IBM Cloud Infrastructure
Business Partner Guide

Your starting point for creating customer value using IBM Cloud infrastructure
Table of Contents

3 A New Era of IT
   Cloud
   Cloud on ramps

5 IBM Cloud Infrastructure Basics
   A brief history
   Flexible cloud models
   Flex images
   Global footprint
   Data bandwidth & pricing
   Granular API
   Triple-network architecture
   IBM Cloud Web-based Portal
   Automation
   Transparency
   Predictable billing
   Security to the core
   Advantage IBM Cloud

10 IBM Cloud Infrastructure Offerings
   Servers
   Storage
   Networking
   Security
   Compliance

15 IBM Cloud Joint Hybrid Solutions

15 Managing Your Infrastructure

15 Support
A New Era of IT

Business and society stand at a moment of enormous change equating to enormous opportunity. Every facet of business today is impacted by three major technology shifts that are changing the world as we know it: data, cloud, and engagement. Any one of them would have disrupted the technology industry. Together, they are changing the world.

However, this change is not most importantly about technology. It’s about unleashing the potential to reshape industries, enable wholly new kinds of value, and solve previously unsolvable problems, which is exactly what cloud computing has done.

Cloud

Simply put, cloud computing is a way to deliver IT resources or even a complete business process as a digital service.

The evolution of cloud is following a pattern similar to that of Web adoption in the 1990s. Initially, it was all about the “browser wars,” but then it matured into e-business. Similarly, the real value of cloud goes beyond cost savings. The value lies in the speed and agility it enables—and especially in the new business models it makes possible. Over 90 percent of new software is being built for delivery over the cloud.

Cloud computing is the central focus of this guide so we will explore this area more thoroughly in subsequent sections.
Cloud on ramps

Since the needs and starting points of every organization are different, the move to cloud computing can take many different paths. These different paths to cloud computing, or cloud “on-ramps,” can generally be categorized into one of three groups:

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)

**Infrastructure as a Service (IaaS)**

The definition of infrastructure as a service (IaaS) is pretty simple. You rent cloud infrastructure – services, storage and networking – on demand, in a pay-as-you-go model. This is the realm of IBM Cloud infrastructure.

Since you don’t need to invest in your own hardware, IaaS is perfect for start-ups or businesses testing out a new idea. Also, since the infrastructure scales on demand, it’s great for workloads that fluctuate rapidly.

Common public IaaS workloads include dev/test, Web site hostings, storage and simple application development.

But some workloads require an advanced solution. Managed IaaS is suited for large enterprises running production workloads. IaaS offerings are expected to grow at a CAGR of 31 percent through 2018.

**Platform as a Service (PaaS)**

The next level of cloud computing is platform as a service (PaaS). This cloud on-ramp provides the application infrastructure. For IBM, this is the realm of the IBM Cloud PaaS.

PaaS provides access to operating systems and associated services. It provides a way to deploy applications to the cloud using programming languages and tools supported by the provider. You do not have to manage or control the underlying infrastructure, but you do have control over the deployed applications and, to some degree, the application hosting environment configurations. With the elaborated platform, world-class products can be created without the overhead of in-house production.

**Software as a Service (SaaS)**

The top layer of the cloud computing model is software as a service (SaaS)—the one most people visualize as the cloud. At one end of the SaaS spectrum, companies offer consumable software services on demand, which are accessed through published application programming interfaces (APIs). This is sometimes known as the “API economy.” There are thousands of such cloud-based services that cloud developers can leverage to integrate SaaS functions into their own applications.

On the other end of the SaaS spectrum, you find a wide range of comprehensive, turn-key business processes that can be consumed by business users on a pay-for-use basis. These are sometimes called business process as a service (BPaaS) offerings. In either case, SaaS offers multi-tenant, elastic (“cloud native”) software services that give businesses a new level of agility needed to respond to changing markets and new opportunities. You can explore the portfolio of IBM and IBM Business Partner SaaS offerings on the IBM Cloud Marketplace.

Now we’ll dive right into IBM Cloud infrastructure as a service, and how you can prosper as our business partner.
IBM Cloud Infrastructure Basics

Leadership in cloud computing infrastructure (public, private, and hybrid) means providing an open, automated, security-rich and high-performance workload-based solution for enabling the endeavors of these optimizers, innovators, and disruptors.

