

**Oracle® Hospitality OPERA Property
Management**

Hardware Sizing Guide for IFC8
Release 5.5, 5.6, and higher

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Preface

This document serves as a guide when determining hardware requirements (such as servers, printers, workstations) for hotel installations running Oracle Hospitality OPERA Property Management Versions 5.0.04.03+, 5.5.x (previously known as 5.0.05), 5.6, and higher. The installation requires Oracle WebLogic application server media.

Audience

The Hardware Sizing Guide is intended for customers of Oracle Hospitality OPERA Property Management Versions 5.0.04.03+, 5.5.x, 5.6, and higher. Using this guide, customers can determine their hardware needs and discuss them with the appropriate personnel for installation and implementation.

Customer Support

To contact Oracle Customer Support, access My Oracle Support at the following URL:

<https://support.oracle.com>

When contacting Customer Support, please provide the following:

- Product version and program/module name
- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instructions to re-create
- Exact error message received and any associated log files
- Screen shots of each step you take

Documentation

Oracle Hospitality product documentation is available on the Oracle Help Center at <http://docs.oracle.com/en/industries/hospitality/>

Additional Resources:

- *Network and Communications Guidelines*
- *OPERA Property Management Workstation Setup Guide*
- *OPERA 5 Client and Server Compatibility Matrix*

1 Sizing Methodology Overview

Servers

Servers have three main components:

1. CPU
2. Memory
3. Drives

Each component has factors that determine the proper size:

- At a high level, CPU and memory are driven by the number of users and the type of processing.
- Disk configuration is driven by data size and the necessity for speed of access (reduced IO contention).

The sizes published in this document are based on analysis of empirical data from Beta sites and load testing results. The hardware specifications are based on available hardware at the time of writing.

The number of connections is the sum of the number of PCs with the ability to connect to Oracle Hospitality OPERA Property Management at one time, plus the number of external connection sources, such as third party software and interface PCs.

Examples and generic calculations are included for determining the user equivalent load of CRS interfaces, GDS, and OWS.

Server sizes are designed to support all Oracle Hospitality OPERA Property Management modules in any configuration, as long as the number of connections is not exceeded. Compatibility and performance of Oracle Hospitality OPERA Property Management hotel servers with other products such as Yield Management, Materials Management, or Back Office products has not been evaluated and should be considered separately when specifying servers.

Large Installations (Over 150 Concurrent Connections)

Larger installs classified as greater than 150 users require a detailed analysis for proper sizing. Contact your Oracle account representative for help with large configurations, as there are many possibilities based on customer preferences.

Supported Platforms

For supported platforms, refer to the document *OPERA 5 Client and Server Compatibility Matrix* on the Oracle Help Center.

2 Operating System Platforms

OPERA Versions

This is a hardware sizing document for current versions of OPERA. All references to supported environments and platforms are in reference to OPERA Version 5.5.x, 5.6, and higher. Please contact Oracle Hospitality for recommendations on Hardware Sizing for other versions of OPERA.

Supported Platforms

As of this writing, for OPERA version 5.5, interface installation is only certified on Microsoft Windows 2012r2 or Microsoft Windows 10 Professional.

Microsoft Windows Server 2016 and Windows Server 2019 64 bit (.NET4.7.2 required) is only certified for OPERA Versions 5.6 and above including Database, Application, Single Servers, OXI and IFC8.

For interfaces (IFC8.14 or higher), a PC may be used with Microsoft Windows 10 Professional.

All references to Microsoft Windows 2012 in this document mean Microsoft Windows 2012r2 Standard Server unless otherwise noted.

