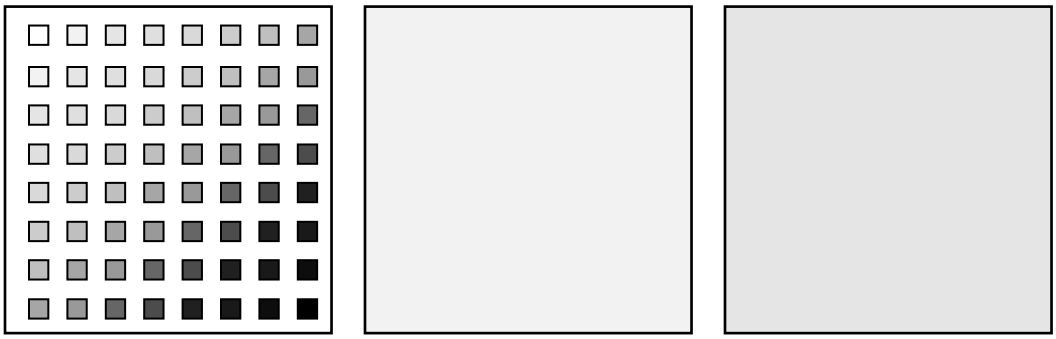
IBM

Database Cloud Server

Installation Guide



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Abstract

This document covers the installation of the Vendita Database Cloud Server in a customer data center. The installation occurs after the Database Cloud Server has been configured, provisioned and tested, and only involves the installation of the Database Cloud Server in a rack, and establishment of network and power connections.

The document assumes that the reader of this document is preparing to take delivery of the Database Cloud Server.

Audience

The target audience for this document is technical personnel who have skills commensurate with installing server hardware in a data center. This document describes the steps need for installing the Vendita Database Cloud Server in a data center.

Resources

The goal of this document is to effectively communicate the installation of the Vendita Database Cloud Server. To make this easier, a comprehensive glossary is provided at the end of this document, which defines terms and concepts covered in this document, as well as terminology associated with the Database Cloud Server. These terms and concepts are industry standard, and cover both database software and servers, in addition to server hardware and operating systems.

Appendix A summarizes all documentation available from IBM Corporation that is associated with the installation of the Database Cloud Server. This documentation may be referenced at some point in this document.

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Introduction

The Vendita Database Cloud Server delivers the capability of running Oracle Database (RDBMS) on IBM Power Systems™ servers with POWER® processors, in a self-contained appliance. The Database Cloud Server builds on the capability delivered by other appliances and engineered systems that deliver an appliance experience for Oracle Database by providing the shortest installation time possible.

The Database Cloud Server is configured at an integration center where it undergoes testing before it is shipped to a customer data center. When the Database Cloud Server arrives at a customer data center, it can be brought online faster than any other database server commercially available today, due to the configuration and testing that occurs at the integration center.

In this document, the process associated with the installation of the Database Cloud Server in a customer data center is reviewed in detail.

Customer success is the primary goal of Vendita. If you have questions or concerns in this process please don't hesitate to contact Vendita help line at (419) 882-4030.

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Preparing for the Database Cloud Server

It is important to perform planning and preparation before you receive the Database Cloud Server, so that when the Database Cloud Server arrives at your data center, it can be brought online immediately.

In the next section, pre-installation requirements are specified that must be followed explicitly. You should read, understand and follow the instructions in the “Pre-Installation Requirements” section.

Technical Delivery Assessment

Vendita generates a “Technical Delivery Assessment”, also known as a “TDA”, for every Database Cloud Server order. This document provides information needed for customers to complete the pre-installation requirements. The Database Cloud Server TDA is referenced throughout the remainder of this guide.

The Database Cloud Server TDA includes information on the following:

1. Rack space required, expressed in terms of rack units for installation.
2. Network addresses required for management and data networks, along with other network setup information, including VLAN id, default gateway and subnet mask.
3. Cable schedule for all network and power cables.
4. Rack-based map of all servers for installation, including all IBM POWER® servers, and Hardware Management Console (HMC) hardware.

