

IBM Master Data Management on Cloud
Version 1 Release 1

User Guide
(Last updated: 2017-06-30)



Note

Before using this information and the product that it supports, read the information in [Notices and trademarks](#).

Edition Notice

This edition applies to version 1, release 1, modification 0 of IBM Master Data Management on Cloud and to all subsequent releases and modifications until otherwise indicated in new editions.

© **Copyright International Business Machines Corporation 2015, 2017.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

- Chapter 1. About IBM Master Data Management on Cloud..... 1**
- Chapter 2. Overview of IBM MDM on Cloud..... 3**
 - Available configurations.....4
 - Offering plans.....4
 - Offering plan hardware configurations.....4
 - Offering plan software configurations.....6
 - Default values for MDM on Cloud instances.....7
 - Application language.....7
 - Time zone.....7
 - Industry type.....8
 - Host name details.....8
 - Default host names.....8
 - Disk partitions and encryption.....9
 - MDM Primary disk layout.....9
 - MDM Secondary disk layout.....9
 - MDM Database disk layout.....10
 - IBM Business Process Manager disk layout.....10
 - InfoSphere Information Server disk layout.....10
 - Default ports in use.....10
 - Ports in use for Small, Medium, and Large configurations11
 - Ports in use for non-production configurations12
 - Ports in use for additional MDM developer configurations14
 - Ports in use for additional BPM designer configurations14
 - Ports in use for additional MDM runtime configurations14
- Chapter 3. IBM MDM on Cloud information roadmap..... 17**
 - Product overviews17
 - Getting started17
 - Customizing MDM solutions17
 - Troubleshooting and support18
- Chapter 4. Getting started and using IBM MDM on Cloud..... 19**
 - Connecting to the gateway machine20
 - Whitelisting other computers.....20
 - About this task.....20
 - Procedure.....21
 - Connecting to an on-premises computer.....21
 - Setting up a non-production environment.....21
 - Launching the MDM Workbench.....22
 - Connecting InfoSphere MDM to BPM Process Center.....22
 - Connecting two InfoSphere MDM instances to a single BPM Process Center.....23
- Chapter 5. Administering IBM MDM on Cloud.....29**
 - Starting IBM MDM on Cloud services manually.....29
 - About these tasks.....29
 - Restarting services for IBM MDM on Cloud Small, Medium, and Large Production offerings29
 - Restarting services for the IBM MDM on Cloud Non-Production offering30
 - Restarting services for IBM MDM on Cloud Additional MDM Developer offerings31
 - Restarting services for IBM MDM on Cloud Additional BPM Designer offerings31

Restarting services for IBM MDM on Cloud Additional MDM Runtime offerings	32
Backing up and restoring IBM MDM on Cloud.....	32
File system backup tips.....	32
Database backup tips.....	32
Procedure.....	32
Connecting to the database.....	33
Changing and displaying firewall security.....	33
To change the security level or to manage rules for the IBM MDM on Cloud server firewall.....	33
To show the Microsoft Windows firewall profiles on the IBM MDM on Cloud client.....	35
To show a list of all open ports on the IBM MDM on Cloud client.....	35
To block an open port on the IBM MDM on Cloud client.....	35
Managing LUKS keys on the server machine.....	35
Procedure.....	35
Notices.....	37

Chapter 1. About IBM Master Data Management on Cloud

IBM® Master Data Management on Cloud (IBM MDM on Cloud) provides IBM InfoSphere® Master Data Management (InfoSphere MDM) Advanced Edition on the IBM SoftLayer global cloud infrastructure.

IBM MDM on Cloud offers the rich features of an on-premises InfoSphere MDM deployment without the cost, complexity, and risk of managing your own infrastructure. IBM MDM on Cloud provides preinstalled MDM configurations for production and development environments in an IBM SoftLayer cloud hosted environment. These configurations are multi-domain and can be deployed in physical MDM or virtual MDM style.

Chapter 2. Overview of IBM MDM on Cloud

IBM® Master Data Management on Cloud provides a proven master data management (MDM) solution on the IBM SoftLayer global cloud platform. It offers the rich features of an on-premises MDM deployment without the cost, complexity, and risk of managing your own infrastructure.

Based on IBM InfoSphere® Master Data Management Advanced Edition, IBM MDM on Cloud is a multi-domain solution that comes pre-installed and ready to run in small, medium, and large server configurations. IBM MDM on Cloud also includes capabilities from IBM Business Process Manager and IBM InfoSphere Information Server.

IBM MDM on Cloud provides a cost-effective entry point to InfoSphere MDM and a path to easily add new environments. It supports the following use cases:

- Quickly deploy development or test environments for new InfoSphere MDM projects.
- Move all or part of your InfoSphere MDM workload to the cloud.
- Comply with corporate mandates to move to the cloud.
- Reduce risk and initial cost for new projects and deliver faster return on investment.

Each data center facility where IBM MDM on Cloud is hosted has the same specifications regarding quality deployment and management methodologies. Leveraging the standardization across all geographic locations, IBM optimizes key data center performance variables such as space, power, network, personnel, and internal infrastructure.

As a hosted offering, IBM MDM on Cloud gives you the same control over your data as the on-premises system. As with an on-premises deployment, the ongoing management of the applications and cloud environment is your responsibility.

To maintain and control the IBM MDM on Cloud services, you must:

- Actively monitor and report any issues that you encounter with IBM MDM on Cloud.
- Maintain the software platform, InfoSphere MDM and the operating system, to meet your security standards.
- Maintain software firewalls on servers that face the internet to provide the required protection.
- Develop integration, transformation, and other jobs, as well as establish connectivity between data sources and applications. You can also develop your own workload, business rules, monitoring, and scheduling for all jobs.

Note: You are responsible for the quality and performance of programs, applications, and jobs that you develop for IBM MDM on Cloud

- Provide user access to IBM MDM on Cloud once the cluster is provisioned, by sharing the web address, username, and password.
- Ensure the continuity, compatibility, and performance of the IBM SaaS platform by installing only permissible software, including any open source packages, and regularly upgrading your IBM MDM on Cloud environment and operating system.
- Create and maintain regular backups of data.
- Setup and manage the encryption of IBM MDM on Cloud according to your security policy and the service terms.

Note the following limitations and restrictions of IBM MDM on Cloud:

- If your offering is designated as “Non-Production“, IBM MDM on Cloud can be deployed only as part of your development and test environments for internal non-production activities. These activities include, but are not limited to:
 - testing
 - performance tuning
 - fault diagnosis
 - internal benchmarking
 - staging
 - quality assurance activity
 - developing internally used additions or extensions to the offering by using published application programming interfaces

- Restricted to SOAP over HTTP as Service Binding.

Available configurations

Select from the IBM® MDM on Cloud offering plans depending on your expected usage, which can include testing, developing, migration, or production. In addition to the four base offerings (Small, Medium, Large, and Non-Production), there are three add-on configurations that expand your solution to include extra development or runtime virtual machines.

Offering plans

Small production plan	The IBM MDM on Cloud Small plan offers InfoSphere® MDM Advanced Edition installed into a virtual server configuration and is suitable as a production or preproduction operational MDM Hub.
Medium production plan	The IBM MDM on Cloud Medium plan offers InfoSphere MDM Advanced Edition installed into a virtual server configuration and is suitable as a production or preproduction operational MDM Hub.
Large production plan	The IBM MDM on Cloud Large plan offers InfoSphere MDM Advanced Edition installed into a bare metal server configuration and is suitable as a production or preproduction operational MDM Hub.
Non-Production plan	The IBM MDM on Cloud Non-Production plan offers InfoSphere MDM Advanced Edition installed into a virtualized environment. It is suitable as an environment for development, customization, and functional testing of the MDM Hub and related processes. The Non-Production plan includes two shared non-production InfoSphere MDM runtime instances: one for development integration testing and a second for QA testing. The plan also includes two InfoSphere MDM developer instances and two IBM Business Process Manager developer instances.
Additional MDM Runtime plan	The Additional MDM Runtime plan provides an additional virtual MDM instance for the IBM MDM on Cloud non-production environment. This is in addition to the two shared InfoSphere MDM runtime instances already available by default with the Non-Production plan. For example, the Additional MDM Runtime enables you to add an additional QA or test server instance to the MDM development environment.
Additional MDM Developer plan	The Additional MDM Developer plan provides an additional InfoSphere MDM developer instance for the IBM MDM on Cloud non-production environment. This is in addition to the two MDM developer instances already available by default with the Non-Production plan. The Additional MDM Developer plan enables you to add an MDM developer to the two provisioned with the Non-Production plan.
Additional BPM Designer plan	The Additional BPM Designer plan provides an additional IBM Business Process Manager designer instance for the IBM MDM on Cloud non-production environment. This is in addition to the two BPM designer instances already available by default with Non-Production plan. For example, the Additional BPM Designer plan enables you to add a BPM designer to the two provisioned with the Non-Production plan.

