Redundancy on MiVoice 5000 Manager

Mitel®

CONTENTS

1 ABOUT THIS DOCUMENT

1.1 PURPOSE OF THIS DOCUMENT

This document describes how to install redundancy on MiVoice 5000 Manager. This mechanism prevents hardware failures on a MiVoice 5000 Manager platform.

.

1.2 APPLICATION FIELD

64 bits CentOS 7 must first be installed (64 bits machine) before installing Mitel applications running with Linux as of MiVoice 5000 Manager ≥ R3.3.

CentOS 7 can only be used during a first installation.

Reference documents for the installation of CentOS:

- Centos 7.x and Double attachment ─ AMT/PTD/PBX/0059

- MiVoice 5000 Manager - Installation and configuration - AMT/PTD/NMA/0040/EN

2 SHORT GUIDE AND RECOMMENDATIONS ON HOW TO IMPLEMENT REDUNDANCY

This section gives a brief description of how to implement redundancy.

The different environments are illustrated at the end of this section.

Redundancy is a functional security mode based on the use of two servers:

A main (Master) server for nominal operation,

A secondary (Slave) server for resuming the operation if the main server fails (resulting in a switchover from Master to Slave).

Only one virtual address must be defined while installing the redundancy which allows the connected devices to communicate with the active machine only.

The two servers are on the same network (LAN); the redundancy is LAN type redundancy.

The link to the ETHERNET network of these servers can be set up either:

- Through **simple attachment**: only one interface connected by a single cable. In this case, the physical interface "**eth**" of each server is used.

- Through **double attachment**: two interfaces linked together by two separate cables. In this case, the virtual interface "**bondx**" (bonding mode) is used; this is the only network view which allows a switchover from one physical interface to the other if any of them fails.

Note: The name of these interfaces may vary according to server type (emx instead of ethx, for instance).

The configuration in double attachment is handled in the document Centos 7.x and Double attachment – AMT/PTD/PBX/0059.

To facilitate the procedure, it is advisable to set each server (main and secondary server) to double attachment. This is the default configuration (factory configuration) of the servers provided by Mitel.

However, the user can work in simple attachment mode by deactivating the virtual interface **bond0** and reconfiguring the **eth0** interface on each server.

In summary, the rules for and order of implementation are:

- In all cases, start by installing the operating system on each server.

- In case of redundancy with double attachment:
  - o Double attachment must always be configured first before implementing redundancy.
  - o Redundancy must then be installed with the bond0 interface on each server.

- In case of redundancy without double attachment:
  - o Redundancy must be implemented with the eth0 interface on each server.

Example of environments:

WAN redundancy without double attachment

LAN redundancy with double attachment
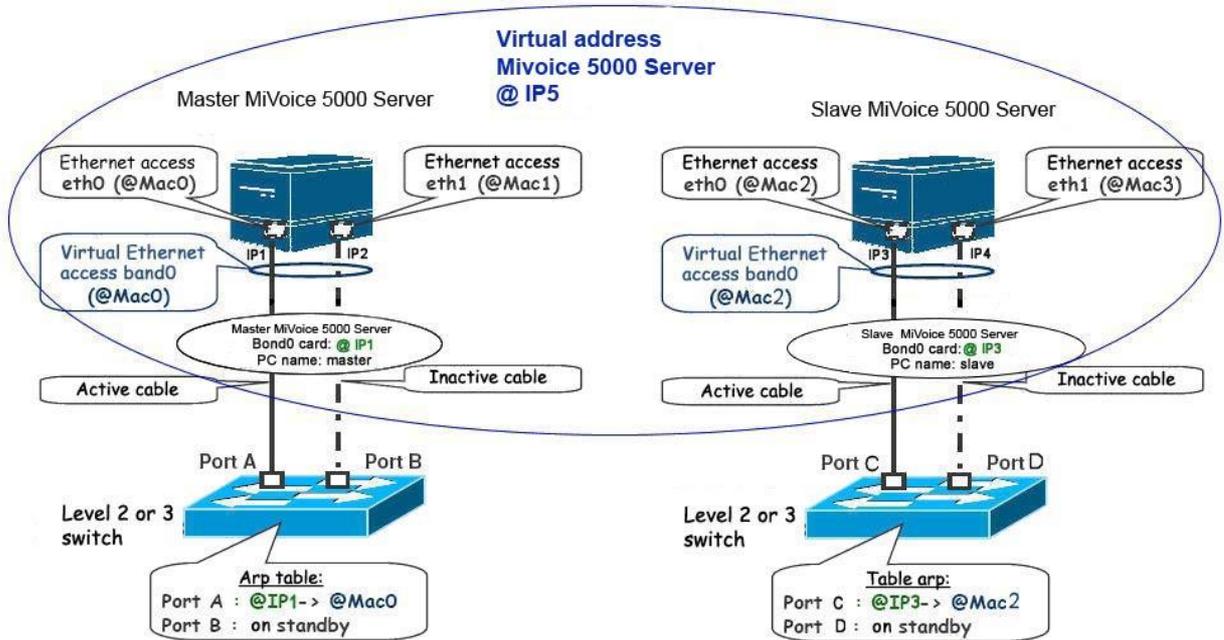
3   INSTALLING REDUNDANCY WITH DOUBLE ATTACHMENT

In this document, the installation of redundancy will only be described with double attachment; Mitel recommends this configuration to facilitate the procedure.

This is the default configuration (factory configuration) of the servers provided by Mitel.

However, the user can work in simple attachment mode by deactivating the virtual interface **bond0** and reconfiguring the **eth0** interface on each server.

The following configuration is described in this chapter:

- The two MiVoice 5000 Manager PCs are located on the same LAN at the customer's.

- Each MiVoice 5000 Manager PC has two Ethernet accesses.

- The virtual IP address used must be on the same subnet as the physical addresses of the two MiVoice 5000 Manager PCs.

- The physical and virtual IP addresses must be fixed.

3.1   PREREQUISITES

Prerequisites on the primary and secondary PCs:

- The configuration of double attachment is handled in the document Centos 7.x and Double attachment ─ AMT/PTD/PBX/0059.

