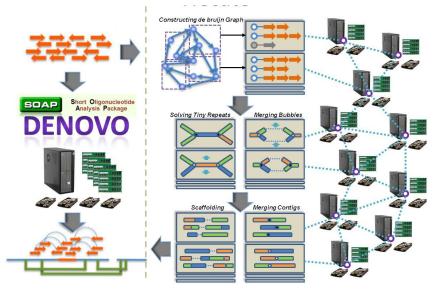
Whole genome resequencing, exome resequencing, RNA-Seq, small RNA, *de novo* Assembly



Enabling Technology



Best Practice Award for IT Infrastructure



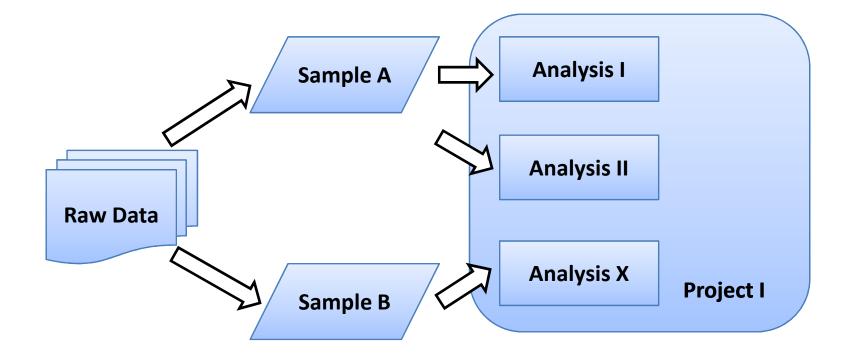
Hadoop-based Flexible Computing

Human Genome	SOAPdenovo	EasyGenomics TM
		(192 cores)
Genome Coverage	86%	86%
Assembly Time	70h	55h
No. of Servers	1	15
Memory Size	500GB x 1	24 GB x 15
Mode	Centralized	Distributed

FIE



Data Management



- "Sample", "Analysis", "Project"
- Mimicking real research procedure
- Automatic management of underlying data structure





High Speed Data Exchange

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	45.00 Mbps
	45.00 Mbps 0 bps
	Fair

Aspera's patented
 fasp™ high-speed file
 transferring technology

10~100X faster than FTP



Resource Management





Multitenancy

Workspace



Managed Data Structure



Managed Task



Safe



Backup







Security

Access	 Username/Password Biometric access HTTPS , Aspera fastp[™]
Multitenancy	 Trusted database connection ACL, Data encryption
Isolation	 Physical isolation Virtual isolation
Compliance	• ISO27000





