Data Gateway Architecture and Build Documentation

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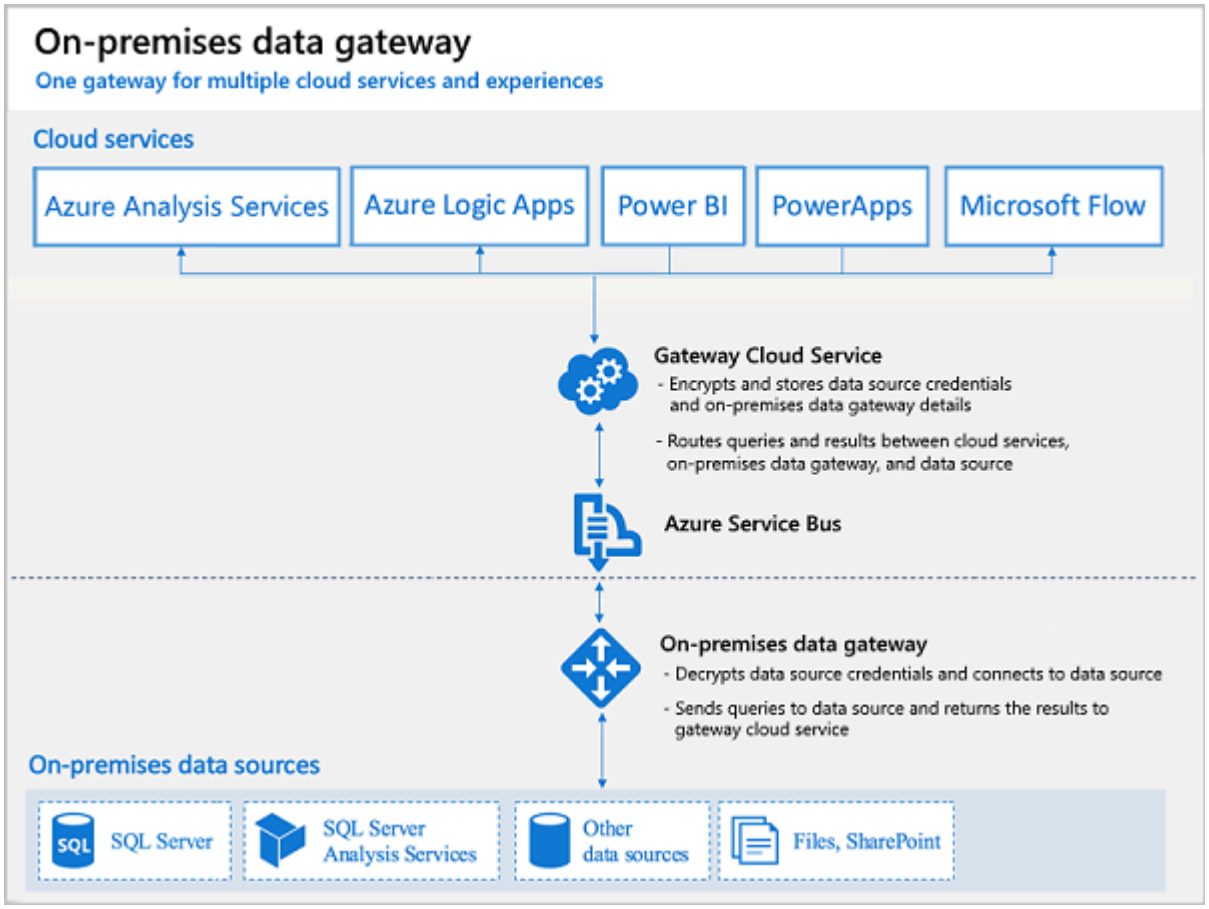
Infrastructure Requirements

The on-premises gateway allows Power Apps and Power Automate to reach back to on-premises resources to support hybrid integration scenarios. The gateway enables Azure Service Bus relay technology to securely allow access to on-premises resources.



