



SURAKSHAAYANAM
KERALA STATE EMERGENCY
MANAGEMENT

KSDMA-SEOC
INSTALLATION DOCUMENT

January 20th, 2016

1. DOCUMENT CONTROL

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2. INTRODUCTION

Introduction to KDMA-EOC

The state is frequently ravaged by the disastrous consequences of coastal erosion, lightning, landslides, floods, drought and petro-chemical transportation related accidents. Other relatively less frequent but significant phenomenon capable of causing disastrous consequences are windfall of trees, earthquakes, intense rainfall, pest attack, forest fire, chemical transportation and storage related accidents. KDMA Disaster management Project is aimed at effective event management of resources in case of any disaster and emergency. This solution aims at effective management of multiple Emergency incident and events and help officials take informed decisions.

2.1 Overview of the Solution provided to KMDA

Kerala Disaster Emergency Management will be built by integration of IBM intelligent Operations center and ESRI.

In case of any emergency an event will be generated on IBM IOC. Once the event has been generated the operators will receive alerts and notifications on a common dashboard. Alerts will also be sent to higher officials, management and stake holders. Notification will be in form of email or sms alert. Once an event is reported on IOC the operator will then co-ordinate with multiple departments to perform the related Standard Operating Procedures. Operators can filter down the nearby resources like ambulance, firebrigade, hospitals, schools etc to quickly locate the nearby resource and take the necessary actions. SOP's can be triggered manually or automatically. The alerts which are reported at the call-centre by calls can be triggered manually and operators will then follow the SOP's to effectively manage the emergency situation. Alerts which are triggered by the system will be populated into IBM IOC and the SOP's will be triggered. IBM IOC reporting generation service can be used to generate the report of the events which are generated and the SOP's that was followed to close the event. IBM IOC Knowledge performance indicators will be used to know the performance in case of any emergency event and which can be used to take necessary actions to optimize the system.

The rainfall, landslide, earthquake, tsunami data will be mapped on ESRI map using arcgis. Further analysis and perditions can be done on ESRI server that will give us predictive models such as flooded area in case of heavy rain fall. These predictions will help to take necessary actions to preserve important assets and effectively take necessary actions during an emergency.

2.2 Purpose and scope of this document

The KDMA Solution Design Document describes the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts detailed design.

2.3 Reference information

- <http://www-969.ibm.com/software/reports/compatibility/clarity-reports/report/html/softwareReqsForProd-uct?deliverableId=1BFA69B0DF6E11E498CB907A2AAE2458&osPlatforms=Linux>
- http://www.ibm.com/support/knowledgecenter/SS3NGB_5.1.0.6/ioc/kc_welcome.html
- <http://www-01.ibm.com/software/industry/intelligent-oper-center/ioc-library/>
- <http://www-01.ibm.com/support/docview.wss?uid=swg27039133>

3. HARDWARE REQUIREMENT

Sno.	Model	Quantity(Units)	Deployment Component	RAM(GB)	CPU(Cores)	Disk(GB)	Storage(TB)
1	X 3650	1	IOC Active	64	16	600	2.4
2	X 3650	1	IOC Passive	64	16	600	2.4
3	X3650	1	ESRI	64	16	600	2.4

4. PROJECT IMPLEMENTATION SCOPE

4.1 Phase I A – Environment setup

4.1.0 INSTALLATION AND CONFIGURATION OF IBM INTELLIGENT OPERATIONS CENTER

1. Installation of OS (RHEL 6.6) on two physical servers.
2. Installation of IOC 5.1.0.4 HA
 - 2.1 Server 1 will consist on all primary servers i.e. as below:
 - Primary Application server
 - Standby Application Server
 - Primary Web server
 - Standby Web server
 - 2.2 Server 2 will consist of all secondary servers i.e. as below:
 - Primary Data server
 - Standby Data server
 - Primary Analytical server
 - Standby Analytical server

5. INSTALLING THE SOLUTION

5.1 Installing the multiserver platform and applications

A multi-server deployment provides extra capacity to maintain performance under peak loads when IBM® Intelligent Operations Center is integrated with intensive data and analytic applications. You can deploy multiple servers in either a standard environment, or in a high availability environment.

5.1.0 PREPARING FOR INSTALLATION

5.1.0.1 Preparing the servers

a) Installing the required packages

Install the following Red Hat Package Manager (RPM) files that are required by the IBM Intelligent Operations Center installation:

1. Select open a terminal window as a root.
- ❖ Copy the rhel-server-6.5- /root/ x86_64-dvd.iso on the Vm. Here I have copied the iso file on the following directory Desktop/rhel-server-6.5-x86_64-dvd.iso.
 - ❖ Make directory and give full permissions to the directory by using the following commands:


```
Command: mkdir /mnt/cdrom
```

```
Command: chmod -R 777 /mnt/cdrom/
```
 - ❖ Mount the copied rheliso file in the directory that you created(i.e /mnt/cdrom) by using the following command.


```
Command: mount -o loop rhel-server-6.5-x86_64-dvd.iso /mnt/cdrom/
```
 - ❖ Go the directory /etc/yum.repos.d/ and droprhel-source.repo by using the following commands:


```
Command: cd /etc/yum.repos.d/
```

```
Command: rm -rf rhel-source.repo
```
 - ❖ Now create a new .repo file by using the following command:


```
Command: vi server.repo
```

 Now edit the server.repo file that you created and add the following lines to the file:

```
[server]
name=server repo
baseurl=file:///mnt/cdrom/
enabled=1
gpgcheck=0
```


Save and close the file.

- ❖ Now run the following command :

Command: yum clean all

- ❖ Now run the following command to import related public keys:

*Command: rpm --import /mnt/cdrom/*GPG**

Ensure that the /tmp directories are fully accessible on all servers, by logging on to each server as a root user and entering the following command:

- ❖ *Command: chmod 1777 /tmp*

Install the following Red Hat Package Manager (RPM) files that are required by the IBM Intelligent Operations Center installation:

- *yum install audit-libs.i686*
- *yum install audit-libs.x86_64*
- *yum install compat-libstdc++*i686*
- *yum install dos2unix.x86_64*
- *yum install gettext.x86_64*
- *yum install glibc.i686*
- *yum install glibc.x86_64*
- *yum install ksh.x86_64*
- *yum install libaio.i686*
- *yum install libaio.x86_64*
- *yum install libgcc.i686*
- *yum install libgcc.x86_64*
- *yum install libstdc++.i686*
- *yum install nss-softokn-freebl.i686*
- *yum install nss-softokn-freebl.x86_64*
- *yum install ntp.x86_64*
- *yum install openssh-clients.x86_64 pam.i686*
- *yum install pam-devel.i686*
- *yum install pam_passwdqc.x86_64*
- *yum install tcsh.x86_64 unzip.x86_64*
- *yum install xorg-x11-xauth.x86_64*
- *yum install zlib.i686 zlib.x86_64*
- *yum install gtk2.i686 gtk2.x86_64*
- *yum install gtk2-engines.i686*
- *yum install gtk2-engines.x86_64 libXtst.i686*
- *yum install libXtst.x86_64*
- *yum install nfs-utils*
- *yum install iscsi-initiator-utils*
- *yum groupinstall "Network Storage Server"*

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- `rpm -ivh /root/Desktop/iscsi-initiator-utils-6.2.0.873-21.el6.x86_64.rpm`
- `yum install iscsi*`
- `yum install gtk2.i686`
- `yum install libXtst.i686`
- `yum install -y PackageKit-gtk-module`
- `yum install -y libcanberra`
- `yum install -y libcanberra-gtk2.i686`
- `yum install -y gtk2-engines.i686`
- `yum install -y PackageKit-gtk-module.i686`

During the install you might receive prompts similar to the example. Answer with 'y'.