Companies and IT providers are looking for the flexibility to deploy cloud-native applications alongside cloud-enabled and legacy applications, using a mixture of bare metal, single-tenant virtualized, and multi-tenant virtualized environments, all through a single management portal and API across a high-performance global network to support unparalleled performance, security, and control.

Additionally, they want to provision, scale up and down both horizontally and vertically, and decommission—and they want to do all of this in minutes or hours. Just think how much these things could benefit business models, cash flows, and companies’ agility in the marketplace. And it’s available today from a look at some of the things that make IaaS solution of choice for many customers worldwide.

A brief history of IBM Cloud infrastructure

IBM Cloud infrastructure started as SoftLayer – a privately held corporation by 10 industry veterans in 2005 with a business model predicated on providing a software-driven IT infrastructure to organizations of all sizes. The founding principles of innovation, empowerment, automation, and integration helped guide the development of this new business and are still in place today as IBM Cloud.

In August 2010, GI Partners acquired a majority equity stake in SoftLayer. Then in November 2010, SoftLayer merged with the Planet Internet Services, and hosted more than 81,000 servers for over 21,000 customers throughout the United States. In July 2011, the company expanded internationally. In June 2013, IBM announced it had a definitive agreement to acquire SoftLayer, which would become part of the IBM Cloud Services division.

Today, SoftLayer is now known as IBM Cloud infrastructure, expanding over 57 IBM Cloud data centers worldwide, and is the very foundation of IBM’s transformation into the cloud arena.

While there are other providers that offer IaaS at one level or another, the unique features of our cloud infrastructure solution is compelling. Now, let’s look at why IBM Cloud stands above the crowd.

Flexible cloud models

While the initial cloud revolution was centered on virtualized, multi-tenancy clouds, this is only one model of cloud computing— and one that isn’t necessarily suited to the full breadth of workloads, use cases or industries. As cloud has matured, organizations are looking to take advantage of the power of consumptive, real-time computing, without compromising performance, security or control. They want to choose when—or not—to use virtualization, control precisely where their infrastructure is physically located, and shape their infrastructure to their application (i.e. hourly vs. monthly compute instances, or four-way vs. octo-core bare metal — not shoehorn their app into someone else’s idea of the right platform. To use cloud to transform your business, you need a cloud vendor that offers flexibility, performance, and control.

With IBM Cloud infrastructure, you gain:

• Triple-network architecture connecting an expanding global footprint of 57 data centers and points of presence.
• The ability to combine bare metal or virtual servers, shared or dedicated environments, and public, private, hybrid or dynamic hybrid models.
• A granular API with over 3,400 exposed documented methods accessed through a robust self-service portal.
• Automation and standardization across the data centers to strengthen security.

IBM Cloud infrastructure is backed by the full expanse of resources and long-standing innovation
of IBM.

We have uniquely designed and deployed a global, interconnected platform that’s designed to meet key operational and economic requirements of cloud infrastructure, including a wealth of compute, storage, networking and security components.

You can take these building blocks and deploy public cloud instances, build private clouds on your choice of virtualization stack, leverage the raw power of bare metal on demand, or combine distributed, hybrid architectures.

Build what you want, or leverage our cloud’s turnkey data and private cloud solutions to design and deploy complex, scalable infrastructure online in near real-time. It’s all delivered as a unified service, managed from a single pane of glass, via the IBM Cloud Web portal, or mobile apps, and accessible via our full-featured API.

IBM Cloud bare metal options mirrors on-premises resources across a continuum of single processor servers, quad proc, hex-core and even GPUs, deploying near-real-time via the self-service portal or API.

Not all workloads are built the same. IBM Cloud’s many customizable options allow you to choose the platform that best servers your lowest- to highest-intensity workloads, and everything in between. This means you gain greater flexibility, business agility and responsiveness. You also reduce risk because as workloads and business requirements change, you can choose offerings required for that specific moment.