3 Hardware Guidelines

OPERA Interface PC/Server Hardware Sizing

Interface Workstation or Server (Note 1)	OS	Microsoft Windows 10 Pro Microsoft Windows 2012r2 Microsoft Windows Server 2016 Microsoft Windows Server 2019	<p>This formula can be used in determining the memory for an interface workstation or server.</p> <p>250MB for each installed property interface, defined as voicemail, call accounting, movies, etc.</p> <p>Add 150MB for the IFC controller.</p> <p>See additional considerations*</p>
	CPU	2 Cores	
	Memory (Note 3)	4 GB	
	Min. Free Disk	50 GB	

User Workstation (Note 1)		Minimum	Recommended	
	OS (Note 4)	Microsoft Windows 10 Pro	Microsoft Windows 10 Pro	See note 2 for bandwidth requirements.
	CPU	2 Cores	2 Cores	See note 5 for minimum OPERA versions supported on each OS.
	Memory (Note 3)	3 GB	4 GB	
	Min. free disk	100 MB	200 MB	Microsoft Windows 10 Pro or Enterprise must be X64. Microsoft Internet Explorer 7, 8, 9, 10, and 11 are supported. For Microsoft Internet Explorer 10 and 11, opera must be a minimum Version 5.5 The Microsoft Edge browser is not supported.

Note 1: Minimum workstation configuration supports one OPERA Session and a small application (< 5 MB memory usage). Users who require multiple OPERA sessions or use other large applications may require more RAM and other resources.

Note 2: Bandwidth of 16kb (kilobits) per user minimum available to OPERA for WAN connections. If the WAN circuit is used to transport other software like email, web browsing, etc., then it is highly recommended that QOS (Quality of Service) software or a dedicated circuit be used to ensure that mission critical applications have priority use of the bandwidth. For latency information, refer to *Network and Communications Guidelines* on the Oracle Help Center.

Note 3: Workstations installed with personal firewall software and/or anti-virus clients could require additional memory.

Note 4: Both 32bit and 64bit workstations are supported unless otherwise noted. On 64bit workstations, the 32bit browser must be used.

Note 5: OS Minimum Supported OPERA version:

Microsoft Windows Server 2012 and Microsoft Windows 10 Professional: 5.5

Microsoft Windows Server 2016 and Microsoft Windows 10 Professional: 5.6

Microsoft Windows Server 2019 and Microsoft Windows 10 Professional: 5.6

Additional Considerations

Hardware Requirements

IFC8 is a Windows based 32-bit program written in Visual Basic 6 using Active X Components and .NET Components.

The Platforms supported by the latest releases of IFC8 are:

Microsoft Windows Server 2012 and Microsoft Windows 10 Professional: 5.5

Microsoft Windows Server 2016 and Microsoft Windows 10 Professional: 5.6

Microsoft Windows Server 2019 and Microsoft Windows 10 Professional: 5.6

Server Operating Systems will not be specifically tested by development, as IFC8 is designed to run on a separate dedicated PC running a Workstation-OS

However, since OS 2012, 2016 and 2019 use the same kernel as a Client OS, it is most likely that no problems should be found when running IFC8 on a server OS.

The following table contains the recommended hardware requirements.

Hardware Requirement	Description
Processor	Pentium Core 2 (2.8 GHz)
RAM	4 to 8 GB recommended with a minimum of 3 GB
Hard disk	250 GB without drive partitioning / 50 GB free for Hotel Property Interface application & Log files
Network card	100/1000
Serial ports	The serial port connections depend on the connecting vendor system or interface. You must verify the connecting system requirements. You can use onboard, USB to Serial port, or box connections.

Memory Requirements

The following table contains the memory requirements for the software.

Memory Requirement	Software
256 MB	Microsoft Windows operating system
250 MB	For each Hotel Property Interface instance

4 Guidelines for Determining User Counts

The best method to determine the correct site sizing is to obtain actual numbers from existing systems and business input for changes that occur after the Oracle Hospitality OPERA Property Management system is deployed. Sometimes it is not possible to gather all required information for a variety of reasons such as a new site, expansion, or no previous comparable system.

Here are some guidelines to follow to estimate the hardware sizing. The numbers obtained with these methods should be reviewed by Oracle and the customer to ensure everyone understands the assumptions that were made and make adjustments as necessary.

