Cloud-ready networks for Microsoft Cloud

For most enterprises, cloud is now a foregone conclusion. It's not a question of should we or shouldn't we, but how fast can we get there. Within their cloud reality, most CIOs have three main concerns: performance, security, and cost. They want to ensure consistent performance for a better end-user experience, while keeping the user and the enterprise safe across all cloud activity, and of course, control the cost of a truly transformative change.

A bad network experience equals a bad cloud experience

Migrating to the cloud is a challenge. Determining what workloads should move is tricky. And managing across on-premises infrastructure and cloud instances is complex. Yet these are areas that IT has its eye on and is working through. At the end of the day, it's the network that can dictate the user experience, adversely affect cost, and create unforeseen security risks. It is time enterprises upgrade their networks to accelerate their cloud vision.

 © 2023 NTT DATA, Inc.
NTT Ltd. and its affiliates are NTT DATA, Inc. companies.

Network challenges when migrating to the cloud

- Existing networks not designed for cloud
- Poor end-user experience impacts cloud adoption
- Inhibitor for new initiatives like IoT and analytics
- High WAN costs when data moves to cloud
- New security exposures create risk
- Slow to roll out new services and applications

A cloud-ready network is critical to cloud success

With a cloud-ready network, you can:

- Accelerate time-to-value and maximize benefits for Azure while achieving enterprise-level performance and security
- Modernize the network to reduce cost, risk, and make it flexible, resilient, scalable, and more secure
- Provide a great user experience for every app regardless of where the data or app sits, or where the user connects from
- Lay a network and cloud foundation that enables future initiatives like digital workplaces, IoT, and analytics

Enterprises can remove the roadblocks to their cloud vision and:

- Accelerate cloud adoption and vision
- Simplify and build cloud-ready networks
- Satisfy global requirements
- Enable innovation

Content

04 Accelerating the client journey to Azure today — and tomorrow

04 The methodology of the journey

04 NTT services for Azure success

05 NTT is a Microsoft preferred partner for network readiness

05 A cloud-ready network is critical to cloud success

05 Security Capabilities for Microsoft Cloud

05 Microsoft Cloud networking: architecture considerations

05 ExpressRoute Routing — Client to Microsoft

06 Azure Stack

06 Using Azure Stack

06 Microsoft Cloud networking: features

07 Load-balancers and application gateway

07 Azure Load Balancers

07 Azure Application Gateway

07 Security within Azure

08 NTT for cloud-ready networks

Accelerating the client journey to Azure today — and tomorrow

NTT can assess and address the current state of the network and cloud usage, helping clients to protect their data and lower risk, while also identifying network requirements needed to accelerate their cloud journey. Ultimately, NTT helps clients deliver a solid plan for success and implement that plan, while driving towards transformational new services and capabilities like enhanced analytics and business insights.

The methodology of the journey

Assess current state
What is cloud used for today, and what is your current network topology? How is the network performing?

Drive insights and analytics
Are you leveraging analytics to manage consumption, refine processes, and develop new cloud services?

Inspect key operational areas

- **Movement & capacity management:** Are data and workloads optimally placed for performance and cost?
- **Cybersecurity:** Are the right capabilities and controls in place to protect business, customer, and employee data, and applications?
- **Network performance:** What is the end-to-end performance from an end user point of view?

