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Solution Brief
Medical/Healthcare

Equinix facilitates data federation for critical genomics research

Connect international research institutions and securely share highly sensitive genomics data

Genome sequencing initiatives rely on data sharing for greatest impact

Genome sequencing offers breakthrough potential for national and international health initiatives, including COVID detection, rare diseases research and precision healthcare development. However, while local initiatives generate valuable data sets, those that can be correlated with other locales and populations are exponentially more revealing. To have the greatest impact, scientists need a safe, easy way to share data sets with global counterparts to better understand genomics traits and trends.

When it comes to genomics sequencing and data sharing, challenges arise

As one person's whole genome sequence already constitutes 200 GB of data, the aggregated data volume of national initiatives can easily reach petabyte scale. However, it is challenging to transfer these data sets because they are heavily regulated and associated with personal privacy. A high-speed, high-throughput and reliable data connection is also required.

Data federation to the rescue

By transparently mapping multiple autonomous database systems into a single federated database interconnected via a computer network and geographically decentralized, data federation is disrupting genomics data collaboration. In this model, there is no need for data copying or data transfer. Instead, a data visiting model allows researchers to send queries to federated, interconnected genome institutes. Query results returned allow researchers to better correlate research findings and improve overall research velocity. All local data remain in their jurisdiction and thus comply with all data privacy and regulatory requirements.

Summary

Equinix facilitates genomics data federation with a variety of deployment options. Researchers and institutions should not be burdened with infrastructure uncertainties, as they should focus their precious time on research. Equinix will be able to help with the right model, right infrastructure options and the right connectivity solutions to ensure secure, fast and reliable outcomes in genomics data hosting and global genomics data collaboration.



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How Equinix supports data federation

Federating data using Network Edge and Equinix Metal®

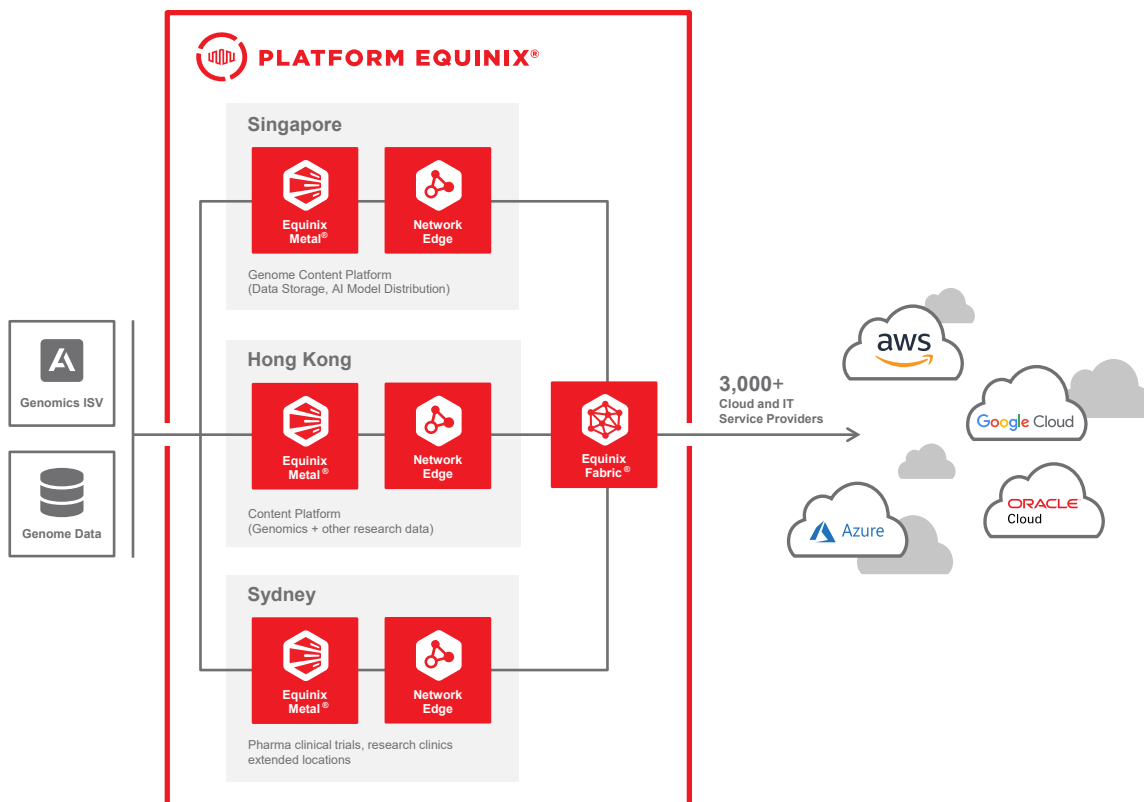
Equinix enables customers to connect to international research institutions via Network Edge. Network Edge is a virtual device that can be a router or firewall, depending on the researcher's requirements. Equinix Metal is a Bare Metal as a Service offering that provides on-demand storage and computation services for customers. It allows access to major cloud providers and digital ecosystems.