You have the flexibility to change, adjust and respond as your business changes without the huge penalties often associated with other service providers, and without investing in owning your entire infrastructure. This also supports tighter integration between business requirements and process and IT capabilities. You can dictate which solutions you use versus the solution dictating the direction of the business.

**Global footprint**

The expanding IBM Cloud global footprint offers access to IBM infrastructure choices through 57 data centers – improving your global reach and performance. We recently announced plans to launch 18 new availability zones in six major IBM Cloud regions.

**Flex images**

Figure 1. IBM Cloud Data Center Locations (as of 2018)
**Data bandwidth & pricing**

It costs nothing to bring data on IBM Cloud. Public data transfer of inbound and outbound network traffic, both to and from IBM Cloud data centers and around the globe, is flexible for your needs.

- **Global private network:** All inbound and outbound network within IBM global private network is unlimited and not charged, offered between and within any IBM Cloud data center, and across our high-speed global network backbone.
- **Inbound data transfer:** Inbound bandwidth is unlimited and not charged.
- **Outbound data transfer:** Public bandwidth is charged per GB tier with bandwidth offered as an allotment for each month.

**Granular API**

The IBM Cloud granular API is an essential element to supporting control. You have the ability, insight and control with the way IBM exposes the API, and with the extensive nature of the API with over 3,400 methods.

And in the area of compliance, this ability to manage the APIs can make a huge difference and is where competitors may break. Competitor’s APIs may be either on or off at the class level. For reduced risk and enhanced security, an enterprise client could prefer the approach of “if we don’t use it, we don’t even want to turn it on.” Enterprise clients will likely appreciate the granularity of the API to lock down and build the environment for what they want to achieve.

The ability to use the API to build auto-scaling environments is also important to your ability to respond to on-demand growth. While keeping costs in check, your environment can scale to meet seasonal or other spikes in demand.

**Triple-network architecture**

The network is perhaps the most fundamental component in terms of performance, yet it’s rarely discussed in detail by hosting providers. IBM Cloud has made significant investment in building a ‘network of networks’ from best-in-class networking infrastructure, hardware and software designed to deliver exceptional bandwidth and connectivity for the highest speed and reliability. IBM Cloud’s network architecture and performance stand apart in the industry.

IBM integrates three distinct and redundant gigabit network architectures – public, private and data center-to-data center management – into a network-within-a-network topology.

Any device at any time can have any of three types of connections:

1. **Public network:** Connection to public Internet through Tier 1 carriers with multiple 10 Gbps connections for public traffic to hosted Web sites or online resources.

2. **Virtual private network (VPN):** Allows access through dedicated, stand-alone third carriers not connected to the public network with unmetered bandwidth usage between servers and data centers.

3. **Management network:** Out-of-plane management network connection through an unlimited VPN connection for more secure management and connectivity between servers housed in separate data centers.

Our 57 data centers (and growing) and points-of-penetration (PoPs) are interconnected with over 2,000 GBps of connectivity around the globe for optimum performance. Having this interconnectivity and the ability for customers to transport data from site to site at no additional charge and be able to get on backbone through the closest PoP is critical. We are one of the only cloud providers with its own global footprint — passing 500 to 600 gigs sustained across this backbone. In fact, we house a large
percentage of content on the Internet.

The entire network and services stack provides native support for IP version 6, helping to ensure that as this critical transition takes place over the next few years, you’ll be well ahead of the game.

**IBM Cloud Portal**

In addition to the API (and built on top of it), IBM Cloud has a full-featured, secure web-based portal for management of your infrastructure. This single portal is built using the same API and gives you control of your entire environment, regardless of data center or architecture. Here you can purchase, provision, deploy and manage infrastructure, gain access to services, tools, automation and tutorials, and better secure access via VPN to the management network. You can also integrate IBM’s APIs into your existing internal management system for more control.

**Automation**

The heard of IBM Cloud infrastructure is automation. We have automated virtually every facet of the services offered to improve customer control and transparency, reduce human error and optimize costs and agility. IBM APIs provide control over services including server acquisition, reboots and reloads, network and storage configuration, security and systems monitoring.

It’s possible because of the standardization used to build each pod within our data centers. Each pod is designed from the ground up with a standard deployment of servers, power and ancillary services. A data center consists of multiple pods with each pod capable of holding 5,000 bare metal servers.