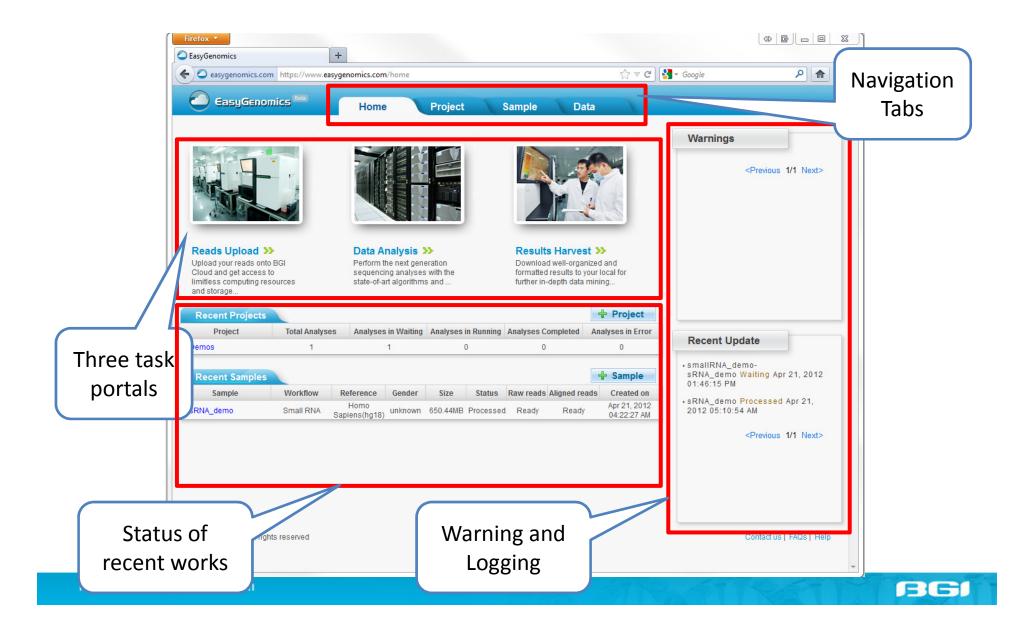
Introduction to EasyGenomicsTM

Xing Xu, Ph.D Senior Product Manager



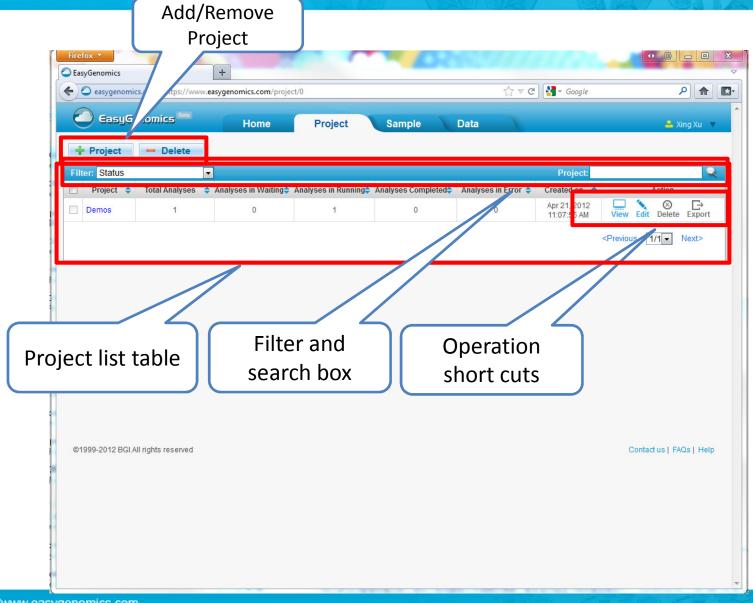


Homepage





Project Table







Analysis Table

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Sample Table

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Read Upload Portal







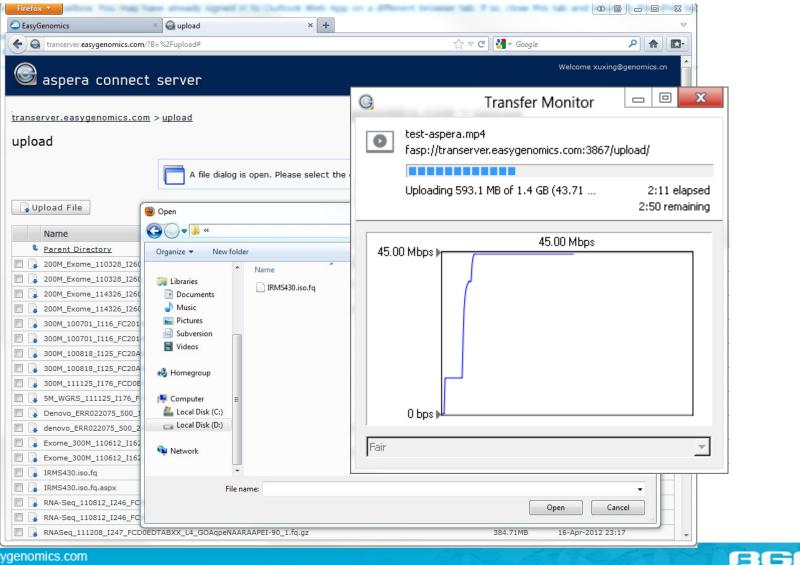
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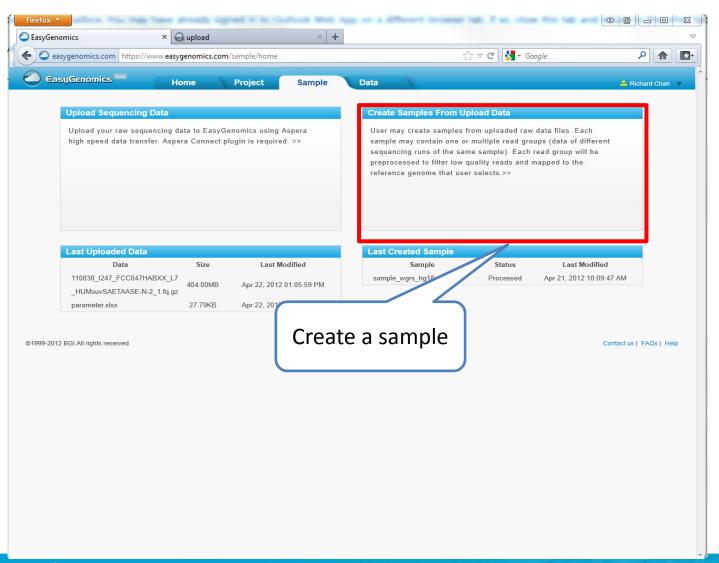




Upload Raw Reads (Aspera connect server)