Considerations

- Workloads may have specific requirements around compatible gateway versions. For dataflows, see using dataflows with on-premises data.
- Gateways aren't supported on Server Core installations.
- Gateways aren't supported on Windows containers.
- The user installing the gateway must be the admin of the gateway.
- The gateway can't be installed on a domain controller.
- If you're planning to use Windows authentication, make sure you install the gateway on a computer that's a member of the same Microsoft Entra environment as the data sources.
- If you use a virtualization layer for your virtual machine, performance might suffer or perform inconsistently.
- When using an on-premises data gateway (standard mode) to access a data source on a remote domain, the gateway has to be installed on a domain joined machine having a trust relationship with the target domain.

Server Specifications

Non Production Server Requirements (1 per non production network zone)

- **Operating System**: Windows Server 2022 Standard/Datacenter
- **Processor**: 8 CPU cores (3.0 GHz or higher)
- **Memory**: 16 GB RAM
- **Storage**: 100 GB SSD (Premium Storage recommended)
- **Network**: 1 Gbps NIC (optional - non produciton network bandwith sufficient)

Production Recommended Requirements (Min 2 servers for redundancy)

- **Operating System**: Windows Server 2022 Datacenter
- **Processor**: 16 CPU cores (3.5 GHz or higher)
- **Memory**: 32 GB RAM
- **Storage**: 256 GB SSD (Premium Storage required)
- **Network**: 10 Gbps NIC (optional - production network bandwith sufficient)

Software Prerequisites

- .NET Framework 4.8 or higher
- PowerShell 5.1 or higher
- TLS 1.2 or higher enabled
- Latest Windows Updates installed

Network Architecture

DMZ Configuration

```
[Internet] <-> [Azure Load Balancer] <-> [DMZ Gateway Servers] <-> [Internal
Firewall] <-> [Backend Services]
```

Network Segmentation

1. **External DMZ Segment**
    - Gateway servers
    - Reverse proxy servers
    - Load balancers

2. **Internal Services Segment**
    - SQL Server instances
    - Application servers
    - Domain controllers
3. **Management Segment**
    - Monitoring tools
    - Administrative access
    - Backup systems

Port usage & Firewall Rules

The gateway service creates an outbound connection to Azure Service Bus so there are no inbound ports required to be open. The outbound connection communicates on ports: TCP 443 (default), 5671, 5672 9350 through 9354

Outbound Rules

- TCP 443 to Azure services
- SQL ports to backend databases
- DNS and NTP to internal services

Security Configuration

Identity and Access

- **Authentication**: Entra ID integration
- **Authorization**: Role-based access control (RBAC)
- **Service Accounts**: Managed Service Identities where possible

Encryption and Certificates

- **Transport**: TLS 1.2+ required
- **Certificates**: Auto-renewed SSL certificates
- **Key Management**: Azure Key Vault integration

Network Security

- IP restriction lists
- Network Security Groups (NSGs)
- Web Application Firewall (WAF)
- DDoS protection

High Availability Design

Gateway Clustering

- Minimum 2 gateway servers per environment
- Active-Active configuration
- Load-balanced endpoints

Failover Configuration

```
{
  "cluster": {
    "primaryNode": "gateway-prod-01",
    "secondaryNodes": [
      "gateway-prod-02",
      "gateway-prod-03"
    ],
    "heartbeatInterval": "30s",
    "failoverThreshold": "90s"
  }
}
```

Performance Optimization

Connection Pooling

```
{
  "poolConfig": {
    "maxPoolSize": 100,
```

```
    "minPoolSize": 10,
    "connectionTimeout": "30s",
    "idleTimeout": "300s"
  }
}
```

Caching Strategy

- Implement Redis Cache for frequently accessed data
- Cache invalidation policies
- Cache-Control headers configuration

Monitoring and Maintenance

Health Checks

- Gateway service status
- Connection metrics
- Performance counters
- Error logs

Alerting Configuration

```
{
  "alerts": {
    "cpuThreshold": 80,
    "memoryThreshold": 85,
    "responseTimeThreshold": "5s",
    "errorRateThreshold": 5
  }
}
```

Backup and Recovery

- Regular configuration backups
- Gateway recovery procedures

- Disaster recovery planning

A recovery key is assigned (that is, not autogenerated) by the administrator at the time the on-premises data gateway is installed. The recovery key is required if the gateway is to be relocated to another machine, or if the gateway is to be restored. Therefore, the key should be retained where other system administrators can locate it if necessary.