Offering plan hardware configurations

Small	Medium	Large	Non-Production
Machine type			
Virtual	Virtual	Bare metal	Virtual
Application Server hardware			
2 nodes	2 nodes	2 nodes	2 nodes per MDM development machine
4 cores per node	8 cores per node	12 cores per node	4 cores per node
16 GB RAM per node	32 GB RAM per node	64 GB RAM per node	16 GB RAM

<i>Table 1: Base Offering plans: hardware (continued)</i>			
Small	Medium	Large	Non-Production
2 x 100 GB hard disks plus 300 GB SAN disk	2 x 100 GB hard disks plus 300 GB local disk	1 TB SATA hard disk	500 GB SAN disk (100 GB + 400 GB)
Database Server hardware			
1 node	1 node	1 node	1 node
4 cores per node	8 cores per node	12 cores per node	4 cores per node
32 GB RAM	64 GB RAM	256 GB RAM	16 GB RAM
100 GB hard disk plus 1 TB SAN disk	100 GB hard disk plus 2 TB SAN disk	4 x 2 TB SATA with RAID controller	500 GB SAN disk
BPM Server hardware			
1 node	1 node	1 node	1 node for BPM Process Center. 2 nodes for BPM Designer
8 cores per node	8 cores per node	16 cores per node	8 cores per node for Process Center. 4 cores per node for Designer.
32 GB RAM	64 GB RAM	64 GB RAM	32 GB RAM for Process Center. 16 GB RAM for Designer.
100 GB hard disk plus 1 TB SAN disk	100 GB hard disk plus 2 TB SAN disk	4 x 2 TB SATA with RAID controller	400 GB (100 GB + 300 GB) SAN disk for Process Center. 400 GB (100 GB + 300 GB) local disk for Designer.
Information Server hardware			
1 node	1 node	1 node	1 node
8 cores per node	8 cores per node	8 cores per node	8 cores per node
32 GB RAM	32 GB RAM	32 GB RAM	32 GB RAM
2 SAN disks: 100 GB and 500 GB	2 SAN disks: 100 GB and 500 GB	4 x 2 TB SATA with RAID controller	600 GB (100 GB + 500 GB) SAN disk
Network			
1 Gbps. 2000 GB per month	1 Gbps. 2000 GB per month	1 Gbps. 2000 GB per month	1 Gbps. 2000 GB per month

<i>Table 2: Additional offering plans: hardware</i>		
Additional MDM Runtime	Additional MDM Developer	Additional BPM Designer
Machine		
Virtual	Virtual	Virtual
Hardware		
1 node	1 node	1 node
4 cores per node	8 cores per node	4 cores per node

<i>Table 2: Additional offering plans: hardware (continued)</i>		
Additional MDM Runtime	Additional MDM Developer	Additional BPM Designer
16 GB RAM	32 GB RAM	16 GB RAM
500 GB (100 + 400 GB) SAN disk	600 GB (100 GB + 500 GB) SAN disk	600 GB (100 GB + 500 GB) SAN disk
Network		
1 Gbps. 2000 GB bandwidth.	1 Gbps. 2000 GB bandwidth.	1 Gbps. 2000 GB bandwidth.
Database Server hardware		
1 node. 4 cores per node. 16 GB RAM. 500 GB SAN disk	N/A	N/A

Offering plan software configurations

<i>Table 3: Offering plans: software</i>						
Offering	Virtual machines	InfoSphere MDM Advanced Edition	IBM InfoSphere Information Server	IBM Business Process Manager	IBM Db2®	IBM WebSphere® Application Server
IBM MDM on Cloud Small	5	one runtime instance with two nodes	one server instance	one instance	one instance	two instances
IBM MDM on Cloud Medium	5	one runtime instance with two nodes	one server instance	one instance	one instance	two instances
IBM MDM on Cloud Large	5	one runtime instance with two nodes	one server instance	one instance	one instance	two instances
IBM MDM on Cloud Non-Production	11	two developer instances. two runtime instances.	one server instance. one client instance.	one BPM Process Center virtual machine. two BPM Process Designer virtual machines.	four instances	four instances
IBM MDM on Cloud Additional MDM Developer	2	one developer instance	Not included	Not included	one instance	one instance
IBM MDM on Cloud Additional BPM Designer	1	Not included	Not included	one BPM Process Designer virtual machine	Not included	Not included
IBM MDM on Cloud MDM Runtime environment	2	one runtime instance with two nodes	Not included	Not included	1 instance	1 instance

IBM MDM on Cloud Small, Medium, and Large production plans

The production offerings include five machines with the following software:

- A primary InfoSphere MDM virtual machine with:
 - InfoSphere MDM Advanced Edition
 - WebSphere Application Server deployment manager (Dmgr)
 - One node
- A secondary InfoSphere MDM virtual machine with:
 - WebSphere Application Server deployment manager (Dmgr)
 - Secondary node
- An MDM Database virtual machine with IBM Db2
- An IBM Business Process Manager virtual machine
- An IBM InfoSphere Information Server virtual machine

IBM MDM on Cloud Non-Production plan

The non-production offering contains 11 virtual machines with the following software:

- Two InfoSphere MDM developer virtual machines. Each developer machine contains InfoSphere MDM Advanced Edition, WebSphere Application Server, Db2, Rational® Application Developer, and the MDM Workbench
- Two instances of InfoSphere MDM Advanced Edition runtime with two nodes each (for a total of four virtual machines)
- One IBM BPM Process Center virtual machine
- Two IBM BPM Process Designer virtual machines
- One IBM InfoSphere Information Server virtual machine
- One IBM InfoSphere Information Server client machine

IBM MDM on Cloud additional developer plan

The additional developer offering includes a single MDM developer virtual machine containing InfoSphere MDM Advanced Edition, WebSphere Application Server, Db2, Rational Application Developer, and the MDM Workbench.

IBM MDM on Cloud additional BPM process designer plan

The additional process designer offering includes a single virtual machine containing IBM BPM Process Designer.

IBM MDM on Cloud additional MDM runtime plan

The additional MDM runtime offering includes two virtual machines with the following software:

- An InfoSphere MDM runtime virtual machine containing InfoSphere MDM Advanced Edition and WebSphere Application Server
- An MDM Database virtual machine with IBM Db2

Default values for MDM on Cloud instances

By default, IBM® MDM on Cloud instances are configured with certain values upon deployment. You can customize these values if necessary.

Application language

The default MDM Application language is English.

Time zone

IBM MDM on Cloud is installed with a default time zone value of America/Atikokan. To modify the time zone, follow [the steps provided in the Knowledge Center](#).

Industry type

By default, the industry type is set to insurance. If this is not appropriate for this deployment, modify the industry type by running the `changeIndustryType` madconfig target

Important: Back up your MDM database before running the `changeIndustryType` madconfig target. The command will clear and recreate rows in the following MDM database tables: `CDCLIENTIMPTP`, `CDCLIENTPOTENTP`, `CDCLIENTSTTP`, `CDCONTRACTRELTP`, `CDCONTRACTROLETP`, `CDCONTRACTSTTP`, `CDCONTRCOMPMP`, `CDERRMESSAGETP`, `CDPRODTP`, `CDCAMPAIGNTP`, `H_CDCLIENTIMPTP`, `H_CDCLIENTPOTENTP`, `H_CDCLIENTSTTP`, `H_CDCONTRACTRELTP`, `H_CDCONTRACTROLETP`, `H_CDCONTRACTSTTP`, `H_CDCONTRCOMPMP`, `H_CDERRMESSAGETP`, `H_CDPRODTP`, and `H_CDCAMPAIGNTP`.

To change the industry type:

1. Back up the MDM database.
2. Browse to the folder `<MDM_INSTALL_HOME>/mds/scripts`.
3. Run the `changeIndustryType` madconfig target.

Microsoft Windows:

```
madconfig changeIndustryType
```

Linux or UNIX:

```
./madconfig.sh changeIndustryType
```

4. Restart the IBM MDM on Cloud instance.

Host name details

IBM® MDM on Cloud environments use a set pattern of host names that are uniquely identified by your order ID.

Below is a list of the default host names for each IBM MDM on Cloud server. In all cases, use your order ID to replace `<orderID>` in the names. The order ID is an IBM-generated system code.

Default host names

IBM MDM on Cloud Small production

- `<orderID>-s-mdmp.ibm.com` : InfoSphere® MDM primary operational server
- `<orderID>-s-mdms.ibm.com` : InfoSphere MDM secondary operational server
- `<orderID>-s-mdmd.ibm.com` : MDM database
- `<orderID>-s-bpmp.ibm.com` : IBM Business Process Manager
- `<orderID>-s-isp.ibm.com` : InfoSphere Information Server

IBM MDM on Cloud Medium production

- `<orderID>-m-mdmp.ibm.com` : InfoSphere MDM primary operational server
- `<orderID>-m-mdms.ibm.com` : InfoSphere MDM secondary operational server
- `<orderID>-m-mdmd.ibm.com` : MDM database
- `<orderID>-m-bpmp.ibm.com` : IBM Business Process Manager
- `<orderID>-m-isp.ibm.com` : InfoSphere Information Server

IBM MDM on Cloud Large production

- `<orderID>-l-mdmp.ibm.com` : InfoSphere MDM primary operational server
- `<orderID>-l-mdms.ibm.com` : InfoSphere MDM secondary operational server
- `<orderID>-l-mdmd.ibm.com` : MDM database
- `<orderID>-l-bpmp.ibm.com` : IBM Business Process Manager
- `<orderID>-l-isp.ibm.com` : InfoSphere Information Server

IBM MDM on Cloud Non-Production

- `<orderID>-d-mdc1.ibm.com` : MDM developer 1
- `<orderID>-d-mdc2.ibm.com` : MDM developer 2
- `<orderID>-d-mdmi.ibm.com` : MDM runtime application server for InfoSphere Information Server
- `<orderID>-d-mdbi.ibm.com` : MDM runtime database for Information Server
- `<orderID>-d-bdpc.ibm.com` : BPM Process Center
- `<orderID>-d-bpd1.ibm.com` : BPM Process Designer client 1
- `<orderID>-d-bpd2.ibm.com` : BPM Process Designer client 2
- `<orderID>-d-iisd.ibm.com` : InfoSphere Information Server
- `<orderID>-d-isc.ibm.com` : DataStage® and QualityStage® Designer client

IBM MDM on Cloud Additional MDM Developer

- `<orderID>-a-mdc<#>.ibm.com` : MDM developer. Where `<#>` indicates the instance number of the server. For example, if it is the third instance, then the numeral 3 is used.

IBM MDM on Cloud Additional BPM Designer

- `<orderID>-a-bpd<#>.ibm.com` : BPM Process Designer client. Where `<#>` indicates the instance number of the server. For example, if it is the third instance, then the numeral 3 is used.

