Requirements

WAY4™ Main Technical Requirements

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Contents

The following notation is used in the document:

- Field labels in screen forms are shown in *italics.*
- Key combinations are shown in angular brackets, for example, <Ctrl>+<F3>.
- Names of screen form buttons and tabs are shown in square brackets, for example, [Approve].
- Sequences for selecting user menu items or context menu items are shown using arrows as follows: "Issuing → Contracts Input & Update".
- Sequences for selecting system menu items are shown using arrows as follows: Database => Change password.
- Variables that differ for each local instance, such as directory and file names, as well as file paths are shown in angular brackets, as in <OWS_HOME>.

Warnings and information are marked as follows:

> ⚠ Warnings about potentially hazardous situations or actions.

> ⓘ Messages with information about important features, additional options, or the best use of certain system functions.

1.   WAY4 System Architecture

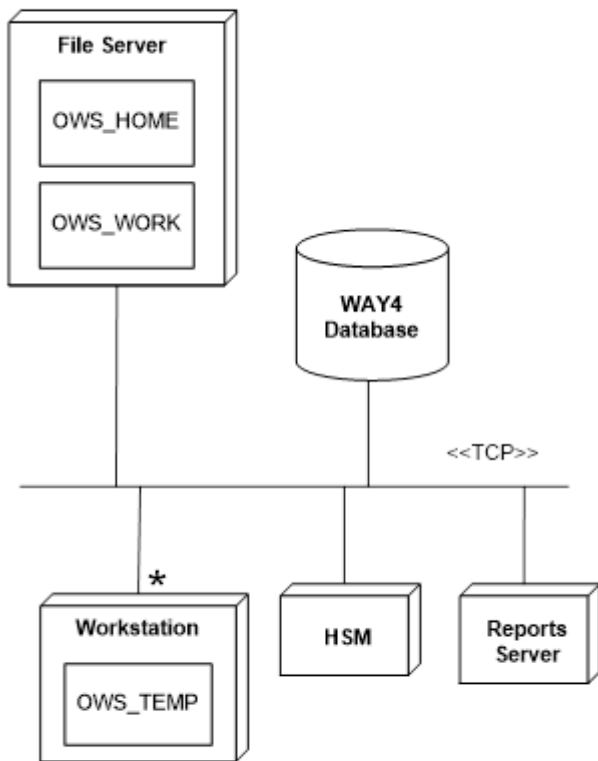WAY4 system architecture is shown in figure.

Fig. WAY4 system architecture

2. Hardware Requirements

The following are general requirements and may be revised after analysis during WAY4 implementation server upgrade. These requirements assume a standard configuration required for issuing 100,000 cards.

2.1 Database Server

System architecture	Unix platform compatible with Oracle Database, with an external disk array
Processor	At least 2 allowing expansion
RAM	At least 4 GB allowing expansion
Disk subsystem	Two 146 GB or more internal storage disks External expandable disk array of 500GB RAID-10, 1000 IOPS or more
Backup	Any device that allows data volumes corresponding to the disk subsystem size to be regularly copied
Software	The hardware must be certified for use with Oracle Database and Unix platform.
Local area network	2 network interfaces, 1000Base-TX Ethernet
Other equipment	Recordable DVD-ROM drive
Quantity	2 sets of equipment or cluster configuration

2.2 Security Hardware

Technical requirements are specified in WAY4™ Data Preparation and Key Management Subsystem Main Technical Requirements.