With this automatization and standardization, you can achieve a uniform deployment of workloads across the data center, reducing the potential for human error. The self-service provisioning is faster so you can move products and services to market more quickly. Bare metal servers can be provisioning in as few as four hours with virtual servers provisioned in minutes. Private clouds can be set up in as little as an hour. And you don’t have to wait for weeks for a firewall, load balancer or server to be ordered and racked. They are all available to you through the IBM Cloud Portal.

**Transparency**

IBM Cloud offers transparency from network topology down to the hardware level—all selectable by the client. This high-granularity of transparency is important for designing, building, and running applications that live and breathe on the Internet. This transparency, plus the audit trail of all actions and access provided by IBM, means you can have more control over your application, performance, security, and compliance management.

With IBM Cloud, you know the details in your data center, pod, rack unit, power port, network port, server, NIC controllers, firmware and serial numbers. With other cloud providers, you may only know your zone and maybe the data center.

**Predictable billing**

Predictable billing offers greater control over budgeting for your infrastructure needs.

- Order services on demand for what you need.
- Pay for what you use; hourly or monthly contracts
- No long-term commitments or ‘surprise’ usage fees
- No additional charges for compute cycles per second, or bandwidth usage for inbound and outbound.
- Systems come with 5TB (bare metal) and 1TB bandwidth outbound.
- All private network traffic and public inbound traffic is unmetered
- Price includes support
- You can contact support 24/7 via ticket, chat or voice, at no extra cost.

**Security to the core**

For greater control over resiliency and risks, security is built into the cloud infrastructure. All of our physical nodes and domains worldwide are supported by the same network topology, the same infrastructure, cabling design, and infrastructure management processes.

A client’s global network can be better secured and managed from a single portal across a consistent infrastructure setup. Our bare metal servers and single-tenant virtual servers offer an advantage for
running sensitive workloads with a greater level of security and a higher level of control granularity.

IBM Cloud provides a wide range of security options for clients to choose from so they can better protect their infrastructures with multiple, overlapping layers of protection customized to their needs and interests. Specifically, we offer physical and operational security, network security, and system, application and data security. All of our security offerings can enhance your security posture.

**Advantage IBM Cloud**

IBM Cloud infrastructure handles all intensive workloads, gives you control of your cloud, and is an integrated platform that can be the difference you need in today’s competitive cloud market. If your organization requires high-performance computing, or you manage large databases, we provide leading-edge, dedicated architecture and ease of provisioning, specifically designed to accommodate high input/output intensity for online gaming, mobile applications and digital and AdTech marketing.

For larger organizations that need a high level of infrastructure control, IBM Cloud provides the ability to customize hardware and control infrastructure via simple and intuitive APIs. Unlike some of our competitors, we also provide a unified integration and control panel for multiple cloud architectures – allowing for easy platform integration across dedicated, virtualized and cloud servers.

Our solutions serve a broad range of customer needs, including:

- Highly flexible architecture
- One integrated platform for public cloud servers, private clouds and bare metal servers
- Unified systems management and API
- Technology-neutral platform
- Support for a broad range of operating systems and virtualization platforms.
- Hybrid, distributed, high-performance architectures managed from a single pane of glass
- Dedicated channel sales resources
- Co-marketing opportunities
- Multiple partnership options available to meet all business models
- Built for partners – easily integrate your offerings with IBM Cloud
- Leading services – compute, network, security, storage and more.
- Global presence

By providing innovative technology that delivers flexibility and high performance, easy to administer programs and flexible financing options, we have unmatched understanding and appreciation of channel importance that translates into success and prosperity for IBM business partners.

We continue to invest in innovation to create a smarter business for our customers and partners. These innovations and continued investments in R&D ensure the continuing demand for IBM Cloud, translating into continued revenue opportunities for partners.
IBM Cloud Infrastructure Offerings

Servers

IBM provides business with a variety of different server types through the cloud, briefly mentioned earlier. Let’s take a deeper look at these offerings.