Using Equinix Metal, researchers can store genomics data on metal servers without purchasing physical infrastructure. The bare metal servers are only dedicated to one subscribing customer, ensuring greater security of highly sensitive genomics data. Connected by Network Edge and Equinix Fabric®, researchers can process genomics analysis workloads on different cloud applications. Results or queries generated can be transferred to worldwide institutions using Equinix Fabric, for further collaboration.

With Equinix Metal's pay-as-you-go model, researchers have the flexibility to scale up and down according to research requirements. This model is especially valuable for short-term or newly started projects when researchers are uncertain about the research timeline. If researchers want to expand their project scope, Equinix Fabric also enables agile and timely federated connection to genome institutes in other locations.

Scenario 1: Federating data using Network Edge and Metal

When a customer lacks physical equipment and is uncertain about infrastructure requirements but wishes to connect with different research institutions, the recommended solution is remote Network Edge + Equinix Metal®.



Genomics data can be hosted and analyzed in Equinix Metal and federated through Network Edge and Equinix Fabric. This setup enables research institutions to connect to 3,000+ Cloud and IT service providers.



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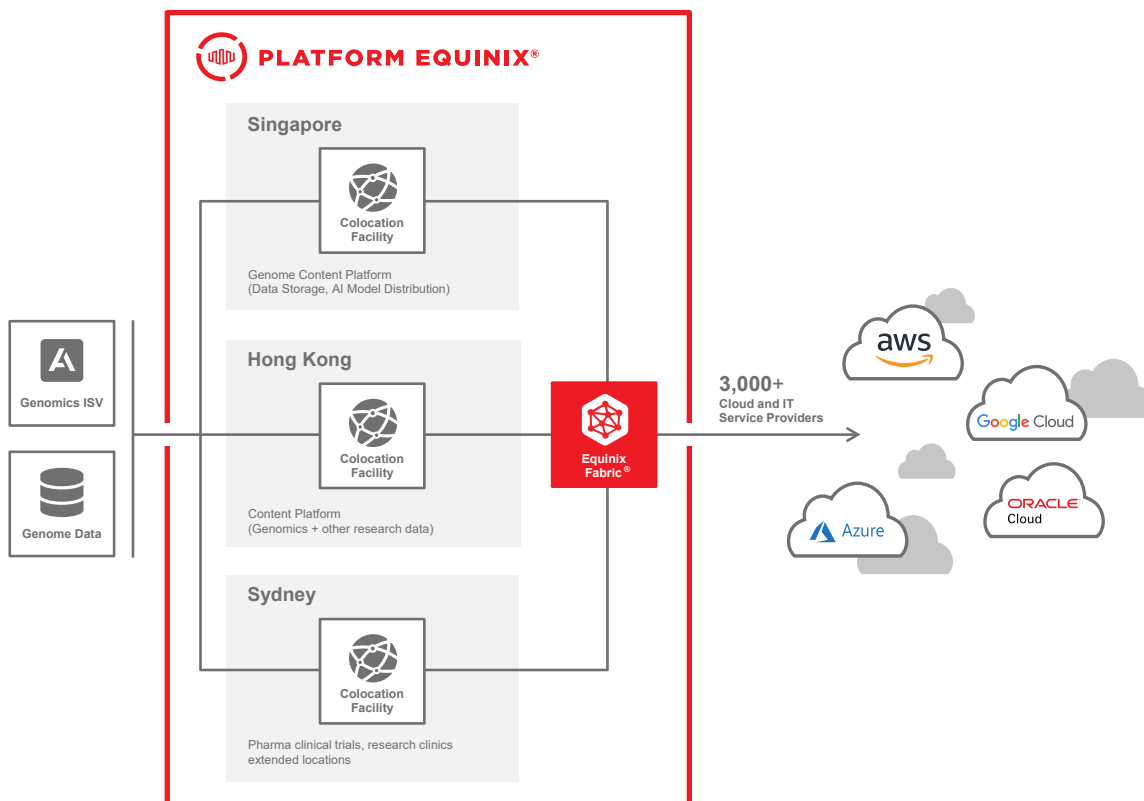
Federating data using colocation facilities

