



# **IPS<sup>®</sup>SYSTEMS**

## **Hardware and Software Requirements**

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# 1 General

This document defines the minimum and recommended hardware and software requirements for deployment of the IPS®SYSTEMS platform.

The system is designed to operate on Microsoft-based infrastructure, and can be deployed on physical or virtualized servers, on-premises or in a data center / cloud-hosted environment.

The document will be periodically updated as needed and/or in response to new technical requirements. Please compare your infrastructure with this document on a regular basis. IPS can guarantee a stable software environment only with up-to-date hardware equipment.

## 2 System Architecture Overview

The system consists of two main tiers:

- › Application Server (APP Server) – hosts application services, APIs, web components, and business logic.
- › Database Server (DB Server) – hosts Microsoft SQL Server database engine and related data components.

## 3 Hardware Requirements

### 3.1 Application Server

Component	Minimum Requirement	Recommended Requirement
CPU	8 cores	12+ cores
RAM	32 GB	64+ GB
Storage	200 GB (OS + APP) SSD/NVMe	300+ GB (OS + APP) SSD/NVMe
Network	1 Gbps	1-10 Gbps
Virtualization	Supported on Hyper-V, VMware, Azure VM, or equivalent	

Table 1: Application server requirements

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**NOTE:** If the NMM (Network Model Management) service is implemented, depending on the size and usage (concurrency) of the models, RAM requirements may increase significantly.

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### 3.2 Database Server

Component	Minimum Requirement	Recommended Requirement
CPU	12 cores	24+ cores
RAM	64 GB	128+ GB
Storage	SSD/NVMe with dedicated volumes: 300 GB (OS) 500 GB (DB data + logs)	SSD/NVMe with dedicated volumes: 500 GB (OS) 1000+ GB (DB data + logs)
Network	1 Gbps	1-10 Gbps
Virtualization	Supported on Hyper-V, VMware, Azure VM, or equivalent	

Table 2: Database server requirements

### 3.3 General Notes

- › RAID 10 or SSD-based storage is strongly recommended for database workloads.
- › Time synchronization (NTP) must be configured on all servers.
- › Backup storage must have at least 150% of expected database size.

## 4 Software Requirements

### 4.1 Operating System

Component	Supported Versions	Notes
Windows Server (LTS or GA)	Windows Server 2022 / 2025	Standard
Hypervisor (optional)	Hyper-V 2019/2022 or VMware ESXi	If virtualized deployment
.NET Framework / Runtime	.Net 4 .Net 4.5 .Net 4.5.1 .Net 4.6.2 .Net 4.7.2 .Net 4.8 .Net 7.0 .Net Core 3.1 .Net Core 7.0 .Net Core 8.0 .Net Core 9.0	Depends on application build
PowerShell	Version 5.1 or higher	Required for scripts and automation

Table 3: Operating system components and supported versions

### 4.2 Database Software

Component	Supported Versions	Notes
Microsoft SQL Server	SQL Server 2019 / 2022 (Standard)	Latest cumulative updates required
SQL Features	Database Engine, Agent	All other SQL server features are optional
SQL Server Collation	SQL_Latin1_General_CP1_CI_AS	Mandatory
Database Compatibility Level	SQL Server 2019 (Compatibility Level 150)	Minimum supported (or the oldest version supported) is SQL Server 2016 Service Pack 1 (Compatibility Level 130)

Table 4: Database software components and supported versions

### 4.3 Additional Software Components

Component	Purpose
Microsoft SQL Management Studio	For Microsoft SQL Server access
IIS (Internet Information Services)	Required for web app hosting (on APP server)
Microsoft Edge / Chrome	For administrative web console access and web app front end access

Table 5: Additional software components

## 5 Network and Security Requirements

Item	Requirement
Domain Integration	Supports Active Directory domain-joined servers
Ports	SQL Server: TCP 1433; HTTPS: TCP 443; RDP: TCP 3389;
Firewall	Allow inbound rules for application and DB communication
Certificates	TLS 1.2 or higher for HTTPS; valid CA-signed certificates
Authentication	Windows Authentication and/or SQL Authentication supported

Table 6: Network and security requirements

## 6 Hosting Scenarios

Deployment Type	Description
On-Premises (Physical)	Installed on dedicated physical servers within corporate network
On-Premises (Virtualized)	Hosted on Hyper-V or VMware infrastructure
Data Center (Hosted)	Managed hosting in external data center (also on VM's)
Cloud (Azure)	Hosted as Azure Virtual Machines or Azure SQL Managed Instance

Table 7: Hosting scenarios

## 7 Performance and Scalability

- › Multi-instance scaling supported on application tier.
- › Database can be scaled vertically (CPU/RAM) or migrated to Azure SQL.
- › Use dedicated disks for tempdb, data, and log files.