Bare metal servers

Configure your cloud down to the bare metal. Get the performance tailored for any of your workload needs. Configure your cloud down to the bare metal with your choice of RAM, hard drives and more, and be online within 20-30 minutes in any IBM Cloud data center worldwide. Enjoy direct access to the Web portal and API, plus one of the most complete packages of standard features and services on the market.

Build your bare metal to spec:

• Simply choose a processor that best meets your performance needs.
• Upgrade from a base config to fine tune the hardware to your workload.
• Deploy your server as configured within 2 to 4 hours.
• Upgrade resources as needed, on demand via our Web portal or API.
• All bare metal servers come with a comprehensive set of features and services.

NVIDIA Tesla GPUs on bare metal servers

NVIDIA Tesla GPUs on IBM Cloud bare metal servers helps businesses harness the processing power needed for high-performance computing, deep learning and AI, by working in conjunction with the server’s CPU to accelerate application and processing performance.

You can run a full enterprise from the cloud, with unparalleled compute performance, speed and accuracy. The most complex compute-intensive workloads can be handled and provision on bare metal or virtual servers – from analytics and graphics to energy exploration and machine learning.

Virtual servers

For faster deployment, better scalability and pay-as-you-go billing, choose IBM Cloud virtual servers, or virtual server instances (VSIs). VSIs seamlessly integrate with our bare metal servers so you can create a custom cloud built for your exact workload needs. Key advantages of VSIs include fast provisioning – in minutes, not hours or days – as well as the following:

• Better control – Directly manage your cloud with one API and portal – a single platform boosts performance and simplifies management.
• More flexibility – Configure your cloud with virtual servers that meet your workload needs. Select your cores, storage and RAM, and be right online.
• Standard features and upgrades – We provide customers with unlimited inbound public bandwidth, unlimited private network (server-to-server) bandwidth.
• Global platform – Access to data centers and network points-of-presence (POPs) via our high speed private network.

Server software

It doesn’t matter if you have the ideal server configuration for your workload if it doesn’t have the operating systems, control panels, database applications, and utility software you need. We offer a comprehensive range of industry leading cloud server software options that are installed using each vendor’s practices, and licensed and billing month-to-month with the rest of your solution.

IBM Cloud Operating Systems (OS)

32- and 64-bit operating systems can be installed during server deployment via Web portal

• CentOS
• CoreOS
• Debian GNU/Linux
• Microsoft
• Red Hat Enterprise Linux
• VMware ESXi
• Citrix XenServer
• CloudLinux
• FreeBSD
• Parallels
• Ubuntu Linux
• Vyatta
**VMware vSphere on bare metal servers**

IBM Cloud infrastructure supports VMware – your basic, run-of-the-mill hypervisor – but now enterprise customers can run VMware on IBM Cloud bare metal servers. This collaboration is significant as it gives customers tremendous flexibility and transparency when moving workloads into the public cloud.

**VMware Cloud Foundation**

VMware Cloud Foundation on IBM Cloud brings together VMware vSphere, vSAN and NSX into a natively-integrated stack of virtual compute, virtual storage and virtual networking built upon our bare metal servers – and all dedicated to you. It can operate independently or as a seamless, hybrid extension of your on-premises data center.

**Virtualization**

Add a layer of virtualization to your server with software from the industry leaders.

- Citrix Xenserver
- Parallels Cloud Server
- Microsoft Hyper-V
- VMware ESX and ESXi
- VMware vSphere or vCenter

**VMware vCenter Server**

VMware vCenter Server on IBM Cloud brings a level of standardized compute virtualization services, that combines IBM Cloud bare metal servers with VMware vSphere and vCenter, to provision and manage your virtual machines. You can move your workloads to and from the cloud without changing your apps, tooling, scripts, or investing in new skills. Platform instances and expansion nodes are priced per-month and they include access to IBM Support and all VMware components that comprise the service.

**IBM Cloud Secure Virtualization**

IBM Cloud Secure Virtualization combines the power of IBM Cloud, VMware Cloud Foundation, HyTrust security software, and Intel TXT-enabled hardware, to achieve seamless security and compliance while taking full advantage of virtualization and a securely governed infrastructure.

**Zerto**

Zerto provides your cloud with a secure, flexible and scalable disaster recovery solution.