Pre-Installation Requirements

This section contains pre-installation information for the Database Cloud Server, organized into the following categories:

- Physical Mounting
- Network Requirements
- Power Requirements
- Environmental Requirements

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Physical Mounting

The pre-installation kit provided specifies the total rack space that will be required for the complete installation of all hardware ordered.

In the rack where you intend to install the Database Cloud Server, please ensure that this amount of space is available.

The Database Cloud Server installation includes several hardware components including the following:

- One or more IBM POWER8™ processor-based servers.
- One or more IBM storage drawers (optional) or,
- One or more IBM storage server (optional) or,
- One or more storage switch (optional) or,
- One Hardware Management Console (optional).

Please note the following regarding each of these components:

1. IBM storage drawers are optional, and are included only in systems with storage requirements that necessitate the inclusion of this product. A storage drawer is associated with one, and only one IBM Power Systems™ server, which has direct connectivity to server and must be mounted directly below the server.
2. Storage servers, including the IBM V5000 and storage switches are optional and are included only in systems with storage requirements that necessitate the inclusion of this product. Storage servers can be shared among IBM Power Systems™ servers.
3. The Hardware Management Console is optional. It is used to perform management functions for the IBM Power Systems™ server. While it is not required that the Hardware Management Console be mounted next to the IBM Power Systems™ server(s) it supports, that is the preferred setup for the sake of simplicity and organization.
4. Both the IBM Power Systems™ server and the Hardware Management Console include DVD drives and USB ports. Do not insert disks into the DVD drives or attach anything to the USB port, except for when directed to do so by these instructions. Ensure that no physical obstructions exist that will impede the opening of the DVD drives.
5. The IBM Power Systems™ server and Hardware Management Console include a wire management armature. The purpose of the wire management armature is to simplify the movement of the

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server hardware on their mounting tracks. The wire management armature is optional, and Vendita does not make any recommendation regarding the usage of this equipment. IBM documentation should be consulted regarding the proper installation and usage of the wire management armature.

6. Do not open the top of the Power Systems server and Hardware Management Console, as there are no user serviceable components inside.
7. Physical installation of the IBM Power Systems™ server and Hardware Management Console server hardware is detailed in instructions provided by IBM. These instructions include steps on mounting the hardware, in addition to recommendations that must be followed to ensure your safety.

Network requirements

The Database Cloud Server requires connectivity to your data center's local area network. As part of the ordering process for the Database Cloud Server, Vendita collects information regarding the network addresses for your Database Cloud Server. The IBM Power Systems™ server and Hardware Management Console will have all network addresses and hostnames configured when delivered.

There are two types of network connections used by the Database Cloud Server, and those are covered in the next two sections.

If you are not familiar with computer network terminology or have difficulty understanding network information, you should confer with a network engineer within your organization.

Network Equipment and Cabling

Network connectivity for the Database Cloud Server and for the optional Hardware Management Console requires direct connectivity to network switch equipment. Customers are responsible for supplying all network switch equipment and network switch configuration for the Database Cloud Server and Hardware Management Console.

Customers must provide all network cables used to connect the Database Cloud Server and optional Hardware Management Console to a network switch equipment.

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The network switch equipment is typically mounted in the same rack as the Database Cloud Server, at the top of the rack. These switches are commonly referred to as “top-of-rack” switches, or TOR switches.

Management Network

The management network is used for accessing the IBM Power Systems™ server flexible service processor. The flexible service processor is a management computer built into the IBM Power Systems™ server. IBM Power Systems™ servers require connectivity to a management network, allowing access to the flexible service processor.

The flexible service processor has two network ports. Both ports must be connected to a network switch. The ports should be on the top-of-rack switch in the rack where the Database Cloud Server is mounted. The ports should be configured for the VLAN id of the management network. Please refer to the documentation for the pre-installation kit for the VLAN id of the management network, and for the network addresses for the flexible service processor network connections.

The Hardware Management Console requires a network port that necessitates connectivity to the top-of-rack network switch where the Hardware Management Console is mounted. The port should be configured for the VLAN id of the management network. Please refer to the documentation of the pre-installation kit for the VLAN id of the management network, and for the network address of the Hardware Management Console.