2.3   Workstation

System architecture	Intel PC
Processor	Any 1 CPU Intel 2.0 GHz or higher
RAM capacity	2 GB or more
Magnetic disk capacity	146 GB hard disk
Local area network	100Base-TX Ethernet
Other equipment	Monitor, keyboard and mouse
Quantity	The number of workstations depends on the number of users

2.4   File Server

System architecture	Intel PC
Processor	Any 2 CPU Intel 2.0 GHz or higher
RAM capacity	4 GB
Magnetic disk capacity	Internal Storage = 146 GB SAS after RAID 10
Local area network	1000Base-TX Ethernet
Other equipment	Monitor, keyboard and mouse
Quantity	2

When Microsoft Remote Desktop Services is used, hardware requirements are determined by the requirements for this Microsoft product. Additionally, requirements for the processor and RAM are added for each session of the DB Manager application:

- 15 sessions per 1 CPU core
- 64 MB of RAM are added for 1 user session.

2.5   Report Server

System architecture	Unix platform compatible with Oracle Reports Server
Processor	At least 2 allowing expansion
RAM	At least 4 GB allowing expansion
Software	The hardware must be certified for use with Oracle Reports Server and Unix platform
Local area network:	1000Base-TX Ethernet
Quantity	1

3.   Software Requirements

3.1   Database Server (Standard Solution)

Operating system from the Unix family (depending on the hardware platform).

Oracle Database Enterprise Edition, bronze support, featuring the following options:

- Database components: Oracle JVM, Oracle XML DB (for Oracle 12c it is installed automatically), Oracle Text (required for WAY4 Web).
- Oracle Partitioning.
- Oracle Advanced Security Option (recommended for compliance with PCI DSS requirements.
- Oracle Diagnostic Pack.

Supported Oracle Database versions:

- Oracle 12c 12.1.0.2 with mandatory installation of the latest PSU (Patch Set Update) and patch 21068213 (ORA-04043). The version of the Oracle DBMS is supported for WAY4 Cards version 03.44 and higher with or without installation of Oracle Real Application Cluster (Oracle RAC).
- Oracle 12c 12.2.0.1 with mandatory installation of the latest RU (Release Updates), patches 25971286 (ORA-04036), 27539876 and 24850493 (Doc ID 2463589.1). The version of the Oracle DBMS is supported for WAY4 Cards version 03.45 and higher without installation of Oracle RAC.
- Oracle 18c with mandatory installation of the latest RU, patch 27385476 (ORA-7445) if Oracle RAC is used.
- Oracle 19c with mandatory installation of the latest RU.

> (i)   Before updating the DB server to Oracle 19c and using the Housekeeping product, check the size of tablespace data files in the *TableSpace Parameters* field of the "Tablespace Group" form (OpenWay → Housekeeping → Configuration → Tablespace Group). The minimum supported data file size is 12 MB for tablespaces with a block size of 32 KB and 7 MB for tablespaces with a block size of 8 KB.
> The Housekeeping product is optional (not included in the basic delivery) and is provided under a separate agreement with OpenWay.

Backup software. Oracle Data Guard or other solution for backing up the database.

3.2   Database Server (Economy Solution)

The specification must be approved by OpenWay.

Operating system from the Unix family (depending on the hardware platform).

Oracle Database Standard Edition 2 (bronze support) featuring the following options:

- Database components: Oracle JVM, Oracle XML DB, Oracle Text (required for WAY4 Web).

The following limitations are applicable:

- Oracle Partitioning is not available – WAY4 has to be installed without partitioning.
- Oracle Advanced Security/TDE is not available – Disk storage level encryption can be used.
- Online index rebuild is not available – WAY4 upgrades have to be run without online index rebuild.
- Online table redefinition is not available – WAY4 Redefinition tool cannot be used.

Supported Oracle Database versions:

- Oracle 12c 12.2.0.1 with mandatory installation of the latest RU, patches 25971286 (ORA-04036), 27539876 and 24850493 (Doc ID 2463589.1).
- Oracle 18c with mandatory installation of the latest RU.
- Oracle 19c with mandatory installation of the latest RU.

Backup software.

3.3   Workstations

The following Microsoft Windows versions are supported:

- Windows 8.
- Windows 8.1.
- Windows 10.
- Windows Server 2012 and Windows Server 2012 R2.
- Windows Server 2016.
- Windows Server 2019.