Note: Turn off the firewalls in all the vms.

Note:

For LVM, We need to install an additional network storage server library

Command: `yum groupinstall "Network Storage Server"`

And install iscsi initiator utilities rpm file

Command: `rpm -ivh /root/Desktop/iscsi-initiator-utils-6.2.0.873-21.el6.x86_64.rpm`

```

root@localhost:~/Desktop
File Edit View Search Terminal Help
[root@localhost Desktop]# rpm -ivh /root/Desktop/iscsi-initiator-utils-6.2.0.873-21.el6.x86_64.rpm
warning: /root/Desktop/iscsi-initiator-utils-6.2.0.873-21.el6.x86_64.rpm: Header V3 RSA/SHA1 Signature, key ID c105b9de: NOKEY
Preparing... ##### [100%]
 1:iscsi-initiator-utils ##### [100%]
[root@localhost Desktop]#

```

b) Configuring LVM Server

1) List the disk partitions

Command: `fdisk -l`

```

root@localhost:~/Desktop
File Edit View Search Terminal Help
[root@localhost Desktop]# fdisk -l

Disk /dev/sda: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0005953e

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1  *           1          2611     20971520   83   Linux
/dev/sda2             2611          9812     57835520   83   Linux
/dev/sda3             9812         12422     20971520   8e   Linux LVM
/dev/sda4            12422         13055      5078016    5   Extended
/dev/sda5            12423         12945      4194304   82   Linux swap / Solaris
[root@localhost Desktop]#

```

2) '**pvdisplay**' shows the physical volume we have created.

Command: `pvdisplay`

```

[root@localhost Desktop]# pvdisplay
"/dev/sda3" is a new physical volume of "20.00 GiB"
--- NEW Physical volume ---
PV Name               /dev/sda3
VG Name
PV Size               20.00 GiB
Allocatable           NO
PE Size               0
Total PE              0
Free PE               0
Allocated PE          0
PV UUID               jaofpL-qUVK-E63w-L9E7-fXYQ-m3Zy-h5iFzU
[root@localhost Desktop]#

```

3) Create volume group

Command: `vgcreate <vgname> <lvm pv disk partition>`

```

[root@localhost Desktop]# vgcreate vg_lvm /dev/sda3
Volume group "vg_lvm" successfully created
[root@localhost Desktop]#

```

4) 'vgdisplay' shows the volume group we have created.

Command:vgdisplay

```
[root@localhost Desktop]# vgdisplay
--- Volume group ---
VG Name                vg_lvm
System ID              lvm2
Format                 lvm2
Metadata Areas         1
Metadata Sequence No   1
VG Access               read/write
VG Status               resizable
MAX LV                 0
Cur LV                 0
Open LV                 0
Max PV                  0
Cur PV                 1
Act PV                  1
VG Size                 20.00 GiB
PE Size                 4.00 MiB
Total PE                5119
Alloc PE / Size         0 / 0
Free PE / Size          5119 / 20.00 GiB
VG UUID                 kT2zFz-sol6-4nLN-CAYk-vnRc-T20j-agywef

[root@localhost Desktop]#
```

5) Create logicalvolume

Command: lvcreate -n <lvname> -L <lv space> <vg name>

```
[root@localhost Desktop]# lvcreate -n lv_lvm -L 19G vg_lvm
Logical volume "lv_lvm" created
```

6) 'lvdisplay' shows the logical volume we have created.

Command:lvdisplay

```
[root@localhost Desktop]# lvdisplay
--- Logical volume ---
LV Path                  /dev/vg_lvm/lv_lvm
LV Name                  lv_lvm
VG Name                  vg_lvm
LV UUID                  UVBsRW-yAlJ-VydS-kjTm-IXmp-uor7-3lqRem
LV Write Access          read/write
LV Creation host, time   localhost.localdomain, 2016-08-10 21:25:27 +0530
LV Status                 available
# open                    0
LV Size                   19.00 GiB
Current LE                4864
Segments                  1
Allocation                inherit
Read ahead sectors        auto
- currently set to        256
Block device              253:0
```

7) List disk partitions

Command:fdisk-l

```
[root@localhost Desktop]# fdisk -l
```

```
Disk /dev/sda: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0005953e
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	1	2611	20971520	83	Linux
/dev/sda2		2611	9812	57835520	83	Linux
/dev/sda3		9812	12422	20971520	8e	Linux LVM
/dev/sda4		12422	13055	5078016	5	Extended
/dev/sda5		12423	12945	4194304	82	Linux swap / Solaris

```
Disk /dev/mapper/vg_lvm-lv_lvm: 83 MB, 83886080 bytes
255 heads, 63 sectors/track, 10 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000
```

8) Create lvm disk partition

Command: *fdisk <lvm mapper path>*

- Press n, then press p, and then press 1.
- Press Enter, and then press Enter again.
- Press w.

```
[root@localhost Desktop]# fdisk /dev/mapper/vg_lvm-lv_lvm
```

```
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel
Building a new DOS disklabel with disk identifier 0xc93482d5.
Changes will remain in memory only, until you decide to write them.
After that, of course, the previous content won't be recoverable.
```

```
Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)
```

```
WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
switch off the mode (command 'c') and change display units to
sectors (command 'u').
```

```
Command (m for help): n
```

```
Command action
```

```
  e   extended
```

```
  p   primary partition (1-4)
```

```
p
```

```
Partition number (1-4): 1
```

```
First cylinder (1-10, default 1):
```

```
Using default value 1
```

```
Last cylinder, +cylinders or +size{K,M,G} (1-10, default 10):
```

```
Using default value 10
```

```
Command (m for help): w
```

```
The partition table has been altered!
```

```
Calling ioctl() to re-read partition table.
```

```
WARNING: Re-reading the partition table failed with error 22: Invalid argument.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Syncing disks.
```

```
[root@localhost Desktop]# reboot now
```

9) Make file system

Command: `mkfs.ext4<lvm-mapper-path>`

```
[root@localhost Desktop]# mkfs.ext4 /dev/mapper/vg_lvm-lv_lvm
mke2fs 1.41.12 (17-May-2010)
Filesystem label=
OS type: Linux
Block size=1024 (log=0)
Fragment size=1024 (log=0)
Stride=0 blocks, Stripe width=0 blocks
20480 inodes, 81920 blocks
4096 blocks (5.00%) reserved for the super user
First data block=1
Maximum filesystem blocks=67371008
10 block groups
8192 blocks per group, 8192 fragments per group
2048 inodes per group
Superblock backups stored on blocks:
    8193, 24577, 40961, 57345, 73729