Data Network

The data network is used for connectivity of the Database Cloud Server to data networks that enable access to the servers and databases on the Database Cloud Server. The Database Cloud Server has at least two network interface cards (NICs) and each NIC has four network ports.

A connection is required from at least one network port on each NIC to the top-of-rack network switch where the Database Cloud Server is mounted. The ports on the top-of-rack switch should be configured for the VLAN of the data network.

Please refer to the pre-installation kit documentation for the VLAN id of the data network, and for the network addresses of the data network ports.

Power Requirements

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The minimum power requirement for the Database Cloud Server is a 20-amp service. The Database Cloud Server requires 120VAC.

It is recommended that the rack where the Database Cloud Server is located have 30 amp service, as well as six power distribution units (PDU).

The cable type for the Database Cloud Server connection and for the optional Hardware Management Console is specified on the pre-installation kit documentation cable schedule.

Multiple Database Cloud Server Installation

A multiple Database Cloud Server installation has more than one IBM Power Systems™ server, excluding the Hardware Management Console.

These installations could consist of multiple IBM POWER® S824 servers, multiple IBM POWER® E850 servers, or a combination of IBM POWER® S824 and IBM POWER® E850 servers, for example. The pre-installation kit treats each IBM Power Systems™ server as a separate installation project, and organizes information together based on each individual server on the order.

In a multiple Database Cloud Server installation, servers may reside on different data networks. However, all servers must reside on one and only one management network.

The Hardware Management Console can manage multiple IBM Power Systems™ servers, and server as a single point of control for the entire installation.

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Shipment and Delivery

Shipment Information

The Database Cloud Server will be shipped to your data center using a transport company that is experienced in shipping server equipment.

Prior to shipment of the Database Cloud Server, you must complete the shipment information form with all information required. This form is provided with the pre-installation kit, and includes all information for returning it to Vendita.

Unpacking and Inspection

When the Database Cloud Server and Hardware Management Console arrive at your data center, inspect the shipment for any signs of shipping damage, and do not unpack the equipment if damage has occurred.

A packing list will be provided to you electronically. Be sure all items detailed in the packing list are contained within the shipment.

In the event that any items are missing from the shipment, or damage has occurred, please contact Vendita immediately at (419) 882-4030.

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Installation

When your Database Cloud Server order arrives at your data center, the equipment should be installed as quickly as possible, as prolonged storage of the equipment is best avoided.

Installation of the Database Cloud Server covers the following activities:

1. Physical installation of all hardware, including IBM Power Systems™ servers, optional Hardware Management Console, and optional storage drawers.
2. Cabling installation between IBM Power Systems™ servers and optional storage drawers, if used.
3. Installation of management network cables.
4. Installation of data network cables.
5. Installation of power cables for each server.
6. Power-on procedure for the system.

Installation Kit

Provided with the Database Cloud Server order is an envelope labeled “Installation Kit” that includes printed materials from Vendita and IBM Corporation related to the installation of the Database Cloud Server and Hardware Management Console.

The sections that follow detail the contents of the installation kit.

Physical Installation

The installation kit includes the following:

1. Instructions from IBM Corporation for the physical installation of the Hardware Management Console in the rack.
2. Instructions from IBM Corporation for the physical installation of the IBM Power Systems™ servers in the rack.
3. Diagram indicating the required physical locations for each server.
4. Order of installation for each server.

Follow the IBM Corporation instructions for installing servers. These instructions must be followed carefully to avoid damaging the server hardware during installation, and to avoid physical injury. A failure to follow these instructions could result in equipment damage and physical injury.

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Cable Installation: IBM Power Systems™ Servers to Storage Drawers (Optional)

If your order includes optional storage drawers, you will receive the following documentation in the installation kit:

1. Cable schedule of cables required for connectivity from server to storage drawer(s). The cable schedule lists each cable individually, and provides a physical description of each cable, a functional description of each cable, and both endpoints for each cable.
2. Checklist for installation of cables between server and storage drawers.

Note that systems ordered with storage drawers that are shipped in a pre-built enclosure will have all cables to storage drawers factory installed, and this step can be skipped.

