

Azure Hybrid Connectivity

Day 1: Core Hybrid Connectivity

Module 1: Introduction to Azure Hybrid Networking & Design Considerations

- Overview of Azure Networking Architecture
- Hybrid Connectivity Scenarios: VPN, ExpressRoute, and VWAN
- Network topology planning and decision framework
- IP addressing, DNS, and segmentation in hybrid networks
- High availability and resiliency considerations
- Security, latency, and throughput comparison between options

Module 2: VPN Gateway Deep Dive & Deployment

- Site-to-Site, Point-to-Site, and VNet-to-VNet VPN
- Gateway SKUs, performance benchmarks, and pricing
- Protocols: IKEv2, IPsec, OpenVPN, SSTP
- IP address planning, BGP support
- Deployment walkthrough: Site-to-Site VPN with multiple branches
- Hands-on Lab: Deploy and test VPN connectivity

Module 3: ExpressRoute Architecture and Configuration

- ExpressRoute connectivity models: CoLo, P2P, IPVPN
- Circuit provisioning and provider coordination
- Routing configuration with BGP: private vs Microsoft peering
- ExpressRoute Global Reach and FastPath
- ExpressRoute coexistence with VPN for failover
- Hands-on Lab: Simulate ExpressRoute deployment with BGP routing

Module 4: Integrating VPN and ExpressRoute – Design & Failover

- Hybrid connectivity design patterns with VPN and ER
- VPN as failover for ExpressRoute: configuration and routing
- Dual-homing branch sites with BGP routing
- Multi-region and global network considerations

- Hands-on: Configure hybrid coexistence with BGP-based failover

Day 2: Azure Virtual WAN, Monitoring, and Troubleshooting

Module 5: Azure Virtual WAN Architecture & Deployment

- VWAN Components: Hubs, Branches, Gateways, User VPN
- Routing architecture: Hub-to-Hub, Hub-to-VNet
- VWAN SKU options and regional considerations
- Hands-on Lab: Deploy VWAN and connect branch sites and VNets

Module 6: VWAN Connectivity Scenarios & Advanced Routing

- Connecting P2S and S2S VPN to VWAN Hub
- VWAN and ExpressRoute integration
- Routing policies: default, custom route tables, segmentation
- Internet breakout and forced tunneling options
- Hands-on Lab: Route management and testing traffic flow

Module 7: Monitoring and Diagnostics in Hybrid Connectivity

- Tools: Network Watcher, Connection Monitor, Packet Capture
- Diagnostic logs for VPN Gateway, ExpressRoute, and VWAN
- Metric analysis: Tunnel health, BGP sessions, latency
- Integration with Log Analytics and Alerts
- Hands-on: Configure monitoring, simulate packet loss, analyze diagnostics

Module 8: Troubleshooting Hybrid Connectivity Issues

- Troubleshooting S2S, P2S VPN, and ExpressRoute issues
- BGP session validation and path analysis
- Troubleshooting VWAN connection and routing anomalies
- Real-world troubleshooting walkthroughs
- CLI and PowerShell diagnostics