3.2 INSTALLING AND CONFIGURING REDUNDANCY ON THE MASTER PC

3.2.1 NAME INPUT AND RESOLUTION ON THE MASTER PC

- Log on to the **root** account with the password **Mitel5000 on the master PC.**

- Type in the command below to give a name to the master PC: **hostnamectl set-hostname master-manager**

- With this command the prompt is used to check the name, by typing in the **hostname** command:

  [root@**master-manager** ~]# hostname
  master-manager

- Go to the /**etc**. directory, edit the hosts file, add to this file the IP addresses / name of the master and slave MiVoice 5000 as follows:

  127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
  192.168.0.101 manager-maitre
  192.168.0.102 manager-esclave
  ::1   localhost localhost.localdomain localhost6 localhost6.localdomain6

  Check that the resolution is actually working by typing in the command:

  ping slave-manager

3.2.2 COLLECTING INFORMATION ON THE MASTER PC

- Type in the **mount** command and check the name of the partition device to be made redundant (/opt/a5000) on the master MiVoice 5000 Manager PC: **sda3 (this name may be different, depending on the PC).**

3.2.3 NAME INPUT AND RESOLUTION ON THE SLAVE PC

- Log on to the **root** account with the password **Mitel5000 on the slave PC.**

- Type in the command below to give a name to the master PC: **hostnamectl set-hostname slave-manager**

- With this command the prompt is used to check the name, by typing in the hostname command:

  [root@**slave-manager** ~]# hostname
  slave-manager

- Go to the /**etc** directory, edit the hosts file, add to this file the IP addresses / name of the master and slave MiVoice 5000 as follows:

  127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
  192.168.0.101 manager-maitre
  192.168.0.102 manager-esclave
  ::1   localhost localhost.localdomain localhost6 localhost6.localdomain6

  Check that the resolution is actually working by typing in the command:

  ping master-manager

3.2.4   COLLECTING INFORMATION ON THE SLAVE PC

- Type in the **mount** command and check the name of the partition device to be made redundant (/opt/a5000) on the slave MiVoice 5000 Server PC: **sda3 (this name may be different depending on the PC).**

⚠️ **Warning:**   **The size of the partition to be made redundant must be the same on the master and slave PCs.**

⚠️ **Warning:**   **The name of the Ethernet interface must be the same on the master and slave PCs.**

3.2.5 INSTALLING AND CONFIGURING REDUNDANCY ON THE MASTER PC

- Log on to the **root** account with the password **Mitel5000** on the master PC.

➢ **From the CD/DVD:**

- Define a mount point:

    #mkdir /mnt/iso

- Insert the CD/DVD and enter:

    mount /dev/cdrom /mnt/iso

➢ **From the iso file:**

- Define a mount point:

    #mkdir /mnt/iso

- Retrieve the iso image **CD_7450_70-RC-A-XX_YY.iso** from the Mitel Website and copy it in the directoty **/tmp**,

- Mount the iso image in the directory **/mnt/iso**,

    #mount -o loop /tmp/CD_7450_70-RC-A-XX_YY.iso /mnt/iso

- Go to the directory **/mnt/iso/duplication**

- Run the installation script with the command **./install_redondance.script**

    o PC Master(1) or Slave(0) ?:1

    o Master IP address ?:192.168.0.100

    o Master Hostname ?: am7450

    o Slave IP address ?:192.168.0.101

    o Slave Hostname ?:am7450-e

    o Virtual IP Address ?:192.168.0.102

    o Virtual IP netmask ?:255.255.255.0

    o Redundancy: Lan(0) or WAN(1) ? : 0

    o Master Ethernet board for redundancy ?:bond0

    o Slave Ethernet board for redundancy ?:bond0

    o Ethernet board for applications ?:bond0

    o Do you want to ping an IP address: 1 (if there is a gateway IP address), or 0 (if there is no gateway IP address)

    o IP address to ping: 192.168.0.254 (gateway IP address)

    o Master Partition ?:sda4 (this name may be different depending on the PC)

    o Slave Partition ?:sda4 (this name may be different depending on the PC)

    o Heartbeat deadtime (in seconds)?: 10

    o Failback auto = ON/OFF ?:OFF

- After checking the redundancy configuration parameters, answer **1** to the question: **do you want to apply these settings: Yes(1) / No(0)**

- Check that the installation is working well:

    o Answer **yes** to the prompt To abort waiting enter 'yes'.

- Check the synchronisation status on the server:
  - Type in the command **cat /proc/drbd**.
  - The following result must appear:

cs:WFConnection st:Primary/Unknown ds:UpToDate/DUnknown

REDUNDANCY INSTALLATION AND CONFIGURATION ON THE MASTER PC HAS BEEN COMPLETED.

- Check the synchronisation status on the server:
  - Type in the command **cat /proc/drbd**.

3.2.6   INSTALLING MIVOICE 5000 MANAGER ON THE MASTER SERVER

3.2.6.1   Installing MiVoice 5000 Manager V3.x

- Log on to the **root** account with the password **Mitel5000** on the master PC.

➢ **From the CD/DVD:**

- Define a mount point:

    #mkdir /mnt/iso

- Insert the CD/DVD and enter:

    mount /dev/cdrom /mnt/iso

➢ **From the iso file:**

- Define a mount point:

    #mkdir /mnt/iso

- Retrieve the iso image **CD_7450_70-RC-A-XX_YY.iso** from the Mitel Website and copy it in the directoty **/tmp**,

- Mount the iso image in the directory **/mnt/iso**,

    #mount -o loop /tmp/CD_7450_70-RC-A-XX_YY.iso /mnt/iso

- In this directory, type the following command:

    #./autorun
- At the end of the installation, enter "**q**" to quit

- Go to the directory **CUSTOM_NAGIOS**.

- Type the command "./**install**"

- The installation of NAGIOS is then launched

- Wait for the end of installation

- Unmount the DVD:

    #CD

    #umount / mnt / iso

3.2.7 INSTALLING AND CONFIGURING REDUNDANCY ON THE SLAVE PC

3.2.7.1 Running the installation script

- Log on to the **root** account with the password **Mitel5000** on the master PC.