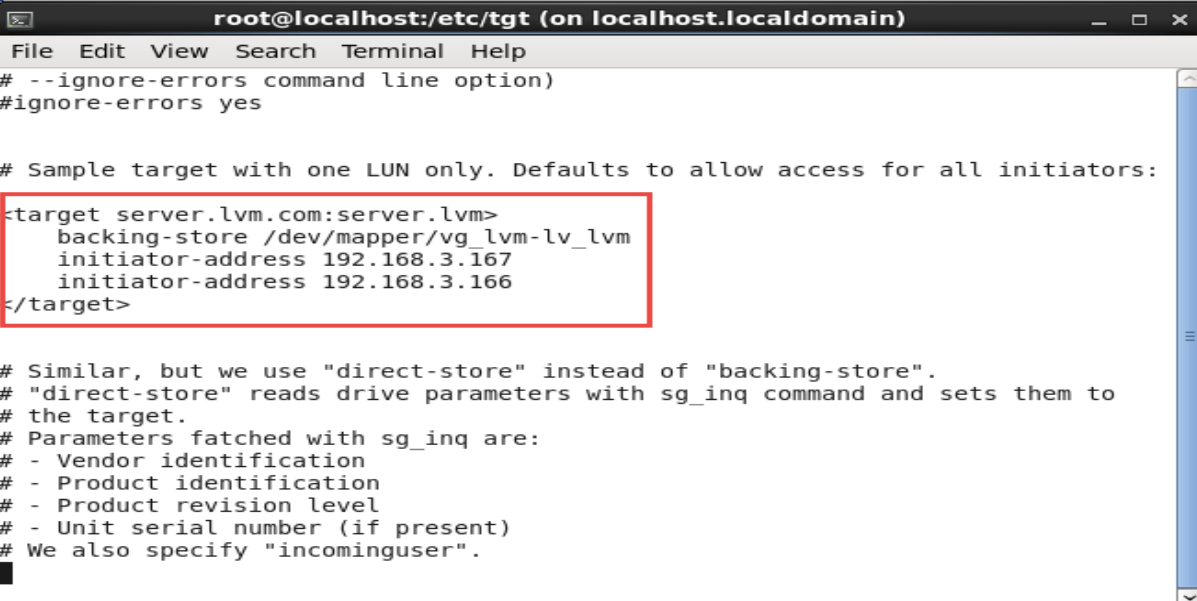
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 29 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
[root@localhost Desktop]#
```

10) Edit targets.conf file and set

LVM server mapper path as backing-store and
client hostnames as initiator-address.

Command: `vi/etc/tgt/targets.conf`



```
root@localhost:/etc/tgt (on localhost.localdomain)
File Edit View Search Terminal Help
# --ignore-errors command line option)
#ignore-errors yes

# Sample target with one LUN only. Defaults to allow access for all initiators:
<target server.lvm.com:server.lvm>
    backing-store /dev/mapper/vg_lvm-lv_lvm
    initiator-address 192.168.3.167
    initiator-address 192.168.3.166
</target>

# Similar, but we use "direct-store" instead of "backing-store".
# "direct-store" reads drive parameters with sg_inq command and sets them to
# the target.
# Parameters fatched with sg_inq are:
# - Vendor identification
# - Product identification
# - Product revision level
# - Unit serial number (if present)
# We also specify "incominguser".
```

11) Restart tgt service

Command: *service-tgt restart*

```
[root@localhost tgt]# service tgt restart
Stopping SCSI target daemon: initiators still connected [FAILED]
Starting SCSI target daemon: [ OK ]
[root@localhost tgt]# service tgt restart
Stopping SCSI target daemon: [ OK ]
Starting SCSI target daemon: [ OK ]
[root@localhost tgt]# █
```

c) Configuring LVM Client 1 i.e. Data Server 1

Now we need to do client configuration for LVM server. After the client server is ready with all the linux configuration done and hostname mapping being done

1) Restart tgt service

Command: *service-tgt restart*

```
[root@client1 Desktop]# service tgt restart
Stopping SCSI target daemon: not running [FAILED]
Starting SCSI target daemon: [ OK ]
[root@client1 Desktop]# service tgt restart
Stopping SCSI target daemon: [ OK ]
Starting SCSI target daemon: [ OK ]
[root@client1 Desktop]# █
```

2) Run the below command for restarting iscsi.

Command:

for i in iscsid iscsi; do chkconfig \$i on; service \$i stop; service \$i start; done

```
[root@client1 Desktop]# for i in iscsid iscsi; do chkconfig $i on; service $i stop; service $i start; done
Not stopping iscsid: iscsi sessions still active [WARNING]
Stopping iscsi: [ OK ]
Starting iscsi: ^C [ OK ]
```

3) Discover targets

Command: *iscsiadm --mode discovery --type sendtargets --portal <lvm server hostname>*

```
[root@client1 Desktop]# iscsiadm --mode discovery --type sendtargets --portal server.lvm.com
192.168.3.165:3260,1 server.lvm.com:server.lvm
```

4) Login to targets

Command:

iscsiadm --mode node targetname <target hostname> --portal <target hostname> --login


```
[root@client1 Desktop]# iscsiadm --mode node targetname server.lvm.com:server.lvm --portal server.lvm.com --login
Logging in to [iface: default, target: server.lvm.com:server.lvm, portal: 192.168.3.165,3260] (multiple)
Login to [iface: default, target: server.lvm.com:server.lvm, portal: 192.168.3.165,3260] successful.
```

5) Check whether the shared drive is added or not.

Command: `cat /proc/partitions`

```
[root@client1 Desktop]# cat /proc/partitions
major minor #blocks name

8          0  52428800 sda
8          1   307200 sda1
8          2  4096000 sda2
8          3 48024576 sda3
8         32    81920 sdc
```

6) Create disk partition

Command: `fdisk /dev/sdc`

- Press n, then press p, and then press 1.
- Press Enter, and then press Enter again.
- Press w.

```
[root@client1 Desktop]# fdisk /dev/sdc

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
        switch off the mode (command 'c') and change display units to
        sectors (command 'u').

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-1011, default 1):
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-1011, default 1011):
Using default value 1011

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
```

7) Check whether the shared disk partition created or not.

Command: `cat /proc/partitions`


```
[root@client1 Desktop]# cat /proc/partitions
major minor #blocks name

 8         0   52428800 sda
 8         1    307200 sda1
 8         2   4096000 sda2
 8         3   48024576 sda3
 8        32     81920 sdc
 8        33     81864 sdc1
```

Note: Finish tasks on Client2 before making file system on Client1

8) Make file system

Command: *mkfs.ext4* */dev/sdc1*

```
[root@client1 Desktop]# mkfs.ext4 /dev/sdc1
mke2fs 1.41.12 (17-May-2010)
Filesystem label=
OS type: Linux
Block size=1024 (log=0)
Fragment size=1024 (log=0)
Stride=0 blocks, Stripe width=0 blocks
20480 inodes, 81864 blocks
4093 blocks (5.00%) reserved for the super user
First data block=1
Maximum filesystem blocks=67371008
10 block groups
8192 blocks per group, 8192 fragments per group
2048 inodes per group
Superblock backups stored on blocks:
    8193, 24577, 40961, 57345, 73729

Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 29 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
[root@client1 Desktop]# █
```

9) Edit fstab file to append the following line to the /etc/fstab file:

Command: *vi /etc/fstab*

/dev/sdc1 /SANDisk1 ext4 rw,suid,dev,noexec,noauto,user,async 0 0

```
#
# /etc/fstab
# Created by anaconda on Thu Aug 4 07:59:40 2016
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
UUID=44da97df-eda1-4170-80af-8b8a80b58fe3 / ext4 defaults 1 1
UUID=4b7f2a8a-848e-4193-b4d0-d2bb6490e318 /boot ext4 defaults 1 2
UUID=1436cf84-069d-4808-98cb-a51ab4d39b98 swap swap defaults 0 0
tmpfs /dev/shm tmpfs defaults 0 0
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0
/dev/sdc1 /SANDisk1 ext4 rw,suid,dev,noexec,noauto,user,async 0 0
```

d) Configuring LVM Client 2 i.e. Data Server 2

Now we need to do client configuration for LVM server. After the client server is ready with all the linux configuration done and hostname mapping being done

- 1) Restart tgt service

Command: `service tgtd restart`

