

WAY4™ Main Technical Requirements

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Chapter 1. WAY4 System Architecture

WAY4 system architecture is shown in Fig. 1.

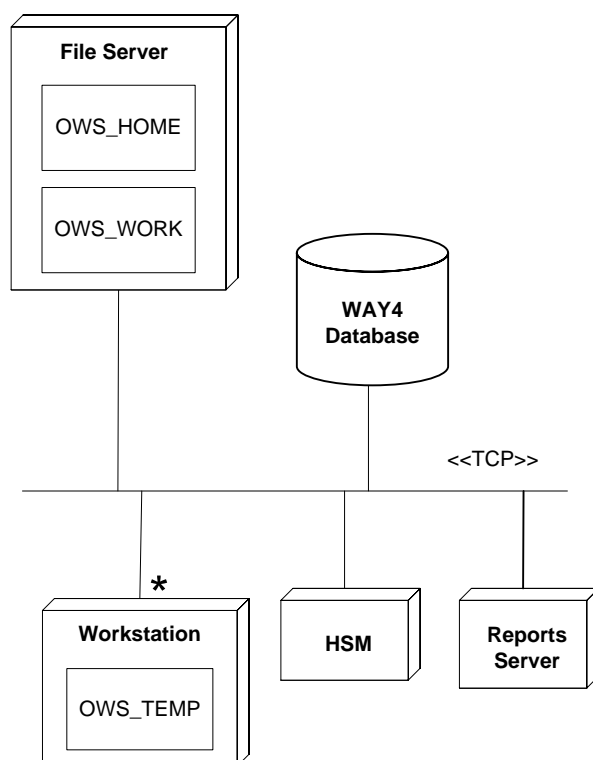


Fig. 1. WAY4 system architecture

Chapter 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.

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

Security Hardware

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

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

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

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

Chapter 3. Software Requirements

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).

Supported Oracle Database versions:

- Oracle 11g 11.2.0.1 or higher. If versions from 11.2.0.3. to 11.2.0.3.3 are used, it is recommended to install patch 13572659 (otherwise, the tool for onlinetable encryption and partitioning may not function). For version 11.2.0.4, patch 17501296 is recommended if Oracle Text enabled.
- 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) and patch 27539876. The version of the Oracle DBMS is supported for WAY4 Cards version 03.45 and higher without installation of Oracle RAC.



Information about the status of Oracle RAC support for Oracle 12c 12.2 can be clarified with the WAY4 vendor starting from April 2018.

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

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 (for Oracle 12c it is installed automatically), 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 12.1.0.2 with mandatory installation of the latest PSU and patch 21068213 (ORA-04043).
- Oracle 12c 12.2.0.1 with mandatory installation of the latest RU and patch 27539876.

Backup software.

Workstations

The following Microsoft Windows versions are supported:

- Windows 7.
- Windows 8.
- Windows 8.1.
- Windows Server 2008 R2.
- Windows Server 2012 and Windows Server 2012 R2.
- Windows 10.

Network client for the file server.

Microsoft .NET Framework 4.5 or higher.

Oracle Client for the corresponding version of the Windows operating system featuring ODBC Driver.

Supported Oracle Client versions: Oracle 11g 11.2.0.1 or higher; if Oracle Database version 11.2.0.3 or higher is used, Oracle Client 11.2.0.3 or higher must be used due to possible problems with changing expired passwords.

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.

File Server

File server supporting SMB, e.g. Windows 2008 R2 / 2012 R2 Server, Linux Red Hat AS/ES 6/7 with a configured SMB server.

The file server must support long filenames and directory names.

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.

Chapter 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.

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	

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

Chapter 5. Environmental Requirements

WAY4 environmental requirements are shown below.

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.

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.