➢ **From the CD/DVD:**

- Define a mount point:

  #mkdir /mnt/iso

- Insert the CD/DVD and enter:

  mount /dev/cdrom /mnt/iso

➢ **From the iso file:**

- Define a mount point:

  #mkdir /mnt/iso

- Retrieve the iso image **CD_7450_70-RC-A-XX_YY.iso** from the Mitel Website and copy it in the directoty **/tmp**,

- Mount the iso image in the directory **/mnt/iso**,

  #mount -o loop /tmp/CD_7450_70-RC-A-XX_YY.iso /mnt/iso

- Go to the directory **/mnt/iso/duplication**

- Run the installation script with the command **./install_redondance.script**
  - PC Master(1) or Slave(0) ?:0
  - Master IP address ?:192.168.0.100
  - Master Hostname ?:master-manager
  - Slave IP address ?:192.168.0.101
  - Slave Hostname?:slave-manager
  - Virtual IP Address ?:192.168.0.102
  - Virtual IP netmask ?:255.255.255.0
  - Redundancy: Lan(0) or WAN(1) ? : 0
  - Master Ethernet board for redundancy ?:bond0
  - Slave Ethernet board for redundancy ?:bond0
  - Ethernet board for applications ?:bond0
  - Do you want to ping an IP address: 1 (if there is a gateway IP address), or 0 (if there is no gateway IP address)
  - IP address to ping: 192.168.0.254 (gateway IP address)
  - Master Partition ?:sda3 (this name may be different, depending on the PC)
  - Slave Partition ?:sda3 (this name may be different, depending on the PC)
  - Heartbeat deadtime (in seconds)?: 10
  - Failback auto = ON/OFF ?:OFF

- After checking the redundancy configuration parameters, answer **1** to the question: **do you want to apply these settings: Yes(1) / No(0)**

- Check that the installation is working well:

- Check that synchronisation is working well:

   [>..................] sync'ed: 7.2% (53284/53332)K

- Check that synchronisation has been completed:
   - o Type in the command **cat /proc/drbd**.
   - o The following result must appear:

   cs:Connected st:Secondary/Primary ds:UpToDate/UpToDate

- Go to the **duplication** directory.

- Then run the switch script: **./switch_redondance_7450.script**

- Check that the switchover has been completed successfully:
   - o Type in the command **cat /proc/drbd**.
   - o The following result must appear:

   cs:Connected st: Primary/Secondary ds:UpToDate/UpToDate

THE "Primary/Secondary" STATUS IS MANDATORY TO CONTINUE
   The command **crm_mon** can also use to check that the switchover on the slave server is effective.

3.2.8   INSTALLING MIVOICE 5000 MANAGER ON THE SLAVE SERVER

3.2.8.1   *Installing MiVoice 5000 Manager V3.x*

- Log on to the **root** account with the password **Mitel5000** on the slave PC.

➢ **From the CD/DVD:**

- Define a mount point:

    #mkdir /mnt/iso

- Insert the CD/DVD and enter:

    mount /dev/cdrom /mnt/iso

➢ **From the iso file:**

- Define a mount point:

    #mkdir /mnt/iso

- Retrieve the iso image **CD_7450_70-RC-A-XX_YY.iso** from the Mitel Website and copy it in the directoty **/tmp**,

- Mount the iso image in the directory **/mnt/iso**,

    #mount -o loop /tmp/CD_7450_70-RC-A-XX_YY.iso /mnt/iso

- In this directory, type the following command:

    #./autorun
- At the end of the installation, enter "**q**" to quit

- Go to the directory **CUSTOM_NAGIOS** on the CD-ROM.

    [root @ miv5000manager] #

- Type the command "./**install**"

- The installation of NAGIOS is then launched

- Wait for the message **End of installation**

- Unmount the DVD:

    #CD

    #umount / mnt / iso

3.2.9 STARTING MIVOICE 5000 MANAGER REDUNDANCY

3.2.9.1 Starting redundancy on the slave server

- Log on to the slave PC with the **root** account and the password **Mitel5000.**

➢ **From the CD/DVD:**

- Define a mount point:

    #mkdir /mnt/iso

- Insert the CD/DVD and enter:

    mount /dev/cdrom /mnt/iso

➢ **From the iso file:**

- Define a mount point:

    #mkdir /mnt/iso

- Retrieve the iso image **CD_7450_70-RC-A-XX_YY.iso** from the Mitel Website and copy it in the directoty **/tmp**,

- Mount the iso image in the directory **/mnt/iso**,

    #mount -o loop /tmp/CD_7450_70-RC-A-XX_YY.iso /mnt/iso

- Go to the directory **/mnt/iso/duplication**

- Run the start script with the command.**/start_redondance.script**

3.2.9.2 Starting redundancy on the master server

- Log on to the master PC with the **root** account and the password **Mitel5000.**

- Check that the switchover caused by the start of redundancy on the slave PC has been correctly executed:

    o Type in the command **cat /proc/drbd**.

    o The following result must appear:

    cs:Connected st: Primary/Secondary ds:UpToDate/UpToDate

Start redundancy by typing in the following command:
- Go to the **duplication** directory.

- Run the start script with the command.**/start_redondance.script**

3.3 INSTALLING MIVOICE 5000 MANAGER CLIENT

Refer to the document AMT/PTD/NMA/0040 version 11/2 minimum.

THE INSTALLATION OF DUPLEX MiVoice 5000 Manager HAS BEEN COMPLETED.

3.4 MIVOICE 5000 MANAGER V7.X DUPLEX POST INSTALLATION

3.4.1 SWITCHOVER TESTS AND NAGIOS IBSTALLATION

- Restart the slave server:
  Shutdown -r now

- Wait for the restart and check the switchover.
  On master server :
  - o Type the command **cat /proc/drbd**
  - o The following result must appear:
  cs:Connected st: Primary/Secondary ds:UpToDate/UpToDate

- Restart the master server:
  Shutdown -r now

- Wait for the restart and check the switchover.
  On master server:
  - Type the command cat /proc/drbd

  - The following result must appear:

  cs:Connected st: Primary/Secondary ds:UpToDate/UpToDate

3.5   DECLARING LICENCES

3.5.1   CHECKING THE STATUS OF LICENCES ON THE MASTER MIVOICE 5000 MANAGER PC

The licence associated with this dongle is obtained from an installation code to be generated during first installation from MiVoice 5000 Manager, in **Menu Administration>Unlock functions**.

This installation code is then used, by logging on to a dedicated server, to generate the actual licence which must be entered in the key field of this same menu.

Note: **It is better to use Internet Explorer to access the MiVoice 5000 Manager portal; this will make it easier to copy the values required to generate the licence. See installation code below.**

CAUTION: **In case of switchover to the slave MiVoice 5000 Manager PC, all the licences, including the redundancy licence, are seen as open on this PC, with a 30 days validity period displayed in the Validity column.**

If the master MiVoice 5000 Manager PC is active, the Validity column does not appear on the table indicating the licences.