Deployment Checklist

Pre-Installation

- ☐ Verify server specifications
- ☐ Configure network segments
- ☐ Set up firewall rules
- ☐ Install prerequisites

Installation

- ☐ Deploy gateway servers
- ☐ Configure clustering
- ☐ Set up monitoring
- ☐ Test connectivity

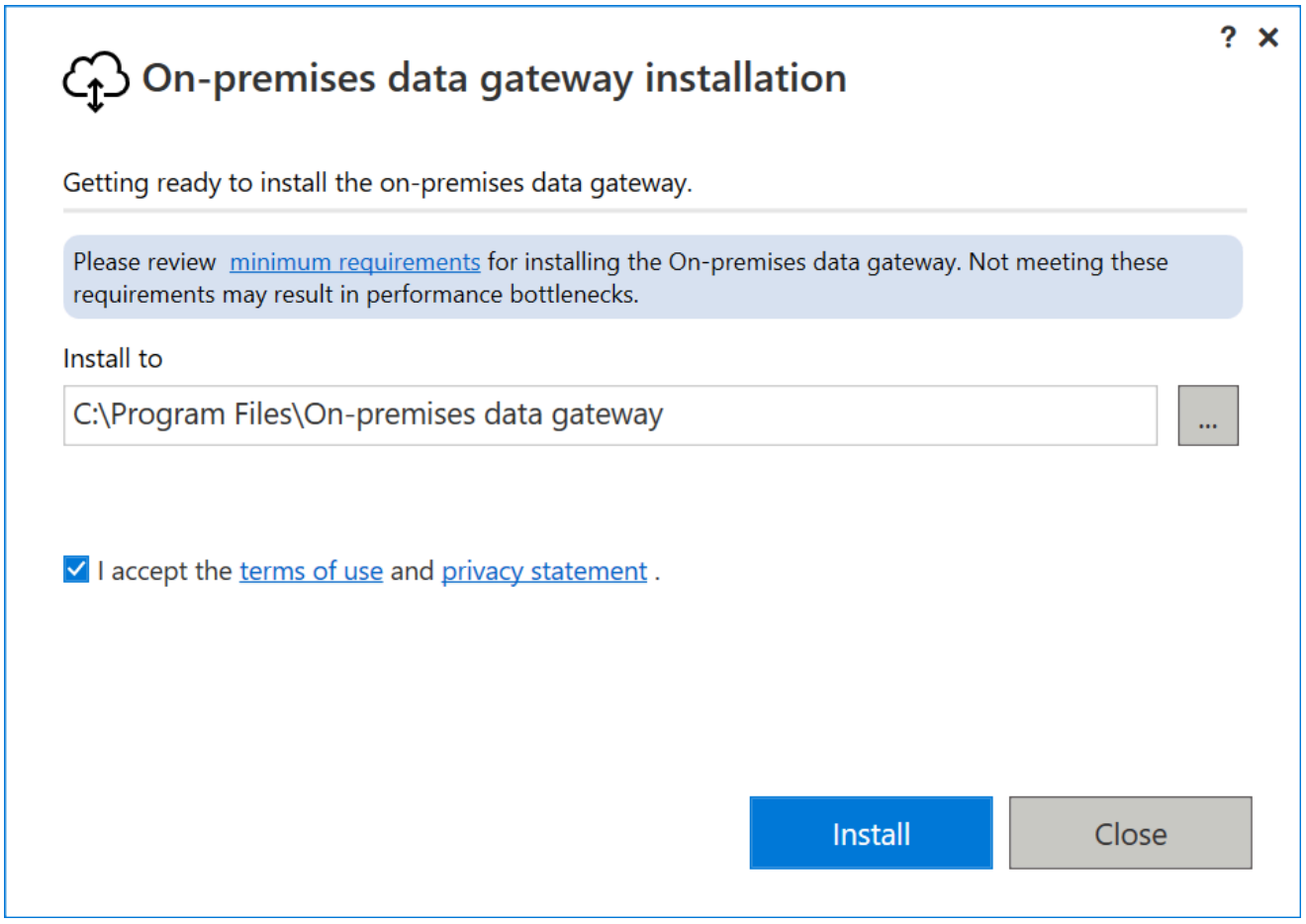
Post-Installation

- ☐ Verify security settings
- ☐ Test failover
- ☐ Document configuration
- ☐ Train support staff