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Sample Page

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EasyGenomics

Sequencing Quality Report





Mapping Report

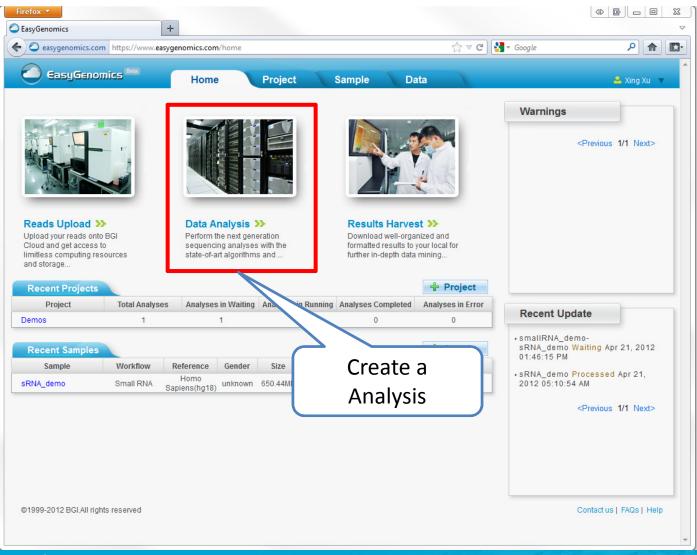
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Data Analysis Portal







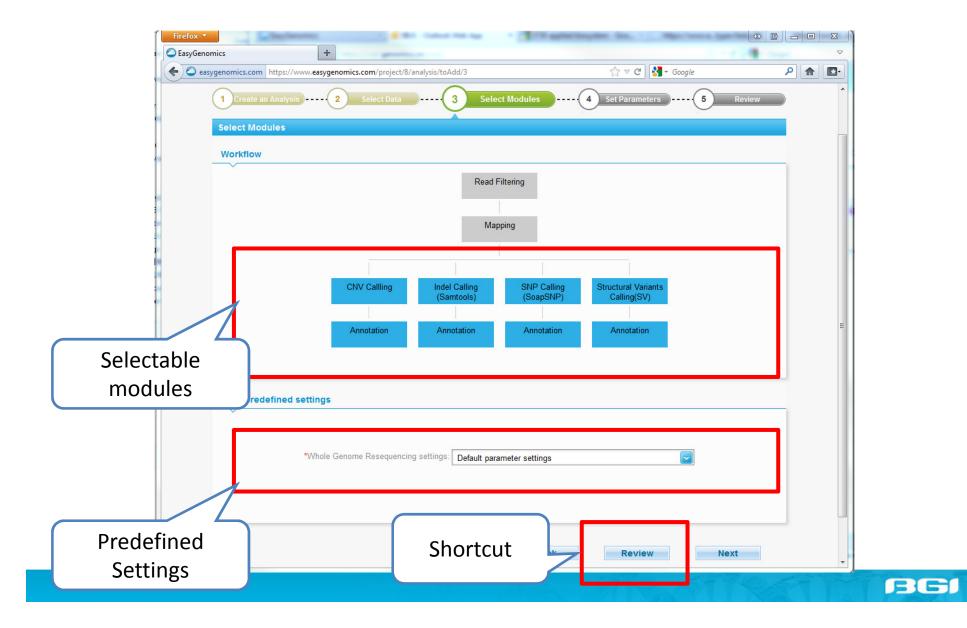
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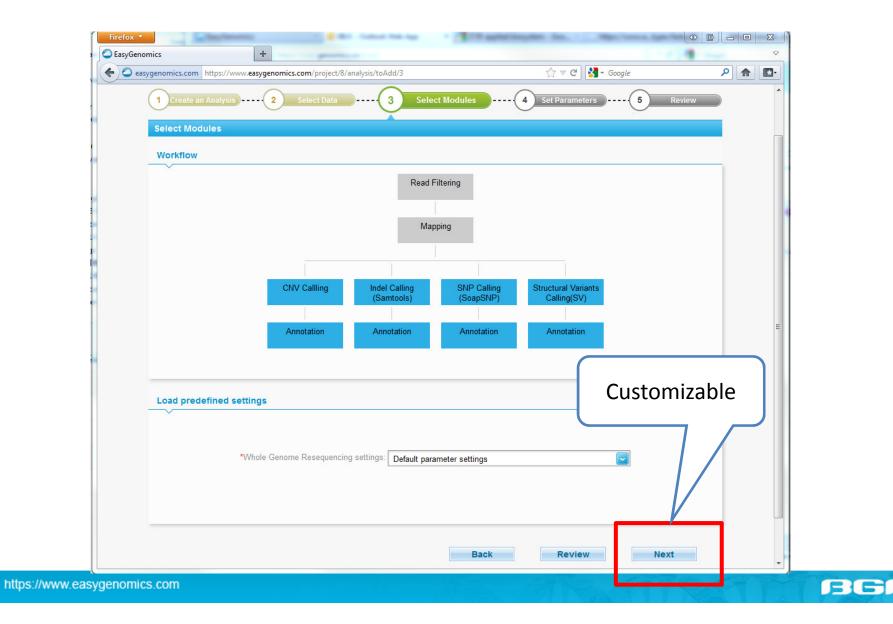