Cable Installation: Management Network Cables

All installations require management network cables for connectivity from the IBM Power Systems™ server flexible service processor to the top-of-rack switch, and from the optional Hardware Management Console to the top-of-rack switch.

The installation kit includes the following documents in order to facilitate this activity:

1. Cable schedule for all management network cables. The cable schedule lists each cable individually, and provides a physical description of each cable, a functional description of each cable, and both endpoints for each cable.
2. Checklist for installation of management network cables.

Cable Installation: Data Network Cables

All installations require data network cables for connectivity from the IBM Power Systems™ server Network Interface Cards to the top-of-rack switch. The installation kit includes the following documents to facilitate this activity:

1. Cable schedule for all data network cables. The cable schedule lists each cable individually, and provides a physical description of each cable, a functional description of each cable, and both endpoints for each cable.
2. Checklist for installation of management network cables.

Cable Installation: Power Cables

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All installations require connections from servers to the power distribution units located in the rack. The installation kit includes the following documents to facilitate this activity:

1. Cable schedule for all power cables indicating cable type, physical description of each cable, and both endpoints for each cable.
2. Checklist for installation of power cables.

System Power-On Procedure

Powering on the system is accomplished by following the procedure outlined in the installation kit. These steps include:

1. Power on optional Hardware Management Console.
2. Power on optional storage drawers.
3. Power on IBM Power Systems™ servers.

By default, all servers are configured to auto start when the IBM Power Systems™ server is powered on. All Oracle Database software is configured to auto start.

System Power-Off Procedure

The Database Cloud Server may need to be powered down occasionally for a variety of reasons.

The power-off procedure can be accomplished by several means, including the command line interface for each Dynamic Logical Partition (DLPAR) and Virtual I/O server, or by using the optional Hardware Management Console to shutdown each partition.

Detailed instructions on powering the system off are included in the installation kit.

Diagrams Included In the Installation Kit

The installation kit includes a system physical detail diagram that depicts the servers and physical installation details, including network and power cables.

The installation kit includes a logical detail diagram showing all DLPAR, virtual I/O servers and database software installations.

The installation kit includes a storage detail diagram depicting all storage, and the storage topography, including mappings related to physical disks to IBM Logical Volume Manager entities and the relationship of these to DLPAR.

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Install Servers in Rack – Systems NOT shipped in enclosure

Having followed the steps outlined in the previous section of this document “Preparing for the Database Cloud Server,” proceed with the installation of the optional Hardware Management Console and Database Cloud Server servers, in addition to the optional storage drawers.

The aforementioned installation kit provides all information required for installation of the servers.

Follow the order of installations carefully, and the IBM guidelines with respect to safety and physical installation of server equipment.

Install Cabling

Once servers are installed in the rack, proceed with the installation of the optional storage drawer(s), management network, data network and power cables to servers.

The aforementioned installation kit provides all information required for those installation actions. Carefully follow the installation order shown below:

1. Optional cable between server hardware and storage drawer(s).
2. Management network cables.
3. Data network cables.
4. Power cables.

System Power-Up

Having completed all installation activities, the system can be powered on. The aforementioned installation kit includes a power-up procedure.

The power-up procedure can take as long as 15 minutes to complete as server hardware powers on, operating systems boot, and database software starts.

Once the system power-up procedure has been completed, the following access is available:

1.) Unix® command line interface connectivity to all DLPAR, VIO servers, and optional Hardware Management Console.
2.) Oracle TNS-level access to any running databases on the DLPAR. Be sure to properly configure all JDBC connections or tnsnames.ora files for this to occur.
3.) Application-level access to all databases.
4.) Access to web-based user interface for Oracle Enterprise Manager.
5.) Access to Hardware Management Console web-based user interface.

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System Login Credentials

System login credentials are gathered during the pre-sales process and are used in provisioning your system. This includes login credentials for LPARs, Oracle databases, virtual I/O servers, and hardware management consoles. This information is collected with the hardware

System login credentials for accessing the all servers is available in a password-protected document transmitted separately to a designated employee in your organization.

This information should be safeguarded at all times. You should carefully change all passwords at your earliest convenience, and use appropriate password management software for these passwords.

Be advised that Vendita cannot restore access to a DLPAR should a root password on a server be lost or forgotten.