**Veeam**

Veeam combines automated backup, restore and replication capabilities with advanced monitoring, reporting and capacity planning to more reliably manage VMware vSphere and Microsoft Hyper-V environments.

**Security**

Add security services to your server from the industry’s most trusted names.

- APF Software Firewall
- McAfee Total Protection
- McAfee Anti-Virus
- McAfee Host Intrusion Protection
- Nimsoft Monitoring
- Microsoft Windows Firewall

**Database**

SQL or NoSQL database software can be installed during server deployment or at any time during the life of your server, ready for your configuration.

- Microsoft SQL Server
- MySQL
- IBM Cloud Analytics
- Cloudera Hadoop
- MongoDB
- Basho Riak

**Control Panel**

Install a control panel providing a GUI interface to streamline server administration. Here are some of the cloud panel choices:

- cPanel/WHM with Fantastico, RVSkin, and Softaculous
- Parallels Plesk Panel

**Storage**

IBM Cloud offers a range of cloud storage options – large storage, fast storage, attached storage, and geographically...
dispersed storage. In this section, we’ll look at the storage offerings that provide security, redundancy, reliability and flexibility.

**Object storage**

Store massive amounts of unstructured data like virtual machine images, media and email archives with IBM Cloud Object Storage based on OpenStack Swift. It’s a simple way to tag and search, scale when needed, and manage it all directly through our API. With pay-as-you-go pricing, you’ll never be locked into storage you won’t use.

Key IBM Cloud Object Storage features include:

- **Infinite scalability** – Never be caught without enough storage. Add capacity when you need it in any IBM Cloud data center around the world.
- **Advanced control** – Easily organize your unstructured data so it’s always easy to locate. Our engineers designed an intelligent management system to allow customers to tag, search and archive objects quickly.
- **High availability** – Auto-healing capabilities keep objects safe by duplicating data per cluster if drives crash.
- **Pay-as-you-go pricing** – You’ll never be locked into any long-term contracts, and you’ll never pay for private network bandwidth, public inbound.

**Block storage**

Get local disk performance with SAN persistence, durability, and flexibility with IBM Cloud block storage. Deploy block storage in volumes up to 12 TB to increase the storage capacity available to your virtual or bare metal servers.

Completely customize the features and performance of your block storage volumes. Provision Endurance resources with snapshots and replication or build a high-powered Performance environment with allocated IOPS.

Key IBM Cloud block storage features include:

- **Durable** – protects against data loss and saves you from having to create and manage OS-level RAID arrays. This durability also means your data is protected during any necessary maintenance and in the event of equipment failure.
- **Allocated IOPS** – Volumes are provisioned with customizable allocated levels of IOPS to meet your workload’s unique storage needs. Multiple volumes may be striped together to achieve even better performance.

**File storage**

Connect your bare metal and virtual servers to durable, fast, and flexible NFS-based file storage. In this Network Attached Storage (NAS) environment, you have total control over your file shares function and perform.

Create file shares with your desired capacity—from 20 GB to 12TB—and choose whether you want those file shares to be provisioned with the flexibility of endurance or the raw power of performance.

- **Durable** – Our file storage protects the integrity of the data and maintains availability through maintenance events and unplanned failures.
- **Snapshots & replications (endurance only)**: Efficient, point-in-time snapshots that are captured non-disruptively and engineered to minimize space.
- **Global footprint**: File shares can be provisioned alongside your cloud servers in our 57 (and growing) IBM Cloud data centers worldwide.

**NetApp ONTAP Select**

NetApp ONTAP Select provides software-defined storage (SDS) capabilities, and virtualizes the local storage on VMware vSphere hosts all while providing enterprise-class storage management. NetApp ONTAP Select on IBM Cloud lets you store on dedicated infrastructure and provides familiar NetApp capabilities, such as deduplication and compression, and dedicated highly available clustered NFS, CIFS and iSCSI storage.

**Mass storage servers**

You know your mission-critical workloads and their storage needs better than anyone else, so you should be able to customize and have total control over a SAN or NAS solution that fits your requirements. With our mass storage servers, including bare metal servers, you can design and manage your own mass storage device with your choice of OS or deploy OS NEXUS QuantaStor to create a turnkey storage appliance.
Backup

Keep identical copies of your data. IBM Cloud provides turnkey Evault, Veeam and R1Soft automatic backup solutions, as well as Veeam and Zerto. You can also create your own using an IBM Cloud virtual or bare metal server running your own backup application.