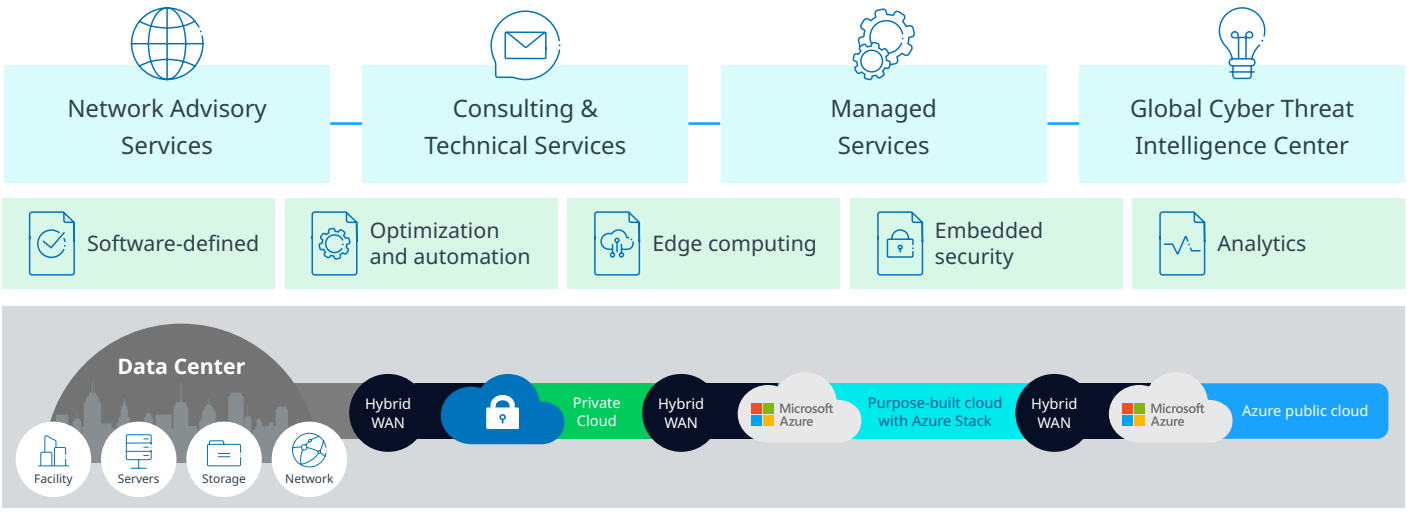
Plan for success
What hybrid operating models and services are needed to ensure ongoing successful adoption and end user experience?

Protect and lower risk
Are the appropriate policies for data, data classification, and associated security requirements in place?

Identify network requirements
To accelerate the cloud journey, what needs to happen from a networking perspective to make that successful?

NTT services for Azure success

NTT provides a full spectrum of services that help our clients build a cloud-ready network so they can leverage the full breadth of Azure features — from assessment, through consulting and technical services, to management, as well as security services. We help our clients achieve the flexibility of software-defined networking for better optimization and automation — from the center to the edge — in a way that's secure and delivers more business insights through detailed analytics. And we cover the entire spectrum of connectivity in cloud-ready Azure network, from data center to private cloud, to purpose-built clouds with Azure Stack, to the Azure public cloud.



 © 2023 NTT DATA, Inc.
NTT Ltd. and its affiliates are NTT DATA, Inc. companies.

NTT is a Microsoft preferred partner for network readiness

NTT has the network expertise, knowledge, skills, global services, and partnerships to help enterprise businesses lay the foundation for a cloud-centric network in order to accelerate Microsoft Cloud adoption including Azure and Office 365. NTT has achieved Partner of the Year with Microsoft, and is a preferred networking readiness partner for Microsoft Cloud.

A cloud-ready network is critical to cloud success

With a cloud-ready network, you can:

- **Plan and Design:** Consulting services to plan cloud strategy, adoption and migration as well as optimized network architecture
- **Build:** NTT Technical Services to deploy the designed end-to-end architecture in terms of all network infrastructure, both hardware and software
- **Operate:** NTT Managed Network Services to monitor and manage the underlying cloud optimized network infrastructure
- **Managed Azure Network Services:** Includes VPN and ExpressRoute Management as part of a broader Managed Services package
- **NTT Network Services:** Includes ExpressRoute Circuits, WAN, SD-WAN, Flexible InterConnect
- **NTT Exchange Provider Services:** Includes Colocation and Data Center, Cloud Connect Service