If the slave MiVoice 5000 Manager PC becomes active after a switchover, the licences are only valid for 30 days. As from D-7, a message is displayed daily in the operations log reminding the administrator that the licences will soon expire.

The message "Operation on secondary server" appears on the welcome page of the slave MiVoice 5000 Manager PC when this latter is active.

The detailed procedure is as follows:

From the master MiVoice 5000 Manager PC:

In the menu **Administration>Unlock functions**:

- Tick the **duplex** box.

- Click **Dongle** (Master Key field).

- In the **Configuration of a virtual dongle** window:

- Enter the Virtual dongle ID (provided by the MiVoice 5000 Manager, example 03FF01XXXXXXXXX).

- Enter the MiVoice 5000 Manager virtual IP address.

- Fill in the Reference ID field corresponding to the dongle ID of any of the iPBXs managed by MiVoice 5000 Manager.

CAUTION: **All these fields must be filled in.**

- Click **Generate code**.

- Click **OK** to confirm the generation.

- The **Installation code** frame indicates the installation code value. Copy this code (to a .txt file for example).

- Click **OK** to close the window.

Switch over to the slave MiVoice 5000 Manager PC:

- On the master MiVoice 5000 Manager PC desktop, double-click the shortcut "**Change to slave**".

In the menu **Administration>Unlock functions**:

- Click **Dongle** (duplication Key Field).

In the Configuration of a virtual dongle window:

- Enter the **Virtual dongle ID** (provided by the MiVoice 5000 Manager, example 03FF01XXXXXXXXX).

- Enter the MiVoice 5000 Manager **virtual IP address**.

- Fill in the **Reference ID field** corresponding to the dongle ID of any of the iPBXs managed by MiVoice 5000 Manager.

⚠️ **CAUTION:** **All these fields must be filled in.**

- Click **Generate code**.

- Click **OK** to confirm the generation.

- The **Installation code** frame indicates the installation code value. Copy this code (to a .txt file for example).

- Click **OK** to close the window.

- Log on to the licence server **https://support.mitel.fr/akop/external.php** then enter these two installation codes.

This server then generates the actual licence for the functions specified during the order and also the redundancy licence.

- Save these licences using the .**txt file export** link.

- Return to the **master** MiVoice 5000 Manager PC:

- On the **slave** MiVoice 5000 Manager PC desktop, double-click the shortcut "**change to master**".

- Return to the same menu **Administration>Unlock functions**.

- Enter the licences needed by the client in the **Master key** field of this same menu, then click **Validate**.

A new frame is displayed underneath, indicating the locked functions.

- Enter the redundancy licence in the **Duplication key** field of this same menu, then click **Validate**.

A new frame is displayed underneath, indicating the locked functions. The functions in question are then authorised, as well as the redundancy function.

It is advisable to store these two licences in a text file.

⚠️ **CAUTION:** **The installation code is changed during each generation, even if no information has been changed (OS, MiVoice 5000 Manager, IP, dongle).**

- If in future the characteristics of the IP address and IID number system are modified, the installation code must be regenerated.

Checking the validity of the logical dongle

A check is made periodically on the following parameters:

- MiVoice 5000 Manager ID (dongle number)

- MiVoice 5000 Manager IP address

- MiVoice 5000 Manager MAC address

- Reference ID of an iPBX managed by MiVoice 5000 Manager.

Modifying any of these parameters results in immediate expiration of the licence and closes all the functions.

- The Reference ID must correspond to a dongle ID of an (unlocked) iPBX generated by MiVoice 5000 Manager, or else the MiVoice 5000 Manager licence will expire 30 days after the wrong information is detected.

- If the reference ID corresponds but this iPBX is not accessible (off or disconnected from the network), the MiVoice 5000 Manager licence expires 30 days after the absence of the iPBX is detected.

- Precautions for use

- The installation code is unique, and the generated keycode can only work with an installation code.

- If an installation code is generated without obtaining a new keycode, the functions subject to a licence are closed within one hour.

- To manage different cases requiring a change of installation code during the system's service life without first asking Mitel for an authorisation.

- After this change, you will no longer have the right to make any modification, you must contact Aastra to indicate your reasons for this change (user modification, physical replacement of the platform, network modification, etc.).

- After analysing your request, you will again be authorised to modify the installation code.

- During a consultation on the AKOP licence server ("search for a key"), the right to modify the installation code on the identification number concerned is indicated via the following information:

- Modification of installation code **allowed**

- Modification of installation code **not allowed**.

- In Menu **Administration>Unlock functions**:

- Enter the new V3.x key associated with the master dongle ID to unlock the client functions, then click **Validate**.

- Enter the new V3.x key associated with the slave dongle ID to unlock the redundancy functions, then click **Validate**.

Note: MiVoice 5000 Manager is working on the master PC.

3.6   CHECKING THAT MASTER MIVOICE 5000 MANAGER IS WORKING CORRECTLY

Make the following checks (list not exhaustive):

- Site identification

- TMA inventories

3.7   CENTOS 7.X SECURITY PATCHES ON THE MASTER AND SLAVE PCS

Refer to the document AMT/PTD/NMA/0062 - Updating the R6.x security patches on OS CentOS 7.x.

3.8 MODIFYING THE GENERAL REDUNDANCY PARAMETERS

If necessary, this procedure applies on an already operational redundant MiVoice 5000 Manager platform; modify one or more redundancy configuration parameters.

This enables the following parameters to:

- Change the **Failback** mode configuration

- Change the switchover timeout in case of failure (Heartbeat deadtime)

- Reconfigure redundancy if the IP address and/or name of both PCs changes

- Reconfigure redundancy if the name of the PCs changes

- Modify the virtual IP address and associated subnet mask.

⚠️ **CAUTION:** **The modifications must be made on both machines. The final execution of the redundancy parameters modification script on the active PC restarts the server (service interruption) possibly with a switchover to the other PC.**

The procedure for this is described below, using as example a modification of the **Failback** mode.

3.8.1 MODIFYING REDUNDANCY PARAMETERS ON THE MASTER MANAGER PC

Before running the redundancy update script:

- Check that the **Networkmanager** service has actually stopped.

- Enter the command:

  # service NetworkManager status

The answer must be > **NetworkManager stopped**.