## 8 High Availability and Failover Configuration

The system supports multiple High Availability (HA) configurations depending on the deployment environment and business continuity requirements.

### 8.1 Application Server Tier

- › Load balancing supported via Windows NLB, F5, Round Robin (RR).
- › Active-active operation with failover <30 seconds.

### 8.2 Database Server Tier

- › Supports SQL Server Always On Availability Groups, Failover Cluster Instances (FCI), Log Shipping.

## 9 Backup and Recovery

Type	Description	Frequency
Database Backup	Full + Differential + Transaction log	Daily / Hourly
Application Files	Configuration files	Daily
System State	OS-level backup	Weekly
VM backup		Weekly

Table 8: Backup and recovery

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## Appendix

### Appendix A) Example of the IPS<sup>®</sup>SYSTEMS Development Environment

#### Server 1 – Database Server:

SQL Server for following databases (single instance):

##### DEV instance

- › IpsEnergy (DB\_DEV)
- › SGDI\_configuration (DB\_DEV)
- › SGDI\_DI (DB\_DEV)
- › IpsEnergyCache (DB\_DEV)
- › IpsEnergyServices\_REST (DB\_DEV)
- › IpsIdentityProvider (DB\_DEV)

#### Server 2 – Application Server:

Application Server with the following IPS components installed:

- › IPS<sup>®</sup>LUNA
- › IPS<sup>®</sup>Publisher
- › IPS Windows Services (oData, NIOM, MRI, OMS, NMM)
- › IPS<sup>®</sup> WEB Services
- › IPS<sup>®</sup>SmartGridDI Windows Services
- › IPS<sup>®</sup>SmartGridDI WEB Service

## **Appendix B) Example of the Development, User Acceptance Test and Production Environment**

To install the complete DEV/UAT/PROD environment, the recommendations are:

### **Server 1 – Database Server: DEVELOPMENT and UAT**

#### **DEV instance**

- › IpsEnergy (DB\_DEV)
- › SGDI\_configuration (DB\_DEV)
- › SGDI\_DI (DB\_DEV)
- › IpsEnergyCache (DB\_DEV)
- › IpsEnergyServices\_REST (DB\_DEV)
- › IpsIdentityProvider (DB\_DEV)

#### **UAT instance**

- › IpsEnergy (DB\_UAT)
- › SGDI\_configuration (DB\_UAT)
- › SGDI\_DI (DB\_UAT)
- › IpsEnergyCache (DB\_UAT)
- › IpsEnergyServices\_REST (DB\_UAT)
- › IpsIdentityProvider (DB\_UAT)

### **Server 2 – Application Server: DEVELOPMENT**

- › IPS<sup>®</sup>LUNA
- › IPS<sup>®</sup>Publisher
- › IPS Windows Services (oData, NIOM, MRI, OMS, NMM)
- › IPS<sup>®</sup> WEB Services
- › IPS<sup>®</sup>SmartGridDI Windows Services
- › IPS<sup>®</sup>SmartGridDI WEB Service

**Server 3 – Application Server: UAT**

- › IPS<sup>®</sup>LUNA
- › IPS<sup>®</sup>Publisher
- › IPS Windows Services (oData, NIOM, MRI, OMS, NMM)
- › IPS<sup>®</sup> WEB Services
- › IPS<sup>®</sup>SmartGridDI Windows Services
- › IPS<sup>®</sup>SmartGridDI WEB Service

**Server 4 – Database Server: PRODUCTION****PROD instance**

- › IpsEnergy (DB\_PROD)
- › SGDI\_configuration (DB\_PROD)
- › SGDI\_DI (DB\_PROD)
- › IpsEnergyCache (DB\_PROD)
- › IpsEnergyServices\_REST (DB\_PROD)
- › IpsIdentityProvider (DB\_PROD)

**Server 5 – Application Server: PRODUCTION**

- › IPS<sup>®</sup>LUNA
- › IPS<sup>®</sup>Publisher
- › IPS Windows Services (oData, NIOM, MRI, OMS, NMM)
- › IPS<sup>®</sup> WEB Services
- › IPS<sup>®</sup>SmartGridDI Windows Services
- › IPS<sup>®</sup>SmartGridDI WEB Service