Security Capabilities for Microsoft Cloud

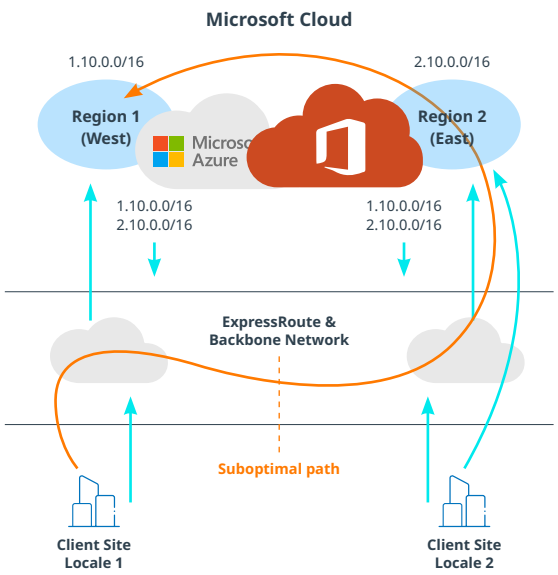
- Security strategy and operational governance
- Administrative control
- User identity
- Application security
- Data
- Device security
- Operating systems
- Network security
- Perimeter security

Microsoft Cloud networking: architecture considerations

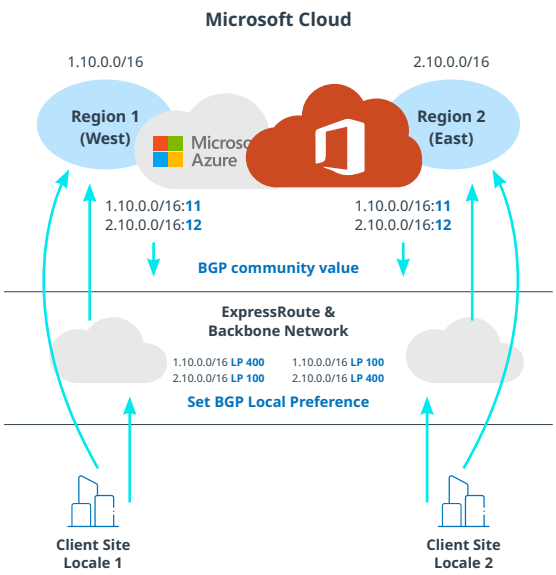
NTT can advise on the options for Microsoft network architectures as well as the network functions that can be designed and deployed as part of an optimized Microsoft Cloud environment. These include both connecting to the Microsoft Cloud and implementing networking functionality within Azure for a holistic solution. Our guidance extends across multiple Azure-managed services, including virtual networking, security, edge environments as well as 3rd party virtual appliances.

A preview of the types of guidance that are available from NTT, can be seen in the illustrated graphic below, as well as on pages 7, 8 and 9.

ExpressRoute Routing - Client to Microsoft



Two different client locales connecting to Microsoft Cloud. Due to the way routes are advertised, client locale 1 is using a suboptimal path to reach its closest Microsoft Cloud node.