Equinix colocation services allow researchers to host sensitive genomics data in a trusted and secure environment. Through Equinix's backbone network named Equinix Fabric®, researchers can share or query appropriate data sets between institutions through a secure, private, low-latency link within Platform Equinix®. With a global footprint of more than 50 locations, Equinix Fabric enables global reach to biobanks and genome institutions, supporting international collaborations to accelerate research discovery.

In addition to connectivity with other genome and research institutions, Equinix Fabric also enables hybrid cloud architectures. The solution ensures performance, reliability and security by privately connecting to local cloud on-ramps, allowing researchers to run secure, private workloads in cloud environments.

Scenario 2: Federating data using colocation facilities

When a customer has its own physical equipment and is certain about its dedicated infrastructure requirement, the recommended solution is colocation + Equinix Fabric.



Genomics data stored in Equinix colocation facilities can be federated to worldwide research institutions and 3,000+ Cloud and IT service providers using Equinix Fabric.



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Solution components

Network Edge

Seamlessly integrate network services and privately route between your apps, data and workloads—across clouds and locations globally.

Equinix Fabric

Software-defined interconnection service that allows any business to connect its own distributed infrastructure to any other company's infrastructure on Platform Equinix across a globally connected network.

Equinix Metal

On-demand, high-performance bare metal, directly integrated with Equinix Fabric to deploy powerful infrastructure across global locations in minutes.

Equinix Colocation

Colocated deployment, whether a complex, customized private cage, or a simple single cabinet, housed within an Equinix International Business Exchange™ (IBX™) data center offers a private, secure, physical entryway to Platform Equinix—the Equinix global data center platform.

Use case

Data federation enables exciting new data collaboration approach

A leading genomics exchange database in California uses data federation to collaborate quickly, securely and seamlessly. The team formulated a virtual computational machine that can query breast cancer data at various biobanks internationally to run tests. Query results are sent to medical research institutes for further analysis. Researchers receive only summary results; patient-specific information is never disclosed and remains where it is hosted, ensuring patient privacy. The newly discovered knowledge is then transferred back to California for database enhancement.

Ready to get started?

For more information on Equinix solutions for healthcare and genomics institutions, contact us today.

Equinix.sg/Solutions/Healthcare

Features

Access services when needed

On-demand storage and computation services are available.

Choose from a variety of clouds

Access major cloud providers and digital ecosystems.

Leverage digital infrastructure

No need to purchase physical infrastructure.

Security

Secure highly sensitive genomics data.

Speedy and reliable processing

Process genomics analysis workloads on various cloud applications.

Pay-as-you-go model

Only use what you need.

Benefits

Get what you need when you need it

On-demand storage and computation services.

Access major cloud providers

Select services from a rich ecosystem of providers.

The ease of digital infrastructure

No need to purchase physical infrastructure.

Security

Protect highly sensitive genomics data.

Fast, secure data processing

Process genomics analysis workloads using a variety of cloud applications.

Greater collaboration

Easily transfer results and queries.

Use only what you need

Leverage the pay-as-you-go model for greater fiscal efficiencies.

Flexibility

Scale up and down as needed.

Agility

Enjoy the speed and flexibility of a timely federated connection.