IBM MDM on Cloud Additional MDM Runtime

- `<orderID>-a-mas<server number>.ibm.com` : InfoSphere MDM operational server. Where `<#>` indicates the instance number of the server. For example, if it is the third instance, then the numeral 3 is used.
- `<orderID>-a-mdb<#>.ibm.com` : MDM database. Where `<#>` indicates the instance number of the server. For example, if it is the third instance, then the numeral 3 is used.

Disk partitions and encryption

IBM® MDM on Cloud production environments consist of five machines. This topic details the disk layout and encryption status.

The Linux Unified Key Setup (LUKS) encryption key details that were used to encrypt your IBM MDM on Cloud partitions are listed in the LOG IN AND GET SET UP section of the Welcome letter that you received from your IBM Sales Representative.

Tip: Add your own keys and remove the supplied keys before you use the system.

Any partition that is encrypted using LUKS can have eight different keys. You can use any of the keys to open the encrypted partition. In addition, you can have any number of keys for your LUKS encrypted partition.

MDM Primary disk layout

See the following table for a summary of layout of the primary InfoSphere® MDM server disk.

Mount point	Encryption status	Partition name	Disk	Data type
/	None	/dev/xvda2	Primary	Operating system
/keystore	None	/dev/xvdc1	Secondary	Disk encryption key
/home/mdmcloud	LUKS	/dev/xvdc2	Secondary	Installation and installables

MDM Secondary disk layout

See the following table for a summary of layout of the secondary InfoSphere MDM server disk.

Mount point	Encryption status	Partition name	Disk	Data type
/	None	/dev/xvda2	Primary	Operating system
/keystore	None	/dev/xvdc1	Secondary	Disk encryption key
/home/mdmcloud	LUKS	/dev/xvdc2	Secondary	Installation and installables

MDM Database disk layout

See the following table for a summary of layout of the MDM Database server disk.

Mount point	Encryption status	Partition name	Disk	Data type
/	None	/dev/xvda2	Primary	Operating system
/keystore	None	/dev/xvdc1	Secondary	Disk encryption key, Db2 native encryption key
/opt	LUKS	/dev/xvdc2	Secondary	Installation and installables

IBM Business Process Manager disk layout

See the following table for a summary of layout of the BPM server disk.

Mount point	Encryption status	Partition name	Disk	Data type
/	None	/dev/xvda2	Primary	Operating system
/keystore	None	/dev/xvdc1	Secondary	Disk encryption key, Db2 native encryption key
/bpm	LUKS	/dev/xvdc2	Secondary	Installation and installables

InfoSphere Information Server disk layout

See the following table for a summary of layout of the InfoSphere Information Server server disk.

Mount point	Encryption status	Partition name	Disk	Data type
/	None	/dev/xvda2	Primary	Operating system
/keystore	None	/dev/xvdc1	Secondary	Disk encryption key, Db2 native encryption key
/bpm	LUKS	/dev/xvdc2	Secondary	Installation and installables

Default ports in use

When configuring your firewall, refer to these details about the default ports that are in use in an IBM® MDM on Cloud deployment.

Ports in use for Small, Medium, and Large configurations

MDM primary

<orderID>-s-mdmp.ibm.com, <orderID>-m-mdmp.ibm.com, <orderID>-l-mdmp.ibm.com

<i>Table 4: SML production - MDM primary</i>		
Ports	Allowed access	Comments
9043, 9443, 94444	All machines	Used to access WebSphere Application Server console, web services, and UI ports
9354, 9043, 5061, 7286, 9633, 9444, 7277, 8879	Db2, Information Server, BPM, and WAS remote node	

Db2

<orderID>-s-mdmd.ibm.com, <orderID>-m-mdmd.ibm.com, <orderID>-l-mdmd.ibm.com

<i>Table 5: SML production - Db2</i>		
Ports	Allowed access	Comments
50602	MDM primary, MDM secondary, and Information Server machines	

MDM secondary

<orderID>-s-mdms.ibm.com, <orderID>-m-mdms.ibm.com, <orderID>-l-mdms.ibm.com

<i>Table 6: SML production - MDM secondary</i>		
Ports	Allowed access	Comments
9043, 9443, 9444	MDM primary, Db2, and Information Server machines	Used to access Web services
9354, 9043, 9443, 5061, 7286, 9633, 7272, 8878	MDM primary, Db2, BPM and Information Server machines	All ports belong to WebSphere Application Server

BPM

<orderID>-s-bpmp.ibm.com, <orderID>-m-bpmp.ibm.com, <orderID>-l-bpmp.ibm.com

<i>Table 7: SML production - BPM</i>		
Ports	Allowed access	Comments
9043, 9443	All machines	To access WebSphere Application Server admin console, BPM Process Portal, and Process Admin UIs
9354, 9043, 9443, 5061, 7286, 9633	MDM primary and MDM secondary machines	WebSphere Application Server owns all of these ports

Information Server

<orderID>-s-iisp.ibm.com, <orderID>-m-iisp.ibm.com, <orderID>-l-iisp.ibm.com

<i>Table 8: SML production - Information Server</i>		
Ports	Allowed access	Comments
2825, 5076, 5077, 5558, 5578, 7284, 7286, 8882, 9043, 9060, 9080, 9081, 9108, 9353, 9403, 9404, 9405, 9446, 9633, 10000, 10001, 10002, 10003, 10004, 10005, 13401, 13402, 31531, 31538, 50000, 5986, 19443	MDM primary, MDM secondary, and Db2 machines	WebSphere Application Server owns all of these ports
9446, 9043, 31538	All machines	Ports are exposed to all IPs

All five machines

<i>Table 9: SML production - All five machines</i>		
Ports	Allowed access	Comments
SSH - 22	All machines	Port 22 is exposed by all machines
Bootp - 68 UDP port	All machines	Port 68 is exposed by all machines
HTTP+SSL 443	All machines	Port 443 is exposed by all machines
PING - ICMP	All machines	Used to allow ping

Ports in use for non-production configurations

MDM Developer

<orderID>-d-mdc1.ibm.com, <orderID>-d-mdc2.ibm.com

<i>Table 10: Non-production - MDM developer</i>		
Ports	Allowed access	Comments
9354, 9043, 9443, 5061, 7286, 9633, 9444, 5901	All machines	WebSphere Application Server owns all of these ports. They are exposed to all IPs.

MDM runtime for Information Server - 1

<orderID>-d-mdmi.ibm.com

<i>Table 11: Non-production - MDM runtime for Information Server 1</i>		
Ports	Allowed access	Comments
9354, 9043, 9443, 5061, 7286, 9633, 9444, 5901	All machines	WebSphere Application Server owns all of these ports. They are exposed to all IPs.

MDM Db2 for Information Server - 1

<orderID>-d-mdbi.ibm.com

<i>Table 12: Non-production - MDM Db2 for Information Server 1</i>		
Ports	Allowed access	Comments
50602	MDM runtime for Information Server - 1	

MDM runtime for BPM - 2

<orderID>-d-mdbm.ibm.com

<i>Table 13: Non-production - MDM runtime for BPM 2</i>		
Ports	Allowed access	Comments
9354, 9043, 9443, 5061, 7286, 9633, 9444, 5901	All machines	WebSphere Application Server owns all of these ports. They are exposed to all IPs.

MDM Db2 for BPM - 2

<orderID>-d-mdbb.ibm.com

<i>Table 14: Non-production - MDM Db2 for BPM 2</i>		
Ports	Allowed access	Comments
50602	MDM runtime for BPM - 2	

BPM Process Center

<orderID>-d-bdpc.ibm.com

<i>Table 15: Non-production - BPM Process Center</i>		
Ports	Allowed access	Comments
9043, 9443	MDM Developer machines - 1 and 2, MDM Runtime for BPM - 2, BPM Designer - 1 and 2	WebSphere Application Server owns all of these ports
9354, 9043, 9443, 5061, 7286, 9633, 50000	All machines	These ports are exposed to all IPs

BPM Designer - 1 and 2

<orderID>-d-bpd1.ibm.com and <orderID>-d-bpd2.ibm.com

<i>Table 16: Non-production - BPM Designer 1 and 2</i>		
Ports	Allowed access	Comments
5986 - WIN RM port for ansible to work 3389 - Remote Desktop	All machines	Windows-specific ports

Information Server

<orderID>-d-iisd.ibm.com

<i>Table 17: Non-production - Information Server</i>		
Ports	Allowed access	Comments
2825, 5076, 5077, 5558, 5578, 7284, 7286, 8882, 9043, 9060, 9080, 9081, 9108, 9353, 9403, 9404, 9405, 9446, 9633, 10000, 10001, 10002, 10003, 10004, 10005, 13401, 13402, 31531, 31538, 50000, 5986, 19443	MDM Runtime for IIS - 1, MDM Db2 Runtime for IIS - 1, IIS Client	WebSphere Application Server owns all of these ports
9446, 9043, 31538	All machines	Ports are exposed to all IPs

Information Server client

<orderID>-d-iisc.ibm.com

<i>Table 18: Non-production - Information Server client</i>		
Ports	Allowed access	Comments
5986 - WIN RM port for ansible to work 3389 - Remote Desktop	All machines	Windows-specific ports

All machines

<i>Table 19: Non-production - All machines</i>		
Ports	Allowed access	Comments
SSH - 22	All machines	Port 22 is exposed by all machines
Bootp - 68 UDP port	All machines	Port 68 is exposed by all machines
HTTP+SSL 443	All machines	Port 443 is exposed by all machines

Ports in use for additional MDM developer configurations

<orderID>-d-mdc<#>.ibm.com

<i>Table 20: Additional MDM developer</i>		
Ports	Allowed access	Comments
9354, 9043, 9443, 5061, 7286, 9633, 9444, 5901	All machines	WebSphere Application Server owns all of these ports. They are exposed to all IPs.
SSH - 22	All machines	Port 22 is exposed
Bootp - 68 UDP port	All machines	Port 68 is exposed
HTTP+SSL 443	All machines	Port 443 is exposed
PING - ICMP	All machines	Used to allow ping

Ports in use for additional BPM designer configurations

<orderID>-d-bpd<#>.ibm.com

<i>Table 21: Additional BPM Designer</i>		
Ports	Allowed access	Comments
5986 - WIN RM port for ansible to work 3389 - Remote Desktop	All machines	Windows-specific ports

Note: There are many other ports open in the Microsoft Windows client virtual machines by default.