```
[root@client1 Desktop]# service tgtd restart
Stopping SCSI target daemon: not running          [ FAILED ]
Starting SCSI target daemon:                      [  OK  ]
[root@client1 Desktop]# service tgtd restart
Stopping SCSI target daemon:                      [  OK  ]
Starting SCSI target daemon:                      [  OK  ]
[root@client1 Desktop]# █
```

- 2) Run the below command for starting iscsi.

Command:

`for i in iscsid iscsi; do chkconfig $i on; service $i stop; service $i start; done`

```
[root@client1 Desktop]# for i in iscsid iscsi; do chkconfig $i on; service $i stop; service $i start; done
Not stopping iscsid: iscsi sessions still active [WARNING]
Stopping iscsi: [  OK  ]
Starting iscsi: ^C [  OK  ]
```

- 3) Discover targets

Command: `iscsiadm --mode discovery --type sendtargets --portal <lvm server hostname>`

```
[root@client1 Desktop]# iscsiadm --mode discovery --type sendtargets --portal server.lvm.com
192.168.3.165:3260,1 server.lvm.com:server.lvm
```

- 4) Login to targets

Command:

`iscsiadm --mode node targetname <target hostname> --portal <target hostname> --login`

```
[root@client1 Desktop]# iscsiadm --mode node targetname server.lvm.com:server.lvm --portal server.lvm.com --login
Logging in to [iface: default, target: server.lvm.com:server.lvm, portal: 192.168.3.165,3260] (multiple)
Login to [iface: default, target: server.lvm.com:server.lvm, portal: 192.168.3.165,3260] successful.
```

- 5) Check whether the shared drive is added or not.

Command: `cat /proc/partitions`

```
[root@client2 Desktop]# cat /proc/partitions
major minor #blocks name
8          0  52428800 sda
8          1   307200 sda1
8          2  4096000 sda2
8          3  48024576 sda3
8          32   81920 sdc
```

- 6) On Client2, to scan a new disk partition that will create the /dev/sdc1 device

Command: `partx -v -a /dev/sdc`

```
[root@client2 Desktop]# partx -v -a /dev/sdc
device /dev/sdc: start 0 size 163840
gpt: 0 slices
dos: 4 slices
# 1:      54-    163781 (    163728 sectors,      83 MB)
# 2:       0-      -1 (         0 sectors,       0 MB)
# 3:       0-      -1 (         0 sectors,       0 MB)
# 4:       0-      -1 (         0 sectors,       0 MB)
added partition 1
```

7) Check whether the shared disk partition added or not.

Command: cat /proc/partitions

```
[root@client2 Desktop]# cat /proc/partitions
major minor #blocks name

 8         0  52428800 sda
 8         1   307200 sda1
 8         2  4096000 sda2
 8         3 48024576 sda3
 8        32    81920 sdc
 8        33   81864 _sdc1
```

8) Edit fstab file to append the following line to the /etc/fstab file:

Command: vi /etc/fstab

```
/dev/sdc1      /SANDisk1      ext4          rw,suid,dev,noexec,noauto,user,async      0      0
#
# /etc/fstab
# Created by anaconda on Thu Aug  4 07:59:40 2016
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
UUID=44da97df-eda1-4170-80af-8b8a80b58fe3 /          ext4      default
ts          1 1
UUID=4b7f2a8a-848e-4193-b4d0-d2bb6490e318 /boot      ext4      default
ts          1 2
UUID=1436cf84-069d-4808-98cb-a51ab4d39b98 swap       swap      default
ts          0 0
tmpfs        /dev/shm      tmpfs     defaults      0 0
devpts       /dev/pts      devpts    gid=5,mode=620 0 0
sysfs        /sys          sysfs     defaults      0 0
proc         /proc         proc       defaults      0 0
/dev/sdc1    /SANDisk1     ext4      rw,suid,dev,noexec,noauto,user,async 0 0
```

Note: After finished steps on Client2, continue to finish steps from (8) on Client1.

e) Configuring Hostnames, Network and stopping the Firewall in each of the servers

In a standard environment, do the following steps on each of the four servers, unless indicated otherwise:

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- Data server
- Analytics server
- Application server
- Web server

In a high availability environment, do the steps on each of the four primary and standby servers, unless indicated otherwise:

- Data server 1 and data server 2
- Analytics server 1 and analytics server 2
- Application server 1 and application server 2
- Web server 1 and web server 2

1. Open a console window, and log on as a root user.
2. Define a fully qualified name and short host name either by using a DNS server, or by creating a definition in the `/etc/hosts` file.

Note: Ensure that the database server host name is not the same as either of the following database names:

- IOADB
 - IOADATA
3. Ensure that the **HOSTNAME** value that is defined in the `/etc/sysconfig/network` file is set to the short host name, and that it is not set to the fully qualified host name. For example, set `HOSTNAME=xyz` instead of `HOSTNAME=xyz.yourco.com`.
 4. Verify that the host name, fully qualified host name, and domain name are configured correctly on each server:
 - a. Enter the following command: `hostname -s`. The verification is successful if the command returns the defined short host name for the server.
 - b. Enter the following command: `hostname -f`. The verification is successful if the command returns the fully qualified domain and host name for the server.
 - c. Enter the following command: `hostname -d`. The verification is successful if the command returns the domain name of the server.
 - d. Choose the appropriate option:
 - In an IPV6 environment, enter the following command: `ping6 server_short_host_name`.
 - In all other environments, enter the following command: `ping server_short_host_name`.

The verification is successful if the command returns a result that indicates that the server is accessible.

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e. Choose the appropriate option:

- In an IPV6 environment, enter the following command: `ping6 server_fully_qualified_host_name`.
- In all other environments, enter the following command: `ping server_fully_qualified_host_name`.

The verification is successful if the command returns a result that indicates that the server is accessible.

To enable local loopback addressing for each server, ensure that the first line in the `/etc/hosts` file is edited with the following content:

```
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
```

Note: This line is typically installed by default on Red Hat.

. For IP version 6, ensure that the following line appears in the `/etc/hosts` file and ensure that the line is not commented out.

```
:::1 localhost localhost.localdomain localhost6 localhost6.localdomain6
```

To verify local loopback addressing, choose the appropriate option:

- In an IPV6 environment, enter the following commands:
 - a. Enter the following command: `ping6 -n localhost6`. The verification is successful if the command returns the address `::1`.
 - b. Enter the following command: `ping6 -n localhost6.localdomain6`. The verification is successful if the command returns the address `::1`.
- In all other environments, enter the following commands:
 - . Enter the following command: `ping -n localhost`. The verification is successful if the command returns the address `127.0.0.1`.
 - a. Enter the following command: `ping -n localhost.localdomain`. The verification is successful if the command returns the address `127.0.0.1`.

In the `/etc/selinux/config` file, configure the SELinux setting to either permissive or disabled. For example, to configure the SELinux setting to permissive, in the `/etc/selinux/config` file, edit the SELinux setting as shown in the following example and then restart the server:

```
SELINUX=permissive
```

Note: The SELinux setting must not be enabled.

Reboot the operating system by using the following command to make the SELinux changes effective:

```
reboot
```

To disable the server firewalls, enter the following commands:

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```
service iptables save
service iptables stop
chkconfig --level 123456 iptables off
```

To install the prerequisite RPM files, enter the following command (on one line):

```
yum install -y
audit-libs.i686          audit-libs.x86_64
compat-libstdc++*i686    compat-libstdc++*x86_64
                        dos2unix.x86_64
                        gettext.x86_64
glibc.i686              glibc.x86_64
                        ksh.x86_64
libaio.i686             libaio.x86_64
libgcc.i686             libgcc.x86_64
libstdc++.i686
nss-softoken-freebl.i686 nss-softoken-freebl.x86_64
                        ntp.x86_64
                        openssh-clients.x86_64
pam.i686
pam-devel.i686
                        pam_passwdqc.x86_64
                        tcsh.x86_64
                        unzip.x86_64
                        xorg-x11-xauth.x86_64
zlib.i686               zlib.x86_64
gtk2.i686               gtk2.x86_64
gtk2-engines.i686       gtk2-engines.x86_64
libXtst.i686            libXtst.x86_64
nfs-utils
```

Note: The nfs-utils RPM file is required only if you are using NFS to mount the installation media.