If not, see Section 6.1. DISABLING NetworkManager

The redundancy parameters modification must be started from the directory **/duplication**.

- Go to the directory **/duplication**.

- Run the redundancy modification script:

  # ./update_redondance.script

The software DRBD and Heartbeat are stopped then restarted at the end of the script, which triggers an automatic return to the master MiVoice 5000 Manager PC if **Failback** mode is set to **ON**.

Each current configuration parameter is displayed gradually and can be modified by entering the new value for this parameter. The value remains unchanged if the operator presses "Enter".

In the example below, **Failback** mode is set to **ON**.

```
***********************
* Update configuration *
***********************
Master PC (1) or Slave PC (0)? [1] :
Master IP Address? [10.102.43.123] :
Master Hostname [master] :
Slave IP Address? [10.102.43.124] :
Slave Hostname? [slave] :
Virtual IP address? [10.102.43.125] :
Virtual IP netmask? [24] :
```

⚠ **CAUTION:** **Enter the prefix value of the mask. For example, the prefix 24 corresponds to mask 255.255.255.0 See the Section Mask/prefix conversion for the table of correspondence.**

```
Do you want a 2nd IP address?: Yes(1) or No(0) ? [0] :
Redundancy: LAN(0) or WAN(1)? [0] :
Master Ethernet board for redundancy? [eth0] :
Slave Ethernet board for redundancy? [eth0] :
Ethernet board for applications? [eth0] :
Do you want to ping an IP address: Yes(1) or No(0) ? [1] :
IP address to ping? [10.102.43.254] :
Master partition? [hda5] :
Slave partition? [hda5] :
Heartbeat deadtime (in seconds)? [10] :
Failback auto = ON/OFF? [OFF] :ON
Stop system log recorder:            [  OK  ]
Start system log recorder :       [  OK  ]
***********************
* Stop Heartbeat      *
***********************
Stopping High-Availability services: Done.
***********************
* Starting DRBD       *
***********************
Reloading DRBD configuration: .
***********************
* Starting Heartbeat  *
***********************
Starting High-Availability services: Done.
Please wait Heartbeat initialization ....
Configuring heartbeat / pacemaker ...
-> Edit CRM config
-> Edit all resources
-> Edit all constraints
```

📝 **Note:** **Stopping the heartbeat service may be take several minutes.**

3.8.2 MODIFYING REDUNDANCY SETTINGS ON THE SLAVE MIVOICE 5000 MANAGER PC

Before running the redundancy update script:

- Check that the **NetworkManager** service has actually stopped.

- Enter the command:

  # service NetworkManager status

The answer must be > **NetworkManager stopped**.

If not, see Section 6.1. DISABLING NetworkManager

The redundancy parameters modification must be started from the directory **/duplication**.

- Go to the directory **/duplication**.

- Run the redundancy modification script:

  # ./update_redondance.script

The software **DRBD** and **Heartbeat** are stopped then restarted at the end of the script, which triggers an automatic return to the master MiVoice 5000 Manager PC if **Failback** mode is set to **ON**.

Each current configuration parameter is displayed gradually and can be modified by entering the new value for this parameter. The value remains unchanged if the operator presses "**Enter**".

In the example below, **Failback** mode is set to **ON**.

```
***********************
* Update configuration *
***********************
Master PC (1) or Slave PC (0)? [0] :
Master IP Address? [10.102.43.123] :
Master Hostname [master] :
Slave IP Address? [10.102.43.124] :
Slave Hostname? [slave] :
Virtual IP address? [10.102.43.125] :
Virtual IP netmask? [24] :
```

⚠️ **CAUTION:** **Enter the prefix value of the mask. For example, the prefix 24 corresponds to mask 255.255.255.0 See the Section Mask/prefix conversion for the table of correspondence.**

```
Do you want a 2nd IP address?: Yes(1) or No(0) ? [0] :
Redundancy: LAN(0) or WAN(1)? [0] :
Master Ethernet board for redundancy? [eth0] :
Slave Ethernet board for redundancy? [eth0] :
Ethernet board for applications? [eth0] :
Do you want to ping an IP address: Yes(1) or No(0) ? [1] :
IP address to ping? [10.102.43.254] :
Master partition? [hda5] :
Slave partition? [hda5] :
Heartbeat deadtime (in seconds)? [10] :
Failback auto = ON/OFF? [OFF] :ON
```

```
Stop system log recorder:            [  OK  ]
Start system log recorder :          [  OK  ]
***********************
* Stop Heartbeat        *
***********************
Stopping High-Availability services: Done.
***********************
* Starting DRBD         *
***********************
Reloading DRBD configuration: .
***********************
* Starting Heartbeat    *
***********************
Starting High-Availability services: Done.
Please wait Heartbeat initialization ....
Configuring heartbeat / pacemaker ...
-> Edit CRM config
-> Edit all resources
-> Edit all constraints
```

3.8.3 CHECKING THE REDUNDANCY STATUS OF THE MASTER MIVOICE 5000 MANAGER PC

The following checks must be made on the **master** Manager PC:

- Check that **DRBD** synchronisation is up to date: run the command **cat /proc/drbd**.

- Check the status of the virtual address, using the **ifconfig** command. This latter must be activated.

- Check the mounting of the partition to be made redundant using the **mount** command, which must be implemented on the device **/dev/drbd0**.

3.8.4 REGENERATING THE INSTALLATION CODE AND LICENCE

This phase must be implemented for systems with a virtual (logical) dongle if the virtual IP address has been modified.

See Section 3.5.

3.9 MODIFYING THE PHYSICAL IP ADDRESSES OR HOST NAME OF MIVOICE 5000 MANAGER PCS

This procedure applies, if required, on an already working redundant MiVoice 5000 Manager platform; modify the physical IP addresses or host name of the PCs to adapt them to the client network configuration.

Concerning the modification of the virtual IP address, proceed as described in Section 4.7 - Modifying the General redundancy settings.

Note: Concerning the modification of the virtual IP address, proceed as described in Section 3.8 Modifying the general redundancy parameters.

Modifying the IP settings of the Ethernet access consists in modifying the network interface configuration text files, by entering:

- The IP address
- The Subnet mask
- The Gateway IP address.

The PC hostname is modified in the OS settings.

Before making any modification, first stop the MiVoice 5000 Manager resources (stop heartbeat).

For more information about these operations procedure, see Chapter in question. then continue this procedure.