1. Application users:
 - a. Each time a user launches a browser and logs into OPERA, it counts as a User.
 - b. OPERA launches Child sessions during normal use of the application. These sessions are already included in the sizing.
 - c. As a rule of thumb, OPERA PMS user count averages at about 10% of the number of rooms. Slightly higher for high-end properties, and slightly lower for Express type hotels. PMS user counts <5% or >20% of the number rooms may be fine, however they warrant a double check with the customer to ensure these numbers are accurate.
 - d. S&C and ORS user counts are very site dependent and need to be gathered from the customer.
2. Property interfaces:
 - a. Count one equivalent OPERA user for 4 property interfaces in database sizing.
 - b. On IFC8 installations, count one equivalent OPERA user for 4 property interfaces in application server sizing.
3. 2 way CRS interface:
 - a. 6 equivalent OPERA users are considered per 1000 rooms in database sizing. This general rule uses two formulas: 1) 1200 reservation messages per day per user and 2) the 100 bookings per day per user. These figures are empirically derived from production sites and load testing information. As block messages can hold a large number of details, block messages need to be converted to equivalent reservation messages. A 10 day block with 20 rooms would equate to 100 reservation messages.
 - i. $\frac{\# \text{ Rooms} * 7 \text{ Msgs per room per day}}{1200 \text{ msg per day per user}}$ = equivalent users.
 - ii. $\frac{\# \text{ Rooms} * \text{avg Stay Length} * \% \text{ occupancy}}{100 \text{ bookings per day per user}}$ = equivalent users.
 - b. Retention of up to 4 days of interface messages is included in the server disk sizing. If the retention period for OXI messages is increased, additional disk space is needed.
100 Rooms would require ~ 50MB per additional day of retention.
4. OPERA Electronic Distribution Systems (OEDS), such as GDS, OWS, ADS:

-
- a. These interfaces can have a large effect on sizing since the actual load is generated by basically uncontrolled end users. It is very important that the customer understand how peaks in load from these interfaces can affect sizing / performance.
 - b. In the past, the calculation of 250 messages = 1 OPERA user was used. Different versions of OPERA and different rate configurations affect the cost of an OWS message so this number is subject to changes in each customer location. Generally, take the cost (measured in logical reads) of 1 general availability lookup message (X) and use the following formula to determine the number of messages/hour that equal 1 OPERA user:
 - i. $1,200,000 / X = \text{Messages per hour}$
 - c. If other means are not available to measure / estimate the message rate from these interfaces, use the following formula. Typical electronic traffic occurs in peaks. Empirical analysis indicates that 80% of all traffic occurs in 6 hours. For calculation purposes, assume all traffic occurs in 6 hours.
 - i. $(\text{Bookings per day from interface} * \text{Look to book ratio for the interface}) / 6 = \text{avg peak msgs per hour}$.
Est. Look to book ratios. OWS 1000, GDS 200.

5 Backup and Antivirus Information

Q. What backup solutions are supported?

A. Oracle does not provide support for any customer backups. Third party products such as Symantec Backup Exec can be used to perform hot backups, with the use of an Oracle agent, but are not supported by Oracle.

Q. What exceptions need to be added to any Antivirus software for OPERA Servers?

A. Please exclude the following folders:

C:\Oracle\Oradata

D:\Oracle\Oradata

D:\Oracle\Admin

File types: .ARC, .CTL, .DBF, .ORA and, RDO

Q. What folders need to be backed up to restore Property Interfaces?

A. The XML information used by the interface program are stored in C:\ or D:\Fidelio. If you have SDC then additional folders may be present such as C:\ or D:\Elevon or SDC which needs to be backed up to restore credit cards.

Q. What ports does OPERA use?

A. Please refer to the section entitled *Overview of Required Network Communication Ports* later in this document.

6 Introduction to Network Design

One way to categorize the different types of computer network designs is by their scope or scale. For historical reasons, the networking industry refers to nearly every type of design as some kind of area network. Common examples of area network types are:

- LAN - Local Area Network
- WLAN - Wireless Local Area Network
- WAN - Wide Area Network
- MAN - Metropolitan Area Network
- SAN - Storage Area Network, System Area Network, Server Area Network, or sometimes Small Area Network
- CAN - Campus Area Network, Controller Area Network, or sometimes Cluster Area Network

LAN and WAN were the original categories of area networks, while the others have gradually emerged over many years of technology evolution. We will only be covering those networks that are pertinent to OPERA.

Local Area Network (Internal Network)

A local area network (LAN) supplies networking capability to a group of computers in close proximity to each other such as in an office building, a school, or a home. A LAN is useful for sharing resources like files, printers, games or other applications. A LAN in turn often connects to other LANs, and to the Internet or other WAN.