Install the Red Hat Enterprise Linux packages for the X Window System on the analytics, application, and web servers.

The X Window System is not required for the initial installation of IBM Intelligent Operations Center, but if you want to update the underlying IBM products by using IBM Installation Manager the X Window System is required. For example, you can update WebSphere® Application Server Liberty Profile and IBM HTTP Server. You can install either the GNU Object Model Envi-

ronment (GNOME) desktop or the K Desktop Environment (KDE) desktop to use with IBM Installation Manager.

Note: DB2® does not use the IBM Installation Manager, so the data server does not require the graphical user interface (GUI) that is provided by either the GNOME desktop or the KDE desktop.

- . Choose one of the following options:
 - To install the GNOME desktop, enter the following command:

```
yum -y groupinstall "X Window System" Desktop
```

- To install the KDE desktop, enter the following command:

```
yum -y groupinstall "X Window System" "KDE Desktop"
```

- a. Enter the following command: `yum -y update`
- b. To start the desktop, enter the following command: `init 5`
- c. To configure the GUI desktop to be the default desktop, edit the `/etc/inittab` file and change the value of the `initdefault` property from 3 to 5. The following example shows the updated line:

```
id:5:initdefault:
```

- d. Save the changes, and then restart the server.

To use the Chinese, Japanese, or Korean language version of the graphical installer, enter the appropriate commands as shown in the following example:

```
yum install -y "@Chinese Support"
```

```
yum install -y "@Japanese Support"
```

```
yum install -y "@Korean Support"
```

5.1.0.2 Security and data privacy

a) Security

By default, IBM Intelligent Operations Center has some installation and configuration features that enhance the security and privacy of the solution. For example, you should not use well-known product user IDs, such as `db2inst1`.

b) User Data Privacy

By default, the IBM Intelligent Operations Center platform installation process enables the DB2® Encryption Offering. Application databases that contain sensitive customer data can use local DB2 encryption facilities to protect sensitive information while the databases are not being accessed.

Encryption of customer data in DB2 does not provide protection against all potential data breach attacks. IBM recommends that installers also install and use complementary tools and techniques:

- Full disk encryption
- Code scanning tools
- Limited access to sensitive data, by granting access to as few users as possible, explicitly granting privileges, and not granting privileges to PUBLIC.

5.1.1 Deploying multiple servers

5.1.1.1 Extracting the installation media and scripts

Provide the installation media and scripts to each server that hosts an IBM® Intelligent Operations Center component.

a) Before you begin

Before you start installing IBM Intelligent Operations Center, review the latest installation updates to ensure that you have the most recent version of the installer. See the technote at [IBM Intelligent Operations Center V5.1 installation updates](#).

b) About this task

The installation media is provided as five ISO images. Use the following procedure to extract the installation media and scripts to an /installmedia directory on the analytics server. In a high availability environment, extract the installation media and scripts to an /installmedia directory on the analytics server 1. Alternatively, you can extract the ISO images files to an NFS server.

After all of the ISO image files have been extracted, create an NFS export to share the /installmedia directory with all the servers that host an IBM Intelligent Operations Center component.

c) Procedure

1. Enter the following commands in a terminal window as the root user to create directories either on the analytics server, or on analytics server 1 in a high availability environment, or on an NFS server:

```
mkdir /solution_iso_images
mkdir /solutionmedia
```



```
mkdir /installmedia
```

2. Copy the ISO image files into the /solution_iso_images directory.

```
IBM_IOC_MultiSer_1of5_Lin_ML.iso
IBM_IOC_MultiSer_2of5_Lin_ML.iso
IBM_IOC_MultiSer_3of5_Lin_ML.iso
IBM_IOC_MultiSer_4of5_Lin_ML.iso
IBM_IOC_MultiSer_5of5_Lin_ML.iso
```

3. Enter the following commands to extract the contents of each of the ISO image files to the /installmedia directory:

```
cd /solution_iso_images
mount -o loop IBM_IOC_MultiSer_1of5_Lin_ML.iso /solutionmedia
cp -r /solutionmedia/* /installmedia/
umount /solutionmedia
mount -o loop IBM_IOC_MultiSer_2of5_Lin_ML.iso /solutionmedia
cp -r /solutionmedia/* /installmedia/
umount /solutionmedia
mount -o loop IBM_IOC_MultiSer_3of5_Lin_ML.iso /solutionmedia
cp -r /solutionmedia/* /installmedia/
umount /solutionmedia
mount -o loop IBM_IOC_MultiSer_4of5_Lin_ML.iso /solutionmedia
cp -r /solutionmedia/* /installmedia/
umount /solutionmedia
mount -o loop IBM_IOC_MultiSer_5of5_Lin_ML.iso /solutionmedia
cp -r /solutionmedia/* /installmedia/
umount /solutionmedia
rmdir /solutionmedia
```

4. On the analytics server, or on analytics server 1 in a high availability environment, or on the NFS server where you extracted the media, configure an NFS export:

- a. Create the /etc/exports file if it does not exist.
- b. Edit the /etc/exports file, and add the following line:

```
/installmedia/ *(ro,sync)
```

- c. Enter the following command to start rpcbind and the NFS server:

```
service rpcbind start; service nfs start
```

- d. Enter the following command to check the NFS server status:

```
service nfs status
```

- e. Enter the following command to verify that the mount is exported:

```
showmount -e localhost
```

5. On each of the servers that do not have the media extracted into /installmedia, create an NFS mount to the /installmedia directory:

- a. Enter the following command to start the NFS server:

```
service nfs start
```

- b. Enter the following command to create the /installmedia directory:

```
mkdir /installmedia
```

Note: If the /installmedia directory exists, ensure that the directory is empty. The directory must be empty for the mount command to work correctly.

- c. Enter the following command to verify that the mount is available:

```
showmount -e analytics or NFS file server hostname
```

A list of available mount points are listed. If the /installmedia directory is correctly mounted, it is displayed as an option. The following example shows the command and the resulting output:

```
#showmount -e ioc51anal
Export list for ioc51anal:
/installmedia *
```

- d. Enter the following command to mount the /installmedia share locally on the server with an NFS mount tool:

```
mount -t nfs ioc51ana:/installmedia /installmedia
```

- e. Repeat steps [5.a](#) to [5.d](#) on each of the servers that does not have the media extracted to the /installmedia directory.

6. On each of the servers, create an installation directory and copy the ioc_platform.tar.gz compressed installation file to the installation directory:

- a. Open a terminal window and log on as the root user.
- b. Enter the following command to create the base IBM Intelligent Operations Center installation directory:

```
mkdir -p /opt/IBM/
```

- c. Enter the following command to copy the ioc_platform.tar.gz installation file from the /installmedia directory to the base IBM Intelligent Operations Center installation directory:

```
cp /installmedia/ioc_platform.tar.gz /opt/IBM/
```

5.1.0.1 Installing the servers in a high availability environment

Create the installation users, configure the installation properties, and run the installation script to configure each server.

a) Before you begin

Prepare the LVM Server and clients for use.