Ports in use for additional MDM runtime configurations

Additional MDM runtime

<orderID>-d-mas<#>.ibm.com

Table 22: Additional MDM runtime

Ports	Allowed access	Comments
9354, 9043, 9443, 5061, 7286, 9633, 9444, 5901	All machines	WebSphere Application Server owns all of these ports. They are exposed to all IPs.
SSH - 22	All machines	Port 22 is exposed
Bootp - 68 UDP port	All machines	Port 68 is exposed
HTTP+SSL 443	All machines	Port 443 is exposed
PING - ICMP	All machines	Used to allow ping

Additional MDM Db2

<orderID>-d-mdb<#>.ibm.com

Table 23: Additional MDM Db2

Ports	Allowed access	Comments
50602	The additional MDM runtime	
SSH - 22	All machines	Port 22 is exposed
Bootp - 68 UDP port	All machines	Port 68 is exposed
HTTP+SSL 443	All machines	Port 443 is exposed
PING - ICMP	All machines	Used to allow ping

Chapter 3. IBM MDM on Cloud information roadmap

This roadmap outlines the information resources that are available for users of IBM® MDM on Cloud. These resources provide information about various subject areas, such as learning basic skills and troubleshooting.

Product overviews

- **[InfoSphere® MDM product overview](#)** IBM InfoSphere Master Data Management (InfoSphere MDM) manages master data for single or multiple domains—customers, patients, citizens, suppliers, locations, products, services offerings, accounts and more—for improving application and business process effectiveness. Learn about the features and benefits of InfoSphere MDM.
- **[InfoSphere MDM product documentation](#)** The InfoSphere MDM Knowledge Center provides you with InfoSphere MDM concepts and usage information to help you to prepare for using your system.
- **[InfoSphere MDM developerWorks resources](#)** Use the MDM developerWorks blogs, forums, and other resources to interact with other InfoSphere MDM users, stay posted on the latest MDM technical resources, learn how to get the most out of MDM tools, ask questions, and share tips and answers to technical problems.
- **[IBM Business Process Manager product overview](#)** IBM Business Process Manager Standard provides tooling and run time for process design, execution, monitoring and optimization—and basic system integration. It is designed for multi-project improvement programs that focus on workflow and productivity. Learn about the features and benefits of IBM Business Process Manager.
- **[IBM® Business Process Manager product documentation](#)** The IBM Business Process Manager Knowledge Center enables you to learn about the capabilities and features in IBM® Business Process Manager.
- **[InfoSphere DataStage features](#)** Learn about the features and benefits of InfoSphere DataStage.
- **[InfoSphere DataStage product documentation](#)** The InfoSphere Information Server Knowledge Center provides you with InfoSphere DataStage concepts and usage information to help new users prepare for using your new system.
- **[InfoSphere DataStage developerWorks forum](#)** Use this forum to interact with other InfoSphere DataStage users to better understand how to design, build, debug and deploy jobs for information collection, integration and transformation.

Getting started

- **[Overview of InfoSphere MDM](#)** This overview covers InfoSphere MDM concepts, technical features, architecture, scenarios, user roles, and more.

Customizing MDM solutions

- **[Configuring and loading data](#)** This section describes how to load data into your MDM solution and provides references such as data dictionaries and data models.
- **[Developing additions and extensions](#)** Detailed technical documentation about how to extend, tune, and configure your MDM solution using the MDM Workbench tooling or other methods.
- **[Governing data](#)** This documentation provides you with details about the InfoSphere MDM data governance capabilities and data stewardship tools. Data stewards can use these tools to enforce the governance standards that are defined by the data governance council.
- **[Using MDM and BPM within the IBM Stewardship Center application](#)** IBM Stewardship Center provides consistent visibility, collaboration, and governance of your master data by combining the strengths of IBM Business Process Manager and InfoSphere® MDM Application Toolkit.
- **[Integrating InfoSphere MDM and InfoSphere Information Server](#)** You can [use the MDM Workbench to share metadata](#) between your MDM solution and InfoSphere Information Server. Learn more about [integrating InfoSphere Information Server features with InfoSphere MDM](#).

Troubleshooting and support

- **IBM Support Portal** Use the IBM Support Portal for InfoSphere MDM to search for known problems and APARs.
- **Troubleshooting documentation** This section of the InfoSphere MDM Knowledge Center provides information and links to common troubleshooting tools, issues, and concepts.

Chapter 4. Getting started and using IBM MDM on Cloud

You must set up your connection to IBM® MDM on Cloud. Then, you can work with IBM MDM on Cloud as you would with the on-premises product.

Prerequisite: You must know the IP addresses and the credentials of your accounts on the IBM MDM on Cloud servers and clients. This information is in the “Access Credentials and Initial Setup” section of the Welcome letter that you received from your IBM Sales Representative.

The IBM MDM on Cloud software is installed at the following locations on the corresponding provisioned servers, depending on the details of your plan:

- InfoSphere® MDM installation location: /home/mdmcloud/IBM
 - IBM Db2® (MDM database) installation location: /opt/ibm/DB2
 - IBM Business Process Manager installation location: /bpm
 - IBM InfoSphere Information Server installation location: /opt/IBM/InformationServer
1. Connect to each of the virtual machines provisioned in your environment. Use the addresses and connection credentials listed in your Welcome letter. Depending on the plan described in your Welcome letter, you will be able to connect to some or all of the following:
 - IBM BPM Designer
 - IBM BPM Process Center
 - IBM InfoSphere Information Server
 - IBM InfoSphere Information Server client
 - InfoSphere MDM runtime operational servers
 - InfoSphere MDM developer instances

You can connect to the MDM developer instances using a tool such as VNC Viewer. IBM Rational Application Developer, including the MDM Workbench, is installed on each developer instance.

1. Install the locally installable components available to you depending on your plan:
 - a. Install InfoSphere MDM, IBM Db2, and IBM WebSphere® Application Server components from /home/mdmcloud/installables.
 - b. Install IBM Business Process Manager components from /software.
 - c. Install IBM InfoSphere Information Server components from /tmp.
2. Move the keys for Db2 encryption and disk encryption for virtual machines to a secure location. The encryption keys for the servers that host InfoSphere MDM, InfoSphere Information Server, or IBM Business Process Manager are initially located in /keystore. For more information about encryption, see [Disk partitions and encryption](#).
3. Set up your InfoSphere Information Server virtual machine:
 - a. On your local system, use an SSH client to connect to the InfoSphere Information Server virtual machine. For example, you can use PuTTY to connect to the server. The user ID, password, and IP address of the server are in your Welcome letter.
 - b. On the InfoSphere Information Server virtual machine, [run the ISALite tool](#). The *IS_install_path* for the InfoSphere Information Server virtual machine is /opt/IBM/InformationServer.
 - c. Connect the InfoSphere Information Server client to the server by doing these steps. (The user ID, password, and IP address of the client are in your Welcome letter.)
 - 1) On your local computer, go to the Start menu. Click **Accessories > Remote Desktop Connection**.
 - 2) Enter the IP address of the Windows system that hosts your InfoSphere Information Server client. Click **Connect**.
 - 3) In the Windows Security window of the InfoSphere Information Server client, enter the user name and password for the client. **Important:** Do not include the domain name with the user name.

- 4) In the InfoSphere Information Server client, open the file C:\Windows\System32\drivers\etc\hosts. Add an entry for the InfoSphere Information Server. The host entry is in the following format: <public_IP_address> <host_name> <short_host_name>
 - d. Verify the connection and installation on the InfoSphere Information Server client by doing the following steps.
 - Run the ISALite tool. The *IS_install_path* for the client computer is C:\IBM\InformationServer.
 - Test the installation of the IBM InfoSphere DataStage and QualityStage® Administrator and InfoSphere DataStage and QualityStage Designer clients.
 - e. Install anti-virus software on the client computer to increase security.
 - f. Enable multiple users to open remote sessions to the InfoSphere Information Server client:
 - 1) Create user accounts.
 - 2) Give users permission to do a remote desktop connection.
 - 3) Configure the Remote Desktop Session server to allow concurrent remote connections. The number of concurrent remote sessions to the client is based on the offering size of your IBM MDM on Cloud instance.
 - g. Reset the password for users on the InfoSphere Information Server client. Likewise, reset the password for administrators on the InfoSphere Information Server server.
 - h. Optional: Change and display firewall security for IBM MDM on Cloud.
4. Connect to the MDM on Cloud client using a remote desktop connection, and then open the client.
 5. Continue working with IBM MDM on Cloud by completing the following tasks:
 - Connecting to an on-premises computer
 - Connecting to the database
 - Setting up a non-production environment

Connecting to the gateway machine

One virtual machine is designated as the gateway machine for each order.

You use the gateway machine to access other machines in the offering. Secure shell (SSH) access from outside the VPN is allowed only to the gateway machine. Use SSH to first connect to the gateway machine, and from there you can connect to the other machines in your offering.

From the gateway machine, you can connect to the Production, Non-production, Additional MDM Runtime, and Additional MDM Developer virtual machines.