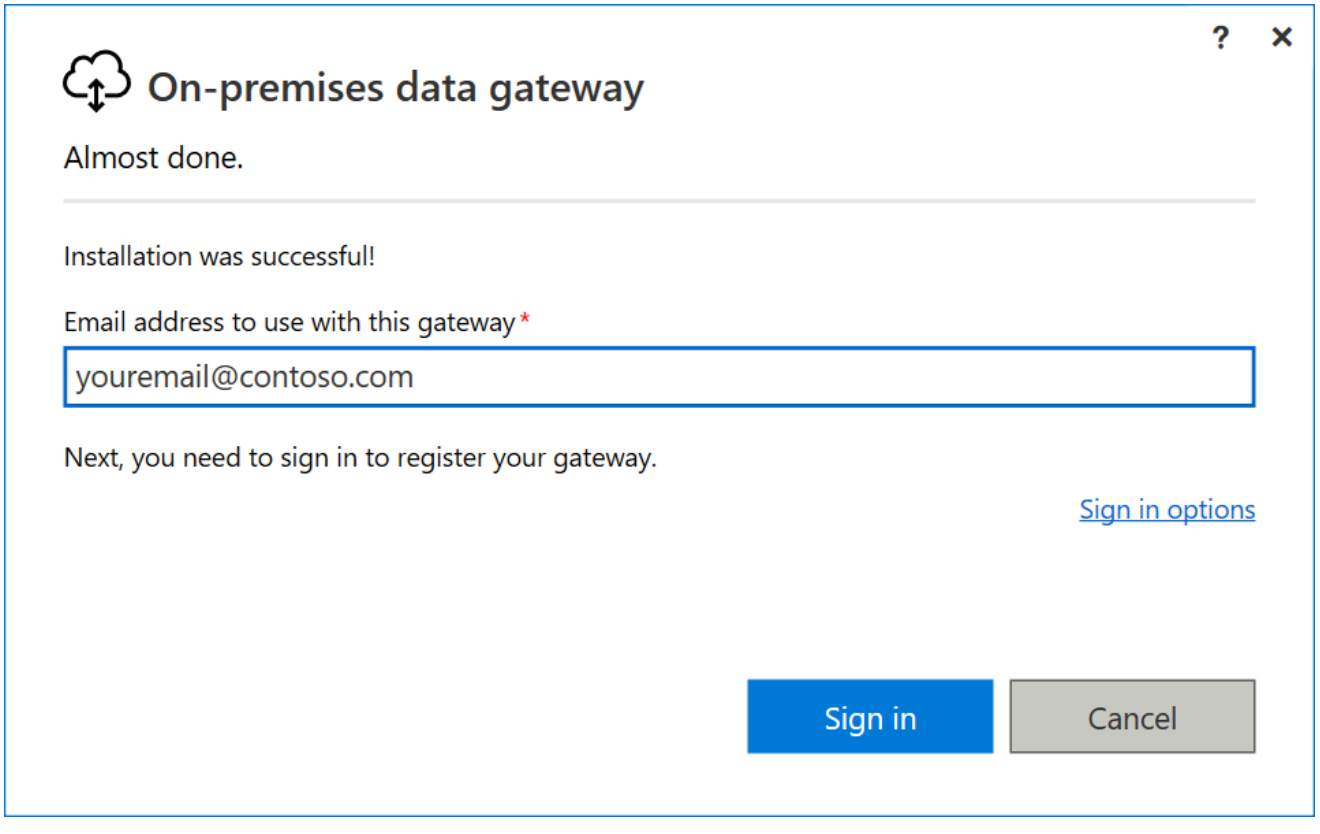
Download and install the Standard Gateway