Note: Redundancy stops working after the IP addresses are modified. Nevertheless, the two PCs must see each other via a "ping".

Once modified, the following settings must be taken into account in the redundancy-settings update procedure described in Section 4.7 - Modifying the General redundancy settings:

- Master IP Address: new IP address of the master PC
- Master hostname: new host name of the master PC
- Slave IP Address: new IP address of the slave PC
- Slave hostname: new host name of the slave PC
- IP address to ping: new test IP address for testing the network status (if used)

If the IP address is modified, the **master** and **slave** licences must be regenerated.

See Section 3.5.

The procedure is now complete.

4 UPGRADING A REDUNDANT MIVOICE 5000 MANAGER

The different types of upgrades to R3.x (x ≥ 3) considered are:

- Upgrading a configuration from ≥ V3.3 to R3.x (x ≥ 3), (with or without updating the patches).

- Upgrading a configuration from < V3.3 to V3.x (x ≥ 3). In this case an upgrade is mandatory, with full reinstallation of CentOS 7.x. See document AMT/PTD/PBX/0168.

4.1.1 CASE OF UPGRADE REQUIRING A REMOTE ACCESS

When the installer cannot intervene locally on the physical or virtual machines via the graphic interface, it is necessary to set up an SSH session with the master and slave machines.

Any command or execution must then be performed on command lines (Linux).

These are also indicated in the various procedures if necessary.

For a remote access, connection must be via the IP address of the physical machine, and not via the virtual IP address which remains inaccessible.

4.1 UPGRADING A CONFIGURATION FROM ≥ V3.3 TO R3.X (X ≥ 3)

This procedure applies, if necessary, on an already operational redundant MiVoice 5000 Manager ≥ V3.3 platform; upgrade this latter with a new MiVoice 5000 Manager software V3.x (x ≥ 3) containing some anomaly corrections or functional upgrades.

The application is upgraded while retaining the installed operating system.

Initial status

- CentOS 7.x

- MiVoice 5000 Manager ≥ V3.3

- Active "master" server

Final status

- Operating system not changed

- MiVoice 5000 Manager V3.x (x ≥ 3), new release in this same range

- Active "master" server

Security patches:

Depending on the case:

- Not installed in the initial state > Patches must be installed.

- Installed in the initial state but not up to date (a more recent release is available) > Patch upgrade is optional.

- Installed in the initial state and up to date compared to the most up-to-date release available > No patch update.

4.1.1 MAIN PHASES

- Back up the configuration on an external device.

- Check that DRBD synchronisation is working on the **master** PC (command: **cat /proc/drbd**).

- Check that the redundant partition is active on /dev/drbd0 on the **master** PC (command: **ifconfig and mount**)

- Upgrade the **master** MiVoice 5000 Manager PC software.

- Upgrade Nagios Extended Status Map on the **master** MiVoice 5000 Manager PC.

- Switch over to the **slave** MiVoice 5000 Manager PC.

- Check that DRBD synchronisation is working on the slave PC (command: **cat /proc/drbd**).

- Check that the redundant partition is active on /dev/drbd0 on the slave PC (command: **ifconfig and mount**)

- Upgrade the **slave** MiVoice 5000 Manager PC software.

- Upgrade Nagios Extended Status Map on the **slave** MiVoice 5000 Manager PC.

- Return to the **master** PC.

- Install MiVoice 5000 Manager clients

- Check the status of licences on the **master** MiVoice 5000 Manager PC.

- Check the status of licences on the **slave**MiVoice 5000 Manager PC.

- Upgrade the operating system security patches (if necessary).

Each phase is described in detail in the sections below.

4.1.2 PRELIMINARY CHECKS ON THE MASTER PC (SYNCHRONISATION AND REDUNDANT PARTITION)

Before upgrading the software on the master MiVoice 5000 Manager PC, first perform the following checks:

Check that DRBD synchronisation is up to date: run the command **cat /proc/drbd**.

cs:Connected st: Primary/Secondary ds:UpToDate/UpToDate

Check the status of the virtual address, using the **ifconfig** and **mount** commands. This must be active, and the redundant partition moved to device **/dev/drbd0**.

Note: For certain server types, especially HP servers, the server needs to be restarted so the partition /dev/drbd0 on /opt/a5000 is mounted and so cat /proc/drbd becomes Primary/Unknown.

4.1.3 UPGRADING THE MASTER MIVOICE 5000 MANAGER PC SOFTWARE

- Log on to the master PC with the **root** account and the password **Mitel5000.**

➢ **From the CD/DVD:**

- Define a mount point:

    #mkdir /mnt/iso

- Insert the CD/DVD and enter:

    mount /dev/cdrom /mnt/iso

➢ **From the iso file:**

- Define a mount point:

    #mkdir /mnt/iso

- Retrieve the iso image **CD_7450_70-RC-A-XX_YY.iso** from the Mitel Website and copy it in the directoty **/tmp**,

- Mount the iso image in the directory **/mnt/iso**,

    #mount -o loop /tmp/CD_7450_70-RC-A-XX_YY.iso /mnt/iso

- In this directory, start **autorun**

    ./autorun

- Select the IP address to use: **2** corresponding to the virtual address.

- At the end of the installation, enter "**q**" to quit

- Go to the directory **CUSTOM_NAGIOS** on the CD-ROM.

    [root @ miv5000manager] #

- Type the command "./**install**"

- The installation of NAGIOS is then launched

- Wait for the message **End of installation**

- Unmount the DVD:

    #CD

    #umount / mnt / iso

4.1.4 SWITCHING OVER TO THE SLAVE MIVOICE 5000 MANAGER PC

Before switching over to the slave manager PC, please wait for the supervision data initialisation messages in the operating log:

Waiting for the message "**Successful reset of supervision data**".

This operation consists in activating the virtual address on the slave MiVoice 5000 Manager PC and deactivating the virtual address on the master MiVoice 5000 Manager PC.

On the **master** PC desktop, double-click the shortcut "**Change to slave**".

In SSH Access mode:

On the **master** PC

Go to the tree [**root@MiVoice 5000 Manager]# cd /opt/duplication/files/**

Run the script on the master PC:

root@..../files]# ./hb_standby

This operation also restarts the MC service on the **slave** MiVoice 5000 Manager PC if a new service is available.