1. Connect to the gateway machine through SSH as user <order ID> through port 4362. Refer to the welcome letter for the unique gateway IP address and order ID. (SSH is provided as the ssh command on Mac OS X and Linux or through Putty or Cygwin, available for Windows.) Example ssh command:

```
ssh <orderid>@<gateway_IP> -p 4362
```

2. Once logged into the gateway machine, from its shell window you can connect to one of the other machines.

```
ssh root@<hostname> -p 4362
```

See [Host name details](#) for the naming conventions of the other machines.

Whitelisting other computers

From any host in your MDM on Cloud, you can connect to computers that you trust by whitelisting them.

About this task

In-order to provide your trusted computers access to your MDM on Cloud virtual machines, you should open up the required ports that you want to access.

This task should be executed in all virtual machines you want to access externally.

A helper script is provided on all linux MDM on Cloud machines.

This script will help to open up set of ports in that machine to the external trusted IP provided. Alternatively, you can modify the IPTables directly.

A property file ports.prop is also provided which lists the ports to be opened. You can edit the property file to add more ports which are required to be opened.

Each line in the property file should have one port.

Procedure

1. Edit the /opt/iis/scripts/ports.prop file and add the ports that you want to open.
1. Run the script that automates the IPTables changes for you.

```
sudo /opt/iis/scripts/enable_ports.sh <Trusted IP Address>
```

2. If you want to open separate set of ports to different trusted IPs, you need to execute the command multiple times with right set of ports and trusted IP

Related information:

- [Default ports in use](#)

Connecting to an on-premises computer

You can connect to an on-premises system from the IBM® MDM on Cloud server or client systems.

Prerequisite: You must know the external IP address of the on-premise computer.

Your on-premise system might be a machine that is running in a UNIX or Microsoft Windows operating system environment.

1. Ensure that you whitelist the external IP of on-premise system [Whitelist trusted IP](#)
2. If the on-premise machine that you need to connect to is behind a firewall, do these steps before you connect for the first time:
 - a. Log in to the IBM MDM on Cloud server machine that you want to connect from.
 - b. On your server machine, ping the on-premise computer. This step verifies that the connection is valid. After the connection is available, you can connect to the on-premise machines.

Setting up a non-production environment

If you have the IBM® MDM on Cloud Non-Production offering plan, then there are some extra steps to complete to set up your non-production environment.

1. Connect to the following virtual machines using the addresses and credentials listed in your Welcome letter:
 - IBM BPM Designer
 - IBM BPM Process Center
 - IBM InfoSphere® Information Server
 - IBM InfoSphere Information Server client
 - InfoSphere MDM runtime virtual machines
 - InfoSphere MDM developer virtual machines.

You can connect to the MDM developer virtual machines using a tool such as VNC Viewer. IBM Rational® Application Developer, including the MDM Workbench, is installed on each developer virtual machine.

2. For Microsoft Windows clients such as IBM BPM Designer and IBM InfoSphere Information Server client, connect the clients to the server by adding the IBM BPM Process Center and IBM InfoSphere Information Server IP addresses and host names to the hosts file.
 - a. Log in to the Windows 2012 client machine as the administrator user.

- b. Open the hosts file located at C:\Windows\System32\drivers\etc.
- c. Add the IP address, fully qualified host name, and host name to the end of the file.
- d. Save the file.

Example:

```
132.27.134.78 mdmwa30-d-bdpc.da109.us-south.services.bluemix.net mdmwa30-d-bdpc
```

3. Link two InfoSphere MDM instances to a single IBM BPM Process Center instance. For details, see [Connecting two InfoSphere MDM instances to a single BPM Process Center](#).

Launching the MDM Workbench

The MDM Workbench development tools enable developers to extend and configure their IBM® MDM on Cloud solutions. Launch the Workbench by connecting to an MDM developer environment server.

This task is valid only for the following IBM MDM on Cloud offerings:

- Non-Production
- Additional Developer

Other offerings do not include access to the MDM Workbench development tools.

1. Log in as the `mdmcloud` user to one of the IBM MDM on Cloud developer environment virtual machines using the public IP address.
2. Start VNC Server:

```
mdmcloud@<servername>:~/IBM$ vncserver
```

3. When prompted for a password, enter any value. This password value will be used again when you connect from the local client using VNC Viewer.
4. On a local machine, open the VNC Viewer. When prompted, provide the password that you used for the VNC Server.
5. From the VNC Viewer command prompt, browse to the folder where IBM Rational® SDP is installed, such as `/home/mdmcloud/IBM/SDP`.
6. Run `./eclipse`. The MDM Workbench application will launch within IBM Rational Application Developer.
7. Browse to select the workspace that you wish to work with and click **OK**.
8. When prompted, provide your WebSphere® Application Server user ID, such as `wasadmin`, and the corresponding password. Click **Finish**.

You can now use the MDM Workbench development tools to extend and configure your IBM MDM on Cloud solution.

Connecting InfoSphere MDM to BPM Process Center

In a non-production environment, MDM on Cloud must set up the connection between the InfoSphere MDM instances and the BPM Process Center instance.

The steps described in this procedure are required only in the BPM Process Center environment. In Process Server environments, running the install scripts is sufficient.

1. Open the Process Admin Console (PAC). The typical URL to access PAC is `https://<hostname>:<port>/ProcessAdmin/login.jsp`.
2. Configure the EPV settings. For each of the listed InfoSphere MDM applications complete the following steps:
 - MDM Party Maintenance
 - Physical MDM Suspected Duplicates
 - Virtual MDM Suspected Duplicates
 - MDM Data Stewardship Dashboard
 - MDM Hybrid Data Quality
 - a. In the Installed Apps tab, activate the latest snapshot for the application.
 - b. Navigate back to the Server Admin tab.
 - c. Select **Admin Tools > Manage EPVs** from the navigation menu.

- d. Choose the tip entry for the applications.
 - e. Set the EPV values for MDM_Connection_Details, if the values are not already set.
 - f. Choose the named snapshot of the applications.
 - g. Set the EPV values for MDM_Connection_Details. Ensure that the values set in the tip entry and snapshot entry are same.
3. Cache the code tables from the InfoSphere MDM operational server into BPM:
 - a. In the Server Admin window, select the MDM Party Maintenance menu.
 - b. Select **Refresh MDM Code Table Data Cache**.
 - c. To retrieve the code table data from the MDM operational server and refresh the cache, click **OK**.
 - d. A confirmation message appears when the cache is refreshed. Click **OK**.

Connecting two InfoSphere MDM instances to a single BPM Process Center

In a non-production environment, you might need to connect two different InfoSphere MDM instances to a single BPM Process Center instance.

The steps are ordered in groups:

A. First InfoSphere MDM instance (MDM1)

In the WebSphere Application Server Integrated Solutions Console (admin console) of the first InfoSphere MDM instance (MDM1), complete these steps:

1. Create an Alias Destination on the InfoSphere MDM server's SIBus:
 - a. Navigate to **Service Integration > Buses > BusName**.
 - b. Click the *BusName* link to open the configurations of the bus.
 - c. Click on the **Destination** link to open the list of destinations.
 - d. Click **New**, then select **Alias**. Click **Next**.
 - e. Provide the destination attribute values:
 - **Identifier** MDMBPMAlias
 - **Bus** Select the Sibus of the InfoSphere MDM environment. The bus name in a typical InfoSphere MDM installation will be MDM.SIB.server1.
 - **Target identifier** Select Other, please specify from the drop down list. Specify the identifier of the BPM environment target. The target identifier name in a typical Process Center installation will be eventqueueDestination.SingleCluster.
 - **Target bus** Select Other, please specify from the drop down list. Specify the identifier of the BPM environment target. The target bus name in a typical Process Center installation will be BPM.ProcessCenter.Bus.
 - f. Click **Next**, then click **Finish**.
 - g. Save the configuration.
2. Create a JMS queue in the MDM environment:
 - a. Navigate to **Resources > JMS > Queues**.
 - b. Select the scope.
 - 1) If it is a standalone InfoSphere MDM server, set it to Node, Server.
 - 2) If InfoSphere MDM is installed in a cluster, set it to Cluster.
 - c. Click **New**.
 - d. Select Default messaging provider, then click **OK**.
 - e. Set the values of the attributes:
 - **Name** MDMBPMQueue
 - **JNDI name** notification/MDMBPMQueue
 - **Bus name** Select the Sibus of the MDM environment. The bus name in a typical MDM installation is MDM.SIB.server1.
 - **Queue name** MDMBPMAlias
 - f. Click **OK** and Save the configuration.

3. Create a JMS Queue Connection Factory in the MDM environment:
 - a. Navigate to **Resources > JMS > Queue connection factories**.
 - b. Select the scope.
 - If it is a standalone MDM server, set it to **Node, Server**. For example, Node=mdmNode, Server=server1.
 - If MDM is installed in a cluster, set the scope to Cluster.
 - c. Click **New**.
 - d. Select Default messaging provider and click **OK**.
 - e. Set the values of the attribute:
 - **Name** MDMBPMQueueConnectionFactory
 - **JNDI name** notification/MDMBPMQueueConnectionFactory
 - **Bus name** Select the SIBus of MDM environment. The Bus name in typical InfoSphere MDM installation will be MDM.SIB.server1.
 - **Provider endpoints** Provide an endpoint, normally with the format <host>:<port>:<Inbound Transport Chain>. You can look at the existing queue connection factories of InfoSphere MDM to get this value.
4. Create the Foreign Bus Connection in the InfoSphere MDM environment:
 - a. Navigate to **Service integration > Buses > BusName**. The bus name in a typical InfoSphere MDM installation will be MDM.SIB.server1.
 - b. Click the *BusName* link to open the configurations of the bus.
 - c. Click the Foreign Bus Connection link to open the list of destinations.
 - d. Click **New**.
 - e. Select Direct Connection, then click **Next**.
 - f. Select Service Integration bus, then click **Next**.
 - g. Select the messaging engine in the InfoSphere MDM environment from the list, then click **Next**.
 - h. Set the values of the attribute:
 - **Name of service Integration bus to connect to (the foreign bus)** Set the value to the name of the SIBus in the BPM environment. The bus name in a typical Process Center installation will be BPM.ProcessCenter.Bus.
 - **Gateway messaging engine in the foreign bus** Set the value to the name of the messaging engine of the BPM environment. The messaging name in a typical BPM Process Center installation will be SingleCluster.000-BPM.ProcessCenter.Bus.
 - **Service integration bus link name** MDM_BPM_LINK_ONE
 - **Bootstrap service integration bus provider endpoints** Set the value using the format <bpmNodeHostName>:<port>:<protocol>. For example, mdmdemowin:7278:BootstrapBasicMessaging. If the BPM cluster has multiple nodes, provide the endpoints for all the nodes as comma-separated list.
 - i. Click **Next**.
 - j. Review the summary, then click **Finish** and **Save** the configurations.