1. Download file

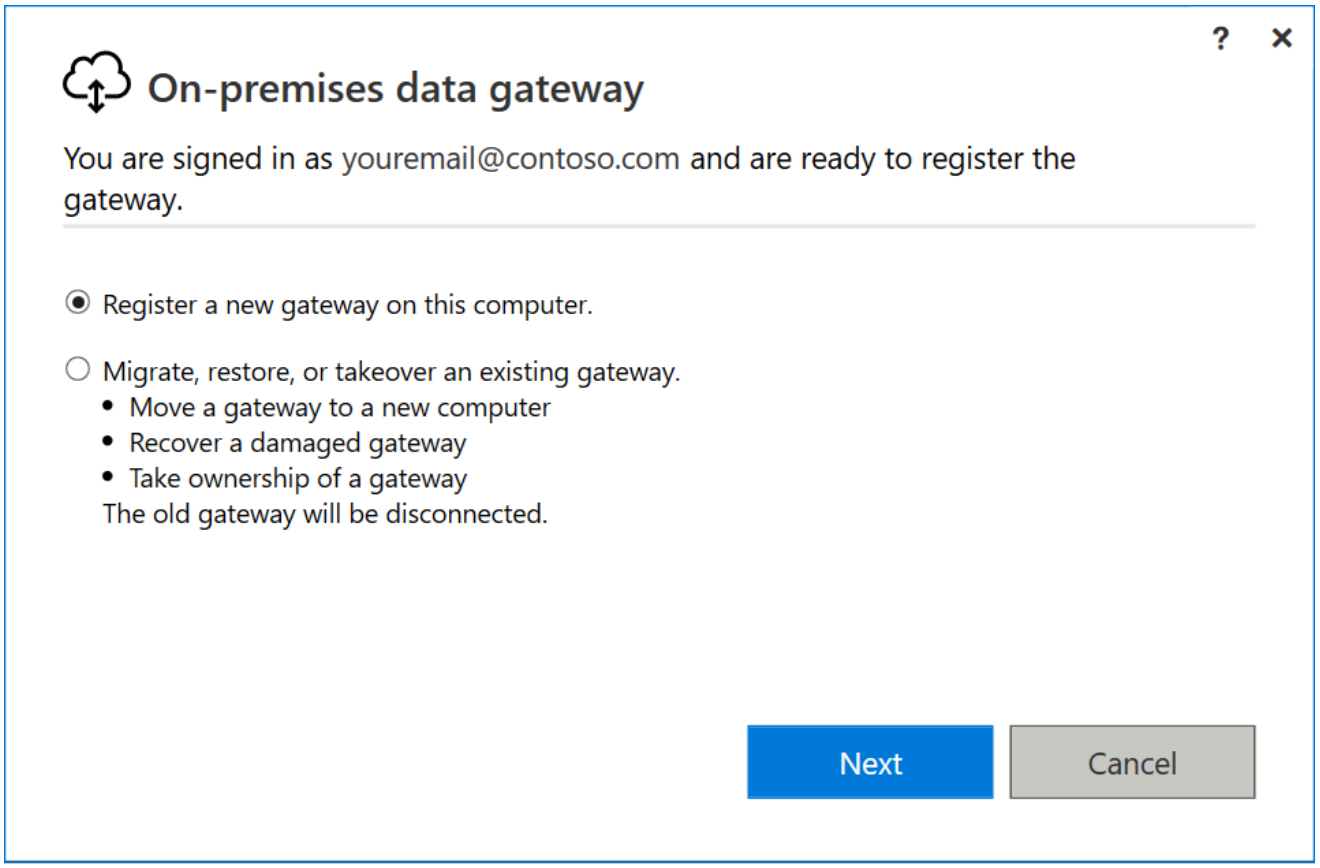
2. In the gateway installer, keep the default installation path, accept the terms of use, and then select **Install** .



