Reference Guide

Silk on Azure Deployment Overview

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Introduction

Organizations increasingly rely on cloud infrastructure to run mission-critical databases and applications. While cloud platforms offer scalability and flexibility, many database workloads require predictable performance, high throughput, and low latency that native cloud storage alone may not provide.

Silk on Microsoft Azure addresses this challenge by introducing a high-performance data platform that optimizes storage performance and resource utilization for cloud environments. Silk operates between application workloads and cloud infrastructure, enabling organizations to migrate and run database workloads in the cloud while maintaining enterprise-grade performance and resiliency.

At the core of the Silk architecture is **Silk Flex**, the orchestration layer responsible for deploying **Silk DataPods**, which are high-performance virtual SAN instances optimized for the cloud. Flex manages cluster operations, provisioning, and lifecycle management while DataPods provide scalable storage services for database workloads.

This guide provides an overview of how to deploy Silk on Microsoft Azure. It outlines the architecture, deployment requirements, and the high-level steps required to prepare an Azure environment and launch a Silk deployment.

Silk on Azure supports two deployment models:

Flex-Managed Mode (SMI)	Customer-Managed Mode (UMI)
Silk automatically manages the identity lifecycle and required Azure resources during deployment.	The customer manages networking, identities, and permissions to align with internal governance requirements.

Both models support the same Silk architecture and capabilities, allowing organizations to choose the approach that best fits their operational and security policies.

Solution Benefits

Silk enhances Azure infrastructure by providing a cloud-optimized data platform that improves performance, flexibility, and operational efficiency for enterprise workloads.

Key benefits include:

High-Performance Storage for Cloud Workloads

An optimized storage architecture delivers consistent database performance in Azure.

Independent Performance & Capacity Scaling

Scale storage capacity and performance separately to match workload demands.

Cloud Optimization & Cost Efficiency

Improve resource utilization and reduce cloud infrastructure costs through workload consolidation and intelligent resource allocation.

Multi-Database & Multi-Workload Support

Run transactional, analytical, and mixed workloads concurrently on shared infrastructure.

Simplified Data Operations

Automation and analytics streamline data operations in the cloud.

Together, these capabilities allow organizations to migrate mission-critical workloads to Azure while maintaining the performance characteristics typically associated with on-premises environments.

Architecture Overview

The Silk architecture on Azure combines orchestration, storage, and Azure infrastructure services to deliver a scalable, high-performance data platform. This section provides a high-level view of how these elements work together within a Silk deployment.

For more details on Silk's architecture works with Microsoft Azure during deployment, see the full Silk on Azure Deployment Guide.

Core Components

The following table summarizes the primary components that make up a Silk deployment on Azure and their roles within the platform:

- **Silk Flex:** Acts as the orchestration and management layer for the deployment. It is responsible for managing the Silk cluster, deploying and configuring Silk DataPods, managing infrastructure resources, and performing lifecycle operations like upgrading and scaling. Flex is deployed as a virtual machine within an Azure virtual network and acts as the control plane for the environment.
- **Silk DataPods:** Provide the storage layer for the Silk platform. Each DataPod functions as a high-performance, cloud-optimized virtual SAN that delivers scalable storage services for database and application workloads.
- **Azure infrastructure:** Silk integrates with several Azure services, including: virtual networks, virtual machines, managed disks, network security groups, and Azure storage services. These components provide the underlying infrastructure required to host the Silk environment.

Deployment Models

Both available deployment models support identical functionality and differ only in how Azure resources and permissions are managed:

Deployment Model	Architecture Description
Flex-Managed Mode (SMI)	In this model, Silk automatically creates and manages the required identities, permissions, and some networking resources. This option provides the simplest deployment experience and minimizes pre-installation efforts.
Customer-Managed Mode (UMI)	In this model, customers pre-create identities, subnets, and network security configurations. This option provides greater control and aligns with environments that require strict governance and compliance controls.