B. Second InfoSphere MDM instance (MDM2)

In the WebSphere Application Server Integrated Solutions Console (admin console) of the second InfoSphere MDM instance (MDM2), complete these steps:

1. Create a new Service Integration Bus on MDM2. The reason for this is because both if InfoSphere MDM environments are identical and have same SIBus names, connecting back from BPM will be an issue because BPM will have to connect to two SIBuses with same name.
 - a. Navigate to **Service integration > Buses > BusName**.
 - b. Click **New**.
 - c. Give a name to the new SIBus to be created such as MDM.SIB.NewBPMSer.
2. For the new SIBus, add a bus member. This is required to create a messaging engine for the new bus.
 - a. Navigate to **Service integration > Buses > BusName**.
 - b. Click the *BusName* link to open the configurations of the bus, then click the SIBus created during the previous step.
 - c. Click Bus members, then click **Add**.

- d. Choose the server or cluster to add to the new bus.
 - If InfoSphere MDM is installed on a server, then select the server option and the corresponding server.
 - If InfoSphere MDM is installed in a cluster, then select the cluster option.
 - e. If InfoSphere MDM is installed on a server, complete these steps:
 - 1) Select Data store for the type of message store.
 - 2) Select Create default data source with generated JNDO name from the properties of data store.
 - 3) Click **Next**.
 - f. Leave the default values for the performance parameters, then click **Next**.
 - g. Review the details and finish the configuration.
3. Follow the [steps in A](#) to repeat the changes made to MDM1 for the MDM2 instance.

C. BPM instance

In the WebSphere Application Server Integrated Solutions Console (admin console) of the BPM instance, complete these steps:

1. Create the Foreign Bus Connection in the BPM environment:
 - a. Navigate to **Service integration > Buses > *BusName***.
 - b. Click the *BusName* link to open the configurations of the bus.
 - c. Click the **Foreign Bus Connection** link to open the list of foreign bus connections.
 - d. Click **New**.
 - e. Select Direct Connection, then click **Next**.
 - f. Select **Service Integration bus**, then click **Next**.
 - g. Select the messaging engine in the BPM environment from the list. Provide the inbound user ID as the admin user ID of BPM, then click **Next**.
 - h. Set the values of the attributes:
 - **Name of service Integration bus to connect to (the foreign bus)** Set the value to the name of the SIBus in the MDM1 instance.
 - **Gateway messaging engine in the foreign bus** Set the value to the name of the messaging engine of the MDM1 instance.
 - **Service integration bus link name** MDM_BPM_LINK_ONE
 - **Bootstrap service integration bus provider endpoints** Set the value using the format `<mdmInstance1HostName>:<port>:<protocol>`. If the InfoSphere MDM cluster has multiple nodes, you can provide the endpoints for all the nodes as comma-separated list.
 - i. Click **Next**.
 - j. Review the summary, then click **Finish** and **Save** the configurations.
2. Repeat step C.1, but this time using the details of the MDM2 instance. Give the following values for the MDM2 attributes:
 - **Name of service Integration bus to connect to (the foreign bus)** Set the value to the name of the SIBus in the MDM2 instance.
 - **Gateway messaging engine in the foreign bus** Set the value to the name of the messaging engine of the MDM2 instance.
 - **Service integration bus link name** MDM_BPM_LINK_TWO
 - **Bootstrap service integration bus provider endpoints** Set the value using the format `<mdmInstance2HostName>:<port>:<protocol>`. If the InfoSphere MDM cluster has multiple nodes, you can provide the endpoints for all the nodes as comma-separated list.

At this point in the procedure, you now have two foreign bus connections created on BPM:

- MDM_BPM_LINK_ONE pointing to the MDM1 instance
- MDM_BPM_LINK_TWO pointing to the new SIBus created on the MDM2 instance

D. BPM Process center

Complete these steps in the BPM Process Center console:

1. Log in to the BPM Process Center Console with admin access.
2. Import the process applications for the IBM Stewardship Center (ISC) if they are not already imported. All of the process applications for the IBM Stewardship Center are available at the installed location <ISC_INSTALLED_FOLDER>/mdmg/processes.
3. Create two snapshots for testing (TESTSNAPSHOTONE and TESTSNAPSHOTTWO) for both the MDM Party Maintenance and Physical MDM Suspected Duplicates process applications. We will focus on testing only these two.
4. Make all four of these new snapshots active.

E. BPM Process admin console

Complete these steps in the BPM Process Admin Console:

1. Log in to the BPM Process Admin Console with admin access.
2. Navigate to **Admin Tools > Manage EPVs**.
3. Select MDM Party Maintenance(TESTSNAPSHOTONE) and then select **EPV MDM_Connection_Details**. Set the details of the MDM1 instance here. Provide a non-secure port such as 9080 for simplicity purposes. Do not select the `uss1` option.
4. Select MDM Party Maintenance(TESTSNAPSHOTTWO) and select **EPV MDM_Connection_Details**. Set the details of the MDM2 instance here. Provide a non-secure port such as 9080 for simplicity purposes. Do not select the `uss1` option.
5. Select Physical MDM Suspected Duplicates(TESTSNAPSHOTONE) and select **EPV MDM_Connection_Details**. Set the details of the MDM1 instance here. Provide a non-secure port such as 9080 for simplicity purposes. Do not select the `uss1` option.
6. Select Physical MDM Suspected Duplicates(TESTSNAPSHOTTWO) and select **EPV MDM_Connection_Details**. Set the details of the MDM2 instance here. Provide a non-secure port such as 9080 for simplicity purposes. Do not select the `uss1` option.

F. MDM databases

Complete these steps on the MDM databases:

1. Run the following SQL commands on the database connected to the MDM1 instance:

```
UPDATE CONFIGELEMENT SET
    VALUE = 'true', LAST_UPDATE_DT = CURRENT_TIMESTAMP WHERE NAME =
    '/IBM/DWLCommonServices/Notifications/enabled';
UPDATE CDEVENTDEFTP SET
    ENABLE_NOTIFY='Y', LAST_UPDATE_DT=CURRENT_TIMESTAMP WHERE (LANG_TP_CD=100 AND
    EVENTDEF_TP_CD=8);
update configelement set value='true',
    last_update_dt=current_timestamp where
    name='/IBM/Party/SuspectProcessing/enabled';
INSERT INTO BPMNOTIFICATIONTYPE VALUES
    ('ntem','MDMSDP', 'TESTSNAPSHOTONE', null, 'MDM_EVT_SDP', null, null, null, null,
    CURRENT_TIMESTAMP, null);
INSERT INTO BPMNOTIFICATIONTYPE VALUES ('nt1','MDMSDP',
    'TESTSNAPSHOTONE', null, 'MDM_EVT_SDP', null, null, null, null, CURRENT_TIMESTAMP,
    null);
INSERT INTO BPMNOTIFICATIONTYPE VALUES ('nt2','MDMSDP', 'TESTSNAPSHOTONE', null,
    'MDM_EVT_SDP', null, null, null, null, CURRENT_TIMESTAMP, null);
INSERT INTO
    BPMNOTIFICATIONTYPE VALUES ('nt3','MDMSDP', 'TESTSNAPSHOTONE', null, 'MDM_EVT_SDP', null,
    null, null, null, CURRENT_TIMESTAMP, null);
INSERT INTO BPMNOTIFICATIONTYPE VALUES
    ('ntpe','MDMHDQ', 'TESTSNAPSHOTONE', null, 'PERSIST_ENTITY', null, null, null, null,
    CURRENT_TIMESTAMP, null);
```

2. Run the following SQL commands on the database connected to the MDM2 instance:

```
UPDATE CONFIGELEMENT SET
    VALUE = 'true', LAST_UPDATE_DT = CURRENT_TIMESTAMP WHERE NAME =
```

```

'/IBM/DWLCommonServices/Notifications/enabled';
UPDATE CDEVENTDEFTP SET
  ENABLE_NOTIFY='Y', LAST_UPDATE_DT=CURRENT_TIMESTAMP WHERE (LANG_TP_CD=100 AND
  EVENTDEF_TP_CD=8);
update configuration set
  value='true', last_update_dt=current_timestamp where
  name='/IBM/Party/SuspectProcessing/enabled';
INSERT INTO BPMNOTIFICATIONTYPE VALUES
  ('ntem','MDMSDP', 'TESTSNAPSHOTTWO', null, 'MDM_EVT_SDP', null, null, null, null,
  CURRENT_TIMESTAMP, null);
INSERT INTO BPMNOTIFICATIONTYPE VALUES ('nt1','MDMSDP',
  'TESTSNAPSHOTTWO', null, 'MDM_EVT_SDP', null, null, null, null, CURRENT_TIMESTAMP,
  null);
INSERT INTO BPMNOTIFICATIONTYPE VALUES ('nt2','MDMSDP', 'TESTSNAPSHOTTWO', null,
  'MDM_EVT_SDP', null, null, null, null, CURRENT_TIMESTAMP, null);
INSERT INTO
  BPMNOTIFICATIONTYPE VALUES ('nt3','MDMSDP', 'TESTSNAPSHOTTWO', null, 'MDM_EVT_SDP', null,
  null, null, null, CURRENT_TIMESTAMP, null);
INSERT INTO BPMNOTIFICATIONTYPE VALUES
  ('ntpe','MDMHDQ', 'TESTSNAPSHOTTWO', null, 'PERSIST_ENTITY', null, null, null, null,
  CURRENT_TIMESTAMP, null);

```

Tips:

- If you give snapshot names in the Process Center Console different than these, make sure to change the SQLs as well. Make sure all the SQLs complete successfully.
- If any duplicate errors come up while inserting data to BPMNOTIFICATIONTYPE table, delete the existing entries causing the issue and run the SQLs again.