Oracle JDK (the required version and installation description, see the document "Oracle Java Commercial Updates for WAY4 ™").

Network client for the file server.

Microsoft .NET Framework 4.5 or higher.

Use of Microsoft Software Restriction Policies to set up policies for running DB Manager and WAY4 Manager. For a detailed description of WAY4 standard directories and access privileges for these directories, see the documents "DB Manager User Management" and "WAY4™ User Management".

Oracle Client for the corresponding version of the Windows operating system featuring ODBC Driver. Supported versions: 12.1, 12.2, 18.3 and 19.3 (for Oracle Database 12c 12.2, Oracle Database 18c and Oracle Database 19c).

When using a 64bit operating system:

- The 32bit version of Oracle Client must be installed; otherwise it will be impossible to use ODBC.
- The ODBC source in a 64bit operating system is configured by running C: \Windows\SysWOW64\odbcad32.exe (32bit version of ODBC Administrator tool), and not from the Control Panel.

In the Oracle ODBC Data Source configuration, check the "Bind TIMESTAMP as DATE" box in the "Workarounds" tab. Unless this is done, some SQL requests run from DB Manager and including date conditions may be executed very slowly.

It is recommended that a dedicated report server (see "Report Server") be created to ensure report generation.

3.4   File Server

File server supporting SMB, e.g. Windows Server (2012 R2, 2016, 2019), Linux Red Hat AS/ES 6/7 with a configured SMB server.

The file server must support long filenames and directory names.

3.5   Report Server

Operating system from the Unix family (depending on the hardware platform).

Oracle Reports Services 12 as a component of Oracle Fusion Middleware 12c version 12.2.1.2 or higher.

4. Personnel Requirements

The following are requirements for personnel working with the WAY4 system. The final section of this document shows the requirements set by OpenWay for the period of installation and certification.

4.1 Customer Personnel Requirements

To ensure that WAY4 will operate correctly after its installation at a bank or a processing centre, the Customer organisation must train a minimum number of personnel.

The Customer organisation shall decide how many designated employees are required and their qualifications, depending on their expected workload or anticipated volumes of issuing and acquiring. However, it is strongly recommended that all the personnel be involved in WAY4 operation.

The following guidelines should be observed while selecting personnel to work with WAY4:

- Employees operating WAY4 must have the appropriate level of education and the relevant practical experience.
- All personnel engaged in operating WAY4 must be trained, tested and certified before actually performing operations.
- The moral qualities and psychological profile of each employee should be meticulously examined to prevent possible fraud.
- It is advisable that all employees speak English fluently. It is also recommended that all supervisory personnel, managers and staff members engaged in settling accounts and disputes have good English writing skills.
- Comprehensive training and certification of security personnel, accountants and software, hardware and telecommunications engineers are mandatory.

Cards Operations, Manager	
Number	1
Department	IT
Skills	Management, marketing, IT, accounting basics
English	Fluency in spoken English and good writing skills
Special training	OpenWay training in operating WAY4, training provided by international payment systems' training
Certification	OpenWay certification recommended

Card Operations, Senior System Administrator	
Number	2
Department	IT
Skills	Management, marketing, IT, accounting basics
English	Fluency in spoken English and good writing skills
Special training	OpenWay training in operating WAY4, training provided by international payment systems
Certification	OpenWay certification recommended

Card Operations, System Administrator

Number	2
Department	IT
Skills	IT, data security basics, basic telecommunications, accounting basics
English	Fluency in spoken English and good writing skills
Special training	OpenWay training in operating WAY4, training provided by international payment systems
Certification	OpenWay certification recommended

Clearing and Dispute Management, Manager

Number	1
Department	IT
Skills	Card operations accounting, IT
English	Fluency in spoken English and good writing skills
Special training	Clearing and dispute management training provided by international payment systems
Certification	OpenWay certification recommended