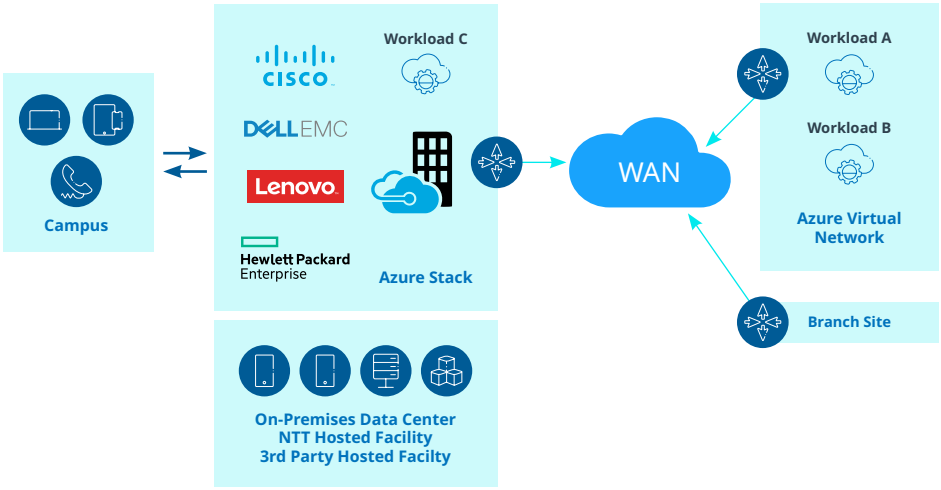


To resolve the suboptimal route, a combination of BGP community values to identify the geographic Microsoft region, and local preference metric to ensure the closest region is always used.

 © 2023 NTT DATA, Inc.
NTT Ltd. and its affiliates are NTT DATA, Inc. companies.

Azure Stack

Azure Stack is designed for clients to deliver Azure-type services from their own on-premise data center or in a third party hosting facility, such as NTT Ltd. solutions. Azure Stack is based on the Azure cloud platform and can be fulfilled using several vendors' hardware.