All

Restart all instances: MDM1, MDM2, and BPM. Ensure that all of the application servers, node agents, and deployment managers are restarted.

Chapter 5. Administering IBM MDM on Cloud

You administer IBM® MDM on Cloud with the same utilities and tools that you use for your on-premises systems.

See [Administering](#) for detailed information about administering your system.

To encrypt Db2® database with native encryption (on production machines only) see [Db2 native encryption](#).

Starting IBM MDM on Cloud services manually

If the IBM® MDM on Cloud hosts are restarted for any reason, such as after maintenance or an outage, you can manually restart the associated services.

About these tasks

The login details for the MDM OS user, db2inst user, and WebSphere Application Server administrator user are listed in the LOG IN AND GET SET UP section of the Welcome letter that you received from your IBM Sales Representative.

Restarting services for IBM MDM on Cloud Small, Medium, and Large Production offerings

IBM Db2 database server

1. Log in to the database server as the db2inst user.
2. Start Db2 by running the command db2start.

Remote IBM WebSphere Application Server node

1. Log in to the WebSphere Application Server machine as the MDM OS user for this instance.
2. Start WebSphere Application Server by running the following command:

```
<WAS_INSTALL_HOME>/profiles/AppSrv02/bin$ ./startNode.sh
```

IBM MDM on Cloud operation server

1. Ensure that Db2 is running on the IBM Db2 database server.
Important: If the Db2 instance is not running, start it before continuing.
2. Log in to the MDM operational server as the MDM OS user for this instance.
3. Start WebSphere Application Server by running the following commands:

```
<WAS_INSTALL_HOME>/profiles/Dmgr01/bin$ ./startManager.sh  
<WAS_INSTALL_HOME>/profiles/AppSrv01/bin$ ./startNode.sh
```

4. Ensure that the remote WebSphere Application Server node is running.
Important: If the WebSphere Application Server node is not running, start it before continuing.
5. Log in to the WebSphere Application Server Integrated Solutions Console (admin console) as the wasadmin user and start the MDM operational server cluster.

IBM InfoSphere Information Server

No action required. All services restart automatically when the server restarts.

IBM Business Process Manager server

1. Log in to the server as the db2inst user.
2. Start Db2 by running the command db2start.
3. Log in as the root user.

4. Start WebSphere Application Server by running the following commands:

```
<BPM_INSTALL_HOME>/profiles/DmgrProfile/bin$ ./startManager.sh  
<BPM_INSTALL_HOME>/profiles/Node1Profile/bin$ ./startNode.sh
```

5. Log in to the WebSphere Application Server Integrated Solutions Console (admin console) as the BPM DEAdmin user.
6. Start the BPM cluster.

Restarting services for the IBM MDM on Cloud Non-Production offering

IBM Db2 runtime database 1

1. Log in to the database server as the db2inst user.
2. Start Db2 by running the command db2start.

IBM MDM on Cloud runtime 1

1. Ensure that Db2 is running on the IBM Db2 runtime database 1 server.

Important: If the Db2 instance is not running, start it before continuing.

2. Log in to the MDM runtime instance 1 server as the MDM OS user for this instance.
3. Start WebSphere Application Server by running the following command:

```
<WAS_INSTALL_HOME>/profiles/Dmgr01/bin$ ./startManager.sh  
<WAS_INSTALL_HOME>/profiles/AppSrv01/bin$ ./startNode.sh
```

4. Log in to the WebSphere Application Server Integrated Solutions Console (admin console) as the wasadmin user.
5. Start the MDM operational server and the MDM user interface server.

IBM MDM on Cloud developer environment 1

1. Log in to the database server as the db2inst user.
2. Start Db2 by running the command db2start.
3. Log in to the MDM developer environment 1 server as the MDM OS user for this instance.
4. Start WebSphere Application Server by running the following command:

```
<WAS_INSTALL_HOME>/profiles/AppSrv01/bin$ ./startServer.sh server1
```

5. Start VNC Server as the MDM OS user for this instance using the following command:

```
./vncserver
```

IBM Db2 runtime database 2

1. Log in to the database server as the db2inst user.
2. Start Db2 by running the command db2start.

IBM MDM on Cloud runtime 2

1. Ensure that Db2 is running on the IBM Db2 runtime database 2 server.

Important: If the Db2 instance is not running, start it before continuing.

2. Log in to the MDM runtime instance 2 server as the MDM OS user for this instance.
3. Start WebSphere Application Server by running the following command:

```
<WAS_INSTALL_HOME>/profiles/Dmgr01/bin$ ./startManager.sh  
<WAS_INSTALL_HOME>/profiles/AppSrv01/bin$ ./startNode.sh
```

4. Log in to the WebSphere Application Server Integrated Solutions Console (admin console) as the wasadmin user.
5. Start the MDM operational server and the MDM user interface server.

IBM MDM on Cloud developer environment 2

1. Log in to the database server as the db2inst user.
2. Start Db2 by running the command db2start.
3. Log in to the MDM developer environment 2 server as the MDM OS user for this instance.
4. Start WebSphere Application Server by running the following command:

```
<WAS_INSTALL_HOME>/profiles/AppSrv01/bin$ ./startServer.sh server1
```

5. Start VNC Server as the MDM OS user for this instance using the following command:

```
./vncserver
```

IBM InfoSphere Information Server

No action required. All services restart automatically when the server restarts.

IBM InfoSphere Information Server Designer client

No action required. All services restart automatically when the server restarts.

BPM Designer client 1

No action required. All services restart automatically when the server restarts.

BPM Designer client 2

No action required. All services restart automatically when the server restarts.

BPM Process Center

1. Log in to the server as the db2inst user.
2. Start Db2 by running the command db2start.
3. As the root user, start WebSphere Application Server by running the following commands:

```
<BPM_INSTALL_HOME>/profiles/DmgrProfile/bin$ ./startManager.sh  
<BPM_INSTALL_HOME>/profiles/Node1Profile/bin$ ./startNode.sh
```

4. Log in to the WebSphere Application Server Integrated Solutions Console (admin console) as the BPM DEAdmin user.
5. Start the BPM cluster.

Restarting services for IBM MDM on Cloud Additional MDM Developer offerings

IBM MDM on Cloud developer environment n

1. Log in to the database server as the db2inst user.
2. Start Db2 by running the command db2start.
3. Log in to the MDM developer environment n server as the MDM OS user for this instance.
4. Start WebSphere Application Server by running the following command:

```
<WAS_INSTALL_HOME>/profiles/AppSrv01/bin$ ./startServer.sh server1
```

5. Start VNC Server as the MDM OS user for this instance using the following command:

```
./vncserver
```

Restarting services for IBM MDM on Cloud Additional BPM Designer offerings

BPM Designer client n

No action required. All services restart automatically when the server restarts.

Restarting services for IBM MDM on Cloud Additional MDM Runtime offerings

IBM Db2 runtime database n

1. Log in to the database server as the db2inst user.
2. Start Db2 by running the command db2start.

IBM MDM on Cloud runtime n

1. Ensure that Db2 is running on the IBM Db2 runtime database *n* server.
Important: If the Db2 instance is not running, start it before continuing.
2. Log in to the MDM runtime instance *n* server as the MDM OS user for this instance.
3. Start WebSphere Application Server by running the following command:

```
<WAS_INSTALL_HOME>/profiles/Dmgr01/bin$ ./startManager.sh  
<WAS_INSTALL_HOME>/profiles/AppSrv01/bin$ ./startNode.sh
```

4. Log in to the WebSphere Application Server Integrated Solutions Console (admin console) as the wasadmin user.
5. Start the MDM operational server and the MDM user interface server.

Backing up and restoring IBM MDM on Cloud

Before making changes to your IBM® MDM on Cloud deployment, back up the key assets of your environment.

Because each deployment is different, this documentation does not attempt to provide specific steps for backing up. Use your preferred archiving and backup tools.

File system backup tips

It is a good idea to schedule daily backups because files change frequently in these directories. Use a back up schedule that consists of a regular full backup and daily incremental backups.

Database backup tips

You can use several methods to back up your database, such as exports, hot back ups, cold back ups, or mirroring. Use any method that is convenient to you for backing up the database schema. For details about how to back up and recover data, see the database vendor documentation.

To ensure data safety, use a well-defined back up strategy in place that backs up data at regular intervals for when a large feed file is imported or a large amount of data is modified. The strategy that you take, offline or online, strongly depends on your database vendor and your available resources. You can take offline backups at specific intervals, in which all users must log off, and the database must be taken offline before you back up the database.

For most production environments, you can take online back ups. In an online backup strategy, you must secure your database log files so you can roll forward the last online back up to a point in time. Online backup is the option that is preferred for most production environments because users can continue to work on database while a back up is taken. Full, valid backups should take place at least one time per week.

Important: Always check the logs and status to make sure that backups are completed successfully with no errors.