Application Processing/Customer Service

Number	2
Department	Plastic Cards Department
Skills	Computer skills, accounting basics, customer relations
English	Fluency in spoken English and basic writing skills
Special training	Application processing training provided by the Customer
Certification	OpenWay certification recommended

Cards Operations Accounting

Number	1
Department	Plastic Cards Department
Skills	Practical banking experience, card operations accounting, IT basics
English	Fluency in spoken English and good writing skills
Special training	Card operations accounting
Certification	OpenWay certification recommended

Cards and PIN Mailers Issuing, Specialist	
Number	2
Department	IT
Skills	IT, plastic card business basics
English	Fluency in spoken English
Special training	Issuing of plastic cards and PIN mailers, security policies
Certification	OpenWay certification recommended

Voice Authorisation (12/24 hours)	
Number	4
Department	Plastic Cards Department
Skills	Computer skills, customer relations
English	Basic
Special training	Voice authorisation training provided by the Customer
Certification	OpenWay certification recommended

Security Officer	
Number	1-3
Department	IT
Skills	IT, data security, personnel management
English	Fluency in spoken English
Special training	Plastic card technologies, Visa and MasterCard security policies, encryption device operation, card fraud information awareness
Certification	OpenWay certification recommended

Payment Terminal and ATM Service Specialist	
Number	1-2
Department	IT
Skills	IT, plastic card business
English	Fluency in spoken English
Special training	Plastic card technologies, payment terminal and ATM operation, data security basics
Certification	OpenWay certification recommended

Telecommunications Engineer	
Number	1
Department	IT
Skills	Telecommunications, IT, plastic card business
English	Fluency in spoken English
Special training	X.25 Networking, international card authorisation systems and clearing, data security basics
Certification	OpenWay certification recommended

Database Administrator	
Number	1
Department	IT
Skills	Oracle-certified database administrator
English	No special requirements
Special training	Mid-level training with Oracle required
Certification	Oracle certification advisable

Marketing and Commercial Customer Relations	
Number	1
Department	Plastic Cards Department
Skills	Marketing, management, IT, accounting basics
English	Fluency in spoken English
Special training	Plastic card business, acquirer device operation
Certification	

4.2 Personnel Requirements during Installation and System Upgrade

The following bank personnel are responsible for overseeing the installation and upgrade of the WAY4 system and must be available during the whole period of installation, upgrade, and testing:

WAY4 System Administrator	Entire installation period
Oracle Database Administrator	Entire installation period
Telecommunications Engineer	When required
Technical Expert, ATM Servicing	During the entire period of installing and configuring ATMs
Security Officers in possession of the mechanical and electronic keys and encryption equipment documentation, trained in encryption device operation	When required

5.   Environmental Requirements

WAY4 environmental requirements are shown below.

5.1   Operating Conditions

Environmental requirements (personnel, equipment, and premises) for the WAY4 system installed at a bank are as follows:

- Database server and NetServer.
- Computer for issuing plastic cards, printer for printing PIN mailers and embosser.
- System Administrator.
- Operators.
- Equipment and personnel for voice authorization.
- Site for testing ATMs.

The following guidelines must be observed when preparing a site for WAY4 system installation:

- The installation area must be large enough for the unobstructed movement of equipment and personnel and provide access to all equipment.
- All offices on the site must be located close to each other to facilitate communication and for security reasons.
- When security restrictions are established for certain premises on the site, the security guidelines of international payment systems must be strictly observed.
- The entire site must have air-conditioning to avoid equipment overheating and ensure comfortable working conditions.
- Electronic locks must be used throughout the site. Rooms with equipment for card issuing and servers require special security locks.
- Every office on the site must have the necessary furniture.

5.2   Environmental Requirements during Installation

The Customer's organisation must meet all environmental requirements required by OpenWay personnel for WAY4 installation before installation begins. All networks must have been fully configured by this time.