Enter the following commands as a root user:

1. To test that your mount point is working correctly, enter the following commands on data server 1 and on data server 2:
2. *mkdir /SANDisk1*
mount /SANDisk1
3. After the test, ensure that you unmount and remove the mount point by entering the following commands on data server 1 and on data server 2:
4. *umount /SANDisk1*
rm -rf /SANDisk1

b) About this task

Configure the four primary servers and the four standby servers in the following order, where server 1 refers to the primary server and server 2 refers to the standby server:

1. Configure data server1 and then configure data server 2.
2. Configure web server 1 and then configure web server 2.
3. Configure analytics server 1 and then analytics server 2.
4. Configure application server 1 and then configure application server 2.

Note: Complete steps 1-8, and optionally step 9, to configure each of the primary and standby servers before you begin step 10.

Note: Wait for the installation scripts to complete on each pair of primary and standby servers before you start the installation steps on the next pair of primary and standby servers.

c) Procedure

Configuring the servers

Note: Complete steps 1-8, and optionally step 9, on each server in turn, unless indicated otherwise.

1. On the server, open a terminal window and log on as a root user.
2. Enter the following command:
cd /opt/IBM
3. Enter the following command to extract the ioc_platform.tar.gz file to the /opt/IBM directory:
tar -zxvf ioc_platform.tar.gz

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Create the installation users and configure a shared SSH key between each of the servers. Create the SSH key on only one server, then share the SSH key with the other servers.

4. On data server 1, create the installation user and configure shared SSH keys:
 - a. On the data server, enter the following commands as a root user:
 - b. `cd /opt/IBM/ioc_install/applications/ioc/bin/ioc_install_user`
`./s1_create_ssh_key.sh`
`./s2_create_install_user.sh`
 - c. To copy the output files to the other primary and standby servers, enter the following command on data server 1 once for each primary and standby server, except for data server 1. In each case, enter the command on one line and replace *server_hostname* with the host name of the server that you are copying the output files to:
`scp /opt/IBM/ioc_install/applications/ioc/bin/ioc_install_user/ioc_rsa`
`/opt/IBM/ioc_install/applications/ioc/bin/ioc_install_user/s2_create_install_user.sh`
`server_hostname:/opt/IBM/ioc_install/applications/ioc/bin/ioc_install_user/`
5. Enter the following commands on each primary and standby server, except for data server 1:
6. `cd /opt/IBM/ioc_install/applications/ioc/bin/ioc_install_user/`
`./s2_create_install_user.sh`
7. To change from a root user to an ioc_installer user and go to the installation directory, enter the following commands:
8. `su - ioc_installer`
`cd /opt/IBM/ioc_install/bin`
9. Configure the installation properties in the ioc.install.properties file:
 - a. To edit the ioc.install.properties file, enter the following command:
`sudo vi ../cfg/ioc.install.properties`
 - b. Configure each of the following installation server host name properties with the fully qualified host name of the corresponding server in the installation environment:
`ana.server.hostname`
`ana.sby.server.hostname`
`app.server.hostname`
`app.sby.server.hostname`
`dat.server.hostname`
`dat.sby.server.hostname`
`web.server.hostname`
`web.sby.server.hostname`
`ldap.hostname`

ldap.sby.hostname

To obtain the fully qualified host name of a server, open a terminal window on the server and enter the following command:

`hostname -f`

- c. Configure the value of the loadbalancer.hostname property. If you do not have a load balancer, configure the loadbalancer.hostname value to be the same as the web.server.hostnamevalue.
- d. On the analytics, application, and web primary and standby servers, configure the values of the liberty.instance.name properties with the appropriate values for each server, as shown in the following table:

Table 1. Values for liberty.instance.name properties on each server

Server	Property name	Property value
Analytics server 1	liberty.instance.name	iocana01
Analytics server 2	liberty.instance.name	iocana02
Application server 1	liberty.instance.name	iocapp01
Application server 2	liberty.instance.name	iocapp02

10. On only data server 1 and data server 2, configure the following properties:
 - a. Configure the value of the db2.data.logs.dir property to match the mount point of the shared disk, for example, /SANdisk1.
 - b. Configure the value of the tsa.quorum.ip property to match the IP address of a highly available IP address that is external to IBM® Intelligent Operations Center, for example, the default gateway.
 - c. Configure the value of the tsa.primary.usenic property to match the value of the current network interface on data server 1. To obtain the value, on data server 1, open a terminal window and enter the ifconfig command.
 - d. Configure the value of the tsa.standby.usenic property to match the value of the current network interface on data server 2. To obtain the value, on data server 2, open a terminal window and enter the ifconfig command.

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11. Optional: Edit the password property values in the installation properties file. Each password property name has the suffix .pwd. The password for sample users is configured in theioc.sample.users.pwd property. Do not use the following special characters in password property values:

- Exclamation point, !
- Opening parenthesis, (
- Closing parenthesis,)
- Ampersand, &
- Dollar sign, \$
- Grave accent, `

Running the installation

Note: The preceding steps to configure the servers must be completed before you begin step 10.

10. On only data server 1, run the following license script, read the license agreement, and enter y or Y to accept the agreement:

```
sudo ./ioc.accept.license.sh
```

11. To run the installation script, enter the following command:

Note: You must run the installation script on the servers in the order that is indicated in [About this task](#).

```
sudo ./ioc.server.install.sh -p 8.server_initials
```

where *server_initials* is:

- dat for data server 1.
- sby.dat for data server 2.
- web for web server 1.
- sby.web for web server 2.
- ana for analytics server 1.
- sby.ana for analytics server 2.
- app for application server 1.
- sby.app for application server 2.

What to do next

The installation log files are saved to the /tmp directory. To prevent the log files from being deleted by automated system maintenance tasks, copy the log files from the /tmp directory to another location.

The naming convention for the log files is:

ioc.install.short_host_name.yymmdd-hhmm_timestamp.three_random_alphanumeric_characters

A basic user registry is installed by default at /opt/IBM/WebSphere/wlp/usr/servers/iocsvr1/server.xml. However, the basic user registry does not support password policies, password length, password expira-