Procedure

1. Back up the MDM database.
2. Back up all of the IBM WebSphere Application Server profiles associated with this deployment.
3. Back up all EAR and WAR files associated with this deployment.
4. Back up all log files that you wish to keep.
5. Back up any customizations (CBA files) deployed in this environment.
6. Back up any customizations that you have applied to the user interface applications.
7. For developer instances, use the Rational Application Developer export function to create backups of any relevant MDM Workbench workspaces.

8. Back up the following configuration files:
 - The configuration settings within the CONFIGELEMENT database table.
 - The contents of the folder MDM_INSTALL_HOME/mds/conf.
 - The contents of the folder WAS_PROFILE_HOME/InstalledApps/CELL_NAME/MDM-native-APP_NAME.ear/native.war/conf.
 - The contents of the folder WAS_PROFILE_HOME/InstalledApps/CELL_NAME/MDM-native-APP_NAME.ear/native.war/work.
9. Back up IBM Business Process Manager databases.
10. Back up IBM InfoSphere Information Server components.

To recover your system and the supporting files, restore the backed up files or directories to their original locations.

Connecting to the database

You must establish a connection with the IBM® MDM on Cloud server to be able to access the MDM database.

Prerequisite: You must know the IP address or host name, port number, and credentials for the IBM MDM on Cloud server.

A database connection URL is a string that the JDBC driver uses to connect to the Db2 database in your instance of IBM MDM on Cloud. The URL contains connection information such as where to search for the database, the name of the database to connect to, and credentials.

1. Download the installation package from IBM Passport Advantage.
2. Add ds.jar to the CLASSPATH environment variable on your local computer. A Microsoft® Windows example:

```
set CLASSPATH=ds.jar;classpath2;classpath3
```

3. Create the JDBC URL to connect to your IBM MDM on Cloud instance with your connection information. For example:

```
jdbc:db2://169.21.34.4:50000/MYDB:user=admin;password=mypass
```

4. Load an IBM MDM on Cloud instance, and then create a connection by using your JDBC URL.

Changing and displaying firewall security

You can change the security level of your IBM® MDM on Cloud server by configuring the iptables firewall. On the client, you can use the netsh command from Microsoft Windows to show the firewall profile and to list open ports.

Prerequisite: You must know the credentials of a user and the IP address of the IBM MDM on Cloud client and server machines. This information is in the “Access Credentials and Initial Setup” section of the Welcome letter that you received from your IBM® Sales Representative.

When the IBM MDM on Cloud server and client are delivered, the network access to the Linux server and the Microsoft Windows client is secured.

If you need to access ports of the IBM MDM on Cloud server from your on premise instances, you must modify the iptables rules.

On the client, you can show the firewall profile, list the open ports, and close an open port.

To change the security level or to manage rules for the IBM MDM on Cloud server firewall

1. Log in to the root account of the IBM MDM on Cloud server.
2. Open a command-line window, and then type the command sudo.
3. Do any of following commands from the prompt.

List the rules in iptables

You can print the rules with the line numbers. This command is useful when you need to insert a rule at a specific location in iptables.

```
iptables -L --line-numbers
```

Restrict access to the server from a range of IP addresses

You can restrict access to a subnet so that only those IP addresses can use `ssh` to access your cloud server.

```
iptables -A INPUT -i eth0 -p tcp -s <ip_subnet_address> --dport 22 -m state --state NEW,ESTABLISHED -j ACCEPT
```

where `<ip_subnet_address>` is the range of IP addresses in the subnet. For example, the following rule allows incoming ssh connections from only the 192.168.100.X subnet:

```
iptables -A INPUT -i eth0 -p tcp -s 192.168.100.0/24 --dport 22 -m state --state NEW,ESTABLISHED -j ACCEPT
```

Restrict access to the server from a single IP address

This restriction is the most stringent.

```
iptables -A INPUT -i eth0 -p tcp -s <ip_address> --dport 22 -m state --state NEW,ESTABLISHED -j ACCEPT
```

where `<ip_address>` is the single IP address that is permitted to access the server. For example, the following rule allows incoming ssh connections from a single port on 192.168.100.11:

```
iptables -A INPUT -i eth0 -p tcp -s 192.168.100.11 --dport 22 -m state --state NEW,ESTABLISHED -j ACCEPT
```

Open a port from another machine

To connect to the IBM MDM on Cloud server from any other machine, you must open the MDM ports. For a list of ports that are open by default see [Default ports in use](#).

```
iptables -A INPUT -p tcp --dport <port_number> -j ACCEPT
```

where `<port_number>` is the IBM MDM on Cloud port that you want to open. For example, the following rule opens port 9446 on the server for incoming traffic from port 9446 of other machines:

```
iptables -A INPUT -p tcp --dport 9446 -j ACCEPT
```

Add a rule at a specific line in the iptables

The order of the rules is important. Rules are appended to the end of existing rules. For example, if the rule that you added follows a DROP rule that matches incoming traffic, the DROP rule is considered before the newly added rule. You can add a rule at a specific line in the iptables to push subsequent rules down in the list.

```
iptables -I INPUT line_number -p tcp -s <ip_address> --dport 22 -j ACCEPT
```

For example, the following rule adds a rule at line 6 to accept incoming traffic on port 22 from 192.168.100.11:

```
iptables -I INPUT 6 -p tcp -s 192.168.100.11 --dport 22 -j ACCEPT
```

Delete all rules in iptables

Important: Before you remove all rules, be sure that the default INPUT policy is ACCEPT. Otherwise, you cannot connect to the Information Server on Cloud server from anywhere.

```
iptables -F
```

To show the Microsoft Windows firewall profiles on the IBM MDM on Cloud client

1. Access the IBM MDM on Cloud client by using Microsoft Remote Desktop Connection.
2. Open a command-line window on the client.
3. Run the command `netsh advfirewall show allprofiles`.

To show a list of all open ports on the IBM MDM on Cloud client

1. Access the IBM MDM on Cloud client by using Microsoft Remote Desktop Connection.
2. On the client, click **Start > Administrative Tools > Server Manager**.
3. In the upper-right corner of the Server Manager window, click **Tools**. From the list, select **Windows Firewall with Advanced Security**.
4. In the left pane, click **Inbound Rules** to see which ports are open for incoming network traffic.

To block an open port on the IBM MDM on Cloud client

Do the previous task. Right-click the port number, and then select the appropriate action.

Managing LUKS keys on the server machine

Any partition that is encrypted by using Linux Unified Key Setup (LUKS) can have eight different keys. You can use any of the keys to open the encrypted partition. In addition, you can add new keys or remove existing ones according to your needs.

Prerequisite: You must know the credentials of the root user and the IP address of the IBM® MDM on Cloud server machine. This information is in the “Access Credentials and Initial Setup” section of the Welcome letter that you received from your IBM Sales Representative.

One LUKS key is specified in the “Encryption Details” section of the Welcome letter that you received from your IBM Sales Representative. This key file is used from `/etc/crypttab` file to unlock the partition when the IBM MDM on Cloud server reboots. For details about encrypted partitions on the IBM MDM on Cloud server, see [Disk partitions and encryption](#).

Procedure

1. On the IBM MDM on Cloud server, open a command-line window.
2. Do any of the following tasks to manage your keys. The commands can be run from any directory.

Add new LUKS key

```
cryptsetup luksAddKey <partition_name>
```

The parameter `<partition_name>` is the partition that is encrypted.

For example, the partition for virtual servers is `/dev/xvdc1`. For bare metal servers, the partition is `/dev/sda5`.

Type in the existing key that is given in the Welcome letter. When prompted, enter the name of the new key.

Remove existing LUKS keys

```
cryptsetup luksRemoveKey <partition_name>
```

When prompted, enter the name of the specific key that you want to remove.

Add a key from a file

```
cryptsetup luksRemoveKey <partition_name> <keyfile_name>
```

The parameter <keyfile_name> must include the full file path of the file.

The command asks for an existing key and then reads the new key from the file.

Notices

Notices

This information was developed for products and services offered in the U.S.A.

IBM® may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan Ltd.
19-21, Nihonbashi-Hakozakicho, Chuo-ku
Tokyo 103-8510, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licenses of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
J46A/G4
555 Bailey Avenue
San Jose, CA 95141-1003 U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs.

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:

© (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. _enter the year or years_. All rights reserved.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Privacy Policy Considerations

IBM Software products, including software as a service solutions, ("Software Offerings") may use cookies or other technologies to collect product usage information, to help improve the end user experience, to tailor interactions with the end user or for other purposes. In many cases no personally identifiable information is collected by the Software Offerings. Some of our Software Offerings can help enable you to collect personally identifiable information. If this Software Offering uses cookies to collect personally identifiable information, specific information about this offering's use of cookies is set forth below.

Depending upon the configurations deployed, this Software Offering may use session and persistent cookies that collect each user's name, user name, password, profile name, or other personally identifiable information for purposes of session management, authentication, enhanced user usability, single sign-on configuration, or web page identification that the user tried to load prior to login. These cookies can be disabled, but disabling them will also likely eliminate the functionality they enable.

If the configurations deployed for this Software Offering provide you as customer the ability to collect personally identifiable information from end users via cookies and other technologies, you should seek your own legal advice about any laws applicable to such data collection, including any requirements for notice and consent.

For more information about the use of various technologies, including cookies, for these purposes, see IBM's Privacy Policy at www.ibm.com/privacy and IBM's Online Privacy Statement at www.ibm.com/privacy/details the section entitled "Cookies, Web Beacons and Other Technologies" and the "IBM Software Products and Software-as-a-Service Privacy Statement" at www.ibm.com/software/info/product-privacy.

Trademarks

IBM, the IBM logo, and [ibm.com](http://www.ibm.com)[®] are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml.

The following terms are trademarks or registered trademarks of other companies:

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce.

Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java[™] and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

ITIL is a registered trademark, and a registered community trademark of The Minister for the Cabinet Office, and is registered in the U.S. Patent and Trademark Office.

UNIX is a registered trademark of The Open Group in the United States and other countries.