Most local area networks are built with relatively inexpensive hardware such as Ethernet cables, network adapters, and hubs. Wireless LAN and other more advanced LAN hardware options also exist.

Demilitarized Zone (DMZ)

In a DMZ configuration, most computers on the LAN run behind a firewall connected to a public network like the Internet. One or more computers also run outside the firewall, in the DMZ. Those computers on the outside intercept traffic and broker requests for the rest of the LAN, adding an extra layer of protection for computers behind the firewall.

Traditional DMZs allow computers behind the firewall to initiate requests outbound to the DMZ. Computers in the DMZ in turn respond, forward or re-issue requests out to the Internet or other public network, as proxy servers do. (Many DMZ implementations, in fact, simply utilize a proxy server or servers as the computers within the DMZ.) The LAN firewall, though, prevents computers in the DMZ from initiating inbound requests.

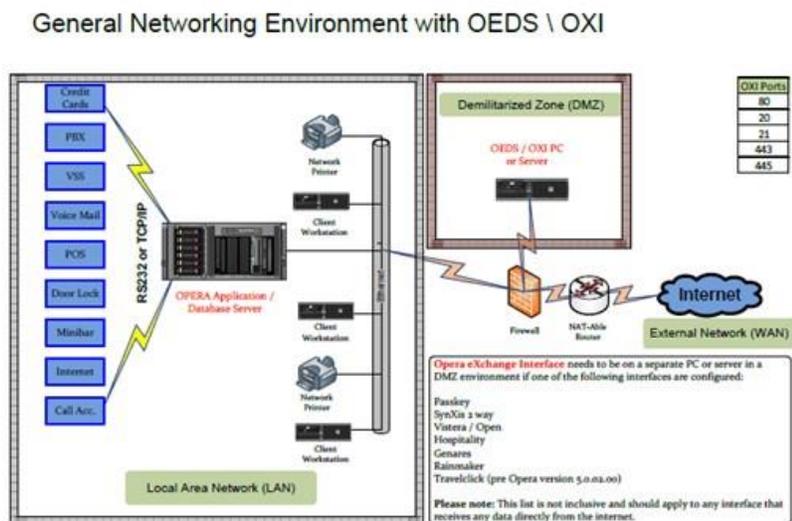
DMZ is a commonly-touted feature of home broadband routers. However, in most instances these features are not true DMZs. Broadband routers often implement a DMZ simply through additional firewall rules, meaning that incoming requests reach the firewall directly. In a true DMZ, incoming requests must first pass through a DMZ computer before reaching the firewall.

External Network

A WAN spans a large geographic area, such as a state, province or country. WANs often connect multiple smaller networks, such as local area networks (LANs) or metro area networks (MANs).

The world's most popular WAN is the Internet. Some segments of the Internet, like VPN-based extranets, are also WANs in themselves. Finally, many WANs are corporate or research networks that utilize leased lines.

High-Level Network Diagram



Overview of Required Network Communication Ports

Port Number	Configurable	Always Required	Protocol	Used for / Comments	Servers
20 / 21	N	N	TCP	Standard FTP Ports	All
22	N	N	TCP /UDP	Standard Secure Shell (SSH) Port	All
23	N	N	TCP	Standard Telnet Port	All
25	N	Y (DB Servers)	TCP	Default SMTP Port / Is required on DB server	DB
		N (Other Servers)		To mail server configured in OPERA	
80	Y	Y	TCP	Default HTTP Port / Can be changed (OappCfgEd)	APP
				Workstations to Application Server	DB
				Interface Servers (IFC 8) to Application Servers	IFC
				Database Servers to Application Servers	OXI
				Database Servers to internet IP addresses when using certain options (e.g., Address)	
				Certain OXI interfaces also need this port	
443	Y	N	TCP	Default HTTPS Port / Can be changed (OappCfgEd)	APP
				Workstations to Application Server	DB
				Interface Servers (IFC 8) to Application Servers	IFC
				Database Servers to Application Servers	OXI
				Database Servers to internet IP addresses when using certain options (e.g., Address)	
				Certain OXI interfaces also need this port	
445	N	Y (App Server) (Note 1)	TCP / UDP	Microsoft File Sharing / Active Directory / Share Port	APP