Proactive, speedy and reliable, our backup solutions discover issues in your cloud environment, before they have a significant impact on your entire infrastructure and data.

Content Delivery Network (CDN)

Heighten your user experience with faster data speed and lower latency by distributing your content and rich media on one of the world’s fastest and most reliable content delivery networks. Built on our data centers – we partnered with Akamai to give customers access to 1,700 networks in 131 countries.

Avoid traffic jams and bottlenecks, and shorten the distance your data travels to end-users with 34 geographically diverse nodes and pay-as-you-go bandwidth.

Networking

Built on the foundation of a revolutionary network architecture, IBM Cloud offers an extensive catalog of network related services to control traffic to and from your infrastructure. Customize network capabilities with uplink upgrades, load balancing within or between data centers, and software-defined networking appliances that protect and optimize performance.

Load balancing

Distribute traffic loads so that no single device gets overwhelmed. IBM Cloud load balancer provides configurability and flexibility to manage the traffic and resource usage of server nodes in your environment.

Local, global and high availability options can be activated, changed, and deactivated at any time. And if you have questions about which load balancing solution is a best fit for your application, our experts have answers.

Here are some quick load balancing highlights:

- Better uptime – mitigate traffic spike by distributing load, and protect your servers from unnecessary downtime.
- SSL offloading – Terminate SSL traffic and establish plain-text communication to reduce load on backend application servers.
- Hassle-free – Easily manage your confirmation using the graphical interface or API. Get shared and dedicated load balancing options with flexible pricing.

Network appliances

Save the hassle of provisioning multiple hardware and software solutions to serve as routers, firewalls, and load balancers. Use software-defined networking solutions to create all-in-one network appliances. Deploy on IBM Cloud bare metal servers, and with a few quick clicks, set and tweak complex network settings in an easy-to-use interface, and your infrastructure’s traffic management is updated in real time.

Direct Link

Simplify and accelerate the security of sensitive data to and from the IBM Cloud with Direct Link. Customers can save on data transfers, protect network paths and move data to and from their on-premises center faster with private POP connections. All traffic across Direct Link and between your servers does not touch the public network traffic. You also get unrestricted access to your servers on our cloud platform.

IBM Cloud Internet Services

IBM Cloud Internet Services (CIS) is a new, one-stop shop for security, reliability and performance capabilities designed to protect public-facing web content and applications before they reach the cloud. If you’re looking to secure your Web-facing applications from distributed DDoS attacks, data theft and bot attacks, or just need to optimize your Web applications and ensure global responsiveness, CIS provides the services any business needs.

F5 Networks Big-IP on IBM Cloud

IBM Cloud Internet Services (CIS) is a new, one Deliver high availability, performance and secure access for critical applications and network resources on the cloud with F5 Networks Big-IP.
on IBM Cloud. This solution gives you the visibility and power to control all traffic in your network. F5’s services can dynamically adapt to ensure high application performance and enterprise-grade security on IBM Cloud.

Security

In the cloud, even small, seemingly innocuous gaps in security coverage can put everything at risk – including data, customer information, uptime and potentially your company’s reputation. Protect your data with IBM Cloud security offerings.

IBM Cloud security software

We offer a complete array of Intrusion Protection Systems (IPS) and Intrusion Detection and Prevention Systems (IDPS) software for both the network and server/host level.

*Nessus Vulnerability Scanner*  
Vulnerability, configuration and compliance assessment. We offer an online Security Scanner, powered by the open source Nessus.

*McAfee Host intrusion protection with reporting*  
Boost security and lower costs by reducing the frequency and urgency of patching. Host Intrusion Prevention integrates with the McAfee ePolicy Orchestrator (ePO) platform for centralized reporting and management that’s accurate, scalable, easy to use and works with other McAfee and non-McAfee security products.