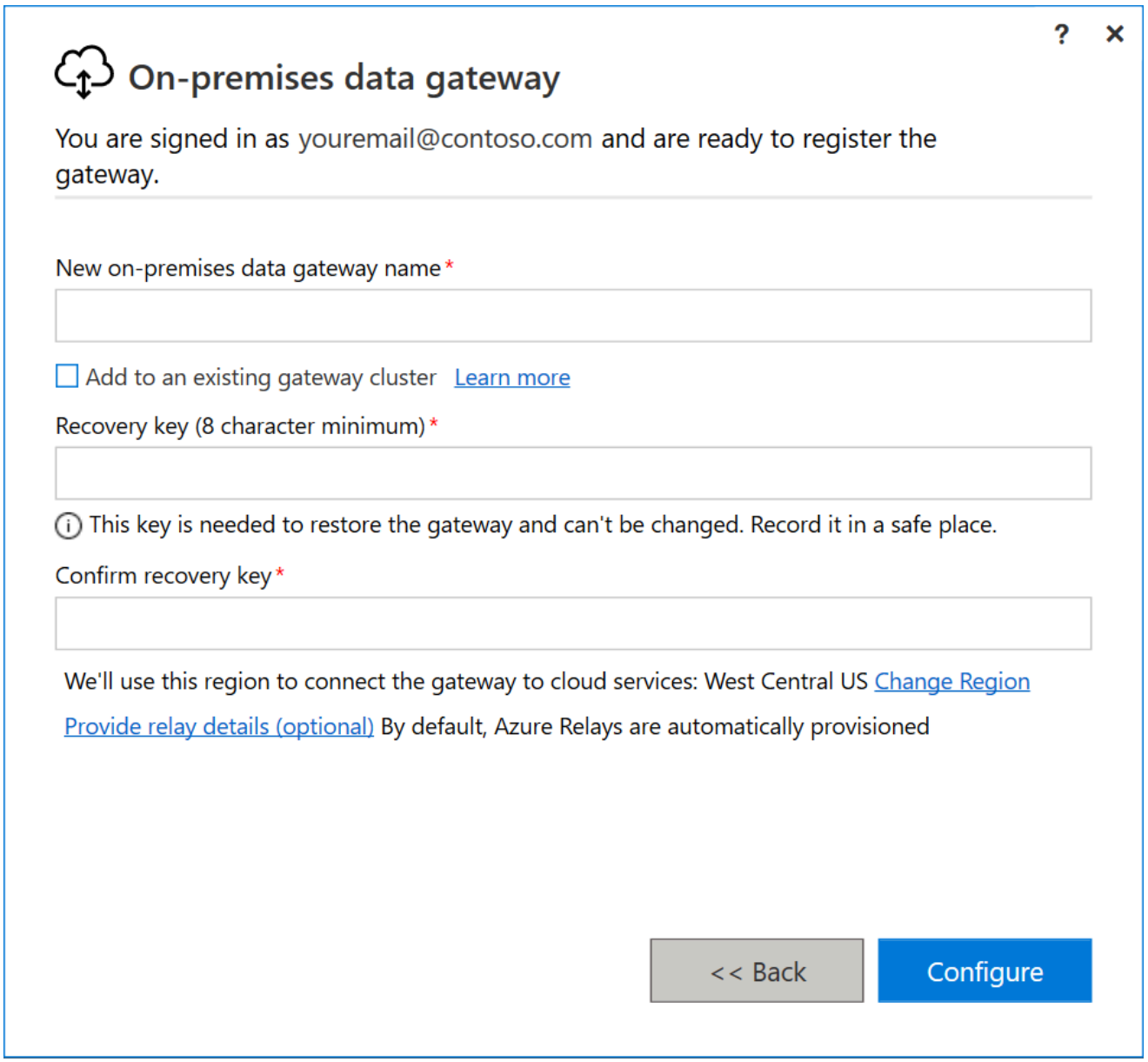
3. Enter the email address for your Office 365 organization account, and then select **Sign in (use service account)**.