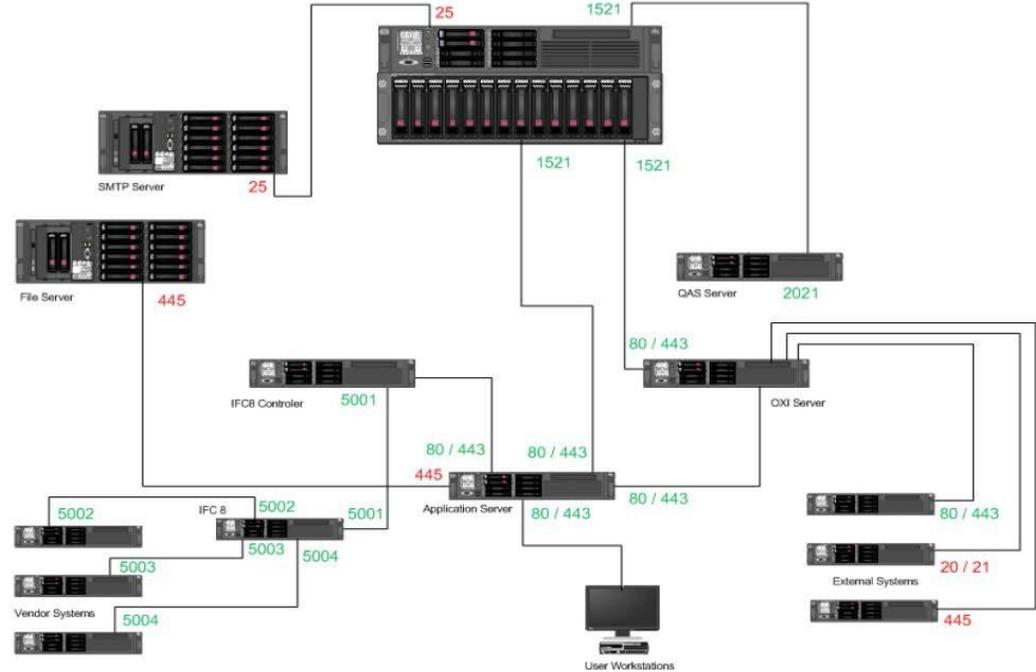
Port Number	Configurable	Always Required	Protocol	Used for / Comments	Servers
		N		Between Application and File Server	FILE
1521	Y	Y (DB Servers)	TCP	Default Oracle Listener Port (Note 2)	DB
		N (Other Servers)		Application Servers to DB Servers	APP
				Old Interface Servers (IFC7) to DB Servers	IFC
				Certain OXI Servers to DB Servers	OXI
				Other Servers that require an Oracle Client / SQLNet connection to the DB	OTH
1526	Y	N	TCP	Commonly used alternative Oracle Listener Port (Note 2)	DB
				Other commonly used ports are 1522, 1571, 1581	
1630	Y	N	TCP	Oracle Connection Manager Default Port	DB
				In some rather rare scenarios it is needed to configure OCM on the DB Servers	
3389				From DB Servers to Application Servers (QAS Servers)	APP
	N	N	TCP	Microsoft Remote Desktop Port	All
4400	Y	Y	TCP	This Port is commonly used as an alternative HTTP Port (see 80)	APP
					DB
					IFC
					OXI
5001	Y	Y (IFC8 Servers)	TCP	The Default Port used for connections from IFC8 to the IFC8 Controller	IFC
		N (Other Servers)			
5002 to 5020	Y	Y (IFC8 Servers)	TCP	Communication Ports between IFC8 and Third Party Systems (Note 3)	IFC
		N (Other Servers)			

Note 1: Only needed when a UNC configuration is used (e.g., the export folder) between Application Server and File Server.

Note 2: Only the initial communication takes place on this port. The connection will be handed over using a different port above 1024. In case your Firewall does not support SQLNet, ports above 1024 will need to be opened.

Note 3: In most cases the IFC8 Server is TCP/IP server and the third party vendor is TCP/IP client - OPERA decides the ports used. In rare cases the third party vendor is TCP/IP server and OPERA is TCP/IP client - the vendor decides the ports used.