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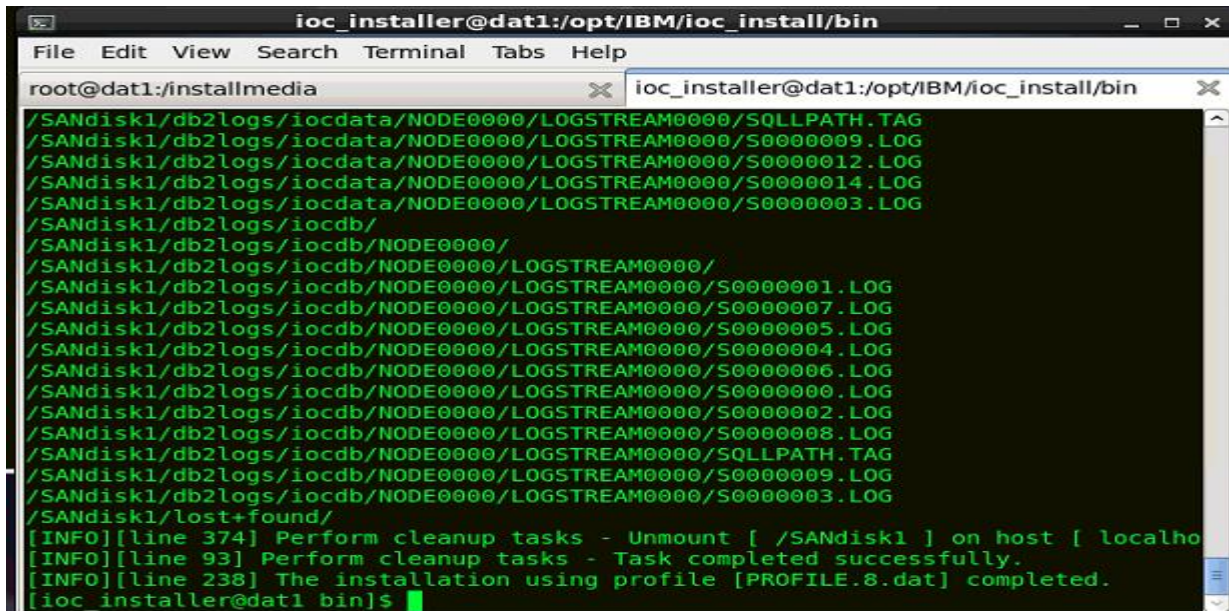
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tion dates, or user lockout. Configure the solution to work with a Lightweight Directory Access Protocol (LDAP) user registry. For more information, see the related link.

For information about the sample users that are installed with the solution, and about how to change user passwords, see the related link to "Securing the solution".

6. SUCCESSFUL INSTALLATION SCREENSHOTS:

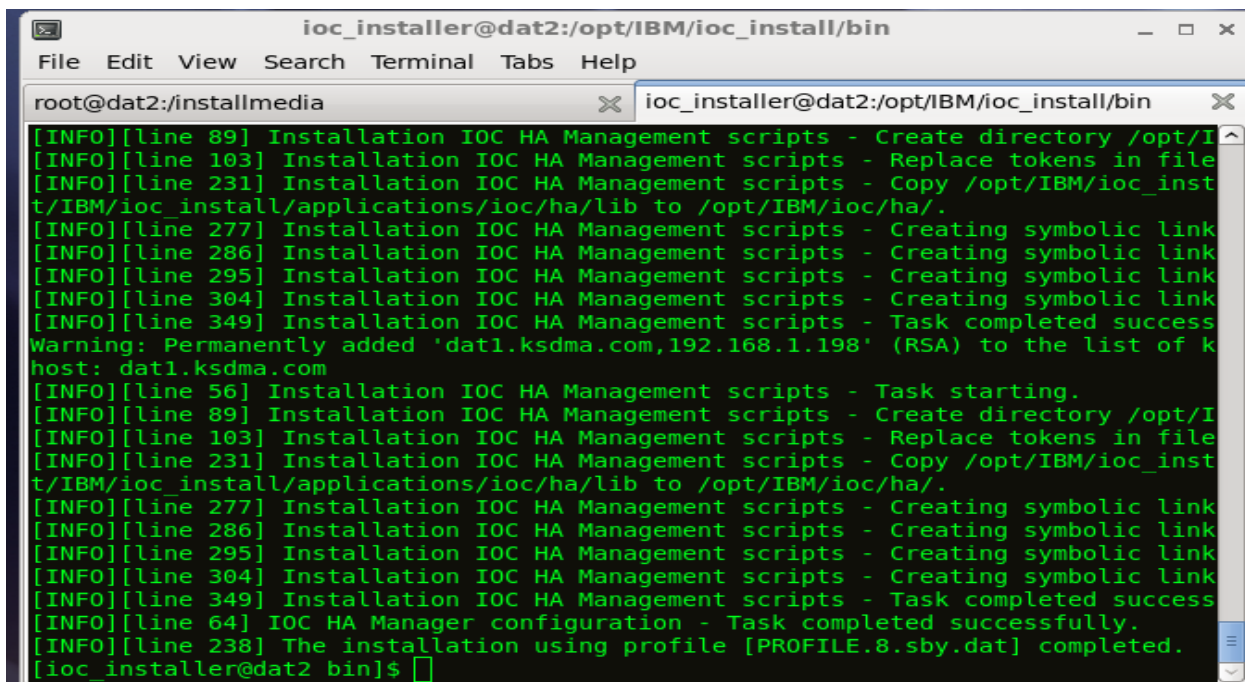
6.1 Primary DataServer



```

ioc_installer@dat1:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Tabs Help
root@dat1:/installmedia x ioc_installer@dat1:/opt/IBM/ioc_install/bin
/SANDisk1/db2logs/iocdata/NODE0000/LOGSTREAM0000/SQLLPATH.TAG
/SANDisk1/db2logs/iocdata/NODE0000/LOGSTREAM0000/S0000009.LOG
/SANDisk1/db2logs/iocdata/NODE0000/LOGSTREAM0000/S0000012.LOG
/SANDisk1/db2logs/iocdata/NODE0000/LOGSTREAM0000/S0000014.LOG
/SANDisk1/db2logs/iocdata/NODE0000/LOGSTREAM0000/S0000003.LOG
/SANDisk1/db2logs/iocdb/
/SANDisk1/db2logs/iocdb/NODE0000/
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000001.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000007.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000005.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000004.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000006.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000000.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000002.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000008.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/SQLLPATH.TAG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000009.LOG
/SANDisk1/db2logs/iocdb/NODE0000/LOGSTREAM0000/S0000003.LOG
/SANDisk1/lost+found/
[INFO][line 374] Perform cleanup tasks - Unmount [ /SANDisk1 ] on host [ localho
[INFO][line 93] Perform cleanup tasks - Task completed successfully.
[INFO][line 238] The installation using profile [PROFILE.8.dat] completed.
[ioc_installer@dat1 bin]$
  
```

6.2 Standby Dataserver



```

ioc_installer@dat2:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Tabs Help
root@dat2:/installmedia x ioc_installer@dat2:/opt/IBM/ioc_install/bin
[INFO][line 89] Installation IOC HA Management scripts - Create directory /opt/I
[INFO][line 103] Installation IOC HA Management scripts - Replace tokens in file
[INFO][line 231] Installation IOC HA Management scripts - Copy /opt/IBM/ioc_inst
t/IBM/ioc_install/applications/ioc/ha/lib to /opt/IBM/ioc/ha/.
[INFO][line 277] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 286] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 295] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 304] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 349] Installation IOC HA Management scripts - Task completed success
Warning: Permanently added 'dat1.ksdma.com,192.168.1.198' (RSA) to the list of k
host: dat1.ksdma.com
[INFO][line 56] Installation IOC HA Management scripts - Task starting.
[INFO][line 89] Installation IOC HA Management scripts - Create directory /opt/I
[INFO][line 103] Installation IOC HA Management scripts - Replace tokens in file
[INFO][line 231] Installation IOC HA Management scripts - Copy /opt/IBM/ioc_inst
t/IBM/ioc_install/applications/ioc/ha/lib to /opt/IBM/ioc/ha/.
[INFO][line 277] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 286] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 295] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 304] Installation IOC HA Management scripts - Creating symbolic link
[INFO][line 349] Installation IOC HA Management scripts - Task completed success
[INFO][line 64] IOC HA Manager configuration - Task completed successfully.
[INFO][line 238] The installation using profile [PROFILE.8.sby.dat] completed.
[ioc_installer@dat2 bin]$
  