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Installation Complete

Having followed the instructions outlined in this document the installation of your Database Cloud Server is complete, and the database servers are ready for usage.

The normal time requirements for the major tasks described in this document are:

- Pre-installation tasks: 2 hours
- Physical installation tasks: 2 hours
- System startup: 20 minutes

Your installation might include additional Oracle software installations to facilitate a database migration. Be advised that database migrations are not covered in this document.

If you have questions or comments regarding this documentation, please contact Vendita.

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Glossary

The following glossary contains terms used within this publication.

Term	Technology	Definition
ACFS	Oracle	ASM Clustered File System
Advanced Memory Expansion	IBM	A feature of AIX® that allows memory to be compressed up to 2X with the addition of physical memory.
AIX®	IBM	AIX®® is IBM's version of Unix®. AIX® is an abbreviation for Advanced Interactive eXecutive.
ASM	Oracle	Automatic Storage Management – A file system designed specifically to store database files in a more efficient manner. Used in place of a cooked file system.
Bare Metal	General	A term for a server with no virtualization, where the server operating system interacts directly with physical entities, like network cards, memory and storage.
Brocade	General	Brocade Corporation is the most significant manufacturer of SANs and associated technologies.
Cooked File System	General	Any of the file systems maintained by an operating system, including *JFS*, *ext3*, NTFS and MS DOS.
Core	General	Refers to a *CPU* core, a single element of processing in a CPU. Different CPU families have different core counts. The POWER8 processor has eight cores per CPU. Intel® server processors typically have two cores per CPU.
Correlated failure	General	A failure resulting from a common manufacturing defect affecting products manufactured at a similar time at a common manufacturing facility, or at different facilities using identical manufacturing processes. See appendix B for the impact of correlated failures on storage.
CPU	General	Central Processing Unit – Refers to the *POWER* or Intel® processor that performs computation within a server.
Dynamic Logical Partition (DLPAR)	IBM	A server created and maintained on a Power Systems server. DLPARs are similar to, but not the same as servers or guest partitions created with other virtualization technologies, like VMWare.
Exadata	Oracle	Oracle Exadata is one of Oracle's Engineered Systems designed to run Oracle RDBMS. The Oracle Exadata features the Exadata storage server.
EXT3 / EXT4	General	File systems commonly used by Linux®-based servers.
Fabric	General	Refers to the internal connection structure of a *SAN*, which resembles a textile fabric. Fabrics support a multitude of paths between connection points.
FCOE	General	See Fibre Channel Over Ethernet
Fibre Channel	General	Common protocol used for connecting servers to storage, uses fiber fiber optic cables instead of copper for increased performance.
Fibre Channel Over Ethernet	General	An implementation is Fibre Channel using Ethernet instead of fiber fiber optic cables.