Deployment Prerequisites

Before deploying Silk on Azure, organizations must prepare their environment to ensure that required resources, permissions, and networking configurations are in place:

Prerequisite	Description
Azure Subscription and Resource Group	A dedicated Azure resource group must be created to host the Silk deployment. This resource group acts as the logical container for all Silk-related resources, including the Flex VM, cluster infrastructure, and DataPods. The resource group must be empty before deployment begins.
Virtual Network and Subnets	Silk must be deployed within an Azure virtual network. The network configuration includes a set of subnets used for management traffic, storage access, and internal cluster communication. The **Flex subnet**, which hosts the Silk Flex VM, must be created before deployment. Depending on the selected deployment model, additional subnets and network security groups may also need to be created and configured in advance.
Identity and Permissions	Silk deployments require appropriate Azure permissions to create and manage resources. Permission requirements depend on the selected deployment model: • **Flex-managed mode:** The deploying user must have Owner permissions on the resource group and appropriate access to the virtual network. • **Customer-managed mode:** A user-assigned managed identity must be created and granted the required roles before deployment.
Compute and Storage Quotas	Azure enforces regional quotas for virtual machines and storage resources. Before deployment, confirm that the subscription has sufficient quota for: • Flex virtual machines • DataPod node virtual machines • Managed disks, including Premium SSD v2 if applicable • Network interfaces If quota limits are insufficient, request increases through Azure before continuing.
Outbound Connectivity	Silk Flex requires outbound HTTPS connectivity to Azure services and Silk platform endpoints. Organizations must ensure that networking policies allow the required outbound traffic. Since Azure is retiring default outbound internet access for private subnets, deployments must use an explicit egress method such as: • Azure NAT Gateway • Azure Firewall • Third-party egress appliances • Proxy-based architectures

Proper outbound connectivity is required for installation, updates, monitoring, and lifecycle operations.

High-Level Deployment Steps

Deploying Silk on Azure involves several key phases that prepare the environment, install the Silk platform, and create the storage cluster:

1. **Complete the pre-installation site survey.** Work with the Silk Cloud Infrastructure team to complete a deployment planning survey. This process validates configuration inputs such as cluster size, networking layout, and resource requirements.
2. **Prepare Azure resources.** Create the required Azure resources, including:
   - A dedicated resource group
   - Virtual network and required subnets
   - Identity configuration (SMI or UMI)
   - Network security configurations

   These resources establish the infrastructure foundation for the deployment.
3. **Validate capacity and quotas.** Confirm that the required Azure VM families, disk types, and networking resources are available in the selected region. Request quota increases if needed.
4. **Configure network connectivity.** Ensure that the Flex subnet has outbound connectivity to required Azure services and Silk endpoints. Configure NAT gateways, firewall rules, or proxies as needed.
5. **Deploy Silk Flex.** Install Silk Flex from the Azure Marketplace. During installation, Flex connects to the configured Azure resources and prepares the environment for cluster creation.
6. **Create the Silk cluster.** After Flex is deployed, upload the cluster configuration file and create the Silk cluster. This process provisions the cluster infrastructure and prepares the environment for DataPods.
7. **Deploy DataPods.** Create Silk DataPods to provide storage services for database workloads. DataPods deliver the performance and scalability capabilities that support enterprise applications running on Azure.

Once deployment is complete, the Silk environment is ready to support application workloads.

Support and Additional Resources

Silk Support

Silk Support assists with:

- Deployment planning and configuration validation
- Cluster file generation
- Troubleshooting installation or networking issues
- Operational guidance and best practices

Contact Silk Support through your Customer Portal.

Silk Documentation

- Whitepaper: Silk Architecture
- Whitepaper: Accelerate Real-Time AI Inferencing in Azure with Silk + Azure Boost
- Blog post: How Silk Helps Enterprises Reduce Cloud Costs with Microsoft Azure Laosv4 VMs
- Whitepaper: Security and Data Encryption With Silk on Azure
- Silk Cloud User Configuration Guide for Azure
- Silk DataPod Management Console User Guide