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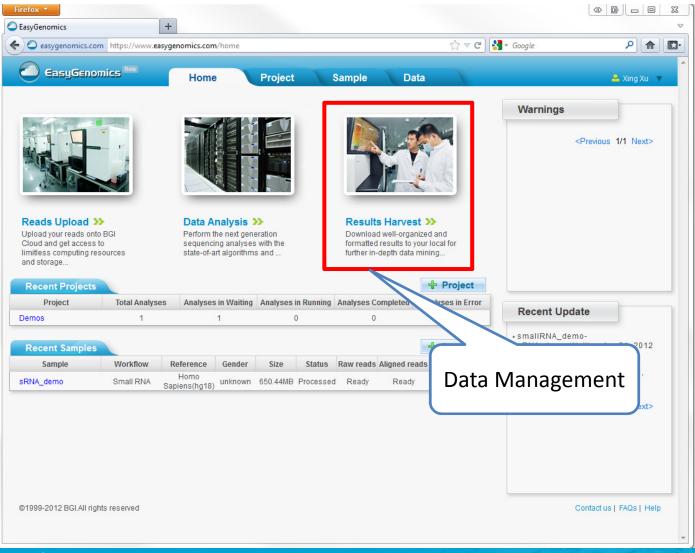


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Data Harvest Portal







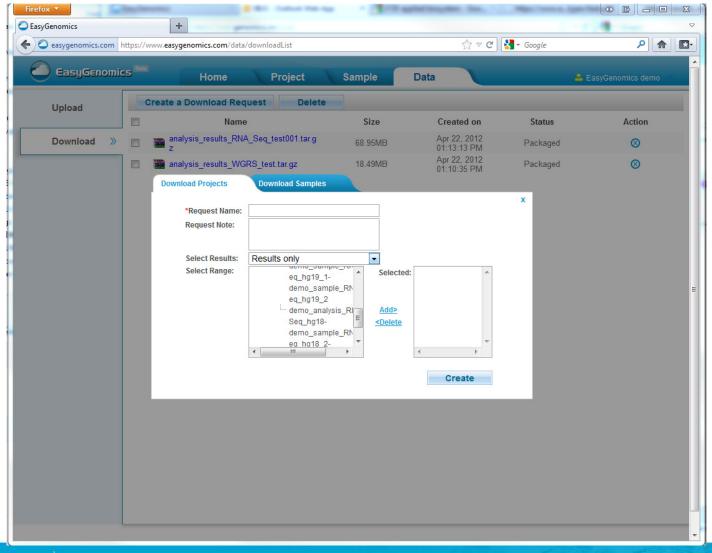
Upload Management

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		🖀 chr17_5000_1.fq.gz	211.33MB	Apr 21, 2012 09:41:47 PM	\otimes
		Ehr17_40000_2.fq.gz	112.99MB	Apr 21, 2012 09:41:41 PM	\otimes
		🖀 chr17_40000_1.fq.gz	109.00MB	Apr 21, 2012 09:41:38 PM	\otimes
		ừ chr17_2000_2.fq.gz	245.71MB	Apr 21, 2012 09:41:36 PM	8
		🖀 chr17_2000_1.fq.gz	235.35MB	Apr 21, 2012 09:41:29 PM	8
		🚰 chr17_20000_2.fq.gz	328.56MB	Apr 21, 2012 09:41:22 PM	\otimes
		🖀 chr17_20000_1.fq.gz	322.35MB	Apr 21, 2012 09:41:14 PM	8
		🖀 chr17_170_2.fq.gz	1.16GB	Apr 21, 2012 09:41:07 PM	8
		🞥 chr17_170_1.fq.gz	1.18GB	Apr 21, 2012 09:40:42 PM	8
		🞥 chr17_10000_2.fq.gz	156.27MB	Apr 21, 2012 09:40:15 PM	8
		🖀 chr17_10000_1.fq.gz	157.04MB	Apr 21, 2012 09:40:11 PM	8





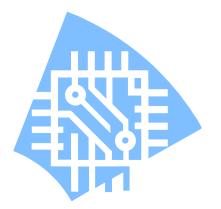
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