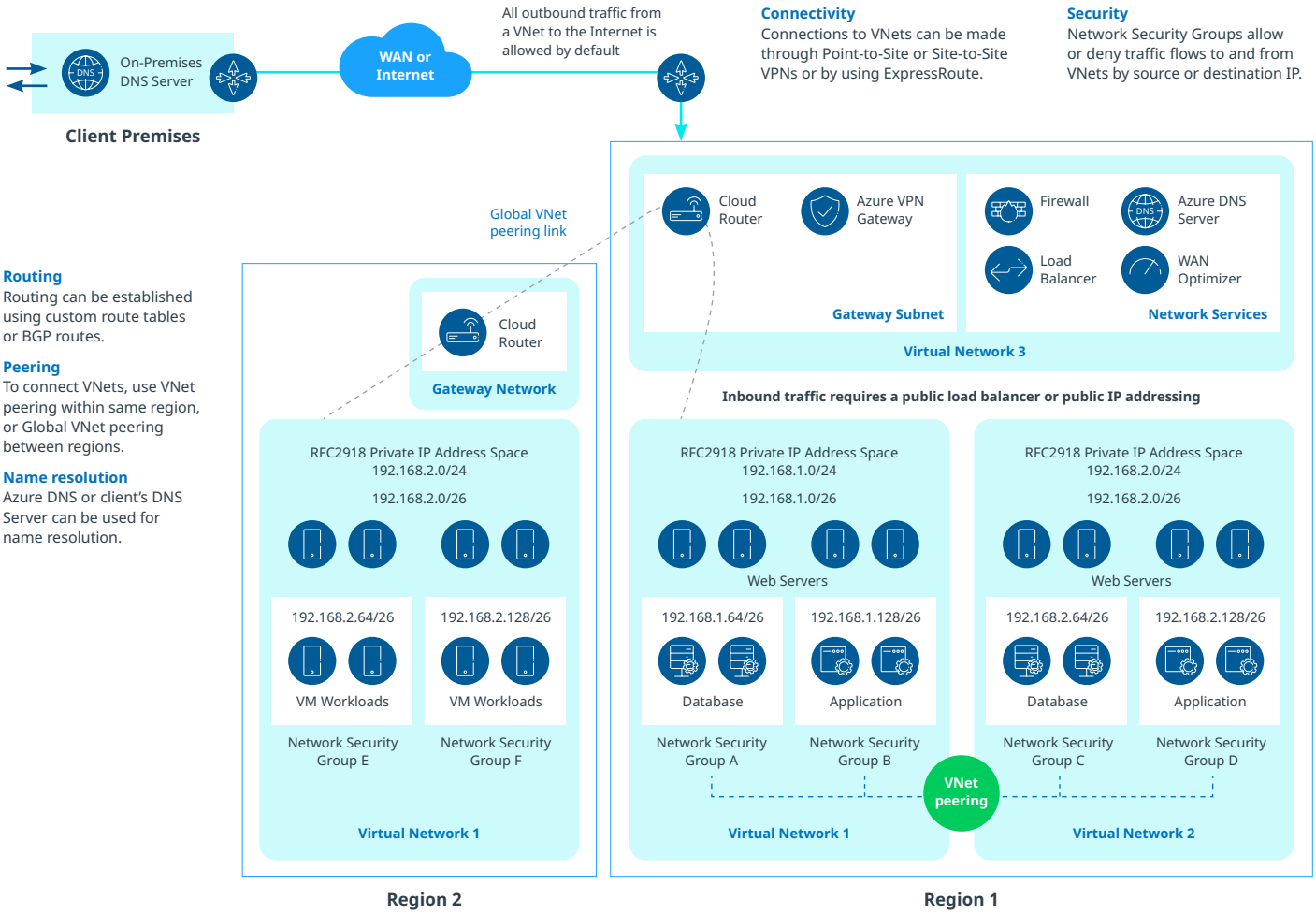
Using Azure Stack

- **Edge network:** Build edge cloud solutions to mitigate latency and bandwidth limitations
- **Modeling cloud applications:** Use Azure Stack to develop and test cloud applications prior to Azure deployment
- **Regulatory requirement:** Specific regulatory requirements might dictate local hosting of sensitive data. Azure Stack can replicate a cloud environment
- **Hybrid cloud:** To create a private cloud solution as part of a broader multi-cloud environment