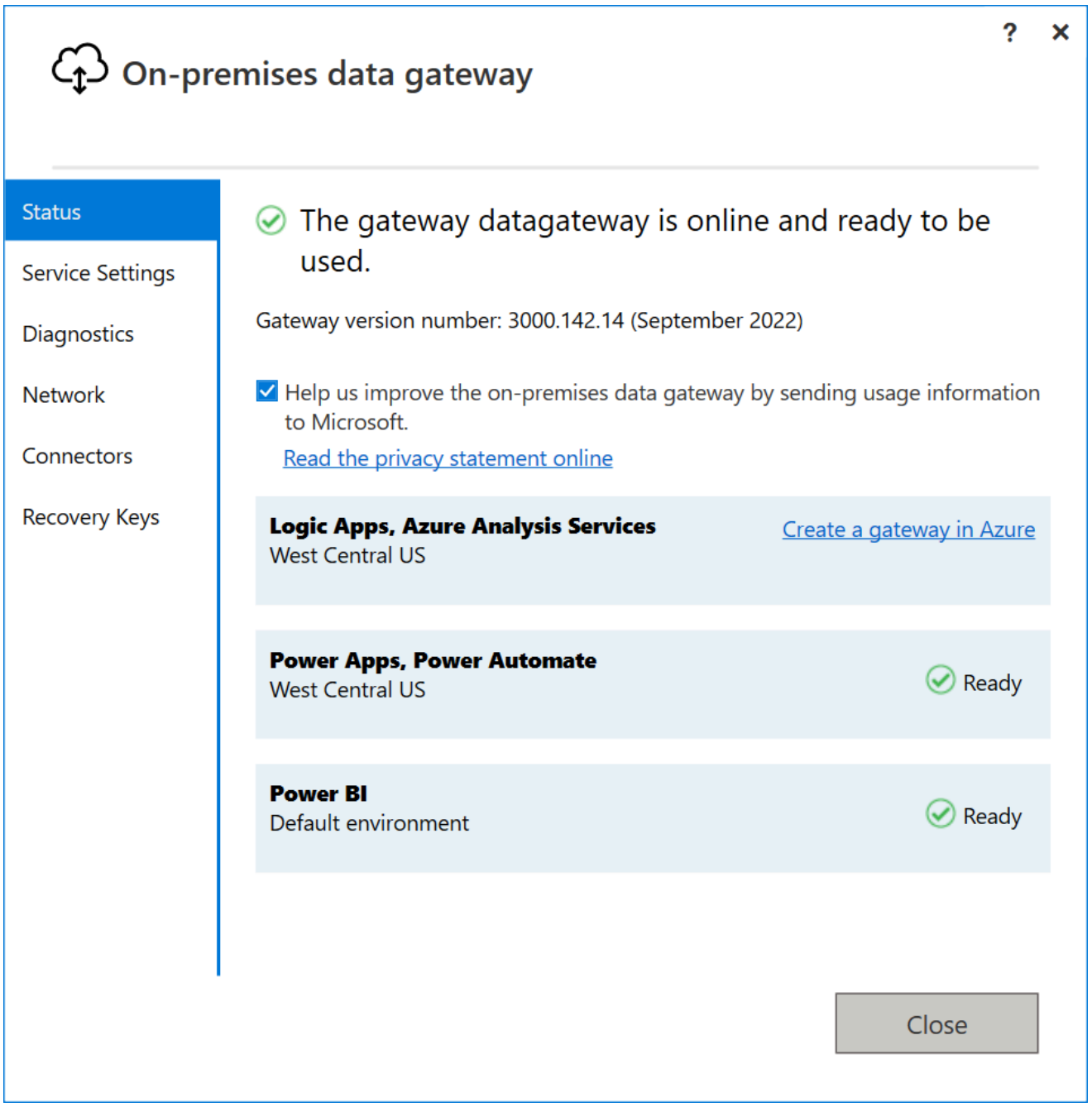
4. Select **Register a new gateway on this computer** > **Next** .



5. Enter a name for the gateway. The name must be unique across the tenant. Also enter a recovery key. You'll need this key if you ever want to recover or move your gateway. Select **Configure** .



6. Review the information in the final window. Because this example uses the same account for Power BI, Power Apps, and Power Automate, the gateway is available for all three services. Select **Close** .


On-premises data gateway
Status
Service Settings
Diagnostics
Network
Connectors
Recovery Keys
The gateway datagateway is online and ready to be used.
Gateway version number: 3000.142.14 (September 2022)
Help us improve the on-premises data gateway by sending usage information to Microsoft.
Read the privacy statement online
Logic Apps, Azure Analysis Services
West Central US
Create a gateway in Azure
Power Apps, Power Automate
West Central US
Ready
Power BI
Default environment
Ready
Close