4.1.5 PRELIMINARY CHECKS ON THE SLAVE PC (SYNCHRONISATION AND REDUNDANT PARTITION)

Before upgrading the software on the **slave** MiVoice 5000 Manager PC, first perform the following checks:

Check that **DRBD** synchronisation is up to date: run the command **cat /proc/drbd**.

cs:Connected st: Primary/Secondary ds:UpToDate/UpToDate

Check the status of the virtual address, using the **ifconfig** and **mount** commands. This must be active, and the redundant partition moved to device **/dev/drbd0**.

Note: For certain server types, especially HP servers, the server needs to be restarted so the partition /dev/drbd0 on /opt/a5000 is mounted and so cat /proc/drbd becomes Primary/Unknown.

4.1.6 UPGRADING THE SLAVE MIVOICE 5000 MANAGER PC SOFTWARE

- Log on to the slave PC with the **root** account and the password **Mitel5000.**

➢ **From the CD/DVD:**

- Define a mount point:

    #mkdir /mnt/iso

- Insert the CD/DVD and enter:

    mount /dev/cdrom /mnt/iso

➢ **From the iso file:**

- Define a mount point:

    #mkdir /mnt/iso

- Retrieve the iso image **CD_7450_70-RC-A-XX_YY.iso** from the Mitel Website and copy it in the directoty **/tmp**,

- Mount the iso image in the directory **/mnt/iso**,

    #mount -o loop /tmp/CD_7450_70-RC-A-XX_YY.iso /mnt/iso

- In this directory, start **autorun**

     ./autorun

- Select the IP address to use: **2** corresponding to the virtual address.

- At the end of the installation, enter "**q**" to quit

- Go to the directory **CUSTOM_NAGIOS** on the CD-ROM.

     [root @ miv5000manager] #

- Type the command "./**install**"

- The installation of NAGIOS is then launched

- Wait for the message **End of installation**

- Unmount the DVD:

     #CD

     #umount / mnt / iso

4.1.7　RETURNING TO THE MASTER PC

On the **master** PC

Go to the tree [**root@MiVoice 5000 Manager]# cd /opt/duplication/files**/

Run the script on the **master** PC:

   root@..../files]# ./hb_takeover

4.1.8   INSTALLING MIVOICE 5000 MANAGER CLIENTS

Refer to the document AMT/PTD/NMA/0040 version 11/2 minimum.

4.1.9   ENTERING LICENCES

The licence associated with this dongle is obtained from an installation code to be generated during first installation from MiVoice 5000 Manager, in **Menu Administration>Unlock functions**.

This installation code is then used, by logging on to a dedicated server, to generate the actual licence which must be entered in the key field of this same menu.

Note: It is better to use Internet Explorer to access the MiVoice 5000 Manager portal; this will make it easier to copy the values required to generate the licence. See installation code below.

CAUTION: In case of switchover to the slave MiVoice 5000 Manager PC, all the licences, including the redundancy licence, are seen as open on this PC, with a 30 days validity period displayed in the Validity column.

If the master MiVoice 5000 Manager PC is active, the Validity column does not appear on the table indicating the licences.

If the slave MiVoice 5000 Manager PC becomes active after a switchover, the licences are only valid for 30 days. As from D-7, a message is displayed daily in the operations log reminding the administrator that the licences will soon expire.

The message "Operation on secondary server" appears on the welcome page of the slave MiVoice 5000 Manager PC when this latter is active.

The detailed procedure is as follows:

From the master MiVoice 5000 Manager PC:

In the menu **Administration>Unlock functions**:

- Check that the **duplex** box has been ticked.

- Click **Dongle** (Master Key field).

In the **Configuration of a virtual dongle** window:

- Check the Virtual dongle ID (provided by MiVoice 5000 Manager, example 03FF01XXXXXXXXX).

- Check the MiVoice 5000 Manager virtual IP address.

- Fill in the reference ID field corresponding to the dongle ID of any of the iPBXs managed by MiVoice 5000 Manager.

CAUTION: All these fields must be filled in.

- Click **Generate code**.

- Click **OK** to confirm the generation.

- The **Installation code** frame indicates the installation code value. Copy this code (to a .txt file for example).

- Click **OK** to close the window.

Switch over to the slave MiVoice 5000 Manager PC:

- On the **master** MiVoice 5000 Manager PC desktop, double-click the shortcut "**Change to slave**".

In the menu **Administration>Unlock functions**:

- Click **Dongle** (duplication Key Field).

- Check the Virtual dongle ID (provided by MiVoice 5000 Manager, example 03FF01XXXXXXXXX).

- Check the MiVoice 5000 Manager virtual IP address.

- Fill in the reference ID field corresponding to the dongle ID of any of the iPBXs managed by MiVoice 5000 Manager.

⚠ **CAUTION:** **All these fields must be filled in.**

- Click **Generate code**.

- Click **OK** to confirm the generation.

- The **Installation code** frame indicates the installation code value. Copy this code (to a .txt file for example).

- Click **OK** to close the window.

- Log on to the licence server **https://support.mitel.fr/akop/external.php** then enter these two installation codes.

This server then generates the actual licence for the functions specified during the order and also the redundancy licence.

- Save these licences using the .**txt file export** link.

Returning to the **master** MiVoice 5000 Manager PC:

- On the **slave** MiVoice 5000 Manager PC desktop, double-click the shortcut "**change to master**".

- Return to the same menu **Administration>Unlock functions**.

- Delete the previous licence in the **Master key** field.

- Enter the licences needed by the client in the **Master key** field of this same menu, then click **Validate**.

A new frame is displayed underneath, indicating the locked functions.

- Delete the previous licence in the **Duplication key** field.

- Enter the redundancy licence in the **Duplication key** field of this same menu, then click **Validate**.

A new frame is displayed underneath, indicating the locked functions. The functions in question are then authorised, as well as the redundancy function.

It is advisable to store these two licences in a text file.

⚠ **CAUTION:** **The installation code is changed during each generation, even if no information has been changed (OS, MiVoice 5000 Manager, IP, dongle).**

- If in future the characteristics of the IP address and IID number system are modified, the installation code must be regenerated.

Checking the validity of the logical dongle

A check is made periodically on the following parameters:

- MiVoice 5000 Manager ID (dongle number)

- MiVoice 5000 Manager IP address

- MiVoice 5000 Manager MAC address

- Reference ID of an iPBX managed by MiVoice 5000 Manager.

Modifying any of these parameters results in immediate expiration of the licence and closes all the functions.