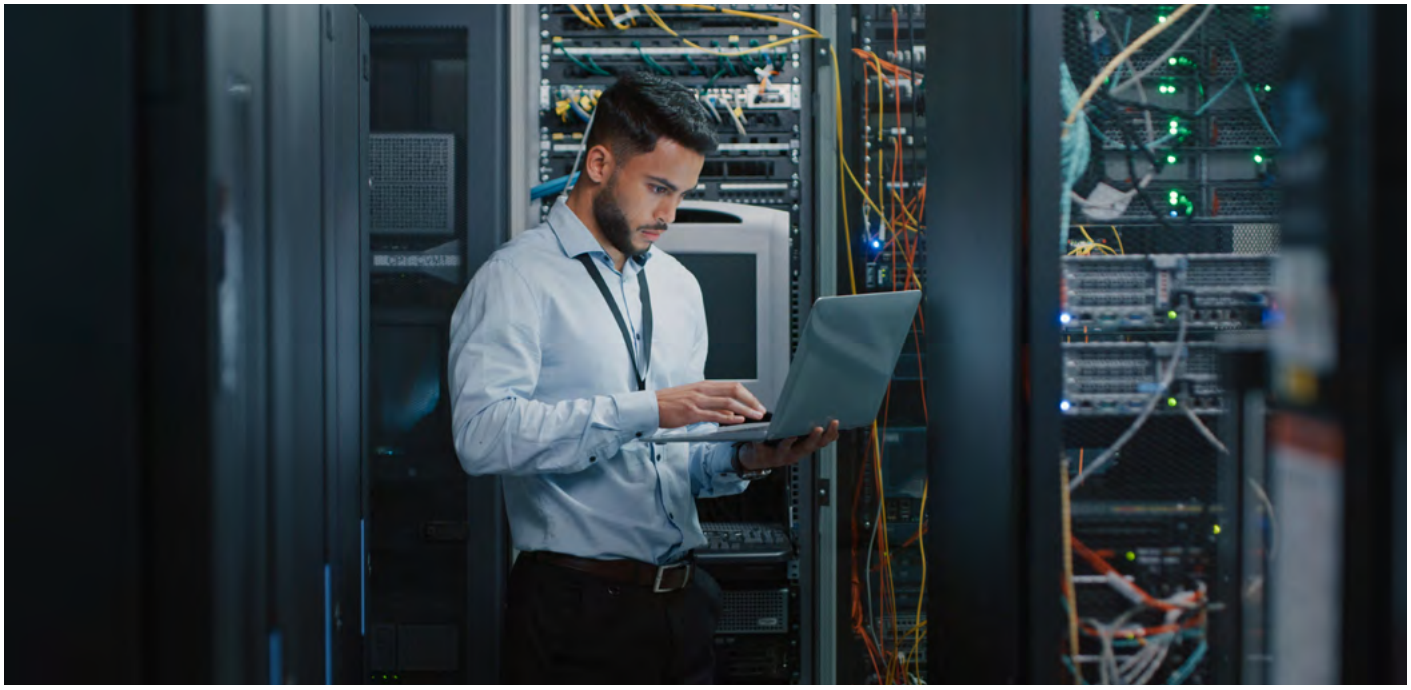
Microsoft Cloud networking: features

Create Virtual Networks

Virtual Networks (VNets) serve as an isolation boundary and provide virtual segmentation and secure communication within Azure.



 © 2023 NTT DATA, Inc.
NTT Ltd. and its affiliates are NTT DATA, Inc. companies.



Load-balancers and application gateway

Load Balancers are used in local Azure data centers to distribute incoming traffic to multiple virtual machines which provide the same service. Load Balancers also serve as the front-end to the Internet when configured with a Public IP address, eliminating the need to configure VMs with Public IPs. Load Balancers provide resilience and scale to cloud-based services.

Azure Load Balancers

For Network level traffic (Layer 4) only

Two main types can be configured:

- Internet-facing w/ public IP
- Internal w/ private IP

Can distribute traffic across multiple VMs or perform specific port-forwarding

- Basic and Standard licenses
- Provide health probe functionality
- No SSL offload capability

Azure Application Gateway

Web traffic load balancer for web-based applications (Layer 7).

Provides HTTP/HTTPS load balancing capabilities.

Provides SSL offload capability.

Can be configured as Internet-facing or Internal.

- Includes a Web Application Firewall
- URL-based Routing
- Redirection
- Cookie-based session affinity
- Multi-site hosting

Security within Azure

When architecting network infrastructure for Microsoft Cloud, it is critical to consider and integrate security into all aspects of the architecture.

- **Network security:** Deploy the appropriate security controls to protect network architecture against security attacks.
- **Encryption:** Protect confidential data by using data encryption.
- **Infrastructure protection:** As cloud-based infrastructure becomes critical for businesses, it's important to manage who can access and change infrastructure.
- **Defense in depth:** Provides layers of security to defend against concerted security attacks. Defense in depth consists of several layers including data, application, compute, network, perimeter, policies and access, and physical security.
- **Identity management:** Provides the ability for users to connect to any application from any location using the same credentials.

 © 2023 NTT DATA, Inc.
NTT Ltd. and its affiliates are NTT DATA, Inc. companies.

> NTT has a long history of partnering with Microsoft around the world — a partnership that will continue to see ongoing investment by both companies for improved value to our joint clients.

NTT for cloud-ready networks

NTT managed networking services address all business challenges across the network. We go beyond traditional connectivity issues and tackle the entire spectrum of the network with global-scale coverage, high-speed connectivity to cloud, premier global partnerships, and providing data for both security and advanced analytics. We accelerate cloud adoption through transformational services that help our clients with hybrid WANs and data centers, cloud connectivity, and security for the ever-growing edge.

High speed connectivity to cloud

Leading global partner with Microsoft, Cisco, Riverbed and F5

Network coverage in 190+ countries

Provides data for security and analytics

For more information about our services for cloud ready networks for Microsoft cloud please click here

NTT DATA

 © 2023 NTT DATA, Inc.
NTT Ltd. and its affiliates are NTT DATA, Inc. companies.