Network Data Graphical View



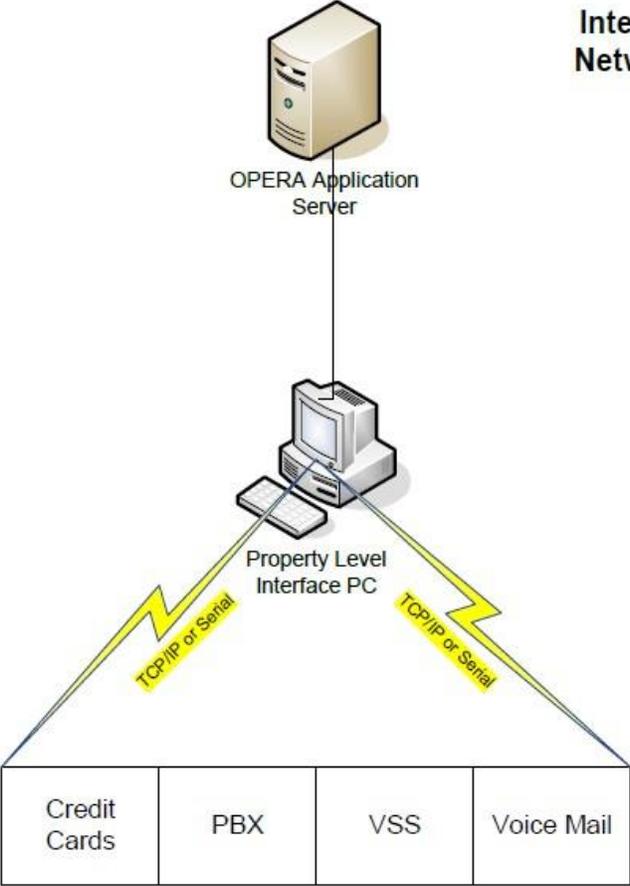
7 Property Level Interfaces

OPERA supports thousands of property level interfaces. In many cases these require a physical connection (via COM port) to a machine running the OPERA Interface Controller software (an Interface PC) that handles translation between the physical connection and the OPERA Application Server. To allow for multiple COM port connections to a single machine, a multiport serial card is often used to expand the COM port capacity of the Interface PC. In other cases, the physical connection may be via TCP/IP to the same Controller. An Interface PC is generally limited to eight Interfaces as this is where the expanded COM port capacity is usually exhausted.

In some cases, it is possible to connect COM ports from a different machine to an interface PC running the Interface Controller. In such a configuration, port 5001 is generally configured from TCP/IP transmission from the machine hosting the COM port to the machine hosting the Interface Controller. For TCP/IP interfaces using the IFC PC as the TCP/IP server, ports 5002 through 5020 are usually configured. If the equipment on the interface side will be the TCP/IP server, then please check with your vendor.

All equipment relating to Property Level Interfaces should be a member of the Internal Network, should NOT be located in the DMZ, and should not be accessible from the internet.

**Internal
Network**



8 Virtualization

Support for Virtual Environments

Oracle has not certified any of its products on any VMware or other virtualization environment. Oracle Support will assist customers running Oracle products in virtual environments in the following manner: Oracle will only provide support for issues that either are known to occur on the native OS, or can be demonstrated not to be as a result of running in a VM (virtual machine).

If a problem is a known Oracle issue, Oracle support will recommend the appropriate solution on the native OS. If that solution does not work in the VM environment, the customer will be referred to the VM vendor for support. When the customer can demonstrate that the Oracle solution does not work when running on the native OS, Oracle will resume support, including logging a bug with Oracle Development for investigation if required.

If the problem is determined not to be a known Oracle issue, we will refer the customer to the VM vendor for support. When the customer can demonstrate that the issue occurs when running on the native OS, Oracle will resume support, including logging a bug with Oracle Development for investigation if required.

Oracle has not certified any of its products on VMware or any virtual environment.

More information about virtualization is at the following URL:

<http://www.oracle.com/technetwork/middleware/ias/oracleas-supported-virtualization-089265.html#vmwaresupportpolicy>