*Two-factor Authentication for IBM Cloud Portal*  
Higher security for logging into your infrastructure and accounts. Within the Web portal, external, two-factor authentication may be activated to add additional protection when logging into the portal. This additional layer of security protects the account from unverified access, ensuring devices, data and account information are protected. Available services include PhoneFactor and Symantec Validation and ID Protection.

*FortiGate Security Appliance*  
You have the choice to add dedicated FortiGate-based Security Appliances through IBM Cloud. These appliances include the functionality of dedicated hardware firewalls together with enhanced security services including stateful packet inspection, VLAN protection, ingress firewall rules, NAT, SSL VPN termination, advanced logging and optional high availability configuration.

Firewalls

Firewalls are an important step in securing your IBM Cloud environment (and all the information stored there), as well as preventing malicious activity from ever reaching your servers or end users. When added to your security strategy, hardware and software firewall options help ensure uptime, protect your servers and network, and give you greater control of your infrastructure’s protection settings.

Some example firewall IBM Cloud solutions include:

- **Hardware firewall** – Protect individual servers with hardware firewalls provisioned on demand without service interruptions.
- **Hardware firewall (dedicated)** – Protect one, multiple, or all servers that share the same VLAN with a dedicated hardware firewall, provisioned on demand without service interruptions.
- **Hardware firewall (high availability)** – Protect one, multiple, or all servers that share the same VLAN, with a secondary physical firewall for failover protection (and automatic fail back when primary firewall is restored).
- **Gateway appliances** – Create and manage virtual routers, firewalls and VPN devices through user high availability options.

Compliance

Our compliance department works with independent third-party organizations to meet the industry’s most stringent guidelines to provide you reports and information for your own compliance needs. The physical and virtual controls of IBM Cloud data centers, and portals are an extension of your own, and we make it easy for you to get the information you need for your own audits.
IBM Cloud Joint Hybrid Solutions

We currently have 9 Cloud Technology Affiliates who have worked with IBM to develop joint cloud solutions that allow clients to do things exactly as they do on-premise in the IBM cloud:

- **F5**: F5 BIG-IP platform
- **Fortinet**: FortiGate Security Appliance
- **HyTrust**: IBM Cloud Secure Virtualization
- **Intel**: Intel TXT, Intel X-86 Servers
- **NetApp**: NetApp Data ONTAP Select
- **Veeam**: Veeam on IBM Cloud
- **VMware**: VMware vSphere, VMware vCenter Server, VMware Cloud Foundation
- **Zerto**: Zerto on IBM Cloud
- **Digital Realty**: Direct Link Offering and Hybrid Co-Location Services

Managing Your Infrastructure

With our fully automated platform, you can directly manage your own infrastructure and do anything that an IBM team member can do . . . except for going into the data center yourself. Or if you would rather focus your time and resources on your core competencies and let us focus on managing your infrastructure, we have a team of managed hosting experts ready to help.

Manage your infrastructure with:

- **Controls** – Use our homegrown resources to access, monitor, and manage your cloud infrastructure and your IBM Cloud account. Our full-featured IBM Cloud portal and mobile applications are built on our API, providing you direct access to your environment.

- **Management tools** – Repetitive and time-consuming management tasks like server replication, testing, and recovery are simplified and automated with our toolbox of server utilities.

- **Monitoring & reporting** – Keep an eye on your servers without having to watch them. We provide monitoring and reporting resources that alert you to possible problems and can trigger support or system response.

- **Managed hosting** – Allow your team to focus exclusively on your sites and applications by letting a dedicated team of systems administrators manage every aspect of your infrastructure environment.

Support 24/7, 365

IBM Cloud Support is available for partners and customers 24/7, 365 worldwide. You can access chat and other support options directly from the IBM Cloud console by clicking ‘Support’ then ‘Support Center’. Or you can call 1 (866) 403-7683 for support anytime.
For more information
Visit ibm.com/cloud/infrastructure

Follow us
@IBMcloud
Facebook

Connect with us
LinkedIn
YouTube

Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.

It is the customer's responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer follows any law.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products about this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. IBM expressly disclaims all warranties, expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a purpose.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.

IBM, the IBM logo, ibm.com and names of other referenced IBM products and services used in the presentation) are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at: www.ibm.com/legal/copytrade.shtml.