```


6.3 Primary Webserver

```

ioc_installer@web1:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Tabs Help
root@web1:/installmedia x ioc_installer@web1:/opt/IBM/ioc_install/bin x
[INFO][line 185] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 205] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 215] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 225] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 235] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 246] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 258] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 270] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 283] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 296] IOC Application installation (WEB server) - Stop IHS server.
[INFO][line 307] IOC Application installation (WEB server) - Start IHS server.
[INFO][line 336] IOC Application installation (WEB server) - Task completed succ
essfully.
[INFO][line 238] The installation using profile [PROFILE.8.web] completed.
[ioc_installer@web1 bin]$

```

6.4 Standby Webserver

```

ioc_installer@web2:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Help
[ioc_installer@web2 bin]$
[INFO][line 185] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 205] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 215] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 225] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 235] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 246] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 258] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 270] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 283] IOC Application installation (WEB server) - Update file /opt/IB
M/HTTPServer/conf/httpd.conf.
[INFO][line 296] IOC Application installation (WEB server) - Stop IHS server.
[INFO][line 307] IOC Application installation (WEB server) - Start IHS server.
[INFO][line 336] IOC Application installation (WEB server) - Task completed succ
essfully.
[INFO][line 238] The installation using profile [PROFILE.8.sby.web] completed.
[ioc_installer@web2 bin]$

```

6.5 Primary AnalyticalServer

```

ioc_installer@ana1:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Help

<include location="/opt/IBM/WebSphere/wlp/usr/servers/iocana01/GeneratedSSLInclude.xml" />

[INFO][line 830] IOC Application installation (ANA server) - Getting SSL certificate from web1.ksdma.com:443 as /opt/IBM/ioc_install/applications/ioc/web_cert_file.pem.
[INFO][line 847] IOC Application installation (ANA server) - Importing SSL certificate /opt/IBM/ioc_install/applications/ioc/web_cert_file.pem to keystore /opt/IBM/WebSphere/wlp/usr/servers/iocana01/resources/security/key.jks.
Certificate was added to keystore
[INFO][line 870] IOC Application installation (ANA server) - Update file /opt/IBM/WebSphere/wlp/usr/servers/iocana01/server.xml.
Appended child "include" element node with "location" attribute "/opt/IBM/WebSphere/wlp/usr/servers/iocana01/GeneratedSSLInclude.xml" to root node.
[INFO][line 890] IOC Application installation (ANA server) - Start server iocana01.
Starting server iocana01.
Server iocana01 started with process ID 70364.
[INFO][line 1001] IOC Application installation (ANA server) - Task completed successfully.
[INFO][line 238] The installation using profile [PROFILE.8.ana] completed.
[ioc_installer@ana1 bin]$

```

6.6 StandBy AnalyticalServer

```

ioc_installer@ana2:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Tabs Help

root@ana2:~/Desktop x ioc_installer@ana2:/opt/IBM/ioc_install/bin x

<include location="/opt/IBM/WebSphere/wlp/usr/servers/iocana02/GeneratedSSLInclude.xml" />

[INFO][line 830] IOC Application installation (ANA server) - Getting SSL certificate from web2.ksdma.com:443 as /opt/IBM/ioc_install/applications/ioc/web_cert_file.pem.
[INFO][line 847] IOC Application installation (ANA server) - Importing SSL certificate /opt/IBM/ioc_install/applications/ioc/web_cert_file.pem to keystore /opt/IBM/WebSphere/wlp/usr/servers/iocana02/resources/security/key.jks.
Certificate was added to keystore
[INFO][line 870] IOC Application installation (ANA server) - Update file /opt/IBM/WebSphere/wlp/usr/servers/iocana02/server.xml.
Appended child "include" element node with "location" attribute "/opt/IBM/WebSphere/wlp/usr/servers/iocana02/GeneratedSSLInclude.xml" to root node.
[INFO][line 890] IOC Application installation (ANA server) - Start server iocana02.
Starting server iocana02.
Server iocana02 started with process ID 52197.
[INFO][line 1001] IOC Application installation (ANA server) - Task completed successfully.
[INFO][line 238] The installation using profile [PROFILE.8.sby.ana] completed.
[ioc_installer@ana2 bin]$

```

6.7 Primary ApplicationServer

```
ioc_installer@app1:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Help
e/wlp/usr/servers/iocapp01/resources/security/key.jks.
[INFO][line 864] IOC Application installation - Importing SSL certificate /opt/I
BM/ioc_install/applications/ioc/nws_cert_file.pem to keystore /opt/IBM/WebSphere
/wlp/usr/servers/iocapp01/resources/security/key.jks.
Certificate was added to keystore
[INFO][line 881] IOC Application installation - Getting SSL certificate from web
1.ksdma.com:443 as /opt/IBM/ioc_install/applications/ioc/web_cert_file.pem.
[INFO][line 898] IOC Application installation - Importing SSL certificate /opt/I
BM/ioc_install/applications/ioc/web_cert_file.pem to keystore /opt/IBM/WebSphere
/wlp/usr/servers/iocapp01/resources/security/key.jks.
Certificate was added to keystore
[INFO][line 920] IOC Application installation - Update file /opt/IBM/WebSphere/w
lp/usr/servers/iocapp01/server.xml.
Appended child "include" element node with "location" attribute "/opt/IBM/WebSph
ere/wlp/usr/servers/iocapp01/GeneratedSSLInclude.xml" to root node.
[INFO][line 933] IOC Application installation - Update file /opt/IBM/WebSphere/w
lp/usr/servers/iocapp01/server.xml.
Removed element node whose "id" attribute is "ASK ear"
[INFO][line 954] IOC Application installation - Start server iocapp01.
Starting server iocapp01.
Server iocapp01 started with process ID 28122.
[INFO][line 1203] IOC Application installation - Task completed successfully.
[INFO][line 238] The installation using profile [PROFILE.8.app] completed.
[ioc_installer@app1 bin]$
```

6.8 StandBy ApplicationServer

```
ioc_installer@app2:/opt/IBM/ioc_install/bin
File Edit View Search Terminal Help
Server iocapp01 started with process ID 29976.
[INFO][line 420] IOC HA HTTP plugin certificates configuration - Running command
[ sudo su - iocadmin -c '/opt/IBM/WebSphere/wlp/bin/server start iocapp02 --cle
an' ] as user [ ioc_installer ] on host [ app2.ksdma.com ].
[INFO][line 421] IOC HA HTTP plugin certificates configuration - Start server io
capp02.
Warning: Permanently added 'app2.ksdma.com,192.168.1.121' (RSA) to the list of k
nown hosts.
Starting server iocapp02.
Server iocapp02 started with process ID 35229.
[INFO][line 905] IOC HA HTTP plugin certificates configuration - Running command
[ sudo /opt/IBM/HTTPServer/bin/apachectl restart ] as user [ ioc_installer ] on
host [ web1.ksdma.com ].
Warning: Permanently added 'web1.ksdma.com,192.168.1.144' (RSA) to the list of k
nown hosts.
[INFO][line 916] IOC HA HTTP plugin certificates configuration - Running command
[ sudo /opt/IBM/HTTPServer/bin/apachectl restart ] as user [ ioc_installer ] on
host [ web2.ksdma.com ].
Warning: Permanently added 'web2.ksdma.com,192.168.1.108' (RSA) to the list of k
nown hosts.
[INFO][line 938] IOC HA HTTP plugin certificates configuration - Task completed
successfully.
[INFO][line 238] The installation using profile [PROFILE.8.sby.app] completed.
[ioc_installer@app2 bin]$
```

7. GLOSSARY

IOC – Intelligent Operations Center