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File System	General	A file system is the low level organization of data on a disk. File systems are maintained by operating systems in most cases. *Oracle Grid Infrastructure* has a file system designed specifically for databases.
Frame	General	Refers to a server and everything it contains. Product examples include the IBM S824, p570 and E850.
FSP	IBM	Flexible Service Processor – A standalone computer included with every IBM Power Systems-based server that manages resource allocation and control of servers on a frame. The *FSP* provides an interface to an IBM *HMC*, or allows stand-alone operation with *IVM*.
Grid Infrastructure	Oracle	Oracle software that includes *RAC*, *ASM* and *ACFS*.
HA	General	See *High Availability*
HBA	General	Hardware Bus Adapter – A server interface card with dedicated processing for connecting to a *SAN*.
High Availability	General	High Availability is a capability afforded by a hardware architecture to tolerate failures of individual hardware components without loss of service.
HMC	IBM	Hardware Management Console – A stand-alone x86-based computer used to manage one of more Power Systems servers. Servers managed by a HMC are referred to as *Managed Servers.* The HMC offers a rich user interface, simplifying setup and maintenance.
IBM Techline	IBM	A team within IBM that assists with the procurement of IBM Power Systems processor-based hardware.
Infiniband	General	Protocol used for connecting servers to storage and for server-to-server communication. Used by the Exadata.
Integrated Virtualization Manager (IVM)	IBM	This is a technology that allows management of a frame without an HMC. A frame configured to use *IVM* is an unmanaged server. Once a frame is configured for *IVM*, it's unchangeable to a managed server.
IVM	IBM	See *Integrated Virtualization Manager.*
JFS / JFS2	General	Journaled File System – A file system commonly used by IBM AIX® servers, maintained by the operating system. An example of a "cooked file system."
Managed Server	IBM	An IBM server managed by an *HMC*. The HMC maintains settings that are stored in the *FSP.*
Miscellaneous Equipment Specification (MES)	IBM	When hardware is added to an IBM system, IBM's ordering system issues a MES number that can be referenced by a HMC to ease and simplify the installation of hardware or features.
Network Attached Storage (NAS)	General	A stand-alone storage server that can be accessed with a variety of storage protocols, including Fibre Channel.
N-port Virtualization (NPIV)	General	A term associated with SAN technology
ODA	Oracle	See Oracle Database Appliance
OEL	Oracle	Oracle Enterprise Linux®
Oracle Database Appliance	Oracle	The Oracle Database Appliance is one of Oracle's Engineered Systems designed to run Oracle RDBMS.
POWER	IBM	POWER is the family of CPUs used in IBM Power Systems servers. POWER is an abbreviation for Performance Optimization With Enhanced RISC.
PowerHA	IBM	IBM PowerHA® is high availability technology available through IBM for POWER processor-based servers.
PowerVC	IBM	IBM PowerVC™ is a management console based on

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		OpenStack, currently under development by IBM. PowerVC provides an easier method of managing server resources, and provisioning DLPARs.
PowerVM	IBM	IBM PowerVM™ is virtualization technology used by IBM POWER processor-based servers. Allows the creation of VIO Servers and supports the creation of a media repository.
Real Application Clusters (RAC)	Oracle	Oracle clustered database technology. It is included with the installation of Oracle Grid Infrastructure
RDBMS	Oracle	Relational Database Management System.
RISC	General	Reduced Instruction Set Computer – This refers to a particular class of CPUs, and is the opposite of Intel® CPUs, which have complex instructions. RISC processors typically have more cores per CPU, and more threads of execution per core.
SAN	General	A network switch designed specifically for storage products, allowing connectivity from multiple servers to a shared storage product.
SAS	General	Serial Attached SSCI – Most common type of drive used in servers featuring a rotating spindle.
SEA	IBM	Shared Ethernet Adapter
SR-IOV	General	Single Root I/O Virtualization – This technology is the basis for self-virtualizing I/O boards that allows the devices to manage virtualized resources. The advantage of SR-IOV for the Database Cloud Server is that individual ports can be assigned to DLPARs without assigning the entire adapter to a DLPAR.
SSD	General	Solid State Drive - A drive that uses circuitry in place of a rotating spindle. SSDs are high performance, but also come at a high cost.
Unmanaged Server	IBM	An IBM Power Systems series server that uses *IVM*, and is not managed by a *HMC*.
VET Code	IBM	A code entered through the *HMC* or *FSP* to enable IBM *PowerVM* for a period of time. PowerVM cannot be used on a POWER server unless a VET code is provided. VET codes are managed through IBM Techline.
VIO Server	IBM	Virtual I/O Server – A special DLPAR to establish connectivity to physical resources, like storage, memory, CPU cores and network adapters, and provide logical version of these resources to AIX® DLPARs.
Virtualized I/O	IBM	I/O presented to a DLPAR that is logical, not physical, entirely created and maintained by a *VIO Server*.
World Wide Port Number	General	WWPN - A unique ID for a port number inside a *SAN.*
Zero Installation Time	Vendita	Refers to the exceptionally rapid installation time of the Database Cloud Server

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Revision History

This section tracks changes to this document. Do not delete this section from MS word document.

This section shall remain as the last page of all documents. When preparing documents for customer or partner distribution, print all pages to a .pdf file, excluding the revision history.

Version	Author	Date	Description
1.01	WAS	2/9/16	Document creation
1.02	WAS	2/22/17	Program changes
1.03	WAS	5/18/17	More detail on “System Login Credentials” added

Document Note

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