- The Reference ID must correspond to a dongle ID of an (unlocked) iPBX generated by MiVoice 5000 Manager, or else the MiVoice 5000 Manager licence will expire 30 days after the wrong information is detected.

- If the reference ID corresponds but this iPBX is not accessible (off or disconnected from the network),

- the MiVoice 5000 Manager licence expires 30 days after the absence of the iPBX is detected.

- Precautions for use

- The installation code is unique, and the generated keycode can only work with an installation code.

- If an installation code is generated without obtaining a new keycode, the functions subject to a licence are closed within one hour.

- To manage different cases requiring a change of installation code during the system's service life without first asking Mitel for an authorisation.

- After this change, you will no longer have the right to make any modification, you must contact Aastra to indicate your reasons for this change (user modification, physical replacement of the platform, network modification, etc.).

- After analysing your request, you will again be authorised to modify the installation code.

- During a consultation on the AKOP licence server ("search for a key"), the right to modify the installation code on the identification number concerned is indicated via the following information:

- Modification of installation code **allowed**

- Modification of installation code **not allowed**.

4.1.10 UPDATING THE OPERATING SYSTEM SECURITY PATCHES

Depending on the case:

- Not installed in the initial status > Patches must be installed with the most recent version.

- Installed in the initial state but not up to date (a more recent release is available on MITEL Extranet) > Patch upgrade is optional.

- Installed in the initial state and up to date compared to the most up-to-date release available > No patch update.

If new patches have been provided on the Extranet, update the security patches to 7.x starting with the (active) master PC.

See document AMT/PTD/NMA/0062 on security patches for the range concerned.

The upgrade process has been completed.

5 REINSTALLATION OF A REDUNDENT SYSTEM

5.1 REINSTALLING THE SLAVE SERVER

Save the MiVoice 5000 Manager configuration

Disconnect the slave server from the network

Install CentOS 7.x

Install the redundancy

- o ./install_redondance.script
- o In master mode
- o No ping

Install the MV5000 Server

Start the redundancy

- o ./start_redondance.script

Update the redundancy

- o ./update_redondance.script

Reactivate the slave mode

- o Activate the ping if necessary

Stop the redundancy

- o pcs cluster stop --force

Reset the DRBD

- o drbdadm create-md r0
- o drbdadm invalidate r0

Reconnect the network

- Start the redundancy
  - o pcs cluster start
  - o Check the DRBD synchronization (cat /proc/drbd)
  - o Check that synchronisation is working well (crm_mon)

Finalization

- Once the synchronization is complete, run a switchover on the slave server
- Generate the new installation code and enter the license
- Return to the master.

5.2 REINSTALLING THE MASTER SERVER

Save the MiVoice 5000 Manager configuration

Disconnect the slave server from the network

Install CentOS 7.x

Install the redundancy

- o ./install_redondance.script
- o No ping

Install the MV5000 Server

Start the redundancy

- o ./start_redondance.script

Update the redundancy (optional)

- o ./update_redondance.script (activate ping if necessary)

Reactivate the slave mode

- o Activate the ping if necessary

Stop the redundancy

- o pcs cluster stop --force

Reset the DRBD

- o drbdadm create-md r0
- o drbdadm invalidate r0

Reconnect the network

- Start the redundancy
  - o pcs cluster start
  - o Check the DRBD synchronization (cat /proc/drbd)
  - o Check that synchronisation is working well (crm_mon)

Finalization

Once the synchronization completed, run a switchover on the master server

On the slave server, run a switchover to master.

/opt/duplication/files/hb_standby

- Generate the new installation code and enter the license

6 APPENDICES

6.1 DISABLING NETWORKMANAGER

In bonding mode, it is necessary to first deactivate the graphic interface of Ethernet access management.

Upon prompt, type in the following commands:

 # service NetworkManager stop

 # chkconfig NetworkManager off

6.2 DISABLING HEARTBEAT

It is necessary to first temporarily disable the MiVoice 5000 Manager resources. This will possibly move the resources to another PC.

Upon prompt, type in the following command:

 # pcs cluster stop

Note: **Stopping the heartbeat service may be take several minutes.**

6.3 CONFIGURING THE FIREWALL

If the firewall is activated, the following ports must be open on each machine:

- Port 7788 TCP : DRBD
- Port 5405 UDP : Corosync

6.4 MASK/ADDRESS PREFIX CONVERSION

Netmask Address Prefix Length

Netmask Address	Prefix Length
255.255.255.255	/32
255.255.255.254	/31
255.255.255.252	/30
255.255.255.248	/29
255.255.255.240	/28
255.255.255.224	/27
255.255.255.192	/26
255.255.255.128	/25
255.255.255.0	/24 (Class C)
255.255.254.0	/23
255.255.252.0	/22
255.255.248.0	/21
255.255.240.0	/20
255.255.224.0	/19
255.255.192.0	/18
255.255.128.0	/17
255.255.0.0	/16 (Class B)
255.254.0.0	/15
255.252.0.0	/14
255.248.0.0	/13
255.240.0.0	/12
255.224.0.0	/11
255.192.0.0	/10
255.128.0.0	/9
255.0.0.0	/8 (Class A)
254.0.0.0	/7
252.0.0.0	/6
248.0.0.0	/5
240.0.0.0	/4
224.0.0.0	/3
192.0.0.0	/2
128.0.0.0	/1
0.0.0.0	/0 (The Internet)

1.1 Mask/address prefix conversion

Netmask Address	Prefix Length
255.255.255.255	/32
255.255.255.254	/31
255.255.255.252	/30
255.255.255.248	/29

255.255.255.240   /28

255.255.255.224   /27

255.255.255.192   /26

255.255.255.128   /25

255.255.255.0   /24 (Class C)

255.255.254.0   /23

255.255.252.0   /22

255.255.248.0   /21

255.255.240.0   /20

255.255.224.0   /19

255.255.192.0   /18

255.255.128.0   /17

255.255.0.0   /16 (Class B)

255.254.0.0   /15

255.252.0.0   /14

255.248.0.0   /13

255.240.0.0   /12

255.224.0.0   /11

255.192.0.0   /10

255.128.0.0   /9

255.0.0.0   /8 (Class A)

254.0.0.0   /7

252.0.0.0   /6

248.0.0.0   /5

240.0.0.0   /4

224.0.0.0   /3

192.0.0.0   /2

128.0.0.0   /1

0.0.0.0   /0 (The Internet)